

Section 20 CONTROL COMMAND

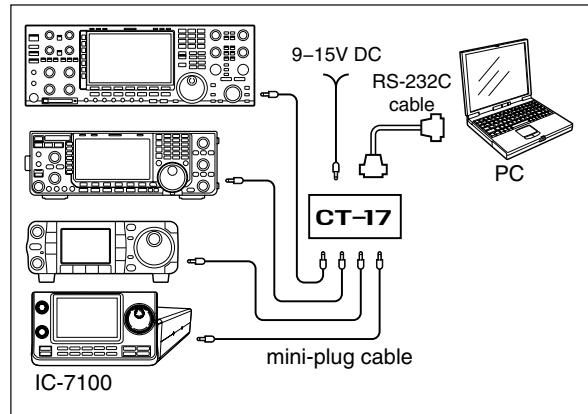
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Remote jack (CI-V) information

◇ CI-V connection example

The transceiver can be connected through an optional CT-17 CI-V LEVEL CONVERTER to a PC equipped with an RS-232C port. The Icom Communications Interface-V (CI-V) controls the transceiver.

Up to 4 Icom CI-V transceivers or receivers can be connected to the PC. See page 17-25 for setting the CI-V condition using the set mode.

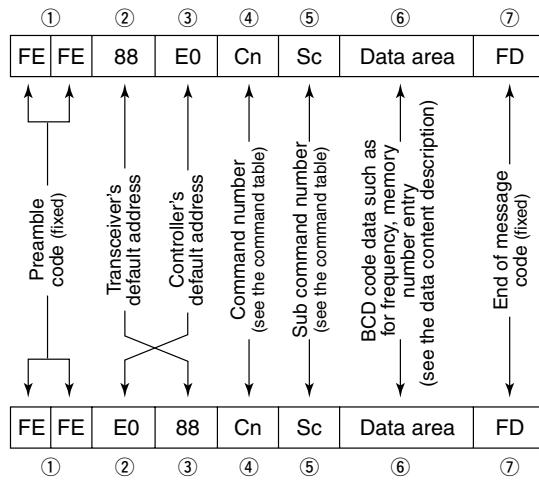


When the transceiver is connected to a PC with the supplied USB cable, the optional CT-17 is not required.

◇ Data format

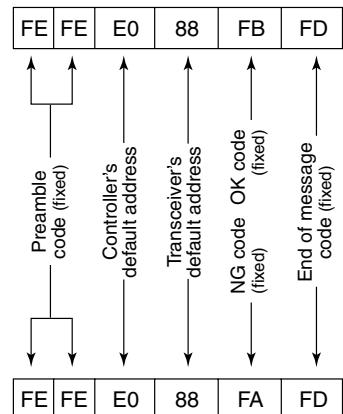
The CI-V system can be operated using the following data formats. Data formats differ depending on command numbers. A data area or sub command is added to some commands.

Controller to IC-7100



IC-7100 to controller

OK message to controller



NG message to controller

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Remote jack (CI-V) information (Continued)

◇ Command table

Cmd.	Sub cmd.	Data	Description	Cmd.	Sub cmd.	Data	Description
00		see p. 20-11	Send the operating frequency for transceive	0F		00	Read Split function OFF
01		see p. 20-11	Send the operating mode for transceive			01	Read Split function ON
02		see p. 20-12	Read the band edge frequencies			11	Read DUP- operation
03		see p. 20-11	Read the operating frequency			12	Read DUP+ operation
04		see p. 20-11	Read the operating mode	00			Set Split function OFF
05		see p. 20-11	Send the operating frequency	01			Set Split function ON
06	00		Select the LSB mode	10		10	Set the simplex operation
	01		Select the USB mode			11	Set DUP- operation
	02		Select the AM mode			12	Set DUP+ operation
	03		Select the CW mode	00			Send/read the 10 Hz (1 Hz) tuning step
	04		Select the RTTY mode			01	Send/read the 0.1 kHz tuning step
	05		Select the FM mode			02	Send/read the 1 kHz tuning step
	06		Select the WFM mode			03	Send/read the 5 kHz tuning step
	07		Select the CW-R mode			04	Send/read the 6.25 kHz tuning step
	08		Select the RTTY-R mode			05	Send/read the 9 kHz tuning step
	17		Select the DV mode			06	Send/read the 10 kHz tuning step
07			Select the VFO mode			07	Send/read the 12.5 kHz tuning step
	00		Select VFO A			08	Send/read the 20 kHz tuning step
	01		Select VFO B			09	Send/read the 25 kHz tuning step
	A0		Equalize VFO A and VFO B			10	Send/read the 50 kHz tuning step
	B0		Exchange VFO A and VFO B			11	Send/read the 100 kHz tuning step
08			Select the Memory mode			12	Send/read the 1 MHz tuning step
	0001 to 0109		Select the Memory channel (0001=M-CH01 to 0099=M-CH99, 0100=1A, 0101=1B, 0102=2A, 0103=2B, 0104=3A, 0105=3B, 0106=144-C1, 0107=144-C2, 0108=430-C1, 0109=430-C2)	11		00	Send/read Attenuator OFF
	A0	01	Select Memory Bank A			12	Send/read 12 dB attenuator
		02	Select Memory Bank B	13			Announce the operating frequency, operating mode and S-meter level by voice synthesizer
		03	Select Memory Bank C		01		Announce the operating frequency and S meter level by voice synthe- sizer
		04	Select Memory Bank D		02		Announce the operating mode by voice synthesizer
		05	Select Memory Bank E	14		01	0000 to 0255
	09		Memory write				Send/read the AF level (0000=min. to 0255=max.)
	0A		Memory copy to VFO		02	0000 to 0255	Send/read the RF gain level (0000=min., 0255=max.)
	0B		Memory clear		03	0000 to 0255	Send/read the squelch level (0000=min. to 0255=max.)
0C			Read offset frequency		06	0000 to 0255	Send/read the NR level (0000=0% to 0255=100%)
	0D		Send offset frequency		07	0000 to 0255	Send/read the inner [TWIN PBT] position (0000=Cutting the higher passband edge, 0128=center, 0255=Cutting the lower passband edge)
0E	00		Scan stop		08	0000 to 0255	Send/read the outer [TWIN PBT] position (0000=Cutting the higher passband edge, 0128=center, 0255=Cutting the lower passband edge)
	01		Programmed/memory scan start		09	0000 to 0255	Send/read the CW PITCH (0000=300 Hz, 0128=600 Hz, 0255=900 Hz)
	02		Programmed scan start		0A	0000 to 0255	Send/read the RF power level (0000=min. to 0255=max.)
	03		ΔF scan start		0B	0000 to 0255	Send/read the MIC gain level (0000=min. to 0255=max.)
	12		Fine programmed scan start		0C	0000 to 0255	Send/read the KEY SPEED (0000=6 WPM to 0255=48 WPM)
	13		Fine ΔF scan start		0D	0000 to 0255	Send/read the NOTCH setting (0000=lowest, 0128=center, 0255=highest)
	22		Memory scan start				
	23		Select memory scan start				
	24		Mode select scan start				
	A1		Set the ±5 kHz ΔF scan span				
	A2		Set the ±10 kHz ΔF scan span				
	A3		Set the ±20 kHz ΔF scan span				
	A4		Set the ±50 kHz ΔF scan span				
	A5		Set the ±100 kHz ΔF scan span				
	A6		Set the ±500 kHz ΔF scan span				
	A7		Set the ±1 MHz ΔF scan span				
	B0		Set as the Non-select Memory channel				
	B1		Set as the Select Memory channel				
	D0		Set Scan resume function OFF				
	D3		Set Scan resume function ON				

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Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
14	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 level (0000=0% to 0255=100%)
	16	0000 to 0255	Send/read the VOX gain level (0000=0% to 0255=100%)
	17	0000 to 0255	Send/read the Anti VOX gain level (0000=0% to 0255=100%)
	18	0000 to 0255	Send/read the LCD contrast level (0000=0% to 0255=100%)
	19	0000 to 0255	Send/read the LCD backlight level (0000=0% to 0255=100%)
15	01	00	Read the squelch status (squelch closed)
		01	Read the squelch status (squelch open)
	02	0000 to 0255	Read the S-meter level (0000=S0, 0120=S9, 0241=S9+60 dB)
	05	00	Read various SQL function's status (squelch closed)
		01	Read various SQL function's status (squelch open)
	11	0000 to 0255	Read the PO meter level (0000=0%, 0143=50%, 213=100%)
	12	0000 to 0255	Read the SWR meter level (0000=SWR1.0, 0048=SWR1.5, 0080=SWR2.0, 0120=SWR3.0)
	13	0000 to 0255	Read the ALC meter level (0000=Min. to 0120=Max.)
	14	0000 to 0255	Read the COMP meter level (0000=0 dB, 0130=15 dB, 0241=30 dB)
	15	0000 to 0255	Read the Vd meter level (0000=0 V, 0013=10 V, 0241=16 V)
	16	0000 to 0255	Read the Id meter level (0000=0, 0097=10, 0146=15, 0241=25)
	17	00	Send/read Preamp OFF
16	02	00	Send/read Preamp ON (144/430 MHz)
		01	Send/read Preamp 1 ON (HF/50 MHz)
		02	Send/read Preamp 2 ON (HF/50 MHz)
	12	01	Send/read AGC FAST
		02	Send/read AGC MID
		03	Send/read AGC SLOW
	22	00	Send/read Noise Blanker OFF
		01	Send/read Noise Blanker ON
	40	00	Send/read Noise Reduction OFF
		01	Send/read Noise Reduction ON
	41	00	Send/read Auto Notch function OFF
		01	Send/read Auto Notch function ON
42	00	00	Send/read Repeater tone OFF
		01	Send/read Repeater tone ON
43	00	00	Send/read Tone squelch OFF
		01	Send/read Tone squelch ON

