XIEGU

Ultra-Portable HF Transceiver

G106

Operation Manual

Version 1.0.11 July 2022

Index

Warnings

1. Please read this manual fully before operation so as to get a good understanding of the G-106's capabilities and functions.

2. When using an external mains power supply or battery, carefully check the polarity of the power cord and do not reverse the polarity. The warranty of this radio does not cover damage caused by an incorrect external power connection error or damage caused by improper power supply voltage.

3. Only qualified technicians shall service this equipment.

4. Do not tamper with the transceiver for any reason.

5. Do not operate the transceiver with a damaged antenna. If part of an antenna comes into contact with your skin, a minor burn can result.

6. Turn off your transceiver prior to entering any area with explosive or flammable materials. Do not operate your transceiver in any area near explosive or flammable materials. Turn off your transceiver before entering any blasting area.

7. To avoid electromagnetic interference, please turn off your transceiver in any area where notices instruct you to do so.

8. Turn off your transceiver before boarding an aircraft; any use of a radio must be in accordance with airline regulations and crew instructions.

9. Do not place the transceiver over any airbag deployment area in vehicles containing airbags.

10. Do not expose the transceiver to direct sunlight over a long period of time, nor place it close to any heat source.

11. When transmitting with the transceiver, hold the microphone 3 to 4 centimetres away from your lips and keep a safe distance away from the antenna in accordance with the ICNIRP and any additional local regulations.

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Feedback Survey: scan to share your suggestions!

We look forward to improving our products based on customer experience, and any ideas would be appreciated!
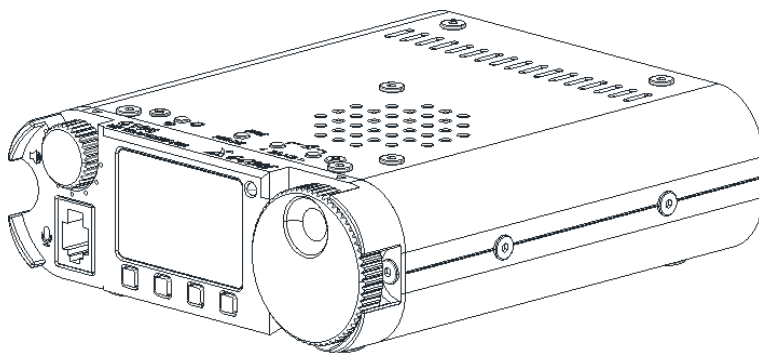
If you have any suggestions for new XIEGU products, you're welcome to contact us via < support@radioddity.com >.

Radioddity thanks Ed Durrant DD5LP for his assistance with revisions to this document.

Information on the G106 and all accessories can be found at www.radioddity.com

Introduction

The G106 is a 5W portable QRP transceiver with an SDR infrastructure using 16bit CODEC sampling to deliver a superior performance. The radio supports three transmission modes SSB/CW/AM as well as FM (88-108MHz) receive only, which allows you to listen to local FM broadcasts while operating. Having a digital CW filter with three bandwidths helps when making DX contacts. With the external DE-19 digital adapter unit (optional) the G106 can be easily connected to a computer to support digital data modes such as FT-8. As an entry-level portable SDR transceiver, the G106 is well suited to QRP CW and FT-8 operations while also supporting SSB and AM.

Basic features:

- High performance SDR infrastructure
- Compact and robust physical structure
- Coverage of all HF amateur radio bands between 3.5 and 29.7MHz
- FM broadcast receive coverage
- Continuous receive coverage across all HF frequencies
- Amateur data communication modes are possible by connection to a computer with the appropriate software installed.
- Computer based remote control is available via a CAT port.

Please read this Manual carefully for a better experience and full understanding of the operation of the G106.

