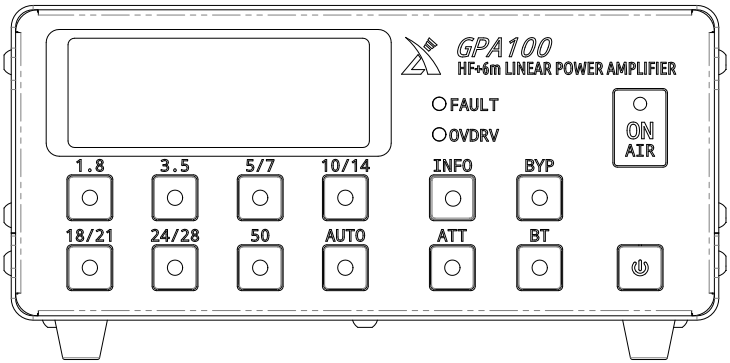
GPA100

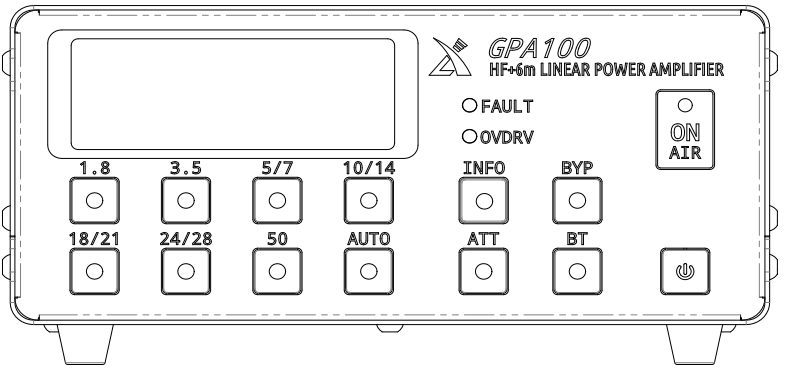
100W solid state linear power amplifier



Operation Manual

Rev：1.01

Dongguan Weisheng Communication Technology Co., Ltd.



GPA100 adopts efficient and stable solid-state amplification technology, equipped with advanced cooling system and intelligent control unit, providing strong power output and more reliable operation experience for amateur radio enthusiasts. The new circuit design makes the amplifier have lower distortion and higher efficiency, and can maintain excellent signal quality even when running at full power.

In addition, GPA100 has greatly reduced weight while maintaining high performance, and the optimized structural design makes it easier to carry and install, whether it is a fixed station or outdoor mobile use. Its powerful power, intelligent control and lightweight design make the user's communication experience more free and efficient.

- Support wireless band control
- Compatible with various radio equipment connection
- Complete protection function

Important Tips!

◆ Please read this manual carefully before operating the device.

◆ Please keep this manual properly. The manual details the correct use of GPA100.

◆ Please control the input power ≤ 5W and do not input excessive power signal.

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GPA100

Safety precautions

- Do not use this device during thunderstorms. Be sure to disconnect the power supply and antenna in advance.
- Do not touch the antenna while this device is transmitting.
- Do not apply AC power to the DC IN connector on the rear panel of the device. This may cause fire or damage the device.
- Do not apply a voltage exceeding 15V DC to the DC IN connector on the rear panel of the device. This may cause fire or damage the device.
- Do not reverse the polarity of the power cord. This may cause fire or damage the device.
- Do not operate or touch the device with wet hands. This may cause electric shock or damage the device.
- If you find that the device is smoking or emitting strange smells, please turn off the power immediately, unplug the power cord, and contact the supplier for disposal.
- Do not use this device in areas, vehicles, or aircraft where the use of this device is prohibited.
- Do not use this device while driving or operating engineering equipment.
- Do not use this device at gas stations, gas stations, or around flammable gases.
- Do not use this device in a hospital or around people wearing medical devices.
- Do not expose this device to rain, snow, or any liquid. This may damage the device.
- Do not disassemble or modify this device.
- Do not place the device near a heat source or in direct sunlight.
- Do not place the device in a dusty or humid place.
- Do not place the device in a poorly ventilated place, and do not block any heat sink on the device. Otherwise, the device may be damaged by overheating.
- Do not wipe the device with organic solvents, such as benzene or alcohol. This may damage the surface of the device.
- Please control the input power of the amplifier and do not use it beyond the limit.
- Do not store or use the device in an area outside the temperature range of -10℃ ~ +50℃.
- Please comply with the relevant laws and regulations of the country or region where you are located and use the device in accordance with the law.

