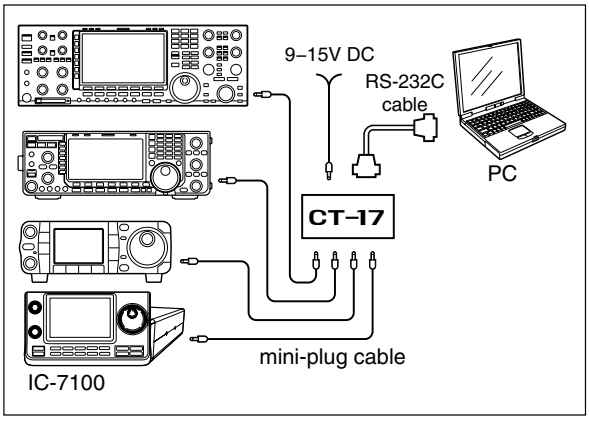
Section 20 CONTROL COMMAND

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.

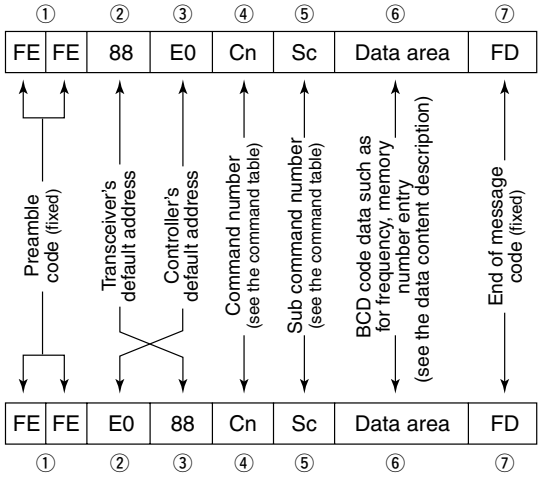


When the transceiver is connected to a PC with the supplied USB cable, the optional CT-17 is not required.

◇ Data format

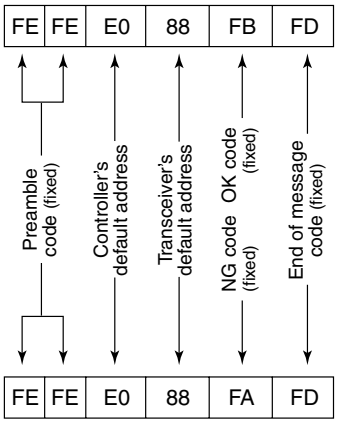
The CI-V system can be operated using the following data formats. Data formats differ depending on command numbers. A data area or sub command is added to some commands.

Controller to IC-7100



IC-7100 to controller

OK message to controller



NG message to controller

Remote jack (CI-V) information (Continued)

◇ Command table

Cmd.	Sub cmd.	Data	Description
00		see p. 20-11	Send the operating frequency for transceive
01		see p. 20-11	Send the operating mode for transceive
02		see p. 20-12	Read the band edge frequencies
03		see p. 20-11	Read the operating frequency
04		see p. 20-11	Read the operating mode
05		see p. 20-11	Send the operating frequency
06		00	Select the LSB mode
		01	Select the USB mode
		02	Select the AM mode
		03	Select the CW mode
		04	Select the RTTY mode
		05	Select the FM mode
		06	Select the WFM mode
		07	Select the CW-R mode
		08	Select the RTTY-R mode
		17	Select the DV mode
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 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)
	A0	01	Select Memory Bank A
		02	Select Memory Bank B
		03	Select Memory Bank C
		04	Select Memory Bank D
		05	Select Memory Bank E
09			Memory write
0A			Memory copy to VFO
0B			Memory clear
0C			Read offset frequency
0D			Send offset frequency
0E	00		Scan stop
	01		Programmed/memory scan start
	02		Programmed scan start
	03		ΔF scan start
	12		Fine programmed scan start
	13		Fine ΔF scan start
	22		Memory scan start
	23		Select memory scan start
	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

