

NX-5000 series

NXDN Function Reference (NXDN FUNC)

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About This Manual

This manual describes the functions of the NX-5200/ NX-5200LG/ NX-5300/ NX-5300LG/ NX-5400/ NX-5600H/ NX-5700/ NX-5700H/ NX-5800/ NX-5800H/ NX-5900 transceiver operated in the NXDN 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 of the transceiver displays the firmware version 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, the following Radio Feature License is required to use the functions of the NXDN system described in this manual:

Function Name	Radio Feature License Name
NXDN Conventional ^{*1}	KWD-5200CV
NXDN Type-C Trunking ^{*2}	KWD-5201TR
NXDN OTAP ^{*1}	KWD-5204AP
microSD ^{*3}	KWD-5002SD
Secure Cryptographic Module ^{*1}	KWD-5005AE
DES 4 Keys ^{*1}	KWD-5006DE
Remote Control	KWD-5007RC
Indoor Location ^{*4}	KWD-5020-IL

^{*1} Implemented before the factory shipment for the K- and F-type transceiver.

^{*2} Implemented before the factory shipment for the K-type transceiver.

^{*3} Cannot be implemented for NX-5200LG/ NX-5300LG.

^{*4} Cannot be implemented for NX-5200S/ NX-5300S/ NX-5700/ NX-5800/ NX-5900/ NX-5700S/ NX-5800S/ NX-5600H/ NX-5700H/ NX-5800H.

IMPORTANT NOTICE:

THOSE WHO INTEND TO EXPORT OR RE-EXPORT OR TRANSPORT ANY COMPUTER(S) AND/OR ANY KINDS OF PERIPHERAL DEVICE(S) WITH AES/DES ENCRYPTION SOFTWARE INSTALLED (INCLUDING TRANSCEIVERS WITH ANY SOFTWARE FOR AES/DES ENCRYPTION) OUTSIDE OF A COUNTRY OR REGION WITH SUCH CONTROLS OR RESTRICTIONS MUST FULLY COMPLY WITH ANY EXPORT AND IMPORT LAWS AND REGULATIONS OF THE COUNTRY OR REGION AND OBTAIN ALL REQUIRED AUTHORIZATIONS OR LICENSES IN ADVANCE.

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 the transceiver and the key of the PC.

" " (Double Quotation Mark)

The characters in " " indicate the name of the functions, buttons, and menus shown on the SE KPG-D1 or the display of the transceiver.

Bold Letters

The characters in bold letters indicate the name of the windows, tabs, checkboxes in SE KPG-D1 and functions assigned to keys on the transceiver.

[] + []

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 Name	Notation	
NX-5200	Portable	VHF
NX-5200LG ^{*2}		VHF
NX-5300		UHF
NX-5300LG ^{*2}		UHF
NX-5400		700 MHz/ 800 MHz
NX-5600H ^{*1}	Mobile	VHF
NX-5700		VHF
NX-5700H		VHF
NX-5800		UHF
NX-5800H		UHF
NX-5900		700 MHz/ 800 MHz

^{*1} This is a Low Band model. The following systems are not supported in the NXDN system:

- NXDN Site Roaming system
- NXDN Site Roaming with RAN system
- NXDN Trunking system

^{*2} Refer to Common FUNC "About NX-5200LG/ NX-5300LG" about NX-5200LG/ NX-5300LG.

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.

Because the display is limited to monochrome for NX-5200LG/ NX-5300LG, the NX-5200LG/ NX-5300LG display differs from the display in this manual (color display).

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
AUX	Auxiliary
BCL	Busy Channel Lockout
CH	Channel
COM port	Communications port
CW	Continuous Wave
DES	Digital Encryption Standard
DFA	Direct Frequency Assignment
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
PF	Programmable Function
PTT	Push-to-Talk
QT	Quiet Talk
RAN	Radio Access Number
RSSI	Received Signal Strength Indication
RX	Receive
TOT	Time-out Timer
TX	Transmit
UID	Unit ID
UTC	Universal Time Coordinated

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About NXDN

NXDN™ is a very narrowband protocol employing 6.25 kHz/ 12.5 kHz FDMA technology.

NXDN™ is the result of a joint technical alliance between Icom Incorporated and JVCKENWOOD Corporation.

About NEXEDGE

NEXEDGE is a generic term to describe the KENWOOD proprietary digital communications system which complies with NXDN common air interface specifications.

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 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...).

Example: Configuring **Selcall on PTT**

For the Personality format:

Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Selcall on PTT

For the Channel Table format:

Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Selcall on PTT

Configuration items:

- Configuring **Selcall on PTT**
- Configuring **Alert Tone/ Alert LED Color**
- Configuring **Group ID**
- Configuring **Lone Worker** to be enabled or disabled
- Configuring **Activity Detection** to be enabled or disabled

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, “NXDN Conventional” or “NXDN 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 an NXDN Conventional or NXDN 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 > NXDN Conventional/ NXDN Site Roaming/ NXDN Site Roaming with RAN > Unit ID (Own))

In this case, if “NXDN Conventional” is configured in **System Type** of **System Information**, **Unit ID (Own)** in NXDN Conventional 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)
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) • KMC-9C (Desktop Microphone) • KMC-53 (Desktop Microphone) • KMC-65 (Microphone) • KMC-66 (Microphone with 12-Keypad) • KAP-2 (PA, HA Unit) • KES-3 (External Speaker) • KES-5 (External Speaker) • KES-5A (External Speaker) • KCT-18 (Ignition Sense Cable) • KCT-46 (Ignition Sense Cable) • KCT-71 (Remote Control Cable) • KCT-72 (Connection Cable) • KCT-77 (Remote Control Cable) • KCT-73MIC (External Microphone) • 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)

About the Built-in GPS Receiver Unit

The GPS receiver unit is built-in for NX-5200/ NX-5200LG/ NX-5300/ NX-5300LG/ NX-5400/ NX-5600H/ NX-5700/ NX-5700H/ NX-5800/ NX-5800H/ NX-5900. Read the following warnings before using the built-in GPS receiver unit:

● **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.

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Blue characters in the main text

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

About Trunking Type

To establish various types of communications in an NXDN Trunking system, **Trunking Type** along with the configuration of the system. Refer to “**Trunking Type**” for **Trunking Type**.

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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.

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Revision History

Date	Description
2016.1.29	1) Added NX-5900 (700 MHz/ 800 MHz model) as a supported model. 2) Added the information of KCH-20R (Featured Panel) as a supported Control Head. 3) Added KPG-36X and KPG-46X as supported programming cables. 4) Changed the description in "About this Manual" as follows: • Changed the version information • Changed the Left Up key to the [+] key • Added Radio Feature License 5) Added terms to "Abbreviations Used in this Document". 6) Added "About Multi RF Deck/ Multi Control Head". 7) Added option information to "About Options to Use the Functions Described in this Document". 8) Corrected the address of the reference help texts according to V1.60 of the help texts. 9) Added the description of Auto Reset Type to "Auto Reset Timer" for NXDN Conventional and NXDN Trunking. 10) Added DTMF and 2-tone to the following items as signaling corresponding to Optional Signaling (NXDN): - Displaying the ID of the Communicating Caller on the LCD (Caller ID Display) - Participating in an On-going Voice Call Midway Through the Call (Late Entry) 1.2 Using the Signaling - Using the Optional Signaling (NXDN) - Reception Behavior during the Scan in an NXDN Conventional System 11) Added "Multi-Zone Scan" to "Searching Whether the Transceiver Receives a Call (Scan)" for NXDN Conventional and NXDN Trunking. 12) Added "Changing the Standby Display (Channel Information)" to "1.1 Initiating Voice Communications (Basic Transmission and Reception)". 13) Added the description related to the behavior of a channel with "Mixed" configured in Channel Type to the following items: - Avoiding Interference with Other Communications (Busy Channel Lockout) - Using the Optional Signaling (NXDN) - Unmuting the Speaker (Audio Control (NXDN)) - Temporarily Disabling the Signaling (Monitor) - Unmuting the Speaker by Linking with the Microphone (Off-hook Decode) 4.1 Toggling the Encryption during Transmission between Enabled and Disabled 14) Added the note to "Using a Channel Being Used by Other Parties (BCL Override)". 15) Added the description of the NX-5400/ NX-5900 behavior to "Communicating Without Using a Repeater (Talk Around)". 16) Added the note to "Temporarily Disabling the Squelch (Squelch Off)". 17) Added "1.3 Waiting for Both Digital Signals and Analog Signals (Mixed Mode)". 18) Corrected the step 1 screen for "Initiating an Individual Call (Individual Call Acknowledge Request)". 19) Corrected the step 1 screen for "Receiving an Individual Call (Individual Call Acknowledge Request)". 20) Added the status numbers of Emergency Status to the description in "Emergency Status Response". 21) Added "Voice Announcement" to Table 1-11. 22) Added "1.12 Using 2-tone to Initiate an Individual Call". 23) Moved the following items to "2.18 Sending GPS Data": - Sending GPS Data on a Channel in an NXDN Conventional System (GPS Data Zone-Channel) - Sending GPS Data Preferentially While Receiving a Group Call (GPS Report Priority (Over Group Call)) 24) Added "Selecting the Transmission Method of GPS Data (GPS Report Channel)" to "1.14 Sending GPS Data". 25) Added the note to "1.17 Disabling the Transceiver Capability by Remote Control (Stun/ Kill)". 26) Added "1.19 Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)". 27) Added "DFA Hunt Sequence" to Table 2-2. 28) Added "Telephone Call" to "Available Calls" in "2.4 Using NXDN ID to Initiate a Selective Call". 29) Corrected the step 1 screen for "Initiating an Individual Call (Message Trunked (Enhanced))". 30) Added the note to "Initiating an Individual Call (Message Trunked (Enhanced))".

Date	Description
2016.1.29	31) Corrected the step 1 screen and step 2 screen for "Receiving an Individual Call (Message Trunked (Enhanced))". 32) Corrected the step 1 screen and step 2 screen for "Initiating an Individual Call (Message Trunked (Enhanced))". 33) Added the note to "Initiating a Group Call (Message Trunked (Enhanced))". 34) Added the following items: 2.14 Communicating with a Telephone (Telephone Call) 2.15 Using a Frequency Added to a System Without Changing the Transceiver Configuration (Direct Frequency Assignment) 2.16 Automatically Switching the System (System Auto Select) 35) Added the description about the manual entry of the site number to "2.17 Locking the Site to Be Used (Site Lock/ Site Select)". Corrected the step 1 screen. 36) Added "Selecting the Transmission Method of GPS Data (GPS Report Channel Type)" to "2.21 Sending GPS Data". 37) Added the note to "3.1 Placing the Transceiver in Emergency Mode". 38) Added "About the Behavior in Emergency Mode in a Site Roaming Zone" to "3.2 Configuration Related to Transmission and Reception in Emergency Mode". 39) Added the note to "Emergency Channel Type". 40) Added the note to "Background Transmission". 41) Corrected the description in "Emergency LED". 42) Added the note to "3.6 Sending an Emergency Status on the Control Channel (Emergency Status on Control Channel)". 43) Added the description of the turn-off behavior for Mobile to "Suspended Power-off". 44) Added the description of DES encryption type (Built-in DES) in "4 COMMUNICATION SECURITY". 45) Added KWD-DE31 and DES encryption type (Built-in DES) to Table 4-1. 46) Added KWD-DE31 to Table 4-3. 47) Added "4.5 Built-in DES". 48) Added the description of Multi-Zone Scan to "5 SCAN". 49) Added the note related to Site Roaming in an NXDN Conventional system to "5 SCAN". 50) Added "5.4 Scanning All Target Zones for Scanning (Multi-Zone Scan)". 51) Added "Adding or Deleting a Zone to or from the Target Zones for Scanning (Zone Delete/Add)". 52) Added the conditions to the note in "6.1 Prioritizing Data Communications Using an External Device (Data Override)". 53) Added the conditions to the description in "6.2 Restricting the Warning Display during Data Communications (Silent Report)". Added the note. 54) Added the keys of KCH-20R (Featured Panel) to the table in "Key Operations for Each Mode". 55) Added 2-tone Mode to "Key Operations for Each Mode". 56) Changed the version number from 1.00 to 1.60 (the Japanese draft version only).
2016.6.20	1) Corrected each version information in "About this Manual". 2) Added the description related to Talk Around Key to "Communicating Without Using a Repeater (Talk Around)". 3) Added the description related to the configuration for decoding Optional Signaling to "Using the Optional Signaling (NXDN)". 4) Added the following items to "1.12 Using 2-tone to Initiate an Individual Call": - Using the PC Command to Send the 2-tone Code - Decoding the 2-tone Code 5) Added the note to "Selecting and Sending the 2-tone Code from a List" of "1.12 Using 2-tone to Initiate an Individual Call". 6) Added "1.13 Using DTMF to Initiate a Selective Call". 7) Added "2.2 Using the Optional Signaling (Optional Signaling for Group Call)". 8) Added "2.15 Using 2-tone to Initiate an Individual Call". 9) Added "Sending GPS Data by Using a GPS Data Transmission Channel (GPS Report Channel)" to "2.23 Sending GPS Data". 10) Changed the version number from 1.60 (the Japanese draft version only) to 1.70.

Date	Description
2016.9.30	1) Changed the version information in "About This Manual". 2) Added the DMR and 5-tone information to "How to Read the In-depth Manual". 3) Added the description about DMR to the note in "1.18 Disabling the Transceiver Capability by Remote Control (Stun/ Kill)". 4) Added the description about the Multi-System Background Hunt to "Background Hunt" in "2.3 Control Channel Hunt (Control Channel Hunt)". 5) Added the description about the Multi-System Hunt to the note in "Starting the Control Channel Hunt Manually (Forced Search)". 6) Added "Out of Range Indicator/ Out of Range Tone" in "2.3 Control Channel Hunt (Control Channel Hunt)". 7) Added the description about the Multi-System Hunt to the note in "2.19 Locking the Site to Be Used (Site Lock/ Site Select)". 8) Added "2.27 Communicating Using Multiple Systems (Multi-System Roaming)". 9) Added "System Select Mode" in "7 KEY OPERATIONS FOR EACH MODE". 10) Added "Out of Range Tone" in "8 BEEP LIST". 11) Changed the version number from 1.70 to 2.00.
2017.6.30	1) Changed the version information in "About This Manual". Added Remote Control to the table for Radio Feature License. 2) Added description on Optional Signaling LED in Table 1-1. 3) Added "Optional Signaling LED" to "1.1 Initiating Voice Communications (Basic Transmission and Reception)". 4) 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 1.9 Sending and Receiving a Status Message (Status Call) 5) Added description on Optional Signaling LED to the following section: 1.5 Making an Individual Call 1.6 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Individual Call Acknowledge Request) 1.7 Making a Group Call 6) Deleted "The default configuration is normally used." from the descriptions in the following items in "1.8 Common Functions for Data Communications": - Transmit Busy Wait Time - Maximum ACK Wait Time - GTC Count - ACK Delay Time - Transmit Delay Time (Receive Capture) - Data Transmit Modulation Delay Time 7) Revised the description on the number of data that can be saved and deleted supplementary notes in "Status Message Stack". 8) 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". 9) Added "1.18 Remote Control by the Wireless Transmission (Remote Control)" and changed the layout and descriptions in the following items: - Disabling the Transceiver Capability by Remote Control (Stun/ Kill) - Monitoring the Situation Around Another Transceiver by Remote Control (Remote Monitor) - Checking Whether Another Transceiver Is in Operation (Radio Check) 10) Added the description on Site Roaming LED and the description and note related to Revert Channel backup in "Site Roaming Behavior". 11) Added description on Optional Signaling LED in Table 2-1. 12) Added "Optional Signaling LED" to "2.1 Initiating Voice Communications (Basic Transmission and Reception)". 13) Added descriptions on the use of PC commands to the following: - Initiating an Individual Call (Transmission Trunked) - Initiating an Individual Call (Message Trunked (Enhanced)) - Initiating a Group Call (Transmission Trunked) - Initiating a Group Call (Message Trunked (Enhanced)) 2.10 Making an Informative Group Call (Broadcast Group Call)

Date	Description
2017.6.30	14) Added description on Optional Signaling LED to the following section: 2.6 Making an Individual Call (Transmission Trunked) 2.7 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) 2.8 Making a Group Call (Transmission Trunked) 2.9 Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced)) 2.10 Making an Informative Group Call (Broadcast Group Call) 2.16 Communicating with a Telephone (Telephone Call) 15) Deleted "The default configuration is normally used." from the descriptions in the following items in "2.11 Common Functions for Data Communications": - Transmit Busy Wait Time - Maximum ACK Wait Time 16) Added supplementary notes on the emission of Emergency Locator Tone in "Duration of Locator Tone 1" and "Duration of Locator Tone 2". 17) Added description on Non-Priority Scan LED and Priority Scan LED to the following sections: 5.2 Scanning in One Zone (Single Scan) 5.3 Scan by Registering Multiple Target Channels for Scan in the List (List Scan) 5.4 Scanning All Target Zones for Scanning (Multi-Zone Scan) 18) Added description on LTR and Conventional in Table 5-1. 19) Changed the transceiver screen in "5.4 Scanning All Target Zones for Scanning (Multi-Zone Scan)". 20) Revised the supplementary notes on Priority-channel Stop Tone in "5.5 Scanning the Specific Channel Preferentially (Priority Scan)". 21) Revised description on "Priority-channel Stop Tone". 22) Changed the version number from 2.00 to 2.20.
2017.9.29	1) Changed the version information in "About This Manual". 2) Changed "Out of Range Indicator/ Out of Range Tone" to "Out of Range Indicator". Added "Out of Range Tone" and "In-service Tone". 3) Added "In-service Tone" to "● Control Tone" in "8 BEEP LIST". 4) Changed the version number from 2.20 to 2.30.
2018.4.9	1) Changed the version information in "About This Manual". 2) Amended "Table 1-14 No. of Short Message Data that Can be Saved" in "1.10 Sending and Receiving a Short Message (Short Data Call)". 3) Added "Sending and Receiving a Short Message (Short Data Call (Extended))" to "1.10 Sending and Receiving a Short Message (Short Data Call)". 4) Added conditions under which reset is not performed to "Hook (Mobile only)" in Table 1-20 and Table 1-27. 5) Added description on the behavior to "Quick Site Roaming Level". 6) Added description on the behavior to "Disabled" in Table 1-35. 7) Added "LCD Brightness" to the list of configurable functions as an Emergency Profile to "3.2 Configuration Related to Transmission and Reception in Emergency Mode". 8) Changed the description of "Background Transmission". Added the note. 9) Added the note to "Emergency LED". 10) Added the note to "Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode". 11) Added description on the behavior to "Disabled" in Table 5-6. 12) Added "7 Digital Encode/ Decode Format". 13) Added "8 Task Request". 14) Changed the version number from 2.30 to 2.50.

Date	Description
2018.8.24	1) Changed the version information in "About This Manual". 2) Revised "Sending GPS Data Together With Emergency Call (GPS Combination)" in "1.15 Sending GPS Data". 3) Added the following items to "2.8 Making a Group Call (Transmission Trunked)": Initiating Another Call While Receiving a Group Call Late Entry Cancel Time 4) Added the description related to an NXDN Trunking system to the note in "Sending and Receiving a Short Message (Short Data Call (Extended))". 5) Added the following items to "7 DIGITAL ENCODE/ DECODE FORMAT": Auto Reset Timer AUTR 6) Changed the version number from 2.50 to 2.60.
2019.6.28	1) Changed the version information in "About This Manual". 2) Added "NX-5600H" and "NX-5700H" to "About the Notation of the Supported Models". 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 description of the behavior during receipt of a status in "Checking Whether Another Transceiver Is in Operation (Radio Check)". 5) Added the description of the RSSI level to the behavior when "Channel Table" is configured in Zone-channel Format" in "Site Roaming Behaviors". 6) Added "Transmission Operation during Receipt of a Group Call" to "2.8 Making a Group Call (Transmission Trunked)". 7) Added the description of the behavior to "Late Entry Cancel Time". 8) Added the description of GPS data transmission to "Sending GPS Data Preferentially While Receiving a Group Call (GPS Report Priority (Over Group Call))". 9) Added the description related to an NXDN Trunking system to the note in "Emergency Channel Type". 10) Changed the version number from 2.60 to 4.00.
2019.12.6	1) Changed the version information in "About This Manual". 2) Added "NX-5800H" to "About the Notation of the Supported Models". 3) Revised the description related to key operation of the following items: Sending a Status Message Sending a Short Message 4) Added the note related to the transceiver behavior in Emergency Mode to "3.1 Placing the Transceiver in Emergency Mode". 5) Added "GPS Data" to Table 4-1. 6) Added the description related to the error display in the following items of "6.3 Transparent": Transmitting Transceiver Behavior Receiving Transceiver Behavior 7) Revised the operation descriptions for the following modes of "8 KEY OPERATIONS FOR EACH MODE". Individual Call Mode Group Call Mode 8) Changed the version number from 4.00 to 4.20.

Date	Description
2020.7.10	1) Changed the version information in "About This Manual". 2) Deleted the description of not supporting the frequency range between 450 MHz and 520 MHz in "NX-5800H" from "About the Notation of the Supported Models". 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) Corrected the description related to GPS Report Channel in "Selecting the Transmission Method of GPS Data (GPS Report Channel)". 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.
2023.6.9	1) Changed the version information in "About This Manual". 2) Added the following items: 1.14 Communicating with a Telephone (Telephone Call) 1.21 Out of Range Indicator Group-registration Timer 4.10 Radio Access Control 3) Corrected the description and the note description related to Priority Monitor ID in "Receiving a High-priority Call (Priority Monitor ID)". 4) Added the conditions of when the transceiver begins Registration in "Conditions for the transceiver to begin Registration". 5) Added the note to "Revert Channel". 6) Changed the version number from 4.31 to 5.10.
2024.9.6	1) Changed the version information in "About This Manual". 2) Added the information related to NX-5200LG/ NX-5300LG to "About the Notation of the Supported Models". 3) Added the note related to NX-5200LG/ NX-5300LG to "GPS Data Storage". 4) Changed the version number from 5.10 to 5.20.
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 "BLE Data" to the description of "Base ID". 7) Added the description of the configuration shared by GPS and BLE. 8) Added "Send the Location Data" to the following items: Sending GPS Data Based On Travel Distance (GPS Distance Change) Selecting the Transmission Method of GPS Data (GPS Report Channel) Selecting the Transmission Method of GPS Data (GPS Report Channel Type) 2.26 Communicating Using Multiple Systems (Multi-System Roaming) 9) Added "1.22 Indoor Location (NXDN)". 10) Added "2.28 Indoor Location (NXDN Trunking)". 11) Added "BLE Data", "BLE Combination" to Table 4-1. 12) Added the description related to BLE transmission to "6.2 Restricting the Warning Display during Data Communications (Silent Report)". 13) Changed the version number from 5.20 to 5.30.

Functions for an NXDN Conventional System

Making an Individual Call

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

Making an Individual Call

Page 23

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 37

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 30

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 46

Sending and Receiving a Short Message

A user can send and receive a message with a maximum of 100 characters.

Sending and Receiving a Short Message (Short Data Call)

Page 57

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 100

Avoiding Interference with Other Communications

If a channel to be used for the transceiver to transmit is being used by other parties, the transmission of the transceiver on the channel is automatically restricted.

Avoiding Interference with Other Communications (Busy Channel Lockout)

Page 10

Using the Indoor Location Function

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

Indoor Location (NXDN)

Page 130

Functions for an NXDN Trunking System	Making an Individual Call A user can establish voice communication by calling an individual target transceiver. Making an Individual Call (Transmission Trunked) Page 169	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 (Transmission Trunked) Page 184
	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 (Message Trunked (Enhanced)) Page 177	Making a Group Call while Retaining the Link to a Traffic Channel The transceiver can retain the link to a traffic channel during communications using Group Call. Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced)) Page 194
	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 197	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 201
	Sending and Receiving a Short Message A user can send and receive a message with a maximum of 100 characters. Sending and Receiving a Short Message (Short Data Call) Page 201	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 229
	Using the Indoor Location Function Indoor Location is the function to manage the position of the transceiver by using Bluetooth. Indoor Location (NXDN Trunking) Page 246	
Security	Enhancing Communication Security The transceiver is equipped with functions to enhance secrecy in communications on each analog channel or digital channel. COMMUNICATION SECURITY Page 273	

NXDN CONVENTIONAL SYSTEM

NXDN is a generic name for a digital communication system protocol utilizing 4-level FSK. Using NXDN, the transceiver can initiate an Individual Call or Group Call for voice calls, communicate various types of messages, or send and receive GPS data. Also, connecting a transceiver to an external device (such as a PC) allows communication because the NEXEDGE transceiver supports serial command communication.

In an NXDN Conventional system, communications are realized by sending and receiving digital signals on an NXDN digital channel. Using an NXDN ID (Unit ID or Group ID) allows the various communications.

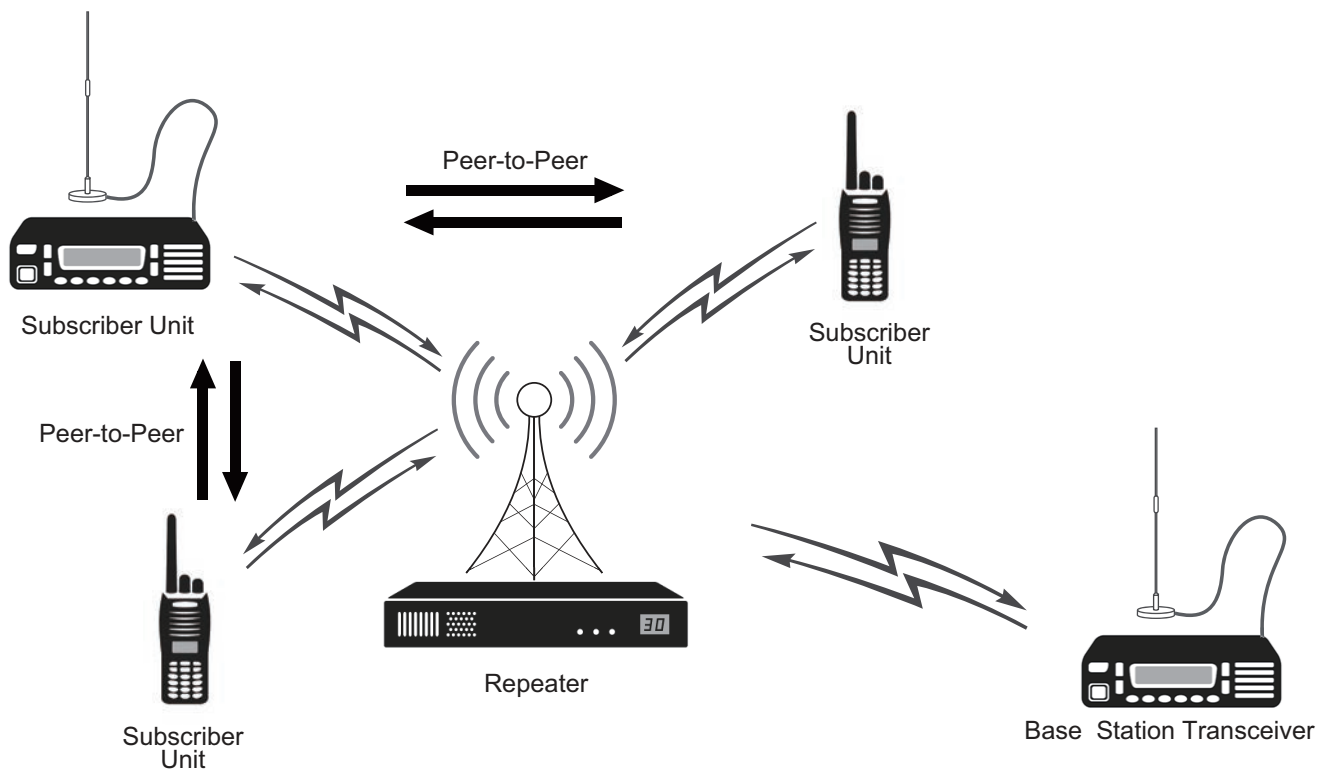


Figure 1-1 Image of Communications in an NXDN Conventional System

1.1 Initiating Voice Communications (Basic Transmission and Reception)

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

About Own ID

To initiate various communications using NXDN, a 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 0001 and FFEF (hexadecimal), or between 1 and 65519 (decimal).

If **Global ID** is enabled, a Unit ID is shared by all NXDN Conventional and NXDN Trunking.

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

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

Note

- Since the management systems of own ID in P25, NXDN and DMR are different from one another, an own ID needs to be configured for each of them separately.

Configuration using KPG-D1/ D1N

- Configuring **Unit ID (Own)** and **Unit ID Name (Own)** ( See Transceiver Settings > Personal > System Information > NXDN Conventional/ NXDN Site Roaming/ NXDN Site Roaming with RAN > Unit ID (Own))
- Configuring **Global ID** to be enabled or disabled ( See Transceiver Settings > Personal > System Information > NXDN Conventional/ NXDN Site Roaming/ NXDN Site Roaming with RAN > 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 an NXDN digital channel. (Refer to **COMMUNICATION SECURITY**.)

Receive

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 has waited for or the NXDN ID matches the NXDN ID preconfigured for the transceiver. When a signaling (RAN) is used, communications are possible if the received RAN code matches the RAN code which the transceiver waits for.

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.

In **Auto Reset Type**, whether the common **Auto Reset Timer** configuration is applied to all communications or 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 Type		Common: All communications behave according to the configurations in Auto Reset Timer , LCD , LED , and Alert Tone configured in Common/Voice . Custom: Voice communications behave according to the configurations in Auto Reset Timer , LCD , LED , and Alert Tone configured in Common/Voice . Data communications behave according to the configurations in Auto Reset Timer , LCD , and Alert Tone configured in Message .
Auto Reset Timer (Common/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 (Common/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 (Common/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 (Common/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 Type** ( [See](#) Transceiver Settings > NXDN > NXDN Information > General > Auto Reset)
- Configuring **Auto Reset Timer (Common/Voice)** ( [See](#) Transceiver Settings > NXDN > NXDN Information > General > Auto Reset > Common/Voice)
- Configuring **Auto Reset Timer (Message)** ( [See](#) Transceiver Settings > NXDN > NXDN 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 an NXDN 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 > NXDN > NXDN Information > Conventional)
- Configuring **Alert LED Color** ( [See](#) Transceiver Settings > NXDN > NXDN Information > Conventional > Alert LED Color)
- Configuring **Alert LED Color (Individual ID List)** ( [See](#) Transceiver Settings > NXDN > Individual ID List > Alert LED Color)
- Configuring **Alert LED Color (Group ID List)** ( [See](#) Transceiver Settings > NXDN > Group ID List > Alert LED Color)

Optional Signaling LED

Optional Signaling LED is the function to flash the LED yellow when the received Optional Signaling matches the Optional Signaling preconfigured in 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 > NXDN > NXDN Information > Conventional)

Displaying the ID of the Communicating Caller on the LCD (Caller ID Display)

Caller ID Display can be used to display the caller's Unit ID Name or Unit ID on the display when the transceiver receives a call in an NXDN Conventional system.

In addition to the above function, the received Unit ID or Group ID can be displayed on the display upon the receipt of the signals transmitted by the transceiver using Group Call.

A user can identify the caller not only by voice, but also through the display.

Depending on the configuration of **Caller ID Display** (Off, RAN, or RAN and Selcall), the operation of the transceiver receiving a call in an NXDN Conventional system is as follows.

- **Off**

When the transceiver receives an NXDN digital signal in an NXDN Conventional system, the received ID does not appear on the display.

- **RAN**

When the transceiver receives a signal transmitted only using the RAN code, the received Unit ID Name or Unit ID appears on the main display if the received RAN code matches the RAN code preconfigured in the transceiver, regardless of the **Optional Signaling (NXDN)** configuration.

If the transceiver receives a Group Call, **Caller ID Display** will not be activated.

- **RAN and Selcall**

When the transceiver receives a signal transmitted only using the RAN code, the received Unit ID Name or Unit ID appears on the main display if the received RAN code matches the RAN code preconfigured in the transceiver, regardless of the **Optional Signaling (NXDN)** configuration.

If the transceiver stands by on the channel where "None", "DTMF", or "2-tone" is configured in **Optional Signaling (NXDN)** when the transceiver receives a Group Call, and if the received RAN code matches the RAN code preconfigured in the transceiver, the received Unit ID Name or Unit ID, and Group ID appear on the display according to the **Unit ID Display on Group Call** configuration.

If the transceiver receives a Group ID which is not registered in the Group ID List, Group ID No. will appear. If the Group ID is not registered in the Group ID List upon the receipt of a Group ID for which "ALL" is configured, **Caller ID Display** will not be activated. Also, if the transceiver stands by on the channel where "NXDN ID" is configured for **Optional Signaling (NXDN)**, **Caller ID Display** will not be activated.

Note

- If the transceiver receives an individual call or a group call using NXDN ID, **Caller ID Display** will not be activated. If the transceiver receives an individual call using NXDN ID, the caller's ID appears. If the transceiver receives a group call using NXDN ID, the message appears according to the configuration for Unit ID Display on Group Call. (Refer to **Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)**.)
- **Caller ID Display** is the function to display the caller information while communicating with the caller. Therefore, a user cannot reply to the displayed Unit ID or Group ID, unlike an individual call or group call using NXDN ID.
- The transceiver can acquire the log data of operating time by sending information of the received Unit ID to a PC.

Configuration using KPG-D1/ D1N

Configuring **Caller ID Display** ( **See** Transceiver Settings > NXDN > NXDN 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 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.

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.
- 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.
- Configure **Over-the-Air Alias** for each of NXDN Conventional and NXDN Trunking systems. The Unit ID Name (Own) configured for each system is used for the Unit ID Name to be transmitted.

Configuration using KPG-D1/ D1N

- Configuring **Over-the-Air Alias** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > NXDN Conventional/ NXDN Site Roaming/ NXDN Site Roaming with RAN > Unit ID (Own))
- Configuring **Unit ID Name (Own)** ( **See** Transceiver Settings > Personal > System Information > NXDN Conventional/ NXDN Site Roaming/ NXDN Site Roaming with RAN > 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 an NXDN 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. However, the transceiver cannot participate in an on-going individual call or group call using signaling (such as DTMF and 2-tone) even if the transceiver receives signaling midway through the call, since signaling is sent one-time when starting transmission.

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 an NXDN Conventional system.

- Single Scan
- List Scan
- Multi-Zone Scan

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

Changing the Standby Display (Channel Information)

Channel Information is the function to change the standby display by operating the transceiver.

The standby display can be changed to the channel name display, Zone-channel number display, transmit and receive frequencies display, transmit and receive QT/DQT display, or transmit and receive RAN display.

By pressing the **Channel Information** key, the display toggles in the following order:

channel name → Zone-channel number → transmit and receive frequencies → transmit and receive QT/DQT → transmit and receive RAN → channel name ...

In **Channel Information**, the frequency display is available, but the display is restricted from being toggled for the zone number 100 or later in order to avoid disclosure of frequency information. The display can be toggled only if the selected Zone-channel satisfies all of the following conditions:

System Type: Analog Conventional or NXDN Conventional

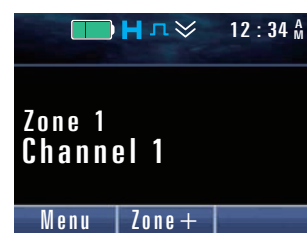
Channel Type: Analog, NXDN or Mixed

Zone: 1 to 99

If a Zone-channel which does not satisfy these conditions is selected, the display is not toggled even if the **Channel Information** key is pressed.

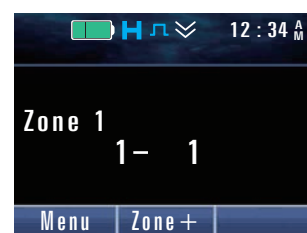
Channel name display

The channel name appears. The default after writing the configuration data is the channel name display.



Zone-channel number display

The Zone-channel number appears.



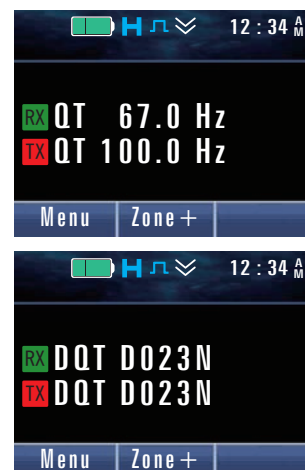
Transmit and receive frequencies display

The transmit and receive frequencies configured for the selected Zone-channel appear. If no frequency is configured, "No Frequency" appears.



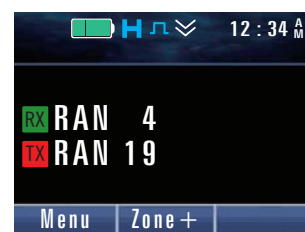
Transmit and receive QT/DQT display

The QT/DQT configuration of the transmitting transceiver and the QT/DQT configuration of the receiving transceiver configured for the selected Zone-channel appear. If "None" is configured for QT/DQT, "QT/DQT None" appears.



Transmit and receive RAN display

The RAN configuration of the transmitting transceiver and the RAN configuration of the receiving transceiver configured for the selected Zone-channel appear. If "None" is configured for RAN, "RAN None" appears.



Note

- In a Multi RF Deck structure for Mobile, if all of the RF Deck channel names appear on the standby display, the display of each RF Deck mandatorily corresponds to the Display Format configuration. In this case, the display is not toggled even if the **Channel Information** key is pressed. (Refer to Common FUNC MULTI RF DECK/ MULTI CONTROL HEAD.)
- If **Talk Around** is enabled, in each display of the transmit and receive frequencies, the transmit and receive QT/DQT, and the transmit and receive RAN, the transmitting transceiver (TX) displays the same information as the receiving transceiver (RX) according to the configuration in **Talk Around**. However, for a channel for which the transmit frequency is not configured, "No Frequency" appears on the transmitting transceiver (TX).
- If **OST** is enabled, the transmit and receive QT/DQT appears according to the configuration in **OST**.
- The **Channel Information** key and the **Display Format** key cannot be configured at the same time for the transceiver. Also, the same applies to when "Display Format" is configured for Menu Mode or the **Lever** switch.
- If the **Channel Information** key is configured for the transceiver, the standby display appears according to the specifications of **Channel Information**. If the **Display Format** key is configured for the transceiver, the standby display appears according to the specifications of **Display Format**.
- If neither the **Display Format** key nor the **Channel Information** key is configured for the transceiver, the standby display appears according to the configuration in **Display Format** of KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

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

Transmitting

Transmitting can be initiated by pressing the **PTT** switch, or by selecting an NXDN ID and then pressing the **PTT** switch. When a signaling (RAN) is used, the transceiver sends the RAN code. In this case, if the transmitted RAN code matches the RAN 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 avoid 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

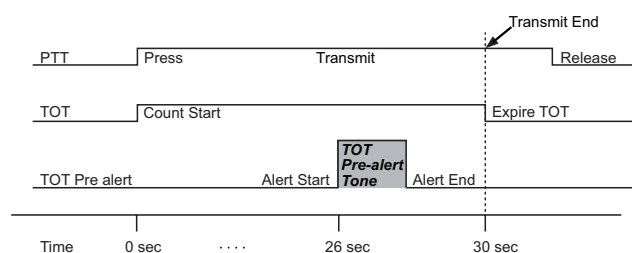


Figure 1-2 TOT Pre-alert

Note

- If "Off" is configured for **TOT Pre-alert**, no TOT Pre-alert tone will sound 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

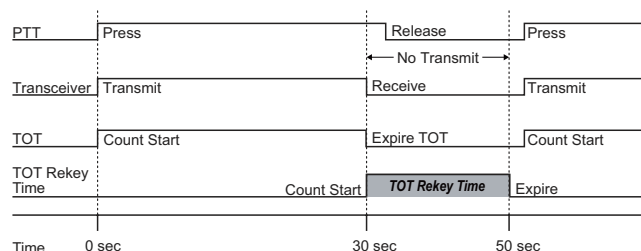


Figure 1-3 TOT Rekey Time

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

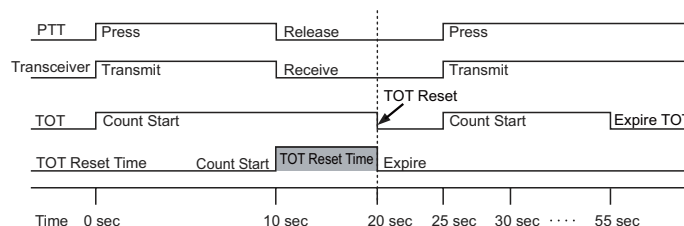


Figure 1-4 TOT Reset Time 1

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

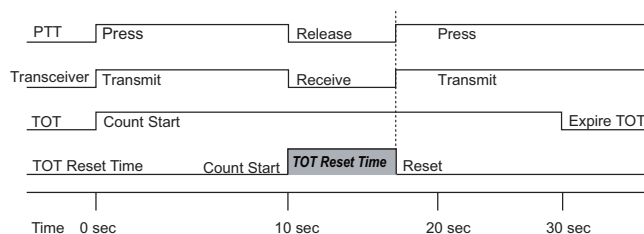


Figure 1-5 TOT Reset Time 2

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 Reset 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 each function of **Time-out Timer** ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General > Time-out Timer)

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 other communications.

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

If the **PTT** switch is pressed while **Busy Channel Lockout** is enabled, the transceiver cannot transmit with "BUSY" appearing on the display and a Warning Tone A (continuous beep) sounding from the transceiver at the same time. The Warning Tone A (continuous beep) sounds from the transceiver until the **PTT** switch is released.

The following are conditions to disable transmission by Busy Channel Lockout (NXDN).

Table 1-2 Busy Channel Lockout (NXDN)

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.
Incorrect RAN	The transceiver cannot transmit if the transceiver receives a carrier and the received RAN code does not match the RAN code preconfigured for the transceiver.
Correct RAN	The transceiver cannot transmit if the transceiver receives a carrier and the received RAN code matches the RAN code preconfigured for the transceiver.
Any RAN	The transceiver cannot transmit while receiving a RAN code.

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

- **If “Analog” is configured in Transmit Mode:**

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

- **If “NXDN” is configured for Transmit Mode:**

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

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 NXDN). If the transceiver receives an analog signal, the transceiver transmits according to the configuration in **Busy Channel Lockout (Analog)**. If the transceiver receives an NXDN signal, the transceiver transmits according to the configuration in **Busy Channel Lockout (NXDN)**.

Note

- **Busy Channel Lockout** cannot be activated in Emergency Mode.

Configuration using KPG-D1/ D1N

- Configuring **Busy Channel Lockout (NXDN) (Personality)** ( See Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Busy Channel Lockout (NXDN) (Channel Edit)** ( See Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)

Communicating Without Using a Repeater (Talk Around)

Talk Around is the function that allows transceivers to communicate directly 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 uses the Decode Signaling (RAN 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.

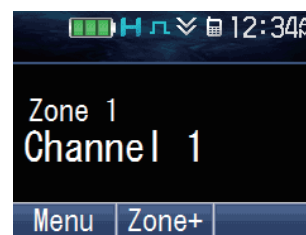
On a channel with **Talk Around** disabled, **Talk Around** can be toggled between enabled and disabled by pressing a key of the transceiver such as the **Talk Around** key.

Operating the transceiver

● Enabling the Talk Around

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

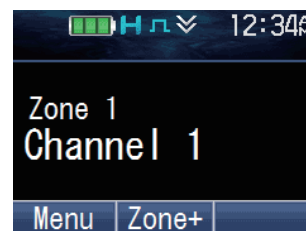
The "  " icon appears and **Talk Around** will be enabled.



● 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 (Personality)** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Talk Around (Channel Edit)** to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Talk Around Key (Personality)** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Talk Around Key (Channel Edit)** to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)

1.2 Using the Signaling

RAN code is the signaling to be used for facilitating communication within a group if the same channel is shared by several groups. Also, NXDN ID, DTMF, and 2-tone can be used as the Optional Signaling to initiate a selective call.

Sharing the Same Channel (Frequency) by Several Groups (RAN)

RAN (Radio Access Number) 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 RAN code if a RAN 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 RAN code.

Table 1-3 RAN Transmission/ Reception Behavior

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

Configuration using KPG-D1/ D1N

- Configuring **RAN Decode/Encode (Personality)** ( [See](#) Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **RAN Decode/Encode (Channel Edit)** ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

Using the Optional Signaling (NXDN)

Optional Signaling is the signaling used to initiate a selective call. NXDN ID, DTMF, and 2-tone are the Optional Signaling which can be used in an NXDN Conventional system. (Refer to [Using NXDN ID to Initiate a Selective Call.](#))

● NXDN ID

NXDN ID is the signaling type using the Unit ID or Group ID stored in the NXDN data frame. The transceiver emits a ring tone (Alert Tone) if the received RAN code matches the RAN code preconfigured in the transceiver and the received Unit ID or Group ID matches the Individual ID or Group ID preconfigured in the transceiver.

To decode an NXDN ID in an NXDN Conventional system, "NXDN ID" needs to be configured in **Optional Signaling (NXDN)** to be used on the channel.

● DTMF

DTMF is a signaling type using audible frequencies. The transceiver emits a ring tone (Alert Tone) and starts Transpond if the received RAN code matches the RAN code preconfigured in the transceiver and the received DTMF code matches the DTMF code preconfigured in the transceiver.

To decode a DTMF code in an NXDN Conventional system, "DTMF" needs to be configured in **Optional Signaling (NXDN)** to be used on the channel.

● 2-tone

2-tone signaling uses a pair of 2 different tone frequencies in series for an individual call. The transceiver emits a ring tone (Alert Tone) and starts Transpond if the received RAN code matches the RAN code preconfigured in the transceiver and the received tone signal matches the tone signal preconfigured in the transceiver.

To decode a 2-tone code in an NXDN Conventional system, "2-tone 1", "2-tone 2", "2-tone 3", or "2-tone 4" needs to be configured in **Optional Signaling (NXDN)** to be used for the channel.

The transceiver behaves as follows according to the type of a received signal on a channel with "Mixed" configured in **Channel Type**.

● If the transceiver receives analog signals

The transceiver behaves according to the configuration in **Optional Signaling (Analog)**.

● If the transceiver receives digital signals

The transceiver behaves according to the configuration in **Optional Signaling (NXDN)**.

Configuration using KPG-D1/ D1N

- Configuring **Optional Signaling (NXDN) (Personality)** ( See Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Optional Signaling (NXDN) (Channel Edit)** ( See Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

Unmuting the Speaker (Audio Control (NXDN))

Audio Control is the condition which allows the transceiver to unmute the speaker by a RAN code and an Optional Signaling.

Using KPG-D1/ D1N, the condition which allows the transceiver to unmute the speaker can be configured for each system configured with Personal Features.

The transceiver unmutes the speaker and emits received audio if the conditions configured for **Audio Control** are satisfied.

Conditions to unmute the speaker can be changed by a combination of the RAN code and the Optional Signaling. The following are the conditions to unmute the speaker.

Table 1-4 Audio Control (NXDN)

Configuration	Description
RAN	The transceiver unmutes the speaker if the received RAN code matches the RAN code preconfigured for the transceiver. Conditions remain unchanged even if the transceiver transmits.
RAN and Optional Signaling	While the received RAN code matches the RAN code preconfigured for the transceiver, the transceiver unmutes the speaker if Optional Signaling matches the Optional Signaling preconfigured for the transceiver. Conditions remain unchanged even if the transceiver transmits.

The transceiver behaves as follows according to the type of a received signal on a channel with “Mixed” configured in **Channel Type**.

- **If the transceiver receives analog signals**

The transceiver behaves according to the configuration in **Audio Control (Analog)**.

- **If the transceiver receives digital signals**

The transceiver behaves according to the configuration in **Audio Control (NXDN)**.

Configuration using KPG-D1/ D1N

Configuring **Audio Control (NXDN)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

Temporarily Disabling the Squelch (Squelch Off)

Squelch Off is the function to disable the RAN code and Optional Signaling configured for the channel on which the transceiver waits for and unmutes the speaker upon detection of an NXDN frame.

The same as with the Monitor function, the Squelch Off function is used to monitor the availability of channels prior to transmitting in order to avoid interfering with other parties.

Also, if an analog channel is configured in an NXDN Conventional system, the Squelch Off function is used to listen to the audio even when the speaker is muted due to a very weak carrier on an analog channel.

To use this function, the **Squelch Off** key or the **Squelch Off Momentary** key is used.

Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then Squelch Off can be toggled between enabled and disabled by selecting Squelch Off. (Refer to Common FUNC Using Menu Mode.)

Operating the transceiver

- **Squelch Off key**

1 Press the **Squelch Off** key while **Squelch Off** is disabled.

The “” icon appears. The **Busy LED** lights green if **Busy LED** is enabled.

The transceiver disables the RAN code and Optional Signaling and unmutes the speaker upon detection of an NXDN frame.

2 Press the **Squelch Off** key while **Squelch Off** is enabled.

The “” icon disappears. A channel where **RAN Decode** or Optional Signaling is configured resumes Signaling Squelch.

- **Squelch Off Momentary key**

1 Press and hold the **Squelch Off Momentary** key.

The “” icon appears.

The **Busy LED** lights green if **Busy LED** is enabled.

The transceiver disables the RAN code and Optional Signaling and unmutes the speaker upon detection of an NXDN frame.

2 Release the **Squelch Off Momentary** key.

The “” icon disappears.

A channel where **RAN Decode** or Optional Signaling is configured resumes Signaling Squelch.

Note

- Pressing the **Squelch Off** key or the **Squelch Off Momentary** key while the Optional Signaling matches resets the matching state of the Optional Signaling.
- If **Squelch Off** becomes enabled during the scan, the transceiver pauses scanning on a channel where the transceiver is scanning. The transceiver does not resume scanning until **Squelch Off** is disabled.
- If **Squelch Off** is enabled on a channel with “Mixed” configured in **Channel Type**, the transceiver forcibly unmutes the speaker. White noise is audible if no carrier is present. In this case, QT tone, DQT code, or RAN code is disabled. If the transceiver receives an analog signal, the transceiver unmutes the speaker only with a carrier. The transceiver unmutes the speaker when the transceiver receives a digital signal even if the received RAN code does not match the RAN code preconfigured for the transceiver.

Configuration using KPG-D1/ D1N

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

Temporarily Disabling the Signaling (Monitor)

Monitor is the function that temporarily disables the RAN code and Optional Signaling that are configured for a channel on which the transceiver waits.

Monitor is used to check the availability of channels prior to transmitting in order to avoid interfering with other parties.

Using the Monitor function temporarily unmutes the speaker if the speaker is muted because the RAN code and Optional Signaling do not match. However, if the speaker is muted due to a very weak carrier, the speaker is not unmuted even by using the Monitor function. In this case, using the Squelch Off function temporarily unmutes the speaker and the audio can be heard.

To use this function, the **Monitor** key or the **Monitor Momentary** key is used.

Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then **Monitor** can be toggled between enabled and disabled by selecting “Monitor”. (Refer to Common FUNC Using Menu Mode.)

While **Monitor** is enabled, the “” icon appears, and the RAN code and Optional Signaling will be disabled.

On a channel with “Mixed” configured in **Channel Type**, while **Monitor** is enabled, the “” icon appears, and the RAN code, QT tone or DQT code, and Analog or NXDN Optional Signaling are disabled.

Operating the transceiver

● Monitor key

1 Press the **Monitor** key while **Monitor** is disabled.

The “” icon appears.

The transceiver disables the RAN code and Optional Signaling and unmutes the speaker upon detection of an NXDN frame.

2 Press the **Monitor** key while **Monitor** is enabled.

The “” icon disappears.

A channel where a RAN Decode is configured resumes Signaling Squelch.

● Monitor Momentary key

1 Press and hold the **Monitor Momentary** key.

The “” icon appears. The transceiver disables the RAN code and Optional Signaling and unmutes the speaker upon detection of an NXDN frame.

2 Release the **Monitor Momentary** key.

The “” icon disappears. A channel where a RAN Decode is configured resumes Signaling Squelch.

Note

- Pressing the **Monitor** key or the **Monitor Momentary** key while the Optional Signaling matches resets the matching state of the Optional Signaling.

Configuration using KPG-D1/ D1N

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

Unmuting the Speaker by Linking with the Microphone (Off-hook Decode) (Mobile Only)

Supported Models: Mobile

Off-hook Decode is the function linked with a microphone on- or off-hook state to unmute the speaker upon detection of an NXDN frame.

The transceiver behaves as follows according to the configuration in **Off-hook Decode**.

