



product modification

040-0487-02

S40730, M46477

LEAD TIME

For TEKTRONIX® 284 Pulse Generator

Serial Numbers B010100 - B069999

This modification kit provides parts and instructions to allow the selection of the maximum LEAD TIME for the Trigger Output signal. After installation, the maximum Lead Time will be selected as either 75ns or 150ns by an internally mounted, two-position switch, SW159. The front panel LEAD TIME switch, SW158, remains a two-position switch. One position selects 5ns. The other position selects 75ns or 150ns depending upon the position of the added internal switch, SW159.

This kit may also be used to replace the delay line, DL158. The old delay line, pn 119-0146-00, is no longer available.

PARTS INCLUDED IN MODIFICATION KIT:

Ckt. No.	Quantity	Part Number	Description
	1 ea		Assembly, switch, Lead Time (consisting of)
	2 ea	210-0405-00	Nut, plain, hex, 2-56 x 0.188
	2 ea	211-0022-00	Screw, mach, 2-56 x 0.188, pnh, poz
SW159	1 ea	260-1833-00	Switch, slide, DPDT, 0.05A, 125V
	1 ea	407-0860-00	Bracket, angle, component mounting
	0.041 ft		Wire, solid, 22AWG, bare
DL158 DL159	1 ea	119-0146-03	Delay line, elec, 145ns w/70ns tap, 50 Ω
	1 ea	210-0201-00	Terminal, lug, 0.12 ID, locking
	6 ea	210-0586-00	Nut, pl, assem washer, 4-40 x 0.25
C156	1 ea	283-0603-00	Capacitor, mica, 113pF, 2 pct, 300V
	1 ea	333-1015-03	Panel, front, 284
	0.417 ft		Cable, RF, 50 Ω coax
	1 ea		Label, identification, 040-kit

INSTRUCTIONS:

WARNING

Before proceeding, ensure the POWER switch is OFF, then disconnect the 284 from the power source.

- () 1. Remove the pulse generator from its cabinet.
- () 2. Set the SQUARE WAVE AMPLITUDE and PERIOD switches to a convenient reference - usually counterclockwise.
- () 3. Loosen the setscrews for the SQUARE WAVE AMPLITUDE and PERIOD knobs and remove the knobs.
- () 4. Remove the nuts and flat washers used to attach the SQUARE WAVE AMPLITUDE and PERIOD switches.

- () 5. Remove the panel bushing used to mount the TD BIAS potentiometer.
- () 6. Remove the latch thumbscrew.
- () 7. Remove the plastic sleeve bushing used with the latch thumbscrew.
- () 8. Remove the nut and flat washer used to secure the POWER ON switch to the front panel.
- () 9. Unsolder the white-black-green wire from the POWER indicator light.
- () 10. Remove the nut securing the POWER indicator light to the rear of the front subpanel and remove the light.
- () 11. Remove the front panel.
- () 12. Install the provided new front panel, using the reverse of the removal procedure as described in steps 2 through 11.

NOTE

The next three steps apply only to those instruments with the internal TD Bias adjustment. This variable 30k Ω resistor, R133, was factory installed at serial number B030000 and up. The resistor is mounted on an added bracket attached to the support chassis.

- () 13. Remove the mounting nut and flat washer used to attach the variable resistor, R133, to the mounting bracket.
- () 14. Remove the screw used to attach the resistor mounting bracket to the support chassis.
- () 15. Remove and discard the resistor mounting bracket.
- () 16. Unsolder the center conductors of the two delay line coaxial leads from the terminals on the LEAD TIME switch, SW158. Note the location of these terminals for installation of the new delay line.
- () 17. Unsolder the shields of the delay line coaxial leads from the adjacent ground lug terminal.

NOTE

Depending upon the age of the instrument, the delay line assembly, DL158, may be mounted in two different methods. In one case, four screws are used to attach the delay line to the support chassis. In the other case, four nuts are used to attach the delay line .

- () 18. Remove the four screws or four nuts used to attach the delay line assembly to the support chassis.

NOTE

If more room is required to remove the delay line assembly, the support chassis can be moved forward. First, remove the screws securing the two circuit board chassis to the support chassis. Loosen the screws which secure the support chassis rings to the rod spacers. Then slide the support chassis forward.

- () 19. Remove the delay line assembly, DL158.
- () 20. Install the provided new delay line assembly, DL158 and DL159, into the instrument.

NOTE

If the support chassis has been moved, slide the chassis to the rear. Secure the support chassis to the two circuit board chassis with the four 6-32 panhead screws removed earlier. Tighten the screws in rings around the rod supports.

- () 21. Secure the left-side (looking from front) of the delay line assembly with two of the 4-40 nuts provided in the kit.
- () 22. Install the provided switch assembly onto the two right-side mounting studs of the delay line assembly, as shown in Fig. 1.

- () 23. Install the provided lug terminal onto the top-right delay line mounting stud. See Fig. 1.

