



WARNING

THE FOLLOWING SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID PERSONAL INJURY, DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

**PLEASE CHECK FOR CHANGE INFORMATION
AT THE REAR OF THIS MANUAL.**

**067-1155-99
7A42 CALIBRATION FIXTURE
SERVICE**

For Qualified Service Personnel Only

INSTRUCTION MANUAL

**Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077**

Serial Number _____

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GENERAL INFORMATION

The 067-1155-99 is a signal source designed to aid in the calibration and performance verification of the 7A42 Logic Triggered Vertical Amplifier. It is housed in a two-wide TM500 plug-in package. Connections are made from it to the 7A42 with 50 ohm coaxial cables.

FRONT-PANEL CONNECTORS

The front panel of the 067-1155-99 has 13 BNC connectors, one banana jack, and a latch release knob to remove the plug-in from the TM 500 mainframe.

The eleven connectors are labeled with letters and subscripts. They provide the digital signals necessary to verify performance of the 7A42. The amplitudes of those with the subscript "0" are ECL levels attenuated by a factor of ten when the line is terminated by 50 ohms to ground. The subscript "0" outputs are to be connected to the 7A42 channel inputs. The subscript "1" outputs are ECL levels

(not attenuated) when the line is terminated by 50 ohms to a -2V supply, and are intended to be used with the 7A42 EXT CLOCK (ECL level) input. The subscript "2" output signal swing is approximately 0V to 1V when terminated by 50 ohms to ground. They are intended to drive the 7A42 RESET input. Figure 1-1 shows the relative timing of these signals.

The 067-1155-99 also provides two voltage references to calibrate the 7A42 trigger thresholds and probe offset DVM. The +5V POWER output is for development and calibration purposes only and is not used during the 7A42 performance verification.

SPECIFICATIONS

The electrical characteristics listed in Table 1-1 apply when the following conditions are met: (1) Adjustment of the instrument must have taken place at an ambient temperature between +20° and +30° C, (2) the instrument and its host mainframe must be allowed a 20-minute warm-up period, (3) all specifications are valid at an ambient temperature of 20° to 30° C, unless otherwise stated, (4) the instrument must be in an environment that meets the limits described in Table 1-2.

Any applicable conditions not listed above are expressly stated as part of that characteristic. Environmental characteristics are listed in Table 1-2.

TABLE 1-1
Electrical Characteristics

Characteristic	Performance Requirement
OUTPUT AMPLITUDE	
A0, B0, C0, D0, E0, and F0	-100mV ≤ V _{OH} ≤ -80mV -180mV ≤ V _L ≤ -160mV with 50 ohm termination to ground.
A1, C1, D1	-1.00V ≤ V _{OH} ≤ -0.80V -1.80V ≤ V _L ≤ -1.60V with 50 ohm termination to -2V.
(For calibration and test only)	+0.55V ≤ V _{OH} ≤ +0.75V -0.25V ≤ V _L ≤ -0.05V with 50 ohm termination to ground.
A2, C2	+0.7V ≤ V _{OH} ≤ +0.9V +0.0V ≤ V _L ≤ +0.2V with 50 ohm termination to ground.

TABLE 1-1 (CONT)
Electrical Characteristics

Characteristic	Performance Requirement
OUTPUT AMPLITUDE (CONT)	
.250V REF	+0.250V \pm 0.001V DC, with 1 megohm load.
5.00V REF	+5.00V \pm 0.01V DC, with 100K ohm load.
+5V POWER	+4.75V to +5.5V DC.

TIMING OF SIGNAL OUTPUTS (refer to timing diagram)

Description	Mnemonic	Spec
Delay, A0 to B0	Tab	4.5ns \pm 0.2ns
Delay, A0 to C0	Tac	9.0ns \pm 0.4ns
Delay, F0 to A0	Tfa	90 ns \pm 20ns
Delay, A0 to A1, C0 to C1, D0 to D1	T01	0ns \pm 0.2ns
Delay, A0 to A2, C0 to C2	T02	0ns \pm 0.2ns
Width (50% points), D0, D1	Td	4.5ns \pm 0.2ns
Width (50% points), E0	Te	9ns \pm 0.4ns
Width (50% points), A2	Ta	90ns \pm 4ns

POWER REQUIREMENTS

From TM500 mainframe,	+33.5V DC	50 ma
	+11.5V DC	20 ma
	-33.5V DC	80 ma
Maximum power consumption:	less than 5 watts.	

TABLE 1-2
Environmental Characteristics

Characteristic	Information
Operating temperature range	+20 to +30° C room ambient.
Storage temperature range	-55 to +75° C.

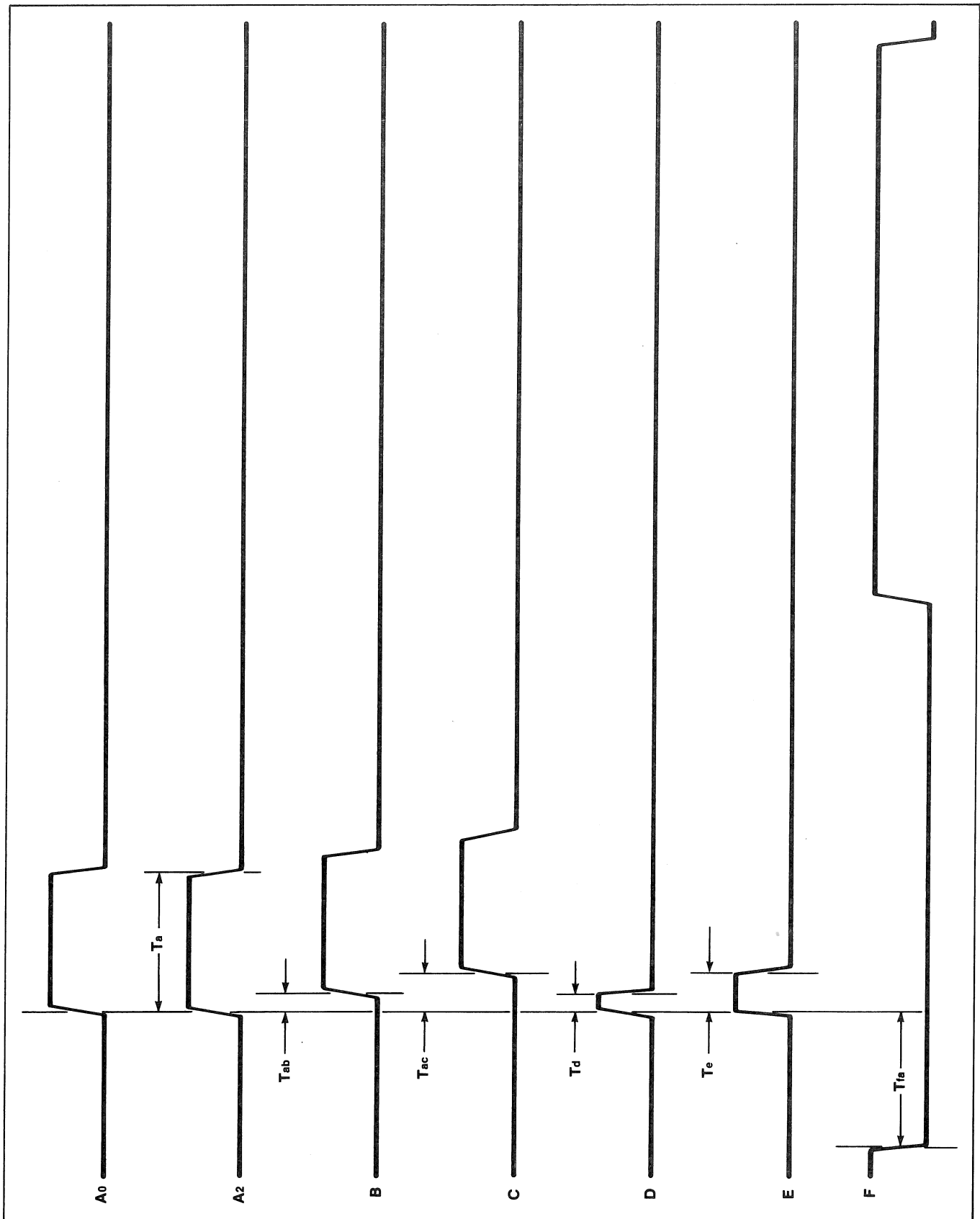


Figure 1-1. Relative timing of output signals.

OPERATING INSTRUCTIONS

This section gives the detailed information necessary to use the 067-1155-99 7A42 Calibration Fixture to verify that the 7A42 meets its electrical specifications.

The 067-1155-99 is an acceptable substitute for some of the required test equipment listed in Table 4-2 of the 7A42 Service Manual, Vol 1. Where applicable, these operating instructions will list a procedure which uses the 067-1155-99 in place of the recommended standard equipment. There are some checks for which the 067-1155-99 cannot be used; in these cases, the user is referred to the procedure and equipment listed in the Checks and Adjustment section of the 7A42 Service Manual.

At the beginning of each section there is a list of equipment, in addition to the 067-1155-99, that is needed in the procedures where the 067-1155-99 can be used. A TM500 or TM5000 mainframe is also needed to house the 067-1155-99. One additional item not in Table 4-2 that is convenient (but not essential) is the BNC to Binding Post Adapter (Tektronix Part No. 103-0035-00).

Figure, Tables, and Setup Conditions mentioned in this procedure are located in the 7A42 Service Manual (Volume 1) in section 4, Checks and Adjustment.

INDEX TO PART II— PERFORMANCE CHECK PROCEDURE

A. CHANNEL AMPLIFIERS—Refer to 7A42 Service Manual

B. TRIGGER VIEW TRACE

1. Preliminary Setup
2. Check Trigger View Amplitude
3. Check Trigger View-Time Coincidence With Channel Display

C. THRESHOLD AND PROBE OFFSET

1. Preliminary Setup
2. Check Threshold Voltage Range—Refer to 7A42 Service Manual
3. Check Threshold Accuracy
4. Check Threshold Hysteresis—Refer to 7A42 Service Manual
5. Check Probe-Tip Input Voltage Accuracy

D. EXTERNAL CLOCK

1. Preliminary Setup
2. Check Ext Clock View-Time Coincidence With Channel Display
3. Check Minimum External Clock Width
4. Check External Clock Input Thresholds—Refer to 7A42 Service Manual
5. Check External Clock Setup Time
6. Check External Clock Hold Time

E. TRIGGER-LEVEL SENSITIVITY

1. Preliminary Setup
2. Check Trigger Filter

3. Check Maximum Toggle Frequency—Refer to 7A42 Service Manual

4. Check Trigger Output Voltage

F. TRIGGER-EDGE SENSITIVITY

1. Preliminary Setup
2. Check Edge Setup Time (Chan-To-Chan)
3. Check Edge Hold Time (Chan-To-Chan)
4. Check Edge Setup Time (Edge-Sens Chan)
5. Check Edge Hold Time (Edge-Sens Chan)

G. TRIGGER-A THEN B

1. Preliminary Setup
2. Check Time Between Event A And Event B
3. Check Time From Event B To Event A
4. Check Minimum Event Duration
5. Check A Then B Gate Output Width
6. Check Gate Output Timing

H. TRIGGER-RESET

1. Preliminary Setup
2. Check Reset Input Thresholds—Refer to 7A42 Service Manual
3. Check Reset Input Pulse Width
4. Check Post-Reset Inhibit Time
5. Check Reset Activation Window

PERFORMANCE CHECK INITIAL SETUP PROCEDURE

Refer to the 7A42 Service Manual for this procedure.

A. CHANNEL AMPLIFIERS

Refer to the 7A42 Service Manual for this procedure.

B. TRIGGER VIEW TRACE

Additional Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

1. Oscilloscope Mainframe
2. Time-Base Unit
14. Coaxial Cable

B1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modifications which may affect this procedure.
- c. Set the time base unit controls:

Triggering	
Mode	Auto
Coupling	Dc
Source	Int
Mag	In (X1)

B2. CHECK TRIGGER VIEW AMPLITUDE

NOTE

First perform step B1, then proceed.

Configure the equipment to the B2. SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF pulse generator.
 2. Connect the F0 output directly to the 7A42 CH1 input with the coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.

- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the GND button (CH1 GND light on). Set the CH1 trace 1 division above the center horizontal graticule line.
- e. Press the GND button (CH1 GND light off).
- f. Set the time-base unit Triggering Level control as necessary for a stable display.
- g. **CHECK**—the trigger view waveform for an amplitude of 0.35 division, within the limits of 0.25 to 0.45 division. Refer to Figure 4-2.
- h. Move the F0 output signal from the CH1 input to the CH2 input connector.
- i. Press the DISPLAY button (CH1 DISPLAY light off).
- j. Press the PROG TRIG button (button light on).
- k. Press the CLEAR button and the CH2 button (red CH2 TRIGGER FUNCTION light on).
- l. Press the PROG CHAN button (button light off).
- m. Press the CH2 button (CH2 button light on).
- n. Press the DISPLAY button (CH2 DISPLAY light on).
- o. Rotate the CH2 POSITION control to position the trace on the screen.
- p. Press the TTL/ECL button (Ch2 ECL TTL button light off).
- q. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- r. **CHECK**—the trigger view waveform for an amplitude of 0.35 division, within the limits of 0.25 to 0.45 division. Refer to Figure 4-2.
- s. Repeat parts h through r for CH3 and CH4.
- t. If you do not intend to perform the following step, replace the J747 BA (Battery Enable link plug that you removed in the Initial Setup Procedure.