Table 1-5 Off-hook Decode

Configuration	Description
Enabled	The transceiver unmutes the speaker according to the configuration in Audio Control while the microphone is in either the on-hook state or off-hook state.
Disabled	The transceiver unmutes the speaker when the transceiver detects a frame if the microphone is in the off-hook state. The transceiver unmutes the speaker according to the configuration in Audio Control while the microphone is in the on-hook state.

Note

- If “Mixed” is configured in **Channel Type**, the transceiver behaves according to the type of a received signal (Analog or NXDN).
- Stun** can be activated regardless of the status of **Off-hook Decode** and the microphone on- or off-hook state.
- The matching state of Optional Signaling will be reset by hooking the microphone on a hanger (On-hook state) after receiving a call by Optional Signaling.
- 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 Decode** to be enabled or disabled ( See Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)

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

Mixed Mode is the function to wait for both digital signals and analog signals.

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**:

● Reception

Mixed Mode can be used to wait for a call in both digital (RAN code) and analog (QT tone and DQT code) modes. The transceiver unmutes the speaker if the received signaling (QT tone, DQT code or RAN code) matches the signaling preconfigured for the transceiver (QT tone, DQT code or RAN code).

● Transmission

The transceiver transmits in the mode (Analog or NXDN) configured in **Transmit Mode**.

If the received signaling (QT tone, DQT code, or RAN code) matches the signaling preconfigured for the transceiver, the transceiver can transmit in the same mode as that 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 Optional Signaling (DTMF, 2-tone, FleetSync, MDC-1200, or NXDN ID) matches the Optional Signaling preconfigured for the transceiver, the transceiver can transmit in the same mode as that 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 1-6 Mixed Mode

Optional Signaling	Transmit Mode	Received signal	Transmission Operation
Disabled	Analog	Digital	The transceiver can transmit using the RAN code configured 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.
Disabled	NXDN	Digital	The transceiver can transmit using the RAN code configured for the transceiver.
Disabled	NXDN	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 RAN code configured 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. However, ID can be specified only if the transceiver receives the FleetSync signaling. 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	NXDN	Digital	The transceiver can transmit specifying the received ID and using the RAN code configured for the transceiver.

Optional Signaling	Transmit Mode	Received signal	Transmission Operation
Enabled	NXDN	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 if the transceiver receives the FleetSync signaling. 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

- Conditions for unmuting the speaker vary depending on the **Audio Control** configuration. (Refer to **Unmuting the Speaker (Audio Control (NXDN))**.)
- 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 NXDN 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 > NXDN Conventional > General)
- Configuring **Channel Type** and **Transmit Mode (Channel Edit)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional > General)
- Configuring **Signaling Reset Timer** ( **See** Transceiver Settings > NXDN > NXDN Information > General)

1.4 Using NXDN ID to Initiate a Selective Call

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

Available Calls

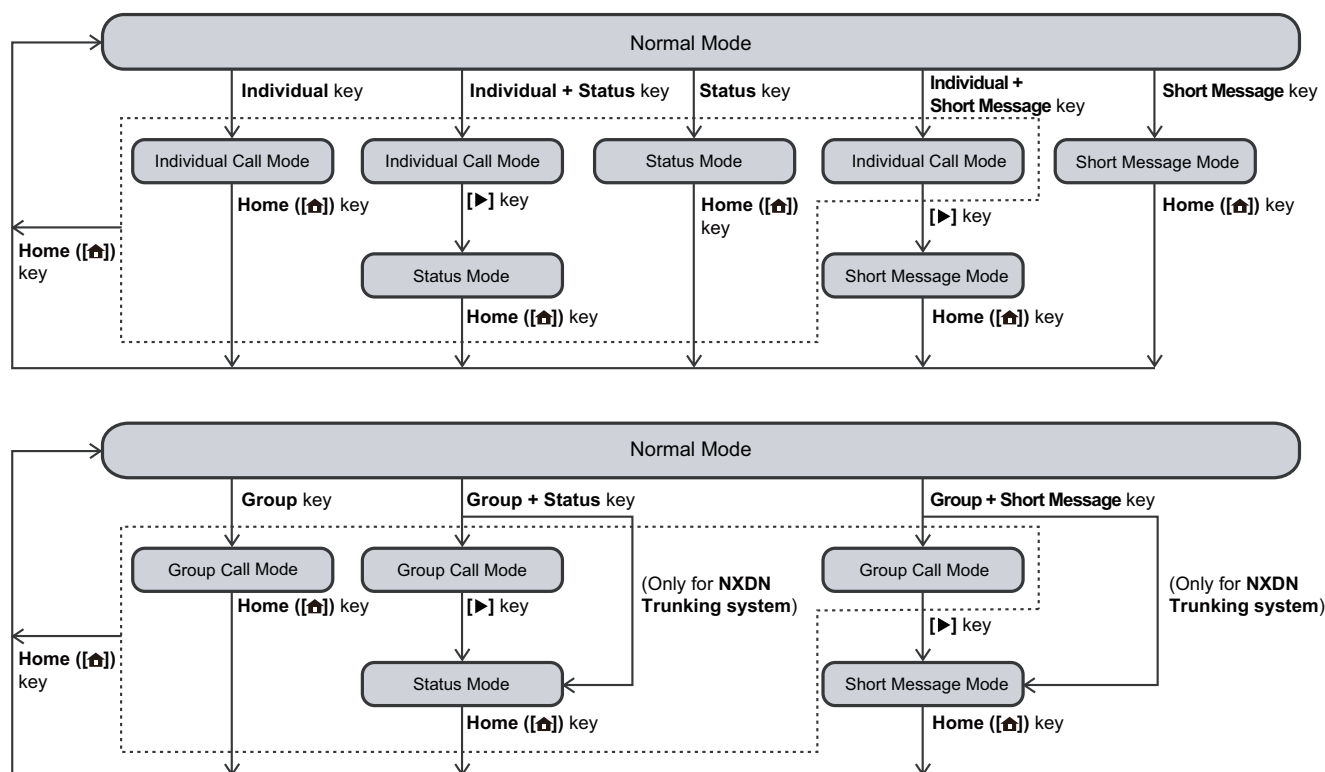
The following various types of calls can be used in an NXDN Conventional system. For transceiver operations and behaviors, refer to the instructions of each call type.

- Individual Call
- Individual Call (Individual Call Acknowledge Request)
- Group Call
- Status Call
- Short Data Call
- Long Data Call

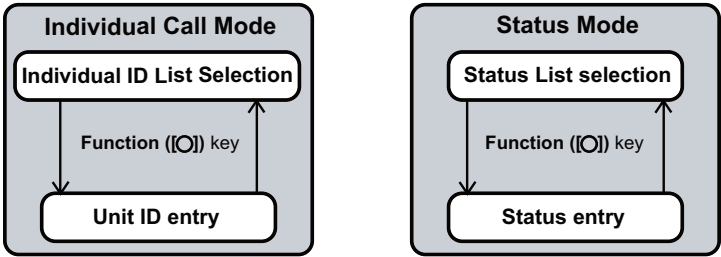
Transition for Each Mode

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. The following are the transition diagrams for each mode. The figure below presents information for both an NXDN Conventional system and NXDN Trunking system.

Transmission



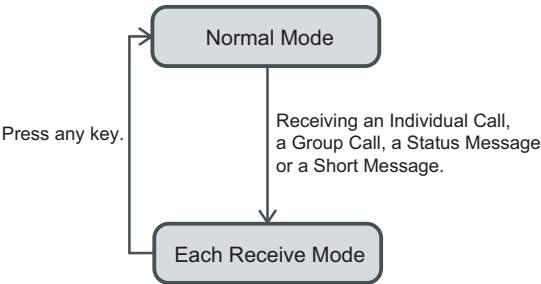
In Individual Call Mode, a Unit ID of the target transceiver can be selected from the Individual ID List or a Unit ID can directly be entered. Also, in Status Mode, a status to be sent can be selected from the Status List or the status can directly be entered. In either mode, the entry method can be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



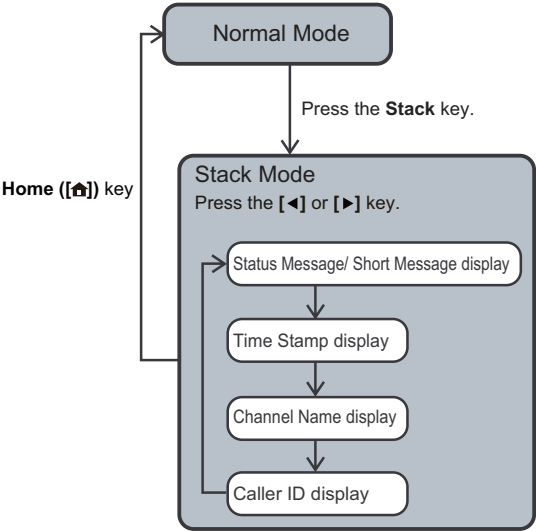
Note

- 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 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 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

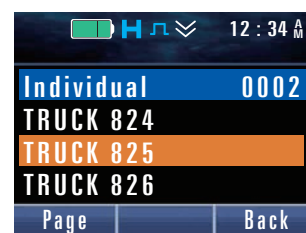
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

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 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.

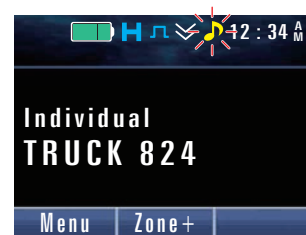
Press the **PTT** switch to initiate a Voice Call. The “🔊” icon blinks, and the display changes to “Individual” and the ID name of the target transceiver.

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 using Manual Dialing, **Manual Dialing** needs to be enabled.

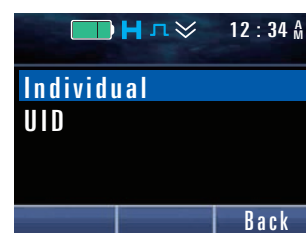
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

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 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.

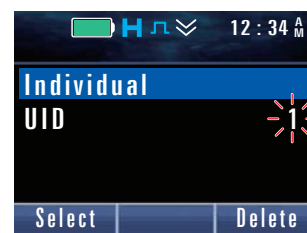
- **If using the keypad:**

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

- **If using the PF keys:**

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

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

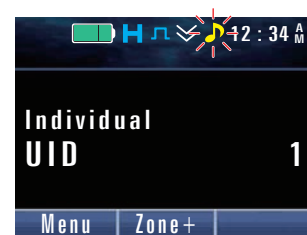


4 Initiating an Individual Call.

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 entry screen for the ID closes at the same time as pressing the **PTT** switch. 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 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 **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling 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 finishes transmitting when the **PTT** switch is released. In this case, a PTT Release Tone (1 beep) is transmitted to the target transceiver if **PTT Release Tone** is enabled. (Refer to Common FUNC Using Sound to Notify the Other Party that the Communication Ends (PTT Release 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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Selcall on PTT (Personality)** (**See** Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > 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.

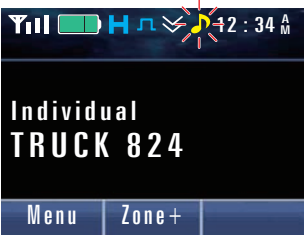
Note

- To receive an Individual Call in an NXDN Conventional system, "NXDN ID" needs to be configured for Optional Signaling to be used on the channel. (Refer to [Using the Optional Signaling \(NXDN\).](#))

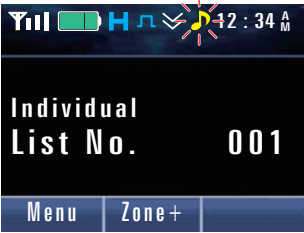
Transceiver behavior

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 sounds. (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 a call. (Refer to [Transceiver behavior when receiving an Individual Call/ Paging Call](#).)
- If the transceiver receives the Unit ID Name by Over-the-Air Alias, the received Unit ID Name will appear.
- If the Unit ID Name received using Over-the-Air Alias is stored in the stack memory of the transceiver, the stored Unit ID Name will appear. If the received Unit ID Name differs from the Unit ID Names stored in the transceiver, the Unit ID Names stored in the transceiver appear, and then the received Unit ID Name appears.
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving an Individual 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 for **Alert Tone (Individual Call)** or **Alert Tone (Paging Call)** used in common in an NXDN 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 for **Alert LED Color (Individual Call)** or **Alert LED Color (Paging Call)** used in common in an NXDN Conventional system.

● 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 > NXDN > NXDN Information > Conventional)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Conventional)
- Configuring **Alert Tone (Individual)/ Alert Tone (Paging)** ( [See](#) Transceiver Settings > NXDN > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)/ Alert LED Color (Paging)** ( [See](#) Transceiver Settings > NXDN > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)/ Alert Tone (Paging Call)** common to NXDN Conventional ( [See](#) Transceiver Settings > NXDN > NXDN Information > Conventional > Alert Tone)
- Configuring **Alert LED Color (Individual Call)/ Alert LED Color (Paging Call)** common to NXDN Conventional ( [See](#) Transceiver Settings > NXDN > NXDN 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.

Individual ID List is commonly used in an NXDN Conventional system and NXDN Trunking system.

Table 1-7 Individual ID List

Configuration	Description
ID	A Unit ID can be configured in the range between 0001 and FFEF (hexadecimal), or between 1 and 65519 (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 registered in the Individual ID List, the ID Name appears when the transceiver receives a call. After that, the received Unit ID Name appears upon receipt of the Unit ID Name by Over-the-Air Alias while receiving a call. If the transceiver cannot receive the Unit ID Name, the stored ID Name appears if the ID Name is stored for the Unit ID stored in the transceiver. 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 registered in the Individual ID List. Individual Call Incoming: If Automatic Response is disabled, the type of tone sounding from the transceiver can be configured for an Individual Call (Individual Call Acknowledge Request) from the Unit IDs registered 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 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. Individual Call Incoming: If Automatic Response is disabled, the color of flashing LED on the transceiver can be configured for an Individual Call (Individual Call Acknowledge Request) from the Unit IDs registered in the Individual ID List. Paging: The color of flashing LED can be configured for a Paging Call 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 **Individual ID List** ( **See** Transceiver Settings > NXDN > 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 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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

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

- 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.
- For an NXDN system, the same Unit ID may be sent multiple times for one transmission depending on the reception conditions of the receiving party.
- If the transceiver receives a Group Call from a telephone, the transceiver will send an ID dedicated to the telephone (U65521 (0xFFFF1)) from the communication port.

Configuration using KPG-D1/ D1N

- Configuring **Unit ID Serial Output** ( See Transceiver Settings > NXDN > NXDN 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 an NXDN Conventional system.

To start with the **Individual Call Acknowledge Request**, an acknowledgment message must be received from the receiving transceiver. (Receiving an Individual Call from the receiving transceiver also 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** must be enabled on the transmitting transceiver by using KPG-D1/ D1N. 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
- Automatic Response
- Incoming Reset Time
- Initiating Reset Time

Note

- **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
 - Individual ID Encode Block
 - Unit ID Serial Output

Configuration using KPG-D1/ D1N

Configuring **Individual Call Acknowledge Request** to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Individual Call Acknowledge Request)

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.

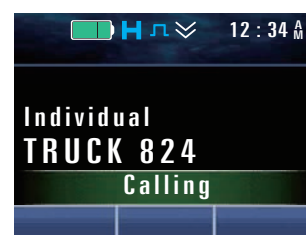
● PC command

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.)

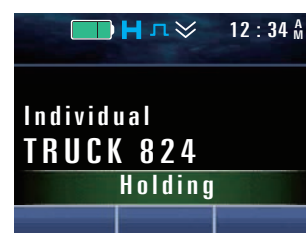
Operating the transceiver

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

A message requesting an acknowledgment is sent.



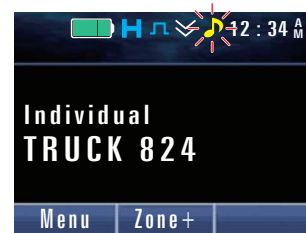
When the receiving transceiver is inside the communication range, "Holding" appears on the display, and the transceiver waits to receive an acknowledgment message from the receiving transceiver.



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 **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 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 time configured for **Maximum ACK Wait Time** elapses without receiving an automatic response message for a message requesting an acknowledgment from the receiving transceiver. The transmitting transceiver can send a message requesting an acknowledgment up to the number of times configured for Number of Retries until the transceiver receives a response message. (Refer to **Maximum ACK Wait Time, Number of Retries**.)
- The transceiver cancels the call processing for the following. At that time, “No Reply” appears on the display for 1 sec.
 - If the transceiver cannot receive an automatic response message from the receiving transceiver even when a message requesting an acknowledgment has been sent for the number of times configured in the Number of Retries. (Refer to **Number of Retries**.)
 - If the time configured for the Initiating Reset Time elapses before the transceiver receives an acknowledgment message from the receiving transceiver. (Refer to **Configuring the Maximum Length of Time to Wait to Receive an Acknowledgment Message (Initiate/Incoming Reset Time)**.)
- If a notification message for cancellation is received from the receiving transceiver while an acknowledgment message from the receiving transceiver is being waited for, “Call Deny” appears for one second, a Call Deny Tone (3 beeps) sounds from the transceiver, and the channel display is restored.

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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > 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 being operated in an NXDN Conventional system can be on standby to receive an Individual Call on the channel if "NXDN ID" has been configured as the receiving Optional Signaling type.

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. Then, when the receiving transceiver transmits an acknowledgment message and the transmitting transceiver receives it, communications become possible.

Operating the transceiver

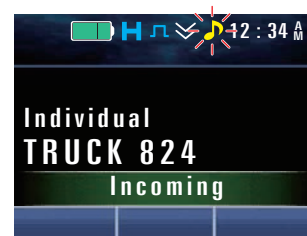
The transceiver's behavior varies depending on the configuration for Automatic Response.

● If Automatic Response is disabled:

1 Receive a message requesting an acknowledgment.

The "🔔" icon blinks, and the ID Name of the transmitting transceiver and "Incoming" appear.

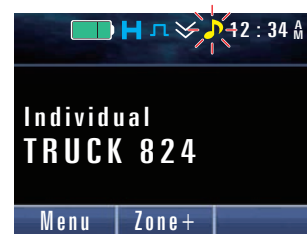
The transceiver sends an automatic response message to the transmitting transceiver to notify that the transceiver has received the message requesting an acknowledgment.



2 Press the **PTT** switch or the **Call Response** key.

Pressing the **PTT** switch initiates an Individual Call to the transmitting transceiver.

If the **Call Response** key is pressed, a Key Beep A (1 beep) sounds from the transceiver and an acknowledgment is sent.



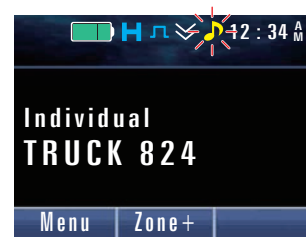
Note

- If a response to the received Individual Call is not sent and the status below is initiated, "Missed Call" appears on the display.
 - When the time configured with **Incoming Reset Time** elapses
 - When the transmitting transceiver cancels call
- 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. However, also in this case, an acknowledgment can be sent by pressing the **Call Response** key.
- For Mobile, if **Off-hook Connect** is enabled, an Individual Call can be initiated to the transmitting receiver by placing the microphone into the off-hook state after reception of a message requesting an acknowledgment.
- Reception can be canceled by pressing the **Clear** key while the transceiver is in the state in Step 1.
- If Alert Tone is configured to sound when receiving, an Alert Tone sounds. (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 a call. (Refer to [Transceiver behavior when receiving an Individual Call \(Individual Call Acknowledge Request\)](#).)

● If Automatic Response is enabled:

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 sounds. (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 a call. (Refer to **Transceiver behavior when receiving an Individual Call (Individual Call Acknowledge Request)**.)

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

● Alert Tone

If Automatic Response 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 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 NXDN Trunking.

If Automatic Response 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)** 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 according to the configuration in **Alert Tone (Individual Call)** common to NXDN Conventional.

● Selective Call Alert LED

If Automatic Response 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 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 NXDN Conventional.

If Automatic Response 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)** 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 to NXDN Conventional.

- **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 > NXDN > NXDN Information > Conventional)
- Configuring **Optional Signaling LED** to be enabled or disabled ( **See** Transceiver Settings > NXDN > NXDN Information > Conventional)
- Configuring **Alert Tone (Individual)/ Alert Tone (Individual Call Incoming)** ( **See** Transceiver Settings > NXDN > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)/ Alert LED Color (Individual Call Incoming)** ( **See** Transceiver Settings > NXDN > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)/ Alert Tone (Individual Call Incoming)** common to NXDN Conventional ( **See** Transceiver Settings > NXDN > NXDN Information > Conventional > Alert Tone)
- Configuring **Alert LED Color (Individual Call)/ Alert LED Color (Individual Call Incoming)** common to NXDN Conventional ( **See** Transceiver Settings > NXDN > NXDN Information > Conventional > Alert LED Color)

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

The **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 (Individual Call Acknowledge Request) is initiated.

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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Individual Call Acknowledge Request)

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

The **Call Processing Tone** is the function to sound 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 an NXDN 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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Individual Call Acknowledge Request > Call Processing Tone)

Sending an Acknowledgment Automatically (Automatic Response)

Automatic Response is the function to automatically send an acknowledgment message upon receipt of a message requesting an acknowledgment of an Individual Call.

If this function is enabled, the transceiver automatically sends an acknowledgment message upon receipt of a message requesting an acknowledgment of an Individual Call.

If this function is disabled, the transceiver automatically sends no acknowledgment message even if the transceiver has received a message requesting an acknowledgment of an Individual Call. In this case, an acknowledgment message can be sent manually by operating the transceiver. For operation methods, refer to “**If Automatic Response is disabled:**” of “**Receiving an Individual Call (Individual Call Acknowledge Request)**”.

Configuration using KPG-D1/ D1N

Configuring **Automatic Response** to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Individual Call Acknowledge Request)

Configuring the Maximum Length of Time to Wait to Receive an Acknowledgment Message (Initiate/Incoming Reset Time)

Initiating Reset Time is the maximum length of time for which the transmitting transceiver is on standby to receive an acknowledgment message from the receiving transceiver after sending a message requesting an acknowledgment of an Individual Call. If the time configured for **Initiating Reset Time** elapses, the transceiver resets the standby state, and the display reverts to the channel display.

Incoming Reset Time is the maximum length of time that allows the transceiver to send an acknowledgment message by operating the transceiver after receiving a message requesting an acknowledgment of an Individual Call, when **Automatic Response** has been disabled. If the time configured for Incoming Reset Time elapses, the transceiver resets the standby state, and the display reverts to the channel display.

Configuration using KPG-D1/ D1N

Configuring **Initiating/Incoming Reset Time** ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Individual Call Acknowledge Request)

1.7 Making a Group Call

Group Call can be used to engage in 2-way 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 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.)

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

Operating the transceiver

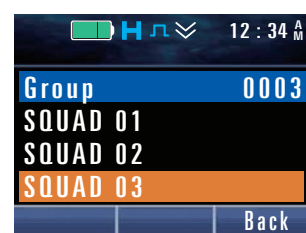
1 Press the **Group** key, **Group + Status** key, or **Group + Short Message** key.

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 **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling 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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > 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.

Note

- To receive a Group Call in an NXDN Conventional system, “NXDN ID” needs to be configured for Optional Signaling to be used on the channel. (Refer to **Using the Optional Signaling (NXDN)**.)

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, Individual ID List number, or 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 when the transceiver is receiving. (Refer to Common FUNC Busy LED.)
- If Alert Tone is configured to sound when receiving, an Alert Tone sounds. (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 a call. (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).)
- When the transceiver receives the Group ID for which "ALL" is configured, the transceiver can respond using the Group ID if the received Group ID is configured in the Group ID List. If no Group ID is configured in the ID List, the receiving transceiver can receive a call but the receiving transceiver cannot respond to the call. In this case, the ID Name of the transmitting transceiver does not appear even if Over-the-Air Alias is enabled. (Refer to [Over-the-Air Alias](#).)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Group Call.
- If **Group ID Scan (NXDN)** is enabled, the transceiver is on standby to receive a Group Call from all Group IDs configured for the Group ID List in an NXDN Conventional system. (Refer to [Group ID Scan \(NXDN\)](#).)

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 an NXDN 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 blinks according to the configuration for **Alert LED Color (Group Call)** used in common in an NXDN Conventional system.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Conventional)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Conventional)
- Configuring the **Alert Tone/ Alert LED Color (Group ID List)** ( [See](#) Transceiver Settings > NXDN > Group ID List)
- Configuring **Alert Tone (Group Call)** common to NXDN Conventional ( [See](#) Transceiver Settings > NXDN > NXDN Information > Conventional > Alert Tone)
- Configuring **Alert LED Color (Group Call)** common to NXDN Conventional ( [See](#) Transceiver Settings > NXDN > NXDN 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 an NXDN 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 1-8 Group ID List

Configuration	Description
ID	A Group ID can be configured in the range between 0001 and FFEF (hexadecimal), or between 1 and 65519 (decimal), or in the range of ALL. ALL allows initiation of a call to all IDs.
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 > NXDN > 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. If the ID Name is not configured in the Individual ID List, the Individual ID List number or the Unit ID is displayed. (Refer to [Receiving a Group Call](#).)

Configuration using KPG-D1/ D1N

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

Group ID Scan (NXDN)

Group ID Scan (NXDN) is the function to standby to receive a Group Call from all Group IDs in an NXDN 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 (NXDN)**.

Note

- This function can be used only if "Group Call" is configured for **Selcall on PTT**.

Configuration using KPG-D1/ D1N

- Configuring **Group ID Scan (NXDN) (Personality)** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Group ID Scan (NXDN) (Channel Edit)** to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Selcall on PTT (Personality)** ( [See](#) Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Selcall on PTT)
- Configuring **Persistent Group ID (NXDN)** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Persistent Group ID (NXDN))

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 Call 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 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.

Configuration using KPG-D1/ D1N

Configuring the **Call Alert Inhibit (Group Calls only)** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN 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

- If this function is enabled in the NXDN Conventional system, call by RAN only also cannot be received while an Individual Call is being received.
- Even if this function is enabled, the following Group Calls can be received.
 - A Group Call by a Group ID registered as a Priority Monitor ID
 - A Group Call using All Group ID
 - A Group Call for Emergency

Configuration using KPG-D1/ D1N

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

1.8 Common Functions for Data Communications

The following functions are used in common for data communications such as Status Call or Short Data Call, Long Data Call data transmission.

- Number of Retries
- Transmit Busy Wait Time
- Maximum ACK Wait Time
- GTC Count
- ACK Delay Time
- Transmit Delay Time (Receive Capture)
- Data Transmit Modulation Delay Time
- Random Access (Contention)
- 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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

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

- This period can also be used for waiting on a data channel, after migrating to the data channel using the GTC.
- 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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

GTC Count

GTC Count is the number of GTC message transmissions by the transmitting transceiver through a single GTC transmission.

GTC (Go To Channel) is a message that allows the transmitting transceiver to induce the receiving transceiver to the data channel.

The transmitting transceiver will migrate to the data channel after transmitting the GTC if the Status, Short or Long Message on Data Zone-Channel or the Status, Short or Long Message on Data System-Personality is configured. When the receiving transceiver receives the GTC, it automatically migrates to the data channel and stands by to receive the data.

Note

- The receiving transceiver waits to receive the Status, Short or Long Message after the receiving transceiver migrates to the data channel. The transceiver restores the voice channel if the transceiver does not receive the acknowledgment within the time configured for **Maximum ACK Wait Time**.
- The transmitting transceiver sends the Status, Short, or Long Message and waits to receive the acknowledgment after the transmitting transceiver migrates to the data channel. The transceiver restores the voice channel if the transceiver does not receive the acknowledgment within the time configured for **Maximum ACK Wait Time**.

Configuration using KPG-D1/ D1N

Configuring **GTC Count** ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN > Parameter)

ACK Delay Time

ACK Delay Time is the length of time from when the transceiver receives data until the transceiver sends the acknowledgment.

ACK Delay Time must be shorter than **Maximum ACK Wait Time** configured for the transmitting transceiver.

Configuration using KPG-D1/ D1N

Configuring **ACK Delay Time** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

Transmit Delay Time (Receive Capture)

Transmit Delay Time is a short period of time to transmit a HEAD_DLY message prior to transmitting the introductory part of data.

When the transmitting transceiver transmits a HEAD_DLY message, the receiving transceiver temporarily pauses scanning to receive the data. Using this function, the data can reliably be sent even if the receiving transceiver is scanning or using the Battery Saver.

Configuration using KPG-D1/ D1N

Configuring **Transmit Delay Time (Receive Capture)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

Data Transmit Modulation Delay Time

Data Transmit Modulation Delay Time is the duration from when the transceiver starts transmitting until the transceiver starts being modulated by the data frame.

Data Transmit Modulation Delay Time is the duration from when the transceiver starts transmitting until the transceiver starts being modulated by the data frame. However, it may be difficult to establish data communications when the transmit and receive frequencies are widely separated or the transceiver is always used in extremely cold areas. In such cases, **Data Transmit Modulation Delay Time** must be extended in order to improve the reliability of data communications.

Configuration using KPG-D1/ D1N

Configuring **Data Transmit Modulation Delay Time** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

Random Access (Contention)

Random Access allows the transceiver to randomize the transmission start time for each transceiver to send data when the channel becomes available.

If a large number of transceivers begin transmitting immediately after the channel becomes available, transmission contention may occur. This function prevents this contention.

Note

- The length of time for Random Access varies depending on the configuration for the Channel Spacing (Narrow or Very Narrow). (Refer to Common FUNC Channel Spacing.)

Configuration using KPG-D1/ D1N

Configuring **Random Access (Contention)** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

Preamble Length

Preamble Length is the function to extend time for sending a preamble when the NXDN 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.

Very Narrow:

$$\text{Time [sec]} = 1/2400 \times 4 \times \text{Configuration value for Preamble Length}$$

Narrow:

$$\text{Time [sec]} = 1/4800 \times 8 \times \text{Configuration value for Preamble Length}$$

Configuration using KPG-D1/ D1N

Configuring **Preamble Length** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameter)

1.9 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 an NXDN Conventional system and NXDN Trunking system. For each operation description, the display of the NXDN Conventional system is used.

Table 1-9 Sending Status Messages

Status Message	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 using KPG-D1/ D1N and the Status Message corresponding to each key can be selected from the Status List in NXDN. 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 the communication port 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.

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

● 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.

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

Note

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

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.

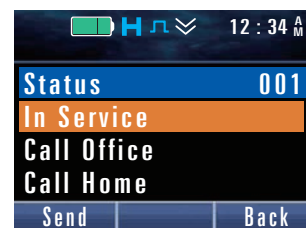
● Press the Group + Status key. (NXDN Conventional system)

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. (NXDN Trunking system)

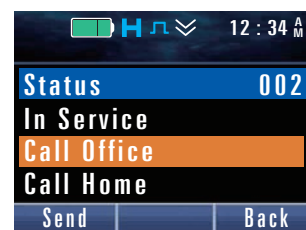
The transceiver enters Status Mode.

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



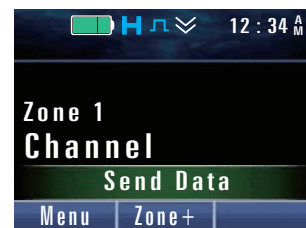
2 Press the [▲] key or [▼] key and then select the target data from the Status List.

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



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

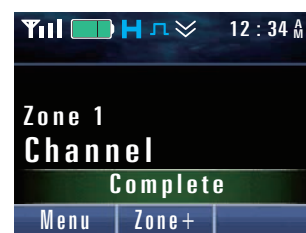
The transceiver sends the Status Message.



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.

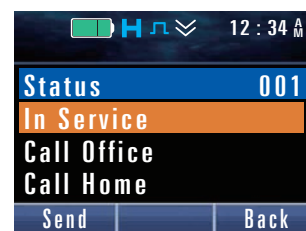
● Press the **Group + Status** key. (NXDN Conventional system)

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. (NXDN Trunking system)

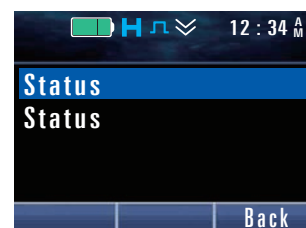
The transceiver enters Status Mode.

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.

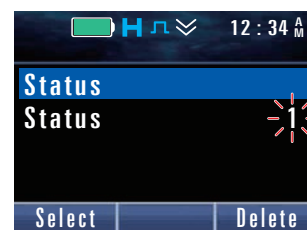
Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

- **If using the keypad:**

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

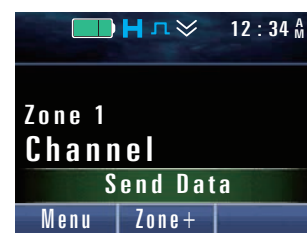
- **If using the PF keys**

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



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

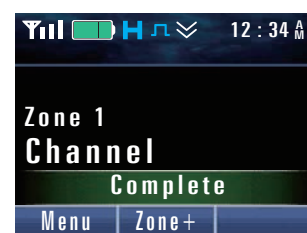
The transceiver sends the Status Message.



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.



Note

- Transmission can be canceled by pressing the **Clear** key while a Status Message is being transmitted.
- For NXDN Conventional, “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 an NXDN 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 an NXDN Conventional system to be enabled or disabled (**See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Manual Dialing** in an NXDN Trunking system to be enabled or disabled (**See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)
- Configuring **Base ID Type** and **Base ID** in an NXDN Conventional system (**See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Base ID Type** and **Base ID** in an NXDN Trunking system (**See** Transceiver Settings > Personal > Personal Features > NXDN 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.

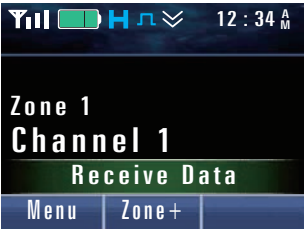
Note

- To use serial communications, a user needs to prepare NXDN 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.

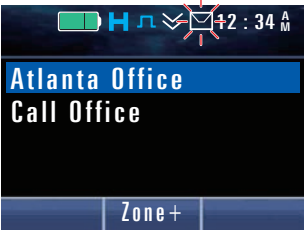


2 A Status Message is received.

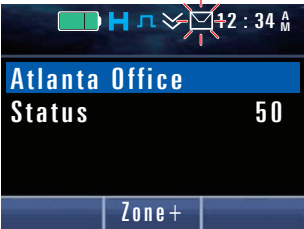
The “✉” icon blinks and “Complete” appears.



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 received, the display shows as below.

Table 1-10 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 transceiver receives a Status Message by a Group Call, the ID Name appears according to the configuration for Unit ID Display on Group Call. (Refer to **Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)**.)
- 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 No. is not configured in the Status List, an Alert Tone sounds according to the configuration in **Alert Tone (Status/Short Message Call)** common to NXDN.

Configuration using KPG-D1/ D1N

- Configuring **Alert Tone (Status List)** ( See Transceiver Settings > NXDN > Status List)
- Configuring **Alert Tone (Status/Short Message Call)** common to NXDN Conventional ( See Transceiver Settings > NXDN > NXDN Information > Conventional > Alert Tone)
- Configuring **Alert Tone (Status/Short Message Call)** common to NXDN Trunking ( See Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)

Status List

When using Status Message, the Status to be sent must be preconfigured in the transceiver using KPG-D1/ D1N. A maximum of 208 statuses can be configured in the Status List.

Table 1-11 Status List

Configuration	Description
Status	The status number can be configured. It can be configured in the range from 1 to 207 and 226.
Status Name	The status number 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. Status for which Transmit Inhibit has been enabled does not appear on the Status selection display in Status Mode. In this case, a user cannot select status for which Transmit Inhibit has been 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.

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

Special Status

Special Status is a function used to prevent a user from sending status number 226 erroneously by operating keys on the transceiver.

Status 226 is a status to disable Emergency Mode.

Configuration using KPG-D1/ D1N

- Configuring **Special Status** of NXDN Conventional to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Special Status** of NXDN Trunking to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

Status Message Stack

Status Message Stack is the function to store a Status Message in the stack memory. A maximum of 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 transceiver blinks the "  " icon for 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 > NXDN > NXDN 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 an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for **Data Zone-Channel (NXDN)** to send a Status Message. When the transmission ends, the transceiver restores the Zone-channel which 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 can be only used in an NXDN Conventional system.
- This function is enabled if “Channel Table” is configured in **Zone-channel Format**, using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

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

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 an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for **Data System-Personality (NXDN)** to send a Status Message. When the transmission ends, the transceiver restores the Zone-channel which 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 can be only used in an NXDN Conventional system.
- This function is enabled if “Personality” is configured in **Zone-channel Format**, 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 > NXDN Conventional > NXDN)
- Configuring **Data System-Personality (NXDN)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN)

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.

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 > NXDN > NXDN 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 selected when the transceiver was turned ON.

Note

- In an NXDN 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 **Power-on Status Message** is sent while the transceiver migrates from Transceiver Password Mode to user mode when the transceiver is turned ON.

Configuration using KPG-D1/ D1N

Configuring **Power-on Status Message** ( See Transceiver Settings > NXDN > NXDN Information > Status > Option)

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 selected when the transceiver was turned OFF.

Note

- In an NXDN Trunking system, the transceiver ends a transmission without sending the Power-off Status again if the transceiver fails to send the Power-off Status.
- In an NXDN Trunking system, the transceiver does not transmit the Power-off Status if the transceiver cannot acquire the control channel when the transceiver is turned OFF.

Configuration using KPG-D1/ D1N

Configuring **Power-off Status Message** ( See Transceiver Settings > NXDN > NXDN Information > Status > Option)

Base ID

Base ID is the target transceiver's ID used to send GPS data, BLE 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

Note

- **Base ID** can be configured using KPG-D1/ D1N. Either Unit ID or Group ID can be configured. ID of the base station that manages operations is normally configured for Base ID.

Configuration using KPG-D1/ D1N

- Configuring **Base ID Type** and **Base ID** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Base ID Type** and **Base ID** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

Emergency Status Response

Emergency Status Response is the function to emit an Alert Tone when the transceiver receives an Emergency Status (Status 224, Status 225, Status 227, Status 228, Status 229).

The transceiver behaves as follows according to the configuration using KPG-D1/ D1N.

Table 1-12 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.
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.
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 .

Configuration using KPG-D1/ D1N

- Configuring **Emergency Status Response (Alert Tone/ Horn/ Voice Announcement)** ( **See** Transceiver Settings > NXDN > NXDN Information > General > Emergency Status Response)
- Configuring **Alert Tone (Emergency Response)** in an NXDN Conventional system ( **See** Transceiver Settings > NXDN > NXDN Information > Conventional > Alert Tone)
- Configuring **Alert Tone (Emergency Response)** in an NXDN Trunking system ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)

AUX Input Status Message (Mobile Only)

Supported Models: Mobile

AUX Input Status Message can be used to send the specified Status Message when the AUX Input port goes high level to low level or goes low level to high level.

The transceiver can send a Status Message when a sensor is attached to the AUX Input port and the status of the AUX Input port changes. The target ID is the ID configured for the **Base ID**. (Refer to **Base ID**.)

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 > NXDN > NXDN Information > Status > Option)
- 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.

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 > NXDN > NXDN Information > Status > Option)
- 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 status transmitted.

When the transceiver receives a status request message, the status stored in the transceiver will automatically be transmitted. Also, the status stored in the transceiver will automatically be stored in GPS data and transmitted.

Table 1-13 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

Configuration using KPG-D1/ D1N

Configuring **Status Hold** ( **See** Transceiver Settings > NXDN > NXDN Information > General)

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

Short Data Call can be used to send and receive a maximum of 100 characters (Short Message). Using this function, a dispatcher can reliably send text messages to the target party.

Note

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

Sending a Short Message

This section describes how to send 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 by 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 an NXDN Conventional system:

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

For an NXDN Trunking system:

The transceiver enters Short Message Mode. The Group ID configured for the channel 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 by 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 an NXDN Conventional system:

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

For an NXDN Trunking system:

The transceiver enters Short Message Mode. The Group ID configured for the channel 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 also places the transceiver in Individual Call Mode. The transceiver enters Short Message Mode by pressing the [►] key, or by 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 an NXDN 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 by pressing and holding the **Menu** ([◻]) key or [*] key after selecting the target Group ID.

For an NXDN Trunking system:

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

Refer to Common FUNC “Keypad Operation” for **Keypad Operation**.

● 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. The transceiver will send a Short Message when a PC sends a command to the transceiver communication port specifying to send a Short Message. (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 an NXDN.

Operating the transceiver

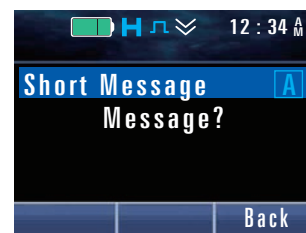
1

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. (NXDN 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. (NXDN Trunking system)**

The transceiver enters Short Message Mode.

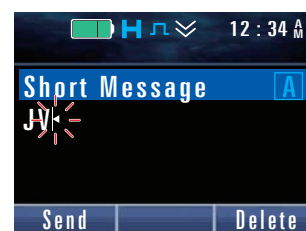
Or, the transceiver enters Short Message Mode by a user pressing the **Menu** key or using a keypad. In this case, the following operations are identical.



2

Enter a Short Message.

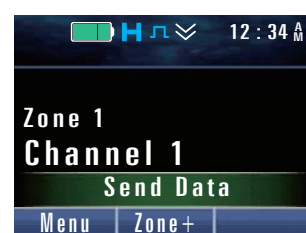
A maximum of 100 characters can be entered. Refer to Common FUNC “Entering or Deleting Characters” for the entry method.



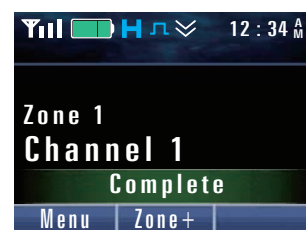
3

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 the **Menu** ([]) key. If entering a message and sending a Short Data Call again, reexecute the operations from step 1.
- For NXDN Conventional, “No Reply” appears on the display and transmission of a Short 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 Short Message is terminated.
- For details on the information displayed on the display during transmission in an NXDN Trunking system, refer to “[Transceiver behavior during transmitting](#)”.

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.

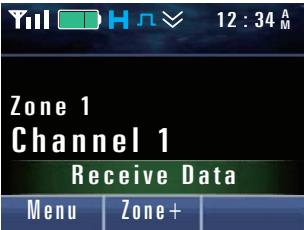
Note

- To use serial communications, a user must prepare NXDN 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.

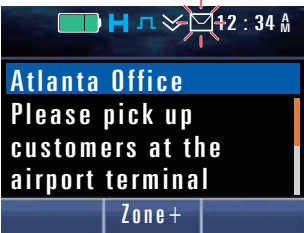


2 The transceiver receives a Short Message.

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 the transceiver receives a Short Message by a Group Call, the ID Name appears according to the configuration for **Unit ID Display on Group Call**. (Refer to **Display When the Transceiver Receives a Group Call (Unit ID Display on Group Call)**.)
- If **Alert Tone (Status/Short Message Call)** is configured to sound when receiving, an Alert Tone will sound.

Configuration using KPG-D1/ D1N

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

Short Message Stack

Short Message Stack is used to store a Short Message in the stack memory. A maximum of 128 Short Messages can be stored in the stack memory.

If a message is stored in the transceiver, the transceiver blinks the “” icon for 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 1-14 No. of Short Message Data That can be Stored

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 > NXDN > NXDN 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 an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for **Data Zone-Channel (NXDN)** to send a Short Message. When the transmission ends, the transceiver restores the Zone-channel which 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 can be only used in an NXDN Conventional system.
- This function is enabled if "Channel Table" is configured in **Zone-channel Format**, 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 > NXDN Conventional > NXDN)
- Configuring **Data Zone-Channel (NXDN)** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN)

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 an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for **Data System-Personality (NXDN)** to send a Short Message. When the transmission ends, the transceiver restores the Zone-channel which 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 can be only used in an NXDN Conventional system.
- This function is enabled if "Personality" is configured in **Zone-channel Format**, 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 > NXDN Conventional > NXDN)
- Configuring **Data System-Personality (NXDN)** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN)

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.

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

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

Short Data Call (Extended) is the function to extend a transmission and reception message (Short Message) by up to a maximum of 314 characters. To use this function, **Extended Short Message** needs to be enabled.

Table 1-15 Extended Short Message

Configuration	Status	Description
Enabled	Transmission	A maximum of 314 characters can be sent in Short Message Mode or by a PC command.
	Reception	When the transceiver receives a Short Message of 101 characters to 314 characters, the content of the message appears. • If Short Message Stack is enabled, the received Short Message is stored in the stack memory of the transceiver. • If Short Message Serial Output is configured, the transceiver sends the received message from a communication port.
Disabled	Transmission	A maximum of 100 characters can be sent in Short Message Mode or by a PC command.
	Reception	Even when the transceiver receives a Short Message of 101 characters to 314 characters, the content of the message appears. • If Short Message Stack is enabled, the first 100 characters of the received Short Message are stored in the stack memory of the transceiver. • If Short Message Serial Output is configured, the transceiver sends the first 100 characters of the received message from a communication port.

The number of Short Messages that can be saved in the stack memory of the transceiver is different when **Extended Short Message** is enabled. Refer to “Table 1-14 No. of Short Message Data that Can be Saved”. (Refer to **Short Message Stack**.)

If the number of characters in a message is 100 characters or less, the transceiver behaves in the same manner as the behavior for a Short Data Call regardless of the configuration in **Extended Short Message**.

The transceiver operation for a **Short Data Call (Extended)** is the same as the operation for a Short Data Call.

Note

- The Data Zone-Channel behaves according to the configuration in **Short Message on Data Zone-Channel**.
- The Data System-Personality behaves according to the configuration in **Short Message on Data System-Personality**.
- In an NXDN Trunking system, the transceiver sends a Short Message of 101 characters or more on a traffic channel by using the Long Data Message protocol.
The behavior of the transceiver is different depending on whether **Extended Short Message** is transmitted and received by an Individual Call or a Group Call.
 - Extended Short Message of Individual Call
The transceiver sends a message requesting the end of communication to the repeater when the transceiver receives an acknowledgment from the target transceiver. If the transceiver receives a message from the repeater to release the traffic channel, the transceiver restores the control channel.
 - Extended Short Message of Group Call
After the transmission from the transceiver ends, communication is not possible on the traffic channel for 3 sec or more.

Configuration using KPG-D1/ D1N

Configuring **Extended Short Message** to be enabled or disabled ( **See** Transceiver Settings > NXDN > NXDN Information > General)

1.11 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). Using this function, information can reliably be sent to the target party.

Note

- 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.)
- This section describes information for both an NXDN Conventional system and NXDN Trunking system. For each operation description, the display of the NXDN Conventional system is used.

Sending a Long Message

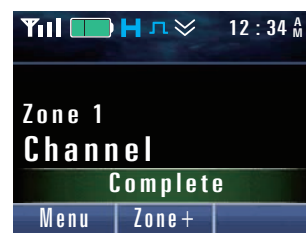
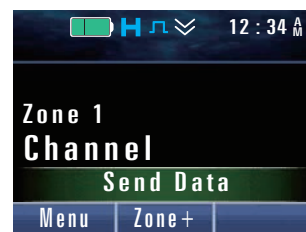
A Long Message is sent via a PC. A Long Message cannot be sent from the transceiver.

Transceiver behavior

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

The transceiver starts sending the Long Message.

If the Long Message is properly sent to the receiving transceiver, "Complete" appears.



Note

- For NXDN Conventional, "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 an NXDN Trunking system, refer to "[Transceiver behavior during transmitting](#)".

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 NXDN compatible software or external devices.

Transceiver behavior

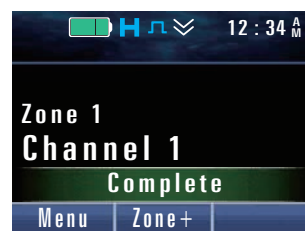
1 The transceiver starts receiving a Long Message.

"Receive Data" appears.



2 The transceiver receives a Long Message.

"Complete" appears.



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.

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 an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for **Data Zone-Channel (NXDN)** to send a Long Message. When the transmission ends, the transceiver restores the Zone-channel which was used before sending the Long Message.

Before moving to the Data Zone-Channel, the transmitting transceiver sends a GTC message to guide the receiving transceiver to the Data Zone-Channel. After receiving a Long Message, the receiving transceiver returns to the zone channel used before the reception of the Long Message.

Long Message on Data Zone-Channel can be used to send data using a specific dedicated channel.

Note

- This function can be only used in an NXDN Conventional system.
- 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 > NXDN Conventional > NXDN)
- Configuring **Data Zone-Channel (NXDN)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN)

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 an NXDN Conventional system.

The channel in an NXDN Conventional system is automatically changed to the channel configured for **Data System-Personality (NXDN)** to send a Long Message. When the transmission ends, the transceiver restores the Zone-channel which was used before sending the Long Message.

Before moving to the Data System-Personality, the transmitting transceiver sends a GTC message to guide the receiving transceiver to the Data System-Personality. After receiving a Long Message, the receiving transceiver returns to the zone channel used before the reception of the Long Message.

Long Message on Data System-Personality can be used to send data using a specific dedicated channel.

Note

- This function can be only used in an NXDN Conventional system.
- 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 > NXDN Conventional > NXDN)
- Configuring **Data System-Personality (NXDN)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN)

1.12 Using 2-tone to Initiate an Individual Call

2-tone signaling uses a pair of 2 different tone frequencies in series for an individual call.

2-tone is a signaling system that can receive a signal with squelch disabled only when 2 tone signals in series sent from the transmitting transceiver match the tone signals preconfigured for the receiving transceiver.

2-tone consists of 2 tone signals in series with 2 different frequencies within the frequency range between 281.25 Hz and 3093.75 Hz in an NXDN Conventional system. These 2 tone signals are sent in series with the carrier wave.

The following are the methods for sending the 2-tone code:

- 2-tone encoding list selection
- **Call** key

Selecting and Sending the 2-tone Code from a List

The transceiver can send a 2-tone code by initiating transmission after selecting a 2-tone code configured in the 2-tone encoding list. (Refer to [2-tone Encoding List](#).)

An encoding tone configured in the 2-tone encoding list can be selected by pressing the **2-tone** key.

Or, by selecting "2-tone" after the transceiver enters Menu Mode by pressing the **Menu** key, an encoding tone configured in the 2-tone encoding list can be selected.

Operating the transceiver

1 Press the **2-tone** key.

The transceiver enters 2-tone Mode, and the 2-tone encoding list appears. The following operations are the same even if the transceiver enters 2-tone Mode by pressing the **Menu** key:

Note

- If the transceiver enters 2-tone Mode on a channel with "Mixed" configured in **Channel Type**, the 2-tone encoding list for analog or the 2-tone encoding list for NXDN appears according to the configuration in **Transmit Mode**.

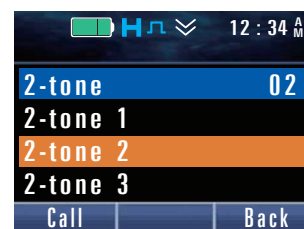


2 Press the [▲]/[▼] key and select the 2-tone code.

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

Note

- A fixed text string ("List No.") and the list number appear for a 2-tone code for which **2-tone Name** is not configured in the 2-tone encoding list.



3 Press the **PTT** switch.

The display returns to the channel display, and the selected 2-tone code is sent. Even after the 2-tone code is sent, the transmission continues while the **PTT** switch is pressed and held.

If the transceiver transmits by pressing the **Menu** ([]) key or [*****] key, the transceiver reverts to receive mode immediately after transmitting a 2-tone code.

Note

- If "RAN and Optional Signaling" is configured in **Audio Control**, the Optional Signaling is in the matching state if transmission is on a channel with "2-tone 1" to "2-tone 4" configured in **Optional Signaling**. In this case, the " " icon appears, and the LED flashes yellow. (Refer to **Unmuting the Speaker (Audio Control (NXDN))**.)

Configuration using KPG-D1/ D1N

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

Using the Call Key to Send the 2-tone Code

Pressing one of the **Call 1** to **Call 6** keys causes the transceiver to transmit the preconfigured tone.

Call 1 to **Call 6** can be assigned to the **PF** keys by using KPG-D1/ D1N and the tone corresponding to each key can be configured by selecting from the 2-tone encoding list of 2-tone.

Configuration using KPG-D1/ D1N

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

Using the PC Command to Send the 2-tone Code

The transceiver sends a 2-tone code when a transmission command for a 2-tone code is sent from a PC to the communication port of the transceiver.

To send a 2-tone code by using 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.)

