Pearce Simpson Director 23 Owners Manual

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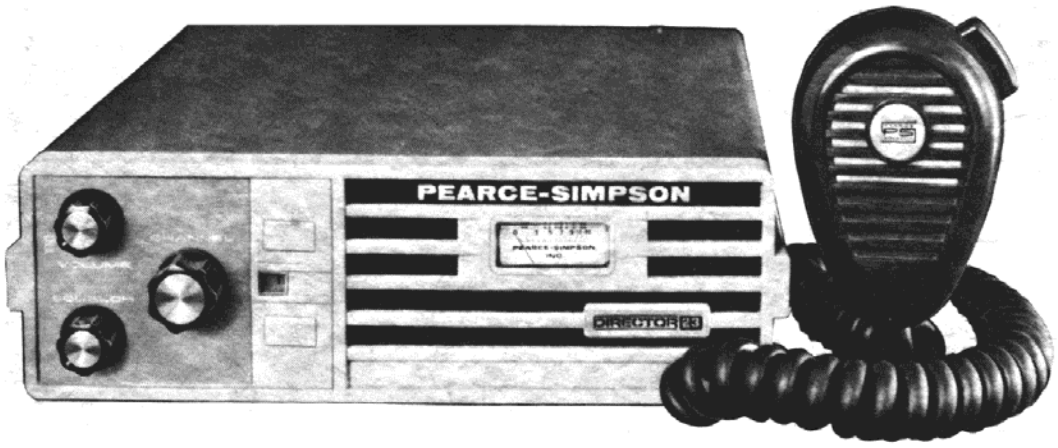

DIRECTOR 23

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

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SECTION I

GENERAL INFORMATION

1.1 DESCRIPTION

Your new PEARCE-SIMPSON DIRECTOR 23 is a compact, all-transistorized, 23 channel Citizens Band Transceiver. This radio, because of its low current drain, is ideally suited for mobile operation from a 12.6 negative ground DC power source. A 12 VDC power cord and an adjustable universal mounting cradle is included with your DIRECTOR 23. To provide the crystal-controlled, 23 channel operation, PEARCE-SIMPSON utilizes an all-transistor Hetrosync^{R} circuit.

The receiver is a sensitive superheterodyne circuit featuring: Dual conversion, low noise RF stage, adjustable squelch, automatic noise limiting, S-meter, tone control, external speaker jack, and instantaneous selection of any of the 23 crystal-controlled channels.

The transmitter section is designed around highly reliable silicon transistors and the Hetrosync^{R} circuit. This circuit makes use of the output of two crystal-controlled oscillators which are beat together to produce the desired frequency. The transmitter final is a conservatively rated stud-mounted high gain RF power transistor, which feeds into a double pi-network circuit for harmonic suppression.

The modulator provides high level amplitude modulation employing saturation limiting and negative peak clipping. This allows high talk power without splatter.

1.2 SPECIFICATIONS

1.2.1 GENERAL

Channels:	23 Crystal-Controlled
Size:	8-1/2" Wide x 2-3/4" High x 8-1/2" Deep
Weight:	6 Pounds
Antenna:	52-Ohm Coaxial
Primary Power:	Input Voltage - 13.8 VDC (EIA Standard)

Transistor Complement:

Q-1	MPS6517	RF Amplifier
Q-2	MPS6517	1st Receiver Mixer
Q-3	MPS6517	2nd Receiver Mixer
Q-4	2N2672	1st IF Amplifier
Q-5	MPS6517	2nd IF Amplifier
Q-6	MPS2716	1st Receiver Audio Amplifier
Q-7	MPS2716	2nd Receiver Audio Amplifier
Q-8	2N1540	Audio Power Amplifier
Q-9	MPS2716	1st Transmit Audio Amplifier
Q-10	MPS2716	2nd Transmit Audio Amplifier
Q-11	MPS706	33 MC Oscillator
Q-12	MPS706	Transmit Mixer
Q-13	MPS706	Transmit Buffer
Q-14	S19386	Transmit Driver
Q-15	PT2677C	Transmit Final
Q-16	MPS2716	AGC Amplifier
Q-101	MPS706	Receiver 6 MC Oscillator
Q-102	MPS706	Transmit 6 MC Oscillator

Diode Complement:

CR-1	1N34A	Detector
CR-2	1N2069	A.N.L. Gate
CR-3	11V Zener	Voltage Regulator
CR-4	1N2069	Reverse Polarity Protector
CR-5	1N2069	Negative Peak Clipper
CR-6	1N2069	Squelch Gate
CR-7	1N54	AGC Detector
CR-8	1N2069	Reverse Polarity Protector
CR-9	1N2069	Transient Suppressor
CR-10	1N2069	S-Meter Multiplier Diode
CR-11	1N54	S-Meter Detector
CR-12	1N462	IF Limiter

