



**80 Channels
PLL-Synthesized 10 Watts
Base/Mobile Transceiver**



220V

Model

3107

Instruction Manual

Table of Contents

	Page
Specifications	3
General description	3
Installation.	
Power connections	3
Antenna	5
Front Panel Controls	6
Rear Panel Connections	6
Noise Suppression.	
Tune-up	8
Corrective steps	8
Schematic	11

**To prevent fire or shock hazards,
do not expose this appliance
to rain or moisture.**

Specifications

Channels, 80 (40+40), 26.965 to 27.855 MHz.
 Antenna impedance, 50 Ohm.
 Power requirements, (1) 117 V 50/60 Hz AC. (2) 13.8 V DC.
 Audio output, 2 W @ 10 % THD, 8 Ohm.
 AC power consumption, 42 W.
 DC current drain, 1.2 A @ maximum RX audio.
 RF power output, 10 W.
 Sensitivity, 1 micro-V @ 10 dB S+N/N.
 Modulation ratio, Up to 100 % AM.

General Description

Your *Hy-Gain 3107* is a precisely-engineered AM transceiver that operates totally on 80 channels of 27 MHz band. Although designed primarily for the base station use by operating from main AC supply, your transceiver will also give the reliable service when installed in mobiles that is unsurpassed.

The *phase-locked loop (PLL)* system of frequency synthesization provides immediate operation on 80 channels electronically without additional adjustments. The selection of either higher or lower 40-frequency group is instantaneous. Operating your transceiver after thoroughly you have read all instructions provided herein will assure long trouble-free service.

Installation

Important notice. As with any AC operated product, precautions should be observed during handling and use to prevent electrical shock. Electronic products of this type should not be immersed in water or used in bathing areas, when on AC power.

Your transceiver operates from 117 V (50/60 Hz) when on AC power, and only in negative-ground system when on DC power.

Power connections.

Power for your transceiver can be supplied in two ways – AC or DC.
117 Volt AC operation. Use 117 Volt AC power for base station operation. Plug AC power cord into AC jack located on rear panel and the other end into a working 117 Volt household outlet.

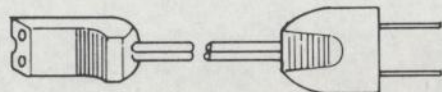
12 Volt DC operation (mobile). First, disconnect AC power cord from unit rear panel jack. This transceiver is designed for 12 Volt DC use with negative ground electrical system only. Almost all cars and small trucks made since 1956 use a negative ground system, while some older cars and heavy trucks

may have a positive ground system. For correct determination of the vehicle's electrical ground system, consult your dealer. If your minus (-) battery terminal is connected to the car's motor block, then the vehicle is a negative ground system. Connect red wire (with in-line 2 A fuse holder) to fuse block, solenoid, voltage regulator (marked 'Batt'), cigarette lighter, or directly to the battery positive pole (+=plus). Connect the black wire to any grounded metal part of the vehicle.

Be sure the black wire is connected to metal, as many underdash and side paneled parts are made of non-conductive plastic. Good ground is essential for satisfactory operation.

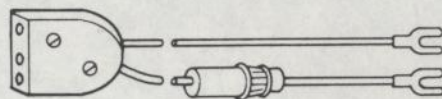
Finally, insert and seat the other end of the DC power cable set into the DC power jack on rear panel.

To AC jack
on rear
panel



To AC 117 V
household
outlet

To DC jack
on rear
panel



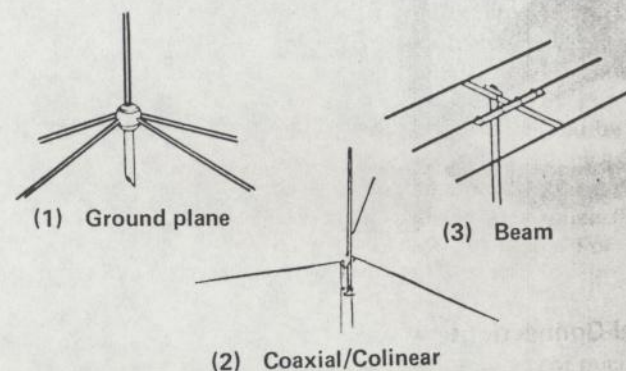
To DC 12 V
Black (Negative)
Red (Positive)

2A Fuse

Antenna

Important notice. When installing or handling base station antenna, avoid contact with any electrical power lines. Being close to any electric power lines — even 117 Volt — can cause a fatal electrical shock.

