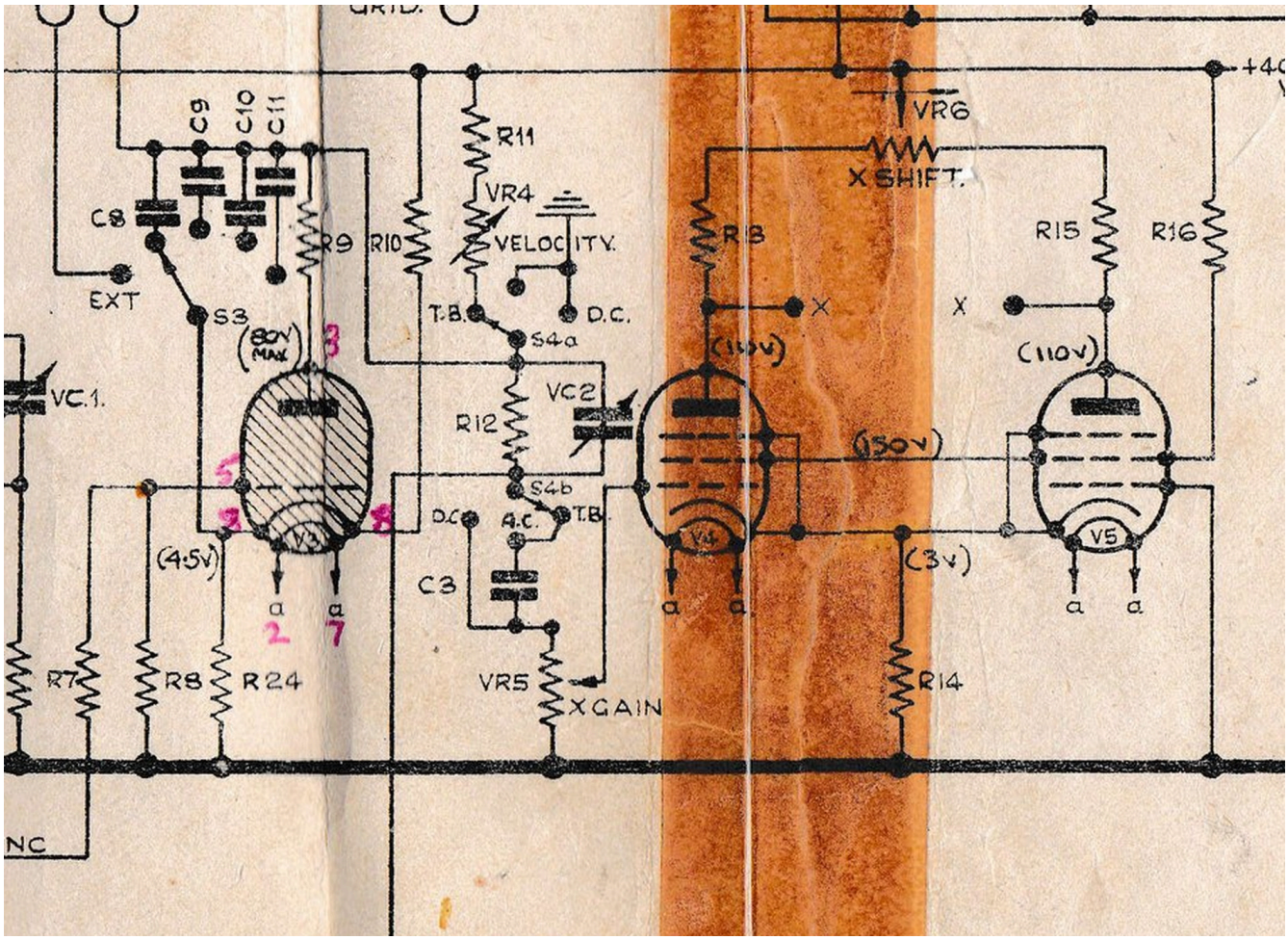
1200B: spot but no trace – time base and X amplifier check sheet

