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EKCO SERVICE DATA

MODELS C273, A274, A277

See also Service News Sheets Nos :

MODELS C273, A274, A277 are seven valve (including rectifier and tuning indicator) receivers for reception of Band 2 VHF/FM signals.

MODEL C273 is a console type receiver with a bass reflex cabinet, and the A274 and A277 are table models, differing in that the cabinet for A274 is of modern contemporary design, whilst that of the A277 is of traditional style. The only electrical difference between all three models is that, in the table models, A274, A277, a small amount of bass boost has been introduced by negative feedback between the anodes of V4.B and V5. Features include, balanced twin loud-speakers, a built-in dipole aerial, and sockets for the connection of a gramophone pick-up and an extension loud-speaker. Provision is also made for an output suitable for connection to a tape recorder.

The receivers are permeability tuned, and have a high sensitivity with low noise and distortion.

MAINS SUPPLY : 200—250 volts A.C. 50 c/s.

MAINS CONSUMPTION : 55 Watts.

CONTROLS : Front of receiver (left to right) VOLUME ON/OFF. TONE, TUNING.

Rear of receiver (left to right) GRAM/RADIO switch, SPEAKER MUTING switch.

LOUD-SPEAKERS :

Console,	LS1	9 ins. x 5 ins.	Elliptical.	LS2 5 ins. Round.
Table,	LS1	9 ins. x 5 ins.	Elliptical.	LS2 6 ins. Round.

VALVES :

V1	ECC85	R.F. Amplifier and Oscillator.
V2	EF89	I.F. Amplifier.
V3	EF89	I.F. Amplifier.
V4	EABC80	Detector and A.F. Amplifier.
V5	EL84	Output Valve.
V6	EZ80	Rectifier.
V7	EM80	Tuning Indicator.

WAVE-BAND COVERAGE : 87.5—100 Mc/s.

INTERMEDIATE FREQUENCY : 10.7 Mc/s.

OUTPUT : 4 Watts.

CIRCUIT DETAILS : Signals from the di-pole aerial are inductively coupled via L1.L2 to V1A, a grounded grid triode, the output of which is coupled to V1B, a self oscillating mixer operating on the low frequency side of the input signal.

The cores of both V1A anode coil L3 and the oscillator coil L4 are ganged together and provide the tuning medium of the receiver. L5 is the oscillator feed back coil.

V1B output at 10.7 Mc/s is developed across the tuned circuit L6.C9 and coupled across the first I.F. transformer to V2, the first I.F. amplifier. The amplified output is then coupled by L8.L9 to a second I.F. amplifier V3 and then to a conventional ratio detector comprising, in the main, the twin diodes of V4A and L11.L12.L13.

Across R13.C29 is developed a D.C. voltage that is related to signal input, and the voltage from the negative side of R13 is applied to the suppressor grid of V3 as A.G.C., and via R11 as drive voltage to the grid of the tuning indicator V7.

The A.F. output is developed across C23 and passes via a de-emphasis network R10.C25 then C26, SW1, the volume control and C30 to the triode V4B. From the anode of V4B the A.F. is R.C. coupled to the final amplifier V5, the output of which is transformer coupled to the twin loud-speakers.

Negative feedback is provided by coupling part of the A.F. from T1 secondary to V5 cathode via R23.C35. The tone control comprises C33.R20.

In models A274.A277 additional feedback is provided between the anodes of V5 and V4B via C34.R21.

The A.C. voltage developed in the high voltage secondary of the mains transformer T2 is applied to the anodes of the full-wave rectifier V6 and the resultant D.C. is smoothed by C37.L14.C36. A separate winding on the transformer is used to supply the heaters of the valves, and a tap on this winding supplies the two pilot lamps LP1 and LP2.

