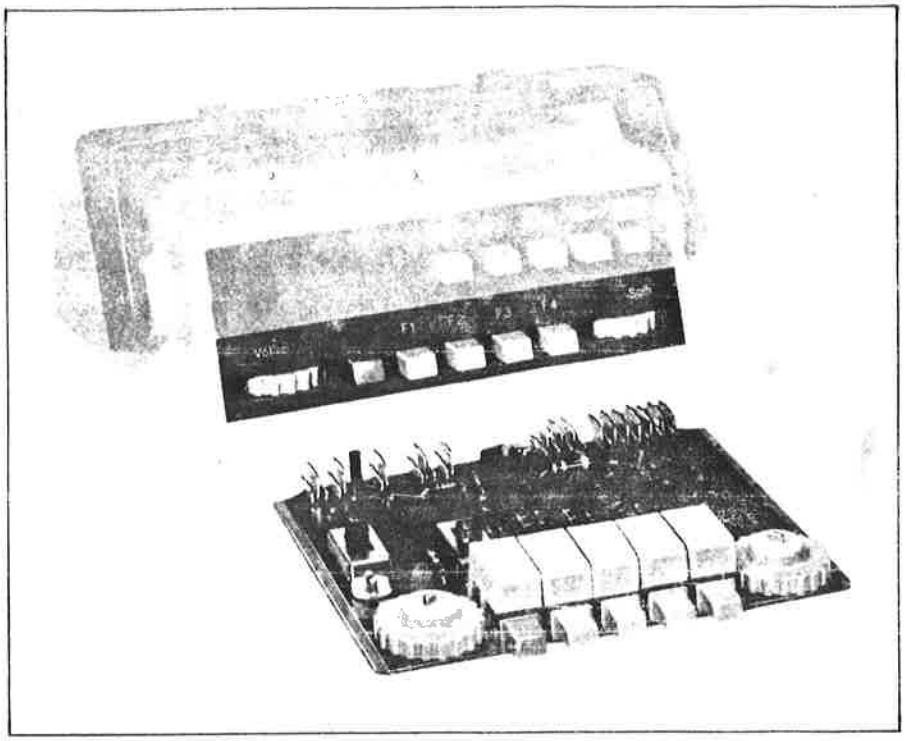
MOTOROLA

MICOR ® SYSTEMS 90

Alternate Control Module



Instruction Manual

68P81102E37-E

MODEL CHART

MICOR® /SYSTEMS 90

ALTERNATE CONTROL MODULE

SUB-MODEL	SUFFIX	DESCRIPTION	MODEL DESCRIPTION: TCN1097A 1-FREQUENCY	MODEL DESCRIPTION: TCN1098A 4-FREQUENCY
		SUFFIX	3	3
TLN4529A		CIRCUIT BOARD (1-FREQ.)	X	
TLN4530A		CIRCUIT BOARD (4-FREQ.)		X
TLN4516A		HARDWARE KIT (1-FREQ.)	X	
TLN4517A		HARDWARE KIT (4-FREQ.)		X

EPS-8858-A

SERVICE MANUAL REPRODUCTION

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1) removal of cover
2) alternate binding or packaging method
3) size reduction of some foldouts, e.g. schematics
4) the division of extremely long schematics (over 17") into two or more sheets.
5) photographs and screens reproduced from printed material (as opposed to original screened negatives)
6) the elimination of colors other than black

We feel that these steps have only minor effect on the readability and utility of basic service information and will allow us to continue to supply this literature at a reasonable cost.

Motorola Communications and Electronics Inc.
Communications and Electronics Parts

12/85 I.U.

Reproduced on Month/Year

1. DESCRIPTION

The "MICOR" "Systems 90" Alternate Control Module may be installed in an accessory housing and used in lieu of the standard control head. This control module is constructed on a durable circuit card and should be practically maintenance free.

2. INSTALLATION

a. Factory Installed Units

When the control module is purchased as part of a radio system, the individual components are shipped with all intercabling connected. This allows a thorough system checkout before unpacking. To install the radio system proceed as follows:

(1) Install the radio and cabling as directed in the radio installation instructions.

(2) Install the trunnion bracket and housing assembly as instructed.

(3) Connect the black connector (P1101) to the control module mating receptacle (J1101).

(4) Insert the two-pin connector (P1104) into the control module mating jack (J1104).

(5) Connect the microphone plug (or the six-pin black connector of W1, if mobile public address is used) to control module jack (J1103).

