

OPERATING NOTE/AUG 1971

1. DESCRIPTION.

2. The Hewlett-Packard Model 10243A (Figure 1) is a 100:1 Divider probe tip used with the Hewlett-Packard Models 1120A and 1121A Active Probes (500 MHz). The divider presents a constant impedance to the active probe regardless of the input impedance. Since the divider maintains a constant output impedance, it can be used in point-to-point circuit probing without experiencing a base-line shift or requiring response adjustments to the oscilloscope. Specifications for the Model 10243A are listed in Table 1.

Table 1. Specifications

INPUT IMPEDANCE:	1 Megohm
SHUNT CAPACITANCE:	< 1 pF at 100 MHz
DYNAMIC RANGE:	±50V, with ±350V offset (dc)
MAXIMUM INPUT VOLTAGE:	±350V (dc plus peak ac)
DIVIDER ATTENUATION:	100:1, ±6%
EFFECT ON RISE TIME OF SYSTEM:	Negligible when used with 1120A or Model 1121A

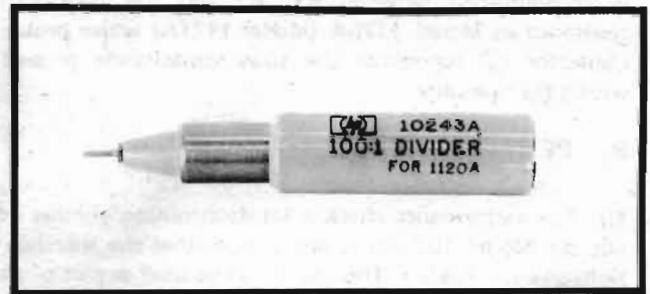


Figure 1. Model 10243A 100:1 Divider

3. CONNECTION.

4. The Model 10243A is connected to the Model 1120A (Model 1121A) probe by sliding the Model 1120A (Model 1121A) probe into the body portion of the divider.

5. USE WITH OTHER ACCESSORIES.

6. The Model 10243A 100:1 Divider may be used with the Model 10242A Bandwidth Limiter or the Model 10241A 10:1 Divider or both. The various combinations of probe tips for the Model 1120A (Model 1121A) probe are shown in Table 2. This table lists the effect on bandwidth and risetime which the Model 1120A (Model 1121A) probe senses from the probe tips.

7. CIRCUIT.

8. The schematic of the Model 10243A is shown in Figure 2. The major components of the divider are resistor R1 and a metal sleeve which is spring loaded to hold R1 in place. The capacitance of C1 is the capacitance

Table 2. Probe Tip Characteristics

Probing End Input Capacitance	Probe Tips			Division Ratio	Bandwidth	Risetime
	Model 10242A	Model 10243A	Model 10241A			
1 pF		10243A	10243A	100:1	500 MHz	0.75 ns
0.7 pF		10243A	10241A	936:1	500 MHz	0.75 ns
6 pF	10242A	10243A	10241A	936:1	≈40 MHz	≈9 ns
All other combinations of probe tips will give improper division ratios or will degrade bandwidth and risetime or both.						

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between R1 and the metal sleeve; C2 is the capacitance between the metal sleeve and the divider body. The capacitance of C1 determines the high-frequency division ratio of the divider. At low frequencies the division ratio is accomplished between R1, R2 and the 100k-ohm resistance in Model 1120A (Model 1121A) active probe. Capacitor C3 represents the stray capacitance present within the assembly.

9. PERFORMANCE CHECK.

10. The performance check is for determining whether or not the Model 10243A is operating within the specifications given in Table 1. This check can be used as part of an incoming inspection or a periodic operational test. Recommended test equipment is listed in Table 3. Use recently calibrated test equipment.