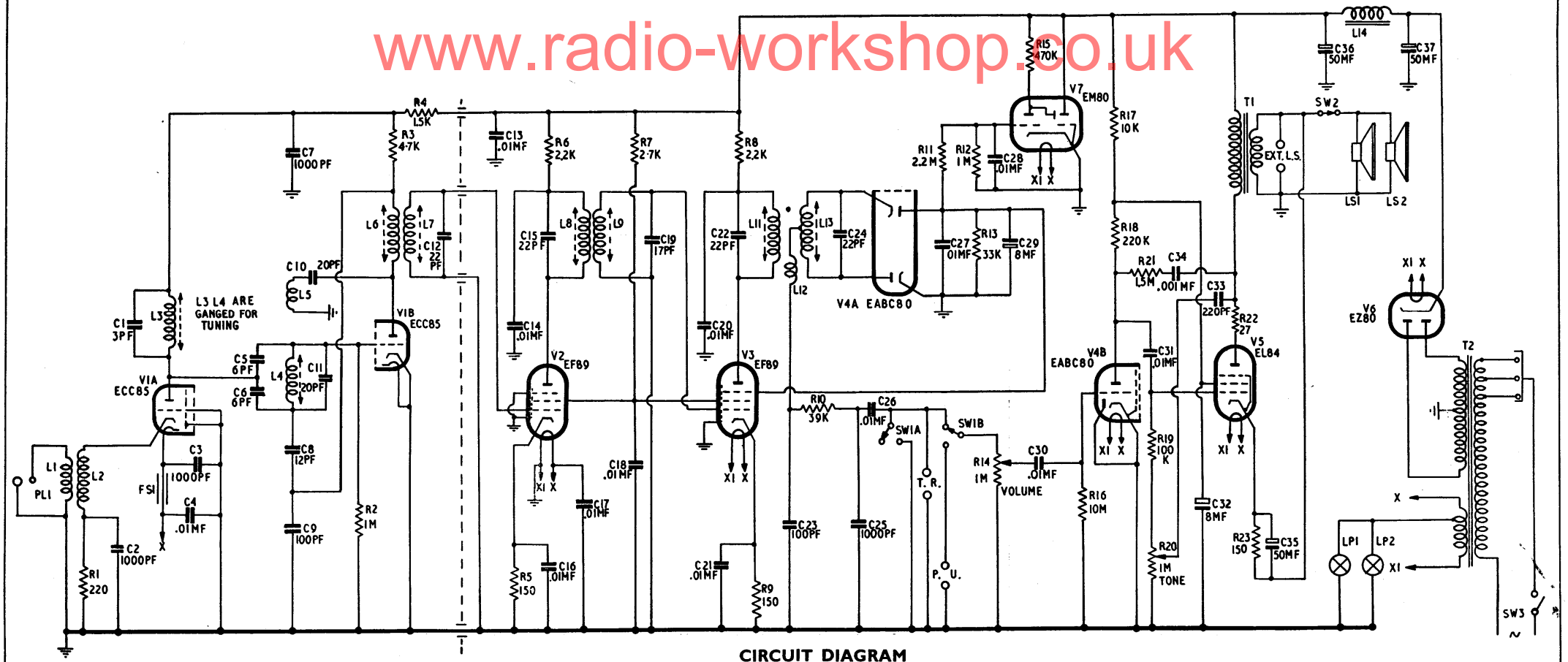
ALIGNMENT PROCEDURE :

INSTRUMENTS REQUIRED : A signal generator capable of covering the stated test frequencies, an output meter or low range A.C. voltmeter, a 0—50 μA meter, and two 220K resistors.

