

Section 19 CONTROL COMMAND

- Remote control (CI-V) information..... 19-2
 - ◇ CI-V connection 19-2
 - ◇ Preparing 19-2
 - ◇ Data format 19-2
 - ◇ Command table 19-3
 - ◇ Data content description 19-9

19 CONTROL COMMAND

Remote control (CI-V) information

◆ CI-V connection

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

Choose your connection method from the following:

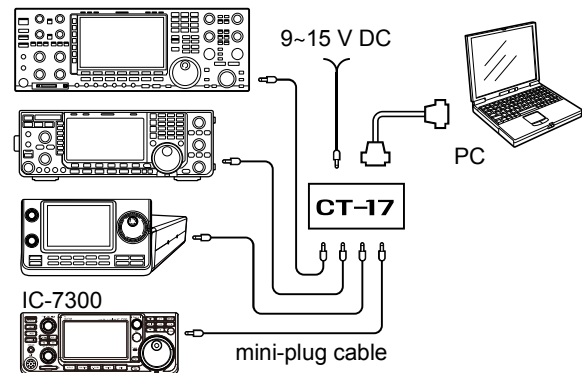
- A USB cable (A-B type, user supplied)
The required USB driver and driver installation guide can be downloaded from the Icom web site.

https://www.icomjapan.com/support/firmware_driver/

① 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.

• Connection example (using CT-17)



◆ Preparing

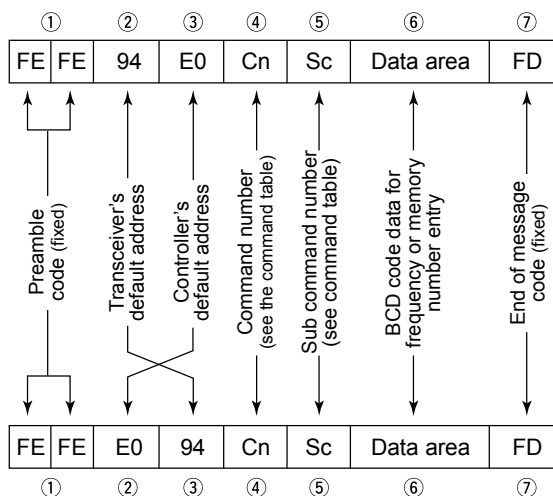
The Icom Communications Interface V (CI-V) is used for remote control.

To control the transceiver, first set its address, data communication speed, and transceive function. These settings are set in Set mode.

◆ Data format

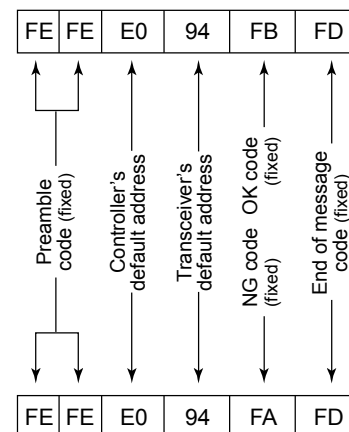
The CI-V system can be written using the following data formats. Data formats differ according to command numbers. A data area or sub command is added for some commands.

Controller to IC-7300

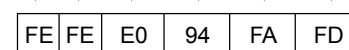


IC-7300 to controller

OK message to controller



NG message to controller



19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◇ Command table

Cmd.	Sub cmd.	Data	Description
00		p. 19-9	Send frequency data (transceive)
01		p. 19-9	Send mode data (transceive)
02		p. 19-9	Read band edge frequencies
03		p. 19-9	Read operating frequency
04		p. 19-9	Read operating mode
05		p. 19-9	Set operating frequency
06		p. 19-9	Operating mode selection for transceive
07			Select the VFO mode
	00		Select VFO A
	01		Select VFO B
	A0		Equalize VFO A and VFO B
	B0		Exchange VFO A and VFO B
08			Select the Memory mode
		0001 to 0109	Select the 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 copy to VFO
0B			Memory clear
0E	00		Scan stop
	01		Programmed/memory scan start
	02		Programmed scan start
	03		F scan start
	12		Fine programmed scan start
	13		Fine Δ F scan start
	22		Memory scan start
	23		Select memory scan start
	A1		Select Δ F scan span ± 5 kHz
	A2		Select Δ F scan span ± 10 kHz
	A3		Select Δ F scan span ± 20 kHz
	A4		Select Δ F scan span ± 50 kHz
	A5		Select Δ F scan span ± 100 kHz
	A6		Select Δ F scan span ± 500 kHz
	A7		Select Δ F 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 to 03	Set as select channel *(01=SEL1, 02=SEL2, 03=SEL3)
	B2	00 to 03	Set for select memory scan *(00=ALL, 01=SEL1, 02=SEL2, 03=SEL3)
	D0		Set Scan resume OFF
	D3		Set Scan resume ON
0F		00/01	Read Split setting (00=OFF, 01=ON)
	00		Turn the split function OFF
	01		Turn the split function ON
10*	00		Send/read the tuning step OFF
	01		Send/read the 100 Hz tuning step
	02		Send/read the 1 kHz tuning step
	03		Send/read the 5 kHz tuning step
	04		Send/read the 9 kHz tuning step
	05		Send/read the 10 kHz tuning step
	06		Send/read the 12.5 kHz tuning step
	07		Send/read the 20 kHz tuning step
	08		Send/read the 25 kHz tuning step
11*		00/20	Send/read Attenuator *(00=OFF, 20=20dB ON)
13	00		Speech all data with voice synthesizer
	01		Speech the operating frequency and S meter level by voice synthesizer
	02		Speech the operating mode by voice synthesizer
14*	01	0000 to 0255	Send/read the AF level *(0000=min. to 0255=max.)
	02	0000 to 0255	Send/read the RF gain level *(0000=min. to 0255=max.)
	03	0000 to 0255	Send/read the squelch level *(0000=min. to 0255=max.)

Cmd.	Sub cmd.	Data	Description
14*	06	0000 to 0255	Send/read the NR level *(0000=0% to 0255=100%)
	07	0000 to 0255	Send/read inner [TWIN PBT] position *(0000=max. CCW, 0128=center, 0255=max. CW)
	08	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=6wpm, 0255=48wpm)
	0D	0000 to 0255	Send/read [NOTCH] position *(0000=max. CCW, 0128=center, 0255=max. CW)
	0E	0000 to 0255	Send/read the COMP level *(0000=0 to 0255=10)
	0F	0000 to 0255	Send/read the Break-IN Delay setting *(0000=2.0d to 0255=13.0d)
	12	0000 to 0255	Send/read NB level *(0000=0% to 0255=100%)
	15	0000 to 0255	Send/read the Monitor gain *(0000=0% to 0255=100%)
	16	0000 to 0255	Send/read the VOX gain *(0000=0% to 0255=100%)
	17	0000 to 0255	Send/read the Anti VOX gain *(0000=0% to 0255=100%)
	19	0000 to 0255	Send/read BRIGHT level *(0000=0%, 0255=100%)
15	01	00/01	Read noise or S-meter squelch status *(squelch close)
	02	0000 to 0255	Read S-meter level *(0000=S0, 0120=S9, 0241=S9+60dB)
	05	00/01	Read various squelch function's status *(squelch closed)
	07	00/01	Read the OVF icon status (00=Disappears, 01=Appears)
	11	0000 to 0255	Read PO meter level *(0000=0%, 0143=50%, 213=100%)
	12	0000 to 0255	Read SWR meter level *(0000=SWR1.0, 0048=SWR1.5, 0080=SWR2.0, 0120=SWR3.0)
	13	0000 to 0255	Read ALC meter level *(0000=Min. to 0120=Max.)
	14	0000 to 0255	Read COMP meter level *(0000=0 dB, 0130=15 dB, 0241=30 dB)
	15	0000 to 0255	Read Vd meter level *(0000=0 V, 0013=10 V, 0241=16 V)
	16	0000 to 0255	Read Id meter level *(0000=0, 0097=10, 0146=15, 0241=25)
16*	02	00 to 02	Preamp (00=OFF, 01=Preamp 1 ON, 02=Preamp 2 ON)
	12	00 to 03	AGC *(00=OFF, 01=FAST, 02=MID, 03=SLOW)
	22	00 to 01	Noise blanker *(00=OFF, 01=ON)
	40	00 to 01	Noise reduction *(00=OFF, 01=ON)
	41	00 to 01	Auto notch function *(00=OFF, 01=ON)
	42	00 to 01	Repeater tone *(00=OFF, 01=ON)
	43	00 to 01	Tone squelch *(00=OFF, 01=ON)
	44	00 to 01	Speech compressor *(00=OFF, 01=ON)
	45	00 to 01	Monitor function *(00=OFF, 01=ON)
	46	00 to 01	VOX function *(00=OFF, 01=ON)
	47	00 to 02	BK-IN function *(00=BK-IN OFF, 01=Semi BK-IN ON, 02=Full BK-IN ON)
	48	00 to 01	Manual notch function *(00=OFF, 01=ON)