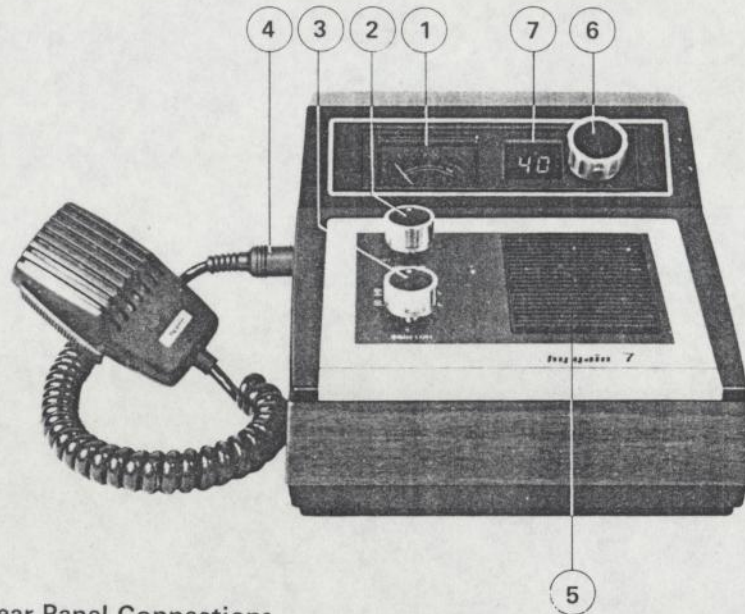
When using your transceiver as a base station, any 27 MHz ground-plane, beam, dipole, or vertical antenna may be used. The range of the transceiver basically depends on the height of the antenna installed. Whenever possible, select the highest location within the legal limits.



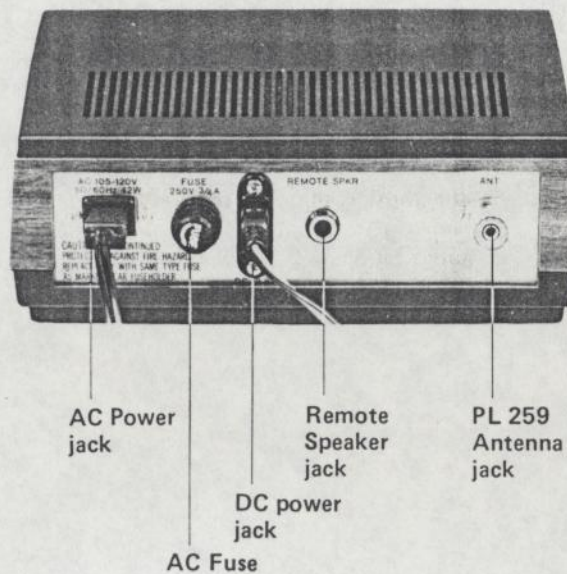
(1) **Ground plane**, is the most commonly used antenna for base stations. It is fairly effective, omni-directional and economical. It is designed for medium-long range communications. (2) **Coaxial/colinear**, is a high-efficiency radiator with improved omni-directional characteristics. Designed for medium-long range communications. (3) **Beam** antenna, is highly directional and must be used with a rotor unless you are communicating with a fixed station. Since it is directional, it greatly reduces noise and interference from all other directions. Designed for long range communications.

Use coaxial cable rated for the 27 MHz frequency when connecting your base station to the antenna. Usually RG58/u cable is adequate up to 50 feet. If installation requires over 50 feet of cable, use RG8/u type to reduce any in-line signal loss.

Front Panel Controls



Rear Panel Connections



- (1) **Signal strength/RF power meter.** During reception, the built-in meter provides a relative indication of signal strength in S units. This provides a comparison between one incoming signal and another.
During transmission, the meter provides an indication of your antenna RF power on upper scale. As you speak the pointer should flicker slightly, indicating that you are modulating the RF carrier. The maximum RF output the transceiver can produce is 10 Watt.
- (2) **On/off-volume-control.** Turns the unit on or off (both for AC and DC operation) at the counterclockwise extreme. Also provides adjustment of sound output from the speaker.
- (3) **Squelch/Band select switch.** This is the rotary control with a push-pull switch. The rotary control is used for squelch, and the push-pull switch for the band selection. (1) **Squelch**, used to eliminate annoying background noise at no signal. To adjust the squelch properly, first rotate the knob counterclockwise (at clear channel). Then rotate it slowly clockwise until the background noise (hissing sound) just disappears. An incoming signal will overcome the squelch action and be heard. To receive extremely weak signals or to disable the squelch circuit, set the squelch-control in fully counterclockwise position. (2) **Band select switch**, selects either the higher or lower 40 channels (80 in all) to which the channel you desire to operate belongs. For channel-to-frequency information, see last page.
- (4) **Microphone jack.** A DIN-type microphone connector to link the microphone to your transceiver. Also allows quick removal of microphone. It is not possible to operate your transceiver without microphone connected (even to receive). This will avoid unauthorized use of your transceiver.
- (5) **Speaker.** Located behind the grill. Disabled when plug from an external speaker is connected to the **External Speaker jack** on rear panel.
- (6) **Channel selector.** 40-channel position rotary selector to select a channel you want to receive or transmit. First, select the group of 40 channels to which the channel you want to operate belong, then use this channel-selector.
- (7) **Digital channel readout.** Illuminated by LED, indicates the channel selected by the channel selector (and the Band select switch).

