FACTORY CALIBRATION PROCEDURE

CONTENTS:

INTRODUCTION:

568

This is the guide for calibrating brand-new instruments, it therefore, calls out many procedures and adjustments that are rarely required for subsequent recalibration. *This procedure is company confidential.* In this procedure, all front panel control labels or Tektronix equipment names are in capital letters (VOLTS/DIV, etc.) internal adjustment labels are capitalized only (Gain Adj, etc.).

Tek form number:

0-413
January 1967

For all serial numbers.

FACTORY TEST LIMITS:

We initially calibrate the instrument to Factory Test Limits. These limits are often more stringent than advertised performance requirements. This helps insure that the instrument will meet advertised requirements after shipment, allows for inaccuracies of test equipment used, and may allow for changes in environmental conditions.

QUALIFICATION:

Factory test limits are qualified by the conditions specified in the main body of the calibration procedure. The numbers and letters to the left of the limits correspond to the factory calibration procedure steps where the check or adjustment is made. Instruments may not meet factory test limits if calibration or check-out methods and test equipment differ substantially from those in this procedure.

ABBREVIATIONS:

Abbreviations in this procedure will be found listed in TEKTRONIX STANDARD A-100.

CHANGE INFORMATION:

This procedure has been prepared by Product Manufacturing Staff Engineering. For information on changes that have been made to this procedure, to make suggestions for changing this procedure, or to order additional copies: please contact PMSE, 47-261. (DC)

EQUIPMENT REQUIRED:

The following equipment is necessary to complete this procedure:

a. TEKTRONIX Test Equipment

1	TYPE 540 SERIES OSCILLOSCOPE
1	TYPE 1A1 PLUG-IN UNIT
1	TYPE 2A60 PLUG-IN UNIT
1	TYPE 2B67 TIME-BASE UNIT
1	TYPE 3B1 TIME-BASE UNIT
* 1	TYPE 184 TIME-MARK GENERATOR
1	TYPE 106 SQUARE-WAVE GENERATOR
1	TYPE P6011 1X PASSIVE PROBE
1	TYPE P6006 10X PASSIVE PROBE
1	TYPE 76TU LINE VOLTAGE CONTROL UNIT

b. Test Fixtures and Accessories

2	TU-4 Test Load Unit (067-0065-00)
1	TU-5-105 Adapter (067-0110-00)
1	CRT deflection plate capacitance normalizer (3M1)(067-0500-00)
1	10K ½W 10% resistor (302-0103-00)
1	50Ω GR to BNC in line termination (017-0083-00)
1	50Ω precision termination, checked to 0.1% (067-0120-00)
1	GR to BNC female adapter (017-0063-00)
1	Clip lead adapter, BNC (012-0057-00)
1	Patch cord, BNC to banana (012-0091-00)
2	50Ω cables, BNC (012-0057-00)
* 1	DC Voltage Bridge (DCVB) (067-0543-00)
1	Digital Instruments continuity test unit (PMPE Dwg. #1616A)
1	"Y" Adapter Cable (PMPE Dwg. #1643B)
1	Adapter Cable (PMPE Dwg. #1644B)
1	TYPE 230 Accessory Cable (012-0119-00)

c. Other Equipment

1	20,000Ω/Volt Multimeter, Tripplet 630 NA (067-0045-00) or equivalent

* This equipment must be traceable to NBS for instrument certification.

Substitute test equipment may be used. The Plant Staff Engineer must approve any substitutions. All equipment listed must perform within its manufacturer's specifications, unless otherwise stated.

It is assumed that all equipment is provided with BNC connectors; if equipment used has other than BNC connectors, adapters, not listed, may be needed.

FACTORY TEST LIMITS

QUALIFICATION

Factory test limits are qualified by the conditions specified in the main body of the calibration procedure. The numbers and letters to the left of the limits correspond to the factory calibration procedure steps where the check or adjustment is made. Instruments may not meet factory test limits if calibration or checkout methods and test equipment differ substantially from those in this procedure.

