



**Cobra 86XLR  
40-Channel  
Citizens Band 2-Way  
Base Station Radio**



Cobra Communications Product Group  
DYNASCAN CORPORATION  
6460 W. Cortland Street  
Chicago, Illinois 60635

# **INSTRUCTION MANUAL**

**for**

**Cobra 86XLR**

**40-Channel**

**Citizens Band Solid State**

**Base Station**

**2-Way Radio**



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## THE CB STORY

The Citizens Band lies between the shortwave broadcast and 10-meter amateur radio bands, and was established by law in 1949. The Class D two-way communications service was opened in 1959. (CB also includes a Class A business band and Class C remote control frequencies.) Acquiring the Class D license requires no detailed technical or Morse-code knowledge that is required for a “Ham” license.

Although the FCC has eliminated the requirement for the \$4.00 CB license fee, a license is still required. Filing procedure remains unchanged. One license can be good for any number of sets used by a given family or business. Once you receive your Class D license for your equipment, anyone may use it.

For example, though the equipment must be licensed to someone over 18 years of age, a child can use the equipment to talk to another child, or an employee can use the equipment as part of his or her routine services. However, final responsibility of legal operation rests with the CB licensee.

### NOTE

FCC regulations permit only “transmissions” (one party to another) rather than “broadcasts” (to a wide audience). Thus, advertising is not allowed on CB channels because it is *broadcasting*.

**HAVE  
A GOOD DAY  
TODAY  
AND  
A BETTER DAY  
TOMORROW!**

# Section I

## Introduction

### FREQUENCY RANGE

The COBRA 86XLR provides high level, trouble-free performance in the Citizens Radio Service which is comprised of the following frequency assignments:

<b>Channel</b>	<b>Channel Frequency in MHz</b>	<b>Channel</b>	<b>Channel Frequency in MHz</b>
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	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 obtain maximum performance from your COBRA 86XLR, please read carefully the following descriptions and operating instructions.

These frequencies are generated and accurately controlled by a phase locked loop (PLL) circuit, comprised of the latest state-of-the-art integrated circuit technology, thereby ensuring high reliability and excellent frequency stability on the above channels.

## 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 or complied with procedures explained on FCC Temporary License Form 555-B. A copy of FCC Application Form 505, FCC Temporary License Form 555-B, and Part 95 of the Commission Rules, are packed with this combination transceiver for your convenience.
2. You are required to complete FCC License Application Form 505 and submit it to the FCC, Gettysburg, Pa. 17362, in order to receive your license.
3. You are required to read and understand Part 95 of the FCC Rules and Regulations, before operating your station. FCC Rules require you to always have on hand a current copy of Part 95 of the FCC Rules, as part of your Station Records.
4. All transmitter adjustments other than those supplied by the manufacturer as front panel operating controls, must be made by, or under the supervision of, the holder of an FCC-issued 1st or 2nd Class Radio Operator License.
5. Replacement or substitution of crystals, transistors, regular diodes or 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 FCC Rules, or violation of the Type Acceptance requirements of Part 2 of the Rules.

# Section II

## Specifications

### GENERAL

Channels	40.
Frequency Range	26.965 to 27.405MHz.
Frequency Control	Advanced PLL (Phase Locked Loop).
Frequency Tolerance	0.005%.
Humidity	90%, relative.
Operating Temperature Range	-30° to +50° C.
Microphone	Plug-in type; dynamic, 500 ohms.
Input Voltage	13.8VDC nominal (positive or negative ground). 120VAC, 60Hz nominal.
Current Drain (13.8VDC)	Transmit: AM full mod., 1.8A. Receive: Squelched, 0.3A; full audio output, 1.3A.
Power Consumption (120 VAC)	Transmit: Full Modulation, 60 watts. Receive: Squelched, 25 watts; full audio, 45 watts.
Size	10.24" L X 8.27" W X 5.91" H.
Weight	6-3/4 lbs.
Antenna Connector	UHF, S0239.
Semiconductors	42 transistors, 28 diodes, 2 FETS, 6 IC's.

Meter Illuminated; indicates relative power output and received signal strength.

## TRANSMITTER

Power Output 4 watts.

