KENWOOD

TS-990S

PC CONTROL COMMAND
Reference Guide

JVCKENWOOD Corporation

PC CONTROL COMMAND REFERENCE GUIDE

ABOUT THIS REFERENCE GUIDE

All descriptions in this reference guide are for the user's convenience. **JVC KENWOOD Corporation** does not support nor warrant the applicability of this documentation in any way.

CONNECTING TO A PC

You can connect the TS-990S transceiver to a PC COM port using a RS-232C connector, to a USB port using a USB 2.0 (AB type) cable, or to a LAN port

Through the transceiver menu, select a baud rate for communications between the PC and the transceiver.

■ Using a RS-232C Straight Cable

Directly connect the RS-232C straight cable between the COM port of the PC and the COM terminal of the transceiver.

■ Using a USB Cable

When using a USB cable, you must first pre-install a virtual COM port driver on the PC. Then, connect the USB cable A connector to the USB port of the PC and the B connector the USB terminal of the transceiver.

Note: No warranty for the operation is granted when connecting through a USB hub.

■ Using a LAN Cable

When connecting the TS-990S and a PC using a hub, connect them with a straight LAN cable. When connecting the TS-990S directly to a PC, connect them with a cross LAN cable.

LAN COMMUNICATION PROCEDURES

1. Through the LAN menu of the transceiver, set the various IP addresses and your user ID and password.
2. Set the TCP/IP using the PC.
3. Send the ##CN command from the PC to connect with the transceiver.
4. When a connection response comes from the transceiver, send the ##ID command to transmit your user ID and password.
5. If the transmitted ID and password are authenticated with those set up in the transceiver, the connection is completed.

Note: If there are no communications for 10 seconds, the TCP/IP connection with the transceiver is terminated.

COM/ USB-B (VIRTUAL COM) CONNECTOR

Entry	Specifications
Protocol	UART (RS-232C)
Baud Rate	Selectable from 4800/ 9600/ 19200/ 38400/ 57600/ 115200 bps
Start Bit	1
Data Bit	8
Stop Bit	1 (2 is available only when using 4800 bps)
Parity Bit	None
Flow Control	Hardware flow control is possible

LAN CONNECTOR

Entry	Specifications
Protocol	TCP/IP
Character Encoding Mode	UTF-16

CHARACTER CODING

Character coding is based on the ASCII code. However, the letters assigned to 80h ~ FFh are replaced as follows by Menu 9-01 (Keyboard Language):

Menu 9-01 Setting	Character Coding
Japanese	ISO-2022-JP
Other than Japanese	ISO-8859-1

AI (AUTO INFORMATION) FUNCTION

The AI (Auto Information) function automatically outputs contents of commands whenever various states of the transceiver changes.

For example, the frequency information of the main band is automatically output to the PC with the FA command when you change the operating frequency of the main band. It is not necessary to first send a read command from the PC. Besides the frequency of the main band, almost all changes of state of the transceiver are automatically output with each command.

Using this function, you can see the state of the transceiver on a PC in real time. This is useful when making an application using log management software.

Turn this function on using the AI command (the initial state is OFF).

CONTROL OPERATION

Most computers handle data in the form of “bits” and “bytes”. A bit is the smallest piece of information a computer can handle. A byte is composed of eight bits. This is the most convenient form for most computer data. This data may be sent in the form of either serial or parallel data strings. The parallel method is faster but more complicated, while the serial method is slower and requires less complicated equipment. The serial form is, therefore, a less expensive alternative.

Serial data transmission uses time-division methods over a single line. Using a single line also offers the advantage of reducing the number of errors due to line noise.

Theoretically, only three lines are required to control the transceiver via the computer:

- Transmit data
- Receive data
- Ground

However, from a practical standpoint, it is also necessary to incorporate some means of controlling when this data transfer will occur. The computer and transceiver cannot be allowed to send data at the same time! The required control is achieved by using the RTS and CTS lines.

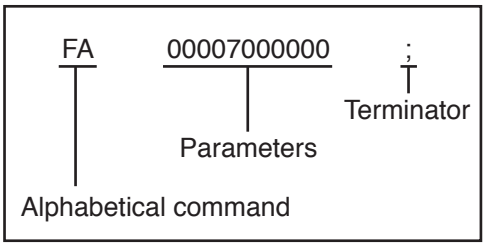
For example, the transceiver is placed into the transmit mode whenever the character string “TX;” is sent from the computer. The character string “TX;” is called a computer control command; it tells the transceiver what to do. There are numerous commands available for control of the transceiver. These commands may be incorporated into a computer program written in any high level language. Programming methods vary from computer to computer; refer to the instruction manuals provided with the terminal program and computer.

COMPUTER CONTROL COMMANDS

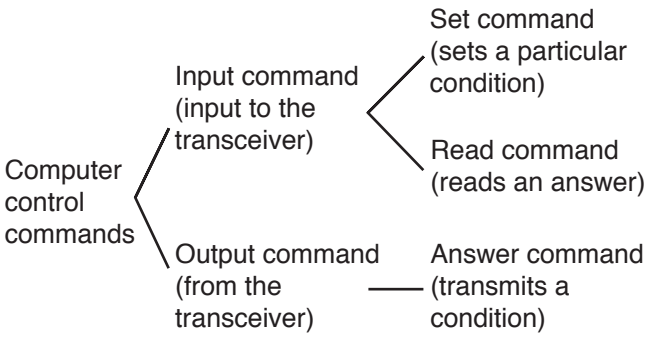
Note: PC control commands will not be available when “MSQ/PKS Pin Assignment (COM Connector)” from the Advanced Menu is set to “On”.

A computer control command is composed of a 2-letter alphabetical command-name, a set of parameters, and the terminator that signals the end of the command.

Example: Command to set the Main Band VFO to 7 MHz



Commands can be classified as shown below:



For example, note the following in the case of the above FA command (Frequency of the Main Band VFO):

- To set the frequency to 7 MHz, the following command is sent from the computer to the transceiver:
  “FA00007000000;” **(Set command)**
- To read the frequency of VFO A, the following command is sent from the computer to the transceiver:
  “FA;” **(Read command)**
- When the Read command above has been sent, the following command is returned to the computer:
  “FA00007000000;” **(Answer command)**

Note:

- Do not use the control characters 00 to 1Fh since they are either ignored or cause a “?” answer.
- Program execution may be delayed while turning the **Tuning** control rapidly.
- Receive data is not processed if the frequency is entered from the keypad.
- When Power-Saving Mode is ON, you cannot start up the transceiver using a PC command.
- When a PC command is used, the timer for the Automatic Power Off is reset.
- When a PC command is used, the timer for the Screen Saver is reset.

■ Command

A command consists of 2 characters. You may use either lower or upper case characters. The commands available for this transceiver are listed in the PC Control Command Tables, beginning on page 4.

■ Parameters

Parameters are used to specify information necessary to implement the desired command. The parameters to be used for each command are predetermined. The number of digits assigned to each parameter is also predetermined. Refer to the PC Control Command Tables {page 4} to configure the appropriate parameters.

When configuring parameters, be sure not to make the following mistakes.

Correct parameter example: “IS+1000;”

IS1000;	Not enough parameters specified (No direction given for the IF shift)
IS+100;	Not enough digits (Only three frequency digits given)
IS_+_1000;	Unnecessary characters (spaces) between parameters
IS+10000;	Too many digits (Five frequency digits given)

■ Terminator

To signal the end of a command, it is necessary to use a semicolon (;). The digit where this special character must appear differs depending on the command used.

■ Error Messages

In addition to the Answer command, the transceiver can send the error messages listed below.

Error Message	Reason for Error
?;	• Command syntax was incorrect. • Command was not executed due to the current status of the transceiver (even though the command syntax was correct). **Note:** Occasionally, this message may not appear due to microprocessor transients in the transceiver.
E;	A communication error occurred, such as an overrun or framing error during a serial data transmission.
O;	Receive data was sent but processing was not completed.

PC CONTROL COMMAND TABLES

AC — Antenna Tuner

	1	2	3	4	5	6	7	8	9	10
Set	A	C	P1	P2	P3	;				
Read	A	C	;							
Answer	A	C	P1	P2	P3	;				

Parameters:
P1
0: RX-AT THRU
1: RX-AT IN
(This parameter is invalid during the Setting command. Always enter 1.)
P2
0: TX-AT THRU
1: TX-AT IN
P3
0: Stop Tuning/ Tuning is inactive
1: Start Tuning/ Tuning is active

- The RX AT circuit sets when the EX command is received.
- To begin tuning, use command “AC111;”.

AG — AF Control

	1	2	3	4	5	6	7	8	9	10
Set	A	G	P1	P2	P2	P2	;			
Read	A	G	P1	;						
Answer	A	G	P1	P2	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
000 ~ 255

AI — Auto Information

	1	2	3	4	5	6	7	8	9	10
Set	A	I	P1	;						
Read	A	I	;							
Answer	A	I	P1	;						

Parameters:
P1
0: AI OFF
1: Not used
2: AI ON
3: Not used

- When AI is ON, the respective response command is sent when the parameter is changed by the command with the response command.
- AI turns OFF when the transceiver power is turned OFF.

AM — Auto Mode

	1	2	3	4	5	6	7	8	9	10
Set	A	M	P1	;						
Read	A	M	;							
Answer	A	M	P1	;						

Parameters:
P1
0: AM OFF
1: AM ON

AN0 Antenna Selection

	1	2	3	4	5	6	7	8	9	10
Set	A	N	0	P1	P2	P3	P4	;		
Read	A	N	0	;						
Answer	A	N	0	P1	P2	P3	P4	;		

Parameters:
P1
0: Main Band
1: Sub Band
P2
1: ANT1
2: ANT2
3: ANT3
4: ANT4
9: No change (setting command only)
P3
0: RX ANT is not used
1: RX ANT is used
9: No change (setting command only)
P4
0: Drive Out OFF
1: Drive Out ON
9: No change (setting command only)

- When setting the command, enter only the parameters you are changing. For parameters you are not changing, enter "9".
- For a response command, parameter P2, P3, and P4 cannot be "9".

AN1 Antenna Name

	1	2	3	4	5	6	7	8	9	10
Set	A	N	1	P1	P2	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	;									
Read	1	2	3	4	5	6	7	8	9	10
	A	N	1	P1	;					
Answer	1	2	3	4	5	6	7	8	9	10
	A	N	1	P1	P2	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	;									

Parameters:
P1
1 ~ 4: Antenna Number
P2
Always a space
P3
String of alphanumeric characters for the Antenna Name (up to 5 characters)

AP0 Audio Peak Filter

	1	2	3	4	5	6	7	8	9	10
Set	A	P	0	P1	P2	;				
Read	A	P	0	P1	;					
Answer	A	P	0	P1	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
1: APF OFF
2: APF ON

AP1 Audio Peak Filter Shift

	1	2	3	4	5	6	7	8	9	10
Set	A	P	1	P1	P2	P2	;			
Read	A	P	1	P1	;					
Answer	A	P	1	P1	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
00 ~ 80
(40 is the center (CW pitch frequency). 00 represents a –200 Hz shift and 80 represents a +200 Hz shift from center. Each step represents a 5 Hz shift. Entering a value of 99 results in the initial value being entered.)

AP2 Audio Peak Filter Pass Bandwidth

	1	2	3	4	5	6	7	8	9	10
Set	A	P	2	P1	P2	;				
Read	A	P	2	P1	;					
Answer	A	P	2	P1	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: NAR
1: MID
2: WIDE
(Entering a value of 9 results in the initial value being entered.)

AS0 Auto Mode Frequency Division Registration

	1	2	3	4	5	6	7	8	9	10
Set	A	S	0	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P1	P1	P1	P2	;				

Parameters:
P1
11-digit Frequency in Hz (unused digits must be 0)
P2 (Mode (refer to the P2 parameter of the OM command))

- You can set a maximum of 32 divisions.

AS1 Number of Auto Mode Frequency Divisions

	1	2	3	4	5	6	7	8	9	10
Read	A	S	1	;						
Answer	A	S	1	P1	P1	;				

Parameters:
P1
01 ~ 32

AS2 Auto Mode Frequency Division Readout

	1	2	3	4	5	6	7	8	9	10
Read	A	S	2	P1	P1	;				
Answer	A	S	2	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P1	P2	P2	P2	P3	;		

Parameters:
P1
00 ~ 31: Frequency division number
P2
11 digit displayed frequency (for example, 14.175 MHz is displayed as 00014175000)
P3 (Mode (refer to the P2 parameter of the OM command))

- If the selected frequency division has no information, P2 and P3 are all set to “0”.
- While the Auto Information (AI) function is ON, this command will not automatically respond.

AS3 Deleting an Auto Mode Frequency Division

	1	2	3	4	5	6	7	8	9	10
Set	A	S	3	P1	P1	;				

Parameters:
P1
00 ~ 31: Frequency division number to be deleted

- If there is only 1 frequency division available, it cannot be deleted.

BC Beat Cancel

	1	2	3	4	5	6	7	8	9	10
Set	B	C	P1	P2	;					
Read	B	C	P1	;						
Answer	B	C	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Beat Cancel OFF
1: Beat Cancel 1 ON
2: Beat Cancel 2 ON

BD / BU

Frequency Band Selection (Setting 1) / [UP]/[DOWN] Operating (Setting 2)

	1	2	3	4	5	6	7	8	9	10
Set 1	B	D / U	P1	P2	P2	;				
Set 2	B	D / U	;							
Read	B	D / U	P1	;						
Answer	B	D / U	P1	P3	;					

Parameters:
P1
0: Main Band
1: Sub Band
(This parameter is invalid during the Setting command; the operating band is always selected. Enter any value.)
P2 (Band Number)
00: 1.8 MHz band
01: 3.5 MHz band
02: 7 MHz band
03: 10 MHz band
04: 14 MHz band
05: 18 MHz band
06: 21 MHz band
07: 24 MHz band
08: 28 MHz band
09: 50 MHz band
10: GEN1
11: GEN2
P3
1 ~ 5: Band memory number
(0 is returned when the frequency range does not support the band memory.)

- When changing the band memory of the same frequency band, appoint the same band direct number for the setting 1 command.
- Using BU; as the setting 2 command performs the same operation as pressing [UP], and using BD; as the setting 2 command performs the same operation as pressing [DOWN].
- When the AI function automatically responds, the BU; command responds.

BI

Break-in

	1	2	3	4	5	6	7	8	9	10
Set	B	I	P1	;						
Read	B	I	;							
Answer	B	I	P1	;						

Parameters:
P1
0: Break-in Off
1: Semi Break-in
2: Full Break-in

- Settings can only be performed in CW mode.
- “0” is returned when reading in any mode other than CW mode.

BP

Notch Control

	1	2	3	4	5	6	7	8	9	10
Set	B	P	P1	P2	P2	P2	;			
Read	B	P	;							
Answer	B	P	P1	P2	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
000 (minimum) ~ 127 (maximum)
(Turning the Notch knob fully to the left selects 000 and turning it fully to the right selects 127.)

- When manual notch function is ON, the Notch knob reflects the notch frequency. When the band eliminator function is ON, the Notch knob reflects the center frequency of the eliminated band.

BS0

Scope Image ON/OFF

	1	2	3	4	5	6	7	8	9	10
Set	B	S	0	P1	;					
Read	B	S	0	;						
Answer	B	S	0	P1	;					

Parameters:
P1
0: Scope Display OFF
1: Scope Display ON

- In some cases, the scope image may be used by another display, but the response will remain the same.

BS1 Scope Image Type

	1	2	3	4	5	6	7	8	9	10
Set	B	S	1	P1	;					
Read	B	S	1	;						
Answer	B	S	1	P1	;					

Parameters:
P1
0: Bandscope
1: Bandscope with Waterfall
2: Audio Scope

- There are times when the transceiver screen display cannot be changed (corresponding to the operating conditions of the [SCP] key).
- In some cases, the scope display may be temporarily displaying a different screen. However, the response does not change, even in that case.

BS2 Bandscope Object

	1	2	3	4	5	6	7	8	9	10
Set	B	S	2	P1	;					
Read	B	S	2	;						
Answer	B	S	2	P1	;					

Parameters:
P1
0: Main Band
1: Sub Band

BS3 Bandscope Operation Mode

	1	2	3	4	5	6	7	8	9	10
Set	B	S	3	P1	;					
Read	B	S	3	;						
Answer	B	S	3	P1	;					

Parameters:
P1
0: Center Mode
1: Fixed Mode (without auto scroll)
2: Fixed Mode (with auto scroll)

- The operation of 2 is supported from the firmware version 1.08

BS4 Bandscope Span (Center Mode)

	1	2	3	4	5	6	7	8	9	10
Set	B	S	4	P1	;					
Read	B	S	4	;						
Answer	B	S	4	P1	;					

Parameters:
P1
0: ±2.5 kHz
1: ±5 kHz
2: ±10 kHz
3: ±25 kHz
4: ±50 kHz
5: ±100 kHz
6: ±250 kHz
(Entering a value of 9 results in the initial value being entered.)

