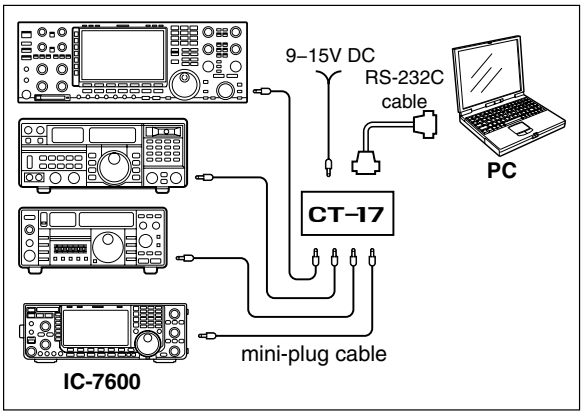
■ Remote jack (CI-V) information

◇ CI-V connection example

The transceiver can be connected 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 a PC equipped with an RS-232C port. See p. 134 for setting the CI-V condition using set mode.

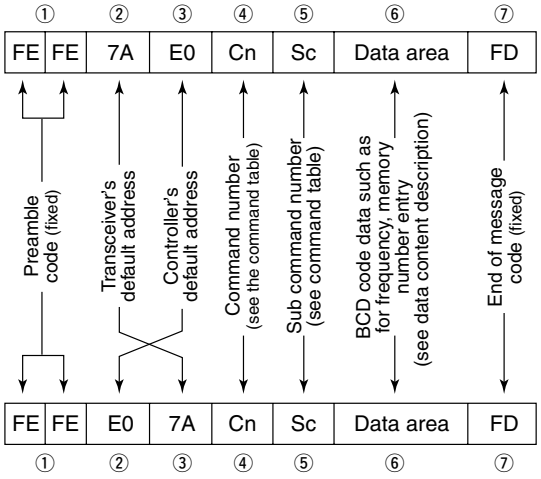


When the transceiver is connected to a PC with the USB cable (third party), the optional CT-17 is not required.

◇ Data format

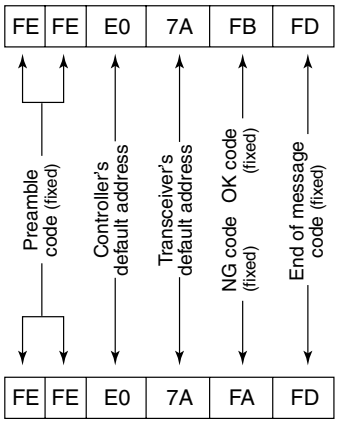
The CI-V system can be operated using the following data formats. Data formats differ according to command numbers. A data area or sub command is added for some commands.

Controller to IC-7600



IC-7600 to controller

OK message to controller



NG message to controller

◇ Command table

Cmd.	Sub cmd.	Data	Description
00		see p. 157	Send frequency data (transceive)
01		see p. 157	Operating mode selection for transceive
02		see p. 159	Read band edge frequencies
03		see p. 157	Read operating frequency
04		see p. 157	Read operating mode
05		see p. 157	Set operating frequency
06		see p. 157	Operating mode selection for transceive
07			Select VFO mode
	B0		Exchange main and sub bands
	B1		Equalize main and sub bands
	C0		Turn the dualwatch OFF
	C1		Turn the dualwatch ON
	D0		Select main band
	D1		Select sub band
08			Select memory mode
		0001 to 0099	Select memory channel (0001=M-CH01, 0099=M-CH99)
		0100	Select program scan edge channel P1
		0101	Select program scan edge channel P2
09			Memory write
0A			Memory to VFO
0B			Memory clear
0E	00		Scan stop
	01		Programmed/memory scan start
	02		Programmed scan start
	03		⊿F scan start
	12		Fine programmed scan start
	13		Fine ⊿F scan start
	22		Memory scan start
	23		Select memory scan start
	A1		Select ⊿F scan span ±5 kHz
	A2		Select ⊿F scan span ±10 kHz
	A3		Select ⊿F scan span ±20 kHz
	A4		Select ⊿F scan span ±50 kHz
	A5		Select ⊿F scan span ±100 kHz
	A6		Select ⊿F scan span ±500 kHz
	A7		Select ⊿F scan span ±1 MHz
	B0		Set as non-select channel
	B1		Set as select channel (The previously set number by CI-V is set after turning power ON, or "1" is selected if no selection is performed.)
		01	Set as select channel "★1"
		02	Set as select channel "★2"
		03	Set as select channel "★3"
	B2	00	Set "ALL" for select memory scan
		01	Set "★1" for select memory scan
		02	Set "★2" for select memory scan
		03	Set "★3" for select memory scan
	D0		Set scan resume OFF
	D3		Set scan resume ON
0F	00		Turn the split function OFF
	01		Turn the split function ON

