KENWOOD

TS-890S

PC CONTROL COMMAND
Reference Guide

JVCKENWOOD Corporation

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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-890S 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

If using the COM port or USB, 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.

Download the driver from the following URL.

https://www.kenwood.com/i/products/info/amateur/software_download.html

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

■ Using a LAN Cable

When connecting the TS-890S and a PC using a hub, connect them with a straight cable. When connecting the TS-890S directly to a PC, connect them with a cross cable.

LAN COMMUNICATION PROCEDURES

1. Through the LAN menu of the transceiver, set the IP addresses and your administrator 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 administrator 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

*: 4800 bps cannot be used with the USB-B connector.

LAN CONNECTOR

Entry	Specifications
Protocol	TCP/IP
Character Encoding Mode	UTF-8

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 VFO A is automatically output to the PC with the FA command when you change the operating frequency of the VFO A. It is not necessary to first send a read command from the PC. Besides the frequency of the VFO A, 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.

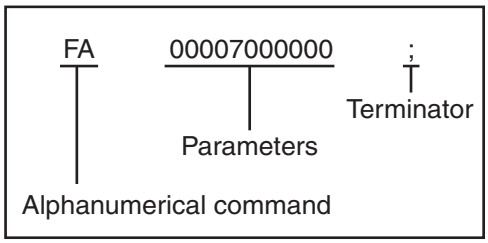
Turn this function on using the AI command (the initial state is OFF).

PC CONTROL COMMANDS

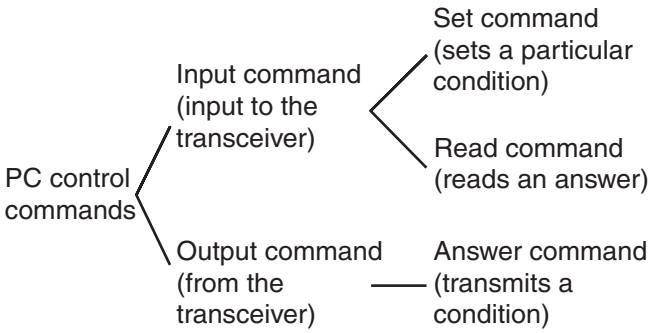
Note: PC control commands will not be available when "PSQ/PKS Pin Assignment (COM Connector)" from the Advanced Menu is set to "On".

A PC control command is composed of a 2 to 5-letter alphanumerical command-name, a set of parameters, and the terminator that signals the end of the command.

Example: Command to set the VFO A 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 VFO A):

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

■ Command

A command consists of 2 to 5 alphanumeric 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 3.

■ 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 3} to configure the appropriate parameters.

■ 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 will 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;	A receive buffer overrun error occurred.

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 (RX AT circuit)
- 0: OFF
- 1: OFF
- ◆ This parameter is invalid during the Setting command. Always enter 1.

P2 (TX AT circuit)
- 0: OFF
- 1: ON

P3
- 0: Stop Tuning/ Tuning is inactive
- 1: Start Tuning/ Tuning is active

- The RX AT circuit sets, use the EX command.
- To start tuning, use command “AC111;”.

AG — AF Level

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

Parameters:

P1
- 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 (Not back up the ON state)
- 3: Not used
- 4: AI ON (Back up the ON state)

- When AI is ON, the respective response command is sent when the parameter is changed by the command with the response command.
- When AI is ON by setting P1 parameter to 2 and the transceiver is turned to OFF, AI is also turned to OFF.
- The backup state is initialized (AI OFF) by full reset, standard reset, or VFO reset.
- The AI function can be set separately for USB connector, COM connector, or LAN connector.

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: Auto Mode OFF
- 1: Auto Mode ON

AN — Antenna Selection

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

Parameters:
P1 (Antenna selection)
1: ANT1
2: ANT2
9: No change (setting command only)
P2 (Receiving antenna usage state)
0: RX ANT is not used
1: RX ANT is used
9: No change (setting command only)
P3 (Drive out selection)
0: Drive out OFF
1: Drive out ON
9: No change (setting command only)
P4 (Antenna output for external receiver)
0: Antenna output OFF
1: Antenna output ON
9: No change

- When setting the command, enter only the parameters you are changing. For parameters you are not changing, enter "9".
- For a response command, parameter P1~ P4 cannot be "9".

AP0 — Audio Peak Filter ON/OFF

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

Parameters:
P1
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	P1	;				
Read	A	P	1	;						
Answer	A	P	1	P1	P1	;				

Parameters:
P1
00 ~ 80
99: Initial value setting (center) (setting command only)
◆ 40 is the center (CW pitch frequency).
◆ 00 represents a –200 Hz shift from center.
◆ 80 represents a +200 Hz shift from center.
◆ Each step represents a 5 Hz shift.

AP2 — Audio Peak Filter Pass Bandwidth

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

Parameters:
P1
0: NAR
1: MID
2: WIDE
9: Initial value setting (setting command only)

AP3 — Audio Peak Filter Gain

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

Parameters:
P1
0 ~ 6
9: Initial value setting (setting command only)

AQ0 AGC Quick Recovery ON/OFF

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

Parameters:
P1
1: OFF
2: ON

- In FM mode, the AQ0 command cannot be set or read (causes an error).

AQ1 AGC Quick Recovery Threshold Level

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

Parameters:
P1
01 ~ 10
99: Initial value setting (setting command only)

- You can read even when AGC is OFF.
- In FM mode, the AQ1 command cannot be set or read (causes an error).

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 (Upper limit frequency of frequency division)
11 digit (for example, 14.175 MHz is displayed as 00014175000)
P2 (Mode of frequency division)
Mode (refer to the P2 parameter of the OM command)

- If the total number of frequency divisions has reached 32, you cannot be newly registered.

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
00 ~ 32

AS2 Auto Mode Frequency Division Readout

	1	2	3	4	5	6	7	8	9	10
Read	A	S	2	P1	P1	;				
Answer	1	2	3	4	5	6	7	8	9	10
	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 (Frequency division number)
00 ~ 31
P2 (Upper limit frequency of frequency division)
11 digit (for example, 14.175 MHz is responded as 00014175000)
P3 (Mode of frequency division)
Refer to the P2 parameter of the OM command

- If the selected frequency division has no information, P2 and P3 are all digits respond to “0”.
- While the 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 (Frequency division number to be deleted)
00 ~ 31

BC — Beat Cancel

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

Parameters:

P1

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 (Target VFO)

0: VFO A
1: VFO B
◆ This parameter is invalid during the Setting command; the operating VFO 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: General coverage

P3 (Band memory number)

1 ~ 3:
◆ 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.
- While the section setting Memory Channel is displayed, you can use BD; to send the start frequency and BU; to send the end frequency.

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: Break-in ON

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

BK — Blanking of Received Signal

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

Parameters:

P1

0: Blanking OFF
1: Blanking ON

- Blanking state is not backed up by this command.
- Blanking by the BK command also operates on the received IF signal.

BP — NOTCH frequency

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

Parameters:
P1
000 ~ 255
◆ Turning the NOTCH control fully to the left selects 000 and turning it fully to the right selects 255.

BS0 — Scope Display 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 display may be temporarily displaying a different screen. However, the response does not change, even in that case.

BS1 — Scope Display 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: Standard Bandscope + Waterfall
1: Expanded Bandscope + Waterfall
2: Bandscope
3: Audio scope
4: Multi-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.

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
2: Auto Scroll Mode

BS4 — Bandscope Span

	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: 5 kHz
1: 10 kHz
2: 25 kHz
3: 50 kHz
4: 100 kHz
5: 200 kHz
6: 500 kHz
9: Initial value setting (setting command only)

BS5 Bandscope Scope Range (Fixed Mode)

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

Parameters:
P1 (Scope range number)
0 ~ 3

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: Receive frequency only
1: 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: Max Hold OFF
1: Max Hold 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 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 ~ 4

BSC — Bandscope Reference 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 ~ 060
◆ 000 represents –20 dB, 040 represents 0 dB, and 060 represents +10 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.
- If the audio scope is displayed, the waterfall of audio scope display will also be cleared.

BSE — Bandscope Marker Shift / Marker Center

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

Parameters:
No parameters are used with this command.

- In the Auto Scroll mode, operates the marker shift function.
- In the Fixed mode, operates the marker center function.
- Invalid in center mode.

BSG — Audio Scope Attenuator

	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

BSK — Bandscope Shift Position

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

Parameters:
P1
0: 4 grids position to the left from center
1: 3 grids position to the left from center
2: 2 grids position to the left from center
3: 1 grid position to the left from center
4: Center
5: 1 grid position to the right from center
6: 2 grids position to the right from center
7: 3 grids position to the right from center
8: 4 grids position to the right from center

BSL — Bandscope Receive Circuit State (OVF Display)

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

Parameters:
P1
0: Normal (OVF is not displayed)
1: Overflow due to excessive input (OVF is displayed)

BSM — Bandscope Scope Range Lower/Upper Frequency Limit (For Fixed Mode/ Auto Scroll Mode)

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

Parameters:
P1 (Scope range number)
0, 1~3
◆ In Fixed mode, P1: 0 is used for reading and responding the lower / upper limit frequencies temporarily changed by the marker center function. In Auto Scroll mode, P1: 0 is used for reading and responding the lower / upper frequency. Cannot be used with setting command.
P2 (Lower Limit Frequency (for Fixed Mode))
8 digit frequency in Hz
◆ unused digits must be 0
P3 (Upper Limit Frequency (for Fixed Mode))
8 digit frequency in Hz
◆ unused digits must be 0

• When P2 and P3 are both 99999999 in the setting command, the initial value is set.

BSN — Audio Scope Display Pause

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

Parameters:
P1
0: Pause OFF
1: Pause ON

BSO — Expands Spectrum Analysis Range (Switching Expand)

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

Parameters:
P1
0: Expand OFF
1: Expand ON

- ◆ Extended switching is possible in Center mode or Auto Scroll mode.
- ◆ When the span is 500 kHz, expand is always OFF.

BY — BUSY LED State

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

Parameters:
P1
0: BUSY LED OFF
1: BUSY LED ON

CA — CW Auto Tune

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

Parameters:
P1
0: Stop CW Auto Tuning/ Tuning is inactive
1: Start CW Auto Tuning/ Tuning is active

CD0 — CW Communication Screen Display

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

Parameters:
P1
0: CW Communication screen display OFF
1: CW Communication screen display ON

CD1 — CW Morse Decoding Threshold Level

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

Parameters:
P1
001 ~ 030

- ◆ 001 or less value of P1 parameter is rectified by 001, and 030 or more value is rectified by 030.

CD2 — Decoded CW Morse Character Output

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

Parameters:
P1
Decoded character (usually 1 character, abbreviation is 2 characters)

- When AI is ON, the character decoded by the Morse code decoder is output.

CD3 — CW Communication Screen (Decode Filter)

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

Parameters:
P1
0: OFF
1: Normal
2: Narrow

CD4 — CW Communication Screen (Quick Mode)

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

Parameters:
P1
0: Quick Mode OFF
1: Quick Mode ON

CD5 — CW Decode

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

Parameters:
P1
0: CW Decode OFF
1: CW Decode ON

- The CD5 command is same as the operation of F5[DEC OFF] or F5[DEC ON] on the CW communication screen.

