

NX-5000 series

DMR Function Reference (DMR FUNC)

Version:	5.30
Last Updated:	October 29, 2025
Language:	English
Type:	K, F

About This Manual.....	viii
How to Read the In-depth Manual.....	ix
About Notations	ix
About the Notation of the Supported Models.....	x
About Examples of the Transceiver Display.....	x
About the Configuration of the Communication Port	x
Abbreviations Used in This Document	xi
About Copyright.....	xii
Software Copyrights	xii
Firmware Copyrights	xii
About Trademarks and Patent Rights.....	xiii
About the Programming Software.....	xiv
About KPG-D1N	xiv
About the Notation of "Configuration Using KPG-D1/ D1N"	xiv
About the Zone-channel Format.....	xiv
About System Type	xv
About Multi RF Deck/ Multi Control Head	xv
About Options to Use the Functions Described in This Document	xvi
About the Built-in GPS Receiver Unit	xviii
How to Search for Information	xviii
Revision History.....	xx

CONTENTS BY PURPOSExxvi

1 DMR CONVENTIONAL SYSTEM1

1.1 Initiating Voice Communications (Basic Transmission and Reception)	2
About Own ID	2
About Communication Security (Encryption).....	2
Receiving	2
Auto Reset Timer	3
Selective Call Alert LED	3
Optional Signaling LED.....	4
Over-the-Air Alias.....	4
Participating in an On-going Voice Call Midway Through the Call (Late Entry)	5
Searching Whether the Transceiver Receives a Call (Scan)	5
Transmitting.....	5
Restricting the Continuous Transmission Duration (Time-out Timer)	6

Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))	8
Using a Channel Being Used by Other Parties (BCL Override).....	9
Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode)	10
Communicating via a Repeater (Repeater Mode).....	12
About the Slot Numbers (Slot Selection)....	12
Auto Slot Select.....	13
1.2 Using the Signaling	14
Sharing the Same Channel (Frequency) by Several Groups (Color Code)	14
1.3 Waiting for Both Digital Signals and Analog Signals (Mixed Mode)	15
1.4 Using DMR ID to Initiate a Selective Call.....	17
Available Calls.....	17
Transition for Each Mode	17
1.5 Making an Individual Call.....	19
Initiating an Individual Call	19
Receiving an Individual Call	22
Individual ID List	24
Restricting IDs for Which the Transceiver Can Initiate a Call (Individual ID Encode Block)	25
Sending the Received Unit ID from the Communication Port (Unit ID Serial Output)	25
1.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)	26
Initiating an Individual Call (Individual Call Acknowledge Request).....	27
Receiving an Individual Call (Individual Call Acknowledge Request).....	29
Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone).....	31
Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)	31
1.7 Making a Group Call.....	32
Initiating a Group Call.....	32
Receiving a Group Call	33
Group ID List	35
Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)	35
Group ID Scan (DMR)	36
Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only))	37

Avoiding Receiving a Group Call during an Incoming Individual Call (Ignore Group Call during Individual Call)	37	Receiving a Long Message	63
1.8 Making an Informative Group Call (Broadcast Group Call)	38	Long Message on Data Zone-Channel	64
Initiating a Broadcast Call	38	Long Message on Data System-Personality	64
Receiving a Broadcast Group Call	39	1.13 Communicating with a Telephone (Telephone Call)	65
1.9 Common Functions for Data Communications	40	Initiating a Telephone Call	65
Number of Retries	40	Receiving a Telephone Call	71
Transmit Busy Wait Time	40	1.14 Sending a DTMF Code	72
Maximum ACK Wait Time	40	Sending the DTMF Code While Transmitting (Manual Dialing)	73
Preamble Length	41	Sending the DTMF Code by Pressing a Key on the Keypad without Using the PTT Switch (Keypad Auto PTT)	73
1.10 Sending and Receiving a Status Message (Status Call)	41	Sending Entered DTMF Codes All at Once (Store and Send)	74
Sending a Status Message	42	Sending a DTMF Code by Selecting from a List (Autodial List)	76
Receiving a Status Message	46	Sending the DTMF Code with a Single Touch (Call 1 Key to Call 6 Key)	77
About the Behavior When a Message Requesting the Status Transmission Is Received	47	Redialing	78
Status List	48	Functions Related to DTMF Code Encoding	78
Status Message Stack	48	Using Autodial List	82
Status Message on Data Zone-Channel	49	Editing the Autodial List with the Transceiver (Autodial Programming)	82
Status Message on Data System-Personality	49	1.15 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode)	86
Sending the Received Status Message from the Communication Port (Status Message Serial Output)	50	1.16 Calling All Transceivers Having the Same Color Code (Unaddressed Call)	88
Power-on Status Message	50	Displaying the ID of the Communicating Caller on the LCD (Caller ID Display)	89
Power-off Status Message	51	1.17 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)	90
Base ID	51	Sending a Call Interruption Request Message	91
Emergency Status Response	53	Receiving a Call Interruption Request Message	94
AUX Input Status Message (Mobile Only)	53	1.18 Sending GPS Data	95
AUX Output Status Message (Mobile Only)	54	Transmission Method of GPS Data	95
Storing the Selected or Sent Status (Status Hold)	54	The ID of the Target Transceiver (GPS Base ID)	96
1.11 Sending and Receiving a Short Message (Short Data Call)	55	Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)	96
DMR Message Communication Configuration (DMR Message Type)	55	Sending GPS Data According to the Request from the Base Station (GPS Report Mode)	97
Sending a Short Message	56	Sending GPS Data Manually by Using a Key (Send the GPS Data)	97
Receiving a Short Message	59	Sending GPS Data Together With Status Call (GPS Combination)	98
Short Message Stack	60		
Short Message on Data Zone-Channel	60		
Short Message on Data System-Personality	61		
Sending the Received Short Message from the Communication Port (Short Message Serial Output)	61		
1.12 Sending and Receiving a Long Message (Long Data Call)	62		
Sending a Long Message	62		

Sending GPS Data Together With Emergency Call (GPS Combination)	98
Sending GPS Data during Voice Communications (GPS Report with Voice).....	99
Sending GPS Data Based On Travel Distance (GPS Distance Change)	100
Selecting the Transmission Method of GPS Data (GPS Report Channel)	101
1.19 GPS Functions	102
Number of Times.....	102
GPS Report Interval Time	102
GPS Time Mark	103
GPS Message Type.....	103
GPS Report on Data Zone-Channel	104
GPS Report on Data System-Personality	104
GPS Report Back to Requested ID	105
GPS Data Storage.....	105
1.20 Receiving GPS Data.....	106
Map Header.....	106
GPS Position Display	107
1.21 Remote Operation by Radio Communication (Remote Control).....	107
Sending a Remote Control Message in Remote Control Mode.....	108
Disabling the Transceiver Capability by Remote Control (Stun/ Kill)	111
Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor).....	112
Checking Whether Another Transceiver Is in Operation (Radio Check).....	113
1.22 Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming).....	114
Site Roaming Behaviors.....	115
Behavior in Asynchronous State	118
Moving to Other Sites that Allow Synchronization with the Repeater (Manual Site Hunt).....	120
Site Roaming LED.....	122
Site Roaming Link Delay Time	123
Dropout Delay Time (Site Roaming).....	123
Dwell Time	123
Quick Site Roaming Level	124
Standard Site Roaming Level	124
Site Roaming Resume Level.....	125
Off-hook Site Roaming.....	125
1.23 Out of Range Indicator.....	126
1.24 Indoor Location	128
BLE Report on Data Zone-Channel/ Data System-Personality (Indoor Location)	128

The ID of the Target Transceiver (BLE Base ID (Indoor Location))	129
Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))	129
Sending the BLE Data Linked With the Configured Mode (BLE Combination (Indoor Location))	131
Sending the BLE Data With the Timing of Automatic Transmission Configured (BLE Report Mode (Indoor Location))	133
Number of Times (Indoor Location)	136
BLE Report Interval Time (Indoor Location).....	136
BLE Time Mark (Indoor Location).....	137
BLE Report Back to Requested ID (Indoor Location).....	138
Sending BLE Data during Voice Communications (BLE Report with Voice)	139
Map Header (Indoor Location)	141

2 DMR-BASED TRUNKING SYSTEM..... 142

2.1 Initiating Voice Communications (Basic Transmission and Reception).....	152
About Own ID.....	152
About Communication Security (Encryption).....	152
Receive	153
Auto Reset Timer.....	153
Selective Call Alert LED	154
Optional Signaling LED.....	154
Over-the-Air Alias.....	155
Receiving a High-priority Call (Priority Monitor ID)	156
Participating in an On-going Voice Call Midway Through the Call (Late Entry)	158
Searching Whether the Transceiver Receives a Call (Scan)	159
Transmitting.....	159
Restricting the Continuous Transmission Duration (Time-out Timer)	159
Avoiding Interference with Other Communications (Busy Channel Lockout).....	160
2.2 Control Channel Hunt (Control Channel Hunt)	161
Passive Scan	168
System Search Policy	169
Composite Control Channel	169
Retaining the Information of the Control Channel Used When the Transceiver is Turned OFF (Last Control Channel)	170
Out of Range Indicator.....	171

2.3	Configuring the Length of Time to Retain the In Service State (Beacon Interval Time).....	172
2.4	Registration in a DMR-based Trunking System.....	173
	Registering the Own Unit ID in a System (Registration)	174
	Registering the Group ID Used by the Own Transceiver in a System (Group Subscription)	177
	Clearing the Registration Information from a System (De-registration)	178
	Authentication Function of a System and Transceiver (Authentication)	179
2.5	Using IP Bearer Service	180
	Confirming Whether the Transceiver Is in Operation (ICMP Echo).....	181
	IP Based Packet Data.....	182
	DMR IP Addressing	182
2.6	Using DMR ID to Initiate a Selective Call.....	183
	Available Calls.....	183
	Transition for Each Mode	183
2.7	Making an Individual Call.....	183
	Initiating an Individual Call	184
	Receiving an Individual Call	189
	Individual ID List	193
	Restricting IDs for Which the Transceiver Can Initiate a Call (Individual ID Encode Block)	194
	Sending the Received Unit ID from the Communication Port (Unit ID Serial Output)	194
	Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)	195
	Preventing the Automatic Assignment of a Traffic Channel (FOACSU)	196
2.8	Making a Group Call.....	197
	Initiating a Group Call.....	197
	Receiving a Group Call	199
	Group ID List	201
	Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)	202
	Group ID Scan.....	202
	Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only))	203
	Preventing Reception of a Group Call While the Transceiver Is Receiving an Individual Call (Ignore Group Call during Individual Call)	204
	PTT Hold Inhibit	204
	Initiating Another Call While Receiving a Group Call.....	205
2.9	Making an Informative Group Call (Broadcast Group Call)	206
	Initiating a Broadcast Call	206
	Receiving a Broadcast Group Call.....	208
2.10	Common Functions for Data Communications	209
	Number of Retries	209
	Maximum ACK Wait Time	209
2.11	Sending and Receiving a Status Message (Status Call)	210
2.12	Sending and Receiving a Short Message (Short Data Call)	210
2.13	Sending and Receiving a Long Message (Long Data Call)	210
2.14	Communicating with a Telephone (Telephone Call)	211
	Initiating a Telephone Call.....	211
	Receiving a Telephone Call	216
2.15	Executing Various Communications by Using the Dialing Function	218
	Configurations for Using the Dialing Function.....	218
	Available Dialing Codes.....	220
	Initiating a Communication in Dialing Mode	223
	Initiating a Communication in Redial Mode.....	228
	ID Display upon Receipt	229
2.16	Locking the Site to Be Used (Site Lock).....	231
2.17	Matching a Channel of the Transceiver to a Channel of the System (Control Channel Switching)	232
2.18	Restricting the Communication Time on a Traffic Channel (Traffic Timer).....	233
2.19	Communicating on a Zone-channel in DMR Conventional while Outside the Communication Area (Alternate Zone-Channel)	234
2.20	Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption).....	236
	Sending a Call Interruption Request Message	237
	Receiving a Call Interruption Request Command	239
	Receiving a Call Interruption Forced Command	239

2.21	Notifying the Status of Communications with Other Sites (Network Failure Indicator).....	240	3.3	Zone-channel Functioning in Emergency Mode.....	265
2.22	Sending GPS Data.....	241		Emergency Channel Type.....	265
	Transmission Method of GPS Data.....	241		Emergency Zone-Channel.....	267
	The ID of the Target Transceiver (GPS Base ID)	242	3.4	Automatically Transmitting and Receiving in Emergency Mode.....	267
	Sending GPS Data Automatically at Certain Intervals (GPS Report Mode).....	243		Emergency Cycle.....	267
	Sending GPS Data According to the Request from the Base Station (GPS Report Mode)	244		Duration of Locator Tone 1	267
	Sending GPS Data Manually by Using a Key (Send the GPS Data)	244		Duration of Locator Tone 2	268
	Sending GPS Data Together With Status Call (GPS Combination)	245		Transmit Duration	269
	Sending GPS Data Together With Emergency Call (GPS Combination)	245		Receive Duration	269
	Sending GPS Data during Voice Communications (GPS Report with Voice).....	246		Emergency Microphone Sense.....	269
	Sending GPS Data Based On Travel Distance (GPS Distance Change)	247		Background Transmission	270
	Sending GPS Data Preferentially While Receiving a Group Call (GPS Report Priority (Over Group Call))	247	3.5	Indication and Sound in Emergency Mode.....	270
2.23	GPS Functions	248		Locator Tone	270
	GPS Report Interval Time	248		Emergency Display	270
	GPS Time Mark	249		Emergency Text	271
	GPS Message Type.....	249		Emergency Mode Type	271
2.24	Receiving GPS Data.....	249		Emergency LED	272
	Map Header.....	250		Surveillance Mode	273
	GPS Position Display	250	3.6	ID Sent When Emergency Mode is Activated	274
2.25	Remote Operation by Radio Communication (Remote Control).....	251		Emergency ID	274
	Sending a Remote Control Message in Remote Control Mode.....	251		Emergency DMR ID Type	275
	Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor).....	257		Emergency DMR ID	275
	Checking Whether Another Transceiver Is in Operation (Radio Check)	258	3.7	Indication When Receiving Emergency Call	276
	Disabling the Transceiver Capability by Remote Control (Stun/ Kill)	259	3.8	Other Functions in Emergency Mode.....	277
				Emergency Channel Lock	277
				Suspended Power-off.....	277
			3.9	Placing the Transceiver in Emergency Mode Using the Lone Worker Function.....	278
				Enabling the Transceiver in Lone Worker Mode/Disabling Lone Worker Mode.....	278
				Functions in Lone Worker Mode.....	280
			3.10	Placing the Transceiver in Emergency Mode by Using the Activity Detection Function...	282
				Man-down Detection	283
				Stationary Detection.....	284
				Motion Detection.....	284
				Using Man-down Detection and Stationary Detection Simultaneously (Man-down with Stationary)	285
			3.11	Transceiver Behavior When the Transceiver Receives an Emergency Status	285
3	COMMUNICATIONS IN AN EMERGENCY	260	4	COMMUNICATION SECURITY.....	286
3.1	Placing the Transceiver in Emergency Mode.....	260			
	Interrupt Emergency CALL.....	262			
	Emergency Alarm.....	262	4.1	Toggling the Encryption during Transmission between Enabled and Disabled	288
3.2	Configuration Related to Transmission and Reception in Emergency Mode	264			

4.2	Configuring the Encryption Key Data Used for Communications.....	289
4.3	Transceiver Behavior upon Receipt of Encrypted Communication Data	291
	Behavior when Data Received Cannot be Properly Decrypted	292
	About the Behavior of the Encryption Icon	293
	About the Behavior of the LED (Secure Indicator) (DMR-based Trunking System Only)	294
4.4	Secure Cryptographic Module (SCM) (for AES/ DES Only)	294
	Applicable SCMs.....	295
	Key Loader	295
4.5	Built-in DES.....	296
4.6	Enhanced Encryption	297
4.7	Protection Function of Encryption Key (Key Retention)	297
4.8	Deleting the Encryption Key (Key Delete)... ..	299
4.9	Deleting All Encryption Keys (Zeroize)	300
	About the SCM Communication Error Display	303
4.10	Multi-key List.....	303
4.11	Transmit Clear Alert Tone	304
4.12	Scrambler/Encryption Status Memory	304
5	SCAN	305
5.1	Starting the Scan.....	305
5.2	Scanning in One Zone (Single Scan)	306
	Conditions to Activate the Scan (Single Scan).....	307
	Conditions to Resume the Scan (Single Scan).....	307
	Transceiver Behavior in the Case that the Scan Cannot Be Resumed (Single Scan).....	307
5.3	Scan by Registering Multiple Target Channels for Scan in the List (List Scan).....	308
	Conditions to Activate the Scan (List Scan)	309
	Conditions to Resume the Scan (List Scan)	309
	Transceiver Behavior in the Case that the Scan Cannot Be Resumed (List Scan)	310
	Scan List	310
	Changing the Scan List (Scan Program)... ..	311
5.4	Scanning All Target Zones for Scanning (Multi-Zone Scan).....	313
	Conditions to Activate the Scan (Multi-Zone Scan).....	314
	Conditions to Resume the Scan (Multi-Zone Scan).....	314
	Transceiver Behavior in the Case that the Scan Cannot Be Resumed (Multi-Zone Scan).....	314
5.5	Scanning the Specific Channel Preferentially (Priority Scan).....	315
	Changing the Priority Channel	317
	Lookback	319
	Priority 1 Temporary Delete/Add, Priority 2 Temporary Delete/Add	320
	Scan Normal Channel.....	320
5.6	Transceiver Behavior during the Scan	321
	Transceiver Behavior When a Zone-channel Is Changed during the Scan.....	321
	Reception Behavior during the Scan in a DMR Conventional System.....	321
	Reception Behavior during the Scan in a DMR-based Trunking System.....	321
5.7	Scan Function.....	322
	Adding or Deleting a Channel to/from the Target Channels for Scan (Scan Delete/Add).....	322
	Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add).....	323
	Revert Channel.....	324
	Dropout Delay Time.....	325
	Dwell Time	325
	Channel Recall.....	326
	Priority-channel Stop Tone	326
	Auto Scan	327
	Selected Channel Scan.....	327
	Power-on Scan	328
	Starting Scanning by Linking with the Microphone (Off-hook Scan)	328
	Scan Stop Tone	329
	Preamble Length.....	329
6	DATA COMMUNICATION FUNCTIONS.....	330
6.1	Prioritizing Data Communications Using an External Device (Data Override).....	330
6.2	Restricting the Warning Display during Data Communications (Silent Report)	331
6.3	Transparent	332
	Transmitting Transceiver Behavior	333
	Receiving Transceiver Behavior.....	335
	Timing for Sending and Receiving Data	336
	Transparent	337

7 DIGITAL ENCODE/ DECODE FORMAT 339

7.1 Encode Format.....	343
ALERT num.....	343
AUTR.....	343
BEEP num	344
BLTOF	344
DEL xtime	345
DELL ltime	345
DISPF	345
DISPS	346
ENC enc.....	346
KEYD	347
KEYE.....	347
LEDF.....	348
LEDF2	348
LEDS.....	348
RACK stime dec	349
RAUXA0.....	349
RAUXA1	350
RAUXB0	350
RAUXB1	351
RAUXC0.....	351
RAUXC1	352
REP rep	352
RSML ltime	353
RSMS stime	353
SELCH channel	354
SELGR zone	354
STOPS.....	355
STRTS.....	355
TEXT 'text'	355
TXTOF.....	356
VIB	356
7.2 Decode Format.....	357
ALERT num.....	357
AUTR.....	357
BEEP num	358
BLTOF	358
BLTON	359
CMP #C num.....	360
CMP ^OWNID	360
CMP #G num	361
CMP ^GL.....	361
CMP ^PGL	361
CMP ^ALL.....	362
CMP #S num	362
CMP ^EMG.....	363
CMP ^EOMD	363
CMP ^EOS	364
CMP ^EOM.....	364
CMP ^EOLW	365

CMP ^EMGC	365
DECA dec.....	366
DECAT time dec	366
DECF dec.....	367
DISPF	367
ENCA enc.....	368
HORN.....	368
LEDF.....	369
LEDF2	369
QUEUE	369
REPOF.....	370
VIB	370

8 TASK REQUEST 371

9 KEY OPERATIONS FOR EACH MODE 377

10 BEEP LIST 391

INDEX 395

About This Manual

This manual describes the functions of the NX-5200/ NX-5300/ NX-5400/ NX-5700/ NX-5800/ NX-5900 transceiver operated in the DMR system.

This document is created for the product having the following design specifications.

Item	Specifications	How to Verify
Market Code	K, F	Printed or labeled on the packaging and the model name plate on the transceiver.
Firmware Version of the Transceiver	5.30.00	Can be viewed in the Transceiver Information dialog box of KPG-D1/ KPG-D1N. Or, firmware version of the transceiver can be viewed by the following ways: Portable transceiver: Turning the transceiver on while pressing and holding the Side 3 key causes the firmware version to appear on the display. Mobile transceiver: Turning the transceiver on while pressing and holding the [+] key causes the firmware version to appear on the display. Common to Portable and Mobile: Turning the transceiver on while pressing and holding the Menu ([]) key causes the transceiver to display Radio Mode Selection. Then, if "Transceiver Info" is selected and the Menu ([]) key is pressed, the transceiver enters Transceiver Information Mode, and then the firmware version can be viewed.
Version of KPG-D1/ KPG-D1N	V 5.30	Can be viewed in the About dialog box of KPG-D1/ KPG-D1N.

K, F: Designed for the North American markets.

Also, to use the functions of the DMR system described in this manual, the following Radio Feature Licenses are required:

Function Name	Radio Feature License Name
DMR Conventional ^{*1 *3}	KWD-5300CV
DMR Tier III Trunking	KWD-5301TR
DMR OTAP ^{*2}	KWD-5304AP
Enhanced Encryption	KWD-5500EE
microSD	KWD-5002SD
Multi RF Deck ^{*2 *4}	KWD-5004MR
Secure Cryptographic Module ^{*2}	KWD-5005AE
DES 4 Keys ^{*2}	KWD-5006DE
Remote Control	KWD-5007RC
Indoor Location ^{*5}	KWD-5020-IL

^{*1} Also includes Trunking 2.5 and S-Trunking. (The support for S-Trunking ended in March 2022.)

^{*2} Implemented before the factory shipment.

^{*3} Implemented before the factory shipment for NX-5200S/ NX-5300S/ NX-5700S/ NX-5800S.

^{*4} Cannot be implemented for NX-5200S/ NX-5300S/ NX-5700S/ NX-5800S.

^{*5} Cannot be implemented for NX-5200S/ NX-5300S/ NX-5700/ NX-5800/ NX-5900/ NX-5700S/ NX-5800S/ NX-5600H/ NX-5700H/ NX-5800H.

How to Read the In-depth Manual

The In-depth Manual has the following sections.

Common Function Reference (Common FUNC)

Describes the functions common to the transceivers.

P25 Function Reference (P25 FUNC)

Describes the P25 functions of the transceiver.

NXDN Function Reference (NXDN FUNC)

Describes the NXDN functions of the transceiver.

DMR Function Reference (DMR FUNC)

Describes the DMR functions of the transceiver.

5-tone Function Reference (5-tone FUNC)

Describes the 5-tone functions of the transceiver.

About Notations

The following notations are used in this manual.

[]

The characters in [] indicate the name of the operating portion of each device and the key of the PC.

" " (Double Quotation Mark)

The characters in " " indicate the name of functions, buttons, and menus shown on the FPU.

Bold Letters

The characters in bold letters indicate the names of the FPU functions, panes, sections, dialog boxes, tabs, edit boxes, dropdown lists, and checkboxes.

[] + []

This notation is used for describing functions activated by pressing 2 keys on the PC keyboard at the same time. For example, the notation to enter a capitalized A on the PC is **[Shift]** + **[a]** for pressing the **[a]** key while pressing the **[Shift]** key.

PF (Programmable Function) Key

This function is used for describing the key that is assigned with any function. When the Reset function is assigned to the **[A]** key, the **[A]** key is described as "the Reset key".

Notations for FPU names

KPG-D1 and KPG-D1N are referred to collectively as "KPG-D1/ D1N" in this document.

About the Notation of the Supported Models

This manual describes the supported models according to the following rules:

Model	Notation	
NX-5200	Portable	VHF
NX-5200S ^{*1 *2}		
NX-5300		UHF
NX-5300S ^{*1 *2}		
NX-5400 ^{*2}		700 MHz/ 800 MHz
NX-5700	Mobile	VHF
NX-5700S ^{*1 *2}		
NX-5800		UHF
NX-5800S ^{*1 *2}		
NX-5900 ^{*2}		700 MHz/ 800 MHz

^{*1} Refer to Common FUNC “About NX-5200S/ NX-5300S/ NX-5700S/ NX-5800S” about NX-5200S/ NX-5300S/ NX-5700S/ NX-5800S.

^{*2} A Trunking 2.5 system is not supported.

About Examples of the Transceiver Display

This manual describes mainly by using the display examples of Portable display if the functions are common to the transceivers. The display examples of Mobile display are also described as needed. Also, the display examples of KCH-19 (Basic Panel) display are mainly used as the display examples for Mobile. The display examples of KCH-20R (Featured Panel) are also used as needed.

About the Configuration of the Communication Port

“Data + GPS Data Output” can be configured for the transceiver having firmware version earlier than 5.30.00. “Data + Location Data Output” can be configured for the transceiver having firmware version 5.30.00 or later.

Refer to Common FUNC “Available Functions for COM Port” for the details of the configuration of the communication port.

Abbreviations Used in This Document

The following abbreviations are used in this in-depth manual. Refer to the abbreviation table below.

Abbreviation	Full Spelling or Meaning
ACK	Acknowledgment
AES	Advanced Encryption Standard
AMBE+2	Advanced Multi-Band Excitation
ARC4	Alleged RC4
AUX	Auxiliary
BCL	Busy Channel Lockout
CC	Color Code
CH	Channel
COM port	Communications port
DES	Data Encryption Standard
DMR	Digital Mobile Radio
DQT	Digital Quiet Talk
DTC	Data Transmission Control
DTMF	Dual Tone Multi-Frequency
ESN	Electronic Serial Number
FCC	Federal Communications Commission
FPU	Field Programming Unit
GPS	Global Positioning System
GTC	Go To Channel
ID	Identification
Mic	Microphone
PABX	Private Automatic Branch Exchange
PF	Programmable Function
PSTN	Public Switched Telephone Networks
PTT	Push-to-Talk
QT	Quiet Talk
RSSI	Received Signal Strength Indication
RX	Receive
TOT	Time-out Timer
TX	Transmit
UID	Unit ID
UTC	Universal Time Coordinated
VOX	Voice-operated Transmission

About Copyright

Software Copyrights

All copyrights and other intellectual property rights for this technical document and relevant in-depth manuals as well as the software described in this technical document, relevant in-depth manuals, and help texts and manuals attached to the software are owned by JVCKENWOOD Corporation.

A right to use the software described in this technical document and relevant in-depth manuals is granted to a licensee by JVCKENWOOD Corporation; however, the title to and ownership of the software shall be owned by JVCKENWOOD Corporation. Refer to the help texts attached to this software for details.

JVCKENWOOD Corporation does not warrant that the quality and performance of the software described in this technical document and relevant in-depth manuals conform to the applicability of any use, and JVCKENWOOD Corporation shall be free from liability for any defects, damage or loss, or from any warranty for anything other than what is expressly described in this technical document and relevant in-depth manuals.

Any distribution, resale, lease, waiver, assignment, reproduction or disclosure on a website of all technical manuals written and made by JVCKENWOOD Corporation including but not limited to in-depth manuals, supplements, and help texts attached to the software shall strictly be prohibited.

Firmware Copyrights

The title to and ownership of copyrights for firmware which is described in this technical document, relevant in-depth manuals, and help texts are reserved for JVCKENWOOD Corporation, and the firmware shall be embedded in KENWOOD product memories.

Any modifying, reverse engineering, copying, reproducing or disclosing on an Internet website of the firmware is strictly prohibited without prior written consent of JVCKENWOOD Corporation.

Furthermore, any reselling, assigning or transferring of the firmware is also strictly prohibited without embedding the firmware in KENWOOD product memories.

Firmware is equipped with the AMBE+2™ voice encoding technology under license from Digital Voice Systems.

About Trademarks and Patent Rights

Adobe and Adobe Acrobat are either trademarks of Adobe Systems Incorporated, or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

NXDN™ is a trademark of Icom Incorporated and JVCKENWOOD Corporation.

This product uses the AMBE+2™ voice encoding technology and the technology is protected by intellectual property rights including patent rights, copyrights, and trade secrets of Digital Voice Systems, Inc.

This voice encoding technology is licensed solely for use within this communications equipment.

The user of this technology is explicitly prohibited from attempting to extract, remove, decompile, reverse engineer, or disassemble the object code, or in any other way convert the object code into human-readable form.

The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc., and any use of such marks by JVCKENWOOD Corporation is under license. All other trademarks and trade names are the trademarks and trade names of their respective owners.

Automatic Injury Detection (AID) is a registered trademark of Select Engineering Services, LLC.

All other product names referenced herein are trademarks or registered trademarks of their respective manufacturers.

About the Programming Software

Various functions and parameters of the transceiver can be configured by using the KPG-D1/ D1N software. Various functions can be enabled by connecting the transceiver to a PC by use of the KPG-36U/ KPG-36X (Portable) or KPG-46U/ KPG-46X (Mobile) programming cable and writing the data configured using KPG-D1/ D1N to the transceiver. In this manual, a corresponding reference in the help texts of KPG-D1/ D1N is described for each function of the Function Reference.

Therefore, you can configure the function by referring to the function also appearing in the texts of KPG-D1/ D1N.

About KPG-D1N

KPG-D1N is the programming software to configure functions for the transceiver to be used in the U.S.A.

KPG-D1N is compliant with the FCC Part 90 standard so that the specification does not allow "Wide" (25 kHz) to be configured in **Channel Spacing** for a VHF or UHF (except 300 MHz) transceiver in the frequency band regulated by the FCC Part 90. Except for the function above, specifications of KPG-D1 and KPG-D1N are the same.

About the Notation of "Configuration Using KPG-D1/ D1N"

In this manual, for the description of each function written as "Configuration using KPG-D1/ D1N", a corresponding reference in the help texts of KPG-D1/ D1N is described. Therefore, you can configure the function by referring to the function also appearing in the help texts of KPG-D1/ D1N.

About the Zone-channel Format

Using KPG-D1/ D1N, the zone information of the transceiver can be configured by selecting whether to configure for each zone the channels in the same communication system (Analog Conventional, P25 Conventional, NXDN Conventional, DMR Conventional, P25 Trunking, NXDN Trunking, DMR-based Trunking), or channels in different systems.

Channel Table:

The communication system to be used can be selected for each zone. Only channels which use the same communication system can be configured in a zone.

Personality:

The communication system to be used can be selected for each channel. Channels which use different communication systems can exist in a zone.

In this manual, the Channel Table format or the Personality format may be described in explanations and references. This indicates that the function is enabled only when the format is configured. Also, the data configured by the Channel Table format can be migrated to the Personality format, but the data configured by the Personality format cannot be migrated to the Channel Table format.

In addition, only the configuration item of the Personality format or only the configuration item of the Channel Table format is described in some "Configuration using KPG-D1/ D1N" parts.

If only the configuration item of the Personality format is described, the configuration can also be done by the Channel Table format by replacing the Personality format configuration target (Transceiver Settings > Personal > Personality...) with the Channel Table format configuration target (Transceiver Settings > Zone/Channel > Channel Edit...).

If only the configuration item of the Channel Table format is described, the configuration can also be done by the Personality format by replacing the Channel Table format configuration target with the Personality format configuration target.

Example: Configuring **Selcall on PTT**

For the Personality format:

Transceiver Settings > Personal > Personality > DMR-based Trunking > Selcall on PTT

For the Channel Table format:

Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking > Selcall on PTT

Configuration items:

- Configuring **Selcall on PTT**
- Configuring **Busy Channel Lockout (DMR)**
- Configuring **Response while Reception**

Refer to the help texts of KPG-D1/ D1N for the method for configuring **Zone-channel Format** using KPG-D1/ D1N.

About System Type

For KPG-D1/ D1N, “DMR Conventional” or “DMR-based Trunking” must be selected in **System Type** of **System Information** of KPG-D1/ D1N in order to configure the system data or Zone-channel data of a DMR Conventional or DMR-based Trunking system.

In this manual, for the description of each function written as “Configuration using KPG-D1/ D1N”, a corresponding reference in the help texts of KPG-D1/ D1N is described as follows:

Configuring Unit ID (Own) ( **See** Transceiver Settings > Personal > System Information > DMR Conventional > ID (Own))

In this case, if “DMR Conventional” is selected in **System Type** of **System Information**, Unit ID (Own) in a DMR Conventional system can be configured.

Refer to the help texts of KPG-D1/ D1N for the method of **System Type** configuration using KPG-D1/ D1N.

About Multi RF Deck/ Multi Control Head

For Mobile, by connecting 1 or 2 Control Heads to multiple mobile transceivers (RF Deck), 1 Multi RF Deck system can be structured.

Refer to Common FUNC “MULTI RF DECK/ MULTI CONTROL HEAD” for the instructions on how to structure and how to configure Multi RF Deck/ Multi Control Head, and for the special functions of Multi RF Deck/ Multi Control Head.

About Options to Use the Functions Described in This Document

To use the functions described in this document, the following KENWOOD optional accessories need to be prepared on your own as necessary.

Portable/ Mobile	Option
Portable	• KMC-25 (Speaker Microphone) • KMC-41 (Speaker Microphone) • KMC-41D (Speaker Microphone) • KMC-42W (Speaker Microphone) • KMC-42WD (Speaker Microphone) • KMC-47GPS/ KMC-47GPSD (GPS Speaker Microphone) • KMC-54WD (Speaker Microphone) • KMC-70 (Speaker Microphone) • KMC-72 (Speaker Microphone) • KWD-AE30 (Secure Cryptographic Module) • KWD-AE31 (Secure Cryptographic Module) • KWD-DE31 (Secure Cryptographic Module) • KPG-93 (Keyloader Interface Cable) • KPG-36U/ KPG-36X (Programming Interface Cable) • KHS-14 (Headset) • KHS-15 (Headset)

Portable/ Mobile	Option
Mobile	• KMC-27A (Microphone) • KMC-27B (Microphone) • KMC-28A (Microphone with 12-Keypad) • KMC-30 (Microphone) • KMC-32 (Microphone with 16-Keypad) • KMC-35 (Microphone) • KMC-36 (Microphone with 12-Keypad) • KMC-60 (Microphone) • KMC-62 (Microphone with 16-Keypad) • KCT-73MIC (External Microphone) • KMC-9C (Desktop Microphone) • KMC-53 (Desktop Microphone) ^{*1} • KMC-65 (Microphone) • KMC-66 (Microphone with 12-Keypad) • KES-3 (External Speaker) • KES-5 (External Speaker) • KES-5A (External Speaker) • KAP-2 (PA, HA Unit) • KCT-18 (Ignition Sense Cable) • KCT-46 (Ignition Sense Cable) • KRA-40G (GPS Antenna) • KWD-AE30 (Secure Cryptographic Module) • KWD-AE31 (Secure Cryptographic Module) • KWD-DE31 (Secure Cryptographic Module) • KPG-115 (Keyloader Interface Cable) • KPG-46U/ KPG-46X (Programming Interface Cable) • KCH-19 (Remote Control Head (Basic Panel)) • KCH-20R (Remote Control Head (Featured Panel)) • KCH-21R (Handheld Control Head) • KRK-14H (Control Head Interface Kit) • KRK-15B (Control Head Remote Kit) • KCT-71 (Remote Control Cable) • KCT-72 (Connection Cable) • KCT-77 (Remote Control Cable)

^{*1} E type only
Supported models NX-5700/ NX-5800

About the Built-in GPS Receiver Unit

The GPS receiver is built-in for NX-5200/ NX-5300/ NX-5400/ NX-5700/ NX-5800/ NX-5900. Read the following warnings before using the built-in GPS receiver unit of NX-5200/ NX-5300/ NX-5400/ NX-5700/ NX-5800/ NX-5900.

● **On the use of the GPS**

With frequency interference in the GPS receive frequency range to the transceiver or another transceiver, the GPS receiver may not position normally.

1. If the GPS receiver positions while transmitting
 - The GPS receiver may be unable to position if the transmit spurious emission of the transceiver interfere within the GPS receive frequency range.
 - The interference to the GPS receiver changes depending on the transmission power of the transceiver. Greater transmission power results in the higher possibility of being unable to position.
2. If the GPS receiver positions while receiving
 - The GPS receiver may be unable to position if the harmonics of the oscillator equipped in the transceiver interfere within the GPS receive frequency range.
3. Effects of other interfering frequencies (such as if other transceivers transmit)
 - If even transmit and receive frequencies other than the above, the GPS receiver may be unable to position if frequencies emitted from other transceivers and electronic equipment interfere within the GPS receive frequency range.

As the built-in GPS receiver unit consumes more power when powered on compared to when powered off, the battery life of the transceiver becomes shorter compared to when the built-in GPS receiver unit is powered off.

How to Search for Information

For your convenience of reading through this document using Adobe Acrobat or Adobe Reader, a link to a corresponding item is pasted in the Contents page, Index page, the lower part of each page and in the context. Clicking the portion where a link is pasted enables a jump to the corresponding page.

Placing a pointer over the portion where a link is pasted changes the shape of the pointer to a hand ().

CONTENTS

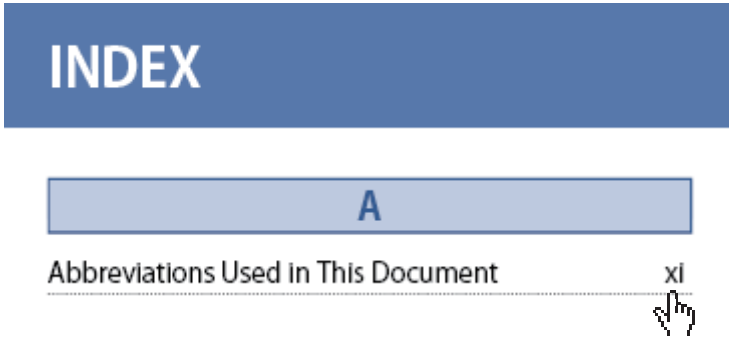
Clicking a title in the Contents page allows a jump to the corresponding page.

CONTENTS

About This Manual.....	viii
How to Read the In-depth Manual.....	ix
About Notations	ix

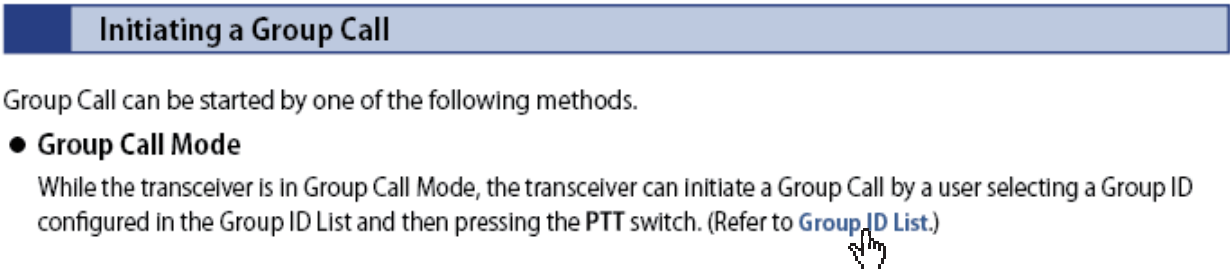
INDEX

Clicking a function name, a title or a page number in the Index pages allows a jump to the corresponding page.



Blue Characters in the Main Text

Clicking a portion with blue characters in the main context allows a jump to the corresponding page.



Blue Characters at the Bottom of Each Page

Clicking a portion with blue characters located at the bottom of each page allows a jump to the first page of the contents or index.



Return to the Previous Page

To return to the previous page, click the "Previous Page" button on your Adobe Acrobat or Adobe Reader, or press the [←] key while pressing and holding the [Alt] key on the keyboard.

Search the Text

The text in this document can be searched using the search function of your Adobe Acrobat or Acrobat Reader.

Revision History

Date	Description
2017.5.31	1) Changed the version information in "About This Manual". 2) Added description on Optional Signaling LED in Table 1-1. 3) Added "Optional Signaling LED" in "1.1 Initiating Voice Communications (Basic Transmission and Reception)". 4) Added description on In-call Busy Channel Lockout in "Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))". 5) Added supplementary notes on the behavior during data communication in "Communicating via a Repeater (Repeater Mode)". 6) Added descriptions on the use of PC commands to the following: - Initiating an Individual Call - Initiating an Individual Call (Individual Call Acknowledge Request) - Initiating a Group Call - Initiating a Broadcast Call 1.10 Sending and Receiving a Status Message (Status Call) - Sending a Short Message 7) Added descriptions on Optional Signaling LED and Unit ID Serial Output in "Receiving an Individual Call". 8) Added supplementary notes on Unit ID Serial Output in "Displaying the ID of the Communicating Caller on the LCD (Caller ID Display)". 9) Added "Sending the Received Unit ID from the Communication Port (Unit ID Serial Output)" in "1.5 Making an Individual Call". 10) Added supplementary notes on In-call Busy Channel Lockout in "1.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)". 11) Added description on Optional Signaling LED in "Receiving an Individual Call (Individual Call Acknowledge Request)". 12) Added descriptions on Optional Signaling LED and Unit ID Serial Output in "Receiving a Group Call". 13) Added descriptions on the behavior of the Selcall on PTT and Persistent Group ID (DMR) configurations in "Group ID Scan (DMR)". 14) Added supplementary notes on the behavior during data communication in "Group ID Scan (DMR)". 15) Added "Avoiding Receiving a Group Call during an Incoming Individual Call (Ignore Group Call during Individual Call)" to "1.7 Making a Group Call". 16) Added descriptions on Optional Signaling LED and Unit ID Serial Output in "Receiving a Broadcast Group Call". 17) Deleted "The default configuration is normally used." from the descriptions on "Transmit Busy Wait Time" and "Maximum ACK Wait Time". 18) Added description on the behavior for stopping the Alert Tone to the supplementary notes of "Receiving a Status Message" (Transceiver Behavior). 19) Revised the description on the number of data that can be saved and deleted supplementary notes in "Status Message Stack". 20) Added description on the maximum number of characters that can be sent and received in "1.11 Sending and Receiving a Short Message (Short Data Call)". Added "DMR Message Communication Configuration (DMR Message Type)". 21) Added description on the behavior for stopping the Alert Tone to the supplementary notes of "Receiving a Short Message" (Transceiver Behavior). 22) Revised the description on the number of data that can be saved and added a table on the number of data that can be saved to the supplementary notes in "Short Message Stack". 23) Added supplementary notes on the display when receiving an Individual Call in "1.12 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode)".

Date	Description
2017.5.31	24) Added description on the use of PC commands and Unit ID Serial Output in "1.13 Calling All Transceivers Having the Same Color Code (Unaddressed Call)". 25) Revised the descriptions in "1.14 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)" as follows: Changed "Busy Channel Lockout (Interrupt CALL)" to "In-call Busy Channel Lockout (Interrupt CALL)". Added supplementary notes. Added "Sending a Call Interruption Request Message" and "Receiving a Call Interruption Request Message". 26) Deleted "GPS Data Query Request" from "GPS Report Back to Requested ID". 27) Added description on In-call Busy Channel Lockout in the supplementary notes of "Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor)". 28) Added "1.19 Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)". 29) Added supplementary notes on the emission of Emergency Locator Tone in "Duration of Locator Tone 1" and "Duration of Locator Tone 2". 30) Made changes to the overall description in "3 COMMUNICATION SECURITY". Added the following descriptions: Enhanced Encryption format Secure Cryptographic Module 31) Added description on Non-Priority Scan LED and Priority Scan LED to the following sections: 4.2 Scanning in One Zone (Single Scan) 4.3 Scan by Registering Multiple Target Channels for Scan in the List (List Scan) 4.4 Scanning All Target Zones for Scanning (Multi-Zone Scan) 32) Added description on LTR and Conventional in Table 4-1. 33) Changed the transceiver screen in "4.4 Scanning All Target Zones for Scanning (Multi-Zone Scan)". 34) Added supplementary notes on Priority-channel Stop Tone in "4.5 Scanning the Specific Channel Preferentially (Priority Scan)". 35) Revised the description in "Priority-channel Stop Tone". 36) Added the following tones to "7 Beep List". Search Mode Tone Busy Tone 2 System Select Tone Key Fail Alert Tone 37) Changed the version number from 1.00 to 2.20.
2017.9.29	1) Changed the version information in "About This Manual". 2) Revised the supplementary notes in "Sending a Call Interruption Request Message". 3) Added description on Emergency Status (DMR) to "Emergency ID" in "2.6 ID Sent When Emergency Mode is Activated". 4) Added "2.7 Indication When Receiving Emergency Call". 5) Changed the version number from 2.20 to 2.30.

Date	Description
2018.4.9	1) Changed the version information in "About This Manual". 2) Added "Over-the-Air Alias" to "1.1 Initiating Voice Communications (Basic Transmission and Reception)". 3) Added information related to Over-the-Air Alias to the following. - Receiving an Individual Call - Individual ID List - Receiving an Individual Call (Individual Call Acknowledge Request) - Displaying the ID of the Communicating Caller on the LCD (Caller ID Display) 4) Added information related to the GPS Combination function to the following. - Power-on Status Message - Selecting the Transmission Method of GPS Data (GPS Report Channel) 5) Amended "Table 1-15 No. of Short Message Data that Can be Saved" in "1.11 Sending and Receiving a Short Message (Short Data Call)". 6) Added the following items to "1.15 Sending GPS Data". - Sending GPS Data Together With Status Call (GPS Combination) - Sending GPS Data Together With Emergency Call (GPS Combination) - Sending GPS Data during Voice Communications (GPS Report with Voice) 7) Added information to "GPS Report Interval Time". 8) Added description on the behavior to "Quick Site Roaming Level". 9) Added description on the behavior to "Disabled" in Table 1-24. 10) Added "GPS Combination" and "GPS Report with Voice" to Table 3-1. 11) Added description on the behavior to "Disabled" in Table 4-5. 12) Added "6 Digital Encode/ Decode Format". 13) Added "7 Task Request". 14) Changed the version number from 2.30 to 2.50.
2018.8.10	1) Changed the version information in "About this Manual". 2) Added "1.12 Sending and Receiving a Long Message (Long Data Call)". 3) Added "5.3 Transparent". 4) Added the following items to "6 DIGITAL ENCODE/ DECODE FORMAT": - Auto Reset Timer - AUTR 5) Changed the version number from 2.50 to 2.60.

Date	Description
2019.6.28	1) Changed the version information in "About This Manual". 2) Added "DMR-based Trunking" to the DMR systems. 3) Added the following to "About Options to Use the Functions Described in this Document". - Portable: - KMC-70 (Speaker Microphone) - KMC-72 (Speaker Microphone) - Mobile: - KMC-65 (Microphone) - KMC-66 (Microphone with 12-Keypad) - KES-5A (External Speaker) 4) Added the note related to "Call Interruption" to "Over-the-Air Alias" of the DMR Conventional system. 5) Added the configuration in a DMR-based Trunking system to the following sections in "Configuration using KPG-D1/ D1N". 1.10 Sending and Receiving a Status Message (Status Call) 1.11 Sending and Receiving a Short Message (Short Data Call) 6) Added the note related to a DMR-based Trunking system to "1.10 Sending and Receiving a Status Message (Status Call)". 7) Added the description of the operation in a DMR-based Trunking system and the note for a DMR-based Trunking system to "Sending a Status Message". 8) Added the range in a DMR-based Trunking system to "Status List". 9) Added the note related to a DMR-based Trunking system to "Power-on Status Message". 10) Added the note related to a DMR-based Trunking system to "Power-off Status Message". 11) Added the note related to a DMR-based Trunking system to "Base ID". 12) Added the description of the behavior in a DMR-based Trunking system to "Emergency Status Response". 13) Added the note related to a DMR-based Trunking system to "1.11 Sending and Receiving a Short Message (Short Data Call)". Added the number of characters available for transmission in a DMR-based Trunking system. 14) Added the note related to a DMR-based Trunking system to "DMR Message Communication Configuration (DMR Message Type)". 15) Added the description of the operation in a DMR-based Trunking system and the note for a DMR-based Trunking system to "Sending a Short Message". 16) Added the note related to a DMR-based Trunking system to "1.12 Sending and Receiving a Long Message (Long Data Call)". 17) Added the note related to a DMR-based Trunking system to "Sending a Long Message". 18) Added or corrected the note in "1.14 Calling All Transceivers Having the Same Color Code (Unaddressed Call)". 19) Added "2 DMR-BASED TRUNKING SYSTEM". 20) Added the configuration in a DMR-based Trunking system to "Configuration using KPG-D1/ D1N" in the following chapters. 3 COMMUNICATIONS IN AN EMERGENCY 4 COMMUNICATION SECURITY 5 SCAN 21) Added the description of the behavior in a DMR-based Trunking system to "Emergency Alarm". 22) Added the description about the configuration in a DMR-based Trunking system to "3.2 Configuration Related to Transmission and Reception in Emergency Mode". 23) Added the description of the behavior in a DMR-based Trunking system to "Emergency Channel Type". 24) Added the description of the behavior in a DMR-based Trunking system to "Emergency ID". 25) Added the description about the configuration in a DMR-based Trunking system to "Emergency DMR ID". 26) Added the descriptions of the behavior in a DMR-based Trunking system to "About the Behavior of the Encryption Icon". 27) Added "About the Behavior of the LED (Secure Indicator) (DMR-based Trunking System Only)".

Date	Description
2019.6.28	28) Added the note related to a DMR-based Trunking system to "4 COMMUNICATION SECURITY". 29) Added the note related to a DMR-based Trunking system to "4.2 Configuring the Encryption Key Data Used for Communications". 30) Added the note related to a DMR-based Trunking system to "4.6 Enhanced Encryption". 31) Added the note related to a DMR-based Trunking system to "5.2 Scanning in One Zone (Single Scan)". 32) Added the note related to a DMR-based Trunking system to "5.3 Scan by Registering Multiple Target Channels for Scan in the List (List Scan)". 33) Added the note related to a DMR-based Trunking system to "5.4 Scanning All Target Zones for Scanning (Multi-Zone Scan)". 34) Added the note related to a DMR-based Trunking system to "5.5 Scanning the Specific Channel Preferentially (Priority Scan)". 35) Added "Reception Behavior during the Scan in a DMR-based Trunking System". 36) Added an example of the behavior in a DMR-based Trunking system to "Timing for Sending and Receiving Data". 37) Added the tables of the following modes to "8 KEY OPERATIONS FOR EACH MODE". Autodial Mode Dialing Mode Redial Mode 38) Changed the version number from 2.60 to 4.00.
2019.12.6	1) Changed the version information in "About this Manual". 2) Added and revised the descriptions related to Call Interruption in "1.15 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)". 3) Revised the procedure in "Operating the transceiver" of "Sending a Call Interruption Request Message". 4) Added the description related to the Call Interruption request to "2.18 Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption)". 5) Added the note related to the transceiver behavior in Emergency Mode to "3.1 Placing the Transceiver in Emergency Mode". 6) Revised the operation descriptions for the following modes of "8 KEY OPERATIONS FOR EACH MODE". Individual Call Mode Group Call Mode 7) Changed the version number from 4.00 to 4.20.
2020.7.10	1) Changed the version information in "About This Manual". 2) Corrected the description related to GPS Report Channel in "Selecting the Transmission Method of GPS Data (GPS Report Channel)". 3) Added the following to "Mobile" in "About Options to Use the Functions Described in This Document". KMC-60 (Microphone) KMC-62 (Microphone with 16-Keypad) 4) Added "1.13 Communicating with a Telephone (Telephone Call)". 5) Changed the version number from 4.20 to 4.30.
2020.10.21	1) Corrected the Sample Scripts for the following items in "7.1 Encode Format/ 7.2 Decode Format": ENC enc STOPS DECAT time dec 2) Changed the version number from 4.30 to 4.31.

Date	Description
2021.6.30	1) Changed the version information in "About This Manual". 2) Added the supported options to "About Options to Use the Functions Described in This Document". 3) Added the conditions for Background Hunt to function to "Background Hunt". 4) Changed the version number from 4.31 to 4.32.
2022.5.12	1) Changed the version information in "About This Manual". 2) Added the following items to "Table 2-2 Function Differences of S-Trunking and DMR Tier III Trunking". DMR IP Addressing ICMP Echo IP Packet Data Services 3) Added the transceiver behavior to "Transceiver's behavior for Registration". 4) Added "2.5 Using IP Bearer Service". 5) Changed the version number from 4.32 to 4.60.
2022.9.9	1) Changed the version information in "About This Manual". 2) Added the information related to a Trunking 2.5 system to "1.11 Sending and Receiving a Short Message (Short Data Call)". 3) Added the note to "Receiving a Short Message". 4) Added the following items: 1.14 Sending a DTMF Code 1.23 Out of Range Indicator 5) Changed the configuration condition of Fleet Dialing Plan from a DMR-based Trunking system to a DMR Tier III Trunking system and S-Trunking system in this manual. 6) Added the information related to a Trunking 2.5 system to "2 DMR-BASED TRUNKING SYSTEM". 7) Added the information about the end of support for the S-Trunking system to "2 DMR-BASED TRUNKING SYSTEM". 8) Changed the version number from 4.60 to 5.00.
2023.6.2	1) Changed the version information in "About This Manual". 2) Added the description of when a Telephone Call is made in Autodial Mode to "1.13 Communicating with a Telephone (Telephone Call)". 3) Corrected the description in "Checking Whether Another Transceiver Is in Operation (Radio Check)". 4) Added the note in "About the Slot Numbers (Slot Selection)". 5) Changed the version number from 5.00 to 5.10.
2025.10.29	1) Changed the version information in "About This Manual". 2) Added "About the Configuration of the Communication Port". 3) Added the following to Radio Feature License. INDOOR LOCATION LICENSE (KWD-5020 -IL) 4) Added the reference for Indoor Location to "CONTENTS BY PURPOSE". 5) Added "Data + Location Data Output" to the description of COM port. 6) Added the description of the configuration shared by GPS and BLE. 7) Added "1.24 Indoor Location". 8) Added description related to the support for All Call to the following items: Receiving a High-priority Call (Priority Monitor ID) 2.20 Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption) 9) Added description on "BLE Data transmission" to "Initiating Another Call While Receiving a Group Call". 10) Added the description related to BLE Report with Voice to "2.20 Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption)". 11) Added the description related to a system that supports Indoor Location to "Sending GPS Data Based On Travel Distance (GPS Distance Change)". 12) Added "BLE Data", "BLE Combination", "BLE Report with Voice" to Table 4-1. 13) Added the description related to BLE transmission to "6.2 Restricting the Warning Display during Data Communications (Silent Report)". 14) Changed the version number from 5.10 to 5.30.

Functions for a DMR Conventional System

Making an Individual Call

A user can establish voice communication by calling an individual target transceiver.

Making an Individual Call

Page 19

Making a Group Call

A user can establish voice communications by calling multiple target transceivers registered for a call group.

Making a Group Call

Page 32

Initiating an Individual Call after Ensuring That the Target Party Is Available for Communications

A user can initiate an Individual Call after identifying whether the receiving transceiver is available for communications.

Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)

Page 26

Sending and Receiving a Status Message

A user can send and receive a simple message called a status.

Sending and Receiving a Status Message (Status Call)

Page 41

Sending and Receiving a Short Message

A user can send and receive short text messages.

Sending and Receiving a Short Message (Short Data Call)

Page 55

Sending GPS Data

By using a built-in or external GPS receiver unit, a user can send the own location information to the base station.

Sending GPS Data

Page 95

Avoiding Interference with Other Communications

If an attempt is made to transmit on a channel that is already being used by other parties, the transmission on the channel by the own transceiver is automatically restricted.

Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))

Page 8

Using the Indoor Location Function

Indoor Location is the function to manage the position of the transceiver by using Bluetooth.

Indoor Location

Page 128

Functions for a DMR-based Trunking System	Making an Individual Call A user can establish voice communication by calling an individual target transceiver. Making an Individual Call Page 183	Making a Group Call A user can establish two-way voice communications with multiple target transceivers registered for a call group. Making a Group Call Page 197
	Making a Broadcast Group Call A user can establish one-way informative group voice communications with multiple target transceivers registered for a call group. Making an Informative Group Call (Broadcast Group Call) Page 206	Sending and Receiving a Status Message A user can send and receive a simple message called a status. Sending and Receiving a Status Message (Status Call) Page 210
	Sending and Receiving a Short Message A user can send and receive short text messages. Sending and Receiving a Short Message (Short Data Call) Page 210	Sending GPS Data By using a built-in or external GPS receiver unit, a user can send the own location information to the base station. Sending GPS Data Page 241

Functions for Communication Security	Enhancing Communication Security The transceiver is equipped with functions to enhance secrecy in communications on a DMR channel. COMMUNICATION SECURITY Page 286
--------------------------------------	---

DMR is a generic name for a digital communication system protocol utilizing 4-level FSK. Using DMR, the transceiver can initiate an individual call or group call for voice calls, text data communications or GPS data communications. Also, connecting a transceiver to an external device (such as a PC) allows communication because the transceiver supports serial command communication.

In a DMR Conventional system, digital signals can be transmitted and received on a DMR digital channel. Using a DMR ID (Unit ID or Group ID) allows the various communications.

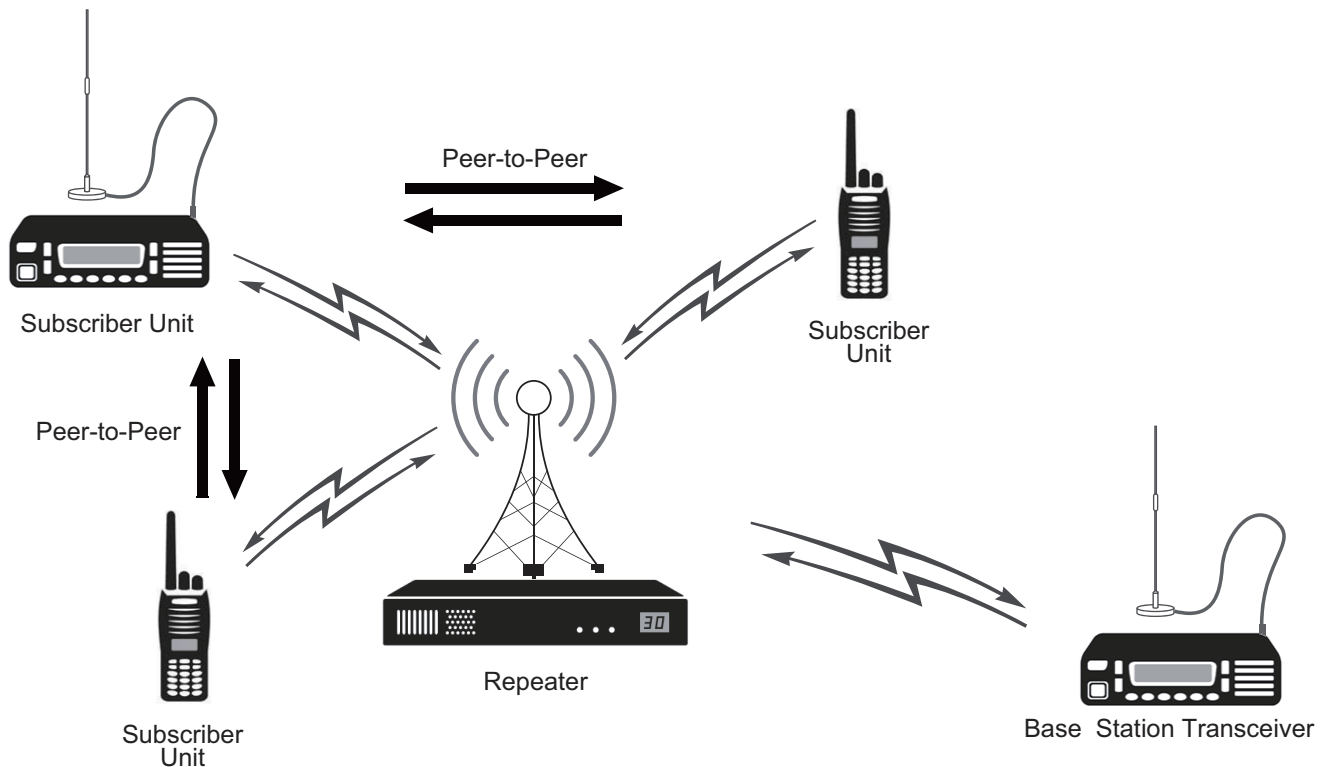


Figure 1-1 Image of Communications in a DMR Conventional System

Transceivers can communicate directly between transceivers without using a repeater. (Refer to [Communicating Without Using a Repeater \(Talk Around/ DMR Direct Mode\)](#).)

Or, the transceiver can communicate with another transceiver via a repeater. (Refer to [Communicating via a Repeater \(Repeater Mode\)](#).)

1.1 Initiating Voice Communications (Basic Transmission and Reception)

This section describes the basic methods for transmission and reception in a DMR Conventional system and the relevant functions.

About Own ID

To initiate various communications by using DMR, **Unit ID (Own)**, the identification code of a transceiver, needs to be configured for the transceiver.

A Unit ID can be configured in the range between 000001 and FFFCDF (hexadecimal), or between 1 and 16776415 (decimal).

If **Global ID** is enabled, a Unit ID is shared by all DMR Conventional.

If **Global ID** is disabled, a Unit ID needs to be configured for each DMR Conventional.

Also, a name specific to the transceiver can be configured for **Unit ID (Own)**.

Note

- Since the management system of own ID in P25 and NXDN is different from the management system of own ID in DMR, each own ID needs to be configured separately.

Configuration using KPG-D1/ D1N

- Configuring **Unit ID (Own)** and **Unit ID Name (Own)** ( [See](#) Transceiver Settings > Personal > System Information > DMR Conventional > Unit ID (Own))
- Configuring **Global ID** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > System Information > DMR Conventional > Unit ID (Own))

About Communication Security (Encryption)

The transceiver is equipped with the Encryption function, which can enhance the confidentiality of communications by encrypting communication data when making various communications on a DMR digital channel. (Refer to [COMMUNICATION SECURITY](#).)

Receiving

Received audio sounds from the speaker if the transceiver receives digital signals, and the frequency matches the frequency of the channel on which the transceiver waits or the DMR ID matches the DMR ID preconfigured for the transceiver. When a signaling (Color Code) is used, communications are possible if the received Color Code matches the Color Code which the transceiver waits.

Auto Reset Timer

Auto Reset Timer is the amount of time from when the received Unit ID or Group ID matches the Unit ID or Group ID preconfigured for the transceiver until the LCD, blinking of LED and emission of Alert Tone will automatically be reset. By using KPG-D1/ D1N, **Auto Reset Timer** can be configured. Also, how the transceiver behaves after the amount of time configured in **Auto Reset Timer** elapses can be configured.

Whether different **Auto Reset Timer** configurations are applied to voice communications and data communications can be configured.

Table 1-1 Auto Reset Timer

Configuration		Description
Auto Reset Timer (Voice or Message)	Off	Auto Reset Timer will not be activated.
	0 sec to 300 sec	After the configured time elapses, the matching state of the Unit ID or Group ID is automatically reset.
LED (Voice only)		If this function is enabled, the flashing LED for the Selective Call Alert LED turns off when the length of time configured in Auto Reset Timer elapses.
Alert Tone (Voice or Message)		If this function is enabled, the intermittently emitted Alert Tone stops when the length of time configured in Auto Reset Timer elapses.
LCD (Voice or Message)		When this function is enabled and the time configured in Auto Reset Timer has elapsed, the flashing LED light triggered by Optional Signaling LED goes off and the display changes from the following display to the previous channel display: • ID display after receiving an Individual Call or Group Call • Status Message display after receiving a Status Message • Short Message display after receiving a Short Message

Configuration using KPG-D1/ D1N

- Configuring **Auto Reset Timer** (Voice) ( [See](#) Transceiver Settings > DMR > DMR Information > General > Auto Reset > Voice)
- Configuring **Auto Reset Timer** (Message) ( [See](#) Transceiver Settings > DMR > DMR Information > General > Auto Reset > Message)

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash when the transceiver receives a call using a DMR ID. A user can notice by the LED that the transceiver is receiving a call.

One of the 7 colors can be used to make the LED flash, and the flashing color can be configured for each type of call.

- Yellow
- Purple
- Blue
- Light Blue
- Red
- Green
- White

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Alert LED Color** ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional > Alert LED Color)
- Configuring **Alert LED Color (Individual ID List)** ( [See](#) Transceiver Settings > DMR > Individual ID List > Alert LED Color)
- Configuring **Alert LED Color (Group ID List)** ( [See](#) Transceiver Settings > DMR > Group ID List > Alert LED Color)

Optional Signaling LED

Optional Signaling LED is the function that causes the LED to flash in yellow when the Optional Signaling received matches that of the transceiver.

A user can notice by the LED that the transceiver is receiving a call.

When Optional Signaling is no longer matching due to operation of the transceiver key or upon elapse of the time configured in **Auto Reset Timer**, the light of the LED goes off.

However, if **Selective Call Alert LED** is enabled, the LED flashes according to the configuration of **Selective Call Alert LED** even when **Optional Signaling LED** is enabled.

Configuration using KPG-D1/ D1N

Configuring **Optional Signaling LED** to be enabled or disabled ( See Transceiver Settings > DMR > DMR Information > Conventional)

Over-the-Air Alias

Over-the-Air Alias allows the receiving transceiver to display the ID Name of the transmitting transceiver when receiving a call even when the ID Name of the transmitting transceiver is not configured for the receiving transceiver.

Using this function, the Unit ID Name of the added unit does not need to be configured such as when a unit is added to the system in service.

The transmitting transceiver sends the Unit ID Name when making voice calls. If the receiving transceiver receives a call such as an Individual Call, the Unit ID Name stored in the reception frame will appear on the display.

The transmitting transceiver sends the Unit ID Name upon converting the data for transmission within the transceiver in the following way according to the character code of Language 1 and characters entered with the Unit ID Name configured with FPU.

- ASCII characters only
7-bit
- When those other than ASCII characters are included and the Language 1 character code is ISO-8859-1
ISO 8-bit
- When those other than ASCII characters are included and Language 1 uses a character code other than ISO-8859-1
UTF-16BE

Note

- If **Over-the-Air Alias** is enabled, the transceiver does not execute the **Call Interruption** reception behavior.
- The received Unit ID Name appears after displaying differently from the received Unit ID Name in the following cases:
 - The Unit ID of the transmitting transceiver is not configured in the Individual ID List.
 - The Unit ID of the transmitting transceiver is not stored as Caller ID.
 - The received Unit ID Name is different from the ID Name configured in the Individual ID List or the ID Name stored in the transceiver.
- When Lookback is being executed during Priority Scan, Unit ID Name may not be displayed depending on the configuration in Lookback Time.
- If **Caller ID Stack** is enabled, received Unit ID Name also is stored in the transceiver stack memory. The stored Unit ID Name is also reflected to ID Name with Individual ID List selected.
- The Unit ID Name (Own) configured in the current system is used for the Unit ID Name to be transmitted.
- The time needed for receiving signals necessary for receiving and displaying the **Over-the-Air Alias** characters are as follows. The characters received will not be displayed for communication shorter than this duration. Also, in the event of participation halfway through a communication via Late Entry or when GPS data is sent out by the transmitting transceiver, a longer time may be required to display the characters depending on the signal strength.

Table 1-2 Data Format and Time Needed for Over-the-Air Alias Reception

Data Format	Approx. 1 sec	Approx. 2 sec	Approx. 2.5 sec	Approx. 3 sec
7-bit	7 characters	14 characters	23 characters	31 characters
ISO 8-bit	6 characters	13 characters	20 characters	27 characters
UTF-16BE	3 characters	6 characters	10 characters	13 characters

Configuration using KPG-D1/ D1N

- Configuring **Over-the-Air Alias** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > DMR Conventional/ DMR Site Roaming > Unit ID (Own))
- Configuring **Unit ID Name (Own)** ( **See** Transceiver Settings > Personal > System Information > DMR Conventional/ DMR Site Roaming > Unit ID (Own))

Participating in an On-going Voice Call Midway Through the Call (Late Entry)

The transceiver can participate in an on-going voice call even if the transceiver receives this call midway through. The transceiver in a DMR Conventional system can participate in an on-going voice call by decoding control data always sent along with audio data, even if the transceiver receives a voice call midway through the call.

Searching Whether the Transceiver Receives a Call (Scan)

Using the Scan function, the transceiver can check each channel in turn whether the channel has a signal. If a channel has a signal, the transceiver receives the signal on the channel.

The following scan functions can be used in a DMR Conventional system.

- Single Scan
- List Scan
- Multi-Zone Scan

Refer to “**SCAN**” for details of Scan.

Transmitting

Transmitting can be initiated by pressing the **PTT** switch, or by selecting a DMR ID and then pressing the **PTT** switch. When a signaling (Color Code) is used, the transceiver sends the Color Code. In this case, if the transmitted Color Code matches the Color Code preconfigured for the receiving transceiver, the transceivers can communicate.

Restricting the Continuous Transmission Duration (Time-out Timer)

Time-out Timer (TOT) is the function to restrict the duration for the transceiver to continuously transmit.

This function is used to prevent a user from occupying a repeater or frequency which is shared with other users. The transceiver automatically stops transmitting and releases the channel if it continuously transmits longer than the configured time.

Time-out Timer can be configured for each system. Also, timers, such as **TOT Pre-alert**, **TOT Rekey Time**, and **TOT Reset Time**, relevant to **Time-out Timer** can be configured.

TOT Pre-alert

TOT Pre-alert is the function to notify a user that a continuous transmission is about to end by the **Time-out Timer**. A TOT Pre-alert Tone (3 beeps) sounds from the transceiver before the transceiver stops the continuous transmission by the **Time-out Timer**.

Example: Time-out Timer: 30 sec, TOT Pre-alert: 4 sec

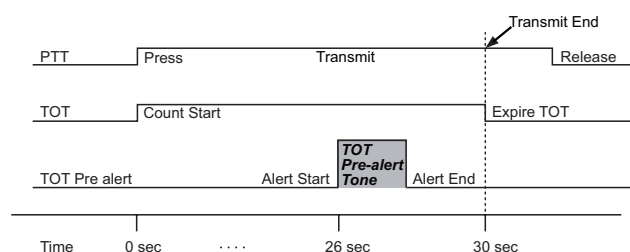


Figure 1-2 TOT Pre-alert

Note

- If "Off" is configured for **TOT Pre-alert**, no TOT Pre-alert tone sounds from the transceiver.

TOT Rekey Time

TOT Rekey Time is the amount of time from when the transceiver stops the transmission by the **Time-out Timer** until transmission becomes possible again.

Example: Time-out Timer: 30 sec, TOT Rekey Time: 20 sec

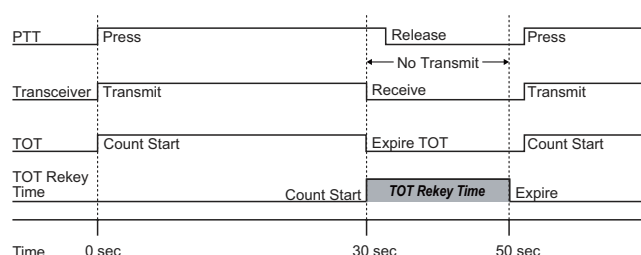


Figure 1-3 TOT Rekey Time

Note

- If "Off" is configured for **TOT Rekey Time**, the transceiver will immediately be ready to transmit.
- The timer will reset and transmission becomes possible if the zone or channel is changed while the **TOT Rekey Time** is counting down.
- TOT Rekey Time** will not reset if the **Revert Channel** is not changed during scanning.

TOT Reset Time

TOT Reset Time is the time required to initialize and reset the elapsed time for **Time-out Timer**.

Example 1: Time-out Timer: 30 sec, TOT Reset Time: 10 sec

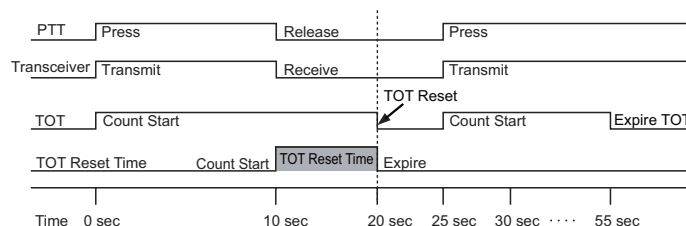


Figure 1-4 TOT Reset Time 1

The transceiver considers a retransmission within this configured length of time as a continuous transmission. In the following example, the counting of **Time-out Timer** continues because the transmission was started by a user pressing the **PTT** switch while the **TOT Reset Time** was counting down.

Example 2: Time-out Timer: 30 sec, TOT Reset Time: 10 sec

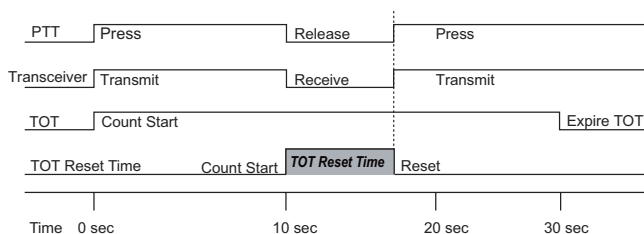


Figure 1-5 TOT Reset Time 2

Note

- If "Off" is configured for **TOT Reset Time**, the **Time-out Timer** will be reset immediately after the transceiver finishes transmitting.
- The timer will be reset if the zone or channel is changed while the **TOT Rekey Time** is counting down.
- **TOT Reset Time** will not reset if the **Revert Channel** is not changed during scanning.

Configuration using KPG-D1/ D1N

Configuring various functions of **Time-out Timer** ([See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > General > Time-out Timer)

Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))

Busy Channel Lockout is the function to automatically restrict the transmission so as not to interfere with other communications.

If an attempt is made to transmit on a channel that is already being used by other groups, the transceiver automatically restricts the transmission.

If the **PTT** switch is pressed while **Busy Channel Lockout** is enabled, a Warning Tone A (continuous beep) sounds from the transceiver, and transmission is disabled. In this case, "BUSY" appears on the display. The Warning Tone A sounds from the transceiver until the **PTT** switch is released.

The following are conditions to disable transmission by **Busy Channel Lockout (DMR)**:

Table 1-3 Busy Channel Lockout (DMR)

Configuration	Description
No	Busy Channel Lockout is disabled. Transmission is not restricted even if the channel on which the transceiver attempts to transmit is busy.
Carrier Only	The transceiver cannot transmit while the transceiver is receiving a carrier.
Correct CC	The transceiver cannot transmit if the transceiver receives a carrier and the received Color Code matches the Color Code preconfigured for the transceiver.

The transceiver is controlled in the following manner according to the configuration in **Transmit Mode** on a channel with "Mixed" configured in **Channel Type**.

- **If "Analog" is configured for Transmit Mode:**

The transceiver transmits according to the configuration in **Busy Channel Lockout (Analog)**.

- **If "DMR" is configured for Transmit Mode:**

The transceiver transmits according to the configuration in **Busy Channel Lockout (DMR)** and **In-call Busy Channel Lockout**.

Also, while the **Signaling Reset Timer** or **Auto Reset Timer** is activated on a channel with "Mixed" configured in **Channel Type**, the transceiver transmits according to the configuration in **Busy Channel Lockout** in the same mode as that of the received signal (Analog or DMR). If the transceiver receives an analog signal, the transceiver transmits according to the configuration in **Busy Channel Lockout (Analog)**. If the transceiver receives a DMR signal, the transceiver transmits according to the configuration in **Busy Channel Lockout (DMR)** and **In-call Busy Channel Lockout**.

In-call Busy Channel Lockout is used for configuration when audio output is possible during an incoming voice call.

The following are conditions for transmission and reception using **In-call Busy Channel Lockout**:

Table 1-4 In-call Busy Channel Lockout

Configuration	Description
Allow TX	During a voice call, pressing the PTT switch disables all transmission restrictions regardless of the configuration of Busy Channel Lockout (DMR) . However, Busy Channel Lockout will function when "Carrier Only" or "Correct CC" is configured for Busy Channel Lockout (DMR) and is in the following state. • When a different voice call is initiated during an incoming voice call • When a voice call with a different ID is initiated during an incoming voice call
Follow BCL	During a voice call, pressing the PTT switch enables restriction on the transmission according to the configuration of Busy Channel Lockout (DMR) .
Interrupt CALL	The receiving call can be terminated by pressing the PTT switch to respond (Talkback) while receiving an Individual Call or Group Call to one's own station or when receiving an Unaddressed Call. (Refer to Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) .)

Note

- **Busy Channel Lockout** cannot be activated in Emergency Mode. However, when "Interrupt CALL" is configured for **In-call Busy Channel Lockout**, the configuration of **In-call Busy Channel Lockout** and **Busy Channel Lockout** will become "Interrupt CALL" and "No" respectively in the Emergency Mode.

Configuration using KPG-D1/ D1N

- Configuring **Busy Channel Lockout (DMR)/ In-call Busy Channel Lockout** (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Busy Channel Lockout (DMR)/ In-call Busy Channel Lockout** (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

Using a Channel Being Used by Other Parties (BCL Override)

BCL Override is the function to transmit on a busy channel even if **Busy Channel Lockout** is activated and transmission is restricted.

Operating the transceiver

1 Press the **PTT** switch while transmission is restricted by **Busy Channel Lockout**.

2 Release the **PTT** switch, then press the **PTT** switch again within 500 ms.

Busy Channel Lockout is temporarily disabled, and the transceiver starts transmitting.

Note

- This function also works while the transceiver is transmitting using the VOX function. For a transmission using VOX, **Busy Channel Lockout** is temporarily disabled and the transceiver can transmit if audio is input within 500 ms after audio input terminates.

Configuration using KPG-D1/ D1N

Configuring **BCL Override** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > General)

Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode)

Talk Around

Talk Around is the function allowing direct communication between transceivers without using a repeater.

If the transceiver cannot link to a repeater due to too great distance between the transceiver and the repeater, the transceiver can directly communicate with the target transceiver by using **Talk Around**.

The transceiver with **Talk Around** enabled transmits on the receive frequency and the Color Code configured for the selected channel.

On a channel with **Talk Around Key** enabled, **Talk Around** can be toggled between enabled and disabled by operating the transceiver.

- Pressing the **Talk Around** key toggles **Talk Around** between enabled and disabled.
- Pressing the **Menu** key causes the transceiver to enter Menu Mode, and then **Talk Around** can be toggled between enabled and disabled by selecting "Talk Around". (Refer to Common FUNC Using Menu Mode.)
- Positioning the **Lever** switch to the position to which "Talk Around" is assigned enables **Talk Around**. Positioning the **Lever** switch to the position to which "Talk Around" is not assigned disables **Talk Around**.

For NX-5400/ NX-5900, by using KPG-D1/ D1N, **Talk Around** can be configured for each channel to be enabled or disabled.

The "  " icon appears if a channel with **Talk Around** enabled is selected. **Talk Around** cannot be disabled by pressing a key of the transceiver such as the **Talk Around** key.

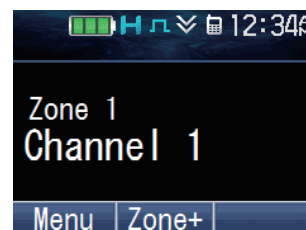
On a channel with **Talk Around** disabled, **Talk Around** can be toggled between enabled and disabled by pressing a key of the transceiver such as the **Talk Around** key.

Operating the transceiver

● Enabling the Talk Around

Press the **Talk Around** key while **Talk Around** is disabled.

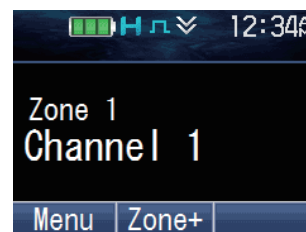
The "  " icon appears and **Talk Around** will be enabled.



● Disabling the Talk Around

Press the **Talk Around** key while **Talk Around** is enabled.

The "  " icon disappears and **Talk Around** will be disabled.



Note

- **Talk Around** is disabled by changing the zone or channel while **Talk Around** is enabled. If **Talk Around** is enabled by the **Lever** switch, **Talk Around** is not disabled even if the zone or channel is changed. However, if **Talk Around Key** is disabled on the target channel, **Talk Around** becomes disabled.
- If **Talk Around** is enabled by operating the **Talk Around** key, **Talk Around** becomes disabled when the transceiver enters Emergency Mode. **Talk Around** does not become disabled when the transceiver enters Emergency Mode on the channel with **Talk Around** enabled by using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Talk Around** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > General)
- Configuring **Talk Around** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)
- Configuring **Talk Around Key** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > General)
- Configuring **Talk Around Key** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)

DMR Direct Mode

DMR Direct Mode is the function allowing direct communication between transceivers without using a repeater.

If the transmit frequency and receive frequency are the same configuration on a DMR digital channel, the channel can be used in DMR Direct Mode. Also, the channel can be used in DMR Direct Mode even if the **Talk Around** function is enabled.

Simultaneous Communications by Dual Slot Direct Mode

The DMR Direct Mode communication methods have the new version (ETSI TS 102 361-1 V2.2.1 2013-02 or later) and old version (earlier than ETSI TS 102 361-1 V2.2.1 2013-02).

Which version is used to communicate can be configured by configuring **Dual Slot Direct Mode** by using KPG-D1/ D1N.

Table 1-5 Dual Slot Direct Mode

Configuration	Description
Enabled	The transceiver communicates using the new version of DMR Direct Mode. In the new version of DMR Direct Mode, if the slot numbers are different, communications of 2 parties can be realized separately without receiving interference even on the channel with the same frequency configured.
Disabled	The transceiver communicates using the old version of DMR Direct Mode. In the old version of DMR Direct Mode, if the slot numbers are different, communications of 2 parties cannot be realized separately without receiving interference even on the channel with the same frequency configured.

Note

- Communication cannot be realized between the transceiver configured with the new version of DMR Direct Mode and the transceiver configured with the old version of DMR Direct Mode.

Configuration using KPG-D1/ D1N

- Configuring **Dual Slot Direct Mode** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Dual Slot Direct Mode** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

Communicating via a Repeater (Repeater Mode)

Repeater Mode is the function to communicate with another transceiver via a repeater.

If the transmit frequency and receive frequency are different configurations on a DMR digital channel, the channel can be used in Repeater Mode.

In Repeater Mode, the transceiver can synchronize with a repeater if the transceiver receives a synchronization signal from the repeater.

If a synchronization signal from a repeater cannot be detected (when no synchronization signal is received, or the Color Code does not match), the transceiver sends a Wakeup Message to prompt synchronization. If the transceiver does not receive any response from the repeater after the lapse of a specific time interval, the transceiver resends the Wakeup Message.

The wait time from when a Wakeup Message is sent until a repeater transmits a synchronization signal (**Sync Wakeup Wait Time**) can be configured by using KPG-D1/ D1N. Also, the number of times a Wakeup Message is resent (**Number of Wakeup Message Retries**) can be configured.

Note

- If a response from a repeater cannot be detected after a Wakeup Message is sent for the number of times configured in **Number of Wakeup Message Retries**, a Call Fail Tone (2 beeps) sounds from the transceiver, and "Fail" appears on the display.
- If the **Talk Around** function is enabled, the transceiver does not behave in Repeater Mode, as the transceiver behaves in DMR Direct Mode even if the transmit frequency and receive frequency are different configurations.
- If synchronization signals from the repeater cannot be detected after resending the Wakeup Message during data communication, Wakeup Message will be resent for the number of times configured in **Number of Wakeup Message Retries**.
- If the transmit frequency and receive frequency are configured to different values on a DMR digital channel, the channel can be used for reception in the DMR Direct Mode. However, Talkback allows for selection of whether to transmit at the receive frequency (when **Talk Around** is enabled) or at the transmit frequency (when Talk Around is disabled).

Configuration using KPG-D1/ D1N

- Configuring **Sync Wakeup Wait Time** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)
- Configuring **Number of Wakeup Message Retries** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

About the Slot Numbers (Slot Selection)

In DMR, the transceiver communicates using the predetermined slot according to the standard.

If communicating in Repeater Mode, the transceiver needs to communicate using the predetermined slot, as the information indicating slot 1 or slot 2 is in the synchronization signal transmitted from a repeater.

Also, for example in Repeater Mode, the signal being transmitted using slot 2 cannot be received when using slot 1, even if the receive frequencies are the same.

The slot number used for communication (1 or 2) or "Auto" can be configured using KPG-D1/ D1N. When configured to "Auto", the **Auto Slot Select** function is activated. (Refer to [Auto Slot Select](#).)

Note

- **Slot Selection** will function only when Repeater Mode or **Dual Slot Direct Mode** is enabled.
- "Auto" needs to be configured in the **Slot Selection** configuration for use in a Repeater Voting system.

Configuration using KPG-D1/ D1N

- Configuring **Slot Selection** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Slot Selection** (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

Auto Slot Select

Auto Slot Select is a function that automatically selects a slot or switches the slot according to the communication status of the transceiver.

Using **Auto Slot Select** allows communication to be carried out by two lines at a single frequency.

Allowing transceivers to make use of vacant slots helps to reduce communication traffic and achieve communication with little delay.

To use this function, "Auto" must be configured for **Slot Selection** using KPG-D1/ D1N. Operation on the transceiver is not required. (Refer to [About the Slot Numbers \(Slot Selection\)](#).)

Table 1-6 Slot Selection Configuration (Auto Slot Select)

Configuration	Description
Auto	Auto Slot Select is enabled.
1 or 2	Auto Slot Select is disabled. Communicates only with the selected slot number.

Note

- **Auto Slot Select** runs only in the Repeater Mode. It does not function in the Direct Mode. **Auto Slot Select** functions even when only the receive frequency is configured in the Repeater Mode.
- When **Talk Around** is enabled, communication is fixed at slot 1 and **Auto Slot Select** is disabled.
- **Auto Slot Select** also functions during an Emergency Mode.
- During Call Hangtime ^{*1} of the repeater, Auto Slot Select of the transceiver is disabled in the following cases:
 - To make a voice call and data transmission to the same ID during Call Hangtime after the transmission ends
 - To make a voice call and data transmission to the caller during Call Hangtime after the reception to the own transceiver ends

^{*1} Call Hangtime is the duration to continue transmission to retain the communication state of the channel used by the repeater after the transceiver ends transmission of voice communication in Repeater Mode.

Configuration using KPG-D1/ D1N

- Configuring **Slot Selection** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Slot Selection** (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

1.2 Using the Signaling

Color Code is the signaling to be used for facilitating communication within a group if the same channel is shared by several groups.

Sharing the Same Channel (Frequency) by Several Groups (Color Code)

Color Code is a digital signaling type having the same function as analog QT tone or DQT code. This signaling is used when the transceiver transmits or receives on a digital channel.

The transceiver mutes calls from a zone having a restricted Color Code if a Color Code is configured for each channel.

Therefore, a user can communicate in a group without listening to conversations from other groups.

The transceiver can distinguish the signaling even if the transceiver receives any signaling during a call since this signaling type has a continuous waveform.

The following is transmission and reception behavior of a Color Code:

Table 1-7 Transmission and Reception Behavior of a Color Code

Reception/ Transmission	Description
Reception	If the transceiver receives a signal and the received Color Code matches the Color Code preconfigured for the transceiver, the transceiver unmutes the speaker and emits the received audio from the speaker.
Transmission	The transceiver sends the preconfigured Color Code while transmitting. Pressing the PTT switch causes the transceiver to send the Color Code.

Note

- The transceiver transmits with the signaling of the received signal regardless of the configuration in **Transmit Mode** if within the amount of time configured in **Signaling Reset Timer** after the transceiver receives a signal on a channel with "Mixed" configured in **Channel Type**.

Configuration using KPG-D1/ D1N

- Configuring **Color Code** (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Color Code** (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

1.3 Waiting for Both Digital Signals and Analog Signals (Mixed Mode)

Mixed Mode can be used to wait for a call in both digital and analog modes.

The channel used in analog mode can also be used in digital mode, hence the transceiver can easily migrate from analog mode to digital mode.

The following is the transceiver behavior for transmission and reception on a channel with "Mixed" configured in **Channel Type**:

Table 1-8 Mixed Mode 1

Reception/ Transmission	Description
Reception	Mixed Mode can be used to wait for a call in both digital (Color Code) and analog (QT tone and DQT code) modes. The transceiver unmutes the speaker if the received signaling (QT tone, DQT code or Color Code) matches the signaling preconfigured for the transceiver (QT tone, DQT code or Color Code).
Transmission	The transceiver transmits in the mode (Analog or DMR) configured in Transmit Mode. If the received signaling (QT tone, DQT code, or Color Code) matches the signaling preconfigured for the transceiver, the transceiver can transmit in the same mode as the mode of the received signal regardless of the configuration in Transmit Mode before the length of time configured in Signaling Reset Timer elapses (except if the transceiver is doing data communications). If the received FleetSync ID or DMR ID matches the FleetSync ID or DMR ID preconfigured for the transceiver, the transceiver can transmit in the same mode as the mode of the received signal regardless of the configuration in Transmit Mode before the length of time configured in Auto Reset Timer elapses. The transceiver can also transmit in the same mode as that of the received signal regardless of the configuration in Transmit Mode while doing data communications as well.

The following is the difference in operation for transmission depending on the transceiver configuration and the received signal.

Table 1-9 Mixed Mode 2

Optional Signaling	Transmit Mode	Received signal	Transmission Operation
Disabled	Analog	Digital	The transceiver can transmit using the Color Code preconfigured for the transceiver until the length of time configured in Signaling Reset Timer elapses.
Disabled	Analog	Analog	The transceiver can transmit using the QT tone or DQT code preconfigured for the transceiver until the length of time configured in Signaling Reset Timer elapses.
Disabled	DMR	Digital	The transceiver can transmit using the Color Code preconfigured for the transceiver until the length of time configured in Signaling Reset Timer elapses.
Disabled	DMR	Analog	The transceiver can transmit using the QT tone or DQT code preconfigured for the transceiver until the length of time configured in Signaling Reset Timer elapses.
Enabled	Analog	Digital	The transceiver can transmit using the Color Code preconfigured for the transceiver and specifying the received ID until the length of time configured in Auto Reset Timer elapses.
Enabled	Analog	Analog	By specifying the received ID, the transceiver can transmit using the QT tone or DQT code preconfigured for the transceiver until the length of time configured in Auto Reset Timer elapses. However, ID can be specified only when FleetSync signaling is received. The transceiver can transmit using only QT tone or DQT code preconfigured for the transceiver if the transceiver receives a DTMF or 2-tone code, or an MDC-1200 ID.
Enabled	DMR	Digital	The transceiver can transmit using the Color Code preconfigured for the transceiver and specifying the received ID until the length of time configured in Auto Reset Timer elapses.
Enabled	DMR	Analog	By specifying the received ID, the transceiver can transmit using the QT tone or DQT code preconfigured for the transceiver until the length of time configured in Auto Reset Timer elapses. However, ID can be specified only when FleetSync signaling is received. The transceiver can transmit using only QT tone or DQT code preconfigured for the transceiver if the transceiver receives a DTMF or 2-tone code, or an MDC-1200 ID.

Note

- While the transceiver is in Emergency Mode, the transceiver transmits according to the configuration in **Transmit Mode**.
- If the transceiver receives FleetSync data, the transceiver sends an ACK in analog mode, and if the transceiver receives DMR data, the transceiver sends an ACK in digital mode. The transceiver transmits according to the configuration in **Transmit Mode** after the transceiver ends data communications regardless of the configuration in **Signaling Reset Timer** or **Auto Reset Timer**.
- If "Off" is configured in **Signaling Reset Timer**, the transceiver retains the status of transmission in the same mode as that of the received signal. This status will be reset by an operation such as changing a channel.
- If "0" is configured in **Signaling Reset Timer**, the transceiver transmits according to the configuration in **Transmit Mode**.

Configuration using KPG-D1/ D1N

- Configuring **Channel Type** and **Transmit Mode** (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > General)
- Configuring **Channel Type** and **Transmit Mode** (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)
- Configuring **Signaling Reset Timer** ( **See** Transceiver Settings > DMR > DMR Information > General)

1.4 Using DMR ID to Initiate a Selective Call

An individual call and group call are available by using DMR IDs. In addition, a message can be sent to a specified target ID in various types of message communications.

Available Calls

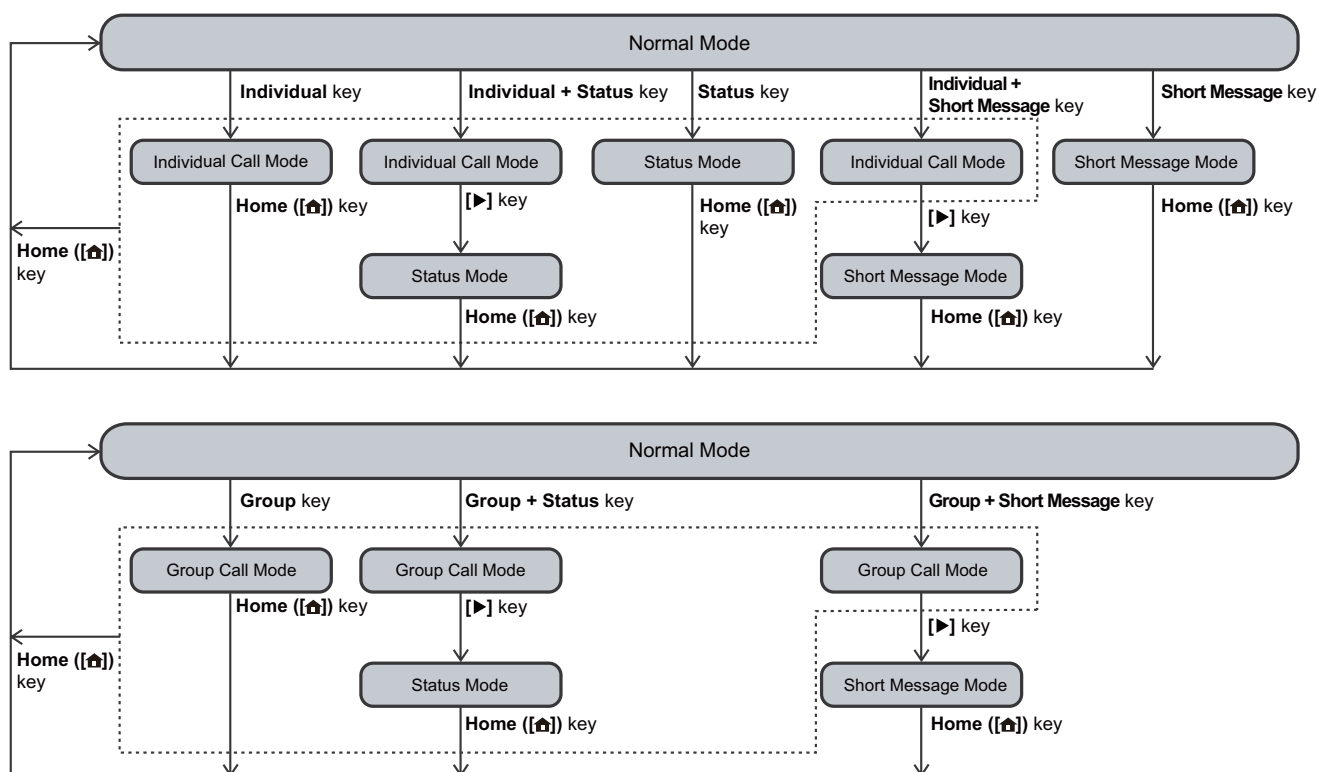
The following various types of calls can be used in a DMR Conventional system. For transceiver operations and behaviors, refer to the instructions of each call type.

- Individual Call/ Paging Call
- Individual Call (Individual Call Acknowledge Request)
- Group Call
- Broadcast Group Call
- Status Call
- Short Data Call

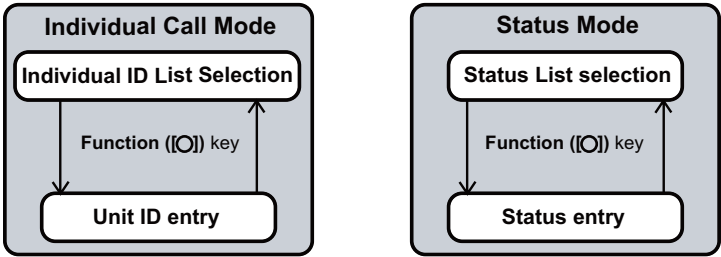
Transition for Each Mode

If a user wishes to send or receive an Individual Call, Group Call, Status Message, or Short Message, the user must operate the transceiver after selecting the desired mode. The following are the transition diagrams for each mode.

Transmission



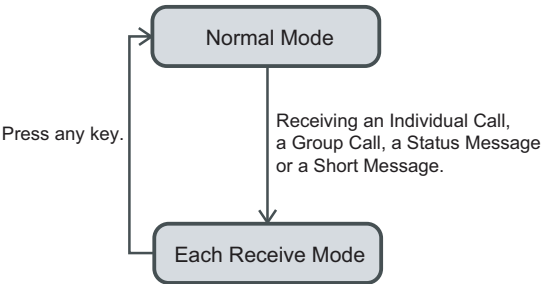
In Individual Call Mode, a Unit ID of the target transceiver can be selected from the Individual ID List or a Unit ID can directly be entered. Also, in Status Mode, a status to be sent can be selected from the Status List or the status can directly be entered. In either mode, the entry method can be changed by pressing and holding the **Function** ([O]) key.



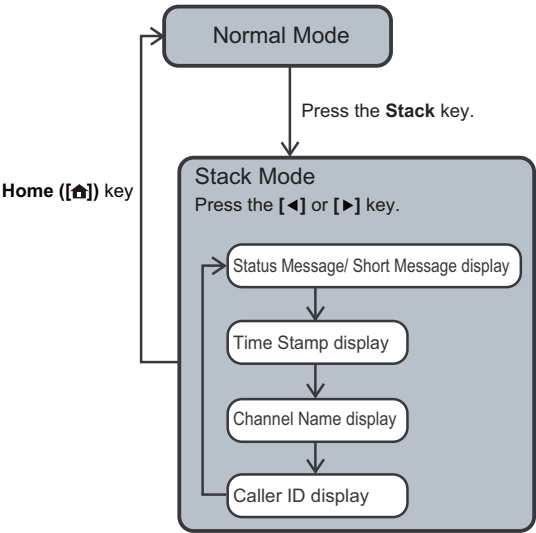
Note

- If **Manual Dialing** is enabled, a Unit ID and status can be manually entered.

Reception



Checking the incoming call history of a received Individual Call, Group Call, Status Message or Short Message



1.5 Making an Individual Call

Individual Call can be used to initiate a call to a target transceiver individually to establish voice calls.

By specifying a Unit ID, the transceiver can initiate a call to the transceiver having the Unit ID.

Initiating an Individual Call

An Individual Call can be started by one of the following methods.

- **Individual Call Mode**

In Individual Call Mode, an Individual Call is initiated by selecting a Unit ID configured in the Individual ID List or directly entering a Unit ID.

Pressing the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key places the transceiver in Individual Call Mode.

The transceiver also enters Individual Call Mode by selecting "Individual", "Individual + Status", or "Individual + Short Message" after the transceiver enters Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

If "Individual", "Individual + Status", or "Individual + Short Message" is configured in **Keypad Operation**, pressing the **[0]** key to **[9]** key on the keypad places the transceiver in Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or will be on hold as the first digit of the Unit ID is entered.

(Refer to Common FUNC Keypad Operation.)

- **Selcall on PTT**

The transceiver initiates an Individual Call when the **PTT** switch is pressed on a channel where "Individual Call" is configured for **Selcall on PTT**. The Unit ID of the target transceiver can be configured by selecting one Unit ID from the Individual ID List by using KPG-D1/ D1N.

- **Talkback**

By pressing the **PTT** switch while the **Auto Reset Timer** is counting down after the transceiver receives an Individual Call, the transceiver can respond (Talkback) to the transceiver which made the Individual Call.

- **Stack Mode**

Selecting the receive history in Stack Mode and pressing the **PTT** switch initiates an Individual Call. (Refer to Common FUNC Viewing the Receive History (Stack).)

- **PC command**

The transceiver starts an Individual Call upon the receipt of a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

The following describes how to initiate an Individual Call in Individual Call Mode.

Operating the transceiver

● Initiating an Individual Call by list selection

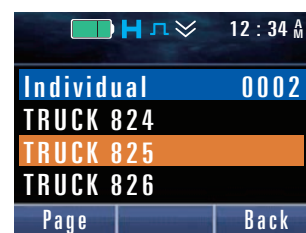
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

The transceiver enters Individual Call Mode, and a selection screen for the Individual ID List will appear.

The following operations are identical even if the transceiver enters Individual Call Mode by a user pressing the **Menu** key or using the keypad.

2 Press the [▲] key or [▼] key to select a Unit ID from the Individual ID List.

Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.



3 Initiating an Individual Call.

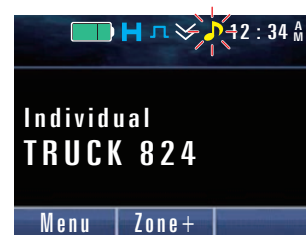
Press the **PTT** switch to initiate a Voice Call. The “🔊” icon blinks, and the display changes to “Individual” and the ID name of the target transceiver.

Press the **Menu** ([□]) key or [*] key to initiate a Paging Call.

If Individual Call Mode has been entered with “Individual + Status” or “Individual + Short Message”, Status Mode or Short Message Mode is entered by pressing the [►] key.

Note

- The selection screen for the Individual ID List closes at the same time as pressing the **PTT** switch. If selecting an ID and sending an Individual Call again, reexecute the operations from step 1.



● Initiating an Individual Call using Manual Dialing

To initiate an Individual Call by directly entering a Unit ID, **Manual Dialing** needs to be enabled.

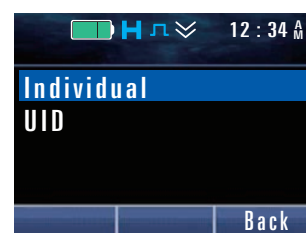
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

The transceiver enters Individual Call Mode, and a selection screen for the Individual ID List will appear.

The following operations are identical even if the transceiver enters Individual Call Mode by a user pressing the **Menu** key or using the keypad.

2 Press the **Function** ([○]) key.

The Unit ID entry display appears.



3 Enter a Unit ID.

Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

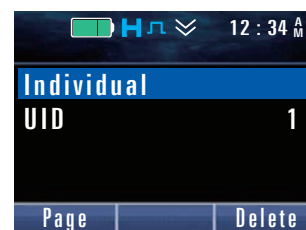
- **Using the keypad**

A Unit ID can be entered by pressing the [0] key to [9] key.

- **Using the PF keys**

Press the [▲] key or the [▼] key to select a number, and press the

Menu ([□]) key or [*] key to confirm the selected number.



4 Initiating an Individual Call.

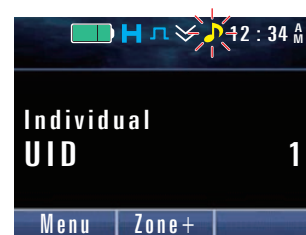
Press the **PTT** switch to initiate a Voice Call. The “🔊” icon blinks, and the display changes to “Individual” and the ID of the target transceiver.

Press the **Menu** ([□]) key or [*] key to initiate a Paging Call.

If Individual Call Mode has been entered with “Individual + Status” or “Individual + Short Message”, Status Mode or Short Message Mode is entered by pressing the [▶] key.

Note

- The selection screen for the Individual ID List closes at the same time as pressing the **PTT** switch. If selecting an ID and sending an Individual Call again, reexecute the operations from step 1.



Note

- If the Individual Call Mode previously used is Manual Dialing mode, the transceiver enters Manual Dialing mode by pressing the **Individual** key. A selection screen for the Individual ID List will appear by pressing the **Function** ([○]) key.
- If no ID is registered in the Individual ID List, the transceiver enters Manual Dialing mode by pressing the **Individual** key if **Manual Dialing** is enabled. In this case, the transceiver cannot enter Individual Call Mode if **Manual Dialing** is disabled.
- If **Transmit LED** is enabled, the LED lights red when the transceiver is transmitting. (Refer to Common FUNC Transmit LED.)
- If **PTT Proceed Tone** is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver (**See** Transceiver Settings > Key Assignment)
- Configuring **Manual Dialing** to be enabled or disabled (**See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Selcall on PTT** (Personality) (**See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Selcall on PTT)
- Configuring **Selcall on PTT** (Channel Edit) (**See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Selcall on PTT)

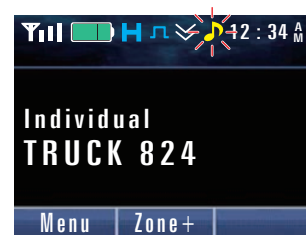
Receiving an Individual Call

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID (Own) preconfigured for the transceiver.