Front Panel
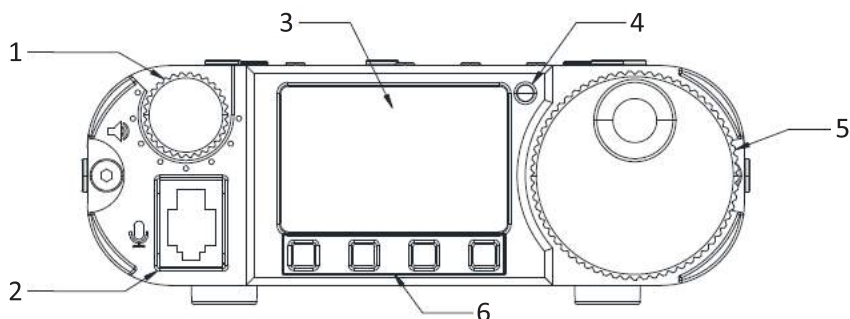
1 Volume knob
Turn the knob to increase or decrease the volume. Short-press to switch audio output to the speaker-microphone.

2 Microphone interface
External speaker microphone interface

3 Display
High contrast monochrome display

4 T/R indicator
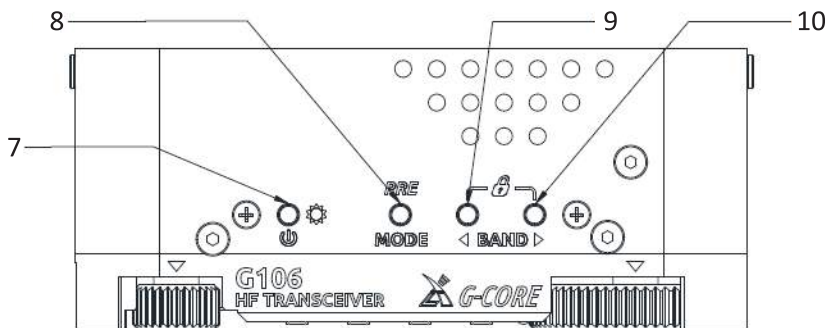Transmit/receive status indicator

5 Main knob
Tuning knob, used to change the radio's frequency.

6 Multi-function buttons
Short-press these buttons to execute the corresponding functions displayed on the screen.

Top Panel Buttons

7 Power button/backlight
● Long-press this button to power the radio on/ off.
● Short-press the button after power on to turn on/off the display backlight

8 MODE button
● Short-press this button to switch between operating modes
● Long-press this button to turn on/off the preamplifier.

9 & 10 Band switch / lock radio
● When on the HF bands, a short-press of these buttons switches between bands.
● A short-press of these buttons in the FM mode switches between stored FM radio stations.
● Pressing both these buttons at the same time locks all buttons and knobs.
● Pressing both buttons at the same time again unlocks the radio's controls.

Rear Panel
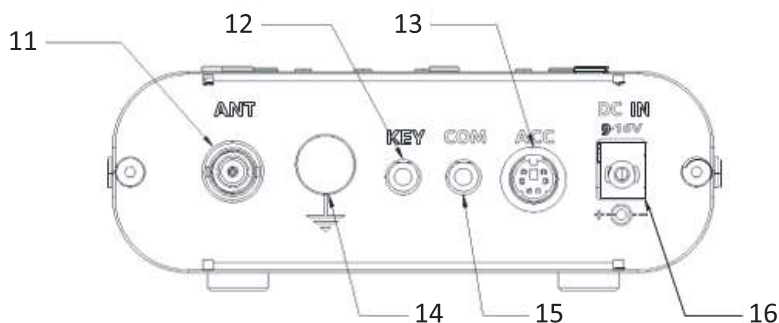
11 Antenna Socket
50 Ω BNC antenna socket.

12 CW KEY Socket
3.5mm stereo socket (3-wire), used to connect a manual or automatic key (see next page for connections)

13 ACC interface
8-pin (not 6-pin as shown in picture) Mini-Din interface (see next page for connections)

14 Grounding nut
Connect this to your station earth.

15 COM Interface
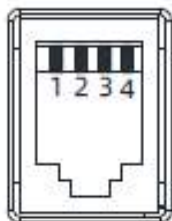3.5mm stereo jack communication interface for CAT control and firmware updates.

