

### QUADRADYNE FOUR BY REGENTONE (Cont.)

former has three contacts, only two are actually used.

The condensers, C15 and C16, are of the small electrolytic type in a green container on which the terminals are positive, while the negatives are connected to black leads alongside their corresponding positive terminals.

In our model the values of two of the components were different from those given by the manufacturers—R7 was 10,000 ohms, instead of 5,000, as given; R11 was 1 megohm, instead of 2 megohms.

The leads from the mains transformer were

coloured as follows:—Underneath, electrolytic condenser side: two dark red, set heaters with black as centre tapping; two silk-covered stranded wires in thick systoflex, ends of high voltage secondary (the joint of the lead from C15 is inside the systoflex).

At the V4 end: buff lead to switch; green, 200 v. tap; red, 220 v. tap; black, 240 v. tap.

**Replacing Chassis.**—Before laying the chassis on the baseboard take the mains lead underneath the power chassis to its original position.

Replace the bolts holding the chassis to the baseboard and slide the assembly into the cabinet. The best method appears to be to slide it in at an angle, so that the coil can

is just clearing the volume control when the condenser drive spindle is at the side of the aperture. Hold the V.C. leads and mains switch leads clear of the front of the chassis.

Replace the woodscrew holding the cleat on the mains lead. This holds the baseboard firmly to the cabinet, so that the set can be laid on its side without danger of the chassis slipping.

Screw in the wave change switch lever. In our model there was no additional grub screw holding the collar to the switch spindle, and as the position of the switch was uncertain one or two trials were required to obtain the correct position.

Replace the six woodscrews underneath the cabinet, and replace the tuning knob.

## BEETHOVEN S.G.4 TRANSPORTABLE

**Circuit.**—The H.F. valve, PM12M (V1) is preceded by the tuned frame aerial, of which the long-wave section is short-circuited for the medium waves. The anode is coupled to the grid coil of the next valve by H.F. choke and filter condenser (H.F. C1 and C4), and the screening grid derives its potential from the junction of the coupling and decoupling resistances of V2.

The detector valve, PM1HL (V2), operates as a leaky grid detector with reaction. In its

anode circuit it has an H.F. choke with bypass condenser (H.F. C2 and C10), and an extra condenser C8 forming a complete filter. The decoupling condenser C7 also acts as the decoupling condenser of V1 screen.

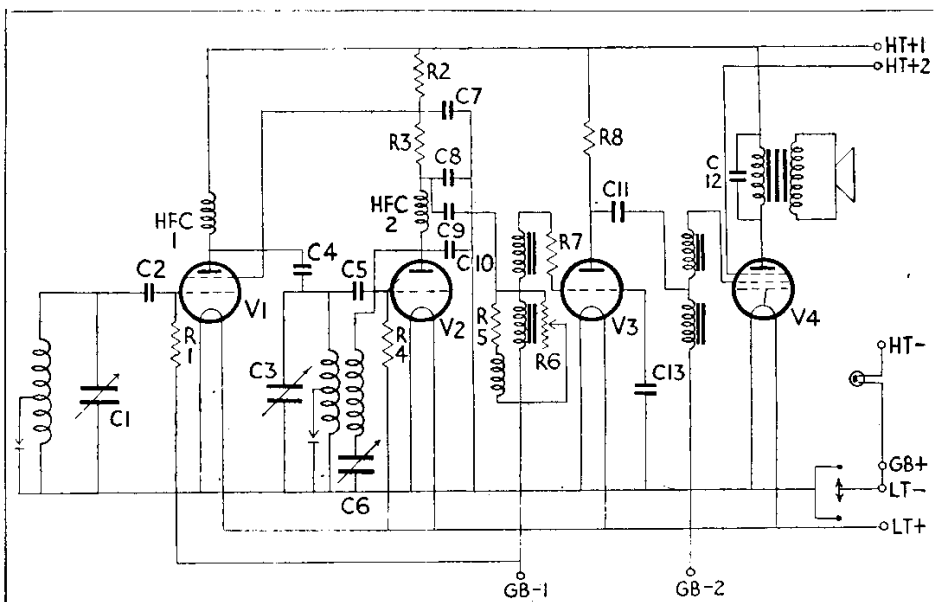
The coupling to the first L.F. transformer is by resistance capacity filter, R3 and C8, and a tone correction circuit, consisting of R5 and a choke, is connected across the primary of the transformer, which is used as a true auto coupler. The volume control

consists of a variable resistance also across the primary.