BS5 Bandscope Lower/Upper Frequency Limit (Fixed Mode)

	1	2	3	4	5	6	7	8	9	10
Read	B	S	5	;						
Answer	B	S	5	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P2	P2	P2	P2	P2	P2	P2	P2	;

Parameters:
P1 (Lower Limit Frequency)
8 digit frequency in Hz (unused digits must be 0)
P2 (Upper Limit Frequency)
8 digit frequency in Hz (unused digits must be 0)

BS6 Bandscope Display Pause

	1	2	3	4	5	6	7	8	9	10
Set	B	S	6	P1	;					
Read	B	S	6	;						
Answer	B	S	6	P1	;					

Parameters:
P1
0: Pause OFF
1: Pause ON

BS7 Bandscope Marker

	1	2	3	4	5	6	7	8	9	10
Set	B	S	7	P1	;					
Read	B	S	7	;						
Answer	B	S	7	P1	;					

Parameters:
P1
0: Scope object receive frequency only
1: Scope object receive frequency and non-scope object receive frequency
2: Scope object receive and transmit frequency
3: Scope object receive frequency and non-scope object receive and transmit frequency

BS8 Bandscope Attenuator

	1	2	3	4	5	6	7	8	9	10
Set	B	S	8	P1	;					
Read	B	S	8	;						
Answer	B	S	8	P1	;					

Parameters:
P1
0: OFF
1: 10 dB
2: 20 dB
3: 30 dB

BS9 Bandscope Max Hold

	1	2	3	4	5	6	7	8	9	10
Set	B	S	9	P1	;					
Read	B	S	9	;						
Answer	B	S	9	P1	;					

Parameters:
P1
0: OFF
1: ON

BSA Bandscope Display Averaging

	1	2	3	4	5	6	7	8	9	10
Set	B	S	A	P1	;					
Read	B	S	A	;						
Answer	B	S	A	P1	;					

Parameters:
P1
0: OFF
1: Level 1
2: Level 2
3: Level 3

BSB Bandscope With Waterfall Display Speed

	1	2	3	4	5	6	7	8	9	10
Set	B	S	B	P1	;					
Read	B	S	B	;						
Answer	B	S	B	P1	;					

Parameters:
P1
1 ~ 3

BSC Bandscope Reference Display Level

	1	2	3	4	5	6	7	8	9	10
Set	B	S	C	P1	P1	P1	;			
Read	B	S	C	;						
Answer	B	S	C	P1	P1	P1	;			

Parameters:
P1
000 ~ 080
(000 represents –20 dB, 040 represents 0 dB, and 080 represents +20 dB. Each step represents 0.5 dB.)

BSD — Bandscope Waterfall Display Clear

	1	2	3	4	5	6	7	8	9	10
Set	B	S	D	;						
Answer	B	S	D	;						

Parameters:
No parameters are used with this command.

- When the AI function is ON, the waterfall display clear timing is returned as a response.

BSE — Bandscope Range Shift (Marker is moved to the center zone with Fixed mode)

	1	2	3	4	5	6	7	8	9	10
Set	B	S	E	;						

Parameters:
No parameters are used with this command.

- Only valid during FIX mode.

BSF — Audio Scope Sound Generator Selection

	1	2	3	4	5	6	7	8	9	10
Set	B	S	F	P1	;					
Read	B	S	F	;						
Answer	B	S	F	P1	;					

Parameters:
P1
0: Main Band Reception Sound
1: Sub Band Reception Sound

BSG — Audio Scope Antenna

	1	2	3	4	5	6	7	8	9	10
Set	B	S	G	P1	;					
Read	B	S	G	;						
Answer	B	S	G	P1	;					

Parameters:
P1
0: 0 dB
1: 10 dB
2: 20 dB
3: 30 dB

BSH — Audio Scope Span (Audio Scope)

	1	2	3	4	5	6	7	8	9	10
Set	B	S	H	P1	;					
Read	B	S	H	;						
Answer	B	S	H	P1	;					

Parameters:
P1
0: 3 kHz
1: 8 kHz

BSI — Oscilloscope Level

	1	2	3	4	5	6	7	8	9	10
Set	B	S	I	P1	;					
Read	B	S	I	;						
Answer	B	S	I	P1	;					

Parameters:
P1
0: 0 dB
1: -10 dB
2: -20 dB
3: -30 dB

BSJ — Oscilloscope Sweep Time

	1	2	3	4	5	6	7	8	9	10
Set	B	S	J	P1	;					
Read	B	S	J	;						
Answer	B	S	J	P1	;					

Parameters:
P1
0: 1 ms
1: 3 ms
2: 10 ms
3: 30 ms
4: 100 ms
5: 300 ms

BY — BUSY LED Status

	1	2	3	4	5	6	7	8	9	10
Read	B	Y	;							
Answer	B	Y	P1	P2	;					

Parameters:
P1 (Main Band)
0: BUSY LED Off
1: BUSY LED lit
P2 (Sub Band)
0: BUSY LED Off
1: BUSY LED lit

CA — CW Auto Tune

	1	2	3	4	5	6	7	8	9	10
Set	C	A	P1	P2	;					
Read	C	A	P1	;						
Answer	C	A	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Pauses CW Auto Tune/ Inactive
1: Starts CW Auto Tune/ Active

CB — Operating Band

	1	2	3	4	5	6	7	8	9	10
Set	C	B	P1	;						
Read	C	B	;							
Answer	C	B	P1	;						

Parameters:
P1
0: Main Band
1: Sub Band

CG — CAR Control

	1	2	3	4	5	6	7	8	9	10
Set	C	G	P1	P1	P1	;				
Read	C	G	;							
Answer	C	G	P1	P1	P1	;				

Parameters:
P1
000 (minimum) ~ 255 (maximum)

CH — MULTI/CH Control

	1	2	3	4	5	6	7	8	9	10
Set	C	H	P1	;						

Parameters:
P1
0: Move the MULTI/CH control up for 1 step
1: Move the MULTI/CH control down for 1 step

CK0 Clock (Local Clock Date and Time)

	1	2	3	4	5	6	7	8	9	10
Set	C	K	0	P1	P1	P2	P2	P3	P3	P4
	11	12	13	14	15	16	17	18	19	20
	P4	P5	P5	;						
Read	1	2	3	4	5	6	7	8	9	10
	C	K	0	;						
Answer	1	2	3	4	5	6	7	8	9	10
	C	K	0	P1	P1	P2	P2	P3	P3	P4
	11	12	13	14	15	16	17	18	19	20
	P4	P5	P5	;						

Parameters:
P1
12 ~ 99: Year
P2
01 ~ 12: Month
P3
01 ~ 31: Day
P4
00 ~ 23: Hour
P5
00 ~ 59: Minute

(You cannot use this command to perform the setting while the automatic retrieval setting by the NTP is ON.)

CK1 Clock (Setting Situation of the Local Clock Date and Time)

	1	2	3	4	5	6	7	8	9	10
Read	C	K	1	;						
Answer	C	K	1	P1	;					

Parameters:
P1
0: Not set
1: Set

CK2 Clock (Local Clock Time Zone)

	1	2	3	4	5	6	7	8	9	10
Set	C	K	2	P1	P1	P1	;			
Read	C	K	2	;						
Answer	C	K	2	P1	P1	P1	;			

Parameters:
P1
000 ~ 112
(Each step represents 15 minutes, where 000 is –14:00, 056 is +00:00 and 112 is +14:00)

CK3 Clock (Time Zone of 2nd Clock)

	1	2	3	4	5	6	7	8	9	10
Set	C	K	3	P1	P1	P1	;			
Read	C	K	3	;						
Answer	C	K	3	P1	P1	P1	;			

Parameters:
P1
000 ~ 112
(Each step represents 15 minutes, where 000 is –14:00, 056 is +00:00 and 112 is +14:00)

CK4 Clock (Identification Character of 2nd Clock)

	1	2	3	4	5	6	7	8	9	10
Set	C	K	4	P1	;					
Read	C	K	4	;						
Answer	C	K	4	P1	;					

Parameters:
P1
1 character

CK5 Clock (Date Format)

	1	2	3	4	5	6	7	8	9	10
Set	C	K	5	P1	;					
Read	C	K	5	;						
Answer	C	K	5	P1	;					

Parameters:
P1
0: MM/DD/YY
1: DD/MM/YY
2: YY/MM/DD

CK6 Clock (Automatic Date/Time Retrieval)

	1	2	3	4	5	6	7	8	9	10
Set	C	K	6	P1	;					
Read	C	K	6	;						
Answer	C	K	6	P1	;					

Parameters:
P1
0: OFF
1: ON

(You must first set up an NTP server address in order to turn this function ON.)

CK7 Clock (NTP Server Address)

	1	2	3	4	5 ~ 55	56	57	58	59
Set	C	K	7	P1	P2	;			
Answer	C	K	7	P1	P2	;			

	1	2	3	4	5	6	7	8	9	10
Read	C	K	7	;						

Parameters:
P1
Always a space
P2
NTP Server Address (up to 50 characters)

(When the configuration command is sent with P2 being blank, the configuration contents of the NTP server address are deleted and the automatic date/time retrieval is automatically turned OFF.)

CK8 Clock

	1	2	3	4	5	6	7	8	9	10
Set	C	K	8	;						

Parameters:
No parameters are used with this command.

- The clock is acquisitioned from the NTP server.

CM0 Registration of CW Message (Paddle Input)

	1	2	3	4	5	6	7	8	9	10
Set	C	M	0	P1	;					
Read	C	M	0	;						
Answer 1	C	M	0	0	;					
Answer 2	C	M	0	P1	P2	P2	P2	;		

Parameters:
P1
0: Non-operational/ Operation ended • End of standby
1: Storing CH1/ Standby
2: Storing CH2/ Standby
3: Storing CH3/ Standby
4: Storing CH4/ Standby
5: Storing CH5/ Standby
6: Storing CH6/ Standby
7: Storing CH7/ Standby
8: Storing CH8/ Standby
P2
000 ~ 100: Progress (%)
(While waiting for registration, P2 is 000.)

- During in operation, the first response is output. While registering or during standby, the second response is output.
- When the “CW Message Entry” menu is set to “Text String”, you cannot use this command.

CM1 Play/Stop the CW Message

	1	2	3	4	5	6	7	8	9	10
Set	C	M	1	P1	;					
Read	C	M	1	;						
Answer	C	M	1	P1	P2	;				

Parameters:
P1
0: Non-operational/ Stop Playback
1: Playing/Start CH1
2: Playing/Start CH2
3: Playing/Start CH3
4: Playing/Start CH4
5: Playing/Start CH5
6: Playing/Start CH6
7: Playing/Start CH7
8: Playing/Start CH8
P2 (Repeat Playback)
0: Non-operational/ During Playback
1: Awaiting Repeat Playback (Repeat interval count)

CM2 Register Status of CW Message (Paddle Input)

	1	2	3	4	5	6	7	8	9	10
Read	C	M	2	P1	;					
Answer	C	M	2	P1	P2	;				

Parameters:
P1
1 ~ 8: CW Message Channel
P2
0: Not Stored
1: Stored

- When the “CW Message Entry” menu is set to “Text String”, you cannot use this command.

CM3 Clear the CW Message (Paddle Input)

	1	2	3	4	5	6	7	8	9	10
Set	C	M	3	P1	;					

Parameters:
P1
1 ~ 8: CW Message Channel

- When the AI function is ON, the CM2 command will notify you when an entry is deleted.
- When the “CW Message Entry” menu is set to “Text String”, you cannot use this command.

CM4 CW Message Memory Name (Paddle Input)

	1	2	3	4	5	6	7	8	9	10
Set	C	M	4	P1	P2	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3
	21	22	23	24	25	26	27	28	29	30
	P3	P3	P3	P3	P3	;				
Read	1	2	3	4	5	6	7	8	9	10
	C	M	4	P1	;					
Answer	1	2	3	4	5	6	7	8	9	10
	C	M	4	P1	P2	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3
	21	22	23	24	25	26	27	28	29	30
	P3	P3	P3	P3	P3	;				

Parameters:
P1
1 ~ 8: CW Message Channel
P2
Always a space
P3
Name (up to 20 characters)

- When the “CW Message Entry” menu is set to “Text String”, you cannot use this command.

CM5 Registering the CW Message Memory (Text Input)

	1	2	3	4	5	6 ~ 55	56	57	58
Set	C	M	5	P1	P2	P3	;		

	1	2	3	4	5	6	7	8	9	10
Read	C	M	5	P1	;					

	1	2	3	4	5	6 ~ 55	56	57	58
Answer	C	M	5	P1	P2	P3	;		

Parameters:
P1
1 ~ 8: CW Message Channel
P2
Always a space
P3
Message (up to 50 characters)

- When the “CW Message Entry” menu is set to “Paddle”, you cannot use this command.

CM6 CW Message Channel Repeat

	1	2	3	4	5	6	7	8	9	10
Set	C	M	6	P1	P2	;				
Read	C	M	6	P1	;					
Answer	C	M	6	P1	P2	;				

Parameters:
P1
1 ~ 8: CW Message Channel
P2
0: Repeat OFF
1: Repeat ON

- This setting cannot be configured for channels that have not been registered.

CM7 Contest Number

	1	2	3	4	5	6	7	8	9	10
Set	C	M	7	P1	;					
Read	C	M	7	P1	;					
Answer	C	M	7	P2	P2	P2	P2	;		

Parameters:
P1
0: Decrementing Numbers
P2
0000 ~ 9999: Contest Number

CN CTCSS frequency

	1	2	3	4	5	6	7	8	9	10
Set	C	N	P1	P2	P2	;				
Read	C	N	;							
Answer	C	N	P1	P2	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2 (CTCSS frequency)

P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)
00	67.0	13	103.5	26	159.8	39	199.5
01	69.3	14	107.2	27	162.2	40	203.5
02	71.9	15	110.9	28	165.5	41	206.5
03	74.4	16	114.8	29	167.9	42	210.7
04	77.0	17	118.8	30	171.3	43	218.1
05	79.7	18	123.0	31	173.8	44	225.7
06	82.5	19	127.3	32	177.3	45	229.1
07	85.4	20	131.8	33	179.9	46	233.6
08	88.5	21	136.5	34	183.5	47	241.8
09	91.5	22	141.3	35	186.2	48	250.3
10	94.8	23	146.2	36	189.9	49	254.1
11	97.4	24	151.4	37	192.8		
12	100.0	25	156.7	38	196.6	99	to default

(Entering a value that does not exist is invalid. 99 is a setting command only.)

DD0 Scope Display Data Output Control (Bandscope Display Information Setting)

	1	2	3	4	5	6	7	8	9	10
Set	D	D	0	P1	;					
Read	D	D	0	;						
Answer	D	D	0	P1	;					

Parameters:
P1
0: No Output
1: High-Speed Output (for LAN connection)
2: Low-Speed Output (for COM connection)
(High-speed output and low-speed output cannot be used simultaneously.)

DD1 Scope Display Data Output Control (Sub-Scope Display Information Setting)

	1	2	3	4	5	6	7	8	9	10
Set	D	D	1	P1	;					
Read	D	D	1	;						
Answer	D	D	1	P1	;					

Parameters:
P1
0: No Output
1: High-Speed Output (for LAN connection)
2: Low-Speed Output (for COM connection)
(High-speed output and low-speed output cannot be used simultaneously.)

DD2 Display Data Output Control (Bandscope Display Information)

	1	2	3	4	5	6 ~ 45	46	47	48
Answer	D	D	2	P1	P1	P2	;		

Parameters:
P1
00 ~ 31: Split Number
P2
Bandscope Spectrum Display Information (40 digits)
20 spectrum information are each expressed as 2 ASCII digits.
Two digits of the beginning of division No. 00 are spectrum information of the left side, and two digits of the end of division No. 31 become the spectrum information of the right side.
The range of value for each spectrum information is from 00h ~ 8Ch (hexadecimal numbering).
00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 8Ch shows a state where the spectrum is not displayed (signal strength = -100 dB).
The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 8Ch, the order becomes “8”, “C”.

- When the AI functions sets the speed as low when using the DD0 command, it is output from division No. 00 to 31, sequentially.
- When the transceiver is not displaying the bandscope, it is not output.
- This command operates only at a baud rate of 115200 bps.
- It is possible to perform high-speed control using the ##DD2 command exclusively for a LAN.

DD3 Display Data Output Control (Subscope Display Information)

	1	2	3	4	5	6 ~ 44	45	46	47
Answer	D	D	3	P1	P1	P2	;		

Parameters:
P1
00 ~ 14: Split Number
P2
Subscope Spectrum Display Information (38 digits)
19 spectrum information are each expressed as 2 ASCII digits.
Two digits of the beginning of division No. 00 are spectrum information of the left side, and two digits of the end of division No. 14 become the spectrum information of the right side.
The range of value for each spectrum information is from 00h ~ 32h (hexadecimal numbering).
00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 32h shows a state where the spectrum is not displayed (signal strength = -50 dB).
The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 32h, the order becomes “3”, “2”.

- When the AI functions sets the speed as low when using the DD1 command, it is output from division No. 00 to 14, sequentially.
- When the transceiver is not displaying the subscope, it is not output.
- This command operates only at a baud rate of 115200 bps.
- It is possible to perform high-speed control using the ##DD3 command exclusively for a LAN.

DF ΔF Display

	1	2	3	4	5	6	7	8	9	10
Read	D	F	;							
Answer	D	F	P1	P2	P3	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P3	P3	P3	P3	P3	;		

Parameters:
P1
0: No ΔF Display Information
1: ΔF Display Information (during split mode or split frequency operation)
P2
0: Plus
1: Minus
(When P1 is 0, P2 also becomes 0.)
P3
11 digit frequency in Hz (enter unused digits as 0)
(When P1 is set to 0, all digits are returned as 0.)

