

\*EEPS-30866-0

**RELAY AND RELAY DRIVER TEST PROCEDURE**

1. GROUND TP12 (RUN/TEST). VERIFY THAT RELAYS K1-K5, AND K22 FOR 30 MHz TUNERS, ARE CLOSED.
2. GROUND TP11 (ELEMENTS IN/OUT) AND TP12 (RUN/TEST). VERIFY THAT RELAYS K6-K21, AND K23 FOR 30 MHz TUNERS, ARE CLOSED. VERIFY THAT RELAYS K1-K5 ARE OPEN.
3. INDIVIDUALLY CHECK EACH RELAY BY:
  - DISCONNECTING EITHER END OF L9.
  - APPLYING 13.8 V TO THE SWITCHED A+ INPUT (GRN).
  - GROUNDING THE APPROPRIATE TEST POINT TO ACTIVATE RELAY (TP1-TP8, TP17-TP28).
4. RECONNECT AND SOLDER L9. REMOVE GROUND FROM TP11 AND TP12.

**VSWR DETECTOR TEST PROCEDURE**

1. CONNECT RF OUT TERMINAL TO ANTENNA OR DUMMY LOAD.
2. APPLY +5 V TO TP13 TO ENABLE SLOW TUNING MODE (SWITCHING AT 2 Hz RATE).
3. TURN ON RADIO TO APPLY SWITCHED A+ TO TUNER.
4. MONITOR VOLTAGE AT U6-11 AND J8-39. VOLTAGE AT U6-11 SHOULD GRADUALLY DROP DURING THE TUNING SEQUENCE AS THE MATCHED CONDITION IS APPROACHED. U8-39 SHOULD BE LOW FOR APPROXIMATELY ONE SECOND DURING THE TUNING SEQUENCE.

**PHASE DETECTOR TEST PROCEDURE**

1. DISCONNECT ANTENNA FROM RF OUT TERMINAL.
2. (T1960A AND T1962A MODELS ONLY.) CONNECT A 560 PF CAPACITOR FROM RF OUT TERMINAL TO GROUND.
3. GROUND TP11 AND TP12. UNSOLDER AND REMOVE EITHER END OF R112.
4. APPLY 3 WATT RF SIGNAL TO RF INPUT TERMINAL.
5. VARY FREQUENCY OF RF INPUT. MEASURE VOLTAGE AT U8-1. VOLTAGE SHOULD BE LOW WHEN INPUT FREQUENCY IS ABOVE 7.5 MHz.
6. RECONNECT AND SOLDER R112. REMOVE GROUND FROM TP11 AND TP12.

*Automatic Antenna Tuner Troubleshooting Chart*

parts list

TLA6102A RF Board
TLA6112A RF Board
PL-6966-A

Table with columns: REFERENCE SYMBOL, MOTOROLA PART NO., DESCRIPTION. Lists various components including capacitors, resistors, diodes, relays, and coils.

Table with columns: REFERENCE SYMBOL, MOTOROLA PART NO., DESCRIPTION. Lists various components including inductors, transistors, resistors, and integrated circuits.

Table with columns: REFERENCE SYMBOL, MOTOROLA PART NO., DESCRIPTION. Lists voltage regulators, mechanical parts like screws and washers, and a transformer.