Mobile Noise Suppression

Tune-up

In most mobile installations, ignition noise is a problem. Before beginning any special noise suppression steps, be sure that the vehicle is well-tuned. Clean and tighten all electrical connections, including alternator, battery, regulator and coil connections. Perform the following maintenance steps as necessary. Solder any crimped spark plug or distributor leads; clean and regap or replace spark plugs and ignition points; and check and clean alternator rings or generator brushes. Retune the engine at the manufacturer's recommended intervals.

Corrective Steps

Usually several sources of noise are present in any vehicle, with the strongest covering the others. In order to find and eliminate the maximum number of noise sources, you will have to start with the strong sources and then work back. To be sure the noise you hear comes from your vehicle and not outside it, drive to a relatively quiet location (free of man-made electrical interference such as noisy power lines, industrial noise or other vehicles). Test for noise with a weak signal on the channel and the engine off. Then start the engine. Ignition noise will probably be present at all engine speeds. If it is severe, it may make a normally readable signal unreadable.

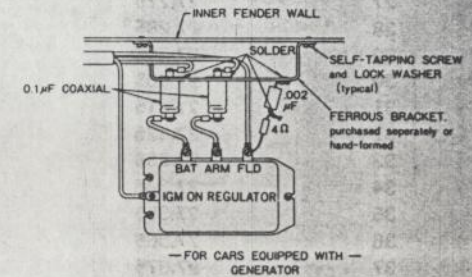
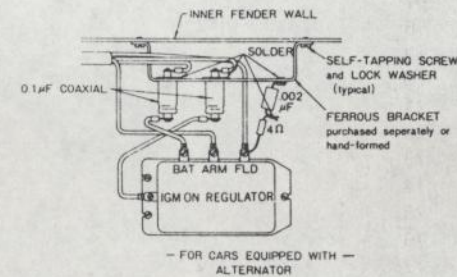
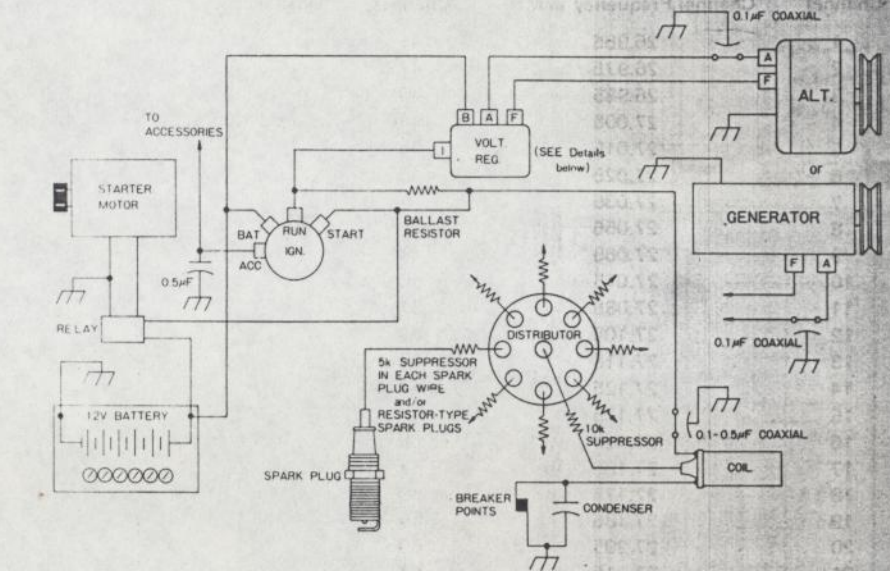
To reduce ignition noise, install resistor-type spark plugs if these are not already installed. If non-resistance ignition wiring is used, install a 10 k-ohm suppressor resistor at each spark plug tower of the distributor. Install a coaxial capacitor at the ignition coil primary as close to the coil primary as possible. This capacitor can be purchased from an electronics parts company or an automotive electrical service company.

A "whining" noise which varies with engine speed and continues with the ignition turned off and the vehicle coasting in gear is characteristic of the alternator. Check and clean it and install an alternator filter (same sources as above).

An irregular, clicking sound which disappears at a slow idle characterizes the voltage regulator. Install a 4-ohm carbon resistor as close to the field terminal of the regulator as possible, then a .002 μF capacitor in series with and as close to the resistor as possible. Connect the capacitor to ground. See the detail drawings in page 6.

Irregular popping noises which vary with road surfaces indicate static discharge at any of several locations in the vehicle. Tighten loose nuts and bolts and bond large areas such as the fenders, exhaust pipe, firewall, etc. to the frame with lengths of heavy wire braid.

Noise Suppression Diagram



Schematic Diagram

