*Supplement to The Wireless & Electrical Trader, October 15, 1949*





"TRADER" SERVICE SHEET
928

# ALBA 3613

*3-Band All-dry Superhet*

THE Alba 3613 is a 4-valve 3-band battery superhet employing all-dry type valves. The waveband ranges are 16-50 m, 200-600 m and 750-2,000 m. Flexible wires are provided for the aerial and earth connections.

*Release date and original price: June, 1949, £11 10s less batts. plus P.T.*

## CIRCUIT DESCRIPTION

Aerial input via series capacitor **C1** is inductively coupled by **L1** (S.W.), **L2** (M.W.), and **L3** (L.W.) to single-tuned circuits **L4, C23** (S.W.), **L5, C23** (M.W.) and **L6, C23** (L.W.) which precede a heptode valve **(V1, Mullard DK91),** a frequency changer with electron coupling.

Oscillator grid coils **L8** (S.W.), **L9** (M.W.), and **L10** (L.W.) are tuned by **C24.** Parallel trimming by **C25** (S.W.), **C26** (M.W.) and **C27** (L.W.); series tracking by **C7** (M.W.) and **C8, C9** (L.W.).

On S.W., an electron-coupled oscillator is employed, the filament circuit of **V1** being completed via a tapping on **L8,** necessitating the inclusion of a filament R.F. choke **L7,** and by-pass capacitors **C4, C5.** On M.W., mixed reaction coupling is obtained via **L11** and the common impedance of tracker **C7** in grid and anode circuits, and on L.W. inductive coupling is provided by anode coil **L12.**

Second valve **(V2, Mullard DF91)** is a variable-mu R.F. pentode operating as intermediate frequency amplifier with tuned transformer couplings.

**Intermediate frequency 470 kc/s.**

Diode second detector is part of single diode pentode valve **(V3, Mullard DAF91).** Audio frequency component in rectified output is developed across manual volume control **R10,** which is also the diode load resistor, and passed via **C15** to C.G. of pentode section, which operates as A.F. amplifier. I.F. filtering by **C12, R8, C13** and **C14.**

The D.C. potential developed across **R10** is tapped off and fed back, through a decoupling network **R9, C2** as G.B. to F.C. (except on S.W.) and I.F. valves, giving automatic gain control.

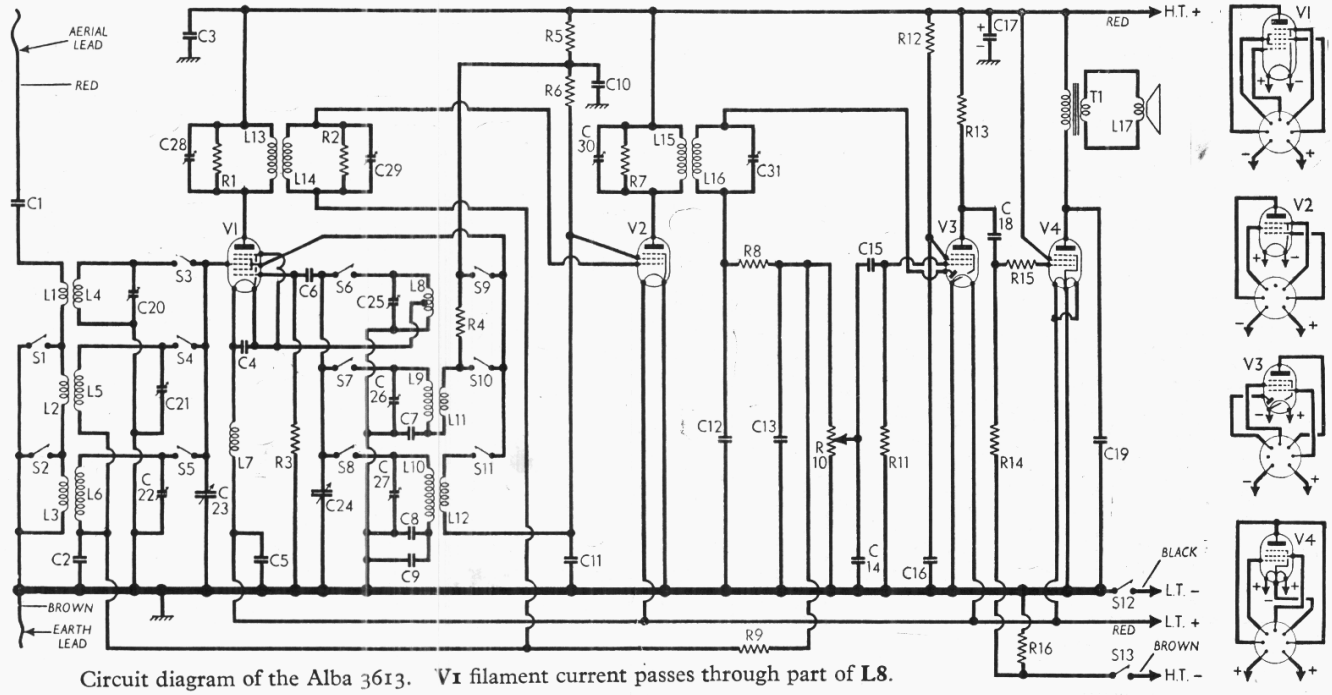
Resistance-capacitance coupling by **R13, C18, R14** via grid stopper **R15,** between **V3** pentode and pentode output valve **(V4, Mullard DL92).**