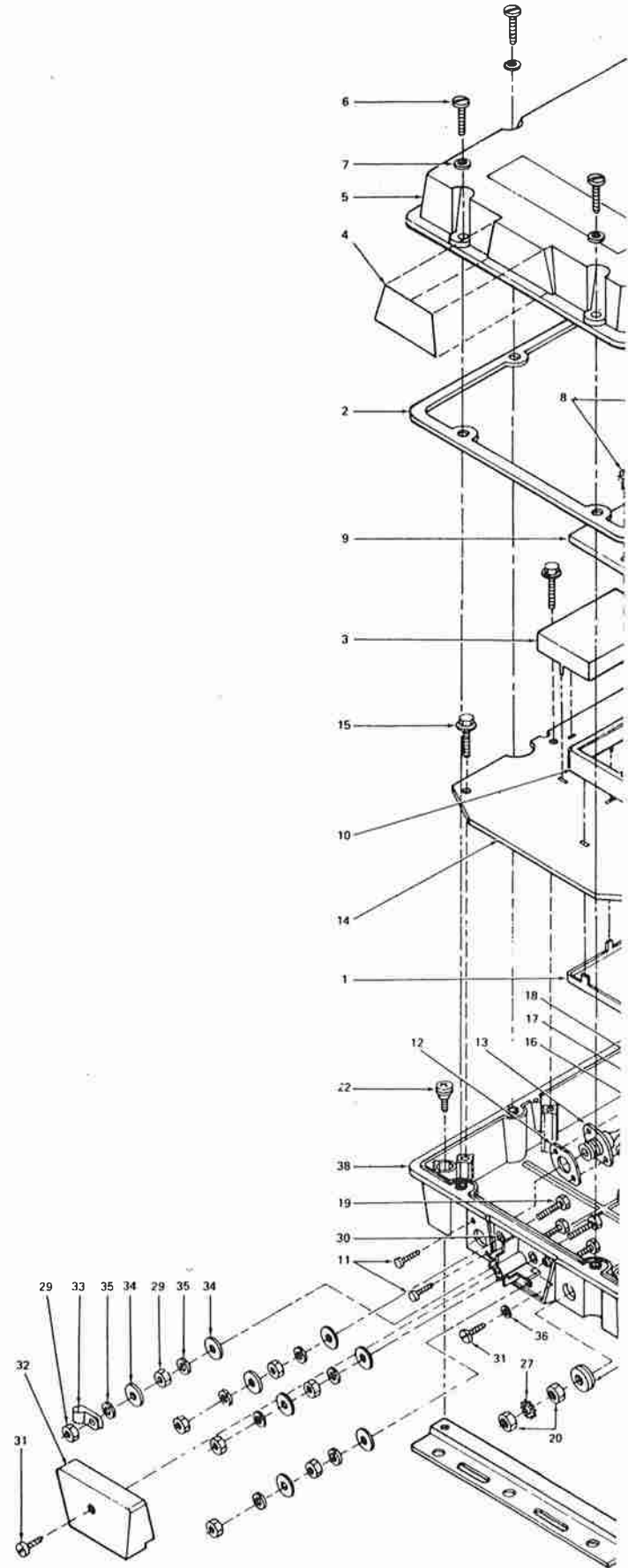
note: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part numbers.

THN6410A Housing Antenna Tuner PL-6967-A

Table with columns: ITEM NO., MOTOROLA PART NO., DESCRIPTION. Lists parts for the antenna tuner housing, including shields, gaskets, nameplates, and various fasteners.

