



G90 Wireless Receiver

Pilot's Handbook

Manuel de pilotage

Pilotenhandbuch

Pilotenhandboek

Manual del Piloto

取扱説明書

Important Safety Instructions



CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN



WARNING : TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT REMOVE SCREWS. NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING : TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THE APPLIANCE TO RAIN OR MOISTURE.

CERTIFICATION

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 UNDESIRE OPERATION.

Warning: Changes or modifications not expressly approved in writing by Line 6 may void the users authority to operate this equipment.

RF Exposure Statement: This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

Note: 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 in-stalled 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.

This Class B digital apparatus complies with Canadian ICES-003. This Category II radiocommunication device complies with Industry Canada Standard RSS-310. Cet appareil numerique de la classe B est conforme a la norme NMB-003 du Canada. Ce dispositif de radiocommunication de catégorie II respecte la norme CNR-310 d'Industrie Canada



You should read these Important Safety Instructions. Keep these instructions in a safe place



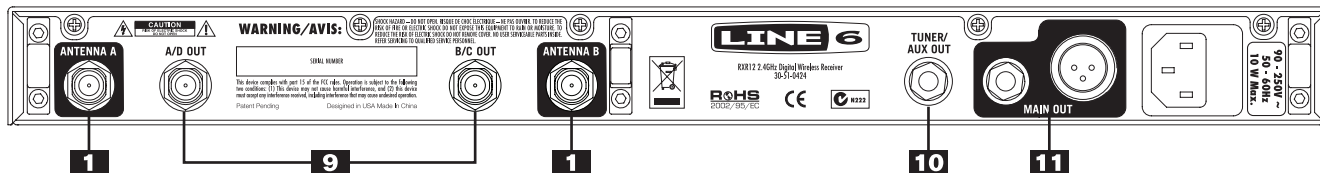
- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- This apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
- **WARNING:** To reduce the risk of fire or electric shock do not expose this apparatus to rain or moisture.
- The appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.
- Connect only to AC power outlets rated: 100/120V 220/240V 50/60Hz (depending on the voltage range of the included power supply).
- Prolonged listening at high volume levels may cause irreparable hearing loss and/or damage. Always be sure to practice "safe listening."
- Service is required when the apparatus has been damaged in any way, such as:
 - power-supply cord or plug is damaged.
 - liquid has been spilled or objects have fallen into the apparatus.
 - the unit has been exposed to rain or moisture.
 - the unit is dropped or the enclosure is damaged.
 - the unit does not operate normally or changes in performance in a significant way.



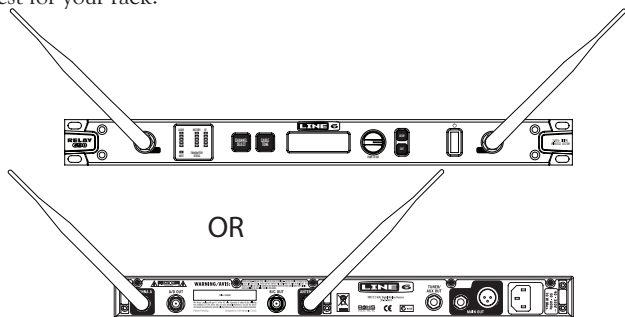
Line 6, Inc.:
26580 Agoura Road,
Calabasas, CA 91302-1921 USA

The POD, Clifton House, Butler's Leap
Rugby, Warwickshire, United Kingdom, CV 21 3RQ

BASIC OPERATION



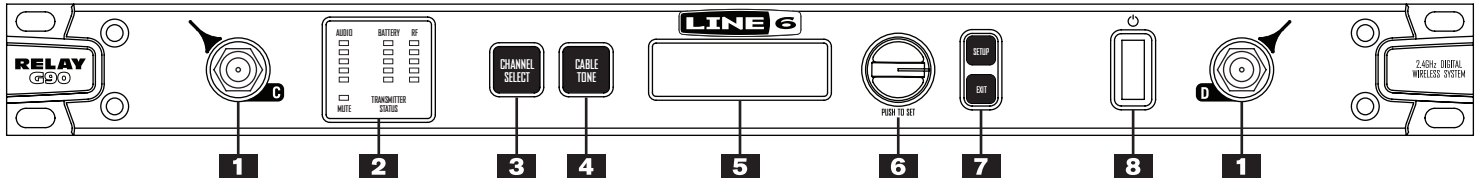
1. Antenna A & B Input Connectors (BNC) - You can connect to either your front (**C & D**) or rear (**A & B**) BNC connectors. Choose what works best for your rack.