Cmd.	Sub cmd.	Data	Description
16	44	00	Send/read Speech compressor OFF
		01	Send/read Speech compressor ON
	45	00	Send/read Monitor function OFF
		01	Send/read Monitor function ON
	46	00	Send/read VOX function OFF
		01	Send/read VOX function ON
	47	00	Send/read BK-IN function OFF
		01	Send/read Semi BK-IN function ON
		02	Send/read Full BK-IN function ON
	48	00	Send/read Manual notch function OFF
		01	Send/read Manual notch function ON
	4B	00	Send/read DTCS OFF
		01	Send/read DTCS ON
4C	00	00	Send/read VSC function OFF
		01	Send/read VSC function ON
	4F	00	Send/read Twin Peak Filter OFF
		01	Send/read Twin Peak Filter ON
	50	00	Send/read Dial lock function OFF
		01	Send/read Dial lock function ON
	56	00	Send/read DSP filter type SHARP
		01	Send/read DSP filter type SOFT
	57	00	Send/read manual notch width WIDE
		01	Send/read manual notch width MID
58	00	02	Send/read manual notch width NAR
		00	Send/read SSB transmit bandwidth WIDE
		01	Send/read SSB transmit bandwidth MID
		02	Send/read SSB transmit bandwidth NAR
5B	00	00	Send/read DSQ/CSQL OFF (DV mode only)
		01	Send/read DSQ/CSQL ON (DV mode only)
		02	Send/read CSQ/CSQL ON (DV mode only)
17		see p. 20-11	Send CW messages*1
18	00		Turn OFF the transceiver
	01		Turn ON the transceiver*2

*1 In the CW mode, if 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 When sending the power ON command (18 01), the command "FE" must be sent before the basic format.

- 19200 bps: 25, • 9600 bps: 13, • 4800 bps: 7,
- 1200 bps: 3, • 300 bps: 2

Example: When operating with 4800 bps

	①	②	③	④	⑤	⑦
F E	F E	F E	8 8	E O	1 8	0 1 F D

x 7

① Preamble code (fixed)

② Transceiver's default address

③ Controller's default address

④ Command number

⑤ Sub command number

⑦ End of message code (fixed)

20 CONTROL COMMAND

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
19	00		Read the transceiver ID
1A	00	see p. 20-16	Send/read the Memory channel contents
	01	see p. 20-12	Send/read the Band stacking register contents
	02	see p. 20-13	Send/read the Memory keyer contents*
	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 40/31=3600 Hz/2700 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	00/01	Send/read the TX Monitor function setting (00=OFF, 01=ON)
	0002	0000 to 0255	Send/read the TX Monitor level (0000=0% to 0255=100%)
	0003		Send/read the Beep level (0000=0% to 0255=100%)
	0004	00/01	Send/read the Beep level limit setting (00=OFF, 01=ON)
	0005	00/01	Send/read the Confirmation beep setting (00=OFF, 01=ON)
	0006	00 to 03	Send/read the Band edge beep setting (00=OFF, 01=ON(Default), 02=ON(User), 03=ON(User & TX Limit))
	0007	00 to 02	Send/read the RF/SQL Control setting (00=Auto, 01=SQL, 02=RF+SQL)
	0008	00 to 05	Send/read the TX Delay setting (HF) (00=OFF, 01=10ms, 02=15ms, 03=20ms, 04=25ms, 05=30ms)
	0009	00 to 05	Send/read the TX Delay setting (50M) (00=OFF, 01=10ms, 02=15ms, 03=20ms, 04=25ms, 05=30ms)
	0010	00 to 05	Send/read the TX Delay setting (70M) (00=OFF, 01=10ms, 02=15ms, 03=20ms, 04=25ms, 05=30ms)
	0011	00 to 05	Send/read the TX Delay setting (144M) (00=OFF, 01=10ms, 02=15ms, 03=20ms, 04=25ms, 05=30ms)
	0012	00 to 05	Send/read the TX Delay setting (430M) (00=OFF, 01=10ms, 02=15ms, 03=20ms, 04=25ms, 05=30ms)
	0013	00 to 05	Send/read the Time-Out Timer setting (0=OFF, 1=3 min., 2=5 min., 3=10 min., 4=20 min., 5=30 min.)
	0014	00/01	Send/read the PTT Lock function setting (00=OFF, 01=ON)

Cmd.	Sub cmd.	Data	Description
1A	05	0015	Send/read the Quick Split function setting (00=OFF, 01=ON)
	0016	see p. 20-13	Send/read the Split offset frequency
	0017	00/01	Send/read the Split Lock function setting (00=OFF, 01=ON)
	0018	see p. 20-13	Send/read the Duplex offset frequency
	0019	00/01	Send/read the One Touch Repeater setting (00=DUP-, 01=DUP+)
	0020	00 to 02	Send/read the Auto Repeater setting (0=OFF, 1=ON(DUP) (for USA version) or ON (for Korea version), 2=ON(DUP,TONE)(for USA version)
	0021	00/01	Send/read the Tuner Auto Start setting (00=OFF, 01=ON)
	0022	00/01	Send/read the PTT Tune setting (00=OFF, 01=ON)
	0023	00	Send/read the Manual selection for the [TUNER] Switch function.
		01	Send/read the Auto selection for the [TUNER] Switch function.
	0024	00/01	Send/read [SPEECH/LOCK] key function setting (00=Push: SPEECH, Hold down: LOCK), 01=Push: LOCK, Hold down: SPEECH)
	0025	00/01	Send/read the Lock function setting (00=MAIN DIAL, 01=PANEL)
	0026	00/01	Send/read the number of memo pad channels (00=5CH, 01=10CH)
	0027	00 to 02	Send/read the Auto TS setting for the Dial (00=OFF, 01=LOW, 02=HIGH)
	0028	00/01	Send/read the microphone Up/ Down speed setting (00=Slow, 01=Fast)
	0029	00 to 02	Send/read the Notch function setting for SSB mode (00=Auto, 01=Manual, 02=Auto/Manual)
	0030	00 to 02	Send/read the Notch function setting for AM mode (00=Auto, 01=Manual, 02=Auto/Manual)
	0031	00/01	Send/read the SSB/CW Synchronous Tuning function setting (00=OFF, 01=ON)
	0032	00/01	Send/read the CW normal side setting (00=LSB, 01=USB)
	0033	00/01	Send/read the voice 1st menu (00=VOICE-Root, 01=VOICE-TX)
	0034	00/01	Send/read the keyer 1st menu (00=KEYER-Root, 01=KEYER-SEND)

* The counter can be inserted into only one channel. Before inserting the counter, be sure to clear the counter on another channel.

20 CONTROL COMMAND

Remote jack (CI-V) information

◊ Command table (Continued)

