

HALCYON A581

AND RGA581 RADIO-GRAM

COMPONENTS AND VALUES

CONDENSERS		Values (μF)
C1	Aerial series condenser	0.0005
C2	Aerial S.W. coupling	0.0005
C3	Band-pass bottom coupling	—
	V1 hex. C.G. decoupling	0.25
C4*	V1 hexode S.G. decoupling	2.0
C5	V1 heater R.F. by-passes	0.01
C6		0.01
C7	V1 osc. C.G. condenser	0.00005
C8	Osc. fixed M.W. tracker	0.0015
C9	V1 osc. anode decoupling	0.1
C10	V2 C.G. decoupling	0.1
C11	H.T. line S.W. R.F. by-pass	0.0001
C12	V2 cathode by-pass	0.1
C13	A.F. coupling to V3 triode	0.001
C14‡	P.U. shunt	0.01
C15	I.F. filter	0.0001
C16*	V3 triode anode decoupling	2.0
C17*	V3 cathode by-pass	50.0
C18	V3 A.V.C. diode coupling	0.0001
C19	V3 to V4 A.F. coupling	0.01
C20*	V4 cathode by-pass	50.0
C21	Tone control condenser	0.05
C22*		8.0
C23*	H.T. smoothing	8.0
C24	H.T. line R.F. by-pass	0.1
C25†	Band-pass primary tuning	0.0005
C26†	Band-pass primary trimmer	0.000035
C27†	Band-pass secondary tuning	0.0005
C28†	Band-pass secondary trimmer	0.000035
C29†	Osc. circuit tuning	0.0005
C30†	Osc. circuit S.W. trimmer	0.000035
C31†	Osc. circuit M.W. trimmer	0.000035
C32†	Osc. circuit L.W. tracker	0.0009
C33†	Osc. circuit M.W. tracker	0.0009
C34†	1st I.F. trans. pri. tuning	—
C35†	1st I.F. trans. sec. tuning	—
C36†	2nd I.F. trans. pri. tuning	—
C37†	2nd I.F. trans. sec. tuning	—

* Electrolytic. † Variable. ‡ Pre-set.
§ Not in our chassis.

A SHORT-WAVE range of 16.5-51 metres is covered by the Halcyon A581 4-valve (plus rectifier) A.C. 3-band superhet. The set is suitable for mains of 200-260 V, 40-100 C/S, and has provision for an extension speaker and a gramophone pick-up.

Models available to special order are fitted with a jack to take a plug connected to a remote volume control by means of which the volume from the receiver can be controlled from a distance. A "fly-wheel" tuning drive is incorporated.

A very similar chassis is fitted in the RGA581 radio-gramophone, but this Service Sheet was prepared on a table model receiver.

CIRCUIT DESCRIPTION

Aerial input via C1 and coupling coils L2, L3 to inductively coupled M.W. and L.W. band-pass filter. Primary L4, L5 tuned by C25; secondary L9, L10 tuned by C27; coupling coils L6, L7. On S.W. band input is via C1, C2 to tapping on coil L8, which is tuned by C27.

First valve (V1, Tungram metallised TX4) is a triode-hexode operating as frequency changer with internal coupling. Oscillator grid coils L11 (S.W.) and L13, L14 (M.W. and L.W.) are tuned by C29; trimming by C30 (S.W.), C31 (M.W.); tracking by C8, C33 (M.W. and C32 (L.W.); oscillator anode coils L12 (S.W.) and L15, L16 (M.W. and L.W.).

Second valve, a variable-mu R.F.

