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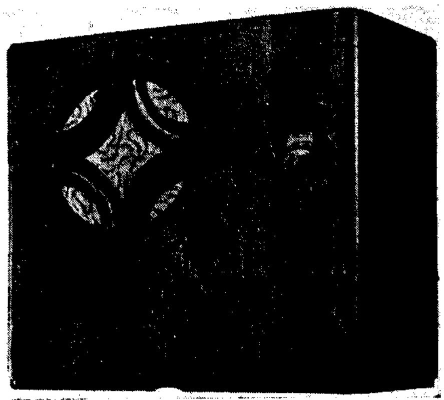
"TRADER" SERVICE SHEET

# 617

# PHILIPS 372B

## BATTERY TRF RECEIVER



The Philips 372B receiver.

SIX valves, including a class B output valve, are employed in the Philips 372B, a 2-band battery receiver, using the Superinductance tuning system. The chassis is mounted on a shelf in the cabinet, the combined HT and GB battery going into the compartment beneath it. The accumulator stands on the shelf, and the chassis is shaped to accept it.

Two interesting features are the inclusion of a six-way connecting panel on the chassis deck for the termination of the battery leads, and a mechanically operated shutter that covers the tuning scale when the receiver is switched off. There is provision for the connection of a gramophone pick-up and an external speaker.

*Release date and original price*: 1934; £11 11s. *complete with batteries.*

### CIRCUIT DESCRIPTION

Two aerial input sockets are provided, **A1** and **A2**. Input from **A2**, which is intended for general reception, is via series choke **L1** (MW) or choke **L2** (LW) to tappings on the tuning coils **L3** (MW) and **L4** (LW), which are tuned by **C21.** The aerial circuit is shunted by impedance matching circuit **R1, C2.** Input from **A1** is fed directly to **A2**, but **A1** is a "split" socket, and upon insertion of the aerial plug the two sections are joined, so that **C1** is connected in parallel with the input circuit. This socket is intended only for the reception of very strong transmisions.

A plate aerial, fitted in the roof of the cabinet and permanently connected to the **A2** socket, permits the receiver to be operated without an external aerial.

First valve **(V1, Mullard metallised PM12M)** is a variable-mu RF tetrode operating as signal frequency amplifier, with tuned-secondary transformer coupling by **L5, L6, L7, L8** and **C24** to a second RF tetrode **(V2, Mullard metallised PM12A)** operating as signal frequency amplifier, but with fixed grid bias potential. **V2** is coupled by another tuned-secondary RF transformer, **L9, L10, L11, L12** and **C27,** to a diode detector valve **(V3, Mullard metallised PM1HL),** a triode with anode and control grid strapped together.

Audio frequency component in rectified output is developed across load resistance comprising **R7** and **R8**, the latter being the manual volume control, and passed via AF coupling condenser **C10** to CG of a third RF tetrode valve **(V4, Mullard metallised PM12A),** which operates as AF amplifier. **R7** limits the maximum signal voltage that can be applied to **V4** to a value that the valve can safely handle. IF filtering by **C11** and **C13** in **V4** CG and anode circuits respectively.

