COSSOR MELODY MAKER Model 524

General Description : Six-valve (including rectifier), combined A.M./F.M. receiver with internal compressed dipole. Released July 1955.

Power Supply : A.C. mains, 200–255 volts (three adjustment tappings), 50–100 c/s. Consumption 60 watts.

Wavebands : L.W. 940–2050 m.; M.W. 187–550 m.; S.W. 15·8–51·3 m.; V.H.F. 87·5–100 Mc/s.

Intermediate Frequencies : A.M. 470 kc/s.; F.M. 10·7 Mc/s.

Valve Analysis : Readings taken on Avometer Model 8 (20,000-ohms/volt) testmeter with receiver switched to M.W. (except for V6) with gang fully closed.

Valve	*Pin* 1	*Pin* 2	*Pin* 3	*Pin* 4	*Pin* 5	*Pin* 6	*Pin* 7	*Pin* 8	*Pin* 9
V1 6AJ8 .	60	SN	0	6·1*	0	225	SP	83	SP
V2 6BY7 .	0·4	SN	0·4	6·1*	0	0	215	75	0
V3 6AK8 .	SN	SN	SN	6·1*	0	SN	0	SN	55
V4 6BQ5 .	—	NR	7	0	6·1*	—	260	—	227
V5 6V4 .	250*	—	270	6·1*	0	—	250*	—	—
V6 6AQ8 .	90	SN	0	6·1*	0	95	SN	NR	0

* A.C. measurement. SN = slightly negative. SP = slightly positive. NR = no reading. Total H.T. current : A.M. 60 mA., F.M. 66 mA.

Alignment Procedure : The method recommended by the manufacturers requires the following equipment: Wobbulator with 70–80-ohm impedance output, such as Cossor F.M. Receiver Alignment Generator Model 1324; oscillograph such as Cossor Models 339B, 1035, 1039M (see Notes), 1052; diode probe; signal generator; output meter.

The alignment of the 10·7-Mc/s. I.F. transformers must precede alignment of 470-kc/s. transformers.

Mechanical Alignment of F.M. Tuner : Check that the outer edge of each aluminium core coincides with a groove cut in the former. It is coarsely adjusted by rotating the brass collar on the tuning-gang shaft. Positioning of individual cores is effected by screw adjustment of the cord pulleys.

F.M. I.F. : The lid of the F.M. tuner unit must be securely fixed in position before alignment.

(*a*) Apply a 10·7-Mc/s. signal wobbulated ±300 kc/s. from an 80-ohm source to a test point situated at the rear of the F.M. tuner unit (tapped junction of R45 and R46) and connect the detector assembly (Fig. 6) to the anode of V2 (6BY7). Turn the gain of the oscilloscope to a maximum.