1. PRELIMINARY INSPECTION

2. PRESET CONTROLS

3. RESISTANCE

4. LINE SELECTOR AND FUSES

5. POWER SUPPLIES

b. Check and adjust low voltage power supplies: Rated voltage ±0.5% under full load

c. Check regulation
Rated voltage ±1% over a range of 104 VAC to 126 VAC line and under no load and full load conditions.

d. Check ripple at 104 VAC and at 126 VAC line as in the following table:

Supply	Maximum Ripple	
	Full load	No load
-150V	4mV	4mV
+125V	5mV	4mV
+300V	6mV	5mV
-12.2V	3mV	3mV

e. Check power line polarity: upper TU-4 neons on; lower TU-4 neons off.

6. HIGH VOLTAGE

a. Adjust HV Adj, R855: -3300VDC ±2%, max

b. Check HV regulation: -3300VDC ±2%, max over a range of 104 VAC to 126 VAC line and under no load and full load conditions.

c. Check FOCUS: No HV variation

7. TRACE ALIGNMENT

b. Adjust Trace Alignment, R870
Range: 6°, min

8. SCALE ILLUM

ccw - no illumination
cw - full illumination

9. CALIBRATOR

* b. Adjust Cal Ampl, R940
zero reference: ±1mV, max
5V and 0.5V: ±1%, max into ≥100kΩ
500mV and 50mV: ±1%, max into 50Ω

* c. Check 20 kHz frequency accuracy:
20 kHz ±0.02%, max

d. Check 1 kHz frequency accuracy:
+50% to -25%, max

e. Check calibrator duty cycle:
49% to 51%

f. Check +PRETRIGGER amplitude: more than 0.2V with a 50Ω load, more than 1V open circuit

g. Check +PRETRIGGER phase relation: leads positive excursion of CALIBRATOR 1/4 cycle ±10% of one cycle.

10. INTENSIFYING PULSE CIRCUIT

a. Check voltage at D836-D839 junction: 0.3VDC to 0.6VDC

b. Check external intensifying input: 5V pulse through 10K resistor causes intensity modulation

11. EXT CRT CATHODE

5V signal causes intensity modulation

12. ALTERNATE SWEEP

13. CHOPPED BLANKING

14. CRT VERTICAL COMPRESSION AND EXPANSION

b. Check CRT vertical compression and expansion: ½ minor div total, max

15. GEOMETRY

b. Adjust Geometry, R873: ½ minor div, max bowing
c. Check horizontal geometry: ½ minor div, max bowing

16. CRT VERTICAL DEFLECTION FACTOR AND ELECTRICAL CENTER

a. Check CRT vertical deflection factor: 18.5V to 20.5V/division
b. Check CRT vertical electrical center: ±0.5 div, max

17. VERTICAL COMPENSATION

b. Adjust CRT vertical compensation, C760: flat topped waveform ±1 trace width, max

18. HORIZONTAL COMPENSATION

b. Adjust CRT horizontal compensation, C761: flat topped waveform ±1 trace width, max

19. CRT HORIZONTAL DEFLECTION FACTOR AND ELECTRICAL CENTER

a. Check CRT horizontal deflection factor: 17.5V to 19.25V/div
b. Check CRT horizontal electrical center: ±0.8 div, max

20. INTERNAL TRIGGER

b. Check internal triggering + and - triggering on 1 minor div signal

21. LINE TRIGGERING

b. Check line triggering correct slope + and - in both plug-in compartments

22. INTERNAL INTENSIFYING CIRCUIT

23. INTERCONNECTING PLUGS

THE END

* Indicates measurement characteristic; test equipment used must be traceable to the NBS for instrument certification.

NOTES

1. PRELIMINARY INSPECTION

Check for unsoldered joints, rosin joints, poor lead dress and long wire ends. Check for loose hardware and protruding parts. Check controls for smooth mechanical operation, proper indexing and spacing between knobs and front panel. Correct all defects found.

Loosen two 6-32 allen head screws and one 6-32 Binding head screw at the CRT clamp. Insert the CRT into the TYPE 568 to a point where the implosion shield is flush with the light guide. Check that there is an opening in the tape surrounding the implosion shield corresponding with the position of the light guide. Align the CRT with the front panel and tighten the CRT clamp screws. Check that the neck pin connectors are on the proper pins and are tight.

Inspect the CRT for phosphor defects, scratches, chips and cracks around the neck pins. Install the CRT filter and graticule cover.