B3. CHECK TRIGGER VIEW-TIME COINCIDENCE WITH CHANNEL DISPLAY

NOTE

If the preceding step was not performed, first perform step B1, then proceed.

Configure the equipment to the B3. SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF pulse generator.
2. Connect the A0 output directly to the 7A42 CH1 input with the coaxial cable (no attenuator).

NOTE

The Amplifier Gain and Trigger Threshold adjustments must be properly adjusted for this check to pass the performance requirements.

- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the CH2 button (button light on).
- e. Press the TTL/ECL button (CH2 ECL TTL light off).
- f. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- g. Press the CH3 button (button light on).
- h. Press the TTL/ECL button (CH3 ECL TTL light off).
- i. Press the 1M Ω /50 Ω button (CH3 50 Ω 1M Ω 15pf light off).
- j. Press the CH4 button (button light on).
- k. Press the TTL/ECL button (CH4 ECL TTL light off).
- l. Press the 1M Ω /50 Ω button (CH4 50 Ω 1M Ω 15pf light off).
- m. Press the CH1 button (button light on).
- n. Press the TRIG VIEW button (button light on).
- o. Press the GND button (CH1 GND light on). Set the CH1 trace 1 division above the center horizontal graticule line.
- p. Press the GND button (CH1 GND light off).
- q. Set the time-base unit Triggering Level control as necessary for a stable display.
- r. Set the time-base unit Time/Div to 2 ns.
- s. Set the time-base unit Position control to position the 50% amplitude level of the Trigger View Transition to the center vertical graticule line. Refer to Figure 4-3.
- t. Press the PROG TRIG button (button light on).
- u. Press the CLEAR button.
- v. Press the CH1 button.
- w. **CHECK**—that the channel transition 50% amplitude level is within 1.5 divisions of the center vertical graticule line. Refer to Figure 4-3.
- x. Press the NOT button.
- y. **CHECK**—repeat part w.
- z. Press the EDGE button.
- aa. **CHECK**—Repeat part w.
- bb. Press the NOT button.
- cc. **CHECK**—repeat part w.
- dd. Press the CLEAR button.
- ee. Press the CH2 button.
- ff. Press the NOT button, the OR button, and the CH1 button respectively.
- gg. **CHECK**—repeat part w.
- hh. Press the NOT button.
- ii. **CHECK**—repeat part w.
- jj. Press the EDGE button.
- kk. **CHECK**—repeat part w.
- ll. Press the NOT button.
- mm. **CHECK**—repeat part w.
- nn. Press the CLEAR button.

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- oo. Press the B button (button light on).
- pp. Repeat parts v through nn.
- qq. Move the A0 output signal from the CH1 input to the CH2 input connector.
- rr. Press the PROG CHAN button (button light off).
- ss. Press the DISPLAY button (CH1 DISPLAY light off).
- tt. Press the CH2 button (button light on).
- uu. Press the DISPLAY button (button light on).
- vv. Press the PROG TRIG button (button light on).
- ww. Press the CLEAR button, and the CH2 button (red CH2 TRIGGER FUNCTION light on).
- xx. Press the PROG CHAN button (button light off).
- yy. Repeat parts o through qq for CH2, CH3 and CH4.
- zz. Replace the J747 BA (Battery Enable link plug that you removed in the Initial Setup Procedure.

C. THRESHOLD AND PROBE OFFSET

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

- 1. Oscilloscope Mainframe
- 2. Time-Base Unit
- 14. Coaxial Cable
- 18. Meter Leads
 - Tektronix 103-0035-00 BNC to Binding Post Adapter (not in Table 4-2)

C1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modifications which may affect this procedure.

- c. Set the time-base unit controls:

Triggering
Mode Auto
Coupling Dc
Source Int
Mag In (X1)

C2. CHECK THRESHOLD VOLTAGE RANGE

Refer to the 7A42 Service Manual for this procedure.

C3. CHECK THRESHOLD ACCURACY

NOTE

If the preceding step was not performed, first perform step C1, then proceed.

Configure the equipment to the C3 SETUP CONDITIONS except:

- 1. Substitute the 067-1155-99 for the Calibration Generator.
- 2. Connect the +.250V REF output to the 7A42 CH1 input with a coaxial cable.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the GND button (CH1 GND light on).
- d. Press the THRESH button (button light on).
- e. Press the TRIG VIEW button (button light on).
- f. Press the LEVEL buttons for a SWITCHING THRESHOLD readout of .000.
- g. Move the SWITCHING THRESHOLD voltage level up and down from the .000 volt level, using the LEVEL buttons, and note that the trigger view trace dc level shifts.
- h. Record the SWITCHING THRESHOLD voltage levels at which the two shifts occur.
- i. **CHECK**—the average of the two values recorded in part h should be .000 volts within the limits of plus or minus .001 volt.
- j. Press the GND button (CH1 GND light off).

- k. Press the LEVEL up button to move the SWITCHING THRESHOLD readout to .250 VOLTS.
- l. Move the SWITCHING THRESHOLD voltage level up and down from the .250 volt level, using the LEVEL buttons.
- m. **CHECK**—that the trigger view trace dc level shifts between high and low at .250 volts, within the limits of .244 and .256 volts, as read on the SWITCHING THRESHOLD readout display.
- n. Press the DISPLAY button (CH1 DISPLAY light off).
- o. Press the CH2 button (button light on).
- p. Press the DISPLAY button (CH2 DISPLAY light on).
- q. Press the TTL/ECL button (CH2 ECL TTL light off).
- r. Press the GND button (CH2 GND light on).
- s. Press the PROG TRIG button (button light on).
- t. Press the CLEAR button.
- u. Press the CH2 button (red CH2 TRIGGER FUNCTION light on).
- v. Press the PROG CHAN button (button light off).
- w. Move the coaxial cable input signal to the CH2 input connector.
- x. Repeat parts f through w for CH2, CH3, and CH4.
- y. **NOTE:** It is not necessary to check the threshold accuracy of the TTL family. Satisfactory verification of the ECL family threshold accuracy adequately verifies TTL family performance.
- z. If you do not intend to perform the following step, replace J747 BA (Battery Enable link plug that you removed in the Initial Setup Procedure).

C4. CHECK THRESHOLD HYSTERESIS

Refer to the 7A42 Service Manual for this procedure.

C5. CHECK PROBE-TIP INPUT VOLTAGE ACCURACY

NOTE

If the preceding step was not performed, first perform step C1, then proceed.

Configure the equipment to the C5 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Power Supply and Digital Voltmeter.
 2. Connect the BNC to Binding Post Adapter to the +5.00V REF output. Attach the meter leads to the Binding Post Adapter, red to red, and black to black. Attach the black meter lead tip to the oscilloscope ground post.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the THRESH button (button light on).
 - c. Press the PROBE OFFSET button (red button light on).
 - d. **CHECK**—the SWITCHING THRESHOLD readout display for a reading of 0.00 volts within the limits of +0.02 to -0.02 volts.
 - e. Touch the red meter lead to the PROBE TIP connector.
 - f. **CHECK**—the SWITCHING THRESHOLD readout display for a reading of +4.88 to +5.12 volts.
 - g. Replace the J747 BA (Battery Enable link plug that you removed in the Initial Setup Procedure).

D. EXTERNAL CLOCK

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

1. Oscilloscope Mainframe
2. Time-Base Unit
14. Coaxial Cable (Two Required)

D1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modifications which may affect this procedure.
- c. Set the time-base unit controls:

Triggering	
Mode	Auto
Coupling	Dc
Source	Int
Mag	In (X1)

D2. CHECK EXT CLOCK VIEW-TIME COINCIDENCE WITH CHANNEL DISPLAY

NOTE

First perform step D1, then proceed.

Configure the equipment to the D2 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the A1 output directly to the 7A42 EXT CLOCK input with a coaxial cable. The BNC T adapter is not needed.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the TTL/ECL button (CH1 ECL TTL light off).
 - c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - d. Press the TRIG VIEW button (button light on).

- e. Press the GND button (CH1 GND light on). Set the CH1 trace 1 division above the center horizontal graticule line.
- f. Press the GND button (CH1 GND light off).
- g. Set the time-base unit Triggering Level control as necessary for a stable display.
- h. Press the PROG TRIG button (button light on).
- i. Press the CLEAR button.
- j. Press the CH2 button (red CH2 TRIGGER FUNCTION light on).
- k. Press the OR button, the NOT button, and the CH2 button (green CH2 TRIGGER FUNCTION light on).
- l. Press the EXT CLOCK SYNC button (button light on).
- m. **CHECK**—that the Ext Clock View Transition (measured at the 50% amplitude levels) occurs simultaneously with the Channel Transition, within 1 division. Refer to Figure 4-7.
- n. Press the Clock Slope button to select the falling edge (button light off).
- o. **CHECK**—that the Ext Clock View Transition (measured at the 50% amplitude levels) occurs simultaneously with the Channel Transition, within 1 division.
- p. If you do not intend to perform the following step, replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

D3. CHECK MINIMUM EXTERNAL CLOCK WIDTH

NOTE

If the preceding step was not performed, first perform step D1, then proceed.

The ECL level minimum EXT CLOCK width can be checked with the 067-1155-99, however the TTL level check requires the equipment and procedure described in the 7A42 Service Manual.

Configure the equipment to the D3 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.

2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the D1 output directly to the 7A42 EXT CLOCK input with a coaxial cable. The BNC T adapter is not needed.
 - a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe off, then back on again.
 - b. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - c. Press the TTL/ECL button (CH1 ECL TTL light off).
 - d. Press the TRIG VIEW button (button light on).
 - e. Press the PROG TRIG button (button light on).
 - f. Press the B button (button light on).
 - g. Press the CH2 button (red CH2 TRIGGER FUNCTION light on).
 - h. Press the OR button, the NOT button, and the CH2 button (green CH2 TRIGGER FUNCTION light on).
 - i. Press the A button (button light on).
 - j. Press the PROG CHAN button (button light off).
 - k. Press the GND button (CH1 GND light on).
 - l. Set the CH1 trace 1 division above the center horizontal graticule line.
 - m. Press the GND button (CH1 GND light off).
 - n. Press the B button (button light on).
 - o. Press the EXT CLOCK SYNC button (button light on).
 - p. **CHECK**—that the waveform display remains triggered.
 - q. Press the CH2 button (button light on).
 - r. Press the TTL/ECL button (CH2 ECL TTL light off).
 - s. **CHECK**—that the waveform display remains triggered.
 - t. Press the A button (button light on).
 - u. Press the PROG TRIG button (button light on).
 - v. Press the CLEAR button.
 - w. Press the CH2 button, the OR button, the NOT button, and the CH2 button, respectively.
 - x. Press the PROG CHAN button (button light off).
 - y. **CHECK**—that the waveform display remains triggered.
 - z. Press the TTL/ECL button (CH2 ECL TTL light on).
 - aa. **CHECK**—that the waveform display remains triggered.
 - bb. Turn the mainframe oscilloscope Power off.
 - cc. Refer to the 7A42 Service manual for the procedure to check the TTL level minimum EXT CLOCK width. Use procedure D3, beginning with step ff.

D4. CHECK EXTERNAL CLOCK INPUT THRESHOLDS

Refer to the 7A42 Service Manual for this procedure.

D5. CHECK EXTERNAL CLOCK SETUP TIME

NOTE

If the preceding step was not performed, first perform step D1, then proceed.

Configure the equipment to the D5 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the C1 output directly to the 7A42 EXT CLOCK input with a coaxial cable. The BNC T adapter is not needed.
 - a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - c. Press the TTL/ECL button (CH1 ECL TTL light off).

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- d. Press the GND button (CH1 GND light on).
- e. Set the CH1 trace 1 division above the center horizontal graticule line.
- f. Press the GND button (CH1 GND light off).
- g. Press the TRIG VIEW button (button light on).
- h. Press the EXT CLOCK SYNC button (button light on).
- i. **CHECK**—that the displayed waveform remains triggered.
- j. If you do not intend to perform the following step, replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.
- h. Set the CH1 trace 1 division above the center horizontal graticule line.
- i. Press the GND button (CH1 GND light off).
- j. Press the TRIG VIEW button (button light on).
- k. Press the EXT CLOCK SYNC button (button light on).
- l. **CHECK**—that the displayed waveform remains triggered.
- m. Replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

D6. CHECK EXTERNAL CLOCK HOLD TIME

NOTE

If the preceding step was not performed, first perform step D1, then proceed.

Configure the equipment to the D6 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the C0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the A1 output directly to the 7A42 EXT CLOCK input with a coaxial cable. The BNC T adapter is not needed.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- c. Press the TTL/ECL button (CH1 ECL TTL light off).
- d. Press the PROG TRIG button (button light on).
- e. Press the CLEAR button, the NOT button, and the CH1 button, respectively (green CH1 TRIGGER FUNCTION light on).
- f. Press the PROG CHAN button (button light off).
- g. Press the GND button (CH1 GND light on).

E. TRIGGER-LEVEL SENSITIVITY

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

1. Oscilloscope Mainframe
2. Time-Base Unit
14. Coaxial Cable (Two Required)

E1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modifications which may affect this procedure.
- c. Set the time-base unit controls:

Triggering
Mode Auto
Coupling Dc
Source Int
Mag In (X1)

E2. CHECK TRIGGER FILTER**NOTE**

First perform step E1, then proceed.