Cmd.	Sub cmd.	Data	Description	Cmd.	Sub cmd.	Data	Description
1A	05	0035	00/01 Send/read the Speaker output setting (00=OFF, 01=ON)	1A	05	0050	00/01 Send/read the S-Level SPEECH function setting (00=OFF, 01=ON)
		0036	00/01 Send/read the MIC AF output setting (00=OFF, 01=ON)		0051	00/01	Send/read the MODE SPEECH function setting (00=OFF, 01=ON)
		0037	00 to 22 Send/read the function of [F-1] on the HM-151 (00=--, 01=P.AMP/ATT, 02=AGC, 03=N.B, 04=NR, 05=NOTCH, 06=RIT, 07=AUTOTUNE/RX>CS, 08=TS, 09=MPAD, 10=M-CLR, 11=BANK, 12=SPLIT, 13=A/B, 14=DUP, 15=TONE/DSQL, 16=COMP, 17=TBW, 18=METER, 19=DR, 20=FROM/TO (DR), 21=SCAN, 22=Voice TX (T1))		0052	00/01	Send/read the speech language (00=English, 01=Japanese)
		0038	00 to 22 Send/read the function of [F-2] on the HM-151 (00=--, 01=P.AMP/ATT, 02=AGC, 03=N.B, 04=NR, 05=NOTCH, 06=RIT, 07=AUTOTUNE/RX>CS, 08=TS, 09=MPAD, 10=M-CLR, 11=BANK, 12=SPLIT, 13=A/B, 14=DUP, 15=TONE/DSQL, 16=COMP, 17=TBW, 18=METER, 19=DR, 20=FROM/TO (DR), 21=SCAN, 22=Voice TX (T1))		0053	00/01	Send/read the Alphabet setting for SPEECH (00=Normal, 01=Phonetic Code)
		0039	00/01 Send/read the SSB mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0054	00/01	Send/read the speech speed setting (00=Slow, 01=Fast)
		0040	00/01 Send/read the CW mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0055	0000 to 0255	Send/read the speech level (0000=0% to 0255=100%)
		0041	00/01 Send/read the RTTY mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0056	see p. 20-11	Send/read the SSB RX HPF/LPF setting
		0042	00/01 Send/read the AM mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0057	00 to 10	Send/read the SSB RX Tone (Bass) level (00=-5 to 10=+5)
		0043	00/01 Send/read the FM mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0058	00 to 10	Send/read the SSB RX Tone (Treble) level (00=-5 to 10=+5)
		0044	00/01 Send/read the DV mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0059	see p. 20-11	Send/read the AM RX HPF/LPF setting
		0045	00/01 Send/read the WFM mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)		0060	00 to 10	Send/read the AM RX tone (Bass) level (00=-5 to 10=+5)
		0046	00/01 Send/read the Power OFF setting when no controller is connected. (00=OFF, 01=ON)		0061	00 to 10	Send/read the AM RX Tone (Treble) level (00=-5 to 10=+5)
		0047	0000 to 0255 Send/read the REF Adjust setting (0000=0%, 0128=50%, 0255=100%)		0062	see p. 20-11	Send/read the FM RX HPF/LPF setting
		0048	00 to 02 Send/read the RX Call Sign SPEECH setting (00=OFF, 01=ON (Kerchunk), 02=ON (All))		0063	00 to 10	Send/read the FM RX tone (Bass) level (00=-5 to 10=+5)
		0049	00/01 Send/read the RX>CS SPEECH function setting (00=OFF, 01=ON)		0064	00 to 10	Send/read the FM RX Tone (Treble) level (00=-5 to 10=+5)
					0065	see p. 20-11	Send/read the DV RX HPF/LPF setting
					0066	00 to 10	Send/read the DV RX tone (Bass) level (00=-5 to 10=+5)
					0067	00 to 10	Send/read the DV RX Tone (Treble) level (00=-5 to 10=+5)
					0068	00 to 10	Send/read the WFM RX Tone (Bass) level (00=-5 to 10=+5)
					0069	00 to 10	Send/read the WFM RX Tone (Treble) level (00=-5 to 10=+5)
					0070	00 to 10	Send/read the CW RX HPF/LPF setting
					0071	00 to 10	Send/read the RTTY RX HPF/LPF setting
					0072	00 to 10	Send/read the SSB TX Tone (Bass) level (00=-5 to 10=+5)
					0073	00 to 10	Send/read the SSB TX Tone (Treble) level (00=-5 to 10=+5)

20 CONTROL COMMAND

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description	Cmd.	Sub cmd.	Data	Description
1A	05	0074	see p. 20-11 Send/read the WIDE SSB TX bandwidth	1A	05	0096	00 to 02 Send/read the "USB2" (COM port) function setting (00=OFF, 01=RTTY Decode, 02=DV Data)
		0075	see p. 20-11 Send/read the MID SSB TX bandwidth		0097	00 to 03	Send/read the [DATA1] function setting (00=OFF, 01=RTTY Decode, 02=DV Data, 03=GPS)
		0076	see p. 20-11 Send/read the NARROW SSB TX bandwidth		0098	00/01	Send/read the GPS output setting (00=OFF, 01=DATA1→USB2)
		0077	00 to 10 Send/read the AM TX tone (Bass) level (00=-5 to 10=+5)		0099	00/01	Send/read the DV or GPS data transfer speed (00=4800 bps, 01=9600 bps)
		0078	00 to 10 Send/read the AM TX Tone (Treble) level (00=-5 to 10=+5)		0100	00 to 04	Send/read the RTTY decode speed (00=300 bps, 01=1200 bps, 02=4800 bps, 03=9600 bps, 04=19200 bps)
		0079	00 to 10 Send/read the FM TX tone (Bass) level (00=-5 to 10=+5)		0101	00 to 02	Send/read the band setting for the [ACC] socket's pin 7 (VSEND usage) (00=OFF, 01=UHF, 02=VHF/UHF)
		0080	00 to 10 Send/read the FM TX Tone (Treble) level (00=-5 to 10=+5)		0102	00/01	Send/read the 9600bps Mode setting (00=OFF, 01=ON)
		0081	00 to 10 Send/read the DV TX tone (Bass) level (00=-5 to 10=+5)		0103	0000 to 0255	Send/read the LCD contrast setting (0000=0% to 0255=100%)
		0082	00 to 10 Send/read the DV TX Tone (Treble) level (00=-5 to 10=+5)		0104	0000 to 0255	Send/read the LCD Backlight setting (0000=0% to 0255=100%)
		0083	00/01 Send/read the USB audio squelch setting (00=OFF (OPEN), 01=ON)		0105	0000 to 0255	Send/read the Key Backlight setting (0000=0% to 0255=100%)
		0084	00/01 Send/read the ACC and USB output setting (00=AF, 01=IF)		0106	00/01	Send/read the Meter Peak Hold setting (00=OFF, 01=ON)
		0085	0000 to 0255 Send/read the ACC and USB AF output Level (0000=0% to 0255=100%)		0107	00/01	Send/read the PBT shifting value display setting while rotating [TWIN PBT] (00=OFF, 01=ON)
		0086	0000 to 0255 Send/read the ACC and USB IF output Level (0000=0% to 0255=100%)		0108	00/01	Send/read the IF filter width and shifting value display setting when the IF filter is switched (00=OFF, 01=ON)
		0087	0000 to 0255 Send/read the ACC modulation level (0000=0% to 0255=100%)		0109	00 to 02	Send/read the RX Call sign display setting (00=OFF, 01=AUTO, 02=Auto (RX Hold))
		0088	0000 to 0255 Send/read the DATA modulation level (0000=0% to 0255=100%)		0110	00/01	Send/read the RX message display setting (00=OFF, 01=ON)
		0089	0000 to 0255 Send/read the USB modulation level (0000=0% to 0255=100%)		0111	00/01	Send/read the RX position display setting when the received Auto Reply signal includes the position (00=OFF, 01=ON)
		0090	00 to 03 Send/read the modulation input setting in the DATA mode OFF (00=MIC, 01=ACC, 02=MIC,ACC, 03=USB)		0112	00 to 02	Send/read the TX Call sign display setting (00=OFF, 01=Your Call Sign, 02=My Call Sign)
		0091	00 to 03 Send/read the modulation input setting in the DATA mode ON (00=MIC, 01=ACC, 02=MIC,ACC, 03=USB)		0113	00/01	Send/read the Scroll Speed setting (00=Slow, 01=Fast)
		0092	00/01 Send/read the external keypad setting for VOICE (00=OFF, 01=ON)		0114	00/01	Send/read the VOICE TX Name Display setting (00=OFF, 01=ON)
		0093	00/01 Send/read the external keypad setting for Memory KEYER (00=OFF, 01=ON)		0115	00/01	Send/read the KEYER Memory Display setting (00=OFF, 01=ON)
		0094	00/01 Send/read the external keypad setting for RTTY Memory (00=OFF, 01=ON)				
		0095	00/01 Send/read the CI-V transceive setting (00=OFF, 01=ON)				

20 CONTROL COMMAND

Remote jack (CI-V) information

◊ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
1A	05	0116	Send/read the Opening Message (00=OFF, 01=ON)
		0117	Send/read the Power ON Check setting (00=OFF, 01=ON)
		0118	Send/read the Display Language (00=English, 01=Japanese)
		0119	Send/read the System Language (00=English, 01=Japanese)
		0120	20000101 to 20991231 Send/read the date setting (20000101=2000/01/01 to 20991231=2099/12/31)
		0121	0000 to 2359 Send/read the time setting (0000(0:00) to 2359(23:59))
		0122	00/01 Send/read the GPS time correction setting (00=OFF, 01=Auto)
		0123	see p. 20-13 Send/read the UTC offset setting
		0124	00/01 Send/read the clock display mode (00=LOCAL, 01=UTC)
		0125	00 to 04 Send/read the Auto Power OFF function setting (00=OFF, 01=30 min., 02=60 min., 03=90 min., 04=120 min.)
		0126	00 to 10 Send/read the compression level (00=0 to 10=10)
		0127	00 to 14 Send/read the repeat interval to transmit the recorded voice audio (00=1 sec. to 14=15 sec.)
		0128	00/01 Send/read the TX voice audio monitor function setting (00=OFF, 01=ON)
		0129	00 to 04 Send/read the numbering system used for contest (serial) numbers (00=Normal, 01=190 ANO, 02=190 ANT, 03=90 NO, 04=90 NT)
		0130	01 to 04 Send/read the count-up trigger channel (01=M1 to 04=M4)
		0131	0001 to 9999 Send/read the current contest serial number (0001=1 to 9999=9999)
		0132	0000 to 0255 Send/read the CW sidetone level (0000=0% to 0255=100%)
		0133	00/01 Send/read the CW sidetone level limit setting (00=OFF, 01=ON)
		0134	01 to 60 Send/read the CW keyer repeat time (01=1 sec. to 60=60 sec.)
		0135	28 to 45 Send/read the CW keyer dot/dash ratio (28=1:1:2.8 to 45=1:1:4.5)
		0136	00 to 03 Send/read the CW Rise time setting (00=2 msec, 01=4 msec, 02=6 msec, 03=8 msec)
		0137	00/01 Send/read the paddle polarity setting (00=Normal, 01=Reverse)
		0138	00 to 02 Send/read the keyer type setting (00=Straight, 01=BUG-Key, 02=ELEC-Key)

