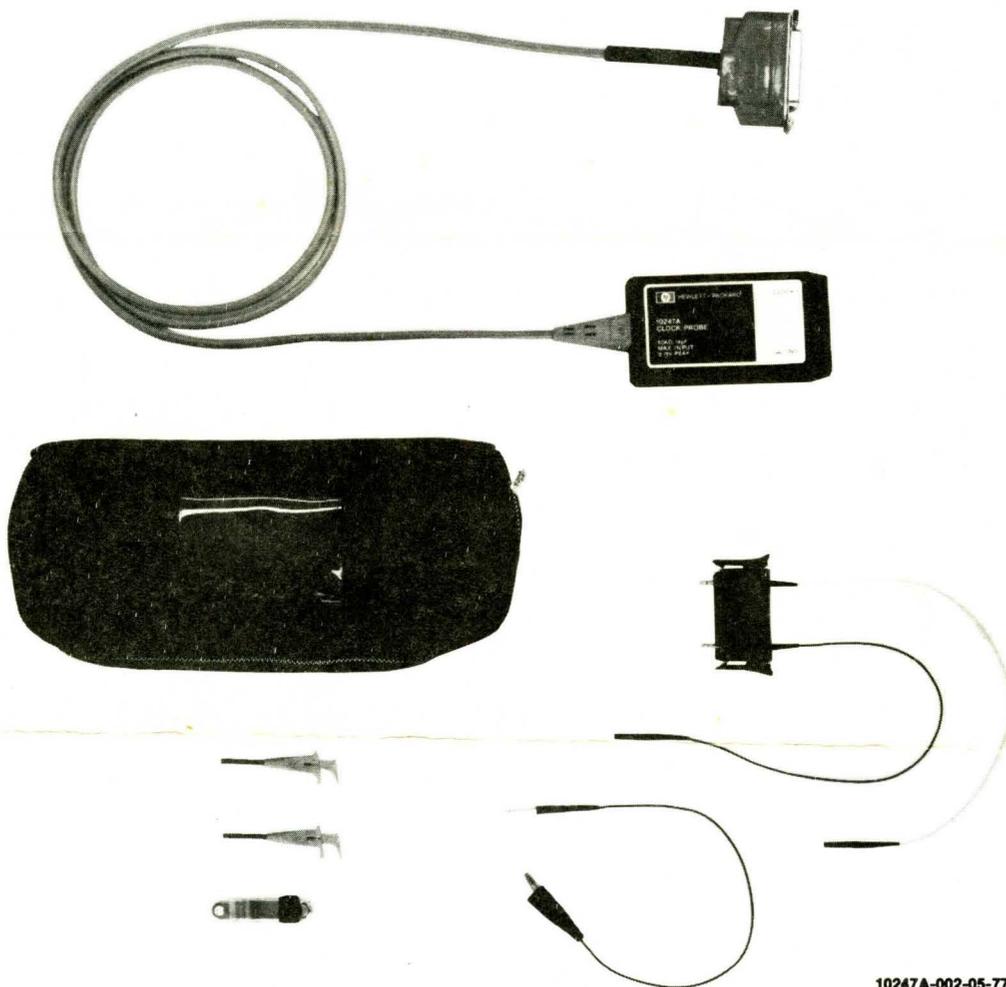


OPERATING NOTE/JANUARY 1978



10247A-002-05-77

Figure 1. Model 10247A Clock Probe

1. DESCRIPTION.

2. The HP Model 10247A Clock Probe (figure 1) is an active probe that provides clock signals for a Hewlett-Packard Logic State Analyzer (LSA). Minimal loading of the circuit under test is accomplished by placing active circuitry in a compact pod located near the point of test. The LSA supplies +5 V and -5.2 V to the probe for operating power. A variable threshold voltage from the LSA sets the threshold for logic recognition. Logic levels from the circuit under test are translated to ECL levels and provided to the LSA. All connections to the LSA are made through a 25-pin connector. Complete specifications and instrument compatibility for the 10247A are listed in table 1.