Cmd.	Sub cmd.	Data	Description
0F		00	Read Split function OFF
		01	Read Split function ON
		11	Read DUP– operation
		12	Read DUP+ operation
	00		Set Split function OFF
	01		Set Split function ON
	10		Set the simplex operation
	11		Set DUP– operation
	12		Set DUP+ operation
10		00	Send/read the 10 Hz (1 Hz) tuning step
		01	Send/read the 0.1 kHz tuning step
		02	Send/read the 1 kHz tuning step
		03	Send/read the 5 kHz tuning step
		04	Send/read the 6.25 kHz tuning step
		05	Send/read the 9 kHz tuning step
		06	Send/read the 10 kHz tuning step
		07	Send/read the 12.5 kHz tuning step
		08	Send/read the 20 kHz tuning step
		09	Send/read the 25 kHz tuning step
		10	Send/read the 50 kHz tuning step
		11	Send/read the 100 kHz tuning step
		12	Send/read the 1 MHz tuning step
11		00	Send/read Attenuator OFF
		12	Send/read 12 dB attenuator
13	00		Announce the operating frequency, operating mode and S-meter level by voice synthesizer
	01		Announce the operating frequency and S meter level by voice synthesizer
	02		Announce 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., 0255=max.)
	03	0000 to 0255	Send/read the squelch level (0000=min. to 0255=max.)
	06	0000 to 0255	Send/read the NR level (0000=0% to 0255=100%)
	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)
	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)
	09	0000 to 0255	Send/read the CW PITCH (0000=300 Hz, 0128=600 Hz, 0255=900 Hz)
	0A	0000 to 0255	Send/read the RF power level (0000=min. to 0255=max.)
	0B	0000 to 0255	Send/read the MIC gain level (0000=min. to 0255=max.)
	0C	0000 to 0255	Send/read the KEY SPEED (0000=6 WPM to 0255=48 WPM)
	0D	0000 to 0255	Send/read the NOTCH setting (0000=lowest, 0128=center, 0255=highest)

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)
16	02	00	Send/read Preamp OFF
		01	Send/read Preamp ON (144/430 MHz) 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	Send/read Repeater tone OFF
		01	Send/read Repeater tone ON
	43	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	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
		02	Send/read manual notch width NAR
	58	00	Send/read SSB transmit bandwidth WIDE
		01	Send/read SSB transmit bandwidth MID
		02	Send/read SSB transmit bandwidth NAR
	5B	00	Send/read DSQL/CSQL OFF (DV mode only)
		01	Send/read DSQL ON (DV mode only)
		02	Send/read 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

× 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)

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)
		0015	00/01	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.

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.		Data	Description
1A	05	0035	00/01	Send/read the Speaker output setting (00=OFF, 01=ON)
		0036	00/01	Send/read the MIC AF output 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=NB, 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))
		0038	00 to 22	Send/read the function of [F-2] on the HM-151 (00=---, 01=P.AMP/ATT, 02=AGC, 03=NB, 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))
		0039	00/01	Send/read the SSB mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0040	00/01	Send/read the CW mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0041	00/01	Send/read the RTTY mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0042	00/01	Send/read the AM mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0043	00/01	Send/read the FM mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0044	00/01	Send/read the DV mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0045	00/01	Send/read the WFM mode selection of the [MODE] key on the HM-151 (00=OFF, 01=ON)
		0046	00/01	Send/read the Power OFF setting when no controller is connected. (00=OFF, 01=ON)
		0047	0000 to 0255	Send/read the REF Adjust setting (0000=0%, 0128=50%, 0255=100%)
		0048	00 to 02	Send/read the RX Call Sign SPEECH setting (00=OFF, 01=ON (Kerchunk), 02=ON (All))
		0049	00/01	Send/read the RX>CS SPEECH function setting (00=OFF, 01=ON)

