INSTRUCTION MANUAL

COBRA CAM 89

SOLID STATE CITIZENS BAND 2-WAY RADIO

A PRODUCT OF
DYNASCAN CORPORATION
1801 WEST BELLE PLAINE AVENUE, CHICAGO, ILLINOIS 60618

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
MODEL CAM 89
CITIZENS BAND SOLID STATE
2-WAY RADIO

PRODUCT OF DYNASCAN CORPORATION
6460 WEST CORTLAND ST.
CHICAGO ILL. 60635

COBRA CAM 89

specifications

GENERAL

Channels	23
Frequency Range	26.965 to 27.255 MHz
Frequency Control	Crystal synthesizer
Frequency Tolerance	0.005%
Operating Temperature Range	–20°C to +40°C
Microphone	Plug-in type; dynamic
Input Voltage	120 VAC, 60 Hz nominal 13.8 VDC nominal (Positive or negative ground)
Power Consumption (120 VAC)	Transmit: AM full mod., 55 watts Receive: Squelched, 25 watts Full audio, 25 watts
Current Drain (13.8 VDC)	Transmit: AM full mod., 1.6A Receive: Squelched, 0.4A Full audio, 1.0A
Size	5¾" H x 13⅜" W x 12⅝" D
Weight	10 pounds
Antenna Connector	UHF, SO239
Semiconductors	23 Transistors, 20 Diodes
Meter 1	Illuminated, indicates relative power output and received signal strength
Meter 2	Illuminated, indicates level of modulation

TRANSMITTER

Power Input	5 watts
Modulation	High and low level Class B
Modulation Capability	100% – Adjustable with Dynamike Microphone Gain Control
Frequency Response	300-2500 Hz
Output Impedance	50 Ohms, unbalanced

RECEIVER

Sensitivity	Less than 1μV for 10 db (S+N)/N
Selectivity	6 db @ 4 kHz, 40 db @ 20 kHz
Image Rejection	30db
I.F. Frequencies	Double conversion, 1st: 11.275 MHz 2nd: 455 kHz
Automatic Gain Control (AGC)	Less than 10 dB change in audio output for inputs from 10 to 500,000 microvolts
Squelch	Adjustable, threshold less than 1μV
Audio Output Power	2.5 Watts into 8 Ohms
Frequency Response	300-3000 Hz
Distortion	Less than 10% @ 2.5 Watts @ 1000 Hz
Built-in Speaker	8 Ohms, round
External Speaker (Not Supplied)	8 Ohms; disables internal speaker when connected

PA SYSTEM

Power Output	3 Watts into external speaker
External Speaker for PA (Not Supplied)	8 Ohms; when PA-CB switch is in PA, the PA speaker also monitors the receiver

COBRA CAM 89 instruction manual

introduction

The Cobra CAM 89 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	17.135
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

To insure that you obtain the maximum performance from your Cobra CAM 89 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 are 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 Citizens 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 also are 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

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 FCC, 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 communication 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 limit antenna height to 20 feet above an existing structure.

MOBILE OPERATION/EMERGENCY POWER OPERATION

It is possible to operate the Cobra CAM 89 from an external 13.8 VDC power supply for emergency power conditions or from an automobile battery for mobile operation. The Cobra CAM 89 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.

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 paragraph numbers correspond to the numbers on the figure.