1. Do not reject a CRT without consulting a trained CRT Checker or referring to the Cathode Ray Tube Checkout Procedure.

2. PRESET CONTROLS

a. TYPE 568 external controls

FOCUS	ccw
INTENSITY	ccw
ASTIGMATISM	ccw
SCALE ILLUM	midr
POWER	ON
CALIBRATOR	OFF

b. Internal adjustments

Geometry, R865	ccw
HV Adj, R841	ccw
-100V, R625	midr
-12.2V, R645	midr
125V, R665	midr
300V, R685	midr
Trace alignment, R870	midr

all other internal adjustments midr
Line Voltage selector 104-126V and
Range 115V

Leave controls and adjustments for any step, as they were in the step preceding, unless noted otherwise.

3. RESISTANCE

3. POWER switch ON, instrument not connected to power source.

Measure power supply resistance to ground as follows:

Power Supply	Test Point	Approximate Resistance	Reverse Polarity	Multimeter range
117 VAC	Two rear notches of ceramic strip next to T601 regulator bd	inf	inf	ΩX100K
-100V	Pin L	4.8KΩ	11KΩ	ΩX1K
-12.2V	Pin H	300Ω	430Ω	ΩX100
+125V	Pin D	9KΩ	4.6KΩ	ΩX1K
+300V	Pin A J21	38KΩ	18KΩ	ΩX10K
+6V	Pin 22	16KΩ	14KΩ	ΩX10K

Check J21, J11 Pin 18, Pin 19 interconnections:

Test Point	Resistance	Multimeter range
J21 pin 18 to J11 pin 18	0Ω	ΩX1
J21 pin 19 to J11 pin 19	0Ω	ΩX1
J21 pin 18 to J21 pin 19	inf	ΩX100K

4. LINE SELECTOR AND FUSES

a. Check fuses

Remove the line selector cover and check that proper fuses are installed. (See Fig. 1). Check F675, AGC 3/10A fast and F695, ACG 1/4A fast (next to CRT on front of center divider).

b. Check line selector

Install two TU-4's in the TYPE 568 plug-in compartments. Set switches on both TU-4's as follows:

INDICATOR	561
SUPPLY	-100
load	FULL LOAD
mode	NORMAL

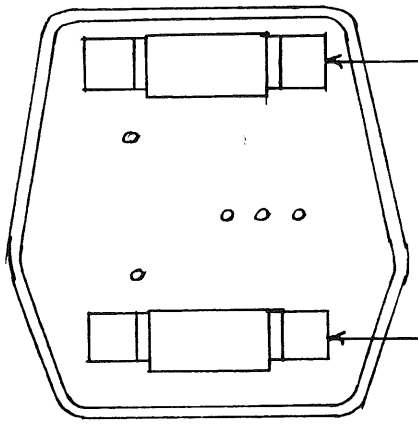

Fig. 1

4b. (cont'd)

Connect the TYPE 568 power cord to TYPE 76TU outlet. Set the TYPE 76TU output to 115VAC. Measure the voltage at the 100V winding of T601 (input leads of D612).

With the line selector set as in the following table measure the voltage across the 100V winding:

Range	Line Selector	Approximate voltage
115	LO	100 VAC
115	M	87 VAC
115	HI	80 VAC
230	M	40 VAC

Leave line selector at M and set the Range to 115.

5. POWER SUPPLIES

a. Setup

Connect a 50Ω cable from the RIPPLE AND PERCENT ERROR connector of one TU-4 to the test scope plug-in INPUT 1. Set the test scope plug-in VOLTS/CM to .005, INPUT SELECTOR to DC and MODE to CH 1. Set the test scope TIME/CM to .5mSEC, TRIGGERING SOURCE to LINE, COUPLING to DC, SLOPE to + and MODE to AUTO.

b. Check and adjust low voltage power supplies: rated voltage ±0.5% under full load

Depress the push for ground reference button on the TU-4 that is connected to the test scope. Position the trace graticule center with the test scope plug-in POSITION control. Release the push for ground reference button and depress the PUSH TO REMOVE RIPPLE button. Adjust -100V, R625, to position the trace to graticule center. Change the TU-4 SUPPLY switch to +125V. Depress the push for ground reference button. Position the trace to graticule center with the test scope plug-in POSITION control. Release the push for ground reference button and depress the PUSH TO REMOVE RIPPLE button. Adjust +125V, R665, to position the trace to graticule center.