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
16*	4F	00 to 01	Twin Peak Filter *(00=OFF, 01=ON) Can be turned ON only when Mark and Shift are set to 2125 Hz and 170 Hz, respectively.
		50	Dial lock function *(00=OFF, 01=ON)
		56	DSP filter type *(00=SHARP, 01=SOFT)
		57	Manual notch width (00=WIDE, 01=MID, 02=NAR)
		58	SSB transmit bandwidth (00=WIDE, 01=MID, 02=NAR)
		65	Send the IP+ function setting (00=OFF, 01=ON)
17		p. 19-13	Send CW messages*2
18	00		Turn OFF the transceiver
	01		Turn ON the transceiver*3
19	00		Read the transceiver ID
1A*	00	p. 19-11	Send/read memory contents
	01	p. 19-10	Send/read band stacking register contents
	02	p. 19-12	Send/read memory keyer contents*1
	03	00 to 49	Send/read the selected filter width (AM: 00=200 Hz to 49=10 kHz; other than AM modes: 00=50 Hz to 31/40=2700 Hz/3600 Hz)
	04	00 to 13	Send/read the selected AGC time constant *(00=OFF, AM: 01=0.3 sec. to 13=8.0 sec., SSB,CW,RTTY:01=0.1 sec. to 13=6.0 sec.)
	05	0001	Send/read SSB RX HPF/LPF settings
		0002	Send/read SSB RX Tone (Bass) level (00=-5 to 10=+5)
		0003	Send/read SSB RX Tone (Treble) level (00=-5 to 10=+5)
	0004	p. 19-9	Send/read AM RX HPF/LPF settings
		0005	Send/read AM RX Tone (Bass) level (00=-5 to 10=+5)
		0006	Send/read AM RX Tone (Treble) level (00=-5 to 10=+5)
	0007	p. 19-9	Send/read FM RX HPF/LPF settings
		0008	Send/read FM RX Tone (Bass) level (00=-5 to 10=+5)
		0009	Send/read FM RX Tone (Treble) level (00=-5 to 10=+5)
	0010	p. 19-9	Send/read CW RX HPF/LPF settings
		0011	Send/read RTTY RX HPF/LPF settings
		0012	Send/read SSB TX Tone (Bass) level (00=-5 to 10=+5)
	0013	00 to 10	Send/read SSB TX Tone (Treble) level (00=-5 to 10=+5)
		0014	Send/read SSB TX bandwidth for wide
		0015	Send/read SSB TX bandwidth for mid
	0016	p. 19-9	Send/read SSB TX bandwidth for narrow
		0017	Send/read AM TX Tone (Bass) level (00=-5 to 10=+5)
		0018	Send/read AM TX Tone (Treble) level (00=-5 to 10=+5)
	0019	00 to 10	Send/read FM TX Tone (Bass) level (00=-5 to 10=+5)
		0020	Send/read FM TX Tone (Treble) level (00=-5 to 10=+5)
		0021	Send/read beep gain (0000=min. to 0255=max.)
	0022	00/01	Send/read beep gain limit *(00=OFF, 01=ON)
		0023	Send/read confirmation beep (00=OFF, 01=ON)
		0024	Send/read the band edge beep OFF
	01	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
	0025	00 to 02	Send/read the RF/SQL Control setting (00=Auto, 01=SQL, 02=RF+SQL)

Cmd.	Sub cmd.	Data	Description
1A*	05	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)
		0027	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)
		0028	Send/read the TX Delay setting (70 MHz) (00=OFF, 01=10 ms, 02=15 ms, 03=20 ms, 04=25 ms, 05=30 ms)
	0029	00 to 05	Send/read the Time-Out Timer setting (00=OFF, 01=3 min., 02=5 min., 03=10 min., 04=20 min., 05=30 min.)
		0030	Send/read quick split set *(00=OFF, 01=ON)
		0031	Send/read FM split offset -9.999 to +9.999 MHz for HF
	0032	p. 19-10	Send/read FM split offset -9.999 to +9.999 MHz for 50 MHz
		0033	Send/read split lock set *(00=OFF, 01=ON)
		0034	Send/read [TUNER] Switch set (00=Manual, 01=Auto)
	0035	00 or 01	Send/read PTT tune set *(00=OFF, 01=ON)
		0036	Send/read RTTY mark frequency (00=1275 Hz, 01=1615 Hz, 02=2125 Hz)
		0037	Send/read RTTY shift width (00=170 Hz, 01=200 Hz, 02=425 Hz)
	0038	00/01	Send/read RTTY keying polarity (00=Normal, 01=Reverse)
		0039	Send/read speech language (00=English, 01=Japanese)
		0040	Send/read speech speed (00=Low, 01=High)
	0041	00/01	Send/read S-level speech (00=OFF, 01=ON)
		0042	Send/read speech with a mode switch operation (00=OFF, 01=ON)
		0043	Send/read speech level (0000=0% to 0255=100%)
	0044	00/01	Send/read [SPEECH/LOCK] key function setting (00=Push: SPEECH, Hold down: LOCK, 01=Push: LOCK, Hold down: SPEECH)
		0045	Send/read the Lock function setting (00=MAIN DIAL, 01=ANEL)
		0046	Send/read memo pad numbers (00=5 ch, 01=10 ch)
	0047	00 to 02	Send/read main dial auto TS (00=OFF, 01=Low, 02=High)
		0048	Send/read mic. up/down speed (00=Low, 01=High)
		0049	Send/read quick RIT/ΔTX clear function (00=OFF, 01=ON)
	0050	00 to 02	Send/read SSB notch operation *(00=Auto, 01=Manual, 02=Auto/Manual)
		0051	Send/read AM notch operation (00=Auto, 01=Manual, 02=Auto/Manual)
		0052	Send/read SSB/CW synchronous tuning function (00=OFF, 01=ON)
	0053	00/01	Send/read CW normal side set (00=LSB, 01=USB)
		0054	Send/read screen capture by the [POWER] switch (00=OFF, 01=ON)
		0055	Send/read screen capture image data saving format (00=PNG format, 01=BMP format)
	0056	00/01	Send/read keyboard type (00=Ten-key, 01=Full Keyboard)
		0057	Send/read calibration marker (00=OFF, 01=ON)
		0058	Send/read reference frequency (0000=0%, 0255=100%)
	0059	00 or 01	Send/read AF/IF signal output to ACC/USB (00=AF, 01=IF)
		0060	Send/read AF output level to ACC/USB (0000=0% to 0255=100%)

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
1A*	05	0061 00/01	Send/read squelch function for the AF signal output to ACC/USB (00=OFF (Open), 01=ON)
		0062 00/01	Send/read beep and speech output setting to ACC/USB (when AF signal output is set) (00=OFF, 01=ON)
		0063 0000 to 0255	Send/read IF signal output level to ACC/USB (0000=0%, 0255=100%)
		0064 0000 to 0255	Send/read MOD input level from ACC (0000=0% to 0255=100%)
		0065 0000 to 0255	Send/read MOD input level from USB (0000=0% to 0255=100%)
		0066 00 to 04	Send/read MOD input connector during DATA OFF (00=MIC, 01=ACC, 02=MIC/ACC, 03=USB, 04=MIC/USB)
		0067 00 to 04	Send/read MOD input connector during DATA (00=MIC, 01=ACC, 02=MIC/ACC, 03=USB, 04=MIC/USB)
		0068 00/01	Send/read the external keypad setting for VOICE * (00=OFF, 01=ON)
		0069 00/01	Send/read the external keypad setting for Memory KEYS (00=OFF, 01=ON)
		0070 00/01	Send/read the external keypad setting for RTTY Memory (00=OFF, 01=ON)
		0071 00/01	Send/read the CI-V transceive setting (00=OFF, 01=ON)
		0072 0000 to 0223	Send/read the transceive CI-V Address for USB to REMOTE in hexadecimal code (0000=00h to 0223=DFh)
		0073 00/01	Send/read the CI-V Output (for ANT) capability (00=OFF, 01=ON)
		0074 00/01	Send/read the CI-V USB port setting (00=Link to [REMOTE], 01=Unlink to [REMOTE]) (Read only)
		0075 00/01	Send/read echo back setting for CI-V operation from USB (00=ON, 01=OFF)
		0076 00/01	Send/read the USB (serial port) function setting (00=CI-V, 01=RTTY Decode)
		0077 00 to 03	Send/read data transfer speed for RTTY decode output (00=4800 bps, 01=9600 bps, 02=19200 bps, 03=38400 bps)
		0078 00 to 02	Send/read transmission control line setting for USB (00=OFF, 01=DTR, 02=RTS) • Different line must be set from both CW keying and RTTY (FSK)
		0079 00 to 02	Send/read CW keying line setting for USB (00=OFF, 01=DTR, 02=RTS) • Different line must be set from both transmission control and RTTY (FSK)
		0080 00 to 02	Send/read RTTY (FSK) line setting for USB (00=OFF, 01=DTR, 02=RTS) • Different line must be set from both CW keying and transmission control"
		0081 0000 to 0255	Send/read LCD unit backlight brightness (0000=0% to 0255=100%)
		0082 00/01	Send/read screen image type (00=A, 01=B)
		0083 00/01	Send/read frequency readout font (00=Basic, 01=Round)
		0084 00/01	Send/read peak hold set for meter *(00=OFF, 01=ON)
		0085 00/01	Send/read memory name indication setting (00=OFF, 01=ON)
		0086 00/01	Send/read manual notch width pop-up indication setting (00=OFF, 01=ON)
		0087 00/01	Send/read PBT shifting value display setting while rotating [TWIN PBT] (00=OFF, 01=ON)
		0088 00/01	Send/read IF filter width and shifting value display setting when the IF filter is switched (00=OFF, 01=ON)