CG — Career Level

	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 ~ 100

CH — MULTI/CH Control

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

Parameters:
P1
0: Up for 1 step
1: 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	P6	P6	;				
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	P6	P6	;				

Parameters:
P1
18 ~ 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	1	2	3	4	5	6	7	8	9	10
	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	1	2	3	4	5	6	7	8	9	10
	C	K	2	;						
Answer	1	2	3	4	5	6	7	8	9	10
	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 (Secondary Clock Time Zone)

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

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

Parameters:
P1
1 character
◆ Uppercase alphabet A to Z

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: Automatic Date/Time Retrieval OFF
1: Automatic Date/Time Retrieval 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 ~		x			
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 setting command P2 is set to blank, the setting contents of the NTP server address are deleted.

CK8 Clock (The clock is obtained from the NTP server)

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

Parameters:
No parameters are used with this command.

CK9 Clock Display

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

Parameters:
P1
0: Off (Clock not displayed)
1: Local Clock
2: Secondary Clock
3: Both (Local Clock and Secondary Clock)

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 (Operation state)
0: Non-operation/ Registration complete • 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 (Progress (%))
000 ~ 100
◆ While waiting for registration, P2 is “000”.

- During in non-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 (Playback/ Stop)
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 State 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 (CW Message channel)
1 ~ 8
P2 (Registration state)
0: Not Stored
1: Stored

- You cannot use this command while “CW Message Entry” menu is set to “Text String”.

CM3 — Clear the CW Message (Paddle Input)

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

Parameters:
P1 (CW Message Channel)
1 ~ 8

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

CM4 — CW Message Memory Name (Paddle Input)

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

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

- You cannot use this command while “CW Message Entry” menu is set to “Text String”.

CM5 Registering the CW Message Memory (Text Input)

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

Parameters:

P1 (CW Message channel)
1 ~ 8

P2
Always a space

P3 (Message)
Up to 50 characters
◆ For usable characters, refer to the instruction manual.

• You cannot use this command while “CW Message Entry” menu is set to “Paddle”.

CM6 CW Message Channel Repeat

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

Parameters:

P1 (CW Message channel)
1 ~ 8

P2 (Repeat setting state)
0: Repeat OFF
1: Repeat ON

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

CM7 Contest Number

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

Parameters:

P1 (Operation)
0: Decrementing Numbers

P2 (Contest Number)
0000 ~ 9999

CN CTCSS frequency

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

Parameters:

P1 (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.

CP — Internal Memory / USB Flash Drive Remaining

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

Parameters:

P1 (Memory type)
- 0: Internal Memory
- 1: USB Flash Drive

P2 (Remaining)
- 0: Sufficient
- 1: Low
- 3: Not mounted (USB Flash Drive only)

DD0 — Bandscope Display Data Output Control

	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 (Bandscope display data output control)
- 0: No Output
- 1: Output to LAN (High cycle)
- 2: Output to LAN (Medium cycle)
- 3: Output to LAN (Low cycle)
- 4: Output to COM/USB (AI function linked)
- 5: Output to COM/USB (AI function not linked)

- When “output to LAN” is set, the display information is ##DD2 command.
- When “Output to COM/USB (AI function linked)” is set, the output information is DD2 command.
- When “Output to COM/USB (AI function not linked)” is set, the output information is DD4 command including scope mode and scope range information.
- “Output to COM/USB (AI function not linked)” can be set only for communication connectors that do not use the AI function. (If you attempt to set to a communication connector that uses the AI function, an error occurs.)
- The AI function cannot be used with the communication connector that sets “Output to COM/USB (AI function not linked)”.

DD1 — Filter Scope Display Data Output Control

	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 (Filter scope display data output control)
- 0: No Output
- 1: Output to LAN (High cycle)
- 2: Output to COM/USB (Low cycle)

DD2

Bandscope Display Information (AI function linked) (COM/USB output only)

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

Parameters:

P1 (Split number)

00 ~ 31

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.

When EXPAND (spectrum analysis range enlargement) is ON, display information in the range enlarged than the range displayed on the transceiver is output.

Example:

- When the display span is 100 kHz, spectral display information in the range enlarged to 300 kHz is output.
- When the display span is 200 kHz, spectral display information in the range enlarged to 400 kHz is output.

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 and the DD0 command is set to “Output to COM/USB (AI function linked”, division No. 00 to No. 31 are output in order.
- This command operates only at a baud rate of 115200 bps.

DD3

Filter Scope Display Information (COM/USB output only)

	1	2	3	4	5	6 ~ 43	44		
Answer	D	D	3	P1	P1	P2	;		

Parameters:

P1 (Split number)

00 ~ 11

P2 (Filter scope 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 7th and 8th digits of division No. 11 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 and the DD1 command is set to “Output to COM/USB”, division No. 00 to No. 11 are output in order.
- When the transceiver is displaying the Audio scope, display Information is not output.
- This command operates only at a baud rate of 115200 bps.

DD4

Bandscope Display Information (AI function not linked, with Scope mode and Scope range information)

Answer 1	1	2	3	4	5	6	7~17		18~28	
	D	D	4	P1	P1	P2	P3		P4	
	29	30								
	P5	;								
Answer 2	1	2	3	4	5	6~45		46		
	D	D	4	P1	P1	P6		;		

Parameters:

P1 (Split number)
0 ~ 32

P2 (Operation mode of Bandscope)
0: Center mode
1: Fixed mode
2: Auto scroll mode

P3 (Scope range information 1)
In Center mode, the span frequency will notify you.
In Fixed or Auto scroll mode, the Lower limit frequency of the scope will notify you.
Unit is Hz, blank digits must be entered as “0”.

P4 (Scope range information 2)
In Center mode, the current center frequency will notify you.
In Fixed or Auto scroll mode, the upper limit frequency of the scope will notify you.
Unit is Hz, blank digits must be entered as “0”.

P5 (Scope display out of range information)
0: In range
1: Out of range (“Outside of the measuring range” is displayed on the scope screen)

P6 (Band scope spectrum display information)
20 spectrum information are each expressed as 2 ASCII digits.
2 digits of the beginning of division No. 01 are Spectrum information of the lower limit frequency of the scope range, and two digits of the end of division No. 32 are Spectrum information of the lower upper frequency of the scope range.
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 DD0 command set to “Output to COM / USB (AI function linked)”, it is output from division No. 00 to 32 sequentially.
- In the Center mode and Auto scroll mode, this command is not output when the EXPAND function is ON.
- This command operates only at a baud rate of 115200 bps.

DF

⊿F Display

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

Parameters:

P1 (State)
0: Simplex mode
1: During split mode or split frequency operation

P2 (Code)
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

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

Parameters:

P1 (Dimmer preset number)
1 ~ 4

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 (Dimmer preset number)
1 ~ 4

P2 (Adjusted item)
0: Display
1: LED

P3 (Dimmer adjustment value (In steps of 5.))
005 ~ 100
999: Initial value setting (setting command only)

- ◆ Values that are not in steps of 5 are rounded down.
- ◆ Dimmer adjusted value 000 (back light off) for the screen is supported by dimmer preset number 4 only.

DN / UP — Microphone UP/DOWN Switch Operation

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

Parameters:

P1 (Step Count)
00 ~ 99

- If the parameter is skipped, the “DN;” and “UP;” commands will adjust by 1 step.
- When setting the parameter from 00 to 99, the frequency is adjusted by the specified step size.
- In the memory channel mode, if you added a parameter, the frequency becomes variable, and if you not added a parameter, the memory channel becomes variable.
- When setting the parameter to 00, the command is accepted, but no changes occur.

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
3-digit Screen ID (refer to the Screen ID table below)

- Various operations via commands may be limited, such as the panel operation of the transceiver, due to the state of the function setting screen.

P1	Screen
000	No Setting Screen
001, 002	Unused
003	AGC Setting Screen
004	AGC Quick Recovery Setting Screen
005	Transmission Voice Input Sound Source Setting Screen
006	Transmission Output Limit Setting Screen
007	Carrier Level Setting Screen
008	VOX Level Setting Screen
009	Transmission Monitor Level Setting Screen
010	Speech Processor Setting Screen
011~014	CW Message Screen
015, 016, 132	CW Communication Screen
017, 133	RTTY Communication Screen
018, 019	RTTY Message Screen
020, 134	PSK Communication Screen
021, 022	PSK Message Screen
023	FM Tone Setting Screen
024	FM CTCSS Setting Screen
025	FM Cross Tone Setting Screen
026	Reception Filter Setting Screen
027	Audio Peak Filter Setting Screen
028	NB1 Level Setting Screen
029	NB2 Level Setting Screen
030	NR1 Level Setting Screen
031	NR2 Level Setting Screen
032	Fixed Mode Scope Range Setting Screen
033, 135	Memory Channel List Screen
034	VFO/ Program Scan Section Setting Screen
035	Program Slow Scan Point Setting Screen
036	Memory Scan Group Setting Screen
037	Voice Message Screen
038~040, 041~043, 045~048, 161~164, 174, 176, 178~183	File Selection Screen
044, 177	LOG View Screen
049~127	Unused
128	Reception Equalizer Screen
129	Reception Equalizer Adjustment Screen
130	Transmission Equalizer Screen
131	Transmission Adjustment Screen
136~159	Menu Related Screen
165, 166	Timer Setting Screen
167	Dimmer Setting Screen
168	Linear Amplifier Menu Setting Screen
169~172	KNS Related Screen
173	Frequency Marker List Screen
160, 184~186	USB/File Management Menu Related Screen

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: ACC 2
- 2: USB Audio
- 3: LAN

EC — VFO A and VFO B 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	;				
Read	E	Q	R	0	;					
Answer	E	Q	R	0	P1	;				

Parameters:
P1
- 0: Reception Equalizer OFF
- 1: Reception Equalizer ON

- The setting command is valid for the selected receive mode.

EQR1 Reception Equalizer Effect

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

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

- The setting command is valid for the selected receive mode.
- 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	;				

Parameters:
P1 (Copy to)
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: Transmission Equalizer OFF
1: Transmission Equalizer ON

- You cannot setting and reading while the transmission mode is CW, FSK, and PSK.
- 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: Formant Pass
3: Bass Boost 1
4: Bass Boost 2
5: Conventional
6: User 1
7: User 2
8: User 3

- You cannot setting and reading while the transmission mode is CW, FSK, and PSK.
- 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 (Copy to)
0: User 1
1: User 2
2: User 3

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

EX Menu Setting

Set

1	2	3	4	5	6	7	8	9 ~	
E	X	P1	P2	P2	P3	P3	P4	P5	
x									
;									

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 ~	
E	X	P1	P2	P2	P3	P3	P4	P5	
x									
;									

Parameters:

P1 (Menu type number)
- 0: Menu
- 1: Advanced Menu

P2 (Category number)
- 00 ~ 99
- ◆ Entering a non-existing number causes an error to occur.
- ◆ Enter any value when using the Advanced Menu.

P3 (Item number)
- 00 ~ 99
- ◆ 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
- 9: Initial value setting (setting command only)
- ◆ Response is always a space.

