

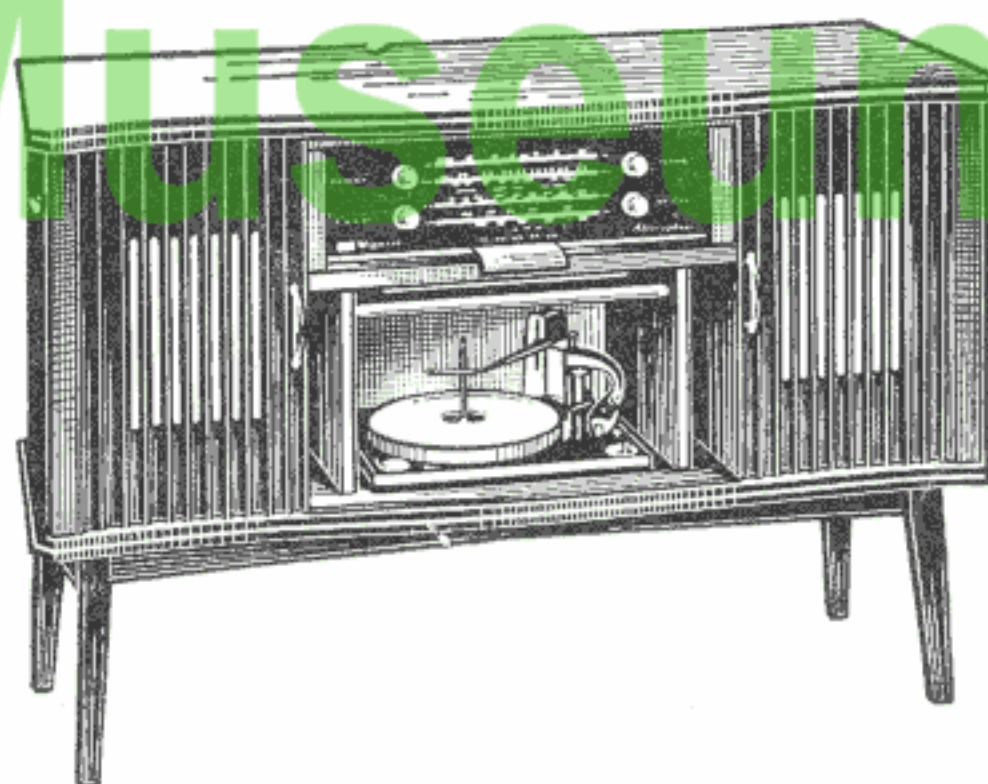
C·R·T·S

SERVICE MANUAL

Covering KB Model

WG 15

Stereophonic Radiogram



KB Museum.org.uk

A DIVISION OF

STC

Issued DECEMBER 1963

COMBINED RADIO AND TELEVISION SERVICE LTD

REGENT WORKS, SIDCUP, KENT. Tel: FOOTscray 3333


SERVICING ORGANISATION FOR K.B. REGENTONE. R.G.D.

ALSO PROVINCIAL DEPOT AT
87 McALPINE STREET,
GLASGOW
CENTral 1779

Service Data

for

WG 15

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GENERAL INFORMATION

The WG15 is a stereophonic radiogram, capable of receiving A.M. broadcast signals in the short, medium and long wavebands, and F.M. broadcast signals in Band II. A 4-speed record changer suitable for 7 inch, 10 inch and 12 inch records is incorporated.

The cabinet has record storage included, and tambour doors enclose the radio and gramophone unit.

WAVE RANGES

Long wave	-	-	-	-	-	-	-	142-290 Kc/s.
Medium wave	-	-	-	-	-	-	-	525-1630 Kc/s.
Short wave	-	-	-	-	-	-	-	6-18.75 Mc/s.
VHF/FM	-	-	-	-	-	-	-	87-101 Mc/s.

POWER OUTPUT (each channel):

3 watts.

CONTROLS

Right-hand Control (Upper)	-	-	-	Tuning
Right-hand Control (Lower)	-	-	-	On/Off — Tone.
Left-hand Control (Upper)	-	-	-	Volume
Left-hand Control (Lower)	-	-	-	Balance
Push-Button Switches (Five)	-	-	-	VHF/FM, short-wave, medium-wave, long-wave, gram.

