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Palomar SSB-500 Owner's Manual

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PALOMAR SSB 500

specifications

GENERAL

Channels	:	40 – AM/Single Sideband
Frequency Range	:	26.965 to 27.405 MHz
Frequency Control	:	Phaselock Synthesizer
Frequency Tolerance	:	±0.005%
Frequency Stability	:	±0.002%
Operating Temperature Range	:	–30°C to +50°C
Microphone	:	Plug-in type dynamic with volume control
Input Voltage	:	13.8V DC (Positive or Negative ground)
Current Drain	:	Receive 1.5A at maximum audio output 0.5A standby (no signal).
Size	:	10-6/10" L. X 8"W. X 2-1/2" H.
Weight	:	6 lbs.
Antenna Connector	:	Standard American type
Semiconductors	:	41 Transistors, 7 FETS,60 Diodes, 7 ICs
Meter	:	Illuminated, indicates relative power output and received signal strength
Power Bandswidth	:	10.5 to 16V

TRANSMITTER

Power	:	4 Watts - AM (max. allowed by FCC) 12 Watts PEP-SSB (max. allowed by FCC)
Modulation	:	High and low level Class B amplitude modulation (AM)
Modulation Capability	:	95% Typical (AM)
Harmonic Suppression and Spurious Emmissions	:	Better than FCC requirement

Frequency Response	:	400 Hz to 2.5 kHz – AM and SSB
Output Impedance	:	50 Ohms, unbalanced
Output Indicators	:	Meter shows relative RF output power, Tx red lamp indicates transmit mode.

RECEIVER

Sensitivity – AM	:	.7μV for 10 db S/N
Sensitivity – SSB	:	.25μV for 10 db S/N
Selectivity	:	6 db at 4.2 kHz 60 db at 7 kHz (AM and SSB)
Image Rejection	:	More than 50 db
Automatic Gain Control (AGC)	:	Change in audio output less than 10 db from 10μV to .5 volts
Squelch	:	Adjustable – threshold less than .5μV
Audio Frequency Response	:	400Hz to 2.5 kHz
Distortion	:	Less than 10% at 3.0 watts output
Adjacent Channel Rejection	:	AM: -60 db, SSB: -65db
Cross Modulation	:	More than 55 db
IF Frequency	:	AM and SSB, 7.8 MHz
Clarifier	:	±1 kHz
Noise Blanker	:	RF type, effective on AM and SSB
Audio Output Power	:	More than 3 watts into 8 ohms
Built-in Speaker	:	8 ohms, dynamic
External Speaker (optional)	:	Disables internal speaker when connected

PUBLIC ADDRESS (PA) SYSTEM

Power Output	:	3 watts into external speaker
External Speaker for PA (optional)	:	When PA switch is in PA mode, the unit functions as a public address system.

PALOMAR SSB 500 instruction manual

introduction

The PALOMAR SSB-500 has been designed to provide a high level, trouble-free performance of both AM and SSB modes in the Citizens Band Service which is comprised of the following frequency assignments:

CHANNEL	CHANNEL FREQUENCY [MHZ]	CHANNEL	CHANNEL FREQUENCY [MHZ]
1	26.965	21	27.215
2	26.975	22	27.225
3	26.985	23	27.255
4	27.005	24	27.235
5	27.015	25	27.245
6	27.025	26	27.265
7	27.035	27	27.275
8	27.055	28	27.285
9	27.065 - Emergency	29	27.295
10	27.075	30	27.305
11	27.085	31	27.315
12	27.105	32	27.325
13	27.115	33	27.335
14	27.125	34	27.345
15	27.135	35	27.355
16	27.155	36	27.365
17	27.165	37	27.375
18	27.175	38	27.385
19	27.185	39	27.395
20	27.205	40	27.405

To insure that you obtain the maximum performance from your PALOMAR SSB-500, please read carefully the following control descriptions and operating instructions.

NOTE: This transceiver has been designed for use in Class D operation in the 27 MHz Citizens Band Radio Service. This transceiver is also designed to meet the Federal Communications Commission requirements applicable to equipment operating in Class D service, and is not to be used for any other purpose. Part 95 and Part 15, Sub-part C of the FCC Regulations define operation in this service. You are required to read and understand these Regulations prior to operating this equipment.

A copy of Part 95 of the FCC Rules and Regulations is furnished with your transceiver. (It is also available from the U.S. Government Printing Office, Washington DC., 20402.)

Complete FCC Forms 505 and 555-B which accompany this manual.

You are also required to submit a complete copy of FCC Form 505 prior to operating this transceiver on the air.

