

# BRUNSWICK BTA2 FOUR BAND SIX

**CIRCUIT.**—The aerial coupling is by separate tuned aerial coils to the grid of the H.F. amplifier, V1, an H.F. pentode. V1 is tuned-anode coupled to a triode-hexode frequency changer, V2, the converted signals passing by an I.F. transformer (tuned to 456 kc.) to the grid of V3, the I.F. amplifying valve.

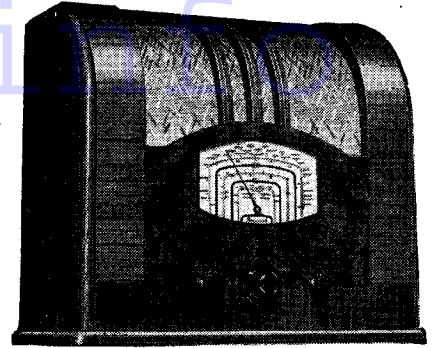
The output of V3 passes to another I.F. transformer having a tapping on the secondary which is connected to the demodulating diode of V4, a double-diode valve. The other diode of V4 provides a D.C. potential for A.V.C.

The rectified output of the demodulating diode is fed through an H.F. stopper resistance to a switch. By means of this switch the I.F. amplifier, V3, is made to operate as an L.F. amplifier when

switched to the "gram." position, R14 acting as the anode load and C14 as the L.F. coupling condenser to the grid of V5, an output pentode.

A manual volume control connected in the grid circuit of V5 operates so as to vary the input. A pentode compensator condenser is connected between the anode of V5 and the chassis, and a variable resistance and condenser in series provide a tone control.

Mains equipment consists of a mains



The Brunswick BTA2 A.C. receiver gives reception on four bands between 12.5 and 2,000 metres.

## VALVE READINGS

No signal. Volume maximum. Bottom M.W. band. 200 volt A.C. mains.

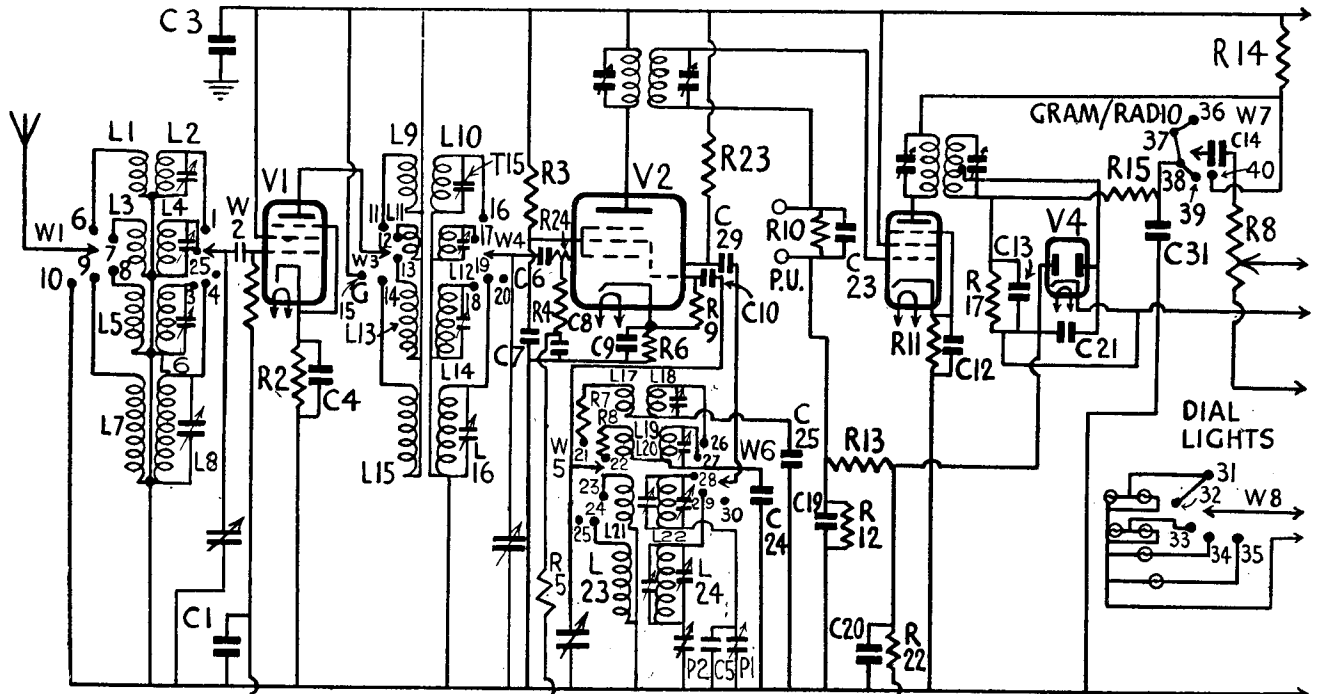
V.	Type.	Electrode.	Volts.	Ma.
1	Mullard VP4B(7) or AC/VP2	Anode ..	194	7.7
		Screen ..	194	3
2	Mullard TH4A(7) or AC/TH1	Anode ..	194	2.8
		Screen ..	90	5.9
3	Mullard VP4B(7) or AC/VP2	Anode ..	142	8.8
		Screen ..	194	3.1
4	Mullard 2D4A(5)	Diodes only	—	—
5	Mazda AC4/PEN (7)	Anode ..	170	34
		Screen ..	194	7.9
6	Mullard 1W4/350(4) or R2.	Filament ..	319	—