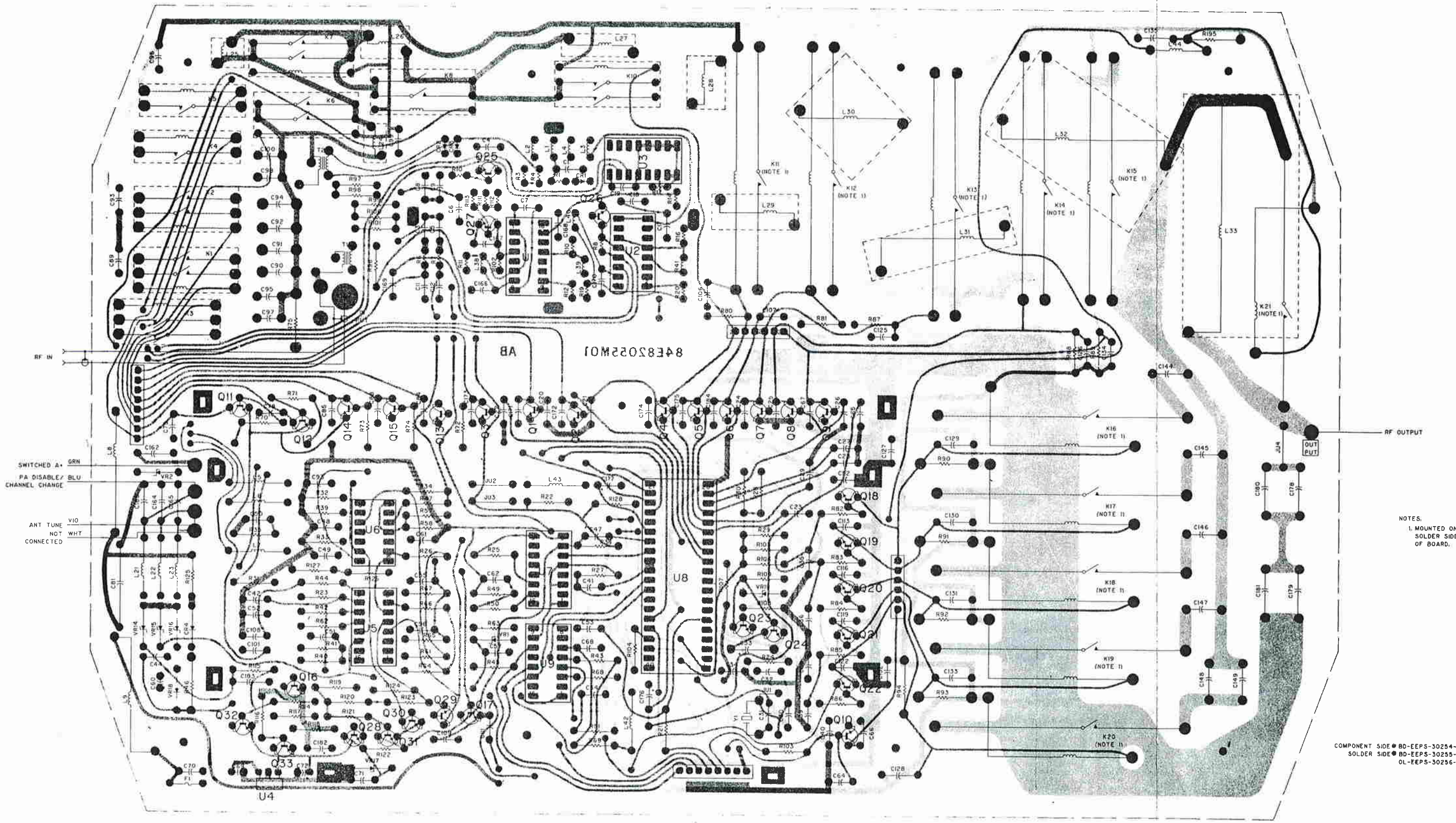
TKN8119A Mobile Antenna Matching Harness PL-6968-A

Table with columns: REFERENCE SYMBOL, MOTOROLA PART NO., DESCRIPTION. Lists components for the antenna matching harness, including eyelets, lugs, terminals, and a braid.





# Automatic Antenna Tuners 2-18 MHz



NOTES:  
1. MOUNTED ON  
SOLDER SIDE  
OF BOARD.

