



KENWOOD

PC CONTROL COMMAND REFERENCE FOR THE TS-990S TRANSCEIVER

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-590S transceiver to a PC COM port using a RS-232C connector, to a USB port using a USB 2.0 (AB type) cable, or to a LAN port

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

■ Using a RS-232C Straight Cable

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

■ Using a USB Cable

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

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

■ Using a LAN Cable

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

LAN COMMUNICATION PROCEDURES

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

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

COM/ USB-B (VIRTUAL COM) CONNECTOR

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

LAN CONNECTOR

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

CHARACTER CODING

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

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

AI (AUTO INFORMATION) FUNCTION

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

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

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

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

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CONTROL OPERATION

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

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

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

- Transmit data
- Receive data
- Ground

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

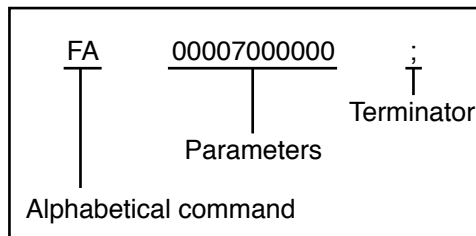
For example, the transceiver is placed into the transmit mode whenever the character string “TX;” is sent from the computer. The character string “TX;” is called a computer control command; it tells the transceiver what to do. There are numerous commands available for control of the transceiver. These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

COMPUTER CONTROL COMMANDS

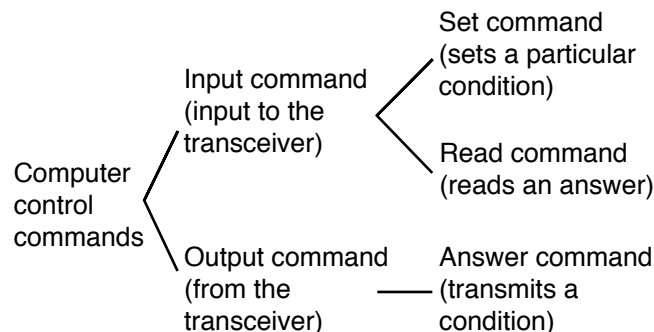
Note: PC control commands will not be available when “MSQ/ PK5 Pin Assignment (COM Connector)” from the Advanced Menu is set to “On”.

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

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



Commands can be classified as shown below:



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

- To set the frequency to 7 MHz, the following command is sent from the computer to the transceiver:
“FA0000700000;” **(Set command)**
- To read the frequency of VFO A, the following command is sent from the computer to the transceiver:
“FA;” **(Read command)**
- When the Read command above has been sent, the following command is returned to the computer:
“FA0000700000;” **(Answer command)**

Note:

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

■ **Command**

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

■ **Parameters**

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

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

Correct parameter example: "IS+1000;"

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

■ **Terminator**

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

■ **Error Messages**

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

Error Message	Reason for Error
?;	<ul style="list-style-type: none"> Command syntax was incorrect. Command was not executed due to the current status of the transceiver (even though the command syntax was correct). <p>Note: Occasionally, this message may not appear due to microprocessor transients in the transceiver.</p>
E;	A communication error occurred, such as an overrun or framing error during a serial data transmission.
O;	Receive data was sent but processing was not completed.

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PC CONTROL COMMAND TABLES

AC		Antenna Tuner									<u>Parameters:</u> P1 0: RX-AT THRU 1: RX-AT IN (This parameter is invalid during the Setting command. Always enter 1.) P2 0: TX-AT THRU 1: TX-AT IN P3 0: Stop Tuning/ Tuning is inactive 1: Start Tuning/ Tuning is active • The RX AT circuit sets when the EX command is received. • To begin tuning, use command "AC111;".
Set	1	2	3	4	5	6	7	8	9	10	
	A	C	P1	P2	P3	;					
Read	1	2	3	4	5	6	7	8	9	10	
	A	C	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	A	C	P1	P2	P3	;					

AG		AF Control									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 000 ~ 255
Set	1	2	3	4	5	6	7	8	9	10	
	A	G	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	A	G	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	A	G	P1	P2	P2	P2	;				

AI		Auto Information									<u>Parameters:</u> P1 0: AI OFF 1: Not used 2: AI ON 3: Not used • When AI is ON, the respective response command is sent when the parameter is changed by the command with the response command. • AI turns OFF when the transceiver power is turned OFF.
Set	1	2	3	4	5	6	7	8	9	10	
	A	I	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	A	I	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	A	I	P1	;							

AM		Auto Mode									<u>Parameters:</u> P1 0: AM OFF 1: AM ON
Set	1	2	3	4	5	6	7	8	9	10	
	A	M	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	A	M	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	A	M	P1	;							

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ANO	Antenna Selection										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	A	N	0	P1	P2	P3	P4	;			
Read	1	2	3	4	5	6	7	8	9	10	P2 1: ANT1 2: ANT2 3: ANT3 4: ANT4 9: No change (setting command only)
	A	N	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	P3 0: RX ANT is not used 1: RX ANT is used 9: No change (setting command only)
	A	N	0	P1	P2	P3	P4	;			
											P4 0: Drive Out OFF 1: Drive Out ON 9: No change (setting command only)
											<ul style="list-style-type: none"> • When setting the command, enter only the parameters you are changing. For parameters you are not changing, enter "9". • For a response command, parameter P2, P3, and P4 cannot be "9".

AN1	Antenna Name										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 4: Antenna Number P2 Always a space P3 String of alphanumeric characters for the Antenna Name (up to 5 characters)
	A	N	1	P1	P2	P3	P3	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
Read	1	2	3	4	5	6	7	8	9	10	
	A	N	1	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	A	N	1	P1	P2	P3	P3	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	

APO	Audio Peak Filter										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	A	P	0	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	P2 1: APF OFF 2: APF ON
	A	P	0	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	A	P	0	P1	P2	;					

AP1	Audio Peak Filter Shift										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	A	P	1	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	P2 00 ~ 80 (40 is the center (CW pitch frequency). 00 represents a -200 Hz shift and 80 represents a +200 Hz shift from center. Each step represents a 5 Hz shift. Entering a value of 99 results in the initial value being entered.)
	A	P	1	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	A	P	1	P1	P2	P2	;				

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AP2		Audio Peak Filter Pass Bandwidth									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: NAR 1: MID 2: WIDE (Entering a value of 9 results in the initial value being entered.)
	A	P	2	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	A	P	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	A	P	2	P1	P2	;					

AS0		Auto Mode Frequency Division Registration									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 11-digit Frequency in Hz (unused digits must be 0) P2 (Mode (refer to the P2 parameter of the OM command)) • You can set a maximum of 32 divisions.
	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	;					

AS1		Number of Auto Mode Frequency Divisions									Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 01 ~ 32
	A	S	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	A	S	1	P1	P1	;					

AS2		Auto Mode Frequency Division Readout									Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 00 ~ 31: Frequency division number P2 11 digit displayed frequency (for example, 14.175 MHz is displayed as 00014175000) P3 (Mode (refer to the P2 parameter of the OM command)) • If the selected frequency division has no information, P2 and P3 are all set to "0". • While the Auto Information (AI) function is ON, this command will not automatically respond.
	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	;			

AS3		Deleting an Auto Mode Frequency Division									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 00 ~ 31: Frequency division number to be deleted • If there is only 1 frequency division available, it cannot be deleted.
	A	S	3	P1	P1	;					

BC		Beat Cancel									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: Beat Cancel OFF 1: Beat Cancel 1 ON 2: Beat Cancel 2 ON
	B	C	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	C	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	C	P1	P2	;						

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BD / BU	Frequency Band Selection (Setting 1) / [UP]/[DOWN] Operating (Setting 2)										Parameters:
Set 1	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band (This parameter is invalid during the Setting command; the operating band is always selected. Enter any value.) P2 (Band Number) 00: 1.8 MHz band 01: 3.5 MHz band 02: 7 MHz band 03: 10 MHz band 04: 14 MHz band 05: 18 MHz band 06: 21 MHz band 07: 24 MHz band 08: 28 MHz band 09: 50 MHz band 10: GEN1 11: GEN2 P3 1 ~ 5: Band memory number (0 is returned when the frequency range does not support the band memory.) • When changing the band memory of the same frequency band, appoint the same band direct number for the setting 1 command. • Using BU; as the setting 2 command performs the same operation as pressing [UP], and using BD; as the setting 2 command performs the same operation as pressing [DOWN]. • When the AI function automatically responds, the BU; command responds.
	B	D/U	P1	P2	P2	;					
Set 2	1	2	3	4	5	6	7	8	9	10	
	B	D/U	;								
Read	1	2	3	4	5	6	7	8	9	10	
	B	D/U	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	D/U	P1	P3	;						

BI	Break-in										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Break-in Off 1: Semi Break-in 2: Full Break-in • Settings can only be performed in CW mode. • "0" is returned when reading in any mode other than CW mode.
	B	I	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	B	I	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	B	I	P1	;							

BP	Notch Control										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 000 (minimum) ~ 127 (maximum) (Turning the Notch knob fully to the left selects 000 and turning it fully to the right selects 127.) • When manual notch function is ON, the Notch knob reflects the notch frequency. When the band eliminator function is ON, the Notch knob reflects the center frequency of the eliminated band.
	B	P	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	B	P	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	B	P	P1	P2	P2	P2	;				

BS0	Scope Image ON/OFF										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Scope Display OFF 1: Scope Display ON • In some cases, the scope image may be used by another display, but the response will remain the same.
	B	S	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	0	P1	;						

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BS1		Scope Image Type										Parameters:
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Bandscope 1: Bandscope with Waterfall 2: Audio Scope • There are times when the transceiver screen display cannot be changed (corresponding to the operating conditions of the [SCP] key). • In some cases, the scope display may be temporarily displaying a different screen. However, the response does not change, even in that case.
		B	S	1	P1	;						
Read		1	2	3	4	5	6	7	8	9	10	
		B	S	1	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		B	S	1	P1	;						

BS2		Bandscope Object										Parameters:
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
		B	S	2	P1	;						
Read		1	2	3	4	5	6	7	8	9	10	
		B	S	2	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		B	S	2	P1	;						

BS3		Bandscope Operation Mode										Parameters:
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Center Mode 1: Fixed Mode 2: Keeping the scope range from Center mode to Fix mode (Setting command only)
		B	S	3	P1	;						
Read		1	2	3	4	5	6	7	8	9	10	
		B	S	3	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		B	S	3	P1	;						

BS4		Bandscope Span (Center Mode)										Parameters:
Set		1	2	3	4	5	6	7	8	9	10	P1 0: ±2.5 kHz 1: ±5 kHz 2: ±10 kHz 3: ±25 kHz 4: ±50 kHz 5: ±100 kHz 6: ±250 kHz (Entering a value of 9 results in the initial value being entered.)
		B	S	4	P1	;						
Read		1	2	3	4	5	6	7	8	9	10	
		B	S	4	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		B	S	4	P1	;						

BS5		Bandscope Lower/Upper Frequency Limit (Fixed Mode)										Parameters:
Read		1	2	3	4	5	6	7	8	9	10	P1 (Lower Limit Frequency) 8 digit frequency in Hz (unused digits must be 0) P2 (Upper Limit Frequency) 8 digit frequency in Hz (unused digits must be 0)
		B	S	5	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		B	S	5	P1	P1	P1	P1	P1	P1	P1	
		11	12	13	14	15	16	17	18	19	20	
		P1	P2	P2	P2	P2	P2	P2	P2	P2	;	

BS6		Bandscope Display Pause										Parameters:
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Pause OFF 1: Pause ON
		B	S	6	P1	;						
Read		1	2	3	4	5	6	7	8	9	10	
		B	S	6	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		B	S	6	P1	;						

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BS7		Bandscope Marker									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Scope object receive frequency only 1: Scope object receive frequency and non-scope object receive frequency 2: Scope object receive and transmit frequency 3: Scope object receive frequency and non-scope object receive and transmit frequency
	B	S	7	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	7	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	7	P1	;						

BS8		Bandscope Attenuator									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: OFF 1: 10 dB 2: 20 dB 3: 30 dB
	B	S	8	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	8	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	8	P1	;						

BS9		Bandscope Max Hold									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: OFF 1: ON
	B	S	9	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	9	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	9	P1	;						

BSA		Bandscope Display Averaging									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: OFF 1: Level 1 2: Level 2 3: Level 3
	B	S	A	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	A	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	A	P1	;						

BSB		Bandscope With Waterfall Display Speed									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 3
	B	S	B	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	B	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	B	P1	;						

BSC		Bandscope Reference Display Level									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 000 ~ 080 (000 represents -20 dB, 040 represents 0 dB, and 080 represents +20 dB. Each step represents 0.5 dB.)
	B	S	C	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	C	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	C	P1	P1	P1	;				

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BSD	Bandscope Waterfall Display Clear										<u>Parameters:</u> No parameters are used with this command.
Set	1	2	3	4	5	6	7	8	9	10	<ul style="list-style-type: none"> When the AI function is ON, the waterfall display clear timing is returned as a response.
	B	S	D	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	D	;							

BSE	Bandscope Range Shift (Marker is moved to the center zone with Fixed mode)										<u>Parameters:</u> No parameters are used with this command.
Set	1	2	3	4	5	6	7	8	9	10	<ul style="list-style-type: none"> Only valid during FIX mode.
	B	S	E	;							

BSF	Audio Scope Sound Generator Selection										<u>Parameters:</u> P1 0: Main Band Reception Sound 1: Sub Band Reception Sound
Set	1	2	3	4	5	6	7	8	9	10	
	B	S	F	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	F	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	F	P1	;						