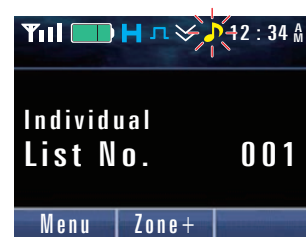
Transceiver behavior

1 The transceiver receives an Individual Call.

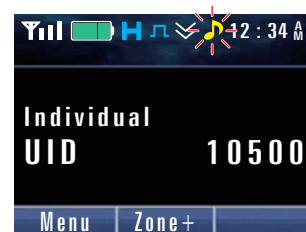
The “📡” icon blinks, and the ID Name of the transmitting transceiver appears.



If the ID Name is not configured in the Individual ID List, the Individual ID List number appears.



If the Unit ID is not configured in the Individual ID List, the Unit ID appears.



2 Press the **PTT** switch.

The transceiver can respond to the received Unit ID. When a key other than the **PTT** switch is pressed, the configured function will be activated.

Note

- If **Busy LED** is enabled, the LED lights green when the transceiver is receiving. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when receiving, an Alert Tone will sound. (Refer to [Transceiver behavior when receiving an Individual Call/ Paging Call](#).)
- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [Transceiver behavior when receiving an Individual Call/ Paging Call](#).)
- When the transceiver receives an Individual Call, the Unit ID Name or Unit ID of the transmitting transceiver appears. If the Unit ID Name is saved on the transceiver, the saved Unit ID Name will be displayed. If the Unit ID Name is not saved on the transceiver, the Unit ID Name configured in the Individual ID List will be displayed. If the Unit ID Name is not configured in the Individual ID List, the Individual ID List number appears.
- If the transceiver receives the Unit ID Name by **Over-the-Air Alias**, the received Unit ID Name will appear.
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving an Individual Call/ Paging Call. (Refer to [Sending the Received Unit ID from the Communication Port \(Unit ID Serial Output\)](#).)

Transceiver behavior when receiving an Individual Call/ Paging Call

● Alert Tone

If the received Unit ID is configured in the Individual ID List, an Alert Tone sounds from the transceiver according to the configuration of **Alert Tone (Individual)** or **Alert Tone (Paging)** for the corresponding Unit ID.

However, if “Common” is configured for **Alert Tone (Individual)** or **Alert Tone (Paging)** in the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, an Alert Tone sounds from the transceiver according to the configuration of **Alert Tone (Individual Call)** or **Alert Tone (Paging Call)** used in common in a DMR Conventional system.

● Selective Call Alert LED

If the received Unit ID is configured in the Individual ID List, the LED flashes according to the configuration of **Alert LED Color (Individual)** or **Alert LED Color (Paging)** for the corresponding Unit ID.

However, if “Common” is configured for **Alert LED Color (Individual)** or **Alert LED Color (Paging)** in the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the LED flashes according to the configuration of **Alert LED Color (Individual Call)** or **Alert LED Color (Paging Call)** used in common in a DMR Conventional system.

● Optional Signaling LED

If **Optional Signaling LED** is enabled, the LED flashes in yellow. However, when **Selective Call Alert LED** is enabled, LED will flash in accordance with the configuration of **Selective Call Alert LED**.

Also, when the transceiver key is operated while the LED flashes according to the **Selective Call Alert LED** configuration, the LED flashes in yellow if the matching state of Optional Signaling persists.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Alert Tone (Individual)/ Alert Tone (Paging)** (Individual ID List) ( [See](#) Transceiver Settings > DMR > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)/ Alert LED Color (Paging)** (Individual ID List) ( [See](#) Transceiver Setting > DMR > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)/ Alert Tone (Paging Call)** used in common in a DMR Conventional system ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional > Alert Tone)
- Configuring **Alert LED Color (Individual Call)/ Alert LED Color (Paging Call)** used in common in a DMR Conventional system ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional > Alert LED Color)

Individual ID List

If making Individual Calls, the desired Unit IDs need to be preconfigured in the transceiver using KPG-D1/ D1N prior to use of the transceiver. A maximum of 1500 Unit IDs can be configured for Individual ID List.

Table 1-10 Individual ID List

Configuration	Description
ID	A Unit ID can be configured in the range between 000001 and FFFCDF (hexadecimal), or between 1 and 16776415 (decimal).
ID Name	The caller's ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the transmitting transceiver is configured in the Individual ID List, the ID Name of the transmitting transceiver appears when the transceiver receives a call. The received Unit ID Name appears upon receipt of the Unit ID Name by the Over-the-Air Alias function while receiving a call. If the transceiver is unable to receive the Unit ID Name, the saved Unit ID Name appears if it is saved in the Unit ID stored on the transceiver. When the Unit ID Name is not saved on the transceiver, the Unit ID Name configured in the Individual ID List appears if a Unit ID Name is configured for the received Unit ID in the Individual ID List. The Unit ID number appears if the above conditions are not satisfied.
ID Mode	The permission or inhibition of transmission of the receiving party can be configured. An ID for which "Receive Only" is configured for ID Mode does not appear on the ID selection display in Individual Call Mode, and a user cannot select the ID in Individual Call Mode. If the transceiver receives a call from an ID for which "Receive Only" is configured for ID Mode, the caller's ID Name appears. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the PTT switch.
Alert Tone	Individual: The type of tone sounding from the transceiver can be configured for an Individual Call from the Unit IDs configured in the Individual ID List. Paging: The type of tone sounding from the transceiver can be configured for a Paging Call from the Unit IDs configured in the Individual ID List.
Alert LED Color	Individual: The color of flashing LED can be configured for an Individual Call from the Unit IDs configured in the Individual ID List. Paging: The color of flashing LED can be configured for a Paging Call from the Unit IDs configured in the Individual ID List.  Note To use Alert LED Color, Selective Call Alert LED needs to be enabled.

Configuration using KPG-D1/ D1N

Configuring **Individual ID List** ( **See** Transceiver Settings > DMR > Individual ID List)

Restricting IDs for Which the Transceiver Can Initiate a Call (Individual ID Encode Block)

Individual ID Encode Block is the range of the Unit ID used by the transceiver to initiate a call.

A Unit ID with which a user is allowed to initiate a call can be restricted using KPG-D1/ D1N. A user can initiate a call to a Unit ID configured in the Individual ID List even if it is outside the range of **Individual ID Encode Block**.

The transceiver for which **Individual ID Encode Block** is not configured can initiate a call to all transceivers.

The transceiver unmutes the speaker and emits received audio when the transceiver receives the Unit ID satisfying the receiving conditions. In this case, the Unit ID of the transmitting transceiver appears on the receiving transceiver. If the Unit ID of the transmitting transceiver is in the range of the **Individual ID Encode Block** or has been registered in the Individual ID List, the receiving transceiver can respond to the transmitting transceiver by pressing the **PTT** switch. If the Unit ID of the transmitting transceiver is outside the range of the **Individual ID Encode Block** and also has not been registered in the Individual ID List, the receiving transceiver cannot respond to the transmitting transceiver.

Configuration using KPG-D1/ D1N

Configuring **Individual ID Encode Block** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Sending the Received Unit ID from the Communication Port (Unit ID Serial Output)

Unit ID Serial Output is the function for sending the received Unit ID from the communication port of the transceiver.

By using **Unit ID Serial Output**, the dispatcher can monitor the transceiver that is engaged in a voice call in real time. Unit ID that is sent from the communication port can also be used for managing the call log.

Note

- The transceiver will send the Unit ID from the communication port only when Color Code and Slot Selection match the Color Code and Slot Selection configured in the transceiver.
- When the transceiver receives a call via Selective Call, Unit ID is sent from the communication port regardless of the configuration of Unit ID Serial Output.
- To use **Unit ID Serial Output**, “Data”, “Data + GPS Data Output”, or “Data + Location Data Output” needs to be assigned to the communication port of the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Unit ID Serial Output** ( **See** Transceiver Settings > DMR > DMR Information > General > Serial Output)
- Assigning functions to **COM port** ( **See** Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > COM Port)

1.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)

Individual Call Acknowledge Request is the function that allows a user to distinguish whether or not the receiving transceiver is available to communicate so as to initiate an Individual Call in a DMR Conventional system.

Individual Call Acknowledge Request enables a call to the particular transceiver having the specified Unit ID in the same way as a normal Individual Call; however, an acknowledgment message must be received from the receiving transceiver for the communication to start (also, receiving an Individual Call from the receiving transceiver allows the communication to start).

The transmitting transceiver sends a message requesting an acknowledgment when initiating an Individual Call. Upon receipt of the message requesting an acknowledgment, the receiving transceiver sends to the transmitting transceiver an acknowledgment message to notify that the receiving transceiver is available for the call. The transmitting transceiver becomes enabled for the communication upon receipt of the acknowledgment message from the receiving transceiver.

To use this function, **Individual Call Acknowledge Request** needs to be enabled and a value other than "No" needs to be configured in **Busy Channel Lockout (DMR)** by using KPG-D1/ D1N for the channel to be used by the transmitting transceiver. Also, using KPG-D1/ D1N, the parameters of the following various functions to be used with **Individual Call Acknowledge Request** can be configured.

- Call Request Tone
- Call Processing Tone
- Call Processing Tone Delay Time
- Call in Progress Tone

Note

- When "Interrupt CALL" is configured for **In-call Busy Channel Lockout**, **Individual Call Acknowledge Request** can be used even when "No" is configured for **Busy Channel Lockout (DMR)**.
- **Individual Call Acknowledge Request** cannot be used while the transceiver is placed in Emergency Mode. A normal Individual Call, which does not require the sending of a message requesting an acknowledgment, can only be used.
- For an Individual Call (**Individual Call Acknowledge Request**), the following functions used for a normal Individual Call are available. (Refer to **Making an Individual Call**.)
 - Individual ID List
 - Unit ID Encode Block

Configuration using KPG-D1/ D1N

- Configuring **Individual Call Acknowledge Request** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Individual Call Acknowledge Request)
- Configuring **Busy Channel Lockout (DMR)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

Initiating an Individual Call (Individual Call Acknowledge Request)

An Individual Call (Individual Call Acknowledge Request) can be activated by one of the following methods.

● Individual Call Mode

Selecting a Unit ID configured in the Individual ID List or directly entering a Unit ID while the transceiver is in Individual Call Mode, and then pressing the **PTT** switch or the **Menu** ([]) key sends a message requesting an acknowledgment.

Pressing the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key places the transceiver in Individual Call Mode.

The transceiver also enters Individual Call Mode by selecting "Individual", "Individual + Status", or "Individual + Short Message" after the transceiver enters Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

If "Individual", "Individual + Status", or "Individual + Short Message" is configured in **Keypad Operation**, pressing the [0] key to [9] key on the keypad also places the transceiver in Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or will be on hold as the first digit of the Unit ID is entered. (Refer to Common FUNC Keypad Operation.)

● Stack Mode

Selecting the receive record in Stack Mode and then pressing the **PTT** switch sends a message requesting an acknowledgment. (Refer to Common FUNC Viewing the Receive History (Stack).)

● Selcall on PTT

Selecting the channel where the target Unit ID for **Selcall on PTT** is configured and then pressing the **PTT** switch sends a message requesting an acknowledgment. The Unit ID of the target transceiver can be configured by selecting one Unit ID from the Individual ID List by using KPG-D1/ D1N.

● Call key

Pressing one of the **Call 1** key to the **Call 6** key sends a message requesting an acknowledgment to the Unit ID which corresponds to the key pressed.

For Mobile, a message requesting an acknowledgment is sent to the Unit ID which corresponds to the active port when any of the "Call 1" to "Call 6" ports allocated to the AUX Input port becomes active.

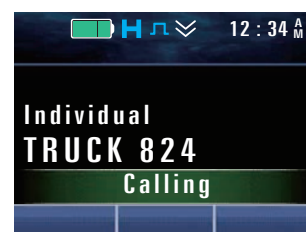
● PC command

A message requesting an acknowledgment is sent when the PC command is received from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Operating the transceiver

1 Follow one of the methods mentioned above to initiate an Individual Call (Individual Call Acknowledge Request).

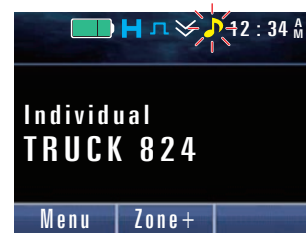
A message requesting an acknowledgment is sent.
When the receiving transceiver is inside the communication range, "Calling" appears on the display, and the transceiver waits to receive an acknowledgment message from the receiving transceiver.



2 Receive an acknowledgment message from the receiving transceiver.

The “” icon blinks, and the transceiver enters a state allowing transmission of an Individual Call.

Receiving an acknowledgment message while the **PTT** switch is being pressed initiates an Individual Call.



3 Press the **PTT** switch.

The Individual Call is initiated.

Note

- If the **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when a call request for an Individual Call (Individual Call Acknowledge Request) is initiated. Also, if the **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver until the transceiver receives an acknowledgment message from the receiving transceiver after the call request for an Individual Call (Individual Call Acknowledge Request) is sent. (Refer to **Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)**, **Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)**.)
- If **Call in Progress Tone** is enabled, a Call in Progress Tone (2 beeps) sounds from the transceiver when the transceiver becomes ready for transmissions with Individual Call.
- If **PTT Proceed Tone** is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)
- While the transceiver is on standby to receive an acknowledgment message from the receiving transceiver, canceling the call is possible by pressing the **Clear** key.
- The transmitting transceiver sends a message requesting another acknowledgment when the length of time configured in **Maximum ACK Wait Time** elapses without receiving an automatic response message for a message requesting an acknowledgment from the receiving transceiver. If a response message cannot be received, the transmitting transceiver can send a message requesting an acknowledgment up to the number of times configured for **Number of Retries**. (Refer to **Maximum ACK Wait Time, Number of Retries**.)
- The transceiver terminates the call if the transceiver cannot receive an automatic response message from the receiving transceiver even if a message requesting an acknowledgment has been sent for the number of times configured in **Number of Retries**. At that time, “No Reply” appears on the display for 1 sec. (Refer to **Number of Retries**.)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Assigning functions to the AUX Input port ( **See** Transceiver Settings > Extended Function > AUX)
- Configuring **Selcall on PTT** (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Selcall on PTT)
- Configuring **Selcall on PTT** (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Selcall on PTT)
- Configuring the Unit ID corresponding to the **Call 1** to **Call 6** key or port ( **See** Transceiver Settings > Key Assignment > Call)

Receiving an Individual Call (Individual Call Acknowledge Request)

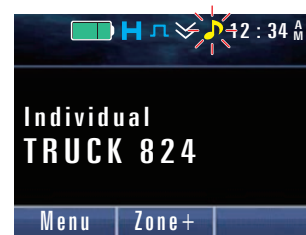
The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID (Own) preconfigured for the transceiver.

To receive an Individual Call (Individual Call Acknowledge Request), the receiving transceiver must receive a message requesting an acknowledgment from the transmitting transceiver. The transceiver becomes enabled for the communication after the transmitting transceiver receives an acknowledgment message.

Operating the transceiver

1 Receive a message requesting an acknowledgment.

The “🔔” icon blinks, and the ID Name of the transmitting transceiver appears.
An acknowledgment message is automatically sent to the transmitting transceiver.



2 Press the **PTT** switch after transmission of an acknowledgment.

The transceiver initiates an Individual Call to the transmitting transceiver.

Note

- If **Busy LED** is enabled, the LED lights green when the transceiver is receiving. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when receiving, an Alert Tone will sound. (Refer to [Transceiver behavior when receiving an Individual Call \(Individual Call Acknowledge Request\)](#).)
- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [Transceiver behavior when receiving an Individual Call \(Individual Call Acknowledge Request\)](#).)
- If the transceiver receives the Unit ID Name by **Over-the-Air Alias**, the received Unit ID Name will appear.
- If the **Over the Air Alias** function is not configured on the transmitting transceiver, and a Unit ID is registered in the Individual ID List but not the Unit ID Name, the Individual ID List number will be displayed. If the Unit ID is not registered in the Individual ID List, the Unit ID appears.

Transceiver behavior when receiving an Individual Call (Individual Call Acknowledge Request)

● Alert Tone

If the received Unit ID is configured in the Individual ID List, an Alert Tone sounds from the transceiver according to the configuration for **Alert Tone (Individual)** of the corresponding Unit ID.

However, if “Common” is configured in **Alert Tone (Individual)** of the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, an Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Individual Call)** used in common in a DMR Conventional system.

● Selective Call Alert LED

If the received Unit ID is configured in the Individual ID List, the LED flashes according to the configuration for **Alert LED Color (Individual)** of the corresponding Unit ID.

However, if “Common” is configured in **Alert LED Color (Individual)** of the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the LED flashes according to the configuration in **Alert LED Color (Individual Call)** used in common in a DMR Conventional system.

● Optional Signaling LED

If **Optional Signaling LED** is enabled, the LED flashes yellow. However, if **Selective Call Alert LED** is enabled, the LED flashes according to the configuration in **Selective Call Alert LED**.

Also, when the transceiver key is operated while the LED flashes according to the **Selective Call Alert LED** configuration, the LED flashes in yellow if the matching state of Optional Signaling persists.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Optional Signaling LED** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Alert Tone (Individual)** (Individual ID List) ( **See** Transceiver Settings > DMR > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)** (Individual ID List) ( **See** Transceiver Settings > DMR > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)** used in common in a DMR Conventional system ( **See** Transceiver Settings > DMR > DMR Information > Conventional > Alert Tone)
- Configuring **Alert LED Color (Individual Call)** used in common in a DMR Conventional system ( **See** Transceiver Settings > DMR > DMR Information > Conventional > Alert LED Color)

Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)

Call Request Tone is the function to emit a Call Request Tone (1 beep) from the transceiver when a call request for an Individual Call (Individual Call Acknowledge Request) is initiated in a DMR Conventional system.

The Call Request Tone (1 beep) from the transceiver notifies the user that a call request for an Individual Call (Individual Call Acknowledge Request) has been initiated.

The user can initiate the communication after the call request has been established.

Configuration using KPG-D1/ D1N

Configuring **Call Request Tone** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Individual Call Acknowledge Request)

Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)

Call Processing Tone is the function to emit a Call Processing Tone (2 beeps) from the transceiver until the transceiver receives an acknowledgment message from the receiving transceiver after the call request for an Individual Call (Individual Call Acknowledge Request) is initiated in a DMR Conventional system.

The Call Processing Tone (2 beeps) from the transceiver notifies a user that the call request for an Individual Call (Individual Call Acknowledge Request) is in progress. A Call Processing Tone stops when the call request is established, and the user can initiate the communication.

After the call request for an Individual Call (Individual Call Acknowledge Request) is initiated, a Call Processing Tone (2 beeps) sounds from the transceiver upon the elapse of the time configured for **Call Processing Tone Delay Time**.

Configuration using KPG-D1/ D1N

Configuring **Call Processing Tone** and **Call Processing Tone Delay Time** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Individual Call Acknowledge Request > Call Processing Tone)

1.7 Making a Group Call

Group Call is the function to establish 2-way group voice communications by initiating a call to a group. The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the All Group ID (\$FFFFFF) for which "ALL" is configured. If the transceiver receives the All Group ID (\$FFFFFF), the transceiver treats the reception as the reception of an All Group Call, and unmutes the speaker. However, if the **PTT** switch is pressed after the reception of an All Group Call, the transceiver does not reply to the transmitting transceiver by an All Group Call.

Initiating a Group Call

Group Call can be started by one of the following methods.

- **Group Call Mode**

While the transceiver is in Group Call Mode, the transceiver can initiate a Group Call by a user selecting a Group ID configured in the Group ID List and then pressing the **PTT** switch. (Refer to [Group ID List](#).)

Pressing the **Group** key, **Group + Status** key, or **Group + Short Message** key places the transceiver in Group Call Mode.

The transceiver also enters Group Call Mode by selecting "Group", "Group + Status", or "Group + Short Message" after the transceiver enters Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

If "Group", "Group + Status", or "Group + Short Message" is configured in **Keypad Operation**, pressing the **[0]** key to **[9]** key on the keypad also places the transceiver in Group Call Mode. The transceiver enters Group ID Shortcut Entry Mode or will be on hold as the first digit of the Group ID is entered. (Refer to Common FUNC Keypad Operation.)

- **Selcall on PTT**

The transceiver initiates a Group Call when the **PTT** switch is pressed on a channel where "Group Call" is configured for **Selcall on PTT**. The Group ID of the target transceiver can be configured by selecting one Group ID from the Group ID List by using KPG-D1/ D1N.

- **PC Command**

The transceiver starts a Group Call upon the receipt of a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Operating the transceiver

The following describes how to initiate a Group Call in Group Call Mode.

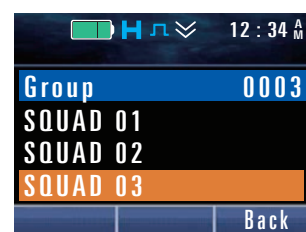
1 Press the **Group** key, **Group + Status** key, or **Group + Short Message** key.

The transceiver enters Group Call Mode and the Group ID List selection display appears.

The following operations are identical even if the transceiver enters Group Call Mode by a user pressing the **Menu** key or using the keypad.

2 Press the **[▲]** key or **[▼]** key to select a Group ID from the Group ID List.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the **PTT** switch.

The transceiver initiates a Group Call.

If Group Call Mode has been entered with "Group + Status" or "Group + Short Message", Status Mode or Short Message Mode is entered by pressing the [▶] key.

Note

- The selection screen for the Group ID List closes at the same time as pressing the **PTT** switch. If selecting an ID and sending a Group Call again, reexecute the operations from step 1.
- If **Transmit LED** is enabled, the LED lights red when the transceiver is transmitting. (Refer to Common FUNC Transmit LED.)
- If **PTT Proceed** Tone is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)
- The transceiver starts a Group Call only by a user pressing the **PTT** switch if the transceiver transmits on a channel with "Group Call" configured for **Selcall on PTT**. In this case, a Group ID does not need to be selected by using the transceiver.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Selcall on PTT** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Selcall on PTT)
- Configuring **Selcall on PTT** (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Selcall on PTT)

Receiving a Group Call

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Group Call.

Transceiver behavior

1 The transceiver receives a Group Call.

The "🔊" icon blinks and a received Group ID appears. If **Unit ID Display on Group Call** is enabled, the ID Name of the transmitting transceiver is displayed. (Refer to [Display When the Transceiver Receives a Group Call \(Unit ID Display on Group Call\)](#).)



2 Press the **PTT** switch.

The transceiver can respond to the received Group ID. When a key other than the **PTT** switch is pressed, the configured function will be activated.

Note

- If **Busy LED** is enabled, the LED lights green when the transceiver is receiving. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when receiving, an Alert Tone will sound. (Refer to [Transceiver behavior when receiving a Group Call](#).)
- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [Transceiver behavior when receiving a Group Call](#).)
- The transceiver can record the receipt of a Group Call. The record can be checked in Stack Mode. (Refer to Common FUNC Viewing the Receive History (Stack).)
- If **Group ID Scan (DMR)** is enabled, the transceiver is on standby to receive a Group Call from all Group IDs configured in the Group ID List. (Refer to [Group ID Scan \(DMR\)](#).)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Group Call. (Refer to [Sending the Received Unit ID from the Communication Port \(Unit ID Serial Output\)](#).)

Transceiver behavior when receiving a Group Call

● Alert Tone

If the received Group ID is configured in the Group ID List, an Alert Tone sounds from the transceiver according to the configuration for **Alert Tone** of the corresponding Group ID.

However, if “Common” is configured for **Alert Tone** in the Group ID List, or if the received Group ID is not configured in the Group ID List, an Alert Tone sounds from the transceiver according to the configuration for **Alert Tone (Group Call)** used in common in a DMR Conventional system.

● Selective Call Alert LED

If the received Group ID is configured in the Group ID List, the LED blinks according to the configuration for **Alert LED Color** of the corresponding Group ID.

However, if “Common” is configured for **Alert LED Color** in the Group ID List, or if the received Group ID is not configured in the Group ID List, the LED flashes according to the configuration for **Alert LED Color (Group Call)** used in common in a DMR Conventional system.

● Optional Signaling LED

If **Optional Signaling LED** is enabled, the LED flashes in yellow. However, when **Selective Call Alert LED** is enabled, LED will flash in accordance with the configuration of **Selective Call Alert LED**.

Also, when the transceiver key is operated while the LED flashes according to the **Selective Call Alert LED** configuration, the LED flashes in yellow if the matching state of Optional Signaling persists.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Alert Tone/ Alert LED Color** (Group ID List) ( [See](#) Transceiver Settings > DMR > Group ID List)
- Configuring **Alert Tone (Group Call)** used in common in a DMR Conventional system ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional > Alert Tone)
- Configuring **Alert LED Color (Group Call)** used in common in a DMR Conventional system ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional > Alert LED Color)

Group ID List

The transceiver uses a Group ID configured in the Group ID List to initiate a Group Call in a DMR Conventional system.

The desired Group IDs must be preconfigured using KPG-D1/ D1N for the transceiver to initiate a Group Call. A maximum of 1,500 Group IDs can be configured in the Group ID List.

Table 1-11 Group ID List

Configuration	Description
ID	A Group ID can be configured in the range between 000001 and FFFCDF (hexadecimal), between 1 and 16776415 (decimal), or "ALL". "ALL" allows initiation of a call to all groups.  Note For All Group ID (ALL), the ID for sending and receiving is fixed to 0xFFFFFFFF.
ID Name	The caller's ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the group is configured in the Group ID List, the ID Name appears when the transceiver receives a call. If the ID Name is not configured in the Group ID List, the Group ID List number appears.
ID Mode	The permission or inhibition of transmission of the receiving party can be configured. An ID for which "Receive Only" is configured for ID Mode does not appear on the ID selection display in Group Call Mode, and a user cannot select the ID in Group Call Mode. If the transceiver receives a call from an ID for which "Receive Only" is configured for ID Mode, the caller's ID Name appears. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the PTT switch.
Alert Tone	The tone type sounding from the transceiver can be configured for a Group Call from the Group IDs registered in the Group ID List.
Alert LED Color	The color of flashing LED can be configured for a Group Call from the Group IDs registered in the Group ID List.  Note To use Alert LED Color, Selective Call Alert LED needs to be enabled.

Configuration using KPG-D1/ D1N

Configuring **Group ID List** ( **See** Transceiver Settings > DMR > Group ID List)

Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)

Unit ID Display on Group Call is the function to display the Unit ID of the transmitting transceiver when the transceiver receives a Group Call.

If this function is enabled, the ID Name of the transmitting transceiver is displayed when the transceiver receives a Group Call. (Refer to [Receiving a Group Call](#).)

Configuration using KPG-D1/ D1N

Configuring **Unit ID Display on Group Call** ( **See** Transceiver Settings > DMR > DMR Information > General)

Group ID Scan (DMR)

Group ID Scan (DMR) is the function to standby to receive a Group Call from all Group IDs in a DMR Conventional system.

If this function is enabled, the transceiver is on standby to receive a Group Call from all Group IDs configured for Group ID List.

If this function is disabled, the transceiver is on standby to receive only the Group Calls from the Group IDs configured for **Selcall on PTT** or for **Persistent Group ID (DMR)**.

However, when “Off” or “Individual Call” is configured for **Selcall on PTT**, calls will only be received from the Group ID configured in **Persistent Group ID (DMR)**.

Note

- Group IDs from which data is received when **Group ID Scan (DMR)** is disabled vary according to the firmware version of the transceiver.
 - 2.10.00 or earlier versions: Group IDs configured in **Group ID List**
 - 2.20.00 or later versions: Group IDs configured in **Selcall on PTT** and **Persistent GID**
- Group ID Scan (DMR)** can also be utilized for communication of data such as Status Message, Short Message and GPS data.

Configuration using KPG-D1/ D1N

- Configuring **Group ID Scan (DMR)** to be enabled or disabled (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Group ID Scan (DMR)** to be enabled or disabled (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)
- Configuring **Selcall on PTT** (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Selcall on PTT)
- Configuring **Selcall on PTT** (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Selcall on PTT)
- Configuring **Persistent Group ID (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Persistent Group ID (DMR))

Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only))

Call Alert Inhibit (Group Calls only) is the function that disables the Alert Tone, Selective Call Alert LED, Horn Alert, Vibrator and Caller ID Stack functions when the transceiver receives a Group Call.

Use of this function prevents specific functions from activating as follows even if these functions are enabled or configured to be enabled when the transceiver receives a Group Call.

- **Alert Tone**

The following Alert Tones do not sound from the transceiver even if the transceiver receives a Group Call.

- Alert Tone (Group ID List)
- Group Call (Alert Tone) (Conventional)

- **Selective Call Alert LED**

A Selective Call Alert LED does not blink even if the transceiver receives a Group Call.

- **Horn Alert (Mobile only)**

The headlight of the vehicle connected to Horn Alert does not light up and the horn is not sounded even when a Group Call is received.

- **Vibrator (Portable only)**

The Vibrator does not function even if the transceiver receives a Group Call.

- **Caller ID Stack**

The Caller ID will not be stored in the transceiver stack memory even if the transceiver receives a Group Call.

Configuration using KPG-D1/ D1N

Configuring the **Call Alert Inhibit (Group Calls only)** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > General)

Avoiding Receiving a Group Call during an Incoming Individual Call (Ignore Group Call during Individual Call)

Ignore Group Call during Individual Call is the function that disables receiving of Group Calls while an Individual Call is being received.

Use this function to assign priority to Individual Calls that are received.

Enabling this function disables receiving of Group Calls (including data communication) while the transceiver is receiving an Individual Call and the Auto Reset Timer is counting down.

Note

- The following types of Group Call can be received even when this function is enabled.
 - Group Call via All Group ID
 - Emergency Group Call
- When this function is enabled, receiving of Unaddressed Call will also be disabled while receiving an Individual Call.
- When this function is enabled, OVCM via receiving of Group Call will be deactivated while receiving an Individual Call. (Refer to **Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode)**.)

Configuration using KPG-D1/ D1N

Configuring **Ignore Group Call during Individual Call** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > General)

1.8 Making an Informative Group Call (Broadcast Group Call)

Broadcast Group Call can be used to engage in one-way informative group voice calls by initiating a call to a group.

The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the Group ID for which "ALL" is configured.

Initiating a Broadcast Call

Broadcast Group Call can be started by one of the following methods:

- **Broadcast key**

Broadcast Call information is added to a Group Call and sent by the transceiver initiating a Group Call while Broadcast Group Call is enabled.

Pressing the **Broadcast** key toggles the Broadcast Group Call between enabled and disabled.

If the **Menu** key is pressed to enter Menu Mode and then "Broadcast" is selected, Broadcast Group Call can also be toggled between enabled and disabled. (Refer to Common FUNC Using Menu Mode.)

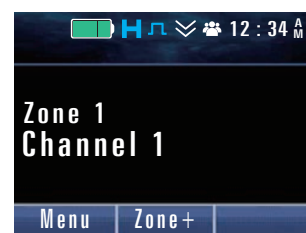
- **PC command**

The transceiver starts a Broadcast Group Call upon the receipt of a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Operating the transceiver

1 Press the **Broadcast** key.

Broadcast Group Call is enabled after a Key Beep A (1 beep) sounds from the transceiver. The "📡" icon appears.
The following operations are identical even if Broadcast Group Call is enabled by pressing the **Menu** key.



2 Initiating a Group Call.

Refer to "**Initiating a Group Call**" for methods to initiate a Group Call.

Pressing the **Broadcast** key after the transmission causes Broadcast Group Call to be disabled.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

Receiving a Broadcast Group Call

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Broadcast Group Call.

Note

- The transceiver can receive the Broadcast Group Call initiated using the Group ID for which "ALL" is configured even if no Group ID is configured for the transceiver.

Operating the transceiver

Press the **Broadcast** key.

The "🔊" icon blinks, and then "Broadcast" and a received Group ID appear.

If Unit ID Display on Group Call is enabled, the ID Name of the transmitting transceiver is displayed. (Refer to [Display When the Transceiver Receives a Group Call \(Unit ID Display on Group Call\)](#).)



Note

- If **Busy LED** is enabled, the LED lights green when the transceiver is receiving. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when receiving, an Alert Tone will sound. (Refer to [Transceiver behavior when receiving a Group Call](#).)
- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [Transceiver behavior when receiving a Group Call](#).)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Broadcast Group Call. (Refer to [Sending the Received Unit ID from the Communication Port \(Unit ID Serial Output\)](#).)

1.9 Common Functions for Data Communications

The following functions are used in common for data communications such as Status Call and Short Data Call:

- Number of Retries
- Transmit Busy Wait Time
- Maximum ACK Wait Time
- Preamble Length

Number of Retries

If the transceiver does not receive the acknowledgment after the transceiver sends data and the time configured for **Maximum ACK Wait Time** elapses, the transceiver resends data. **Number of Retries** is the number of times for the transceiver to resend data. A smaller number can be configured if there is good communicating conditions, and a larger number can be configured if there are inferior communicating conditions.

Configuration using KPG-D1/ D1N

Configuring **Number of Retries** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

Transmit Busy Wait Time

The transceiver confirms that the traffic channel is available before sending data and then starts sending data when the channel is available. **Transmit Busy Wait Time** is the duration to wait for the traffic channel to become available.

A transmission is canceled when the channel is busy and the Transmit Busy Wait Time elapses.

Configuration using KPG-D1/ D1N

Configuring **Transmit Busy Wait Time** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

Maximum ACK Wait Time

Maximum ACK Wait Time is the length of time that the transceiver stands by to receive the acknowledgment after the transceiver sends data. If the transceiver does not receive the acknowledgment within the time configured for **Maximum ACK Wait Time**, the transceiver resends data.

Note

- A Long Data Message transmits data divided over multiple times. The receiving transceiver stands by to receive the next data for the time configured for **Maximum ACK Wait Time** after receiving the previous data. The transceiver exits Long Data Message Receive Mode if the transceiver does not receive any data during the period.
- For Transparent communications, the transceiver stands by to receive the next data while **Maximum ACK Wait Time** is counting down after the transceiver receives the data. If the transceiver does not receive any data during this period, the transceiver exits the Transparent receive mode.

Configuration using KPG-D1/ D1N

Configuring **Maximum ACK Wait Time** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

Preamble Length

Preamble Length is the function to extend the duration for sending a preamble when the DMR frame is sent.

Extending the time for sending a preamble at the beginning of transmission makes the receiving transceiver easier to receive a call and reduces missing of the beginning of the audio during the scan.

The extended time of a preamble is determined by using the following equation.

$$\text{Time [sec]} = 60 \text{ ms} \times \text{Configuration value for Preamble Length}$$

Configuration using KPG-D1/ D1N

Configuring **Preamble Length** ( See Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

1.10 Sending and Receiving a Status Message (Status Call)

Status Call is a simple messaging system that allows a user to send and receive a status (Status Message). Since the message is replaced by status, communications can take place quickly and communication traffic can be reduced.

The following methods are available to send a Status Message.

Note

- This section describes information for both a DMR Conventional system and DMR-based Trunking system. For each operation description, the display of the DMR Conventional system is used.
- The range of the statuses that can be sent and received varies as follows in a DMR Conventional system and DMR-based Trunking system:
DMR-based Trunking system: 0 to 99
DMR Conventional system: 0 to 1023

Table 1-12 Sending Status Messages

Transmission Methods	Description
Status Mode	The transceiver enters Status Mode by a user pressing a PF key or a key on the keypad, and then the transceiver will send a Status Message. (Refer to Sending a Status Message .)
Call key	Pressing one of the "Call 1" to "Call 6" keys allocated to the PF keys of the transceiver causes the transceiver to send the preconfigured Status Message. For Mobile, the Status Message preconfigured in the transceiver is sent when any of the "Call 1" to "Call 6" ports allocated to the AUX Input port becomes active. "Call 1" to "Call 6" can be assigned to the PF keys or AUX Input ports by using KPG-D1/ D1N, and the Status Message corresponding to each key can be selected from the Status List in DMR. In this case, a Status Message is always sent to the preconfigured Base ID.
Turning the transceiver on/ off	The transceiver sends the Status Message configured in the transceiver when the transceiver is turned on or off. (Refer to Power-on Status Message , Power-off Status Message .) In this case, a Status Message is always sent to the preconfigured Base ID.
AUX Input Status Message (Mobile Only)	The specified Status Message is sent when the AUX Input port goes high level to low level or goes low level to high level. (Refer to AUX Input Status Message (Mobile Only) .)
PC Command	The transceiver will send a Status Message when the transceiver receives a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Assigning functions to the AUX Input port ( [See](#) Transceiver Settings > Extended Function > AUX)
- Configuring the Status Message corresponding to the **Call 1** to **Call 6** keys ( [See](#) Transceiver Settings > Key Assignment > Call)

Sending a Status Message

This section describes how to send a Status Message in Status Mode.

The transceiver enters Status Mode with one of the following operations, and then the transceiver will send a Status Message.

- **Status key, Individual + Status key, or Group + Status key**

Pressing the **Status** key places the transceiver in Status Mode. In this case, a Status Message is addressed to a Base ID. Pressing the **Individual + Status** key places the transceiver in Individual Call Mode. The transceiver enters Status Mode by pressing the [▶] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Unit ID. The transceiver's behavior when the **Group + Status** key is pressed varies depending on the system.

For a DMR Conventional system:

The transceiver enters Group Call Mode. The transceiver enters Status Mode by pressing the [▶] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Group ID.

For a DMR-based Trunking system:

The transceiver enters Status Mode. The target transceiver's Group ID must be selected before entering Status Mode.

- **Menu key**

Pressing the **Menu** key places the transceiver in Menu Mode, and then the transceiver enters Status Mode by selecting "Status". In this case, a Status Message is addressed to a Base ID.

The transceiver can be placed in Individual Call Mode by selecting "Individual + Status" after placing the transceiver in Menu Mode by pressing the **Menu** key. The transceiver enters Status Mode by pressing the [▶] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Unit ID.

The transceiver's behavior varies depending on the system when the **Menu** key is pressed to enter Menu Mode and then "Group + Status" is selected.

For a DMR Conventional system:

The transceiver enters Group Call Mode. The transceiver enters Status Mode by pressing the [▶] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Group ID.

For a DMR-based Trunking system:

The transceiver enters Status Mode. The target transceiver's Group ID must be selected before entering Status Mode. Refer to Common FUNC "Using Menu Mode" for operations in Menu Mode.

- **Keypad entry**

If "Status" is configured for **Keypad Operation**, pressing the [0] key to [9] key on the transceiver keypad causes the transceiver to enter Status Mode. In this case, a Status Message is addressed to a Base ID.

If "Individual + Status" is configured in **Keypad Operation**, pressing the [0] key to [9] key on the keypad places the transceiver in Individual Call Mode. The transceiver enters Status Mode by pressing the [▶] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Unit ID. (Refer to Common FUNC Keypad Operation.)

The transceiver's behavior varies depending on the system while "Group + Status" is configured in **Keypad Operation**.

For a DMR Conventional system:

Pressing the [0] key to [9] key on the transceiver keypad places the transceiver in Group Call Mode. The transceiver enters Status Mode by pressing the [▶] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Group ID.

For a DMR-based Trunking system:

Pressing the [0] key to [9] key on the transceiver keypad places the transceiver in Status Mode. The target transceiver's Group ID must be selected before entering Status Mode.

Note

- For operating in Individual Call Mode or Group Call Mode, refer to the information on the various call types of DMR.

Operating the transceiver

● Sending a Status Message by list selection

1 Select one of the following operations to place the transceiver in Status Mode.

- **Press the Status key.**

The transceiver enters Status Mode. In this case, a Status Message is addressed to a Base ID.

- **Press the Individual + Status key.**

Pressing the [▶] key after selecting the Unit ID of the target transceiver causes Status Mode to be entered.

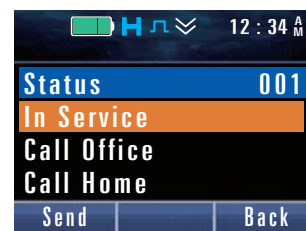
- **Press the Group + Status key. (DMR Conventional system)**

Pressing the [▶] key after selecting the Group ID of the target transceiver causes Status Mode to be entered.

- **Press the Group + Status key after selecting the Group ID configured for the channel. (DMR-based Trunking system)**

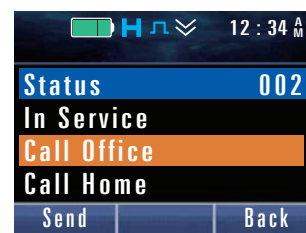
The transceiver enters Status Mode.

Or, the transceiver enters Status Mode by pressing the **Menu** key or using a keypad. In this case, the following operations are identical.



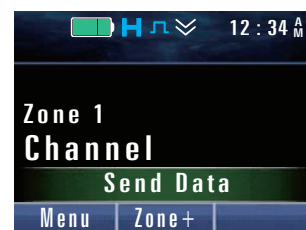
2 Press the [▲] key or [▼] key and then select the target data from the Status List.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the PTT switch or the Menu ([□]) key.

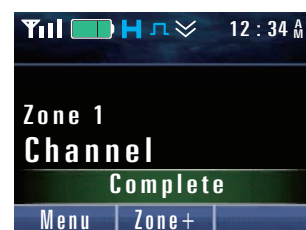
The transceiver sends the Status Message.



If the Status Message is properly sent to the target transceiver, "Complete" appears.

Note

- The selection screen for the Status List closes at the same time as pressing the **PTT** switch or **Menu** ([□]) key. If selecting an ID and sending a Status Call again, reexecute the operations from step 1.



● Sending a Status Message using Manual Dialing

To send a Status Message using **Manual Dialing**, **Manual Dialing** must be enabled using KPG-D1/ D1N.

1

Select one of the following operations to place the transceiver in Status Mode.

- **Press the Status key.**

The transceiver enters Status Mode. In this case, a Status Message is addressed to a Base ID.

- **Press the Individual + Status key.**

Pressing the [▶] key after selecting the Unit ID of the target transceiver causes Status Mode to be entered.

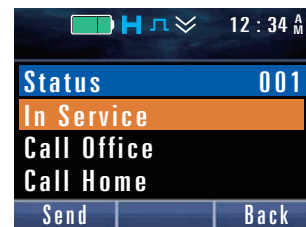
- **Press the Group + Status key. (DMR Conventional system)**

Pressing the [▶] key after selecting the Group ID of the target transceiver causes Status Mode to be entered.

- **Press the Group + Status key after selecting the Group ID configured for the channel. (DMR-based Trunking system)**

The transceiver enters Status Mode.

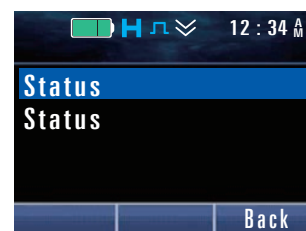
Or, the transceiver enters Status Mode by pressing the **Menu** key or using a keypad. In this case, the following operations are identical.



2

Press the **Function** ([○]) key.

The status entry display appears.



3

Enter a status.

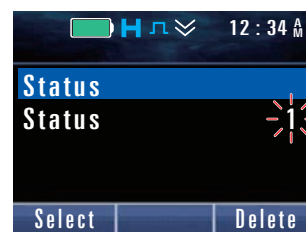
Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

- **Using the keypad**

A code can be entered by pressing the [0] key to [9] key.

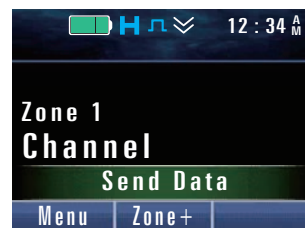
- **Using the PF keys**

Press the [▲] key or the [▼] key to select a number, and press the **Menu** ([□]) key or [*] key to confirm the selected number.

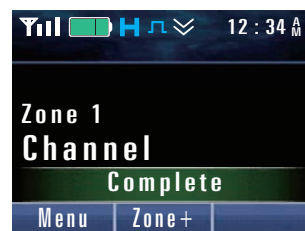


4 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver sends the Status Message.



If the Status Message is properly sent to the target transceiver, "Complete" appears.



Note

- The entry screen for status closes at the same time as pressing the **PTT** switch or **Menu** ([]) key. If entering status and sending a Status Call again, reexecute the operations from step 1.
- Transmission can be canceled by pressing the **Clear** key while a Status Message is being transmitted.
- In a DMR Conventional system, "No Reply" appears on the display and transmission of a Status Message is terminated if no response is received from the target transceiver. If transmission fails because of busy status, "Busy" appears on the display and transmission of a Status Message is terminated.
- For details on the information displayed on the display during transmission in a DMR-based Trunking system, refer to "[Transceiver behavior during transmitting](#)".

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Assigning functions to the **Keypad Operation** of the transceiver ( [See](#) Transceiver Settings > Key Assignment > General > Primary/ Secondary)
- Configuring **Manual Dialing** in DMR Conventional to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Manual Dialing** in DMR-based Trunking to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Base ID Type** and **Base ID** in DMR Conventional ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Base ID Type** and **Base ID** in DMR-based Trunking ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Receiving a Status Message

Upon receiving a Status Message, the received Status Message appears on the display, and the transceiver can send the Status Message to an external device from the communication ports.

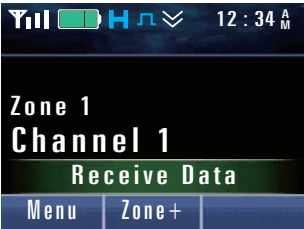
Note

- To use serial communications, a user needs to prepare DMR compatible software or external devices.
- A received Status Message can be left as a record. The record can be checked in Stack Mode. (Refer to Common FUNC Viewing the Receive History (Stack).)

Transceiver behavior

1 The transceiver starts receiving a Status Message.

“Receive Data” appears.

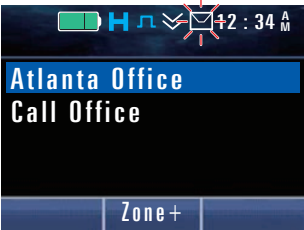


2 A Status Message is received.

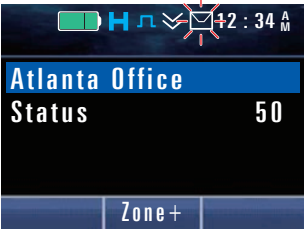
The “✉” icon blinks and “Complete” appears.



The Status Message appears.



If the status is not configured for Status List or the Status Name is not configured, a status No. appears.



If any Emergency status or Horn Alert status (Mobile only) is configured by using KPG-D1/ D1N, the display appears as below when each status is received:

Table 1-13 Status reception

Status	Display
Reception of Emergency Status	Emergency
Reception of Man-down Status	Man Down
Reception of Lone Worker Status	Emg Lone-Work
Reception of Stationary Status	Emg Stationary
Reception of Motion Status	Emg Motion
Reception of Horn Alert Status (Mobile only)	Horn Alert

Note

- If the received status number is configured in the Status List, an Alert Tone sounds from the transceiver according to the configuration of the corresponding Status List. However, if "Common" is configured in **Alert Tone** of the Status List, or if the received status number is not configured in the Status List, an Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Status/Short Message Call)** used in common in a DMR Conventional system. Pressing any key on the transceiver stops the Alert Tone.

Configuration using KPG-D1/ D1N

- Configuring **Alert Tone** (Status List) ( **See** Transceiver Settings > DMR > Status List)
- Configuring **Alert Tone (Status/Short Message Call)** used in common in a DMR Conventional system ( **See** Transceiver Settings > DMR > DMR Information > Conventional > Alert Tone)
- Configuring **Alert Tone (Status/Short Message Call)** common in DMR-based Trunking ( **See** Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)
- Configuring the contents that appear on the display when various types of status are received (DMR Conventional) ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))
- Configuring the contents that appear on the display when various types of status are received (DMR-based Trunking) ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency > Emergency ID (DMR-based Trunking))
- Configuring **Horn Alert Status** ( **See** Transceiver Settings > DMR > DMR Information > Status > Option)

About the Behavior When a Message Requesting the Status Transmission Is Received

The transceiver sends status 1023 in a Conventional system and status 99 in a Trunking system if a status has never been selected, such as when the transceiver is turned on.

If the transceiver receives a status transmission request message in the Stun state, the status configured in **Stun Response Status** will be sent. If **Stun Response Status** is not configured, the transceiver transmits the status as when the transceiver is in the normal state and not in the Stun state.

Note

- The transceiver determines that a **Horn Alert Status** or **AUX Output Status Message** has been received only when the transceiver receives a Status Message between 0 and 99 on a channel in a DMR-based Trunking system.

Configuration using KPG-D1/ D1N

Configuring **Stun Response Status** ( **See** Transceiver Settings > DMR > DMR Information > Status > Option)

Status List

To use a Status Message, the status to be sent must be preconfigured in the transceiver by using KPG-D1/ D1N prior to the transmission. A maximum of 1024 statuses can be configured in the Status List.

Table 1-14 Status List

Configuration	Description
Status	The status number can be configured. In a DMR Conventional system, a status number can be configured in the range between 0 and 1023. In a DMR-based Trunking system, a status number can be configured in the range between 0 and 99.
Status Name	The status name can be configured. It is not easy to recognize the meaning of a status only by viewing a status number. In this case, a user can link the status number to a short message; hence, it can be easily understood. A maximum of 16 characters can be configured. If the status number is configured in the Status List, the Status Name appears when the transceiver receives a Status Message. If the transceiver receives a status that is not configured in the Status List, the status number appears on the transceiver display.
Transmit Inhibit	The permission or inhibition of transmission of status can be configured. The status for which Transmit Inhibit is enabled does not appear on the status selection display in Status Mode. In this case, a user cannot select a status for which Transmit Inhibit is enabled in Status Mode.
Alert Tone	The type of tone sounding from the transceiver can be configured for a received status number from the status numbers registered in the Status List.
Voice Announcement	Voice guidance of when the transceiver receives a status can be configured for each status. If the transceiver receives a status for which voice guidance is configured, the voice guidance is executed. If Alert Tone is enabled, voice guidance is executed after an Alert Tone is emitted. To configure voice guidance for Voice Announcement, "User Programmable" needs to be configured in Voice Announcement Type .

Configuration using KPG-D1/ D1N

- Configuring **Status List** ( **See** Transceiver Settings > DMR > Status List)
- Configuring **Voice Announcement Type** ( **See** Transceiver Settings > Optional Features > Optional Features 1 > Voice Announcement)

Status Message Stack

Status Message Stack is the function to store a Status Message in the stack memory. Up to 250 Status Messages and Caller IDs in total can be stored in the stack memory of the transceiver.

If a message is stored in the transceiver, the " " icon blinks as notification. In this case, a user can read the stored Status Message if the transceiver enters Stack Mode. (Refer to Common FUNC Viewing the Receive History (Stack).)

Configuration using KPG-D1/ D1N

Configuring **Status Message Stack** ( **See** Transceiver Settings > DMR > DMR Information > General > Stack)

Status Message on Data Zone-Channel

Status Message on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send a Status Message in a DMR Conventional system.

The transceiver automatically changes the channel to the channel in a DMR Conventional system configured in **Data Zone-Channel (DMR)** to send a Status Message. When the transmission ends, the transceiver restores the Zone-channel that was used before sending the Status Message. **Status Message on Data Zone-Channel** can be used to send data using a specific dedicated channel.

Note

- This function is enabled if "Channel Table" is configured in **Zone-channel Format** by using KPG-D1/ D1N.
- This function is not applied if an Emergency Status is sent while the transceiver is in Emergency Mode.

Configuration using KPG-D1/ D1N

- Configuring **Status Message on Data Zone-Channel** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data Zone-Channel (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Status Message on Data System-Personality

Status Message on Data System-Personality is the function that allows the transceiver to automatically change the channel to the Data System-Personality to send a Status Message in a DMR Conventional system.

The transceiver automatically changes the channel to the channel in a DMR Conventional system configured in **Data System-Personality (DMR)** to send a Status Message. When the transmission ends, the transceiver restores the Zone-channel that was used before sending the Status Message. **Status Message on Data System-Personality** can be used to send data using a specific dedicated channel.

Note

- This function is enabled if "Personality" is configured in **Zone-channel Format**, using KPG-D1/ D1N.
- This function is not applied if an Emergency Status is sent while the transceiver is in Emergency Mode.

Configuration using KPG-D1/ D1N

- Configuring **Status Message on Data System-Personality** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data System-Personality (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Sending the Received Status Message from the Communication Port (Status Message Serial Output)

Status Message Serial Output allows the transceiver to send the Status and the Unit ID of the transmitting transceiver from its communication port when the transceiver receives a Status Message.

Using **Status Message Serial Output**, the dispatcher can monitor the received Status Message in real time.

In a DMR Tier III Trunking system and S-Trunking system, a DMR ID in the range between 1 and 16776415 is used for a Unit ID and Group ID in the data to be sent even if **Fleet Dialing Plan** is enabled.

Note

- To use **Status Message Serial Output**, “Data”, “Data + GPS Data Output”, or “Data + Location Data Output” needs to be assigned to the communication port of the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Status Message Serial Output** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > General > Serial Output)
- Assigning functions to **COM port** ( **See** Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > COM Port)

Power-on Status Message

Power-on Status Message allows the transceiver to send the selected Status Message when the transceiver is turned on.

Using the **Power-on Status Message**, the base station can recognize that the transceiver has been turned on. The transceiver sends the message to the Base ID of the system to which the channel selected when the transceiver is turned on belongs.

The configuration in **Power-on Status Message** is used in common in a DMR Conventional system and DMR-based Trunking system. In **Power-on Status Message**, a status can be configured in the range between 0 and 1023. However, the configuration range of **Power-on Status Message** is between 0 and 99 in a DMR-based Trunking system. Therefore, if a status 100 or higher is configured when the transceiver sends a **Power-on Status Message** in a DMR-based Trunking system, the transceiver changes the status to 99 to send the Status Message.

Note

- In a DMR-based Trunking system, the transceiver ends a transmission without sending the Power-on Status again if the transceiver fails to send the Power-on Status.
- If **Transceiver Password** is used at the same time, a Status Message is sent when the transceiver is turned on and the transceiver migrates from Transceiver Password Mode to user mode.
- For transmission with GPS data added by using the **GPS Combination** function, or when BLE data is sent by using the **BLE Combination** function, using the functions by configuring the **Preamble Length** configuration to 1 second or more is recommended. (Refer to [Sending GPS Data Together With Status Call \(GPS Combination\)](#), [Sending the BLE Data Linked With the Configured Mode \(BLE Combination \(Indoor Location\)\)](#), [Preamble Length](#).)

Configuration using KPG-D1/ D1N

Configuring **Power-on Status Message** ( **See** Transceiver Settings > DMR > DMR Information > Status > Power-on/off Status Message)

Power-off Status Message

Power-off Status Message allows the transceiver to send the selected Status Message when the transceiver is turned off.

Using the **Power-off Status Message**, the base station can recognize that the transceiver has been turned off. The transceiver sends the message to the Base ID of the system to which the channel selected when the transceiver is turned off belongs.

The configuration in **Power-off Status Message** is used in common in a DMR Conventional system and DMR-based Trunking system. In **Power-off Status Message**, a status can be configured in the range between 0 and 1023. However, the configuration range of **Power-off Status Message** is between 0 and 99 in a DMR-based Trunking system. Therefore, if a status 100 or higher is configured when the transceiver sends a **Power-off Status Message** in a DMR-based Trunking system, the transceiver changes the status to 99 to send the Status Message.

Note

- In a DMR-based Trunking system, the transceiver ends a transmission without sending the Power-off Status again if the transceiver fails to send the Power-off Status.

Configuration using KPG-D1/ D1N

Configuring **Power-off Status Message** ( See Transceiver Settings > DMR > DMR Information > Status > Power-on/off Status Message)

Base ID

Base ID is the target transceiver's ID used to send GPS data or Transparent data and the following Status Messages and Short Messages.

- AUX Input Status Message (Mobile Only)
- Power-on Status Message
- Power-off Status Message
- A Status Message that is sent by selecting a status number or directly entering a status number after the transceiver enters Status Mode by pressing the **Status** key or the **[0]** key to **[9]** key on the keypad
- A Status Message that is sent by selecting a status number or directly entering a status number after the transceiver enters Status Mode by a user selecting "Status" from Menu Mode
- A Status Message that is sent by pressing any of the **PF** keys having "Call 1" to "Call 6" allocated
- A Status Message that is sent when any of the AUX Input ports having "Call 1" to "Call 6" allocated becomes active (Mobile only)
- A Short Message that is sent by entering a text string after the transceiver enters Short Message Mode by pressing the **Short Message** key or the **[0]** key to **[9]** key on the keypad
- A Short Message that is sent by entering a text string after the transceiver enters Short Message Mode by a user selecting "Short Message" from Menu Mode

By using KPG-D1/ D1N, either Unit ID or Group ID can be configured as **Base ID**.

In a DMR Tier III Trunking system and S-Trunking system, if **Fleet Dialing Plan** is enabled, **Base ID** can be configured even in the Prefix-Fleet-IN/GN format. The ID of the base station which is responsible for operation and administration of system is normally configured.

Table 1-15 Destination ID Configuration

Configuration	Description
Base ID Type	The ID type (Group ID or Unit ID) of the target transceiver when the transceiver sends GPS data can be configured.
Base ID	The ID of the target transceiver when the transceiver sends GPS data can be configured. Base ID can be configured in the range between 000001 and FFFCDF (hexadecimal), or between 1 and 16776415 (decimal). If "Group ID" is configured in Base ID Type , "ALL" can be configured.
Prefix-Fleet-IN/GN	The ID of the target transceiver when the transceiver sends GPS data by using Fleet Dialing can be configured. The ID consists of Prefix, Fleet, and IN (Individual Number)/GN (Group Number). • Prefix A Prefix number can be configured in the range between 328 and 806. • Fleet A Fleet number can be configured in the range between 20 and 89. • IN (Individual Number)/ GN (Group Number) If "User ID" is configured in Base ID Type: If the Fleet is between 20 and 41, an Individual number can be configured in the range between 200 and 899. If the Fleet is between 42 and 89, an Individual number can be configured in the range between 200 and 549. If "Group ID" is configured in Base ID Type: A Group number can be configured in the range between 900 and 999.

Configuration using KPG-D1/ D1N

- Configuring **Base ID Type** and **Base ID** in DMR Conventional ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Fleet Dialing Plan** to be enabled or disabled ( **See** Model > Product Information > Feature Selection > DMR)
- Configuring **Base ID Type** and **Base ID** in DMR-based Trunking ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Base ID (Fleet Dialing)** in DMR-based Trunking ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Emergency Status Response

Emergency Status Response is the function to emit an Alert Tone when the transceiver receives an Emergency Status. The transceiver behaves as follows according to the configuration using KPG-D1/ D1N.

Table 1-16 Emergency Status Response

Configuration	Description
Alert Tone	The Alert Tone configured for Alert Tone (Emergency Response) sounds from the transceiver when receiving an Emergency Status. In a DMR-based Trunking system, the Alert Tone does not stop even if the Auto Reset Timer elapses. Pressing any key stops the Alert Tone. However, when the transceiver receives a voice call, the Alert Tone which sounds for the reception of a voice call and the received voice call output have priority.
Horn (Mobile only)	If receiving an Emergency Status, the Alert Tone configured for Alert Tone (Emergency Response) sounds from the transceiver and the Horn Alert port is activated. In a DMR-based Trunking system, the behavior of the Horn Alert port does not stop even if the Auto Reset Timer elapses.
Voice Announcement	If the transceiver receives an Emergency Status for which voice guidance is configured, the voice guidance is executed. If Alert Tone is enabled, voice guidance is executed after an Alert Tone is emitted. To configure voice guidance for Voice Announcement, "User Programmable" needs to be configured in Voice Announcement Type . In a DMR-based Trunking system, the Alert Tone does not stop even if the Auto Reset Timer elapses. Pressing any key stops the Alert Tone. However, when the transceiver receives a voice call, the Alert Tone which sounds for the reception of a voice call and the received voice call output have priority.

Configuration using KPG-D1/ D1N

- Configuring **Emergency Status Response (Alert Tone/ Horn/ Voice Announcement)** ( [See](#) Transceiver Settings > DMR > DMR Information > General > Emergency Status Response)
- Configuring **Alert Tone (Emergency Response)** in DMR Conventional ( [See](#) Transceiver Settings > DMR > DMR Information > Conventional > Alert Tone)
- Configuring **Alert Tone (Emergency Response)** common in DMR-based Trunking ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)

AUX Input Status Message (Mobile Only)

Supported Models: Mobile

AUX Input Status Message is the function that sends out a specified Status Message when the AUX Input port goes high level to low level or goes low level to high level.

A Status Message can be sent out when there is a change in the AUX Input port status by attaching a sensor to the port.

The target transceiver is the ID configured in Base ID. (Refer to [Base ID](#).)

The configuration in **AUX Input Status Message** is used in common in a DMR Conventional system and DMR-based Trunking system. In **AUX Input Status Message**, a status can be configured in the range between 0 and 1023. However, the configuration range of **AUX Input Status Message** is between 0 and 99 in a DMR-based Trunking system. Therefore, if a status 100 or higher is configured when the transceiver sends an **AUX Input Status Message** in a DMR-based Trunking system, the transceiver changes the status to 99 to send the Status Message.

To use this function, **AUX Input Status Message** must be assigned to one of AUX Input ports.

Configuration using KPG-D1/ D1N

- Configuring **AUX Input Status Message** ( [See](#) Transceiver Settings > DMR > DMR Information > Status > AUX Input Status Message)
- Assigning functions to the AUX Input port ( [See](#) Transceiver Settings > Extended Function > AUX)

AUX Output Status Message (Mobile Only)

Supported Models: Mobile

AUX Output Status Message is the function to switch the status of the AUX Output port from high to low or from low to high when the transceiver receives the specified Status Message. This function can be used to remotely turn the external device on or off.

The configuration in **AUX Output Status Message** is used in common in a DMR Conventional system and DMR-based Trunking system. In **AUX Output Status Message**, a status can be configured in the range between 0 and 1023. However, the configuration range of **AUX Output Status Message** is between 0 and 99 in a DMR-based Trunking system. Therefore, the AUX Output port switches from high level to low level or from low level to high level only when the transceiver receives the Status Message for a status between 0 and 99.

To use this function, **AUX Output Status Message** must be assigned to one of AUX Output ports.

Configuration using KPG-D1/ D1N

- Configuring **AUX Output Status Message** ( See Transceiver Settings > DMR > DMR Information > Status > AUX Output Status Message)
- Assigning functions to the AUX Output port ( See Transceiver Settings > Extended Function > AUX)

Storing the Selected or Sent Status (Status Hold)

Status Hold is the function to store in the transceiver the status selected from the Status List in Status Mode and the transmitted status.

When the transceiver receives a Status Inquiry Message, the status stored in the transceiver will automatically be transmitted. Also, the status stored in the transceiver will be used as the status to be transmitted when the Status Inquiry Message is received.

Table 1-17 Status Hold

Configuration	Description
Selected	The transceiver stores the status selected from the Status List in Status Mode.
Selected + Transmit	The transceiver stores a status selected from the Status List in Status Mode and a status transmitted by one of the following method. • The status transmitted when one of the AUX Input Status Message 1 to AUX Input Status Message 3 ports change (Mobile only) • The status transmitted when the transceiver is turned on (Power-on Status) • The status transmitted by pressing any of the PF keys having "Call 1" to "Call 6" allocated • The status transmitted when any of the AUX Input ports having "Call 1" to "Call 6" allocated becomes active (Mobile only) • The status transmitted by using a PC command

Although the range of the status that can be sent varies in a DMR Conventional system and DMR-based Trunking system, the Status List can be used in common. If the transceiver receives a Status Inquiry Message on a channel in a DMR-based Trunking system when the status stored in the transceiver is 100 or higher, the transceiver changes the status to 99 to transmit. However, the status stored in the transceiver is not changed.

Configuration using KPG-D1/ D1N

Configuring **Status Hold** ( See Transceiver Settings > DMR > DMR Information > Status)

1.11 Sending and Receiving a Short Message (Short Data Call)

Short Data Call is the message communication function to send and receive a text string. Information which is difficult to send by voice, such as an address or a telephone number, can be reliably sent.

Note

- This section describes information for both a DMR Conventional system and DMR-based Trunking system. For each operation description, the display of the DMR Conventional system is used.

The number of characters that can be sent and received is as follows:

● DMR Conventional

The number of characters that can be sent:

- During communication via Group Call: up to 365 characters
- During communication via Individual Call: up to 489 characters

The number of characters that can be received:

- During communication via Group Call: up to 369 characters
- During communication via Individual Call: up to 493 characters

● Trunking 2.5

The number of characters that can be sent and received:

- During communication via Group Call: up to 23 characters
- During communication via Individual Call: up to 23 characters

● DMR Tier III Trunking/ S-Trunking

The number of characters that can be sent and received:

- During communication via Group Call: up to 365 characters
- During communication via Individual Call: up to 489 characters

Also, in a DMR-based Trunking system, the communication channel varies as follows depending on the number of characters to send and receive, and on whether encrypted communications are used:

Table 1-18 Channel Used in a DMR-based Trunking System

Encryption	Number of Characters That Can Be Sent and Received	
	46 bytes or less	47 bytes or more (DMR Tier III Trunking, S-Trunking only)
Disabled	Control Channel	Traffic Channel
Enabled	Traffic Channel	Traffic Channel

DMR Message Communication Configuration (DMR Message Type)

In a DMR Conventional system, when "KENWOOD-defined Data" is configured in **DMR Message Type**, the transceiver carries out communication of mutually-compatible messages with transceivers that support KENWOOD's DMR Protocol. It is also compatible with the original communication standards of Hytera.

When "DMR Standard" is configured for **DMR Message Type**, the transceiver carries out communication in accordance with the DMR standard. Communication of mutually-compatible messages can be carried out with the transceiver of a different manufacturer that supports the configuration of the DMR standard.

Short Message in both the KENWOOD-defined Data and DMR Standard configuration can be received regardless of the configuration of **DMR Message Type**.

Note

- In a DMR-based Trunking system, "DMR Standard" is fixed as the data format of **DMR Message Type**.

Configuration using KPG-D1/ D1N

Configuring **DMR Message Type** ( See Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Sending a Short Message

The transceiver sends a Short Message by one of the following operations.

● Short Message Mode

The transceiver enters Short Message Mode and sends a Short Message by one of the following operations.

• Short Message key, Individual + Short Message key, or Group + Short Message key

Pressing the **Short Message** key places the transceiver in Short Message Mode. In this case, a Short Message is addressed to a Base ID.

Pressing the **Individual + Short Message** key places the transceiver in Individual Call Mode. The transceiver enters Short Message Mode by pressing the [►] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Unit ID.

The transceiver's behavior when the **Group + Short Message** key is pressed varies depending on the system.

For a DMR Conventional system:

The transceiver enters Group Call Mode. The transceiver enters Short Message Mode by pressing the [►] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Group ID.

For a DMR-based Trunking system:

The transceiver enters Short Message Mode. The target transceiver's Group ID must be selected before entering Short Message Mode.

• Menu key

The transceiver enters Short Message Mode when the **Menu** key is pressed to enter Menu Mode and then "Short Message" is selected. In this case, a Short Message is addressed to a Base ID.

The transceiver enters Menu Mode by pressing the **Menu** key and then the transceiver enters Individual Call Mode by selecting "Individual + Short Message". The transceiver enters Short Message Mode by pressing the [►] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Unit ID.

The transceiver's behavior varies depending on the system when the **Menu** key is pressed to enter Menu Mode and then "Group + Short Message" is selected.

For a DMR Conventional system:

The transceiver enters Group Call Mode. The transceiver enters Short Message Mode by pressing the [►] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Group ID.

For a DMR-based Trunking system:

The transceiver enters Short Message Mode. The target transceiver's Group ID must be selected before entering Short Message Mode.

Refer to Common FUNC "Using Menu Mode" for operations in Menu Mode.

• Keypad entry

If "Short Message" is configured for **Keypad Operation**, pressing the [0] key to [9] key on the transceiver keypad causes the transceiver to enter Short Message Mode. The transceiver will be on hold as the first digit of the Short Message is entered. In this case, a Short Message is addressed to a Base ID.

If "Individual + Short Message" is configured in **Keypad Operation**, pressing the [0] key to [9] key on the keypad places the transceiver in Individual Call Mode. The transceiver enters Short Message Mode by pressing the [►] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Unit ID.

The transceiver's behavior varies depending on the system while "Group + Short Message" is configured for **Keypad Operation**.

For a DMR Conventional system:

Pressing the [0] key to [9] key on the transceiver keypad places the transceiver in Group Call Mode. The transceiver enters Short Message Mode by pressing the [►] key, or pressing and holding the **Menu** ([□]) key or [*] key after selecting the target Group ID.

For a DMR-based Trunking system:

Pressing the [0] key to [9] key on the transceiver keypad places the transceiver in Short Message Mode. The target transceiver's Group ID must be selected before entering Short Message Mode.

● PC command

The transceiver will send a Short Message when a PC sends a command to the transceiver communication port specifying to send a Short Message. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

This section describes how to send a Short Message in Short Message Mode.



Note

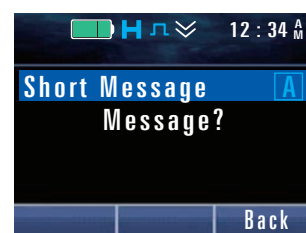
- For operating in Individual Call Mode or Group Call Mode, refer to the information on the various call types of DMR.

Operating the transceiver

1

Select one of the following operations to place the transceiver in Short Message Mode.

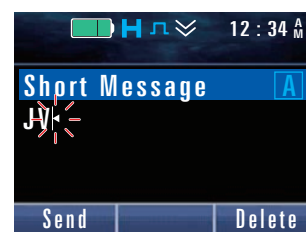
- **Press the Short Message key.**
The transceiver enters Short Message Mode. In this case, a Short Message is addressed to a Base ID.
- **Press the Individual + Short Message key.**
Pressing the [▶] key after selecting the Unit ID of the target transceiver causes Short Message Mode to be entered.
- **Press the Group + Short Message key. (DMR Conventional system)**
Pressing the [▶] key after selecting the Group ID of the target transceiver causes Short Message Mode to be entered.
- **Press the Group + Short Message key after selecting the Group ID configured for the channel. (DMR-based Trunking system)**
The transceiver enters Short Message Mode.
Or, the transceiver enters Short Message Mode by pressing the **Menu** key or using a keypad. In this case, the following operations are identical.



2

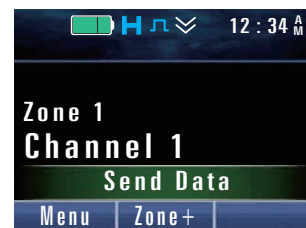
Enter a Short Message.

For a Group call, a maximum of 365 characters can be entered, and for an Individual Call, a maximum of 489 characters can be entered. Refer to Common FUNC "Entering or Deleting Characters" for the entry method.

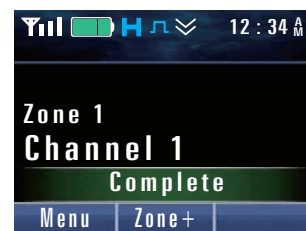


3 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver sends the Short Message.



"Complete" appears if the Short Message is properly sent to the target transceiver.



Note

- The entry screen for message closes at the same time as pressing the **PTT** switch or **Menu** ([]) key. If entering a message and sending a Short Data Call again, reexecute the operations from step 1.
- In a DMR Conventional system, "No Reply" appears on the display and transmission of a Short Message is terminated if no response is received from the target transceiver. If transmission fails because of busy status, "Busy" appears on the display and transmission of a Short Message is terminated.
- For details on the information displayed on the display during transmission in a DMR-based Trunking system, refer to "[Transceiver behavior during transmitting](#)".

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Assigning functions to the **Keypad Operation** of the transceiver ( [See](#) Transceiver Settings > Key Assignment > General > Primary/ Secondary)
- Configuring **Base ID Type** and **Base ID** in DMR Conventional ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Base ID Type** and **Base ID** in DMR-based Trunking ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Receiving a Short Message

Upon receiving a Short Message, the received Status Message appears on the display, and the transceiver can send the Short Message to an external device from the communication ports.

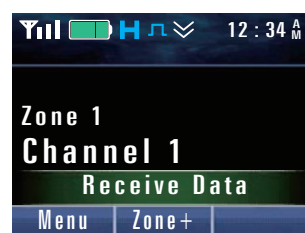
Note

- To use serial communications, a user needs to prepare DMR compatible software or external devices.
- A received Short Message can be left as a record. The record can be checked in Stack Mode. (Refer to Common FUNC Viewing the Receive History (Stack).)

Transceiver behavior

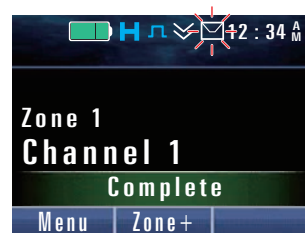
1 The transceiver starts receiving a Short Message.

"Receive Data" appears.

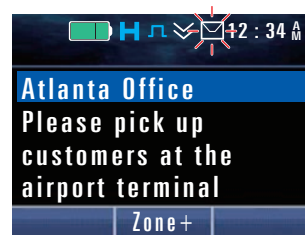


2 The transceiver receives a Short Message.

The "✉" icon blinks and "Complete" appears.



The initial portion (three lines) of the ID Name and Short Message of the transmitting transceiver appears for three seconds. Then, the display is scrolled line by line every two seconds until the last line is shown. After the last line is shown, the display scroll is repeated from the first line.



Note

- If **Alert Tone (Status/Short Message Call)** is configured to sound when receiving, an Alert Tone will sound. Pressing any key on the transceiver stops the Alert Tone.
- If the received message fits on a single screen, a scroll display is not activated.

Configuration using KPG-D1/ D1N

- Configuring **Alert Tone (Status/Short Message Call)** in DMR Conventional (See Transceiver Settings > DMR > DMR Information > Conventional)
- Configuring **Alert Tone (Status/Short Message Call)** in DMR-based Trunking (See Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)

Short Message Stack

Short Message Stack is used to store a Short Message in the stack memory. If storing Short Messages using the DMR protocol, a maximum of 32 Short Messages can be stored in the stack memory.

If a message is stored in the transceiver, the “” icon blinks as notification. In this case, a user can read the stored Short Message when the transceiver enters Stack Mode. (Refer to Common FUNC Viewing the Receive History (Stack).)

Note

- The maximum number of Short Message data that can be stored in the transceiver stack memory varies as follows depending on the configuration of **Short Message Stack** in each communication protocol.

Table 1-19 No. of Short Message Data that Can be Saved

Short Message Stack Configuration				No. of Data that Can be Saved
FleetSync	NXDN	P25	DMR	
Disabled	Disabled	Disabled	Disabled	0
Enabled	Disabled	Disabled	Disabled	128
Disabled	Enabled	Disabled	Disabled	128/ 48 ^{*1}
Enabled	Enabled	Disabled	Disabled	128/ 48 ^{*1}
Disabled	Disabled	Enabled	Disabled	64
Enabled	Disabled	Enabled	Disabled	64
Disabled	Enabled	Enabled	Disabled	64/ 48 ^{*2}
Enabled	Enabled	Enabled	Disabled	64/ 48 ^{*2}
Disabled	Disabled	Disabled	Enabled	32
Enabled	Disabled	Disabled	Enabled	32
Disabled	Enabled	Disabled	Enabled	32
Enabled	Enabled	Disabled	Enabled	32
Disabled	Disabled	Enabled	Enabled	32
Enabled	Disabled	Enabled	Enabled	32

^{*1} Up to 128 if **Extended Short Message** is disabled.

Up to 48 if **Extended Short Message** is enabled.

^{*2} Up to 64 if **Extended Short Message** is disabled.

Up to 48 if **Extended Short Message** is enabled.

Configuration using KPG-D1/ D1N

Configuring **Short Message Stack** ( See Transceiver Settings > DMR > DMR Information > General > Stack)

Short Message on Data Zone-Channel

Short Message on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send a Short Message in a DMR Conventional system.

The transceiver automatically changes the channel to the channel in a DMR Conventional system configured in **Data Zone-Channel (DMR)** to send a Short Message. When the transmission ends, the transceiver restores the Zone-channel that was used before sending the Short Message. **Short Message on Data Zone-Channel** can be used to send data using a specific dedicated channel.

Note

- This function is enabled if “Channel Table” is configured in **Zone-channel Format** by using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Configuring **Short Message on Data Zone-Channel** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data Zone-Channel (DMR)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Short Message on Data System-Personality

Short Message on Data System-Personality is the function that allows the transceiver to automatically change the channel to the **Data System-Personality** to send a Short Message in a DMR Conventional system.

The transceiver automatically changes the channel to the channel in a DMR Conventional system configured in **Data System-Personality (DMR)** to send a Short Message. When the transmission ends, the transceiver restores the Zone-channel that was used before sending the Short Message. **Short Message on Data System-Personality** can be used to send data using a specific dedicated channel.

Note

- This function is enabled if “Personality” is configured in **Zone-channel Format** by using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Configuring **Short Message on Data System-Personality** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data System-Personality (DMR)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Sending the Received Short Message from the Communication Port (Short Message Serial Output)

Short Message Serial Output allows the transceiver to send a Short Message and the Unit ID of the transmitting transceiver from the transceiver’s communication port when the transceiver receives a Short Message.

Using **Short Message Serial Output**, the dispatcher can monitor received Short Messages in real time.

In a DMR Tier III Trunking system and S-Trunking system, a DMR ID in the range between 1 and 16776415 is used for a Unit ID and Group ID in the data to be sent even if **Fleet Dialing Plan** is enabled.

Note

- To use **Short Message Serial Output**, “Data”, “Data + GPS Data Output”, or “Data + Location Data Output” needs to be assigned to the communication port of the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Short Message Serial Output** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > General > Serial Output)
- Assigning functions to **COM port** ( [See](#) Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > COM Port)

1.12 Sending and Receiving a Long Message (Long Data Call)

Long Data Call can be used to send and receive a maximum of 4,096 characters (Long Message).

By using Long Message, information can reliably be sent to the target transceiver.

The transceiver cannot display the received Long Message on the display.

Note

- This section describes information for both a DMR Conventional system and DMR-based Trunking system (DMR Tier III Trunking and S-Trunking only). For each operation description, the display of the DMR Conventional system is used.

Sending a Long Message

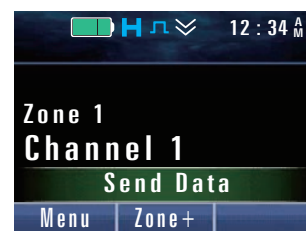
A Long Message is sent from an external device such as a PC. A Long Message cannot be sent from the transceiver. To send a Long Message, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Operating the transceiver

1

A PC sends the PC command to the transceiver to request transmission of a Long Message.

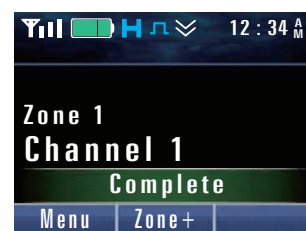
The transceiver starts sending the Long Message.



2

The transceiver ends transmission of the Long Message.

If the Long Message is properly sent to the target transceiver, "Complete" appears on the display of the transceiver for approximately 1 sec.



Note

- In a DMR Conventional system, "No Reply" appears on the display and transmission of a Long Message is terminated if no response is received from the target transceiver. If the target transceiver is busy, "Busy" appears on the display and transmission of a Long Message is terminated.
- For details on the information displayed on the display during transmission in a DMR-based Trunking system, refer to "Transceiver behavior during transmitting".

Configuration using KPG-D1/ D1N

Configuring **COM port** (See Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > COM Port)

Receiving a Long Message

The received Long Message data can be transferred via a PC or external device.

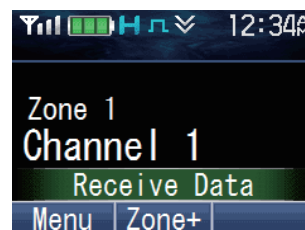
Note

- To use serial communications, a user needs to prepare DMR compatible software or external devices.

Operating the transceiver

1 The transceiver starts receiving a Long Message.

"Receive Data" appears on the display.



2 The transceiver receives the Long Message.

"Complete" appears on the display for approximately 1 sec.



3 The transceiver restores the previous display.

The received Long Message is transferred to an external device such as a PC with the serial output.

Note

- If an ACK for a receipt response message cannot be received, the transceiver resends the receipt response message up to a maximum number of times configured in **Number of Retries**. Even if an ACK cannot be received, because the transceiver is receiving a Long Message, "Complete" appears for 1 sec and the transceiver completes reception of the Long Message.

Long Message on Data Zone-Channel

Long Message on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send a Long Message in a DMR Conventional system.

The transceiver automatically changes the channel to the channel in a DMR Conventional system configured in **Data Zone-Channel (DMR)** to send a Long Message. When the transmission ends, the transceiver restores the Zone-channel which was used before sending the Long Message. **Long Message on Data Zone-Channel** can be used to send data using a specific dedicated channel.

Note

- This function is enabled if "Channel Table" is configured in **Zone-channel Format**, using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Configuring **Long Message on Data Zone-Channel** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data Zone-Channel (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Long Message on Data System-Personality

Long Message on Data System-Personality is the function that allows the transceiver to automatically change the channel to the **Data System-Personality** to send a Long Message in a DMR Conventional system.

The transceiver automatically changes the channel to the channel in a DMR Conventional system configured in **Data System-Personality (DMR)** to send a Long Message. When the transmission ends, the transceiver restores the Zone-channel which was used before sending the Long Message. **Long Message on Data System-Personality** can be used to send data using a specific dedicated channel.

Note

- This function is enabled if "Personality" is configured in **Zone-channel Format**, using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Configuring **Long Message on Data System-Personality** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data System-Personality (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

1.13 Communicating with a Telephone (Telephone Call)

Telephone Call is the function to initiate voice communications using a telephone by connecting to a telephone line such as PSTN and PABX.

A call can be initiated from the transceiver to a telephone, and from a telephone to the transceiver.

For a Telephone Call in a DMR Conventional system, voice communications by a SIP Phone are made by using an Individual Call or Group Call (an incoming call only).

Initiating a Telephone Call

Telephone Call has two configurations: the configuration with an IP Gateway connection and the configuration without an IP Gateway connection.

In the configuration where an IP Gateway is connected, the transceiver can identify an Individual ID unique to PSTN or PABX.

The sender ID (Telephone ID) of when an IP Gateway is connected is \$FFFFE1 for PABX and \$FFFFE0 for PSTN.

When an Individual Call or Group Call is received from a Telephone ID, **Auto Reset Timer** functions as "0 sec" regardless of the FPU settings.

A Telephone Call can be initiated by one of the following methods:

● Paging Call

By pressing the **PTT** switch or **Menu** ([]) key after a target ID is selected or a target ID is directly specified in Individual Call Mode, the transceiver sends a Paging Call.

The KAIROS system or the NXR-1700/ NXR-1800 repeater system is used for a Paging Call.

Also, the target ID of a Paging Call needs to match the configuration in a system.

● Autodial Mode (Autodial key)

In Autodial Mode, a Telephone Call is initiated by selecting a DTMF code configured in the Autodial List, or directly entering a DTMF code and pressing the **PTT** switch. (Refer to [Sending a DTMF Code by Selecting from a List \(Autodial List\)](#).)

Pressing the **Autodial** key places the transceiver in Autodial Mode.

The transceiver can also be placed in Autodial Mode by executing "Autodial" after placing the transceiver in Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

● Keypad entry

If "Autodial" is configured in **Keypad Operation**, pressing a key on the keypad causes the transceiver to enter Autodial Mode. If the transceiver with **Store and Send** enabled is in Autodial Mode, the transceiver will be on hold as the first digit of the DTMF code is entered. A Telephone Call is initiated by entering a DTMF code and pressing the **PTT** switch.

To make a Telephone Call from Autodial Mode, "01" needs to be added to the beginning of the DTMF code for a PSTN telephone line, and "02" needs to be added to the beginning of the DTMF code for a PABX telephone line.

● Call key

Pressing any of the keys for **Call 1** to **Call 6**, or activating any of the ports for **Call 1** to **Call 6** (Mobile only) initiates a Telephone Call addressed to a telephone number of the selected Autodial List. A DTMF code of the target transceiver can be configured for the **Call 1** to **Call 6** keys by selecting one DTMF code from the Autodial List by using KPG-D1/ D1N. (Refer to [Sending the DTMF Code with a Single Touch \(Call 1 Key to Call 6 Key\)](#).)

To make a Telephone Call from a Call key, "01" needs to be added to the beginning of the DTMF code for a PSTN telephone line, and "02" needs to be added to the beginning of the DTMF code for a PABX telephone line.

Note

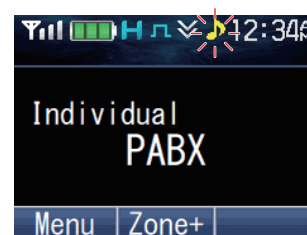
- To make a Telephone Call by Paging Call, **Individual Call Acknowledge Request** needs to be disabled.
- To make a Telephone Call in Autodial Mode or by a Call key, the **Autodial Telephone Interconnect** configuration needs to be enabled.
- Telephone Call functions by using the Individual Call and Group Call functions. Therefore, for **Busy Channel Lockout**, configure the transceiver to be able to transmit even while unmuted. In addition, use Telephone Call after configuring the Encryption and **Call Interruption** functions to be disabled.
- To use **Autodial Telephone Interconnect**, execute the configuration described just above (in Note), and configure anything other than "No" in **Busy Channel Lockout**.
- When a call is made to a telephone by Paging Call, an ID available for the call is the same as the one for making a Paging Call to the transceiver. Therefore, **Individual ID Encode Block** needs to be properly configured so that a call can be made from the transceiver to a telephone.

Operating the transceiver

● Initiating a Telephone Call by using Individual Call

The transceiver starts an Individual Call by telephone after starting a Paging Call. When the telephone of the other party responds, communications by Telephone Call become possible.

The "📞" icon starts blinking, and "Individual" and "PABX" or "PSTN" appear.

**Note**

- When a response from a telephone is received, the transceiver behaves the same as when an Individual Call is received (Refer to [Receiving an Individual Call](#)).
- Pressing the **Clear** key terminates a Telephone Call, and the transceiver restores the previous channel display.

Operating the transceiver

● Initiating a Telephone Call by selecting a DTMF code from the Autodial List

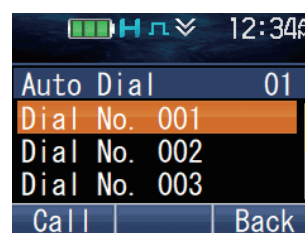
1 Press the **Autodial** key on the channel of the system with Autodial Telephone Interconnect enabled.

The transceiver enters Autodial Mode and then the Autodial List selection display appears.

The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.

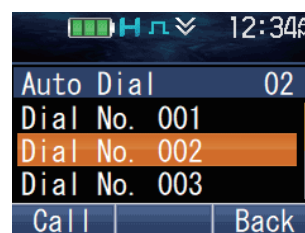
Note

- If **Store and Send** is enabled, the DTMF code entry display will appear. Pressing the **Function** ([O]) key causes the transceiver to switch to the selection screen for the Autodial List.



2 Press the [▲] or [▼] key to select the DTMF code to be sent from the Autodial List.

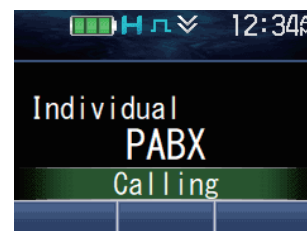
Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the **PTT** switch or the **Menu** ([]) key.

The connection request for a Telephone Call to the repeater is executed by Individual Call.

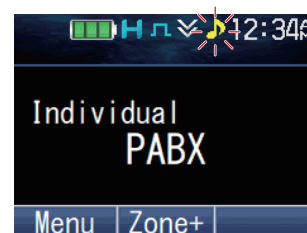
"Individual", "PABX" or "PSTN", and "Calling" appear.



4 Receive the response from the repeater.

The "  " icon blinks.

The communication state of Individual Call is entered, and the selected DTMF code is sent.



● Initiating a Telephone Call by directly entering a DTMF code

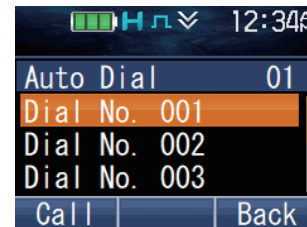
1 Press the **Autodial** key on the channel of the system with Autodial Telephone Interconnect enabled.

The transceiver enters Autodial Mode and then the Autodial List selection display appears.

The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.

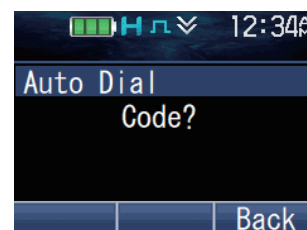


- If **Store and Send** is enabled, the DTMF code entry display will appear.



2 Press the **Function** ([]) key.

The DTMF code entry display appears.



3 Enter a DTMF code.

Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

- **If using the keypad**

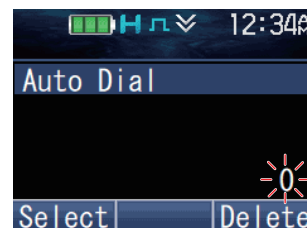
Press a key on the keypad to enter a DTMF code.

- **If using the PF keys**

Press the [▲] key or the [▼] key to enter a DTMF code, and press the **Menu** ([□]) key to confirm the entered DTMF code.

Note

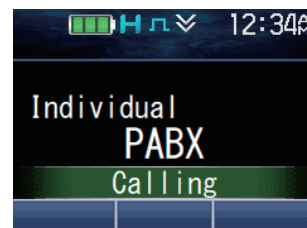
- To enter the DTMF "A" code, press and hold the [*] key and then press the [2] key.
- To enter the DTMF "B" code, press and hold the [*] key and then press the [5] key.
- To enter the DTMF "C" code, press and hold the [*] key and then press the [8] key.
- To enter the DTMF "D" code, press and hold the [*] key and then press the [0] key.
- To enter the DTMF "*" code, press the [*] key twice.
- To enter the DTMF "#" code, press the [*] key, and then press the [#] key.
- If "Direct Entry" is configured in * and # key-entry Pattern, pressing the [*] key or [#] key directly enters the "*" or "#" tone. In this case, the above operations are unavailable.



4 Press the PTT switch or the Menu ([□]) key.

The connection request for a Telephone Call to the repeater is executed by Individual Call.

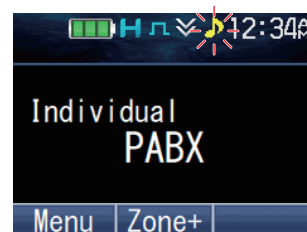
"Individual", "PABX" or "PSTN", and "Calling" appear.



5 Receive the response from the repeater.

The "📞" icon blinks.

The communication state of Individual Call is entered, and the entered DTMF code is sent.



● Redialing

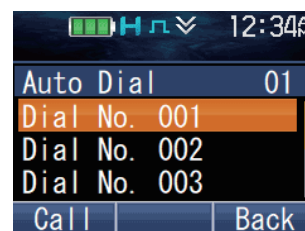
1 Press the **Autodial** key on the channel of the system with Autodial Telephone Interconnect enabled.

The transceiver enters Autodial Mode and then the Autodial List selection display appears.

The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.

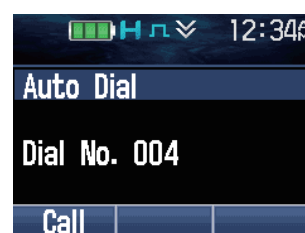
Note

- If **Store and Send** is enabled, the DTMF code entry display will appear. Pressing the **Function** ([**O**]) key causes the transceiver to switch to the selection screen for the Autodial List.



2 Press the **[*]** key and then press the **[0]** key.

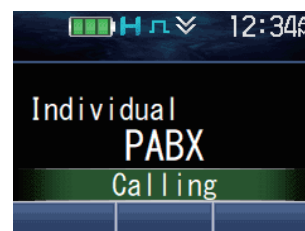
The name or DTMF code of the target transceiver of the last transmission appears.



3 Press the **PTT** switch or the **Menu** ([**□**]) key.

The connection request for a Telephone Call to the repeater is executed by Individual Call.

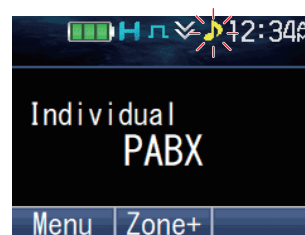
"Individual", "PABX" or "PSTN", and "Calling" appear.



4 Receive the response from the repeater.

The "📞" icon blinks.

The communication state of Individual Call is entered, and the selected DTMF code is sent.



Note

- If **Transmit LED** is enabled, the LED lights red during the transmission of a Telephone Call. (Refer to Common FUNC Transmit LED.)
- If **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when the **PTT** switch is pressed to execute the connection request of a Telephone Call to the repeater. Also, if **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver while the transceiver is waiting for a response from the repeater. (Refer to **Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)**.)
- If **Call in Progress Tone** is enabled, a Call in Progress Tone (2 beeps) sounds from the transceiver when the transceiver becomes ready for communications.

- If **Sidetone** of DTMF is enabled, a DTMF tone sounds from the speaker when a DTMF code is sent.
- Pressing the **Clear** key terminates a Telephone Call. For Mobile, if the **Mic On-hook Disconnect** is enabled, a Telephone Call terminates by placing the microphone in the on-hook state.
- For details on the information displayed on the display during transmission, refer to “**Transceiver behavior during transmitting**”.

Configuration using KPG-D1/ D1N

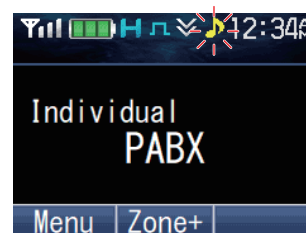
- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Store and Send** to be enabled or disabled ( [See](#) Transceiver Settings > DTMF > Encode)
- Configuring **Autodial Telephone Interconnect** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional (DMR Site Roaming) > DMR > Autodial Telephone Interconnect)
- Configuring **Call Request Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional (DMR Site Roaming) > DMR > Autodial Telephone Interconnect)
- Configuring **Call Processing Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional (DMR Site Roaming) > DMR > Autodial Telephone Interconnect > Call Processing Tone)
- Configuring **Call in Progress Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional (DMR Site Roaming) > DMR > Autodial Telephone Interconnect)
- Configuring the DTMF code corresponding to the **Call 1** to **Call 6** keys or the ports ( [See](#) Transceiver Settings > Key Assignment > Call)
- Configuring **Sidetone** to be enabled or disabled ( [See](#) Transceiver Settings > DTMF > Encode)
- Configuring **On-hook Disconnect** to be enabled or disabled ( [See](#) Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)

Receiving a Telephone Call

The transceiver can receive a Telephone Call from a telephone.

● Receiving a Telephone Call by using Individual Call

When a Telephone Call is received, the “📞” icon starts blinking, and “Individual” and “PABX” or “PSTN” appear.



Note

- An Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Individual Call)** when the transceiver receives a Telephone Call by Individual Call.
- Pressing the **Clear** key terminates a Telephone Call, and the transceiver restores the previous channel display.

● Receiving a Telephone Call by using Group Call

When a Telephone Call is received, the “📞” icon starts blinking, and “Group”, the received Group ID, and “PABX” or “PSTN” appear.



Note

- For a Telephone Call by using Group Call, a disconnection request is not sent to the system even if the **Clear** key is pressed. A Key Beep B (2 beeps) sounds from the transceiver, and the transceiver restores the previous channel display.
- “PABX” and “PSTN” are displayed according to the configuration in **Unit ID Display on Group Call**.

Configuration using KPG-D1/ D1N

- Configuring **Alert Tone (Individual Call)** (See Transceiver Settings > DMR > DMR Information > Conventional > Alert Tone)
- Configuring **Unit ID Display on Group Call** to be enabled or disabled (See Transceiver Settings > DMR > DMR Information > General)

1.14 Sending a DTMF Code

DTMF (Dual Tone Multi-frequency) is the signaling type that uses 2 different frequency tones simultaneously.

DTMF signaling uses 2 different frequencies combined (one lower and one higher frequency) and consists of the 0 to 9, A to D, * and # tones.

Table 1-20 DTMF Tone Frequency List

DTMF Code	Frequency	
	Low Frequency	High Frequency
0	941 Hz	1336 Hz
1	697 Hz	1209 Hz
2	697 Hz	1336 Hz
3	697 Hz	1477 Hz
4	770 Hz	1209 Hz
5	770 Hz	1336 Hz
6	770 Hz	1477 Hz
7	852 Hz	1209 Hz
8	852 Hz	1336 Hz
9	852 Hz	1477 Hz
A	697 Hz	1633 Hz
B	770 Hz	1633 Hz
C	852 Hz	1633 Hz
D	941 Hz	1633 Hz
*	941 Hz	1209 Hz
#	941 Hz	1477 Hz

Various functions of DTMF Encode can be used in an DMR Conventional system.

The following are the methods for sending a DTMF code:

- Manual Dialing
- Keypad Auto PTT
- Store and Send
- Autodial List selection
- **Call** key
- Redial

Sending the DTMF Code While Transmitting (Manual Dialing)

The DTMF code corresponding to a particular key on the keypad can be sent when pressing the key while transmitting by pressing the **PTT** switch.

Operating the transceiver

1 Press the **PTT** switch.

2 Press the key corresponding to the DTMF code to be sent.

The transceiver sends the DTMF code.

3 Repeat Step 2 as necessary.

Configuration using KPG-D1/ D1N

Configuring **Manual Dialing** to be enabled or disabled ( See Transceiver Settings > DTMF > Encode)

Sending the DTMF Code by Pressing a Key on the Keypad without Using the PTT Switch (Keypad Auto PTT)

Pressing a key on the keypad allows the transceiver to start transmitting immediately and can send the DTMF code corresponding to the key. This function can be used to send the DTMF code just by pressing keys on the keypad without pressing the **PTT** switch.

Note

- To use this function, **Manual Dialing** needs to be enabled.

Operating the transceiver

1 Press the key corresponding to the DTMF code to be sent.

The transceiver sends the DTMF code.

2 Repeat Step 1 as necessary.

Configuration using KPG-D1/ D1N

- Assigning functions to the **Keypad Operation** of the transceiver ( See Transceiver Settings > Key Assignment > General > Keypad > Primary/ Secondary)
- Configuring **Manual Dialing** to be enabled or disabled ( See Transceiver Settings > DTMF > Encode)

Sending Entered DTMF Codes All at Once (Store and Send)

The DTMF codes to be sent can be temporarily entered beforehand using the keypad, then sent all at once. A maximum of 34 digits can be transmitted in a single operation.

To use this function, **Store and Send** needs to be enabled using KPG-D1/ D1N.

The transceiver can enter Autodial Mode and the DTMF code can be entered using one of the following operations:

- **Autodial key**

Pressing the **Autodial** key places the transceiver in Autodial Mode.

- **Menu key**

Pressing the **Menu** key places the transceiver in Menu Mode, and then the transceiver enters Autodial Mode by selecting "Autodial". (Refer to Common FUNC Using Menu Mode.)

- **Keypad entry**

If "Autodial" is configured in **Keypad Operation**, pressing a key on the keypad causes the transceiver to enter Autodial Mode. The transceiver will be on hold as the first digit of the DTMF code is entered. (Refer to Common FUNC Keypad Operation.)

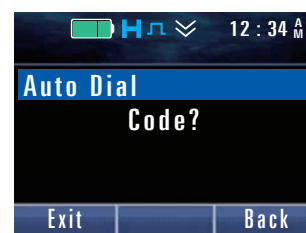
Operating the transceiver

- **If using the keypad:**

1 Press the **Autodial** key.

The transceiver enters Autodial Mode and the DTMF code entry display appears.

The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.



2 Enter using the keypad the DTMF code to be sent.

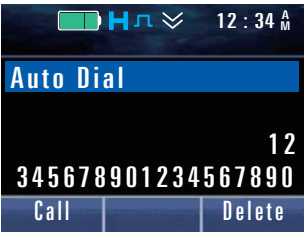
Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

Note

- To enter the DTMF "A" code, press and hold the [*] key and then press the [2] key.
- To enter the DTMF "B" code, press and hold the [*] key and then press the [5] key.
- To enter the DTMF "C" code, press and hold the [*] key and then press the [8] key.
- To enter the DTMF "D" code, press and hold the [*] key and then press the [0] key.
- To enter the DTMF "*" code, press the [*] key twice.
- To enter the DTMF "#" code, press the [*] key and then press the [#] key.
- While * and # key-entry Pattern is disabled, pressing the [*] key or [#] key directly enters the "*" or "#" tone. In this case, the above operations are unavailable.



3 Enter the DTMF code by repeating step 2.



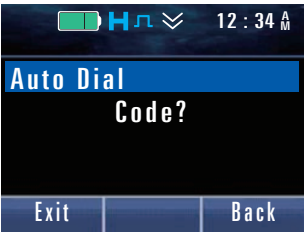
4 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver sends the DTMF code.

● Without using the keypad

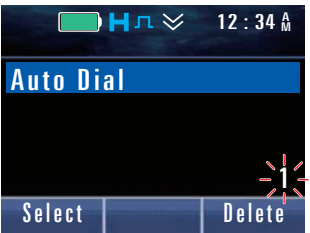
1 Press the **Autodial** key.

The transceiver enters Autodial Mode and the DTMF code entry display appears.
The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key.



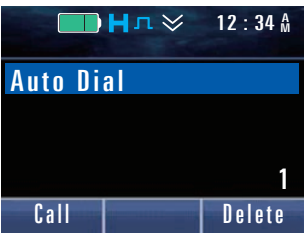
2 Enter the DTMF code to be sent by pressing the [▲] key or [▼] key.

The characters are entered from the right end and the character being entered blinks. Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

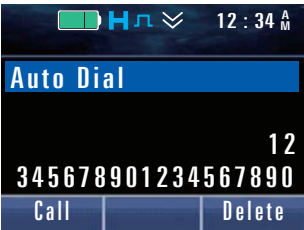


3 Confirm the entered DTMF code by pressing the **Menu** ([]) key.

An entered digit stops blinking and remains lighted.



4 Enter the DTMF code by repeating step 2 and 3.



5 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver sends the DTMF code.

Configuration using KPG-D1/ D1N

- Configuring **Store and Send** to be enabled or disabled ( [See](#) Transceiver Settings > DTMF > Encode)
- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Assigning functions to the **Keypad Operation** of the transceiver ( [See](#) Transceiver Settings > Key Assignment > General > Keypad > Primary/ Secondary)
- Configuring *** and # key-entry Pattern** to be enabled or disabled ( [See](#) Transceiver Settings > DTMF > Encode)

Sending a DTMF Code by Selecting from a List (Autodial List)

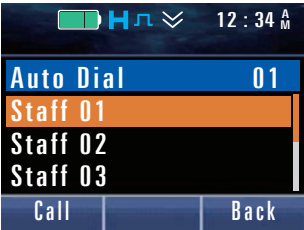
The DTMF code configured in **Autodial List** can be selected and sent.
To use this function, **Store and Send** needs to be disabled using KPG-D1/ D1N.
The transceiver can enter Autodial Mode and the DTMF codes can be selected using one of the following operations:

- **Autodial key**
Pressing the **Autodial** key places the transceiver in Autodial Mode.
- **Menu key**
Pressing the **Menu** key places the transceiver in Menu Mode, and then the transceiver enters Autodial Mode by selecting "Autodial". (Refer to Common FUNC Using Menu Mode.)
- **Keypad entry**
If "Autodial" is configured in **Keypad Operation**, pressing a key on the keypad causes the transceiver to enter Shortcut Entry Mode for Autodial Mode. (Refer to Common FUNC Keypad Operation.)

Operating the transceiver

1 Press the **Autodial** key.

The transceiver enters Autodial Mode and then the **Autodial List** selection display appears.
The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.



2 Press the [▲] key or [▼] key to select the DTMF code to be sent from the Autodial List.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the PTT switch or the Menu ([]) key.

The transceiver sends the DTMF code.

Configuration using KPG-D1/ D1N

- Configuring **Store and Send** to be enabled or disabled (See Transceiver Settings > DTMF > Encode)
- Assigning functions to the **PF** keys on the transceiver (See Transceiver Settings > Key Assignment)
- Assigning functions to the **Keypad Operation** of the transceiver (See Transceiver Settings > Key Assignment > General > Keypad > Primary/ Secondary)

Sending the DTMF Code with a Single Touch (Call 1 Key to Call 6 Key)

Pressing one of the **Call 1** to **Call 6** keys causes the transceiver to send the preconfigured DTMF code.

"Call 1" to "Call 6" can be assigned to the **PF** keys using KPG-D1/ D1N and the DTMF code corresponding to each key can be selected from the **Autodial List**.

Note

- For Mobile, the DTMF code preconfigured in the transceiver can be sent when any of the AUX Input ports to which "Call 1" to "Call 6" are allocated becomes active. (Refer to Common FUNC Available Functions for AUX Input Ports.)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver (See Transceiver Settings > Key Assignment)
- Configuring the DTMF codes corresponding to **Call 1** to **Call 6** keys (See Transceiver Settings > Key Assignment > Call)

Redialing

A previously sent DTMF code can be sent again.

Operating the transceiver

1 Press the **Autodial** key while the transceiver is in standby mode.

The transceiver enters Autodial Mode.

2 Press the **[*]** key and then **[0]** key.

The DTMF code last sent appears.

3 Press the **PTT** switch or the **Menu** () key.

The transceiver sends the DTMF code.

