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Cobra 138 / 139 Owner's Manual Parts List

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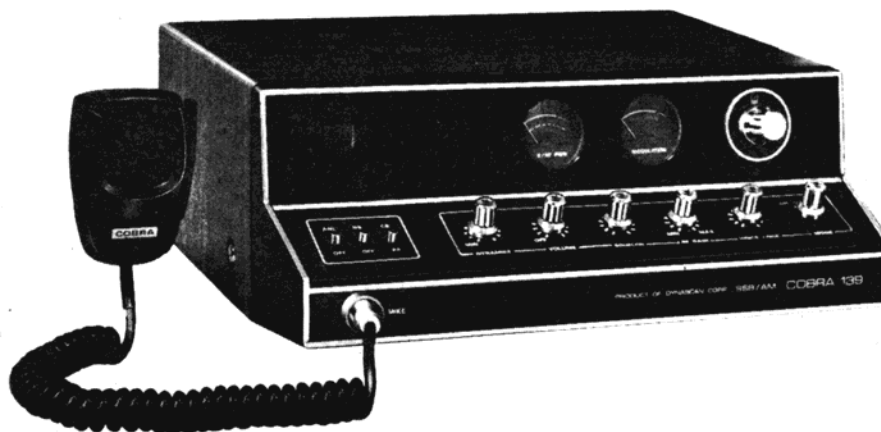
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INSTRUCTION MANUAL

COBRA¹³⁸ 139

SOLID STATE CITIZENS BAND SSB/AM TWO WAY RADIOS



A PRODUCT OF

DYNASCAN CORPORATION

1801 WEST BELLE PLAINE AVENUE, CHICAGO, ILLINOIS 60613



Dear CB'er:

Welcome to the expanding family of Cobra Communications users.

I hope you will find your Two-Way Radio Communications experience to be as exciting as it is practical. Whatever the purpose of your radio system, Cobra equipment is reliable and a pleasure to use. Dynascan takes special care to provide you with equipment that is compact, handsomely styled, and thoroughly dependable. Many years of valuable experience designing test equipment and other electronic products are behind our two-way communications systems. Premium quality solid-state components and integrated circuits are incorporated into Cobra radios to assure high performance and long life. Special attention is given to each detail to bring you the finest CB radio on the market today because we know that you take pride in your communication equipment.

If you have any comments or suggestions about Cobra, please send them to us. Communications is our business, and it is very important that we communicate with you.

Thank you for your confidence in Cobra two-way radio equipment. We hope you will consider our other fine Cobra products as the need arises.

Sincerely,

A handwritten signature in cursive script that reads "Carl Korn".

Carl Korn
President

INSTRUCTION MANUAL

FOR

COBRA 138 and 139
CITIZENS BAND SOLID STATE
2-WAY RADIOS

A PRODUCT OF
DYNASCAN CORPORATION
1801 W. BELLE PLAINE AVE., CHICAGO, ILLINOIS 60613

COBRA 138

specifications

GENERAL

Channels	23 AM, 23 LSB, 23 USB
Frequency Range	26.965 to 27.255 MHz
Frequency Control	Crystal synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Operating Temperature Range	-20°C to +50°C
Microphone	Plug-in type; dynamic with push-to-talk switch and coiled cord.
Input Voltage	13.8 VDC nominal, 15.9 V max., 11.7 V min. (positive or negative ground).
Current Drain	Transmit: AM full mod., 2.2A; SSB, 8 watts PEP output, 1.8A. Receiver: squelched, 0.5A; maximum audio output, 1.3A.
Size	2½" H, 7½" W, 10½" D.
Weight	5 pounds
Antenna Connector	UHF, S0239
Semiconductors	26 transistors, 2 field effect transistors, 2 integrated circuits, 58 diodes.
Meter	Illuminated; indicates relative power output and received signal strength.