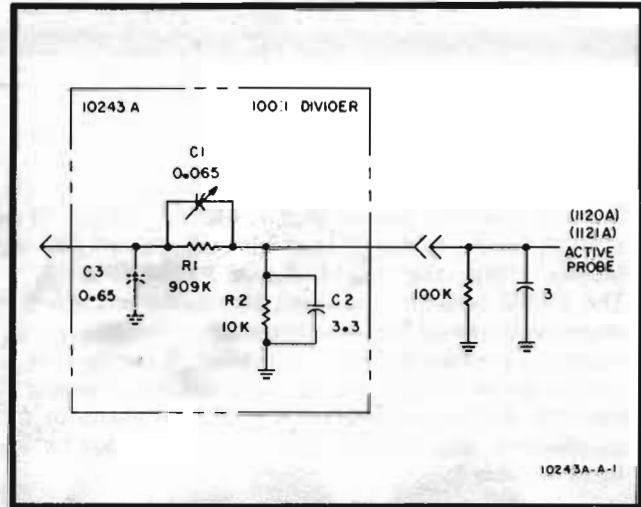


Figure 2. Model 10243A Schematic

Table 3. Recommended Test Equipment

Instrument		Required Characteristics	Required For
Type	Model		
Monitor Oscilloscope	HP 140-series w/1410A, 1424A or 1425A plug-ins	1 GHz bandwidth Sensitivity 5 mV/div Sweep speed 0.5 ns/div	Performance Check and Adjustment
Pulse Generator	HP 1900A with 1920A, 1905A, 1908A or 1910A	Risetime < 350 ps Amplitude +5V Pulse width 1 usec	"
Active Probe	HP 1120A	No substitute	"
Power Supply	HP 1122A	No Substitute	"
50-ohm T connector (2 required)	HP 10221A	No substitute	"
50-ohm Load (2 required)	HP 0950-0090	1 GHz bandwidth	"
GR874 to BNC Adapter	HP 1250-0850	1 GHz bandwidth	"
20 dB Attenuator (2 required)	GR874-G20	1 GHz bandwidth	"

- a. Set Model 1120A (Model 1121A) probe coupling to DC and offset to OFF.
- b. Connect test equipment as shown in Figure 3-A.
- c. Set pulse generator for an output of +5V and pulse width of approximately 1 usec.
- d. Set monitor oscilloscope for sweep speed of 50 ns/div and vertical sensitivity to display pulse of exactly 10 div. (8 div if 8x10 div CRT oscilloscope is used).
- e. Reconnect test equipment as shown in Figure 3-B. This removes two 20 dB attenuators from between pulse generator and Model 10221A T connector and inserts Model 10243A to Model 1120A (Model 1121A) probe.
- f. Vertical deflection as observed on monitor oscilloscope should be 10 div $\pm 6\%$ (> 9.4 div and < 10.6 div). (8x10 div CRT oscilloscope: > 7.5 div and 8.5 div).

11. ADJUSTMENT.

12. The Model 10243A has only one adjustment. This adjustment is for setting risetime and flatness of pulse. Use recommended test equipment listed in Table 3.

- a. Set up test equipment as shown in Figure 3-B.
- b. Perform the procedure in Paragraph 10, steps e and f.
- c. Adjust C1 (screwdriver slot inside of probe body) for minimum pulse perturbations and best pulse risetime. This requires removing probe tip from the probe, adjusting C1, and reconnecting the probe tips.

