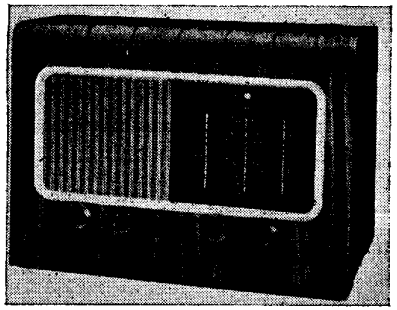
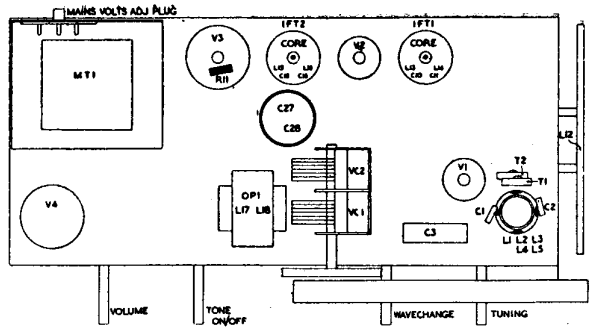
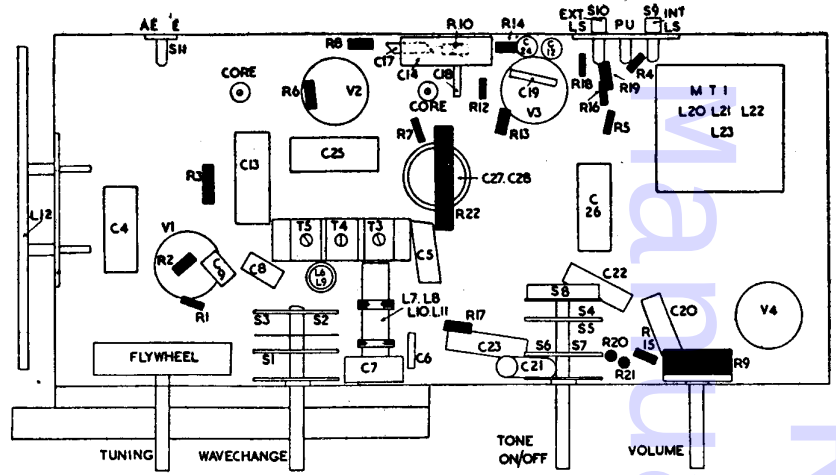
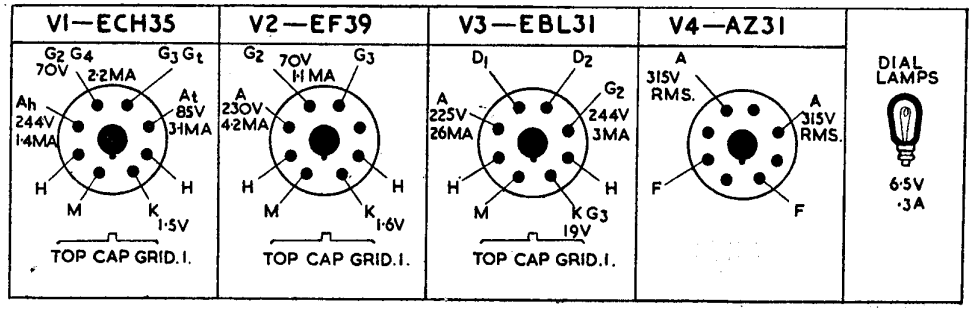
# PYE 18A






*Four-valve, three-waveband superhet with interna plate and frame aerials, sockets for external aerial, earth, magnetic gramophone pickup and low-impedance extension loudspeaker. For 200-250V 40-100 c/s AC. Inlaid veneer wood cabinet. Made by Pye Ltd., Radio Works, Cambridge.*