5. Each TU-4 is capable of half-loading the power supplies when set to FULL LOAD. To check power supplies under full load conditions, set both TU-4's to FULL LOAD. For low load conditions set both TU-4's to NO LOAD.

The PUSH TO REMOVE RIPPLE button removes ripple from the display so a more accurate reading may be obtained.

The push for ground reference button (center of SUPPLY knob) produces a ground reference on the test scope.

One cm of vertical deflection on the test scope represents 0.5% error in power supply voltage when the test scope vertical deflection factor is set to .005V/cm.

5b. (cont'd)

In similar fashion check and adjust +300V, R685 and -12.2V, R645. Repeat step 5b.

c. *Check regulation: rated voltage ±1% over a range of 104 VAC to 126 VAC line and under no load and full load conditions*

Set the TYPE 76TU for 104 VAC and check power supply voltages with the TU-4 load switches in the FULL LOAD and NO LOAD positions. Change the TYPE 76TU output voltage to 126 VAC and repeat step 5c.

d. *Check power supply ripple at 104 VAC line and at 126 VAC line*

Supply	Maximum Ripple	
	Full load	no load
-100V	4mV	4mV
+125V	5mV	4mV
+300V	6mV	5mV
-12.2V	3mV	3mV

Return the TYPE 76TU to 115 VAC line.

e. *Check power line polarity: upper TU-4 neon bulbs on lower TU-4 neon bulbs off*

Check the AC LINE neon bulbs on both TU-4's. Upper neon on and lower neon off indicates correct line polarity. If both neons are on, line polarity is reversed.

6. HIGH VOLTAGE

a. *Adjust HV Adj, R855: -3300VDC ±2% max*

Position the spot off screen. Set the multimeter to a range suitable to measure -3300VDC and connect the meter leads between ground and the rear terminal of the four terminal ceramic strip adjacent to J224. Adjust R855 for -3300VDC.

6. (cont'd)

b. Check HV regulation: -3300VDC ±2%, max over a range of 104 VAC to 126 VAC line and under no load and full load conditions

Turn the INTEN full cw. Set both TU-4 load selector switches to FULL LOAD. Check the multimeter for -3234VDC to -3366VDC as the line voltage is varied from 104 VAC to 126 VAC. Change the TU-4 load selector switches to NO LOAD. Again check for -3234VDC to -3366VDC as the line voltage is varied from 104 VAC to 126 VAC. Set the TYPE 76TU for 115 VAC line.

c. Check FOCUS: no HV variation

Vary the FOCUS control over its range while checking for no variation in the reading on the multimeter. Remove the multimeter leads. Turn the INTEN control to midr.

7. TRACE ALIGNMENT

a. Setup

Remove the two TU-4's from the TYPE 568 plug-in compartments. Install a TYPE 2A60 in the left compartment and a TYPE 2B67 in the right compartment. Set the TYPE 2B67 MODE to NORMAL, TIME/DIV to 1mSEC, TRIGGERING LEVEL to FREE RUN, SLOPE to +, COUPLING to AC SLOW and SOURCE to INT. Set the TYPE 2A60 input selector to DC and VOLTS/DIV to .5.

b. Adjust Trace Alignment, R870: Range 6°, min

Center the trace vertically. Rotate the Trace Alignment control from full ccw to full cw and check for adequate range, (see Fig. 2). Adjust the Trace Alignment control to align trace with the center graticule line.