Functions Related to 2-tone Code Encoding

Functions related to 2-tone code encoding are shown below:

- Duration of 1st Tone
- Duration of 2nd Tone
- Duration of Single Tone
- Gap Time
- First Tone Delay Time
- Sidetone
- 2-tone encoding list

Duration of 1st Tone

Duration of 1st Tone is the 1st Tone Encode duration for transmitting the 2-tone code (1st Tone and 2nd Tone) configured in the 2-tone encoding list.

Duration of 1st Tone is configured using KPG-D1/ D1N. Usually, 1 sec is configured for this function.

Duration of 2nd Tone

Duration of 2nd Tone is the 2nd Tone Encode duration for transmitting the 2-tone code (1st Tone and 2nd Tone) configured in the 2-tone encoding list.

Duration of 2nd Tone is configured using KPG-D1/ D1N. Usually, 3 sec is configured for this function.

Duration of Single Tone

Duration of Single Tone is the Single Tone Encode duration for transmitting the Single Tone configured in the 2-tone encoding list.

Duration of Single Tone is configured using KPG-D1/ D1N. Usually, 5 sec is configured for this function.

Gap Time

Gap Time is the unmodulated duration between the 1st Tone and the 2nd Tone when sending the 2-tone code (1st Tone and 2nd Tone) configured in the 2-tone encoding list.

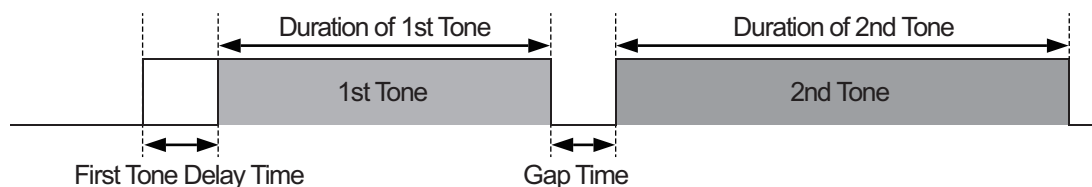
Gap Time is configured using KPG-D1/ D1N. Usually, 0 ms is configured for this function.

First Tone Delay Time

First Tone Delay Time is the length of time from when the transceiver starts transmission until the transceiver actually starts transmitting a tone when the transceiver sends a 2-tone code.

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

● 2-tone Encode



● Single Tone Encode

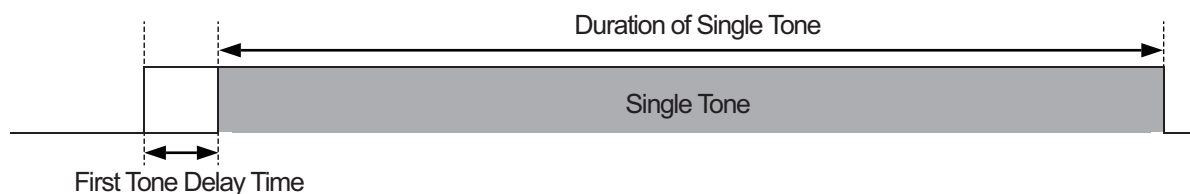


Figure 1-6 Duration of Single Tone/ Gap Time/ First Tone Delay Time

Sidetone

Sidetone is the function to emit the tone of the 2-tone code from the speaker while the transceiver transmits the 2-tone code.

2-tone Encoding List

2-tone encoding list is the code list used for transmitting a 2-tone code. By selecting a code configured in this list, the transceiver can transmit a 2-tone code.

The following items can be configured in the 2-tone encoding list:

Table 1-16 2-tone Encoding List Configuration

Configuration	Description
Single Tone	Whether the code to be sent for each list number is used as a Single Tone is configured. 2nd Tone cannot be configured if the code is configured to be used as a Single Tone.
2-tone Name	2-tone Name can be used to assign a name to each list number. A maximum of 14 characters can be configured.
1st Tone	The 1st Tone frequency is configured. The frequency can be configured in the range between 281.25 Hz and 3093.75 Hz inclusive.
2nd Tone	The 2nd Tone frequency is configured. The frequency can be configured in the range between 281.25 Hz and 3093.75 Hz inclusive. 2nd Tone cannot be configured if Single Tone is configured.

Configuration using KPG-D1/ D1N

- Configuring **Duration of 1st Tone** ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)
- Configuring **Duration of 2nd Tone** ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)
- Configuring **Duration of Single Tone** ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)
- Configuring **Gap Time** ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)
- Configuring **First Tone Delay Time** ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)
- Configuring **Sidetone** to be enabled or disabled ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)
- Configuring the 2-tone encoding list ( [See](#) Transceiver Settings > 2-tone > 2-tone (Digital) > Encode)

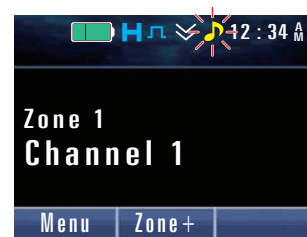
Decoding the 2-tone Code

The transceiver can wait for a 2-tone code on a channel with "2-tone 1", "2-tone 2", "2-tone 3", or "2-tone 4" configured in **Optional Signaling (NXDN)**. (Refer to [Using the Optional Signaling \(NXDN\)](#).)

Transceiver behavior

The transceiver receives the 2-tone code corresponding to the **Call Format** preconfigured for the transceiver.

The “🔊” icon blinks and the transceiver emits the received audio according to the configuration in **Audio Control (NXDN)** if the received 2-tone code matches the 2-tone code preconfigured for the transceiver. (Refer to **Unmuting the Speaker (Audio Control (NXDN))**.)



Note

- If **Busy LED** is enabled, the LED lights green. (Refer to Common FUNC Busy LED.)
- If **Selective Call Alert LED** is enabled, the LED flashes when the transceiver is receiving. The flashing LED color varies according to the configuration in **Alert LED Color of Call Format**.
- If anything other than “Off” is configured in **Alert Tone of Call Format**, an Alert Tone sounds from the transceiver. Also, if **Transpond** of **Call Format** is enabled, the transceiver transmits a multiplexed Transpond tone.
- After the length of time configured in **Auto Reset Timer** elapses, the matching state of the 2-tone code is reset.

Functions Related to 2-tone Code Decoding

The following functions associated with 2-tone code decoding can be configured for each of 2-tone 1, 2-tone 2, 2-tone 3, and 2-tone 4:

- Decoder 1 to Decoder 4
- A Tone/ B Tone/ C Tone/ D Tone
- Auto Reset Timer
- Clear to Transpond
- Selective Call Alert LED

Standby code (Decoder 1 to Decoder 4)

Four types of Decoders can be configured for 2-tone 1, 2-tone 2, 2-tone 3, and 2-tone 4 respectively. The transceiver can wait to receive the 2-tone codes configured in Decoder 1 to Decoder 4 at the same time.

The following items can be configured for each Decoder.

● Call Format

Call Format is the combination of A Tone, B Tone, C Tone, and D Tone the transceiver waits to receive. The following combinations are available.

Table 1-17 List of Call Format Combinations

Combination	Description
A and B	The transceiver waits to receive A Tone and B Tone.
A and C	The transceiver waits to receive A Tone and C Tone.
A and D	The transceiver waits to receive A Tone and D Tone.
B and A	The transceiver waits to receive B Tone and A Tone.

Combination	Description
B and C	The transceiver waits to receive B Tone and C Tone.
B and D	The transceiver waits to receive B Tone and D Tone.
C and A	The transceiver waits to receive C Tone and A Tone.
C and B	The transceiver waits to receive C Tone and B Tone.
C and D	The transceiver waits to receive C Tone and D Tone.
D and A	The transceiver waits to receive D Tone and A Tone.
D and B	The transceiver waits to receive D Tone and B Tone.
D and C	The transceiver waits to receive D Tone and C Tone.
Long A	The transceiver waits to receive A Tone.
Long B	The transceiver waits to receive B Tone.
Long C	The transceiver waits to receive C Tone.
Long D	The transceiver waits to receive D Tone.

 Note

- If anything other than "Long A", "Long B", "Long C", or "Long D" is configured in **Call Format**, the transceiver waits to receive the first tone for 1 sec and the second tone for 3 sec. If "Long A", "Long B", "Long C", or "Long D" is configured in **Call Format**, the transceiver waits to receive the corresponding tone for 5 or more sec.

● Transpond/ Alert Tone

Transpond and **Alert Tone** are functions that allow the transceiver to transmit a multiplexed Transpond tone, or that allow an Alert Tone to sound from the transceiver when the transceiver is called with 2-tone signaling.

Table 1-18 Transpond/ Alert

Transpond	Alert	Description
No	Off	The transceiver does not respond at all.
Yes	Off	The transceiver transmits a Transpond tone.
No	Anything other than Off	An Alert Tone sounds from the transceiver.
Yes	Anything other than Off	An Alert Tone sounds from the transceiver after transmitting a Transpond tone.

The Alert Tone to be emitted when the transceiver is called with 2-tone signaling is selected from 8 types of tones configured in **Alert Tone Pattern**. (Refer to Common FUNC Configuring the Alert Tone (Alert Tone Pattern).)

● Alert LED Color

When the 2-tone code matches, the LED flashes according the configuration in **Alert LED Color**.

Table 1-19 Alert LED Color

Configuration	Description
Off	The LED does not flash.
Red	The LED flashes red.
Blue	The LED flashes blue.
Green	The LED flashes green.
Yellow	The LED flashes yellow.
Light Blue	The LED flashes light blue.
Purple	The LED flashes purple.
White	The LED flashes white.

Frequencies for standby code (A Tone/ B Tone/ C Tone/ D Tone)

A Tone, **B Tone**, **C Tone**, and **D Tone** are the frequencies of the tone signals the receiving transceiver waits to receive.

The frequency can be configured between 281.25 Hz and 3093.75 Hz inclusive.

Auto Reset Timer

Auto Reset Timer is the length of time from when the received 2-tone code matches the 2-tone code preconfigured for the transceiver until the matching state is automatically reset.

Auto Reset Timer is configured using KPG-D1/ D1N. Also, how the transceiver behaves after the length of time configured in **Auto Reset Timer** elapses can be configured.

Table 1-20 Auto Reset Timer

Configuration		Description
Auto Reset Timer	Off	Auto Reset Timer does not function.
	0 sec to 300 sec	After the configured time elapses, the matching state of the 2-tone code is automatically reset.
LED		If LED 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		If Alert is enabled, the intermittently emitted Alert Tone stops when the length of time configured in Auto Reset Timer elapses.
Monitor		If Monitor is enabled, the matching state of the 2-tone code is reset when the length of time configured in Auto Reset Timer elapses.

Clear to Transpond

Clear to Transpond is the function that allows the transceiver to wait to initiate the Transpond until the channel becomes available if the channel is occupied by other users when the transceiver attempts to initiate the Transpond.

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash when the transceiver receives a 2-tone code.

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

Note

- The matching state of 2-tone code is reset on the following conditions. Also, the Transpond is reset on the following conditions. The Transpond is suspended if transmission is disabled by **Clear to Transpond**.

Table 1-21 Conditions to Reset the 2-tone Code

Conditions	Description
Pressing a key	When the following keys are pressed • Channel Up key • Channel Recall key • Channel Down key • Clear key • Direct Channel 1 key to Direct Channel 5 key • Direct Channel 1 Select key to Direct Channel 5 Select key • Emergency key • Home Channel key • Home Channel Select key • Monitor key • Monitor Momentary key • Scan key • Scan Normal key • Scan Program key • Front Panel Programming key • Squelch Off key • Squelch Off Momentary key • Transceiver Password key • Zone Up key • Zone Down key • Zone Up/Down key • Zone Select key • Channel Up/Down key • Channel Select key
Hook (Mobile only)	When the microphone is in the on-hook state (However, the 2-tone code is not reset while the audio sounds from the transceiver.)
Expiration of the Auto Reset Timer	When the length of time configured in Auto Reset Timer elapses (This condition is the condition to reset 2-tone.)
Transmission	When transmission is made using the following (This condition is the condition to reset the Transpond.) • PTT switch • External PTT (Voice) port (Mobile only) • External PTT (Data) port (Mobile only)

Configuration using KPG-D1/ D1N

- Configuring **Call Format** ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))
- Configuring **Transpond** ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))
- Configuring **Alert Tone** ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))
- Configuring **Alert LED Color** ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))
- Configuring **A Tone/ B Tone/ C Tone/ D Tone** ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))
- Configuring **Auto Reset Timer** ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4) > Auto Reset)
- Configuring **Clear to Transpond** to be enabled or disabled ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))
- Configuring **Selective Call Alert LED** to be enabled or disabled ( **See** Transceiver Settings > 2-tone > 2-tone (Digital) > Decode (2-tone 1 to 4))

1.13 Using DTMF to Initiate a Selective Call

DTMF (Dual Tone Multi-frequency) is the signaling type that uses 2 different frequency tones simultaneously. DTMF is used for operations such as making an individual call and placing the transceiver in the Stun state by remote control.

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 1-22 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 and DTMF Decode can be used in an NXDN Conventional system.

Also, to decode a DTMF code in an NXDN Conventional system, "DTMF" needs to be configured as the Optional Signaling to be used on the channel. (Refer to [Using the Optional Signaling \(NXDN\)](#).)

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

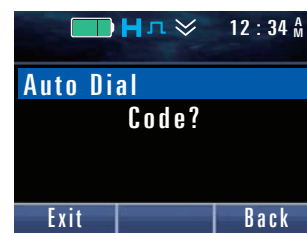
- **If using the keypad:**

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.



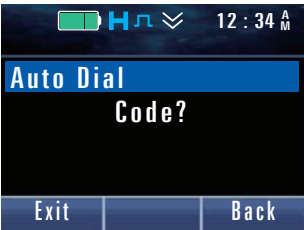
4 Press the **PTT** switch or the **Menu** ([]) key.

The transceiver sends the DTMF code.

● Without using the keypad

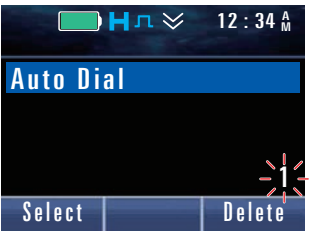
1 Press the **Autodial** key.

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.



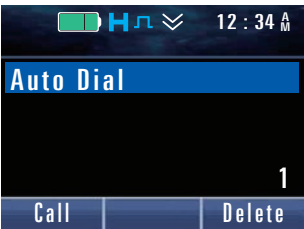
2 Enter the DTMF code to be sent by pressing the [] key or [] key.

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.

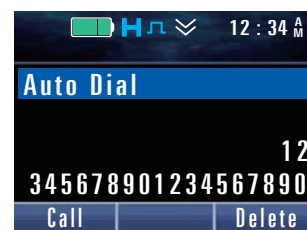


3 Confirm the entered DTMF code by pressing the **Menu** ([]) key.

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:

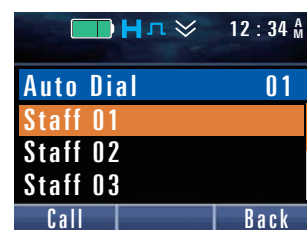
- **Autodial key**
Pressing the **Autodial** key places the transceiver in Autodial Mode.
- **Menu key**
Pressing the **Menu** key places the transceiver in Menu Mode, and then the transceiver enters Autodial Mode by selecting "Autodial". (Refer to Common FUNC Using Menu Mode.)
- **Keypad entry**
If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

Disabling the Transceiver Capability by Remote Control (Stun)

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.

When the transceiver receives a Stun code, the transceiver multiplexes a Stun-on Tone and initiates the Transpond. After that, the transceiver enters the Stun state according to the configuration in **Stun Code Response**.

The Stun state cannot be reset by **Auto Reset Timer** or by the user’s operation. The transceiver transmits a Stun-off Tone and then resets the Stun state when the transceiver receives a Revive Code (Stun Code + “#”).

Stun Code and **Stun Code Response** can be configured using KPG-D1/ D1N.

Table 1-23 Stun

Configuration	Description
Stun Code	Stun Code is a standby code for Stun.
Stun Code Response	In Stun Code Response , how the transceiver responds when the received DTMF code matches the DTMF code configured in Stun Code can be configured as below: Transmit Inhibit: Transmit capability is disabled. User operations of the transceiver are also inhibited. Automatic transmission, such as Transpond, is still available. Transceiver Inhibit: Transmit and receive capabilities are disabled. User operations of the transceiver are also inhibited.

Note

- The transceiver cannot enter Emergency Mode while the transceiver is in the Stun state.

Configuration using KPG-D1/ D1N

- Configuring **Stun Code** ( **See** Transceiver Settings > DTMF > Decode > Stun)
- Configuring **Stun Code Response** ( **See** Transceiver Settings > DTMF > Decode > Stun)

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 1-24 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

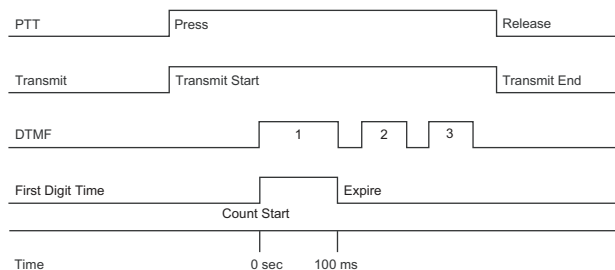


Figure 1-7 First Digit Time

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

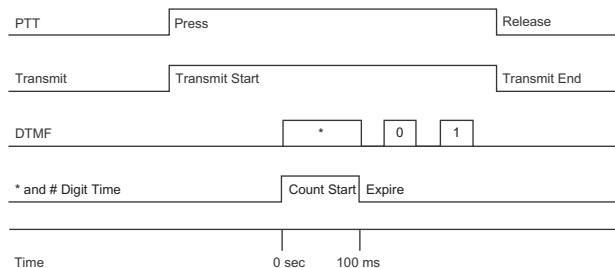


Figure 1-8 * and # Digit Time

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 **DTMF Sidetone** to be enabled or disabled ( [See](#) Transceiver Settings > DTMF > Encode)

Functions Related to DTMF Code Decoding

Functions related to DTMF code decoding are shown below.

- Code
- Transpond
- Alert Tone
- Alert LED Color
- Selective Call Alert LED
- Auto Reset Timer
- Clear to Transpond

Note

- To decode a DTMF code in an NXDN Conventional system, "DTMF" needs to be configured in **Optional Signaling (NXDN)** to be used on the channel. (Refer to [Using the Optional Signaling \(NXDN\)](#).)

Standby code

Two DTMF codes for standby can be configured for the transceiver. The transceiver can wait to receive the DTMF codes configured in **No.1** and **No.2** at the same time.

The following items can be configured in each of **No.1** and **No.2**:

● Transpond/ Alert Tone

Transpond and Alert Tone are functions that allow the transceiver to transmit a multiplexed Transpond tone, or that allow an Alert Tone to sound from the transceiver when the transceiver is called with DTMF.

Table 1-25 Transpond/ Alert

Transpond	Alert	Description
No	Off	The transceiver does not respond at all.
Yes	Off	The transceiver transmits a Transpond tone.
No	Anything other than Off	An Alert Tone sounds from the transceiver.
Yes	Anything other than Off	An Alert Tone sounds from the transceiver after transmitting a Transpond tone.

The Alert Tone to be emitted when the transceiver is called with DTMF signaling is selected from 8 types of tones configured in **Alert Tone Pattern**. (Refer to Common FUNC Configuring the Alert Tone (Alert Tone Pattern).)

● Alert LED Color

When the DTMF code matches, the LED flashes according the configuration in **Alert LED Color**.

Table 1-26 Alert LED Color

Configuration	Description
Off	The LED does not flash.
Red	The LED flashes red.
Blue	The LED flashes blue.
Green	The LED flashes green.
Yellow	The LED flashes yellow.
Light Blue	The LED flashes light blue.
Purple	The LED flashes purple.
White	The LED flashes white.

Auto Reset Timer

Auto Reset Timer is the length of time from when the received DTMF code matches the DTMF code preconfigured for the transceiver until the matching state is automatically reset.

Auto Reset Timer is configured using KPG-D1/ D1N. Also, how the transceiver behaves after the length of time configured in **Auto Reset Timer** elapses can be configured.

Table 1-27 Auto Reset Timer

Configuration		Description
Auto Reset Timer	Off	Auto Reset Timer does not function.
	0 sec to 300 sec	After the configured time elapses, the matching state of the DTMF code is automatically reset.
LED		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		If this function is enabled, the intermittently emitted Alert Tone stops when the length of time configured in Auto Reset Timer elapses.
Monitor		If this function is enabled, the matching state of the DTMF code is reset if the length of time configured in Auto Reset Timer elapses.

Clear to Transpond

Clear to Transpond is the function that allows the transceiver to wait to initiate the Transpond until the channel becomes available if the channel is occupied by other users when the transceiver attempts to initiate the Transpond.

Selective Call Alert LED

Selective Call Alert LED is the function to make the LED flash when the transceiver receives a DTMF code.

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

Note

- The matching state of the DTMF codes is reset on the following conditions. Also, the Transpond is reset on the following conditions. The Transpond is suspended if transmission is disabled by **Clear to Transpond**.

Table 1-28 Conditions to Reset the DTMF Code

Conditions	Description
Pressing a key	When the following keys are pressed • Channel Up key • Channel Recall key • Channel Down key • Clear key • Direct Channel 1 key to Direct Channel 5 key • Direct Channel 1 Select key to Direct Channel 5 Select key • Emergency key • Home Channel key • Home Channel Select key • Monitor key • Monitor Momentary key • Scan key • Scan Normal key • Scan Program key • Front Panel Programming key • Squelch Off key • Squelch Off Momentary key • Transceiver Password key • Zone Up key • Zone Down key • Zone Up/Down key • Zone Select key • Channel Up/Down key • Channel Select key
Hook (Mobile only)	When the microphone is in the on-hook state (However, the DTMF code is not reset while the audio sounds from the transceiver.)
Expiration of the Auto Reset Timer	When the length of time configured in Auto Reset Timer elapses (This condition is the condition to reset the DTMF code.)
Receiving a code	When a "Code + #" code is received
Transmission	When transmission is made using the following (This condition is the condition to reset the Transpond.) • PTT switch • External PTT (Voice) port (Mobile only) • External PTT (Data) port (Mobile only)

Configuration using KPG-D1/ D1N

- Configuring **Transpond** ( **See** Transceiver Settings > DTMF > Decode)
- Configuring **Alert Tone** ( **See** Transceiver Settings > DTMF > Decode)
- Configuring **Alert LED Color** ( **See** Transceiver Settings > DTMF > Decode)
- Configuring **Auto Reset Timer** ( **See** Transceiver Settings > DTMF > Decode > Auto Reset)
- Configuring **Clear to Transpond** to be enabled or disabled ( **See** Transceiver Settings > DTMF > Decode)
- Configuring **Selective Call Alert LED** to be enabled or disabled ( **See** Transceiver Settings > DTMF > Decode)

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 1-29 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.



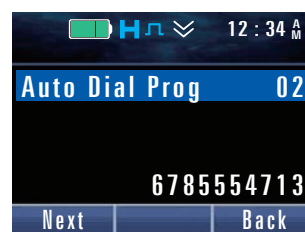
4 Enter a DTMF name.

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



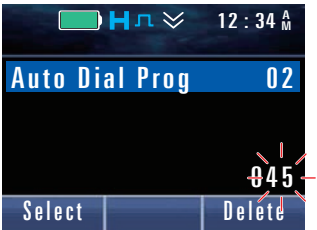
5 Press the Menu ([□]) key or [*] key after entering the DTMF name.

The DTMF code edit display appears.



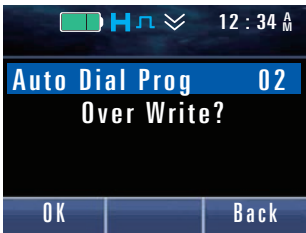
6 Enter a DTMF code.

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

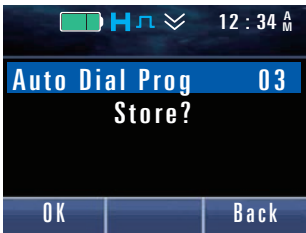


7 Press the Menu ([F]) key or [*] key after entering the DTMF code.

The writing completion message display appears.
“Over Write?” appears if the existing data in the **Autodial List** is changed.

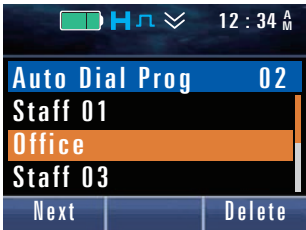


“Store?” appears if new data is added in the **Autodial List**.



8 Press the Menu ([F]) 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.



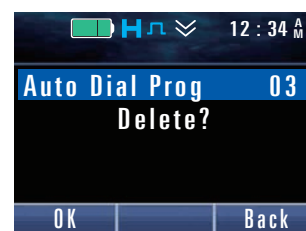
2 Press the [▲] key or [▼] key and then select the target data from the Autodial List.

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)

1.14 Communicating with a Telephone (Telephone Call)

Telephone Call in an NXDN Conventional system makes a voice call by a SIP Phone via the repeater.

Voice calls by a SIP Phone are a Group Call (an incoming call only) and an Individual Call, and the mechanisms of **Individual Call Acknowledge Request** apply to an incoming call of Individual Call. Therefore, the transceiver of when an Individual Call (Telephone Call) is received behaves according to the configuration in **Automatic Response** of Individual Call Acknowledge Request.

Initiating a Telephone Call

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

To make a Telephone Call, enable the configuration in **Autodial Telephone Interconnect**.

- **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. (Refer to [Sending Entered DTMF Codes All at Once \(Store and Send\)](#).)

- **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 \(Call 1 Key to Call 6 Key\)](#).)

Note

- Telephone Call functions by using the Individual Call and Group Call functions. Therefore, in **Busy Channel Lockout**, configure the transceiver to be able to transmit even while unmuted. In addition, use Telephone Call after configuring the Encryption function to be disabled.
- The JVCKENWOOD repeater that can use Telephone Call is NXR-1700/ NXR-1800.
- When a Telephone Call is received, "Phone Call" appears in Stack Mode because the transceiver executes the Stack behavior, but a DTMF code cannot be selected and sent from Stack Mode.
- The Unit IDs of a Group Call and an Individual Call by a SIP Phone are fixed to \$FFF5.
- When a Group Call or Individual Call is received from a SIP Phone, **Auto Reset Timer** functions as "0 sec" regardless of the FPU configurations.

Operating the transceiver

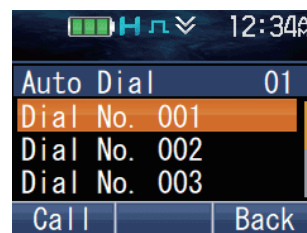
● Initiating a Telephone Call by selecting a DTMF code from the Autodial List

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.

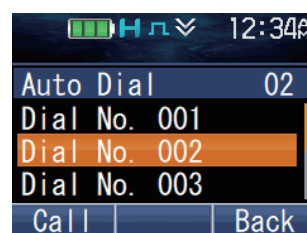
Note

- If **Store and Send** is enabled, the DTMF code entry display will appear.
Pressing the **Function** ([]) 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.



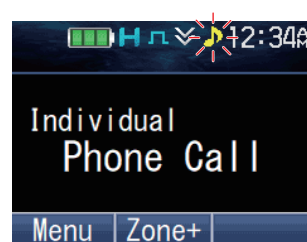
3 Press the **PTT** switch or the **Menu** ([]) key.

The connection request of a SIP Phone to the repeater is executed by Individual Call.
"Individual", "Phone Call", 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

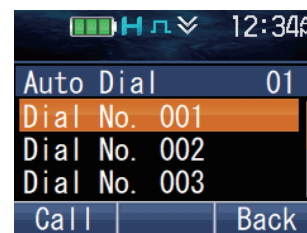
1 Press the **Autodial** key on the channel of the system with Autodial Telephone Interconnect enabled.

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.

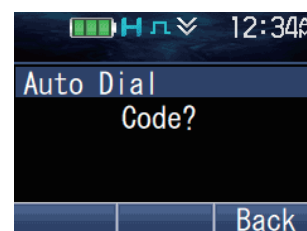


- If **Store and Send** is enabled, the DTMF code entry display will appear.



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

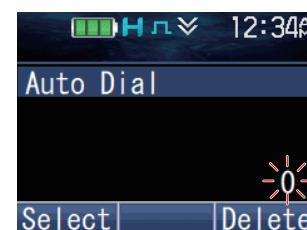
Press a key on the keypad to enter a DTMF code.

● 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.

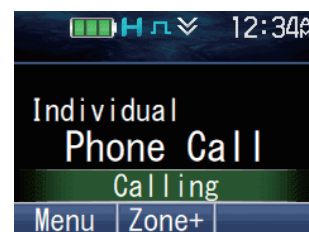


- To enter the DTMF "A" code, press and hold the [*] key and then press the [2] key.
- To enter the DTMF "B" code, press and hold the [*] key and then press the [5] key.
- To enter the DTMF "C" code, press and hold the [*] key and then press the [8] key.
- To enter the DTMF "D" code, press and hold the [*] 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.



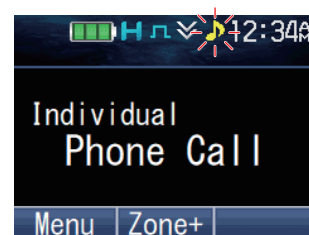
4 Press the **PTT** switch or the **Menu** ([]) key.

The connection request of a SIP Phone to the repeater is executed by Individual Call.
"Individual", "Phone Call", 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.



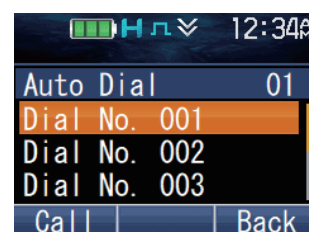
● Redialing

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.

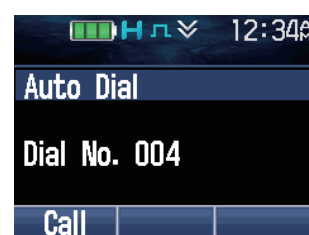
Note

- If **Store and Send** is enabled, the DTMF code entry display will appear.
Pressing the **Function** ([]) 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 of a SIP Phone to the repeater is executed by Individual Call.

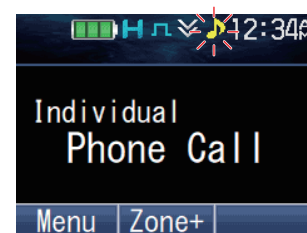
"Individual", "Phone Call", and "Calling" appear.



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 initiate the connection request of a SIP Phone. Also, if **Call Processing Tone** is enabled, a Call Processing Tone (2 beeps) sounds from the transceiver until the transceiver receives from the repeater a response after the connection request of a SIP Phone 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 **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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Autodial Telephone Interconnect)
- Configuring **Call Request Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Autodial Telephone Interconnect)
- Configuring **Call Processing Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Autodial Telephone Interconnect > Call Processing Tone)
- Configuring **Call in Progress Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > 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

If a Telephone Call by Individual Call is received, the transceiver behaves according to **Automatic Response** in **Individual Call Acknowledge Request**.

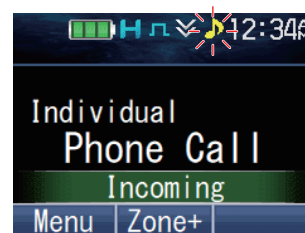
Operating the transceiver

- If Automatic Response is disabled

1

Receive a Telephone Call.

The “📞” icon blinks, and “Individual”, “Phone Call”, and “Incoming” appear. The transceiver sends an automatic response message to the repeater and notifies that the transceiver has received a message requesting an acknowledgment.



2

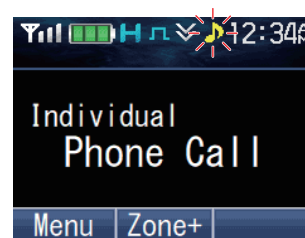
Press the **PTT** switch or the **Call Response** key.

By pressing the **PTT** switch, the transceiver responds to the repeater by an Individual Call.

If the **Call Response** key is pressed, a Button Beep A (1 beep) sounds from the transceiver, and an acknowledgment message to notify that the transceiver is available for the call is sent to the repeater.

Note

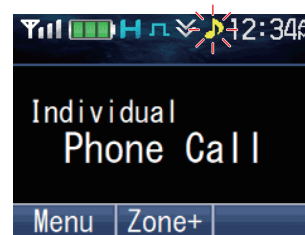
- For Mobile, when **Off-hook Connect** is enabled, the transceiver can respond to the transmitting telephone by placing the microphone in the off-hook state.



● If Automatic Response is enabled

1 Receive a Telephone Call.

The “📞” icon blinks, and “Individual” and “Phone Call” appear.
An acknowledgment message to notify that the transceiver is available for the call is automatically sent to the repeater.



2 Press the **PTT** switch.

The transceiver responds to the transmitting telephone.

Note

- 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.

Configuration using KPG-D1/ D1N

- Configuring **Automatic Response** to be enabled or disabled (See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Individual Call Acknowledge Request)
- Configuring **Individual Call Acknowledge Request** (See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Off-hook Connect** to be enabled or disabled (See Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)
- Configuring **On-hook Disconnect** to be enabled or disabled (See Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)

1.15 Communicating using a CW Message

Continuous Wave (CW) is a radio emission type that is used to send and receive Morse code messages over the air.

CW Message is used to send Morse code messages preconfigured in the transceiver by using the **PF** keys.

Pressing the **CW Message** key causes the transceiver to send the CW Message.

The transceiver can send a CW Message only on a channel where "Very Narrow" is configured for Channel Spacing in an NXDN Conventional system. The transceiver will switch to analog modulation mode when the transceiver sends a CW Message.

A maximum of 32 alphanumeric characters and symbols can be configured and sent.

The CW Message to be sent can be configured using KPG-D1/ D1N. The following functions are relevant to sending a CW Message.

- CW Speed
- CW Modulation Delay Time
- Audio Frequency
- CW Sidetone

Note

- CW specifications are compliant with articles in FCC 90.425 Station Identification and International Morse Code.

Configuration using KPG-D1/ D1N

- Configuring **CW Message** ([See](#) Transceiver Settings > NXDN > NXDN Information > General > CW ID)
- Assigning functions to the **PF** keys on the transceiver ([See](#) Transceiver Settings > Key Assignment)

CW Speed

CW Speed refers to how fast the CW Message is sent by using Morse code.

Configuration using KPG-D1/ D1N

Configuring **CW Speed** ([See](#) Transceiver Settings > NXDN > NXDN Information > General > CW ID)

CW Modulation Delay Time

CW Modulation Delay Time is the amount of time from when the transceiver starts transmitting until the transceiver starts sending the CW Message.

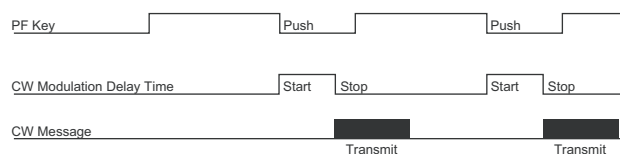


Figure 1-9 CW Modulation Delay Time

Note

- If "Off" is configured for **CW Modulation Delay Time**, the transceiver sends a CW Message immediately after the transceiver starts transmitting.

Configuration using KPG-D1/ D1N

Configuring **CW Modulation Delay Time** ([See](#) Transceiver Settings > NXDN > NXDN Information > General > CW ID)

Audio Frequency

Audio Frequency is the frequency used to send the CW Message.

Configuration using KPG-D1/ D1N

Configuring **Audio Frequency** ( **See** Transceiver Settings > NXDN > NXDN Information > General > CW ID)

CW Sidetone

CW Sidetone is the function to emit tones from the speaker while the transceiver sends a CW Message.

Configuration using KPG-D1/ D1N

Configuring **CW Sidetone** to be enabled or disabled ( **See** Transceiver Settings > NXDN > NXDN Information > General > CW ID)

1.16 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.
- This section describes information for both an NXDN Conventional system and NXDN Trunking system.

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 voice communications**
 - [Sending GPS Data Together With Voice Communications \(GPS Combination\)](#)
- **GPS data transmission together with Status Message**
 - [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 \(Data with Voice\)](#)
- **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** in an NXDN Conventional system ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN)
- Configuring **GPS Base ID Type** and **GPS Base ID** in an NXDN Site Roaming system ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS)
- Configuring **GPS Base ID Type** and **GPS Base ID** in an NXDN Trunking system ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

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](#).)
 - If the transceiver is transmitting ^{*1}
 - While the transceiver is in busy state
 - While the transceiver unmutes the speaker
 - While the Public Address function is used (Mobile only)
 - If Transmit Frequency is not configured or "Receive Only" is configured for ID Mode
 - While transmission is disabled by the Time-out Timer
 - While the transceiver is sending or receiving the NXDN data
 - While the transceiver is connected to the repeater
 - Transceiver Password Mode
 - Emergency Mode
- ^{*1} However, since Data with Voice is activated while the voice data is sent, the transmission of GPS data will not be canceled.
- 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** in an NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS)
- Configuring **GPS Report Mode** in an NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

Sending GPS Data According to the Request from the Base Station (GPS Report Mode)

The transceiver can 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.

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](#).)
- 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** in an NXDN Conventional system ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS)
- Configuring **GPS Report Mode** in an NXDN Trunking system ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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 the GPS Data". (Refer to Common FUNC Using Menu Mode.)

Configuration using KPG-D1/ D1N

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

Sending GPS Data Together With Voice Communications (GPS Combination)

The transceiver can send GPS data by adding the GPS data to a signal while making voice calls.

To use this function, **Voice Call** for **GPS Combination** must be enabled by using KPG-D1/ D1N.

Note

- The GPS data added to a signal is sent to the ID configured for **GPS Base ID** or **Base ID**.
- For encrypted communications using KWD-AE30/ KWD-AE31/ KWD-DE31, only audio is encrypted.
- 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 (Voice Call)** of NXDN Conventional to be enabled or disabled ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN > GPS Combination)
- Configuring **GPS Combination (Voice Call)** of NXDN Site Roaming to be enabled or disabled ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS > GPS Combination)
- Configuring **GPS Combination (Voice Call)** of NXDN Trunking to be enabled or disabled ([See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Standard GPS Report Mode > GPS Combination)

Sending GPS Data Together With Status Call (GPS Combination)

The transceiver can send GPS data by adding the GPS data to a Status Message using NXDN.

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**.
- For encrypted communications using KWD-AE30/ KWD-AE31/ KWD-DE31, only audio is encrypted.
- 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)** of NXDN Conventional to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN > GPS Combination)
- Configuring **GPS Report Status Number Block** in an NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN > GPS Combination)
- Configuring **GPS Combination (Status)** of NXDN Site Roaming to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS > GPS Combination)
- Configuring **GPS Report Status Number Block** in an NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS > GPS Combination)
- Configuring **GPS Combination (Status)** of NXDN Trunking to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Standard GPS Report Mode > GPS Combination)
- Configuring **GPS Report Status Number Block** in an NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Standard 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 the Emergency Status (Status 224, Status 225, Status 227, Status 228, and Status 229). To use this function, **Emergency (Voice Call)** or **Emergency (Status)** for **GPS Combination** must be enabled by using KPG-D1/ D1N. **Emergency (Voice Call)** adds GPS data to the Emergency Status when the transceiver starts voice communication in Emergency Mode.

When the transceiver sends the Emergency Status only, **Emergency (Status)** adds GPS data before transmission. For **Emergency (Status)**, the statuses of Emergency Status and GPS data vary in each system.

● If Emergency Status On Control Channel is enabled in an NXDN Trunking system

The transceiver sends an Emergency Status on the control channel during automatic transmission. Then, the transceiver sends GPS data on the control channel.

● If "0" is configured in Transmit Duration in an NXDN Conventional system

The transceiver sends only an Emergency Status during automatic transmission. The transceiver sends GPS data after transmission of the Emergency Status.

Note

- The GPS data added to the Emergency Status 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.
- For encrypted communications using KWD-AE30/ KWD-AE31/ KWD-DE31, only audio is encrypted.
- 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 (Emergency (Voice Call))** of NXDN Conventional to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN > GPS Combination)
- Configuring **GPS Combination (Emergency (Status))** of NXDN Conventional to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN > GPS Combination)
- Configuring **GPS Combination (Emergency (Voice Call))** of NXDN Site Roaming to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS > GPS Combination)
- Configuring **GPS Combination (Emergency (Status))** of NXDN Site Roaming to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS > GPS Combination)
- Configuring **GPS Combination (Emergency (Voice Call))** of NXDN Trunking to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Standard GPS Report Mode > GPS Combination)
- Configuring **GPS Combination (Emergency (Status))** of NXDN Trunking to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Standard GPS Report Mode > GPS Combination)

Sending GPS Data during Voice Communications (Data with Voice)

The transceiver can multiplex GPS data on audio data and send the data during voice communications.

If the timing of automatic GPS data transmission configured for **GPS Report Internal Time** comes while the transceiver is sending audio data, the transceiver multiplex GPS data on the audio data and send the data.

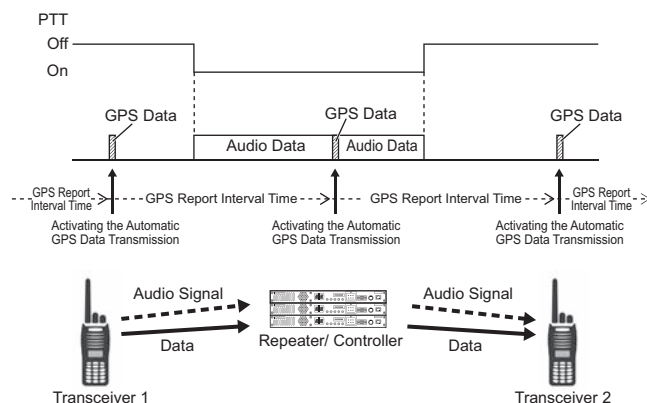


Figure 1-10 Data with Voice

Note

- If the transceiver is being used for voice communications and receives GPS data, LCD display, LED, and Alert Tone will function according to the configurations for voice calls.
- On a channel where "Very Narrow" is configured for **Channel Spacing**, note that the sound quality may be degraded if the amount of time configured for the **GPS Report Interval Time** is short.
- In an Indoor Location system, even if GPS data is received, GPS data is not sent at the timing of the GPS Report transmission 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

Sending GPS Data Based On Travel Distance (GPS Distance Change)

GPS data can be sent 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 sent GPS data using the function (Voice Call, Status, or Emergency) of **GPS Combination, Send the GPS Data** or **Send the Location 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

- 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** in an NXDN Conventional system to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS > GPS Distance Change)
- Configuring **Distance Value** in an NXDN Conventional system ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS > GPS Distance Change)
- Configuring **GPS Distance Change** in an NXDN Trunking system to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > GPS Distance Change)
- Configuring **Distance Value** in an NXDN Trunking system ( See Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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 NXDN 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 1-30 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 "NXDN" is configured in Transmit Mode of the selected channel, GPS data is automatically sent by Data Zone-Channel (NXDN) or Data System-Personality (NXDN).
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.
NXDN	GPS data is automatically sent by Data Zone-Channel (NXDN) or Data System-Personality (NXDN) regardless of the configuration in Transmit Mode of the selected channel.

Note

- This function is not applicable to GPS data sent by using the **Send the GPS Data** key, the **Send the Location Data** key, and the **GPS Combination** function.
- If anything other than "Selected" is configured in **GPS Report Channel**, **GPS Report Back to Requested ID** becomes disabled.
- If anything other than "Selected" is configured in **GPS Report Channel**, the GTC is not sent when GPS data is sent by using **GPS Report Channel** even if **GTC Count** is configured.
- In an LTR Trunking system, analog mode or NXDN 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 "NXDN" 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 "NXDN".

Configuration using KPG-D1/ D1N

Configuring **GPS Report Channel** ( See Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS)

1.17 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 Data Storage
- GPS Report Back to Requested ID
- GPS ACK Request

Note

- This section describes information for both an NXDN Conventional system and NXDN Trunking system.

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** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS)
- Configuring **Number of Times** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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. 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).)

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.
- The GPS data is multiplexed into audio data and sends both data without pausing voice communications, even if the transceiver automatically sends GPS data during the voice communications. However, if the amount of time configured using **GPS Report Interval Time** (Portable/Ignition On or Ignition Off) is short (less than 10 sec), note that sound quality may be degraded.
- 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** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS > GPS Report Interval Time)
- Configuring **GPS Report Interval Time** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS)
- Configuring **GPS Time Mark** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

GPS Message Type

GPS Message Type allows the transceiver to change the length of the message to send GPS data.

Table 1-31 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** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS)
- Configuring **GPS Message Type** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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 an NXDN Conventional system.

The transceiver automatically changes the channel to the Data Zone-Channel to send 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 using a specific dedicated channel.

Note

- This function can be only used in an NXDN Conventional system.
- This function is enabled if "Channel Table" is configured in **Zone-channel Format**, using KPG-D1/ D1N.
- 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 System-Personality** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS)

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 an NXDN Conventional system.

The transceiver automatically changes the channel to the Data System-Personality to send 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 using a specific dedicated channel.

Note

- This function can be only used in an NXDN Conventional system.
- This function is enabled if "Personality" is configured in **Zone-channel Format**, using KPG-D1/ D1N.
- 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 > NXDN 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 **GPS Storage 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 with **GPS Data Record Format**. If no output format is configured, GPS data is not written. (Refer to Common FUNC About microSD Card.)
- A microSDHC card cannot be used for NX-5200LG/ NX-5300LG.

Configuration using KPG-D1/ D1N

- Configuring **GPS Data Storage** ( **See** Transceiver Settings > Optional Features > Optional Features 2 > microSD/Memory > GPS Data)
- Configuring **GPS Storage Interval** ( **See** Transceiver Settings > Optional Features > Optional Features 2 > microSD/Memory > GPS Data)

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 above-mentioned 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** in an NXDN Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > GPS)
- Configuring **GPS Report Back to Requested ID** in an NXDN Trunking system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

GPS ACK Request

GPS ACK Request is a function to place a request to send the acknowledgment with a mobile station transceiver when GPS data in the NXDN format is sent from the base station transceiver to the mobile station transceiver.

Table 1-32 GPS ACK Request

Configuration	Description
Enabled	The base station transceiver requests the mobile station transceiver to send the acknowledgment message when a request message to send GPS data in the NXDN format is sent by the base station transceiver. The mobile station transceiver sends an acknowledgment message and then GPS data upon receipt of a request message to send GPS data in the NXDN format.
Disabled	The base station transceiver does not request the mobile station transceiver to send an acknowledgment message when a request message to send GPS data in the NXDN format is placed by the base station transceiver. Upon receipt of a message which requests transmission of GPS data in the NXDN format, the mobile station transceiver sends GPS data without sending an acknowledgment message. Disable the sending and receiving of receipt an acknowledgment message to shorten transmission times and reduce transmission traffic.

Note

- In a system that supports Indoor Location, the configuration value is shared with BLE ACK Request. GPS ACK Request and BLE ACK Request function with the same configuration. (Refer to [BLE ACK Request \(Indoor Location\)](#).)

Configuration using KPG-D1/ D1N

- Configuring **GPS ACK Request** in an NXDN Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS > NXDN)
- Configuring **GPS ACK Request** in an NXDN Site Roaming system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS)
- Configuring **GPS ACK Request** in an NXDN Trunking system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

1.18 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, "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.)
- This section describes information for both an NXDN Conventional system and NXDN Trunking system.

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 1-33 Map Header

Data	Description
\$GPGGA (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the \$GPGGA data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
\$GPGLL (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the \$GPGLL data in the NMEA-183 format from the received GPS data and sends the extracted data from the communication port.
\$GPRMC (NMEA)	Upon receipt of the GPS data, the transceiver at the base station extracts the \$GPRMC data in the NMEA-183 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/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**.

1.19 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 1-34 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 Status Inquiry 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 a communication port 0 to 2 or the Bluetooth of the transceiver.

Note

- To use the Remote Control function, Remote Control (KWD-5007RC) in Radio Feature License is additionally required.
- This section describes information for both an NXDN Conventional system and NXDN Trunking system.

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

● Sending a Remote Control Message by list selection

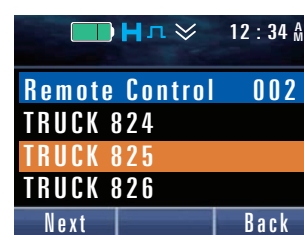
1 Press the **Remote Control** key.

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.

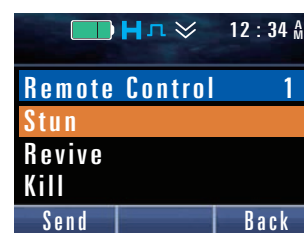
2 Press the [▲] key or [▼] key to select a Unit ID from the Individual ID List.

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 Status Inquiry message is sent.

● If anything other than “Monitor” is selected

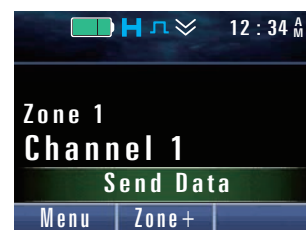
Go to step 5.

● If “Monitor” is selected

Go to step 6.

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

The selected Remote Control message is sent.



6 Press the **Menu** ([]) key, or [*****] key.

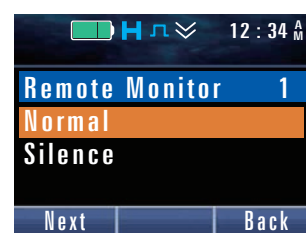
The selection screen of the Remote Monitor transmission mode appears. Select "Normal" or "Silence".

- **Normal**

The transceiver which received the Remote Monitor message displays "Remote TX" on the display and lights the Transmit LED when the transceiver is in the state of continuous transmission.

- **Silence**

The transceiver which received the Remote Monitor message does not change the display and does not light the Transmit LED even if the transceiver is in the state of continuous transmission.



7 Press the **Menu** ([]) key, or [*****] key.

The screen to configure the transmission time of the Remote Monitor appears.

 Note

- If a previously used transmission time of the Remote Monitor is stored in the transceiver, the stored time appears.



8 Enter the transmission time of Remote Monitor.

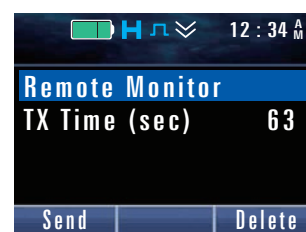
Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

- **If using the keypad:**

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

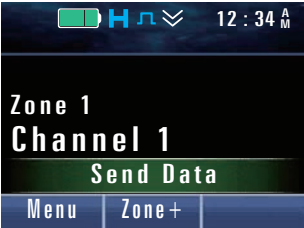
- **If using the PF keys:**

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



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

A Remote Monitor message is sent.



● **Sending a Remote Control message by using Manual Dialing**

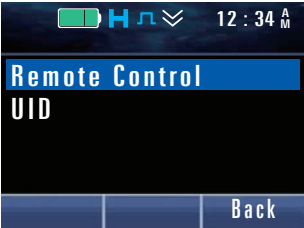
To send a Remote Control message by directly entering a Unit ID, **Manual Dialing** needs to be enabled.

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.

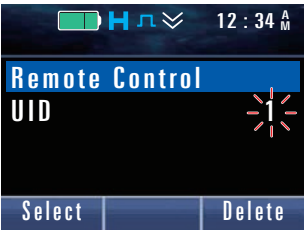
The Unit ID entry display appears.



3 Enter a Unit ID.

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

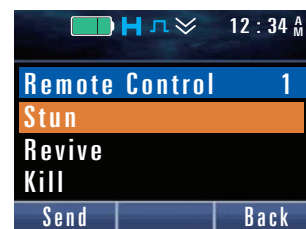
- **If using the keypad:**
A Unit ID can be entered by pressing the [0] key to [9] key.
- **If using the PF keys:**
Press the [] key or the [] key to select a number, and press the **Menu** ([]) key or [*****] key to confirm the selected number.



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

The selection display of the options menu appears.

Refer to step 4 onwards of “**Sending a Remote Control Message by list selection**” for the subsequent operations.



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** in an NXDN Conventional system to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Manual Dialing** in an NXDN Trunking system to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

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 1-35 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.
Remote Revive	If the transceiver is in the Stun state when receiving a Remote Revive message, the Stun state is reset.
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.

Note

- This function is applicable only when an individual call is initiated.
- In an NXDN Conventional system, the received RAN Code and the RAN 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). In a Multi RF Deck system for Mobile, the Stun state can also be reset by receiving a Remote Revive Message (DMR).
- A Remote Control message can also be sent by sending a PC command from a PC to the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Remote Stun/Kill** in an NXDN Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Remote Stun/Kill** in an NXDN Trunking system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN 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.

An individually specified transceiver can be controlled by sending a Remote Monitor 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 Monitor 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 can be configured by Remote Control Mode.