DIMENSIONS

Height (on Legs)	-	-	-	-	-	26½ inches (67 cms)
Width	-	-	-	-	-	40¾ inches (104 cms)
Depth	-	-	-	-	-	16½ inches (42 cms)

WEIGHT

82 lbs. (37.2 Kgs)

POWER SUPPLY

200-250 volts, 50 c/s, 80 watts.

CIRCUIT DESCRIPTION



F.M. Tuner

F.M. reception is obtained by using a fully screened V.H.F. tuner covering Band II. The aerial input circuit, L15, L16, is a broad band circuit and the signal is coupled to the cathode of the first half of V6, which is operated as a grounded grid amplifier.

The anode circuit of this amplifier, L17, is tuned, together with the oscillator coil, L18, L19, by the ganged capacitor.

The second half of V6 operates as an oscillator mixer with the R.F. signal injected at the oscillator null point, formed by condensers C43, C44. Some regeneration is employed from the anode of this stage, feed-back voltages being coupled back via C45.

V1, 6CI2, is used as an oscillator mixer on A.M. and an I.F. amplifier on F.M.

On A.M. the grid of the heptode is connected to the A.M. aerial coils, which are mounted on the ferrite rod aerial in the case of the M.W. and L.W. bands.

The triode section of V.1 is used as an A.M. oscillator, condenser C13 being connected in parallel with part of the oscillator coil, L7, when changing from Medium to Long Wave.

On F.M. the grid of the heptode section is connected to the F.M., I.F., L20, L21, included in the V.H.F. tuner, and the grid of the triode A.M. oscillator is earthed via C11 and R8.

The anode circuit of V1 contains an A.M. and F.M., I.F. transformer, connected in series. The F.M. and A.M., I.F. outputs are fed direct to the grid of V2.

V2, EF89, is an I.F. amplifier on both A.M. and F.M. and its anode circuit contains an A.M., I.F., L8, L9, and the F.M. ratio transformer in series. The three diodes of V3, 6LD12, are used as the A.M. detector, and the F.M. ratio detector, the detected outputs being switched to the two symmetrical audio amplifiers, V4 and V3C, connected in parallel on radio.

On Gram, the two outputs of the Stereo pick-up are switched, one to the audio amplifier, V4, and the other to the audio amplifier, V3C. These two audio amplifiers have identical circuits, with ganged volume controls.

The ganged tone-control acts as a treble cut and feeds the audio signals to the grids of the two 6P15 output stages.

A balance control operates on the grids of the output valves.

Negative-feedback from the secondary of the output transformer is applied to the grids of V4 and V3C.

The power unit is contained on the chassis and uses a UUI2 rectifier. The mains transformer gives complete mains isolation and the mains on/off switch is combined with the tone control.

VALVE COMPLEMENT

	A.M. Function	F.M. Function
6L12		R.F. Amplifier and oscillator mixer.
6C12	Frequency Changer	I.F. amplifier
EF89	I.F. amplifier	I.F. amplifier
6LD12	Detector audio amplifier	Ratio detector and audio amplifier
6AT6	Audio amplifier	Audio amplifier
6P15 (2 off)	Audio output	Audio output
UU12	Rectifier	Rectifier

INTERNAL AERIAL

A rotatable ferrite rod aerial is incorporated.

REMOVAL OF CHASSIS FROM CABINET

1. Remove two screws retaining back cover.
2. Remove back cover from cabinet.
3. Unplug all sockets at rear of chassis.
4. Remove four front knobs.
5. Remove two nuts holding rear flange of chassis to cabinet.
6. Lift rear of chassis and carefully withdraw from cabinet.

