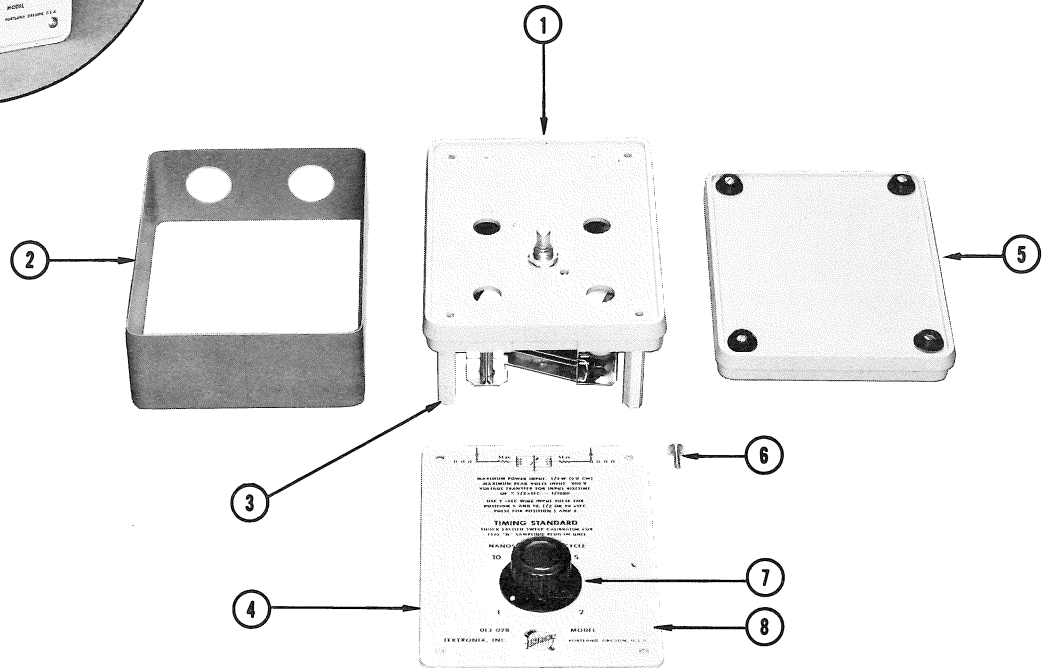
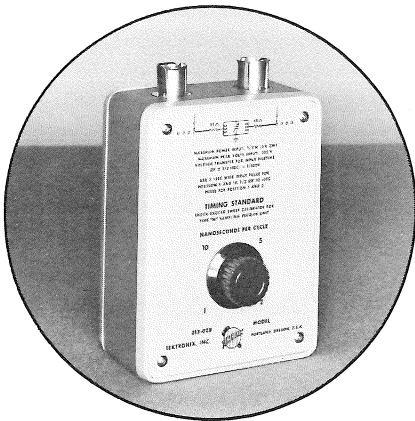


TIMING STANDARD

(Part No. 013-0028-00)



REF. NO.	PART NO.	SERIAL/MODEL NO.		QTY.	DESCRIPTION
		EFF.	DISC.		
1	200-0308-00 - - - - - 211-0038-00			1	COVER, front - mounting hardware: (not included w/cover) 2 SCREW, 4-40 x 5/16 inch, 100° csk, FHS
2	380-0026-00			1	HOUSING, wrap-around
3	384-0586-00			2	ROD, spacer
4	333-0674-00			1	PANEL, front
5	200-0309-00			1	COVER, box
	348-0037-00			4	FOOT, rubber
	211-0012-00			4	SCREW, 4-40 x 3/8 inch, PHS
6	211-0071-00			4	SCREW, 4-40 x 3/8 inch, PHS
7	366-0117-00 - - - - - 213-0004-00			1	KNOB, charcoal - knob includes: 1 SCREW, set, 6-32 x 3/16 inch, HSS
8	334-0679-00			1	TAG, metal serial number

DATA SHEET NO.

061-0857-00
JUNE 1967
(Revised)

FOR REPLACEMENT PARTS NOT LISTED
CONTACT YOUR TEKTRONIX FIELD OFFICE.



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TIMING STANDARD 013-0028-00**CALIBRATION PROCEDURE**

This is a complete procedure for checking and/or adjusting the period of damped-wave oscillations from the Tektronix shock-excited Timing Standard. The Timing Standard provides damped-wave oscillations of 10, 5, 2 and 1 nanoseconds per cycle for checking the sweep rates of fast sweep oscilloscopes such as Sampling Timing Units.

Recommended Equipment

1. Test oscilloscope. Sweep rates of 10, 5, 2 and 1 nanosecond/cm. Tektronix Type 661 Oscilloscope with Type 4S1 and Type 5T3 plug-in units.

2. Pulse generator, with 2 ns, 10 volt pulses at approximately 100 kHz rate. Tektronix Type 111 Pulse Generator.

3. Two 50 Ω RG58 connecting cables with GR connectors. Approximately 1.5 feet, or 2 ns signal delay. Tektronix part number 017-0505-00.