Configure the equipment to the E2 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator).
3. Set the time-base sweep speed to 20ns/div.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the TRIG VIEW button (button light on).
- e. Press the GND button (CH1 GND light on).
- f. Position the CH1 trace 1 division above the center horizontal graticule line.
- g. Press the GND button (CH1 GND light off).
- h. Press the PROG TRIG button (button light on).
- i. Note the width of the trigger view pulse (approx 90ns).
- j. Turn the TRIGGER FILTER control on, just out of the detent position (minimum on position).
- k. **CHECK**—that the trigger view pulse width is reduced not more than 15 ns from the width observed in step i.
- l. Turn the TRIGGER FILTER control OFF (in detent).
- m. Set the time-base unit Time/Div to 0.2 μ s.
- n. Press the CLEAR button, the CH1 button, and the NOT button, respectively (green CH1 TRIGGER FUNCTION light on).
- o. Note the width of the trigger view pulse, the time that trigger view is in the high state (approx 700ns).
- p. Turn the TRIGGER FILTER control out of the detent, to the maximum clockwise position.
- q. **CHECK**—that the trigger view pulse width is reduced by at least 300 ns. Record the exact amount of reduction.
- r. Press the B button (button light on).
- s. Press the CH1 button, then the NOT button (green CH1 TRIGGER FUNCTION light on).
- t. Turn the TRIGGER FILTER control OFF (in detent).
- u. As in step o, note the width of the trigger view pulse, the time that trigger view is in the high state (approx 700ns).
- v. Turn the TRIGGER FILTER control out of the detent, to the maximum clockwise position.
- w. **CHECK**—that the trigger view pulse width is reduced by at least 300 ns. Record the exact amount of reduction.
- x. **CHECK**—find the difference between the values recorded in part q and part w. The difference between these two values must be less than 10% of the sum of the two recorded values.
- y. Turn the TRIGGER FILTER and control OFF (in detent).
- z. Set the time-base unit Time/Div to 20 ns.
- aa. Press the NOT button (red CH1 TRIGGER FUNCTION light on).
- bb. Note the width of the trigger view pulse (approx 90ns).
- cc. Turn the TRIGGER FILTER control on, just out of the detent position (minimum on position).
- dd. **CHECK**—that the trigger view pulse width is reduced not more than 15 ns from the value observed in step bb.
- ee. If you do not intend to perform the following step, replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

E3. CHECK MAXIMUM TOGGLE FREQUENCY

Refer to the 7A42 Service Manual for this procedure.

E4. CHECK TRIGGER OUTPUT VOLTAGE

NOTE

If the preceding step was not performed, first perform step E1, then proceed.

Configure the equipment to the E4 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the F0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator).
3. Set the time-base sweep speed to 100ns/div.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the GND button (CH1 GND light on).
- e. Set the CH1 trace 2 divisions above the center horizontal graticule line.
- f. Press the GND button (CH1 GND light off).
- g. Press the CH4 button (button light on).
- h. Press the 1M Ω /50 Ω button (CH4 50 Ω 1M Ω 15pf light off).
- i. Press the DISPLAY button (CH4 DISPLAY light on).
- j. Press the GND button (CH4 GND light on).
- k. Position the CH4 display baseline (zero volts) 3 divisions below the center horizontal graticule line.
- l. Press the GND button (CH4 GND light off).
- m. **CHECK**—that the trigger output pulse amplitude level ranges from less than +0.2 V to greater than +0.8 V.
- n. Replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

F. TRIGGER-EDGE SENSITIVITY

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

1. Oscilloscope Mainframe
2. Time-Base Unit
14. Coaxial Cable (two required)

F1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modifications which may affect this procedure.
- c. Set the time-base-unit controls:

Triggering	
Mode	Auto
Coupling	Dc
Source	Int
Mag	In (X1)

F2. CHECK EDGE SETUP TIME (CHAN-TO-CHAN)

NOTE

First perform step F1, then proceed.

Configure the equipment to the F2 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Calibration Generator.
2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the B0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- c. Press the TTL/ECL button (ECL TTL light off).
- d. Press the CH2 button (button light on).

- e. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- f. Press the TTL/ECL button (CH2 ECL TTL light off).
- g. Press the DISPLAY button (CH2 DISPLAY light on).
- h. Press the TRIG VIEW button (button light on).
- i. Press the PROG TRIG button (button light on).
- j. Press the CLEAR button.
- k. Press the CH1 button, the AND button, the CH2 button, and the EDGE button, respectively.
- l. **CHECK**—that the waveform display is triggered.
- m. Press the CLEAR button.
- n. Press the NOT button, the CH1 button, the AND button, the NOT button, the CH2 button, and the EDGE button, respectively.
- o. **CHECK**—that the waveform display is triggered.
- p. Reverse the signal connections on the CH1 and CH2 input connections.
- q. Press the CLEAR button.
- r. Press the CH1 button, the EDGE button, the AND button, and the CH2 button, respectively.
- s. **CHECK**—that the waveform display is triggered.
- t. Press the CLEAR button.
- u. Press the NOT button, the CH1 button, the EDGE button, the AND button, the NOT button, and the CH2 button, respectively.
- v. **CHECK**—that the waveform display is triggered.

NOTE

The "Channel-to-Channel Edge Setup Time" performance requirement applies for all combinations of channels in A and B trigger functions. To completely verify this specification would require performing the preceding checks 24 times. This specification was completely checked at the factory. Because of this, if you make performance checks on a routine basis we feel that completing the preceding checks "once" will give a high confidence level that all combinations will meet specifications, unless:

NOTE

1. the trigger self-test (performed at power-up) fails, or

2. any ICs on the Trigger Board have been replaced. (Refer to the Maintenance section for a list of checks to perform when specific ICs have been replaced.)

- w. If you do not intend to perform the following step, replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

F3. CHECK EDGE HOLD TIME (CHAN-TO-CHAN)**NOTE**

If the preceding step was not performed, first perform step F1, then proceed.

Configure the equipment to the F3 SETUP CONDITIONS except:

- 1. Substitute the 067-1155-99 for the Calibration Generator.
- 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the B0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- c. Press the TTL/ECL button (ECL TTL light off).
- d. Press the CH2 button (button light on).
- e. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- f. Press the TTL/ECL button (CH2 ECL TTL light off).
- g. Press the DISPLAY button (CH2 DISPLAY light on).
- h. Press the TRIG VIEW button (button light on).
- i. Press the PROG TRIG button (button light on).
- j. Press the CLEAR button.

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- k. Press the CH1 button, the EDGE button, the AND button, the NOT button, and the CH2 button, respectively.
- l. **CHECK**—that the waveform display is triggered.
- m. Press the CLEAR button.
- n. Press the NOT button, the CH1 button, the EDGE button, the AND button, and the CH2 button respectively.
- o. **CHECK**—that the waveform display is triggered.
- p. Reverse the signal connections on the CH1 and CH2 input connectors.
- q. Press the CLEAR button.
- r. Press the NOT button, the CH1 button, the AND button, the CH2 button, and the EDGE button, respectively.
- s. **CHECK**—that the waveform display is triggered.
- t. Press the CLEAR button.
- u. Press the CH1 button, the AND button, the NOT button, the CH2 button, and the EDGE button, respectively.
- v. **CHECK**—that the waveform display is triggered.

NOTE

The "Channel-to-Channel Edge Hold Time" performance requirement applies for all combinations of channels in A and B trigger functions. To completely verify this specification would require performing the preceding checks 24 times. This specification was completely checked at the factory. Because of this, if you make performance checks on a routine basis we feel that completing the preceding checks "once" will give a high confidence level that all combinations will meet specifications, unless:

1. the trigger self-test (performed at power-up) fails, or

2. any ICs on the Trigger Board have been replaced. (Refer to the Maintenance section for a list of checks to perform when specific ICs have been replaced.)

- w. If you do not intend to perform the following step, replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

F4. CHECK EDGE SETUP TIME (EDGE-SENS CHAN)

NOTE

If the preceding step was not performed, first perform step F1, then proceed.

Configure the equipment to the F4 SETUP CONDITIONS except:

- 1. Substitute the 067-1155-99 for the HF Pulse Generator.
- 2. Connect the E0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the CH2 button (button light on).
- e. Press the TTL/ECL button (CH2 ECL TTL light off).
- f. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- g. Press the CH1 button (button light on).
- h. Press the GND button (CH1 GND light on).
- i. Set the CH1 trace 1 division above the center horizontal graticule line.
- j. Press the GND button (CH1 GND light off).
- k. Set the time-base unit Triggering Level control as necessary for a stable display.
- l. Press the PROG TRIG button (button light on).
- m. Press the CLEAR button.
- n. Press the TRIG VIEW button (button light on).
- o. Press the NOT button, the EDGE button, and the CH1 button, respectively.
- p. **CHECK**—that the pulse display remains triggered (falling edge of pulse aligned with the leading edge of the trigger view pulse).
- q. Press the CLEAR button.

- r. Press the NOT button, the CH2 button, the OR button, the NOT button, the EDGE button, and the CH1 button, respectively.
- s. **CHECK**—that the pulse display remains triggered (falling edge of pulse aligned with the leading edge of the trigger view pulse).
- t. Press the CLEAR button.
- u. Press the B button (button light on).
- v. Press the NOT button, the EDGE button, and the CH1 button, respectively.
- w. **CHECK**—that the pulse display remains triggered (falling edge of pulse aligned with the leading edge of the trigger view pulse).
- x. Press the CLEAR button.
- y. Press the NOT button, the CH2 button, the OR button, the NOT button, the EDGE button, and the CH1 button, respectively.
- z. **CHECK**—that the pulse display remains triggered (falling edge of pulse aligned with the leading edge of the trigger view pulse).

NOTE

The "Edge-Sensitive Channel Edge Setup Time" performance requirement applies for all combinations of channels in A and B trigger functions. To completely verify this specification would require performing the preceding checks 4 times. This specification was completely checked at the factory. Because of this, if you make performance checks on a routine basis we feel that completing the preceding checks "once" will give a high confidence level that all combinations will meet specifications, unless:

1. the trigger self-test (performed at power-up) fails, or

2. any ICs on the Trigger Board have been replaced. (Refer to the Maintenance section for a list of checks to perform when specific ICs have been replaced.)

- aa. If you do not intend to perform the following step, replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

F5. CHECK EDGE HOLD TIME (EDGE-SENS CHAN)**NOTE**

If the preceding step was not performed, first perform step F1, then proceed.

Configure the equipment to the F5 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the D0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator).
 - a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the TTL/ECL button (ECL TTL light off).
 - c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - d. Press the CH2 button (button light on).
 - e. Press the TTL/ECL button (CH2 ECL TTL light off).
 - f. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
 - g. Press the CH1 button (button light on).
 - h. Press the GND button (CH1 GND light on).
 - i. Set the CH1 trace 1 division above the center horizontal graticule line.
 - j. Press the GND button (CH1 GND light off).
 - k. Set the time-base unit Triggering Level control as necessary for a stable display.
 - l. Press the PROG TRIG button (button light on).
 - m. Press the CLEAR button.
 - n. Press the TRIG VIEW button (button light on).
 - o. Press the EDGE button, and the CH1 button.
 - p. **CHECK**—that the pulse display remains triggered (rising edge of pulse aligned with the leading edge of the trigger view pulse).
 - q. Press the CLEAR button.

- r. Press the NOT button, the CH2 button, the OR button, the EDGE button, and the CH1 button, respectively.
- s. **CHECK**—that the pulse display remains triggered (rising edge of pulse aligned with the leading edge of the trigger view pulse).
- t. Press the CLEAR button.
- u. Press the B button (button light on).
- v. Press the EDGE button, and the CH1 button.
- w. **CHECK**—that the pulse display remains triggered (rising edge of pulse aligned with the leading edge of the trigger view pulse).
- x. Press the CLEAR button.
- y. Press the NOT button, the CH2 button, the OR button, the EDGE button, and the CH1 button, respectively.
- z. **CHECK**—that the pulse display remains triggered (rising edge of pulse aligned with the leading edge of the trigger view pulse).

NOTE

The "Edge-Sensitive Channel Edge Hold Time" performance requirement applies for all combinations of channels in A and B trigger functions. To completely verify this specification would require performing the preceding checks 4 times. This specification was completely checked at the factory. Because of this, if you make performance checks on a routine basis we feel that completing the preceding checks "once" will give a high confidence level that all combinations will meet specifications, unless:

1. the trigger self-test (performed at power-up) fails, or

2. any ICs on the Trigger Board have been replaced. (Refer to the Maintenance section for a list of checks to perform when specific ICs have been replaced.)

- aa. Replace the J474 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

G. TRIGGER-A THEN B

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

- 1. Oscilloscope Mainframe
- 2. Time-Base Unit
- 14. Coaxial Cable (Three Required)

G1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modification which may affect this procedure.
- c. Set the time-base unit controls:

Triggering
 Mode Auto
 Coupling Dc
 Source Int
 Mag In (X1)

G2. CHECK TIME BETWEEN EVENT A AND EVENT B

NOTE

First perform step G1, then proceed.

Configure the equipment to the G2 SETUP CONDITIONS except:

- 1. Substitute the 067-1155-99 for the Calibration Generator.
- 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the B0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the CH2 button (button light on).