## CAPACITORS

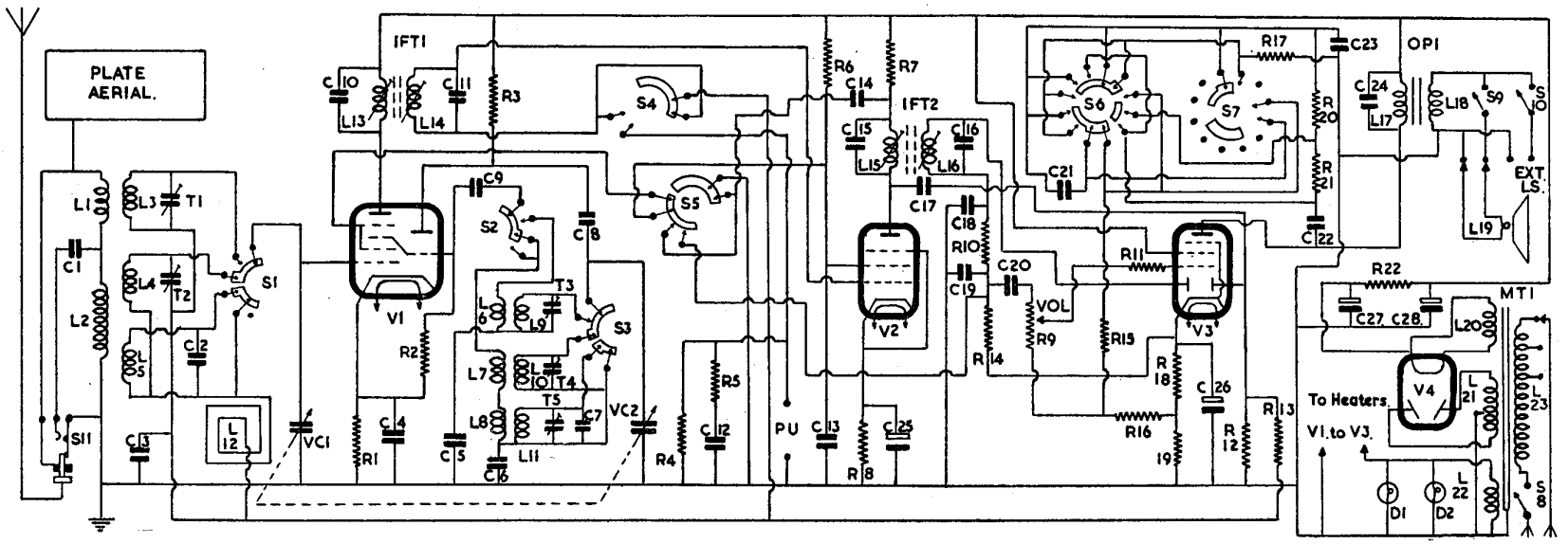
| C | Capacity | Type |
|---|---|---|
| 1 | 220pF | Silver Mica |
| 2 | 50pF | Silver Mica |
| 3 | .1 | Tubular 500V |
| 4 | .1 | Tubular 500V |
| 5 | 5000pF | Silver Mica |
| 6 | 570pF | Silver Mica |
| 7 | 330pF | Silver Mica |
| 8 | 50pF | Silver Mica |
| 9 | 50pF | Silver Mica |
| 10 | 70pF | Silver Mica |
| 11 | 70pF | Silver Mica |
| 12 | .05 | Tubular 350V |
| 13 | .1 | Tubular 350V |
| 14 | .1 | Tubular 500V |
| 15 | 70pF | Silver Mica |
| 16 | 70pF | Silver Mica |
| 17 | 10pF | Silver Mica |
| 18 | 100pF | Silver Mica |
| 19 | 100pF | Silver Mica |
| 20 | .01 | Tubular 1000V |
| 21 | .02 | Tubular 750V |
| 22 | .02 | Tubular 750V |
| 23 | .01 | Tubular 1000V |
| 24 | .001 | Tubular 1000V |
| 25 | 50 | Electrolytic 12V |
| 26 | 25 | Electrolytic 25V |
| 27 | 32 | Electrolytic 450V |
| 28 | 8 | Electrolytic 450V |