## COMPONENTS AND VALUES

| | RESISTORS | Values (ohms) | Locations |
|---|---|---|---|
| R1 | I.F. shunt... ... | 560,000 | A2 |
| R2 | I.F. shunt... ... | 560,000 | A2 |
| R3 | V1 Osc. C.G. ... | 100,000 | E4 |
| R4 | Osc. anode load ... | 10,000 | F4 |
| R5 | H.T. decoupling ... | 5,000 | F4 |
| R6 | V2 S.G. H.T. feed... | 10,000 | F4 |
| R7 | I.F. shunt... ... | 330,000 | B2 |
| R8 | I.F. stopper ... | 150,000 | B2 |
| R9 | A.G.C. decoupling | 2,200,000 | D5 |
| R10 | Volume control ... | 2,000,000 | C3 |
| R11 | V3 pent. C.G. ... | 10,000,000 | C4 |
| R12 | V3 S.G. H.T. feed... | 4,700,000 | D4 |
| R13 | V3 pent. load ... | 1,000,000 | C5 |
| R14 | V4 C.G. resistor ... | 2,200,000 | C4 |
| R15 | V4 C.G. stopper ... | 10,000 | C4 |
| R16 | V4 G.B. resistor ... | 680 | C3 |

| | CAPACITORS | Values (μF) | Locations |
|---|---|---|---|
| C1 | Aerial series ... | 0·0001 | F4 |
| C2 | A.G.C. decoupling | 0·05 | E4 |
| C3 | H.T. R.F. by-pass | 0·1 | D3 |
| C4 | L.T. R.F. by-pass | 0·005 | E5 |
| C5 | L.T. R.F. by-pass | 0·1 | E5 |
| C6 | V1 osc. C.G. ... | 0·0001 | E4 |
| C7 | Osc. M.W. tracker | 0·000455 | F4 |
| C8 | Osc. L.W. tracker | 0·000175 | F5 |
| C9 | Osc. L.W. tracker | ** | F5 |
| C10 | H.T. decoupling ... | 0·1 | F4 |
| C11 | S.G. decoupling ... | 0·05 | E4 |
| C12 | I.F. by-pass capacitors ... ... | 0·0001 | B2 |
| C13 | | 0·0001 | B2 |
| C14 | | 0·0001 | C4 |
| C15 | A.F. coupling ... | 0·005 | C4 |
| C16 | V3 S.G. decoupling | 0·1 | C4 |
| C17* | H.T. reservoir ... | 8·0 | D4 |
| C18 | A.F. coupling ... | 0·001 | C4 |
| C19 | Tone corrector ... | 0·001 | C5 |
| C20‡ | Aerial S.W. trim ... | 0·00004 | A2 |
| C21‡ | Aerial M.W. trim. | 0·00004 | A2 |
| C22‡ | Aerial L.W. trim.... | 0·00008 | A2 |
| C23† | Aerial tuning ... | §0·000438 | A2 |
| C24† | Oscillator tuning ... | §0·000438 | A1 |
| C25‡ | Osc. S.W. trim. ... | 0·00004 | F5 |
| C26‡ | Osc. M.W. trim. ... | 0·00004 | F5 |
| C27‡ | Osc. L.W. trim. ... | 0·00008 | F5 |
| C28‡ | 1st I.F. transformer tuning ... ... | 0·00018 | A2 |
| C29‡ | | 0·00018 | A2 |
| C30‡ | 2nd I.F. transformer tuning ... | 0·00018 | B2 |
| C31‡ | | 0·00018 | B2 |

* Electrolytic. † Variable. ‡ Pre-set.
§ "Swing" value, min. to max. ** Lengths of wire.




