

SECTION 16.

FREQUENCY-STANDARD INTERFACE BOARD (A16)

16.1 DESCRIPTION

The Frequency-Standard Interface board provides the 10-MHz timebase for the System Analyzer and the interface for an external 10-MHz input. A standard temperature-compensated crystal oscillator (TCXO) provides stability of ± 1 PPM. An optional oven-compensated crystal oscillator (OCXO) provides stability of ± 0.05 PPM over temperature variation.

A block diagram of the 10-MHz Frequency-Standard Interface board is shown in Figure 16-1, a schematic in Figure 16-2, the printed wiring board assembly and the parts list in Figure 16-3, and the assembly and parts list in Figure 16-4.

16.2 THEORY OF OPERATION

16.2.1 INTERNAL SOURCE

Oscillator A16A2 generates a 10-MHz signal that is split to two amplifiers. One amplifier (Q3) provides the

internal timebase; the other amplifier (Q2) provides the external timebase. The two identical amplifiers provide a peak-to-peak signal of 1 to 2V (as adjusted by R18) into a 50-ohm load.

A voltage regulator (U1 and Q1) on the board supplies the voltage to the oscillator and monitors the supply current. For the ovenized option, at power on, the oven draws high current at approximately 1A. As the oven warms up, the current decreases, reaching some low value when the operating temperature is reached. A current detector turns the oven-ready indicator on when the current has decreased to the stabilized value of approximately 325 mA.

16.2.2 EXTERNAL SOURCE

An external 10-MHz timebase can be used by switching S1 (accessible from the bottom of the Analyzer) to the external position. The external source is amplified by Q3, which has an input impedance of 10K ohm. The external source signal must be between 175 mVrms and 2.0 Vrms into 10K ohm.

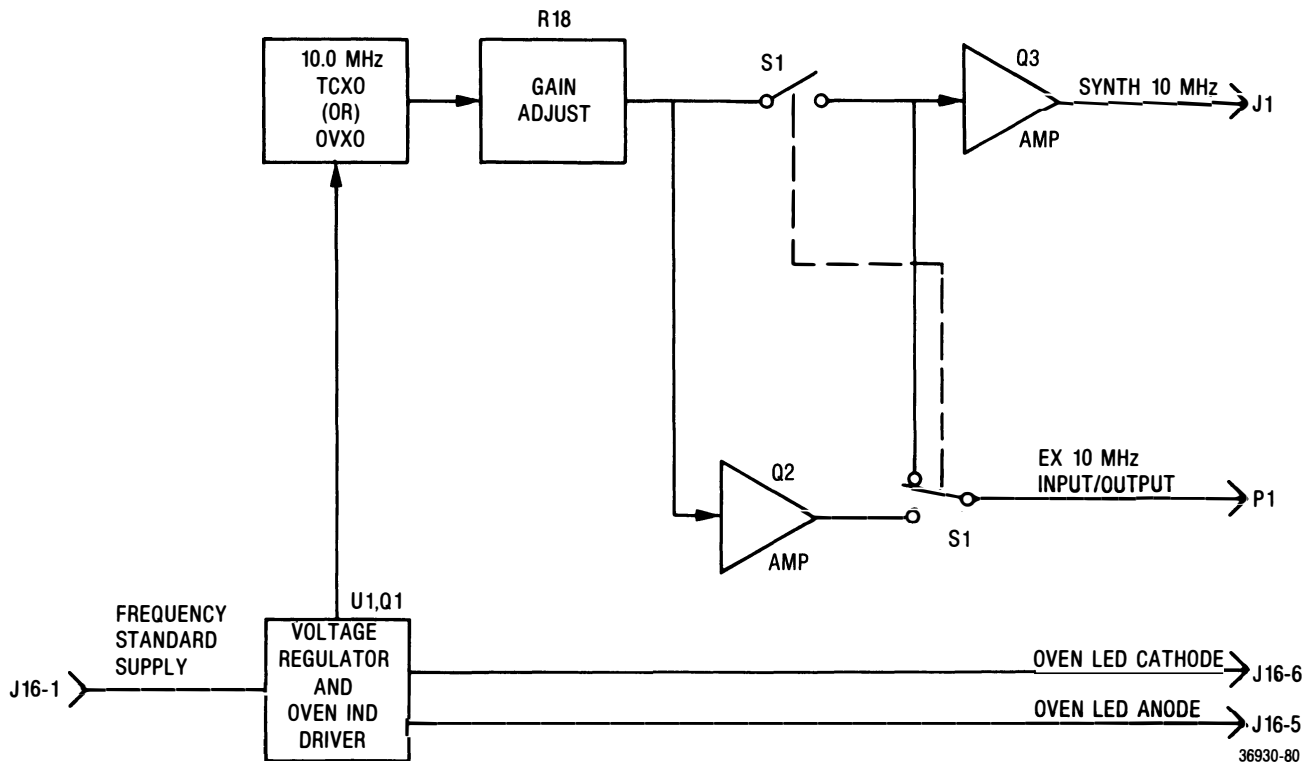


Figure 16-1. Frequency-Standard Interface Board (A16) — Block Diagram

FREQUENCY - STANDARD INTERFACE BOARD (A16)