Table 1. Specifications

<p>PROBE INPUTS INPUT RC: approx 50kΩ shunted by approx 14 pF. INPUT THRESHOLD: Variable to ±10 Vdc. MINIMUM INPUT SWING: 0.6 V p-p. MAXIMUM INPUT: ±15 Vdc. INSTRUMENT COMPATIBILITY HP Model 1610A, Logic State Analyzer.</p>

3. ACCESSORIES SUPPLIED.

4. The 10247A is supplied with: two 12-inch color-coded connection leads; two detachable hook-type

Operating Note Part No. 10247-90902
 Microfiche Part No. 10247-90802



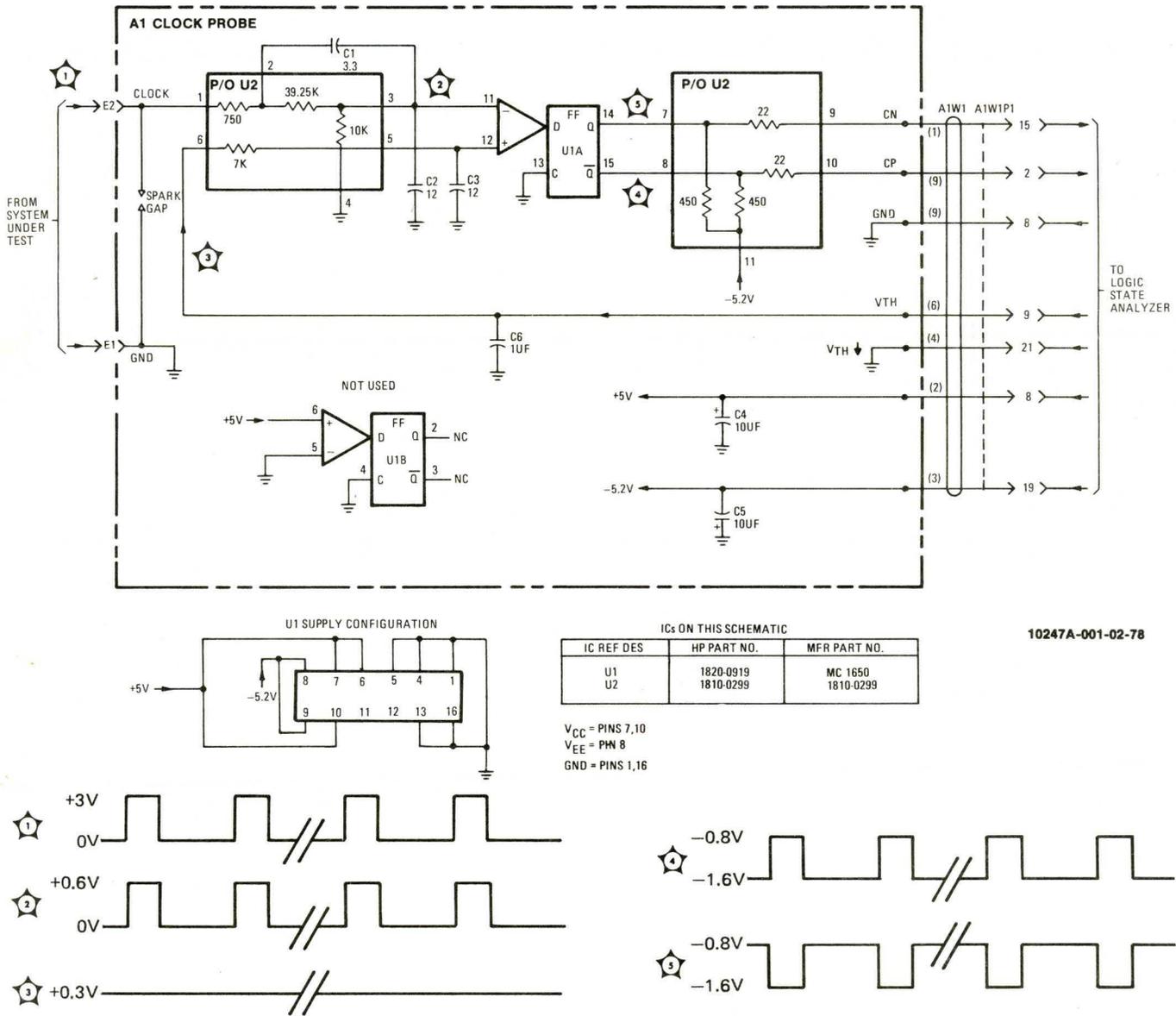


Figure 2. Model 10247A Schematic

circuit probes; a vinyl carrying case; a connector clip; a pod clip; a ground lead with alligator connector.

