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570

TYPE 570 CHARACTERISTIC CURVE TRACER

FACTORY

CALIBRATION PROCEDURE

First, make a visual mechanical inspection. Check for long ends, unsoldered joints, wire dress, etc. Preset all pots and trimmers to mid-range, and preset front panel controls as follows:

<u>RANGE DC VOLTS</u>	<u>VOLT METER</u>	<u>140</u>	<u>+400 - C484</u>
<u>INDICATION</u>		<u>+DC</u>	<u>+400 - C505</u>
<u>STEPS/FAMILY</u>		mid-range	
<u>STEPS/SEC</u>		<u>120 (ccw)</u>	<u>-300 - C506</u>
<u>START ADJUST</u>	<u>GRID-STEP GENERATOR</u>	mid-range	<u>+100 #3 V515</u>
<u>VOLTS/STEP</u>		<u>1</u>	
<u>VERTICAL</u>		<u>PLATE</u>	
<u>MA/DIV</u>		<u>1</u>	
<u>HORIZONTAL</u>	<u>CRT DISPLAY</u>	<u>PLATE</u>	
<u>VOLTS/DIV</u>		<u>1</u>	
<u>PEAK VOLTS</u>		<u>100</u>	
<u>SERIES LOAD</u>	<u>PLATE SWEEP GENERATOR</u>	<u>10K</u>	
<u>HEATER</u>		<u>6.3 3.15</u>	
<u>VARIABLE (HEATER)</u>		full left (ccw)	
<u>+DC</u>		<u>100</u>	
<u>VARIABLE (+DC)</u>	<u>OPERATING VOLTAGES</u>	full right (cw)	
<u>-DC</u>		full left (ccw)	
<u>MAIN POWER</u>		<u>OFF</u>	
<u>TEST POWER</u>		<u>ON</u>	

Do #19 (check value of Series Load Resistors)

- CHECK RESISTANCE TO GROUND OF TRANSFORMER PRIMARY AND ALL LOW-VOLTAGE SUPPLIES.

With the TEST POWER switch ON, the resistance to ground should be approximately:

Main Supply:	-150v	10KΩ	Floating Supply:	+400v	over 100K ohms
	+100v	20KΩ		-300v	over 100K ohms
	+300v	30KΩ			
	+400	30KΩ			

Check transformer primary for infinite resistance to ground. Check the -150 27K jack on the Test Panel for 27KΩ between the jack and the -150v supply. *Test power switch on.*

- ADJUST -150 AND CHECK RIPPLE AND REGULATION.

Turn the MAIN POWER switch ON. Set the -150 ADJ. for exactly +100v at the +DC jack on the Test Panel. Check the -150v, +100v and 300 v supplies to be within ±2% of their rated value. Unregulated supplies may vary from their rated value by approximately 5%. Maximum ripple on all supplies is as follows:

-150v	--	5mv	+400	--	4.5v (unregulated)
+100v	--	5mv	+400	--	.5v (floating supply)
+300v	--	30mv (usually higher at 105v ac line)	-300	--	.5v (floating supply)

Check regulation of all supplies between 105v and 125v ac line.

3. ADJUST THE HIGH-VOLTAGE SUPPLY.

Set the -1700 ADJ. for -1700v at the crt filament leads. Check hv regulation at maximum intensity.

4. CHECK RANGE DC VOLTS OF VOLTMETER AGAINST STANDARD METER AND +DC SUPPLY.

With an accurate volt meter on the +DC jack on the Test Panel, compare the readings on the front panel meter against the test meter. The meter accuracy should be within ±2% on all ranges and should be checked as follows:

RANGE DC VOLTS

INDICATION

700
350
140
70
35
14
7

Check at 300v

Check at 300v, 200v and 100v

Set meter to indicate 70v

Check for 70v, set meter to indicate 35v

Check for 35v, set meter to indicate 14v

Check for 14v, set meter to indicate 7v

Check for 7v

Select V525 for low gm so that variable plus DC control will lower meter indication to proper minimum voltage

no make!

5. CHECK THE OPERATION OF THE -DC CONTROL.

Vary the -DC control through its range for an indication from 0 to -100v on the panel meter and at the -DC jack.