Cmd.	Sub cmd.	Data	Description
1A	05	0139	Send/read Mic. up/down keyer setting (00=OFF, 01=ON)
		0140	Send/read the Twin Peak Filter setting (00=OFF, 01=ON)
		0141	00 to 02 Send/read the RTTY mark frequency (00=1275 Hz, 01=1615 Hz, 02=2125 Hz)
		0142	00 to 02 Send/read the RTTY shift width (00=170 Hz, 01=200 Hz, 02=425 Hz)
		0143	00/01 Send/read the RTTY keying polarity (00=Normal, 01=Reverse)
		0144	00/01 Send/read the RTTY decode USOS setting (00=OFF, 01=ON)
		0145	00/01 Send/read the RTTY decode new line code setting (00=CR,LF,CR+LF, 01=CR+LF)
		0146	00/01 Send/read the RTTY TX USOS setting (00=OFF, 01=ON)
		0147	00/01 Send/read the RTTY Decode Log setting (00=OFF, 01=ON)
		0148	00/01 Send/read the RTTY Decode Log file type (00=Text, 01=HTML)
		0149	00/01 Send/read the RTTY Decode Log Time Stamp setting (00=OFF, 01=ON)
		0150	00/01 Send/read the RTTY Decode Log Time Stamp (Time) (00=Local, 01=UTC)
		0151	00/01 Send/read the RTTY Decode Log Time Stamp (Frequency) (00=OFF, 01=ON)
		0152	00 to 03 Send/read the DTMF Speed setting (00=100 msec., 01=200 msec., 02=300 msec., 03=500 msec.)
		0153	00/01 Send/read the Scan speed setting (00=Slow, 01=Fast)
		0154	00/01 Send/read the Scan resume setting (00=OFF, 01=ON)
		0155	00 to 10 Send/read the Scan pause timer setting (00=2 sec. to 09=20 sec., 10=HOLD)
		0156	00 to 06 Send/read the Scan resume timer (00=0 sec. to 05=5 sec., 6=HOLD)
		0157	00/01 Send/read the Dial function during a scan (00=OFF, 01=Up/Down)
		0158	0000 to 0255 Send/read the NB level (0000=0% to 0255=100%)
		0159	00 to 09 Send/read the NB depth (00=1 to 09=10)
		0160	0000 to 0255 Send/read the NB width (0000=1 to 0255=100%)
		0161	00 to 15 Send/read the NR level for other than the DR mode (00=0 to 15=15)

20 CONTROL COMMAND

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description	Cmd.	Sub cmd.	Data	Description
1A	05	0162	00 to 15 Send/read NR level for the DR mode (00=0 to 15=15)	1A	05	0186	see p. 20-13 Send/read the manually programmed position
		0163	0000 to 0255 Send/read the VOX gain (0000=0% to 0255=100%)		0187	00/01	Send/read the GPS Indicator setting (00=OFF, 01=ON)
		0164	0000 to 0255 Send/read the ANTI-VOX gain (0000=0% to 0255=100%)		0188	00/01	Send/read the Position Format setting (00=ddd°mm.mm', 01=ddd°mm'ss")
		0165	00 to 20 Send/read the VOX delay time (00=0.0 sec. to 20=2.0 sec.)		0189	00/01	Send/read the Distance and Altitude unit (00=meter, 01=feet/mile)
		0166	0020 to 0130 Send/read the BK-IN delay time (0020=2.0d to 0130=13.0d)		0190	00 to 02	Send/read the GPS speed unit (00=km/h, 01=mph, 02=knots)
		0167	00/01 Send/read the recording mode (00=TX&RX, 01=RX Only)		0191	see p. 20-13	Send/read GPS alarm area (Group)
		0168	00/01 Send/read the squelch status for the RX voice audio recording (00=Always, 01=Squelch Auto)		0192	00 to 02	Send/read GPS alarm area (RX/Memory) (00=Limited, 01=Extended, 02=Both)
		0169	00/01 Send/read the QSO audio record file Split function setting (00=OFF, 01=ON)		0193	00 to 02	Send/read the GPS TX Mode setting (00=OFF, 01=GPS(DV-G), 02=GPS-A(DV-A))
		0170	00/01 Send/read the PTT Automatic Recording function setting (00=OFF, 01=ON)		0194	00/01	Send/read the GPS (RMC) Sentence setting (00=OFF, 01=ON)
		0171	00 to 03 Send/read the Skip Timer setting while playing back (00=3 sec., 01=5 sec., 02=10 sec., 03=30 sec.)		0195	00/01	Send/read the GPS (GGA) Sentence setting (00=OFF, 01=ON)
		0172	00 to 02 Send/read the Standby Beep setting (00=OFF, 01=ON, 02=ON (to me:High Tone))		0196	00/01	Send/read the GPS (GLL) Sentence setting (00=OFF, 01=ON)
		0173	00 to 02 Send/read Auto Reply setting (00=OFF, 01=ON, 02=Voice)		0197	00/01	Send/read the GPS (GSA) Sentence setting (00=OFF, 01=ON)
		0174	00/01 Send/read the DV Data TX setting (00=PTT, 01=Auto)		0198	00/01	Send/read the GPS (VTG) Sentence setting (00=OFF, 01=ON)
		0175	00 to 02 Send/read the Digital Monitor setting (00=Auto, 01=Digital, 02=Analog)		0199	00/01	Send/read the GPS (GSV) Sentence setting (00=OFF, 01=ON)
		0176	00/01 Send/read the Digital Repeater setting function setting (00=OFF, 01=ON)		0200	see p. 20-14	Send/read the GPS Message
		0177	00/01 Send/read the RX Call Sign Auto Write setting (00=OFF, 01=Auto)		0201	see p. 20-13	Send/read the Unproto Address
		0178	00/01 Send/read the RX RPT Call Sign Auto Write setting (00=OFF, 01=Auto)		0202	00/01	Send/read the position data extension setting (00=OFF, 01=COURSE/SPEED)
		0179	00/01 Send/read the DV Auto Detect setting (00=OFF, 01=ON)		0203	00 to 02	Send/read the GPS-A Time Stamp setting (00=OFF, 01=DHM, 02=HMS)
		0180	00/01 Send/read the RX Record (RPT) setting (00=ALL, 01=Latest Only)		0204	00/01	Send/read the GPS-A altitude setting (00=OFF, 01=ON)
		0181	00/01 Send/read the BK function setting (00=OFF, 01=ON)		0205	00 to 03	Send/read the GPS-A Symbol (00=No.1, 01=No.2, 02=No.3, 03=No.4)
		0182	00/01 Send/read the EMR mode setting (00=OFF, 01=ON)		0206	see p. 20-13	Send/read the GPS-A Symbol No.1 setting
		0183	0000 to 0255 Send/read EMR AF Level (0000=0% to 0255=100%)		0207	see p. 20-13	Send/read the GPS-A Symbol No.2 setting
		0184	00 to 02 Send/read the external GPS receiver setting (00=OFF, 01=External GPS, 02=Manual)		0208	see p. 20-13	Send/read the GPS-A Symbol No.3 setting
		0185	00/01 Send/read the GPS Receiver Baud setting (00=4800 bps, 01=9600 bps)		0209	see p. 20-13	Send/read the GPS-A Symbol No.4 setting
					0210	00 to 42	Send/read the GPS-A SSID (00=---, 01=(-0), 02=-1 to 16=-15, 17=-A to 42=-Z)