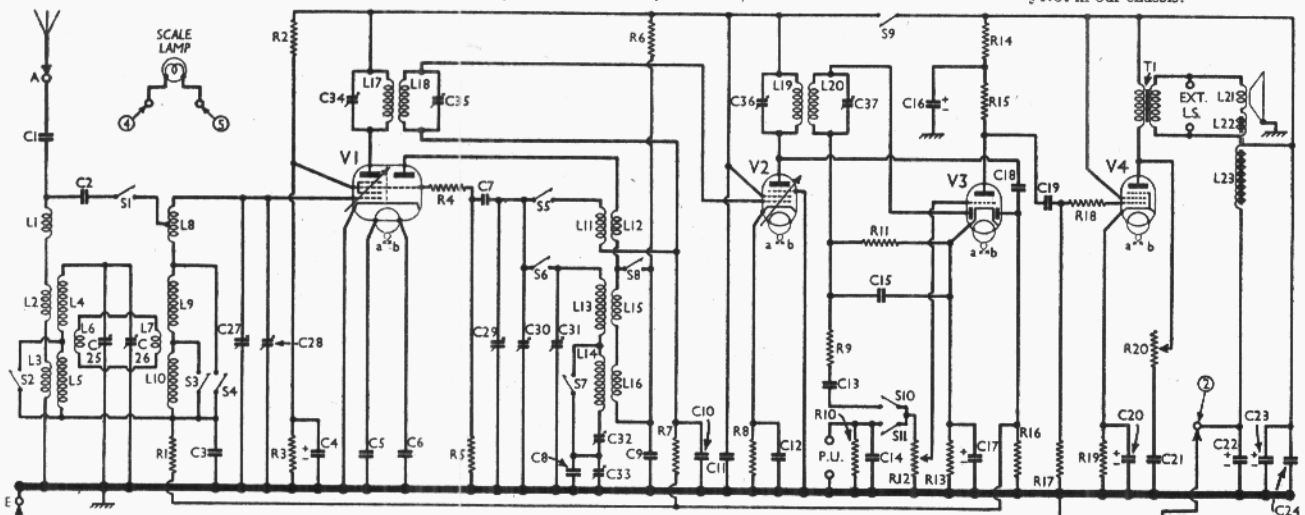
pentode (V2, Tungram metallised VP4B), operates as intermediate frequency amplifier with tuned-primary tuned-secondary transformer couplings C34, L17, L18, C35 and C36, L19, L20, C37.

Intermediate frequency 130.5 KC/S. Diode second detector forms part of double diode triode valve (V3, Tungram metallised DDT4). Audio frequency component in rectified output is developed across load resistance R11 and passed via I.F. stopper R9, coupling condenser C13, switch S10, and manual volume control R12 to C.G. of triode section. Provision for connection of gramophone pick-up across R12 via switch S11.

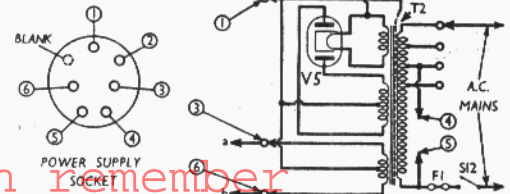
Second diode of V3, fed from V2 anode via C18, provides D.C. potential which is developed across R16 and fed back through decoupling circuits as G.B. to F.C. and I.F. valves, giving automatic volume control. Delay voltage is obtained from drop along R13.

Resistance-capacity coupling by R15, C19 and R17 between V3 triode and pentode output valve (V4, Tungram APP4C). Variable tone control in anode circuit by R20 and C21. Provision for connection of low impedance external speaker across secondary of T1.

H.T. current is supplied by I.H.C. full-wave rectifying valve (V5, Tungram AP4V). Smoothing by speaker field coil L23 and dry electrolytic condensers C22, C23. R.F. filtering in H.T. positive line by C24 and C11 (for S.W.).



Circuit diagram of the Halcyon A581 3-band A.C. superhet. The connections of the power supply unit and its plug and socket are indicated. C14 and R10 are not in our chassis.





Under - chassis view. All the switches are clearly marked. R7 is inside insulating sleeving. R10 and C14 were not in our chassis, but in later models they will be found near the pick - up sockets, close to C4.

