KENWOOD

PC CONTROL COMMAND REFERENCE FOR THE TS-590S TRANSCEIVER

Kenwood Corporation

PC CONTROL COMMAND REFERENCE GUIDE

ABOUT THIS REFERENCE GUIDE

All descriptions in this reference guide are for the user's convenience. **Kenwood** does not support or warrantee this documentation in any way.

CONNECTING TO A PC

You can connect the TS-590S transceiver to a PC COM port using a traditional RS-232C connector, or to a USB port using a USB 2.0 (AB type) cable.

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: Operation is not guaranteed when connecting through a USB hub.

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

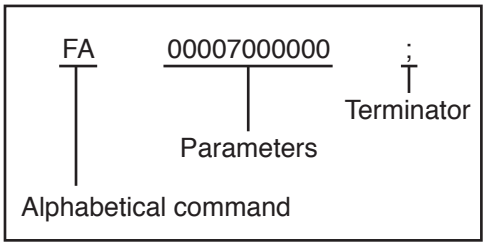
From a practical standpoint however, it is also necessary to incorporate some means of controlling when this data transfer will occur. The computer and transceiver cannot be allowed to send data at the same time! The required control is achieved by using the RTS and CTS lines.

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.

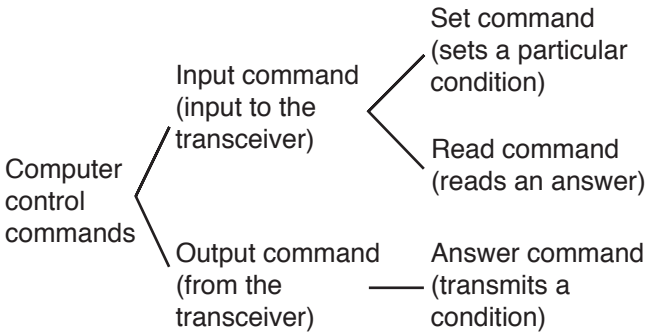
COMPUTER CONTROL COMMANDS

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 VFO A to 7 MHz



Commands can be classified as shown below:



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

- To set the frequency to 7 MHz, the following command is sent from the computer to the transceiver:

  "FA00007000000;" **(Set command)**

- To read the frequency of VFO A, the following command is sent from the computer to the transceiver:

  "FA;" **(Read command)**

- When the Read command above has been sent, the following command is returned to the computer:

  "FA00007000000;" **(Answer command)**

Note:

- Do not use the control characters 00 to 1Fh since they are either ignored or cause a "?" answer.
- Program execution may be delayed while turning the **Tuning** control rapidly.
- Receive data is not processed if the frequency is entered from the keypad.

■ 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 3.

■ Parameters

Parameters are used to specify information necessary to implement the desired command. The parameters to be used for each command are predetermined. The number of digits assigned to each parameter is also predetermined. Refer to the PC Control Command Tables {page 3} to configure the appropriate parameters.

When configuring parameters, be careful 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)

Note: If a particular parameter is not applicable to this transceiver, the parameter digits should be filled using any character except the ASCII control codes (00 to 1Fh) and the terminator (;).

■ Terminator

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

■ Error Messages

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

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

PC CONTROL COMMAND TABLES

AC

Sets or reads the internal antenna tuner status.

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

Parameters:
P1
0: RX-AT THRU
1: RX-AT IN
P2
0: TX-AT THRU
1: TX-AT IN
P3
0: Stop Tuning (Set)/ Tuning is stopped (Answer)
1: Start Tuning (Set)/ Tuning is active (Answer)

- The setting cannot be performed for RX IN/THRU
- AT Tuning will not begin when using the TX THRU status.
- To begin tuning, you must use command “AC111”.

AG

Sets or reads the AF gain.

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

Parameters:
P1
0: Always 0
P2
000 (minimum) ~ 255 (maximum)

AI

Sets or reads the Auto Information (AI) function ON/ OFF.

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

Parameters:
P1
0: AI OFF
2: AI ON

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

AN

Selects the antenna connector ANT1/ ANT2.

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

Parameters:
P1
0: ANT1
1: ANT2
9: No change
P2
0: RX ANT is not used
1: RX ANT is used
9: No change
P3
0: Drive Out OFF
1: Drive Out ON
9: No change

- When setting the command, enter only the parameters you are changing. For parameters you are not changing, enter “9”.
- For a response command, parameter P1, P2, and P3 cannot be “9”.

AS

Sets or reads the Auto Mode function parameters.

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

Parameters:
P1
0: Always 0
P2
00 ~ 31: Channel number
P3
11-digit Frequency in Hz (unused digits must be 0)
P4 (Mode (refer to the MD command)
1: LSB
2: USB
3: CW
4: FM
5: AM
6: FSK
7: CWR (CW Reverse)
9: FSKR (FSK Reverse)
P5 (Data mode (refer to the DA command))
0: No Data mode
1: Data mode
(example: USB-DATA: P4=2 / P5=1)

Conditions when configuring:
- You cannot set the channel to a frequency lower than the frequency of the previous channel.
- When the channel is set to a frequency higher than the next channel, all subsequent channel frequencies that are lower than the set frequency are changed to the frequency you just set.
- To reset all channels to their initial conditions, set them to to 9.5 MHz, LSB mode (DATA-OFF).

BC

Sets or reads the Beat Cancel function status.

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

Parameters:
P1
0: Beat Cancel OFF
1: Beat Cancel 1 ON
2: Beat Cancel 2 ON

BD / BU

Sets a frequency band.