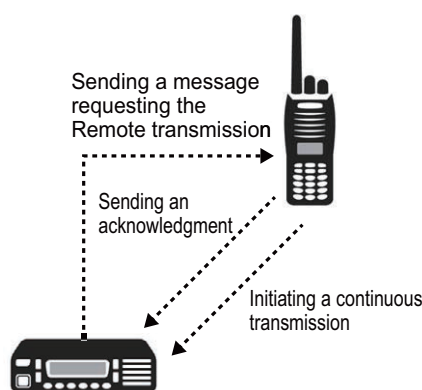


Figure 1-11 Remote Monitor

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 can be configured by Remote Control Mode or a PC command.

Note

- The transceiver initiates a continuous transmission only if the Remote Monitor message is received by an Individual Call. The transceiver does not initiate a continuous transmission even if the Remote Monitor message is received using anything other than Individual Call.
- While the transceiver is in the state of continuous transmission by **Remote Monitor**, **Time-out Timer** and **Busy Channel Lockout** are disabled. However, **Time-out Timer** behaves depending on the system configuration in an NXDN Trunking system.
- In an NXDN Conventional system, the received RAN Code and the RAN code configured for the transceiver need to match to receive the Remote Monitor message.
- A Remote Control message can also be sent by sending a PC command from a PC to the transceiver.

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.

In Remote Control Mode, the Status Inquiry Message is sent in the same manner as the transmission operation by a PC command. (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 will send the Status Inquiry Message using Individual Call if a PC sends the Radio Check transmission command (Status Request Transmission command) to the transceiver.
- The transceiver that receives the Status Inquiry Message sends a Status Message. (Refer to [Sending a Status Message](#).)

The transceiver sends the status configured for **Default Status** if no status is selected yet when the transceiver is turned ON, for instance.

If status is selected in Status Mode, the transceiver sends the selected status.

The transceiver will send the status retained in the transceiver if the transceiver migrates to normal mode after selecting the status.

The transceiver sends the status configured for **Stun Response Status** while Stun is enabled (Transmit Inhibit or Transceiver Inhibit). If **Stun Response Status** is not configured, the transceiver transmits the status in the same manner as when the transceiver is in the normal state.

- If the transceiver which sent the Status Inquiry Message receives the sent status, the transceiver will receive the status in the same manner as receiving regular status messages. However, for Mobile, **Horn Alert** and the **AUX Output Status Message** function do not function even if the status sent from the transceiver is the same status as **Horn Alert Status** and **AUX Output Status Message**. (Refer to [Receiving a Status Message](#).)

Note

- In an NXDN Conventional system, the transceiver can receive a Status Inquiry Message if the received RAN code matches the RAN code preconfigured for the transceiver.

Configuration using KPG-D1/ D1N

- Configuring **Default Status** ([See](#) Transceiver Settings > NXDN > NXDN Information > Status > Option)
- Configuring **Stun Response Status** ([See](#) Transceiver Settings > NXDN > NXDN Information > Status > Option)

1.20 Migrating Automatically to the Site Providing Better Radio Environment (Site Roaming)

Site Roaming is the function to migrate automatically to the site (channel) providing better radio environment if the transceiver is operated in an NXDN 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.

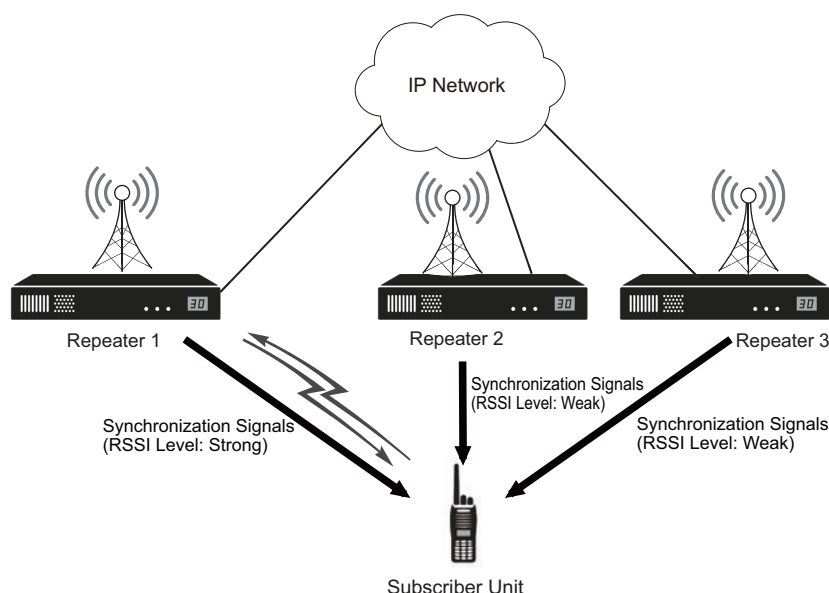
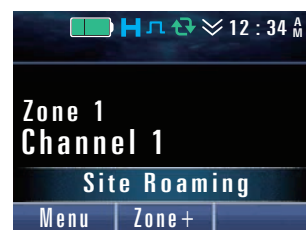


Figure 1-12 Image of Communications of Site Roaming

This function can be used by configuring Site Roaming or Site Roaming with RAN channels for each system by using KPG-D1/ D1N.

Site Roaming Behaviors

When a Zone-channel or System-Personality of the system that is configured as "Site Roaming" or "Site Roaming with RAN" 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

If a channel to which a Personality is assigned in a system with "Site Roaming" or "Site Roaming with RAN" configured is selected, Site Roaming is initiated for the Personality in the same system. At this time, the Personality name appears.

When the transceiver transmits, the RAN code configured for the Personality to be the Revert Channel is multiplexed on a signal.

As scan is performed on Personalities, 1 Personality is backed up as a Revert Channel on 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

If a zone in a system with “Site Roaming” or “Site Roaming with RAN” configured is selected, Site Roaming is initiated for the channels configured in the zone.

When the transceiver transmits, the RAN code configured for Revert Channel is multiplexed on a signal.

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.

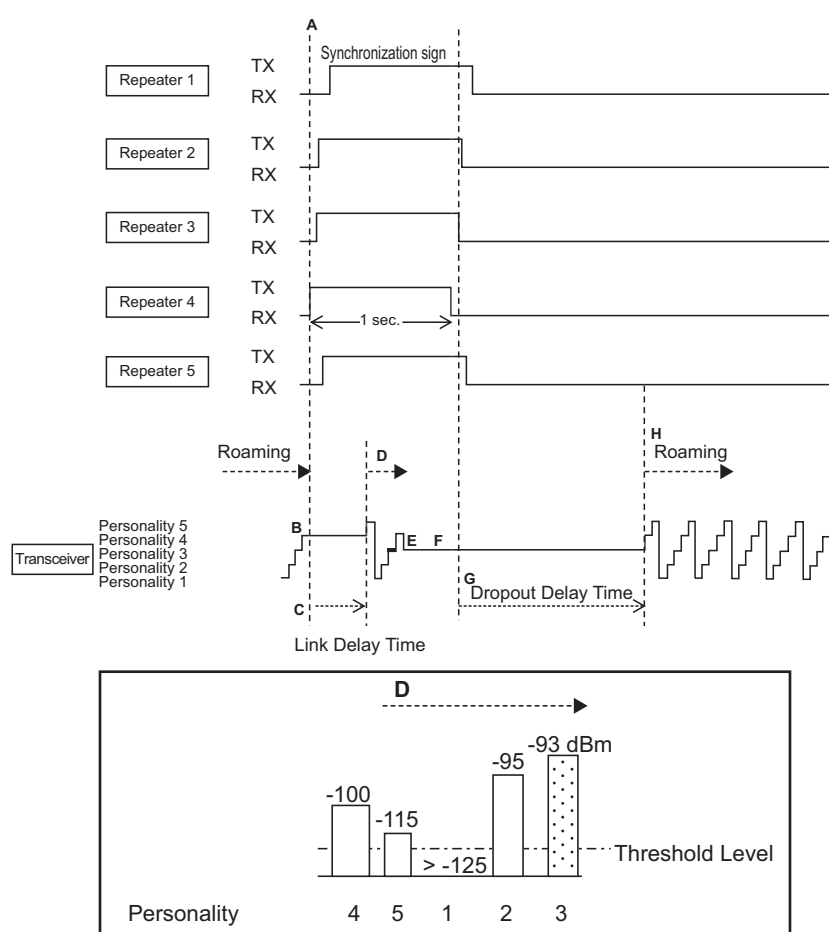


Figure 1-13 Basic Behaviors of Site Roaming

- A:** The repeater in an NXDN Conventional system transmits a synchronization signal at regular time intervals. Or, the repeater in an NXDN Conventional system transmits a call signal according to a transmission request from another transceiver.
- B:** For example, the transceiver in a system with “Site Roaming” or “Site Roaming with RAN” configured detects an adequate RSSI level on Personality 4.
- 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 checking all the Personalities, the transceiver migrates to the Personality having the strongest RSSI level (for example, Personality 3) and checks whether the received RAN code matches the RAN code preconfigured for the Personality.

If “Site Roaming” is configured in System Type:

If the RAN code matches, the transceiver unmutes the speaker and changes the Revert Channel to Personality 3.

If the RAN code does not match, the transceiver changes the Revert Channel to Personality 3 without unmuteing the speaker. Then, the transceiver migrates to the Personality having the second strongest RSSI level (for example, Personality 2) and checks whether the RAN code matches. If the RAN code matches in this step, the transceiver unmutes the speaker and changes the Revert Channel to Personality 2.

If the RAN code does not match in the Personality having the second strongest RSSI level or lower, the Revert Channel is not updated.

If “Site Roaming with RAN” is configured in System Type:

If the RAN code matches, the transceiver unmutes the speaker and changes the Revert Channel to Personality 3.

If the RAN code does not match, the transceiver migrates to the Personality having the second strongest RSSI level (for example, Personality 2) and checks whether the RAN code matches. If the RAN code matches in this step, the transceiver unmutes the speaker and changes the Revert Channel to Personality 2.

F: While the RAN code matches, the transceiver remains on the Personality and does not resume Site Roaming.

G: If the received signals disappear or the RAN code does not match, **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:

- 2 or more and a maximum of 512 Personalities can be configured for a system with “Site Roaming” or “Site Roaming with RAN” configured.
- The following functions cannot be configured for a Personality with “Site Roaming” or “Site Roaming with RAN” configured:
 - Scan Add
 - Scan List Number

Channel Table:

- 2 or more and a maximum of 512 channels can be configured for a zone with “Site Roaming” or “Site Roaming with RAN” configured.
- The following functions cannot be configured for a channel with “Site Roaming” or “Site Roaming with RAN” configured:
 - Scan Add
 - Scan List Number
 - Emergency Profile Number
 - Key Assignment
- A Personality or channel with “Site Roaming” or “Site Roaming with RAN” configured cannot be configured for the following functions:
 - Home Channel
 - Scan List Members
 - Data System-Personality (Analog) (Data Zone-Channel (Analog))
 - Data System-Personality (NXDN) (Data Zone-Channel (NXDN))
 - Emergency Zone-Channel
- The transceiver does not respond at all even if the following keys are operated on a Personality or channel with “Site Roaming” or “Site Roaming with RAN” configured:
 - **Home Channel** key
 - **Home Channel Select** key
 - **Scan** key

- The Emergency behavior of the transceiver on the Zone-channel of NXDN Site Roaming is in accordance with the configuration of **Emergency Channel Type**.
- When **Zone-channel Format** is configured as "Personality" and the following conditions are met, the transceiver starts up in the Emergency Mode on the Revert Channel (Personality).
 - "Selected" is configured for **Emergency Channel Type**.
 - NXDN 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 an NXDN Site Roaming channel is selected while scan is enabled.
- If a Zone-channel of NXDN 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 NXDN Site Roaming Zone-channel.
 - When "Personality" is configured for **Zone-channel Format**
If a Revert Channel (Personality) is backed up, the transceiver starts up in this Personality. If a Revert Channel (Personality) not backed up, the transceiver starts up in the Personality that is configured for the channel.
- Among the Personalities (Channels), the following functions will behave according to the selected Personality (Channel) instead of that of Revert.
 - Lone Worker
 - Activity Detection

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 channel after Site Roaming is initiated, **Site Roaming Link Delay Time** is activated. Upon the elapse of the length of time configured in **Site Roaming Link Delay Time** after detecting a signal, the transceiver checks all Personalities in the same system or the other channels in the same zone to search for a signal. The transceiver checks all Personalities or channels, migrates to the Personality or channel having the strongest RSSI level, and checks whether the RAN code matches. If the RAN code does not match or if a RAN code is not configured for the Personality or channel, the transceiver migrates to the Personality or channel having the second strongest RSSI level and checks whether the RAN code matches.

Configuration using KPG-D1/ D1N

Configuring **Site Roaming Link Delay Time** ( **See** Transceiver Settings > Scan > Scan Information > 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.

If the received signals disappear or the RAN code does not match, **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 > 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 > 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. In this case, **Site Roaming Link Delay Time** becomes disabled, and if the RAN code matches, the transceiver unmutes the speaker. 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 > 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.

Since a Personality or channel having a signal with a level lower than the value configured in **Standard Site Roaming Level** is excluded from Site Roaming, the transceiver does not search the Personality or channel. If the transceiver receives a signal with a level higher than the value configured in **Standard Site Roaming Level** during Site Roaming, Site Roaming pauses and then **Site Roaming Link Delay Time** is activated. Then, if the RAN code matches, the transceiver unmutes the speaker.

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 > 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.

Configuration using KPG-D1/ D1N

Configuring **Site Roaming Resume Level** ( See Transceiver Settings > Scan > Scan Information > 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 1-36 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 > Site Roaming)

1.21 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 NXDN 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 NXDN 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 by a tone (1 beep) of being outside the service area if the transceiver is outside the service area.

The transceiver emits an Out of Range Tone (1 beep) if a Beacon and other NXDN 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 1-37 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 NXDN 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 NXDN 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.

Configuration using KPG-D1/ D1N

- Configuring **Out of Range Indicator** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Out of Range)
- Configuring **Out of Range Tone** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Out of Range)
- Configuring **In-service Check Time** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Out of Range)

1.22 Indoor Location (NXDN)

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 NXDN 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
- Data with Voice
- Number of Times
- BLE Report Interval Time
- BLE Time Mark
- BLE Report Back to Requested ID
- BLE ACK Request
- Map Header

Note

- For details about the Indoor Location function, refer to Common FUNC "Indoor location".
- This section describes information for both an NXDN Conventional system and NXDN Trunking system.

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.

Before moving to the Data Zone-Channel/ Data System-Personality, the transmitting transceiver sends GTC (Go To Channel) to guide the communication target to the Data Zone-Channel/ Data System-Personality.

Note

- If both Analog and NXDN **Data Zone-Channel/ Data System-Personality** are configured, the NXDN 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 NXDN.
- **BLE Report on Data Zone-Channel/ Data System-Personality** is not supported in an NXDN Trunking system.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report on Data Zone-Channel** in NXDN Conventional system to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE)
- Configuring **GPS/BLE Report on Data System-Personality** in NXDN Conventional system to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN 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 65519.

For Blank, the BLE data is sent to the ID configured for the **Base ID**.

An ID having the number of 60001 or larger cannot be used in a NXDN Trunking system. 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 NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN)
- Configuring **GPS/BLE Base ID Type** in NXDN Site Roaming system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Base ID Type** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE)
- Configuring **GPS/BLE Base ID** in NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN)
- Configuring **GPS/BLE Base ID** in NXDN Site Roaming system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Base ID** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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.

ACK is not sent for location information transmission.

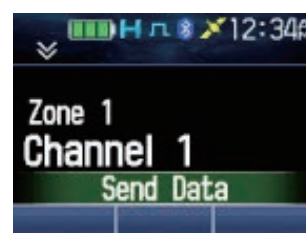
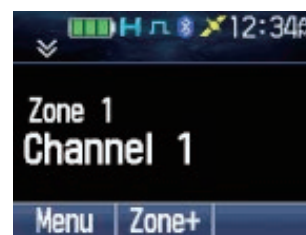
Transceiver behavior

● For location information transmission

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

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** key on the transceiver (See Transceiver Settings > Key Assignment)
- Configuring **Bluetooth** to be enabled or disabled (See Transceiver Settings > Optional Features > Optional Features 2 > GPS/ Bluetooth > GPS/Bluetooth Preset (Default))
- Configuring **Built-in GPS Receiver/Bluetooth** to be enabled or disabled (See Transceiver Settings > Optional Features > Optional Features 2 > GPS/Bluetooth)
- 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** and **GPS/BLE Base ID** in NXDN Conventional system (See Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN)
- Configuring **GPS/BLE Base ID Type** and **GPS/BLE Base ID** in NXDN Site Roaming system (See Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Base ID Type** and **GPS/BLE Base ID** in NXDN Trunking system (See Transceiver Settings > Personal > Personal Features > NXDN Trunking > 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 \(GPS Combination\)](#)".

In the respective mode of Voice Call, Status, or Emergency, the BLE data can be added. The display follows each state.

Table 1-38 BLE Combination

Mode	Description
Voice Call	The transceiver transmits by adding the BLE data when a Voice Call is initiated.
Status	The transceiver transmits by adding the BLE data for a Status transmission.
BLE Report Status Number Block	The range of Statuses sent by adding the BLE data is configured in Status. Among the status numbers 1 to 207, the range of Status Messages to which the BLE data is added can be configured.
Emergency (Voice Call)	The transceiver transmits by adding the BLE data when a Voice Call for Emergency with the Emergency Status (Status 224, Status 225, Status 227, Status 228, or Status 229) added is initiated.
Emergency (Status)	The transceiver transmits by adding the BLE data when only the Emergency Status (Status 224, Status 225, Status 227, Status 228, or Status 229) is transmitted under the following conditions:

Table 1-39 BLE Combination

System	Description
NXDN Trunking	When Emergency Status On Control Channel is enabled, the transceiver sends the BLE data on a control CH after the Emergency Status is transmitted on the control CH at the timing of automatic transmission.
NXDN Conventional	When "0 (s)" is configured in Transmit Duration , the transceiver only transmits the Emergency Status at the timing of automatic transmission. The BLE data is sent after the transmission.

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.

In an NXDN Trunking system, the following behaviors occur according to the combination of the Voice Call, Status, or Emergency call destination and the BLE data transmission destination:

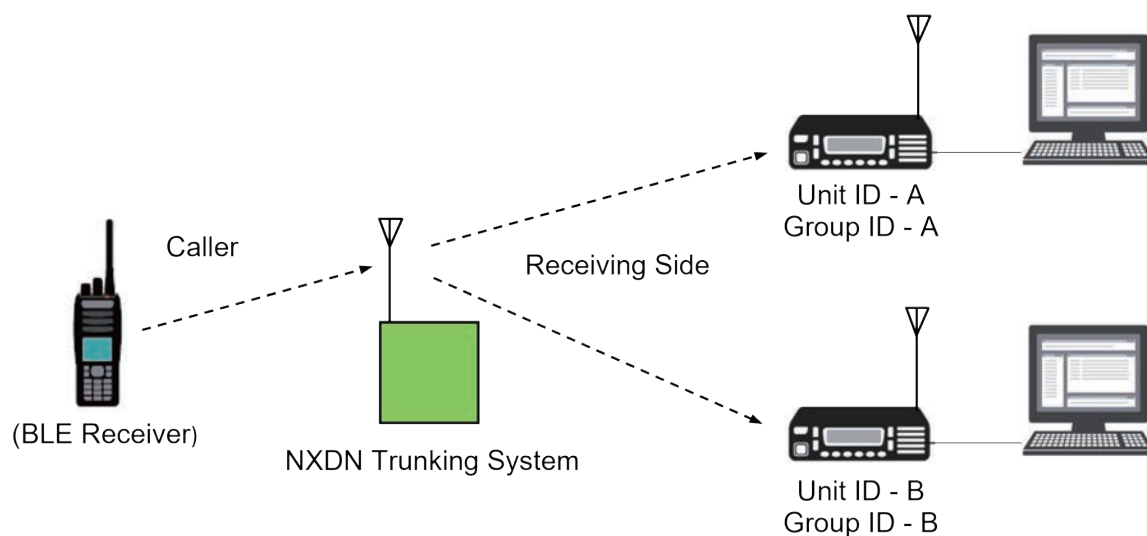


Figure 1-14 BLE Combination

Table 1-40 BLE Combination (Voice Call)

Caller		Receiving Side Behavior	
Voice Call Destination	BLE Data Transmission Destination	Voice Call	BLE Data
Group ID-A	Group ID-A	Yes	Yes
Group ID-B	Group ID-A	Yes	No
Unit ID-A	Group ID-A	Yes	Yes
Unit ID-B	Group ID-A	Yes	No
Group ID-A	Unit ID-A	Yes	Yes
Group ID-B	Unit ID-A	Yes	No
Unit ID-A	Unit ID-A	Yes	Yes
Unit ID-B	Unit ID-A	Yes	No

Yes: Reception available

No: Reception not available

Table 1-41 BLE Combination (Status)

Caller		Receiving Side Behavior	
Status Call Destination	BLE Data Transmission Destination	Status Data	BLE Data
Group ID-A	Group ID-A	Yes	Yes
Group ID-B	Group ID-A	Yes	Yes
Unit ID-A	Group ID-A	Yes	Yes
Unit ID-B	Group ID-A	Yes	Yes
Group ID-A	Unit ID-A	Yes	Yes
Group ID-B	Unit ID-A	Yes	Yes
Unit ID-A	Unit ID-A	Yes	Yes
Unit ID-B	Unit ID-A	Yes	Yes

Yes: Reception available

Table 1-42 BLE Combination (Emergency (Voice Call))

Caller		Receiving Side Behavior	
Emergency Call Destination	BLE Data Transmission Destination	Emergency	BLE Data
Group ID-A	Group ID-A	Yes	Yes
Group ID-B	Group ID-A	Yes	No
Unit ID-A	Group ID-A	Yes	Yes
Unit ID-B	Group ID-A	Yes	No
Group ID-A	Unit ID-A	Yes	Yes
Group ID-B	Unit ID-A	Yes	No
Unit ID-A	Unit ID-A	Yes	Yes
Unit ID-B	Unit ID-A	Yes	No

Yes: Reception available

No: Reception not available

Table 1-43 BLE Combination (Emergency (Status))

Caller		Receiving Side Behavior	
Status Call Destination	BLE Data Transmission Destination	Status Data	BLE Data
Group ID-A	Group ID-A	Yes	Yes
Group ID-B	Group ID-A	Yes	Yes
Unit ID-A	Group ID-A	Yes	Yes
Unit ID-B	Group ID-A	Yes	Yes
Group ID-A	Unit ID-A	Yes	Yes
Group ID-B	Unit ID-A	Yes	Yes
Unit ID-A	Unit ID-A	Yes	Yes
Unit ID-B	Unit ID-A	Yes	Yes

Yes: Reception available

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Combination (Voice Call)** in NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Voice Call)** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Voice Call)** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Status)** in NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Status)** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Status)** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > Standard GPS/BLE Report Mode > GPS/BLE Combination)

- Configuring **GPS/BLE Combination (GPS Report Status Number Block)** in NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (GPS Report Status Number Block)** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (GPS Report Status Number Block)** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > Standard GPS/BLE Report Mode > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency (Voice Call))** in NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency (Voice Call))** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency (Voice Call))** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > Standard GPS/BLE Report Mode > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency (Status))** in NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency (Status))** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE > GPS/BLE Combination)
- Configuring **GPS/BLE Combination (Emergency (Status))** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > Standard GPS/BLE Report Mode > 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 1-44 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 Respond to Polling 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

BLE data transmission by the expiry of BLE Report Interval Time is canceled under the following states. In this case, display and tone behavior are not performed.

Also, the transceiver does not suspend transmission using **Transmit Busy Wait Time** to avoid collisions with BLE data transmissions by other mobile station transceivers.

- During transmission (However, the BLE data transmission during the audio transmission by the Data with Voice function is not canceled.)
- During the Busy state (Refer to “**Random Access (Contention)**”).
- While unmuted
- When Transmit Frequency or Encode ID is not configured
- While transmission is prohibited by TOT
- During NXDN data communications
- While waiting for Transpond transmission
- During Transceiver Password Mode
- During Emergency Mode
- While waiting for a response by an incoming Individual Call Acknowledge Request (while Incoming appears)
- While waiting for a response by an incoming Individual Call (Message Trunked (Enhanced)) (while Incoming appears)
- While a Trunking system is in Failsafe Mode
- While a Trunking system is operated on a mixed control CH
- Out of Range

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 location information transmission 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 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

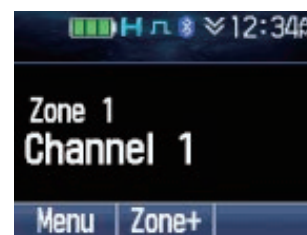
Refer to “**Sending GPS Data Automatically at Certain Intervals (GPS Report Mode)**” for the behavior when GPS data is determined to be sent in the first response when a BLE data transmission request is received. If it is determined that GPS data and BLE data are not to be sent in the first response 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.

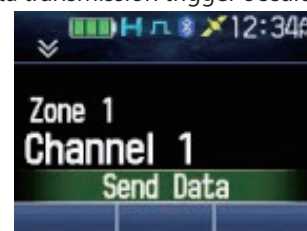
"Send Data" appears while BLE data is being sent.

When the BLE data transmission is complete, "Complete" appears on the LCD of the transceiver.

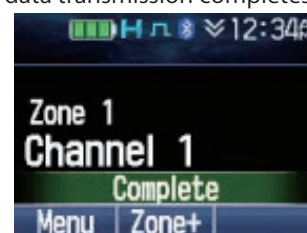
The Transmit LED lights while BLE data is being sent .



BLE data transmission trigger occurs.



BLE data transmission completes.



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 NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE)
- Configuring **GPS/BLE Report Mode** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Report Mode** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)

Sending BLE Data during Voice Communications (Data with Voice (Indoor Location))

Supported Models: Portable

Data with Voice is the function to simultaneously send BLE data during voice communication.

Data with Voice is an item to configure for the mobile station in Indoor Location, and is the function of the RF System method.

If the timing of automatic BLE data transmission by BLE Report Interval Time comes while the transceiver is sending audio data, the transceiver multiplexes BLE data on the audio data and sends the data.

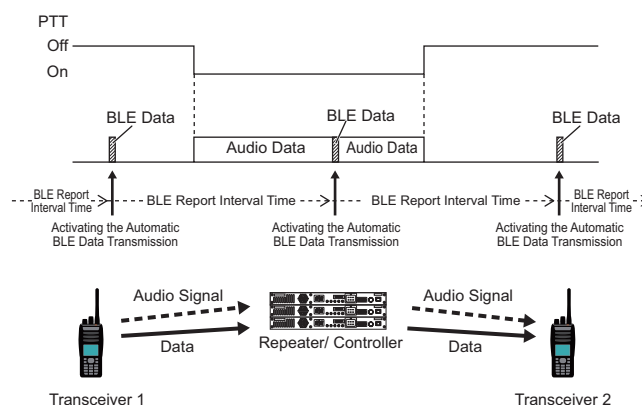


Figure 1-15 Data with Voice

The following behaviors occur at the timing of the BLE Report transmission.

If a beacon signal (**Send Location via** configuration: "RF System") is received, the BLE data is multiplexed.

If a beacon signal (**Send Location via** configuration: "RF System") is not received, the BLE data is not multiplexed.

For Very Narrow, BLE data can be sent with almost no sound quality degradation by temporarily switching the audio data to the data communication format during voice communication. For Narrow, because the BLE data is sent using free space other than audio data, the sound quality degradation does not occur.

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.

The multiplexed BLE data is sent to the target configured in **Base ID Type** and **Base ID**.

If a **BLE Base ID** is configured, the transmission to the BLE Base ID as the target occurs with higher priority than the transmission to a Base ID.

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.

During encrypted communications by AES/DES Advanced Encryption, only audio is encrypted. During encrypted communications by DES Encryption, only audio is encrypted.

Note

- For Very Narrow, the sound quality degradation may occur if the amount of time configured in BLE Report Interval Time is short.

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 NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE)
- Configuring **Number of Times** in NXDN Site Roaming system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **Number of Times** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)

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 time interval configured in **BLE Report Interval Time**.
- 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 NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE)

- Configuring **GPS/BLE Report Interval Time (Portable/Ignition On)** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Report Interval Time (Portable/Ignition On)** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)

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 Next KAS-20.

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 NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE)
- Configuring **GPS/BLE Time Mark** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Time Mark** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)

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 NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN)
- Configuring **GPS/BLE Base ID Type** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Base ID Type** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE)
- Configuring **GPS/BLE Base ID** in NXDN Conventional system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN)
- Configuring **GPS/BLE Base ID** in NXDN Site Roaming system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Base ID** in NXDN Trunking system ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE)
- Configuring **GPS/BLE Report Back to Requested ID** in NXDN Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE)
- Configuring **GPS/BLE Report Back to Requested ID** in NXDN Site Roaming system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE Report Back to Requested ID** in NXDN Trunking system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)

BLE ACK Request (Indoor Location)

BLE ACK Request is the function to place a request to send the acknowledgment with a mobile station transceiver when a request message to send BLE data in the NXDN format is sent from the base station transceiver to the mobile station transceiver.

BLE ACK Request is an item to configure for the base station in Indoor Location, and is the function of the RF System method.

Table 1-45 BLE ACK Request

Configuration	Description
Enabled	The base station transceiver requests the mobile station transceiver to send the acknowledgment message when a request message to send BLE data in the NXDN format is sent by the base station transceiver. The mobile station transceiver sends an acknowledgment message and then BLE data upon receipt of a request message to send BLE data in the NXDN format.
Disabled	The base station transceiver does not request the mobile station transceiver to send an acknowledgment message when a request message to send BLE data in the NXDN format is placed by the base station transceiver. Upon receipt of a message which requests transmission of BLE data in the NXDN format, the mobile station transceiver sends BLE data without sending an acknowledgment message. By disabling the sending and receiving of receipt acknowledgment messages, the transmission time can be shortened, and the transmission traffic can be reduced.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE ACK Request** in NXDN Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > GPS/BLE > NXDN)
- Configuring **GPS/BLE ACK Request** in NXDN Site Roaming system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Site Roaming/ NXDN Site Roaming with RAN > GPS/BLE)
- Configuring **GPS/BLE ACK Request** in NXDN Trunking system to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)

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 1-46 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 Map Header (**\$PKPBD (KW)**) to be enabled or disabled ( [See](#) Transceiver Settings > Optional Features > Optional Features 2 > GPS/Bluetooth > Bluetooth > BLE Base Station Settings)

NXDN is a generic name for a digital communication system protocol utilizing 4-level FSK. Using NXDN, the transceiver can initiate an Individual Call or Group Call for voice calls, communicate various types of messages, or send and receive GPS data. Also, connecting a transceiver to an external device (such as a PC) allows communication because the NEXEDGE transceiver supports serial command communication.

In an NXDN 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 NXDN IDs (Unit ID and Group ID), such as an individual call or group call.

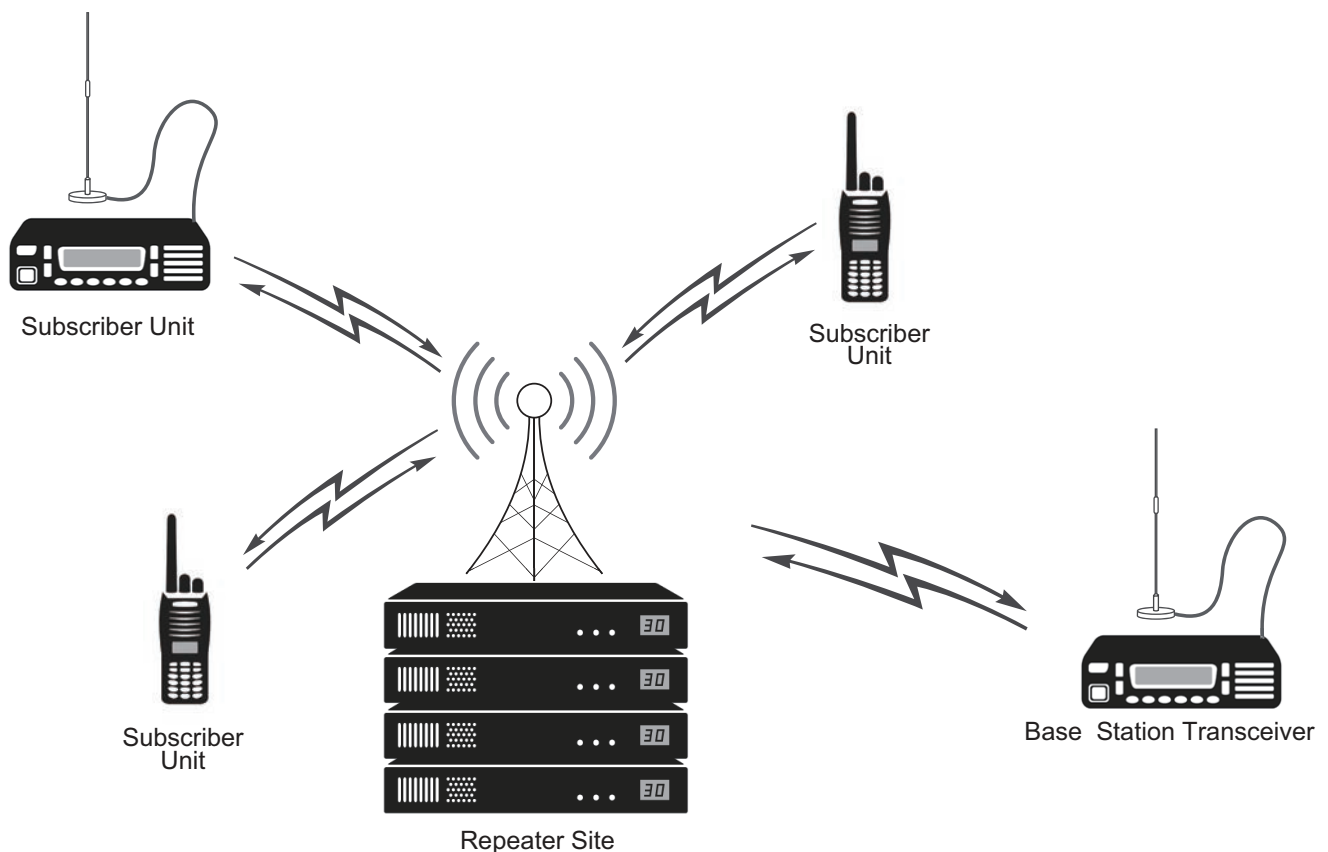


Figure 2-1 Image of Communications in an NXDN Trunking System

2.1 Initiating Voice Communications (Basic Transmission and Reception)

This section describes the basic methods for transmission and reception in an NXDN Trunking system and the relevant functions.

About Own ID

To initiate various communications using NXDN, a 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 0001 and FFEF (hexadecimal), or between 1 and 65519 (decimal). However, an ID having the number of 60001 or larger cannot be used in an NXDN Trunking system.

If **Global ID** is enabled, a Unit ID is shared by all NXDN Conventional and NXDN Trunking.

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

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

Note

- Since the management system of own ID in P25 is different from the management system of own ID in NXDN, 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 > NXDN Trunking)
- Configuring **Global ID** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > System Information > NXDN Trunking)

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 an NXDN digital channel. (Refer to [COMMUNICATION SECURITY](#).)

About Trunking Type

To establish various types of communications in an NXDN Trunking system, **Trunking Type** needs to be configured along with the configuration of the system. Refer to "[Trunking Type](#)" for **Trunking Type**.

Control Channel Acquisition and Registration

To establish various types of communications in an NXDN Trunking system, the transceiver needs to acquire a control channel and register in a system before starting communication. The control channel acquisition and registration are automatically executed when the transceiver is turned ON or when a system to be used is changed with site roaming.

Refer to "[Control Channel Hunt \(Control Channel Hunt\)](#)" for details on the transceiver behavior of control channel acquisition.

Refer to "[Registration in an NXDN Trunking System](#)" for details on the transceiver behavior of registration.

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 NXDN ID matches the NXDN 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.

In **Auto Reset Type**, whether the common **Auto Reset Timer** configuration is applied to all communications or different **Auto Reset Timer** configurations are applied to voice communications and data communications can be configured.

Table 2-1 Auto Reset Timer

Configuration		Description
Auto Reset Type		Common: All communications behave according to the configurations in Auto Reset Timer , LCD , LED , and Alert Tone configured in Common/Voice . Custom: All communications behave according to the configurations in Auto Reset Timer , LCD , LED , and Alert Tone configured in Common/Voice . Data communications behave according to the configurations in Auto Reset Timer , LCD , and Alert Tone configured in Message .
Auto Reset Timer (Common/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 (Common/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 (Common/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 (Common/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 Type** ( [See](#) Transceiver Settings > NXDN > NXDN Information > General > Auto Reset)
- Configuring **Auto Reset Timer (Common/Voice)** ( [See](#) Transceiver Settings > NXDN > NXDN Information > General > Auto Reset > Common/Voice)
- Configuring **Auto Reset Timer (Message)** ( [See](#) Transceiver Settings > NXDN > NXDN 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 an NXDN 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 > NXDN > NXDN Information > Trunking)
- Configuring **Alert LED Color** ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)
- Configuring **Alert LED Color (Individual ID List)** ( [See](#) Transceiver Settings > NXDN > Individual ID List > Alert LED Color)
- Configuring **Alert LED Color (Group ID List)** ( [See](#) Transceiver Settings > NXDN > Group ID List > Alert LED Color)

Optional Signaling LED

Optional Signaling LED is the function to flash the LED yellow when the received Optional Signaling matches the Optional Signaling preconfigured in 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 even if **Optional Signaling LED** is enabled, the LED flashes according to the configuration of **Selective Call Alert LED**.

Configuration using KPG-D1/ D1N

Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN 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 data 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.

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.
- Voice communications by NXDN Trunking system does not allow Unit ID Name data transmission on the control channel. Unit ID Name data is transmitted at the same time as voice data transmission on the traffic channel only.
- 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.
- Configure **Over-the-Air Alias** for each of NXDN Conventional and NXDN Trunking systems. The Unit ID Name (Own) configured for each system is used for the Unit ID Name to be transmitted.

Configuration using KPG-D1/ D1N

Configuring **Over-the-Air Alias** to be enabled or disabled ( **See** Transceiver Settings > Personal > System Information > NXDN 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 an NXDN Trunking system.

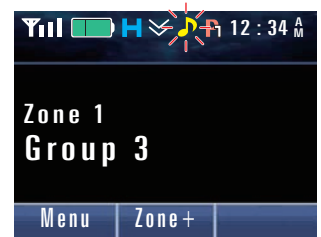
If a Group Call of a **Priority Monitor ID** is initiated on another traffic channel while a Group Call of anything other than a **Priority Monitor ID** is being received, the transceiver participates in a communication by receiving the Group Call of a **Priority Monitor ID**. If a Group Call of a **Priority Monitor ID** having higher priority is initiated on another traffic channel while a Group Call of a **Priority Monitor ID** is being received, the transceiver participates in a communication by receiving the Group Call of a **Priority Monitor ID** having higher priority.

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 while the transceiver is making a voice call using a Group Call 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.

Note

- This function is applicable only if the transceiver is making voice calls using the Group Call. This function is not applicable to data communications.
- If the transceiver is receiving a Group Call by a Group ID not configured in **Priority Monitor ID**, the transceiver can receive only a Group Call of a **Priority Monitor ID** by switching to **Priority Monitor ID** communication. If the transceiver is receiving a Group Call of a **Priority Monitor ID**, the transceiver can receive only a Group Call of a **Priority Monitor ID** having higher priority.
- The transceiver that is transmitting 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.
- If the transceiver receives a **Priority Monitor ID** during scanning, transmission from the transceiver is performed 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.
- 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 2-2 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.)
- Channels configured as **Priority Monitor ID** will be scanned every time during scanning even if the ID is not registered as a member of List Scan.

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.

Using KPG-D1/ D1N allows a configuration whether selected channel is used as a Priority Monitor ID from 1 through 4.

Configuration using KPG-D1/ D1N

- Configuring **Priority Monitor ID** ( See Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Priority Monitor ID)
- Configuring **Selected Channel** ( See Transceiver Settings > Personal > Personal Features > NXDN 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 an NXDN Trunking system, the transmitting 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.

The Late Entry depends on the system configuration.

Searching Whether the Transceiver Receives a Call (Scan)

Using the scan function, the transceiver searches for a call or communications from target Group IDs according to the following scan functions. The transceiver migrates to a traffic channel and start receiving if a channel which can be decoded is detected.

- Single Scan
- List Scan
- Multi-Zone Scan

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

Transmitting

Pressing the **PTT** switch, or selecting an NXDN 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 and releases the channel if it continuously transmits longer than the configured time.

In an NXDN Trunking system, the system controls the amount of time that the transceiver can continuously transmit on a traffic channel. When time that allows continuous transmission has not been specified in the system, the **Time-out Timer** configured in the transceiver is used.

Also, TOT Pre-alert, 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

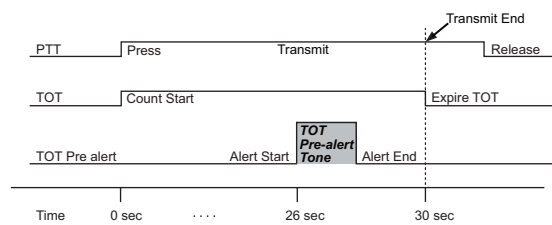


Figure 2-2 TOT Pre-alert

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 > NXDN Trunking > General)
- Configuring **TOT Pre-alert** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

2.2 Using the Optional Signaling (Optional Signaling for Group Call)

Optional Signaling is the signaling used to initiate a selective call. In an NXDN Trunking system, **Optional Signaling for Group Call** is the Optional Signaling for a Group Call, and an individual call can be made using 2-tone. (Refer to [Using 2-tone to Initiate an Individual Call](#).)

2-tone signaling uses a pair of 2 different tone frequencies in series for an individual call. The transceiver emits a ring tone (Alert Tone) and flashes the LED if the received Group ID matches the Group ID preconfigured for the transceiver and the received 2-tone code matches the 2-tone code preconfigured for the transceiver.

To decode a 2-tone code in an NXDN Trunking system, "2-tone 1", "2-tone 2", "2-tone 3", or "2-tone 4" needs to be configured in **Optional Signaling for Group Call** used for the channel.

Configuration using KPG-D1/ D1N

- Configuring **Optional Signaling for Group Call (Personality)** ( [See](#) Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Optional Signaling for Group Call (Channel Edit)** ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking)

Unmuting the Speaker (Audio Control for Group Call)

Audio Control for Group Call is the condition which allows the transceiver to unmute the speaker by a Group ID and Optional Signaling (2-tone). The conditions on which the transceiver unmutes the speaker can be configured for each NXDN Trunking system by using KPG-D1/ D1N.

The transceiver unmutes the speaker and emits the received audio when the conditions configured in **Audio Control for Group Call** are satisfied.

Conditions to unmute the speaker can be changed by a combination of the Group ID and the Optional Signaling. The following are the conditions to unmute the speaker:

Table 2-3 Audio Control for Group Call

Configuration	Description
Group ID	The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver. The conditions for unmuting the speaker do not change even if the transceiver transmits.
Group ID and Optional Signaling	The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver and the received Optional Signaling (2-tone) matches the Optional Signaling preconfigured for the transceiver. The conditions for unmuting the speaker do not change even if the transceiver transmits.

Configuration using KPG-D1/ D1N

Configuring **Audio Control for Group Call** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

Temporarily Disabling the Squelch (Squelch Off)

Squelch Off is the function to disable the Optional Signaling (2-tone) configured for the channel on which the transceiver waits and to unmute the speaker if the received Group ID alone matches the Group ID preconfigured for the transceiver.

The same as with the Monitor function, the Squelch Off function is used to monitor the availability of channels prior to transmitting in order to avoid interfering with other parties.

To use this function, the **Squelch Off** key or the **Squelch Off Momentary** key is used.

Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then **Squelch Off** can be toggled between enabled and disabled by selecting "Squelch Off". (Refer to Common FUNC Using Menu Mode.)

Operating the transceiver

● Squelch Off key

1 Press the **Squelch Off** key while **Squelch Off** is disabled.

The "🔊" icon appears.

The Optional Signaling is disabled. The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver.

The Busy LED lights green if Busy LED is enabled.

2 Press the **Squelch Off** key while **Squelch Off** is enabled.

The "🔊" icon disappears.

The squelch function by the Optional Signaling is enabled.

● Squelch Off Momentary key

1 Press and hold the **Squelch Off Momentary** key.

The "🔊" icon appears.

The Optional Signaling is disabled. The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver.

The Busy LED lights green if Busy LED is enabled.

2 Release the **Squelch Off Momentary** key.

The "🔊" icon disappears.

The squelch function by the Optional Signaling is enabled.

Configuration using KPG-D1/ D1N

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

Temporarily Disabling the Optional Signaling (Monitor)

Monitor is the function that temporarily disables the Optional Signaling (2-tone) configured for a channel on which the transceiver waits.

Monitor is used to check the availability of channels prior to transmitting in order to avoid interfering with other parties.

Using the Monitor function temporarily unmutes the speaker if the speaker is muted because the Optional Signaling does not match. However, if the speaker is muted due to a very weak carrier, the speaker is not unmuted even by using the Monitor function. In this case, using the Squelch Off function temporarily unmutes the speaker and the audio can be heard.

To use the Monitor function, the **Monitor** key or the **Monitor Momentary** key is used.

Or, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then **Monitor** can be toggled between enabled and disabled by selecting "Monitor". (Refer to Common FUNC Using Menu Mode.)

While **Monitor** is enabled, the "🔊" icon appears, and the Optional Signaling will be disabled.

Operating the transceiver

● Monitor key

1 Press the **Monitor** key while **Monitor** is disabled.

The "🔊" icon appears.

The Optional Signaling is disabled. The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver.

2 Press the **Monitor** key while **Monitor** is enabled.

The "🔊" icon disappears.

The squelch function by the Optional Signaling is enabled.

● Monitor Momentary key

1 Press and hold the **Monitor Momentary** key.

The "🔊" icon appears.

The Optional Signaling is disabled. The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver.

2 Release the **Monitor Momentary** key.

The "🔊" icon disappears.

The squelch function by the Optional Signaling is enabled.

Configuration using KPG-D1/ D1N

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

Unmuting the Speaker by Linking with the Microphone (Off-hook Decode) (Mobile Only)

Off-hook Decode is the function that enables the transceiver to decode the Optional Signaling (2-tone) even when the microphone is in the off-hook state.

The transceiver behaves as follows according to the configuration in **Off-hook Decode**:

Table 2-4 Off-hook Decode

Configuration	Description
Enabled	The transceiver unmutes the speaker according to the configuration in Audio Control for Group Call regardless of the microphone on-hook or off-hook state.
Disabled	The transceiver unmutes the speaker if the received Group ID matches the Group ID preconfigured for the transceiver while the microphone is in the off-hook state. The transceiver unmutes the speaker according to the configuration in Audio Control for Group Call while the microphone is in the on-hook state.

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 Decode** to be enabled or disabled ( **See** Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)

2.3 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 an NXDN Trunking zone in another system from the current system is selected
- When the transceiver cannot receive a signal on a control channel
- When the transceiver receives a DISC message on a traffic channel

Table 2-5 Hunt Sequence

Order	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	Preferential Hunt Sequence	2 channels configured as Preferential Hunt Control Channel are searched. Preferential Hunt Control Channel is the channel having the highest priority when searching for a control channel.
3	DFA Hunt Sequence	A channel acquired by DFA (Direct Frequency Assignment) is searched. (Refer to Using a Frequency Added to a System without Changing the Transceiver Configuration (Direct Frequency Assignment) .)
4	Normal Hunt Sequence	A channel configured as Normal Hunt Control Channel is searched. Normal Hunt Control Channel is a channel that can be used as a control channel in each site.
5	System Add Channel Sequence	48 channels that are additionally registered by a broadcast message sent from the system are searched.
6	Site Hunt Sequence	A channel configured as Site Hunt Control Channel in each site is searched. Site Hunt Control Channel is a channel that can be used as a control channel in each site.
7	Comprehensive Hunt Sequence	All channels that can be used as a control channel are searched based on all frequencies configured in a Frequency Table.
8	Failsoft Channel Sequence	A channel configured as Failsoft Channel is searched.

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 a message or annunciation information from a system after acquiring a control channel, the transceiver starts the Background Hunt to acquire a control channel providing better conditions, such as a control channel having better signal strength or higher priority.

If the transceiver finds a site providing better conditions compared with the current control channel, the transceiver will migrate to that control channel and start the process to acquire the control channel to be in the standby state.

The transceiver executes the Background Hunt at the intervals configured in **Search Interval Time**.

Also, if **Multi-System Background Hunt** is enabled, the Background Hunt can be executed among different systems. (Refer to [Executing the Background Hunt in Different Systems \(Multi-System Background Hunt\)](#).)

Comprehensive Hunt

Comprehensive Hunt is the function to check for all channels configured in the Frequency Table as candidate control channels 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 reactivates the Preferential Hunt Sequence.

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 **Preferential Hunt Control Channel** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Preferential Hunt Control Channel)
- Configuring **Normal Hunt Control Channel** ( [See](#) Transceiver Settings > NXDN Network > Control Channel Hunt Table > Normal Hunt Control Channel (Hunt Table Type = Normal))
- Configuring **Site Hunt Control Channel** ( [See](#) Transceiver Settings > NXDN Network > Control Channel Hunt Table > Site Hunt Control Channel (Hunt Table Type = Site))
- Configuring **Frequency Table** ( [See](#) Transceiver Settings > NXDN Network > Frequency Table)
- Configuring **Failsoft Channel** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > Failsoft Channel)
- Configuring **Background Hunt** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN Network > Hunt Options > Background Hunt)
- Configuring **Comprehensive Hunt** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN Network > Hunt Options)

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 2-6 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

- 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 > NXDN Network > Hunt Options)

Retaining the Information of the Control Channel Used When the Transceiver Is Turned OFF (Last Control Channel)

The **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 an NXDN 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. Preferential Hunt Control Channel is the 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 > NXDN Network > Hunt Options)

Starting the Control Channel Hunt Manually (Forced Search)

Forced Search allows a user to manually start the test to acquire another control channel providing better conditions while the transceiver is in the idle state after acquiring a control channel.

The following are hunt sequences to be used by Forced Search. (Refer to [Hunt Sequence](#).)

- Preferential Hunt Sequence
- Normal Hunt Sequence
- System Add Channel Sequence
- Site Hunt Sequence
- Comprehensive Hunt Sequence

Note

- Channels configured as Failsoft Channel will not be target control channels to be searched.

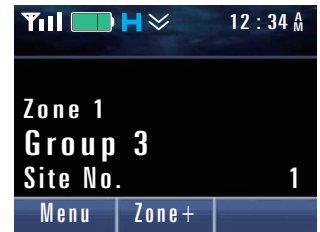
Operating the transceiver

1 Press the **System Search** key.

The site number of the current control channel appears for 2 sec.

Note

- If the **System Search** key is pressed in an NXDN Trunking system with **Multi-System Hunt** enabled, the system name of the system in use and the site number of the control channel in use appear for 2 sec. (Refer to [Communicating Using Multiple Systems \(Multi-System Roaming\)](#).)
- Transceiver operation is identical even if “System Search” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)



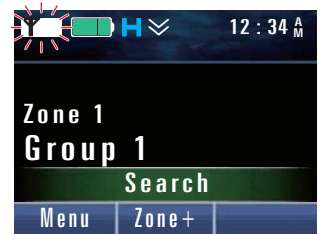
2 Press and hold the **System Search** key.

A Search Mode Tone (1 beep) sounds from the transceiver, and then the transceiver will start the Forced Search.

The transceiver leaves the acquired control channel and starts the hunt sequence, and then the transceiver proceeds to search for another control channel using the Preferential Hunt Sequence. If a control channel is found, the transceiver migrates to that control channel. In such a case, the transceiver is in the standby state after processing an acquisition of control channel. If no control channel is found, the transceiver continues the hunt sequence.

Note

- Transceiver operation is identical even if “System Search” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)



Note

- The transceiver cannot receive a call while the transceiver is performing the Forced Search.
- The Forced Search cannot be used if Site Lock is enabled on the transceiver. However, the site number can be displayed.
- In an NXDN Trunking system with **Multi-System Hunt** enabled, the Multi-System Hunt is executed for each system configured in **Multi-System Hunt List**. (Refer to [Communicating Using Multiple Systems \(Multi-System Roaming\)](#).)

