

**hy-gain**

# 2795

SOLID STATE 120 CHANNEL  
CITIZENS BAND 2-WAY RADIO



INSTRUCTION MANUAL

**hy-gain**

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## introduction

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### **To the Owners**

Thank you for your confidence in selecting the model **2795**. We know you will find your transceiver as exciting as it is practical. Only the highest quality components are incorporated into your radio to assure reliability and maximum performance.

Installing and operating the transceiver is not complicated, but the flexibility provided by its many features may not be fully appreciated until a little time is spent becoming familiar with its controls and connections.

It will be to your advantage to save the packaging material — carton, filler, cushioning, etc., they will prove valuable in preventing damage should you ever have occasion to transport or ship the unit.

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## installations

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### Installation

Plan the location of the transceiver and the microphone bracket before starting the installation. Select a location that is convenient for operation and does not interfere with the driver or passengers in the vehicle. The transceiver is usually mounted underneath the dash panel.

### Mounting and Connections

The transceiver is supplied with a universal mounting bracket. The transceiver is held in the bracket by two bolts permitting adjustment to the most convenient angle. The bracket must be mounted with the machine screws and the nuts supplied. The mounting must be mechanically strong and also provide a good electrical contact to the chassis of the vehicle. Proceed as follows to mount the transceiver.

1. After you have determined the most convenient location in your vehicle, hold the transceiver with mounting bracket in the exact location desired. If nothing interferes with mounting it in the desired location, remove the mounting bracket and use it as a template to mark the location for the mounting bolts. Before drilling the holes, make sure nothing interferes with the installation of the mounting bolts.
2. Connect the antenna cable plug to the standard receptacle on the rear panel. Most CB antennas are terminated with a type **PL-259** plug and mate with the receptacle of the transceiver.
3. Connect the **power cord** plug to the **dc power socket** on rear panel.
4. **Negative Ground Systems.** Almost all domestic mobiles and trucks are **negative** grounded. The **red** lead at the end of the power cord connects to the **positive** pole of the battery or **electrical system**, and the **black** lead connects to the **negative** pole of the battery or suitable **chassis ground**.
5. **Positive Ground Systems.** In **positive ground** system mobile, connect the **red** lead to the **positive** pole of the battery or suitable **chassis ground**, and the **black** lead to the **negative** pole of the battery or **electrical system**.
6. Mount the microphone bracket to dashboard or other convenient location.