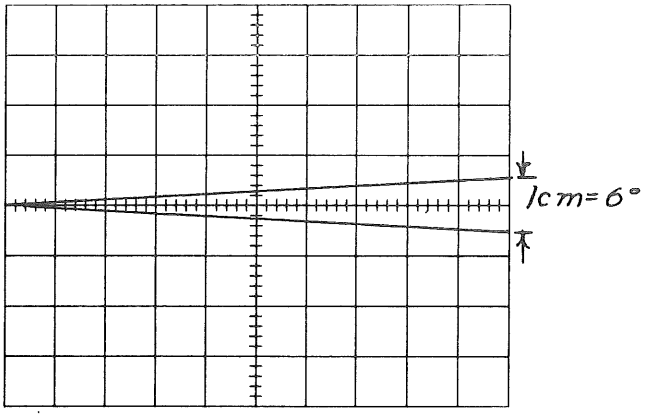

Fig. 2

8. SCALE ILLUM ccw - no illumination
cw - maximum illumination

Rotate the SCALE ILLUM control through its range. Check for a smooth change in illumination with no illumination ccw and maximum illumination cw.

9. CALIBRATOR

a. Setup

Connect TYPE 568 5V BNC connector -- 50Ω cable -- clip lead adapter -- DC VOLTAGE BRIDGE ± INPUT and GND. Connect DC VOLTAGE BRIDGE OUTPUT -- 50Ω cable -- test scope plug-in INPUT L.

Set the DC VOLTAGE BRIDGE controls as follows:

RANGE	11V
POLARITY	+
INPUT VOLTAGE	0-0-0
POWER	ON
mode	NULL SIGNAL

b. Adjust Cal Ampl, R940
Zero reference: ±1mV, max
5V and 0.5V ±1%, max into ≥100KΩ
500mV and 50mV ±1%, max into 50Ω

Switch TYPE 568 CALIBRATOR to 1 kHz and back to OFF until the smaller of two possible display amplitudes is obtained. The calibrator is now in its low state. The test scope display amplitude should be ±1mV, or less. Change the DC VOLTAGE BRIDGE to 5-0-0. Switch the TYPE 568 CALIBRATOR to 1 kHz and back to OFF until the calibrator rests in its high state. Adjust R940 for a null on the test scope.

Move the 50Ω cable to TYPE 568 .5V BNC connector. Change the DC VOLTAGE BRIDGE RANGE to 1.1V. Check for a null on the test scope at 0.5V ±1%.

Insert a 50Ω precision termination between the 50Ω cable and TYPE 568 5V BNC connector. Again check for a null on the test scope at 0.5V ±1%. Move the 50Ω precision termination to TYPE 568 .5V BNC connector. Change the DC VOLTAGE BRIDGE INPUT VOLTAGE to 0-5-0. Check for a null on the test scope at 0.05V ±1%.

9. (cont'd)

c. Check 20 kHz frequency accuracy: 20 kHz ±0.02%, max

Set TYPE 568 CALIBRATOR switch to 20 kHz. Connect a 50Ω cable from TYPE 568 5V BNC connector to test scope TYPE 1A1 INPUT 1. Connect a 50Ω cable from TYPE 184 MARKER OUTPUT to test scope TYPE 1A1 INPUT 2. Depress TYPE 184 50μS button. Trigger the test scope and set TYPE 1A1 VOLTS/CM controls for approximately equal display amplitude on both channels, then change TYPE 1A1 MODE to ADD. Set the test scope TIME/CM to 1 SEC.

Check for a maximum of 40 zero crossings in 10cm (0.02%).

d. Check 1 kHz frequency accuracy: +50% to -25%, max

Change the TYPE 184 MARKER SELECTOR to 1mS, test scope TYPE 1A1 MODE to ALT, test scope TIME/CM to .1mSEC and TYPE 568 CALIBRATOR switch to 1 kHz. Adjust the test scope TIME/CM VARIABLE as necessary and compare the TYPE 568 calibrator to the TYPE 184 marker. Check TYPE 568 calibrator display for a maximum of 1.5 cycles/marker as the plus test limit. Check for a minimum of 0.75 cycles/marker as the minus test limit.

e. Check calibrator duty cycle: 49% to 51%

Remove the TYPE 184 signal from test scope TYPE 1A1 INPUT 2. Adjust the test scope TIME/CM VARIABLE to display exactly one cycle of TYPE 568 calibrator waveform/10cm. Check that the first half-cycle of the display occupies from 4.9 to 5.1 horizontal cm. Change the TYPE 568 CALIBRATOR to 20 kHz and the test scope TIME/CM to 5 μSEC. Check calibrator duty cycle as before.