Functions Related to DTMF Code Encoding

Functions related to DTMF code encoding are shown below.

- DTMF Speed
- First Digit Delay Time
- First Digit Time
- * and # Digit Time
- DTMF Hold Time
- D Code Assignment
- Sidetone

DTMF Speed

DTMF Speed is the speed to send out the DTMF codes. Transmission speed of the DTMF code can be configured by entering the number of digits to be sent per second. The transceiver sends the DTMF code at the configured speed. The number of digits of the DTMF code to be sent per second can be selected from 6, 8, 10, or 15 by using KPG-D1/ D1N. The following are durations for Digit Time (transmission duration) and Gap Time (silent duration) depending on the selected value.

Table 1-21 DTMF Speed

Range	Digit Time (Transmission Duration)	Gap Time (Silent Duration)
6 digits/sec	84 ms	84 ms
8 digits/sec	62 ms	62 ms
10 digits/sec	50 ms	50 ms
15 digits/sec	34 ms	34 ms

Configuration using KPG-D1/ D1N

Configuring **DTMF Speed** ( **See** Transceiver Settings > DTMF > Encode)

First Digit Delay Time

First Digit Delay Time is the length of time from when the transceiver starts transmitting until the transceiver starts sending the first digit of the DTMF code.

The transceiver transmits an unmodulated signal until the length of time configured in **First Digit Delay Time** elapses.

Configuration using KPG-D1/ D1N

Configuring **First Digit Delay Time** ( See Transceiver Settings > DTMF > Encode)

First Digit Time

First Digit Time is the function to extend the length of time to send the first digit of the DTMF code when the transceiver starts sending the DTMF code.

Extending the transmission time of the first digit of the DTMF code helps the receiving transceiver easily recognize the incoming DTMF code in order to avoid failure in receiving the DTMF code while the transceiver is in the battery saver mode or scanning.

The length of time to send the first digit of the DTMF code is the sum of the transmission time configured in **DTMF Speed** and the **First Digit Time**.

Transmission time for the 1st digit of DTMF = value configured in DTMF Speed (Digit Time) + value configured in First Digit Time

Example: First Digit Time: 100 ms, Encode Code: 123

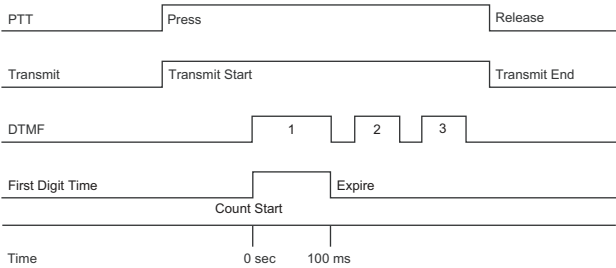


Figure 1-6 First Digit Time

Configuration using KPG-D1/ D1N

Configuring **First Digit Time** ( See Transceiver Settings > DTMF > Encode)

* and # Digit Time

*** and # Digit Time** is the function to extend the transmission time for the * tone and # tone of when the DTMF code is sent out.

Since * tone and # tone are more frequently used for special tasks than 0 to 9 tones, this function is used for the receiving transceiver to easily recognize the incoming DTMF code.

The length of time to transmit the * tone and # tone is the sum of the transmission time configured in **DTMF Speed** and the *** and # Digit Time**.

Transmission time for the * tone and # tone of DTMF = value configured in DTMF Speed (Digit Time) + value configured in * and # Digit Time

Example: * and # Digit Time: 100 ms, Encode Code: *01

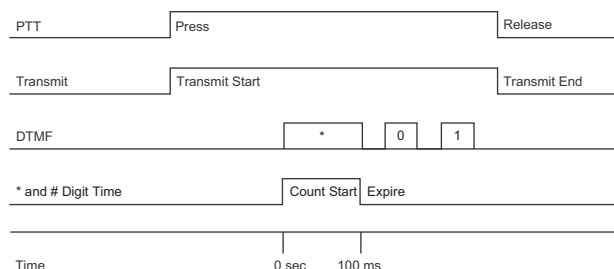


Figure 1-7 * and # Digit Time

Note

- If the first digit of the DTMF code is the * tone or # tone, the transceiver compares the extension time configured in **First Digit Time** with the extension time configured in *** and # Digit Time**, and uses the longer extension time to send the first digit.

Configuration using KPG-D1/ D1N

Configuring *** and # Digit Time** (See Transceiver Settings > DTMF > Encode)

DTMF Hold Time

DTMF Hold Time is the length of time from when the keypad is disabled until the transceiver restores the receive mode while sending the DTMF code by using **Keypad Auto PTT** or **Manual Dialing**.

The DTMF signal received until its transmission is interrupted may be treated as one string of code depending on the devices on the receiving side. Therefore, the transceiver holds the transmission not to interrupt the digit sequence when transmitting a continuous DTMF signal.

Configuration using KPG-D1/ D1N

Configuring **DTMF Hold Time** (See Transceiver Settings > DTMF > Encode)

D Code Assignment

D Code Assignment is the function to select whether the D Code is used for the D tone of DTMF or a dialing pause (unmodulated transmission).

Configuration using KPG-D1/ D1N

Configuring **D Code Assignment** (See Transceiver Settings > DTMF > Encode)

Emitting the DTMF code tone (Sidetone)

Sidetone is the function to emit a DTMF code tone from the speaker while the transceiver transmits the DTMF code.

Note

- If "Silent" is configured in **Emergency Mode Type**, the transceiver does not emit a **DTMF Sidetone**. (Refer to [Emergency Mode Type](#).)
- If the transceiver sends the DTMF code while **PTT Proceed Tone** is enabled, the transceiver does not emit a **Proceed Tone**. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)

Configuration using KPG-D1/ D1N

Configuring **Sidetone** to be enabled or disabled ( [See](#) Transceiver Settings > DTMF > Encode)

Using Autodial List

Autodial List is the list in which the DTMF code used for Autodial Mode is configured.

Autodial List can be configured by using KPG-D1/ D1N.

Table 1-22 Autodial List Configuration

Configuration	Description
DTMF Name	A name can be assigned to the DTMF code. A maximum of 14 characters can be configured.
Code	The DTMF code to be sent can be configured. A maximum of 34 numeric digits can be configured.

Configuration using KPG-D1/ D1N

Configuring **Autodial List** ( See Transceiver Settings > DTMF > Autodial List)

Editing the Autodial List with the Transceiver (Autodial Programming)

In Autodial Programming Mode, data configured in **Autodial List** can be added, changed, or deleted by operating the transceiver.

Pressing the **Autodial Programming** key places the transceiver in Autodial Programming Mode.

Or, the transceiver enters Autodial Programming Mode if “Autodial Programming” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

Note

- While *** and # key-entry Pattern** is disabled, pressing the [*] key or [#] key in Autodial Programming Mode directly enters the “*” or “#” tone. In this case, A to D tones cannot be entered by pressing the [*] key, and the characters entered by pressing the [#] key cannot be cleared.

Operating the transceiver

● Changing or adding data in the Autodial List

1 Press the **Autodial Programming** key.

The transceiver enters Autodial Programming Mode.

The following operations are identical even if the transceiver enters Autodial Programming Mode by pressing the **Menu** key.



2 Press the [▲] key or [▼] key and then select the target data from the Autodial List.

Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.



If data is newly added to the **Autodial List**, “Blank” needs to be selected. Although the following procedure describes the operation with the displays that appear when changing the existing data in the **Autodial List**, the operation is identical.



3 Press the Menu ([□]) key, or [*] key.

The DTMF name edit display for the selected data appears.



4 Enter a DTMF name.

Refer to Common FUNC “Entering or Deleting Characters” for the entry method.



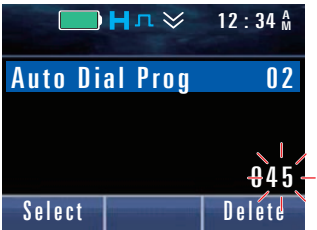
5 Press the Menu ([□]) key or [*] key after entering the DTMF name.

The DTMF code edit display appears.



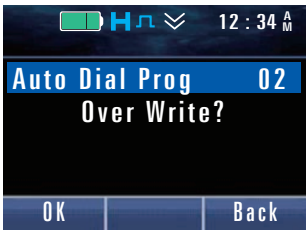
6 Enter a DTMF code.

Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

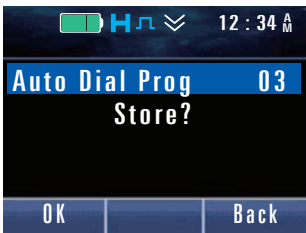


7 Press the Menu ([]) key or [*] key after entering the DTMF code.

The writing completion message display appears.
“Over Write?” appears if the existing data in the **Autodial List** is changed.

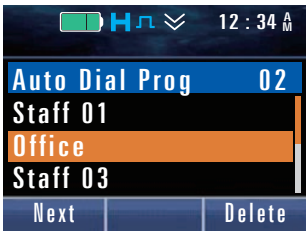


“Store?” appears if new data is added in the **Autodial List**.



8 Press the Menu ([]) key, or [*] key.

The data is written in the transceiver memory, and the **Autodial List** selection display appears.



● Deleting data from the Autodial List

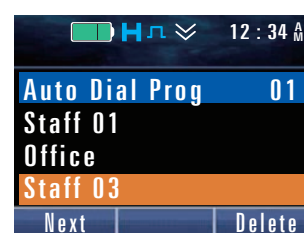
1 Press the **Autodial Programming** key.

The transceiver enters Autodial Programming Mode.
The following operations are identical even if the transceiver enters Autodial Programming Mode by pressing the **Menu** key.



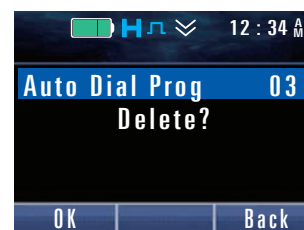
2 Press the [▲] key or [▼] key and then select the target data from the Autodial List.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the **Back** ([↩]) key, or [#] key.

"Delete?" appears.



4 Press the **Menu** ([⏏]) key, or [*] key.

The selected data will be cleared.



Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Configuring *** and # key-entry Pattern** to be enabled or disabled ( **See** Transceiver Settings > Key Assignment > General > Keypad)

1.15 Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode)

Open Voice Channel Mode (OVCM) is the function to hear a conversation even if the received ID does not match when the transceiver receives various voice calls (Individual Call, Group Call, Broadcast Call).

When the use of OVCM is permitted for the transceiver receiving the various voice calls, the transceiver can hear the conversations even if the received ID does not match.

This function is used for transceivers other than the transceiver of the Specified ID to participate in a conversation.

To use this function, **Open Voice Channel Mode** must be enabled by using KPG-D1/ D1N. Also, to send out a signal that is applied with OVCM, press the **OVCM** key to enable **Open Voice Channel Mode**.

Or, calls by OVCM can be enabled if "OVCM" is selected from Menu Mode. (Refer to Common FUNC Using Menu Mode.)

The "  " icon blinks on the transceiver display when OVCM is enabled.

Table 1-23 Open Voice Channel Mode

Configuration	Description
Enabled	Transmit Operation: By pressing the OVCM key, or by selecting "OVCM" from Menu Mode, calls by OVCM can be enabled or disabled. The transceiver can transmit a signal with OVCM applied while calls by OVCM are in the enabled status. Receive Operation: Conversations can be heard even if the ID does not match when the transceiver receives a call with OVCM applied.
Disabled	Transmit Operation: Calls by OVCM cannot be enabled nor disabled even if the OVCM key is pressed or "OVCM" is selected from Menu Mode. Therefore, the transceiver cannot transmit a signal with OVCM applied. Receive Operation: Conversations cannot be heard if the ID does not match even when the transceiver receives a call with OVCM applied.

For example, Transceiver A specifies the ID of Transceiver B, and initiates a call with OVCM applied (refer to the figure below).

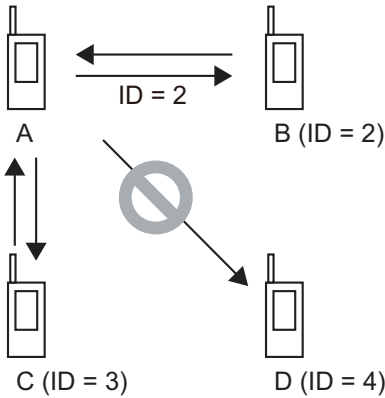


Figure 1-8 Operation Examples

Table 1-24 Configuration Examples

Transceivers	Open Voice Channel Mode	Call by OVCM
A	Enabled	Enabled
B	Disabled	Disabled
C	Enabled	Disabled
D	Disabled	Disabled

- Because the ID matches, Transceiver B can communicate with Transceiver A even if **Open Voice Channel Mode** is disabled.
- Because **Open Voice Channel Mode** is enabled, Transceiver C can communicate with Transceiver A even if the ID does not match.
- Because **Open Voice Channel Mode** is disabled and the ID does not match, Transceiver D cannot communicate with Transceiver A.

Also, even if calls by OVCM are disabled, Transceiver B or C receiving a call with OVCM applied transmits a signal with OVCM applied when replying.

Note

- If the transceiver is turned off and turned back on while calls by OVCM are enabled, calls by OVCM are disabled.
- OVCM does not function for the transmission of an Unaddressed Call or All Group Call.
- OVCM does not function while the transceiver is in Emergency Mode.
- Calls transmitted by OVCM are not stored in the stack memory of the transceiver.
- Even when the Unit ID is configured in the Individual ID List, the list number of the Individual ID List will be displayed on the screen when an Individual Call that is applied with OVCM is received if the ID name is not configured. If the Unit ID is not configured in the Individual ID List, the received Unit ID is displayed.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Configuring **Open Voice Channel Mode** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

1.16 Calling All Transceivers Having the Same Color Code (Unaddressed Call)

Unaddressed Call is the function to initiate 2-way voice communication with multiple transceivers without specifying a group.

In a regular Group Call, the transceiver can communicate only with transceivers included in the Group ID specified.

Unaddressed Call can initiate a call to all transceivers having the same Color Code on the same channel.

Using this function, such as during an emergency, the transceiver can initiate a call without distinguishing the group to share information with the users of multiple groups.

To use this function, "Off" needs to be configured in **Selcall on PTT** of the channel to be used for an Unaddressed Call by using KPG-D1/ D1N.

Note

- When an Unaddressed Call is sent, send a Group Call by specifying Default Unaddressed ID (\$FFFFEF) of Group ID as the destination ID.
- The receiving transceiver of an Unaddressed Call treats the call as an Unaddressed Call if the destination ID of the received Group Call is Default Unaddressed ID (\$FFFFE0 or \$FFFFEF), determines whether the Color Code matches, and unmutes the speaker.
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving an Unaddressed Call. (Refer to [Sending the Received Unit ID from the Communication Port \(Unit ID Serial Output\)](#).)
- An Unaddressed Call can also be initiated by receiving a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Configuration using KPG-D1/ D1N

- Configuring **Color Code** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Color Code** (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)
- Configuring **Selcall on PTT** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Selcall on PTT)
- Configuring **Selcall on PTT** (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Selcall on PTT)

Displaying the ID of the Communicating Caller on the LCD (Caller ID Display)

Caller ID Display is the function to display the received ID on the transceiver display when an Unaddressed Call is received.

While this function is enabled, the Unit ID Name or Unit ID of the transmitting transceiver appears if an Unaddressed Call is received and the received Color Code matches the Color Code preconfigured for the transceiver.

A user can identify the caller not only by voice, but also through the display.

Note

- If the ID Name of the transmitting transceiver is configured in the Individual ID List, the ID Name of the transmitting transceiver appears. If the ID Name of the transmitting transceiver is not configured in the Individual ID List, the Unit ID of the transmitting transceiver appears.
- If the transceiver receives an Individual Call or Group Call, **Caller ID Display** does not function. If the transceiver receives an Individual Call, the Unit ID of the transmitting transceiver appears. If the transceiver receives a Group Call, the ID appears according to the configuration in **Unit ID Display on Group Call**. (Refer to [Display When the Transceiver Receives a Group Call \(Unit ID Display on Group Call\)](#).)
- A user cannot reply to an ID on the transceiver while the ID appears on the main display.
- If the Unit ID Name is saved on the transceiver, the saved Unit ID Name will be displayed. If the Unit ID Name is not saved on the transceiver, the Unit ID Name configured in the Individual ID List will be displayed. If the Unit ID Name is not configured in the Individual ID List, the Individual ID List number appears.
- The received Unit ID Name appears upon receipt of the Unit ID Name by the **Over-the-Air Alias** function while the Unit ID is displayed.
- The Unit ID received can be sent from the communication port of the transceiver. (Refer to [Sending the Received Unit ID from the Communication Port \(Unit ID Serial Output\)](#).)

Configuration using KPG-D1/ D1N

Configuring **Caller ID Display** ( **See** Transceiver Settings > DMR > DMR Information > Conventional)

1.17 Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)

Call Interruption is the function to enable a transceiver other than the transmitting transceiver to terminate voice communications by sending and receiving the Call Interruption request message. A transceiver receiving the Call Interruption request message on the channel where the transceiver is performing voice communication terminates voice communication.

By pressing the **Call Interruption** key, a Call Interruption request message can be sent.

When the **Call Interruption** key is used while the transceiver is in Emergency Mode, **Emergency Cycle needs** to be disabled.

Also, a Call Interruption request message can be sent by the following functions:

- **In-call Busy Channel Lockout (Interrupt CALL)**

The current incoming call can be interrupted by pressing the **PTT** switch to respond (Talkback) while receiving an Individual Call or Group Call addressed to the own transceiver on the channel where "Interrupt CALL" is configured for **In-call Busy Channel Lockout**.

When the transceiver enters Emergency Mode, if "Interrupt CALL" is configured for **In-call Busy Channel Lockout** of the channel used in Emergency Mode, pressing the **PTT** switch can terminate the communication which is being received when the voice communication and Broadcast Call not addressed to the own station are received.

- **Interrupt ALL CALL**

Call Interruption is executed and voice communication can be terminated when an All Call is initiated during voice communication (including voice communication not addressed to the own transceiver) on the selected channel.

- **Interrupt Message CALL**

Call Interruption is executed and voice communication can be terminated when transmission of a message is initiated during voice communication (including voice communication not addressed to the own station) on the channel to send the message.

- **Interrupt Emergency CALL**

When the transceiver automatically transmits audio according to **Emergency Cycle** in Emergency Mode, **Call Interruption** is executed and voice communication can be terminated if voice communication (including voice communication not addressed to the own station) is performed on the channel used for Emergency Mode.

To send a Call Interruption request message using these functions, **Encode (Call Interruption)** of the channel used needs to be enabled. To receive a Call Interruption request message, **Decode (Call Interruption)** of the channel used also needs to be enabled.

Note

- In DMR Direct Mode, Call Interruption does not function if the received Color Code does not match the Color Code configured in the transceiver, or if the slot number does not match. (Refer to **Communicating Without Using a Repeater (Talk Around/DMR Direct Mode), About the Slot Numbers (Slot Selection)**.)
- In Repeater Mode, Call Interruption does not function if the received Color Code does not match the Color Code configured in the transceiver. (Refer to **Communicating via a Repeater (Repeater Mode)**.)
- When a signal encrypted in the AES/ DES, DES (Built-in DES) or Enhanced Encryption format is received, Call Interruption is not activated regardless of the matching status of Color Code and slot number. When a signal that is encrypted by means of bit scrambling, Call Interruption is activated according to the matching or non-matching status of Color Code and slot number. (Refer to **COMMUNICATION SECURITY**.)
- While in the Emergency Mode, the transceiver will not transmit Call Interruption request messages or indicate whether Call Interruption is successful or unsuccessful.
- During Emergency Mode, voice communication continues even if the transceiver receives a Call Interruption request message during the voice communication.
- While the transceiver is receiving voice communication by Emergency Call, a Call Interruption request message is not sent even if Call Interruption operation is performed. The Call Interruption operation is determined as a failure.
- If the receiving status cannot be determined such as during the scan or immediately after transmission of a Call Interruption request message ends, the transceiver may enter the following states:
 - Displays the indication of the Call Interruption behavior.
 - Emits a Tone.
- A Call Interruption request message can also be transmitted by receiving a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

Sending a Call Interruption Request Message

To receive a Call Interruption request message, Encode (Call Interruption) of the channel used also needs to be enabled.

Operating the transceiver

● Transmission using the Call Interruption key

1 Press the **Call Interruption** key during voice communication.

Key Beep A (1 beep) sounds from the transceiver, and "Interrupt" appears on the display. A Call Interruption request message is sent to all IDs according to the conditions to terminate voice communications.

Note

- When the **Call Interruption** key is pressed while receiving a signal encrypted in the AES/ DES, DES (Built-in DES) or Enhanced Encryption format, Call Fail Tone (2 beeps) is emitted from the transceiver and "Fail" appears on the display for 1 second. A Call Interruption request message is not sent in this case.
- When the **Interruption** key is pressed and "Interrupt" appears on the display, transmission of the Call Interruption request message can be canceled by pressing the **Clear** key.
- Although "Interrupt" appears on the display even when the **Call Interruption** key is pressed during Call Hangtime, a Call Interruption request message is not sent.
- If neither the conditions to terminate voice communications nor the conditions during Call Hangtime are satisfied, a Key-entry Error Tone (1 beep) sounds from the transceiver, and the transceiver does not respond.
- When the transceiver is not receiving signals while the transceiver is scanning or during the **Battery Saver** behavior, or if the transceiver is receiving another protocol such as analog and NXDN, "Interrupt" may appear on the display.



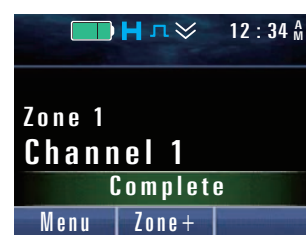
2 Transmission of Call Interruption request message is complete.

When there is no more signal, Transaction Confirmed Tone (2 beeps) is emitted from the transceiver, and voice communication ends after "Complete" appears on the display for 1 second.

Note

- If the **PTT** switch of the transceiver is pressed when it starts to receive a signal that is unable to receive a Call Interruption request message^{*1}, the initiation of sending a Call Interruption is suspended for up to 7 seconds.
 - If the Call Interruption request message becomes receivable during the holding time, the sending of a Call Interruption starts.
 - If the Call Interruption request message is not received even after the holding time elapses, the sending of a Call Interruption is canceled.

^{*1} In particular when receiving a carrier other than DMR carrier, or when receiving a signal that does not contain or unable to acquire a synchronization signal in DMR.



● Transmission using the In-call Busy Channel Lockout (Interrupt CALL) function

The **In-call Busy Channel Lockout (Interrupt CALL)** function can be used to send a Call Interruption request message before a voice call starts to end voice communication. "Interrupt CALL" needs to be configured in **In-call Busy Channel Lockout** of the channel in use. (Refer to [Avoiding Interference with Other Communications \(Busy Channel Lockout \(DMR\)\)](#).)

1

Press the **PTT** switch during voice communication to respond (Talkback).

"Interrupt" appears on the display. A Call Interruption request message is sent to all IDs according to the conditions to terminate voice communications.

Note

- When the **PTT** switch is pressed and a response (Talkback) is sent while receiving a signal encrypted in the AES/ DES, DES (Built-in DES) or Enhanced Encryption format, Call Fail Tone (2 beeps) is emitted from the transceiver and "Fail" appears on the display for 1 second. A Call Interruption request message is not sent in this case.

The same applies during transmission via an Interrupt Emergency Call and Interrupt ALL Call. However, "Fail" does not appear on the display for Interrupt Emergency Call and Interrupt ALL Call.

- Although "Interrupt" appears on the display even when the **PTT** switch is pressed during Call Hangtime, a Call Interruption request message is not sent.
- If the **PTT** switch remains depressed, this will be followed by an outgoing call.
- When the transceiver is not receiving signals while the transceiver is scanning or during the **Battery Saver** behavior, or if the transceiver is receiving another protocol such as analog and NXDN, "Interrupt" may appear on the display.



2

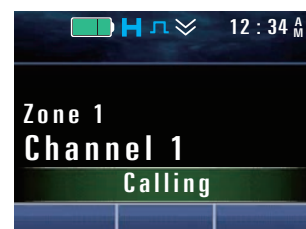
Transmission of Call Interruption request message is complete.

When the received signal drops out, the voice communication terminates. When **Individual Call Acknowledge Request** is enabled, "Calling" appears on the display when there is no more signal, and a request message for confirmation of receipt is sent. (Refer to [Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications \(Individual Call Acknowledge Request\)](#).)

Note

- If the **PTT** switch of the transceiver is pressed when it starts to receive a signal that is unable to receive a Call Interruption request message ^{*1}, the initiation of sending a Call Interruption is suspended for up to 7 seconds.
 - If the Call Interruption request message becomes receivable during the holding time, the sending of a Call Interruption starts.
 - If the Call Interruption request message is not received even after the holding time elapses, the sending of a Call Interruption is canceled.

^{*1} In particular when receiving a carrier other than DMR carrier, or when receiving a signal that does not contain or unable to acquire a synchronization signal in DMR.



● Transmission using the Interrupt Message Call function

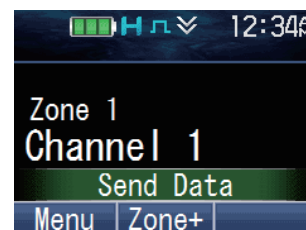
The Interrupt Message Call function can be used to send a Call Interruption request message before sending a message to end voice communication.

1 Send a message during voice communication.

"Send Data" appears on the display. A Call Interruption request message is sent to all IDs according to the conditions to terminate voice communications.

Note

- When message sending operation is performed while receiving a signal encrypted in the AES/ DES, DES (Built-in DES) or Enhanced Encryption format, Busy Tone 2 (3 beeps) is emitted from the transceiver and "Busy" appears on the display for 1 second. A Call Interruption request message is not sent in this case.



2 Transmission of Call Interruption request message is complete.

When there is no more signal, a message is sent.

Note

- If the **PTT** switch of the transceiver is pressed when it starts to receive a signal that is unable to receive a Call Interruption request message ^{*1}, the initiation of sending a Call Interruption is suspended for up to 7 seconds.
 - If the Call Interruption request message becomes receivable during the holding time, the sending of a Call Interruption starts.
 - If the Call Interruption request message is not received even after the holding time elapses, the sending of a Call Interruption is canceled.

^{*1} In particular when receiving a carrier other than DMR carrier, or when receiving a signal that does not contain or unable to acquire a synchronization signal in DMR.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Encode (Call Interruption)** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Call Interruption)
- Configuring **Encode (Call Interruption)** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Call Interruption)
- Configuring **In-call Busy Channel Lockout** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **In-call Busy Channel Lockout** (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)
- Configuring **Interrupt ALL CALL** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > General)
- Configuring **Interrupt Message CALL** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > General)
- Configuring **Interrupt Emergency CALL** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency)

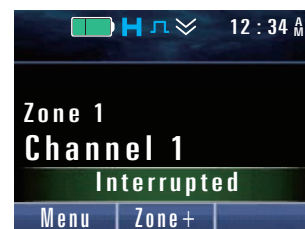
Receiving a Call Interruption Request Message

To receive a Call Interruption request message, Decode (Call Interruption) of the channel used also needs to be enabled.

Transceiver behavior

The transceiver receives a Call Interruption request message during voice communication, and the voice communication ends.

During the interval while the **PTT** switch is depressed, Key Beep A (1 beep) is emitted from the transceiver and "Interrupted" appears on the display.



Configuration using KPG-D1/ D1N

- Configuring **Decode (Call Interruption)** to be enabled or disabled(Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Call Interruption)
- Configuring **Decode (Call Interruption)** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Call Interruption)

1.18 Sending GPS Data

Global Positioning System (GPS) is the system to acquire the current location information of the own transceiver by receiving signals from the Global Positioning System satellites orbiting the earth.

The transceiver of the mobile station can send the acquired own location information (GPS data) to the base station. The base station can send received GPS data to the PC as serial commands.

A GPS receiver unit compatible with the NMEA-0183 standard is required for the communication port of the mobile station transceiver to send GPS data. The transceiver has a built-in GPS receiver unit. The optional GPS receiver unit also can be connected with the transceiver.

Note

- To use the built-in GPS receiver unit, **Built-in GPS Receiver/Bluetooth** must be enabled when configuring data by using KPG-D1/ D1N. In this case, the configuration for the communication port is not required.
- To use the optional GPS receiver unit, "GPS" must be assigned to the communication port to which the GPS receiver unit is connected. For Portable, a GPS microphone (KMC-47GPS/ KMC-47GPSD) is usable. For Mobile, an optional third-party GPS receiver unit is usable.

Transmission Method of GPS Data

The following are the methods to send GPS data:

- **Automatic GPS data transmission**
 - [Sending GPS Data Automatically at Certain Intervals \(GPS Report Mode\)](#)
 - [Sending GPS Data According to the Request from the Base Station \(GPS Report Mode\)](#)
- **Manual GPS data transmission**
 - [Sending GPS Data Manually by Using a Key \(Send the GPS Data\)](#)
- **GPS data transmission together with Status Call**
 - [Sending GPS Data Together With Status Call \(GPS Combination\)](#)
- **GPS data transmission linked with an Emergency Call**
 - [Sending GPS Data Together With Emergency Call \(GPS Combination\)](#)
- **GPS data transmission during voice communications**
 - [Sending GPS Data during Voice Communications \(GPS Report with Voice\)](#)
- **GPS data transmission linked with travel distance**
 - [Sending GPS Data Based On Travel Distance \(GPS Distance Change\)](#)

The ID of the Target Transceiver (GPS Base ID)

GPS Base ID is the ID of the target transceiver used for sending GPS data.

By using KPG-D1/ D1N, either Unit ID or Group ID can be configured as **GPS Base ID**. The ID of the base station which is responsible for operation and administration of system is normally configured.

Note

- If **GPS Base ID** is not configured, GPS data is sent to the **Base ID** to which data such as a Status Message and Short Message is to be sent. (Refer to **Base ID**.)
- In a system that supports Indoor Location, the configuration value is shared with BLE Base ID. GPS Base ID and BLE Base ID function with the same configuration. (Refer to **The ID of the Target Transceiver (BLE Base ID (Indoor Location))**.)

Configuration using KPG-D1/ D1N

Configuring **GPS Base ID Type** and **GPS Base ID** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > DMR)

Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)

GPS data can be sent automatically at the intervals configured in **GPS Report Interval Time**.

This function is used for controlling or monitoring vehicles on a time basis by periodically sending location information to the base station.

To use this function, "Auto" must be configured for **GPS Report Mode** by using KPG-D1/ D1N.

Note

- The transceiver sends the GPS data upon receipt of the GPS data transmission request from the base station even if "Auto" is configured for **GPS Report Mode**.
- If the transceiver is under the following conditions, the automatic transmission of GPS data at certain intervals will be canceled. The transceiver suspends transmission for the period of time configured for **Transmit Busy Wait Time**, to avoid collisions with GPS data transmissions by other transceivers. A transmission is canceled when the channel is busy and the **Transmit Busy Wait Time** elapses. (Refer to **Transmit Busy Wait Time**.)
 - While the transceiver is transmitting
 - While the transceiver is in busy state
 - While the transceiver unmutes the speaker
 - While the **Public Address** function is used (Mobile only)
 - The **PTT** switch is pressed while **Intercom** is enabled (only for a Dual Control Head structure of Mobile)
 - If the transmit frequency is not configured
 - While transmission is disabled by the **Time-out Timer**
 - While the transceiver is sending or receiving the DMR data
 - Transceiver Password Mode
 - Emergency Mode
 - Out of Range
 - While the transceiver is waiting for a response by the reception of an Individual Call (FOACSU) (while "Incoming" appears)
 - During Passive Scan
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- There is no ACK transmission by the base station for GPS data transmission from the transceiver of a mobile station.

Configuration using KPG-D1/ D1N

Configuring **GPS Report Mode** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

Sending GPS Data According to the Request from the Base Station (GPS Report Mode)

GPS Report Mode allows the transceiver to automatically send GPS data when a GPS data transmission request is received from the base station.

This function is used when the base station controls the timing to require GPS data. This function is also used to avoid a data collision if there are many transceivers.

To use this function, "Poll" must be configured for GPS Report Mode by using KPG-D1/ D1N.

Note

- The transceiver sends GPS data to the ID configured for **GPS Base ID** or **Base ID**, not to the ID that sent the data transmission request. However, if **GPS Report Back to Requested ID** is enabled, GPS data is sent to the ID that sent the data transmission request. (Refer to [GPS Report Back to Requested ID](#).)
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- There is no ACK transmission by the base station for GPS data transmission from the transceiver of a mobile station.

Configuration using KPG-D1/ D1N

Configuring **GPS Report Mode** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

Sending GPS Data Manually by Using a Key (Send the GPS Data)

GPS data can be sent manually by a user pressing the **Send the GPS Data** key. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the GPS data can be sent manually by selecting the "Send GPS Data". (Refer to Common FUNC Using Menu Mode.)

Note

- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- There is no ACK transmission by the base station for GPS data transmission from the transceiver of a mobile station.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)

Sending GPS Data Together With Status Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to a DMR Status Message.

To use this function, **Status** for **GPS Combination** must be enabled by using KPG-D1/ D1N. The range of status numbers (**GPS Report Status Number Block**) to which GPS data can be added can be configured.

Note

- The GPS data added to a Status Message is sent to the ID configured for **GPS Base ID** or **Base ID**.
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- In a system that supports Indoor Location, the configuration value is shared with BLE Combination. GPS Combination and BLE Combination function with the same configuration. (Refer to [Sending the BLE Data Linked With the Configured Mode \(BLE Combination \(Indoor Location\)\)](#).)

Configuration using KPG-D1/ D1N

- Configuring **GPS Combination (Status)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > DMR > GPS Combination)
- Configuring **GPS Report Status Number Block** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > DMR > GPS Combination)

Sending GPS Data Together With Emergency Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to an Emergency Status.

To use this function, **Emergency** for **GPS Combination** must be enabled by using KPG-D1/ D1N.

While in the Emergency Mode, GPS data, Emergency Status and audio data are transmitted as follows according to the configuration of **Transmit Duration**.

- **When Transmit Duration is configured to a value other than “0 sec”**
 - During automatic transmission, GPS data and Emergency Status will be added before the audio data.
 - During transmission by pressing the **PTT** switch, only Emergency Status is added before the audio data. GPS data will not be added even if **Emergency** is enabled.
- **When Transmit Duration is configured to “0 sec”**
 - During automatic transmission, GPS data and Emergency Status are transmitted but audio data will not be transmitted.
 - During transmission by pressing the **PTT** switch, only Emergency Status is added before the audio data. GPS data will not be added even if **Emergency** is enabled.

Note

- The GPS data added to a Status Message is sent to the ID configured for **GPS Base ID** or **Base ID**. When an ID is configured in both **GPS Base ID** and **Base ID**, **GPS Base ID** has priority.
- Emergency Status can be configured in **Emergency Call Status**. Emergency Status will not be added to the GPS data if **Emergency Call Status** is not configured. (Refer to [ID Sent When Emergency Mode is Activated](#).)
- When **Emergency Cycle** is configured to “0”, **GPS Combination** will not function even if **Emergency** is enabled.
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.

Configuration using KPG-D1/ D1N

Configuring **GPS Combination (Emergency)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > DMR > GPS Combination)

Sending GPS Data during Voice Communications (GPS Report with Voice)

The transceiver can multiplex GPS data on audio data and send the data during voice communications.

When audio data transmission starts or during the transmission, GPS data can be multiplexed on the audio data for transmission at specific time intervals.

Multiplexing of GPS data behaves as follows according to the configuration of **Report (GPS Report with Voice)**.

Table 1-25 GPS Data Multiplexing Behavior

Report	Description
Off	GPS data is not multiplexed during audio data transmission.
One-shot	GPS data is multiplexed at the start of audio data transmission.
Interval	GPS data is multiplexed at the start of or during audio data transmission according to the cycle that is calculated based on the value configured in Interval (GPS Report with Voice) . The cycle for multiplexing GPS data can be calculated using the formula below. GPS data multiplex cycle [sec] = Interval (GPS Report with Voice) configuration value x 3.6 sec

Note

- GPS data will not be transmitted automatically according to the **Portable / Ignition On (GPS Report Interval Time)** or **Ignition Off (GPS Report Interval Time)** during audio data transmission regardless of the configuration for **Report (GPS Report with Voice)**.
- If **Report (GPS Report with Voice)** is configured to “One-shot” or “Interval”, Call Interruption request messages cannot be received.
- According to the DMR specifications, GPS data that is transmitted contains only the coordinates and Position Error information (Unknown), and GPS data is transmitted to the same destination as the audio data even if **GPS Base ID, Base ID Type or Base ID** is configured.
- During serial output of the location information, the Unit ID value inside Map Header KW 1/ KW 2/ KW 3 (\$PKNDS, \$PKNID, \$PKNSH) will be complemented using the Unit ID of the sender of the audio data.
- If data is received while voice communication is in progress, the LCD display, LED and Alert Tone will function according to the configurations during a voice call.
- GPS data is not encrypted during encrypted communication.
- If there exists unsent GPS data at the timing of GPS data transmission when GPS data is not received from the GPS receiver unit or when **Built-in GPS Receiver/Bluetooth** is disabled, the latest GPS data will be transmitted. If there exists only sent GPS data at the timing of GPS data transmission, GPS data will not be transmitted.
- GPS data is not transmitted when GPS data with no positioning information is received from the GPS receiver unit.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report with Voice. GPS Report with Voice and BLE Report with Voice function with the same configuration. (Refer to [Sending BLE Data during Voice Communications \(BLE Report with Voice\)](#).)

Configuration using KPG-D1/ D1N

- Configuring **Report (GPS Report with Voice)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > DMR > GPS Report with Voice)
- Configuring **Interval (GPS Report with Voice)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > DMR > GPS Report with Voice)

Sending GPS Data Based On Travel Distance (GPS Distance Change)

GPS Distance Change allows the transceiver to send GPS data when the distance between the location of the previous GPS data transmission and the current location exceeds the value configured in **Distance Value**.

The transceiver calculates the distance between the position where the GPS data was sent and the current position at regular time intervals (3 sec) after the transceiver automatically or manually sent GPS data. The GPS data is sent if the calculated distance exceeds the value configured for **Distance Value**. If no GPS data is sent after the transceiver is turned on, the transceiver regards the location information first received from the GPS unit as the previous transmission position and calculates the distance to the current position. The distance is calculated from the latitudinal and longitudinal values.

Note

- GPS data is not encrypted during encrypted communication.
- GPS data is not transmitted when GPS data with no positioning information is received from the GPS receiver unit.
- In a system that supports Indoor Location, **GPS Distance Change** does not function if one of the following conditions is satisfied:
 - When a beacon signal (whether RF System or Bluetooth System is configured in **Send Location via** does not matter) is received
 - During GPS Delay Time

Configuration using KPG-D1/ D1N

- Configuring **GPS Distance Change** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > GPS Distance Change)
- Configuring **Distance Value** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > GPS Distance Change)

Selecting the Transmission Method of GPS Data (GPS Report Channel)

GPS Report Channel is the function to lock analog mode or DMR mode for the transmission method of GPS data regardless of the mode used for voice communications when the transceiver automatically sends GPS data by using the **GPS Report on Data Zone-Channel** or **GPS Report on Data System-Personality** function.

GPS Report Channel is enabled when GPS data is automatically sent by receiving a Polling request, when GPS data is automatically and periodically sent at the time configured in FPU, and when GPS data linked with the travel distance of the transceiver is automatically sent (**GPS Distance Change**).

The transceiver behaves as follows according to the configuration in **GPS Report Channel**.

Table 1-26 GPS Report Channel

Configuration	Description
Selected	If "Analog" is configured in Transmit Mode of the selected channel, GPS data is automatically sent by Data Zone-Channel (Analog) or Data System-Personality (Analog) . If "DMR" is configured in Transmit Mode of the selected channel, GPS data is automatically sent by Data Zone-Channel (DMR) or Data System-Personality (DMR) .
Analog	GPS data is automatically sent by Data Zone-Channel (Analog) or Data System-Personality (Analog) regardless of the configuration in Transmit Mode of the selected channel.
DMR	GPS data is automatically sent by Data Zone-Channel (DMR) or Data System-Personality (DMR) regardless of the configuration in Transmit Mode of the selected channel.

Note

- This function is not applicable to GPS data sent by pressing the **Send the GPS Data** key, BLE data sent by pressing the **Send the Location Data** key, or GPS data sent by using the **GPS Combination** function.
- If anything other than "Selected" is configured in **GPS Report Channel**, **GPS Report Back to Requested ID** becomes disabled.
- In an LTR Trunking system, analog mode or DMR mode cannot be locked for the transmission method of GPS data. In an LTR Trunking system, the transceiver always behaves by the configuration of "Selected".
- Even if "Analog" or "DMR" is configured in **GPS Report Channel**, the transceiver behaves by the configuration of "Selected" for the first transmission when the transceiver receives a Polling request and sends GPS data. If the transceiver is to subsequently continue GPS data transmission, **GPS Report Channel** is enabled for automatic transmission, and the transceiver behaves by the configuration of "Analog" or "DMR".

Configuration using KPG-D1/ D1N

- Configuring **GPS Report on Data Zone-Channel** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)
- Configuring **Data Zone-Channel (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **GPS Report on Data System-Personality** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)
- Configuring **Data System-Personality (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **GPS Report Channel** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

1.19 GPS Functions

The following functions are relevant to GPS data transmission:

- Number of Times
- GPS Report Interval Time
- GPS Time Mark
- GPS Message Type
- GPS Report on Data Zone-Channel
- GPS Report on Data System-Personality
- GPS Report Back to Requested ID
- GPS Data Storage

Number of Times

Number of Times allows the transceiver to automatically send GPS data for the configured number of times if “Poll” is configured for **GPS Report Mode**.

The transceiver sends GPS data for the number of times configured for **Number of Times** at the intervals configured for **GPS Report Interval Time**.

Note

- In a system that supports Indoor Location, the configuration value is shared with Number of Times for BLE. Number of Times for GPS and Number of Times for BLE function with the same configuration. (Refer to **Number of Times (Indoor Location)**.)

Configuration using KPG-D1/ D1N

Configuring **Number of Times** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

GPS Report Interval Time

GPS Report Interval Time allows the transceiver to send GPS data at the configured intervals if “Auto” is configured for **GPS Report Mode**.

GPS Report Interval Time (Portable/Ignition On)

GPS Report Interval (Portable/Ignition On) is the interval to send the GPS data while the vehicle’s engine is running. Also, in order to automatically send GPS data with Portable, this configuration is used.

GPS Report Interval Time (Ignition Off) (Mobile only)

GPS Report Interval (Ignition Off) is the interval to send GPS data while the vehicle is parked. Also, if the Ignition Sense function is not used (nothing is entered in the Ignition Sense port), GPS data is sent according to the configuration in **Ignition Off**. (Refer to Common FUNC Turning the Transceiver ON or OFF According to the State of the Ignition Sense Port (Ignition Sense).)

Note

- **GPS Report Interval Time** is used to configure the trigger cycle to start sending GPS data. The timing at which the receiving transceiver completes receiving GPS data may vary depending on the transmit conditions at the transmitting transceiver.
- GPS data will not be transmitted automatically according to the **Portable / Ignition On (GPS Report Interval Time)** or **Ignition Off (GPS Report Interval Time)** during audio data transmission.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report Interval Time. GPS Report Interval Time and BLE Report Interval Time function with the same configuration. (Refer to **BLE Report Interval Time (Indoor Location)**.)

Configuration using KPG-D1/ D1N

Configuring **GPS Report Interval Time** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS > GPS Report Interval Time)

GPS Time Mark

GPS Time Mark is the offset time from UTC (Coordinated Universal Time) to send GPS data.

This function is useful for avoiding a data collision if there are many transceivers that send GPS data.

Configuring a different timing for each transceiver allows each transceiver to send GPS data with different timing. Using this function can avoid a data collision.

Note

- In a system that supports Indoor Location, the configuration value is shared with BLE Time Mark. GPS Time Mark and BLE Time Mark function with the same configuration. (Refer to [BLE Time Mark \(Indoor Location\)](#).)

Configuration using KPG-D1/ D1N

Configuring **GPS Time Mark** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

Table 1-27 GPS Message Type

Configuration	Behavior
Full	The message to be sent is the GPS data corresponding to \$GPGGA, \$GPRMC and \$GPGLL.
Short	The message to be sent is the GPS data corresponding to \$GPGLL. When the base station receives this GPS data, a part of the data is sent as blank data even if \$GPGGA and \$GPRMC are configured for PC serial output at Base Station Setting .

Configuration using KPG-D1/ D1N

Configuring **GPS Message Type** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

GPS Report on Data Zone-Channel

GPS Report on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send GPS data in a DMR Conventional system.

The transceiver automatically changes the channel to the channel of a DMR Conventional system configured in **Data Zone-Channel (DMR)** when sending GPS data. When the transmission ends, the transceiver restores the Zone-channel which was used before sending GPS data. **GPS Report on Data Zone-Channel** can be used to send data by using a specific dedicated channel.

Note

- This function is enabled if "Channel Table" is configured in **Zone-channel Format**, using KPG-D1/ D1N.
- This function is not applied in the following cases:
 - GPS data transmission by **GPS Combination (Emergency)**
 - GPS data transmission by **GPS Report with Voice**
- In a system that supports Indoor Location, the configuration value is shared with BLE Report on Data Zone-Channel. GPS Report on Data Zone-Channel and BLE Report on Data Zone-Channel function with the same configuration. (Refer to **BLE Report on Data Zone-Channel/ Data System-Personality (Indoor Location)**.)

Configuration using KPG-D1/ D1N

- Configuring **GPS Report on Data Zone-Channel** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)
- Configuring **Data Zone-Channel (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

GPS Report on Data System-Personality

GPS Report on Data System-Personality is the function that allows the transceiver to automatically change the channel to the Data System-Personality to send GPS data in a DMR Conventional system.

The transceiver automatically changes the channel to the channel of a DMR Conventional system configured in **Data System-Personality (DMR)** when sending GPS data. When the transmission ends, the transceiver restores the Zone-channel which was used before sending GPS data. **GPS Report on Data System-Personality** can be used to send data by using a specific dedicated channel.

Note

- This function is enabled if "Personality" is configured in **Zone-channel Format** by using KPG-D1/ D1N.
- This function is not applied in the following cases:
 - GPS data transmission by **GPS Combination (Emergency)**
 - GPS data transmission by **GPS Report with Voice**
- In a system that supports Indoor Location, the configuration value is shared with BLE Report on Data System-Personality. GPS Report on Data System-Personality and BLE Report on Data System-Personality function with the same configuration. (Refer to **BLE Report on Data Zone-Channel/ Data System-Personality (Indoor Location)**.)

Configuration using KPG-D1/ D1N

- Configuring **GPS Report on Data System-Personality** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)
- Configuring **Data System-Personality (DMR)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

GPS Report Back to Requested ID

GPS Report Back to Requested ID is the function that enables the receiving transceiver to send the GPS data to the ID of the transceiver, which sends a GPS Polling Request, upon receipt of the following GPS Polling Requests:

- GPS Data Single Polling Request
- GPS Data Multiple Polling Request

When the above-mentioned GPS Polling Request is received, the GPS data is sent to the ID of the transceiver which sends the GPS Polling Request, if this function is enabled.

If this function is disabled, the GPS data is sent to the ID configured with GPS Base ID or **Base ID** even when the abovementioned **GPS Polling Request** is received.

Note

- In a system that supports Indoor Location, the configuration value is shared with BLE Report Back to Requested ID. GPS Report Back to Requested ID and BLE Report Back to Requested ID function with the same configuration. (Refer to **BLE Report Back to Requested ID (Indoor Location)**.)

Configuration using KPG-D1/ D1N

Configuring **GPS Report Back to Requested ID** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS)

GPS Data Storage

GPS Data Storage is the function that allows GPS data to be saved in both the internal memory and microSDHC card.

The transceiver stores the GPS data at the intervals configured for **Interval**. The stored GPS data can be sent from the transceiver or can be read using a PC. (Refer to Common FUNC Storing the GPS Data (GPS Data Storage).)

Acquired GPS data is temporarily saved in the RAM in the transceiver. When the number of saved data items reaches 3, the GPS data is written on both the internal memory and microSDHC card. If the transceiver is turned off when the number of GPS data items temporarily saved in the RAM in the transceiver is 1 or 2, the GPS data is erased without being written on the internal memory and microSDHC card.

The internal memory allows a maximum of 3,500 GPS data items to be written.

The microSDHC card allows GPS data acquired for up to 250 days or GPS data which do not exceed the capacity of the card to be written.

Note

- GPS data is written in the output format configured in **Record Format (Manual/Auto)**. If no output format is configured, GPS data is not written. (Refer to Common FUNC About microSD Card.)

Configuration using KPG-D1/ D1N

- Configuring **Record Format (Manual/Auto)** to be enabled or disabled ( **See** Transceiver Settings > Optional Features > Optional Features 2 > microSD/Memory > GPS Data Storage (Manual/Auto))
- Configuring **Interval** to be enabled or disabled ( **See** Transceiver Settings > Optional Features > Optional Features 2 > microSD/Memory > GPS Data Storage (Manual/Auto))

1.20 Receiving GPS Data

The base station receiving GPS data from the mobile station transceiver can send the GPS data to a PC as serial commands. If a PC installed with a mapping application is connected to the communication port of the base station transceiver, the location information of mobile station transceivers appears on a map on the PC display. This function enables a dispatch control or traffic control system.

Also, if a mobile station transceiver connecting to a GPS receiver unit or having a built-in GPS receiver unit receives location information (GPS data) from a GPS satellite, the current location information of the own transceiver can be displayed on the LCD.

Note

- The GPS data acquired from the GPS satellite can be stored at certain intervals in both the internal memory of the transceiver and a microSDHC card. (Refer to Common FUNC Storing the GPS Data (GPS Data Storage).)
- For a transceiver receiving GPS data, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port to which a PC with the mapping application installed is connected. (Refer to Common FUNC Available Functions for COM Port.)

Map Header

Whether to send data to the mapping application when the base station transceiver receives the GPS data from the mobile station transceiver can be configured.

The following are the type of data that can be sent to the mapping application.

Table 1-28 Map Header

Data	Description
\$GPGGA (NMEA)	Upon receipt of the GPS data, the base station transceiver extracts the \$GPGGA data in the NMEA-0183 format from the received GPS data and sends the extracted data from the communication port.
\$GPGLL (NMEA)	Upon receipt of the GPS data, the base station transceiver extracts the \$GPGLL data in the NMEA-0183 format from the received GPS data and sends the extracted data from the communication port.
\$GPRMC (NMEA)	Upon receipt of the GPS data, the base station transceiver extracts the \$GPRMC data in the NMEA-0183 format from the received GPS data and sends the extracted data from the communication port.
\$PKNDS (KW)	Upon receipt of the GPS data, the base station transceiver creates the \$PKNDS data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The \$PKNDS data contains the \$GPRMC data in the NMEA-0183 format, Unit ID, and the status information.
\$PKNID (KW)	Upon receipt of the GPS data, the base station transceiver creates the \$PKNID data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The base station transceiver extracts only Unit ID and the status information from the received GPS data and sends the extracted data from the communication port of the repeater. This sentence is recommended to be used along with \$GPGGA (NMEA), \$GPGLL (NMEA) or \$GPRMC (NMEA). For example, if \$GPGGA (NMEA) and \$PKNID are used simultaneously, the transceiver at the base station sends from the communication port of the repeater the \$GPGGA data in addition to the Unit ID and the status information extracted from the GPS data.
\$PKNSH (KW)	Upon receipt of the GPS data, the base station transceiver creates the \$PKNSH data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The \$PKNSH data contains the \$GPGLL data in the NMEA-0183 format and the Unit ID. In order to send GPS data in Emergency Mode or by pressing the PTT switch, this sentence is used.

Configuration using KPG-D1/ D1N

Configuring **Map Header** ( See Transceiver Settings > Optional Features > Optional Features 2 > GPS/Bluetooth > GPS > Base Station Settings)

GPS Position Display

GPS Position Display is the function to display the current location information of the own transceiver on the LCD. Refer to Common FUNC “GPS POSITION DISPLAY” for details about **GPS Position Display**.

1.21 Remote Operation by Radio Communication (Remote Control)

Remote Control is the function to remotely operate using radio communication the control of an individually specified transceiver.

An individually specified transceiver can be controlled by sending various Remote Control messages and by making the transceiver receive the messages.

Remote Control has the following functions:

Table 1-29 Remote Control Functions

Function	Description
Remote Stun	This is the function to disable the use of an individually specified transceiver (Stun state) by making the transceiver receive a Remote Stun message. If the transceiver receives the Remote Revive message, the Stun state will be reset. (Refer to Disabling the Transceiver Capability by Remote Control (Stun/ Kill).)
Remote Kill	This is the function to inhibit the use of an individually specified transceiver and disable all operations by making the transceiver receive a Remote Kill message. (Refer to Disabling the Transceiver Capability by Remote Control (Stun/ Kill).)
Remote Monitor	This is the function to make an individually specified transceiver transmit continuously by making the transceiver receive a Remote Monitor message. (Refer to Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor).)
Radio Check	This is the function to check whether or not an individually specified transceiver is being operated by making the transceiver receive a Radio Check message. (Refer to Checking Whether Another Transceiver Is in Operation (Radio Check).)

An individually specified transceiver can be controlled by sending various Remote Control messages in Remote Control Mode and by making the transceiver receive the messages.

Pressing the **Remote Control** key places the transceiver in Remote Control Mode. Or, pressing the **Menu** key to enter Menu Mode and then selecting “Remote Control” places the transceiver in Remote Control Mode. (Refer to Common FUNC Using Menu Mode.)

Also, various Remote Control messages can be sent by sending a transmission command of the various Remote Control messages from a PC to the transceiver. In this case, “Data”, “Data + GPS Data Output”, or “Data + Location Data Output” needs to be assigned to the communication port of the transceiver.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

Sending a Remote Control Message in Remote Control Mode

Various Remote Control messages can be sent in Remote Control Mode.

Operating the transceiver

● Initiating an Individual Call by list selection

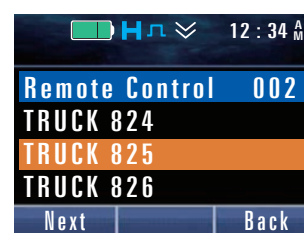
1 Press the **Remote Control** key.

The transceiver enters Remote Control Mode and then the Unit ID selection display will appear.

The following operations are identical even if the transceiver enters Remote Control Mode by pressing the **Menu** key.

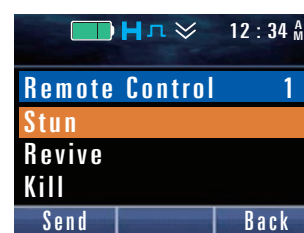
2 Press the [▲] key or [▼] key to select a Unit ID from the Individual ID List.

Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.



3 Press the **Menu** ([□]) key, or [*] key.

The selection display of the options menu appears.



4 Press the [▲] key or [▼] key to select the Remote Control message to send.

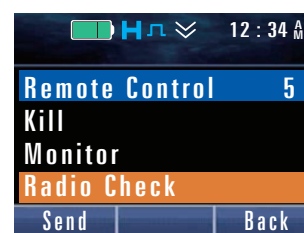
Stun: A Remote Stun message is sent.

Revive: A Remote Revive message is sent.

Kill: A Remote Kill message is sent.

Monitor: A Remote Monitor message is sent.

Radio Check: A Radio Check message is sent.



5 Press the **PTT** switch, **Menu** ([□]) key or [*] key.

The selected Remote Control message is sent.

● Sending a Remote Control message by using Manual Dialing

To send a Remote Control message by directly entering a Unit ID, Manual Dialing needs to be enabled.

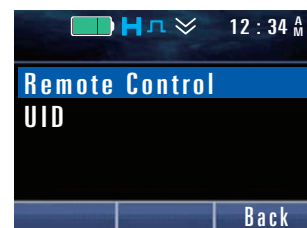
1 Press the **Remote Control** key.

The transceiver enters Remote Control Mode and then the Unit ID selection display will appear.

The following operations are identical even if the transceiver enters Remote Control Mode by pressing the **Menu** key.

2 Press the **Function** ([**○**]) key.

The Unit ID entry display appears.



3 Enter a Unit ID.

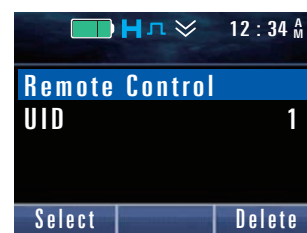
Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

- **Using the keypad**

A Unit ID can be entered by pressing the [0] key to [9] key.

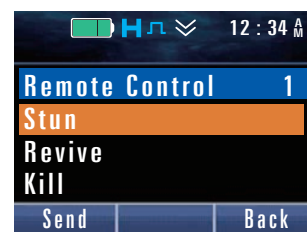
- **Using the PF keys**

Press the [▲] key or the [▼] key to select a number, and press the **Menu** ([□]) key or [*] key to confirm the selected number.



4 Press the **Menu** ([**□**]) key, or [*] key.

The selection display of the options menu appears.



5 Press the [▲] key or [▼] key to select the Remote Control message to send.

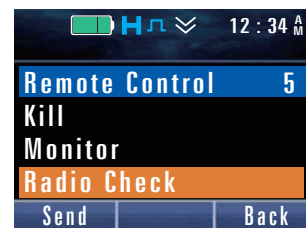
Stun: A Remote Stun message is sent.

Revive: A Remote Revive message is sent.

Kill: A Remote Kill message is sent.

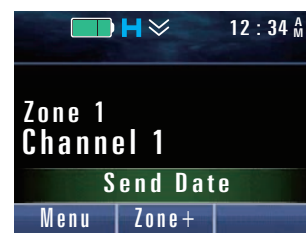
Monitor: A Remote Monitor message is sent.

Radio Check: A Radio Check message is sent.

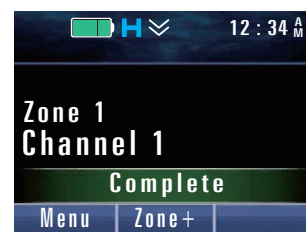


6 Press the PTT switch, Menu ([□]) key or [*] key.

The selected Remote Control message is sent.



"Complete" appears if the Remote Control message is properly sent to the target transceiver.



Note

- If the Remote Control Mode previously used is Manual Dialing mode, the transceiver enters Manual Dialing mode by pressing the **Remote Control** key. A selection screen for the Individual ID List will appear by pressing the **Function** ([○]) key.
- If no ID is registered in the Individual ID List, the transceiver enters Manual Dialing mode by pressing the **Remote Control** key if **Manual Dialing** is enabled. In this case, the transceiver cannot enter Remote Control Mode if **Manual Dialing** is disabled.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Configuring **Manual Dialing** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Disabling the Transceiver Capability by Remote Control (Stun/ Kill)

The transceiver capability can be disabled by wireless remote control. This function allows a system administrator to remotely disable the transceiver, for instance, if the transceiver is lost.

The transceiver which has been disabled by this function can be enabled to be usable again by remote control from an external device using radio communication.

An individually specified transceiver can be controlled by sending a Remote Stun message, Remote Revive message, or Remote Kill message in Remote Control Mode and by making the transceiver receive the message.

(Refer to [Sending a Remote Control Message in Remote Control Mode](#).)

The following is the transceiver behavior when the transceiver receives a Remote Control message:

Table 1-30 Remote Control

Remote Control Message	Description
Remote Stun	The transceiver is disabled if the transceiver receives the Remote Stun message. Whether to accept a Remote Stun message when the transceiver receives the Remote Stun message can be configured using KPG-D1/ D1N. If the transceiver is configured not to accept a Remote Stun message, the transceiver sends a NACK and does not respond at all even if a Remote Stun message is received.
Remote Revive	If the transceiver is in the Stun state when receiving a Remote Revive message, the Stun state is reset. If the transceiver is configured not to accept a Remote Stun message, the transceiver sends a NACK and does not respond at all even if a Remote Stun message is received.
Remote Kill	If the transceiver receives the Remote Kill message, use of the transceiver is prohibited and all operations are disabled. All configuration data of the transceiver is cleared, hence the Kill state is not reset even if the transceiver receives the Remote Revive message. However, the configuration data can be written to the transceiver by using KPG-D1/ D1N. Also, whether to accept a Remote Kill message when the transceiver receives the Remote Kill message can be configured using KPG-D1/ D1N. If the transceiver is configured not to accept a Remote Kill message, the transceiver does not respond at all even if a Remote Kill message is received.

Note

- This function is applicable only when an individual call is initiated.
- The received Color Code and the Color Code configured for the transceiver need to match to receive the Remote Stun message, Remote Revive message, or Remote Kill message.
- The Stun state is identical to Stun for DTMF and FleetSync.
- The Stun state is reset by Remote Revive even if the transceiver entered the Stun state by receiving DTMF or FleetSync signaling.
- The Stun state is also reset by receiving the DTMF code (Stun Code + #) or FleetSync status (Status 92).

Configuration using KPG-D1/ D1N

Configuring **Remote Stun/Kill** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor)

Remote Monitor is the function to remotely operate using radio communication an individually specified transceiver to transmit continuously.

Use of this function allows the base station to monitor the situation around the transceiver.

If a PC sends the Remote transmission command to the transceiver, the transceiver will send a message requesting the Remote transmission by using Individual Call. The target ID of the Individual Call is specified in Remote Control Mode or by the Remote transmission command.

An individually specified transceiver can be controlled by sending a Remote Control message in Remote Control Mode and by making the transceiver receive the message. (Refer to [Sending a Remote Control Message in Remote Control Mode](#).)

The transceiver which has received the Remote Control message sends an acknowledgment to the transmitting transceiver, and then unmutes the speaker and initiates a continuous transmission using Individual Call. The duration of the continuous transmission is determined according to the configuration in **Remote Monitor Timer** (10 sec to 120 sec) of the transceiver which has received the message requesting the Remote transmission.

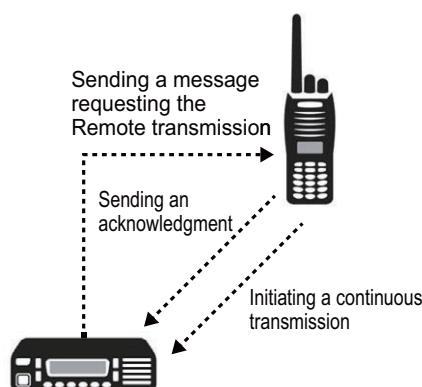


Figure 1-9 Remote Monitor

Remote Monitor has a Normal Mode and a Silence Mode: the former is a mode notifying a user of the transceiver's status of continuous transmission by an indication on the LCD and by lighting the Transmit LED, and the latter is a mode not notifying a user of the transceiver's status of continuous transmission. Which mode is used is determined according to the configuration in **Remote Monitor Display** of the transceiver which has received the message requesting the Remote transmission.

- **If "On" is configured in Remote Monitor Display (Normal Mode)**

The transceiver which received the message requesting the Remote transmission sends an acknowledgment to the transmitting transceiver, and then displays "Remote TX" on the display and transmits with the Transmit LED lighting.

- **If "Off" is configured in Remote Monitor Display (Silence Mode)**

The transceiver which received the message requesting the Remote transmission sends an acknowledgment to the transmitting transceiver, and then transmits without changing the indication of LCD and without lighting the Transmit LED.

Note

- To receive a Remote Monitor request message and accept the received message, **Remote Monitor** needs to be enabled.
- The transceiver initiates a continuous transmission only if the message requesting the Remote transmission is received by an Individual Call. The transceiver does not initiate a continuous transmission even if the message requesting the Remote transmission is received using anything other than Individual Call.
- While the transceiver is in the status of continuous transmission by **Remote Monitor**, the **Time-out Timer**, **Busy Channel Lockout** and **In-call Busy Channel Lockout** functions are disabled.
- The received Color Code and the Color Code configured for the transceiver need to match to receive a Remote Monitor request message.

Configuration using KPG-D1/ D1N

- Configuring **Remote Monitor** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Remote Monitor)
- Configuring **Remote Monitor Timer** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Remote Monitor)
- Configuring **Remote Monitor Display** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Remote Monitor)

Checking Whether Another Transceiver Is in Operation (Radio Check)

Radio Check can be used to check by using radio communication whether an individually specified transceiver is operated in the system.

Radio Check has two types of confirmations: the confirmation from Remote Control Mode and the confirmation by a PC command.

If Radio Check is selected in Remote Control Mode to execute **Radio Check** in Remote Control Mode, a Radio Check message proprietarily defined by Motorola is sent to the specified Unit ID. By making an individually specified transceiver receive the message, the transceiver can be controlled. (Refer to [Sending a Remote Control Message in Remote Control Mode](#).)

Checking Whether Another Transceiver Is in Operation by Using a PC command (Radio Check)

To use the **Radio Check** function, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

- The transceiver sends the Status Inquiry Message proprietarily defined by JVCKENWOOD to the specified Unit ID if a PC sends the Radio Check transmission command (the Status Request Transmission (Digital Ver2) command) to the communication port of the transceiver.
- The transceiver that received the Status Inquiry Message sends a Status Message in response. (Refer to [Sending a Status Message](#).)
 - The transceiver sends a status configured in Default Status if the Status Inquiry Message is received when a status has never been selected, such as when the transceiver is turned on.
 - If the Status Inquiry Message is received when a status is selected in Status Mode, the transceiver sends the selected status.
 - The transceiver sends the last selected status (the backed up status) if the transceiver migrates to normal mode after selecting the status in Status Mode.
 - If the transceiver in the Stun state receives the Status Inquiry Message when **Stun Response Status** is not configured, the transceiver sends a status in the same manner as when the transceiver is in the normal state.
- The transceiver behaves in the same manner as when the normal status is received when the status sent back from the transceiver that received the Status Inquiry Message is received. (Refer to [Receiving a Status Message](#).) However, Horn Alert and AUX Output Status Message 1 to AUX Output Status Message 3 do not function even if the status sent from the transceiver is the same status as Horn Alert Status and AUX Output Status Message 1 to AUX Output Status Message 3.

Note

- Whether to accept a Radio Check message when the transceiver receives the Radio Check message can be configured using KPG-D1/ D1N.
- The received Color Code and the Color Code configured for the transceiver need to match to receive the Radio Check message.

Configuration using KPG-D1/ D1N

Configuring **Radio Check** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

1.22 Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)

Site Roaming is the function that automatically switches the channel to a site (channel) that provides a better radio environment when the transceiver is used under the DMR Conventional system.

The transceiver receives a synchronization signal transmitted from the repeaters in multiple sites at regular time intervals, and detects the RSSI level. Therefore, the transceiver migrates automatically to the channel providing better radio environment.

Up to a maximum of 16 sites can be configured for KENWOOD's repeaters. It is therefore recommended that the Site Roaming system be used by a maximum number of 16 channels.

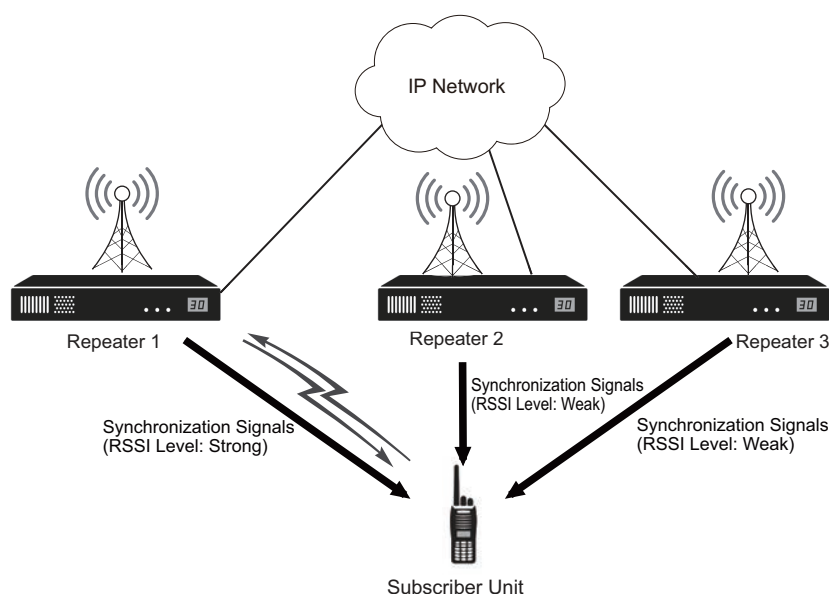


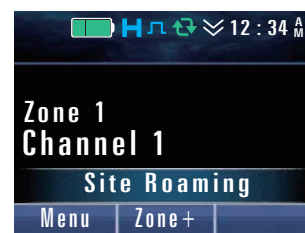
Figure 1-10 Image of Communications of Site Roaming

This function can be used by configuring the DMR Site Roaming channels for each system using KPG-D1/ D1N.

Site Roaming Behaviors

When System-Personality or the Zone-channel of the system that is configured as “DMR Site Roaming” is selected, Site

Roaming starts automatically. “Site Roaming” is displayed when the “↻” icon lights up and **“Site Roaming” Displayed** is enabled. For portable transceivers, the LED light flashes according to the configuration of **Site Roaming LED**.



● The behavior if “Personality” is configured in Zone-channel Format

When the channel selected is assigned with Personality of the system configured as “DMR Site Roaming”, Site Roaming starts for the Personalities of the same system. In this case, the Personality name is displayed.

Transmission by a transceiver will be in accordance with the **Slot Selection** and **Color Code** configurations of Personality to be used as the Revert Channel. As scan is performed on Personality, one Personality is backed up as a Revert Channel for each system.

The Personality the transceiver received last time is retained even if the transceiver is turned OFF. When the transceiver is turned ON and transmits next time, the Personality is used as the Revert Channel. If no Revert Channel exists, the Personality configured for the selected Zone-channel is used as the Revert Channel. While the transceiver is receiving, or if the transceiver transmits while the **Dropout Delay Time** or **Dwell Time** is counting down, the transceiver transmits using the Revert Channel.

● The behavior if “Channel Table” is configured in Zone-channel Format

When the zone of a system that is configured as “DMR Site Roaming” is selected, Site Roaming starts for channels that are configured within the zone.

Transmission by a transceiver will be in accordance with the **Slot Selection** and **Color Code** configurations of the Revert Channel.

The channel the transceiver received last time is retained even if the transceiver is turned OFF. When the transceiver is turned ON and transmits next time, the channel will be used as the Revert Channel. If there is no Revert Channel, the channel of the lowest number configured for the zone will be used as the Revert Channel. While the transceiver is receiving, or if the transceiver transmits while the length of time configured for **Dropout Delay Time** or **Dwell Time** is elapsing, the transceiver transmits using the Revert Channel.

When the transceiver receives a synchronization signal from the repeater, the transceiver basically behaves as follows.

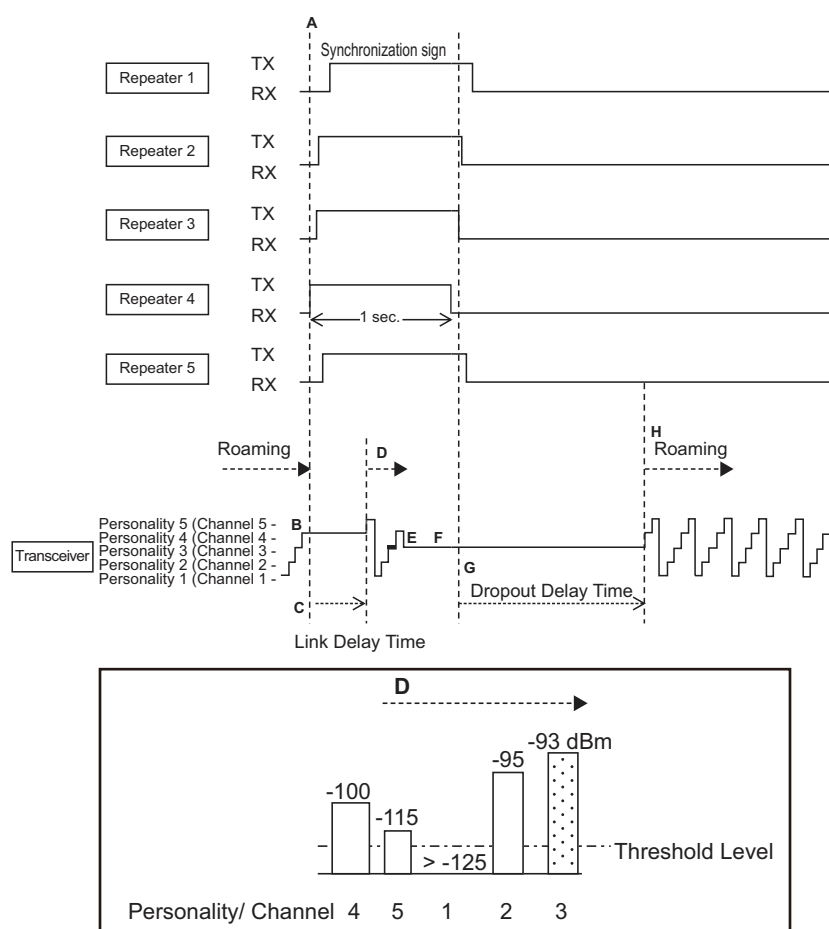


Figure 1-11 Basic Behaviors of Site Roaming

- A:** The repeater of the DMR Conventional system sends out synchronization signals at a fixed interval. Alternatively, the repeater of the DMR Conventional system sends out call signals according to the transmission request from other transceivers.
- B:** Assuming that the transceiver detected a sufficient RSSI level in a system that is configured as “DMR Site Roaming” on Personality 4, for example.
- C:** The transceiver activates **Site Roaming Link Delay Time**.
- D:** Upon elapse of the length of time configured in **Site Roaming Link Delay Time**, the transceiver checks all Personalities in the same system and searches for the Personality having the strongest RSSI level.
- E:** After all the Personality checks are complete, the transceiver moves to the Personality with the highest RSSI level (e.g., Personality 3) and checks whether the Color Code received matches the Color Code configured as Personality.
 - If the Color Codes match each other, Revert Channel is updated to Personality 3. Furthermore, if the ID and **Slot Selection** are found to be matching in a voice call, the speaker is unmuted.
 - If the Color Codes do not match each other, the transceiver moves to the Personality with the second highest RSSI level (e.g., Personality 2) and checks whether the Color Codes match each other. If the Color Codes match each other, Revert Channel is updated to Personality 2.
- F:** The transceiver stays in the same Personality and Site Roaming does not resume while the Color Codes are matching.
- G:** When there is no more signal or when the Color Codes are no longer matching, Dropout Delay Time is activated.
- H:** After the length of time configured in **Dropout Delay Time** elapses, the transceiver resumes Site Roaming.

Note

- The configurations by using KPG-D1/ D1N are restricted as follows according to the configuration for **Zone-channel Format** (Personality or Channel Table).

Personality:

- A minimum of 2 Personalities and a maximum of 512 Personalities can be configured for a system that is configured as "DMR Site Roaming".
- The following functions cannot be configured for the Personalities that are configured as "DMR Site Roaming".
 - Scan Add
 - Scan List Number

Channel Table:

- A minimum of 2 channels and a maximum of 512 channels can be configured for a zone that is configured as "DMR Site Roaming".
- The following functions cannot be configured for the channels that are configured as "DMR Site Roaming".
 - Scan Add
 - Scan List Number
 - Emergency Profile Number
 - Key Assignment
- The Personalities or channels that are configured as "DMR Site Roaming" cannot be configured for the following functions.
 - Home Channel
 - Scan List Members
 - Data System-Personality (DMR) (Data Zone-Channel (DMR))
 - Emergency Zone-Channel
- The following key operations are disabled on the Personalities or channels that are configured as "DMR Site Roaming".
 - **Home Channel** key
 - **Home Channel Select** key
 - **Scan** key
- The Emergency behavior of the transceiver on the Zone-channel of DMR Site Roaming is in accordance with the configuration of **Emergency Channel Type**.
- If "Personality" is configured for **Zone-channel Format** and the following conditions are met, the Emergency Mode starts up in the Personality of Revert.
 - "Selected" is configured for **Emergency Channel Type**
 - DMR Site Roaming channel is selected
- The Revert Channel during Site Roaming will be backed up even when the transceiver is turned off. However, if "Channel Table" is configured for **Zone-channel Format**, the backed-up Revert Channel will be cleared when the Zone-channel is changed. If "Personality" is configured for **Zone-channel Format**, the backed-up Revert Channel will not be cleared when the Zone-channel is changed.
- Site Roaming starts if the Zone-channel is changed and a DMR Site Roaming channel is selected while scan is enabled.
- If a Zone-channel of DMR Site Roaming is configured as the selected Zone-channel when the transceiver turns on, the transceiver will behave as follows.
 - When "Channel Table" is configured for **Zone-channel Format**
The backed-up Revert Channel is cleared and the transceiver starts up in the preset DMR Site Roaming Zone-channel.
 - When "Personality" is configured for **Zone-channel Format**
The transceiver starts up in the Personality in question if the Personality of Revert is backed up. The transceiver starts up in the Personality configured for the channel if the Personality of Revert is not backed up.
- Among the Personalities (Channels), the following functions will behave according to the selected Personality (Channel) instead of that of Revert.
 - Lone Worker
 - Activity Detection

Configuration using KPG-D1/ D1N

- Configuring “**Site Roaming**” **Displayed** to be enabled or disabled ( **See** Transceiver Settings > Scan > Scan Information > DMR Site Roaming)
- Configuring **Site Roaming LED** ( **See** Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Behavior in Asynchronous State

If the transceiver is unable to detect the synchronization signal from the repeater, it will send out a Wakeup Message to prompt the repeater for synchronization during transmission on the Revert Channel or selected channel. The waiting time for transmitting the synchronization signal and number of times for sending the Wakeup Message are determined by the configuration of **Sync Wakeup Wait Time** and **Number of Wakeup Message Retries** respectively.

The Wakeup Message is sent in the following ways according to the configuration of **Active Site Hunt**.

Table 1-31 Active Site Hunt

Configuration	Description
Enabled	If the transceiver is unable to detect the synchronization signal from the repeater, it will send out a Wakeup Message to prompt the repeater for synchronization during transmission on the Revert Channel or selected channel. If a response from the repeater cannot be detected after sending out the Wakeup Message for the number of times as configured in Number of Wakeup Message Retries, the transceiver moves to another channel in the same system that is configured as “DMR Site Roaming” and sends out the Wakeup Message once to search for repeaters that can be synchronized. A Wakeup Message will be sent out once on each channel in sequence starting from the one following the Revert Channel or selected channel. (Refer to (Example) Behavior of Active Site Hunt.) The transceiver searches for the repeater available for synchronization, and if there is a synchronized Personality that is equal to or higher than the RSSI level set by Standard Site Roaming Level, the search for the repeater terminates at the time. The channel that is synchronized becomes the Revert Channel.
Disabled	If the transceiver is unable to detect the synchronization signal from the repeater, it will send out a Wakeup Message to prompt the repeater for synchronization during transmission on the Revert Channel or selected channel. If a response from a repeater cannot be detected after a Wakeup Message is sent for the number of times configured in Number of Wakeup Message Retries, the transceiver outputs a Call Fail Tone (2 beeps) from the speaker and “Out of Range” appears on the display for 1 second.

(Example) Behavior of Active Site Hunt

This is an example of the behavior of **Active Site Hunt** when **Active Site Hunt** is enabled and transmission started with Revert Channel (Channel 2). Assuming that the channels registered to the transceiver are Channel 1 to Channel 4.



Note

- Wakeup Message is not sent if the transceiver is able to synchronize with a repeater.
- The number of times for sending out Wakeup Messages on other channels is limited to once regardless of the configuration of **Number of Wakeup Message Retries**.
- The Revert Channel appears on the display while the transceiver is searching for a synchronizable repeater.
- As the transceiver searches in sequence for a repeater on other channels, it may take a longer time for voice connection via transmission to be established.
- When the transceiver sends out a Power-on/off Status Message and when it is in the Emergency Mode, **Active Site Hunt** will be disabled. "Out of Range" does not appear on the display even when a response from the repeater is not detected.
- The transceiver determines whether to migrate to the Revert Channel based on the RSSI level set by **Standard Site Roaming Level**. The transceiver does not determine it based on the RSSI level set by **Quick Site Roaming Level**.

Configuration using KPG-D1/ D1N

- Configuring **Sync Wakeup Wait Time**
 - ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)
 - ( **See** Transceiver Settings > Personal > Personal Features > DMR Site Roaming > DMR > Parameters)
- Configuring **Number of Wakeup Message Retries**
 - ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)
 - ( **See** Transceiver Settings > Personal > Personal Features > DMR Site Roaming > DMR > Parameters)

Moving to Other Sites that Allow Synchronization with the Repeater (Manual Site Hunt)

Manual Site Hunt is the function for searching for a synchronizable repeater regardless of the current synchronization status with a repeater.

As with **Active Site Hunt**, the transceiver is able to search for a synchronizable repeater by sending out a Wakeup Message once on other channels in the same system that is configured as "DMR Site Roaming".

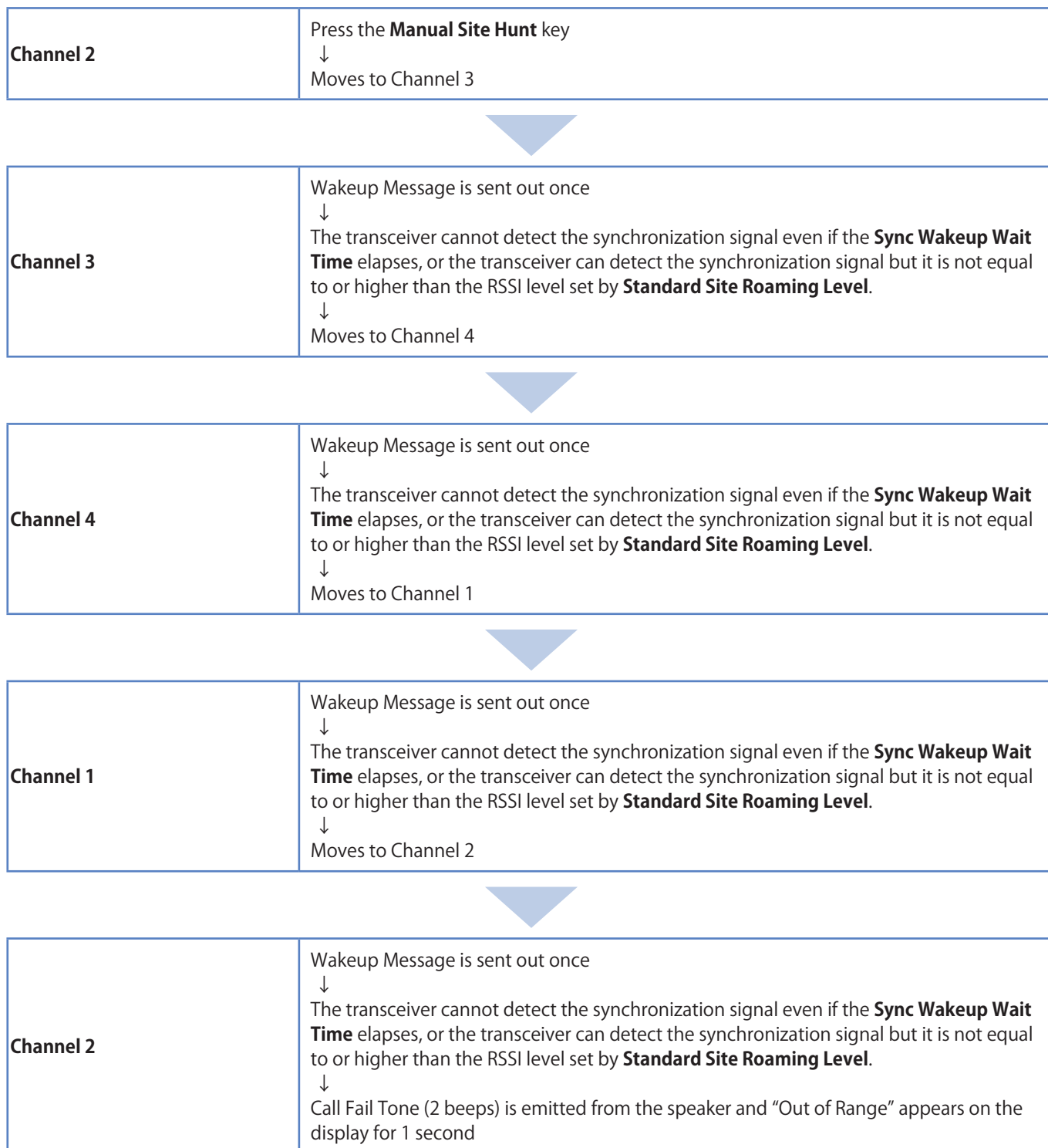
Manual Site Hunt is used for shifting from the current Revert Channel to the channel of another site.

By pressing the **Manual Site Hunt** key or the **Menu** key to enter the Menu Mode, followed by selecting "Manual Site Hunt", Search Mode Tone (1 beep) is emitted from the speaker, after which the search for a synchronizable repeater starts. Once the search for a repeater starts, a Wakeup Message is sent out once on each channel in sequence starting from the one following the Revert Channel. (Refer to **(Example) Behavior of Manual Site Hunt**.)

The transceiver searches for the repeater available for synchronization, and if a channel is synchronized and equal to or higher than the RSSI level set by **Standard Site Roaming Level**, the search for the repeater terminates at that time and a System Select Tone (4 beeps) sounds. The channel that is synchronized becomes the Revert Channel.

(Example) Behavior of Manual Site Hunt

This is an example of the behavior of **Manual Site Hunt** on the Revert Channel (Channel 2) when the **Manual Site Hunt** key is pressed. Assuming that the channels registered to the transceiver are Channel 1 to Channel 4.



Note

- The behavior of **Manual Site Hunt** is independent of the configuration of **Active Site Hunt**. Also, it runs even when the transceiver is already synchronized with a repeater.
- **Manual Site Hunt** runs only when a channel of the DMR Conventional system that is configured as “DMR Site Roaming” is selected.
- **Manual Site Hunt** does not function while the transceiver is in Emergency Mode.
- “Search” appears on the display while the transceiver is searching for a synchronizable repeater.
- Pressing the **Clear** key while the transceiver is searching for a synchronizable repeater ends Manual Site Hunt.
- The transceiver determines whether to migrate to the Revert Channel based on the RSSI level set by **Standard Site Roaming Level**. The transceiver does not determine it based on the RSSI level set by **Quick Site Roaming Level**.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)

Site Roaming LED

Supported Models: Portable

Site Roaming LED is the function that sends a visual notification to inform the user that the transceiver is executing Site Roaming.

The LED can be configured to flash in one of the 7 colors below when the transceiver starts Site Roaming.

- Yellow
- Purple
- Blue
- Light Blue
- Red
- Green
- White

Configuration using KPG-D1/ D1N

Configuring **Site Roaming LED** to be enabled or disabled ( **See** Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Site Roaming Link Delay Time

The length of time until the repeater in each site is activated may vary depending on the site. **Site Roaming Link Delay Time** is the function to configure the length of time to tolerate a variation in time of when each repeater is activated by delaying the time to start searching for a signal on other channels.

If the transceiver detects a signal on a Personality or channel after Site Roaming has started, **Site Roaming Link Delay Time** is activated. When the time interval configured in **Site Roaming Link Delay Time** has elapsed after a signal has been detected, the transceiver checks all Personalities in the same system or other channels within the same zone to search for signals. The transceiver checks all Personalities or channels and moves to the Personality or channel with the highest RSSI level to check whether the Color Codes match each other. If the Color Codes do not match each other, the transceiver moves to the Personality or channel with the second highest RSSI level and checks whether the Color Codes match each other.

Configuration using KPG-D1/ D1N

Configuring **Site Roaming Link Delay Time** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Dropout Delay Time (Site Roaming)

If the transceiver receives a synchronization signal or call from the repeater during Site Roaming, Site Roaming pauses.

Dropout Delay Time is the length of time from when the transceiver finishes receiving signals until the transceiver resumes Site Roaming.

When there is no more signal or when the Color Codes are no longer matching, **Dropout Delay Time** is activated. After the length of time configured in **Dropout Delay Time** elapses, the transceiver resumes Site Roaming.

Configuration using KPG-D1/ D1N

Configuring **Dropout Delay Time** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Dwell Time

When the transceiver starts transmitting by pressing the **PTT** switch during Site Roaming, Site Roaming pauses. **Dwell Time** is the length of time from when the transceiver terminates transmission until the transceiver resumes Site Roaming.

After the transceiver terminates the transmission, **Dwell Time** is activated. After the length of time configured in **Dwell Time** elapses, the transceiver resumes Site Roaming.

Configuration using KPG-D1/ D1N

Configuring **Dwell Time** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Quick Site Roaming Level

Quick Site Roaming Level is the function to allow Site Roaming to behave faster when the transceiver is in an area with a strong signal.

If the transceiver receives a signal with a level higher than the value configured in **Quick Site Roaming Level** during Site Roaming, the channel becomes the Revert Channel. When this occurs, **Site Roaming Link Delay Time** is disabled and Revert Channel is updated when the Color Codes match each other. Similarly, when signals with a level that is equivalent to or higher than the value configured in **Quick Site Roaming Level**, the behavior will be the same while **Site Roaming Link Delay Time** is counting or while checking Personality.

However, if "Off" is configured in **Quick Site Roaming Level** and **Standard Site Roaming Level**, the transceiver initiates Site Roaming using the threshold value preconfigured in the transceiver.

Configuration using KPG-D1/ D1N

Configuring **Quick Site Roaming Level** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Standard Site Roaming Level

Standard Site Roaming Level is the function to allow Site Roaming to behave faster when the transceiver is in an area with a strong signal.

The transceiver searches for a signal with a level higher than the value configured in **Standard Site Roaming Level** during Site Roaming.

Personalities or channels with a signal that falls below the value configured in **Standard Site Roaming Level** are excluded from Site Roaming, and the search will not run on these Personalities or channels. When the transceiver receives a signal with a level higher than the value configured in **Standard Site Roaming Level** during Site Roaming, Site Roaming is paused and **Site Roaming Link Delay Time** is activated. If the Color Codes match each other, Revert Channel is updated.

However, if "Off" is configured in **Quick Site Roaming Level** and **Standard Site Roaming Level**, the transceiver initiates Site Roaming using the threshold value preconfigured in the transceiver.

Configuration using KPG-D1/ D1N

Configuring **Standard Site Roaming Level** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Site Roaming Resume Level

Site Roaming Resume Level is the threshold value of the RSSI level used for determining whether to resume Site Roaming according to the rise and fall of the RSSI level for the signal received by the transceiver.

If the RSSI level of the received signal is lower than the level configured in **Site Roaming Resume Level** while the transceiver remains on the channel synchronized by Site Roaming, **Dropout Delay Time** is activated.

After the length of time configured in **Dropout Delay Time** elapses, the transceiver resumes Site Roaming. If the RSSI level of the received signal becomes higher than the level configured in **Site Roaming Resume Level** while the **Dropout Delay Time** is counting down, the **Dropout Delay Time** is automatically extended and the transceiver does not resume Site Roaming.

When **Auto Reset Timer** is activated upon receiving a call and the receiving status continues after the time interval configured in **Dropout Delay Time** has elapsed, the transceiver does not resume Site Roaming. When the time interval configured in **Dropout Delay Time** has elapsed after receiving has ended, the transceiver resumes Site Roaming.

Configuration using KPG-D1/ D1N

Configuring **Site Roaming Resume Level** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

Off-hook Site Roaming

Supported Models: Mobile

Off-hook Site Roaming is the function to start Site Roaming depending on the status of microphone, either on-hook or off-hook.

The transceiver behaves as follows according to the configuration in **Off-hook Site Roaming**.

Table 1-32 Off-hook Site Roaming

Configuration	Description
Enabled	The transceiver can start Site Roaming while the microphone is in either the on-hook state or off-hook state. Even if the microphone changes from the on-hook state to off-hook state during Site Roaming, Site Roaming does not pause.
Disabled	The transceiver can start Site Roaming if the microphone is in the on-hook state. The transceiver cannot start Site Roaming if the microphone is in the off-hook state. If the microphone changes from the on-hook state to off-hook state during Site Roaming, Site Roaming pauses on the Revert Channel. Even if the microphone changes from the on-hook state to off-hook state while Site Roaming pauses, the channel does not change. When the microphone goes to on-hook state, the transceiver resumes Site Roaming. However, if the microphone goes to the on-hook state while audio is being emitted, audio output will continue without resuming Site Roaming. Subsequently, when there is no more signal and the length of time configured in Dropout Delay Time elapses, the transceiver resumes Site Roaming. If Auto Reset Timer is also counting at the same time, Site Roaming resumes after counting by the timer with the longer time interval has ended.

Configuration using KPG-D1/ D1N

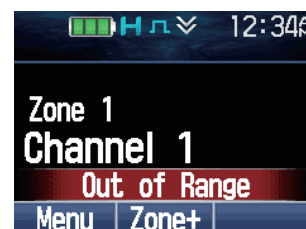
Configuring **Off-hook Site Roaming** ( See Transceiver Settings > Scan > Scan Information > DMR Site Roaming)

1.23 Out of Range Indicator

Out of Range Indicator is the function to notify a user of being outside the service area if the transceiver is outside the service area.

If the transceiver cannot receive a Beacon or other DMR signals periodically sent by the repeater within a certain period of time, **Out of Range Indicator** is activated and notification of being outside the service area is made.

If **Out of Range Indicator** is enabled, "Out of Range" appears on the display if a Beacon and other DMR signals cannot be received within the time configured in **In-service Check Time**.



Out of Range Tone

Out of Range Tone is the function to notify a user of being outside the service area by a tone if the transceiver is outside the service area.

The transceiver emits an Out of Range Tone (1 beep) if a Beacon and other DMR signals cannot be received within the time configured in **In-service Check Time**. The transceiver behaves as follows according to the configuration in **Out of Range Tone**:

Table 1-33 Out of Range Tone

Configuration	Description
Off	The transceiver does not emit an Out of Range Tone (1 beep).
One-shot	If a Beacon and other DMR signals cannot be received within the time configured in In-service Check Time , the transceiver emits an Out of Range Tone (1 beep) only once. After that, the transceiver does not emit an Out of Range Tone (1 beep) even when the transceiver continuously fails to acquire a control channel.
Cycle	The transceiver emits an Out of Range Tone (1 beep) at 30-sec intervals while the transceiver continuously fails to receive a Beacon and other DMR signals.

In-service Check Time

In-service Check Time is the amount of time for **Out of Range Indicator** and **Out of Range Tone** to initiate if the transceiver cannot receive a Beacon sent from the repeater within the amount of time configured in **In-service Check Time**.

In-service Check Time is configured to be longer than **Beacon Transmit Interval Time** of the repeater.

Note

- **Out of Range Indicator**, **Out of Range Tone**, and **In-service Check Time** stop counting down if the channel and zone are changed. If **Out of Range Indicator** and **Out of Range Tone** are enabled in the target system, **In-service Check Time** starts counting down.
- **Out of Range Indicator** does not stop and continues to function when the transceiver transmits. Also, **Out of Range Tone** does not sound.
However, if a Wakeup Message is sent to the repeater and the response is received when the transceiver transmits, the transceiver starts transmission after **Out of Range Indicator** and **Out of Range Tone** stop.

Configuration using KPG-D1/ D1N

- Configuring **Out of Range Indicator** in DMR Conventional to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Out of Range)
- Configuring **Out of Range Tone** in DMR Conventional ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Out of Range)
- Configuring **In-service Check Time** in DMR Conventional ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Out of Range)
- Configuring **Out of Range Indicator** in DMR Site Roaming to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Site Roaming > DMR > Out of Range)
- Configuring **Out of Range Tone** in DMR Site Roaming ( **See** Transceiver Settings > Personal > Personal Features > DMR Site Roaming > DMR > Out of Range)
- Configuring **In-service Check Time** in DMR Site Roaming ( **See** Transceiver Settings > Personal > Personal Features > DMR Site Roaming > DMR > Out of Range)

1.24 Indoor Location

Indoor Location is the function to manage the position of the transceiver by using Bluetooth.

After beacon data from each beacon transmitter is received by using the BLE Scan function, the transceiver managed by Indoor Location selects the data of the strongest signal strength level among the latest received signals, and sends the information of the beacon transmitter (hereafter referred to as BLE data) to the location server.

In a DMR Conventional system, the Indoor Location function has the following functions related to sending and receiving BLE data:

- BLE Report on Data Zone-Channel/ Data System-Personality
- BLE Base ID
- Send the Location Data
- BLE Combination
- BLE Report Mode
- Number of Times
- BLE Report Interval Time
- BLE Time Mark
- BLE Report Back to Requested ID
- BLE Report with Voice
- Map Header



- For details about the Indoor Location function, refer to Common FUNC “Indoor location”.

BLE Report on Data Zone-Channel/ Data System-Personality (Indoor Location)

Supported Models: Portable

BLE Report on Data Zone-Channel/ Data System-Personality is the function to send BLE data by Data Zone-Channel/ Data System-Personality.

BLE Report on Data Zone-Channel/ Data System-Personality is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method. This function is used when data communication needs to be performed on a specific dedicated channel.

A configuration value is shared with GPS Report on Data Zone-Channel/ Data System-Personality. GPS Report on Data Zone-Channel/ Data System-Personality and BLE Report on Data Zone-Channel/ Data System-Personality function with the same configuration.

By using this function, the transceiver automatically changes the channel to the Data Zone-Channel/ Data System-Personality to send BLE data. After transmission, the transceiver returns to the Zone-Channel which was used for reception before sending the BLE data.

If **Data Zone-Channel/ Data System-Personality** is not configured, the transceiver sends the BLE data on the Current Zone-Channel.



- If both Analog and DMR Data Zone-Channel/ Data System-Personality are configured, the DMR Data Zone-Channel/ Data System-Personality is always used for sending the BLE data. The BLE does not have the configuration item equivalent to a GPS Report Channel, and the behavior is fixed to DMR.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report on Data Zone-Channel** in DMR Conventional system (See Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)
- Configuring **GPS/BLE Report on Data System-Personality** in DMR Conventional system to be enabled or disabled (See Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)

The ID of the Target Transceiver (BLE Base ID (Indoor Location))

Supported Models: Portable

BLE Base ID is the target ID for BLE data only.

BLE Base ID is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Base ID. GPS Base ID and BLE Base ID function with the same configuration. ID of the base station that manages operations is normally configured for BLE Base ID.

The BLE data is sent to the BLE Base ID. This is used to separate the BLE data destination from the other data destinations.

The following configurations are available for the BLE Base ID:

- Base ID Type

Either a value for Unit ID or for Group ID can be configured in Base ID Type.

- Base ID

An ID can be configured in the range of 0 (All Group ID: only available when a Group ID is selected) and 1 to 16776415.

For Blank, the BLE data is sent to the ID configured for the Base ID.

The BLE Base ID Type and BLE Base ID configured for the current System are enabled.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Base ID Type** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR)
- Configuring **GPS/BLE Base ID Type** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)
- Configuring **GPS/BLE Base ID** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR)
- Configuring **GPS/BLE Base ID** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))

Supported Models: Portable

Send the Location Data is the function to send the location information of the own station by the user key operation. Either BLE data or GPS data is sent as location information. When a valid beacon signal is received, the BLE data is preferentially sent. **Send the Location Data** is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

Location information is sent to the Base ID or BLE Base ID (GPS Base ID) by using one of the following key operations:

- **Send the Location Data key**

By pressing the **Send the Location Data** key, the transceiver sends location information.

- **Menu key**

By pressing the **Menu** key to enter Menu Mode and then executing “Send the Location Data”, the transceiver sends location information.

To use this function, the GPS function needs to be enabled to receive GPS data, or the Bluetooth function needs to be enabled to receive a valid beacon signal.

If both the GPS function and Bluetooth function are disabled, a Key-entry Error Tone (1 beep) sounds from the transceiver, and location information cannot be sent.

If neither GPS data nor a valid beacon signal is received, a Key-entry Error Tone (1 beep) sounds from the transceiver, and location information cannot be sent.

If a beacon signal (**Send Location via** configuration: "RF System") is received, the BLE data is sent. GPS data is not sent even if GPS data is received.

If a beacon signal (**Send Location via** configuration: "Bluetooth System") is received, a Key-entry Error Tone (1 beep) sounds from the transceiver, and location information cannot be sent. GPS data is not sent even if GPS data is received.

During GPS Delay Time, a Key-entry Error Tone (1 beep) sounds from the transceiver, and location information cannot be sent. GPS data is not sent even if GPS data is received.

When GPS data is received without receiving a beacon signal, GPS data is sent. Even if non-positioning data is received from the GPS receiver, GPS data is sent. Refer to "[Sending GPS Data Manually by Using a Key \(Send the GPS Data\)](#)".

For a CH with no Indoor Location supported, and when BLE Scan is not functioning, the behavior is the same as when the **Send the GPS Data** key is pressed.

For DMR Conventional, ACK is not sent for location information transmission.

For DMR-based Trunking, if the **PTT** switch is pressed during the transmission of GPS data by the **Send the Location Data** key, GPS data transmission stops, and voice transmission starts.

For DMR-based Trunking, because the RF System in Indoor Location is not supported, BLE data is not sent when the **Send the Location Data** key is executed. Only the GPS data transmission behavior is performed when the GPS data transmission condition is satisfied.

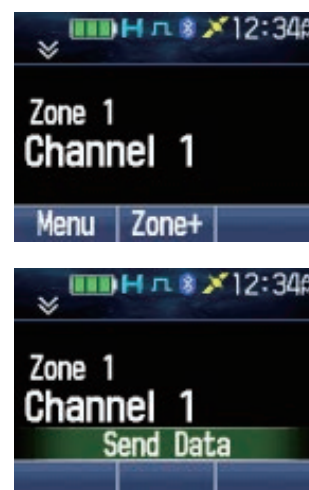
Refer to "[Sending GPS Data Manually by Using a Key \(Send the GPS Data\)](#)" for the display, operation method, and behavior of DMR-based Trunking.

Transceiver behavior

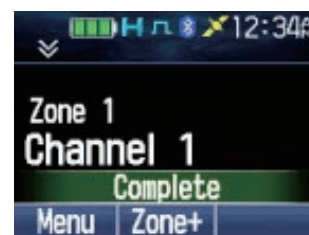
● For location information transmission (DMR Conventional)

By pressing the **Send the Location Data** key while GPS data or a valid beacon signal (**Send Location via** configuration: "RF System") is received, the transceiver sends location information to the Base ID or BLE Base ID (GPS Base ID).

"Send Data" appears on the LCD while location information is being sent. The Transmit LED lights while location information is being sent.



When the location information transmission is complete, the transceiver emits the Complete Tone and displays “Complete” on the LCD for 1 second.



● If location information transmission is busy (DMR Conventional)

If the transceiver cannot transmit because the transmission is busy, a Busy Tone 2 sounds from the transceiver, and “Busy” appears on the LCD for 1 second, and then the transceiver restores the standby display.



Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ([See](#) Transceiver Settings > Key Assignment)
- Configuring **Built-in GPS Receiver/Bluetooth** to be enabled or disabled ([See](#) Transceiver Settings > Optional Features > Optional Features 2 > GPS/Bluetooth)
- Configuring **Bluetooth** to be enabled or disabled ([See](#) Transceiver Settings > Optional Features > Optional Features 2 > GPS/ Bluetooth > GPS/Bluetooth Preset (Default))
- Configuring **COM port** ([See](#) Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > COM port 0, COM Port Bluetooth)
- Configuring **GPS/BLE Base ID Type** in DMR Conventional system ([See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR)
- Configuring **GPS/BLE Base ID Type** in DMR Site Roaming system ([See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)
- Configuring **GPS/BLE Base ID** in DMR Conventional system ([See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR)
- Configuring **GPS/BLE Base ID** in DMR Site Roaming system ([See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

Sending the BLE Data Linked With the Configured Mode (BLE Combination (Indoor Location))

Supported Models: Portable

BLE Combination is the function to configure the timing of BLE data transmission.

BLE Combination is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Combination. GPS Combination and BLE Combination function with the same configuration.

When a BLE Combination behavior trigger occurs, the following behaviors occur:

- If a beacon signal (**Send Location via** configuration: “RF System”) is received, the BLE data is sent. GPS data is not sent even if GPS is received.
- If a beacon signal (**Send Location via** configuration: “Bluetooth System”) is received, location information is not sent. GPS data is not sent even if GPS is received.

During GPS Delay Time, location information is not sent. GPS data is not sent even if GPS is received.

If the above conditions are not satisfied, GPS Combination functions. Refer to “[Sending GPS Data Together With Status Call \(GPS Combination\)](#)”.

BLE data can be added and sent when a Status Message is sent or when an Emergency Status or audio data is sent in Emergency Mode. The display follows each state.

Table 1-34 BLE Combination

Mode	Description
Status Message Transmission	If the Status configuration is enabled, BLE Report Status Number Block can be configured. The transceiver transmits by adding the BLE data when sending the Status Number within the specified range.
BLE Report Status Number Block	The range of Statuses sent by adding the BLE data is configured in Status. Among the status numbers 0 to 1023, the range of Status Messages to which the BLE data is added can be configured.
Emergency Status Transmission (For DMR Conventional)	The transceiver transmits by adding the BLE data when sending an Emergency Status or audio data during Emergency Mode. For the relationship of the transmissions of an Emergency Status, audio data, and BLE data during Emergency Mode, refer to the tables below. If Emergency Call Status is not configured, an Emergency Status is not sent.

