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■ Remote control (CI-V) information

◊ CI-V connection

The transceiver's operating frequency, mode, VFO and memory selection, can be remotely controlled when connecting to a PC.

Choose the connection method from the following:

- A USB cable (A-B type, user supplied)

The required USB driver and driver install guide can be downloaded from Icom web site.

Access to "http://www.icom.co.jp/world," then click "Support," "Firmware Updates / Software downloads" in sequence.

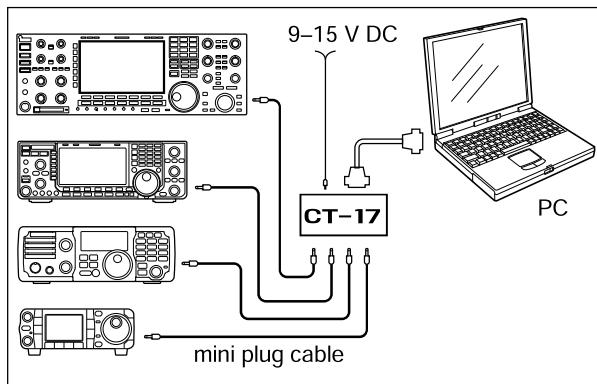
*The download procedure on the web page may be changed without notice.

- The optional CT-17 (CI-V level converter)

*Connects to a PC with an RS-232C port.

CT-17 accepts only an RS-232C cable. The use of an RS-232C-USB converter is not guaranteed.

• Connection example— using CT-17



◊ Preparing

The Icom Communications Interface V (CI-V) is used for remote control.

To control the transceiver, first set its address, data communication speed, and transceive function.

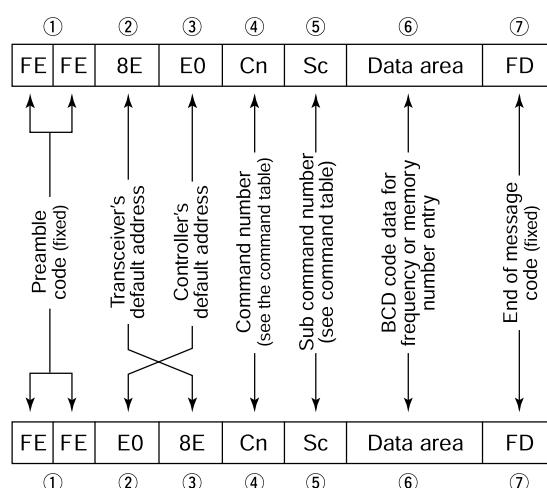
These settings are set in the Set mode.

(pp. 15-17, 15-18)

◊ Data format

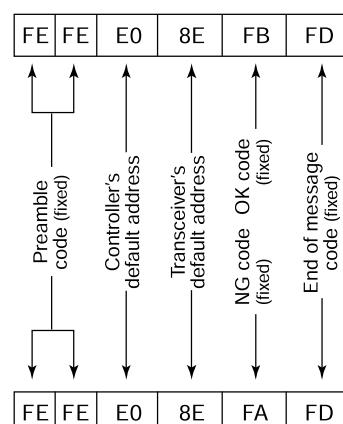
The CI-V system can be operated using the following data formats. Data formats differ according to command numbers. A data area or sub command is added for some commands.

Controller to IC-7850/IC-7851



IC-7850/IC-7851 to controller

OK message to controller



NG message to controller

◇ Command table

Cmd.	Sub Cmd.	Data	Description
00		see p. 18-11	Send frequency data (transceive)
01		see p. 18-11	Send mode data (transceive)
02		see p. 18-13	Read band edge frequencies
03		see p. 18-11	Read operating frequency
04		see p. 18-11	Read operating mode
05		see p. 18-11	Set operating frequency
06		see p. 18-11	Operating mode selection for transceive
07	②9		Select VFO mode
	B0		Exchange the Main and Sub bands
	B1		Equalize the Main and Sub bands
	C2	00 or 01	Send/read the dualwatch setting (00=OFF, 01=ON) *Sub commands, C0 (dualwatch ON) and C1 (dualwatch OFF), are also usable for only setting.
	D2	00	Send/read Main band selection *Sub command, D0, is also usable for only setting.
		01	Send/read Sub band selection *Sub command, D1, is also usable for only setting.
08			Select memory mode
	0001 to 0099		Select memory channel (0001=M-CH01, 0099=M-CH99)
	0100		Select program scan edge channel P1
	0101		Select program scan edge channel P2
09			Memory write
0A			Memory to VFO
0B			Memory clear
0E	00		Scan stop
	01		Programmed/memory scan start
	02		Programmed scan start
	03		ΔF scan start
	12		Fine programmed scan start
	13		Fine ΔF scan start
	22		Memory scan start
	23		Select memory scan start
	A1		Select ΔF scan span ±5 kHz
	A2		Select ΔF scan span ±10 kHz
	A3		Select ΔF scan span ±20 kHz
	A4		Select ΔF scan span ±50 kHz
	A5		Select ΔF scan span ±100 kHz
	A6		Select ΔF scan span ±500 kHz
	A7		Select ΔF scan span ±1 MHz
	B0		Set as non-select channel
	B1		Set as select channel (The previously set number by CI-V is set after turning power ON, or "1" is selected if no selection is performed.)
	01		Set as select channel "★1"
	02		Set as select channel "★2"
	03		Set as select channel "★3"
	B2	00	Set "ALL" for select memory scan
	01		Set "★1" for select memory scan
	02		Set "★2" for select memory scan
	03		Set "★3" for select memory scan
	D0		Set scan resume OFF
	D3		Set scan resume ON
0F		00 or 01	Read split setting (00=OFF, 01=ON)
	00		Turn the split function OFF
	01		Turn the split function ON
10		00	Send/read tuning step OFF
	01		Send/read 100 Hz tuning step
	02		Send/read 1 kHz tuning step
	03		Send/read 5 kHz tuning step
	04		Send/read 9 kHz tuning step
	05		Send/read 10 kHz tuning step
	06		Send/read 12.5 kHz tuning step
	07		Send/read 20 kHz tuning step
	08		Send/read 25 kHz tuning step

Cmd.	Sub Cmd.	Data	Description
11 [†] ②9	00		Send/read attenuator OFF
	03		Send/read 3 dB attenuator
	06		Send/read 6 dB attenuator
	09		Send/read 9 dB attenuator
	12		Send/read 12 dB attenuator
	15		Send/read 15 dB attenuator
	18		Send/read 18 dB attenuator
	21		Send/read 21 dB attenuator
12 [†] ②9	00 or 01		Select/read ANT1 selection (00=RX ANT OFF; 01=RX ANT ON)
	01	00 or 01	Select/read ANT2 selection (00=RX ANT OFF; 01=RX ANT ON)
	02	00 or 01	Select/read ANT3 selection (00=RX ANT OFF; 01=RX ANT ON)
	03	00	Select/read ANT4 selection (00=RX ANT OFF; fix)
13	00		Announce all data with voice synthesizer
	01		Announce frequency and S-meter level with voice synthesizer
	02		Announce receive mode with voice synthesizer
14 [†]	01 ②9	0000 to 0255	Send/read [AF] level (0000=max. CCW, 0255=max. CW)
	02 ②9	0000 to 0255	Send/read [RF] level (0000=max. CCW, 0255=max. CW)
	03 ②9	0000 to 0255	Send/read [SQL] level (0000=max. CCW, 0255=max. CW)
	05 ②9	0000 to 0255	Send/read [APF] position (0000=Pitch-550 Hz, 0128=Pitch, 0255=Pitch+550 Hz; 10 Hz steps)
	06 ②9	0000 to 0255	Send/read [NR] level (0000=0%, 0255=100%)
	07 ②9	0000 to 0255	Send/read inner [TWIN PBT] position (0000=max. CCW, 0128=center, 0255=max. CW)
	08 ②9	0000 to 0255	Send/read outer [TWIN PBT] position (0000=max. CCW, 0128=center, 0255=max. CW)
	09	0000 to 0255	Send/read CW pitch (0000=300 Hz, 0128=600 Hz, 0255=900 Hz; 5 Hz steps)
	0A	0000 to 0255	Send/read [RF PWR] position (0000=max. CCW, 0255=max. CW)
	0B	0000 to 0255	Send/read [MIC] position (0000=max. CCW, 0255=max. CW)
	0C	0000 to 0255	Send/read [KEY SPEED] level (0000=6 wpm, 0255=48 wpm)
	0D ②9	0000 to 0255	Send/read [NOTCH] position (0000=max. CCW, 0128=center, 0255=max. CW)
	0E	0000 to 0255	Send/read COMP level (0000=0, 0255=10)
	0F	0000 to 0255	Send/read [DELAY] position (0000=2.0d, 0255=13.0d)
	11 ②9	0000 to 0255	Send/read [AGC] level (0000=max. CCW to 0255=max. CW)
	12 ②9	0000 to 0255	Send/read NB level (0000=0%, 0255=100%)
	13 ②9	0000 to 0255	Send/read [DIGI-SEL] position (0000=max. CCW to 0255=max. CW)
	14	0000 to 0255	Send/read DRIVE gain (0000=0%, 0255=100%)
	15	0000 to 0255	Send/read Monitor gain (0000=0%, 0255=100%)
	16	0000 to 0255	Send/read VOX gain (0000=0%, 0255=100%)
	17	0000 to 0255	Send/read Anti VOX gain (0000=0%, 0255=100%)
	18	0000 to 0255	Send/read [CONTRAST] position (0000=max. CCW to 0255=max. CW)
	19	0000 to 0255	Send/read BRIGHT level (0000=0%, 0255=100%)