9. Antenna A/D & B/C Output Connectors (BNC) - Use the connectors to daisy chain multiple Relay G90 receivers. The outputs can be for **Antenna A & B** or **C & D**. It is user selectable which antennas get routed to the outputs. Be sure each additional receiver and its transmitter are set to a different channel.

10. Tuner/Aux Out - Use this output to connect to an external tuner or into a second audio path. The **Tuner/Aux Out** continues operation even when the **Main Out** is muted.

11. Main Out - Use the 1/4 inch output when connecting to an amplifier or effects pedals. Use the balanced XLR output when connecting to studio grade equipment that supports balanced XLR connections such as mixing consoles.



1. Antenna C & D Input Connectors (BNC) - For correct operation connect the supplied detachable antenna by pressing on the BNC connector and twisting clockwise for 1/2 turn. **Note: C & D Antenna inputs are not DC Biased.**

2. Transmitter Status Display

Audio - Green LEDs will light indicating the audio signal level.

Battery - All five battery LEDs will be lit to indicate full battery life. The bottom LED will change to red once your battery life falls below two hours and flash red when it falls below one hour.

RF - When transmitter is on and has the same channel set as the receiver, these LEDs light green to indicate signal strength/quality: from 5 Green = Data excellent, interference low to 1 Green meaning Data minimal, may have significant interference. When transmitter is off, or set to a different channel than receiver these LEDs show as follows: No LED = No data, no interference. 1 Red = No data, some interference up to 5 Red = No data, high interference.

Mute - Lit LED indicates muted transmitter.

3. Channel Select - You must have the same channel selected on the transmitter and receiver. Both ship from the factory set to channel 1, so you're all ready to go. To select a different channel:

- Press the **Channel Select**, turn **Edit** knob to select a channel and then press **Edit (Push To Set)** knob to commit the channel.
- Set the transmitter's channel to match, as described in its Pilot's Handbook.

The Scan Channel feature checks all available channels for interference, and recommends the best channels to use:

- Press **Channel Select** button, then press the **Setup** Button.
 - The Display shows all 14 possible channels. The best channels are highlighted, and if the transmitter is on there's also indication of which channel that's currently set to.
 - Turn the **Edit knob** to select one of the channels that's highlighted as best to use, and select that same channel on the transmitter.
- 4. Cable Tone** - Guitar cables have a natural electrical property called capacitance. This means that longer cables roll off more high frequencies. You can use Cable Tone to simulate the effects of different guitar cable lengths and styles.
- 5. Display** - The display will normally show the current channel you are receiving as well as expected battery life and signal strength of your antenna frequencies. The display also can show **Channel Select**, **Cable Tone** and **Setup** options.
- 6. Edit (Push To Set) Knob** - Use this knob to adjust a currently selected parameter in your display such as channel number or setup features. Push the **Edit Knob** in to commit any changes made when using it.
- 7. Setup Buttons** - Press Select Button to see the list of Setup parameters. Turn **Edit Knob** to move through the list. To edit a parameter, press **Setup** Button turn **Edit Knob**, and press **Edit Knob** to lock that value in. Press **Exit** to leave Setup page.
- 8. Power Switch** - Flip this switch to turn your G90 receiver on or off.

DISPLAY OPERATION



The LCD screen on power up with no transmitter present displays the current channel selection, **RF LEVEL** indicates no Line 6 equipment detected as shown above.



The LCD screen in normal operation when a transmitter is detected displays the transmitter name or model number detected on the current channel (model number is default, selected on transmitter). Bars appear on each side of **B** & **A** to indicate RF Antenna signal strength (5 bars = strong, 3 bars = fair signal strength, 1 bar = weak signal strength). Your battery life in hours:minutes is displayed to the left of the battery icon.

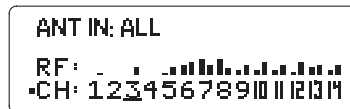
Note: The battery meter displays 20 minute increments. Be aware of “alkaline rebound” when turning off the unit and turning it back on, as it may look like it has more power than it really has. You can use rechargeable Alkaline batteries, but the hours and minutes are calibrated to alkaline batteries so the power reading may be inaccurate.