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

Parameters:
P1 (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: GENE

- Unlike previous models, this command no longer functions as a conventional Band Down/ Band Up.
- While the section setting Memory Channel is displayed, you can use BD; to send the start frequency and BU; to send the end frequency.

BP

Adjusts the Notch Frequency of the Manual Notch Filter.

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

Parameters:
P1
000 (minimum) ~ 127 (maximum)

BY

Reads the busy signal status.

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

Parameters:
P1
0: Not busy
1: Busy
P2
0: Always 0

• This command is used with Sky Command.

CA

Sets and reads the CW TUNE function status.

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

Parameters:
P1
0: Cancels CW TUNE/ Inactive
1: Starts CW TUNE/ Active

CG

Sets and reads the Carrier Level.

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

Parameters:
P1
000 (minimum) ~ 100 (maximum)

CH

Operate the MULTI/CH encoder.

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

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

CN

Sets and reads the CTCSS frequency.

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

Parameters:
P1
00 ~ 41

No.	Freq. (Hz)	No.	Freq. (Hz)	No.	Freq. (Hz)	No.	Freq. (Hz)
00	67.0	11	97.4	22	141.3	33	206.5
01	69.3	12	100.0	23	146.2	34	210.7
02	71.9	13	103.5	24	151.4	35	218.1
03	74.4	14	107.2	25	156.7	36	225.7
04	77.0	15	110.9	26	162.2	37	229.1
05	79.7	16	114.8	27	167.9	38	233.6
06	82.5	17	118.8	28	173.8	39	241.8
07	85.4	18	123.0	29	179.9	40	250.3
08	88.5	19	127.3	30	186.2	41	254.1
09	91.5	20	131.8	31	192.8	—	—
10	94.8	21	136.5	32	203.5	—	—

CT

Sets and reads the CTCSS function status.

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

Parameters:
P1
0: CTCSS OFF
1: CTCSS ON
2: Cross Tone ON

- If Tone or CTCSS is ON when Cross Tone is turned ON, they will automatically turn OFF.

DA

Sets and reads the DATA mode.

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

Parameters:
P1
0: DATA mode OFF
1: DATA mode ON

- You can use this command in LSB, USB, and FM mode. When used in CW, FSK, or AM mode, an error occurs.
- When used in any mode other than DATA mode, the P1 parameter response is always 0.

DN / UP

Emulates the microphone DWN and UP keys.

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

Parameters:
P1
00 ~ 99

- If no P1 parameter is specified, the command is interpreted as 1 step down (DN;) or 1 step up (UP;).
- 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.

EM

Sets the Emergency communication frequency mode.

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

- There are no parameters for this command.
- The transceiver switches to the Emergency frequency after sending this command.
- This command is not available for E market versions (an error occurs).

EX

Sets or reads the Menu.

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

Parameters:
P1
000 ~ 087: Menu number
P2
00: Always 00
P3
0: Always 0
P4
0: Always 0
P5
String of alphanumeric characters for the Menu setting (variable length)

- Refer to the following table for the menus corresponding to parameter P1, and the available settings corresponding to parameter P5.

Menu (P1)	Function	Command Parameter (P5)										
		0	1	2	3	4	5	6	7	8	9	10 ~
000	Display brightness	OFF	1	2	3	4	5	6				
001	Key illumination	1	2									
002	Panel key response for double function	1	2	3								
003	Beep volume	OFF	1	2	3	4	5	6	7	8	9	

Menu (P1)	Function	Command Parameter (P5)										
		0	1	2	3	4	5	6	7	8	9	10 ~
004	Sidetone volume	OFF	1	2	3	4	5	6	7	8	9	
005	Message playback volume	OFF	1	2	3	4	5	6	7	8	9	
006	Voice guide volume	OFF	1	2	3	4	5	6	7			
007	Voice guide speed	0	1	2	3	4						
008	Voice guide language	EN	JP									
009	Auto announcement	OFF	ON									
010	MHz step (MHz)	0.1	0.5	1								
011	Tuning control adjustment rate (Hz)	250	500	1000								
012	MULTI/CH control rounding off process	OFF	ON									
013	Dedicated step change inside the BC band (AM)	OFF	ON									
014	MULTI/CH control step change for SSB/CW/FSK (kHz)	0.5	1	2.5	5	10						
015	MULTI/CH control step change for AM (kHz)	5	6.25	10	12.5	15	20	25	30	50	100	
016	MULTI/CH control step change for FM (kHz)	5	6.25	10	12.5	15	20	25	30	50	100	
017	Maximum number of Quick Memory channels	3	5	10								
018	Temporary variable of the standard memory frequency	OFF	ON									
019	Program Scan slow down function	OFF	ON									
020	Program Scan slow down frequency range (Hz)	100	200	300	400	500						
021	Program Scan hold	OFF	ON									
022	Scan Resume method	TO	CO									
023	Auto mode change	OFF	ON									
024	Following speed setting of AUTO NOTCH	0	1	2	3	4						
025	SSB/AM Low Cut transmit filter (Hz)	10	100	200	300	400	500					
026	SSB/AM High Cut transmit filter (Hz)	2500	2600	2700	2800	2900	3000					
027	SSB-DATA Low Cut transmit filter (Hz)	10	100	200	300	400	500					
028	SSB-DATA High Cut transmit filter (Hz)	2500	2600	2700	2800	2900	3000					
029	Effective change of Speech Processor	SOFT	HARD									
030	Transmit equalizer	OFF	HB1	HB2	FP	BB1	BB2	C	U			
031	Receive equalizer	OFF	HB1	HB2	FP	BB1	BB2	FLAT	U			
032	Electronic keyer operation mode	A	B									
033	Insert keying ON/OFF	OFF	ON									
034	Side tone/ pitch frequency setting (Hz)	300	350	400	450	500	550	600	650	700	750	up to 1000 (steps of 50)
035	CW clipping (ms)	1	2	4	6							
036	Keying weight ratio	AUTO	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	up to 4.0 (steps of 0.1)
037	Reverse keying auto weight ratio	OFF	ON									
038	Bug key function	OFF	ON									
039	Paddle dot/dash replacement setting	OFF	ON									
040	Mic paddle function	PF	PA									
041	Auto CW TX in SSB mode	OFF	ON									