Configuration using KPG-D1/ D1N

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

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 approximately 10 sec elapse after starting to search for a control channel.



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 acquired after approximately 10 sec have elapsed since the start of the search for a control channel. The transceiver behaves as follows according to the configuration in **Out of Range Tone**:

Table 2-7 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 acquired after approximately 10 sec have elapsed since the start of the search for a control channel. 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 the transceiver roams to other system by Multi-System Roaming, it behaves according to the configuration in **In-service Tone** of the system before roaming.

Configuration using KPG-D1/ D1N

- Configuring **Out of Range Indicator** to be enabled or disabled (See Transceiver Settings > NXDN Network > Hunt Options)
- Configuring **Out of Range Tone** (See Transceiver Settings > NXDN Network > Hunt Options)
- Configuring **In-service Tone** to be enabled or disabled (See Transceiver Settings > NXDN Network > Hunt Options)

2.4 Registration in an NXDN 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-registration 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.

Registration Clear 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.

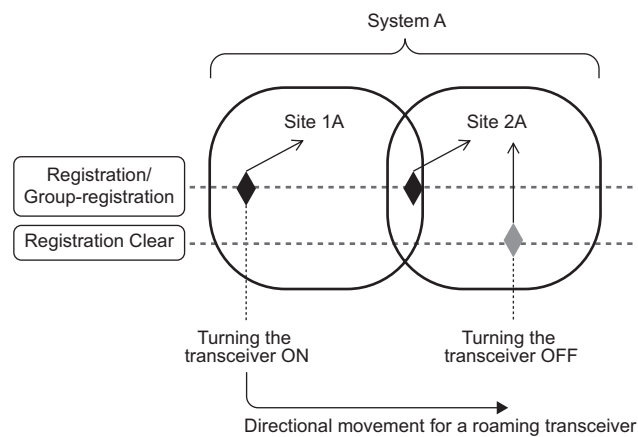


Figure 2-3 Registration/ Group-registration/ Registration Clear

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 different sites regardless of single-site system or multi-site system.
- **If the zone is changed to a zone in an NXDN Trunking System**
The transceiver will begin Registration if a zone in an Analog Conventional system or NXDN Conventional system is changed to an NXDN Trunking system by a user operating the transceiver and a control channel is acquired.
- **If changed to a different NXDN Trunking system**
If an NXDN Trunking system is changed to a different NXDN Trunking system by operating the transceiver, the transceiver begins Registration when a control channel is acquired.
- **When an available control channel is found**
The transceiver begins Registration again when an available control channel is found by a channel number (frequency number) that is different from the current channel number (frequency number).

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 1152 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.
- 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.

Registering the Group ID Used by the Own Transceiver in a System (Group-registration)

The transceiver can register the Group ID used by itself in the system.

Conditions for the transceiver to begin Group-registration

The transceiver begins Group-registration under the following conditions.

• For Registration

The transceiver registers both the Unit ID of own transceiver (location registration) and Group ID (group registration) when the transceiver begins Registration, such as a case when the transceiver is turned ON or when the transceiver roams to a different site.

• If changing to another Group ID without Group Registration

The transceiver begins Group-registration 2 sec after changing the Group ID by a user operating the transceiver.

• If attempting to initiate a call using a Group ID without Group Registration

If the transceiver attempts to transmit using a new Group ID that is different from the registered Group ID in the system, the transceiver will continue to initiate a Group Call after beginning Group Registration for the new Group ID.

Note

- The transceiver does not begin Group-registration while the transceiver is on a traffic channel. If a Group ID for which the transceiver waits on a control channel is different from the Group ID registered in the system at the time when a call on a traffic channel ends, the transceiver will begin Group-registration again.
- The transceiver's behavior is similar to the behavior if the transceiver sends data using a Group Call or initiates a Group Call using a PC command. If the Group ID for a group that has not been registered in the system is changed after a transmission ends, the transceiver will begin Group-registration 2 sec after changing the Group ID.
- If the transceiver begins Group-registration prior to a user pressing the **PTT** switch to initiate a Group Call, the transceiver will terminate the Group Call when the transceiver receives a response message from the system indicating a group registration failure.

Behavior of the transceiver when the transceiver registers the location registration and group registration

The following is the transceiver's behavior if the transceiver begins location registration and group registration.

- The transceiver remains on the acquired control channel if both location registration and group registration are successful.
- The transceiver attempts to acquire a control channel again if the transceiver receives a response message from the system indicating rejection of group registration, even if location registration is successful.
- The transceiver remains on the acquired control channel without registering the group if the transceiver receives a response message from the system indicating failure in Group Registration, even if location registration is successful.

If **Group-registration Invalid Tone** is enabled, a Group-registration Invalid Tone (2 beeps) sounds from the transceiver at 30-sec intervals.

If **Group-registration Invalid Indicator** is enabled, "GP Reg Invalid" is displayed on the display of the transceiver.



Behavior of the transceiver during Group-registration

The transceiver starts Group-registration if changing to a Group ID without group registration, or if attempting to transmit using a Group ID without group registration. The following is the transceiver's behavior during Group-registration.

- The transceiver remains on the acquired control channel if the transceiver receives a response message from the system indicating permission for group registration.
- The transceiver attempts to acquire a control channel again if the transceiver receives a response message from the system indicating rejection of group registration, or if the transceiver does not receive any response from the system, or if the timer for random access expires.
- The transceiver remains on the acquired control channel without registering the group if the transceiver receives the response message from the system indicating failure in group registration. If **Group-registration Invalid Tone** is enabled, a Group-registration Invalid Tone (2 beeps) sounds from the transceiver at 30-sec intervals. If **Group-registration Invalid Indicator** is enabled, "GP Reg Invalid" is displayed on the display of the transceiver.
- If the transceiver information registered in the system is already cleared when the transceiver initiates a Group Call, the transceiver begins Group-registration and then the transceiver will terminate the Group Call upon receipt of a response message from the system indicating non-registration of the group in the system.



Note

- The transceiver may not be able to receive a Group Call using the Group ID without group registration in the system. This depends on the system configuration.
- If receiving a Group ID differing from the Group ID for the group registered in the system, the transceiver will not begin Group-registration at the time of receiving the call.
- If a Group ID is added to the transceiver by receiving a request for changing the remote group, the transceiver will begin Group-registration 2 sec after changing to add the Group ID. If the transceiver restores to the previous channel upon receipt of a message requesting to reset the change of the remote group, the transceiver will begin Group-registration 2 sec after changing to that Group ID of the channel. (Refer to [Adding a Group ID by Remote Control \(Remote Group Add\)](#).)

Group-registration Timer

In **Group-registration Timer**, the length of time until Group-registration is executed again before the Group ID expiration date in a system expires is configured.

The transceiver can continue the registration of a Group ID by configuring **Group-registration Timer** and executing Group-registration again.

Group-registration Timer starts or restarts in the following cases:

- **Group-registration Timer** starts when the transceiver executes Group-registration to a system and a message from the system indicating permission for group registration is received.
- **Group-registration Timer** restarts if the transceiver makes a Voice Call, Data Call or Status addressed to a Group ID for a system, and the initiation of a Group Call in the system is confirmed after a message for traffic channel assignment or an acknowledgment is received on a control channel.
- If the transceiver executes Registration Clear (De-Registration), **Group-registration Timer** stops.

Note

- Even if **Group-registration Timer** expires while the transceiver is unable to execute Group-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. Group-registration is executed after the transceiver is ready for Group-registration, for example, after the service is terminated.

Configuration using KPG-D1/ D1N

- Configuring **Group-registration Invalid Indicator** ( [See](#) Transceiver Settings > NXDN Network > Hunt Options)
- Configuring **Group-registration Invalid Tone** ( [See](#) Transceiver Settings > NXDN Network > Hunt Options)
- Configuring **Group-registration Timer** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

Clearing the Registration Information from a System (Registration Clear)

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 NXDN 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 NXDN Trunking system**
The transceiver will migrate to the changed channel 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), the transceiver does not receive any response from the system, or 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.

2.5 Using NXDN ID to Initiate a Selective Call

An individual call and group call are available by using NXDN 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 an NXDN Trunking system. For transceiver operations and behaviors, refer to the instructions of each call type.

- Individual Call (Transmission Trunked)
- Group Call (Transmission Trunked)
- Individual Call (Message Trunked (Enhanced))
- Group Call (Message Trunked (Enhanced))
- Broadcast Group Call
- Status Call
- Short Data Call
- Long Data Call
- Telephone Call

For an Individual Call and Group Call, the transceiver behavior varies depending on the configuration of the **Trunking Type** ("Transmission Trunked" or "Message Trunked (Enhanced)"). (Refer to **Trunking Type**.)

Note

- If a user wishes to send or receive an Individual Call, Group Call, Status Message, or Short Message, refer to "**Transition for Each Mode**" for the transitions to each mode.

Trunking Type

For an Individual Call and Group Call in an NXDN Trunking system, the method for releasing a traffic channel varies as follows, depending on the configuration of **Trunking Type**. The configuration for **Trunking Type** must be changed along with the configuration of the system.

Table 2-8 Trunking Type

Configuration	Description
Transmission Trunked	The system releases a traffic channel after the communication ends on the traffic channel by a user of the transmitting transceiver releasing the PTT switch. This parameter can be used for calls such as an Individual Call and Group Call which do not determine whether or not the receiving transceiver is available for communications before initiating a call. (Refer to Making an Individual Call (Transmission Trunked) , Making a Group Call (Transmission Trunked) .)
Message Trunked (Enhanced)	The link to a traffic channel is maintained after the communication ends by a user of the transmitting transceiver releasing the PTT switch on a traffic channel until a certain period of time elapses. To release the traffic channel before a certain period of time elapses, an additional operation is required on the transceiver. While the link to a traffic channel is being maintained, the transceiver can communicate again without reestablishing a link by pressing the PTT switch. This parameter can be used for calls such as an Individual Call and Group Call which determine whether or not the receiving transceiver is available for communications before initiating a call. (Refer to Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) , Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced)) .)

Configuration using KPG-D1/ D1N

Configuring **Trunking Type** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)

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.

2.6 Making an Individual Call (Transmission Trunked)

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.

“Transmission Trunked” needs to be configured for **Trunking Type** on both the transmitting transceiver and the receiving transceiver to initiate an Individual Call in an NXDN Trunking system. “Transmission Trunked” or “Message Trunked” also needs to be configured for **Trunking Type** on the system. (Refer to [Trunking Type](#).)

Initiating an Individual Call (Transmission Trunked)

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 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**

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.

- **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

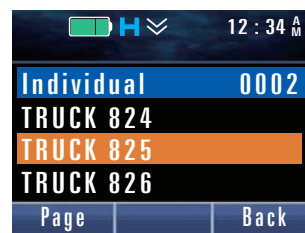
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

The transceiver enters Individual Call Mode and 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 [▲] key or [▼] key to select a Unit ID from the Individual ID List.

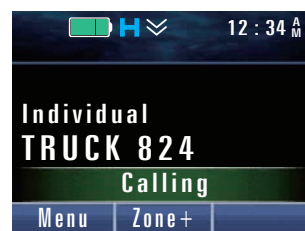
Refer to Common FUNC “Selecting or Clearing Data from a List” for selection methods.



3 Initiating an Individual Call.

Press the **PTT** switch to initiate a Voice Call.

The 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.

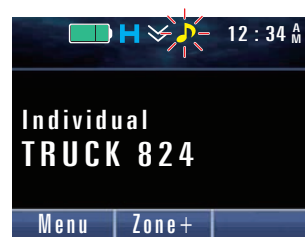
Press the **Menu** ([□]) key or [*] key to initiate a Paging Call.

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 using Manual Dialing, **Manual Dialing** must be enabled using KPG-D1/ D1N.

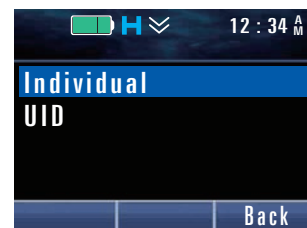
1 Press the **Individual** key, **Individual + Status** key, or **Individual + Short Message** key.

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.

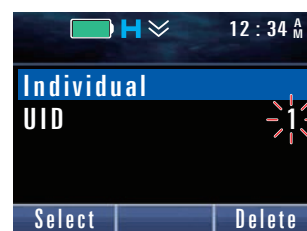
Refer to Common FUNC “Entering or Deleting a Code” for the entry method.

- **If using the keypad:**

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

- **If using the PF keys:**

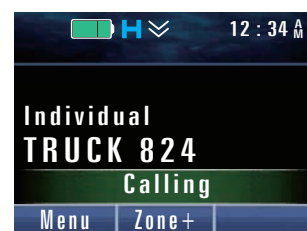
A character can be selected by pressing the [▲] key or [▼] key, and the selected character can be confirmed by pressing the **Menu** ([]) key or [*] key.



4 Initiating an Individual Call.

Press the **PTT** switch to initiate a Voice Call.

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.

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

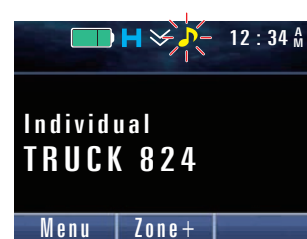
If Individual Call Mode has been entered with “Individual + Status” or “Individual + Short Message”, Status Mode or Short Message Mode is entered by pressing the [▶] key.

 Note

- The entry screen for the ID closes at the same time as pressing the **PTT** switch. 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 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.



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 an NXDN Trunking system.

Table 2-9 Transceiver Behavior During Transmitting

Status	Transceiver Behavior
If the transceiver receives a response message indicating the queue state from the system:	If no traffic channel is available in the system and if the transceiver receives a response message indicating the queue state from the system, a Call Queue Tone (2 beeps) sounds from the transceiver and then “Queued” appears on the display. After that, the transceiver will enter the standby state.
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, 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 **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 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 the **Manual Dialing** to be enabled or disabled (**See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)
- Configuring **Selcall on PTT (Personality)** (**See** Transceiver Settings > Personal > Personality > NXDN Trunking > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking > Selcall on PTT)

Receiving an Individual Call (Transmission Trunked)

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

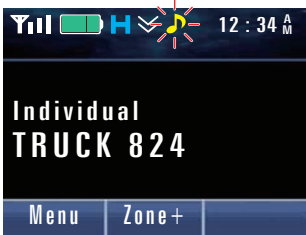
Note

- When the transceiver receives an Individual Call in an NXDN Trunking system, the transceiver will automatically send a response message to the system indicating permission for the incoming calls.

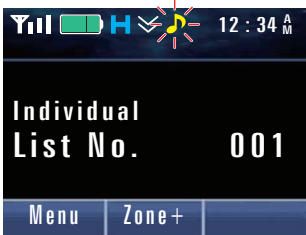
Transceiver behavior

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 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 sounds. (Refer to **Transceiver behavior when receiving an Individual Call (Transmission Trunked)/ Paging Call**.)
- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving a call. (Refer to **Transceiver behavior when receiving an Individual Call (Transmission Trunked)/ Paging Call**.)
- If the transceiver receives the Unit ID Name by Over-the-Air Alias, the received Unit ID Name will appear.
- If the Unit ID Name received using Over-the-Air Alias is stored in the stack memory of the transceiver, the stored 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 (Transmission Trunked).

Transceiver behavior when receiving an Individual Call (Transmission Trunked)/ 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 for **Alert Tone (Individual Call)** or **Alert Tone (Paging Call)** used in common in an NXDN Trunking 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 for **Alert LED Color (Individual Call)** or **Alert LED Color (Paging Call)** used in common in an NXDN Trunking system.

● 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 > NXDN > NXDN Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Alert Tone (Individual)/ Alert Tone (Paging)** ( **See** Transceiver Settings > NXDN > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)/ Alert LED Color (Paging)** ( **See** Transceiver Settings > NXDN > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)/ Alert Tone (Paging Call)** common to NXDN Trunking ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Individual Call)/ Alert LED Color (Paging Call)** common to NXDN Trunking ( **See** Transceiver Settings > NXDN > NXDN 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.

Individual ID List is commonly used in an NXDN Conventional system and NXDN Trunking system.

Table 2-10 Individual ID List

Configuration	Description
ID	A Unit ID can be configured in the range between 0001 and FFEF (hexadecimal), or between 1 and 65519 (decimal). However, an ID having the number of 60001 or larger cannot be used in an NXDN 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 registered in the Individual ID List, the ID Name appears when the transceiver receives a call. After that, the received Unit ID Name appears upon receipt of the Unit ID Name by Over-the-Air Alias while receiving a call. If the transceiver cannot receive the Unit ID Name, the stored ID Name appears if the ID Name is stored for the Unit ID stored in the transceiver. 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 main display. 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 registered in the Individual ID List. Individual Call Incoming: If Automatic Response is disabled, the type of tone sounding from the transceiver can be configured for an Individual Call (Message Trunked (Enhanced)) from the Unit IDs registered 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 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. Individual Call Incoming: If Automatic Response is disabled, the color of flashing LED can be configured for an Individual Call (Message Trunked (Enhanced)) from the Unit IDs registered in the Individual ID List. Paging: The color of flashing LED can be configured for a Paging Call 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 **Individual ID List** ( **See** Transceiver Settings > NXDN > Individual ID List)

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 an NXDN 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 an NXDN 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.

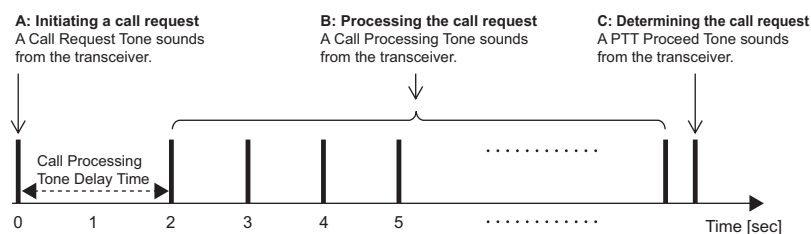


Figure 2-4 Call Request Tone/ Call Processing Tone

- 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).)

Note

- This function can be used with the following calls:
 - Individual Call (Message Trunked (Enhanced))
 - Group Call (Transmission Trunked)
 - Group Call (Message Trunked (Enhanced))

Configuration using KPG-D1/ D1N

- Configuring **Call Request Tone** to be enabled or disabled ( See Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Call Processing Tone** to be enabled or disabled ( See Transceiver Settings > NXDN > NXDN Information > Trunking > Call Processing Tone)

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 > NXDN Trunking > General)

2.7 Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced))

The Individual Call (Message Trunked (Enhanced)) is the function that allows a user to distinguish whether or not the receiving transceiver is available to communicate for initiating an Individual Call in an NXDN Trunking system.

Using the Individual Call (Message Trunked (Enhanced)) function, communications can be started without reestablishing a link between the transceiver and a traffic channel to respond to a call, as the link to the traffic channel has been maintained.

This enables the occupation of a traffic channel assuring the continuity of communications without facing the busy channel to respond to a call. The traffic channel can be released by the transceiver operation.

The transmitting transceiver sends a message requesting an Individual Call to a system when initiating an Individual Call.

After receiving the message requesting an Individual Call, the system sends a message requesting an acknowledgment to the receiving transceiver to confirm the availability of the receiving transceiver. The receiving transceiver sends an acknowledgment for the message requesting the acknowledgment to the system. Subsequently, upon receipt of a message requesting the connection from the receiving transceiver, the system assigns a traffic channel. The transmitting transceiver and the receiving transceiver can communicate after receiving from the system a message assigning a traffic channel.

To use this function, "Message Trunked (Enhanced)" needs to be configured for **Trunking Type** on both the transmitting transceiver and the receiving transceiver using KPG-D1/ D1N. "Message Trunked (Enhanced)" also needs to be configured for **Trunking Type** on the system. (Refer to **Trunking Type**.)

Note

- For an Individual Call (Message Trunked (Enhanced)), the following functions for a normal Individual Call are available. (Refer to **Making an Individual Call (Transmission Trunked)**.)
 - Individual ID List
 - Unit ID Encode Block

Initiating an Individual Call (Message Trunked (Enhanced))

An Individual Call (Message Trunked (Enhanced)) can be initiated by doing any one of the following operations.

● Individual Call Mode

A message requesting an Individual Call is sent to a system by pressing the **PTT** switch after selecting a Unit ID configured in the Individual ID List, or directly specifying a Unit ID in Individual Call Mode.

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

A message requesting an Individual Call is sent to a system by selecting the channel for which the target Unit ID for **Selcall on PTT** has been configured and then by pressing the **PTT** switch. 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** 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.

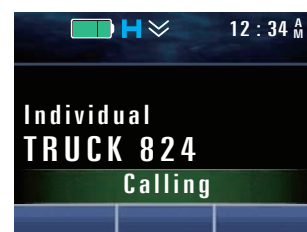
● PC Command

A message requesting an Individual Call is sent to the system 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.)

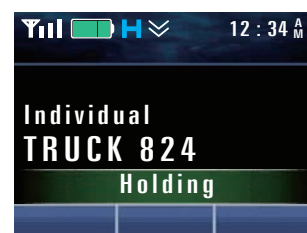
Operating the transceiver

1 Initiate an Individual Call (Message Trunked (Enhanced)) by following one of the methods mentioned above.

A message requesting an Individual Call is sent to a system.

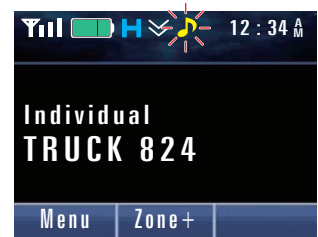


If the receiving transceiver is within the communications range, "Holding" appears on the display waiting for a response from the receiving transceiver.



2 Receive from the system a message for traffic channel assignment.

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



3 Press the PTT switch.

The Individual 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 a call requesting an Individual Call (Message Trunked (Enhanced)) is initiated. Also, if the **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 (Message Trunked (Enhanced)) 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).)
- The DTMF code can be sent during the call by pressing one of the [0] key to [9] key, the [*] key or the [#] key.
- 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.
- 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)
- Assigning functions to the AUX Input port (**See** Transceiver Settings > Extended Function > AUX)
- Configuring **Selcall on PTT (Personality)** (**See** Transceiver Settings > Personal > Personality > NXDN Trunking > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking > 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 (Message Trunked (Enhanced))

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 (Message Trunked (Enhanced)), the transceiver must receive from the system a message requesting an acknowledgment for the Individual Call, and send to the system a message requesting the connection. The transceivers can initiate the communication after receiving the message for traffic channel assignment from the system.

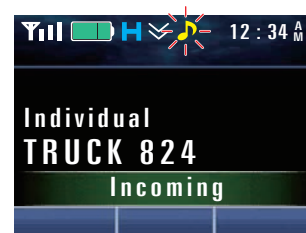
Operating the transceiver

The transceiver's behavior varies depending on the configuration for Automatic Response.

● If Automatic Response is disabled

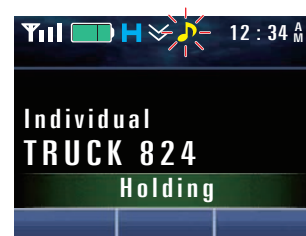
1 Receive from the system a message requesting reception of an Individual Call.

The "📡" icon blinks, and the ID Name of the transmitting transceiver and "Incoming" appear.



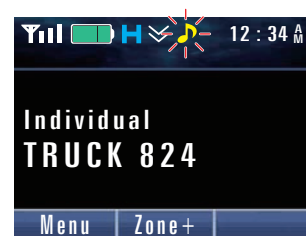
2 Press the **PTT** switch or the **Call Response** key.

The "📡" icon blinks and a message requesting the connection is sent to the system.



3 Receive from the system a message for traffic channel assignment.

The transceiver enters a state allowing communication. By pressing the **PTT** switch, the transmitting transceiver can be called.

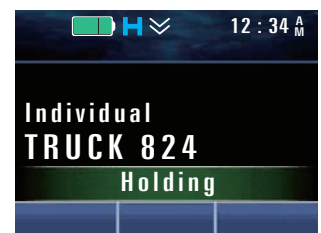


Note

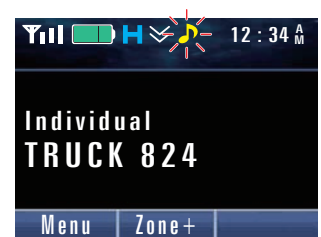
- If a response to the received Individual Call is not sent and the status below is initiated, "Missed Call" appears on the display.
 - When the time configured with **Incoming Reset Time** elapses
 - When the transmitting transceiver cancels call
 - The time configured in **Incoming Reset Time** elapsed.
 - The system timed out.
- 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 a message requesting the connection is transmitted. 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.
- If the transceiver receives an Emergency Call, the transceiver automatically sends a message requesting a connection regardless of the configuration for the Automatic Response.
- If Alert Tone is configured to sound when receiving, an Alert Tone sounds. (Refer to [Transceiver behavior when receiving an Individual Call \(Message Trunked \(Enhanced\)\)](#).)
- If **Selective Call Alert LED** is enabled, the LED flashes when the transceiver is receiving. (Refer to [Transceiver behavior when receiving an Individual Call \(Message Trunked \(Enhanced\)\)](#).)
- **If Automatic Response is enabled**

1**Receive from the system a message requesting reception of an Individual Call.**

A message requesting the connection 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 the transceiver receives an Emergency Call, the transceiver automatically sends a message requesting a connection regardless of the configuration for the Automatic Response.
- If Alert Tone is configured to sound when receiving, an Alert Tone sounds. (Refer to [Transceiver behavior when receiving an Individual Call \(Message Trunked \(Enhanced\)\)](#).)
- If **Selective Call Alert LED** or **Optional Signaling LED** is enabled, the LED flashes when the transceiver is receiving a call. (Refer to [Transceiver behavior when receiving an Individual Call \(Message Trunked \(Enhanced\)\)](#).)

Transceiver behavior when receiving an Individual Call (Message Trunked (Enhanced))

● Alert Tone

If Automatic Response 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 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 NXDN Trunking.

If Automatic Response 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)** 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 to NXDN Trunking.

● Selective Call Alert LED

If Automatic Response 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 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 NXDN Trunking.

If Automatic Response 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)** 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 to NXDN 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 > NXDN > NXDN Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Alert Tone (Individual)/ Alert Tone (Individual Call Incoming)** ( [See](#) Transceiver Settings > NXDN > Individual ID List > Alert Tone)
- Configuring **Alert LED Color (Individual)/ Alert LED Color (Individual Call Incoming)** ( [See](#) Transceiver Settings > NXDN > Individual ID List > Alert LED Color)
- Configuring **Alert Tone (Individual Call)/ Alert Tone (Individual Call Incoming)** common to NXDN Trunking ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Individual Call)/ Alert LED Color (Individual Call Incoming)** common to NXDN Trunking ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)

Sending an Acknowledgment Automatically (Automatic Response)

Automatic Response is the function to automatically send a message requesting the connection upon receipt of a message requesting an acknowledgment for an Individual Call.

If this function is enabled, the transceiver automatically sends a message requesting the connection upon receipt of a message requesting an acknowledgment for an Individual Call.

If this function is disabled, the transceiver automatically sends no message requesting the connection even if the transceiver has received message requesting an acknowledgment for an Individual Call. In this case, a message requesting the connection can be sent manually by a user operating the transceiver. For operation methods, refer to “**If Automatic Response is disabled**” of “**Receiving an Individual Call (Message Trunked (Enhanced))**”.

Configuration using KPG-D1/ D1N

Configuring **Automatic Response** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Individual Call)

2.8 Making a Group Call (Transmission Trunked)

Group Call can be used to engage in 2-way 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.

"Transmission Trunked" needs to be configured for **Trunking Type** on both the transmitting transceiver and the receiving transceiver to initiate a Group Call in an NXDN Trunking system. "Transmission Trunked" or "Message Trunked" also needs to be configured for **Trunking Type** on the system. (Refer to **Trunking Type**.)

Initiating a Group Call (Transmission Trunked)

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

- **Selecting a channel**

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**

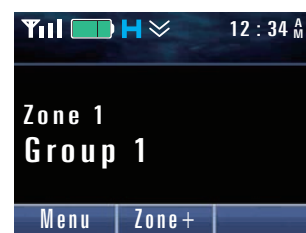
The transceiver starts a Group Call using Group ID configured for the channel when the **PTT** switch is pressed on the channel where "Group Call" is configured for Selcall on PTT.

- **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.)

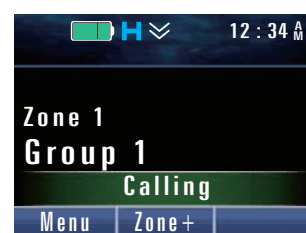
Operating the transceiver

1 Select a channel configured with a Group ID for making a Group Call.



2 Press the **PTT** switch.

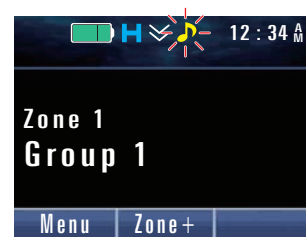
A message requesting a Group Call is sent to the system.



3 Receive from the system a message for traffic channel assignment.

The “🔊” icon blinks and the transceiver enters a state allowing communication.

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 **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**”.

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 > NXDN Trunking > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking > Selcall on PTT)

Receiving a Group Call (Transmission Trunked)

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, Individual ID List number, or 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**, an Alert Tone sounds from the transceiver according to the configuration in **Alert Tone (Conference Group Call)** common to NXDN 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 for **Alert LED Color (Conference Group Call)** common to NXDN Trunking.
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- 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).)
- When the transceiver receives the Group ID for which “ALL” is configured, the transceiver can respond using the Group ID if the received Group ID is registered in the received zone.
If no Group ID is configured in the ID List, the receiving transceiver can receive a call but the receiving transceiver cannot respond to the call. In this case, the ID Name of the transmitting transceiver does not appear even if **Over-the-Air Alias** is enabled. (Refer to **Over-the-Air Alias**.)
- The transceiver can send the ID of the transmitting transceiver from the communication port on the transceiver when receiving a Group Call.
- If the transceiver receives a Group Call from a telephone, the Encryption function will be disabled.

Configuration using KPG-D1/ D1N

- Configuring **Selective Call Alert LED** to be enabled or disabled ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Alert Tone/ Alert LED Color (Personality)** ( **See** Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Alert Tone/ Alert LED Color (Channel Edit)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking)
- Configuring **Alert Tone (Conference Group Call)** common to NXDN Trunking ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Conference Group Call)** common to NXDN Trunking ( **See** Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)

Transmission Operation during Receipt of a Group Call

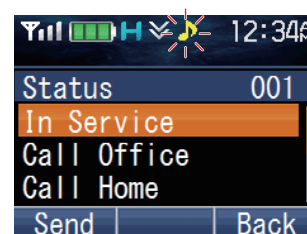
The transceiver can send a Status Message or Short Message, etc. during receipt of a Group Call.

Sending a Status Message after entering Status Mode during receipt of a Group Call

1

Select a Status Message after entering Status Mode during receipt of a Group Call.

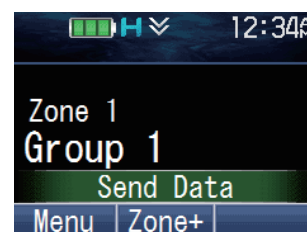
Refer to “[Sending a Status Message](#)” of 1 NXDN CONVENTIONAL SYSTEM for operation methods.



2

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

The transceiver sends the Status Message.

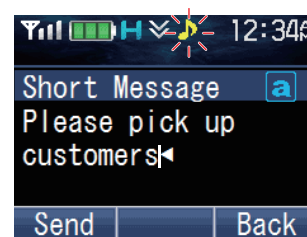


Sending a Short Message after entering Short Message Mode during receipt of a Group Call

1

Enter a Short Message after entering Short Message Mode during receipt of a Group Call.

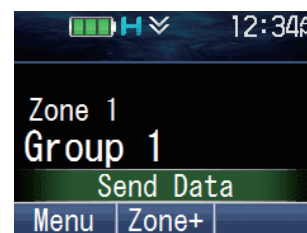
Refer to “[Sending a Short Message](#)” of 1 NXDN CONVENTIONAL SYSTEM for operation methods.



2

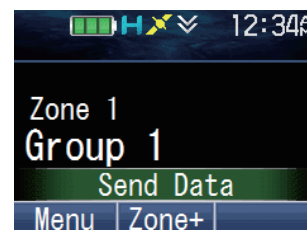
Press the **PTT** switch or the **Menu** ([]) key.

The transceiver sends the Short Message.



Sending the own location information by the key operation during receipt of a Group Call

Pressing the **Send the GPS Data** key or the **Send the Location Data** key during receipt of a Group Call sends the own location information. (Refer to [Sending GPS Data](#).)



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. If the ID Name is not configured in the Individual ID List, the Individual ID List number or the Unit ID is displayed. (Refer to [Receiving a Group Call \(Transmission Trunked\)](#), [Receiving a Group Call \(Message Trunked \(Enhanced\)\)](#), and [Receiving a Broadcast Group Call](#).)

Note

- This function can be used with the Group Call (Message Trunked (Enhanced)) and the Broadcast Group Call.

Configuration using KPG-D1/ D1N

Configuring **Unit ID Display on Group Call** ([See](#) Transceiver Settings > NXDN > NXDN Information > General)

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 with the Group Call (Message Trunked (Enhanced)) and the Broadcast Group Call.

Configuration using KPG-D1/ D1N

Configuring the **Call Alert Inhibit (Group Calls only)** to be enabled or disabled ( See Transceiver Settings > NXDN > NXDN 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 by a Group ID registered as a Priority Monitor ID
 - A Group Call using All Group ID
 - A Group Call for Emergency
- This function can be used with the Group Call (Message Trunked (Enhanced)) and the Broadcast Group Call.

Configuration using KPG-D1/ D1N

Configuring **Ignore Group Call during Individual Call** to be enabled or disabled ( See Transceiver Settings > NXDN > NXDN 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 an NXDN 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 prevents the transceivers maintaining transmission from initiating transmission simultaneously when transmission becomes possible; therefore, the collision of calls can be avoided.

Table 2-11 PTT Hold Inhibit

Configuration	Description
Enabled	If transmission is inhibited on a traffic channel when the transceiver initiates a transmitting using Group Call in an NXDN Trunking system, the transmission behavior is not retained 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 transmitting using Group Call in an NXDN Trunking system, the transmission behavior is maintained until the transmission is possible. 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 in Emergency Mode.
- This function can be used with the Group Call (Message Trunked (Enhanced)).

Configuration using KPG-D1/ D1N

Configuring **PTT Hold Inhibit** to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > NXDN 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 and Paging 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. Also, selecting an Individual ID from Individual Call Mode and pressing the **Menu** ([]) key or [*] key initiates a Paging Call. To initiate a Paging Call, “Transmission Trunked” needs to be configured in **Trunking Type**. (Refer to [Initiating an Individual Call](#), [Initiating an Individual Call \(Message Trunked Enhanced\)](#).)

- **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 **Menu** ([]) key sends the Short Message. (Refer to [Sending and Receiving a Short Message \(Short Data Call\)](#).)

- **Telephone Call transmission from Autodial Mode**

Selecting a telephone number from the Autodial List and pressing the **PTT** switch or **Menu** ([]) key after entering Autodial Mode 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 or Paging Call transmission from Stack Mode**

Selecting the receive history in Stack Mode and pressing the **PTT** switch initiates an Individual Call. Also, selecting the receive history in Stack Mode and pressing the **Menu** ([]) key or [*] key initiates a Paging Call. To initiate a Paging Call, “Transmission Trunked” needs to be configured in **Trunking Type**. (Refer to Common FUNC Viewing the Receive History (Stack).)

- **GPS Data Transmission**

GPS data can be sent manually by pressing the **Send the GPS Data** key or the **Send the Location Data** key during receipt of GPS data. Also, pressing the **Menu** key causes the transceiver to enter Menu Mode, and then the GPS data can also be sent by selecting “Send the GPS Data” or “Send the Location Data”. (Refer to [Sending GPS Data](#), [Sending BLE Data Manually by Using a Key \(Send the Location Data \(Indoor Location\)\)](#), Common FUNC Using Menu Mode.)

- **BLE Data Transmission**

BLE data can be sent by pressing the **Send the Location Data** key during receipt of a valid beacon signal (**Send Location via** configuration: “RF System”). 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 \(Message Trunked \(Enhanced\)\)](#), [Sending and Receiving a Status Message \(Status Call\)](#), and [Initiating a Telephone Call](#).)

- Individual Call (Message Trunked (Enhanced))
- Status Data Call
- Telephone Call

Configuration using KPG-D1/ D1N

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

Late Entry Cancel Time

Late Entry Cancel Time is the function to cancel the message for the configured length of time if the transceiver receives a message assigned to a traffic channel of the specified Group Call.

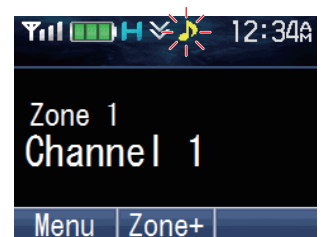
By canceling the message for traffic channel assignment which is sent on a control channel, the transceiver does not participate in a Group Call even if the call is receivable, and the transceiver can remain on the control channel.

This function allows another Call prioritized over a Group Call, and the efficient operation in a system. (Refer to [Participating in an On-going Voice Call Midway Through the Call \(Late Entry\)](#).)

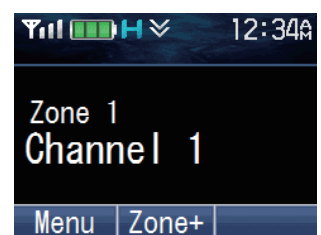
Operating the transceiver

Press the **Clear** key while receiving a Group Call on a traffic channel.

- While receiving a Group Call



- When the **Clear** key is pressed



If "Message Trunked (Enhanced)" is configured in **Trunking Type**, a Key Beep A (1 beep) sounds from the transceiver. However, if **Disconnect Indication Tone** is enabled, a Disconnect Indication Tone (2 beeps) sounds after a Key Beep A (1 beep).

If the own transceiver has started the transmission of a Group Call when "Message Trunked (Enhanced)" is configured in **Trunking Type**, **Late Entry Cancel Time** does not start counting down because the following operations terminate the call:

- The **Clear** key is pressed.
- The microphone is placed in the on-hook state when **On-hook Disconnect** is enabled (Mobile only).

If “Transmission Trunked” is configured in **Trunking Type**, a Key Beep B (2 beeps) sounds from the transceiver.

The transceiver starts the countdown of Late Entry Cancel Time after migrating from a traffic channel to a control channel.

During the countdown, the following messages for traffic channel assignment of the Group Call received until just before the countdown starts are canceled.

- VCALL_ASSGN message
- VCALL_ASSGN_DUP message

If **Auto Reset Timer** is configured in the transceiver, the Auto Reset Timer stops.

Note

- For Mobile, if **On-hook Disconnect** is enabled, Late Entry Cancel Time is activated by placing the microphone in the on-hook state.

To use Late Entry Cancel Time, the transceiver needs to be preconfigured by using KPG-D1/ D1N.

Table 2-12 Late Entry Cancel Time Configuration

Configuration	Description
Off	The transceiver does not start the countdown of Late Entry Cancel Time.
1 sec to 254 sec	The transceiver starts the countdown of Late Entry Cancel Time. During the configured length of time, the message for traffic channel assignment of the Group Call received on the traffic channel is canceled.

The following operations and states of the transceiver stop the countdown of **Late Entry Cancel Time**:

- If a call other than a canceled Group Call is initiated (including if data transmission such as Status Message transmission from Status Mode is executed)
- If a message for traffic channel assignment other than a cancellation target (“VCALL_ASSGN”, “VCALL_ASSGN_DUP”) is received
- If Hunt is initiated
- If the zone or system is changed
- If the Group is changed
- If roaming to another NXDN Trunking site or NXDN Trunking system

Configuration using KPG-D1/ D1N

Configuring **Late Entry Cancel Time** ( See Transceiver Settings > NXDN Network > NXDN Network - Hunt Options)

2.9 Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced))

Group Call (Message Trunked (Enhanced)) is the function that allows you to establish two-way group voice communications by initiating a call to a group. Using the Group Call (Message Trunked (Enhanced)) function, communications can be started without reestablishing a link between the transceiver and a traffic channel to respond to a call, as the link to the traffic channel has been maintained. This enables the occupation of a traffic channel assuring the continuity of communications without facing the busy channel to respond to a call. The traffic channel can be released by the transceiver operation.

To use this function, "Message Trunked (Enhanced)" needs to be configured for **Trunking Type** on both the transmitting transceiver and the receiving transceiver using KPG-D1/ D1N. "Message Trunked (Enhanced)" also needs to be configured for **Trunking Type** on the system. (Refer to [Trunking Type](#).)

Note

- The following functions can be used with the Group Call (Message Trunked (Enhanced)). (Refer to [Making a Group Call \(Transmission Trunked\)](#).)
 - Unit ID Display on Group Call
 - Call Alert Inhibit (Group Calls Only)
 - Ignore Group Call during Individual Call
 - PTT Hold Inhibit

Initiating a Group Call (Message Trunked (Enhanced))

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

● Selecting a channel

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

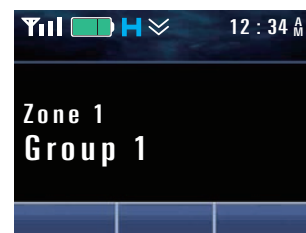
The transceiver starts a Group Call using Group ID configured for the channel when the **PTT** switch is pressed on the channel where "Group Call" is configured for Selcall on PTT.

● 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.)

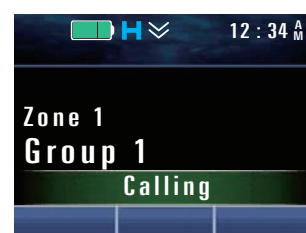
Operating the transceiver

1 Select a channel configured with a Group ID for making a Group Call.



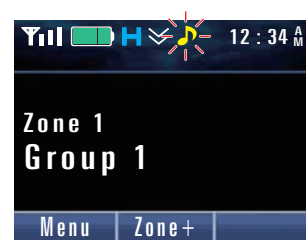
2 Press the **PTT** switch.

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 the **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when a call requesting a Group Call (Message Trunked (Enhanced)) is initiated. Also, if the **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 Group Call (Message Trunked (Enhanced)) 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 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 DTMF code can be sent during the call by pressing one of the [0] key to [9] key, the [*] key or the [#] key.
- 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.
- For details on the information displayed on the display during transmission, refer to “**Transceiver behavior during transmitting**”.

Receiving a Group Call (Message Trunked (Enhanced))

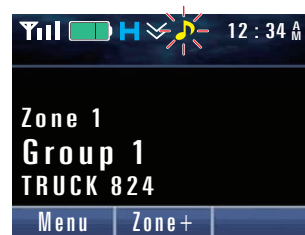
If the received Group ID matches the Group ID configured for the transceiver, the transceiver can receive the Group Call.

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, Individual ID List number, or Unit ID of the transmitting transceiver is displayed.



2

Press the **PTT** switch.

The transceiver can respond to the received Group ID.

Even after the **PTT** switch is released to end the transmission, the link between the transceiver and the traffic channel is maintained.

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 to NXDN 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 for **Alert LED Color (Conference Group Call)** common to NXDN Trunking.
- If **Optional Signaling LED** is enabled, the LED flashes in yellow. (Refer to **Optional Signaling LED**.)
- 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

- Configuring **Selective Call Alert LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Alert Tone/ Alert LED Color (Personality)** ( [See](#) Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Alert Tone/ Alert LED Color (Channel Edit)** ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking)
- Configuring **Alert Tone (Conference Group Call)** common to NXDN Trunking ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Conference Group Call)** common to NXDN Trunking ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)

2.10 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 in an NXDN Trunking system.

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. Also, the transceiver starts a Broadcast 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.)

Note

- The following functions can be used with the Broadcast Group Call. (Refer to [Making a Group Call \(Transmission Trunked\)](#), [Making a Group Call with the Link to a Traffic Channel Retained \(Message Trunked \(Enhanced\)\)](#).)
 - Unit ID Display on Group Call
 - Call Alert Inhibit (Group Calls Only)
 - Ignore Group Call during Individual Call

Initiating a Broadcast Call

The transceiver can initiate a Broadcast Group Call by a user pressing the **PTT** switch while Broadcast Group Call is enabled.

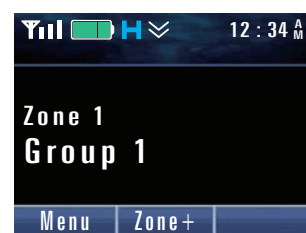
Pressing the **Broadcast** key toggles the Broadcast Group Call between enabled and disabled.

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.)

Operating the transceiver

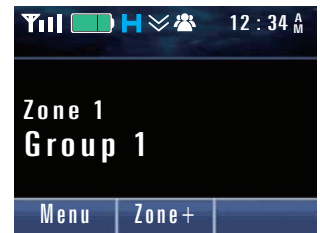
1

Select a channel configured with a Group ID for making a Broadcast Group Call.



2 Press the **Broadcast** key.

" " 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.



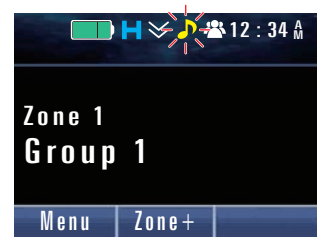
3 Press the **PTT** switch.

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 **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 the **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when a call requesting a Broadcast Group 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 a Broadcast Group 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 **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).)
- 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)

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

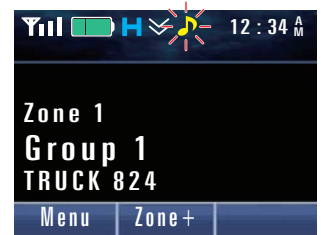
- The transceiver can receive the Broadcast Group Call initiated using the Group ID for which "ALL" is configured even if no Group ID is configured for the transceiver.

Transceiver behavior

The transceiver receives a Broadcast Group Call.

The "🔊" icon blinks and a received Group ID appears.

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



Note

- If Alert Tone is configured to sound when 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 for Alert LED Color LED (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 > NXDN > NXDN Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ([See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Alert Tone (Broadcast Group Call)** ([See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)
- Configuring **Alert LED Color (Broadcast Group Call)** ([See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)

2.11 Common Functions for Data Communications

The following functions are used in common for data communications such as Status Call or Short Data Call, Long Data Call data transmission.

- Number of Retries
- Transmit Busy Wait Time
- 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 > NXDN Trunking > General > Parameter)

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 > NXDN Trunking > General > Parameter)

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 > NXDN Trunking > General > Parameter)

2.12 Sending and Receiving a Status Message (Status Call)

Refer to “[Sending and Receiving a Status Message \(Status Call\)](#)” in 1 NXDN CONVENTIONAL SYSTEM.

Power-on Status Message

Refer to “[Power-on Status Message](#)” in 1 NXDN CONVENTIONAL SYSTEM.

Power-off Status Message

Refer to “[Power-off Status Message](#)” in 1 NXDN CONVENTIONAL SYSTEM.

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

Refer to “[Sending and Receiving a Short Message \(Short Data Call\)](#)” in 1 NXDN CONVENTIONAL SYSTEM.

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

Refer to “[Sending and Receiving a Long Message \(Long Data Call\)](#)” in 1 NXDN CONVENTIONAL SYSTEM.

2.15 Using 2-tone to Initiate an Individual Call

2-tone signaling uses a pair of 2 different tone frequencies in series for an individual call.

2-tone is a signaling system that can receive a signal with squelch disabled only when 2 tone signals in series sent from the transmitting transceiver match the tone signals preconfigured for the receiving transceiver.

2-tone consists of 2 tone signals in series with 2 different frequencies within the frequency range between 281.25 Hz and 3093.75 Hz in an NXDN Trunking system. These 2 tone signals are sent in series with the carrier wave.

The following are the methods for sending the 2-tone code:

- 2-tone encoding list selection
- **Call** key
- PC command

Selecting and Sending the 2-tone Code from a List

The transceiver can send a 2-tone code by initiating a Group Call after the 2-tone code configured in the 2-tone encoding list is selected. (Refer to [2-tone Encoding List](#).)

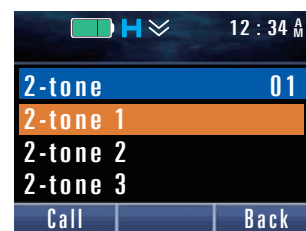
An encoding tone configured in the 2-tone encoding list can be selected by pressing the **2-tone** key.

An encoding tone configured in the 2-tone encoding list can also be selected by selecting "2-tone" after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

Operating the transceiver

1 Press the **2-tone** key.

The transceiver enters 2-tone Mode, and the 2-tone encoding list appears. The following operations are the same even if the transceiver enters 2-tone Mode by pressing the **Menu** key:



2 Press the [▲] key or [▼] key and select the 2-tone code.

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

Note

- A fixed text string ("List No.") and the list number appear for a 2-tone code for which **2-tone Name** is not configured in the 2-tone encoding list.



3 Press the **PTT** switch.

The transceiver initiates a Group Call.



4 Receive from the system a message for traffic channel assignment.

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



5 Press the **PTT** switch.

Transmission of a Group Call is initiated, and the selected 2-tone code is sent. Even if the **PTT** switch is being pressed and held to receive a message for traffic channel assignment, transmission by a Group Call is initiated. Even after the 2-tone code is sent, the transmission continues while the **PTT** switch is pressed and held.

Note

- If “Group ID and Optional Signaling” is configured in **Audio Control for Group Call**, the Optional Signaling is in the matching state if transmission is on a channel with “2-tone 1” to “2-tone 4” configured in **Optional Signaling for Group Call**. In this case, the “🔊” icon appears, and the LED flashes yellow. (Refer to [Using the Optional Signaling \(Optional Signaling for Group Call\)](#).)
- If **Transmit LED** is enabled, the LED lights red when the transceiver is transmitting. (Refer to Common FUNC Transmit LED.)
- 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 according to the configuration in **Alert LED Color LED (Conference Group Call)**.
- If **Call Request Tone** is enabled, a Call Request Tone (1 beep) sounds from the transceiver when a call requesting a Group 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 a Group 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 \(Call Processing Tone\)](#).)

Configuration using KPG-D1/ D1N

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

Using the Call Key to Send the 2-tone Code

Pressing one of the **Call 1** to **Call 6** keys causes the transceiver to transmit the preconfigured tone.

Call 1 to **Call 6** can be assigned to the **PF** keys by using KPG-D1/ D1N and the tone corresponding to each key can be configured by selecting from the 2-tone encoding list of 2-tone.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Configuring the tones corresponding to **Call 1** to **Call 6** keys ( [See](#) Transceiver Settings > Key Assignment > Call)

Using the PC Command to Send the 2-tone Code

The transceiver sends a 2-tone code when a transmission command for a 2-tone code is sent from a PC to the communication port of the transceiver.

To send a 2-tone code by using 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.)

Functions Related to 2-tone Code Encoding

Functions related to 2-tone code encoding are shown below:

- Duration of 1st Tone
- Duration of 2nd Tone
- Duration of Single Tone
- Gap Time
- First Tone Delay Time
- Sidetone
- 2-tone encoding list

Refer to "[Functions Related to DTMF Code Encoding](#)" of 1 NXDN CONVENTIONAL SYSTEM for details of each function.

Decoding the 2-tone Code

The transceiver can wait for a 2-tone code on a channel with "2-tone 1", "2-tone 2", "2-tone 3", or "2-tone 4" configured in **Optional Signaling for Group Call**. (Refer to [Using the Optional Signaling \(Optional Signaling for Group Call\)](#).)

Transceiver Behavior

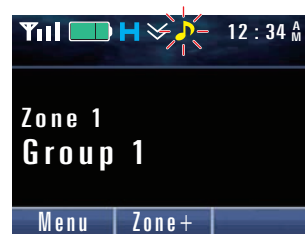
The transceiver behavior varies depending on the configuration in **Audio Control for Group Call** (Group ID, or Group ID and Optional Signaling). (Refer to [Unmuting the Speaker \(Audio Control for Group Call\)](#).)

- If “Group ID” is configured in Audio Control for Group Call

1 The transceiver receives a Group Call.

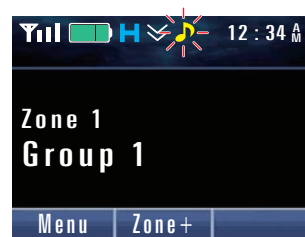
The transceiver migrates to the traffic channel.

The “🔊” icon blinks and the transceiver emits the received audio if the received Group ID matches the Group ID preconfigured for the transceiver.



2 Receive the 2-tone code corresponding to the [Call Format](#) preconfigured for the transceiver.

The “🔊” icon blinks if the received 2-tone code matches the 2-tone code preconfigured for the transceiver.



