Manual Supplement

Manual Title:	5820A Service	Supplement Issue:	**3**
Part Number:	673142	Issue Date:	8/00
Print Date:	June 1999	Page Count:	5
Revision/Date:			

This supplement contains information necessary to ensure the accuracy of the above manual. Enter the corrections in the manual if either one of the following conditions exist:

1. The revision letter stamped on the indicated PCA is equal to or higher than that given with each change.
2. No revision letter is indicated at the beginning of the change.

FLUKE®

Change #1

On page 1-8, Table 1-4, under Leading Edge Aberrations [2],

Change: 5 to 15 ns
To: 5 to 30 ns

Change: after 15 ns
To: after 30 ns

On page 3-33, Table 3-17, Time from 50% of Rising Edge,

Change: 5 - 15 ns
To: 5 - 30 ns

Change: > 15 ns
To: > 30 ns

Change #2

On page 3-37, step #7 replace the last sentence with the following,

Compare Column E to the specifications listed in the final column.

Change #3

On page 3-3, Table 3-1, under **Edge Rise Time and Aberrations Verification**, in the Attenuator and Adapter rows,

Change: 10 dB, 3.5 mm (m/f)
To: 10 dB, SMA (m/f)

Change: BNC (f) to 3.5 mm (m)
To: BNC (f) to SMA (m)

On page 3-4, Table 3-1, replace the entire **Pulse Width Skew Calibration and Verification,** section with the following:

High-Frequency Digital Storage Oscilloscope	Tektronix 11801 with Tektronix SD-22/26 sampling head or Tektronics TDS 820 8 GHz option.	
Attenuator (2)		3 dB, SMA (m/f)
SMA T connector		(m)-(f)-(m)
0.5 M SMA cable		(m)-(m)
Adapter (2)		BNC(f) to SMA(m)
N to BNC Cable (2)	(supplied with Scope Calibrator)	

On page 3-33, under ***Edge Aberrations***, replace the text with the following:

"The following equipment is needed for this procedure:

- High Frequency Digital Storage Oscilloscope: Tektronix 11801 with Tektronix SD-22/26 sampling head

- N to BNC output cables provided with the Scope Calibrator (2)

Before you begin this procedure, verify that the Scope Calibrator is in the edge mode (the Edge menu is displayed), program it to output 1 V p-p @ 1 MHz, and press the soft key under TRIG to select the TRIG/1 External Trigger output.. Press OPR STBY to activate the output and trigger.

Set the DSO vertical to 10 mV/div and horizontal to 10 ns/div. Next, set the signal edge against the left side of the DSO display. Mentally note the signal amplitude 90 ns from the edge; use this point as the reference level. It maybe helpful to set the DSO to average 4 per reading. Now set the DSO to 1 ns/div and look at the first 10 ns of the edge signal with the rising edge at the left edge of the DSO display.

With the vertical setting, each line on the DSO represents a 1% (i.e. 10 mV) of aberration. Determine that the Scope Calibrator falls within the typical specifications shown in Table 3-17. For time greater than 10 ns, set the DSO to 10 ns/div. Verify the aberrations are within specification.

On page 3-53 & 3-54, replace the ***Pulse Width Verifications, Pulse Skew Calibration and Verification, and Pulse Period Verification,*** section in their entirety.

Pulse Width Verification

The following equipment is used to verify the pulse width.

- High Frequency Digital Storage Oscilloscope: Tektronix 11801 with Tektronix SD-22/26 sampling head
- 3 dB attenuator, SMA (m/f)
- BNC(f) to SMA adapter (2)
- N to BNC cable supplied with the Scope Calibrator (2)

Put the Calibrator into standby. Connect the N to BNC cable supplied with the Scope Calibrator to the Calibrator Mainframe's CHAN 1 connector. Connect the other end of the N to BNC cable to one BNC(f) to SMA(m) adapter then to the DSO's sampling head through the 3-dB attenuator.

Using the second BNC(f) to SMA(m) adapter and N to BNC cable, connect the Calibrator Mainframe's EXT TRIG (channel 5) connector to the 11801's Trigger Input. On the Calibrator keypad, select MORE MODES. On the display, press the soft key under Pulse. Press the soft key under TRIG to select the TRIG/1 External Trigger output. Press OPR STBY on the Calibrator to activate the output.

Auto set the Digital Scope. Then set the Digital Scope to these starting values:

Main Time Base position (initial)	2 ns/div
Vertical scale	200 mV/div
Trigger	source = ext; level = 200 mV; ext atten = x10; slope = +; mode = auto
Measurement Function	positive width

1. Program the Calibrator Mainframe to output the pulse width and period at 1.5 V as listed in Table 3-26.
2. Change the horizontal scale of the DSO so that you can view one positive pulse width. Record the width measurement made by the DSO. Compare to the tolerance column of Table 3-26.
3. Change the pulse amplitude and repeat the measurements for an amplitude of 0.15 V. You will need to change the vertical scale of the DSO.