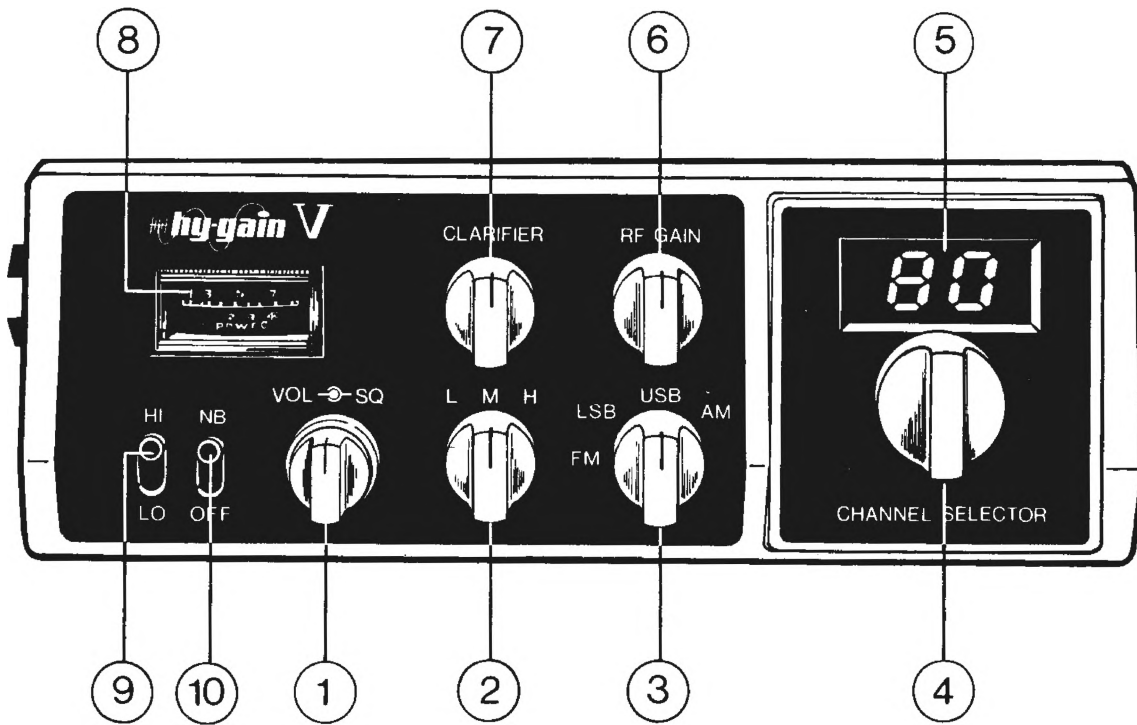
### Ignition Noise Interference

Use of the mobile transceiver at low level signal condition is normally limited by the presence of electrical noises. The primary source of noise in an automobile installation is from the generator and ignition system in the vehicle. Under most operating conditions, when signal level is adequate, the background noise does not present a serious problem. Also when extremely low level signals are being received the transceiver may be operated with the vehicle engine off. The unit requires very low current and therefore will not significantly discharge the battery. Even though your transceiver has a **noise blanker**, in some installations ignition noise interference may be high enough to make good communications impossible. The electrical noise may come from several sources. Many possibilities exist and variations between vehicles require different solutions to reduce the noises. Consult with your dealer or two-way radio technician for help in locating and correcting the source of severe noise interference.

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## control location

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## control functions

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### Controls

There are 9 controls and 2 indicators on the front panel of your transceiver.

**1. Volume/Squelch.** These are concentric controls which do the following individual adjustment:

**Volume (inner knob).** Turn clockwise to apply power to the radio and set the desired listening level. **Squelch (outer knob).** This control is used to cut off or eliminate the receiver background noise in the absence of an incoming signal. For maximum receive sensitivity the control should be adjusted only to the point where the receiver background noise is eliminated. Turn fully counterclockwise then slowly clockwise until the receiver noise disappears. Any signal to be received must now be slightly higher than the average received noise. Further clockwise rotation will increase the threshold level which a signal must overcome to be heard. Only strong signals will be heard at a maximum clockwise setting.

**2. L/M/H (Band Switch).** In this transceiver, 120 channels are divided into 3 groups of 40 channels, low 40, middle 40, and high 40. Set this selector to the position to which the channel you desire belongs.

**3. FM-LSB-USB-AM.** This selects the mode of operation in either FM, AM, upper sideband, or lower sideband. Transmissions in the FM, AM or sideband mode can only be communicated to a station operating in the same mode.

**4. Channel Selector.** This switch selects one of 120 channels desired in conjunction with the **L/M/H Band** switch. The selected channel will be digitally displayed in the window above.

Channels **1** through **40** are selected on this selector with the **Hi-Lo Band** switch placed in the **L** position, channels **41** through **80** in the **M** position, while channels **81** through **120** in the **Hi** position.

**5. Channel Indicator.** This is an LED (light emitting diode) digital channel readout to show the channel selected by the **Channel selector**.

**6. RF Gain.** Controls the reception sensitivity of the receiver. If a station received sounds distorted, place this control in counterclockwise position where the **S** meter pointer does not exceed S9.

**7. Clarifier.** This provides fine tuning of the receiver. On regular AM or FM reception, this will permit adjustment to off-frequency transmissions. In the SSB (either USB, or LSB) modes, this is used as a voice clarifier to adjust for clearer voice reception.