Menu (P1)	Function	Command Parameter (P5)										
		0	1	2	3	4	5	6	7	8	9	10 ~
042	Frequency correction for changing SSB to CW mode	OFF	ON									
043	Break-in null configuration at time of keying speed configuration	OFF	ON									
044	FSK shift	170	200	425	850							
045	FSK keying polarity	OFF	ON									
046	FSK tone frequency (Hz)	1275	2125									
047	Mic gain for FM	1	2	3								
048	Power fine	OFF	ON									
049	Time-out Timer	OFF	3	5	10	20	30					
050	Configuring the Transverter function and power down	OFF	1	2								
051	TX hold when AT completes the tuning	OFF	ON									
052	AT operation when receiving	OFF	ON									
053	HF linear amplifier control	OFF	1	2	3							
054	50 MHz linear amplifier control	OFF	1	2	3							
055	Constant recording	OFF	ON									
056	Voice/ message playback repeat	OFF	ON									
057	Voice/ message playback repeat duratin (seconds)	0	1	2	3	4	5	6	7	8	9	up to 60 (steps of 1)
058	Split transfer function	OFF	ON									
059	Write split transfer data to the VFO	OFF	ON									
060	Transmit inhibit	OFF	ON									
061	COM port communication speed	4800	9600	19200	38400	57600	115200					
062	USB port communication speed	4800	9600	19200	38400	57600	115200					
063	DATA modulation line	ACC2	USB									
064	USB audio input level	0	1	2	3	4	5	6	7	8	9	
065	USB audio output level	0	1	2	3	4	5	6	7	8	9	
066	ACC2 terminal AF input level	0	1	2	3	4	5	6	7	8	9	
067	ACC2 terminal AF output level	0	1	2	3	4	5	6	7	8	9	
068	External AF output beep mix	OFF	ON									
069	DATA VOX	OFF	ON									
070	DATA VOX delay	0	5	10	15	20	25	30	35	40	45	up to 100 (steps of 5)
071	DATA VOX gain for USB audio input	0	1	2	3	4	5	6	7	8	9	
072	DATA VOX gain for ACC2 terminal input	0	1	2	3	4	5	6	7	8	9	
073	PKS polarity change	OFF	ON									
074	Busy transmit inhibit	OFF	ON									
075	CTCSS mute operation change	1	2									
076	PSQ control signal logic selection	LO	OPEN									
077	PSQ control signal output condition	OFF	BSY	SQL	SND	BSY-SND	SQL-SND					
078	APO function (minutes)	OFF	60	120	180							

Menu (P1)	Function	Command Parameter (P5)										
		0	1	2	3	4	5	6	7	8	9	10 ~
079	Panel PF A function	00 ~ 99 (2-digit) Refer to the TS-590S instruction manual for the numbers and functions.										
080	Panel PF B function											
081	Mic PF 1 function											
082	Mic PF 2 function											
083	Mic PF 3 function											
084	Mic PF 4 function											
085	Mic PF (DWN) function											
086	Mic PF (UP) function											
087	Power on message	Power on Message (up to 8 ASCII characters)										

FA / FB

Sets or reads the VFO A/ VFO B frequency.

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

Parameters:
P1
Frequency (11 digits in Hz)

- For example, enter 00014195000 for 14.195 MHz. Blank digits must be entered as 0.

FL

Sets and reads the IF filter.

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

Parameters:
P1
1: IF Filter A
2: IF Filter B

FR / FT

Selects or reads the VFO or Memory channel.

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

Parameters:
P1
0: VFO A
1: VFO B
2: Memory Channel

- When using the FR command to select VFO A or VFO B, the selected VFO changes to the simplex state. When using the FT command, the selected VFO changes to the split state.
- You cannot use the FT command to select Memory Channel mode. Use only the FR command.

FS

Sets and reads the Fine Tuning function status.

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

Parameters:
P1
0: Fine Tuning function OFF
1: Fine Tuning function ON

FV

Verifies the Firmware version.

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

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

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

FW

Sets or reads the DSP filtering bandwidth.

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

Parameters:
P1
0000 ~ 9999 (in Hz)

CW:
- 0050, 0080, 0100, 0150, 0200, 0250, 0300, 0400, 0500, 0600, 1000, 1500, 2000, 2500
- An entered value of 0049 or lower results in 0050 being entered. An entered value of any other number not listed will result in the closest lower value being entered (for example, 1400 will revert to 1000). A value of 2501 or higher results in 2500 being entered.

FSK:
- 0250, 0500, 1000, 1500
- An entered value of 0249 or lower results in 0250 being entered. An entered value of any other number not listed will result in the closest lower value being entered (for example, 1400 will revert to 1000). A value of 1501 or higher results in 1500 being entered.

FM: (Modulation degree setting)
- 0000 (Normal), 0001 (Narrow)

- Use the SH and SL commands to change the slope tune for SSB/AM/FM.
- The FW command cannot be used in SSB or AM mode (an error tone will sound).
- When entering an unused number, the closest lower value will be automatically entered

GC

Sets or reads the AGC.

