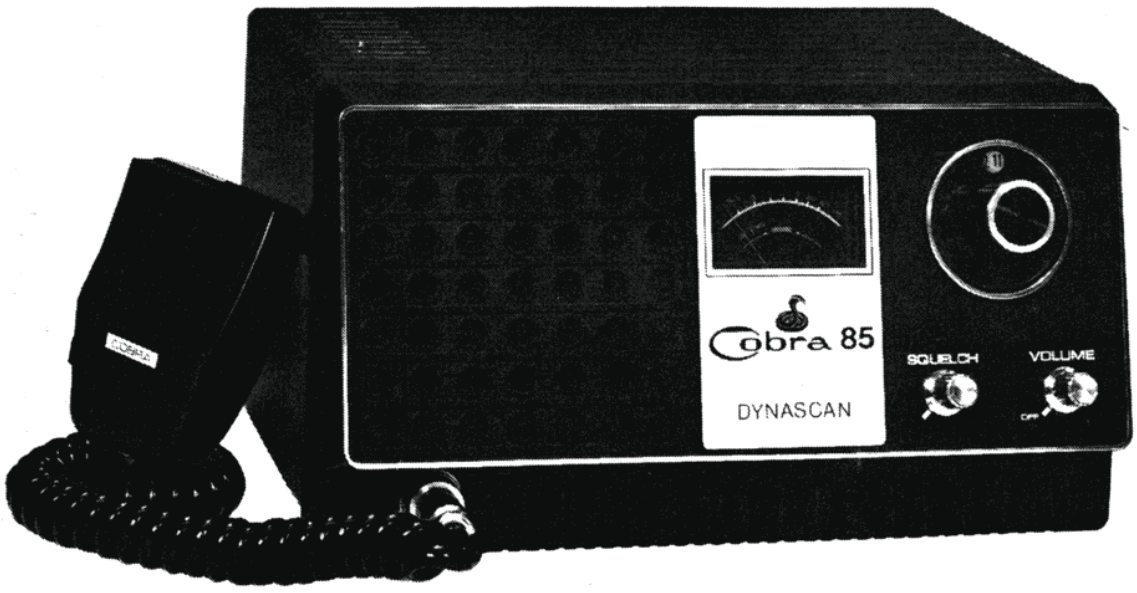
INSTRUCTION MANUAL

COBRA 85

SOLID STATE CITIZENS BAND 2-WAY RADIO



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,

Carl Korn

Carl Korn
President

INSTRUCTION MANUAL

FOR

COBRA 85
CITIZENS BAND SOLID STATE
2-WAY RADIO

A PRODUCT OF

DYNASCAN CORPORATION

6460 WEST CORTLAND ST. / CHICAGO ILL. 60635

GENERAL

Channels	23
Frequency Range	26.965 to 27.255 MHz.
Frequency Control	Crystal synthesizer.
Frequency Tolerance	0.005%
Operating Temperature Range	-30°C to + 50°C.
Microphone	Plug-in type; dynamic, 500 ohms.
Input Voltage	13.8 VDC nom. (reversible ground). 120 VAC, 60 Hz nominal
Current Drain (13.8 VDC)	*Transmit:* AM full mod. 1.8A. *Receive:* Squelched, 0.4A; full audio output, 1.3A.
Power Consumption (120VAC)	*Transmit:* Full modulation, 60 watts. *Receive:* Squelched, 25 watts; full audio, 45 watts.
Size	8-1/4" L x 7-1/2" W x 5-5/16" H
Weight	7.5 lbs.
Antenna Connector	UHF, SO239.
Semiconductors	24 transistors, 20 diodes.
Meter	Illuminated; indicates relative power output and received signal strength.

TRANSMITTER

Power Input	5 watts.
Modulation	High and low level Class B.
Modulation Capability	100%.
Frequency Response	500 – 2000 Hz.
Output Impedance	50 ohms, unbalanced.

RECEIVER

Sensitivity	Less than 1 μV for 10 dB (S+N)/N.
Selectivity	6 dB @ 4 KHz, 50 dB @ 20 KHz.
Image Rejection	40 dB.
I.F. Frequencies	Double conversion, 1st: 7.8 MHz. 2nd: 455 KHz.
Automatic Gain Control (AGC)	Less than 20 dB change in audio output for inputs from 10 to 50,000 μV.
Squelch	Adjustable; threshold less than 1 μV.
Audio Output Power	2.0 watts into 8 ohms.
Frequency Response	500 – 2000 Hz.
Distortion	Less than 10% @ 1.0 watt @ 1000 Hz.
Built-in Speaker	8 ohms, round.
External Speaker (Not supplied)	8 ohms; disables internal speaker when connected.

