NOTE: This VxN1017A mike is used on MCX1000

9.4 TOUCH-CODE ENCODER PALM MICROPHONE

The Touch-Code Encoder Palm Microphone, model VMN1017A, includes :

- VLN4383A Logic Board
- VLN4384A Beeper Board
- VLN4386A TT Keypad
- VLN4713A Hardware

The main functional blocks of the Touch-Code Encoder Microphone are highlighted in Figure 9-9

The exploded view, schematics and board details for the Logic and Beeper Boards are found in Figures 9-10 to 9-17.

9.4.1 DESCRIPTION

The model VMN1017A Touch-Code Encoder Microphone for use in the MCX1000 Radio allows the transmission of dual-tone, multi-frequency (DTMF) signals, used for remote signaling applications and mobile telephone operations. This microphone is used in place of the standard palm microphone. No modifications to the radio set are required.

Normal voice transmission is accomplished by pressing the push-to-talk (PTT) button and speaking directly towards the small opening in the keypad. Pressing any keypad button generates either continuous or timed (jumper selectable) DTMF tones. At the same time a keypad button is pressed , the automatic push-to-talk circuitry in the microphone is enabled which keys the radio set transmitter. A single frequency beep tone (sidetone) is also generated. This tone provides feedback to the operator indicating the required time a keypad button must be held down for proper system timing when the microphone is operated in the timed DTMF mode.

During DTMF tone transmission, the microphone is disabled to eliminate background noise from interfering with the signaling tones.

9.4.2 INSTALLATION

The Touch-Code Encoder Palm Microphone is a direct replacement for the MCX1000 radio set palm microphone. The microphone plugs into the mating receptacle on the radio set or on the control head in the normal manner.

The Touch-Code encoder deviation (preset at the factory), should be checked during installation. Refer to the maintenance section following for details.

9.4.3 OPERATION

Microphone Mode

The microphone is operated in the normal manner. Lift and hold the microphone about two inches from the lips. Press the PTT button and speak clearly into the opening on the keypad. Release the PTT button to listen.

Touch-Code Mode

Timed Tones Operation
(JU3 installed in Position B)

The digits of the operator's selected DTMF signal are entered through the keypad by firmly pressing a finger on one keypad button at a time. In this mode, the operator must hold the keypad button down for the first digit of the DTMF signal (and for each successive digit) until the sidetone beep stops. Holding the keypad button down for a longer time does not increase the DTMF tone duration. Releasing the keypad button before the sidetone beep stops produces a shortened DTMF signal and may prevent proper digit recognition by the system decoder.

NOTE

DO NOT press the microphone PTT button since the auto push-to-talk circuitry within the microphone is enabled whenever a keypad button is pressed. Pressing the microphone PTT button and a keypad button at the same time will prevent DTMF tone generation.

Continuous Tones Operation
(JU3 installed in Position A)

Use of the keypad and auto push-to-talk functions are the same as mentioned in the previous paragraph. In this manner of operation, the DTMF signal and sidetone beep are generated continuously (as long as the keypad button is held

down) and for as long as the auto push-to-talk timer in the microphone is active. The minimum time a keypad button must be held down depends upon the decoder or telephone interconnect used at the receiving end of the system. Once the auto push-to-talk timer times out, the radio set transmitter dekeys and continued attempts to generate the remaining DTMF signal tones are meaningless.

9.4.4 DEVIATION ADJUSTMENT

The Touch-Code feature of the microphone has been factory adjusted to provide proper deviation. Readjustment may be required if either the radio set transmitter or the microphone are serviced. The radio set must be adjusted for proper Instantaneous Deviation Control (IDC) prior to checking Touch-Code deviation.

1. Adjust a service monitor (Motorola R-1200A or equivalent) to the radio set transmitter frequency.

2. Prior to checking Touch-Code deviation, disable all other sources of modulation such as Private-Line, Digital Private-Line, or low speed data.

3. Press the # button on the keypad and observe the Touch-Code deviation on the service monitor. Correct deviation is 3 kHz.

4. A hole which allows access to tone deviation potentiometer R32 is located on the rear housing to the right of the nameplate. A long tuning tool, Motorola Part No. 66-84974L01, is required.

5. Adjust tone deviation potentiometer R32 for 3 kHz deviation of the DTMF signal (if required).

6. When setting deviation, it is important to set the level during the 1.2 seconds immediately following actuation of the # button. This is necessary since accurate setting of deviation can only be achieved if the automatic push-to-talk feature is enabled when the deviation level is set.

9.4.5 TIPS FOR USING THE ENCODER MICROPHONE

DTMF signaling was originally developed for telephone signaling on telephone lines and there are certain constraints on its adaptability to mobile radio. However, improved reliability will result if the simple precautions below are followed.