(6) On four-frequency models, connect the remaining six-pin blue connector (P1102) to control module jack (J1102).

b. Field Installed Units

Alternate Control Modules can be installed in the field as a replacement for a standard control head, but some wiring changes are required. Refer to the following procedure for installation instructions (see Figure 1).

(1) Disconnect all connectors mating with the control head.

(2) Remove the control head from the mechanical mounting.

(3) If a vacancy does not exist for the control module, install a housing assembly.

(4) Refer to the following chart and prepare the control module as directed.

JUMPER CHART

ACCESSORIES	JUMPER CONFIGURATION
HANDSET AND HANG-UP UNIT	Remove JU1102
VPA (VOICE PRIVACY ADAPTER)	Remove JU1101 (Positive ground only)
"CHANNEL-SCAN" MONITOR	Connect JU1103 to C (without "Channel-Scan" Monitor JU1103 is connected to G).

NOTE

Insert any other accessories at this time.

(5) Install the rear housing cover and secure with two captive screws.

(6) Remove the following wires, with pins attached, from the 22-pin plug (P1101) which was disconnected from the control head in step (1).

- RED-BLK from position 2 (if VPA is used.
- ORG or ORG-BRN from position 3.
- BLK-WHT from position 5 (if "Channel-Scan" Monitor is used).
- GRN from position 6.
- BLK-VIOLET from position 9.

(7) Relocate two of the wires removed in the previous step to different positions in P1101 as follows:

- ORG or ORG-BRN into position 9.
- RED-BLK into position 5 (with VPA).

(8) Insert two other wires removed in step (6), into the two-pin connector (P1104) provided, as follows:

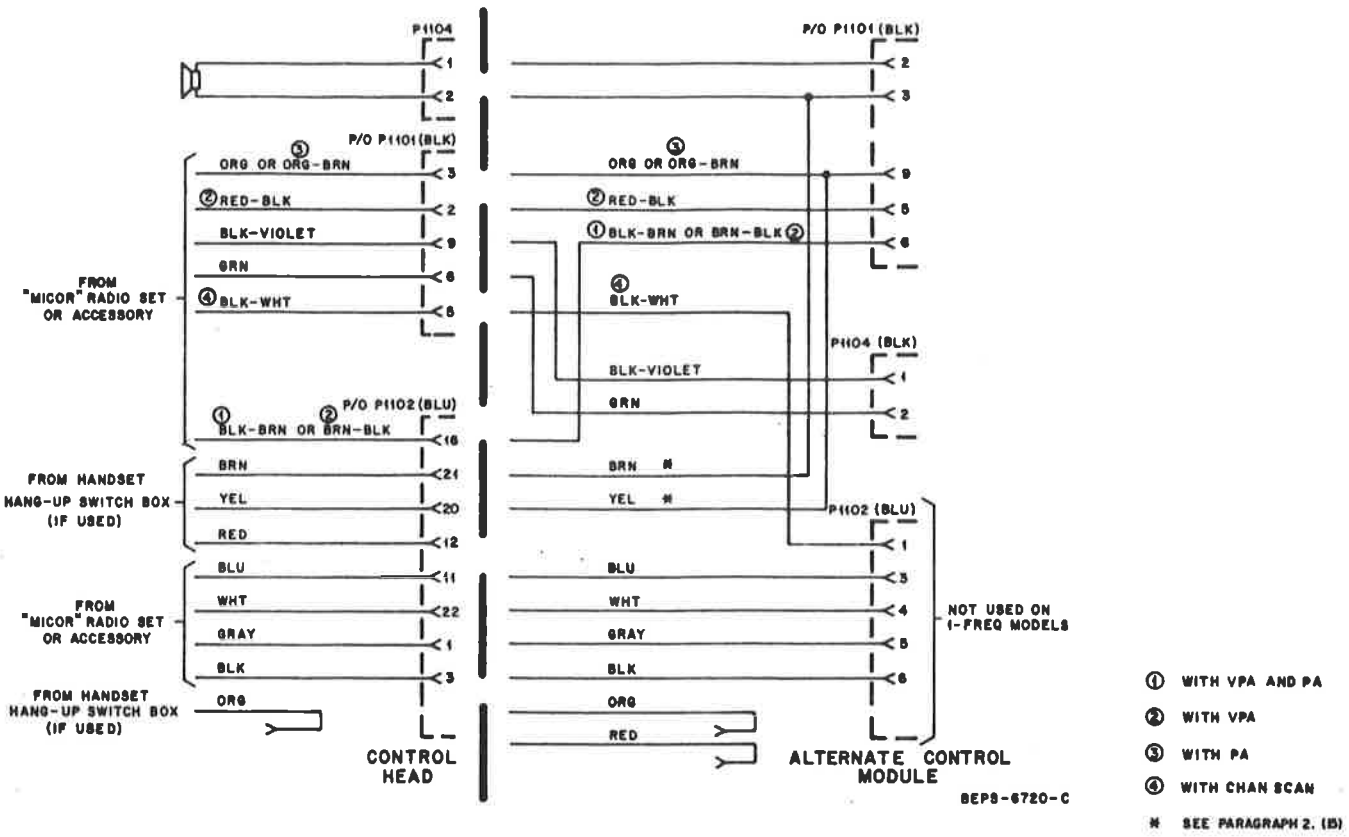

Figure 1.
Wiring Changes

- BLK-VIOLET into position 1.
- GRN into position 2.

(9) Remove the speaker wires from the existing two-pin connector (P1104) and insert them into positions 2 and 3 of P1101. Save P1104.

(10) On multi-frequency models and sets employing a hang-up switch unit, a blue 22-position connector (P1102) is used. Remove all wires from P1102. Save P1102.

(11) Insert four of the wires removed in step 10, into the blue six-position connector (P1102) supplied, as follows:

- BLU into position 3.
- WHT into position 4.
- GRAY into position 5.
- BLK into position 6.

(12) With VPA, insert the BRN-BLK wire removed from P1102 into position 6 of P1101.

(13) If "Channel-Scan" monitor is used, insert the remaining wire removed in step 6 (BLK-WHT) into position 1 of P1102.

(14) If a handset and hang-up unit is used, make the following changes:

(a) Cut the female pins from the YEL and BRN leads of the hang-up unit cable.

(b) Strip 1/2" of insulation from each lead.

(c) Splice the YEL lead into the ORG lead connected to P1101 position 9 of the control module.

(d) Splice the BRN lead from the hang-up unit into the speaker lead connected to P1101 position 3 of the control module. The speaker audio will be switched, but the handset audio will always remain on.

(e) Tape the RED and ORG handset leads back.

(f) Insert the GRN lead from the hang-up unit cable into P1101 position 15.

(g) Insert the BLK hang-up cable lead into P1101 position 19. This completes the wiring of the handset hang-up unit.

(15) Insert mic connector P1103 into mating jack J1103.

(16) Insert the remaining connectors into the control module mating jacks.

(17) Remove the escutcheon backing and attach escutcheon to the housing assembly front panel.

3. OPERATING INSTRUCTIONS

a. Equipment "Turn-On"

Apply power to the radio set by depressing the frequency switch actuator projecting through the escutcheon (see Figure 2). The "ON" window will be brightly illuminated indicating that power has been applied to the radio. On four-frequency models depress the frequency selector corresponding with the desired frequency. This will cause the corresponding frequency indicator to be brightly illuminated.

A condition can exist when the unit is on but none of the frequency select buttons are depressed. Early version control modules are not on a frequency when this condition exists. This is indicated by no frequency indicator light being on at full brilliance.

Later version control modules automatically revert to a preselected frequency as determined by jumper JU1105 when all buttons are out. JU1105 from eyelet E to eyelet 1 would preselect frequency 1 as the revert frequency. Likewise, a jumper from eyelet E to eyelet 2 would preselect frequency 2, and so on. Jumper JU1106 causes the corresponding frequency indicator light to be brightly illuminated when the revert circuit is activated. JU1106 from eyelet L should always be terminated in the numbered eyelet corresponding to the revert frequency selected. Therefore, JU1105 and JU1106 should always be terminated in like numbered eyelets.

A one frequency radio is always on frequency when the module is on.

b. To Receive

NOTE

Omit steps (1) and (5) for radio sets without "Private-Line" operation.

(1) To hear all on-frequency signals, set the monitor-operate switch (on the side of the hang-up switch box) in the monitor position [ ].

(2) Turn the SQUELCH control fully toward the left.

(3) Turn the VOLUME control toward the right until noise is heard.

(4) With no signal being received, adjust the SQUELCH control by turning the control slowly toward the right until the noise quiets.