Adjust both cores of the I.F. transformers (second I.F. transformer on the

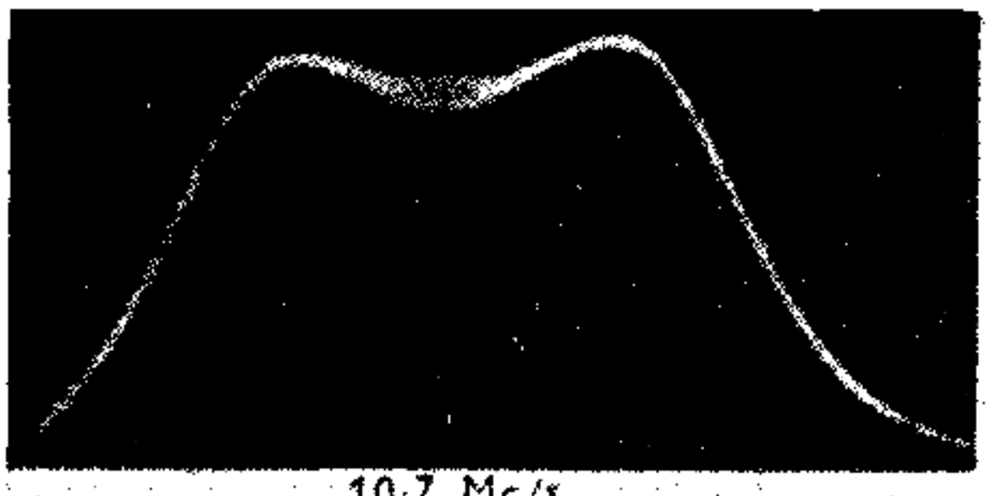


FIG. 1

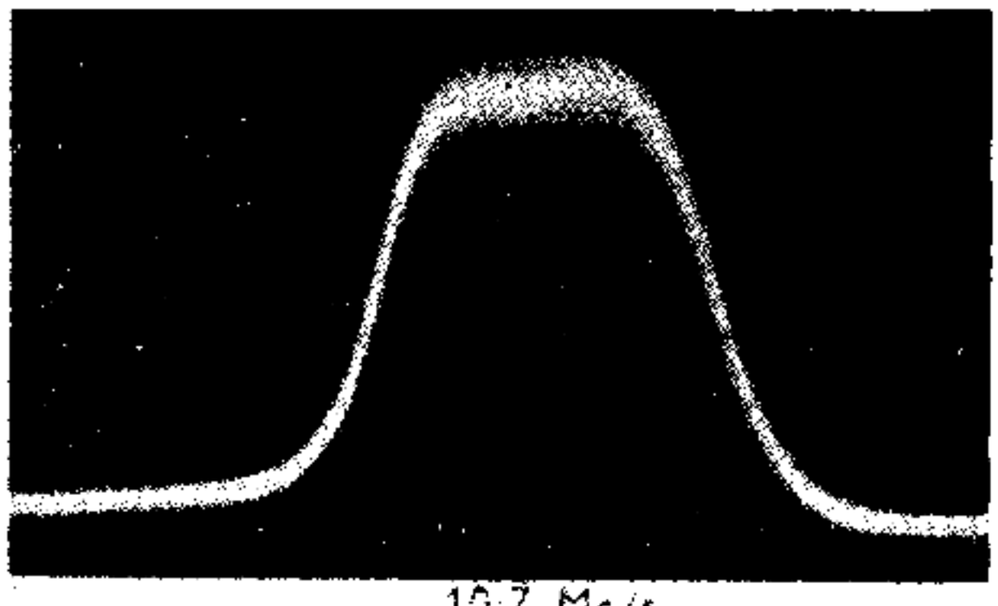


FIG. 2