6. CHECK (GRID A, GRID B AND -150 27K) OUTPUT JACKS FOR PROPER VOLTAGES.

With the TEST POSITION switch at GRID A or OFF, the GRID B jack on the Test Panel should be biased about -125v. When the TEST POSITION switch is at GRID B or OFF, the GRID A jack should read approximately -125v. The -150 27K jack should read -150v. *Reads about 70volts with 20k volt meter*

Turn the TEST POWER switch on. Advance the INTENSITY control and position the spot to the central area of the graticule. Check the FOCUS and ASTIGMATISM controls for proper operation. Obtain a horizontal trace by switching HORIZONTAL VOLTS/DIV to .2, or for sufficient horizontal trace to align with the graticule. Push crt against graticule and align trace with the horizontal graticule lines. Tighten crt clamp.

7. ADJUST PHASE A AND B.

Obtain a vertical bar pattern by switching the HORIZONTAL control to GRID, patch the P jack to one of the ground jacks on the Test Panel. Adjust the STEPS/FAMILY control for 6 to 10 steps. With the STEPS/SEC control at the 120 (ccw) position, adjust the PHASE ADJ A control for optimum flatness at the bottom of the display. With the STEPS/SEC control at the 120 (cw) position, adjust the PHASE ADJ B control for optimum flatness at the top of the display. Check the 240 STEPS/SEC position for alternate switching.

8. SET CRT GEOM. ADJ.

With the same display as in Step 7, adjust GEOM ADJ for minimum curvature of the vertical traces. (1 minor division of bow allowed per 6 major divisions.)

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below s/n 5122

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9. ADJUST VERT. GAIN AND CHECK VERTICAL MA/DIV SWITCH.

0.1 above
5121

Switch the VERTICAL (CRT DISPLAY) to SCREEN and the MA/DIV control to 10. Switch the INDICATION control to +DC and set the +DC VARIABLE control for exactly 140v. Switch the meter to HTR and position the spot to the bottom graticule line. Switch the meter to +DC and adjust the VERT GAIN ADJ for a deflection of 10 divisions. Switch back and forth between the HTR and +DC positions until all interaction has been compensated for.

Adjust the +DC VARIABLE control for 100v and switch the INDICATION control to HTR. Switch the VERTICAL MA/DIV control to 50 and position the spot to the bottom graticule line. Plug the special calibrator/unit into the +DC jack and ground jack on the Test Panel. There should now be 2 divisions of deflection. Switch the VERTICAL MA/DIV control to 20 for 5 divisions of deflection, and then to 10 for 10 divisions of deflection. Check all positions of the VERTICAL MA/DIV control using the special calibrator unit. The accuracy must be within $\pm 3\%$.

HORIZ.

10. ADJUST VOLTS/DIV BAL.

Connect the P jack to the K jack on the test panel. Switch HORIZONTAL to PLATE. Rotate the VOLTS/DIV switch and adjust the VOLTS/DIV BAL (under the chassis) for no horizontal shifting of the spot.

Keep peak volts to less than 100v.

11. SET VOLTS/STEP ZERO ADJ.

Switch the HORIZONTAL control to GRID and VOLTS/DIV to .1. Turn the START ADJUST full left (ccw). Ground pin 8 of V115. Depress the ZERO BIAS button and place the spot under the center graticule line. Release the switch and with the VOLTS/STEP ZERO ADJ. return the spot to the center. Remove ground.

12. CHECK START ADJUST POSITION AND RANGE.

With the START ADJUST in the full left (ccw) position, the first step should be slightly to the left of the zero bias point. With the control in the full right position, there should be 6 or more steps to the right of the zero bias point. The index on the START ADJUST knob should point to the 0 on the front panel when the first step is at the zero bias point.

13. ADJUST HOR. GAIN.

CAREFUL !!!
DO NOT GND DC

With the +DC control at 100, switch the HORIZONTAL control to PLATE. Switch the VOLTS/DIV control to 10 and the SERIES LOAD control to 1M. Alternately connect the P jack on the Test Panel between GND and +DC. Adjust the HOR. GAIN for 10 divisions of deflection.

14. SET THE VOLTS/STEP ADJ.

Switch the HORIZONTAL control to GRID and the VOLTS/DIV control to .1. Switch the VOLTS/STEP control to .1. Set the VOLTS/STEP ADJ. for 1 step per graticule division.