It is the user's responsibility to see that this unit is operated at all times in accordance with the FCC Citizens Radio Service regulations.
WARNING: Transmitter section adjustments must be performed only by a qualified technician holding a valid first or second class FCC Radiotelephone License.

section I

installation

Location

Plan the location of the transceiver and 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. In automobiles, the transceiver is usually mounted to the underneath of the dash panel, with the microphone bracket beside it or directly on the unit.

Mounting and Connection

The PALOMAR SSB-500 is supplied with a universal mounting bracket. The transceiver is held in the bracket by four bolts permitting adjustment at the most convenient angle.

The bracket must be mounted with the machine screws supplied. The mounting must be mechanically strong and also provide a good electrical connection to the chassis of the vehicle. Proceed as follows to mount the SSB-500.

1. After you have determined the most convenient location in your vehicle, hold the PALOMAR SSB-500 with mounting bracket in the exact location desired. If nothing will interfere with mounting it in the desired position, remove the bracket 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 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.

3. Connect the power cord plug to the DC power socket on the rear panel of the unit. If you are installing the transceiver in an automobile built in the U.S.A. after 1966, or if you are certain that your vehicle has a Negative Ground System, follow these instructions:

   A. Connect the DC power input wire with the fuse to +12V DC. In an automobile installation, +12V DC is usually obtained from the accessory contact on the ignition switch. This prevents the set being left on accidentally when the driver leaves the car and also permits operating the unit without

the engine running. Locate the accessory contact on most ignition switches by tracing the power wire from the AM broadcast receiver in the car.

B. Connect the black lead to – 12V DC. This is usually the chassis of the car. Any convenient location with good electrical contact (remove paint) may be used.

4. Follow the instructions below if you are certain that your vehicle has a Positive Ground System.

   A. Connect the positive (red) wire to a screw bolt on the metal frame supporting the instrument panel, or to any metal point that is part of the vehicle's metal structure. (Remove any paint or coating to ensure good electrical contact).

   B. Connect black negative lead to – 12V DC. Usually, – 12V is obtained from the accessory contact on the ignition switch or directly on the minus battery terminal.

5. Mount the microphone bracket on the right side of the transceiver or near the transceiver, using four screws supplied. When mounting in an automobile, place the bracket under the dash so the microphone is readily accessible.

Ignition Noise Interference

Use of a Mobile transceiver at low signal level is normally limited by the presence of noise. The primary source of noise in 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 vehicle engine turned off. The unit requires very little current and therefore will not significantly discharge the vehicle battery.

Even though the PALOMAR SSB-500 has a selectable automatic noise limiter, in some installations ignition 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 requires different solutions to reduce the noise. Consult with your PALOMAR dealer or a CB Radio technician for help in locating and correcting the source of severe noise.

Antenna

Since the maximum allowable power output of the transceiver is limitted by the FCC, the antenna is one important factor affecting transmission distance. Only a properly matched antenna system will allow maximum power transfer

from the 50 ohms transmission line to the radiating element. In mobile installations (cars, trucks, boats, etc.), an antenna system that is non-directional should be used.

A vertically 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 problems of height imposed by the 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 distances. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 cable termination.

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. When installed in a boat, the transceiver will not operate at maximum efficiency without a ground plane, unless the vessel has a steel hull.

Before installing the transceiver in a boat, consult your dealer for information regarding an adequate grounding system and prevention of electrolysis between fittings in the hull and water.

Remote Speaker

The external speaker jack (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 (built-in) speaker is disconnected.

Public Address

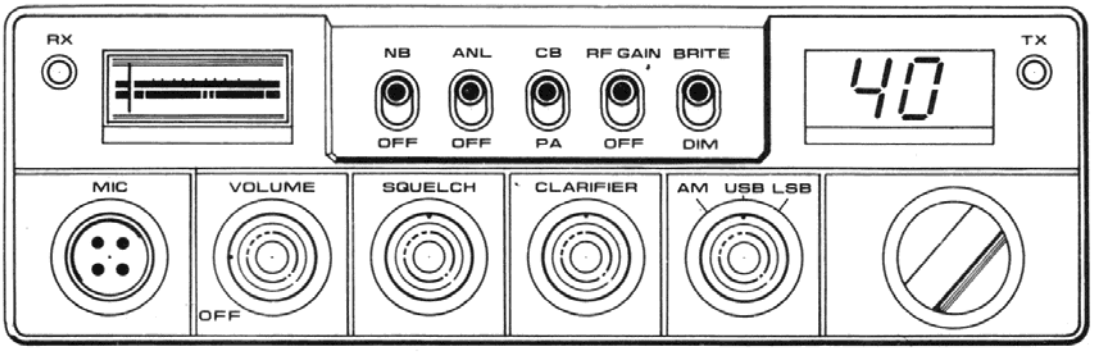
An external 8 ohms, 3 Watts speaker must be connected to the Public Address speaker jack (PA SP) on the rear panel when the transceiver is used as a Public Address system. The speaker should be directed away from the microphone to prevent acoustic feedback. Physical separation or isolation of the microphone and speaker is important when operating the PA at high output levels.

section II

operation

CONTROLS AND INDICATORS

There are ten controls and four indicators on the front panel of your PALOMAR SSB-500.