COIL AND TRANSFORMER DATA

L3/L5	-	-	-	-	-	-	-	-	6.2 Ohms.
L4/L6	-	-	-	-	-	-	-	-	5.8 Ohms.
L8	-	-	-	-	-	-	-	-	5.8 Ohms.
L9	-	-	-	-	-	-	-	-	3.7 Ohms.
L10	-	-	-	-	-	-	-	-	2.75 Ohms.
L13	-	-	-	-	-	-	-	-	470 Ohms.
L22	-	-	-	-	-	-	-	-	260 Ohms.
L24	-	-	-	-	-	-	-	-	28.2 Ohms. (from neutral to 240/250V. tap)
									25.6 Ohms. (from neutral to 220/230V. tap)
									23.1 Ohms. (from neutral to 200/210V. tap)
L25	-	-	-	-	-	-	-	-	470 Ohms.

All other values less than 1 Ohm.

WG.15 CHASSIS ALIGNMENT PROCEDURE

The two I.F. Transformers in the centre of the chassis include the A.M., I.F.'s and the F.M. 2nd and 3rd I.F.'s. The 1st F.M., I.F. is located in the F.M. tuner unit. The A.M., I.F. cores are nearest the rear of the chassis. The A.M. trimmers are located under the chassis, the oscillators nearest the wave-change switch and the aerial trimmers at the opposite end of the bank.

A.M./I.F.

Set wave-change switch to Medium wave with tuning condenser at maximum (vanes fully meshed). Connect an output meter of 3 ohms impedance across the L/S sockets of one channel. An A.C. Voltmeter may be used, connected across the Loudspeaker terminals.

Connect a signal generator to the grid of 6C12/ECH81 (Pin 2). Feed in a modulated 470 Kc/s signal, and adjust I.F. cores for maximum output with Volume Control set at maximum. The Generator should have a 0.1 mfd. in series with the output lead.

A.M./M.W.

Connect signal generator to receiver Aerial and Earth sockets, *using a dummy aerial* and check that pointer lines up with end of scale. Tune set and generator to 500M (600 Kc/s). Adjust M.W. oscillator core for maximum and M.W. Aerial Coil on Ferrite Rod for maximum output. Tune set and generator to 200M (1500 Kc/s). Adjust M.W. oscillator and aerial trimmers for maximum output. Repeat these two operations until no further improvement is obtained at 500M and 200M. Seal M.W. Aerial Coil with wax.

A.M./L.W.

Set wave-change switch to Long Wave. Tune generator and receiver to 1500M (200 Kc/s). Adjust L.W. oscillator trimmer for maximum output. Adjust L.W. aerial coil on Ferrite Rod for maximum output. Repeat operations and seal Aerial Coil with wax.

A.M./S.W.

Connect generator to receiver Aerial and Earth Sockets using dummy aerial. Tune generator and receiver to 50M (6 Mc/s). Adjust S.W. oscillator coil core for maximum output. Adjust S.W. aerial coil core for maximum output. Tune generator and set to 20M (15 Mc/s). Adjust S.W. oscillator trimmer for maximum output. Adjust S.W. aerial trimmer for maximum output.

During S.W. adjustments the tuning condenser should be "rocked" to compensate for slight pulling between the oscillator and signal circuits. Check that the S.W. oscillator trimmer is set to the peak, requiring the lowest capacity at 20 metres. Repeat these operations until no further improvement can be obtained at 20 or 50 metres.

F.M./I.F.

If available, a Wobbulator should be used for F.M./I.F. alignment. It is also possible to use an A.M. signal generator. Both methods are described:—

i) Wobbulator Alignment:

Remove cover from F.M. tuner unit. Disconnect 5 mfd condenser in diode circuit, and unscrew bottom core of last F.M./I.F. transformer. Connect input of C.R.O. between hot end of volume control and chassis.

Feed in a 10.7 Mc/s Wobbled signal to the junction of the 6.8K and 4.7K ohm resistors in F.M. tuner. There is H.T. on this test point so it is advisable to use an isolating condenser in the signal input lead.

