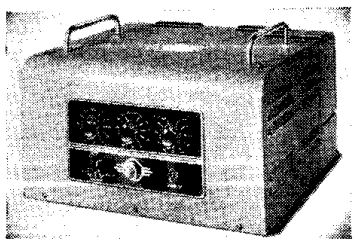
TRIX T633B AMPLIFIER



Multi purpose six-valve push-pull amplifier with 30 watts output. Input sockets provide for radio, pickup, and microphone with facilities for mixing inputs. Output sockets for high and low impedance PM speakers. Housed in crackle finished metal cabinet with lifting handles. Suitable for 200 to 250V, 40-100c/s. Made by The Trix Electrical Co., Ltd., 1-5 Maple Place, Tottenham Court Road, London, W1.

THE amplifier consists of a microphone pre-amplifier V1, a radio-pickup input amplifier V2A, a mixer valve V2B the output signal of which is transformer coupled to two beam-tetrodes connected in push-pull. The output matching transformer is provided with tapped high and low impedance secondaries which allow the use of speaker networks of 4 to 15 and 80 to 3,000 ohms impedance.

Microphone.—If a moving-coil mic is used it should be coupled to the amplifier through a type E matching unit. When a transverse-current carbon mic is employed a type D matching unit is necessary. With the latter type mic the operating voltage is obtained via the input socket from R26 in the negative HT return lead to chassis.

Microphone signal is fed to high-gain microphone pre-amplifier V1 of which R1 is the load. Cathode bias is provided by R5 decoupled by C2. Screen voltage is obtained from R2 decoupled by C1. Suppressor is strapped to cathode.

Amplified mic signal is developed across anode load R4 and fed by C3 to mic volume control R14 in grid circuit of mixer valve V2B. HT for anode and screen of V1 is decoupled by R3, C4.

Radio/Pickup signal is fed through a separate input socket to radio-gram volume control R8 and thence to grid of triode amplifier V2A. Cathode bias and a small degree of negative feed-back is provided by R9. Amplified signal is developed across anode load R7 and fed by C8, R12 to grid of mixer valve V2B.

HT feed to anode V2A is decoupled by R6, C6.

Mixer stage.—Input signal to grid of V2B can be either that of mic from anode V1 or radio/gram from anode V2A or both according to the setting of S1. When S1 is switched to MIC then slider of radio/gram volume control R8 is earthed to chassis and thus no signal is passed to grid of V2A.

With S1 in Radio/Gram position then slider of mic volume control R14 is earthed to chassis thus preventing mic signal from being passed on to grid V2B. At the same time, however, bottom end of R11 is connected down to chassis to function as grid load.

In Mixer position of S1 both volume controls are operative and the two signals are fed to grid

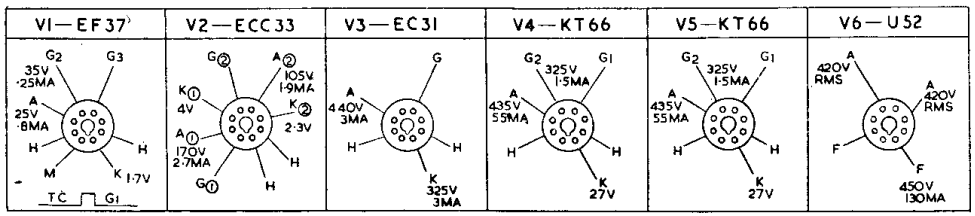
Continued on page 26.