5. Each connection lead has a 0.025-inch female tip on one end for backplane pin connections. These female tips can be attached to recessed male pins on the hook-type probes. The other ends of the leads are attached to the connector clip. This clip snaps onto the probe pod for quick connection. The pod clip can be attached to the pod cable for securing or supporting the pod.

6. ACCESSORIES AVAILABLE.

7. A clock probe lead replacement kit, HP Part No. 10247-68701 is available for the Model 10247A. This kit supplies the following four replacement items:

NOTE

The items in this kit are in addition to those supplied with the probe. If single replacement items are needed, order them by the part numbers given in table 2.

- 1 each connector clip, MP6
- 1 each black connection lead, W1
- 1 each yellow connection lead, W2
- 1 each ground lead, W3

8. PRINCIPLES OF OPERATION.

9. Model 10247A circuitry (see figure 2) consists of an input attenuation network, a comparator, and series terminated transmission lines. The 10247A accepts positive and negative input data up to 15 volts

peak amplitude with threshold levels up to ± 10 Vdc. Resistor pack U2 contains a 5:1 voltage divider which scales input data swings to levels compatible with the reference input to comparator U1. The reference threshold voltage supplied by the LSA has been scaled by a factor of 5. For example, the threshold of TTL is typically +1.5 Vdc. The reference TTL threshold V_{th} supplied by the logic state analyzer to U1 pin 5 is approximately +0.3 Vdc.

10. A waveform timing chart for the clock-probe circuitry is shown on figure 2. In a static condition, U1 output pin 2 is LO (approximately -1.6 V), and U1 output pin 3 is HI (approximately -0.8 V). When the input clock voltage level applied to pin 6 exceeds the threshold level present at pin 5, pin 2 goes HI and pin 3 goes LO. The pulses on U1 pin 2 and pin 3 are then sent via series terminated transmission lines to the LSA.

11. MAINTENANCE.

12. **PERFORMANCE TESTS.** The 10247A must be

tested with an HP Logic State Analyzer in accordance with performance tests provided in the Logic Analyzer Operating and Service Manual.

13. **REPAIR.** When repairing PC Board A1, be very careful to avoid breaking the small soldered wires where W1 attaches to A1.

14. **REPLACEABLE PARTS.** Table 2 lists replaceable parts and the HP part number of each item. Figure 3 shows the location of each part.