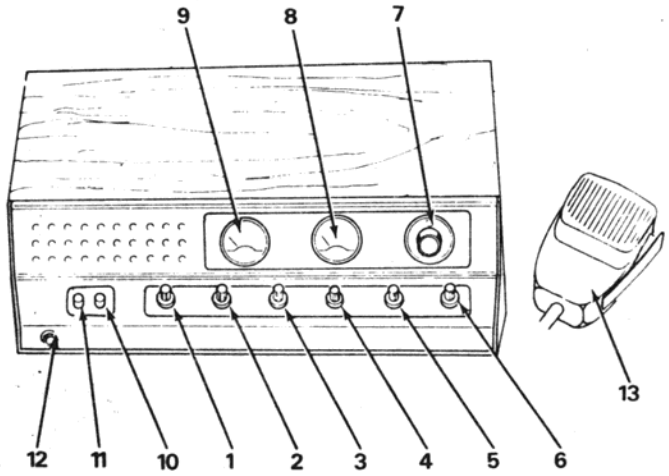


FIG. 1

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 the control should 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. **TONE.** This control is used to shape the audio response to the operators preference. Base is increased by counterclockwise rotation and treble is increased by clockwise rotation.
5. **RF GAIN.** Adjust as required to optimize signal. This control is used primarily to optimize reception in strong signal areas. Gain is reduced by counterclockwise rotation of the control.

6. **DELTA TUNE.** Allows variation of the receiver operating frequencies above and below the assigned frequency and is used to optimize AM signals as described in the Operating Procedure paragraphs.
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 FFC 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.
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 the 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. **ANL SWITCH.** In the ANL position the automatic noise limiter in the audio circuits is activated.
12. **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:

Pin Number	Function
1	Auto Shield (Ground)
2	Audio Lead
3	Transmit
4	Speaker

13. **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 a low impedance dynamic microphone.

B. OPERATING PROCEDURE TO RECEIVE

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. 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.
5. Set the CHANNEL selector switch to the desired channel.
6. Set the RF gain control full clockwise for the maximum RF gain.
7. Adjust the DELTA-TUNE CONTROL to optimize AM signals.

C. OPERATING PROCEDURE TO TRANSMIT

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 a poorly matched antenna (high SWR; over 2:1) can cause damage to the transmitter.

D. ACCESSORY CIRCUIT OPERATION

1. **ANL OPERATING.** Slide the ANL switch to ANL position. It activates the noise reduction circuits of the automatic noise limiter.
2. **RF GAIN.** If the signal is very strong reduce the RF gain by moving the SSB RF gain control counterclockwise to optimize the quality of the received signal. Note that the SQUELCH control may require some readjustment with reduced RF Gain.
3. **PUBLIC ADDRESS (PA) OPERATION.** To use this feature, a speaker having a voice coil mipedance of 8 ohms and a power handling capability of at least three watts should be used. Connect speaker to PA SPKR. jack on rear panel.
   Complete elimination of outside signals can be obtained by disconnecting the antenna cable from the transceiver. With the PA speaker connected, 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.
   NOTE: Sound level is adjusted with the DYNAMIKE control.

section III

maintenance and adjustment

The Transceiver is specifically designed for the environment encountered in base station 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. 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 95D 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 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 the last page of this manual.

WARRANTY SERVICE INSTRUCTIONS

1. Refer to instruction manual for adjustments that may be applicable.
2. Check common electrical 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 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 perferred) to the nearest Dynascan authorized 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 Irving Park Road

