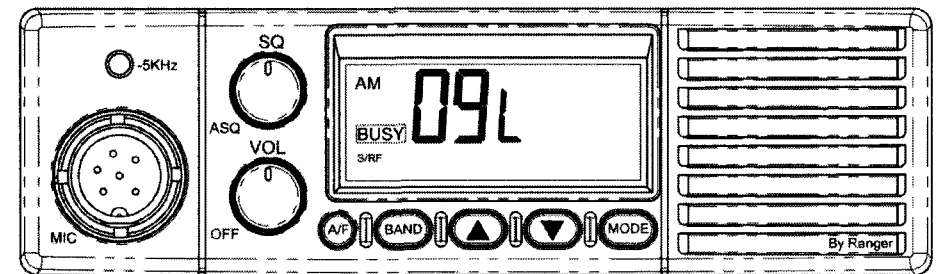


# Mirage MX-25

## AM/FM

### Amateur Transceiver



P/N:ATHUNT010B  
Printed in Malaysia

## User's Manual

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## SPECIFICATIONS

### GENERAL

Model	Mirage MX-25
Channels	120
Frequency Range	28.315~29.655 MHz
Emission	AM/FM
Frequency Control	Phase-Lock-loop (PLL) Synthesizer
Frequency Stability	0.001%
Temperature Range	-20°C to +50°C
Antenna Impedance	50 Ohms
Antenna Connectors	Standard SO-239 type
Input Voltage	13.8V DC
Size	140 (W) x 150 (D) x 41 (H) m/m
Weight	1 kg.

### TRANSMITTER

RF Power Output	AM: 10W,FM:10W
Spurious Emission	More than -60 dB
Audio Distortion	10%
Frequency Response	300 to 2500 Hz
Microphone	CONDENSER MIC

### RECEIVER

Sensitivity	AM: 1.0 uV for 10dB Sinad
	FM: 0.5 uV for 20dB Sinad
Squelch Sensitivity	< 0.5 uV
Image Rejection	More than 60 dB
AGC Figure of Merit	100 mV for 10dB Change in Audio Output
Audio Power Output	3W @ 10% Distortion
Audio Response	300 to 2500 Hz

(SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE)

## 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 automobile, the transceiver is usually mounted the dash panel with the microphone bracket beside it.

### MOUNTING THE RADIO

The transceiver is supplied with a universal mounting bracket. When mounting the bracket and radio to your car, make sure it is mechanically strong. In addition, provide a good electrical connection 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 will interfere with mounting it in the desired position remove 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 transceiver antennas are terminated with a type PL-259 plug and mate with the receptacle.
3. Connect the red DC power input wire (with the fuse) to +13.8V DC. This wire extends from the rear panel. In automobile installation, +13.8V 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.
4. Connect the black lead to -13.8V DC. This is usually the chassis of the car. Any convenient location with good electrical contact (remove paint) may be used.
5. Mount the microphone bracket on the right side of the transceiver, using two screws supplied. When mounting in an automobile, place the bracket under the dash so that microphone is readily accessible.

## INSTALLATION

### IGNITION NOISE INTERFERENCE

Use of a mobile receiver at low signal levels is normally limited by the presence of electrical 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. In addition, when extremely low-level signals are being received, the transceiver may be operated with vehicle's engine turned off. The unit requires very little current, therefore will not significantly discharge the vehicle's battery.

Even though the transceiver has ANL and NB controls, in some installation ignition interference may be high enough to make good communications impossible. The electrical noise may come from several sources. Many possibilities exist, as variations between vehicles require different solutions to reduce the noise.

### ANTENNA

A vertically polarized, quarter-wavelength whip antenna provides the most reliable operation and greatest range. Shorter, loaded-type whip antennas are more attractive, compact and adequate for applications where the maximum possible distance is not required. In addition, loaded whips do not present the problems of high wind resistance imposed by a full quarter-wavelength 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 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 good metal electrical ground in the vehicle. When installed in a boat, the transceiver will not operate at maximum efficiency without a ground plate, 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.

## INSTALLATION

### TUNING THE ANTENNA FOR OPTIMUM S.W.R

Since there is such a wide variety of a base and mobile antenna, this section will strictly concern itself to the various types of mobile adjustable antennas.

Because the antenna length is directly related to the channel frequency, it must be tuned to resonate optimally on all channels of the transceiver. Channel 1 requires a longer antenna than Channel 40 because it is lower in its frequency of operation.