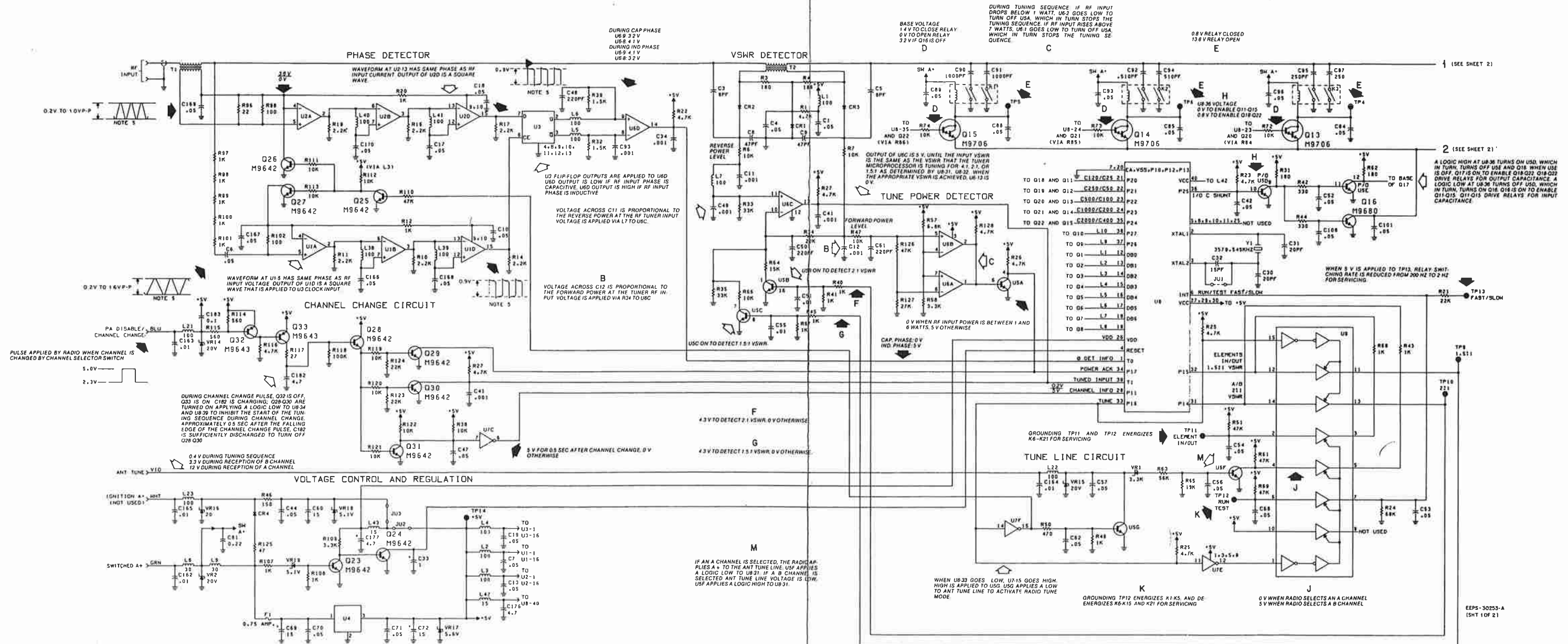
COMPONENT SIDE ● 8D-EEPS-30254-O  
SOLDER SIDE ● 8D-EEPS-30255-O  
OL-EEPS-30256-A