## RESISTORS

| R | Ohms | Watts |
|---|---|---|
| 1 | 220 | ½ |
| 2 | 47K | ½ |
| 3 | 47K | ½ |
| 4 | 220K | ½ |
| 5 | 15K | ½ |
| 6 | 47K | ½ |
| 7 | 2.2K | ½ |
| 8 | 330 | ½ |
| 9 | 1M Potentiometer | |
| 10 | 47K | ½ |
| 11 | 47K | ½ |
| 12 | 1M | ½ |
| 13 | 1M | ½ |
| 14 | 470K | ½ |
| 15 | 15K | ½ |
| 16 | 2.2K | ½ |
| 17 | 47K | ½ |
| 18 | 220 | ½ |
| 19 | 470 | ½ |
| 20 | 22K | ½ |
| 21 | 27K | ½ |
| 22 | 3K | 8 |

## INDUCTORS

| L | Ohms |
|---|---|
| 1 | .5 |
| 2 | 50 |
| 3 | Very Low |
| 4 | 1.5 |
| 5 | 13.5 |
| 6 | 21 |
| 7 | 2.5 together |
| 8 | |
| 9 | Very Low |
| 10 | 3 |
| 11 | 3.75 |
| 12 | .75 |
| 13 | 9 |
| 14 | 9 |
| 15 | 9 |
| 16 | 9 |
| 17 | 500 |
| 18 | .25 |
| 19 | 2 |
| 20 | Very Low |
| 21 | 350 total |
| 22 | Very Low |
| 23 | 18 total |




*Continued on page 24*

## DENCO DR22

also provides oscillator anode (At) voltage of V1. L22, C10, which form the primary of IFT1, are in the hexode anode circuit.

**Oscillator** is connected in a tuned-grid parallel-fed circuit. L12, L14, L16, L18, L20 are the permeability-tuned coils which are connected by S3 to fixed tuning capacitor C7, and through C8 to oscillator grid of V1. Automatic bias for grid is developed on C8 with R3 as leak resistor. As each range is tuned to a specific frequency no tracking capacitors are required.

Anode reaction voltages are developed inductively by L13, L15, L17, L19, L21 and are fed by S4 through coupling capacitor C9 from oscillator anode. R1, which feeds screen, also functions as oscillator anode load.

**IF amplifier** operates at 465 kc/s. L23, C11, which form the secondary of IFT1, feed signal and AVC voltages to grid of RF pentode section of V2. R4, C6 decouple the AVC line.

Cathode of V2 is connected down to chassis. Screen voltage is obtained from R5 decoupled by C14 and suppressor grid is earthed to chassis. L24, C12, the primary of IFT2, is in the anode circuit.

**Signal rectifier.** L25, C13, which form the secondary of IFT2, feed signal to diode section of V2. R7, R8 form a tapped load resistor and R6, C15, C16 constitute an IF filter.

**AVC** is provided by the DC component of the rectified signal and is tapped off from junction of R7, R8 and is fed by R4 to grids of V1 and V2. C6 is decoupling capacitor.

**Output stage.** C17 feeds rectified signal to R9, the volume control, and thence, through stopper resistor R11, to grid of output pentode V3. Cathode bias is provided by R10 and decoupled by C21.

Screen voltage is obtained from R12 and decoupled by C20. L26, the primary of OP1, the output matching transformer, is in the anode circuit. C18 is a fixed tone correction capacitor.