[†] Send/read data, ②9 Command 29 supported

18 CONTROL COMMAND

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
15	01 ②9	00	Read noise or S-meter squelch status (squelch close)
		01	Read noise or S-meter squelch status (squelch open)
	02 ②9	0000 to 0255	Read S-meter level (0000=S0, 0120=S9, 0241=S9+60 dB)
		00	Read various squelch (tone squelch, and so on) status (squelch close)
		01	Read various squelch (tone squelch, and so on) status (squelch open)
	11	0000 to 0255	Read RF power meter (0000=0 W, 0143=100 W, 0213=200 W)
	12	0000 to 0255	Read SWR meter (0000=SWR1.0, 0048=SWR1.5, 0080=SWR2.0, 0120=SWR3.0)
	13	0000 to 0255	Read ALC meter (0000=0, 0120=Max.)
	14	0000 to 0255	Read COMP meter (0000=0 dB, 0130=15 dB, 0241=30 dB)
	15	0000 to 0255	Read VD meter (0151=44 V, 0180=48 V, 0211=52 V)
	16	0000 to 0255	Read ID meter (0000=0 A, 0165=10 A, 0241=15 A)
16 [†]	02 ②9	00	Preamplifier OFF
		01	Preamplifier 1 ON
		02	Preamplifier 2 ON
	12 ②9	00	AGC OFF selection
		01	AGC FAST selection
		02	AGC MID selection
		03	AGC SLOW selection
	22 ②9	00	Noise blanker OFF
		01	Noise blanker ON
	32 ②9	00	Audio peak filter OFF
		01	Audio peak filter WIDE ON (320 Hz is selected when SHARP APF is set)
		02	Audio peak filter MID ON (160 Hz is selected when SHARP APF is set)
		03	Audio peak filter NAR ON (80 Hz is selected when SHARP APF is set)
40 ②9	00	Noise reduction OFF	
	01	Noise reduction ON	
41 ②9	00	Auto notch function OFF	
	01	Auto notch function ON	
42 ②9	00	Repeater tone OFF	
	01	Repeater tone ON	
43 ②9	00	Tone squelch OFF	
	01	Tone squelch ON	
44	00	Speech compressor OFF	
	01	Speech compressor ON	
45	00	Monitor function OFF	
	01	Monitor function ON	
46	00	VOX function OFF	
	01	VOX function ON	
47	00	BK-IN function OFF	
	01	Semi BK-IN function ON	
	02	Full BK-IN function ON	
48 ②9	00	Manual notch function OFF	
	01	Manual notch function ON	
4C ②9	00	VSC function OFF	
	01	VSC function ON	
4D ②9	00	AGC VR function OFF	
	01	AGC VR function ON	
4E ②9	00	DIGI-SEL function OFF	
	01	DIGI-SEL function ON	
4F ②9	00	Twin peak filter OFF	
	01	Twin peak filter ON (Can be turned ON only when Mark and Shift are set to 2125 Hz and 170 Hz, respectively)	
50 ②9	00	Dial lock function OFF	
	01	Dial lock function ON	

[†]Send/read data, ②9 Command 29 supported

Cmd.	Sub Cmd.	Data	Description
16 [†]	53 ②9	00	ANT-RX I/O setting OFF
		01	ANT-RX I/O setting "A"
		02	ANT-RX I/O setting "B"
	55 ②9	00	15 kHz roofing filter selection
		01	6 kHz roofing filter selection
	56 ②9	02	3 kHz roofing filter selection
		03	1.2 kHz roofing filter selection
	57 ②9	00	SHARP selection for DSP filter type
		01	SOFT selection for DSP filter type
	58	00	WIDE selection for manual notch width
		01	MID selection for manual notch width
	5E	02	NAR selection for manual notch width
		00	Main/Sub band tracking function OFF
		01	Main/Sub band tracking function ON
17		see p. 18-13	Send CW messages ^{*1}
18	00		Turn OFF the transceiver
	01		Turn ON the transceiver ^{*2}
19	00		Read the transceiver ID
1A [†]	00	see p. 18-12	Send/read memory contents
	01	see p. 18-11	Send/read band stacking register contents
	02	see p. 18-11	Send/read memory keyer contents
	03 ②9	00 to 49	Send/read the selected filter width (AM: 00=200 Hz to 49=10 kHz; Other than AM: 00=50 Hz to 31=2700 Hz/40=3600 Hz)
		00 to 13	Send/read the selected AGC time constant (00=OFF, AM: 01=0.1 sec. to 13=6.0 sec., SSB, CW, RTTY, PSK: 01=0.3 sec. to 13=6.0/8.0 sec.)
	04 ②9	see p. 18-12	Send/read SSB RX HPF/LPF settings
		0002 00 to 10	Send/read SSB RX Tone (Bass) level (00=-5 to 10=+5)
		0003 00 to 10	Send/read SSB RX Tone (Treble) level (00=-5 to 10=+5)
		0004 see p. 18-12	Send/read AM RX HPF/LPF settings
		0005 00 to 10	Send/read AM RX Tone (Bass) level (00=-5 to 10=+5)
		0006 00 to 10	Send/read AM RX Tone (Treble) level (00=-5 to 10=+5)
		0007 see p. 18-12	Send/read FM RX HPF/LPF settings
		0008 00 to 10	Send/read FM RX Tone (Bass) level (00=-5 to 10=+5)
		0009 00 to 10	Send/read FM RX Tone (Treble) level (00=-5 to 10=+5)
		0010 see p. 18-12	Send/read CW RX HPF/LPF settings
		0011 see p. 18-12	Send/read RTTY RX HPF/LPF settings
		0012 see p. 18-12	Send/read PSK RX HPF/LPF settings
		0013 00 to 10	Send/read SSB TX Tone (Bass) level (00=-5 to 10=+5)
		0014 00 to 10	Send/read SSB TX Tone (Treble) level (00=-5 to 10=+5)
		0015 00 to 10	Send/read AM TX Tone (Bass) level (00=-5 to 10=+5)
		0016 00 to 10	Send/read AM TX Tone (Treble) level (00=-5 to 10=+5)
		0017 00 to 10	Send/read FM TX Tone (Bass) level (00=-5 to 10=+5)
		0018 00 to 10	Send/read FM TX Tone (Treble) level (00=-5 to 10=+5)
		0019 see p. 18-13	Send/read SSB TX bandwidth for wide
		0020 see p. 18-13	Send/read SSB TX bandwidth for mid.
		0021 see p. 18-13	Send/read SSB TX bandwidth for narrow
		0022 0000 to 0255	Send/read speech level (0000=0% to 0255=100%)

^{*1} In the CW mode, if the [TRANSMIT] or an external TX switch is ON, or the Break-in function is ON, a message will be transmitted as CW code when you send it from your PC.

^{*2} The power ON command (18 01) is usable only when the transceiver is in the standby mode.