Table 1-35 For Automatic Transmission (Emergency Status Transmission)

Emergency Status Transmission	Automatic Transmission of Audio Data by the Transmit Duration Configuration	BLE Data Transmission
Not transmit	Not transmit (Transmit Duration configuration: "0 (s)")	Not transmit
Not transmit	Transmit (Transmit Duration configuration: other than "0 (s)")	Transmit
Transmit	Not transmit (Transmit Duration configuration: "0 (s)")	Transmit
Transmit	Transmit (Transmit Duration configuration: other than "0 (s)")	Transmit

If the **BLE Report with Voice** function is enabled, BLE Report with Voice functions when the condition is that audio data is sent. Refer to "[Sending BLE Data during Voice Communications \(BLE Report with Voice\)](#)" for the **BLE Report with Voice** function.

Table 1-36 Transmission by the Switch (Emergency Status Transmission)

Emergency Status Transmission	Audio Data Transmission by the PTT Switch	BLE Data Transmission
Not transmit	Transmit	Not transmit
Transmit	Transmit	Not transmit

If the **BLE Report with Voice** function is enabled, BLE Report with Voice functions. Refer to "[Sending BLE Data during Voice Communications \(BLE Report with Voice\)](#)" for the **BLE Report with Voice** function.

The added BLE data is sent to the target configured in **Base ID Type** and **Base ID**.

If a **BLE Base ID** is configured, the transmission occurs to the BLE Base ID as the target.

The **Base ID** and **BLE Base ID** configured for the current system are enabled.

Note

- For DMR Conventional, if "0" is configured in **Emergency Cycle**, BLE Combination (Emergency) does not function even if the configuration is enabled.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Combination (Status)** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Status)** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (GPS/BLE Report Status Number Block)** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (GPS/BLE Report Status Number Block)** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency)** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency)** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE > GPS/BLE Combination)

Sending the BLE Data With the Timing of Automatic Transmission Configured (BLE Report Mode (Indoor Location))

Supported Models: Portable

BLE Report Mode is the function to configure whether to send BLE data automatically or after receiving a request.

BLE Report Mode is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Report Mode. GPS Report Mode and BLE Report Mode function with the same configuration.

ID of the base station that manages operations is normally configured for Base ID.

The following behaviors occur according to the configuration in **BLE Report Mode**:

Table 1-37 BLE Report Mode

Configuration	Description
Poll	The data transmission is performed at the timing of when a BLE data transmission request is received from the base station. This is used when the base station controls the timing to require location information. This is useful to avoid data collision with multiple mobile stations.  Note Instead of sending the data to the ID that issued the request, the data is sent to the ID configured in Base ID. Therefore, the requestor does not necessarily match the data destination. However, if BLE Report Back to Requested ID is configured, the data is sent to the requestor.
Auto	The transceiver sends the BLE data at the time interval configured in BLE Report Interval Time. This configuration is useful for controlling or monitoring vehicles on a time basis by periodically sending location information. The data transmission is performed at the timing of when a BLE data transmission request is received from the base station. The first response when a BLE data transmission request from the base station is received behaves as follows: If a beacon signal (Send Location via configuration: "RF System") is received, the BLE data is sent. If a beacon signal (Send Location via configuration: "Bluetooth System") is received, neither the BLE data nor the GPS data is sent. During GPS Delay Time, neither the BLE data nor the GPS data is sent. When GPS data is received without receiving a beacon signal, GPS data is sent. Refer to "Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)" for the behavior in this case.

The following behaviors occur at the timing of the BLE Report transmission. The second and subsequent responses when a BLE data transmission request from the base station is received are also included in the following contents:

- If a beacon signal (**Send Location via** configuration: "RF System") is received, the BLE data is sent. However, if synchronization information is not received from KAS-20E, the BLE data is not sent. Refer to "**BLE Time Mark (Indoor Location)**" for details.
- If a beacon signal (**Send Location via** configuration: "RF System") is not received, the BLE data is not sent.

On a System with Indoor Location, the following requests from the base station are for both GPS data and BLE data:

- GPS Data Auto Report Start Request
- GPS Data Auto Report Stop Request
- GPS Data Single Polling Request
- GPS Data Multiple Polling Request

Automatic BLE data transmission is canceled under the following conditions. In this case, display and tone behavior are not performed.

To avoid collisions with BLE data transmissions by other mobile stations, the suspension of transmission using **Transmit Busy Wait Time** is not done.

- While the transceiver is transmitting
- During the Busy state
- While unmuted
- When Transmit Frequency is not configured
- While transmission is prohibited by TOT
- During data communications
- During Transceiver Password Mode
- During Emergency Mode

For DMR Conventional, ACK is not sent for BLE data transmission.

The Base ID and BLE Base ID configured for the current system are enabled. Refer to "**Base ID**" and "**The ID of the Target Transceiver (BLE Base ID (Indoor Location))**" for details.

For BLE data by Poll on a Mixed Channel, the first transmission at the timing of when a Polling request is received is the location information transmission by the signal (FleetSync or DMR) that received the Polling request. If BLE data transmission continues thereafter, BLE data transmission according to the Transmit Mode configuration for the Mixed Channel is performed.

On an Analog Channel, GPS data is sent.

Transceiver behavior

● BLE data transmission (DMR Conventional)

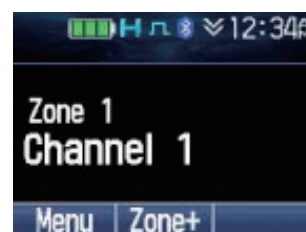
Refer to "**Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)**" for the behavior when GPS data is determined to be sent in the first response when a BLE data transmission request is received. If it is determined that GPS data and BLE data are not to be sent in the first response when a BLE data transmission request is received, or if it is determined that BLE data is not to be sent at the timing of the BLE Report transmission, no change occurs.

If it is determined that BLE data is to be sent in the first response when a BLE data transmission request is received, or if it is determined that BLE data is to be sent at the timing of the BLE Report transmission, the BLE data is sent.

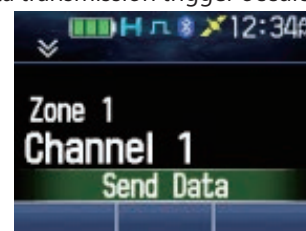
"Send Data" appears while BLE data is being sent.

When the BLE data transmission is complete, "Complete" appears on the LCD of the transceiver.

The Transmit LED lights while BLE data is being sent.



BLE data transmission trigger occurs.



BLE data transmission completes.

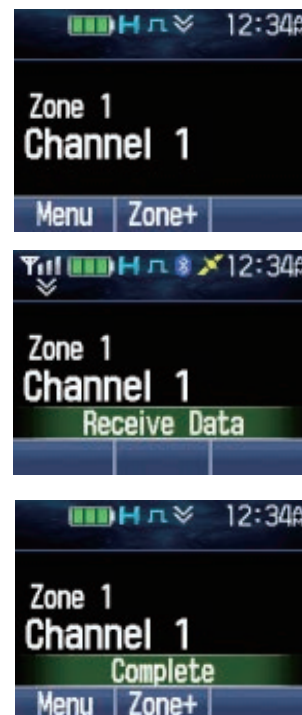


● BLE data reception (DMR Conventional)

When BLE data is being received from other transceivers, the transceiver behaves as follows:

The Busy LED lights while BLE data is being received.

“Receive Data” appears on the LCD of the transceiver while BLE data is being received.



When the BLE data reception is complete, “Complete” appears on the LCD of the transceiver.

Note

- To send BLE data, the behavior is based on the time information (hereafter, referred to as synchronization information) received from KAS-20E. Therefore, if the mobile station transceiver does not receive synchronization information from KAS-20E, the second and subsequent BLE data transmission for a Polling request from KAS-20E and the BLE data transmission by BLE Auto Report do not occur.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report Mode** in DMR Conventional system (See Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)
- Configuring **GPS/BLE Report Mode** in DMR Site Roaming system (See Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

Number of Times (Indoor Location)

Supported Models: Portable

Number of Times is the function to configure the number of times to send BLE data if “Poll” is configured in BLE Report Mode.

Number of Times is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with Number of Times for GPS. Number of Times for GPS and Number of Times for BLE function with the same configuration.

If “Poll” is configured in BLE Report Mode and if a GPS data request is received using Air, BLE data is sent automatically for the number of times configured in **Number of Times**.

BLE data is sent for the number of times configured in **Number of Times** at the intervals configured in **BLE Report Interval Time** after the request is received.

If a beacon signal (**Send Location via** configuration: “RF System”) is not received at the timing of the BLE Report transmission, the BLE data is not sent.

The configuration range of **Number of Times** is from 1 to 60. BLE data and GPS data are sent for the configured number of times.

Configuration using KPG-D1/ D1N

- Configuring **Number of Times** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)
- Configuring **Number of Times** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

BLE Report Interval Time (Indoor Location)

Supported Models: Portable

BLE Report Interval Time is the function to configure the transmission interval of BLE data.

BLE Report Interval Time is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Report Interval Time. GPS Report Interval Time and BLE Report Interval Time function with the same configuration.

If “Auto” is configured in BLE Report Mode, the transceiver sends the BLE data at the time interval configured in **BLE Report Interval Time**.

The **BLE Report Interval Time (Portable/Ignition On)** configuration ranges from 1 second to 3600 seconds, and the following behaviors occur:

- BLE data is sent at the configured time interval.
- BLE Report Interval Time can also be changed using the Air Command.
- Configuring a value that is divisible by 3600 is recommended.
- BLE Report Interval Time is used to configure the trigger cycle to start sending BLE data. The timing at which the receiving transceiver completes receiving BLE data may vary depending on the transmit conditions of the transmitting transceiver.

Note

- Automatic transmission of BLE data by BLE Report Interval Time is not performed during audio data communication.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report Interval Time (Portable/Ignition On)** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)
- Configuring **GPS/BLE Report Interval Time (Portable/Ignition On)** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

BLE Time Mark (Indoor Location)

Supported Models: Portable

BLE Time Mark is the function to configure the offset time until the transceiver actually sends BLE data based on the time information (hereafter, referred to as synchronization information) received from KAS-20E. By configuring the offset time, data collisions can be avoided when many transceivers sending BLE data exist.

BLE Time Mark is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Time Mark. GPS Time Mark and BLE Time Mark function with the same configuration.

Configuring a different timing for the transceivers in the same area allows the transceivers to send BLE data with different timing. This prevents data collisions due to transmissions at the same timing.

The configuration range of **BLE Time Mark** is from 0 second to 3599 seconds.

The timing of transmission is delayed by the time configured in **BLE Time Mark**. However, the value equal to or higher than BLE Report Interval cannot be configured.

KAS-20E periodically notifies synchronization information to the All Group ID.

- When receiving synchronization information, the mobile station displays "Receive Data" followed by "Complete".
- When BLE Scan is enabled, each time the mobile station receives synchronization information from KAS-20E, the mobile station updates and stores it in the internal memory.
- When BLE Scan is disabled, even if the mobile station receives synchronization information from KAS-20E, the mobile station discards the information.
- The mobile station does not perform the BLE transmission behavior related to Time Mark until the mobile station receives synchronization information from KAS-20E.

In the following cases, the mobile station initializes the synchronization information stored in the internal memory:

- Upon deactivating BLE Scan
- The CH change with a System change

Note

- When a CH is changed without a System change, because the mobile station does not initialize the synchronization information, the reference time of the BLE Report will be slightly different from that of other mobile stations at the destination CH. This may cause the BLE Report transmission timing to conflict with other mobile stations until the synchronization information is received at the destination CH.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Time Mark** in DMR Conventional system ( See Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)
- Configuring **GPS/BLE Time Mark** in DMR Site Roaming system ( See Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

BLE Report Back to Requested ID (Indoor Location)

Supported Models: Portable

BLE Report Back to Requested ID is the function to send BLE data to the Polling requestor, not to the Base ID, when a Polling request is received.

BLE Report Back to Requested ID is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Report Back to Requested ID. GPS Report Back to Requested ID and BLE Report Back to Requested ID function with the same configuration.

If BLE Report Back to Requested ID is configured, BLE data is sent to the Polling requestor.

If BLE Report Back to Requested ID is not configured, BLE data is sent to the Base ID.

The following Polling requests are applicable:

- GPS Data Single Polling Request
- GPS Data Multiple Polling Request

The Base ID and BLE Base ID configured for the current System are enabled.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Base ID Type** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR)
- Configuring **GPS/BLE Base ID Type** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)
- Configuring **GPS/BLE Base ID** in DMR Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR)
- Configuring **GPS/BLE Base ID** in DMR Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)
- Configuring **GPS/BLE Report Back to Requested ID** in DMR Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE)
- Configuring **GPS/BLE Report Back to Requested ID** in DMR Site Roaming system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Site Roaming > GPS/BLE)

Sending BLE Data during Voice Communications (BLE Report with Voice)

Supported Models: Portable

BLE Report with Voice is the function to simultaneously send BLE data when audio data is sent.

BLE Report with Voice is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

A configuration value is shared with GPS Report with Voice. GPS Report with Voice and BLE Report with Voice function with the same configuration.

BLE data is multiplexed on the audio data and sent at the start of audio data transmission or at regular time intervals during audio data transmission.

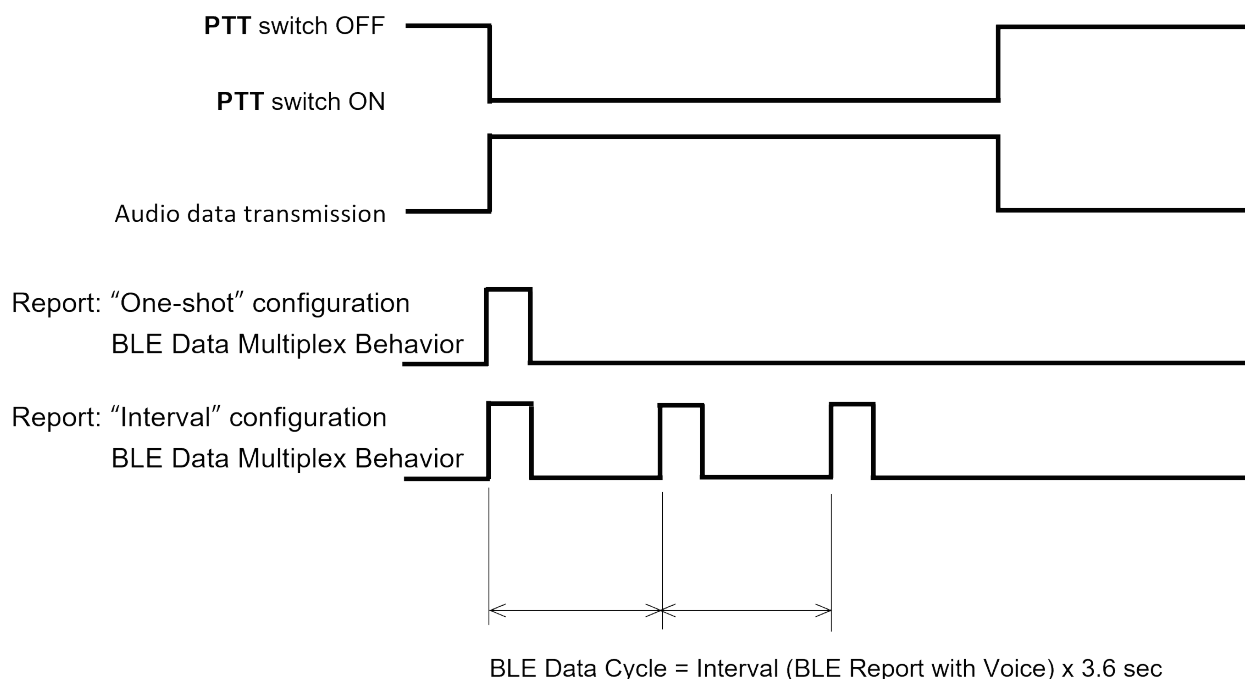


Figure 1-12 Report (BLE Report with Voice) Configuration and BLE Data Multiplex Behavior

The behavior for multiplexing BLE data is as follows according to the configuration in Report (BLE Report with Voice):

Table 1-38 Report (BLE Report with Voice)

Configuration	Description
Off	BLE data is not multiplexed during audio data transmission.
One-shot	BLE data is multiplexed at the start of audio data transmission.
Interval	The Interval (BLE Report with Voice) configuration is enabled, and BLE data is multiplexed at the start of or during audio data transmission according to the cycle that is calculated based on the value configured in Interval (BLE Report with Voice).

The cycle (s) for multiplexing BLE data can be calculated using the formula below:

- BLE data multiplex cycle (s) = Interval (BLE Report with Voice) configuration value $\times$ 3.6 (s)

The location information to be multiplexed is determined by the BLE priority at the start of audio transmission.

GPS data multiplex and BLE data multiplex are not switched during audio transmission.

The multiplex data determination at the start of audio transmission is as follows:

- If a beacon signal (**Send Location via** configuration: "RF System") is received, the BLE data is multiplexed. GPS data is not multiplexed even if GPS is received.
- If a beacon signal (**Send Location via** configuration: "Bluetooth System") is received, location information is not multiplexed. GPS data is not multiplexed even if GPS is received.
- During GPS Delay Time, location information is not multiplexed. GPS data is not multiplexed even if GPS is received.

If the above conditions are not satisfied, GPS Report with Voice functions. Refer to "**Sending GPS Data during Voice Communications (GPS Report with Voice)**".

Data is not multiplexed even if GPS or a beacon signal is received during audio transmission (without data multiplexed).

If GPS cannot be captured during audio transmission (with GPS data multiplexed), the GPS data received last is multiplexed.

If a beacon signal (**Send Location via** configuration: "RF System") cannot be received during audio transmission (with BLE data multiplexed), BLE data is not multiplexed.

Note

- Regardless of the Report (BLE Report with Voice) configuration, automatic transmission of BLE data by BLE Report Interval Time is not performed during audio data transmission.
- For DMR Conventional, if "One-shot" or "Interval" is configured in Report (BLE Report with Voice), the Decode behavior of Call Interruption is not performed.
- According to the DMR specifications, BLE data is sent to the audio transmission destination as a target even if BLE Base ID, Base ID Type, and Base ID are configured.
- During serial output of the location information, the Unit ID value inside Map Header is complemented using the Unit ID of the sender of the audio data.
- If data is received while voice communication is in progress, the LCD display, LED, and Alert Tone behave according to the configurations during voice communication.
- BLE data is not encrypted during encrypted communication.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report with Voice (Report)** in DMR Conventional system ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR > GPS/BLE Report with Voice)
- Configuring **GPS/BLE Report with Voice (Report)** in DMR Site Roaming system ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > GPS/BLE Report with Voice)
- Configuring **GPS/BLE Report with Voice (Interval)** in DMR Conventional system ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > DMR > GPS/BLE Report with Voice)
- Configuring **GPS/BLE Report with Voice (Interval)** in DMR Site Roaming system ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > GPS/BLE > GPS/BLE Report with Voice)

Map Header (Indoor Location)

Map Header (Indoor Location) is an item to configure for the base station in Indoor Location, and is the function of the RF System method. Whether to send data to the mapping application when the base station transceiver receives the BLE data from the mobile station transceiver can be configured.

Table 1-39 Map Header (Indoor Location)

Data	Description
\$PKPBD (KW)	Upon receipt of the BLE data, the base station transceiver creates the \$PKPBD data which is the KENWOOD proprietary sentence from the received BLE data and sends the created data from the communication port. BLE beacon data is included in the \$PKPBD data.

Configuration using KPG-D1/ D1N

Configuring **\$PKPBD (KW)** in DMR Conventional system to be enabled or disabled ( See Transceiver Settings > Optional Features > Optional Features 2 > GPS/Bluetooth > Bluetooth > BLE Base Station Settings)

DMR is a generic name for a digital communication system protocol utilizing 4-level FSK. Using DMR, the transceiver can make an individual call or group call for voice calls, communicate various types of messages, or communicate GPS data, etc. Also, connecting a transceiver to an external device (such as a PC) allows communication because the transceiver supports serial command communication.

In a DMR-based Trunking system, 2 types of channels, control channels and traffic channels, are used (these are referred to collectively as a system).

A control channel is used for sending various messages to control a system. A control channel is also used for calls, such as Status Call or Short Data Call.

A traffic channel is used for sending various types of communication information of users.

Via a system, the transceiver can establish communications using DMR IDs (Unit ID and Group ID), such as an individual call or group call.

Note

- The support for “S-Trunking” and “S-Trunking system” as described in this chapter (DMR-BASED TRUNKING SYSTEM) ended in March 2022.

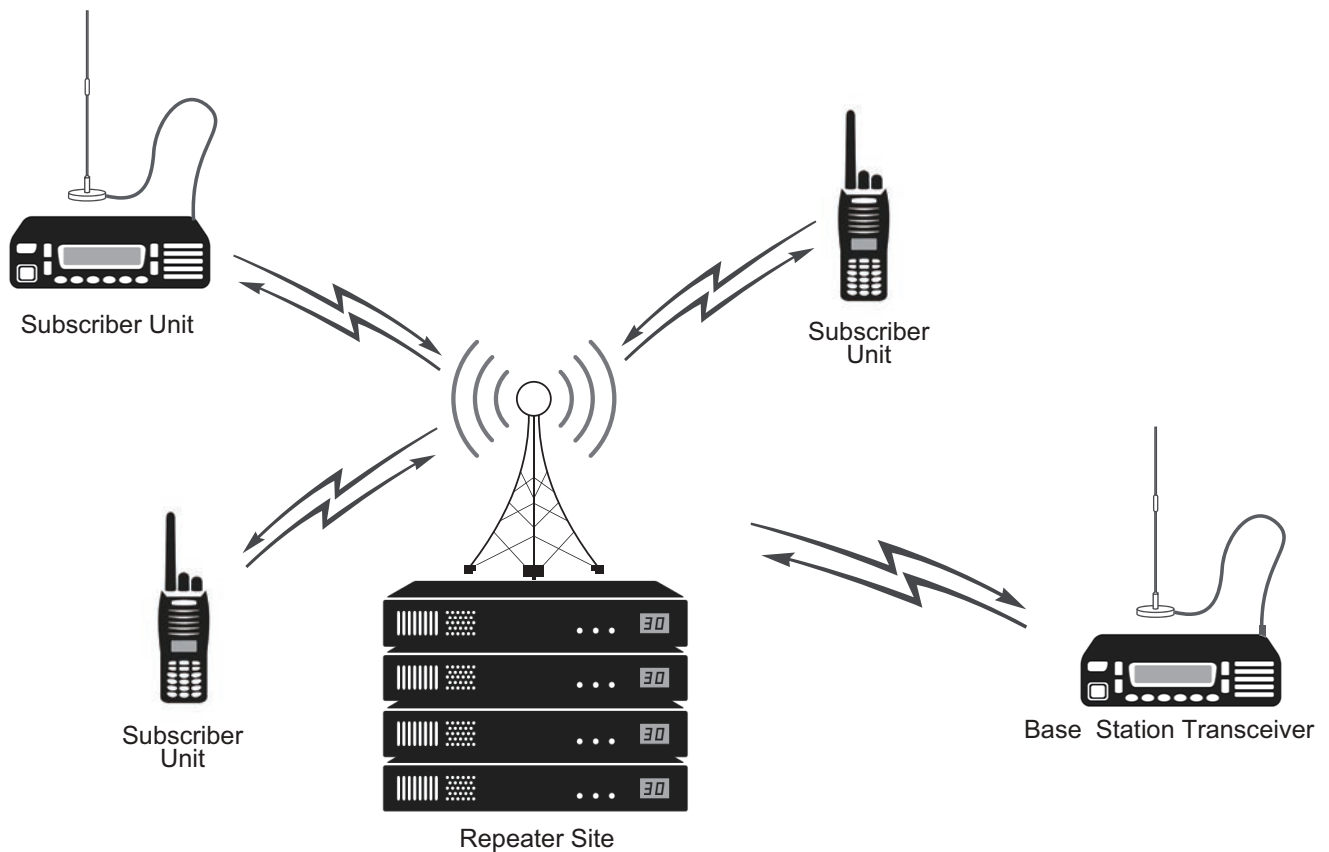


Figure 2-1 Image of Communications in a DMR-based Trunking System

About the Trunking format in a DMR-based Trunking system

There are the following 3 Trunking formats for a DMR-based Trunking system:

- Trunking 2.5
- S-Trunking
- DMR Tier III Trunking

The image of each Trunking format is below.

● DMR Tier 2.5 Trunking

For a system, Trunking 2.5 has 2 types of behavior: Hibernating Station Mode and Continuous Station Mode.

Corresponding to the system behavior, the transceiver automatically switches between the Hibernating Station Mode and Continuous Station Mode behaviors.

- Hibernating Station Mode
Intermittent transmission is made on a control channel.

The control channel migrates to another repeater periodically or when interfering frequencies occur.

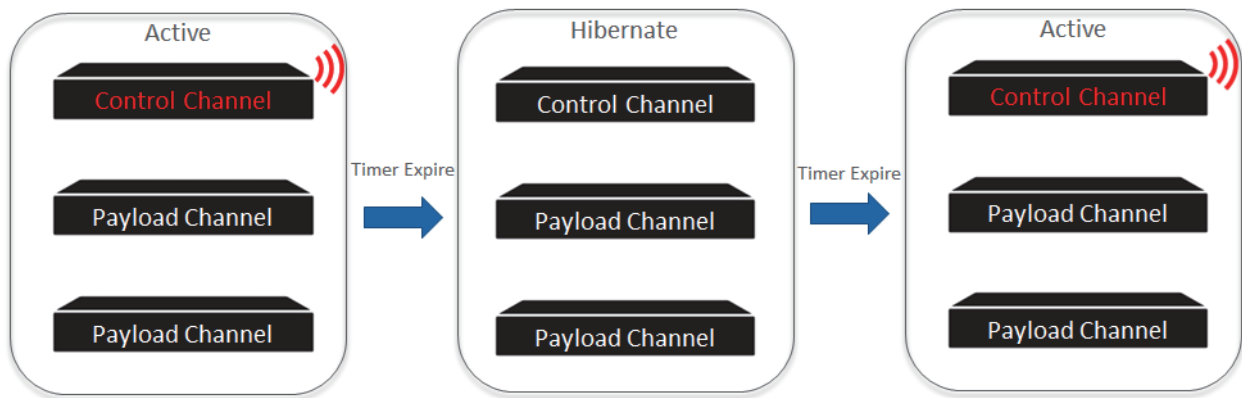


Figure 2-2 Image of the Trunking 2.5 (Hibernating Station Mode) Format

- Continuous Station Mode
Continuous transmission continues on a control channel.
The control channel migrates to another repeater periodically or when interfering frequencies occur.

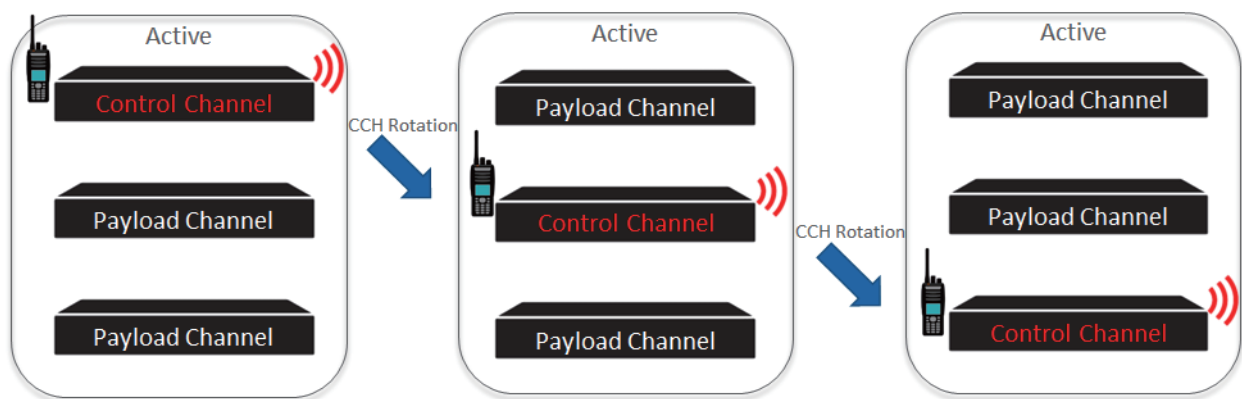


Figure 2-3 Image of the Trunking 2.5 (Continuous Station Mode) Format

● DMR Tier III Trunking

For DMR Tier III Trunking, continuous transmission continues on a control channel.

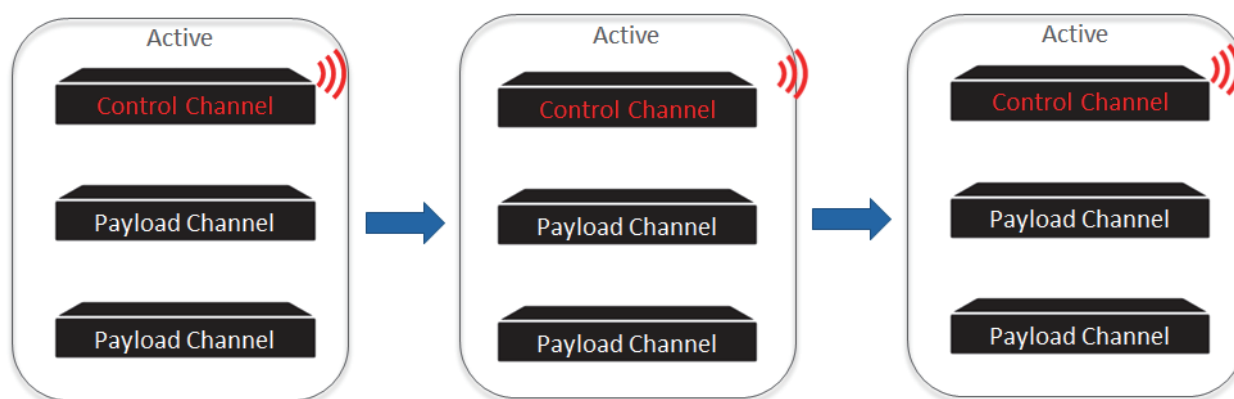


Figure 2-4 Image of the DMR Tier III Trunking Format

● S-Trunking

For S-Trunking, intermittent transmission is made on a control channel.

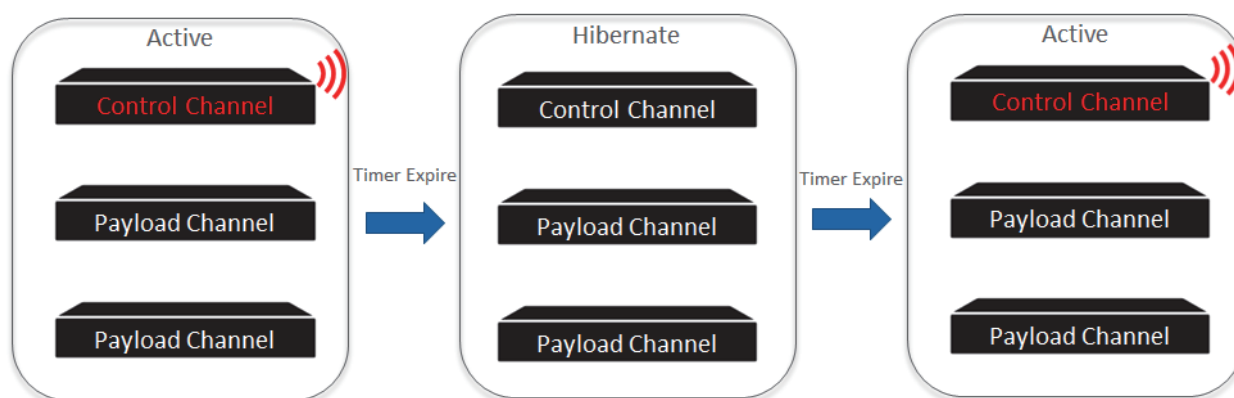


Figure 2-5 Image of the S-Trunking Format

The transceiver needs to be configured to the same Trunking format as a system. If a Trunking format which is different from that of a system is configured, the transceiver does not behave.

The main differences of Trunking 2.5, DMR Tier III Trunking, and S-Trunking are as follows:

Table 2-1 Differences of Trunking 2.5, DMR Tier III Trunking and S-Trunking

Item	Trunking 2.5	DMR Tier III Trunking	S-Trunking
Standard	Tait/ JVCKENWOOD proprietary (Proprietary specifications based on the DMR Standard ETSI TS 102 361-4)	DMR Standard ETSI TS 102 361-4	JVCKENWOOD proprietary (Proprietary specifications based on the DMR Standard ETSI TS 102 361-4)
FCC Station Class Code	FB6	FB8	FB6
Output Signal on a Repeater Control Channel	Hibernating: Intermittent output Continuous: Continuous output (Rotation)	Continuous output	Intermittent output
Rotation of the Control Channel	Supported	Supported	Supported
Busy Channel Lockout Behavior	Supported (only for the behavior with "Carrier Only" configured in Busy Channel Lockout)	Not supported	Supported (only for the behavior with "Carrier Only" configured in Busy Channel Lockout)
Power Save	Not supported	Compliant with DMR Standard ETSI TS 102 361-4	Not supported
Enhanced Encryption	Not supported	Supported	Not supported
Comprehensive Hunt	Not supported	Supported	Not supported
Alternate Zone-Channel	Not supported	Supported	Not supported
Vote Now	Supported	Supported	Not supported
Composite Control Channel	Supported	Supported	Not supported

The function differences of Trunking 2.5, DMR Tier III Trunking, and S-Trunking are as follows:

Table 2-2 Function Differences of Trunking 2.5, DMR Tier III Trunking, and S-Trunking

Function Name	Difference	Trunking 2.5	DMR Tier III Trunking	S-Trunking
Active Hunt	Exists	Supported Refer to Active Hunt .	Not supported	Not supported
Alert LED Color (Broadcast Group Call)	None	Refer to Receiving a Broadcast Group Call .		
Alert LED Color (Group Call)	None	Refer to Transceiver behavior when receiving a Group Call .		
Alert LED Color (Individual Call Incoming)	None	Refer to About the transceiver behavior when receiving an Individual Call .		
Alert LED Color (Individual Call)	None	Refer to About the transceiver behavior when receiving an Individual Call .		
Alert LED Color (Telephone Group Call)	None	Refer to Receiving a Group Call .		
Alert LED Color (Telephone Individual Call)	None	Refer to Receiving a Telephone Call .		

Function Name	Difference	Trunking 2.5	DMR Tier III Trunking	S-Trunking
Alert Tone (Broadcast Group Call)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone (Emergency Response)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone (Group Call)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone (Individual Call Incoming)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone (Individual Call)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone (Status/Short Message Call)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone (Task Request)	Exists	Not supported	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.	
Alert Tone (Telephone Individual Call)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alert Tone Restriction from 2nd Call	None	Refer to Common FUNC Restricting Alert Tone When Consecutively Receiving a Call (Alert Tone Restriction from 2nd Call).		
Alert Tone (Telephone Group Call)	None	Refer to Common FUNC Tones that Sound When the Transceiver Receives a Call.		
Alternate Zone-Channel	Exists	Not supported	Supported Refer to Communicating on a Zone-channel in DMR Conventional while Outside the Communication Area (Alternate Zone-Channel) .	Not supported
Authentication	None	Refer to Authentication Function of a System and Transceiver (Authentication) .		
Auto Reset Timer	None	Refer to Auto Reset Timer .		
AUX Input Status Message	None	Refer to AUX Input Status Message (Mobile Only) .		
AUX Output Status Message	None	Refer to AUX Output Status Message (Mobile Only) .		
Background Hunt	Exists	Not supported	Refer to Background Hunt .	
Base ID	None	Refer to Base ID .		
Beacon Interval Time	Exists	Not supported	Not supported	Supported Refer to Configuring the Length of Time to Retain the In Service State (Beacon Interval Time) .
Broadcast Group Call	None	Refer to Making an Informative Group Call (Broadcast Group Call) .		
Busy Channel Lockout	Exists	Supported Refer to Avoiding Interference with Other Communications (Busy Channel Lockout) .	Not supported	Supported Refer to Avoiding Interference with Other Communications (Busy Channel Lockout) .

Function Name	Difference	Trunking 2.5	DMR Tier III Trunking	S-Trunking
Call Interruption	None	Refer to Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption) .		
Call Processing Tone	None	Refer to Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone) .		
Call Request Tone	None	Refer to Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone) .		
Caller ID Stack	None	Refer to Common FUNC Caller ID Stack.		
Clear Caller ID Stack on Reply	None	Refer to Common FUNC Clear Caller ID Stack on Reply.		
Composite Control Channel	Exists	Supported Refer to Composite Control Channel .		Not supported
Comprehensive Hunt	Exists	Not supported	Supported Refer to Comprehensive Hunt .	Not supported
Control Channel Hunt	None	Refer to Control Channel Hunt (Control Channel Hunt) .		
Control Channel Switching	None	Refer to Matching a Channel of the Transceiver to a Channel of the System (Control Channel Switching) .		
Dialing	Exists	Not supported	Supported Refer to Executing Various Communications by Using the Dialing Function .	
Dialing Codes	Exists	Not supported	Supported Refer to Various configurations for Dialing Codes .	
Dialing Mode	Exists	Not supported	Supported Refer to Initiating a Communication in Dialing Mode .	
DMR IP Addressing	Exists	Supported Refer to DMR IP Addressing .		Not supported
Enhanced Encryption	Exists	Not supported	Supported Refer to Enhanced Encryption .	Not supported
Fleet Dialing Plan	Exists	Not supported	Supported Refer too Configurations for Using the Dialing Function .	
GPS Base ID	None	Refer to Sending GPS Data during Voice Communications (GPS Report with Voice) .		
GPS Combination	None	Refer to Sending GPS Data Together With Status Call (GPS Combination) . Refer to Sending GPS Data Together With Emergency Call (GPS Combination) .		
GPS Distance Change	None	Refer to Sending GPS Data Based On Travel Distance (GPS Distance Change) .		
GPS Message Type	None	Refer to GPS Message Type .		
GPS Report Interval Time (Ignition Off)	None	Refer to GPS Report Interval Time (Ignition Off) (Mobile only) .		
GPS Report Interval Time (Portable/ Ignition On)	None	Refer to GPS Report Interval Time (Portable/Ignition On) .		
GPS Report Mode	None	Refer to Sending GPS Data According to the Request from the Base Station (GPS Report Mode) .		
GPS Report Priority (Over Group Call)	None	Refer to Sending GPS Data Preferentially While Receiving a Group Call (GPS Report Priority (Over Group Call)) .		
GPS Report with Voice	None	Refer to Sending GPS Data during Voice Communications (GPS Report with Voice) .		
GPS Time Mark	None	Refer to GPS Time Mark .		

Function Name	Difference	Trunking 2.5	DMR Tier III Trunking	S-Trunking
Call Alert Inhibit (Group Calls only)	None	Refer to Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only)) .		
Group Call	None	Refer to Making a Group Call .		
Group ID List	None	Refer to Group ID List .		
Group Subscription	None	Refer to Registering the Group ID Used by the Own Transceiver in a System (Group Subscription) .		
ICMP Echo	Exists	Supported Refer to Confirming Whether the Transceiver Is in Operation (ICMP Echo) .	Not supported	
Ignore Group Call during Individual Call	None	Refer to Preventing Reception of a Group Call While the Transceiver Is Receiving an Individual Call (Ignore Group Call during Individual Call) .		
Individual Call	None	Refer to Making an Individual Call .		
Individual ID Encode Block	None	Refer to Restricting IDs for Which the Transceiver Can Initiate a Call (Individual ID Encode Block) .		
Individual ID List	None	Refer to Individual ID List .		
IP Packet Data Services	Exists	Supported Refer to IP Based Packet Data .	Not supported	
Last Control Channel	None	Refer to Retaining the Information of the Control Channel Used When the Transceiver is Turned OFF (Last Control Channel) .		
Late Entry	None	Refer to Participating in an On-going Voice Call Midway Through the Call (Late Entry) .		
Late Entry Cancel Time	None	Refer to Late Entry Cancel Time .		
Long Data Call	Exists	Not supported	Supported Refer to Sending and Receiving a Long Message (Long Data Call) .	
Manual Dialing	None	Refer to Sending a Remote Control Message in Remote Control Mode .		
Map Header	None	Refer to Map Header .		
Maximum ACK Wait Time	None	Refer to Maximum ACK Wait Time .		
Network Failure Indicator	None	Refer to Notifying the Status of Communications with Other Sites (Network Failure Indicator) .		
Number of Retries	None	Refer to Number of Retries .		
Out of Range Indicator	None	Refer to Out of Range Indicator .		
Over-the-Air Alias	None	Refer to Over-the-Air Alias .		
Passive Scan	Exists	Supported Refer to Passive Scan .	Not supported	Not supported
Power Save	Exists	Not supported	Supported Refer to Common FUNC Reducing Battery Consumption (Battery Saver).	Not supported
Power-off Status	None	Refer to Power-off Status Message .		
Power-on Status	None	Refer to Power-on Status Message .		
Priority Monitor ID	Exists	Supported Refer to Receiving a High-priority Call (Priority Monitor ID) .	Not supported	
PTT Hold Inhibit	None	Refer to PTT Hold Inhibit .		

Function Name	Difference	Trunking 2.5	DMR Tier III Trunking	S-Trunking
Redial Mode	None	Refer to Initiating a Communication in Redial Mode .		
Registration	None	Refer to Registering the Own Unit ID in a System (Registration) .		
Registration Timer	Exists	Supported Refer to Registration Timer .		Not supported
Remote Control Mode	None	Refer to Remote Operation by Radio Communication (Remote Control) .		
Selective Call Alert LED	None	Refer to Selective Call Alert LED .		
Send the GPS Data	None	Refer to Sending GPS Data Manually by Using a Key (Send the GPS Data) .		
Short Data Call	None	Refer to Sending and Receiving a Short Message (Short Data Call) .		
Short Message Serial Output	None	Refer to Sending the Received Short Message from the Communication Port (Short Message Serial Output) .		
Short Message Stack	None	Refer to Short Message Stack .		
Site Lock	None	Refer to Locking the Site to Be Used (Site Lock) .		
Status Call	None	Refer to Sending and Receiving a Status Message (Status Call) .		
Status Hold	None	Refer to Storing the Selected or Sent Status (Status Hold) .		
Status List	None	Refer to Status List .		
Status Message (Serial Output)	None	Refer to Sending the Received Status Message from the Communication Port (Status Message Serial Output) .		
Status Message Stack	None	Refer to Status Message Stack .		
System Parameter	None	Refer to About the system parameters in a DMR-based Trunking system .		
System Search Policy	Exists	Behaves when an output signal from the repeater is received	Always behaves	Behaves when an output signal from the repeater is received
		Refer to System Search Policy .		
Telephone Call	None	Refer to Communicating with a Telephone (Telephone Call) .		
Telephone Call Alert LED	None	Refer to Receiving a Telephone Call .		
Traffic Timer	None	Refer to Restricting the Communication Time on a Traffic Channel (Traffic Timer) .		
Unit ID (Own)	None	Refer to About Own ID .		
Unit ID Display on Group Call	None	Refer to Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call) .		
Unit ID Name (Own)	None	Refer to About Own ID .		
Unit ID Serial Output	None	Refer to Sending the Received Unit ID from the Communication Port (Unit ID Serial Output) .		
Vote Now	Exists	Supported Refer to Vote Now .		Not supported

About Trunking Format

Trunking Format is the configuration with which format among Trunking 2.5, DMR Tier III Trunking, and S-Trunking the transceiver behaves in a DMR-based Trunking system.

To configure Trunking Format, the system and transceiver need to match with the same format.

Trunking Format is configured in **Type**. The following is the transceiver behavior according to the configuration in **Type**:

Table 2-3 Type

Configuration	Description
Trunking 2.5	Behaves in a Trunking 2.5 system.
Tier III	Behaves in a DMR Tier III Trunking system.
S-Trunking	Behaves in an S-Trunking system.

Configuration using KPG-D1/ D1N

Configuring **Type** ( See Transceiver Settings > Personal > System Information > DMR-based Trunking)

About the system parameters in a DMR-based Trunking system

The transceiver can roam in a site connected to a network by using the network information included in the system information. System operation in a wide range becomes available, such as communication between mobile stations of different sites.

A DMR-based Trunking system has System Codes to distinguish networks and sites. A System Code is notified by a DMR-based Trunking system. The transceiver determines whether to register and to roam by comparing the System Code to the System Code stored in the own station according to the configuration in **Coverage Type**.

The System Code consists of 16 bits as follows:

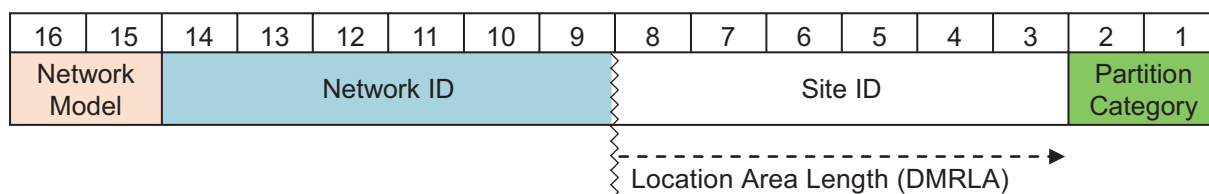


Figure 2-6 System Code Structure

Also, the configuration ranges of **Network ID**, **Site ID**, and **Location Area Length (DMRLA)** vary depending on **Network Model**.

Table 2-4 Configuration Range of Various Parameters

Network Model	Network ID Range	Site ID Range	DMRLA Range
Tiny	0 to 511	0 to 7	0 to 3
Small	0 to 127	0 to 31	0 to 5
Large	0 to 15	0 to 255	0 to 8
Huge	0 to 3	0 to 1023	0 to 10

The following are the various parameters in a DMR-based Trunking system:

Table 2-5 System Parameter

Parameter	Description
Network Model	This is the parameter that shows the scale of the network (Tiny, Small, Large, Huge). The configuration ranges of Network ID and Site ID vary depending on Network Model .
Network ID	Configures the ID to distinguish the network. The configuration range varies depending on Network Model .
Site ID	Configures the ID to distinguish the site. The configuration range varies depending on Network Model .
Location Area Length (DMRLA)	Configures the configuration range (number of bits) of the Location Area ID. The configuration range varies depending on Network Model .
Location Area ID	Configures the ID to distinguish the site group. The site group can be structured in Location Area ID. The range determined by Location Area Length (DMRLA) in the Site ID field can be configured as the Location Area ID. If "0" is configured in Location Area Length (DMRLA), the transceiver behaves as if all sites are within the same Location Area. However, the transceiver always executes Registration if the transceiver migrates to another site.  Note If the transceiver roams from one site to another site, the transceiver always executes Registration even if the site where the transceiver migrated has the same Location Area ID as the site where the transceiver most recently executed Registration, or even if the site has a different Location Area ID.
Location Site ID	The part excluding the Location Area ID in the Site ID field is configured as the Location Site ID .
Partition Category	In a site using 2 control channels, Partition Category is configured to distribute the transceivers on the 2 control channels and not to concentrate the transceivers on 1 control channel. If "A" is configured in Partition Category, the control channel configured as "A" or "AB" in the same manner accepts. If "B" is configured in Partition Category, the control channel configured as "B" or "AB" in the same manner accepts.
Coverage Type	Configures the roaming area of the transceiver. Single Site: The transceiver behaves on 1 site only, such as a system not connected to a network. Roaming is unavailable because Network Model, Network ID, Location Area ID, and Location Site ID need to match. Intra-Location Area: Roaming is available within the Location Area to which multiple sites belong. Network Model, Network ID, and Location Area ID need to match. Intra-Network: Roaming is available within the network to which multiple Location Areas belong. Network Model and Network ID need to match.
Lowest Frequency Number	Configures the lowest Frequency Number to be used among the frequency numbers configured in the Channel Plan.
Highest Frequency Number	Configures the highest Frequency Number to be used among the frequency numbers configured in the Channel Plan.

Configuration using KPG-D1/ D1N

- Configuring various parameters in a DMR-based Trunking system ( **See** Transceiver Settings > DMR Network > Network Information)
- Configuring **Partition Category** ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking)

2.1 Initiating Voice Communications (Basic Transmission and Reception)

The following describes the basic methods for transmission and reception in a DMR-based Trunking system and the relevant functions.

About Own ID

To initiate various communications by using DMR, **Unit ID (Own)**, the identification code of a transceiver, needs to be configured for the transceiver.

If the transceiver is configured not to use the Dialing function, a Unit ID can be configured in the range between 000001 and FFFCDF (hexadecimal), or between 1 and 16776415 (decimal).

If the transceiver is configured to use the Dialing function in a DMR Tier III Trunking system or S-Trunking system, a Unit ID is configured in the format divided into Number Prefix (NP), Fleet Individual Number (FIN), and Individual Number (IN). The configuration ranges are as follows:

Number Prefix (NP): 328 to 806

Fleet Individual Number (FIN): 20 to 89

Individual Number (IN):

200 to 899 (if the FIN value is 20 to 41)

200 to 549 (if the FIN value is 42 to 89)

If **Global ID** is enabled, one Unit ID is shared by all DMR-based Trunking systems.

If **Global ID** is disabled, one Unit ID needs to be configured for each DMR-based Trunking system.

Also, a name specific to the transceiver can be configured for **Unit ID (Own)**.

Note

- Since the management system of own ID in P25 and NXDN is different from the management system of own ID in DMR, each own ID needs to be configured separately.

Configuration using KPG-D1/ D1N

- Configuring **Unit ID (Own)** and **Unit ID Name (Own)** ( [See](#) Transceiver Settings > Personal > System Information > DMR-based Trunking > Unit ID (Own))
- Configuring **Global ID** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > System Information > DMR-based Trunking > Unit ID (Own))

About Communication Security (Encryption)

The transceiver is equipped with the Encryption function, which can enhance the confidentiality of communications by encrypting communication data when making various communications on a DMR digital channel. (Refer to [COMMUNICATION SECURITY](#).)

Receive

Received audio sounds from the speaker if the transceiver receives a message requesting various types of communications on a control channel from a system and the received DMR ID matches the DMR ID preconfigured for the transceiver.

Auto Reset Timer

Auto Reset Timer is the amount of time from when the received Unit ID or Group ID matches the Unit ID or Group ID preconfigured for the transceiver until the LCD, flashing of LED and emission of Alert Tone will automatically be reset.

By using KPG-D1/ D1N, **Auto Reset Timer** can be configured. Also, how the transceiver behaves after the time configured in **Auto Reset Timer** elapses can be configured.

Whether different **Auto Reset Timer** configurations are applied to voice communications and data communications can be configured.

Table 2-6 Auto Reset Timer

Configuration		Description
Auto Reset Timer (Voice or Message)	Off	Auto Reset Timer will not be activated.
	0 sec to 300 sec	After the configured time elapses, the matching state of the Unit ID or Group ID is automatically reset.
LED (Voice only)		If this function is enabled, the flashing LED for the Selective Call Alert LED turns off when the length of time configured in Auto Reset Timer elapses.
Alert Tone (Voice or Message)		If this function is enabled, the intermittently emitted Alert Tone stops when the time configured in Auto Reset Timer elapses.
LCD (Voice or Message)		When this function is enabled and the time configured in Auto Reset Timer has elapsed, the flashing LED light triggered by Optional Signaling LED goes off and the display changes from the following display to the previous channel display: • ID display after receiving an Individual Call or Group Call • Status Message display after receiving a Status Message • Short Message display after receiving a Short Message

Configuration using KPG-D1/ D1N

- Configuring **Auto Reset Timer** (Voice) ( See Transceiver Settings > DMR > DMR Information > General > Auto Reset > Voice)
- Configuring **Auto Reset Timer** (Message) ( See Transceiver Settings > DMR > DMR Information > General > Auto Reset > Message)

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash when the transceiver receives a call using a DMR ID. A user can notice by the LED that the transceiver is receiving a call.

One of the 7 colors can be used to make the LED flash, and the flashing color can be configured for each type of call.

- Yellow
- Purple
- Blue
- Light Blue
- Red
- Green
- White

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Alert LED Color** ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking > Alert LED Color)
- Configuring **Alert LED Color (Individual ID List)** ( [See](#) Transceiver Settings > DMR > Individual ID List > Alert LED Color)
- Configuring **Alert LED Color (Group ID List)** ( [See](#) Transceiver Settings > DMR > Group ID List > Alert LED Color)

Optional Signaling LED

Optional Signaling LED is the function that causes the LED to flash in yellow when the Optional Signaling received matches that of the transceiver.

A user can notice by the LED that the transceiver is receiving a call.

When Optional Signaling is no longer matching due to operation of the transceiver key or upon elapse of the time configured in **Auto Reset Timer**, the light of the LED goes off.

However, if **Selective Call Alert LED** is enabled, the LED flashes according to the configuration of **Selective Call Alert LED** even when **Optional Signaling LED** is enabled.

Configuration using KPG-D1/ D1N

Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)

Over-the-Air Alias

Over-the-Air Alias allows the receiving transceiver to display the ID Name of the transmitting transceiver when receiving a call even if the ID Name of the transmitting transceiver is not configured for the receiving transceiver. Using this function, Unit ID Name of the added unit does not need to be configured such as when a unit is added to the system in service.

The transmitting transceiver sends Unit ID Name when making voice calls. If the receiving transceiver receives a call such as an Individual Call, the Unit ID Name stored in the reception frame will appear on the display.

The transmitting transceiver sends the Unit ID Name upon converting the data for transmission within the transceiver in the following way according to the character code of Language 1 and characters entered with the Unit ID Name configured with FPU.

- ASCII characters only
7-bit
- When those other than ASCII characters are included and the Language 1 character code is ISO-8859-1
ISO 8-bit
- When those other than ASCII characters are included and Language 1 uses a character code other than ISO-8859-1
UTF-16BE

Note

- The received Unit ID Name appears after displaying differently from the received Unit ID Name in the following cases:
 - The Unit ID of the transmitting transceiver is not configured in the Individual ID List.
 - The Unit ID of the transmitting transceiver is not stored as Caller ID.
 - The received Unit ID Name is different from the ID Name configured in the Individual ID List or the ID Name stored in the transceiver.
- If **Caller ID Stack** is enabled, received Unit ID Name also is stored in the transceiver stack memory. The stored Unit ID Name is also reflected to ID Name with Individual ID List selected.
- The Unit ID Name (Own) configured in the current system is used for the Unit ID Name to be transmitted.
- The time needed for receiving signals necessary for receiving and displaying the **Over-the-Air Alias** characters are as follows. The characters received will not be displayed for communication shorter than this duration. Also, in the event of participation halfway through a communication via Late Entry or when GPS data is sent out by the transmitting transceiver, a longer time may be required to display the characters depending on the signal strength.

Table 2-7 Data Format and Time Needed for Over-the-Air Alias Reception

Data Format	Approx. 1 sec	Approx. 2 sec	Approx. 2.5 sec	Approx. 3 sec
7-bit	7 characters	14 characters	23 characters	31 characters
ISO 8-bit	6 characters	13 characters	20 characters	27 characters
UTF-16BE	3 characters	6 characters	10 characters	13 characters

Configuration using KPG-D1/ D1N

- Configuring **Over-the-Air Alias** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > Unit ID (Own))
- Configuring **Unit ID Name (Own)** ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > Unit ID (Own))

Receiving a High-priority Call (Priority Monitor ID)

Priority Monitor ID is the ID that the transceiver preferentially receives when the transceiver is making voice calls using Group Call on a traffic channel in a Trunking 2.5 system or DMR Tier III Trunking system.

If a Group Call of a **Priority Monitor ID** is initiated on another traffic channel during the Hang Time after a Group Call, Broadcast Call, or Individual Call of anything other than a **Priority Monitor ID** is received, the transceiver participates in a communication by receiving the Group Call of a **Priority Monitor ID**. If a Group Call of a **Priority Monitor ID** having higher priority is initiated on another traffic channel during the Hang Time after a Group Call of a **Priority Monitor ID** is received, the transceiver participates in a communication by receiving the Group Call of a **Priority Monitor ID** having higher priority.

In addition, **All Group ID** (\$FFFFFF (ALLMSID)/ \$FFFFFD (ALLMSIDL)/ \$FFFFFE (ALLMSIDZ)) functions in the same manner as **Priority Monitor ID**.

If an All Call is initiated on another traffic channel during the Hang Time after a Group Call, Broadcast Call, or Individual Call is received on a traffic channel other than a channel configured in **Priority Monitor ID**, the transceiver participates in a communication of higher priority on another traffic channel by immediately migrating from the channel.

All Group ID functions with higher priority than **Priority Monitor ID**.

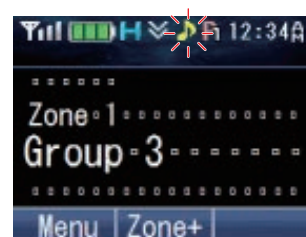
If an All Call is initiated on another traffic channel during the Hang Time after a Group Call of a **Priority Monitor ID** is received, the transceiver participates in a communication of higher priority by immediately migrating from the channel.

KPG-D1/ D1N can be used to configure up to 4 zone channels used as Priority Monitor ID.

Transceiver behavior

The transceiver receives a Priority Monitor ID during the Hang Time after a Group Call is received on a traffic channel.

The “🔔” icon blinks and the transceiver starts communicating using the Priority Monitor ID.



The following icons will be displayed:

Priority Monitor ID 1: 📻

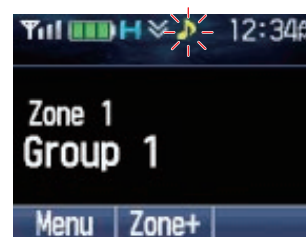
Priority Monitor ID 2: 📻

Priority Monitor ID 3: 📻

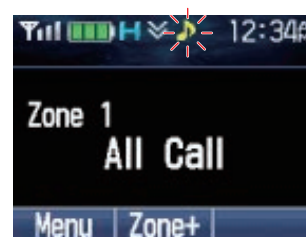
Priority Monitor ID 4: 📻

The transceiver can respond to the received Group ID by a user pressing the **PTT** switch. When a key other than the **PTT** switch is pressed, the configured function will be activated.

After a Group Call voice communication on a channel not configured in **Priority Monitor ID**, the transceiver enters the Hang Time state.



During the Hang Time after a Group Call voice communication on a traffic channel, the transceiver switches to communication by an All Group ID.



Note

- This function is applicable only during the Hang Time after a voice call by Group Call, Broadcast Call, or Individual Call is received. It is not applicable to data communications.
- If the transceiver is in the Hang Time after a Group Call, Broadcast Call, or Individual Call by a Group ID not configured in **Priority Monitor ID** is received, the transceiver can receive only a Group Call or All Call of a **Priority Monitor ID** by switching to **Priority Monitor ID** communication. If the transceiver is in the Hang Time after a Group Call of a **Priority Monitor ID** is received, the transceiver can receive only a Group Call of a **Priority Monitor ID** having higher priority.
- The transceiver that is transmitting or receiving on a traffic channel cannot participate in Group Call communication even if a Group Call of a **Priority Monitor ID** is initiated on another traffic channel. However, some systems may instruct the transceiver to stop transmission. In this case, the transceiver participates in communication on other traffic channels after transmission stops.
- If the transceiver receives a **Priority Monitor ID** during scanning, the transceiver behaves according to the configuration in **Revert Channel** because the scan behavior is prioritized.
If "Last Called + Selected" is configured in **Revert Channel**, the transceiver behaves with Talkback by **Priority Monitor ID** in the same manner as when the scan is disabled.
- Regardless of whether own station or another station is in Emergency state, the transceiver remains on the current traffic channel while participating in an Emergency Call even if communication by **Priority Monitor ID** or All Group ID occurs on other traffic channels.
- The following are the basic behaviors of the transceiver when a call by a Priority Monitor ID is received when the scan is enabled or disabled:

Table 2-8 Behaviors of the Transceiver When a Call by a Priority Monitor ID Is Received

Scan Status	Transceiver behavior	
While the scan is on	Display at the time of reception	Priority Monitor ID is displayed. ^{*1}
	Transmission at the time of reception	Transmission is done on the Revert Channel.
While the scan is off	Display at the time of reception	Priority Monitor ID is displayed. ^{*2}
	Transmission at the time of reception	Talkback is executed using a Priority Monitor ID.

^{*1} Channels configured as Priority Monitor ID are scanned every time during the scan independent of the Scan Delete/ Add configuration.

^{*2} After the call of Priority Monitor ID ends, the transceiver returns to the selected channel after the Auto Reset Timer elapses.

- **Priority Monitor ID** is mainly the function on a traffic channel, but a Group Call of a channel configured in **Priority Monitor ID** is received even on a control channel if **Priority Monitor ID** is configured.
However, for a control channel, a Group Call is received without applying the priority of a Priority Monitor ID number (priority order).
(Example: Even if a Group Call of Priority Monitor ID 1 is received on a traffic channel, the Group Call of Priority Monitor ID 2 is received after the migration to a control channel when a Group Call configured for Priority Monitor ID 2 is received.)
- The Priority Monitor ID icon, Alert Tone, and Alert LED are cleared by Auto Reset Timer.
- Even if All Group ID is configured as the Priority Monitor ID, the Priority icon does not appear.

Using the selected channel as the Priority Monitor ID (Selected Channel)

Selected Channel is a function that the channel selected during scanning is used as Priority Monitor ID.

From the 4 channels configured as Priority Monitor ID, a single Priority Monitor ID in Selected Channel can be configured by using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Configuring **Priority Monitor ID** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Priority Monitor ID)
- Configuring **Selected Channel** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Priority Monitor ID)

Participating in an On-going Voice Call Midway Through the Call (Late Entry)

The transceiver can participate in an on-going voice call even if the transceiver receives this call midway through. In a DMR-based Trunking system, the transceiver sends a communication request on the control channel, and the transceiver will migrate to the specified traffic channel to communicate. A transceiver that is turned ON after the traffic channel assignment is completed or a transceiver that migrated from another site cannot participate in the on-going communications because they have not received the traffic channel assignment message. In this case, the transceiver can participate in on-going communications by receiving the traffic channel assignment message that is periodically sent from the system on the control channel.

Also, if **Late Entry Cancel Time** is configured, the transceiver can be prevented from participating in on-going communications by canceling the traffic channel assignment message that is periodically sent from the system on the control channel.

Late Entry Cancel Time

Late Entry Cancel Time is the function to cancel the traffic channel assignment message of a specific Group Call.

By canceling the traffic channel assignment message which is sent on a control channel, the transceiver does not participate in a Group Call even if the call is receivable, and the transceiver can remain on the control channel. This allows a call prioritized over a Group Call to take place.

The countdown of **Late Entry Cancel Time** starts when the transceiver migrates to a control channel by the following operations while the transceiver is receiving a Group Call on a traffic channel.

- The **Clear** key is pressed.
- The microphone for Mobile is placed in the on-hook state (if **On-hook Disconnect** is enabled).

While **Late Entry Cancel Time** is counting down, the traffic channel assignment message of the last-received Group Call is canceled.

Configuration using KPG-D1/ D1N

Configuring **Late Entry Cancel Time** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Searching Whether the Transceiver Receives a Call (Scan)

The transceiver searches on whether the transceiver has received an individual call or group call on a control channel.

The following Single Scan functions can be used in a DMR-based Trunking system.

Refer to “**SCAN**” for details of Scan.

Transmitting

Pressing the **PTT** switch, or selecting a DMR ID and then pressing the **PTT** switch sends a message requesting various types of communications to a system on a control channel. The transceiver can start communications after the system assigns a traffic channel to the transceiver.

Restricting the Continuous Transmission Duration (Time-out Timer)

Time-out Timer (TOT) is the function to restrict the duration for the transceiver to continuously transmit.

This function is used to prevent communication channel occupancy by a specific user for a long duration of time.

The transceiver automatically stops transmitting if it continuously transmits longer than the configured time.

Also, **TOT Pre-alert**, the timer configuration relevant to the **Time-out Timer** function, can be configured.

TOT Pre-alert

TOT Pre-alert is the function to notify a user that a continuous transmission is about to end by the **Time-out Timer**. A TOT Pre-alert Tone (3 beeps) sounds from the transceiver before the transceiver stops the continuous transmission by the **Time-out Timer**.

Example: Time-out Timer: 30 sec, TOT Pre-alert: 4 sec

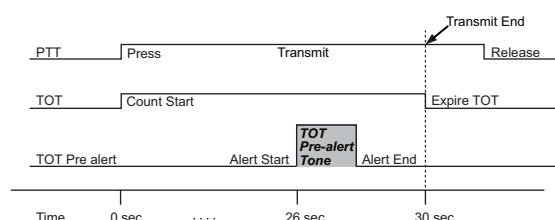


Figure 2-7 TOT Pre-alert

Note

- If “Off” is configured for **TOT Pre-alert**, no TOT Pre-alert tone will sound from the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Time-out Timer** ([See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **TOT Pre-alert** ([See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Avoiding Interference with Other Communications (Busy Channel Lockout)

Busy Channel Lockout is the function to automatically restrict the transmission so as not to interfere with the communications of other systems.

This function is only supported in a Trunking 2.5 system and S-Trunking system.

Busy Channel Lockout functions before the transceiver makes a random access if the transceiver has not received an output signal from the repeater.

If the conditions for transmission are satisfied in **Busy Channel Lockout**, the transceiver sends a Wakeup Message to the repeater and makes a random access.

If the transceiver receives an output signal from the repeater, Busy Channel Lockout does not function.

The following are the transceiver behaviors by the configuration in **Busy Channel Lockout**:

Table 2-9 Busy Channel Lockout

Configuration	Description
No	Busy Channel Lockout does not function. The transceiver makes a random access if the PTT switch is pressed.
Carrier Only	The transceiver cannot transmit while the transceiver is receiving a carrier.

Transceiver behavior during Busy Channel Lockout

The following are the transceiver behaviors of when **Busy Channel Lockout** is executed:

- “Calling” appears and the transmission is suspended during the **Busy Channel Lockout** behavior.
- For voice communication, if **Call Request Tone** is enabled, a Call Request Tone sounds.
- If **Call Processing Tone** is enabled, a Call Processing Tone sounds while the transceiver is waiting for a response.
- If the **Busy Channel Lockout** behavior is disabled, the transceiver starts transmitting.

Configuration using KPG-D1/ D1N

Configuring **Busy Channel Lockout** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

2.2 Control Channel Hunt (Control Channel Hunt)

The control channel hunt is the function to search for and acquire automatically an available control channel on a system when the transceiver is turned ON.

By searching for a control channel according to the hunt sequence, the transceiver can acquire a control channel providing better communication conditions, such as a control channel having better signal strength or higher priority.

The control channel hunt is automatically started when the transceiver is in the following states.

- When the transceiver is turned ON
- When a channel in a DMR-based Trunking system is selected
- When the transceiver cannot receive a signal on a control channel

Trunked Channel Plan and Normal Hunt Control Channel need to be configured in KPG-D1/ D1N to execute Control Channel Hunt.

Note

- When the transceiver enters the following states in an S-Trunking system, if the transceiver has not received an output signal from the repeater, the transceiver sends a Wakeup Message to the repeater and starts the control channel hunt from the Resuming a Control Channel Sequence.
 - When the transceiver is turned ON
 - When a channel in a DMR-based Trunking system is selected
- In a DMR Tier III Trunking system, if **Out of Range Indicator** is enabled, "Search" appears on the display when 10 sec elapse after starting to search for a control channel.
- If **Out of Range Indicator** is configured, the Out of Range Indicator function is activated when no available control channel has been found even after 60 sec of the control channel search. (Refer to [Out of Range Indicator](#).)

Trunked Channel Plan

In **Trunked Channel Plan**, 16 Trunked Channel Plans can be configured. For each Trunked Channel Plan, "Fixed" or "Flexible" is selected as the **Plan Type**.

Table 2-10 Plan Type

Plan Type	Description
Fixed	Configures the receive frequency and transmit frequency for Channel 1 in Base Receive Frequency and Base Transmit Frequency . Configures the channel spacing in Step . Receive Frequency and Transmit Frequency in each of the 4094 channels are frequencies calculated in the following manner: $\text{Receive Frequency} = \text{Base Receive Frequency} + (\text{channel number} - 1) \times \text{Step}$ $\text{Transmit Frequency} = \text{Base Transmit Frequency} + (\text{channel number} - 1) \times \text{Step}$
Flexible	Configures Receive Frequency and Transmit Frequency for each channel. A maximum of 4094 channels can be configured. Multiple channels can be configured at the same time by using Auto Setting .

Normal Hunt Control Channel

In **Normal Hunt Control Channel**, a maximum of 1024 control channels can be configured as the control channels for which the transceiver executes Short Hunt.

Table 2-11 Normal Hunt Control Channel Configuration

Configuration	Description
Frequency No.	Configures the frequency for which the transceiver executes Short Hunt. The channel number in Trunked Channel Plan is selected. The channel number can be selected within the range between Lowest Frequency Number and Highest Frequency Number .
Color Code	Configures the Color Code of a control channel for which the transceiver executes Short Hunt.
Slot Selection	Configures the slot of a control channel for which the transceiver executes Short Hunt. The transceiver transmits and receives on the configured slot.

Control channel hunt sequence

The transceiver searches for a control channel based on a frequency configured in **Trunked Channel Plan**. The following are the types of control channel hunt sequences:

Table 2-12 Control Channel Hunt Sequence (For Trunking 2.5 system)

Order	Control Channel Hunt Sequence	Description
1	Resuming a Control Channel Sequence	The control channel search which was stopped before the transceiver was turned OFF is resumed.
2	Active Hunt	A control channel is acquired after a Wakeup Message is sent to the control channels of the site currently in use and adjacent sites.

Table 2-13 Control Channel Hunt Sequence (For DMR Tier III Trunking system, S-Trunking system)

Order	Control Channel Hunt Sequence	Description
1	Resuming a Control Channel Sequence	The control channel search which was stopped before the transceiver was turned OFF and the search for the control channel which was acquired immediately before are resumed. Also, for each site that was connected in the past, a control channel of the adjacent site is searched.
2	Preferential Hunt Sequence	The 2 channels configured as Preferential Hunt Control Channel are searched. A Preferential Hunt Control Channel is a channel having the highest priority when searching for a control channel.
3	Short Hunt Sequence	A channel configured in Normal Hunt Control Channel is searched. For every 16 channels configured in Normal Hunt Control Channel , a search is executed in this order: for the control channel for which the search was stopped before the transceiver was turned off, for the control channel of the site that is adjacent to each site that was connected in the past, and for the control channel that was acquired immediately before the control channel for which the search was stopped before the transceiver was turned off.
4	Comprehensive Hunt Sequence (DMR Tier III Trunking system only)	The channels available as control channels are searched based on all frequencies used in the network among frequencies configured in Trunked Channel Plan .

Note

- In a Trunking 2.5 system, “the behavior specifying only the site” of Preferential Hunt Control Channel is supported, and the priority level of “the behavior specifying only the site” is used in **Vote Now**.
- The control channel of the site that is adjacent to each site that was connected in the past, which is searched by Resuming a Control Channel Sequence, is initialized when the control channel is registered in a system on a different network.

Active Hunt

Active Hunt is the function for the transceiver to acquire a control channel. The transceiver acquires a control channel after a Wakeup Message is sent to the control channels of the site currently in use and adjacent sites.

The overall flow of Active Hunt is as follows:

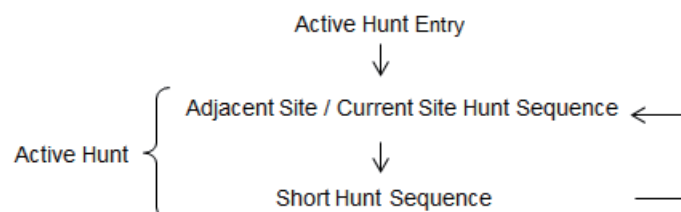


Figure 2-8 Flow of Active Hunt

For Adjacent Site/ Current Site Hunt Sequence, the transceiver is periodically notified from a system of “the information on all channels that can be the control channels of the site currently in use and adjacent sites”. Based on this information, if a control channel with Registration completed is lost, the transceiver sends a Wakeup Message to a channel to be the next control channel in the order of receipt of notification from a system.

- If a communication (C_Aloha or C_BCAST) from a system is found after a Wakeup Message is sent, the transceiver determines that the channel communicated from the system is a control channel, and returns to the communication area.
- If a communication (P_Move) from a system is found after a Wakeup Message is sent, the transceiver migrates to the channel specified by a notification from a system, and returns to the communication area if the migration target is a control channel.
- If a communication (C_Aloha, C_BCAST, or P_Move) from a system cannot be found after a Wakeup Message is sent, the transceiver does not send a Wakeup Message again on the same channel, and sends a Wakeup Message after migrating to the next channel.

Backup of the information on each channel is as follows:

- The information on the control channel of the site currently in use and “the information on all channels that can be the control channels” are backed up even if the transceiver is turned off. For this reason, Resuming a Control Channel Sequence and Current Site Hunt function even after the transceiver restarts.
- The information on all channels that can be the control channels” of adjacent sites is not backed up if the transceiver is turned off. For this reason, Adjacent Site Hunt is skipped while “the information on all channels that can be the control channels” cannot be acquired from a system after the transceiver restarts.

A maximum of 5 adjacent sites are used in Active Hunt.

The transceiver restarts Active Hunt from the beginning if the time configured in **Wakeup Message Resend Timer** elapses.

The transceiver does not send a Wakeup Message for the second or later cycle of Active Hunt if **Wakeup Message Resend Timer** is disabled. (However, the number of cycles of Active Hunt counting down is initialized if the transceiver is temporarily within the communication area. When the transceiver is temporarily within the communication area and in the state of Active Hunt again, a Wakeup Message is sent from the first cycle of Active Hunt.)

When Active Hunt cycles once while a Wakeup Message is sent after **Wakeup Message Resend Timer** elapses, the transceiver temporarily pauses the transmission of Wakeup Message again from the next cycle and starts the Wakeup Message Resend Timer from the beginning. The transceiver repeats this behavior during Active Hunt.

Note

- By shortening **Wakeup Message Resend Timer**, the transceiver increases the frequency of Wakeup Message transmission by Active Hunt, and reconnection to a system becomes easier.
- The frequency of Wakeup Message transmission by the transceiver is decreased by disabling **Wakeup Message Resend Timer** or by increasing the configured time. In this case, although reconnection to a system becomes harder, the frequency of LED flashes by the transceiver that is outside of the communication area is reduced.

Background Hunt

Background Hunt is the function to periodically attempt to acquire a control channel providing better conditions while the transceiver is in the standby state on a control channel.

When the transceiver receives the information of an adjacent site from the system on the control channel, the transceiver stores the information as the channel information of the adjacent site (a maximum of 16 entries) in memory.

The transceiver executes the **Background Hunt** to acquire a control channel providing better conditions, such as a control channel having better signal strength or higher priority, at the intervals configured in **Search Interval Time**.

If the transceiver finds a site providing better conditions compared with the current control channel by using **Background Hunt**, the transceiver migrates to the control channel having better conditions and starts the process to acquire the control channel to be in the standby state.

The behavior of **Background Hunt** varies depending on the configuration of the most preferentially searched channel (**Preferential Hunt Control Channel**), the currently acquired control channel, and the channel information of a registered adjacent site.

The conditions for **Background Hunt** to function are as follows:

Table 2-14 Conditions for Background Hunt to Function 1

Configuration of the Most Preferentially Searched Channel (Preferential Hunt Control Channel)		Currently Acquired Control Channel	
Priority 1	Priority 2	For Priority 1	For Priority 2
Enabled	Enabled	Background Hunt does not function.	The transceiver can migrate to a new control channel only if the channel information of an adjacent site is the same as the information for the configuration of Priority 1. When Background Hunt functions, the transceiver executes the acquisition process of a new control channel regardless of the configuration of Level Margin (the signal strength level difference for migration conditions). After that, the transceiver migrates to the acquired control channel and enters the standby state.
	Disabled	Background Hunt does not function.	-
Disabled	Enabled	-	Background Hunt does not function.
	Disabled	-	-

Table 2-15 Conditions for Background Hunt to Function 2

Configuration of the Most Preferentially Searched Channel (Preferential Hunt Control Channel)		Currently Acquired Control Channel
Priority 1	Priority 2	For Anything Other Than Priority 1/ Priority 2
Enabled	Enabled	Background Hunt functions, and the channel information of an adjacent site is checked in the following order: in the case where the information is the same as the configuration for Priority 1, in the case where the information is the same as the configuration for Priority 2, and in other cases. If the channel information of an adjacent site is the same as the configuration for Priority 1 or Priority 2: The transceiver migrates to a new control channel regardless of the configuration in Level Margin. If the channel information of an adjacent site is not the same as the configuration for Priority 1 or Priority 2: If the signal strength level of the control channel to be newly acquired is stronger than the signal strength level of the current control channel by the value equal to or greater than the value configured in Level Margin, the transceiver executes the acquisition process of the new control channel. After that, the transceiver migrates to the acquired control channel and enters the standby state.
	Disabled	Background Hunt functions, and the channel information of an adjacent site is checked in the following order: in the case where the information is the same as the configuration for Priority 1, in the case where the information is different from the configuration for Priority 1. If the channel information of an adjacent site is the same as the configuration for Priority 1: The transceiver migrates to a new control channel regardless of the configuration in Level Margin. If the channel information of an adjacent site is different from the configuration for Priority 1: If the signal strength level of the control channel to be newly acquired is stronger than the signal strength level of the current control channel by the value equal to or greater than the value configured in Level Margin, the transceiver executes the acquisition process of the new control channel. After that, the transceiver migrates to the acquired control channel and enters the standby state.
Disabled	Enabled	Background Hunt functions, and the channel information of an adjacent site is checked in the following order: in the case where the information is the same as the configuration for Priority 2, in the case where the information is different from the configuration for Priority 2. If the channel information of an adjacent site is the same as the configuration for Priority 2: The transceiver migrates to a new control channel regardless of the configuration in Level Margin. If the channel information of an adjacent site is different from the configuration for Priority 2: If the signal strength level of the control channel to be newly acquired is stronger than the signal strength level of the current control channel by the value equal to or greater than the value configured in Level Margin, the transceiver executes the acquisition process of the new control channel. After that, the transceiver migrates to the acquired control channel and enters the standby state.
	Disabled	Background Hunt functions and checks the channel information of an adjacent site. If the signal strength level of the control channel to be newly acquired is stronger than the signal strength level of the current control channel by the value equal to or greater than the value configured in Level Margin, the transceiver executes the acquisition process of the new control channel. After that, the transceiver migrates to the acquired control channel and enters the standby state.

Note

- For the site for which the network control function with other sites becomes unavailable, the control channel migration by using Background Hunt is not executed.

Vote Now

Vote Now is the function to migrate to a new control channel if the transceiver checks the priority level and RSSI value of a new control channel candidate notified from a system, and the new control channel has better conditions than the currently acquired control channel. Because the notification specifying control channel confirmation (hereafter, the Vote Now notification) is periodically received from a system, the transceiver can always acquire a good communication environment.

To use this function, **Vote Now** is enabled, and "MS Priority" or "TS Priority" is configured in **Vote Now Priority**.

For the transceiver to follow the site priority level configured by using KPG-D1/ D1N, "MS Priority" is configured in **Vote Now Priority**. To follow the site priority level included in the Vote Now notification from a system, "TS Priority" is configured.

If "MS Priority" is configured in **Vote Now Priority**, the transceiver behaves as follows according to the priority level configured in **Preferential Site** by using KPG-D1/ D1N (for a DMR Tier III Trunking system, the transceiver follows the priority level configured in Site ID of Preferential Hunt Control Channel):

- If the Vote Now notification is received from a system while the transceiver is on a Priority 1 site, the transceiver does execute site migration.
- If the Vote Now notification for a Priority 1 site is received from a system while the transceiver is on a Priority 2 site, the transceiver immediately migrates from the current site. If the Vote Now notification for a site of the same Priority as or lower Priority than the current site is received, the transceiver does not execute site migration.
- If the Vote Now notification for a Priority 1 or Priority 2 site is received while the transceiver is on a site where Priority is not configured (Priority 1 or Priority 2 is not configured), the transceiver immediately migrates to the site indicated by the Vote Now notification.
- If the Vote Now notification for another site where Priority is not configured is received while the transceiver is on a site where Priority is not configured, the transceiver compares the RSSI value of the control channel of the current site and the RSSI value of the new control channel candidate indicated by the Vote Now notification. If the RSSI value of the new control channel candidate is higher than that of the control channel of the current site, the transceiver migrates to the new control channel. If the RSSI value of the new control channel candidate is lower than that of the control channel of the current site, the transceiver remains on the control channel of the current site. Also, the conditions for the RSSI value can be adjusted in **Level Margin**.

If "TS Priority" is configured in **Vote Now Priority** the transceiver behaves as follows according to the priority level included in the Vote Now notification from a system:

- If the Vote Now notification for a site of higher Priority than the current site is received, the transceiver immediately migrates to the site.
- If the Vote Now notification for a site of the same Priority as or lower Priority than the current site is received, the transceiver does not execute site migration.
- If the Vote Now notification for another site where Priority is not configured is received while the transceiver is on a site where Priority is not configured, the transceiver compares the RSSI value of the control channel of the current site and the RSSI value of the new control channel candidate. If the RSSI value of the new control channel candidate is higher, the transceiver migrates to the new control channel. If the RSSI value of the new control channel candidate is lower, the transceiver remains on the control channel of the current site. Also, the conditions for the RSSI value can be adjusted in **Level Margin**.

The following is the transceiver behavior for **Vote Now**:

Table 2-16 Transceiver Behavior for Vote Now

Priority Level of Preferential Site/ Priority Level of Vote Now Notification		Priority Level of New Control Channel Candidate		
		No Priority	Priority Low (Priority 1)	Priority High (Priority 2)
Priority Level of Current Control Channel	No Priority	(Depends on the RSSI value) * ¹	Immediate migration	Immediate migration
	Priority Low (Priority 1)	(No Roaming) * ²	(No Roaming) * ²	Immediate migration
	Priority High (Priority 2)	(No Roaming) * ²	(No Roaming) * ²	(No Roaming) * ²

*¹ Migrates to the new control channel if the RSSI value of the new control channel candidate is higher than the RSSI value of the current control channel + Level Margin.

*² Does not migrate to the new control channel.

Level Margin is the configuration value used when comparing RSSI values. The standard for the transceiver to migrate from the current site can be raised by increasing the configuration in **Level Margin**. By adjusting the configuration in **Level Margin**, the transceiver can be migrated to an adequately good site.

Note

- **Vote Now** is only supported in a Trunking 2.5 system and DMR Tier III Trunking system.

Comprehensive Hunt

In **Comprehensive Hunt**, the transceiver executes the acquisition test in order for all frequencies used in the network among frequencies configured in **Trunked Channel Plan** to acquire a frequency to be used as a control channel, if the transceiver cannot acquire a control channel according to the normal control channel acquisition procedure.

If the transceiver fails the acquisition test for all candidate control channels, the transceiver restarts the search from the Resuming a Control Channel Sequence.

This function is only supported in a DMR Tier III Trunking system.

Note

- Since the Comprehensive Hunt Sequence attempts the acquisition for all candidate control channels, it may take an overly long time to acquire the control channel.

Configuration using KPG-D1/ D1N

- Configuring **Trunked Channel Plan** ( [See](#) Transceiver Settings > DMR Network > Trunked Channel Plan)
- Configuring **Lowest Frequency Number** ( [See](#) Transceiver Settings > DMR Network > DMR Network - Network Information)
- Configuring **Highest Frequency Number** ( [See](#) Transceiver Settings > DMR Network > DMR Network - Network Information)
- Configuring **Normal Hunt Control Channel** ( [See](#) Transceiver Settings > DMR Network > Normal Hunt Control Channel)
- Configuring **Preferential Hunt Control Channel** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Preferential Hunt Control Channel)
- Configuring **Wakeup Message Resend Timer** ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Wakeup Message Resend Timer)
- Configuring **Vote Now** to be enabled or disabled ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Vote Now)
- Configuring **Vote Now Priority** ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Vote Now)
- Configuring **Background Hunt** to be enabled or disabled ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Background Hunt)
- Configuring **Level Margin** ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Background Hunt)
- Configuring **Search Interval Time** ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Background Hunt)
- Configuring **Comprehensive Hunt** to be enabled or disabled ( [See](#) Transceiver Settings > DMR Network > Hunt Options > Comprehensive Hunt)

Passive Scan

Passive Scan is the function for the transceiver to scan the channels in the current site while the control channel is paused in Hibernating Station Mode. By scanning the channels in the current site, the transceiver can immediately find the control channel even if the control channel of the repeater migrates.

When the transceiver receives a pause notification from the control channel, the transceiver executes Passive Scan during the time of Inactivity Timer included in the notification. Also, the transceiver completes Passive Scan when the pause is finished and the transceiver finds the active control channel.

If no control channel is found after Inactivity Timer has elapsed, the transceiver determines that the control channel has been lost, finishes Passive Scan, and migrates to the Control Channel Hunt behavior.

The status of the control channel and transceiver when Passive Scan is executed is as follows:

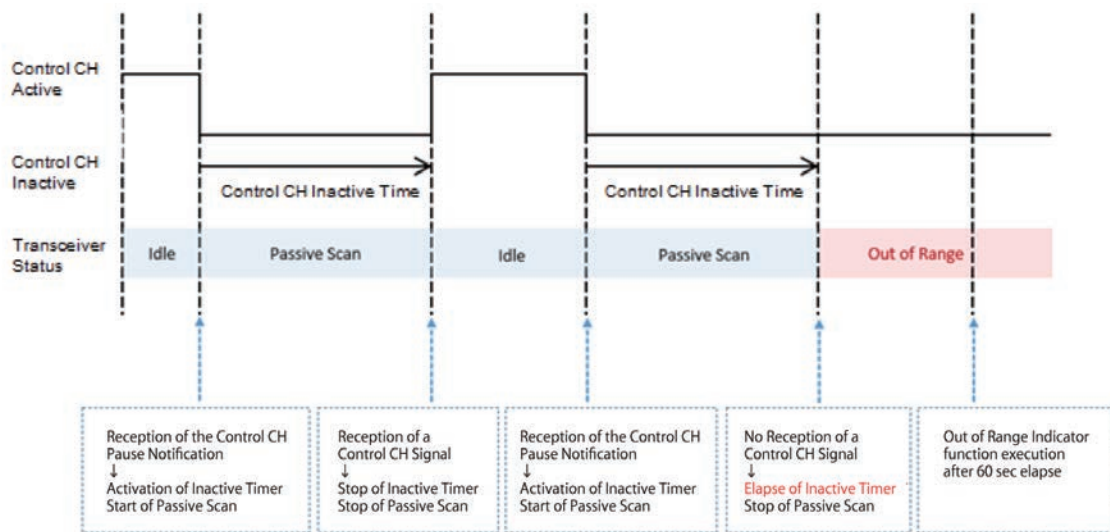


Figure 2-9 Status of the Control Channel and Transceiver in Passive Scan

Note

- During Passive Scan, if no response is received from the system when a Wakeup Message is sent to the control channel to initiate voice communication or data communication, the transceiver enters the Out of Range state and finishes Passive Scan.
- The following automatic transmission is not executed during Passive Scan:
 - Auto GPS Report
 - GPS Distance Change
- If the rotation of the control channel occurs due to downlink interference of the system, etc. during Passive Scan, the transceiver whose Inactive Timer expires is not able to acquire the original control channel. Therefore, the transceiver enters the Active Hunt state and sends a Wakeup Message. In this case, the traffic channel, not the control channel, receives the Wakeup Message and responds to the transceiver as to which channel is the control channel. The transceiver can acquire the control channel even if the rotation of the control channel occurs while the repeater is behaving intermittently.
- Passive Scan is only supported in a Trunking 2.5 system.

System Search Policy

System Search Policy is a policy used by the transceiver to search the system.

Using this function, the transceiver can be configured to start roaming easily in order for a user to select the system having good signal strength. The transceiver can also be configured not to start roaming in order to keep using the system in use as much as possible around the system critical point.

Table 2-17 System Search Policy

System Search Policy	Description
Normal	This is normal configuration considering both roaming and coverage. This configuration is used for normal communications.
Roaming Preferential	This configuration gives higher priority for roaming to maintain communication quality and allows the transceiver to start the system search easily. This configuration is used to install many multiple sites having relatively small communication area.
Site Preferential	This configuration prioritizes the coverage of the current site, and the transceiver is less likely to start a system. This configuration is used when the transceiver is operated with a single site, or the transceiver is used to widen the operation area of the transceiver by installing a small number of sites having wide coverage.

Note

- In a Trunking 2.5 system and S-Trunking system, the transceiver determines **System Search Policy** only while the transceiver is receiving the output signal from the repeater.
- For the signal strength level while the transceiver acquires a control channel, Roaming Preferential is the strongest level followed by Normal and Site Preferential.
- For the frequency of the transceiver to migrate from the current site to another site, Roaming Preferential is the highest frequency rate followed by Normal and Site Preferential.

Configuration using KPG-D1/ D1N

Configuring **System Search Policy** ( See Transceiver Settings > DMR Network > Hunt Options)

Composite Control Channel

Composite Control Channel is the function for the repeater to behave by temporarily switching from the control channel to the traffic channel.

By the repeater assigning a control channel as a traffic channel temporarily if the channel resources in the site are insufficient, the transceiver can effectively use the channel in the site.

Note

- The following restrictions occur while the repeater is behaving by switching to a traffic channel by using Composite Control Channel:
 - Functions, such as **Late Entry**, which are provided by the repeater on the control channel are not provided for the transceiver.
 - Behaviors which require a control channel from the transceiver to the repeater are not available. For example, refer to the descriptions of "If a random access for a Call Interruption request message fails" in Call Interruption or "If the transceiver does not receive any message from the system:" in the various Calls for the display specifications of when Registration, Call Interruption, Emergency Call, and other various Calls fail to function.
 - The transceiver attempting to migrate to another site by the Hunt behavior or Vote Now assumes that no control channel exists at the destination site and skips the migration to another site. For the Hunt behavior, the Hunt behavior to the next control channel is continued, and for Vote Now, the transceiver remains on the current site without migrating to a new site.

Retaining the Information of the Control Channel Used When the Transceiver is Turned OFF (Last Control Channel)

Last Control Channel can be used to retain the information for the last-used site if the transceiver is turned OFF while the transceiver is operated in a DMR-based Trunking system.

There are two types of operation for the system. Whether the transceiver starts searching for a control channel from the last-used site or from the preferred channel when the transceiver searches for a control channel can be configured depending on the operation mode of the system.

- **If giving preference to always using the site having good signal strength:**

Since the last-used site normally has high signal strength, it is effective to start searching for a control channel from the last-used site.

- **If giving preference to always using the preconfigured site:**

The transceiver may register at a site having poor signal strength every time. To avoid this problem, it is effective to always start searching for a preferred channel.

If this function is enabled, the information for the last-used site is retained even if the transceiver is turned OFF. When the transceiver is turned ON again, the transceiver starts searching for a control channel from a control channel in the retained site.

If this function is disabled, the information for the last-used site is not retained after the transceiver is turned OFF. When the transceiver is turned ON again, the transceiver starts searching for a control channel from the control channel configured as a Preferential Hunt Control Channel. A Preferential Hunt Control Channel is a channel having the highest priority when searching for a control channel.

Configuration using KPG-D1/ D1N

Configuring **Last Control Channel** to be enabled or disabled ( **See** Transceiver Settings > DMR Network > Hunt Options)

Out of Range Indicator

Out of Range Indicator is a function to notify a user that no available control channel has been found after searching for a control channel.

If **Out of Range Indicator** is enabled, “Out of Range” appears on the display when no available control channel has been found even if 60 sec elapse after entering the Out of Service state.



Out of Range Tone

Out of Range Tone is the tone to notify the user that the transceiver is unable to acquire a control channel.

The transceiver emits an Out of Range Tone (1 beep) when no available control channel has been found even if 60 sec elapse after entering the Out of Service state. The transceiver behaves as follows according to the configuration in **Out of Range Tone**:

Table 2-18 Out of Range Tone

Configuration	Description
Off	The transceiver does not emit an Out of Range Tone (1 beep).
One-shot	The transceiver emits an Out of Range Tone (1 beep) only once when no available control channel has been found even if 60 sec elapse after entering the Out of Service state. Thereafter, the transceiver does not emit an Out of Range Tone (1 beep) even when it continuously fails to acquire a control channel.
Cycle	The transceiver emits an Out of Range Tone (1 beep) at 30-sec intervals when it continuously fails to acquire a control channel.

In-service Tone

In-service Tone is the tone to notify the user that the transceiver has acquired an available control channel.

If **In-service Tone** is enabled, the transceiver emits an In-service Tone (3 beeps) when an available control channel has been acquired after the transceiver has emitted an Out of Range Tone (1 beep) when it continuously fails to acquire a control channel.

Note

- If **Out of Range Indicator** is disabled in a DMR Tier III Trunking system, “Search” does not appear while searching for a control channel.

Configuration using KPG-D1/ D1N

- Configuring **Out of Range Indicator** to be enabled or disabled (See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)
- Configuring **Out of Range Tone** (See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)
- Configuring **In-service Tone** (See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)

2.3 Configuring the Length of Time to Retain the In Service State (Beacon Interval Time)

In **Beacon Interval Time**, the length of time for the transceiver to retain the In Service state (the state where the transceiver is determined as within the system service area) is configured even if the output signal from the repeater disappears.

This function is only supported in an S-Trunking system.

The transceiver displays the “” icon for the duration configured in **Beacon Interval Time** after the output signal from the repeater disappears.

The status of the “” icon is the strength of the output signal last received from the repeater.

After a valid control channel is acquired, the transceiver can retain the In Service state during **Beacon Interval Time** when the output signal from the repeater disappears because of intermittent repeater behavior.

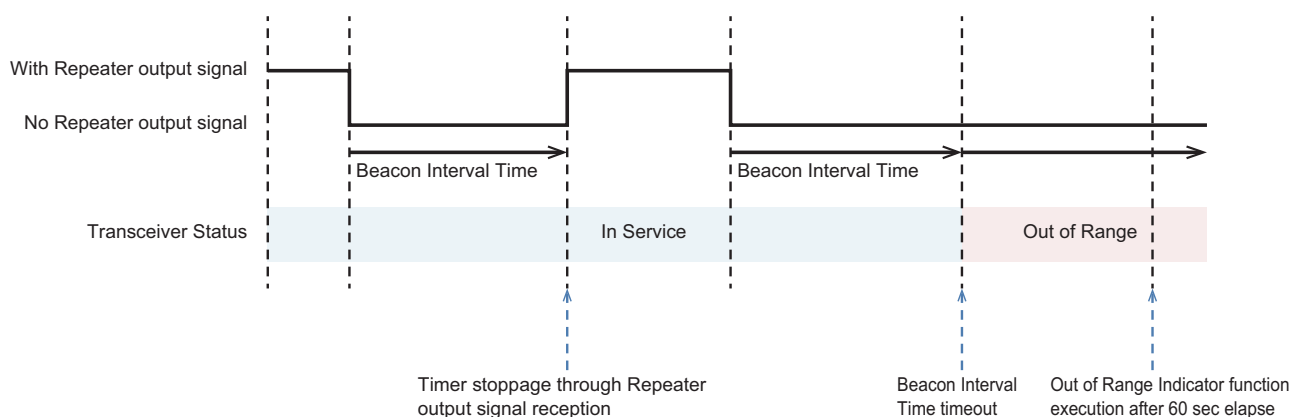


Figure 2-10 Beacon Interval Time

Configuration using KPG-D1/ D1N

Configuring **Beacon Interval Time** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)

2.4 Registration in a DMR-based Trunking System

Registration is a function that enables registration with the system the location data of the transceiver at the time the transceiver searches for or acquires a control channel, for instance by turning the transceiver ON. By registering the location of the transceiver, the system can recognize which site the transceiver belongs to and specifies the site where the communication can be established. Therefore, in the case of Individual Call, a request for an incoming call can immediately be placed with a site where the called transceiver resides; hence, the system can effectively be operated.

Group Subscription is a function that enables the transceiver to register with the system groups to be used. By registering groups, the system can recognize in which site the transceiver waiting for a Group Call resides. Therefore, in the case that a Group Call is made in a multi-site system, the system can limit the registered sites as coverage for the call; hence, the system can effectively handle a Group Call.

De-registration is a function that enables clearing from the system of the transceiver registration information, for instance by turning the transceiver OFF. This function can be used on the system side to recognize a transceiver that does not reside in the site.

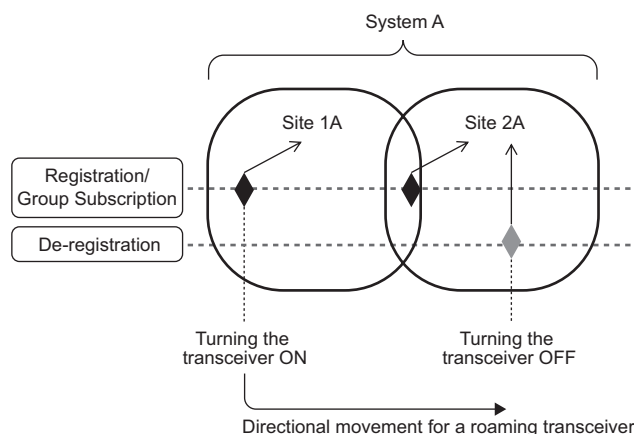


Figure 2-11 Registration/ Group Subscription/ De-registration

Registration specifications are different for a Trunking 2.5 system/ DMR Tier III Trunking system and S-Trunking system. Therefore, Registration does not succeed if the transceiver is configured with a Trunking format which is different from that of the system.

Table 2-19 Registration Specifications

Trunking Format	Description
Trunking 2.5/ DMR Tier III Trunking	The transceiver executes Registration according to the standards of the DMR Standard ETSI TS 102 361-4 V1.9.2.
S-Trunking	The transceiver executes Registration by using a message of proprietary specifications based on the DMR Standard ETSI TS 102 361-4.

Registering the Own Unit ID in a System (Registration)

The transceiver can register its own Unit ID in the system.

Conditions for the transceiver to begin Registration

The transceiver begins Registration under the following conditions.

- **When the transceiver is turned ON**

The transceiver begins Registration upon acquisition of a control channel after the transceiver is turned ON.

- **If roaming to different sites**

The transceiver begins Registration when the transceiver roams to sites regardless of single-site system or multi-site system.

- **If changed to a DMR-based Trunking system**

The transceiver will begin Registration if a system other than a DMR-based Trunking system is changed to a DMR-based Trunking system by a user operating the transceiver and a control channel is acquired.

- **If changed to a different DMR-based Trunking system**

The transceiver will begin Registration if a DMR-based Trunking system is changed to a different DMR-based Trunking system by a user operating the transceiver and a control channel is acquired.

- **If Registration is requested from a system (Mass Registration)**

The transceiver will begin Registration if a Broadcast message requesting Registration is received from a system and the transceiver is a Registration request target.

- **If a call is requested without location registration information in a system**

If the transceiver makes a call request without the location registration information of the mobile station in a system, the transceiver begins Registration after indicating that the call request failed.

- **When Registration Timer elapses**

The transceiver executes Registration when Registration Timer elapses.

Behavior of the transceiver during Registration

The following is the transceiver's behavior during Registration.

- If the location of the own transceiver is successfully registered, the transceiver will remain on the acquired control channel. Otherwise, the transceiver attempts to acquire another control channel again.
- If the transceiver receives the response message indicating failure in Registration from the system when the transceiver begins Registration, the transceiver retains the information (a maximum of 8 messages) and then the transceiver will attempt to acquire a control channel again. Since the information is not cleared even if the zone is changed and it is retained until the transceiver is turned OFF, the transceiver will not begin Registration if the acquired control channel has the same Site No. as the Site No. that was previously determined as a Registration failure. Also, if the transceiver does not receive any response from the system when the transceiver begins Registration or if a timer for Random Access expires, the transceiver will attempt to acquire a new control channel again. In this case, incompleteness of Registration prevents the transceiver from being used in the system. Upon acquisition of a new control channel, the transceiver begins Registration according to the conditions.
- If the transceiver receives the response message indicating failure in Registration from the system at one site and then acquires a control channel of another site, the transceiver executes Registration even if the site where the transceiver acquired the control channel has the same **Location Area ID** as the site where the transceiver received the response message indicating failure in Registration.
- The transceiver cannot initiate a call until location registration is completed, because Registration is a mandatory condition to communicate using a system. However, in a system that does not require location registration, the transceiver can initiate a call even if location registration is not completed. This depends on the system configuration.
- If the transceiver information registered in the system has already been cleared when the transceiver initiates a call, the transceiver begins Registration and then terminates the call upon receipt of a response message from the system indicating non-registration.
- When Registration is executed, if the system sends a message requesting the execution of Authentication to prevent unauthorized access of the site, the transceiver sends a response message and executes authentication.
- If **IP Packet Data Services** is enabled, the IP address of the transceiver is notified to a system during the execution of Registration (IP Connection Advice).
Even if a message of IP connection failure (IP_Connection_failed) is received from a system for a Registration request or an IP address notification to a system, the transceiver determines Registration as successful and remains on the current control channel.

Note

- When the transceiver executes Registration, additional information may be notified to the system depending on the functions.
If the following functions are used at the same time, because the additional information cannot be notified by a single Registration, Registration is executed twice.
 - Group Subscription and Battery Saver
 - Group Subscription and IP Packet Data Service
 - Group Subscription and Battery Saver and IP Packet Data Service ^{*1}

^{*1} Battery Saver and IP Packet Data Service are notified together by a single Registration.

Registration Timer

In **Registration Timer**, the maximum length of wait time until Registration is executed is configured to maintain the validity of the Unit ID by executing Registration again before the Unit ID expiration date in the system expires. When the Unit ID expiration date expires, the transceiver executes Registration again to maintain the validity of the Unit ID.

Registration Timer starts or restarts in the following cases:

- If the system sends back a REG_accepted, IP_Connection_failed, or Reg_Subscription/ Attachment service message, **Registration Timer** starts or restarts.
- If the transceiver receives a response from the system to the request to start the transceiver, **Registration Timer** restarts.
- If the transceiver sends back for a response from the system to the request to start the system, **Registration Timer** restarts.
- If the transceiver executes De-Registration, **Registration Timer** stops.

Note

- In addition to the timer duration (0.5 h - 168 h), the configuration of **Registration Timer** also has "Off" to stop the timer.
- Even if **Registration Timer** expires while the transceiver is unable to execute Registration, such as when some services are running, for example, while a Group Call is being received, or when the transceiver is outside of the communication area, the service is not immediately interrupted. Registration is executed after the transceiver is ready for Registration, for example, after the service is terminated.
- In Hibernating Station Mode of a Trunking 2.5 system, if **Registration Timer** expires while the control channel is paused, the transceiver sends the Wakeup Message to the system to execute the Registration behavior.
- **Registration Timer** is only supported in a Trunking 2.5 system and DMR Tier III Trunking system.

Configuration using KPG-D1/ D1N

Configuring **Registration Timer** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Registering the Group ID Used by the Own Transceiver in a System (Group Subscription)

The transceiver can register the Group ID used by itself in the system.

The following are the conditions for the transceiver to execute Group Subscription and the transceiver's behavior. The transceiver behavior varies depending on whether **Group Subscription** is enabled or disabled.

Table 2-20 Conditions to Execute Group Subscription and the Transceiver's Behavior

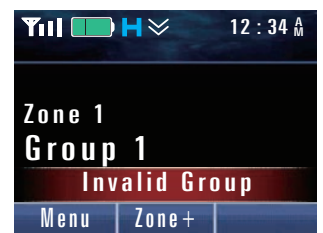
Conditions	Group Subscription	
	Enabled	Disabled
When the transceiver begins Registration, such as a case when the transceiver is turned ON or when the transceiver roams to a different site	The transceiver requests Registration to the system by the Registration request message with the Group ID included, and executes group registration to the system.	The transceiver requests Registration to the system without including the Group ID in the Registration request message.
When changing to another group without group registration by a user operating the transceiver	The transceiver requests Registration to the system by the Registration request message with the Group ID included, and executes group registration to the system. The transceiver requests Registration to the system 2 sec after changing the Group ID by a user operating the transceiver.	The transceiver does not request Registration to the system.

Note

- If the Group ID is All Group ID, the transceiver does not execute group registration even if **Group Subscription** is enabled.
- If the transceiver transmits and receives with a Group ID different from the registered Group ID, the transceiver does not request Registration to the system.

Behavior when group registration fails

If group registration fails even if Registration is successful, the transceiver remains on the acquired control channel without registering the group. If **Group Subscription Invalid Indicator Tone** is enabled, a Group Subscription Invalid Indicator Tone (2 beeps) sounds from the transceiver at 30-sec intervals. Also, if **Group Subscription Invalid Indicator** is enabled, "Invalid Group" is displayed on the display of the transceiver.



In a group which failed to be registered, the transceiver cannot transmit, including Talkback transmission. Reception is available in a group which failed to be registered.