Chicago, Illinois 60618

PARTS LIST FOR COBRA CAM-89

CIRCUIT SYMBOL	DESCRIPTION	DYNASCAN PART NO.
	TRANSISTORS, DIODES	
TR-21	Transistor 2SC235 (O)	176-042-9-007
TR-8,9	Transistor 2SC1173 (Y)	172-014-9-001
TR-36	Transistor 2SC1173 (O)	172-014-9-003
TR-19	Transistor 2SC1226A (P)	176-042-9-005
TR-18	Transistor 2SC756-2-4	172-014-9-002
TR-1,2	Transistor 2SC394 (Y)	176-042-9-001
TR-3,4,5,10,11, 12,15,16,17	Transistor 2SC372 (O) or 2SC839 (F)	176-042-9-002
TR-6,14,37	Transistor 2SC372 (Y) or 2SC945 (R)	176-042-9-003
TR-7	Transistor 2SC733 (Y)	176-042-9-004
TR-13	Transistor 2SC373	176-025-9-001
TR-20	Transistor 2SC735 (O)	176-042-9-006
D-1,2,6,7,12,19, 20	Diode CD37	151-040-9-002
D-3,4,5,10,11,14	Diode IN60	150-001-9-005
D-9	Diode SR1K-1	151-040-9-003
D-62,63	Diode SR1K-2	151-045-9-001
D-8	Diode CZ092	152-051-9-001
D-61	Diode BZ162	152-057-9-001
D-60	Diode WZ061	152-052-9-002
D-13	Diode IS2688C	153-004-9-001
	MISCELLANEOUS	
CF	Ceramic Filter LF-B6	140-009-9-001
	COILS, TRANSFORMERS	
L-7	TVI Trap Coil TC-71024	041-056-9-003
L-3	Ant. Filter Coil NS-1344	044-028-9-001
L-9	TX Matching Coil TC-71025	044-028-9-002
L-10	TX Final Coil TC-71029	044-028-9-003
L-12	TX Driver Coil TC-71023	044-028-9-004
L-13	TX Pre-Driver Coil TC-71026	044-028-9-005
L-1	14MHz Trap Coil TC-71096	041-056-9-001
L-5	RF Choke Coil TC-71095B	042-011-9-001
T-1	RX Ant. Coil TKXN-22160BU	066-017-9-001
T-2	RX RF Amp. Coil TKXC-22534BU	066-017-9-002
T-11	23MHz OSC Coil TKXC-23169F	066-017-9-003
T-12,13	38MHz Filter Coil TKXC-23170Z	066-017-9-004
T-14	38MHz TKXC-223535BM Filter Coil	066-017-9-005
T-15,16	TX 27MHz Filter Coil KXN-13638HM	066-017-9-006
T-17	TX KXN-13636BM 27MHz Filter Coil	066-017-9-007
T-3	1st IFT Coil TKAC-22536IE	060-016-9-001
T-4	1st IFT Coil TKAC-21165A	060-016-9-002
T-5	2nd IFT Coil YLN-208448M	060-016-9-003
T-6	2nd IFT Coil YMC-20845AC	060-016-9-004
T-8	2nd IFT Coil YMC-20846AC	060-016-9-005
T-18	Power Transformer N60-7979PT	065-103-9-001
T-9	AF Input Transformer 69M	061-022-9-001
T-10	AF Output Transformer N28-7518BM	061-022-9-002
L-2,3,11	Micro Inductor LF4 2R2K	041-056-9-002

CIRCUIT SYMBOL	DESCRIPTION	DYNASCAN PART NO.

COILS, TRANSFORMERS (Continued)

L-14	Micro Inductor LF4 6R8K	041-061-9-002
L-16	Micro Inductor LF4010	041-062-9-001
L-4	Line Filter Choke 115C	044-028-9-006

RESISTORS CONTROLS

R-38	Metalized Resistor 0.5 ohm ½W K	004-012-9-001
R-81	Metalized Resistor 12 ohm 2W K	013-005-9-001