DM0 Dimmer

	1	2	3	4	5	6	7	8	9	10
Set	D	M	0	P1	;					
Read	D	M	0	;						
Answer	D	M	0	P1	;					

Parameters:
P1
1 ~ 4: Dimmer Preset Number

DM1 Dimmer Adjustment

	1	2	3	4	5	6	7	8	9	10
Set	D	M	1	P1	P2	P3	P3	P3	;	
Read	D	M	1	P1	P2	;				
Answer	D	M	1	P1	P2	P3	P3	P3	;	

Parameters:
P1
1 ~ 4: Dimmer Preset Number
P2
0: Main Display
1: Sub Display
2: LED
P3
005 ~ 100: Dimmer Adjustment Value (In steps of 5. Values that are not in steps of 5 are rounded down.)
(Entering a value of 999 results in the initial value being entered.)

- Dimmer adjusted value 000 (back light off) for the Main and Sub screen is supported by dimmer preset number 4 only. (The value 000 is supported from the firmware version 1.08.)

DN / UP Microphone DWN/UP Switch Operation

	1	2	3	4	5	6	7	8	9	10
Set	D / U	N / P	P1	P1	;					

Parameters:
P1
00 ~ 99: Step Count

- If the parameter is skipped, the “DN;” and “UP;” commands will adjust by 1 step.
- When setting the parameter from 01 to 99, the frequency is adjusted by the specified step size.
- In Memory mode and Quick Memory mode, the command with no P1 parameter specified is treated as a Memory channel down (DN;) or up (UP;) command. With parameters, it is treated as the frequency down or up command.
- When setting the parameter to 00, the command is accepted, but no changes occur.

DP Sub-Display

	1	2	3	4	5	6	7	8	9	10
Set	D	P	P1	;						
Read	D	P	;							
Answer	D	P	P1	;						

Parameters:
P1
0: Single Frequency Display (enlargement OFF, dial display)
1: Single Frequency Display (enlargement ON, no dial display)
2: Dual Frequency Display (enlargement OFF, sub-scope)
3: Dual Frequency Display (enlargement OFF, no sub-scope)
4: X-Y Scope (only during RTTY communication screen display)
5: Vector scope (only during PSK communication screen display)

DS0 Screen Display State (Basic Screen)

	1	2	3	4	5	6	7	8	9	10
Set	D	S	0	P1	;					
Read	D	S	0	;						
Answer	D	S	0	P1	;					

Parameters:
P1
0: Standard
1: SWL Display Mode

DS1 Screen Display State (Function Configuration Screen)

	1	2	3	4	5	6	7	8	9	10
Read	D	S	1	;						
Answer	D	S	1	P1	P1	P1	;			

Parameters:
P1
000: No Setting Screen
001 ~ 002: Unused
003: Antenna Name Setting Screen
004: Preselector Setting Screen
005: AGC Setting Screen
006: Transmission Voice Input Sound Source Setting Screen
007: Transmission Output Limit Setting Screen
008: VOX Level Setting Screen
009: Speech Processor Effect Type Setting Screen
010: Transmission Filter Setting Screen
011 ~ 014: CW Message Screen
015: RTTY Communication Screen (Normal)
016 ~ 017: RTTY Message Screen
018: PSK Communication Screen (Normal)
019 ~ 020: PSK Message Screen
021: FM Tone Setting Screen
022: Reception Filter Setting Screen
023: Audio System Peak Filter Setting Screen
024: NB1 Level (Sub) Setting Screen
025: NB2 Level (Sub) Setting Screen
026: Auto Notch Tracking Speed Setting Screen
027: Band Eliminator Filter Setting Screen
028: NR1 Level (Sub) Setting Screen
029: NR2 Level (Sub) Setting Screen
030: Memory Channel Screen (Normal)
031: Program Scan Section Setting Screen
032: Program Slow Scan Point Setting Screen
033: Memory Scan Group Setting Screen
034: Voice Message Screen
035 ~ 037: Recording File Screen
038: Timer Setting Screen
039: Program Timer Setting Screen
040: Dimmer Setting Screen
041: NB2 (Main) Setting Screen
042 ~ 127: Unused
128: Reception Equalizer Screen
129: Reception Equalizer Adjustment Screen
130: Transmission Equalizer Screen
131: Transmission Equalizer Adjustment Screen
132: RTTY Communication Screen (Enlarged)
133: PSK Communication Screen (Enlarged)
134: Memory Channel List Screen (Enlarged)
135 ~ 159: Menu-Related Screen
160 ~ 163: File Selection Screen

- Various operations via commands may be limited, such as the panel operation of the main body, due to the state of the function setting screen.
- "041" is supported from the firmware version 1.10.

DS2 Screen Display State (Other)

	1	2	3	4	5	6	7	8	9	10
Read	D	S	2	;						
Answer	D	S	2	P1	;					

Parameters:
P1
0: Various edit screen display OFF
1: Frequency is being entered
2: Frequency entry log is being displayed
3: Channel number is being entered
4: Character string is being edited
5: Memory Channel is being registered

- During various character string editing, various operations by the command may be limited, such as panel operation of the transceiver during frequency entry, channel number entry, and memory channel registration.

DS3 End the Function Setting Screen

	1	2	3	4	5	6	7	8	9	10
Set	D	S	3	;						

Parameters:
No parameters are used with this command.

- The same transceiver behavior as when transceiver [ESC] is pressed.

DV — DATA VOX

	1	2	3	4	5	6	7	8	9	10
Set	D	V	P1	;						
Read	D	V	;							
Answer	D	V	P1	;						

Parameters:
P1
0: OFF
1: ACC2
2: USB Audio
3: Optical

EC — Main Band and Sub Band Frequency Information Exchange

	1	2	3	4	5	6	7	8	9	10
Set	E	C	;							

Parameters:
No parameters are used with this command.

EM — Emergency Communication Frequency Mode

	1	2	3	4	5	6	7	8	9	10
Set	E	M	;							

Parameters:
No parameters are used with this command.

- The transceiver switches to the Emergency frequency after sending this command. When using split operation, switching to Emergency also switches to simplex operation.
- This command is not available for E market versions (an error occurs).

EQR0 — Reception Equalizer

	1	2	3	4	5	6	7	8	9	10
Set	E	Q	R	0	P1	P2	;			
Read	E	Q	R	0	P1	;				
Answer	E	Q	R	0	P1	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Reception Equalizer OFF
1: Reception Equalizer ON

- The setting command is effective for the selected receive mode in the target band.

EQR1 — Reception Equalizer Effect

	1	2	3	4	5	6	7	8	9	10
Set	E	Q	R	1	P1	P2	;			
Read	E	Q	R	1	P1	;				
Answer	E	Q	R	1	P1	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: High Boost 1
1: High Boost 2
2: Format Pass
3: Bass Boost 1
4: Bass Boost 2
5: Flat
6: User 1
7: User 2
8: User 3

- The setting command is effective for the selected receive mode in the target band.
- Use the UR command for equalizing of the chosen effect.

EQR2 — Reception Equalizer Copy

	1	2	3	4	5	6	7	8	9	10
Set	E	Q	R	2	P1	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: User 1
1: User 2
2: User 3

- The adjustment contents in the effect which are currently being selected are copied first.

EQT0 Transmission Equalizer

	1	2	3	4	5	6	7	8	9	10
Set	E	Q	T	0	P1	;				
Read	E	Q	T	0	;					
Answer	E	Q	T	0	P1	;				

Parameters:
P1
0: OFF
1: ON

- The setting command is effective for the selected transmit mode.

EQT1 Transmission Equalizer Effect

	1	2	3	4	5	6	7	8	9	10
Set	E	Q	T	1	P1	;				
Read	E	Q	T	1	;					
Answer	E	Q	T	1	P1	;				

Parameters:
P1
0: High Boost 1
1: High Boost 2
2: Format Pass
3: Bass Boost 1
4: Bass Boost 2
5: Conventional
6: User 1
7: User 2
8: User 3

- The setting command is effective for the selected transmit mode.
- Use the UT command for equalizing of the chosen effect.

EQT2 Transmission Equalizer Copy

	1	2	3	4	5	6	7	8	9	10
Set	E	Q	T	2	P1	;				

Parameters:
P1
0: User 1
1: User 2
2: User 3

- The adjustment contents in the effect which are currently being selected are copied first.

EX Set or Read the Menu

	1	2	3	4	5	6	7	8	9	10
Set	E	X	P1	P2	P2	P3	P3	P4	P5	P5
	11	12	13	14	15	16	17	18	19	20
	P5	P5	P5	P5	P5	P5	P5	P5	P5	P5
	21	22	23	24	25	26	27	28	29	30
	P5	P5	P5	;						
Read	1	2	3	4	5	6	7	8	9	10
	E	X	P1	P2	P2	P3	P3	;		
Answer	1	2	3	4	5	6	7	8	9	10
	E	X	P1	P2	P2	P3	P3	P4	P5	P5
	11	12	13	14	15	16	17	18	19	20
	P5	P5	P5	P5	P5	P5	P5	P5	P5	P5
	21	22	23	24	25	26	27	28	29	30
	P5	P5	P5	;						

Parameters:
P1
0: Menu
1: Advanced Menu
P2
00 ~ 99: Category Number
(Entering a non-existing number causes an error to occur. Enter any value when using the Advanced Menu.)
P3
00 ~ 99: Entry Number
(Entering a non-existing number causes an error to occur. Entering a number that cannot be set also causes an error to occur.)
P4 (Configuration Classification)
Space: Normal Configuration (Response is always a space.)
9: Initializing
P5
String of alphanumeric characters for the Menu setting
(Entering a value larger than the size limit causes an error to occur.)

- Normally a 3-digit number (blank digits must be entered as 0).
- PF key settings use 4 digits (refer to the PF key allotment ID lists).
- Frequency settings use 8 digits (blank digits must be entered as 0).
- A power-on message can vary in length from 0 to 15 characters.
- Screen saver text can vary in length from 0 to 10 characters.

(Refer to the Menu tables below for the EX Command Parameter lists. Entering a value other than the listed values causes an error to occur.)

EX Command Parameter Lists

Menu											
P1	P2	P3	Function	P5							
				000	001	002	003	004	005	006 ~
0	00	00	Color Display Pattern (Main screen)	Type 1	Type 2	Type 3				
0	00	01	Color Display Pattern (Sub screen)	Type 1	Type 2	Type 3	Same as Main			
0	00	02	Font Style (Frequency display)	Font 1	Font 2	Font 3				
0	00	03	Dial Color Pattern	Type 1	Type 2					
0	00	04	Screen Saver	Off	Type 1	Type 2				
0	00	05	Screen Saver Wait Time	Preview (5 [sec])	5 [min]	15 [min]	30 [min]	60 [min]		
0	00	06	Screen Saver Message	Up to 10 alphanumeric characters						
0	00	07	Power-on Message	Up to 15 alphanumeric characters						
0	00	08	FM Mode S-meter Sensitivity	Low	High					
0	00	09	Meter Response Speed		1	2	3	4		
0	00	10	Meter Display Pattern	Type 1	Type 2	Type 3				
0	00	11	Meter Display Peak Hold	Off	On					
0	00	12	Long Press Duration of Panel Keys	200 [ms]	300 [ms]	400 [ms]	500 [ms]	600 [ms]	700 [ms]	Up to 2000 [ms] (in steps of 100)
0	00	13	Touchscreen Tuning	Off	On					
0	00	14	Operating Band (High/Low & Shift/Width Controls)	Main and Sub Bands	Main Band Only					
0	00	15	PF A: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	16	PF B: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	17	Voice (Main Band): Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	18	Voice (Sub Band): Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	19	External PF 1: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	20	External PF 2: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	21	External PF 3: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	22	External PF 4: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	23	External PF 5: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	24	External PF 6: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	25	External PF 7: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	26	External PF 8: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	27	Microphone PF 1: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	28	Microphone PF 2: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	29	Microphone PF 3: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	30	Microphone PF 4: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	31	Microphone Down: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	32	Microphone Up: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	33	Automatic Power Off	Off	60 [min]	120 [min]	180 [min]			
0	01	00	Beep Volume	Off	1	2	3	4	5	Up to 20 (in steps of 1)
0	01	01	Voice Message Volume (Play)	Off	1	2	3	4	5	Up to 20 (in steps of 1)
0	01	02	Sidetone Volume	Linked with monitor control	Off	1	2	3	4	Up to 20 (in steps of 1)
0	01	03	Voice Guidance Volume	Off	1	2	3	4	5	Up to 20 (in steps of 1)
0	01	04	Voice Guidance Speed		1	2	3	4		
0	01	05	User Interface Language (Voice Guidance & Messages)	English	Japanese					

Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	01	06	Automatic Voice Guidance	Off	On					
0	01	07	Headphones Mixing Balance	0	1	2	3	4	5	Up to 10 (in steps of 1)
0	01	08	Headphones Left/Right Reverse	Off	On					
0	02	00	FFT Scope Averaging (RTTY Decode)	0	1	2	3	4	5	Up to 9 (in steps of 1)
0	02	01	RX UOS	Off	On					
0	02	02	Newline Code	CR+LF	All					
0	02	03	Diddle	Off	Blank Code	Letters Code				
0	02	04	TX UOS	Off	On					
0	02	05	Automatic Newline Insertion	Off	On					
0	02	06	FSK Spacing	170 [Hz]	200 [Hz]	425 [Hz]	850 [Hz]			
0	02	07	FSK Keying Polarity	Off	On					
0	02	08	FSK Tone Frequency	1275 [Hz]	2125 [Hz]					
0	02	09	FFT Scope Averaging (PSK Decode)	0	1	2	3	4	5	Up to 9 (in steps of 1)
0	02	10	PSK AFC Tuning Range	±8 [Hz]	±15 [Hz]					
0	02	11	PSK Tone Frequency	1.0 [kHz]	1.5 [kHz]	2.0 [kHz]				
0	02	12	RTTY/PSK Log File Format	html	txt					
0	02	13	RTTY/PSK Time Stamp	Off	Time Stamp	Time Stamp + Frequency				
0	02	14	Clock (RTTY/PSK Time Stamp)	Local Clock	Secondary Clock					
0	03	00	Frequency Rounding Off (Multi/ Channel Control)	Off	On					
0	03	01	SSB/CW/FSK/PSK Mode Frequency Step Size (Multi/Channel Control)	0.5 [kHz]	1 [kHz]	2.5 [kHz]	5 [kHz]	10 [kHz]		
0	03	02	AM Mode Frequency Step Size (Multi/ Channel Control)	5 [kHz]	6.25 [kHz]	10 [kHz]	12.5 [kHz]	15 [kHz]	20 [kHz]	006: 25 007: 30 008: 50 009: 100
0	03	03	FM Mode Frequency Step Size (Multi/ Channel Control)	5 [kHz]	6.25 [kHz]	10 [kHz]	12.5 [kHz]	15 [kHz]	20 [kHz]	006: 25 007: 30 008: 50 009: 100
0	03	04	Frequency Step Size (Up/Down Keys)	100 [kHz]	500 [kHz]	1000 [kHz]				
0	03	05	9 kHz Step in AM Broadcast Band (Multi/Channel Control)	Off	On					
0	03	06	Tuning Control (Main): Number of Steps per Revolution	250 [Step]	500 [Step]	1000 [Step]				
0	03	07	Tuning Control (Sub): Number of Steps per Revolution	250 [Step]	500 [Step]	1000 [Step]				
0	03	08	Number of Band Memories	1	3	5				
0	04	00	Number of Quick Memory Channels	3 [ch]	5 [ch]	10 [ch]				
0	04	01	Temporary Change (Memory Channel Configurations)	Off	On					
0	04	02	Program Slow Scan	Off	On					
0	04	03	Program Slow Scan Range	100 [Hz]	200 [Hz]	300 [Hz]	400 [Hz]	500 [Hz]		
0	04	04	Scan Hold	Off	On					
0	04	05	Scan Resume	Time- operated	Carrier-operated					
0	05	00	Paddle Jack Configuration (Front)	Key	Paddle	Paddle (Bug key mode)				

Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	05	01	Key Jack Configuration (Rear)	Key	Paddle	Paddle (Bug key mode)				
0	05	02	Electronic Keyer Squeeze Mode	Mode A	Mode B					
0	05	03	Dot and Dash Reversed Keying	Off	On					
0	05	04	Paddle (Microphone Up/Down Keys)	Off	On					
0	05	05	Automatic CW TX with Keying in SSB Mode	Off	On					
0	05	06	Carrier Frequency Offset (SSB Mode to CW Mode)	Off	On					
0	05	07	CW Keying Weight Ratio	Automatic	2.5	2.6	2.7	2.8	2.9	Up to 4.0 (in steps of 0.1)
0	05	08	CW Keying Reversed Weight Ratio	Off	On					
0	05	09	Interrupt Keying	Off	On					
0	05	10	CW Message Entry	Text string	Paddle					
0	05	11	Contest Number	0001 ~ 9999 (Must be a 4-digit number)						
0	05	12	Contest Number Format	Off	190 to ANO	190 to ANT	90 to NO	90 to NT		
0	05	13	Channel Number (Count-up Message)	Off	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	006: Ch 6 007: Ch 7 008: Ch 8
0	05	14	CW Rise Time	1 [ms]	2 [ms]	4 [ms]	6 [ms]			
0	05	15	CW/ Voice Message Retransmit Interval Time	0 [s]	1 [s]	2 [s]	3 [s]	4 [s]	5 [s]	Up to 60 [s] (in steps of 1)
0	06	00	Playback Time (Full-time Recording)	Last 10 [s]	Last 20 [s]	Last 30 [s]				
0	06	01	Recorded Audio File Storage Location	Internal	USB					
0	06	02	Time-out Timer	Off	3 [min]	5 [min]	10 [min]	20 [min]	30 [min]	
0	06	03	TX Inhibit	Off	On					
0	06	04	Transmit Power Step Size	1 [W]	5 [W]					
0	06	05	TX Filter Numbers	2	3					
0	06	06	RX Filter Numbers	2	3					
0	06	07	Filter Control in SSB Mode (High/Low and Shift/Width)	High & Low Cuts	Shift & Width					
0	06	08	Filter Control in SSB-Data Mode (High/Low and Shift/Width)	High & Low Cuts	Shift & Width					
0	06	09	VOX Voice Delay (Microphone)	Off	Short	Medium	Long			
0	06	10	VOX Voice Delay (except Microphone)	Off	Short	Medium	Long			
0	07	00	Baud Rate (COM Port)	4800 [bps]	9600 [bps]	19200 [bps]	38400 [bps]	57600 [bps]	115200 [bps]	
0	07	01	Baud Rate (USB Port)	4800 [bps]	9600 [bps]	19200 [bps]	38400 [bps]	57600 [bps]	115200 [bps]	
0	07	02	Quick Data Transfer	Off	On					
0	07	03	Overwrite Location (Quick Data Transfer)	VFO	Quick Memory					
0	07	04	Overwrite Location (DX Packet Cluster Tuned Data)	Operating Band	Sub Band					
0	07	05	USB: Audio Input Level	0	1	2	3	4	5	Up to 100 (in steps of 1)
0	07	06	ACC 2: Audio Input Level	0	1	2	3	4	5	Up to 100 (in steps of 1)
0	07	07	Optical: Audio Input Level	0	1	2	3	4	5	Up to 100 (in steps of 1)
0	07	08	USB: Audio Output Level (Main Band)	0	1	2	3	4	5	Up to 100 (in steps of 1)