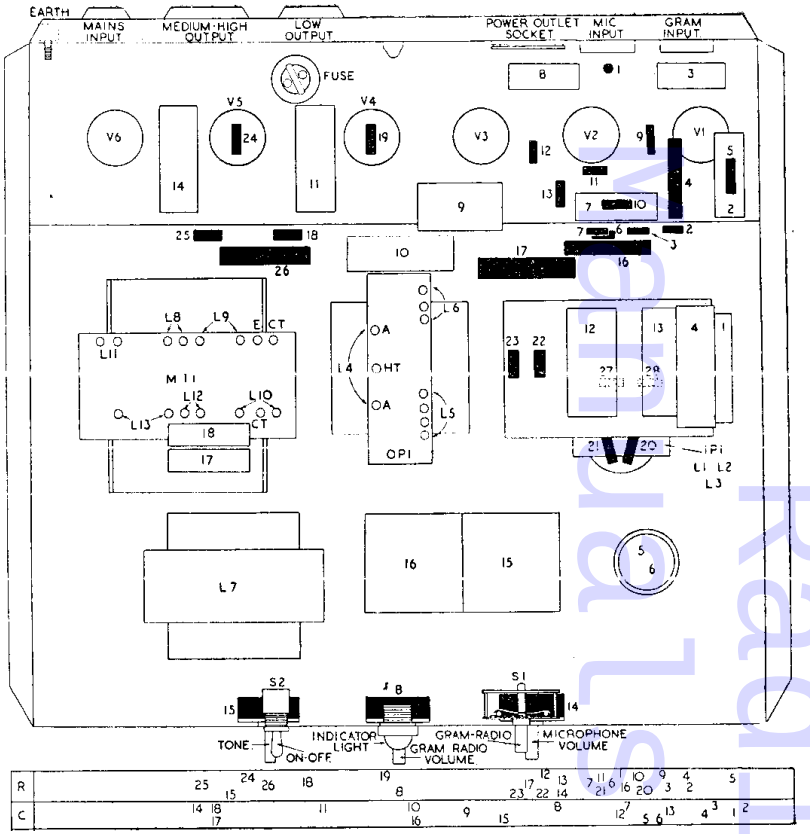
RESISTORS

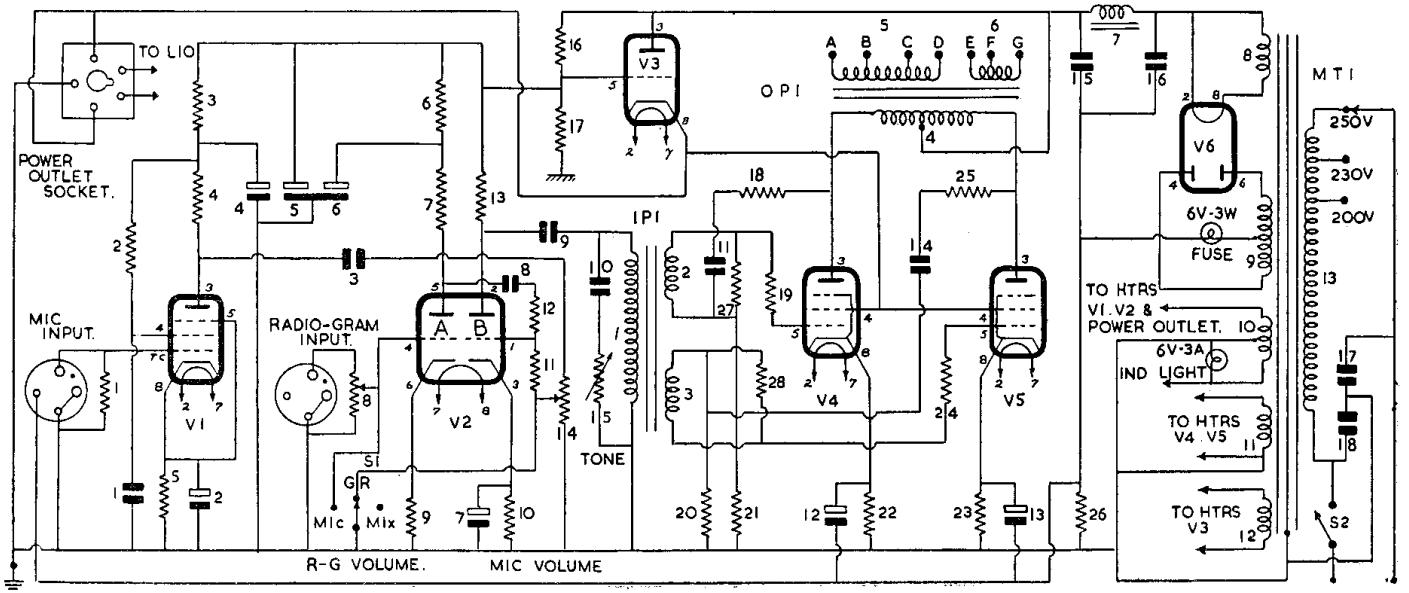
R	Ohms	Watts
1	470K	½
2	1M	½
3	47K	½
4	270K	1
5	12K	½
6	47K	½
7	47K	½
8	10K	Potr.
9	1.5K	½
10	1.5K	½
11	270K	½
12	270K	½
13	47K	½
14	500K	Potr.
15	100K	Potr.
16	10K	2W
17	60K	2W
18	100K	½
19	10K	½
20	10K	½
21	10K	½
22	450	WW 5W
23	450	WW 5W
24	10K	½
25	100K	½
26	68	2W
27	220K	½
28	220K	½