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0023	Send/read CW side tone gain (0000=0% to 0255=100%)
		0024	00 or 01 Send/read CW side tone gain limit (00=OFF, 01=ON)
		0025	00 to 06 Send/read audio output level at APF ON (00=0 dB, 06=+6 dB)
		0026	0000 to 0255 Send/read beep gain (0000=min. to 0255=max.)
		0027	00 or 01 Send/read beep gain limit (00=OFF, 01=ON)
		0028	00 to 30 Send/read headphones output ratio for the volume level (00=-15 dB to 30=+15 dB)
		0029	00 or 01 Send/read headphone output selection (00=separated, 01=mixed)
		0030	00 or 01 Send/read AF/SQL signal output to ACC-A (00=MAIN; 01=SUB)
		0031	00 or 01 Send/read AF/SQL signal output to ACC-B (00=MAIN; 01=SUB)
		0032	00 or 01 Send/read AF/IF signal output to ACC-A (00=AF; 01=IF)
		0033	00 or 01 Send/read the band selection for AF/IF signal output to ACC-A (While holding down [XFC] during split frequency operation) (00=Main band, 01=Sub band)
		0034	0000 to 0255 Send/read AF output level to ACC-A (0000=0% to 0255=100%)
		0035	00 or 01 Send/read squelch function for the AF signal output to ACC-A (00=OFF (Open), 01=ON)
		0036	00 or 01 Send/read voice synthesizer and beep output setting to ACC-A (when audio output is set) (00=OFF, 01=ON)
		0037	0000 to 0255 Send/read IF signal output level to ACC-A (0000=0%, 0255=100%)
		0038	00 or 01 Send/read AF/IF signal output to ACC-B (00=AF; 01=IF)
		0039	00 or 01 Send/read the band selection for AF/IF signal output to ACC-B (While holding down [XFC] during split frequency operation) (00=Main band, 01=Sub band)
		0040	0000 to 0255 Send/read AF output level to ACC-B (0000=0% to 0255=100%)
		0041	00 or 01 Send/read squelch function for the AF signal output to ACC-B (00=OFF (Open), 01=ON)
		0042	00 or 01 Send/read voice synthesizer and beep output setting to ACC-B (when audio output is set) (00=OFF, 01=ON)
		0043	0000 to 0255 Send/read IF signal output level to ACC-B (0000=0%, 0255=100%)
		0044	00 or 01 Send/read AF/IF signal output to S/P DIF (00=AF, 01=IF)
		0045	00 or 01 Send/read the band selection for AF/IF signal output to S/P DIF (While holding down [XFC] during split frequency operation) (00=Main band, 01=Sub band)
		0046	0000 to 0255 Send/read AF output level to S/P DIF (0000=0% to 0255=100%)
		0047	00 or 01 Send/read squelch function for the AF signal output to S/P DIF (00=OFF (Open), 01=ON)
		0048	00 or 01 Send/read voice synthesizer and beep output setting to S/P DIF (when audio output is set) (00=OFF, 01=ON)
		0049	0000 to 0255 Send/read IF signal output level to S/P DIF (0000=0%, 0255=100%)
		0050	00 or 01 Send/read AF/IF signal output to USB B (00=AF, 01=IF)
		0051	00 or 01 Send/read the band selection for AF/IF signal output to USB B (While holding down [XFC] during split frequency operation) (00=Main band, 01=Sub band)
		0052	0000 to 0255 Send/read AF output level to USB B (0000=0% to 0255=100%)

[†] Send/read data

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0053	00 or 01 Send/read squelch function for the AF signal output to USB B (00=OFF (Open), 01=ON)
		0054	00 or 01 Send/read voice synthesizer and beep output setting to USB B (when audio output is set) (00=OFF, 01=ON)
		0055	0000 to 0255 Send/read IF signal output level to USB B (0000=0%, 0255=100%)
		0056	00 or 01 Send/read AF/IF signal output to LAN (00=AF, 01=IF)
		0057	00 or 01 Send/read the band selection for AF/IF signal output to LAN (While holding down [XFC] during split frequency operation) (00>Main band, 01=Sub band)
		0058	0000 to 0255 Send/read MOD input level from ACC-A (0000=0% to 0255=100%)
		0059	0000 to 0255 Send/read MOD input level from ACC-B (0000=0% to 0255=100%)
		0060	0000 to 0255 Send/read MOD input level from S/P DIF (0000=0% to 0255=100%)
		0061	0000 to 0255 Send/read MOD input level from USB B (0000=0% to 0255=100%)
		0062	0000 to 0255 Send/read MOD input level from LAN (0000=0% to 0255=100%)
		0063	00 to 10 Send/read MOD input connector during DATA OFF (00=MIC, 01=ACC-A, 02=ACC-B, 03=MIC/ACC-A, 04=MIC/ACC-B, 05=ACC-A/ACC-B, 06=MIC/ACCA/ACC-B, 07=S/P DIF, 08=USB, 09=LAN, 10=MIC/USB)
		0064	00 to 10 Send/read MOD input connector during DATA1 (00=MIC, 01=ACC-A, 02=ACC-B, 03=MIC/ACC-A, 04=MIC/ACC-B, 05=ACC-A/ACC-B, 06=MIC/ACCA/ACC-B, 07=S/P DIF, 08=USB, 09=LAN, 10=MIC/USB)
		0065	00 to 10 Send/read MOD input connector during DATA2 (00=MIC, 01=ACC-A, 02=ACC-B, 03=MIC/ACC-A, 04=MIC/ACC-B, 05=ACC-A/ACC-B, 06=MIC/ACCA/ACC-B, 07=S/P DIF, 08=USB, 09=LAN, 10=MIC/USB)
		0066	00 to 10 Send/read MOD input connector during DATA3 (00=MIC, 01=ACC-A, 02=ACC-B, 03=MIC/ACC-A, 04=MIC/ACC-B, 05=ACC-A/ACC-B, 06=MIC/ACCA/ACC-B, 07=S/P DIF, 08=USB, 09=LAN, 10=MIC/USB)
		0067	00 to 02 Send/read the band selection for operating frequency band signal output to ACC-A (00=MAIN, 01=SUB, 02=TX)
		0068	00 to 02 Send/read the band selection for operating frequency band signal output to ACC-B (00=MAIN, 01=SUB, 02=TX)
		0069	00 or 01 Send/read relay type selection (00=Reed, 01=MOS-FET)
		0070	00 to 07 Send/read the Main band's external meter output selection (00=Auto, 01=S (Main), 02=Po, 03=SWR, 04=ALC, 05=COMP, 06=VD, 07=ID)
		0071	00 to 07 Send/read the Sub band's external meter output selection (00=Auto, 01=S (Sub), 02=Po, 03=SWR, 04=ALC, 05=COMP, 06=VD, 07=ID)
		0072	0000 to 0255 Send/read the Main band's external meter output level (0000=0% to 0255=100%)
		0073	0000 to 0255 Send/read the Sub band's external meter output level (0000=0% to 0255=100%)
		0074	00 to 02 Send/read reference signal in/out setting (00=IN, 01=OFF, 02=OUT)
		0075	0000 to 0255 Send/read reference signal frequency setting (0000=0% to 0255=100%)
		0076	0000 to 0255 Send/read LCD unit backlight brightness (0000=0% to 0255=100%)
		0077	0000 to 0255 Send/read switch indicator brightness (0000=1 to 0255=100%)

18 CONTROL COMMAND

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0078 00 to 02	Send/read screen image type (00=A, 01=B, 02=50th Anniversary for only IC-7850)
		0079 00 to 08	Send/read frequency readout font (00=Basic (1), 01=Basic (2), 02=Basic (3), 03=Italic (1), 04=Italic (2), 05=Italic (3), 06=Round (1), 07=Round (2), 08=Round (3))
		0080 00 to 02	Send/Read response speed for Standard and Edgewise meter needle (00=Slow, 01=Mid, 02=Fast)
		0081 00 to 02	Send/read meter type (00=Standard, 01=Edgewise, 02=Bar)
		0082 00 or 01	Send/read meter type during expanded screen (00=Edgewise, 01=Bar)
		0083 00 or 01	Send/read peak hold set for Bar meter (00=OFF, 01=ON)
		0084 00 or 01	Send/read memory name indication setting (00=OFF, 01=ON)
		0085 00 or 01	Send/read audio peak filter width popup indication setting (00=OFF, 01=ON)
		0086 00 or 01	Send/read manual notch width pop-up indication setting (00=OFF, 01=ON)
		0087 00 to 03	Send/read screen saver function (00=OFF, 01=15 minutes, 02=30 minutes, 03=60 minutes)
		0088 00 to 03	Send/read screen saver type (00=Bounce, 01=Rotation, 02=Twist, 03=Sleep)
		0089 00 or 01	Send/read output signal setting for external display (00=OFF, 01=ON)
		0090 00 or 01	Send/read flame rate shift setting for external display (00=OFF, 01=ON)
		0091 00 or 01	Send/read image resolution for external display (00=800x480, 01=800x600)
		0092 00 or 01	Send/read synchronous pulse level setting (00=L, 01=H)
		0093 00 or 01	Send/read opening message indication (00=OFF, 01=ON)
		0094 see p. 18-12	Send/read opening message contents (up to 10-character)
		0095 20000101 to 20991231	Send/read date (20000101=1st Jan. 2000 to 20991231=31st Dec. 2099)
		0096 0000 to 2359	Send/read time (0000=00:00 to 2359=23:59)
		0097 00 or 01	Send/read NTP (Network Time Protocol) function setting (00=OFF, 01=ON)
		0098 see p. 18-12	Send/read NTP server address setting
		0099 see p. 18-11	Send/read UTC offset time
		0100 00 or 01	Send/read CLOCK2 function (00=OFF, 01=ON)
		0101 see p. 18-11	Send/read UTC offset time for CLOCK2
		0102 see p. 18-12	Send/read CLOCK2 name (up to 3-character)
		0103 00 or 01	Send/read calibration marker (00=OFF, 01=ON)
		0104 00 or 01	Send/read confirmation beep (00=OFF, 01=ON)
		0105 00	Send/read the band edge beep OFF
		01	Send/read the band edge beep ON (Beep sounds with a default amateur band)
		02	Send/read the band edge beep with user setting ON
		03	Send/read the band edge beep with user setting/TX limit ON
		0106 0050 to 0200	Send/read the Main band's beep audio frequency (0050=500 Hz to 0200=2000 Hz)
		0107 0050 to 0200	Send/read the Sub band's beep audio frequency (0050=500 Hz to 0200=2000 Hz)
		0108 00 or 01	Send/read TX output power limit function (00=OFF, 01=ON)