Cmd.	Sub cmd.		Data	Description
1A	05	0050	00/01	Send/read the S-Level SPEECH function setting (00=OFF, 01=ON)
		0051	00/01	Send/read the MODE SPEECH function setting (00=OFF, 01=ON)
		0052	00/01	Send/read the speech language (00=English, 01=Japanese)
		0053	00/01	Send/read the Alphabet setting for SPEECH (00=Normal, 01=Phonetic Code)
		0054	00/01	Send/read the speech speed setting (00=Slow, 01=Fast)
		0055	0000 to 0255	Send/read the speech level (0000=0% to 0255=100%)
		0056	see p. 20-11	Send/read the SSB RX HPF/LPF setting
		0057	00 to 10	Send/read the SSB RX Tone (Bass) level (00=–5 to 10=+5)
		0058	00 to 10	Send/read the SSB RX Tone (Treble) level (00=–5 to 10=+5)
		0059	see p. 20-11	Send/read the AM RX HPF/LPF setting
		0060	00 to 10	Send/read the AM RX tone (Bass) level (00=–5 to 10=+5)
		0061	00 to 10	Send/read the AM RX Tone (Treble) level (00=–5 to 10=+5)
		0062	see p. 20-11	Send/read the FM RX HPF/LPF setting
		0063	00 to 10	Send/read the FM RX tone (Bass) level (00=–5 to 10=+5)
		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)

Remote jack (CI-V) information

◇ Command table (Continued)

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

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.		Data	Description
1A	05	0116	00/01	Send/read the Opening Message (00=OFF, 01=ON)
		0117	00/01	Send/read the Power ON Check setting (00=OFF, 01=ON)
		0118	00/01	Send/read the Display Language (00=English, 01=Japanese)
		0119	00/01	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	00/01	Send/read Mic. up/down keyer setting (00=OFF, 01=ON)
		0140	00/01	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)

Remote jack (CI-V) information

◇ Command table (Continued)

Cmd.	Sub cmd.		Data	Description
1A	05	0162	00 to 15	Send/read NR level for the DR mode (00=0 to 15=15)
		0163	0000 to 0255	Send/read the VOX gain (0000=0% to 0255=100%)
		0164	0000 to 0255	Send/read the ANTI-VOX gain (0000=0% to 0255=100%)
		0165	00 to 20	Send/read the VOX delay time (00=0.0 sec. to 20=2.0 sec.)
		0166	0020 to 0130	Send/read the BK-IN delay time (0020=2.0d to 0130=13.0d)
		0167	00/01	Send/read the recording mode (00=TX&RX, 01=RX Only)
		0168	00/01	Send/read the squelch status for the RX voice audio recording (00=Always, 01=Squelch Auto)
		0169	00/01	Send/read the QSO audio record file Split function setting (00=OFF, 01=ON)
		0170	00/01	Send/read the PTT Automatic Recording function 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.)
		0172	00 to 02	Send/read the Standby Beep setting (00=OFF, 01=ON, 02=ON (to me:High Tone))
		0173	00 to 02	Send/read Auto Reply setting (00=OFF, 01=ON, 02=Voice)
		0174	00/01	Send/read the DV Data TX setting (00=PTT, 01=Auto)
		0175	00 to 02	Send/read the Digital Monitor setting (00=Auto, 01=Digital, 02=Analog)
		0176	00/01	Send/read the Digital Repeater setting function setting (00=OFF, 01=ON)
		0177	00/01	Send/read the RX Call Sign Auto Write setting (00=OFF, 01=Auto)
		0178	00/01	Send/read the RX RPT Call Sign Auto Write setting (00=OFF, 01=Auto)
		0179	00/01	Send/read the DV Auto Detect setting (00=OFF, 01=ON)
		0180	00/01	Send/read the RX Record (RPT) setting (00=ALL, 01=Latest Only)
		0181	00/01	Send/read the BK function setting (00=OFF, 01=ON)
		0182	00/01	Send/read the EMR mode setting (00=OFF, 01=ON)
		0183	0000 to 0255	Send/read EMR AF Level (0000=0% to 0255=100%)
		0184	00 to 02	Send/read the external GPS receiver setting (00=OFF, 01=External GPS, 02=Manual)
		0185	00/01	Send/read the GPS Receiver Baud setting (00=4800 bps, 01=9600 bps)