(RTL-1020A)

Figure 16-2. Schematic

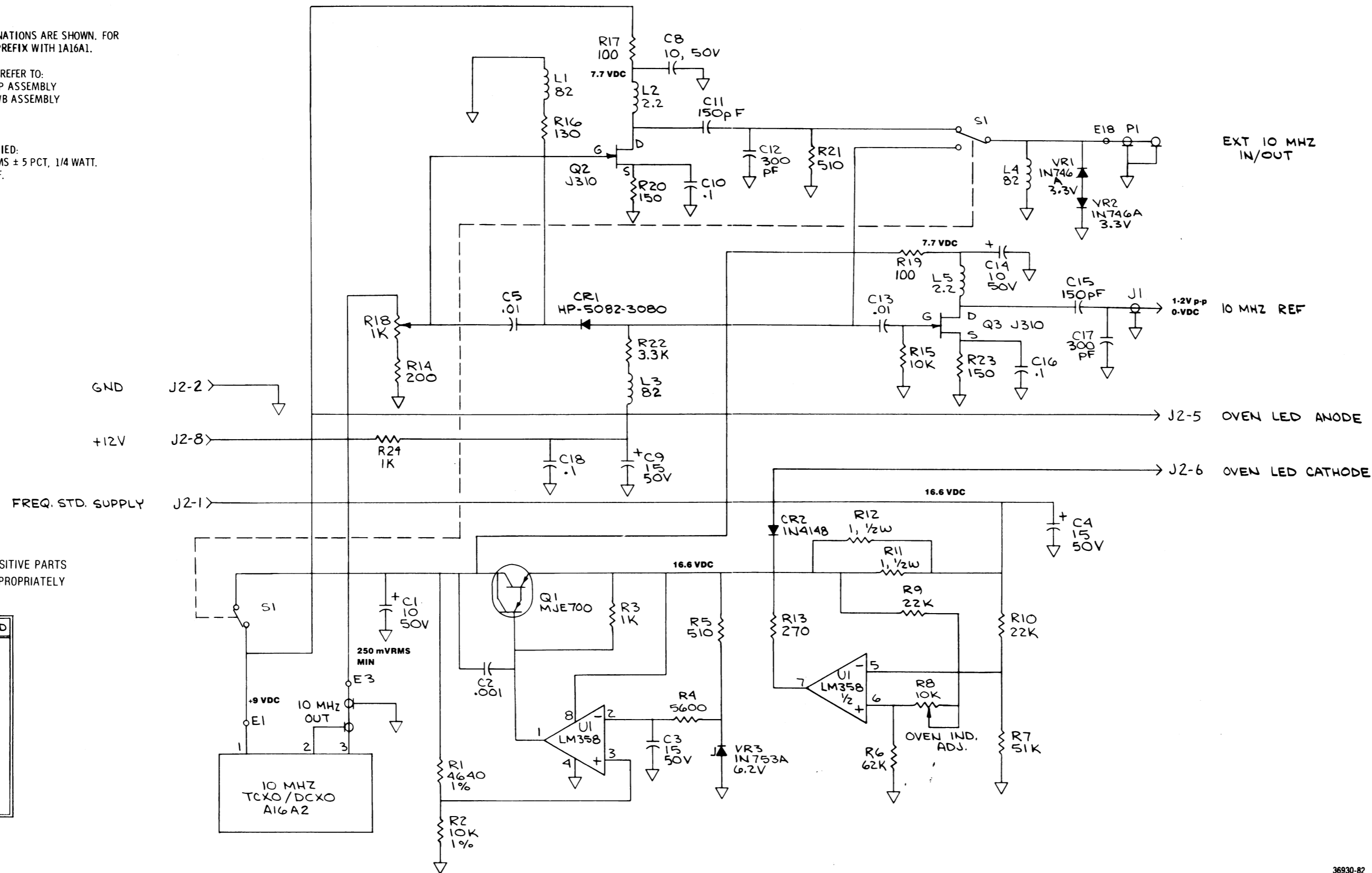
NOTES:

- PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATIONS PREFIX WITH 1A16A1.
- FOR REFERENCE DRAWINGS REFER TO:
A16 01-P22160E TOP ASSEMBLY
A16A1 01-P22168E PWB ASSEMBLY
A16A2 0CX058-P03355N
A16A3 TCX058-P00354N
- UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE IN OHMS ± 5 PCT, 1/4 WATT.
ALL CAPACITORS ARE IN UF.
ALL INDUCTORS ARE IN UH.
ALL VOLTAGES ARE IN DC.