Circuit diagram of the Alba 3613. V1 filament current passes through part of **L8.**

| OTHER COMPONENTS | | Approx. Values (ohms) | Locations |
|---|---|---|---|
| L1 | Aerial coupling coils | 0·2 | A1 |
| L2 | | 1·0 | A1 |
| L3 | | 57·0 | A1 |
| L4 | Aerial tuning coils | 0·1 | A1 |
| L5 | | 3·7 | A1 |
| L6 | | 15·0 | A1 |
| L7 | Fil. choke ... | 0·3 | E5 |
| L8 | Osc. S.W. coil ... | 0·2 | F3 |
| L9 | Osc. M.W. and L.W tuning coils | 2·0 | F4 |
| L10 | | 4·5 | F4 |
| L11 | Osc. M.W. and L.W. react. coils | 1·7 | F4 |
| L12 | | 2·0 | F4 |
| L13 | 1st I.F. trans. Pri. | 8·6 | A2 |
| L14 | 1st I.F. trans. Sec. | 8·6 | A2 |
| L15 | 2nd I.F. trans. Pri. | 8·6 | B2 |
| L16 | 2nd I.F. trans. Sec. | 8·6 | B2 |
| L17 | Speech coil ... | 2·2 | — |
| T1 | Output trans. Pri. | 380·0 | — |
| | Output trans. Sec. | 0·7 | — |
| S1-S11 | Waveband switches | — | F3 |
| S12 | L.T. switch ... | — | C3 |
| S13 | H.T. switch ... | — | C3 |

## CIRCUIT ALIGNMENT

Except for the cursor adjustment, all the following operations may be carried out with the chassis in position in the cabinet. With the gang at maximum capacitance the cursor should be vertical and coincident with the 590 m calibration mark on the glass scale. It may be adjusted in position by rotating the drum drive on its spindle, after slackening the two boss screws.

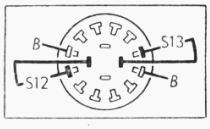
**I.F. Stages.**—Switch set to M.W,, turn gang to minimum and volume control to maximum, connect signal generator via an 0.1 $\mu$F capacitor in the "live" lead to control grid (pin 6) of **V1** and chassis. A convenient point for connection of the "live" lead is the fixed vanes tag of **C23** (rear section of gang). Feed in a 470 kc/s (638.3 m) signal, and adjust **C31, C30, C29** and **C28** (location references B2, A2) for maximum output. Repeat these operations until no improvement results.

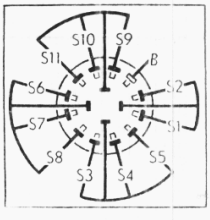
**R.F. and Oscillator Stages.**—Transfer "live" signal generator lead to **A** (red) lead via a suitable dummy aerial.

**S.W.**—Switch set to S.W., tune to 16.7 m on scale, feed in a 16.7 (18 Mc/s) signal, and adjust **C25** (F5) and **C20** (A2) for maximum output. Repeat these operations until no improvement results.

**M.W.**—Switch set to M.W., tune to 200 m on scale, feed in a 200 m (1,500 kc/s) signal, and adjust **C26** (F5) and **C21** (A2) for maximum output. Repeat these operations until no improvement results.

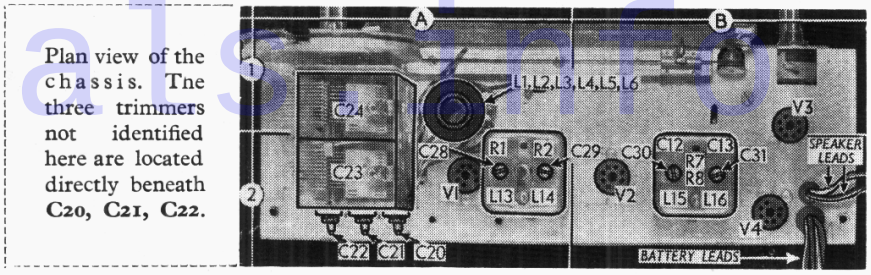
**L.W.**—Switch set to L.W., tune to 800 m on scale, feed in an 800 m (375 kc/s) signal, and adjust **C27** (F5) and **C22** (A2) for maximum output. Repeat these operations until no improvement results.




The waveband switch unit (right) and battery switch unit (above), as seen from the rear.

| Switch | S.W. | M.W. | L.W. |
|---|---|---|---|
| S1 | C | — | — |
| S2 | — | C | — |
| S3 | C | — | — |
| S4 | — | C | — |
| S5 | — | — | C |
| S6 | C | — | — |
| S7 | — | C | — |
| S8 | — | — | C |
| S9 | C | — | — |
| S10 | — | C | — |
| S11 | — | — | C |




Plan view of the chassis. Tne three trimmers not identified here are located directly beneath **C20, C21, C22.**

## GENERAL NOTES

**Switches.—S1-S11** are the waveband switches, ganged in a single rotary unit beneath the chassis. The unit is indicated in our under-chassis view, and shown in detail in the right-hand diagram in col. 1, where it is viewed from the rear of an inverted chassis. **S1, S3, S6** and **S9** close on S.W.; **S2, S4, S7** and **S10** close on M.W.; **S5, S8** and **S11** close on L.W.