16 DCIN external DC power
5.5/2.5mm DC power supply socket

Instructions for External Interface Connections

(2) MIC interface

PIN1: PTT
PIN2: MIC+
PIN3: SPK+
PIN4: HCOM

Note: There is a bias voltage on the MIC cable (pin 2). Avoid shorting it to ground.

(15) COM Interface

RXD — — GND

TXD —

(13) ACC interface

GND — — DATE
+8V — — AF‗OUT
ALC — — AF‗IN
BAND — — PTT
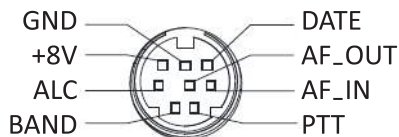
(12) Key wiring diagram

Di   Da   Common

Di   Da   Common
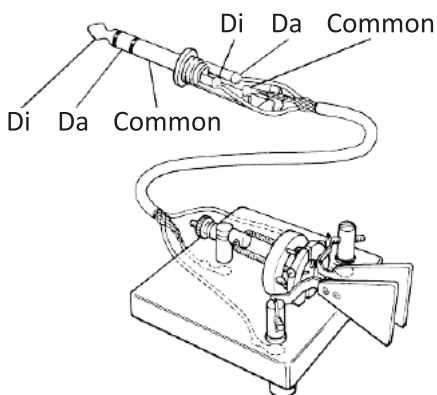
Connect straight key/ morse key according to the diagram shown in the figure above.

Note:

● If the connector of the straight key is a 6.5mm 2-pole plug, please change it to a 3-pole 3.5mm stereo plug according to the wiring method shown in the figure above, and connect the trigger end of the morse key to the "Di" or "Da" terminal.

● Take care that direct use of the 2-pole to 3-pole adapter or incorrect wiring may result the radio in CW transmission status all the time!

Connection of External Power Supply

A 9-16V external DC power supply can be used to power the G106. The current load capacity of the power supply shall be at least 3A. The supplied power lead can be used to connect the radio and DC power supply.

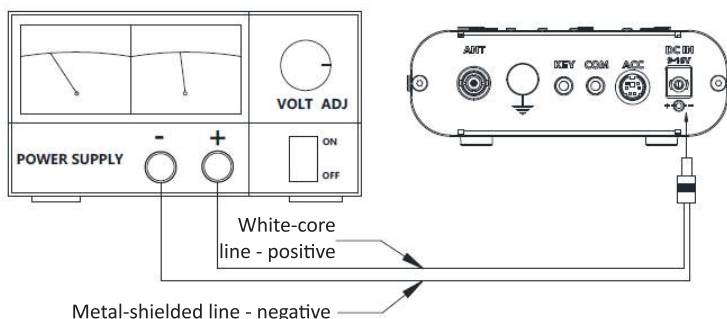The DC power supply must be connected in strict accordance with following diagram to avoid a reverse polarity connection.

The white centre-core wire is connected to the positive pole of the power supply, and the metal-shield is connected to the negative pole of the power supply.

White-core line - positive

Metal-shielded line - negative

An EMC ferrite bead can be applied on the power lead to prevent external noise from entering the radio via its power lead and radio-frequency interference from radiating externally when an external power supply is connected to the G106. The clamp-on ferrite bead should be installed at the end closest to the power plug to give the greatest .

Wind the power line around the ferrite bead twice.

As close to the interface as possible
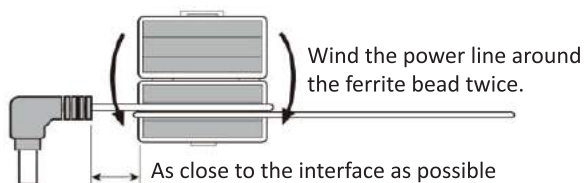
● Before connection the polarity of the power lead should be carefully inspected to avoid reverse polarity connection from the external PSU.