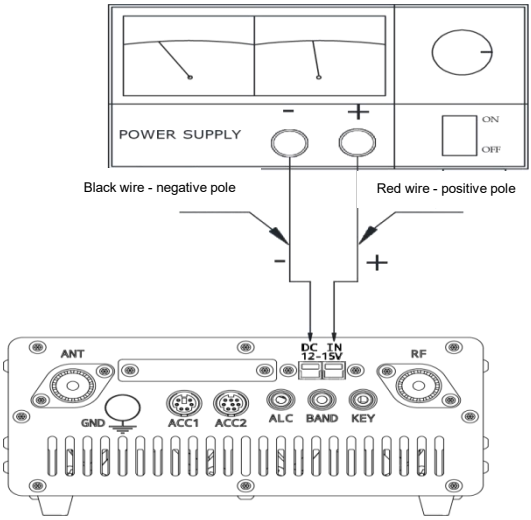
Pre-use Instructions:

- Before using the GPA100 amplifier for transmission, ensure that the antenna system's standing wave (SWR) is ⩽3.
- If using an external antenna tuner (manual or automatic), connect the GPA100 amplifier between the radio and the external antenna tuner and set it to pass-through mode. After the antenna tuner has tuned the antenna system to a working state, connect the GPA100 amplifier.
- Do not tune the antenna tuner while the GPA100 is transmitting.

Power supply wiring

GPA100 can use a 12~15V external DC power supply with a current load capacity of at least 30A. The power cord provided can be used to connect the amplifier to the DC power supply.

When connecting the DC power supply, please carefully follow the instructions in the figure below to avoid reverse polarity of the power supply. When using an external power supply, in order to improve the anti-interference ability, you can put an EMC magnetic ring on the side of the power cord close to the amplifier.



Attention!

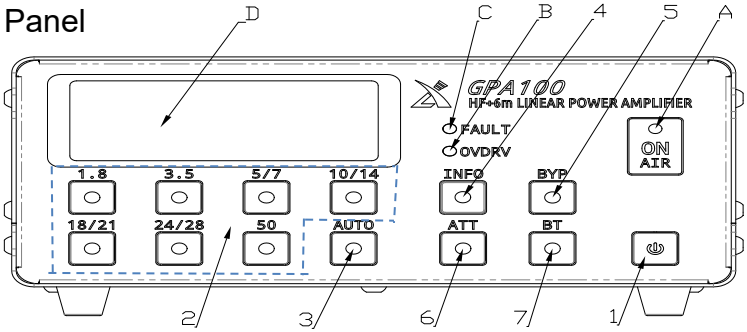
- When using an external power supply, please check the polarity of the power cord carefully. Do not reverse the polarity of the power cord.
- Reverse power connection may cause serious damage to the device.
- The device only supports DC power input.
- Recommended operating voltage: 13.8V DC.
- Do not connect an external power supply higher than 15V DC, otherwise it will cause serious damage to the device.

Important tips!

- Do not use this device at overpressure or beyond the limit!
- The temperature of the device is high when in use. Do not block the air inlet at the bottom and increase ventilation. Pay attention to high temperatures to prevent burns.
- Do not use the amplifier without connecting the antenna.
- When the GPA100 has an overcurrent (≥30A) or short circuit, the power cord fuse may blow, causing automatic shutdown/failure to start. Please check whether the fuse is invalid!

Panel Description

Front Panel



1. Power button

Press this button to turn on the power when the power is off.

Press this button for 2 seconds to turn off the power when the power is on.

2. Band selection button

Manual band switching, seven bands for you to choose freely, press the button, the button light will light up and enter the corresponding working band.

3. AUTO button

Press this button to enter the automatic band switching mode, and press it to enter the channel selection interface.

4. INFO button

Press it to enter the error information interface, press it again to exit, and press it to clear the alarm record and turn off the FAULT indicator.

5. BYP button

A short press activates the direct channel; a long press turns the buzzer on/off.

6. ATT button

Press it to turn on the power attenuator; Press it again to turn off the attenuation.

7. BT button

Press it to turn on Bluetooth, the light flashes, and Bluetooth enters the connectable state; the connection success light is always on.

Press it for 2 seconds to display the Bluetooth name, MAC address and connection status.

A. ON AIR indicator light

After turning on the power, this indicator lights up green.

When the transceiver is in the transmitting state, the indicator light is red.

B. OVDRV indicator light

The yellow warning light will light up after the output power exceeds the limit for a certain period of time.

C.FAULT indicator light

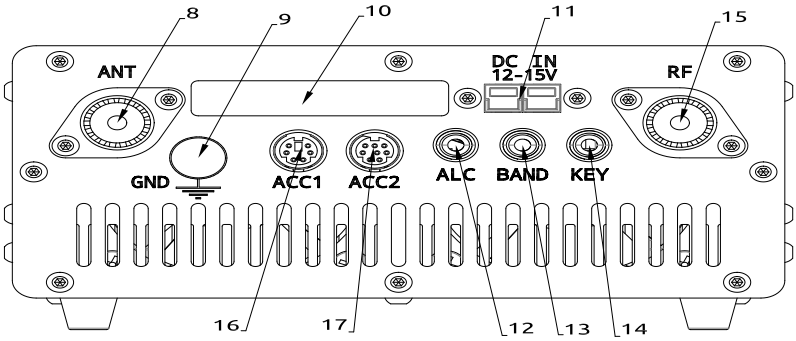
Lights up when an alarm message appears during transmission.