COBRA 85 instruction manual

introduction

The Cobra 85 has been designed to provide high level, trouble-free performance in the Citizens Radio Service which is comprised of the following frequency assignments:

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

WARNING

1. Operation of this equipment requires a valid Station License issued by the Federal Communications Commission. Do not transmit with your equipment until you have received your License. Illegal operation can result in severe penalties. Be certain you have read Part 95 of the F.C.C. Rules and Regulations, before operating your station.

2. License applications are to be made on F.C.C. Form 505, available from your nearest F.C.C. field office. (A copy of this form is included with your new Cobra transceiver.)

3. You are required to maintain a current copy of Part 95 of the F.C.C. Rules, as part of your Station records. Copies of Part 95 are available from the Superintendent of Documents, GPO, Washington, D.C. 20402.

4. Your Station License is to be posted in accordance with Paragraph 95.101 of the Rules and an executed Transmitter Identification Card (F.C.C. Form 452-C) is to be attached to each transmitter. (A copy of this form also is included with your new Cobra transceiver.)

5. F.C.C. Rules require that ALL transmitter adjustments other than those supplied by the manufacturer as front panel operating controls, be made by, or under the supervision of, the holder of an F.C.C.-issued 1st or 2nd Class Radio Operator License.

6. Replacement or substitution of crystals, transistors, regulator diodes or any other part of a unique nature, with parts other than those recommended by Dynascan, may cause violation of the technical regulations of Part 95 of the F.C.C. Rules, or violation of the Type Acceptance requirements of Part 2 of the Rules.

section I

installation

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, 60 Hz 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 F.C.C. the antenna is the most 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.

The recommended method of antenna tuning is to use an in-line watt-meter or VSWR bridge to adjust the antenna tuning for minimum reflected power on channel 11.

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 communications with a mobile unit. For point-to-point operation where both stations are fixed, a directional beam will usually increase communicating 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. F.C.C. regulations limit antenna height to 20 feet above an existing structure.

Mobile Operation/Emergency Power Operation

It is possible to operate the Cobra 85 from an external 13.8V DC power supply for emergency power conditions or from an automobile battery for mobile operation. The Cobra 85 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 have the in-line fuse holders as an integral part of the positive lead.

Remote Speaker

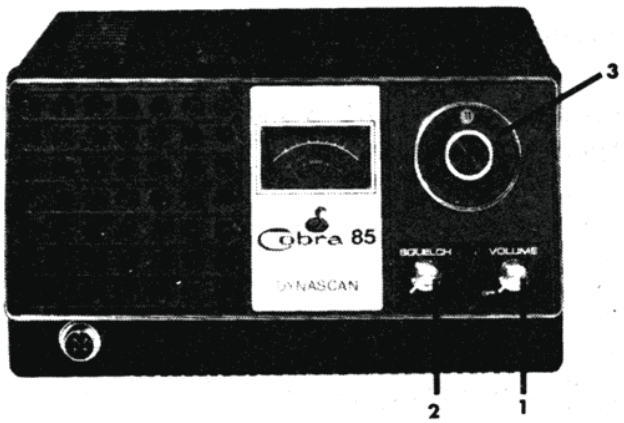
The external speaker jack (EXT. SPKR.) on the rear panel is used for remote receiver monitoring. The external speaker should have 8 ohms impedance and be able to handle at least 3.5 watts.

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

section II
operation

CONTROLS AND INDICATORS

There are three controls and one indicator on the front panel of your Cobra 85.



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 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.

3. **CHANNEL SELECTOR.** This switch selects any one of the twenty-three Citizens Band channels desired. The selected channel is illuminated in the rectangular portion of the Channel Selector dial directly above the Channel Selector knob. Channels 10 thru 15 and 23 may be used for communications between stations operating under the same license. Channel 9 has been reserved by the F.C.C. 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 motorist.

B. PWR/S METER. Shows relative transmitter power when transmitting and input signal strength when receiving. Illuminated when power is on.

C. 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 switch to receive. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice. The radio comes complete with the low impedance dynamic microphone.

D. OPERATING PROCEDURE TO RECEIVE

1. Turn the set ON by turning the VOLUME control clockwise, until a click is heard.
2. Set the VOLUME for a comfortable listening level.
3. 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.
4. Set the CHANNEL selector switch to the desired channel.

E. OPERATING 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. The output meter will indicate proportional output power.

section III

maintenance and adjustment

The transceiver is specifically designed for the environment encountered in base stations and mobile 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. Refer to the schematic diagram and parts list.