15. SET VOLTS/DIV CAL (R227).

Switch HORIZONTAL VOLTS/DIV control to 10 and the VOLTS/STEP control to 10. Adjust R227 (on HORIZONTAL VOLTS/DIV switch) for 1 step per graticule division. The horizontal gain and the setting of R227 will interact; therefore, Steps 13, 14 and 15 must be rechecked until all interaction is minimized. Check all positions of the VOLTS/STEP switch against the VOLTS/DIV switch.

check if 725 is operative
have at least 7 to 8 div
vert upward positioning of trace

16. ADJUST MIN. NO. CURVES TO 4 CURVES AND CHECK MAXIMUM NUMBER.

Turn the STEPS/FAMILY control full left (ccw) and adjust the MIN. NO. CURVES control for four steps (5 dots). Turn the STEPS/FAMILY control right (cw) and check to see that there are at least 12 steps before the generator drops out. With the STEPS/FAMILY in the full right position, check the SINGLE FAMILY button for a single display of steps.

17. ADJUST R350 AND CHECK ALL HEATER SWITCH POSITIONS.

Plug an accurate ac voltmeter into the HTR connector on the Test Panel and adjust the VARIABLE HEATER control for an output voltage of exactly 6.3v. Set the INDICATION control to HTR and adjust R350 (mounted on the INDICATION switch) for a reading of 100% on the meter. Connect the P jack on the Test Panel to GND and position the spot under the left hand graticule line. Now connect the P jack to the HTR jack and observe a horizontal deflection. Check through the entire range of the HEATER switch keeping the VARIABLE control set to 100% ($\pm 5\%$) at all times.

<u>HEATER</u> (volts)	<u>VOLTS/DIV</u>	Deflections (divisions)
1.25	.2	8.8
1.4	.2	9.9
2.0	.3	5.6
2.35	.3	6.6
2.5	.3	7.0
3.15	.3	8.9
4.2	1	5.9
4.7	1	6.6
5.0	1	7.0
6.3	1	8.9
7.5	2	5.3
12.6	2	8.9
18.9	5	5.3
25	5	7.0
35	5	9.9
50	10	7.0
117	20	8.3

Handwritten calculations:

$$\begin{array}{r} 12.6 \\ 1.41 \\ \hline 12.6 \\ 504 \\ \hline 126 \\ \hline 17.765 \end{array}$$

18. CHECK PLATE SWEEP PEAK VOLTS SWITCH.

With the HORIZONTAL VOLTS/DIV control at .5 and PLATE and the SERIES LOAD at 300, check all positions of the PEAK VOLTS switch for the proper horizontal deflection.

Handwritten note: X 50

<u>VOLTS/DIV</u>	<u>PEAK VOLTS</u>	Deflection
.5	5	10 divisions
1	10	10
2	20	10
3	50	10
10	100	10
20	200	10
50	300	6
50	500	10

19. CHECK VALUE OF SERIES LOAD RESISTORS.

Measure between pin 3 of V315 and the P connector on the Test Panel. Check all positions of the SERIES LOAD resistor switch for the same resistance as indicated on the panel. *Keep indication in heater position $\pm 5\%$*

($\pm 5\%$)	300	- 0 Ω	2K	- 1750 Ω
<i>all others same as panel</i>	1K	- 750 Ω	5K	4750 Ω

20. ADJUST PLATE SWEEP (C311) AND PLATE TRANS. (C315) BALANCE CAPACITORS.

Switch the VERTICAL MA/DIV control to .02 and PLATE. Switch PEAK VOLTS to 500 and SERIES LOAD to 1M. Connect the ungrounded side of C315 to either terminal 5 or 7 of T310. C316 (terminal 5 to ground) may have to be moved to terminal 7 or removed in order to get minimum deflection. Both C315 and C311 are adjusted for a minimum trace width.