20 CONTROL COMMAND

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.	Data	Description
1A	05	0211	see p. 20-14 Send/read the GPS-A comment
		0212	00 to 08 Send/read the GPS Auto TX interval setting (00=OFF, 01=5 sec., 02=10 sec., 03=30 sec., 04=1 min., 05=3 min., 06=5 min., 07=10 min., 08=30 min.)
	0213	00/01	Send/read the QSO Log setting (00=OFF, 01=ON)
	0214	00/01	Send/read the RX History Log function setting (00=OFF, 01=ON)
	0215	00 to 02	Send/read the QSO/RX Log CSV format setting (Separator/Decimal) (00=Separator is “,” and Decimal is “.”, 01=Separator is “;” and Decimal is “.”, 02=Separator is “;” and Decimal is “.”)
	0216	00 to 02	Send/read the QSO/RX Log CSV format setting (Date) (00=“yyyy/mm/dd”, 01=“mm/dd/yyyy”, 02=“dd/mm/yyyy”)
	0217	00/01	Send/read the Weather Alert setting (USA only) (00=OFF, 01=ON)
	0218	00 to 02	Send/read the Memory Name Display setting [System language: English] (00=OFF, 01=ON) [System language: Japanese] (00=OFF, 01=Normal, 02=Large)
	0219	00/01	Send/read the Display Type setting for the DR mode (00=Normal, 01=Large)
	0220	00 to 02	Send/read the Compass Direction setting (00=Heading Up, 01=North Up, 02=South Up)
	0221	00	Send/read command to disable to output the antenna controller status (frequency and so on) from [REMOTE].
	06	see p. 20-14	Send/read the DATA mode setting
1B	00	see p. 20-14	Send/read the Repeater tone frequency
	01	see p. 20-14	Send/read the Tone squelch frequency
	02	see p. 20-14	Send/read the DTCS code and polarity
	07	see p. 20-14	Send/read the CSQL code (DV mode)
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 Antenna tuner OFF (through)
		01	Send/read Antenna tuner ON
	02	00	Send/read the Manual tuning selection
		01	Send/read Transmit frequency monitor check OFF
	03	00	Send/read Transmit frequency monitor check ON
		see p. 20-11	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].
		01	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	see p. 20-12 Read the TX band edge frequencies
		02	Read number of User-set TX frequency band
	1F	00	see p. 20-12 Send/read the User-set TX band edge frequencies
		01	see p. 20-14 Send/read the DV MY call sign
		02	see p. 20-14 Send/read the DV TX call signs
20	00	00	00/01 ^{*3} Send/read the Auto DV RX Call signs output setting (00=OFF, 01=ON)
	01	see p. 20-15	Output the DV RX Call signs
		02	see p. 20-15 Read the DV RX Call signs
		00	00/01 ^{*3} Send/read the Auto DV RX message output setting (00=OFF, 01=ON)
	01	see p. 20-15	Output the DV RX message
		02	see p. 20-15 Read the DV RX message
	02	00	00/01 ^{*3} Send/read the Auto DV RX status output setting (00=OFF, 01=ON)
		01	see p. 20-15 Output the DV RX status
		02	see p. 20-15 Read the DV RX status
		00	see p. 20-17 Send/read RIT frequency.
21	01	00	Send/read RIT setting OFF.
		01	Send/read RIT setting ON.
		see p. 20-17	Send/read the selected or unselected VFO frequency.
25	see p. 20-17	see p. 20-17	Send/read the selected or unselected VFO's operating mode and filter.
	see p. 20-17	see p. 20-17	Send/read the selected or unselected VFO's operating mode and filter.

^{*3} Output setting is automatically turned OFF after turning the power OFF, then ON.

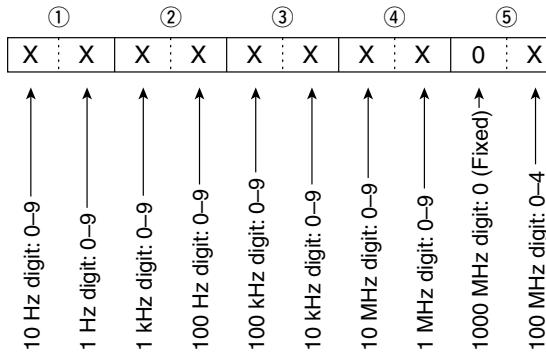
20 CONTROL COMMAND

Remote jack (CI-V) information (Continued)

◇ Data content description

• Operating frequency

Command: 00, 03, 05, 1C 03



• Operating mode

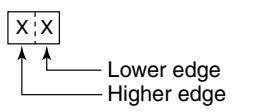
Command: 01, 04, 06

		①	②
		X : X	X : X
① Operating mode	② Filter setting		
00: LSB	05: FM	01: FIL1	
01: USB	06: WFM	02: FIL2	
02: AM	07: CW-R	03: FIL3	
03: CW	08: RTTY-R	—	
04: RTTY	17: DV	—	

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

• SSB transmission bandwidth setting

Command: 1A 05 0074, 0075, 0076



Lower edge	Higher edge
0: 100Hz	0: 2500Hz
1: 200Hz	1: 2700Hz
2: 300Hz	2: 2800Hz
3: 500Hz	3: 2900Hz

• RX HPF and LPF settings in each operating mode

Command: 1A 05 0056, 0059, 0062, 0065



HPF
00: through
01 to 20: 100 to 2000 Hz

LPF
05 to 24: 500 to 2400 Hz
25: through

Set the LPF value larger than HPF one.

• CW message contents

Command: 17

Set a CW message of up to 30 characters.

• Character's code

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

- “FF” stops sending CW messages.

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

20 CONTROL COMMAND

Remote jack (CI-V) information

◊ Data content description (Continued)

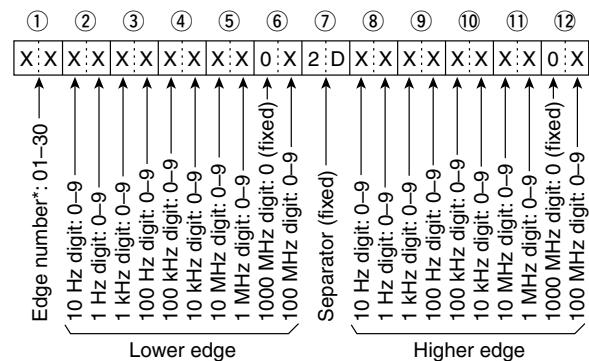
• Character code setting

Command: 1A 00, 1A 05 0200, 1A 05 0201,
 1A 05 0206, 1A 05 0207, 1A 05 0208,
 1A 05 0209, 1A 05 0211, 1F 02, 20 0001,
 20 0002

Character	ASCII code	Character	ASCII code
A-Z	41-5A	a-z	61-7A
0-9	30-39	Space	20
!	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

• Band edge frequency setting

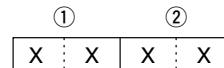
Command: 02*, 1E 01, 1E 03



* Edge number (①) is not sent with command 02 (reading the band edge frequencies).

• Band stacking register

Command: 1A 01



When sending the contents, the codes, such as operating frequency and operating mode*, should be added after the frequency band code and register code, as shown below.

*See ⑤ to ⑩ on 'Memory content setting.' (p. 20-16)

① Frequency band code

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	144	144.000000-148.000000
12	430	420.000000-450.000000
13	GENE	Other than above

② Register code

Code	Registered No.
01	1 (latest)
02	2
03	3 (oldest)

To read the contents, the register code should be added after the frequency band code, as shown below.

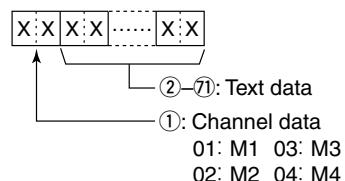
Example: When reading the oldest contents in the 21 MHz band, the code "0703" is used.

Remote jack (CI-V) information

- ◆ Data content description (Continued)

- **Memory keyer contents**

Command: 1A 02

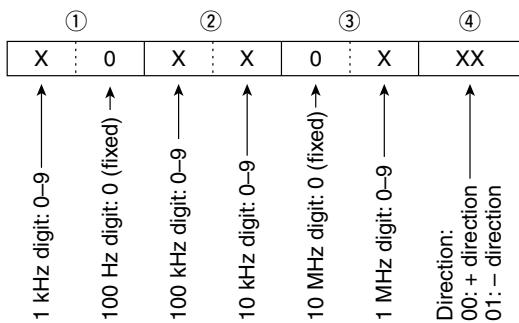


- Character's code

Character	ASCII code	Description
0–9	30–39	Number
A–Z	41–5A	Alphabetical characters
a–z	61–7A	Alphabetical characters
space	20	Word space
/	2F	Symbol
?	3F	Symbol
,	2C	Symbol
.	2E	Symbol
@	40	Symbol
^	5E	e.g., to send BT, enter ^BT
*	2A	Inserts contest number (can be used for 1 channel only)