Dynamike Adjusts microphone gain.

Modulation High-and low-level Class B.

Modulation Capability 100%.

Frequency Response 500-2500Hz.

Output Impedance 50 ohms, unbalanced.

## RECEIVER

Sensitivity Less than 1  $\mu$  V for 10 dB (S+N)/N.

Selectivity 6 dB @ 4KHz, 50 dB @ 20 KHz.

Image Rejection 40 dB.

Adjacent Channel Rejection Greater than 50 dB.

I.F. Frequencies Double Conversion, 1st: 4.665 MHz.  
2nd: 455 KHz.

Delta Tune  $\pm$  1 KHz.

Automatic Gain Control (AGC) Less than 20 dB change in audio output for inputs from 10 to 500,000  $\mu$  V.

Squelch Adjustable; threshold less than 1  $\mu$  V.

ANL Automatic Noise Limiter (switchable).

Audio Output Power 2.0 watts into 8 ohms.

Frequency Response	500-2500 Hz.
Distortion	Less than 10% @ 1.0 watt @ 1000 Hz.
Built-in Speaker	8 ohms, round.
External Speaker (Not Supplied)	8 ohms, 3 watts; disables internal speaker when connected.

# Section III

## Installation

### Location

Prior to operation install the transceiver as follows: Select a location for the unit, which has:

1. Access to a 120V, 60 Hz power source, or 13.8 VDC.
2. Convenient routing for the antenna lead-in cable if an outside antenna installation is required.

### Base Station Antenna Installation

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 50 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 21.

The radio may be used with any type of 50 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. FCC regulations for base station antenna height are:

1. Omni-directional antennas may not be higher than 60 feet above the ground when using a tower, mast or pole, and no higher than 20 feet above an existing structure.

2. Beam antennas may not be higher than 20 feet above the ground when using a tower, mast, pole, or an existing structure.

These are only general regulations applicable to most but not all parts of the nation. Locations near airports and some military installations are subject to different rules, therefore it is best to contact your nearest Federal Communications office for information regarding your specific area.

### **Mobile or Emergency Power Operation**

The COBRA 86XLR can be operated from an external 13.8V DC power supply, or from a 13.8 Volt automobile battery.

The DC cord is coded as follows:

Negative lead is grey with a black stripe.

Positive lead is grey. The in-line fuse holder is an intergral part of the positive lead.

### **Remote Speaker**

The EXT.SPKR. jack on the rear panel is provided for external speaker operation. 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 IV Operation

## CONTROLS AND INDICATORS

There are six controls and two indicators on the front panel of your COBRA 86XCR.



## 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 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 forty Citizen Band Channels desired. The selected channel is illuminated in the circle portion of the Channel Selector dial directly above the Channel Selector knob. 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 be also used to render assistance to a motorist.

4. **DELTA-TUNE.** For normal operation set the control to the center position. This feature has several uses and can greatly enhance receiver operation. First, if a received signal is slightly off frequency, the Delta-Tune control can be operated as required to optimize the received signal level. The effectiveness of the Delta-Tune feature under these conditions can be observed either by listening for a more readable signal at the speaker or by noting the S-meter reading when the Delta-Tune control is operated. Another effective application of this control is in eliminating adjacent channel interference. If it is verified that an exceptionally high level signal from an adjacent channel is creating interference on the channel being used, the Delta-Tune can be used to minimize or eliminate the interference. Operate the control as required to obtain minimum adjacent channel interference.
5. **DYNAMIKE.** Adjusts the microphone gain in the transmit and PA modes. In the Public Address mode the control functions as the volume control.
6. **ANL SWITCH.** In the ANL position, the automatic noise limiting circuits are activated. By reducing unwanted noise, listening comfort and clarity are improved.
7. **PWR/S METER.** Indicates relative transmitter power when transmitting and input signal strength when receiving. Illuminated when power is on.
8. **PRESS-TO-TALK MICROPHONE.** 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, receiver is actuated. The radio comes equipped with a low impedance dynamic microphone.

#### **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. With no signal present turn the SQUELCH control slowly clockwise, until the noise just disappears. 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.