Due to the various methods of adjusting antennas for proper S.W.R. we have chosen what we think is the optimum method:

#### A. Antenna with adjustment screws (set screws)

1. Starts with the antenna extended and tighten the setscrew lightly enough so that the antenna can be lightly tapped with your finger for easy adjustment.
2. Set your transceiver to Channel 20. Press the PTT (push-to-talk) switch, and tap the antenna (making it shorter). The S.W.R meter will show a lower reading each time the antenna is tapped. By continuing to shorten the antenna, you will notice the S.W.R reading will reach a low point and then start rising again. This means that you have passed the optimum point for Channel 20.

Extend the antenna a short distance and again follow the procedure above. When the lowest point has been reached, switch to Channel 1 and then to Channel 40 and compare S.W.R readings. They should be almost equal.

#### NOTE

*The proper setting is achieved when the SWR is 1.5 or below, and when it has similar reading for channels 1 and 40.*

#### B. Antennas which must be cut to proper length

1. Follow the same procedure as above but adjust the length by cutting in 1/8" increments until a good match is obtained.
2. *Be very careful not to cut too much at one time, as once it is cut, it can no longer be lengthen.*
3. The whip is easily cut by filing a notch all the way around and breaking the piece off with pliers.

## INSTALLATION

If you are having difficulties in adjusting the antenna, check the following:

- a. All doors must be closed when adjusting the antenna.
- b. Make sure that the base of the antenna is grounded.
- c. Check your coaxial cable routing (it may be pinched when routed into the car).
- d. Try a different location in your car (keeping in mind the radiation pattern you wish).
- e. Is the antenna vertical?
- f. Try a different location in your neighborhood. Stay away from large metal objects when adjusting (metal telephone poles or light posts, fences, etc.).

#### NOTE

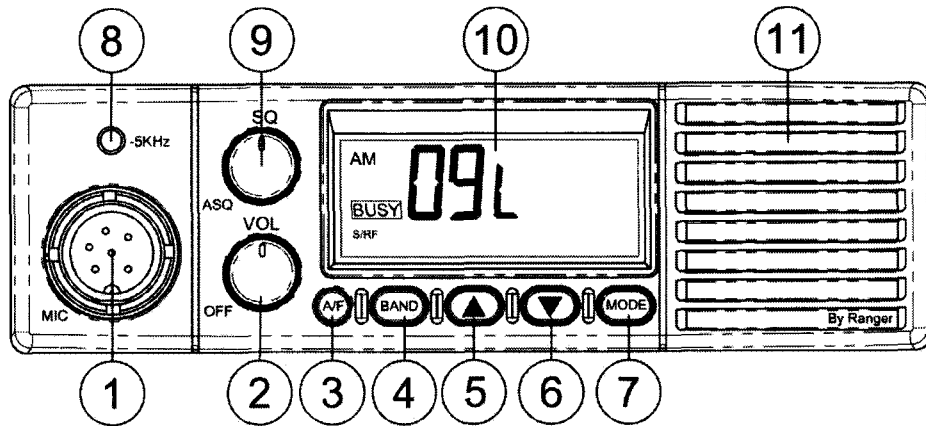
*The transceiver will operate into an SWR of 2 to 1 indefinitely and sustain an SWR of 2:1 for a maximum of 5 minutes at rated operating conditions.*

## EXTERNAL 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 4 watts. When the external speaker is plugged in, the internal speaker is disabled.

## OPERATION

### FRONT PANEL



1. **MICROPHONE JACK:** Used for connecting a microphone for voice source.
2. **ON/OFF VOLUME CONTROL:** This knob controls the volume and power to the radio. To turn radio on, rotate the knob clockwise. Turning the knob further will increase the volume of the receiver.
3. **A/F:** This button allows you to select one of the operating mode: AM or FM.
4. **BAND:** This button allows you to select J.K or I band for operation.
5. **UP SELECTOR:** This button is used for changing the channel.
6. **DOWN SELECTOR:** This button is used for changing the channel.
7. **MODE BUTTON:** This button allows you to select multiple setting modes.