[†] Send/read data

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0109 00 to 05	Send/read the TX Delay setting (HF) (00=OFF, 01=10 ms, 02=15 ms, 03=20 ms, 04=25 ms, 05=30 ms)
		0110 00 to 05	Send/read the TX Delay setting (50 MHz) (00=OFF, 01=10 ms, 02=15 ms, 03=20 ms, 04=25 ms, 05=30 ms)
		0111 00 to 05	Send/read TOT setting for remote or the [TRANSMIT] key operation (00=OFF, 01=3 minutes, 02=5 minutes, 03=10 minutes, 04=20 minutes, 05=30 minutes)
		0112 00 or 01	Send/read quick dualwatch function (00=OFF, 01=ON)
		0113 00 or 01	Send/read quick split set (00=OFF, 01=ON)
		0114 see p. 18-12	Send/read FM split offset -9.999 to +9.999 MHz for HF
		0115 see p. 18-12	Send/read FM split offset -9.999 to +9.999 MHz for 50 MHz
		0116 00 or 01	Send/read split lock set (00=OFF, 01=ON)
		0117 00 or 01	Send/read tuner auto start set (00=OFF, 01=ON)
		0118 00 or 01	Send/read PTT tune set (00=OFF, 01=ON)
		0119 00 or 01	Send/read transverter set (00=OFF, 01=ON)
		0120 see p. 18-12	Send/read transverter offset
		0121 00 to 02	Send/read RTTY mark frequency (00=1275 Hz, 01=1615 Hz, 02=2125 Hz)
		0122 00 to 02	Send/read RTTY shift width (00=170 Hz, 01=200 Hz, 02=425 Hz)
		0123 00 or 01	Send/read RTTY keying polarity (00=Normal, 01=Reverse)
		0124 00 to 02	Send/read PSK tone frequency (00=1000 Hz, 01=1500 Hz, 02=2000 Hz)
		0125 00 or 01	Send/read speech language (00=English, 01=Japanese)
		0126 00 or 01	Send/read speech speed (00=Low, 01=High)
		0127 00 or 01	Send/read S-level speech (00=OFF, 01=ON)
		0128 00 or 01	Send/read speech with a mode switch operation (00=OFF, 01=ON)
		0129 00 or 01	Send/read memo pad numbers (00=5 ch, 01=10 ch)
		0130 00 or 01	Send/read [MAIN DIAL] function (00=MAIN, 01=MAIN+SUB)
		0131 00 to 02	Send/read [MAIN DIAL] auto TS (00=OFF, 01=Low, 02=High)
		0132 00 to 02	Send/read [SUB DIAL] auto TS (00=OFF, 01=Low, 02=High)
		0133 00 or 01	Send/read mic. up/down speed (00=Low, 01=High)
		0134 00 or 01	Send/read quick RIT/ΔTX clear function (00=OFF, 01=ON)
		0135 00 to 02	Send/read SSB notch operation (00=Auto, 01=Manual, 02=Auto/Manual)
		0136 00 to 02	Send/read AM notch operation (00=Auto, 01=Manual, 02=Auto/Manual)
		0137 00 or 01	Send/read DIGI-SEL control function (00=DIGI-SEL, 01=APF)
		0138 00 or 01	Send/read band indication for Filter screen (00=Fix, 01=Auto)
		0139 00 or 01	Send/read SSB/CW synchronous tuning function (00=OFF, 01=ON)
		0140 00 or 01	Send/read CW normal side set (00=LSB, 01=USB)
		0141 00 or 01	Set/read APF type (00=SHARP, 01=SOFT)
		0142 00 or 01	Send/read band setting for audio output from mic. connector (00=MAIN+SUB, 01=SUB)
		0143 00 or 01	Send/read bias voltage output for mic. audio input ([MIC]; pin 1) (00=OFF, 01=ON)
		0144 00 or 01	Send/read external keypad set for RTTY memory (00=OFF, 01=ON)
		0145 00 or 01	Send/read external keypad set for PSK memory (00=OFF, 01=ON)
		0146 00 or 01	Send/read the voice memory transmission set for [F1] to [F8] on the keyboard (00=OFF, 01=ON)

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0147	Send/read the memory keyer transmission set for [F1] to [F8] on the keyboard (00=OFF, 01=ON)
		0148	Send/read external keypad set for voice memory (00=OFF, 01=ON)
		0149	Send/read external keypad set for memory keyer (00=OFF, 01=ON)
		0150	Send/read screen capture by the [POWER] switch (00=OFF, 01=ON)
		0151	Send/read screen capture by the [Print Screen] key on the keyboard (00=OFF, 01=ON)
		0152	Send/read captured screen image data saving memory device (00=SD card, 01=USB flash drive)
		0153	Send/read screen capture image data saving format (00=PNG format, 01=BMP format)
		0154	Send/read the Shutdown function (00=Shutdown, 01=Standby/Shutdown)
		0155	Send/read CI-V transceive set (00=OFF, 01=ON)
		0156	Send/read the transceive CI-V Address for LAN to REMOTE in hexadecimal code (0000=00h to 0223=Dfh)
		0157	Send/read antenna controller status (frequency, and so on) data output from [REMOTE] (00=OFF, 01=ON)
		0158	Send/read echo back setting for CI-V operation (00=OFF, 01=ON)
		0159	Send/read data transfer speed for RTTY or PSK decode output from USB B (00=4800 bps, 01=9600 bps, 02=19200 bps, 03=38400 bps)
		0160	Send/read transmission control line setting for USB B (00=OFF, 01=USB1 DTR, 02=USB1 RTS, 03=USB2 DTR, 04=USB2 RTS) *Different line must be set from both CW keying and RTTY (FSK)
		0161	Send/read CW keying line setting for USB B (00=OFF, 01=USB1 DTR, 02=USB1 RTS, 03=USB2 DTR, 04=USB2 RTS) *Different line must be set from transmission control
		0162	Send/read RTTY (FSK) line setting for USB B (00=OFF, 01=USB1 DTR, 02=USB1 RTS, 03=USB2 DTR, 04=USB2 RTS) *Different line must be set from transmission control
		0163	Send/read keyboard type (00=English, 01=Japanese, 02=United Kingdom, 03=French, 04=French (Canadian), 05=German, 06=Portuguese, 07=Portuguese (Brazilian), 08=Spanish, 09=Spanish (Latin American), 10=Italian)
		0164	Send/read keyboard repeat delay (0010=100 msec., 0100=1000 msec.; 50 msec. steps)
		0165	Send/read keyboard repeat rate (00=2.0 cps to 31=30.0 cps)
		0166	Send/read mouse pointer speed (00=Slow, 01=Mid, 02=Fast)
		0167	Send/read mouse pointer speed acceleration (00=OFF, 01=ON)
		0168	Send/read DHCP client setting (auto IP address setting using DHCP server) (00=OFF, 01=ON)
		0169	Send/read IP address setting (fixed setting) (0000000000000001 (0.0.0.1) to 0255025502550254 (255.255.255.254)) *Usable when the DHCP client setting is OFF

[†] Send/read data

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0170	Read the IP address set by the DHCP server (0000000000000001 (0.0.0.1) to 0255025502550254 (255.255.255.254)) *If the DHCP client setting is OFF, sends back the manually set IP address (fixed IP address)
		0171	Send/read subnet mask (01=128.0.0 to 30=255.255.255.252)
		0172	Send/read default gateway (0000000000000001 (0.0.0.1) to 0255025502550254 (255.255.255.254), FF=Blank) *Usable when the DHCP client setting is OFF
		0173	Send/read primary DNS (Domain Name System) server address (0000000000000001 (0.0.0.1) to 0255025502550254 (255.255.255.254), FF=Blank) *Usable when the DHCP client setting is OFF
		0174	Send/read secondly DNS (Domain Name System) server address (0000000000000001 (0.0.0.1) to 0255025502550254 (255.255.255.254), FF=Blank) *Usable when the DHCP client setting is OFF
		0175	see p. 18-12 Send/read network name when remotely operating using the optional RS-BA1 (up to 15-character)
		0176	Send/read the remote control setting (00=OFF, 01=ON)
		0177	Send/read the control port setting by accessing from internet (000001=1 to 065535=65535)
		0178	Send/read the serial port setting by accessing from internet (000001=1 to 065535=65535)
		0179	Send/read the audio port setting by accessing from internet (000001=1 to 065535=65535)
		0180	Send/read the internet access line setting (00=FTTH (Fiber To The Home), 01=ADSL/CATV)
		0181	see p. 18-12 Send/read Network radio name (up to 16-character)
		0182	Send/read scope indication during TX (00=OFF, 01=ON)
		0183	Send/read scope max. hold (00=OFF, 01=ON)
		0184	Send/read scope center frequency set (00=Filter center, 01=Carrier point center, 02=Carrier point center (Abs. Freq.))
		0185	Send/read scope marker position setting during fix type scope (00=Filter center, 01 Carrier point)
		0186	Send/read external monitor signal width (00=Narrow, 01=Wide)
		0187	Send/read averaging function for spectrum scope (00=OFF, 01=Averaging the two observations, 02=Averaging the three observations, 03=Averaging the four observations)
		0188	Send/read spectrum display type (00=Fill, 01=Fill+Line)
		0189	see p. 18-12 Send/read spectrum fill color
		0190	see p. 18-12 Send/read spectrum line color
		0191	see p. 18-12 Send/read spectrum color for peak hold
		0192	Send/read waterfall set for spectrum scope (00=OFF, 01=ON)
		0193	Send/read waterfall speed (00=Slow, 01=Mid, 02=Fast)
		0194	Send/read waterfall height when expanded scope is selected (00=Small, 01=Mid, 02=Larger)