RESISTANCES		Values (ohms)
R1	V1 hexode C.G. decoupling ..	1,000,000
R2	V1 hexode S.G. potentiometer	19,000
R3		15,000
R4	V1 osc. C.G. stabiliser ..	50
R5	V1 osc. C.G. resistance ..	33,000
R6	V1 osc. anode decoupling ..	15,000
R7	V2 C.G. decoupling ..	1,000,000
R8	V2 fixed G.B. resistance ..	300
R9	I.F. stopper ..	250,000
R10*	P.U. shunt ..	10,000
R11	V3 signal diode load resistance	100,000
R12	Manual volume control ..	1,000,000
R13	V3 G.B. resistance ..	1,000
R14	V3 triode anode decoupling ..	10,000
R15	V3 triode anode load ..	33,000†
R16	V3 A.V.C. diode load ..	1,000,000
R17	V4 C.G. resistance ..	100,000
R18	V4 C.G. I.F. stopper ..	100,000
R19	V4 G.B. resistance ..	150
R20	Variable tone control ..	50,000

* Not in our chassis. † 10,000 Ω in our chassis.

OTHER COMPONENTS		Approx. Values (ohms)
L1	Aerial choke coil ..	5·2
L2	Aerial M.W. coupling coil	
L3	Aerial L.W. coupling coil	
L4	Band-pass primary coils	3·4
L5		32·0
L6	Band-pass coupling coils	Very low
L7		Very low
L8	Aerial S.W. tuning coil ..	Very low
L9	Band-pass secondary coils	2·6
L10		30·0
L11	Osc. S.W. tuning coil ..	Very low
L12	Osc. S.W. reaction coil ..	0·1
L13	Osc. M.W. and L.W. tuning coils	2·25
L14		22·0
L15	Osc. M.W. and L.W. reaction	3·0
L16		70·0
L17	1st I.F. trans. { Pri. ..	70·0
L18		Sec. ..
L19	2nd I.F. trans. { Pri. ..	70·0
L20		Sec. ..
L21	Speaker speech coil ..	1·5
L22	Hum neutralising coil ..	0·1
L23	Speaker field coil ..	1,600·0
T1	Speaker input trans. { Pri. ..	360·0
		Sec. ..
	Pri. total ..	45·0
T2		Mains trans. { Heater sec. ..
	Rect. heat. sec. ..	0·25
	H.T. sec. total	300·0
S1-S8	Waveband switches	—
S9-S11	Radio-gram change switches ..	—
S12	Mains switch, ganged R12	—

DISMANTLING THE SET

A detachable bottom is fitted to the cabinet and upon removal (six counter-sunk-head wood screws) gives access to most of the components beneath the receiver chassis.

Removing Chassis.—It will probably be found best to remove the receiver chassis and power pack together, and to do this first remove the four control knobs (recessed grub screws) and remove the volume control from the front of the cabinet (nut and lock washer).

Now remove the eight self-tapping bolts (with washers) holding the chassis and power pack to the bottom of the cabinet, the two round-head wood screws (with rubber washers) holding the tuning scale to the top of the cabinet, and the two round-head wood screws (with distance pieces) holding the pointer carriage to the front of the cabinet.

Next unsolder the speaker leads, when the chassis and power pack may be withdrawn together. When replacing, connect the red/yellow lead to the bottom

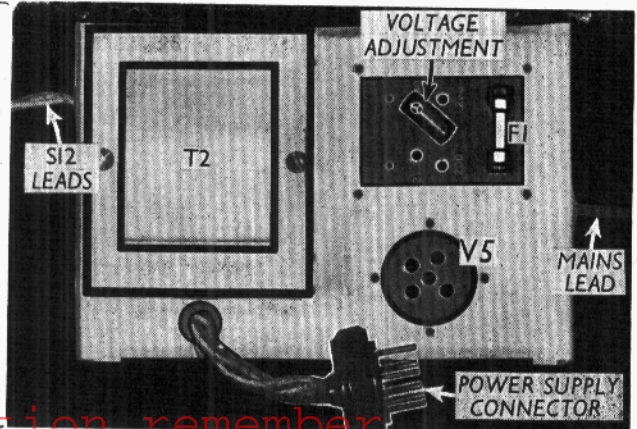
tag on the left-hand speaker panel, and the brown/green lead to the top tag. Take the yellow/black lead to the bottom tag on the transformer and the blue/red and brown/green leads to the top tag.