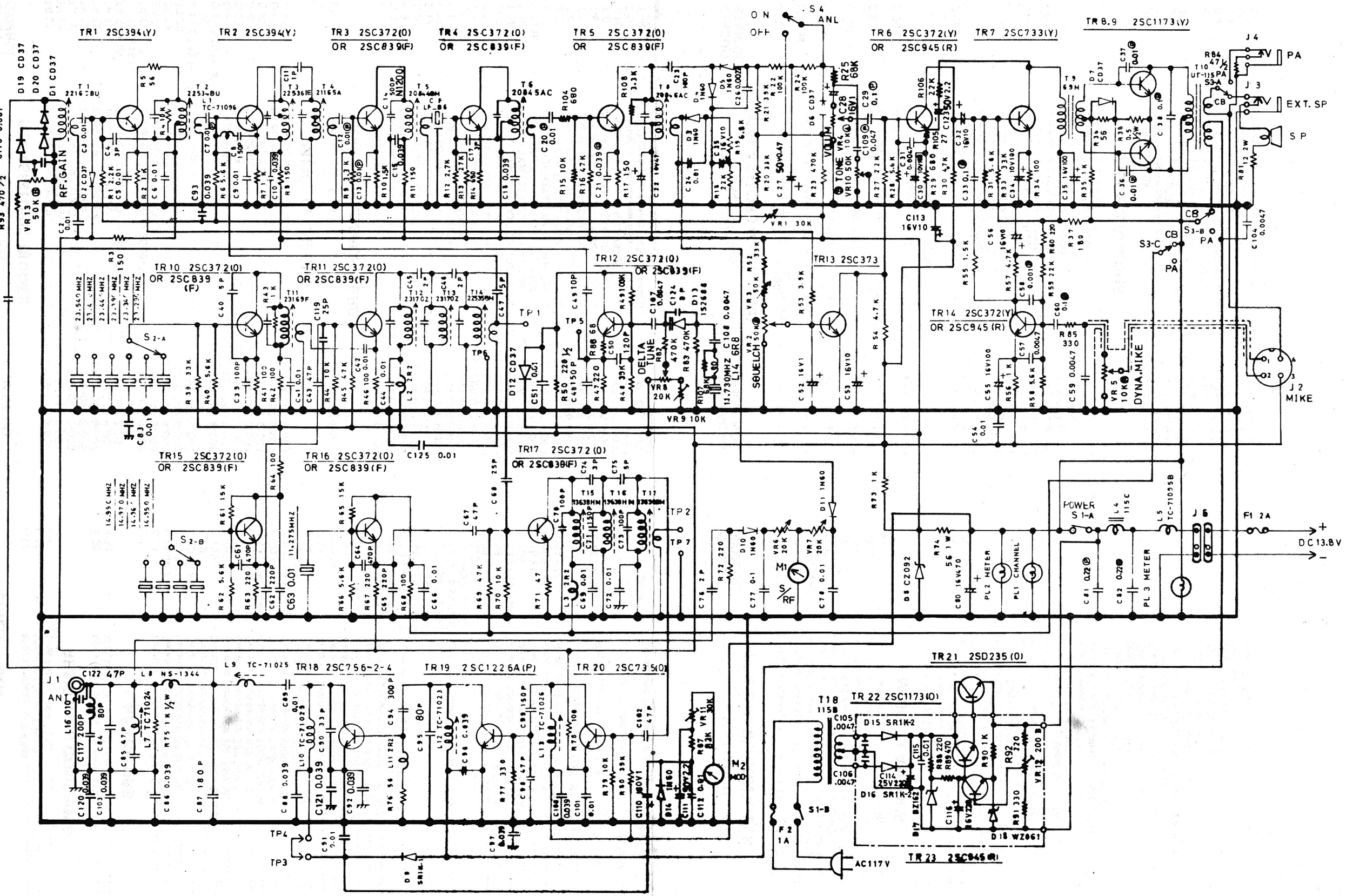
CAPACITORS

C-11	Ceramic Condensor 1P 50V C. SL	020-109-9-006
C-45,46,76	Ceramic Condensor 2P 50V C.SL	020-109-9-007
C-4,17,74	Ceramic Condensor 3P 50V SL	020-109-9-003
C-40,75,47	Ceramic Condensor 5P 50V SL	020-109-9-010
C-49	Ceramic Condensor 10P 50V K. SL	020-109-9-012
C-122	Ceramic Condensor 20P 50V SL	020-127-9-001
C-68,119	Ceramic Condensor 25P 50V SL	020-109-9-015
C-1,90	Ceramic Condensor 33P 50V SL	020-125-9-001
C-43,67,85,98,102	Ceramic Condensor 47P 50V SL	020-109-9-001
C-23,39,70,73,95	Ceramic Condensor 100P 50V SL	020-109-9-008
C-50,84	Ceramic Condensor 120P 50V SL	020-125-9-004
C-8,71,99,48	Ceramic Condensor 150P 50V SL	020-109-9-004
C-62,65,87	Ceramic Condensor 220P 50V SL	020-109-9-013
C-94	Ceramic Condensor 250P 50V SL	020-125-9-005
C-117	Ceramic Condensor 200P 50V SL	020-127-9-002
C-61,64	Ceramic Condensor 470P 50V SL	020-109-9-014
C-14	Ceramic Condensor 500P 50V K (N1200)	020-127-9-003
C-118	Ceramic Condensor 0.001 F 50V Z	020-125-9-006
C-26	Ceramic Condensor 0.0022 F 50V Z	020-132-9-001
C-31,57,59,104,105, 107,108,106	Ceramic Condensor 0.0047 F 50V Z	020-127-9-004
C-2,3,5,6,9,24,41,42, 44,51,54,63,66,69, 72,78,83,89,91,101, 112,204,202,205,	Ceramic Condensor 0.01 F 50V Z	020-109-9-002
C-10,15,18,86,88,92, 93,96,97,100,103, 120,121.	Ceramic Condensor 0.039 F 50V Z	020-127-9-005
C-77	Ceramic Condensor 0.1 F 12V Z	020-127-9-006
C-58	Mylar Condensor 0.001 F 50V K	025-074-9-003
C-7,12,13,20,36,37	Mylar Condensor 0.01 F 50V K	025-087-9-001
C-109	Mylar Condensor 0.047 F 50V K	025-074-9-005
C-16,21	Mylar Condensor 0.1 F 50V K	025-074-9-002
C-38,38,60	Mylar Condensor 0.1 F 50V K	025-074-9-002
C-81,628	Mylar Condensor 0.22 F 50V K	025-074-9-006
