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# MANUAL CHANGE INFORMATION

Date: 12/7/87 Change Reference: C3/1287

Product: 7A13 Differential Comparator

Manual Part No.: 070-1948-00

Product Group: 42

## DESCRIPTION

These changes effect all serial numbers.

## TEXT CHANGES

Section 1, Page 1-4, REPLACE Table 1-4.

TABLE 1-4

### SYSTEM CHARACTERISTICS

(Indicator Oscilloscope: 7600 Series with P6105A Probe.)

BW (MHz)	T <sub>r</sub> (ns)	<sup>1</sup> Accuracy (%)			Sig Out	
		<sup>2</sup> EXT CAL	<sup>3</sup> INT CAL	<sup>4</sup> INT CAL	BW (MHz)	T <sub>r</sub> (ns)
75	4.8	1.5	2.5	3.5	55	6.4
75	4.8	1.5	2.5	3.5	55	6.4

(Indicator Oscilloscope: 7700-Series with P6105A Probe.)

95	3.6	1.5	2.5	3.5	55	6.4
95	3.6	1.5	2.5	3.5	55	6.4

Section 5, Page 5-20 thru 5-41, all references to Type 106 CHANGE TO READ: Pg 506.

Table 5-2, DELETE items 3, 13, and 14. Step 27, under, Examples of Applicable Test Equipment, CHANGE the part number to read: 067-0525-02.

Page 5-20, DELETE Fig. 5-8, move all the following Fig. numbers, thru Fig. 5-21, back one digit.

REPLACE all the text on Pages 5-20 thru 5-25, with the following:

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## HIGH-FREQUENCY COMPENSTATION ADJUSTMENTS

### Equipment Required

- |                                |                                      |
|--------------------------------|--------------------------------------|
| 1. Indicator oscilloscope.     | 6. 10X attenuator.                   |
| 2. Time-Base unit.             | 7. 50 ohm termination.               |
| 3. Plug-in extender.           | 8. Polarized viewer or viewing hood. |
| 4. Square-Wave Generator.      | 9. Screwdriver                       |
| 5. 5 ns, 50 ohm coaxial cable. | 10. Alignment tool                   |

### 17. Check/Adjust High-Frequency Compensation (both inputs)

#### Square-Wave Generator

Repetition Rate	10 kHz
Range	
Multiplier	1
Symmetry	As is
Amplitude	Not applicable
Hi Amplitude/Fast Rise	Fast Rise
+ Transition Amplitude	Fully CCW
- Transition Amplitude	Not applicable
Power	On

**7A13**

+ INPUT	DC
- INPUT	GND
VOLTS/DIV	10 mV
BW	5 MHz

#### Time Base Plug-In

Level/Scope (Triggering)	Positive Slope Region
Magnifier	X1
Time/Div	0.1 MV

a. For Performance Check Only, go to step 18.

b. ADJUST—R196, R432, R333, R336, C187, R187, C163, C113, C150, C250 and C213 (see Figs. 5-8 and 5-9) in the given order for optimum response to a square wave. C250 and C213 are mainly - INPUT adjustments. To perform the adjustments, use the information in the procedure that follows.

c. Turn off the indicator oscilloscope. Insert the Plug-In Extender between the 7A13 and the indicator oscilloscope. Turn on the indicator oscilloscope.

d. Remove the 10X attenuator and connect the 5 ns coaxial cable directly to the PG 506 + OUTPUT connector. Disconnect the PG 506 signal from the 7A13 - INPUT connector and apply it to the + INPUT connector.

e. Using Table 5-4 and Fig. 5-10 as a guide, perform the high-frequency compensation adjustments. Note that when using the table, the Plug-In Extender is used while adjusting R196, R432, R336, and R333. For all the remaining adjustments, the Plug-In Extender is removed and the 7A13 is inserted directly into the indicator oscilloscope. Use a 6-division peak-to-peak waveform amplitude during the adjustment procedure. Keep the waveform positioned about one division below the top of the graticule when using the + INPUT connector and about one division above the bottom of the graticule when using the - INPUT connector.

f. After completing the high-frequency compensation adjustments and checking that the instrument operates properly for all VOLTS/DIV switch settings from 50 mV to 1 mV, perform steps 18 through 20.

g. Disconnect the signal from the 7A13 and leave the generator turned on.

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**TABLE 5-4**  
High-Frequency Compensation Adjustment Sequence

Type PG 506 Repetition Rate	Signal Applied to:	Time Base Sweep Rate	Adjustment	Approximate Time Domain <sup>f</sup>	Procedure
10 kHz	- INPUT Connector	.1 ms/div	R196 <sup>†</sup>	50 $\mu$ s	Turn off the oscilloscope. Insert the Plug-In Extender between the 7A13 and indicator oscilloscope. Turn on the indicator oscilloscope. Set the VOLTS/DIV switch to 10 mV and the BW switch to 5 MHz. Adjust for best flat top. Reset BW switch to FULL for remaining adjustments
100 kHz		.5 $\mu$ s/div	R432	100 ns	Adjust for optimum square corner. (Ignore fast spike, if any, that may remain on the top front corner.)
		.5 $\mu$ s/div or 1 $\mu$ s/div	R336 R432	50 ns	Adjust for optimum square corner.
		50 ns/div	R333		
		5 ns/div or 10 ns/div	C187	5 ns to 10 ns	Turn off indicator oscilloscope. Remove the Plug-In Extender and insert the 7A13 directly into the indicator oscilloscope. Turn on indicator oscilloscope. Adjust for optimum square corner. Leave the 7A13 inserted directly in the indicator oscilloscope for the remaining adjustments. Adjust for minimum ripple near front corner. Adjust for optimum square corner. Adjust in equal increments to maintain C150 and C250 at or nearly the same physical positions.
			R187	2 ns to 7 ns	
			C163	2 ns	
			C113	2 ns to 4 ns	
			C150	1 ns to 3 ns	
			C250	1 ns to 3 ns	
		- INPUT Connector	10 ns/div	C213 C250	2 ns to 6 ns 1 ns to 5 ns
- INPUT Connector	5 ns/div	C150 C113 C163	same as given previously	Adjust for optimum square corner.	
- INPUT Connector	5 ns/div	C213 C250	Same as given previously	Adjust for optimum square corner.	
- INPUT Connector	5 ns/div	C163 C113 C150	Same as given previously	Adjust for optimum square corner. Set 7A13 for 1 mV and readjust for optimum square corner. If a bump is present in the 5 ns to 10 ns region, perform step 20.	
				C187	Same as given previously