CHANNEL SELECT & CABLE TONE

Channel Select Mode: Select channel [1-14] (To enter this mode the **Channel Select/Toggle Button** is used)



Channel Select Mode is used to select a channel of operation and to search for other Line 6 transmitters in use. Upon entering this menu turn the **Edit Knob** to select a channel of operation. This is a preview only and the channel change will occur when the **Edit Knob** is pressed to save the selection.



To enter the Channel Scan Mode press the Setup Button while in the Channel Select Mode. In this mode a scan of the RF environment will be performed and the result of unused channels will be displayed. To select a channel from this menu, rotate **Edit Knob** to desired channel and press **Edit Knob** to save channel change and return to Main Screen. Press the **Exit Button** before the value is saved to return to the Main Screen and abandon any changes. Default setting is 1.

Cable Tone Mode: Press the **Cable Tone** button to enter this mode.



Rotate **Edit/Push To Set** knob to preview setting. As the setting is changed it takes effect immediately. The cable tone function can be disabled in this menu by rotating the **Edit/Push To Set** knob to the left until the word “DISABLED” appears. After determining the desired tone, press **Edit/Push To Set** knob to save and return to Main Screen or press the Exit Button to go to Main Screen without saving changes. The first selection is 3 FT, the next selection is 5 FT then the selection will move in 5FT increments up to

30FT then in 10FT increments up to 100FT and the next and last selection is 125FT. Press the Exit Button before the value is saved to return to the Main Screen and abandon any change. Default setting is DISABLED.

SETUP MENU:

Setup Mode: (To enter setup push the **Setup** Button)

To setup your G90's advanced parameters, press **SETUP** and use the **Edit Knob** to scroll through menu options. Press the **Edit Knob** while the desired option is highlighted and in larger letters on the LCD to select it for editing. Rotate the **Edit Knob** to change the value in the value field. Once the desired value is present, press the **Edit Knob** to save the new value. While in edit mode you may press the **Exit** button to abandon changes and revert to previous values if they have not yet been saved. In any Setup Page you may press the **Exit** button at any time to go back to Main Screen. While in Setup Mode the LCD will return to the main screen automatically after about 30 seconds of inactivity.

ANT IN MODE A&B, C&D, or ALL



ANT IN: A & B
ANT OUT: OFF
TOGGLE: DISABLED

Rotate the **Edit Knob** until large letters indicate current option shown above.



ANT IN: A & B
ANT OUT: OFF
TOGGLE: DISABLED

Press **Edit Knob** and shaded box appears when in edit mode

ANT IN MODE is used to select antennas to be used for the system. There are 4 available antennas that can be used for RF reception. Rotate the **Edit Knob** to change the selection. Once the desired selection is on the screen press the **Edit Knob** to save and exit. Press the **Exit** button anytime to abort changes and revert to previous selection.

- The A&B selection uses the 2 rear antennas.
- The C&D selection uses the 2 front antennas.
- The ALL selection uses all 4 antennas.

It is recommended to only select antennas in use. If ALL is selected, but only 2 antennas are attached on the unit, the performance will be negatively affected. **IMPORTANT:** Make sure the antennas selected match the antennas attached to the unit for proper functionality. **NOTE:** A change to ANT IN selection will automatically set the ANT OUT to OFF. Default setting is C&D. When Line 6 active antennas are used only connect to A & B inputs. These antenna jacks supply power to the antennas to ensure proper operation.

ANT OUT MODE A&B, C&D, or OFF

ANT IN: A & B
ANT OUT: OFF
TOGGLE: DISABLED

ANT OUT MODE is used to select the antennas to be routed to the RF output on the rear of the unit. There are 2 sets of antennas that can be used for RF reception.

- The A&B selection routes the 2 rear antennas to the RF output jack.
- The C&D selection routes the 2 front antennas to the RF output jack.
- If ANT IN is set to ALL, ANT OUT has the options, A&B, C&D, and OFF.
- Any change made to ANT IN, will force the ANT OUT to OFF.

TOGGLE MODE: Channels for toggle function. Default setting is DISABLED

ANT OUT: OFF
TOGGLE: DISABLED
BACKLIGHT: WHITE

TOGGLE MODE is used to select 2 channels for quick toggle between when using multiple instruments. The 2 channels are selected in this menu. Use the **Edit Knob** to select the first channel then press the **Edit Knob** to save it.

ANT OUT: OFF
TOGGLE: CH 1
BACKLIGHT: WHITE

A second option will now appear on the same LCD line. Use the **Edit Knob** to select the second channel and press the **Edit Knob** to save it.