### **C. 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 output power.
3. When transmitting, hold the microphone two inches from the mouth and speak clearly in a normal voice.

### **CAUTION**

Be sure the antenna is properly connected to the radio before transmitting. Prolonged transmitting without an antenna or a poorly matched antenna could cause damage to the transmitter.

## ALTERNATE MICROPHONES

For best results, the user should select a low-impedance dynamic type microphone or a transistorized microphone. Transistorized type microphones have a low output impedance characteristic. 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 the fourth lead is ground (see schematic, Fig. 3). The microphone should provide the functions shown below:

### 4-Wire Mic Cable

Pin Number	Mic Cable Lead
1	Audio Shield
2	Audio Lead
3	Transmit Control
4	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.
2. All leads should be cut to the same length. Strip the ends of each wire  $1/8''$  and tin the exposed wire.

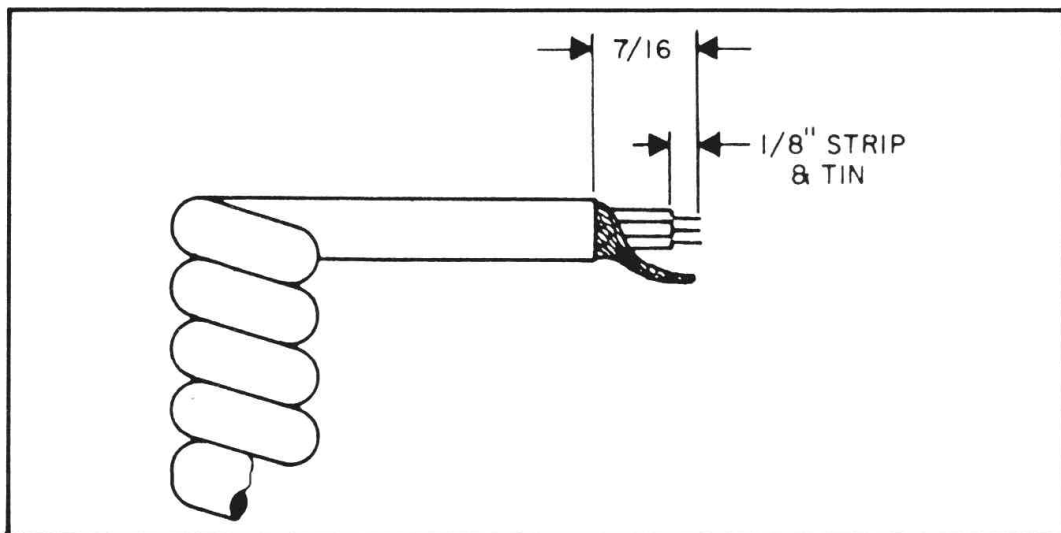


Fig. 1. Microphone cable preparation.

Before beginning 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.

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 below.