TRANSMITTER

Power Input	AM, 5 watts SSB, 15 watts, P.E.P.
Modulation	AM, high and low level Class B.
Modulation Capability	100% – adjustable with DYNAMIKE microphone gain control.
Intermodulation Distortion	SSB: 3rd and 5th order, more than -25dB. 7th and 9th order, more than -35dB.
SSB Carrier Supression	More than -40dB
Unwanted Sideband	More than -45dB
Frequency Response	AM and SSB: 350 to 2500 Hz.
Output Impedance	50 ohms, unbalanced
SSB Filter	7.8 MHz, crystal lattice type 6dB @ 4.2 KHz 60dB @ 7.0 KHz
Output Indicators	Meter shows relative RF output power; red transmit lamp lights up.

RECEIVER

Sensitivity	SSB: Less than $.25\mu\text{V}$ for 10dB (S+N)/N at greater than $\frac{1}{2}$ watt of audio. AM: Less than $.75\mu\text{V}$ for 10dB (S+N)/N at greater than $\frac{1}{2}$ watt of audio.
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Selectivity	SSB and AM: 6dB @ 4.2 KHz, 60dB @ 7.0 KHz.
Cross Modulation	More than 55dB
Image Rejection	More than 50dB
I.F. Frequency	AM and SSB: 7.8 MHz
AM and SSB RF Gain Control	Adjustable for optimum signal reception.
Automatic Gain Control	(AGC): Less than 10dB change in audio output for inputs from 10 to 500,000 microvolts.
Squelch	Adjustable; threshold less than .5 μ V.
Noise Blanker	RF type, effective on AM and SSB.
Voice Lock Range	\pm 600 Hz
Audio Output Power	3.5 watts into 8 ohms
Frequency Response	350 to 2500 Hz
Distortion	Less than 10% at 3.5 watts output.
Built-in Speaker	8 ohms, round
External Speaker (Not Supplied)	8 ohms; disables internal speaker when connected.

PA SYSTEM

Power Output	3.5 watts into external speaker.
External Speaker for PA	8 ohms (not supplied)

COBRA 139

specifications

GENERAL

Channels	23 AM, 23 LSB, 23 USB
Frequency Range	26.965 to 27.255 MHz
Frequency Control	Crystal synthesizer
Frequency Tolerance	0.005%
Frequency Stability	0.001%
Operating Temperature Range	-20°C to +50°C
Microphone	Plug-in type; dynamic with push-to-talk switch and coiled cord.
Input Voltage	120 V AC 60 Hz nominal, 132 V AC maximum and 108 V AC minimum. 13.8 V DC nominal, 15.9 V DC maximum and 11.7 V DC minimum (positive or negative ground).
Power Consumption (120 VAC)	Transmit: full mod., 58.5 watts. Receive: squelched, 21 watts
Current Drain (13.8 VDC)	Transmit: AM full mod., 2.2 A; SSB, 8 watts P.E.P. output, 1.8 A. Receive: squelched, 0.5 A; full audio output, 1.3 A.
Size	5-3/4" H, 13-3/8" W, 12-5/8" D
Weight	10 pounds

Antenna Connector	UHF, S0239
Meters	Shows relative power output, received signal strength, and modulation.
Semiconductors	29 transistors, 2 field effect transistors, 2 integrated circuits, 65 diodes.

TRANSMITTER

Power Input	AM, 5 watts SSB, 15 watts, P.E.P.
Modulation	AM, high and low level Class B.
Modulation Capability	100% – adjustable with DYNAMIKE microphone gain control.
Intermodulation Distortion	SSB: 3rd and 5th order, more than -25dB. 7th and 9th order, more than -35db.
SSB Carrier Supression	More than -40dB
Unwanted Sideband	More than -45dB
Frequency Response	AM and SSB: 350 to 2500 Hz.
Output Impedance	50 ohms, unbalanced
SSB Filter	7.8MHz, crystal lattice type 6dB @ 4.2 KHz 60dB @ 7.0 KHz
Output Indicator	Meters show relative RF output power and modulation

RECEIVER

Sensitivity	SSB: Less than $.25\mu\text{V}$ for 10dB (S+N)/N at greater than $\frac{1}{2}$ watt of audio. AM: Less than $.75\mu\text{V}$ for 10dB (S+N)/N at greater than $\frac{1}{2}$ watt of audio.
Selectivity	SSB and AM: 6dB @ 4.2 KHz, 60dB @ 7.0 KHz.
Cross Modulation	More than 55dB
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Audio Output Power	3.5 watts into 8 ohms
Frequency Response	350 to 2500 Hz
Distortion	Less than 10% at 3.5 watts output.
Built-in Speaker	8 ohms
External Speaker (Not Supplied)	8 ohms, disables internal speaker when connected.