4. Time-mark generator for timing reference signals of 10, 5, 2 and 1 ns/cycle, $\pm 0.01\%$. Tektronix Type 184 Time-Mark Generator.

5. One 50 Ω coaxial cable, approximately 3 feet with BNC connectors. Such as 42 inch cable, Tektronix part number 012-0057-00.

6. Connector adapter, GR874 to BNC female. Tektronix part number 017-0063-00.

7. 50 Ω 5:1 Attenuator, GR Type 874G14. Tektronix part number 017-0079-00.

8. No. 1 Phillips head screwdriver.

9. 1/16-inch Allen wrench.

10. Adjustment tools:

a. Plastic screwdriver with protruding bit, such as Walsco 2543, or Tektronix part number 003-0301-00.

b. Low capacitance tool for adjusting piston capacitors. Tektronix part number 003-0034-00 and 003-0307-00.

c. Pocket screwdriver, 3 inch shank and blade width of approximately 3/32 inch. Tektronix part number 003-0192-00.

Preliminary Procedure

1. Set the Timing Standard knob to 10 NANOSECONDS PER CYCLE. Loosen the set screw and remove the knob and four cover plate screws to expose the adjustments. Replace the knob with the dot at the 10 NANOSECOND PER CYCLE position.

2. Install the Sampling and Timing Units in the Type 661, apply power to all test equipment and allow about 15 minutes for warm-up and stabilization.

3. Set the control of the test equipment as follows:

Type 4S1 Sampling Unit

Channel A Millivolts/cm 10

Channel B Millivolts/cm 100
Triggering B and AC
Mode B only
Smoothing Normal

Type 5T3 Timing Unit

Equivalent Time/cm 10 ns
Trigger Source Int +
Triggering Adjust for stable display
Stability or UHF Sync Auto Recovery
Time Position Midrange for displays like Fig. 1.
Samples/cm 50

Type 661 Oscilloscope

Horizontal Display $\times 1$
Horizontal Position Midrange for centered display
Scale Illum. As desired
Focus, Intensity, Astigmatism Adjust for a well focused normal intensity display

Time-Mark Generator

Marker Selector 10 ns/cycle (sine waves)

Type 111 Pulse Generator

Repetition Rate Max (≈ 100 kHz)
Range 10 KC
Output Polarity +

4. Connections:

a. Time-mark generator marker output connector to Type 4S1 channel B input. Use 50 Ω coaxial cable with BNC connectors, a GR to BNC adapter, and a 5:1 attenuator at the Type 4S1 input.

b. Type 111 Pulse Output connector to either connector of the Timing Standard. Use 2 ns signal delay coaxial cable. Do not use a change line. Output pulse will have a 2 ns duration.

c. Other Timing Standard connector to Type 4S1 channel A input. Use 2 ns signal delay coaxial cable.

Calibration Procedure

1. Set up the equipment and controls as stated in the Preliminary Procedure.

2. 10 NANOSECONDS PER CYCLE

a. Set the Type 5T3 Timing Unit Variable Equivalent Time/cm control for a display of exactly 1 cycle/cm. (The display is of the Time-Mark Generator 10 ns/cycle reference signal.)

b. Set the Sampling Unit Mode switch to A Only and Triggering switch to A.