Configuration using KPG-D1/ D1N

- Configuring **Group Subscription** to be enabled or disabled (See Transceiver Settings > DMR Network > Network Information)
- Configuring **Group Subscription Invalid Indicator** to be enabled or disabled (See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)
- Configuring **Group Subscription Invalid Indicator Tone** to be enabled or disabled (See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)

Clearing the Registration Information from a System (De-registration)

The transceiver can clear from the system the information about the transceiver location registration.

Conditions for the transceiver to clear the location registration information from the system

The transceiver clears from the system the information about the transceiver location registration under the following conditions.

- **If the transceiver is turned OFF**

The transceiver will be turned OFF after clearing from the system the information about the location registration. If Power-off Status Message is configured, the transceiver will clear from the system the information about location registration after sending the Power-off Status Message. In Portable, if the transceiver is turned OFF by a user removing the battery pack, the transceiver will not clear from the system the information about the location registration.

- **If changed to a system other than a DMR-based Trunking system**

The transceiver will migrate to the changed Zone-channel after clearing from the system the information about location registration.

- **If changed to a different DMR-based Trunking system**

The transceiver will migrate to the changed channel after clearing from the system the information about location registration.

- **If whether the system with the location registered after Registration is executed can be determined as DMR Tier III if Trunking 2.5 is configured for the transceiver**

The transceiver will execute Control Channel Hunt after clearing from the system the information about location registration.

Behavior of the transceiver when the transceiver clears the location registration information from the system

If the transceiver receives from the system a response message (indicating permission, rejection or failure), if the transceiver does not receive any response from the system, or if the timer for random access expires, the transceiver will refresh the information about the site from where the information of the location registration has cleared.

Authentication Function of a System and Transceiver (Authentication)

Authentication is the function to execute authentication between the transceiver and a DMR-based Trunking system for the system to accept only an authenticated transceiver and exclude an invalid transceiver.

Also, the transceiver can authenticate a system to prevent the transceiver from responding to a Stun, Revive or Kill request from an invalid system.

Authentication by Registration

The system authenticates for the transceiver mainly during the execution of Registration. The system requests authentication to the transceiver, the transceiver responds to the authentication request, and the system determines whether the transceiver is valid or not.

Authentication upon receipt of the Stun/ Revive/ Kill request

If Authentication for Stun/Revive is enabled, the transceiver executes an authentication request if Stun or Revive is received from the system. If the transceiver receives a Kill request from the system, the transceiver executes an authentication request to the system regardless of the configuration in Authentication for Stun/Revive.

The system responds to the authentication request, and the transceiver determines whether the system is valid or not. If the system is determined as an invalid system in the authentication results, the transceiver does not accept the Stun, Revive or Kill request.

About the authentication key

A 128-bit **Authentication Key** is required for authentication between the transceiver and the system. **Authentication Key** can be configured using KPG-D1/ D1N.

Authentication will be unsuccessful if the same authentication key as the authentication key configured in **Authentication Key** is not registered for the system.

Note

- If the authentication by Registration fails, the transceiver enters the hunt state.

Configuration using KPG-D1/ D1N

- Configuring **Authentication Key** ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > System Options)
- Configuring **Authentication for Stun/Revive** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > System Options)

2.5 Using IP Bearer Service

IP Bearer Service is the function to make data communication which complies with ETSI TS 102 361-3 by using UDP/IP or TCP/IP.

The transceiver can use IP Bearer Service when the configuration in **IP Packet Data Services** is enabled.

IP Bearer Service is used to communicate the OTAP data of a Trunking 2.5 system and DMR Tier III Trunking system. (Refer to Common FUNC Writing Configuration Data Using Wireless Communication (OTAP).)

The following functions can be used in IP Bearer Service:

- ICMP Echo
- IP Based Packet Data

Note

- If the transceiver fails in the notification of an IP address by using IP Connection Advice, IP Bearer Service cannot be used. (Refer to **Behavior of the transceiver during Registration.**)
- To use IP Bearer Service, **DMR Air Interface IP Address** needs to be configured by using KPG-D1/ D1N.
- UDP/IP is used for the communication of OTAP data in a Trunking 2.5 system and DMR Tier III Trunking system. For this reason, the IP Bearer Service function of a Trunking 2.5 system and DMR Tier III Trunking system only supports UDP/IP.
- The Encryption/ Decryption of OTAP communication using IP Bearer Service only supports the DES format. The bit scramble format, AES format, and ARC4 (Enhanced Encryption) format are not supported.
- If the timing of GPS data automatic transmission comes while the transceiver is sending data by using IP Bearer Service, the automatic transmission of GPS data does not occur and the GPS data to be transmitted is discarded.
- To use IP Bearer Service, 576 bytes or greater needs to be configured in Maximum Transmission Unit (MTU) for a network.

Configuration using KPG-D1/ D1N

- Configuring **IP Packet Data Services** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Packet Data)
- Configuring **DMR Air Interface IP Address** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Packet Data)

Confirming Whether the Transceiver Is in Operation (ICMP Echo)

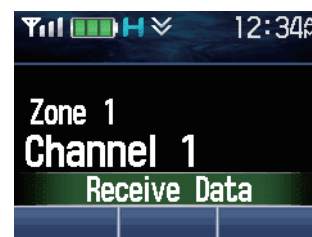
ICMP Echo is the function to confirm from a system whether the transceiver is in operation.

By sending an ICMP Echo Reply when the transceiver receives an ICMP Echo Request from a system, whether the transceiver is in operation can be confirmed.

Transceiver behavior

1 Receives from a system an ICMP Echo request message on a control channel.

"Receive Data" appears on the display.

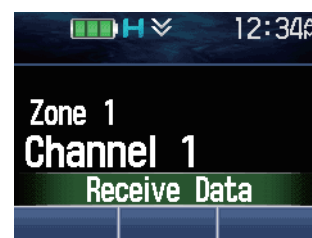


2 Migrates to a traffic channel, and receives the ICMP Echo Request data.

When the reception of ICMP Echo Request data ends, an ACK is sent to a system.

Note

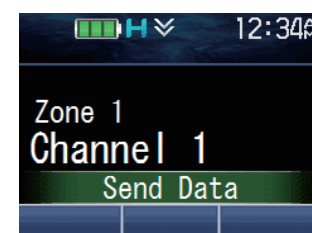
- If the configuration in Busy LED is enabled, the LED lights green on the traffic channel.
- If the configuration in TX LED is enabled, the LED lights red during ACK transmission.
- The "Y" icon disappears during ACK transmission.



(During ACK transmission)

3 Sends the ICMP Echo Reply data

"Send Data" appears on the display.



When an ACK of ICMP Echo Reply data is received from a system, "Complete" appears on the display for 1 sec.

When the transmission of ICMP Echo Reply data ends, the transceiver returns from a traffic channel to a control channel.



(1 sec)

IP Based Packet Data

IP Based Packet Data is the function for the transceiver to receive IP based Packet data specified by ETSI TS 102 361-1.

If the configuration in **IP Packet Data Services** is enabled, the transceiver can receive the data which is sent from a system by making the configured own IP address (**DMR Air Interface IP Address**) the destination. Also, data transmission from the transceiver is not supported, except the transmission behavior that occurs during the reception of data sent from a system.

By using the IP Based Packet Data function, the transceiver can receive OTAP data.

Configuration using KPG-D1/ D1N

Configuring **IP Packet Data Services** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Packet Data)

DMR IP Addressing

DMR IP Addressing is the function to configure an individual IP address regulated in ETSI TS 102 361-3 for the transceiver.

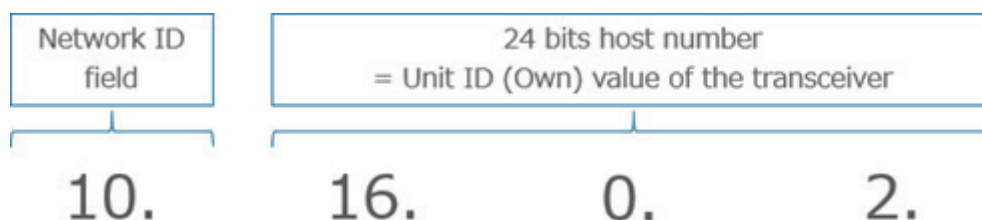
Among the address formats for DLL derived IP addressing, only Class A (DLL (Data Link Layer) individual address) is supported for the NX-5000 series transceiver.

In DMR IP Addressing, an individual IP address (**DMR Air Interface IP Address**) can be configured for each transceiver by using KPG-D1/ D1N.

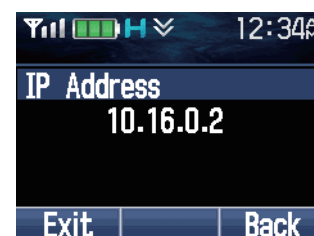
In **DMR Air Interface IP Address**, only the first octet, which is at the beginning of an IP address, is configured.

For the second octet, third octet, and fourth octet, the values calculated from Unit ID (Own) configured for the transceiver are automatically configured.

Example: The IP address if the Network ID field = 0d10 = 0x0A, Unit ID (Own) = 0d1048578 = 0x100002



Pressing the **Menu** key places the transceiver in Menu Mode, and then selecting "IP Address" causes the transceiver to display the IP address. (Refer to Common FUNC Using Menu Mode.)



Note

- The display of an IP address is only supported in a Trunking 2.5 system and DMR Tier III Trunking system.

Configuration using KPG-D1/ D1N

Configuring **DMR Air Interface IP Address** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Packet Data)

2.6 Using DMR ID to Initiate a Selective Call

An individual call and group call are available by using DMR IDs. In addition, a message can be sent to a specified target ID in various types of message communications.

Available Calls

The following various types of calls can be used in a DMR-based Trunking system. For transceiver operations and behaviors, refer to the instructions of each call type.

- Individual Call
- Group Call
- Broadcast Group Call
- Telephone Call
- Status Call
- Short Data Call
- Long Data Call

Transition for Each Mode

If a user wishes to send or receive an Individual Call, Group Call, Status Message, or Short Message, the user must operate the transceiver after selecting the desired mode. Refer to **“Transition for Each Mode”** for transition for each mode.

2.7 Making an Individual Call

Individual Call is the function used to initiate a call to a target transceiver individually to establish voice calls.

By specifying a Unit ID, the transceiver can initiate a call to the transceiver having the Unit ID.

An Individual Call has 2 behaviors: FOACSU (Full Off Air Call Set-Up) and OACSU (Off Air Call Set-Up).

FOACSU:

By retaining a call until the receiving transceiver responds, the transceiver can start communications after a traffic channel is assigned upon the response of the receiving transceiver. (If the target transceiver does not exist, the unnecessary assignment of a traffic channel can be avoided.)

OACSU:

A traffic channel is assigned to the transceiver without the response of the target transceiver, and the transceiver can start communications.

Initiating an Individual Call

An Individual Call can be started by one of the following methods:

- **Individual Call Mode**

In Individual Call Mode, an Individual Call is initiated by selecting a Unit ID configured in the Individual ID List or directly entering a Unit ID. (Refer to [Individual ID List](#).)

Pressing the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key places the transceiver in Individual Call Mode.

Or, the transceiver also enters Individual Call Mode by selecting "Individual", "Individual + Status", or "Individual + Short Message" after the transceiver enters Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

If "Individual", "Individual + Status", or "Individual + Short Message" is configured in **Keypad Operation**, pressing the **[0]** key to **[9]** key on the keypad also places the transceiver in Individual Call Mode. The transceiver enters Unit ID Shortcut Entry Mode or will be on hold as the first digit of the Unit ID is entered. (Refer to Common FUNC Keypad Operation.)

- **Selcall on PTT**

The transceiver initiates an Individual Call when the **PTT** switch is pressed on a channel where "Individual Call" is configured in Selcall on PTT. The Unit ID of the target transceiver can be configured by selecting one Unit ID from the Individual ID List by using KPG-D1/ D1N.

- **Dialing Mode (DMR Tier III Trunking system, S-Trunking system only)**

In Dialing Mode, an Individual Call is initiated by directly entering an Individual ID and pressing the **PTT** switch. By pressing the Dialing key, or by pressing the **Menu** key to enter Menu Mode and then selecting "Dialing", the transceiver enters Dialing Mode.

- **Redial Mode (DMR Tier III Trunking system, S-Trunking system only)**

In Redial Mode, an Individual Call is initiated by selecting an Individual ID and pressing the **PTT** switch. By pressing the **Redial** key, or by pressing the Menu key to enter **Menu** Mode and then selecting "Redial", the transceiver enters Redial Mode.

- **Talkback**

After an Individual Call is received, pressing the **PTT** switch while the Unit ID Name or Unit ID of the transmitting transceiver is displayed enables the transceiver to respond (Talkback) to the transmitting transceiver of the Individual Call.

- **Call key**

Pressing one of the **Call 1** to the **Call 6** keys sends a message requesting an Individual Call to the system for the Unit ID allocated to the key pressed.

For mobile, if any of ports from "Call 1" through "Call 6" assigned as AUX Input ports becomes active, a message requesting Individual Call will be sent to the system for the Unit ID corresponding to the activated port.

- **Stack Mode**

Selecting the receive history in Stack Mode and pressing the **PTT** switch initiates an Individual Call. (Refer to Common FUNC Viewing the Receive History (Stack).)

- **Response to incoming calls**

When the transceiver receives an Individual Call, the transceiver can respond to the transmitting transceiver by pressing the **PTT** switch while "Incoming" appears on the main display, or upon the receipt of a PC command from the communication port.

For Mobile, when **Off-hook Connect** is enabled, the transceiver can respond to the transmitting transceiver even by placing the microphone in the off-hook state.

- **PC command**

The transceiver starts an Individual Call upon the receipt of a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

The following describes how to initiate an Individual Call in Individual Call Mode.

Operating the transceiver

● Initiating an Individual Call by List Selection

1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

The transceiver enters Individual Call Mode and the Individual ID List selection screen appears.

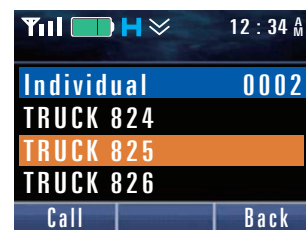
The following operations are identical even if the transceiver enters Individual Call Mode by pressing the **Menu** key or using the keypad.

2 Press the [▲] or [▼] key to select a Unit ID from the Individual ID List.

Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.

Note

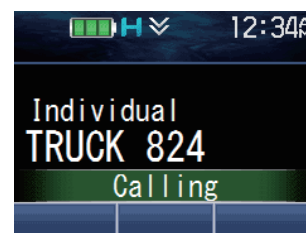
- If Individual Call Mode has been entered with “Individual + Status” or “Individual + Short Message”, Status Mode or Short Message Mode is entered by pressing the [▶] key.



3 Press the **PTT** switch or the **Menu** ([□]) key.

A message requesting an Individual Call is sent to a system.

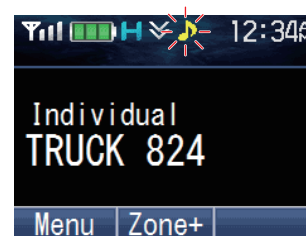
The display changes to “Individual” and the ID name of the target transceiver.



The transceiver can start communications after a traffic channel is assigned to the transceiver and the “📶” icon is blinking.

Note

- The selection screen for the Individual ID List closes at the same time as pressing the **PTT** switch or the **Menu** ([□]) key. If selecting an ID and sending an Individual Call again, reexecute the operations from step 1.



● Initiating an Individual Call using Manual Dialing

To initiate an Individual Call using Manual Dialing, **Manual Dialing** must be enabled using KPG-D1/ D1N.

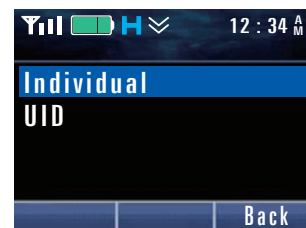
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

The transceiver enters Individual Call Mode and the Individual ID List selection screen appears.

The following operations are identical even if the transceiver enters Individual Call Mode by pressing the **Menu** key or using the keypad.

2 Press the **Function** ([]) key.

The Unit ID entry display appears.



3 Enter a Unit ID.

Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

- **If using the keypad**

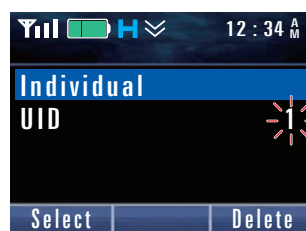
A Unit ID can be entered by pressing the [0] key to [9] key.

- **If using the PF keys**

Press the [▲] key or [▼] key to select a character, and press the **Menu** ([]) key or [*] key to confirm the selected character.

 Note

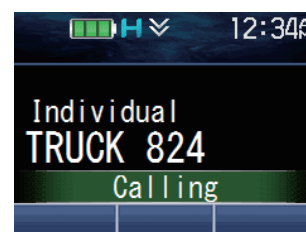
- If Individual Call Mode has been entered with “Individual + Status” or “Individual + Short Message”, Status Mode or Short Message Mode is entered by pressing the [▶] key.



4 Press the **PTT** switch or the **Menu** ([]) key.

A message requesting an Individual Call is sent to a system.

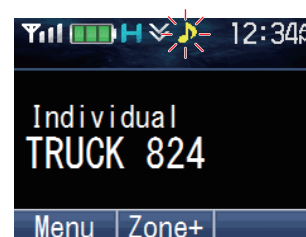
The display changes to “Individual” and the ID name of the target transceiver.



The transceiver can start communications after a traffic channel is assigned to the transceiver and the “” icon is blinking.

 Note

- The entry screen for the ID closes at the same time as pressing the **PTT** switch or the **Menu** ([]) key. If entering an ID and sending an Individual Call again, reexecute the operations from step 1.

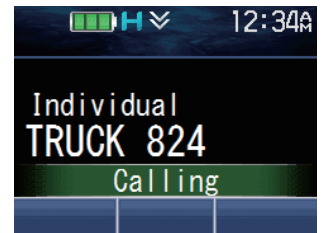


 Note

- If the Individual Call Mode previously used is Manual Dialing mode, the transceiver enters Manual Dialing mode by pressing the **Individual** key. A selection screen for the Individual ID List appears by pressing the **Function** ([]) key.
- If no ID is registered in the Individual ID List, the transceiver enters Manual Dialing mode by pressing the **Individual** key if **Manual Dialing** is enabled. In this case, the transceiver cannot enter Individual Call Mode if **Manual Dialing** is disabled.

Transceiver behavior during transmitting

“Calling” appears on the display of the transceiver from when the transceiver initiates various call requests until the call requests are determined.



The following displays appear depending on the response message from the system after initiating various calls in a DMR-based Trunking system:

Table 2-21 Transceiver Behavior During Transmitting

Status	Transceiver behavior
If no traffic channel is available in the system and if the transceiver receives a response message indicating the queue state from the system:	For Individual Call, Group Call, Broadcast Group Call, and Telephone Call: The Call Queue Tone (2 beeps) sounds from the transceiver, and “Queued” appears on the display. After that, the transceiver will enter the standby state. For Status Call, Short Data Call (46 bytes or less), and GPS data transmission: The Call Fail Tone (2 beeps) sounds from the transceiver, and “Fail” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends. For Short Data Call (47 bytes or more) and Long Data Call: The transceiver enters the standby state while “Send Data” remains displayed.
If the transceiver receives a response message from the system indicating a busy state of the receiving transceiver:	The Busy Tone 2 (3 beeps) sounds from the transceiver, and “Busy” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a response message from the system, indicating that no traffic channel is available:	The System Busy Tone (3 beeps) sounds from the transceiver and “System Busy” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a response message from the system indicating no response from the receiving transceiver:	The No Reply Tone (4 beeps) sounds from the transceiver, and “No Reply” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a message from the system notifying that the receiving transceiver rejected response:	The Call Deny Tone (3 beeps) sounds from the transceiver, and “Call Deny” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a message from the system, such as a service invalid message:	The Call Invalid Tone (4 beeps) sounds from the transceiver, and “Invalid” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver does not receive any message from the system:	The Call Fail Tone (2 beeps) sounds from the transceiver, and “Fail” appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.  Note If a random access and Unsolicited Radio Check from the system are performed at the same time, the transceiver stops the random access because the transceiver prioritizes a response behavior to Unsolicited Radio Check. Even if the transceiver stops the random access, the transceiver performs the behavior of “If the transceiver does not receive any message from the system”.

Note

- If **Transmit LED** is enabled, the LED lights red when the transceiver is transmitting. (Refer to Common FUNC Transmit LED.)
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- If **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when a call requesting an Individual Call is initiated. Also, if **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver until the transceiver receives from the system a message for traffic channel assignment after the call requesting an Individual Call is initiated. (Refer to **Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)**.)
- If **Call in Progress Tone** is enabled, a Call in Progress Tone (2 beeps) sounds from the transceiver when the transceiver becomes ready for transmissions with Individual Call.
- If **PTT Proceed Tone** is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)
- Press the **Clear** key to terminate the Individual Call. While the transceiver is on standby to receive a response from the receiving transceiver, canceling the call is possible by pressing the **Clear** key.
- If **Disconnect Indication Tone** is enabled, a Disconnect Indication Tone (2 beeps) sounds from the transceiver when an Individual Call is completed.
- For Mobile, if **On-hook Disconnect** is enabled, an Individual Call terminates by placing the microphone in the on-hook state.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Assigning functions to the AUX Input port ( **See** Transceiver Settings > Extended Function > AUX)
- Configuring **Selcall on PTT** ( **See** Transceiver Settings > Personal > Personality > DMR-based Trunking > Selcall on PTT)
- Configuring the Unit IDs corresponding to the **Call 1** to **Call 6** keys or the ports ( **See** Transceiver Settings > Key Assignment > Call)

Receiving an Individual Call

The transceiver can receive an Individual Call if the received Unit ID matches the Unit ID (Own) preconfigured for the transceiver.

To receive an Individual Call, the transceiver must receive from the system a message requesting reception of an Individual Call, and send a response message to the system. The transceivers can initiate the communication after receiving the message for traffic channel assignment from the system.

Transceiver behavior

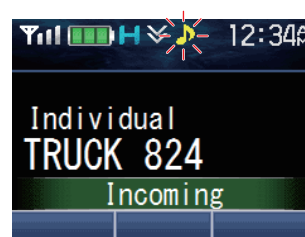
The transceiver's behavior varies depending on the configuration for FOACSU.

● If FOACSU is enabled

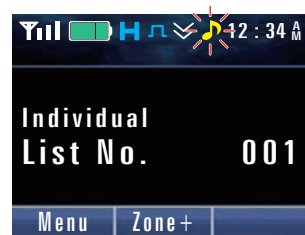
1

Receive from the system a message requesting reception of an Individual Call.

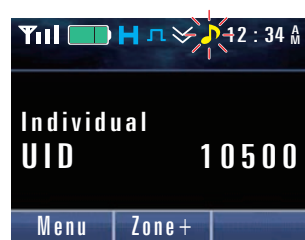
The “📞” icon blinks, and the ID Name of the transmitting transceiver and “Incoming” appear.



If the ID Name is not configured in the Individual ID List, the Individual ID List number appears.



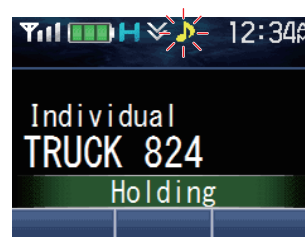
If the Unit ID is not configured in the Individual ID List, the Unit ID appears.



2

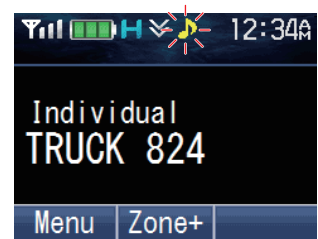
Press the **PTT** switch or the **Call Response** key.

The “📞” icon blinks and a response message is sent to the system.



3 Receive from the system a message for traffic channel assignment.

The transceiver enters a state allowing communication.



Note

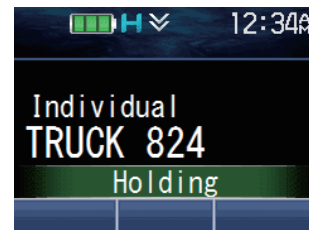
- If a response to the received Individual Call is not sent and the status below is initiated, "Missed Call" appears on the display.
 - When a certain period of time (T_AnswerCall) elapses without the transceiver responding to an incoming call
 - When the transceiver receives a cancellation message from the system
- When an Individual Call is received from an opponent having the **ID Mode** configured as "Receive Only" with the Individual ID List, pressing the **PTT** switch causes the transceiver to generate Warning Tone A (continuous beep) and does not allow response. Even in this case, pressing the **Call Response** key still allows the transceiver to respond to the received Individual Call.
- For Mobile, if **Off-hook Connect** is enabled, the received Individual Call can be answered by placing the microphone in the off-hook state.
- If the **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when the transceiver starts sending a response message. Also, if **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver until the transceiver receives from the system a message for traffic channel assignment. (Refer to [Notifying the User with a Tone That a Call Request Has Been Initiated \(Call Request Tone\)/ Notifying the User with a Tone That a Call Request Is in Progress \(Call Processing Tone\)](#).)
- If **Call in Progress Tone** is enabled, a Call in Progress Tone (2 beeps) sounds from the transceiver when the transceiver becomes ready for transmissions with Individual Call.
- Reception can be canceled by pressing the **Clear** key while the transceiver is in the state in Step 1.
- Pressing the **Clear** key allows terminating the Individual Call. For Mobile, if **On-hook Disconnect** is enabled, an Individual Call terminates by placing the microphone in the on-hook state.
- If **Disconnect Indication Tone** is enabled, a Disconnect Indication Tone (2 beeps) sounds from the transceiver when an Individual Call is completed.
- The transceiver automatically sends a response message for the following cases:
 - If **On-hook Disconnect** is enabled and the microphone is on-hook for Mobile
 - If **Suppress Emergency Call** is enabled and the transceiver receives an Individual Call of Emergency
- If Alert Tone is configured to sound when receiving, an Alert Tone sounds. (Refer to [About the transceiver behavior when receiving an Individual Call](#).)
- If **Selective Call Alert LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [About the transceiver behavior when receiving an Individual Call](#).)

● If FOACSU is disabled

1

Receive from the system a message requesting reception of an Individual Call.

A response message is automatically sent to the system.



2

Receive from the system a message for traffic channel assignment.

The “📡” icon blinks and the transceiver enters a state allowing communication. By pressing the **PTT** switch, the transmitting transceiver can be called.



Note

- Pressing the **Clear** key allows terminating the Individual Call. For Mobile, if **On-hook Disconnect** is enabled, an Individual Call terminates by placing the microphone in the on-hook state.
- If Alert Tone is configured to sound when receiving, an Alert Tone sounds. (Refer to [About the transceiver behavior when receiving an Individual Call.](#))
- If **Busy LED** is enabled, the LED lights green regardless of whether reception is enabled or disabled on a traffic channel. (Refer to Common FUNC Busy LED.)
- If **Selective Call Alert LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [About the transceiver behavior when receiving an Individual Call.](#))

About the transceiver behavior when receiving an Individual Call

● Alert Tone

If FOACSU is enabled:

If the received Unit ID is configured in the Individual ID List, an Alert Tone sounds from the transceiver according to the configuration for **Alert Tone (Individual Call Incoming)** of the corresponding Unit ID.

However, if "Common" is configured in **Alert Tone (Individual Call Incoming)** of the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Individual Call Incoming)** common to DMR-based Trunking.

If FOACSU is disabled:

If the received Unit ID is configured in the Individual ID List, an Alert Tone sounds from the transceiver according to the configuration for **Alert Tone (Individual)** of the corresponding Unit ID.

However, if "Common" is configured in **Alert Tone (Individual)** of the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Individual Call)** common in DMR-based Trunking.

● Selective Call Alert LED

If FOACSU is enabled:

If the received Unit ID is configured in the Individual ID List, the LED flashes according to the configuration for **Alert LED Color (Individual Call Incoming)** of the corresponding Unit ID.

However, if "Common" is configured in **Alert LED Color (Individual Call Incoming)** of the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the LED flashes according to the configuration in **Alert LED Color (Individual Call Incoming)** common to DMR-based Trunking.

If FOACSU is disabled:

If the received Unit ID is configured in the Individual ID List, the LED flashes according to the configuration for **Alert LED Color (Individual)** of the corresponding Unit ID.

However, if "Common" is configured in **Alert LED Color (Individual)** of the Individual ID List, or if the received Unit ID is not configured in the Individual ID List, the LED flashes according to the configuration in **Alert LED Color (Individual Call)** common in DMR-based Trunking.

● Optional Signaling LED

If **Optional Signaling LED** is enabled, the LED flashes in yellow. However, if **Selective Call Alert LED** is enabled, the LED flashes according to the configuration of **Selective Call Alert LED**.

Also, when a key on the transceiver is operated while the LED flashes according to the configuration of **Selective Call Alert LED**, the LED will flash in yellow if the Optional Signaling received continues to match that of the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( **See** Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Alert Tone (Individual)** (Individual ID List) ( **See** Transceiver Settings > DMR > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)** (Individual ID List) ( **See** Transceiver Settings > DMR > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)/ Alert Tone (Individual Call Incoming)** common in DMR-based Trunking ( **See** Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Individual Call)/ Alert LED Color (Individual Call Incoming)** common in DMR-based Trunking ( **See** Transceiver Settings > DMR > DMR Information > Trunking > Alert LED Color)

Individual ID List

If making Individual Calls, the desired Unit IDs need to be preconfigured in the transceiver using KPG-D1/ D1N prior to use of the transceiver. A maximum of 1500 Unit IDs can be configured for Individual ID List.

If **Fleet Dialing Plan** is enabled in a DMR Tier III Trunking system or S-Trunking system, ID can be configured even divided into the Prefix-Fleet-IN format.

Table 2-22 Individual ID List

Configuration	Description
ID	A Unit ID can be configured in the range between 000001 and FFFCDF (hexadecimal), or between 1 and 16776415 (decimal).
Prefix	A Prefix number can be configured in the range between 328 and 806.  Note To configure a Prefix number, Fleet Dialing Plan needs to be enabled in a DMR Tier III Trunking system or S-Trunking system.
Fleet	A Fleet number can be configured in the range between 20 and 89.  Note To configure a Fleet number, Fleet Dialing Plan needs to be enabled in a DMR Tier III Trunking system or S-Trunking system.
IN	If the Fleet is between 20 and 41, an Individual number can be configured in the range between 200 and 899. If the Fleet is between 42 and 89, an Individual number can be configured in the range between 200 and 549.  Note To configure an Individual number, Fleet Dialing Plan needs to be enabled in a DMR Tier III Trunking system or S-Trunking system.
ID Name	The caller's ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the transmitting transceiver is configured in the Individual ID List, the ID Name of the transmitting transceiver appears when the transceiver receives a call. The received Unit ID Name appears upon receipt of the Unit ID Name by the Over-the-Air Alias function while receiving a call. If the transceiver is unable to receive the Unit ID Name, the saved Unit ID Name appears if it is saved in the Unit ID stored on the transceiver. When the Unit ID Name is not saved on the transceiver, the Unit ID Name configured in the Individual ID List appears if a Unit ID Name is configured for the received Unit ID in the Individual ID List. The Unit ID number appears if the above conditions are not satisfied.
ID Mode	The permission or inhibition of transmission of the receiving party can be configured. An ID for which "Receive Only" is configured for ID Mode does not appear on the ID selection display in Individual Call Mode, and a user cannot select the ID in Individual Call Mode. If the transceiver receives a call from an ID for which "Receive Only" is configured for ID Mode, the caller's ID Name appears on the transceiver. In this case, a user cannot initiate a call to the calling transceiver even if the user attempts to respond by pressing the PTT switch.
Alert Tone	Individual: The type of tone sounding from the transceiver can be configured for an Individual Call from the Unit IDs registered in the Individual ID List. Alert Tone (Individual Call Incoming): The type of tone sounding from the transceiver can be configured for an Individual Call in the FOACSU format which is received from a Unit ID registered in the Individual ID List.
Alert LED Color	Individual: The color of flashing LED can be configured for an Individual Call from the Unit IDs registered in the Individual ID List. Alert LED Color (Individual Call Incoming): The color of flashing LED can be configured for an Individual Call of the FOACSU format from the Unit IDs registered in the Individual ID List.  Note To use Alert LED Color, Selective Call Alert LED needs to be enabled.

Configuration using KPG-D1/ D1N

Configuring the Individual ID List ( **See** Transceiver Settings > DMR > Individual ID List)

Restricting IDs for Which the Transceiver Can Initiate a Call (Individual ID Encode Block)

Individual ID Encode Block is the Unit ID range used to initiate a call.

A Unit ID with which a user is allowed to initiate a call can be restricted using KPG-D1/ D1N. A user can initiate a call to a Unit ID configured in the Individual ID List even if it is outside the range of **Individual ID Encode Block**.

The transceiver for which no **Individual ID Encode Block** is configured can initiate a call to all transceivers.

The transceiver unmutes the speaker and emits received audio when the transceiver receives the Unit ID satisfying the receiving conditions. In this case, the Unit ID of the transmitting transceiver appears on the receiving transceiver. If the Unit ID of the transmitting transceiver is in the range of the **Individual ID Encode Block** or has been registered in the Individual ID List, the receiving transceiver can respond to the transmitting transceiver by pressing the **PTT** switch. If the Unit ID of the transmitting transceiver is outside the range of the **Individual ID Encode Block** and also has not been registered in the Individual ID List, the receiving transceiver cannot respond to the transmitting transceiver.

Configuration using KPG-D1/ D1N

Configuring **Individual ID Encode Block** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Sending the Received Unit ID from the Communication Port (Unit ID Serial Output)

Unit ID Serial Output can be used to send the received Unit ID from the transceiver's communication port.

With the **Unit ID Serial Output** enabled, the dispatcher can monitor and control in real time transceivers that are transmitting.

Also, the Unit ID sent from the communication port can also be used for management of the call log.

Note

- The transceiver will send the Unit ID from the communication port only when Color Code and Slot Selection match the Color Code and Slot Selection configured in the transceiver.
- When the transceiver receives a call via Selective Call, Unit ID is sent from the communication port regardless of the configuration in **Unit ID Serial Output**.
- To use **Unit ID Serial Output**, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to the communication port of the transceiver.
- Even if **Fleet Dialing Plan** is enabled in a DMR Tier III Trunking system or S-Trunking system, a DMR ID in the range between 1 and 16776415 is used for a Unit ID and Group ID in the data to be sent.
- When the transceiver receives a Group Call from a telephone, U16776896 (0xFFEC0) is output if the call is PSTN, and U16776897 (0xFFEC1) is output if the call is PABX.

Configuration using KPG-D1/ D1N

- Configuring **Unit ID Serial Output** ( See Transceiver Settings > DMR > DMR Information > General > Serial Output)
- Assigning functions to **COM port** ( See Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > COM port)

Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)

Call Request Tone is the function to sound a Call Request Tone (1 beep) from the transceiver when a call request for an Individual Call or Group Call is initiated by pressing the **PTT** switch in a DMR-based Trunking system.

Also, **Call Processing Tone** is the function to sound a Call Processing Tone (2 beeps) from the transceiver while the **PTT** switch is pressed and held after a call request for an Individual Call or Group Call is initiated by pressing the **PTT** switch in a DMR-based Trunking system.

Depending on the system condition, it may take few seconds to determine the call request upon the initiation of a call request using Individual Call or Group Call. Use of this function notifies a user by emitting a tone from the transceiver of the condition from when the transceiver initiates a call request using Individual Call or Group Call until the call request is determined.

When the transceiver initiates an Individual Call or Group Call using this function, the transceiver behaves as follows:

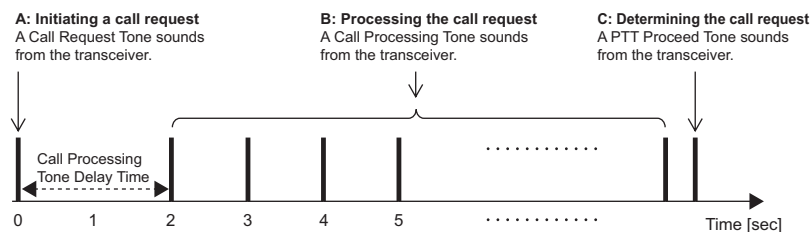


Figure 2-12 Call Request Tone/ Call Processing Tone

- A: A Call Request Tone (1 beep) sounds from the transceiver when a call request is initiated by pressing the **PTT** switch.
- B: A Call Processing Tone (2 beeps) sounds from the transceiver while the **PTT** switch is pressed and held after initiating a call request by pressing the **PTT** switch. The length of time from when a call request is initiated by pressing the **PTT** switch until the Call Processing Tone (2 beeps) sounds from the transceiver can be configured in **Call Processing Tone Delay Time**.
- C: If **PTT Proceed Tone** is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when a call request is determined. A user can start conversations. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)

Configuration using KPG-D1/ D1N

- Configuring **Call Request Tone** to be enabled or disabled (See Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Call Processing Tone** to be enabled or disabled (See Transceiver Settings > DMR > DMR Information > Trunking > Call Processing Tone)
- Configuring **Call Processing Tone Delay Time** (See Transceiver Settings > DMR > DMR Information > Trunking > Call Processing Tone)

Preventing the Automatic Assignment of a Traffic Channel (FOACSU)

FOACSU (Full Off Air Call Set-Up) is the function to prevent a traffic channel from being assigned until the receiving transceiver responds by using Individual Call.

If this function is enabled, the transceiver retains an Individual Call until the receiving transceiver responds. A traffic channel is assigned to the transceiver with the response of the receiving transceiver, and the transceiver can start communications.

If this function is disabled, a traffic channel is automatically assigned to the transceiver without the response of the receiving transceiver, and the transceiver can start communications.

Note

- To activate **FOACSU**, the activation of **FOACSU** also needs to be configured in the system.

Behavior of when the transceiver receives an Individual Call of Emergency

If **Suppress Emergency Call** is enabled, **FOACSU** is not activated when the transceiver receives an Individual Call of Emergency even if **FOACSU** is enabled. Using this function, a traffic channel is automatically assigned to the transceiver even without the response of the receiving transceiver, and the transceiver can start communications.

Configuration using KPG-D1/ D1N

- Configuring **FOACSU** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > FOACSU)
- Configuring **Suppress Emergency Call** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > FOACSU)

2.8 Making a Group Call

Group Call is the function to establish 2-way group voice communications by initiating a call to a group.

The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the All Group ID (\$FFFFFF) for which "ALL" is configured.

If the transceiver receives the All Group ID (\$FFFFFF), the transceiver treats the reception as the reception of an All Group Call, and unmutes the speaker. However, if the **PTT** switch is pressed after the reception of an All Group Call, the transceiver does not reply to the transmitting transceiver by an All Group Call.

Initiating a Group Call

Group Call can be started by one of the following methods:

- **Selecting a channel**

Select a channel with the Group ID for the transmission configured. When a channel is selected and the **PTT** switch is pressed, the transceiver starts a Group Call using Group ID configured for the channel.

If "Transmit/Receive" is configured in **ID Mode** of the selected channel, the transceiver can call or wait for a call on the channel. If "Receive Only" is configured in **ID Mode**, the transceiver can wait for a call on the channel but not make a call.

- **Selcall on PTT**

The transceiver initiates a Group Call when the **PTT** switch is pressed on a channel where "Group Call" is configured in **Selcall on PTT**. The Group ID of the target transceiver can be configured by selecting one Group ID from the Group ID List by using KPG-D1/ D1N.

- **PC command**

The transceiver starts a Group Call upon the receipt of a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

- **Dialing Mode (DMR Tier III Trunking system, S-Trunking system only)**

In Dialing Mode, a Group Call is initiated by directly entering a Group ID and pressing the **PTT** switch. By pressing the **Dialing** key, or by pressing the **Menu** key to enter Menu Mode and then selecting "Dialing", the transceiver enters Dialing Mode.

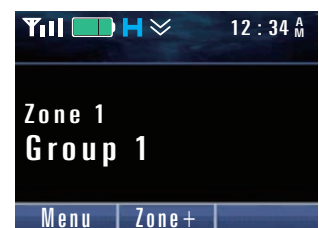
- **Redial Mode (DMR Tier III Trunking system, S-Trunking system only)**

In Redial Mode, a Group Call is initiated by selecting a Group ID and pressing the **PTT** switch. By pressing the **Redial** key, or by pressing the **Menu** key to enter Menu Mode and then selecting "Redial", the transceiver enters Redial Mode.

Operating the transceiver

1

Select a channel configured with a Group ID for making a Group Call.



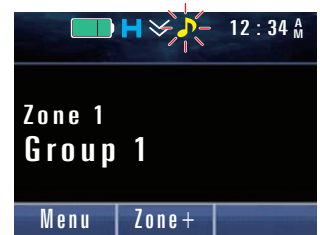
2 Press the **PTT** switch.

A message requesting a Group Call is sent to the system.



3 Receive from the system a message for traffic channel assignment.

The “” icon blinks and the transceiver enters a state allowing communication.



4 Press the **PTT** switch.

The Group Call is initiated.

Even after the **PTT** switch is released to end the transmission, the link between the transceiver and the traffic channel is maintained.

Note

- If **Transmit LED** is enabled, the LED lights red when the transceiver is transmitting. (Refer to Common FUNC Transmit LED.)
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- If **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when the **PTT** switch is pressed to initiate a call request. Also, if **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver while the **PTT** switch is pressed and held after a call request is initiated by pressing the **PTT** switch. (Refer to **Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)**.)
- If **Call in Progress Tone** is enabled, a Call in Progress Tone (2 beeps) sounds from the transceiver when the transceiver becomes ready for transmissions with Group Call.
- If **PTT Proceed Tone** is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)
- The transceiver starts a Group Call only by a user pressing the **PTT** switch if the transceiver transmits on a channel with “Group Call” configured for **Selcall on PTT**. In this case, a Group ID does not need to be selected by using the transceiver.
- For details on the information displayed on the display during transmission, refer to “**Transceiver behavior during transmitting**”.
- Pressing the **Clear** key allows terminating the Group Call. For Mobile, if **On-hook Disconnect** is enabled, a Group Call terminates by placing the microphone in the on-hook state.
- If **Disconnect Indication Tone** is enabled, a Disconnect Indication Tone (2 beeps) sounds from the transceiver when a Group Call is completed.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Configuring **Selcall on PTT** ( **See** Transceiver Settings > Personal > Personality > DMR-based Trunking > Selcall on PTT)

Receiving a Group Call

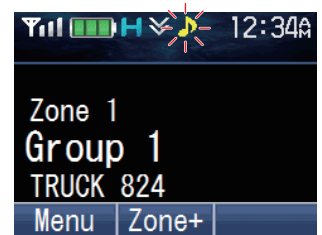
If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Group Call.

Transceiver behavior

1

Receive a Group Call.

The “🔊” icon blinks and a received Group ID appears.
If **Unit ID Display on Group Call** is enabled, the Unit ID of the transmitting transceiver is displayed. (Refer to **Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)**.)



2

Press the PTT switch.

The transceiver can respond to the received Group ID. When a key other than the **PTT** switch is pressed, the configured function will be activated.

Note

- If **Busy LED** is enabled, the LED lights green regardless of whether reception is enabled or disabled on a traffic channel. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when receiving, an Alert Tone will sound from the transceiver according to the configuration in **Alert Tone** that has been configured in the Personality or zone. However, if “Common” is configured in **Alert Tone**, the Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Conference Group Call)** common in DMR-based Trunking.
- If **Selective Call Alert LED** is enabled, the LED flashes when receiving according to the configuration for **Alert LED Color** that has been configured in the Personality or zone. However, if “Common” is configured in **Alert LED Color**, the LED flashes according to the configuration in **Alert LED Color (Conference Group Call)** common in DMR-based Trunking.
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- When the transceiver receives a Group Call from a telephone, if Alert Tone is configured to sound, an Alert Tone will sound from the transceiver according to the configuration in **Alert Tone (Telephone Group Call)**. Also, if **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes according to the configuration in **Alert LED Color (Telephone Group Call)**.
- If **Group ID Scan** is enabled, the transceiver is on standby to receive a Group Call from all Group IDs configured in the Group ID List. (Refer to **Group ID Scan**.)
- The transceiver can record the receipt of a Group Call. The record can be checked in Stack Mode. (Refer to Common FUNC Viewing the Receive History (Stack).)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Group Call.
- When the transceiver receives a Group Call from a telephone, the Encryption function is disabled, and the transceiver communicates without encryption on a traffic channel.
- If the transceiver receives a Group Call from a telephone, the PTT Hold Inhibit function functions with the function always enabled regardless of the FPU settings.
- If the transceiver receives a Group Call from a telephone, **Auto Reset Timer** functions as “0 sec” regardless of the FPU settings.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Alert Tone/ Alert LED Color** (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR-based Trunking)
- Configuring **Alert Tone/ Alert LED Color** (Zone/Channel Information) ( [See](#) Transceiver Settings > Zone/Channel Information > Zone/Channel Information > DMR-based Trunking)
- Configuring **Alert Tone (Conference Group Call)/ Alert Tone (Telephone Group Call)** common in DMR-based Trunking ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Conference Group Call)/ Alert LED Color (Telephone Group Call)** common in DMR-based Trunking ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking > Alert LED Color)

Group ID List

In a DMR-based Trunking system, the Group ID List is used only in Group ID Scan. (Refer to [Group ID Scan](#).)

If **Fleet Dialing Plan** is enabled in a DMR Tier III Trunking system or S-Trunking system, ID can be configured even divided into the Prefix-Fleet-GN format.

Table 2-23 Group ID List

Configuration	Description
ID	A Group ID can be configured in the range between 000001 and FFFCDF (hexadecimal), between 1 and 16776415 (decimal), or "ALL". "ALL" allows initiation of a call to all groups.  Note For All Group ID (ALL), the ID for sending and receiving is fixed to 0xFFFFF.
Prefix	A Prefix number can be configured in the range between 328 and 806.  Note To configure a Prefix number, Fleet Dialing Plan needs to be enabled in a DMR Tier III Trunking system or S-Trunking system.
Fleet	A Fleet number can be configured in the range between 20 and 89.  Note To configure a Fleet number, Fleet Dialing Plan needs to be enabled in a DMR Tier III Trunking system or S-Trunking system.
GN	A Group number can be configured in the range between 900 and 999.  Note To configure a Group number, Fleet Dialing Plan needs to be enabled in a DMR Tier III Trunking system or S-Trunking system.
ID Name	The caller's ID Name is configured. A maximum of 14 characters can be configured for the ID Name. If the ID Name of the group is configured in the Group ID List, the ID Name appears when the transceiver receives a call. If the ID Name is not configured in the Group ID List, the Group ID List number appears.
ID Mode	The permission or inhibition of transmission of the receiving party can be configured. If the transceiver receives a call from an ID for which "Receive Only" is configured for ID Mode, the caller's ID Name appears. In this case, a user cannot initiate a call to the party even if the user attempts to respond by pressing the PTT switch.
Alert Tone	The tone type sounding from the transceiver can be configured for a Group Call from the Group IDs registered in the Group ID List.
Alert LED Color	The color of flashing LED can be configured for a Group Call from the Group IDs registered in the Group ID List.  Note To use Alert LED Color, Selective Call Alert LED needs to be enabled.

Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)

Unit ID Display on Group Call is the function to display the Unit ID of the transmitting transceiver when the transceiver receives a Group Call.

If this function is enabled, the ID Name of the transmitting transceiver is displayed when the transceiver receives a Group Call. (Refer to [Receiving a Group Call](#).)

Configuration using KPG-D1/ D1N

Configuring **Unit ID Display on Group Call** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > General)

Group ID Scan

Group ID Scan is the function to standby to receive multiple Group Calls in a DMR-based Trunking system.

If this function is enabled, the transceiver is on standby to receive a Group Call from a Group ID configured for the channel and all Group IDs configured in the Group ID List.

If this function is disabled, the transceiver is on standby to receive only a Group Call from a Group ID configured for the channel.

Group ID Scan cannot be used at the same time as Single Scan.

Note

- **Group ID Scan** can also be used for communication of data such as Status Message, Short Message, and GPS data.

Configuration using KPG-D1/ D1N

- Configuring **Group ID Scan** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR-based Trunking)
- Configuring **Group ID Scan** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking)

Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only))

Call Alert Inhibit (Group Calls only) is the function that disables the Alert Tone, Selective Call Alert LED, Horn Alert, Vibrator and Caller ID Stack functions when the transceiver receives a Group Call.

Use of this function prevents specific functions from activating as follows even if these functions are enabled or configured to be enabled when the transceiver receives a Group Call.

- **Alert Tone**

The following Alert Tones do not sound from the transceiver even if the transceiver receives a Group Call.

- Alert Tone (Zone Information)
- Conference Group Call (Alert Tone) (Trunking)
- Broadcast Group Call (Alert Tone) (Trunking)

- **Selective Call Alert LED**

A Selective Call Alert LED does not blink even if the transceiver receives a Group Call.

- **Horn Alert (Mobile only)**

The headlights or the horn of a vehicle being connected to the Horn Alert port does not light or sound even if the transceiver receives a Group Call.

- **Vibrator (Portable only)**

The Vibrator does not function even if the transceiver receives a Group Call.

- **Caller ID Stack**

The Caller ID will not be stored in the transceiver stack memory even if the transceiver receives a Group Call.

Note

- This function can be used even with the Broadcast Group Call.

Configuration using KPG-D1/ D1N

Configuring **Call Alert Inhibit (Group Calls only)** to be enabled or disabled ( See Transceiver Settings > DMR > DMR Information > General)

Preventing Reception of a Group Call While the Transceiver Is Receiving an Individual Call (Ignore Group Call during Individual Call)

Ignore Group Call during Individual Call is the function that prevents receipt of a Group Call if receiving an Individual Call.

This function is used to prioritize the receipt of Individual Calls.

If this function is enabled, the transceiver cannot receive a Group Call (including data communications) while receiving an Individual Call and the **Auto Reset Timer** is counting down.

Note

- Even if this function is enabled, the following Group Calls can be received.
 - A Group Call using All Group ID
 - A Group Call for Emergency
- This function can be used even with the Broadcast Group Call.

Configuration using KPG-D1/ D1N

Configuring **Ignore Group Call during Individual Call** to be enabled or disabled ( See Transceiver Settings > DMR > DMR Information > General)

PTT Hold Inhibit

PTT Hold Inhibit can be used to prevent the transmission behavior if transmission is disabled on a traffic channel when the transceiver starts transmitting using Group Call in a DMR-based Trunking system.

While a transceiver transmits a Group Call, another transceiver receiving this Group Call cannot transmit a Group Call. If this function is enabled, the transceiver can notify the user that transmission is disabled even if the **PTT** switch is pressed to transmit when the transceiver is receiving a Group Call while another transceiver is transmitting using Group Call.

Using this function prevent the transceivers maintaining transmission from initiating transmission simultaneously when transmission becomes possible; therefore, the collision of calls can be avoided.

Table 2-24 PTT Hold Inhibit

Configuration	Description
Enabled	If transmission is inhibited on a traffic channel when the transceiver initiates a transmission using Group Call in a DMR-based Trunking system, the transmission behavior is not maintained and the transmission ends immediately. While pressing the PTT switch, the Warning Tone A (continuous beep) sounds from the transceiver and transmission cannot be initiated.
Disabled	If transmission is inhibited on a traffic channel when the transceiver initiates a transmission using Group Call in a DMR-based Trunking system, the transmission behavior is maintained until transmission is available. While pressing the PTT switch, the transmission behavior is maintained. Pressing and holding the PTT switch, transmission will initiate if transmission becomes possible.

Note

- The transmission behavior is maintained regardless of the **PTT Hold Inhibit** configuration while the transceiver is in Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **PTT Hold Inhibit** to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Initiating Another Call While Receiving a Group Call

The following operations are available while the transceiver is receiving a Group Call on the traffic channel:

- **Transmission of Individual Call from Individual Call Mode**

Selecting an Individual ID from the Individual ID List and pressing the **PTT** switch after entering Individual Call Mode initiates an Individual Call. (Refer to [Initiating an Individual Call](#).)

- **Status Message transmission from Status Mode**

Selecting a status from the Status List and pressing the **Menu** ([]) key, [*] key, or **PTT** switch after entering Status Mode sends a Status Message. (Refer to [Sending and Receiving a Status Message \(Status Call\)](#).)

- **Short Message transmission from Short Message Mode**

A Short Message is entered after entering Short Message Mode. Pressing the **PTT** switch or the **Menu** ([]) key sends a Status Message. (Refer to [Sending and Receiving a Short Message \(Short Data Call\)](#).)

- **Telephone Call transmission from Autodial Mode**

Pressing the **PTT** switch or the **Menu** ([]) key after entering Autodial Mode and then selecting a telephone number from the Autodial List sends a Telephone Call. (Refer to [Initiating a Telephone Call](#).)

- **Remote Control message transmission from Remote Control Mode**

The message to be sent is selected from the options menu after entering Remote Control Mode. Pressing the **Menu** ([]) key, [*] key, or **PTT** switch sends the Remote Control message. (Refer to [Remote Operation by Radio Communication \(Remote Control\)](#).)

Note

- In this case, a Telephone Call is initiated after the transceiver migrates from a traffic channel to a control channel.

- **Individual Call transmission from Stack Mode**

Selecting the receive history in Stack Mode and pressing the **PTT** switch initiates an Individual Call. (Refer to [Common FUNC Viewing the Receive History \(Stack\)](#).)

- **GPS Data transmission**

GPS data can be sent manually by a user pressing the **Send the GPS Data** key. Also, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the GPS data can also be sent by selecting "Send GPS Data". (Refer to [Sending GPS Data](#), [Common FUNC Using Menu Mode](#).)

- **BLE Data transmission**

BLE data can be sent manually by a user pressing the **Send the BLE Data** key. Also, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the BLE data can also be sent by selecting "Send the Location Data". (Refer to [Sending BLE Data Manually by Using a Key \(Send the Location Data \(Indoor Location\)\)](#), [Common FUNC Using Menu Mode](#).)

- **Call transmission by using a Call key**

Pressing one of the **Call 1** to **Call 6** keys sends the request message preconfigured in the transceiver for the following Call to the system: (Refer to [Initiating an Individual Call](#), [Sending and Receiving a Status Message \(Status Call\)](#), and [Initiating a Telephone Call](#).)

- Individual Call
- Status Data Call
- Telephone Call

● Transmission from Dialing Mode

The transceiver can make various calls by entering a dialing code in Dialing Mode. By pressing the **Dialing** key, or by pressing the **Menu** key to enter Menu Mode and then selecting “Dialing”, the transceiver enters Dialing Mode. (Refer to [Executing Various Communications by Using the Dialing Function.](#))

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)

2.9 Making an Informative Group Call (Broadcast Group Call)

Broadcast Group Call can be used to engage in one-way informative group voice calls by initiating a call to a group. The transceiver can initiate a call to the transceivers having the same Group ID by specifying the Group ID. The transceiver can also initiate a call to all transceivers by specifying the Group ID for which “ALL” is configured.

Initiating a Broadcast Call

Broadcast Group Call can be started by one of the following methods:

● Broadcast key

Broadcast Call information is added to a Group Call and sent by the transceiver initiating a Group Call while Broadcast Group Call is enabled.

Pressing the **Broadcast** key toggles the Broadcast Group Call between enabled and disabled.

If the **Menu** key is pressed to enter Menu Mode and then “Broadcast” is selected, Broadcast Group Call can also be toggled between enabled and disabled. (Refer to Common FUNC Using Menu Mode.)

● PC command

The transceiver starts a Broadcast Group Call upon the receipt of a PC command from the communication port. To use a PC command, “Data”, “Data + GPS Data Output”, or “Data + Location Data Output” needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

● Dialing Mode (DMR Tier III Trunking system, S-Trunking system only)

In Dialing Mode, a Broadcast Group Call is initiated by directly entering a Broadcast code and pressing the **PTT** switch.

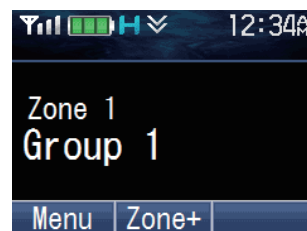
By pressing the **Dialing** key, or by pressing the **Menu** key to enter Menu Mode and then selecting “Dialing”, the transceiver enters Dialing Mode.

● Redial Mode (DMR Tier III Trunking system, S-Trunking system only)

In Redial Mode, a Broadcast Group Call is initiated by entering a Broadcast code and pressing the **PTT** switch. By pressing the **Redial** key, or by pressing the **Menu** key to enter Menu Mode and then selecting “Redial”, the transceiver enters Redial Mode.

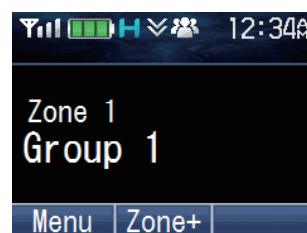
Operating the transceiver

1 Select a channel configured with a Group ID for making a Broadcast Group Call.



2 Press the **Broadcast** key.

The “” icon appears and then Broadcast Group Call will be enabled. The following operations are identical even if Broadcast Group Call is enabled by pressing the **Menu** key.



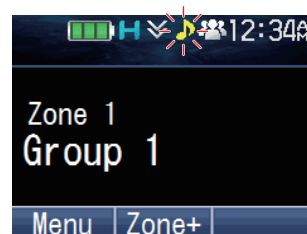
3 Press the **PTT** switch.

A message requesting a Broadcast Group Call is sent to a system.



4 Receive from the system a message for traffic channel assignment.

The “” icon blinks and the transceiver enters a state allowing communication.



5 Press the **PTT** switch.

The Broadcast Group Call is initiated.

Even after the **PTT** switch is released to end the transmission, the link between the transceiver and the traffic channel is maintained.

Pressing the **Broadcast** key after the transmission causes Broadcast Group Call to be disabled.

Note

- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- The transceiver cannot transmit the Broadcast Group Call by specifying the All Group ID.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

Receiving a Broadcast Group Call

If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Broadcast Group Call.

Note

- The transceiver can receive the Broadcast Group Call initiated using the Group ID for which “ALL” is configured even if no Group ID is configured for the transceiver.

Operating the transceiver

Press the **Broadcast** key.

The “” icon blinks, and then “Broadcast” and a received Group ID appear.

If **Unit ID Display on Group Call** is enabled, the ID Name of the transmitting transceiver is displayed. (Refer to **Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)**.)



Note

- If **Busy LED** is enabled, the LED lights green when the transceiver is receiving. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when the transceiver is receiving, an Alert Tone will sound from the transceiver according to the configuration in **Alert Tone (Broadcast Group Call)**.
- If **Selective Call Alert LED** is enabled, the LED flashes when the transceiver is receiving according to the configuration in **Alert LED Color (Broadcast Group Call)**.
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- A user cannot reply to the received Group ID. Pressing the **PTT** switch causes “Receive Only” to appear on the transceiver display.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( See Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( See Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Alert Tone (Broadcast Group Call)** ( See Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Broadcast Group Call)** ( See Transceiver Settings > DMR > DMR Information > Trunking > Alert LED Color)

2.10 Common Functions for Data Communications

The following functions are used in common for data communications such as Status Call and Short Data Call:

- Number of Retries
- Maximum ACK Wait Time

Number of Retries

If the transceiver does not receive the acknowledgment after the transceiver sends data and the time configured for **Maximum ACK Wait Time** elapses, the transceiver resends data. **Number of Retries** is the number of times for the transceiver to resend data. A smaller number can be configured if there is good communicating conditions, and a larger number can be configured if there are inferior communicating conditions.

Configuration using KPG-D1/ D1N

Configuring **Number of Retries** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Parameters)

Maximum ACK Wait Time

Maximum ACK Wait Time is the length of time that the transceiver stands by to receive the acknowledgment after the transceiver sends data.

If the transceiver does not receive the acknowledgment within the time configured for **Maximum ACK Wait Time**, the transceiver resends data.

Note

- A Long Data Message transmits data divided over multiple times. The receiving transceiver stands by to receive the next data for the time configured for **Maximum ACK Wait Time** after receiving the previous data. The transceiver exits Long Data Message Receive Mode if the transceiver does not receive any data during the period.

Configuration using KPG-D1/ D1N

Configuring **Maximum ACK Wait Time** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Parameters)

2.11 Sending and Receiving a Status Message (Status Call)

Refer to “[Sending and Receiving a Status Message \(Status Call\)](#)” in 1 DMR CONVENTIONAL SYSTEM.

- **Power-on Status Message**

Refer to “[Power-on Status Message](#)” in 1 DMR CONVENTIONAL SYSTEM.

- **Power-off Status Message**

Refer to “[Power-off Status Message](#)” in 1 DMR CONVENTIONAL SYSTEM.

2.12 Sending and Receiving a Short Message (Short Data Call)

Refer to “[Sending and Receiving a Short Message \(Short Data Call\)](#)” in 1 DMR CONVENTIONAL SYSTEM.

2.13 Sending and Receiving a Long Message (Long Data Call)

Refer to “[Sending and Receiving a Long Message \(Long Data Call\)](#)” in 1 DMR CONVENTIONAL SYSTEM.

2.14 Communicating with a Telephone (Telephone Call)

Telephone Call is the function to initiate voice communications using a telephone by connecting to a telephone line such as PSTN and PABX.

A call can be initiated from the transceiver to a telephone, and from a telephone to the transceiver.

Initiating a Telephone Call

A Telephone Call can be initiated by one of the following methods:

- **Autodial Mode**

In Autodial Mode, a Telephone Call is initiated by selecting a DTMF code configured in the Autodial List, or directly entering a DTMF code and pressing the **PTT** switch.

To make a Telephone Call from Autodial Mode, "01" needs to be added to the beginning of the DTMF code for a PSTN telephone line, and "02" needs to be added to the beginning of the DTMF code for a PABX telephone line.

Pressing the **Autodial** key places the transceiver in Autodial Mode.

The transceiver can also be placed in Autodial Mode by executing "Autodial" after placing the transceiver in Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

Or, if "Autodial" is configured in **Keypad Operation**, pressing a key on the keypad causes the transceiver to enter Autodial Mode. The transceiver will be on hold as the first digit of the DTMF code is entered. A Telephone Call is initiated by entering a DTMF code and pressing the **PTT** switch.

- **Call key**

A Telephone Call can be initiated by pressing one of the **Call 1** to **Call 6** keys. A DTMF code of the target transceiver can be configured for the **Call 1** to **Call 6** keys by selecting one DTMF code from the Autodial List by using KPG-D1/ D1N.

- **Selcall on PTT**

The transceiver initiates a Telephone Call when the **PTT** switch is pressed on a channel where "Telephone Call" is configured in **Selcall on PTT**. A DTMF code of the target transceiver can be configured by selecting one DTMF code from the Autodial List by using KPG-D1/ D1N.

- **Dialing Mode (DMR Tier III Trunking system, S-Trunking system only)**

In Dialing Mode, a PABX Call or PSTN Call is initiated by directly entering the code of the PABX Call or PSTN Call and pressing the **PTT** switch. By pressing the **Dialing** key, or by pressing the **Menu** key to enter Menu Mode and then selecting "Dialing", the transceiver enters Dialing Mode.

- **Redial Mode (DMR Tier III Trunking system, S-Trunking system only)**

In Redial Mode, a PABX Call or PSTN Call is initiated by selecting the code of the PABX Call or PSTN Call and pressing the **PTT** switch. By pressing the **Redial** key, or by pressing the **Menu** key to enter Menu Mode and then selecting "Redial", the transceiver enters Redial Mode.

- **Response to incoming calls**

When the transceiver receives a Telephone Call, the transceiver can respond to the transmitting telephone by pressing the **PTT** switch, or the **Call Response** key while "PABX" or "PSTN" appears on the main display.

For Mobile, when **Off-hook Connect** is enabled, the transceiver can respond to the transmitting telephone by placing the microphone in the off-hook state.

 Note

- When the transceiver receives a Telephone Call, the Encryption function is disabled, and the transceiver communicates without encryption on a traffic channel.
- If the transceiver receives a Telephone Call, **Auto Reset Timer** functions as "0 sec" regardless of the FPU settings.

The following describes how to initiate a Telephone Call in Autodial Mode if **Store and Send** is disabled.

Operating the transceiver

● Initiating a Telephone Call by selecting a DTMF code from the Autodial List

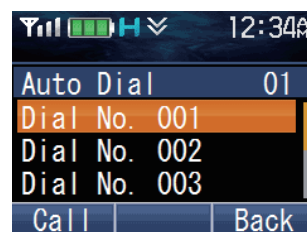
1 Press the **Autodial** key.

The transceiver enters Autodial Mode and then the Autodial List selection display appears.

The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.

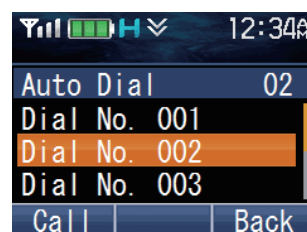
Note

- If **Store and Send** is enabled, the DTMF code entry display will appear. Pressing the **Function** ([O]) key causes the transceiver to switch to the selection screen for the Autodial List.



2 Press the [▲] or [▼] key to select the DTMF code to be sent from the Autodial List.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the **PTT** switch or the **Menu** ([□]) key.

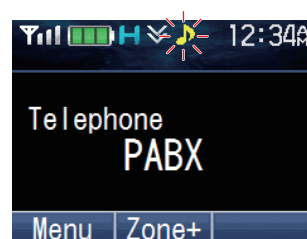
The transceiver initiates the Telephone Call.

"Telephone", the name or code of the target transceiver, and "Calling" appear.



4 Receive from the system a message for traffic channel assignment.

"📞" icon blinks, and then "PABX" or "PSTN" appears and the audio of the traffic channel sounds.



5 Press the **PTT** switch.

A user can start conversations.

● Initiating a Telephone Call by directly entering a DTMF code

1

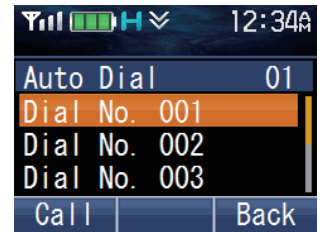
Press the **Autodial** key.

The transceiver enters Autodial Mode and then the Autodial List selection display appears.

The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.

Note

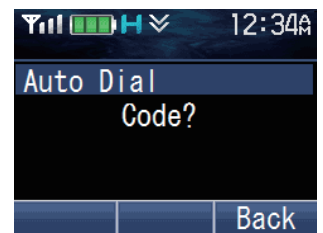
- If **Store and Send** is enabled, the DTMF code entry display will appear.



2

Press the **Function** ([**○**]) key.

The DTMF code entry display appears.



3

Enter a DTMF code.

Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

● If using the keypad

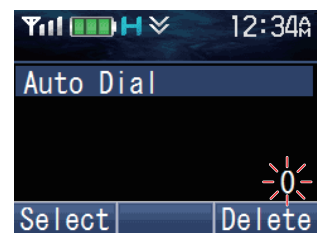
Press a key on the keypad to enter a DTMF code.

● If using the PF keys

Press the [**▲**] key or the [**▼**] key to enter a DTMF code, and press the **Menu** ([**□**]) key to confirm the entered DTMF code.

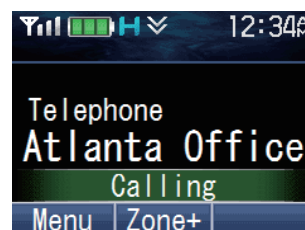
Note

- To enter the DTMF "A" code, press and hold the [*] key and then press the [2] key.
- To enter the DTMF "B" code, press and hold the [*] key and then press the [5] key.
- To enter the DTMF "C" code, press and hold the [*] key and then press the [8] key.
- To enter the DTMF "D" code, press and hold the [*] key and then press the [0] key.
- To enter the DTMF "*" code, press the [*] key twice.
- To enter the DTMF "#" code, press the [*] key, and then press the [#] key.
- If "Direct Entry" is configured in *** and # key-entry Pattern**, pressing the [*] key or [#] key directly enters the "*" or "#" tone. In this case, the above operations are unavailable.



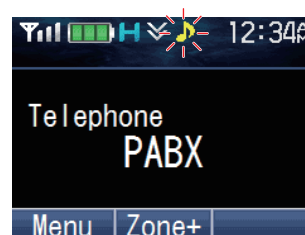
4 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver initiates the Telephone Call.
“Telephone”, the name or code of the target transceiver, and “Calling” appear.



5 Receive from the system a message for traffic channel assignment.

“” icon blinks, and then “PABX” or “PSTN” appears and the audio of the traffic channel sounds.



6 Press the **PTT** switch.

A user can start conversations.

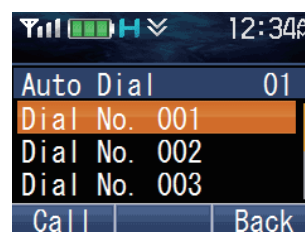
● Redialing

1 Press the **Autodial** key.

The transceiver enters Autodial Mode and then the Autodial List selection display appears.
The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key or with keypad entry.

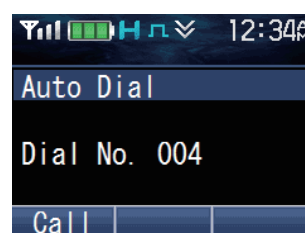
Note

- If **Store and Send** is enabled, the DTMF code entry display will appear.
Pressing the **Function** ([]) key causes the transceiver to switch to the selection screen for the Autodial List.



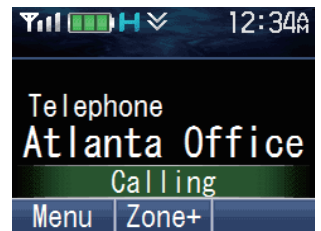
2 Press the [*] key and then press the [0] key.

The name or DTMF code of the target transceiver of the last transmission appears.



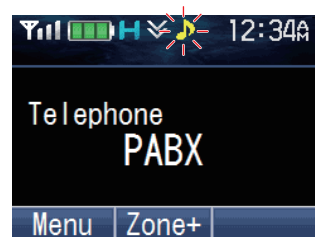
3 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver initiates the Telephone Call.
"Telephone", the name or code of the target transceiver, and "Calling" appear.



4 Receive from the system a message for traffic channel assignment.

"📞" icon blinks, and then "PABX" or "PSTN" appears and the audio of the traffic channel sounds.



5 Press the **PTT** switch.

A user can start conversations.

Note

- If **Transmit LED** is enabled, the LED lights red when the transceiver is transmitting. (Refer to Common FUNC Transmit LED.)
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- If **Call Request Tone** is enabled, a Call Request Tone sounds from the transceiver when the **PTT** switch is pressed to initiate a call request. Also, if **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver until the transceiver receives from the system a message for traffic channel assignment after the call requesting a Telephone Call is initiated. (Refer to **Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)**.)
- If **Call in Progress Tone** is enabled, a Call in Progress Tone (2 beeps) sounds from the transceiver when the transceiver becomes ready for communications.
- If **PTT Proceed Tone** is enabled, a Proceed Tone (3 beeps) sounds from the transceiver when the transceiver becomes ready for communications after the **PTT** switch is pressed. (Refer to Common FUNC Using Sound to Notify the Timing to Start Communications (PTT Proceed Tone).)
- Pressing the **Clear** key terminates a Telephone Call. For Mobile, if the **Mic On-hook Disconnect** is enabled, a Telephone Call terminates by placing the microphone in the on-hook state.
- If **Disconnect Indication Tone** is enabled, a Disconnect Indication Tone (2 beeps) sounds from the transceiver when the communication ends.
- For details on the information displayed on the display during transmission, refer to "**Transceiver behavior during transmitting**".

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Selcall on PTT** ( [See](#) Transceiver Settings > Personal > Personality > DMR-based Trunking > Selcall on PTT)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Call Request Tone** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Call in Progress Tone** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **PTT Proceed Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Disconnect Indication Tone** to be enabled or disabled ( [See](#) Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring the DTMF code corresponding to the **Call 1** to **Call 6** keys or the ports ( [See](#) Transceiver Settings > Key Assignment > Call)

Receiving a Telephone Call

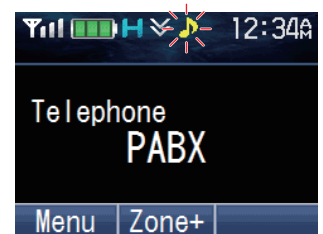
The transceiver can receive a Telephone Call from a telephone.

Operating the transceiver

1

Receive a Telephone Call.

The “” icon blinks, and then “Telephone” and “PABX” or “PSTN” appear.



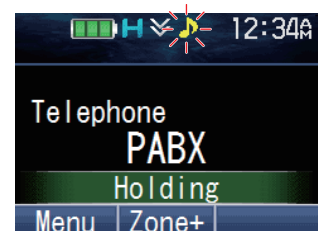
2

Press the **PTT** switch or the **Call Response** key.

The transceiver responds to the transmitting telephone.

Note

- For Mobile, when **Off-hook Connect** is enabled, the transceiver can respond to the transmitting telephone by placing the microphone in the off-hook state.



3 Receive from the system a message for traffic channel assignment.

Audio sounds on the traffic channel.



4 Press the **PTT** switch.

A user can start conversations.

Note

- An Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Telephone Individual Call)** when the transceiver receives a Telephone Call by Individual Call.
- If **Telephone Call Alert LED** is enabled, the LED flashes according to the configuration in **Alert LED Color (Telephone Individual Call)**.
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)

Configuration using KPG-D1/ D1N

- Configuring **Off-hook Connect** to be enabled or disabled (See Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)
- Configuring **Alert Tone (Telephone Individual Call)** (See Transceiver Settings > DMR > DMR Information > Trunking > Alert Tone)
- Configuring **Telephone Call Alert LED** to be enabled or disabled (See Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled (See Transceiver Settings > DMR > DMR Information > Trunking)
- Configuring **Alert LED Color (Telephone Individual Call)** (See Transceiver Settings > DMR > DMR Information > Trunking > Alert LED Color)

2.15 Executing Various Communications by Using the Dialing Function

Dialing is the function to execute various communications by using a dialing code corresponding to the standard. If the Dialing function is used, the Dialing standards described in ETSI TS 102 361-4 Annex E are followed. Also, in this case, for Unit IDs and Group IDs, the ID system converted according to this standard is used.

Configurations for Using the Dialing Function

To use the Dialing function, the following configurations need to be configured:

- **Fleet Dialing Plan**

Whether to use the Dialing function by the transceiver is configured.

- **Various configurations for Dialing Codes**

Whether to permit the transmission by using various communications in Dialing Mode is configured.

Fleet Dialing Plan

Whether to use the Dialing function by the transceiver can be configured.

The transceiver behavior varies as follows depending on the configuration in **Fleet Dialing Plan** of a DMR Tier III Trunking system and S-Trunking system:

Table 2-25 Fleet Dialing Plan

Fleet Dialing Plan	Description
Enabled	The Dialing function can be used by the transceiver. For a Unit ID and Group ID, the format converted from a DMR ID 1 to 16776415 and divided into Number Prefix (NP), Fleet Individual Number (FIN), and Individual Number (IN)/Group Number (GN) is used.
Disabled	The Dialing function cannot be used by the transceiver. For a Unit ID and Group ID, a DMR ID 1 to 16776415 is used.

Various configurations for Dialing Codes

Whether to permit the transmission by using various communications in Dialing Mode can be configured. In Dialing Mode, the various types of communications can be initiated. With this configuration, the transmission can be restricted by the types of communications.

With the following configurations, the transmission will be permitted or will not be permitted by the types of communications in Dialing Mode.

Table 2-26 Various Configurations for Dialing Codes

Configuration	Description
PABX Call	Configures whether to permit the transmission of a PABX Call in Dialing Mode.
PSTN Call	Configures whether to permit the transmission of a PSTN Call in Dialing Mode.
All Call	Configures whether to permit the transmission of an All Call in Dialing Mode.
Priority Call	Configures whether to permit the transmission of a Priority Call in Dialing Mode.
Emergency Call	Configures whether to permit the transmission of an Emergency Call in Dialing Mode.
Broadcast Call	Configures whether to permit the transmission of a Broadcast Call in Dialing Mode.
Status Call	Configures whether to permit the transmission of a Status Call in Dialing Mode.
Short Data Call	Configures whether to permit the transmission of a Short Data Call in Dialing Mode.
Interfleet Individual Call	Configures whether to permit the transmission of an Individual Call to a Fleet other than the own Fleet Individual Number (FIN) in Dialing Mode.
Interfleet Group Call	Configures whether to permit the transmission of a Group Call to a Fleet other than the own Fleet Group Number (FGN) in Dialing Mode.
Interprefix Individual Call	Configures whether to permit the transmission of an Individual Call to a Prefix other than the own Number Prefix (NP) in Dialing Mode. To permit an Interprefix Individual Call, an Interfleet Individual Call needs to be permitted.
Interprefix Group Call	Configures whether to permit the transmission of a Group Call to a Prefix other than the own Number Prefix (NP) in Dialing Mode. To permit an Interprefix Group Call, an Interfleet Group Call needs to be permitted.
Range of Individual Numbers	Configures in the own Fleet Individual Number (FIN) the upper limit of an Individual Number (IN) for which the transmission of an Individual Call is permitted in Dialing Mode.
Range of Group Numbers	Configures in the own Fleet Group Number (FGN) the upper limit of a Group Number (GN) for which the transmission of a Group Call is permitted in Dialing Mode.

Note

- The configuration for Dialing Codes does not influence the receiving behavior of the transceiver.

Configuration using KPG-D1/ D1N

Configuring whether to permit the transmission by using various communications in Dialing Mode

( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Dialing Codes)

Available Dialing Codes

The following are the dialing codes available in Dialing Mode and the configuration conditions required for communications:

Table 2-27 Available Dialing Codes List

Communication Type	Priority	Dialing Code	Dialing Code Configuration Conditions
Individual Call Destination n = 3 digits (IN)	Normal	nnn	• Within the range in Range of Individual Numbers
	High Priority	*8*nnn	• Within the range in Range of Individual Numbers • Permitting a Priority Call
	Emergency	*9*nnn	• Within the range in Range of Individual Numbers • Permitting an Emergency Call
Interfleet Individual Call Destination n = 5 digits (FIN+IN)	Normal	nnnnn	• Permitting an Interfleet Individual Call
	High Priority	*8*nnnnn	• Permitting an Interfleet Individual Call • Permitting a Priority Call
	Emergency	*9*nnnnn	• Permitting an Interfleet Individual Call • Permitting an Emergency Call
Interprefix Individual Call Destination n = 8 digits (NP+FIN+IN)	Normal	nnnnnnnn	• Permitting an Interfleet Individual Call • Permitting an Interprefix Individual Call
	High Priority	*8*nnnnnnnn	• Permitting an Interfleet Individual Call • Permitting an Interprefix Individual Call • Permitting a Priority Call
	Emergency	*9*nnnnnnnn	• Permitting an Interfleet Individual Call • Permitting an Interprefix Individual Call • Permitting an Emergency Call
Group Call Destination n = 3 digits (GN)	Normal	nnn	• Within the range in Range of Group Numbers
	High Priority	*8*nnn	• Within the range in Range of Group Numbers • Permitting a Priority Call
	Emergency	*9*nnn	• Within the range in Range of Group Numbers • Permitting an Emergency Call
Interfleet Group Call Destination n = 5 digits (FGN+GN)	Normal	nnnnn	• Permitting an Interfleet Group Call
	High Priority	*8*nnnnn	• Permitting an Interfleet Group Call • Permitting a Priority Call
	Emergency	*9*nnnnn	• Permitting an Interfleet Group Call • Permitting an Emergency Call
Interprefix Group Call Destination n = 8 digits (NP+FGN+GN)	Normal	nnnnnnnn	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call
	High Priority	*8*nnnnnnnn	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call • Permitting a Priority Call
	Emergency	*9*nnnnnnnn	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call • Permitting an Emergency Call

Communication Type	Priority	Dialing Code	Dialing Code Configuration Conditions
Broadcast Group Call Destination n = 3 digits (GN)	Normal	*11*nnn	• Within the range in Range of Group Numbers • Permitting a Broadcast Call
	High Priority	*11*8*nnn *8*11*nnn	• Within the range in Range of Group Numbers • Permitting a Broadcast Call • Permitting a Priority Call
	Emergency	*11*9*nnn *9*11*nnn	• Within the range in Range of Group Numbers • Permitting a Broadcast Call • Permitting an Emergency Call
Interfleet Broadcast Group Call Destination n = 5 digits (FGN+GN)	Normal	*11*nnnnn	• Permitting an Interfleet Group Call • Permitting a Broadcast Call
	High Priority	*11*8*nnnnn *8*11*nnnnn	• Permitting an Interfleet Group Call • Permitting a Broadcast Call • Permitting a Priority Call
	Emergency	*11*9*nnnnn *9*11*nnnnn	• Permitting an Interfleet Group Call • Permitting a Broadcast Call • Permitting an Emergency Call
Interprefix Broadcast Group Call Destination n = 8 digits (NP+FGN+GN)	Normal	*11*nnnnnnnn	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call • Permitting a Broadcast Call
	High Priority	*11*8*nnnnnnnn *8*11*nnnnnnnn	• Permitting an Interprefix Group Call • Permitting an Interfleet Group Call • Permitting a Broadcast Call • Permitting a Priority Call
	Emergency	*11*9*nnnnnnnn *9*11*nnnnnnnn	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call • Permitting a Broadcast Call • Permitting an Emergency Call
All Group Call	Normal	*1987	• Permitting an All Call
	High Priority	*1981	• Permitting an All Call • Permitting a Priority Call
	Emergency	*1982	• Permitting an All Call • Permitting an Emergency Call
PSTN Call Destination n = 1 digit to 32 digits	Normal	01n...	• Permitting a PSTN Call
	High Priority	*8*01n...	• Permitting a PSTN Call • Permitting a Priority Call
	Emergency	*9*01n...	• Permitting a PSTN Call • Permitting an Emergency Call
PABX Call Destination n = 1 digit to 32 digits	Normal	02n...	• Permitting a PABX Call
	High Priority	*8*02n...	• Permitting a PABX Call • Permitting a Priority Call
	Emergency	*9*02n...	• Permitting a PABX Call • Permitting an Emergency Call

Communication Type	Priority	Dialing Code	Dialing Code Configuration Conditions
Individual Status Call Destination n = 3 digits (IN) Status number s = 00 to 99	-	*0ss*nnn	• Within the range in Range of Individual Numbers • Permitting a Status Call
Interfleet Individual Status Call Destination n = 5 digits (FIN+IN) Status number s = 00 to 99	-	*0ss*nnnnn	• Permitting an Interfleet Individual Call • Permitting a Status Call
Interprefix Individual Status Call Destination n = 8 digits (NP+FIN+IN) Status number s = 00 to 99	-	*0ss*nnnnnnnn	• Permitting an Interfleet Individual Call • Permitting an Interprefix Individual Call • Permitting a Status Call
Group Status Call Destination n = 3 digits (GN) Status number s = 00 to 99	-	*0ss*nnn	• Within the range in Range of Group Numbers • Permitting a Status Call
Interfleet Group Status Call Destination n = 5 digits (FGN+GN) Status number s = 00 to 99	-	*0ss*nnnnn	• Permitting an Interfleet Group Call • Permitting a Status Call
Interprefix Group Status Call Destination n = 8 digits (NP+FGN+GN) Status number s = 00 to 99	-	*0ss*nnnnnnnn	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call • Permitting a Status Call
Individual Short Data Call Destination n = 3 digits (IN) Short Message d = 1 digit to 489 digits	-	*2*nnn*ddd...	• Within the range in Range of Individual Numbers • Permitting a Short Data Call
Interfleet Individual Short Data Call Destination n = 5 digits (FIN+IN) Short Message d = 1 digit to 489 digits	-	*2*nnnnn*ddd...	• Permitting an Interfleet Individual Call • Permitting a Short Data Call
Interprefix Individual Short Data Call Destination n = 8 digits (NP+FIN+IN) Short Message d = 1 digit to 489 digits	-	*2*nnnnnnnn*ddd...	• Permitting an Interfleet Individual Call • Permitting an Interprefix Individual Call • Permitting a Short Data Call
Group Short Data Call Destination n = 3 digits (GN) Short Message d = 1 digit to 365 digits	-	*2*nnn*ddd...	• Within the range in Range of Group Numbers • Permitting a Short Data Call
Interfleet Group Short Data Call Destination n = 5 digits (FGN+GN) Short Message d = 1 digit to 365 digits	-	*2*nnnnn*ddd...	• Permitting an Interfleet Group Call • Permitting a Short Data Call
Interprefix Group Short Data Call Destination n = 8 digits (NP+FGN+GN) Short Message d = 1 digit to 365 digits	-	*2*nnnnnnnn*ddd...	• Permitting an Interfleet Group Call • Permitting an Interprefix Group Call • Permitting a Short Data Call

 Note

- A communication whose priority is High Priority will be a Priority Call. A Priority Call is controlled by the system, and a traffic channel can be assigned preferentially. However, the receiving transceiver is not notified that the call is a Priority Call.
- A communication whose priority is Emergency will be an Emergency Call. The receiving transceiver is notified that the call is an Emergency Call, and the transceiver notifies a user that the call is an Emergency Call according to the configuration of the transceiver. Also, an Emergency Call is controlled by the system, and a traffic channel can be assigned preferentially.

Initiating a Communication in Dialing Mode

The various communications can be initiated by entering a dialing code in Dialing Mode.

One of the following methods can place the transceiver in Dialing Mode:

- **Dialing key**

Pressing the **Dialing** key places the transceiver in Dialing Mode.

- **Menu key**

Pressing the **Menu** key places the transceiver in Menu Mode, and then the transceiver enters Dialing Mode by selecting "Dialing".

- **Keypad Operation**

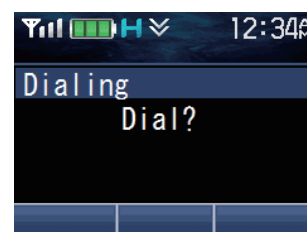
If "Dialing" is configured in **Keypad Operation**, pressing the [0] key to [9] key, [*] key, or [#] key on the transceiver keypad causes the transceiver to enter Dialing Mode. The transceiver will be on hold as the first digit of the dialing code is entered.

Operating the transceiver

1 Press the **Dialing** key.

The transceiver enters Dialing Mode.

The following operations are identical even if the transceiver enters Dialing Mode by pressing the **Menu** key or with keypad entry.



2 Enter a dialing code.

Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

- **If using the keypad**

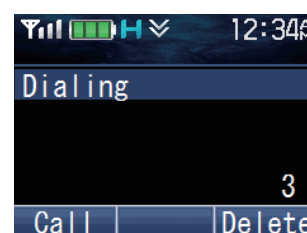
A dialing code can be entered by pressing the [0] key to [9] key.

- **If using the PF keys**

Press the [▲] key or the [▼] key to enter a dialing code, and press the **Menu** ([□]) key or [*] key to confirm the entered dialing code.



- While "Direct Entry" is configured in *** and # key-entry Pattern (DMR Dialing)**, pressing the [*] key or [#] key can directly enter "*" or "#".

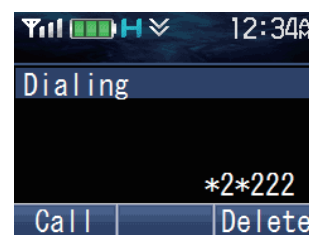


3 Press the **PTT** switch, the **Menu** ([□]) key, or the [#] key.

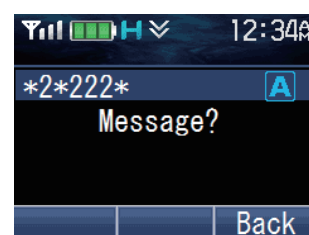
The various communications can be initiated according to the entered dialing code.

- If sending a Short Data Call:

- 1 In Dialing Mode, enter the destination (*2*destination*) after the dialing code which specifies a Short Data Call.

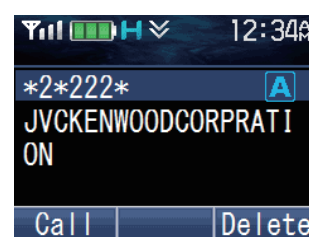


The Short Message entry screen appears.



- 2 Enter a Short Message.

For a Group call, a maximum of 365 characters can be entered, and for an Individual Call, a maximum of 489 characters can be entered. Refer to Common FUNC "Entering or Deleting Characters" for the entry method.

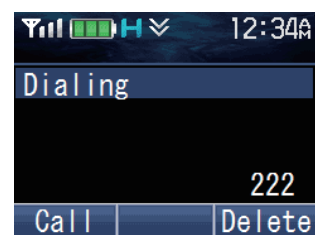


- 3 Press the **PTT** switch, the **Menu** ([]) key, or the **[#]** key.

The transceiver sends the Short Data Call to the entered destination.

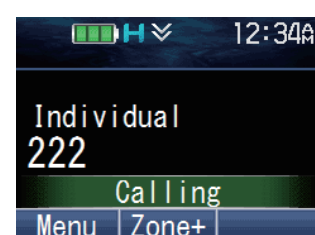
- If sending an Individual Call:

1 In Dialing Mode, enter a 3-digit Individual Number.



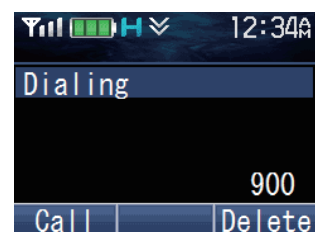
2 Press the PTT switch, the Menu ([F]) key, or the [#] key.

The transceiver sends the Individual Call to the entered destination.



- If sending a Group Call:

1 In Dialing Mode, enter a 3-digit Group Number.



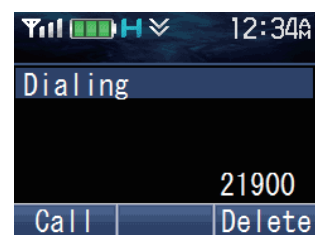
2 Press the PTT switch, the Menu ([F]) key, or the [#] key.

The transceiver sends the Group Call to the entered destination.



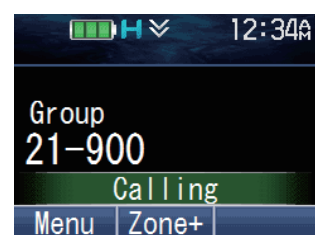
- If sending an Interfleet Group Call:

1 In Dialing Mode, enter a 2-digit Fleet and a 3-digit Group Number.



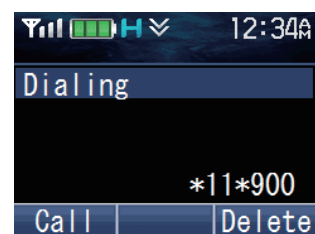
2 Press the **PTT** switch, the **Menu** ([]) key, or the **[#]** key.

The transceiver sends the Interfleet Group Call to the entered destination.



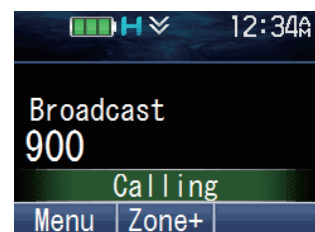
- If sending a Broadcast Group Call:

1 In Dialing Mode, enter the destination Group Number after the Control Code which specifies Broadcast.



2 Press the **PTT** switch, the **Menu** ([]) key, or the **[#]** key.

The transceiver sends the Broadcast Group Call to the entered destination.



● If sending an All Call:

1 In Dialing Mode, enter the Control Code which specifies an All Call.



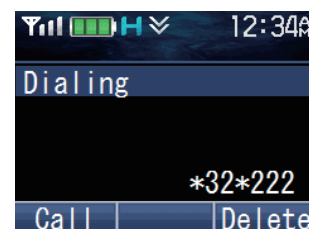
2 Press the **PTT** switch, the **Menu** ([]) key, or the **[#]** key.

The transceiver sends the All Call to the entered destination.



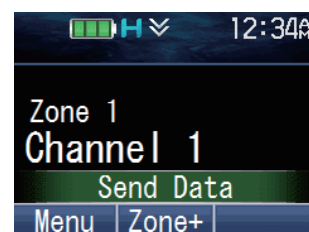
● If sending a Status Call:

1 In Dialing Mode, enter the destination after the Control Code which specifies a Status Call.



2 Press the **PTT** switch, the **Menu** ([]) key, or the **[#]** key.

The transceiver sends the Status to the entered destination and with the entered Status.



Note

- If an invalid dialing code is entered, and then the **PTT** switch, the **Menu** ([]) or the **[#]** key is pressed, an Invalid Dialing Entry Tone (1 beep) sounds from the transceiver, "Invalid Entry" appears on the display, and the dialing code entry screen is restored.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

Initiating a Communication in Redial Mode

A dialing code entered in the past can be sent again by selecting the code from the dialing history list.

In Redial Mode, the latest 3 records are displayed, and a code can be sent by selecting the code from the dialing history list.

One of the following methods can place the transceiver in Redial Mode:

- **Redial key**

Pressing the **Redial** key places the transceiver in Redial Mode.

- **Menu key**

Pressing the **Menu** key places the transceiver in Menu Mode, and then the transceiver enters Redial Mode by selecting "Redial".

Note

- Only the available dialing codes which were sent in Dialing Mode can be retained in the dialing history list. Even if multiple systems are used, all dialing codes are retained in a single dialing history list.
- The dialing code which has already been retained in the dialing history list is not redundantly retained. However, the dialing history list is updated to place the dialing code sent last at the top of the list.
- The dialing history list is retained only while the transceiver is turned on, and the list will be deleted when the transceiver is turned off.
- Broadcast Mode is reset if the transceiver enters Redial Mode.

Operating the transceiver

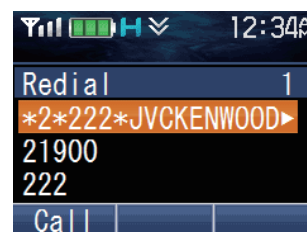
1 Press the **Redial** key.

The transceiver enters Redial Mode and then the dialing code selection display appears.

The following operations are identical even if the transceiver enters Redial Mode by pressing the **Menu** key.

Note

- If no dialing code is retained, a Key-entry Error Tone (1 beep) sounds from the transceiver, "Empty" appears on the display for 1 sec, and the transceiver does not enter Redial Mode.

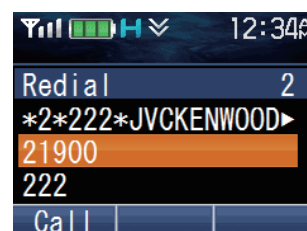


2 Press the [▲] or [▼] key and select the dialing code.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.

Note

- If the **Menu** ([□]) key is pressed, a Key Beep A (1 beep) sounds from the transceiver, and the selected dialing code is displayed. Pressing the **Menu** ([□]) key again restores the list display.



3 Press the **PTT** switch, the **Menu** ([]) key, or the **[#]** key.

The transmission is started by using the selected dialing code.

Note

- The display during the transmission varies depending on the type of communication.
- The dialing history list is updated to place the dialing code which was selected and sent at the top of the list.



Configuration using KPG-D1/ D1N

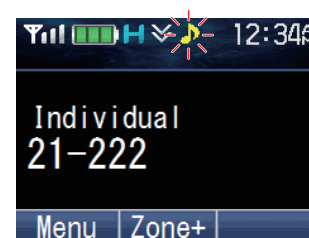
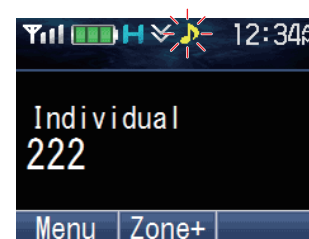
Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

ID Display upon Receipt

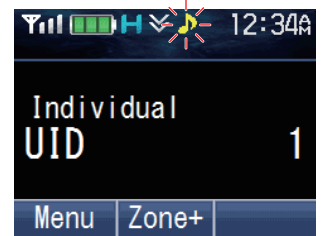
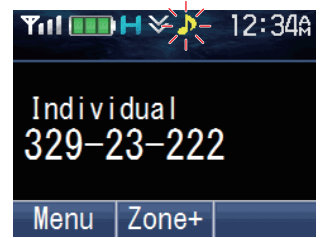
If the transceiver receives a call from the ID registered in the ID List, the ID name or list number appears on the display.

If the transceiver receives a call from the ID which is not registered in the ID List, the ID appears on the display as follows:

- Only an Individual Number is displayed if the received Prefix and Fleet are identical to the own Prefix and Fleet.
- A Fleet and an Individual Number are displayed if the received Prefix is identical to the own Prefix and the received Fleet is not identical to the own Fleet.



- A Prefix, Fleet, and Individual Number are displayed if the received Prefix and Fleet are not identical to the own Prefix and Fleet.
- A DMR ID 1 to 16776415 is displayed if the received ID is an ID which cannot be converted to the ID system of Dialing.

**Note**

- The above are the displays when an Individual Call is received; however, the following IDs displays are identical even when the IDs are displayed for the calls:
 - Sender ID display when a Status Call is received
 - Sender ID display when a Short Data Call is received
 - Sender ID display for Caller ID Stack
 - Sender ID display for Status Message Stack
 - Sender ID display for Short Message Stack
 - Sender ID display for Playback Mode

2.16 Locking the Site to Be Used (Site Lock)

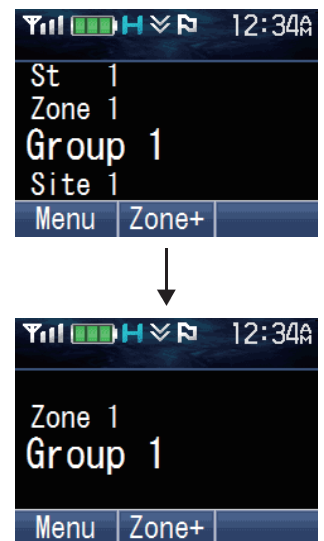
Site Lock can be used to lock the site to be used as the current site and prevent the transceiver from roaming to other sites by a user operating transceiver keys when the transceiver is used around the border of the site coverage area. If this function is enabled, the transceiver is locked on the current site and cannot roam.

By pressing the **Site Lock** key, or by pressing the **Menu** key to enter Menu Mode and then selecting "Site Lock", Site Lock can be enabled and disabled.

Operating the transceiver

1 Press the **Site Lock** key while Site Lock is disabled.

The "📶" icon appears, and the Site ID and site name of the current site appear on the display for 2 sec. In 2 sec, Site Lock is enabled.



2 Press the **Site Lock** key while Site Lock is enabled.

The "📶" icon disappears and then Site Lock will be disabled.

Note

- Transceiver operation is identical even if "Site Lock" is selected after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)
- If the Site Lock is enabled, Background Hunt does not function.
- The Site Lock does not become disabled even if the transceiver cannot receive signals from a control channel while the Site Lock is enabled.
- The Site Lock can be enabled for the current site only if the transceiver has acquired a control channel.
- If the Site Lock is enabled, Vote Now does not function.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

2.17 Matching a Channel of the Transceiver to a Channel of the System (Control Channel Switching)

Control Channel Switching is the behavior to change the control channel acquired by the transceiver according to the control channel of the system in accordance with the change of the control channel of the system.

By varying the control channels in the site (without locking them to a specific repeater), the operation of the transmission line of the repeater can be reduced. In addition, by distributing the operating load of the repeater as a system, it has the advantage of reducing the frequency of system maintenance and increasing the reliability of the system.

When the transceiver is in the idle state on the control channel, the transceiver receives the information (C_MOVE) sent from the system and confirms the information in C_MOVE. If the transceiver determines that the control channel on the system has switched from the C_MOVE information, the transceiver performs a new control channel acquisition process.

For a Trunking 2.5 system, if the transceiver on the traffic channel is notified from the system that the control channel has switched, the transceiver performs a new control channel acquisition process after the call ends.

Also, for a Trunking 2.5 system, because the control channel is changed within the site, Registration of when a new control channel is acquired is not executed.

2.18 Restricting the Communication Time on a Traffic Channel (Traffic Timer)

Traffic Timer is the function to restrict the time for the transceiver to communicate by the occupation of a traffic channel.

In a DMR-based Trunking system, **Traffic Timer** corresponding to each type of communication (normal voice communication, voice communication by Emergency Call, voice communication by a telephone connected to PSTN/ PABX, data communication) is available. If the time configured in **Traffic Timer** elapses, the transceiver terminates a call and reverts to the control channel.

Table 2-28 Traffic Timer

Traffic Timer	Description
Traffic Time (Non-emergency)	The maximum length of time for the transceiver to communicate by the occupation of a traffic channel during normal voice communication can be configured.
Traffic Time (Emergency)	The maximum length of time for the transceiver to communicate by the occupation of a traffic channel during voice communication by Emergency Call can be configured.
Traffic Time (Line)	The maximum length of time for the transceiver to communicate by the occupation of a traffic channel during voice communication by a telephone connected to PSTN/ PABX can be configured.
Traffic Time (Packet)	The maximum length of time for the transceiver to communicate by the occupation of a traffic channel during data communication can be configured.

Note

- The system may notify the transceiver of the four types of **Traffic Time** by using the Broadcast message. If the transceiver receives the notification from the system, the transceiver behaves according to the time specified by the system. However, even if the transceiver receives the notification from the system, if the specified value is "0", the transceiver behaves according to the time in **Traffic Time** configured using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

- Configuring **Traffic Time (Non-emergency)** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Traffic Time (Emergency)** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Traffic Time (Line)** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Traffic Time (Packet)** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

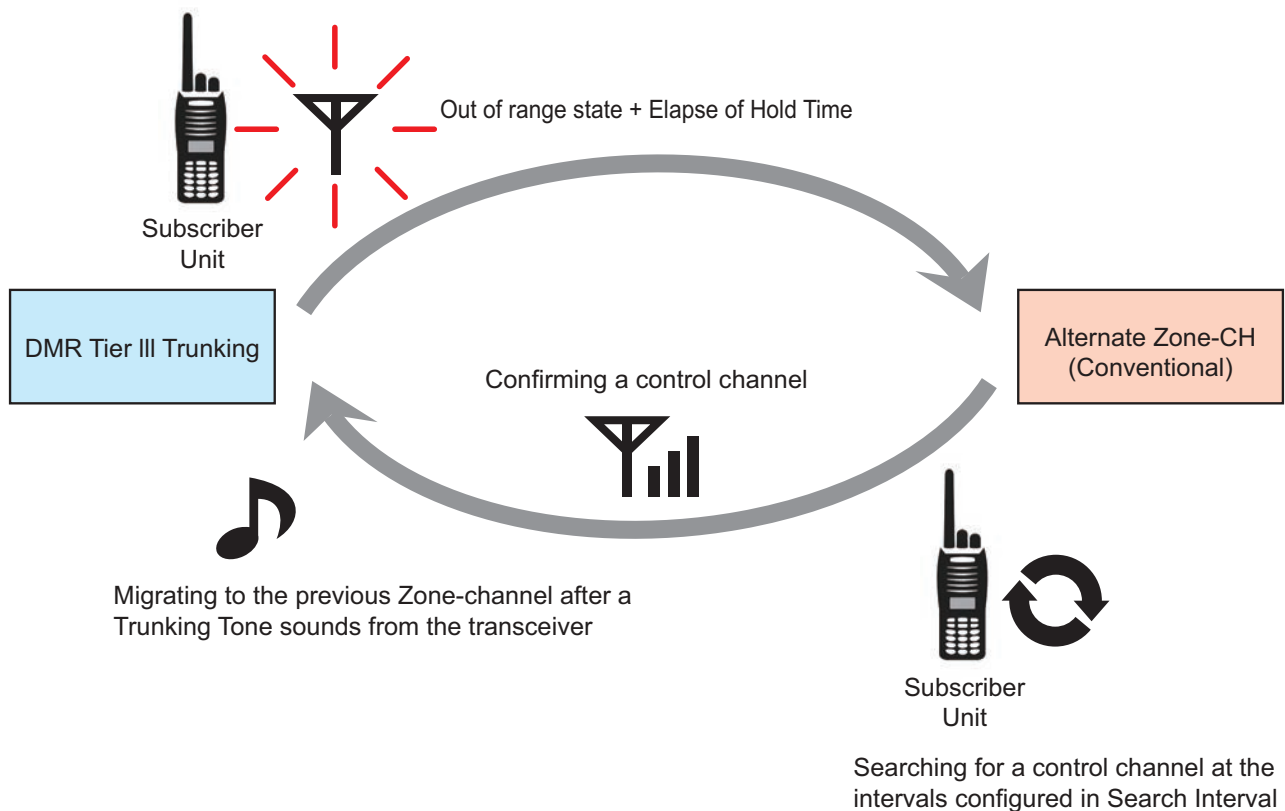
2.19 Communicating on a Zone-channel in DMR Conventional while Outside the Communication Area (Alternate Zone-Channel)

Alternate Zone-Channel is the function for the transceiver to automatically migrate to a Zone-channel in a DMR Conventional system to communicate when the transceiver is detected to be outside the communication area of a DMR Tier III Trunking system for a certain period of time.

The transceiver periodically searches for a control channel in a DMR Tier III Trunking system after migrating to a Zone-channel in a DMR Conventional system. If a control channel is found, the transceiver restores the previous Zone-channel in the DMR Tier III Trunking system.

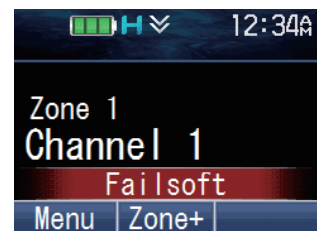
When a DMR Tier III Trunking system becomes unavailable for any reason, the transceiver can communicate on an alternative Zone-channel.