1. Limit placing your calls whenever possible to areas of optimum system coverage (full quieting). Calls made in noisy (fringe) areas may not be reliably placed.

2. Whenever possible, initiate your calls when the vehicle is not moving. Dialing when the vehicle is moving may not only be distracting for the driver, but reduces the reliability of the signaling due to weak signal (dead spot) or noise interference encountered with two-way radios in moving vehicles.

9.5 MOBILE SPEAKER ILLUSTRATED PARTS LIST

Two mobile speaker kits are available. They are :

- MBTSN6031A Speaker (Dash Mt. Radio)
- MBTSN6032A Speaker (Remote Mt. Radio)

Figure 9-18 contains the Illustrated Parts List for the Mobile Speaker. A mobile speaker is included with every mobile radio.

9.6 BASE STATION MOUNTING TRAY AND SPEAKER ILLUSTRATED PARTS LIST

- MBTRN4898A Base Station Speaker Tray

Figure 9-19 contains the Illustrated Parts List for the Base Station Mounting Tray and Speaker. The MCX1000 Radio mounts conveniently on top of this tray for ease of operation during base station use. This tray and speaker is included when the base station option is ordered. Option information is contained in Section 2 of this manual.

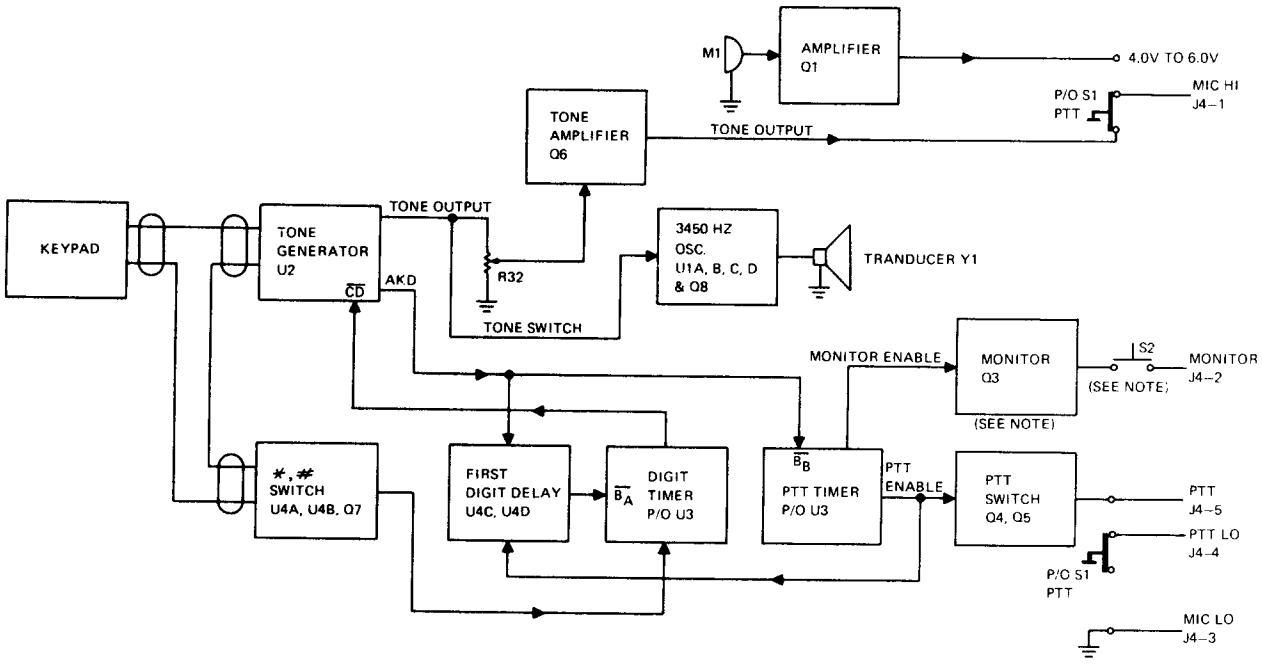

Figure 9-9
Touch-Code Encoder Microphone
Functional Block Diagram

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parts list

VLN4386A DTMF MICROPHONE TOUCH TONE KEYPAD

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
3	0780188F02	FRM KEY PAD
5	2880085E09	CONN MALE HEADER (2)
4	4580192F01	ACTR KEY PAD
6	8400288M01	BD KEY PAD

