

## SECTION 5

### SAFETY RELATED ADJUSTMENTS

When exchanging ☒ part check HV hold-down circuit, HV regulation circuit, LOW B protector circuit and beam current protector circuit.

☒ R33, R34 [HV hold-down] PA board  
☒ IC2, Q7, D9, D12, C13, R20, R21, R22, R23, R24, R32, R33, R34, R35, R36, R82, HV BLOCK, PA mount

☒ R41, R42 [HV regulation] PA board  
☒ IC1, IC6, IC7, IC8, IC9, D13, C16, R37, R38, R39, R40, R41, R42, R53, R55, R56, R58, R59, R129, X1, HV BLOCK, PA mount, PB mount

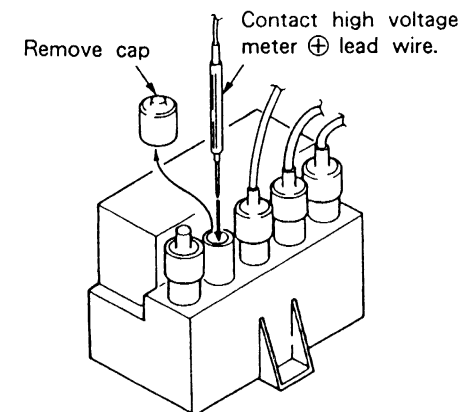
☒ R29, R30 [LOW B protector] PA board  
☒ IC1, IC3, IC5, Q8, D4, D5, D10, D11, R9, R10, R26, R28, R29, R30, R31, R88, R95, PA mount, R733 (CD board)

☒ R1, R4 [Beam current protector] PA board  
☒ IC2, IC3, IC5, Q1, Q2, Q7, Q8, D4, D5, D9, R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R20, R21, R22, R23, R24, R43, R44, R45, R46, R47, R82, R88, R119, R120, R121, R122, R733 (DA board), PA mount, PB mount

#### ☒ R33, R34 : HV Hold-down

1. Confirm set power is turned OFF.
2. Connect high voltage meter  $\oplus$  to HV filter vacant terminal and  $\ominus$  to chassis earth.
3. Remove resistance mounted between PA board TP7 – TP9 . Connect variable resistor and set at  $47K\Omega$ .
4. Remove resistance mounted between PA board TP10 – TP12. Connect variable resistor and set at  $27K\Omega$ .
5. Turn RV1 fully counterclockwise.
6. Turn set power ON.
7. Input monoscope signal, and set CONTR and BRT at maximum.
8. Turn variable resistor between TP10 – TP12 to change resistance value and adjust high voltage to around  $34.0\pm 0.3KV$ .
9. Turn variable resistor between TP7 – TP9 to change resistance value, adjust high voltage to around  $34.0\pm 0.3KV$ , and confirm hold-down circuit operates and raster disappears.
10. Turn set power OFF.
11. Remove variable resistor between TP7 – TP9 . Measure the volume resistance value and solder on the same amount of resistance to R33, R34 (carbon, 1/4W).