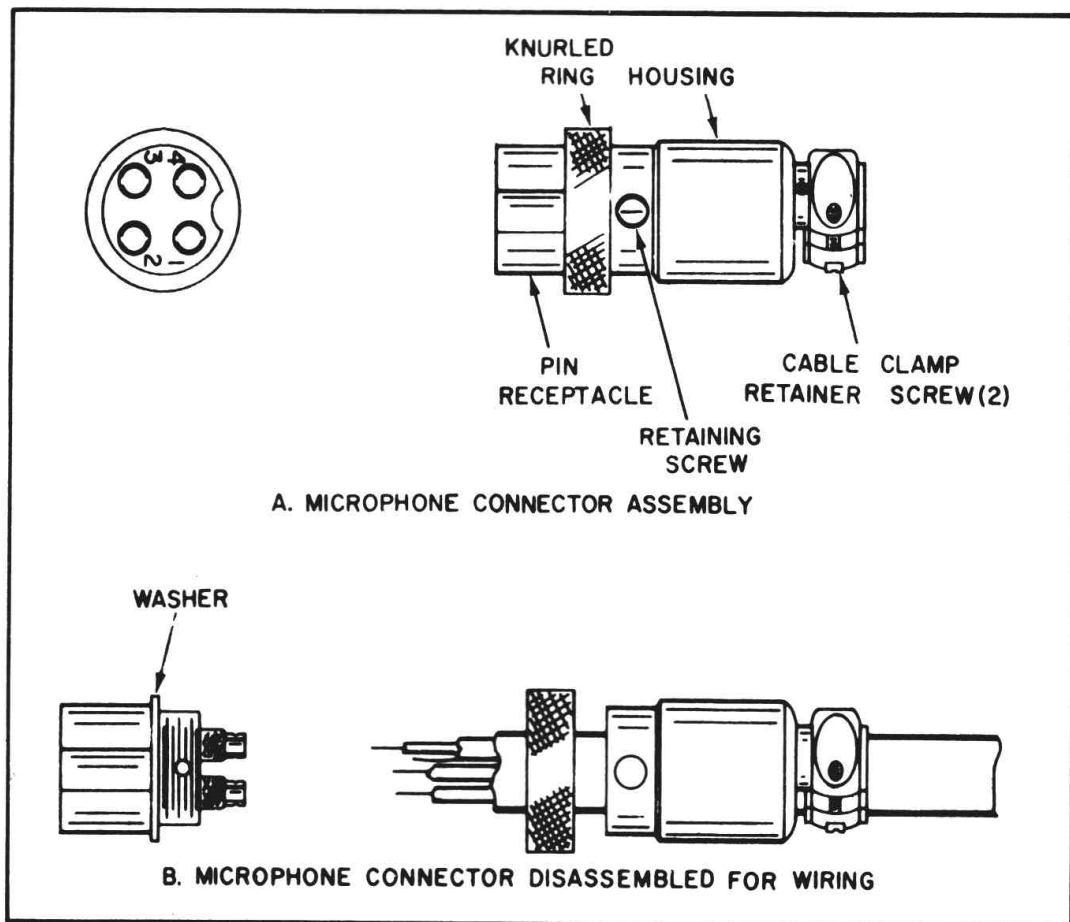


Fig. 2. Microphone plug wiring.

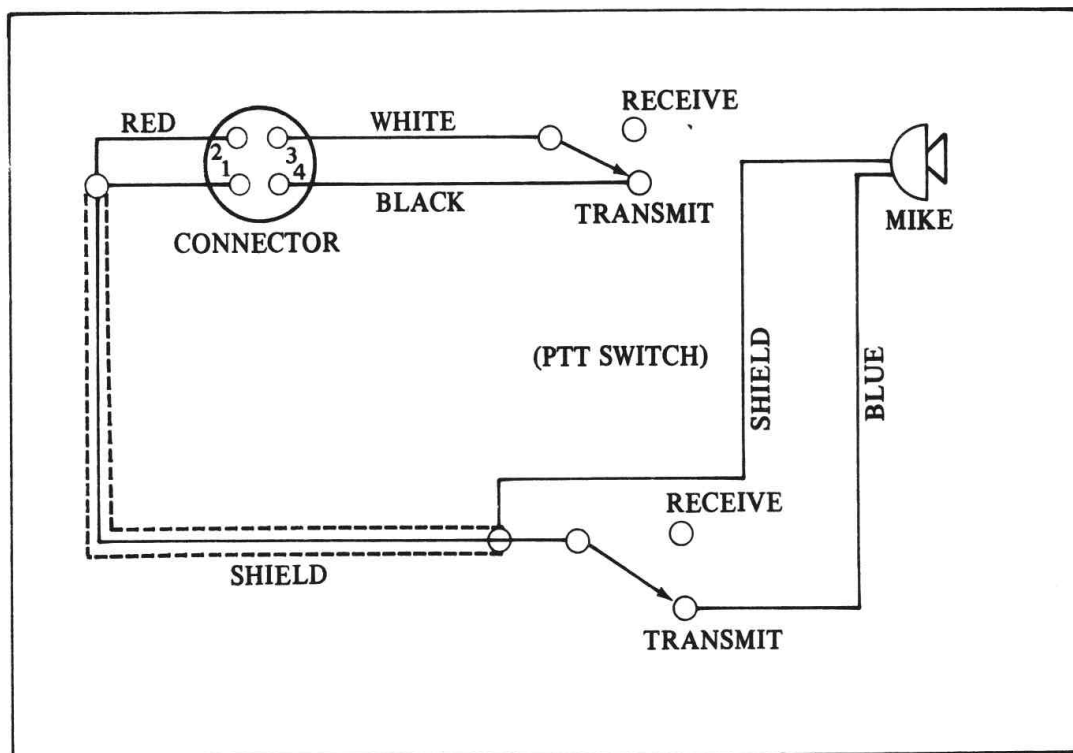


Fig. 3. Microphone and connector wiring diagram.