INDUCTORS

L	Ohms
1	500
2	1750
3	1750
4	160
5	54
6	1
7	54
8	Very low
9	175
10	Very low
11	Very low
12	Very low
13	9.5 Total







CAPACITORS

C	Capacity	Type
1	.05	Tubular 1000V
2	50	Electrolytic 12V
3	.02	Tubular 750V
4	4	Electrolytic 500V
5	8	Electrolytic 450V
6	8	Electrolytic 450V
7	50	Electrolytic 12V
8	.02	Tubular 750V
9	.5	Tubular 400V
10	.05	Tubular 1000V
11	.05	Tubular 1000V
12	50	Electrolytic 50V
13	50	Electrolytic 50V
14	.05	Tubular 1000V
15	4	Paper Type 600V
16	4	Paper Type 600V
17	.005	Tubular 1000V
18	.005	Tubular 1000V

SERVICE CASEBOOK

"That's a job well done." Next time you get that feeling send details to the Technical Editor and earn yourself a bonus with a Casebook paragraph

INVICTA UNIVERSAL

A UNIVERSAL Invicta superhet would perform intermittently. We found that the fading was accompanied by a complete loss of HT, so we tried a new rectifier.

Results were the same; after checking that the valveholder was making good contact, we connected an AC voltmeter from the rectifier anode to chassis, and in due course found that the AC faded out. On checking all components and connections between rectifier anode and the mains lead, we discovered that the HT tapping on the power resistance was making imperfect contact with the resistance winding itself.—G.R.W.

MARCONIPHONE T18DA

THE label attached to a Marconi T18DA simply said "smokes after half an hour." Routine testing gave no clue, though the smoothing resistors had been overheating. Connected to the supply and after the half hour period the HT to the frequency changer was found to be short circuited.

On testing both chassis and valve proved OK. The valve was replaced and once again the fault appeared. The cause of the trouble proved to be an inch of wire embedded in wax on the base of the IF transformer. When warm the wire moved sufficiently to touch the chassis at the same time contacting the primary of the IF transformer.—A.C.T.

McMICHAEL SCREAMER

A McMICHAEL 8-valve superhet belonging to a neighbouring customer would suddenly start a loud screaming. The noise continued even when the receiver was switched to gram and this indicated a fault in the output stage which consisted of a pair of EBC33s driving a pair of 6V6s in push-pull.

The fault occurred only about once a month and had been doing so for nearly 12 months. The owner could cure the fault by pulling out one of the EBC33's, and then replacing it. The receiver would then work perfectly for about another month.

The receiver was brought in and all voltages and currents were normal. Resistors and condensers were measured, and coupling condensers "Megged," but no leakages or faults revealed.

There were no dry joints at any of the valve bases, and all connections were secure. The EBC33's were swapped around and the receiver returned, but the trouble started again within a fortnight.