Timing Standard

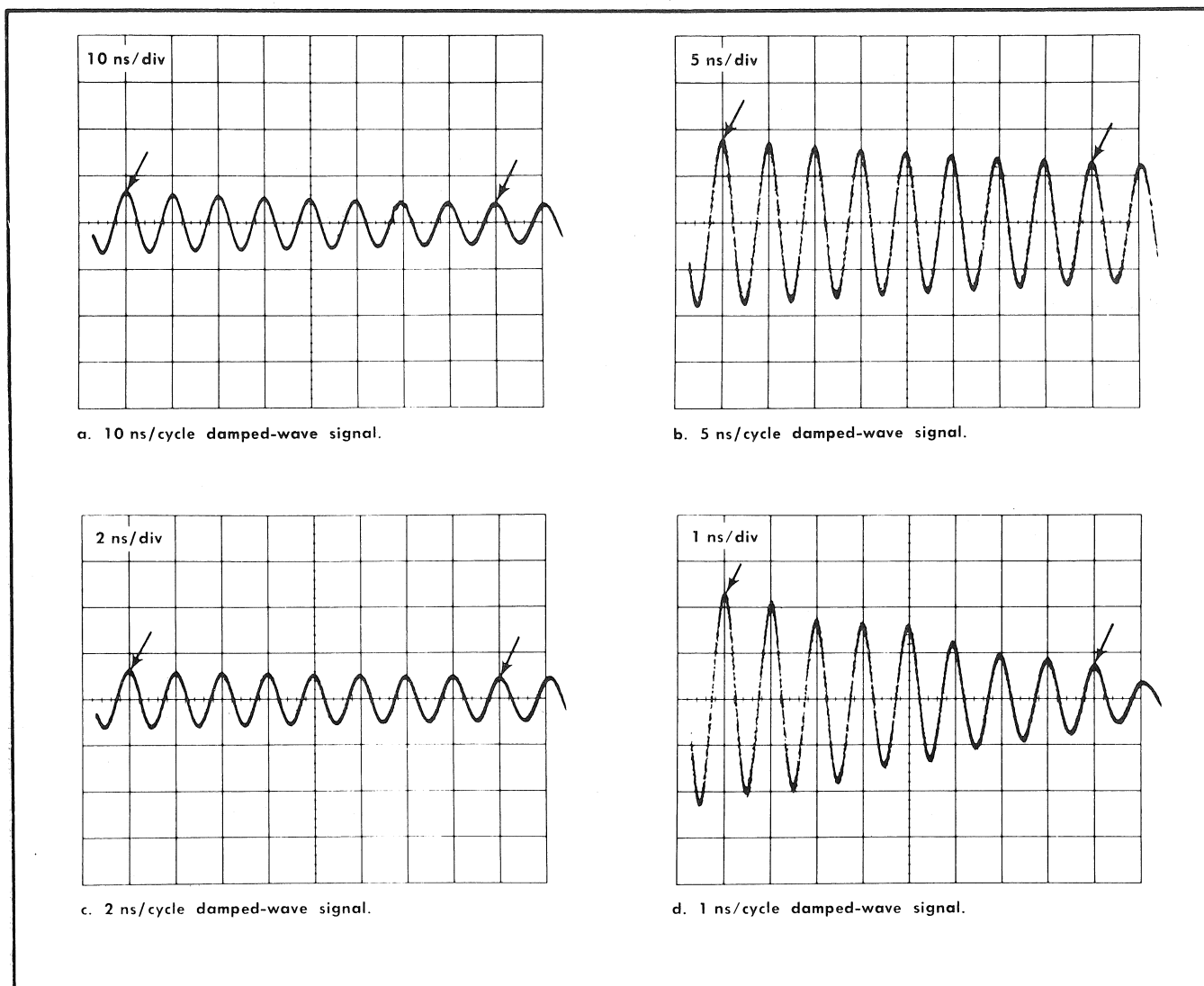


Fig. 1. Typical displays at (A) 10 ns, (B) 5 ns, (C) 2 ns and (D) 1 ns.

c. Check—Display of the Timing Standard damped-wave signal is 1 cycle/cm. If other than 1 cycle/cm, then adjust C922 for exactly 1 cycle/cm. See Fig. 1a. Use adjustment tool (item 10a).

3. 5 NANoseconds PER CYCLE

a. Set the Time-Mark Generator HF Selector toggle switch to 5 ns/cycle. Move the output from the marker output connector to the HF output connector.

b. Set the Type 4S1 Sampling Unit Mode switch to B Only, Triggering switch to B and the Channel B Millivolts/cm switch to 20.

c. Set the Type 5T3 Timing Unit Equivalent Time/cm switch to 5 nSec and adjust the Variable control for a display of exactly 1 cycle/cm. (The display is of the Time-Mark Generator 5 ns/cycle reference signal.)

d. Set the Type 4S1 Sampling Unit Mode switch to A Only and Triggering switch to A.

e. Set the Timing Standard knob to 5 (C918).

f. Check—Display of the Timing Standard damped-wave signal is 1 cycle/cm. If other than 1 cycle/cm, then adjust C918 for exactly 1 cycle/cm. See Fig. 1b.

4. 2 NANoseconds PER CYCLE

a. Set the Time-Mark Generator HF Selector toggle switch to 2 ns/cycle.

b. Set the Type 4S1 Sampling Unit Mode switch to B Only and Triggering switch to B.

c. Set the Type 5T3 Timing Unit Equivalent Time/cm switch to 2 nSec and adjust the Variable control for a display of exactly 1 cycle/cm.

d. Set the Type 4S1 Sampling Unit Mode switch to A Only and Triggering to A.

e. Set the Timing Standard knob to 2 (C914).

f. Check—Display of the Timing Standard damped-wave signal is 1 cycle/cm. If other than 1 cycle/cm, then adjust C914 for exactly 1 cycle/cm. See Fig. 1c.

5. 1 NANoseconds PER CYCLE

a. Set the Type 4S1 Sampling Unit Mode switch to B Only and Triggering switch to B.

b. Set the Type 5T3 Timing Unit Equivalent Time/cm switch to 1 nSec and adjust the Variable control for exactly 1 cycle/2 cm.

c. Set the Type 4S1 Sampling Unit Mode switch to A Only and Triggering switch to A.

d. Set the Timing Standard knob to 1 (C910).

e. Check—Display of the Timing Standard damped-wave signal is 1 cycle/cm, (set the Timing Unit Time Position control so the first few cycles are at the left of the CRT). If other than 1 cycle/cm, then adjust C910 for exactly 1 cycle/cm. See Fig. 1d. Use adjustable tool item 10b.

This completes the calibration of the Timing Standard. Disconnect all test equipment. Set the Timing Standard knob to 10, loosen the set screw, remove knob and replace the cover plate and knob.