D. LCD display screen

GPA100 LCD display screen, showing working status information.

Panel Description

Rear Panel



8. ANT interface

ANT interface is connected to the antenna end, and the connector model is SL16-K.

9. Ground terminal

Removable hand screw.

10. Bluetooth antenna cover

The Bluetooth antenna is inside.

11. DC IN power socket

GPA100 uses 12~15V DC voltage. DC is the negative pole (black socket), and IN is the positive pole (red socket).

12. ALC interface

External ALC input port for automatic level control.

13. BAND interface

Switch the working band of the device through an external voltage signal. For specific correspondence, please refer to the table data in Appendix 5.

14. KEY interface

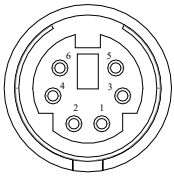
Input low level to enter the transmitting state, and input high level to enter the receiving state.

15. RF interface

RF interface is connected to the output end of the transceiver, and the connector model is SL16-K.

16. ACC1 (six-core) socket

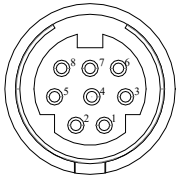
The interface definition is as follows (rear view):



1： ACC_VCC	2： ACC_PTT	3： ACC_BAND
4： ACC_ALC	5： NC	6： GND

17. ACC2 (eight-core) socket

The interface definition is as follows (rear view):

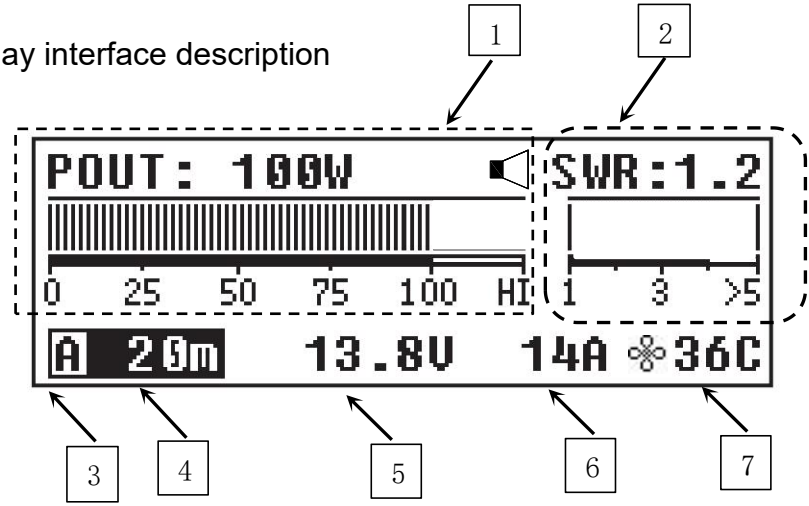


1: ACC_PTT	2: ACC_BAND	3: NC	4: NC
5: ACC_ALC	6: NC	7: GND	8: ACC_VCC

Important tips!

- Please control the input power of GPA100 to ≤5W, and do not input excessive power signals.
- Please adjust the output power of the radio appropriately according to the actual output power of the amplifier so that the output power of the amplifier is within the rated output range.
- Long-term high-power transmission will cause the radiator to overheat and bring danger. Please be sure to strengthen external active heat dissipation and appropriately reduce the transmission time.
- The power supply capacity of ACC does not exceed 100mA.

Display interface description



1. Output power value + bar meter

This area displays the GPA100's output power. [The image shows an output power of 100W.]

The bar meter displays dynamically based on the output power level. The image shows a 100W output.

When the buzzer is operating, the " "icon will light up.

2. Standing wave value + bar meter

This area displays the current standing wave value of the amplifier input. [The figure shows the standing wave 1.2].

The bar meter will display dynamically according to the standing wave value, and the figure shows the corresponding standing wave value 1.2.

3. Mode display

This area displays the current working mode of the device,

A: AUTO automatic band switching, M: MANUAL manual band switching.

4. Band display

This area displays the wavelength corresponding to the current working band. [The current band shown in the figure is 20m band]

5. Working voltage value

This area displays the DC voltage value input to GPA100. [The input voltage is 13.8V as shown in the figure]

6. Working current value

This area displays the current value consumed by GPA100. [The current current shown in the figure is 14A]

7. Internal radiator temperature value

This area displays the internal temperature value. [The current internal temperature shown in the figure is 36℃].