P5 (String of alphanumeric characters for the Menu setting)
- Normally a 3-digit number (blank digits must be entered as “0”.)
- PF key settings use 4 digits (refer to the PF Key assignment ID lists).
- 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 larger than the size limit causes an error to occur.)
- ◆ When the P4 is set to the initial value, omit this parameter.

EX Command Parameter Lists

Menu											
P1	P2	P3	Function	P5							
				000	001	002	003	004	005	006 ~
0	00	00	Color Display Pattern	Type 1	Type 2	Type 3				
0	00	01	Function Key Style	Type 1	Type 2	Type 3				
0	00	02	Font Style (Frequency Display)	Font 1	Font 2	Font 3	Font 4	Font 5		
0	00	03	Screen Saver	Off	Type 1	Type 2	Type 3	Display Off		
0	00	04	Screen Saver Wait Time	Preview (5 [sec])	5 [min]	15 [min]	30 [min]	60 [min]		
0	00	05	Screen Saver Message	Up to 10 alphanumeric characters						
0	00	06	Power-on Message	Up to 15 alphanumeric characters						
0	00	07	FM Mode S-Meter Sensitivity	Normal	High					
0	00	08	Meter Response Speed (Analog)		1	2	3	4		
0	00	09	Meter Display Pattern	Digital	Analog (White)	Analog (Black)				
0	00	10	Meter Display Peak Hold	Off	On					
0	00	11	S-Meter Scale	Type 1	Type 2					
0	00	12	TX Digital Meter	Off	On					
0	00	13	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	14	Touchscreen Tuning	Off	On					
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	PF C: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	18	External PF 1: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	19	External PF 2: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	20	External PF 3: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	21	External PF 4: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	22	External PF 5: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	23	External PF 6: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	24	External PF 7: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	25	External PF 8: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	26	Microphone PF 1: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	27	Microphone PF 2: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	28	Microphone PF 3: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	29	Microphone PF 4: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	30	Microphone DOWN: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	31	Microphone UP: Key Assignment	Refer to the list of function allotment numbers for the PF key						
0	00	32	Automatic Power Off	Off	60 [min]	120 [min]	180 [min]			
0	01	00	Beep Volume	Off	1	2	3	4	5	Up to 20
0	01	01	Voice Message Volume (Play)	Off	1	2	3	4	5	Up to 20
0	01	02	Sidetone Volume	Linked with Monitor Control	Off	1	2	3	4	Up to 20
0	01	03	Voice Guidance Volume	Off	1	2	3	4	5	Up to 20
0	01	04	Voice Guidance Speed		1	2	3	4		
0	01	05	User Interface Language (Voice Guidance & Messages)	English	Japanese					
0	01	06	Automatic Voice Guidance	Off	On					
0	02	00	FFT Scope Averaging (RTTY Decode)	0	1	2	3	4	5	Up to 9
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]					

Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	02	09	RTTY Tuning Scope	FFT Scope	X-Y Scope					
0	02	10	FFT Scope Averaging (PSK Decode)	0	1	2	3	4	5	Up to 9
0	02	11	PSK AFC Tuning Range	±8 [Hz]	±15 [Hz]					
0	02	12	PSK Tone Frequency	1.0 [kHz]	1.5 [kHz]	2.0 [kHz]				
0	02	13	PSK Tuning Scope	FFT Scope	Vector Scope					
0	02	14	CW/RTTY/PSK Log File Format	html	txt					
0	02	15	CW/RTTY/PSK Time Stamp	Off	Time Stamp	Stamp + Frequency				
0	02	16	Clock (CW/RTTY/PSK Time Stamp)	Local Clock	Secondary Clock					
0	02	17	Waterfall when Tuning (RTTY/PSK Audio Scope)	Straight	Follow					
0	03	00	Frequency Rounding Off (Multi/ Channel Control)	Off	On					
0	03	01	SSB Mode Frequency Step Size (Multi/Channel Control)	0.5 [kHz]	1 [kHz]	2.5 [kHz]	5 [kHz]	10 [kHz]		
0	03	02	CW/FSK/PSK Mode Frequency Step Size (Multi/Channel Control)	0.5 [kHz]	1 [kHz]	2.5 [kHz]	5 [kHz]	10 [kHz]		
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 [kHz] 007: 30 [kHz] 008: 50 [kHz] 009: 100 [kHz]
0	03	04	AM Mode Frequency Step Size (Multi/ Channel Control)	5 [kHz]	6.25 [kHz]	10 [kHz]	12.5 [kHz]	15 [kHz]	20 [kHz]	006: 25 [kHz] 007: 30 [kHz] 008: 50 [kHz] 009: 100 [kHz]
0	03	05	9 kHz Step in AM Broadcast Band (Multi/Channel Control)	Off	On					
0	03	06	MHz Step	100 [kHz]	500 [kHz]	1000 [kHz]				
0	03	07	Tuning Control :	250 [Step]	500 [Step]	1000 [Step]				
0	03	08	Tuning Speed Control		Off	2	3	4	5	Up to 10
0	03	09	Tuning Speed Control Sensitivity		1	2	3	4	5	Up to 10
0	03	10	Lock Function	Frequency Lock	Tuning Control Lock					
0	03	11	Number of Band Memories	1	3	5				
0	03	12	Split Frequency Offset by RIT/XIT Control	Off	TX Frequency Offset while RX	RX Frequency Offset while TX	Both			
0	03	13	Band Direct Keys in Split Mode	RX Band	RX Band and Cancel Split Mode	RX/TX Band				
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)				
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	CW BFO Sideband	USB	LSB					
0	05	06	Automatic CW TX with Keying in SSB Mode	Off	On					
0	05	07	Carrier Frequency Offset	Off	On					

Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	05	08	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	09	CW Keying Reversed Weight Ratio	Off	On					
0	05	10	Interrupt Keying	Off	On					
0	05	11	CW Message Entry	Text String	Paddle					
0	05	12	Contest Number	0001 ~ 9999 (Must be a 4-digit number)						
0	05	13	Contest Number Format	Off	190 to ANO	190 to ANT	90 to NO	90 to NT		
0	05	14	Channel Number (Countup Message)	Off	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	006: Channel 6 007: Channel 7 008: Channel 8
0	05	15	CW Rise Time	1 [ms]	2 [ms]	4 [ms]	6 [ms]			
0	05	16	CW/ Voice Message Retransmit Interval Time	0 [s]	1 [s]	2 [s]	3 [s]	4 [s]	5 [s]	Up to 60 [s]
0	06	00	Playback Time (Fulltime Recording)	Last 10 [s]	Last 20 [s]	Last 30 [s]				
0	06	01	Recording with Squelch	Off	On					
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	ID Beep	Off	1 [min]	2 [min]	3 [min]	4 [min]	5 [min]	
0	06	06	TX Filter Low Cut (SSB/AM)	10 [Hz]	100 [Hz]	200 [Hz]	300 [Hz]	400 [Hz]	500 [Hz]	
0	06	07	TX Filter High Cut (SSB/AM)	2500 [Hz]	2600 [Hz]	2700 [Hz]	2800 [Hz]	2900 [Hz]	3000 [Hz]	006: 3500 [Hz] 007: 4000 [Hz]
0	06	08	TX Filter Low Cut (SSB-DATA/AM-DATA)	10 [Hz]	100 [Hz]	200 [Hz]	300 [Hz]	400 [Hz]	500 [Hz]	
0	06	09	TX Filter High Cut (SSB-DATA/AM-DATA)	2500 [Hz]	2600 [Hz]	2700 [Hz]	2800 [Hz]	2900 [Hz]	3000 [Hz]	006: 3500 [Hz] 007: 4000 [Hz]
0	06	10	RX Filter Numbers	2	3					
0	06	11	Filter Control in SSB Mode (High/Low and Shift/Width)	High & Low Cut	Shift & Width					
0	06	12	Filter Control in SSB-DATA Mode (High/Low and Shift/Width)	High & Low Cut	Shift & Width					
0	06	13	VOX Voice Delay (Microphone)	Off	Short	Middle	Long			
0	06	14	VOX Voice Delay (Except Microphone)	Off	Short	Middle	Long			
0	06	15	Delta Frequency Display	Off	On					
0	07	00	Baud Rate (COM Port)	4800 [bps]	9600 [bps]	19200 [bps]	38400 [bps]	57600 [bps]	115200 [bps]	
0	07	01	Baud Rate (Virtual Standard COM)	9600 [bps]	19200 [bps]	38400 [bps]	57600 [bps]	115200 [bps]		
0	07	02	Baud Rate (Virtual Enhanced COM)	9600 [bps]	19200 [bps]	38400 [bps]	57600 [bps]	115200 [bps]		
0	07	03	Decoded Character Output	Off	On					
0	07	04	Quick Data Transfer	Off	1 (TX/RX)	1 (Sub RX)	2			
0	07	05	Overwrite Location (Quick Data Transfer)	VFO	Quick Memory					
0	07	06	USB: Audio Input Level	0	1	2	3	4	5	Up to 100
0	07	07	ACC 2: Audio Input Level	0	1	2	3	4	5	Up to 100
0	07	08	USB: Audio Output Level	0	1	2	3	4	5	Up to 100
0	07	09	ACC 2: Audio Output Level	0	1	2	3	4	5	Up to 100
0	07	10	TX Monitor Level (Rear Connectors)	Linked	0					
0	07	11	Audio Output Type (Rear Connectors)	All	Received Audio Only					
0	08	00	Bandscope Display during TX	Off	On					
0	08	01	TX Audio Waveform Display	Off	On					
0	08	02	Bandscope Maximum Hold	10 [s]	Continuous					
0	08	03	Waterfall when Tuning (Center Mode)	Straight	Follow					
0	08	04	Waterfall Gradation Level		1	2	3	4	5	Up to 10
0	08	05	Tuning Assist Line (SSB Mode)	Off	300 [Hz]	400 [Hz]	500 [Hz]	600 [Hz]	700 [Hz]	006: 800 [Hz] 007: 1000 [Hz] 008: 1500 [Hz] 009: 2210 [Hz]
0	08	06	Frequency Scale (Center Mode)	Relative Frequency	Absolute Frequency					

Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	08	07	Automatic Correction Step (Touchscreen Tuning)	100 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]			
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

Advanced Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
1	00	00	Indication Signal Type (External Meter 1)	Automatic	TX Power	ALC	Drain Voltage (Vd)	Compression Level (COMP)	Current (Id)	006: SWR
1	00	01	Indication Signal Type (External Meter 2)	Automatic	TX Power	ALC	Drain Voltage (Vd)	Compression Level (COMP)	Current (Id)	006: SWR
1	00	02	Output Level (External Meter 1)	0 [%]	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	Up to 100 [%]
1	00	03	Output Level (External Meter 2)	0 [%]	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	Up to 100 [%]
1	00	04	Reference Signal Source	Internal	External					
1	00	05	Reference Oscillator Calibration	Parameter value of 0000 ~ 1000, corresponding to setting values of -500 ~ +500						
1	00	06	TX Power Down with Transverter Enabled	Off	On					
1	00	07	TX Hold After Antenna Tuning	Off	On					
1	00	08	Antenna Tuner during RX	Off	On					
1	00	09	Antenna Tuner Operation per Band	Off	On					
1	00	10	Microphone Gain (FM Mode)	0	1	2	3	4	5	Up to 100
1	00	11	PKS Polarity Reverse	Off	On					
1	00	12	TX Inhibit While Busy	Off	On					
1	00	13	CTCSS Unmute for Internal Speaker	Mute	Unmute					
1	00	14	PSQ Logic State	Low	Open					
1	00	15	PSQ Reverse Condition	Off	Busy	Sql	Send	Busy-Send	Sql-Send	
1	00	16	PSQ/PKS Pin Assignment (COM Connector)	Off	On					
1	00	17	Virtual Standard COM Port – RTS	Flow Control	CW Keying	RTTY Keying	PTT	DATA SEND		
1	00	18	Virtual Standard COM Port – DTR	Off	CW Keying	RTTY Keying	PTT	DATA SEND		
1	00	19	Virtual Enhanced COM Port – RTS	Off	CW Keying	RTTY Keying	PTT	DATA SEND		
1	00	20	Virtual Enhanced COM Port - DTR	Off	CW Keying	RTTY Keying	PTT	DATA SEND		
1	00	21	External Display	Off	On					
1	00	22	Resolution (External Display)	800x600	848x480					
1	00	23	Touchscreen Calibration	Does not correspond to a command						
1	00	24	Software License Agreement	Does not correspond to a command						
1	00	25	Important Notices concerning Free Open Source	Does not correspond to a command						
1	00	26	About Various Software License Agreements	Does not correspond to a command						
1	—	27	Firmware Version	Reading command only						

◆ P2 is any value.