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

Parameters:
P1
0: AGC Off
1: AGC Slow
2: AGC Fast
3: AGC Off → On (AGC returns to its Slow/Fast status before turning Off.)

- This command cannot be performed in FM mode (an error sounds).
- Entering a P1 parameter value of 4 or higher causes an error tone to sound.
- A P1 parameter value of 3 is used only for turning AGC On.
- While AGC is On, entering a P1 parameter value of 3 will not change the AGC status.

GT

Sets or reads the AGC time constant.

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

Parameters:
P1
01 ~ 20 (in steps of 1)

- Entering a P1 parameter value of 00 results in 01 being entered and entering a P1 parameter value higher than 20 results in 20 being entered.
- If AGC is OFF or while in FM mode, the GT command cannot be read (an error tone sounds).

ID

Reads the transceiver ID number.

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

Parameters:
P1
021: TS-590S

IF

Reads the transceiver status.

Read

1	2	3	4	5	6	7	8	9	10
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	;		

Parameters:

P1
11 digit displayed frequency (for example, 00014175000 is 14.175 MHz)

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
Memory channel number (refer to the MC command)

P8
0: RX
1: TX

P9
Operating mode (refer to the MD command)

P10
Function (refer to the FR/FT commands)

P11
Scan status (refer to the SC command)

P12
0: Simplex operation
1: Split operation

P13
0: OFF
1: Tone ON
2: CTCSS ON
3: Cross Tone ON

P14
00 ~ 42: Tone/ CTCSS frequency (refer to the TN/CN commands)
When Tone is ON, this number is the Tone frequency. When CTCSS is ON, this number is the CTCSS frequency. When Cross Tone is ON, the transceiver transmits on the Tone frequency and receives on the CTCSS frequency. When OFF, it shows the Tone frequency.

P15
0: Always 0

- While the Auto Information (AI) function is ON, a response is automatically sent when the RIT/XIT frequency is changed or the Memory channel frequency is changed.
- The IF command cannot read the transceiver status while it is in Data mode.

IS

Sets and reads the DSP Filter Shift.

Set

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

Read

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

Answer

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

Parameters:

P1
Always a space

P2
0000 ~ 9999 (in Hz)

CW:

- 0300, 0350, 0400, 0450, 0500, 0550, 0600, 0650, 0700, 0750, 0800, 0850, 0900, 0950, 1000
- An entered value of 0299 or lower results in 0300 being entered. An entered value of any other number not listed will result in the closest lower value being entered (for example, 0633 will revert to 0600). A value of 1001 or higher results in 1000 being entered.

- Use the SH and SL commands to change the slope tune for SSB/AM/FM/SSB DATA/FM DATA mode.
- The IS command cannot be used in any mode other than CW/ CW-R (an error tone will sound).

KS

Sets and reads the Keying speed.

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

Parameters:

P1

004 ~ 060 (in steps of 1)

- An entered value of 003 or lower results in 004 being entered. A value of 061 or higher results in 060 being entered.

KY

Converts the entered characters into morse code while keying.

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

Parameters:

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.

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 symbols listed in the following table.

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

- 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.

LK

Sets and reads the Lock status.

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

Parameters:

P1

0: Lock OFF

1: Lock ON

P2

0: Always 0

LM

Sets and reads the VGS-1 electric keyer recording status.

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

Parameters:

P1
- 0: Not recording (used only as response)
- 1: Channel 1
- 2: Channel 2
- 3: Channel 3
- 4: Channel 4
- 5: RX (constant recording)

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)

P3

000 ~ 100

When a recording is saved to Channels 1 and 2:
- Shows the remaining recording time as 000 ~ 030 (seconds).

When a recording is saved to Channels 3 and 4:
- Shows the remaining recording time as 000 ~ 015 (seconds).

CW message:
- Shows the recording progress as 000 ~ 100 (%).

- Entering a P1 parameter value other than those listed causes an error.
- When parameter P1 is set to 5, parameter P2 must be set to 2.

MC

Sets and reads the Memory Channel number.

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

Parameters:

P1

Sets the 100's digit for the channel number
When entering a setting command, enter 0 or a space for a channel number less than 100.
For a response command, a space is entered for a channel number less than 100.

P2

00 ~ 99: Two digit channel number
When the channel number is less than 10, both for setting and response commands, the first digit is "0".

- Channel numbers P00 ~ P09 are represented by 100 ~ 109.

MD

Sets and reads the operating mode status.

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

Parameters:

P1
- 0: None (setting failure)
- 1: LSB
- 2: USB
- 3: CW
- 4: FM
- 5: AM
- 6: FSK
- 7: CW-R
- 8: None (setting failure)
- 9: FSK-R

MF

Sets and reads Menu A or B.

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

Parameters:

P1
- 0: Menu A
- 1: Menu B

MG

Sets and reads the microphone gain.

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

Parameters:
P1
000 ~ 100 (in steps of 1)

- An entered value of 101 or higher results in 100 being entered.

ML

Sets and reads the TX Monitor function output level.

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

Parameters:
P1
000: TX Monitor is OFF
001 (minimum) ~ 009 (maximum)

- An entered value of 010 or higher results in 009 being entered.

MR

Reads the Memory channel data.