When the cooling fan inside the machine is turned on (≥35℃), a small fan icon will appear to the left of the temperature value.

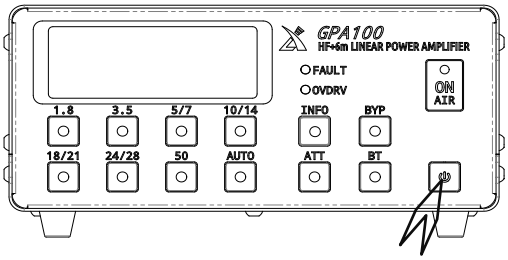
Basic Operation

Turn amplifier on | off

Operation method:

Power on:

Short press the power button ON AIR green light turns on, then release the power button and wait for the system to start up.



Power off:

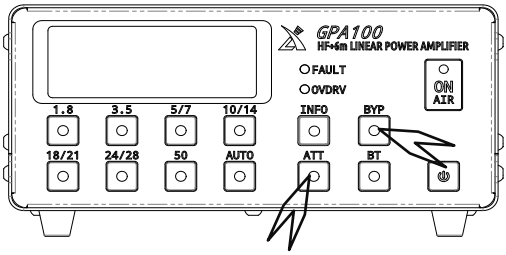
Press and hold the power button until the display interface exits, then release the power button.

Direct | Attenuation switch

Operation method:

Short press the BYP button to enter the direct channel, and the button light will light up; short press again to close the channel, and the button light will go out.

Short press the ATT button to turn on the input power attenuator, and the light will light up; short press again to turn it off.



Tips: When the output power is low during normal transmission, check whether the two button lights are on.

Channel | Mode switch

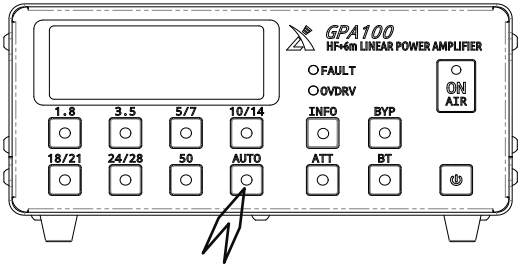
Channel selection in automatic mode

Press and hold the AUTO button: Enter the channel selection interface

Optional channels:

ACC channel (default)

BLUETOOTH channel (manual switching required)



Frequency band switching mode setting

Press the AUTO button shortly: Switch the frequency band selection mode

[A]- Automatic mode

[M] - Manual mode

Operation steps

Automatic mode setting

Short press the AUTO button, and the screen will display [A] in the lower left corner to enter the automatic mode.

Manual frequency band switching

Use the number buttons on the panel to switch directly to the corresponding amateur band. After switching, the screen will automatically display [M], indicating that it has entered the manual mode.

Switching of external control channels

In automatic mode, long press the AUTO button, and the screen will display the channel options (ACC/BLUETOOTH). At this time, the four band buttons below the display screen correspond to the operation buttons on the display screen:

UP	DOWN	OK	EXIT
1.8	3.5	5/7	10/14

Move the cursor up and down by clicking the corresponding button. After the cursor selects the desired channel, click OK, and finally click EXIT to return to the main interface.

Note!

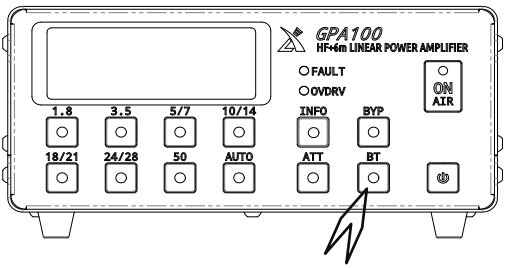
- The default channel is ACC when starting up, and the Bluetooth function needs to be manually switched to the BLUETOOTH channel.
- After manually switching the frequency band, if you need to return to automatic mode, you need to short press the AUTO button to reactivate [A].

Bluetooth module function

Operation method:

Short press the BT button, Bluetooth turns on (the light flashes), and Bluetooth enters the connectable state; the connection success light is always on; long press the BT button and the screen displays the Bluetooth name (XG_GPA100), MAC address and connection status.

When used with other devices, the Bluetooth module can be used to switch bands.



➢ For specific implementation methods, please refer to Appendix 4

Protection and warning

GPA100 has high standing wave, high current, high power, over-temperature protection and other functions. The internal sensor will trigger the protection action after detecting the threshold value signal. At this time, the FAULT on the right side of the panel will light up red. The protection threshold values of each sensor are as follows:

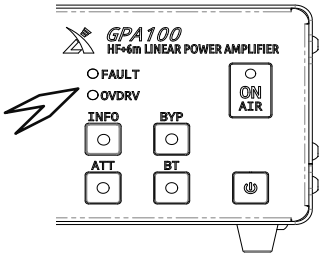
Serial number	project	Alarm threshold	Alarm Type	Trigger time
1	Temperature	≥85℃	high temp	≥5min
2	Current	≥22A	high current	≥30s
3	Standing wave	≥3	high swr	≥0.5s
4	Efficiency	≤33%	low efficiency	≥1s
5	Total power	≥270W	over tpower	≥30s

Note: The low efficiency alarm threshold is related to the output power. The table shows the threshold value corresponding to 100W output.