- e. Press the TTL/ECL button (CH2 ECL TTL light off).
- f. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- g. Press the DISPLAY button (CH2 DISPLAY light on).
- h. Press the PROG TRIG button (button light on).
- i. Press the CLEAR button.
- j. Press the CH1 button, and the EDGE button.
- k. Press the B button.
- l. Press the CH2 button, and the EDGE button.
- m. Press the A THEN B button (button light on).
- n. Press the TRIG VIEW button (button light on).
- o. **CHECK**—that the waveform display is triggered on the screen, and that the rising edge of the CH2 transition is aligned with the leading edge of the trigger view pulse.
- p. If you do not intend to perform the following step, replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

G3. CHECK TIME FROM EVENT B TO EVENT A

NOTE

If the preceding step was not performed, first perform step G1, then proceed.

Configure the equipment to the G3 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Calibration Generator.
 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the B0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the TTL/ECL button (CH1 ECL TTL light off).
 - c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - d. Press the CH2 button (button light on).
 - e. Press the DISPLAY button (CH2 DISPLAY light on).
 - f. Press the TTL/ECL button (CH2 ECL TTL light off).
 - g. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
 - h. Press the CH3 button (button light on).
 - i. Press the DISPLAY button (CH2 DISPLAY light on).
 - j. Press the 1M Ω /50 Ω button (CH3 50 Ω 1M Ω 15pf light off).
 - k. **CHECK**—the two signal displays, CH1 and CH2, should be triggered on screen with the CH2 transition delayed about 5 ns behind the CH1 transition. The CH3 trace should display the trigger output signal, about 2 divisions in amplitude and somewhat delayed behind the other two signals.
 - l. Press the PROG TRIG button (button light on).
 - m. Press the CLEAR button.
 - n. Press the CH2 button, and the EDGE button.
 - o. Press the B button (button light on).
 - p. Press the NOT button, and the CH1 button.
 - q. Press the A THEN B button (button light on).
 - r. Set the time-base unit Time/Div to 10 ns.
 - s. **CHECK**—that the waveforms are triggered on the screen, and that the falling edge of the CH1 transition is followed by both the falling edge of the CH2 transition and the falling edge of the CH3 trigger output transition. The ring visible on the falling CH3 transition is normal.
 - t. Set the oscilloscope mainframe B Trigger Source to Right Vert.
 - u. Note the relative timing between the CH3 transition and either the CH1 or CH2 transition.
 - v. Repeatedly press the EDGE button.

- w. **CHECK**—that the relative timing between the CH3 transition and either the CH1 or CH2 transition does not change more than 0.2 division.
- x. **CHECK**—for little or no change in the general shape of the CH3 transition.
- y. Set the oscilloscope mainframe B Trigger Source to Vert Mode.
- z. Move the J701 link-plug back to the Normal position (refer to Fig. 4286-454).
- aa. If you do not intend to perform the following step, replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

G4. CHECK MINIMUM EVENT DURATION

NOTE

If the preceding step was not performed, first perform step G1, then proceed.

Configure the equipment to the G4 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Calibration Generator.
 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the B0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the TTL/ECL button (CH1 ECL TTL light off).
 - c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - d. Press the CH2 button (button light on).
 - e. Press the DISPLAY button (CH2 DISPLAY light on).
 - f. Press the TTL/ECL button (CH2 ECL TTL light off).
 - g. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
 - h. Press the PROG TRIG button (button light on).
 - i. Press the CLEAR button.
 - j. Press the CH1 button, the AND button, the NOT button, and the CH2 button, respectively.
 - k. Press the B button.
 - l. Press the NOT button, and the CH1 button.
 - m. Press the A THEN B button (button light on).
 - n. Press the TRIG VIEW button (button light on).
 - o. **CHECK**—that the waveform display is triggered on the screen.
 - p. Press the A button (button light on).
 - q. Press the A THEN B button (button light off).
 - r. Press the CLEAR button.
 - s. Press the NOT button, and the CH1 button.
 - t. Press the B button (button light on).
 - u. Press the CLEAR button.
 - v. Press the CH1 button, the AND button, the NOT button, and the CH2 button, respectively.
 - w. **CHECK**—that the waveform display is triggered on the screen.
 - x. If you do not intend to perform the following step, replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

G5. CHECK A THEN B GATE OUTPUT WIDTH

NOTE

If the preceding step was not performed, first perform step G1, then proceed.

Configure the equipment to the G5 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Calibration Generator.
 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the B0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.

- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the CH2 button (button light on).
- e. Press the TTL/ECL button (CH2 ECL TTL light off).
- f. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- g. Press the DISPLAY button (CH2 DISPLAY light on).
- h. Press the PROG TRIG button (button light on).
- i. Press the B button (button light on).
- j. Press the CH2 button (red CH2 TRIGGER FUNCTION light on).
- k. Press the A THEN B button (button light on).
- l. Connect a coaxial cable from the oscilloscope mainframe Sig Out connector to the CH4 input connector.
- m. Press the PROG CHAN button.
- n. Press the CH4 button.
- o. Press the DISPLAY button.
- p. Press the 1M Ω /50 Ω button.
- q. Press the TTL/ECL button.
- r. Set the oscilloscope mainframe B Trigger Source to Right Vert.
- s. **CHECK**—that the width of the A THEN B gate pulse, displayed in CH4, is 1 division, within 0.2 division, measured at the 50% amplitude levels.
- t. Set the oscilloscope mainframe B Trigger Source back to Vert Mode.
- u. If you do not intend to perform the following step, replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

G6. CHECK GATE OUTPUT TIMING

NOTE

If the preceding step was not performed, first perform step G1, then proceed.

Configure the equipment to the G6 SETUP CONDITIONS except:

- 1. Substitute the 067-1155-99 for the HF Pulse Generator.
- 2. Connect the A0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator).
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the GND button (CH1 GND light on).
- e. Set the CH1 trace 1 division above the center horizontal graticule line.
- f. Press the GND button (CH1 GND light off).
- g. Press the upper VOLTS/DIV button to display 20 mV in the crt readout display.
- h. Press the CH2 button (button light on).
- i. Press the DISPLAY button (CH2 DISPLAY light on).
- j. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- k. Press the PROG TRIG button (button light on).
- l. Press the B button.
- m. Press the NOT button, and the CH1 button.
- n. Press the A THEN B button (button light on).
- o. Set the CH1 and CH2 POSITION controls to vertically center the two waveforms on the graticule.
- p. **CHECK**—for less than 3 divisions between the rising edge of the CH1 signal and the rising edge of the CH2 signal.
- q. Move the J701 link plug back to the Normal position (refer to Figure 4-14).
- r. Replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

H. TRIGGER-RESET

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

1. Oscilloscope Mainframe
2. Time-Base Unit
14. Coaxial Cable (Three Required)
15. Adapter Cable

H1. PRELIMINARY SETUP

- a. Perform the Performance Check Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modification which may affect this procedure.
- c. Set the time-base unit controls:

Triggering
 Mode Auto
 Coupling Dc
 Source Int
 Mag In (X1)

H2. CHECK RESET INPUT THRESHOLDS

Refer to the 7A42 Service Manual for this procedure.

H3. CHECK RESET INPUT PULSE WIDTH

NOTE

If the preceding step was not performed, first perform step H1, then proceed.

Configure the equipment to the H3 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the LF Pulse Generator.
2. Connect the F0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the A0 output directly to the 7A42 CH2 input with a coaxial cable (no attenuator). Connect the SMB to BNC adapter cable to the A2 output but do not make the connection to the 7A42 RESET input at this time.
3. Set the time-base sweep speed to 100ns/div.

- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- c. Press the TTL/ECL button (CH1 ECL TTL light off).
- d. Press the GND button (CH1 GND light on).
- e. Position the CH1 trace 2 divisions above the center horizontal graticule line (GND reference).
- f. Press the GND button (CH1 GND light off).
- g. Press the CH2 button (button light on).
- h. Press the 1M Ω /50 Ω button (CH2 50 Ω 1M Ω 15pf light off).
- i. Press the TTL/ECL button (CH2 ECL TTL light off).
- j. Press the DISPLAY button (CH2 DISPLAY light on).
- k. Press the GND button (CH2 GND light on).
- l. Position the CH2 trace at the center horizontal graticule line.
- m. Press the GND button (CH2 GND light off).
- n. Press the TRIG VIEW button (button light on).
- o. Press the PROG TRIG button (button light on).
- p. Press the CLEAR button, the CH1 button, and the NOT button, respectively (green CH1 TRIGGER FUNCTION light on).
- q. Press the oscilloscope mainframe B Trigger Source Left Vert button.
- r. Connect the adapter cable to the 7A42 RESET connector (already attached to the A2 output at the other end).
- s. Set the time-base Hold Off control as necessary for a stable display.
- t. **CHECK**—that the display is triggered, and appears the same as illustrated in Figure 4-16, with the exception that the CH1 trace is inverted.
- u. Press the CLEAR button.

- v. Press the CH1 button, the EDGE button, and the NOT button, respectively (the CH1 TRIGGER FUNCTION light is flashing green).
- w. Press the B button (button light on).
- x. Press the CLEAR button, and the CH4 button (red CH4 TRIGGER FUNCTION light on).
- y. Press the PROG CHAN button (button light on).
- z. Press the CH3 button (button light on).
- aa. Press the DISPLAY button.
- bb. Press the TTL/ECL button (CH3 ECL TTL light off).
- cc. Press the 1M Ω /50 Ω button (CH3 50 Ω 1M Ω 15pf light off).
- dd. Press the A THEN B button (button light on).
- ee. Press the oscilloscope mainframe B Triggering Source Right Vert button.
- ff. **CHECK**—that the display is triggered, and appears the same as illustrated in Figure 4-17, again with the exception that the CH1 trace is inverted in polarity.
- gg. Press the oscilloscope mainframe B Trigger Source Left Vert button.
- hh. If you do not intend to perform the following step, replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.
- a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
- b. Press the TTL/ECL button (CH1 ECL TTL light off).
- c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
- d. Press the GND button (CH1 GND light on).
- e. Position the CH1 trace two divisions above the center horizontal graticule line.
- f. Press the GND button (CH1 GND light off).
- g. Press the PROG TRIG button (button light on).
- h. Press the CLEAR button.
- i. Press the NOT button, and the CH1 button.
- j. Press the B button (button light on).
- l. Press the CH2 button, the OR button, the NOT button, and the CH2 button, respectively.
- m. Press the A button (button light on).
- n. Set the time-base Position control to align the falling edge of the square wave with a vertical graticule line, and note its position.
- o. Connect the SMB to BNC adapter cable to the 7A42 RESET input (the other end is already connected to the C2 output).
- p. Press the B button (button light on).
- q. **CHECK**—that the falling edge of the square wave has shifted to the left not more than 1 division (10 ns), from the point noted in part n.
- r. If you do not intend to perform the following step, replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

H4. CHECK POST-RESET INHIBIT TIME

NOTE

If the preceding step was not performed, first perform step H1, then proceed.

Configure the equipment to the H4 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the C0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the SMB to BNC adapter cable to the C2 output but do not make the connection to the 7A42 RESET input at this time.

H5. CHECK RESET ACTIVATION WINDOW

NOTE

If the preceding step was not performed, first perform step H1, then proceed.

Configure the equipment to the H5 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the HF Pulse Generator.
2. Connect the C0 output directly to the 7A42 CH1 input with a coaxial cable (no attenuator). Connect the SMB to BNC adapter cable from the C2 output to the 7A42 RESET input. Connect the B0 output through a coaxial cable to the time base external trigger input, however, the time-base trigger source should be set to INT (internal) at this time.
 - a. Initialize the 7A42 front-panel settings by turning the oscilloscope mainframe Power off, then back on again.
 - b. Press the TTL/ECL button (CH1 ECL TTL light off).
 - c. Press the 1M Ω /50 Ω button (CH1 50 Ω 1M Ω 15pf light off).
 - d. Press the GND button (CH1 GND light on).
 - e. Position the CH1 trace 2 divisions above the center horizontal graticule line.
 - f. Press the GND button (CH1 GND light off).
 - g. Press the TRIG VIEW button (button light on).
 - h. **CHECK**—that the square-wave signal is not triggered on the screen.
 - i. Press the time-base unit EXT Triggering Source button. Note that the falling edge of the square wave signal is triggered on the screen, but there is no signal on the trigger view trace. An adjustment of the time-base trigger level may be necessary to obtain a stable display.
 - j. Press the time-base unit INT Triggering Source button.
 - k. Move the coaxial cable supplying the CH1 signal from the C0 output to the A0 output.
 - l. **CHECK**—that the CH1 square wave rising edge and the trigger view pulse rising edge are both triggered on the screen, and that both occur at approximately the same time. An adjustment of the time-base trigger level control may be necessary to obtain a stable display.
 - m. Replace the J747 BA (Battery Enable) link plug that you removed in the Initial Setup Procedure.

End of Part II Performance Check Procedure.

INDEX TO PART III— ADJUSTMENT PROCEDURE

- A. POWER SUPPLY—Refer to 7A42 Service Manual
- B. ATTENUATOR OFFSET—Refer to 7A42 Service Manual
- C. AMPLIFIER—Refer to 7A42 Service Manual
- D. TRIGGER THRESHOLD AND PROBE OFFSET
 - 1. Preliminary Setup
 - 2. Adjust Trigger View Position—
Refer to 7A42 Service Manual
 - 3. Adjust Trigger Thresholds
 - 4. Adjust Probe Offset

ADJUSTMENT INITIAL SETUP PROCEDURE

Refer to the 7A42 Service Manual for this procedure.

A. POWER SUPPLY

Refer to the 7A42 Service Manual for this procedure.

B. ATTENUATOR OFFSET

Refer to the 7A42 Service Manual for this procedure.

C. AMPLIFIER

Refer to the 7A42 Service Manual for this procedure.