The L.F. valve, PM1HL (V3) has an H.F. stopper R7 in its grid circuit, and the anode is coupled to the second L.F. transformer by another filter R8 and C11.

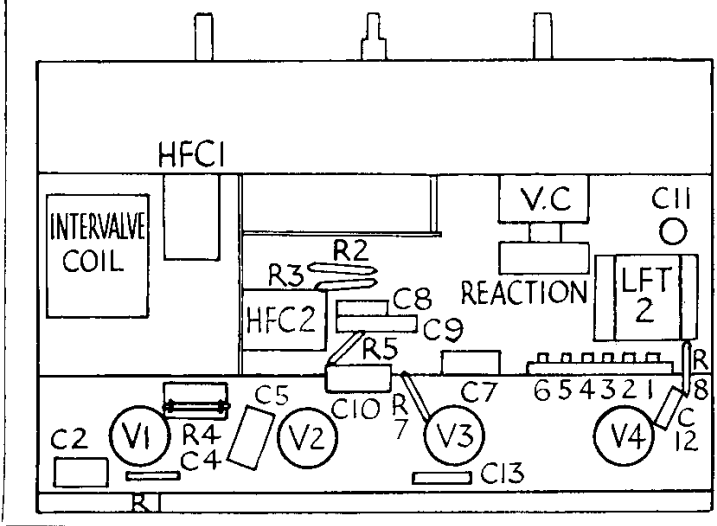
The output valve, PM22A (V4), is a pentode which is compensated for high note

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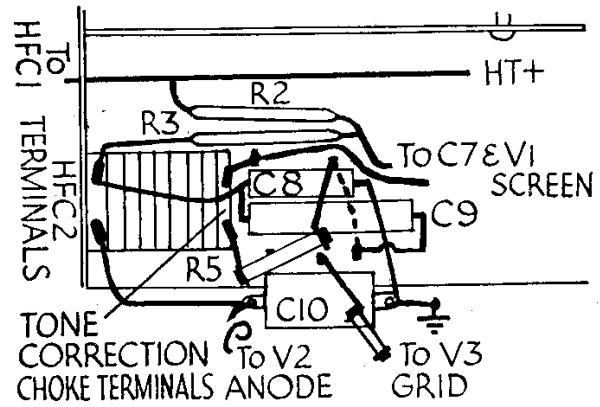


RESISTANCES		
R.	Purpose.	Ohms.
1	V1 grid leak	2 meg.
2	Decoupling anode V2 (S.G.V1)	40,000
3	V2 L.F. coupling resistance	40,000
4	V2 grid leak	2 meg.
5	Tone correction circuit	10,000
6	Variable volume control	9,000
7	H.F. stopper grid V3	1 meg.
8	V3 L.F. coupling resistance	21,000
9	Primary output transformer	680
10	Primary L.F.T.2	1,100
11	Secondary L.F.T.2	2,900
12	Primary L.F.T.1	1,050
13	Secondary L.F.T.1	4,000

CONDENSERS		
C.	Purpose.	Mfd.
1	Tuning frame aerial	.0007
2	V1 grid	.0009
3	Tuning grid coil of V2	.00055
4	H.F. filter feed to V2 tuned grid	.001
5	V2 grid	.00025
6	Reaction condenser	.00027
7	L.F. decoupling anode V2 (S.G.V1)	.5
8	Part of H.F. filter, anode V2	.0025
9	L.F. filter condenser to L.F.T.1	.1
10	Part of H.F. filter, anode V2	.0001
11	L.F. filter to L.F.T.2	.1
12	Tone compensating anode V4	.0025
13	V3 grid stabiliser	.0001



The circuit (top left) of the Beethoven Transportable consists of H.F. and detector valves followed by a high-gain L.F. section. Note how the V1 screen voltage is obtained. As all components are inside the chassis only one layout is given (left). Below is a detail diagram of the detector anode circuit.