BSG	Audio Scope Antenna										<u>Parameters:</u> P1 0: 0 dB 1: 10 dB 2: 20 dB 3: 30 dB
Set	1	2	3	4	5	6	7	8	9	10	
	B	S	G	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	G	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	G	P1	;						

BSH	Audio Scope Span (Audio Scope)										<u>Parameters:</u> P1 0: 3 kHz 1: 8 kHz
Set	1	2	3	4	5	6	7	8	9	10	
	B	S	H	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	H	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	H	P1	;						

BSI	Oscilloscope Level										<u>Parameters:</u> P1 0: 0 dB 1: -10 dB 2: -20 dB 3: -30 dB
Set	1	2	3	4	5	6	7	8	9	10	
	B	S	I	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	I	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	I	P1	;						

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BSJ	Oscilloscope Sweep Time										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: 1 ms 1: 3 ms 2: 10 ms 3: 30 ms 4: 100 ms 5: 300 ms
	B	S	J	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	B	S	J	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	B	S	J	P1	;						

BY	BUSY LED Status										<u>Parameters:</u>
Read	1	2	3	4	5	6	7	8	9	10	P1 (Main Band) 0: BUSY LED Off 1: BUSY LED lit P2 (Sub Band) 0: BUSY LED Off 1: BUSY LED lit
	B	Y	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	B	Y	P1	P2	;						

CA	CW Auto Tune										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: Pauses CW Auto Tune/ Inactive 1: Starts CW Auto Tune/ Active
	C	A	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	C	A	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	C	A	P1	P2	;						

CB	Operating Band										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	C	B	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	C	B	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	C	B	P1	;							

CG	CAR Control										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 000 (minimum) ~ 255 (maximum)
	C	G	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	C	G	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	C	G	P1	P1	P1	;					

CH	MULTI/CH Control										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Move the MULTI/CH control up for 1 step 1: Move the MULTI/CH control down for 1 step
	C	H	P1	;							

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CK0		Clock (Local Clock Date and Time)									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 12 ~ 99: Year P2 01 ~ 12: Month P3 01 ~ 31: Day P4 00 ~ 23: Hour P5 00 ~ 59: Minute (You cannot use this command to perform the setting while the automatic retrieval setting by the NTP is ON.)
	C	K	0	P1	P1	P2	P2	P3	P3	P4		
	11	12	13	14	15	16	17	18	19	20		
P4	P5	P5	;									
Read		1	2	3	4	5	6	7	8	9	10	
	C	K	0	;								
	11	12	13	14	15	16	17	18	19	20		
Answer		1	2	3	4	5	6	7	8	9	10	
	C	K	0	P1	P1	P2	P2	P3	P3	P4		
	P4	P5	P5	;								

CK1		Clock (Setting Situation of the Local Clock Date and Time)									Parameters:	
Read		1	2	3	4	5	6	7	8	9	10	P1 0: Not set 1: Set
	C	K	1	;								
Answer		1	2	3	4	5	6	7	8	9	10	
	C	K	1	P1	;							

CK2		Clock (Local Clock Time Zone)									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 000 ~ 112 (Each step represents 15 minutes, where 000 is -14:00, 056 is +00:00 and 112 is +14:00)
	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	;					

CK3		Clock (Time Zone of 2nd Clock)									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 000 ~ 112 (Each step represents 15 minutes, where 000 is -14:00, 056 is +00:00 and 112 is +14:00)
	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	;					

CK4		Clock (Identification Character of 2nd Clock)									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 1 character
	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	;							

PC CONTROL COMMAND REFERENCE GUIDE

CK5	Clock (Date Format)										<u>Parameters:</u> P1 0: MM/DD/YY 1: DD/MM/YY 2: YY/MM/DD
	Set	1	2	3	4	5	6	7	8	9	
	C	K	5	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	C	K	5	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	C	K	5	P1	;						

CK6	Clock (Automatic Date/Time Retrieval)										<u>Parameters:</u> P1 0: OFF 1: ON (You must first set up an NTP server address in order to turn this function ON.)
	Set	1	2	3	4	5	6	7	8	9	
	C	K	6	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	C	K	6	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	C	K	6	P1	;						

CK7	Clock (NTP Server Address)										<u>Parameters:</u> P1 Always a space P2 NTP Server Address (up to 50 characters) (When the configuration command is sent with P2 being blank, the configuration contents of the NTP server address are deleted and the automatic date/time retrieval is automatically turned OFF.)
	Set	1	2	3	4	5 ~ 55	56	57	58	59	
	C	K	7	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	C	K	7	;							
Answer	1	2	3	4	5 ~ 55	56	57	58	59		
	C	K	7	P1	P2	;					

CK8	Clock										<u>Parameters:</u> No parameters are used with this command. • The clock is acquisitioned from the NTP server.
	Set	1	2	3	4	5	6	7	8	9	
	C	K	8	;							

CM0	Registration of CW Message (Paddle Input)										<u>Parameters:</u> P1 0: Non-operational/ Operation ended • End of standby 1: Storing CH1/ Standby 2: Storing CH2/ Standby 3: Storing CH3/ Standby 4: Storing CH4/ Standby 5: Storing CH5/ Standby 6: Storing CH6/ Standby 7: Storing CH7/ Standby 8: Storing CH8/ Standby P2 000 ~ 100: Progress (%) (While waiting for registration, P2 is 000.) • During inoperation, 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.
	Set	1	2	3	4	5	6	7	8	9	
	C	M	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	C	M	0	;							
Answer 1	1	2	3	4	5	6	7	8	9	10	
	C	M	0	0	;						
Answer 2	1	2	3	4	5	6	7	8	9	10	
	C	M	0	P1	P2	P2	P2	;			

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CM1	Play/Stop the CW Message										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Non-operational/ Stop Playback 1: Playing/Start CH1 2: Playing/Start CH2 3: Playing/Start CH3 4: Playing/Start CH4 5: Playing/Start CH5 6: Playing/Start CH6 7: Playing/Start CH7 8: Playing/Start CH8 P2 (Repeat Playback) 0: Non-operational/ During Playback 1: Awaiting Repeat Playback (Repeat interval count)
	C	M	1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	P1 0: Non-operational/ Stop Playback 1: Playing/Start CH1 2: Playing/Start CH2 3: Playing/Start CH3 4: Playing/Start CH4 5: Playing/Start CH5 6: Playing/Start CH6 7: Playing/Start CH7 8: Playing/Start CH8 P2 (Repeat Playback) 0: Non-operational/ During Playback 1: Awaiting Repeat Playback (Repeat interval count)
	C	M	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	P1 0: Non-operational/ Stop Playback 1: Playing/Start CH1 2: Playing/Start CH2 3: Playing/Start CH3 4: Playing/Start CH4 5: Playing/Start CH5 6: Playing/Start CH6 7: Playing/Start CH7 8: Playing/Start CH8 P2 (Repeat Playback) 0: Non-operational/ During Playback 1: Awaiting Repeat Playback (Repeat interval count)
	C	M	1	P1	P2	;					

CM2	Register Status of CW Message (Paddle Input)										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel P2 0: Not Stored 1: Stored
	C	M	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel P2 0: Not Stored 1: Stored
	C	M	2	P1	P2	;					
											• When the "CW Message Entry" menu is set to "Text String", you cannot use this command.

CM3	Clear the CW Message (Paddle Input)										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel
	C	M	3	P1	;						
											• When the AI function is ON, the CM2 command will notify you when an entry is deleted. • When the "CW Message Entry" menu is set to "Text String", you cannot use this command.

CM4	CW Message Memory Name (Paddle Input)										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel P2 Always a space P3 Name (up to 20 characters)
	C	M	4	P1	P2	P3	P3	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3	
	21	22	23	24	25	26	27	28	29	30	
	P3	P3	P3	P3	P3	;					
Read	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel P2 Always a space P3 Name (up to 20 characters)
	C	M	4	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel P2 Always a space P3 Name (up to 20 characters)
	C	M	4	P1	P2	P3	P3	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P3	P3	P3	P3	P3	P3	P3	P3	P3	P3	
	21	22	23	24	25	26	27	28	29	30	
	P3	P3	P3	P3	P3	;					

CM5	Registering the CW Message Memory (Text Input)										Parameters:
Set	1	2	3	4	5	6 ~ 55	56	57	58	P1 1 ~ 8: CW Message Channel P2 Always a space P3 Message (up to 50 characters)	
	C	M	5	P1	P2	P3	;				
Read	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: CW Message Channel P2 Always a space P3 Message (up to 50 characters)
	C	M	5	P1	;						
Answer	1	2	3	4	5	6 ~ 55	56	57	58	P1 1 ~ 8: CW Message Channel P2 Always a space P3 Message (up to 50 characters)	
	C	M	5	P1	P2	P3	;				
											• When the "CW Message Entry" menu is set to "Paddle", you cannot use this command.

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CM6	CW Message Channel Repeat										Parameters: P1 1 ~ 8: CW Message Channel P2 0: Repeat OFF 1: Repeat ON • This setting cannot be configured for channels that have not been registered.									
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										
Answer	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										

CM7	Contest Number										Parameters: P1 0: Decrementing Numbers P2 0000 ~ 9999: 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										
Answer	1	2	3	4	5	6	7	8	9	10	C	M	7	P2	P2	P2	P2	;		
	Read	1	2	3	4	5	6	7	8	9										

CN	CTCSS frequency										Parameters: P1 0: Main Band 1: Sub Band P2 (CTCSS frequency)																																																																																																																
Set	1	2	3	4	5	6	7	8	9	10	C	N	P1	P2	P2	;																																																																																																											
	Read	1	2	3	4	5	6	7	8	9											10																																																																																																						
Answer	1	2	3	4	5	6	7	8	9	10	C	N	P1	P2	P2	;																																																																																																											
	Read	1	2	3	4	5	6	7	8	9											10																																																																																																						
											<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>P2</th><th>Freq. (Hz)</th><th>P2</th><th>Freq. (Hz)</th><th>P2</th><th>Freq. (Hz)</th><th>P2</th><th>Freq. (Hz)</th> </tr> </thead> <tbody> <tr><td>00</td><td>67.0</td><td>13</td><td>103.5</td><td>26</td><td>159.8</td><td>39</td><td>199.5</td></tr> <tr><td>01</td><td>69.3</td><td>14</td><td>107.2</td><td>27</td><td>162.2</td><td>40</td><td>203.5</td></tr> <tr><td>02</td><td>71.9</td><td>15</td><td>110.9</td><td>28</td><td>165.5</td><td>41</td><td>206.5</td></tr> <tr><td>03</td><td>74.4</td><td>16</td><td>114.8</td><td>29</td><td>167.9</td><td>42</td><td>210.7</td></tr> <tr><td>04</td><td>77.0</td><td>17</td><td>118.8</td><td>30</td><td>171.3</td><td>43</td><td>218.1</td></tr> <tr><td>05</td><td>79.7</td><td>18</td><td>123.0</td><td>31</td><td>173.8</td><td>44</td><td>225.7</td></tr> <tr><td>06</td><td>82.5</td><td>19</td><td>127.3</td><td>32</td><td>177.3</td><td>45</td><td>229.1</td></tr> <tr><td>07</td><td>85.4</td><td>20</td><td>131.8</td><td>33</td><td>179.9</td><td>46</td><td>233.6</td></tr> <tr><td>08</td><td>88.5</td><td>21</td><td>136.5</td><td>34</td><td>183.5</td><td>47</td><td>241.8</td></tr> <tr><td>09</td><td>91.5</td><td>22</td><td>141.3</td><td>35</td><td>186.2</td><td>48</td><td>250.3</td></tr> <tr><td>10</td><td>94.8</td><td>23</td><td>146.2</td><td>36</td><td>189.9</td><td>49</td><td>254.1</td></tr> <tr><td>11</td><td>97.4</td><td>24</td><td>151.4</td><td>37</td><td>192.8</td><td></td><td></td></tr> <tr><td>12</td><td>100.0</td><td>25</td><td>156.7</td><td>38</td><td>196.6</td><td>99</td><td>to default</td></tr> </tbody> </table> <p>(Entering a value that does not exist is invalid. 99 is a setting command only.)</p>	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
P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)																																																																																																																				
00	67.0	13	103.5	26	159.8	39	199.5																																																																																																																				
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DD0	Scope Display Data Output Control (Bandscope Display Information Setting)										Parameters: P1 0: No Output 1: High-Speed Output (for LAN connection) 2: Low-Speed Output (for COM connection) (High-speed output and low-speed output cannot be used simultaneously.)									
Set	1	2	3	4	5	6	7	8	9	10	D	D	0	P1	;					
	Read	1	2	3	4	5	6	7	8	9										
Answer	1	2	3	4	5	6	7	8	9	10	D	D	0	P1	;					
	Read	1	2	3	4	5	6	7	8	9										

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DD1	Scope Display Data Output Control (Sub-Scope Display Information Setting)										<u>Parameters:</u> P1 0: No Output 1: High-Speed Output (for LAN connection) 2: Low-Speed Output (for COM connection) (High-speed output and low-speed output cannot be used simultaneously.)
	Set	1	2	3	4	5	6	7	8	9	
Read	D	D	1	P1	;						
	1	2	3	4	5	6	7	8	9	10	
Answer	D	D	1	P1	;						