Alarm information query:

Short press the INFO button: enter the alarm information query interface and view the current error cause.

Long press the INFO button: eliminate the alarm information and turn off the FAULT red warning light.



Warning light status description:

FAULT light: the red light of the trigger alarm is on.

OOVDRV light: When the transmission output power is ≥125W and lasts for 30s or longer, the system will light up the OVDRV yellow warning light and open the BYP direct channel. Stop transmitting and the system will automatically return to normal working state.

Buzzer Alarm:

The amplifier's buzzer alarm function is enabled by default. When the FAULT indicator illuminates, a buzzer will sound.

The buzzer function can be turned on or off as needed.

To toggle the buzzer on or off, press and hold the BYP button on the far right of the first row of the panel.

[Release protection] Release the PTT button of the transceiver, and the GPA100 will be released from protection and return to the receiving state.

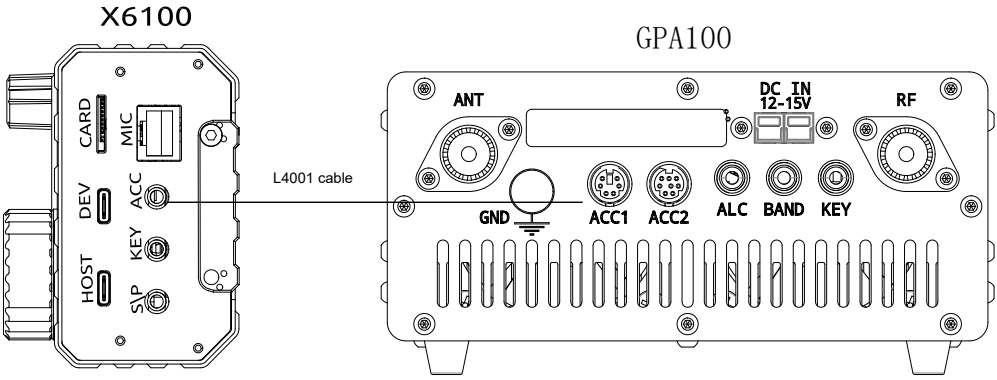
Note!

- When using a multi-band antenna, due to the design and manufacturing factors of the antenna, the impedance characteristics of the antenna in different frequency bands may differ, causing fluctuations in the output power in different frequency bands.

Appendix

Appendix 1

Connection between X6100 and GPA100 (using L4001 cable)



After connecting X6100 to the ACC1 interface of GPA100 amplifier via L4001 cable, the output power can be extended to 100W.

After connection, X6100 can automatically control the band switching of GPA100. At the same time, ALC control will be established between the two machines. When the power output from X6100 to GPA100 exceeds the limit, the output power of the radio will be automatically reduced to make the output power of GPA100 constant.

We recommend that you set the output power of X6100 to 2~5W.

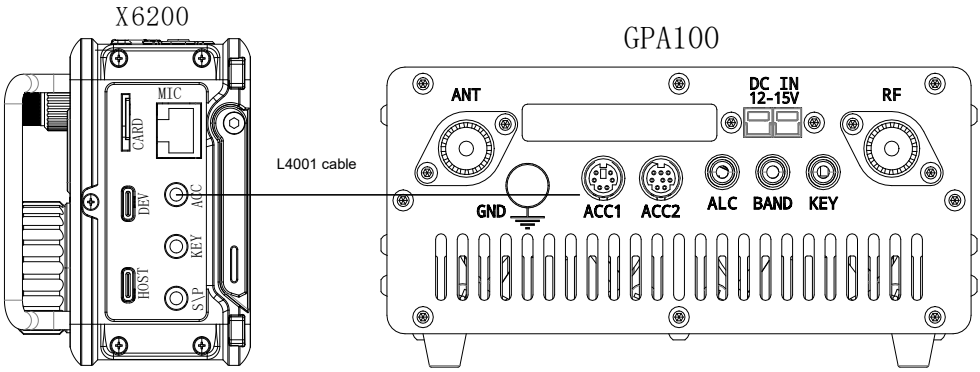
- When ordering GPA100, L4001 cable will be given as a gift.
- X6100 transceiver needs to be ordered separately.

Note!

- After the GPA100 is connected to the radio, please make sure that the amplifier is in automatic mode ([A] is displayed in the lower left corner of the screen) and the channel selection is ACC (press and hold AUTO to enter channel selection). Otherwise, the working band may not match, resulting in abnormal phenomena such as no transmission power.