ANT OUT: OFF
TOGGLE: CH 1-CH 2
BACKLIGHT: WHITE

Once the channels are selected the main menu changes in appearance to notify the user it is in toggle mode. This changes the function of the **Channel Select** button. The **Channel Select** button now toggles back and forth between the selected channels when pressed. To take the unit out of toggle mode enter into this menu and select the disabled option and save. See new Main Screen with Toggle enabled below. Press and hold **Channel Select** for 1.5 seconds to dis-engage Channel Toggle and return to the "Channel Select" screen with the current channel indicated.

First channel selected:

TC 1: LES 2
6:40 [Battery Icon] [Signal Strength Icon] [Antenna Icon]

Press Channel Select button to toggle to second channel:

TC 2: TYLER
6:40 [Battery Icon] [Signal Strength Icon] [Antenna Icon]

BACKLIGHT COLOR MODE

TOGGLE: CH1 CH2
BACKLIGHT: WHITE
CONTRAST: 12

BACKLIGHT COLOR MODE allows the user to change the LCD back-light color.

LCD CONTRAST MODE

TOGGLE: CH1 CH2
BACKLIGHT: WHITE
CONTRAST: 12

LCD CONTRAST MODE allows the user to change the LCD contrast level. Once in this menu selection the current contrast level will be displayed. There are 20 levels of contrast. Default is 12.

G90 RECEIVER AF GAIN ADJUSTMENTS

(Firmware V2.0 or later)

The default output from the G90 receiver is +0 dB or unity gain. This allows a connected amplifier to use the same input level with the G90 as it would if a guitar were connected by cable. If a boost or attenuation is required, the G90 AF Gain may be adjusted using the following procedure:

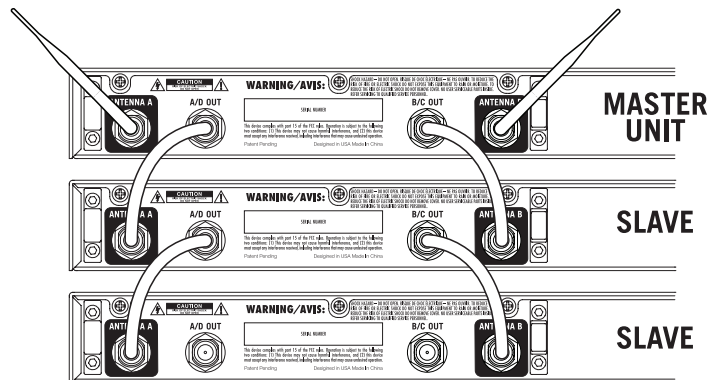
Press the **SETUP** button, then scroll with the **EDIT KNOB** until “AF GAIN” is displayed. Press the **EDIT KNOB** to select it. The highlighted line of the display will show a value ranging from -18dB to +12dB. By default it will show “AF GAIN: +0dB”, and will increment in 1 dB steps through the range. Turn the **EDIT KNOB** clockwise to increase the gain and counterclockwise to decrease it.

As you turn the **EDIT KNOB** to increase or decrease the gain, the level changes will be heard immediately. When the desired level is reached, press the **EDIT KNOB** to commit the change.

Typically, you will use the “AF GAIN: +0dB” or unity gain position, and adjust the trim or gain control on the guitar amplifier to boost or attenuate the signal level. This setting will usually result in the best overall audio system signal-to-noise ratio.

MULTIPLE SYSTEMS AND THE BUILT IN ANTENNA DISTRIBUTION

Connect a passive antenna to either the **Antenna A** and **Antenna B** connectors on the rear panel or **Antenna C** and **Antenna D** connectors on the front panel. Select the proper antenna values for the Ant In and the Ant Out menu selections. Up to 6 other units can be daisy chained from this master unit allowing the usage of only these 2 antennas for multiple systems. Connect a pair of 6 inch LMR-195 50 ohm coax cables from the master unit's RF output to the slave units corresponding RF input's on the rear panel. Repeat as more slave units are added. See below. The antenna selection for input and output can be A&B (rear panel) or C&D (front panel) depending on need. This is software selectable.



BNC TERMINATORS

50 OHM BNC Terminators are provided to terminate the ANT OUTPUTS when not in use. This prevents unwanted RF transmission from interfering with your Antenna A & B Inputs. We recommend installing them until such time as you run a multi-receiver system. In a multi-receiver system, use one set of terminators to terminate the last receiver in the chain.