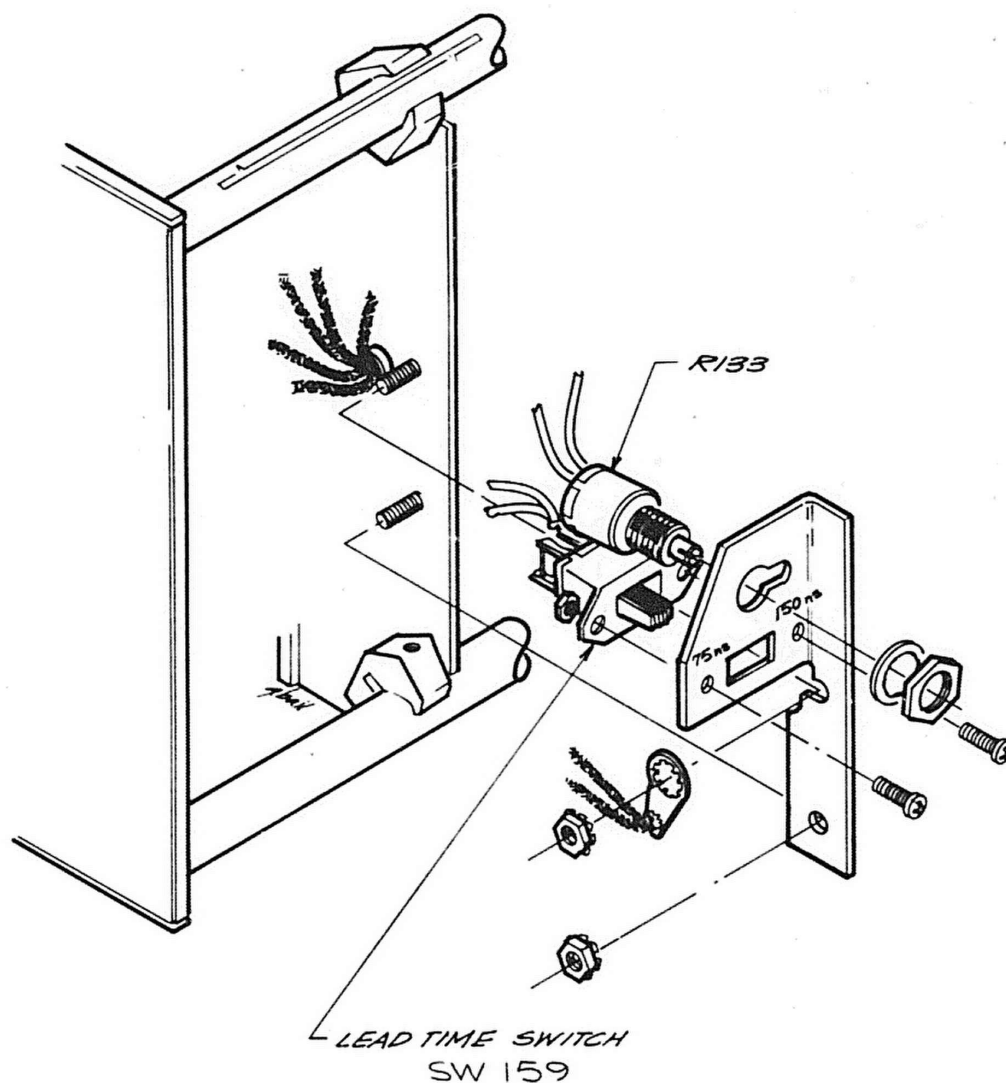


Fig. 1. Mounting bracket installation.

- () 24. Secure the new switch assembly to the support chassis with two of the provided 4-40 nuts.
- () 25. Install the variable resistor, R133 (if present), into the hole above the 75ns-150ns Lead Time switch, SW159, in the new mounting bracket.

- () 26. Secure the variable resistor, R133, with the flat washer and nut removed earlier. Ensure the lock washer goes between the variable resistor and mounting bracket.
- () 27. Solder the center conductor of one of the green delay line coaxial leads to the top inboard terminal of the TEST LEAD switch, SW158. This is one of the terminals from which the coaxial leads were removed earlier.
- () 28. Solder one end of the center conductor of the provided 5 inch coaxial cable to the bottom inboard terminal of the TEST LEAD switch, SW158. This terminal is located directly below the terminal mentioned in the above step.
- () 29. Solder the shields of the two coaxial cables, connected to SW158 in the preceeding steps, to the ground lug terminal adjacent to SW158.
- () 30. Solder the center conductor of the other green delay line coaxial cable to the top center terminal of the new 75ns - 150ns Test Lead switch, SW159. See Fig. 2.
- () 31. Solder the center conductor of the added 5 inch coaxial cable (see step 28 above) to the bottom center terminal of the Test Lead switch, SW159. See Fig. 2.