WARNING:
STATIC-SENSITIVE PARTS
HANDLE APPROPRIATELY

LAST USED	NOT USED
C1B	C6, C7
CR2	
L5	
Q3	
R24	
U1	
VR3	
S1	



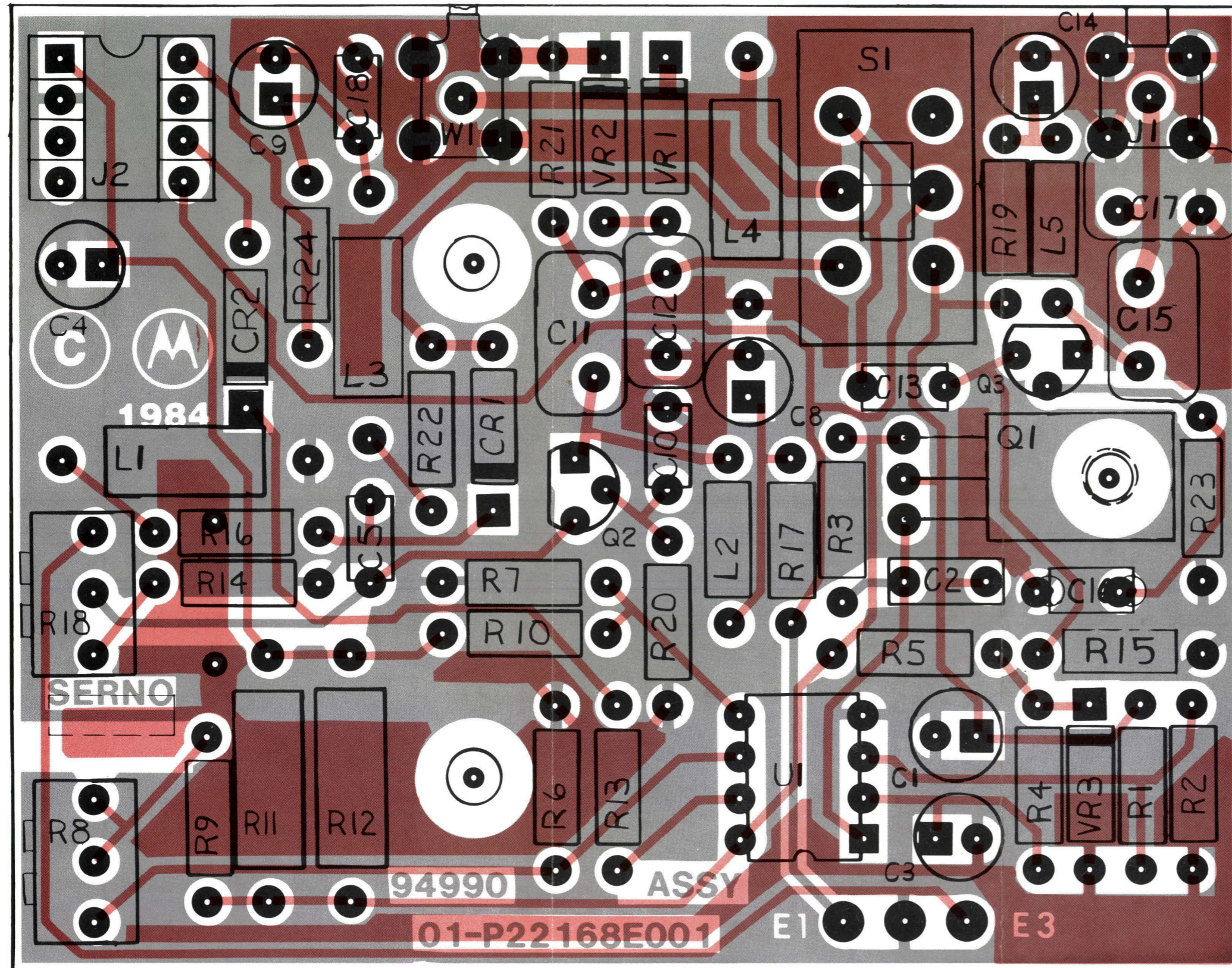
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FREQUENCY-STANDARD INTERFACE BOARD (A16)
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FREQUENCY - STANDARD
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Figure 16-3. Printed Wiring Board Assembly
and Parts List