Cmd.	Sub cmd.	Data	Description
1A*	05	0089 00 to 03	Send/read screen saver function (00=OFF, 01=15 minutes, 02=30 minutes, 03=60 minutes)
		0090 00/01	Send/read opening message indication (00=OFF, 01=ON)
		0091 p. 19-10	Send/read opening message contents (up to 10-character)
		0092 00/01	Send/read Power ON Check setting (00=OFF, 01=ON)
		0093 00/01	Send/read Display Language (00=English, 01=Japanese)
		0094 20000101 to 20991231	Send/read date setting (20000101=2000/01/01 to 20991231=2099/12/31)
		0095 0000 to 2359	Send/read time setting (0000=00:00 to 2359=23:59)
		0096 p. 19-13	Send/read UTC offset time
		0097 00/01	Send/read scope indication during TX (00=OFF, 01=ON)
		0098 00 to 02	Send/read scope max. hold (00=OFF, 01=ON)
		0099 00 to 02	Send/read scope center frequency set (00=Filter center, 01=Carrier point center, 02=Carrier point center (Abs. Freq.))
		0100 00/01	Send/read scope marker position (FIX Type/ SCROLL Type) setting (00=Filter center, 01=Carrier point)
		0101 00/01	Send/read external monitor signal width (00=Narrow, 01=Wide)
		0102 00 to 03	Send/read averaging function for spectrum scope (00=OFF, 01=2, 02=3, 03=4)
		0103 00/01	Send/read spectrum display type (00=Fill, 01=Fill+Line)
		0104 p. 19-9	Send/read spectrum fill color
		0105 p. 19-9	Send/read spectrum line color
		0106 p. 19-9	Send/read spectrum color for peak hold
		0107 00/01	Send/read waterfall set for spectrum scope (00=OFF, 01=ON)
		0108 00 to 02	Send/read waterfall speed (00=Slow, 01=Mid, 02=Fast)
		0109 00 to 02	Send/read waterfall height when expanded scope is selected (00=Small, 01=Mid, 02=Larger)
		0110 00 to 07	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)
		0111 00/01	Send/read scope waterfall marker auto-hide (00=OFF, 01=ON)
		0112 p. 19-9	Send/read scope edge 1 frequencies for 0.03 to 1.60 MHz band
		0113 p. 19-9	Send/read scope edge 2 frequencies for 0.03 to 1.60 MHz band
		0114 p. 19-9	Send/read scope edge 3 frequencies for 0.03 to 1.60 MHz band
		0115 p. 19-9	Send/read scope edge 1 frequencies for 1.60 to 2.00 MHz band
		0116 p. 19-9	Send/read scope edge 2 frequencies for 1.60 to 2.00 MHz band
		0117 p. 19-9	Send/read scope edge 3 frequencies for 1.60 to 2.00 MHz band
		0118 p. 19-9	Send/read scope edge 1 frequencies for 2.00 to 6.00 MHz band
		0119 p. 19-9	Send/read scope edge 2 frequencies for 2.00 to 6.00 MHz band
		0120 p. 19-9	Send/read scope edge 3 frequencies for 2.00 to 6.00 MHz band
		0121 p. 19-9	Send/read scope edge 1 frequencies for 6.00 to 8.00 MHz band
		0122 p. 19-9	Send/read scope edge 2 frequencies for 6.00 to 8.00 MHz band
		0123 p. 19-9	Send/read scope edge 3 frequencies for 6.00 to 8.00 MHz band

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
1A*	05	0124 p. 19-9	Send/read scope edge 1 frequencies for 8.00 to 11.00 MHz band
		0125 p. 19-9	Send/read scope edge 2 frequencies for 8.00 to 11.00 MHz band
		0126 p. 19-9	Send/read scope edge 3 frequencies for 8.00 to 11.00 MHz band
		0127 p. 19-9	Send/read scope edge 1 frequencies for 11.00 to 15.00 MHz band
		0128 p. 19-9	Send/read scope edge 2 frequencies for 11.00 to 15.00 MHz band
		0129 p. 19-9	Send/read scope edge 3 frequencies for 11.00 to 15.00 MHz band
		0130 p. 19-9	Send/read scope edge 1 frequencies for 15.00 to 20.00 MHz band
		0131 p. 19-9	Send/read scope edge 2 frequencies for 15.00 to 20.00 MHz band
		0132 p. 19-9	Send/read scope edge 3 frequencies for 15.00 to 20.00 MHz band
		0133 p. 19-9	Send/read scope edge 1 frequencies for 20.00 to 22.00 MHz band
		0134 p. 19-9	Send/read scope edge 2 frequencies for 20.00 to 22.00 MHz band
		0135 p. 19-9	Send/read scope edge 3 frequencies for 20.00 to 22.00 MHz band
		0136 p. 19-9	Send/read scope edge 1 frequencies for 22.00 to 26.00 MHz band
		0137 p. 19-9	Send/read scope edge 2 frequencies for 22.00 to 26.00 MHz band
		0138 p. 19-9	Send/read scope edge 3 frequencies for 22.00 to 26.00 MHz band
		0139 p. 19-9	Send/read scope edge 1 frequencies for 26.00 to 30.00 MHz band
		0140 p. 19-9	Send/read scope edge 2 frequencies for 26.00 to 30.00 MHz band
		0141 p. 19-9	Send/read scope edge 3 frequencies for 26.00 to 30.00 MHz band
		0142 p. 19-9	Send/read scope edge 1 frequencies for 30.00 to 45.00 MHz band
		0143 p. 19-9	Send/read scope edge 2 frequencies for 30.00 to 45.00 MHz band
		0144 p. 19-9	Send/read scope edge 2 frequencies for 30.00 to 45.00 MHz band
		0145 p. 19-9	Send/read scope edge 1 frequencies for 45.00 to 60.00 MHz band
		0146 p. 19-9	Send/read scope edge 2 frequencies for 45.00 to 60.00 MHz band
		0147 p. 19-9	Send/read scope edge 3 frequencies for 45.00 to 60.00 MHz band
		0148 p. 19-9	Send/read scope edge 1 frequencies for 60.00 to 74.80 MHz band
		0149 p. 19-9	Send/read scope edge 2 frequencies for 60.00 to 74.80 MHz band
		0150 p. 19-9	Send/read scope edge 3 frequencies for 60.00 to 74.80 MHz band
		0151 00/01	Send/read audio FFT scope display type (00=Fill, 01=Fill+Line)
		0152 p. 19-9	Send/read the Audio FFT scope waveform color
		0153 00/01	Send/read the Audio FFT scope waterfall display (00=OFF, 01=ON)
		0154 p. 19-9	Send/read the Audio Oscilloscope scope waveform color
		0155 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
		0156 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)
		0157 0001 to 9999	Send/read present number (0001=1 to 9999=9999)