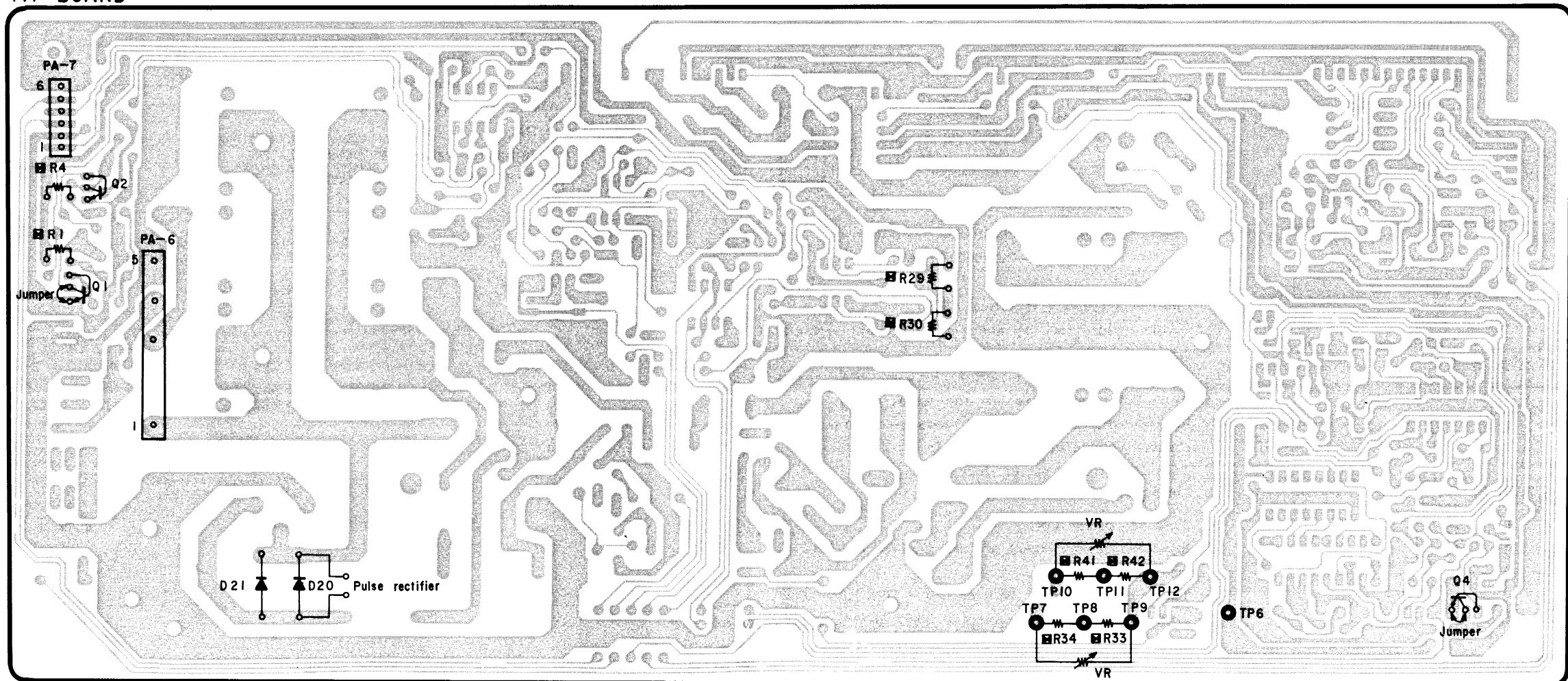
12. Next, slightly raise volume resistance value between TP10 – TP12.
13. Turn set power ON.
14. Turn variable resistor between TP10 – TP12 again and raise high voltage. Confirm hold-down circuit operates at  $34.0\pm 0.3KV$  and raster disappears.
15. Next, adjust HV regulation.



#### ☒ R41, R42 : HV regulation

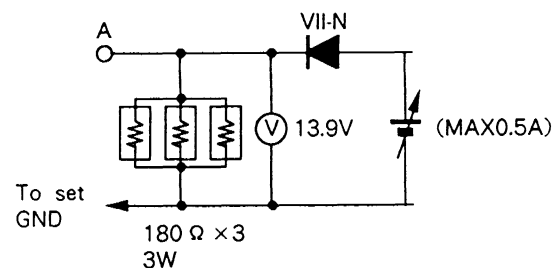
1. Confirm set power is OFF.
2. Connect high voltage meter  $\oplus$  to HV filter vacant terminal and  $\ominus$  to chassis earth.
3. Set variable resistor between PA board TP10 – TP12 to  $27K\Omega$ .
4. Turn set power ON.
5. Press CUT-OFF key and cut-off R, G, B.
6. Turn variable resistor between TP10 – TP12 to change resistance value and adjust high voltage to around  $33.0\pm 0.3KV$ .
7. Turn set power OFF.
8. Remove variable resistor between TP10 – TP12. Measure the volume resistance value and solder on the same amount of resistance to R41, R42 (carbon, 1/4W).
9. Turn set power OFF.
10. Confirm high voltage meter reads  $33.0\pm 0.3KV$ .
11. Turn set power OFF and remove high voltage meter.

#### PA BOARD



**R29, R30 : LOW B Protector**

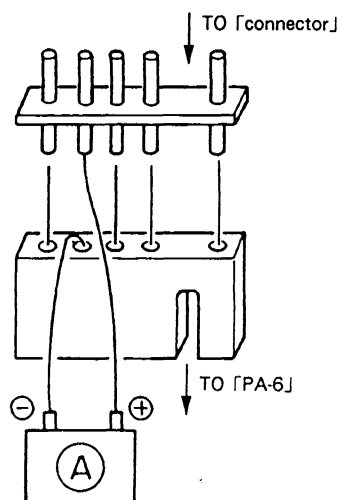
- Prepare jig circuit as shown in figure.
- Adjust until high voltage meter shows 13.9V.



1. Turn set power ON.
2. Contact jig circuit A point to PA board TP6 (12V line) for 0.5–1 sec, and remove immediately. Confirm power turns OFF when doing so.
3. If power does not turn OFF, adjust R29, R39.