Removing Power Pack.—If it should be desired to remove the power pack alone, remove the four self-tapping bolts (with washers) holding it to the bottom of the cabinet, withdraw the plug from the socket on the chassis, and unsolder the leads from the mains switch.

Removing Speaker.—To remove the speaker from the cabinet, unsolder the leads and remove the nuts (and lock washers) from the three screws holding it to the sub-baffle. When replacing see that the transformer is on the right, connect the leads as above, and take the two leads from the extension speaker panel to the two tags on the left of the transformer. Do not forget to take the black/yellow earthing lead to the soldering tag on the top right-hand screw.

Continued overleaf

Plan view of the power supply unit. The leads on the left go to the mains switch S12.



HALCYON A581—Continued

VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating on mains of 230 V, using the 240 V tapping on the mains transformer. The receiver was tuned to the lowest wavelength on the medium band and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, chassis being negative.

Valve	Anode Voltage (V)	Anode Current (mA)	Screen Voltage (V)	Screen Current (mA)
V1 TX4*	220	3.5	75	2.9
V2 VP4B	220	6.4	220	2.0
V3 DDT4	140	3.4	—	—
V4 APP4C	210	25.0	220	2.5
V5 APV4	290†	—	—	—

* Oscillator anode, 125 V, 7 mA.
† Each anode, A.C.

GENERAL NOTES

Switches.—S1-S8 are the wavechange switches, ganged in a single unit beneath the chassis. The table below gives the switch positions for the three control settings, starting from fully anti-clockwise. O indicates open and C closed.

Switch	S.W.	M.W.	L.W.
S1	C	O	O
S2	C	C	O
S3	C	C	O
S4	C	O	O
S5	O	O	O
S6	C	C	C
S7	C	C	O
S8	C	O	O

S9-S11 are the radio-gram switches of the Q.M.B. type, fitted at the rear of the chassis. S9 opens and mutes radio on gram., while S10, S11 form a single-pole change-over switch, S10 being closed on

radio, and S11 on gram. Looking from the rear of the underside of the chassis, S9 is on the right of the unit, and S10, S11 on the left. The upper tag on the right is not used.

S12 is the Q.M.B. mains switch, ganged with the volume control R12.

Coils.—L1-L7 and L9, L10 are un-screened, on a common tubular former beneath the chassis. The various coils are indicated in our under-chassis view. L8 and L11, L12 are the S.W. coils on two separate tubular formers, also beneath the chassis. L12 is the fine wire winding of the two. L13-L16, and the I.F. transformers L17, L18 and L19, L20 are in three screened units on the chassis deck, with their associated trimmers. The first of these units also contains C8.

Scale Lamp.—The scale is flood-lit from the rear by a high voltage lamp, with an M.E.S. base, which fits a holder on the chassis deck. In appearance the lamp resembles a "traction" type. Replacements may be obtained from Halcyon, quoting replacement No. 4908. The lamp is rated at 230 V, 10 W, and is connected permanently across the 220 V tapping on the primary of the mains transformer.

Fuse F1.—This is a glass tubular type, mounted in clips on the power supply unit, and rated at 1.0 A.

External Speaker.—Two sockets are provided on a panel mounted at the rear of the cabinet for a low impedance (about 20) external speaker.

Condensers C22, C23.—These are two 8 μF dry electrolytics in a single carton beneath the chassis, having a common negative (black) lead. The red lead is the positive of C22 and the yellow the positive of C23.

Radiogram RGA581.—This has an almost identical chassis, except that the radio-gram switch unit (S9-S11) is mounted on the motor board.

Power Supply Unit.—This is connected to the main chassis by a 6-pin plug fitting a 7-pin valve socket on the chassis

deck. The connections are indicated by numbered circles and arrows in the circuit diagram, on which is inset a diagram of the sockets, looking at the underside of the chassis.