Cmd.	Sub cmd.		Data	Description
1A	05	0186	see p. 20-13	Send/read the manually programmed position
		0187	00/01	Send/read the GPS Indicator setting (00=OFF, 01=ON)
		0188	00/01	Send/read the Position Format setting (00=ddd°mm.mm', 01=ddd°mm'ss")
		0189	00/01	Send/read the Distance and Altitude unit (00=meter, 01=feet/mile)
		0190	00 to 02	Send/read the GPS speed unit (00=km/h, 01=mph, 02=knots)
		0191	see p. 20-13	Send/read GPS alarm area (Group)
		0192	00 to 02	Send/read GPS alarm area (RX/Memory) (00=Limited, 01=Extended, 02=Both)
		0193	00 to 02	Send/read the GPS TX Mode setting (00=OFF, 01=GPS(DV-G), 02=GPS-A(DV-A))
		0194	00/01	Send/read the GPS (RMC) Sentence setting (00=OFF, 01=ON)
		0195	00/01	Send/read the GPS (GGA) Sentence setting (00=OFF, 01=ON)
		0196	00/01	Send/read the GPS (GLL) Sentence setting (00=OFF, 01=ON)
		0197	00/01	Send/read the GPS (GSA) Sentence setting (00=OFF, 01=ON)
		0198	00/01	Send/read the GPS (VTG) Sentence setting (00=OFF, 01=ON)
		0199	00/01	Send/read the GPS (GSV) Sentence setting (00=OFF, 01=ON)
		0200	see p. 20-14	Send/read the GPS Message
		0201	see p. 20-13	Send/read the Unproto Address
		0202	00/01	Send/read the position data extension setting (00=OFF, 01=COURSE/SPEED)
		0203	00 to 02	Send/read the GPS-A Time Stamp setting (00=OFF, 01=DHM, 02=HMS)
		0204	00/01	Send/read the GPS-A altitude 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)
		0206	see p. 20-13	Send/read the GPS-A Symbol No.1 setting
		0207	see p. 20-13	Send/read the GPS-A Symbol No.2 setting
		0208	see p. 20-13	Send/read the GPS-A Symbol No.3 setting
		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)

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 ",", 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].
		01	Send/read command to enable 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)

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

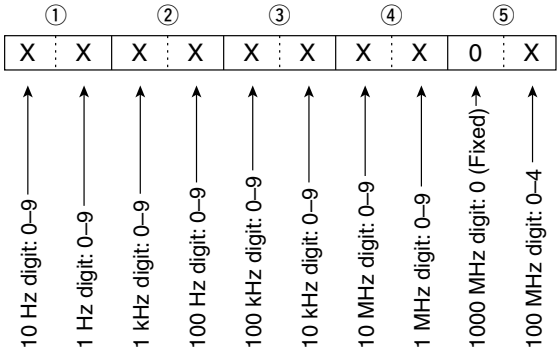
Cmd.	Sub cmd.	Data	Description
1C	00	00	Send/read transceiver's status (RX). When "CI-V Output (for ANT)" (Command: 1C 04) is set to "ON," automatically outputs when changed.
		01	Send/read transceiver's status (TX). When "CI-V Output (for ANT)" (Command: 1C 04) is set to "ON," automatically outputs when changed.
	01	00	Send/read Antenna tuner OFF (through)
		01	Send/read Antenna tuner ON
		02	Send/read the Manual tuning selection
	02	00	Send/read Transmit frequency monitor check OFF
		01	Send/read Transmit frequency monitor check ON
	03	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
	03	see p. 20-12	Send/read the User-set TX band edge frequencies
1F	00	see p. 20-14	Send/read the DV MY call sign
	01	see p. 20-14	Send/read the DV TX call signs
	02	see p. 20-14	Send/read the DV TX message
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
	01 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
21	00	see p. 20-17	Send/read RIT frequency.
	01	00	Send/read RIT setting OFF.
		01	Send/read RIT setting ON.
25		see p. 20-17	Send/read the selected or unselected VFO frequency.
26		see p. 20-17	Send/read the selected or unselected VFO's operating mode and filter.