21. ADJUST GRID (C502) AND SCREEN (C509) BALANCE CAPACITORS.

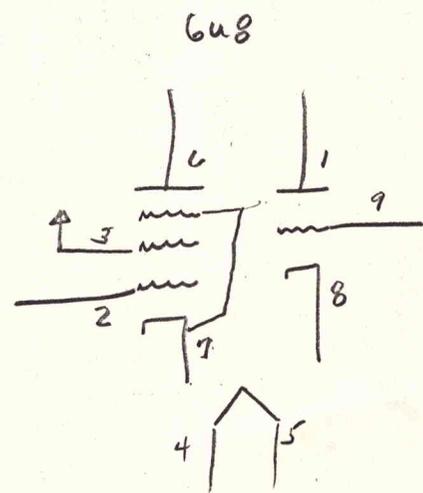
Switch the VERTICAL control to GRID. C502 can be connected to either terminal 14 or 16 of T501. Adjust C502 for a minimum trace width. Switch the VERTICAL control to SCREEN. C509 can be connected to either terminal 7 or 9 of T501. Adjust C509 for a minimum trace width. Recheck the setting of C502 since there will be a slight interaction between C502 and C509.

22. PLACE A 6U8 IN POSITION, ADJUST C205 AND CHECK ZERO BIAS AND SINGLE FAMILY SWITCHES.

Switch TEST POWER to OFF. Insert a 6U8 in the test socket and make all necessary connections from the pin jacks to the Test Panel. Set up the GRID-STEP GENERATOR and the CRT DISPLAY for the typical operating conditions of the tube under test. Switch the TEST POWER ON and adjust the OPERATING VOLTAGES and the PLATE SWEEP GENERATOR. Switch TEST POSITION switch to GRID A or B and observe a display of curves. Turn the VOLTS/DIV control to 20 or 50 and adjust C205 for optimum retrace. Check the operation of the SINGLE FAMILY control with the STEPS/FAMILY control turned full right (cw).

23. CHECK ALL ACCESSORIES. (ON Q.C.)

24. RECORD CRT TYPE AND SERIAL NUMBER ON THE CALIBRATION RECORD.



PK	volts	100
Series Load		10K
Htr		6.3V
DC		+100
Horiz		10 v/step
Vert		
Grid	volts/step	

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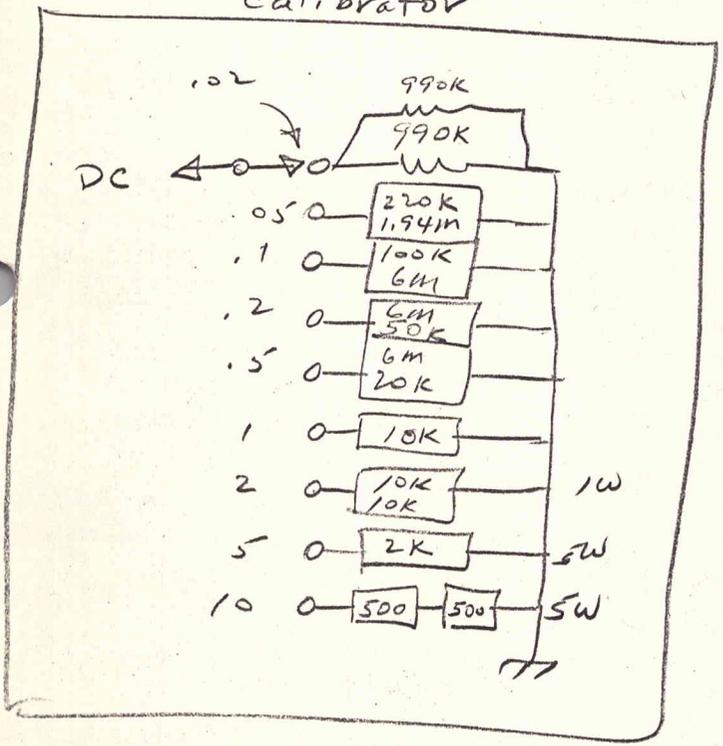
Mod 90102 - Shunt R536 with 10-22 mΩ 1/2W 15%
to bring +100 into proper value.

Mod #90104 - Shunt 228 (47k) with 820K 1/2W 15% when
horizontal 1/div cal won't come in.

6AX5 V505 - change to bring TV meter indicating
within specs.

With Vert CRT Display in PLATE
and grounding P jack, the rectified
pulses from plate sweep generator
are applied to vert "pot chain" to
produce horizontal bars. Grounding
"P" jack grounds cathodes of Plate
sweep rectifiers, and current thru
center tap of transformer passes
thru vert attenuators

calibrator



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