A. CONTROL FUNCTIONS

1. **OFF/ON VOLUME**: Turn clockwise to apply power to the unit and to set the desired listening level.

2. **SQUELCH**: This control is used to cut off or eliminate receiver background noise in the absence of an incoming signal. For maximum receiver sensitivity it is desired that the control be adjusted only to the point where the receiver background noise or ambient background noise is eliminated. Turn fully counterclockwise then slowly clockwise until the receiver noise disappears. Any signals to be received must now be slightly stronger than the average received noise. Further clockwise rotation will increase the threshold level which a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting.

3. **CHANNEL SELECTOR**: This switch selects any one of the 40 channels designated as Citizens Band channels desired. The selected channel is indicated digitally in the Channel Indicator LED (Light Emitting Diode) read-out provided above the Channel Selector switch.

Channel 9 has been reserved by the FCC for emergency communications involving the immediate safety of life of individuals or immediate protection of property. Channel 9 may also be used to render assistance to a Mortarist.

4. **LSB-USB-AM MODE SWITCH**: Selects mode of operation – Lower Sideband, Upper Sideband or standard AM.

5. **NB-OFF SWITCH**: "NB" position selects special RF noise reduction circuit (Noise Blanker) to combat ignition noise.

6. **ANL-OFF SWITCH**: In the ANL position, the Automatic Noise Limiter circuit is activated.

7. **CB-PA SWITCH**: Selects the mode of operation. The PA function should not be used unless an external speaker is connected as described in Section I, Installation Section. In the CB position, the PA function is disabled and the unit will transmit and received on the selected frequency.

8. **RF GAIN-OFF SWITCH**: Place this switch in RF GAIN position when usual operation or receiving week station. Place this switch in OFF position for strong station.

9. **BRITE-DIM SWITCH**: Controls the brightness of the LED channel indicator for optimum intensity. In the BRITE position for day driving and in DIM position for night time driving.

10. **CLARIFIER**: This control permits slight adjustment of receiver tuning. Used for clarity on SSB reception and fine tuning of stations on AM reception.

B. INDICATOR FUNCTIONS

1. **SIGNAL STRENGTH/POWER OUTPUT METER**: Shows relative incoming signal strength when receiving and relative transmit power when transmitting.

2. **TX (TRANSMIT) LAMP**: This lamp will illuminate during transmit mode of operation.

3. **RX (RECEIVE) LAMP**: This lamp will illuminate during receive mode or PA mode of operation.

4. **CHANNEL INDICATOR**: This is an LED (Light Emitting Diode) which shows the channel selected by Channel Selector switch.

C. PUSH-TO-TALK MICROPHONE WITH REMOTE VOLUME GAIN

The receiver and transmitter are controlled by the Push-to-Talk switch on the microphone. Press the switch and the transmitter is activated; release switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. Rotate the remote volume – gain knob on microphone to increase or decrease your modulation level. The radio comes complete with the low impedance dynamic microphone (supplied).

D. OPERATING PROCEDURE TO RECEIVE:

1. Rotate the Squelch Control to the fully counter clockwise position initially.
2. Set the CB-PA Switch to the CB position.
3. Set the Clarifier Control to the center (12 o'clock) position.
4. Set the LSB-USB-AM Switch to either AM for standard AM reception or LSB or USB, depending on whether signal to be received is on the Upper or Lower sideband.
5. Set the NB-OFF switch in the OFF position initially.
6. Select desired channel (1 – 40) by rotating the Channel Selector switch to the desired position.
7. Rotate the Volume Control with Power Switch clockwise to apply power to the transceiver. Since the transceiver is fully transistorized, operation will be instantaneous. Continue rotating the Volume control clockwise to provide a comfortable listening level.
8. If necessary, adjust RF GAIN-OFF and ANL switches for clearer reception.

E. OPERATING PROCEDURE TO TRANSMIT ON AM AND SSB:

WARNING: NEVER ATTEMPT TO TRANSMIT WITHOUT AN ANTENNA OR DUMMY LOAD CONNECTED TO THE TRANSCEIVER.

Before operating the transceiver, the followings MUST be done:

1. Valid Class D Citizens Band equipment license shall be posted at the main control (fixed) station location.
   NOTE: Operation under a Temporary Permit, FCC Form 555-B, which is furnished with your SSB–500, is permissible while your regular license application is being processed by the FCC.