### TRIMMING INSTRUCTIONS

| Apply signal as stated below | Tune Receiver to | Trim in Order stated for Max. Output |
|---|---|---|
| (1) 465 kc/s to g1 of V1 via .01mF ... ... | — | Core L25, L24, L23, L22 |
| (2) 170—225 kc/s to AE E sockets via dummy aerial ... ... | Switch 1 | Core L12, L3 |
| (3) 190 — 260 kc/s as above ... ... | 2 | Core L14, L5 |
| (4) 530 — 700 kc/s as above ... ... | 3 | Core L16, L7 |
| (5) 740—1,000 kc/s as above ... ... | 4 | Core L18, L9 |
| (6) 1.08—1.48 mc/s as above ... ... | 5 | Core L20, L11 |

(7) Finally check setting of cores on actual station signal and re-adjust if necessary

L27, the secondary of OP1, feeds into an 8 inch PM loudspeaker, L28.

**High tension** is provided by an indirectly heated half-wave rectifier, V4. Its anode voltage is obtained direct from the input mains. R14 is a current limiter and C19 a filter capacitor. R13, C22, C23 provide resistance capacity smoothing.

**Heaters of V1 to V4** are series connected and obtain current of 100 mA from the mains through voltage dropper R15. S5, which is ganged to the volume control spindle, is the on-off switch.

A 250 mA fuse is inserted in the mains lead to chassis.

**Chassis removal.** Remove the two control knobs and rear panel of cabinet. Remove the two wood screws securing AE/E panel brackets to bottom of case. Unsolder leads to primary of OP1 on the loudspeaker.

Remove the two chassis bolts on underside of cabinet. Carefully press inwards the righthand side panel (viewed from rear) of chassis so that volume control spindle clears the side of cabinet, and withdraw chassis.

The manufacturers have allowed sufficient "play" in the wiring to avoid strain or damage to components when the righthand side panel of chassis is pressed inward.

## PYE 18A—*from page 24*

the mains input transformer, supplies its anode voltages and L20 its filament current. Resistance-capacity smoothing is provided by R22, C27, C28.

**Heaters of V1 to V3 and Dial Lights** obtain their current from L22.

L23, the primary of MT1, is tapped for input voltages of 200-215, 216-235, 236-250 volts AC, 40-100 cycles.

S8, which is ganged to the tone control switch, is the ON/OFF switch.

**Chassis Removal.**—Remove back of set and pull off the four control knobs. Unclip SW aerial lead from top of cabinet and unplug loudspeaker leads. Remove the two chassis retaining screws located one at each end of rear side of chassis. Withdraw chassis approximately 2 in., tip up and lift out, taking care not to damage the frame aerial.

## ATLAS UNITS—*from page 25*

bars ensure the retention of the bar in its final position. The end caps may now be fitted by the knurled screw.

**Maintenance.** Tubes are easily replaced by removing end caps of the fitting and detaching Crinothene diffusers. As tubes are in series, both go out when one fails.

Diffusers should be taken down and cleaned at regular intervals using warm soapy water but not applying heat when drying.

**GRQ/2240, GSQ/2240.** This is another twin 40W unit, electrically like the above, but with a different spine (Fig. 4) fitted with Perspex and Crinothene reflectors. It is for ceiling mounting, double or single rod suspension or chain suspension.

Perspex reflectors should be cleaned with warm soapy water, metal polish or Cirrasol. Wiping dry should be avoided as it accelerates collection of dust.

**GB/2030, GA/3030, GAL/3030.** The GB/2030 is illustrated in Fig. 5, the construction of the triple tube model (GA/3030) is shown in Fig. 6. GAL/2030 has louvres. The units are 40¼ by 12⅜ by 6 in., and weigh 17 and 22 lb. respectively. Metal work is finished "Portland stone" and diffusers are Perspex.

**Wiring.** Fig. 7 shows the GB/2030 circuit and Fig. 8 the GA/3030 wiring.

**Installation.** The spines, which are similar, may be mounted directly to the ceiling, suspended on two rods, suspended from one rod with adaptor piece, or suspended from chains. The GA/3030 has a central reflector trough fitted by quick-release fasteners after the unit is mounted and the electrical connections made. The tubes are then inserted and the outer diffusing covers fitted and the end caps snapped into position. The GB/2030 is totally enclosed by a one-piece Perspex moulding. The white enamelled reflector plate is fitted by quick-release fasteners after the unit has been mounted and the electrical connections made. The tubes are then inserted and the Perspex moulding engaged over the diaphragm End caps snap on.