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

Parameters:
P1
0: Simplex
1: Split
P2, P3
Channel number (refer to the MC command)
P4
Frequency (depending on the P1 setting, unused high-end digits will become 0)
P5
Mode (depending on the P1 setting, refer to the MD command)
P6
Data mode (depending on the P1 setting, refer to the DA command)
P7
0: TONE/CTCSS OFF
1: TONE ON
2: CTCSS ON
3: Cross Tone ON
P8
Tone frequency (refer to the TN command)
P9
CTCSS frequency (refer to the CN command)
P10
000: Always 000
P11
0: Always 0
P12
0: Always 0
P13
000000000: Always 000000000
P14
00: FM Normal
01: FM Narrow
P15
0: Channel Lockout OFF
1: Channel Lockout ON
P16
Memory name (up to 8 digits)

- When reading the simplex channel data or the receive frequency of the split channel in receive mode, enter 0 for parameter P1. When reading the transmit frequency of the split channel in transmit mode, enter 1.
- When reading the start frequency of a section defined channel, enter 0 for parameter P1. When reading the end frequency, enter 1.
- If the selected channel is empty, P4 ~ P15 will be 0 and P16 will be blank.

MW

Sets the Memory channel data.

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

Parameters:

P1
0: Simplex
1: Split

P2, P3
Channel number (refer to the MC command)

P4
Frequency (depending on the P1 setting, unused high-end digits will become 0)

P5
Mode (depending on the P1 setting, refer to the MD command)

P6
Data mode (depending on the P1 setting, refer to the DA command)

P7
0: TONE/CTCSS OFF
1: TONE ON
2: CTCSS ON
3: Cross Tone ON

P8
Tone frequency (refer to the TN command)

P9
CTCSS frequency (refer to the CN command)

P10
000: Always 000

P11
0: Always 0

P12
0: Always 0

P13
000000000: Always 000000000

P14
00: FM Normal
01: FM Narrow

P15
0: Channel Lockout OFF
1: Channel Lockout ON

P16
Memory name (up to 8 digits)

- When registering a simplex channel, set parameter P1 to 0. After setting P1 to 0, the channel becomes a simplex channel, even if it was already a split channel.
- When registering a split channel, set parameter P1 to 1 (set the transmission frequency and mode). The reception frequency and mode are not updated at this time.
- When registering a section defined channel,set parameter P1 to 0 to enter the Start frequency, then set P1 to 1 to set the End frequency.
- When you have a blank channel selected, and set parameter P1 to 1, the channel becomes a split channel. However, the transmit and receive frequencies are the same, and the transmit and receive modes are the same.
- When registering a section defined channel and parameter P1 is set to 1, the Start and End frequencies are the same.

NB

Sets and reads the Noise Blanker function status.

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

Parameters:

P1
0: NB OFF
1: NB1 ON
2: NB2 ON

NL

Sets and reads the Noise Blanker level.

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

Parameters:
P1
001 ~ 010 (in steps of 1)

- When NB1 is ON, it sets and reads the NB1 level.
- When NB2 is ON, it sets and reads the NB2 level.
- Entering a P1 parameter value of 000 results in 001 being entered and entering a P1 parameter value higher than 010 results in 010 being entered.
- When NB is set to OFF, an error occurs.

NR

Sets and reads the Noise Reduction function status.

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

Parameters:
P1
0: NR OFF
1: NR1 ON
2: NR2 ON

NT

Sets and reads the Notch Filter status.

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

Parameters:
P1
0: Notch OFF
1: Auto Notch
2: Manual Notch
P2 (bandwidth of Manual Notch)
0: Normal
1: Wide

- When setting the command, parameter P2 is ignored unless parameter P1 is set to 2.
- When receiving a response, parameter P2 will always be 0 unless parameter P1 is 2.

PA

Sets and reads the Pre-amplifier function status.

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

Parameters:
P1
0: Pre-amp OFF
1: Pre-amp ON
P2
0: Always 0

PB

Sets and reads the voice and CW message playback status.

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

Parameters:
P1
0: Stops playback
1: Playback Channel 1
2: Playback Channel 2
3: Playback Channel 3
4: Playback Channel 4
5: Playback constant recorded sound
P2
Playback Channel
P3 ~ P5 (Playback queueing buffer status)
0: None
1: Channel 1
2: Channel 2
3: Channel 3
4: Channel 4
5: Constant recorded sound

PC

Sets and reads the output power.

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

Parameters:
P1
005 ~ 100: SSB/ CW/ FM/ FSK
005 ~ 025: AM

- When the Power Fine function is On, the step size is 1 W.
- When the Power Fine function is Off, the step size is 5 W. In this case, if an inappropriate value is entered, the value is rounded down to the nearest 5's value. For example, when you enter a value of 093, it is rounded down to 090.
- Entering a value lower than the minimum value results in the minimum value being entered and entering a value higher than maximum value results in the maximum value being entered.

PL

Sets and reads the Speech Processor input/output level.

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

Parameters:
P1 (Input level)
000 (minimum) ~ 100 (maximum)
P2 (Output level)
000 (minimum) ~ 100 (maximum)

- Entering a value of 101 or higher results in 100 being entered.

PR

Sets and reads the Speech Processor function ON/ OFF.

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

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

PS

Sets and reads the Power ON/ OFF status.

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

Parameters:
P1
0: Power OFF
1: Power ON
9: Power OFF (low current mode)

- When turning the power Off by setting the P1 parameter to 0, more current is consumed than if you turn the power Off by operating the transceiver panel power switch. However, you can switch the power back On without any special procedures, using the PS command.
- When turning the power Off by setting the P1 parameter to 9, the same amount of standby current is consumed as if you turned the power Off by operating the transceiver panel power switch. In this case, to turn the power back On using the PS command, you must perform the following procedure:
  1) When using hardware flow control, turn the flow control Off.
  2) Send dummy data (;).
  3) Wait for more than 200 ms.
  4) Send "PS1;" within 2 seconds of sending the dummy data.