- If “Group ID and Optional Signaling” is configured in Audio Control for Group Call

1 The transceiver receives a Group Call.

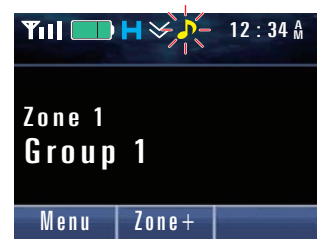
The transceiver migrates to the traffic channel.



2 The received Group ID matches the Group ID preconfigured for the transceiver.

3 Receive the 2-tone code corresponding to the **Call Format** preconfigured for the transceiver.

The “🔊” icon blinks and the transceiver emits the received audio if the received 2-tone code matches the 2-tone code preconfigured for the transceiver.



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 **Selective Call Alert LED** is enabled, the LED flashes when the transceiver is receiving according to the configuration in **Alert LED Color LED (Conference Group Call)**.
- If anything other than “Off” is configured in **Alert Tone of Call Format**, an Alert Tone sounds from the transceiver. Also, if **Transpond of Call Format** is enabled, the transceiver transmits a multiplexed Transpond tone.
- After the length of time configured in **Auto Reset Timer** elapses, the matching state of the 2-tone code is reset.
- The transceiver cannot transmit even if the **PTT** switch is pressed while in the matching state of the 2-tone codes after the transceiver receives the 2-tone code by a Broadcast Call. In this case, while the **PTT** switch is being pressed, “Receive Only” appears on the display and Warning Tone A (continuous beep) sounds from the transceiver. (Refer to **Making an Informative Group Call (Broadcast Group Call)**.)
- The matching state of the 2-tone codes is reset if the transceiver switches to communications by Priority Monitor ID while in the matching state of the 2-tone codes. (Refer to **Receiving a High-priority Call (Priority Monitor ID)**.)

Functions Related to 2-tone Code Decoding

The following functions associated with 2-tone code decoding can be configured for each of 2-tone 1, 2-tone 2, 2-tone 3, and 2-tone 4:

- Decoder 1 to Decoder 4
- A Tone/ B Tone/ C Tone/ D Tone
- Auto Reset Timer
- Clear to Transpond
- Selective Call Alert LED

Refer to “**Functions Related to 2-tone Code Decoding**” of 1 NXDN CONVENTIONAL SYSTEM for details of each function.

Note

- The **Transpond** and **Clear to Transpond** functions of 2-tone decoding cannot be used in an NXDN Trunking system.

2.16 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. (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. 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. (Refer to [Sending Entered DTMF Codes All at Once \(Store and Send\)](#).)

- **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. (Refer to [Sending the DTMF Code with a Single Touch \(Call 1 Key to Call 6 Key\)](#).)

- **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.

- **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 "Phone Call" 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

- To use the speed dial, the dial number needs to be entered as "***nnn". A maximum of 3 numerical digits between 001 and 255 needs to be entered in "nnn". For example, if the speed dial number is "1", "***001" needs to be entered. If "nnn" is not within the extent, the transceiver does not initiate a Telephone Call and a Warning Tone A (continuous beep) sounds from the transceiver.

Operating the transceiver

1 Initiate a Telephone Call by one of the methods mentioned above.

"Phone Call" appears and the "📞" icon blinks when the transceiver becomes ready for communications.

If **Telephone Call Alert LED** is enabled, the LED flashes according to the configuration in **Alert LED Color (Telephone Individual Call)**.



2 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. (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).)
- The DTMF code can be sent during the call by pressing one of the [0] key to [9] key, the [*] key or the [#] key.
- Pressing the **Clear** key terminates a Telephone Call. For Mobile, if **On-hook Disconnect** is enabled, a Telephone Call terminates by placing the microphone in the on-hook state.
- The transceiver also terminates communications when the length of time configured in **Incoming Reset Time** elapses.
- 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 (Personality)** (**See** Transceiver Settings > Personal > Personality > NXDN Trunking > Selcall on PTT)
- Configuring **Selcall on PTT (Channel Edit)** (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking > Selcall on PTT)
- Configuring **Off-hook Connect** to be enabled or disabled (**See** Transceiver Settings > Optional Features > Optional Features 1 > Microphone-hook)
- Configuring **Call Request Tone** to be enabled or disabled (**See** Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Telephone Call Alert LED** to be enabled or disabled (**See** Transceiver Settings > NXDN > NXDN Information > Trunking)

- Configuring **Alert LED Color (Telephone Individual Call)** ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)
- Configuring **Call in Progress Tone** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **PTT Proceed Tone** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)
- Configuring **Incoming Reset Time** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General)
- Configuring **Disconnect Indication Tone** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)

Receiving a Telephone Call

“Phone Call” appears and the “” icon blinks when the transceiver receives a Telephone Call.



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](#).)
- The transceiver can respond to the transmitting telephone by pressing the **PTT** switch or the **Call Response** key when the transceiver receives a Telephone Call. For Mobile, when **Off-hook Connect** is enabled, the transceiver can also respond to the transmitting telephone by placing the microphone in the off-hook state.

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)** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert Tone)
- Configuring **Telephone Call Alert LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Optional Signaling LED** to be enabled or disabled ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking)
- Configuring **Alert LED Color (Telephone Individual Call)** ( [See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Alert LED Color)

2.17 Using a Frequency Added to a System without Changing the Transceiver Configuration (Direct Frequency Assignment)

Direct Frequency Assignment (DFA) is the function where an NXDN Trunking system directly notifies the transceiver of frequency information as the frequency information.

The transceiver which received from the system a broadcast message with the frequency information of a new site added, such as when the site is added to an NXDN Trunking system, can immediately use the site. The site can be expanded without overwriting the configuration data of the transceiver in operation.

When receiving a broadcast message with frequency information from an NXDN Trunking system, the following frequency information is stored in the internal memory of the transceiver. In addition to the configuration data of KPG-D1/ D1N, a new Hunt Table is structured and becomes a search target of a control channel. This information is not cleared even if turning the transceiver OFF, and is stored in the internal memory of the transceiver.

Table 2-13 Parameters of Direct Frequency Assignment

Frequency Information	Broadcast Message Including Frequency Information	Amount That Can Be Stored	Timing of Storage
Base frequency	SITE_INFO message	A maximum of 8 pairs (available for managed in each network)	When a SITE_INFO message is received
Step			
Frequency numbers ascending and descending on a control channel	CCH_INFO message	A maximum of 1,152 pairs (available for managed in each network)	When a CCH_INFO message is received
Bandwidth (or Bit Rate)			

The transceiver calculates the frequency of a newly added site as follows:

$$\text{Frequency} = \text{base frequency} + (\text{frequency number}) \times (\text{step})$$

Note

- To use this function, "Direct Frequency Assignment" needs to be configured for the frequency notification method in an NXDN Trunking system.

Confirming the Stored Frequency Information (DFA Information)

The frequency information stored in the internal memory of the transceiver can be confirmed in **DFA Information** of KPG-D1/ D1N. By reading the frequency information from the transceiver in **DFA Information**, the various information of each network can be viewed. Refer to the help texts of KPG-D1/ D1N for instructions on how to operate **DFA Information**.

Configuration using KPG-D1/ D1N

Confirming the Stored Frequency Information ( See Tools > DFA Information)

Deleting the Stored Frequency Information (DFA Data Erase)

The frequency information stored in the internal memory of the transceiver can be deleted when writing the configuration data to the transceiver. Refer to the help texts of KPG-D1/ D1N (**DFA Data Erase**) for instructions.

Configuration using KPG-D1/ D1N

Deleting the Stored Frequency Information ( Program > Write Data to the Transceiver > DFA Data Erase)

Example of System Operation Using Direct Frequency Assignment

This section describes the operation example of an NXDN Trunking system using **Direct Frequency Assignment**.

Adding a new site

- 1) The transceiver acquires the base frequency and step information from a SITE_INFO message in an existing site and stores them in the internal memory of the transceiver.
- 2) After acquiring the frequency number (descending only) of a control channel in a new adjacent site from an ADJ_SITE_INFO message in the existing site, the transceiver calculates the frequency and migrates to this new site.
- 3) After acquiring the ascending and descending frequency numbers from a CCH_INFO message in the new site, the transceiver stores the ascending and descending frequency numbers in the internal memory of the transceiver, calculates the frequency, and executes location registration.

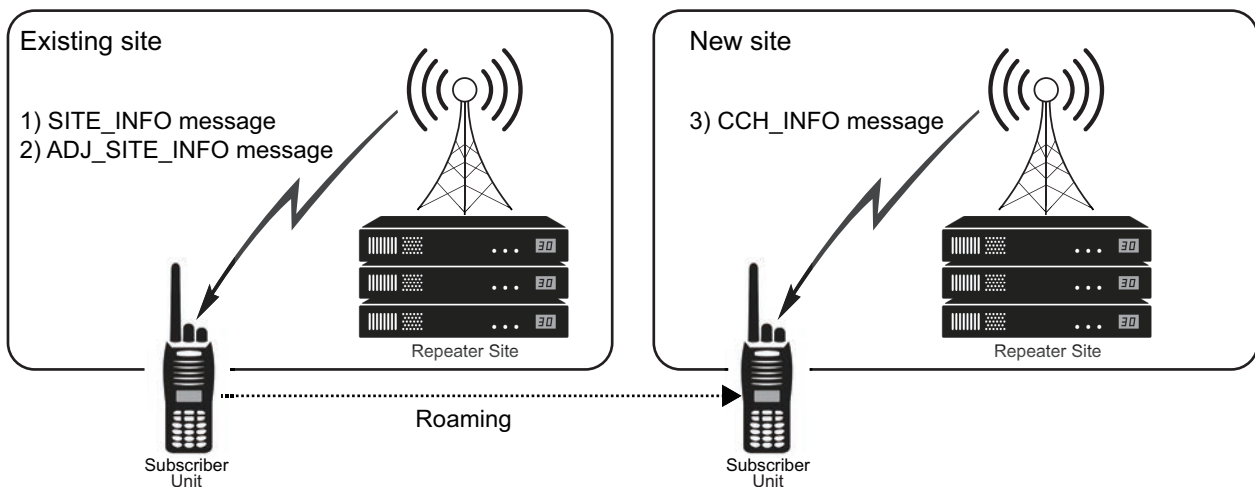


Figure 2-5 Adding a new site

Acquiring a traffic channel in a new site

- 1) The transceiver sends a VCALL_REQ message to a newly added site.
- 2) If the transceiver receives a VCALL_ASSGN message with the frequency number of a traffic channel added, the transceiver calculates the frequency of the traffic channel and migrates to this traffic channel.

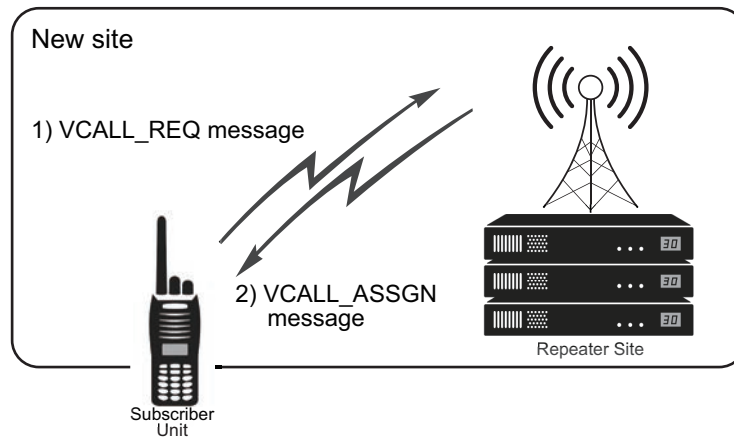


Figure 2-6 Acquiring a traffic channel in a new site

Adding a control channel to an existing site

- 1) The transceiver acquires the base frequency and step information from a SITE_INFO message and stores them in the internal memory of the transceiver.
- 2) The transceiver acquires the frequency number of a control channel newly added from a CCH_INFO message and stores the frequency number in the internal memory of the transceiver. Then, the transceiver calculates the frequency of the control channel and migrates to this control channel.

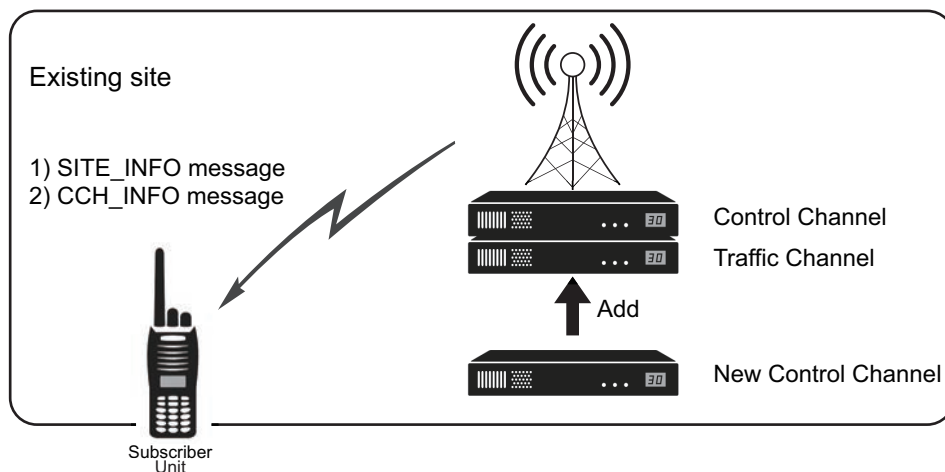


Figure 2-7 Adding a Control Channel to an Existing Site

Adding a traffic channel to an existing site

- 1) The transceiver sends a VCALL_REQ message to the existing site.
- 2) If the transceiver receives a VCALL_ASSGN message with the frequency number of a newly added traffic channel, the transceiver calculates the frequency of the traffic channel and migrates to this traffic channel.

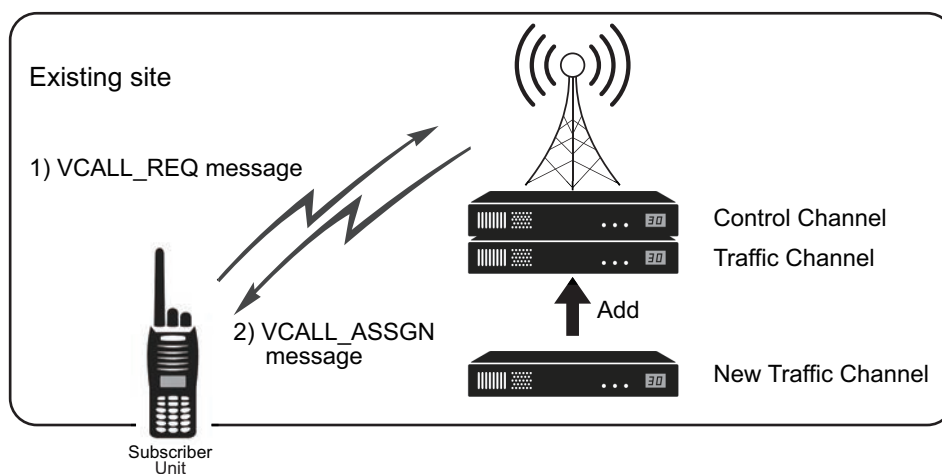


Figure 2-8 Adding a Traffic Channel to an Existing Site

2.18 Automatically Switching the System (System Auto Select)

System Auto Select is the function to search for an available system and automatically switch the system when the transceiver is outside the communication area in the current system, if the transceiver is being operated in an NX-Bridge system (Multi System operation).

If the transceiver becomes outside the communication area in an NXDN Trunking system, **System Selection Wait Time** is activated. The transceiver remains in the current system while **System Selection Wait Time** is counting down. After the length of time configured in **System Selection Wait Time** elapses, **System Auto Select** is initiated. In **System Auto Select**, the search target system preconfigured in the transceiver is searched sequentially, and the transceiver automatically switches to an available system when the system is found.

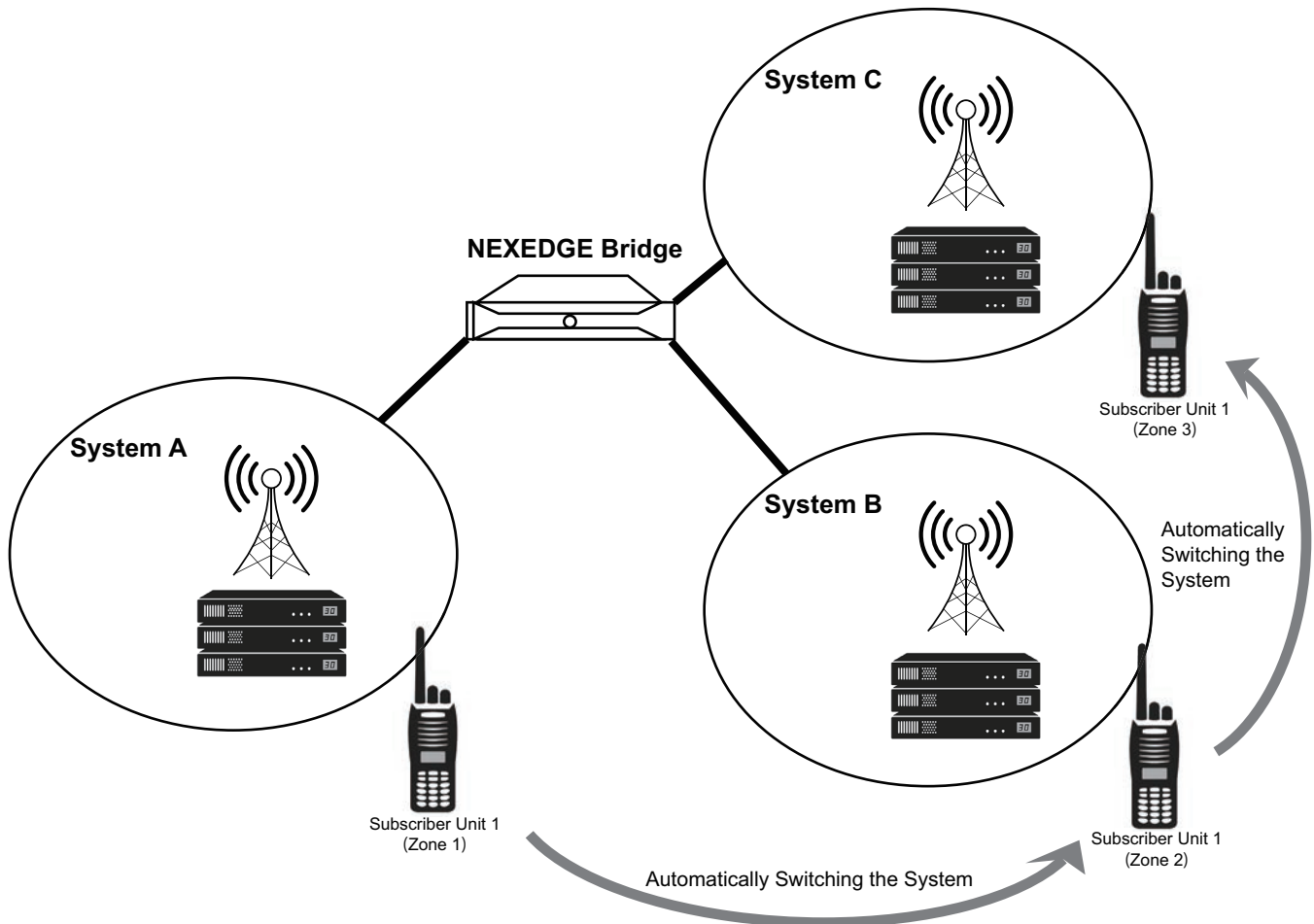


Figure 2-9 System Auto Select

In **System Auto Select**, if the transceiver migrates to the Zone-channel of the system to be the search target, the following hunt sequence is executed in the same manner as when the transceiver normally switches the system. (Refer to **Control Channel Hunt (Control Channel Hunt)**.)

If an available control channel is not found by executing a hunt sequence, the transceiver migrates to the next Zone-channel configured in the System Search List. (Refer to **System Search List**.)

Resuming a Control Channel Sequence



Preferential Hunt Sequence



Normal Hunt Sequence



System Add Channel Sequence



Site Hunt Sequence



Comprehensive Hunt Sequence



Failsoft Channel Sequence

Note

- If the following keys are operated while **System Auto Select** is activated, **System Auto Select** ends. Then, the transceiver returns to the zone channel selected when starting **System Auto Select**.
 - **Channel Up/Down** key
 - **Zone Up/Down** key
 - **Channel Down** key
 - **Channel Up** key
 - **Zone Down** key
 - **Zone Up** key
 - **Site Up** key
 - **Site Down** key
- If the following keys are operated or the status of the AUX Input port changes while **System Auto Select** is activated, **System Auto Select** ends. Then, the transceiver returns to the zone channel selected when starting **System Auto Select**, and the function behaves. The behavior is the same even if the channel is changed in Channel Entry Mode or Group ID Entry Mode, and even if each function is executed from Menu Mode.
 - **Channel Select** key
 - **Zone Select** key
 - **Site Select** key
 - **Scan** key
 - **Scan Normal** key
 - **Direct Channel 1** to **Direct Channel 5** keys
 - **Direct Channel 1 Select** to **Direct Channel 5 Select** keys
 - **Home Channel** key
 - **Home Channel Select** key
 - **Emergency** key
 - **Transceiver Password** key
 - **Maintenance** key
 - **Lone Worker** key
 - **Activity Detection** key

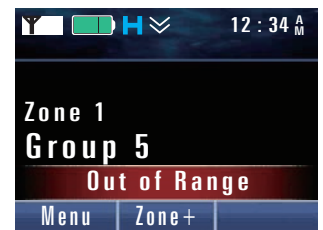
- **Zeroize** key
 - **Channel Recall** key
 - **Channel Select A** to **Channel Select D** (AUX Input) (Mobile only)
 - **Emergency** (AUX Input) (Mobile only)
 - **Scan** (AUX Input) (Mobile only)
 - **DTC** (AUX Input) (Mobile only)
 - **Data PTT** (AUX Input) (Mobile only)
 - **Zeroize** (AUX Input) (Mobile only)
- Even if the following keys are operated while **System Auto Select** is behaving and the status of the AUX Input port changes, a Key-entry Error Tone (1 beep) sounds from the transceiver and the transceiver does not respond at all. In this case, the behavior of **System Auto Select** continues.
 - **Scan Program** key
 - **Front Panel Programming** key
 - **Low Transmit Power** key
 - **High Transmit Power** key
 - **Scrambler/Encryption** key
 - **Scrambler/Encryption Code** key
 - **Scrambler/Encryption** (AUX Input) (Mobile only)

Transceiver behavior

1

The transceiver becomes outside the communication area in an NXDN Trunking system.

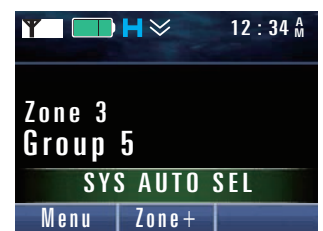
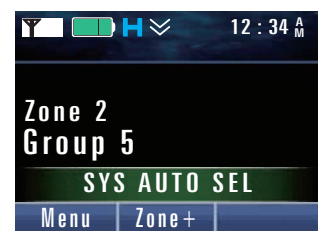
System Selection Wait Time is activated.



2

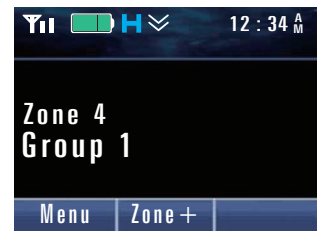
The length of time configured in **System Selection Wait Time** elapses.

System Auto Select starts and the system is switched sequentially. "SYS AUTO SEL" appears on the transceiver display while **System Auto Select** is behaving.



3 An available system is found, and registration succeeds.

A System Select Tone (4 beeps) sounds from the transceiver, and then **System Auto Select** ends.



Note

- If an available system is not found, the transceiver returns to the zone selected when starting **System Select Tone**, and **System Auto Select** ends.
- If **Comprehensive Hunt** is enabled and many channels are configured in **Frequency Table**, the migration to the next zone may take time because the number of channels to be searched is large.
- If the transceiver is turned OFF and then turned ON again while **System Auto Select** is activated, the transceiver is turned ON in the zone where **System Auto Select** is started.
- In a zone where "Auto" is configured in **Home Channel Revert**, the transceiver migrates to a channel other than the Home Channel, and **System Selection Wait Time** is not activated even if the transceiver becomes outside the communication area in the destination channel while the **Home Channel Revert Timer** is counting down. If the transceiver is outside the communication area when the countdown of the **Home Channel Revert Timer** ends and the transceiver returns to the Home Channel, **System Selection Wait Time** is activated.
- When the transceiver is in the following states, System Auto Select is not activated:
 - "Off" is configured in **System Selection Wait Time**
 - Lone Worker Mode
 - Activity Detection On
 - Emergency Mode
 - Maintenance Mode
 - OTAP Mode
 - Transceiver Password Mode
 - Front Panel Programming Mode
 - Scan Programming Mode
 - Error Zone-Channel
 - Remote Group Add (GID change prohibition)
 - When the channel is changed by using **Direct CH/GID 1** to **Direct CH/GID 5** (Return is enabled)
 - When the channel is changed by using **Home Channel** (only if "Manual" is configured in **Home Channel Revert**)
 - When the channel is changed by using **Channel Recall**
 - When the channel is changed by using **Channel Select A** to **Channel Select D** (AUX Input) (Mobile only)
 - Stun state
 - When executing Zeroize
 - When executing Forced Search
 - Failsoft Mode
 - When the Zone-channel is changed

System Selection Wait Time

System Selection Wait Time is the length of time from when the transceiver becomes outside the communication area in the currently selected system until the transceiver starts the **System Auto Select** behavior.

Configuring **System Selection Wait Time** can prevent **System Auto Select** from being activated accidentally even if the transceiver temporarily enters a coverage area with weak signals and becomes outside the communication area.

If the transceiver becomes outside the communication area, **System Selection Wait Time** is activated. If no available control channel is found and the length of time configured in **System Selection Wait Time** elapses, the transceiver starts **System Auto Select**. If an available control channel is found while the **System Selection Wait Time** is counting down, the transceiver stops the countdown of the **System Selection Wait Time** and does not start **System Auto Select**.

Note

- If "Off" is configured in **System Selection Wait Time**, **System Auto Select** does not behave and the transceiver remains in the selected system even if the transceiver becomes outside the communication area.

Configuration using KPG-D1/ D1N

Configuring **System Selection Wait Time** ( See Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > System Auto Select)

Selected Channel Hold

Selected Channel Hold is the function to retain the channel number selected in the zone where the transceiver became outside the communication area when the zone switched by **System Auto Select**.

Table 2-14 Selected Channel Hold

Configuration	Description
Enabled	When the zone is switched by System Auto Select , the transceiver migrates to the same channel number as the channel number selected in the zone where the transceiver became outside the communication area, and the transceiver starts the control channel hunt. If the same channel number as the channel number selected in the zone where the transceiver became outside the communication area does not exist in the destination zone, the transceiver migrates to the backup channel number in the destination zone and starts the control channel hunt. If no backup channel exists, the transceiver migrates to the lowest channel number in the zone and starts the control channel hunt.
Disabled	When the zone is switched by System Auto Select , the channel number selected in the zone where the transceiver became outside the communication area is not retained. The transceiver migrates to the backup channel number in the destination zone and starts the control channel hunt. If no backup channel number exists, the transceiver migrates to the lowest channel number in the zone and starts the control channel hunt.

Configuration using KPG-D1/ D1N

Configuring **Selected Channel Hold** to be enabled or disabled ( See Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > System Auto Select)

System Search List

System Search List is the function to specify the Zone-channel of the system to be the search target of **System Auto Select**. The transceiver sequentially migrates to the Zone-channel configured in **System Search List** and executes the control channel hunt.

The channel number and also "Last Used Channel" can be configured in the configuration of the channel. The transceiver migrates to the backup channel of the destination zone if "Last Used Channel" is configured. If no backup channel exists in the destination zone, the transceiver migrates to the lowest channel number in the zone and executes the control channel hunt.

Note

- If "Last Used Channel" is configured for a channel of the System Search List, and if "Auto" is configured in Home Channel Revert for the zone that includes the channel, the transceiver migrates to the **Home Channel** of this zone, not to the backup channel, and executes the control channel hunt.

Configuration using KPG-D1/ D1N

Configuring **System Search List** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > System Auto Select > System Search List)

2.19 Locking the Site to Be Used (Site Lock/ Site Select)

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.

Selecting a site in Site Select Mode or directly entering the site number can lock the transceiver on the selected site. Also, selecting a site by using the **Selector** or **PF** keys can lock the transceiver on the selected site. To select a site, site information must be configured using KPG-D1/ D1N. Or, the following functions must be assigned to the **Selector** and **PF** keys in order to select a site using the **Selector** or **PF** keys:

Table 2-15 Site Select

Key	Function	Reference
Selector *1	Site Up/Down Site Select	Common FUNC Available Functions for the Selector (Portable only)
PF key	Site Up Site Up (Continuous) Site Down Site Down (Continuous)	Common FUNC Available Functions for the PF Keys

*1 Portable only

Operating the transceiver

● Enabling or disabling the Site Lock

1 Press the **Site Lock** key while Site Lock is disabled.

The “” icon appears, and the site number of the current site and the site name 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.)
- The Site Lock can be enabled for the current site only if the transceiver has acquired a control channel.

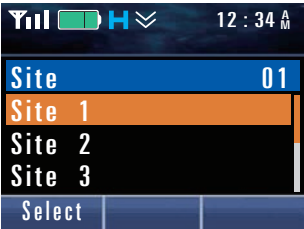
● **Using Site Select Mode (list selection)**

1 Press and hold the **Site Lock** key.

The transceiver enters Site Select Mode, and then the list will appear.

 Note

- If “Site Select” is selected after the transceiver enters Menu Mode by pressing the **Menu** key, the transceiver can also enter Site Select Mode.



2 Select the site to be locked 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.

The “” icon appears and Site Lock is enabled for the selected site number.



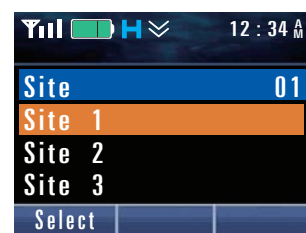
● Using Site Select Mode (manual entry)

1 Press and hold the **Site Lock** key.

The transceiver enters Site Select Mode, and then the list will appear.

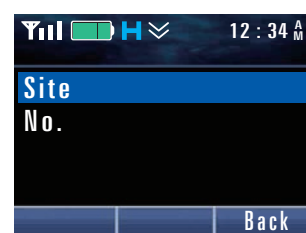
Note

- If "Site Select" is selected after the transceiver enters Menu Mode by pressing the **Menu** key, the transceiver can also enter Site Select Mode.
- If no Site Name is configured, the site number entry display appears. In this case, proceed to step 3.



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

The site number entry display appears.



3 Enter a site number.

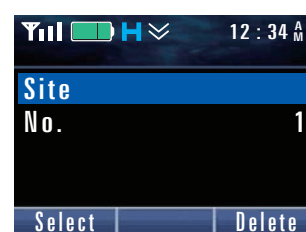
Refer to Common FUNC "Entering or Deleting a Code" for the entry method.

● If using the keypad:

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

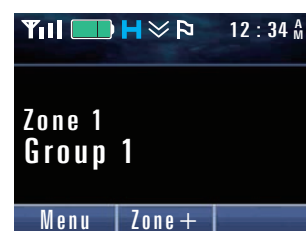
● If using the PF keys:

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



4 Press the **Menu** ([□]) key, or [*] key.

Site Lock is enabled for the entered site number.



● Using the Selector (Portable only) or the PF key

Select one of the following operations:

- Select the site to be locked by using the **Site Up** key or **Site Down** key.
- Select the site to be locked by turning the **Selector** (Site Up/Down).
- Select the site to be locked by turning the **Selector** (Site Select).

The “” icon appears, and the site number of the selected site and the site name appear on the display for 2 sec. In 2 sec, Site Lock is enabled.



Note

- The status of the Site Lock, either enabled or disabled, is retained in the transceiver. The site number is also retained while the Site Lock is enabled.
- The Site Lock will not be disabled even if the transceiver cannot receive signals from a control channel while the Site Lock is enabled.
- If no Site Name is configured, the transceiver cannot enter Site Select Mode. If no Site Name is configured, the site cannot be selected using the **Site Up** key or **Site Down** key or **Selector** (Site Up/Down). However, rotating the **Selector** (Site Select) selects a Site Number from 1 to 16 even if no Site Name is configured.
- If the Site Lock is enabled, **Multi-System Background Hunt** does not function. (Refer to [Executing the Background Hunt in Different Systems \(Multi-System Background Hunt\)](#).)

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Assigning functions to the **Selector** ( [See](#) Transceiver Settings > Key Assignment > Top/Side)
- Configuring site information ( [See](#) Transceiver Settings > NXDN Network > Site Information)

2.20 Adding a Group ID by Remote Control (Remote Group Add)

Remote Group Add is the function to make a transceiver receive a message requesting to change the remote group and add a Group ID by sending the request message for the remote group change from a transceiver connected to a PC.

This function allows the system to establish communications by making target transceivers temporarily participate in a group or temporarily configuring a new group by gathering mobile stations in different parties.

To run this function, the following need to be configured using KPG-D1/ D1N.

- **Remote Regroup**

To enable Remote Regrouping function, enable **Remote Regroup** per NXDN Trunking system.

- **Remote Regroup Zone-Channel**

One channel per NXDN Trunking system can be assigned for Remote Regrouping channel. If **Zone-channel Format** is "Channel Table", this channel is configured by selecting "Regroup" for the Group ID of the channel. If **Zone-channel Format** is "Personality", this channel is configured by selecting "Regroup" for Group ID of the Personality and assigning the Personality to **Remote Regroup Zone-Channel**.

Configuration using KPG-D1/ D1N

- Configuring **Remote Regroup** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking)
- Configuring **Group ID (Personality)** ( [See](#) Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Group ID (Channel Edit)** ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking)
- Configuring **Remote Regroup Zone-Channel** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking)

Sending the Message Requesting to Change the Remote Group or Reset the Change of the Remote Group

The transceiver connected to a PC sends the message requesting to change the remote group or reset the change of the remote group.

Operating the transceiver

- **Sending the message requesting to change the remote group**

Send the command requesting to change the remote group to the transceiver from the PC.

The transceiver sends the message requesting to change the remote group to the specified transceiver using an Individual Call.

- **Sending the message requesting to reset the change of the remote group**

Send the command requesting to reset the change of the remote group to the transceiver from the PC.

The transceiver sends the message requesting to reset the change of the remote group to the specified transceiver using an Individual Call.

Note

- To send the message requesting to change the remote group or reset the change of the remote group, "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 message requesting to change the remote group or reset the change of the remote group can only be sent using an Individual Call.

Receiving the Message Requesting to Change the Remote Group or Reset the Change of the Remote Group

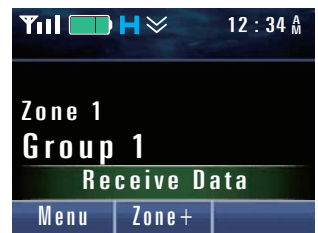
A transceiver that received a message requesting to change the remote group will move to Remote Regroup Zone-Channel configured in the system of a channel received and run with the Group ID specified by the message (hereinafter, this Group ID is referred to as Regroup ID).

Operating the transceiver

● Receiving the message requesting to change the remote group

1 The transceiver starts receiving the message requesting to change the remote group.

"Receive Data" appears.



2 Receive the message requesting to change the remote group.

"Complete" appears.

The transceiver runs with the Regroup ID specified by the message requesting to change the remote group.

If the change of the Group ID is permitted by the information in the received message, transmission and reception are available with Regroup ID. The transceiver can also transmit and receive by selecting a Group ID other than the Regroup ID by a user operating transceiver keys.

If the change of the Group ID is prohibited by the information in the received message, transmission and reception are available only with Regroup ID.

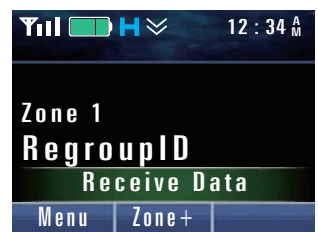
In this case, another zone or channel cannot be selected by a user operating transceiver keys.



● Receiving the message requesting to reset the change of the remote group

1 The transceiver starts receiving the message requesting to reset the change of the remote group.

"Receive Data" appears.



2

Receive the message requesting to reset the change of the remote group.

"Complete" appears.

The transceiver returns to the previous channel and runs with the Group ID configured for the channel.



 Note

- Multiple Regroup IDs cannot be added. Therefore, the Regroup ID will be overwritten if the transceiver to which the Regroup ID has already been added receives the message requesting to change the remote group.
- The Regroup ID will be cleared if the configuration data is written on the transceiver by using KPG-D1/ D1N.

Transceiver's Behavior when Using the Regroup ID

The following are the transceiver's behavior when using the added Regroup ID.

- The added Regroup ID will be retained even after the transceiver is turned OFF.
- The added Regroup ID can be used even if the transceiver migrates to another site.
- A Key-entry Error Tone (1 beep) sounds from the transceiver and the transceiver does not respond at all even by a user pressing the **Scan Delete/Add** key while the Regroup ID is selected.
- During a scan, if the transceiver receives a message requesting to change the remote group where the change of Group ID is enabled, the scan will continue. During the scan, if the transceiver receives a message requesting to change the remote group where changes of the Group ID is not allowed, the scan will pause. The transceiver transmits using the Regroup ID when the transceiver transmits in the above conditions. Also, the transceiver resumes the scan when the transceiver receives the message requesting to reset the change of the remote group in this state.
- If the transceiver receives the message requesting to change the remote group where the change of the Group ID is enabled, the conditions to resume a scan are satisfied and the transceiver will resume the scan, while the scan is temporarily paused if the conditions to resume the scan are not satisfied because of the lack of channels to scan. If the transceiver receives the message requesting to reset the change of the remote group in this state, the conditions to resume the scan are not satisfied again and the scan will pause.
- In Emergency mode, the transceiver cannot send and receive the message requesting to change the remote group or to reset the change of the remote group.

2.21 Transceiver Behavior When the System Fails to Provide the Trunking Control Service (Failsoft)

Failsoft is a function that provides the minimal communication capability for the transceivers in the site coverage area in the case that the system fails to provide the Trunking control service among the sites, for instance, in a case when a cable connecting repeaters is cut or an error occurs in communication between controllers.

If the system fails to provide the trunking control service for the site, the system migrates the channel to the Failsoft channel and then the system will send a broadcast message to the transceivers indicating that the system is in Failsoft state. When a transceiver searches using the hunt sequence for a channel configured as a Failsoft Channel and then receives the broadcast message from the system indicating the Failsoft state of the system, the transceiver will enter Failsoft Mode.

On the Failsoft Channel, signals are simply repeated within the site and only Group voice communications (Conference Group Call, Broadcast Group Call, All Group Call) can be done for the selected Group ID. In Failsoft Mode, the transceiver searches for a control channel in adjacent sites at intervals configured in **Search Interval Time**, and then acquires a channel operating as a control channel, the transceiver will exit Failsoft Mode.

Transceiver behavior

The transceiver receives the broadcast message from the system indicating the Failsoft state of the system.

The transceiver enters Failsoft Mode. "Failsoft" appears on the display.



Note

- While the system is in the Failsoft state, functions on a control channel, such as location registration, will not be available.
- If the transceiver acquires a control channel in Failsoft Mode, the transceiver exits Failsoft Mode and then starts location registration. The transceiver also starts location registration if the transceiver acquires a control channel in the site where the location of the transceiver has already been registered or the transceiver acquires a control channel in another site.
- If the transceiver is unable to acquire a Failsoft Channel, the transceiver will not enter Failsoft Mode.
- The transceiver turns off current scan if the transceiver enters Failsoft Mode during the scan. The scan remains off even if Failsoft Mode completed.

Configuration using KPG-D1/ D1N

- Configuring **Failsoft Channel** (See Transceiver Settings > Personal > Personal Features > NXDN Trunking > Failsoft Channel)
- Configuring **Search Interval Time** (See Transceiver Settings > NXDN Network > Hunt Options)

2.22 Transceiver Behavior in the Case that the Site Fails to Connect to the Network (Network Failure)

Network Failure is the function to provide a communication capability as a single site within a site if the site fails to connect to the network in a multi-site system due to a system failure. Use of this function allows the transceiver to communicate within the site even if the system is in the state of Network Failure.

Upon the receipt of the broadcast message notifying that the system is in the state of Network Failure, the transceiver enters Network Failure Mode.

Network Failure Indicator is enabled, "Network Fail" appears on the display of the transceiver while the transceiver is operated in Network Failure Mode.



Also, if **Network Failure Tone** is enabled, a Network Failure Tone A (2 beeps) sounds at 5-sec intervals from the transceiver while the transceiver is operated in Network Failure Mode, and a Network Failure Tone B (1 beep) sounds from the transceiver when the transceiver exits Network Failure Mode.

Note

- The transceiver cannot transmit/receive within a roaming site while the system is in a state of Network Failure.
- Even if the transceiver is operating in Network Failure Mode, the Background Hunt will operate as normal.
- Pressing any key on the transceiver stops the Network Failure Tone A (2 beeps) from sounding.

Configuration using KPG-D1/ D1N

- Configuring **Network Failure Indicator** (See Transceiver Settings > NXDN Network > Hunt Options)
- Configuring **Network Failure Tone** (See Transceiver Settings > NXDN Network > Hunt Options)

2.23 Sending GPS Data

Refer to “[Sending GPS Data](#)” in 1 NXDN CONVENTIONAL SYSTEM.

This section describes the function for GPS data transmission available only in an NXDN Trunking system.

Sending GPS Data on a Channel in an NXDN Conventional System (GPS Data Zone-Channel)

The **GPS Data Zone-Channel** is the zone and channel in a Conventional Group that is used for sending GPS data in an NXDN Trunking system. To use a **GPS Data Zone-Channel**, “Conventional Channel” needs to be configured for the **GPS Report Channel Type**.

If “Conventional Channel” has been configured in **GPS Report Channel Type**, the transceiver automatically migrates to the GPS Data Zone-Channel corresponding to the current site so as to send the GPS data at the time of sending GPS data.

After sending the GPS data, the transceiver restores the previous channel in an NXDN Trunking system.

Also, only a channel in an NXDN Conventional system can be configured for the **GPS Data Zone-Channel**.

GPS Report Channel Type

The **GPS Report Channel Type** is the channel type in an NXDN Trunking system that is used by the transceiver to automatically send GPS data.

The transceiver can use a control channel, traffic channel or channel in an NXDN Conventional system to automatically send GPS data.

GPS Report Channel Type 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 depending on the configuration for the **GPS Report Channel Type**.

Table 2-16 Configuration for GPS Report Channel Type

Configuration	Description
Control Channel	The GPS data is automatically sent on a control channel in the current site including polling.
Traffic Channel	The GPS data is automatically sent on a traffic channel in the current site as a Long Data Message including polling.
Conventional Channel	The GPS data including polling is automatically sent on the zone and channel configured for GPS Data Zone-Channel . The zone and channel corresponding to the current site number are applied. The transceiver automatically migrates to a GPS Data Zone-Channel corresponding to the current site to send the GPS data at the time of sending GPS data.

Note

- In a system that supports Indoor Location, the configuration value is shared with BLE Data Zone-Channel. GPS Data Zone-Channel and BLE Data Zone-Channel function with the same configuration. (Refer to [BLE Data Zone-Channel/ Data System-Personality \(Indoor Location\)](#).)

Configuration using KPG-D1/ D1N

- Configuring **GPS Data Zone-Channel** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS Data Zone-Channel)
- Configuring **GPS Report Channel Type** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

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 if the timing of automatic GPS data transmission including polling while the transceiver is receiving Group Call (Transmission Trunked).

If this function is enabled, the transmission of GPS data is started at the timing of automatic GPS data transmission including polling while the transceiver is receiving Group Call (Transmission Trunked). However, if the Group ID of the Group Call which is being received and the target ID (Base Station) of the GPS data are the same, the receipt of the Group Call continues and the transceiver does not send the GPS data, even if the timing of automatic GPS data transmission arrives.

This function is used to avoid restricting automatic GPS data transmission by the frequent receipt of Group Calls (Transmission Trunked).

Note

- This function can be used only if "Transmission Trunked" is configured for **Trunking Type**. If "Message Trunked (Enhanced)" is configured for **Trunking Type**, even if the timing of automatic GPS data transmission including polling comes while receiving a Group Call (Message Trunked (Enhanced)), the transmission of GPS data will not start.
- GPS data transmission will not start even if the timing of automatic GPS data transmission including polling comes when a control channel is used as a traffic channel in a system where a channel is used as both a control channel and traffic channel.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report Priority (Over Group Call). GPS Report Priority (Over Group Call) and BLE Report Priority (Over Group Call) function with the same configuration. (Refer to [Sending BLE Data Preferentially While Receiving a Group Call \(BLE Report Priority \(Over Group Call\) \(Indoor Location\)\)](#).)

Configuration using KPG-D1/ D1N

Configuring **GPS Report Priority (Over Group Call)** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS)

Selecting the Transmission Method of GPS Data (GPS Report Channel Type)

GPS Report Channel Type is the function for determining the transmission method of when GPS data is automatically transmitted.

This function is used such as to reduce the traffic of GPS data transmission on the control channel.

GPS Report Channel Type 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 depending on the configuration for the **GPS Report Channel Type**.

Table 2-17 GPS Report Channel Type

Configuration	Description
Control Channel	The transceiver sends GPS data on the control channel of the site that is currently in operation.
Traffic Channel	The transceiver sends GPS data as a Long Data Message on the traffic channel of the site that is currently in operation.
Conventional Channel	GPS data is transmitted on the Zone-Channel or System-Personality of the NXDN Conventional system that is configured in GPS Data Zone-Channel or GPS Data System-Personality . The transceiver automatically migrates to the GPS Data Zone-Channel or GPS Data System-Personality configured for the current site and transmits at the timing of GPS data transmission. At this time, registration information is not deleted. After sending the GPS data, the transceiver restores to the previous channel. At this time, registration is not executed.

Note

- During audio transmission, the transceiver multiplexes GPS data on the audio and sends the data, except when “Conventional Channel” is configured in **GPS Report Channel Type**.
- This function is not applicable to GPS data sent by using the **Send the GPS Data** key, the **Send the Location Data** key, and the **GPS Combination** function.
- If the transceiver receives a Polling request and sends GPS data, the transceiver sends GPS data without applying the configuration in **GPS Report Channel Type** only the first time. If the transceiver is to subsequently continue GPS data transmission, **GPS Report Channel Type** is enabled for automatic transmission, and the transceiver sends GPS data according to the configuration in **GPS Report Channel Type**.
- In a system that supports Indoor Location, the configuration value is shared with BLE Report Channel Type. GPS Report Channel Type and BLE Report Channel Type function with the same configuration. (Refer to [Selecting the Transmission Method of BLE Data \(BLE Report Channel Type \(Indoor Location\)\)](#).)

Configuration using KPG-D1/ D1N

- Configuring **GPS Report Channel Type** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Standard GPS Report Mode)
- Configuring **GPS Data Zone-Channel** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS Data Zone-Channel)
- Configuring **GPS Data System-Personality** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS Data System-Personality)

Sending GPS Data by Using a GPS Data Transmission Channel (GPS Report Channel)

GPS Report Channel is the function that allows the transceiver to send GPS data by using a GPS data transmission channel.

By using **GPS Report Channel**, the transceiver can send GPS data without using the control channel at the timing specified in a NEXEDGE system. In this case, the transceiver sends GPS data by using the slot assigned by the GPS Report Channel.

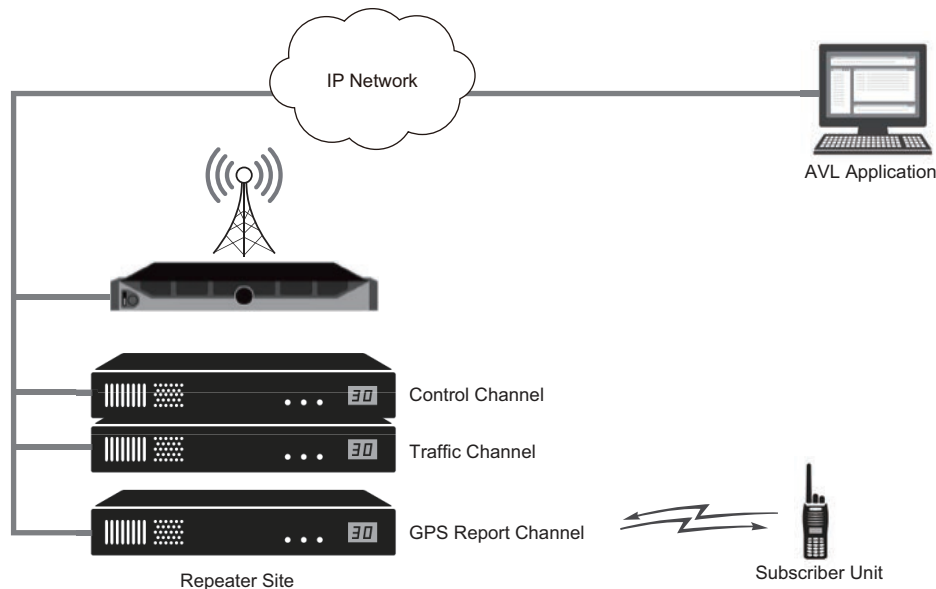


Figure 2-10 Advanced GPS Report Mode

If the transceiver sends GPS data by using the GPS Report Channel, the traffic to the control channel can be reduced.

Also, a transmission interval of the transceiver GPS data can be configured for each UID in the NEXEDGE system. The transceiver used for a purpose of high update rates of GPS data (such as police or emergency services) can be configured and operated with a short GPS data transmission interval and the number of transceivers that can be added can be expanded.

Refer to NEXEDGE 2nd Generation Function Reference "ABOUT GPS" for details.

Note

- The transceiver behavior of when the transceiver sends GPS data by using the channel for GPS data transmission depends on the system configuration. However, using KPG-D1/ D1N, the warning display (**Advanced GPS Report Error Indicator**) and warning tone (**Advanced GPS Report Error Tone**) of when the channel for GPS data transmission cannot be used because of a problem in the system can be configured for the transceiver.
- The GPS data is sent to the ID configured in **Base ID** or **GPS Base ID**.
- If the transceiver is operated in a system using the channel for GPS data transmission, the transceiver does not use the following functions even if the functions are configured:
 - GPS Report Mode
 - Number of Times
 - GPS Time Mark
 - GPS Message Type
 - GPS Report Channel Type
 - GPS Report Interval Time
- These functions are disabled while the transceiver is in Emergency Mode.

Advanced GPS Report Error Indicator

Advanced GPS Report Error Indicator is the function to display a warning message on the display when the channel for GPS data transmission cannot be used because of a problem in the system, even if **GPS Report Channel** is enabled.

If this function is enabled, "GPS Report Err" appears on the display of the transceiver when the channel for GPS data transmission cannot be used.

Advanced GPS Report Error Tone

Advanced GPS Report Error Tone is the function to emit a warning tone from the transceiver when the channel for GPS data transmission cannot be used because of a problem in the system, even if **GPS Report Channel** is enabled.

If this function is enabled, a warning tone sounds from the transceiver at 30 sec intervals when the channel for GPS data transmission cannot be used.

Configuration using KPG-D1/ D1N

- Configuring **GPS Report Channel** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS > Advanced GPS Report Mode)
- Configuring **Advanced GPS Report Error Indicator** to be enabled or disabled ( **See** Transceiver Settings > NXDN Network > Hunt Options)
- Configuring **Advanced GPS Report Error Tone** to be enabled or disabled ( **See** Transceiver Settings > NXDN Network > Hunt Options)

2.24 Receiving GPS Data

Refer to "**Receiving GPS Data**" in 1 NXDN CONVENTIONAL SYSTEM.

2.25 Remote Operation by Radio Communication (Remote Control)

Refer to "**Remote Operation by Radio Communication (Remote Control)**" in 1 NXDN CONVENTIONAL SYSTEM.

2.26 Communicating Using Multiple Systems (Multi-System Roaming)

Multi-System Roaming is the function that enables the transceiver to roam into a system other than the system to which the transceiver belongs in a multi system where multiple systems of different System Codes are connected by using the Roaming Gateway.

If this function is used, the communication area expands because the transceiver can communicate using multiple systems.