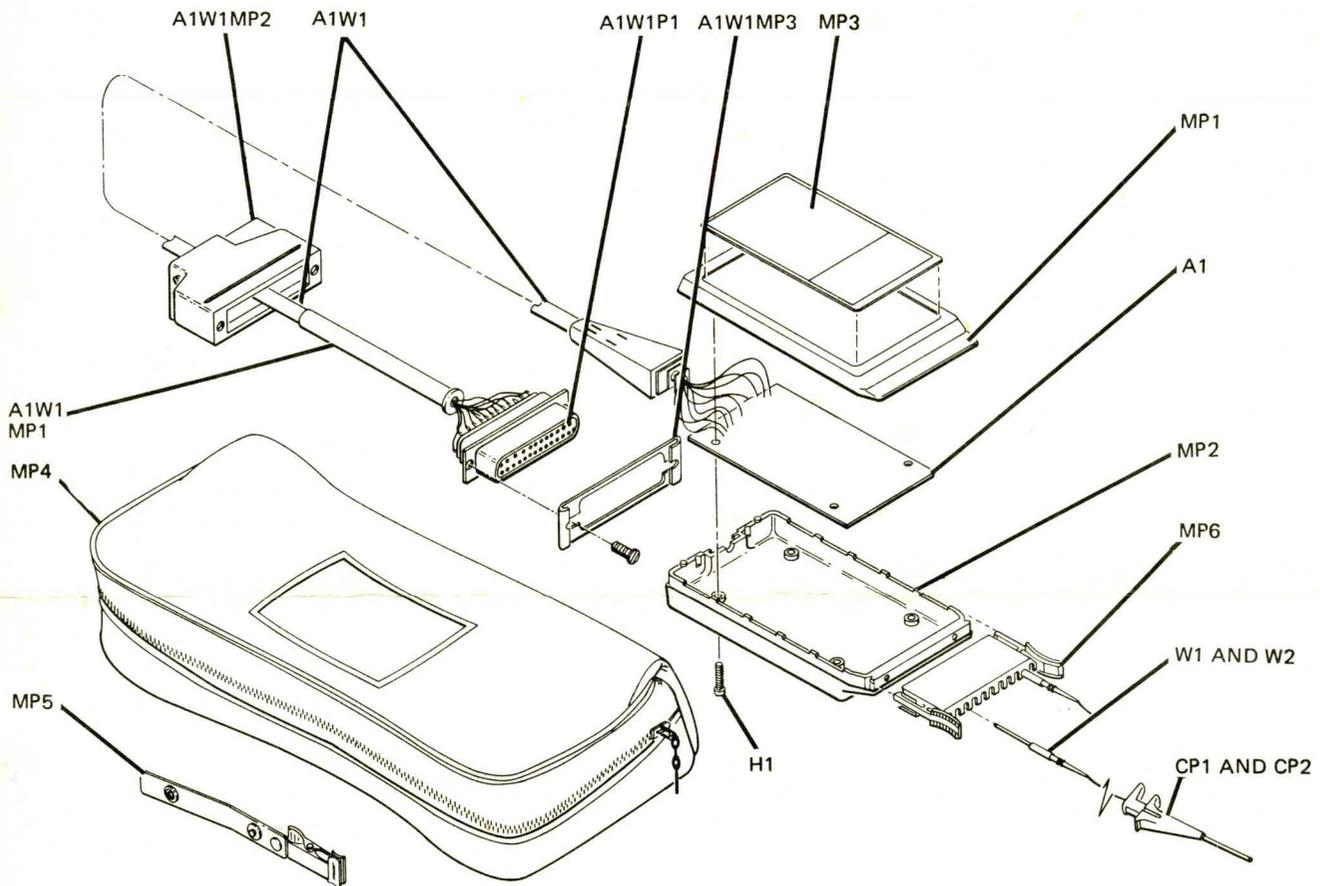
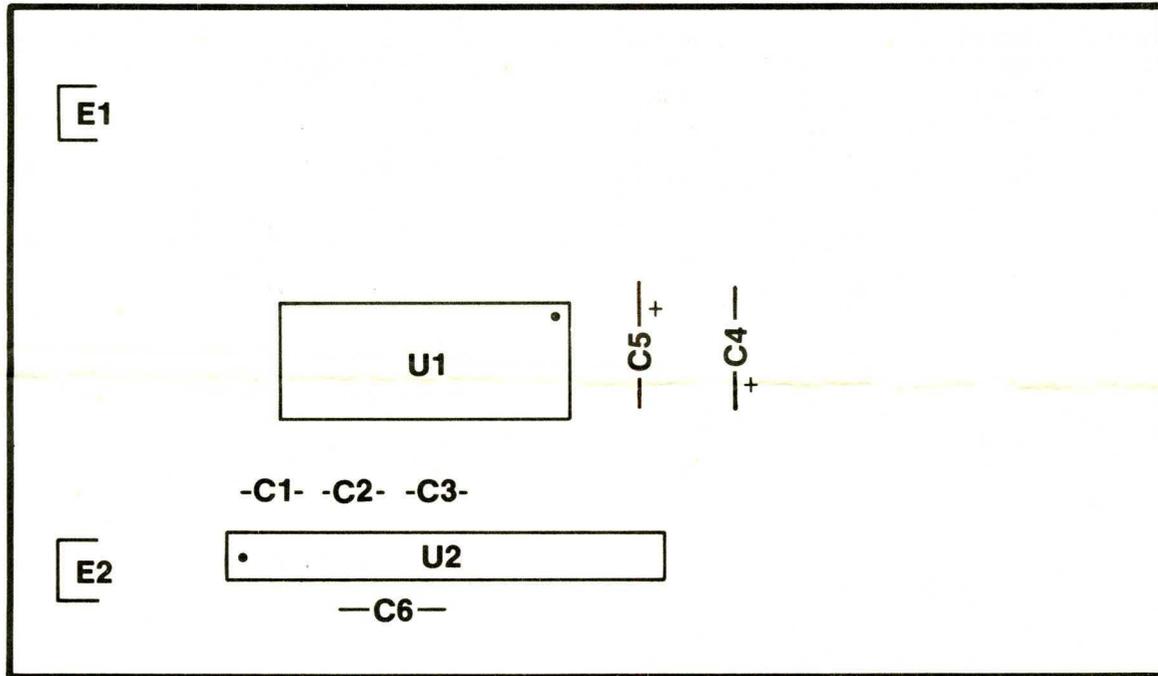
15. To order a part from Hewlett-Packard, address the order to the nearest HP Sales/Service Office. Include the probe model number, reference designation of the part, and the HP part number. If a part is not listed, provide a complete description of the part, including function and location.