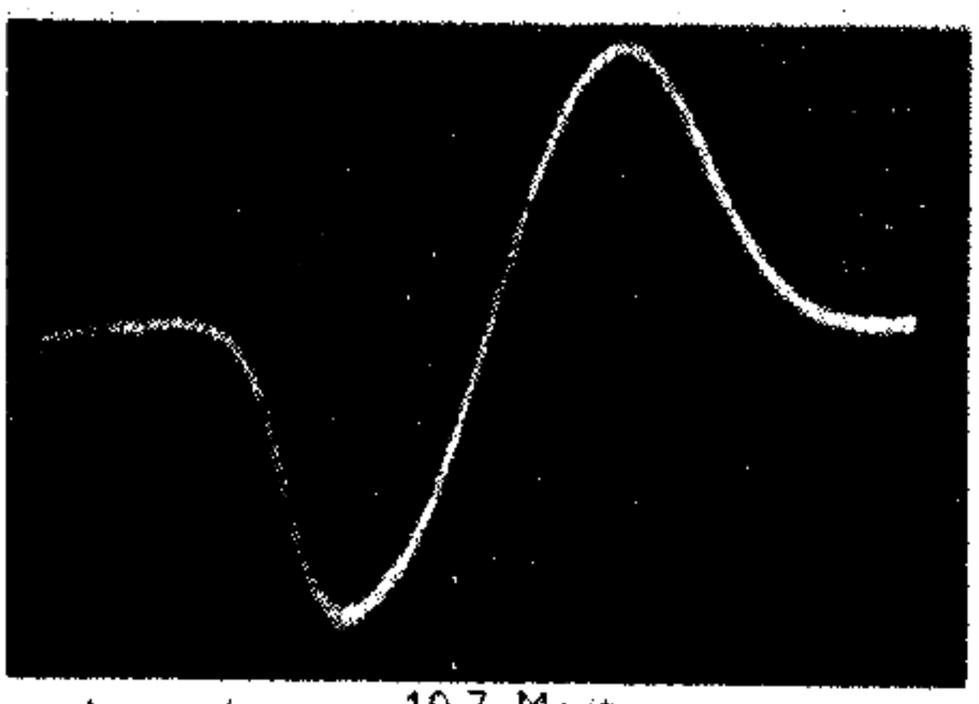


FIG. 3

FIG. 4

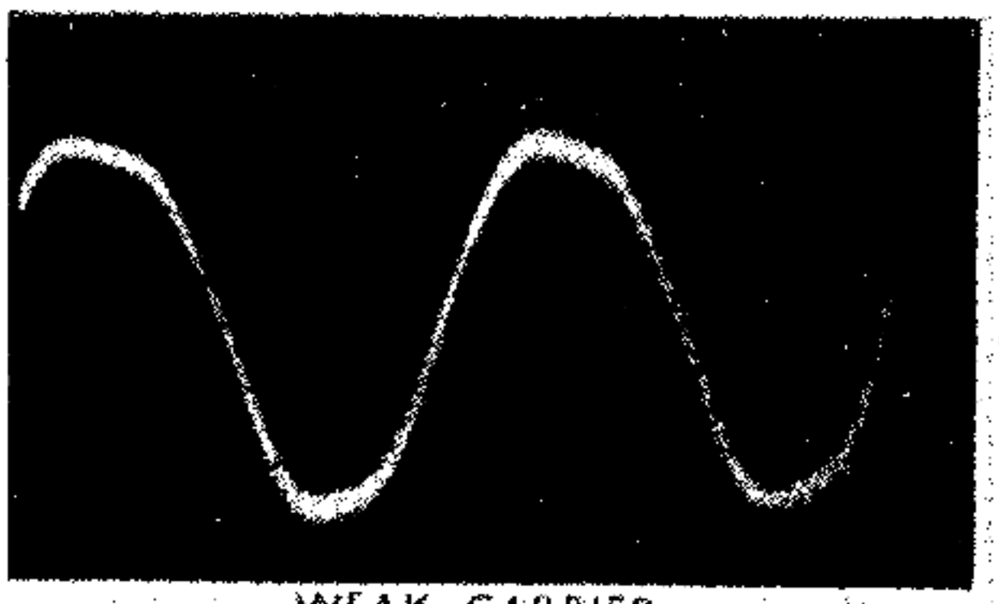

WEAK CARRIER
400c/s SINE WAVE MODULATION
DEVIATION ± 100 Kc/s

FIG. 5