**FM/2080, FMQ/2080.** These have similar construction to the GB/2030 with dimensions of 64 by 5¾ by 12½ in., and weight of 32 lb.

**Wiring.**—The circuit for FM/2080 is seen in Fig. 7, and for the Quickstart version in Fig. 9.

**Installation.**—For direct ceiling fixing, four 3/16 in. diameter holes are provided in the main channel at 18-in. by 2-in. centres. If fixing rods are used, the ceiling plates provided should be fitted (assembled with the rods) at 18-in. centres. The main channel is then fixed by means of locknuts to the suspension tubes.

The mains are connected through the wiring entry to a two-way terminal block. Next the reflector plate is secured by two quick-release spring fasteners. The tubes are then inserted and tested.

The Perspex cover is fitted by sliding one end over the diaphragm so that its remote end can be raised upwards and then engaged over the other diaphragm. The cover should then be adjusted so that an equal amount protrudes past the diaphragms at each end. The end caps snap on.

**FU/0030, FU/2030, FU/0080, FUQ/0080.** These are all Perspex enclosed fittings of the general shape shown in Fig. 10.

**Wiring.** Circuits are FU/0030 and 0080 (Fig. 11), FU/2030 (Fig. 7) and FUQ/0080 (Fig. 12).

NOTE.—Compensated chokes in 30W circuits are set as follows: Mains Voltage 200—220V, Choke Setting 240—250; MV 230—240, CS 210—220 or 240—250 with special condenser; MV 250, CS 200—210. In 80W circuits: MV 200—210, CS 240—250; MV 200, CS 230—240; MV 230—240, CS 210—220; MV 250, CS 200.