PA SYSTEM

Power Output	3.5 watts into external speaker.
External Speaker for PA	8 ohms (not supplied)

COBRA 138 & 139

instruction manual

introduction

The Cobra 138 and 139 transceivers described in this manual represent the most advanced SSB/AM two-way radios ever designed for use as Class D stations in the Citizens Radio Service. Both units feature a 23-channel crystal synthesizer which is used in the AM mode and in the upper and lower single sideband modes, providing complete coverage of all 23 channels shown below:

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

The Cobra 138 and 139 have vastly superior receivers which include RF gain control and noise blanker circuitry which is effective in both AM and SSB modes. The receivers also feature increased protection against cross modulation and strong adjacent channel signals.

To insure that you obtain the maximum performance from your two-way radio, please read carefully the following control descriptions and operating instructions.

NOTE: These transceivers have been designed for use in Class "D" operation in the 11 meter Citizens Radio Service. They are designed to meet the Federal Communications Commission requirements applicable to equipment operating in Class "D" service, and not to be used for any other purpose. Part 95 (formerly Part 19) of the F.C.C. regulations, defines operation in this service and you are required to read and understand these regulations prior to operating this equipment. Copies of Manual VI (covering the F.C.C. regulations for Amateur and Citizen's Band Radio Service) include Part 95 and are available for \$3.50

from the Division of Public Documents, U.S. Government Printing Office, Washington, D.C. 20402. You are also required to submit a completed copy of F.C.C. Form 505 prior to operating this equipment on the air. **YOU WILL BE IN VIOLATION OF PART 95 OF THE REGULATIONS IF YOU OPERATE THIS EQUIPMENT ON THE AIR PRIOR TO RECEIVING YOUR LICENSE AND CALL SIGNS.**

Warning: Transmitter section adjustments must be performed by a qualified technician holding a valid first or second class FCC Radiotelephone License.

section I

installation

COBRA 138

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 underneath the dash panel, with the microphone bracket beside it.

Mounting and Connection

The Cobra 138 is supplied with a universal mounting bracket. The transceiver is held in the bracket by four bolts, permitting adjustment to the most convenient angle.

The bracket must be mounted with the machine screws and nuts 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 transceiver:

1. After you have determined the most convenient location in your vehicle, hold the Cobra 138 with mounting in the exact location desired. If nothing will interfere with mounting it in the desired position, 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 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 DC power input wire with the fuse to +12V DC. This wire extends from the rear panel. In automobile installation, +12V DC is usually obtained from the accessory contact on the ignition switch. This prevents the set from 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.

NOTE

In positive ground automobiles the red wire goes to the chassis and the black wire is connected to the ignition switch.

4. Connect the black leads to -12V 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 or left side of the transceiver, using the two screws supplied. If it is desired to mount the microphone bracket to the dash of a car or boat, use the microphone bracket as a template to locate the mounting holes.

Antenna

Since the maximum allowable power output of the transmitter is limited 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 52 ohm transmission line to the radiating element. Most quality antennas previously suitable for use on AM also will be satisfactory for SSB. Due to the nature of an SSB transmitter, the VSWR must be kept below 2:1 or instability of the final amplifier might occur.

The recommended method of antenna tuning is to use an in-line watt-meter or VSWR bridge to adjust the antenna for minimum reflected power on channel 11 in the AM mode. When the antenna system is adjusted for proper matching in the mode, no further adjustment for SSB will be necessary. In mobile installations (cars, trucks, boats, etc.), an antenna system that is non-directional should be used.