## TRANSPORTABLE BY BEETHOVEN (Cont.)

accentuation by the condenser C12, which is connected between the anode and H.T. +. A permanent magnet M.C. speaker completes the circuit.

**Special Notes.**—The fuse is in the H.T. — lead.

The volume control operates, also on gramophone as the P.U. leads are connected directly across it.

In our model the grid leak of V1 (R1) was taken direct to L.T. —.

The choke in the tone correction circuit across the primary of L.F.T.1 is actually wound on the same former as H.F.C.2. The connections on this double choke are: two at base, H.F.C.2; two at top, tone correction.

The volume control and reaction condenser are ganged and "staggered" so that the vanes of the reaction condenser do not mesh

### VALVE READINGS

Battery data: HT + (red, 120 volts; green, 96 volts; GB, white, +; blue, — 1.5 volts; yellow — 3 volts.

Valve	Type.	Electrode.	Volts.	m.a.
1	PM12M	anode ... screen ...	118 80	1.8 —
2	PM1HL...	anode ...	38	.8
3	PM1HL...	anode ...	95	.65
4	PM22A ...	anode ... aux. grid ...	118 95	4.2 1.0

till the V.C. is at maximum. As the resistance is wire-wound, the junction is easily recognised by those who know the device.

**Quick Tests.**—These consist of testing voltages on valves.

**Removing Chassis.**—Remove knobs (grub screws). Take out fillets underneath battery compartment, and remove compartment by unscrewing two countersunk screws from each side.

Pull the leads and wander-plugs through the holes, and remove the two blocks holding the frame aerial.

Remove the four wood screws from the flange at the back of the chassis, and lift out the chassis complete with frame aerial and L.S.

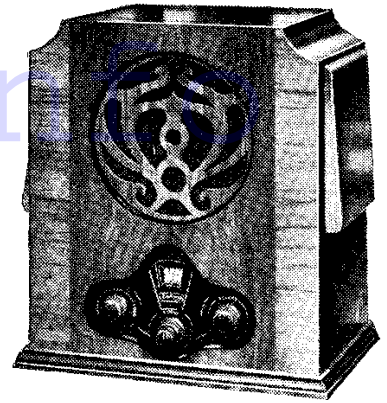
**General Notes.**—In case any repair has to be performed on the L.F.T.1 section, we give a special diagram of the connections and the relative positions of the components.

The connections on the small panel near V4 are (1) V4 anode, (2) H.T. +, (3) V4 aux. grid, (4) L.F.T.2 (a terminal), GB — 2, (5) GB — 1, (6) H.T. —.

When no reception can be obtained and the voltage on the screen of V1 is abnormally high, the detector valve should be suspected as the drop in voltage to the screen is caused by V2 current through R2.

**Replacing Chassis.**—Do not forget to replace the cover over the H.F. coil if this has been removed.

Slide chassis carefully into the cabinet, re-



The Beethoven S.G.4 Transportable made by Montague Radio Inventions and Development Co., Ltd.

place blocks holding frame aerial to front of cabinet.

If the battery compartment was difficult to remove through fitting too perfectly, it is advisable to place it in position before replacing the fillets and to take the wander-plugs through the holes before fixing the compartment.

Replace the four screws on the flange at the back of the chassis and replace the knobs.