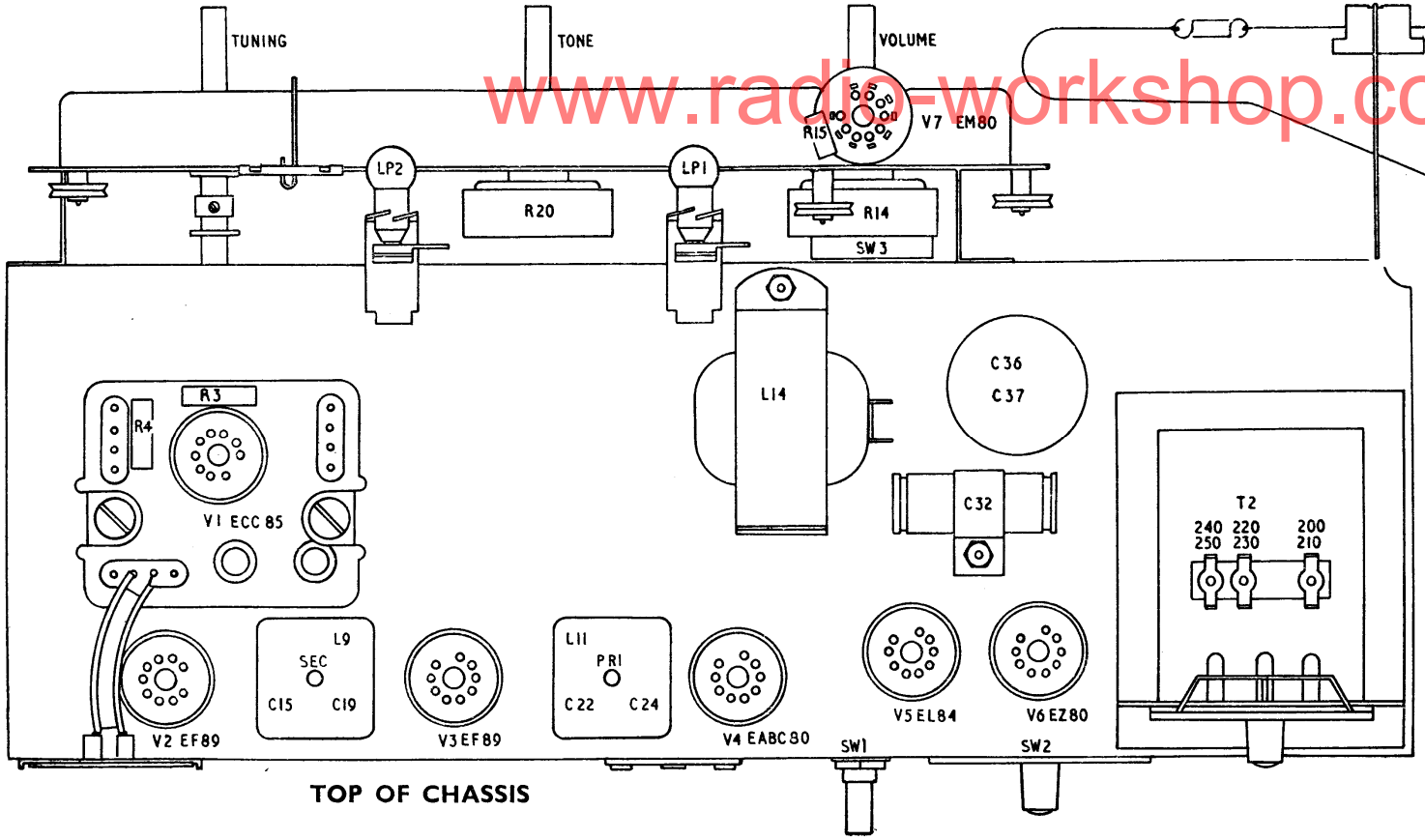
I.F. ALIGNMENT : Connect the two 220K resistors in series across the ratio detector load R13. Tune the receiver to the low frequency end of the band.

With the 0—50 μA meter connected between the junction of the two resistors and chassis, inject 10.7 Mc/s signal, unmodulated to the control grid (Pin 2) of the second I.F. amplifier V3. Tune L11 for peak meter reading. Connect the μA meter between the junction of the two 220K resistors and the junction of L12.R10. C23. Tune L13 for zero current, checking that the polarity of the indicator reverses when tuning through the zero point. Re-connect the μA meter between the resistors and chassis. Inject 10.7 Mc/s to the grid (pin 2) of V2. Tune L9.L8 for peak meter reading, then re-tune L11 if required. Connect the A.F. output meter to the loud-speaker tags. Frequency modulate the signal (±25 Kc/s deviation at 400 c/s) and, with tone and volume controls fully clockwise, check sensitivity for 500 mW output. Check I.F. bandwidth with μA meter connected between the resistors and the chassis using an unmodulated signal. Tune L11 for bandwidth symmetry if necessary. Sensitivity should be approx. 1mV, and the bandwidth ±160 Kc/s at 6dB.

