CI-V implementation of Xiegu X6200

Extract of the extended manual that comes with the X6200 if purchased at Radioddity

as of Firmware V1.0.6

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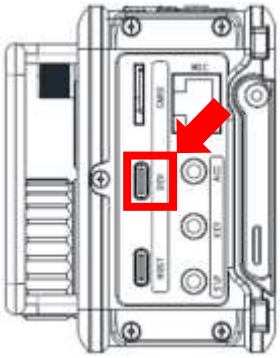
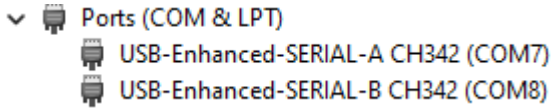
1 CAT control using CI-V commands

CI-V is an abbreviation for '**C**omputer **I**nterface, version **V**', it was introduced by ICOM® and has been used for CAT control for their radios for several decades. The Xiegu G90 uses a subset of the standard CI-V CAT instruction set. The CI-V codes sent remotely control the transceiver based on standard instructions as well as being able to configure some of the very specific radio parameters. PC programs can use these control instructions to extract data (e.g., frequency, mode) or to control the radio during data transmission.



The USB-C type socket labeled 'DEV' on the right-hand side of the Xiegu X6200 can be used to connect the Xiegu X6200 to a PC as a USB device (DEVice) using the USB-A to USB-C cable provided.

From the PC's point of view, the Xiegu X6200 provides two serial interfaces of the interface chip type CH342. If the CH342 driver is not installed automatically by the host OS, it needs to be installed manually, or the host OS driver tool may be used to install it from the Internet.



Both virtual serial ports can communicate at up to 115200 bps, 8 data bits, no parity and one stop bit and does so on SERIAL-A for terminal access. For CAT control, a speed of 19.200 bps on the SERIAL-B port is used.

Notes:	*If in your computer program you choose a different radio make/other model which also is compatible with CI-V instructions, some instructions may not be responded to by the XIEGU X6200.*

The following tables relate to firmware V1.0.6. Other firmware versions may have slight differences in which CI-V commands are supported.
The preamble for all commands is (in HEX) '`FE FE A4 00`' with 'A4' being the target address of the Xiegu X6200 and '`00`' being the target address of the PC. The end character is 'FD'.

If, for example, the receiver is currently tuned for '21.002.360' kHz and you send the command for 'Get active VFO frequency' '`FE FE A4 00 03 FD`' to the Xiegu X6200 you would get back '`FE FE 00 A4 03 60 23 00 21 00 FD`'.

2 Command table

The following 5 tables represent the current state of implementation based on XIEGU X6200 APP V1.06 and FIRMWARE V1.06.

Table	Content
1	X6200 CI-V commands
2	BCD frequency format
3	Mode, Data & filter bandwidth
4	Band and Spectrum mode
5	Filter bandwidth

2.1.1.1 CI-V – X6200 CI-V commands

Table 1 (part 1 of 5) X6200 CI-V commands			
CMD	**Sub-CMD**	**DATA**	**Description**
0x02	**-**	**-**	**Get Frequency range of receiver. Returned as Freq(dash)Freq in BCD.**
0x07	**0x00**	**-**	**Select VFO-A as main VFO (VFO-B becomes secondary)**
	0x01	**-**	**Select VFO-B as main VFO (VFO-A becomes secondary)**
	0xB0	**-**	**Swap selected VFO (A->B or B->A).**
0x0F	**0x00**	**-**	**Turn split operation off.**
	0x01	**-**	**Turn split operation on.**
0x11	**-**	**-**	**Get attenuator state (00 = off, 01 = on).**
	0x00	**-**	**Turn attenuator off.**
	0x01	**-**	**Turn attenuator on.**