D. TRIGGER THRESHOLD AND PROBE OFFSET

Equipment Required: (Numbers correspond to those listed in Table 4-2, Test Equipment).

- 1. Oscilloscope Mainframe
- 2. Time-Base Unit
- 11. Flexible Plug-in Extender (Two required)
- 14. Coaxial Cable
- 18. Meter Leads
- 24. Alignment Tool

Tektronix 103-0035-00 BNC to Binding
Post Adapter (not in Table 4-2)

D1. PRELIMINARY SETUP

- a. Perform the Adjustment Initial Setup Procedure.
- b. Refer to Section 5, Instrument Options, and to the change information at the rear of the manual for any modifications which may affect this procedure.
- c. Set the oscilloscope mainframe and time base unit controls:

MAINFRAME

Power.....On
Vertical Mode.....Left
Horizontal Mode.....B
B Trigger Source.....Left Vert
B Intensity.....Visible display
Readout.....Visible display
Focus.....Well defined display

TIME BASE

Triggering
Mode.....Auto
Coupling.....Dc
Source.....Int
Mag.....In (X1)

D2. ADJUST TRIGGER VIEW POSITION

Refer to the 7A42 Service Manual for this procedure.

D3. ADJUST TRIGGER THRESHOLDS

NOTE

If the preceding step was not performed, first perform step D1, then proceed.

Configure the equipment to the D3 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Calibration Generator.
2. Connect the +.250V REF output directly to the 7A42 CH1 input connector with a coaxial cable. Do not use the 50 ohm feedthrough terminator at the 7A42 inputs.

Follow steps a through v of adjustment procedure D3 given in the 7A42 Service Manual.

D4. ADJUST PROBE OFFSET

NOTE

If the preceding step was not performed, first perform step D1, then proceed.

Configure the equipment to the D3 SETUP CONDITIONS except:

1. Substitute the 067-1155-99 for the Calibration Generator.
2. Connect the Tektronix 103-0035-00 BNC to Binding Post Adapter to the +5.00V REF output. Attach the meter leads to the Binding Post Adapter, red to red, black to black. Attach the tip of the black meter lead to the oscilloscope ground post.

Follow steps a through j of adjustment procedure D4 given in the 7A42 Service Manual.

This completes the Part III—Adjustment Procedure.

THEORY OF OPERATION

Components discussed below are shown on schematic diagrams in section 6 of this manual.

OSCILLATOR

Transistors Q220 and Q222 form a square wave oscillator which free runs with a frequency of about 11 MHz. Assume initially that Q222 is on while Q220 is off. The voltage at the emitter of Q220 becomes more negative as C221 discharges through R223. Capacitor C221 discharges until the emitter-base junction of Q220 becomes forward biased. As Q220 turns on the oscillator state changes. Regeneration starts when Q220 conducts and C221 stops discharging; this reduces the collector current of Q222. Thus, the collector voltage of Q222 rises positive which causes the base and emitter of Q220 to rise positive. The positive going voltage is coupled to the emitter of Q222, turning it off.

Now Q220 is conducting and Q222 is not. The voltage at the emitter of Q222 goes negative as C221 charges through R224. When the emitter-base junction of Q222 becomes forward biased the oscillator will again change state to complete the cycle.

Transistor Q221 level shifts and buffers the square wave output signal to ECL logic levels. Potentiometer R220 provides frequency adjustment.

COUNTER

Universal counter U210 is used in the count-down mode to generate the output waveforms. The count decrements after each rising edge of the clock input supplied by Q221. The output at pin 2 is a square wave which is high during counts 7, 6, 5, and 4, and low during 3, 2, 1, and 0. The output at pin 14 is wire-ORed with the outputs from pins 15 and 2, after being inverted by gates U310B and U310C, to form a signal that goes low during count 6 and remains high otherwise. This signal is buffered by gate U310D.

CONTROLLED TIMING OUTPUTS

The signals at the front panel A, B, and C outputs are representations of the waveform at pin 15 of U310C. The B signal is delayed behind the A signal by delay line DL320.

The C signals are further delayed by delay line DL420. The different output amplitudes and levels are obtained with ac coupling and resistor networks.

CONTROLLED WIDTH OUTPUTS

The pulse signals at the front panel D and E outputs have a width that is controlled by the delay lines DL612 and DL610, respectively. The gates from U600 form complementary versions of the count-6 signal. The D and E output signals go high only during the propagation time of the associated delay lines. At the E0 output, for example, assume the level at pin 7 of U600D is initially high. At this time the pin 10 output (U600D) will be high and the pin 11 output will be low. When pin 7 goes low, the outputs both change state; the high to low transition reaches pin 6 of U620B immediately causing output pin 3 to go high. The low to high transition is delayed from reaching U620B pin 7 by the delay line DL610. After pin 7 finally goes high, pin 3 returns to the low state.

REFERENCE VOLTAGES

The +.250V reference voltage is formed by a resistive divider across precision voltage reference VR200; R200 provides adjustment of this voltage. The output voltage on pin 6 of U100 is a precision +5.00V reference; R100 provides adjustment of this voltage.

POWER SUPPLIES

A high-efficiency switching power supply converts the mainframe + and - 33.5 volt supplies to regulated -5V, -2V, and +5V for use by the digital circuitry. Three terminal regulator U130 provides +5V to the switching power supply. Three-terminal regulator U120 forms -15 volts which is used to bias the oscillator and output circuits. The switching power supply is common to the 7A42; refer to the 7A42 Service Manual for a detailed circuit description. In the 067-1155 the 7A42 supply primary voltages are 33.5V rather than 50V, and the regulator IC operates from the 11.5V supply rather than 15V.

Theory of Operation—067-1155-99

In TM5000 mainframes, the primary voltages are positive and negative 26 volts (regulated) rather than 33.5 volts. The power supply accommodates the lower primary voltage by increasing the switching transistor's duty cycle.

Resistor R220 is a test-selectable load on the +5V output to keep that voltage within specified limits since the switcher regulates from its -5V supply only.

CALIBRATION PROCEDURE

Required Test Equipment:

TM500 or TM5000 mainframe, any size	
TM500 Flexible Plug-in Extender.....	067-0645-02
4-1/2 digit DVM	DM501A or equiv.
Test Oscilloscope Mainframe	7800, 7900 or 7100 family
Oscilloscope Plug-ins	7A24, time base
Coaxial Cables (2 needed)	012-0057-01
BNC to Post Adapter (2 convenient)	103-0035-00
Assorted 1/2 watt resistors	(see power supply adjustment)
100K ohm resistor	315-0104-00
1 Megohm resistor	315-0105-00

Required Tooling:

A peltola cable terminator installation fixture will be needed to complete the delay line assemblies after their lengths have been adjusted. A soldering station will also be needed in the event that a component value needs to be test selected.

POWER SUPPLY ADJUSTMENT

Connect the 067-1155-99 through the flexible extender to the TM500 mainframe. Be sure that the extender is not inverted on either end. Preset the current limit pot on the power supply to the maximum CCW position. Monitor the -5V supply with the DVM while the instrument is turned on. Adjust the -5V ADJ pot on the left hand side of the power supply board for a reading of -5.1 volts. Measure the +5V supply at the +5V POWER jack on the front panel. If this supply is not within the specified limits, test select R220 to bring it in to spec. A larger value of R220 will increase the supply voltage; a smaller value will decrease it. Spot check the other supply voltages, -15V, -2V, +11.5V, etc, to see if they are within reasonable limits (10%).

Move the AUX LOAD jumper on the power supply board to the "in" position; the LED will light red. Adjust the current limit pot CW until the the LED begins to blink. Back off on the adjustment until the LED just lights steadily. Return the AUX LOAD jumper to the "out" position; the LED should go out.

REFERENCE VOLTAGE ADJUSTMENT

Connect the 1 Megohm resistor across the two binding posts of the 103-0035-00 BNC to Post

Adapter. Attach the adapter to the +.250V REF output, and connect the DVM to the posts. Adjust R200 for a reading of exactly +0.025V.

Now connect the 100K ohm resistor across the binding posts of the (other) adapter. Attach the adapter to the +5.00V REF output and adjust R100 for a reading of exactly +5.00V on the DVM.

OSCILLATOR FREQUENCY ADJUSTMENT

Connect output A2 through a coaxial cable to a 7A42 input channel. Trigger the test scope on the rising edge of this signal. With the time base set at 10ns/div, adjust R220 for a pulse width of 90ns (9 divisions) measured at the 50% amplitude points of the waveform.

DELAY LINE LENGTH ADJUSTMENTS

The delay lines are initially longer than necessary so that they can be shortened if needed. To adjust the line lengths, the instrument must first be assembled and tested with the long lines. The resulting delays are measured. If a correction is needed, the excess length can be calculated from the knowledge that the propagation speed of the signal in this coax is about .127ns per inch (50ps per cm). Since the total delays are also a function of the individual ICs in each instrument it is recommended that the

Calibration Procedure—067-1155-99

cables be calibrated in the instrument in which they are to eventually be installed.

To measure the delay between the A and B signals, for example, connect the A0 and B0 outputs through two coaxial cables (same length) to the two input channels of the 7A24. Measure the delay between the 50% points on the rising edges of the two waveforms. The delay line C (DL420) should be adjusted by measuring the delay from A0 to C0 rather than from B0 to C0 after the A to B delay

has been calibrated to prevent accumulation of error. The subscript 1 and 2 outputs require no separate calibration; just check to see that they are functional.

The pulse outputs D0 and E0 should be measured and the D and E delay lines (DL612 and DL610 respectively) shortened as needed to bring the pulse widths at the 50% points into spec. The F0 output requires no calibration.

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

Only the circuit numbers will appear on the diagrams. Each diagram is clearly marked with the assembly number views located in the Mechanical Parts List. The component number is obtained by adding the assembly number prefix to the circuit number.

The Electrical Parts List is divided and arranged by assemblies in numerical sequence (e.g., assembly A1 with its subassemblies and parts, precedes assembly A2 with its subassemblies and parts).

Chassis-mounted parts have no assembly number prefix and are located at the end of the Electrical Parts List.

LIST OF ASSEMBLIES

A list of assemblies can be found at the beginning of the Electrical Parts List. The assemblies are listed in numerical order. When the complete component number of a part is known, this list will identify the assembly in which the part is located.

CROSS INDEX-MFR. CODE NUMBER TO MANUFACTURER

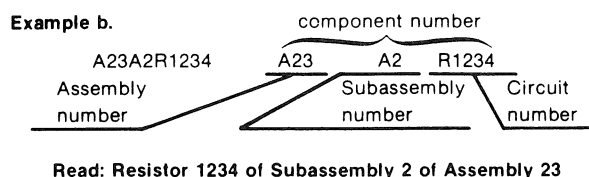
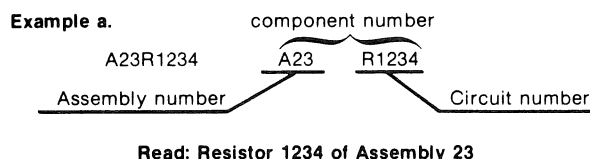
The Mfr. Code Number to Manufacturer index for the Electrical Parts List is located immediately after this page. The Cross Index provides codes, names and addresses of manufacturers of components listed in the Electrical Parts List.

ABBREVIATIONS

Abbreviations conform to American National Standard Y1.1.

COMPONENT NUMBER (column one of the Electrical Parts List)

A numbering method has been used to identify assemblies, subassemblies and parts. Examples of this numbering method and typical expansions are illustrated by the following:



TEKTRONIX PART NO. (column two of the Electrical Parts List)

Indicates part number to be used when ordering replacement part from Tektronix.

SERIAL/MODEL NO. (columns three and four of the Electrical Parts List)

Column three (3) indicates the serial number at which the part was first used. Column four (4) indicates the serial number at which the part was removed. No serial number entered indicates part is good for all serial numbers.

NAME & DESCRIPTION (column five of the Electrical Parts List)

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

MFR. CODE (column six of the Electrical Parts List)

Indicates the code number of the actual manufacturer of the part. (Code to name and address cross reference can be found immediately after this page.)

MFR. PART NUMBER (column seven of the Electrical Parts List)

Indicates actual manufacturers part number.