## CONDENSERS

C.	Purpose.	Mfd.
1	A.V.C. decoupling ..	.1
2	Grid blocking ..	.00005
3	V1 screen decoupling ..	.5
4	V1 bias decoupling ..	.1
5	M.W. fixed pad ..	.0003
6	V2 grid blocking ..	.0002
7	V2 screen decoupling ..	.1
8	V2 A.V.C. decoupling ..	.1
9	V2 bias decoupling ..	.1
10	Osc. grid ..	.0002
11	V3 decoupling ..	.006
12	V3 bias decoupling ..	.1
13	H.F. by-pass ..	.0001
14	L.F. coupling ..	.02
15	V5 compensator ..	.006
16	Tone control ..	.02
17	V5 bias decoupling ..	50
18	H.T. smoothing ..	16
19	V3 A.V.C. decoupling ..	.002
20	A.V.C. decoupling ..	.02
21	A.V.C. diode feed ..	.0001
22	H.T. smoothing ..	8
23	P.U. shunt ..	.006
24	S.W. 2 pad ..	.002
25	S.W. 1 pad ..	.005
27	M.W. fixed trimmer ..	.00025
28	L.W. fixed trimmer ..	.00005
29	Osc. anode feed ..	.0001
30	H.F. by-pass ..	.006
31	H.F. by-pass ..	.0001

## RESISTANCES

R.	Purpose.	Ohms.
1	V1 A.V.C. feed ..	.5 meg.
2	V1 bias ..	200
3	V2 screen decoupling ..	15,000
4	V2 A.V.C. feed ..	.5 meg
5	A.V.C. decoupling ..	25 meg.
6	V2 bias ..	200
7	Osc. modifier ..	40
8	Osc. modifier ..	150
9	Osc. grid leak ..	50,000
10	P.U. shunt ..	50,000
11	V3 bias ..	200
12	A.V.C. diode load (part) ..	.3 meg.
13	A.V.C. diode load (part) ..	.5 meg.
14	L.F. coupling ..	5,000
15	H.F. stopper ..	70,000
16	Tone control ..	.5 meg.
17	Diode load ..	.3 meg.
18	Volume control ..	5 meg.
19	V5 stabiliser ..	150
20	V5 bias ..	100
21	Delay bias ..	150
22	A.V.C. feed ..	.3 meg.
23	Osc. anode feed ..	3,000
24	V2 stabiliser ..	50



transformer, a full-wave rectifying valve, V6, electrolytic smoothing condensers, and a smoothing choke consisting of the speaker field-energising coil. A mains suppressor condenser is connected between one side of the mains and the chassis earth line.

**Chassis Removal.**—The cabinet is provided with a false bottom whereby the underside of the chassis may be inspected and small components replaced.

Remove the back of the cabinet and the three control knobs. The combined tuning and volume control knobs are removed by detaching the grub-screw fixed to the smaller knob, when the two knobs can be pulled off. The other two knobs are of the grub-screw fixing type.

Remove the four chassis-securing bolts from the base and unclasp the speaker cable. The

speaker (secured by six bolts) can be removed if desired, or, alternatively, the leads to the speaker panel unsoldered. For the reverse process, looking from the rear of the set, the blue lead is connected to the lowest tag, the black lead to the one above and the red to the second tag from the top.

**Special Notes.**—The mains adjustment device uses a bridging contact that contains a fuse. The fuse may be replaced by unscrewing the two metal connectors and feeding 1-amp. fuse wire through the small hole provided.

The receiver has six pilot lights rated at 6 volts 0.3 amp.