Cmd.	Sub cmd.	Data	Description
10		00	Select 10 Hz (1 Hz) tuning step
		01	Select 100 Hz tuning step
		02	Select 1 kHz tuning step
		03	Select 5 kHz tuning step
		04	Select 9 kHz tuning step
		05	Select 10 kHz tuning step
		06	Select 12.5 kHz tuning step
		07	Select 20 kHz tuning step
		08	Select 25 kHz tuning step
11		00	Send/read attenuator OFF
		06	Send/read 6 dB attenuator
		12	Send/read 12 dB attenuator
		18	Send/read 18 dB attenuator
12		0000	Send/read ANT1 selection (RX ANT OFF)
		0001	Send/read ANT1 selection (RX ANT ON)
		0100	Send/read ANT2 selection (RX ANT OFF)
		0101	Send/read ANT2 selection (RX ANT ON)
13	00		Announce all data with voice synthesizer
	01		Announce frequency and S-meter level with voice synthesizer
	02		Announce receive mode with voice synthesizer
14	01	0000 to 0255	Send/read [AF] level (0000=max. CCW, 0255=max. CW)
	02	0000 to 0255	Send/read [RF] level (0000=max. CCW, 0255=11 o'clock)
	03	0000 to 0255	Send/read [SQL] level (0000=11 o'clock, 0255=max. CW)
	06	0000 to 0255	Send/read [NR] level (0000=0%, 0255=100%)
	07	0000 to 0255	Send/read inner [TWIN PBT] position (0000=max. CCW, 0128=center, 0255=max. CW)
	08	0000 to 0255	Send/read outer [TWIN PBT] position (0000=max. CCW, 0128=center, 0255=max. CW)
	09	0000 to 0255	Send/read CW pitch (0000=300 Hz, 0128=600 Hz, 0255=900 Hz; 5 Hz steps)
	0A	0000 to 0255	Send/read [RF POWER] level (0000=max. CCW, 0255=max. CW)
	0B	0000 to 0255	Send/read [MIC GAIN] level (0000=max. CCW, 0255=max. CW)
	0C	0000 to 0255	Send/read [KEY SPEED] level (0000=max. CCW, 0255=max. CW)
	0D	0000 to 0255	Send/read [NOTCH] position (0000=max. CCW, 0128=center, 0255=max. CW)
	0E	0000 to 0255	Send/read COMP level (0000=0, 0255=10)
	0F	0000 to 0255	Send/read [BK-IN DELAY] position (0000=max. CCW, 0255=max. CW)
	10	0000 to 0255	Send/read [BAL] position (0000=max. CCW, 0128=center, 0255=max. CW)
	12	0000 to 0255	Send/read NB level (0000=0%, 0255=100%)
	14	0000 to 0255	Send/read DRIVE gain (0000=0%, 0255=100%)
	15	0000 to 0255	Send/read Monitor gain (0000=0%, 0255=100%)
	16	0000 to 0255	Send/read VOX gain (0000=0%, 0255=100%)
	17	0000 to 0255	Send/read Anti VOX gain (0000=0%, 0255=100%)
	19	0000 to 0255	Send/read BRIGHT level (0000=0%, 0255=100%)
15	01	00	Read squelch condition (squelch close)
		01	Read squelch condition (squelch open)
	02	0000 to 0255	Read S-meter level (0000=S0, 0120=S9, 0241=S9+60 dB)
	11	0000 to 0255	Read RF power meter (0000=0%, 0143=50%, 0213=100%)
	12	0000 to 0255	Read SWR meter (0000=SWR1.0, 0048=SWR1.5, 0080=SWR2.0)
	13	0000 to 0255	Read ALC meter (0000=0, 0120=Max.)
	14	0000 to 0255	Read COMP meter (0000=0 dB, 0130=15 dB, 0241=30 dB)

◇ Command table (continued)

Cmd.	Sub cmd.	Data	Description
15	15	0000 to 0255	Read VD meter (0152=10 V, 0181=13 V, 0212=16 V)
	16	0000 to 0255	Read ID meter (0000=0 A, 0097=10 A, 0241=25 A)
16	02	00	Preamp OFF
		01	Preamp 1 ON
		02	Preamp 2 ON
	12	00	AGC FAST selection
		01	AGC MID selection
		02	AGC SLOW selection
	22	00	Noise blanker OFF
		01	Noise blanker ON
	32	00	Audio peak filter OFF
		01	Audio peak filter WIDE ON (320 Hz is selected when SHARP APF is set)
		02	Audio peak filter MID ON (160 Hz is selected when SHARP APF is set)
		03	Audio peak filter NAR ON (80 Hz is selected when SHARP APF is set)
	40	00	Noise reduction OFF
		01	Noise reduction ON
	41	00	Auto notch function OFF
		01	Auto notch function ON
	42	00	Repeater tone OFF
		01	Repeater tone ON
	43	00	Tone squelch OFF
		01	Tone squelch ON
	44	00	Speech compressor OFF
		01	Speech compressor ON
	45	00	Monitor function OFF
		01	Monitor function ON
	46	00	VOX function OFF
		01	VOX function ON
	47	00	BK-IN function OFF
		01	Semi BK-IN function ON
		02	Full BK-IN function ON
	48	00	Manual notch function OFF
		01	Manual notch function ON
	4F	00	Twin peak filter OFF
		01	Twin peak filter ON
	50	00	Dial lock function OFF
		01	Dial lock function ON
19	00		Read the transceiver ID
1A	00	see p. 159	Send/read memory contents
	01	see p. 157	Send/read band stacking register contents
	02	see p. 157	Send/read memory keyer contents
	03	00 to 49	Send/read the selected filter width (SSB, CW, PSK: 00=50 Hz, 40=3600 Hz; RTTY: 00=50 Hz, 31=2700 Hz; AM: 00=200 Hz, 49=10 kHz)
	04	00 to 13	Send/read the selected AGC time constant (00=OFF, 01=0.1/0.3 sec., 13=6.0/8.0 sec.)
	05 0001	see p. 120	Send/read SSB RX HPF/LPF
	0002	00 to 10	Send/read SSB RX Tone (Bass) level (00=–5, 10=+5)
	0003	00 to 10	Send/read SSB RX Tone (Treble) level (00=–5, 10=+5)
	0004	see p. 120	Send/read AM RX HPF/LPF
	0005	00 to 10	Send/read AM RX tone (Bass) level (00=–5, 10=+5)
	0006	00 to 10	Send/read AM RX Tone (Treble) level (00=–5, 10=+5)
	0007	see p. 120	Send/read FM RX HPF/LPF
	0008	00 to 10	Send/read FM RX tone (Bass) level (00=–5, 10=+5)
	0009	00 to 10	Send/read FM RX Tone (Treble) level (00=–5, 10=+5)
	0010	see p. 121	Send/read CW RX HPF/LPF
	0011	see p. 121	Send/read RTTY RX HPF/LPF
	0012	see p. 121	Send/read PSK RX HPF/LPF
	0013	00 to 10	Send/read SSB TX Tone (Bass) level (00=–5, 10=+5)
	0014	00 to 10	Send/read SSB TX Tone (Treble) level (00=–5, 10=+5)