● The limited warranty of the radio does not cover damage caused by a fault in the external power connection or damage caused by an out-of-range voltage being applied.

Operation

The G106 accesses various functions through the multi-function menus. All functions are allocated to different menu pages and there are 4 options on each page.
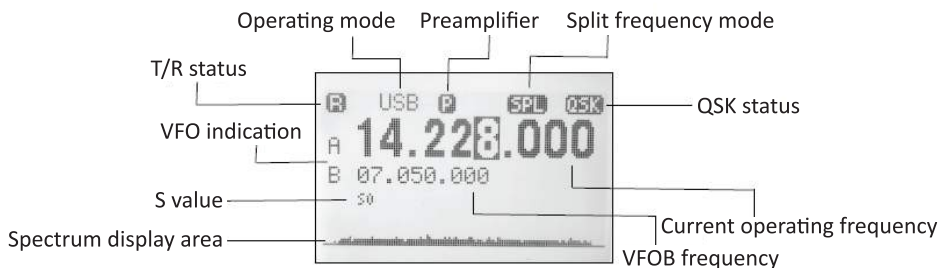
Main knob

Multi-function buttons
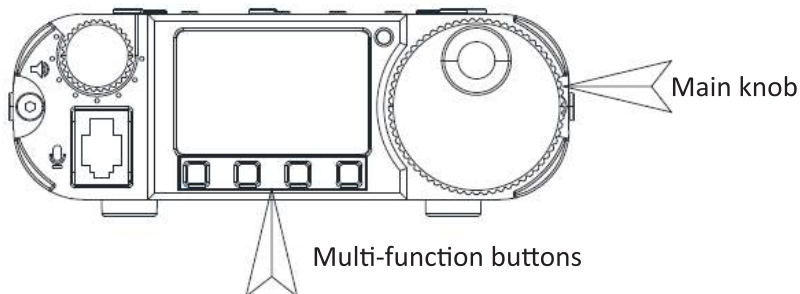
The menu items can be selected and changed using the following method:

● Short-press any multi-function button to call up the menu and turn the main tuning knob to switch between the five menu pages in turn.

● Press the multi-function button corresponding to the menu option displayed on the screen to execute the corresponding function.

● Some functions only work if you press "SAVE" after their adjustment. If you press "QUIT", you will directly exit from the page and the changes will not be saved.

Page	Menu Item			
1 / 5	**V/M**	**A/B**	**MW**	**MC**
	Freq/Chnl mode	VFOA-VFOB switch	Mem Chnl write	Erase mem Chnl
2 / 5	**CWF**	**CWT**	**CWR**	**QSK**
	CW filter selection	CW sidetone	CW dot-dash ratio	QSK switch
3 / 5	**KS**	**KM**	**IMB**	**CSN**
	Automatic keyer rate	Keyer mode	IAMBIC mode	Startup display
4 / 5	**SPL**	**DIS**	**BP**	**VER**
	Split frequency mode	Display mode	Keypad tone	Version info
5 / 5	**WFM**	/	/	/
	FM receiver	/	/	/

The G106 uses a black and white dot matrix display screen to display all status information in a user-friendly way. Visibility in sunlight is also better due to the contrast of a black & white screen.

Operating mode Preamplifier Split frequency mode

T/R status

VFO indication

S value

Spectrum display area

QSK status

Current operating frequency

VFOB frequency

Basic Operation

To turn the radio on and off:
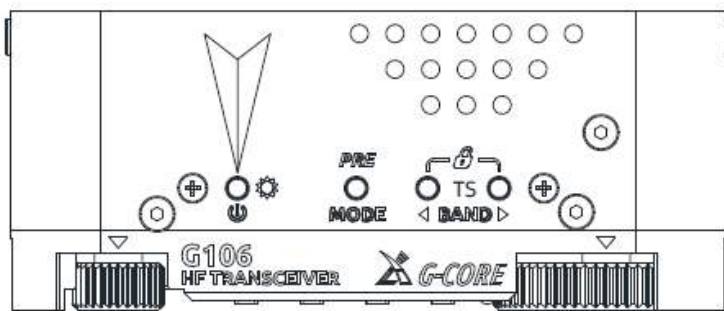
1. A short-press on the power button will turn the radio on when it is in a powered off state.
2. To turn the radio off a longer (about 2 seconds) press of the power button is required.