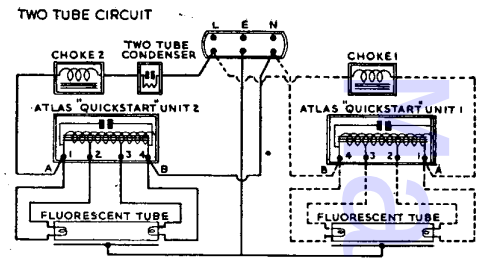



Fig. 9.—Quickstart twin 80W circuit

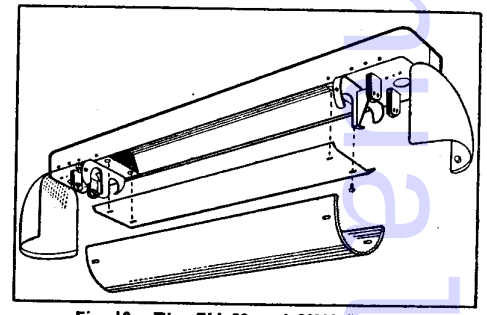


Fig. 10.—The FU 30 and 80W fittings

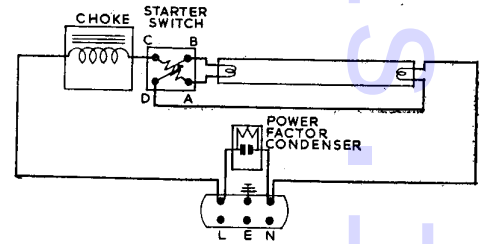



Fig.11.—Single tube, 30 and 80W circuit

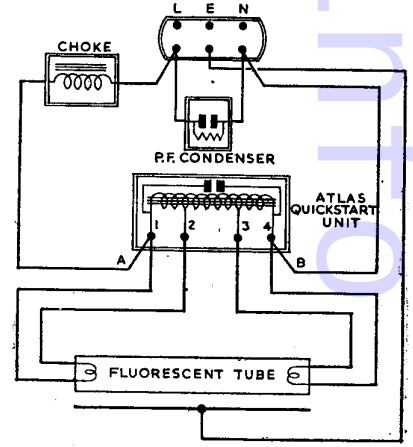



Fig. 12.—Quickstart single 80W circuit

## SOBELL 518TG

**AERIAL** is fed to S1 and thence to coupling coils L1 (SW), L3 (MW), L6 (LW). L4, trimmed by T11 and tuned by VC1, is the MW aerial bandpass coil. L2 (SW), L5 (MW), L7 (LW) are the grid coils and these are switched by S2 to signal grid of triodehexode frequency changer V1 and to tuning capacitor VC2.

The MW coil L5 is wound on a separate former placed about 1½ in. from its aerial coil L4, thus providing loose inductive bandpass coupling. T1, T2, T3 are trimmers.

**Oscillator** is connected in a shunt-fed tuned-anode circuit. L9 (SW), L11 (MW), L13 (LW), trimmed by T4, T5, T6, C10 and padded by C8, C9, C11, are the anode coils. S4 switches them to tuning capacitor VC3 and through C7 to oscillator anode of V1, of which R2 is the load resistor.

The grid reaction voltages are developed inductively on L8 (SW), L10 (MW), L12 (LW) and are switched by S3 through C5 to oscillator grid. Automatic bias for grid is developed on C5 and R5 as leak resistor. R6 is SW damping resistor and C6 provides a neutralising capacity between signal and oscillator grids of V1, when on the SW band.

**IF amplifier** operates at 465 kc/s. L15, T8, the secondary of IFT1, feed signal and AVC voltages to g1 of IF amplifier V2. L16, T9, the primary of IFT2, is in the anode circuit.

**Signal rectifier.** L17, T10, forming the secondary of IFT2, feed signal to one of diodes of V3.

On MW and LW a positive potential derived from the cathode of V4 is fed through R17, R10 and L17 to mute the signal diode. On SW the muting voltage is removed by S6 connecting junction of R10, R17 to cathode of V3. Thus on SW reception the signal diode is operating at a much greater sensitivity.

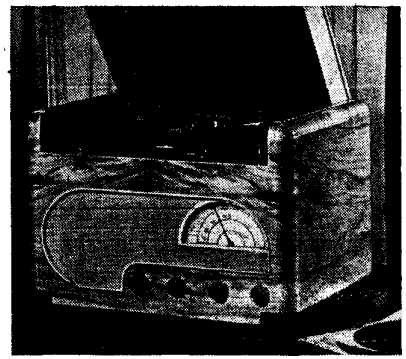
**Pickup.** Sockets are fitted for connection of the magnetic pickup supplied with the gramophone unit. The pickup signal is fed through R26 to R27 and thence through PU socket on receiver chassis to S5, which in the "gram" position passes it via C17 to the volume control R12. S7, which is ganged to the wavechange switch, removes the HT voltage to hexode screen and oscillator anode of V1, to prevent radio breakthrough on gramophone reproduction.

**AF amplifier.** The signal appearing across the volume control R12 is fed to grid of triode section of V3. Cathode bias is provided by R13, decoupled by C21. R21 is the anode load resistor and R20, C22 decouple the HT feed to its anode.

**Output stage.** C18 feeds signal through R25 and stopper resistor R19 to grid of tetrode output valve V4. A potentiometer R16, with capacitor C19, forms the grid load resistor and variable tone control.

Cathode bias is provided by R18, decoupled b6 C23. The network consisting of R17, R10 and S6, which is connected between cathode of V4 and signal diode of V3, is a LW and MW muting circuit and its operation is explained under "Signal Rectifier" section. Screen voltage, decoupled by C24, is obtained from R24, which supplies the HT to anodes and screen V1 and screen V2.