# Section V

## Maintenance and Adjustment

The COBRA 86XLR transceiver is designed specifically for use as a base station and may also be used in mobile installations. The use of all solid circuitry results in light weight and high reliability. Should a failure occur, replace parts only with identical parts. Do not substitute. Refer to the schematic diagram and parts list.

### 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 the last page of this manual.

### FCC WARNING

Federal law requires that adjustment of the radio frequency section of this transceiver may not be made by a Citizen's Band operator. Only a United States licensed First or Second Class commercial license holder may tune the transmitter section of this transceiver, per FCC part 95 section 95.97d.

# Section VI

## Appendix

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.

### 10 CODE

Code	Meaning	Code	Meaning
10-1	Receiving poorly	10-29	Time is up for contact
10-2	Receiving well	10-30	Does not conform to FCC rules
10-3	Stop transmitting	10-32	I will give you a radio check
10-4	OK, message received	10-33	EMERGENCY TRAFFIC
10-5	Relay message	10-34	Trouble at this station
10-6	Busy, stand by	10-35	Confidential information
10-7	Out of service, leaving air	10-36	Correct time is
10-8	In service, subject to call	10-37	Wrecker needed at
10-9	Repeat message	10-38	Ambulance needed at
10-10	Transmission completed, standing by	10-39	Your message delivered
10-11	Talking too rapidly	10-41	Please turn to channel
10-12	Visitors present	10-42	Traffic accident at
10-13	Advise Weather/Road conditions	10-43	Traffic Tie up at
10-16	Make pick up at	10-44	I have a message for you
10-17	Urgent business	10-45	All units within range please report
10-18	Anything for us?	10-50	Break channel
10-19	Nothing for you, return to base	10-60	What is next message number?
10-20	My location is	10-62	Unable to copy, use phone
10-21	Call by telephone	10-63	Net directed to
10-22	Report in person to	10-64	Net clear
10-23	Stand by	10-65	Awaiting your next message/assignment
10-24	Completed last assignment	10-67	All units comply
10-25	Can you contact	10-70	Fire at
10-26	Disregard last information		
10-27	I am moving to channel		
10-28	Identify your station		

## 10 CODE (Continued)

Code	Meaning	Code	Meaning
10-71	Proceed with transmission in sequence	10-91	Talk closer to mike
10-73	Speed trap at	10-92	Your transmitter is out of adjustment
10-75	You are causing interference	10-93	Check my frequency on this channel
10-77	Negative contact	10-94	Please give me a long count
10-81	Reserve hotel room for	10-95	Transmit dead carrier for 5 seconds
10-82	Reserve room for	10-99	Mission completed, all units secure
10-84	My telephone number is	10-200	Police needed at
10-85	My address is		
10-89	Radio repairman needed at		
10-90	I have TVI		

### A FEW RULES THAT SHOULD BE OBEYED

1. You must identify your official licensed call sign at the beginning and end of every conversation.
2. 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.
3. You are not allowed to blast others off the air by over-powering them with illegally amplified transmitter power, or illegally high antennas.
4. You can't use CB to promote illegal activities.
5. You are not allowed to use profanity.
6. You may not play music in your CB.
7. You may not use your CB to sell merchandise or professional services.

## HOW YOUR CB CAN SERVE YOU

- Participate in local civil defense activities.
- Provide help fast in event of emergency.
- Aid travelers by suggesting good spots to eat and sleep.
- Provide direct contact from your office or home to your mobile unit.
- Make friends in your leisure time.
- Provide “local information” to aid others.
- Help law enforcement officers by reporting emergency situations.