Cmd.	Sub cmd.	Data	Description
1A*	05	0158 0000 to 0255	Send/read CW side tone gain (0000=0% to 0255=100%)
		0159 00/01	Send/read CW side tone gain limit (00=OFF, 01=ON)
		0160 01 to 60	Send/read CW keyer repeat time (01=1 sec. to 60=60 sec.)
		0161 28 to 45	Send/read CW keyer dot/dash ratio (28=1:1:2.8 to 45=1:1:4.5)
		0162 00 to 03	Send/read rise time (00=2 msec., 01=4 msec., 02=6 msec., 03=8 msec.)
		0163 00/01	Send/read paddle polarity (00=Normal, 01=Reverse)
		0164 00 to 02	Send/read keyer type (00=Straight, 01=Bug, 02=Paddle)
		0165 00/01	Send/read mic. up/down keyer set (00=OFF, 01=ON)
		0166 00 to 03	Send/read averaging function for RTTY FFT scope (00=OFF, 01=2, 02=3, 03=4)
		0167 p. 19-9	Send/read RTTY FFT scope waveform color
		0168 00/01	Send/read RTTY decode USOS (00=OFF, 01=ON)
		0169 00/01	Send/read RTTY decode new line code (00=CR,LF,CR+LF, 01=CR+LF)
		0170 00/01	Send/read RTTY TX USOS (00=OFF, 01=ON)
		0171 p. 19-9	Send/read received RTTY text font color
		0172 p. 19-9	Send/read transmitted RTTY text font color
		0173 00/01	Send/read RTTY log function (00=OFF, 01=ON)
		0174 00/01	Send/read file saving format for the RTTY log (00=Text, 01=HTML)
		0175 00/01	Send/read RTTY time stamp set (00=OFF, 01=ON)
		0176 00/01	Send/read RTTY Decode Log Time Stamp (00=Local, 01=UTC)
		0177 00/01	Send/read RTTY frequency stamp (00=OFF, 01=ON)
		0178 00/01	Send/read scan speed (00=Low, 01=High)
		0179 00/01	Send/read scan resume (00=OFF, 01=ON)
		0180 00/01	Send/read auto monitor function setting when transmitting a recorded voice memory (00=OFF, 01=ON)
		0181 01/15	Send/read repeat interval to transmit recorded voice audio (01=1 sec. to 15=15 sec.)
		0182 00/01	Send/read recording mode for QSO recorder (00=TX&RX, 01=RX Only)
		0183 00/01	Send/read recording TX audio for QSO recorder (00=Microphone audio, 01=TX monitor audio)
		0184 00/01	Send/read squelch relation to recording RX audio for QSO recorder (00=Always, 01=Squelch Auto)
		0185 00/01	Send/read QSO record file split function setting (00=OFF, 01=ON)
		0186 00/01	Send/read PTT Automatic Recording function setting (00=OFF, 01=ON)
		0187 00 to 03	Send/read RX audio recording status for 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.)
		0188 00 to 03	Send/read QSO PLAY Skip time (00=3 sec., 01=5 sec., 02=10 sec., 03=30 sec.)
		0189 00 to 09	Send/read NB depth (00=1 to 09=10)
		0190 0000 to 0255	Send/read NB width (0000=1 to 0255=100)
		0191 00 to 20	Send/read VOX delay (00=0.0 sec. to 20=2.0 sec.)
		0192 00 to 03	Send/read VOX voice delay (00=OFF, 01=Short, 02=Mid., 03=Long)

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
1A*	05	0193 00/01	Send/read the MF band attenuator setting (00=OFF, 01=ON)
		0194 00 to 02	Send/read on-screen keyboard layout (00=English, 01=German, 02=French)
		0195 0000 to 0255	Send/read the Transmit voice level for the VOICE TX function (0000=0% to 0255=100%)
		0196 p. 19-9	Send/read SSB-D TX bandwidth
		0197 00/01	Inhibit Timer at USB connection (00=OFF, 01=ON)
		0198 p. 19-12	Send/read the Front key customize [VOX/BK-IN] setting
		0199 p. 19-12	Send/read the Front key customize [AUTOTUNE] setting
		0200 p. 19-12	Send/read the Front key customize [▲] setting
		0201 p. 19-12	Send/read the Front key customize [▼] setting
		0202 p. 19-12	Send/read the MIC key customize [UP] setting
		0203 p. 19-12	Send/read the MIC key customize [DOWN] setting
		0204 p. 19-9	Send/read scope edge 4 frequencies for 0.03 - 1.60 MHz
		0205 p. 19-9	Send/read scope edge 4 frequencies for 1.60 - 2.00 MHz
		0206 p. 19-9	Send/read scope edge 4 frequencies for 2.00 - 6.00 MHz
		0207 p. 19-9	Send/read scope edge 4 frequencies for 6.00 - 8.00 MHz
		0208 p. 19-9	Send/read scope edge 4 frequencies for 8.00 - 11.00 MHz
		0209 p. 19-9	Send/read scope edge 4 frequencies for 11.00 - 15.00 MHz
		0210 p. 19-9	Send/read scope edge 4 frequencies for 15.00 - 20.00 MHz
		0211 p. 19-9	Send/read scope edge 4 frequencies for 20.00 - 22.00 MHz
		0212 p. 19-9	Send/read scope edge 4 frequencies for 22.00 - 26.00 MHz
		0213 p. 19-9	Send/read scope edge 4 frequencies for 26.00 - 30.00 MHz
		0214 p. 19-9	Send/read scope edge 4 frequencies for 30.00 - 45.00 MHz
		0215 p. 19-9	Send/read scope edge 4 frequencies for 45.00 - 60.00 MHz
		0216 p. 19-9	Send/read scope edge 4 frequencies for 60.00 - 74.80 MHz
		0217 00/01	Send/read PTT Port Function setting 00=PTT Input 01=PTT Input + SEND Output
	06	p. 19-10	Send/read DATA mode setting
	07	00 to 01	Send/read IP+ function setting (00=OFF, 01=ON)
1B*	00	p. 19-13	Send/read repeater tone frequency
	01	p. 19-13	Set/read TSQL tone frequency

Cmd.	Sub cmd.	Data	Description
1C	00*	00	Send/read transceiver's status RX • When CI-V Output (for ANT) (Command: 1A 05 0157) is set to ON, automatically outputs when changed.
		01	Send/read transceiver's status TX • When CI-V Output (for ANT) (Command: 1A 05 0157) is set to ON, automatically outputs when changed.
	01*	00 to 02	00=Send/read the antenna tuner OFF 01=Send/read the antenna tuner ON 02=Send/read to tuning
	02*	00/01	Send/read transmit frequency monitor setting (00=OFF, 01=ON)
	03	p. 19-9	Read transmit frequency • When CI-V Output (for ANT) (Command: 1A 05 0157) is set to ON, automatically outputs when changed.
	04*	00/01	Send/read command to disable to output the antenna controller status frequency and so on from [REMOTE] • Send/read command to enable to output the antenna controller status frequency and so on from [REMOTE].
	1E	00	Read number of available TX frequency band
		01	Read TX band edge frequencies
		02	Read number of user-set TX frequency band
		03*	Read user-set TX band edge frequencies
	21*	00	Send/read RIT frequency
		01	Send/read RIT setting (00=OFF, 01=ON)
		02	Send/read ΔTX setting (00=OFF, 01=ON)
	25*	p. 19-13	Send/read the selected or unselected VFO frequency
	26*	p. 19-13	Send/read the selected or unselected VFO's operating mode and filter
	27*	00	Read the Scope waveform data • Only when "Scope ON/OFF status" (Command: 27 10) and "Scope data output" (Command: 27 11) are set to "ON," outputs the waveform data to the controller.
		10	00/01 Send/read the Scope ON/OFF status (00=OFF, 01=ON)
		11	00/01 Send/read the Scope wave data output*4 (00=OFF, 01=ON)
		12	00 Send/read the Main or Sub scope setting (00=Main only)
		13	00 Send/read the Single/Dual scope setting (00=Single only)
		14	p. 19-14 Send/read the Scope Center mode, Fixed mode, SCROLL-C mode, or SCROLL-F mode setting
		15	p. 19-14 Send/read the Span setting in the Center mode or SCROLL-C mode Scope
		16	p. 19-15 Send/read the Edge number setting in the Fixed mode or SCROLL-F mode Scope
		17	p. 19-15 Send/read the Scope hold function ON or OFF
		19	p. 19-15 Send/read the Scope Reference level setting
1A	p. 19-15		Send/read the Sweep speed setting
			1B 00/01 Send/read the Scope indication during TX in the Center mode (00=OFF, 01=ON)

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
27*	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	p. 19-15	Send/read the Scope VBW setting
	1E	p. 19-15	Send/read the Scope Fixed edge frequencies
	20	00/01	Send/read the Marker Position (FIX Type/ SCROLL Type) setting (00=Filter Center, 01=Carrier Point)
28*	00	00 to 08	Transmits the Voice TX memory content (01=T1 to 08=T8, 0x00=Cancel TX)

* (Asterisk) Send/read data

*1 To insert a counter, first clear the other channel's counter.

*2 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.

*3 When sending the power ON command (18 01), you need to repeatedly send "FE" before the standard format. The following is the approximated quantity of the repetition.

