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Pearce Simpson Panther SSB Owner's Manual
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PEARCE-SIMPSON

DIVISION OF **GLADDING** CORP.



PANTHER SSB

CORRECTION

THE MANUAL IS IN ERROR ABOUT GROUND INSTALLATION.
THIS PARTICULAR RADIO CAN ONLY BE USED IN NEGATIVE,
BUT NOT POSITIVE, GROUND INSTALLATION.

SECTION 1

GENERAL INFORMATION

DESCRIPTION

Your new PEARCE-SIMPSON PANTHER SSB is a compact, all-transistorized, 23 channel Citizens Band SSB/AM Transceiver. This radio, because of its low current drain, is ideally suited for mobile operation from a 12.6 VDC power source. A 12 VDC power cord and a mounting cradle are included with your PANTHER SSB. To provide the crystal-controlled, 23-channel operation, PEARCE-SIMPSON utilizes an all-transistor HetroSync™ circuit.

The receiver is a sensitive superheterodyne circuit featuring: Dual conversion, low noise RF stage, slide-o-tune, adjustable squelch, noise blanker, 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™ circuit. This circuit makes use of the output of three crystal-controlled oscillators which are beat together to produce the desired frequency. The transmitter final is a conservatively rated high gain RF power transistor.

Both transmitter and receiver work on upper sideband and lower sideband.

SPECIFICATIONS

GENERAL :

Channels	: 23 Channels, Crystal-Controlled AM, Upper Side Band and Lower Side Band
Frequency Range	: 26.965 MHz. to 27.255 MHz.
Frequency Control	: Synthesizer
Frequency Tolerance	: 0.025%
Frequency Stability	: 0.001%
Operating Temperature Range	: -20°C to +50°C
Primary Power	: Input Voltage — 13.8 VDC (EIA Standard)
Antenna	: 52-ohm Coaxial
Size	: 7 ½" W × 2 ½" H × 10 ½" D
Weight	: 7 pounds

RECEIVER :

Sensitivity	: S.S.B.- Less than 0.3μV for 10db S+N/N A.M.- Less than 0.8μV for 10db S+N/N
Selectivity	: S.S.B.- 6db at 2.0 KHz., 60db at 5.5 KHz. A.M.- 6db at 10KHz., 50db at 20 KHz.
Spurious Rejection	: 50db minimum
Squelch Range	: S.S.B.- Adjustable from 0.5μV to 1,000μV A.M.- Adjustable from 0.5μV to 1,000μV

1st I.F. Frequency : S.S.B.- 7.8 MHz.
 A.M.- 7.8 MHz.
 2nd I.F. Frequency : A.M.- 455 KHz.
 Noise Blanker : Series gate type (uses F.E.T.)
 Slide-O-Tune Range : ± 600 Hz.
 Audio Output Power : 3.5W

TRANSMITTER :

Power : S.S.B.-15 watts, p.e.p.
 A.M.- 3.5 watts
 Modulation Capability : A.M.- 100%
 Spurious Harmonic Suppression : 50db minimum
 Carrier Suppression : S.S.B.- -40 db
 Unwanted Side Band : -40db
 Frequency Response : S.S.B.- 350 Hz. to 2,500 Hz.
 A.M.- 250 Hz. to 2,000 Hz.
 Output Impedance : 50 ohms (unbalanced)
 S.S.B. Filter : 7.8 MHz, Crystal lattice type, 6db
 at 2.1 KHz., 60db at 5.5 KHz.
 Automatic Load Control : Holds p.e.p. to 1 db increase w/10db
 (in case of Input)

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))

SECTION 2

INSTALLATION & INITIAL ADJUSTMENT

IMPORTANT

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

MOBILE STATION INSTALLATION

MOUNTING

For mobile installation, the mounting cradle serves as a means of mounting your PANTHER SSB in any position and attitude which will be convenient to the user. After you have determined the most convenient location in your vehicle, hold the PANTHER SSB 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 PANTHER SSB 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.

POWER CONNECTION

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.

ANTENNAS

Your PANTHER SSB 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 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 center loaded 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 antenna 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.