QD

Deletes the Quick Memory.

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

Parameters:
No parameters are used with this command.

- You cannot perform this command when Quick Memory mode is OFF (an error occurs).

QI

Stores the settings in the Quick Memory.

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

Parameters:
No parameters are used with this command.

QR

Sets and reads the Quick Memory channel data.

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

Parameters:
P1
0: Quick Memory OFF
1: Quick Memory ON
P2
0 ~ 9: Quick Memory channel number

- If parameter P1=0, set parameter P2 to 0.
- When configuring a value above the number of Quick Memory channels set by the menu, an error occurs.
- When specifying a blank channel, an error occurs.

RA

Sets and reads the RF Attenuator status.

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

Parameters:
P1
00: ATT OFF
01: ATT ON
P2
00: Always 00

RC

Clears the RIT/XIT frequency.

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

Parameters:
No parameters are used with this command.

- When the RIT/XIT function is ON, this command will clear the RIT/XIT frequency.
- When the RIT/XIT funtion is OFF, an error occurs.

RD / RU

Sets and reads the RIT/XIT frequency Up/ Down. Also sets and reads the scan speed in Scan mode.

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

Parameters:
P1
00000 ~ 99999: Frequency (in Hz)
P2
1 ~ 9: Scan speed

When Scan is OFF:
- This command is only used for the RIT/XIT frequency.
- The RU command is used to increase the frequency and the RD command is used to decrease the frequency.
- When no value for parameter P1 is entered, the frequency is adjusted by 1 step.
- The RIT/XIT setting has a frequency range of +9.999 kHz ~ -9.999 kHz

When Scan is ON:
- This command is used to set or read the scan speed. When the scan speed changes, a response is returned.
- When no value for parameter P1 is entered, the current scan speed is retrieved.
- Enter “RDxxxxx;” to increase the scan speed (where “x” can be any character).
- Enter “RUxxxxx;” to increase the scan speed (where “x” can be any character).

RG

Sets and reads the RF Gain status.

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

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

- Entering a value of 256 or higher results in 255 being entered.

RL

Sets and reads the Noise Reduction Level.

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

Parameters:
P1 (When NR1 is ON: reads the setting of the NR1 effective level)
01 ~ 10

- Entering a value of 00 results in 01 being entered. Entering a value of 11 or higher results in 10 being entered.

P1 (When NR2 is ON: reads the setting of the SPAC following speed)
00 ~ 09 (2 ms ~ 20 ms, in steps of 2 ms)

- When the Noise Reduction setting is OFF, an error occurs.

RM

Sets and reads the Meter function.

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

Parameters:
P1
0: No selection (selection cannot be made)
1: SWR
2: COMP
3: ALC
P2
0000 ~ 0030: Meter value in dots

- There are always three types of responses: SWR, COMP, and ALC.
- The ALC meter value is output during VGS recording and standby.

RT

Sets and reads the RIT function status.

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

Parameters:
P1
0: RIT OFF
1: RIT ON

RX

Sets the receiver function status.

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

Parameters:
No parameters are used with this command.

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

SC

Sets and reads the Scan function status.

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

Parameters:
P1
0: Scan OFF
1: Scan ON (VFO Scan, Memory Scan, Quick Memory Scan)
4: Tone Scan ON
5: CTCSS Scan ON
P2
0: Scan OFF
1: Scan ON (VFO Scan, Memory Scan, Quick Memory Scan)
4: Tone Scan ON
5: CTCSS Scan ON
7: Program Scan ON
P3
0: Cancel the Slow Scan frequency point and outside the Slow Scan frequency range.
1: Set the Slow Scan frequency point and inside the Slow Scan frequency range.

- When parameter P1=1 is sent, the transceiver performs either Program Scan or VFO Scan depending on the VFO mode. In Quick Memory mode, it performs Quick Memory scan.

SD

Sets and reads the CW break-in time delay.

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

Parameters:
P1
0000 (ms): Full break-in
0050 ~ 1000 (ms) (in steps of 50)

- An entered value of 1001 or higher results in 1000 being entered.
- An entered value that does not match the 50 ms step value will be rounded down to the nearest 50 ms step.

SH / SL

Sets and reads the slope tune bandwidth settings.

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

Parameters:
P1
00 ~ 99

- The SH command is for the high-cut frequency and the SL command is for the low-cut frequency.
- In SSB Data mode, the SH command is used for Width and the SL command is used for Shift.
- An entered value higher than the maximum value for each entry type results in the maximum value being entered.

SSB/FM/FM Data mode High-cut frequency (Hz)
00: 1000, 01: 1200, 02: 1400, 03: 1600, 04: 1800, 05: 2000, 06: 2200, 07: 2400, 08: 2600, 09: 2800, 10: 3000, 11: 3400, 12: 4000, 13: 5000

SSB/FM/FM Data mode Low-cut frequency (Hz)
00: 0, 01: 50, 02: 100, 03: 200, 04: 300, 05: 400, 06: 500, 07: 600, 08: 700, 09: 800, 10: 900, 11: 1000

AM mode High-cut frequency (Hz)
00: 2500, 01: 3000, 02: 4000, 03: 5000

AM mode Low-cut frequency (Hz)
00: 0, 01: 100, 02: 200, 03: 300

SSB Data mode band width (Hz)
00: 50, 01: 80, 02: 100, 03: 150, 04: 200, 05: 250, 06: 300, 07: 400, 08: 500, 09: 600, 10: 1000, 11: 1500, 12: 2000, 13: 2500

SSB Data mode Shift frequency (Hz)
00: 1000, 01: 1100, 02: 1200, 03: 1300, 04: 1400, 05: 1500, 06: 1600, 07: 1700, 08: 1800, 09: 1900, 10: 2000, 11: 2100, 12: 2210

SM

Reads the S-meter value.