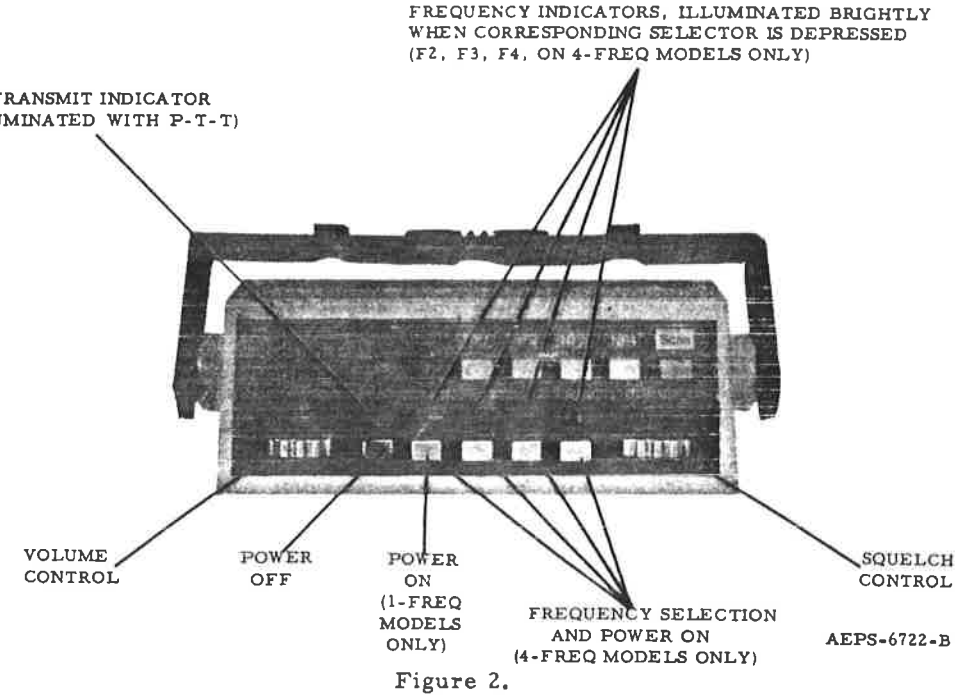

Figure 2.
Operators Controls and Indicators

(5) To hear "Private-Line" signals only, set the monitor-operate switch on the hang-up switch box in the operate position and place the microphone in the hang-up box.

(6) Set the VOLUME control to the desired listening level with a received signal.

(7) The control head contains an "Extender OFF-ON" switch (S1102) which is "spring-loaded", and normally remains in its "ON" position. When an "Extender" radio is used with the control head, a comparison check can be made between "Extender" and Non-"Extender" operation of the radio by actuating switch S1102 back and forth between its "ON" and "OFF" positions.

c. To Transmit

(1) "Private-Line" Radio Sets

(a) Turn "on" the radio set. Turn "on" the vehicle ignition switch (if required). To conserve the battery, the engine should be running while transmitting.

(b) Lift the microphone out of the hang-up switch box. Listen for other stations which may be transmitting. If signals are heard, wait until the communication channel is clear before proceeding. Hold the microphone about one inch from the lips and about 30° away from the face. Press the push-to-talk button on the microphone. The red transmit indicator will be illuminated and the radio will transmit a carrier. Speak slowly and clearly across the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk button and replace the microphone. This returns the radio receiver to PL tone-coded squelch operation.

(2) Carrier Squelch Radio Sets

(a) Turn "on" the radio set. Turn "on" the vehicle ignition (if required). To conserve the battery, the engine should be running while transmitting.

(b) Remove the microphone from the hang-up bracket. Hold the microphone about one inch from the lips and about 30° away from the face. Press the push-to-talk button on the microphone. The red transmit indicator will be illuminated and the radio will transmit a carrier. Speak slowly and clearly across the microphone in a normal or slightly louder-than-normal voice. At the end of the message, release the push-to-talk button and replace the microphone.

d. Equipment "Turn-Off"

Depress the orange switch actuator to remove power from the radio set. All lamps will go "out" to indicate this condition.

4. MAINTENANCE

The alternate control module is a passive unit and will cause very few system malfunctions, throughout the life of the equipment. Should any incorrect operation be attributed to the control module, a few checks with an ohmmeter will point out the defective component.

a. Circuit Card Removal

Performing these resistance checks will require removing the control module circuit card, and is accomplished as follows:

(1) Remove the plugs mating with the control module (and any other circuit card in the same housing).

(2) Loosen two captive screws securing the rear housing cover and remove the rear cover.