Cmd.	Sub cmd.	Data	Description
1A	05 0015	00 to 10	Send/read AM TX Tone (Bass) level (00=–5, 10=+5)
	0016	00 to 10	Send/read AM TX Tone (Treble) level (00=–5, 10=+5)
	0017	00 to 10	Send/read FM TX Tone (Bass) level (00=–5, 10=+5)
	0018	00 to 10	Send/read FM TX Tone (Treble) level (00=–5, 10=+5)
	0019	see p. 122	Send/read SSB TX bandwidth for WIDE
	0020	see p. 122	Send/read SSB TX bandwidth for MID.
	0021	see p. 122	Send/read SSB TX bandwidth for NARROW
	0022	0000 to 0255	Send/read DRIVE gain (0000=0%, 0255=100%)
	0023	0000 to 0255	Send/read speech level (0000=0%, 0255=100%)
	0024	0000 to 0255	Send/read CW sidetone level (0000=0%, 0255=100%)
	0025	00	CW sidetone level limit OFF
		01	CW sidetone level limit ON
	0026	0000 to 0255	Send/read beep level (0000=0%, 0255=100%)
	0027	00	Beep level limit OFF
		01	Beep level limit ON
	0028	00	Squelch mute effect OFF (squelch is fixed open) for audio output from USB-B connector
		01	Squelch mute effect ON for audio output from USB-B connector
	0029	0000 to 0255	Send/read modulation level for audio input to USB-B connector (0000=0%, 0255=100%)
	0030	00	[MIC] selection for MOD input connector during DATA OFF
		01	[ACC] selection for MOD input connector during DATA OFF
		02	Both [MIC] and [ACC] selection for MOD input connector during DATA OFF
		03	[USB] selection for MOD input connector during DATA OFF
	0031	00	[MIC] selection for MOD input connector during DATA1
		01	[ACC] selection for MOD input connector during DATA1
		02	Both [MIC] and [ACC] selection for MOD input connector during DATA1
		03	[USB] selection for MOD input connector during DATA1
	0032	00	[MIC] selection for MOD input connector during DATA2
		01	[ACC] selection for MOD input connector during DATA2
		02	Both [MIC] and [ACC] selection for MOD input connector during DATA2
		03	[USB] selection for MOD input connector during DATA2
	0033	00	[MIC] selection for MOD input connector during DATA3
		01	[ACC] selection for MOD input connector during DATA3
		02	Both [MIC] and [ACC] selection for MOD input connector during DATA3
		03	[USB] selection for MOD input connector during DATA3
	0034	00	Lead selection for SEND relay type
		01	MOS-FET selection for SEND relay type
	0035	00	Auto selection for external meter output
		01	S (receiving signal strength) selection for external meter output
		02	Po (RF power) selection for external meter selection
		03	SWR selection for external meter output
		04	ALC selection for external meter output
		05	COMP selection for external meter output
		06	Vd selection for external meter output
		07	Id selection for external meter output
	0036	0000 to 0255	Send/read external meter output level (see p. 125)

