

MODELS GR3SA, GR4SA

The models are designed for the reproduction of monophonic sound, but can be easily converted for stereophonic reproduction by the addition of a second channel amplifier, which is supplied as a Conversion Kit, No. 7 obtainable from Dynatron Radio Ltd. Installation instructions are provided with each kit.

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MODELS GR3ST, GR4ST

These are stereophonic reproducers, the only extra requirement being the TLS2 extension speaker unit which incorporates speakers identical to those used in the **Mazurka** and is housed in a cabinet of similar styling and finish.

All versions of the **Mazurka** are fitted with twin-channel pre-amplifiers which have ganged and matched volume, treble and bass controls.

GR3 models are fitted with auto-change units.

GR4 models incorporate single-playing record units.

TECHNICAL DATA

Stereo and Stereo-Adaptable Models

Mains Voltage: 195 to 255 volts 50 c/s with taps at 205V, 225V and 245V.

For 60 c/s operation a conversion pulley is required.

Fuses: Double-pole 1.5A each.

Mains Switch: Double-pole ganged to the Balance control.

Valves: 1 x ECC83 Pre-amplifier and tone control stages.
2 x ECL82 Phase inverter and power output stage-SA models.
4 x ECL82 Phase inverters and power output stages-ST models.
1 x EZ81 Full-wave rectifier.

Pick-up: Turn-over ceramic cartridge, sapphire styli for '78' r.p.m. and long-playing mono or stereo records.

Frequency

Response: 30 c/s to 15 kc/s.

- Tone Controls:** Bass +14dB to -14dB at 50 c/s.
Treble +14dB to -14dB at 10 kc/s.
Referred to 1 kc/s.
- Balance Control:** ±10dB between channels.
- Power Output:** ST models 6 watts per channel.
SA models 7 watts.
- Loudspeakers:** Elliptical 10" x 6" high flux P.M. 3 ohms impedance.
Round 3½" high note high flux P.M. 3 ohms impedance.
- Cabinet:** MAZURKA
Dimensions: 13½" high. 20" wide. 17¾" deep.
Weight: 46 lb.
Finish: Walnut veneer, inner lining in sycamore.
TLS2
Dimensions: 13½" high. 20" wide. 14¾" deep.
Weight: 20 lb.
Finish: Walnut veneer.

CIRCUIT DESCRIPTION

Stereo models

These models contain a pre-amplifier and tone control unit TC18, power amplifier LF18 and second channel amplifier LF18/ST—a sub-chassis mounted on the LF18 chassis.

Gramophone or radio inputs are selected by switch SW1 and fed to the grids of pre-amplifier stages V1a/b. via ganged volume control RV1a/b which is tapped to provide bass compensation for low volume control settings.

The signals from the anodes of V1 are fed to independent bass and treble controls; tone selection being obtained by frequency selective potentiometers.

The outputs from the tone control unit are fed to socket SK2 mounted on the amplifier chassis and thence to the grids of V2A and V4A via SW4 the channel reverse switch; the grid of these valves will, therefore, receive inputs dependent upon the setting of the switch.

Triodes V2A/V3A and V4A/V5A operate as self-balancing phase inverter stages. Phase correcting networks in the anodes circuit of V2A/V4A provide stability against feedback.

The outputs of V3A/V5A are fed to the grids of the pentode sections of V3B/V2B and V5B/V4B operating in push-pull in the ultra-linear mode.

Phase correcting networks between screens and anodes ensure stable circuit operation.

The audio output from T2 is fed to the two 3 ohm internal speakers; the output from T1 being fed via socket SK4 to the stereo extension unit TLS2 which incorporates speakers identical to those used in the reproducer.

The balancing of channels is achieved by means of varying the relative negative feedback of both channels by means of RV4.

H.T. supplies are obtained from a conventional full-wave valve rectifier (V6) and smoothing circuit.

Stereo Adaptable Models

These models contain a tone control unit TC18 and a power amplifier LF18 both of which function as described under "Stereo Models" but with the following exceptions:

The inputs from the pre-amplifier and tone control unit are linked and fed as a single channel to the grid of V2A; the channel reverse switch SW4 being rendered inoperative. Balance control RV4 should always be set to its mid-position during operation.

REMOVING UNITS FROM CABINET

Before removing any unit from the cabinet, ensure that the mains supply has been disconnected. An inter-unit wiring diagram is printed on the bottom service panel.