Remote jack (CI-V) information (Continued)

◇ Data content description

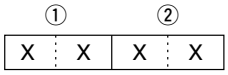
• Operating frequency

Command: 00, 03, 05, 1C 03



• Operating mode

Command: 01, 04, 06

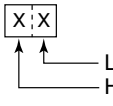


① Operating mode		② Filter setting
00: LSB	05: FM	01: FIL1
01: USB	06: WFM	02: FIL2
02: AM	07: CW-R	03: FIL3
03: CW	08: RTTY-R	—
04: RTTY	17: DV	—

- 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
0: 100Hz
1: 200Hz
2: 300Hz
3: 500Hz

Higher edge
0: 2500Hz
1: 2700Hz
2: 2800Hz
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.

Remote jack (CI-V) information

◇ Data content description (Continued)

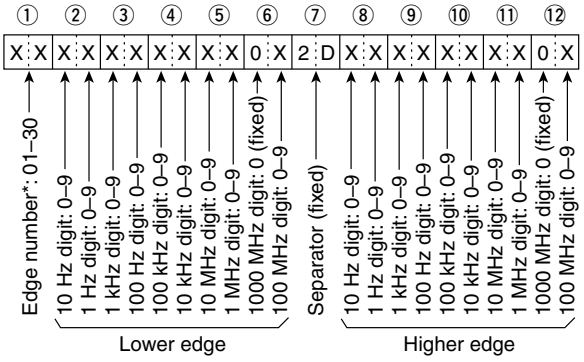
• Character code setting

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

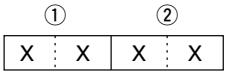
Command: 02*, 1E 01, 1E 03



* 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 ㊿ 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.

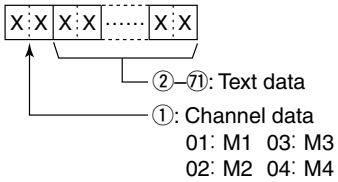
Example: When reading the oldest contents in the 21 MHz band, the code “0703” is used.

Remote jack (CI-V) information

◇ Data content description (Continued)

• Memory keyer contents

Command: 1A 02

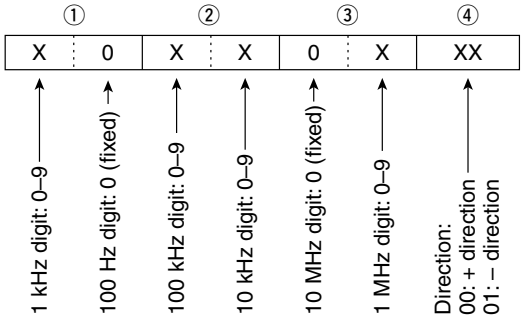


• Character's code

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)