Cmd.	Sub cmd.		Data	Description
1A	05	0037	0000 to 0255	Send/read reference frequency (0000=0%, 0255=100%)
		0038	0000 to 0255	Send/read LCD backlight brightness level (0000=0% (dark), 0255=100% (bright))
		0039	0000 to 0255	Send/read key backlight brightness level (0000=0% (dark), 0255=100% (bright))
		0040	00	Display type A selection
			01	Display type B selection
		0041	00	Basic font selection
			01	Italic font selection
			02	Round font selection
		0042	00	SLOW selection for meter response
			01	MID selection for meter response
			02	FAST selection for meter response
		0043	00	Standard meter selection for normal screen indication
			01	Edgewise meter selection for normal screen indication
			02	Bar meter selection for normal screen indication
		0044	00	Edgewise meter selection for wide screen indication
			01	Bar meter selection for wide screen indication
		0045	00	Meter peak hold function for Bar meter OFF
			01	Meter peak hold function for Bar meter ON
		0046	00	Memory name indication OFF
			01	Memory name indication ON
		0047	00	Audio peak filter width pop-up indication OFF
			01	Audio peak filter width pop-up indication ON
		0048	00	Manual notch filter width pop-up indication OFF
			01	Manual notch filter width pop-up indication ON
		0049	00	Screen saver OFF
			01	15 min. selection for screen saver
			02	30 min. selection for screen saver
			03	60 min. selection for screen saver
		0050	00	Bound selection for screen saver type
			01	Round selection for screen saver type
			02	Twist selection for screen saver type
		0051	00	Opening screen indication OFF
			01	Opening screen indication ON
		0052	see p. 158	Send/read opening screen contents.
		0053	20000101 to 20991231	Send/read date (20000101=1st Jan. 2000, 20991231=31st Dec. 2099)
		0054	0000 to 2359	Send/read time (0000=00:00, 2359=23:59)
		0055	00	Clock 2 OFF
			01	Clock 2 ON
		0056	see p. 157	Send/read offset time for clock 2
		0057	see p. 158	Send/read clock 2 name *Up to 3 characters
		0058	00	Calibration marker OFF
			01	Calibration marker ON
		0059	00	Confirmation beep OFF
			01	Confirmation beep ON
		0060	00	Band edge beep OFF
			01	Band edge beep ON (Beep sounds with a default amateur band)
			02	Band edge beep with user setting ON
			03	Band edge beep with user setting/TX limit ON
		0061	0050 to 0200	Send/read beep audio frequency (0050=500 Hz, 0200=2000 Hz)
		0062	00	Auto selection for [RF/SQL]
			01	SQL selection for [RF/SQL]
			02	RF+SQL selection for [RF/SQL]
		0063	00	Quick dualwatch OFF
			01	Quick dualwatch ON
		0064	00	Quick split function OFF
			01	Quick split function ON
		0065	see p. 158	FM split offset frequency setting for HF
		0066	see p. 158	FM split offset frequency setting for 50 MHz
		0067	00	Split lock function OFF
			01	Split lock function ON
		0068	00	Tuner auto start OFF
			01	Tuner auto start ON

Cmd.	Sub cmd.		Data	Description
1A	05	0069	00	PTT tune OFF
			01	PTT tune ON
		0070	00	Antenna selection OFF
			01	Manual antenna selection
			02	Auto antenna selection
		0071	00	Transverter functions automatically
			01	Transverter function ON
		0072	see p. 158	Transverter offset frequency
		0073	00	1275 Hz selection for RTTY mark frequency
			01	1615 Hz selection for RTTY mark frequency
			02	2125 Hz selection for RTTY mark frequency
		0074	00	170 Hz selection for RTTY shift width
			01	200 Hz selection for RTTY shift width
			02	425 Hz selection for RTTY shift width
		0075	00	RTTY keying with normal polarity
			01	RTTY keying with reverse polarity
		0076	00	1000 Hz selection for PSK tone frequency
			01	1500 Hz selection for PSK tone frequency
			02	2000 Hz selection for PSK tone frequency
		0077	00	English selection for voice synthesizer speech language
			01	Japanese selection for voice synthesizer speech language
		0078	00	Speech speed slow
			01	Speech speed fast
		0079	00	S-meter level announcement OFF
			01	S-meter announcement ON
		0080	00	Operating mode announcement (after pushing mode switch) OFF
			01	Operating mode announcement (after pushing mode switch) ON
		0081	00	[SPEECH/LOCK] key function setting (Push momentariliy=SPEECH, Push and hold=LOCK)
			01	[SPEECH/LOCK] key function setting (Push momentariliy=LOCK, Push and hold=SPEECH)
		0082	00	Number of memo pad channels 5
			01	Number of memo pad channels 10
		0083	00	Auto TS for main dial OFF
			01	Auto TS for main dial ON with LOW
			02	Auto TS for main dial ON with HIGH
		0084	00	LOW selection for microphone Up/Down speed
			01	HIGH selection for microphone Up/Down speed
		0085	00	Quick RIT/⊿TX clear OFF
			01	Quick RIT/⊿TX clear ON
		0086	00	Auto notch selection for SSB operation
			01	Manual notch selection for SSB operation
			02	Auto/Manual notch selection for SSB operation
		0087	00	Auto notch selection for AM operation
			01	Manual notch selection for AM operation
			02	Auto/Manual notch selection for AM operation
		0088	00	SSB/CW synchronous tuning function OFF
			01	SSB/CW synchronous tuning function ON
		0089	00	LSB selection for CW normal side set
			01	USB selection for CW normal side set
		0090	00	SHARP selection for APF type
			01	SOFT selection for APF type
		0091	00	Voice memory transmission OFF with external keypad
			01	Voice memory transmission ON with external keypad
		0092	00	Memory keyer transmission OFF with external keypad
			01	Memory keyer transmission ON with external keypad
		0093	00	RTTY memory transmission OFF with external keypad
			01	RTTY memory transmission ON with external keypad
		0094	00	PSK memory transmission OFF with external keypad
			01	PSK memory transmission ON with external keypad