One morning, the owner came to tell me the set had started screaming, so I was soon there. The chassis was removed whilst still switched on, and it was revealed there was a slight positive voltage on the grid of the EBC33 valve that "cured" the fault when removed.

A brief examination of the circuit showed a 20pF condenser between the anode and grid of this valve, and as this was a possible cause of the voltage on the grid, it was replaced.

The receiver is now working perfectly. The condenser that was removed showed no leakage, but was certainly the cause of all the trouble. I can't say why the removal of the valve always effected a temporary cure.—J. HALL, *Peel, I.o.M.*

MULLARD MUS1603

THIS receiver was completely dead due to a burnt-out wire wound resistance in the HT line. A quick ohmmeter test showed the line to be clear of shorts and a replacement was fitted. On plugging in the set for test the new resistance started smoking. The set was hastily disconnected and the ohmmeter brought into action again. This time one side of the resistor showed a reading of 5 ohms to earth.

Subsequent tests showed that this 5 ohms was the primary resistance of the first IFT, and that the short was in the UCH21 frequency changer.

The wire-wound resistor burnt out, but the primary of the IFT was undamaged! The resistor was probably faulty, anyway.—P. J. S.

PHILIPS 716B

CRACKLE, low volume, or failure to operate, if not due to more obvious causes, may result from the AVC feed condenser developing a leak or a complete short, allowing it to pass HT to the diode anode of the 2D2 valve. Best test is to unsolder one end and observe results.—P. J. S.

PHILIPS 797A

A PHILIPS 797A gave loud modulation hum on all stations and reception was weaker than normal. Reversing mains plug and trying RF filter condensers effected no improvement. After trying re-alignment I tested all coils and found MW aerial coupling coil O/C. For a cheap repair I put in a 7.5K shunt resistor and small top capacity coupling to bandpass primary coil. Modulation hum was completely cured.—D. GUTHRIE, Glasgow.

PHILIPS 830A

A PHILIPS 830A suffering from distortion and reverse action of the volume control was brought in for repair (circuit in July 1942 supplement). Maximum output with the control set to the minimum position led to the testing of polarity across the control and of the decoupling components.

Leakage between C17, the output valve grid decoupling condenser, and one of the other condensers in the multiple unit proved to be the cause of the trouble.—A.C.T.

REGENTONE TR20 TELEVISOR

A REGENTONE TR20 TV console gave a good contrast picture and first class sound, but the frame linearity was poor despite very careful adjustments of the frame controls. The raster was widely spaced at the top and compressed at the bottom. Frequently, too, the frame oscillator would pack up completely.

We tried a new frame oscillator valve without improvement and a new rectifier and were about to check circuit voltages when we noticed that the mains supply selector panel was set at 250 instead of the correct 230 volts.

Immediately upon resetting the selector we obtained a perfect raster.—G.R.W.

COSSOR 916

ONE of these came in for repair, the fault being that on the picture was superimposed a pattern not unlike rain coming down at an angle of 30 deg. After making a check on the smoothing which appeared OK I went to the mixer valve circuit and sure enough by moving the position of C8 (Supplement, March, 1950), which tunes L3, one could make or take away this pattern at will. I presume this condenser had slightly altered its value.—H. B., *Nottingham.*

HMV 5302

COMPLAINT: No LW reception. Procedure: IF alignment checked OK, LW oscillator proved functioning, MW input from aerial found to be below average, but results OK with signal applied to oscillator grid. Coils and switches found OK. Replaced 220 pF coupling capacitor to X81 control grid and results returned to normal. —TENBY.

MARCONIPHONE 23ARG

COMPLAINT: Very strong modulation hum between 1400-1600 metres. Routine checks showed low voltages and revealed that although mains voltage was 220 the input transformer tapping was at 250V.

Correction removed fault—one that had baffled the dealer who had sold the set.—TENBY.

PHILIPS 600A

NO raster. EHT was reaching tube, as proved by characteristic glow obtained when switching off. Disconnected C1 (Philips' manual) thus removing HT supply to EHT generator to proceed with testing without risk of damage to tube.