(3) Remove the circuit card from the housing.

b. Lamp Replacement

The encapsulated lamps are replaced by unsoldering the leads and removing the assembly from the circuit card. The replacement lamps are placed on the board and secured by soldering the leads to the circuit card.

c. Repair

Other components on the circuit card can be replaced by following accepted repair procedures. Refer to the "MICOR" radio instruction manual for information pertaining to ordering replacement parts. Upon completion of repairs, the circuit card is reinstalled as follows:

(1) Slide the circuit card completely into the housing.

(2) Install the rear housing cover and secure with two captive screws.

(3) Reconnect the connectors to the control module (and to any other circuit card into the same housing).

MODEL CHART

MICOR® /SYSTEMS 90

ALTERNATE CONTROL MODULE

SUB-MODEL	SUFFIX	DESCRIPTION	MODEL	SUFFIX	DESCRIPTION
			TCN1097A	3	1-FREQUENCY
			TCN1098A	3	4-FREQUENCY
TLN4529A		CIRCUIT BOARD (1-FREQ.)	X		
TLN4530A		CIRCUIT BOARD (4-FREQ.)			X
TLN4516A		HARDWARE KIT (1-FREQ.)	X		
TLN4517A		HARDWARE KIT (4-FREQ.)			X

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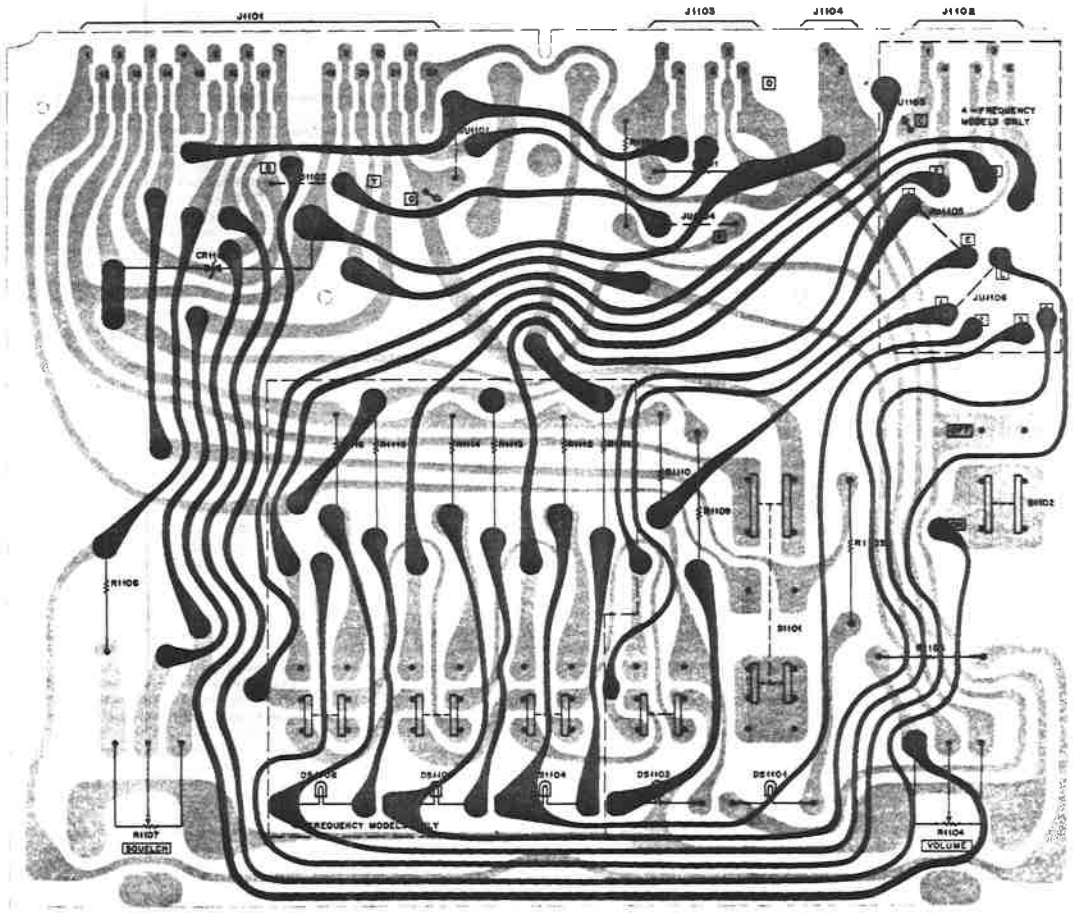