PF Key Assignment Lists

Function	PF Key Allotment ID	Function	PF Key Allotment ID
Menus		IF FIL	1039
Menu 00-00	0000	LOCK	1040
Menu 00-01	0001	LSB/USB	1041
▼	▼	M.IN	1042
Menu 09-03	0903	M/V, M>V	1043
Advanced Menus		MAX-Po	1044
Advanced MENU 0	2000	Message Memory CH 1	1045
Advanced MENU 1	2001	Message Memory CH 2	1046
▼	▼	Message Memory CH 3	1047
Advanced MENU 27	2027	Message Memory CH 4	1048
Various functions		Message Memory CH 5	1049
A/B, A=B	1000	Message Memory CH 6	1050
AGC	1001	Message Memory CH 7	1051
AGC OFF	1002	Message Memory CH 8	1052
ANT	1003	METER	1053
APF	1004	MHz	1054
AT	1005	MONI	1055
ATT	1006	Mute (Sub Receiver)	1056
Band Direct (1.8MHz)	1007	NB1	1057
Band Direct (3.5MHz)	1008	NB2	1058
Band Direct (7MHz)	1009	NCH	1059
Band Direct (10MHz)	1010	NR	1060
Band Direct (14MHz)	1011	PLAY	1061
Band Direct (18MHz)	1012	PRE	1062
Band Direct (21MHz)	1013	PROC	1063
Band Direct (24MHz)	1014	Q-M.IN	1064
Band Direct (28MHz)	1015	Q-MR	1065
Band Direct (50MHz)	1016	REC	1066
BC	1017	RIT	1067
Capture	1018	RX ANT	1068
CAR	1019	RX EQ	1069
CL	1020	RX Monitor	1070
Contest Number Decrement	1021	Safe Removal of USB Flash Drive	1071
CW T.	1022	SCAN	1072
CW/CW-R	1023	SCP	1073
DATA	1024	SEND	1074
DATA SEND	1025	SPLIT	1075
DATA VOX	1026	STOP	1076
DIMMER	1027	SWL	1077
DOWN Key(Microphone)	1028	TF-SET	1078
DRV	1029	TX EQ	1079
DSP Monitor	1030	TX TUNE1	1080
Emergency Frequency	1031	TX TUNE2	1081
ESC	1032	UP Key (Microphone)	1082
Extended Memory Channel	1033	VOICE1	1083
FIL CLR	1034	VOICE2	1084
FINE	1035	VOICE3	1085
FM/AM	1036	VOX	1086
FSK/PSK	1037	XIT	1087
GENE	1038	Off	9999

FA — VFO A Frequency

Set	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	;						
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
◆ Blank digits must be entered as “0”.

• The frequency set with this command is the frequency before RIT/XIT is added.

FB — VFO B Frequency

Set	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	;						
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
◆ Blank digits must be entered as “0”.

• The frequency set with this command is the frequency before RIT/XIT is added.

FC — Change the Frequency (Tuning Control)

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

Parameters:

P1 (Direction to change)
0: Up
1: Down

P2 (Size to change)
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

Set	1	2	3	4	5	6	7	8	9	10
	F	L	0	P1	;					
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 (RX filter selection)
0: A
1: B
2: C
◆ You cannot select “C” when the menu [6-10] (RX Filter Numbers) is set to “2”.

P2 (270 Hz Option)
0: Not installed
1: Installed

FL1 Roofing Filter

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

Parameters:

P1 (RX filter selection)
- 0: A
- 1: B
- 2: C
- ◆ You cannot select “C” when the menu [6-10] (RX Filter Numbers) is set to “2”.

P2 (Roofing filter selection)
- 0: Auto
- 1: 270 Hz
- 2: 500 Hz
- 3: 2.7 kHz
- 4: 6 kHz
- 5: 15 kHz
- 9: Initial value setting (setting command only)
- ◆ You cannot set in FM mode (Fixed at 15 kHz).

P3 (Roofing Filter Bandwidth)
- 0027 ~ 1500 (in steps of 10 Hz)
- ◆ When P2 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	;				
Read	F	L	2	P1	;					
Answer	F	L	2	P1	P2	;				

Parameters:

P1 (RX filter selection)
- 0: A
- 1: B
- 2: C
- ◆ You cannot select “C” when the menu [6-10] (RX Filter Numbers) is set to “2”.

P2 (IF filter shape selection)
- 0: Sharp
- 1: Medium
- 2: Soft
- 3: None (FM mode only)
- 9: Initial value setting (setting command only)
- ◆ Read only in FM mode.

FL3 AF Filter Type

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

Parameters:

P1 (RX filter selection)
- 0: A
- 1: B
- 2: C
- ◆ You cannot selects to “C” when the menu [6-10] (RX Filter Numbers) is set to “2”.

P2 (AF filter type selection)
- 0: Narrow
- 1: Medium
- 2: Wide
- 9: Initial value setting (setting command only)

FM0 Frequency Marker Function

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

Parameters:

P1
- 0: Frequency Marker Display OFF
- 1: Frequency Marker Display ON

FM1 Frequency Marker List Registration

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

Parameters:

P1 (Additional frequency to frequency marker list)
11 digits in Hz
◆ Unused upper digits must be entered as “0”.

- Use the setting command 1, you can register the current receiving frequency.
- Use the setting command 2, you can register the specified frequency.
- You cannot be newly registered when the total number of registrations has reached 50.
- You cannot register already registered frequencies.

FM2 Total Number Registered of Frequency Marker List

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

Parameters:

P1 (Total number)
00~50

FM3 Frequency Marker List Readout

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

Parameters:

P1 (List number)
01~50
◆ The list number is not displayed on the transceiver, It is 01, 02, ... in order from the top.

P2 (Frequency of the specified list number)
11 digits in Hz
◆ Unused upper digits must be entered as “0”.

- If the specified P1 parameter is exceeds the total number registered, parameter P2 is all 0.
- Even when the AI function is ON, this command does not automatically respond.

FM4 Frequency Marker List Delete

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

Parameters:

P1 (List number)
01~50
◆ The list number is not displayed on the transceiver, It is 01, 02, ... in order from the top.

P2 (Frequency to be deleted from the list)
11 digits in Hz
◆ Unused upper digits must be entered as “0”.

- Use the setting command 1, you can delete all registered frequencies.
- Use the setting command 2, you can delete a frequency with the specified list number.
- Use the setting command 3, you can delete only the specified frequency. If the specified frequency is not registered in the list, an error occurs.

FR Receiver Function (VFO A / VFO B / Memory channel)

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

Parameters:

P1
0: VFO A
1: VFO B
3: Memory Channel

- This command can be use to select or read the receiver function (VFO A/ VFO B/ Memory Channel).
- When using this command to select Memory Channel, it switches to simplex mode or split mode depending on the recalled channel.

FS — FINE Function

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

Parameters:

P1 (FINE function setting)
- 0: FINE Function OFF
- 1: FINE Function ON

P2 (RX VFO FINE state)
- 0: FINE Function OFF
- 1: FINE Function ON

P3 (TX VFO FINE state)
- 0: FINE Function OFF
- 1: FINE Function ON

FT — Transmitter Function (VFO A / VFO B)

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

Parameters:

P1
- 0: VFO A
- 1: VFO B
- 3: Memory Channel (Answer only)

- If you set a different VFO for the transmitter function and receiver function, become in split mode.
- In the memory channel mode, you cannot switch the transmitter function by this command.

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

Character string of the firmware version.

- For example: “FV1.00;” (firmware version 1.00)

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 (Read / Response target)

In the case of simplex
- 0: Normal / narrow setting information of the frequency display area on the left side.

In case of split (including when using TF-SET)
- 0: Normal / narrow setting information of the frequency display area on the left side.
- 1: Normal / narrow setting information of the frequency display area on the right side.
- ◆ Invalid with the setting command. Enter any value.

P2 (Normal / Narrow)
- 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	;						
Read	G	C	;							
Answer	G	C	P1	;						

Parameters:

P1
- 0: AGC OFF
- 1: AGC SLOW
- 2: AGC MID
- 3: AGC FAST
- 4: AGC OFF → ON (Setting command only)

- This command cannot be performed in FM mode.
- Setting the AGC to AGC Off → On will turn the AGC On and will set the previous AGC state (SLOW/MID/FAST).

GT — AGC Time Constant Preset

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

Parameters:

P1 (Slow preset value)
- 01 ~ 20
- 99: Initial value setting (setting command only)

P2 (Mid preset value)
- 01 ~ 20
- 99: Initial value setting (setting command only)

P3 (Fast preset value)
- 01 ~ 20
- 99: Initial value setting (setting command only)

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

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
- 024: TS-890S

IP0 — DHCP

	1	2	3	4	5	6	7	8	9	10
Set	I	P	0	P1	;					
Read	I	P	0	;						
Answer	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 (DHCP ON/OFF)
- 0: DHCP OFF
- 1: DHCP ON

P2 ~ P5 (IP address (each 3-digits number))
- 001.000.000.000 223.255.255.255
- 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 (each 3-digits number))
001.000.000.000 ~ 223.255.255.255

P5 ~ P8 (Subnet Mask address (each 3-digits number))
000.000.000.000 ~ 255.255.255.252

P9 ~ P12 (Default Gateway address (each 3-digits number))
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 (each 3-digits number))
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 (each 3-digits number))
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 (MAC address)
00 ~ FF
◆ A ~ F entries must be capitalized.

IS Receive Filter Shift Frequency

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

Parameters:

P1

+: Plus direction

–: Minus direction

◆ If the shift frequency is 0 Hz, You can use either +, –, and space.