To turn off the screen during operation:

1. A short-press of the power button while the radio is running will turn off the backlight in the screen.
2. A second short press will turn it back on.

Adjusting the Audio Volume

1. Rotate the volume control knob at the top left-hand corner to adjust output volume.
2. Short press the volume control knob to switch between the in-built speaker and the speaker in the hand microphone.
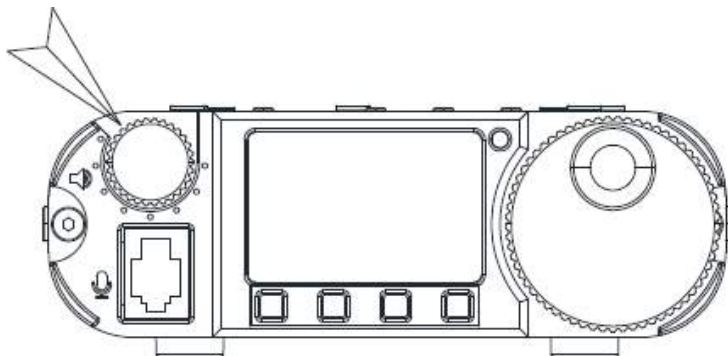
Selecting Operational Mode and Band

1. Press the MODE on the top of the radio to switch to the required mode.
2. Press the BAND left and right buttons to cycle through the bands

3.5MHz↔5MHz↔7MHz↔10MHz↔14MHz↔18MHz↔21MHz↔24MHz↔28MHz
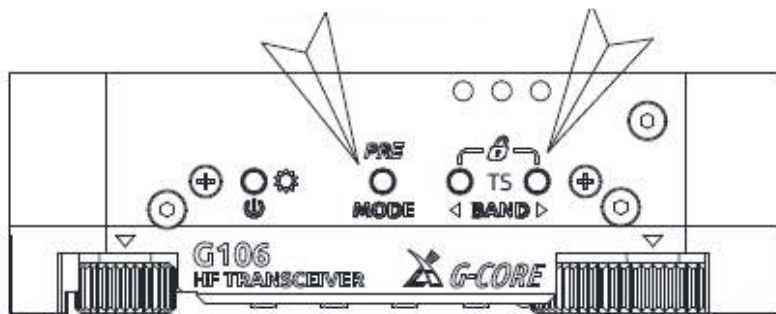
Setting the Tuning Step (TS) Frequency

To select the step required when tuning (100Hz, 1 KHz etc) we use the BAND buttons as follows:

Long-press the BAND left or right button for 2s to step up or down in the displayed step value.

Once set, turn the main tuning knob to go to the required frequency.
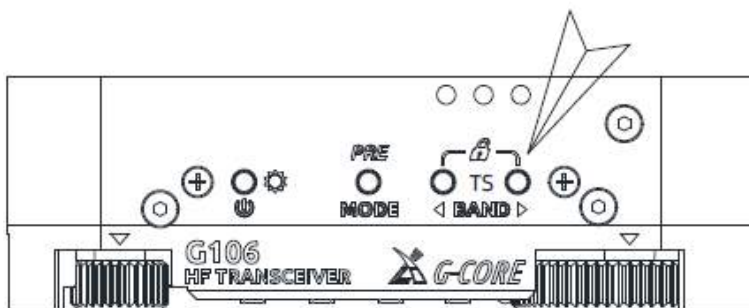
Enabling the Receive Pre-amplifier

To turn on or off the pre-amplifier long-press the MODE button. When enabled a P will be displayed at the top of the display.