Menu											
P1	P2	P3	Function	P5							
				000	001	002	003	004	005	006 ~	
0	07	09	USB: Audio Output Level (Sub Band)	0	1	2	3	4	5	Up to 100 (in steps of 1)	
0	07	10	ACC 2: Audio Output Level (Main Band)	0	1	2	3	4	5	Up to 100 (in steps of 1)	
0	07	11	ACC 2: Audio Output Level (Sub Band)	0	1	2	3	4	5	Up to 100 (in steps of 1)	
0	07	12	Optical: Audio Output Level (Main Band)	0	1	2	3	4	5	Up to 100 (in steps of 1)	
0	07	13	Optical: Audio Output Level (Sub Band)	0	1	2	3	4	5	Up to 100 (in steps of 1)	
0	07	14	Audio Output Type (Rear Connectors)	All	Received Audio Only						
0	07	15	Speaker Output Configuration	Normal	Reversed	Mixed					
0	07	16	USB: Audio Output Configuration	Normal	Reversed	Mixed					
0	07	17	ACC2: Audio Output Configuration	Normal	Reversed	Mixed					
0	07	18	Optical: Audio Output Configuration	Normal	Reversed	Mixed					
0	08	00	Bandscope Display During TX	Off	On						
0	08	01	TX Audio Signal Waveform Display	Off	On						
0	08	02	Bandscope Maximum Hold	10 [s]	Continuous						
0	08	03	Marker Offset Frequency (SSB Mode)	Off (Carrier Point)	300 [Hz]	400 [Hz]	500 [Hz]	600 [Hz]	700 [Hz]	006: 800 [Hz] 007: 1000 [Hz] 008: 1500 [Hz] 009: 2200 [Hz]	
0	08	04	Frequency Scale (Center Mode)	Relative Frequency	Absolute Frequency						
0	08	05	Fixed Mode LF Band Lower Limit (min. 0.03 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	06	Fixed Mode LF Band Upper Limit (max. 0.300 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	07	Fixed Mode MF Band 1 Lower Limit (min. 0.300 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	08	Fixed Mode MF Band 1 Upper Limit (max. 0.522 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	09	Fixed Mode MF Band 2 Lower Limit (min. 0.522 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	10	Fixed Mode MF Band 2 Upper Limit (max. 1.705 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	11	Fixed Mode 1.8 MHz Band Lower Limit (min. 1.705 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	12	Fixed Mode 1.8 MHz Band Upper Limit (max. 2.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	13	Fixed Mode 3.5 MHz Band Lower Limit (min. 2.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	14	Fixed Mode 3.5 MHz Band Upper Limit (max. 4.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	15	Fixed Mode 5 MHz Band Lower Limit (min. 4.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	16	Fixed Mode 5 MHz Band Upper Limit (max. 6.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	17	Fixed Mode 7 MHz Band Lower Limit (min. 6.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	18	Fixed Mode 7 MHz Band Upper Limit (max. 8.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	19	Fixed Mode 10 MHz Band Lower Limit (min. 8.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	20	Fixed Mode 10 MHz Band Upper Limit (max. 11 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	21	Fixed Mode 14 MHz Band Lower Limit (min. 11 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	22	Fixed Mode 14 MHz Band Upper Limit (max. 15 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	23	Fixed Mode 18 MHz Band Lower Limit (min. 15 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							
0	08	24	Fixed Mode 18 MHz Band Upper Limit (max. 20 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)							

Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	08	25	Fixed Mode 21 MHz Band Lower Limit (min. 20 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	26	Fixed Mode 21 MHz Band Upper Limit (max. 22 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	27	Fixed Mode 24 MHz Band Lower Limit (min. 22 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	28	Fixed Mode 24 MHz Band Upper Limit (max. 26 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	29	Fixed Mode 28 MHz Band Lower Limit (min. 26 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	30	Fixed Mode 28 MHz Band Upper Limit (max. 30 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	31	Fixed Mode 50 MHz Band Lower Limit (min. 30 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	32	Fixed Mode 50 MHz Band Upper Limit (max. 60 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	09	00	Send Message by Function Keys (USB Keyboard)	Off	On					
0	09	01	Keyboard Language (USB Keyboard)	Japanese	English (US)	English (UK)	French	French (Canadian)	German	006: Portuguese 007: Portuguese (Brazilian) 008: Spanish 009: Spanish (Latin American) 010: Italian
0	09	02	Repeat Delay Time (USB Keyboard)		1	2	3	4		
0	09	03	Repeat Speed (USB Keyboard)		1	2	3	4	5	Up to 32 (in steps of 1)

Advanced Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
1	00	00	Indication Signal Type (Main Band)	Automatic	TX Power	ALC	Drain Voltage (Vd)	Compression Level (COMP)	Current (Id)	006: SWR
1	00	01	Indication Signal Type (Sub Band)	TX Power	ALC	Drain Voltage (Vd)	Compression Level (COMP)	Current (Id)	SWR	
1	00	02	Output Level (Main Band)	0 [%]	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	Up to 100 [%] (in steps of 1)
1	00	03	Output Level (Sub Band)	0 [%]	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	Up to 100 [%] (in steps of 1)
1	00	04	REF I/O Connector Configuration	Off	Output	Input				
1	00	05	Reference Oscillator Calibration	Parameter value of 000 ~ 510, corresponding to setting values of -255 ~ +255 (in steps of 1)						
1	00	06	Bandwidth (Additional Roofing Filter)	Off	300 [Hz]	400 [Hz]	500 [Hz]	600 [Hz]	700 [Hz]	Up to 3500 [Hz] (in steps of 100)
1	00	07	Attenuation (Additional Roofing Filter)	Parameter value of 000 ~ 040, corresponding to setting values of -20 ~ +20 (in steps of 1)						
1	00	08	TX Power Down with Transverter Enabled	Off	On					
1	00	09	TX Hold After Antenna Tuning	Off	On					
1	00	10	Antenna Tuner During RX	Off	On					
1	00	11	Linear Amplifier Control (HF Band)	Off	Active High	Active High + Relay Control	Active High + Relay & TX Delay Ctrl	Active Low	Active Low + TX Delay Control	

Advanced Menu											
P1	P2	P3	Function	P5							
				000	001	002	003	004	005	006 ~	
1	00	12	Linear Amplifier Control (50 MHz Band)	Off	Active High	Active High + Relay Control	Active High + Relay & TX Delay Ctrl	Active Low	Active Low + TX Delay Control		
1	00	13	Microphone Gain (FM Mode)		1	2	3	4	5	Up to 100 (in steps of 1)	
1	00	14	PKS Polarity Reverse	Off	On						
1	00	15	TX Inhibit While Busy	Off	On						
1	00	16	CTCSS Unmute for Internal Speaker (Main Band)	Mute	Unmute						
1	00	17	CTCSS Unmute for Internal Speaker (Sub Band)	Mute	Unmute						
1	00	18	MSQ Logic State	Low	Open						
1	00	19	SSQ Logic State	Low	Open						
1	00	20	MSQ Reverse Condition	Off	Busy	Sql	Send	Busy-Send	Sql-Send		
1	00	21	SSQ Reverse Condition	Off	Busy	Sql	Send	Busy-Send	Sql-Send		
1	00	22	Standby State Low Power Consumption	Off	On						
1	00	23	Cooling Fan Control After Shutdown	Off	On						
1	00	24	MSQ/PKS Pin Assignment	Off	On						
1	00	25	External Display	Off	On						
1	00	26	Resolution (External Display)	800x600	840x480						
—	—	—	Touchscreen Calibration	Does not correspond to a command							
—	—	–	Software License Agreement	Does not correspond to a command							
—	—	–	Important Notices Concerning Free Open Source	Does not correspond to a command							
—	–	—	About Various Software License Agreements	Does not correspond to a command							

PF Key Allotment Lists

Function	PF Key Allotment ID
Menus	
Menu 00-00	0000
Menu 00-01	0001
▼	▼
Menu 09-02	0902
Menu 09-03	0903
Panel Switch	
AT/AT Tune	1000
VOX/ SEL	1001
PROC/ SEL	1002
ANT1	1003
ANT2	1004
ANT3	1005
ANT4	1006
Data1/ SEL	1007
Data2/ SEL	1008
Data3/ SEL	1009
RX (Main Band)	1010
TX (Main Band)	1011
M>S	1012
M/S	1013
RX (Sub Band)	1014
TX (Sub Band)/ (Split Frequency)	1015
TS-SET	1016
Main	1017
Sub	1018
M/V (Memory)	1019
M.IN (Memory)	1020
M>V (Memory)	1021
REC (Recorder)/ Full-time REC	1022
Stop (Recorder)	1023
Play (Recorder)	1024
S.DISP/ SEL	1025
MR (Quick Memo)/ SEL	1026
MIN (Quick Memo)	1027
CW T. (Main Band)	1028
FIL A/ SEL (Main Band)	1029
FIL B/ SEL (Main Band)	1030
FIL C/ SEL (Main Band)	1031
AGC SEL (Main Band)	1032
AGC Slow (Main Band)	1033
AGC Mid (Main Band)	1034
AGC Fast (Main Band)	1035
AGC Off (Main Band)	1036
NCH SEL (Main Band)	1037
A.NCH SEL (Main Band)	1038
BEF SEL (Main Band)	1039
APF SEL (Main Band)	1040
Mute (Main Band)	1041
CW T. (Sub Band)	1042
FIL A/ SEL (Sub Band)	1043
FIL B/ SEL (Sub Band)	1044
FIL C/ SEL (Sub Band)	1045
AGC SEL (Sub Band)	1046
AGC Slow (Sub Band)	1047
AGC Mid (Sub Band)	1048
AGC Fast (Sub Band)	1049
AGC Off (Sub Band)	1050
NCH SEL (Sub Band)	1051
A.NCH SEL (Sub Band)	1052
BEF SEL (Sub Band)	1053
NB1 SEL (Sub Band)	1054
NB2 SEL (Sub Band)	1055
NR1 SEL (Sub Band)	1056
NR2 SEL (Sub Band)	1057
APF SEL (Sub Band)	1058
Mute (Sub Band)	1059
Special Functions	
Voice1 (Main Band)	1100
Voice2	1101
Voice3	1102
Voice1 (Sub Band)	1103
DSP Monitor	1104
RX Monitor	1105
TX Tune	1106
Data Send	1107
Send	1108
Data VOX/ SEL	1109
Message Memory CH1	1110
Message Memory CH2	1111
Message Memory CH3	1112
Message Memory CH4	1113
Message Memory CH5	1114
Message Memory CH6	1115
Message Memory CH7	1116
Message Memory CH8	1117
Contest Number Decrement	1118
SWL	1119
RF Scope	1120
AF Scope	1121
Waterfall	1122
Extended Memory Channel	1123
DOWN Key (Microphone)	1124
UP Key (Microphone)	1125
Capture	1126
Safe Removal of USB Flash Drive	1127
Emergency Frequency	1128
Off	9999

FA — Main Band Frequency

	1	2	3	4	5	6	7	8	9	10
Set	F	A	P1	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	F	A	;							
Answer	1	2	3	4	5	6	7	8	9	10
	F	A	P1	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P1	P1	;						

Parameters:
P1
Frequency (11 digits in Hz)
(For example, enter 00014195000 for 14.195 MHz. (Blank digits must be entered as 0.) When calling an unregistered Memory Channel, the response is all spaces.)

- You can set the frequency even while in Memory Channel mode, except when on an unassigned channel.
- When configuring a standard channel, the frequency is temporarily variable.
- Configuration is possible when the frequency is within a section defined channel.
- The frequency set with this command is the frequency before RIT/XIT is added.

FB — Sub Band Frequency

	1	2	3	4	5	6	7	8	9	10
Set	F	B	P1	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	F	B	;							
Answer	1	2	3	4	5	6	7	8	9	10
	F	B	P1	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P1	P1	;						

Parameters:
P1
Frequency (11 digits in Hz)
(For example, enter 00014195000 for 14.195 MHz. (Blank digits must be entered as 0.) When calling an unregistered Memory Channel, the response is all spaces.)

- You can set the frequency even while in Memory Channel mode, except when on an unassigned channel.
- When configuring a standard channel, the frequency is temporarily variable.
- Configuration is possible when the frequency is within a section defined channel.
- The frequency set with this command is the frequency before RIT/XIT is added.

FC — Change the Frequency (Tuning Control)

	1	2	3	4	5	6	7	8	9	10
Set	F	C	P1	P2	P3	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Up
1: Down
P3
0: Normal frequency step size
1: Double the frequency step size
2: 5 times the frequency step size
3: 10 times the frequency step size
4: 50 times the frequency step size
5: 100 times the frequency step size

FL0 — Select the Receive Filter

	1	2	3	4	5	6	7	8	9	10
Set	F	L	0	P1	P2	;				
Read	1	2	3	4	5	6	7	8	9	10
	F	L	0	P1	;					
Answer	1	2	3	4	5	6	7	8	9	10
	F	L	0	P1	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: A
1: B
2: C

FL1 Roofing Filter

	1	2	3	4	5	6	7	8	9	10
Set	F	L	1	P1	P2	P3	;			
Read	F	L	1	P1	P2	;				
Answer	F	L	1	P1	P2	P3	P4	P4	P4	P4
	11	12	13	14	15	16	17	18	19	20
	;									

Parameters:
P1
0: Main Band
1: Sub Band
P2 (Receive Filter)
0: A
1: B
2: C
P3 (Roofing Filter)
0: Auto
1: 270 Hz
2: 500 Hz
3: 2.7 kHz
4: 6 kHz
5: 15 kHz (You cannot set the filter to a value of over 15 kHz while in FM mode.)
6: Additional Roofing Filter (You cannot select Additional Roofing Filter if "Bandwidth (Additional Roofing Filter)" is set to OFF in the Advanced Menu.)
(The P3 setting is invalid on the Sub Band; Auto is always selected. Entering a value of 9 results in the initial value being entered.)
P4 (Roofing Filter Bandwidth)
0027 ~ 1500 (in steps of 10 Hz)

• When P3 is set to Auto, this parameter will tell you the bandwidth of the chosen roofing filter by the reception circuit.

FL2 IF Filter Shape

	1	2	3	4	5	6	7	8	9	10
Set	F	L	2	P1	P2	P3	;			
Read	F	L	2	P1	P2	;				
Answer	F	L	2	P1	P2	P3	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: A
1: B
2: C
P3
0: Sharp
1: Medium
2: Soft
3: None (FM mode only)
(Entering a value of 9 results in the initial value being entered. FM mode can read only.)

FL3 AF Filter Type

	1	2	3	4	5	6	7	8	9	10
Set	F	L	3	P1	P2	P3	;			
Read	F	L	3	P1	P2	;				
Answer	F	L	3	P1	P2	P3	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: A
1: B
2: C
P3
0: Narrow
1: Medium
2: Wide
(Entering a value of 9 results in the initial value being entered.)

FS Fine Tuning

	1	2	3	4	5	6	7	8	9	10
Set	F	S	P1	P2	;					
Read	F	S	P1	;						
Answer	F	S	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Fine Tuning OFF
1: Fine Tuning ON

FV — Firmware Version

	1	2	3	4	5	6	7	8	9	10
Read	F	V	;							
Answer	F	V	P1	P1	P1	P1	;			

Parameters:
P1
Reads out the character string of the firmware version.

- For example, for firmware version 1.00, it reads “FV1.00;”.

FW — FM Normal/Narrow

	1	2	3	4	5	6	7	8	9	10
Set	F	W	P1	P2	;					
Read	F	W	P1	;						
Answer	F	W	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Normal
1: Narrow

- This command can be used only in FM mode.

GC — AGC Time Constant

	1	2	3	4	5	6	7	8	9	10
Set	G	C	P1	P2	;					
Read	G	C	P1	;						
Answer	G	C	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: AGC Off
1: AGC Slow
2: AGC Mid
3: AGC Fast
4: AGC Off → On (AGC returns to its Slow/Mid/Fast status before turning Off.)