◇ Command table (continued)

Cmd.	Sub cmd.		Data	Description
1A	05	0095	00	Voice memory transmission OFF with [F1]–[F4] on the keyboard
			01	Voice memory transmission ON with [F1]–[F4] on the keyboard
		0096	00	Memory keyer transmission OFF with [F1]–[F4] on the keyboard
			01	Memory keyer transmission ON with [F1]–[F4] on the keyboard
		0097	00	CI-V transceive OFF
			01	CI-V transceive ON
		0098	00	CI-V selection for [USB-B] usage
			01	Decode selection for [USB-B] usage
		0099	00	300 bps selection for decode speed
			01	1200 bps selection for decode speed
			02	4800 bps selection for decode speed
			03	9600 bps selection for decode speed
			04	19200 bps selection for decode speed
		0100	00	English keyboard selection
			01	Japanese keyboard selection
			02	United Kingdom keyboard selection
			03	French keyboard selection
			04	French (Canadian) keyboard selection
			05	German keyboard selection
			06	Portuguese keyboard selection
			07	Portuguese (Brazilian) keyboard selection
			08	Spanish keyboard selection
			09	Spanish (Latin American) keyboard selection
			10	Italian keyboard selection
		0101	0010 to 0100	Send/read keyboard repeat delay (0010=100 msec., 0100=1000 msec.; 50 msec. steps)
		0102	00 to 31	Send/read keyboard repeat speed (00=2.0 cps, 31=30.0 cps)
		0103	00	Scope indication during TX OFF
			01	Scope indication during TX ON
		0104	00	Scope max. hold function OFF
			01	Scope max. hold function ON
		0105	00	Filter center selection for scope center frequency (center mode only)
			01	Carrier point center selection for scope center frequency (center mode only)
			02	Carrier point center (Abs. Freq.) selection for scope center frequency (center mode only)
		0106	see p. 158	Send/read waveform color for receiving signal
		0107	see p. 158	Send/read waveform color for max. hold
		0108	00	SLOW selection for scope sweep speed in ±2.5 kHz span
			01	MID selection for scope sweep speed in ±2.5 kHz span
			02	FAST selection for scope sweep speed in ±2.5 kHz span
		0109	00	SLOW selection for scope sweep speed in ±5 kHz span
			01	MID selection for scope sweep speed in ±5 kHz span
			02	FAST selection for scope sweep speed in ±5 kHz span
		0110	00	SLOW selection for scope sweep speed in ±10 kHz span
			01	MID selection for scope sweep speed in ±10 kHz span
			02	FAST selection for scope sweep speed in ±10 kHz span
		0111	00	SLOW selection for scope sweep speed in ±25 kHz span
			01	MID selection for scope sweep speed in ±25 kHz span
			02	FAST selection for scope sweep speed in ±25 kHz span
		0112	00	SLOW selection for scope sweep speed in ±50 kHz span
			01	MID selection for scope sweep speed in ±50 kHz span
			02	FAST selection for scope sweep speed in ±50 kHz span

Cmd.	Sub cmd.		Data	Description
1A	05	0113	00	SLOW selection for scope sweep speed in ±100 kHz span
			01	MID selection for scope sweep speed in ±100 kHz span
			02	FAST selection for scope sweep speed in ±100 kHz span
		0114	00	SLOW selection for scope sweep speed in ±250 kHz span
			01	MID selection for scope sweep speed in ±250 kHz span
			02	FAST selection for scope sweep speed in ±250 kHz span
		0115	see p. 158	Scope edge frequencies for 0.03 to 1.60 MHz band
		0116	see p. 158	Scope edge frequencies for 1.60 MHz to 2.00 MHz band
		0117	see p. 158	Scope edge frequencies for 2.00 MHz to 6.00 MHz band
		0118	see p. 158	Scope edge frequencies for 6.00 MHz to 8.00 MHz band
		0119	see p. 158	Scope edge frequencies for 8.00 MHz to 11.00 MHz band
		0120	see p. 158	Scope edge frequencies for 11.00 MHz to 15.00 MHz band
		0121	see p. 158	Scope edge frequencies for 15.00 MHz to 20.00 MHz band
		0122	see p. 158	Scope edge frequencies for 20.00 MHz to 22.00 MHz band
		0123	see p. 158	Scope edge frequencies for 22.00 MHz to 26.00 MHz band
		0124	see p. 158	Scope edge frequencies for 26.00 MHz to 30.00 MHz band
		0125	see p. 158	Scope edge frequencies for 30.00 MHz to 45.00 MHz band
		0126	see p. 158	Scope edge frequencies for 45.00 MHz to 60.00 MHz band
		0127	00	Auto monitor function OFF during voice memory transmission
			01	Auto monitor function ON during voice memory transmission
		0128	03 to 10	Send/read voice memory short play time (03=3 sec., 10=10 sec.)
		0129	05 to 15	Send/read voice memory normal record time (05=5 sec., 15=15 sec.)
		0130	00	Normal selection for contest number style
			01	"190→ANO" selection for contest number style
			02	"190→ANT" selection for contest number style
			03	"90→NO" selection for contest number style
			04	"90→NT" selection for contest number style
		0131	01	M1 selection for count up trigger channel
			02	M2 selection for count up trigger channel
			03	M3 selection for count up trigger channel
			04	M4 selection for count up trigger channel
		0132	0001 to 9999	Send/read present number (0001=1, 9999=9999)
		0133	01 to 60	Send/read CW keyer repeat time (01=1 sec., 60=60 sec.)
		0134	28 to 45	Send/read CW keyer dot/dash ratio (28=1:1:2.8, 45=1:1:4.5)
		0135	00	2 msec. selection for rise time of the transmitted CW envelope
			01	4 msec. selection for rise time of the transmitted CW envelope
			02	6 msec. selection for rise time of the transmitted CW envelope
			03	8 msec. selection for rise time of the transmitted CW envelope
			04	10 msec. selection for rise time of the transmitted CW envelope
		0136	00	Normal selection for paddle polarity
			01	Reverse selection for paddle polarity
		0137	00	Straight selection for keyer type
			01	BUG-KEY selection for keyer type
			02	ELEC-KEY selection for keyer type
		0138	00	Mic. up/down keyer function OFF
			01	Mic. up/down keyer function ON