13. REPLACEMENT OF PROBE TIP PIN.

14. When replacement of the active probe tip pin becomes necessary, proceed as follows:

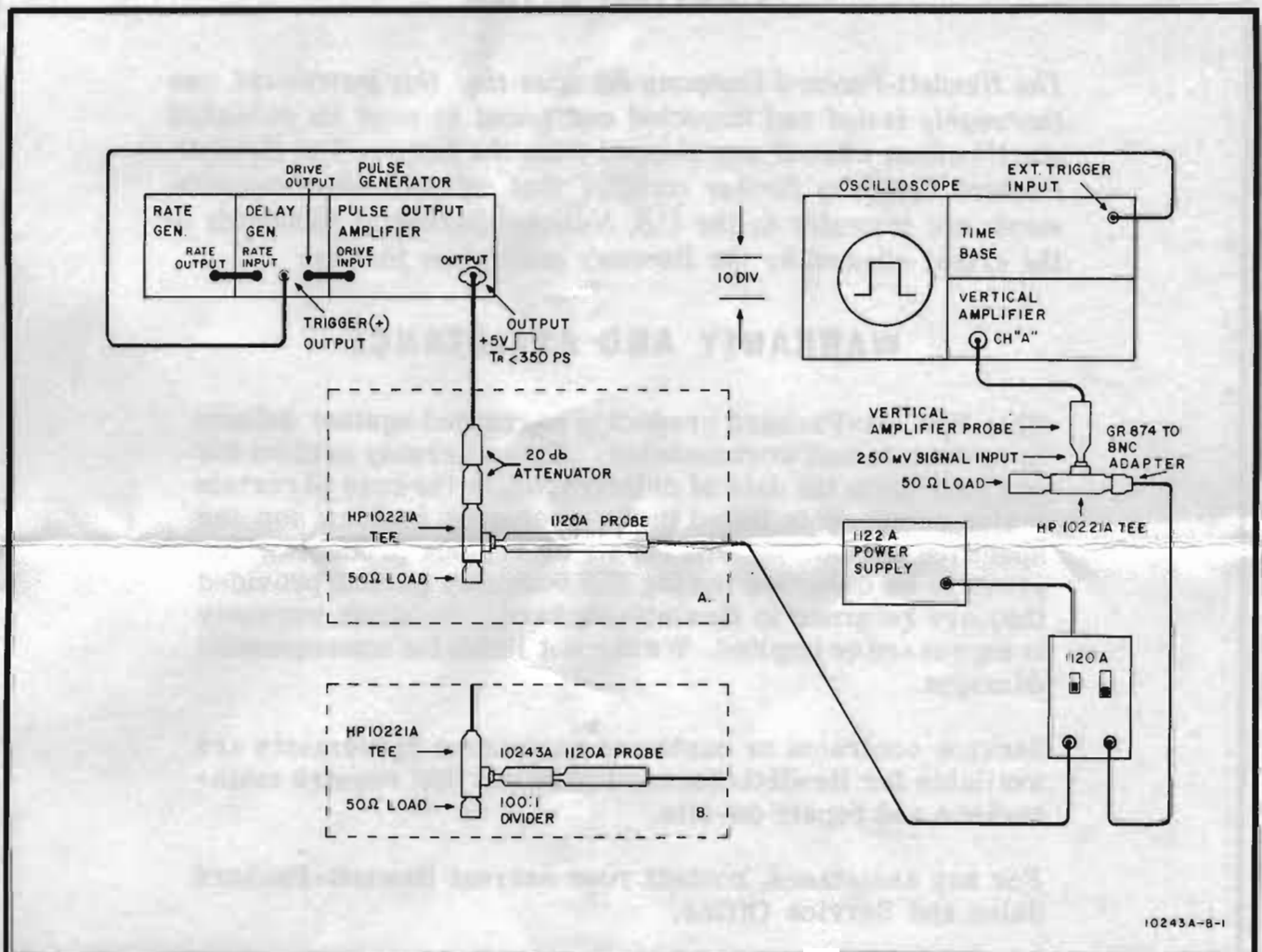


Figure 3. Test Equipment Set-up

- a. Remove and discard the damaged probe tip pin.
- b. Insert new probe tip pin and tighten with fingers.



Applying excessive pressure when seating the probe tip pin will damage the threads within the probe body.

- c. Use long-nose pliers for final seating.

15. REPLACEABLE PARTS.

16. There is only one replaceable part in the Model 10243A, the probe tip pin. Order Hewlett-Packard Part No. 01120-26101. Contact the nearest Hewlett-Packard Sales/Service Office for replacement.

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CERTIFICATION

The Hewlett-Packard Company certifies that this instrument was thoroughly tested and inspected and found to meet its published specifications when it was shipped from the factory. The Hewlett-Packard Company further certifies that its calibration measurements are traceable to the U.S. National Bureau of Standards to the extent allowed by the Bureau's calibration facility.

WARRANTY AND ASSISTANCE

This Hewlett-Packard product is warranted against defects in materials and workmanship. This warranty applies for one year from the date of delivery, or, in the case of certain major components listed in the operating manual, for the specified period. We will repair or replace products which prove to be defective during the warranty period provided they are returned to Hewlett-Packard. No other warranty is expressed or implied. We are not liable for consequential damages.

Service contracts or customer assistance agreements are available for Hewlett-Packard products that require maintenance and repair on-site.

For any assistance, contact your nearest Hewlett-Packard Sales and Service Office.