9. (cont'd)

f. Check +PRETRIGGER amplitude: more than 0.2V with a 50Ω load more than 1V open circuit

Move the 50Ω cable from TYPE 568 5V BNC connector to +PRETRIGGER. Set the TYPE 1A1 VOLTS/CM switch to .5. Check for more than 2cm of deflection on the test scope. Insert a 50Ω precision termination between the +PRETRIGGER BNC connector and the 50Ω cable. Change the TYPE 1A1 VOLTS/CM switch to .1. Check for more than 2cm of deflection on the test scope.

g. Check +PRETRIGGER phase relation: leads positive excursion of CALIBRATOR 1/4 cycle ±10% of one cycle

Connect a 50Ω cable from CALIBRATOR .5V BNC connector to TYPE 1A1 INPUT 2 (leave +PRETRIGGER connected to TYPE 1A1 INPUT 1). Set Channel 2 VOLTS/CM to .2. Set the test scope TIME/CM to 10μSEC. Set the TYPE 568 CALIBRATOR switch to 20 kHz. Check that the +PRETRIGGER pulse occurs 12.5μs ±5μs ahead of the positive excursion of the calibrator waveform.

10. INTENSIFYING PULSE CIRCUIT

a. Check voltage at D836-D839 junction: 0.3VDC to 0.6VDC

Connect the multimeter leads between ground and the forward lead of D836 (diode adjacent to the Geom adjustment). Note the meter reading. Remove the meter leads.

a. If the voltage at the junction of D836-D839 anodes exceeds 0.6VDC any sweep plug-in with an intensifying circuit could be damaged.

b. Check external intensifying input: 5V pulse through 10K resistor causes intensity modulation

Set the TYPE 2B67 TRIGGERING LEVEL to AUTO, SLOPE to +, COUPLING to AC SLOW and SOURCE to EXT. Set the TIME/DIV to 50μSEC. Connect TYPE 568 PRETRIGGER to TYPE 2B67 EXT TRIG with a BNC to banana patch cord. Set the TYPE 568 CALIBRATOR switch to 20 kHz and connect a 1X probe to the 5V BNC connector. Connect a 10K ½W 10% resistor from the probe tip to pin 17 of J101.

Check for alternate bright and dark areas on the trace.

11. EXT CRT CATHODE

5V signal causes intensity modulation

Remove the 10K resistor from the probe tip. Set the Z axis selector switch on the rear panel of the TYPE 568 to EXT CRT CATHODE. Touch the probe tip to J878, EXT CRT CATHODE. Check for alternate bright and dark areas on the trace.

12. ALTERNATE SWEEP

a. Setup

Insert a TU-4 into the right plug-in compartment and a TYPE 2B67 into the left plug-in compartment of the TYPE 568. Set the TU-4 mode switch to DUAL TRACE. Turn the TYPE 2B67 LEVEL control to FREE RUN. Adjust INTEN, FOCUS and ASTIG controls for a well-defined trace of normal brightness.

b. Check alternate sweep

Check for a display of two vertical traces. Interchange the TU-4 and TYPE 2B67. Check for a horizontal display of two traces. Change the TU-4 mode switch to NORMAL.

13. CHOPPED BLANKING

a. Setup

Connect TYPE 106 OUTPUT -- 5ns cable -- 50Ω in line termination -- BNC T -- TU-4 SIGNAL INPUT -- BNC to banana patch cord -- TU-4 Z AXIS INPUT.

b. Check CHOPPED BLANKING

Adjust the TYPE 106 controls for a 1cm display of 100 kHz signal. Set the CRT cathode selector switch on the rear panel of the TYPE 568 to CHOPPED BLANKING. The upper portion of the display must dim or disappear and the lower portion brighten.

Remove the TYPE 106 signal and the BNC to banana patch cord.

14. CRT VERTICAL COMPRESSION AND EXPANSION

a. Setup

Change the TYPE 2B67 TIME/DIV to 1mSEC, TRIGGERING LEVEL to AUTO and SOURCE to INT. Connect TYPE 106 OUTPUT -- GR to BNC female adapter -- 50Ω cable -- TU-4 SIGNAL INPUT.

b. Check CRT vertical compression and expansion: 1/2 minor div, max

Adjust the TYPE 106 controls for exactly 2cm of 1 kHz signal with the display centered. Postion the top of the display to the top graticule line. Note the compression or expansion. Position the bottom of the display to the bottom graticule line, note the compression or expansion. Compression or expansion must not exceed ½ minor div. Remove the TU-4 and replace it with a TYPE 2A60.