This function is only supported in a DMR Tier III Trunking system. For a Trunking 2.5 system and S-Trunking system, because **Alternate Zone-Channel** cannot be used, the transceiver becomes unable to communicate if the transceiver is outside of the communication area.

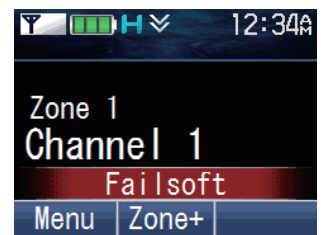


Transceiver behavior

If the transceiver becomes outside the communication area in a DMR Tier III Trunking system, and the time configured in Hold Time elapses, the transceiver automatically migrates to the Zone-channel configured in **Alternate Zone-Channel**. In this case, "Failsoft" appears on the display.



In the Zone-channel (Alternate Zone-Channel) where the transceiver migrates to, a control channel in a DMR Tier III Trunking system is searched at the intervals configured in **Search Interval**.



If a control channel is found, a Trunking Tone (2 beeps) sounds from the transceiver, and the transceiver restores the previous Zone-channel in the DMR Tier III Trunking system.

Note

- **Hold Time** and **Search Interval Time** are extended by the following operations:
 - Key operation
 - **PTT** switch operation
 - AUX Input
 - PC Command
- Even if **Alternate Zone-Channel** is configured in a DMR Tier III Trunking system, the transceiver does not migrate to an Alternate Zone-Channel under the following conditions:
 - While the transceiver is in Emergency Mode
 - While Public Address functions
 - While the transceiver is in Lone Worker Mode
 - While the transceiver is in Function Mode
 - When the transceiver temporarily migrates from a Zone-channel by the **Direct Channel, Home Channel, or Channel Select** function
- On an Alternate Zone-Channel, the transceiver does not search for a control channel in a DMR Tier III Trunking system under the following conditions:
 - While transmitting
 - While receiving (Audio Unmute)
 - During data communications
 - While the transceiver is in Emergency Mode
 - While Public Address functions
 - While the transceiver is in Lone Worker Mode
 - While the transceiver is in Function Mode
- If the condition that a control channel in a DMR Tier III Trunking system cannot be searched is satisfied when **Search Interval Time** elapses on an Alternate Zone-Channel, **Search Interval Time** restarts.
- If a Zone-channel is changed by user operation while the transceiver is on an Alternate Zone-Channel, the state where the transceiver is on an Alternate Zone-Channel is cleared.
- If the transceiver is turned off and then turned on again on an Alternate Zone-Channel, the transceiver restores the previous Zone-channel in a DMR Tier III Trunking system.
- If Emergency is executed while the transceiver is on an Alternate Zone-Channel, the transceiver behaves according to the configuration of Emergency for the Alternate Zone-Channel. Also, the state where the transceiver is on an Alternate Zone-Channel is cleared.

Configuration using KPG-D1/ D1N

- Configuring **Alternate Zone-Channel** (**See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)
- Configuring **Hold Time** (**See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)
- Configuring **Search Interval Time** (**See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Out of Range)

2.20 Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption)

Call Interruption is the function to prioritize own communications even when the traffic channel is being used for other communications.

A Call Interruption request is executed to the system if the **Call Interruption** is operated while the transceiver is receiving audio on a traffic channel. When a Call Interruption request is accepted in a system, a Call Interruption command is transmitted to the transceiver transmitting audio. The transceiver which receives the Call Interruption request command ends voice transmission.

To request Call Interruption, press the **Call Interruption** key while the transceiver is receiving audio on a traffic channel.

If "Interrupt CALL" is configured in **Response while Reception**, a Call Interruption request is executed by pressing the **PTT** switch while the transceiver is receiving audio on a traffic channel.

The following are the 2 types of Call Interruption commands transmitted from a system:

Table 2-29 Call Interruption Commands

Command	Description
Request Command	The transceiver which received a request command stops voice transmission if the configuration in Decode (Call Interruption) is enabled.
Forced Command	The transceiver which received a forced command forcibly stops voice transmission regardless of the configuration in Decode (Call Interruption).

Note

- In a DMR-based Trunking system, unlike in a DMR Conventional system, **Call Interruption** functions even in the following cases:
 - If the received audio is encrypted
 - If **Over-the-Air Alias** is configured
 - If "One-shot" or "Interval" is configured in **Report (GPS Report with Voice)**
 - If "One-shot" or "Interval" is configured in **Report (BLE Report with Voice)**
- Call Interruption** is restricted by the type of call received on a traffic channel regardless of whether the received audio is encrypted, and regardless of whether the call is an Emergency Call. Basically, **Call Interruption** cannot be executed for a call for which Talkback cannot be activated.
- Whether a Call Interruption request is accepted in a system is determined by the system specifications.
- If the transceiver receives a Group Call from a telephone, the transceiver does not execute the Call Interruption behavior.
- The display behavior of Call Interruption is not executed because the display specifications of Emergency Mode occur for the transceiver while in Emergency Mode.
- A Call Interruption request message can also be transmitted by receiving a PC command from the communication port. To use a PC command, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)
- During an All Call, the transceiver does not stop transmission even if a Call Interruption command is received, regardless of the type of Call Interruption command.

Sending a Call Interruption Request Message

To send a Call Interruption request message by operating the **Call Interruption** key, **Encode (Call Interruption)** of the channel used needs to be enabled.

To send a Call Interruption request message by operating the **PTT** switch, **Encode (Call Interruption)** of the channel used is enabled, and "Interrupt Call" needs to be configured in **Response while Reception**.

Operating the transceiver

● Transmission using the Call Interruption key

1 Press the **Call Interruption** key during audio reception on a traffic channel.

Key Beep A (1 beep) sounds from the transceiver, and "Interrupt" appears on the display.

The transceiver migrates to a control channel and sends a Call Interruption request message to the system.

Note

- A Call Interruption request message is sent to the system even when the **Call Interruption** key is pressed during reception of the encrypted audio.
- If the **Clear** key is pressed while "Interrupt" appears by pressing the **Call Interruption** key, the "Interrupt" display is cleared, and the transceiver reverts to the previous receive mode. However, the Call Interruption request accepted by the system cannot be canceled.



2 Transmission of Call Interruption request message is complete.

When the Call Interruption request message is accepted by the system and the transceiver receives an ACK from the system, the transceiver migrates to the previous traffic channel.

When the voice transmission by the other transceiver stops and the voice transmission by the own transceiver becomes available, a Transaction Confirmed Tone (2 beeps) sounds from the transceiver, and "Complete" appears on the display for 1 sec. After that, pressing the **PTT** switch transmits the communication.



● Transmission using the PTT switch

1

Press the **PTT** switch during audio reception on a traffic channel.

"Interrupt" appears on the transceiver display. The transceiver migrates to a control channel and sends a Call Interruption request message to the system.

Note

- If "Follow PTT Hold Inhibit" is configured in **Response while Reception**, the Call Interruption behavior does not occur because the transceiver behaves according to the configuration in **PTT Hold Inhibit**.
- A Call Interruption request message is sent to the system even when the **PTT** switch is pressed during reception of the encrypted audio.
- If the **PTT** switch is released while "Interrupt" appears by pressing the **PTT** switch, the "Interrupt" display is cleared, and the transceiver reverts to the previous receive mode.



2

Transmission of Call Interruption request message is complete.

When the Call Interruption request message is accepted by the system and the transceiver receives an ACK from the system, the transceiver migrates to the previous traffic channel.

When the voice transmission by the other transceiver stops and the voice transmission by the own transceiver becomes available, "Complete" appears on the display for 1 sec. After that, if the **PTT** switch remains pressed, a Transaction Confirmed Tone (2 beeps) does not sound and the communication transmission starts.



Note

- If the following occurs after the Call Interruption request message is sent to the system, a Call Fail Tone (2 beeps) sounds and "Fail" appears on the display:
 - If a random access for a Call Interruption request message fails
 - If a NACK is received from the system
 - If **Call Interruption Wait Time** expires before the voice transmission becomes available even though an ACK has been received from the system

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver (**See** Transceiver Settings > Key Assignment)
- Configuring **Encode (Call Interruption)** to be enabled or disabled (Personality) (**See** Transceiver Settings > Personal > Personality > DMR-based Trunking > Call Interruption)
- Configuring **Encode (Call Interruption)** to be enabled or disabled (Channel Edit) (**See** Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking > Call Interruption)
- Configuring **Response while Reception** (**See** Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking)
- Configuring **Call Interruption Wait Time** (**See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Receiving a Call Interruption Request Command

The transceiver which received a request command ends voice transmission if the configuration in **Decode (Call Interruption)** is enabled.



Transceiver behavior

If **Decode (Call Interruption)** is enabled, the transceiver ends voice transmission and “Interrupted” appears on the display upon receipt of a Call Interruption request command from the system during voice transmission on a traffic channel.

While the **PTT** switch is pressed, a Warning Tone A sounds to prompt a user to release the **PTT** switch.

If **Decode (Call Interruption)** is disabled, the transceiver continues voice transmission even if the transceiver receives a Call Interruption request command from the system.

Receiving a Call Interruption Forced Command

The transceiver which received a forced command forcibly ends voice transmission regardless of the configuration in **Decode (Call Interruption)**.



Transceiver behavior

The transceiver ends voice transmission and “Interrupted” appears on the display upon receipt of a Call Interruption forced command from the system during voice transmission on a traffic channel.

While the **PTT** switch is pressed, a Warning Tone A sounds to prompt a user to release the **PTT** switch.

Configuration using KPG-D1/ D1N

- Configuring **Decode (Call Interruption)** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR-based Trunking > Call Interruption)
- Configuring **Decode (Call Interruption)** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking > Call Interruption)

2.21 Notifying the Status of Communications with Other Sites (Network Failure Indicator)

Network Failure Indicator is the function that notifies by the display and the tone the transceiver of the state that the network control function with other sites becomes unavailable due to a failure even if the system is functioning normally as a site.

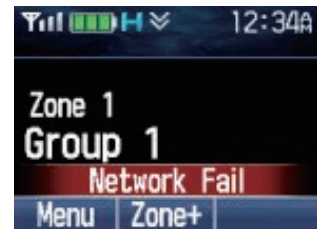
In a multi-site system, a message indicating the Network Failure status is notified from the system to the transceiver when the system cannot connect to another site, and a message indicating the return from the Network Failure status (normal status) is notified from the system to the transceiver when the system can connect to another site.

When these messages are received, the transceiver behaves as follows:

Transceiver behavior

● If the connection to another site becomes unavailable

When a broadcast message indicating the Network Failure status is received, "Network Fail" appears on the display and a Network Failure Tone A sounds at 5-sec intervals.



● If the connection to another site becomes available

When a broadcast message indicating a return from the Network Failure status is received, the "Network Fail" display is reset and a Network Failure Tone B sounds.



Note

- To display "Network Fail" when a broadcast message indicating the Network Failure status is received, the configuration of "Display" in **Network Failure Indicator** needs to be enabled.
- To emit "Network Failure Tone A" and "Network Failure Tone B" when a broadcast message indicating the Network Failure status is received, the configuration of "Tone" in **Network Failure Indicator** needs to be enabled.
- If the system is in a state of Network Failure, the transmit and receive function cannot be used in the roaming site.
- Even after the transceiver receives a broadcast message indicating the Network Failure status, the Background Hunt behavior is performed (for a DMR Tier III Trunking system and S-Trunking system).
- When the transceiver receives a Vote Now notification, and if the Network Failure status is displayed in the information included in the Vote Now notification to indicate whether to be in a Network Failure status, the transceiver does not migrate to the adjacent site and remains on the current site (for Trunking 2.5 and DMR Tier III Trunking).
- Pressing any key stops a Network Failure Tone A.

Configuration using KPG-D1/ D1N

- Configuring **Network Failure Indicator (Display)** to be enabled or disabled (See Transceiver Settings > DMR Network > Hunt Options > Network Failure Indicator)
- Configuring **Network Failure Indicator (Tone)** to be enabled or disabled (See Transceiver Settings > DMR Network > Hunt Options > Network Failure Indicator)

2.22 Sending GPS Data

Global Positioning System (GPS) is the system to acquire the current location information of the own transceiver by receiving signals from the Global Positioning System satellites orbiting the earth.

The transceiver of the mobile station can send the acquired own location information (GPS data) to the base station. The base station can send received GPS data to the PC as serial commands.

A GPS receiver unit compatible with the NMEA-0183 standard is required for the communication port of the mobile station transceiver to send GPS data. The transceiver has a built-in GPS receiver unit. The optional GPS receiver unit also can be connected with the transceiver.

Note

- To use the built-in GPS receiver unit, **Built-in GPS Receiver/Bluetooth** must be enabled when configuring data by using KPG-D1/ D1N. In this case, the configuration for the communication port is not required.
- To use the optional GPS receiver unit, "GPS" must be assigned to the communication port to which the GPS receiver unit is connected. For Portable, a GPS microphone (KMC-47GPS/ KMC-47GPSD) is usable. For Mobile, an optional third-party GPS receiver unit is usable.

Transmission Method of GPS Data

The following are the methods to send GPS data:

- **Automatic GPS data transmission**
 - [Sending GPS Data Automatically at Certain Intervals \(GPS Report Mode\)](#)
 - [Sending GPS Data According to the Request from the Base Station \(GPS Report Mode\)](#)
- **Manual GPS data transmission**
 - [Sending GPS Data Manually by Using a Key \(Send the GPS Data\)](#)
- **GPS data transmission together with Status Call**
 - [Sending GPS Data Together With Status Call \(GPS Combination\)](#)
- **GPS data transmission linked with an Emergency Call**
 - [Sending GPS Data Together With Emergency Call \(GPS Combination\)](#)
- **GPS data transmission during voice communications**
 - [Sending GPS Data during Voice Communications \(GPS Report with Voice\)](#)
- **GPS data transmission linked with travel distance**
 - [Sending GPS Data Based On Travel Distance \(GPS Distance Change\)](#)

The ID of the Target Transceiver (GPS Base ID)

GPS Base ID is the ID of the target transceiver used for sending GPS data.

By using KPG-D1/ D1N, either Unit ID or Group ID can be configured as **GPS Base ID**.

If **Fleet Dialing Plan** is enabled in a DMR Tier III Trunking system or S-Trunking system, GPS Base ID can be configured even in the Prefix-Fleet-IN/GN format. The ID of the base station which is responsible for operation and administration of system is normally configured.

Table 2-30 Destination ID Configuration

Configuration	Description
GPS Base ID Type	The ID type (Group ID or Unit ID) of the target transceiver when the transceiver sends GPS data can be configured.
GPS Base ID	The ID of the target transceiver when the transceiver sends GPS data can be configured. GPS Base ID can be configured in the range between 000001 and FFFCDF (hexadecimal), or between 1 and 16776415 (decimal). If "Group ID" is configured in GPS Base ID Type , "ALL" can be configured.
Prefix-Fleet-IN/GN	The ID of the target transceiver when the transceiver sends GPS data by using Fleet Dialing can be configured. The ID consists of Prefix, Fleet, and IN (Individual Number)/ GN (Group Number). • Prefix A Prefix number can be configured in the range between 328 and 806. • Fleet A Fleet number can be configured in the range between 20 and 89. • IN (Individual Number)/ GN (Group Number) If "Unit ID" is configured in GPS Base ID Type: If the Fleet is between 20 and 41, an Individual number can be configured in the range between 200 and 899. If the Fleet is between 42 and 89, an Individual number can be configured in the range between 200 and 549. If "Group ID" is configured in GPS Base ID Type: A Group number can be configured in the range between 900 and 999.

Note

- If **GPS Base ID** is not configured, GPS data is sent to the **Base ID** to which data such as a Status Message and Short Message is to be sent.

Configuration using KPG-D1/ D1N

- Configuring **GPS Base ID Type** and **GPS Base ID** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS)
- Configuring **GPS Base ID (Fleet Dialing)** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS)
- Configuring **Base ID Type** and **Base ID** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)
- Configuring **Fleet Dialing Plan** to be enabled or disabled ( **See** Model > Product Information > Feature Selection > DMR)

Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)

GPS data can be sent automatically at the intervals configured in **GPS Report Interval Time**.

This function is used for controlling or monitoring vehicles on a time basis by periodically sending location information to the base station.

To use this function, "Auto" must be configured for **GPS Report Mode** by using KPG-D1/ D1N.

Note

- In a DMR-based Trunking system, the GPS data transmission by "Auto" of **GPS Report Mode** and the GPS data transmission by the Location Information Protocol (LIP) behave exclusively.
The transceiver executes the GPS data transmission behavior by "Auto" of **GPS Report Mode** when the transceiver is turned on. After that, if the transceiver receives the GPS data transmission request by the Location Information Protocol (LIP), the transceiver stops the GPS data transmission behavior by "Auto". When the GPS data transmission behavior stops, the transceiver restarts the GPS data transmission behavior by "Auto" if the transceiver migrates to a site with a different Site ID or if a channel is changed to a channel of another system.
- The transceiver sends the GPS data upon receipt of the GPS data transmission request from the base station even if "Auto" is configured for **GPS Report Mode**.
- If the transceiver is under the following conditions, the automatic transmission of GPS data at certain intervals will be canceled.
 - While the transceiver is transmitting
 - While the transceiver is in busy state
 - While the transceiver unmutes the speaker
 - While the **Public Address** function is used (Mobile only)
 - The **PTT** switch is pressed while **Intercom** is enabled (only for a Dual Control Head structure of Mobile)
 - If the transmit frequency is not configured
 - While transmission is disabled by the **Time-out Timer**
 - While the transceiver is sending or receiving the DMR data
 - Transceiver Password Mode
 - Emergency Mode
 - Out of Range
 - While the transceiver is waiting for a response by the reception of an Individual Call (FOACSU) (while "Incoming" appears)
 - During Passive Scan
- If the **PTT** switch is pressed during the automatic transmission of GPS data, the GPS data transmission stops, and voice transmission starts.
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report Mode. GPS Report Mode and BLE Report Mode function with the same configuration. (Refer to [Sending the BLE Data With the Timing of Automatic Transmission Configured \(BLE Report Mode \(Indoor Location\)\)](#).)

Configuration using KPG-D1/ D1N

Configuring **GPS Report Mode** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode)

Sending GPS Data According to the Request from the Base Station (GPS Report Mode)

GPS Report Mode allows the transceiver to automatically send GPS data when a GPS data transmission request is received from the base station.

This function is used when the base station controls the timing to require GPS data. This function is also used to avoid transmit collisions if there are many transceivers.

To use this function, "Poll" must be configured for **GPS Report Mode** by using KPG-D1/ D1N.

The GPS data transmission by "Poll" of **GPS Report Mode** includes the following polling:

- **Location Information Protocol (LIP)**

The reception of the GPS data transmission request and the GPS data transmission are performed using the Location Information Protocol (LIP) of the Unified Single Block Data Polling Service (USBD).

Communication by the Location Information Protocol (LIP) is performed in one of the slots of the repeater including the control channel.

- **NMEA format**

When the transceiver receives a transmission request of GPS data, the GPS data is sent using the NMEA format. Communication in the NMEA format is performed in a slot of the control channel.

 Note

- The transceiver sends the GPS data upon receipt of the GPS data transmission request from the base station even if "Auto" is configured for **GPS Report Mode**.
- GPS data is sent to the ID that sent the data transmission request.
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.

Configuration using KPG-D1/ D1N

Configuring **GPS Report Mode** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode)

Sending GPS Data Manually by Using a Key (Send the GPS Data)

GPS data can be sent manually by a user pressing the **Send the GPS Data** key. Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the GPS data can be sent manually by selecting the "Send GPS Data". (Refer to Common FUNC Using Menu Mode.)

 Note

- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- If the **PTT** switch is pressed during the transmission of GPS data by **Send the GPS Data**, the GPS data transmission stops, and voice transmission starts.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)

Sending GPS Data Together With Status Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to a DMR Status Message.

To use this function, **Status** for **GPS Combination** must be enabled by using KPG-D1/ D1N. The range of status numbers (**GPS Report Status Number Block**) to which GPS data can be added can be configured.

Note

- The GPS data added to a Status Message is sent to the ID configured for **GPS Base ID** or **Base ID**.
- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- If the **PTT** switch is pressed during the transmission of GPS data by **GPS Combination**, the GPS data transmission stops, and voice transmission starts.

Configuration using KPG-D1/ D1N

- Configuring **GPS Combination (Status)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Combination)
- Configuring **GPS Report Status Number Block** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Combination)

Sending GPS Data Together With Emergency Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to an Emergency Status.

To use this function, **Emergency** for **GPS Combination** must be enabled by using KPG-D1/ D1N.

In Emergency Mode, the GPS data is sent to the ID configured in **GPS Base ID** or **Base ID**.

If **Emergency Alarm (DMR)** or **Emergency Status (DMR)** is configured, GPS data is sent after the **Emergency Alarm (DMR)** or **Emergency Status (DMR)** is sent.

GPS data is sent regardless of the configuration in **Emergency Alarm (DMR)** or **Emergency Status (DMR)**.

Note

- GPS data is not encrypted during encrypted communication.
- Even if non-positioning data is received from the GPS receiver unit, GPS data is sent.
- If the **PTT** switch is pressed during the transmission of GPS data by **GPS Combination**, the GPS data transmission stops, and voice transmission starts.

Configuration using KPG-D1/ D1N

Configuring **GPS Combination (Emergency)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Combination)

Sending GPS Data during Voice Communications (GPS Report with Voice)

The transceiver can multiplex GPS data on audio data and send the data during voice communications.

When audio data transmission starts or during the transmission, GPS data can be multiplexed on the audio data for transmission at specific time intervals.

Multiplexing of GPS data behaves as follows according to the configuration of **Report (GPS Report with Voice)**.

Table 2-31 GPS Data Multiplexing Behavior

Report	Description
Off	GPS data is not multiplexed during audio data transmission.
One-shot	GPS data is multiplexed at the start of audio data transmission.
Interval	GPS data is multiplexed at the start of or during audio data transmission according to the cycle that is calculated based on the value configured in Interval (GPS Report with Voice) . The cycle for multiplexing GPS data can be calculated using the formula below. GPS data multiplex cycle [sec] = Interval (GPS Report with Voice) configuration value x 3.6 sec

Note

- During audio data transmission, GPS data is sent according to the configuration in **Interval (GPS Report with Voice)**, regardless of **Portable/Ignition On (GPS Report Interval Time)** and **Ignition Off (GPS Report Interval Time)**.
- According to the DMR specifications, GPS data that is transmitted contains only the coordinates and Position Error information (Unknown), and GPS data is transmitted to the same destination as the audio data even if **GPS Base ID, Base ID Type** or **Base ID** is configured.
- During serial output of the location information, the Unit ID value inside Map Header KW 1/ KW 2/ KW 3 (\$PKNDS, \$PKNID, \$PKNSH) will be complemented using the Unit ID of the sender of the audio data.
- If data is received while voice communication is in progress, the LCD display, LED and Alert Tone will function according to the configurations during a voice call.
- GPS data is not encrypted during encrypted communication.
- If there exists unsent GPS data at the timing of GPS data transmission when GPS data is not received from the GPS receiver unit or when **Built-in GPS Receiver/Bluetooth** is disabled, the latest GPS data will be transmitted. If there exists only sent GPS data at the timing of GPS data transmission, GPS data will not be transmitted.
- GPS data is not transmitted when GPS data with no positioning information is received from the GPS receiver unit.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report with Voice. GPS Report with Voice and BLE Report with Voice function with the same configuration. (Refer to **Sending BLE Data during Voice Communications (BLE Report with Voice)**.)

Configuration using KPG-D1/ D1N

- **Configuring Report (GPS Report with Voice)** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Report with Voice)
- **Configuring Interval (GPS Report with Voice)** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Report with Voice)

Sending GPS Data Based On Travel Distance (GPS Distance Change)

GPS Distance Change allows the transceiver to send GPS data when the distance between the location of the previous GPS data transmission and the current location exceeds the value configured in **Distance Value**.

The transceiver calculates the distance between the position where the GPS data was sent and the current position at regular time intervals (3 sec) after the transceiver automatically or manually sent GPS data. The GPS data is sent if the calculated distance exceeds the value configured for **Distance Value**. If no GPS data is sent after the transceiver is turned ON, the transceiver regards the location information first received from the GPS unit as the previous transmission position and calculates the distance to the current position. The distance is calculated from the latitudinal and longitudinal values.

Note

- GPS data is not encrypted during encrypted communication.
- GPS data is not transmitted when GPS data with no positioning information is received from the GPS receiver unit.
- If the **PTT** switch is pressed during the transmission of GPS data by **GPS Distance Change**, the GPS data transmission stops, and voice transmission starts.
- In a system that supports Indoor Location, **GPS Distance Change** does not function if one of the following conditions is satisfied:
 - When a beacon signal (whether RF System or Bluetooth System is configured in **Send Location via** does not matter) is received
 - During GPS Delay Time

Configuration using KPG-D1/ D1N

- Configuring **GPS Distance Change** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Distance Change)
- Configuring **Distance Value** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Distance Change)

Sending GPS Data Preferentially While Receiving a Group Call (GPS Report Priority (Over Group Call))

GPS Report Priority (Over Group Call) is the function that gives higher priority to sending GPS data, and stops receipt of a Group Call at the timing of automatic GPS data transmission while the transceiver is receiving a Group Call.

This function is used to avoid restricting automatic GPS data transmission by the frequent receipt of Group Calls.

To use this function, **GPS Report Priority (Over Group Call)** is enabled.

Configuration using KPG-D1/ D1N

Configuring **GPS Report Priority (Over Group Call)** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode)

2.23 GPS Functions

The following functions are relevant to GPS data transmission.

- GPS Report Interval Time
- GPS Time Mark
- GPS Message Type

GPS Report Interval Time

GPS Report Interval Time allows the configuration of the intervals to send GPS data if “Auto” is configured in **GPS Report Mode**.

GPS Report Interval Time (Portable/Ignition On)

GPS Report Interval (Portable/Ignition On) is the interval to send the GPS data while the vehicle’s engine is running. In order to automatically transmit GPS data for Portable, this configuration is used.

GPS Report Interval Time (Ignition Off) (Mobile only)

GPS Report Interval (Ignition Off) is the interval to send GPS data while the vehicle is parked. Also, if the Ignition Sense function is not used (nothing is entered in the Ignition Sense port), GPS data is sent according to the configuration in Ignition Off. (Refer to Common FUNC Turning the Transceiver ON or OFF According to the State of the Ignition Sense Port (Ignition Sense).)



- **GPS Report Interval Time** is used to configure the trigger cycle to start sending GPS data. The timing at which the receiving transceiver completes receiving GPS data may vary depending on the transmit conditions at the transmitting transceiver.
- GPS data will not be transmitted automatically according to the **Portable /Ignition On (GPS Report Interval Time)** or **Ignition Off (GPS Report Interval Time)** during audio data transmission.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report Interval Time. GPS Report Interval Time and BLE Report Interval Time function with the same configuration. (Refer to **BLE Report Interval Time (Indoor Location)**.)

Configuration using KPG-D1/ D1N

Configuring **GPS Report Interval Time** (**See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode > GPS Report Interval Time)

GPS Time Mark

GPS Time Mark is the offset time from UTC (Coordinated Universal Time) to send GPS data.

This function is useful for avoiding a data collision if there are many transceivers that send GPS data.

Configuring a different timing for each transceiver allows each transceiver to send GPS data with different timing. Using this function can avoid a data collision.

Note

- In a system that supports Indoor Location, the configuration value is shared with BLE Time Mark. GPS Time Mark and BLE Time Mark function with the same configuration. (Refer to **BLE Time Mark (Indoor Location)**.)

Configuration using KPG-D1/ D1N

Configuring **GPS Time Mark** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode)

GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

Table 2-32 GPS Message Type

Configuration	Operation
Full	The message to be sent is the GPS data corresponding to \$GPGGA, \$GPRMC and \$GPGLL.
Short	The message to be sent is the GPS data corresponding to \$GPGLL. When the base station receives this GPS data, a part of the data is sent as blank data even if \$GPGGA and \$GPRMC are configured for PC serial output at Base Station Setting .

Configuration using KPG-D1/ D1N

Configuring **GPS Message Type** ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > GPS > GPS Report Mode)

2.24 Receiving GPS Data

The base station receiving GPS data from the transceiver of a mobile station can send the GPS data to a PC as serial commands. If a PC installed with a mapping application is connected to the communication port of the base station transceiver, the location information of mobile station transceivers appears on a map on the PC display. This function is convenient for a dispatch control or traffic control system.

Also, if a mobile station transceiver connecting to a GPS receiver unit or having a built-in GPS receiver unit receives location information (GPS data) from a GPS satellite, the current location information of the own transceiver can be displayed on the LCD.

Note

- The GPS data acquired from the GPS satellite can be stored at certain intervals in both the internal memory of the transceiver and a microSDHC card. (Refer to Common FUNC Storing the GPS Data (GPS Data Storage).)
- For a transceiver receiving GPS data from a mobile station transceiver, "Data + GPS Data Output" or "Data + Location Data Output" needs to be assigned to the communication port to which a PC with the mapping application installed is connected. (Refer to Common FUNC Available Functions for COM Port.)

Map Header

Whether to send data to the mapping application when the base station transceiver receives the GPS data from the mobile station transceiver can be configured.

The following are the type of data that can be sent to the mapping application.

Table 2-33 Map Header

Data	Description
\$GPGGA (NMEA)	Upon receipt of the GPS data, the base station transceiver extracts the \$GPGGA data in the NMEA-0183 format from the received GPS data and sends the extracted data from the communication port.
\$GPGLL (NMEA)	Upon receipt of the GPS data, the base station transceiver extracts the \$GPGLL data in the NMEA-0183 format from the received GPS data and sends the extracted data from the communication port.
\$GPRMC (NMEA)	Upon receipt of the GPS data, the base station transceiver extracts the \$GPRMC data in the NMEA-0183 format from the received GPS data and sends the extracted data from the communication port.
\$PKNDS (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the \$PKNDS data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The \$PKNDS data contains the \$GPRMC data in the NMEA-0183 format, Unit ID, and the status information.
\$PKNID (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the \$PKNID data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The transceiver at the base station extracts only Unit ID and the status information from the received GPS data and sends the extracted data from the communication port of the repeater. This sentence is recommended to be used along with \$GPGGA (NMEA), \$GPGLL (NMEA) or \$GPRMC (NMEA). For example, if \$GPGGA (NMEA) and \$PKNID are used simultaneously, the transceiver at the base station sends from the communication port of the repeater the \$GPGGA data in addition to the Unit ID and the status information extracted from the GPS data.
\$PKNSH (KW)	Upon receipt of the GPS data, the transceiver at the base station creates the \$PKNSH data which is the KENWOOD proprietary sentence from the received GPS data and sends the created data from the communication port. The \$PKNSH data contains the \$GPGLL data in the NMEA-0183 format and the Unit ID. In order to send GPS data in Emergency Mode or by pressing the PTT switch, this sentence is used.

Configuration using KPG-D1/ D1N

Configuring **Map Header** ( See Transceiver Settings > Optional Features > Optional Features 2 > GPS > Base Station Settings)

GPS Position Display

GPS Position Display is the function to display the current location information of the own transceiver on the LCD. Refer to Common FUNC “GPS POSITION DISPLAY” for details about **GPS Position Display**.

2.25 Remote Operation by Radio Communication (Remote Control)

Remote Control is the function to remotely operate using radio communication the control of an individually specified transceiver.

An individually specified transceiver can be controlled by sending various Remote Control messages to make the transceiver receive the messages.

Remote Control has the following functions:

Table 2-34 Remote Control Functions

Function	Description
Remote Monitor	This is the function to make an individually specified transceiver transmit continuously by making the transceiver receive a Remote Monitor message. (Refer to Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor) .)
Radio Check	This is the function to check whether or not an individually specified transceiver is being operated by making the transceiver receive a Radio Check message. (Refer to Checking Whether Another Transceiver Is in Operation (Radio Check) .)

An individually specified transceiver can be controlled by sending various Remote Control messages in Remote Control Mode to make the transceiver receive the messages.

Pressing the **Remote Control** key places the transceiver in Remote Control Mode. Or, pressing the **Menu** key to enter Menu Mode and then selecting "Remote Control" places the transceiver in Remote Control Mode. (Refer to Common FUNC Using Menu Mode.)

Also, various Remote Control messages can be sent by sending a transmission command of the various Remote Control messages from a PC to the transceiver. In this case, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

Sending a Remote Control Message in Remote Control Mode

Various Remote Control messages can be sent in Remote Control Mode.

Operating the transceiver

● Initiating an Individual Call by List Selection

1 Press the **Remote Control** key.

The transceiver enters Remote Control Mode and then the Unit ID selection display will appear.

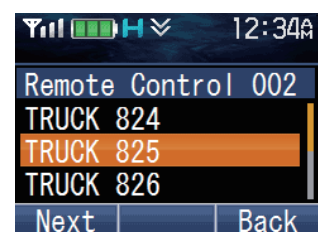
The following operations are identical even if the transceiver enters Remote Control Mode by pressing the **Menu** key.

Note

- If **Fleet Dialing Plan** is enabled in a DMR Tier III Trunking system or S-Trunking system, the transceiver cannot enter Remote Control Mode when an ID is not registered in the Individual ID List.

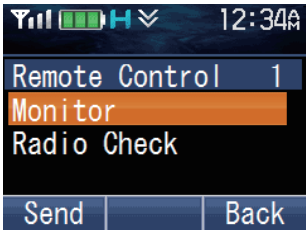
2 Press the [▲] or [▼] key to select a Unit ID from the Individual ID List. Press the **Menu** ([□]) key.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



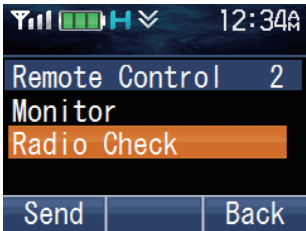
3 Press the **Menu** ([]) key or [*] key.

The selection display of the options menu appears.



4 Press the [▲] or [▼] key to select the Remote Control message to send.

Monitor: A Remote Monitor message is sent.
Radio Check: A Status Polling Service message is sent.

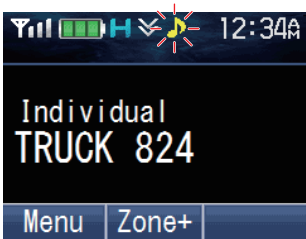


5 Press the **PTT** switch, the **Menu** ([]) key, or the [*] key.

- **For Monitor**
An Individual Call with Remote Monitor configured is sent.

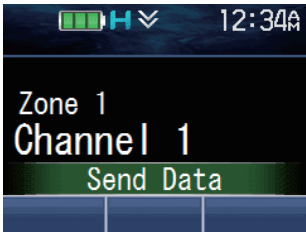


If the transceiver receives a message for traffic channel assignment from the system, the "" icon blinks, and the Remote transmission (Individual Call) starts from the receiving transceiver.

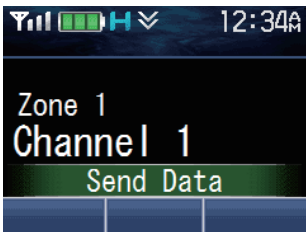


● **For Radio Check**

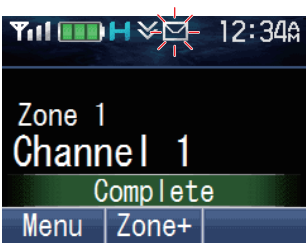
A Status Polling Service message is sent. "Send Data" appears on the display.



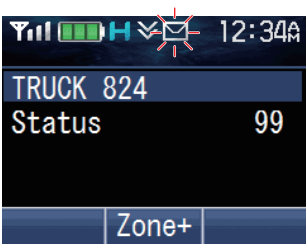
Upon completion of the transmission of a Status Polling Service message, the transceiver waits for a response from the target transceiver.



When the transceiver receives a status from the system, "Complete" appears on the display for 1 sec.



"Status" and the ID Name of the transmitting transceiver appear on the display.



● Sending a Remote Control message by using Manual Dialing

To send a Remote Control message by directly entering a Unit ID, **Manual Dialing** needs to be enabled.

1 Press the **Remote Control** key.

The transceiver enters Remote Control Mode and then the Unit ID selection display will appear.

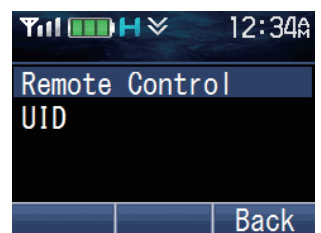
The following operations are identical even if the transceiver enters Remote Control Mode by pressing the **Menu** key.

Note

- If **Fleet Dialing Plan** is enabled in a DMR Tier III Trunking system or S-Trunking system, the transceiver cannot enter Remote Control Mode when an ID is not registered in the Individual ID List.

2 Press the **Function** ([**○**]) key.

The Unit ID entry display appears.



3 Enter a Unit ID.

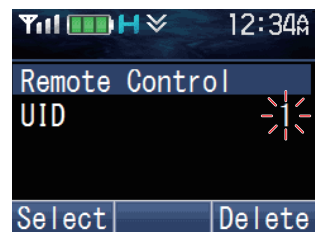
Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

● If using the keypad

A Unit ID can be entered by pressing the [0] key to [9] key.

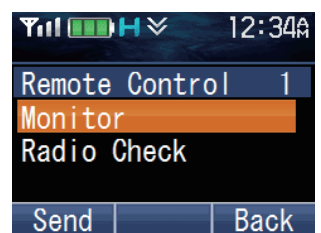
● If using the PF keys

Press the [▲] key or the [▼] key to select a number, and press the **Menu** ([□]) key or the [*] key to confirm the selected number.



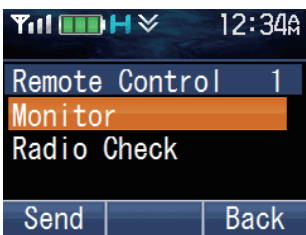
4 Press the **Menu** ([**□**]) key or [*] key.

The selection display of the options menu appears.



5 Press the [▲] or [▼] key to select the Remote Control message to send.

Monitor: A Remote Monitor message is sent.
Radio Check: A Status Polling Service message is sent.



6 Press the PTT switch, the Menu ([□]) key, or the [*] key.

- **For Monitor**
An Individual Call with Remote Monitor configured is sent.

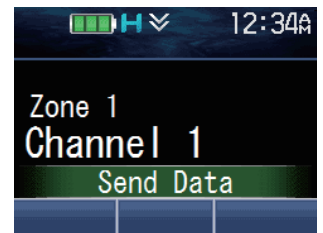


If the transceiver receives a message for traffic channel assignment from the system, the " 📶 " icon blinks, and the Remote transmission (Individual Call) starts from the receiving transceiver.

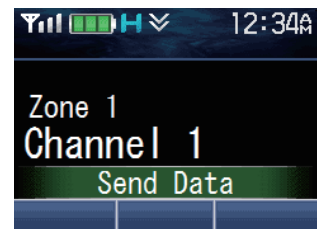


● For Radio Check

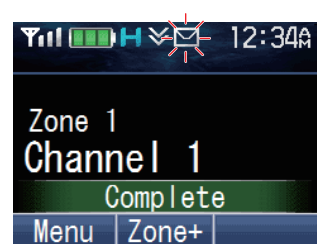
A Status Polling Service message is sent. "Send Data" appears on the display.



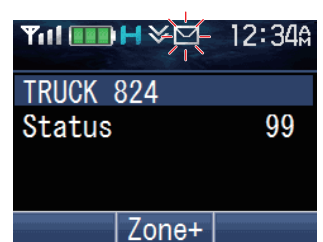
Upon completion of the transmission of a Status Polling Service message, the transceiver waits for a response from the target transceiver.



When the transceiver receives a status from the system, "Complete" appears on the display for 1 sec.



"Status" and the ID Name of the transmitting transceiver appear on the display.



Note

- If the Remote Control Mode previously used is Manual Dialing mode, the transceiver enters Manual Dialing mode by pressing the **Remote Control** key. A selection screen for the Individual ID List appears by pressing the **Function** ([O]) key.
- If no ID is registered in the Individual ID List, the transceiver enters Manual Dialing mode by pressing the **Remote Control** key if **Manual Dialing** is enabled. The transceiver cannot enter Remote Control Mode if **Manual Dialing** is disabled.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver (See Transceiver Settings > Key Assignment)
- Configuring **Manual Dialing** to be enabled or disabled (See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General)

Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor)

Remote Monitor is the function to remotely operate using radio communication an individually specified transceiver to transmit continuously.

Use of this function allows the base station to monitor the situation around the transceiver.

If a PC sends the Remote transmission command to the transceiver, the transceiver sends an Individual Call with Remote Monitor configured. The target of the Individual Call is specified by the Remote transmission command. Also, an Individual Call with Remote Monitor configured can also be sent in Remote Control Mode. (Refer to [Sending a Remote Control Message in Remote Control Mode](#).)

The transceiver which received the Individual Call with Remote Monitor configured unmutes the speaker and initiates a continuous transmission using Individual Call. The duration of the continuous transmission is determined according to the configuration in **Remote Monitor Timer** (10 sec to 120 sec) of the transceiver which has received the Individual Call with Remote Monitor configured.

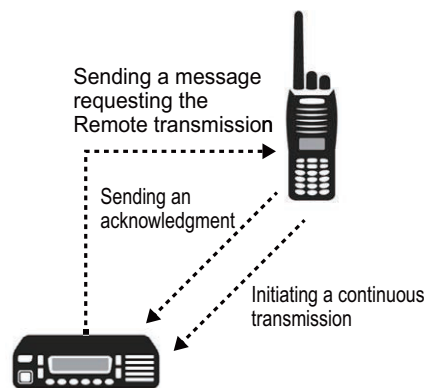


Figure 2-13 Remote Monitor

Remote Monitor has a Normal Mode and a Silence Mode: the former is a mode notifying a user of the transceiver's status of continuous transmission by an indication on the LCD and by lighting the Transmit LED, and the latter is a mode not notifying a user of the transceiver's status of continuous transmission. Which mode is used is determined according to the configuration in **Remote Monitor Display** of the transceiver which has received the Individual Call with Remote Monitor configured.

- **If "On" is configured in Remote Monitor Display (Normal Mode)**

The transceiver which received the Individual Call with Remote Monitor configured displays "Remote TX" on the display and transmits with the Transmit LED lighting.

- **If "Off" is configured in Remote Monitor Display (Silence Mode)**

The transceiver which received the Individual Call with Remote Monitor configured transmits without changing the indication of LCD and without lighting the Transmit LED.

Note

- To accept the Individual Call with Remote Monitor configured, **Remote Monitor** of KPG-D1/ D1N needs to be enabled.
- While the transceiver is in the state of continuous transmission by **Remote Monitor**, **Time-out Timer** is disabled. (Refer to [Restricting the Continuous Transmission Duration \(Time-out Timer\)](#).)

Configuration using KPG-D1/ D1N

- Configuring **Remote Monitor** to be enabled or disabled ([See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Remote Monitor)
- Configuring **Remote Monitor Timer** ([See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Remote Monitor)
- Configuring **Remote Monitor Display** ([See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > General > Remote Monitor)

Checking Whether Another Transceiver Is in Operation (Radio Check)

Radio Check can be used to check by using radio communication whether an individually specified transceiver is operated in the system.

Radio Check has two types of confirmations: the confirmation from Remote Control Mode and the confirmation by a PC command.

If Radio Check is selected in Remote Control Mode to execute **Radio Check** in Remote Control Mode, a Status Polling Service message which complies with the DMR Standard is sent to the specified Unit ID. (Refer to [Sending a Remote Control Message in Remote Control Mode](#).)

Checking Whether Another Transceiver Is in Operation by Using a PC command (Radio Check)

To use the **Radio Check** function, "Data", "Data + GPS Data Output", or "Data + Location Data Output" needs to be assigned to a communication port 0 to 2 or the Bluetooth of the transceiver. (Refer to Common FUNC Available Functions for COM Port.)

- The transceiver sends a Status Polling Service message which complies with the DMR Standard to the specified Unit ID if a PC sends the Radio Check transmission command (the Status Request Transmission (Digital Ver2) command) to the communication port of the transceiver.
- The transceiver that received a Status Polling Service message sends a Status Message in response. (Refer to [Sending a Status Message](#).)
 - The transceiver sends a status configured in Default Status if a Status Polling Service message is received when a status has never been selected, such as when the transceiver is turned on.
 - If a Status Polling Service message is received when a status is selected in Status Mode, the transceiver sends the selected status.
 - The transceiver sends the last selected status (the backed up status) if the transceiver migrates to normal mode after selecting the status in Status Mode.
 - If the transceiver in the Stun state receives a Status Polling Service message when **Stun Response Status** is not configured, the transceiver sends a status in the same manner as when the transceiver is in the normal state.
- The transceiver behaves in the same manner as when the normal status is received when the status sent back from the transceiver that received a Status Polling Service message is received. (Refer to [Receiving a Status Message](#).)

However, Horn Alert and AUX Output Status Message 1 to AUX Output Status Message 3 do not function even if the status sent from the transceiver is the same status as Horn Alert Status and AUX Output Status Message 1 to AUX Output Status Message 3.

Disabling the Transceiver Capability by Remote Control (Stun/ Kill)

By the transceiver receiving a Remote Control message from the system, the transceiver can be prevented from being used.

This function allows a system administrator to remotely disable the transceiver, for instance, if the transceiver is lost.

Also, by the transceiver receiving a Remote Control message from the system, the transceiver which has been disabled by this function can be enabled again.

The following is the transceiver behavior when the transceiver receives a Remote Control message:

Table 2-35 Remote Control

Remote Control Message	Description
Remote Stun	The transceiver is disabled if the transceiver receives the Remote Stun message. Whether to accept a Remote Stun message when the transceiver receives the Remote Stun message can be configured using KPG-D1/ D1N. If the transceiver is configured not to accept a Remote Stun message, the transceiver sends a NACK and does not respond at all even if a Remote Stun message is received. If Authentication for Stun/Revive is enabled, the transceiver executes an authentication request if a Remote Stun message is received from the system. The system responds to the authentication request, and the transceiver determines whether the system is valid or not. If the transceiver determines that the system is valid via authentication, the transceiver sends an acknowledgment for the Remote Stun message and becomes disabled. If the transceiver determines that the system is invalid, the transceiver sends a NACK for the Remote Stun message and does not respond at all. (Refer to Authentication Function of a System and Transceiver (Authentication).)
Remote Revive	If the transceiver is in the Stun state when receiving a Remote Revive message, the Stun state is reset. If the transceiver is configured not to accept a Remote Stun message, the transceiver sends a NACK and does not respond at all even if a Remote Revive message is received. If Authentication for Stun/Revive is enabled, the transceiver executes an authentication request if a Remote Revive message is received from the system. The system responds to the authentication request, and the transceiver determines whether the system is valid or not. If the transceiver determines that the system is valid via authentication, the transceiver sends an acknowledgment for the Remote Revive message and the Stun state is reset. If the transceiver determines that the system is invalid, the transceiver sends a NACK for the Remote Revive message and does not respond at all. (Refer to Authentication Function of a System and Transceiver (Authentication).)
Remote Kill	If the transceiver receives the Remote Kill message, use of the transceiver is prohibited and all operations are disabled. All configuration data of the transceiver is cleared, hence the Kill state is not reset even if the transceiver receives the Remote Revive message. However, the configuration data can be written to the transceiver by using KPG-D1/ D1N. Also, whether to accept a Remote Kill message when the transceiver receives the Remote Kill message can be configured using KPG-D1/ D1N. If the transceiver is configured not to accept a Remote Kill message, the transceiver sends a NACK and does not respond at all even if a Remote Kill message is received. The transceiver executes an authentication request if a Remote Kill message is received from the system. The system responds to the authentication request, and the transceiver determines whether the system is valid or not. If the transceiver determines that the system is valid via authentication, the transceiver sends an acknowledgment to the Remote Kill message, and use of the transceiver is prohibited and all operations are disabled. If the transceiver determines that the system is invalid, the transceiver sends a NACK for the Remote Kill message and does not respond at all. (Refer to Authentication Function of a System and Transceiver (Authentication).)

Configuration using KPG-D1/ D1N

- Configuring **Remote Stun** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > System Options)
- Configuring **Remote Kill** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > System Options)
- **Authentication for Stun/Revive** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > DMR-based Trunking > System Options)

Emergency is the function to be used for the transceiver to transmit and receive for emergency purposes. This function is used for a user to immediately contact the base station in emergency situations.

The transceiver behaves according to the configurations in Emergency Mode when the transceiver is placed in Emergency Mode. The base station transceiver can notice an occurrence of an emergency situation in the transmitting transceiver upon receipt of a call by use of Emergency.

3.1 Placing the Transceiver in Emergency Mode

One of the following operations can place the transceiver in Emergency Mode:

- **Emergency key**

Pressing and holding the **Emergency** key for longer than the time configured in **Hold Delay** causes the transceiver to enter Emergency Mode.

For Portable, "Emergency" can be assigned to the **AUX** key or the **PF 1** key of the speaker microphone only as the function when the key is held.

For Mobile, "Emergency" can be assigned to the **AUX** key only as the function when the key is held.

Also, "Emergency" can be assigned to the AUX Input port for Mobile. In this case, the transceiver enters Emergency Mode if the AUX Input port to which "Emergency" is assigned goes low level. (Refer to Common FUNC Available Functions for AUX Input Ports.)

- **Lone Worker**

Using **Lone Worker**, the transceiver can automatically enter Emergency Mode and notify the base station of the emergency status when the transceiver becomes disabled from operating due to an accident.

When the time configured in **Lone Worker Interval** elapses and then the time configured in **Duration of Lone Worker Tone** elapses while the transceiver is in Lone Worker Mode, the transceiver enters Emergency Mode. (Refer to [Placing the Transceiver in Emergency Mode Using the Lone Worker Function](#).)

- **Activity Detection**

If **Activity Detection** is used, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status when the transceiver is detected to be in tilted, stationary, or shaking state for a certain period of time due to an accident. **Man-down Detection**, **Stationary Detection**, and **Motion Detection** are the functions available in Activity Detection. (Refer to [Placing the Transceiver in Emergency Mode by Using the Activity Detection Function](#).)

- **Heart Rate Service/ Automatic Injury Detection Service**

The transceiver enters Emergency Mode if the transceiver is connected to a Bluetooth-compatible device which supports **Heart Rate Service** or **Automatic Injury Detection Service** and the transceiver is in any of the following statuses:

(Refer to Common FUNC Activation of Emergency, Notifying of Damage on a Bluetooth-compatible Device to the Transceiver (Automatic Injury Detection Service).)

- When the status where the heart rate notified from a Bluetooth-compatible device goes higher than Upper Threshold continues while Delay Time is activated
- When the status where the heart rate notified from a Bluetooth-compatible device goes lower than Lower Threshold continues while Delay Time is activated
- When a notification of injury is received from a Bluetooth-compatible device

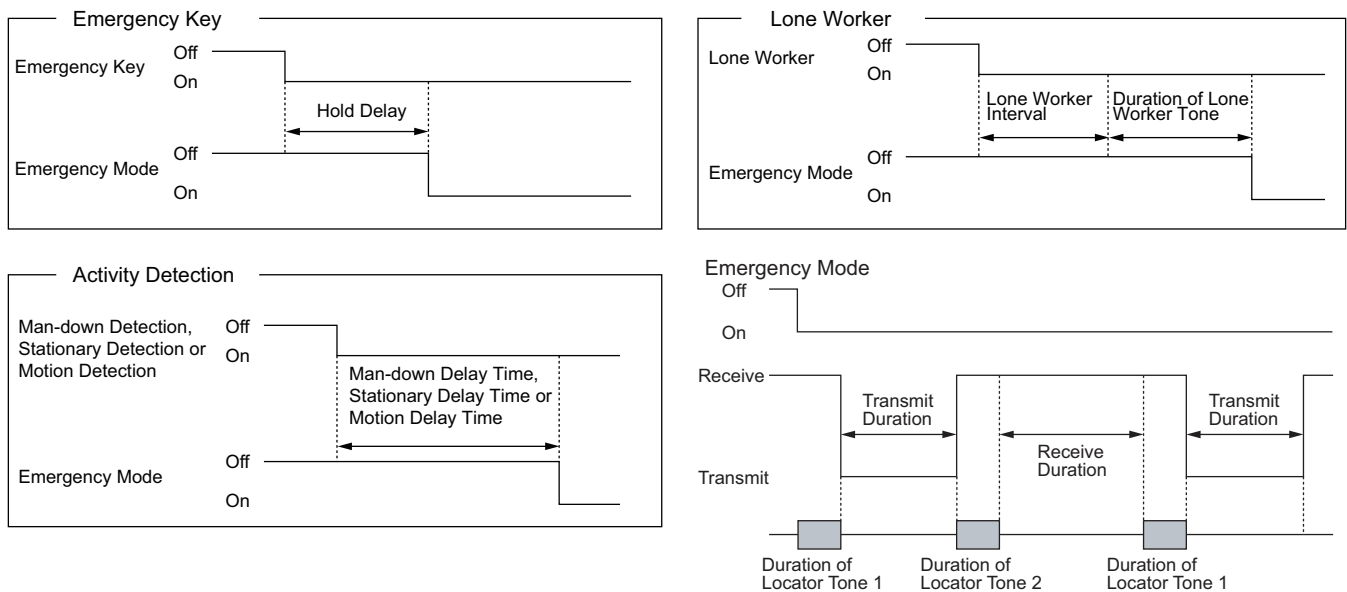


Figure 3-1 Emergency Mode

If Emergency Mode is activated by pressing the **Emergency** key or by the Lone Worker function, Emergency Mode will be exited when the **Emergency** key is pressed longer than the time configured in **Hold Delay** or when the transceiver is turned off. If Emergency Mode is activated by the Activity Detection function, Emergency Mode will be exited when the transceiver is turned off.

However, if **Suspended Power-off** is enabled, the transceiver will not be turned off and remains in Emergency Mode even if the transceiver is operated to be turned off while in Emergency Mode. (Refer to [Suspended Power-off](#).)

Note

- The transceiver automatically executes intermittent transmission while in Emergency Mode. Also, the speaker is unmuted during the automatic transmission.
For Mobile, if the transceiver migrates to Emergency Mode, the transceiver automatically executes intermittent transmission according to the Mic Line configured in **Modulation Line**.
- If the transceiver enters Emergency Mode during a scan, Emergency behaves according to the configuration in **Emergency Profile** for the selected channel.
- The **PTT** switch can be used even if the transceiver is in Emergency Mode. The transceiver reverts to automatic receive mode when the transceiver completes transmitting by releasing the **PTT** switch.
- In Emergency Mode, the microphone sensitivity is determined by the configuration in **Emergency Microphone Sense**. (Refer to [Emergency Microphone Sense](#).)
- Remote Monitor** (DMR-based Trunking) functions even if the transceiver is in Emergency Mode. The transceiver restores automatic receive mode after transmission by **Remote Monitor** completes.
- The transceiver does not decode the Stun Code and Optional Signaling in Emergency Mode.
- If the transceiver receives the status configured for **Emergency Termination Status** in Emergency Mode, the transceiver exits Emergency Mode.
- While the transceiver is under the following conditions, the transceiver does not enter Emergency Mode:
 - In the Stun state
 - If the transceiver is in Transceiver Password entry state
 - When "Selected" is configured in **Emergency Channel Type** and the selected channel is an error channel
- The Radio Check command (DMR-based Trunking) can also be received when the transceiver is in Emergency Mode.
- The following functions are disabled while the transceiver is in Emergency Mode:
 - Lone Worker** key
 - Lone Worker Channel (if "Preset" is configured in **Lone Worker Type**)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ([See](#) Transceiver Settings > Key Assignment)
- Configuring **Emergency Termination Status** ([See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))

Interrupt Emergency CALL

Interrupt Emergency CALL is the function to execute **Call Interruption** if voice communication (including voice communication not addressed to the own transceiver) is made on a channel used in Emergency Mode when the transceiver enters Emergency Mode.

Call Interruption is the function to enable a transceiver other than the transmitting transceiver to terminate voice communications by sending and receiving the Call Interruption request message. A transceiver receiving the Call Interruption request message on the channel where the transceiver is performing voice communication terminates voice communication. (Refer to [Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver \(Call Interruption\)](#).)

Configuration using KPG-D1/ D1N

Configuring **Interrupt Emergency CALL** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency)

Emergency Alarm

Emergency Alarm is the function to send an Emergency Alarm before the transceiver enters Emergency Mode to notify the base station that the transceiver is in an Emergency situation.

Using this function can reliably notify the base station that the transceiver is in an Emergency situation.

● Behavior of the transmitting transceiver

DMR Conventional system:

- The transceiver sends an Emergency Alarm when the **Emergency** key is pressed and when Lone Worker or various Activity Detection functions are activated on a DMR digital channel.
- If the transceiver receives an acknowledgment from the receiving transceiver, the transceiver enters Emergency Mode.
- After sending an Emergency Alarm, if the transceiver receives no acknowledgment until the length of time configured for **Maximum ACK Wait Time** elapses, the transceiver resends the Emergency Alarm. If the transceiver still cannot receive an acknowledgment after sending the Emergency Alarm 5 times, the transceiver enters Emergency Mode.

DMR-based Trunking system:

- The transceiver sends an Emergency Alarm when the **Emergency** key is pressed and when Lone Worker or various Activity Detection functions are activated on a DMR digital channel.
- If the transceiver receives an acknowledgment from the receiving transceiver, the transceiver starts the **Emergency Cycle** behavior.
- If the transceiver cannot receive an acknowledgment, the transceiver resends an Emergency Alarm for the number of times configured in **Number of Retries**. If the transceiver still cannot receive an acknowledgment after resending for the number of times configured in **Number of Retries**, the transceiver starts the **Emergency Cycle** behavior.

● Behavior of the receiving transceiver

DMR Conventional system:

- If the transceiver receives an Emergency Alarm, the transceiver notifies a user of the receipt of the Emergency Alarm according to the configuration for **Emergency Alarm Response**.
- If **Emergency Alarm ACK** is enabled, the transceiver returns an acknowledgment when the transceiver receives an Emergency Alarm.

DMR-based Trunking system:

- If the transceiver receives an Emergency Alarm, the transceiver notifies a user of the receipt of the Emergency Alarm according to the configuration for **Emergency Alarm Response**.

Note

- If a zone or channel is changed while the transceiver is in Emergency Mode, the transceiver resends an Emergency Alarm on the channel to which the transceiver has migrated.

About the configuration of Emergency Alarm

For the transceiver to send an Emergency Alarm, the configurations by using KPG-D1/ D1N need to be as follows:

- **DMR Conventional system**

Emergency Alarm (DMR): Enabled

Emergency ID (DMR Conventional): DMR

Emergency DMR ID Type: Group ID

For the receiving transceiver to return an acknowledgment when an Emergency Alarm is received, **Emergency Alarm Ack** needs to be enabled.

- **DMR-based Trunking system**

Emergency Alarm (DMR): Enabled

Emergency ID (DMR-based Trunking): DMR

Emergency DMR ID Type: Group ID or Unit ID

Emergency Alarm Response

Emergency Alarm Response is the function to enable the transceiver to notify a user of the receipt of an Emergency Alarm when the transceiver receives the Emergency Alarm.

The transceiver behaves as follows according to the configuration using KPG-D1/ D1N.

Table 3-1 Emergency Alarm Response

Configuration	Description
LCD	If an Emergency Alarm is received, the Group ID appears on the display. Also, the Emergency message and the Unit ID of the transmitting transceiver alternately appear. In a DMR-based Trunking system, the display and blinking are not reset even if the Auto Reset Timer elapses. Pressing any key resets the display and blinking. However, when the transceiver receives a voice call, the display for the reception of a voice call has priority.
Alert Tone	The Alert Tone configured for Alert Tone (Emergency Response) sounds from the transceiver when receiving an Emergency Alarm. In a DMR-based Trunking system, the Alert Tone does not stop even if the Auto Reset Timer elapses. Pressing any key stops the Alert Tone. However, when the transceiver receives a voice call, the Alert Tone which sounds for the reception of a voice call and the received voice call output have priority.
Horn (Mobile Only)	The Horn Alert port becomes active when receiving an Emergency Alarm. In a DMR-based Trunking system, the behavior of the Horn Alert port does not stop even if the Auto Reset Timer elapses.

Note

- For a DMR-based Trunking system, if LCD is enabled in **Emergency Alarm Response** and Status Message Stack is also enabled, an Emergency Alarm is stacked as a Status Message.

Configuration using KPG-D1/ D1N

- Configuring **Emergency Alarm (DMR)** in DMR Conventional to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency)
- Configuring **Emergency Alarm (DMR)** in DMR-based Trunking to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency)
- Configuring **Number of Retries** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency)
- Configuring **Maximum ACK Wait Time** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameter)
- Configuring **Emergency Alarm Response** ( **See** Transceiver Settings > DMR > DMR Information > General > Emergency Alarm Response)
- Configuring **Emergency Alarm Ack** (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring **Emergency Alarm Ack** (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)

3.2 Configuration Related to Transmission and Reception in Emergency Mode

The transceiver can have a maximum of 8 configurations related to transmission and reception in Emergency Mode as the Emergency Profile. By allocating **Emergency Profile** to each zone or channel, the Emergency behavior of the transceiver can vary depending on the zone or channel.

The functions that can be configured as an **Emergency Profile** are as follows:

- Emergency Channel Type
- Emergency Zone-Channel
- Emergency Mode Type
- Emergency Cycle
- Duration of Locator Tone 1
- Transmit Duration
- Duration of Locator Tone 2
- Receive Duration
- Emergency LED
- LCD Brightness

The common functions in Emergency Mode are as follows. One configuration from below is available for the transceiver:

- Emergency Display
- Emergency Microphone Sense
- Emergency Text
- Background Transmission
- Emergency Channel Lock
- Suspended Power-off
- Surveillance Mode
- Functions related to Lone Worker
- Functions related to Activity Detection
- Functions related to Bluetooth

Emergency Profile can be configured for each zone or channel. If “Common” is configured in **Emergency Profile** for a channel, the transceiver executes the Emergency behavior by using **Emergency Profile Number** configured for the zone of the channel.

Also, in a DMR Conventional system, **Emergency ID** (DMR Conventional) can be configured for each system. (Refer to **ID Sent When Emergency Mode is Activated**.)

In a DMR-based Trunking system, **Emergency ID** (DMR-based Trunking) and **Emergency Alarm** can be configured for each system. (Refer to **ID Sent When Emergency Mode is Activated**, **Emergency Alarm**.)

Configuration using KPG-D1/ D1N

- Configuring the various functions of **Emergency Profile** ( **See** Transceiver Settings > Emergency Information > Emergency Profile)
- Configuring Common Functions for **Emergency Mode** ( **See** Transceiver Settings > Emergency Information)

3.3 Zone-channel Functioning in Emergency Mode

The channel to be used when the transceiver enters Emergency Mode can be configured.

Emergency Channel Type

Emergency Channel Type is the type of a channel used when the transceiver is placed in Emergency Mode.

Table 3-2 Emergency Channel Type

Configuration	Description
Selected	When the transceiver enters Emergency Mode, the transceiver resets the migration state of channels, such as Home Channel, and then the transceiver executes Emergency on the previously selected channel.
Fixed	After entering Emergency Mode, the transceiver migrates to the Zone-channel configured in Emergency Zone-Channel and then executes the Emergency behavior.

The transceiver behaves as below according to the configuration for **Emergency Channel Type** :

- **Selected**

- **If a channel in a DMR Conventional system is selected:**

The transceiver behaves according to the configurations of **Emergency ID** and **Emergency DMR ID Type** (DMR Conventional).

Table 3-3 Emergency ID (DMR Conventional)

Configuration	Description
None	The transceiver transmits only using the Color Code.
DMR	If "Group ID" is configured for Emergency DMR ID Type , the transceiver initiates a Group Call by using the Group ID configured for Emergency DMR ID . If "Unit ID" is configured for Emergency DMR ID Type , the transceiver initiates an Individual Call by using the Unit ID configured for Emergency DMR ID .

- **If a channel in a DMR-based Trunking system is selected:**

The transceiver behaves according to the **Emergency DMR ID Type** (DMR-based Trunking) configuration.

If "Group ID" is configured for **Emergency DMR ID Type**, the transceiver initiates a Group Call by using the Group ID configured for **Emergency DMR ID**.

If "Unit ID" is configured for **Emergency DMR ID Type**, the transceiver initiates an Individual Call by using the Unit ID configured for **Emergency DMR ID**.

- **Fixed**

- **If a channel in a DMR Conventional system is configured in Emergency Zone-Channel:**

The transceiver behaves according to the configurations of **Emergency ID** and **Emergency DMR ID Type** (DMR Conventional).

Table 3-4 Emergency ID (DMR Conventional)

Configuration	Description
None	The transceiver transmits only using the Color Code.
DMR	If "Group ID" is configured for Emergency DMR ID Type , the transceiver initiates a Group Call by using the Group ID configured for Emergency DMR ID . If "Unit ID" is configured for Emergency DMR ID Type , the transceiver initiates an Individual Call by using the Unit ID configured for Emergency DMR ID .

- **If a channel in the DMR-based Trunking system is configured in Emergency Zone-Channel:**

The transceiver behaves according to the **Emergency DMR ID Type** (DMR-based Trunking) configuration.

If "Group ID" is configured for **Emergency DMR ID Type**, the transceiver initiates a Group Call by using the Group ID configured for **Emergency DMR ID**.

If "Unit ID" is configured for **Emergency DMR ID Type**, the transceiver initiates an Individual Call by using the Unit ID configured for **Emergency DMR ID**.

 Note

- If the transceiver executes the Emergency behavior on a channel in a DMR-based Trunking system, the transceiver executes the Hunt behavior when the transceiver is outside of the coverage area for the channel, and automatically acquires a control channel available in the system.
- If Preset Channel is configured in **Emergency Channel Type**, and if a channel of a DMR-based Trunking system is configured in **Emergency Zone-Channel**, the transceiver executes the Hunt behavior in the same manner as the normal zone change when **Emergency** is pressed in a zone other than a DMR-based Trunking system, and the transceiver automatically acquires a control channel available in the system.

Configuration using KPG-D1/ D1N

- Configuring **Emergency Channel Type** ( **See** Transceiver Settings > Emergency > Emergency Profile)
- Configuring **Emergency ID (DMR Conventional)** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))
- Configuring **Emergency ID (DMR-based Trunking)** ( **See** Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency > Emergency ID (DMR-based Trunking))

Emergency Zone-Channel

Emergency Zone-Channel is the Zone-channel used in Emergency Mode if “Fixed” is configured in **Emergency Channel Type**.

Configuration using KPG-D1/ D1N

Configuring **Emergency Zone-Channel** ( See Transceiver Settings > Emergency > Emergency Profile)

3.4 Automatically Transmitting and Receiving in Emergency Mode

The number of times for which the transceiver toggles between transmission and reception, or the duration for a single session of automatic transmission or reception for emergency in Emergency Mode can be configured. Also, the microphone sensitivity can be changed and the Background Tone (1 beep) can be multiplexed on the audio to be transmitted in Emergency Mode.

Emergency Cycle

Emergency Cycle is the number of times that the transceiver toggles between transmission and reception for an emergency in Emergency Mode.

Table 3-5 Emergency Cycle

Configuration	Description
1 to 200	The transceiver repeats automatic transmission and automatic reception for the configured number of times, and then the transceiver exits Emergency Mode.
Infinite	The transceiver continues to alternate between automatic transmission and reception until the Emergency key is pressed again or the transceiver is turned off.
Off	The transceiver does not automatically transmit and receive in Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **Emergency Cycle** ( See Transceiver Settings > Emergency Information > Emergency Profile)

Duration of Locator Tone 1

Duration of Locator Tone 1 is the duration to emit an Alert Tone which notifies that the transceiver will start transmission before the transceiver starts automatic transmission in Emergency Mode.

The transceiver automatically repeat transmitting and receiving in Emergency Mode. When the transceiver switches from reception to transmission, an Emergency Locator Tone (2 beeps) sounds from the transceiver for the length of the time configured for **Duration of Locator Tone 1**.

When the tone sounds, a user can easily recognize without viewing the transceiver that the transceiver is about to automatically transmit in Emergency Mode. This tone can also be used to locate a user who is in emergency situations.

Note

- This function is enabled if “Audible” is configured for **Emergency Mode Type**.
- For a portable transceiver that is connected to a Bluetooth or external speaker, Emergency Locator Tone (2 beeps) is emitted from the speaker of the transceiver regardless of the configuration of **Bluetooth Speaker** and **External Speaker**. Also, the audio received will be output according to the configuration of the **Bluetooth Speaker** and **External Speaker**.
- For Mobile, where an Emergency Locator Tone (2 beeps) and received audio are emitted from depends on the configuration in **External Speaker**.
- Refer to Common FUNC “Switching the Speaker to Emit Audio (Bluetooth Speaker)” for the speaker to emit the Locator Tone (2 beeps) if a speaker supporting Bluetooth is connected.

Configuration using KPG-D1/ D1N

Configuring **Duration of Locator Tone 1** ( **See** Transceiver Settings > Emergency Information > Emergency Profile)

Duration of Locator Tone 2

Duration of Locator Tone 2 is the duration to emit an Alert Tone which notifies that the transceiver has completed an automatic transmission in Emergency Mode, and starts receiving.

The transceiver automatically repeat transmitting and receiving in Emergency Mode. When the transceiver switches from reception to transmission, an Emergency Locator Tone (2 beeps) sounds from the transceiver for the length of time configured for **Duration of Locator Tone 2**.

When the tone sounds, a user can easily recognize without viewing the transceiver that the transceiver ends to automatically transmit in Emergency Mode. This tone can also be used to locate a user who is in emergency situations.

Note

- This function is enabled if “Audible” is configured for **Emergency Mode Type**.
- For a portable transceiver that is connected to a Bluetooth or external speaker, Emergency Locator Tone (2 beeps) is emitted from the speaker of the transceiver regardless of the configuration of **Bluetooth Speaker** and **External Speaker**. Also, the audio received will be output according to the configuration of the **Bluetooth Speaker** and **External Speaker**.
- For Mobile, where an Emergency Locator Tone (2 beeps) and received audio are emitted from depends on the configuration in **External Speaker**.
- Refer to Common FUNC “Switching the Speaker to Emit Audio (Bluetooth Speaker)” for the speaker to emit the Locator Tone (2 beeps) if a speaker supporting Bluetooth is connected.

Configuration using KPG-D1/ D1N

Configuring **Duration of Locator Tone 2** ( **See** Transceiver Settings > Emergency Information > Emergency Profile)

Transmit Duration

Transmit Duration is the duration for a single session of automatic transmission for emergency.

The transceiver switches to automatic reception for emergency when the time configured in **Transmit Duration** elapses after the transceiver starts automatic transmission for emergency.

The transceiver behaves as follows when “0” is configured in **Transmit Duration**:

- **If “None” is configured for Emergency ID:**

The transceiver does not send anything during automatic transmission.

- **If anything other than “None” is configured for Emergency ID:**

The transceiver sends only an Emergency Status during automatic transmission.



- In a DMR-based Trunking system, “None” does not exist as the configuration in **Emergency ID**.
- In a DMR-based Trunking system, the transceiver does not send an Emergency Status during automatic transmission.

Configuration using KPG-D1/ D1N

Configuring **Transmit Duration** (See Transceiver Settings > Emergency Information > Emergency Profile)

Receive Duration

Receive Duration is the duration for a single session of automatic reception for emergency in Emergency Mode.

The transceiver switches to automatic transmission for emergency when the time configured in **Receive Duration** elapses after the transceiver starts automatic reception for emergency.

Configuration using KPG-D1/ D1N

Configuring **Receive Duration** (See Transceiver Settings > Emergency Information > Emergency Profile)

Emergency Microphone Sense

Emergency Microphone Sense is the function used to adjust the microphone input sensitivity in Emergency Mode.

In **Emergency Microphone Sense**, the microphone sensitivity can be configured within the following range:

6 dB, 4 dB, 2 dB, 0 dB, -2 dB, -4 dB, -6 dB, -8 dB, -10 dB, -12 dB, -14 dB, -16 dB, -18 dB, -20 dB

The appropriate level of microphone sensitivity for normal operation is 0 dB. Based on this level, the parameter of the microphone sensitivity can be configured.



- The microphone sensitivity of the headset connected via Bluetooth also functions according to the configuration in **Emergency Microphone Sense** while the transceiver is in Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **Emergency Microphone Sense** (See Transceiver Settings > Emergency > Emergency Information)

Background Transmission

Background Transmission is a function that sends out a Background Tone (1 beep) when the transceiver transmits in the Emergency Mode.

This tone notifies the receiving transceiver that the transmitting transceiver is in an Emergency state.

Note

- A Background Tone is not emitted from the speaker of the transmitting transceiver.
- As it is not possible to multiplex Background Tone on the audio, audio sound will be muted when Background Tone is being sent out.

Configuration using KPG-D1/ D1N

Configuring **Background Transmission** ( See Transceiver Settings > Emergency > Emergency Information)

3.5 Indication and Sound in Emergency Mode

Functions related to the tone that sounds from the transceiver when the automatic transmission starts or ends in Emergency Mode, and display and the LED notification in Emergency Mode can be configured.

Locator Tone

An Emergency Locator Tone (2 beeps) sounds from the transceiver before the automatic transmission starts or when the automatic transmission completes in Emergency Mode.

In Emergency Mode, the transceiver repeats an automatic communication only the number of times configured in Emergency Cycle. (Refer to [Automatically Transmitting and Receiving in Emergency Mode.](#))

Emergency Display

Emergency Display is the function to display the channel configured in **Emergency Zone-Channel** when in Emergency Mode or to retain the display appearance before the transceiver enters Emergency Mode.

Table 3-6 Emergency Display

Configuration	Description
Selected	The previously selected channel is retained on the display even if the transceiver enters Emergency Mode.
Emergency Channel	A channel configured in Emergency Zone-Channel appears when the transceiver enters Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **Emergency Display** ( See Transceiver Settings > Emergency > Emergency Information)

Emergency Text

Emergency Text is the function to display the text on the transceiver display while in Emergency Mode.
If this function is enabled, the text configured in **Text** appears on the display when the transceiver enters Emergency Mode.

Display example:

Emergency Zone-Channel: Zone 1, Channel 1

Emergency Display: Emergency Channel

Text: "Emergency"



Configuration using KPG-D1/ D1N

- Configuring **Emergency Text** to be enabled or disabled ( See Transceiver Settings > Emergency > Emergency Information)
- Configuring **Text** ( See Transceiver Settings > Emergency > Emergency Information)

Emergency Mode Type

Emergency Mode Type is the function to determine whether the received audio or various tones are muted while the transceiver is in Emergency Mode.

Table 3-7 Emergency Mode Type

Configuration	Description
Silent	The transceiver mutes the received audio and various tones while in Emergency Mode.
Audible	The transceiver emits the received audio and various tones in the same manner as in normal mode even while in Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **Emergency Mode Type** ( See Transceiver Settings > Emergency Information > Emergency Profile)

Emergency LED

Emergency LED is the function to light the Transmit LED when the transceiver transmits in Emergency Mode and light the Busy LED when the transceiver receives in Emergency Mode.

The transceiver behaves as follows depending on the **Emergency LED** configuration.

- **If the Emergency LED is enabled:**

- While in Emergency Mode, the Transmit LED is on during data transmission, and the Busy LED is on during data receipt.
- For Portable, if “Audible” is configured in **Emergency Mode Type**, the backlight lights while the transceiver is in Emergency Mode.
- The Busy LED lights even though the received audio is not output due to the output of the Locator Tone while the transceiver is on the traffic channel.
- For Portable, if the transceiver enters Emergency Mode while the backlight is lit, the backlight continues to light. However, when “Silent” is configured in **Emergency Mode Type**, the backlight turns off when entering Emergency Mode.
- For Mobile, regardless of the configuration in **Emergency LED** and the configuration in **Emergency Mode Type**, the state of the backlight when the transceiver enters Emergency Mode does not change.

- **If the Emergency LED is disabled:**

- While in Emergency Mode, the Transmit LED is off during data transmission, and the Busy LED is off during data receipt.
- For Portable, the backlight does not light while the transceiver is in Emergency Mode.
- For Portable, if the transceiver enters Emergency Mode while the backlight is lit, the backlight turns off.
- For Mobile, regardless of the configuration in **Emergency LED** and the configuration in **Emergency Mode Type**, the state of the backlight when the transceiver enters Emergency Mode does not change.

Note

- For mobile transceivers, the brightness of the backlight in the Emergency Mode follows the configuration of **LCD Brightness**. It is not dependent on the configuration of **Emergency LED**. (Refer to Common FUNC Changing the Brightness of the Backlight (LCD Brightness).)

Configuration using KPG-D1/ D1N

Configuring **Emergency LED** ( **See** Transceiver Settings > Emergency Information > Emergency Profile)

Surveillance Mode

Surveillance Mode is the function to continue the Surveillance function as enabled even if the transceiver enters Emergency Mode while the Surveillance function is enabled.

While the Surveillance function is enabled, the transceiver does not emit a tone or light the backlight even when the transceiver functions.

The Surveillance function is used when the change of the transceiver status needs to be kept unnoticed, such as while on a Public Safety operation.

The transceiver behaves as follows according to the configuration in **Surveillance Mode**:

- **If Surveillance Mode is enabled**

Even if the transceiver enters Emergency Mode while the Surveillance function is enabled, the Surveillance function remains enabled, and the transceiver does not emit a tone and the backlight and LED do not light. The Surveillance function remains enabled even if the transceiver exits Emergency Mode.

- **If Surveillance Mode is disabled**

The Surveillance function is disabled if the transceiver enters Emergency Mode while the Surveillance function is enabled.

The transceiver behaves according to the configurations in Emergency Mode when the transceiver is placed in Emergency Mode. The Surveillance function remains disabled even if the transceiver exits Emergency Mode.



- While in Emergency Mode, the Surveillance function cannot be toggled between enabled and disabled by operating the transceiver.

Configuration using KPG-D1/ D1N

Configuring **Surveillance Mode** to be enabled or disabled (**See** Transceiver Settings > Emergency > Emergency Information)

3.6 ID Sent When Emergency Mode is Activated

The Emergency ID can be sent each time the transceiver starts automatic transmission and reception in Emergency Mode.

Emergency ID

Emergency ID is the type of code to be sent out each time the transceiver starts automatic emergency transmission and reception in Emergency Mode.

Table 3-8 Emergency ID

Configuration	Description
None	The transceiver transmits and receives according to the configuration for Color Code of the Zone-channel used for Emergency Mode.
DMR	When transmitting in Emergency Mode, the transceiver initiates a Group Call or an Individual Call according to the configurations for Emergency DMR ID Type and Emergency DMR ID. Also, the following status IDs that are sent when automatic transmission in Emergency Mode is started can be configured for each factor that activates Emergency Mode (Emergency Key, Lone Worker, Man-down, Stationary, or Motion): If the received status ID matches the status ID configured in any of the following, the corresponding fixed character string is displayed. Refer to Table 1-13 in "Receiving a Status Message". Emergency Call Status The status ID that is sent when the transceiver enters Emergency Mode by pressing the Emergency key Lone Worker Status The status ID that is sent when the transceiver enters Emergency Mode by the Lone Worker function Man-down Status The status ID that is sent when the transceiver enters Emergency Mode by the Man-down function, Heart Rate Service function, or Automatic Injury Detection Service function Stationary Status The status ID that is sent when the transceiver enters Emergency Mode by the Stationary function Motion Status The status ID that is sent when the transceiver enters Emergency Mode by the Motion function To send the above status ID when automatic transmission in Emergency Mode starts, Emergency Status (DMR) needs to be enabled. If Emergency Status (DMR) is disabled, the status ID will not be sent. However, in a DMR Conventional system, if "None" is configured in Emergency ID, the status ID will not be sent even when Emergency Status (DMR) is enabled. Also, if the status ID of the corresponding activation factor is not configured and the activation factor places the transceiver in Emergency Mode, the status ID configured in Emergency Call Status is sent.

Note

- In a DMR-based Trunking system, "None" does not exist as the configuration in **Emergency ID**.

Configuration using KPG-D1/ D1N

- Configuring **Emergency ID (DMR Conventional)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))
- Configuring various status IDs in DMR Conventional ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))
- Configuring various status IDs in DMR-based Trunking ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency > Emergency ID (DMR-based Trunking))
- Configuring **Emergency Status (DMR)** in DMR Conventional to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency)
- Configuring **Emergency Status (DMR)** in DMR-based Trunking to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency)

Emergency DMR ID Type

Emergency DMR ID Type is the type of DMR ID used in Emergency Mode.

“Group ID” or “Unit ID” can be configured for **Emergency DMR ID Type** in each system.

Configuration using KPG-D1/ D1N

- Configuring **Emergency DMR ID Type** in DMR Conventional ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))
- Configuring **Emergency DMR ID Type** in DMR-based Trunking ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency > Emergency ID (DMR-based Trunking))

Emergency DMR ID

Emergency DMR ID is the DMR ID used for transmission and reception in Emergency Mode.

If “Unit ID” is configured for **Emergency DMR ID Type**, the Unit ID used for initiating an Individual Call in Emergency Mode can be configured for each system.

If “Group ID” is configured for **Emergency DMR ID Type**, the Group ID used for initiating a Group Call in Emergency Mode can be configured for each system.

In a DMR-based Trunking system, if **Fleet Dialing Plan** is enabled, an ID can be configured even in the Prefix-Fleet-IN/GN format.

Configuration using KPG-D1/ D1N

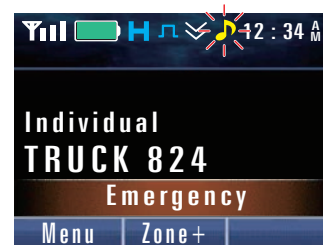
- Configuring **Emergency DMR ID** in DMR Conventional ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))
- Configuring **Emergency DMR ID** in DMR-based Trunking ( [See](#) Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Emergency > Emergency ID (DMR-based Trunking))

3.7 Indication When Receiving Emergency Call

When receiving an Emergency Call from an Individual Call or Group Call, "Emergency" is displayed on the display of the transceiver.

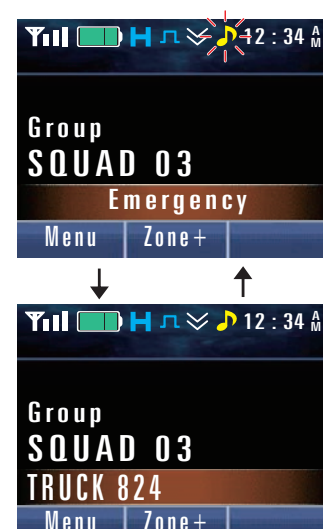
● Indication when receiving an Individual Call

When receiving an Emergency Call from an Individual Call, the "📞" icon blinks on the display of the transceiver, and "Emergency" as well as the ID name of the transmitting transceiver appear on the display.



● Indication when receiving a Group Call

When receiving an Emergency Call from a Group Call, the "📞" icon blinks on the display of the transceiver, and "Emergency" and the ID name of the transmitting transceiver appear alternately at 1-sec intervals on the display.



Note

- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving a call. For the behaviors of the LED during receiving, refer to "[Receiving an Individual Call](#)" and "[Receiving a Group Call](#)".
- For the indication when an Emergency Call is received after receiving a status ID, refer to "[Receiving a Status Message](#)".
- Even when **Caller ID Stack** is configured to "Individual Call", when an Emergency Call is received via Group Call, the Caller ID will be saved to the stack memory of the transceiver. (Refer to Common FUNC Caller ID Stack.)

3.8 Other Functions in Emergency Mode

Emergency Channel Lock and **Suspended Power-off** are other available functions in Emergency Mode.

Emergency Channel Lock

Emergency Channel Lock is the function to disable changing a zone or channel while the transceiver is in Emergency Mode.

If this function is enabled, a zone or channel cannot be changed while the transceiver is in Emergency Mode.

If this function is disabled, a zone or channel can be changed while the transceiver in Emergency Mode is not transmitting.

Configuration using KPG-D1/ D1N

Configuring **Emergency Channel Lock** to be enabled or disabled ( **See** Transceiver Settings > Emergency > Emergency Information)

Suspended Power-off

Suspended Power-off is the function to disable the transceiver to be turned off and retain the transceiver to be in Emergency Mode even if the transceiver is operated to be turned off while in Emergency Mode.

For Mobile, the transceiver behavior varies as below depending on the configuration in **Emergency Mode Type**:

- **If “Silent” is configured in Emergency Mode Type**

The transceiver will not be turned off and remains in Emergency Mode even if the **Power** switch is pressed while the transceiver is in Emergency Mode. In this case, the LCD is tuned off and the transceiver appears to be turned off. The LED behaves according to the configuration in **Emergency LED** while **Suspended Power-off** is enabled.

- **If “Audible” is configured in Emergency Mode Type**

The transceiver will not be turned off and remains in Emergency Mode even if the **Power** switch is pressed while the transceiver is in Emergency Mode. In this case, the LCD display does not change. The LED behaves according to the configuration in **Emergency LED** while **Suspended Power-off** is enabled.

For Portable, the transceiver will not be turned off and remains in Emergency Mode even if the transceiver is operated to be turned off while in Emergency Mode. In this case, the LCD display does not change. The LED behaves according to the configuration in **Emergency LED** while **Suspended Power-off** is enabled.

If **Suspended Power-off** is enabled, the transceiver cannot be turned off until the transceiver exits Emergency Mode. However, for Mobile, the transceiver can be turned off by pressing and holding the **Power** switch for 5 sec or more even while **Suspended Power-Off** is activated.

Note

- If Emergency Mode is activated by the Activity Detection function or Bluetooth function, **Suspended Power-off** does not function.
- If Emergency Mode is activated by the Lone Worker function, **Suspended Power-off** functions.

Configuration using KPG-D1/ D1N

Configuring **Suspended Power-off** to be enabled or disabled ( **See** Transceiver Settings > Emergency > Emergency Information)

3.9 Placing the Transceiver in Emergency Mode Using the Lone Worker Function

Lone Worker is the function that automatically places the transceiver in Emergency Mode if the transceiver is not operated for a certain period of time.

If the transceiver is placed in Lone Worker Mode while the user has a task at a dangerous place, for instance, the transceiver automatically enters Emergency Mode and notifies a base station of the emergency status because a user cannot operate the transceiver due to an accident.

Since the Lone Worker Tone (2 beeps) sounds from the transceiver prior to entering Emergency Mode if the transceiver is in the Lone Worker Mode, the Lone Worker function can also be used to warn a user.

Enabling the Transceiver in Lone Worker Mode/Disabling Lone Worker Mode

The transceiver enters or exits Lone Worker Mode by a user operating the keys on the transceiver.

Operating the transceiver

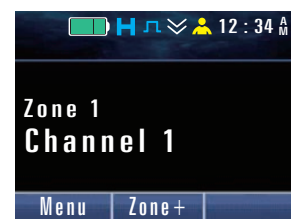
● Enabling the Transceiver in Lone Worker Mode/Disabling Lone Worker Mode

1

Do either of the following operations while the transceiver is not in Lone Worker Mode:

- Press the **Lone Worker** key.
- Select a channel where **Lone Worker** is enabled.
- Press the **Menu** key to enter Menu Mode, and select "Lone Worker" and then select "ON".

The "  " icon appears, the transceiver enters Lone Worker Mode, and then **Lone Worker Interval** is activated. The Key Beep A (1 beep) sounds from the transceiver when the **Lone Worker** key is pressed.

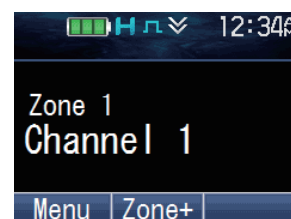


2

Do either of the following operations while the transceiver is in Lone Worker Mode:

- Press the **Lone Worker** key.
- Select a channel where **Lone Worker** is disabled.
- Press the **Menu** key to enter Menu Mode, and select "Lone Worker" and then select "OFF".

The "  " icon disappears and the transceiver exits Lone Worker Mode. The Key Beep B (2 beeps) sounds from the transceiver when the **Lone Worker** key is pressed.



If no key is pressed after **Lone Worker Interval** is activated, the Lone Worker Tone (2 beeps) sounds from the transceiver when the time configured in **Lone Worker Interval** elapses. The Lone Worker Tone (2 beeps) sounds for the duration configured in **Duration of Lone Worker Tone**. If no key is pressed while the Lone Worker Tone (2 beeps) continues to sound from the transceiver, and if the time configured in **Duration of Lone Worker Tone** elapses, the transceiver enters Emergency Mode.

The transceiver behaves according to the configuration of Emergency after the transceiver enters Emergency Mode.

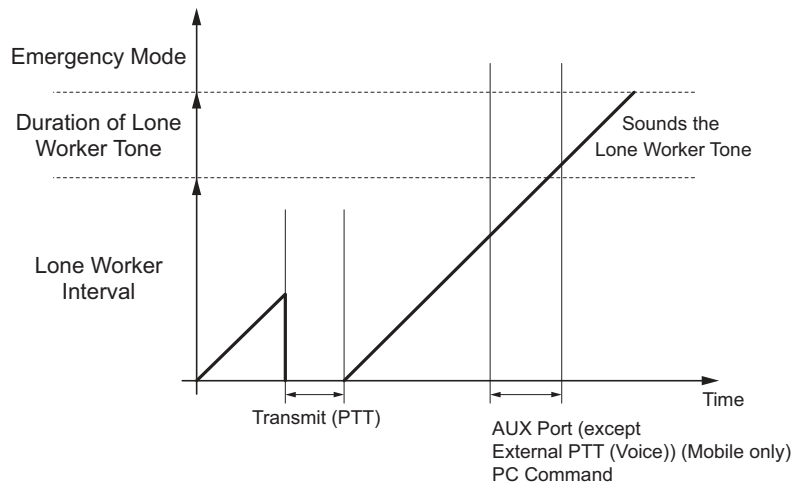


Figure 3-2 Lone Worker Mode

Note

- If "Transmit/Receive Inhibit" is configured in **Lone Worker Type**, Lone Worker cannot be turned ON or OFF in Menu Mode. (Refer to **Lone Worker Type**.)
- Lone Worker cannot be activated while the transceiver is in the Stun state or while in Transceiver Password Mode.
- For Mobile, if the AUX Input port to which "Emergency" is assigned becomes active for the time configured in **Emergency Delay Time** while the transceiver is in Lone Worker Mode, the transceiver enters Emergency Mode.
- Lone Worker can be activated even if the Key Lock state is activated while the transceiver is in Lone Worker Mode.
- If the transceiver migrates from Lone Worker Mode to Emergency Mode, the transceiver exits Emergency Mode if the **Emergency** key is pressed for a length of time greater than the length of time configured in **Hold Delay**.
- If a scan initiates while the transceiver is in Lone Worker Mode, the scan initiates with Lone Worker Mode enabled. If the scan starts while the transceiver is in a mode other than Lone Worker mode, the scan starts with Lone Worker Mode disabled.
- Lone Worker will be turned off for channels not programmed for the transceiver. Also, when Lone Worker switches to the OFF state upon moving to a channel not programmed for the transceiver, this state will not be retained on the transceiver.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver (**See** Transceiver Settings > Key Assignment)
- Configuring **Lone Worker (DMR Conventional)** to be enabled or disabled (Personality) (**See** Transceiver Settings > Personal > Personality > DMR Conventional > General)
- Configuring **Lone Worker (DMR Conventional)** to be enabled or disabled (Channel Edit) (**See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)

Functions in Lone Worker Mode

The transceiver enters or exits Lone Worker Mode by a user operating the keys on the transceiver.

The following functions are relevant to Lone Worker Mode.

- Lone Worker Type
- Lone Worker Interval
- Duration of Lone Worker Tone

Lone Worker Type

Lone Worker Type allows you to configure how the transceiver behaves in Lone Worker Mode.

The transceiver behaves as below while in Lone Worker Mode according to the configuration in **Lone Worker Type**:

Table 3-9 Lone Worker Type

Configuration	Description
Normal	Lone Worker Mode can be toggled between enabled and disabled by pressing the Lone Worker key. A user can transmit and receive using the transceiver in the same manner as normal even if the transceiver enters Lone Worker Mode and while the time configured in Lone Worker Interval is counted. The status of Lone Worker Mode, either enabled or disabled by pressing the Lone Worker key, is retained in the transceiver. The status of Lone Worker Mode, either enabled or disabled, is also retained in the transceiver even if the channel is changed or the transceiver is turned ON or OFF.
Transmit/ Receive Inhibit	Lone Worker Mode can be toggled between enabled and disabled by pressing the Lone Worker key. A user cannot transmit or receive using the transceiver while the time configured in Lone Worker Interval is counted after the transceiver enters Lone Worker Mode. Only the following PF keys can be used while the transceiver is in Lone Worker Mode: • Lone Worker key • Emergency key • Function key • Backlight key • LCD Brightness key • Zeroize key • Battery Status key The status of Lone Worker Mode, either enabled or disabled by pressing the Lone Worker key, is retained in the transceiver. The status of Lone Worker Mode, either enabled or disabled, is also retained in the transceiver even if the channel is changed or the transceiver is turned ON or OFF.
Preset	If a channel is selected, Lone Worker Mode is enabled or disabled depending on the configuration in Lone Worker for the selected channel. Lone Worker Mode can also be toggled between enabled and disabled by pressing the Lone Worker key. A user can transmit and receive using the transceiver in the same manner as normal even if the transceiver enters Lone Worker Mode and while the time configured in Lone Worker Interval is counted. The status of Lone Worker Mode, either enabled or disabled by pressing the Lone Worker key, is not retained in the transceiver. If "Lone Worker" is assigned to the Lever switch, whether Lone Worker is enabled or disabled for the transceiver when a channel is changed depends on the selection in the Lever switch.

Lone Worker Type can be configured using KPG-D1/ D1N depending on the usage of the transceiver. The transceiver behavior varies as below depending on the configuration in **Lone Worker Type**:

Table 3-10 Lone Worker Type

Transceiver Behavior	Configuration in Lone Worker Type		
	Normal	Transmit/Receive Inhibit	Preset
Toggling Lone Worker Mode between enabled and disabled when a channel is changed	No	No	Yes
Toggling Lone Worker Mode between enabled and disabled by pressing the Lone Worker key	Yes	Yes	Yes
Retaining the status of Lone Worker Mode, either enabled or disabled, in the transceiver	Yes	Yes	No
Transmitting and receiving by operating the transceiver in the same manner as normal mode	Yes	No	Yes

Yes: possible, No: not possible

Configuration using KPG-D1/ D1N

Configuring **Lone Worker Type** ( See Transceiver Settings > Emergency > Emergency Information > Lone Worker)

Lone Worker Interval

Lone Worker Interval is the interval time from when the transceiver enters Lone Worker Mode until the Lone Worker Tone (2 beeps) sounds from the transceiver.

If no key is pressed after the transceiver enters Lone Worker Mode and then **Lone Worker Interval** is activated, the Lone Worker Tone (2 beeps) sounds from the transceiver when the time configured in Lone Worker Interval elapses. For the time configured in **Duration of Lone Worker Tone**, the Lone Worker Tone (2 beeps) sounds from the transceiver.

If any key is pressed before the time configured in **Lone Worker Interval** elapses, **Lone Worker Interval** is reset and then restarts counting down from the beginning. Also, if the **Lone Worker** key is pressed before the time configured in **Lone Worker Interval** elapses, Lone Worker Mode becomes disabled and then the transceiver reverts to the normal mode.

Configuration using KPG-D1/ D1N

Configuring **Lone Worker Interval** ( See Transceiver Settings > Emergency > Emergency Information > Lone Worker)

Duration of Lone Worker Tone

Duration of Lone Worker Tone is the length of time that the Lone Worker Tone (2 beeps) sounds from the transceiver.

If no key is pressed after the transceiver enters Lone Worker Mode and then **Lone Worker Interval** is activated, the Lone Worker Tone (2 beeps) sounds from the transceiver when the time configured in **Lone Worker Interval** elapses. For the time configured in **Duration of Lone Worker Tone**, the Lone Worker Tone (2 beeps) sounds from the transceiver. If no key is pressed while the Lone Worker Tone (2 beeps) continues to sound from the transceiver, and if the time configured in **Duration of Lone Worker Tone** elapses, the transceiver enters Emergency Mode.

If any key is pressed while the Lone Worker Tone (2 beeps) continues to sound from the transceiver, the Lone Worker Tone (2 beeps) stops sounding, and **Lone Worker Interval** is reset, and then restarts counting down from the beginning.

Configuration using KPG-D1/ D1N

Configuring **Duration of Lone Worker Tone** ( See Transceiver Settings > Emergency > Emergency Information > Lone Worker)

3.10 Placing the Transceiver in Emergency Mode by Using the Activity Detection Function

Supported Models: Portable

Activity Detection is the function to detect the status of the transceiver by analyzing the behavior of the transceiver by using the acceleration sensor and tilt sensor embedded in the transceiver, and to automatically place the transceiver in Emergency Mode.

Using this function, if the transceiver detects that the transceiver is tilted, remains stationary, or moves vigorously for a certain period of time due to an accident, the transceiver automatically enters Emergency Mode and notifies the base station of the emergency status.

To use this function, **Activity Detection** must be enabled.

Operating the transceiver

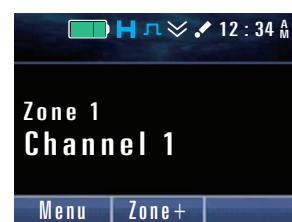
● Enabling Activity Detection/Disabling Activity Detection

1 Do either of the following operations while Activity Detection is disabled:

- Press the **Activity Detection** key.
- Select a channel where **Activity Detection** is enabled.
- Press the **Menu** key to enter Menu Mode, and select "Activity Detection" and then select "On".

The "  " icon appears and **Activity Detection** will be enabled.

If **Activity Detection** is enabled by using the **Activity Detection** key or the **Menu** key, the Key Beep A (1 beep) sounds from the transceiver.

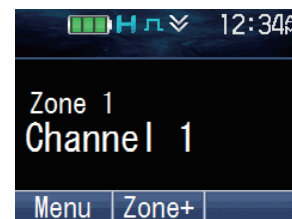


2 Do either of the following operations while Activity Detection is disabled:

- Press the **Activity Detection** key.
- Select a channel where **Activity Detection** is disabled.
- Press the **Menu** key to enter Menu Mode, and select "Activity Detection" and then select "Off".

The "  " icon disappears and **Activity Detection** will be disabled.

If **Activity Detection** is disabled by using the **Activity Detection** key or the **Menu** key, the Key Beep B (2 beeps) sounds from the transceiver.



Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Activity Detection (DMR Conventional)** to be enabled or disabled (Personality) ( [See](#) Transceiver Settings > Personal > Personality > DMR Conventional > General)
- Configuring **Activity Detection (DMR Conventional)** to be enabled or disabled (Channel Edit) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)

Man-down Detection

Man-down Detection is the function to place the transceiver automatically in Emergency Mode when the transceiver becomes tilted and continues this position even after the time configured in **Man-down Delay Time** elapses.

Using this function, the transceiver can automatically enter Emergency Mode and notify a base station of the emergency status when a user falls due to an accident.

If **Man-down Pre-alert** is configured, a Man-down Pre-alert (1 beep) sounds from the transceiver before the transceiver enters Emergency Mode. The transceiver does not enter Emergency Mode if the transceiver returns from the tilted position before the time configured in **Man-down Delay Time** elapses.

The threshold value of the tilt angle (**Man-down Angle**) to be used to detect that the transceiver is tilted can be configured to 45 ° , 60 ° , or 75 ° .

Note

- Pressing the **PTT** switch while the time configured in **Man-down Delay Time** elapses pauses the **Man-down Delay Time** count down. Releasing the **PTT** switch resumes the counting down.
- Pressing the **Activity Reset** key resets the **Man-down Delay Time** timer and restarts counting down from the beginning.

Configuration using KPG-D1/ D1N

- Configuring **Man-down Detection** to be enabled or disabled ( [See](#) Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Man-down Delay Time** ( [See](#) Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Man-down Pre-alert** to be enabled or disabled ( [See](#) Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Man-down Angle** ( [See](#) Transceiver Settings > Emergency > Emergency Information > Activity Detection)

Stationary Detection

Stationary Detection is the function to place the transceiver automatically in Emergency Mode when the transceiver becomes stationary and continues this position even after the time configured in **Stationary Delay Time** elapses.

Using this function, the transceiver can automatically enter Emergency Mode and notify a base station of the emergency status when a user cannot operate the transceiver due to an accident.

If **Stationary Pre-alert** is configured, a Stationary Pre-alert (1 beep) sounds from the transceiver before the transceiver enters Emergency Mode. The transceiver does not enter Emergency Mode if the transceiver returns from the stationary state before the time configured in **Stationary Delay Time** elapses.

Note

- Pressing the **PTT** switch while the time configured in **Stationary Delay Time** elapses pauses the **Stationary Delay Time** count down. Releasing the **PTT** switch resumes the counting down.
- Pressing the **Activity Reset** key resets the **Stationary Delay Time** timer and restarts counting down from the beginning.

Configuration using KPG-D1/ D1N

- Configuring **Stationary Detection** to be enabled or disabled ( **See** Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Stationary Delay Time** ( **See** Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Stationary Pre-alert** ( **See** Transceiver Settings > Emergency > Emergency Information > Activity Detection)

Motion Detection

Motion Detection is the function to place the transceiver automatically in Emergency Mode when the transceiver receives strong shocks by being strongly shaken or swung and continues this state for the time configured in **Motion Delay Time**.

Using this function, the transceiver can automatically enter Emergency Mode and notify a base station of the emergency status when the transceiver repeatedly receives powerful shocks due to an accident.

If **Motion Pre-alert** is configured, a Motion Pre-alert (1 beep) sounds from the transceiver before the transceiver enters Emergency Mode.

The transceiver does not enter Emergency Mode if the severe movement of the transceiver stops before the time configured in **Motion Delay Time** elapses.

Note

- Pressing the **PTT** switch while the time configured in **Motion Delay Time** elapses pauses the **Motion Delay Time** count down. Releasing the **PTT** switch resumes the counting down.
- Pressing the **Activity Reset** key resets the **Motion Delay Time** timer and restarts counting down from the beginning.

Configuration using KPG-D1/ D1N

- Configuring **Motion Detection** to be enabled or disabled ( **See** Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Motion Delay Time** ( **See** Transceiver Settings > Emergency > Emergency Information > Activity Detection)
- Configuring **Motion Pre-alert** ( **See** Transceiver Settings > Emergency > Emergency Information > Activity Detection)

Using Man-down Detection and Stationary Detection Simultaneously (Man-down with Stationary)

Man-down with Stationary is the function to detect emergency using both the **Man-down Detection** and **Stationary Detection** functions.

If this function is enabled, the transceiver detects emergency using both the **Man-down Detection** and **Stationary Detection** functions. If both **Man-down Detection** and **Stationary Detection** enter the detection state, **Man-down Delay Time** is activated. If the time configured in **Man-down Delay Time** elapses while the transceiver continues to be in the state, the transceiver enters Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **Man-down with Stationary** to be enabled or disabled ( [See](#) Transceiver Settings > Emergency > Emergency Information > Activity Detection)

3.11 Transceiver Behavior When the Transceiver Receives an Emergency Status

An Alert Tone can sound when the transceiver receives a DMR Emergency Status. This behavior can be configured for **Emergency Status Response**.

Refer to “[Emergency Status Response](#)” for details of Emergency Response.

Encryption is the function that enhances secrecy in communications on the DMR digital channels by encrypting voice data or user data such as a Short Message and a Long Message.

The following Encryption function can be used in a DMR system.

However, for a Trunking 2.5 system and S-Trunking system, the Enhanced Encryption format is not supported.

- Bit scramble encryption type
- AES/ DES encryption type
- DES encryption type (Built-in DES)
- Enhanced Encryption format

The AES/ DES encryption function offers enhanced encryption strength compared to encryption functions using the bit scrambling format or the DES (Built-in DES) or Enhanced Encryption format. To make use of the AES/ DES encryption function, it is necessary to mount the optional Secure Cryptographic Module (henceforth "SCM") to the transceiver and write the encryption key data to the SCM. (Refer to [Secure Cryptographic Module \(SCM\) \(for AES/ DES Only\)](#).)

When a transceiver transmits or receives a signal in the bit scrambling, DES (Built-in DES) or Enhanced Encryption format, the communication data is encrypted or decrypted using the encryption key data configured in the transceiver. In comparison, the AES/ DES method encrypts or decrypts the communication data using the encryption key data configured for SCM.

Transmission

If Encryption is enabled, the transceiver encrypts and sends out audio data or user data such as Short Message. If Encryption is disabled, the transceiver transmits communication data without encryption.

Reception

Upon receipt of the encrypted communication data, the transceiver decrypts the received data using the encryption key data configured in the transceiver or SCM. If the data is properly decrypted, the received audio sounds from the speaker. The receive behavior of the transceiver, however, differs depending on the Encryption status (enabled or disabled) and the configuration for **Encryption Type**. Refer to "[Transceiver Behavior upon Receipt of Encrypted Communication Data](#)" for details.