DD2	Display Data Output Control (Bandscope Display Information)										<u>Parameters:</u> P1 00 ~ 31: Split Number P2 Bandscope Spectrum Display Information (40 digits) 20 spectrum information are each expressed as 2 ASCII digits. Two digits of the beginning of division No. 00 are spectrum information of the left side, and two digits of the end of division No. 31 become the spectrum information of the right side. The range of value for each spectrum information is from 00h ~ 8Ch (hexadecimal numbering). 00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 8Ch shows a state where the spectrum is not displayed (signal strength = -100 dB). The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 8Ch, the order becomes "8", "C". <ul style="list-style-type: none"> • When the AI functions sets the speed as low when using the DD0 command, it is output from division No. 00 to 31, sequentially. • When the transceiver is not displaying the bandscope, it is not output. • This command operates only at a baud rate of 115200 bps. • It is possible to perform high-speed control using the ##DD2 command exclusively for a LAN.
	Answer	1	2	3	4	5	6 ~ 45	46	47	48	
	D	D	2	P1	P1	P2	;				

DD3	Display Data Output Control (Subscope Display Information)										<u>Parameters:</u> P1 00 ~ 14: Split Number P2 Subscope Spectrum Display Information (38 digits) 19 spectrum information are each expressed as 2 ASCII digits. Two digits of the beginning of division No. 00 are spectrum information of the left side, and two digits of the end of division No. 14 become the spectrum information of the right side. The range of value for each spectrum information is from 00h ~ 32h (hexadecimal numbering). 00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 32h shows a state where the spectrum is not displayed (signal strength = -50 dB). The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 32h, the order becomes "3", "2". <ul style="list-style-type: none"> • When the AI functions sets the speed as low when using the DD1 command, it is output from division No. 00 to 14, sequentially. • When the transceiver is not displaying the subscope, it is not output. • This command operates only at a baud rate of 115200 bps. • It is possible to perform high-speed control using the ##DD3 command exclusively for a LAN.
	Answer	1	2	3	4	5	6 ~ 44	45	46	47	
	D	D	3	P1	P1	P2	;				

DF	Δ F Display										<u>Parameters:</u> P1 0: No Δ F Display Information 1: Δ F Display Information (during split mode or split frequency operation) P2 0: Plus 1: Minus (When P1 is 0, P2 also becomes 0.) P3 11 digit frequency in Hz (enter unused digits as 0) (When P1 is set to 0, all digits are returned as 0.)
	Read	1	2	3	4	5	6	7	8	9	
Answer	D	F	;								
	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	P3	P3	;			

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DM0	Dimmer										Parameters: P1 1 ~ 4: Dimmer Preset Number									
	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	D	M	0	P1	;														

DM1	Dimmer Adjustment										Parameters: P1 1 ~ 4: Dimmer Preset Number P2 0: Main Display 1: Sub Display 2: LED P3 005 ~ 100: Dimmer Adjustment Value (In steps of 5. Values that are not in steps of 5 are rounded down.) (Entering a value of 999 results in the initial value being entered.)									
	Set	1	2	3	4	5	6	7	8	9		10	D	M	1	P1	P2	P3	P3	P3
Read	1	2	3	4	5	6	7	8	9	10	D	M	1	P1	P2	;				
	Answer	D	M	1	P1	P2	P3	P3	P3	;										

DN / UP	Microphone DWN/UP Switch Operation										Parameters: P1 00 ~ 99: Step Count • If the parameter is skipped, the “DN;” and “UP;” commands will adjust by 1 step. • When setting the parameter from 01 to 99, the frequency is adjusted by the specified step size. • In Memory mode and Quick Memory mode, the command with no P1 parameter specified is treated as a Memory channel down (DN;) or up (UP;) command. With parameters, it is treated as the frequency down or up command. • When setting the parameter to 00, the command is accepted, but no changes occur.									
	Set	1	2	3	4	5	6	7	8	9		10	D/U	N/P	P1	P1	;			

DP	Sub-Display										Parameters: P1 0: Single Frequency Display (enlargement OFF, dial display) 1: Single Frequency Display (enlargement ON, no dial display) 2: Dual Frequency Display (enlargement OFF, sub-scope) 3: Dual Frequency Display (enlargement OFF, no sub-scope) 4: X-Y Scope (only during RTTY communication screen display) 5: Vector scope (only during PSK communication screen display)									
	Set	1	2	3	4	5	6	7	8	9		10	D	P	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	D	P	;							
	Answer	D	P	P1	;															

DS0	Screen Display State (Basic Screen)										Parameters: P1 0: Standard 1: SWL Display Mode									
	Set	1	2	3	4	5	6	7	8	9		10	D	S	0	P1	;			
Read	1	2	3	4	5	6	7	8	9	10	D	S	0	;						
	Answer	D	S	0	P1	;														

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DS1	Screen Display State (Function Configuration Screen)										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 000: No Setting Screen 001 ~ 002: Unused 003: Antenna Name Setting Screen 004: Preselector Setting Screen 005: AGC Setting Screen 006: Transmission Voice Input Sound Source Setting Screen 007: Transmission Output Limit Setting Screen 008: VOX Level Setting Screen 009: Speech Processor Effect Type Setting Screen 010: Transmission Filter Setting Screen 011 ~ 014: CW Message Screen 015: RTTY Communication Screen (Normal) 016 ~ 017: RTTY Message Screen 018: PSK Communication Screen (Normal) 019 ~ 020: PSK Message Screen 021: FM Tone Setting Screen 022: Reception Filter Setting Screen 023: Audio System Peak Filter Setting Screen 024: NB1 Level (Sub) Setting Screen 025: NB2 Level (Sub) Setting Screen 026: Auto Notch Tracking Speed Setting Screen 027: Band Eliminator Filter Setting Screen 028: NR1 Level (Sub) Setting Screen 029: NR2 Level (Sub) Setting Screen 030: Memory Channel Screen (Normal) 031: Program Scan Section Setting Screen 032: Program Slow Scan Point Setting Screen 033: Memory Scan Group Setting Screen 034: Voice Message Screen 035 ~ 037: Recording File Screen 038: Timer Setting Screen 039: Program Timer Setting Screen 040: Dimmer Setting Screen 041 ~ 127: Unused 128: Reception Equalizer Screen 129: Reception Equalizer Adjustment Screen 130: Transmission Equalizer Screen 131: Transmission Equalizer Adjustment Screen 132: RTTY Communication Screen (Enlarged) 133: PSK Communication Screen (Enlarged) 134: Memory Channel List Screen (Enlarged) 135 ~ 159: Menu-Related Screen 160 ~ 163: File Selection Screen • Various operations via commands may be limited, such as the panel operation of the main body, due to the state of the function setting screen.
	D	S	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	D	S	1	P1	P1	P1	;				

DS2	Screen Display State (Other)										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	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.
	D	S	2	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	D	S	2	P1	;						

DS3	End the Function Setting Screen										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	No parameters are used with this command. • The same transceiver behavior as when transceiver [ESC] is pressed.
	D	S	3	;							

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DV	DATA VOX										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: OFF 1: ACC2 2: USB Audio 3: Optical
	D	V	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	D	V	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	D	V	P1	;							

EC	Main Band and Sub Band Frequency Information Exchange										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	No parameters are used with this command.
	E	C	;								

EM	Emergency Communication Frequency Mode										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	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).
	E	M	;								

EQR0	Reception Equalizer										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: Reception Equalizer OFF 1: Reception Equalizer ON • The setting command is effective for the selected receive mode in the target band.
	E	Q	R	0	P1	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	E	Q	R	0	P1	;					
Answer	1	2	3	4	5	6	7	8	9	10	
	E	Q	R	0	P1	P2	;				

EQR1	Reception Equalizer Effect										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: High Boost 1 1: High Boost 2 2: Format Pass 3: Bass Boost 1 4: Bass Boost 2 5: Flat 6: User 1 7: User 2 8: User 3 • The setting command is effective for the selected receive mode in the target band. • Use the UR command for equalizing of the chosen effect.
	E	Q	R	1	P1	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	E	Q	R	1	P1	;					
Answer	1	2	3	4	5	6	7	8	9	10	
	E	Q	R	1	P1	P2	;				

EQR2	Reception Equalizer Copy										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: User 1 1: User 2 2: User 3 • The adjustment contents in the effect which are currently being selected are copied first.
	E	Q	R	2	P1	P2	;				

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EQT0	Transmission Equalizer										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: OFF 1: ON • The setting command is effective for the selected transmit mode.
	E	Q	T	0	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	E	Q	T	0	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	E	Q	T	0	P1	;					

EQT1	Transmission Equalizer Effect										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: High Boost 1 1: High Boost 2 2: Format Pass 3: Bass Boost 1 4: Bass Boost 2 5: Conventional 6: User 1 7: User 2 8: User 3 • The setting command is effective for the selected transmit mode. • Use the UT command for equalizing of the chosen effect.
	E	Q	T	1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	E	Q	T	1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	E	Q	T	1	P1	;					

EQT2	Transmission Equalizer Copy										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: User 1 1: User 2 2: User 3 • The adjustment contents in the effect which are currently being selected are copied first.
	E	Q	T	2	P1	;					

EX	Set or Read the Menu										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Menu 1: Advanced Menu P2 00 ~ 99: Category Number (Entering a non-existing number causes an error to occur. Enter any value when using the Advanced Menu.) P3 00 ~ 99: Entry Number (Entering a non-existing number causes an error to occur. Entering a number that cannot be set also causes an error to occur.) P4 (Configuration Classification) Space: Normal Configuration (Response is always a space.) 9: Initializing P5 String of alphanumeric characters for the Menu setting (Entering a value larger than the size limit causes an error to occur.) • Normally a 3-digit number (blank digits must be entered as 0). • PF key settings use 4 digits (refer to the PF key allotment ID lists). • Frequency settings use 8 digits (blank digits must be entered as 0). • A power-on message can vary in length from 0 to 15 characters. • Screen saver text can vary in length from 0 to 10 characters. (Refer to the Menu tables below for the EX Command Parameter lists. Entering a value other than the listed values causes an error to occur.)
	E	X	P1	P2	P2	P3	P3	P4	P5	P5	
	11	12	13	14	15	16	17	18	19	20	
	P5	P5	P5	P5	P5	P5	P5	P5	P5	P5	
	21	22	23	24	25	26	27	28	29	30	
P5	P5	P5	;								
Read	1	2	3	4	5	6	7	8	9	10	
	E	X	P1	P2	P2	P3	P3	;			
Answer	1	2	3	4	5	6	7	8	9	10	
	E	X	P1	P2	P2	P3	P3	P4	P5	P5	
	11	12	13	14	15	16	17	18	19	20	
	P5	P5	P5	P5	P5	P5	P5	P5	P5	P5	
	21	22	23	24	25	26	27	28	29	30	
P5	P5	P5	;								

PC CONTROL COMMAND REFERENCE GUIDE

EX Command Parameter Lists

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

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

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

PC CONTROL COMMAND REFERENCE GUIDE

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

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Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
0	08	15	Fixed Mode 5 MHz Band Lower Limit (min. 4.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	16	Fixed Mode 5 MHz Band Upper Limit (max. 6.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	17	Fixed Mode 7 MHz Band Lower Limit (min. 6.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	18	Fixed Mode 7 MHz Band Upper Limit (max. 8.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	19	Fixed Mode 10 MHz Band Lower Limit (min. 8.0 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	20	Fixed Mode 10 MHz Band Upper Limit (max. 11 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	21	Fixed Mode 14 MHz Band Lower Limit (min. 11 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	22	Fixed Mode 14 MHz Band Upper Limit (max. 15 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	23	Fixed Mode 18 MHz Band Lower Limit (min. 15 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	24	Fixed Mode 18 MHz Band Upper Limit (max. 20 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	25	Fixed Mode 21 MHz Band Lower Limit (min. 20 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	26	Fixed Mode 21 MHz Band Upper Limit (max. 22 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	27	Fixed Mode 24 MHz Band Lower Limit (min. 22 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	28	Fixed Mode 24 MHz Band Upper Limit (max. 26 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	29	Fixed Mode 28 MHz Band Lower Limit (min. 26 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	30	Fixed Mode 28 MHz Band Upper Limit (max. 30 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	31	Fixed Mode 50 MHz Band Lower Limit (min. 30 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	08	32	Fixed Mode 50 MHz Band Upper Limit (max. 60 MHz)	8-digit frequency (in Hz) with unused digits entered as 0 (in steps of 1 kHz)						
0	09	00	Send Message by Function Keys (USB Keyboard)	Off	On					
0	09	01	Keyboard Language (USB Keyboard)	Japanese	English (US)	English (UK)	French	French (Canadian)	German	006: Portuguese 007: Portuguese (Brazilian) 008: Spanish 009: Spanish (Latin American) 010: Italian
0	09	02	Repeat Delay Time (USB Keyboard)		1	2	3	4		
0	09	03	Repeat Speed (USB Keyboard)		1	2	3	4	5	Up to 32 (in steps of 1)

Advanced Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
1	00	00	Indication Signal Type (Main Band)	Automatic	TX Power	ALC	Drain Voltage (Vd)	Compression Level (COMP)	Current (Id)	006: SWR
1	00	01	Indication Signal Type (Sub Band)	TX Power	ALC	Drain Voltage (Vd)	Compression Level (COMP)	Current (Id)	SWR	