A vertically polarized quarter-wavelength 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 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 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 S0239) 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 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.

Ignition Noise Interference

The usability of a mobile receiver at low signal levels is normally limited by the presence of electrical noise. The primary source of noise in automobile installations 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 turned off. The unit requires very little current and therefore, will not significantly discharge the vehicle battery.

Even though the Cobra 138 has a highly effective noise blanker for use in AM and SSB modes, 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 require different solutions to reduce the noise. Consult a skilled 2-way radio repairman for help in locating and correcting the source of severe noise.

Unfortunately, there is no hard and fast rule for the elimination of noise. The worst offender in marine installations will be the ignition systems of boats powered by gasoline engines. Generators on both gasoline and diesel engines, auxiliary generators, electric motors on refrigerators, bilge pumps, fans, etc., must be filtered by the use of a "spark shield" made to fit most common gasoline marine engines. These shields are easily installed and can be removed for spark plug and point servicing in less than a minute.

Auxiliary generators on cars and boats are quieted by installing capacitors. Use capacitors in metal cans and of the highest quality. We recommend that a 1.0 μ fd capacitor be used. This is larger than normally used in automobile installation, but the same capacitor can be used to filter other motors. Install capacitors at the generator armature terminal or, in extreme cases, directly on each brush holder. The metal can is connected to the generator frame. **NEVER CONNECT A CAPACITOR TO THE FIELD TERMINAL OF A GENERATOR.**

Voltage regulators on the generators are frequently a source of troublesome noise. Before attempting any filtering on the regulator have it cleaned and adjusted by an expert. If noise is still present, install capacitors on the

armature terminal of the regulator. Again, do not put a capacitor on the field terminal.

Base Station Operation (Operation from 110-120V AC, House Current)

To operate your transceiver from your home or office, using the regular house current as the power source, you will require a separate power supply capable of supplying two amps at a 13.8 volt DC output with a nominal input voltage of 120 volts AC, 50-60 Hz.

Base Station Antenna (See Cobra 139 Installation)

COBRA 139

Prior to beginning operation of the transceiver, a basic installation must be prepared. Installation of the transceiver itself is a rather simple procedure.

In selecting the location for the unit, two basic factors must be considered:

1. Access to a 120V, 60Hz power source.
2. The location must be convenient for running the antenna lead-in cable if an outside antenna installation is proposed.

Base Station Antenna

Since the maximum allowable power output of the transmitter is limited 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 52 ohm transmission line to the radiating element. Most quality antennas previously suitable for use on AM also will be satisfactory for SSB. Due to the nature of an SSB transmitter, the VSWR must be kept below 2:1 or instability of the final amplifier might occur.

The recommended method of antenna tuning is to use an in-line watt-meter or VSWR bridge to adjust the antenna for minimum reflected power on channel 11 in the AM mode. When the antenna system is adjusted for proper matching in the AM mode, no further adjustment for SSB will be necessary.

The radio may be used with any type of 52 ohm base station antenna. A ground plane vertical antenna will provide the most uniform horizontal coverage. This type of antenna is best suited for communication with a mobile unit.

For point-to-point operation where both stations are fixed, a directional

beam will usually increase communications range since this type of antenna concentrates transmitted energy in one direction. The beam antenna also allows the receiver to “listen” in only one direction thus reducing interfering signals.

Antenna height is an important factor when maximum range is desired. Keep the antenna clear of surrounding structures or foliage. FCC regulations limit antenna height to 20 feet above an existing structure.

Mobile Operation/Emergency Power Operation

It is possible to operate the Cobra 139 from an external 13.8V DC power supply for emergency power conditions or from an automobile battery for mobile operation (See Cobra 138 Installation Section for mobile suggestions). The Cobra 139 is supplied with a polarized plug for operation on external DC supply.

The plug is coded as follows:

Negative lead is black.

Positive lead is red and has the in-line fuse holder as an integral part of the positive lead.

COBRA 138 & 139

Public Address

An external 8 ohm, 3.5 watt speaker may be connected to the PA speaker jack located 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 feed-back. Physical separation or isolation of the microphone and speaker must be used when operating the PA at high output levels.