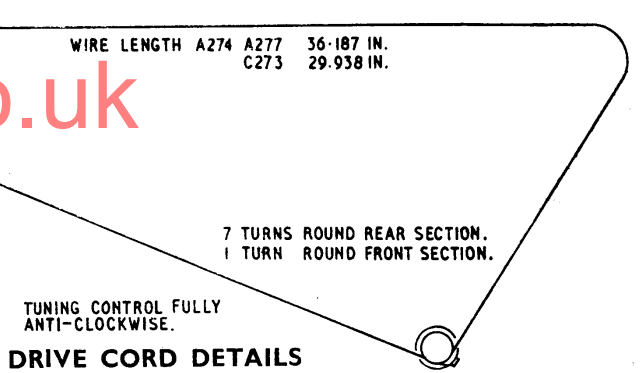
Inject 10.7 Mc/s unmod. to the Ae socket, and tune L7 for the peak meter reading, tune L6 with the core approx. half way in for *minimum* reading, check sensitivity and bandwidth as above. I.F. sensitivity should be 3.2 mV and bandwidth ±150 Kc/s at 6dB.



CIRCUIT DIAGRAM



TOP OF CHASSIS

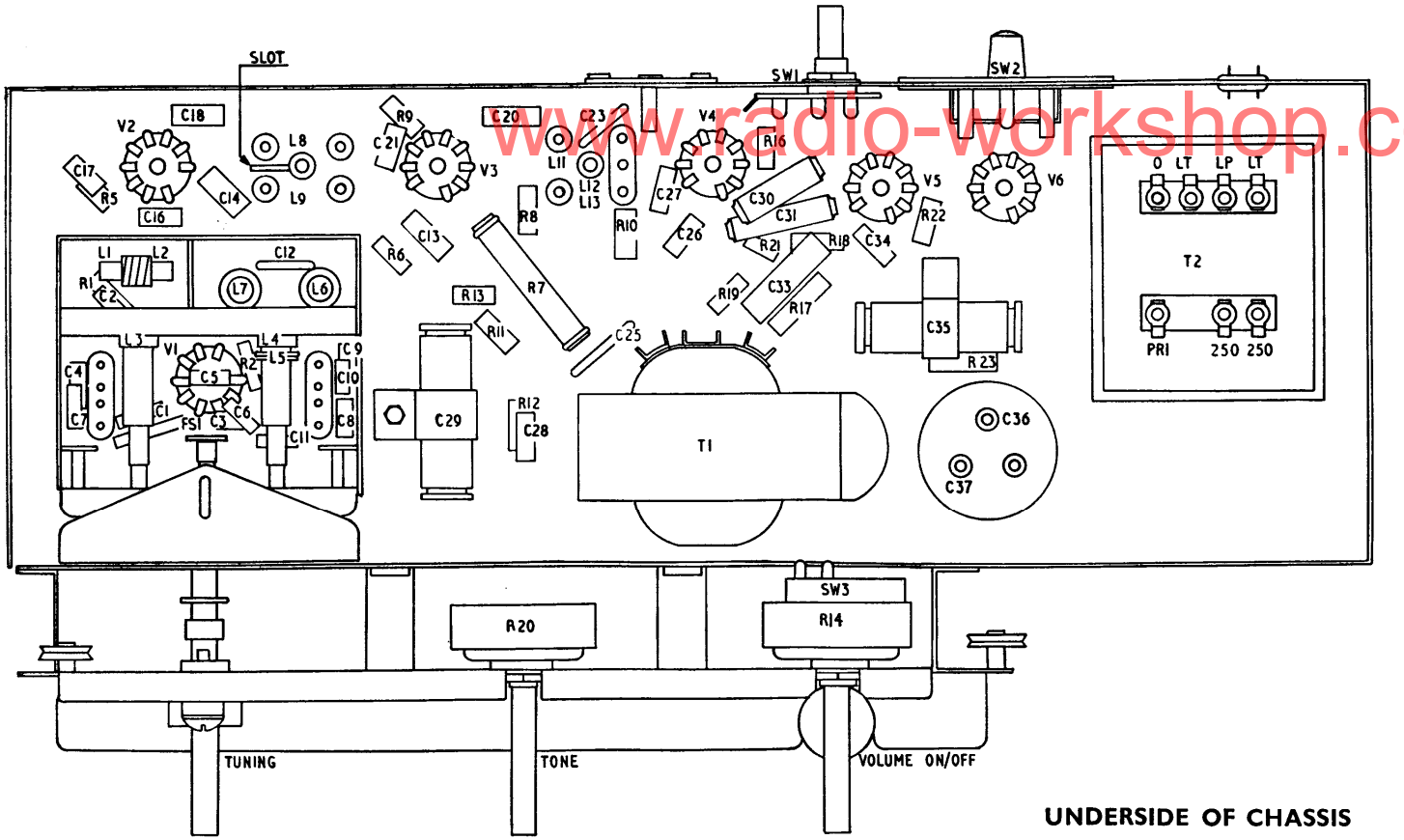


DRIVE CORD DETAILS

R.F. ALIGNMENT : Turn tuning control fully anti-clockwise, and set the pointer to 87 Mc/s on the scale. Check that the core carriage is 1/16 ins. from the end of the guides, with the cores just projecting from the coil formers. Adjust, if necessary, by unlocking the grub screw on the wire drive drum, re-positioning the tuning shaft, and re-locking the grub screw.

Inject 87 Mc/s (mod. ±25 Kc/s) to the aerial socket and adjust oscillator tuning core L4 for peak output. Inject 94 Mc/s, (modulated) tune the receiver for peak output and tune L3 for maximum output.

Check that the oscillator is operating correctly on the low frequency side by tuning the receiver to 100 Mc/s, and identifying the image with the input signal at approximately 78.6 Mc/s. Check that the calibration is within ±0.3 Mc/s.



UNDERSIDE OF CHASSIS