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

Parameters:
P1
0: Always 0
P2
0000 ~ 0030: S-meter value

- The P2 parameter value is the number of dots displayed on the meter.
- The SM command reads the S-meter during reception and the RF (power) meter during transmission.

SQ

Sets and reads the squelch value.

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

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

- An entered value of 256 or higher results in 255 being entered.

SR

Resets the transceiver.

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

Parameters:
P1
1: VFO reset
2: Full reset

- An entered value other than those listed results in an error.

SS

Sets and reads the Program Slow Scan frequency.

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

Parameters:

P1
0 ~ 9: Memory channel number for Program Slow Scan

P2
0 ~ 4: Slow down frequency spot

P3
Slow down frequency (11 digits in Hz)

- If no point frequency has been set, parameter P3 is all 0's.
- If parameter P3 is set to all 0's, the point frequency set for parameter P2 is deleted.
- Other than when deleting parameter P3, you cannot set a frequency exceeding the section selected channel lower/upper frequency limits.
- If a P2 parameter is skipped (not entered sequentially from 0 to 4), the parameter will not be accepted.
- If the specified P1 parameter is an empty Memory channel, the SS command becomes invalid.
- When the AI function is ON, all slow scan points of the current Memory channel are output.
- When the AI function is ON and the status of the slow scan points changes (newly registered or deleted points), all slow scan points are output.
- In each section selected channel, when multiple slow scan point frequencies are set up, if you delete a frequency from one of the slow scan point numbers, the remaining point frequencies are renumbered with slow scan point numbers, starting from 0.

Example:
The following table lists point numbers and their respective frequency settings, before deleting any frequencies.

Slow Scan Point Number (P2)	Slow Scan Point Frequency (before deletion)
0	14.0 (MHz)
1	14.1 (MHz)
2	14.2 (MHz)
3	14.3 (MHz)
4	14.35 (MHz)

If Slow Scan Point number 1 is deleted, numbers 2 ~ 4 step up one spot to fill in spots 1 ~ 3, leaving spot 4 empty.

Slow Scan Point Number (P2)	Slow Scan Point Frequency (after deletion)
0	14.0 (MHz)
1	14.2 (MHz)
2	14.3 (MHz)
3	14.35 (MHz)
4	Empty

The Slow Scan Point frequencies following the deleted point are read, and the empty point is written as a space (the frequency is not set).

SU

Sets and reads the Scan group.

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

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

P2 ~ P12

Parameter	When Selecting the Program Scan Section	When Setting the Memory Scan Group
P2	The section set in Channel P0	Group 0
P3	The section set in Channel P1	Group 1
P4	The section set in Channel P2	Group 2
P5	The section set in Channel P3	Group 3
P6	The section set in Channel P4	Group 4
P7	The section set in Channel P5	Group 5
P8	The section set in Channel P6	Group 6
P9	The section set in Channel P7	Group 7
P10	The section set in Channel P8	Group 8
P11	The section set in Channel P9	Group 9
P12	Always 0	Group P

0: Unselected
1: Selected

• When parameters P2 ~ P12 are selected in the Memory Scan group, unselecting them will configure All Channel Scan.

SV

Performs the Memory Transfer function.

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

Parameters:
No parameters are used with this command.

TN

Sets and reads the Tone frequency.

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

Parameters:
P1
00 ~ 42 (refer to the table below)

No.	Freq. (Hz)	No.	Freq. (Hz)	No.	Freq. (Hz)	No.	Freq. (Hz)
00	67.0	11	97.4	22	141.3	33	206.5
01	69.3	12	100.0	23	146.2	34	210.7
02	71.9	13	103.5	24	151.4	35	218.1
03	74.4	14	107.2	25	156.7	36	225.7
04	77.0	15	110.9	26	162.2	37	229.1
05	79.7	16	114.8	27	167.9	38	233.6
06	82.5	17	118.8	28	173.8	39	241.8
07	85.4	18	123.0	29	179.9	40	250.3
08	88.5	19	127.3	30	186.2	41	254.1
09	91.5	20	131.8	31	192.8	42	1750
10	94.8	21	136.5	32	203.5	—	—

• An entered value of 43 or higher results in an error.

TO

Sets and reads the Tone status.

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

Parameters:
P1
0: Tone OFF
1: Tone ON

TS

Sets and reads the TF-Set status.

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

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

TX

Sets the transmission mode.

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

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

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

VD

Sets and reads the VOX Delay time.

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

Parameters:
P1
0000 ~ 3000 ms (in steps of 150)

- An entered value of 3001 or higher results in 3000 being entered.
- An entered value that does not match the 150 ms step value will be rounded down to the nearest 150 ms step.

VG

Sets and reads the VOX Gain.

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

Parameters:
P1
000 ~ 009 (in steps of 1)

- An entered value of 010 or higher results in 09 being entered.

VR

Sets the Voice synthesis generation function.

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

Parameters:
P1
0: Auto (set P1 to 4 to cancel)
1: VOICE 1
2: VOICE 2
3: VOICE 3
4: Cancel

- The cancel status is not retained when the transceiver power is turned OFF.