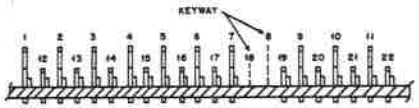

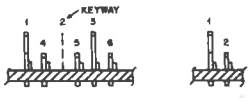

VIEW FROM BACK EDGE OF BOARD

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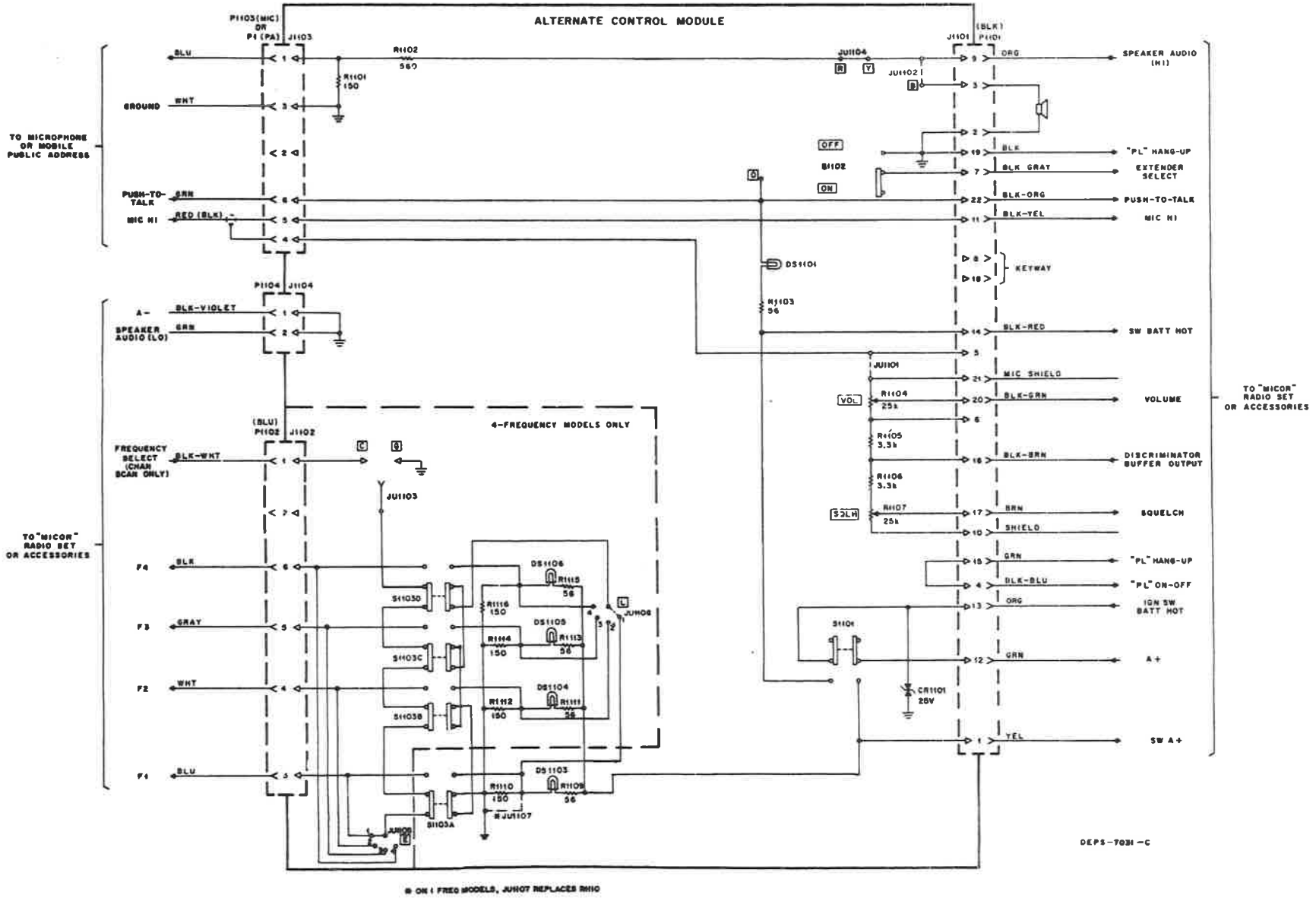
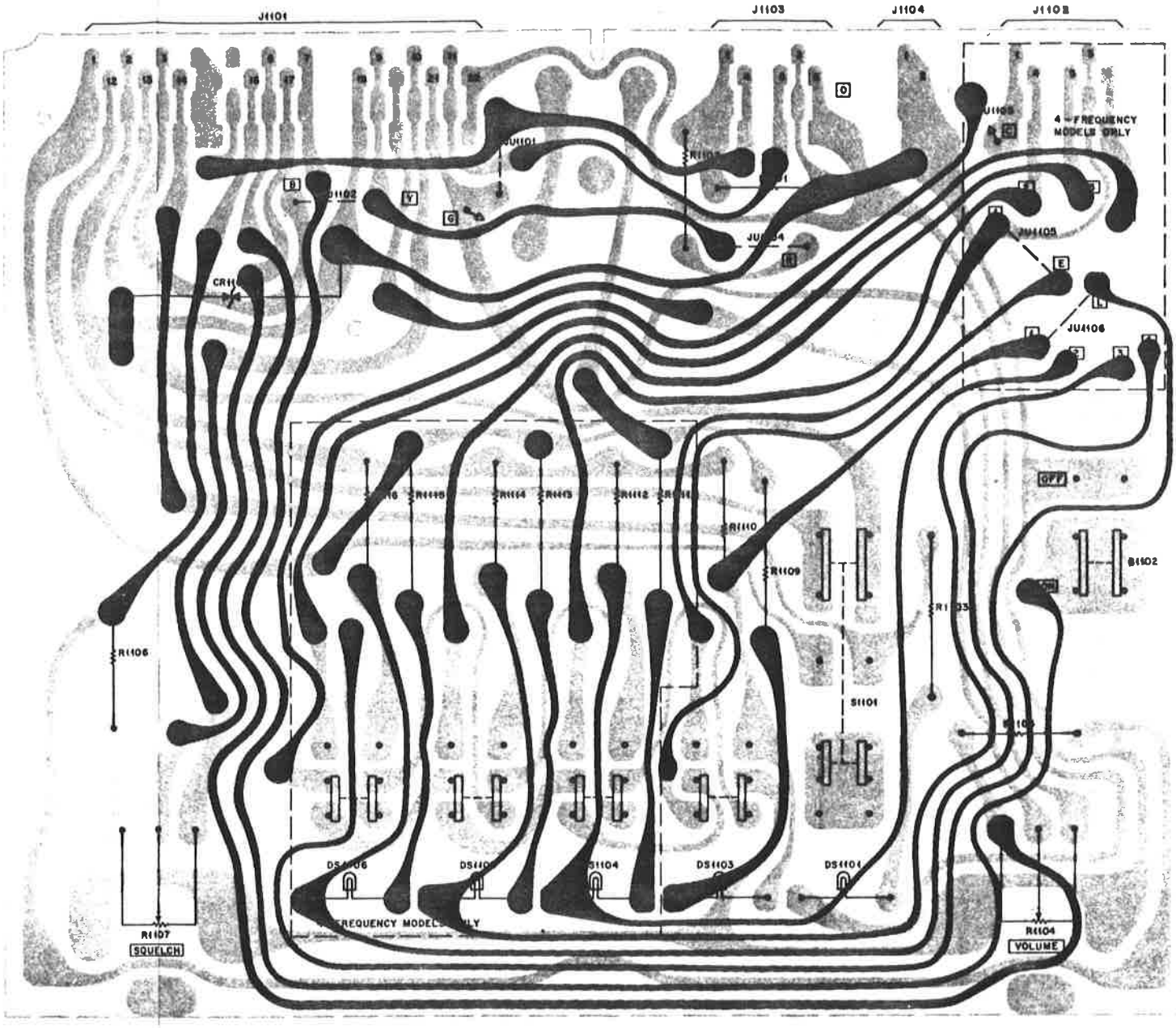