L18, the primary of OP1, the output matching transformer, is in the anode circuit and C20 provides fixed tone correction. L19, the secondary, feeds into an 8-in. PM loudspeaker L20. Sockets are fitted on L19 to allow a low-impedance extension speaker to be used with the receiver.



**High tension** is provided by an indirectly heated, full-wave rectifier V5. L23, the HT secondary of MT1, the mains input transformer, supplies its anode voltages and L22 its heater current. Choke-capacity smoothing is provided by L21 and capacitors C25, C26. Further smoothing of screen supply of V4 and HT line to earlier stages is supplied by R24, C24.

**Heaters of V1 to V4 and dial lights** obtain their current from L24. A special tapping giving a slightly lower voltage for the dial lights is provided so as to prolong the life of the bulbs.

**Note.** Earlier versions of this chassis had the tone control incorporated in a negative feedback circuit between anode of V3 and V4.

The modified circuit is shown and values of additional components are included in the Tables. The positions of the extra components are not indicated in the layout diagrams.

### TRIMMING INSTRUCTIONS

| Apply signal as stated below | Tune Receiver to | Trim in Order stated for Max. Output |
|---|---|---|
| (1) 465 kc/s to g1 of V1 via .1 mF. Temporarily connect K V3 to junction of R10, R17. | MW band with gang condenser fully meshed | T10, T9, T8, T7 |
| (2) Check to see that po horizontal scale line city. | inter of dial when gang is | lies along the at max. capa- |
| (3) 334 kc/s to AE socket, via dummy aerial | 900 metres | T6, T3 |
| (4) 150 kc/s as above | 2000 metres | Core L13, L7 and repeat (3) and (4) |
| (5) 1.4 mc/s as above | 214 metres | T5, T2, T11 |
| (6) 600 kc/s as above | 500 metres | Core L11, L5, L4 and repeat (5) and (6) |
| (7) Remove temporary and R10, R17 | connection | between K of V3 |
| (8) 18 mc/s as in (6) | 6.7 metres | T4, T1* |
| (9) 6.98 mc/s as above | 43 metres | Core L9, L2 and repeat (8) and (9) |

*If two peaks are found when adjusting T4, select setting of lower capacity.

## PYE 18A—*from page 22*

**AERIAL.**—A plate or capacity aerial is provided for SW reception and a frame aerial for MW and LW reception. The plate aerial is connected to the SW aerial coupling coil L1 and the frame L12 to the bottom end of grid tuned coils L4 (MW), L5 (LW). When an external aerial is used, then its signal is fed through C1 to junction of coupling coils L1 (SW) and L2 (MW, LW). Withdrawal of the aerial plug from its socket operates S11 and connects C1 down to chassis.

The grid tuned coils L3 (SW) and L4 (MW), L5 (LW) with frame L12, are connected by S1 to tuning capacitor VC1 and to g1 of triode-hexode frequency changer V1. T1 (SW), T2 (MW) and C2 (LW) are trimmers. A following shorting blade on S1 shorts out the unused tuned coils.

AVC, decoupled by R13, C3, is fed through the coils to g1 of V1. Cathode bias is provided by R1 decoupled by C4. Screen (g2, g4) voltage is obtained from R6, through S5, and is decoupled by C13. S5 in the GRAM position disconnects the HT from screen to prevent radio breakthrough. L13, C10, which form the primary of IFT1, are in the hexode anode circuit.

**Oscillator** is connected in a shunt fed tuned anode circuit. L9 (SW), L10 (MW), L11 (LW), the anode coils, are switched by S3 to tuning capacitor VC2 and through C8 to oscillator anode (At) V1, of which R3 is the load resistor.