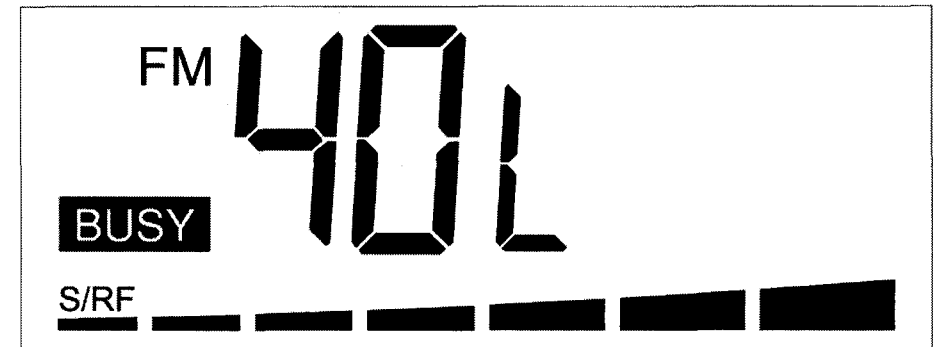
## OPERATION

8. **-5KHZ BUTTON:** In the -5KHz position, the transmit and receive frequency is shifted 5KHz down.
9. **AQL/SQ SQUELCH CONTROL:** This knob is used to select one of the functions: AQL (Auto Squelch) or Squelch. Squelch eliminates background noise being heard from the speaker, which can be disturbing when no transmissions are being received through the receiver. To use this feature, turn the knob fully counterclockwise and then slowly turn clockwise until the background noise is just eliminated. Further clockwise rotation will increase the threshold level that a signal must overcome in order to be heard. Only strong signals will be heard at a maximum clockwise setting. AQL shuts off weak transmissions and unwanted noise due to terrain and conditions, it slightly reduces the maximum range at which signals can be heard.
10. **LCD DISPLAY:** The LCD display indicates the operating functions.

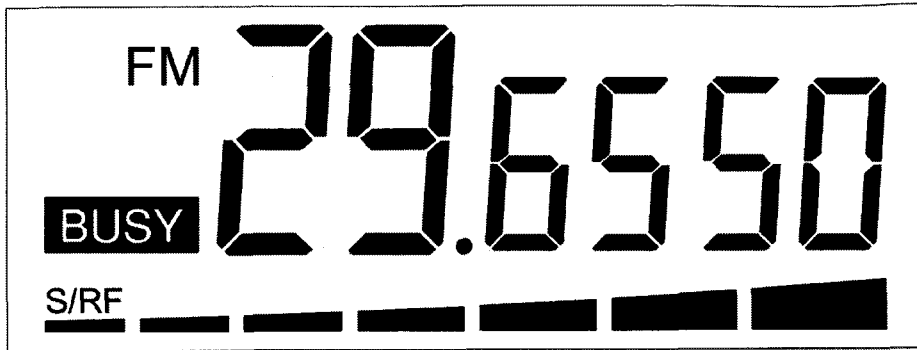
### LCD DISPLAY OPERATING INSTRUCTIONS:

Generally, Mirage MX-25 has two display modes:

1. Band and Channel Number



2. Frequency



In non-setting state:

A short press on the MODE key can shift the above two modes, and keep the display mode.

A short press on UP or Down to change the channel.