Find No.	Qty. Req.	Part No.	Nomenclature	Part Value
C 001	1	23-80341B15	CAPACITOR	10UF-20-50
C 002	1	21-80341B93	CAPACITOR	1000PF-20-100
C 003	1	23-80341B27	CAPACITOR	15UF-20-50
C 004	1	23-80341B27	CAPACITOR	15UF-20-50
C 005	1	21-80342B09	CAPACITOR	01UF-20-50
C 008	1	23-80341B15	CAPACITOR	10UF-20-50
C 009	1	23-80341B27	CAPACITOR	15UF-20-50
C 010	1	21-80342B10	CAPACITOR	1UF-20-50
C 011	1	21-80369A94	CAPACITOR	150PF-5-500
C 012	1	21-80339B23	CAPACITOR	300PF-5-300
C 013	1	21-80342B09	CAPACITOR	01UF-20-50
C 014	1	23-80341B15	CAPACITOR	10UF-20-50
C 015	1	21-80369A94	CAPACITOR	150PF-5-500
C 016	1	21-80342B10	CAPACITOR	1UF-20-50
C 017	1	21-80339B23	CAPACITOR	300PF-5-300
C 018	1	21-80342B10	CAPACITOR	1UF-20-50
CR001	1	48-80339B87	DIODE	
CR002	1	48-84463K02	DIODE	
J 001	1	09-80344B23	CONNECTOR	
J 002	1	09-80331A95	SOCKET,SOLDER DIP	8 PIN
L 001	1	24-80340B59	COIL	82UH
L 002	1	24-80369A32	COIL	2.2UH
L 003	1	24-80340B59	COIL	82UH
L 004	1	24-80340B59	COIL	82UH
L 005	1	24-80369A32	COIL	2.2UH
Q 001	1	48-80340B31	TRANSISTOR	
Q 002	1	48-00869878	TRANSISTOR	N CHANNEL JFET
Q 003	1	48-00869878	TRANSISTOR	N CHANNEL JFET
R 001	1	06-10621C59	RESISTOR	4.64K-1-1/4
R 002	1	06-10621C91	RESISTOR	10K-1-1/4
R 003	1	06-11009C49	RESISTOR	1K-5-1/4
R 004	1	06-11009C67	RESISTOR	5.6K-5-1/4
R 005	1	06-11009C42	RESISTOR	510-5-1/4
R 006	1	06-11009C92	RESISTOR	62K-5-1/4
R 007	1	06-11009C90	RESISTOR	51K-5-1/4
R 008	1	18-83452F13	RESISTOR,VARIABLE	10K
R 009	1	06-11009C81	RESISTOR	22K-5-1/4
R 010	1	06-11009C81	RESISTOR	22K-5-1/4
R 011	1	06-80037G01	RESISTOR	1.5-1/2
R 012	1	06-80037G01	RESISTOR	1.5-1/2
R 013	1	06-11009C35	RESISTOR	270-5-1/4
R 014	1	06-11009C32	RESISTOR	200-5-1/4
R 015	1	06-11009C73	RESISTOR	10K-5-1/4
R 016	1	06-11009C28	RESISTOR	130-5-1/4
R 017	1	06-11009C25	RESISTOR	100-5-1/4
R 018	1	18-83452F09	RESISTOR,VARIABLE	1K
R 019	1	06-11009C25	RESISTOR	100-5-1/4
R 020	1	06-11009C29	RESISTOR	150-5-1/4
R 021	1	06-11009C42	RESISTOR	510-5-1/4
R 022	1	06-11009C61	RESISTOR	3.3K-5-1/4
R 023	1	06-11009C29	RESISTOR	150-5-1/4
R 024	1	06-11009C49	RESISTOR	1K-5-1/4
S 001	1	40-80340B12	SWITCH,DPDT	
U 001	1	51-82848M17	INTEGRATED CIRCUIT	
VR001	1	48-83461E03	DIODE,ZENER	3.3V-5-5
VR002	1	48-83461E03	DIODE,ZENER	3.3V-5-5
VR003	1	48-83461E36	DIODE,ZENER	6.2V-5-5
W 001	1	30-80343B94	CABLE ASSY,A16 BACK PANEL	