A pair of sockets at the rear of the chassis enable a pick-up of the crystal or high-impedance type to be connected, and a similar pair of sockets enable an external speaker to be operated. This should be of the permanent magnet moving-coil type with a 9,000 ohms impedance matching transformer.

**I.F. Circuits.**—Connect an output meter across the primary of the speaker transformer and a modulated oscillator between the top grid and cap of V2 and chassis. Switch the receiver to the medium waveband and short-circuit the oscillator section of the gang condenser. Turn the volume control to the maximum position.

(Continued on page 48.)

## Brunswick Six on Test

**MODEL BTA2.** — Standard model for operation on A.C. 200-260 volts, 50-100 cycles. Price, £14 3s. 6d.

**DESCRIPTION.** — Four-band, six-valve, including rectifier, table model superhet receiver.

**FEATURES.** — Full-vision scale illuminated in sections by wave switch. Concentric tuning with volume control in centre. Combined tone and master switch. Elliptical cone high-fidelity speaker. Pick-up and speaker sockets. Fuse in voltage adjuster.

**LOADING.**—75 watts.

### Sensitivity and Selectivity

**SHORT WAVES** (12.5-35 and 35-90 metres).—Very satisfactory gain and selectivity. Easy control with no drift. Representative performance for the valve combination.

**MEDIUM WAVES** (200-550 metres).—Good gain and selectivity with quiet background. Local stations spread on adjacent channels only and gain is well maintained.

**LONG WAVES** (800-2,000 metres).—Satisfactory gain and selectivity. All main stations easily received.

### Acoustic Output

Well balanced tone with the tone control not too vigorous in action. Clean top and good attack, with representative medium- and low-note radiations. Practically no coloration on speech and pleasing balance on orchestral music, with ample volume for an ordinary room.

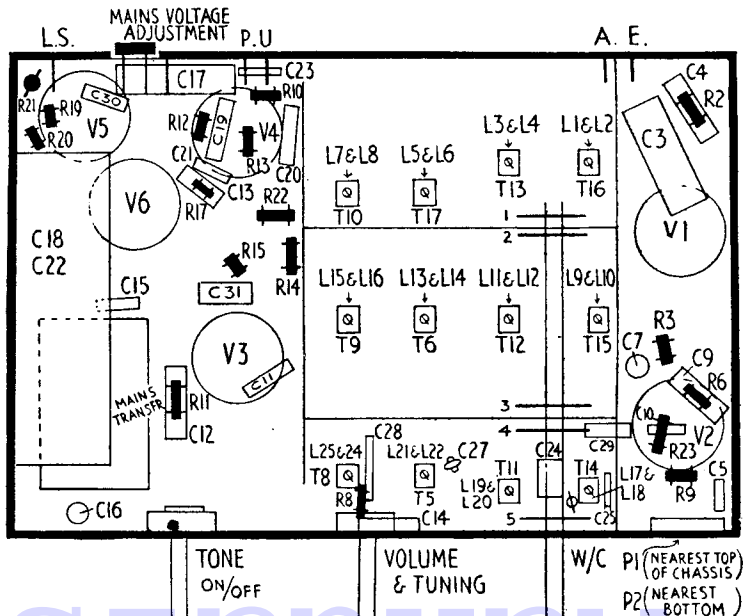
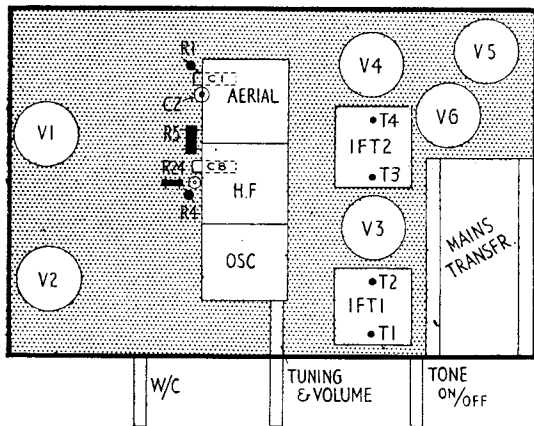
## WINDINGS

Winding.	Ohms.	Winding.	Ohms.
L1	.1	L12	.1
L2	.14	L13	.7
L3	.1	L14	3
L4	.14	L15	2.8
L5	3	L16	17
L6	3	IPT's (each)	7.5
L7	15.5	IPT2 secondary (part)	4.4
L8	15.5	Field	1400
L9	.4	Speaker trans. primary	400
L10	.1	Mains trans. primary	25
L11	1.2	Total H.T. secondary	510