**8. Meter.** This shows the relative strength of an incoming signal from the antenna, and transmit power output to the antenna. The meter is illuminated when power is on.

**9. Tone Switch.** Changes the receiving audio quality in two ways. **Hi** position emphasizes high tones, while **Lo** position emphasizes low tones.

**10. NB (noise blanker) Switch.** In the **NB** position, the **RF noise blanker** is activated. The noise blanker is very effective in reduction of repetitive impulse noise such as ignition interference.

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## connections

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### Antenna

Only a properly matched antenna system will allow maximum power transfer from the **52** ohms transmission line to the radiating element. In mobile installations (cars, trucks, etc.), an antenna system that is non-directional should be used.

A vertical polarized quarter-wave length whip antenna provides the most reliable operation and greatest range. The shorter loaded type whip antennas are more attractive, compact and adequate for applications where the maximum possible distance is not required. Also the loaded whips do not present the problem of height imposed by full quarter-wave length whip.

Mobile whip antennas utilize the metal body of the vehicle as a ground plane. When mounted at a corner of the vehicle, they are slightly directional in the direction of the body of the vehicle. For all practical purposes, however, the radiation pattern is non-directional. The slight directional characteristic will be observed only at extreme distance. A standard antenna connector is provided on the transceiver for easy connection to a standard cable terminations.

If the transceiver is not mounted on a metal surface, it is necessary to run a separate ground wire from the unit to a good metal electrical ground in the vehicle.

### Remote Speaker Connection

The external speaker jack (marked **EXT SP**) on the rear panel is used for remote receiver monitoring. The external speaker should have **8** ohms impedance and be able to handle at least **3** watts. When the external speaker is plugged in, the internal speaker is automatically disconnected.

### Selective Call Connection

Special provision has been made for your transceiver to connect the optional selective call device. Ask your dealer for definite information. The selective call unit is connected to the **Sell-Call** jack on rear panel of the transceiver, which is normally occupied with a prewired plug for normal operation. **Do not remove the plug unless you are using a selective call unit.**

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## operation

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### Microphone and Transmit Switch

The receiver and transmitter are controlled by the **transmit switch** at the side of the microphone (supplied). Depress the transmit switch and the transmitter is activated, release the switch to receive. When transmitting hold the microphone 5 or 6 centimeters from your lips and speak in a normal voice. The transceiver will not be operative without microphone connected to avoid unauthorized use.

### Receive Operation

Connect the microphone to the radio and proceed as follows:

1. Rotate the **Squelch** control to **9** o'clock position.
2. Rotate the **RF Gain** control in fully clockwise position.
3. Temporarily, place the **FM-LSB-USB-AM** switch in **AM** position.
4. Turn unit on by rotating the **Volume** control clockwise and set for a comfortable listening level.
5. Select a channel that is unoccupied by any other station and turn **Squelch** control clockwise slowly until the hissing noise just disappears.
6. Adjust the **FM-LSB-USB-AM** switch and **Clarifier** for FM or SSB reception. The knack of adjusting the Clarifier is very critical and important when listening to an SSB signal. We suggest you spend some time becoming familiar with its use.

### Transmit Operation

After you have checked that the channel you have chosen is clear proceed as follows.

1. Select a mode of emission – FM, LSB, USB or AM.
2. Again, make sure that the channel is clear.
3. Depress the transmit switch on the microphone.
4. Speak clearly with your mouth 5 to 6 cm from microphone.
5. To stop transmission and receive, release the transmit switch.
6. Allow a 2 to 3 second break between the incoming signal and your transmission.

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## **maintenance**

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### **Maintenance**

The transceiver is specifically designed for the environment encountered in mobile installation. The use of fully transistorized circuitry containing very reliable ICs and semi-conductors result in high reliability and stability in both transmit and receive operation. Should a failure occur, however, replace parts only with identical parts specified in the schematic diagram (page 9).