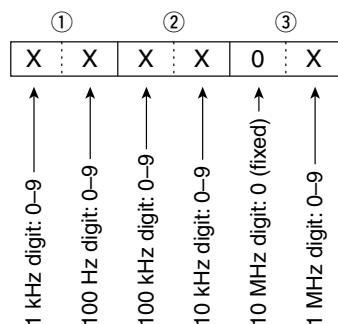
- Split offset frequency setting

Command: 1A 05 0016



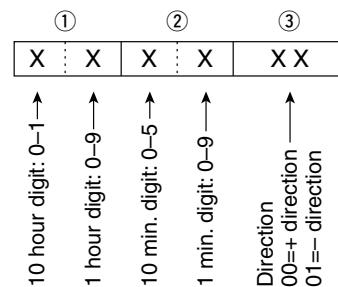
- Duplex Offset frequency setting

Command: 1A 05 0018



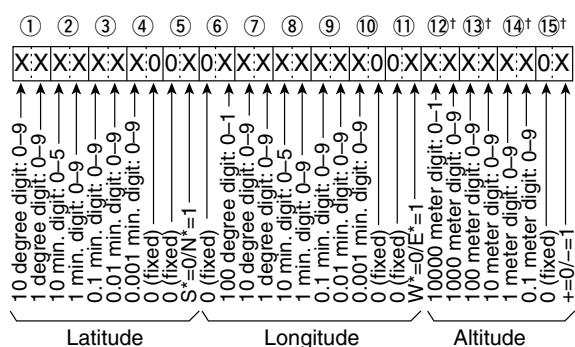
- UTC Offset setting

Command: 1A 05 0123



- My position data setting

Command: 1A 05 0186



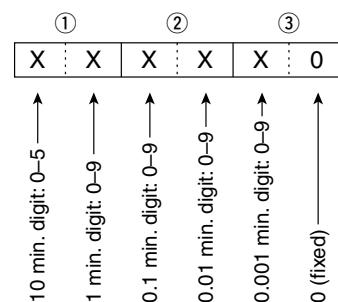
*S: South latitude N: North latitude
W: West longitude E: East longitude

[†] When reading the contents with no altitude, sends 12, 13, 14 and 15 as “EE”

When sending the contents with no altitude, set ⑫, ⑬, ⑭ and ⑮ to “FF”.

- **Alarm area (Group) setting**

Command: 1A 05 0191



- **Unproto Address setting**

Command: 1A 05 0201

Set an unproto address of up to 56 characters

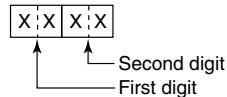
See ‘Character code setting’ (p. 20-12)

Remote jack (CI-V) information

- ◊ Data content description (Continued)

• GPS-A Symbol setting

Command : 1A 05 0206, 0207, 0208, 0209



- ◊ /, \, 0 to 9, A to Z can be used for the first digit character.
- ◊ See 'Character code setting' for the second digit character. (p. 20-12)

• Comment setting

Command: 1A 05 0211

Set a comment of up to 43 characters.
See 'Character code setting.' (p. 20-12)

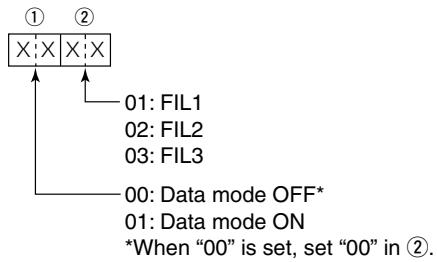
• GPS message setting

Command: 1A 05 0200

Set a GPS message of up to 20 characters.
See 'Character code setting.' (p. 20-12)

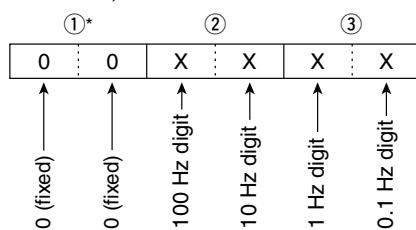
• Data mode with filter width setting

Command: 1A 06



• Repeater tone/tone squelch frequency setting

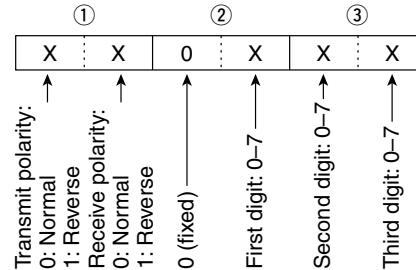
Command: 1B 00, 1B 01



*Not necessary when setting a frequency.

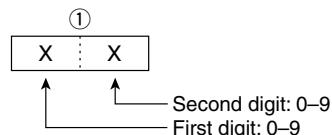
• DTCS code and polarity setting

Command: 1B 02



• Digital code squelch setting

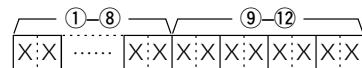
Command: 1B 07



• DV MY call sign setting

Command: 1F 00

Set your own call sign and note of up to 12 characters.



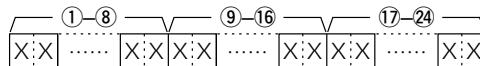
①-⑧ Your own call sign setting

⑨-⑫ Note setting

• DV TX call signs setting

Command: 1F 01

Set "UR," "R1" and "R2" call signs of 8 characters (fixed).



①-⑧ UR (Destination) call sign setting

⑨-⑯ R1 (Access repeater) call sign setting

⑯-㉔ R2 (Gateway/Link repeater) call sign setting

• Character's code of the call sign

Character	ASCII code	Character	ASCII code
0-9	30-39	A-Z	41-5A
Space	20	/	2F

• DV TX message setting

Command: 1F 02

Set the transmit message of up to 20 characters.

See 'Character code setting.' (p. 20-12)

◊ "FF" stops sending or reading messages.

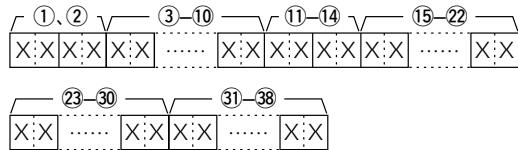
20 CONTROL COMMAND

Remote jack (CI-V) information

◊ Data content description (Continued)

• DV RX call sign setting

Command: 20 0001, 20 0002



① Header flag data (First byte)

Data		Description
Bit		
7	0 (fixed)	—
6	0 (fixed)	—
5	0 (fixed)	—
4	0/1	0= Voice, 1= Data
3	0/1	0= Direct, 1= Through repeater
2	0/1	0= No Break-in, 1= Break-in
1	0/1	0= Data, 1= Control
0	0/1	0= Normal, 1= Emergency

② Header flag data (Second byte)

Data			Function
Bit 2	Bit 1	Bit 0	
1	1	1	Repeater control
1	1	0	Send auto acknowledge
1	0	1	(Not used)
1	0	0	Request to re-transmit
0	1	1	Send acknowledge
0	1	0	Receive no reply
0	0	1	Repeater disabled
0	0	0	NULL

③-⑩ Caller station's call sign (8 characters; fixed)

⑪-⑯ Caller station's note (4 characters; fixed)

⑰-㉚ Called station's call sign (8 characters; fixed)

㉛-㉜ Access repeater's call sign (R1) (8 characters)

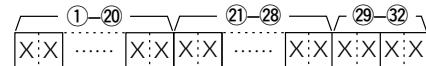
㉟-㉞ Gateway/Link repeater's call sign (R2) (8 characters; fixed)

See 'Character code setting.' (p. 20-12)

“FF” stands for no call sign receiving after turning ON the transceiver.

• DV RX message setting

Command: 20 0101, 20 0102



①-㉚ RX message (20 characters; fixed)

㉑-㉘ Call sign of the calling station (8 characters; fixed)

㉙-㉚ Note of the calling station (4 characters; fixed)

See 'Character code setting.' (p. 20-12)

“FF” stands for no message receiving after turning ON the transceiver.

• DV RX Status setting

Command: 20 0201, 20 0202

Data		Status	Description
Bit			
7	0	—	—
6	0/1	Receiving a voice call	During receiving a digital voice signal, select “1.” (Regardless of DSQ and CSQ setting)
5	0/1	Last call finisher	When the last call was finished by you, select “1.”
4	0/1	Receiving a signal	When the audio tone can be heard, select “1.”
3	0/1	Receiving a BK call	During receiving a BK call, select “1.”
2	0/1	Receiving a EMR call	During receiving a EMR call, select “1.”
1	0/1	Receiving a signal other than DV	When “DV” and “FM” are blinking, select “1.”
0	0/1	Packet loss status	During displaying a packet loss

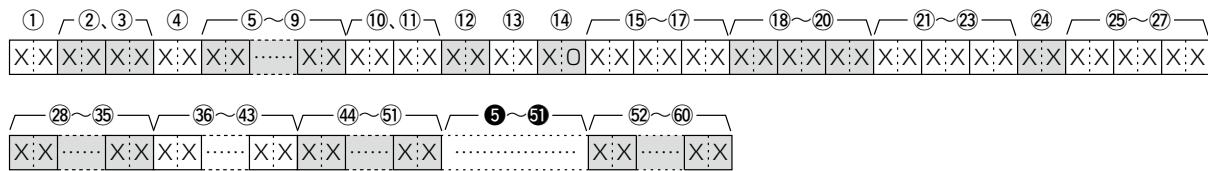
20 CONTROL COMMAND

Remote jack (CI-V) information

◊ Data content description (Continued)

• Memory content setting

Command: 1A 00



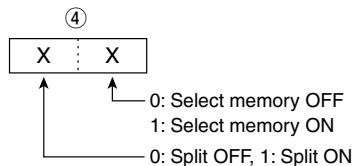
① Bank number

01: A, 02: B, 03: C, 04: D, 05: E

②, ③ Memory channel number

- 0001–0099: Memory channel 1 to 99
- 0100: Programmed scan edge 1A
- 0101: Programmed scan edge 1b
- 0102: Programmed scan edge 2A
- 0103: Programmed scan edge 2b
- 0104: Programmed scan edge 3A
- 0105: Programmed scan edge 3b
- 0106: Call channel 144-C1
- 0107: Call channel 144-C2
- 0108: Call channel 430-C1
- 0109: Call channel 430-C2

④ Split and Select memory settings



When the program channel is selected, both settings should be "0."