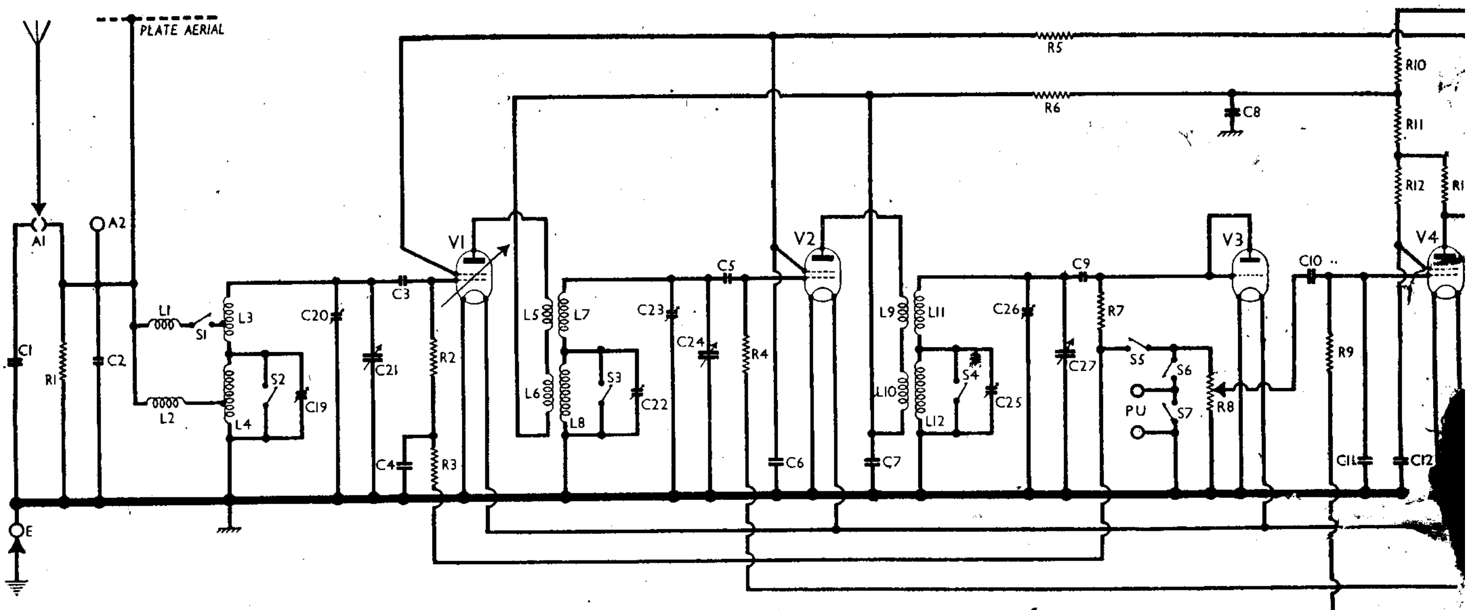
DC potential developed across **R8** is tapped off and fed back through a decoupling circuit as GB to first RF amplifier, giving automatic volume control.

Provision for connection of gramophone pick-up by sockets across **R8.** Switches **S5** and **S6** permit the pick-up to be switched in and out of circuit, **S5** opening on gram to mute radio, so that the pick-up may be left permanently connected. When the receiver is switched to radio, **S7** closes and short-circuits the pick-up sockets.

Resistance-capacity coupling by **R13, C14** and **R14,** via grid stopper **R15,** between **V4** and triode driver valve **(V5, Mullard PM2DX),** which is in turn transformer coupled by **T1** to double-triode class B push-pull output valve **(V6, Mullard PM2B).**

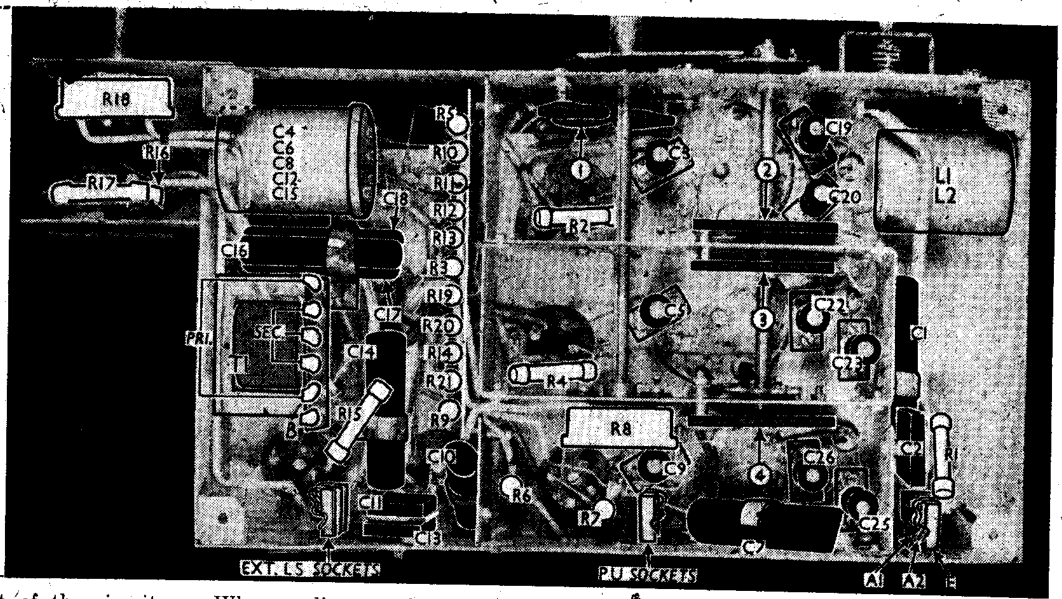
Fixed tone correction by **C17, C18** in anode circuits. Variable tone control by **C16, R18** between anodes. Provision for connection of high impedance external speaker between anodes.