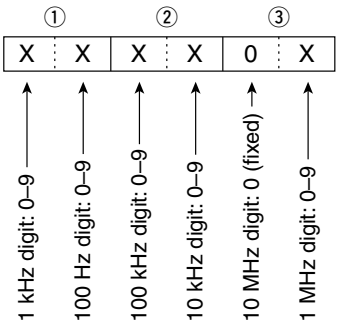
• Split offset frequency setting

Command: 1A 05 0016



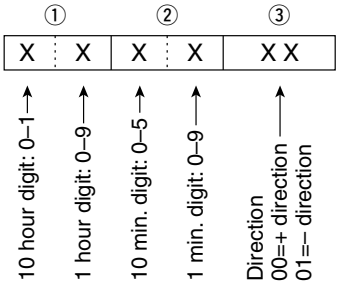
• Duplex Offset frequency setting

Command: 1A 05 0018



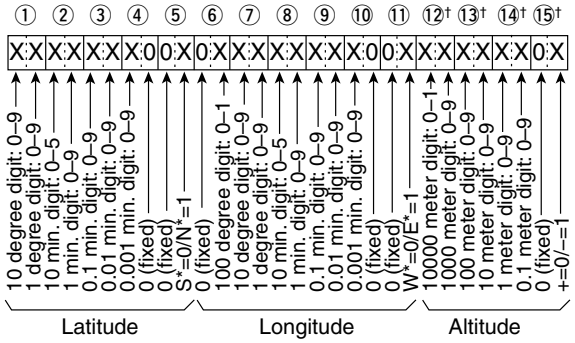
• UTC Offset setting

Command: 1A 05 0123



• My position data setting

Command: 1A 05 0186

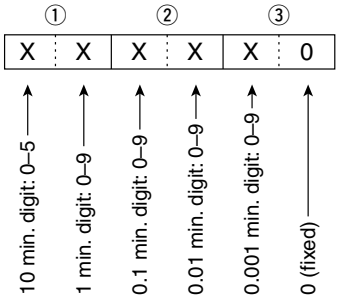


*S: South latitude N: North latitude
W: West longitude E: East longitude

† When reading the contents with no altitude, sends ⑫, ⑬, ⑭ and ⑮ as "FF."
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

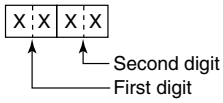
Command: 1A 05 0201
Set an unproto address of up to 56 characters.
See 'Character code setting.' (p. 20-12)

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

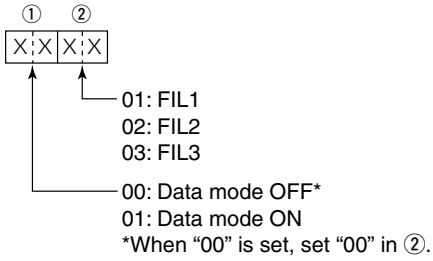
Command: 1A 05 0211
Set a comment of up to 43 characters.
See 'Character code setting.' (p. 20-12)

• GPS message setting

Command: 1A 05 0200
Set a GPS message of up to 20 characters.
See 'Character code setting.' (p. 20-12)

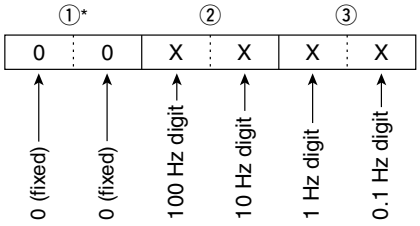
• Data mode with filter width setting

Command: 1A 06



• Repeater tone/tone squelch frequency setting

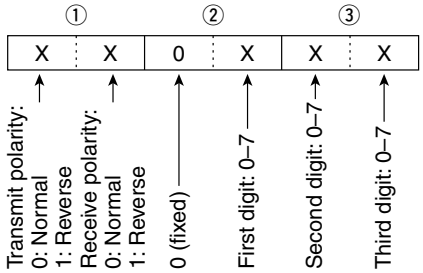
Command: 1B 00, 1B 01



*Not necessary when setting a frequency.

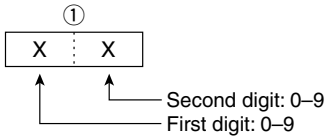
• DTCS code and polarity setting

Command: 1B 02



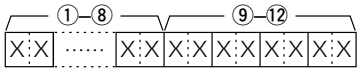
• Digital code squelch setting

Command: 1B 07



• DV MY call sign setting

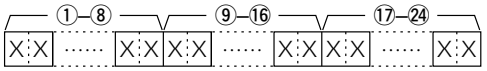
Command: 1F 00
Set your own call sign and note of up to 12 characters.