- This command cannot be performed in FM mode (an error sounds).
- Setting the AGC to AGC Off → On will turn the AGC On and will set the previous AGC status (Slow/Mid/Fast).

GT — AGC Time Constant Preset

	1	2	3	4	5	6	7	8	9	10
Set	G	T	P1	P2	P2	P3	P3	P4	P4	;
Read	G	T	P1	;						
Answer	G	T	P1	P2	P2	P3	P3	P4	P4	;

Parameters:
P1
0: Main Band
1: Sub Band
P2 (Slow Preset Value)
01 ~ 20 (in steps of 1)
(Entering a value of 99 results in the initial value being entered.) P3 (Mid Preset Value)
01 ~ 20 (in steps of 1)
(Entering a value of 99 results in the initial value being entered.) P4 (Fast Preset Value)
01 ~ 20 (in steps of 1)
(Entering a value of 99 results in the initial value being entered.)

- While the AGC is OFF, the GT command can still be read.
- While in FM mode, the GT command cannot be set or read.

GT2 — AGC Time Constant Preset Copy

	1	2	3	4	5	6	7	8	9	10
Set	G	T	2	P1	;					

Parameters:
P1
0: Main Band
1: Sub Band

ID — Transceiver ID Number

	1	2	3	4	5	6	7	8	9	10
Read	I	D	;							
Answer	I	D	P1	P1	P1	;				

Parameters:
P1
022

IP0 DHCP

Set	1	2	3	4	5	6	7	8	9	10
	I	P	0	P1	;					
Read	1	2	3	4	5	6	7	8	9	10
	I	P	0	;						
Answer	1	2	3	4	5	6	7	8	9	10
	I	P	0	P1	P2	P2	P2	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P4	P4	P4	P5	P5	P5	;			

Parameters:
P1
0: DHCP OFF
1: DHCP ON
P2 ~ P5
001.001.001.001 ~ 223.223.223.223: IP address (If no IP address is acquired when DHCP is turned ON, the IP address is replaced with hyphens: ---.---.---.---)

- When DHCP is ON, the IP address acquired automatically is output as a response. When DHCP is OFF, the set fixed IP address is output as a response.

IP1 IP Address (Manual Configuration)

Set	1	2	3	4	5	6	7	8	9	10
	I	P	1	P1	P1	P1	P2	P2	P2	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P4	P4	P4	P5	P5	P5	P6	P6
	21	22	23	24	25	26	27	28	29	30
	P6	P7	P7	P7	P8	P8	P8	P9	P9	P9
	31	32	33	34	35	36	37	38	39	40
	P10	P10	P10	P11	P11	P11	P12	P12	P12	P13
	41	42	43	44	45	46	47	48	49	50
	P13	P13	P14	P14	P14	P15	P15	P15	P16	P16
	51	52	53	54	55	56	57	58	59	60
	P16	P17	P17	P17	P18	P18	P18	P19	P19	P19
	61	62	63	64	65	66	67	68	69	70
	P20	P20	P20	;						
Read	1	2	3	4	5	6	7	8	9	10
	I	P	1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	I	P	1	P1	P1	P1	P2	P2	P2	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P4	P4	P4	P5	P5	P5	P6	P6
	21	22	23	24	25	26	27	28	29	30
	P6	P7	P7	P7	P8	P8	P8	P9	P9	P9
	31	32	33	34	35	36	37	38	39	40
	P10	P10	P10	P11	P11	P11	P12	P12	P12	P13
	41	42	43	44	45	46	47	48	49	50
	P13	P13	P14	P14	P14	P15	P15	P15	P16	P16
	51	52	53	54	55	56	57	58	59	60
	P16	P17	P17	P17	P18	P18	P18	P19	P19	P19
	61	62	63	64	65	66	67	68	69	70
	P20	P20	P20	;						

Parameters:
P1 ~ P4 (IP address)
001.000.000.000 ~ 223.255.255.255
P5 ~ P8 (Subnet Mask address)
000.000.000.000 ~ 255.255.255.255
P9 ~ P12 (Default Gateway address)
001.000.000.000 ~ 223.255.255.255
(If P9 ~ P12 are not set, they will become all blank.)
P13 ~ P16 (Priority DNS Server address)
001.000.000.000 ~ 223.255.255.255
(If P13 ~ P16 are not set, they will become all blank.)
P17 ~ P20 (Secondary DNS Server address)
001.000.000.000 ~ 223.255.255.255
(If P17 ~ P20 are not set, they will become all blank.)

IP2 MAC Address

Read	1	2	3	4	5	6	7	8	9	10
	I	P	2	;						
Answer	1	2	3	4	5	6	7	8	9	10
	I	P	2	P1	P1	P2	P2	P3	P3	P4
	11	12	13	14	15	16	17	18	19	20
	P4	P5	P5	P6	P6	;				

Parameters:
P1 ~ P6
00 ~ FF: MAC address (A ~ F entries must be capitalized)

IP3 ID and Password Management

Set	1	2	3	4	5	6	7	8	9	10
	I	P	3	P1	P2	P3	P4	P5	P5	P5
	11	12	13	14	15	16	17	18	19	20
	P5	P5	P5	P5	P5	P6	P6	P6	P6	P6
	21	22	23	24	25	26	27	28	29	30
	P6	P6	P6	P7	P7	P7	P7	P7	P7	P7
	31	32	33	34	35	36	37	38	39	40
	P7	P8	P8	P8	P8	P8	P8	P8	P8	;
Read	1	2	3	4	5	6	7	8	9	10
	I	P	3	P9	;					

Parameters:

P1
1 ~ 8: Character string length of current ID

P2
1 ~ 8: Character string length of current password

P3
1 ~ 8: Character string length of new ID

P4
1 ~ 8: Character string length of new password

P5
Up to 8 digits: Current ID

P6
Up to 8 digits: Current password

P7
Up to 8 digits: New ID

P8
Up to 8 digits: New password

P9
0: Update failed
1: Update successful
(If the current ID and password do not match, the update fails.)

KS Keying speed

Set	1	2	3	4	5	6	7	8	9	10
	K	S	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10
	K	S	;							
Answer	1	2	3	4	5	6	7	8	9	10
	K	S	P1	P1	P1	;				

Parameters:

P1
004 ~ 060 (in steps of 1)

KY CW Keying

Set 1	1	2	3	4	5	6	7	8	9	10
	K	Y	P1	P2	P2	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	P2	P2	P2	P2	P2	P2
	21	22	23	24	25	26	27	28	29	30
	P2	P2	P2	P2	P2	P2	P2	;		
Set 2	1	2	3	4	5	6	7	8	9	10
	K	Y	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	K	Y	;							
Answer	1	2	3	4	5	6	7	8	9	10
	K	Y	P1	;						

Parameters:

P1
For Setting 1, always enter a space or “2”.
For Setting 2, entering 0 will cause Setting 1 to stop. An error will occur if any value other than 0 is entered.
0: Character buffer space
1: No character buffer space

P2
Enter a character string for keying.
The characters listed in the following table can be entered.

A	B	C	D	E	F	G	H	I	J
K	L	M	N	O	P	Q	R	S	T
U	V	W	X	Y	Z				
a	b	c	d	e	f	g	h	i	j
k	l	m	n	o	p	q	r	s	t
u	v	w	x	y	z				
0	1	2	3	4	5	6	7	8	9
(space)		'	"	(	)	*	+	,	–
.	/	:	=	?	@				

Using abbreviations, you can enter the following symbols:

Abbreviation	Symbol	Abbreviation	Symbol
$\overline{BT}$	[	$\overline{SK}$	>
$\overline{AR}$	_	$\overline{KN}$	]
$\overline{AS}$	<	$\overline{BK}$	\
$\overline{HH}$	#	$\overline{SN}$	%

- When setting spaces in parameter P1, the parameter P2 has a fixed length of 24 bytes. Characters that are left blank will be filled with spaces, but these spaces will not be converted to morse code. Continuously set spaces are keying as a single space.
- When setting “2” in parameter P1, the parameter P2 has a maximum variable length of 24 bytes. Continuously set spaces are keying as continuous spaces.
- Although you can use lower-case letters as well as upper-case letters for the P2 parameter, there is no distinction made between them when sending the morse code.
- You cannot enter a semicolon (;) for the P2 parameter.
- P1: 2 is supported from the firmware version 1.10.

LK F.Lock

	1	2	3	4	5	6	7	8	9	10
Set	L	K	P1	P2	;					
Read	L	K	;							
Answer	L	K	P1	P2	;					

Parameters:
P1
0: Main Band F.Lock OFF
1: Main Band F.Lock ON
P2
0: Sub Band F.Lock OFF
1: Sub Band F.Lock ON

LM Voice Message Recording

	1	2	3	4	5	6	7	8	9	10
Set	L	M	P1	P2	;					
Read	L	M	;							
Answer	L	M	P1	P2	P3	P3	P3	;		

Parameters:
P1
1: Channel 1
2: Channel 2
3: Channel 3
4: Channel 4
5: Channel 5
6: Channel 6
P2
0: Recording is inactive (recording stops by the setting command)
1: Recording is ready
2: Start recording (displays while recording by the response command)
3: Delete
P3
000 ~ 100 (s): Elapsed time of the sound recording

- Invalid when the Voice Message List display is OFF. (Use the PB0 command to turn the Voice Message List display ON/OFF.)
- The start of recording is possible only when recording is ready.

LP0 Transmission Output Limiter

	1	2	3	4	5	6	7	8	9	10
Read	L	P	0	;						
Answer	L	P	0	P1	P1	P1	;			

Parameters:
P1
005 ~ 200 (W)

- The upper power limit level response is given, depending on the current transmission frequency and mode.

LP1 Transmission Output Limiter

	1	2	3	4	5	6	7	8	9	10
Set	L	P	1	P1	P2	P2	P3	P3	P3	;
Read	L	P	1	P1	P2	P2	;			
Answer	L	P	1	P1	P2	P2	P3	P3	P3	;

Parameters:
P1
0: Transmission power upper limit setting other than while in data mode
1: Transmission power upper limit setting for data mode
2: Transmission power upper limit setting during TX tuning
P2
00: 1.8M band
01: 3.5M band
02: 5M band
03: 7M band
04: 10M band
05: 14M band
06: 18M band
07: 21M band
08: 24M band
09: 28M band
10: 50M band
P3
005 ~ 200 (W)
(Entering a value of 99 results in the initial value being entered.)

MA0 Memory Channel Configuration

Set

1	2	3	4	5	6	7	8	9	10
M	A	0	P1	P1	P1	P2	P3	P3	P3
11	12	13	14	15	16	17	18	19	20
P3	P3	P3	P3	P3	P3	P3	P3	P4	P5
21	22	23	24	25	26	27	28	29	30
P6	P7	P7	P8	P8	P9	P9	P9	P9	P9
31	32	33	34	35	36	37	38	39	40
P9	P9	P9	P9	P9	P9	P10	P11	P12	P13
41	42	43	44	45	46	47	48	49	50
P13	P14	P14	P15	P16	P17	P18	P18	P18	P18
51	52	53	54	55	56	57	58	59	60
P18	P18	P18	P18	P18	P18	;			

Read

1	2	3	4	5	6	7	8	9	10
M	A	0	P1	P1	P1	;			

Answer

1	2	3	4	5	6	7	8	9	10
M	A	0	P1	P1	P1	P2	P3	P3	P3
11	12	13	14	15	16	17	18	19	20
P3	P3	P3	P3	P3	P3	P3	P3	P4	P5
21	22	23	24	25	26	27	28	29	30
P6	P7	P7	P8	P8	P9	P9	P9	P9	P9
31	32	33	34	35	36	37	38	39	40
P9	P9	P9	P9	P9	P9	P10	P11	P12	P13
41	42	43	44	45	46	47	48	49	50
P13	P14	P14	P15	P16	P17	P18	P18	P18	P18
51	52	53	54	55	56	57	58	59	60
P18	P18	P18	P18	P18	P18	;			

Parameters:

P1
000 ~ 119: Channel Number (Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119)

P2
0: Simplex Memory channel
1: Dual Memory channel
2: Section defined Memory channel
(The memory channel type is decided while setting the P9 and P10 values, so this parameter is ignored. Enter a dummy value.)

P3
Frequency 1 (11 digits in Hz.)

P4
Mode information for frequency 1 (refer to the P2 value of the OM command)

P5
0: FM Wide for frequency 1
1: FM Narrow for frequency 1

P6
0: FM Tone function OFF for frequency 1
1: Tone for frequency 1
2: CTCSS for frequency 1
3: Cross Tone for frequency 1

P7
Tone frequency for frequency 1 (refer to the P2 value of the TN command)

P8
CTCSS frequency for frequency 1 (refer to the P2 value of the CN command)

P9
Frequency 2 (11 digits in Hz. Blank digits must be entered as 0.)

P10
Mode information for frequency 2 (refer to the P1 value of the OM command)

P11
0: FM Wide for frequency 2
1: FM Narrow for frequency 2

P12
0: FM Tone function OFF for frequency 2
1: Tone for frequency 2
2: CTCSS for frequency 2
3: Cross Tone for frequency 2

P13
Tone frequency for frequency 2 (refer to the P2 value of the TN command)

P14
CTCSS frequency for frequency 2 (refer to the P2 value of the CN command)

P15
0: Simplex
1: Split

P16
0: Dual reception OFF
1: Dual reception ON

P17
1: Scan Lockout OFF
2: Scan Lockout ON

P18
Channel Name (Up to 10 digits.)

- When setting the channel currently being accessed, the new settings are reflected the next time that channel is accessed.
- When the section defined memory channel is in the process of being read, it cannot be set.
- When reading a blank channel, parameters P2 to P18 becomes blank.
- When reading a single memory channel, all parameters for frequency 2 become 0.

MA1 Memory Channel Direct Entry

	1	2	3	4	5	6	7	8	9	10
Set	M	A	1	P1	P1	P1	P1	P1	P1	P1
	11	12	13	14	15	16	17	18	19	20
	P1	P1	P1	P1	P2	P3	;			

Parameters:
P1
11 digit frequency in Hz. (Blank digits must be entered as 0.)
P2
Mode information (refer to the P2 value of the OM command)
P3
0: FM Wide
1: FM Narrow
(In modes other than FM, this parameter is ignored.)

- The frequency1 information of the memory channel which was appointed when using this command is updated
- When registering a new dual memory channel, use the MI command.
- The start and end frequencies are registered as the same frequency when setting it at a section appointment memory channel.
- When the AI function is ON, a response can consist of the MA0 command.

MA2 Memory Channel Name

	1	2	3	4	5	6	7	8	9	10
Set	M	A	2	P1	P1	P1	P2	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P3	P3	P3	P3	P3	;		

Parameters:
P1
000 ~ 119: Channel number (Channel numbers P00 ~ P09 are represented by 100 ~ 109.)
P2
Space: Always a space
P3
10 digit channel name

- Setting an unassigned channel causes an error.
- When the AI function is ON, a response is provided by the MA0 command.

MA3 Scan Lockout

	1	2	3	4	5	6	7	8	9	10
Set	M	A	3	P1	P1	P1	P2	;		

Parameters:
P1
000 ~ 119: Channel number
P2
0: Scan Lockout OFF
1: Scan Lockout ON

- Setting an unassigned channel causes an error.
- When the AI function is ON, a response is provided by the MA0 command.

MA4 Channel Copy

	1	2	3	4	5	6	7	8	9	10
Set	M	A	4	P1	P1	P1	P2	P2	P2	;

Parameters:
P1
000 ~ 119: Original channel number
P2
000 ~ 119: Target channel number

- If the original channel number is an unassigned channel, it cannot be copied.

MA5 Channel Deletion

	1	2	3	4	5	6	7	8	9	10
Set	M	A	5	P1	P1	P1	;			

Parameters:
P1
000 ~ 119: Channel number

MA6 Section Defined Memory Channel End Frequency

	1	2	3	4	5	6	7	8	9	10
Set	M	A	6	P1	P1	P1	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	P2	P2	P2	;		

Parameters:
P1
000 ~ 109: Channel number
P2
11 digit frequency in Hz. (Blank digits must be entered as 0.)

- You cannot set an unassigned channel.
- Use the MA1 or MI command to register a new section defined memory channel (the start and end frequency are the same).
- When the AI function is ON, a response is provided by the MA0 command.

ME0 Popup Message 1

	1	2	3	4	5	6	7	8	9	10
Set	M	E	0	P1	P1	P1	P2	P3	;	
Read	M	E	0	;						
Answer	M	E	0	P1	P1	P1	;			

Parameters:

P1
3-digit message ID (refer to the Message ID table below)

P2
0: Functions as the [ESC] key
1: Functions as the [F1] key
2: Functions as the [F2] key
3: Functions as the [F3] key
4: Functions as the [F4] key
5: Functions as the [F5] key
6: Functions as the [F6] key
7: Functions as the [F7] key

P3
0: Functions as a key press
1: Functions as a long key press (not used)
2: Functions as a key release (used when releasing [F-REC] during the voice message recording screen)

- Operation of the F key which is specified with the setting command for P2 differs every message. [?;] is not returned even when pressing the F key to which no function is assigned.