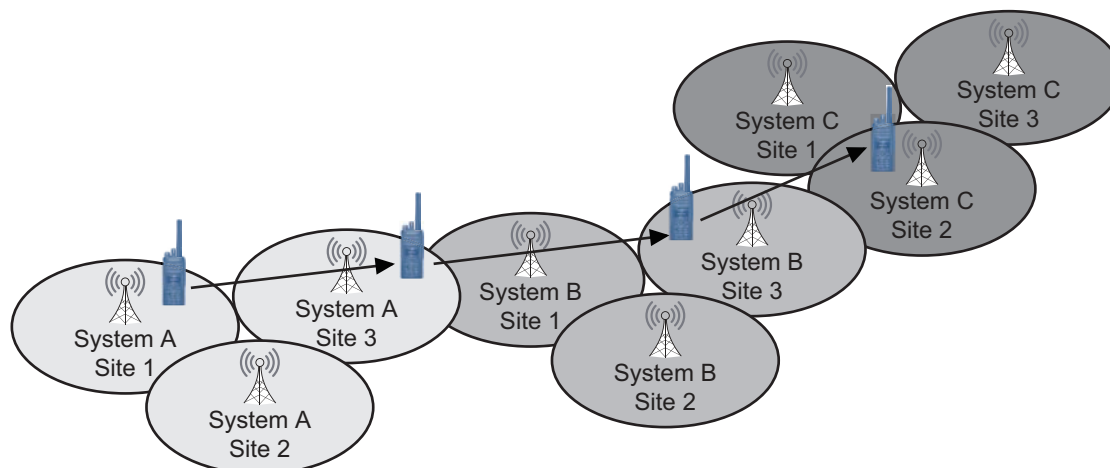


Figure 2-11 Multi-System Roaming

The transceivers that belong to the same system (hereinafter referred to as “Home System”) can communicate with each other. For a system other than the system to which the transceiver belongs (hereinafter referred to as “Roaming System”), the transceiver is basically operated in the Home System configuration just by using the system temporarily. However, the number of network configurations and the number of System Keys each need to be the same as the number of systems to be roamed to enter a Roaming System.

The Home System has a single NXDN Trunking system configuration, which includes the network and System Key configurations of the Home System and the network and System Key configurations of a Roaming System. The Home System can have a maximum of 23 Roaming Systems.

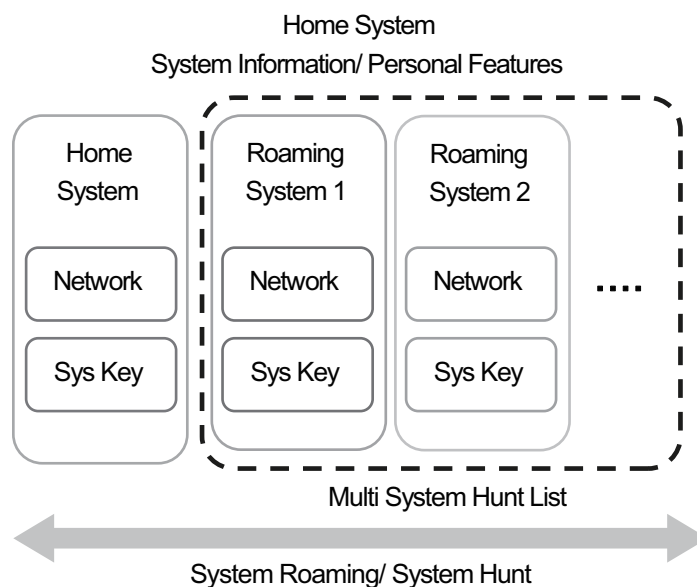


Figure 2-12 System Roaming/ System Hunt

Note

- In a Roaming System, Failsoft and the GPS data transmission functions and the location information transmission functions other than the following functions do not function:
 - GPS data transmission in Advanced GPS Report Mode
 - GPS data transmission by Send the GPS Data
 - Location information transmission by Send the Location Data
 - Location information transmission by the receipt of a GPS Data Single Polling Request
- In a Roaming System, all of the Personal Features of the system configured as a Roaming System and the following configurations of **NXDN Network** and **System Information** are not used. The configurations of the Home System are used for these configurations.
 - Last Control Channel
 - ID Range
 - Unit ID
 - Global ID
 - Over-the-Air Alias
 - Unit ID Name (Own)
 - Global ID Name

Multi-System Hunt

Multi-System Hunt is the function to roam among the systems configured in **Multi-System Hunt List**.

If this function is enabled, the Multi-System Hunt is started according to the configuration of **Multi-System Hunt Trigger**.

Table 2-18 Multi-System Hunt Trigger

Configuration	Description
After Standard Hunt	If the transceiver becomes outside the communication area and the hunt sequence ends in the current system, the Multi-System Hunt is started in the order of systems configured in Multi-System Hunt List .
Time	If the transceiver becomes outside the communication area and the length of time configured in Time elapses, the Multi-System Hunt is started in the order of systems configured in Multi-System Hunt List. This configuration is used to prevent the transceiver from being migrated to a different system erroneously even if the transceiver temporarily enters an area with a weak signal and becomes outside the communication area. Note • The length of time configured in Time counts down from when the transceiver becomes outside the communication area until the Multi-System Hunt is started.

Configuration using KPG-D1/ D1N

- Configuring **Multi-System Hunt** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming)
- Configuring **Multi-System Hunt Trigger** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming)
- Configuring **Time** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming)

Multi-System Hunt List

Multi-System Hunt List is the list in which systems targeted for roaming are configured.

If the transceiver is in the communication area, the systems configured in **Multi-System Hunt List** are the targets for roaming by the **Multi-System Background Hunt** function. (Refer to [Executing the Background Hunt in Different Systems \(Multi-System Background Hunt\)](#).)

If the transceiver is outside the communication area, the Multi-System Hunt is executed by switching systems in the order configured in **Multi-System Hunt List**.

In a multi-system, the systems are automatically switched. In the switched system, the same hunt sequence as the hunt sequence of a single system is executed.

Configuration using KPG-D1/ D1N

Configuring **Multi-System Hunt List** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming)

Transceiver Behavior When Executing the Multi-System Hunt

Transceiver behavior immediately after turning the transceiver ON

If the transceiver is turned ON, the transceiver starts the Multi-System Hunt on the control channel of the system last used when the transceiver was last turned OFF.

If the transceiver executes the Multi-System Hunt and all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

The transceiver behavior varies as follows depending on the configuration in **Last Control Channel**. (Refer to [Retaining the Information of the Control Channel Used When the Transceiver Is Turned OFF \(Last Control Channel\)](#).)

- **If Last Control Channel is enabled:**

If the system last used when the transceiver was last turned OFF is the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

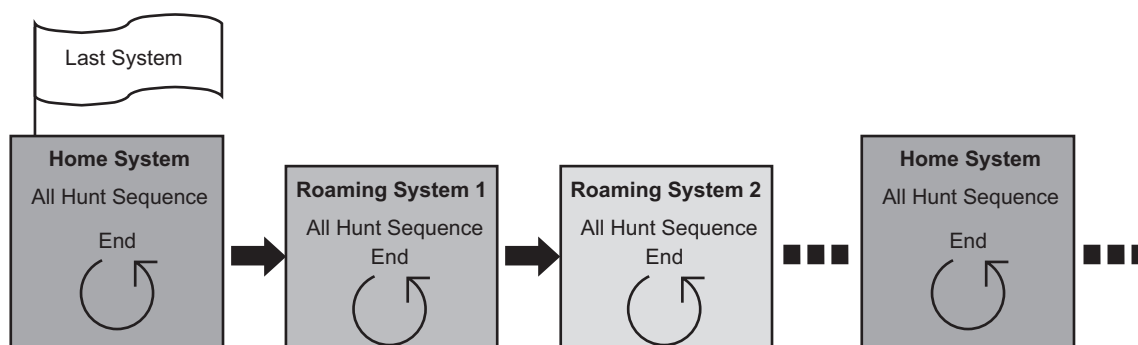


Figure 2-13 Multi-System Hunt 1

If the system last used when the transceiver was last turned OFF is a system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of the system. When all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

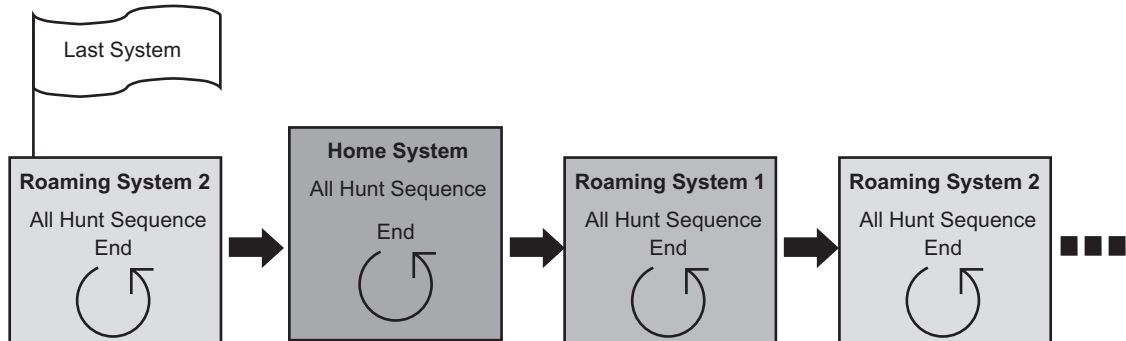


Figure 2-14 Multi-System Hunt 2

- **If Last Control Channel is disabled:**

The transceiver always starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

Transceiver behavior when the transceiver becomes outside the communication area

If the transceiver becomes outside the communication area, the transceiver starts the Multi-System Hunt in the current system.

If the transceiver executes the Multi-System Hunt and all hunt sequences end without acquiring a control channel, the transceiver continues the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

The transceiver behavior varies as below depending on the configuration in **Multi-System Hunt Trigger**: (Refer to **Multi-System Hunt**.)

- **If “After Standard Hunt” is configured in Multi-System Hunt Trigger:**

If the transceiver becomes outside the communication area in the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

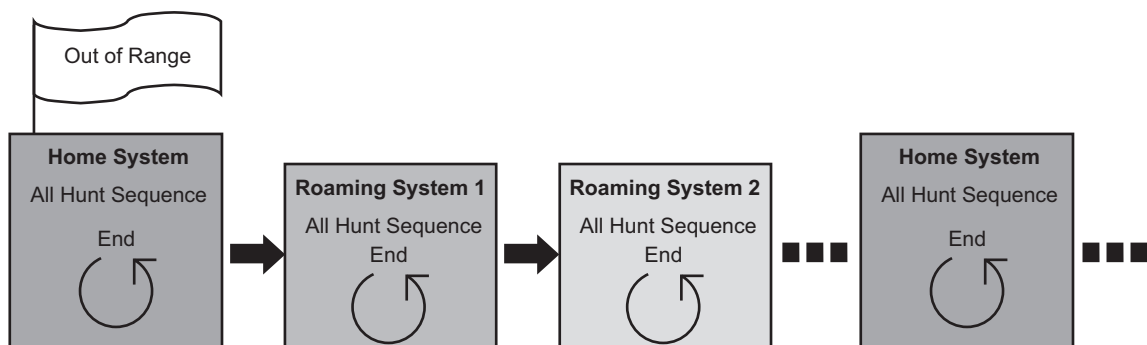


Figure 2-15 Multi-System Hunt 3

If the transceiver becomes outside the communication area in any system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of this system. When all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

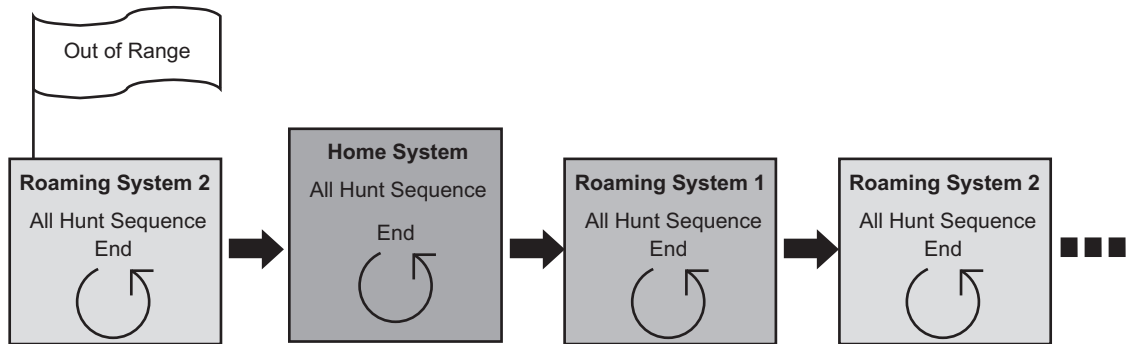


Figure 2-16 Multi-System Hunt 4

- If “Time” is configured in Multi-System Hunt Trigger:

If the transceiver becomes outside the communication area in the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When the length of time configured in **Time** elapses, the transceiver starts the Multi-System Hunt by forcibly switching systems in the order configured in **Multi-System Hunt List**.

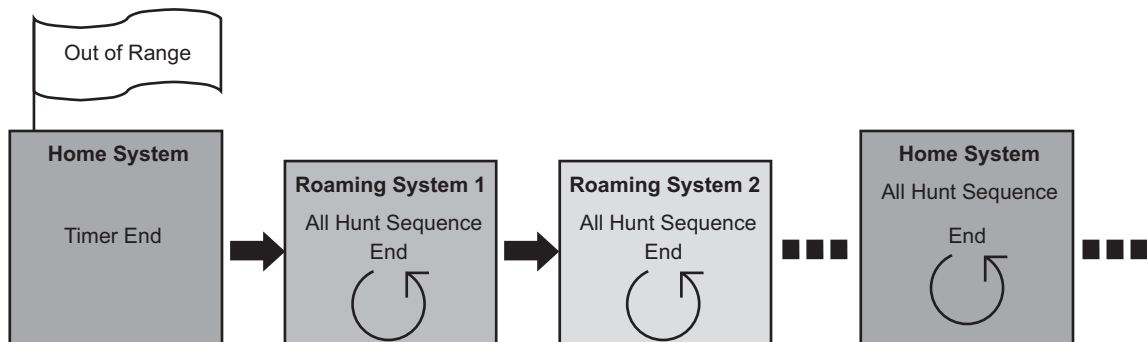


Figure 2-17 Multi-System Hunt 5

If the transceiver becomes outside the communication area in any system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of this system. If the length of time configured in **Time** elapses, the transceiver forcibly migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

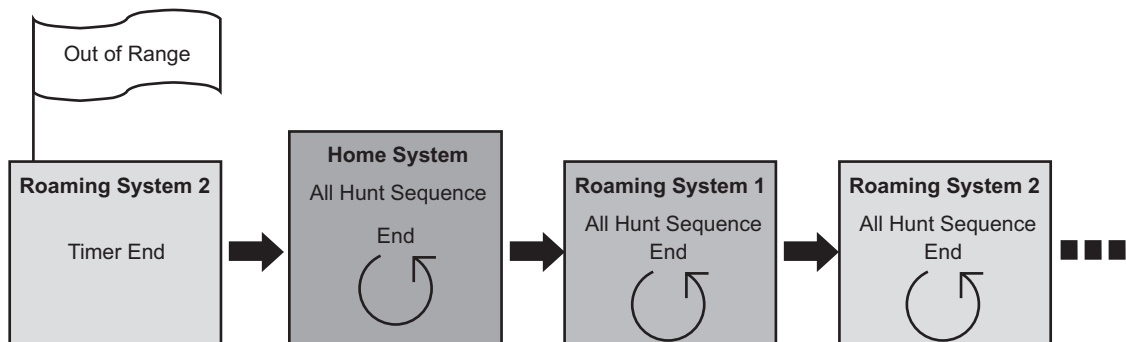


Figure 2-18 Multi-System Hunt 6

Transceiver behavior when Forced Search is executed

If Forced Search is executed in an NXDN Trunking system with **Multi-System Hunt** enabled, the Multi-System Hunt is executed for each system configured in **Multi-System Hunt List**. (Refer to [Starting the Control Channel Hunt Manually \(Forced Search\)](#).)

When all hunt sequences end without acquiring a control channel in a system, the transceiver starts the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**. If all hunt sequences end without acquiring a control channel in the Roaming System registered last in **Multi-System Hunt List**, the transceiver returns to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver repeats this behavior until the transceiver acquires a control channel.

If Forced Search is executed in the Home System, the transceiver starts the Multi-System Hunt on the control channel of the Home System. When all hunt sequences end without acquiring a control channel, the transceiver starts the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

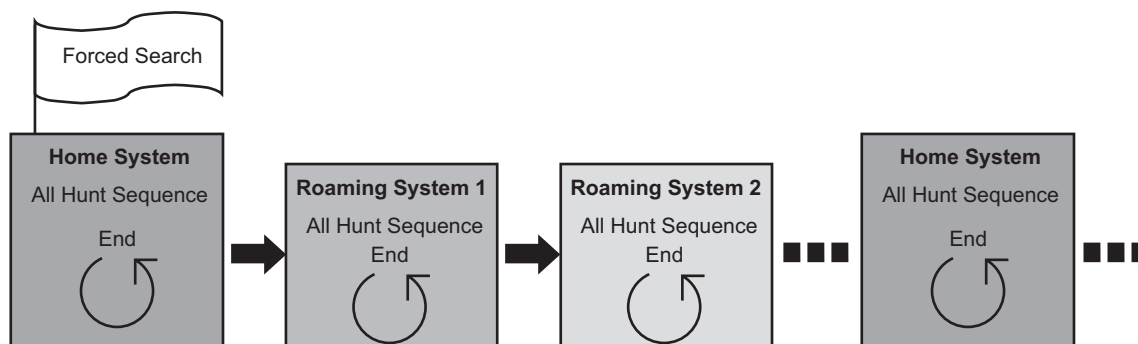


Figure 2-19 Multi-System Hunt 7

If the transceiver becomes outside the communication area in any system other than the Home System, the transceiver starts the Multi-System Hunt on the control channel of this system. When all hunt sequences end without acquiring a control channel, the transceiver migrates to the Home System and starts the Multi-System Hunt. Hereafter, the transceiver continues the Multi-System Hunt by switching systems in the order configured in **Multi-System Hunt List**.

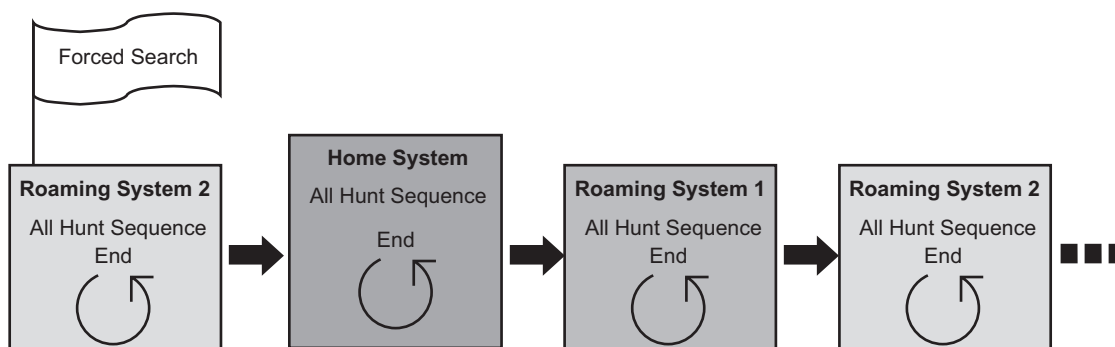


Figure 2-20 Multi-System Hunt 8

Using the System Auto Select Function (System Auto Select)

System Auto Select is the function to make the system in operation the search target.

If this function is enabled and the transceiver becomes outside the communication area, after all Multi-System Hunts of all systems configured in **Multi-System Hunt List** are executed, the transceiver switches to a system in operation that uses the **System Auto Select** function and starts **System Auto Select**. In **System Auto Select**, the search target system preconfigured in the transceiver is searched sequentially, and the transceiver automatically switches to an available system when the system is found. If **System Auto Select** is configured in the Home System, the **System Auto Select** behavior starts after the System Selection Wait Time elapses. (Refer to [Automatically Switching the System \(System Auto Select\)](#).)

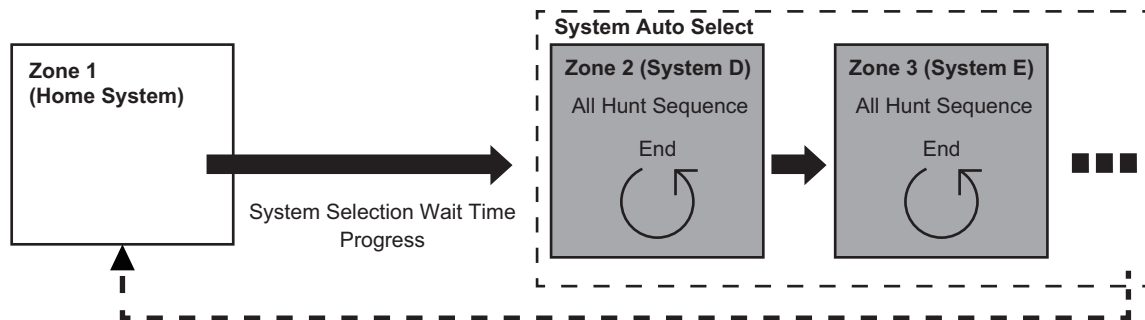


Figure 2-21 System Auto Select

Executing the Background Hunt in Different Systems (Multi-System Background Hunt)

Multi-System Background Hunt is the function to execute Background Hunt among the systems configured in **Multi-System Hunt List**.

Using this function, the transceiver can automatically acquire a control channel providing better conditions than the currently acquired control channel by expanding the range to other systems as well as the same system, while the transceiver is in the standby state after acquiring a control channel. The target system of **Multi-System Background Hunt** is a system configured in **Multi-System Hunt List**. To use this function, the target system of **Multi-System Background Hunt** needs to be specified in the channel information of an adjacent site (**Adjacent Site Information**) in the system.

Also, for **Multi-System Background Hunt**, the Home System can have the most preferentially searched channel (**Preferential Hunt Control Channel**). (Refer to [Control Channel Hunt \(Control Channel Hunt\)](#).)

Note

- In **Multi-System Background Hunt**, the following configurations of each system are commonly used:
 - Search Interval Time (Refer to [Control Channel Hunt \(Control Channel Hunt\)](#).)
 - System Search Policy (Refer to [System Search Policy](#).)
- By using **Direct Frequency Assignment** (DFA), the transceiver can roam by **Multi-System Background Hunt** even for a newly added system. The transceiver can roam even if a frequency is not configured in the transceiver to operate in the newly added system. However, the newly added system needs to be registered as the Roaming System in **Multi-System Hunt List** beforehand. (Refer to [Using a Frequency Added to a System without Changing the Transceiver Configuration \(Direct Frequency Assignment\)](#).)

Signal strength level when Multi-System Background Hunt is initiated

The signal strength levels when **Multi-System Background Hunt** is initiated on the control channel of the Home System or Roaming System can each be configured.

Table 2-19 Level Margin

Configuration	Description
Roaming System Level Margin	This is the signal strength level when Multi-System Background Hunt is initiated on the control channel of the Roaming System. If the signal strength level of the control channel to be newly acquired of the Roaming System is greater than the signal strength level of the currently acquired control channel of the Home System or Roaming System by the level equal to or higher than the level configured in Roaming System Level Margin, Multi-System Background Hunt is initiated on the control channel to be newly acquired of the Roaming System. To remain in the Home System as much as possible, configure this value as a large value.
Home System Level Margin	This is the signal strength level when Multi-System Background Hunt is initiated on the control channel of the Home System. If the signal strength level of the control channel to be newly acquired of the Home System is greater than the signal strength level of the currently acquired control channel of the Roaming System by the level equal to or higher than the level configured in Home System Level Margin, Multi-System Background Hunt is initiated on the control channel to be newly acquired of the Home System. To return to the Home System as much as possible, configure this value as a small value.

Conditions for Multi-System Background Hunt to function

The conditions for **Multi-System Background Hunt** to function are as follows:

Table 2-20 Conditions for Multi-System Background Hunt to Function

Channel Information of the Adjacent Site (Candidate as the Control Channel to Be Acquired)		Currently Acquired Control Channel		
		Home System		Roaming System
		Priority 1/ Priority 2	Other Than Priority 1/ Priority 2	Other Than Priority 1/ Priority 2
Home System	Priority 1/ Priority 2	Multi-System Background Hunt does not function because the system is the same.	Multi-System Background Hunt does not function because the system is the same.	Because the control channel to be newly acquired has a higher priority level than the currently acquired control channel, the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel, regardless of the configuration in Home System Level Margin .
	Other Than Priority 1/ Priority 2	Multi-System Background Hunt does not function because the system is the same.	Multi-System Background Hunt does not function because the system is the same.	If the signal strength level of the control channel to be newly acquired is greater than the signal strength level of the currently acquired control channel by the value equal to or greater than the value configured in Home System Level Margin , the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel.
Roaming System	Other Than Priority 1/ Priority 2	The Roaming System cannot have the most preferentially searched channel. (Preferential Hunt Control Channel). Also, Multi-System Background Hunt does not function because a control channel with higher priority than the currently acquired control channel does not exist.	If the signal strength level of the control channel to be newly acquired is greater than the signal strength level of the currently acquired control channel by the value equal to or greater than the value configured in Roaming System Level Margin , the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel.	If the system is the same: Multi-System Background Hunt does not function. If the system is different: If the signal strength level of the control channel to be newly acquired is greater than the signal strength level of the currently acquired control channel by the value equal to or greater than the value configured in Roaming System Level Margin , the transceiver migrates to the new control channel and enters the standby state after executing the acquisition of the control channel.

Note

- If the System Lock or Site Lock is enabled, **Multi-System Background Hunt** does not function. (Refer to [Locking the System to Be Used \(System Lock/ System Select\)](#).)
- Refer to “Out of Range Indicator” for the display and the configuration of the behavior when no available control channel is found after searching for a control channel.

Configuration using KPG-D1/ D1N

- Configuring **Multi-System Background Hunt** to be enabled or disabled ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming > Multi-System Background Hunt)
- Configuring **Roaming System Level Margin** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming > System Background Hunt Level Margin)
- Configuring **Home System Level Margin** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Trunking > General > Multi-System Roaming > System Background Hunt Level Margin)

2.27 Locking the System to Be Used (System Lock/ System Select)

System Lock is the function to lock the system to be used as the current system and prevent the transceiver from roaming to other systems by operating the transceiver keys in a system that uses Multi-System Roaming. If this function is enabled, the transceiver is locked in the current system and cannot roam.

If the transceiver enters Menu Mode by pressing the **System Lock** key or the **Menu** key and “System Lock” is selected, the System Lock is enabled for the selected system.

The System Lock can also be enabled by selecting a system in System Select Mode. Also, selecting a system by using the **Selector** or **PF** keys can enable the System Lock.

The following functions need to be assigned to the **Selector** and **PF** keys in order to select the system to enable the System Lock by using the **Selector** or **PF** keys:

Table 2-21 System Lock/ System Select

Key	Function	Reference
Selector *1	System Up/Down System Select	Common FUNC Available Functions for the Selector (Portable only)
PF key	System Up System Up (Continuous) System Down System Down (Continuous)	Common FUNC Available Functions for the PF Keys

*1 Portable only

Note

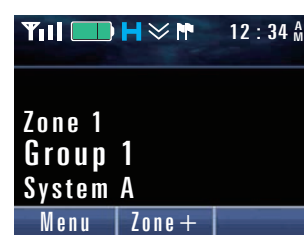
- This function functions only if a channel in an NXDN Trunking system with **Multi-System Hunt** enabled is selected. (Refer to [Multi-System Hunt](#).)

Operating the transceiver

● Enabling or disabling the System Lock

1 Press the **System Lock** key while the System Lock is disabled.

The “” icon appears and a Key Beep A (1 beep) sounds from the transceiver. The system name of the system in use appears on the display for 2 sec and the System Lock becomes enabled.



2 Press the **System Lock** key while the System Lock is enabled.

The “” icon disappears and the System Lock becomes disabled.

Note

- The transceiver operation is identical even if “System Lock” is selected after entering Menu Mode by pressing the **Menu** key. (Refer to Common FUNC Using Menu Mode.)

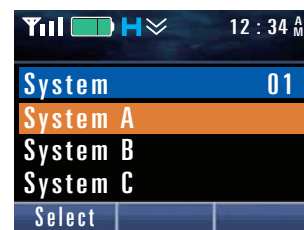
● Using System Select Mode

1 Press and hold the **System Lock** key.

A Key Beep A (1 beep) sounds from the transceiver and the transceiver enters System Select Mode. The system list is displayed.

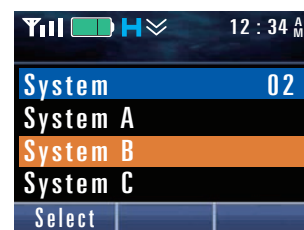
Note

- If “System Select” is selected after the transceiver enters Menu Mode by pressing the **Menu** key, the transceiver can also enter System Select Mode. (Refer to Common FUNC Using Menu Mode.)



2 Press the [▲] key or [▼] key to select a system for which the System Lock is to be enabled.

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

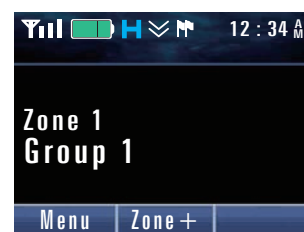


3 Press the **Menu** () key, or [*] key.

The “” icon appears and a Key Beep B (2 beeps) sounds from the transceiver. The System Lock becomes enabled for the selected system.

Note

- If the transceiver enters System Select Mode while outside the communication area, the System Lock cannot be enabled. Therefore, if the system is selected and confirmed, the transceiver enters Site Select Mode and the Site Lock can be enabled. Refer to “**Locking the Site to Be Used (Site Lock/ Site Select)**” for the operation of Site Select Mode.

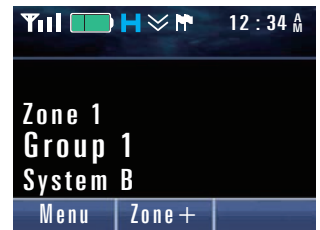


● Using the Selector (Portable only) or the PF key

Select one of the following operations:

- Press the **System Up** key or **System Down** key to select a system for which the System Lock is to be enabled.
- Turn the **Selector** (System Up/Down) to select a system for which the System Lock is to be enabled.
- Turn the **Selector** (System Select) to select a system for which the System Lock is to be enabled.

The "  " icon appears and a Key Beep A (1 beep) sounds from the transceiver.
The system name of the system in use appears on the display for 2 sec and the System Lock becomes enabled.



Note

- If the Site Lock is disabled, the transceiver can roam between sites in the system even if the System Lock is enabled for the system in use.
- Because the site is fixed even if the System Lock is disabled if the Site Lock is enabled, the transceiver becomes unable to roam to other systems.
- If the Site Lock is enabled while the "  " icon appears, the "  " icon disappears and the "  " icon appears. In this case, if the Site Lock is disabled, the "  " icon disappears and the "  " icon appears again.
- The status of the System Lock, either enabled or disabled, is retained in the transceiver.
- If the System Lock is enabled, **Background Hunt** does not function. (Refer to [Executing the Background Hunt in Different Systems \(Multi-System Background Hunt\)](#).)
- The System Lock does not become disabled even if the transceiver cannot receive signals from a control channel while the System Lock is enabled.

Configuration using KPG-D1/ D1N

- Assigning functions to the **PF** keys on the transceiver ( [See](#) Transceiver Settings > Key Assignment)
- Assigning functions to the **Selector** ( [See](#) Transceiver Settings > Key Assignment > Top/Side)

2.28 Indoor Location (NXDN Trunking)

Supported Models: Portable

Refer to “**Indoor Location (NXDN)**” in 1 NXDN CONVENTIONAL SYSTEM.

This section describes the function for BLE data transmission available only in an NXDN Trunking system.

Selecting the Transmission Method of BLE Data (BLE Report Channel Type (Indoor Location))

BLE Report Channel Type is the function to configure the transmission method of BLE data during operation on an NXDN Trunking system.

This is useful when you want to reduce the traffic of the control CH by BLE data communication.

BLE Report Channel Type 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 Channel Type. GPS Report Channel Type and BLE Report Channel Type function with the same configuration.

BLE Report Channel Type is the function enabled for Polling and BLE Auto Report.

The following behaviors occur according to the configuration in **BLE Report Channel Type**:

Table 2-22 BLE Report Channel Type

Configuration	Description
Control Channel	BLE data is sent on the control CH of the site currently in operation.
Traffic Channel	BLE data is sent as a Long Data Message on the traffic CH of the site currently in operation.
Conventional Channel	In BLE Data Zone-Channel/ Data System-Personality, BLE data is sent by using the Channel/ Personality of the Conventional Group configured for the site currently in operation.

When the transceiver sends BLE data, the transceiver automatically moves to the **BLE Data Zone-Channel/ Data System-Personality** configured for the current site and sends the data. Registration Clear is not performed at this time. Then, after sending the BLE data, the transceiver returns to the original channel. Registration is not performed at this time.

During audio transmission, the transceiver multiplexes BLE data on the audio and sends the data, except when “Conventional Channel” is configured in **BLE Report Channel Type**.

This function is disabled for the **Send the Location Data** key and BLE Combination.

When a Conventional Channel is configured, if **BLE Report on Data Zone-Channel/ Data System-Personality** is configured, BLE data is sent by using the Data Zone-Channel/ Data System-Personality configured for the system.

When a Polling request is received, BLE data is sent with this function disabled only at the timing of the first Polling request reception. If BLE data transmission continues thereafter, this function is enabled with the BLE data transmission automatically sent.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report Channel Type** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)
- Configuring **BLE Data Zone-Channel** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking)
- Configuring **BLE Data System-Personality** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking)

BLE Data Zone-Channel/ Data System-Personality (Indoor Location)

BLE Data Zone-Channel/ Data System-Personality is the channel in a Conventional Group that is used for sending BLE data in an NXDN Trunking system.

BLE 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.

A configuration value is shared with GPS Data Zone-Channel/ Data System-Personality. GPS Data Zone-Channel/ Data System-Personality and BLE Data Zone-Channel/ Data System-Personality function with the same configuration.

BLE Data Zone-Channel/ Data System-Personality can be configured only when “Conventional Channel” is configured in **BLE Report Channel Type**. Only a Conventional channel whose Channel Type is NXDN can be configured.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report Channel Type** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)
- Configuring **GPS/BLE Data Zone-Channel** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking)
- Configuring NXDN Trunking **GPS/BLE Data System-Personality** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking)

Sending BLE Data Preferentially While Receiving a Group Call (BLE Report Priority (Over Group Call) (Indoor Location))

BLE Report Priority (Over Group Call) is the function that interrupts reception and prioritizes transmission of BLE data when automatic BLE data transmission including transmission by receiving a Polling request is performed during a Group Call.

This function is used to avoid restricting automatic BLE data transmission by the frequent receipt of Group Calls.

BLE Report Priority (Over Group Call) 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 Priority (Over Group Call). GPS Report Priority (Over Group Call) and BLE Report Priority (Over Group Call) function with the same configuration.

Table 2-23 BLE Report Priority (Over Group Call)

Configuration	Description
Enabled	If BLE Report Priority (Over Group Call) is enabled, even if the transceiver is on a traffic CH due to Group Call reception, the transceiver returns to the control CH and starts sending BLE data at the timing of BLE automatic transmission.
Disabled	If BLE Report Priority (Over Group Call) is disabled, automatic BLE transmission is canceled while a Group Call is being received. If Trunking Type is Message Trunked (Enhanced), this function is disabled and automatic BLE transmission is canceled while a Group Call is being received.

For operation by a mixed control CH, this function is disabled and automatic BLE transmission is canceled while a Group Call is being received.

Configuration using KPG-D1/ D1N

- Configuring **GPS/BLE Report Priority (Over Group Call)** in NXDN Trunking system to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > GPS/BLE > Standard GPS/BLE Report Mode)
- Configuring **GPS/BLE Data Zone-Channel** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking)
- Configuring **GPS/BLE Data System-Personality** in NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking)

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**

If **Lone Worker** is used, 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 [Using the Activity Detection Function to Place the Transceiver in Emergency Mode](#).)

- **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

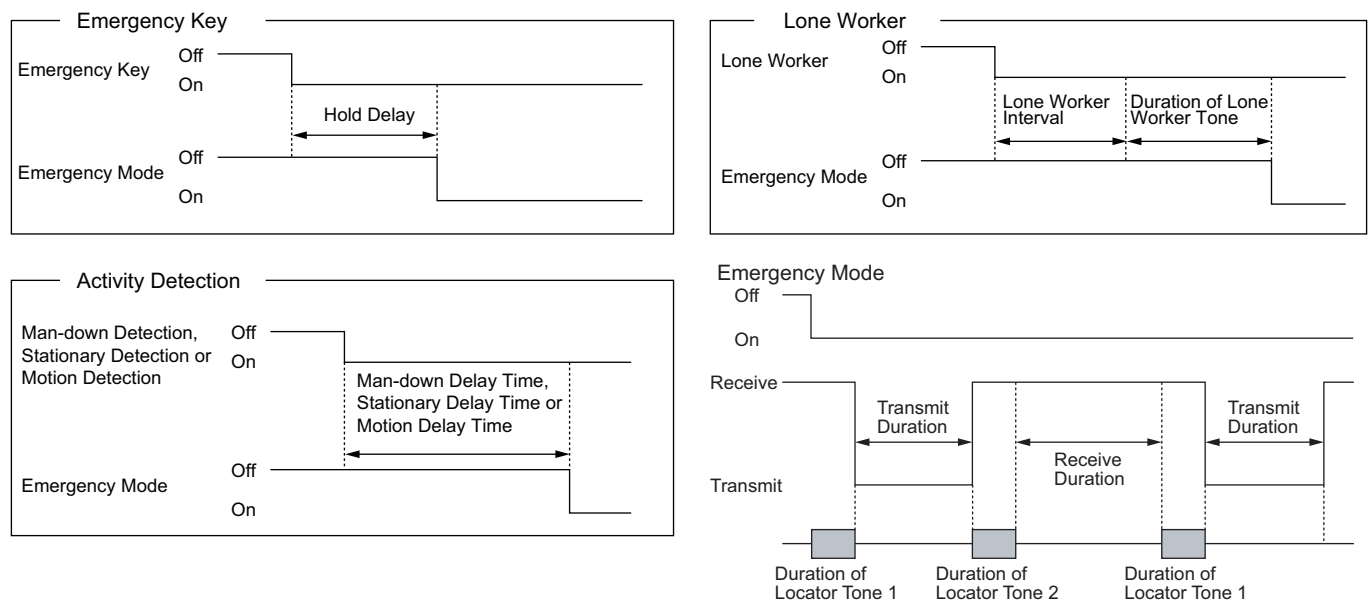


Figure 3-1 Emergency Mode

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**.)
- The transceiver does not decode the Stun Code and Optional Signaling in Emergency Mode.
- The transceiver exits Emergency Mode if receiving an Emergency Termination Status (NXDN: 226) while in 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
- When in Emergency Mode, the transceiver controls the mute in the same behavior as with "RAN" configured in Audio Control (NXDN) on a channel in an NXDN Conventional system.
- The Radio Check command 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)

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, an **Emergency ID** (NXDN Conventional) can be configured for each separate NXDN Conventional system. (Refer to [ID to Be Sent When Emergency Mode Is Activated](#).)

In an NXDN Trunking system, **Emergency ID** (NXDN Trunking) and **Emergency Status on Control Channel** can be configured for each system. (Refer to [ID to Be Sent When Emergency Mode Is Activated](#), [Sending an Emergency Status on the Control Channel \(Emergency Status on Control Channel\)](#).)

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)

About the Behavior in Emergency Mode in a Site Roaming Zone

If the transceiver enters Emergency Mode when a Personality or channel with “Site Roaming” or “Site Roaming with RAN” configured is selected in an NXDN Conventional system, the transceiver behaves as follows:

- **The behavior if “Personality” is configured in Zone-channel Format**

Emergency behaves according to the configuration in **Emergency Profile** configured for the Personality.

- **The behavior if “Channel Table” is configured in Zone-channel Format**

Emergency Profile cannot be configured for each channel in a zone with “Site Roaming” or “Site Roaming with RAN” configured. Therefore, Emergency behaves according to the configuration in **Emergency Profile** configured for the zone.

If “Selected” is configured in **Emergency Channel Type** of the **Emergency Profile** that is referred to when the transceiver enters Emergency Mode, Emergency behaves on the Revert Channel. If “Fixed” is configured in **Emergency Channel Type**, a channel with “Site Roaming” or “Site Roaming with RAN” configured cannot be configured in **Emergency Zone-Channel**.

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 3-1 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 an NXDN Conventional system is selected:

The transceiver behaves according to the configuration of the **Emergency ID** and **Emergency NXDN ID Type** (NXDN Conventional).

Table 3-2 Emergency ID (NXDN Conventional)

Configuration	Description
None	The transceiver transmits only using the RAN code.
NXDN	If "Group ID" is configured for Emergency NXDN ID Type , the transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID . If "Unit ID" is configured for Emergency NXDN ID Type , the transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID .

If a channel in an NXDN Trunking system is selected:

The transceiver behaves according to the **Emergency NXDN ID Type** (NXDN Trunking) configuration.

Table 3-3 Emergency NXDN ID Type (NXDN Trunking)

Configuration	Description
Group ID	The transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID . When receiving a Group Call, the transceiver also uses the Group ID configured for the Emergency NXDN ID .
Unit ID	The transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID . When receiving a Group Call, the transceiver uses the currently selected Group ID.

● Fixed

If a channel in the NXDN Conventional system is configured to an Emergency Zone-Channel:

The transceiver behaves according to the configuration of the **Emergency ID** and **Emergency NXDN ID Type** (NXDN Conventional).

Table 3-4 Emergency ID (NXDN Conventional)

Configuration	Description
None	The transceiver transmits only using the RAN code.
NXDN	If "Group ID" is configured for Emergency NXDN ID Type , the transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID . If "Unit ID" is configured for Emergency NXDN ID Type , the transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID .

If a channel in the NXDN Trunking system is configured to an Emergency Zone-Channel:

The transceiver behaves according to the **Emergency NXDN ID Type** (NXDN Trunking) configuration.

Table 3-5 Emergency NXDN ID Type (NXDN Trunking)

Configuration	Description
Group ID	The transceiver initiates a Group Call using the Group ID configured for Emergency NXDN ID . When receiving a Group Call, the transceiver also uses the Group ID configured for the Emergency NXDN ID .
Unit ID	The transceiver initiates an Individual Call using the Unit ID configured for Emergency NXDN ID . When receiving a Group Call, the transceiver uses the Group ID configured for Emergency Zone-Channel .

Note

- If "Fixed" is configured in **Emergency Channel Type**, a channel with "Site Roaming" or "Site Roaming with RAN" configured cannot be configured in **Emergency Zone-Channel**.
- If the transceiver executes the Emergency behavior on a channel in an NXDN 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 "Fixed" is configured in **Emergency Channel Type**, and if a channel of an NXDN 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 an NXDN 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 (NXDN Conventional)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > Emergency > Emergency ID (NXDN Conventional))
- Configuring **Emergency ID (NXDN Trunking)** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > Emergency > Emergency ID (NXDN 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 3-6 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 **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 **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 of a single automatic transmission cycle in Emergency Mode.

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**:

● NXDN Conventional Channel

When “None” is configured in **Emergency ID**, the transceiver does not transmit during automatic transmission.

When **Emergency ID** is configured anything other than “None”, the transceiver only transmits the Emergency Status during automatic transmission.

● NXDN Trunking Channel

When **Emergency Status On Control Channel** is disabled, the transceiver does not transmit during automatic transmission.

When **Emergency Status On Control Channel** is enabled, the transceiver only transmits the Emergency Status on the control channel 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.

Note

- 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 3-7 Emergency Display

Configuration	Description
Selected Channel	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 3-8 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.



Note

- 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 Sending an Emergency Status on the Control Channel (Emergency Status on Control Channel)

The Emergency Status on Control Channel is a function in the NXDN Trunking system to send an Emergency Status on a control channel, where normally it is sent on a traffic channel.

When this function is enabled, notification of an Emergency situation can be transmitted even when all traffic channels are in use.

Table 3-9 Emergency Status on Control Channel

Configuration	Description
Enabled	If transmission is executed by Emergency Mode automatic transmission or the PTT switch, an Emergency voice call is initiated after the Emergency Status is sent on the control channel. At this time, an Emergency Status is also sent on the traffic channel. When an Emergency Status is sent on the control channel, the transceiver does not wait for an ACK.
Disabled	If transmission is executed by Emergency Mode automatic transmission or the PTT switch, an Emergency voice call is initiated without sending the Emergency Status on the control channel. The Emergency Status is sent on the traffic channel when communication is established.

Note

- This function can be used only in an NXDN Trunking system.
- If **Emergency Status on Control Channel** is enabled, it takes longer to start voice transmission because a Voice Call is executed after an Emergency Status is sent on a control channel.
- If the **Emergency Status on Control Channel** is enabled, but the communication channel is changed due to communication from the transceiver sending the Emergency Status or the Console, the receiver cannot receive the Emergency Status sent by the transceiver.

Configuration using KPG-D1/ D1N

Configuring **Emergency Status on Control Channel** to be enabled or disabled ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > Emergency)

3.7 ID to Be 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

In the NXDN Conventional System, an **Emergency ID** is the type of code to be sent out each time the transceiver starts automatic transmission and reception in Emergency Mode.

Table 3-10 Emergency ID

Configuration	Description
None	The transceiver transmits and receives according to the RAN configuration for the Zone-channel used for Emergency Mode.
NXDN	When transmitting in Emergency Mode, the transceiver initiates a Group Call or an Individual Call according to the configurations for Emergency NXDN ID Type and Emergency NXDN ID .

Note

- If an analog channel is configured in **Emergency Zone-Channel**, a DTMF code or FleetSync ID can be sent each time the transceiver starts automatic transmission or reception in Emergency Mode.

Configuration using KPG-D1/ D1N

Configuring **Emergency ID** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > Emergency > Emergency ID (NXDN Conventional))

Emergency NXDN ID Type

Emergency NXDN ID Type is the type of NXDN ID used for automatic transmissions while the transceiver is in Emergency Mode in an NXDN Conventional system or NXDN Trunking system.

“Group ID” or “Unit ID” can be configured for the Emergency NXDN ID Type in each system.

Configuration using KPG-D1/ D1N

- Configuring **Emergency NXDN ID Type** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > Emergency > Emergency ID (NXDN Conventional))
- Configuring the **Emergency NXDN ID Type** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > Emergency > Emergency ID (NXDN Trunking))

Emergency NXDN ID

The **Emergency NXDN ID** is the NXDN ID used for transmissions and receptions while the transceiver is in Emergency Mode in an NXDN Conventional system or NXDN Trunking system.

If “Unit ID” is configured for **Emergency NXDN 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 NXDN ID Type**, the Group ID used for initiating a Group Call in Emergency Mode can be configured for each system.

Configuration using KPG-D1/ D1N

- Configuring **Emergency NXDN ID** in an NXDN Conventional system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > Emergency > Emergency ID (NXDN Conventional))
- Configuring **Emergency NXDN ID** in an NXDN Trunking system ( **See** Transceiver Settings > Personal > Personal Features > NXDN Trunking > Emergency > Emergency ID (NXDN Trunking))

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.
- If Emergency is activated by the Activity Detection function or Bluetooth function while **Suspended Power-off** functions, the transceiver switches to Emergency Mode while **Suspended Power-off** continues to function.

Configuration using KPG-D1/ D1N

Enabling and disabling the **Suspended Power-off** ( **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

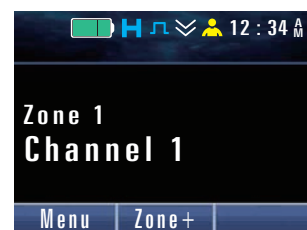
● Enabling the Transceiver in Lone Worker Mode/ Disabling Lone Worker Mode

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.

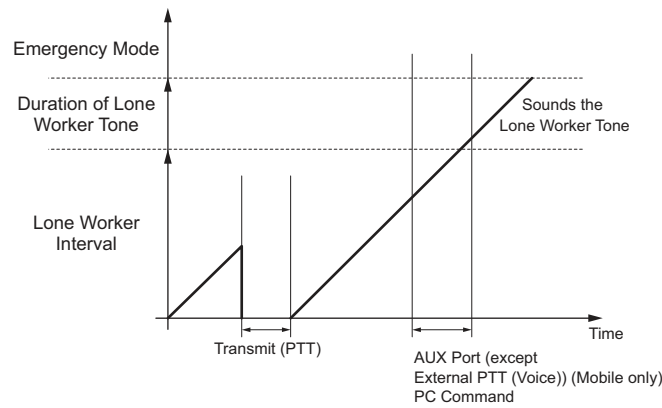


Figure 3-2 Lone Worker Mode

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.
- If "Transmit/Receive Inhibit" is configured in **Lone Worker Type**, though the transceiver functions to receive when an Individual Call or Telephone Call to the own transceiver is received while in Lone Worker Mode in a zone in an NXDN Trunking System, the transceiver cannot reply, cancel the reception state, or exit Lone Worker Mode. Lone Worker Mode can be disabled if Incoming Reset Time of the receiving transceiver elapses, if the transmitting transceiver cancels the transmission, or if Initiating Reset Time of the transmitting transceiver elapses.
- 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 (Personality)** in an NXDN Conventional system to be enabled or disabled (**See** Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Lone Worker (Channel Edit)** in an NXDN Conventional system to be enabled or disabled (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional > General)
- Configuring **Lone Worker (Personality)** in an NXDN Trunking system to be enabled or disabled (**See** Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Lone Worker (Channel Edit)** in an NXDN Trunking system to be enabled or disabled (**See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking)

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 3-11 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 3-12 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: Available

No: Unavailable

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 Using the Activity Detection Function to Place the Transceiver in Emergency Mode

Supported Models: Portable

Activity Detection is the function to detect the status of the transceiver by analyzing the behavior of the transceiver 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

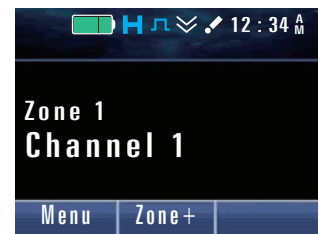
1

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.



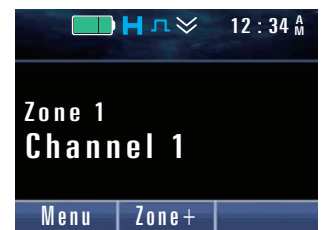
2

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 (Personality)** in an NXDN Conventional system to be enabled or disabled (🔍 See Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Activity Detection (Channel Edit)** in an NXDN Conventional system to be enabled or disabled (🔍 See Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Activity Detection (Personality)** in an NXDN Trunking system to be enabled or disabled (🔍 See Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Activity Detection (Channel Edit)** in an NXDN Trunking system to be enabled or disabled (🔍 See Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking)

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 an NXDN 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 NXDN 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 an NXDN system:

- Bit scramble encryption type
- AES/ DES encryption type
- DES encryption type (Built-in DES)

The Encryption function by means of AES/ DES provides more secure encryption than bit scramble encryption or by means of DES (Built-in DES). To use the Encryption function by means of AES/ DES, an optional Secure Cryptographic Module (hereinafter referred to as "SCM") needs to be installed in the transceiver, and the encryption key data also needs to be configured for the SCM. (Refer to [Secure Cryptographic Module \(SCM\) \(for AES/ DES Only\)](#).)

While bit scramble encryption or the DES encryption (Built-in DES) is enabled for the transceiver to transmit or receive a signal, the communication data can be encrypted or decrypted using the encryption key data configured in the transceiver. For use with the AES/ DES encryption, the communication data can be encrypted or decrypted using the encryption key data configured on the SCM.

Transmission

If Encryption is enabled, the transceiver encrypts and then sends voice data or user data such as a Short Message or a Long 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 the 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

A maximum of 32 sets of encryption key data, such as the encryption key data for use with the Encryption function by means of bit scramble or the DES encryption (Built-in DES), and the encryption key information for use with the Encryption function by means of AES/ DES, can be configured in **Multi-key List** by using KPG-D1/ D1N. Status of encryption, either enabled or disabled, and the **Multi-key List Number** having the encryption key data can be configured for each channel. (Refer to [Multi-key List](#).)