P2

Shift Frequency (4 digits in Hz)

◆ For the settable shift frequency, refer to the table below. If other shift frequency is specified, it is corrected to the settable shift frequency.

◆ Entering a value of 9999 results in the initial value being entered. (P1 can be use either +, –, and space)

Shift frequency range for SSB (Hz)		Shift frequency range for CW (Hz)	
50~2500	50 STEP	–800~800	10 STEP

KS Keying Speed

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

Parameters:

P1

004 ~ 060

KY CW Keying

	1	2	3	4 ~		x				
Set 1	K	Y	P1	P2		;				

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

Parameters:

P1 (Keying string buffer state)

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.

In response command, outputs the following value.

0: Character buffer space

1: No character buffer space

P2 (Enter a character string for keying (1 to 24 characters))

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.

LA0 — Target Band of Linear Amplifier Menu

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

Parameters:
P1
0: HF
1: 50 MHz
2: 70 MHz

LA1 — Linear Amplifier ON/OFF

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

Parameters:
P1
0: Linear Amplifier OFF
1: Linear Amplifier ON
9: Setting initial value (setting command only)

LA2 — Linear Amplifier Transmission Control

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

Parameters:
P1
0: Active Low
1: Active High
9: Setting initial value (setting command only)

LA3 — Linear Amplifier Transmission Delay ON/OFF

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

Parameters:
P1
0: Transmission Delay OFF
1: Transmission Delay ON
9: Setting initial value (setting command only)

LA4 — Linear Amplifier Transmission Delay Time

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

Parameters:
P1 (Operation mode)
0: CW/FSK/PSK
1: SSB/FM/AM
P2 (TX delay time)
00: 5 ms
01: 10 ms
02: 15 ms
03: 20 ms
04: 25 ms
05: 30 ms
06: 35 ms
07: 40 ms
08: 45 ms (When P1 is SSB/FM/AM)
09: 50 ms (When P1 is SSB/FM/AM)
99: Setting initial value (setting command only)

LA5 Linear Amplifier Relay Control

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

Parameters:
P1
0: Relay Control OFF
1: Relay Control ON
9: Setting initial value (setting command only)

LA6 Linear Amplifier External ALC Voltage

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

Parameters:
P1
00: -1 V
01: -2 V
02: -3 V
03: -4 V
04: -5 V
05: -6 V
06: -7 V
07: -8 V
08: -9 V
09: -10 V
10: -11 V
11: -12 V
99: Setting initial value (setting command only)

LK Lock

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

Parameters:
P1
0: Lock OFF
1: 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 (Recording channel)
1: CH 1
2: CH 2
3: CH 3
4: CH 4
5: CH 5
6: CH 6
P2 (Operation)
0: Recording ends or stops
1: Recording is ready
2: Recording starts or while recording
3: Delete
P3 (Elapsed time of the sound recording)
000 ~ 100 (s)

- 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 (Reading the current setting value)

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

Parameters:

P1 (Transmission Power Upper Limit)
005 ~ 100 (W)

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

LP1

Transmission Output Limiter Configuration

	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 (Setting type)
0: Transmission power upper limit setting for SSB mode
1: Transmission power upper limit setting for CW mode
2: Transmission power upper limit setting for FSK/PSK mode
3: Transmission power upper limit setting for FM/AM mode
4: Transmission power upper limit setting for DATA mode
5: Transmission power upper limit setting during TX tuning

P2 (Frequency Band)
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: 50 MHz band
11: 70 MHz band

P3 (Transmission Power Upper Limit)
005 ~ 100 (W)
999: Initial value setting (setting command only)

LP2

Transmission Output Limiter ON/OFF

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

Parameters:

P1
0: Transmission Output Limiter OFF
1: Transmission Output Limiter ON

MA0 Memory Channel Configuration

Set

1	2	3	4	5	6	7	8	9	10
M	A	0	P1	P1	P1	P2	P2	P2	P2
11	12	13	14	15	16	17	18	19	20
P2	P2	P2	P2	P2	P2	P2	P3	P4	P5
21	22	23	24	25	26	27	28	29	30
P6	P6	P7	P7	P8	P8	P8	P8	P8	P8
31	32	33	34	35	36	37	38	39	40 ~
P8	P8	P8	P8	P8	P9	P10	P11	P12	P13
	x								
P13	;								

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	P2	P2	P2
11	12	13	14	15	16	17	18	19	20
P2	P2	P2	P2	P2	P2	P2	P3	P4	P5
21	22	23	24	25	26	27	28	29	30
P6	P6	P7	P7	P8	P8	P8	P8	P8	P8
31	32	33	34	35	36	37	38	39	40 ~
P8	P8	P8	P8	P8	P9	P10	P11	P12	P13
	x								
P13	;								

Parameters:

P1 (Channel number)
000 ~ 119
- ◆ Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119.

P2 (Frequency information (11 digits in Hz.))
- ◆ Blank digits must be entered as “0”.

P3 (Mode Information)
- ◆ Refer to the P2 value of the OM command.

P4 (FM Normal/ Narrow information)
0: Normal
1: Narrow

P5 (FM tone type)
0: OFF
1: Tone
2: CTCSS
3: Cross Tone

P6 (Tone frequency)
- ◆ Refer to the P1 value of the TN command.

P7 (CTCSS frequency)
- ◆ Refer to the P1 value of the CN command.

P8 (Split transmission frequency information (11 digits))
- ◆ Blank digits must be entered as “0”.

P9 (Split Transmission mode information)
- ◆ Refer to the P2 value of the OM command.

P10 (Split Transmission FM Normal/ Narrow information)
0: Normal
1: Narrow

P11 (Split information)
0: Simplex
1: Split

P12 (Scan lockout)
0: Lockout OFF
1: Lockout ON

P13 (Channel name)
Up to 10 characters

- When setting the channel currently being accessed, the new settings are reflected the next time that channel is accessed.
- When the Programmable VFO is in the process of being read, it cannot be set.
- When reading a blank channel, parameters P2 to P12 becomes blank.
- When reading a single memory channel, all parameters for Split Transmission become 0.
- When setting the split memory channel, set the same setting on the transmission side and the reception side for FM normal / narrow information (P4, P10).

MA1 Memory Channel (Direct Write)

Set

1	2	3	4	5	6	7	8	9	10
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 (Frequency information (11 digits in Hz.))
- ◆ Blank digits must be entered as “0”.

P2 (Mode information
- ◆ Refer to the P2 value of the OM command.

P3 (FM Normal/ Narrow information)
0: Normal
1: Narrow
- ◆ In modes other than FM, this parameter is ignored.

- The frequency 1 information of the memory channel which was appointed when using this command is updated
- When writing to an unregistered section specification memory channel, the start frequency and the end frequency are registered as the same frequency.
- When writing to the registered Programmable VFO, if the specified frequency is within the registered section, this command is accepted and stored as the current operation frequency. The start/end frequency is not rewritten.
- When the AI function is ON, a response can consist of the MA0 command.

MA2 Memory Channel (Channel Name)

Set

1	2	3	4	5	6	7	8 ~	x
M	A	2	P1	P1	P1	P2	P3	;

Parameters:

P1 (Channel number)

000 ~ 119

◆ Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119.

P2 (Unused (1 digit))

Always a space

P3 (Name)

Up to 10 characters

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

MA3 Memory Channel (Scan Lockout)

Set

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

Parameters:

P1 (Channel number)

000 ~ 119

◆ Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119.

P2 (Scan lockout state)

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 Memory Channel (Channel Copy)

Set

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

Parameters:

P1 (Original channel number)

000 ~ 119

◆ Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119.

P2 (Target channel number)

000 ~ 119

◆ Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119.

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

MA5 Memory Channel (Channel Deletion)

Set

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

Parameters:

P1 (Channel number)

000 ~ 119

◆ Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119.

MA6 Programmable VFO End Frequency

Set

1	2	3	4	5	6	7	8	9	10
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 (Programmable VFO number)

100 ~ 109

◆ Channels P0 ~ P9 are represented as 100 ~ 109.

P2 (11 digit end 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 Programmable VFO (the start and end frequency are the same).
- When the AI function is ON, a response is provided by the MA0 command.

MA7 Memory Channel (Temporary Change Frequency)

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

Parameters:

P1 (Target frequency for read and answer (Read / response only))

0: Frequency on the left side frequency display area

1: Frequency on the right side frequency display area (Split channel only)

P2 (11 digit end frequency in Hz)

◆ Blank digits must be entered as “0”.

◆ Response while calling an unregistered memory channel, all digits are space.

- This command is used to temporarily change the frequency of the currently calling (displaying) channel and read the displayed frequency in the memory channel mode.
- The frequency of this command is the frequency before adding the RIT/XIT frequency.
- In the Programmable VFO, it can be set the registered frequency range.
- You cannot be set to an empty channel.
- This command can temporarily change the frequency regardless of the setting state of the menu [4-01] “Temporary Change (Memory Channel Configurations)”.
- When the AI function is ON, the response command is outputted when switching from the VFO mode to the memory channel mode or when switching the memory channel.

ME0 Pop-up Message 1

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

Parameters:

P1 (3-digit message ID)

Refer to the Message ID table below

P2 (Operations on Messages)

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 (Key Operation)

0: Functions as a key press

1: Functions as a long key press (Valid on screens with long pressed key only)

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 responded even when pressing the F key to which no function is assigned.

Message ID	Screen
000	No message screen (End of display)
001	Extraordinary communication configuration frequency access screen
002	Transmission output limiter OFF verification screen
003	Equalizer copy verification screen
004	Quick Memory all delete verification screen
005	CW message (paddle) register queue screen
006	CW message registering screen
007	Voice message recording queue screen
008	Voice message recording screen
009	Voice message playback screen
010	Voice message playback transmission screen
011	Audio file playback screen
012	Audio file playback NG screen
013	File deletion verification screen
014	Unused
015	COM connector operational modification screen (normal mode)
016	COM connector operational modification screen (PSQ/PKS mode)
017	Program timer configuration completion screen
018	Clock unestablished screen
019	Unused
020	NTP day and time acquisition success screen
021	NTP day and time acquisition failure screen
022~ 024	Unused
025	Data loading completion screen
026	Data loading completion (restart) screen
027	Loading file NG screen
028	Data loading failure screen
029~ 033	Unused
034	USB flash drive preparation request screen
035	Data retention completion screen
036	Format verification screen
037	Unmount verification screen 1
038	Unmount completion screen
039	Reset run verification screen (Standard)
040	Reset run verification screen (Full)
041	Reset run verification screen (VFO)
042	Reset run verification screen (Memory)
043	Reset run verification screen (Menu)
044	Running the reset screen
045	Processing screen (while all data writing out except NTP acquisition and configuration)
046	Processing screen (while NTP acquisition and configuration data writing out)
047	USB flash drive detection error screen
048	USB flash drive retention failure screen
049	USB flash drive capacity insufficient
050	Program Timer day not yet specified alert warning
051	Program Timer time excess alert warning
052	Program Timer identical time alert warning
053	Unused
057	Format failure screen
058	Operation environmental data change screen
059	File deletion failure screen

Message ID	Screen
060	Unmount failure screen
061	Firmware file transferring screen
062	Firmware file detection error screen
063	Firmware version mismatch data loading error screen
064	Firmware rewrite failure screen
065	Firmware update success screen
066	Unused
067	File access failure screen
068	Display restriction notification screen
069	Unused
070	File save destination change error screen (during audio file recording)
071	File save destination change error screen (during CW communication log recording)
072	File save destination change error screen (during RTTY communication log recording)
073	File save destination change error screen (during PSK communication log recording)
074	Copy item unspecified screen
075	Copy preparation screen
076	Copy standby from PC screen
077	Notification screen (cannot be copied during audio file recording)
078	Notification screen (cannot be copied during CW communication log recording)
079	Notification screen (cannot be copied during RTTY communication log recording)
080	Notification screen (cannot be copied during PSK communication log recording)
081	Notification screen (cannot be copied during KNS log recording)
082	Files all delete verification screen
083	Deletion item not yet specified screen
084	Image file read verification screen
085	Notification screen (cannot be deleted during audio file recording)
086	Notification screen (cannot be deleted during CW communication log recording)
087	Notification screen (cannot be deleted during RTTY communication log recording)
088	Notification screen (cannot be deleted PSK communication log recording)
089	Notification screen (cannot be deleted during KNS log recording)
090	Unmount verification screen 2
091	Copy stop screen due to excess number of files

ME1 Pop-up 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 (Operations on Messages)
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 (Key Operation)
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.