Voltage checks at tube base with valve voltmeter showed no volts at tube grid irrespective of position of brightness control R21. A resistance check showed dead S/C between grid and chassis. Removed valveholder from tube base and S/C disappeared. Fault due to S/C between grid and spark trap in tube. On receipt of replacement tube all was well again.

NOTE.—If for any reason a tube is removed from a projection TV, the aperture should be covered by a clean cloth to prevent the ingress of dust.—R. H. S., *Hayes.*

PHILIPS MODEL 735A

HIGH hum, instability, intermittent or continuous crackle may be traced to the smoothing condensers. Electrolyte leaks from the condenser, corroding the chassis and the bottom of the can, causing poor earth connection. A test may be made by earthing the can firmly to the chassis with the business end of a screwdriver.

If a new condenser is fitted always remove the old one since, if it is left connected to the HT line, the ripple current it by-passes may arc to chassis at the corroded earth contact and cause interference.—P. J. S.

PYE BATTERY FOUR

FAIR volume on local stations but otherwise very poor. Signal injection test showed a marked loss of gain in the IF stage. The secondary of the first IFT was found to be several hundred ohms higher than its neighbour. Visual inspection revealed that it was clinging to continuity by a single strand of its Litz wire. The end of the wire was brought out, cleaned, tinned and resoldered. The set functioned perfectly.

Tip for stripping Litz wire: Dip the end in methylated spirits and then pass it quickly through the flame of a match. A gentle rub with fine sandpaper and the wire is ready.—P. J. S.

TRIX T633B—*from page 25.*

V2B for amplification. Cathode bias is provided by R10 decoupled by C7. Amplified signal is developed across anode load R13 and fed by C9 to primary L1 of push-pull input transformer IP1y

Variable top cut tone control is provided b. R15, C10 across primary L1.

Output Stage.—Secondaries L2, L3 of IP1 provide opposite-phased signals for grids of beam tetrode push-pull output valves V4, V5. R19, R24 are grid stoppers and R20, R21 are loads.

On earlier models, secondaries L2, L3 of IP1 were fitted with damping resistors R27, R28. Each output valve is provided with its own cathode bias by means of R22 (V4) and R23 (V5), decoupling being given by C12, C13.

Screen voltage is obtained from cathode of stabiliser valve V3. Primary L4 of output matching transformer OP1 is in the anode circuit of V4, V5, the HT for which is fed to its centre-tap.

Negative feedback from anodes V4, V5 is applied by R18, C11 and R25, C14 respectively through secondaries L2, L3 of input transformer IP1 to their grids.

Secondary L5 of output matching transformer OP1 is tapped for speaker networks of 80 to 3,000 ohms impedance. Low impedance speakers (4, 8 and 15 ohms) are fed from a separate secondary L6.

HT is provided by a directly-heated full wave rectifier V6. HT secondary L9 of mains input transformer MT1 provides its anode voltages and L8 its heater current.

Choke-capacity smoothing is given by L7, C15, C16. HT for V1, V2 is obtained from potential divider R16, R17 decoupled by C5. The potential at junction of R16, R17 is also used as grid control voltage of output valve screen voltage stabiliser V3.

The stabilised voltage is also fed to a power outlet socket for use with radio tuner or pre-amplifier units.

Negative side of HT supply is fitted with a 6V 3W fuse bulb and is returned to chassis through R26 to provide a microphone operating voltage.

Heaters of V1, V2 and indicator lamp obtain their current from secondary L10 of MT1, the centre tap of which is earthed to reduce hum level.

Heater of stabiliser V3 is fed from a separate secondary L12. Heaters of output valves V4, V5 obtain their current from secondary L11, one side of which is earthed.

Primary L13 of MT1 is tapped for input voltages of 200-215, 220-230, 240-250V, 40-100c/s. Mains input is fitted with filter capacitors C17, C18 and ON/OFF switch S2.