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 RF wattmeter 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 **WARRANTY SERVICE INSTRUCTIONS** on page 16 of this manual.

appendix A

ALTERNATE MICROPHONES AND INSTALLATION

For best results, the user should select a low-impedence dynamic type microphone or a transistorized microphone. The transistorized type microphones have a low output impedance characteristic. Some microphones are provided with a four-lead cable. The audio conductor and its shielded lead comprise two of the leads. The third lead is the push-to-talk lead for the transceiver keying circuit, and the fourth lead is the push-to-talk ground return. The following table indicates the wiring arrangement for both types of microphone cables:

3-Wire Mic Cable		4-Wire Mic Cable	
Pin Number	**Mic Cable Lead**	**Pin Number**	**Mic Cable Lead**
1	Audio Shield	1	Audio Shield
2	Audio Lead	2	Audio Lead
3	Relay Control (PTT)	3	Relay Control (PTT)
4	Connect to Pin 1	4	Relay Control Ground

If the microphone to be used is provided with pre-cut leads, they must be revised as follows:

1. The leads should be cut so that they extend 7/16" beyond the plastic insulating jacket of the microphone cable. See Fig. 1 below.

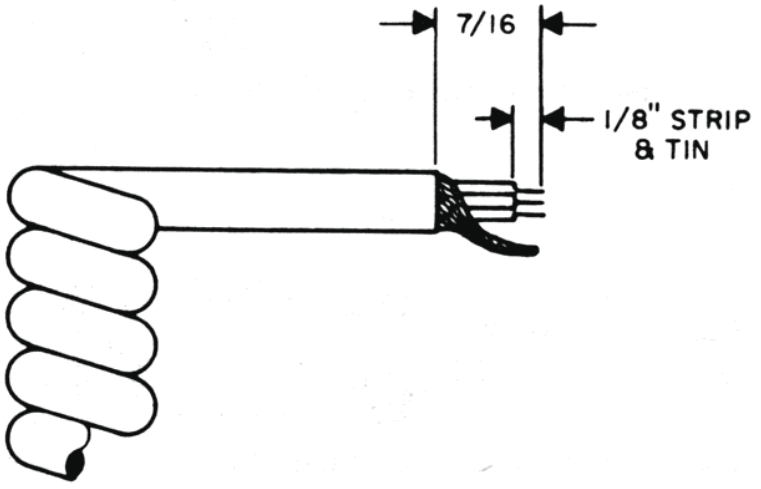


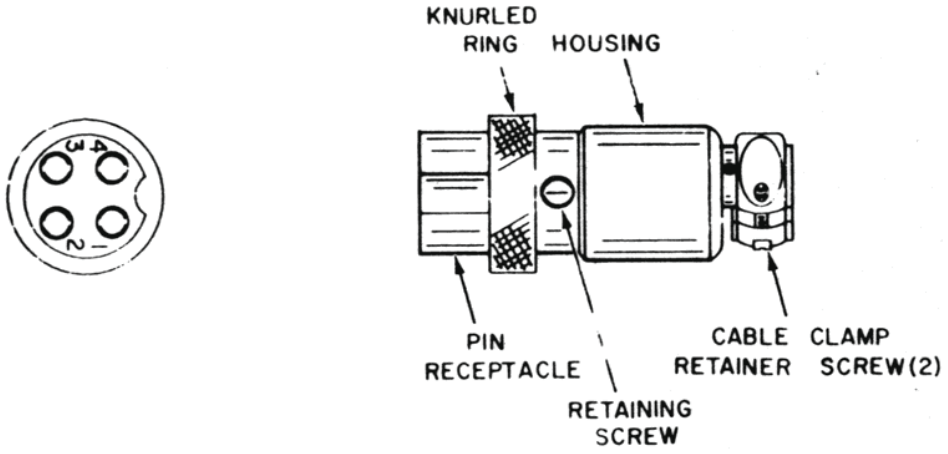
Fig. 1. Microphone cable preparation

2. All leads should be cut to the same length. Strip the ends of each wire 1/8" and tin the exposed wire.

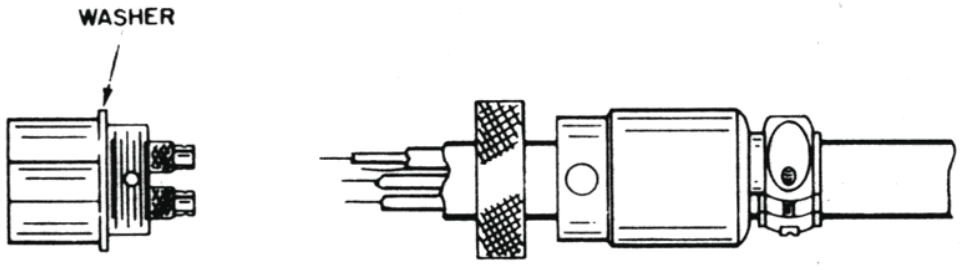
Before beginning the actual wiring, read carefully the circuit and wiring information provided with the microphone you select. Use the minimum heat required in soldering the connections. Keep the exposed wire lengths to a minimum to avoid shorting when the microphone plug is reassembled.