When the Call channel is selected, the Select memory setting should be "0."

⑤–⑨ Operating frequency setting

See '• Operating frequency.' (p. 20-11)

⑩, ⑪ Operating mode setting

See '• Operating mode.' (p. 20-11)

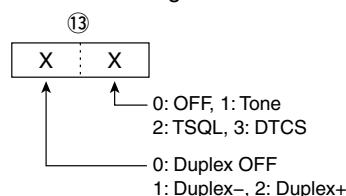
⑫ Data mode setting

1 byte data (XX)

00: Data mode OFF

01: Data mode ON

⑬ Duplex and Tone settings



⑭ Digital squelch setting

⑭

X : 0

↑ 0: Digital squelch function OFF

- 1: Digital call sign squelch function ON (DSQL)
- 2: Digital code squelch function ON (CSQL)

⑮–⑯ Repeater tone frequency setting

⑰–⑱ Tone squelch frequency setting

See '• Repeater tone/tone squelch frequency setting.' (p. 20-14)

⑲–⑳ DTCS code setting

See '• DTCS code and polarity setting.' (p. 20-14)

㉑ Digital code squelch setting

See '• Digital code squelch setting.' (p. 20-14)

㉒–㉓ Duplex offset frequency setting

See '• Duplex Offset frequency setting.' (p. 20-13)

㉔–㉕ Destination call sign setting

(8 characters; fixed)

㉖–㉗ R1 (Access repeater) call sign setting

(8 characters; fixed)

㉘–㉙ R2 (Gateway/Link repeater) call sign setting

(8 characters; fixed)

See '• DV TX call signs setting.' (p. 20-14)

㉚–㉛ Memory name setting

16 characters (Fixed)

See '• Character code setting.' (p. 20-12)

About clearing operation:

"1A 00" command with the format as below clears the data of the selected memory channel.

②, ③: Memory channel 0 to 99

④ : FF

⑤ or later: None

NOTE:

- The same data as ⑤–⑯ are stored in ⑮–⑯.
- When the Split function is ON, the data of ⑮–⑯ is used for transmit.
- Even if the Split function is OFF, enter the data into ⑮–⑯ to match your transceiver. We recommend that you set the same data as ⑮–⑯.

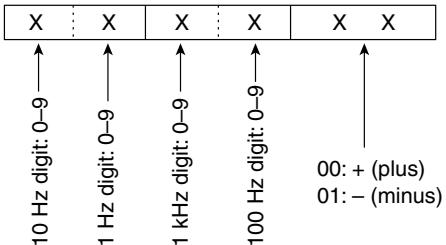
20 CONTROL COMMAND

Remote jack (CI-V) information

◊ Data content description (Continued)

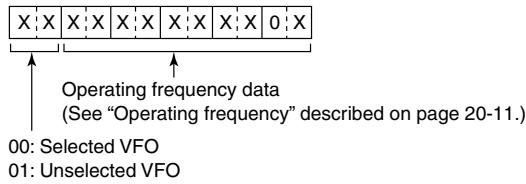
- **RIT frequency settings**

Command: 21 00



- **Selected or unselected VFO frequency settings**

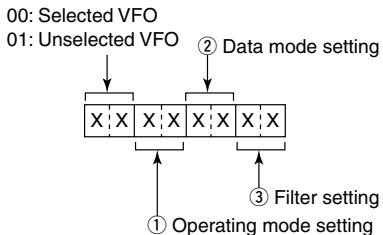
Command: 25



- **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 is automatically selected.



① Operating mode	② Data mode setting	③ Filter setting
00: LSB	05: FM	00: Data mode OFF
01: USB	06: WFM	01: Data mode ON
02: AM	07: CW-R	—
03: CW	08: RTTY-R	—
04: RTTY	17: DV	—

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21 SPECIFICATIONS AND OPTIONS

Specifications

◊ General

- Frequency coverage: (unit: MHz)
 - Receive
0.030000–199.99999^{*1*2}
400.000000–470.000000^{*1*2}
 - Transmit
1.800000– 1.999999^{*2}, 3.500000– 3.999999^{*2},
5.255000– 5.405000^{*1*3},
5.332000^{*3*4}, 5.348000^{*3*4}, 5.358500^{*3*4},
5.373000^{*3*4}, 5.405000^{*3*4},
7.000000– 7.300000^{*2}, 10.100000– 10.150000^{*2},
14.000000– 14.350000^{*2}, 18.068000– 18.168000^{*2},
21.000000– 21.450000^{*2}, 24.890000– 24.990000^{*2},
28.000000– 29.700000^{*2}, 50.000000– 54.000000^{*2},
70.000000– 70.500000^{*2}, 144.000000– 148.000000^{*2},
430.000000–450.000000^{*2}
- *¹Some frequency ranges are not guaranteed.
- *²Depending on version.
- *³USA version only.
- *⁴Center frequency.
- Mode:
J3E (USB/LSB), A1A (CW),
F1B (RTTY), A3E (AM),
F3E (FM/WFM) WFM: RX only,
DV (F7W)
- No. of memory channels: 495 CH (99 CH × 5 bank)
- No. of scan edge memory channels:
6 CH (2 CH × 3 edges)
- No. of call channels: 4 CH (2 CH × 2 band)
- Antenna connector: SO-239 × 2
- Antenna impedance: 50 Ω
- Usable temperature range:
–10°C to +60°C;
+14°F to +140°F
- Frequency stability:
Less than ±0.5 ppm, 5 minutes
after power ON. (0°C to +50°C;
+32°F to +122°F at 430 MHz band)
- Frequency resolution: 1 Hz
- Power supply: 13.8 V DC ±15%
(negative ground)
- Power consumption:
Transmit
Max. power: 22.0 A
Receive
Standby: 0.9 A
Max. audio: 1.2 A
- Dimensions (projections not included):
Main unit: 167(W) × 58(H) × 225(D) mm;
6.6(W) × 2.3(H) × 8.9(D) in
Controller: 165(W) × 64(H) × 78.5(D) mm;
6.5(W) × 2.5(H) × 3.1(D) in
- Weight (approximately):
Main unit: 2.3 kg; 5.1 lb
Controller: 0.5 kg; 1.1 lb
- ACC connector: 13-pin
- DATA1 connector: 3-conductor 2.5 (d) mm (1/10")
- DATA2 connector: 6-pin
- REMOTE connector: 2-conductor 3.5 (d) mm (1/8")

◊ Transmitter

- Output power (at 13.8 V DC/+25°C): (continuously adjustable)

Frequency band	Output power
HF/50 MHz	2 to 100 W (AM: 1 to 30 W)*
70 MHz	2 to 50 W (AM: 1 to 15 W)*
144 MHz	2 to 50 W
430 MHz	2 to 35 W

* In the AM mode, transmission can be performed only on the HF/50/70 MHz frequency band.

- Modulation system:

SSB:	Digital PSN modulation
AM:	Digital Low power modulation
FM:	Digital Phase modulation
DV:	GMSK Digital Phase modulation

- Spurious emission:

(Spurious domain)

HF bands:	Less than –50 dB
50 MHz band:	Less than –63 dB
70/144/430 MHz bands:	Less than –60 dB

(Out-of-band domain)

HF bands:	Less than –40 dB
50/70/144/430 MHz bands:	Less than –60 dB

- Carrier suppression: More than 50 dB

- Unwanted sideband suppression: More than 50 dB

- Microphone connector: 8-pin modular jack

- Microphone impedance: 600 Ω

- ELEC-KEY connector: 3-conductor 3.5(d) mm (1/8")

- KEY connector: 2-conductor 3.5(d) mm (1/8")

21 SPECIFICATIONS AND OPTIONS

Specifications (Continued)

◊ Receiver

- Receive system

SSB/CW/RTTY/AM/FM/DV:

WFM:	Triple superheterodyne system
	Double superheterodyne system

- Intermediate frequencies

1st:	124.487 MHz (SSB/CW/RTTY/AM/FM/DV) 134.732 MHz (WFM)
2nd:	455 kHz (SSB/CW/RTTY/AM/FM/DV)
3rd:	10.7 MHz (WFM) 36 kHz (SSB/CW/RTTY/AM/FM/DV)