18 CONTROL COMMAND

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0195	00 to 09 Send/read peak color level set for waterfall of the spectrum scope (00=Grid 1, 01=Grid 2, 02=Grid 3, 03=Grid 4, 04=Grid 5, 05=Grid 6, 06=Grid 7, 07=Grid 8, 08=Grid 9, 09=Grid 10)
		0196	00 or 01 Send/read the Main and Sub scope screen arrangement during dual scope (00=Up and down, 01=Left and right)
		0197	00 or 01 Send/read the Main/Sub scope access setting linked to the [MAIN]/[SUB] key operation (00=OFF, 01=ON)
		0198	see p. 18-12 Send/read scope edge 1 frequencies for 0.03 to 1.60 MHz band
		0199	see p. 18-12 Send/read scope edge 2 frequencies for 0.03 to 1.60 MHz band
		0200	see p. 18-12 Send/read scope edge 3 frequencies for 0.03 to 1.60 MHz band
		0201	see p. 18-12 Send/read scope edge 1 frequencies for 1.60 to 2.00 MHz band
		0202	see p. 18-12 Send/read scope edge 2 frequencies for 1.60 to 2.00 MHz band
		0203	see p. 18-12 Send/read scope edge 3 frequencies for 1.60 to 2.00 MHz band
		0204	see p. 18-12 Send/read scope edge 1 frequencies for 2.00 to 6.00 MHz band
		0205	see p. 18-12 Send/read scope edge 2 frequencies for 2.00 to 6.00 MHz band
		0206	see p. 18-12 Send/read scope edge 3 frequencies for 2.00 to 6.00 MHz band
		0207	see p. 18-12 Send/read scope edge 1 frequencies for 6.00 to 8.00 MHz band
		0208	see p. 18-12 Send/read scope edge 2 frequencies for 6.00 to 8.00 MHz band
		0209	see p. 18-12 Send/read scope edge 3 frequencies for 6.00 to 8.00 MHz band
		0210	see p. 18-12 Send/read scope edge 1 frequencies for 8.00 to 11.00 MHz band
		0211	see p. 18-12 Send/read scope edge 2 frequencies for 8.00 to 11.00 MHz band
		0212	see p. 18-12 Send/read scope edge 3 frequencies for 8.00 to 11.00 MHz band
		0213	see p. 18-12 Send/read scope edge 1 frequencies for 11.00 to 15.00 MHz band
		0214	see p. 18-12 Send/read scope edge 2 frequencies for 11.00 to 15.00 MHz band
		0215	see p. 18-12 Send/read scope edge 3 frequencies for 11.00 to 15.00 MHz band
		0216	see p. 18-12 Send/read scope edge 1 frequencies for 15.00 to 20.00 MHz band
		0217	see p. 18-12 Send/read scope edge 2 frequencies for 15.00 to 20.00 MHz band
		0218	see p. 18-12 Send/read scope edge 3 frequencies for 15.00 to 20.00 MHz band
		0219	see p. 18-12 Send/read scope edge 1 frequencies for 20.00 to 22.00 MHz band
		0220	see p. 18-12 Send/read scope edge 2 frequencies for 20.00 to 22.00 MHz band
		0221	see p. 18-12 Send/read scope edge 3 frequencies for 20.00 to 22.00 MHz band
		0222	see p. 18-12 Send/read scope edge 1 frequencies for 22.00 to 26.00 MHz band
		0223	see p. 18-12 Send/read scope edge 2 frequencies for 22.00 to 26.00 MHz band
		0224	see p. 18-12 Send/read scope edge 3 frequencies for 22.00 to 26.00 MHz band
		0225	see p. 18-12 Send/read scope edge 1 frequencies for 26.00 to 30.00 MHz band
		0226	see p. 18-12 Send/read scope edge 2 frequencies for 26.00 to 30.00 MHz band
		0227	see p. 18-12 Send/read scope edge 3 frequencies for 26.00 to 30.00 MHz band
		0228	see p. 18-12 Send/read scope edge 1 frequencies for 30.00 to 45.00 MHz band

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0229	see p. 18-12 Send/read scope edge 2 frequencies for 30.00 to 45.00 MHz band
		0230	see p. 18-12 Send/read scope edge 2 frequencies for 30.00 to 45.00 MHz band
		0231	see p. 18-12 Send/read scope edge 1 frequencies for 45.00 to 60.00 MHz band
		0232	see p. 18-12 Send/read scope edge 2 frequencies for 45.00 to 60.00 MHz band
		0233	see p. 18-12 Send/read scope edge 3 frequencies for 45.00 to 60.00 MHz band
		0234	00 or 01 Send/read the voice 1st menu. (00=VOICE-Root, 01=VOICE-PLAY)
		0235	00 or 01 Send/read the auto monitor function setting when transmitting a recorded voice memory (00=OFF, 01=ON)
		0236	01 to 15 Send/read the repeat interval to transmit the recorded voice audio (01=1 sec. to 15=15 sec.)
		0237	00 or 01 Send/read the QSO recording device setting (00=SD card, 01=USB flash drive)
		0238	00 or 01 Send/read the recording mode. (00=TX&RX, 01=RX Only)
		0239	00 or 01 Send/read recording TX audio for the QSO recorder (00=Microphone audio, 01=TX monitor audio)
		0240	00 or 01 Send/read the squelch relation to recording RX audio for the QSO recorder (00=Always, 01=Squelch Auto)
		0241	00 or 01 Send/read the QSO record file split function setting (00=OFF, 01=ON)
		0242	00 or 01 Send/read the PTT Automatic Recording function setting (00=OFF, 01=ON)
		0243	00 to 03 Send/read the RX audio recording status for the PTT Automatic Recording function (00=OFF (records no RX audio), 01=Records the RX audio just before 5 sec., 02=Records the RX audio just before 10 sec., 03=Records the RX audio just before 15 sec.)
		0244	00 to 03 Send/read QSO PLAY Skip time (00=3 sec., 01=5 sec., 02=10 sec., 03=30 sec.)
		0245	05 to 30 Send/read the instant record time when [REC] is pushed (05=5 sec. to 30=30 sec.)
		0246	03 to 10 Send/read the instant playback time when [PLAY] is pushed (03=3 sec. to 10=10 sec.)
		0247	00 Normal selection for contest number style 01 "190→ANO" selection for contest number style 02 "190→ANT" selection for contest number style 03 "90→NO" selection for contest number style 04 "90→NT" selection for contest number style
		0248	01 to 08 Send/read count up trigger channel (01=M1, 02=M2, 03=M3, 04=M4, 05=M5, 06=M6, 07=M7, 08=M8)
		0249	0001 to 9999 Send/read present number (0001=1 to 9999=9999)
		0250	01 to 60 Send/read CW keyer repeat time (01=1 sec. to 60=60 sec.)
		0251	28 to 45 Send/read CW keyer dot/dash ratio (28=1:1:2.8 to 45=1:1:4.5)
		0252	00 to 03 Send/read rise time (00=2 msec., 01=4 msec., 02=6 msec., 03=8 msec.)
		0253	00 or 01 Send/read paddle polarity (00=Normal, 01=Reverse)
		0254	00 to 02 Send/read keyer type (00=Straight, 01=Bug-key, 02=ELEC-Key)
		0255	00 or 01 Send/read mic. up/down keyer set (00=OFF, 01=ON)