Note: The pre-amplifier is rarely required on the lower HF bands and it is recommended to turn it off on the higher bands if there are very strong signals or interference present.

CW Mode Operation

Insert your straight or paddle Morse key into the KEY interface on the rear of the G106 (see earlier in this manual for the definition of connections).

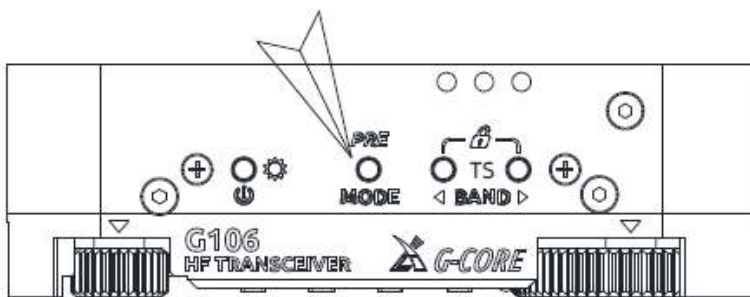Suggested configuration steps:

1. Turn on the QSK function through the menu settings and set the required rate. (note: if QSK is not enabled no CW will be transmitted although in this mode the radio can be used as a CW practice oscillator).

2. Press on the Morse key to start CW communications.

3. In the menu (2/5) select the CWF function to set the filter bandwidth to the desired value (options are 500Hz, 250Hz and 50Hz) by turning the main tuning knob. Press SAVE followed by EXIT.

4. Go back into menu (2/5) and this time select the CWT function to set which sidetone you wish to hear. Again, press SAVE followed by EXIT to set the value.

You should now be ready to operate on the CW mode however you may also wish to adjust the following related settings to your taste or as required by your key.
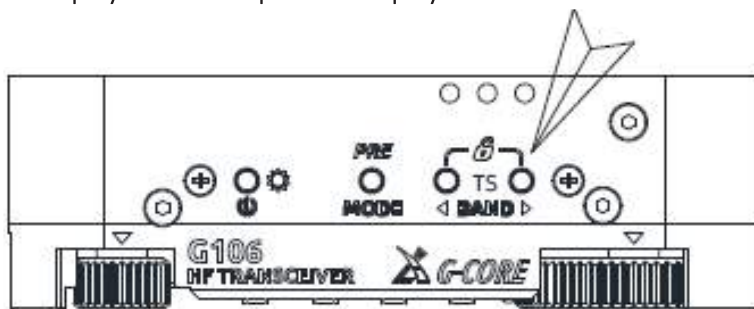
KS: automatic keying rate.

KM: manual/auto keyer mode.

IMB: IAMBIC keying mode.

Locking the Radios Controls

The controls on the radio can be locked or unlocked by pressing and holding both BAND buttons at the same time for at least 2 seconds. Once locked a lock symbol is displayed at the top of the display.

Antenna

The G106 requires an antenna that is resonant on the frequency in use. For "wide-band" antennas an external ATU is required.

Listening to FM Broadcast Stations Through the G106

To have the G106 receive local VHF FM broadcast stations follow these steps:
1. Access the multi-function menu [5/5] and select the WFM function.
2. Functions of buttons while in Wide band FM receive mode:
● </> button at the bottom of the screen: tune up and down the FM band to automatically search for radio stations. Automatically store the radio stations QUIT: Quit FM radio.
● Main tuning knob: Manually adjust the radio frequency.
● BAND left and right buttons: Switch between the radio stations   that have been automatically stored.
● Use the volume knob to change the volume.