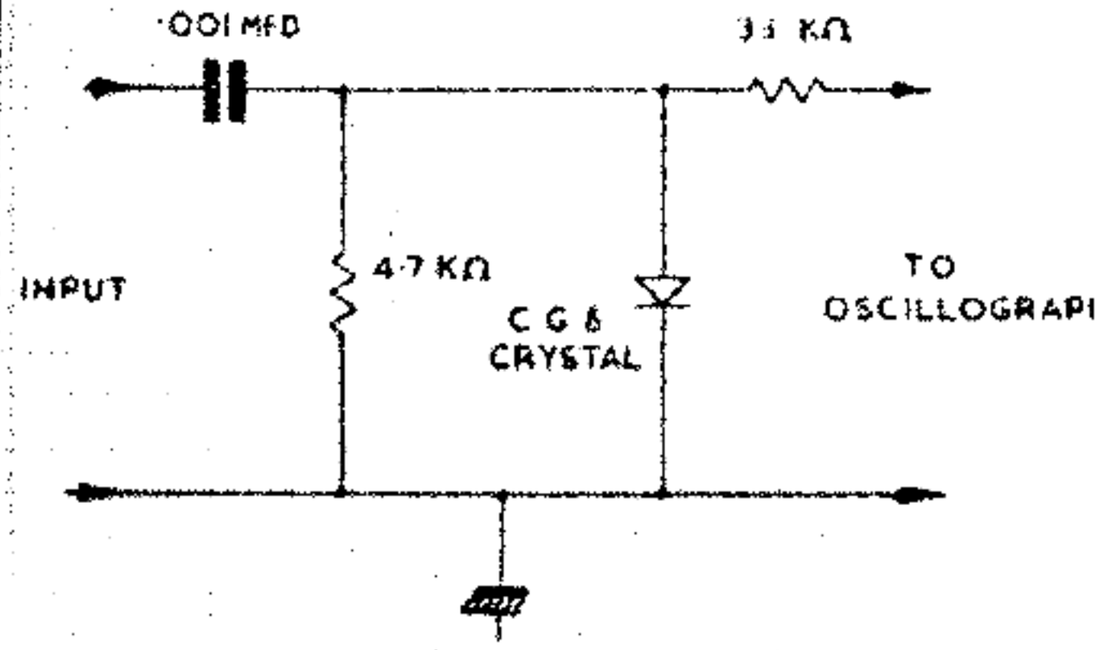


FIG. 6

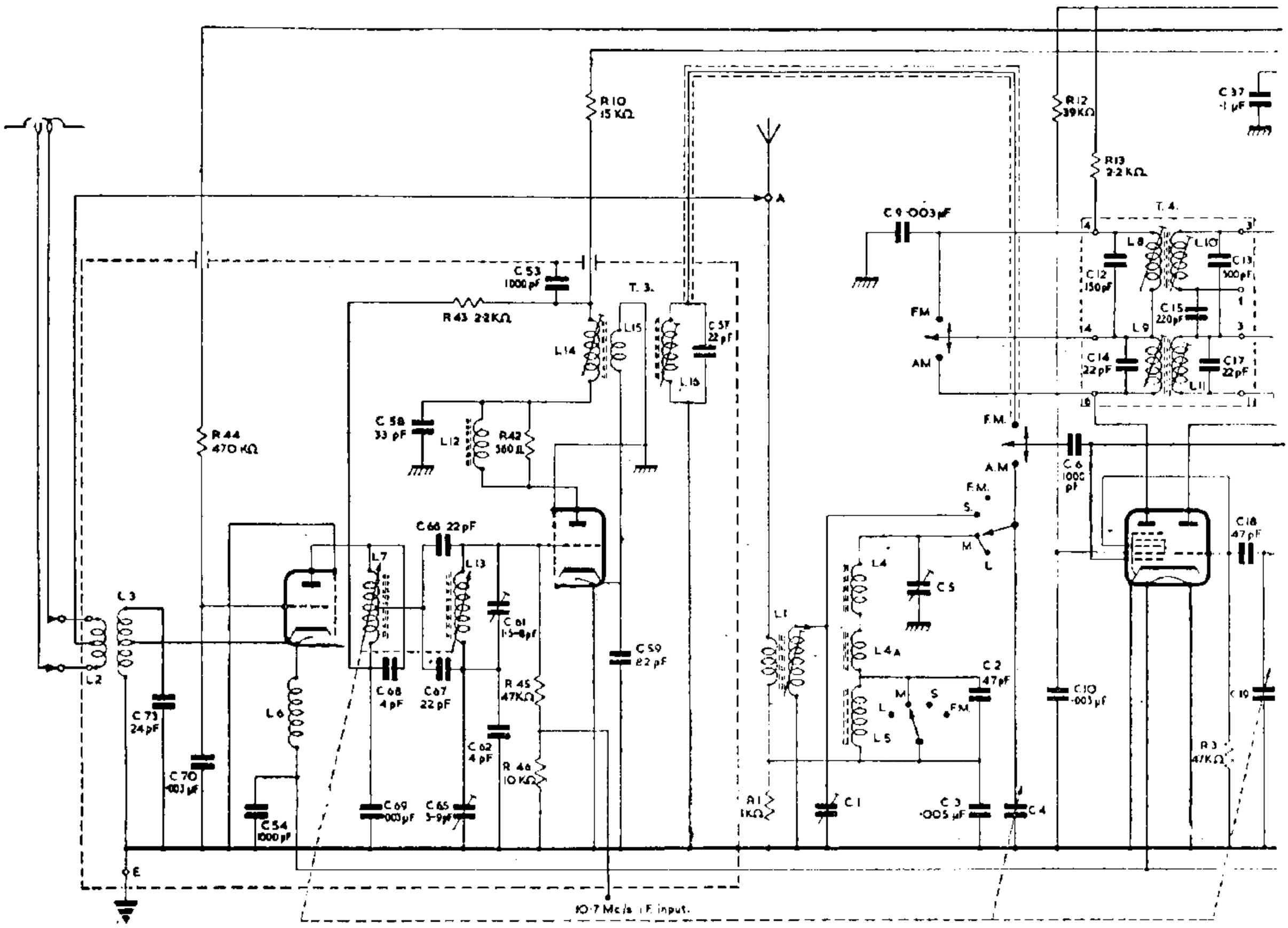
chassis and first I.F. transformer in F.M. unit) until a response similar to Fig. 2 is displayed.