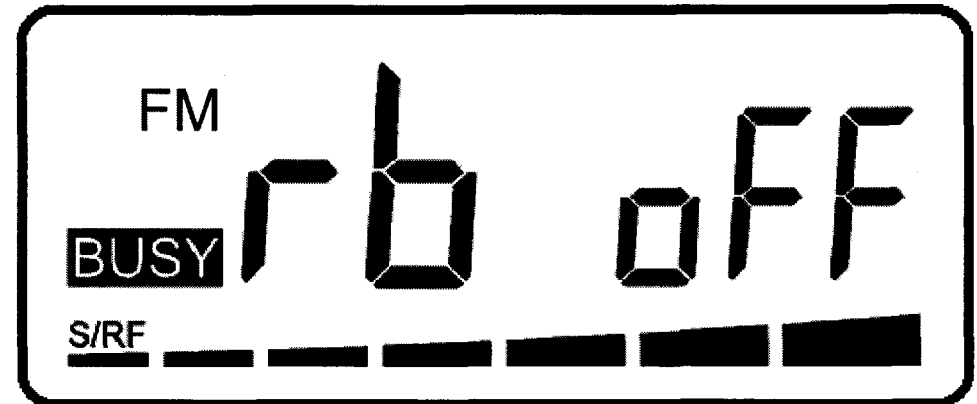
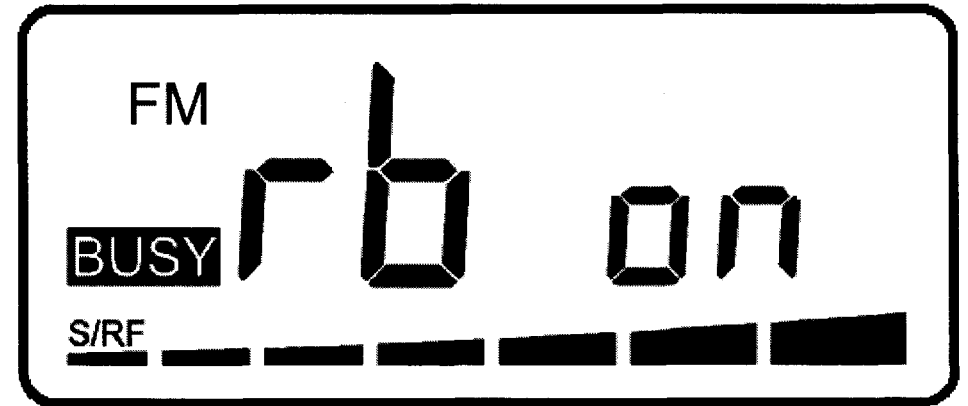
A long press on UP or DOWN for 3 seconds to enter into Scan channel.

A short press on the BAND key to select J,K,L Band.

A short press on the A/F key to select AM or FM.

A long press on MODE key for 3 seconds to enter into the setting RB mode.  
Press UP or DOWN to adjust ON or OFF.  
A short press on MODE to confirm, and enter into the next mode to set NB.  
(If no operations for 10 seconds, it will exit the setting mode automatically.)

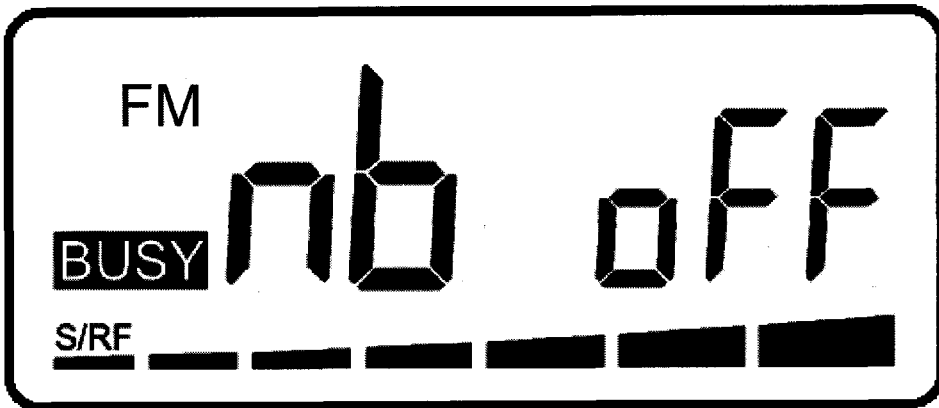
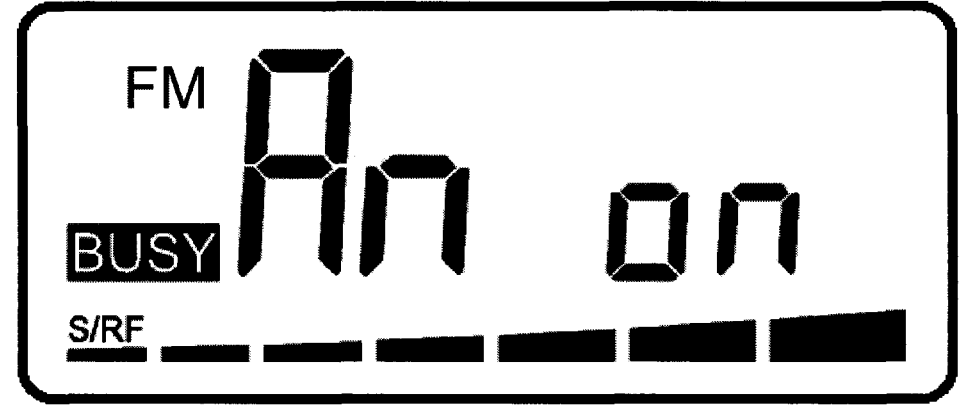
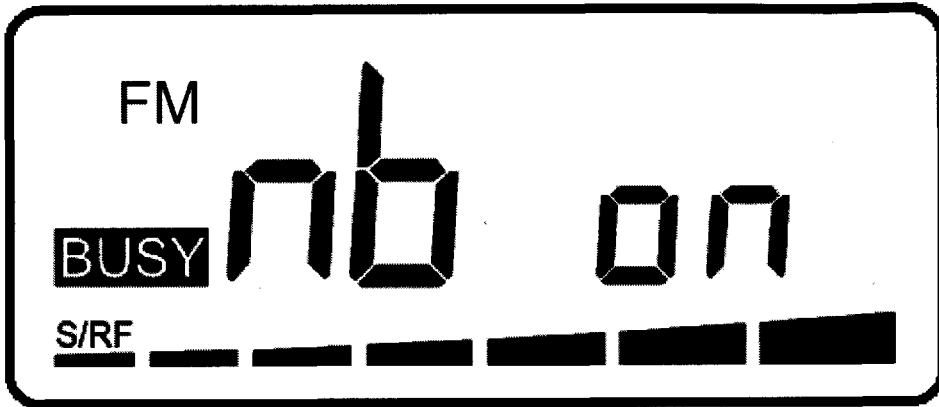
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Press UP or DOWN to adjust ON or OFF.  
Press MODE to confirm, and enter into the next mode to set ANL.  
(If no operations for 10 seconds, it will exit the setting mode automatically.)