HT is supplied to **V1** and **V2** screen grids from a separate tapping HT+1 on




Circuit diagram of the Philips 372B TRF receiver. V3 is a triode valve with anode and grid strapped to operate as a diode, R7, R8 acting as the load resistance. The DC potential across R8 is fed back to V1 as AVC voltage. The plate aerial is a sheet of metal extending across the roof of the cabinet. Aerial A1 socket is split, the two halves being joined when a plug is inserted so that C1 shunts the aerial circuit. V1 and V2 are RF amplifiers.

Under-chassis view. The switch units are indicated here by numbers in circles and arrows, the arrows indicating the directions in which the units are viewed in the diagrams in column 3 overleaf. A diagram in column 5 overleaf shows the internal connections of the multiple condenser unit seen in the top left-hand corner.




the HT battery, the rest of the circuit being supplied from a single HT+2 tapping. Grid bias potentials for **V2, V4** and **V5** are obtained from tappings on a potential divider, comprising resistances **R19, R20, R21,** which is connected across the GB section of the HT battery.

## VALVE ANALYSIS

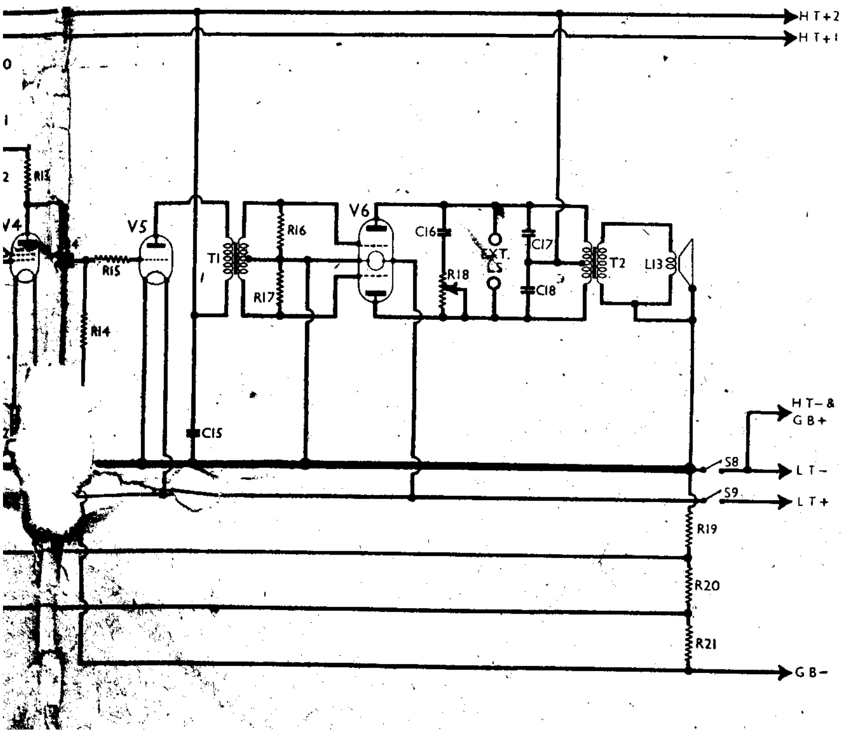
Valve voltages and currents given in the table (col. 5) are those quoted in the makers' manual. They are average values and are therefore approximate. Variations up to 20 per cent. will not necessarily indicate a fault. The figures are based on the assumption that the potential at HT+1 is 60 V, that at HT+2 is 130 V, and that the GB− potential is −3 V.