Table 1 (part 2 of 5) X6200 CI-V commands			
CMD	**Sub-CMD**	**DATA**	**Description**
0x14	0x01	-	Get receiver audio volume (in BCD format 0-255). 00=00% 255=100%
	0x02	-	Get RF Gain (in BCD format 0-255).
	0x03	-	Get squelch level (in BCD format 0-255).
	0x06	-	Get NR level (in BCD format 0-255).
	0x09	-	Get CW Sidetone value (in BCD format 0-255). 00=400Hz, 255=1200Hz
	0x0A	-	Get Tx power setting (in BCD format) 0=0.5W 72=3w 145=5w 255=8w.
	0x0B	-	Get Hand Microphone Gain setting (in BCD format level 0=00, 30=255).
	0x0C	-	Get CW keyer speed setting. 5=0 wpm, 255=50 wpm.
	0x0D	-	Get DNF centre frequency. (notch FC) - 00=100, 255=3000
	0x0F	-	Get QSK time setting. 0=0 ms, 255 = 1000 ms.
	0x12	-	Get NB Level (in BCD format 0-255). Level 0=00, level 100=255
	0x15	-	Get MONI level (in BCD format 0-255). Level 0=00, level 100=255
	0x19	-	Get LCD backlight level (in BCD format 0-255). Level 1=00, level 10=255

Table 1 (part 3 of 5) X6200 CI-V commands			
CMD	**Sub-CMD**	**DATA**	**Description**
0x14	0x01	BCD code	Set audio level (range 0-255 in BCD). 00=00% 255=100%
	0x02	BCD code	Set RF Gain. 00=00% 255=100%
	0x03	BCD code	Set squelch level. 00=00% 255=100%
	0x06	BCD code	Set NR level (depth) 00=00% 255=100%
	0x09	BCD code	Values - 00=400Hz, 255=1200Hz.
	0x0A	BCD code	Set Tx power setting. 00=0.5w, 255=8w (operating on ext. PSU).
	0x0B	BCD code	Set Hanf MIC Gain. 00=level 0, 255=level 30.
	0x0C	BCD code	Set CW keyer speed. 00=5wpm, 255=50wpm.
	0x0D	BCD code	Set DNF centre frequency (Notch FC). 00=100Hz, 255=3000Hz.
	0x0F	BCD code	Set QSK hang time. 00=0 ms, 255=1000 ms
	0x12	BCD code	Set NB Level. 00=level 0, 255=level 100
	0x15	BCD code	Set MONI level. 00=level 0, 255=level 100
	0x19	BCD code	Set LCD backlight level. 00=level 1, 255=level 10
0x15	0x02	-	Get S-Meter reading. BCD code of 0-255 equates to 0-100%.
	0x11	-	Get output RF power BCD code of 0-255 equates to 0-100%
	0x12	-	Get SWR meter reading. BCD code of 0-255 equates to 0-100%.
	0x15	-	Get Volt meter reading. BCD code of 0-255 equates to 0-100%.
0x16	0x02	-	Get Preamp state (On=1 Off=0).
	0x12	-	Get AGC mode (off=0, fast=1, slow=2, auto=3).
	0x22	-	Get Noise Blanker switch state (0=off, 1=on).
	0x50	-	Get key lock status (1=locked, 0=free).

Table 1 (part 4 of 5) X6200 CI-V commands			
CMD	**Sub-CMD**	**DATA**	**Description**
0x16	0x02	0x00	Turn preamp off.
		0x01	Turn preamp on.
	0x12	0x00	Turn AGC off.
		0x01	Set AGC to fast.
		0x02	Set AGC to slow.
		0x03	Set AGC to auto.
	0x22	0x00	Turn noise blanker off.
		0x01	Turn noise blanker on.
	0x40	0x00	Turn NR off
		0x01	Turn NR on
	0x41	0x00	Turn DNF off
		0x01	Turn DNF on
	0x44	0x00	Turn COMP off
		0x01	Turn COMP on
	0x50	0x00	Unlock keys and knobs on radio.
		0x01	Lock key and knobs on radio.
0x19	0x00	-	Get radio ID (A4)
0x1A	0x01	-	Get Band /Spectrum display (see Table 2-3) - Byte 2 always 02
	0x03	-	Get IF filter width (see table 2-4)
	0x05	0x00 + 0x62	Get LOCK status (00 unlocked, 01=locked)
	0x01	D0 + D1	Set Band stacking register D1- Band Number(01-0C), D2 irrelevant (any number). For format of response see Table 2-3
	0x05	0x00 + 0x62 + D3	Set Lock status 3 bytes 00 62 D1 (D3=00 unlock, D3=01 lock)