VLN4713A DTMF MICROPHONE HARDWARE

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION	80112
1	1580185F01	HSNG MIC FRONT	
2	3880144D03	BTN MIC	
6	2880085E03	MALE HEADER	
6A		LOGIC BOARD	
7	3000057M01	CABLE, MIC	
8	4280188G01	RETNR 0 RING (4)	
9	4380187F01	SPACER PC BD MIC (4)	
10		TRANSDUCER ASSY P/O VLN4823A	
11		GASKET P/O VLN4384A, 0180725T82	
12		SPACER P/O VLN4384A, 0180725T82	
MK1		CONDENSER P/O VLN4384A, (ASSEMBLY # 0180725T82)	
13		S2 SWITCH, P/O VLN4384A	
14		CONTACT BTN P/O VLN4384A, 4080252E02	
15		S1 SWITCH P/O VLN4384A	
16		P3, P/O VLN4384A, 0980237F01	
17		BEEPER BOARD	
18	0180730T59	REAR HSNG ASSEMBLY	
19		ABOVE ASSEMBLY NOT FIELD	
20		REPAIRABLE. CONSISTS OF	
21		PARTS WITH REFERENCE	
23		SYMBOL #'S 18, 19, 20, 21,	
24		23, 24, 25	
25			
22		P1, P2, P/O VLN4383A	
26	3280253E02	GSKT SW PL	
27		J3, P/O VLN4383A	
28	0380076E05	SCR METRIC HI LO (3)	
29	0300140085	SCR TPG 4-20X3/8 PHLPAN STL (4)	
30		J4, P/O VLN4384A	
		Non-referenced items	
	3300201M04	NAMEPLATE	
	3580089D02	BAFFLE FELT MIC	
	0100851093	MIC MOUNTING	