Remote Speaker

The external speaker jack (EXT. SPKR.) 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 3.5 watts.

When the external speaker is plugged in, the internal speaker is disconnected.

section II

operation

NOTE

Refer to Figure 1 for Cobra 138 and Figure 2 for Cobra 139. Paragraph numbers correspond to the numbered controls on each figure.

A. CONTROL FUNCTIONS

1. **DYNAMIKE.** This control is used to vary the amount of modulation in transmit. In PA operation this control sets the PA volume.
2. **OFF/ON VOLUME.** Turn clockwise to apply power to the unit and to set the desired listening level.
3. **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 signal 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.
4. **RF GAIN.** Adjust as required to optimize signal. This control is functional in both AM and SSB modes and is used primarily to optimize reception in strong signal areas. Gain is reduced by counterclockwise rotation of the control.
5. **VOICE LOCK.** Allows variation of both the transmitter and receiver operating frequencies above and below the assigned frequency. Although this control is intended primarily to tune in SSB signals it may be used to optimize AM signals as described in the Operating Procedure paragraphs.

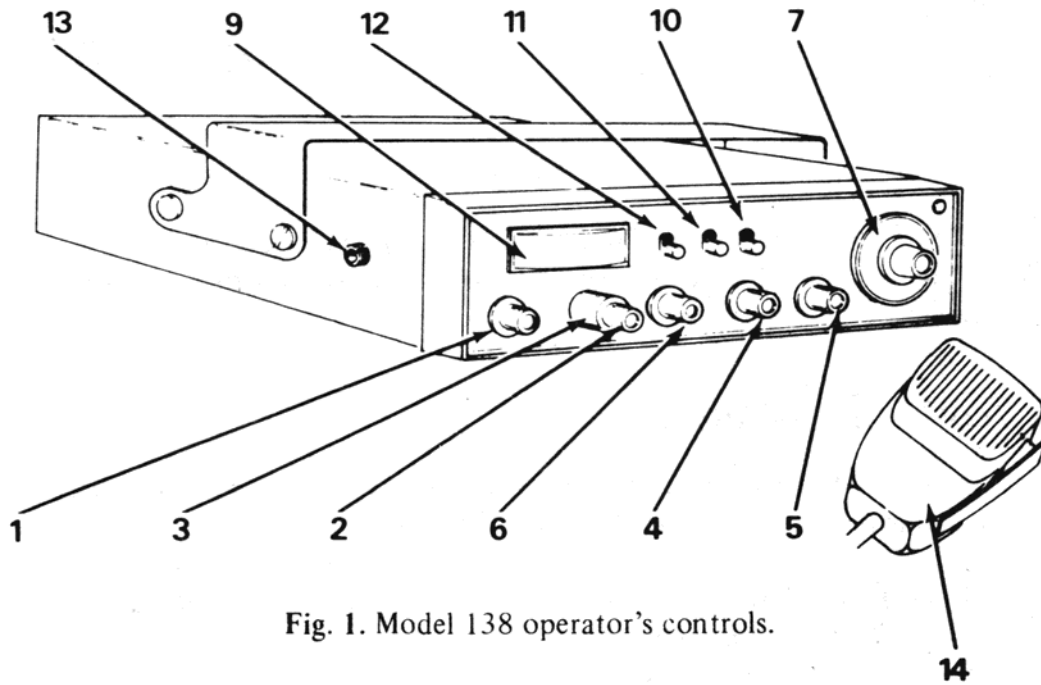


Fig. 1. Model 138 operator's controls.