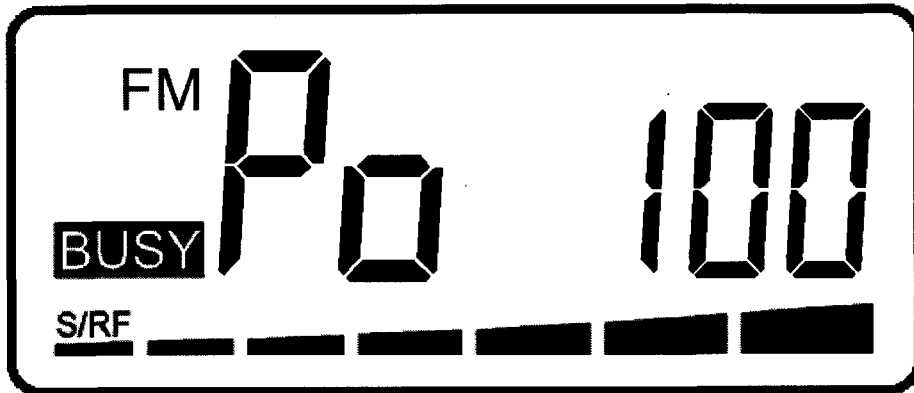
Press UP or DOWN to adjust ON or OFF.  
Press MODE to confirm, and enter into the next mode to set POWER.  
(If no operations for 10 seconds, it will exit the setting mode automatically.)

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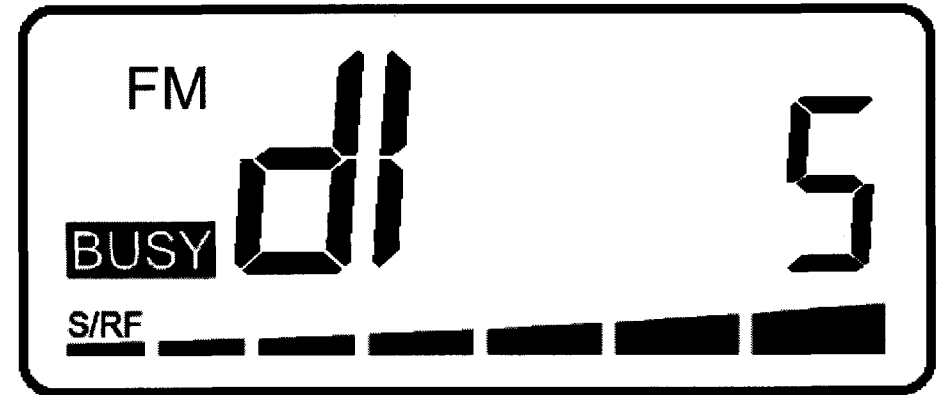
Press UP or DOWN to adjust Power HI or LOW.  
Press MODE to confirm, and enter into the next mode to set COLOUR.  
(If no operations for 10 seconds, it will exit the setting mode automatically.)