Message ID	Display
0	No message display
1	Unused
2	Extraordinary communication configuration frequency access display
3	AGC copy verification display (M > S)
4	AGC copy verification display (S > M)
5	AGC Off verification display
6	Equalizer copy verification display
7	Quick Memory all delete verification display
8	CW message (paddle) register queue display
9	CW message registering display
10	Voice message sound recording queue display
11	Voice message sound recording display
12	Voice message playback display
13	Voice message playback transmission display
14	Audio file playback display
15	Audio file playback NG display
16	File deletion verification display
17	Unused
18	Internal memory capacity insufficient display
19	COM connector operational modification display (normal mode)
20	COM connector operational modification display (MSQ/PKS mode)
21	Unused
22	Program timer configuration completion display
23	Clock unestablished display
24	Program timer start time approach display
25	Program timer finish time approach display
26	Sleep timer sleep approach display
27	Program timer recording display
28	Timer sound recording failure display
29	Data loading verification display (REC.FILE)
30	NTP day and time acquisition success display
31	NTP day and time acquisition failure display
32	Data loading verification display (RXEQ)
33	Data loading verification display (TXEQ)
34	Data loading verification display (Configuration Data)
35	Data loading completion display
36	Data loading completion (restart) display

Message ID	Display
37	Loading file NG display
38	Data loading failure display
39	Data retention verification display (RXEQ)
40	Data retention verification display (TXEQ)
41	Data retention verification display (RTTY)
42 ~ 47	Unused
48	Data retention verification display (PSK)
49	Data retention verification display (REC.FILE)
50	Data retention verification display (Configuration Data)
51	Data retention completion display
52	Format verification display
53	Unmount verification display
54	Unmount completion display
55	Reset run verification display (standard)
56	Reset run verification display (full)
57	Reset run verification display (VFO)
58	Reset run verification display (Memory Channel)
59	Reset run verification display (Menu)
60	Running the reset display (Main LCD)
61	Processing display (whole)
62	Processing display (while NTP acquisition and configuration data writing out)
63 ~ 66	Unused
67	USB memory detection error display
68	USB bus power error display
69	Memory retention failure display
70	USB memory capacity insufficient/writing inhibited display
71	Temperature protection display
72	Frequency unlocking display
73 ~ 74	Unused
75	Program Timer day not yet specified alert warning
76	Unused
77	Program Timer time excess alert warning
78	Program Timer identical time alert warning
79	High temperature transmission protection display
80	Cooling fan malfunction detection display
81	AC/DC power source operational protection display
82	AC/DC power source high temperature detection shutdown posting display
83	Equalizer adaptation
84	Adjustment mode, measurement display
85	Adjustment mode, end of adjustment display
86	Adjustment mode, adjustment failure display
87	Format failure display
88	Operation environmental data change display
89	File deletion failure display
90	Unused
91	USB memory unmount failure display
92	Unused
93	Firmware version mismatch data loading error display
94	Data damage detection error display
95	Unused
96 ~ 107	DSP error detection display

ME1 Popup Message 2

	1	2	3	4	5	6	7	8	9	10
Set	M	E	1	P1	P1	P1	P2	P3	;	
Read	M	E	1	;						
Answer	M	E	1	P1	P1	P1	;			

Parameters:
P1
3-digit message ID (refer to the Message ID table above)
P2
0: Functions as the [ESC] key
1: Functions as the [F1] key
2: Functions as the [F2] key
3: Functions as the [F3] key
4: Functions as the [F4] key
5: Functions as the [F5] key
6: Functions as the [F6] key
7: Functions as the [F7] key
P3
0: Functions as a key press
1: Functions as a long key press

- Operation of the F key which is specified with the setting command for P2 differs every message. [?;] is not returned even when pressing the F key where allocation of the operation is not done.
- In some situations, the messaged posted using the ME1 command is simultaneously posted with the message from the ME0 command. In such a case, the ME1 message has priority.

MF Operation Environment Configuration

	1	2	3	4	5	6	7	8	9	10
Set	M	F	P1	;						
Read	M	F	;							
Answer	M	F	P1	;						

Parameters:
P1
0: Configuration A
1: Configuration B

- When changing environments, the transceiver reboots, thus the AI function turns OFF. As such, the MF command does not support automatic response.

MG Microphone Gain

	1	2	3	4	5	6	7	8	9	10
Set	M	G	P1	P1	P1	;				
Read	M	G	;							
Answer	M	G	P1	P1	P1	;				

Parameters:
P1
000 ~ 255 (in steps of 1)

- Configure the FM mode microphone gain using the menu. (Refer to the EX command.)

MI Microphone Gain

	1	2	3	4	5	6	7	8	9	10
Set	M	I	P1	P2	P2	P2	;			

Parameters:
P1
0: Single memory channel
1: Dual memory channel
(When registering to a section defined Memory channel, it is registered to the section defined Memory channel regardless of the setting of this parameter.)
P2
000 ~ 119: Channel number (Channel numbers P00 ~ P09 are represented by 100 ~ 109. Channel numbers E00 ~ E09 are represented by 110 ~ 119.)

- In the case where a blank channel is called, registration of the memory channel is not possible.
- When RX and TX of the sub side both turn OFF (in simplex operation and during single reception state), or when accessing a blank channel on the sub side, dual memory channel cannot be registered.
- With the section defined memory channel, the start and end frequency are stored as the same frequency. The end frequency is set using the MA7 command.

ML — TX Monitor Level

	1	2	3	4	5	6	7	8	9	10
Set	M	L	P1	P1	P1	;				
Read	M	L	;							
Answer	M	L	P1	P1	P1	;				

Parameters:
P1
000 ~ 255 (in steps of 1)

MN — Memory Channel Number

	1	2	3	4	5	6	7	8	9	10
Set	M	N	P1	P2	P2	P2	;			
Read	M	N	P1	;						
Answer	M	N	P1	P2	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
000 ~ 119: Channel number (Channel numbers P00 ~ P09 are represented by 100 ~ 109. Channel numbers E00 ~ E09 are represented by 110 ~ 119.)

MO0 — TX Monitor

	1	2	3	4	5	6	7	8	9	10
Set	M	O	0	P1	;					
Read	M	O	0	;						
Answer	M	O	0	P1	;					

Parameters:
P1
0: TX Monitor Off
1: TX Monitor On

MO1 — RX Monitor

	1	2	3	4	5	6	7	8	9	10
Set	M	O	1	P1	;					
Read	M	O	1	;						
Answer	M	O	1	P1	;					

Parameters:
P1
0: RX Monitor Off
1: RX Monitor On

- This setting command is for the operating band.

MO2 — DSP Monitor

	1	2	3	4	5	6	7	8	9	10
Set	M	O	2	P1	;					
Read	M	O	2	;						
Answer	M	O	2	P1	;					

Parameters:
P1
0: DSP Monitor Off
1: DSP Monitor On

- This setting command is for the operating band.

MS — Transmission Audio Entry Sound Generator Selection

	1	2	3	4	5	6	7	8	9	10
Set	M	S	P1	P2	P3	P4	P5	;		
Read	M	S	P1	;						
Answer	M	S	P1	P2	P3	P4	P5	;		

Parameters:

P1
- 0: SS signal of SEND/PTT/REMOTE/ACC2 connector
- 1: PKS signal of DATA SEND/ACC2 connector

P2
- 0: Microphone input transmission OFF
- 1: Microphone input transmission ON

P3
- 0: ACC2 input transmission OFF
- 1: ACC2 input transmission ON

P4
- 0: USB-Audio input transmission OFF
- 1: USB-Audio input transmission ON

P5
- 0: Optical input transmission OFF
- 1: Optical input transmission ON

- ACC2 input (P3) and USB-Audio input (P4) cannot both be ON at the same time.
- P2 ~ P5 cannot all be OFF at the same time.
- The transmission sound source is appointed by P1 if P2 ~ P5 are all set as “9” and they are returned to their initial settings.

MT — Meter Selection

	1	2	3	4	5	6	7	8	9	10
Set	M	T	P1	;						
Read	M	T	;							
Answer	M	T	P1	P2	;					

Parameters:

P1 (Meter Display Item)
- 0: PO (Type 2, Type 3 only)
- 1: ALC (Type 2, Type 3 only)
- 2: SWR
- 3: COMP
- 4: ID
- 5: VD
- 6: TEMP (Type 1 only)

P2 (Meter Display Pattern)
- 0: Type 1
- 1: Type 2
- 2: Type 3
- 3: Same meter as the Sub band (The pattern which is displayed on the menu screen.)

(Even when setting P2 as Type 1 ~ Type 3, the display may display the same meter as the Sub band. In this case, parameter P2 is returned as 3.)

MU — Mute

	1	2	3	4	5	6	7	8	9	10
Set	M	U	P1	P2	;					
Read	M	U	P1	;						
Answer	M	U	P1	P2	;					

Parameters:

P1
- 0: Main Band
- 1: Sub Band

P2
- 0: Mute OFF
- 1: Mute ON

MV — Memory Channel/VFO

	1	2	3	4	5	6	7	8	9	10
Set	M	V	P1	P2	;					
Read	M	V	P1	;						
Answer	M	V	P1	P2	;					

Parameters:

P1
- 0: Main Band
- 1: Sub Band

P2
- 0: VFO Mode
- 1: Single Memory Channel Mode
- 2: Dual Memory Channel Mode

- You cannot directly switch between Single and Dual Memory Channel mode. Switch after returning to VFO mode.

NB1 — Noise Blanker 1

	1	2	3	4	5	6	7	8	9	10
Set	N	B	1	P1	P2	;				
Read	N	B	1	P1	;					
Answer	N	B	1	P1	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: NB1 OFF
1: NB1 ON

NB2 — Noise Blanker 2

	1	2	3	4	5	6	7	8	9	10
Set	N	B	2	P1	P2	;				
Read	N	B	2	P1	;					
Answer	N	B	2	P1	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: NB2 OFF
1: NB2 ON

NBD — Noise Blanker 2, type B Depth

	1	2	3	4	5	6	7	8	9	10
Set	N	B	D	P1	P2	P2	P2	;		
Read	N	B	D	P1	;					
Answer	N	B	D	P1	P2	P2	P2	;		

Parameters:
P1: 0 (Fix)
P2 (Depth)
001 ~ 020
(Entering a value of 99 results in the initial value being entered.)

- This command is supported from the firmware version 1.10.

NBT — Noise Blanker 2 Type

	1	2	3	4	5	6	7	8	9	10
Set	N	B	T	P1	P2	;				
Read	N	B	T	P1	;					
Answer	N	B	T	P1	P2	;				

Parameters:
P1: 0 (Fix)
P2 (Type)
0: Type 1
1: Type 2

- This command is supported from the firmware version 1.10.

NBW — Noise Blanker 2, type B Width

	1	2	3	4	5	6	7	8	9	10
Set	N	B	W	P1	P2	P2	P2	;		
Read	N	B	W	P1	;					
Answer	N	B	W	P1	P2	P2	P2	;		

Parameters:
P1: 0 (Fix)
P2 (Width)
001 ~ 020
(Entering a value of 99 results in the initial value being entered.)

- This command is supported from the firmware version 1.10.

ND — BEF Attenuation

	1	2	3	4	5	6	7	8	9	10
Set	N	D	P1	P2	P2	;				
Read	N	D	P1	;						
Answer	N	D	P1	P2	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
00: 20 dB
01: 40 dB
02: 60 dB
03: 80 dB
(Entering a value of 99 results in the initial value being entered.)

NL1 — Noise Blanker 1 Level

	1	2	3	4	5	6	7	8	9	10
Set	N	L	1	P1	P2	P2	P2	;		
Read	N	L	1	P1	;					
Answer	N	L	1	P1	P2	P2	P2	;		

Parameters:
P1
0: Main Band
1: Sub Band
P2
001 ~ 032 (Main Band)
001 ~ 010 (Sub Band)
(Entering a value of 99 results in the initial value being entered (Sub band only).)

NL2 — Noise Blanker 2 Level

	1	2	3	4	5	6	7	8	9	10
Set	N	L	2	P1	P2	P2	P2	;		
Read	N	L	2	P1	;					
Answer	N	L	2	P1	P2	P2	P2	;		

Parameters:
P1
0: Main Band
1: Sub Band
P2
001 ~ 032 (Main Band)
001 ~ 010 (Sub Band)
(Entering a value of 99 results in the initial value being entered (Sub band only).)

NR — Noise Reduction

	1	2	3	4	5	6	7	8	9	10
Set	N	R	P1	P2	;					
Read	N	R	P1	;						
Answer	N	R	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: NR OFF
1: NR1 ON
2: NR2 ON

NS — Auto Notch Tracking Speed

	1	2	3	4	5	6	7	8	9	10
Set	N	S	P1	P2	;					
Read	N	S	P1	;						
Answer	N	S	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0 (Slow) ~ 4 (Fast)
(Entering a value of 9 results in the initial value being entered.)

NT — Notch, BEF

	1	2	3	4	5	6	7	8	9	10
Set	N	T	P1	P2	;					
Read	N	T	P1	;						
Answer	N	T	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Notch OFF
1: Auto Notch
2: Manual Notch
3: BEF

NW — Notch Width, BEF Width

	1	2	3	4	5	6	7	8	9	10
Set	N	W	P1	P2	P3	P3	;			
Read	N	W	P1	P2	;					
Answer	N	W	P1	P2	P3	P3	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Manual Notch
1: BEF
P3 (Manual Notch)
00: Normal
01: Wide
P3 (BEF)
00: 300 Hz
01: 400 Hz
02: 500 Hz
03: 600 Hz
04: 700 Hz
05: 800 Hz
06: 900 Hz
07: 1000 Hz
08: 1100 Hz
09: 1200 Hz
(Entering a value of 99 for the BEF parameter results in the initial value being entered.)

- When the function being changed is turned OFF, you cannot change the bandwidth of the manual notch.

OM — Operating Mode

	1	2	3	4	5	6	7	8	9	10
Set	O	M	P1	P2	;					
Read	O	M	P1	;						
Answer	O	M	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
(This parameter is not used for the setting command. The operating band is always used. Enter any value.)
P2
0: Unused
1: LSB
2: USB
3: CW
4: FM
5: AM
6: FSK
7: CW-R
8: Unused
9: FSK-R
A: PSK
B: PSK-R
C: LSB-D1
D: USB-D1
E: FM-D1
F: AM-D1
G: LSB-D2
H: USB-D2
I: FM-D2
J: AM-D2
K: LSB-D3
L: USB-D3
M: FM-D3
N: AM-D3

PA — Pre-amplifier

	1	2	3	4	5	6	7	8	9	10
Set	P	A	P1	P2	;					
Read	P	A	;							
Answer	P	A	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Pre-amp OFF
1: Pre-amp ON

PB0 Voice Message List

	1	2	3	4	5	6	7	8	9	10
Set	P	B	0	P1	;					
Read	P	B	0	;						
Answer	P	B	0	P1	;					

Parameters:
P1
0: List display OFF
1: List display ON

PB1 Voice Message Playback, etc.

	1	2	3	4	5	6	7	8	9	10
Set	P	B	1	P1	P2	;				
Read	P	B	1	;						
Answer	P	B	1	P1	P2	P3	P3	P3	;	

Parameters:
P1
1: Playback Channel 1
2: Playback Channel 2
3: Playback Channel 3
4: Playback Channel 4
5: Playback Channel 5
6: Playback Channel 6
P2 (Operation)
0: Stop
1: Begin Playback
2: Pause/Unpause
3: Fast Forward/ End Fast Forward
4: Rewind/ End Rewind
5: Begin Transmission Playback
6: Repeat Wait (response only)
P3
000 ~ 100: Playback elapsed time in seconds
(While paused, this parameter is 000.)

- You cannot use this command while the Voice Message List display (PB0) is OFF.
- You cannot set additional operations for the P2 parameter during the rewind and fast forward operations.

PB2 Voice Message Channel Registration State

	1	2	3	4	5	6	7	8	9	10
Read	P	B	2	P1	;					
Answer	P	B	2	P1	P2	P3	P3	P3	;	

Parameters:
P1
1: Playback Channel 1
2: Playback Channel 2
3: Playback Channel 3
4: Playback Channel 4
5: Playback Channel 5
6: Playback Channel 6
P2
0: Unregistered channel
1: Registered channel
P3
000 ~ 100: Registered time in seconds (while paused, this parameter is returned as 000)

- You cannot use this command while the Voice Message List display (PB0) is OFF.
- The P3 parameter becomes 000 for unregistered channels.

PB3 Voice Message Channel Repeat

	1	2	3	4	5	6	7	8	9	10
Set	P	B	3	P1	P2	;				
Read	P	B	3	P1	;					
Answer	P	B	3	P1	P2	;				

Parameters:
P1
1: Playback Channel 1
2: Playback Channel 2
3: Playback Channel 3
4: Playback Channel 4
5: Playback Channel 5
6: Playback Channel 6
P2
0: Repeat OFF
1: Repeat ON

- You cannot use this command while the Voice Message List display (PB0) is OFF.
- You cannot set unregistered channels.

PB4 Voice Message Channel Name

	1	2	3	4	5	6 ~ 35	36	37	38
Set	P	B	4	P1	P2	P3	;		
Read	P	B	4	P1	;				
Answer	P	B	4	P1	P2	P3	;		

Parameters:
P1
1: Playback Channel 1
2: Playback Channel 2
3: Playback Channel 3
4: Playback Channel 4
5: Playback Channel 5
6: Playback Channel 6
P2
Always a space
P3
Up to 30 characters: Channel name

- You cannot use this command while the Voice Message List display (PB0) is OFF.
- You cannot set unregistered channels.

PB5 Voice Message Sound Recording Sound Generator

	1	2	3	4	5	6	7	8	9	10
Set	P	B	5	P1	;					
Read	P	B	5	;						
Answer	P	B	5	P1	;					

Parameters:
P1
0: Microphone
1: ACC2
2: USB Audio
3: Optical

- You cannot use this command while the Voice Message List display (PB0) is OFF.