1.2.2 RECEIVER

Frequency Range:	26.965 - 27.255 mc
Sensitivity:	.8 uv for 10 db S+N/N using 1000 cps, 30% modulation

Selectivity:	6 db Bandwidth - 6 kc
	20 db Bandwidth - 12 kc
	50 db Bandwidth - 20 kc
Cross Modulation:	75 db for 10 uv Desired
Image Rejection:	45 db Minimum
Spurious Rejection:	60 db Minimum
Adjacent Channel Rej.:	45 db Minimum
Squelch Range:	Adjustable from 0.5 uv - 1000 uv
Squelch Sensitivity:	0.5 uv or less will open squelch
Noise Limiter:	Pre-set Automatic
1st IF Frequency:	5995 kc to 6035 kc
2nd IF Frequency:	455 kc
Speaker:	2-1/4" x 6-1/2" Oval

1.2.3 TRANSMITTER

Frequency Range:	26.965 - 27.255 mc
Carrier Freq. Stability:	+.003% -30°C to +65°C
Output Power:	4 Watts into 52 Ohms with 13.8VDC Supply
Emission:	8A3
Modulation Capability:	100%
Spurious & Harmonic Suppression:	55 db Minimum

1.3 CITIZENS RADIO SERVICE

According to FCC Rules and Regulations, Part 95, Section 95.1, the Citizens Radio Service is intended "to provide for private short-distance radio communications service for the business or personal activities of licensees".

The following are some of the rules and regulations of particular importance to the new licensee:

95.3(A) CITIZENS RADIO SERVICE. "A radio communications service of fixed, land and mobile stations intended for short-distance personal or business radio communications, radio signaling and control or remote objects or devices by radio; all to the extent that these uses are not specifically prohibited in this part."

95.3(B) CLASS D STATION. "A station in the Citizens Radio Ser-

vice licensed to be operated on an authorized frequency in the 26.96-27.23 mc/s band or on the frequency 27.255 mc/s, with input power of 5 watts or less and for radiotelephony only."

95.105 CURRENT COPY OF RULES REQUIRED. "Each licensee in this service shall maintain as part of his station records, a current copy of Part 95, Citizens Radio Service, of this chapter."

TRANSMITTER IDENTIFICATION CARD. "In accordance with Rule 95.101, an identification card, legibly indicating the call sign and the licensee's name and address must be affixed to the transmitter Attach this card to the side of the transmitter in a readily visible location."

DO NOT TRANSMIT WITH YOUR EQUIPMENT UNTIL YOU HAVE RECEIVED YOUR LICENSE FROM THE FCC. Illegal operation can result in severe penalties. Be sure that you have read and understand Part 95 of the FCC Rules and Regulations before operating your station.

FREQUENCIES AVAILABLE FOR CLASS D OPERATION

Channel	mc/s	Channel	mc/s	Channel	mc/s
1	26.965	9	27.065*	17	27.165
2	26.975	10	27.075*	18	27.175
3	26.985	11	27.085*	19	27.185
4	27.005	12	27.105*	20	27.205
5	27.015	13	27.115*	21	27.215
6	27.025	14	27.125*	22	27.225
7	27.035	15	27.135	23	27.255*
8	27.055	16	27.155		

*Channels available for communications between units of different stations. (In accordance with FCC Part 95.41 (d) (2)

1.4 H.E.L.P.

The HIGHWAY EMERGENCY LOCATING PLAN was originated by the Automobile Manufacturer's Association (AMA) as a means of promptly summoning aid in the event of a highway emergency. CB

CHANNEL 9 has been designated as the channel to be monitored and used for this program.

Operation for this purpose is simple:

1. To initiate a call for aid, turn on your DIRECTOR 23, rotate the channel selector to CHANNEL 9.

2. Listen to be sure that the channel is not in use.

3. When the channel is clear, press the microphone button and speak as follows - "THIS IS (Give Radio License Number) CALLING A H.E.L.P. MONITOR. I NEED (Police, Garage, Doctor). GO AHEAD PLEASE".

4. Release the microphone button and listen for a reply. If none is heard, repeat the message.

5. When message is acknowledged, give specific information on - Name and location; description and license number of vehicle; the nature of your problem; kind of help desired.

Your DIRECTOR 23 is delivered to you with crystals for all 23 channels, including CHANNEL 9 already installed.

Other features which are included in your DIRECTOR 23 to make it desirable for H.E.L.P. use:

1. The DIRECTOR 23 remains operational at battery voltages even below 9.5 volts. This means that when the battery is too low to operate the starter, a call for assistance can still be transmitted.