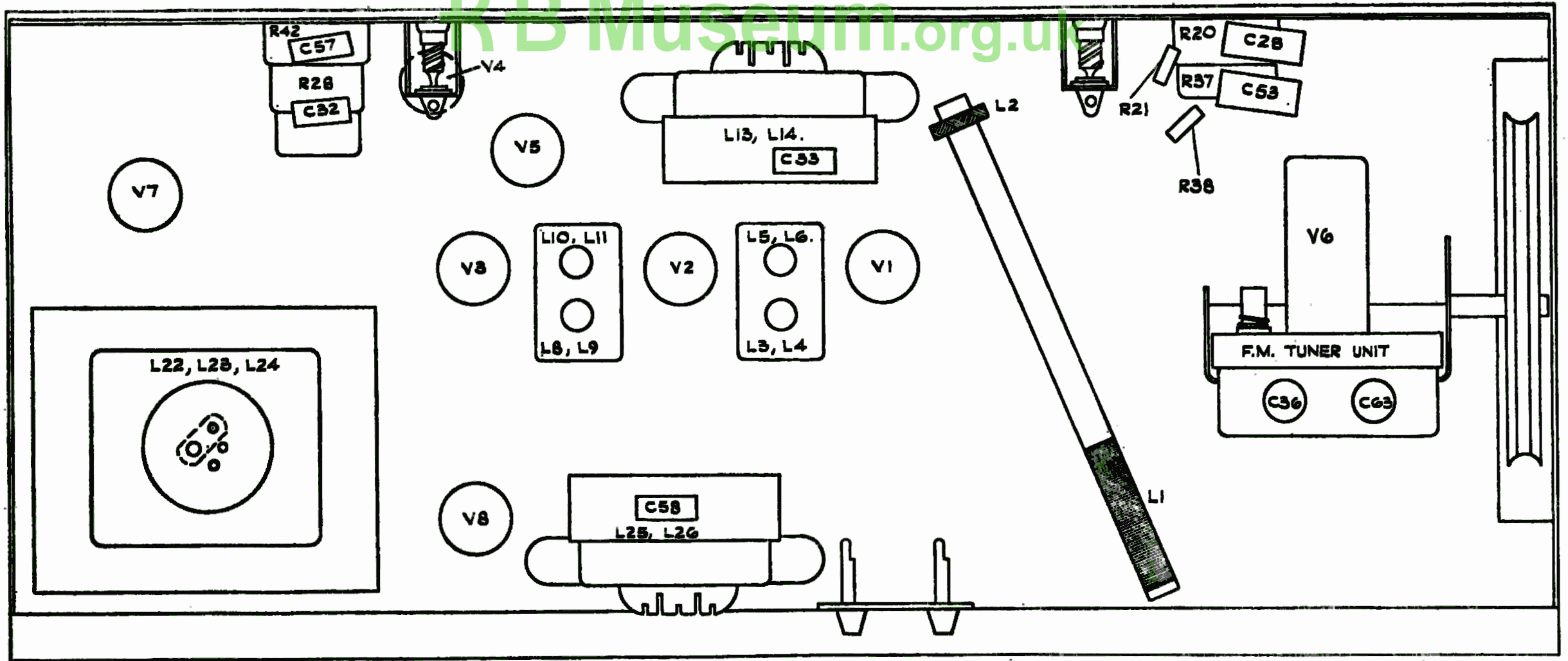
Adjust the 5 I.F. cores for maximum output and symmetrical shape on C.R.O. leaving the bottom core of final F.M./I.F. unscrewed. Re-connect the 5 μ F condenser and screw in bottom core (final I.F.) until an "S" shaped discriminator curve with a straight centre line is obtained.