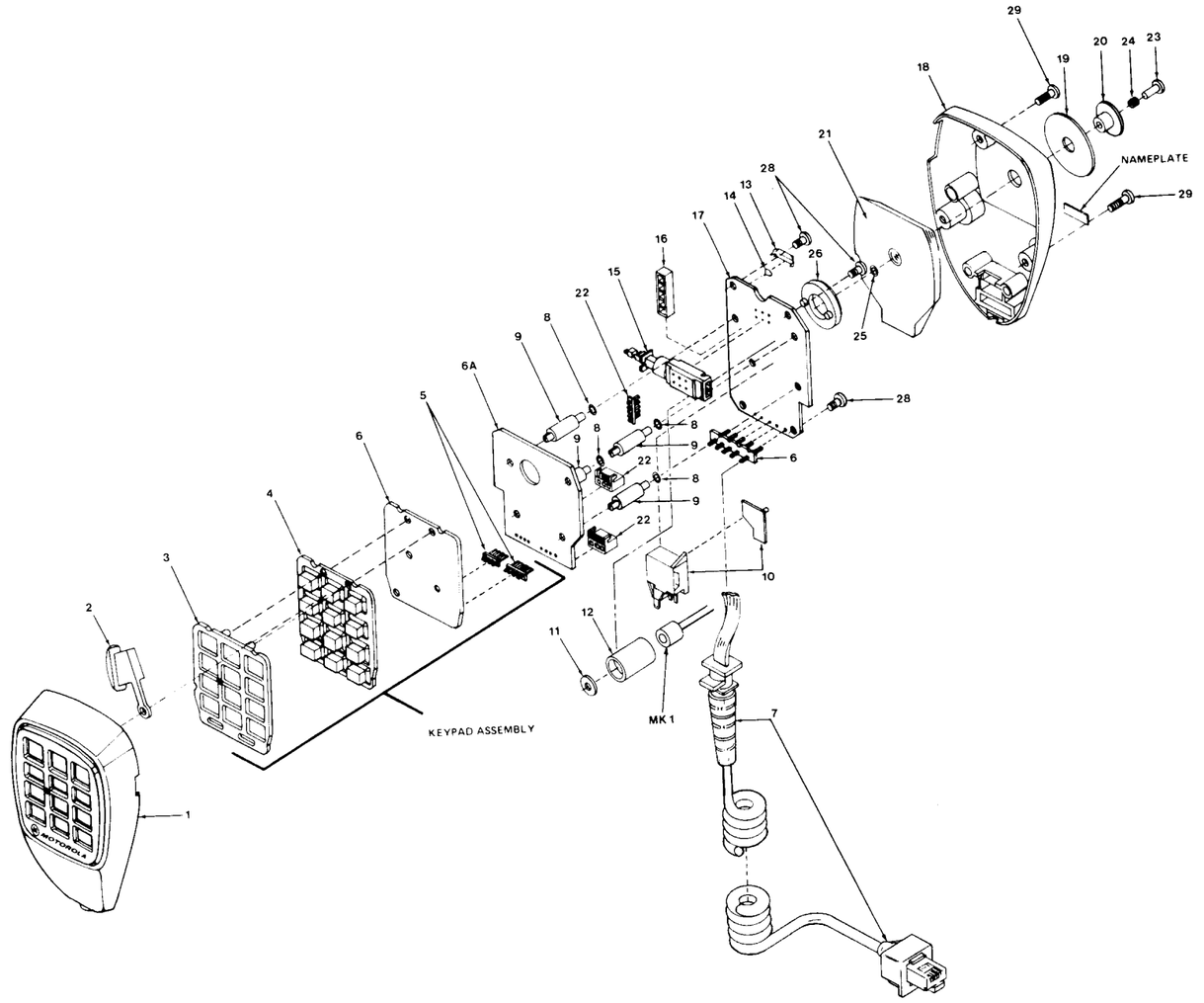

Figure 9-10
Touch-Code Encoder Microphone
Exploded View

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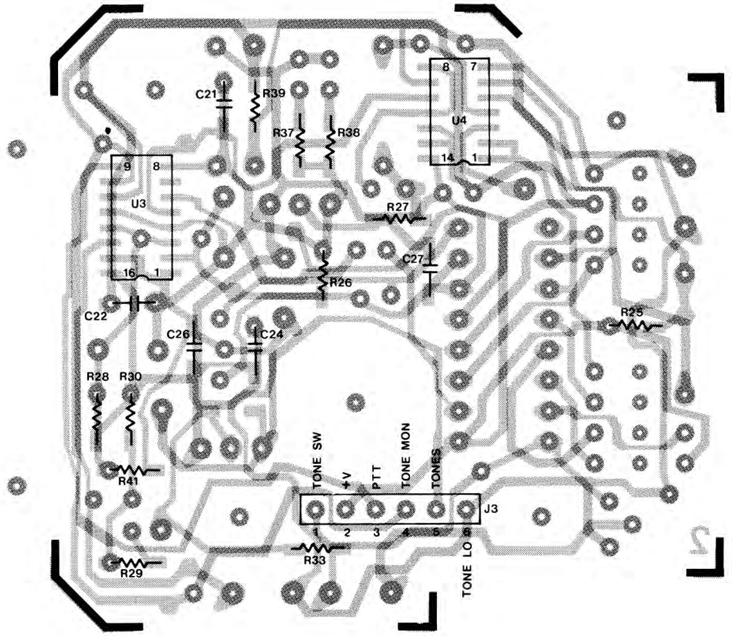
parts list

VLN4383A DTMF MICROPHONE LOGIC BOARD

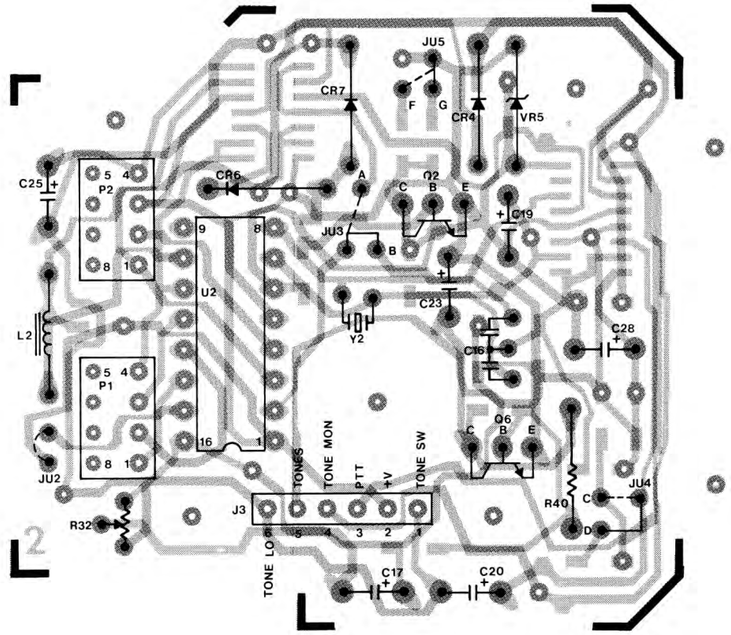
REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
		Resistor, chip, 5% 1/8W. (unless stated otherwise)
R25	0600015M97	100K
R26	0600015M89	47K
R27	0600015M97	100K
R28	0600016M02	150K
R29	0600016M14	470K
R30	0600016M16	560K
R32	1805501C03	POT CKT BD
R33	0600015M63	3900
R37	0600016M15	510K
R38	0600016M04	180K
R39	0600016M08	270K
R40	0611009A65HB	FCF 4.7K 1/4W.
R41	0600016M20	820K 1/4 W.
		Capacitor, chip, uf (unless stated otherwise)
C17	2311013F57	TANT 1 20 35V
C18	2111032A21	CHIP .01 10 X7R 50V
C19	2311013D05	TANT 2.2 10 20V
C20	2311013D05	TANT 2.2 10 20V
C21	2111032A09	CHIP .001 10 X7R 50V
C22	2111032A09	CHIP .001 10 X7R 50V
C23	2311013D15	TANT 15 10 20V
C24	2111032A09	CHIP .001 10 X7R 50V
C25	2311013D05	TANT 2.2 10 20V
C26	2111032A09	CHIP .001 10 X7R 50V
C27	2111032A09	CHIP .001 10 X7R 50V
C28	2311013F57	TANT 1 20 35V
		Connector
J3	2880085E08	CONN MALE HEADER
P1	0980238F01	RECP 4 PIN CKT BD MTNG
P2	0980238F01	RECP 4 PIN CKT BD MTNG
		Coil
L2	2482723H27	RF 1.2uH GRN
		Transistor
Q6	4800869642	M9642
Q7	4800869643	M9643
		Resonator
C16Y2	4800112M01	CERAMIC
		Diode
CR4	4883654H01	SLCN
CR6	4883654H01	SLCN
CR7	4883654H01	SLCN
VR5	4882256C03	ZENER 4.70V
		Integrated Circuit
U2	5180065C11	TN GENR
U3	5180073C09	CMOS DUAL MONOSTABLE
U4	5180073C08	CMOS QUAD NAND GATE SOIC