The transceiver can have a maximum of 1,024 sets of encryption key data in the SCM if the SCM is used by means of AES/ DES. Encryption key data associated with the CKR ID in **Multi-key List** can be selected. **Multi-key List** can be configured with encryption key data by means of bit scramble and encryption key information by means of AES/DES mixed.

The transceiver can have a maximum of 4 sets of encryption key data in the internal memory of the transceiver if the DES encryption (Built-in DES) is used. Encryption key data configured in **Multi-key List** can be selected. **Multi-key List** can be configured with encryption key data by means of bit scramble and encryption key data by means of DES (Built-in DES) mixed.

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 Scramble	AES/ DES (KWD-AE30)	AES/ DES (KWD-AE31/ KWD-DE31)	Built-in DES
Status Message	No	No	No	No
Short Message	Yes	Yes	Yes	Yes
Long Message	Yes	Yes	Yes	Yes
Transparent	Yes	No	No	No
GPS Data	Yes	Yes	Yes	Yes
GPS Combination	Yes	Voice: Yes, Data: No	Voice: Yes, Data: No	Voice: Yes, Data: No
Data with Voice	Yes	Voice: Yes, Data: No	Voice: Yes, Data: No	Voice: Yes, Data: No
BLE Data	Yes	Yes	Yes	Yes
BLE Combination	Yes	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.
- The communication data cannot be encrypted using the Encryption function by means of AES/ DES for GPS data transmission using GPS Combination or Data with Voice, or for data transmission using Transparent if KWD-AE30/ KWD-AE31/ KWD-DE31 is used.

Configuration using KPG-D1/ D1N

- Configuring **Encryption (Personality)** in an NXDN Conventional system to be enabled or disabled and **Multi-key List Number (Personality)** ( **See** Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Encryption Settings)
- Configuring **Encryption (Channel Edit)** in an NXDN Conventional system to be enabled or disabled and **Multi-key List Number (Channel Edit)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Encryption Settings)
- Configuring other **Encryption** configurations in NXDN ( **See** Transceiver Settings > Encryption > NXDN)
- Configuring **Encryption (Personality)** in an NXDN Trunking system to be enabled or disabled and **Multi-key List Number (Personality)** ( **See** Transceiver Settings > Personal > Personality > NXDN Trunking > Encryption Settings)
- Configuring **Encryption (Channel Edit)** in an NXDN Trunking system to be enabled or disabled and **Multi-key List Number (Channel Edit)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Trunking > Encryption Settings)

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 then sends voice data or user data such as a Short Message or a Long 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

- In an NXDN Conventional system, 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.
- In an NXDN Trunking system, whether the Encryption status (to be enabled or disabled) is configured for the transceiver or for each channel can be selected.
- 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 NXDN) configured in **Transmit Mode** of the channel.

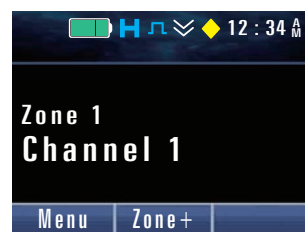
Operating the transceiver

● Configuring Encryption during transmission to be enabled

Press the **Scrambler/Encryption** key while Encryption is disabled.

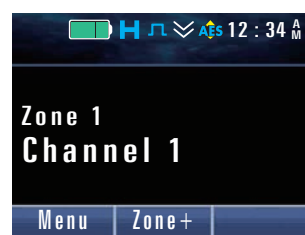
● For the bit scramble encryption type

The "🔑" icon appears and then Encryption will be enabled.



● AES/ DES or DES (Built-in DES) format

The "AES" icon or "DES" icon appears and Encryption is enabled.



Note

- The "AES" icon appears if the encryption type is AES, and the "DES" icon appears if the encryption type is DES.

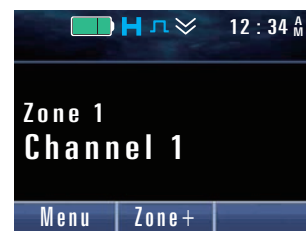
Pressing the **PTT** switch encrypts and sends the audio data.

● Configuring Encryption during transmission to be disabled

Press the **Scrambler/Encryption** key while Encryption is enabled.

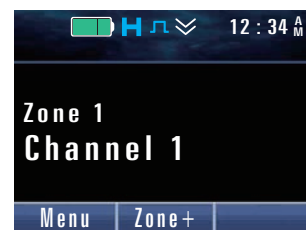
● For the bit scramble encryption type

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.



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 scramble or AES/ DES 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 by using KPG-D1/ D1N to select 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.)

Operating the transceiver

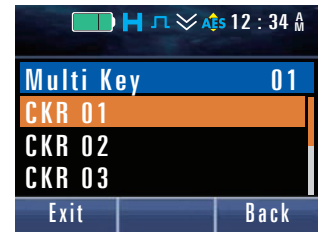
1 Press and hold the **Scrambler/ Encryption** key.

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).
- "Incorrect Key" appears if an Encryption Key whose KEY ID is 64 or more is configured when "NXDN" is configured in **Mode** and "Encryption Module" is configured in **Type** of **Multi-key List**.
- 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**.

For user data such as a Short Message and a Long Message, the data receiving behavior is executed according to the registration status of **Multi-key List**.

● Bit scramble encryption type

Depending on the configuration of **Key ID Scan** whether Key IDs in the Multi-Key List are scanned or not can be decided.

• If Key ID Scan is enabled:

The transceiver scans Key IDs (0 to 63) in **Multi-key List** if the transceiver receives an encrypted signal.

For audio data, if the Key ID included in the Encryption Key of received 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.

Data is decrypted by the same method when user data such as Short Message and Long Message is received. If data is correctly decrypted, the data receiving behavior is executed. If data is not correctly decrypted, the data is canceled.

• If Key ID Scan is disabled:

For audio data, if the transceiver receives an encrypted signal, the transceiver does not scan Key IDs in **Multi-Key List** but uses the Key Data corresponding to the **Multi-key List Number** configured for the channel on which the transceiver waited for the call 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.

Data is decrypted by the same method when user data such as Short Message and Long Message is received. If data is correctly decrypted, the data receiving behavior is executed. If data is not correctly decrypted, the data is canceled.

● AES/ DES encryption type

The transceiver scans Key IDs (0 to 63) in the SCM if the transceiver receives an encrypted signal.

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.

Data is decrypted by the same method when user data such as Short Message and Long Message is received. If data is correctly decrypted, the data receiving behavior is executed. If data is not correctly decrypted, the data is canceled.

● DES encryption type (Built-in DES)

The transceiver scans Key IDs (0 to 63) in **Multi-key List** if the transceiver receives an encrypted signal.

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 in 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.

Data is decrypted by the same method when user data such as Short Message and Long Message is received. If data is correctly decrypted, the data receiving behavior is executed. If data is not correctly decrypted, the data is canceled.

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

- Upon receipt of unencrypted communication data, 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.
- If Key ID Scan is disabled, decryption occurs as below when a Voice Call using each ID is received in an NXDN Trunking system zone:
 - Upon receipt of a Priority Monitor ID, decryption occurs by using the Key ID configured for the Zone-channel of the Priority Monitor ID.
 - Upon receipt of an All Group ID, decryption occurs by using the Key ID configured for the Zone-channel only if the received All Group ID is registered in the same zone.

For a Voice Call or Data Call other than the above, decryption occurs by using the Key ID configured for the Zone-channel on which the transceiver waited for the call.

Configuration using KPG-D1/ D1N

Configuring **Encryption Type** ( **See** Transceiver Settings > Encryption > NXDN)

About the Behavior of the Encryption Icon

If the transceiver satisfies the following conditions when the encrypted audio data is received, the “” icon blinks for the bit scramble format. The “” or “” icon blinks for the AES/ DES format. The “” icon blinks for the DES (Built-in DES) format.

- **If “None” is configured for Optional Signaling(NXDN):**
 - RAN matches.
 - Key ID matches.
- **If “NXDN ID” is configured for Optional Signaling(NXDN):**
 - RAN matches.
 - Key ID matches.
 - Group ID matches (upon receipt of a Group Call).
 - Unit ID matches (upon receipt of an Individual Call).
- **For an NXDN Trunking system**
 - Key ID matches.
 - Group ID matches (upon receipt of a Group Call).
 - Unit ID matches (upon receipt of an Individual Call).

About the Behavior of the LED (Secure Indicator) (NXDN Trunking System Only)

Secure Indicator is the function to flash the LED green when the transceiver receives an encrypted voice call in an NXDN Trunking system.

If this function is enabled, the LED of the transceiver flashes green when the transceiver receives an encrypted voice call on a communication channel.

The following is the relationship between Busy LED and secure Indicator:

Table 4-2 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 > NXDN 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.

Also, an Encryption Key needs to be configured for the SCM using Key Loader in order to use the Encryption function. (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 4-3 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 Encryption function by means of DES (Built-in DES) can encrypt and decrypt communication data during voice communication or data communication by configuring an Encryption Key (Key ID and Key Data) in **Multi-key List**. The transceiver can have a maximum of 4 Encryption Keys of Built-in DES (Key ID and 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 Protection Function of Encryption Key (Key Retention)

Key Retention is the function to retain or delete Encryption Key information stored in the SCM or the Encryption Key configured for Built-in DES according to the configuration using 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 4-4 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.

● 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

● 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.

4.7 Deleting the Encryption Key (Key Delete)

Key Delete is the function to delete the Encryption Key configured for an SCM by using the Key Loader or the Encryption Key configured for Built-in DES.

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

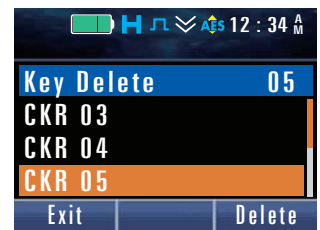
1 Press the **Key Delete** key.

Enters Key Delete Mode.

The following operations can also be used even if the transceiver enters Delete Mode by pressing the **Menu** key:

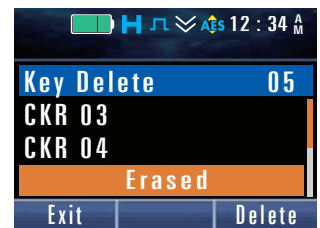
2 Press the [▲] key or [▼] key and then select a Multi-key from the Multi-Key List.

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)

4.8 Deleting All Encryption Keys (Zeroize)

Zeroize is the function to delete all Encryption Keys stored in the SCM or configured for Built-in DES.

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, 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 \(Key Delete\)](#)

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.



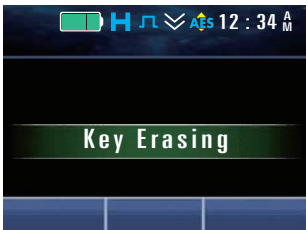
Then, A Key Fail Alert Tone (6 beeps) sounds from the transceiver every 10 sec and displays “Key Fail” for 1 sec, and then the transceiver restores the channel display.



Executing Zeroize using the Menu Mode

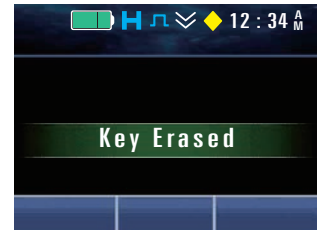
1 Press the Menu key to enter Menu Mode and then select “Zeroize”.

“Key Erasing” appears on the display and Zeroize is executed.

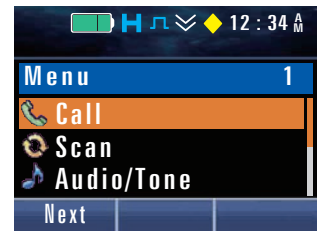


2 Zeroize completes.

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.

4.9 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 ID**

Key ID allows you to configure an ID code to identify the Encryption Key in the range of 0 to 63.

- **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

An SCM is required for Encryption by means of AES/ DES. To use an SCM, an Encryption Key must be configured on the SCM by 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.

An Encryption Key configured in **Multi-key List** can be configured for the transceiver by specifying the corresponding **Multi-key List Number**.

NXDN Conventional system:

A **Multi-key List Number** can be configured for each channel.

NXDN Trunking system:

A **Multi-key List Number** can be configured for each channel if "Channel" is configured for Encryption (NXDN Trunking).

Only one **Multi-key List Number** can be configured for the transceiver if "Transceiver" is configured for Encryption (NXDN Trunking).

Configuration using KPG-D1/ D1N

Configuring **Multi-key List** ( **See** Transceiver Settings > Encryption > Multi-key List)

4.10 Radio Access Control

Radio Access Control is the function to eliminate unauthorized access to the repeater by the transceiver.

After configuring the Radio Access Control Key which is common to the repeater, the transceiver communicates by scrambling with the scrambled code generated from the configured common Radio Access Control Key.

If the Radio Access Control Key does not match between the transceiver and the repeater, communication becomes impossible because scrambling cannot be descrambled.

- **Radio Access Control Key List**

In **Radio Access Control Key List**, a Radio Access Control Key which is common to the repeater is configured.

- **Key Data**

In **Key Data**, 6 to 11 characters from "0" to "9", "A" to "Z", "a" to "z", "-", "_", "\$", and "#" are configured.

- **Radio Access Control Key List Number**

From **Radio Access Control Key List**, a Radio Access Control Key is selected for each channel, and the Radio Access Control Key which is common to the repeater to be accessed is configured.

Note

- This function can be used only in an NXDN Conventional system and NXDN Site Roaming system.
- The JVCKENWOOD repeater that can use **Radio Access Control** is NXR-1700/ NXR-1800. Refer to NXR-1700/ NXR-1800 FUNC (In-depth Manual) "Radio Access Control" about the repeater configuration.
- To prevent the leakage of a Radio Access Control Key, **Key Data** cannot be read even if the configuration data is read from the transceiver.
- On a channel with **Radio Access Control** enabled, the transceiver transmits by scrambling, but for reception, the transceiver receives both the scrambled communication and the communication without scrambling.
- Even on a channel with **Radio Access Control** enabled, the transceiver transmits with Radio Access Control disabled if Talk Around is enabled.

Configuration using KPG-D1/ D1N

- Configuring **Radio Access Control Key List** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > Radio Access Control)
- Configuring **Radio Access Control Key List Number (Personality)** ( **See** Transceiver Settings > Personal > Personality > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring **Radio Access Control Key List Number (Channel Edit)** ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)

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.



Note

- In an NXDN Conventional system, because Site Roaming is executed for a channel with "Site Roaming" or "Site Roaming with RAN" configured in **System Type**, the configuration in **Scan Type** is disabled. Refer to "[Migrating Automatically to the Site Providing Better Radio Environment \(Site Roaming\)](#)" for instructions on scanning by Site Roaming in an NXDN Conventional system.

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.

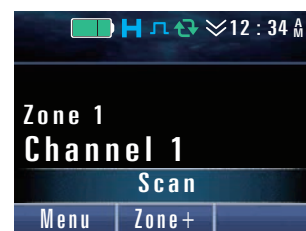
The "↻" icon appears and then Revert Channel is displayed.

If "**Scan**" **Displayed** is enabled, "Scan" is displayed.

For portable transceivers, the LED flashes according to the configuration of **Non-Priority Scan LED** and **Priority Scan LED** respectively in the case of Non-priority Scan and Priority Scan.

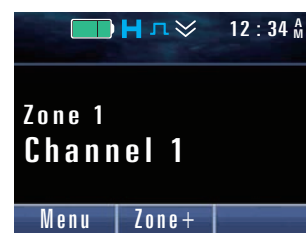


- The transceiver behaves in the same manner even if the scan is started by other method. (Refer to [Starting the Scan](#).)



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.



- 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 an NXDN Trunking system and even if the All Group IDs are excluded from the target for scanning, those 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 an NXDN Conventional system to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Scan Add** in an NXDN Trunking system to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN 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 an NXDN 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 an NXDN 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.

Operating the transceiver

1

Press the Scan key.

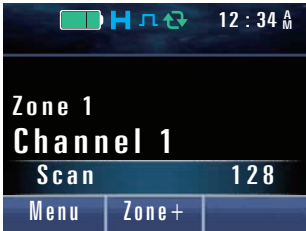
The scan starts after a Key Beep A (1 beep) sounds from the transceiver. The "↻" icon appears and then Revert Channel is displayed.

If **"Scan" Displayed** is enabled, "Scan nnn" (nnn indicates Scan List No.) is displayed.

For portable transceivers, the LED flashes according to the configuration of **Non-Priority Scan LED** and **Priority Scan LED** respectively in the case of Non-priority Scan and 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 Edit)** in an NXDN Conventional system ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > Scan > List Scan)
- Configuring **Scan List Number (Zone Edit)** in an NXDN Trunking system ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > NXDN Trunking > Scan > List Scan)
- Configuring **Scan List Number (Channel Edit)** in an NXDN Conventional system ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > General)
- Configuring **Scan List Number (Channel Edit)** in an NXDN Trunking system ( [See](#) Transceiver Settings > Zone/Channel > Channel Edit > NXDN 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 (List Scan)

- **For an NXDN Conventional system**

For the transceiver to start the List Scan, 2 or more Zone-channels must be registered as members in a Scan List.

- **For an NXDN Trunking system**

One of the following conditions must be satisfied for the transceiver to start the List Scan:

- If the zone channel is registered as a member in the Scan List
- If two or more Group IDs configured in Priority Monitor ID exist

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)

If the transceiver does not satisfy the conditions to resume the scan, the scan remains paused.

● For an NXDN Conventional system

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.

● For an NXDN Trunking system

One of the following conditions must be satisfied to resume the List Scan while the transceiver pauses the scan:

- If the zone channel is registered as a member in the Scan List
- If two or more Group IDs configured in Priority Monitor ID exist

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.
NXDN Trunking	A Zone-channel in a system where "NXDN Trunking" is configured in System Type selected in System Number can be registered as a member for List Scan.
LTR and Conventional	A Zone-channel in a system where "LTR Trunking", "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

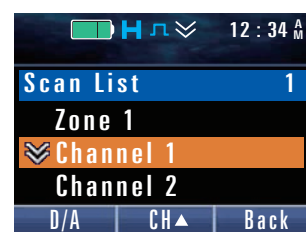
● Adding a member for List Scan

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.

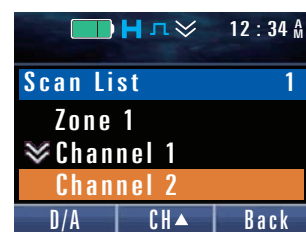
Note

- 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.

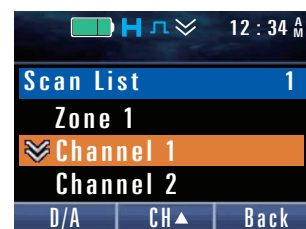
Note

- 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 an NXDN 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.

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 flashes according to the configuration of **Non-Priority Scan LED** and **Priority Scan LED** respectively in the case of Non-priority Scan and Priority Scan.

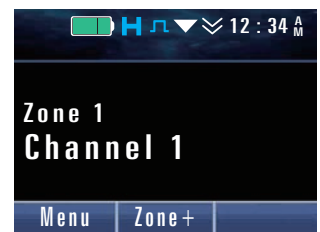


Note

- 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 > NXDN 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".

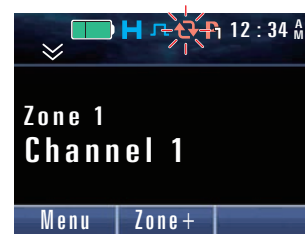
Table 5-3 Type

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

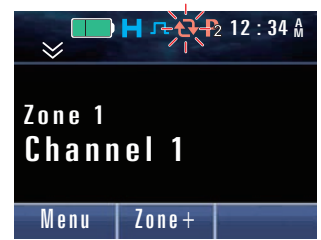
- **If the Zone-channel configured for the Priority 1 is selected, or if the scan is paused on the Zone-channel configured for the Priority 1**

The "P" icon appears. When Priority Scan is paused, the "P" icon blinks.



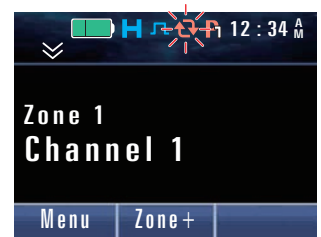
- If the **Zone-channel configured for the Priority 2** is selected, or if the scan is paused on the **Zone-channel configured for the Priority 2**

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

- 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.
- The transceiver behaves as follows if one of the **Direct Channel 1** key to **Direct Channel 5** key is pressed during the scan:
 - 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.
- If Over-the-Air Alias or AES/ DES is used in Priority Scan in an NXDN Conventional system, Lookback Time must be set longer, or the speaker may not be unmuted during the reception of a normal channel (not a priority channel). The table below shows standard time periods for detecting audio frames in the channel of an NXDN Conventional system. If Over-the-Air Alias or AES/ DES is used, it may take 1 to 2 seconds until the speaker is unmuted. Because of this, if Lookback is executed with Lookback Time set shorter than the time periods in the table, the speaker may not be unmuted.

Table 5-4 Behavior during Priority Scan

Function Used during Priority Scan	Standard Time Period for Detecting Audio Frame
Over-the-Air Alias	960 ms
AES/ DES	1280 ms
Over-the-Air Alias and AES/ DES	1920 ms

Configuration using KPG-D1/ D1N

- Configuring **Priority 1 (Single Scan)** ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Scan > Single Scan > Priority 1)
- Configuring **Priority 2 (Single Scan)** ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Scan > Single Scan > Priority 2)
- Configuring **Priority 1 (Scan List)** ( [See](#) Transceiver Settings > Scan > Scan List > Options > Priority 1)
- Configuring **Priority 2 (Scan List)** ( [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**.

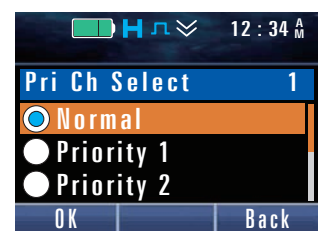
Operating the transceiver

● 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.



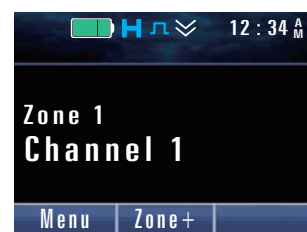
2 Select the priority of a channel by pressing the [▲] key or [▼] key.

Priority can be selected from "Normal", "Priority 1", "Priority 2", and "Priority 1&2".



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

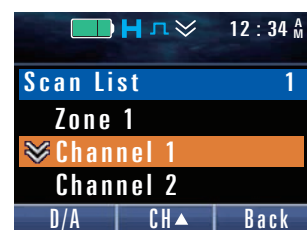
After the Key Beep B (2 beeps) sounds, the transceiver exits Priority-channel Select Mode and restores the previous channel display.



● Changing the Priority Channel in Scan Program Mode (List Scan)

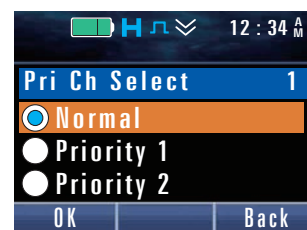
1 Press the Scan Program key after selecting the channel to be configured as Priority Channel.

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.



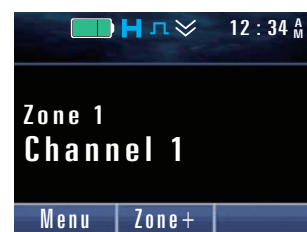
3 Select the priority of a channel by pressing the [▲] key or [▼] key.

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 RAN in an NXDN 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.

Configuration using KPG-D1/ D1N

- Configuring **Lookback Time A/ Lookback Time B (Single Scan)** ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Scan > Single Scan)
- Configuring **Lookback Time A/ Lookback Time B (Scan List)** ( [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 > Scan > Single Scan > Priority 1)
- Configuration **Priority 2 Temporary Delete/Add (Single Scan)** to be enabled or disabled ( [See](#) Transceiver Settings > Zone/Channel > Zone Edit > Scan > Single Scan > Priority 2)
- Configuring **Priority 1 Temporary Delete/Add (Scan List)** to be enabled or disabled ( [See](#) Transceiver Settings > Scan > Scan List > Options > Priority 1)
- Configuring **Priority 2 Temporary Delete/Add (Scan List)** 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.

This operation is also applied to Priority Monitor ID in an NXDN Trunking system. (Refer to [Receiving a High-priority Call \(Priority Monitor ID\)](#).)

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 an NXDN 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 an NXDN 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 an NXDN Conventional System

The following are the reception behaviors during the scan in an NXDN Conventional system:

● RAN behavior

The transceiver receives an RAN code in each channel, and pauses the scan if it matches the RAN code preconfigured for the transceiver. If the matching state of the RAN codes becomes inconsistent, **Dropout Delay Time** is activated.

After the time configured in **Dropout Delay Time** elapses, the transceiver resumes the scan.

● RAN - Optional Signaling AND behavior

The transceiver receives an RAN code and pauses the scan if it matches the RAN code preconfigured for the transceiver.

The transceiver does not emit the received audio and then waits to receive Optional Signaling (DTMF/ 2-tone/ NXDN ID).

The transceiver resumes scanning after the amount of time configured in **Dropout Delay Time** elapses if the RAN code matching state becomes inconsistent while waiting to receive the Optional Signaling.

The transceiver starts Alert and others to emit the received audio when the received Optional Signaling matches the Optional Signaling preconfigured for the transceiver while waiting to receive the Optional Signaling. The transceiver stands by on the channel when the Optional Signaling matches.

Reception Behavior during the Scan in an NXDN Trunking System

While the transceiver scans in an NXDN 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.

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 Single Scan or 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

- For Multi-Zone Scan, 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.
- 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.

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 5-5 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.

Configuration	Description
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 a scan with "NXDN Trunking" in Scan Type of Scan List, Priority 1/ Priority 1 + Talkback/ Priority 2/ Priority 2 + Talkback cannot be configured in **Revert Channel**.
- For Single Scan in a zone in an NXDN 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 > Scan > Single Scan)
- Configuring **Revert Channel (Scan List)** ( **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 RAN 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)** of NXDN Conventional to be enabled or disabled ( **See** Transceiver Settings > Personal > Personality > NXDN Conventional > General)
- Configuring **Auto Scan (Personality)** of NXDN Trunking to be enabled or disabled ( **See** Transceiver Settings > Personal > Personality > NXDN Trunking)
- Configuring **Auto Scan (Channel Edit)** of NXDN Conventional to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional > General)
- Configuring **Auto Scan (Channel Edit)** of NXDN Trunking to be enabled or disabled ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN 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 5-6 Off-hook Scan

Configuration	Description
Enabled	Pressing the Scan key causes the transceiver to start scanning regardless of the microphone on- 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 microphone goes to on-hook state when the audio sounds, the transceiver continues the audio output status without resuming the scan. 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 (NXDN Conventional System only)

Preamble Length is the function to extend time for sending a preamble when the NXDN 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 254.

Configuration using KPG-D1/ D1N

Configuring **Preamble Length** ( **See** Transceiver Settings > Personal > Personal Features > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN > Parameters)

Data communications are available for the transceiver by using the various functions of NXDN, or 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)
- Configuring **Data Override** to be enabled or disabled ( **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 an NXDN system:

- AUX Input Status Message transmission
- Status transmission on receipt of Status Inquiry Message
- GPS transmission by GPS Combination (Status)
- BLE transmission by BLE Combination (Status)
- Automatic GPS data transmission
- Automatic BLE data transmission
- GPS transmission by GPS Polling reception
- BLE transmission by BLE Polling reception
- GPS transmission by GPS Distance Change (Automatic GPS transmission, GPS Combination (Status))
- GPS transmission on a GPS Report Channel (GRCH) in an NXDN Trunking system

Note

- **Silent Report** does not apply when the transceiver receives a Status Inquiry Message by Radio Check 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 NXDN 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.

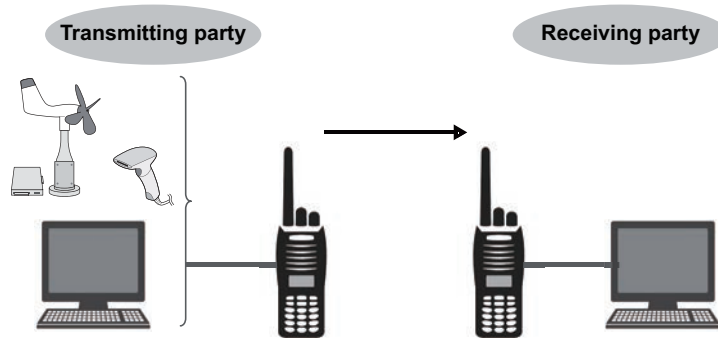


Figure 6-1 Image of Transparent

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 NXDN protocol if the received data size exceeds 314 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. In an NXDN Trunking system, data which is equal to or less than 80 bytes is sent on a control channel, and data which is more than 80 bytes is sent on a traffic channel.

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:

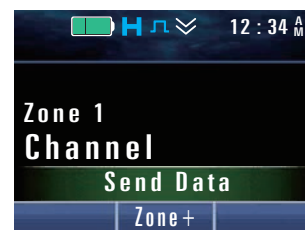
When the status of the CTS port becomes the low level ^{*1}, the serial data will not be sent from the transceiver. (Portable: Pin No. 4 (14-pin universal connector), Mobile: Pin No. 4 (25-pin connector on the back panel))

^{*1} Portable: 0 V, Mobile: -8 V

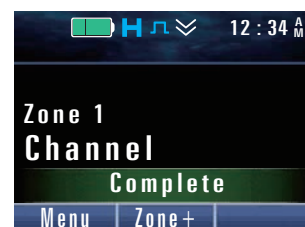
Transceiver behavior

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 314 bytes.



"Complete" appears for 1 sec when the transmission completes, and the transceiver restores the previous display.



In an NXDN 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

- In an NXDN 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

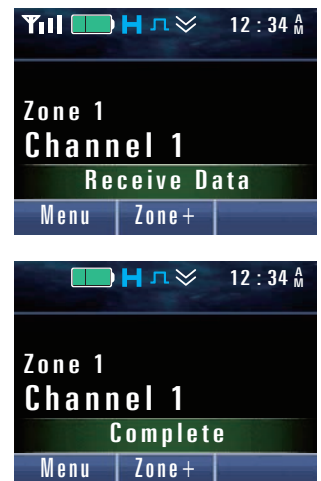
The transceiver which receives the Transparent data from the transceiver for which "Transparent (Digital)" is assigned to its communication port sends the data received from the communication port to which "Transparent (Digital)" is assigned.

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 an NXDN 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

Examples in an NXDN Conventional system

Example 1: If “Transparent” is assigned to a communication port

The following assumes that 250 bytes of Transparent Data are sent from a PC to the transmitting transceiver. The following is the block diagram if the parameters are configured as below.

Transmit Delay Time: 100 ms

Data Transmit Modulation Delay Time: 400 ms

Transparent Header: Enable

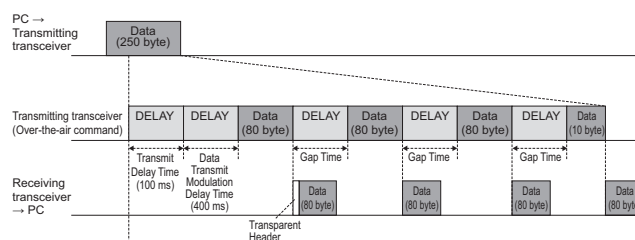


Figure 6-2 Transparent (NXDN Conventional)

The DELAY frame is placed for the amount of time configured for **Transmit Delay Time** and **Data Transmit Modulation Delay Time** before the transceiver begins transmitting, and it is also placed between blocks of data to be sent (Gap Time).

The length of time configured for **Data Transmit Modulation Delay Time** applies to the Gap Time in an NXDN Conventional system. If the time configured for **Data Transmit Modulation Delay Time** is equal to or less than 80 ms, the Gap Time is a fixed value (80 ms).

Example 2: If “Transparent (Digital)” is assigned to a communication port

The following assumes that 950 bytes of Transparent Data are sent from a PC to the transmitting transceiver. The following is the block diagram if the parameters are configured as below.

Transmit Delay Time: 100 ms

Data Transmit Modulation Delay Time: 400 ms

Transparent Header: Enable

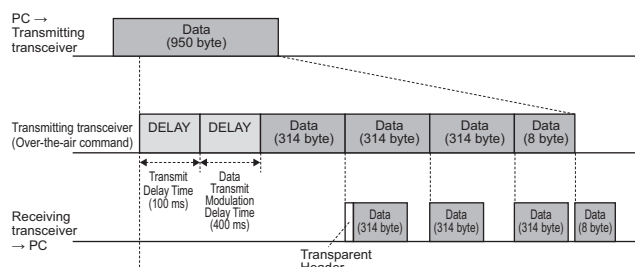


Figure 6-3 Transparent (NXDN Conventional)

The DELAY frame is placed for the amount of the time configured for **Transmit Delay Time** and **Data Transmit Modulation Delay Time**, and then the data is sent. There is no Gap Time between data blocks to be sent.

- Examples in an NXDN Trunking system**

Example 1: If “Transparent” is assigned to a communication port

The following assumes that 250 bytes of Transparent Data are sent from a PC to the transmitting transceiver. The data is sent on a communication channel as shown in the block diagram below.

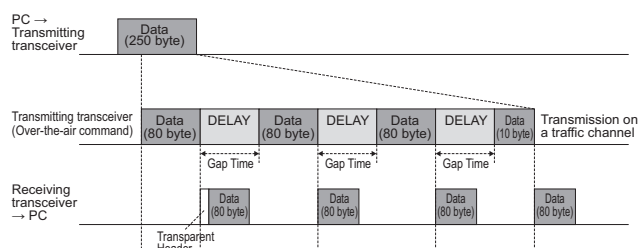


Figure 6-4 Transparent (NXDN Trunking)

The DELAY frame is placed between blocks of data to be sent (Gap Time) and the data is sent. 80 ms is fixed value for the Gap Time in an NXDN Trunking system.

Example 2: If “Transparent (Digital)” is assigned to a communication port

The following assumes that 950 bytes of Transparent Data are sent from a PC to the transmitting transceiver. The data is sent on a communication channel as shown in the block diagram below. There is no Gap Time between data blocks to be sent.

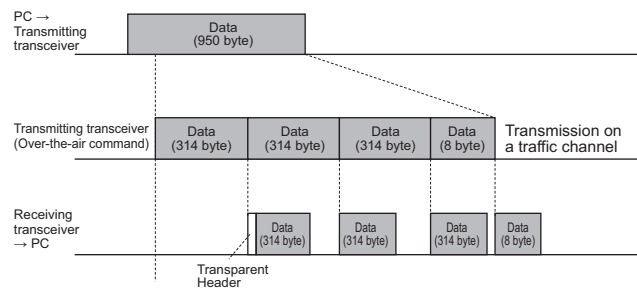


Figure 6-5 Transparent (NXDN Trunking)

Example 3: If “Transparent” or “Transparent (Digital)” is assigned to a communication port

The following assumes that 80 bytes of Transparent Data are transferred from a PC to the transmitting transceiver.

The data is sent on a control channel as shown in the block diagram below.

In this example, there is no difference in sending data even if either “Transparent” or “Transparent (Digital)” is assigned to a communication port.

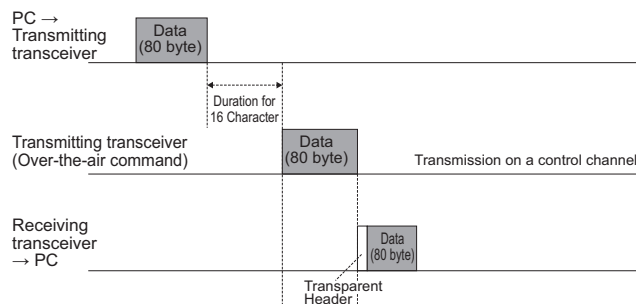


Figure 6-6 Transparent (NXDN Trunking)

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** to be enabled or disabled( **See** Transceiver Settings > NXDN > NXDN 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 start 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.

Note

- Serial Data cannot be prioritized for a zone in an NXDN Trunking system. In a zone in an NXDN Trunking system, the transceiver functions in the same manner as if “Receiving Data” is configured for COM Port Priority, even if “Serial Data” is configured for COM Port Priority.

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 Data Zone-Channel to send Transparent data.

The transceiver automatically changes the channel to that in an NXDN Conventional system configured in **Data Zone-Channel (NXDN)** when transmitting 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 can be only used in an NXDN Conventional system.
- This function is enabled if “Channel Table” is configured in **Zone-channel Format**, using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

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

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 that in an NXDN Conventional system configured in **Data System-Personality (NXDN)** when transmitting 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 can be only used in an NXDN Conventional system.
- This function is enabled if "Personality" is configured in **Zone-channel Format**, using KPG-D1/ D1N.

Configuration using KPG-D1/ D1N

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

Preamble Length

Preamble Length is the function to extend time for sending a preamble when the NXDN 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.

Very Narrow:

$$\text{Time [sec]} = 1/2400 \times 4 \times \text{Configuration value for Preamble Length}$$

Narrow:

$$\text{Time [sec]} = 1/4800 \times 8 \times \text{Configuration value for Preamble Length}$$

Note

- This function can be only used in an NXDN Conventional system.

Configuration using KPG-D1/ D1N

Configuring **Preamble Length** ( [See](#) Transceiver Settings > Personal > Personal Features > NXDN Conventional > NXDN > Parameters)

Digital Encode/ Decode Format is a function that controls the behavior of the transceiver using commands when calls are received via NXDN digital communication (NXDN Conventional system only).

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
- Individual Call Incoming
- 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.

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.

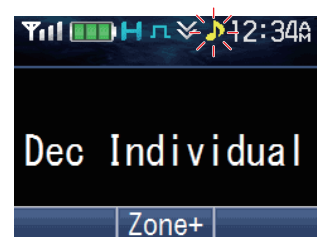
For example, if the following Decode Format is configured, the transceiver executes the **ENCA enc** command and executes the Encode Format specified in enc if the received ID matches with the ID configured on the transceiver. “Dec Individual” appears on the display.

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 > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring the Digital Profile Number (**Channel Edit**) ( **See** Transceiver Settings > Zone/Channel > Channel Edit > NXDN Conventional (NXDN Site Roaming/ NXDN Site Roaming with RAN) > NXDN)
- Configuring the Decode Format to be Executed for Each Profile When a Call is Received ( **See** Transceiver Settings > Digital Profiles > 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 NXDN 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 (Alert Tone Pattern).)
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
	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
	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
	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): STOPS 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 NXDN 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 (Alert Tone Pattern).)
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 65519 (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 65519 (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 *: 1 to 9 Matching range in the case of CMP #S **: 1 (= 01) 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: 1 to 207 (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 (226). 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 (224) 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.

CMP ^EOMD

Description	When the CMP ^EOMD command is executed, the transceiver determines whether the Status ID received is a Man-down Status (225) 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.

CMP ^EOS

Description	When the CMP ^EOS command is executed, the transceiver determines whether the Status ID received is a Stationary Status (227) 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.

CMP ^EOM

Description	When the CMP ^EOM command is executed, the transceiver determines whether the Status ID received is a Motion Status (228) 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.

CMP ^EOLW

Description	When the CMP ^EOLW command is executed, the transceiver determines whether the Status ID received is a Lone Worker Status (229) 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.

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
Usage Example	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.
Usage Example	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.
	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
Usage Example	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.

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	A maximum of 290 characters

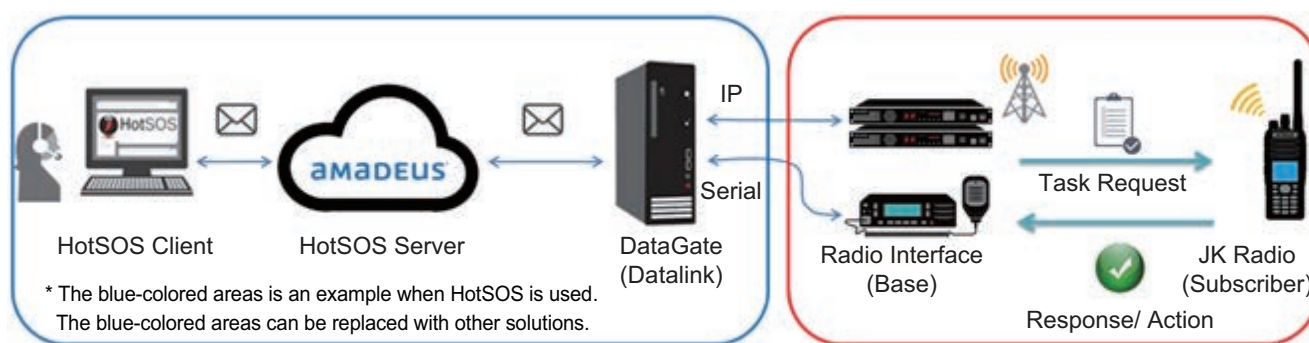


Figure 8-1 System Configuration Example for Task Request

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.

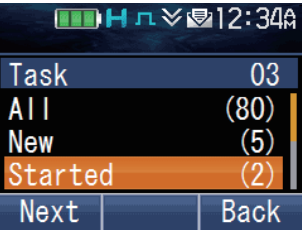
Table 8-3 Transceiver Status

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 Task Confirmation Mode.



2 Select the Category List by pressing the [▲] key or [▼] key.

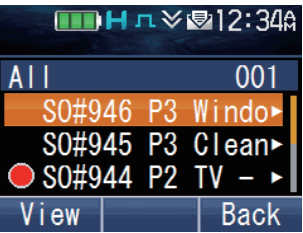
Below is an example of the display by Category.

- All: All Task Requests
- New: Unread Task Request messages
- Started: FPU settings

(The above are a part of the displayed information)

 Note

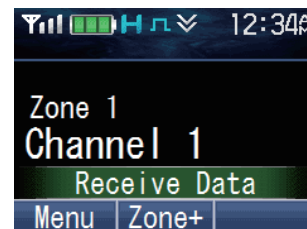
- Unread messages are indicated by the “” icon.
- The “All” and “New” categories are items that exist at all times regardless of the FPU settings. Other items will vary in name and quantity according to the FPU settings.



Behavior of the Transceiver (Subscriber)

- Below are the steps for receiving and displaying a Task Request Message.

1 Message receiving starts.

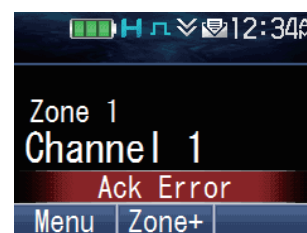


2 Message receiving is complete.

Saves the Task Request if **Task Request Receivable** is enabled.

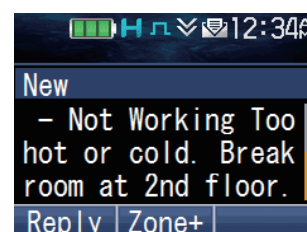
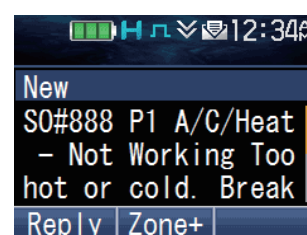


If ACK cannot be sent out successfully, an "Ack Error" message is displayed for 1 second, after which data receiving ends.



3 Displays the Task Request details.

The first 3 lines of the message are 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

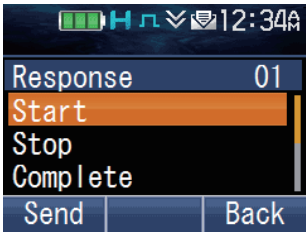
- If **Alert Tone(Task Request)** is enabled, an Alert Tone is emitted from the transceiver.

Operating the Transceiver (Subscriber)

- Below are the steps for responding to a Task Request.

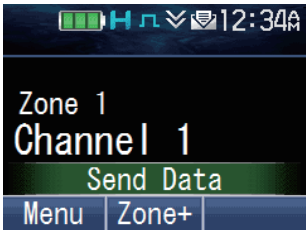
1 In the Task Request View, press the **Menu** ([]) key or [*****] key.

A Task Request Response selection screen appears.



2 On the Response selection screen, press the **PTT** switch, **Menu** ([]) 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.

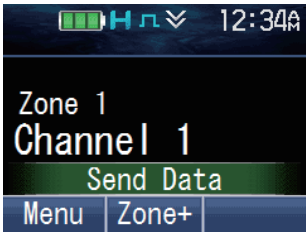


Transceiver Behavior (Base)

- 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.

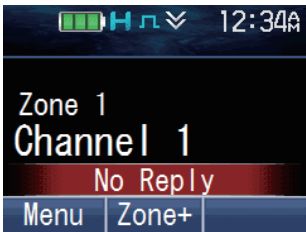


2 Sending is complete.

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.

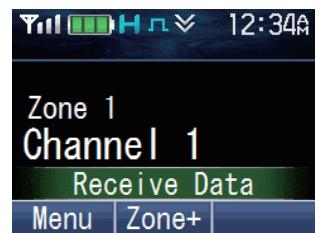


● Below are the steps for receiving a response to the Task Request Message.

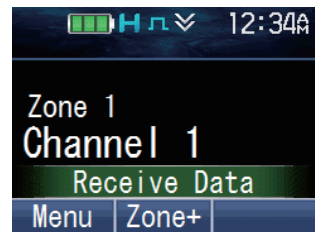
1

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.



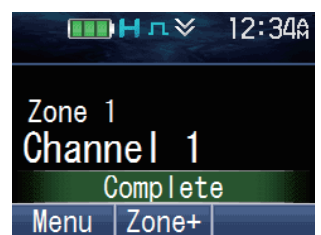
After data receiving is complete, the transceiver sends an ACK.



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.



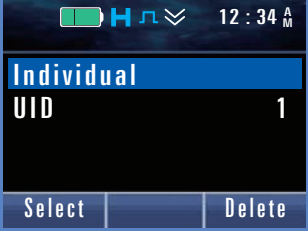
Note

- 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
- To send a Task Request message which exceeds 100 characters (including the Message ID) from the base in an NXDN system, **Extended Short Message** needs to be enabled for the base and subscriber by using the FPU.

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 an **Alert Tone (Task Request)** ([See](#) Transceiver Settings > NXDN > NXDN Information > Conventional > Task Request)
- Configuring an **Alert Tone (Task Request)** ([See](#) Transceiver Settings > NXDN > NXDN Information > Trunking > Task Request)

Key operations for selecting a list or entering characters are described for each mode in this section. 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	Initiates a Paging Call after aborting the current mode.	Initiates a Paging 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 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.
[*]	Press	Initiates a Paging Call after aborting the current mode.	Initiates a Paging 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

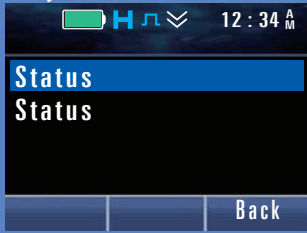
^{*3} Portable and KCH-20R (Featured Panel) only

Key		Group Call Mode (NXDN 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 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.

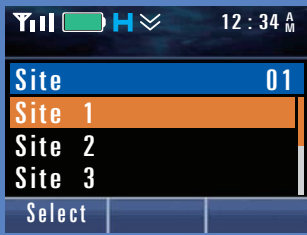
*1 Portable only

*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.	Sends 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		Site Select Mode (NXDN Trunking)	Scrambler/Encryption Code Mode
			
Menu ([)	Press	Confirms the configuration and then aborts the current mode.	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	Migrates to the site number entry 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 sites registered in the system one at a time.	Selects a Multi-key configured in Multi-key List one at a time.
	Hold Down	Selects sites registered in the system continuously.	Selects Multi-keys configured in 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 site registered in the list.	Directly selects a Multi-key registered in the list.
[*]	Press	Confirms the configuration and then aborts the current mode.	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		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		2-tone Mode	System Select Mode
Menu ([])	Press	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).	
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 a 2-tone code one at a time.	Selects a system one at a time.
	Hold Down	Selects a 2-tone code continuously.	Selects systems 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 2-tone code registered in the list.	Directly selects a system registered in the list.
[*]	Press	Transmits after aborting the current mode.	Confirms the configuration and then aborts the current 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.	

^{*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)	Receiving an Individual Call (Individual Call Acknowledge Request) Placing the Transceiver in Emergency Mode Using the Lone Worker Function Using the Activity Detection Function to Place the Transceiver in Emergency Mode Scanning in One Zone (Single Scan) Scan by Registering Multiple Target Channels for Scan in the List (List 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 Using the Activity Detection Function to Place the Transceiver in Emergency Mode Scanning in One Zone (Single Scan) Scan by Registering Multiple Target Channels for Scan in the List (List Scan) Scanning the Specific Channel Preferentially (Priority Scan)
Key Beep C	3 beeps  1630 Hz (50 ms)	Secure Cryptographic Module (SCM) (for AES/ DES Only) Scanning the Specific Channel Preferentially (Priority Scan)
Key-entry Error Tone	1 beep  700 Hz (50 ms)	Transceiver's Behavior when Using the Regroup ID 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)	Control Channel Hunt (Control Channel Hunt)
Out of Range Tone	1 beep  770 Hz (400 ms)	Out of Range Indicator
In-service Tone	3 beeps  770 Hz (50 ms)	Out of Range Indicator

Tone Name	Pattern	Reference
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) Initiating an Individual Call (Transmission Trunked) 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) Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) Making a Group Call (Transmission Trunked) Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced)) Making an Informative Group Call (Broadcast Group Call)
Call In Progress Tone	2 beeps  980 Hz (100 ms)	Receiving an Individual Call (Individual Call Acknowledge Request) Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced))
Disconnect Indication Tone	2 beeps  980 Hz (300 ms) 490 Hz (300 ms)	Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced))
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) Receiving an Individual Call (Individual Call Acknowledge Request) Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) PTT Hold Inhibit
TOT Pre-alert Tone	3 beeps  1630 Hz (50 ms)	Restricting the Continuous Transmission Duration (Time-out Timer) Restricting the Continuous Transmission Duration (Time-out Timer)
Busy Tone 2	3 beeps  940 Hz (150 ms)	Initiating an Individual Call (Transmission Trunked) Transparent Sending BLE Data Manually by Using a Key (Send the Location Data (Indoor Location))
Call Queue Tone	2 beeps  940 Hz (50 ms)	Initiating an Individual Call (Transmission Trunked)
System Busy Tone	3 beeps  440 Hz (200 ms)	Initiating an Individual Call (Transmission Trunked)
Call Invalid Tone	4 beeps  440 Hz (1 sec) 440 Hz (50 ms)	Initiating an Individual Call (Transmission Trunked)

Tone Name	Pattern	Reference
No Reply Tone	4 beeps  440 Hz (50 ms) 440 Hz (1 sec)	Initiating an Individual Call (Transmission Trunked)
Call Fail Tone	2 beeps  440 Hz (50 ms) 440 Hz (1 sec)	Initiating an Individual Call (Transmission Trunked)
Call Deny Tone	3 beeps  440 Hz (200 ms) 440 Hz (80 ms) 440 Hz (900 ms)	Receiving an Individual Call (Individual Call Acknowledge Request)
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-registration Invalid Tone	2 beeps  440 Hz (50 ms)	Registering the Group ID Used by the Own Transceiver in a System (Group-registration)
Call Processing Tone	2 beeps  940 Hz (50 ms)	Receiving an Individual Call (Individual Call Acknowledge Request) Notifying the User with a Tone That a Call Request Is in Progress (Call Processing Tone) Initiating an Individual Call (Transmission Trunked) 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) Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) Making a Group Call (Transmission Trunked) Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced)) Making an Informative Group Call (Broadcast Group Call)
Network Failure Tone A	2 beeps  620 Hz (100 ms) 930 Hz (100 ms)	Transceiver Behavior in the Case that the Site Fails to Connect to the Network (Network Failure)
Network Failure Tone B	1 beep  1630 Hz (1 sec)	Transceiver Behavior in the Case that the Site Fails to Connect to the Network (Network Failure)
Man-down Pre-alert Tone	1 beep  1630 Hz (50 ms)	Man-down Detection

Tone Name	Pattern	Reference
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)

● Locator Tone

Tone Name	Pattern	Reference
Emergency Locator Tone	2 beeps  1630 Hz (90 ms) 940 Hz (90 ms)	Placing the Transceiver in Emergency Mode

● Sidetone

Tone Name	Pattern	Reference
Proceed Tone	3 beeps  1000 Hz (20 ms)	Making an Individual Call Receiving an Individual Call (Individual Call Acknowledge Request) Making a Group Call Making an Individual Call (Transmission Trunked) 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) Initiating an Individual Call After Ensuring That the Target Party Is Available for Communications (Message Trunked (Enhanced)) Making a Group Call (Transmission Trunked) Making a Group Call with the Link to a Traffic Channel Retained (Message Trunked (Enhanced)) Making an Informative Group Call (Broadcast 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
PTT Release Tone	1 beep  1397 Hz (100 ms)	Making an Individual Call
Background Tone	1 beep  1630 Hz (50 ms)	Background Transmission

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