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
⑰–㉔ 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

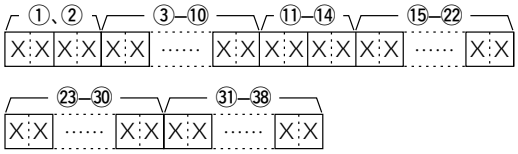
Command: 1F 02
Set the transmit message of up to 20 characters.
See 'Character code setting.' (p. 20-12)
"FF" stops sending or reading messages.

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

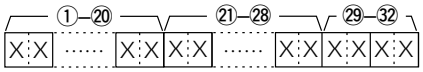
③–⑩ Caller station's call sign (8 characters; fixed)
⑪–⑭ Caller station's note (4 characters; fixed)
⑮–㉒ Called station's call sign (8 characters; fixed)
㉓–㉚ Access repeater's call sign (R1) (8 characters)
㉛–㊳ Gateway/Link repeater's call sign (R2) (8 characters; fixed)

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



①–⑳ RX message (20 characters; fixed)
㉑–㉘ Call sign of the calling station (8 characters; fixed)
㉙–㉜ 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

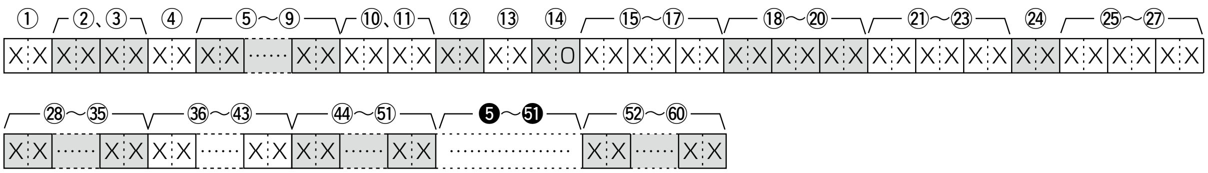
Data		Status	Description
Bit			
7	0	—	—
6	0/1	Receiving a voice call	During receiving a digital voice signal, select "1." (Regardless of DSQL and CSQL setting)
5	0/1	Last call finisher	When the last call was finished by you, select "1."
4	0/1	Receiving a signal	When the audio tone can be heard, select "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

Remote jack (CI-V) information

◇ Data content description (Continued)

• Memory content setting

Command: 1A 00

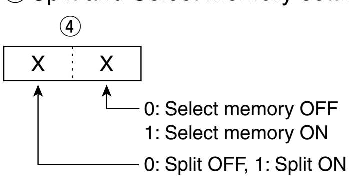


① Bank number
01: A, 02: B, 03: C, 04: D, 05: E

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



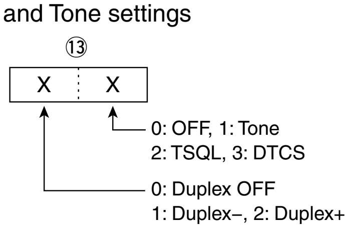
When the program channel is selected, both settings should be “0.”
When the Call channel is selected, the Select memory setting should be “0.”