Note : To adjust this response accurately to frequency it is advantageous to use a crystal "pip". If difficulty is experienced in obtaining the correct overall response (Fig. 2), a check can be made on the second I.F. transformer as follows :

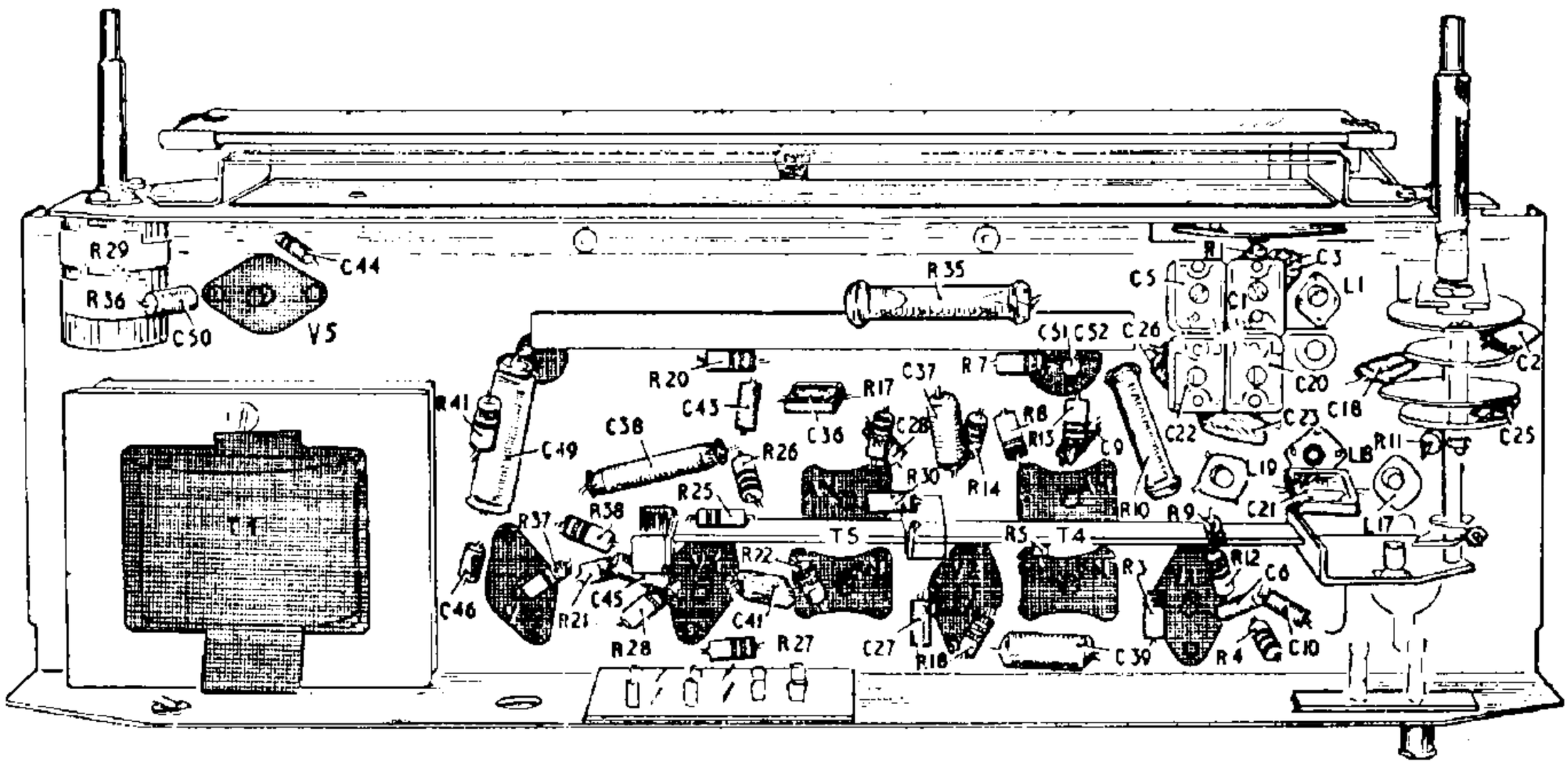
Apply a 10·7-Mc/s. signal wobbulated ±300 kc/s. from the 80-ohm termination to grid of V1 (6AJ8) and adjust both cores of the second I.F. transformer until a response similar to Fig. 1 is obtained.