[†] Send/read data

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0256	Send/read averaging function for RTTY FFT scope (00=OFF, 01=Averaging the two observations, 02=Averaging the three observations, 03=Averaging the four observations)
		0257	see p. 18-12 Send/read RTTY FFT scope waveform color
		0258	00 or 01 Send/read RTTY decode USOS (00=OFF, 01=ON)
		0259	00 or 01 Send/read RTTY decode new line code (00=CR,LF,CR+LF, 01=CR+LF)
		0260	00 to 02 Send/read RTTY diddle (00=OFF, 01=Blank, 02=LTRS (Letter code))
		0261	00 or 01 Send/read RTTY TX USOS (00=OFF, 01=ON)
		0262	00 or 01 Send/read RTTY auto CR+LF by TX using the [F12] key on the keyboard (00=OFF, 01=ON)
		0263	00 or 01 Send/read RTTY time stamp set (00=OFF, 01=ON)
		0264	00 or 01 Send/read clock selection for RTTY time stamp (0=Local time, 1=CLOCK2)
		0265	00 or 01 Send/read RTTY frequency stamp (00=OFF, 01=ON)
		0266	see p. 18-12 Send/read received RTTY text font color
		0267	see p. 18-12 Send/read transmitted RTTY text font color
		0268	see p. 18-12 Send/read RTTY time stamp text font color
		0269	see p. 18-12 Send/read text font color in RTTY TX buffer
		0270	00 or 01 Send/read the RTTY log function (00=OFF, 01=ON)
		0271	00 or 01 Send/read the file saving format for the RTTY log (00=Text, 01=HTML)
		0272	00 or 01 Send/read the file saving memory device for the RTTY log (00=SD card, 01=USB flash drive)
		0273	00 to 03 Send/read averaging function for PSK FFT scope (00=OFF, 01=Averaging the two observations, 02=Averaging the three observations, 03=Averaging the four observations)
		0274	see p. 18-12 Send/read PSK FFT scope waveform color
		0275	00 or 01 Set/read PSK AFC function tuning range (00=±8 Hz, 01=±15 Hz)
		0276	00 or 01 Send/read PSK time stamp set (00=OFF, 01=ON)
		0277	00 or 01 Send/read clock selection for PSK time stamp (0=Local time, 1=CLOCK2)
		0278	00 or 01 Send/read PSK frequency stamp (00=OFF, 01=ON)
		0279	see p. 18-12 Send/read received PSK text font color
		0280	see p. 18-12 Send/read transmitted PSK text font color
		0281	see p. 18-12 Send/read PSK time stamp text font color
		0282	see p. 18-12 Send/read text font color in PSK TX buffer
		0283	00 or 01 Send/read the PSK log function (00=OFF, 01=ON)
		0284	00 or 01 Send/read the file saving format for the PSK log (00=Text, 01=HTML)
		0285	00 or 01 Send/read the file saving memory device for the PSK log (00=SD card, 01=USB flash drive)
		0286	00 or 01 Send/read scan speed (00=Low, 01=High)
		0287	00 or 01 Send/read scan resume (00=OFF, 01=ON)
		0288	00 or 01 Send/read audio FFT scope display type (00=Fill, 01=Fill+Line)
		0289	see p. 18-12 Send/read the Audio FFT scope waveform color
		0290	00 or 01 Send/read the Audio FFT scope waterfall display (00=OFF, 01=ON)
		0291	see p. 18-12 Send/read the Audio Oscilloscope scope waveform color
		0292	see p. 18-13 Send/read antenna selection for 0.03 to 1.60 MHz band

[†] Send/read data, ^㉙ Command 29 supported

Cmd.	Sub Cmd.	Data	Description
1A [†]	05	0293	see p. 18-13 Send/read antenna selection for 1.60 to 2.00 MHz band
		0294	see p. 18-13 Send/read antenna selection for 2.00 to 6.00 MHz band
		0295	see p. 18-13 Send/read antenna selection for 6.00 to 8.00 MHz band
		0296	see p. 18-13 Send/read antenna selection for 8.00 to 11.00 MHz band
		0297	see p. 18-13 Send/read antenna selection for 11.00 to 15.00 MHz band
		0298	see p. 18-13 Send/read antenna selection for 15.00 to 20.00 MHz band
		0299	see p. 18-13 Send/read antenna selection for 20.00 to 22.00 MHz band
		0300	see p. 18-13 Send/read antenna selection for 22.00 to 26.00 MHz band
		0301	see p. 18-13 Send/read antenna selection for 26.00 to 30.00 MHz band
		0302	see p. 18-13 Send/read antenna selection for 30.00 to 45.00 MHz band
		0303	see p. 18-13 Send/read antenna selection for 45.00 to 60.00 MHz band
		0304	00 or 01 Send/read antenna temporary memory set (00=OFF, 01=ON)
		0305	00 to 02 Send/read antenna selection (00=[ANT]: Auto/[RX-I/O]: Auto, 01=[ANT]: Auto/[RX-I/O]: Manual, 02=[ANT]: Manual/[RX-I/O]: Manual)
		0306	00 or 01 Send/read usage for ANT2 (00=OFF, 01=TX/RX)
		0307	00 or 01 Send/read usage for ANT3 (00=OFF, 01=TX/RX)
		0308	00 to 02 Send/read usage for ANT4 (00=OFF, 01=TX/RX, 02= RX)
		0309	00 to 20 Send/read VOX delay (00=0. sec. to 20=2.0 sec.)
		0310	00 to 03 Send/read VOX voice delay (00=OFF, 01=Short, 02=Mid., 03=Long)
		0311	00 to 09 Send/read NB depth (00=1 to 09=10)
		0312	0000 to 0255 Send/read NB width (0000=1 to 0255=100)
		0313	00 or 01 Read the CI-V command link setting with [REMOTE] for USB port 00=Link to [REMOTE], 01=Unlink from [REMOTE]
		0314	00 or 01 MAIN/SUB band Tracking function is enable or disabled. 00=MAIN/SUB Tracking function is disabled. 01=Assigns the function to the [MAIN] key
		0315	00 or 01 Send/read the Waterfall Marker Auto-hide set (00=OFF, 01=ON)
		0316	00 or 01 Send/read the RC-28's main dial function. (00=Sub only, 01=Main/Sub)
		0317	00 to 02 Send/read the Auto TS setting on the RC- 28's main dial. (00=OFF, 01=Low, 02=High)
		0318	00 or 01 Send/read the [TRANSMIT] key action on the RC-28. (00=Push to toggle, 01=Hold down to transmit)
		0319	0000 to 0255 Send/read the Transmit voice level for the VOICE TX function. (0000=0% to 0255=100%)
		0320	see p. 18-13 Send/read the transmission passband width for the SSB-D mode.
		0321	00/01 Send/read the timer setting of the USB SEND/Keying Inhibit at Connection. (00=OFF, 01=ON)
06		see p. 18-12	Send/read DATA mode with filter set
07 ^㉙	00 or 01		Send/read 1.2 kHz filter calibration (00=Stop, 01=Start)
08 ^㉙	00 to 02		Read 1.2 kHz filter calibration result (00=Calibrating, or has not been calibrated after Power ON, 01=Succeeded, 02=Failed)
09 ^㉙	0000 to 0440		Send/read 1.2 kHz filter calibration adjusted value (0000=0% to 0440=100%)

18 CONTROL COMMAND

◊ Command table (continued)

Cmd.	Sub Cmd.	Data	Description
1A [†]	0A	see p. 18-13	Send/read limited TX output power level for the TX power limit function
	0B	00 or 01	Send/read NTP server access (00=Stop, 01=Start)
	0C	00 to 02	Read NTP server access result (00=Accessing, or has not been accessed after Power ON, 01=Succeeded, 02=Failed)
1B [†]	00	see p. 18-13	Send/read repeater tone frequency
	01	see p. 18-13	Set/read TSQL tone frequency
1C [†]	00	00	Send/read transceiver's status (RX) *When "CI-V Output (for ANT)" (Command: 1C 04) is set to "ON," automatically outputs when changed.
	01		Send/read transceiver's status (TX) *When "CI-V Output (for ANT)" (Command: 1C 04) is set to "ON," automatically outputs when changed.
	01	00	Send/read the antenna tuner OFF (through)
	01		Send/read the antenna tuner ON
	02	00	Send/read to tuning
	02	00	Send/read transmit frequency monitor setting OFF
	02	01	Send/read transmit frequency monitor setting ON
	03	see p. 18-11	Read transmit frequency *When "CI-V Output (for ANT)" (Command: 1C 04) is set to "ON," automatically outputs when changed.
	04	00	Send/read command to disable to output the antenna controller status (frequency and so on) from [REMOTE]
	04	01	Send/read command to enable to output the antenna controller status (frequency and so on) from [REMOTE]
	00		Read number of available TX frequency band
	01	see p. 18-13	Read TX band edge frequencies
	02		Read number of user-set TX frequency band
	03	see p. 18-13	Send/read user-set TX band edge frequencies
21	00	see p. 18-13	Send/read RIT frequency
	01	00 or 01	Send/read RIT setting (00=OFF, 01=ON)
	02	00 or 01	Send/read ΔTX setting (00=OFF, 01=ON)
25		see p. 18-14	Send/read the Main or Sub band frequency
26		see p. 18-14	Send/read the selected operating mode and filter