Fault (5 October 2026): after C5, C6 (EHT) and C7 (HT smoothing) were replaced, the scope shows a spot but no horizontal trace. **Keep BRILLIANCE low while the spot is still.**

Circuit section: time base V3 and X amplifier V4, V5



How it works: V3 is a gas triode. C8–C11 (chosen by S3) charge from +400 V through R11 and VELOCITY (VR4) until V3 strikes and discharges them. That makes a sawtooth of up to **80 V** on V3's anode. With S4 on T.B., S4a and S4b take the sawtooth through R12 to V4's grid, with VC2 as a speed-up capacitor. V4 and V5 are a cathode-coupled push-pull pair (R14 is the common cathode resistor) driving the X plates from anodes X and X. X SHIFT (VR6) sets the balance of the two anode loads, R13 and R15.

Valve bases (seen from underneath, pins counted clockwise from the key)

EF36 (V4, V5) – international octal, with the control grid on the top cap

Pin	Electrode	Expected (from the circuit)
1	Metallising (shield)	0 V (earthed, or joined to the cathode)
2	Heater	6.3 V AC between pins 2 and 7
3	**Anode**	**About 110 V**, both valves within about 10 %

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4	**Screen (g2)**	**About 150 V**
5	Suppressor (g3)	Joined to the cathode
7	Heater	See pin 2
8	**Cathode**	**About 3 V** (V4 and V5 share R14)
Top cap	**Control grid (g1)**	About 0 V DC

V3, 6K25: Mazda helium-filled thyratron (= CV2217 / T41), 6.3 V 0.95 A heater

International octal: 1 metallising, 2 heater, 3 anode, 4 no connection, 5 grid, 6 no connection, 7 heater, 8 cathode. This matches the pencil numbers on the drawing. It drops about 40 V when conducting. The 884/6Q5G uses the same base and could stand in.

Pin	Electrode	Expected
2	Heater	6.3 V AC between pins 2 and 7
3	**Anode**	Sawtooth up to **80 V**. A DC meter reads roughly 30–60 V when it's running
5	**Grid**	A few volts negative of the cathode, fed from SYNC via R7, with R8 to earth
7	Heater	See pin 2
8	**Cathode**	About **4.5 V** (R24 to earth)

You can see a faint blue or violet glow in V3 while it is running.

What the readings mean

V3 anode (DC meter, S4 on T.B.)	Likely fault
Near +400 V, no glow	V3 isn't striking. Check V3's heater, R24, R8 (the drawing says "R8 adjust in test"), the grid bias and the valve itself
Near 0 V	No charging current. Check R11, VR4 (a worn track is common), R9, the S3 contacts, and C8–C11 for a short
30–60 V and glowing	The time base is running. Check the wire from V3 to S4a, R12, S4b and V4's top cap

V4/V5 readings	Likely fault
Both anodes at about 400 V, cathodes at 0 V	No emission (heater?) or no screen volts. Check pin 4 and the heaters
Both anodes at 0 V	No HT to R13/R15/VR6. Check the +400 V line next to the new C7
One anode high, the other low, and X SHIFT has no effect	VR6 is open, or one valve is dead

HT check points: V7 cathode **about 430 V**; the +400 V line after R20 **about 400 V**; R21/R22 junction (the final anode) **about 110 V**. Make sure the new electrolytics' negatives are on chassis and that **8 µF is on the reservoir side and 16 µF is after R20**.

Safety: the EHT is about −800 V and the HT 430 V. Discharge C5, C6 and C7 before touching anything. Film EHT caps hold their charge for a long time.

Reading	Value
X SHIFT moves the spot?	___
Line on screen with S4 on A.C. and a finger on X?	___

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V3 glow?	___
V3 anode / cathode / grid	___ / ___ / ___
V4 anode / screen / cathode	___ / ___ / ___
V5 anode / screen / cathode	___ / ___ / ___
HT: V7 cathode / +400 V line	___ / ___

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