⑤–⑨ Operating frequency setting
See ‘• Operating frequency.’ (p. 20-11)

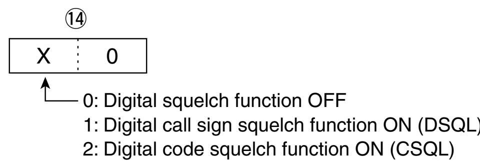
⑩, ⑪ Operating mode setting
See ‘• Operating mode.’ (p. 20-11)

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



⑮–⑰ Repeater tone frequency setting
⑱–⑳ Tone squelch frequency setting
See ‘• Repeater tone/tone squelch frequency setting.’ (p. 20-14)

㉑–㉓ DTCS code setting
See ‘• DTCS code and polarity setting.’ (p. 20-14)

㉔ Digital code squelch setting
See ‘• Digital code squelch setting.’ (p. 20-14)

㉕–㉗ Duplex offset frequency setting
See ‘• Duplex Offset frequency setting.’ (p. 20-13)

㉘–㉟ Destination call sign setting
(8 characters; fixed)
㊱–㊸ R1 (Access repeater) call sign setting
(8 characters; fixed)
㊹–(51) R2 (Gateway/Link repeater) call sign setting
(8 characters; fixed)
See ‘• DV TX call signs setting.’ (p. 20-14)

(52)–(67) 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

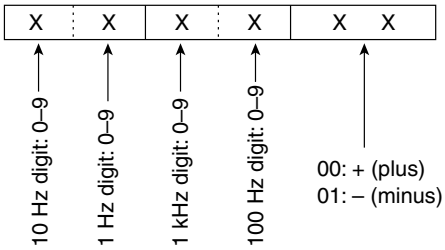
NOTE:
- The same data as ⑤–(51) are stored in ❺–(51).
- When the Split function is ON, the data of ❺–(51) is used for transmit.
- Even if the Split function is OFF, enter the data into ❺–(51) to match your transceiver. We recommend that you set the same data as ⑤–(51).

Remote jack (CI-V) information

◇ Data content description (Continued)

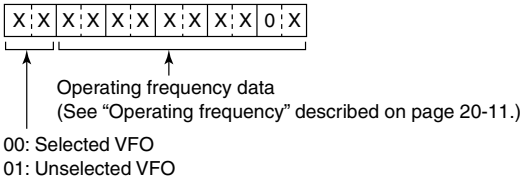
• RIT frequency settings

Command: 21 00



• Selected or unselected VFO frequency settings

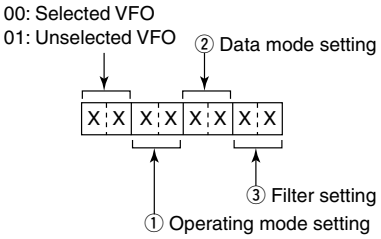
Command: 25



• 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: FIL1
01: USB	06: WFM	01: Data mode ON	02: FIL2
02: AM	07: CW-R	—	03: FIL3
03: CW	08: RTTY-R	—	—
04: RTTY	17: DV	—	—

Section 21 SPECIFICATIONS AND OPTIONS

Specifications

◇ General

• Frequency coverage: (unit: MHz)

Receive

0.030000 – 199.999999*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

*1 Some frequency ranges are not guaranteed.
*2 Depending on version. *3 USA version only.
*4 Center 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″)

Specifications (Continued)

◇ Receiver

• Receive system
SSB/CW/RTTY/AM/FM/DV: Triple superheterodyne system
WFM: 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)
	10.7 MHz (WFM)
3rd:	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 Less than 3.4 kHz/–40 dB
CW (BW: 500 Hz):	More than 500 Hz/–6 dB Less than 700 Hz/–40 dB
RTTY (BW: 500 Hz):	More than 500 Hz/–6 dB Less than 800 Hz/–40 dB
AM (BW: 6 kHz):	More than 6.0 kHz/–6 dB Less than 10.0 kHz/–40 dB
FM (BW: 15 kHz):	More than 12.0 kHz/–6 dB Less than 22.0 kHz/–40 dB
DV (CH space: 12.5 kHz):	More than –50 dB

• Spurious and image rejection ratio

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

All stated specifications are typical and subject to change without notice or obligation.

Options

AT-180 HF/50 MHz AUTOMATIC ANTENNA 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.

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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Count on us!

A7085-2EX-5
 May 2021

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