Figure 9-12
Touch-Code Encoder Microphone
Tone / Logic Board Parts List



SHOWN FROM SOLDER SIDE

SOLDER SIDE - RED
COMPONENT SIDE - GREY



SHOWN FROM COMPONENT SIDE

SOLDER SIDE - RED
COMPONENT SIDE - GREY

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Figure 9-11
Touch-Code Encoder Microphone
Tone / Logic Board- Board Details

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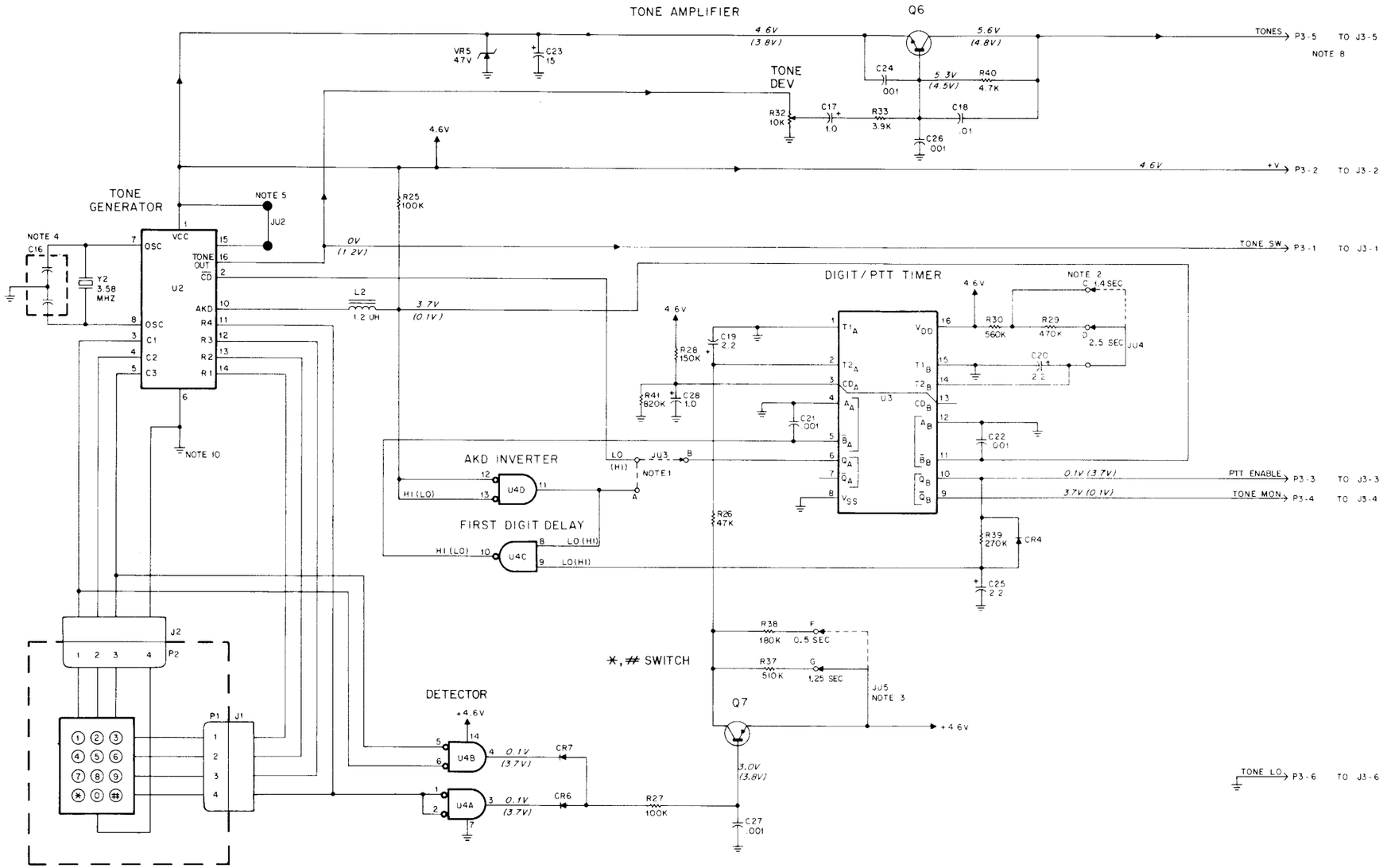