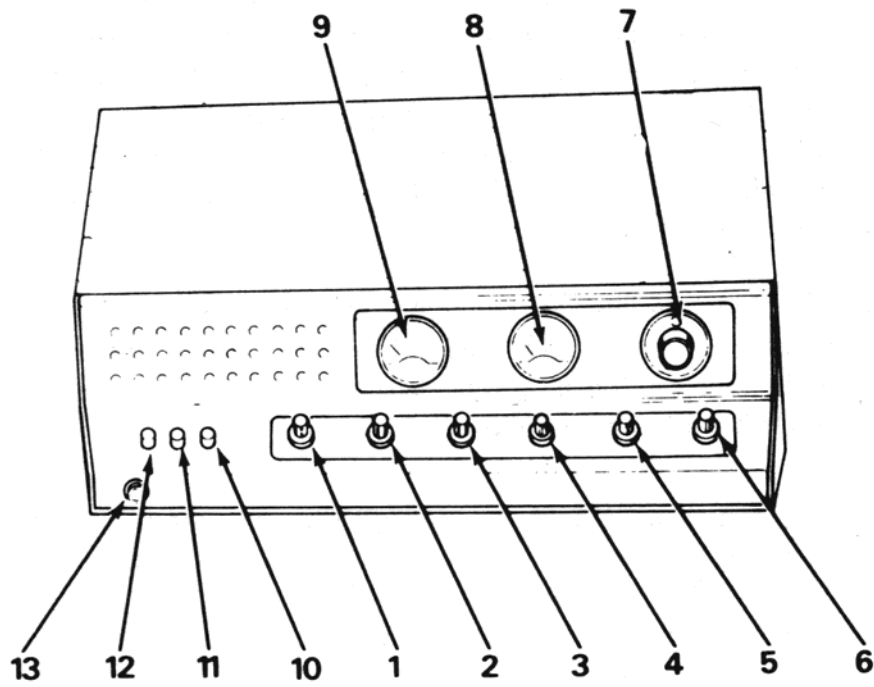


Fig. 2. Model 139 operator's controls.

6. **MODE.** This switch selects AM, USB or LSB mode of operation. Unless the station with which communication is desired is equipped with SSB, the AM mode is normally used. The mode selector switch changes the mode of operation of both transmitter and receiver simultaneously. An explanation of how to determine which mode to use is contained in the following paragraphs under Operating Procedure.
7. **CHANNEL SELECTOR.** This switch selects the desired channel for transmission and reception on both AM and SSB. Channels 10 thru 15 and 23 may be used for communications between stations operating under different licenses whereas all other channels, except Channel 9, may be used only between units operating under the same license. 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 also may be used to render assistance to a motorist. This is an FCC rule and applies to both AM and SSB modes of transmission.
8. **MODULATION METER.** The percent of modulation while transmitting can be observed on this meter. This meter is also used with the **Dynamike** control to set modulation.
9. **TRANSMIT POWER/S METER.** When the transceiver is in the receive mode, relative signal strength is indicated in S units on the lower scale of this meter. When transmitting, relative power output is indicated on the upper scale of this meter.
10. **PA-CB SWITCH.** Selects the mode of operation. The PA function should not be used unless an external speaker is connected as described in Installation Section of this manual. In the CB position, the PA function is disabled and the unit will transmit and receive on the selected frequency.
11. **NOISE BLANKER SWITCH.** Placing this switch in the NB position activates a highly effective, RF type, noise blanker circuit. This control functions in AM and SSB.
12. **ANL SWITCH.** In the ANL position the automatic noise limiter in the audio circuits is activated.
13. **MIC JACK.** The microphone is connected to this jack. A matching connector is supplied attached to the microphone. The following chart shows the pin functions:

COBRA 138	COBRA 139 Pin Number	Function
Sleeve	1	Audio Shield (Ground)
Tip	2	Audio Lead
Ring	3	Relay Control (PTT)

14. PRESS-TO-TALK MICROPHONE. The receiver and transmitter are controlled by the press-to-talk switch on the microphone. Press the switch and the transmitter is activated; release the switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. The radios come complete with the low impedance dynamic microphone.