Message ID	Screen
000	No message screen (end of display)
001	Program timer start time approaching screen
002	Program timer recording screen
003	USB bus power error screen
004	Temperature protection screen
005	Frequency unlock screen
006	Transmission protection screen due to high temperature
007	Reference signal input error screen
008	Unused
009	Backup data corruption detection screen
010 ~ 021	DSP error detection screen
022	Unused
023	Hardware error detection screen
024	Display color adjustment screen
025	Timer power off screen

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 ~ 100

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

MH MHz Step Function

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

Parameters:
P1
0: MHz Step Function OFF
1: MHz Step Function ON

MI Memory Channel Registration

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

Parameters:
P1 (Channel number)
000 ~ 119
◆ 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.
- With the Programmable VFO, the start and end frequency are stored as the same frequency. The end frequency is set using the MA6 command.

MK — Mode Key Operation

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

Parameters:

P1

0: [LSB/USB] key
1: [CW/CW-R] key
2: [FSK/PSK] key
3: [FM/AM] key
4: [FSK-R] key
5: [PSK-R] key

◆ The [FSK-R] key and [PSK-R] key are virtual keys for PC command control.

- This command is to operate the transceiver when pressing each mode key.
- To read the current mode, use the OM 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 ~ 020

MN — Memory Channel Number

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

Parameters:

P1 (Channel number)

000 ~ 119

◆ 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

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

MS Transmission Audio Entry Sound Generator Selection

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

Parameters:
P1 (Transmission means)
0: SEND/PTT
1: DATA SEND (PF)
P2 (Front)
0: OFF
1: Microphone
P3 (Rear)
0: OFF
1: ACC 2
2: USB Audio
3: LAN

- P2 and P3 cannot be OFF at the same time.
- When both P2 and P3 are set to "9" with the setting command, P1 is set to the initial value.

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 (Transmission meter setting)
0: PO (Meter Display Pattern: Analog (White), Analog (Black) only)
1: ALC (Meter Display Pattern: Analog (White), Analog (Black) only)
2: SWR
3: COMP
4: ID
5: VD
6: TEMP (Meter display pattern: Digital only)
P2 (Meter display pattern)
0: Digital
1: Analog (White)
2: Analog (Black)
3: Mini Digital

◆ Even when P2 is set to Digital, Analog (White) or Analog (Black), it may switch to Mini Digital depending on the display screen. In this case, parameter P2 is answered as 3 (Mini Digital).

MU Mute

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

Parameters:
P1
0: Mute OFF
1: Mute ON

- Mute state is not backed up by this command
- This command mutes for received voice only.

MV — Memory Channel/ VFO

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

Parameters:
P1
0: VFO Mode
1: Memory Channel Mode

NB1 — Noise Blanker 1

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

Parameters:
P1
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	;					
Read	N	B	2	;						
Answer	N	B	2	P1	;					

Parameters:
P1
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	P1	P1	;			
Read	N	B	D	;						
Answer	N	B	D	P1	P1	P1	;			

Parameters:
P1 (Depth)
001 ~ 020
999: Initial value setting (setting command only)

NBT — Noise Blanker 2 Type

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

Parameters:
P1 (Type)
0: Type A
1: Type B

NBW — Noise Blanker 2, type B Width

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

Parameters:
P1 (Width)
001 ~ 020
999: Initial value setting (setting command only)

NL1 — Noise Blanker 1 Level

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

Parameters:
P1
001 ~ 020
999: Initial value setting (setting command only)

NL2 — Noise Blanker 2 Level

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

Parameters:
P1
001 ~ 010
999: Initial value setting (setting command only)

NR — Noise Reduction

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

Parameters:
P1
0: NR OFF
1: NR1 ON
2: NR2 ON (valid except FM mode)

NT — Notch

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

Parameters:
P1
0: Notch OFF
1: Notch ON

NW — Notch Bandwidth

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

Parameters:
P1 (Bandwidth)
0: Normal
1: Middle
2: Wide

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 (Read / Answer item)

In simplex mode

0: The operation mode displayed in the frequency display area on the left side.

1: The operation mode displayed in the frequency display area on the right side.

In split mode (including TF-SET)

0: The operation mode displayed in the frequency display area on the left side.

1: The operation mode displayed in the frequency display area on the right side.

◆ This parameter is ignored with the setting command. (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-D
D: USB-D
E: FM-D
F: AM-D

• The setting target during reception is the reception mode. The setting target during transmission/TF-SET is the transmission mode.

PA — Pre-amplifier

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

Parameters:

P1

0: Pre-amplifier OFF
1: PRE 1
2: PRE 2

PB0 — Voice Message List Display

	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 (Message channel)
1: CH 1
2: CH 2
3: CH 3
4: CH 4
5: CH 5
6: CH 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 (Playback elapsed time in seconds)
000 ~ 100
◆ While stopped, 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 (Message channel)
1: CH 1
2: CH 2
3: CH 3
4: CH 4
5: CH 5
6: CH 6
P2 (Registration state)
0: Unregistered channel
1: Registered channel
P3 (Registered time in seconds)
000 ~ 100

- 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 (Playback channel)
1: CH 1
2: CH 2
3: CH 3
4: CH 4
5: CH 5
6: CH 6
P2 (Repeat setting state)
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 ~	x	9	10
Set	P	B	4	P1	P2	P3	;		

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

	1	2	3	4	5	6 ~	x	9	10
Answer	P	B	4	P1	P2	P3	;		

Parameters:

P1 (Playback channel)
- 1: CH 1
- 2: CH 2
- 3: CH 3
- 4: CH 4
- 5: CH 5
- 6: CH 6

P2
- Always a space

P3 (Channel name)
- Up to 30 characters

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

PB5 Voice Message Recording Sound Source

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

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

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

Parameters:

P1
- 0: Microphone
- 1: ACC 2
- 2: USB Audio
- 3: LAN

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

PB6 Voice Message Recording Total Remaining Time

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

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

Parameters:

P1 (Remaining time)
- 000 ~ 100 (sec)

- 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	;				

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

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

Parameters:

P1

HF/ 50 MHz band
- 005 ~ 100: SSB/ CW/ FM/ FSK/ PSK
- 005 ~ 025: AM

70 MHz band
- 005 ~ 050: SSB/ CW/ FM/ FSK/ PSK
- 005 ~ 013: AM

- The change step is 1 W or 5 W steps depending on the Menu [6 - 04] “Transmit Power Step Size” setting.
- If the transmission output limiter function is ON, P1 cannot be set above the limit value.
- If the Drive out function is ON, set / read for the Drive out level.
- To set 12.5 W in AM mode of 70 MHz band, P1 is set to “013”. When reading the 12.5 W state in AM mode of 70 MHz band, P1 is 013. (E type only)

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	;	

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

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

Parameters:

P1 (Input level)
- 000 (minimum) ~ 100 (maximum)

P2 (Output level)
- 000 (minimum) ~ 100 (maximum)

PR0 Speech Processor ON/ OFF

	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)

- In PC control by COM connection, when turning on the power with this command, it is necessary to send dummy data (eg ";") first, wait about 100 ms and send "PS1;".
- When the transceiver is turned ON using this command, regardless of ON / OFF of the AI function, the radio firstly outputs "PS3;" and then outputs a response command "PS1;" at the time of completion of activation.
- 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 ~ 160: 300 Hz to 1100 Hz (in steps of 5 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	;	

Parameters:

P1 (Quick Memory Channel Number)
0 ~ 9

P2 (Frequency Information on left side VFO (11-digit))
Unused high-end digits will become 0.
◆ When no information is available for a parameter, it is returned as blank.

P3 (Mode Information on left side VFO)
Refer to the P2 value of the OM command.
◆ When no information is available for a parameter, it is returned as blank.)

P4 (Frequency Information on right side VFO (11-digit))
Unused high-end digits will become 0.
◆ When no information is available for a parameter, it is returned as blank.)

P5 (Mode Information on right side VFO)
Refer to the P2 value of the OM command.
◆ When no information is available for a parameter, it is returned as blank.)

P6 (Simplex Information)
0: Simplex
1: Split
◆ When no information is available for a parameter, it is returned as blank.)

- This command will not automatically respond when using the AI function.

QD — Quick Memory Channel All Delete

Set	1	2	3	4	5	6	7	8	9	10
	Q	D	;							
Answer	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 all deleting the Quick Memory Channel.
- You cannot perform this command when Quick Memory Channel mode is OFF.

QI — Writing Quick Memory Channel

Set	1	2	3	4	5	6	7	8	9	10
	Q	I	;							
Answer	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 Channel.

QR — Quick Memory Channel ON/OFF

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 (State)
0: Quick Memory Channel OFF
1: Quick Memory Channel ON

P2 (Channel number)
0 ~ 9
◆ If parameter P1=0, set parameter P2 to 0.
◆ When selecting Quick Memory Channel ON but not setting a channel number, this setting is space.

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

QS — Speaker Mute

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

Parameters:

P1

0: Speaker Mute OFF

1: Speaker Mute ON

◆ Speaker mute state is canceled when power OFF.

◆ Even when the AI function is ON, this command does not automatically respond.

RA — Attenuator

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

Parameters:

P1

0: 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 (Frequency (in Hz), Set 2 command only)

00000 ~ 09999

• Use the setting command 1 to adjust the RIT/XIT 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 command 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 (Operation)

0: Recording/Playback stop

1: Begin manual recording/recording in progress

2: Full-time recording storage (setting only)

3: Begin quick playback/playback in progress

4: Pause manual 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 (Playback progression)

001 ~ 100

◆ 000 when no playback is in progress.

◆ The AI function performs an auto response every second for the playback progression (Automatic response is not continuous, response will be a discrete value).