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Advanced Menu										
P1	P2	P3	Function	P5						
				000	001	002	003	004	005	006 ~
1	00	02	Output Level (Main Band)	0 [%]	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	Up to 100 [%] (in steps of 1)
1	00	03	Output Level (Sub Band)	0 [%]	1 [%]	2 [%]	3 [%]	4 [%]	5 [%]	Up to 100 [%] (in steps of 1)
1	00	04	REF I/O Connector Configuration	Off	Output	Input				
1	00	05	Reference Oscillator Calibration	Parameter value of 000 ~ 510, corresponding to setting values of -255 ~ +255 (in steps of 1)						
1	00	06	Bandwidth (Additional Roofing Filter)	Off	300 [Hz]	400 [Hz]	500 [Hz]	600 [Hz]	700 [Hz]	Up to 3500 [Hz] (in steps of 100)
1	00	07	Attenuation (Additional Roofing Filter)	Parameter value of 000 ~ 040, corresponding to setting values of -20 ~ +20 (in steps of 1)						
1	00	08	TX Power Down with Transverter Enabled	Off	On					
1	00	09	TX Hold After Antenna Tuning	Off	On					
1	00	10	Antenna Tuner During RX	Off	On					
1	00	11	Linear Amplifier Control (HF Band)	Off	Active High	Active High + Relay Control	Active High + Relay & TX Delay Ctrl	Active Low	Active Low + TX Delay Control	
1	00	12	Linear Amplifier Control (50 MHz Band)	Off	Active High	Active High + Relay Control	Active High + Relay & TX Delay Ctrl	Active Low	Active Low + TX Delay Control	
1	00	13	Microphone Gain (FM Mode)		1	2	3	4	5	Up to 100 (in steps of 1)
1	00	14	PKS Polarity Reverse	Off	On					
1	00	15	TX Inhibit While Busy	Off	On					
1	00	16	CTCSS Unmute for Internal Speaker (Main Band)	Mute	Unmute					
1	00	17	CTCSS Unmute for Internal Speaker (Sub Band)	Mute	Unmute					
1	00	18	MSQ Logic State	Low	Open					
1	00	19	SSQ Logic State	Low	Open					
1	00	20	MSQ Reverse Condition	Off	Busy	Sql	Send	Busy-Send	Sql-Send	
1	00	21	SSQ Reverse Condition	Off	Busy	Sql	Send	Busy-Send	Sql-Send	
1	00	22	Standby State Low Power Consumption	Off	On					
1	00	23	Cooling Fan Control After Shutdown	Off	On					
1	00	24	MSQ/PKS Pin Assignment	Off	On					
1	00	25	External Display	Off	On					
1	00	26	Resolution (External Display)	800x600	840x480					
-	-	-	Touchscreen Calibration	Does not correspond to a command						
-	-	-	Software License Agreement	Does not correspond to a command						
-	-	-	Important Notices Concerning Free Open Source	Does not correspond to a command						
-	-	-	About Various Software License Agreements	Does not correspond to a command						

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PF Key Allotment Lists

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

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FA	Main Band Frequency										Parameters: P1 Frequency (11 digits in Hz) (For example, enter 00014195000 for 14.195 MHz. (Blank digits must be entered as 0.) When calling an unregistered Memory Channel, the response is all spaces.)
	Set	1	2	3	4	5	6	7	8	9	
F		A	P1	P1	P1	P1	P1	P1	P1	P1	
11		12	13	14	15	16	17	18	19	20	
Read	P1	P1	P1	;							
	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	;							

FB	Sub Band Frequency										Parameters: P1 Frequency (11 digits in Hz) (For example, enter 00014195000 for 14.195 MHz. (Blank digits must be entered as 0.) When calling an unregistered Memory Channel, the response is all spaces.)
	Set	1	2	3	4	5	6	7	8	9	
F		B	P1	P1	P1	P1	P1	P1	P1	P1	
11		12	13	14	15	16	17	18	19	20	
Read	P1	P1	P1	;							
	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	;							

FC	Change the Frequency (Tuning Control)										Parameters: P1 0: Main Band 1: Sub Band P2 0: Up 1: Down P3 0: Normal frequency step size 1: Double the frequency step size 2: 5 times the frequency step size 3: 10 times the frequency step size 4: 50 times the frequency step size 5: 100 times the frequency step size
	Set	1	2	3	4	5	6	7	8	9	
F		C	P1	P2	P3	;					

FLO	Select the Receive Filter										Parameters: P1 0: Main Band 1: Sub Band P2 0: A 1: B 2: C
	Set	1	2	3	4	5	6	7	8	9	
F		L	0	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	F	L	0	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	F	L	0	P1	P2	;					

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FL1	Roofing Filter										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	F	L	1	P1	P2	P3	;				
Read	1	2	3	4	5	6	7	8	9	10	P3 (Roofing Filter) 0: Auto 1: 270 Hz 2: 500 Hz 3: 2.7 kHz 4: 6 kHz 5: 15 kHz (You cannot set the filter to a value of over 15 kHz while in FM mode.) 6: Additional Roofing Filter (You cannot select Additional Roofing Filter if "Bandwidth (Additional Roofing Filter)" is set to OFF in the Advanced Menu.) (The P3 setting is invalid on the Sub Band; Auto is always selected. Entering a value of 9 results in the initial value being entered.)
	F	L	1	P1	P2	;					
Answer	1	2	3	4	5	6	7	8	9	10	
	F	L	1	P1	P2	P3	P4	P4	P4	P4	
	11	12	13	14	15	16	17	18	19	20	
	;										

FL2	IF Filter Shape										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	F	L	2	P1	P2	P3	;				
Read	1	2	3	4	5	6	7	8	9	10	P3 0: Sharp 1: Medium 2: Soft 3: None (FM mode only) (Entering a value of 9 results in the initial value being entered. FM mode can read only.)
	F	L	2	P1	P2	;					
Answer	1	2	3	4	5	6	7	8	9	10	
	F	L	2	P1	P2	P3	;				

FL3	AF Filter Type										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	F	L	3	P1	P2	P3	;				
Read	1	2	3	4	5	6	7	8	9	10	P3 0: Narrow 1: Medium 2: Wide (Entering a value of 9 results in the initial value being entered.)
	F	L	3	P1	P2	;					
Answer	1	2	3	4	5	6	7	8	9	10	
	F	L	3	P1	P2	P3	;				

FS	Fine Tuning										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band
	F	S	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	F	S	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	F	S	P1	P2	;						

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FV	Firmware Version										<u>Parameters:</u> P1 Reads out the character string of the firmware version. <ul style="list-style-type: none"> For example, for firmware version 1.00, it reads "FV1.00;"
	Read	1	2	3	4	5	6	7	8	9	
	F	V	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	V	P1	P1	P1	P1	;				

FW	FM Normal/Narrow										<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 0: Normal 1: Narrow <ul style="list-style-type: none"> This command can be used only in FM mode.
	Set	1	2	3	4	5	6	7	8	9	
	F	W	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	F	W	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	F	W	P1	P2	;						

GC	AGC Time Constant										<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 0: AGC Off 1: AGC Slow 2: AGC Mid 3: AGC Fast 4: AGC Off → On (AGC returns to its Slow/Mid/Fast status before turning Off.) <ul style="list-style-type: none"> This command cannot be performed in FM mode (an error sounds). Setting the AGC to AGC Off → On will turn the AGC On and will set the previous AGC status (Slow/Mid/Fast).
	Set	1	2	3	4	5	6	7	8	9	
	G	C	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	G	C	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	G	C	P1	P2	;						

GT	AGC Time Constant Preset										<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 (Slow Preset Value) 01 ~ 20 (in steps of 1) (Entering a value of 99 results in the initial value being entered.) P3 (Mid Preset Value) 01 ~ 20 (in steps of 1) (Entering a value of 99 results in the initial value being entered.) P4 (Fast Preset Value) 01 ~ 20 (in steps of 1) (Entering a value of 99 results in the initial value being entered.) <ul style="list-style-type: none"> While the AGC is OFF, the GT command can still be read. While in FM mode, the GT command cannot be set or read.
	Set	1	2	3	4	5	6	7	8	9	
	G	T	P1	P2	P2	P3	P3	P4	P4	;	
Read	1	2	3	4	5	6	7	8	9	10	
	G	T	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	G	T	P1	P2	P2	P3	P3	P4	P4	;	

GT2	AGC Time Constant Preset Copy										<u>Parameters:</u> P1 0: Main Band 1: Sub Band
	Set	1	2	3	4	5	6	7	8	9	
	G	T	2	P1	;						

ID	Transceiver ID Number										<u>Parameters:</u> P1 022
	Read	1	2	3	4	5	6	7	8	9	
	I	D	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	I	D	P1	P1	P1	;					

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IF	Read the Transceiver Status										<u>Parameters:</u>
Read	1	2	3	4	5	6	7	8	9	10	P1 11-digit displayed frequency of the Main band (for example, 00014175000 is 14.175 MHz) (When calling an unregistered Memory Channel, the response consists of all spaces.) P2 Spaces (5) P3 RIT/XIT frequency ± 9990 Hz P4 0: RIT OFF 1: RIT ON P5 0: XIT OFF 1: XIT ON P6, P7 Main band Memory Channel number (refer to the MC command) P8 0: Always 0 P9 Main band operating mode (refer to the MD command) P10 Function (refer to the FR/FT commands) P11 0: Always 0 P12 0: Simplex operation 1: Split operation P13 0: Always 0 P14 00: Always 00 P15 0: Always 0 • While the Auto Information (AI) function is ON, a response is automatically sent when the RIT/XIT frequency is changed.
	I	F	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	I	F	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	P1	P1	P2	P2	P2	P2	P2	P3	P3	
	21	22	23	24	25	26	27	28	29	30	
	P3	P3	P3	P4	P5	P6	P7	P7	P8	P9	
	31	32	33	34	35	36	37	38	39	40	
P10	P11	P12	P13	P14	P14	P15	;				

IPO	DHCP										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: DHCP OFF 1: DHCP ON P2 ~ P5 001.001.001.001 ~ 223.223.223.223: IP address (If no IP address is acquired when DHCP is turned ON, the IP address is replaced with hyphens: ---.---.---.---) • When DHCP is ON, the IP address acquired automatically is output as a response. When DHCP is OFF, the set fixed IP address is output as a response.
	I	P	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	I	P	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	I	P	0	P1	P2	P2	P2	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P4	P4	P4	P5	P5	P5	;				

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IP1	IP Address (Manual Configuration)										<u>Parameters:</u> P1 ~ P4 (IP address) 001.000.000.000 ~ 223.255.255.255 P5 ~ P8 (Subnet Mask address) 000.000.000.000 ~ 255.255.255.255 P9 ~ P12 (Default Gateway address) 001.000.000.000 ~ 223.255.255.255 (If P9 ~ P12 are not set, they will become all blank.) P13 ~ P16 (Priority DNS Server address) 001.000.000.000 ~ 223.255.255.255 (If P13 ~ P16 are not set, they will become all blank.) P17 ~ P20 (Secondary DNS Server address) 001.000.000.000 ~ 223.255.255.255 (If P17 ~ P20 are not set, they will become all blank.)
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	;								

IP2	MAC Address										<u>Parameters:</u> P1 ~ P6 00 ~ FF: MAC address (A ~ F entries must be capitalized)
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	;					

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IP3	ID and Password Management										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: Character string length of current ID P2 1 ~ 8: Character string length of current password P3 1 ~ 8: Character string length of new ID P4 1 ~ 8: Character string length of new password P5 Up to 8 digits: Current ID P6 Up to 8 digits: Current password P7 Up to 8 digits: New ID P8 Up to 8 digits: New password P9 0: Update failed 1: Update successful (If the current ID and password do not match, the update fails.)
	I	P	3	P1	P2	P3	P4	P5	P5	P5	
	11	12	13	14	15	16	17	18	19	20	
	P5	P5	P5	P5	P5	P6	P6	P6	P6	P6	
	21	22	23	24	25	26	27	28	29	30	
	P6	P6	P6	P7	P7	P7	P7	P7	P7	P7	
	31	32	33	34	35	36	37	38	39	40	
P7	P8	P8	P8	P8	P8	P8	P8	P8	;		
Read	1	2	3	4	5	6	7	8	9	10	
	I	P	3	P9	;						

KS	Keying speed										Parameters:	
Set	1	2	3	4	5	6	7	8	9	10	P1 004 ~ 060 (in steps of 1)	
	K	S	P1	P1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10		
	K	S	;									
Answer	1	2	3	4	5	6	7	8	9	10		
	K	S	P1	P1	P1	;						

KY	CW Keying										Parameters:
Set 1	1	2	3	4	5	6	7	8	9	10	P1 For Setting 1, always enter a space. For Setting 2, entering 0 will cause Setting 1 to stop. An error will occur if any value other than 0 is entered. 0: Character buffer space 1: No character buffer space P2 Enter a character string for keying. The characters listed in the following table can be entered.
	K	Y	P1	P2	P2	P2	P2	P2	P2	P2	
	11	12	13	14	15	16	17	18	19	20	
	P2	P2	P2	P2	P2	P2	P2	P2	P2	P2	
Set 2	21	22	23	24	25	26	27	28	29	30	
	P2	P2	P2	P2	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10	
	K	Y	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	K	Y	P1	;							

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}	%

- Parameter P2 has a fixed length of 24 bits. Characters that are left blank will be filled with spaces, but these spaces will not be converted to morse code. You can, however, prepare an internal buffer that will allow you to send 25 or more characters.
- 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.