## ATLAS MAINS THREE

**Circuit.**—The H.F. valve, AC/SG/VM (V1) is preceded by a tuned secondary aerial transformer, the bias for which is provided by a separate rectifier system, which also supplies the bias potential for the output valve. The actual voltage is obtained from a potentiometer at the junction of R6 and R7. The variable mu characteristic of the valve is not used for controlling volume.

The anode lead is taken to a tapping on the tuned anode coil and the anode circuit is decoupled.

The detector valve, AC/2HL (V2), works as a power grid detector, with a .0001 mfd. grid condenser and .25 megohm grid leak. Bias for the pick-up is provided from the bias potential for the H.F. valve.

Reaction is used and a stabilising resistance to provide smooth control is included in the lead from the anode. The anode circuit consists of a by-pass condenser, H.F. choke and coupling resistance to the parallel-fed L.F. transformer.

Decoupling consists of a 20,000 ohm resistance and 2 mfd. condenser.

The output valve, 4IMP. (V3) is an indirectly heated triode, and the L.S. circuit is conventional.

The mains equipment is in two sections, with one mains transformer. One high voltage winding is connected to a full wave metal rectifier on the voltage doubling circuit for HT, and another winding is connected to a half wave metal rectifier for the grid bias voltages. This method allows all the cathodes to be at chassis potential. As with battery sets, the positive of the G.B. circuit is connected to chassis.

### VALVE READINGS

Valve.	Type.	Electrode.	Volts.	M.A.
1	A.C., S.G., V.M.	anode ... screen ...	185 110	15 —
2	A.C.2	anode ...	90	3.5
3	H.L. 4IMP.	anode ...	215	20

**Quick Tests.**—The speaker transformer is covered and only two points of H.T. potential are accessible.

Voltages between the following and chassis:—

Positive terminal on electrolytic condenser (H.T. unsmoothed) 360 volts.\*

Anode of S.G. valve, 190 volts.

**Removing Chassis.**—Remove tuning knobs (grub screw), pull off the wave change and the reaction knobs, and remove four screws from underneath. Cut the strings holding the L.S. leads and lift the chassis out.

**Set Chassis.**—To reach the components in the set chassis undo the two bolts holding the flanges at the side of the outer casing and undo the two bolts alongside the tuning dial.

Ease the control section outwards and unsolder the following leads—two to the terminal strip at the right hand end (looking from the rear) and three from the terminal strip at the other end. Unsolder the lead from V2 grid condenser (C6) and the lead from the H.F. intervalve coil to the S.G. anode.

The two sections can then be separated. Note that the upper terminal of four is blank, as is the middle one of three on the valve deck section.

**Power Pack.**—To separate the valve deck from the power pack remove two bolts holding the stays at the ends and slacken the two bolts at the end of the cover over the terminal strip.

The bolts fit into grooves in the power pack side, so that when the ten links (soldering tags) between the chassis have been unsoldered, the two can be separated without removing the bolts.

If trouble is definitely traced to the power pack this can be removed without dismantling the set chassis.

**Quick Tests at Power Pack Terminals** (with chassis out).—To reach these,

\* In taking this reading take care not to cause a short circuit to the casing.



Screen-grid, detector and pentode valves form the circuit combination of the Atlas 334 receiver by H. Clarke & Co. (Manchester), Ltd.

slacken two bolts at the ends of the terminal cover that reaches from the S.G. to the output valve, and slip the flanges from underneath the heads.

Voltages between the terminals and chassis, counting from output valve end:—

- (1) V3 valve anode, +215 volts.
- (2) H.T. + smoothed +220 volts.
- (3) Feed to det. between R9 and R5, +150 volts.
- (4) Screen of V1, +110 volts.
- (5) Bias for V3, —8 volts.
- (6) Pick-up, 0 volts.
- (7) Bias for V1, .75 volts.
- (8) Aerial, 0 volts.
- (9) Chassis, 0 volts.

**General Notes.**—The power pack is the combined H.T., L.T. and G.B. eliminator, and though the rectifier is drawn diagrammatically as two separate rectifiers, they are  
(Continued on opposite page.)