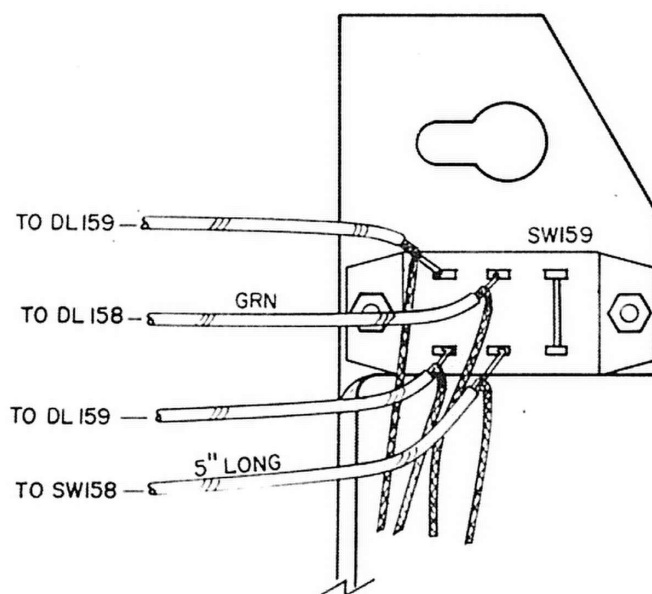


Fig. 2. Wiring for new Lead Time switch, SW159.

- () 32. Solder the center conductor of one of the two remaining delay line coaxial leads to the bottom rear terminal of the new Test Lead switch, SW159. See Fig. 2.
- () 33. Solder the center conductor of the remaining delay line coaxial lead to top rear terminal of the Test Lead switch, SW159. See Fig. 2.
- () 34. Solder the shields of the four coaxial cables, connected to SW159 in the preceding steps, to the ground lug terminal below the switch. The terminal was added in step 23.
- () 35. Replace C156, a 100pF ceramic capacitor located near Q150 on the Pulse Generator circuit board, with the 113pF ceramic capacitor provided in the kit.
- () 36. Refer to the Performance Check/Calibration section of the instruction manual and check instrument performance, making any necessary adjustments.
- () 37. Remove the protective backing from the provided 040-kit identification label and apply the label to a clean, dry area on the rear panel.

Attach the following manual insert to the instruction manual.

DRL:ct

INSTRUCTION MANUAL

MODIFICATION INSERT

LEAD TIME

for

284 Pulse Generator
SN B010100 - B069999

Installed in SN _____ Date _____

This modification insert is provided to supplement the Instruction Manual for the above listed product(s). The information given in this insert supersedes that given in the Manual.

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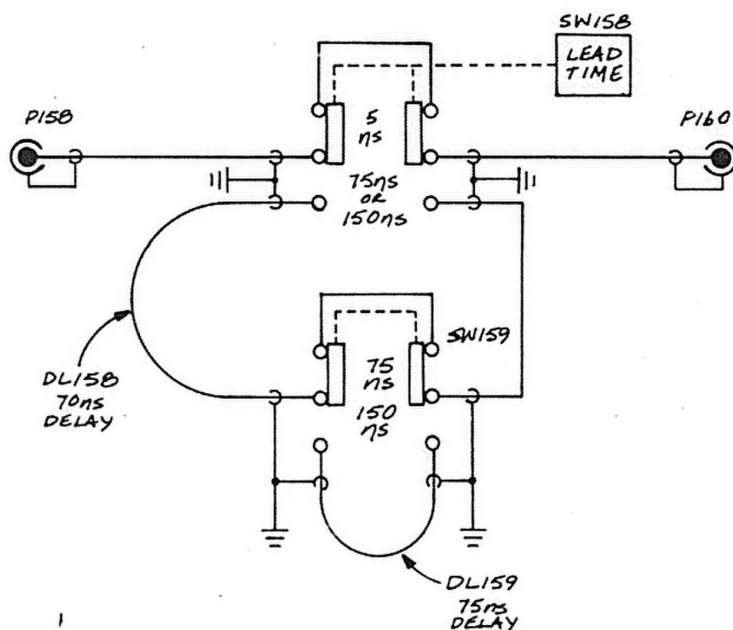
GENERAL INFORMATION

This modification kit allowed the maximum lead time for the Trigger Output signal to be selected. The maximum Lead Time is now selected internally by a new two-position switch as either 75ns or 150ns. The front panel LEAD TIME switch remains a two-position switch selecting 5ns in one position and 75ns or 150ns in the other position, depending upon the position of the internal switch. In order to accomplish this modification, the delay line, DL158, was replaced, a new switch was mounted on the support chassis, and the front panel was replaced.

The kit may have also been used to replace the delay line, DL158. The old delay line, pn 119-0146-00, is no longer available.

REPLACEABLE ELECTRICAL PARTS:

Ckt. No.	Part Number	Description
C156	283-0603-00	Capacitor, mica, 113pF, 2 pct, 300V
DL158 DL159	119-0146-03	Delay line, elec, 145ns w/70ns tap, 50 Ω
SW159	260-1833-00	Switch, slide, DPDT, 0.05A, 125V



Partial - PULSE GENERATOR

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