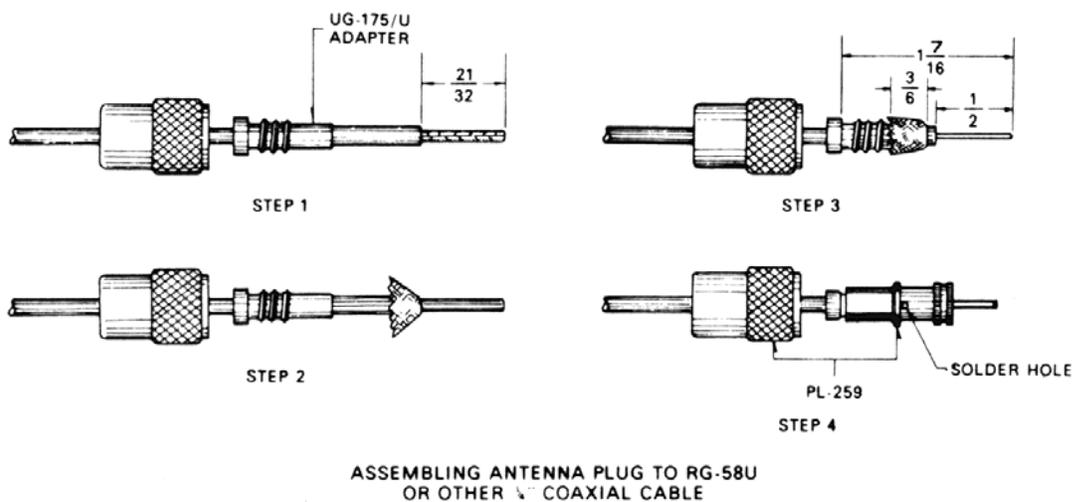


Figure 1

TRANSMISSION LINE

To connect an antenna to the transceiver, a 52-ohm coaxial transmission line is required. RG-8/U coax is recommended for length in excess of 50 feet and RG-58/U coax is recommended for length 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 1 for assembling connector to RG-58/U.)

INSTALLATION ADJUSTMENTS

The output circuit of the PANTHER SSB 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 The built-in SWR bridge is ideal for this type of adjustment.

The PANTHER SSB 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.

NOISE SUPPRESSION

The PANTHER SSB contains automatic noise limiter on AM and noise blanker on AM and SSB, 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 service of a qualified technician may be required. See your PEARCE-SIMPSON dealer for advice.

SECTION 3

OPERATING INSTRUCTIONS

Your PANTHER SSB operates on sixty-nine different channels. There are 23 AM channels, 23 upper sideband and 23 lower sideband. When in the AM mode, the PANTHER SSB will hear only signals being transmitted on double sideband with full carrier (AM). The unit may also receive SSB signals when on the AM mode but you will not be able to understand them. When operating in either of the SSB modes, strong AM signals may also be heard. It is recommended that you return to the AM mode if you wish to listen to these signals.

So that you will better understand the difference between AM, upper sideband and lower sideband, a simplified explanation of their characteristics is in order.

An AM signal consists of a carrier frequency and two sidebands, an upper and lower. Each sideband is an exact duplicate of the other. An AM receiver, when it detects an AM signal, filters out the carrier so that you hear only the intelligence on the sideband. If you listen to an AM signal when your receiver is in the sideband mode, the receiver will not reject the carrier frequency (unless the clarifier is tuned exactly right) and a steady tone will be heard as well as the intelligence. Therefore, for best reception of AM, your mode selector should be in the AM position.

When transmitting on single sideband, no carrier and only one sideband, either upper or lower, is being transmitted. When on AM, your receiver cannot take just this one sideband and change it into usable intelligence. You can recognize a sideband signal coming in on AM by its fluttering characteristic and its unintelligible sound. A signal transmitted on upper sideband can only be properly heard by a receiver tuned to the upper sideband. Such a signal will not be intelligible.

When listening to a sideband signal on the proper mode, it may sound either too high pitched or too low pitched. The reason for this is that your receiver may not be tuned to the exact same frequency as the transmitter it is listening to. For this reason, CHEETAH SSB is equipped with a Clarifier. By turning this Clarifier, you slightly change the frequency of both your transmitter and receivers (within legal limits) so that reception will be in a normal tone.