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LK	F.Lock										Parameters: P1 0: Main Band F.Lock OFF 1: Main Band F.Lock ON P2 0: Sub Band F.Lock OFF 1: Sub Band F.Lock ON
	Set	1	2	3	4	5	6	7	8	9	
	L	K	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	L	K	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	L	K	P1	P2	;						

LM	Voice Message Recording										Parameters: P1 1: Channel 1 2: Channel 2 3: Channel 3 4: Channel 4 5: Channel 5 6: Channel 6 P2 0: Recording is inactive (recording stops by the setting command) 1: Recording is ready 2: Start recording (displays while recording by the response command) 3: Delete P3 000 ~ 100 (s): Elapsed time of the sound recording <ul style="list-style-type: none"> • 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.
	Set	1	2	3	4	5	6	7	8	9	
	L	M	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	L	M	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	L	M	P1	P2	P3	P3	P3	;			

LP0	Transmission Output Limiter										Parameters: P1 005 ~ 200 (W) <ul style="list-style-type: none"> • The upper power limit level response is given, depending on the current transmission frequency and mode.
	Read	1	2	3	4	5	6	7	8	9	
	L	P	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	L	P	0	P1	P1	P1	;				

LP1	Transmission Output Limiter										Parameters: P1 0: Transmission power upper limit setting other than while in data mode 1: Transmission power upper limit setting for data mode 2: Transmission power upper limit setting during TX tuning P2 00: 1.8M band 01: 3.5M band 02: 5M band 03: 7M band 04: 10M band 05: 14M band 06: 18M band 07: 21M band 08: 24M band 09: 28M band 10: 50M band P3 005 ~ 200 (W) (Entering a value of 99 results in the initial value being entered.)
	Set	1	2	3	4	5	6	7	8	9	
	L	P	1	P1	P2	P2	P3	P3	P3	;	
Read	1	2	3	4	5	6	7	8	9	10	
	L	P	1	P1	P2	P2	;				
Answer	1	2	3	4	5	6	7	8	9	10	
	L	P	1	P1	P2	P2	P3	P3	P3	;	

PC CONTROL COMMAND REFERENCE GUIDE

MAO	Memory Channel Configuration										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 000 ~ 119: Channel Number (Channels P0 ~ P9 are represented as 100 ~ 109 and channels E0 ~ E9 are represented as 110 ~ 119) P2 0: Simplex Memory channel 1: Dual Memory channel 2: Section defined Memory channel (The memory channel type is decided while setting the P9 and P10 values, so this parameter is ignored. Enter a dummy value.) P3 Frequency 1 (11 digits in Hz.) P4 Mode information for frequency 1 (refer to the P2 value of the OM command) P5 0: FM Wide for frequency 1 1: FM Narrow for frequency 1 P6 0: FM Tone function OFF for frequency 1 1: Tone for frequency 1 2: CTCSS for frequency 1 3: Cross Tone for frequency 1 P7 Tone frequency for frequency 1 (refer to the P2 value of the TN command) P8 CTCSS frequency for frequency 1 (refer to the P2 value of the CN command) P9 Frequency 2 (11 digits in Hz. Blank digits must be entered as 0.) P10 Mode information for frequency 2 (refer to the P2 value of the OM command) P11 0: FM Wide for frequency 2 1: FM Narrow for frequency 2 P12 0: FM Tone function OFF for frequency 2 1: Tone for frequency 2 2: CTCSS for frequency 2 3: Cross Tone for frequency 2 P13 Tone frequency for frequency 2 (refer to the P2 value of the TN command) P14 CTCSS frequency for frequency 2 (refer to the P2 value of the CN command) P15 0: Simplex 1: Split P16 0: Dual reception OFF 1: Dual reception ON P17 1: Scan Lockout OFF 2: Scan Lockout ON P18 Channel Name (Up to 10 digits.) • When setting the channel currently being accessed, the new settings are reflected the next time that channel is accessed. • When the section defined memory channel is in the process of being read, it cannot be set. • When reading a blank channel, parameters P2 to P18 becomes blank. • When reading a single memory channel, all parameters for frequency 2 become 0.
	M	A	0	P1	P1	P1	P2	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P3	P3	P3	P3	P3	P3	P3	P3	P4	P5	
	21	22	23	24	25	26	27	28	29	30	
	P6	P7	P7	P8	P8	P9	P9	P9	P9	P9	
	31	32	33	34	35	36	37	38	39	40	
	P9	P9	P9	P9	P9	P9	P10	P11	P12	P13	
	41	42	43	44	45	46	47	48	49	50	
	P13	P14	P14	P15	P16	P17	P18	P18	P18	P18	
51	52	53	54	55	56	57	58	59	60		
P18	P18	P18	P18	P18	P18	;					
Read	1	2	3	4	5	6	7	8	9	10	
	M	A	0	P1	P1	P1	;				
Answer	1	2	3	4	5	6	7	8	9	10	
	M	A	0	P1	P1	P1	P2	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P3	P3	P3	P3	P3	P3	P3	P3	P4	P5	
	21	22	23	24	25	26	27	28	29	30	
	P6	P7	P7	P8	P8	P9	P9	P9	P9	P9	
	31	32	33	34	35	36	37	38	39	40	
	P9	P9	P9	P9	P9	P9	P10	P11	P12	P13	
	41	42	43	44	45	46	47	48	49	50	
	P13	P14	P14	P15	P16	P17	P18	P18	P18	P18	
51	52	53	54	55	56	57	58	59	60		
P18	P18	P18	P18	P18	P18	;					

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MA1	Memory Channel Direct Entry										Parameters: P1 11 digit frequency in Hz. (Blank digits must be entered as 0.) P2 Mode information (refer to the P2 value of the OM command) P3 0: FM Wide 1: FM Narrow (In modes other than FM, this parameter is ignored.) <ul style="list-style-type: none"> • The frequency1 information of the memory channel which was appointed when using this command is updated • When registering a new dual memory channel, use the MI command. • The start and end frequencies are registered as the same frequency when setting it at a section appointment memory channel. • When the AI function is ON, a response can consist of the MA0 command.
	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	;					

MA2	Memory Channel Name										Parameters: P1 000 ~ 119: Channel number (Channel numbers P00 ~ P09 are represented by 100 ~ 109.) P2 Space: Always a space P3 10 digit channel name <ul style="list-style-type: none"> • Setting an unassigned channel causes an error. • When the AI function is ON, a response is provided by the MA0 command.
	1	2	3	4	5	6	7	8	9	10	
	M	A	2	P1	P1	P1	P2	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
P3	P3	P3	P3	P3	P3	P3	;				

MA3	Scan Lockout										Parameters: P1 000 ~ 119: Channel number P2 0: Scan Lockout OFF 1: Scan Lockout ON <ul style="list-style-type: none"> • Setting an unassigned channel causes an error. • When the AI function is ON, a response is provided by the MA0 command.
	1	2	3	4	5	6	7	8	9	10	
	M	A	3	P1	P1	P1	P2	;			
	11	12	13	14	15	16	17	18	19	20	

MA4	Channel Copy										Parameters: P1 000 ~ 119: Original channel number P2 000 ~ 119: Target channel number <ul style="list-style-type: none"> • If the original channel number is an unassigned channel, it cannot be copied.
	1	2	3	4	5	6	7	8	9	10	
	M	A	4	P1	P1	P1	P2	P2	P2	;	
	11	12	13	14	15	16	17	18	19	20	

MA5	Channel Deletion										Parameters: P1 000 ~ 119: Channel number
	1	2	3	4	5	6	7	8	9	10	
	M	A	5	P1	P1	P1	;				
	11	12	13	14	15	16	17	18	19	20	

MA6	Section Defined Memory Channel End Frequency										Parameters: P1 000 ~ 109: Channel number P2 11 digit frequency in Hz. (Blank digits must be entered as 0.) <ul style="list-style-type: none"> • You cannot set an unassigned channel. • Use the MA1 or MI command to register a new section defined memory channel (the start and end frequency are the same). • When the AI function is ON, a response is provided by the MA0 command.
	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	;				

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MEO	Popup Message 1										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 3-digit message ID (refer to the Message ID table below)
	M	E	0	P1	P1	P1	P2	P3	;		
Read	1	2	3	4	5	6	7	8	9	10	P3 0: Functions as a key press 1: Functions as a long key press (not used) 2: Functions as a key release (used when releasing [F-REC] during the voice message recording screen)
	M	E	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	E	0	P1	P1	P1	;				

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

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

PC CONTROL COMMAND REFERENCE GUIDE

ME1	Popup Message 2										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 3-digit message ID (refer to the Message ID table above)
	M	E	1	P1	P1	P1	P2	P3	;		
Read	1	2	3	4	5	6	7	8	9	10	P2 0: Functions as the [ESC] key 1: Functions as the [F1] key 2: Functions as the [F2] key 3: Functions as the [F3] key 4: Functions as the [F4] key 5: Functions as the [F5] key 6: Functions as the [F6] key 7: Functions as the [F7] key
	M	E	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	P3 0: Functions as a key press 1: Functions as a long key press
	M	E	1	P1	P1	P1	;				
											<ul style="list-style-type: none"> • Operation of the F key which is specified with the setting command for P2 differs every message. [?;] is not returned even when pressing the F key where allocation of the operation is not done. • In some situations, the messaged posted using the ME1 command is simultaneously posted with the message from the ME0 command. In such a case, the ME1 message has priority.

MF	Operation Environment Configuration										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Configuration A 1: Configuration B
	M	F	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	<ul style="list-style-type: none"> • When changing environments, the transceiver reboots, thus the AI function turns OFF. As such, the MF command does not support automatic response.
	M	F	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	F	P1	;							

MG	Microphone Gain										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 000 ~ 255 (in steps of 1)
	M	G	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	<ul style="list-style-type: none"> • Configure the FM mode microphone gain using the Advanced menu. (Refer to the EX command.)
	M	G	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	G	P1	P1	P1	;					

MI	Microphone Gain										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Single memory channel 1: Dual memory channel (When registering to a section defined Memory channel, it is registered to the section defined Memory channel regardless of the setting of this parameter.)
	M	I	P1	P2	P2	P2	;				
											P2 000 ~ 119: Channel number (Channel numbers P00 ~ P09 are represented by 100 ~ 109. Channel numbers E00 ~ E09 are represented by 110 ~ 119.)
											<ul style="list-style-type: none"> • In the case where a blank channel is called, registration of the memory channel is not possible. • When RX and TX of the sub side both turn OFF (in simplex operation and during single reception state), or when accessing a blank channel on the sub side, dual memory channel cannot be registered. • With the section defined memory channel, the start and end frequency are stored as the same frequency. The end frequency is set using the MA7 command.

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ML	TX Monitor Level										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 000 ~ 255 (in steps of 1)
	M	L	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	M	L	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	L	P1	P1	P1	;					

MN	Memory Channel Number										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 000 ~ 119: Channel number (Channel numbers P00 ~ P09 are represented by 100 ~ 109. Channel numbers E00 ~ E09 are represented by 110 ~ 119.)
	M	N	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	M	N	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	N	P1	P2	P2	P2	;				

MO0	TX Monitor										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: TX Monitor Off 1: TX Monitor On
	M	O	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	O	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	O	0	P1	;						

MO1	RX Monitor										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: RX Monitor Off 1: RX Monitor On • This setting command is for the operating band.
	M	O	1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	O	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	O	1	P1	;						

MO2	DSP Monitor										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: DSP Monitor Off 1: DSP Monitor On • This setting command is for the operating band.
	M	O	2	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	O	2	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	O	2	P1	;						

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MS	Transmission Audio Entry Sound Generator Selection										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: SS signal of SEND/PTT/REMOTE, ACC2 connector 1: PKS signal of DATA SEND/ACC2 connector P2 0: Microphone input transmission OFF 1: Microphone input transmission ON P3 0: ACC2 input transmission OFF 1: ACC2 input transmission ON P4 0: USB-Audio input transmission OFF 1: USB-Audio input transmission ON P5 0: Optical input transmission OFF 1: Optical input transmission ON • ACC2 input (P3) and USB-Audio input (P4) cannot both be ON at the same time. • P2 ~ P5 cannot all be OFF at the same time. • The transmission sound source is appointed by P1 if P2 ~ P5 are all set as "9" and they are returned to their initial settings.
	M	S	P1	P2	P3	P4	P5	;			
Read	1	2	3	4	5	6	7	8	9	10	
	M	S	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	S	P1	P2	P3	P4	P5	;			

MT	Meter Selection										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 (Meter Display Item) 0: PO (Type 2, Type 3 only) 1: ALC (Type 2, Type 3 only) 2: SWR 3: COMP 4: ID 5: VD 6: TEMP (Type 1 only) P2 (Meter Display Pattern) 0: Type 1 1: Type 2 2: Type 3 3: Same meter as the Sub band (The pattern which is displayed on the menu screen.) (Even when setting P2 as Type 1 ~ Type 3, the display may display the same meter as the Sub band. In this case, parameter P2 is returned as 3.)
	M	T	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	M	T	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	T	P1	P2	;						

MU	Mute										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: Mute OFF 1: Mute ON
	M	U	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	U	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	U	P1	P2	;						

MV	Memory Channel/VFO										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: VFO Mode 1: Single Memory Channel Mode 2: Dual Memory Channel Mode • You cannot directly switch between Single and Dual Memory Channel mode. Switch after returning to VFO mode.
	M	V	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	V	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	V	P1	P2	;						

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NB1		Noise Blanker 1									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 0: NB1 OFF 1: NB1 ON
Set	1	2	3	4	5	6	7	8	9	10	
	N	B	1	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	N	B	1	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	N	B	1	P1	P2	;					