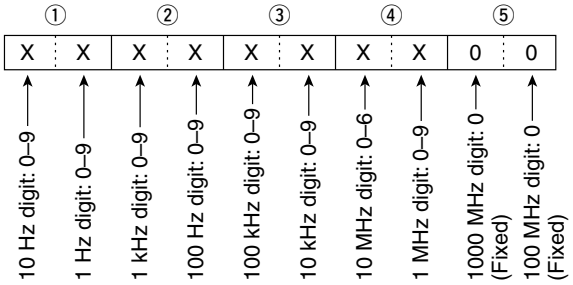
Cmd.	Sub cmd.		Data	Description
1A	05	0139	00	RTTY decoder FFT scope averaging function OFF
			01	Number 2 selection for RTTY decoder FFT scope averaging function
			02	Number 3 selection for RTTY decoder FFT scope averaging function
			03	Number 4 selection for RTTY decoder FFT scope averaging function
		0140	see p. 158	Set/read FFT scope waveform color set for RTTY decoder
		0141	00	RTTY decode USOS function OFF
			01	RTTY decode USOS function ON
		0142	00	"CR,LF,CR+LF" selection for RTTY decode new line code
			01	"CR+LF" selection for RTTY decode new line code
		0143	00	OFF selection for RTTY diddle
			01	BLANK selection for RTTY diddle
			02	LTRS selection for RTTY diddle
		0144	00	RTTY encode USOS function OFF
			01	RTTY encode USOS function ON
		0145	00	RTTY auto CR+LF by keyboard's [F12] OFF
			01	RTTY auto CR+LF by keyboard's [F12] ON
		0146	00	RTTY time stamp OFF
			01	RTTY time stamp ON
		0147	00	Local time selection for RTTY time stamp
			01	Clock2 selection for RTTY time stamp
		0148	00	Frequency stamp for RTTY time stamp OFF
			01	Frequency stamp for RTTY time stamp ON
		0149	see p. 158	Send/read received text font color for RTTY decoder
		0150	see p. 158	Send/read transmitted text font color (RTTY)
		0151	see p. 158	Send/read time stamp text font color (RTTY)
		0152	see p. 158	Send/read text font color in TX buffer (RTTY)
		0153	00	PSK decoder FFT scope averaging function OFF
			01	Number 2 selection for PSK decoder FFT scope averaging function
			02	Number 3 selection for PSK decoder FFT scope averaging function
			03	Number 4 selection for PSK decoder FFT scope averaging function
		0154	see p. 158	Set/read FFT scope waveform color set for PSK decoder
		0155	00	±8 Hz selection for PSK AFC function tuning range
			01	±15 Hz selection for PSK AFC function tuning range
		0156	00	PSK time stamp OFF
			01	PSK time stamp ON
		0157	00	Local time selection for PSK time stamp
			01	Clock2 selection for PSK time stamp
		0158	00	Frequency stamp for PSK time stamp OFF
			01	Frequency stamp for PSK time stamp ON
		0159	see p. 158	Send/read received text font color for PSK decoder
		0160	see p. 158	Send/read transmitted text font color (PSK)
		0161	see p. 158	Send/read time stamp text font color (PSK)
		0162	see p. 158	Send/read text font color in TX buffer (PSK)
		0163	00	LOW scan speed selection
			01	HIGH scan speed selection
		0164	00	Scan resume OFF
			01	Scan resume ON
		0165	0000 to 0255	Send/read VOX gain (0000=0%, 0255=100%)
		0166	0000 to 0255	Send/read ANTI-VOX gain (0000=0%, 0255=100%)
		0167	00 to 20	Send/read VOX delay time (00=0.0 sec., 20=2.0 sec.)
		0168	00	VOX voice delay function OFF
			01	Short selection for VOX voice delay
			02	Mid selection for VOX voice delay
			03	Long selection for VOX voice delay