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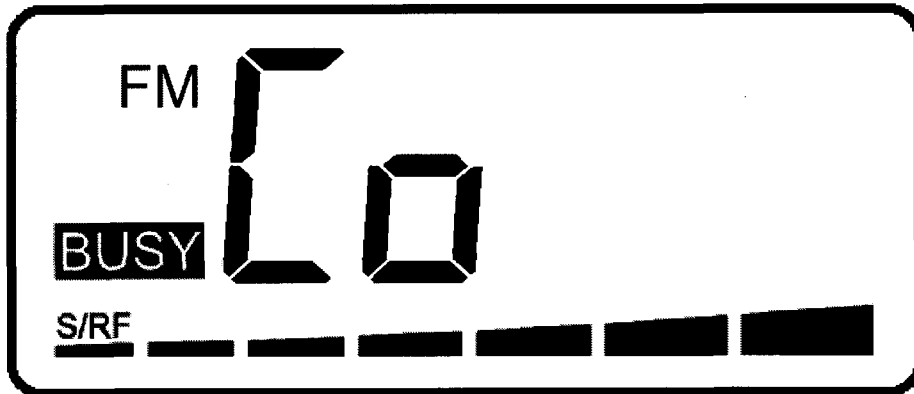
Press UP or DOWN to adjust the six different step bright light.  
Press MODE to confirm, and exit the setting mode.  
(If no operations for 10 seconds, it will exit the setting mode automatically.)

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Press UP or DOWN to adjust the backlight colour.  
Press MODE to confirm, and enter into the next mode to set DIMMER.  
(If no operations for 10 seconds, it will exit the setting mode automatically.)

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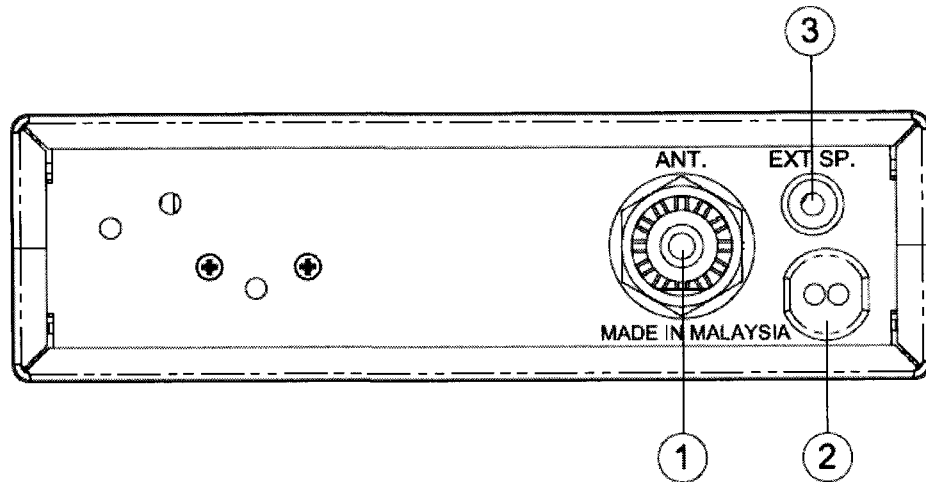


11. FRONT SPEAKER: The voice will output from this speaker.



## OPERATION

### REAR PANEL



1. **ANTENNA:** This jack accepts 50 ohms coaxial cable with a PL-259 type plug.
2. **DC POWER:** This accepts 13.8V DC power cable with built-in fuse. The power cord provided with the radio has a black and red wire. The black goes to negative and red goes to positive.
3. **EXT. SP:** This jack accepts 4 to 8 ohms, 5 watts external speaker. When the external speaker is connected to this jack, the built-in speaker will be disabled.