NOTES:

1. Placing JU3 in Position A defeats timed tone operation. In Position A, tone duration lasts as long as touch-pad key is pressed. In Position B, tone duration is controlled by timer U3.
2. Placing JU4 in Position C selects a PTT hold time of 1.4 seconds. Placing JU4 in Position D selects a PTT hold time of 2.5 seconds.
3. Placing JU5 in Position F selects a *, # time of .5 second. Placing JU5 in Position G selects a *, # time of 1.25 seconds.
4. Y2 and C16 are a matched set and must be replaced as a pair. See parts list.
5. Pressing two keypad buttons in the same row or column will generate the single tone for that row or column. Removing jumper JU2 will inhibit any tone generation if more than one keypad button is pressed.
6. Voltages indicated as (0.1V) are active voltages (when either PTT or keypad buttons are depressed). Standby voltages are shown without parenthesis.
8. P3 connects to J3 on Mic / Beeper Board.
9. Unless otherwise indicated, resistor values are in ohms, and capacitor values are in microfarads.
10. The ground symbol on this diagram is actually referenced to mic lo, not radio set ground.

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Figure 9-13
Touch-Code Encoder Microphone
Tone / Logic Board Schematic Diagram

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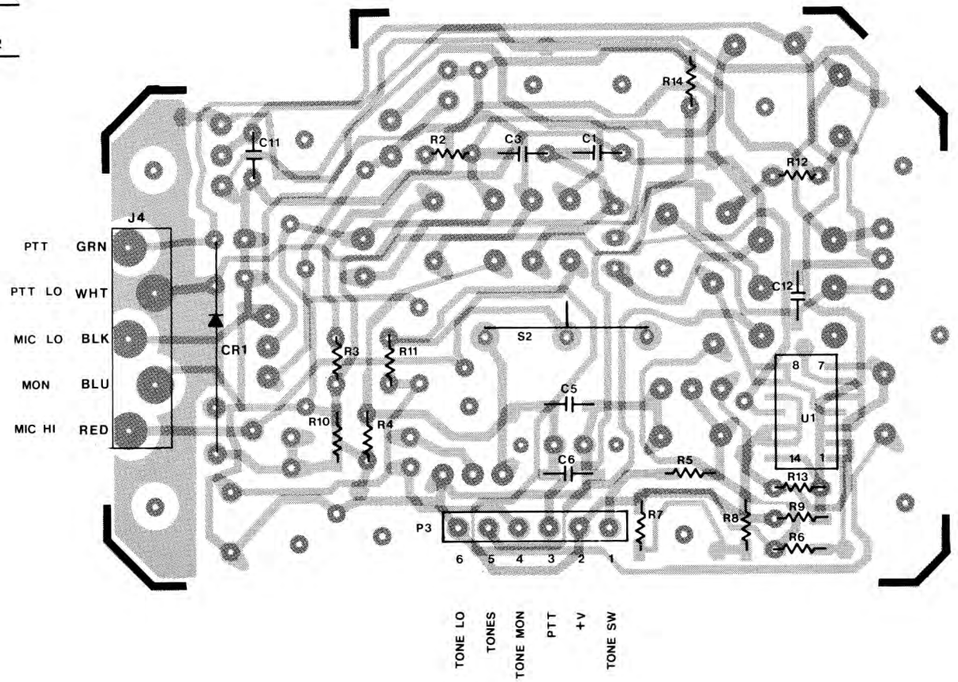
parts list