NOTE

Board assembly A1 is not sold separately. To obtain a replacement, the entire probe unit (Model 10247A) must be ordered.

Table 2. Replaceable Parts

REFERENCE DESIGNATION	HP PART NO.	QTY.	DESCRIPTION	MFR CODE	MFR PART NO.
A1C1	0160-3848	1	CAPACITOR-FXD 3.3pF ± 5 pF 100WVDC CER	02010	3417-100A-3R3D
A1C2, 3	0160-3883	2	CAPACITOR-FXD 12pF $\pm 5\%$ 100WVDC CER	02813	CN10A102J
A1C4, 5	0180-2668	2	CAPACITOR-FXD 10UF $\pm 20\%$ 10WVDC TA	04200	196D106X0010JE3
A1C6	0160-3508	1	CAPACITOR-FXD 1UF $+80-20\%$ 50WVDC CER	02813	CZ30C105Z
A1E1, 2	1460-1473	2	SPRING-CONTACT	28480	1460-1473
A1U1	1820-0919	1	IC ECL DUAL A-D	04713	MC1650L
A1U2	1810-0327	1	RESISTOR NETWORK	28480	1810-0327
A1W1	10247-61618	1	CABLE ASSEMBLY, 7 CONDUCTOR	28480	10247-61618
A1W1P1	1251-0063	1	PLUG, 25 PIN	04486	DBM-25P
A1W1MP1	1251-0352	1	BUSHING	04486	CA18220-6
A1W1MP2	1251-0392	1	HOOD, PLASTIC	04486	DB51212-1
A1W1MP3	1251-1042	1	SLIDELOCK (2 SCREWS INCLUDED)	04486	DB51221-1
CP1, 2	10230-62101	2	PROBE ASSEMBLY, HOOK-TYPE	28480	10230-62101
H1	0624-0306	4	SCREW, TS 2-28 0.500 LG	28480	0624-0306
MP1	5040-8125	1	COVER, TOP	28480	5040-8125
MP2	5040-8008	1	COVER, BOTTOM	28480	5040-8008
MP3	7120-5666	1	NAMEPLATE	28480	7120-5666
MP4	1540-0320	1	CASE, CARRYING	28480	1540-0320
MP5	5040-0538	1	CLIP, POD	28480	5040-0538
MP6	5040-0563	1	CONNECTOR, CLIP	28480	5040-0563
W1	5061-1215	1	CABLE: PIN ADAPTER; BLACK	28480	5061-1215
W2	5061-1216	1	CABLE: PIN ADAPTER; YELLOW	28480	5061-1216
W3	10231-61625	1	CABLE ASSEMBLY, GROUND	28480	10231-61625



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Figure 3. Model 10247A Parts Identification