2. All 23 channels are available to provide you communications for H.E.L.P., as well as your personal and business needs.

SECTION II

INSTALLATION & INITIAL ADJUSTMENT

> IMPORTANT
>
> BEFORE DISCARDING ANY OF THE PACKING MATERIALS, EXAMINE THEM CAREFULLY FOR ITEMS YOU MAY HAVE OVERLOOKED.

2.1 MOBILE STATION INSTALLATION

2.1.1 MOUNTING

For mobile installation, the adjustable universal mounting cradle serves as a means of mounting your DIRECTOR 23 in any position and attitude which will be convenient to the user (See Figure 2.1 for a typical automobile installation). After you have determined the most convenient location in your vehicle, hold the DIRECTOR 23, mounted in the cradle, in the exact location desired. If nothing will interfere with mounting it in the desired position, remove the cradle from the DIRECTOR 23 and use it as a template to mark the location for the mounting bolts. Before drilling the holes, make sure nothing will interfere with the installing of the mounting bolts.

2.1.2 POWER CONNECTION

The DIRECTOR 23 is constructed to be used in vehicles using negative ground systems ONLY. The red power lead is to be connected to the positive terminal of the battery. The black lead is to be connected to ground. (The radio is reverse polarity protected. If you make a mistake in connecting the power leads, the radio will not be damaged. It will be inoperative until the power is connected correctly.) If existing wiring is used, be sure that it is heavy enough to prevent voltage drop to the radio. A good source of positive battery voltage is at the accessory connection on the ignition switch. Using this as a power source insures the radio will be off when the ignition switch is turned "OFF", and power will be supplied to the radio when it is in the "ON" or "ACCESSORY" position.

FIGURE 2.1

TYPICAL AUTOMOBILE INSTALLATION

2.1.3 ANTENNAS

Your DIRECTOR 23 has been adjusted at the factory to give optimum performance using a 52-ohm antenna. There are a number of 52-ohm antennas available for mobile citizens band use.

For an automobile installation, a whip may be used with good efficiency because the automobile acts as a counterpoise and reduces detuning effects. The mounting location also has a great effect on the efficiency.

The most efficient and practical installation is a full quarter wave whip mounted on the left rear deck of fender top midway between the rear window and bumper.

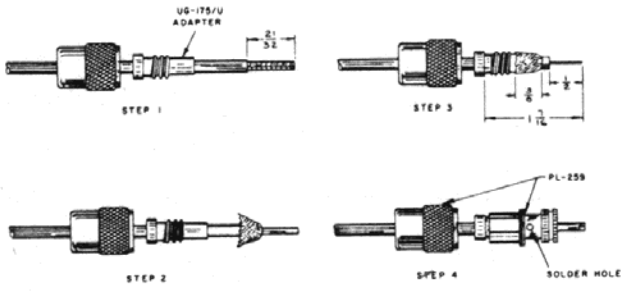
The so-called "short whip" is a less efficient antenna because the radiation area is reduced. However, full use of its capability may

be achieved since a shorter antenna may be mounted in a more advantageous position on an automobile, such as in the middle of the top.

There are also newer mobile antennas on the market which are made to replace the entertainment radio antenna and are similar in appearance. These antennas serve three purposes: AM and FM entertainment broadcast reception and Citizens Band transmission and reception. With some of these antennas, it is possible to simultaneously transmit on CB and receive on AM broadcast with interaction. These antennas are quite efficient for all three types of operation when properly adjusted.

For a marine installation, the full-length quarter wave whip antenna is very efficient, however it requires radials which make it hard to mount in small boats. Another excellent antenna is the coaxial sleeve type which requires no radial. A similar antenna is the centerloaded 1/2 wave which is about the same as the full length 1/4 wave whip and it requires no radials. Care must be used when choosing one of the shortened type antennas as considerable variation in efficiency will be found between the various makes and models. As a general rule, avoid those with short radiating elements because the greater the radiating area, the stronger the radiated signal will be.

Your PEARCE-SIMPSON dealer is prepared to offer advice and will help you choose the most desirable antenna for your needs.



ASSEMBLING ANTENNA PLUG TO RG-58U OR OTHER 1/4" COAXIAL CABLE

FIGURE 2.2

2.1.4 TRANSMISSION LINE

To connect an antenna to the transceiver, a 52-ohm coaxial transmission line is required. RG-8/U coax is recommended for lengths in excess of 50 feet and RG-58/U coax is recommended for lengths less than 50 feet to connect to the transceiver. The RG-8/U requires a PL-259 type connector and the RG-58/U coax requires a PL-259 connector with a UG-175/U adaptor. (See Figure 2.2 for assembling connector to RG-58/U.)