TONE CONTROL UNIT TC18

- (1) Remove the rear panel, bottom service panel and the panel behind tone control unit.
- (2) Disconnect power supply plug from amplifier chassis. Remove pick-up plugs from record player and ease the leads from the clamping block situated below loudspeakers.

- (3) Remove the four screws securing tone control chassis. Remove unit from cabinet.
- (4) To replace the unit, reverse the above procedure. Ensure however that the pick-up leads are connected to the correct sockets on the record-player. i.e. **Brown** for right-hand channel, **Grey** for left-hand channel.

AMPLIFIER CHASSIS LF18

- (1) Remove rear panel. Disconnect power and signal, motor mains and loudspeaker plugs from the chassis.
- (2) Remove the four chassis securing screws and withdraw chassis from cabinet.
- (3) To replace the chassis reverse the above procedure.

MOTOR AND TURNTABLE ASSEMBLY

- (1) Remove rear and bottom panels. Disconnect record unit mains and pick-up plugs.
- (2) If the reproducer is fitted with a single record player, the turntable should be removed first.
- (3) The record player is secured to the underside of the motor board by three locking clips. To release the clips depress the springs by pressure with the hand on the motor board and twist the clips to an upright position.
- (4) The record playing assembly can now be withdrawn from the cabinet.
- (5) To replace the assembly, reverse the above procedure.

LOUDSPEAKERS

- (1) Remove the rear panel and the panel behind the tone control unit.
- (2) Disconnect motor mains and pick-up plugs from the record playing unit.
- (3) Unscrew the six screws securing motor board assembly. Remove motor board assembly from cabinet.
- (4) Unscrew the four nuts securing loudspeaker to cabinet. Withdraw loudspeaker from cabinet.

- (5) To replace loudspeaker and motor board, reverse the above procedure.

TEST SPECIFICATION

Test Equipment Required.

Audio Oscillator.

Output Meter. (with a change-over switch or additional 3 ohms non-inductive load)

Avo Model 7.

Sensitivity

Conditions of Measurement

- (1) **Volume** control at maximum.
- (2) **Bass, treble, and balance** controls at mid-position.
- (3) Output meter and 3 ohm N.I.L. connected in lieu of loudspeakers.

Method of Measurement

- (1) Inject a signal of a frequency of 1 kc/s into the radio or pick-up sockets as required.
- (2) Adjust the input to produce an output of 1 watt.
- (3) Check both channels.
Radio: 0.125V
Pick-Up: 0.125V Limits ± 2 dB

Bass Control

Conditions of Measurement

- (1) **Volume** control at maximum.
- (2) **Treble** and **balance** controls at mid-position.
- (3) **Bass** control at maximum.
- (4) Output meter and a 3 ohm N.I.L. connected in lieu of loudspeakers.

Method of Measurement.

- (1) Inject a signal at a frequency of 50 c/s to the pick-up sockets and adjust the input to produce an output of 2.0 watts.
- (2) Turn the **Bass** control to mid-position; the output should fall by 15.0dB.
- (3) Turn the **Bass** control to minimum; the output should fall by a further 14.0dB.

- (4) Check both channels.
Limits $\pm 3\text{dB}$.

Treble Control

Conditions of Measurement

- (1) **Volume** control at maximum.
- (2) **Bass** and **Balance** controls at mid-position.
- (3) **Treble** control at maximum.
- (4) Output meter and a 3 ohm N.I.L. connected in lieu of loudspeakers.

Method of Measurement

- (1) Inject a signal at a frequency of 10 kc/s into the pick-up sockets and adjust the input to produce an output of 2.0 watts.
- (2) Turn **Treble** control to mid-position; the output should fall by 14.0dB.
- (3) Turn **Treble** control to minimum; the output should fall by a further 14.0dB.
- (4) Check both channels.
Limits $\pm 3\text{dB}$.

Frequency Response

Conditions of Measurement

- (1) **Volume** control at maximum.
- (2) **Bass**, **Treble** and **Balance** controls at mid-position.
- (3) Output meter and 3 ohm N.I.L. connected in lieu of loudspeakers.

Method of Measurement

- (1) Inject a signal at a frequency of 1 kc/s into pick-up sockets.
- (2) Adjust the input to produce an output of 0.1 watt.