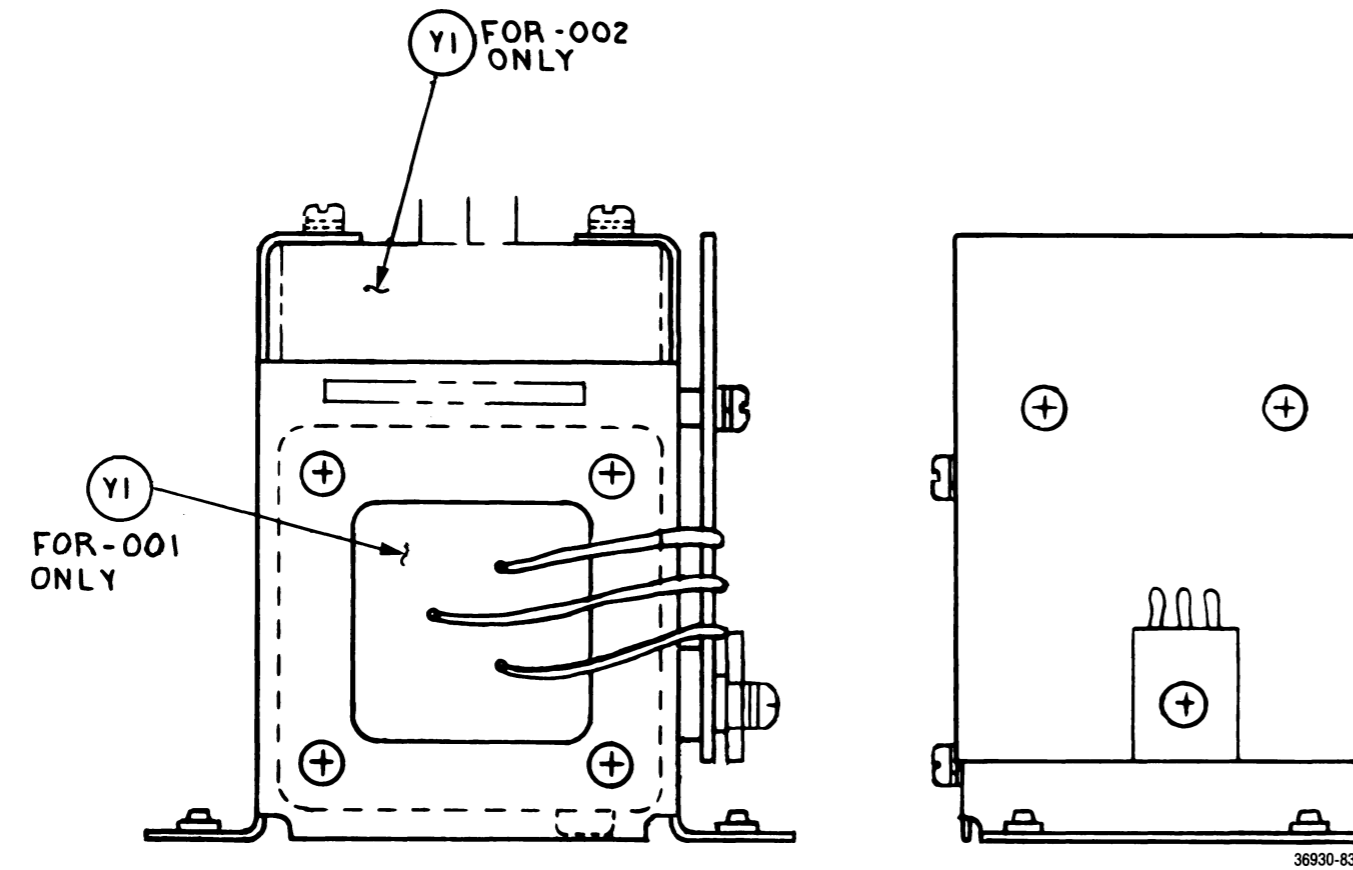
COMPONENTS AND COMPONENT
SIDE TRACK SHOWN IN BLACK.
SOLDER-SIDE TRACK SHOWN
IN ORANGE

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**FREQUENCY – STANDARD
INTERFACE BOARD (A16)**

(RTL-1020A)

Figure 16-4. Assembly and Parts List



FREQUENCY-STANDARD INTERFACE BOARD (A16)

Find No.	Qty. Req.	Part No.	Nomenclature	Part Value
Y 001	1	48-80343B34	TCXO 10 MHZ	