About the configuration of encryption key data

By using the KPG-D1/ D1N, it is possible to configure up to a total of 32 encryption key data used by encryption functions in the bit scrambling, DES (Built-in DES) or Enhanced Encryption format as well as encryption key information used by the AES/ DES encryption function in the **Multi-key List**. The Encryption status (to be enabled or disabled) and the **Multi-key List Number** with the encryption key data can be configured for each channel. (Refer to [Multi-key List](#).)

When the SCM uses the AES/ DES method, up to 1,024 encryption key data can be stored inside the SCM. The encryption key data that is linked to the CKR ID of the **Multi-key List** can be selected. The **Multi-key List** can be configured to contain a combination of encryption key data in the bit scrambling or Enhanced Encryption format and encryption key information in the AES/DES format.

When the SCM uses the DES (Built-in DES) format, up to 4 encryption key data can be stored inside the built-in memory of the transceiver. The encryption key data that is configured in the **Multi-key List** can be selected. The **Multi-key List** can be configured to contain a combination of encryption key data in the bit scrambling, Enhanced Encryption and DES (Built-in DES) formats.

Also, the Encryption status (enabled or disabled) and Encryption Key used for communications can be changed by the transceiver operation.

Note

- The following are the types of user data and whether the various user data can be encrypted or not:

Table 4-1 Encryptable User Data

User Data	Bit Scrambling	AES/ DES (KWD-AE30/ KWD-AE31/ KWD-DE31)	Built-in DES	Enhanced Encryption
Status Message	No	No	No	No
Short Message	No	Yes	Yes	Yes
Long Message	No	Yes	Yes	Yes
Transparent	No	Yes	Yes	Yes
GPS Data	No	No	No	No
GPS Combination	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No
GPS Report with Voice	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No
BLE Data	No	No	No	No
BLE Combination	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No
BLE Report with Voice	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No	Voice: Yes Data: No

Yes: encryptable, No: not encryptable

- Upon transmission using the Encryption function by means of AES/ DES, the transmission cannot be done if no SCM is installed in the transceiver, if the SCM is disabled, or if an Encryption Key corresponding to the **Multi-key List Number** is not configured on the SCM. In this case, the Key Fail Alert Tone (6 beeps) sounds from the transceiver, and "Key Fail" appears on the transceiver display for 1 sec.

Configuration using KPG-D1/ D1N

- Enabling or disabling **Encryption** and configuring the **Multi-key List Number** for DMR Conventional (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR > Encryption Settings)
- Enabling or disabling **Encryption** and configuring the **Multi-key List Number** for DMR Conventional (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR > Encryption Settings)
- Configuring **Encryption Type** of DMR ( **See** Transceiver Settings > Encryption > DMR)

4.1 Toggling the Encryption during Transmission between Enabled and Disabled

Pressing the **Scrambler/ Encryption** key toggles the status of Encryption during transmission between enabled and disabled.

Or, Encryption during transmission can be toggled between enabled and disabled by pressing the **Menu** key to enter Menu Mode, and then selecting "Scrambler/Encryption". (Refer to Common FUNC Using Menu Mode.)

If Encryption is enabled, the transceiver encrypts and sends out audio data or user data such as Short Message. If Encryption is disabled, the transceiver transmits communication data without encryption.

The receiving behavior of the transceiver differs depending on the Encryption status, either to be enabled or disabled, and the configuration for **Encryption Type**. Refer to "**Transceiver Behavior upon Receipt of Encrypted Communication Data**" for details.

Note

- The Encryption status (to be enabled or disabled) can be configured for each channel, so the configured Encryption status applies only for the selected channel.
- If the status of Scrambler/Encryption (to be enabled or disabled) is switched for the channel where "Mixed" is configured in **Channel Type**, the status of Scrambler/Encryption (to be enabled or disabled) applies for a channel according to the mode (either Analog or DMR) configured in **Transmit Mode** of the channel.

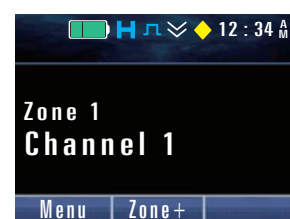
Operating the transceiver

● Configuring Encryption during transmission to be enabled

Press the **Scrambler/ Encryption** key while Encryption is disabled.

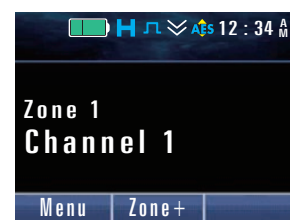
● For the bit scramble encryption type

The "  " icon appears and then Encryption will be enabled.



● AES/ DES or DES (Built-in DES) format

The "  " icon or "  " icon appears and Encryption is enabled.

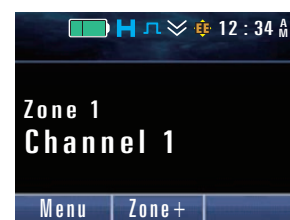


Note

- The "  " icon appears if the encryption type is AES, and the "  " icon appears if the encryption type is DES.

● Enhanced Encryption format

The "  " icon appears and then Encryption will be enabled.



Pressing the **PTT** switch encrypts and sends the audio data.

● Configuring Encryption during transmission to be disabled

Press the **Scrambler/Encryption** key while Encryption is enabled.

● For the bit scramble encryption type

The “” icon disappears and Encryption will be disabled.

● AES/ DES or DES (Built-in DES) format

The “” icon or “” icon disappears and Encryption is disabled.

● Enhanced Encryption format

The “” icon disappears and Encryption will be disabled.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

4.2 Configuring the Encryption Key Data Used for Communications

An Encryption Key used for communications can be selected from **Multi-key List** and configured.

When the transceiver is using the bit scrambling, AES/ DES or Enhanced Encryption format, it can store up to 32 Encryption Keys (Key ID, Key Data). When the transceiver is using the DES (Built-in DES) format, it can store up to 4 Encryption Keys (Key ID, Key Data). However, only 1 of the Encryption Keys can be used for transmission.

An Encryption Key used for transmission can be configured for each channel by using KPG-D1/ D1N by selecting the Encryption Key from the Multi-key List. (Refer to [Multi-key List](#).)

The transceiver needs to enter Scrambler/ Encryption Code Mode in order to change an Encryption Key. In Scrambler/Encryption Code Mode, a Multi-key corresponding to the Encryption Key data used for transmission can be selected from the Multi-key List configured for the transceiver.

Pressing the **Scrambler/Encryption Code** key causes the transceiver to enter Encryption Code Mode.

Or, the transceiver can also enter Scrambler/Encryption Code Mode by pressing the **Menu** key to place the transceiver in Menu Mode and then selecting “Scrambler/Encryption Code”. (Refer to Common FUNC Using Menu Mode.)

Note

- For a Trunking 2.5 system and S-Trunking system, a Multi-key corresponding to ARC4 (Enhanced Encryption) cannot be configured from the Multi-key List.

Operating the transceiver

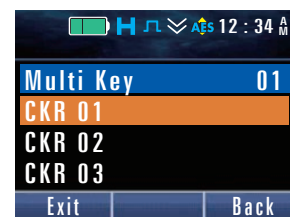
1 Press and hold the **Scrambler/ Encryption** key.

The transceiver enters Scrambler/Encryption Code Mode. The Multi-key configured for a channel appears.

The following operations can also be used even if the transceiver enters Scrambler/Encryption Code Mode by pressing the **Menu** key or the **Scrambler/Encryption Code** key.

Note

- If Encryption is disabled, Encryption will be enabled when the transceiver enters Scrambler/Encryption Code Mode. Even after the transceiver exits from Scrambler/Encryption Code Mode, Encryption remains enabled.



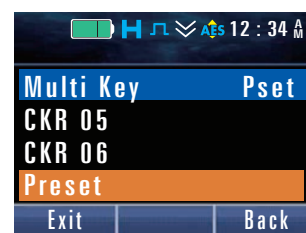
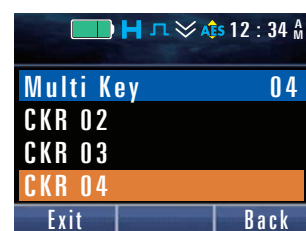
2 Press the [▲] key or [▼] key to select Key Data.

Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.

Selecting “Preset” can restore the value preconfigured for the selected channel.

Note

- If the Encryption Key corresponding to the selected Multi-key is not configured on the SCM, or if the Encryption Key is deleted from the SCM, “Erased” appears (the AES/ DES encryption only).
- When the channels of P25, NXDN and DMR are configured to coexist using the KPG-D1/ D1N, only a Multi-key corresponding to the **System Type** (P25, NXDN, or DMR) of the channel on which the transceiver is waiting appears in the **Multi-key List**.



3 Press the **Menu** ([□]) key, or [*] key.

The Multi-key selected in step 2 is configured for the selected channel.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( See Transceiver Settings > Key Assignment)

4.3 Transceiver Behavior upon Receipt of Encrypted Communication Data

Upon receipt of the encrypted communication data, the transceiver behaves as follows according to the Encryption status (enabled or disabled) and the configuration for **Encryption Type**.

If Encryption is enabled:

For audio data, regardless of the configuration for **Encryption Type**, the received audio sounds from the speaker according to the audio control conditions and the configuration in **Multi-key List**.

In the case of user data such as Short Message, the behavior when receiving data is determined according to the registration status of the **Multi-key List**.

● Bit scramble encryption type

The bit scrambling format allows the transceiver to decrypt only encrypted audio data. Upon receipt of the encrypted audio data, the transceiver decrypts the received data using the Encryption Key corresponding to the **Multi-key List Number** that is configured for the channel on which the transceiver is waiting. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds incompletely from the speaker.

● AES/ DES encryption type

When an encrypted signal is received, the transceiver searches for the Key ID (1 to 255) inside the SCM.

For audio data, if the Algorithm (AES or DES) and Key ID included in the Encryption Key used for encryption of the received communication data match the Algorithm and Key ID included in the Encryption Key configured on the SCM, the transceiver uses the Encryption Key to decrypt the data. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds incompletely from the speaker. The transceiver mutes the speaker if the parameters for Algorithm do not match or if the Key IDs do not match.

When user data such as a Short Message is received, the transceiver decrypts the data in the same way. After the data is successfully decrypted, the transceiver will proceed to receive the data. If decryption of the data is not successful, the data will be discarded.

● DES encryption type (Built-in DES)

When an encrypted signal is received, the transceiver searches for the Key ID (1 to 255) inside the **Multi-key List**.

For audio data, if the Algorithm (DES) and Key ID included in the Encryption Key used for encryption of the received communication data match the Key ID included in the Encryption Key configured for the transceiver, the transceiver uses the Encryption Key to decrypt the data. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds incompletely from the speaker. The transceiver mutes the speaker if the parameters for Algorithm do not match or if the Key IDs do not match.

When user data such as a Short Message is received, the transceiver decrypts the data in the same way. After the data is successfully decrypted, the transceiver will proceed to receive the data. If decryption of the data is not successful, the data will be discarded.

● Enhanced Encryption format

The transceiver scans Key IDs (1 to 255) in **Multi-key List** if the transceiver receives an encrypted signal.

For audio data, if the Key ID included in the Encryption Key used for encryption of the received communication data matches the Key ID included in the Encryption Key configured for the transceiver, the transceiver uses the Encryption Key to decrypt the data. If the data is properly decrypted, the received audio sounds from the speaker. If the data is decrypted incorrectly, the received audio sounds incompletely from the speaker. The transceiver mutes the speaker if the Key IDs do not match each other.

When user data such as a Short Message is received, the transceiver decrypts the data in the same way. After the data is successfully decrypted, the transceiver will proceed to receive the data. If decryption is not successful, the data will be discarded.

If Encryption is disabled:

The following are the transceiver behaviors that may vary depending on the configuration for Encryption Type (Type 1 or Type 2):

● Type 1

The transceiver behaves in the same manner as a transceiver with Encryption enabled.

However, if the transceiver receives an encrypted signal on the channel with Encryption disabled, no received audio sounds from the speaker.

● Type 2

No received audio sounds from the speaker.

Note

- When unencrypted communication data is received, the transceiver emits the received audio from the speaker according to the audio control conditions regardless of the Encryption status (enabled or disabled) or configuration for Encryption Type.
- When encrypted communication data is received by the transceiver at the receiving end, the transceiver will still return a receipt confirmation even when data decryption is not successful. For this reason, the transceiver at the transmitting end behaves in the same way as when data communication is successful.

Configuration using KPG-D1/ D1N

Configuring **Encryption Type** ( See Transceiver Settings > Encryption > DMR)

Behavior when Data Received Cannot be Properly Decrypted

In the case of the AES/ DES and Enhanced Encryption formats, when encrypted communication data is received and decryption is successful, the transceiver will proceed to receive the data and output the received audio from the speaker.

For a Short Message, when data decryption is not successful, the behavior of the transceiver changes as follows according to the configuration in **DMR Message Type**.

For a Long Message and Transparent, if data decryption is not successful, the data is discarded and the data receiving operation is not performed by the transceiver. However, under certain conditions, the transceiver may proceed with the data receiving operation without discarding it, and the serial output of the data that is not properly decrypted may occur.

Table 4-2 Behavior when Data Received Cannot be Properly Decrypted

DMR Message Type Configuration	Description
DMR Standard	If data decryption is not successful, the data is discarded and data receiving operation is not performed by the transceiver. However, under certain conditions, the transceiver may proceed with the data receiving operation without discarding it, and the data that is not properly decrypted may appear on the display.
Kenwood-defined Data	When data decryption is not successful, the transceiver proceeds with the data receiving operation without discarding it, and the data that is not properly decrypted appears on the display.

Configuration using KPG-D1/ D1N

Configuring **DMR Message Type** ( See Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

About the Behavior of the Encryption Icon

Bit scramble encryption type

If the transceiver satisfies the following conditions when the encrypted audio data is received, the “” icon blinks:

● DMR Conventional system

- Color Code matches.
- Group ID matches (upon receipt of an Unaddressed Call/ Group Call).
- Unit ID matches (upon receipt of an Individual Call).

● DMR-based Trunking system

- Talkgroup ID matches (upon receipt of a Group Call).
- Unit ID matches (upon receipt of an Individual Call/ Telephone Call)

AES/ DES and DES (Built-in DES) formats

If the transceiver satisfies the following conditions when the encrypted audio data is received, the “” or “” icon will appear blinking. The “” icon blinks in the DES (Built-in DES) format.

● DMR Conventional system

- Color Code matches.
- Key ID matches.
- Group ID matches (upon receipt of an Unaddressed Call/ Group Call).
- Unit ID matches (upon receipt of an Individual Call).

● DMR-based Trunking system

- Key ID matches.
- Talkgroup ID matches (upon receipt of a Group Call).
- Unit ID matches (upon receipt of an Individual Call/ Telephone Call)

Enhanced Encryption format

If the transceiver satisfies the following conditions when the encrypted audio data is received, the “” icon blinks:

● DMR Conventional system

- Color Code matches.
- Key ID matches.
- Group ID matches (upon receipt of an Unaddressed Call/ Group Call).
- Unit ID matches (upon receipt of an Individual Call).

● DMR-based Trunking system

- Key ID matches.
- Talkgroup ID matches (upon receipt of a Group Call).
- Unit ID matches (upon receipt of an Individual Call/ Telephone Call)

About the Behavior of the LED (Secure Indicator) (DMR-based Trunking System Only)

Secure Indicator is the function to flash the LED green when the transceiver receives an encrypted voice call in a DMR-based Trunking system.

If this function is enabled, the LED of the transceiver flashes green when the transceiver receives an encrypted voice call on a traffic channel.

The following is the relationship between Busy LED and secure Indicator:

Table 4-3 LED Statuses upon Receipt of Voice Communication

Configuration using KPG-D1/ D1N		Encryption status of the received signal	
Secure Indicator	Busy LED	Clear	Secure
Check	Check	Lights	Flashes
	Uncheck	Disappears	Flashes
Uncheck	Check	Lights	Lights
	Uncheck	Disappears	Disappears

Configuration using KPG-D1/ D1N

Configuring **Secure Indicator** to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > DMR-based Trunking > Encryption)

4.4 Secure Cryptographic Module (SCM) (for AES/ DES Only)

The Encryption function by means of AES/ DES can be used by installing a Secure Cryptographic Module (SCM) in the transceiver. All encryption and decryption of communication data can be processed by the SCM. The encryption and decryption of communication data using AES/ DES encryption is not available in a transceiver where no SCM is installed.

To make use of the Encryption function, it is necessary to configure the Encryption Key for SCM using Key Loader. (Refer to [Key Loader](#).)

Configuration using KPG-D1/ D1N

Configuring **Secure Cryptographic Module** to be enabled or disabled ( See Model > Product Information > Feature Selection)

Applicable SCMs

The following are the SCMs that can be used with the transceiver:

Table 4-4 Available SCMs

SCM	Firmware Version
KWD-AE30	A3.0.3
KWD-AE31	A4.0.4
KWD-DE31	D4.0.4

Note

- The Encryption function using AES/ DES is unavailable if an SCM having firmware version earlier than the versions described above is installed in the transceiver.
- Information (such as the model name and the firmware version of the SCM installed in the transceiver) can be viewed in the **Transceiver Information** dialog box using KPG-D1/ D1N.

Installing KWD-AE30/ KWD-AE31

Refer to the Installation Manual or the service manual supplied with KWD-AE30/ KWD-AE31 for instructions on how to install KWD-AE30/ KWD-AE31 in the transceiver.

Key Loader

Using the Key Variable Loader or the Software Key Loader, Encryption Key data can be configured on the SCM and configured Encryption Key data can be deleted.

Key Variable Loader

An Encryption Key can be configured on the SCM by using the Motorola KVL 3000/ KVL 3000 Plus/ KVL 4000.

“KEYLOAD” appears on the display and the transceiver enters the KVL mode, after connecting KVL 3000/ KVL 3000Plus/ KVL 4000 to the transceiver with the connection cable and turning ON the transceiver.

Alternatively, “KEYLOAD” appears on the display and the transceiver enters the KVL mode, after connecting KVL 3000/ KVL 3000Plus/ KVL 4000 to the transceiver with the connection cable and turning ON the transceiver with the [▼] key being pressed. The operations available using KVL 3000/ KVL 3000Plus/ KVL 4000 are as follows:

● Key Load

An Encryption Key can be configured on the SCM.

● Key Delete

The Encryption Key configured on the SCM can be deleted.

● Key View

A Key ID, CKR and Algorithm ID configured in the transceiver can be displayed.

Software Key Loader

An Encryption Key can be configured on the SCM using the Software Key Loader (KPG-AE1/ KPG-DE1).

When the transceiver is turned ON after connecting the transceiver to a PC with KPG-AE1/ KPG-DE1 installed using the KPG-36U/ KPG-36X (Portable) or KPG-46U/ KPG-46X (Mobile) programming cable, the following operations can be executed. "KEYLOAD" appears on the display while KPG-AE1/ KPG-DE1 and the transceiver communicate.

● Key Load

An Encryption Key can be configured on the SCM.

● Key Delete

The Encryption Key configured on the SCM can be deleted.

● Key View

A Key ID configured in the transceiver can be displayed.

KPG-AE1/ KPG-DE1 supports KWD-AE31. Also, a USB Secure Key is required for use with KPG-AE1.

For KWD-AE30, the Encryption Key cannot be configured using KPG-AE1/ KPG-DE1.

Note

- To connect KVL 4000 to the portable transceiver by using the KCT-51 HRS Adapter, the transceiver must be placed in Key Loader Mode before connecting. The transceiver enters Key Loader Mode by turning ON the transceiver while pressing and holding the [▼] key. This operation is not required if not using the KCT-51 HRS Adapter or if using Software Key Loader.
- Contact KENWOOD for the connection cable.
- Refer to the instruction manual supplied with the KVL 3000/ KVL 3000Plus/ KVL 4000 or the help texts for KPG-AE1/ KPG-DE1 for details.

4.5 Built-in DES

The Encryption function by means of DES (Built-in DES) can be used by enabling **DES 4 Keys** by using KPG-D1/ D1N.

The DES (Built-in DES) encryption function enables encryption or decryption of communication data during voice or data communication by configuring the Encryption Key (Key ID, Key Data) in the **Multi-key List**. The transceiver is able to store up to 4 Built-in DES Encryption Keys (Key ID, Key Data). (Refer to [Multi-key List](#).)

Note

- SCM and Built-in DES cannot be used at the same time.
- If the transceiver with an SCM installed is turned ON while the Encryption Key of Built-in DES is configured for the transceiver, the SCM is not initialized, and encrypted communication is executed by using Built-in DES.

Configuration using KPG-D1/ D1N

Configuring **DES 4 Keys** to be enabled or disabled ( See Model > Product Information > Feature Selection)

4.6 Enhanced Encryption

The ARC4-format encryption function can be used by enabling **Enhanced Encryption** using the KPG-D1/ D1N.

The Enhanced Encryption type is the encryption type that is defined by the DMR Association, and is the Encryption function using a 40 bit encryption key.

The ARC4 encryption function enables encryption or decryption of communication data during voice or data communication by configuring the Encryption Key (Key ID, Key Data) in the **Multi-key List**. The transceiver is able to store up to 32 ARC4 Encryption Keys (Key ID, Key Data). (Refer to [Multi-key List](#).)

In a DMR-based Trunking system, the transceiver does not behave on a channel with Trunking 2.5 or S-Trunking configured in **Trunking Format** even if the transceiver receives the data encrypted by using ARC4.



- **Enhanced Encryption** is not supported in a DMR 2.5 Trunking system and S-Trunking system.
- **Enhanced Encryption** is the function to convert audio data or communication data to encrypted data. ARC4 (Alleged RC4) used for **Enhanced Encryption** and RC4 use the same encryption type. Secrecy in communications can be enhanced by encryption.
- "RC4" is a registered trademark of RSA Security LLC.

Configuration using KPG-D1/ D1N

Configuring **Enhanced Encryption** to be enabled or disabled ([See](#) Model > Product Information > Feature Selection)

4.7 Protection Function of Encryption Key (Key Retention)

Key Retention is the function for retaining or deleting Encryption Key information stored in the SCM or the Encryption Key of Built-in DES or Enhanced Encryption according to the configuration of the KPG-D1/ D1N.

Using this function, Encryption Key data can automatically be deleted, for instance, in case the transceiver is stolen or the transceiver has been left unused.

The behavior of the transceiver varies depending on the configuration in **Key Retention** as shown below:

SCM

● Disable

Since the security level is high, this configuration (Disable) is the default.

If the SCM is configured, the encryption key data is deleted when Tamper is detected or when the ESN is determined as inconsistent.

The behavior specifications of when Tamper is detected under each condition are as follows:

Table 4-5 Behavior Specifications

Power Off	Conditions	About Encryption Key Data
With the battery removed	Less than 30 sec (power off time)	The encryption key data is still retained when the transceiver is turned ON again.
	Elapse of 30 sec or more (power off time)	The encryption key data is deleted when the transceiver is turned ON again.
	If the SCM is temporarily removed	The encryption key data is deleted when the transceiver is turned ON again.
With the battery attached	Less than 30 sec (power off time)	The encryption key data is still retained when the transceiver is turned ON again.
	Elapse of 30 sec or more (power off time)	The encryption key data is still retained when the transceiver is turned ON again.
	If the SCM is temporarily removed	The encryption key data is deleted when the transceiver is turned ON again.

● Timed

If the transceiver is turned OFF for a duration longer than the duration configured by using the FPU, and if the ESN is inconsistent, the encryption key data is deleted. For the duration that can be configured by using the FPU, 1, 3, 7, 10, or 30 (days) can be selected. By directly editing the memory map, a value other than the values above can also be configured.

In addition to when the transceiver is turned OFF, in consideration that the battery pack may be removed, the date and time history of when the transceiver is turned OFF is backed up once an hour while the transceiver behaves in user mode.

Note

- The time configured for Duration is counted down using the internal clock. The internal clock operates on a built-in rechargeable lithium battery pack if the battery pack of the transceiver is detached. The lithium battery pack is automatically charged from the battery pack connected to the transceiver. If the battery pack is removed, the battery life of the built-in lithium battery pack is approximately 2 weeks. If the battery pack is removed, the battery life of the built-in lithium battery pack is approximately 2 weeks.

● Infinite

If the SCM is configured, the encryption key data is deleted only when the ESN is determined as inconsistent.

Since the security level of this configuration (Infinite) is low, using this configuration along with **Transceiver Password** is recommended. If **Transceiver Password** is configured, the Encryption Key will be deleted if an incorrect password is entered 15 times in a row. For **Transceiver Password**, refer to Common FUNC “Password for Transceiver Operation (Transceiver Password)”.

Note

- Encryption Key data is deleted when the transceiver is turned ON. However, Encryption Key data is deleted immediately only if the SCM is detached from the transceiver, while the power source is supplied to the SCM.
- If the SCM installed in the transceiver is uninstalled and is reinstalled in another transceiver, the Encryption Key data is deleted regardless of the configuration for Key Retention.

Built-in DES/ Enhanced Encryption

● Infinite

An Encryption Key is not deleted. The transceiver behaves as an ESN is always matched.

● Timed

If the transceiver is turned OFF for a duration longer than the duration configured by using the FPU, the encryption key data is deleted. For the duration that can be configured by using the FPU, 1, 3, 7, 10, or 30 (days) can be selected. By directly editing the memory map, a value other than the values above can also be configured.

In addition to when the transceiver is turned OFF, in consideration that the battery pack may be removed, the date and time history of when the transceiver is turned OFF is backed up once an hour while the transceiver behaves in user mode.

Note

- The time configured for Duration is counted down using the internal clock. The internal clock operates on a built-in rechargeable lithium battery pack if the battery pack of the transceiver is detached. The lithium battery pack is automatically charged from the battery pack connected to the transceiver.

4.8 Deleting the Encryption Key (Key Delete)

Key Delete is the function for deleting the Encryption Key that is configured using the Key Loader in the SCM or the Encryption Key of Built-in DES and Enhanced Encryption.

The transceiver needs to enter Key Delete Mode in order to delete Encryption Key data using this function.

Pressing the **Key Delete** key places the transceiver in Key Delete Mode.

The transceiver can also enter Key Delete Mode by pressing the **Menu** key to place the transceiver in Menu Mode and then selecting "Key Delete". (Refer to Common FUNC Using Menu Mode.)

Operating the transceiver

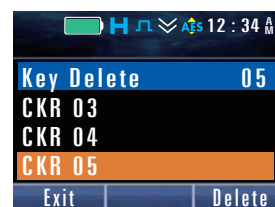
1 Press the **Key Delete** key.

Enters Key Delete Mode.

The following operations can also be used even if the transceiver enters Delete Mode by pressing the **Menu** key:

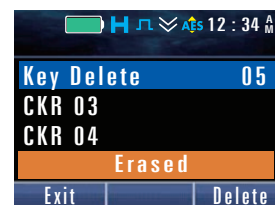
2 Press the [▲] key or [▼] key and then select a Multi-key from the Multi-key List.

Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the **Back** ([↩]) key, or [#] key.

The selected Multi-key is deleted.



Note

- Pressing and holding either the **Back** ([↩]) key or [#] key deletes all Multi-key data.
- If the Encryption Key corresponding to the selected Multi-key is not configured on the SCM, or if the Encryption Key is deleted from the SCM, "Erased" appears.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)

4.9 Deleting All Encryption Keys (Zeroize)

Zeroize is the function for deleting all the Encryption Keys that are configured in the SCM or all the Encryption Keys of Built-in DES and Enhanced Encryption.

While using the SCM, the transceiver executes Zeroize in the following cases:

- 1) **If Zeroize is executed by pressing the Zeroize key**
→ Refer to [Executing Zeroize using the Zeroize key](#).
- 2) **If Zeroize is executed from Menu Mode**
→ Refer to [Executing Zeroize using the Menu Mode](#).
- 3) **If Zeroize of the AUX Input port is executed on Mobile**
→ Refer to [Executing Zeroize using the AUX Input port \(Mobile only\)](#).
- 4) **If ESN authentication is determined inconsistent when the transceiver is turned ON**
- 5) **If the transceiver detects Tamper when turned ON**
- 6) **If the transceiver has been turned OFF longer than the time configured in KPG-D1/ D1N when the transceiver is turned ON**
→ Refer to [Protection Function of Encryption Key \(Key Retention\)](#).
- 7) **If Zeroize is enabled when configuration data is written to the transceiver using KPG-D1/ D1N**
All encryption key data configured on an SCM are deleted when writing the configuration data to the transceiver with Zeroize enabled (in the **Write Data to the Transceiver** dialog box) in KPG-D1/ D1N.
- 8) **If Transceiver Password entry fails 15 times in a row**
All Encryption Keys configured on an SCM are deleted if an incorrect password is entered 15 times in a row when the transceiver is turned ON with the transceiver password configured. In this case, the user will not be notified that the Encryption Key has been deleted. Therefore, "Key Erased" does not appear on the display.
Also, the number of failed times cannot be reset until the entered password matches the password configured in the transceiver even if the transceiver is turned OFF.
- 9) **If all Keys are deleted in Key Delete Mode**
→ Refer to [Deleting the Encryption Key \(Key Delete\)](#).
- 10) **If Zeroize (Key Erasure/ Key Delete) is executed in Key Loader**
→ Refer to [Key Loader](#).

While using Built-in DES or Enhanced Encryption, the transceiver executes Zeroize in the following cases:

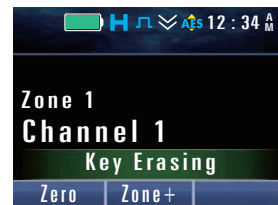
- 1) **If Zeroize is executed by pressing the Zeroize key**
→ Refer to [Executing Zeroize using the Zeroize key](#).
- 2) **If Zeroize is executed from Menu Mode**
→ Refer to [Executing Zeroize using the Menu Mode](#).
- 3) **If Zeroize of the AUX Input port is executed on Mobile**
→ Refer to [Executing Zeroize using the AUX Input port \(Mobile only\)](#).
- 4) **If the transceiver has been turned OFF longer than the time configured in KPG-D1/ D1N when the transceiver is turned ON**
→ Refer to [Protection Function of Encryption Key \(Key Retention\)](#).
- 5) **If Transceiver Password entry fails 15 times in a row**
All Encryption Keys configured on an SCM are deleted if an incorrect password is entered 15 times in a row when the transceiver is turned ON with the transceiver password configured. In this case, the user will not be notified that the Encryption Key has been deleted. Therefore, "Key Erased" does not appear on the display.
Also, the number of failed times cannot be reset until the entered password matches the password configured in the transceiver even if the transceiver is turned OFF.
- 6) **If all Keys are deleted in Key Delete Mode**
→ Refer to [Deleting the Encryption Key \(Key Delete\)](#).
- 7) **When the Enhanced Encryption (KWD-5500EE) status on the KPT-300LMC has been changed from permitted to prohibited (Enhanced Encryption only)**

The following describes the operation from 1) to 3):

Executing Zeroize using the Zeroize key

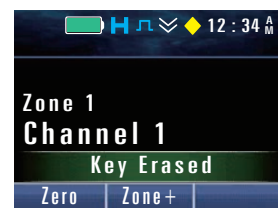
1 Press the **Zeroize** key.

"Key Erasing" appears on the display and Zeroize is executed.

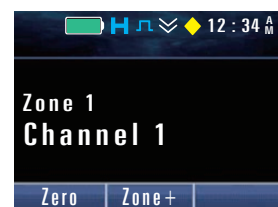


2 Zeroize completes.

A Key Beep C (3 beeps) sounds from the transceiver, and "Key Erased" appears on the display for 2 sec.



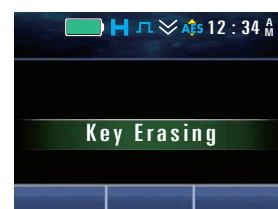
Then, A Key Fail Alert Tone (6 beeps) sounds from the transceiver every 10 sec and displays "Key Fail" for 1 sec, and then the transceiver restores the channel display.



Executing Zeroize using the Menu Mode

1 Press the **Menu** key to enter Menu Mode and then select "Zeroize".

"Key Erasing" appears on the display and Zeroize is executed.

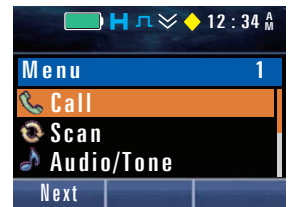


2 Zeroize completes.

A Key Beep C (3 beeps) sounds from the transceiver, and “Key Erased” appears on the display for 2 sec.



Then, the transceiver restores the Menu Mode display.



Executing Zeroize using the AUX Input port (Mobile only)

The Encryption Key can be deleted by assigning “Zeroize” to an AUX Input port and toggling the status of the port between High and Low.

All Encryption Keys stored in the SCM are deleted if Low or High level is continuously detected for the time configured in **Zeroize Delay Time**.

Note

- If Zeroize is executed, keys for the AES-128 bit authentication used in **P25 Radio Authentication** are also deleted. (Refer to P25 FUNC P25 Radio Authentication (P25 Trunking System Only).)

If the transceiver is in the following state, the Zeroize process is not executed:

- In the Transceiver Inhibit state
- In the Stun state
- While transmitting Power Off Status
- In Transceiver Password Mode
- While Emergency Indicator functions
- While executing Zeroize

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver (See Transceiver Settings > Key Assignment)
- Allocating functions to the AUX Input port (See Extended Function > AUX)
- Configuring **Zeroize Delay Time** (See Extended Function > AUX > AUX Input)
- Configuring **Zeroize** to be enabled or disabled (See Program > Write Data to the Transceiver)

About the SCM Communication Error Display

If a communication error occurs between the transceiver and the SCM when the transceiver transmits or receives using the Encryption function, "SCM Init Error" appears on the transceiver display for 1 sec.

In this status, the transceiver cannot use the Encryption function to transmit or receive.



If this communication error occurs, contact the place of purchase.

4.10 Multi-key List

Multi-key List is the list to configure the Encryption Key and the encryption key information that are used for encryption and decryption of communication data. A maximum of 32 sets of Encryption Keys and encryption key information can be configured in **Multi-key List** by using KPG-D1/ D1N.

The parameters that need to be configured vary depending on the encryption type to be used.

Bit scramble encryption type

To use bit scramble encryption, an Encryption Key needs to be configured in **Multi-key List**.

- **Key Data**

Key Data allows you to configure the Encryption Key in the range of 1 to 32767.

- **Key Name**

Key Name allows you to configure using a maximum of 14 alphanumeric characters and symbols a name corresponding to the Encryption Key.

AES/ DES encryption type

SCM is used for the AES/ DES format. To make use of SCM, it is necessary to configure the Encryption Key for SCM using Key Loader. (Refer to [Key Loader](#).)

In **Multi-key List**, a CKR ID, which is encryption key information used to associate it with an Encryption Key configured in the SCM, must be configured.

- **CKR ID**

CKR ID allows you to configure a CKR ID of the Encryption Key configured on an SCM in the range of 1 to 4095.

- **Key Name**

Key Name allows you to configure using a maximum of 14 alphanumeric characters and symbols a name corresponding to the Encryption Key.

DES encryption type (Built-in DES)

In **Multi-key List**, a CKR ID, which is encryption key information used to associate it with an Encryption Key configured in the transceiver, must be configured.

- **CKR ID**

CKR ID 1 to CKR ID 4 are automatically configured.

- **Key Name**

Key Name allows you to configure using a maximum of 14 alphanumeric characters and symbols a name corresponding to the Encryption Key.

Enhanced Encryption format

To use the Enhanced Encryption format, an Encryption Key needs to be configured in the **Multi-key List**.

- **Key Data**

Key Data allows you to configure the Encryption Key in the range of 1 to FFFFFFFFE.

- **Key ID**

Key Data allows an ID code for identifying an Encryption Key to be configured to a value between 1 to 255.

- **Key Name**

Key Name allows you to configure using a maximum of 14 alphanumeric characters and symbols a name corresponding to the Encryption Key.

A **Multi-key List Number** corresponding to the Encryption Key configured in the **Multi-key List** can be configured for each channel.

Configuration using KPG-D1/ D1N

Configuring **Multi-key List** ( **See** Transceiver Settings > Encryption > Multi-key List)

4.11 Transmit Clear Alert Tone

Transmit Clear Alert Tone is the function used to notify a user with a short beep that the communication data is not encrypted when the transceiver starts transmitting without communication data being encrypted.

With this function enabled, the Transmit Clear Alert Tone (1 beep) sounds from the transceiver if the Encryption function of the channel is disabled when the transceiver transmits.

Configuration using KPG-D1/ D1N

Configuring **Transmit Clear Alert Tone** to be enabled or disabled ( **See** Transceiver Settings > Encryption > General)

4.12 Scrambler/Encryption Status Memory

Scrambler/Encryption Status Memory is the function to retain the enabled or disabled status of the Encryption function for each channel and the configuration of a Multi-key for each channel.

If **Scrambler/Encryption Status Memory** is enabled, the stored configurations of the enabled/disabled status of the Encryption function and **Multi-key List Number** are read as default when data is read from the transceiver by using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

Configuring **Scrambler/Encryption Status Memory** ( **See** Transceiver Settings > Optional Features > Optional Features 1 > Others)

Scan is the function to check whether the transceiver receives a call from other transceivers.

The transceiver sequentially searches for availability of signal on each channel, and the transceiver receives on the channel where the signal is detected.

Three methods are available for Scan as shown below.

- **Single Scan**

The transceiver scans target channels in the same zone.

- **List Scan**

The transceiver scans the Zone-channel registered as a member in a Scan List.

- **Multi-Zone Scan**

The transceiver scans all target channels in the target zones.

5.1 Starting the Scan

Scan can be started by one of the following methods:

- **Operating the PF Keys**

- Pressing the **Scan** key starts or stops scanning.
- Pressing the **Scan Normal** key starts or stops scanning.
- Even if the Priority Channel is configured, pressing the **Scan Normal** key disables the Priority Channel and mandatorily executes Non-Priority Scan.
- Executing "Scan" or "Scan Normal" after pressing the **Menu** key to enter Menu Mode starts or stops scanning.

- **Lever switch operation**

Operating the **Lever** switch to be in the position where "Scan" or "Scan Normal" is allocated starts scanning.

Operating the **Lever** switch to be in the position where "Scan" or "Scan Normal" is not allocated stops scanning.

- **Status changes of the AUX Input port (Mobile only)**

When the AUX Input port where "Scan" is assigned goes low level, the scan starts. When the AUX Input port where "Scan" is assigned goes high level, the scan stops.

- **Turning the transceiver on**

If **Power-on Scan** is enabled, the scan starts when the transceiver is turned on. (Refer to [Power-on Scan](#).)

- **Selecting a channel**

The scan starts if a channel with **Auto Scan** enabled is selected. (Refer to [Auto Scan](#).)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Allocating functions to the **Lever** switch ( [See](#) Transceiver Settings > Key Assignment > Top/Side)
- Allocating functions to the AUX Input port ( [See](#) Extended Function > AUX)

5.2 Scanning in One Zone (Single Scan)

The transceiver scans using Single Scan all the added channels in the zone where the transceiver starts scanning. If a scan starts in the zone where "Single" is configured in **Scan Type**, Single Scan is executed. Or, if the transceiver migrates during the scan to the zone where "Single" is configured in **Scan Type**, Single Scan is executed.

The target channel for scan is either the channel with **Scan Add** enabled by using KPG-D1/ D1N or the channel with **Scan Add** enabled by using the **Scan Delete/Add** key.

Operating the transceiver

1 Press the **Scan** key.

The scan starts after a Key Beep A (1 beep) sounds from the transceiver.

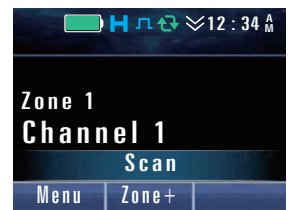
The "↻" icon appears and then Revert Channel is displayed.

If "**Scan**" **Displayed** is enabled, "Scan" is displayed.

For portable transceivers, the LED light flashes according to the configuration of **Non-Priority Scan LED** in the case of non-priority scan, and according to the configuration of **Priority Scan LED** in the case of priority scan.

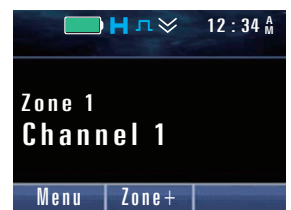
Note

- The transceiver behaves in the same manner even if the scan is started by other method. (Refer to [Starting the Scan](#).)



2 Press the **Scan** key during the scan.

The scan completes after a Key Beep B (2 beeps) sounds from the transceiver and the "↻" icon disappears.



Note

- Single Scan functions only in the zone consisting of channels of the same system. However, Single Scan functions even when the zone includes Conventional channels of other systems or channels of an LTR Trunking system.
- If **Selected Channel Scan** is enabled, the selected channel can be scanned even if the channel is excluded from the target channels for scan. (Refer to [Selected Channel Scan](#).)
- If All Group IDs are selected in the channel of a DMR-based Trunking system and even if the All Group IDs are excluded from the target for scanning, those All Group IDs are scanned.
- For Portable, if the transceiver changes the zone during a Single Scan by using **Selector** with "Zone Select" configured and if the new zone is not configured, the "↻" icon blinks and the scan pauses.
- If another zone is selected during the Single Scan, the transceiver starts the scan according to the configuration in **Scan Type** of the selected zone.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Scan Add** in DMR Conventional to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)
- Configuring **Scan Add** in DMR-based Trunking to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking)
- Configuring **Scan Type** ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Scan)
- Configuring **"Scan" Displayed** to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan Information > General)

Conditions to Activate the Scan (Single Scan)

One of the following conditions must be satisfied for the transceiver to start the Single Scan:

- **For a DMR Conventional system**
 - Two or more channels exist in the zone where the transceiver scans.
 - A channel to be scanned and a Priority Channel exist in the zone.
 - Even if no channel to be scanned exists, Priority Channel 1 and Priority Channel 2 exist in the zone.
- **For a DMR-based Trunking system**
 - Two or more channels exist in the zone where the transceiver scans.
 - When one channel to be scanned and one Group ID configured in Priority Monitor ID exist in the zone.
 - When two Group IDs configured in Priority Monitor ID exist in the zone even if a channel to be scanned does not exist in the zone.

Conditions to Resume the Scan (Single Scan)

One of the following conditions must be satisfied to resume the scan while the transceiver pauses the scan:

- Two or more channels exist in the zone where the transceiver scans.
- A channel to be scanned and a Priority Channel to be scanned exist in the zone.
- Even if no channel to be scanned exists, Priority Channel 1 and Priority Channel 2 to be scanned exist in the zone.

If the transceiver does not satisfy the conditions to resume the scan, the scan remains paused.

Transceiver Behavior in the Case that the Scan Cannot Be Resumed (Single Scan)

If the transceiver manually switches during the scan to the zone or channel which does not satisfy the condition to resume the scan, the transceiver displays the selected channel and the scan remains paused.

If the **PTT** switch is pressed while the condition to resume the scan is not satisfied, the transceiver transmits using the **Revert Channel**. Upon elapse of the time configured in Dwell Time after completion of the transmission, the transceiver reverts to the selected channel; however, the scan does not resume.

5.3

Scan by Registering Multiple Target Channels for Scan in the List (List Scan)

Using the List Scan enables the transceiver to scan the Zone-channels registered as a member in a Scan List.

If a scan starts in a zone where “List” is configured in **Scan Type** or on a channel where a Scan List Number is configured, List Scan is executed. Or, if the transceiver is in the zone where “List” is configured in **Scan Type** and migrates to the channel where a Scan List Number is configured during the scan, List Scan is executed.

- Note
- List Scan cannot be executed in a DMR-based Trunking system.

Operating the transceiver

1

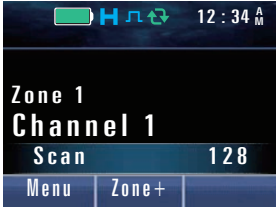
Press the Scan key.

The scan starts after a Key Beep A (1 beep) sounds from the transceiver.

The “↺↻” icon appears and then Revert Channel is displayed.

If “**Scan**” **Displayed** is enabled, “Scan nnn” (nnn indicates Scan List No.) is displayed.

For portable transceivers, the LED light flashes according to the configuration of **Non-Priority Scan LED** in the case of non-priority scan, and according to the configuration of **Priority Scan LED** in the case of priority scan.

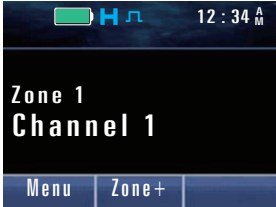


- Note
- The transceiver behaves in the same manner even if the scan is started by other method. (Refer to **Starting the Scan.**)

2

Press the Scan key during the scan.

The scan completes after a Key Beep B (2 beeps) sounds from the transceiver and the “↺↻” icon disappears.



- Note
- If **Selected Channel Scan** is enabled, the selected channel can be scanned even if the channel is excluded from the target channels for scan. (Refer to **Selected Channel Scan.**)
 - If another zone is selected during the List Scan, the transceiver starts the scan according to the configuration in **Scan Type** of the selected zone.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring **Scan List** ( [See](#) Transceiver Settings > Scan > Scan List)
- Configuring **Scan List Number** (Zone) ( [See](#) Transceiver Settings > Zone/Channel > Zone/Channel Information > Conventional)
- Configuring **Scan List Number** (Channel) ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)
- Configuring **Scan Type** ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Scan)
- Configuring **“Scan” Displayed** to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan Information > General)

Conditions to Activate the Scan (List Scan)

For the transceiver to start the List Scan, 2 or more Zone-channels must be registered as members in a Scan List.

Note

- A Priority Channel is always registered as a member in a Scan List. However, if “Selected” is configured for the type of the Priority Channel (**Type**), the selected channel becomes the Priority Channel and target channel for scan, regardless of the configuration in **Selected Channel Scan** or whether the selected channel is registered as a member in a Scan List. (Refer to [Priority Channel Type \(Type\)](#).)
- If **Selected Channel Scan** is enabled, the scan can be initiated even if only a single Zone-channel is configured as a member in a Scan List because the selected channel also becomes the target channel for scan.

Conditions to Resume the Scan (List Scan)

For the transceiver to resume the List Scan, 2 or more Zone-channels to be scanned must be registered as members in a Scan List.

If the transceiver does not satisfy the conditions to resume the scan, the scan remains paused.

Note

- If a channel is temporarily excluded from the target channels for scanning by the **Priority Temporary Delete/Add** function, the channel is not scanned even if the channel is registered as a member in Scan List.
- If **Selected Channel Scan** is enabled, the scan can be resumed even if only a single Zone-channel is configured as a member in a Scan List because the selected channel also becomes the target channel for scan.

Transceiver Behavior in the Case that the Scan Cannot Be Resumed (List Scan)

If the transceiver manually switches during the scan to the zone or channel which does not satisfy the condition to resume the scan, the transceiver displays the selected channel and the scan remains paused.

If the **PTT** switch is pressed while the condition to resume the scan is not satisfied, the transceiver transmits using the **Revert Channel**. Upon elapse of the time configured in Dwell Time after completion of the transmission, the transceiver reverts to the selected channel; however, the scan does not resume.

Scan List

In order to use List Scan, target members for List Scan must be registered in a Scan List. A maximum of 128 Scan Lists can be configured. In each Scan List, a maximum of 31 Zone-channels can be registered as target members for List Scan.

Scan Type (Scan List)

In order to register a target member for List Scan, **Scan Type (Scan List)** must be configured.

Table 5-1 Scan Type (Scan List)

Configuration	Description
Conventional	A Zone-channel in a system where "Analog Conventional", "P25 Conventional", "NXDN Conventional", or "DMR Conventional" is configured in System Type can be registered as a member for List Scan. Configuring a Priority Channel enables Priority Scan.
LTR and Conventional	A Zone-channel in a system where "LTR Trunking", "Analog Conventional", "Analog Conventional", "Analog Conventional", "P25 Conventional", "NXDN Conventional", or "DMR Conventional" is configured in System Type can be registered as a member for List Scan.

Scan List Number (Channel)

List Scan is executed according to the Scan List Number configured for the channel where scan is initiated. According to the configuration in **Scan List Number**, List Scan is executed as follows:

Table 5-2 Scan List Number (Channel)

Configuration	Description
Zone Common	List Scan is executed by referring to the Scan List Number configured for the zone.
1 to 128	List Scan is executed according to the List Number in the corresponding Scan List.
None	List Scan is not executed.

Configuration using KPG-D1/ D1N

Configuring **Scan List** ( See Transceiver Settings > Scan > Scan List > Members)

Changing the Scan List (Scan Program)

A desired Zone-channel can be registered as a member for List Scan in the Scan List by operating the transceiver. Also, a registered member in the Scan List can be deleted from the list.

The Scan List can be edited in Scan Program Mode.

Pressing the **Scan Program** key places the transceiver in Scan Program Mode.

Or, pressing the **Menu** key to enter Menu Mode and then selecting "Scan Program " places the transceiver in Scan Program Mode. (Refer to Common FUNC Using Menu Mode.)

Operating the transceiver

● Adding a member for List Scan

1 Select the channel for which the Scan List to be edited is configured and then press the **Scan Program** key.

A Key Beep A (1 beep) sounds from the transceiver.
The transceiver enters Scan Program Mode and the edit screen of the Scan List appears.
The following operations are identical even if the transceiver enters Scan Program Mode by pressing the **Menu** key.

Note

- If the selected channel is registered in the Scan List, the "≡" icon appears on the left of the channel name.



2 Select a Zone-channel to add to the Scan List.

Select a channel by pressing the [▲] key or [▼] key.
Select a zone by pressing the [◀] key or [▶] key.
Refer to Common FUNC "Selecting or Clearing Data from a List" for selection methods.



3 Press the **Menu** ([□]) key, or [*] key.

A Key Beep A (1 beep) sounds from the transceiver, and then the Zone-channel selected in Step 2 is added to a Scan List. The "≡" icon appears on the left of the channel name.

Note

- In the following cases, a member cannot be added to a Scan List:
 - If the zone channel to be added to a Scan List is already configured as a member in the Scan List
 - If a channel which is inappropriate for the configuration in **Scan Type (Scan List)**, such as a channel in an NXDN Trunking system, is selected for the Scan List with "Conventional" configured in **Scan Type (Scan List)**



● Deleting a member from List Scan

1 Select the channel for which the Scan List to be edited is configured and then press the **Scan Program** key.

A Key Beep A (1 beep) sounds from the transceiver.
The transceiver enters Scan Program Mode and the edit screen of the Scan List appears.
The following operations are identical even if the transceiver enters Scan Program Mode by pressing the **Menu** key.

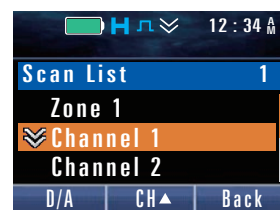
Note

- If the selected channel is registered in the Scan List, the “≡” icon appears on the left of the channel name.



2 Select a Zone-channel to be deleted from the Scan List.

Select a channel by pressing the [▲] key or [▼] key.
Select a zone by pressing the [◀] key or [▶] key.
Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.

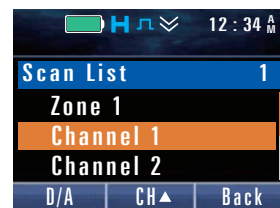


3 Press the **Menu** ([□]) key, or [*] key.

Key Beep B (2 beeps) sounds from the transceiver, and then the Zone-channel selected in Step 2 is deleted from the Scan List. The “≡” icon disappears from the left of the channel name.

Note

- In the following cases, a member cannot be deleted from the Scan List:
 - If the zone channel to be deleted from the Scan List is a Priority Channel
 - If the number of members registered in the Scan List is zero



Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)

5.4 Scanning All Target Zones for Scanning (Multi-Zone Scan)

In a DMR Conventional system, by using Multi-Zone Scan, the transceiver can scan all channels to be scanned in the target zones.

If a scan starts in the zone where "Multi-Zone" is configured in **Scan Type**, Multi-Zone Scan is executed. Or, if the transceiver migrates during the scan to the zone where "Multi-Zone" is configured in **Scan Type**, Multi-Zone Scan is executed.

The target zone for scanning is either the zone with **Zone Add** enabled by using KPG-D1/ D1N or the zone with **Zone Add** enabled by using the **Zone Delete/Add** key.

The target channel for scan is either the channel with **Scan Add** enabled by using KPG-D1/ D1N or the channel with **Scan Add** enabled by using the **Scan Delete/Add** key.

Note

- Multi-Zone Scan cannot be executed in a DMR-based Trunking system.

Operating the transceiver

1 Press the Scan key.

The scan starts after a Key Beep A (1 beep) sounds from the transceiver.

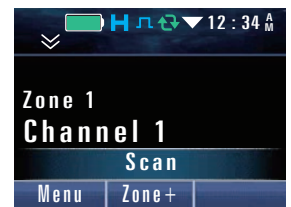
The "↻" icon appears and then Revert Channel is displayed.

If "**Scan**" **Displayed** is enabled, "Scan" is displayed.

For portable transceivers, the LED light flashes according to the configuration of **Non-Priority Scan LED** in the case of non-priority scan, and according to the configuration of **Priority Scan LED** in the case of priority scan.

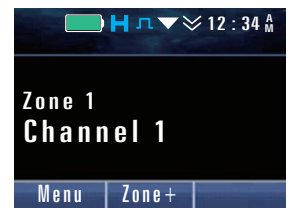
Note

- The transceiver behaves in the same manner even if the scan is started by other method. (Refer to **Starting the Scan**.)



2 Press the Scan key during the scan.

The scan completes after a Key Beep B (2 beeps) sounds from the transceiver and the "↻" icon disappears.



Note

- "Multi-Zone" can be configured in **Scan Type** only for the zones structured with the following systems:
 - System Type = Analog Conventional
 - System Type = P25 Conventional
 - System Type = NXDN Conventional
 - System Type = LTR Trunking
 - System Type = DMR Conventional

Even if these systems exist in the same zone, "Multi-Zone" can be configured in **Scan Type**. In this case, "Single" can also be configured in **Scan Type**, and starting Multi-Zone Scan can also scan the zones with "Single" configured in **Scan Type**.

- If **Selected Channel Scan** is enabled, the selected channel can be scanned even if the channel is excluded from the target channels for scan. (Refer to **Selected Channel Scan**.)
- For Portable, if the transceiver changes the zone during Multi-Zone Scan by using the **Selector** with "Zone Select" configured and if the new zone is not configured, the "↺↻" icon blinks and the scan pauses.
- If another zone is selected during the Multi-Zone Scan, the transceiver starts the scan according to the configuration in **Scan Type** of the selected zone.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)
- Configuring **Scan Add** to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)
- Configuring **Zone Add** to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Zone Edit > Scan)
- Configuring **Scan Type** ( **See** Transceiver Settings > Zone/Channel > Zone Edit > Scan)
- Configuring **"Scan" Displayed** to be enabled or disabled ( **See** Transceiver Settings > Scan > Scan Information > General)

Conditions to Activate the Scan (Multi-Zone Scan)

One of the following conditions must be satisfied for the transceiver to start the Multi-Zone Scan:

- When a total of two or more channels targeted to be scanned exists in the zone targeted to be scanned
- When only one target zone exists, and when one target channel exists in the target zone and a Priority Channel exists in the target zone or another zone
- When Priority Channel 1 and Priority Channel 2 exist in another zone, even if no zone to be scanned exists

Conditions to Resume the Scan (Multi-Zone Scan)

One of the following conditions must be satisfied to resume the Multi-Zone Scan while the transceiver pauses the scan:

- When a total of two or more channels targeted to be scanned exists in the zone targeted to be scanned
- When only one target zone exists, and when one target channel exists in the target zone and a Priority Channel exists in the target zone or another zone
- When Priority Channel 1 and Priority Channel 2 exist in another zone, even if no zone to be scanned exists

If the transceiver does not satisfy the conditions to resume the scan, the scan remains paused.

Transceiver Behavior in the Case that the Scan Cannot Be Resumed (Multi-Zone Scan)

If the transceiver manually switches during the scan to the zone or channel which does not satisfy the condition to resume the scan, the transceiver displays the selected channel and the scan remains paused.

If the **PTT** switch is pressed while the condition to resume the scan is not satisfied, the transceiver transmits using the **Revert Channel**. Upon elapse of the time configured in **Dwell Time** after completion of the transmission, the transceiver reverts to the selected channel, and the scan does not resume.

5.5 Scanning the Specific Channel Preferentially (Priority Scan)

Priority Scan is the function to prioritize and scan the target channels.

This function can be used for Single Scan, List Scan or Multi-Zone Scan in a Conventional channel.

- **Single Scan**

A maximum of 2 Priority Channels can be configured in each zone.

- **List Scan**

A maximum of 2 Priority Channels can be configured in each Scan List.

- **Multi-Zone Scan**

A maximum of 2 Priority Channels can be configured for **Multi-Zone Scan**.

If a Priority Channel is configured, the transceiver monitors Priority Channel by executing Lookback even when receiving on a normal channel.

On the channel where Priority 1 has the highest priority, Lookback is not executed while receiving on Priority 1.

Priority 2 is the channel prioritized next to Priority 1; therefore, Lookback is executed on Priority 1 while receiving on Priority 2.

Priority Channel Type (Type)

Priority Channel Type can be selected from “None”, “Fixed”, “Selected” and “Operator Selectable”.

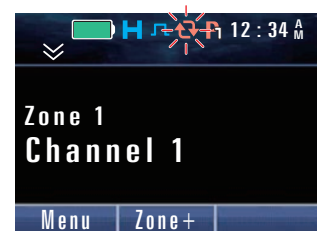
Table 5-3 Type

Configuration	Description
None	No Priority Channel is configured.
Fixed	The channel configured using KPG-D1/ D1N is configured as the Priority Channel. The Priority cannot be changed by operating the transceiver.
Selected	The channel selected on the Transceiver is configured as the Priority Channel.
Operator Selectable	The channel configured by a user in Priority-channel Select Mode (Single Scan/ Multi-Zone Scan) or Scan Program (List Scan) is configured as the Priority Channel. (Refer to Changing the Priority Channel , Changing the Scan List (Scan Program) .)

Transceiver behavior

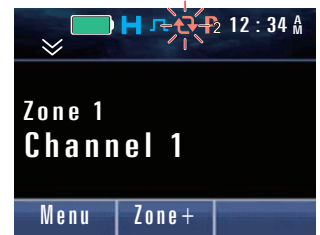
- **If the Zone-channel configured for the Priority 1 is selected, or if the scan is paused on the Zone-channel configured for the Priority 1**

The “” icon appears. When Priority Scan is paused, the “” icon blinks.



- If the **Zone-channel configured for the Priority 2** is selected, or if the scan is paused on the **Zone-channel configured for the Priority 2**

The “” icon appears. When Priority Scan is paused, the “” icon blinks.



- If the **same Zone-channel is selected for Priority 1 and the Priority 2**, or if the scan is paused on the **same Zone-channel configured for Priority 1 and the Priority 2**

The “” icon with higher priority appears. When Priority Scan is paused, the “” icon blinks.



Note

- Priority Scan cannot be executed in a DMR-based Trunking system.
- If **Priority-channel Stop Tone** is enabled, a Priority-channel Tone (1 beep) is emitted from the transceiver when the scan is paused on the Priority Channel and the speaker is unmuted.
- The Priority Channel is scanned even if the Priority Channel is excluded from the target channels for scan. However, the Priority Channel can be temporarily excluded from the target channels for scan by using the **Priority Temporary Delete/Add** function.
- If the same channel is selected for **Priority 1** and **Priority 2**, and if **Priority Temporary Delete/Add** of either **Priority 1** or **Priority 2** is permitted, **Priority Temporary Delete/Add** is executed only on the permitted Priority Channel when the **Scan Delete/Add** key is pressed.
- Pressing the **Home Channel** key during the scan does not change the Priority Channel even if “Selected Priority Scan” is configured for the Priority.
- During the scan, if one of the **Direct Channel 1** key to **Direct Channel 5** key is pressed, or one of the External PTT (Direct Channel 1 Voice) port to External PTT (Direct Channel 5 Voice) port becomes active, the transceiver behaves as follows:
 - If **Return** is disabled, Direct Channel 1 to Direct Channel 5 become the Priority Channels if Direct Channel 1 to Direct Channel 5 are Conventional channels.
 - If **Return** is enabled, the Priority Channel does not change.

Configuration using KPG-D1/ D1N

- Configuring **Priority 1** (Single Scan) ( See Transceiver Settings > Zone/Channel > Zone Edit > Single Scan > Priority 1)
- Configuring **Priority 2** (Single Scan) ( See Transceiver Settings > Zone/Channel > Zone Edit > Single Scan > Priority 2)
- Configuring **Priority 1** (List Scan) ( See Transceiver Settings > Scan > Scan List > Options > Priority 1)
- Configuring **Priority 2** (List Scan) ( See Transceiver Settings > Scan > Scan List > Options > Priority 2)
- Configuring **Priority-channel Stop Tone** to be enabled or disabled ( See Transceiver Settings > Scan > Scan Information > General)

Changing the Priority Channel

The Priority Channel can be changed by operating the transceiver.

● Single Scan/ Multi-Zone Scan

The Priority Channel can be changed in Priority-channel Select Mode.

Pressing the **Priority-channel Select** key places the transceiver in Priority-channel Select Mode.

Or, pressing the **Menu** key to enter Menu Mode and then selecting "Priority-channel Select" places the transceiver in Priority-channel Select Mode. (Refer to Common FUNC Using Menu Mode.)

The transceiver can enter Priority-channel Select Mode only if "Operator Selectable Priority Scan" is configured in either **Priority 1** or **Priority 2**.

● List Scan

The Priority Channel can be changed on the Priority Channel edit screen in Scan Program Mode.

Pressing the **Scan Program** key places the transceiver in Scan Program Mode.

Or, pressing the **Menu** key to enter Menu Mode and then selecting "Scan Program " places the transceiver in Scan Program Mode. (Refer to Common FUNC Using Menu Mode.)

Pressing the **Function** ([O]) key in Scan Program Mode displays the Priority Channel edit screen.

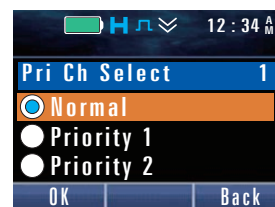
The transceiver can enter the Priority Channel edit screen only if "Operator Selectable Priority Scan" is configured in either **Priority 1** or **Priority 2**.

Operating the transceiver

● Changing the Priority Channel in Priority-channel Select Mode (Single Scan/ Multi-Zone Scan)

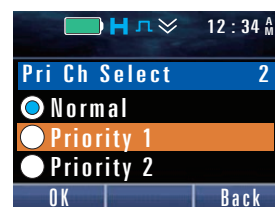
1 Press the **Priority-channel Select** key after selecting the channel to be configured as the Priority Channel.

The transceiver enters Priority-channel Select Mode.
The following operations are identical if the transceiver enters Priority-channel Select Mode by pressing the **Menu** key.



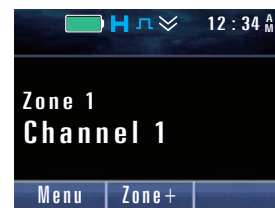
2 Select the priority of a channel by pressing the [▲] key or [▼] key.

Priority can be selected from "Normal", "Priority 1", "Priority 2", and "Priority 1&2".



3 Press the **Menu** ([]) key, or [*****] key.

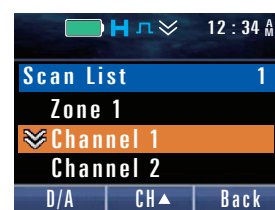
After the Key Beep B (2 beeps) sounds, the transceiver exits Priority-channel Select Mode and restores the previous channel display.



● Changing the Priority Channel in Scan Program Mode (List Scan)

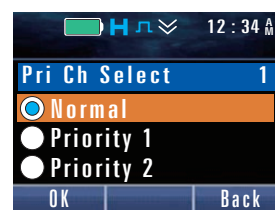
1 Press the **Scan Program** key after selecting the channel to be configured as Priority Channel.

A Key Beep A (1 beep) sounds from the transceiver.
The transceiver enters Scan Program Mode and the edit screen of the Scan List appears.
The following operations are identical even if the transceiver enters Autodial Mode by pressing the **Menu** key.



2 Press the **Function** ([]) key.

The transceiver enters the Priority Channel edit screen.



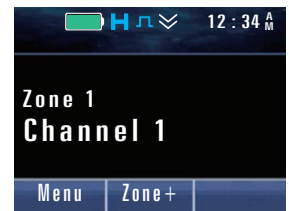
3 Select the priority of a channel by pressing the [**▲**] key or [**▼**] key.

Priority can be selected from "Normal", "Priority 1", "Priority 2", and "Priority 1&2".



4 Press the **Menu** ([]) key, or [*****] key.

After a Key Beep C (3 beeps) sounds, the transceiver exits Scan Program Mode and restores the previous channel display.



Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)

Lookback

Lookback is the function to periodically checks for a Priority Channel if a Priority Channel is configured for the transceiver and the transceiver receives on a normal channel (a channel which is not Primary Channel).

Either **Lookback Time A** or **Lookback Time B** is applied for the interval to initiate checking for a signal on a Priority Channel according to the receiving status of the Priority Channel.

Lookback Time A

Lookback Time A is the interval time to check during a Priority Scan for a signal on a Priority Channel without a carrier while the transceiver receives a signal on a normal channel whose carrier is different from the carrier of the Priority Channel.

Since the transceiver may receive a call on the Priority Channel, the time configured in **Lookback Time A** must be shorter than the time configured in **Lookback Time B**.

Lookback Time B

Lookback Time B is the interval time to check during a Priority Scan for a signal on a Priority Channel which does not match the QT/DQT in an Analog Conventional system or a Priority Channel which does not match the Color Code in a DMR Conventional system even though a carrier exists, while the transceiver receives a signal on a normal channel whose carrier is different from the carrier of the Priority Channel.

Note

- If DMR digital signals are received on a normal channel in a DMR Conventional system, **Lookback Time A** and **Lookback Time B** function according to the sum of 500 ms added to the value configured using KPG-D1/ D1N.
- When DMR digital signals are received on the normal channel of the DMR Conventional system, the **Lookback** interval increases according to the configuration of KPG-D1/ D1N compared to the NXDN system and other systems.
Configuration example: DMR Repeater Mode
 - Normal channel: slot 1, standby Group ID 1
 - Priority channel: slot 2, standby Group ID 2
 - When the normal and priority channels receive signals with the same channel (frequency) but a different slot

Configuration using KPG-D1/ D1N

- Configuring **Lookback Time A/ Lookback Time B** (Single Scan) ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Single Scan)
- Configuring **Lookback Time A/ Lookback Time B** (List Scan) ( [See](#) Transceiver Settings > Scan > Scan List > Options)

Priority 1 Temporary Delete/Add, Priority 2 Temporary Delete/Add

A Priority Channel is always scanned regardless of the Scan Delete/Add configuration. If this function is enabled, pressing the **Scan Delete/Add** key temporarily deletes a Priority Channel from the target channels for scan when the scan pauses on the Priority Channel during the scan.

Configuration using KPG-D1/ D1N

- Configuration **Priority 1 Temporary Delete/Add** (Single Scan) to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Single Scan > Priority 1)
- Configuration **Priority 2 Temporary Delete/Add** (Single Scan) to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Single Scan > Priority 2)
- Configuring **Priority 1 Temporary Delete/Add** (List Scan) to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan List > Options > Priority 1)
- Configuring **Priority 2 Temporary Delete/Add** (List Scan) to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan List > Options > Priority 2)

Scan Normal Channel

Scan Normal Channel is the function to execute the scan by disabling the Priority Channel configuration even if a Priority Channel is configured.

Even if the Priority Channel is configured, pressing the **Scan Normal** key disables the configuration and mandatorily executes Scan Normal Channel.

Note

- The condition for Scan Normal Channel to start is that two or more channels to be scanned need to exist in the same way as the normal scan.
In a DMR Conventional system, because a priority channel is treated as a normal channel, the priority channel is not the target for scanning if Scan Delete is executed for the priority channel.
In a DMR-based Trunking system, because a Group ID configured in Priority Monitor ID is treated as a normal Group ID, the Group ID configured in Priority Monitor ID is not the target for scanning if Scan Delete is executed for the Group ID.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)

5.6 Transceiver Behavior during the Scan

This section describes various behaviors of the transceiver during the scan.

Note

- The length of time from when the transceiver pauses the scan for transmission or reception until the transceiver resumes the scan can be configured using **Dropout Delay Time** and **Dwell Time**. (Refer to [Dropout Delay Time](#), [Dwell Time](#).)

Transceiver Behavior When a Zone-channel Is Changed during the Scan

If a Zone-channel is changed manually during the scan, the transceiver pauses the scan on a new channel. After a second elapses, the scan resumes.

If a Zone-channel is changed manually while the scan pauses for reception, and if the channel where the scan is paused is different from the selected channel, the scan pauses on the selected channel.

Reception Behavior during the Scan in a DMR Conventional System

The following are the reception behaviors during the scan in a DMR Conventional system:

The transceiver receives a Color Code in each channel, and pauses the scan if the received Color Code matches the Color Code preconfigured for the transceiver.

In this case, if the transceiver receives an Unaddressed Call, Individual Call or Group Call and the ID matches the ID preconfigured for the transceiver, the scan stops and audio is emitted from the speaker.

If the ID does not match for the Individual Call or Group Call received, the scan stops but audio is not emitted from the speaker.

If the matching state of the Color Code becomes inconsistent, **Dropout Delay Time** is activated. After the time configured in **Dropout Delay Time** elapses, the transceiver resumes the scan.

Note

- When **Repeater Mode** or **Dual Slot Direct Mode** is enabled, the scan will stop if the Slot Selections match and the Color Codes match.
- When **Dual Slot Direct Mode** of DMR Direct Mode is disabled, the scan will stop only if the Color Codes match.

Reception Behavior during the Scan in a DMR-based Trunking System

While the transceiver scans in a **DMR-based Trunking** system, the transceiver will receive as follows:

- The transceiver pauses scanning when the decoded Group ID matches the Group ID to be scanned.
- The transceiver pauses scanning when the decoded Unit ID matches the Unit ID preconfigured for the transceiver.

Note

- Group ID Scan and Single Scan cannot be used at the same time.

5.7 Scan Function

The following functions are relevant to the scan.

- Scan Delete/Add
- Zone Delete/Add
- Revert Channel
- Dropout Delay Time
- Dwell Time
- Channel Recall
- Priority-channel Stop Tone
- Auto Scan
- Selected Channel Scan
- Power-on Scan
- Off-hook Scan (Mobile Only)
- Scan Stop Tone
- Preamble Length

Adding or Deleting a Channel to/from the Target Channels for Scan (Scan Delete/Add)

Scan Delete/Add is the function to add a channel to be scanned to the Scan List or delete a channel to be scanned from the Scan List.

This function is used to reliably receive a call from a primary channel by deleting unnecessary channels to increase the scan speed.

The following are the transceiver behavior:

● When Scan is disabled

For a zone with "Single" or "Multi-Zone" configured in Scan Type:

Pressing the **Scan Delete/Add** key allows you to add the selected channel to the target channels for scan or delete the selected channel from the target channels for scan. The Scan Delete/Add information is retained in the transceiver.

For a zone with "List" configured in Scan Type:

Pressing the **Scan Delete/Add** key allows you to add the selected channel as a member to the Scan List configured for the selected channel, or delete the channel from the Scan List configured for the selected channel. The Scan Delete/Add information is retained in the transceiver.

● When the scan is paused

For a zone with "Single" or "Multi-Zone" configured in Scan Type:

Pressing the **Scan Delete/Add** key allows you to add the selected channel temporarily to the target channels for scan or delete the selected channel temporarily from the target channels for scan (Temporary Delete/Add). This status is retained until the scan is terminated by operations such as pressing the **Scan** key, and the status is cleared when the scan completes.

For a zone with "List" configured in Scan Type:

Pressing the **Scan Delete/Add** key temporarily deletes a selected channel if it is registered in the members of Scan List.

Pressing the **Scan Delete/Add** key again restores it (Temporary Delete/Add). This status is retained until the scan is terminated by operations such as pressing the Scan key, and the status is cleared when the scan completes.

● During the scan

Pressing the **Scan Delete/Add** key causes a Key-entry Error Tone (1 beep) to sound from the transceiver but the transceiver does not respond at all.

Note

- The operation above is enabled even if the transceiver enters Menu Mode by pressing the **Menu** key and then executes “Scan Delete/Add”. (Refer to Common FUNC Using Menu Mode.)
- For the zone with “List” configured in Scan Type, a target channel for scan can be added or deleted in Scan Program Mode. (Refer to [Changing the Scan List \(Scan Program\)](#).)

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)

Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add)

Zone Delete/Add is the function to add a zone to the target zones for scanning or delete a zone from the target zones for scanning when using Multi-Zone Scan.

For Multi-Zone Scan, this function is used to increase the scan speed and reliably receive a call from a primary zone by deleting unnecessary zones.

Pressing the **Zone Delete/Add** key adds or deletes a zone to or from the target zones for scanning.

Or, a zone can be added to or deleted from the target zones for scanning by executing “Zone Delete/Add” after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

Note

- Only zones structured with a Conventional system or an LTR Trunking system can be added to or deleted from the target zones for scanning.
- If there is only one target zone left while Multi-Zone Scan pauses, the zone cannot be deleted from the target zones even if Zone Delete/Add is executed.
- While the scan other than Multi-Zone Scan pauses, the selected zone cannot be deleted from the target zones even when Zone Delete/Add is executed.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)

Revert Channel

Revert Channel is the Zone-channel which is used when the transceiver transmits by pressing the **PTT** switch during the scan.

Table 5-4 Revert Channel

Configuration	Description
Last Called + Selected	The transceiver transmits on the last-called Zone-channel by pressing the PTT switch during the scan. The transceiver transmits on the Zone-channel where the transceiver pauses the scan by pressing the PTT switch during the scan. If the Zone-channel is changed, the transceiver transmits using the new channel after the Zone-channel is changed until the transceiver receives another call.
Selected	The transceiver transmits on the new channel after the Zone-channel is changed regardless of the scan status.
Selected + Talkback	During the scan, the transceiver transmits on the new Zone-channel after the zone-channel is changed. While the scan is paused, the transceiver transmits on the Zone-channel where the transceiver pauses scanning.
Priority 1	The transceiver transmits on a Priority 1 regardless of the scanning status.
Priority 1 + Talkback	The transceiver transmits on a Priority 1 during the scan. While the scan is paused, the transceiver transmits on the Zone-channel where the transceiver pauses scanning.
Priority 2	The transceiver transmits on a Priority 2 regardless of the scanning status.
Priority 2 + Talkback	The transceiver transmits on a Priority 2 during the scan. While the scan is paused, the transceiver transmits on the Zone-channel where the transceiver pauses scanning.

Note

- **Revert Channel** always appears on the display of the transceiver during the scan.
- For Single Scan of a zone in a DMR-based Trunking system, Priority 1/ Priority 1 + Talkback/ Priority 2/ Priority 2 + Talkback cannot be configured in **Revert Channel**.
- If Home Channel is activated, the transceiver transmits on the Home Channel regardless of the configuration in **Revert Channel**.
- If the Direct Channel function (Return = Check) is activated, the transceiver transmits on the Direct Zone Channel regardless of the configuration in **Revert Channel**.

Configuration using KPG-D1/ D1N

- Configuring **Revert Channel** (Single Scan) ( **See** Transceiver Settings > Zone/Channel > Zone Edit > Single Scan)
- Configuring **Revert Channel** (List Scan) ( **See** Transceiver Settings > Scan > Scan List > Options)

Dropout Delay Time

Dropout Delay Time is the time from when the transceiver finishes receiving signals until the transceiver resumes scanning.

The transceiver pauses scanning when the transceiver receives a call during the scan. The transceiver resumes the scan when the time configured in **Dropout Delay Time** elapses after the transceiver finishes receiving.

The following are conditions to resume scanning:

- There is no signal to receive.
- The matching state of the Color Code becoming inconsistent

The transceiver activates Talkback according to the configuration in **Revert Channel** while the time configured in **Dropout Delay Time** elapses.

If the scan is paused while the time configured in **Dropout Delay Time** elapses, and if the channel is not the Priority Channel 1 or Priority Channel 2, the Priority Channel 1 and Priority Channel 2 are monitored by executing Lookback.

Configuration using KPG-D1/ D1N

Configuring **Dropout Delay Time** ( See Transceiver Settings > Scan > Scan Information > General)

Dwell Time

During the scan, the scan pauses when the **PTT** switch is pressed to transmit. **Dwell Time** is the time from when the transceiver completes transmitting until the transceiver resumes scanning.

The transceiver activates Talkback according to the configuration in **Revert Channel** while the time configured in **Dwell Time** elapses.

If the scan is paused while the time configured in **Dwell Time** elapses, and if the channel is not the Priority Channel 1 or Priority Channel 2, the Priority Channel 1 and Priority Channel 2 are monitored by executing Lookback.

Configuration using KPG-D1/ D1N

Configuring **Dwell Time** ( See Transceiver Settings > Scan > Scan Information > General)

Channel Recall

Channel Recall is the function to migrate to the last called Zone-channel by pressing the **Channel Recall** key.

Even if a user is away from the transceiver, the user can notice later that the transceiver has received a call during the scan.

Note

- If the **Channel Recall** key is pressed while no signal is received after scan starts, the transceiver migrates to the channel from which the transceiver started scanning.
- If **Channel Recall** is enabled, the transceiver does not resume the scan even if the time configured in **Dropout Delay Time** or **Dwell Time** elapses.
- **Channel Recall** is disabled if the channel is changed while **Channel Recall** is enabled. The transceiver resumes scanning after the Key Delay Time elapses (1 sec).
- The transceiver does not execute Lookback while **Channel Recall** is enabled.
- If the scan is paused with **Channel Recall** and **Scan Stop Tone** enabled, the Scan Stop Tone (2 beeps) sounds from the transceiver at 30-sec intervals.
- The channel to which the transceiver migrated using **Channel Recall** is not configured as the Selected Channel.
- Even if **Channel Recall** is enabled, the transmission using GPS Auto is executed by **Revert Channel**.

Configuration using KPG-D1/ D1N

Assigning functions to the **PF** keys on the transceiver ( **See** Transceiver Settings > Key Assignment)

Priority-channel Stop Tone

Priority-channel Stop Tone is the function that emits a Priority-channel Tone (1 beep) from the transceiver when the scan is paused and the speaker is unmuted upon receipt of a signal on a Priority Channel during the scan.

Configuration using KPG-D1/ D1N

Configuring **Priority-channel Stop Tone** to be enabled or disabled ( **See** Transceiver Settings > Scan > Scan Information > General)

Auto Scan

Auto Scan is the function to start the scan automatically by selecting the channel with **Auto Scan** enabled.

Whether to enable or disable **Auto Scan** can be configured for each channel. The scan on a channel where **Auto Scan** is enabled cannot be stopped. The scan starts unconditionally if the transceiver migrates to a channel with **Auto Scan** enabled.

Note

- If "Personality" is configured in **Zone-channel Format** for KPG-D1/ D1N, whether to enable or disable **Auto Scan** can be configured for each Personality.
- When the transceiver migrates to a channel where **Auto Scan** is enabled, the scan pauses if the conditions for starting the scan are not satisfied.
- If the transceiver migrates to a channel where **Auto Scan** is enabled after the scan is started by pressing the **Scan** key, the scan cannot be terminated even if the **Scan** key is pressed.
- In a zone where "None" is configured in **Scan Type**, the scan does not start even if the transceiver migrates to a channel with **Auto Scan** enabled.

Configuration using KPG-D1/ D1N

- Configuring **Auto Scan** (Personality > DMR Conventional) to be enabled or disabled ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > General)
- Configuring **Auto Scan** (Channel Edit > DMR Conventional) to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > General)
- Configuring **Auto Scan** (Personality > DMR-based Trunking) to be enabled or disabled ( **See** Transceiver Settings > Personal > Personality > DMR-based Trunking)
- Configuring **Auto Scan** (Channel Edit > DMR-based Trunking) to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR-based Trunking)

Selected Channel Scan

Selected Channel Scan is the function to add the selected channel to the target channels for scan even if the channel is excluded from the target.

Configuration using KPG-D1/ D1N

Configuring **Selected Channel Scan** to be enabled or disabled ( **See** Transceiver Settings > Scan > Scan Information > General)

Power-on Scan

Power-on Scan is the function to start the scan automatically when the transceiver is turned on.

Portable

If “Zone Select” is configured in **Selector** or for the **Lever** switch, the transceiver starts the scan according to the configuration in **Scan Type** for the zone number indicated by the pointer of **Selector** or the **Lever** switch when the transceiver is turned on. If the zone number indicated by the pointer of the **Selector** or the **Lever** switch is not configured for the transceiver, the scan does not start.

If anything other than “Zone Select” is configured in **Selector** or for the **Lever** switch, the transceiver starts the scan according to the configuration in **Scan Type** for the zone selected when the transceiver is turned on.

Mobile

The transceiver starts the scan according to the configuration in **Scan Type** for the zone selected when the transceiver is turned on.

Configuration using KPG-D1/ D1N

Configuring **Power-on Scan** to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan Information > General)

Starting Scanning by Linking with the Microphone (Off-hook Scan)

Supported Models: Mobile

Off-hook Scan is the function to start scanning regardless of the microphone hook status.

The transceiver scans as follows according to the configuration in **Off-hook Scan**:

Table 5-5 Off-hook Scan

Configuration	Description
Enabled	Pressing the Scan key causes the transceiver to start scanning regardless of the microphone on-hook or off-hook state.
Disabled	If the microphone is in the on-hook state, pressing the Scan key causes the transceiver to start scanning; however if the microphone is in the off-hook state, the transceiver cannot start scanning. If the microphone changes from the on-hook state to off-hook state in Scan Mode, the scan pauses on the Revert Channel. When the microphone goes to on-hook state, the transceiver resumes scanning. However, if the microphones goes to the on-hook state while audio is being emitted, audio output will continue without resuming scanning. Subsequently, scanning resumes when there is no more signal and the length of time configured in Dropout Delay Time elapses.

Note

- On-hook indicates the state that the microphone is hooked. Off-hook indicates the state that the microphone is not hooked.

Configuration using KPG-D1/ D1N

Configuring **Off-hook Scan** to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan Information > General)

Scan Stop Tone

Scan Stop Tone is the function to emit the Scan Stop Tone (2 beeps) from the transceiver while the scan pauses, for example, while the transceiver migrates to a Home Channel or Direct Channel.

The transceiver pauses scanning if the conditions to start the scan are not satisfied, such as while the transceiver is migrating to a Home Channel or Direct Channel, and then a Scan Stop Tone (2 beeps) sounds from the transceiver at 30-sec intervals.

Note

- The Scan Stop Tone (2 beeps) does not sound while the transceiver is transmitting or while the speaker is unmuted for reception.

Configuration using KPG-D1/ D1N

Configuring **Scan Stop Tone** to be enabled or disabled ( **See** Transceiver Settings > Scan > Scan Information > General)

Preamble Length

Preamble Length is the function to extend the duration for sending a preamble when the DMR frame is sent.

Extending the time for sending a preamble at the beginning of transmission makes the receiving transceiver easier to receive a call and reduces missing of the beginning of the audio during the scan.

The range is from 0 to 144.

Configuration using KPG-D1/ D1N

Configuring **Preamble Length** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

Data communications are available for the transceiver by using the functions of DMR, or by using an external device connected to the transceiver.

6.1 Prioritizing Data Communications Using an External Device (Data Override)

Data Override is the function that allows prioritization of data communication using an external device even if the communication is made by a user operating the transceiver.

This function is used to send GPS data periodically even during reception.

The transceiver behaves as follows according to the configuration in **Data Override**:

Table 6-1 Data Override

Configuration	Description
Enabled	Data communications using an external device has a high priority level. Data Override is activated when the following AUX Input ports (Mobile only) are activated and when the transceiver receives a PC command from the serial port: • External PTT (Data) • Data PTT • DTC • Channel Select A to Channel Select D When Data Override is activated, the transceiver automatically exits the following statuses: • Function Mode • Public Address Mode (Mobile only) • The state when the transceiver temporarily migrates to a channel by pressing one of the Direct Channel 1 key to Direct Channel 5 key or Home Channel key or Channel Recall key
Disabled	The transceiver key control has the priority. The transceiver suspends the transmission even if the transceiver receives the above data transmission request from an external device.

Note

- While the transceiver is under the following conditions, **Data Override** is not activated:
 - While the transceiver is transmitting
 - While transmitting with the Public Address function (Mobile only)
 - While External PTT (PA) is active (Mobile only)
 - While the transceiver is in Emergency Mode
 - In Transceiver Password Mode
 - In the Stun state

Configuration using KPG-D1/ D1N

- Configuring **Data Override** to be enabled or disabled
 - ( **See** Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface > Serial Input)
 - ( **See** Extended Function > AUX > AUX Input)

6.2 Restricting the Warning Display during Data Communications (Silent Report)

Silent Report is the function to configure whether the transceiver transmits in standby display state without emitting the Alert Tone and flashing or lighting the LED, when sending and receiving the status and GPS data.

This function is used to keep a user from noticing the data communication request from a base station and GPS data transmission.

If this function is enabled, the LCD display, the LED display, and emitting the Alert Tone during data communications can be restricted as follows:

- The display during data communications (such as "Send Data", "Complete", "Busy", and "No Reply") is not displayed.
- The LED does not light or flash during data transmission.
- The Alert Tone, Control Tone, or Warning Tone is not emitted.

This function can be used for the following communications in a DMR Conventional system:

- AUX Input Status Message transmission
- Status transmission on receipt of Status Request
- Automatic GPS data transmission
- Automatic BLE data transmission
- GPS transmission by GPS Polling reception
- BLE transmission by BLE Polling reception

Note

- Silent Report is not applied when the transceiver receives a Status Request or receives GPS Polling.

Configuration using KPG-D1/ D1N

Configuring **Silent Report** to be enabled or disabled ( See Transceiver Settings > Optional Features > Optional Features 1 > Others)

6.3 Transparent

Transparent is the function that allows data communications using the DMR protocol. This function can be used by connecting a PC, card reader or telemetry devices to the transceiver. Using this function, the transceiver can send or receive data without limiting the data type.

This function can be used without operating the transceiver. All operations are controlled by data from other devices.

Using this function, a PC connected to the receiving transceiver can decode the transmitted bar-code data, for instance, while the bar-code reader is connected to a PC on the transmitting transceiver to transmit the bar-code data.

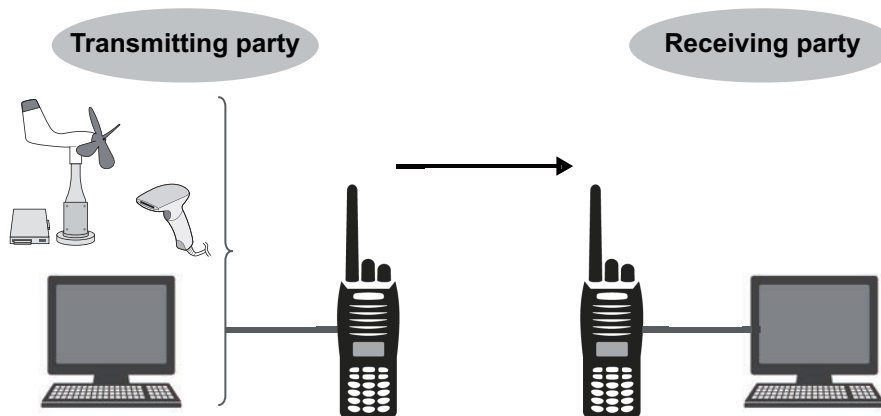


Figure 6-1 Image of Transparent

Data communications using Transparent can be used to send or receive the ASCII characters of 0x00 to 0xFF without any restriction.

In addition, data communications using Transparent supports baud rates of 1200 bps, 2400 bps, 4800 bps, 9600 bps and 19200 bps. (Refer to Common FUNC COM Port Functions.)

Note

- To use this function, "Transparent (Digital)" must be assigned to the communication port connecting the transceiver and an external device by using KPG-D1/ D1N.

Transmitting Transceiver Behavior

The ASCII characters from 0x00 to 0xFF can be sent or received.

The communication port of the transceiver assigned "Transparent (Digital)" sends the received data automatically using the DMR protocol if the received data size exceeds 1570 bytes upon the receipt of data from an external device.

The transceiver automatically sends the received data if the transceiver does not receive any data for a duration sufficient to receive 16 characters after receiving the last data.

The transmitting transceiver transmits over the Air when the data time elapses in the following way:

- **If a baud rate of 19200 and 1 stop bit are configured for the PC and transmitting transceiver:**

When a duration equal to or more than $1/19200 \times 10 \times 16 = 8.3$ ms elapses

- **If a baud rate of 9600 and 2 stop bit are configured for the PC and transmitting transceiver:**

When a duration equal to or more than $1/9600 \times 11 \times 16 = 18.3$ ms elapses

Data is transmitted to the IDs configured in the Base ID Type and Base ID.

The maximum data capacity for the receive buffer of the transmitting transceiver in order to receive data from a PC is limited to 2048 bytes. If the transmit speed and reception from a PC is unbalanced and the overflowing received data exceeds 2048 bytes, the excessive data may not be sent.

If the transceiver receives the 2048 bytes of data while the transceiver is configured so that the RTS and CTS ports are available, the transceiver starts the flow control to an external device. (Refer to Common FUNC Available Functions for COM Port.)

The transceiver can control not to overflow from the buffer the data sent from the external device as soon as the transceiver has started the flow control, so that the transceiver can receive the 2048 bytes of data. In the RTS and CTS ports, the data communications with an external device are controlled as follows.

RTS:

When the buffer of the transceiver for serial communications becomes full, the status of the RTS port will be the low level ^{*1}. (Portable: Pin No. 9 (14-pin universal connector), Mobile: Pin No. 5 (25-pin connector on the back panel))

CTS:

When the status of the CTS port becomes the low level ^{*1}, the serial data will not be sent from the transceiver. (Portable: Pin No. 4 (14-pin universal connector), Mobile: Pin No. 4 (25-pin connector on the back panel))

^{*1} Portable: 0 V, Mobile: -8 V

Note

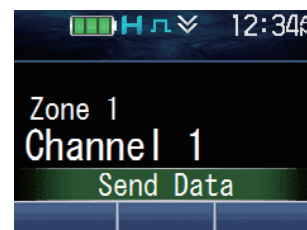
- In a DMR-based Trunking system, the transceiver sends data on a traffic channel regardless of the data size.

Transceiver behavior

Data is sent from a device to the transceiver.

The communication port of the transceiver assigned "Transparent (Digital)" automatically starts transmitting if the received data size reaches 1570 bytes.

"Complete" appears for 1 sec when the transmission completes, and the transceiver restores the previous display.



In a DMR-based Trunking system, the transceiver display behaves as follows depending on the response message from the system when data is sent automatically:

Table 6-2 Trunking Format

Configuration	Description
If no traffic channel is available in the system and if the transceiver receives a response message indicating the queue state from the system:	The transceiver enters the standby state while "Send Data" remains displayed. No tone sounds.
If the transceiver receives a response message from the system indicating a busy state of the receiving transceiver:	The Busy Tone 2 (3 beeps) sounds from the transceiver, and "Busy" appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a response message from the system indicating such as a temporary failure:	The System Busy Tone (3 beeps) sounds from the transceiver and "System Busy" appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a response message from the system indicating no response from the receiving transceiver:	The No Reply Tone (4 beeps) sounds from the transceiver, and "No Reply" appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver receives a message from the system, such as a service invalid message:	The Call Invalid Tone (4 beeps) sounds from the transceiver, and "Invalid" appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.
If the transceiver does not receive any message from the system:	The Call Fail Tone (2 beeps) sounds from the transceiver, and "Fail" appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends. Note If a random access and Unsolicited Radio Check from the system are performed at the same time, the transceiver stops the random access because the transceiver prioritizes a response behavior to Unsolicited Radio Check. Even if the transceiver stops the random access, the transceiver performs the behavior of "If the transceiver does not receive any message from the system".

Note

- In a DMR Conventional system, if the transceiver cannot transmit because the channel is busy, the Busy Tone 2 (3 beeps) sounds from the transceiver, and "Busy" appears on the display for 1 sec. Then, the transceiver restores the channel display and transmission ends.

Receiving Transceiver Behavior

The transceiver which receives the Transparent data from the transceiver for which “Transparent (Digital)” is assigned to its communication port sends the data received from the communication port to which “Transparent (Digital)” is assigned.

If the Header function is enabled using KPG-D1/ D1N, the ID information of the transmitting transceiver is added to the beginning of the transmission data. The device that received the data can identify who sent the data. (Refer to [Transparent Header](#).)

Transceiver behavior

Data is received.



“Complete” appears for 1 sec when the reception completes, and then the transceiver restores the previous display.



Note

- In a DMR Conventional system, if the transceiver cannot send an ACK, “Ack Error” appears on the display for 1 sec. Then, the transceiver restores the channel display and ends the reception of data.

Timing for Sending and Receiving Data

● Example in a DMR Conventional system

Example: If “Transparent (Digital)” is assigned to a communication port

The following assumes that 3600 bytes of Transparent Data are sent from a PC to the transmitting transceiver. If “Enable” is configured in Transparent Header, the data is sent on a traffic channel as shown in the block diagram below. There is no Gap Time between data blocks to be sent.

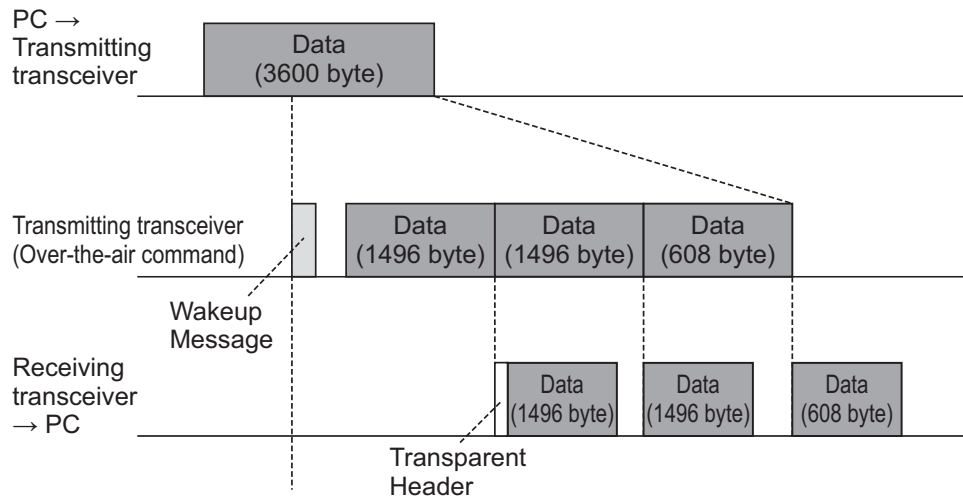


Figure 6-2 Transparent (DMR Conventional)

If a synchronization signal from a repeater cannot be detected, the transceiver resends a Wakeup Message for the number of times configured in **Number of Wakeup Message Retries**.

● Example in a DMR-based Trunking system

Example: If “Transparent (Digital)” is assigned to a communication port

The following assumes that 3600 bytes of Transparent Data are sent from a PC to the transmitting transceiver. If “Enable” is configured in Transparent Header, the data is sent on a traffic channel as shown in the block diagram below. There is no Gap Time between data blocks to be sent.

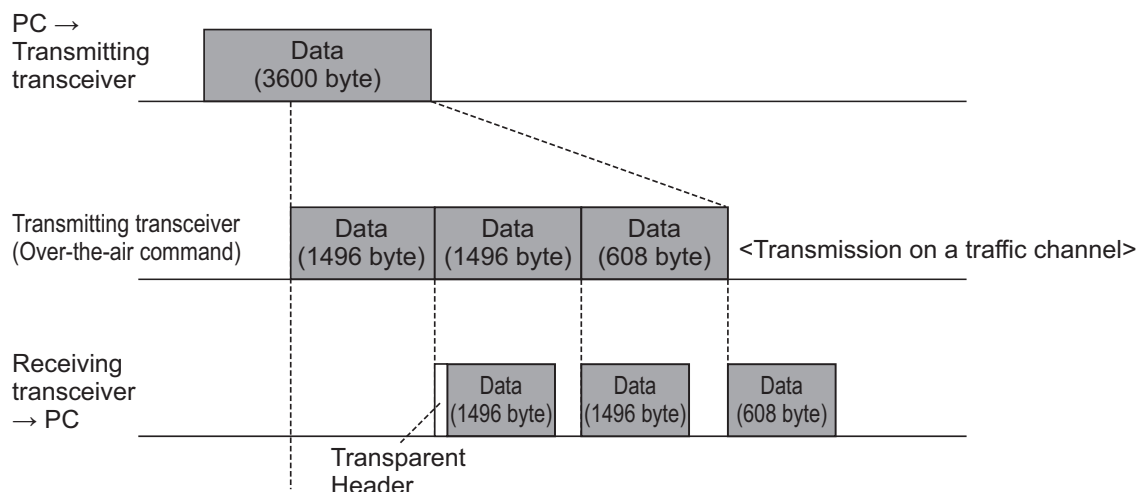


Figure 6-3 Transparent (DMR-based Trunking)

Transparent

The following functions are relevant to data communications using Transparent:

- Transparent Header
- COM Port Priority
- Transparent on Data Zone-Channel
- Transparent on Data System-Personality
- Preamble Length

Transparent Header

Transparent Header is the function to send the KENWOOD proprietary sentence to an application which is used during data communications using Transparent.

The Header is sent for data sent first. Transparent Data is sent after sending the Header.

The application software may be able to recognize from where the data is sent by analyzing this Header information.

Configuration using KPG-D1/ D1N

Configuring **Transparent Header** ( See Transceiver Settings > DMR > DMR Information > General > Serial Output)

COM Port Priority

The transceiver can make data communications if “Data”, “Data + GPS Data Output”, “Data + Location Data Output”, “Transparent”, or “Transparent (Digital)” is assigned to its communication port. COM Port Priority can be used to improve the reliability of the communication between a PC and the transceiver.

Table 6-3 COM port Priority

Configuration	Description
Serial Data	Transparent Data sent from a PC has the higher priority level. If the PC that is connected using a serial port sends Transparent Data while the transceiver is receiving data over the Air, the transceiver stops receiving data over the Air and then immediately starts sending Transparent Data.
Receiving Data	Receiving over the Air has the higher priority level. If the PC that is connected using a serial port sends Transparent Data while the transceiver is receiving data over the Air, the transceiver does not send Transparent Data until the transceiver completes receiving data over the Air.

Configuration using KPG-D1/ D1N

Configuring **COM Port Priority** ( See Transceiver Settings > Optional Features > Optional Features 1 > Serial Interface)

Transparent on Data Zone-Channel

Transparent on Data Zone-Channel is the function that allows the transceiver to automatically change the channel to the Data Zone-Channel to send Transparent data.

The transceiver automatically changes the channel to the channel of a DMR Conventional system configured in **Data Zone-Channel (DMR)** when sending Transparent data. When the transmission ends, the transceiver restores the Zone-channel used before sending the Transparent data. **Transparent on Data Zone-Channel** can be used for data communications on a specific dedicated channel.

Note

- This function is enabled if “Channel Table” is configured in **Zone-channel Format**, using KPG-D1/ D1N.
- This function is not supported in a DMR-based Trunking system.

Configuration using KPG-D1/ D1N

- Configuring **Transparent on Data Zone-Channel** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data Zone-Channel (DMR)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Transparent on Data System-Personality

Transparent on Data System-Personality is the function that allows the transceiver to automatically change the channel to Data System-Personality to send Transparent data.

The transceiver automatically changes the channel to the channel of a DMR Conventional system configured in **Data System-Personality (DMR)** when sending Transparent data. When the transmission ends, the transceiver restores the Zone-channel used before sending the Transparent data. **Transparent on Data System-Personality** can be used for data communications on a specific dedicated channel.

Note

- This function is enabled if "Personality" is configured in **Zone-channel Format**, using KPG-D1/ D1N.
- This function is not supported in a DMR-based Trunking system.

Configuration using KPG-D1/ D1N

- Configuring **Transparent on Data System-Personality** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)
- Configuring **Data System-Personality (DMR)** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR)

Preamble Length

Preamble Length is the function to extend the duration for sending a preamble when the DMR frame is sent.

Extending the time for sending a preamble at the beginning of transmission makes the receiving transceiver easier to receive a call and reduces missing of the beginning of the audio during the scan.

The extended time of a preamble is determined by using the following equation.

$$\text{Time [sec]} = 60 \text{ ms} \times \text{Configuration value for Preamble Length}$$

Configuration using KPG-D1/ D1N

Configuring **Preamble Length** ( [See](#) Transceiver Settings > Personal > Personal Features > DMR Conventional > DMR > Parameters)

Digital Encode/ Decode Format is a function that controls the behavior of the transceiver using commands when calls are received via DMR digital communication.

The Decode Format that is executed when the following calls are received can be configured as a digital profile. A maximum of 16 digital profiles can be configured.

- Individual Call
- Group Call
- Broadcast Group Call
- Paging Call
- Status Message Call

By specifying a digital profile number for each Personality or channel, the corresponding Decode Format will be executed when calls are received.

Note

- Digital Encode/ Decode Format is not supported for a DMR-based Trunking system.

Transceiver behavior

Below is an example of the behavior when an Individual Call is received.

The transceiver stands by with the Personality or channel that specifies the digital profile number for which Decode Format is configured in **Individual Call** of **Decode Format**.

1 The transceiver receives an Individual Call.

The "🔊" icon blinks, and the ID Name of the transmitting transceiver appears.



2 The transceiver executes the Decode Format configured in Individual Call.

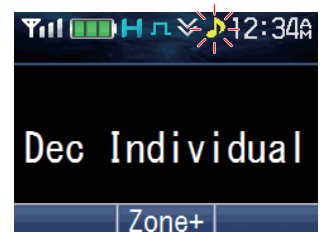
For example, if the following Decode Format is configured, the transceiver executes the **ENCA enc** command and executes the Encode Format specified in enc if the received ID matches with the ID configured on the transceiver. "Dec Individual" appears on the display.

Decode Format:

CMP #C 824 ENCA ENC_TEXT

Encode Format (ENC_TEXT):

TEXT 'Dec Individual'



 Note

- When Decode Format is configured for the different types of calls, the Alert Tone that is configured for that call will not function.
- When the **Alert Tone Restriction from 2nd Call** configuration is enabled and the Decode Format command related to the following behavior is configured, the said command will not run if a call is received from the same ID for two consecutive times.
 - Alert Tone
 - Selectable Call Alert LED
 - Horn Alert
 - Caller ID Stack
- If Decode Format is configured, the following functions when receiving a call will be subject to restrictions, and the LED may flash or an Alert Tone may be emitted from the transceiver according to the configuration of the Decode Format.
 - Selective Call Alert LED
 - Caller ID Stack
 - Status Message Stack
 - Alert Tone
 - Horn Alert
 - Vibrator
 - Auto Backlight (ID/Message Reception)

Configuration using KPG-D1/ D1N

- Configuring the Digital Profile Number (Personality) ( **See** Transceiver Settings > Personal > Personality > DMR Conventional > DMR)
- Configuring the Digital Profile Number (Channel Edit) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > DMR Conventional > DMR)
- Configuring the Decode Format to be Executed for Each Profile When a Call is Received ( **See** Transceiver Settings > Digital Customization > Profiles > Decode)

Auto Reset Timer

Auto Reset Timer in this section is the Auto Reset Timer to be configured in Digital Profile.

Auto Reset Timer is the time until the status of the sounding of an Alert Tone or the status of the LCD display executed by Digital Encode/ Decode Format is automatically reset. If the **AUTR** command is executed by Digital Encode/ Decode Format, the transceiver starts counting down by the Auto Reset Timer. Upon lapse of the time configured in Auto Reset Timer, the following command statuses executed by Digital Encode/ Decode Format are reset:

- ALERT num
- BEEP num
- DISPF
- LEDF
- LEDF2
- HORN

By using KPG-D1/ D1N, **Auto Reset Timer** can be configured. Also, how the transceiver behaves after the time configured in **Auto Reset Timer** elapses can be configured.

Table 7-1 Auto Reset Timer Configuration

Configuration		Description
Auto Reset Timer	Off	Auto Reset Timer does not function. The transceiver behaves the same as when the AUTR command is not configured.
	0 sec to 300 sec	Upon lapse of the configured time, the statuses configured in the following are reset. If "0" is configured, the statuses configured in the following are reset at the same time as when the AUTR command is executed: • LCD • LED • Alert Tone Horn Alert activated by executing the HORN command does not depend on the configurations of above items. Horn Alert stops when the amount of time configured in Auto Reset Timer elapses.
LCD	Enabled	Upon lapse of the time configured in Auto Reset Timer , the blinking of the content displayed on the transceiver display executed by the DISPF command stops.
	Disabled	Even if the time configured in Auto Reset Timer elapses, the blinking of the content displayed on the transceiver display executed by the DISPF command continues.
LED	Enabled	Upon lapse of the time configured in Auto Reset Timer , the flashing of the LED executed by the following commands stops: • LEDF • LEDF2
	Disabled	Even if the time configured in Auto Reset Timer elapses, the flashing of the LED executed by the following commands continues: • LEDF • LEDF2
Alert Tone	Enabled	Upon lapse of the time configured in Auto Reset Timer , the Alert Tone and beep sounding intermittently by the following commands stop: • ALERT num • BEEP num
	Disabled	Even if the time configured in Auto Reset Timer elapses, the Alert Tone and beep sounding intermittently by the following commands continue: • ALERT num • BEEP num

Table 7-2 AUTR Command Configuration

Configuration Status	Description
Not Configured	If Digital Encode/ Decode Format is executed during the scan, the configuration statuses of the following continue when the transceiver resumes the scan: • LCD • LED • Alert Tone
Configured	If Digital Encode/ Decode Format is executed during the scan, the configuration statuses of the following do not continue when the transceiver resumes the scan: • LCD • LED • Alert Tone However, if "Off" is configured in Auto Reset Timer, the configuration statuses of the above continue. Also, even if anything other than "Off" is configured in Auto Reset Timer, the configuration statuses of the above continue if the above are disabled.