- 115200 bps: 150 "FE"s
- 57600 bps: 75 "FE"s
- 38400 bps: 50 "FE"s
- 19200 bps: 25 "FE"s
- 9600 bps: 13 "FE"s
- 4800 bps: 7 "FE"s

Example: When using 4800 bps

F	E	F	E	F	E	9	4	E	O	1	8	0	1	F	D
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

x7

*4 You can only set this item when "Unlink from [REMOTE]" is selected on the "CI-V USB port" screen, and then "115200" is selected on the "CI-V Baud Rate" screen.

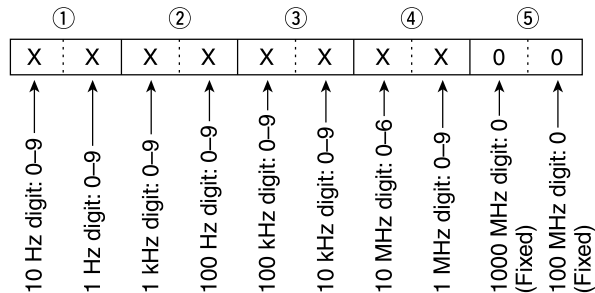
19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

◆ Data content description

• Operating frequency

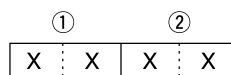
Command: 00, 03, 05, 1C 03



• Operating mode

Command: 01, 04, 06

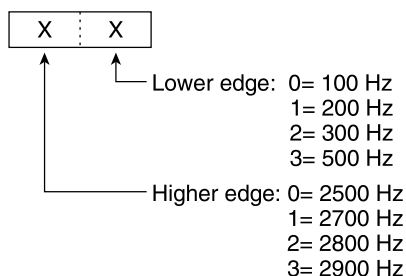
Filter setting (②) can be skipped with command 01 and 06. In that case, "FIL1" is selected with command 01 and the default filter setting of the operating mode is automatically selected with command 06.



① Operating mode	② Filter setting
00: LSB	05: FM
01: USB	07: CW-R
02: AM	08: RTTY-R
03: CW	03: FIL3
04: RTTY	

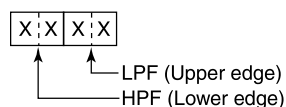
• SSB/SSB-D transmission passband width settings

Command : 1A 050014, 050015, 050016, 050196



• RX HPF/LPF setting for each operating mode

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



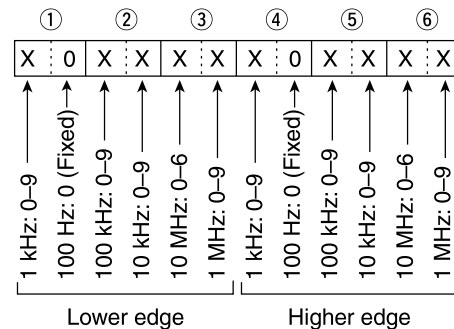
HPF	LPF
00: Through	05-24: 500~2400 Hz
01-20: 100~2000 Hz	25: Through

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

• Bandscope edge frequency settings

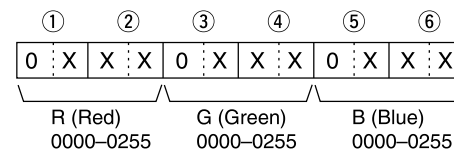
Command: 1A 050112 ~ 1A 050150

1A 050204 ~ 1A 050216



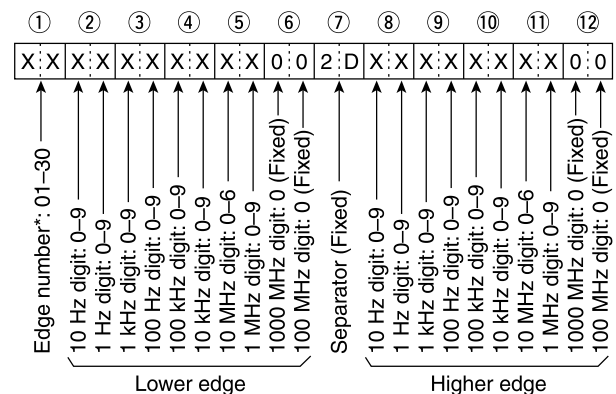
• Color settings

Command : 1A 050104, 050105, 050106, 050152, 050154, 050167, 050171, 050172



• Band edge frequency settings

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

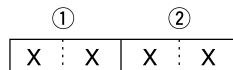


19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

• Band stacking register

Command: 1A 01



① Frequency band codes

Code	Freq. band	Frequency range (unit: MHz)
01	1.8	1.800000–1.999999
02	3.5	3.400000–4.099999
03	7	6.900000–7.499999
04	10	9.900000–10.499999
05	14	13.900000–14.499999
06	18	17.900000–18.499999
07	21	20.900000–21.499999
08	24	24.400000–25.099999
09	28	28.000000–29.999999
10	50	50.000000–54.000000
11	GENE	Other than above

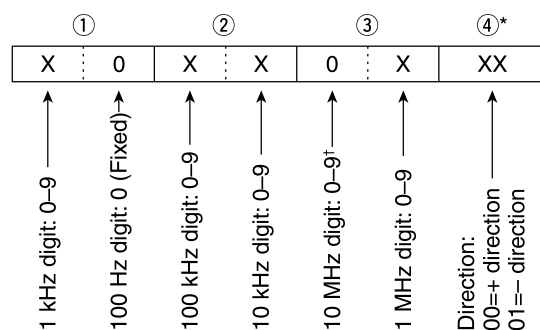
② Register codes

Code	Registered number
01	1 (latest)
02	2
03	3 (oldest)

For example, when sending/reading the oldest contents in the 21 MHz band, the code “0703” is used.

• Offset frequency settings

Command : 1A 050031, 050032



*1 There is no need to enter the transverter offset frequency setting.

*2 Transverter offset only. Fix to '0' for split offset setting.

• Codes for character entries

- Character codes— Letters and Numbers

Character	ASCII code	Character	ASCII code
A–Z	41–5A	a–z	61–7A
0–9	30–39		

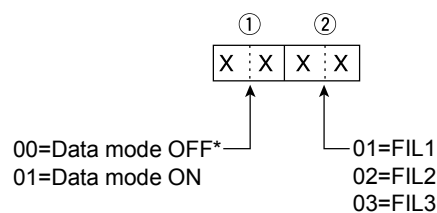
- Character codes— Symbols

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/selectable characters
1A 00	Memory name All characters are usable.
1A 050091	Opening message Uppercase letters, numbers, symbols (- / . @) and space are usable.

• Data mode with filter width settings

Command : 1A 06



00=Data mode OFF*
01=Data mode ON

01=FIL1
02=FIL2
03=FIL3

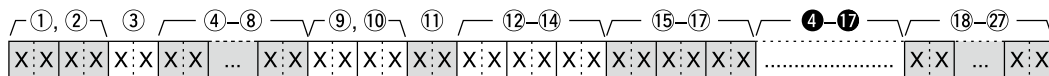
*When 00 is set, also set 00 to ②

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

• Memory content

Command : 1A 00



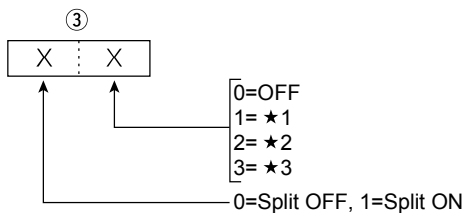
①, ② Memory channel numbers

0001~0099: Memory channel 01 to 99

0100: Programmed scan edge P1

0101: Programmed scan edge P2

③ Split and Select memory setting



① Set both 0 for P1 and P2.

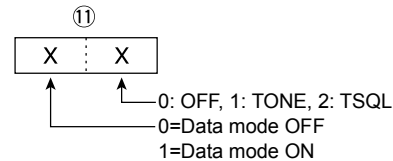
④~⑧ Operating frequency setting

See “• Operating frequency.”

⑨, ⑩ Operating mode setting

See “• Operating mode.”

⑪ Data mode and tone type settings



⑫~⑭ Repeater tone frequency setting

⑮~⑰ Tone squelch frequency setting

See “• Repeater tone/tone squelch settings.”

⑱~⑳ Memory name settings

Up to 10 characters.

See “• Codes for character entries”

To clear the memory channel contents on 1A 00:

①, ②: Memory channel (0001~0099)

③: “FF”

④: None

NOTE:

- The same data as ④~⑰ are stored in ④~⑰.
- When the Split function is ON, the data of ④~⑰ is used for transmit.
- Even if the Split function is OFF, enter the data into ④~⑰ to match your transceiver. We recommend that you set the same data as ④~⑰.