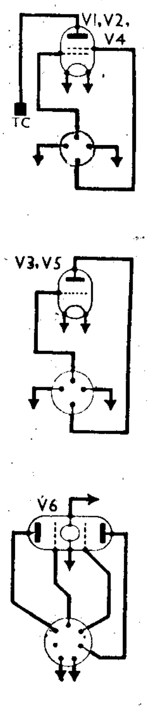
When readings are being taken, the receiver should be switched to MW, the volume control should be at maximum, and there should be no signal input.

Voltages should be measured on the most suitable scale of a 1,000 ohms-per-volt meter whose negative lead is connected to chassis.

| Valve | Anode Voltage (V) | Anode Current (mA) | Screen Voltage (V) | Screen Current (mA) |
|---|---|---|---|---|
| V1 PM12M | 123 | 0·3 | 52 | 0·07 |
| V2 PM12A | 123 | 0·5 | 52 | 0·11 |
| V3 PM1HL | — | — | — | — |
| V4 PM12A | 52 | 0·35 | 35 | 0·1 |
| V5 PM2DX | 128 | 2·8 | — | — |
| V6 PM2B | 129† | 1·15† | — | — |

† Each anode.




## COMPONENTS AND VALUES

| | RESISTANCES | Values (ohms) |
|---|---|---|
| R1 | Aerial circuit shunt ... | 32,000 |
| R2 | V1 CG resistance ... | 1,000,000 |
| R3 | V1 CG decoupling ... | 1,000,000 |
| R4 | V2 CG resistance ... | 1,250,000 |
| R5 | V1, V2 SG's decoupling... | 40,000 |
| R6 | V1, V2 anodes decoupling | 1,000 |
| R7 | Part V3 diode load ... | 320,000 |
| R8 | Manual volume control; part V3 diode load ... | 500,000 |
| R9 | V4 CG resistance ... | 2,000,000 |
| R10 | V1, V2, V4 SG's and V4 anode HT feed potential divider ... ... | 5,000 |
| R11 | | 64,000 |
| R12 | | 640,000 |
| R13 | V4 anode load ... ... | 125,000 |
| R14 | V5 CG resistance ... | 1,000,000 |
| R15 | V5 grid stopper ... ... | 100,000 |
| R16 | T1 secondary shunt resistances ... ... ... | 10,000 |
| R17 | | 10,000 |
| R18 | Variable tone control ... | 50,000 |
| R19 | GB battery potential divider ... ... | 40 |
| R20 | | 160 |
| R21 | | 320 |

| | CONDENSERS | Values (μF) |
|---|---|---|
| C1 | A1 aerial shunt ... ... | 0·025 |
| C2 | A2 aerial shunt ... ... | 0·00008 |
| C3 | V1 CG condenser ... | 0·00001 |
| C4 | V1 CG decoupling ... | 0·1 |
| C5 | V2 CG condenser ... | 0·000025 |
| C6 | V1, V2 SG's decoupling | 0·5 |
| C7 | V1, V2 anodes decoupling ... ... ... | 0·1 |
| C8 | | 0·1 |
| C9 | Coupling to V3 diode ... | 0·000015 |
| C10 | AF coupling to V4 ... | 0·01 |
| C11 | IF by-pass ... ... | 0·00025 |
| C12 | V4 SG decoupling ... | 0·1 |
| C13 | IF by-pass ... ... | 0·00025 |
| C14 | V4 to V5 coupling ... | 0·01 |
| C15 | HT circuit reservoir ... | 0·1 |
| C16 | Part variable tone control | 0·01 |
| C17 | Fixed tone correctors ... | 0·005 |
| C18 | | 0·005 |
| C19‡ | Aerial circ. LW trimmer | 0·000027 |
| C20‡ | Aerial circ. MW trimmer | 0·000027 |
| C21† | Aerial circuit tuning ... | 0·00043 |
| C22‡ | 1st RF trans. LW trimmer ... ... ... | 0·000027 |
| C23‡ | 1st RF trans. MW trimmer ... ... ... | 0·000027 |
| C24† | 1st RF trans. sec tuning | 0·00043 |
| C25‡ | 2nd RF trans. LW trimmer ... ... ... | 0·000027 |
| C26‡ | 2nd RF trans. MW trimmer ... ... ... | 0·000027 |
| C27† | 2nd RF trans. sec. tuning | 0·00043 |

† Variable. ‡ Pre-set.