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000IZ	DALE ELECTRONICS CORP.	P.O. BOX 3164	TEMPE, AZ 85282
000JO	DILECTRON INC.	2669 S MYRTLE AVE	MONROVIA, CA 91016
000JR	MUSASHI WORKS OF HITACHI LTD	1450 JOSUIHON-CHO	KODAIRA-SHI, TOKYO, JAPAN
000KK	XICOR INC.	851 BUCKEYE COURT	MILPITAS, CA 95035
00853	SANGAMO ELECTRIC CO., S. CAROLINA DIV.	P O BOX 128	PICKENS, SC 29671
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01281	TRW ELECTRONIC COMPONENTS, SEMICONDUCTOR OPERATIONS	14520 AVIATION BLVD.	LAWDALE, CA 90260
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
02735	RCA CORPORATION, SOLID STATE DIVISION	ROUTE 202	SOMERVILLE, NY 08876
03508	GENERAL ELECTRIC COMPANY, SEMI-CONDUCTOR PRODUCTS DEPARTMENT	ELECTRONICS PARK	SYRACUSE, NY 13201
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MYRTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD, PO BOX 20923	PHOENIX, AZ 85036
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
12697	CLAROSTAT MFG. CO., INC.	LOWER WASHINGTON STREET	DOVER, NH 03820
12969	UNITRODE CORPORATION	580 PLEASANT STREET	WATERTOWN, MA 02172
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY P O BOX 3049	WEST PALM BEACH, FL 33402
14552	MICRO SEMICONDUCTOR CORP.	2830 E FAIRVIEW ST.	SANTA ANA, CA 92704
15454	RODAN INDUSTRIES, INC.	2905 BLUE STAR ST.	ANAHEIM, CA 92806
15818	TELEDYNE SEMICONDUCTOR	1300 TERRA BELLA AVE.	MOUNTAIN VIEW, CA 94043
18324	SIGNETICS CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
20932	EMCON DIV OF ILLINOIS TOOL WORKS INC.	11620 SORRENTO VALLEY RD P O BOX 81542	SAN DIEGO, CA 92121
24546	CORNING GLASS WORKS, ELECTRONIC COMPONENTS DIVISION	550 HIGH STREET	BRADFORD, PA 16701
27014	NATIONAL SEMICONDUCTOR CORP.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
32997	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
34335	ADVANCED MICRO DEVICES	901 THOMPSON PL.	SUNNYVALE, CA 94086
50434	HEWLETT-PACKARD COMPANY	640 PAGE MILL ROAD	PALO ALTO, CA 94304
51642	CENTRE ENGINEERING INC.	2820 E COLLEGE AVENUE	STATE COLLEGE, PA 16801
53184	XCITON CORPORATION	5 HEMLOCK STREET	LATHAM, NY 12110
54473	MATSUSHITA ELECTRIC, CORP. OF AMERICA	1 PANASONIC WAY	SECAUCUS, NJ 07094
55210	GETTIG ENG. AND MFG. COMPANY	PO BOX 85, OFF ROUTE 45	SPRING MILLS, PA 16875
55680	NICHICON/AMERICA/CORP.	6435 N PROESEL AVENUE	CHICAGO, IL 60645
56289	SPRAGUE ELECTRIC CO.	87 MARSHALL ST.	NORTH ADAMS, MA 01247
59660	TUSONIX INC.	2155 N FORBES BLVD	TUCSON, AZ 85705
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73138	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
73899	JFD ELECTRONICS COMPONENTS CORP.	PINETREE ROAD	OXFORD, NC 27565
75042	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
75378	CTS KNIGHTS, INC.	400 REIMANN AVE.	SANDWICH, IL 60548
76493	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	19070 REYES AVE., P O BOX 5825	COMPTON, CA 90224
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
80031	ELECTRA-MIDLAND CORP., MEPCO DIV.	22 COLUMBIA ROAD	MORRISTOWN, NJ 07960
88407	BULOVA WATCH CO. INC. ELECTRONICS DIV.	61-20 WOODSIDE AVE	WOODSIDE, NY 11377
90201	MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET P. O. BOX 372	INDIANAPOLIS, IN 46206
91637	DALE ELECTRONICS, INC.	P. O. BOX 609	COLUMBUS, NE 68601

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1	670-8128-00		CKT BOARD ASSY:MFG CAL SOURCE	80009	670-8128-00
A2	670-7513-00		CKT BOARD ASSY:POWER SUPPLY	80009	670-7513-00
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A1	670-8128-00		CKT BOARD ASSY:MFG CAL SOURCE	80009	670-8128-00
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A1C100	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C110	290-0769-00		CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	500D152
A1C111	290-0769-00		CAP.,FXD,ELCTLT:10UF,+50-10%,100V	56289	500D152
A1C120	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C121	290-0782-00		CAP.,FXD,ELCTLT:4.7UF,+75-10%,35V	55680	35ULA4R7V-T
A1C122	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C210	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C220	283-0333-00		CAP.,FXD,CER DI:35PF,5%,1000V	72982	838-534 A 350>
A1C221	283-0768-00		CAP.,FXD,MICA D:132PF,1%,500V	00853	D15-5F1320F0
A1C310	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C311	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C320	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C321	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C330	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C331	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C332	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C430	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C431	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C510	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C520	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C521	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C530	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C531	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C532	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C533	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C600	283-0111-00		CAP.,FXD,CER DI:0.1UF,20%,50V	56289	273C11
A1C620	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C621	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
A1C622	283-0203-00		CAP.,FXD,CER DI:0.47UF,20%,50V	72982	8131M058Z5U0474M
.					
A1F110	159-0116-00		FUSE,CARTRIDGE:1A,125V,0.4 SEC,0.17 LEADS	75915	273001
A1F120	159-0116-00		FUSE,CARTRIDGE:1A,125V,0.4 SEC,0.17 LEADS	75915	273001
A1F130	159-0116-00		FUSE,CARTRIDGE:1A,125V,0.4 SEC,0.17 LEADS	75915	273001
.					
A1J100	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J200	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J300	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J320	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J330	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J332	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00

Replaceable Electrical Parts—067-1155-99

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A1J420	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J422	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J430	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J432	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J520	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J530	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J532	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J534	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J610	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J612	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J614	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J620	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J622	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J630	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1J632	131-1003-00		CONN,RCPT,ELEC:CKT BD MT,3 PRONG	80009	131-1003-00
A1L110	108-0336-00		COIL,RF:100UH	80009	108-0336-00
A1L200	108-0336-00		COIL,RF:100UH	80009	108-0336-00
A1P100	131-0608-00		TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A1P200	131-0608-00		TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD	22526	47357
A1Q220	151-0190-00		TRANSISTOR:SILICON,NPN	07263	5032677
A1Q221	151-0190-00		TRANSISTOR:SILICON,NPN	07263	5032677
A1Q222	151-0190-00		TRANSISTOR:SILICON,NPN	07263	5032677
A1R100	311-1235-00		RES.,VAR,NONWIR:100K OHM,20%,0.50W	32997	3386F-T04-104
A1R200	311-2082-00		RES.,VAR,NONWIR:TRMR,200 OHM,10%,0.5W	73138	72-256-0
A1R200	321-0232-00		RES.,FXD,FILM:2.55K OHM,1%,0.125W	91637	MFF1816G25500F
A1R201	321-0291-00		RES.,FXD,FILM:10.5K OHM,1%,0.125W	91637	MFF1816G10501F
A1R202	315-0622-00		RES.,FXD,CMPSN:6.2K OHM,5%,0.25W	01121	CB6225
A1R220	311-1222-00		RES.,VAR,NONWIR:100 OHM,20%,0.50W	32997	3386F-T04-101
A1R221	315-0151-00		RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
A1R222	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R223	315-0302-00		RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A1R224	315-0302-00		RES.,FXD,CMPSN:3K OHM,5%,0.25W	01121	CB3025
A1R225	315-0222-00		RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
A1R226	315-0332-00		RES.,FXD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
A1R230	301-0101-00		RES.,FXD,CMPSN:100 OHM,5%,0.50W	01121	EB1015
A1R300	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	91637	MFF1816G249R0F
A1R301	321-0077-00		RES.,FXD,FILM:61.9 OHM,1%,0.125W	91637	MFF1816G61R90F
A1R310	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R311	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R312	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R313	321-0083-00		RES.,FXD,FILM:71.5 OHM,1%,0.125W	91637	MFF1816G71R50F
A1R314	323-0172-00		RES.,FXD,FILM:604 OHM,1%,0.50W	91637	MFF1226G604R0F
A1R320	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R322	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R322	321-0083-00		RES.,FXD,FILM:71.5 OHM,1%,0.125W	91637	MFF1816G71R50F
A1R330	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R331	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R332	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
A1R333	315-0152-00		RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
A1R334	315-0271-00		RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
AIR335	321-0077-00		RES.,FXD,FILM:61.9 OHM,1%,0.125W	91637	MFF1816G61R90F
AIR420	323-0163-00		RES.,FXD,FILM:487 OHM,1%,0.50W	75042	CECT0-4870F
AIR421	321-0083-00		RES.,FXD,FILM:71.5 OHM,1%,0.125W	91637	MFF1816G71R50F
AIR422	323-0163-00		RES.,FXD,FILM:487 OHM,1%,0.50W	75042	CECT0-4870F
AIR430	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	91637	MFF1816G249R0F
AIR431	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR432	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR433	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	91637	MFF1816G249R0F
AIR434	321-0077-00		RES.,FXD,FILM:61.9 OHM,1%,0.125W	91637	MFF1816G61R90F
AIR510	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR520	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR521	321-0083-00		RES.,FXD,FILM:71.5 OHM,1%,0.125W	91637	MFF1816G71R50F
AIR522	323-0163-00		RES.,FXD,FILM:487 OHM,1%,0.50W	75042	CECT0-4870F
AIR523	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR530	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR531	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR532	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR533	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	91637	MFF1816G249R0F
AIR534	315-0152-00		RES.,FXD,CMPSN:1.5K OHM,5%,0.25W	01121	CB1525
AIR535	315-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
AIR536	321-0077-00		RES.,FXD,FILM:61.9 OHM,1%,0.125W	91637	MFF1816G61R90F
AIR600	315-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
AIR601	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR610	323-0159-00		RES.,FXD,FILM:442 OHM,1%,0.5W,TC=TO		
AIR611	321-0083-00		RES.,FXD,FILM:71.5 OHM,1%,0.125W	91637	MFF1816G71R50F
AIR612	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	91637	MFF1816G249R0F
AIR620	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR621	321-0077-00		RES.,FXD,FILM:61.9 OHM,1%,0.125W	91637	MFF1816G61R90F
AIR622	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR623	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR624	321-0083-00		RES.,FXD,FILM:71.5 OHM,1%,0.125W	91637	MFF1816G71R50F
AIR625	323-0160-00		RES.,FXD,FILM:453 OHM,1%,0.50W	75042	CECT0-4530F
AIR630	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR631	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR632	315-0510-00		RES.,FXD,CMPSN:51 OHM,5%,0.25W	01121	CB5105
AIR633	315-0271-00		RES.,FXD,CMPSN:270 OHM,5%,0.25W	01121	CB2715
AIR634	321-0135-00		RES.,FXD,FILM:249 OHM,1%,0.125W	91637	MFF1816G249R0F
AIR635	321-0077-00		RES.,FXD,FILM:61.9 OHM,1%,0.125W	91637	MFF1816G61R90F
AIU100	156-1437-00		MICROCIRCUIT,LI:VOLTAGE REFERENCE	04713	MC1404AU5DS
AIU120	156-0527-00		MICROCIRCUIT,LI:NEG VOLTAGE REGULATOR,15V	04713	MC7915CT
AIU130	156-0277-00		MICROCIRCUIT,LI:VOLTAGE REGULATOR	07263	MICROA7805UC
AIU210	156-0641-00		MICROCIRCUIT,DI:UNIVERSAL,HEXIDECIMAL CNTR	80009	156-0641-00
AIU310	156-1641-01		MICROCIRCUIT,DI:SCREENED	04713	MC10H102(LD OR P
AIU320	156-1641-01		MICROCIRCUIT,DI:SCREENED	04713	MC10H102(LD OR P
AIU420	156-1641-01		MICROCIRCUIT,DI:SCREENED	04713	MC10H102(LD OR P
AIU520	156-1641-01		MICROCIRCUIT,DI:SCREENED	04713	MC10H102(LD OR P
AIU600	156-1676-00		MICROCIRCUIT,DI:SCREENED	04713	MC10H107(LD OR P
AIU620	156-1641-01		MICROCIRCUIT,DI:SCREENED	04713	MC10H102(LD OR P
AIVR200	156-1490-00		MICROCIRCUIT,LI:VOLTAGE REFERENCE	32293	ICL8069CCSQ