VLN4823A DTMF MICROPHONE BEEPER BOARD

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION	80112
		Capacitor, uf (unless stated otherwise)	
C1	2111032A09	CHIP .001 .10 X7R 50V	
C2	0811051A07	MTLZ POLYEST .01 5 63V	
C3	2111031A47	CHIP 220 pf 5 NPO 50V	
C4	2311013D13	TANT 10 10 20V	
C5	2111032A09	CHIP .001 .10 X7R 50V	
C6	2111031A25	CHIP 27 pf 5 NPO 50V	
C7	0811051A05	MTLZ POLYEST .0047 5 63V	
C8	2311013D13	TANT 10 10 20V	
C9	2311013F57	TANT 1 20 35V	
C10	2311013C12	TANT 27 10 15V	
C11	2111032A09	CHIP .001 .10 X7R 50V	
C12	2111032A21	CHIP .01 10 X7R 50V	
C13	0811051A11	MTLZ POLYEST .047 5 63V	
C14	2311013F57	TANT 1 20 35V	
		Diode	
CR2	4883654H01	SLCN	
CR3	4883654H01	SLCN	
CR9	4883654H01	SLCN	
VR1	4882256C54	ZENER 12V	
VR2	4882256C54	ZENER 12V	
		Connector	
J4	3910184A10	PLUG (5 used)	
P3	0980237F01	RECP 6 PIN CKT BD MTNG	
		Coil	
L1	2480108G02	CHK AUDIO 110MH	
		Transistor	
Q1	4800869594	NPN 69594	
Q2	4800869642	M9642	
Q3	4800869642	M9642	
Q4	4800869642	M9642	
Q5	4800869640	M9640	
Q8	4800869642	M9642	
		Resistor, chip, 5%, 1/8 W (unless stated otherwise)	
R1	0611020A19	FCF 56 1/4 W.	
R2	0600016M10	330K	
R3	0600015M49	1000	
R4	0600015M57	2200	
R5	0600015M85	33K	
R6	0600015M77	15K	
R7	0600015M51	1200	
R8	0600015M83	27K	
R9	0600015M33	220	
R10	0600015M85	33K	
R11	0600015M61	3300	
R12	0600015M77	15K	
R13	0600016M14	470K	
R14	0600015M77	15K	
R18	0611020A46	FCF 750 1/4 W.	
		Switch	
S1	4080065E02	MOMENTARY	
	4080252E01	CONT	
S2	4080252E02	SW CONT BTN	
		Non-referenced items	
	KSN1100A	3.2 KHZ TRANSDUCER	
	0180725T82	MIC CET	
		Integrated Circuit	
U1	5180073C08	IC CMOS QUAD NAND GATE SOIC	



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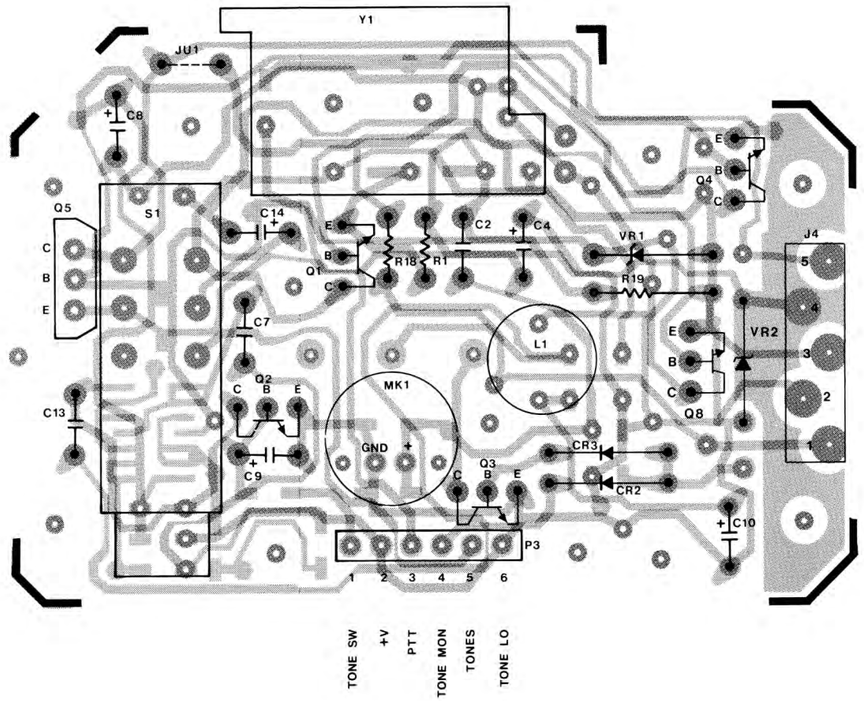
SOLDER SIDE - RED
COMPONENT SIDE - GREY