Cmd.	Sub Cmd.	Data	Description
27	00	see p. 18-15	Read the Scope waveform data *Only when "Scope ON/OFF status" (Command: 27 10) and "Scope data output" (Command: 27 20) are set to "ON," outputs the waveform data to the controller.
10		00 or 01	Send/read the Scope ON/OFF status (00=Scope OFF, 01=Scope ON)
11		00 or 01	Send/read the Scope data output (00=Output OFF, 01=Output ON) *Only when "CI-V USB Port" is set to "Unlink from [REMOTE]" and "CI-V USB Baud Rate" is set to 115200 (bps), "Output ON" is selectable.
12		00 or 01	Send/read the Main or Sub scope setting (00=Main scope, 01=Sub scope)
13		00 or 01	Send/read the Single/Dual scope setting (00=Single scope, 01=Dual scope)
14		see p. 18-15	Send/read the Scope Center mode or Fixed mode setting
15		see p. 18-15	Send/read the span setting in the Center mode Scope
16		see p. 18-15	Send/read the Edge number setting in the Fixed mode Scope
17		see p. 18-15	Send/read the Scope hold function ON or OFF
18		see p. 18-16	Send/read the Scope Attenuator setting
19		see p. 18-16	Send/read the Scope Reference level setting
1A		see p. 18-16	Send/read the Sweep speed setting
1B		00 or 01	Send/read the Scope indication during TX in the Center mode (00=OFF, 01=ON)
1C		00 to 02	Send/read scope center frequency setting in the Center mode (00=Filter center, 01=Carrier point center, 02=Carrier point center (Abs. Freq.))
1D		see p. 18-16	Send/read the Scope VBW setting
1E		see p. 18-16	Send/read the Scope Fixed edge frequencies
28	00	00 to 08	Transmits the Voice TX memory content (00=T1 to 08=T8, 0x00=Cancel TX)
29 [†]		00/01 + Supported commands see p. 18-16	Regardless of active/inactive the Main or Sub band, you can directly specify the Main or Sub band, and send/read the supported command settings. (00=MAIN, 01=SUB)

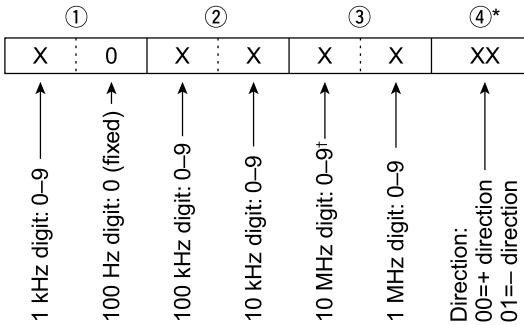
[†] Send/read data, ② Command 29 supported

18 CONTROL COMMAND

◊ Data content description (continued)

- **Offset frequency settings**

Command: 1A 050114, 050115, 050120

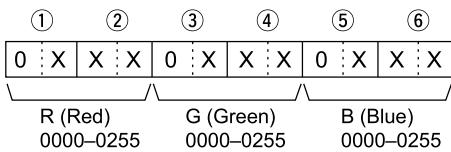


*No need to enter for transverter offset frequency setting.

†Transverter offset only, fix to '0' for split offset setting.

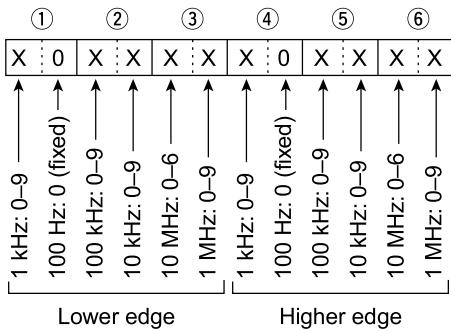
- **Color settings**

Command: 1A 050189, 050190, 050191, 050257, 050266, 050267, 050268, 050269, 050274, 050279, 050280, 050281, 050282, 050289, 050291



- **Bandscope edge frequency settings**

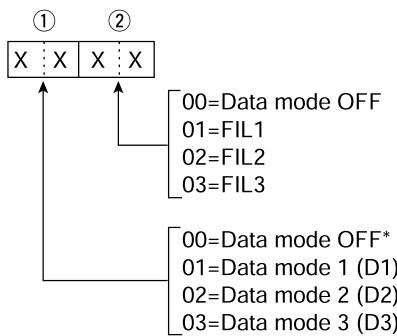
Command: 1A 050198~050233



Lower edge Higher edge

- **Data mode with filter width settings**

Command: 1A 06



* When "00" is set, set "00" in ②

- **Codes for the memory name, opening message, NTP server address, CLOCK2 name, network name, and network radio name contents**

- **Character codes— Letters**

Character	ASCII code	Character	ASCII code
A-Z	41-5A	a-z	61-7A

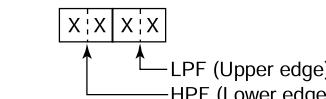
- **Character codes— Symbols**

Character	ASCII code	Character	ASCII code
!	21	#	23
\$	24	%	25
&	26	\	5C
?	3F	"	22
,	27	,	60
^	5E	+	2B
-	2D	*	2A
/	2F	.	2E
,	2C	:	3A
;	3B	=	3D
<	3C	>	3E
(28)	29
[5B]	5D
{	7B	}	7D
_	7C	—	5F
@	7E	@	40

Command	Set item/usable characters
1A 00	Memory name All characters are usable.
1A 050094	Opening message Upper case letters, numbers, some symbols (- / . @) and space are usable.
1A 050098	NTP server address Upper and lower case letters, numbers, and some symbols (. _) are usable.
1A 050102	CLOCK2 name All characters are usable.
1A 05 0175	Network name Upper case letters, numbers, and some symbols (! # \$ % & & ^ + - . , ; = () [] { } _ @) are usable.
1A 05 0181	Network radio name Upper and lower case letters, numbers, some symbols (! # \$ % & & ^ + - * / . , : ; = < > () [] { } ! _ @) and space are usable.

- **RX HPF/LPF setting for each operating mode**

Command: 1A 050001, 050004, 050007, 050010, 050011, 050012

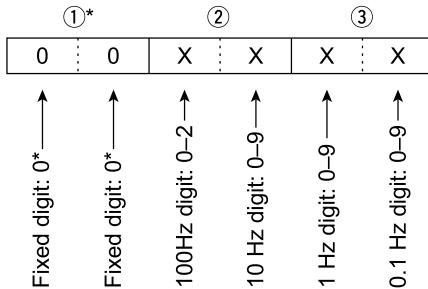


HPF
00: Through
01~20: 100~2000 Hz
25: Through

LPF
05~24: 500~2400 Hz

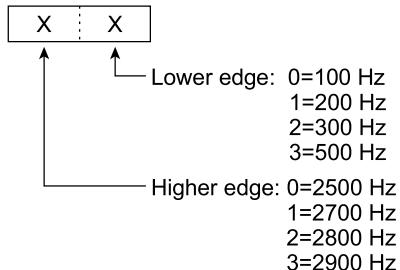
*The value of the HPF should be smaller than the LPF.

• Repeater tone/tone squelch frequency settings
Command: 1B 00, 1B 01



*Not necessary when setting a frequency.

• SSB/SSB-D transmission passband width settings
Command: 1A 050019, 050020, 050021, 050320

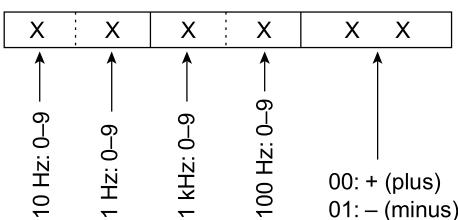


• Antenna memory settings
Command: 1A 050292~050303

Data	Antenna selection	
	for TX	for RX
00		ANT1
01		ANT2
02		ANT3
03		ANT4
04*	ANT1	ANT4
05*	ANT2	ANT4
06*	ANT3	ANT4

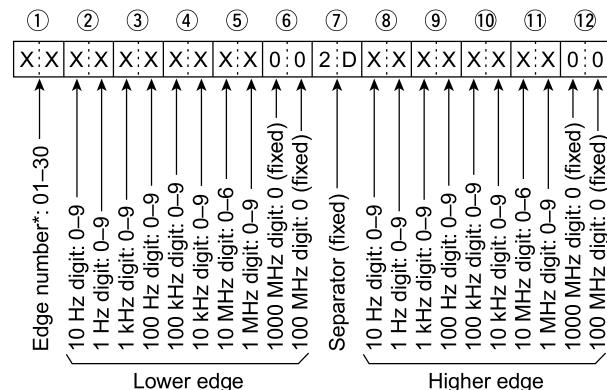
**RX" should be selected for ANT4.

• RIT frequency settings
Command: 21 00



• Band edge frequency settings

Command: 02*, 1E 01, 1E 03



*Edge number setting is not necessary with command 02.

• Codes for CW message contents

Command: 17 Up to 30 characters

To send CW messages, the following character codes are used.

Character	ASCII code	Character	ASCII code
0-9	30-39	,	27
A-Z	41-5A	(28
a-z	61-7A)	29
/	2F	=	3D
?	3F	+	2B
.	2E	"	22
-	2D	@	40
,	2C	Space	20
:	3A		

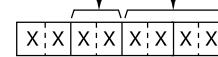
• "FF" stops sending CW messages.

• "^" is used to transmit a string of characters with no inter-character space.