Cmd.	Sub cmd.		Data	Description
1A	05	0169	0000 to 0255	Send/read NB level (0000=0%, 0255=100%)
		0170	00 to 09	Send/read NB depth (00=1, 09=10)
		0171	0000 to 0255	Send/read NB width (0000=1, 0255=100)
		0172	0000 to 0255	Send/read MONITOR gain (0000=0%, 0255=100%)
	06		see p. 158	Send/read DATA mode with filter set
	07		00	WIDE selection for SSB transmit bandwidth
			01	MID selection for SSB transmit bandwidth
			02	NAR selection for SSB transmit bandwidth
	08		00	SHARP selection for DSP filter type
			01	SOFT selection for DSP filter type
	09		00	3 kHz roofing filter selection
			01	6 kHz roofing filter selection
			02	15 kHz roofing filter selection
	0A		00	WIDE selection for manual notch width
			01	MID selection for manual notch width
			02	NAR selection for manual notch width
1B	00		see p. 159	Send/read repeater tone frequency
	01		see p. 159	Send/read tone squelch frequency
1C	00		00	Transceiver's condition (RX)
			01	Transceiver's condition (TX)
	01		00	Antenna tuner OFF (through)
			01	Antenna tuner ON
			02	Tuning
1E	00			Read number of available TX frequency band
	01		see p. 159	Read TX band edge frequencies
	02			Read number of user-set TX frequency band
	03		see p. 159	Send/read user-set TX band edge frequencies

◇ Data content description

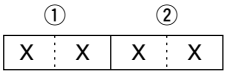
• Operating frequency

Command : 00, 03, 05



• Operating mode

Command : 01, 04, 06

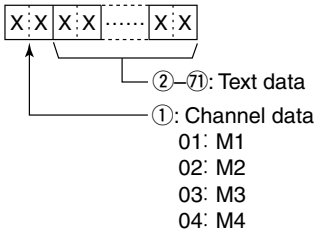


① Operating mode		② Filter setting
00: LSB	05: FM	01: FIL1
01: USB	07: CW-R	02: FIL2
02: AM	08: RTTY-R	03: FIL3
03: CW	12: PSK	
04: RTTY	13: PSK-R	

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

• Memory keyer contents

Command : 1A 02

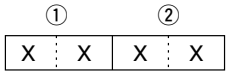


• Character's code

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

• Band stacking register

Command : 1A 01



① Frequency band code

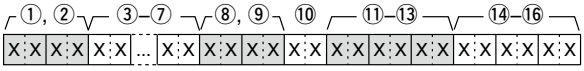
Code	Freq. band	Frequency range (unit: MHz)
01	1.8	1.800000– 1.999999
02	3.5	3.400000– 4.099999
03	7	6.900000– 7.499999
04	10	9.900000–10.499999
05	14	13.900000–14.499999
06	18	17.900000–18.499999
07	21	20.900000–21.499999
08	24	24.400000–25.099999
09	28	28.000000–29.999999
10	50	50.000000–54.000000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

② Register code

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

For example, when reading the oldest contents in the 21 MHz band, the code "0703" is used.

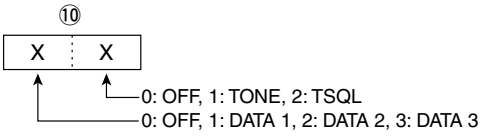
When sending the contents, the following code should be added after code ②.



③–⑦ Operating frequency setting
See "• Operating frequency."

⑧, ⑨ Operating mode setting
See "• Operating mode."

⑩ Data mode setting
1 byte data (XX)

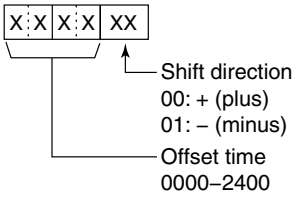


⑪–⑬ Repeater tone frequency setting

⑭–⑯ Tone squelch frequency setting
See "• Repeater tone/tone squelch setting."

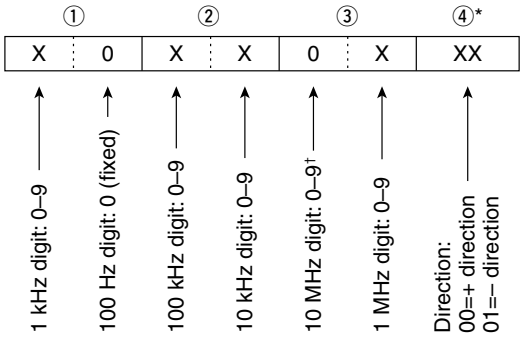
• Clock 2 offset time setting

Command : 1A 05 0056



• Offset frequency setting

Command : 1A 05 0065, 0066, 0072



*No need to enter for transverter offset frequency setting.
†Transverter offset only; Fix to '0' for split offset setting.

• Codes for memory name, opening message and CLOCK2 name contents

To send or read the desired memory name settings, the character codes, instructed codes for memory keyer contents, and follows are used.