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

• Memory keyer character entries

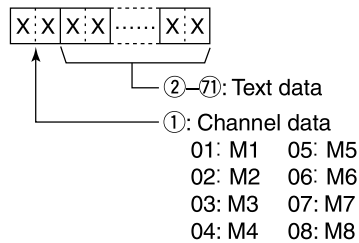
Command: 1A 02

- Character codes

Character	ASCII code	Description
0–9	30–39	Numbers
A–Z	41–5A	Letters
space	20	Word space
/	2F	Symbol
?	3F	Symbol
,	2C	Symbol
.	2E	Symbol
@	40	Symbol
^	5E	Example: to send $\bar{B}\bar{T}$, enter ^4254
*	2A	Inserts contest number (can be used for 1 channel only)

• Memory keyer content

Command: 1A 02



• [VOX/BK-IN] setting

Command: 1A 050198

Data	Function
00	VOX/BK-IN
01	PRESET
02	Voice/Keyer/RTTY Memory 1
03	Voice/Keyer/RTTY Memory 2
04	Voice/Keyer/RTTY Memory 3
05	Voice/Keyer/RTTY Memory 4

• [AUTOTUNE] setting

Command: 1A 050199

Data	Function
00	AUTOTUNE
01	PRESET
02	Voice/Keyer/RTTY Memory 1
03	Voice/Keyer/RTTY Memory 2
04	Voice/Keyer/RTTY Memory 3
05	Voice/Keyer/RTTY Memory 4

• [▲]/[▼] setting

Command: 1A 050200, 050201

Data	Function
00	M-CH UP
01	M-CH DOWN
02	PRESET
03	Voice/Keyer/RTTY Memory 1
04	Voice/Keyer/RTTY Memory 2
05	Voice/Keyer/RTTY Memory 3
06	Voice/Keyer/RTTY Memory 4

• MIC Key Customize setting

Command: 1A 050202, 050203

Data	Function
00	No function
01	UP
02	DOWN
03	UP (VFO: kHz)
04	DOWN (VFO: kHz)
05	XFC
06	VFO/MEMO
07	BAND UP
08	BAND DOWN
09	BAND DOWN
10	MODE
11	Voice/Keyer/RTTY Memory 1
12	Voice/Keyer/RTTY Memory 2
13	Voice/Keyer/RTTY Memory 3
14	Voice/Keyer/RTTY Memory 4
15	TS
16	MPAD
17	SPLIT
18	A/B
19	TUNER

19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

• Codes for CW message contents

Command : 17 Up to 30 characters

To send CW messages, use the following character codes.

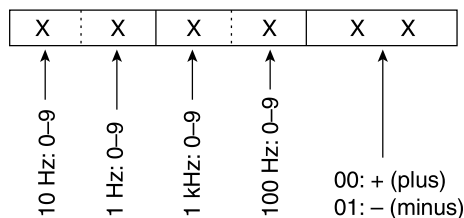
Character	ASCII code	Character	ASCII code
0-9	30-39	'	27
A-Z	41-5A	(28
a-z	61-7A)	29
/	2F	=	3D
?	3F	+	2B
.	2E	"	22
-	2D	@	40
,	2C	Space	20
:	3A		

① "FF" stops sending CW messages.

① "A" is used to transmit a string of characters with no inter-character space.

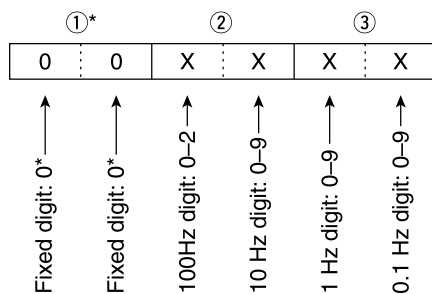
• RIT frequency settings

Command : 21 00



• Repeater tone/tone squelch frequency settings

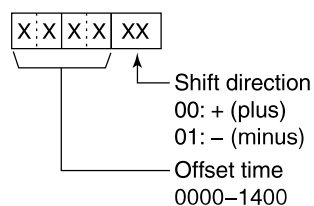
Command : 1B 00, 1B 01



*Not necessary when setting a frequency.

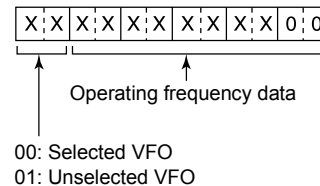
• UTC Offset setting

Command : 1A 05 0096



• Selected or unselected VFO frequency settings

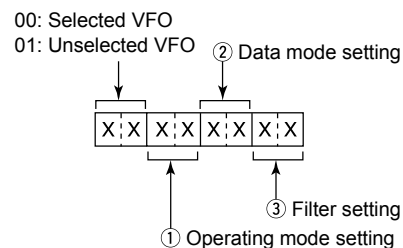
Command: 25



• Selected or unselected VFO'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 are automatically selected.



① Operating mode	② Data mode setting	③ Filter setting
00: LSB	05: FM	00: Data mode OFF
01: USB	07: CW-R	01: Data mode ON
02: AM	08: RTTY-R	02: FIL2
03: CW		03: FIL3
04: RTTY		

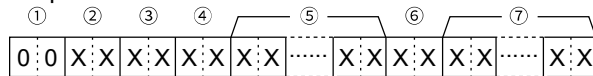
19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

• Scope waveform data

Command : 27 00

Outputs the waveform data to the controller



① 00 (Fixed)

② Order of division data (Current): 01~11

③ Division number (Maximum): 11 (USB)

① When sent through the USB port, the data is divided by 11 and sent in sequential order.

① 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 Spectrum scope mode data:

- 00 = Center mode scope
- 01 = Fixed mode scope
- 02 = SCROLL-C mode scope
- 03 = SCROLL-F mode scope

⑤ Waveform information

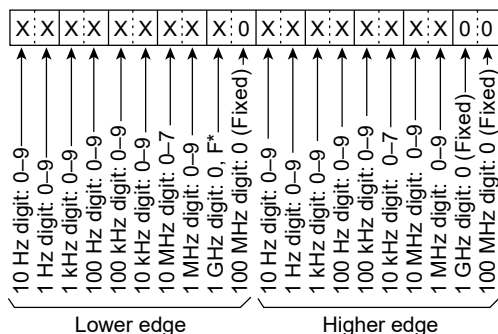
The waveform information is different between Center mode and fixed mode.

• In the Center mode:

Center frequency and span are sent.

See below for Frequency data, and the Scope span settings (② ~ ⑥) to the right.

• In the Fixed, SCROLL-C, and SCROLL-F modes:
Lower edge and higher edge frequencies are sent.



* "F" means that the Lower edge frequency is a negative value.

⑥ Out of range information

- 00 = In range
- 01 = Out of range

① If the scope data is out of range, the waveform data (⑦) is omitted.

⑦ Waveform data

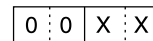
The transceiver outputs the drawn waveform data.

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	0~160
Data length	475

• Spectrum scope mode settings

Command: 27 14

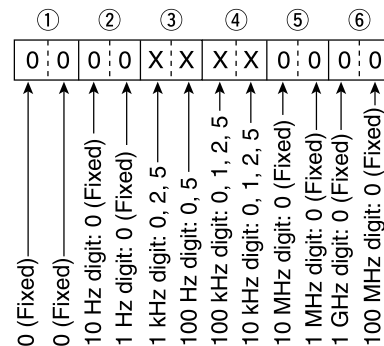


- 00=Center mode
- 01=Fixed mode
- 02=SCROLL-C mode
- 03=SCROLL-F mode

• Scope span settings

(in the Center mode and SCROLL-C mode Scope)

Command : 27 15



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

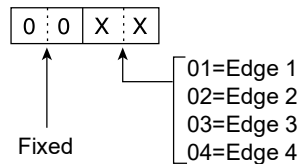
19 CONTROL COMMAND

Remote control (CI-V) information (Continued)

• Scope Edge number settings

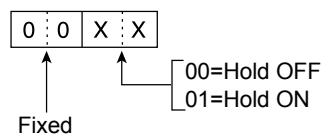
(in the Fixed mode and SCROLL-F mode Scope)

Command: 27 16



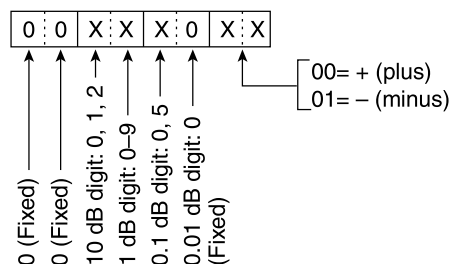
• Scope Hold settings

Command: 27 17



• Scope Reference level settings

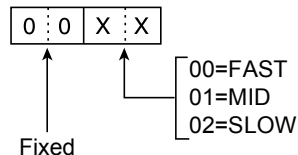
Command : 27 19



①Adjustable range: -20.0 dB ~ +20.0 dB in 0.5 dB steps

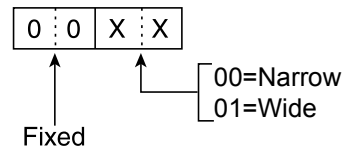
• Scope Sweep speed settings

Command : 27 1A



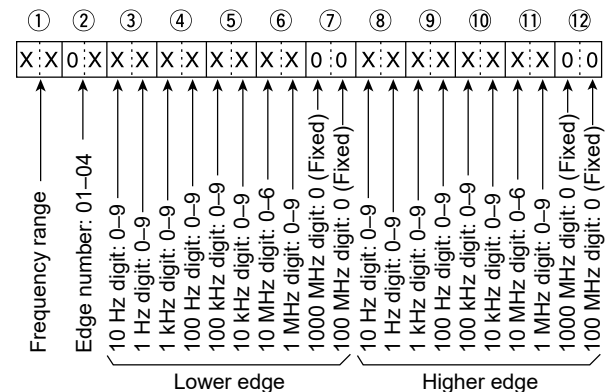
• Scope VBW (Video Band Width) settings

Command : 27 1D



• Scope Fixed edge frequency settings

Command : 27 1E



①Entry of digits less than 1 kHz is ignored.