(*b*) Disconnect detector assembly and clip oscilloscope leads to A.F. change-over slider contact (*i.e.*, across R29).

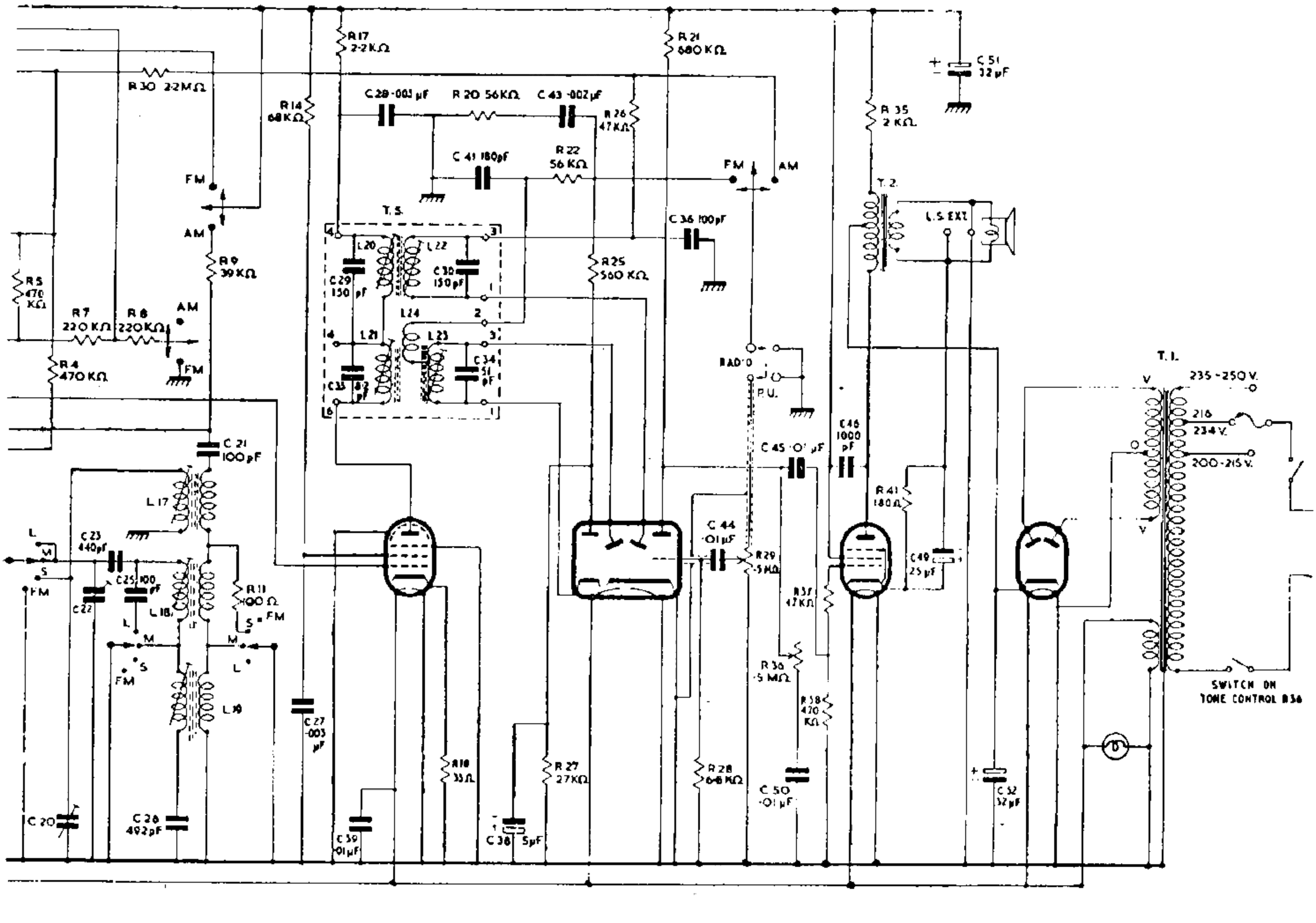
Oscilloscope gain turned to a maximum.