Table 1 (part 5 of 5) X6200 CI-V commands			
CMD	**Sub-CMD**	**DATA**	**Description**
0x1C	0x00	-	Get state of PTT switch (1= on transmit, 0= on receive).
	0x00	0x00	Release the PTT switch (go to receive).
		0x01	Close the PTT switch (go to transmit).
	0x01	-	Get state of antenna tuner (returns 00 (off), 01 (on) or 02 (tuning)).
		0x00	Turn internal ATU off.
		0x01	Turn internal ATU on.
		0x02	Perform automatic tune of antenna using internal tuner. If needed turns ATU on before tune action and leaves the internal tuner turned on afterwards.
0x1D	0x19	-	Get Xiegu model ID (6200)
0x25	0x00	-	Get currently selected VFOs frequency (in BCD)
	0x01	-	Get currently non-selected VFOs frequency (in BCD)
	0x00	see table 2	Set currently selected VFOs frequency
	0x01	see table 2	Set currently non-selected VFOs frequency
0x26	0x00	-	Get currently selected VFO Mode/Data/Filter (3 chars)
	0x01	-	Get currently not-selected VFO Mode/Data/Filter (3 chars)
	0x00	see table 3	Set currently selected VFO Mode/Data/Filter (3 chars)
	0x01	see table 3	Set currently not-selected VFO Mode/Data/Filter (3 chars)

2.1.1.2 CI-V - BCD frequency format

Table 2 BCD frequency format		
Byte 0	D(7:4)	10 Hz
	D(3:0)	1 Hz
Byte 1	D(7:4)	1 kHz
	D(3:0)	100 Hz
Byte 2	D(7:4)	100 kHz
	D(3:0)	10 kHz
Byte 3	D(7:4)	10 MHz
	D(3:0)	1 MHz
Byte 4	D(7:4)	1 GHz
	D(3:0)	100 MHz

2.1.1.3 CI-V - Mode

Table 3 Mode, Data & filter bandwidth			
Data		Mode	Comments
0x00 0x00	0x01/2/3	LSB	Notes:
0x00 0x01	0x01/2/3	LSB-D	
0x01 0x00	0x01/2/3	USB	Byte 1 is MODE, Byte 2 is whether this is a data mode (01) or not (00) Byte 3 is the number of the filter selected (1,2 or3). Note when changing filter selection (on radio or via this command) the filter is changed for both VFOA and VFOB.
0x01 0x01	0x01/2/3	USB-D	
0x02 0x00	0x01/2/3	AM	
0x03 0x00	0x01/2/3	CW	
0x05 0x00	0x01/2/3	NFM	
0x07 0x00	0x01/2/3	CWR	