- Sensitivity

For all versions

SSB, CW (10 dB S/N):

1.800 – 29.99500 MHz	Less than 0.15 µV * ¹
50 MHz band	Less than 0.12 µV * ²
70 MHz band	Less than 0.15 µV * ²
144/430 MHz bands	Less than 0.11 µV * ³

AM (10 dB S/N):

0.500 – 1.800000 MHz	Less than 13 µV * ¹
1.800 – 29.99500 MHz	Less than 2 µV * ¹
50/70 MHz bands	Less than 1 µV * ²
144/430 MHz bands	Less than 1 µV * ³

FM (12 dB SINAD):

28.000 – 29.70000 MHz	Less than 0.5 µV * ¹
50/70 MHz bands	Less than 0.25 µV * ²
144/430 MHz bands	Less than 0.18 µV * ³

WFM (12 dB SINAD):

76.000–108.00000 MHz	Less than 10 µV * ³
----------------------	--------------------------------

DV (1% BER):

28.000 – 29.70000 MHz	Less than 1 µV * ¹
50/70 MHz bands	Less than 0.63 µV * ²
144/430 MHz bands	Less than 0.35 µV * ³

*¹ Preamp 1 is ON, *² Preamp 2 is ON, *³ Preamp is ON

For European versions

SSB (BW=2.4 kHz, 12 dB SINAD):

1.800 – 2.999999 MHz	Less than 10 dBµV emf * ¹
3.000 – 29.99500 MHz	Less than 0 dBµV emf * ¹
50/70 MHz bands	Less than -6 dBµV emf * ²
144/430 MHz bands	Less than -6 dBµV emf * ³

AM (BW=4 kHz, 60% Modulation, 12 dB SINAD):

1.800 – 2.999999 MHz	Less than 16 dBµV emf * ¹
3.000 – 29.99500 MHz	Less than 6 dBµV emf * ¹
50/70 MHz bands	Less than 0 dBµV emf * ²
144/430 MHz bands	Less than 0 dBµV emf * ³

FM (BW=7 kHz, 60% Modulation, 12 dB SINAD):

28.000 – 29.70000 MHz	Less than 0 dBµV emf * ¹
50/70 MHz bands	Less than -6 dBµV emf * ²
144/430 MHz bands	Less than -6 dBµV emf * ³

*¹ Preamp 1 is ON, *² Preamp 2 is ON, *³ Preamp is ON

- Squelch sensitivity

Frequency band	Squelch sensitivity
HF* ¹	SSB : Less than 5.6 µV
	FM : Less than 0.3 µV
50/70 MHz* ²	SSB : Less than 5.6 µV
	FM : Less than 0.3 µV
144/430 MHz* ³	SSB : Less than 5.6 µV
	FM : Less than 0.3 µV

*¹ Preamp 1 is ON, *² Preamp 2 is ON, *³ Preamp is ON

- Selectivity (IF filter shape is set to SHARP.)

SSB (BW: 2.4 kHz):	More than 2.4 kHz/-6 dB
CW (BW: 500 Hz):	Less than 3.4 kHz/-40 dB
RTTY (BW: 500 Hz):	More than 500 Hz/-6 dB
AM (BW: 6 kHz):	Less than 700 Hz/-40 dB
FM (BW: 15 kHz):	More than 500 Hz/-6 dB
DV (CH space: 12.5 kHz):	Less than 800 Hz/-40 dB
	More than 10.0 kHz/-40 dB
	More than 12.0 kHz/-6 dB
	Less than 22.0 kHz/-40 dB

- Spurious and image rejection ratio

HF band:	More than 70 dB
50/70 MHz bands*:	More than 70 dB
144/430 MHz bands*:	*Except 1/2 IF through on 50/70 MHz bands
	More than 65 dB

*Except IF through on 144 MHz band

• AF output power:	More than 2.0 W at 10% distortion with an 8 Ω load
• AF output impedance:	8 Ω
• RIT variable range:	±9.999 kHz
• PHONES connector:	3-conductor 3.5 (d) mm (1/8")
• External SP connector:	2-conductor 3.5 (d) mm (1/8")/8 Ω
• DSP ANF attenuation:	More than 30 dB (with 1 kHz single tone)
• DSP MNF attenuation:	More than 70 dB
• DSP NR attenuation:	More than 6 dB (noise rejection in SSB)

21 SPECIFICATIONS AND OPTIONS

Options

AT-180 HF/50 MHz AUTOMATIC AN-
TENNA TUNER


Fully automatic antenna tuner with preset memories for each 100 kHz. Unique "automatic tuner on" function is available. See page 16-4 for AT-180 specifications.

AH-4 HF AUTOMATIC ANTENNA TUNER


Specially designed to tune a long wire antenna for portable or mobile HF/50 MHz operation. The "PTT tune" function provides simple operation.

- Input power rating: 120 W

AH-2b ANTENNA ELEMENT


A 2.5 m long antenna element for mobile operation with the AH-4.

- Frequency coverage 7–54 MHz band with the AH-4

AH-740 AUTOMATIC TUNING ANTENNA

High performance, automatic high-speed tuning antenna.

- Frequency coverage
With 1.54 m whip antenna:
2.5 MHz–29.9999 MHz
With AH-5NV:
2.2 MHz–29.9999 MHz


PS-126 DC POWER SUPPLY


- Output voltage : 13.8 V DC
- Max. output current : 25 A

SP-35 EXTERNAL SPEAKER


External speakers suitable for mobile operation.

SP-35: Compact-type; 4 Ω/7 W

HM-36 HAND MICROPHONE


Hand microphone equipped with [UP]/[DOWN] switches.
An optional OPC-599 is required for connection.

SM-30 DESKTOP MICROPHONE


Includes a low frequency cut function.
An optional OPC-599 is required for connection.

SM-50 DESKTOP MICROPHONE


Unidirectional, dynamic microphone for base station operation. Includes [UP]/[DOWN] switches, a low cut switch and mic gain control.

An optional OPC-589 is required for connection.

21 SPECIFICATIONS AND OPTIONS

Options (Continued)

IC-PW1/EURO HF/50 MHZ ALL BAND 1 KW LINEAR AMPLIFIER



Full-duty 1 kW linear amplifier including an automatic antenna tuner. Has automatic tuning and band selection capability. Full break-in (QSK) operation is possible. The amplifier/power supply unit and the remote control unit are separated. An optional OPC-599 is required for connection.

MBF-1 MOUNTING BASE



Allows you to conveniently vehicle-mount the Controller. An MBA-1 must be used in combination with the MBF-1.

HM-103 HAND MICROPHONE

Hand microphone equipped with [UP]/[DOWN] switches.

HM-151 HAND MICROPHONE

Remote control microphone.

HM-198 HAND MICROPHONE

Hand microphone equipped with [UP]/[DOWN] switches. The same as that supplied with the transceiver.

MB-62 MOBILE MOUNTING BRACKET

Mounts the transceiver Main unit or the AT-180 inside a vehicle.

MBA-1 MOUNTING BRACKET

Metal plate for attaching the Controller to an MBF-1, wall or other such flat surface.

AH-5NV NVIS KIT

Approximately 4.5 m (14.8 ft) long antenna for the AH-740.

Frequency coverage with AH-740
2.2 MHz – 29.9999 MHz

OPC-420 SHIELDED CONTROL CABLE

The shielded control cable protects the transceiver from RF feedback and extends the separation between the AH-4 and the transceiver up to 10 meters (32.8 feet).

OPC-589 MICROPHONE ADAPTER CABLE

Conversion between 8-pin modular and 8-pin metal connector for using a desktop microphone.

OPC-599 ADAPTER CABLE

13-pin, ACC connector to 7-pin + 8-pin ACC connector.

OPC-742 ACC 13-PIN CABLE

Required when using both of the AT-180 and 144/430MHz Linear amplifier.

OPC-1529R

DATA COMMUNICATION CABLE (RS-232C type)

Allows low-speed data communication in the DV mode, and receiving a GPS data from a third-party GPS receiver.

OPC-2218LU

DATA COMMUNICATION CABLE (USB type)

Allows low-speed data communication in the DV mode.

OPC-2253 CONTROL CABLE

OPC-2254 CONTROL CABLE

OPC-2253: 3.5 m (11.5 ft) type,
OPC-2254: 5 m (16.4 ft) type

OPC-2321 CONTROL CABLE

For the connection between transceiver and the AH-740.

Approximately 6 m (19.7 ft) long

CS-7100 CLONING SOFTWARE

Use this software to program settings, memory channels and set mode contents quickly and easily via your PC's USB port.

A USB cable is required. (A-Mini B type, supplied with the transceiver)

RS-BA1 IP REMOTE CONTROL SOFTWARE

To remotely control radios using the RS-BA1, **BE SURE** that you comply with your local regulations.

CT-17 CI-V LEVEL CONVERTER UNIT



For remote transceiver control using a personal computer equipped with an RS-232C port. You can change frequencies, operating mode, memory channels, and so on with your computer.

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