15. GEOMETRY

a. Setup

Apply 1ms and .1ms markers from TYPE 184 to TYPE 2A60 INPUT. Set the TYPE 2A60 VOLTS/DIV to .2 and VARIABLE and POSITION controls for markers extending from bottom to top of the graticule. Set TYPE 2B67 TIME/DIV to 1mSEC and VARIABLE for exactly ten 1ms markers in ten divisions. Adjust the INTEN FOCUS and ASTIG for a normally bright, well-defined trace.

b. Adjust Geometry, R873: 1/2 minor div, max bowing

Adjust R873 (Regulator board) for minimum bowing of the vertical lines. Check over the entire graticule for ½ minor division or less of bowing in 8 vertical divisions.

c. Check horizontal resolution: resolve 100 markers/10 divisions

Adjust the TYPE 2A60 VOLTS/DIV and VARIABLE so the .1ms markers extend from the bottom to the top of the graticule. Check for no overlapping of .1ms markers within the graticule area.

15. (cont'd)

d. Check orthogonality deviation: 1/2 minor div in 6 div, max

Check that the baseline is parallel with the bottom graticule line. (Adjust Trace Alignment, R870 as necessary.) Align 1mS markers with the vertical graticule lines at the baseline. Check that the time markers are not displaced from the graticule lines more than 1/2 minor division at a point 6 divisions above the baseline. Move the baseline up two divisions and again check orthogonality.

e. Check horizontal geometry: 1/2 minor division, max bowing

Remove the TYPE 184 signal from TYPE 2A60 INPUT. Set the TYPE 2B67 TRIGGER LEVEL to FREE RUN. Recheck the trace alignment. Position the trace from the top to the bottom of the graticule and check for no bowing or departure from a straight line greater than 1/2 minor division.

g. Check vertical resolution: no overlapping of 1/2 minor div spaced lines

Connect a 50Ω cable from TYPE 568 CALIBRATOR .5 VOLTS to TYPE 2A60 INPUT. Set the TYPE 2A60 VOLTS/DIV to 5. Set the TYPE 2B67 TIME/DIV to .2mSEC and LEVEL to FREE RUN. Check for no overlapping of the two parallel traces over the entire graticule.

16. CRT VERTICAL DEFLECTION FACTOR AND ELECTRICAL CENTER

a. Check CRT vertical deflection factor: 18.5V to 20.5V/division

Set the multimeter to a range suitable to measure 164VDC and connect the meter leads to the CRT vertical deflection plate leads. Set the trace to the top graticule line and note the meter reading.

Move the trace to the bottom graticule lines. Reverse the meter polarity and note the meter reading. Total voltage change must be between 148 and 164 volts. Remove the meter leads.

16. (cont'd)

b. Check CRT vertical electrical center ±2.5 minor div, max

Connect the vertical deflection plates together with a short jumper. Note the displacement of the trace from graticule center as in the following table:

Max Vertical deflection factor	Maximum Centering error
18.5-19.5V/div	±2.5 minor div
19.75V/div	±2.25 minor div
20.0V/div	±2.0 minor div
20.25V/div	±1.75 minor div
20.5V/div	±1.5 minor div

17. VERTICAL COMPENSATION

a. Setup

Install a CRT deflection plate capacitance normalizer in the left compartment of the TYPE 568. Connect TYPE 106 OUTPUT -- TU-5-105 adapter -- 50Ω cable -- CRT deflection capacitance normalizer input. Set the TYPE 2B67 TIME/DIV to 50μSEC, TRIGGERING SLOPE to +, COUPLING to AC SLOW and SOURCE to INT.

b. Adjust CRT vertical compensation, C760: flat topped waveform ±1 trace width, max

Set the TYPE 106 frequency to 10 kHz. Adjust the TYPE 2B67 TRIGGERING LEVEL for a stable display. Adjust C760 for a flat topped square-wave.

b. It may be necessary to dress the CRT deflection plate leads to effect proper adjustment of C760.