Appendix 2

Connection between X6200 and GPA100 (using L4001 cable)



After connecting X6200 to the ACC1 interface of GPA100 amplifier via L4001 cable, the output power can be extended to 100W.

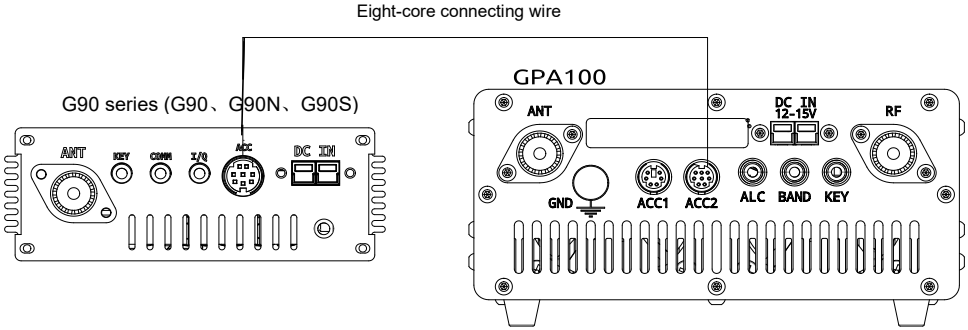
After connection, X6200 can automatically control the band switching of GPA100. At the same time, ALC control will be established between the two machines. When the power output from X6200 to GPA100 exceeds the limit, the output power of the radio will be automatically reduced to make the output power of GPA100 constant.

We recommend that you set the output power of X6200 to 2~5W.

■ X6200 transceiver needs to be ordered separately.

Appendix 3

Connection between G90 series (G90, G90N, G90S) and GPA100 (using Eight-core connecting wire)



After G90 is connected to the ACC2 interface of GPA100 amplifier via eight-core pair cable, the output power can be extended to 100W.

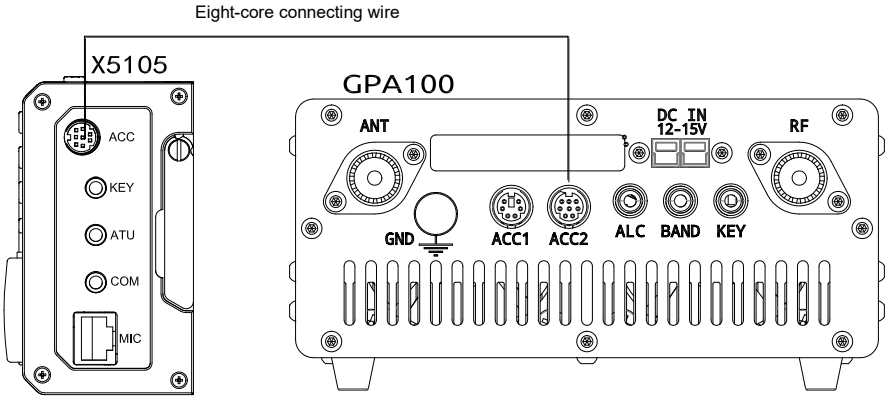
After connection, G90 can automatically control the band switching of GPA100. At the same time, ALC control will be established between the two machines. When the power output from G90 to GPA100 exceeds the limit, the output power of the radio station will be automatically reduced to make the output power of GPA100 constant.

We recommend that you set the output power of G90 to 2~5W.

- When ordering GPA100, an eight-core pair cable will be provided as a gift.
- G90 series transceivers need to be ordered separately.

Appendix 4

Connection between X5105 and GPA100 (using eight-core pair cable)



When connected to the GPA100 amplifier's ACC2 port via an eight-pair cable, the X5105 can expand its output power to 100W.

Once connected, the X5105 automatically controls the GPA100's band switching. ALC control is also established between the two devices. If the X5105's output power to the GPA100 exceeds the power limit, the radio's output power is automatically reduced to maintain a constant GPA100 output power.

We recommend setting the X5105's output power between 2 and 5W.

- The X5105 transceiver must be ordered separately.

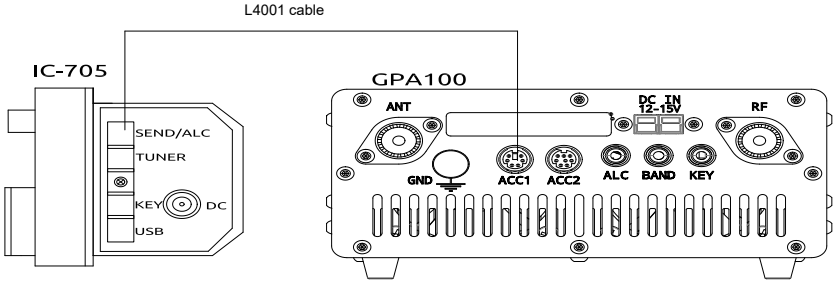
Note!