VV

Performs the VFO copy (A=B) function.

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

Parameters:
No parameters are used with this command.

VX

Sets and reads the VOX and Break-in function status.

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

Parameters:
P1
0: VOX OFF
1: VOX ON

- When transmitting the VX command in CW mode, the Break-in function is set and read, rather than the VOX function.

XI

Reads the transmit frequency and mode.

	1	2	3	4	5	6	7	8	9	10
Read	X	I	;							
Answer	X	I	P1	P1	P1	P1	P1	P1	P1	P1
	P1	P1	P1	P2	P3	P4	P4	;		

Parameters:
P1
Frequency (11 digits in Hz)
P2
Transmission mode (refer to the MD command)
P3
0: Data mode OFF
1: Data mode ON
P4
00: Always 00

- When the transmit frequency changes across the HF zone and the 50MHz range, the AI function automatically sends a response when the transmission mode changes.

XO

Sets and reads the offset direction and frequency for the transverter mode.

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

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

- When setting the offset frequency, the 1 Hz digit is set to 0.

XT

Sets and reads the XIT function status.

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

Parameters:
P1
0: XIT OFF
1: XIT ON

UR / UT

Sets and reads the RX / TX equalizer.

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

Parameters:
P1: 0 Hz level
P2: 300 Hz level
P3: 600 Hz level
P4: 900 Hz level
P5: 1200 Hz level
P6: 1500 Hz level
P7: 1800 Hz level
P8: 2100 Hz level
P9: 2400 Hz level
P10: 2700 Hz level
P11: 3000 Hz level
P12: 3300 Hz level
P13: 3600 Hz level
P14: 3900 Hz level
P15: 4200 Hz level
P16: 4500 Hz level
P17: 4800 Hz level
P18: 5100 Hz level

- Each parameter has a range from 00 ~ 30 (where 00 is -24 dB and each value increases the step by 1 dB, to a maximum of +6 dB at 30). An entered value of 31 or higher results in an error.
- When the equalizer is set to OFF through the Menu, you cannot adjust the level using this command (an error occurs).
- When the equalizer is set to anything other than OFF, through the Menu, you can use this command to adjust the level.
- When the equalizer is set to “USER” through the Menu, the level you select will be stored in the transceiver memory.
- When the AI function is ON, if any changes are made to the equalizer settings, a response command is output.

VS0

Sets and reads the Visual Scan start/ stop/ pause status.

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

Parameters:
P1
0: Visual Scan OFF
1: Visual Scan ON (while scanning)
2: Visual Scan pause
3: Visual Scan restart (when paused) (set command only)

- Visual Scan will not start when the AI function is OFF.
- Visual Scan can only be used in VFO mode.
- You cannot start Visual Scan while transmitting.
- During Visual Scan, reception is muted and the S meter will not display signal strength. (While paused, reception and the S meter function normally.)
- During Visual Scan, you cannot change the band, the VFO A/B, the Memory Channel mode, or the Quick Memory Channel mode. Additionally, you cannot transmit.
- When the transceiver power is turned OFF, Visual Scan will also turn OFF.

VS1

Sets the Visual Scan center frequency.

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

Parameters:

P1

Center frequency (11 digits in Hz, unused high level digits are set to 0)

- To read the center frequency, use the “VS3;” command.
- The center frequency is stored in each band, and can be changed using the Band Direct key.

Band Direct Key	Default Value
[1.8]	1.85 MHz
[3.5]	3.55 MHz
[7]	7.05 MHz
[10]	10.15 MHz
[14]	14.05 MHz
[18]	18.118 MHz
[21]	21.05 MHz
[24]	24.94 MHz
[28]	28.05 MHz
[50]	50.05 MHz
[GENE]	5.05 MHz

- Do not enter a frequency outside the reception frequency range. An error will occur.

VS2

Sets the Visual Scan span.

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

Parameters:

P1

0: 20 kHz (in steps of 100 Hz)
1: 50 kHz (in steps of 250 Hz)
2: 100 kHz (in steps of 500 Hz)
3: 200 kHz (in steps of 1 kHz)
4: 500 kHz (in steps of 2.5 kHz)
5: 1 MHz (in steps of 5 kHz)
6: 2 MHz (in steps of 10 kHz)

- To read the span, use the “VS3;” command.
- The span is stored in each band, and can be changed using the Band Direct key.

Band Direct Key	Default Value
[1.8]	100 Hz
[3.5]	100 Hz
[7]	100 Hz
[10]	100 Hz
[14]	100 Hz
[18]	100 Hz
[21]	100 Hz
[24]	100 Hz
[28]	100 Hz
[50]	5100 Hz
[GENE]	100 Hz

VS3

Reads the Visual Scan upper/ lower/ center frequency, and span.

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

Parameters:

P1
Lower frequency (11 digits in Hz)

P2
Center frequency (11 digits in Hz)

P3
Upper frequency (11 digits in Hz)

P4 (span)
0: 20 kHz ±10 kHz (in steps of 100 Hz)
1: 50 kHz ±25 kHz (in steps of 250 Hz)
2: 100 kHz ±50 kHz (in steps of 500 Hz)
3: 200 kHz ±100 kHz (in steps of 1 kHz)
4: 500 kHz ±250 kHz (in steps of 2.5 kHz)
5: 1 MHz ±500 kHz (in steps of 5 kHz)
6: 2 MHz ±1 MHz (in steps of 10 kHz)

VS4

Reads the Visual Scan sweep frequency and signal level.

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

Parameters:

P1
Sweep frequency (11 digits in Hz)

P2 (signal level)
0000 ~ 0060