NB2		Noise Blanker 2									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 0: NB2 OFF 1: NB2 ON
Set	1	2	3	4	5	6	7	8	9	10	
	N	B	2	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	N	B	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	N	B	2	P1	P2	;					

ND		BEF Attenuation									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 00: 20 dB 01: 40 dB 02: 60 dB 03: 80 dB (Entering a value of 99 results in the initial value being entered.)
Set	1	2	3	4	5	6	7	8	9	10	
	N	D	P1	P2	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	N	D	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	N	D	P1	P2	P2	;					

NL1		Noise Blanker 1 Level									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 001 ~ 032 (Main Band) 001 ~ 010 (Sub Band) (Entering a value of 99 results in the initial value being entered (Sub band only).)
Set	1	2	3	4	5	6	7	8	9	10	
	N	L	1	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10	
	N	L	1	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	N	L	1	P1	P2	P2	P2	;			

NL2		Noise Blanker 2 Level									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 001 ~ 032 (Main Band) 001 ~ 010 (Sub Band) (Entering a value of 99 results in the initial value being entered (Sub band only).)
Set	1	2	3	4	5	6	7	8	9	10	
	N	L	2	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10	
	N	L	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	N	L	2	P1	P2	P2	P2	;			

NR		Noise Reduction									<u>Parameters:</u> P1 0: Main Band 1: Sub Band P2 0: NR OFF 1: NR1 ON 2: NR2 ON
Set	1	2	3	4	5	6	7	8	9	10	
	N	R	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	N	R	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	N	R	P1	P2	;						

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NS		Auto Notch Tracking Speed										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	;											P1 0: Main Band 1: Sub Band P2 0 (Slow) ~ 4 (Fast) (Entering a value of 9 results in the initial value being entered.)
	N	S	P1	P2																		
Read	1	2	3	4	5	6	7	8	9	10	;											
	N	S	P1	;																		
Answer	1	2	3	4	5	6	7	8	9	10	;											
	N	S	P1	P2																		

NT		Notch, BEF										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	;											P1 0: Main Band 1: Sub Band P2 0: Notch OFF 1: Auto Notch 2: Manual Notch 3: BEF
	N	T	P1	P2																		
Read	1	2	3	4	5	6	7	8	9	10	;											
	N	T	P1	;																		
Answer	1	2	3	4	5	6	7	8	9	10	;											
	N	T	P1	P2																		

NW		Notch Width, BEF Width										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	;											P1 0: Main Band 1: Sub Band P2 0: Manual Notch 1: BEF P3 (Manual Notch) 00: Normal 01: Wide P3 (BEF) 00: 300 Hz 01: 400 Hz 02: 500 Hz 03: 600 Hz 04: 700 Hz 05: 800 Hz 06: 900 Hz 07: 1000 Hz 08: 1100 Hz 09: 1200 Hz (Entering a value of 99 for the BEF parameter results in the initial value being entered.) • When the function being changed is turned OFF, you cannot change the bandwidth of the manual notch.
	N	W	P1	P2	P3	P3																
Read	1	2	3	4	5	6	7	8	9	10	;											
	N	W	P1	P2	;																	
Answer	1	2	3	4	5	6	7	8	9	10	;											
	N	W	P1	P2	P3	P3																

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OM	Operating Mode										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band (This parameter is not used for the setting command. The operating band is always used. Enter any value.) P2 0: Unused 1: LSB 2: USB 3: CW 4: FM 5: AM 6: FSK 7: CW-R 8: Unused 9: FSK-R A: PSK B: PSK-R C: LSB-D1 D: USB-D1 E: FM-D1 F: AM-D1 G: LSB-D2 H: USB-D2 I: FM-D2 J: AM-D2 K: LSB-D3 L: USB-D3 M: FM-D3 N: AM-D3
	O	M	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	O	M	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	O	M	P1	P2	;						

PA	Pre-amplifier										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: Pre-amp OFF 1: Pre-amp ON
	P	A	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	A	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	A	P1	P2	;						

PBO	Voice Message List										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: List display OFF 1: List display ON
	P	B	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	B	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	B	0	P1	;						

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PB1	Voice Message Playback, etc.										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1: Playback Channel 1 2: Playback Channel 2 3: Playback Channel 3 4: Playback Channel 4 5: Playback Channel 5 6: Playback Channel 6
	P	B	1	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	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)
	P	B	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	P3 000 ~ 100: Playback elapsed time in seconds (While paused, this parameter is 000.)
	P	B	1	P1	P2	P3	P3	P3	;		
											<ul style="list-style-type: none"> • 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										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 1: Playback Channel 1 2: Playback Channel 2 3: Playback Channel 3 4: Playback Channel 4 5: Playback Channel 5 6: Playback Channel 6
	P	B	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	P2 0: Unregistered channel 1: Registered channel
	P	B	2	P1	P2	P3	P3	P3	;		
											<p>P3 000 ~ 100: Registered time in seconds (while paused, this parameter is returned as 000)</p> <ul style="list-style-type: none"> • 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										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1: Playback Channel 1 2: Playback Channel 2 3: Playback Channel 3 4: Playback Channel 4 5: Playback Channel 5 6: Playback Channel 6
	P	B	3	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	P2 0: Repeat OFF 1: Repeat ON
	P	B	3	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	P	B	3	P1	P2	;					
											<ul style="list-style-type: none"> • You cannot use this command while the Voice Message List display (PB0) is OFF. • You cannot set unregistered channels.

PB4	Voice Message Channel Name										Parameters:
Set	1	2	3	4	5	6 ~ 35		36	37	38	P1 1: Playback Channel 1 2: Playback Channel 2 3: Playback Channel 3 4: Playback Channel 4 5: Playback Channel 5 6: Playback Channel 6
	P	B	4	P1	P2	P3		;			
Read	1	2	3	4	5	6	7	8	9	10	P2 Always a space
	P	B	4	P1	;						
Answer	1	2	3	4	5	6 ~ 35		36	37	38	P3 Up to 30 characters: Channel name
	P	B	4	P1	P2	P3		;			
											<ul style="list-style-type: none"> • You cannot use this command while the Voice Message List display (PB0) is OFF. • You cannot set unregistered channels.

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PB5	Voice Message Sound Recording Sound Generator										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	<u>P1</u> 0: Microphone 1: ACC2 2: USB Audio 3: Optical • You cannot use this command while the Voice Message List display (PB0) is OFF.
	P	B	5	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	B	5	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	B	5	P1	;						

PB6	Voice Message Sound Recording Total Time										<u>Parameters:</u>
Read	1	2	3	4	5	6	7	8	9	10	<u>P1</u> 000 ~ 100: Duration in seconds • You cannot use this command while the Voice Message List display (PB0) is OFF.
	P	B	6	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	B	6	P1	P1	P1	;				

PC	Output Power										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	<u>P1 (TS-990S)</u> 005 ~ 200: SSB/ CW/ FM/ FSK 005 ~ 050: AM • If a transmission output limiter is in use, the retrieved output power value will be limited.
	P	C	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	P	C	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	C	P1	P1	P1	;					

PL	Speech Processor Input/Output Level										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	<u>P1 (Input level)</u> 000 (minimum) ~ 255 (maximum) <u>P2 (Output level)</u> 000 (minimum) ~ 255 (maximum)
	P	L	P1	P1	P1	P2	P2	P2	;		
Read	1	2	3	4	5	6	7	8	9	10	
	P	L	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	L	P1	P1	P1	P2	P2	P2	;		

PRO	Speech Processor										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	<u>P1</u> 0: Speech Processor OFF 1: Speech Processor ON
	P	R	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	R	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	R	0	P1	;						

PR1	Speech Processor Effect Type										<u>Parameters:</u>
Set	1	2	3	4	5	6	7	8	9	10	<u>P1</u> 0: Soft 1: Hard
	P	R	1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	R	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	R	1	P1	;						

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PS	Power ON/ OFF										Parameters:	
Set	1	2	3	4	5	6	7	8	9	10	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)	
	P	S	P1	;								
Read	1	2	3	4	5	6	7	8	9	10		
	P	S	;									
Answer	1	2	3	4	5	6	7	8	9	10		
	P	S	P1	;								
												<ul style="list-style-type: none"> • While the transceiver is in economical standby mode, you cannot use this command to turn the power ON/OFF. • When the transceiver is turned ON using this command, the response command (PS1;) is output. The transceiver cannot accept commands until activation is completed. • During timer recording preparations, you cannot perform setting commands. • During timer recording operation, you cannot perform commands other than ID, ME and PS.

PT	Side Tone/Pitch Frequency										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 000 ~ 080: 300 Hz to 1100 Hz (in steps of 10 Hz)
	P	T	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	P	T	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	T	P1	P1	P1	;					

QA	Quick Memory Channel Information										Parameters:	
Read	1	2	3	4	5	6	7	8	9	10	P1 0 ~ 9: Quick Memory Channel Number P2 11-digit Main band frequency (Unused high-end digits will become 0.) (When no information is available for a parameter, it is returned as blank.) P3 Main band mode (Refer to P2 of the MS command.) (When no information is available for a parameter, it is returned as blank.) P4 11-digit Sub band frequency (Unused high-end digits will become 0.) (When no information is available for a parameter, it is returned as blank.) P5 Sub band mode (Refer to P2 of the MS command.) (When no information is available for a parameter, it is returned as blank.) P6 0: Simplex 1: Split (When no information is available for a parameter, it is returned as blank.) P7 0: Dual Reception OFF 1: Dual Reception ON (When no information is available for a parameter, it is returned as blank.)	
	Q	A	P1	;								
Answer	1	2	3	4	5	6	7	8	9	10		
	Q	A	P1	P2	P2	P2	P2	P2	P2	P2		
	11	12	13	14	15	16	17	18	19	20		
	P2	P2	P2	P2	P3	P4	P4	P4	P4	P4		
	21	22	23	24	25	26	27	28	29	30		
P4	P4	P4	P4	P4	P4	P5	P6	P7	;			
												<ul style="list-style-type: none"> • Auto answer is not provided by the AI function.

QD	Quick Memory All Delete										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	No parameters are used with this command.
	Q	D	;								
Read	1	2	3	4	5	6	7	8	9	10	
	Q	D	;								
											<ul style="list-style-type: none"> • When the AI function is ON, a response is output when deleting the Quick Memory. • You cannot perform this command when Quick Memory mode is OFF (an error occurs).

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QI		Writing the Quick Memory									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	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.
		Q	I	;								
Read		1	2	3	4	5	6	7	8	9	10	
		Q	I	;								

QR		Quick Memory									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Quick Memory OFF 1: Quick Memory ON P2 0 ~ 9: Quick Memory channel number (If parameter P1=0, set parameter P2 to 0. When selecting Quick Memory ON but not setting a channel number, this setting is blank.) • When configuring a value above the number of Quick Memory channels set by the menu, an error occurs. • When specifying a blank channel, an error occurs.
		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	;						

RA		Attenuator									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band (This parameter is invalid during the Setting command; the operating band is always selected. Enter any value.) P2 0: ATT OFF 1: -6 dB 2: -12 dB 3: -18 dB
		R	A	P1	P2	;						
Read		1	2	3	4	5	6	7	8	9	10	
		R	A	P1	;							
Answer		1	2	3	4	5	6	7	8	9	10	
		R	A	P1	P2	;						

RC		RIT/XIT Frequency Clear									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	No parameters are used with this command. • Clears the RIT/XIT frequency regardless if the RIT/XIT function is ON or OFF.
		R	C	;								

RD / RU		RIT/XIT Frequency Up/ Down									Parameters:	
Set 1		1	2	3	4	5	6	7	8	9	10	P1 (Set 2 command only) 00000 ~ 09999: Frequency (in Hz) • Use setting 1 to adjust the frequency by 1 step. • The RU command is used to increase the frequency and the RD command is used to decrease the frequency. • Use the setting 2 to set a RIT/XIT frequency via the P1 paramter. Use the RU command to enter a positive frequency and the RD command to enter a negative frequency.
		R	D/U	;								
Set 2		1	2	3	4	5	6	7	8	9	10	
		R	D/U	P1	P1	P1	P1	P1	;			

RE		Recording Function									Parameters:	
Set		1	2	3	4	5	6	7	8	9	10	P1 0: Recording/Playback stop 1: Begin normal recording/recording in progress 2: Recording storage (setting only) 3: Begin quick playback/playback in progress 4: Pause normal recording/resume recording 5: Pause quick playback/resume playback 6: Recording failure (response only) 7: Playback failure (response only) (The AI function will not perform an auto response when a recording or playback failure occurs due to the operation of the transceiver.) P2 001 ~ 100: Playback progression (000 when no playback is in progress.) (The AI function performs an auto response every second for the playback progression.)
		R	E	P1	;							
Read		1	2	3	4	5	6	7	8	9	10	
		R	E	;								
Answer		1	2	3	4	5	6	7	8	9	10	
		R	E	P1	P2	P2	P2	;				

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RF		RIT/XIT Frequency Up/ Down									Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 (RIT/XIT frequency direction) 0: + direction 1: - direction P2 0000 ~ 9999: RIT/XIT frequency in Hz
	R	F	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	R	F	P1	P2	P2	P2	P2	;			

RG		RF Gain									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P1 000 ~ 255 (in steps of 1)
	R	G	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	R	G	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	G	P1	P2	P2	P2	;				

RL1		Noise Reduction 1 Level									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 (NR1 level) 01 ~ 10 (Entering a value of 99 results in the initial value being entered (Sub band only).)
	R	L	1	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	R	L	1	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	R	L	1	P1	P2	P2	;				