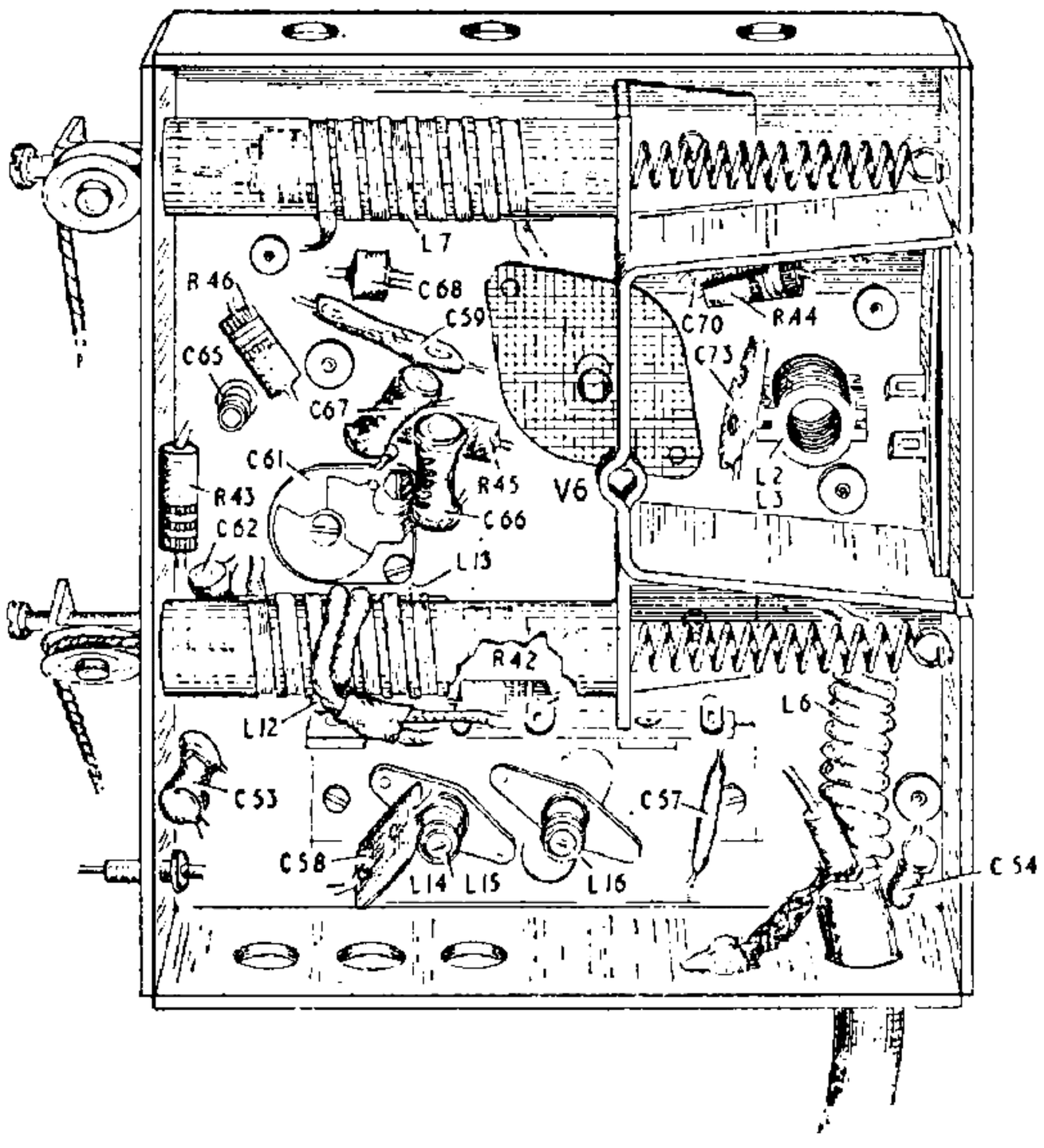
CIRCUIT DIAGRAM -



UNDERSIDE VIEW OF MAIN CHASSIS



Cossor Model 524



Lay-out of V.H.F. Sub-chassis

Adjust third I.F. transformer (discriminator) until Fig. 3 is obtained.

Note : The peaks of this response must be carefully balanced relative to the detuned datum line. Slight readjustment of the secondary of the second I.F. transformer (*i.e.*, under chassis core) may be necessary to obtain optimum balance and linearity.

To check linearity and balance of the discriminator response at higher signal levels, increase the input signal 40 db., simultaneously reducing output.