Replaceable Electrical Parts—067-1155-99

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A2	670-7513-00		CKT BOARD ASSY:POWER SUPPLY	80009	670-7513-00
A2C105	283-0051-00		CAP.,FXD,CER DI:0.0033UF,5%,100V	56289	1C20C0G332J100B
A2C108	283-0179-00		CAP.,FXD,CER DI:0.68UF,10%,100V	56289	3C37X5R684K100B
A2C111	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C115	290-0782-00		CAP.,FXD,ELCTLT:4.7UF,+75-10%,35V	55680	35ULA4R7V-T
A2C116	290-0782-00		CAP.,FXD,ELCTLT:4.7UF,+75-10%,35V	55680	35ULA4R7V-T
A2C117	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C118	281-0775-00		CAP.,FXD,CER DI:0.1UF,20%,50V	04222	MA205E104MAA
A2C119	281-0765-00		CAP.,FXD,CER DI:100PF,5%,100V	51642	G1710-100NP0101J
A2C122	283-0249-00		CAP.,FXD,CER DI:0.068UF,10%,50V	72982	8131N075 C 683K
A2C205	290-0776-00		CAP.,FXD,ELCTLT:22UF,+50-10%,10V	55680	ULA1A220TEA
A2C207	283-0164-00		CAP.,FXD,CER DI:2.2UF,20%,25V	04222	SR402E225MAA
A2C220	290-0683-00		CAP.,FXD,ELCTLT:100UF,+20%,200V		
A2C301	281-0812-00		CAP.,FXD,CER DI:1000PF,10%,100V	72982	8035D9AADX7R102K
A2C302	281-0772-00		CAP.,FXD,CER DI:0.0047UF,10%,100V	04222	GC701C472K
A2C325	290-0768-00		CAP.,FXD,ELCTLT:10UF,+50-10%,100V	54473	ECE-A100V10L
A2C330	290-0768-00		CAP.,FXD,ELCTLT:10UF,+50-10%,100V	54473	ECE-A100V10L
A2C405	283-0693-00		CAP.,FXD,MICA D:1730PF,1%,500V	00853	D19-5F1731F0
A2C410	290-0818-00		CAP.,FXD,ELCTLT:390UF,+100-10%,40V	56289	672D397H040DS5C
A2C425	290-0771-00		CAP.,FXD,ELCTLT:220UF,+50-10%,10VDC	56289	502D231
A2C530	290-0932-00		CAP.,FXD ELECT:390UF,+ 100-10%,15VDC	90201	VPR391N01E1A3J
A2C540	290-0771-00		CAP.,FXD,ELCTLT:220UF,+50-10%,10VDC	56289	502D231
A2C630	290-0818-00		CAP.,FXD,ELCTLT:390UF,+100-10%,40V	56289	672D397H040DS5C
A2C640	290-0771-00		CAP.,FXD,ELCTLT:220UF,+50-10%,10VDC	56289	502D231
A2CR100	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A2CR110	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A2CR111	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A2CR121	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A2CR230	152-0400-00		SEMICONV DEVICE:SILICON,400V,1A	80009	152-0400-00
A2CR400	152-0400-00		SEMICONV DEVICE:SILICON,400V,1A	80009	152-0400-00
A2CR402	152-0400-00		SEMICONV DEVICE:SILICON,400V,1A	80009	152-0400-00
A2CR406	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A2CR407	152-0141-02		SEMICONV DEVICE:SILICON,30V,150MA	01295	1N4152R
A2CR410	152-0582-00		SEMICONV DEVICE:SILICON,20V,3A	04713	1N5820
A2CR503	152-0400-00		SEMICONV DEVICE:SILICON,400V,1A	80009	152-0400-00
A2CR520	152-0581-00		SEMICONV DEVICE:SILICON,20V,1A	04713	1N5817
A2CR620	152-0582-00		SEMICONV DEVICE:SILICON,20V,3A	04713	1N5820
A2DS125	150-1036-00		LAMP,LED:RED,3.0V,40MA	01295	TIL 209A
A2J230	131-0608-00		TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 3)	22526	47357
A2J440	131-0608-00		TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 6)	22526	47357
A2J450	131-0608-00		TERMINAL,PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY OF 7)	22526	47357
A2L220	108-0473-00		COIL,RF:150UH	80009	108-0473-00
A2L310	108-0473-00		COIL,RF:150UH	80009	108-0473-00
A2L420	108-0336-00		COIL,RF:100UH	80009	108-0336-00
A2L530	108-0336-00		COIL,RF:100UH	80009	108-0336-00
A2L630	108-0336-00		COIL,RF:100UH	80009	108-0336-00

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
A2Q100	151-0190-00		TRANSISTOR:SILICON,NPN	07263	S032677
A2Q200	151-0190-00		TRANSISTOR:SILICON,NPN	07263	S032677
A2Q300	151-0188-00		TRANSISTOR:SILICON,PNP	04713	SPS6868K
A2Q305	151-0350-02		TRANSISTOR:SPS6700,SELECTED	80009	151-0350-02
A2Q312	151-0207-00		TRANSISTOR:SILICON,NPN	03508	X32D6191
A2Q313	151-0347-00		TRANSISTOR:SILICON,NPN	56289	2N5551
A2Q315	151-0350-02		TRANSISTOR:SPS6700,SELECTED	80009	151-0350-02
A2Q317	151-0347-00		TRANSISTOR:SILICON,NPN	56289	2N5551
A2Q402	151-0444-03		TRANSISTOR:SILICON,NPN	80009	151-0444-03
A2Q500	151-0678-00		TRANSISTOR:SILICON,NPN	04713	MJE13005
A2R100	315-0333-00		RES.,FXD,CMPSN:33K OHM,5%,0.25W	01121	CB3335
A2R102	315-0153-00		RES.,FXD,CMPSN:15K OHM,5%,0.25W	01121	CB1535
A2R105	315-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A2R109	315-0432-00		RES.,FXD,CMPSN:4.3K OHM,5%,0.25W	01121	CB4325
A2R113	315-0473-00		RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
A2R119	321-0816-00		RES.,FXD,FILM:5K OHM,1%,0.125W	24546	NA55D5001F
A2R120	321-0816-00		RES.,FXD,FILM:5K OHM,1%,0.125W	24546	NA55D5001F
A2R121	321-0816-00		RES.,FXD,FILM:5K OHM,1%,0.125W	24546	NA55D5001F
A2R122	321-0305-00		RES.,FXD,FILM:14.7K OHM,1%,0.125W	91637	MFF1816G14701F
A2R125	311-0609-00		RES.,VAR,NONWIR:2K OHM,10%,0.50W	73138	82-26-1
A2R128	315-0221-00		RES.,FXD,CMPSN:220 OHM,5%,0.25W	01121	CB2215
A2R130	308-0290-00		RES.,FXD,WW:8 OHM,5%,5W	91637	CW2A-8R000J
A2R208	315-0112-00		RES.,FXD,CMPSN:1.1K OHM,5%,0.25W	01121	CB1125
A2R215	315-0101-00		RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A2R216	315-0101-00		RES.,FXD,CMPSN:100 OHM,5%,0.25W	01121	CB1015
A2R218	321-0282-00		RES.,FXD,FILM:8.45K OHM,1%,0.125W	91637	MFF1816GB4500F
A2R220	315-0151-00		RES.,FXD,CMPSN:150 OHM,5%,0.25W	01121	CB1515
A2R222	315-0471-00		RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
A2R225	315-0132-00		RES.,FXD,CMPSN:1.3K OHM,5%,0.25W	01121	CB1325
A2R226	301-0682-00		RES.,FXD,CMPSN:6.8K OHM,5%,0.50W	01121	EB6825
A2R300	315-0122-00		RES.,FXD,CMPSN:1.2K OHM,5%,0.25W	01121	CB1225
A2R301	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A2R302	315-0102-00		RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
A2R303	315-0222-00		RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
A2R305	307-0106-00		RES.,FXD,CMPSN:4.7 OHM,5%,0.25W	01121	CB47G5
A2R308	315-0104-00		RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A2R309	315-0104-00		RES.,FXD,CMPSN:100K OHM,5%,0.25W	01121	CB1045
A2R310	315-0361-00		RES.,FXD,CMPSN:360 OHM,5%,0.25W	01121	CB3615
A2R400	311-1007-00		RES.,VAR,NONWIR:20 OHM,20%,0.50W	73138	82-38-1
A2R401	315-0561-00		RES.,FXD,CMPSN:560 OHM,5%,0.25W	01121	CB5615
A2R405	315-0100-00		RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
A2R410	308-0710-00		RES.,FXD,WW:0.27 OHM,10%,1W	75042	BW20-R2700J
A2R420	315-0103-00		RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
A2R500	315-0473-00		RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
A2T510	120-1462-00		TRANSFORMER,RF:HF FLYBACK	80009	120-1462-00
A2U210	156-0933-01		MICROCIRCUIT,L1:RGLTR,PULSE WIDTH MOD,SCRN	34333	SG9976
A2W310	131-0566-00		BUS CONDUCTOR:DUMMY RES,2.375,22 AWG	57668	JWW-0200E0

Replaceable Electrical Parts—067-1155-99

Component No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Name & Description	Mfr Code	Mfr Part Number
CHASSIS PARTS					
J10	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J11	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J12	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J14	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J20	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J21	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J22	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J23	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J24	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J30	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J32	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J33	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
J34	131-1315-01		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

Graphic symbols and class designation letters are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The overline on a signal name indicates that the signal performs its intended function when it is in the low state.

Abbreviations are based on ANSI Y1.1-1972.

Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

Y14.15, 1966 Drafting Practices.
Y14.2, 1973 Line Conventions and Lettering.
Y10.5, 1968 Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

American National Standard Institute
1430 Broadway
New York, New York 10018

Component Values

Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (pF).
Values less than one are in microfarads (μ F).

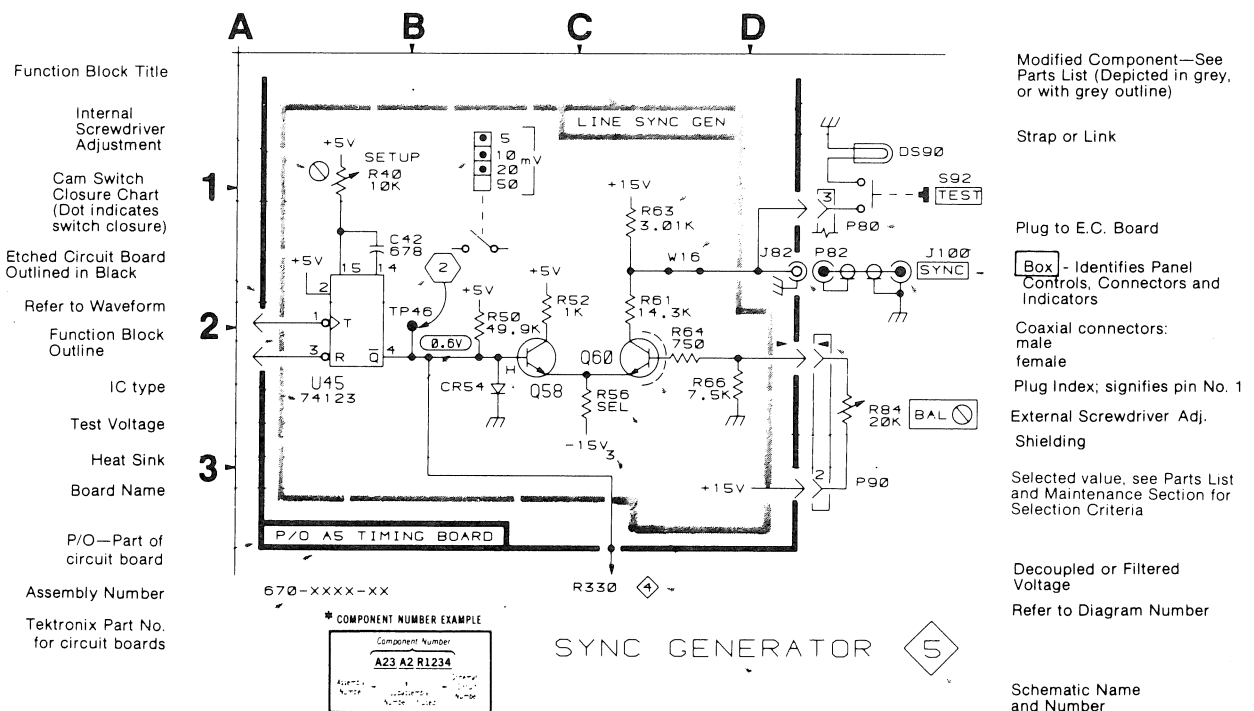
Resistors = Ohms (Ω).

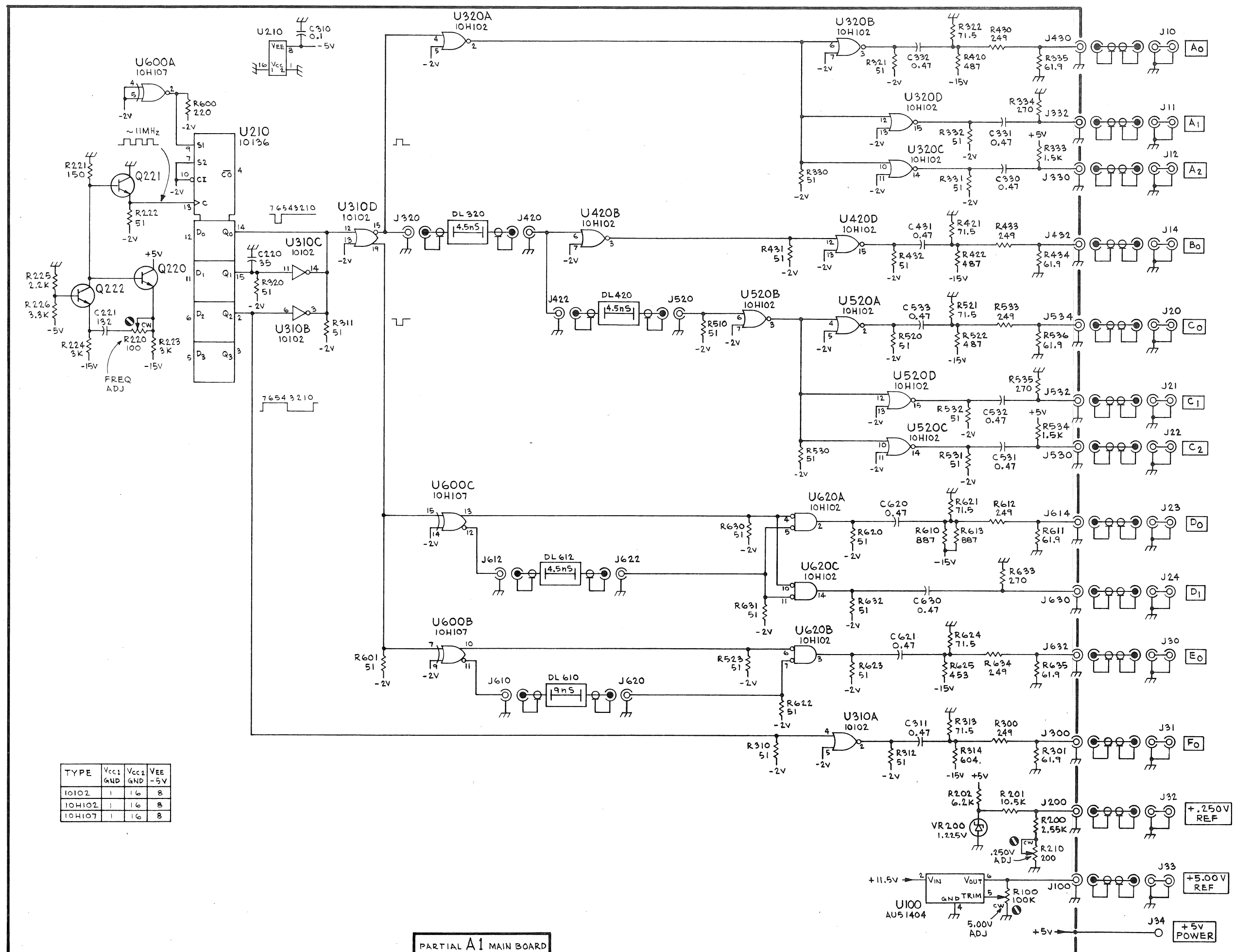
— The information and special symbols below may appear in this manual. —

Assembly Numbers and Grid Coordinates

Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the circuit board outline on the diagram, in the title for the circuit board component location illustration, and in the lookup table for the schematic diagram and corresponding component locator illustration. The Replaceable Electrical Parts list is arranged by assemblies in numerical sequence; the components are listed by component number *(see following illustration for constructing a component number).

