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## Type 53C CALIBRATION PROCEDURE

The 530 series oscilloscope used should have been previously checked for power supply outputs, power supply ripple and regulation, vertical amplifier gain, vertical amplifier band pass, and calibrator accuracy.

The EP53 plug-in extension is necessary to allow access to the input attenuators and the peaking coils.

1. Determine zero input vertical level of scope (jumper plug-in outputs together and observe the vertical level of the trace).

2. Adjust "vert pos range"

   Jumper pin 5 of V4553 to pin 5 of V4563 and adj. "vert pos range" to level determined in step 1.

   Remove jumper.

3. Adjust "multi stability."

   OPERATING MODE to alternate sweeps.

   Free run the main sweep and adjust "multi stability" for stable switching at the end of each sweep. Check all sweep ranges.

4. Adjust DC BAL

   OPERATING MODE to alternate sweeps.

   Free run the sweep and adjust AMPL A DC BAL so the VARIABLE ATTEN for the A section does not shift the A trace. Adjust AMPL B DC BAL so the VARIABLE ATTEN for the B section does not shift the B trace.

   With front panel VERT POSITION controls between 3 and 9 o'clock both traces should be in the graticule with the A trace on top. If not, select 6BQ7's and/or 12AU7's and repeat this complete step.

5. Adjust "chopping rate."

   OPERATING MODE switch to chopped.

   Set the TIME/CM to 1 microsec/cm and adjust "chopping rate" for 10 cm/cycle. Chopping square wave must be symmetrical within 10%, if not select V3803.

   Set TIME/CM to 10 μsec/cm and adjust C3613 and C3653 for best square wave. Adjust C3583 and C4583 for minimum spiking. Use Use no more than 1 cm vertical defl for these adjustments.

Adjustment of C3583 and C4583 will be different when the 1 cm is positioned at the top of the graticule or at the bottom, compromise between the two positions.

6. Check for hum and microphonics.

With the VARIABLE ATTEN control to its most sensitive position there should be no noticeable hum on the trace. Microphonics should not exceed 2 mm.

7. Adjust the vertical gain.

OPERATING MODE to A only

VOLTS/CM to .05

VARIABLE ATTEN clockwise.

With .2 volts in from the calibrator adjust R3563 ("Ampl A gain adj") for 4 cm.

8. Check attenuation ratios.

VOLTS/CM to .05

CALIBRATOR to .5 volts

Adj VARIABLE ATTEN control for 5 cm deflection

Rotate the VOLTS/CM control counter clockwise and at the same time rotate the CALIBRATOR switch clockwise. 5 cm deflection should result from each pair of switch positions within 3%.

9. Repeat steps 7 and 8 for the B amplifier.

Adjust R4563 ("ampl B gain adj")

10. Standardize the input capacitance of the A channel.

OPERATING MODE to A only.

VOLTS/CM to .05

VARIABLE ATTEN clockwise

1 kc from 105 to INPUT A through a 530 standards probe.

With POLARITY on normal dc adjust C3223 for best square wave.

Switch POLARITY to inverted dc and adjust C3273 for best square wave.

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11. Compensate the attenuators for A channel

VARIABLE ATTEN clockwise

1 kc from 105 through a 530 standards probe

Adjust for best square wave as follows:

| VOLTS/CM | Adjust |
|---|---|
| .1 | C3143B<br>C3153B |
| .2 | C3113B<br>C3123B |
| .5 | C3083<br>C3093 |
| 5.0 | C3053<br>C3063 |

Check all other attenuator ranges for proper "stacking" of attenuators. There should be no more than 1 mm of spike on a 6 cm square wave. If excessive spiking is present, check the dc value of the input resistance. R3203 should be 1 meg ±1%.

12. Standardize the input capacitance of the B channel.

OPERATING MODE to B only

VOLTS/CM to .05

VARIABLE ATTEN clockwise

1 kc from 105 to INPUT B through a 530 standards probe.

With POLARITY on normal dc adjust C4223 for best square wave.

Switch POLARITY to inverted dc and adjust C4273 for best square wave.

13. Compensate the attenuators for B channel.

VARIABLE ATTEN clockwise.

1 kc from 105 through a 530 standards probe.

Adjust for best square wave as follows:

| VOLTS/CM | Adjust |
|---|---|
| .1 | C4143B |
| | C4153B |
| .2 | C4113B |
| | C4123B |
| .5 | C4083 |
| | C4093 |
| 5.0 | C4053 |
| | C4063 |

Check all other attenuator ranges for proper "stacking" of attenuators. There should be no more than 1 mm of spike on a 6 cm square wave. If excessive spiking is present, check the dc value of the input resistance. R4203 should be 1 meg ±1%.

14. Adjust high-frequency compensation.

350 kc from 105 properly terminated (termination to match the cable used) into either input and adjust C3613, C3653, L3603, and L4603 for best square wave.

15. Check bandpass.

Remove EP53 extension and plug unit directly into scope. Should be no more than 3 db down at 8.5 mc through either channel.

16. Check dc output level.

The voltage at pin 1 and 3 of the amphenol connector must be between 65 and 70 volts with the trace centered.