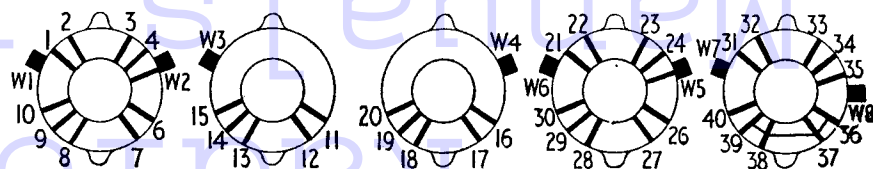
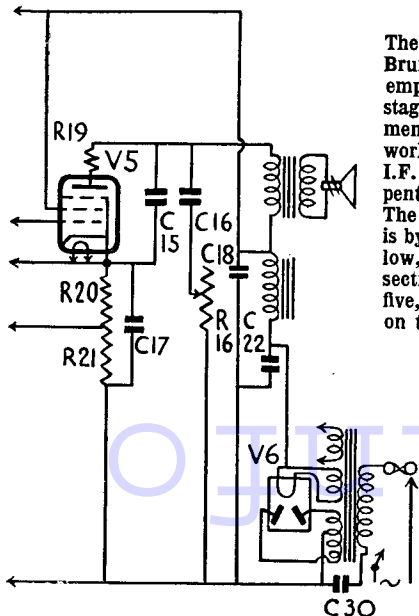
## QUICK TESTS

Quick tests are available on this receiver on the leads to the speaker panel. Voltages measured between these and the chassis should be:—  
Red lead, 194 volts, smoothed H.T.  
Black lead, 172 volts, smoothed H.F.  
Blue lead, 319 volts, unsmoothed H.T.

A clean and accessible chassis layout is a feature of the Brunswick BTA2 A.C. allwave superhet. The tinted diagram on the left depicts the upper side of the chassis, while that immediately below on the right shows the underside view. At the bottom of the page diagrams indicate connections to the switch banks.



The circuit of the Brunswick BTA2 employs a two-stage arrangement for pick-up work, using the I.F. and output pentode valves. The double diode is by-passed. Below, the switch sections, one to five, as numbered on the chassis diagram.



(Continued from page 46.)  
control knobs (spring fixing), the escutcheon plate and also the pointer from the tuning control shaft.

Uncleat the leads from the wavechange switch from the side of the cabinet and remove the tagged leads to the speaker transformer. For the reverse process, from top to bottom, the black lead is connected to the top bolt, the systoflex lead to the next but one, the two red leads to the next, and the two white leads to the remaining bolt.

Remove the four chassis securing bolts and the green lead attached to the bolt at the top rear of the chassis and the yellow lead connected to the right end bolt on the speaker panel.

The chassis can then be withdrawn.

**Special Notes.**—The mains adjustment resistance is located at the rear of the chassis to enable alterations to be easily effected. A choice of six voltage tappings is available, the flying lead being connected to the desired terminal. A twin choke and two condenser arrangement is fixed on a metal bracket that also supports the mains resistance.

The mains plug contains two fuses rated at one amp. These can be replaced by taking the plug to pieces.

Two marked sockets on the side of the cabinet enable an earth and an external aerial to be connected for use in screened buildings and remote localities.

A similar pair of sockets on the opposite side of the chassis enable either headphones or an external speaker to be operated. If headphones are used they should be of the low impedance type of D.C. resistance approximately 50 ohms. If special plugs are used and pushed right home then the internal speaker is cut out.

When these plugs are not pushed right home the internal speaker and headphones work simultaneously.

If an external speaker is used then this should be of the permanent magnet type with a speech coil impedance of 2 to 4 ohms.

Electrolytic condensers C21 and C22 are mounted on the side of the cabinet. Mains suppressor condensers C23 and C24 with filter chokes are mounted on the mains panel bracket with the associated mains resistance R12. C6 and C9 are located near the A and E sockets. R3 is inside the screening cap of V2.

The wavechange switch is of the enclosed contact type.

## Circuit Alignment Notes

Connect a low impedance output meter to the headphones socket on the side of the cabinet or a high impedance output meter, in series with a condenser of suitable voltage rating, across the primary of the matching transformer.

Connect a modulated oscillator between the external aerial and earth sockets, preferably via a dummy aerial or fixed condenser. Set the volume control to midway between maximum and minimum positions. Alignment should be carried out with the receiver in the cabinet.

Switch the receiver to the medium band and set the pointer to read 210 metres on the wavelength scale. Tune the oscillator to 210 metres (1,425 kc.), and adjust the trimmers on the gang condenser, C4 and C5 for maximum response. As these are inaccessible with an ordinary screwdriver, they should be adjusted by a flat spanner. A suitable one is supplied in the Trim-kit service aid supplied by the makers.