C-27	Electrolytic Condensor 0.47 F $^{+75}_{-10}$ % 50V	022-122-9-016
C-28,29,52	Electrolytic Condensor 1 F $^{+150}_{-0}$ % 16V	022-099-9-003
C-110	Electrolytic Condensor 1 F $^{+150}_{-0}$ % 50V	022-122-9-001
C-25,32,53,56,113,	Electrolytic Condensor 10 F $^{+100}_{-10}$ % 16V	022-120-9-001

CIRCUIT SYMBOL	DESCRIPTION	DYNASCAN PART NO.
	CAPACITORS (Continued)	
C-22	Electrolytic Condensor 47 F $^{+100}_{-10}$ % 10V	022-120-9-002
C-30,34	Electrolytic Condensor 100 F $^{+100}_{-10}$ % 10V	022-099-9-004
C-35,55	Electrolytic Condensor 100 F $^{+100}_{-10}$ % 16V	022-120-9-004
C-201	Electrolytic Condensor 220 F $^{+100}_{-10}$ % 16V	022-122-9-008
C-80	Electrolytic Condensor 470 F $^{+100}_{-10}$ % 16V	022-099-9-006
C-203	(ECE-T25R2200Z) Electrolytic Condensor 220 F 25V	022-007-9-007
	CRYSTALS	
C-203	Crystal 23.290 MHz (2007B)	133-004-9-001
	Crystal 23.340 MHz (2007B)	133-004-9-002
	Crystal 23.390 MHz (2007B)	133-004-9-003
	Crystal 23.440 MHz (2007B)	133-004-9-004
	Crystal 23.490 MHz (2007B)	133-004-9-005
	Crystal 23.540 MHz (2007B)	133-004-9-006
	Crystal 14.950 MHz (2006B)	133-004-9-007
	Crystal 14.960 MHz (2006B)	133-004-9-008
	Crystal 14.970 MHz (2006B)	133-004-9-009
	Crystal 14.990 MHz (2006B)	133-004-9-010
	Crystal 11.730 MHz (2005B)	133-004-9-012
	Crystal 11.275 MHz (2005B)	133-004-9-011
	Crystal Socket S-00105	749-079-9-001
	MISCELLANEOUS	
J-1	M-R Connector	772-025-9-001
J-2	Metal Consent SM144 (4P)	773-045-9-001
J-5	3F Consent CN3795	733-054-9-001
J-3,4	Jack SJ-296 3.5	773-045-9-002
	Speaker 107D10T (1.5W)	580-015-9-001
S-2	Rotary Switch 1-2-24 (4S32COOO-A)	083-162-9-001
S-4	Slide Switch SL-2-2-2-14 (white)	084-036-9-001
S-3	Slide Switch SL-3-3-2-03 (white)	084-036-9-002
M-1	Meter S/RF	320-055-9-001
M-2	Meter Mod	320-054-9-001