The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration may only appear opposite the first diagram on which it was illustrated; the lookup table will list the diagram number of other diagrams that the circuitry of the circuit board appears on.





REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number
00X Part removed after this serial number

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5 Name & Description

Assembly and/or Component

Attaching parts for Assembly and/or Component

---*---

Detail Part of Assembly and/or Component

Attaching parts for Detail Part

---*---

Parts of Detail Part

Attaching parts for Parts of Detail Part

---*---

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol ---*--- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH	ELCTRN	ELECTRON	IN	INCH	SE	SINGLE END
#	NUMBER SIZE	ELEC	ELECTRICAL	INCAND	INCANDESCENT	SECT	SECTION
ACTR	ACTUATOR	ELCTLT	ELECTROLYTIC	INSUL	INSULATOR	SEMICON	SEMICONDUCTOR
ADPTR	ADAPTER	ELEM	ELEMENT	INTL	INTERNAL	SHLD	SHIELD
ALIGN	ALIGNMENT	EPL	ELECTRICAL PARTS LIST	LPHLDR	LAMPHOLDER	SHLDR	SHOULDERED
AL	ALUMINUM	EQPT	EQUIPMENT	MACH	MACHINE	SKT	SOCKET
ASSEM	ASSEMBLED	EXT	EXTERNAL	MECH	MECHANICAL	SL	SLIDE
ASSY	ASSEMBLY	FIL	FILLISTER HEAD	MTG	MOUNTING	SLFLKG	SELF-LOCKING
ATTEN	ATTENUATOR	FLEX	FLEXIBLE	NIP	NIPPLE	SLVG	SLEEVEING
AWG	AMERICAN WIRE GAGE	FLH	FLAT HEAD	NON WIRE	NOT WIRE WOUND	SPR	SPRING
BD	BOARD	FLTR	FILTER	OBD	ORDER BY DESCRIPTION	SQ	SQUARE
BRKT	BRACKET	FR	FRAME or FRONT	OD	OUTSIDE DIAMETER	SST	STAINLESS STEEL
BRS	BRASS	FSTNR	FASTENER	OVH	OVAL HEAD	STL	STEEL
BRZ	BRONZE	FT	FOOT	PH BRZ	PHOSPHOR BRONZE	SW	SWITCH
BSHG	BUSHING	FXD	FIXED	PL	PLAIN or PLATE	T	TUBE
CAB	CABINET	GSKT	GASKET	PLSTC	PLASTIC	TERM	TERMINAL
CAP	CAPACITOR	HDL	HANDLE	PN	PART NUMBER	THD	THREAD
CER	CERAMIC	HEX	HEXAGON	PNH	PAN HEAD	THK	THICK
CHAS	CHASSIS	HEX HD	HEXAGONAL HEAD	PWR	POWER	TNSN	TENSION
CKT	CIRCUIT	HEX SOC	HEXAGONAL SOCKET	RCPT	RECEPTACLE	TPG	TAPPING
COMP	COMPOSITION	HLCPS	HELICAL COMPRESSION	RES	RESISTOR	TRH	TRUSS HEAD
CONN	CONNECTOR	HLEXT	HELICAL EXTENSION	RGD	RIGID	V	VOLTAGE
COV	COVER	HV	HIGH VOLTAGE	RLF	RELIEF	VAR	VARIABLE
CPLG	COUPLING	IC	INTEGRATED CIRCUIT	RTNR	RETAINER	W/	WITH
CRT	CATHODE RAY TUBE	ID	INSIDE DIAMETER	SCH	SOCKET HEAD	WSHR	WASHER
DEG	DEGREE	IDNT	IDENTIFICATION	SCOPE	OSCILLOSCOPE	XFMR	TRANSFORMER
DWR	DRAWER	IMPLR	IMPELLER	SCR	SCREW	XSTR	TRANSISTOR

Replaceable Mechanical Parts—067-1155-99

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
	105-0718-01		1		BAR, LATCH RLSE:	80009	105-0718-01
	105-0719-00		1		LATCH, RETAINING: PLUG-IN	80009	105-0719-00
	129-0154-00		3		SPACER, POST: 0.25 OD X 1.50 INCH LONG, AL	80009	129-0154-00
	131-1315-01		13		CONN, RCPT, ELEC: BNC, FEMALE	24931	28JR 306-1
	136-0139-00		1		JACK, TIP: BANANA STYLE, W/RED CAP	80009	136-0139-00
	200-1837-00		2		COVER, PLUG-IN: TOP AND BOTTOM	80009	200-1837-00
	210-0046-00		1		WASHER, LOCK: 0.261 ID, INTL, 0.018 THK, BRS	78189	1214-05-00-0541C
	210-0269-00		1		TERMINAL, LUG: NON LOCKING, 0.257" MTG HOLE (ATTACHING PART FOR 136-0139-XX)	78584	905-020
	210-0583-00		1		NUT, PLAIN, HEX: 0.25-32 X 0.312 INCH, BRS (ATTACHING PART FOR 136-0139-XX)	73743	2X20317-402
	210-0898-00		1		WSHR, SHOULDERED: 0.375 OD X 0.105 " THK (ATTACHING PART FOR 136-0139-XX)	80009	210-0898-00
	211-0504-00		18		SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL	83385	OBD
	211-0507-00		4		SCREW, MACHINE: 6-32 X 0.312 INCH, PNH STL (ATTACHING PART FOR 407-1693-XX)	83385	OBD
	213-0793-00		6		SCREW, TPG, TF: 6-32 X 0.4375, TAPTITE, FIL (ATTACHING PART FOR 333-2380-XX)	93907	OBD
	213-0229-00		8		SCR, TPG, THD FOR: 6-20 X 0.375" 100 DEG, FLH STL (ATTACHING PART FOR 333-3062-XX)	93907	OBD
	213-0232-00		1		SCR, TPG, THD FOR: 2-32 X 0.312 INCH, PNH STL (ATTACHING PART FOR 105-0719-XX)	83385	OBD
	333-2380-00		1		PANEL, REAR:	80009	333-2380-00
	333-3062-00		1		PANEL, FRONT:	80009	333-3062-00
	337-1399-04		2		SHIELD, ELEC: SIDE	80009	337-1399-04
	337-3145-00		1		SHIELD, ELEC: FRONT SUBPANEL	80009	337-3145-00
	343-0549-00		8		STRAP, TIEDOWN: 0.091 W X 3.62 INCH LONG	06383	PLTIM
	366-1690-00		1		KNOB: SIL GY, 0.53 X 0.23 X 1.059	80009	366-1690-00
	385-0160-00		4		SPACER, POST: 0.812 L W/6-32 THD THRU, AL	80009	385-0160-00
	386-5082-00		1		SUBPANEL, FRONT:	80009	386-5082-00
	407-1693-00		4		BRACKET, COVER: ALUMINUM	80009	407-1693-00
	426-1245-00		2		FR SECT, PLUG-IN: LEFT SIDE, TOP AND BOTTOM	80009	426-1245-00
	426-1246-00		1		FR SECT, PLUG-IN: RIGHT SIDE, TOP AND BOTTOM	80009	426-1246-00
	426-1246-01		1		FR SECT, PLUG-IN: RIGHT SIDE, TOP AND BOTTOM	80009	426-1246-01
					A1 MFG CAL SOURCE BOARD INCLUDES:		
	210-0586-00		2		.NUT, PL, ASSEM WA: 4-40 X 0.25, STL	83385	OBD
	211-0008-00		2		.SCREW, MACHINE: 4-40 X 0.250, PNH, STL, CD PL (ATTACHING PARTS FOR U120, U130)	83385	OBD
					A2 POWER SUPPLY BOARD INCLUDES:		
	131-0993-00		1		.BUS, CONDUCTOR: 2 WIRE BLACK	00779	850100-01
	176-0119-00		AR		.WIRE, ELEC: 14 AWG, BARE, 12.0L	80009	176-0119-00
	210-0586-00		1		.NUT, PL, ASSEM WA: 4-40 X 0.25, STL	83385	OBD
	210-1178-00		1		.WASHER, SHLDR: U/W TO-220 TRANSISTOR	49671	DF137A
	211-0008-00		1		.SCREW, MACHINE: 4-40 X 0.250, PNH, STL, CD PL	83385	OBD
	220-0829-00		2		.NUT, PRESSMOUNT: 4-40 X 0.216 OD, STL CD PL	46384	KF2-440
	346-0032-00		3		.STRAP, RETAINING: 0.075 DIA X 4.0 L, MLD RBR	98159	2859-75-4

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
WIRE KITS											
	175-1825-00		10						CABLE ASSY, RF:50 OHM COAX, 8.0 LONG (A1J530 TO A1J22; A1J533 TO A1J20; A1J630 TO A1J24; A1J632 TO A1J30; A1J614 TO A1J23; A1J330 TO A1J12; A1J332 TO A1J11; A1J430 TO A1J10; A1J432 TO A1J14)	80009	175-1825-00
	175-3102-00		2						CABLE, ASSY, RF:50 OHM COAX, 10.0, 9-N (A1J200 TO A1J32; A1J300 TO A1J31)	80009	175-3102-00
	175-3491-00		1						CABLE ASSY, RF:50 OHM COAX, 11.0 L, 9-2 (A1J100 TO A1J33)	80009	175-3491-00
	175-8768-00		1						CABLE ASSY, SP, ELEC: 7, 22 AWG, 8.0L, RIBBON (A2P200 TO A2P440)	80009	175-8768-00
	175-8769-00		1						CABLE ASSY, SP, ELEC: 7, 22 AWG, 7.0L, RIBBON (A2P100 TO A2P450)	80009	175-8769-00
	175-8770-00		3						CABLE ASSY, RF:50 OHM COAX, 40.0L, 6-N (A1J320 TO A1J420; A1J422 TO A1J520; A1J612 TO A1J622)	80009	175-8770-00
	175-8771-00		1						CABLE ASSY, RF:50 OHM COAX, 80.0L, 6-N (A1J610 TO A1J620) (SINGLE WIRE FROM A1+5V TO JACK)	80009	175-8771-00

MANUAL CHANGE INFORMATION

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

Date: July 1, 1983

Change Reference:

Product: 067-1155-99

Manual Part No.: 061-2820-00

DESCRIPTION

EFF SN: ALL

TEXT CHANGES

SECTION 1, page 1-1, SPECIFICATIONS, performance requirement for A1, C1, D1 Output Amplitude for calibration and test only;

CHANGE TO READ:

A1, C1
(for calibration and test only)

$+0.55V \leq V_{OH} \leq +0.75V$
 $-0.25V \leq V_{OL} \leq -0.05V$ with 50 ohm termination to ground.

D1
(for calibration and test only)

$+0.60V \leq V_{OH} \leq +0.80V$
 $-0.05V \leq V_{OL} \leq +0.05V$ with 50 ohm termination to ground.

SECTION 5, Replaceable Electrical Parts**CHANGE TO READ:**

page 5-4

A1P100	131-0608-00	TERMINAL, PIN:0.365 L X 0.025 PH BRZ GOLD (QUANTITY 6)	22526	47357
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A1P200	131-0608-00	TERMINAL, PIN: 0.365 L X 0.025 PH BRZ GOLD (QUANTITY 7)	22526	47357
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page 5-5

A1R535	315-0271-00	RES.,FXD,CMPSN:270 OHM, 5%,0.25W	01121	CB2715
A1R610	323-0188-00	RES.,FXD,FILM:887 OHM 1%, 0.5W	75042	CECTO-8870
A1R613	323-0188-00	RES.,FXD,FILM:887 OHM 1%, 0.5W	75042	CECTO-8870

SECTION 7, Replaceable Mechanical Parts, page 7-2;**CHANGE TO READ:**

200-1837-00 to 200-1837-02

ADD:

195-1976-00	1	LEAD, ELECTRICAL: 26AWG, 12.0L	80009	195-1976-00
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page 7-2, after A1 MFG CAL SOURCE BOARD INCLUDES;

ADD:

136-0727-00	1	SKT, PL-IN ELEK: MICROCIRCUIT, 8 DIP	09922	DILB08P-108
136-0252-07	21	SOCKET, PIN CONN: W/O DIMPLE	22526	75060-012