PB6 Voice Message Sound Recording Total Time

	1	2	3	4	5	6	7	8	9	10
Read	P	B	6	;						
Answer	P	B	6	P1	P1	P1	;			

Parameters:
P1
000 ~ 100: Duration in seconds

- You cannot use this command while the Voice Message List display (PB0) is OFF.

PC Output Power

	1	2	3	4	5	6	7	8	9	10
Set	P	C	P1	P1	P1	;				
Read	P	C	;							
Answer	P	C	P1	P1	P1	;				

Parameters:
P1 (TS-990S)
005 ~ 200: SSB/ CW/ FM/ FSK
005 ~ 050: AM

- If a transmission output limiter is in use, the retrieved output power value will be limited.

PL Speech Processor Input/Output Level

	1	2	3	4	5	6	7	8	9	10
Set	P	L	P1	P1	P1	P2	P2	P2	;	
Read	P	L	;							
Answer	P	L	P1	P1	P1	P2	P2	P2	;	

Parameters:
P1 (Input level)
000 (minimum) ~ 255 (maximum)
P2 (Output level)
000 (minimum) ~ 255 (maximum)

PR0 Speech Processor

	1	2	3	4	5	6	7	8	9	10
Set	P	R	0	P1	;					
Read	P	R	0	;						
Answer	P	R	0	P1	;					

Parameters:
P1
0: Speech Processor OFF
1: Speech Processor ON

PR1 Speech Processor Effect Type

	1	2	3	4	5	6	7	8	9	10
Set	P	R	1	P1	;					
Read	P	R	1	;						
Answer	P	R	1	P1	;					

Parameters:
P1
0: Soft
1: Hard

PS Power ON/ OFF

	1	2	3	4	5	6	7	8	9	10
Set	P	S	P1	;						
Read	P	S	;							
Answer	P	S	P1	;						

Parameters:
P1
0: Power OFF
1: Power ON
2: Power Source OFF (end) during processing (response only)
3: Power Source ON (activate) during processing (response only)
4: During timer recording preparations (response only)
5: During timer recording operation (response only)
6: During timer recording cancellation confirmation display (response only)

- While the transceiver is in economical standby mode, you cannot use this command to turn the power ON/OFF.
- When the transceiver is turned ON using this command, the response command (PS1;) is output. The transceiver cannot accept commands until activation is completed.
- During timer recording preparations, you cannot perform setting commands.
- During timer recording operation, you cannot perform commands other than ID, ME and PS.

PT Side Tone/Pitch Frequency

	1	2	3	4	5	6	7	8	9	10
Set	P	T	P1	P1	P1	;				
Read	P	T	;							
Answer	P	T	P1	P1	P1	;				

Parameters:
P1
000 ~ 080: 300 Hz to 1100 Hz (in steps of 10 Hz)

QA — Quick Memory Channel Information

Read	1	2	3	4	5	6	7	8	9	10
	Q	A	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	Q	A	P1	P2	P2	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	P3	P4	P4	P4	P4	P4
	21	22	23	24	25	26	27	28	29	30
	P4	P4	P4	P4	P4	P4	P5	P6	P7	;

Parameters:
P1
0 ~ 9: Quick Memory Channel Number
P2
11-digit Main band frequency (Unused high-end digits will become 0.)
(When no information is available for a parameter, it is returned as blank.)
P3
Main band mode (Refer to P2 of the MS command.)
(When no information is available for a parameter, it is returned as blank.)
P4
11-digit Sub band frequency (Unused high-end digits will become 0.)
(When no information is available for a parameter, it is returned as blank.)
P5
Sub band mode (Refer to P2 of the MS command.)
(When no information is available for a parameter, it is returned as blank.)
P6
0: Simplex
1: Split
(When no information is available for a parameter, it is returned as blank.)
P7
0: Dual Recpetion OFF
1: Dual Recpetion ON
(When no information is available for a parameter, it is returned as blank.)

- Auto answer is not provided by the AI function.

QD — Quick Memory All Delete

Set	1	2	3	4	5	6	7	8	9	10
	Q	D	;							
Read	1	2	3	4	5	6	7	8	9	10
	Q	D	;							

Parameters:
No parameters are used with this command.

- When the AI function is ON, a response is output when deleting the Quick Memory.
- You cannot perform this command when Quick Memory mode is OFF (an error occurs).

QI — Writing the Quick Memory

Set	1	2	3	4	5	6	7	8	9	10
	Q	I	;							
Read	1	2	3	4	5	6	7	8	9	10
	Q	I	;							

Parameters:
No parameters are used with this command.

- Performs the same function as pressing [Q-M.IN].
- When the AI function is ON, a response is output when writing to the Quick Memory.

QR — Quick Memory

Set	1	2	3	4	5	6	7	8	9	10
	Q	R	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	Q	R	;							
Answer	1	2	3	4	5	6	7	8	9	10
	Q	R	P1	P2	;					

Parameters:
P1
0: Quick Memory OFF
1: Quick Memory ON
P2
0 ~ 9: Quick Memory channel number
(If parameter P1=0, set parameter P2 to 0. When selecting Quick Memory ON but not setting a channel number, this setting is blank.)

- When configuring a value above the number of Quick Memory channels set by the menu, an error occurs.
- When specifying a blank channel, an error occurs.

RA — Attenuator

Set	1	2	3	4	5	6	7	8	9	10
	R	A	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	R	A	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	R	A	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
(This parameter is invalid during the Setting command; the operating band is always selected. Enter any value.)
P2
0: ATT OFF
1: -6 dB
2: -12 dB
3: -18 dB

RC — RIT/XIT Frequency Clear

	1	2	3	4	5	6	7	8	9	10
Set	R	C	;							

Parameters:
No parameters are used with this command.

- Clears the RIT/XIT frequency regardless if the RIT/XIT function is ON or OFF.

RD / RU — RIT/XIT Frequency Up/ Down

	1	2	3	4	5	6	7	8	9	10
Set 1	R	D / U	;							
Set 2	R	D / U	P1	P1	P1	P1	P1	;		

Parameters:
P1 (Set 2 command only)
00000 ~ 09999: Frequency (in Hz)

- Use setting 1 to adjust the frequency by 1 step.
- The RU command is used to increase the frequency and the RD command is used to decrease the frequency.
- Use the setting 2 to set a RIT/XIT frequency via the P1 parameter. Use the RU command to enter a positive frequency and the RD command to enter a negative frequency.

RE — Recording Function

	1	2	3	4	5	6	7	8	9	10
Set	R	E	P1	;						
Read	R	E	;							
Answer	R	E	P1	P2	P2	P2	;			

Parameters:
P1
0: Recording/Playback stop
1: Begin normal recording/recording in progress
2: Recording storage (setting only)
3: Begin quick playback/playback in progress
4: Pause normal recording/resume recording
5: Pause quick playback/resume playback
6: Recording failure (response only)
7: Playback failure (response only)
(The AI function will not perform an auto response when a recording or playback failure occurs due to the operation of the transceiver.)
P2
001 ~ 100: Playback progression (000 when no playback is in progress.)
(The AI function performs an auto response every second for the playback progression.)

RF — RIT/XIT Frequency Up/ Down

	1	2	3	4	5	6	7	8	9	10
Read	R	F	;							
Answer	R	F	P1	P2	P2	P2	P2	;		

Parameters:
P1 (RIT/XIT frequency direction)
0: + direction
1: – direction
P2
0000 ~ 9999: RIT/XIT frequency in Hz

RG — RF Gain

	1	2	3	4	5	6	7	8	9	10
Set	R	G	P1	P2	P2	P2	;			
Read	R	G	P1	;						
Answer	R	G	P1	P2	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P1
000 ~ 255 (in steps of 1)

RL1 — Noise Reduction 1 Level

	1	2	3	4	5	6	7	8	9	10
Set	R	L	1	P1	P2	P2	;			
Read	R	L	1	P1	;					
Answer	R	L	1	P1	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2 (NR1 level)
01 ~ 10
(Entering a value of 99 results in the initial value being entered (Sub band only).)

RL2 Noise Reduction 2 Level

	1	2	3	4	5	6	7	8	9	10
Set	R	L	2	P1	P2	P2	;			
Read	R	L	2	P1	;					
Answer	R	L	2	P1	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2 (NR2 level)
00 (2 ms) ~ 09 (20 ms)
(Entering a value of 99 results in the initial value being entered (Sub band only).)

RM Meter

	1	2	3	4	5	6	7	8	9	10
Set	R	M	P1	P2	;					
Read	R	M	;							
Answer	R	M	P1	P3	P3	P3	P3	;		

Parameters:
P1
1: ALC
2: SWR
3: COMP
4: ID
5: VD
6: TEMP
P2 (Read Setting)
0: Do not read
1: Read
(When turning the power ON, all meters are reset to “do not read”.)
P3 (Meter oscillation)
0000 ~ 0070: Meter value in dots
(This value shows the oscillation (number of dots) of the transceiver digital meter.)

- The meter value of the meter type (multi data input is possible) which has been set, is output.
- You can set the type of meter to be displayed using the MT command.
- The ALC meter value is output during VGS recording and standby.

RT RIT ON/OFF

	1	2	3	4	5	6	7	8	9	10
Set	R	T	P1	;						
Read	R	T	;							
Answer	R	T	P1	;						

Parameters:
P1
0: RIT OFF
1: RIT ON

RX Receiver Function Status

	1	2	3	4	5	6	7	8	9	10
Set	R	X	;							
Answer	R	X	;							

Parameters:
No parameters are used with this command.

- A response is output only when the AI function is working.

SB Sub Band Receiver

	1	2	3	4	5	6	7	8	9	10
Set	S	B	P1	;						
Read	S	B	;							
Answer	S	B	P1	;						

Parameters:
P1
0: OFF
1: ON

SC0 Scan

	1	2	3	4	5	6	7	8	9	10
Set	S	C	0	P1	;					
Read	S	C	0	;						
Answer	S	C	0	P2	P3	;				

Parameters:
P1 (Setting only)
0: Scan OFF
1: Scan ON
P2 (Scan status)
0: Scan OFF
1: Scan ON (Main Band)
2: Scan ON (Sub Band)
P3
0: Outside the Slow Scan frequency range
1: Inside the Slow Scan frequency range
(Other than Program Scan, it is always 0.)

SC1 Scan Speed

	1	2	3	4	5	6	7	8	9	10
Set	S	C	1	P1	;					
Read	S	C	1	;						
Answer	S	C	1	P1	;					

Parameters:
P1
1 ~ 9: Scan speed

SC2 Tone Scan/ CTCSS Scan

	1	2	3	4	5	6	7	8	9	10
Set	S	C	2	P1	P2	;				
Read	S	C	2	P1	;					
Answer	S	C	2	P1	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2
0: Tone/CTCSS Scan OFF
1: Tone Scan
2: CTCSS Scan

- You can perform the setting when the scan operating band is in FM mode.
- The Tone function turns ON automatically when performing Tone Scan with this command.
- The CTCSS function turns ON automatically when performing CTCSS Scan with this command.

SD Break-in Delay Time

	1	2	3	4	5	6	7	8	9	10
Set	S	D	P1	P1	P1	P1	;			
Read	S	D	;							
Answer	S	D	P1	P1	P1	P1	;			

Parameters:
P1
0050 ~ 1000 (ms) (in steps of 50)

- An entered value that does not match the 50 ms step value will be rounded down to the nearest 50 ms step.

SE0 Preselector ON/OFF

	1	2	3	4	5	6	7	8	9	10
Set	S	E	0	P1	;					
Read	S	E	0	;						
Answer	S	E	0	P1	;					

Parameters:
P1
0: Preselector OFF
1: Preselector ON

SE1 Preselector Band Shift

	1	2	3	4	5	6	7	8	9	10
Set	S	E	1	P1	P1	;				
Read	S	E	1	;						
Answer	S	E	1	P1	P1	P2	P2	;		

Parameters:

P1 (Band shift)
00 ~ 40 (in steps of 1)
(The band shift center is 20. When setting the P1 parameter to 99, it returns to the initial value (center). Setting cannot be performed when the main band frequency is on a preselector non-operation band. When reading on a non-operation band, the center value is returned.)

P2
00: 1.8 MHz Band
01: 3.5 MHz Band
02: 5 MHz Band
03: 7 MHz Band
04: 10 MHz Band
05: 14 MHz Band
06: 18 MHz Band
07: 21 MHz Band
08: 24 MHz Band
09: 28 MHz Band
10: Preselector inoperative band

SH Receive Filter High-cut Frequency/ Shift Frequency

	1	2	3	4	5	6	7	8	9	10
Set	S	H	P1	P2	P2	;				
Read	S	H	P1	;						
Answer	S	H	P1	P2	P2	;				

Parameters:

P1
0: Main Band
1: Sub Band

P2 (High-cut Frequency ID/ Shift Frequency ID)

P2	High-cut Freq. (Hz)		Shift Freq. (Hz)	
	AM	Other	SSB	CW
00	2500	1000	1000	-800
01	3000	1200	1100	-750
02	4000	1400	1200	-700
03	5000	1600	1300	-650
04		1800	1400	-600
05		2000	1500	-550
06		2200	1600	-500
07		2400	1700	-450
08		2600	1800	-400
09		2800	1900	-350
10		3000	2000	-300
11		3400	2100	-250
12		4000	2210	-200
13		5000		-150
14				-100
15				-50
16				0
17				50
18				100
19				150
20				200
21				250
22				300
23				350
24				400
25				450
26				500
27				550
28				600
29				650
30				700
31				750
32				800

(An error occurs when entering an ID with no assigned frequency for the setting command. Entering a value of 99 results in the initial value being entered.)

SL — Receive Filter Low-cut Frequency/ Wide Frequency

	1	2	3	4	5	6	7	8	9	10
Set	S	L	P1	P2	P2	;				
Read	S	L	P1	;						
Answer	S	L	P1	P2	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2 (Low-cut Frequency ID/ Wide Frequency ID)

P2	Low-cut Freq. (Hz)		Wide Freq. (Hz)			
	AM	Other	SSB	CW	FSK	PSK
00	0	0	50	50	250	50
01	100	50	80	80	300	80
02	200	100	100	100	400	100
03	300	200	150	150	500	150
04		300	200	200	1000	200
05		400	250	250	1500	250
06		500	300	300		300
07		600	400	400		400
08		700	500	500		500
09		800	600	600		600
10		900	1000	1000		1000
11		1000	1500	1500		1500
12			2000	2000		
13			2200	2500		
14			2400			
15			2600			
16			2800			
17			3000			

(An error occurs when entering an ID with no assigned frequency for the setting command. Entering a value of 99 results in the initial value being entered.)

SM — S-Meter/Power Meter

	1	2	3	4	5	6	7	8	9	10
Read	S	M	P1	;						
Answer	S	M	P1	P2	P2	P2	P2	;		

Parameters:
P1
0: Main Band
1: Sub Band
P2 (Meter oscillation)
0000 ~ 0070: Meter value (in dots)
(This value shows the oscillation (number of dots) of the transceiver digital meter. The SM command reads the S-meter during reception and the power meter during transmission. While receiving, the Sub band value is returned as 0000.)

SP — Split Operation Frequency Setting

	1	2	3	4	5	6	7	8	9	10
Set 1	S	P	P1	;						
Set 2	S	P	P1	P2	P3	;				
Read	S	P	;							
Answer	S	P	P1	;						

Parameters:
P1
0: During no operation/ Complete the setting
1: During the setting/ Start the setting
2: Cancel the setting (Set only)
(When using Setting 2, set the P1 parameter to 0. The “SPLIT” LED blinks during this setting.)
P2 (Shift direction)
0: + shift
1: – shift
P3 (Shift amount)
1 ~ 9 (in kHz)

- When performing setting 2, Split operation activates automatically.

SQ — Squelch Level

	1	2	3	4	5	6	7	8	9	10
Set	S	Q	P1	P2	P2	P2	;			
Read	S	Q	P1	;						
Answer	S	Q	P1	P2	P2	P2	;			

Parameters:
P1
0: Main Band
1: Sub Band
P2
000 ~ 255 (in steps of 1): Squelch level

SR — Reset

	1	2	3	4	5	6	7	8	9	10
Set	S	R	P1	;						

Parameters:
P1
1: Menu reset
2: Memory channel reset
3: VFO reset
4: Standard reset
5: Full reset

SS — Program Slow Scan Point Frequency

	1	2	3	4	5	6	7	8	9	10
Set	S	S	P1	P2	P3	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P3	P3	P3	;				
Read	1	2	3	4	5	6	7	8	9	10
	S	S	P1	P2	;					
Answer	1	2	3	4	5	6	7	8	9	10
	S	S	P1	P2	P3	P3	P3	P3	P3	P3
	11	12	13	14	15	16	17	18	19	20
	P3	P3	P3	P3	P3	;				

Parameters:
P1
0 ~ 9: Memory channel number for Program Slow Scan
P2
0 ~ 4: Slow down frequency spot
P3
Slow down frequency (11 digits in Hz)

- If no point frequency has been set, parameter P3 is all 0's.
- If parameter P3 is set to all 0's, the point frequency set for parameter P2 is deleted.
- Other than when deleting parameter P3, you cannot set a frequency exceeding the section selected channel lower/upper frequency limits.
- If the specified P1 parameter is an empty Memory channel, the SS command becomes invalid.