① Selectable Frequency ranges

Data	Frequency range (Hz)
01	0.03 – 1.60
02	1.60 – 2.00
03	2.00 – 6.00
04	6.00 – 8.00
05	8.00 – 11.00
06	11.00 – 15.00
07	15.00 – 20.00
08	20.00 – 22.00
09	22.00 – 26.00
10	26.00 – 30.00
11	30.00 – 45.00
12	45.00 – 60.00
13	60.00 – 74.80

② Selectable Edge number: 01 = 1, 02 = 2, 03 = 3, 04 = 4

INDEX

Symbols and Numerics		C	
ΔF scan	10-6	Calibration Marker	12-9
Operation	10-6	Captured screen, viewing	13-5
ΔTX		Capturing a screen	13-5
Function	4-11	Center mode	5-3
Monitor function	4-11	Screen	5-2
1/4 Tuning function	3-5	CENTER Type Display	5-6
5 MHz frequency band operation (USA version only)	3-12	CI-V	
A		Address	12-10
ACC		Baud Rate	12-10
ACC AF Beep/Speech... Output	12-9	Command table	19-3
ACC AF Output Level	12-9	Connection	19-2
ACC AF SQL	12-9	Data format	19-2
ACC IF Output Level	12-9	Output (for ANT)	12-10
ACC Output Select	12-9	Preparing	19-2
MOD Level	12-9	Transceive	12-10
Socket, about	18-2	USB Baud Rate	12-11
Accessories, supplied	i	USB Echo Back	12-11
Adobe Acrobat Reader Installer	iii	USB Port	12-10
AGC		USB→REMOTE Transceive Address	12-10
Function control	4-4	Cleaning	14-2
time constant preset value, selecting	4-4	Clock	12-13
Time constant, setting	4-4	Connections	
AH-4, using	11-3	Front panel	2-2
AH-740, using	11-3	FSK and AFSK	2-5
ALC jack, about	18-4	Linear amplifier	2-6
All Reset	12-14, 14-4	Non-Icom linear amplifier	2-6
AM, tone control		Rear panel	2-3
RX audio High/Low pass filter setting	12-3	Connectors (Set mode)	12-9
RX Bass	12-3	Contest number menu (001 SET)	4-20
RX Treble	12-3	CW	
TX Bass	12-3	Auto Tuning function	4-16
TX Treble	12-3	Dot/Dash Ratio	4-21
Antenna tuner		Full Break-in mode	4-16
Connecting	2-4	Normal Side (LSB/USB)	12-6
External	11-3	Operating	4-14
Internal	11-2	Paddle Polarity	4-21
ANTI VOX	4-10	Pitch control, setting	4-14
Attenuator	4-3	Reverse mode	4-16
Audio scope		RX audio High/Low pass filter setting	12-3
Screen	5-9	Semi Break-in mode	4-15
Set screen	5-9	Side tone, monitoring	4-17
Auto		D	
Monitor (VOICE TX SET)	7-6	Data mode	
Notch function	4-9	(AFSK) operation	4-31
Tuning Step function	3-5	Selecting	3-3
Averaging (Scope set screen)	5-6	DATA MOD (Modulation signal)	12-10
B		DATA OFF MOD	12-10
Backlight	12-12	Date (Set mode)	12-13
Band Edge		DC power socket, about	18-4
Beep	3-6, 12-4	Decoder	
Deleting	3-8	New Line Code	4-28
Editing	3-7	Threshold level, setting	4-23
Entering	3-7	Decode USOS	4-28
Inserting	3-9	DELAY (VOX)	4-10
New entry	3-8	Deleting (Voice recorder)	
Resetting	3-9	All files	6-5
Band stacking registers	3-3	File	6-5
Basic manual	iii	Folder	6-6
Beep		DEPTH (Noise Blanker)	4-8
Confirmation	12-4	Dial Lock function	3-10
Level	12-4	Display	
Level Limit	12-4	Background, selecting	13-3
Break-in function	4-15	Font, selecting	13-3
Full	4-16	Font (Set mode)	12-12
Semi	4-15	Language	12-12
		Type (Background color)	12-12
		Type, selecting (Background color)	13-3

INDEX

E	
Emergency	
Mode ,tuner	11-4
Set mode	12-14
Entering and editing	1-9
Characters	1-9
Example	1-10
External DC power supply, connecting	2-4
EXT-SP jack	18-4
F	
FEATURES	i
FFT Scope	
Averaging	4-28
Waterfall Display	5-9
Waveform Color	4-28, 5-9
Waveform Type	5-9
File Type (RTTY decode log)	4-27
Fine Δ F scan	10-6
Operation	10-6
Fine Programmed scan	10-3
Operation	10-3
Fine Tuning function (1 Hz step)	3-4
Firmware update	15-2
Preparation	15-3
Set mode	12-13
Unzipping the firmware folder	15-4
Updating	15-5
Firmware version, checking	15-2
Fixed Edges	5-7
Fixed mode	5-3
Screen	5-2
FM	
Repeater operation	4-29
RX audio High/Low pass filter setting	12-3
RX Bass	12-3
RX Treble	12-3
SPLIT Offset (HF)	12-5
TX Bass	12-3
TX Treble	12-3
Font	
Color (Receive/Transmit characters)	4-28
Selecting	13-3
Format (SD Card)	12-13
Front panel	1-2
Full Break-in mode	4-16
FUNCTION screen	1-7
List	1-7
Function (Set mode)	12-4
Fuse	14-2
G	
Grounding	2-2
H	
HAM radio Terms	iii
Heat dissipation	2-2
I	
IC-PW1, connecting	2-6
IC-PW1EURO, connecting	2-6
IF filter	
Selecting	4-6
Shape, selecting	4-6
IP Plus function	4-7

K	
Key	
KEY jack, about	18-4
speed, setting	4-15
Type (Keyer set menu)	4-21
Key assignment	
Front panel	12-6
Microphone	12-6
Keyboard	
Characters	1-9
Entering and editing	1-9
Example	1-10
Full Keyboard Layout	1-9, 12-9
Types	1-9, 12-9
Keyer	
Function, electronic	4-17
Memory edit menu (EDIT)	4-19
Repeat time	4-21
Set menu (CW-KEY SET)	4-21
Keypad	
Connecting	18-3
Keypad KEYS	12-10
Keypad RTTY	12-10
Keypad VOICE	12-10
L	
LEVEL (Noise Blanker)	4-8
Load Setting (SD Card)	12-13
Lock Function, about	12-6
M	
Main dial	
Friction, adjusting	13-2
Using	3-4
MAIN DIAL Auto TS	12-6
Marker	5-3
Position (Fix Type)	5-6
MB-118, mounting	17-3
MB-123, attaching	17-3
Memo Pad	9-6
Calling up	9-6
List, using	9-6
Quantity	12-6
Saving the displayed contents	9-6
Memory	
Mode	3-2
Name, entering	9-5
Name (Set mode)	12-12
Operation	10-4
Scan	10-4
Screen	9-5
Memory channel	9-2
Clearing	9-4
Entering	3-6
Selecting	9-2
in the MEMORY screen	9-3
using the keypad	9-2
with the up and down keys	9-2
Memory channel contents	
Copying	9-4
to another memory channel	9-4
to the VFO	9-4
Entering	9-3
in the Memory mode	9-3
in the VFO mode	9-3
Memory keyer (KEYER)	4-18
MENU screen	1-7