SHOWN FROM COMPONENT SIDE



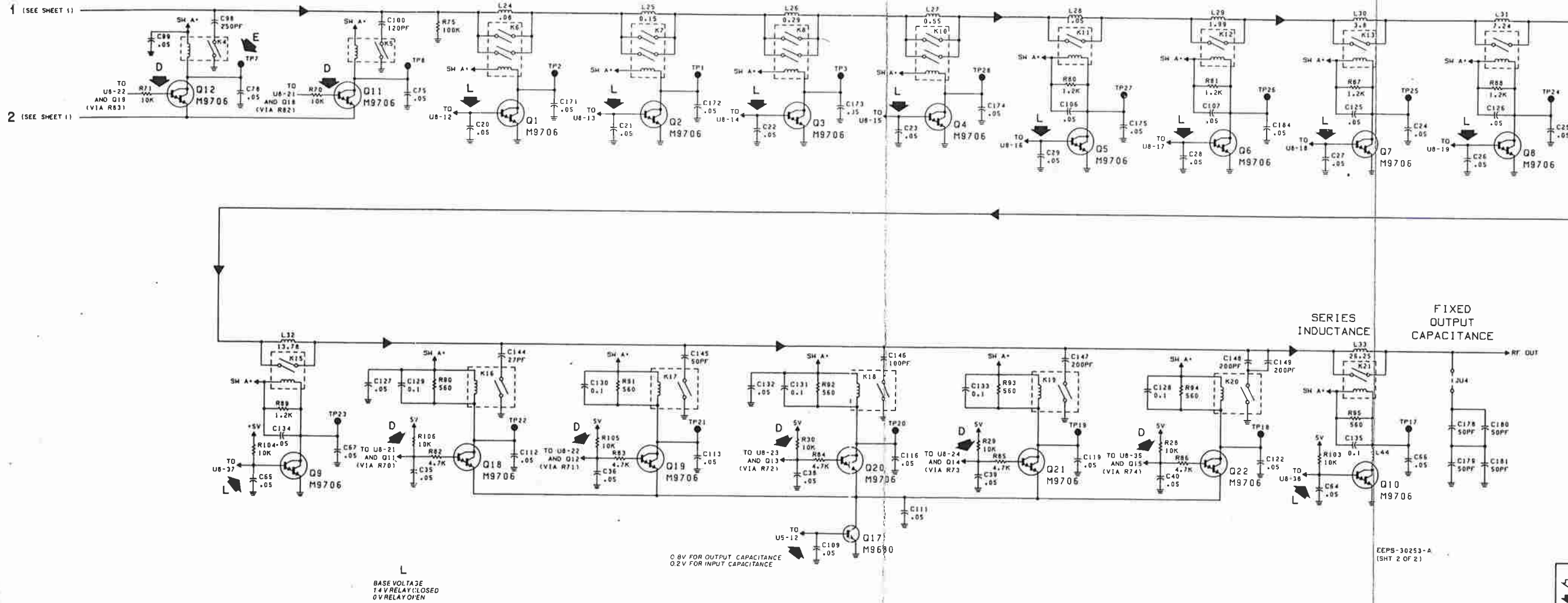
# Automatic Antenna Tuners

2-18 MHz



Automatic Antenna Tuner Schematic Diagram

# Automatic Antenna Tuners 2-18 MHz



## NOTES

- UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS; CAPACITOR VALUES ARE IN MICROFARADS; INDUCTOR VALUES ARE IN MICROHENRIES
- THIS DIAGRAM SHOWS POSITIVE LOGIC  
LOGIC "1" 2 TO 5.4 V DC  
LOGIC "0" 0 TO 1.8 V DC
- SOME INTEGRATED CIRCUITS ON THIS BOARD ARE CMOS DEVICES
- IC TYPES AND CONNECTIONS FOR THIS BOARD ARE AS FOLLOWS:

REFERENCE DESIGNATION	TYPE	VCC	GND
U1, U2	MC10115	1, 16	8
U3	MC10131	1, 16	8
U4	MC7805CP	1	2
U5	CA3081	-	15
U6	MC3302	3	12
U7	MC14049B	1	8
U8	8046	40, 26	20
U9	MC14503	16	8

- PHASE DETECTOR WAVEFORMS AND VOLTAGES ARE MEASURED DURING TUNING SEQUENCE WITH A 2 MHz, 3 WATT LEVEL AT TUNER RF INPUT
- VOLTAGE SHOWN ABOVE LINE IS MEASURED DURING TUNING SEQUENCE. VOLTAGE SHOWN BELOW LINE IS MEASURED UNDER ALL OTHER CONDITIONS. FOR EXAMPLE 3.6V  
0.7
- MEASURED WITH TUNER COMPLETELY MISMATCHED AND A 2 MHz, 3 WATT SIGNAL AT TUNER RF INPUT.

## JUMPER TABLE

MODEL	JU1	JU2	JU3	JU4
T1959A	IN	IN	OUT	IN
T1961A	IN	IN	OUT	IN
T1962A	IN	IN	OUT	IN

## LEGEND:

- THEORY NOTE
- MAINTENANCE NOTE
- PRIMARY SIGNAL FLOW
- SECONDARY SIGNAL FLOW

Automatic Antenna Tuner  
Schematic Diagram