CIRCUIT SYMBOL	DESCRIPTION	DYNASCAN PART NO.
	RESISTORS, CONTROLS	
VR-10,13,2	Variable Resistor 50K ohm B 24 Tone SQ RF Gain	008-210-9-006
VR-8	Variable Resistor 2GK0ohm B 16 Voice Lock	008-210-9-004
VR-4,Si-A,Si-B	Variable Resistor 10K ohm A 24 Vol on/off	008-210-9-005
VR-5	Variable Resistor 10K ohm A 24 Dynamike	008-210-9-003
VR-3	Semi-Fixed Resistor 50K ohm 2P 68BM	008-209-9-008
VR-1,11	Semi-Fixed Resistor 30K ohm 2P 6BM	008-209-9-009
VR-6,7	Semi-Fixed Resistor 20K ohm 2P 63BM	008-209-9-010
VR-9	Semi-Fixed Resistor 10K ohm 2P 6BM	008-209-9-011
VR-19	Semi-Fixed Resistor 200ohm 3P 58M	008-209-9-012
	MISCELLANEOUS	
	Microphone DF-107B (SKI)	562-006-9-001
	Microphone Hanger 12-42438-01	741-074-9-001
PL-1	Pilot Lamp 14V 50mA 250m/m (Red) Lead Wire	400-035-9-004
PL-2,3	Pilot Lamp 14V 50mA 250m/m White Lead Wire	400-035-9-001
	Chassis SPt 11.0t/ZMC-3 M1-02420	257-059-9-001
	Back Panel SPC-11.0t/ZMC-3 M2-02403	262-012-9-001
	Bonnet (Top Cabinet) M2L02404	253-036-9-001
	Bottom Cabinet M2-02405	252-015-9-001
	(Left) • UT-69C-008	
	Front Panel Setting Metal M4-00162	251-131-9-001
	(Right) UT-69C-009	
	Front Panel Setting Metal M4-00163	251-132-9-001
	Front Panel M1-02401	380-213-9-001
	Knob, Channel M4-01727	751-095-9-001
	Knob, Volume, Squelch, Etc. M4-01728	751-095-9-002
	Channel Number Disc. M4-01957	380-176-9-002
	Front Plate M3-02423	260-050-9-001
	Brand Plate M3-02424	260-051-9-001
	Brand Plate for Microphone M4-02296	260-047-9-001
	Speaker Net M4-02413	763-025-9-001
	Rubber Foot 25 ×17H (Black)	381-058-9-001
	Styrofoam Box (Right & Left) M2-02415/16	503-080-9-001
	Display Box M3-02427	500-239-9-001
	Instruction Manual	480-140-9-001
	Schematic & Parts List	499-064-9-001
	FCC Application Form	492-041-9-001
	Warranty Card	491-138-9-001
	Service Dept. Address List	492-036-0-000

CIRCUIT DIAGRAM FOR COBRA CAM-89



WARRANTY

"DYNASCAN warrants that each product manufactured by it will be free from defects in material and workmanship under normal usage and service for a period of ninety days after its purchase new from an authorized DYNASCAN 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 five days after the purchase of the product new from an authorized DYNASCAN distributor.*

DYNASCAN CORPORATION

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