RF — RIT/XIT Frequency

	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 (RIT/XIT frequency in Hz)
0000 ~ 9999

RG — RF Gain

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

Parameters:
P1
000 ~ 255

RL1 — Noise Reduction 1 Level

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

Parameters:
P1
01 ~ 10
99: Initial value setting (setting command only)

RL2 — Noise Reduction 2 Time Constant

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

Parameters:
P1
00 (2 ms) ~ 09 (20 ms)
99: Initial value setting (setting command 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 (Meter type)
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
◆ This value shows the oscillation (number of dots) of the transceiver digital meter.

- The meter value of the meter type (multiple settings are possible at the same time) set for read is output with response command.
- You can set the type of meter to be displayed using the MT command.
- The ALC meter value is output during recording and standby (Even when P2 set to “do not read”).

RT — RIT Function State, RIT Shift

	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
2: RIT shift (setting command only)

RX — Receiver Function State

	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 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	P1	P2	;				

Parameters:
P1 (Scan Operation/ State)
0: Scan OFF
1: Scan ON
P2 (Slow Scan State)
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

SC2 — Tone Scan/ CTCSS Scan

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

Parameters:
P1
0: Tone/CTCSS Scan OFF
1: Tone Scan
2: CTCSS Scan

- You can set 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.

SC3 — Program Scan/ VFO Scan Selection

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

Parameters:
P1
0: Program Scan
1: VFO Scan

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

0000 ~ 1000 (ms) (in steps of 50)

- Enters other than 50 step units are corrected to values in increments of 50 steps.

SF

Sets and Reads the VFO (Frequency and Mode)

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

Parameters:

P1 (Target VFO)

0: VFO A

1: VFO B

P2 (Frequency)

11 digits in Hz

◆ Enter unused digits as “0”.

P3 (Operation mode)

Refer to P2 of the OM command.

- The frequency handled by this command is the frequency before adding the RIT / XIT frequency.
- Transmission VFO cannot be set during transmission.
- Setting command is not accepted during TF-SET.
- While the AI function is ON, this command will not automatically respond.

SH	Receive Filter High-cut Frequency/ Shift Frequency									
Set	1	2	3	4	5	6	7	8	9	10
	S	H	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10
	S	H	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	S	H	P1	P2	P2	P2	;			

Parameters:

P1 (Type)

0: Setting value

1: Presetting value

P2: High-cut Frequency ID

P2	High-cut Frequency (Hz)		
	SSB/SSB-DATA	AM/AM-DATA	FM/FM-DATA
000	600	2.0 k	1000
001	700	2.1 k	1100
002	800	2.2 k	1200
003	900	2.3 k	1300
004	1000	2.4 k	1400
005	1100	2.5 k	1500
006	1200	2.6 k	1600
007	1300	2.7 k	1700
008	1400	2.8 k	1800
009	1500	2.9 k	1900
010	1600	3.0 k	2000
011	1700	3.5 k	2100
012	1800	4.0 k	2200
013	1900	5.0 k	2300
014	2000		2400
015	2100		2500
016	2200		2600
017	2300		2700
018	2400		2800
019	2500		2900
020	2600		3000
021	2700		3400
022	2800		4000
023	2900		5000
024	3000		
025	3400		
026	4000		
027	5000		

P2: Shift Frequency ID in SSB/SSB-DATA mode

P2	Shift Frequency (Hz)
	SSB/SSB-DATA
000	50
001	100
002 ~ 048	150 ~ 2450 (in steps of 50 Hz)
049	2500

P2: Shift frequency ID in CW mode

P2	Shift Frequency (Hz)
	CW
000	-800
001	-790
002 ~ 079	-780 ~ -10 (in steps of 10 Hz)
080	0
081	10
082 ~ 159	20 ~ 700 (in steps of 10 Hz)
160	800

- An error occurs when entering an ID with no assigned frequency for the setting command.
- Entering a value of 999 results in the initial value being entered.
- You can set and read the shift frequency even using the IS command.

SL — Receive Filter Low-cut Frequency/ Passband Width

	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 (Type)

0: Setting value

1: Preset value

P2 (Low-cut Frequency ID/ Passband Width ID)

P2	Low-cut Frequency (Hz)			Passband Width (Hz)			
	SSB/ SSB-DATA	AM/ AM-DATA	FM/ FM-DATA	SSB/ SSB-DATA	CW	FSK	PSK
00	0	0	0	50	50	250	50
01	50	100	50	80	80	300	80
02	100	200	100	100	100	350	100
03	200	300	200	150	150	400	150
04	300		300	200	200	450	200
05	400		400	250	250	500	250
06	500		500	300	300	1000	300
07	600		600	350	350	1500	350
08	700		700	400	400		400
09	800		800	450	450		450
10	900		900	500	500		500
11	1000		1000	600	600		600
12	1100			700	700		700
13	1200			800	800		800
14	1300			900	900		900
15	1400			1000	1000		1000
16	1500			1100	1500		1200
17	1600			1200	2000		1400
18	1700			1300	2500		1500
19	1800			1400			1600
20	1900			1500			1800
21	2000			1600			2000
22				1700			2200
23				1800			2400
24				1900			2600
25				2000			2800
26				2100			3000
27				2200			
28				2300			
29				2400			
30				2500			
31				2600			
32				2700			
33				2800			
34				2900			
35				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	;							
Answer	S	M	P1	P1	P1	P1	;			

Parameters:

P1 (Meter oscillation)

0000 ~ 0070

- ◆ 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.

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 (Split operation frequency setting)
- 0: Complete the setting/ During no operation
- 1: Start the setting/ During the setting
- 2: Cancel the setting (setting command only)
- ◆ When using setting 2, set the P1 parameter to "0".
- ◆ The "SPLIT" blinks during this setting.

P2 (Shift direction)
- 0: + shift
- 1: – shift

P3 (Shift amount (in kHz))
- 1 ~ 9

- When performing setting 2, split operating frequency sets automatically.

SQ — Squelch Level

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

Parameters:

P1
- 000 ~ 255

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	S	S	P1	P2	;					
Answer	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 (Memory channel number for Program Slow Scan)
- 0 ~ 9

P2 (Slow down frequency spot)
- 0 ~ 4

P3 (Slow down frequency (11 digits in Hz))

- In the response command, if no point frequency has been set, parameter P3 is all 0's.
- In the setting command, 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 (Selection information type)
- 0: Program Scan section
- 1: Memory Scan group section

P2 ~ P13 (Selection setting / situation)
- 0: Unselected
- 1: Selected

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	N/A (Answer is always “0”, Setting is “0” or “1”)	Group P
P13	N/A (Answer is always “0, Setting is “0” or “1”)	Group E

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 — 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: Split OFF
- 1: Split ON

TF1 — Transmit Filter Low-cut Frequency

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

Parameters:

P1
- 0: 10 Hz
- 1: 100 Hz
- 2: 200 Hz
- 3: 300 Hz
- 4: 400 Hz
- 5: 500 Hz

◆ Use the EX command for setting.

- No transmission filter setting transmission mode (FM/CW/PSK/FSK) cannot be read. an error occurs.)
- When the AI function is ON, automatically responds when the transmission mode is switched from the mode without transmission filter setting (FM/CW/PSK/FSK) to the mode with transmission filter setting (SSB/AM).

TF2 Transmit Filter High-cut Frequency

	1	2	3	4	5	6	7	8	9	10
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

◆ Use the EX command for setting.

- Read mode is available when the transmit mode is set to the mode with transmission filter setting (SSB/AM). (No transmission filter setting transmission mode (FM/CW/PSK/FSK) cannot be read. an error occurs.))
- When the AI function is ON, automatically responds when the transmission mode is switched from the mode without transmission filter setting (FM/CW/PSK/FSK) to the mode with transmission filter setting (SSB/AM).

TI Temporary TX Inhibit

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

Parameters:

P1

0: TX permission
1: Temporary TX Inhibit

◆ Not backed up by this command.
◆ While the AI function is ON, this command will not automatically respond.

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 function OFF or temporary release
1: Timer function ON (restart from temporary release)

TM1 Program Timer

Set 1	1	2	3	4	5	6	7	8	9	10
	T	M	1	P1	;					
Set 2	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	P10	P10	P10	P11	P11	P11	P11
	21	22	23	24	25	26	27	28	29	30
	P12	P12	P12	P12	P12	P12	P12	P12	P12	P12
	31	32	33	34	35	36	37	38	39	40
	P12	P13	;							
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	P10	P10	P10	P11	P11	P11	P11
	21	22	23	24	25	26	27	28	29	30
	P12	P12	P12	P12	P12	P12	P12	P12	P12	P12
	31	32	33	34	35	36	37	38	39	40
	P12	P13	;							

Parameters:

P1 (Timer mode)
- 0: OFF
- 1: Power-on (On Timer)
- 2: Power-off (Off Timer)
- 3: Power-on/off (On/Off Timer)
- 4: Record (Timer Recorder)

P2 (Sunday)
P3 (Monday)
P4 (Tuesday)
P5 (Wednesday)
P6 (Thursday)
P7 (Friday)
P8 (Saturday)
- 0: Unselected
- 1: Selected

P9 (Repeat)
- 0: OFF
- 1: ON

P10 (Power-on time)
- 0000 ~ 2359
- ◆ When the P1 parameter is Power-off (Off Timer), this configuration is ignored and the response becomes blank.

P11 (Power-off time)
- 0000 ~ 2359
- ◆ When the P1 parameter is Power-on (On Timer), this configuration is ignored and the response becomes blank.

P12 (Reservation contents of receive frequency)
- 11 digit frequency (in Hz). Set the unused upper digits to “0”.

P13 (Reservation contents of receive frequency mode)
- Refer to the OM command P2 parameter.

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 (Sleep timer setting)
- 0: OFF
- 1: 5 minutes
- 2: 10 minutes
- 3: 15 minutes
- 4: 30 minutes
- 5: 60 minutes
- 6: 90 minutes
- 7: 120 minutes

P2 (Time to sleep (in minutes))
- 000 ~ 120
- ◆ 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	P1	;					
Read	T	N	;							
Answer	T	N	P1	P1	;					

Parameters:
P1 (Tone Frequency)

P1	Freq. (Hz)	P1	Freq. (Hz)	P1	Freq. (Hz)	P1	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	1750.0
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.

TO — Tone/ CTCSS/ Cross Tone

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

Parameters:
P1 (Tone function type)
0: OFF
1: Tone
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

TX — Transmission Mode

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

Parameters:
P1
0: Transmission by SEND/PTT
1: Transmission by DATA SEND/PKS
2: TX TUNE

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

UD — VFO Frequency UP/DOWN

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

Parameters:

P1 (Target VFO)
- 0: VFO A
- 1: VFO B

P2 (Frequency change direction)
- 0: Direction Up
- 1: Direction Down

P3 (Change the step number (Set 1 command only))
- 00~99

- The frequency change amount per step is same as the change step by the Tuning control.
- In simplex mode, it is also valid for the VFO on the unused side.
- If you send a command in the format of setting 2 omitting specification of the number of changing steps of parameter P3, it will be changed in 1 step.
- You cannot be set in memory channel mode.
- You cannot be set during TF-SET

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.
- ◆ The value is outside range will result in an error.
- ◆ An entered value of 99 for parameters P1 ~ P18 sets that parameter to its initial value.