RL2		Noise Reduction 2 Level									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 (NR2 level) 00 (2 ms) ~ 09 (20 ms) (Entering a value of 99 results in the initial value being entered (Sub band only).)
	R	L	2	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	R	L	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	R	L	2	P1	P2	P2	;				

RM		Meter									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 1: ALC 2: SWR 3: COMP 4: ID 5: VD 6: TEMP P2 (Read Setting) 0: Do not read 1: Read (When turning the power ON, all meters are reset to "do not read".) P3 (Meter oscillation) 0000 ~ 0070: Meter value in dots (This value shows the oscillation (number of dots) of the transceiver digital meter.) • The meter value of the meter type (multi data input is possible) which has been set, is output. • You can set the type of meter to be displayed using the MT command. • The ALC meter value is output during VGS recording and standby.
	R	M	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	R	M	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	R	M	P1	P3	P3	P3	P3	;			

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RT		RIT ON/OFF									<u>Parameters:</u> P1 0: RIT OFF 1: RIT ON
Set	1	2	3	4	5	6	7	8	9	10	
	R	T	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	R	T	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	R	T	P1	;							

RX		Receiver Function Status									<u>Parameters:</u> No parameters are used with this command. • A response is output only when the AI function is working.
Set	1	2	3	4	5	6	7	8	9	10	
	R	X	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	R	X	;								

SB		Sub Band Receiver									<u>Parameters:</u> P1 0: OFF 1: ON
Set	1	2	3	4	5	6	7	8	9	10	
	S	B	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	S	B	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	B	P1	;							

SCO		Scan									<u>Parameters:</u> P1 (Setting only) 0: Scan OFF 1: Scan ON P2 (Scan status) 0: Scan OFF 1: Scan ON (Main Band) 2: Scan ON (Sub Band) P3 0: Outside the Slow Scan frequency range 1: Inside the Slow Scan frequency range (Other than Program Scan, it is always 0.)
Set	1	2	3	4	5	6	7	8	9	10	
	S	C	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	S	C	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	C	0	P2	P3	;					

SC1		Scan Speed									<u>Parameters:</u> P1 1 ~ 9: Scan speed
Set	1	2	3	4	5	6	7	8	9	10	
	S	C	1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	S	C	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	C	1	P1	;						

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SC2	Tone Scan/ CTCSS Scan										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 0: Tone/CTCSS Scan OFF 1: Tone Scan 2: CTCSS Scan • You can perform the setting when the scan operating band is in FM mode. • The Tone function turns ON automatically when performing Tone Scan with this command. • The CTCSS function turns ON automatically when performing CTCSS Scan with this command.
	S	C	2	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	S	C	2	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	S	C	2	P1	P2	;					

SD	Break-in Delay Time										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0050 ~ 1000 (ms) (in steps of 50) • An entered value that does not match the 50 ms step value will be rounded down to the nearest 50 ms step.
	S	D	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
	S	D	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	D	P1	P1	P1	P1	;				

SEO	Preselector ON/OFF										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Preselector OFF 1: Preselector ON
	S	E	0	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
	S	E	0	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	E	0	P1	;						

SE1	Preselector Band Shift										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 (Band shift) 00 ~ 40 (in steps of 1) (The band shift center is 20. When setting the P1 parameter to 99, it returns to the initial value (center). Setting cannot be performed when the main band frequency is on a preselector non-operation band. When reading on a non-operation band, the center value is returned.) P2 00: 1.8 MHz Band 01: 3.5 MHz Band 02: 5 MHz Band 03: 7 MHz Band 04: 10 MHz Band 05: 14 MHz Band 06: 18 MHz Band 07: 21 MHz Band 08: 24 MHz Band 09: 28 MHz Band 10: Preselector inoperative band
	S	E	1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	S	E	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	E	1	P1	P1	P2	P2	;			

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SH	Receive Filter High-cut Frequency/ Shift Frequency										Parameters:																																																																																																																																																																																	
Set	1	2	3	4	5	6	7	8	9	10	P1																																																																																																																																																																																	
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SM	S-Meter/Power Meter										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 (Meter oscillation) 0000 ~ 0070: Meter value (in dots) (This value shows the oscillation (number of dots) of the transceiver digital meter. The SM command reads the S-meter during reception and the power meter during transmission. While receiving, the Sub band value is returned as 0000.)
	S	M	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	M	P1	P2	P2	P2	P2	;			

SP	Split Operation Frequency Setting										Parameters:
Set 1	1	2	3	4	5	6	7	8	9	10	P1 0: During no operation/ Complete the setting 1: During the setting/ Start the setting 2: Cancel the setting (Set only) (When using Setting 2, set the P1 parameter to 0. The "SPLIT" LED blinks during this setting.) P2 (Shift direction) 0: + shift 1: - shift P3 (Shift amount) 1 ~ 9 (in kHz)
	S	P	P1	;							
Set 2	1	2	3	4	5	6	7	8	9	10	
	S	P	P1	P2	P3	;					
Read	1	2	3	4	5	6	7	8	9	10	
	S	P	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	P	P1	;							

• When performing setting 2, Split operation activates automatically.

SQ	Squelch Level										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 000 ~ 255 (in steps of 1): Squelch level
	S	Q	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	S	Q	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	Q	P1	P2	P2	P2	;				

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SR	Reset										<u>Parameters:</u> P1 1: Menu reset 2: Memory channel reset 3: VFO reset 4: Standard reset 5: Full reset
	Set	1	2	3	4	5	6	7	8	9	
	S	R	P1	;							

SS	Program Slow Scan Point Frequency										<u>Parameters:</u> P1 0 ~ 9: Memory channel number for Program Slow Scan P2 0 ~ 4: Slow down frequency spot P3 Slow down frequency (11 digits in Hz)
	Set	1	2	3	4	5	6	7	8	9	
	S	S	P1	P2	P3	P3	P3	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P3	P3	P3	P3	P3	;					
Read	1	2	3	4	5	6	7	8	9	10	
	S	S	P1	P2	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	S	S	P1	P2	P3	P3	P3	P3	P3	P3	
	11	12	13	14	15	16	17	18	19	20	
	P3	P3	P3	P3	P3	;					

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

SU	Program Scan Section/ Memory Scan Group										<u>Parameters:</u> P1 0: Program Scan section defined memory setting 1: Memory Scan group setting P2 ~ P13
	Set	1	2	3	4	5	6	7	8	9	
	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	;					

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

0: Unselected
1: Selected

SV	Memory Transfer Operation										<u>Parameters:</u> No parameters are used with this command. • Performs the same function as the transceiver [M>V] key.
	Set	1	2	3	4	5	6	7	8	9	
	S	V	;								

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TB		Tone Frequency (Transmit Band/Split)										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	T	B	P1	;								P1 0: Main Band (Split OFF) 1: Sub Band (Split ON)
	Read	1	2	3	4	5	6	7	8	9												
Answer	1	2	3	4	5	6	7	8	9	10	T	B	P1	;								
	Read	1	2	3	4	5	6	7	8	9												

TFO		Transmit Filter										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	T	F	0	P1	;							P1 0: FIL-A 1: FIL-B 2: FIL-C
	Read	1	2	3	4	5	6	7	8	9												
Answer	1	2	3	4	5	6	7	8	9	10	T	F	0	P1	;							
	Read	1	2	3	4	5	6	7	8	9												

TF1		Transmit Filter Low-cut Frequency										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	T	F	1	P1	;							P1 0: 10 Hz 1: 100 Hz 2: 200 Hz 3: 300 Hz 4: 400 Hz 5: 500 Hz (Entering a value of 9 results in the initial value being entered.)
	Read	1	2	3	4	5	6	7	8	9												
Answer	1	2	3	4	5	6	7	8	9	10	T	F	1	P1	;							
	Read	1	2	3	4	5	6	7	8	9												

TF2		Transmit Filter High-cut Frequency										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	T	F	2	P1	;							P1 0: 2500 Hz 1: 2600 Hz 2: 2700 Hz 3: 2800 Hz 4: 2900 Hz 5: 3000 Hz 6: 3500 Hz 7: 4000 Hz (Entering a value of 9 results in the initial value being entered.)
	Read	1	2	3	4	5	6	7	8	9												
Answer	1	2	3	4	5	6	7	8	9	10	T	F	2	P1	;							
	Read	1	2	3	4	5	6	7	8	9												

TMO		Timer										Parameters:										
Set	1	2	3	4	5	6	7	8	9	10	T	M	0	P1	;							P1 0: Timer OFF/ pause 1: Timer ON/ unpaue
	Read	1	2	3	4	5	6	7	8	9												
Answer	1	2	3	4	5	6	7	8	9	10	T	M	0	P1	;							
	Read	1	2	3	4	5	6	7	8	9												

PC CONTROL COMMAND REFERENCE GUIDE

TM1	Program Timer										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Program Timer OFF 1: Program Timer ON P2 0: Repeat OFF 1: Repeat ON P3 (Sunday) P4 (Monday) P5 (Tuesday) P6 (Wednesday) P7 (Thursday) P8 (Friday) P9 (Saturday) 0: Unselected 1: Selected P10 (Operation classification) 0: ON (On Timer) 1: OFF (Off Timer) 2: ON & OFF (On/Off Timer) 3: REC (Timer Recorder) P11 0000 ~ 2359: Start time (When the P10 parameter is OFF (Off Timer), this configuration is ignored and the response becomes blank.) P12 0000 ~ 2359: End time (When the P10 parameter is ON (On Timer), this configuration is ignored and the response becomes blank.) P13 (Main band frequency) 11 digit frequency (in Hz). Unused digits are 0. P14 (Main band mode) Refer to the OM command P2 parameter. P15 (Sub band frequency) 11 digit frequency (in Hz). Unused digits are 0. P16 (Sub band mode) Refer to the OM command P2 parameter. P17 (Transmit/Receive state) 0: Simplex 1: Split 2: Dual Reception 3: TF-WATCH
	T	M	1	P1	P2	P3	P4	P5	P6	P7	
	11	12	13	14	15	16	17	18	19	20	
	P8	P9	P10	P11	P11	P11	P11	P12	P12	P12	
	21	22	23	24	25	26	27	28	29	30	
	P12	P13	P13	P13	P13	P13	P13	P13	P13	P13	
	31	32	33	34	35	36	37	38	39	40	
	P13	P13	P14	P15	P15	P15	P15	P15	P15	P15	
	41	42	43	44	45	46	47	48	49	50	
P15	P15	P15	P16	P17	;						
Read	1	2	3	4	5	6	7	8	9	10	
	T	M	1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	T	M	1	P1	P2	P3	P4	P5	P6	P7	
	11	12	13	14	15	16	17	18	19	20	
	P8	P9	P10	P11	P11	P11	P11	P12	P12	P12	
	21	22	23	24	25	26	27	28	29	30	
	P12	P13	P13	P13	P13	P13	P13	P13	P13	P13	
	31	32	33	34	35	36	37	38	39	40	
	P13	P13	P14	P15	P15	P15	P15	P15	P15	P15	
	41	42	43	44	45	46	47	48	49	50	
P15	P15	P15	P16	P17	;						

TM2	Sleep Timer										Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: OFF 1: 5 minutes 2: 10 minutes 3: 15 minutes 4: 30 minutes 5: 60 minutes 6: 90 minutes 7: 120 minutes P2 000 ~ 120: Sleep duration (in minutes) (When the timer is OFF, P2 is returned as 000.) • The sleep timer operation starts when any value other than OFF is set.
	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	;			