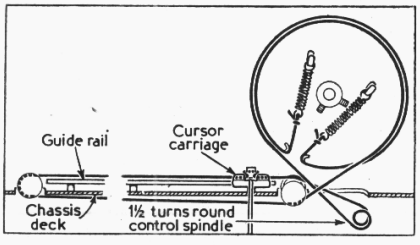
**S12, S13** are the battery switches, indicated in our under-chassis illustration and shown in detail in the left-hand diagram in col. 1.

**Capacitor C9.**—This provides supplementary capacitance to the tracker **C8,** and may not always be present. It consists of a length of twin flexible cable, one conductor going to either side of **C8.** In our chassis, **C9** comprised two separate lengths of cable, each 4½ ins long.

**Batteries and Leads.**—No batteries are specified by the makers, but they provide a standard 2-pin all-dry L.T. battery plug for a 1.5 V unit, and recommend a 90 V H.T. battery for which wander plugs are provided. Grid bias is automatic.

**Drive Cord Replacement.**—About 3ft 6in of high-grade plaited and waxed fishing line is required for the drive cord, whose course is shown in the sketch below, where it is viewed from the front with the gang at maximum.

Starting with the gang at maximum, tie one tension spring to one end of the cord and hook it on to the left-hand anchor tag, then follow our sketch, taking care to arrange the triple cross-over sequence in the same order as we show it. Tie the second tension spring to the free end of the cord so as to open both springs to about 1½ times their normal length when hooked up, but before hooking the second one, loop the cord as it passes through the cursor carriage over the anchor provided for it.




Sketch of the tuning drive system, as seen from the front with the gang at maximum.

## VALVE ANALYSIS

Valve voltages and currents given in the table below are those measured in our receiver when it was operating from a set of new batteries. The receiver was tuned to the lowest wavelength on the M.W. band, and the volume control was at maximum, but there was no signal input.

Voltages were measured on the 100V range of a model 7 Avometer, chassis being the negative connection. The grid bias voltage measured across **R16** was 10.5V.

| Valve | | Anode | | Screen | |
|---|---|---|---|---|---|
| | | V | mA | V | mA |
| V1 | DK91 | 79 | 0·13 | 39 | 1·75 |
| V2 | DF91 | 79 | 2·5 | 45 | 1·01 |
| V3 | DAF91 | 3 | † | † | † |
| V4 | DL92 | 75 | 6·8 | 79 | 1·8 |

† Negligible readings.

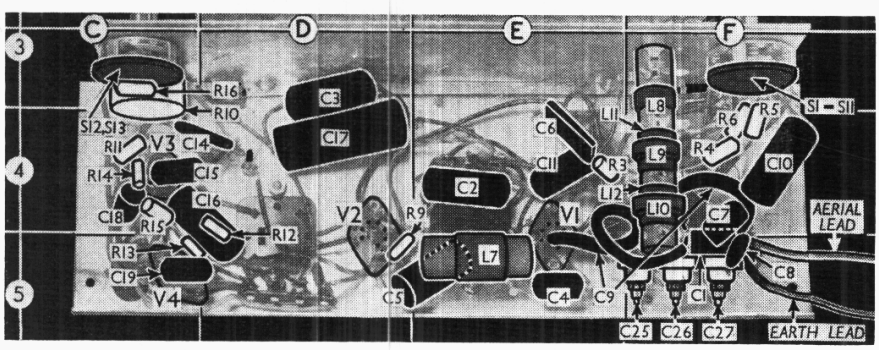
## DISMANTLING THE SET

**Removing Chassis.** — Remove the four control knobs (recessed grub screws), and unsolder the speaker leads at tags on speaker transformer; remove two countersunk-head woodscrews securing rear corners of chassis to wooden battens, and withdraw chassis from cabinet.

*When replacing*, the speaker leads should be resoldered to the top and bottom tags on the speaker transformer.

**Removing Speaker.**—Slacken the nuts of the four clamps securing speaker to sub-baffle, swivel clamps aside, and lift out speaker.

*When replacing*, the transformer should be on the right, and the leads to it should be connected as previously described.




Under-chassis view. **C9** consists of two pieces of twin flexible lead.

*Printed in England by The Cornwall Press Ltd., Paris Garden, London, S.E.1.*