I.F. Alignment (A.M.) : Inject signal of 470 kc/s. modulated at 400 c/s., 30 per cent into grid of V1 (6AJ8, pin 2) and connect output meter (impedance 3 ohms) to external loudspeaker sockets. Then with set switched to M.W. and tuning condenser at its mid position, adjust cores for maximum output in the following sequence, keeping output at about 200 mW.: second I.F. transformer secondary; second I.F. transformer primary; first I.F. transformer secondary; first I.F. transformer primary. Repeat adjustments.

Dial pointer alignment (if required) with tuning condenser at mechanical maximum, set the pointer to the MAX. mark on the dial.

R.F. Alignment (F.M.) : Before proceeding with the alignment, care must be taken to ensure that the F.M. tuner unit is aligned mechanically and the lid is securely clamped down by the self-tapping screw.

(*a*) Align pointer, if necessary, to a maximum at the extreme end of the dial (*i.e.*, gang condenser set to a maximum). Retune pointer to 90 Mc/s. calibration mark.

(*b*) Apply signal of 90 Mc/s. modulated ±100 kc/s. (or ±75 kc/s.) from an 80-ohm source into the dipole aerial socket and connect the oscilloscope to the A.M./F.M. slider switch (*i.e.*, across volume control) as before. Adjust the air-spaced oscillator trimmer C61 for a maximum undistorted response similar to Fig. 4 or Fig. 5. (Fig. 4 will be obtained if a wobbulator locked to the oscillograph is used and Fig. 5 for an F.M. signal generator modulated by a sine wave.)

(*c*) Similarly adjust the R.F. core-pulley screw for maximum amplitude. Check calibration and sensitivity at 87·5 Mc/s., 90 Mc/s., 95 Mc/s. and 100 Mc/s.

R.F. Alignment (A.M.) : Connect output meter as for A.M. I.F. alignment. Switch to S.W. and set pointer at 18 Mc/s. Inject 18 Mc/s. via all-wave dummy aerial and adjust the S.W. oscillator (C20) and aerial (C1) trimmers, using the *higher* oscillator frequency for maximum output, rocking the tuning condenser to avoid pulling. Set pointer to 6 Mc/s. and adjust first the S.W. oscillator core and then the aerial core for maximum output (the inner of the two peaking positions is correct).

Return to 18 Mc/s. and repeat both adjustments until neither affects the other.

Switch to M.W., set pointer to " M " (193 m.) on scale and inject 1550 kc/s. to aerial socket via dummy aerial. Adjust aerial and oscillator trimmers, using the higher oscillator frequency for maximum output. Set pointer to " M " (522 m.) mark and inject 575 kc/s., adjust first the M.W.

oscillator core and then the M.W. aerial inductance (by sliding the matching coil) for maximum output.

Repeat both adjustments until neither affects the other.

Switch to L.W. Adjust to " L " (1875 m.) mark. Inject a 160-kc/s. signal to aerial socket via dummy aerial. Adjust first the L.W. oscillator core and then slide main L.W. aerial coil on core for coarse adjustment and finally small matching coil, for maximum output.

Repeat adjustments until correct.

Notes : Above alignment instructions are primarily for external aerial conditions, and can be modified for internal-aerial operation by readjustment of the M.W. aerial trimmer and the L.W. aerial coil. This can be done on a station such as the M.W. Light Programme transmitter and Droitwich for long waves.

For oscillographs with low-gain amplifiers it is not possible to connect directly across the volume control, but by connecting to the output-valve grid circuit (*i.e.*, across R38), the amplification of the A.F. triode may be utilised. The volume control should be set near maximum, but overloading of the oscillograph should be avoided, and vertical amplitude of the trace kept down to about 2–2½ cm.

The shape of the marker pip may be improved by connecting a small capacitor 0·002–0·005 μF. across the oscillograph input.

Servicing Notes : The neutralising adjustment, C65, should not be changed unless excessive oscillator radiation is detected. An external dipole aerial is necessary when the A.G.C. voltage across C38 and R27 is less than 6 volts when measured with Avometer Model 8 (25-volt range) or 5 volts measured with Avometer Model 7 (100-volt range). A centre tap is provided on the F.M. aerial-input coil to enable an external F.M. aerial to be used on the A.M. bands; the connecting plug need not be removed from the A.M. aerial socket when receiving F.M. signals.