CONTROLS AND INDICATORS

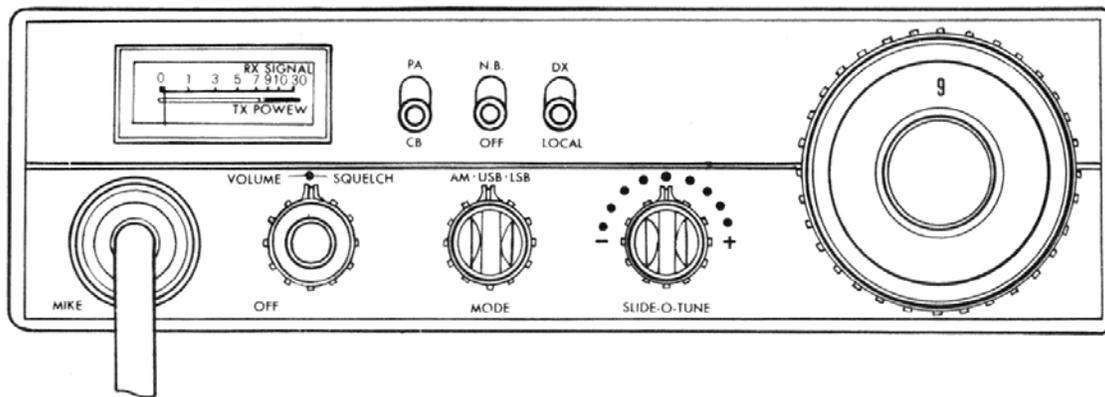


Figure 2

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™ circuit for any of the 23 CB channels.

MODE SELECTOR

This selector enables you to select either of SSB modes (upper sideband or lower sideband) or AM. This switch changes both transmitter and receiver simultaneously on each mode.

VOLUME CONTROL AND ON-OFF SWITCH

This control turns the power ON and OFF, and adjusts the loudness of received signal.

RF GAIN SWITCH

This switch selects the strength of incoming signal. If too strong signal comes in, set the DX/LOCAL Switch to "LOCAL" position. If you are listening weak signal, set the switch to "DX" position.

SQUELCH CONTROL

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

NOISE BLANKER

The noise blanker is desired to reduce excessive noise such as electrical interference, ignition noise, etc. To operate, simply set the switch to "N.B." position.

SLIDE-O-TUNE

This control allows you to vary the operating frequencies of both transmitter and receiver below and above the assigned frequency. This may be used for optimum tuning of both SSB and AM signals.

PA-CB SWITCH

This switch is to select the operating mode of either CB or PA.

PEARCE-SIMPSON'S EXCLUSIVE FIVE-WAY METER

This meter is exclusively designed by Pearce-Simpson to work in seven different ways. Those functions are as follows:

1. S meter: A change of one S unit indicates a change of 6 dB in signal level. The metering circuit is calibrated so that for 100 microvolts, the S meter will read S9.
2. RF output meter. This shows relative RF power when transmitting. To operate, place the slide switch to "S/RF" position.
3. A receiver-on indicator: When the receiver is on, the meter lights up in amber color.
4. A transmitter-on indicator: When the transmitter is on, the meter lights up in red color.
5. Modulation indicator: The meter needle fluctuates when the transmitter is modulated.

SECTION 4

REPLACEMENT PARTS

SEMI CONDUCTORS

SYMBOL	DESCRIPTION	PARTS NUMBER
FET-1	3SK22Y RF Amplifier	
FET-2	2SK30Y Noise Amplifier for N.B.	
TR-1	2SC839H 1st Mixer	
TR-2	2SC839H AM 2nd Local Amplifier	
TR-3	2SC839H 2nd Mixer	
TR-4	2SC839H 1st I.F. Amplifier	
TR-5	2SC839H 2nd I.F. Amplifier	
TR-6	2SC945R SSB A.G.C. Amplifier	
TR-7	2SC733R SSB A.G.C. Amplifier	
TR-8	2SC945R SSB A.G.C. Amplifier	
TR-9,10	2SC945R Squelch Amplifier	
TR-11	2SC945R AM A.G.C. Amplifier	
TR-12	2SC839H 1st Local Amplifier	
TR-13	2SC839H 7.8 MHz. Amplifier for SSB TX/RX	
TR-14	2SC839H 7.8 MHz. Amplifier for AM TX	
TR-15	2SC839H I.F. Amplifier for SSB	
TR-16	2SC945QL 1st A.F. Amplifier & A.G.C. Amplifier	
TR-17	2SC945R 2nd A.G.C. Amplifier & S-Meter Amplifier	
TR-18	2SC839H 11 MHz. Local OSC	
TR-19	2SC839H 7 MHz. Local OSC for U.S.B.	
TR-20	2SC839H 7 MHz. Local OSC for L.S.B.	
TR-21	2SC839H Carrier Oscillator	
TR-22	2SC839H Buffer	
TR-23	2SC945R Mike Amplifier	
TR-24	2SC945R 1st AF Amplifier for TX	
TR-25	2SC1307 RF Power Amplifier	
TR-26	2SC1306 TX Driver	
TR-27	2SC710C 1st TX Mixer	
TR-28,29	2SC1096L RF Power Control	
TR-30,31	2SC1096L AF Power Amplifier	
TR-32	2SC735Y AF Driver	
TR-33	2SC945R 1st AF Amplifier	
I.C.-1	TA7045M 7.8 MHz./19 MHz. Mixer	