2.1.1.4 CI-V - Band and Spectrum mode

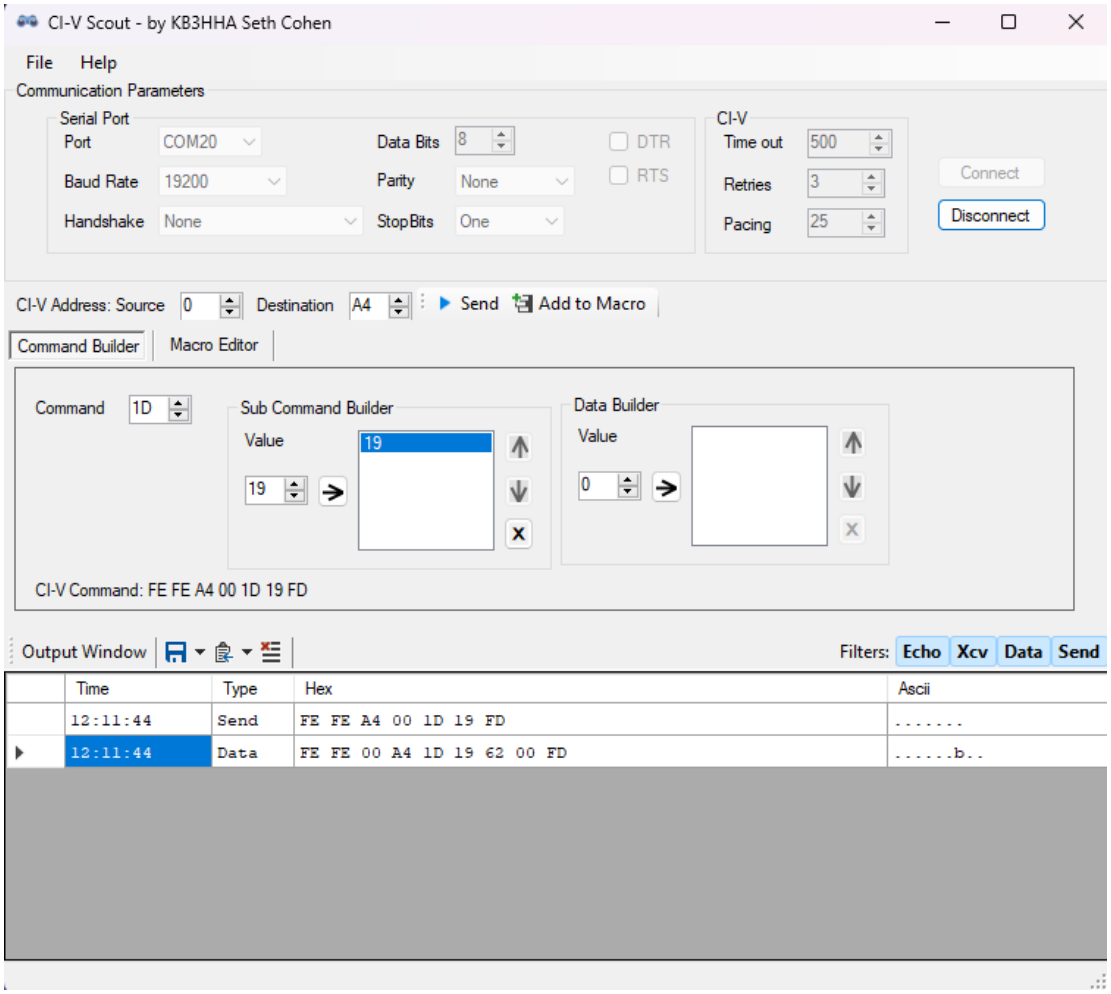
Table 4 Band and Spectrum mode		
First byte	Band	Spectrum display format
1	160M	Second Byte always 02
2	80M	
3	60M	
4	40M	
5	30M	
6	20M	
7	17M	
8	15M	
9	12M	
A	10M	
B	6M	
C	FM/AIR	

2.1.1.5 CI-V - Filter bandwidth

Table 5 IF Filter bandwidth			
Mode	**Value**	**Width (Hz)**	**Step (Hz)**
SSB/CW	**0~9**	**50~500**	**50**
SSB/CW	**10~40**	**600~3600**	**100**
RTTY	**10~31**	**600~2700**	**100**
AM/NFM	**0~49**	**200~10000**	**200**

3 CI-V Scout

Most of the programs used for digital mode operation utilize CI-V commands for remote 'CAT'-control. For those users that want to take a deep dive into CI-V we recommend you have a close look at 'CI-V Scout' by Seth Cohen. CI-V Scout is a free Windows based tool for testing CI-V communications with radios that use the CI-V protocol, such as your Xiegu X6200.



Connect the supplied USB-cable between the Xiegu X6200 DEV port and your PC and setup CI-V Scout to use the com: port corresponding to SERIAL-B of the Xiegu X6200 at a baud rate of 19200bps (to check which port this is use Windows device manager). You can send single commands including subcommands and data to the Xiegu X6200 as well as scripted macros that you create in advance, either manually or through saving individual commands in the program.

For more details go to: https://kb3hha.com/CIVScout

We would like to thank all Radioddity customers for their constructive feedback. If you find an error in the firmware of the Xiegu X6200 or in this documentation, or even if a detail has not been described to the needed extent, please feel free to write a message to support@radioddity.com. In general, firmware updates for your Xiegu X6200 are free of charge. The use of non-Xiegu firmware for this radio is strongly discouraged and may invalidate your warranty.

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