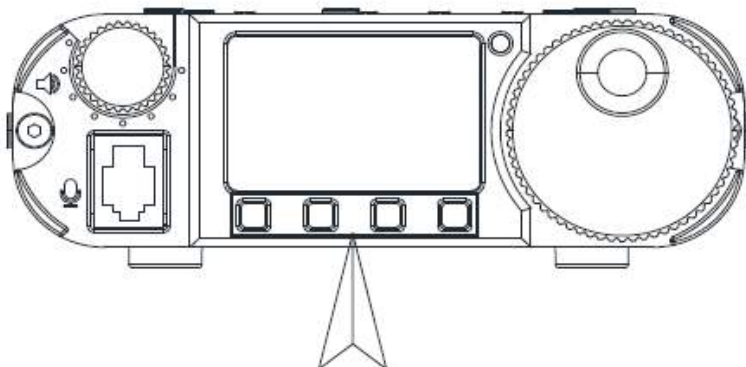## View Software (Firmware) Version Information

Access the multi-function menu [4/5] VER function to go to the firmware version information display. The information is displayed as follows (example):

```
-------VERSION-------

       V1.08
     May 9 2022
      12:50:07
Press any key to exit
```
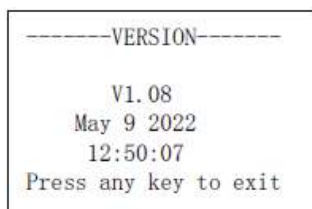
Press any button to exit the display.

Use of Memory Channels

Storing new frequencies in the channel memories:

1. Select the desired frequency and mode.

2. Access the multi-function menu [1/5] MW (memory write) function. Turn the main tuning knob to select a desired empty channel. Then, a flashing "MW" will be displayed on the screen, next to which, there is an icon "E", indicating that the current channel is empty and can be stored to. Press "SAVE" to save the tuned frequency and mode into the channel. If the channel you have chosen is not indicated as empty the current data will overwrite the existing data.

3. If you press "QUIT", you will directly exit from the current page and the channel will not be saved.

4. In channel mode, short-press the BAND left and right buttons to switch between the stored channels.

Deleting a stored channel:

1. In channel mode, select the channel to be deleted.

2. Access the multi-function menu [1/5], MC function and select "CLR" to delete the current channel. If you press "QUIT", you will directly exit from the current page and the channel will not be deleted.

Setting the Start-up Display Text (Call Sign)

Your radio station call sign can be displayed on the G106's startup screen.
To do this, follow these steps:

1. Call the multi-function menu [3/5], CSN function to edit the startup interface.

2. The three function buttons on the editor are as follows:
   QUIT: give up editing and exit
   BACK: delete the last character
   SAVE: save and exit

3. Turn the main tuning knob to choose the desired character and press the
   main knob in to select the character.

4. Press the SAVE button to save and exit. The information you set will now be
   displayed at startup the next time you turn the radio on.

G106 Operational Display Definition

The display of G106 can be set to display different content as follows:

1. Access the multi-function menu [4/5], DIS function to go to the display
   mode selection where three options are available SCOPE+S, SCOPE and BIG
   SCOPE:
   SCOPE+S: displays spectrum + signal strength S value
   SCOPE: displays spectrum only
   BIG SCOPE: displays a larger format spectrum

2. Turn the main knob to select the desired display mode, press SAVE to save
   and exit. About 5s later, the interface will automatically switch to the
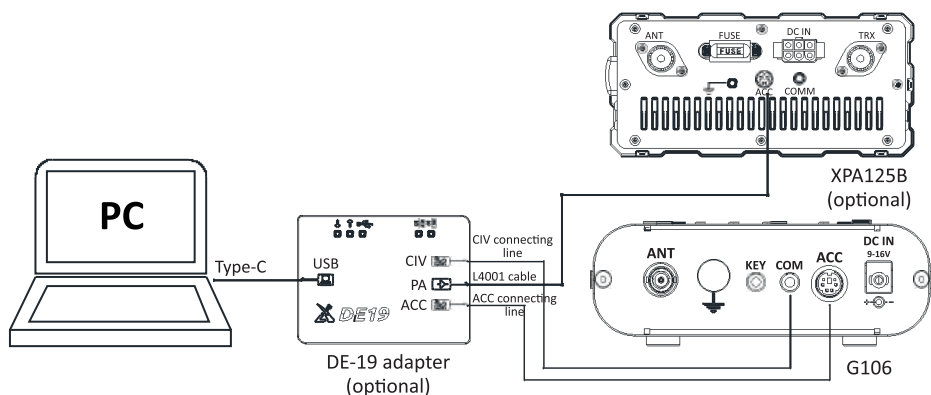   normal display state.