ii) Signal Generator Method

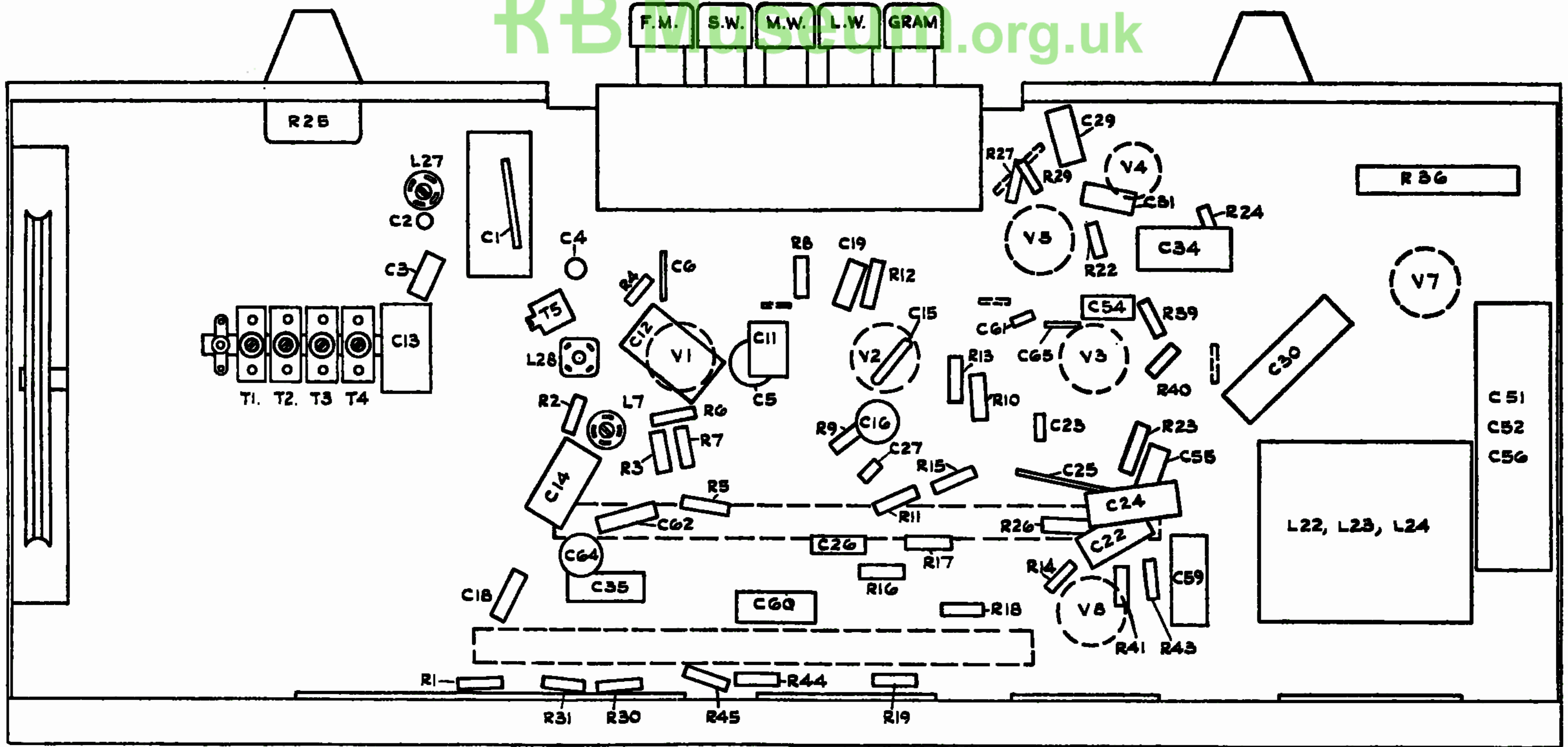
Connect a high resistance D.C. Voltmeter across the 5 mfd. condenser in the diode circuit, (positive to chassis). Connect signal generator to tuner test point, as described above, and feed in a 10.7 Mc/s (audio modulated), and adjust 5 I.F. cores for maximum output on Voltmeter. The bottom core of the final F.M./I.F. is not adjusted at this stage. Move signal generator tuning either side of 10.7 Mc/s to check that double-humping is not taking place. The input to test point should be kept at a level to produce about 4 volts on meter during alignment. Retune signal generator for maximum output on the meter, this may be a little off 10.7 Mc/s, adjust the bottom core of the last I.F. for *minimum* modulated output from the loudspeaker. This should be a sharp null point. This core may need slight re-adjustment on a station for best quality reception and maximum A.M. rejection.

F.M./R.F.

Check that the pointer lines up with end of scale when tuning condenser is at maximum (vaner fully meshed). Connect high resistance D.C. Voltmeter across the 5 mfd. condenser in the diode circuit. Tune set to 95 Mc/s. (replace tuner cover). Connect signal generator to F.M. aerial sockets. Adjust F.M. oscillator and R.F. and aerial cores for maximum output on meter at 95 Mc/s.



TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

V1
6CI2

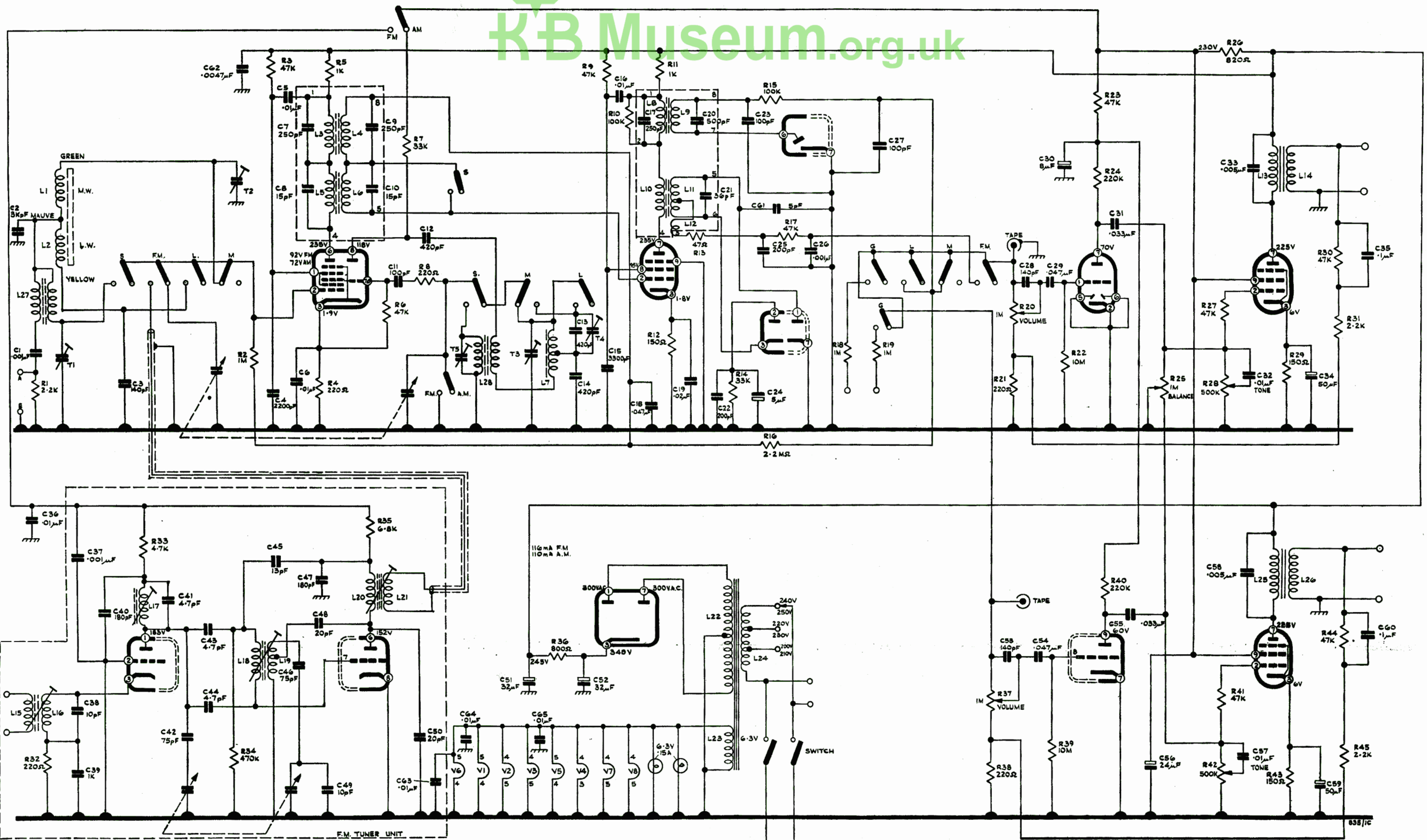
V2
EF89

V3A
6LD12
V3B

V4
6AT6

V5
6PI5

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V6
6LI2

V7
UUI2

V3c
6LD12

V8
6PI5

835 / IC.