INDEX

Meter display	3-11
Selection	3-11
Meter Peak Hold	12-12
MF Band ATT	12-4
MIC	
Up/Down Keyer	4-21
Up/Down Speed	12-6
Microphone	
Connector, about	18-3
Gain, adjusting	3-11
Mini scope screen	5-4
MODE SPEECH	12-5
Monitor function	4-11
Multi-function dial	1-8
Multi-function menu	1-8
Multi-function meter, selecting	3-11
My Call (Set mode)	12-12
My call sign, displaying	13-5

N

Noise Blanker, about	4-8
Level and time, adjusting	4-8
Noise Reduction, about	4-9
Level, adjusting	4-9
Noise squelch	3-10
Notch function, about	4-9
Auto	4-9
Manual	4-9
Width menu display	12-12
[NOTCH] Switch	
AM	12-6
SSB	12-6

O

Opening Message	12-12
Operating band, selecting	3-3
Operating frequency	
Entering	3-5
Setting	3-4
Operating mode, selecting	3-3
Options	17-2
Oscilloscope Waveform Color	5-9
Others (Set mode)	12-14
OVF	3-10

P

P.AMP1/2	4-3
Partial Reset	12-14, 14-4
PHONES jack, about	18-4
PLAYER SET screen	6-9
Power	
ON Check	12-12
ON or OFF	3-2
When first applying	3-2
Preamplifiers	4-3
PRESET	13-6
Editing	13-6
Loading	13-6
Programmed scan	10-3
Protection function	13-4

Q

QSO audio	
Playing back	6-3
Recording	6-2
QUICK MENU	1-7
Quick recording	6-2
Quick RIT/ Δ TX Clear	12-6
Quick Split function, using	4-13
Quick SPLIT (Set mode)	12-5

R

Rear panel	1-4
RECORDER SET screen	6-8
Recording (Receive/transmit audio)	
Basic recording	6-2
Playing back	6-3
QSO audio	6-3
Recorded file on a PC	6-7
Voice TX memory	7-2
QSO audio	6-2
Quick recording	6-2
REF adjustment	13-4
REF Adjust (Set mode)	12-9
Remote control (CI-V) information	19-2
REMOTE jack, about	18-4
Repeater	
Input signal, checking	4-30
Tone frequency, checking	4-29
Tone frequency, setting	4-29
Resetting	14-4
All reset	14-4
Partial reset	14-4
RFG	3-10
RF gain	3-10
RF/SQL Control	12-4
Rise Time	4-21
RIT	
Function	4-3
Monitor function	4-3
RTTY	
Decode Baud Rate	12-11
Decode log set mode	4-27
DECODE screen, functions	4-23
Decode set mode	4-28
FSK, operating	4-22
Keying Polarity	12-5
Log contents	4-26
Log, turning ON	4-26
Mark Frequency	12-5
Memory content, transmitting	4-24
Memory, editing	4-25
Reverse mode	4-22
RX audio High/Low pass filter setting	12-3
Shift Width	12-5

S

Save Setting (SD Card)	12-13
Scan	
Fine Δ F scan	10-6
Fine Programmed scan	10-3
Preparation	10-2
Resume	10-2
Set mode	10-2
Speed	10-2
Types	10-2
Screen Capture	
Capture function	13-5
Capture [POWER] SW	12-9
File Type	12-9
Viewing	12-13
Screen Saver	12-12
Scroll mode	5-3
Screen	5-2

SWR measurement	
Plot.....	13-3
Spot.....	13-2
SWR, Multi-function meter.....	3-11

T

Time-Out Timer (CI-V)	12-5
Time (Set mode).....	12-13
Time Set (Set mode)	12-13
Time Stamp	
Frequency (RTTY decode log)	4-27
RTTY decode log.....	4-27
Time (RTTY decode log)	4-27
Tone scan operation	10-7
Tone squelch operation	4-30
Touch screen	iii, 1-5
Touch Screen Calibration	12-14
Function.....	14-3
Maintenance.....	iii
Operation (Spectrum scope)	5-4
Precautions	iii
Transmission, basic	3-10
Transmit filter width, setting.....	4-14, 12-3
Transmit output power, adjusting.....	3-10
Troubleshooting.....	14-5
Tuner	
Connecting	2-4
External	11-3
Internal	11-2
Preset Memory Clear	12-5
PTT Start	12-5
PTT Tuner start.....	11-2
[TUNER] Switch.....	12-5
Tuning	
1/4	3-5
CW Auto	4-16
Manual.....	11-2
PTT Tuner start.....	11-2
Tuning Step	
Auto	3-5
Changing	3-4
Function.....	3-4
Twin PBT	
IF filter width display.....	12-12
PBT shift value	12-12
Using	4-5
Twin Peak Filter.....	4-22
TX Delay	12-5
TX USOS	4-22

U

Unmount (SD Card).....	12-13
Updating the firmware	15-5
USB	
Baud Rate (CI-V).....	12-10
Echo Back (CI-V).....	12-11
Inhibit Timer at USB Connection	12-11
Keying (CW).....	12-11
Keying (RTTY).....	12-11
MOD Level	12-9
SEND	12-11
Serial Function	12-11
USB AF Beep/Speech... Output	12-9
USB AF Output Level	12-9
USB AF SQL.....	12-9
USB IF Output Level	12-9
USB Output Select	12-9
USB Port (CI-V).....	12-10
USB→REMOTE Transceiver Address.....	12-10
UTC Offset.....	12-13

INDEX

V

VBW (Video Band Width)	5-6
VFO	
Mode	3-2
Selecting	3-2
Using	3-2
VFO A and VFO B	
Equalizing	3-2
Receive and transmit frequencies	4-13
Selecting	3-2
VFO and Memory modes	3-2
VOICE DELAY	4-10
Voice memory contents	
Name, entering	7-3
Repeatedly transmitting	7-4
Transmitting	7-4
VOICE PLAYER screen	6-4
Voice recorder	
Deleting a file	6-5
Deleting a folder	6-6
File information, checking	6-4
File Split function	6-8
Folder information, checking	6-5
Voice TX memory	
Output level	7-5
Recording	7-2
Repeat Time	7-6
VOICE TX SET screen	7-6
Volume level, adjusting	3-2
VOX	
Adjusting	4-10
ANTI	4-10
Function	4-10
GAIN	4-10
Turning ON	4-10

W

Waterfall (Spectrum Scope)	
Display	5-7
Marker Auto-hide	5-7
Peak Color Level	5-7
Size (Expand Screen)	5-7
Speed	5-7
Waveform (Spectrum Scope)	
Color (Current)	5-7
Color (Line)	5-7
Color (Max Hold)	5-7
Type	5-6
WIDTH (Noise Blanker)	4-8

ABOUT CE

INSTALLATION NOTES

For amateur base station installations it is recommended that the forward clearance in front of the antenna array is calculated relative to the EIRP (Effective Isotropic Radiated Power). The clearance height below the antenna array can be determined in most cases from the RF power at the antenna input terminals.

As different exposure limits have been recommended for different frequencies, a relative table shows a guideline for installation considerations.

Below 30 MHz, the recommended limits are specified in terms of V/m or A/m fields as they are likely to fall within the near-field region. Similarly, the antennas may be physically short in terms of electrical length and that the installation will require some antenna matching device which can create local, high intensity magnetic fields. Analysis of such MF installations is best considered in association with published guidance notes such as the FCC OET Bulletin 65 Edition 97-01 and its annexes relative to amateur transmitter installations. The EC recommended limits are almost identical to the FCC specified 'uncontrolled' limits and tables exist that show pre-calculated safe distances for different antenna types for different frequency bands. Further information can be found at <http://www.arrl.org/>.

• Typical amateur radio installation

Exposure distance assumes that the predominant radiation pattern is forward and that radiation vertically downwards is at unity gain (sidelobe suppression is equal to main lobe gain). This is true of almost every gain antenna today. Exposed persons are assumed to be beneath the antenna array and have a typical height of 1.8 m.

The figures assume the worst case emission of a constant carrier.

For the bands 10 MHz and higher the following power density limits have been recommended:

10–50 MHz 2 W/sq m

Vertical clearance by EIRP output

1 Watts 2.1 m
10 Watts 2.8 m
25 Watts 3.4 m
100 Watts 5 m
1000 Watts 12 m

Forward clearance by EIRP output

100 Watts 2 m
1000 Watts 6.5 m
10,000 Watts 20 m
100,000 Watts 65 m

In all cases any possible risk depends on the transmitter being activated for long periods. (actual recommendation limits are specified as an average during 6 minutes)
Normally the transmitter is not active for long periods of time. Some radio licenses will require that a timer circuit automatically cuts the transmitter after 1–2 minutes etc.

Similarly some types of emission, i.e., SSB, CW, AM etc. have a lower 'average' output power and the assessed risk is even lower.

Count on us!