Colonel Samuel S. Smith of the Missouri Highway Patrol called the number of drunken drivers, wrong-way drivers and speeders reported by CBers as “amazing.” He said, that even the “Smokey Bear” warnings don’t shake their beliefs that “the potential benefits of CB radio to law enforcement are so great that they far outweigh the disadvantages.” In regards to CB radar warnings to other CBers, Colonel Smith said cheerfully that “We’ve overheard warnings being relayed to truckers long after our operations have been discontinued . . . so we actually receive a residual benefit from these warnings.”

## USE CHANNEL 9 FOR EMERGENCY MESSAGES ONLY

FCC gives the following examples of permitted and prohibited types of communications for use on Channel 9. These are guidelines and are not intended to be all-inclusive.

<b>Permitted</b>	<b>Example Message</b>
Yes	“A tornado sighted six miles north of town.”
No	“This is observation post number 10. No tornado sighted.”
Yes	“I am out of gas on Interstate 95.”
No	“I am out of gas in my driveway.”
Yes	“There is a four-car collision at Exit 10 on the Beltway, send police and ambulance.”
No	“Traffic is moving smoothly on the Beltway.”
Yes	“Base to Unit 1, the Weather Bureau has just issued a thunderstorm warning. Bring the sailboat into port.”
No	“Attention all motorists. The Weather Bureau advises that the snow tomorrow will accumulate 4 to 6 inches.”
Yes	“There is a fire in the building on the corner of 6th and Main Streets.”
No	“This is Halloween patrol unit number 3. Everything is quiet here.”

## WARRANTY SERVICE INSTRUCTIONS

1. Refer to the MAINTENANCE section of your Cobra instruction manual for adjustments that may be applicable.
2. Defective parts removed from units which are within the 90-Day Limited Warranty period should be sent PREPAID to the Service Department listed below. Be sure to state the model and serial number of the unit from which the parts were removed and date the unit was purchased. These parts will be exchanged at no charge, under the terms of the Warranty.
3. If the above-mentioned procedures do not correct the problem you are experiencing with your unit, pack it securely (preferably in the original carton or double-packed). Enclose a letter describing the problem and include your name and address. Deliver to, or ship PREPAID (UPS preferred) to the nearest Cobra authorized service agency (see list enclosed with unit).

If your list of authorized Cobra service agencies has been misplaced, contact your local dealer for the name of your nearest service agency, or write to:

### *Service Department*

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

### NOTE

For future reference, jot down the serial number (shown on the rear of your Cobra 86XLR) below.

SERIAL NO. \_\_\_\_\_

## LIMITED 90-DAY WARRANTY

DYNASCAN CORPORATION warrants to the original purchaser that its COBRA Citizens Band Radios, and the component parts thereof, will be free from defects in workmanship and materials for a period of ninety (90) days from the date of purchase.

DYNASCAN will, without charge, repair or replace, at its option, defective radios or component parts upon delivery to an authorized COBRA service contractor or the factory service department, accompanied by proof of the date of purchase in the form of a sales receipt.

To obtain warranty coverage, this CB radio must be registered by completing and mailing the enclosed warranty registration card to DYNASCAN Cobra Communications, P. O. Box 35148, Chicago, Illinois 60635 within five (5) days from the date of purchase.

**Exclusions:** This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. It is void if the serial number is altered, defaced or removed.

As indicated in your product instruction booklet, certain COBRA models are suitable for dash board installation without modification of the dash. In other cases professional installation is recommended. In either event, DYNASCAN is not responsible for damages to the product or the automobile resulting from improper installation.

DYNASCAN shall not be liable for any consequential damages, including without limitation damages resulting from loss of use or cost of installation. Some states do not allow limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may also have other rights which vary from state to state.

For your convenience we suggest you contact your dealer, who may be authorized to make repairs or can refer you to the nearest service contractor. If warranty service cannot be obtained locally, please send the unit to Cobra Communications Service, 2815 West Irving Park Road, Chicago, Illinois 60618, properly packaged to avoid damage in shipment.



**Cobra**<sup>®</sup>

**Cobra Communications Product Group**

**DYNASCAN CORPORATION**

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**480-189-9-001**

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