SU — Program Scan Section/ Memory Scan Group

	1	2	3	4	5	6	7	8	9	10
Set	S	U	P1	P2	P3	P4	P5	P6	P7	P8
	11	12	13	14	15	16	17	18	19	20
	P9	P10	P11	P12	P13	;				
Read	1	2	3	4	5	6	7	8	9	10
	S	U	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	S	U	P1	P2	P3	P4	P5	P6	P7	P8
	11	12	13	14	15	16	17	18	19	20
	P9	P10	P11	P12	P13	;				

Parameters:
P1
0: Program Scan section defined memory setting
1: Memory Scan group setting

P2 ~ P13

Parameter	When Selecting the Program Scan Section	When Setting the Memory Scan Group
P2	The section set in Channel 0	Group 0
P3	The section set in Channel 1	Group 1
P4	The section set in Channel 2	Group 2
P5	The section set in Channel 3	Group 3
P6	The section set in Channel 4	Group 4
P7	The section set in Channel 5	Group 5
P8	The section set in Channel 6	Group 6
P9	The section set in Channel 7	Group 7
P10	The section set in Channel 8	Group 8
P11	The section set in Channel 9	Group 9
P12	Always 0	Group P
P13	Always 0	Group E

0: Unselected
1: Selected

SV — Memory Transfer Operation

	1	2	3	4	5	6	7	8	9	10
Set	S	V	;							

Parameters:
No parameters are used with this command.

- Performs the same function as the transceiver [M>V] key.

TB — Tone Frequency (Transmit Band/Split)

	1	2	3	4	5	6	7	8	9	10
Set	T	B	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	T	B	;							
Answer	1	2	3	4	5	6	7	8	9	10
	T	B	P1	;						

Parameters:
P1
0: Main Band (Split OFF)
1: Sub Band (Split ON)

TF0 Transmit Filter

	1	2	3	4	5	6	7	8	9	10
Set	T	F	0	P1	;					
Read	T	F	0	;						
Answer	T	F	0	P1	;					

Parameters:
P1
0: FIL-A
1: FIL-B
2: FIL-C

TF1 Transmit Filter Low-cut Frequency

	1	2	3	4	5	6	7	8	9	10
Set	T	F	1	P1	;					
Read	T	F	1	;						
Answer	T	F	1	P1	;					

Parameters:
P1
0: 10 Hz
1: 100 Hz
2: 200 Hz
3: 300 Hz
4: 400 Hz
5: 500 Hz
(Entering a value of 9 results in the initial value being entered.)

TF2 Transmit Filter High-cut Frequency

	1	2	3	4	5	6	7	8	9	10
Set	T	F	2	P1	;					
Read	T	F	2	;						
Answer	T	F	2	P1	;					

Parameters:
P1
0: 2500 Hz
1: 2600 Hz
2: 2700 Hz
3: 2800 Hz
4: 2900 Hz
5: 3000 Hz
6: 3500 Hz
7: 4000 Hz
(Entering a value of 9 results in the initial value being entered.)

TM0 Timer

	1	2	3	4	5	6	7	8	9	10
Set	T	M	0	P1	;					
Read	T	M	0	;						
Answer	T	M	0	P1	;					

Parameters:
P1
0: Timer OFF/ pause
1: Timer ON/ unpause

TM1 Program Timer

Set

1	2	3	4	5	6	7	8	9	10
T	M	1	P1	P2	P3	P4	P5	P6	P7
11	12	13	14	15	16	17	18	19	20
P8	P9	P10	P11	P11	P11	P11	P12	P12	P12
21	22	23	24	25	26	27	28	29	30
P12	P13	P13	P13	P13	P13	P13	P13	P13	P13
31	32	33	34	35	36	37	38	39	40
P13	P13	P14	P15	P15	P15	P15	P15	P15	P15
41	42	43	44	45	46	47	48	49	50
P15	P15	P15	P16	P17	;				

Read

1	2	3	4	5	6	7	8	9	10
T	M	1	;						

Answer

1	2	3	4	5	6	7	8	9	10
T	M	1	P1	P2	P3	P4	P5	P6	P7
11	12	13	14	15	16	17	18	19	20
P8	P9	P10	P11	P11	P11	P11	P12	P12	P12
21	22	23	24	25	26	27	28	29	30
P12	P13	P13	P13	P13	P13	P13	P13	P13	P13
31	32	33	34	35	36	37	38	39	40
P13	P13	P14	P15	P15	P15	P15	P15	P15	P15
41	42	43	44	45	46	47	48	49	50
P15	P15	P15	P16	P17	;				

Parameters:

P1
- 0: Program Timer OFF
- 1: Program Timer ON

P2
- 0: Repeat OFF
- 1: Repeat ON

P3 (Sunday)
P4 (Monday)
P5 (Tuesday)
P6 (Wednesday)
P7 (Thursday)
P8 (Friday)
P9 (Saturday)
- 0: Unselected
- 1: Selected

P10 (Operation classification)
- 0: ON (On Timer)
- 1: OFF (Off Timer)
- 2: ON & OFF (On/Off Timer)
- 3: REC (Timer Recorder)

P11
- 0000 ~ 2359: Start time

(When the P10 parameter is OFF (Off Timer), this configuration is ignored and the response becomes blank.)

P12
- 0000 ~ 2359: End time

(When the P10 parameter is ON (On Timer), this configuration is ignored and the response becomes blank.)

P13 (Main band frequency)
- 11 digit frequency (in Hz). Unused digits are 0.

P14 (Main band mode)
- Refer to the OM command P2 parameter.

P15 (Sub band frequency)
- 11 digit frequency (in Hz). Unused digits are 0.

P16 (Sub band mode)
- Refer to the OM command P2 parameter.

P17 (Transmit/Receive state)
- 0: Simplex
- 1: Split
- 2: Dual Reception
- 3: TF-WATCH

TM2 Sleep Timer

Set

1	2	3	4	5	6	7	8	9	10
T	M	2	P1	;					

Read

1	2	3	4	5	6	7	8	9	10
T	M	2	;						

Answer

1	2	3	4	5	6	7	8	9	10
T	M	2	P1	P2	P2	P2	;		

Parameters:

P1
- 0: OFF
- 1: 5 minutes
- 2: 10 minutes
- 3: 15 minutes
- 4: 30 minutes
- 5: 60 minutes
- 6: 90 minutes
- 7: 120 minutes

P2
- 000 ~ 120: Sleep duration (in minutes)

(When the timer is OFF, P2 is returned as 000.)

- The sleep timer operation starts when any value other than OFF is set.

TN — FM Tone Frequency

	1	2	3	4	5	6	7	8	9	10
Set	T	N	P1	P2	P2	;				
Read	T	N	P1							
Answer	T	N	P1	P2	P2	;				

Parameters:
P1
0: Main Band
1: Sub Band
P2 (Tone Frequency)

P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)
00	67.0	13	103.5	26	159.8	39	199.5
01	69.3	14	107.2	27	162.2	40	203.5
02	71.9	15	110.9	28	165.5	41	206.5
03	74.4	16	114.8	29	167.9	42	210.7
04	77.0	17	118.8	30	171.3	43	218.1
05	79.7	18	123.0	31	173.8	44	225.7
06	82.5	19	127.3	32	177.3	45	229.1
07	85.4	20	131.8	33	179.9	46	233.6
08	88.5	21	136.5	34	183.5	47	241.8
09	91.5	22	141.3	35	186.2	48	250.3
10	94.8	23	146.2	36	189.9	49	254.1
11	97.4	24	151.4	37	192.8	50	1750
12	100.0	25	156.7	38	196.6	99	Default

(Entering a value that does not exist is invalid. 99 is a setting command only.)

TO — FM Tone/ CTCSS/ Cross-Tone

	1	2	3	4	5	6	7	8	9	10
Set	T	O	P1	P2	;					
Read	T	O	P1	;						
Answer	T	O	P1	P2	;					

Parameters:
P1
0: Main Band
1: Sub Band
P1
0: OFF
1: Tone ON
2: CTCSS
3: Cross-Tone

TS — TF-Set

	1	2	3	4	5	6	7	8	9	10
Set	T	S	P1	;						
Read	T	S	;							
Answer	T	S	P1	;						

Parameters:
P1
0: TF-Set OFF
1: TF-Set ON

TR — Frequency Tracking

	1	2	3	4	5	6	7	8	9	10
Set	T	R	P1	;						
Read	T	R	;							
Answer	T	R	P1	;						

Parameters:
P1
0: Frequency tracking OFF
1: Frequency tracking ON

TX — Transmission Mode

	1	2	3	4	5	6	7	8	9	10
Set	T	X	P1	;						
Answer	T	X	P1	;						

Parameters:
P1
0: SEND/PTT (normal transmission using the MIC input)
1: DATA SEND/PKS (ACC2/ USB input)
2: TX TUNE

- If no P1 parameter is specified, it is set to 0 (SEND/PTT).
- A response is output only when using the AI function.

UR / UT — RX / TX Equalizer

	1	2	3	4	5	6	7	8	9	10
Set	U	R / T	P1	P1	P2	P2	P3	P3	P4	P4
	11	12	13	14	15	16	17	18	19	20
	P5	P5	P6	P6	P7	P7	P8	P8	P9	P9
	21	22	23	24	25	26	27	28	29	30
	P10	P10	P11	P11	P12	P12	P13	P13	P14	P14
	31	32	33	34	35	36	37	38	39	40
	P15	P15	P16	P16	P17	P17	P18	P18	;	
Read	1	2	3	4	5	6	7	8	9	10
	U	R / T	;							
Answer	1	2	3	4	5	6	7	8	9	10
	U	R / T	P1	P1	P2	P2	P3	P3	P4	P4
	11	12	13	14	15	16	17	18	19	20
	P5	P5	P6	P6	P7	P7	P8	P8	P9	P9
	21	22	23	24	25	26	27	28	29	30
	P10	P10	P11	P11	P12	P12	P13	P13	P14	P14
	31	32	33	34	35	36	37	38	39	40
	P15	P15	P16	P16	P17	P17	P18	P18	;	

Parameters:
P1: 0 Hz level
P2: 300 Hz level
P3: 600 Hz level
P4: 900 Hz level
P5: 1200 Hz level
P6: 1500 Hz level
P7: 1800 Hz level
P8: 2100 Hz level
P9: 2400 Hz level
P10: 2700 Hz level
P11: 3000 Hz level
P12: 3300 Hz level
P13: 3600 Hz level
P14: 3900 Hz level
P15: 4200 Hz level
P16: 4500 Hz level
P17: 4800 Hz level
P18: 5100 Hz level
00 ~ 30: Where 00 is +6 dB, 06 is 0 dB, and 30 is -24 dB.
(An entered value of 99 for parameters P1 ~ P18 sets that parameter to its initial value.)

- The levels you select using this command will be stored in the transceiver memory.

VD — VOX Delay Time

	1	2	3	4	5	6	7	8	9	10
Set	V	D	P1	P2	P2	P2	;			
Read	V	D	P1	;						
Answer	V	D	P1	P2	P2	P2	;			

Parameters:
P1 (Input type)
0: MIC
1: ACC2
2: USB-Audio
3: Optical
P2
000 ~ 020: VOX Delay Time (value x 150 ms)
(An entered value of 999 sets the parameter to its initial value.)

VG0 — VOX Gain

	1	2	3	4	5	6	7	8	9	10
Set	V	G	0	P1	P2	P2	P2	;		
Read	V	G	0	P1	;					
Answer	V	G	0	P1	P2	P2	P2	;		

Parameters:
P1 (Input type)
0: Microphone
1: ACC2
2: USB-Audio
3: Optical
P2
000 ~ 255: VOX Gain level for Microphone input (in steps of 1)
000 ~ 020: VOX Gain level for an input other than the Microphone
(An entered value of 999 sets the parameter to its initial value.)

VG1 — Anti-VOX Level

	1	2	3	4	5	6	7	8	9	10
Set	V	G	1	P1	P2	P2	P2	;		
Read	V	G	1	P1	;					
Answer	V	G	0	P1	P2	P2	P2	;		

Parameters:
P1 (Input type)
0: MIC
1: ACC2
2: USB-Audio
3: Optical
P2
000 ~ 020: Anti-VOX level
(An entered value of 999 sets the parameter to its initial value.)

VR0 — Voice Guide

	1	2	3	4	5	6	7	8	9	10
Set	V	R	0	P1	;					

Parameters:
P1
1: Voice 1 (Main Band)
2: Voice 2
3: Voice 3
4: Voice 1 (Sub Band)

VR1 Auto Announce Pause

	1	2	3	4	5	6	7	8	9	10
Set	V	R	1	P1	;					
Read	V	R	1	;						
Answer	V	R	1	P1	;					

Parameters:
P1
0: Resume
1: Pause
(This command will not automatically respond when using the AI function.)

VV Main Band to Sub Band Copy ([M>S] key operation)

	1	2	3	4	5	6	7	8	9	10
Set	V	V	;							

Parameters:
No parameters are used with this command.

VX VOX Function

	1	2	3	4	5	6	7	8	9	10
Set	V	X	P1	;						
Read	V	X	;							
Answer	V	X	P1	;						

Parameters:
P1
0: VOX OFF
1: VOX ON

- This command cannot be set in modes other than SSB/AM/FM.
- When reading this command in a mode other than SSB/AM/FM, 0 is returned.

XO Transverter Offset Direction and Frequency

	1	2	3	4	5	6	7	8	9	10
Set	X	O	P1	P2	P2	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	;					
Read	X	O	;							
Answer	X	O	P1	P2	P2	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	;					

Parameters:
P1 (For the transceiver frequency, the transverter frequency can be set in either direction)
0: + direction
1: – direction
P2
Offset frequency in Hz (11 digits in Hz)

- The frequency which the difference frequency to the frequency which is acquired by the FA/FB command (subtraction) becomes the transverter display frequency.
- The settings in which the transverter display frequency becomes 0 or the setting exceeds 4,294,967,295 Hz causes an error.

XT XIT ON/OFF

	1	2	3	4	5	6	7	8	9	10
Set	X	T	P1	;						
Read	X	T	;							
Answer	X	T	P1	;						

Parameters:
P1
0: XIT OFF
1: XIT ON

XV Transverter ON/OFF

	1	2	3	4	5	6	7	8	9	10
Set	X	V	P1	;						
Read	X	V	;							
Answer	X	V	P1	;						

Parameters:
P1
0: Transverter OFF
1: Transverter ON

00	Notification of Restart									
Read	1	2	3	4	5	6	7	8	9	10
	0	0	;							

Parameters:
No parameters are used with this command.

- When the transceiver is automatically restarted by a function such as reset, this command is output.
- If the AI function is OFF, this command is not output.

LAN EXCLUSIVE COMMAND TABLES

##CN	LAN Connection Command									
Read	1	2	3	4	5	6	7	8	9	10
	#	#	C	N	;					
Answer	1	2	3	4	5	6	7	8	9	10
	#	#	C	N	P1	;				

Parameters:
P1
0: Connection Denied
1: Connection Authorized

- If a LAN connection already exists, performing this command will result in a connection denial.

##DD2	Display Data Output Control (Bandscope Display Information For High-Speed Output)								
Answer	1	2	3	4	5	6 ~ 1285	1286	1287	1288
	#	#	D	D	2	P1	;		

Parameters:
P1
Bandscope spectrum display information (1280 digits)
640 spectrum information are each expressed as 2 ASCII digits.
Two digits of the beginning of division No. 00 are spectrum information of the left side, and two digits of the end of division No. 31 become the spectrum information of the right side.
Two digits at the beginning are spectrum information of the left side, and two digits at the end become the spectrum information of the right side.
The range of value for each spectrum information is from 00h ~ 8Ch (hexadecimal numbering).
00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 8Ch shows a state where the spectrum is not displayed (signal strength = -100 dB).
The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 8Ch, the order becomes “8”, “C”.

- When the AI function is ON, the data is output at a constant period by the LAN terminal when the DD0 command is set to the high-speed output.
- When the transceiver is not displaying the bandscope, it is not output.

##DD3	Display Data Output Control (Subscope Display Information For High-Speed Output)								
Answer	1	2	3	4	5	6 ~ 1285	1286	1287	1288
	#	#	D	D	3	P1	;		

Parameters:
P1
Subscope Spectrum Display Information (570 digits)
285 spectrum information are each expressed as 2 ASCII digits.
Two digits at the beginning are spectrum information of the left side, and two digits at the end become the spectrum information of the right side.
The range of value for each spectrum information is from 00h ~ 32h (hexadecimal numbering).
00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 32h shows a state where the spectrum is not displayed (signal strength = -50 dB).
The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 32h, the order becomes “3”, “2”.

- When the AI function is ON, the data is output at a constant period by the LAN terminal when the DD0 command is set to the high-speed output.
- When the transceiver is not displaying the subscope, it is not output.

##ID LAN Connection Login Command

Read	1	2	3	4	5	6	7	8	9	10
	#	#	I	D	P1	P2	P3	(P3)	(P3)	(P3)
	11	12	13	14	15	16	17	18	19	20
	(P3)	(P3)	(P3)	(P3)	(P4)	(P4)	(P4)	(P4)	(P4)	(P4)
	21	22	23	24	25	26	27	28	29	30
	(P4)	(P4)	;							
Answer	1	2	3	4	5	6	7	8	9	10
	#	#	I	D	P5	;				

Parameters:

P1
1 ~ 8: Account length

P2
1 ~ 8: Password length

P3 (User account)
User account data entered as ASCII code

P4 (User password)
User password data entered as ASCII code

P5
0: Authorization Failure
1: Authorization Successful

- For example, if the user account name is “kenwood” and the password is “admin”, enter the following:
  ##ID75kenwoodadmin