To wire the microphone cable to the plug provided, proceed as follows (see Fig. 2):

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 and washer as shown in Fig. 2B.



A. MICROPHONE CONNECTOR ASSEMBLY



B. MICROPHONE CONNECTOR DISASSEMBLED FOR WIRING

Fig. 2. Microphone plug wiring

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 of the front panel. The numbers of the pins of the microphone plug are shown in Fig. 3, as viewed from the back of the plug. Before soldering the wire to the pins, pre-tin the wire receptacle of each pin of the plug.

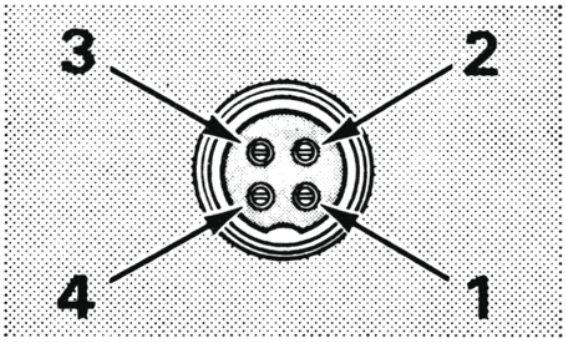


Fig. 3. Microphone plug pin numbers viewed from rear of pin receptacle

Be sure that the housing and the knurled ring of Fig. 2 are pushed back onto the microphone cable before starting to solder. If the washer is not captive to the pin receptacle body, make sure that it is placed on the threaded portion of the pin receptacle body before soldering.

If the microphone jack is used to hold the pin receptacle during the soldering operation, best results are obtained if the connections to pins 1 and 4 are made first and then the connections to pins 2 and 3. Use a minimum amount of solder and be careful to prevent excessive solder accumulation on the pins, which could cause a short between the pin and the microphone plug housing.

6. When all soldering connections to the pins of the microphone plug are complete, 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 onto 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.

7. 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 secure to the insulating jacket of the microphone cable.

8. Upon completion of the microphone plug wiring, the microphone plug is then secured to the front panel MIC connector.

appendix B

10-CODE

Citizens Band radio operators have largely adopted the 10-code for standard questions and answers. Its use permits faster communications and better understanding in noisy areas. The following table lists some of the more common codes and their meanings.

Code	Meaning	Code	Meaning
10-1	Receiving poorly	10-10	Standing by
10-2	Receiving well	10-13	Advise road/weather conditions
10-3	Stop transmitting	10-20	What is your location?
10-4	OK	10-33	Emergency traffic
10-7	Out of service	10-36	Correct time
10-8	In service	10-41	Switch to channel
10-9	Repeat	10-99	Cannot copy you

WARRANTY SERVICE INSTRUCTIONS

1. Refer to instruction manual for adjustments that may be applicable.

2. 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.

3. If the above-mentioned procedures do not correct the difficulty, pack the product securely using the same packaging 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 Dynascan-authorized Cobra Communications service agency.

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

Service Department

Cobra Communications Product Group
DYNASCAN CORPORATION
2815 West Irving Park Road
Chicago, Illinois 60618

90-DAY LIMITED WARRANTY

"DYNASCAN warrants that each product manufactured by it will be free from defects in materials and workmanship under normal usage and service for a period of ninety days after its purchase new from an authorized COBRA distributor. Our obligation under this warranty is limited to repairing or replacing any product or component which we are satisfied does not conform with the foregoing warranty and which is returned to our factory or our authorized service contractor, transportation prepaid, and we shall not otherwise be liable for any damages, consequential or otherwise. *The foregoing warranty is exclusive and in lieu of all other warranties (including any warranty of merchantability), whether expressed or implied.* Such warranty shall not apply to any product or component (i) repaired or altered by anyone other than DYNASCAN or its authorized service contractor (except normal tube replacement) without DYNASCAN's prior written approval; (ii) tampered with or altered in any way or subjected to misuse, negligence or accident, (iii) which has the serial number altered, defaced or removed; or (iv) which has been improperly connected, installed or adjusted otherwise than in accordance with DYNASCAN's instructions. DYNASCAN reserves the right to discontinue any model at any time or change specifications or design without notice and without incurring any obligation. *The warranty shall be void and there shall be no warranty of any product or component if a DYNASCAN warranty registration card is not properly completed and postmarked to the DYNASCAN factory within ten days after the purchase of the product new from an authorized COBRA distributor.*

Cobra

DYNASCAN CORPORATION

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480-164-9-001