REPLACEMENT PARTS

DIODES

SYMBOL	DESCRIPTION	PARTS NUMBER
D-1,19,27,28,29,30,33, 34,35,36	1N-60P	
D-2	ZE1.5	
D-3,4,8,9,10,11,12,24, 25,37,38,49,53,64	1N-60	
D-5,13	1N4448	
D-6,7,16,17,18,20,21, 23,31,32,39,40,42,43, 56,57	1S2473 (vertical)	
D-14,15,45,46,47,48	1S1007	
D-22	WZ081	
D-26,44,52	BZ090	
D-41,50	1S2473 (horizontal)	
D-51,58	SR1K-2	
D-55	CD86003	

INDUCTANCES

SYMBOL	DESCRIPTION	PARTS NUMBER
L-1	LF-1 100 μ H Micro Inductor	
L-2	LF-4 8.2 μ H Micro Inductor	
L-3,4,5	LF-1 470 μ H Micro Inductor	
L-6,9,11	TC-71024 27 MHz./54 MHz. Trap	
L-7,8	NS-1367 27 MHz. Filter	
L-10,12,13	NS1515B Choke	
L-14	LF-4 3.9 μ H Micro Inductor	
L-15	NS1516 Choke	

TRANSFORMERS

SYMBOL	DESCRIPTION	PARTS NUMBER
T-1	TKXC22019GN Receiver Antenna	
T-2,3	TKXC22017AO Receiver RF	
T-4	TKAC22526N Receiver 1st I.F.	
T-5,14,15	TKAC22015A 7.8 MHz.	
T-6	LPN5944BM 455 KHz.	
T-7	LLC3657 455 KHz.	
T-8	LLC4990A2 455 KHz.	
T-9	TKXN21017ZVI 11 MHz.	
T-10,11,12,13	KXN6711BM 19 MHz.	
T-16	113CC2804AC 7.8 MHz. Carrier OSC	

REPLACEMENT PARTS

TRANSFORMERS

SYMBOL	DESCRIPTION	PARTS NUMBER
T-17	TKAN21016AO 7.8 MHz. Balance Modulator	
T-18	TKXC23444N TX 27 MHz.	
T-19	TKXN21014AO TX 27 MHz.	
T-20	TKXN21379UH TX 27 MHz.	
T-21	TKAC23360ZVI TX 7.8 MHz.	
CH	Choke Transformer N28-7111H	
IPT	AF Input Transformer N24A-7258A	
OPT	AF Output Transformer N35-7274	

CAPACITORS

SYMBOL	DESCRIPTION	PARTS NUMBER
C-29	0.47 μ H 50 VDC Electrolytic	
C-11,16,94,95,151,190, 194	1 μ F 50 VDC Electrolytic	
C-53	2.2 μ F 25 VDC Electrolytic	
C-57,58,145,146,147, 176,180	4.7 μ F 25 VDC Electrolytic	
C-15,37,54,144,181	10 μ F 16 VDC Electrolytic	
C-56	22 μ F 10 VDC Electrolytic	
C-91,97,148	33 μ F 6.3 VDC Electrolytic	
C-27,60,73,134,150	47 μ F 10 VDC Electrolytic	
C-187,192	220 μ F 6.3 VDC Electrolytic	
C-178	220 μ F 10 VDC Electrolytic	
C-186,191	220 μ F 16 VDC Electrolytic	
C-179	220 μ F 25 VDC Electrolytic	
C-93	330 μ F 10 VDC Electrolytic	
C-185	470 μ F 16 VDC Electrolytic	
C-197	1,000 μ F 25 VDC Electrolytic	
C-142	1 μ F 10 VDC Tantal	
C-25	500 pF 50 WV Styrol (Vertical)	
C-48,86,124,164	0.1 μ F 25 WV Semi-conductive	
C-156	1 pF 50 WV Silvered Mica	
C-7,69,71,79,123	2 pF 50 WV Silvered Mica	
C-13,20	5 pF 50 WV Silvered Mica	
C-9,137,139,140,174	10 pF 50 WV Silvered Mica	
C-21,105,106,107, 108,109,110,111,112	20 pF 50 WV Silvered Mica	
C-172	25 pF 50 WV Silvered Mica	
C-17,36,61,170	30 pF 50 WV Silvered Mica	