G90 ANTENNAS

The G90 is optimized for 1/2 wave antennas. As an option, the antennas can be detached and extended for up to 10' with LMR-195 (50 ohm) cable.

When integrating the G90 receiver into your guitar rig, be sure the antennas are not inside a metal rack case or touching any metal parts of your case. When using front or rear mount antennas, install your receiver in the highest rack space of your rig. Set your antennas to 45 degree angles.

HOW TO ACHIEVE OPTIMUM RF PERFORMANCE

- Maintain a line of sight between the transmitter and receiver antennas.
- Avoid placing the transmitter and the receiver where metal materials may be present.
- Avoid placing the receiver in the bottom of a rack unless the antennas are remotely located.
- Avoid placing the receiver next to other RF generating equipment (3 meters (10 ft) recommended).
- Use the proper cable when remotely locating receiver antennas. For best performance, use LMR-195 coaxial cable.
- For remote antenna placement, use Line 6 1/2 Wave Antenna, P180 or P360 Active Remote Antenna Kits.
- Avoid placing the receiver next to other RF transmitting equipment (we recommend that you install the G90 Receiver at least 3 meters (10 ft) away from RF transmitters, i.e. In-Ear transmitters).

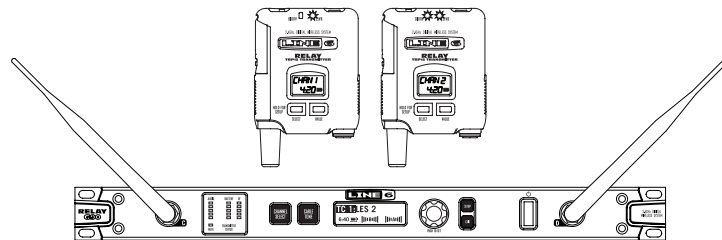
- The Effective Range of the G90 with 1/2 Wave antennas is]100 m (300 ft.) under optimal conditions.]

NOTE: Actual working range depends on RF signal absorption, reflection, and interference. Refer to P180 or P360 remote antenna manual for setup and use instructions.

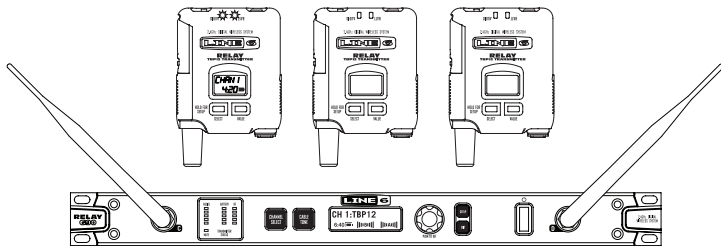
MULTI TRANSMITTER/ RECEIVER SETUPS

Depending on your setup, multiple TBP12 transmitters may be employed to cover transmission on multiple guitars. There are 3 techniques to set up a system for use of multiple transmitters with one output to a single amplifier:

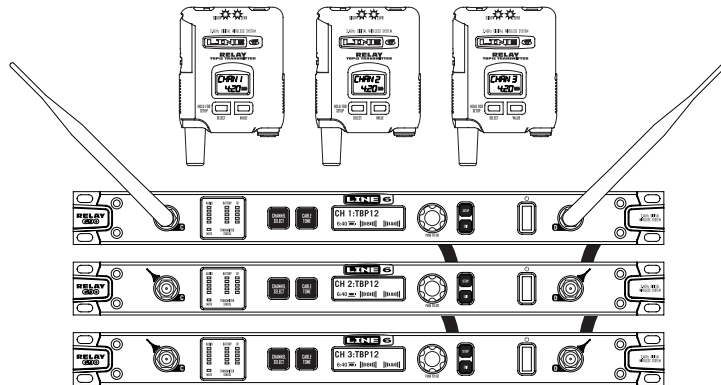
- 1. Setup 1** – 2 TX, 1 RX in Channel Toggle mode (See Channel Toggle section above for operation). This approach is used for 2 transmitters (TX) and 1 receiver (RX). Once you've set up your toggle function, simply pressing **Channel Select** on the front panel will toggle between your two selected channels. **Note:** It takes 2-3 seconds for receiver to toggle and switch to the preprogrammed channel, if you require more than two transmitters on separate channels read on.