## FREQUENCY CHART

CHANNEL	J	K	L
1	28.315	28.765	29.215
2	28.325	28.775	29.225
3	28.335	28.785	29.235
4	28.355	28.805	29.255
5	28.365	28.815	29.265
6	28.375	28.825	29.275
7	28.385	28.835	29.285
8	28.405	28.855	29.305
9	28.415	28.865	29.315
10	28.425	28.875	29.325
11	28.435	28.885	29.335
12	28.455	28.905	29.355
13	28.465	28.915	29.365
14	28.475	28.925	29.375
15	28.485	28.935	29.385
16	28.505	28.955	29.405
17	28.515	28.965	29.415
18	28.525	28.975	29.425
19	28.535	28.985	29.435
20	28.555	29.005	29.445
21	28.565	29.015	29.465
22	28.575	29.025	29.475
23	28.605	29.055	29.505
24	28.585	29.035	29.485
25	28.595	29.045	29.495
26	28.615	29.065	29.515
27	28.625	29.075	29.525
28	28.635	29.085	29.535
29	28.645	29.095	29.545
30	28.655	29.105	29.555
31	28.665	29.115	29.565
32	28.675	29.125	29.575
33	28.685	29.135	29.585
34	28.695	29.145	29.595
35	28.705	29.155	29.605
36	28.715	29.165	29.615
37	28.725	29.175	29.625
38	28.735	29.185	29.635
39	28.745	29.195	29.645
40	28.755	29.205	29.655

## OPERATION

### PROCEDURE TO RECEIVE AND TRANSMIT

#### A. MICROPHONE

The receiver and transmitter are controlled by the push-to-talk switch on the microphone. Press the switch to transmit, release switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. This transceiver comes complete with a low impedance dynamic microphone.

#### B. PROCEDURE TO RECEIVE

1. Be sure that power source, microphone and antenna are connected to the proper connectors before going to the next step.
2. Turn **VOL** knob clockwise to apply power to the radio.
3. Set the **VOL** for a comfortable listening level.
4. Set the **MODE** switch to the desired mode.
5. Listen to the background noise from the speaker. Turn the **SQ** knob slowly clockwise until the noise just disappears. The **SQ** is now properly adjusted. The receiver will remain quiet until a signal is actually received. Do not advance the control too far or some of weaker signals will not be heard.
6. Set the **CHANNEL** selector switch to the desired channel.

#### C. PROCEDURE TO TRANSMIT

1. Select the desired channel of transmission.
2. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice.

## OPERATION

### ALTERNATE MICROPHONES AND INSTALLATION

For best results, the user should select a Condenser type microphone. The microphones must be provided with a four-lead cable. The audio conductor and its shielded lead comprise two of the leads. The third lead is for transmit control and fourth is for receiving control.

The microphone should provide the functions shown in schematic below.

#### 6 WIRE MIC CABLE

<u>Pin Number</u>	<u>Mic Cable Lead</u>
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	Receive Control
5	Channel Up
6	Channel Down

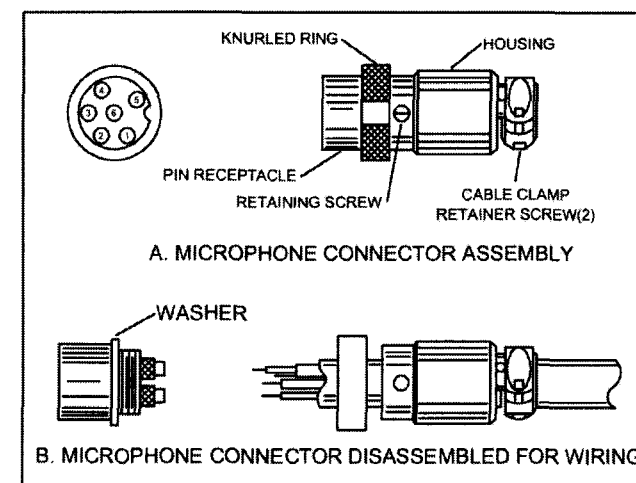


Fig. 1 Transceiver Microphone Schematic Diagram

## OPERATION

If the microphone to be used is provided with precut leads, they must be revised as follows.

1. Cut leads so that they extend 7/16" beyond the plastic insulating jacket of the microphone cable.
2. All leads should be cut to the same length. Strip the ends of each wire 1/8" and tin the exposed wire.

Before starting the actual wiring, carefully read the circuit and wiring information provided with the microphone you select. Use the minimum heat required in soldering the connections. Keep the exposed wire lengths to a minimum to avoid shorting when the microphone plug is reassembled.