If the performance described in the **Receive Operation** and **Transmit Operation** selections can not be obtained, review the instructions to ensure that the proper procedures are followed. If a problem still exists, ask your dealer or qualified radio technician for specific information.



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## technical information

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### General

**Frequency Composition:** PLL (phase locked loop) synthesization.

**Frequency Range:** 26.965 to 28.305 MHz.

**Channels:** 120

**Frequency Tolerance:**  $\pm 0.005\%$ .

**Emission:** FM, AM, lower sideband, upper sideband.

**Operating Temperature Range:**  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ .

**Operating Power Voltage:** 13.8 volts (nominal 12 volts) dc.

### Receive Portion

**Sensitivity at 10 dB S/N (AM):** 0.7 microvolts\*.

**Sensitivity at 10 dB S/N (SSB):** 0.2 microvolts\*.

**Sensitivity at 20 dB S/N (FM):** 0.5 microvolts\*.

**IF Response at 6 dB down (AM):** 6 kHz.

**IF Response at 6 dB down (SSB):** 2 kHz.

**IF Response at 6 dB down (FM):** 6 kHz

**Audio Output Power for 8 ohms:** 3 watts.

**Clarification:**  $\pm 800$  Hz.

**Squelch Range:** 0.7 to 300 microvolts.

**Intermediate Frequency (AM/FM):** 10.695 MHz, 455 kHz.

**Intermediate Frequency (SSB):** 10.695 MHz.

\* : with the **RF Gain** in fully clockwise position.

### Transmit Portion

**Harmonic Suppression:** 60 dB down.

**SSB Generation:** Double balanced modulator with crystal lattice filter.

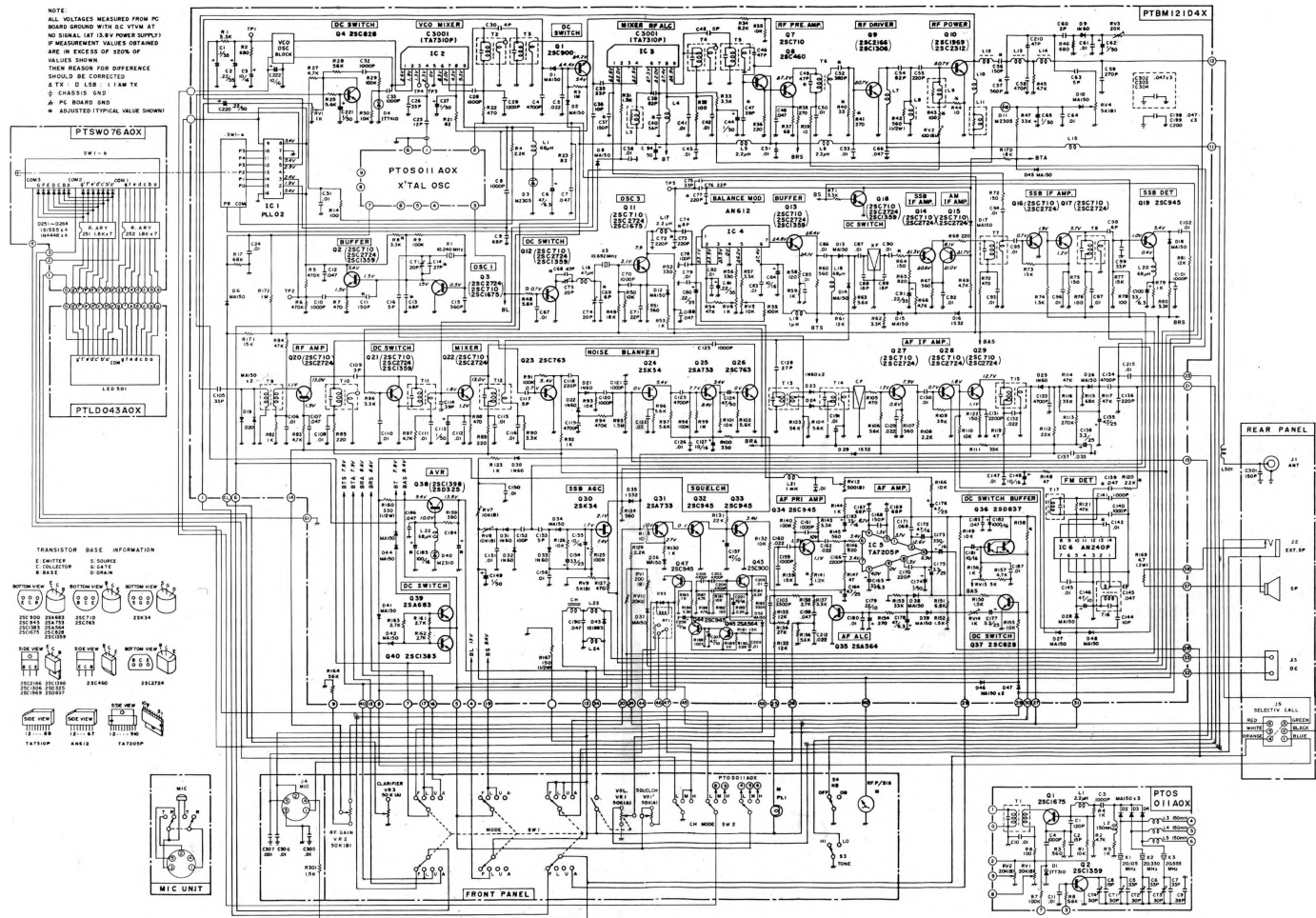
**Carrier Suppression (SSB):** 40 dB down.