1. When X6100, X6200,X5105, G90 series (G90, G90N, G90S) are used in conjunction with GPA100, GPA100 works in ACC channel.

2. You can switch between [ACC channel - BLUETOOTH channel] by pressing and holding the AUTO button.

Appendix 5

Connection between IC-705 and GPA100 (using the Bluetooth function of GPA100 to achieve wireless band switching)



After IC-705 is connected to the ACC1 interface of the GPA100 amplifier through the L4001 cable, the output power can be expanded to 100W.

Instructions for using the Bluetooth module:

- ◊ Click the BT button on the front panel of GPA100 to turn on Bluetooth. The button light flashes, indicating that Bluetooth has been turned on and is ready to connect;
- ◊ Use IC-705 to search for Bluetooth, find the Bluetooth named "XG_GPA100" and connect, PIN: 0000;
- ◊ Bluetooth is successfully connected, and the BT button light on the GPA100 main panel is always on;
- ◊ Press and hold the AUTO button to enter the channel selection interface and select the BLUETOOTH channel;
- ◊ After returning to the main interface, use IC-705 to switch the band and observe whether the wavelength in the lower right corner of the GPA100 panel display is updated synchronously. If the connection is successful。

We recommend that you set the output power of IC-705 to 2-5W.

■ IC-705 radio and corresponding cables must be ordered separate.

Note!

◆ Long press the BT button to enter the Bluetooth information interface, which contains the Bluetooth name, address and connection status.

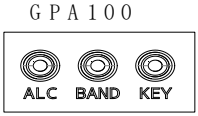
◆ Before using IC-705 to switch channels, make sure the amplifier is working on the BLUETOOTH channel.

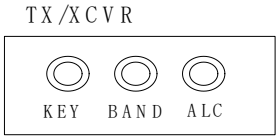
◆ After using, turn off the power, the amplifier will record the last operation and settings before shutting down, and there is no need to switch channels again when you turn it on again.

Appendix 6

Connection method of other shortwave radio stations with GPA100

GPA100 has three RCA function interfaces, which are suitable for various types of radio stations with these three function interfaces. The specific functions of each socket are as follows:





KEY interface: input low level (<0.7V) to enter the transmitting state, input high level (>1.2V) to enter the receiving state.

BAND interface: Control the input voltage value to achieve band switching. The GPA100 band control voltage is divided as follows:

Band	Voltage	Band	Voltage	Band	Voltage
1.8MHz	230mV	10MHz	1150mV	24MHz	2070mV
3.5MHz	460mV	14MHz	1380mV	28MHz	2300mV
5.0MHz	690mV	18MHz	1610mV	50MHz	2530mV
7MHz	920mV	21MHz	1840mV	/	/

ALC interface: Output signal is fed back to the transmitter for automatic level control (ALC). The output signal range is 0-3.0V, corresponding to an output power of 0-100%.

- The above provides the information required to connect the GPA100 to other QRP devices. Please do not exceed the input voltage limit of each interface.
- For radio equipment that cannot use or does not have ALC signals, please control the radio output power to 2~5W, and increase or decrease the radio output power according to the actual output power of the amplifier to ensure that the output power of the amplifier is within the rated power range.

Attention!

- Please make sure to take effective grounding measures for the radio and amplifier, and put a magnetic ring with a magnetic permeability of 300-800 on the end of the feeder and connecting cable close to the amplifier to improve the anti-interference ability of the equipment.

Parameter

Specifications

Frequency Range:	1.8～2.0MHz	3.5～3.9MHz
	5.3515～5.3665MHz	7.0～7.2MHz
	10.1～10.15MHz	14.0～14.35MHz
	18.068～18.168MHz	21.0～21.45MHz
	24.89～24.99MHz	28.0～29.7MHz
	50.00～54.00MHz	
Maximum output RF power:	＜29.7MHz：100W（±1dB）	
	50～54MHz：80W（±1dB）	
Maximum operating temperature:	≤55℃	
Overall gain:	＜29.7MHz：14dB（±1dB）	
	50～54MHz：12dB（±1dB）	
Spurious suppression:	≥50dB	
Supply voltage:	12.0～15.0V DC，Negative ground	
Current parameters:	Standby:300mA @Max	
	Emission:25A @Max	
Body size:	About 245*164*82mm (length*width*height) (excluding protrusions)	
Machine weight:	About 2600g	

Packing List

Item Name	Quantity
GPA100 host	1
L4001 cable	1
Eight-core pair cable	1
Power cord	1
Warranty card	1
Manual	1
Certificate of Compliance	1 （printed on the box label）

Elektro- und Elektronikgeräte

Informationen für private Haushalte

Das Elektro- und Elektronikgerätegesetz (ElektroG) enthält eine Vielzahl von Anforderungen an den Umgang mit Elektro- und Elektronikgeräten. Die wichtigsten sind hier zusammengestellt.