Table 3-26. Pulse Generator Verification: Pulse Width

Nominal Value (V p-p)	Pulse Width (s)	Period (s)	Measured Value (s)	Deviation (s)	1-Year Spec. (s)
1.5	1.0×10^{-9}	200.0×10^{-9}			250×10^{-12}
1.5	9.9×10^{-9}	200.0×10^{-9}			700×10^{-12}
1.5	79.9×10^{-9}	1.000×10^{-6}			4.2×10^{-9}
1.5	500.0×10^{-9}	10.00×10^{-6}			25.2×10^{-9}
0.150	1.0×10^{-9}	200.0×10^{-9}			250×10^{-12}
0.150	9.9×10^{-9}	200.0×10^{-9}			700×10^{-12}
0.150	79.9×10^{-9}	1.000×10^{-6}			4.2×10^{-9}
0.150	500.0×10^{-9}	10.00×10^{-6}			25.2×10^{-9}

Pulse Skew Calibration and Verification

The following equipment is used to Calibrate and verify Pulse Skew

- High Frequency Digital Storage Oscilloscope: Tektronix 11801 with Tektronix SD-22/26 sampling head
- SMA T m-f-m connector
- 3 dB attenuator, SMA (m/f)
- BNC(f) to SMA adapter (2)
- 0.5 m SMA (m) - SMA (m) cable
- N to BNC cable supplied with the Scope Calibrator (2)

The skew function was introduced in December 1998. It is available only in Scope Calibrators shipped since that time. Skew calibration and verification is normally performed as part of the pulse width calibration and verification procedure.

For these procedures, skew is measured from 30% of the trigger signal amplitude to 30% of pulse amplitude. As an example, the trigger output is ~1.0 V into 50 Ω, if the pulse amplitude is 1.5 V, the skew would be measured from 450 mV point on the pulse to 300 mV on the trigger.

Put the Calibrator into standby. Connect the N to BNC cable supplied with the Scope Calibrator to the Calibrator Mainframe's CHAN 1 connector. Connect the other end of the N to BNC cable to one BNC(f) to SMA(m) adapter then to the DSO's channel 1 sampling head through the 3 dB attenuator.

Using the second N to BNC cable, connect to the Calibrator Mainframe's EXT TRIG (channel 5) connector. Connect the BNC end of the cable to a BNC(f) to SMA(m) adapter. Next, connect the adapter to one end of the SMA T connector. Connect the T connector to the 3 dB attenuator and attached the attenuator to the DSO's channel 2 sampling head. The other end of the T connector should be connected through a 0.5-M cable to the trigger input of the DSO.

Calibration

On the Scope Calibrator keypad, select SETUP. On the display select the Cal soft key. Next select Cal 58XXA soft key. For the next soft key selections, press Options followed by Next until you see the message, "Adjust Trigger Skew to 0.0". Follow the front panel skew calibration procedure until you see the message, "Connect 40 ohm Resistor". At this point select Options and then Save the calibration constants.

Verification

On the Calibrator keypad, select MORE MODES. On the display, press the soft key under Pulse. Press the soft key under TRIG to select the TRIG/1 External Trigger output. Program the Calibrator Mainframe to output 1 ns pulse width and 3 µs period at 1.5 V with no skew (i.e. the rising trigger edge against the rising pulse). Press OPR STBY on the Calibrator to activate the output. Press the soft key under SKEW.

Auto set the DSO. Then set the DSO to these starting values:

Main Time Base position (initial)	2 ns/div
Vertical scale channel 1 (Pulse)	200 mV/div
Vertical scale channel 2 (Ext Trig)	100 mV/div
Trigger	source = ext; level = 200 mV; ext atten = x1; slope = +; mode = auto
Measurement Function	none

1. Set skew = 0.0 ns. Verify the skew between the 30% level of the trigger and pulse edge is less than 500 ps.
2. Use the values in the Table 3-27 to verify the skew specification. Change the horizontal scale of the DSO as needed. Record the skew measurement made and compare to the tolerance column of Table 3-27. Continue through the values in the table recording results.

Table 3-27. Pulse Skew

Pulse Amp.	Function	Measurement	Skew	Width	Period	Measured Value	Deviation	Spec (s)
1.5 V	pulse	skew	0.0E-09	1.0E-09	3.0E-06			500.0E-12
1.5 V	pulse	skew	-10.0E-09	1.0E-09	3.0E-06			500.0E-12
1.5 V	pulse	skew	-5.00E-09	1.0E-09	3.0E-06			500.0E-12
1.5 V	pulse	skew	15.0E-09	1.0E-09	3.0E-06			500.0E-12
1.5 V	pulse	skew	30.0E-09	1.0E-09	3.0E-06			500.0E-12

On page 3-55, under ***Pulse Period Verification***, replace the text with the following:

Pulse Period Verification

This procedure uses the following equipment:

- PM 6680 Frequency Counter with an ovenized timebase (Option PM 9690 or PM 9691)
- N to BNC cable supplied with the Scope Calibrator

Set the Calibrator Mainframe to the Pulse menu. Press OPR STBY on the Calibrator Mainframe to activate the output. Then follow these steps to verify the Pulse period.

1. Set the PM 6680's FUNCTION to measure period on channel A with auto trigger, DC couple, 50 Ω impedance, and filter off.
2. Using the N to BNC cable, connect the CHAN 1 connector on the Calibrator Mainframe to PM 6680 channel A.

3. Program the Calibrator Mainframe to output the pulse width and period (at 1.5 V) as listed in Table 3-28.
4. Allow the PM 6680 reading to stabilize, then record the PM 6680 reading for each period listed for the Calibrator Mainframe.

Table 3-28. Pulse Generator Verification: Period

Nominal Value (V p-p)	Pulse Width (s)	Period (s)	Measured Value (s)	Deviation (s)	1-Year Spec. (s)
1.5	5.0×10^{-9}	200×10^{-9}			66×10^{-15}
1.5	500×10^{-9}	0.01			3.3×10^{-9}
1.5	500×10^{-9}	0.02			6.6×10^{-9}

Change #4 - W1013947

On page 6-4, Table 6-1, change the following part number,

From:	A63MP12	KEYPAD, ELASTOMERIC	621943	1
To:	A63MP12	KEYPAD, ELASTOMERIC	1586646	1