The colour coding of the leads to the corresponding pins in the plug is: 1, green; 2, red; 3 and 6, black; 4 and 5, yellow.

Chassis Divergencies.—Recent models contain R10 and C14 connected in parallel with the pick-up sockets. They are shown in our circuit diagram, but not in the chassis illustrations. Actually they are mounted beneath the chassis, close to the pick-up sockets.

R15 is changed from 10,000 Ω to 33,000 Ω in recent models, while C11 (0.0001 μF mica) is added.

A model is available fitted with a jack which permits remote volume control to be used.

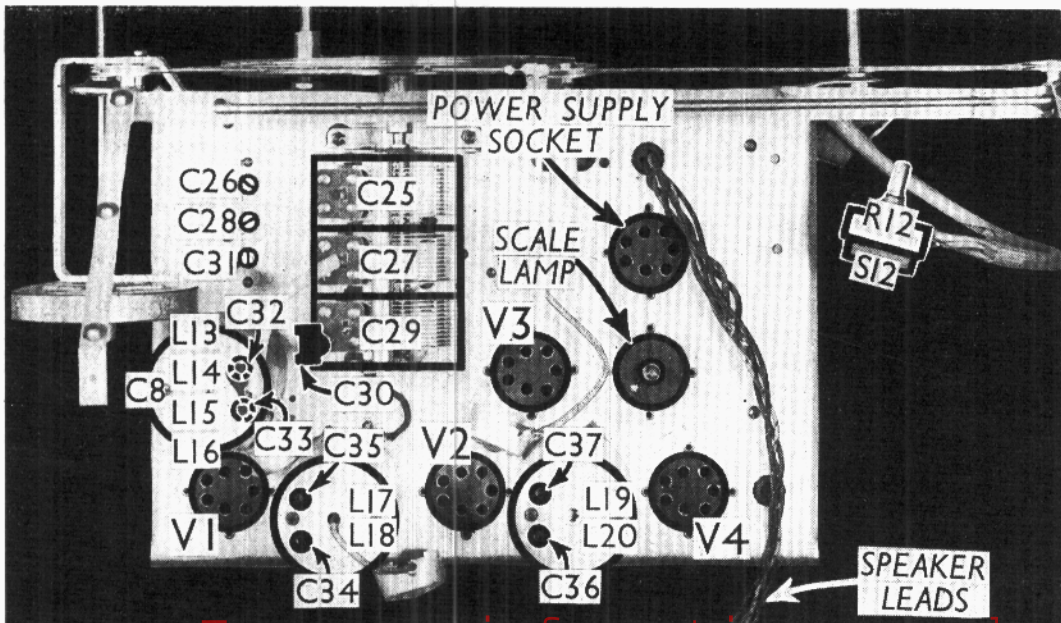
CIRCUIT ALIGNMENT

I.F. Stages.—Feed a 130.5 KC/S signal to V1 control grid (top cap) and chassis, and adjust C37, C36, C35 and C34 in that order, for maximum output.

R.F. and Oscillator Stages.—Switch set to S.W., feed a 13 m. (23.07 MC/S) signal into A and E sockets, tune to 13 m. on scale, and adjust C30 for maximum output. If there are two peaks, that with the least trimmer capacity is correct.

Switch set to M.W., tune to 250 m. on scale, feed in a 250 m. (1,200 KC/S) signal, and adjust C31 for maximum output. If there are two peaks, that with the trimmer nearest its minimum position is correct. Now adjust C28 and C26 for maximum output. Feed in a 500 m. (600 KC/S) signal, tune it in, and adjust C33 for maximum output, rocking the gang meanwhile for optimum results.

Switch set to L.W., feed in an 1,800 m. (166.7 KC/S) signal, tune to 1,800 m. on scale. Adjust C32 for maximum output, rocking the gang meanwhile.



Plan view of the chassis. Note the holder for the high voltage scale lamp, and the socket to which the power supply unit connects. C30 is a trimmer attached to C29. The trimmers C26, C28 and C31 are adjusted through holes in the chassis deck.