**R1, R4 : Beam Current Protector**

1. Confirm set power is turned OFF.
2. Disconnect PA board connector PA-6 and connect jig shown in figure.
3. Short circuit PA board Q1 emitter and collector.
4. Turn set power ON.
5. Input monoscope signal, send beam current by CONTR, BRT and G2VR, and confirm protector circuit operates at under  $4700\mu\text{A}$  and raster is erased.
6. If protector circuit does not operate, adjust R4.
7. Remove jig short-circuiting Q1 emitter and collector.
8. Next, short-circuit Q4 emitter and collector.
9. Turn set power ON.
10. Send beam current by CONTR, BRT and G2VR, and confirm protector operates at under  $4700\mu\text{A}$  and raster is erased.
11. When protector does not operate, adjust R1.
12. Remove jig short-circuiting Q4 emitter and collector.

**To Check without Using High Voltage Meter****R33, R34 : HV Hold-down**

1. Use voltage dividing network shown in figure to calibrate detection unit.

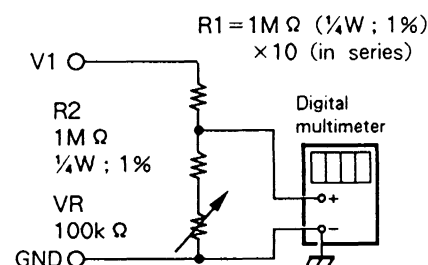
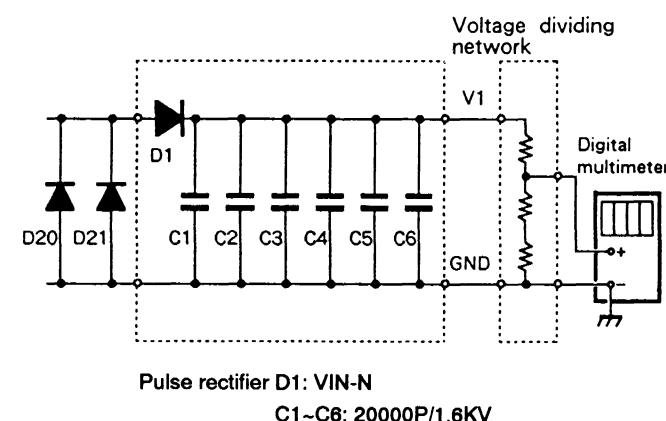


Fig. 1 : Voltage dividing network

2. Remove PA board connector (PA-7) to hold down high voltage. Connect V1 to 100V line of set and read V1 voltage with digital multimeter. Next, adjust volume (VR) so that digital multimeter value is  $1/10$  of V1.
3. Connect pulse rectifier between PA board D20 or D21 anode and cathode.

Pulse rectifier D1: VIN-N  
C1~C6: 20000P/1.6KV

4. Confirm set power is turned OFF.
5. Confirm pulse rectifier and voltage dividing network are connected.
6. Remove resistance mounted between PA board TP7 – TP9, connect volume and set at  $47\text{K}\Omega$ .
7. Remove resistance mounted between TP10 – TP12, connect volume and set at  $27\text{K}\Omega$ .
8. Turn RV1 fully counter clockwise. Connect PA board connector (PA-7).
9. Turn set power ON.
10. Input monoscope signal, and set CONTR and BRT at maximum.
11. Turn variable resistor between TP10 – TP12 and adjust until digital multimeter value is  $96.5\pm 0.5\text{VDC}$ .

12. Turn variable resistor between TP7 – TP9, and confirm hold-down circuit operates and raster is erased when digital multimeter is  $96.5\pm 0.5\text{VDC}$ .
13. Turn set power OFF.
14. Remove volume between TP9 – TP11. Measure the volume resistance value and solder on the same resistance volume to R33, R34 (carbon, 1/4W).
15. Slightly raise volume resistance between TP10 – TP12.
16. Turn set power ON.
17. Turn volume between TP10 – TP12 and confirm hold-down circuit operates and raster is erased when digital multimeter value is  $96.5\pm 0.5\text{VDC}$ .
18. Next, adjust HV regulation.

**R41, R42 : HV Regulation**

1. Confirm set power is OFF.
2. Set variable resistor between PA board TP10 – TP12 at  $27\text{K}\Omega$ .
3. Turn set power ON.
4. Press CUT-OFF key to cut-off R, G, B.
5. Turn variable resistor between TP10 – TP12 and change resistance value. Confirm digital multimeter value is  $83.5\pm 0.5\text{VDC}$ .
6. Turn set power OFF.
7. Remove TP10 – TP12 variable resistor. Measure the volume resistance value and solder on the same resistance volume to R41, R42 (carbon, 1/4W).
8. Turn set power ON.
9. Confirm digital multimeter value is  $83.5\pm 0.5\text{VDC}$ .
10. Turn set power OFF and remove pulse rectifier.