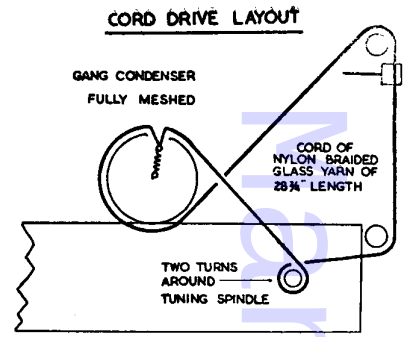
T3 (SW), T4 (MW), T5, C7 (LW) are trimmers and C5 (SW), C6 (MW, LW) padders. A following shorting blade on S3 shorts out the unused tuned coils. The grid reaction voltages are developed inductively on L6 (SW), L7 (MW), L8 (LW) and are switched by S2 through C9 to oscillator grid. Automatic bias for grid is developed on C9 with R2 as leak resistor.

**IF Amplifier** operates at 465 Kc/s. L14, C11, the secondary of IFT1, feeds signal and AVC voltages to grid of IF amplifier V2. S4 in the gram position disconnects the AVC line from bottom of L14 and connects in its place the pickup signals, sockets being fitted for a high impedance type magnetic pickup. Cathode bias is provided by R8 and decoupled by C25. Screen voltage is obtained from R6 and decoupled by C13. Suppressor is strapped to cathode. L15, C15, which form the primary of IFT2, are in the anode circuit of V2. R7, with C14, decouples the HT to anode of V2 when receiver is used for radio reception. In the gram position of S5, however, V2 is used as an AF amplifier and R7 acts as an AF load and C14 feeds signal developed across it through C20 to volume control R9.

**Signal Rectifier.**—L16, C16, the secondary of IFT2, feeds signal to one of diodes of V3. R14 is load resistor and R10, C18, C19 form an IF filter.

**AVC.**—C17 feeds signal at anode of V2 to second diode of V3. R12 is the load resistor and R13 feed resistor to grids of V1 and V2. C3 is line decoupling capacitor. Cathode bias developed across R18, R19 provides delay voltage.

**Output Stage.**—C20 feeds rectified radio signal or pickup signal to volume control R9 and thence through stopper resistor R11 to grid of output pentode section of V3. The earthy end of R9 is connected through R16 to junction of cathode resistors R18, R19. The bias for grid is developed across R18. C26 is decoupling capacitor. Screen voltage is obtained from HT line. L17, the primary of output matching transformer OP1, is




in the anode circuit. C24 prevents rise in impedance of L17 at the higher frequencies. L18, the secondary of OP1, feeds into an 8-in. PM loudspeaker, L19. Sockets are fitted for a low impedance (2-4 ohm) extension speaker. S9, S10 enable the internal or external speakers to be used separately or together.

**Negative Feedback Tone Control.**—S6, S7, together with R15, R17, R20, R21, C21, C22, C23, which are connected in a negative feedback circuit between anode and grid of output pentode section of V3, provide six degrees of tone control. Four operate on the radio signals and two on pickup reproduction.

**HT** is provided by a directly heated, full-wave rectifier, V4. L21, the HT secondary of MT1

*Continued on page 27*

### TRIMMING INSTRUCTIONS

| Apply signal as stated below | Tune Receiver to | Trim in Orde stated for Max. Outpu |
|---|---|---|
| (1) 465 kc/s to g1 of V1 via .1 mF. .. .. | 570 metres (100)* | Cores of L16 L15, L14, L13 |
| Lead and connect 500K Resistor between 1 and AVC line .. .. | — | — |
| (2) 1.5 mc/s to AE. and E. sockets via dummy aerial | 200 metres (7) | T4, T2 |
| (3) 600 kc/s as above .. | 500 metres (78) | Check calibration |
| (4) 250 kc/s as above .. | 1200 metres (31) | T5 |
| (5) 167 kc/s as above .. | 1800 metres (75) | Check calibration |
| (6) 17.14 mc/s as above .. | 17.5 metres (6) | T3, T1 |
| (7) .. .. .. | 43 metres (75.5) | Check tracking and if necessary adjust turns on L3. Calibration can be corrected by adjusting turns on L9. Repeat (6) & (7) until correct. |

* Figures in brackets refer to calibration printed on back of dial reflector assembly.