• Character's code— Alphabetical characters

Character	ASCII code	Character	ASCII code
a–z	61–7A	—	—

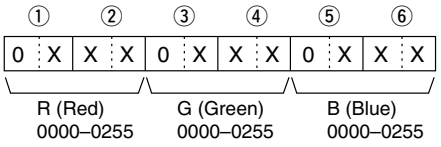
• Character's code— Symbols

Character	ASCII code	Character	ASCII code
!	21	#	23
$	24	%	25
&	26	¥	5C
?	3F	”	22
’	27	`	60
+	2B	–	2D
:	3A	;	3B
=	3D	<	3C
>	3E	(	28
)	29	[	5B
]	5D	{	7B
}	7D	|	7C
_	5F	–	7E
@	40		

Command	Set item/Available characters
1A00	Memory name All characters are available.
1A05 0052	Opening message Capital letters, numerals, some symbols (– / . @) and space are available.
1A05 0057	CLOCK 2 name Capital letters, small letters, numerals, some symbols (! # $ % & ¥ ? " ’ ` ^ + – ✱ / . , : ; = < > ( ) [ ] { } ¦ _ ¯ @) and space are available.

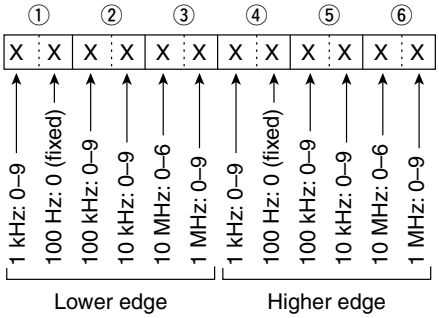
• Color setting

Command : 1A 05 0106, 0107, 0140, 0149, 0150, 0151, 0152, 0154, 0159, 0160, 0161, 0162



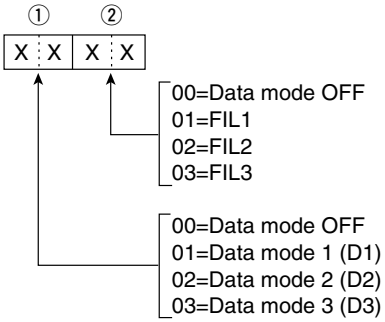
• Bandscope edge frequency setting

Command : 1A 05 0115, 0116, 0117, 0118, 0119, 0120, 0121, 0122, 0123, 0124, 0125, 0126



• Data mode with filter width setting

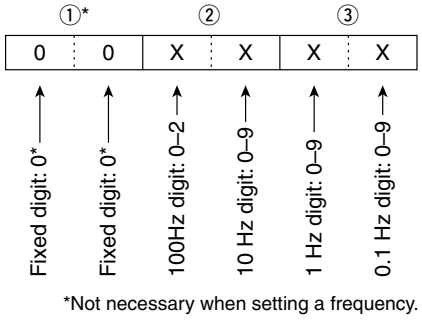
Command : 1A 06



◇ Data content description (continued)

• Repeater tone/tone squelch frequency setting

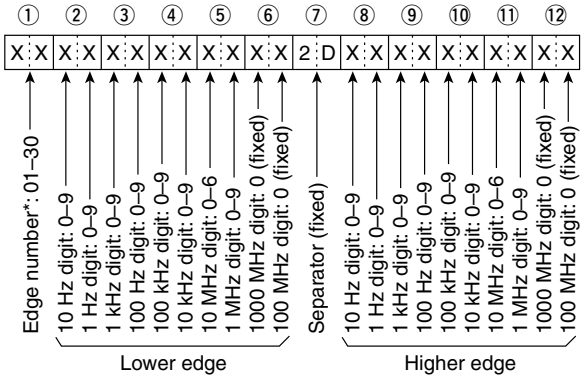
Command : 1B 00, 1B 01



*Not necessary when setting a frequency.

• Band edge frequency setting

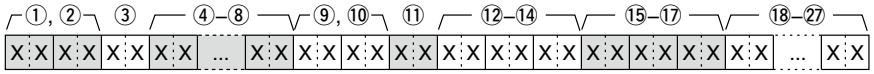
Command 02*, 1E 01, 1E 03



* Edge number setting is not necessary with command 02.

• Memory content setting

Command : 1A 00



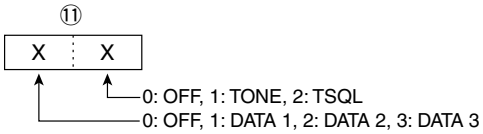
①, ② Memory channel number
0000–0099 : Memory channel 0 to 99
0100 : Programmed scan edge P1
0101 : Programmed scan edge P2

③ Select memory setting
00 : OFF
01 : ★1
02 : ★2
03 : ★3

④–⑧ Operating frequency setting
See "• Operating frequency."

⑨, ⑩ Operating mode setting
See "• Operating mode."

⑪ Data mode setting
1 byte data (XX)



⑫–⑭ Repeater tone frequency setting
⑮–⑰ Tone squelch frequency setting
See "• Repeater tone/tone squelch setting."

⑱–㉗ Memory name setting
Up to 10 characters.
See "• Codes for memory name, opening message and Clock 2 name contents."