**Opposite Sideband Suppression (SSB):** 60 dB down.

**RF Output Power at 13.8 volts dc (AM/FM):** 7.5 watts.

**RF Output Power at 13.8 volts dc (SSB):** 12 watts PEP.

# schematic diagram



CHANNEL FREQUENCIES

LOW CHANNEL	CHANNEL FREQUENCY IN MHZ	MID CHANNEL	CHANNEL FREQUENCY IN MHZ	HIGH CHANNEL	CHANNEL FREQUENCY IN MHZ
1	26.965	41	27.415	1	27.865
2	26.975	42	27.425	2	27.875
3	26.985	43	27.435	3	27.885
4	27.005	44	27.455	4	27.905
5	27.015	45	27.465	5	27.915
6	27.025	46	27.475	6	27.925
7	27.035	47	27.485	7	27.935
8	27.055	48	27.505	8	27.955
9	27.065	49	27.515	9	27.965
10	27.075	50	27.525	10	27.975
11	27.085	51	27.535	11	27.985
12	27.105	52	27.555	12	28.005
13	27.115	53	27.565	13	28.015
14	27.125	54	27.575	14	28.025
15	27.135	55	27.585	15	28.035
16	27.155	56	27.605	16	28.055
17	27.165	57	27.615	17	28.065
18	27.175	58	27.625	18	28.075
19	27.185	59	27.635	19	28.085
20	27.205	60	27.655	20	28.105
21	27.215	61	27.665	21	28.115
22	27.225	62	27.675	22	28.125
23	27.255	63	27.705	23	28.155
24	27.235	64	27.685	24	28.135
25	27.245	65	27.695	25	28.145
26	27.265	66	27.715	26	28.165
27	27.275	67	27.725	27	28.175
28	27.285	68	27.735	28	28.185
29	27.295	69	27.745	29	28.195
30	27.305	70	27.755	30	28.205
31	27.315	71	27.765	31	28.215
32	27.325	72	27.775	32	28.225
33	27.335	73	27.785	33	28.235
34	27.345	74	27.795	34	28.245
35	27.355	75	27.805	35	28.255
36	27.365	76	27.815	36	28.265
37	27.375	77	27.825	37	28.275
38	27.385	78	27.835	38	28.285
39	27.395	79	27.845	39	28.295
40	27.405	80	27.855	40	28.305

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