2.2 INSTALLATION ADJUSTMENTS

The output circuit of the DIRECTOR 23 transmitter has been factory adjusted to operate into any good 52-ohm antenna. No attempt should be made to tune the transmitter to the antenna. Instead, the antenna should be adjusted to present the lowest possible SWR (Standing Wave Ratio). A very low SWR means that the antenna is operating at maximum efficiency and will also mean that it is adjusted to 52 ohms. An improperly adjusted antenna causes standing waves to appear on the feed line. Since this feed line is a fixed 52 ohms, and cannot be adjusted, this mismatch appears at the transmitter. If the transmitter is adjusted to compensate for this mismatch, both it and the antenna will no longer be operating at peak efficiency. Since the transmitter has already been adjusted for 52 ohms output and the coaxial feed line has a fixed 52-ohm value, the only remaining element to be adjusted to this value is the antenna itself. When received, the antenna is probably cut as near as is possible to this value. The mounting location on the vehicle or building and surrounding objects affect the antenna however, and requires that it be adjusted to compensate for them.

Many of the newer Citizens Band antennas provide means of adjusting them for lowest SWR. Instructions for doing so are included with the antenna. For such antennas as the full quarter wave length whip, it is necessary to carefully vary the length until the lowest SWR is obtained. For all adjustments to the antenna, connect an SWR meter in the feed line to the antenna.

The DIRECTOR 23 will work into an antenna system having an SWR as high as 3:1. For best communications, you will want this figure as near 1:1 as possible so that the antenna will be operating at its best efficiency.

2.3 NOISE SUPPRESSION

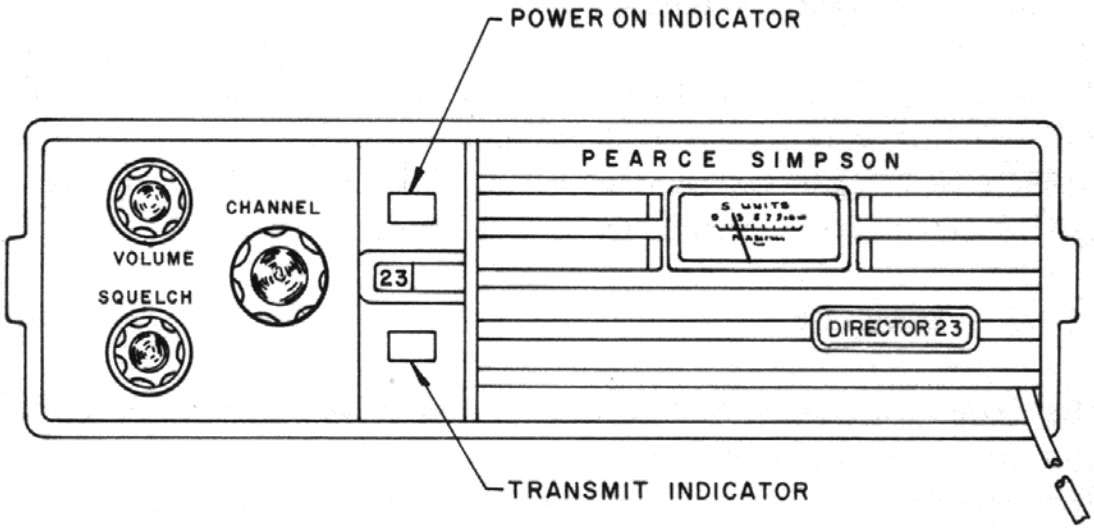
The DIRECTOR 23 contains a built-in automatic noise limiter and input power filtering. In most vehicular installations, the noise suppression for the entertainment radio will be sufficient. Vehicles and boats not having this suppression may require that it be installed. In most cases, installation of distributor suppressors and generator condensers will be sufficient. In severe cases, the services of a qualified technician may be required. See your PEARCE-SIMPSON dealer for advice.

SECTION III

OPERATING INSTRUCTIONS

3.1 CONTROLS AND INDICATORS

There are three controls and three indicators on the front panel of your DIRECTOR 23. (See Figure 3.1) The tone control is located on the back panel.



DIRECTOR 23 FRONT PANEL
FIGURE 3.1

3.1.1 CHANNEL SELECTOR

The Channel Selector Switch has 23 operating positions. This switch sets both transmit and receive frequencies simultaneously by switching the proper crystals into the PEARCE-SIMPSON HetroSync^{R} circuit for any one of the 23 CB channels.

3.1.2 SQUELCH CONTROL

The Squelch Control is used to silence background noises (atmospheric or man-made noise) in the absence of a received radio signal. In the full counterclockwise position, the DIRECTOR 23 is unsquelched (no noise silencing at all). In the fully clockwise position, the unit is squelched for even very strong signals.