PREVIOUS REVISIONS AND PARTS LIST SHOWN ON BACK OF THIS DIAGRAM

Alternate Control Module
Schematic Diagram and
Circuit Board Detail
Motorola No. 63P81102E38-D
2/7/79-NPC



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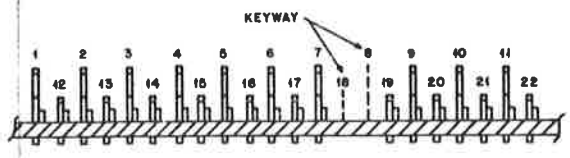
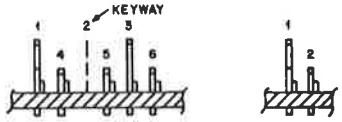


J1101



J1102, J1103 J1104

VIEW FROM BACK EDGE OF BOARD

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REVISIONS

63P81102F38-D

CHASSIS AND SUFFIX NO.	REF. SYMBOL	CHANGE	LOCATION
TCN1097A-1 (TLN4529A-1) TCN1098A-1 (TLN4530A-1)		CIRCUIT BOARD REVISED	
TCN1097A-2 TCN1098A-2 (TLN4530A-2)	DS1102	REMOVED, WAS 65B83554G01, 12 V; 0.19 A; WEDGE BASE; TYPE NO. 161	DS1102 & R1108 WERE SERIES-CONNECTED BETWEEN GROUND & J1101-1 (R1108 TO GROUND
	(NON-REF.)	LAMP SOCKET REMOVED, WAS 9C84285C01 (FOR DS1102)	
	R1108	REMOVED IN 1-FREQ. (NOW USED IN 4-FREQ. ONLY)	
	R1104	FROM 18D82238D22 TO 18D82238D23	"VOLUME" "SQUELCH" S1103
	R1107		
	DS1101	FROM 65B84326C01 TO 65C84047E02	
	DS1103 THRU 1106	FROM 65B84326C01 TO 65C84047E01	
TCN1097A-3 (TLN4529A-2) TCN1098A-3 (TLN4530A-3)	CR1101	ZENER DIODE ADDED 48D83461E45	J1101-13

PARTS LIST

TCN1097A Alternate Control Module (1-Freq.)
TCN1098A Alternate Control Module (4-Freq.) PL-1239-C

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		SEMICONDUCTOR DEVICE, diode: (SEE NOTE)
CR1101	48D83461E45	silicon; dual Zener type; 25 V ±5%
		LAMP:
DS1101	65B84047E02	assembly; 80 mA; 14 V; encapsulated
DS1103 thru 1106	65B84047E01	assembly; 80 mA; 14 V; encapsulated
		CONNECTOR, receptacle:
J1101 thru 1104		c/o; 28C84268C01 CONTACT, male (large) and 28C84269C02 CONTACT, male (small)
		RESISTOR, fixed: unl stated
R1101	6S6373	150 ±10%; 1/2 W
R1102	6S400058	560 ±5%; 1/2 W
R1103	6S2037	56 ±10%; 1 W
R1104	18D82238D23	var; 25k ±30%; 0.2 W
R1105	6S2003	3.3k ±5%; 1/2 W
R1106	6S2003	3.3k ±5%; 1/2 W
R1107	18D82238D23	var; 25k ±30%; 0.2 W
R1108	6S3994	27 ±10%; 2 W (4-Freq. Only)
R1109	6S2037	56 ±10%; 1 W
R1110	6S5645	150 ±5%; 1/2 W (4-Freq. Only)
R1111	6S2037	56 ±10%; 1 W (4-Freq. Only)
R1112	6S5645	150 ±5%; 1/2 W (4-Freq. Only)
R1113	6S2037	56 ±10%; 1 W (4-Freq. Only)
R1114	6S5645	150 ±5%; 1/2 W (4-Freq. Only)
R1115	6S2037	56 ±10%; 1 W (4-Freq. Only)
R1116	6S5645	150 ±5%; 1/2 W (4-Freq. Only)
		SWITCH,
S1101, 1102	40B84635C01	slide: dpdt
S1103	40D84324C03	pushbutton; 2 form "C"; interlocking (TCN1097A)
	or40D84324C06	pushbutton; 5 form "C"; interlocking (TCN1098A)
NON-REFERENCED ITEMS		
	13D84319C21	ESCUTCHEON (TCN1097A)
	13D84319C14	ESCUTCHEON (TCN1098A)
	38C84321C02	BUTTON (ORG)
	38C84321C01	BUTTON (PEARL)
	66B84690C01	TOOL, contact removal
	36C84900C01	KNOB, control
	38B84617C01	STOP, button (TCN1098A)
	39S10184A10	TERMINAL, pin: male; 2 req'd.
	39S10184A07	TERMINAL, pin: female; 1 req'd. (TCN1098A)
	37C82603D60	SLEEVING (blank) (TCN1098A)
	1V80717B64	CIRCUIT BOARD ASSY. (TCN1097A)
	14C84360C01	INSULATOR, switch (S1103)
	1V80717B66	CIRCUIT BOARD ASSY. (TCN1098A)
	14C84566B01	INSULATOR, connector: 2 contact (speaker)
	14C84590B01	INSULATOR, connector: 5 contact (microphone) (TCN1098A)
	2S10101A68	SPRING WASHER (knob retainer)

NOTE:

Replacement diodes, transistors and integrated circuits must be ordered by Motorola part number only for optimum performance.