<sup>f</sup>The 90% point on the rising portion of the waveform (see Fig. 5-11C for location) is the time reference used to determine the time domain or area affected by the adjustment. For example, with the sweep rate set at 5 ns/div, adjustment of C187 will affect the 5 ns to 10 ns area near the top front corner of the waveform when measured with respect to the 90% point on the rising portion of the waveform.

<sup>†</sup>If R196 is adjusted, repeat step 3.

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Page 5-26, Step 18, **CHANGE step a** as follows:

a. Set the PG 506 Square-Wave Generator controls to the following positions:

Period	1 kHz
Amplitude	Fully CCW
Hi Amplitude/Fast Rise	Hi Amplitude

Pages 5-30 thru 5-32, all references to Type 191 **CHANGE TO READ**: SG 503

Page 5-30, Step 20, **CHANGE step a TO READ**:

a. Set the Medium-Frequency Sine-Wave Generator (SG 503) controls as follows:

Frequency dial	1 MHz
Frequency Range	1 MHz
Power	On

Page 5-31, Step 21, the table following Time Base Plug-In, **CHANGE TO READ**:

**PG 506**

Period	100 Hz
Amplitude	CCW
Hi Amplitude/Fast Rise	Hi Amplitude
Power	On

Page 5-34, Equipment Required, **DELETE**, item 8.

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## MANUAL CHANGE INFORMATION

Date: 10-20-89 Change Reference: C4/1089

Manual Part No.: 070-1948-00

Product: 7A13 Instruction

Product Group: 42

### DESCRIPTION

These changes are effective for all serial numbers.

## TEXT CHANGES

Page 5-12, Step 8. Check/Adjust Gain, **CHANGE TO READ:**

### 8. Check/Adjust Gain and Volts/DIV Accuracy

a. Apply the 40 mV peak-to-peak square wave from the indicator oscilloscope Cal output connector through a 50-ohm coaxial cable to the 7A13 + INPUT connector.

b. Set the 7A13 controls as follows:

+ INPUT Mode      DC  
VOLTS/DIV          10 mV  
POSITION            Center the display

c. ADJUST—The front panel GAIN control (R329) for exactly 4 divisions of vertical deflection.

d. Disconnect the calibrator signal.

#### NOTE

*Performance Check: Since the Gain adjustment is an external control, this control may be adjusted as part of the performance check.*

e. Connect Standard Amplitude Calibrator to the 7A13 + INPUT through 50  $\Omega$  coax.

f. CHECK the remaining V/DIV positions as per Table 5-2.

TABLE 5-2.

VOLTS/DIV Switch Position	CALIBRATOR Output Peak to Peak	VERTICAL DEFLECTION (Accuracy $\pm 1.5\%$ )
10 mV	50 mV	5 div
20 mV	1 V	5 div
50 mV	2 V	4 div
.1 V	.5 V	5 div
.2 V	1 V	5 div
.5 V	2 V	4 div
1 V	5 V	5 div
2 V	10 V	5 div
5 V	20 V	4 div
10 V	50 V	5 div

g. Repeat steps f and g for the -INPUT.

h. Disconnect Equipment.



# MANUAL CHANGE INFORMATION

Date: 5/6/88 Change Reference: C110/0588 Rev 2

Manual Part No.: see product

Product: All 7000 Service manuals

Product Group: 42

## DESCRIPTION

Effective for all serial numbers.

Revised 9/26/88

Revised 10/13/88

## REPLACEABLE ELECTRICAL PARTS LIST CHANGES

The part number has changed for a transistor which may be used in your 7000-Series product. Part number 151-0220-00 has changed to 151-0220-07. Use the new 151-0220-07 part number when ordering a replacement for transistors listed as 151-0220-00 in your Replaceable Electrical Parts List.

Most berg sockets, part number 136-0252-07, have been removed from this 7000-Series instrument to facilitate assembly and improve reliability.



# MANUAL CHANGE INFORMATION

Date: 14-JUN-90 Change Reference: M73208

Product: 7A13 INSTRUCTION MANUAL

Manual Part No.: 070-1948-00

Product Group: 42

## DESCRIPTION

These changes are effective at serial number B257462 & above

## REPLACEABLE PARTS LIST

ADD:

Ckt No.	Part Number	Description
C177	283-0000-00	CAP, FXD, CER:0.001 $\mu$ F, 500V

## SCHEMATIC CHANGES

7A13

ATTENUATOR & SWITCHING

1