- 2. Setup 2** – 3 or more TX all set to the same channel, 1 RX set to the same channel. Setup 3 transmitters all on the same channel, and keep the inactive TX units off. That way the receiver would only see the desired, active transmitter, which is the transmitter strapped to the artist. If any two transmitters were inadvertently on at the same time, the closest transmitter to the receiver would connect to the receiver. This is not recommended use and would have unpredictable results.



3. Setup 3 – 3 or more TX units, with 3 or more RX units and an input selector. Setup multiple TX units with each transmitter set to a unique channel. Rackmount a matching quantity of G90 receivers, set channels to match, and run the multiple audio outputs to an Input Selector switch. (We recommend the Whirlwind Rackmount Multi-selector available at www.toursupply.com) The Line 6 P180 remote antenna user guide for additional guidance. After the remote antennas are in place the receiver units can be Daisy Chained using the RF outputs and LMR-195 patch cables (see Multiple Systems and the Built In Antenna Distribution section above). Connect the audio out of your selector switch to your amp.



Note: Up to 6 G90 Receivers can be daisy-chained together when using external antennas. The last receiver in the chain should be “terminated” when linking receivers together.

TX POWER USAGE

When you’re using multiple systems we recommend running the transmitters in low power mode unless RF conditions become prohibitive.

TROUBLESHOOTING

Issue	Cause	See Solution...
No sound	System not turned on. Source malfunction. Improper connection or improper channel selection. Expired battery.	Power, Signal Source, Cables or RF
Intermittent sound	Source malfunction. Improper connection. Multiple transmitters are set to the same operating channel. Transmitter has gone out of range. Transmitting through metal wall. Unknown source of RF in local area.	Signal Source, Cables or RF
Lack of range	Improper or lack of antenna connection. Multiple transmitters are set to the same operating channel. Unknown source of RF in local area.	RF

Power

Make certain that the transmitter and receiver are receiving sufficient power. The bodypack transmitter requires 3V DC via two alkaline AA batteries. Check the battery status indicator on the transmitter and or the receiver and replace depleted batteries if necessary. The G90 receiver requires an IEC connection to 120V/240V AC.

Signal Source

Make certain that the source is operating as desired by checking source power, signal levels and connections. If necessary, bypass digital wireless transmission and check the source directly.

Cables

Make certain that all connections and cables are in working order.

RF

Check for stray RF - Turn all known transmitters off. Check to see if any red RF LEDs on the receiver's front panel RF indicator are lit. If none are lit, then the receiver is not detecting the presence of RF signal on the currently selected channel. If one or more are lit, then the receiver is detecting the presence of unknown RF signal.

Check for other Line 6 RF

Turn all known transmitters off. Follow the Channel Scan Mode described in the channel select section above.

WLAN/WIFI

Should the Line 6 Relay adversely affect any WLAN/WIFI under use perform one or more of the following:

1. Enable power save mode on TX unit.
2. Move the nearest Relay TX unit away from the affected unit until service is acceptable. Continue to operate with this distance as a minimum requirement.

Note: Amount of separation for acceptable performance depends on location, distance, and type of WLAN/WIFI. Minimum of 2 meters is recommended.

USING G90, G50 & G30 Together

The G90 has 14 channels, which shares the first 12 channels with the G50 and the first 6 channels with the G30. All 2.4GHz Line 6 transmitters work with all Line 6 2.4GHz receivers to the lowest limitation, channel count, features, etc.

TECH SPECS

Power Requirements	IEC 90~250V 50~60Hz 10W Max.
Guitar Input Impedance	1.3M
Output Impedance ¼"	1500 Ohms
Output Impedance XLR	600 Ohms
Input Connector	TA4f
Battery Life	8 hours on high power & 10 hours on low power.
Dynamic Range	>120dB A-weighted
Frequency Response	10~20KHz, - 2.5dB
Signal Compression/Expansion	No
Distortion	0.03% THD
Susceptible to TV Interference	No
Frequency Models	1, usable throughout North America and World-wide
RF Range	2.4Ghz (License-free ISM Band)
Selectable Channels	14, always available
Maximum Simultaneous Channels	14, always available
Battery Life Display	Battery life meter on transmitter and receiver
FCC Approval	License Free

TA4f Wiring

PIN 1 : SHIELD (SLEEVE)
PIN 2 : NOT USED
PIN 3 : SIGNAL (TIP)
PIN 4 : SHIELD (SLEEVE)