For the long waves no further trimming is required, but the usual calibration checks should be made at 550, 900 and 1,900 metres.

## Replacement Condensers

Exact replacement condensers for the Baby QU are available from A. H. Hunt, Ltd., Garratt Lane, Wandsworth, London.

## Pye Baby QU on Test

**MODEL Baby QU.**—Standard model for universal A.C./D.C. operation, 200-250 volts, 40-100 cycles. Price 8 gns.

**DESCRIPTION.**—Two-band, four-valve, including rectifier, universal transportable.

**FEATURES.**—Self-contained frame aerials. Turntable on base of cabinet. Full-vision scale marked in station names and metres. Combined wave selection and master switch. Combined volume and reaction. Sockets for external earth and aerial and for headphones or external speaker. Mounted in leatherette case with carrying strap.

**LOADING.**—58 watts.

### Sensitivity and Selectivity.

**MEDIUM WAVES (200-550 metres).**—Excellent gain and adequate selectivity helped by the directional properties of the aerial. Reaction control very smooth and free from overlap.

**LONG WAVES (900-2,000 metres).**—Similar performance to medium waves, with adequate selectivity. Complete separation of all the usual stations, with very good sensitivity.

### Acoustic Output

Very well balanced tone for a small portable, with crisp, clean attack and reasonable medium- and low-note radiation. Speech only slightly coloured and sufficient volume for an ordinary room.

S.W.18. For the block containing C21 and C22 there is unit 3.915, at 7s. 6d.; for C7 or C19, unit 2.985, at 1s. 3d.; and for either C11 or C15, unit 2.964, at 1s. 10d.

(Continued from page 45.)

Tune the oscillator to 456 kc. and adjust T3 and T4 and then T1 and T2 for maximum, reducing the input from the oscillator as the circuits come into line to render the A.V.C. inoperative. The I.F. trimmers are initially sealed by red paper strips.

**Signal Circuits.**—Remove the short-circuit from the oscillator section of the gang. Leave the output meter connected as before, but feed the oscillator to the aerial and earth terminals, via either a dummy aerial or fixed condenser. Only feed sufficient input from the oscillator to obtain definite peaks in the output meter, so as to keep the A.V.C. inoperative.

**Medium Waves.**—Tune the set and oscillator to 200 metres (1,500 kc.) and adjust first T5 and then T6 and T7 for maximum. Tune the set and oscillator to 550 metres (545 kc.) and adjust P1 for maximum simultaneously rocking the gang to ensure optimum results. Repeat both operations.

**Long Waves.**—Tune the set and oscillator to 1,000 metres (300 kc.) and adjust first T8 and then T9 and T10 for maximum.

Tune the set and oscillator to 2,000 metres (150 kc.) and adjust P2 for maximum, simultaneously rocking the gang to ensure optimum results. Repeat both operations.

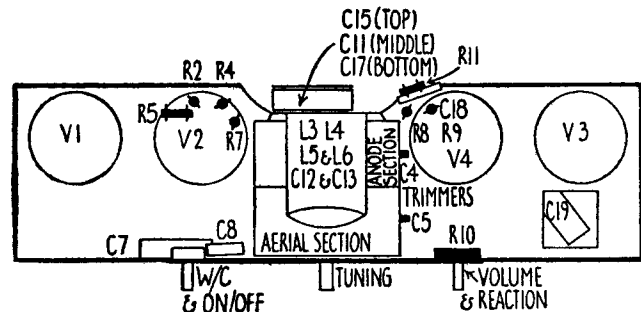
**Short Waves.**—Tune set and oscillator to 35 metres (8,571 kc.) and adjust first T11 and then T12 and T13, and then finally retrim T11 for maximum response.

The padding is fixed, but check at 40 and 80 metres. Tune the set and oscillator to 13 metres (23,077 kc.) and adjust first T14 and then T15 and T16; finally retrim T14 for maximum response.

A Hunt's block is used in the BTA2. The list number is 3475 and the price 8s. 9d.

## WINDINGS

Winding.	Ohms.	Winding.	Ohms
L1	1.72	L7	below 1
L2	26	L8	below 1
L3	3	L9	1,000
L4	below 1	L10	2
L5+L3	12.5	L11	2
L6+L4	2.7	T1 prim	450



Left is the top view of the chassis, and below the underneath arrangement.

A simple layout has been secured in the design of the Pye Baby QU, the chassis being mounted towards the top of the cabinet.