1. Getrennte Erfassung von Altgeräten

Elektro- und Elektronikgeräte, die zu Abfall geworden sind, werden als Altgeräte bezeichnet. Besitzer von Altgeräten haben diese einer vom unsortierten Siedlungsabfall getrennten Erfassung zuzuführen. Altgeräte gehören insbesondere nicht in den Hausmüll, sondern in spezielle Sammel- und Rückgabesysteme.

2. Batterien und Akkus sowie Lampen

Besitzer von Altgeräten haben Altbatterien und Altakkumulatoren, die nicht vom Altgerät umschlossen sind, sowie Lampen, die zerstörungsfrei aus dem Altgerät entnommen werden können, im Regelfall vor der Abgabe an einer Erfassungsstelle vom Altgerät zu trennen. Dies gilt nicht, soweit Altgeräte einer Vorbereitung zur Wiederverwendung unter Beteiligung eines öffentlich-rechtlichen Entsorgungsträgers zugeführt werden.

3. Möglichkeiten der Rückgabe von Altgeräten

Besitzer von Altgeräten aus privaten Haushalten können diese bei den Sammelstellen der öffentlich-rechtlichen Entsorgungsträger oder bei den von Herstellern oder Vertreibern im Sinne des ElektroG eingerichteten Rücknahmestellen unentgeltlich abgeben.

Rücknahmepflichtig sind Geschäfte mit einer Verkaufsfläche von mindestens 400 m² für Elektro- und Elektronikgeräte sowie diejenigen Lebensmittelgeschäfte mit einer Gesamtverkaufsfläche von mindestens 800 m² , die mehrmals pro Jahr oder dauerhaft Elektro- und Elektronikgeräte anbieten und auf dem Markt bereitstellen. Dies gilt auch bei Vertrieb unter Verwendung von Fernkommunikationsmitteln, wenn die Lager- und Versandflächen für Elektro- und Elektronikgeräte mindestens 400 m² betragen oder die gesamten Lager- und Versandflächen mindestens 800 m² betragen. Vertreiber haben die Rücknahme grundsätzlich durch geeignete Rückgabemöglichkeiten in zumutbarer Entfernung zum jeweiligen Endnutzer zu gewährleisten.

Die Möglichkeit der unentgeltlichen Rückgabe eines Altgerätes besteht bei rücknahmepflichtigen Vertreibern unter anderem dann, wenn ein neues gleichartiges Gerät, das im Wesentlichen die gleichen Funktionen erfüllt, an einen Endnutzer abgegeben wird. Wenn ein neues Gerät an einen privaten Haushalt ausgeliefert wird, kann das gleichartige Altgerät auch dort zur unentgeltlichen Abholung übergeben werden; dies gilt bei einem Vertrieb unter Verwendung von Fernkommunikationsmitteln für Geräte der Kategorien 1, 2 oder 4 gemäß § 2 Abs. 1 ElektroG, nämlich „Wärmeüberträger“ , „Bildschirmgeräte“ oder „Großgeräte“ (letztere mit mindestens einer äußeren Abmessung über 50 Zentimeter). Zu einer entsprechenden Rückgabe-Absicht werden Endnutzer beim Abschluss eines Kaufvertrages befragt. Außerdem besteht die Möglichkeit der unentgeltlichen Rückgabe bei Sammelstellen der Vertreiber unabhängig vom Kauf eines neuen Gerätes für solche Altgeräte, die in keiner äußeren Abmessung größer als 25 Zentimeter sind, und zwar beschränkt auf drei Altgeräte pro Geräteart.

4. Datenschutz-Hinweis

Altgeräte enthalten häufig sensible personenbezogene Daten. Dies gilt insbesondere für Geräte der Informations- und Telekommunikationstechnik wie Computer und Smartphones. Bitte beachten Sie in Ihrem eigenen Interesse, dass für die Löschung der Daten auf den zu entsorgenden Altgeräten jeder Endnutzer selbst verantwortlich ist.

5. Bedeutung des Symbols „durchgestrichene Mülltonne“

Das auf Elektro- und Elektronikgeräten regelmäßig abgebildete Symbol einer durchgestrichenen Mülltonne weist darauf hin, dass das jeweilige Gerät am Ende seiner Lebensdauer getrennt vom unsortierten Siedlungsabfall zu erfassen ist.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

•Reorient or relocate the receiving antenna.
•Increase the separation between the equipment and receiver.
•Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
•Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RF Exposure Information

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

XIEGU

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www.cqxiegu.com

The information in this manual may change with firmware upgrades of the device, without prior notice.