B. OPERATING PROCEDURE TO RECEIVE (COBRA 138 AND 139)

1. Be sure that power source and antenna are connected to the proper connections before going to the next step.
2. Set PA-CB Switch to the CB position and turn unit on by turning VOL control clockwise.
3. Set the VOLUME 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 SQUELCH control slowly clockwise until the noise JUST disappears (no signal should be present). Leave the control at this setting. The SQUELCH 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 the weaker signals will not be heard.
6. Set the CHANNEL selector switch to the desired channel.
7. Set the RF gain control full clockwise for maximum RF gain.
8. Adjust the VOICE LOCK control to clarify the SSB signals or to optimize AM signals.

C. OPERATING PROCEDURE TO TRANSMIT (138 AND 139)

1. Select the desired channel.
2. If the channel is clear, depress the push-to-talk switch on the microphone and speak in a normal voice. The output lamp will light, indicating proportional output power.

CAUTION

Be sure the antenna is properly connected to the unit before transmitting. Transmitting without an antenna or with a poorly matched antenna (high SWR; over 2) can cause damage to the transmitter.

D. ACCESSORY CIRCUIT OPERATION

1. **NOISE BLANKER.** If excessive ignition noise interference is present, activate the noise blanker circuitry by placing the NB switch (#11) to the NB position.
2. **ANL OPERATION.** Slide the ANL switch to ANL position. It activates the noise reduction circuits of the automatic noise limiter in AM only.

E. PUBLIC ADDRESS (PA) OPERATION.

To use this feature a speaker having a voice coil impedance of 8 ohms and a power handling capability of at least three watts should be used. This speaker must be plugged into the PA SPKR jack at the rear of the transceiver. If the public address feature is to be used primarily for outdoor applications, the use of a weather-proof horn type public address speaker is recommended. The durability of this type speaker plus the inherent efficiency of such a speaker will provide more than adequate results when combined with the high audio output level available.

With the PA speaker connected as outlined previously, be sure that there is physical separation between the microphone and the speaker itself. If the speaker is located close to the microphone, acoustic feedback will result when the public address system is operated at high volume. A directional type outdoor speaker reduces the amount of isolation required. Some experimentation will determine the minimum amount of isolation required for a given sound level from the public address system. NOTE: Sound level is adjusted with DYNAMIKE Control.

F. RECEIVING SSB SIGNALS

There are three types of signals presently in use for communications in the Citizens Band; AM, USB, and LSB. When the MODE switch on your unit is placed in the AM position, only standard double sideband full carrier signals will be detected. An SSB signal may be recognized while in the AM mode by its characteristic Donald Duck sound and the inability of the AM detector to produce an intelligible output. The USB and LSB modes will detect upper sideband, lower sideband respectively, and standard AM signals.

SSB reception differs from standard AM reception in that the SSB receiver does not require a carrier or opposite sideband to produce an intelligible signal. A single sideband transmitted signal consists only of the upper or the lower sideband and no carrier is transmitted. The elimination of the carrier from the AM signal helps to eliminate the biggest cause of whistles and tones heard on channels which make even moderately strong AM signals unreadable. Also SSB takes only half the channel space allowed; therefore, two SSB conversations will fit into each channel, expanding the 23 AM channels to 46 SSB channels. The reduction in channel space required also helps in the receiver because only half of the noise and interference can be received with 100% of the SSB signal.

An SSB signal may be received only when the listening receiver is functioning in the same mode. In other words, an upper sideband signal (USB) may be made intelligible only if the receiver is functioning in the USB position.

If a lower sideband (LSB) signal is heard when the receiver is in the USB mode, no amount of tuning will make the signal intelligible. The reason for this may be understood if you consider that when modulation is applied to the transmitter's microphone in the USB mode, the transmitter's output frequency is increased whereas in the LSB mode the transmitter's output frequency is decreased. The result in listening to the receiver is that when the MODE switch is in the proper position (either USB or LSB), a true reproduction of single tone of modulation will result, and if the tone is increased in frequency (such as a low-pitched whistle to a high-pitched whistle) you will hear the increase in the output tone of the receiver. If the incorrect mode is selected, an increase in tone of a whistle applied to the transmitter will cause a decrease in the resultant tone from the receiver.