- With all the effects, the equalized contents are backed up using this setting command.

VD — VOX Delay Time

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

Parameters:

P1 (Input type)
- 0: Microphone
- 1: ACC 2
- 2: USB-Audio
- 3: LAN

P2 (VOX Delay Time (value x 150 ms))
- 000 ~ 020
- 999: Initial value setting (setting command only)

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: ACC 2
2: USB-Audio
3: LAN
P2 (VOX Gain)
000 ~ 020
999: Initial value setting (setting command only)

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	1	P1	P2	P2	P2	;		

Parameters:
P1 (Input type)
0: Microphone
1: ACC 2
2: USB-Audio
3: LAN
P2 (Level)
000 ~ 020
999: Initial value setting (setting command only)

VR0 Voice Guide

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

Parameters:
P1
1: Voice 1
2: Voice 2
3: Voice 3

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 VFO A to VFO B Copy ([A=B] 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/FM/AM.
- When reading this command in a mode other than SSB/FM/AM, 0 is returned.

XO — Transverter Oscillating 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	1	2	3	4	5	6	7	8	9	10
	X	O	;							
Answer	1	2	3	4	5	6	7	8	9	10
	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))

◆ Enter unused digits as “0”.

- 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 minus or the setting exceeds 4,294,967,295 Hz causes an error.

XT — XIT Function State, XIT Shift

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

Parameters:

P1

0: XIT OFF

1: XIT ON

2: XIT shift (setting command only)

XV — Transverter Function

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

Parameters:

P1

0: Transverter Function OFF

1: Transverter Function ON

00 — Notification of Restart

	1	2	3	4	5	6	7	8	9	10
Read	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 Request

	1	2	3	4	5	6	7	8	9	10
Read	#	#	C	N	;					
Answer	#	#	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

Bandscope Display Information (LAN Output Only)

	1	2	3	4	5	6 ~ 1285	1286		
Answer	#	#	D	D	2	P1	;		

Parameters:

P1 (Bandscope spectrum display information (1280 digits))

640 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.

When EXPAND (spectrum analysis range enlargement) is ON, display information in the range enlarged than the range displayed on the transceiver is output.

Example:

- When the display span is 100 kHz, spectral display information in the range enlarged to 300 kHz is output.
- When the display span is 200 kHz, spectral display information in the range enlarged to 400 kHz is output.

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 “Output to LAN (high frequency)”, “Output to LAN (medium frequency)”, or “Output to LAN (low frequency)”.

##DD3

Filter Scope Display Information (LAN Output Only)

	1	2	3	4	5	6 ~ 431	432		
Answer	#	#	D	D	3	P1	;		

Parameters:

P1 (Spectrum Display Information (426 digits))

213 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 DD1 command is set to “Output to LAN”.
- When the transceiver is displaying the audio scope, it is not output.

##ID

LAN Connection Login

Read	1	2	3	4	5	6	7	8	9	10 ~
	#	#	I	D	P1	P2	P2	P3	P3	P4
		x		x						
	P4	P5		;						
Answer	1	2	3	4	5	6	7	8	9	10
	#	#	I	D	P6	;				

Parameters:

P1 (Account type)
- 0: Administrator ID
- 1: User ID

P2 (Character string length of account)
- 01 ~ 32

P3 (Character string length of password)
- 01 ~ 32

P4 (Account for Administrator ID or User ID)
- Account

P5 (Password for Administrator ID or User ID)
- Password

(Example)
Administrator ID, account: kenwood, password: admin
"##ID00705kenwoodadmin;"

P6 (Authentication result)
- 0: Authorization Failure
- 1: Authorization Successful

##KN0

KNS operation (LAN connector)

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

Parameters:

P1
- 0: OFF
- 1: ON (LAN)
- 2: ON (Internet)
- 9: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN1

Administrator ID, Password

Set	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	1	P1	P1	P2	P2	P3
	11	12	13	14 ~		x		x		x
	P3	P4	P4	P5		P6		P7		P8
	x	x								
	P8	;								
Answer 1	1	2	3	4	5	6	7	8	9	10~
	#	#	K	N	1	P3	P3	P4	P4	P7
	x	x		x						
	P7	P8		;						
Answer 2	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	1	0	;			

Parameters:

P1 (Character string length of current administrator ID)
- 01~32

P2 (Character string length of current administrator password)
- 01~32

P3 (Character string length of new administrator ID)
- 01~32

P4 (Character string length of new administrator password)
- 01~32

P5 (Current administrator ID)
- Up to 32 characters

P6 (Current administrator password)
- Up to 32 characters

P7 (New administrator ID)
- Up to 32 characters

P8 (New administrator password)
- Up to 32 characters

- The registration success is the Answer 1 command, the registration failure is the Answer 2 command is output as the Answer command.
  - ◆ If the current administrator ID and administrator password are different the transceiver settings, the update will fail.
- The setting command can be used only when logged in with administrator ID.

##KN2 Built-in VoIP Function

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

Parameters:
P1
0: Built-in VoIP Function OFF
1: Built-in VoIP Function ON
9: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN3 VoIP Audio Input/Output Level

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

Parameters:
P1 (Type)
0: Audio Input Level (VoIP)
1: Audio Output Level (VoIP)
P2 (Level)
000~100
999: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN4 VoIP Jitter Buffer

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

Parameters:
P1 (x20ms)
04: 80 ms
10: 200 ms
25: 500 ms
40: 800 ms
99: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN5 Speaker Mute During Remote Operation

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

Parameters:
P1
0: Speaker Mute OFF
1: Speaker Mute ON
9: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN6 KNS Operation Access Log

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

Parameters:
P1
0: Access Log OFF
1: Access Log ON
9: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN7 Registered User Remote Operation

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

Parameters:
P1
0: Remote Operation OFF
1: Remote Operation ON
9: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KN8 KNS Registered User List Number Readout

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

Parameters:
P1
000~100

- This command can be use either log in of administrator ID or user ID.

##KN9 Registration of KNS User List

Set	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	9	P2	P2	P3	P3	P4
	11	12	13~		x		x		x	x
	P4	P4	P5		P6		P7		P8	P9
	x									
	;									
Answer 1	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	9	P1	P1	P1	P2	P2
	11	12	13	14	15	16~		x		x
	P3	P3	P4	P4	P4	P5		P6		P7
	x	x	x	x						
	P7	P8	P9	;						
Answer 2	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	9	0	;			

Parameters:
P1 (List Number)
000~099
◆ 000 for the first addition, 099 for the 100th addition.
P2 (Character string length of user ID)
01~32
P3 (Character string length of password))
01~32
P4 (Character string length of description)
000~128
P5 (User ID)
Up to 32 characters
P6 (Password)
Up to 32 characters
P7 (Description)
Up to 128 characters
P8 (Restriction selection)
0: TX/RX
1: RX only
P9 (Enabled/Temporarily disabled selection)
0: Enabled
1: Temporarily disabled

- When the registration is successful, answer 2 command is outputted, and when the registration is fails, answer 1 command is outputted.
- The setting command can be used only when logged in with administrator ID.

##KNA Edit User Information of KNS User List

Set	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	A	P1	P1	P1	P2	P2
	11	12	13	14	15	16~		x		x
	P3	P3	P4	P4	P4	P5		P6		P7
	x	x	x	x						
	P7	P8	P9	;						
Read	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	A	P1	P1	P1	;	
Answer	1	2	3	4	5	6	7	8	9	10
	#	#	K	N	A	P1	P1	P1	P2	P2
	11	12	13	14	15	16~		x		x
	P3	P3	P4	P4	P4	P5		P6		P7
	x	x	x	x						
	P7	P8	P9	;						

Parameters:
P1 (Number to edit or read)
000~099
◆ 000 for the first addition, 099 for the 100th addition.
P2 (Character string length of user ID)
01~32
P3 (Character string length of password))
01~32
P4 (Character string length of description)
000~128
P5 (User ID)
Up to 32 digits
P6 (Password)
Up to 32 digits
P7 (Description)
Up to 128 digits
P8 (Restriction selection)
0: TX/RX
1: RX only
P9 (Enabled/Temporarily disabled selection)
0: Enabled
1: Temporarily disabled

- This command can be use either login of administrator ID or user ID.

##KNB Delete User from KNS User List

	1	2	3	4	5	6	7	8	9	10
Set	#	#	K	N	B	P1	P1	P1	;	

Parameters:
P1 (Number to delete)
000~099

- The setting command can be used only when logged in with administrator ID.

##KNC KNS Welcome Message

	1	2	3	4	5	6	7 ~	x	
Set	#	#	K	N	C	P1	P2	;	

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

	1	2	3	4	5	6	7 ~	x	
Answer	#	#	K	N	C	P1	P2	;	

Parameters:
P1
Always a space
P2 (KNS Welcome message)
Up to 128 characters
◆ If P2 is set to blank and a setting command is sent, the setting contents are deleted.

- This command can be use either login of administrator ID or user ID.

##KND KNS Operation Session Time

	1	2	3	4	5	6	7	8	9	10
Set	#	#	K	N	D	P1	P1	;		

	1	2	3	4	5	6	7	8	9	10
Read	#	#	K	N	D	;				

	1	2	3	4	5	6	7	8	9	10
Answer	#	#	K	N	D	P1	P1	;		

Parameters:
P1
00: 1 min
01: 2 min
02: 3 min
03: 5 min
04: 10 min
05: 15 min
06: 20 min
07: 30 min
08: 40 min
09: 50 min
10: 60 min
11: 90 min
12: 120 min
13: Unlimited
14: Initial value setting (setting command only)

- The setting command can be used only when logged in with administrator ID.

##KNE Changing Password (Logged in Currently Administrator / Registered User)

	1	2	3	4	5	6 ~	x		
Read	#	#	K	N	E	P1	;		

	1	2	3	4	5	6	7	8	9	10
Answer	#	#	K	N	E	P2	;			

Parameters:
P1 (New password)
Up to 32 characters
P2 (Result)
0: NG
1: OK

- This command can be use either login of administrator ID or user ID.

##ST Elapsed Session Time

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

Parameters:
P1
Elapsed time (hour)
P2
Elapsed time (minutes)
P3
Elapsed time (sec)
P4
Setting time (hour)
P5
Setting time (minutes)
P6
Setting time (seconds)

◆ Unused digits will respond with “0”.

##TI TX Inhibited/ Authorized (Login User of Built-in KNS Server)

	1	2	3	4	5	6	7	8	9	10
Answer	#	#	T	I	P1	;				

Parameters:
P2 (Result)
0: TX Inhibited
1: TX Authorized

##UE Enable / Disable (Login User of Built-in KNS Server)

	1	2	3	4	5	6	7	8	9	10
Answer	#	#	U	E	P1	;				

Parameters:
P2
0: Disabled
1: Enabled

##VP Voice Communication by VoIP

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

Parameters:
P1 (Voice communication state by VoIP)
0: Stop
1: Start (high quality sound)
2: Start (low quality sound)

- You cannot switch sound quality after starting voice communication. If you sets different sound quality after starting, the LAN connection will be disconnected.

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