Figure 9-15
Touch-Code Encoder Microphone
Microphone/Beeper Board Parts List



SHOWN FROM COMPONENT SIDE

SOLDER SIDE - RED
COMPONENT SIDE - GREY

Figure 9-14
Touch-Code Encoder Microphone
Microphone / Beeper Board
- Board Details

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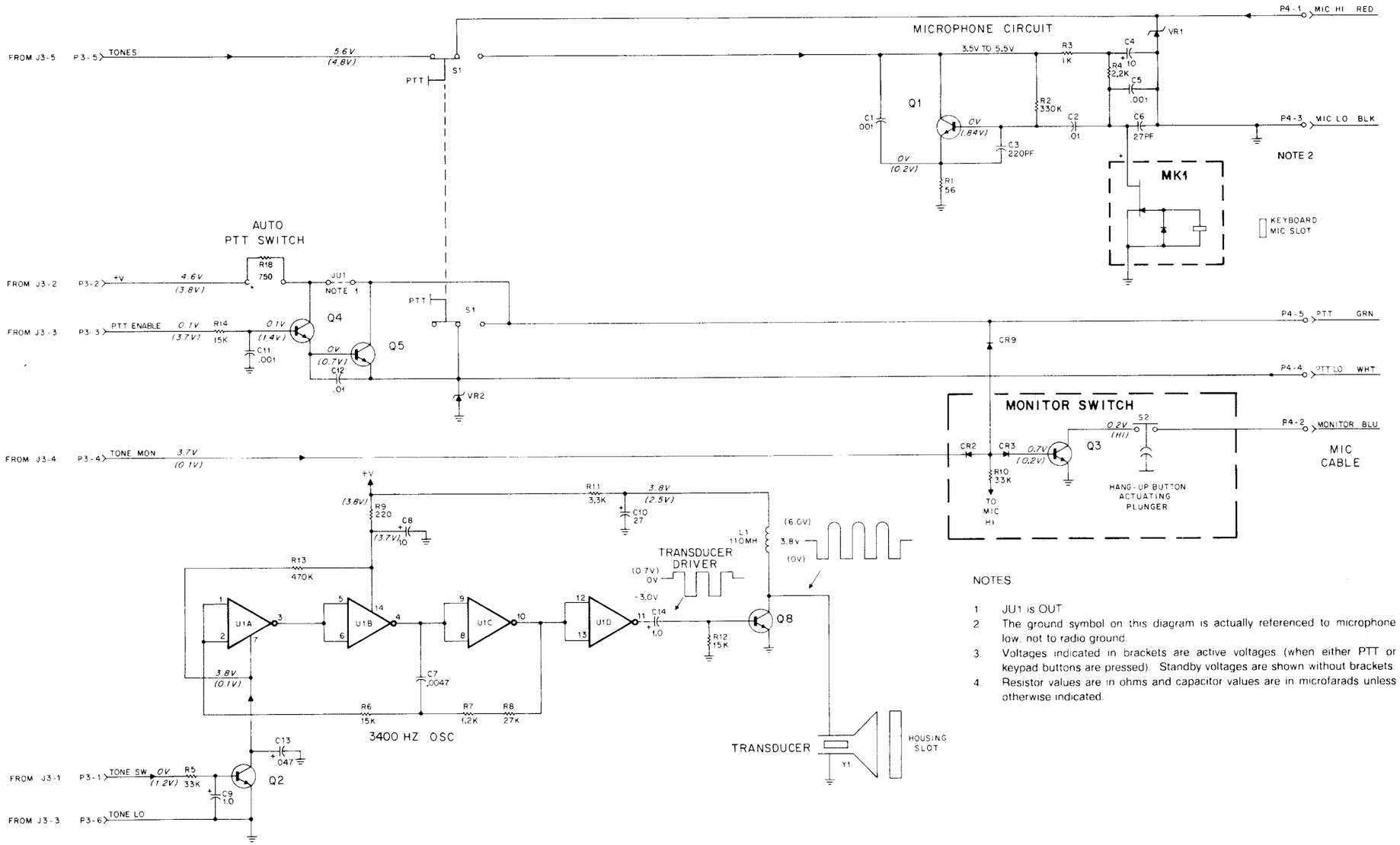

NOTES:

1. JU1 is OUT
2. The ground symbol on this diagram is actually referenced to microphone low, not to radio ground.
3. Voltages indicated in brackets are active voltages (when either PTT or keypad buttons are pressed). Standby voltages are shown without brackets.
4. Resistor values are in ohms and capacitor values are in microfarads unless otherwise indicated.

Figure 9-16
Touch-Code Encoder Microphone
Microphone / Beeper Board
Schematic Diagram

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