Thus when a voice is used in place of a whistle or tone, in the proper listening mode the voice will be received correctly whereas in the incorrect mode, the voice will be translated backwards and can not be made intelligible by the voice lock control. When listening to an AM transmission a correct sideband is heard in either mode since both upper and lower sideband are received.

Once the desired SSB mode has been selected, frequency adjustment may be necessary in order to make the incoming signal intelligible. The VOICE LOCK control allows the operator to vary frequency above and below the exact center frequency of the received signal. If the sound of the incoming signal is high or low pitched, adjust the operation of the VOICE LOCK. Consider it as performing the same function as a phonograph speed control. When the speed is set too high, voices will be high pitched and if set too low, voices will be low pitched. Also, there is only one correct speed that will make a particular record produce the same sound that was recorded. If the record is played on a turntable that rotates in the wrong direction (opposite sideband) no amount of speed control (VOICE LOCK) will produce an intelligible sound.

An AM signal received while listening in one of the SSB modes will produce a steady tone (carrier) in addition to the intelligence, unless the SSB receiver is tuned to exactly the same frequency by the VOICE LOCK control. For simplicity it is recommended that the AM mode be used to listen to AM signals.

section III

maintenance and adjustment

The Transceiver is specifically designed for the environment encountered in mobile installations. 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. Refer to the schematic diagram and parts list.

WARNING

Federal law requires that adjustment of the radio frequency section of this transceiver may not be made by a Citizens Band operator. Only a United States licensed first or second class commercial license holder may tune the transmitter sections of this transceiver (FCC part 95 D section 95.97d).

ADJUSTMENT

The transceiver is factory aligned and should not require any adjustments when used with a 50 ohm antenna. If an antenna other than 50 ohms impedance is used, adjustment of the transmitter output circuit may be made to obtain optimum power transfer to the antenna. This adjustment should be made only by qualified personnel using a high quality in-line r-f watt-meter which will not produce standing waves when inserted in the antenna cable.

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. If a problem still exists, refer to the WARRANTY SERVICE INSTRUCTIONS.

WARRANTY SERVICE INSTRUCTIONS

1. Refer to the instruction manual for adjustments that may be applicable.
2. Check common electronic parts. Always check instruction manual for applicable adjustments after such replacement.
3. Defective parts removed from units which are within the warranty period should be sent to the factory prepaid with model and serial number of product from which removed and date of product purchase. These parts will be exchanged at no charge.
4. If the above mentioned procedures do not correct the difficulty, pack the product securely using the same packing arrangement as supplied by the manufacturer. A detailed list of troubles encountered must be enclosed as well as your name and address. Forward prepaid (express preferred) to the nearest authorized DYNASCAN communication service agency.

Contact your local DYNASCAN Distributor for the name and location of your nearest service agency, or write to

Service Department
DYNASCAN CORPORATION
2815 W. Irving Park Rd.
Chicago, Illinois 60613

LIMITED 90-DAY WARRANTY

"DYNASCAN warrants that each product manufactured by it will be free from defects in material and workmanship under conditions of normal use and service for a period of ninety (90) days from the date of purchase from an authorized DYNASCAN distributor. DYNASCAN will, at its option, repair or replace any product or component not conforming with the foregoing warranty and which is returned, transportation prepaid, to our factory or our authorized service contractor. DYNASCAN shall not otherwise be liable for any damages, consequential or otherwise. DYNASCAN makes no other express warranties. Any implied warranties (including any warranty of merchantability) are limited in duration to ninety (90) days from the date of purchase. This warranty does not apply to (i) damage resulting from unauthorized alterations and repairs, misuse, negligence or accident; or (ii) damage resulting from improper installation, connection or adjustment otherwise than in accordance with DYNASCAN's product instructions. This warranty is void if the serial number has been altered, defaced or removed. DYNASCAN reserves the right to discontinue any model at any time or change specifications or design without notice and without incurring any obligation. To register this warranty, the enclosed DYNASCAN warranty registration card should be completed and mailed to DYNASCAN, 1801 W. Belle Plaine Avenue, Chicago, Illinois 60613, within five (5) days after date of purchase.



DYNASCAN CORPORATION

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