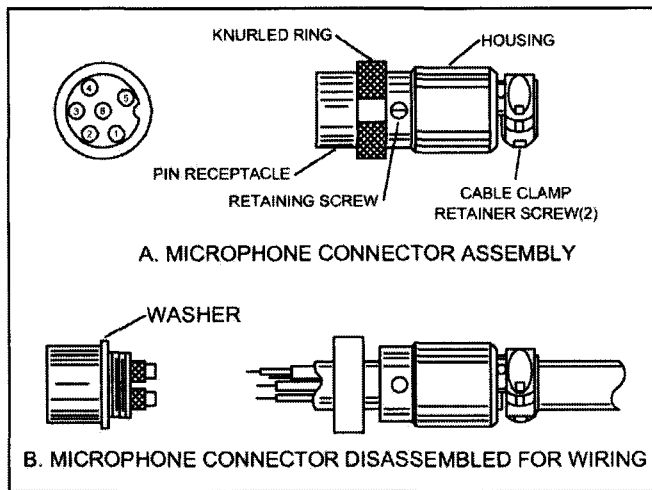


Fig. 2 Microphone plug wiring

To wire the microphone cable to the plug provided, proceed as follows:

1. Remove the retaining screw.
2. Unscrew the housing from the pin receptacle body.
3. Loosen the two cable clamp retainer screws.
4. Feed the microphone cable through the housing, knurled ring as shown Figure 2.

## OPERATION

5. The wires must now be soldered to the pins as indicated in the above wiring tables. If a vise or clamping tool is available, it should be used to hold the pin receptacle body during the soldering operation, so that both hands are free to perform the soldering. If a vise or clamping tool is not available, the pin receptacle body can be held in a stationary position by inserting it into the microphone jack on the front panel. Before soldering the wire to the pins, pre-tin the wire receptacle of each pin of the plug.

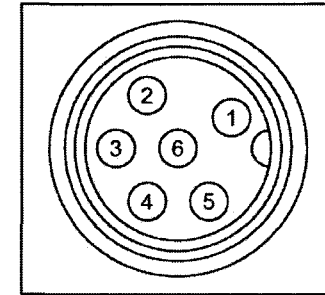


Fig. 3 Microphone plug pin numbers viewed from rear of pin receptacle.

6. Be sure that the housing and the knurled ring of Figure 2 are pushed back onto the microphone cable before starting to solder.
7. When all soldering connections to the pins of the microphone are completed, push the knurled ring and the housing forward and screw the housing onto the threaded portion of the pin receptacle body. Note the location of the screw clearance hole in the plug housing with respect to the threaded hole in the pin receptacle body. When the housing is completely threaded into the pin receptacle body, a final fraction of a turn either clockwise or counterclockwise may be required to align the screw hole with the threaded hole in the pin receptacle body. When these are aligned, the retaining screw is then screwed into place to secure the housing to the pin receptacle body.
8. The two cable clamp retainer screws should now be tightened to secure the housing to the microphone cord. If the cutting directions have been carefully followed, the cable clamp should be secure to the insulation jacket of the microphone cable.
9. Upon completion of the microphone plug wiring, connect and secure the microphone plug into the transceiver.

## OPERATION

### MAINTENANCE AND ADJUSTMENT

This transceiver is specifically designed for the environment encountered in base installations. The use of all solid state circuitry and its light weight result in high reliability. Should a failure occur, however, replace parts only with identical parts. Do not substitute.

#### NOTE

If the performance described in the OPERATION and MAINTENANCE AND ADJUSTMENT sections is not obtained, review the operating instructions to insure that proper procedures were followed.

## OPERATION

### A FEW RULES THAT SHOULD BE OBEYED

1. You are not allowed to carry on a conversation with another station for more than five minutes at a time without taking a one-minute break, to give others a chance to use the channel.
2. You are not allowed to blast others off the air by over-powering them with illegally amplified transmitter power, or illegally high antennas.
3. You cannot use the transceiver to promote illegal activities.
4. You are not allowed to use profanity.
5. You may not play music in your transceiver.
6. You may not use your transceiver to sell merchandised or professional service.

### HOW YOUR AMATEUR TRANSCEIVER CAN SERVE YOU

1. Warn of traffic tie-ups ahead.
2. Provide weather and road information.
3. Provide help fast in event of emergency or breakdown.
4. Suggest good spots to eat and sleep.
5. Make long trips more interesting, and help keep you awake.
6. Provide direct contact with your office or home.
7. Make friends for you as you travel.
8. Provide "local information" to find your destination.
9. Help law enforcement officers by reporting drunk and reckless drivers.

**MFMO**

**MEMO**

**MEMO**

**MEMO**