• Transmit output power settings for transmit output power limiting

Command: 1A 0A

01: DATA OFF Output power limit
02: DATA ON 0005: 5 W~0200: 200 W



Frequency band code

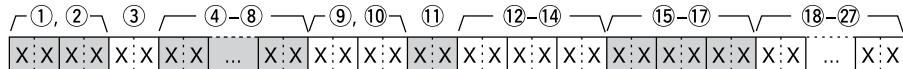
01: 1.8 MHz 07: 18 MHz
02: 3.5 MHz 08: 21 MHz
03: 5 MHz 09: 24 MHz
04: 7 MHz 10: 28 MHz
05: 10 MHz 11: 50 MHz
06: 14 MHz

18 CONTROL COMMAND

◊ Data content description (continued)

• **Memory content setting**

Command: 1A 00



①, ② **Memory channel numbers**

0001~0099: Memory channel 1 to 99

0100: Programmed scan edge P1

0101: Programmed scan edge P2

To clear the memory channel contents, add the code "FF" after the memory channel number.
(instead of the data ③ to ⑦)

This completes the memory clearing.

③ **Select memory setting**

00: OFF

01: ★1

02: ★2

03: ★3

④~⑧ **Operating frequency setting**

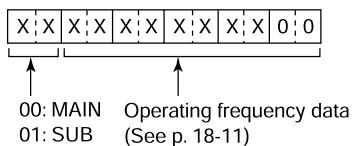
See "• Operating frequency."

⑨, ⑩ **Operating mode setting**

See "• Operating mode."

• **Main or Sub band's frequency settings**

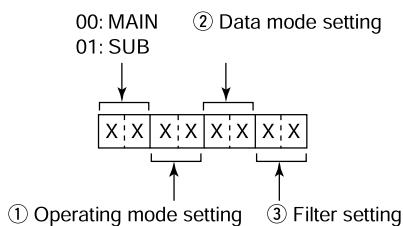
Command : 25



• **Main or Sub band's operating mode and filter settings**

Command : 26

Both data and filter settings can be skipped. In that case, "DATA OFF" and the default filter setting of the operating mode is automatically selected.

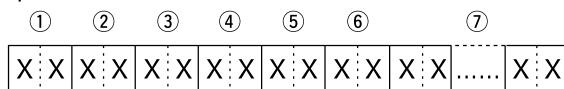


① Operating mode	② Data mode	③ Filter
00: LSB	05: FM	00: Data mode OFF
01: USB	07: CW-R	01: Data mode 1 (D1)
02: AM	08: RTTY-R	02: Data mode 2 (D2)
03: CW	12: PSK	03: Data mode 3 (D3)
04: RTTY	13: PSK-R	

• Scope waveform data

Command: 27 00

Outputs the waveform data to the controller



① Main or Sub scope data

- 00=Main scope, 01=Sub scope

② Order of division data (Current)

③ Division number (01 or 15)

When data is sent to the controller through the LAN port, all data is sent together. However, when the data is sent through the USB port, the data is divided by 15 and sent in sequential order.

	Division number	Data length	
LAN	1	704	
USB	15	1st data	15
		2nd or later data	53
		15th data	42

The 1st data sends only the wave information (① ~ ⑥) without the waveform data (⑦).

The 2nd or later data sends the minimum wave information (① ~ ③) with waveform data (⑦).

④ Center or Fixed mode data

- 00 = Center mode scope, 01 = Fixed mode scope

⑤ Waveform information

The waveform information is different between Center mode and fixed mode.

- In the Center mode: Center frequency and span are sent

See page 18-11 for Frequency data, and the Scope span settings to the right.

- In the Fixed mode: Lower edge and higher edge frequencies are sent

See page 18-16 for Scope Fixed edge frequency settings ③ ~ ⑫.

⑥ Out of range information

- 00 = In range, 01 = Out of range

If the scope data is out of range, the waveform data (⑦) is omitted.

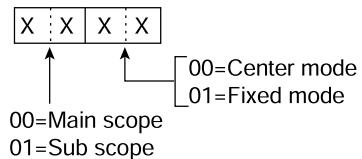
⑦ Waveform data

The transceiver outputs the drawn waveform data. The data range or data length of the waveform data is judged by the controller. (The data range is basically the same as the display size of the scope on the controller.)

Data range	0 ~ 136
Data length	689

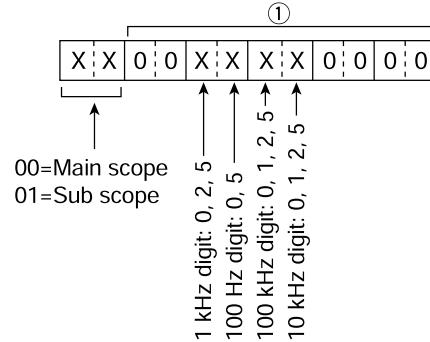
• Center/Fixed mode settings

Command: 27 14



• Scope span settings

Command: 27 15

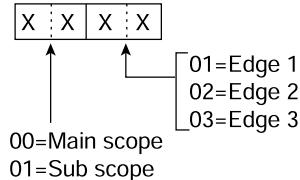


① Selectable Span

Span (Hz)	
2500	2.5 k
5000	5 k
10000	10 k
25000	25 k
50000	50 k
100000	100 k
250000	250 k
500000	500 k

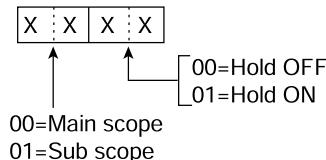
• Scope Edge number settings

Command: 27 16



• Scope Hold settings

Command: 27 17

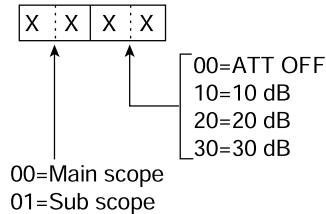


18 PANEL DESCRIPTION

◊ Data content description (continued)

• Scope Attenuator settings

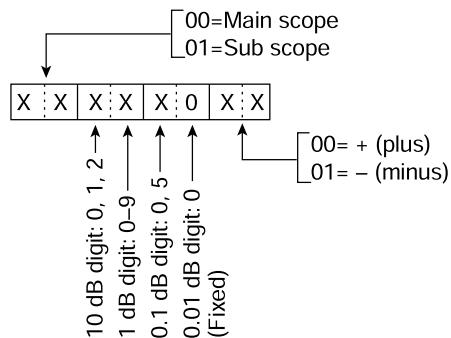
Command: 27 18



• Scope Reference level settings

Command: 27 19

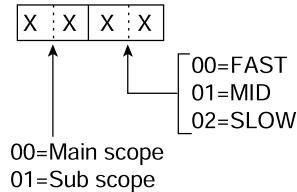
Common settings for the Main and Sub scopes



• Adjustable range: -20.0 dB ~ +20.0 dB in 0.5 dB steps

• Scope Sweep speed settings

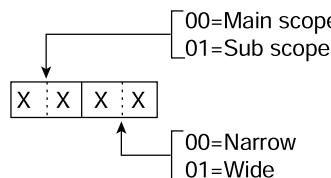
Command: 27 1A



• Scope VBW (Video Band Width) settings

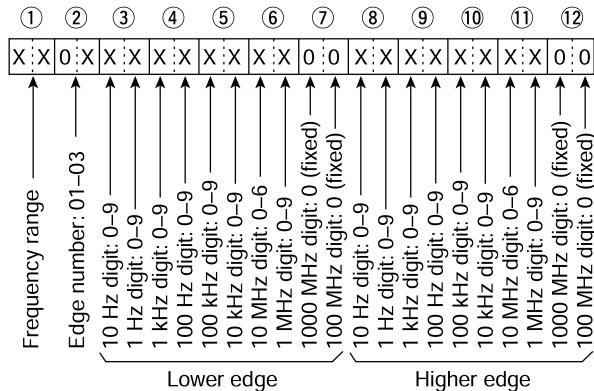
Command: 27 1D

Common settings for the Main and Sub scopes



• Scope Fixed edge frequency settings

Command: 27 1E



• Entry of 100 Hz or smaller digits are ignored.

① Selectable Frequency ranges

Data	Frequency range	Data	Frequency range
01	0.03 – 1.60 MHz	07	15.00 – 20.00 MHz
02	1.60 – 2.00 MHz	08	20.00 – 22.00 MHz
03	2.00 – 6.00 MHz	09	22.00 – 26.00 MHz
04	6.00 – 8.00 MHz	10	26.00 – 30.00 MHz
05	8.00 – 11.00 MHz	11	30.00 – 45.00 MHz
06	11.00 – 15.00 MHz	12	45.00 – 60.00 MHz

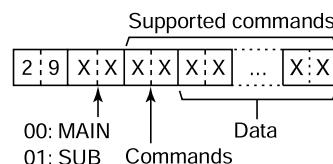
② Selectable Edge number: 01 = 1, 02 = 2, 03 = 3

• Setting after directly specify the Main/Sub band

Command : 29

Specify the Main or Sub band before entering the supported commands.

When you receive the OK code (FB), or the NG code (FA), the Command 29 and Main/Sub specify (00/01) is omitted.



The supported commands are marked by '29' in the command table.