Tip: If the display menu is already shown, you may short-press the main tuning
knob to quickly return to the spectrum display state.

Enable / Disable Keypad Tone

Access the multi-function menu [4/5], BP function and press the BP function
button again to enable or disable the keypad tone.

Connection with XPA125B and Computer

The G106 can be connected to a computer and an XPA125B using an optional DE-19 adapter, providing convenience for data communication and power amplifier control.

1. Connect the units as shown in the diagram above.

2. Install the relevant CH342 port driver for the operating system in use (search online and download).

3. Select the model "XIEGU G90" in the data communication software (or control software) you are using.

4. Choose the DE-19 virtual sound ports for sound input/output in your software. Note that different sound devices are required for input and output.

Note: If you choose a different radio model even one that supports C-IV instructions, some actions will not work.

Computer Control Instructions

The G106 accepts C-IV instructions. You can remotely control the transceiver based on supported instructions of the instruction set or configure control instructions required by other software (e.g. digital data modes) to control the G106. Select Xiegu G90 as the radio in the software if G106 is not shown.

Wave Band Voltage Data

The ACC interface of G106 provides "wave band data" for each of the supported bands, which can be used to switch peripheral devices automatically (e.g. automatic antenna switches and linear amplifiers).

Wave band	Voltage	Wave band	Voltage	Wave band	Voltage	Wave band	Voltage
/	/	7MHz	920mV	18MHz	1610mV	28MHz	2300mV
3.5MHz	460mV	10MHz	1150mV	21MHz	1840mV	/	/
5.0MHz	690mV	14MHz	1380mV	24MHz	2070mV	/	/

Packing List

Item Name	Qty.
G106 radio	1
Standard hand microphone	1
Power cord	1
Warranty card	1
Manual	1
Certificate of conformity	1

Optional Supporting Products

- **DE-19:** external USB communications adapter (applicable to G90, G90S, G106), used for control from a computer and digital data mode communications
- **XPA125B:** 100W power amplifier with built-in antenna tuner (ATU)
- **L4001 cable:** dedicated control cable for connecting XPA125B (applicable to X6100, G106)

Specifications

Receive frequency range	0.55-30MHz ; 88-108MHz (FM broadcast)
Transmit frequency ranges	3.5-3.9MHz ; 5MHz (region specific)
	7.0-7.2MHz ; 10.1-10.15MHz
	14-14.35MHz ; 18.068-18.168MHz
	21-21.45MHz ; 24.89-24.99MHz
	28-29.7MHz
Operating modes	SSB/CW/AM ; (WFM receive only)
Receive sensitivity	CW: 0.25µV @ 10dB S/N
	SSB: 0.5µV @ 10dB S/N
	AM: 10µV @ 10dB S/N
Frequency stability	±1.5ppm within 30min after power on
	@25°C: 1ppm/hour
Transmitted power	≥5W @ 13.8V DC
Transmission spurious suppression	≥50dB
Audio output power	0.3W
Operating voltage	9-15V
Standby current consumption (max)	0.37A
Current draw on transmit (max)	2.8A
Dimensions	120 x 40 x 135 mm
Weight (radio only)	720g

● All specification are typical and apply to amateur bands only. Due to technical improvements, the above specifications are subject to change without notice.

● The operating frequency range of transceivers sold in different countries or regions will be set according to lacal regulations. Ask local dealer for details.

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