Note

- The Auto Reset Timer of Optional Signaling and the Auto Reset Timer of Digital Encode/ Decode Format behave independently. The LCD display and the flashing of **Optional Signaling LED** (including the "🔊" icon) executed by anything other than the Digital Encode/ Decode Format command function by the Auto Reset Timer in a DMR Conventional system. (Refer to [Auto Reset Timer](#).)

Configuration using KPG-D1/ D1N

- Configuring **Auto Reset Timer** ( [See](#) Transceiver Settings > Digital Profiles > Profiles > General > Auto Reset)
- Configuring **LCD** to be enabled or disabled ( [See](#) Transceiver Settings > Digital Profiles > Profiles > General > Auto Reset)
- Configuring **LED** to be enabled or disabled ( [See](#) Transceiver Settings > Digital Profiles > Profiles > General > Auto Reset)
- Configuring **Alert Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Digital Profiles > Profiles > General > Auto Reset)

7.1 Encode Format

Encode Format is a script that is used when executing the Decode Format. When Decode Format is executed, the Encode Format that is described in the Decode Format is being called and executed. The script for the Encode Format can be created using the following commands.

Note

- This section explains the description of each command, the usage example, and the transceiver behavior. In addition, configuration range is also described for commands having a limit in its configuration range.

ALERT num

Description	When the ALERT num command is executed, the transceiver emits the Alert Tone configured for “num”. The Alert Tone can be configured by selecting from 8 types of Alert Tones configured for the transceiver. (Refer to Common FUNC Configuring the Alert Tone (Special Alert Tone).)
Range	num: 1 to 8
Usage Example	Sample Script
	Decode Format: CMP #C 100 ENCA enc_alert
	Encode Format (enc_alert): LEDF ALERT 2
	Transceiver behavior When a call is received from a station whose Caller ID is 100, the transceiver executes Encode Format ‘enc_alert’. When ‘enc_alert’ is executed, the LED flashes in orange color and the Alert 2 tone is emitted from the transceiver.

AUTR

Description	When the AUTR command is executed, Auto Reset Timer is activated and then the timer for Auto Reset Timer starts counting down. The timer counts down the time configured in Auto Reset Timer . When the time configured in Auto Reset Timer elapses, the following enabled functions become disabled according to the configuration in Auto Reset Timer : - LCD - LED - Alert Tone Note Auto Reset Timer in this section is the Auto Reset Timer to be configured in Digital Profile.
Usage Example	Sample Script
	Decode Format: CMP #C 1000 ENCA ind_call
	Encode Format (ind_call): LEDF ALERT 1 DISPF AUTR
	Transceiver behavior When a call is received from a station whose Caller ID is 1000, the transceiver executes Encode Format ‘ind_call’. When ‘ind_call’ is executed, the LED flashes in yellow color and the ALERT 1 tone is emitted from the transceiver. The LCD display blinks, and the transceiver activates the Auto Reset Timer.

BEEP num

Description	When the BEEP num command is executed, the transceiver emits the beep tone configured for "num". The beep can be configured by selecting from 48 types of beep patterns (0 to 47).
Range	num: 0 to 47
Usage Example	Sample Script
	Decode Format: CMP #C 110 ENCA enc_beep
	Encode Format (enc_beep): LEDF2 BEEP 10
	Transceiver behavior When a call is received from a station whose Caller ID is 110, the transceiver executes Encode Format 'enc_beep'. When 'enc_beep' is executed, the LED flashes in blue color and the BEEP 10 tone is emitted from the transceiver.

BLTOF

Description	Portable: When the BLTOF command is executed is executed, the display backlight goes off. Mobile: KCH-19 (Basic Panel)/ KCH-20R (Featured Panel): When the BLTOF command is executed, "Level 1" is configured in LCD Brightness . KCH-21R (Handheld Control Head): When the BLTOF command is executed, "Off" is configured in LCD Brightness .
Usage Example	Sample Script
	Decode Format: CMP #S 30 ENCA enc_blt off
	Encode Format (enc_blt off): BEEP 20 BLTOF
	Transceiver behavior When a call with Status ID 30 is received, the transceiver executes Encode Format 'enc_blt off'. When 'enc_blt off' is executed, BEEP 20 tone is emitted from the transceiver and the backlight goes off.  Note - For mobile transceivers, if the BLTOF command is executed in a Dual Control Head configuration, "Level 1" or "Off" is configured for LCD Brightness of each Control Head. - For mobile transceivers, if the BLTOF command is executed while Auto Dimmer functions, "Off" is automatically configured for Auto Dimmer.

DEL xtime

Description	When the DEL xtime command is executed, the transceiver waits to execute the next command for the length of time configured for "xtime". DEL stands for "Delay".
Range	xtime: 0 ms to 7000 ms (in steps of 1 ms)
Usage Example	Sample Script
	Decode Format: CMP #S 200 ENCA auxa_act
	Encode Format (auxa_act): RAUXA1 DEL 1000 RAUXA0
	Transceiver behavior When a call with Status ID 200 is received, the transceiver executes Encode Format 'auxa_act'. When 'auxa_act' is executed, the transceiver activates the AUX A port for 1000 ms and deactivates it again.

DELL ltime

Description	When the DELL ltime command is executed, the transceiver waits to execute the next command for the length of time configured for "ltime". DELL stands for "Delay Long".
Range	ltime: 0 sec to 255 sec (in steps of 1 sec)
Usage Example	Sample Script
	Decode Format: CMP #S 30 ENCA auxb_act
	Encode Format (auxb_act): RAUXB1 DELL 3 RAUXB0
	Transceiver behavior When a call with Status ID 30 is received, the transceiver executes Encode Format 'auxb_act'. When 'auxb_act' is executed, the transceiver activates the AUX B port for 3 seconds and deactivates it again.

DISPF

Description	When the DISPF command is executed, the information on the transceiver display starts blinking.
Usage Example	Sample Script
	Decode Format: CMP #C 2000 ENCA call_2000
	Encode Format (call_2000): TEXT 'CALL 2000' DISPF
	Transceiver behavior When a call is received from a station whose Caller ID is 2000, the transceiver executes Encode Format 'call_2000'. When 'call_2000' is executed, a blinking "CALL 2000" message appears on the display.

DISPS

Description	When the DISPS command is executed, the blinking of the display by the execution of the DISPF command stops and the transceiver returns to the normal display.
Usage Example	Sample Script
	Decode Format: CMP #C 2000 ENCA call2_2000
	Encode Format (call2_2000): TEXT 'CALL 2000' DISPF DELL 3 DISPS
	Transceiver behavior When a call is received from a station whose Caller ID is 2000, the transceiver executes Encode Format 'call2_2000'. When 'call2_2000' is executed, a blinking "CALL 2000" message appears on the display for 3 seconds after which the display returns to the illuminated state.

ENC enc

Description	When the ENC enc command is executed, the transceiver executes the Encode Format configured for "enc". When the Encode Format is executed repeatedly with the "REP ~ RSML/ RSMS" command, Encode Format is executed when repeat ends.
Usage Example	Sample Script
	Decode Format: CMP #S 15 ENCA auxa_act
	Encode Format (auxa_act): RAUXA1 DELL 3 RAUXA0 ENC auxb_act
	Encode Format (auxb_act): RAUXB1 DELL 3 RAUXB0
	Transceiver behavior When a call with Status ID 15 is received, the transceiver executes Encode Format 'auxa_act'. When 'auxa_act' is executed, the transceiver activates the AUX A port for 3 seconds and deactivates it again, followed by executing Encode Format 'auxb_act'. When 'auxb_act' is executed, the transceiver activates the AUX B port for 3 seconds and deactivates it again.

KEYD

Description	When the KEYD command is executed, the transceiver locks all the keys, and all key operations become disabled. Using this command in combination with the Decode Format forbids key operation by the receiving transceiver.
Usage Example	Sample Script
	Decode Format: CMP #S 10 ENCA key_lock
	Encode Format (key_lock): KEYD
	Transceiver behavior When a call with Status ID 10 is received, the transceiver executes Encode Format 'key_lock'. When 'key_lock' is executed, Key Lock is turned on and key operation is disabled.
	 Note • After Key Lock is turned on by executing the KEYD command, the "🔑" icon lights up. • After Key Lock is turned on by executing the KEYD command, the Key Lock pop-up will not appear on the display. • The KEYD command does not function in the case of a Multi RF Deck/ Multi Control Head configuration.

KEYE

Description	When the KEYE command is executed, the transceiver unlocks all the keys. Using this command in combination with the Decode Format unlocks the key lock state of the receiving transceiver.
Usage Example	Sample Script
	Decode Format: CMP #S 20 ENCA key_unlock
	Encode Format (key_unlock): KEYE
	Transceiver behavior When a call with Status ID 20 is received, the transceiver executes Encode Format 'key_unlock'. When 'key_unlock' is executed, Key Lock is turned off and key operation is enabled.
	 Note • After Key Lock is turned on by executing the KEYE command, the Key Lock pop-up will not appear on the display. • While "Key Lock" assigned to the Lever switch is active, the KEYE command does not function. • If no key is operated within the length of time configured in Auto Key Lock Timer after the key lock state is unlocked by the KEYE command, the transceiver automatically enters the key lock state. • The KEYE command does not function in the case of a Multi RF Deck/ Multi Control Head configuration.

LEDF

Description	When the LEDF command is executed, the LED flashes in orange color.
Usage Example	Sample Script
	Decode Format: CMP #C 1000 ENCA call_1000
	Encode Format (call_1000): TEXT 'CALL 1000' LEDF
	Transceiver behavior When a call is received from a station whose Caller ID is 1000, the transceiver executes Encode Format 'call_1000'. When 'call_1000' is executed, a blinking "CALL 1000" message appears on the display and the LED flashes in orange color.

LEDF2

Description	When the LEDF2 command is executed, the LED flashes in blue color.
Usage Example	Sample Script
	Decode Format: CMP #C 2000 ENCA call_2000
	Encode Format (call_2000): TEXT 'CALL 2000' LEDF2
	Transceiver behavior When a call is received from a station whose Caller ID is 2000, the transceiver executes Encode Format 'call_2000'. When 'call_2000' is executed, a blinking "CALL 2000" message appears on the display and the LED flashes in blue color.

LEDS

Description	When the LEDS command is executed, the flashing LED goes off.
Usage Example	Sample Script
	Decode Format: CMP #S 30 ENCA call_end
	Encode Format (call_end): TXTOF LEDS
	Transceiver behavior When a call with Status ID 30 is received, the transceiver executes Encode Format 'call_end'. When 'call_end' is executed, the text display disappears, the transceiver returns to the standby mode and the LED light goes off.

RACK stime dec

Description	When the RACK stime dec command is executed, the transceiver enters the standby state with the Decode Format configured for “dec” for the length of time configured for “stime”.
Range	stime (Standard Time): 0 ms to 60000 ms (in steps of 10 ms) dec: Decode Format Name
Usage Example	Sample Script
	Decode Format: CMP #S 100 ENCA auxa_act
	Encode Format (auxa_act): REP 10 RAUXA0 RAUXA1 DELL 1 RAUXA0 RACK 5000 act_stop RSML 5
	Decode Format (act_stop): CMP #S 200 REPOF BEEP 16
Usage Example	Transceiver behavior
	When a call with Status ID 100 is received, the transceiver executes Encode Format ‘auxa_act’. When ‘auxa_act’ is executed, the transceiver deactivates the AUX A port temporarily, switches to the active state for 1 second, followed by restoring it to the inactive state. Next, the transceiver executes Decode Format ‘act_stop’ for 5000 ms.
	After executing ‘act_stop’ and 5 seconds have elapsed after deactivating the AUX A port, the transceiver executes Encode Format ‘auxa_act’ again.
	Encode Format ‘auxa_act’ can be executed repeatedly up to 10 times.
	If Status ID 200 is received before 5000 ms have elapsed, the transceiver emits a BEEP 16 tone and execution of ‘auxa_act’ ends.

RAUXA0

Supported Models: Mobile

Description	When the RAUXA0 command is executed, the AUX A port becomes inactive. If the AUX A function is assigned to an AUX Output port, the external device connected to the AUX Output port can be controlled.
Usage Example	Sample Script
	Decode Format: CMP #S 123 ENCA auxa_on CMP #S 111 ENCA auxa_off
	Encode Format (auxa_on): RAUXA1
	Encode Format (auxa_off): RAUXA0
Usage Example	Transceiver behavior
	When a call with Status ID 123 is received, the transceiver executes Encode Format ‘auxa_on’. When ‘auxa_on’ is executed, the transceiver activates the AUX A port.
	When a call with Status ID 111 is received, the transceiver executes Encode Format ‘auxa_off’. When ‘auxa_off’ is executed, the transceiver deactivates the AUX A port.

RAUXA1

Supported Models: Mobile

Description	When the RAUXA1 command is executed, the AUX A port becomes active. If the AUX A function is assigned to an AUX Output port, the external device connected to the AUX Output port can be controlled.
Usage Example	Sample Script
	Decode Format: CMP #S 123 ENCA auxa_on CMP #S 111 ENCA auxa_off
	Encode Format (auxa_on): RAUXA1
	Encode Format (auxa_off): RAUXA0
	Transceiver behavior
	When a call with Status ID 123 is received, the transceiver executes Encode Format 'auxa_on'. When 'auxa_on' is executed, the transceiver activates the AUX A port. When a call with Status ID 111 is received, the transceiver executes Encode Format 'auxa_off'. When 'auxa_off' is executed, the transceiver deactivates the AUX A port.

RAUXB0

Supported Models: Mobile

Description	When the RAUXB0 command is executed, the AUX B port becomes inactive. If the AUX B function is assigned to an AUX Output port, the external device connected to the AUX Output port can be controlled.
Usage Example	Sample Script
	Decode Format: CMP #S 123 ENCA auxb_on CMP #S 111 ENCA auxb_off
	Encode Format (auxb_on): RAUXB1
	Encode Format (auxb_off): RAUXB0
	Transceiver behavior
	When a call with Status ID 123 is received, the transceiver executes Encode Format 'auxb_on'. When 'auxb_on' is executed, the transceiver activates the AUX B port. When a call with Status ID 111 is received, the transceiver executes Encode Format 'auxb_off'. When 'auxb_off' is executed, the transceiver deactivates the AUX B port.

RAUXB1

Supported Models: Mobile

Description	When the RAUXB1 command is executed, the AUX B port becomes active. If the AUX B function is assigned to an AUX Output port, the external device connected to the AUX Output port can be controlled.
Usage Example	Sample Script
	Decode Format: CMP #S 123 ENCA auxb_on CMP #S 111 ENCA auxb_off
	Encode Format (auxb_on): RAUXB1
	Encode Format (auxb_off): RAUXB0
	Transceiver behavior
	When a call with Status ID 123 is received, the transceiver executes Encode Format 'auxb_on'. When 'auxb_on' is executed, the transceiver activates the AUX B port. When a call with Status ID 111 is received, the transceiver executes Encode Format 'auxb_off'. When 'auxb_off' is executed, the transceiver deactivates the AUX B port.

RAUXC0

Supported Models: Mobile

Description	When the RAUXC0 command is executed, the AUX C port becomes inactive. If the AUX C function is assigned to an AUX Output port, the external device connected to the AUX Output port can be controlled.
Usage Example	Sample Script
	Decode Format: CMP #S 123 ENCA auxc_on CMP #S 111 ENCA auxc_off
	Encode Format (auxc_on): RAUXC1
	Encode Format (auxc_off): RAUXC0
	Transceiver behavior
	When a call with Status ID 123 is received, the transceiver executes Encode Format 'auxc_on'. When 'auxc_on' is executed, the transceiver activates the AUX C port. When a call with Status ID 111 is received, the transceiver executes Encode Format 'auxc_off'. When 'auxc_off' is executed, the transceiver deactivates the AUX C port.

RAUXC1

Supported Models: Mobile

Description	When the RAUXC1 command is executed, the AUX C port becomes active. If the AUX C function is assigned to an AUX Output port, the external device connected to the AUX Output port can be controlled.
Usage Example	Sample Script
	Decode Format: CMP #S 123 ENCA auxc_on CMP #S 111 ENCA auxc_off
	Encode Format (auxc_on): RAUXC1
	Encode Format (auxc_off): RAUXC0
	Transceiver behavior
	When a call with Status ID 123 is received, the transceiver executes Encode Format 'auxc_on'. When 'auxc_on' is executed, the transceiver activates the AUX C port. When a call with Status ID 111 is received, the transceiver executes Encode Format 'auxc_off'. When 'auxc_off' is executed, the transceiver deactivates the AUX C port.

REP rep

Description	When the REP rep command is executed, the transceiver executes Encode Format repeatedly for the number of times configured for "rep".
Range	rep: 0 (infinite) or 1 time to 255 times
Usage Example	Sample Script
	Decode Format: CMP #S 100 ENCA auxa_act
	Encode Format (auxa_act): REP 10 RAUXA0 RAUXA1 DELL 1 RAUXA0 RACK 5000 act_stop RSML 5
	Decode Format (act_stop): CMP #S 200 REPOF BEEP 16
	Transceiver behavior
	When a call with Status ID 100 is received, the transceiver executes Encode Format 'auxa_act'. When 'auxa_act' is executed, the transceiver deactivates the AUX A port temporarily, switches to the active state for 1 second, followed by restoring it to the inactive state. Next, the transceiver executes Decode Format 'act_stop' for 5000 ms. When 5 seconds have elapsed after restoring the AUX A port to the inactive state, the transceiver executes Encode Format 'auxa_act' again. Encode Format 'auxa_act' can be executed repeatedly up to 10 times. If Status ID 200 is received before 5000 ms have elapsed, the transceiver emits a BEEP 16 tone and execution of 'auxa_act' ends.

RSML ltime

Description	When the RSML ltime command is executed, the transceiver executes Encode Format repeatedly by the REP rep command at the intervals configured for "ltime". (Refer to REP rep .) The RSML ltime command is used for the transceiver to wait to receive an acknowledgment.
Range	ltime: 0 sec to 255 sec (in steps of 1 sec)
Usage Example	Sample Script
	Decode Format: CMP #S 100 ENCA auxa_act
	Encode Format (auxa_act): REP 10 RAUXA0 RAUXA1 DELL 1 RAUXA0 RACK 5000 act_stop RSML 5
	Decode Format (act_stop): CMP #S 200 REPOF BEEP 16
Usage Example	Transceiver behavior
	When a call with Status ID 100 is received, the transceiver executes Encode Format 'auxa_act'. When 'auxa_act' is executed, the transceiver deactivates the AUX A port temporarily, switches to the active state for 1 second, followed by restoring it to the inactive state. Next, the transceiver executes Decode Format 'act_stop' for 5000 ms.
	When 5 seconds have elapsed after restoring the AUX A port to the inactive state, the transceiver executes Encode Format 'auxa_act' again.
	Encode Format 'auxa_act' can be executed repeatedly up to 10 times. If Status ID 200 is received before 5000 ms have elapsed, the transceiver emits a BEEP 16 tone and execution of 'auxa_act' ends.

RSMS stime

Description	When the RSMS stime command is executed, the transceiver executes Encode Format repeatedly by the REP rep command at the intervals configured for "stime". (Refer to REP rep .)
Range	stime (Standard Time): 0 ms to 2550 ms (in steps of 10 ms)
Usage Example	Sample Script
	Decode Format: CMP #S 100 ENCA auxa_act
	Encode Format (auxa_act): REP 10 RAUXA0 RAUXA1 DELL 1 RAUXA0 RACK 2000 act_stop RSMS 2500
	Decode Format (act_stop): CMP #S 200 REPOF BEEP 16
Usage Example	Transceiver behavior
	When a call with Status ID 100 is received, the transceiver executes Encode Format 'auxa_act'. When 'auxa_act' is executed, the transceiver deactivates the AUX A port temporarily, switches to the active state for 1 second, followed by restoring it to the inactive state. Next, the transceiver executes Decode Format 'act_stop' for 2000 ms.
	When 2500 seconds have elapsed after restoring the AUX A port to the inactive state, the transceiver executes Encode Format 'auxa_act' again.
	Encode Format 'auxa_act' can be executed repeatedly up to 10 times. If Status ID 200 is received before 2000 ms have elapsed, the transceiver emits a BEEP 16 tone and execution of 'auxa_act' ends.

SELCH channel

Description	When the SELCH channel command is executed, the transceiver migrates to the channel configured for "channel". If UP is configured for "channel", executing the SELCH channel command increases the channel number by one. If DOWN is configured for "channel", executing the SELCH channel command decreases the channel number by one.
Range	channel: Channel number 1 to Channel number 512, UP or DOWN
Usage Example	Sample Script
	Decode Format: CMP #S 10 ENCA set_10ch
	Encode Format (set_10ch): SELCH 10
	Transceiver behavior When a call with Status ID 10 is received, the transceiver executes Encode Format 'set_10ch'. When 'set_10ch' is executed, the transceiver moves to Channel 10.
	 Note • If Digital Profile is configured to "None" for the selected zone channel, the SELCH channel command will not function. • If the zone channel selected for the Channel Type configuration (NXDN or DMR) is different from that before executing the command, the SELCH channel command will not function.

SELGR zone

Description	When the SELGR zone command is executed, the transceiver migrates to the zone configured for "zone". If UP is configured for "zone", executing the SELGR zone command increases the zone number by one. If DOWN is configured for "zone", executing the SELGR zone command decreases the zone number by one.
Range	zone: Zone number 1 to Zone number 128, UP or DOWN
Usage Example	Sample Script
	Decode Format: CMP #S 100 ENCA set_zone100
	Encode Format (set_zone100): SELGR 100 SELCH 10
	Transceiver behavior When a call with Status ID 100 is received, the transceiver executes Encode Format 'set_zone100'. When 'set_zone100' is executed, the transceiver moves to Channel 10 of Zone 100.
	 Note • If Digital Profile is configured to "None" for the selected zone channel, the SELGR zone command will not function. • If the zone channel selected for the Channel Type configuration (NXDN or DMR) is different from that before executing the command, the SELGR zone command will not function.

STOPS

Description	When the STOPS command is executed, the transceiver stops scanning.
Usage Example	Sample Script
	Decode Format: CMP #S 30 ENCA scan_stop
	Encode Format (scan_stop): STOP ALERT 2
	Transceiver behavior When a call with Status ID 30 is received, the transceiver executes Encode Format 'scan_stop'. When 'scan_stop' is executed, scanning ends and the transceiver emits the ALERT 2 tone.

STRTS

Description	When the STRTS command is executed, the transceiver starts scanning.
Usage Example	Sample Script
	Decode Format: CMP #S 50 ENCA scan_start
	Encode Format (scan_start): ALERT 1 STRTS
	Transceiver behavior When a call with Status ID 50 is received, the transceiver executes Encode Format 'scan_start'. When 'scan_start' is executed, the transceiver emits the ALERT 1 tone and scanning starts.

TEXT 'text'

Description	When the TEXT 'text' command is executed, the transceiver displays the text string configured for "text" on the display. Execution of the TXTOF command restores the previous display. (Refer to TXTOF.)  Note - When the TEXT command is executed, the following are the cases according to the number of characters to be displayed: - For 14 characters or less: The text appears in Basic Frame 1. - For 15 characters or more: For Portable and KCH-21R, the text appears in Function Frame 1. For KCH-19 and KCH-20R, the text appears in Message Frame.
Range	text: A maximum of 48-digit alphanumeric character
Usage Example	Sample Script
	Decode Format: CMP #C 2000 ENCA call_2000
	Encode Format (call_2000): TEXT 'CALL 2000'
	Transceiver behavior When a call is received from a station whose Caller ID is 2000, the transceiver executes Encode Format 'call_2000'. When 'call_2000' is executed, a "CALL 2000" message appears on the display.

TXTOF

Description	Upon execution of the TXTOF command when a text string appears on the display by executing the TEXT command, the display returns to the previous display.
Usage Example	Sample Script
	Decode Format: CMP #S 30 ENCA call_end
	Encode Format (call_end): TEXT 'CALL END' DELL 3 TXTOF
	Transceiver behavior When a call with Status ID 30 is received, the transceiver executes Encode Format 'call_end'. When 'call_end' is executed, a "CALL END" message appears on the display for 3 seconds, after which the original display is being restored.

VIB

Supported Models: Portable

Description	Upon execution of the VIB command when Vibrator is enabled, the Vibrator unit vibrates. The Vibrator unit vibrates for 10 sec at 500-ms intervals. Pressing any key while the Vibrator unit is vibrating stops the Vibrator unit from vibrating.
Usage Example	Sample Script
	Decode Format: CMP #C 500 ENCA act_vib
	Encode Format (act_vib): ALERT 2 LEDF VIB
	Transceiver behavior When a call is received from a station whose Caller ID is 500, the transceiver executes Encode Format 'act_vib'. When 'act_vib' is executed, the ALERT 2 tone is emitted from the transceiver and the LED flashes in orange color. If the Vibrator is enabled, the vibrator will be activated.

7.2 Decode Format

Decode Format is a script that is executed when receiving calls via DMR digital communication. The script for the Decode Format can be created using the following commands.

Note

- This section explains the description of each command, the usage example, and the transceiver behavior. In addition, configuration range is also described for commands having a limit in its configuration range.

ALERT num

Description	When the ALERT num command is executed, the transceiver emits the Alert Tone configured for "num". The Alert Tone can be configured by selecting from 8 types of Alert Tones configured for the transceiver. (Refer to Common FUNC Configuring the Alert Tone (Special Alert Tone).)
Range	num: 1 to 8
Usage Example	Sample Script
	Decode Format: CMP #C 100 ALERT 8
	Transceiver behavior
	When a call is received from a station whose Caller ID is 100, the transceiver emits the ALERT 8 tone.

AUTR

Description	When the AUTR command is executed, Auto Reset Timer is activated and then the timer for Auto Reset Timer starts counting down. The timer counts down the time configured in Auto Reset Timer. When the time configured in Auto Reset Timer elapses, the following enabled functions become disabled according to the configuration in Auto Reset Timer: • LCD • LED • Alert Tone Note • Auto Reset Timer in this section is the Auto Reset Timer to be configured in Digital Profile.
Usage Example	Sample Script
	Decode Format: CMP #C 1000 LEDF2 ALERT 8 DISPF AUTR
	Transceiver behavior
	When a call is received from a station whose Caller ID is 1000, the following statuses occur, and the transceiver activates the Auto Reset Timer: • The LED flashes blue. • The ALERT 8 tone sounds from the transceiver. • The LCD display blinks.

BEEP num

Description	When the BEEP num command is executed, the transceiver emits the beep tone configured for "num". The beep can be configured by selecting from 48 types of beep patterns (0 to 47).
Range	num: 0 to 47
Usage Example	Sample Script
	Decode Format: CMP #C 100 ALERT 8 CMP ^OWNID BEEP 10
	Transceiver behavior
	When a call is received from a station whose Caller ID is 100, the transceiver emits the ALERT 8 tone. If the destination is Unit ID (Own), the transceiver emits the BEEP 10 tone.

BLTOF

Description	Portable: When the BLTOF command is executed is executed, the display backlight goes off. Mobile: KCH-19 (Basic Panel)/ KCH-20R (Featured Panel): When the BLTOF command is executed, "Level 1" is configured in LCD Brightness. KCH-21R (Handheld Control Head): When the BLTOF command is executed, "Off" is configured in LCD Brightness.
Usage Example	Sample Script
	Decode Format: CMP #C 1000 BEEP 10 BLTOF
	Transceiver behavior
	When a call is received from a station whose Caller ID is 1000, the transceiver emits the BEEP 10 tone and the backlight of the display goes off.  Note - For mobile transceivers, if the BLTOF command is executed in a Dual Control Head configuration, "Level 1" or "Off" is configured for LCD Brightness of each Control Head. - For mobile transceivers, if the BLTOF command is executed while Auto Dimmer functions, "Off" is automatically configured for Auto Dimmer.

BLTON

Description	Portable: When the BLTON command is executed, the display backlight lights up. Mobile: When the BLTON command is executed, "Level 7" is configured in LCD Brightness.
Usage Example	Sample Script
	Decode Format: CMP #S 10 ALERT 1 BLTON CMP #S 30 ALERT 3 BLTOF
	Transceiver behavior
	When a call with Status ID 10 is received, the transceiver emits the ALERT 1 tone and the backlight of the display is turned on. When a call with Status ID 30 is received, the transceiver emits the ALERT 3 tone and the backlight of the display goes off.  Note • For mobile transceivers, if the BLTON command is executed in a Dual Control Head configuration, "Level 7" is configured for LCD Brightness of each Control Head. • For mobile transceivers, if the BLTON command is executed while Auto Dimmer functions, "Off" is automatically configured for Auto Dimmer.

CMP #C num

Description	When the CMP #C num command is executed, the transceiver compares the received ID with the ID specified in "num" and executes the subsequent commands if the IDs are found to be matching. It is possible to specify the range of IDs (0 to 9) by replacing a specific digit with a wild card "*". When the wild card "*" is configured, zero-fill is executed as follows and a check to determine whether the IDs are matching is performed regardless of the preconfigured number of digits. Matching range in the case of CMP #C **: 1 (= 01) to 99 Matching range in the case of CMP #C ***: 1 (= 001) to 999 Matching range in the case of CMP #C *1: 1 (= 01), 11, 21, 31, 41, 51, 61, 71, 81 or 91
Range	num: 1 to 16776415 (in steps of 1)
Usage Example	Sample Script Decode Format: CMP #C 100* DECA id_1000 CMP #C 20** DECA id_2000 CMP ^OWNID DECA id_other Decode Format (id_1000): CMP #C 100* LEDF ALERT 1 Decode Format (id_2000): CMP #C 20** LEDF2 ALERT 2 Decode Format (id_other): CMP ^OWNID DISPF ALERT 3 Transceiver behavior When a call is received from a station whose Caller ID is from 1000 to 1009, the transceiver executes Decode Format 'id_1000'. When 'id_1000' is executed, the LED flashes in orange color and the Alert 1 tone is emitted from the transceiver. When a call is received from a station whose Caller ID is from 2000 to 2099, the transceiver executes Decode Format 'id_2000'. When 'id_2000' is executed, the LED flashes in blue color and the Alert 2 tone is emitted from the transceiver. If the destination is Unit ID (Own), the transceiver executes Decode Format 'id_other'. When 'id_other' is executed, the information on the display flashes and the Alert 3 tone is emitted from the transceiver.

CMP ^OWNID

Description	When the CMP ^OWNID command is executed, the transceiver compares the received ID with its own ID and executes the subsequent commands if the IDs are found to be matching.
Usage Example	Sample Script Decode Format: CMP #C 100 ALERT 5 CMP ^OWNID ALERT 6 Transceiver behavior When a call is received from a station whose Caller ID is 100, the transceiver emits the ALERT 5 tone. If the destination is Unit ID (Own), the transceiver emits the ALERT 6 tone.

CMP #G num

Description	When the CMP #G num command is executed, the transceiver compares the received Group ID with the Group ID specified in "num" and executes the subsequent commands if the IDs are found to be matching. It is possible to specify the range of IDs (0 to 9) by replacing a specific digit with a wild card "*". When the wild card "*" is configured, zero-fill is executed as follows and a check to determine whether the IDs are matching is performed regardless of the preconfigured number of digits. Matching range in the case of CMP #G **: 1 (= 01) to 99 Matching range in the case of CMP #G ***: 1 (= 001) to 999 Matching range in the case of CMP #G *1: 1 (= 01), 11, 21, 31, 41, 51, 61, 71, 81 or 91
Range	num: 1 to 16776415 (in steps of 1)
Usage Example	Sample Script
	Decode Format:
	CMP #G 100 ALERT 5 CMP #G 20* ALERT 6 CMP #G 3** ALERT 7
	Transceiver behavior
	When a call with Group ID 100 is received, the transceiver emits the ALERT 5 tone. When a call with a Group ID from 200 to 209 is received, the transceiver emits the ALERT 6 tone. When a call with a Group ID from 300 to 399 is received, the transceiver emits the ALERT 7 tone.

CMP ^GL

Description	When the CMP ^GL command is executed, the transceiver determines whether the Group ID received is registered in the Group ID List and executes the subsequent commands if it is registered.
Usage Example	Sample Script
	Decode Format:
	CMP #G 100 ALERT 5 CMP ^GL ALERT 6
	Transceiver behavior
	When a call with Group ID 100 is received, the transceiver emits the ALERT 5 tone. If the ID of the received Group Call is registered in the Group ID List, the transceiver emits the ALERT 6 tone.

CMP ^PGL

Description	When the CMP ^PGL command is executed, the transceiver determines whether the Group ID received is registered in the Persistent Group ID List and executes the subsequent commands if it is registered.
Usage Example	Sample Script
	Decode Format:
	CMP #G 100 BEEP 10 CMP ^PGL BEEP 20
	Transceiver behavior
	When a call with Group Call 100 is received, the transceiver emits the BEEP 10 tone. If the ID of the received Group Call is registered in the Persistent Group ID List, the transceiver emits the BEEP 20 tone.

CMP ^ALL

Description	When the CMP ^ALL command is executed, the transceiver determines whether the Group ID received is an ALL Group ID and executes the subsequent commands if it is an ALL GROUP ID.
Usage Example	Sample Script
	Decode Format: CMP ^ALL ALERT 3 CMP ^GL ALERT 4
	Transceiver behavior
	If the ID of the received Group Call coincides with the ALL Group ID, the transceiver emits the ALERT 3 tone. If the ID of the received Group Call is registered in the Group ID List, the transceiver emits the ALERT 4 tone.

CMP #S num

Description	When the CMP #S num command is executed, the transceiver compares the received Status ID with the Status ID specified in "num" and executes the subsequent commands if the IDs are found to be matching. It is possible to specify the range of IDs (0 to 9) by replacing a specific digit with a wild card "*". When the wild card "*" is configured, zero-fill is executed as follows and a check to determine whether the IDs are matching is performed regardless of the preconfigured number of digits. Matching range in the case of CMP #S *: 0 to 9 Matching range in the case of CMP #S **: 0 (= 00) to 99 Matching range in the case of CMP #S *1: 1 (= 01), 11, 21, 31, 41, 51, 61, 71, 81 or 91
Range	num: 0 to 1023 (in steps of 1)
Usage Example	Sample Script
	Decode Format: CMP #S 10 ALERT 1 CMP #S 2* ALERT 2 CMP #S 1** ALERT 3
	Transceiver behavior
	When a call with Status ID 10 is received, the transceiver emits the ALERT 1 tone. When a call with a Status ID from 20 to 29 is received, the transceiver emits the ALERT 2 tone. When a call with a Status ID from 100 to 199 is received, the transceiver emits the ALERT 3 tone.
 Note - Decode Format does not apply to Horn Alert Status. Upon receiving a Horn Alert Status, the transceiver activates the Horn Alert. The transceiver will not execute the subsequent commands in this case even when the same Status ID as Horn Alert Status is specified in "num" and the IDs are found to be matching. - Decode Format does not apply to Terminate Emergency Status. Upon receiving a Terminate Emergency Status, the transceiver cancels the Emergency status. The transceiver will not execute the subsequent commands in this case even when the same Status ID as Terminate Emergency Status is specified in "num" and the IDs are found to be matching.	

CMP ^EMG

Description	When the CMP ^EMG command is executed, the transceiver determines whether the Status ID received is an Emergency Status and executes the subsequent commands if it is an Emergency Status.
Usage Example	Sample Script
	Decode Format: CMP ^EMG ENCA emg_act
	Encode Format (emg_act): ALERT 8 TEXT 'EMERGENCY' DISPF DELL 10 TXTOF
	Transceiver behavior If the Status ID received is an Emergency Status, the transceiver executes Encode Format 'emg_act'. When 'emg_act' is executed, the transceiver emits the ALERT 8 tone and an "EMERGENCY" message appears blinking on the display for 10 seconds.  Note • Emergency Status can be configured in Emergency Call Status .

Configuration using KPG-D1/ D1N

Configuring **Emergency Call Status** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))

CMP ^EOMD

Description	When the CMP ^EOMD command is executed, the transceiver determines whether the Status ID received is a Man-down Status and executes the subsequent commands if it is a Man-down Status.
Usage Example	Sample Script
	Decode Format: CMP ^EOMD ENCA emg_mandown
	Encode Format (emg_mandown): ALERT 8 TEXT 'MAN - DOWN' DISPF DELL 10 TXTOF
	Transceiver behavior If the Status ID received is a Man-down Status, the transceiver executes Encode Format 'emg_mandown'. When 'emg_mandown' is executed, the transceiver emits the ALERT 8 tone and a "MAN - DOWN" message appears blinking on the display for 10 seconds.  Note • Man-down Status can be configured in Man-down Status .

Configuration using KPG-D1/ D1N

Configuring **Man-down Status** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))

CMP ^EOS

Description	When the CMP ^EOS command is executed, the transceiver determines whether the Status ID received is a Stationary Status and executes the subsequent commands if it is a Stationary Status.
Usage Example	Sample Script
	Decode Format: CMP ^EOS ENCA emg_sta
	Encode Format (emg_sta): ALERT 8 TEXT 'STATIONARY' DISPF DELL 10 TXTOF
	Transceiver behavior If the Status ID received is a Stationary Status, the transceiver executes Encode Format 'emg_sta'. When 'emg_sta' is executed, the transceiver emits the ALERT 8 tone and a "STATIONARY" message appears blinking on the display for 10 seconds.  Note • Stationary Status can be configured in Stationary Status .

Configuration using KPG-D1/ D1N

Configuring **Stationary Status** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))

CMP ^EOM

Description	When the CMP ^EOM command is executed, the transceiver determines whether the Status ID received is a Motion Status and executes the subsequent commands if it is a Motion Status.
Usage Example	Sample Script
	Decode Format: CMP ^EOM ENCA meg_mot
	Encode Format (meg_mot): ALERT 8 TEXT 'MOTION' DISPF DELL 10 TXTOF
	Transceiver behavior If the Status ID received is a Motion Status, the transceiver executes Encode Format 'emg_mot'. When 'emg_mot' is executed, the transceiver emits the ALERT 8 tone and a "MOTION" message appears blinking on the display for 10 seconds.  Note • Motion Status can be configured in Motion Status .

Configuration using KPG-D1/ D1N

Configuring **Motion Status** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))

CMP ^EOLW

Description	When the CMP ^EOLW command is executed, the transceiver determines whether the Status ID received is a Lone Worker Status and executes the subsequent commands if it is a Lone Worker Status.
Usage Example	Sample Script
	Decode Format: CMP ^EOLW ENCA emg_lonewk
	Encode Format (emg_lonewk): ALERT 8 TEXT 'LONE WORKER' DISPF DELL 10 TXTOF
	Transceiver behavior If the Status ID received is a Lone Worker Status, the transceiver executes Encode Format 'emg_lonewk'. When 'emg_lonewk' is executed, the transceiver emits the ALERT 8 tone and a "LONE WORKER" message appears blinking on the display for 10 seconds.  Note • Lone Worker Status can be configured in Lone Worker Status .

Configuration using KPG-D1/ D1N

Configuring **Lone Worker Status** ( **See** Transceiver Settings > Personal > Personal Features > DMR Conventional > Emergency > Emergency ID (DMR Conventional))

CMP ^EMGC

Description	When the CMP ^EMGC command is executed, the transceiver determines whether the call received is an Emergency Call and executes the subsequent commands if it is an Emergency Call. This is not applicable to Emergency Status.
Usage Example	Sample Script
	Decode Format: CMP ^EMGC LEDF2 CMP #C 12345 ALERT 7 ENCA enc_ecall
	Encode Format (enc_ecall): TEXT 'Calling Received' DELL 5 TXTOF
	Transceiver behavior If the received call is an Emergency Call, the LED flashes in blue color regardless of the Caller ID. When a call other than an Emergency Call is received from a station whose Caller ID is 12345, the transceiver emits the ALERT 7 tone and executes Encode Format 'enc_ecall'. When 'enc_ecall' is executed, a "Calling Received" message appears on the display for 5 seconds, after which the original display is being restored.

DECA dec

Description	When the DECA dec command is executed, the transceiver executes the Decode Format specified in "dec".
Range	dec: Decode Format Name
Usage Example	Sample Script
	Decode Format: CMP #C 1000 DECA id_1000 CMP #C 2000 DECA id_2000 CMP ^OWNID DECA id_other
	Decode Format (id_1000): CMP #C 1000 LEDF ALERT 1
	Decode Format (id_2000): CMP #C 2000 LEDF2 ALERT 2
	Decode Format (id_other): CMP ^OWNID DISPF ALERT 3
	Transceiver behavior
	When a call is received from a station whose Caller ID is 1000, the transceiver executes Decode Format 'id_1000'. When 'id_1000' is executed, the LED flashes in orange color and the Alert 1 tone is emitted from the transceiver.
	When a call is received from a station whose Caller ID is 2000, the transceiver executes Decode Format 'id_2000'. When 'id_2000' is executed, the LED flashes in blue color and the ALERT 2 tone is emitted from the transceiver.
	If the destination is Unit ID (Own), the transceiver executes Decode Format 'id_other'. When 'id_other' is executed, the information on the display flashes and the Alert 3 tone is emitted from the transceiver.

DECAT time dec

Description	When the DECAT time dec command is executed, the transceiver executes the Decode Format specified in "dec" during the time interval configured in "time". This command is used when executing other Decode Formats for a specific period of time.
	 Note - While executing the DECAT time dec command, the Decode Format specified in "dec" will not be executed even upon receiving an incoming call for which Decode Format of FPU is configured to "None". For example, if Decode Format of Group Call on the FPU is configured to "None", the Decode Format specified in "dec" will not be executed even when a Group Call is received while waiting for a call during the standby interval configured in "time" of the DECAT time dec command. - While executing the DECAT time dec command, the Decode Format specified in "dec" instead of the configuration on the FPU will be executed upon receiving an incoming call for which Decode Format of FPU is configured to a value other than "None". For example, if Decode Format of Group Call on the FPU is configured to a value other than "None", the Decode Format specified in "dec" instead of the configuration on the FPU will be executed when a Group Call is received while waiting for a call during the standby interval configured in "time" of the DECAT time dec command.
Range	time: 0 ms to 60000 ms (in steps of 10 ms) dec: Decode Format Name
Usage Example	Sample Script
	Decode Format: CMP #C 1000 DECAT 3000 DecNextST
	Decode Format (DecNextST): CMP #S 100 LEDF ALERT 1 CMP #S 200 LEDF2 ALERT 2
	Transceiver behavior
	When a call is received from a station whose Caller ID is 1000, the transceiver executes the next Decode Format 'DecNextST' for a period of 3000 ms.
	When a call with Status ID 100 is received within 3000 ms, the LED flashes in orange color and the ALERT 1 tone is emitted from the transceiver.
	When a call with Status ID 200 is received within 3000 ms, the LED flashes in blue color and the ALERT 2 tone is emitted from the transceiver.

DECF dec

Description	The transceiver executes the DECF dec command, followed by executing the Decode Format specified in "dec". This command is normally used when the script to be executed in Decode Format is insufficient in size.
Range	dec: Decode Format Name
Usage Example	Sample Script
	Decode Format: CMP ^PGL BEEP 10 DECF none_pglist
	Decode Format (none_pglist): CMP ^GL LEDF BEEP 5
	Transceiver behavior The transceiver checks whether the received Group ID is registered in the Persistent Group ID List. If the received Group ID is registered in the Persistent Group ID List, the transceiver emits the BEEP 10 tone. If the received Group ID is not registered in the Persistent Group ID List, the transceiver executes Decode Format 'none_pglist'. If the received Group ID is registered in the Group ID List, the LED flashes in orange color and the BEEP 5 tone is emitted from the transceiver.

DISPF

Description	When the DISPF command is executed, the information on the transceiver display starts blinking.
Usage Example	Sample Script
	Decode Format: CMP #C 1000 LEDF DISPF
	Transceiver behavior When a call is received from a station whose Caller ID is 1000, the LED flashes in orange color and the information on the display also starts blinking.

ENCA enc

Description	When the ENCA enc command is executed, the transceiver executes the Encode Format specified in "enc".
Range	enc: Encode Format Name
Usage Example	Sample Script
	Decode Format: CMP #C 100 ENCA text_100 CMP #C 200 ENCA text_200
	Encode Format (text_100): ALERT 5 TEXT 'CALL 100' DSPF DELL 3 TXTOF
	Encode Format (text_200): ALERT 6 TEXT 'CALL 200' DSPF DELL 3 TXTOF
	Transceiver behavior When a call is received from a station whose Caller ID is 100, the transceiver executes Encode Format 'text_100'. When 'text_100' is executed, the transceiver emits the ALERT 5 tone and a "CALL 100" message appears blinking on the display for 3 seconds. When a call is received from a station whose Caller ID is 200, the transceiver executes Encode Format 'text_200'. When 'text_200' is executed, the transceiver emits the ALERT 6 tone and a "CALL 200" message appears blinking on the display for 3 seconds.

HORN

Supported Models: Mobile

Description	Executing the HORN command activates Horn Alert. Horn Alert functions according to the settings in Horn Alert Logic Signal , Horn Alert Mode and Off-hook Horn Alert .
Usage Example	Sample Script
	Decode Format: CMP #S 50 LEDF HORN
	Transceiver behavior When a call with Status ID 50 is received, the LED flashes in orange color and Horn Alert is activated.
	 Note If Horn Alert is disabled, the HORN command will not function.

LEDF

Description	When the LEDF command is executed, the LED flashes in orange color.
Usage Example	Sample Script
	Decode Format: CMP #C 12345 LEDF VIB
	Transceiver behavior
	When a call is received from a station whose Caller ID is 12345, the LED flashes in orange color. If the Vibrator is enabled, the vibrator will be activated.

LEDF2

Description	When the LEDF2 command is executed, the LED flashes in blue color.
Usage Example	Sample Script
	Decode Format: CMP #S 100 LEDF2 ALERT 2
	Transceiver behavior
	When a call with Status ID 100 is received, the LED flashes in blue color and the ALERT 2 tone is emitted from the transceiver.

QUEUE

Description	When the QUEUE command is executed, the Caller ID received will be saved to the stack memory according to the stack setting of FPU (Status Message Stack, Caller ID Stack). Information that is saved can be viewed in the Stack Mode.
Usage Example	Sample Script
	Decode Format: CMP #C 100 QUEUE ALERT 5 CMP ^OWNID ALERT 5
	Transceiver behavior
	When a call is received from a station whose Caller ID is 100, the transceiver emits the ALERT 5 tone after the received Caller ID has been saved to the stack memory according to the Status Message Stack or Caller ID Stack setting. If the destination is Unit ID (Own), the transceiver emits the ALERT 5 tone without saving the received Caller ID to the stack memory.

REPOF

Description	When the REPOF command is executed, the transceiver stops the Encode Format from being executed repeatedly using the REP rep command of the Encode Format. (Refer to REP rep .)
Usage Example	Sample Script
	Decode Format: CMP #S 100 ENCA auxa_act
	Encode Format (auxa_act): REP 10 RAUXA0 RAUXA1 DELL 1 RAUXA0 RACK 5000 act_stop RSML 5
	Decode Format (act_stop): CMP #S 200 REPOF BEEP 16
	Transceiver behavior When a call with Status ID 100 is received, the transceiver executes Encode Format 'auxa_act'. When 'auxa_act' is executed, the transceiver deactivates the AUX A port temporarily, switches to the active state for 1 second, followed by restoring it to the inactive state. Next, the transceiver executes Decode Format 'act_stop' for 5000 ms. When 5 seconds have elapsed after restoring the AUX A port to the inactive state, the transceiver executes Encode Format 'auxa_act' again. Encode Format 'auxa_act' can be executed repeatedly up to 10 times. If Status ID 200 is received before 5000 ms have elapsed, the transceiver emits a BEEP 16 tone and execution of 'auxa_act' ends.

VIB

Supported Models: Portable

Description	Upon execution of the VIB command when Vibrator is enabled, the Vibrator unit vibrates. The Vibrator unit vibrates for 10 sec at 500-ms intervals. Pressing any key while the Vibrator unit is vibrating stops the Vibrator unit from vibrating.
Usage Example	Sample Script
	Decode Format: CMP #C 1000 LEDF VIB
	Transceiver behavior When a call is received from a station whose Caller ID is 1000, the LED flashes in orange color. If the Vibrator is enabled, the vibrator will be activated.

Task Request is a function for performing task management using the Short Message function.

It allows the task administrator using the Dispatch Console to monitor the progress of a task by issuing work instructions to the transceiver users and having the transceiver users reply with a response message.

This function is only supported for DMR Tier III Trunking and S-Trunking.

Table 8-1 Task Request Specifications

Item	Description
No. of Saved Items	Up to 100
Mode	Task Request Confirmation Mode
Ways to Enter the Mode	PF key • Task Request Confirmation Menu key • Execute "Task Request Confirmation" from Menu Mode
Way to Respond to Task Request	Select from the Response List
No. of Characters	Not more than 290

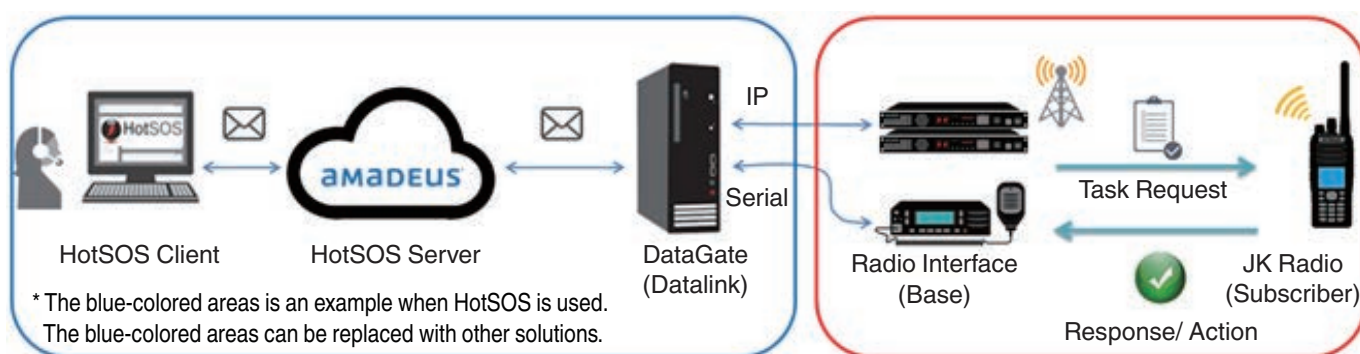


Figure 8-1 System Configuration Example for Task Request

Transceiver behavior

● State before Entering Task Request Confirmation Mode

To save the Task Request data, the following settings need to be configured on the transceiver.

Table 8-2 Settings for Saving Task Request Data

Transceiver	Configuration	Description
Subscriber	Task Request Receivable	Enabling this option allows saving or viewing of or reply to the Task Request messages.
	Message Deletable	Enabling this option allows a Task Request to be deleted in the Task Request Confirmation Mode.
	Response/ Category	A Response can be selected from below or a response text not longer than 14 characters can be registered. • No.1 Start/ Started (this is the default display and is changeable) • No.2 Stop/ Stopped (this is the default display and is changeable) • No.3 Complete/ Completed (this is the default display and is changeable) • No.4 to No.16: Blank (text can be registered manually)
	PF key	Refer to Table 8-1
Base	Short Message Serial Output	The reply message received from the subscriber is serially output as a Short Message command.
	COM port	If "Data", "Data + GPS Data Output", or "Data + Location Data Output" is assigned to the communication port of the transceiver, a Task Request can be sent by using a Short Message PC command.

The display in the LCD varies depending on whether there is saved Task Request data.

- When there are saved data and unread messages: “” appears blinking
- When there is saved data but no unread messages: “” lights up



The status of the transceiver changes as follows depending on whether there is saved Task Request data.

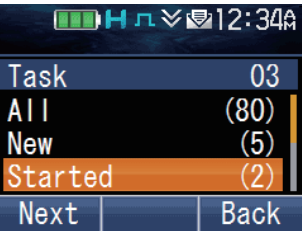
Table 8-3 Transceiver Status

Task Request	Tone	Display	Status
Saved data present	Key Beep A (1 beep)	“  ”	Task Request Confirmation Mode
No saved data	Key-entry Error Tone (1 beep)	Displays “Empty” for 1 second	Returns to operation display

Operating the Transceiver (Subscriber)

- Below are the steps for entering the Task Request Confirmation Mode to display the Task Request list.

1 Press the **Task** key or **Menu** key to enter the Task Confirmation Mode.



2 Press the [▲] key or [▼] key and select Category.

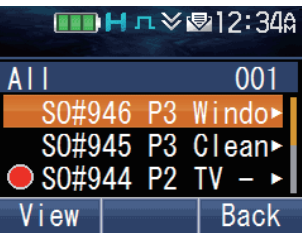
Below is an example of the display by Category.

- **All:** All
- **New:** Unread
- **Started:** FPU settings

(The above are a part of the displayed information)

Note

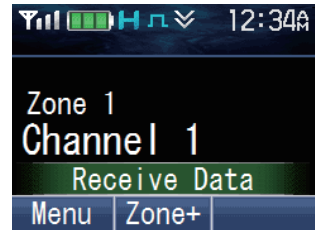
- Unread messages are indicated by the “” icon.
- The “All” and “New” categories are items that exist at all times regardless of the FPU settings. Other items will vary in name and quantity according to the FPU settings.



Behavior of the Transceiver (Subscriber)

- Below are the steps for receiving and displaying a Task Request Message.

1 Message receiving starts.

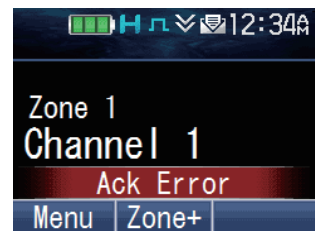


2 Message receiving is complete.

Saves the Task Request if **Task Request Receivable** is enabled.

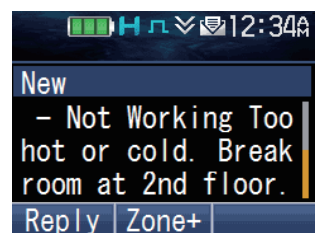
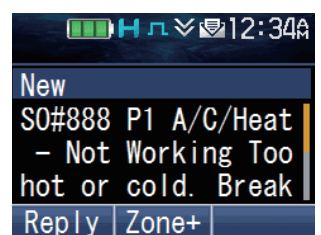


If ACK cannot be sent out successfully, an "Ack Error" message is displayed for 1 second, after which data receiving ends.



3 Displays the Task Request details.

The first 3 lines of the message is displayed for 3 seconds, followed by scrolling down line by line every 2 seconds. After the last line is shown, the display returns to the beginning of the message and scrolling repeats.



Note

- If **Alert Tone (Task Request)** is enabled, an Alert Tone is emitted from the transceiver.

Operating the Transceiver (Subscriber)

- Below are the steps for responding to a Task Request.

1 In the Task Request View, press the Menu ([F]) key or [*] key.

A Task Request Response selection screen appears.



2 On the Response selection screen, press the PTT switch, Menu ([F]) key, or [*] key.

The transceiver displays “Send Data” and starts sending the Response to the Caller ID. If TX LED is enabled, the LED lights up in red color during the transmission process.
When ACK is received, the transceiver emits the Complete Tone and displays “Complete” for 1 second. After the display disappears, the transceiver returns to the channel display screen.

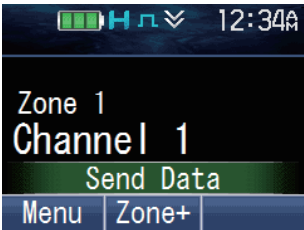


Transceiver Behavior (Base)

- Below are the steps for sending a Task Request Message.

1 Message sending starts.

After receiving a PC command, sending of a Task Request to the subscriber starts.

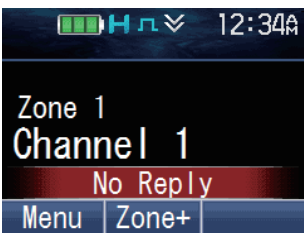


2 Sending is complete.

When ACK is received, "Complete" appears for 1 sec, and sending is complete. After sending is complete, the transceiver returns to the channel display.



If ACK cannot be received, "No Reply" appears for 1 second, after which transmission of the Task Request ends.



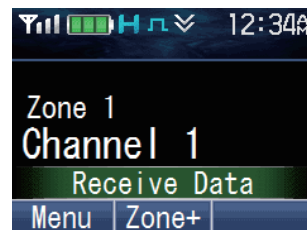
If a Task Request cannot be sent due to the Busy state, "Busy" appears for 1 second, after which transmission of the Task Request ends.



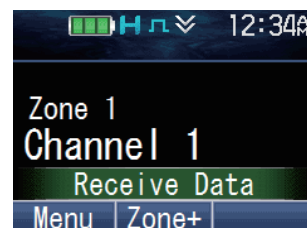
● Below are the steps for receiving a response to the Task Request Message.

1 Message receiving starts.

"Receive Data" is displayed while a response to a Task Request is being received. If Busy LED is configured, the LED lights up in green color.



After data receiving is complete, the transceiver sends an ACK.



2 Receiving is complete.

When sending of ACK is complete, "Complete" appears for 1 sec and receiving is complete. After receiving is complete, the transceiver returns to the channel display.



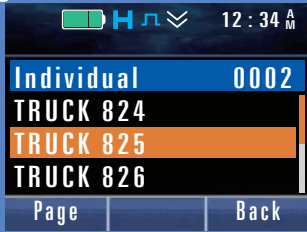
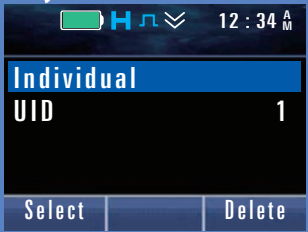
Note

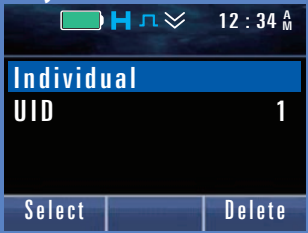
- If a new Task Request is received when there are 100 saved Task Requests, the stored messages will be deleted starting from the oldest data and the new message will be saved.
- The saved Task Request messages can be deleted in the following ways.
 - Deleting by selecting one or all Task Request messages from the Task Request Confirmation Mode (deletion by the user)
 - Receiving a message to delete Task Requests (deletion by Air)
- As Task Request is a function that makes use of Short Message, the following items will behave according to their settings even when the Task Request function is in use.
 - DMR Message Type
 - Short Message on Data System-Personality
 - Short Message on Data Zone-Channel

Configuration using KPG-D1/ D1N

- Saving a **Task Request** (See Transceiver Settings > Optional Features > Optional Features 1 > Task Request)
- Deleting a **Task Request** (See Transceiver Settings > Optional Features > Optional Features 1 > Task Request)
- Responding to a **Task Request** (See Transceiver Settings > Optional Features > Optional Features 1 > Task Request > No. 1~16)
- Selecting a **Task Request** Category (See Transceiver Settings > Optional Features > Optional Features 1 > Task Request > No. 1~16)
- Configuring **Alert Tone (Task Request)** in DMR Conventional (See Transceiver Settings > DMR > DMR Information > Conventional > Task Request)
- Configuring **Alert Tone (Task Request)** in DMR-based Trunking (See Transceiver Settings > DMR > DMR Information > Trunking > Task Request)

Key operations for selecting a list or entering characters are described for each mode in this chapter. Refer to Common FUNC “Operating the Transceiver in Each Mode (Common Operation)” for instruction.

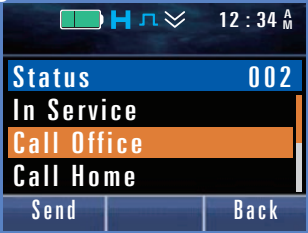
Key		Individual Call Mode	
		Selecting a list	Manual entry
			
Menu ([)	Press	DMR Conventional: Initiates a Paging Call after aborting the current mode. DMR-based Trunking: Sends a message requesting a call after aborting the current mode.	DMR Conventional: Initiates a Paging Call after aborting the current mode (after finalizing the Digit No.). Finalizes the Digit No. (while the Digit No. is flashing). DMR-based Trunking: Sends a call after aborting the current mode (after finalizing the Digit No.). Finalizes the Digit No. (While the Digit No. is flashing)
	Hold	Migrates to Status Mode or Short Message Mode.	Migrates to Status Mode or Short Message Mode (after finalizing the Digit No.).
Back ([)	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Deletes one character. Returns to the menu if no character is entered (if the transceiver enters this mode by pressing the Menu key).
	Hold Down	-	Deletes all characters.
Function ([)	Press	Migrates to the code entry mode (only if Manual Dialing is enabled).	Migrates to the list selection mode.
Home ([)	Press	Aborts the current mode.	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
Side 3 ^{*1}	Press	The configured function functions.	
[▲]/[▼]	Press	Selects Unit IDs registered in the Individual ID List one at a time.	Selects Digit No. one at a time.
	Hold Down	Selects Unit IDs registered in the Individual ID List continuously.	Selects Digit No. continuously.
[◀] or [▲] ^{*2}	Press	-	
[▶] or [■] ^{*2}	Press	Migrates to Status Mode or Short Message Mode.	
Selector ^{*3}	-	The configured function functions after aborting the current mode.	
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.	
[0] to [9]	Press	Directly selects a Unit ID registered in the list.	Enters the Digit No.

Key		Individual Call Mode	
		Selecting a list	Manual entry
			
[*]	Press	DMR Conventional: Initiates a Paging Call after aborting the current mode. DMR-based Trunking: Sends a message requesting a call after aborting the current mode.	DMR Conventional: Initiates a Paging Call after aborting the current mode (after finalizing the Digit No.). Finalizes the Digit No. (while the Digit No. is flashing). DMR-based Trunking: Sends a call after aborting the current mode (after finalizing the Digit No.). Finalizes the Digit No. (While the Digit No. is flashing)
	Hold	Migrates to Status Mode or Short Message Mode.	Migrates to Status Mode or Short Message Mode (after finalizing the Digit No.).
[#]	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Deletes one character. Returns to the menu if no character is entered (if the transceiver enters this mode by pressing the Menu key).
	Hold Down	-	Deletes all characters.
PTT Switch	Press	Transmits after aborting the current mode.	

*1 Portable only

*2 KCH-20R (Featured Panel) only

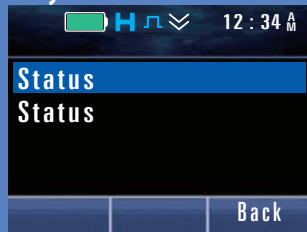
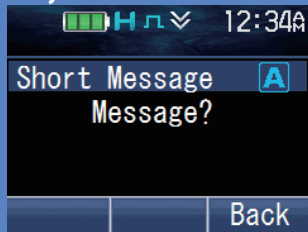
*3 Portable and KCH-20R (Featured Panel) only

Key		Group Call Mode (DMR Conventional)	Status Mode
		Selecting a list 	Selecting a list 
Menu ([)	Press	-	Transmits the status after aborting the current mode.
	Hold	Migrates to Status Mode or Short Message Mode.	-
Back ([)	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	
	Hold Down	-	
Function ([)	Press	-	Migrates to the status entry mode (only if Manual Dialing is enabled).
Home ([)	Press	Aborts the current mode.	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
Side 3 ^{*1}	Press	The configured function functions.	
[] / [)	Press	Selects Group IDs registered in the Group ID List one at a time.	Selects statuses registered in the Status ID List one at a time.
	Hold Down	Selects Group IDs registered in the Group ID List continuously.	Selects statuses registered in the Status ID List continuously.
[] or [) ^{*2}	Press	-	Migrates to Individual Call Mode or Group Call Mode.
[] or [) ^{*2}	Press	Migrates to Status Mode or Short Message Mode.	-
Selector ^{*3}	-	The configured function functions after aborting the current mode.	
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.	
[0] to [9]	Press	Directly selects a Group ID registered in the list.	Directly selects a status registered in the list.
[*]	Press	-	Transmits the status after aborting the current mode.
	Hold	Migrates to Status Mode or Short Message Mode.	-
[#]	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	
PTT Switch	Press	Transmits after aborting the current mode.	Transmits the status after aborting the current mode.

*1 Portable only

*2 KCH-20R (Featured Panel) only

*3 Portable and KCH-20R (Featured Panel) only

Key		Status Mode	Short Message Mode
		Manual entry 	Manual entry 
Menu ([)	Press	Transmits the status after aborting the current mode (after finalizing the Digit No.). Finalizes the Digit No. (While the Digit No. is flashing)	Sends the message after aborting the current mode (after finalizing the characters). Finalizes the characters. (While the characters are flashing)
Back ([)	Press	Deletes one character. Returns to the menu if no character is entered (if the transceiver enters this mode by pressing the Menu key).	
	Hold Down	Deletes all characters.	
Function ([)	Press	Migrates to the list selection mode.	Switches character types (upper case/lower case/figure).
Home ([)	Press	Aborts the current mode.	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
Side 3 ^{*1}	Press	The configured function functions.	
[] / [)	Press	Selects Digit No. one at a time.	If "Characters" is configured in Up/Down: Selects characters one at a time. If "Line Up/Down" is configured in Up/Down: Shifts the cursor up and down.
	Hold Down	Selects Digit No. continuously.	If "Characters" is configured in Up/Down: Selects characters continuously. If "Line Up/Down" is configured in Up/Down: Shifts the cursor up and down continuously.
[] or [] ^{*2}	Press	Migrates to Individual Call Mode or Group Call Mode.	Shifts the cursor to the left. Migrates to Individual Call Mode or Group Call Mode if no character is entered.
	Hold Down	-	Shifts the cursor to the left continuously.
[] or [] ^{*2}	Press	-	Shifts the cursor to the right.
	Hold Down	-	Shifts the cursor to the right continuously.
Selector ^{*3}	-	The configured function functions after aborting the current mode.	
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.	
[0] to [9]	Press	Enters the Digit No.	Enters characters.
[*]	Press	Transmits the status after aborting the current mode (after finalizing the Digit No.). Finalizes the Digit No. (While the Digit No. is flashing)	Switches character types (upper case/lower case/figure) (after finalizing the characters). Finalizes the characters. (While the characters are flashing)
[#]	Press	Deletes one character. Returns to the menu if no character is entered (if the transceiver enters this mode by pressing the Menu key).	
	Hold Down	Deletes all characters.	
PTT Switch	Press	Transmits the status after aborting the current mode.	Send the message after aborting the current mode.

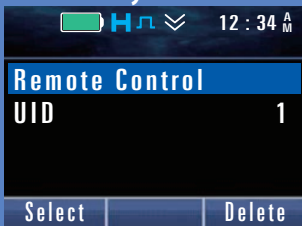
^{*1} Portable only^{*2} KCH-20R (Featured Panel) only^{*3} Portable and KCH-20R (Featured Panel) only

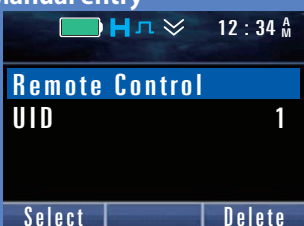
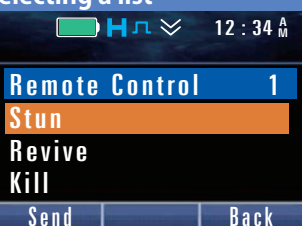
Key		Scrambler/Encryption Code Mode	
			
Menu ([)	Press	Confirms the configuration and then aborts the current mode. (If Key is selected) Restores the presets and then aborts the current mode. (If Preset is selected)	
Back ([)	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	
Function ([)	Press	-	
Home ([)	Press	Aborts the current mode.	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
Side 3 ^{*1}	Press	The configured function functions.	
[] / [)	Press	Selects Multi-keys registered in the Multi-key List one at a time.	
	Hold Down	Selects Multi-keys registered in the Multi-key List continuously.	
[] / [] or [] / [) ^{*2}	Press	-	
	Hold Down	-	
Selector ^{*3}	-	The configured function functions after aborting the current mode.	
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.	
[0] to [9]	Press	Directly selects a Multi-key registered in the list.	
[*]	Press	Confirms the configuration and then aborts the current mode (when Key is selected). Restores the presets and then aborts the current mode (when Preset is selected).	
[#]	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	
PTT Switch	Press	Transmits after aborting the current mode.	

^{*1} Portable only

^{*2} KCH-20R (Featured Panel) only

^{*3} Portable and KCH-20R (Featured Panel) only

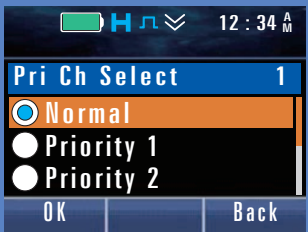
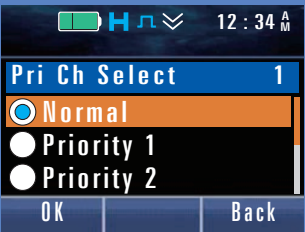
Key		Remote Control Mode		
		Selecting a list 	Manual entry 	Selecting a list 
Menu ([])	Press	Migrates to the Remote Control Option selection display.	Migrates to the Remote Control Option selection display. Finalizes the Digit No. (While the Digit No. is flashing)	Transmits the selected Remote Control Message after aborting the current mode.
Back ([])	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Deletes one character. Returns to the menu if no character is entered (if the transceiver enters this mode by pressing the Menu key).	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).
	Hold Down	-	Deletes all characters.	-
Function ([])	Press	Migrates to the code entry mode (only if Manual Dialing is enabled in a DMR Conventional system).	Migrates to the list selection mode.	-
Home ([])	Press	Aborts the current mode.		
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.		
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.		
Side 3 ^{*1}	Press	The configured function functions.		
[]/[]	Press	Selects Unit IDs registered in the Individual ID List one at a time.	Selects Digit No. one at a time.	Selects configuration items one at a time.
	Hold Down	Selects Unit IDs registered in the Individual ID List continuously.	Selects Digit No. continuously.	Selects configuration items continuously.
[]/[] or []/[] ^{*2}	Press	-		Migrates to the Unit ID list selection mode.
	Hold Down	Migrates to the Remote Control Option selection display.		-
Selector ^{*3}	-	The configured function functions after aborting the current mode.		
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.		
[0] to [9]	Press	Directly selects a Unit ID registered in the list.	Enters the Digit No.	Selects a configuration item from the list.

Key		Remote Control Mode		
		Selecting a list 	Manual entry 	Selecting a list 
[*]	Press	Migrates to the Remote Control Option selection display.	Migrates to the Remote Control Option selection display. Finalizes the Digit No. (While the Digit No. is flashing)	Transmits the selected Remote Control Message after aborting the current mode.
[#]	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Deletes one character. Returns to the menu if no character is entered (if the transceiver enters this mode by pressing the Menu key).	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).
	Hold Down	-	Deletes all characters.	-
PTT Switch	Press	Transmits after aborting the current mode.		Transmits the selected Remote Control Message after aborting the current mode.

*1 Portable only

*2 KCH-20R (Featured Panel) only

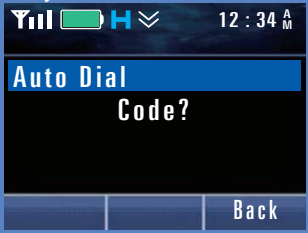
*3 Portable and KCH-20R (Featured Panel) only

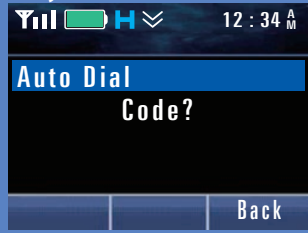
Key		Scan Program Mode	Priority-channel	Priority-channel Select Mode
				
Menu ([])	Press	Confirms addition or deletion.	Confirms the configuration and then restores the Scan List edit screen.	Confirms the configuration and then aborts the current mode.
Back ([])	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Restores the Scan List edit screen.	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).
Function ([])	Press	The transceiver enters the Priority Channel edit screen.	Restores the Scan List edit screen.	-
Home ([])	Press	Aborts the current mode.		
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.		
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.		
Side 3 ^{*1}	Press	The configured function functions.		
[]/[]	Press	Selects channels one at a time.	Selects configuration items one at a time.	
	Hold Down	Selects channels continuously.	Selects configuration items continuously.	
[]/[] or []/[] ^{*2}	Press	Selects zones one at a time.	-	
	Hold Down	Selects zones continuously.	-	
Selector ^{*3}	-	The configured function functions after aborting the current mode.		
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.		
[0] to [9]	Press	-	Selects a configuration item from the list.	
[*]	Press	Confirms addition or deletion.	Confirms the configuration and then restores the Scan List edit screen.	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).
[#]	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Restores the Scan List edit screen.	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).
PTT Switch	Press	-		Transmits after aborting the current mode.

*1 Portable only

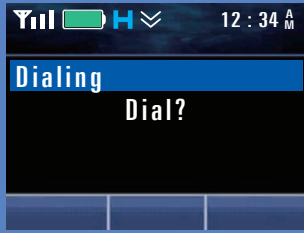
*2 KCH-20R (Featured Panel) only

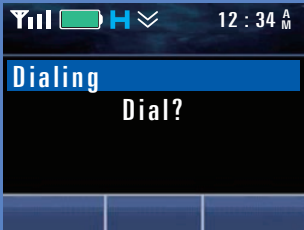
*3 Portable and KCH-20R (Featured Panel) only

Key		Autodial Mode	
		Selecting a list	Manual entry
			
Menu ([])	Press	Transmits after aborting the current mode.	Transmits after aborting the current mode (after finalizing the DTMF code). Confirms the DTMF code (while the DTMF code blinks).
	Hold Down	-	-
Back ([])	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	Returns to the menu (if the transceiver enters this mode by pressing the Menu key). Deletes one character (While entering and after confirming the DTMF code).
	Hold Down	-	Deletes all characters (While entering and after confirming the DTMF code).
Function ([])	Press	Migrates to the DTMF code entry mode (only if Store and Send is enabled).	Migrates to the list selection mode.
	Hold Down	-	-
Home ([])	Press	Aborts the current mode.	
	Hold Down	-	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
	Hold Down	-	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
	Hold Down	-	
Side 3 ^{*1}	Press	The configured function functions.	
	Hold Down	-	
[]/[]	Press	Selects DTMF codes registered in Autodial List one at a time.	Selects a DTMF code one at a time.
	Hold Down	Selects DTMF codes registered in Autodial List continuously.	Selects a DTMF code continuously.
[] or [] ^{*2}	Press	-	
	Hold Down	-	

Key		Autodial Mode	
		Selecting a list	Manual entry
			
[▶] or [■] * ²	Press	-	
	Hold Down	-	
Selector * ³	-	The configured function functions after aborting the current mode.	
Lever Switch * ¹	-	The configured function functions after aborting the current mode.	
[0] to [9]	Press	Selects a DTMF code directly from the list.	Enters a DTMF code.
[A] to [D]		-	Enters a DTMF code.
[*]	Press	Pressing the [0] key after pressing the [*] key allows redialing.	If "Function Key" is configured in * and # key-entry Pattern: Pressing the [0] key after migrating to the state that a DTMF code is entered allows redialing. Pressing the [7], [*] or [#] key enters "P", "**", or "#". If "Direct Entry" is configured in * and # key-entry Pattern: Enters "**".
	Hold Down	-	If "Function Key" is configured in * and # key-entry Pattern: Pressing the [2], [5], [8] or [0] key enters "A", "B", "C", or "D" respectively.
[#]	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	If "Function Key" is configured in * and # key-entry Pattern: Returns to the menu (if the transceiver enters this mode by pressing the Menu key). Deletes one character (While entering and after confirming the DTMF code). If "Direct Entry" is configured in * and # key-entry Pattern: Enters "#".
	Hold Down	-	If "Function Key" is configured in * and # key-entry Pattern: Deletes all characters (While entering and after confirming the DTMF code).
PTT Switch	Press	Transmits after aborting the current mode.	

*¹ Portable only*² KCH-20R (Featured Panel) only*³ Portable and KCH-20R (Featured Panel) only

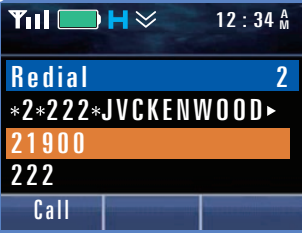
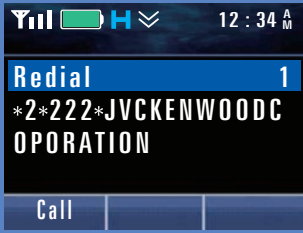
Key		Dialing Mode	
		Manual entry	
Menu ([])	Press	Transmits after aborting the current mode (if the entered code is enabled). Displays an error and continues the mode (if the entered code is disabled). Confirms the dialing code (while the dialing code blinks).	
	Hold Down	-	
Back ([])	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key). Deletes one character (While entering and after confirming the dialing code).	
	Hold Down	Deletes all characters (While entering and after confirming the dialing code).	
Function ([])	Press	-	
	Hold Down	-	
Home ([])	Press	Aborts the current mode.	
	Hold Down	-	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
	Hold Down	-	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
	Hold Down	-	
Side 3 ^{*1}	Press	The configured function functions.	
	Hold Down	-	
[]/[]	Press	Selects a dialing code one at a time.	
	Hold Down	Selects a dialing code continuously.	
[] or [] ^{*2}	Press	-	
	Hold Down	-	
[] or [] ^{*2}	Press	-	
	Hold Down	-	

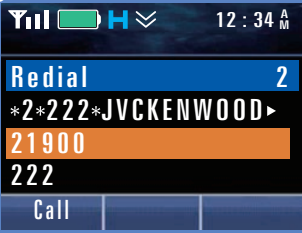
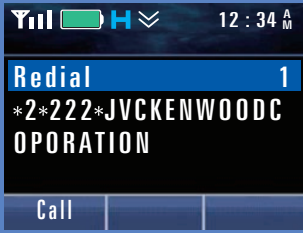
Key		Dialing Mode	
		Manual entry	
			
Selector ^{*3}	-	The configured function functions after aborting the current mode.	
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.	
[0] to [9]	Press	Enter a dialing code.	
[A] to [D]		-	
[*]	Press	If "Function Key" is configured in * and # key-entry Pattern (DMR Dialing): Confirms the dialing code (while the dialing code blinks). Pressing the [*] or [#] key after pressing the [*] key enters "*" or "#" (before entering and after confirming the dialing code). If "Direct Entry" is configured in * and # key-entry Pattern (DMR Dialing): Enters "*".	
	Hold Down	-	
[#]	Press	If "Function Key" is configured in * and # key-entry Pattern (DMR Dialing): Returns to the menu (if the transceiver enters this mode by pressing the Menu key). Deletes one character (While entering and after confirming the dialing code). If "Direct Entry" is configured in * and # key-entry Pattern (DMR Dialing): Enters "#" (before entering a dialing code). Transmits after aborting the current mode (if the entered code is enabled). Displays an error and continues the mode (if the entered code is disabled).	
	Hold Down	If "Function Key" is configured in * and # key-entry Pattern (DMR Dialing): Deletes all characters (While entering and after confirming the dialing code).	
PTT Switch	Press	Transmits after aborting the current mode (if the entered code is enabled). Displays an error and continues the mode (if the entered code is disabled).	

^{*1} Portable only

^{*2} KCH-20R (Featured Panel) only

^{*3} Portable and KCH-20R (Featured Panel) only

Key		Redial Mode	
		Selecting a list	View
			
Menu ([])	Press	Transmits after aborting the current mode (if the selected code is enabled). Displays an error and continues the mode (if the selected code is disabled).	
	Hold Down	-	
Back ([])	Press	Returns to the menu (if the transceiver enters this mode by pressing the Menu key).	
	Hold Down	-	
Function ([])	Press	Displays a dialing code.	Migrates to the list selection mode.
	Hold Down	-	
Home ([])	Press	Aborts the current mode.	
	Hold Down	-	
Side 1 ^{*1} or [+] ^{*2}	Press	The configured function functions.	
	Hold Down	-	
Side 2 ^{*1} or [-] ^{*2}	Press	The configured function functions.	
	Hold Down	-	
Side 3 ^{*1}	Press	The configured function functions.	
	Hold Down	-	
[]/[]	Press	Selects a dialing code which is retained in the dialing history list one at a time.	Moves by line one at a time.
	Hold Down	Selects a dialing code which is retained in the dialing history list continuously.	Moves by line continuously.
[] or [] ^{*2}	Press	-	Selects a list.
	Hold Down	-	
[] or [] ^{*2}	Press	-	Selects a list.
Selector ^{*3}	-	The configured function functions after aborting the current mode.	
Lever Switch ^{*1}	-	The configured function functions after aborting the current mode.	

Key		Redial Mode	
		Selecting a list	View
			
[0] to [9]	Press	Selects a list (only the [1] key to [3] key are available).	-
[A] to [D]		-	-
[*]	Press	-	-
	Hold Down	-	-
[#]	Press	If "Function Key" is configured in * and # key-entry Pattern (DMR Dialing): Returns to the menu (if the transceiver enters this mode by pressing the Menu key). If "Direct Entry" is configured in * and # key-entry Pattern (DMR Dialing): Transmits after aborting the current mode (if the selected code is enabled). Displays an error and continues the mode (if the selected code is disabled).	
	Hold Down	-	
PTT Switch	Press	Transmits after aborting the current mode (if the selected code is enabled). Displays an error and continues the mode (if the selected code is disabled).	

*1 Portable only

*2 KCH-20R (Featured Panel) only

*3 Portable and KCH-20R (Featured Panel) only

● Control Tone

Tone Name	Pattern	Reference
Key Beep A	1 beep  1630 Hz (50 ms)	Making an Informative Group Call (Broadcast Group Call) Placing the Transceiver in Emergency Mode Using the Lone Worker Function Placing the Transceiver in Emergency Mode by Using the Activity Detection Function Scanning in One Zone (Single Scan) Scan by Registering Multiple Target Channels for Scan in the List (List Scan) Scanning All Target Zones for Scanning (Multi-Zone Scan) Changing the Scan List (Scan Program) Scanning the Specific Channel Preferentially (Priority Scan)
Key Beep B	2 beeps  1630 Hz (50 ms)	Placing the Transceiver in Emergency Mode Using the Lone Worker Function Placing the Transceiver in Emergency Mode by Using the Activity Detection Function Scanning in One Zone (Single Scan) Scan by Registering Multiple Target Channels for Scan in the List (List Scan) Scanning All Target Zones for Scanning (Multi-Zone Scan) Changing the Scan List (Scan Program) Scanning the Specific Channel Preferentially (Priority Scan)
Key Beep C	3 beeps  1630 Hz (50 ms)	Scanning the Specific Channel Preferentially (Priority Scan)
Key-entry Error Tone	1 beep  700 Hz (50 ms)	Adding or Deleting a Channel to/from the Target Channels for Scan (Scan Delete/Add) Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))
Priority-channel Tone	1 beep  2000 Hz (50 ms)	Scanning the Specific Channel Preferentially (Priority Scan) Priority-channel Stop Tone
Scan Stop Tone	2 beeps  700 Hz (50 ms)	Channel Recall Scan Stop Tone
Search Mode Tone	1 beep  770 Hz (400 ms)	Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)
Call Request Tone	1 beep  1630 Hz (50 ms)	Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)

Tone Name	Pattern	Reference
Call In Progress Tone	2 beeps  980 Hz (100 ms)	Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)
Transaction Confirmed Tone	2 beeps  490 Hz (300 ms) 980 Hz (300 ms)	Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)
Complete Tone	5 beeps  980 Hz (20 ms)	Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))

● Warning Tone

Tone Name	Pattern	Reference
Warning Tone A	continuous beep  700 Hz (until the PTT switch is released)	Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))
Busy Tone 2	3 beeps  940 Hz (150 ms)	Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption) Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))
TOT Pre-alert Tone	3 beeps  1630 Hz (50 ms)	Restricting the Continuous Transmission Duration (Time-out Timer)
System Select Tone	4 beeps  980 Hz (50 ms) 1220 Hz (50 ms) 980 Hz (50 ms) 1220 Hz (50 ms)	Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)
Call Fail Tone	2 beeps  440 Hz (50 ms) 440 Hz (1 sec)	Communicating via a Repeater (Repeater Mode) Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming) Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)
Lone Worker Tone	2 beeps  1630 Hz (150 ms) 940 Hz (150 ms)	Placing the Transceiver in Emergency Mode Using the Lone Worker Function
Group Subscription Invalid Indicator Tone	2 beeps  440 Hz (50 ms)	Registering the Group ID Used by the Own Transceiver in a System (Group Subscription)

Tone Name	Pattern	Reference
Call Processing Tone	2 beeps  940 Hz (50 ms)	Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)
Network Failure Tone A	2 beeps  620 Hz (100 ms) 930 Hz (100 ms)	Notifying the Status of Communications with Other Sites (Network Failure Indicator)
Network Failure Tone B	1 beep  1630 Hz (1000 ms)	Notifying the Status of Communications with Other Sites (Network Failure Indicator)
Man-down Pre-alert Tone	1 beep  1630 Hz (50 ms)	Man-down Detection
Stationary Pre-alert Tone	1 beep  770 Hz (50 ms)	Stationary Detection
Motion Pre-alert Tone	1 beep  1210 Hz (50 ms)	Motion Detection
Key Fail Alert Tone	6 beeps  940 Hz (100 ms)	Deleting All Encryption Keys (Zeroize)
Invalid Dialing Entry Tone	1 beep  490 Hz (2 sec)	Executing Various Communications by Using the Dialing Function

● Locator Tone

Tone Name	Pattern	Reference
Emergency Locator Tone	2 beeps  1630 Hz (90 ms) 940 Hz (90 ms)	Automatically Transmitting and Receiving in Emergency Mode

● Sidetone

Tone Name	Pattern	Reference
Proceed Tone	3 beeps  1000 Hz (20 ms)	Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) Making a Group Call

Alert Tone

Tone Name	Pattern	Reference
Transmit Clear Alert Tone	1 beep  1477 Hz (50 ms)	Transmit Clear Alert Tone

● Transmit Tone

Tone Name	Pattern	Reference
Background Tone	1 beep  1630 Hz (50 ms)	Background Transmission

A

Abbreviations Used in This Document	xi
About Communication Security (Encryption)	2, 152
About Copyright	xii
About Examples of the Transceiver Display	x
About KPG-D1N	xiv
About Multi RF Deck/ Multi Control Head	xv
About Notations	ix
About Options to Use the Functions Described in This Document	xvi
About Own ID	2, 152
About System Type	xv
About the authentication key	179
About the Behavior of the Encryption Icon	293
About the Behavior of the LED (Secure Indicator) (DMR-based Trunking System Only)	294
About the Behavior When a Message Requesting the Status Transmission Is Received	47
About the Built-in GPS Receiver Unit	xviii
About the Configuration of the Communication Port	x
About the Notation of "Configuration Using KPG-D1/ D1N"	xiv
About the Notation of the Supported Models	x
About the Programming Software	xiv
About the SCM Communication Error Display	303
About the Slot Numbers (Slot Selection)	12
About the system parameters in a DMR-based Trunking system	150
About the transceiver behavior when receiving an Individual Call	192
About the Trunking format in a DMR-based Trunking system	143
About the Zone-channel Format	xiv
About This Manual	viii
About Trademarks and Patent Rights	xiii
About Trunking Format	150
Active Hunt	162
Adding or Deleting a Channel to/from the Target Channels for Scan (Scan Delete/Add)	322

Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add)	323
ALERT num	343, 357
Applicable SCMs	295
Authentication by Registration	179
Authentication Function of a System and Transceiver (Authentication)	179
Authentication upon receipt of the Stun/ Revive/ Kill request	179
Automatically Transmitting and Receiving in Emergency Mode	267
Auto Reset Timer	3, 153, 341
Auto Scan	327
Auto Slot Select	13
AUTR	343, 357
AUX Input Status Message (Mobile Only)	53
AUX Output Status Message (Mobile Only)	54
Available Calls	17, 183
Available Dialing Codes	220
Avoiding Interference with Other Communications (Busy Channel Lockout)	160
Avoiding Interference with Other Communications (Busy Channel Lockout (DMR))	8
Avoiding Receiving a Group Call during an Incoming Individual Call (Ignore Group Call during Individual Call)	37

B

Background Hunt	164
Background Transmission	270
Base ID	51
BEEP LIST	391
BEEP num	344, 358
Behavior in Asynchronous State	118
Behavior of the transceiver during Registration	175
Behavior of the transceiver when the transceiver clears the location registration information from the system	178
Behavior of when the transceiver receives an Individual Call of Emergency	196
Behavior when Data Received Cannot be Properly Decrypted	292

Behavior when group registration fails	177
BLE Report Back to Requested ID (Indoor Location)	138
BLE Report Interval Time (Indoor Location)	136
BLE Report on Data Zone-Channel/ Data System-Personality (Indoor Location)	128
BLE Time Mark (Indoor Location)	137
BLTOF	344, 358
BLTON	359
Built-in DES	296

C

Calling All Transceivers Having the Same Color Code (Unaddressed Call)	88
Causing Transceivers Other than the Transceiver of the Specified ID to Participate in a Conversation (Open Voice Channel Mode)	86
Changing the Priority Channel	317
Changing the Scan List (Scan Program)	311
Channel Recall	326
Checking Whether Another Transceiver Is in Operation by Using a PC command (Radio Check)	258
Checking Whether Another Transceiver Is in Operation (Radio Check)	113, 258
Clearing the Registration Information from a System (De-registration)	178
CMP ^ALL	362
CMP ^EMG	363
CMP ^EMGC	365
CMP ^EOLW	365
CMP ^EOM	364
CMP ^EOMD	363
CMP ^EOS	364
CMP ^GL	361
CMP ^OWNID	360
CMP ^PGL	361
CMP #C num	360
CMP #G num	361
CMP #S num	362
Common Functions for Data Communications	40, 209

Communicating on a Zone-channel in DMR Conventional while Outside the Communication Area (Alternate Zone-Channel)	234
Communicating via a Repeater (Repeater Mode)	12
Communicating with a Telephone (Telephone Call)	65, 211
Communicating Without Using a Repeater (Talk Around/ DMR Direct Mode)	10
COMMUNICATION SECURITY	286
COMMUNICATIONS IN AN EMERGENCY	260
COM Port Priority	337
Composite Control Channel	169
Comprehensive Hunt	167
Conditions for the transceiver to begin Registration	174
Conditions for the transceiver to clear the location registration information from the system	178
Conditions to Activate the Scan (List Scan)	309
Conditions to Activate the Scan (Multi-Zone Scan)	314
Conditions to Activate the Scan (Single Scan)	307
Conditions to Resume the Scan (List Scan)	309
Conditions to Resume the Scan (Multi-Zone Scan)	314
Conditions to Resume the Scan (Single Scan)	307
Configuration Related to Transmission and Reception in Emergency Mode	264
Configurations for Using the Dialing Function	218
Configuring the Encryption Key Data Used for Communications	289
Configuring the Length of Time to Retain the In Service State (Beacon Interval Time)	172
CONTENTS	i
CONTENTS BY PURPOSE	xxvi
Control Channel Hunt (Control Channel Hunt)	161

D

DATA COMMUNICATION FUNCTIONS	330
DECA dec	366
DECAT time dec	366
DECF dec	367
Decode Format	357

Deleting All Encryption Keys (Zeroize)	300
Deleting the Encryption Key (Key Delete)	299
DELL Itime	345
DEL xtime	345
DIGITAL ENCODE/ DECODE FORMAT	339
Disabling the Transceiver Capability by Remote Control (Stun/ Kill)	111, 259
DISPF	345, 367
Displaying the ID of the Communicating Caller on the LCD (Caller ID Display)	89
Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)	35, 202
DISPS	346
DMR-BASED TRUNKING SYSTEM	142
DMR CONVENTIONAL SYSTEM	1
DMR IP Addressing	182
DMR Message Communication Configuration (DMR Message Type)	55
Dropout Delay Time	325
Dropout Delay Time (Site Roaming)	123
Duration of Locator Tone 1	267
Duration of Locator Tone 2	268
Duration of Lone Worker Tone	282
Dwell Time	123, 325

E

Editing the Autodial List with the Transceiver (Autodial Programming)	82
Emergency Alarm	262
Emergency Channel Lock	277
Emergency Channel Type	265
Emergency Cycle	267
Emergency Display	270
Emergency DMR ID	275
Emergency DMR ID Type	275
Emergency ID	274
Emergency LED	272
Emergency Microphone Sense	269
Emergency Mode Type	271
Emergency Status Response	53
Emergency Text	271

Emergency Zone-Channel	267
Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode	278
ENCA enc	368
ENC enc	346
Encode Format	343
Enhanced Encryption	297
Executing Various Communications by Using the Dialing Function	218
Executing Zeroize using the AUX Input port (Mobile only)	302
Executing Zeroize using the Menu Mode	301
Executing Zeroize using the Zeroize key	301

F

Firmware Copyrights	xii
Fleet Dialing Plan	218
Functions in Lone Worker Mode	280
Functions Related to DTMF Code Encoding	78

G

GPS Data Storage	105
GPS Functions	102, 248
GPS Message Type	103, 249
GPS Position Display	107, 250
GPS Report Back to Requested ID	105
GPS Report Interval Time	102, 248
GPS Report Interval Time (Ignition Off) (Mobile only)	102, 248
GPS Report Interval Time (Portable/Ignition On)	102, 248
GPS Report on Data System-Personality	104
GPS Report on Data Zone-Channel	104
GPS Time Mark	103, 249
Group ID List	35, 201
Group ID Scan	202
Group ID Scan (DMR)	36

H

HORN	368
------	-----

How to Read the In-depth Manual	ix
How to Search for Information	xviii

I

ID Display upon Receipt	229
ID Sent When Emergency Mode is Activated	274
INDEX	395
Indication and Sound in Emergency Mode	270
Indication When Receiving Emergency Call	276
Individual ID List	24, 193
Indoor Location	128
Initiating a Broadcast Call	38, 206
Initiating a Communication in Dialing Mode	223
Initiating a Communication in Redial Mode	228
Initiating a Group Call	32, 197
Initiating an Individual Call	19, 184
Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request)	26
Initiating an Individual Call (Individual Call Acknowledge Request)	27
Initiating Another Call While Receiving a Group Call	205
Initiating a Telephone Call	65, 211
Initiating Voice Communications (Basic Transmission and Reception)	2, 152
In-service Check Time	126
In-service Tone	171
Interrupt Emergency CALL	262
IP Based Packet Data	182

K

KEYD	347
KEYE	347
Key Loader	295
KEY OPERATIONS FOR EACH MODE	377

L

LEDF	348, 369
LEDF2	348, 369

LEDS	348
Locator Tone	270
Locking the Site to Be Used (Site Lock)	231
Lone Worker Interval	281
Lone Worker Type	280
Long Message on Data System-Personality	64
Long Message on Data Zone-Channel	64
Lookback	319
Lookback Time A	319
Lookback Time B	319

M

Making a Group Call	32, 197
Making an Individual Call	19, 183
Making an Informative Group Call (Broadcast Group Call)	38, 206
Man-down Detection	283
Map Header	106, 250
Map Header (Indoor Location)	141
Maximum ACK Wait Time	40, 209
Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)	114
Mobile	328
Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor)	112, 257
Motion Detection	284
Moving to Other Sites that Allow Synchronization with the Repeater (Manual Site Hunt)	120
Multi-key List	303

N

Normal Hunt Control Channel	161
Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)	31
Notifying the User with a Tone That a Call Request Has Been Initiated (Call Request Tone)/ Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)	195
Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone)	31
Number of Retries	40, 209
Number of Times	102

Number of Times (Indoor Location)	136
-----------------------------------	-----

O

Off-hook Site Roaming	125
Optional Signaling LED	4, 154
Other Functions in Emergency Mode	277
Out of Range Indicator	171, 126
Out of Range Tone	171, 126
Over-the-Air Alias	4, 155

P

Participating in an On-going Voice Call Midway Through the Call (Late Entry)	5, 158
Passive Scan	168
Placing the Transceiver in Emergency Mode	260
Placing the Transceiver in Emergency Mode by Using the Activity Detection Function	282
Placing the Transceiver in Emergency Mode Using the Lone Worker Function	278
Portable	328
Power-off Status Message	51
Power-on Scan	328
Power-on Status Message	50
Preamble Length	41, 329, 338
Preventing Reception of a Group Call While the Transceiver Is Receiving an Individual Call (Ignore Group Call during Individual Call)	204
Preventing the Automatic Assignment of a Traffic Channel (FOACSU)	196
Preventing the Functions Working with Group Call Reception from Activating (Call Alert Inhibit (Group Calls Only))	37, 203
Prioritizing Data Communications Using an External Device (Data Override)	330
Prioritizing Own Voice Communications by Terminating Other Voice Communications (Call Interruption)	236
Priority 1 Temporary Delete/Add, Priority 2 Temporary Delete/Add	320
Priority-channel Stop Tone	326
Priority Channel Type (Type)	315
Protection Function of Encryption Key (Key Retention)	297

PTT Hold Inhibit	204
------------------	-----

Q

QUEUE	369
Quick Site Roaming Level	124

R

RACK stime dec	349
RAUXA0	349
RAUXA1	350
RAUXB0	350
RAUXB1	351
RAUXC0	351
RAUXC1	352
Receive	153
Receive Duration	269
Receiving	2
Receiving a Broadcast Group Call	39, 208
Receiving a Call Interruption Forced Command	239
Receiving a Call Interruption Request Command	239
Receiving a Call Interruption Request Message	94
Receiving a Group Call	33, 199
Receiving a High-priority Call (Priority Monitor ID)	156
Receiving a Long Message	63
Receiving an Individual Call	22, 189
Receiving an Individual Call (Individual Call Acknowledge Request)	29
Receiving a Short Message	59
Receiving a Status Message	46
Receiving a Telephone Call	71, 216
Receiving GPS Data	106, 249
Receiving Transceiver Behavior	335
Reception Behavior during the Scan in a DMR-based Trunking System	321
Reception Behavior during the Scan in a DMR Conventional System	321
Redialing	78

Registering the Group ID Used by the Own Transceiver in a System (Group Subscription)	177
Registering the Own Unit ID in a System (Registration)	174
Registration in a DMR-based Trunking System	173
Registration Timer	176
Remote Operation by Radio Communication (Remote Control)	107, 251
REPOF	370
REP rep	352
Restricting IDs for Which the Transceiver Can Initiate a Call (Individual ID Encode Block)	25, 194
Restricting the Communication Time on a Traffic Channel (Traffic Timer)	233
Restricting the Continuous Transmission Duration (Time-out Timer)	6, 159
Restricting the Warning Display during Data Communications (Silent Report)	331
Retaining the Information of the Control Channel Used When the Transceiver is Turned OFF (Last Control Channel)	170
Revert Channel	324
Revision History	xx
RSML ltime	353
RSMS stime	353

S

SCAN	305
Scan by Registering Multiple Target Channels for Scan in the List (List Scan)	308
Scan Function	322
Scan List	310
Scan List Number (Channel)	310
Scanning All Target Zones for Scanning (Multi-Zone Scan)	313
Scanning in One Zone (Single Scan)	306
Scanning the Specific Channel Preferentially (Priority Scan)	315
Scan Normal Channel	320
Scan Stop Tone	329
Scan Type (Scan List)	310
Scrambler/Encryption Status Memory	304

Searching Whether the Transceiver Receives a Call (Scan)	5, 159
Secure Cryptographic Module (SCM) (for AES/ DES Only)	294
SELCH channel	354
Selected Channel Scan	327
Selecting the Transmission Method of GPS Data (GPS Report Channel)	101
Selective Call Alert LED	3, 154
SELGR zone	354
Sending a Call Interruption Request Message	91, 237
Sending a DTMF Code	72
Sending a DTMF Code by Selecting from a List (Autodial List)	76
Sending a Long Message	62
Sending and Receiving a Long Message (Long Data Call)	62, 210
Sending and Receiving a Short Message (Short Data Call)	55, 210
Sending and Receiving a Status Message (Status Call)	41, 210
Sending a Remote Control Message in Remote Control Mode	108, 251
Sending a Short Message	56
Sending a Status Message	42
Sending BLE Data during Voice Communications (BLE Report with Voice)	139
Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))	129
Sending Entered DTMF Codes All at Once (Store and Send)	74
Sending GPS Data	95, 241
Sending GPS Data According to the Request from the Base Station (GPS Report Mode)	97, 244
Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)	96, 243
Sending GPS Data Based On Travel Distance (GPS Distance Change)	100, 247
Sending GPS Data during Voice Communications (GPS Report with Voice)	99, 246
Sending GPS Data Manually by Using a Key (Send the GPS Data)	97, 244
Sending GPS Data Preferentially While Receiving a Group Call (GPS Report Priority (Over Group Call))	247

Sending GPS Data Together With Emergency Call (GPS Combination)	98, 245
Sending GPS Data Together With Status Call (GPS Combination)	98, 245
Sending the BLE Data Linked With the Configured Mode (BLE Combination (Indoor Location))	131
Sending the BLE Data With the Timing of Automatic Transmission Configured (BLE Report Mode (Indoor Location))	133
Sending the DTMF Code by Pressing a Key on the Keypad without Using the PTT Switch (Keypad Auto PTT)	73
Sending the DTMF Code While Transmitting (Manual Dialing)	73
Sending the DTMF Code with a Single Touch (Call 1 Key to Call 6 Key)	77
Sending the Received Short Message from the Communication Port (Short Message Serial Output)	61
Sending the Received Status Message from the Communication Port (Status Message Serial Output)	50
Sending the Received Unit ID from the Communication Port (Unit ID Serial Output)	25, 194
Sharing the Same Channel (Frequency) by Several Groups (Color Code)	14
Short Message on Data System-Personality	61
Short Message on Data Zone-Channel	60
Short Message Stack	60
Site Roaming Behaviors	115
Site Roaming LED	122
Site Roaming Link Delay Time	123
Site Roaming Resume Level	125
Software Copyrights	xii
Standard Site Roaming Level	124
Starting Scanning by Linking with the Microphone (Off-hook Scan)	328
Starting the Scan	305
Stationary Detection	284
Status List	48
Status Message on Data System-Personality	49
Status Message on Data Zone-Channel	49
Status Message Stack	48
STOPS	355

Storing the Selected or Sent Status (Status Hold)	54
STRTS	355
Surveillance Mode	273
Suspended Power-off	277
System Search Policy	169

T

TASK REQUEST	371
Terminating Voice Communications by a Transceiver Other Than the Transmitting Transceiver (Call Interruption)	90
TEXT 'text'	355
The ID of the Target Transceiver (BLE Base ID (Indoor Location))	129
The ID of the Target Transceiver (GPS Base ID)	96, 242
Timing for Sending and Receiving Data	336
Toggling the Encryption during Transmission between Enabled and Disabled	288
TOT Pre-alert	6, 159
TOT Rekey Time	6
TOT Reset Time	7
Transceiver Behavior during the Scan	321
Transceiver behavior during transmitting	187
Transceiver Behavior in the Case that the Scan Cannot Be Resumed (List Scan)	310
Transceiver Behavior in the Case that the Scan Cannot Be Resumed (Multi-Zone Scan)	314
Transceiver Behavior in the Case that the Scan Cannot Be Resumed (Single Scan)	307
Transceiver Behavior upon Receipt of Encrypted Communication Data	291
Transceiver Behavior When a Zone-channel Is Changed during the Scan	321
Transceiver behavior when receiving a Group Call	34
Transceiver behavior when receiving an Individual Call (Individual Call Acknowledge Request)	30
Transceiver behavior when receiving an Individual Call/ Paging Call	23
Transceiver Behavior When the Transceiver Receives an Emergency Status	285
Transition for Each Mode	17, 183
Transmission Method of GPS Data	95, 241

Transmit Busy Wait Time	40
Transmit Clear Alert Tone	304
Transmit Duration	269
Transmitting	5, 159
Transmitting Transceiver Behavior	333
Transparent	332, 337
Transparent Header	337
Transparent on Data System-Personality	338
Transparent on Data Zone-Channel	337
Trunked Channel Plan	161
TXTOF	356

U

Using a Channel Being Used by Other Parties (BCL Override)	9
Using Autodial List	82
Using DMR ID to Initiate a Selective Call	17, 183
Using Man-down Detection and Stationary Detection Simultaneously (Man-down with Stationary)	285
Using the Signaling	14

V

Various configurations for Dialing Codes	218
VIB	356, 370
Vote Now	165

W

Waiting for Both Digital Signals and Analog Signals (Mixed Mode)	15
---	----

Z

Zone-channel Functioning in Emergency Mode	265
---	-----