CHASSIS REMOVAL : Remove the four control knobs, held by the grub screws, then remove the back cover held by four wood screws. In both table models the chassis is secured by four 4BA screws, located at the bottom of the cabinet. Remove these screws, and the chassis can then be withdrawn to the extent of the speaker leads.

To remove the chassis from the console model, remove the knobs and the back cover as above, then remove the two 2BA screws located at the rear of the chassis, which secure it to the cabinet.

Remove the two plugs from the loud-speaker socket located beside the chassis. The chassis can then be removed.

VALVE BASE DATA :

Valve	Type	Pins									Base
		1	2	3	4	5	6	7	8	9	
V1	ECC85	A2	G2	K2	H	H	A1	G1	K1	Hct	B9A
V2	EF89	S	G1	K	H	H	S	A	G2	G3	B9A
V3	EF89	S	G1	K	H	H	S	A	G2	G3	B9A
V4	EABC80	Ad'''	Ad''	Kd''	H	H	Ad'	Kd',Kd''',S	G	A	B9A
V5	EL84	—	G1	K,G3	H	H	—	A	—	G2	B9A
V6	EZ80	A1	—	K	H	H	—	A2	—	—	B9A
V7	EM80	G	K1,G1	—	H	H	—	A	—	T	B9A

VOLTAGE AND CURRENT DATA :

Valve	Type	Anode		Screen		Cathode	
		V	mA	V	mA	V	mA
V1A	ECC85	236	8.3	—	—	2.0	8.3
V1B	ECC85	203	5.5	—	—	0	5.5
V2	EF89	229	8.1	90	2.5	1.57	10
V3	EF89	229	8.0	90	3.0	1.52	10
V4	EABC80	71	0.7	—	—	—	—
V5	EL84	245	33.2	208	3.85	5.88	37
V6	EZ80	250	—	—	—	260	75.2
V7	EM80	40 RMS	420uA	Target 250	1.6	—	—

RESISTANCE OF WINDINGS :

L14 215 ohms
T1 Pri 184 ohms
T2 Pri 30 ohms
T2 H.T. Sec 220 ohms
All other windings less than 1 ohm.

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