PC CONTROL COMMAND REFERENCE GUIDE

TN	FM Tone Frequency										Parameters:																																																																																																																							
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P2 (Tone Frequency)																																																																																																																							
	T	N	P1	P2	P2	;																																																																																																																												
Read	1	2	3	4	5	6	7	8	9	10																																																																																																																								
	T	N	P1																																																																																																																															
Answer	1	2	3	4	5	6	7	8	9	10	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">P2</th><th style="text-align: center;">Freq. (Hz)</th><th style="text-align: center;">P2</th><th style="text-align: center;">Freq. (Hz)</th><th style="text-align: center;">P2</th><th style="text-align: center;">Freq. (Hz)</th><th style="text-align: center;">P2</th><th style="text-align: center;">Freq. (Hz)</th></tr> </thead> <tbody> <tr><td style="text-align: center;">00</td><td style="text-align: center;">67.0</td><td style="text-align: center;">13</td><td style="text-align: center;">103.5</td><td style="text-align: center;">26</td><td style="text-align: center;">159.8</td><td style="text-align: center;">39</td><td style="text-align: center;">199.5</td></tr> <tr><td style="text-align: center;">01</td><td style="text-align: center;">69.3</td><td style="text-align: center;">14</td><td style="text-align: center;">107.2</td><td style="text-align: center;">27</td><td style="text-align: center;">162.2</td><td style="text-align: center;">40</td><td style="text-align: center;">203.5</td></tr> <tr><td style="text-align: center;">02</td><td style="text-align: center;">71.9</td><td style="text-align: center;">15</td><td style="text-align: center;">110.9</td><td style="text-align: center;">28</td><td style="text-align: center;">165.5</td><td style="text-align: center;">41</td><td style="text-align: center;">206.5</td></tr> <tr><td style="text-align: center;">03</td><td style="text-align: center;">74.4</td><td style="text-align: center;">16</td><td style="text-align: center;">114.8</td><td style="text-align: center;">29</td><td style="text-align: center;">167.9</td><td style="text-align: center;">42</td><td style="text-align: center;">210.7</td></tr> <tr><td style="text-align: center;">04</td><td style="text-align: center;">77.0</td><td style="text-align: center;">17</td><td style="text-align: center;">118.8</td><td style="text-align: center;">30</td><td style="text-align: center;">171.3</td><td style="text-align: center;">43</td><td style="text-align: center;">218.1</td></tr> <tr><td style="text-align: center;">05</td><td style="text-align: center;">79.7</td><td style="text-align: center;">18</td><td style="text-align: center;">123.0</td><td style="text-align: center;">31</td><td style="text-align: center;">173.8</td><td style="text-align: center;">44</td><td style="text-align: center;">225.7</td></tr> <tr><td style="text-align: center;">06</td><td style="text-align: center;">82.5</td><td style="text-align: center;">19</td><td style="text-align: center;">127.3</td><td style="text-align: center;">32</td><td style="text-align: center;">177.3</td><td style="text-align: center;">45</td><td style="text-align: center;">229.1</td></tr> <tr><td style="text-align: center;">07</td><td style="text-align: center;">85.4</td><td style="text-align: center;">20</td><td style="text-align: center;">131.8</td><td style="text-align: center;">33</td><td style="text-align: center;">179.9</td><td style="text-align: center;">46</td><td style="text-align: center;">233.6</td></tr> <tr><td style="text-align: center;">08</td><td style="text-align: center;">88.5</td><td style="text-align: center;">21</td><td style="text-align: center;">136.5</td><td style="text-align: center;">34</td><td style="text-align: center;">183.5</td><td style="text-align: center;">47</td><td style="text-align: center;">241.8</td></tr> <tr><td style="text-align: center;">09</td><td style="text-align: center;">91.5</td><td style="text-align: center;">22</td><td style="text-align: center;">141.3</td><td style="text-align: center;">35</td><td style="text-align: center;">186.2</td><td style="text-align: center;">48</td><td style="text-align: center;">250.3</td></tr> <tr><td style="text-align: center;">10</td><td style="text-align: center;">94.8</td><td style="text-align: center;">23</td><td style="text-align: center;">146.2</td><td style="text-align: center;">36</td><td style="text-align: center;">189.9</td><td style="text-align: center;">49</td><td style="text-align: center;">254.1</td></tr> <tr><td style="text-align: center;">11</td><td style="text-align: center;">97.4</td><td style="text-align: center;">24</td><td style="text-align: center;">151.4</td><td style="text-align: center;">37</td><td style="text-align: center;">192.8</td><td style="text-align: center;">50</td><td style="text-align: center;">1750</td></tr> <tr><td style="text-align: center;">12</td><td style="text-align: center;">100.0</td><td style="text-align: center;">25</td><td style="text-align: center;">156.7</td><td style="text-align: center;">38</td><td style="text-align: center;">196.6</td><td style="text-align: center;">99</td><td style="text-align: center;">Default</td></tr> </tbody> </table> <p>(Entering a value that does not exist is invalid. 99 is a setting command only.)</p>								P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)	P2	Freq. (Hz)	00	67.0	13	103.5	26	159.8	39	199.5	01	69.3	14	107.2	27	162.2	40	203.5	02	71.9	15	110.9	28	165.5	41	206.5	03	74.4	16	114.8	29	167.9	42	210.7	04	77.0	17	118.8	30	171.3	43	218.1	05	79.7	18	123.0	31	173.8	44	225.7	06	82.5	19	127.3	32	177.3	45	229.1	07	85.4	20	131.8	33	179.9	46	233.6	08	88.5	21	136.5	34	183.5	47	241.8	09	91.5	22	141.3	35	186.2	48	250.3	10	94.8	23	146.2	36	189.9	49	254.1	11	97.4	24	151.4	37	192.8	50	1750	12	100.0	25	156.7	38	196.6	99	Default
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T	N	P1	P2	P2	;																																																																																																																													

TO	FM Tone/ CTCSS/ Cross-Tone										Parameters:		
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Main Band 1: Sub Band P1 0: OFF 1: Tone ON 2: CTCSS 3: Cross-Tone		
	T	O	P1	P2	;								
Read	1	2	3	4	5	6	7	8	9	10			
	T	O	P1	;									
Answer	1	2	3	4	5	6	7	8	9	10			
	T	O	P1	P2	;								

TS	TF-Set										Parameters:	
Set	1	2	3	4	5	6	7	8	9	10	P1 0: TF-Set OFF 1: TF-Set ON	
	T	S	P1	;								
Read	1	2	3	4	5	6	7	8	9	10		
	T	S	;									
Answer	1	2	3	4	5	6	7	8	9	10		
	T	S	P1	;								

TR	Frequency Tracking										Parameters:	
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Frequency tracking OFF 1: Frequency tracking ON	
	T	R	P1	;								
Read	1	2	3	4	5	6	7	8	9	10		
	T	R	;									
Answer	1	2	3	4	5	6	7	8	9	10		
	T	R	P1	;								

PC CONTROL COMMAND REFERENCE GUIDE

TX		Transmission Mode									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 0: SEND/PTT (normal transmission using the MIC input) 1: DATA SEND/PKS (ACC2/ USB input) 2: TX TUNE • If no P1 parameter is specified, it is set to 0 (SEND/PTT). • A response is output only when using the AI function.
	T	X	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	T	X	P1	;							

UR / UT		RX / TX Equalizer									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1: 0 Hz level P2: 300 Hz level P3: 600 Hz level P4: 900 Hz level P5: 1200 Hz level P6: 1500 Hz level P7: 1800 Hz level P8: 2100 Hz level P9: 2400 Hz level P10: 2700 Hz level P11: 3000 Hz level P12: 3300 Hz level P13: 3600 Hz level P14: 3900 Hz level P15: 4200 Hz level P16: 4500 Hz level P17: 4800 Hz level P18: 5100 Hz level 00 ~ 30: Where 00 is +6 dB, 06 is 0 dB, and 30 is -24 dB. (An entered value of 99 for parameters P1 ~ P18 sets that parameter to its initial value.) • The levels you select using this command will be stored in the transceiver memory.
	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	;			

VD		VOX Delay Time									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 (Input type) 0: MIC 1: ACC2 2: USB-Audio 3: Optical P2 000 ~ 020: VOX Delay Time (value x 150 ms) (An entered value of 999 sets the parameter to its initial value.)
	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	;				

VGO		VOX Gain									Parameters:
Set	1	2	3	4	5	6	7	8	9	10	P1 (Input type) 0: Microphone 1: ACC2 2: USB-Audio 3: Optical P2 000 ~ 255: VOX Gain level for Microphone input (in steps of 1) 000 ~ 020: VOX Gain level for an input other than the Microphone (An entered value of 999 sets the parameter to its initial value.)
	V	G	0	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10	
	V	G	0	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	V	G	0	P1	P2	P2	P2	;			

PC CONTROL COMMAND REFERENCE GUIDE

VG1		Anti-VOX Level										Parameters: P1 (Input type) 0: MIC 1: ACC2 2: USB-Audio 3: Optical P2 000 ~ 020: Anti-VOX level (An entered value of 999 sets the parameter to its initial value.)
Set		1	2	3	4	5	6	7	8	9	10	
	V	G	1	P1	P2	P2	P2	;				
Read		1	2	3	4	5	6	7	8	9	10	
	V	G	1	P1	;							
Answer		1	2	3	4	5	6	7	8	9	10	
	V	G	0	P1	P2	P2	P2	;				

VRO		Voice Guide										Parameters: P1 1: Voice 1 (Main Band) 2: Voice 2 3: Voice 3 4: Voice 1 (Sub Band)
Set		1	2	3	4	5	6	7	8	9	10	
	V	R	0	P1	;							

VR1		Auto Announce Pause										Parameters: P1 0: Resume 1: Pause (This command will not automatically respond when using the AI function.)
Set		1	2	3	4	5	6	7	8	9	10	
	V	R	1	P1	;							
Read		1	2	3	4	5	6	7	8	9	10	
	V	R	1	;								
Answer		1	2	3	4	5	6	7	8	9	10	
	V	R	1	P1	;							

VV		Main Band to Sub Band Copy ([M>S] key operation)										Parameters: No parameters are used with this command.
Set		1	2	3	4	5	6	7	8	9	10	
	V	V	;									

VX		VOX Function										Parameters: P1 0: VOX OFF 1: VOX ON • This command cannot be set in modes other than SSB/AM/FM. • When reading this command in a mode other than SSB/AM/FM, 0 is returned.
Set		1	2	3	4	5	6	7	8	9	10	
	V	X	P1	;								
Read		1	2	3	4	5	6	7	8	9	10	
	V	X	;									
Answer		1	2	3	4	5	6	7	8	9	10	
	V	X	P1	;								

XO		Transverter Offset Direction and Frequency										Parameters: P1 (For the transceiver frequency, the transverter frequency can be set in either direction) 0: + direction 1: - direction P2 Offset frequency in Hz (11 digits in Hz) • The frequency which the difference frequency to the frequency which is acquired by the FA/FB command (subtraction) becomes the transverter display frequency. • The settings in which the transverter display frequency becomes 0 or the setting exceeds 4,294,967,295 Hz causes an error.
Set		1	2	3	4	5	6	7	8	9	10	
	X	O	P1	P2	P2	P2	P2	P2	P2	P2	P2	
	11	12	13	14	15	16	17	18	19	20		
Read		1	2	3	4	5	6	7	8	9	10	
	X	O	;									
	11	12	13	14	15	16	17	18	19	20		
Answer		1	2	3	4	5	6	7	8	9	10	
	X	O	P1	P2	P2	P2	P2	P2	P2	P2	P2	
	11	12	13	14	15	16	17	18	19	20		

PC CONTROL COMMAND REFERENCE GUIDE

XT	XIT ON/OFF										<u>Parameters:</u> P1 0: XIT OFF 1: XIT ON	
	Set	1	2	3	4	5	6	7	8	9		10
		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	;								

XV	Transverter ON/OFF										<u>Parameters:</u> P1 0: Transverter OFF 1: Transverter ON	
	Set	1	2	3	4	5	6	7	8	9		10
		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	;								

00	Notification of Restart										<u>Parameters:</u> No parameters are used with this command.
	Read	1	2	3	4	5	6	7	8	9	
	0	0	;								
											<ul style="list-style-type: none"> • When the transceiver is automatically restarted by a function such as reset, this command is output. • If the AI function is OFF, this command is not output.

LAN EXCLUSIVE COMMAND TABLES

##CN	LAN Connection Command										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 0: Connection Denied 1: Connection Authorized
	#	#	C	N	;						
Answer	1	2	3	4	5	6	7	8	9	10	• If a LAN connection already exists, performing this command will result in a connection denial.
	#	#	C	N	P1	;					

##DD2	Display Data Output Control (Bandscope Display Information For High-Speed Output)										Parameters:
Answer	1	2	3	4	5	6 ~ 1285	1286	1287	1288	P1 Bandscope spectrum display information (1280 digits) 640 spectrum information are each expressed as 2 ASCII digits. Two digits of the beginning of division No. 00 are spectrum information of the left side, and two digits of the end of division No. 31 become the spectrum information of the right side. Two digits at the beginning are spectrum information of the left side, and two digits at the end become the spectrum information of the right side. The range of value for each spectrum information is from 00h ~ 8Ch (hexadecimal numbering). 00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 8Ch shows a state where the spectrum is not displayed (signal strength = -100 dB). The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 8Ch, the order becomes "8", "C".	
	#	#	D	D	2	P1	;				
											<ul style="list-style-type: none"> • When the AI function is ON, the data is output at a constant period by the LAN terminal when the DDO command is set to the high-speed output. • When the transceiver is not displaying the bandscope, it is not output.

##DD3	Display Data Output Control (Subscope Display Information For High-Speed Output)										Parameters:
Answer	1	2	3	4	5	6 ~ 1285	1286	1287	1288	P1 Subscope Spectrum Display Information (570 digits) 285 spectrum information are each expressed as 2 ASCII digits. Two digits at the beginning are spectrum information of the left side, and two digits at the end become the spectrum information of the right side. The range of value for each spectrum information is from 00h ~ 32h (hexadecimal numbering). 00h shows the state where the spectrum is extended to the top (signal strength = 0 dB) and 32h shows a state where the spectrum is not displayed (signal strength = -50 dB). The respective spectrum information is converted to ASCII code of the hexadecimal number of from the upper byte digits. For 32h, the order becomes "3", "2".	
	#	#	D	D	3	P1	;				
											<ul style="list-style-type: none"> • When the AI function is ON, the data is output at a constant period by the LAN terminal when the DDO command is set to the high-speed output. • When the transceiver is not displaying the subscope, it is not output.

##ID	LAN Connection Login Command										Parameters:
Read	1	2	3	4	5	6	7	8	9	10	P1 1 ~ 8: Account length P2 1 ~ 8: Password length P3 (User account) User account data entered as ASCII code P4 (User password) User password data entered as ASCII code P5 0: Authorization Failure 1: Authorization Successful
	#	#	I	D	P1	P2	P3	(P3)	(P3)	(P3)	
	11	12	13	14	15	16	17	18	19	20	
	(P3)	(P3)	(P3)	(P3)	(P4)	(P4)	(P4)	(P4)	(P4)	(P4)	
	21	22	23	24	25	26	27	28	29	30	
(P4)	(P4)	;									
Answer	1	2	3	4	5	6	7	8	9	10	• For example, if the user account name is "kenwood" and the password is "admin", enter the following: ##ID75kenwoodadmin
	#	#	I	D	P5	;					