18. HORIZONTAL COMPENSATION

a. Setup

Interchange TYPE 2B67 and CRT deflection plate capacitance normalizer.

18. (cont'd)

b. Adjust CRT horizontal compensation, C761: flat topped waveform ±1 trace width, max

Adjust C761 for a flat topped square-wave. Remove the CRT deflection plate capacitance normalizer and place a TYPE 2A60 in the right compartment.

19. CRT HORIZONTAL DEFLECTION FACTOR AND ELECTRICAL CENTER

a. Check CRT horizontal deflection factor: 17.5V to 19.25V/division

Set the multimeter to a range suitable to measure 195 VDC and connect the meter leads to the CRT horizontal deflection plate leads. Set the trace to the left graticule line and note the meter reading. Move the trace to the right graticule line. Reverse the meter polarity and note the meter reading. Total voltage change must be between 175 and 192.5V

b. Check CRT horizontal electrical center: ±0.8 div, max

Connect the horizontal deflection plates together with a short jumper. Note the displacement of the trace from graticule center.

20. INTERNAL TRIGGER

a. Setup

Connect a 50Ω cable from the .5V calibrator BNC connector to TYPE 2A60 INPUT. Set the CALIBRATOR switch to 20 kHz.

b. Check internal triggering + & - triggering on 1 minor div signal

Set the TYPE 2A60 VOLTS/DIV and VARIABLE for one minor div of display amplitude. Adjust the TYPE 2B67 TRIGGERING LEVEL for a stable display. Move the TYPE 2B67 SLOPE switch between + and - and check that the TYPE 2B67 can be triggered on both slopes. Remove the 50Ω cable from TYPE 2A60 INPUT. The trace should disappear. Interchange TYPE 2A60 and TYPE 2B67 plug-in units and again check internal triggering.

21. LINE TRIGGERING

a. Setup

Connect a 10X probe to TYPE 2A60 INPUT. Connect the probe tip to 115 VAC at the line selector.

b. Check line triggering: correct slope + and - in both plug-in compartments

Check that the TYPE 2B67 triggers on the proper slope as the TRIGGERING SLOPE switch is changed from + to -. Interchange TYPE 2A60 and TYPE 2B67 plug-in units and again check that the TYPE 2B67 triggers on the proper slope.

22. INTERNAL INTENSIFYING CIRCUIT

a. Setup

Install a TYPE 3B1 in the right compartment and a TYPE 2A60 in the left compartment. Preset the TYPE 3B1 controls as follows:

TIME/DIV	1mSEC
DELAY TIME RANGE	.1mSEC
DELAYED SWEEP TRIGGERING	
SLOPE	+
COUPLING	AC
SOURCE	INT
MODE	NORM
NORMAL OR DELAYING SWEEP TRIGGERING	
SLOPE	+
COUPLING	AUTO
SOURCE	INT

b. Check internal intensifying input

Change the TYPE 3B1 MODE to INTEN and check for an intensified portion of the trace.

23. INTERCONNECTING PLUGS

Turn TYPE 568 POWER off. Connect the Digital instruments continuity test unit and check interconnecting plugs as in the following table:

23. (cont'd)

J12 & J22 to J101		("Y" Adapter cable & TYPE 230 Accessory Cable)
Upper	Lower	Continuity
1	1	yes
2	2	yes
3	3	yes
4	4	no
5	5	no
6	6	yes
7	7	yes
8	8	yes
9	9	yes
10	10	yes
11	11	yes
12	12	no
13	13	no
14	14	no
15	15	no
16	16	yes
17	17	no
18	18	no
19	19	no
20	20	yes
21	21	yes
22	22	yes
23	23	yes
24	24	no
25	25	yes
26	26	yes
27	27	yes
28	28	yes
29	29	yes
30	30	yes
31	31	yes
32	32	yes
33	33	yes
34	34	yes
35	35	yes

(Adapter cable & TYPE 230 Accessory cable).

J24 to J224		
Upper	Lower	Continuity
1 thru 30		yes

J14 to J214		
Upper	Lower	Continuity
1 thru 30		yes

THE END