50 c/s	—3.0dB
1 kc/s	0dB (Reference level)
10 kc/s	—3.0dB

 Limits $\pm 3.0\text{dB}$.
- (3) Set the **Volume** control to position '5' with a suitable input at 50 c/s to produce 0.1 watt output. This should be +2dB w.r.t. to 1 kc/s.

Cross-Talk

Conditions of Measurement

- (1) **Balance** and **Tone** controls at mid-position.
- (2) Output meter and 3 ohm N.I.L. connected in lieu of loudspeakers.

Method of Measurement

- (1) Inject the appropriate frequencies into the pick-up and adjust the input to produce 1 watt output. Measure the output at the loudspeaker sockets on the other channel.
- (2) Measured at 250 c/s, 1 kc/s and 10 kc/s readings should not be worse than 26dB between channels.
- (3) Check both channels for cross-talk.

Balance Control

Conditions of Measurement

- (1) **Selector** switch to **Radio**.
- (2) **Stereo 'Left-Right'** switch to **'Right'**.
- (3) Output meter and 3 ohm N.I.L. in lieu of loudspeakers.

Method of Measurement

- (1) Inject a signal at a frequency of 1 kc/s into the **Radio/Tape** socket.
- (2) Turn the **Balance** control fully clockwise and adjust the input to produce an output of 1 watt on the right-hand channel. The output on the left-hand channel should be —10dB below 1 watt.
- (3) Turn the **Balance** control fully anti-clockwise; the left-hand channel output should be 1 watt. The right-hand channel will be— 10dB below 1 watt.

Hum and Noise

With the **Volume** control at maximum, **Tone** and **Balance** controls at mid-position, the hum and noise factor should be better than 60dB below 6 watts on both channels.

Volume Control Matching

Conditions of Measurement

- (1) **Treble**, **Bass** and **Balance** controls at mid-position.
- (2) **Selector** switch in **Radio** position.

- (3) **Volume** control at maximum.
- (4) Output meter and 3 ohm N.I.L. connected in lieu of loudspeakers.

Method of Measurement

- (1) Inject a signal at a frequency of 1 kc/s at the **Radio/Tape** input socket; adjust the input to produce an output of 1 watt.
- (2) Check the power output on both channels with the volume control at maximum. On positions 7, 5 and 3, the matching should not be worse than 3dB between channels.

VALVE VOLTAGES FOR

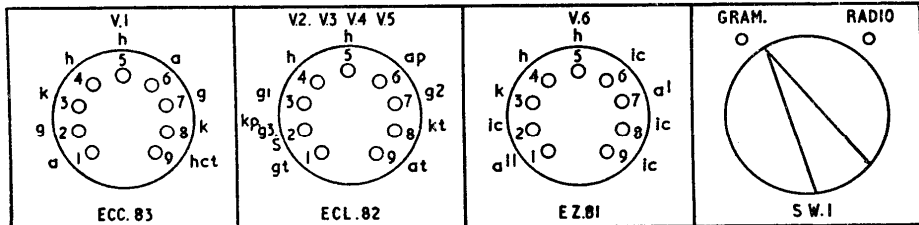
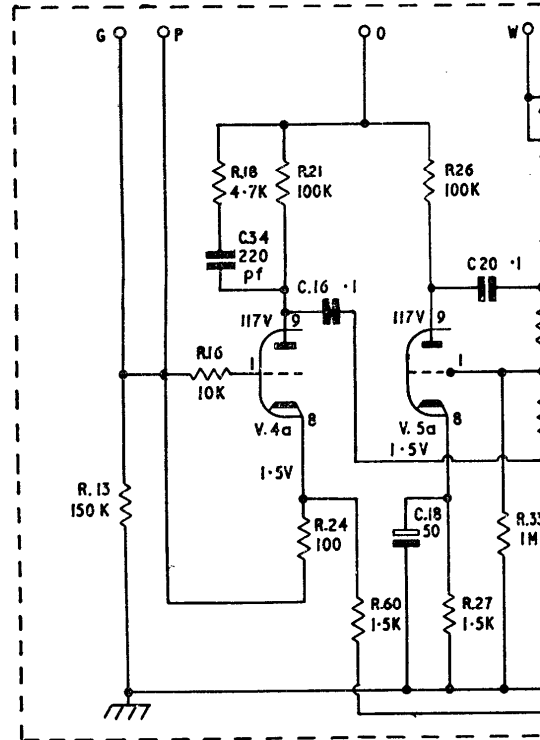
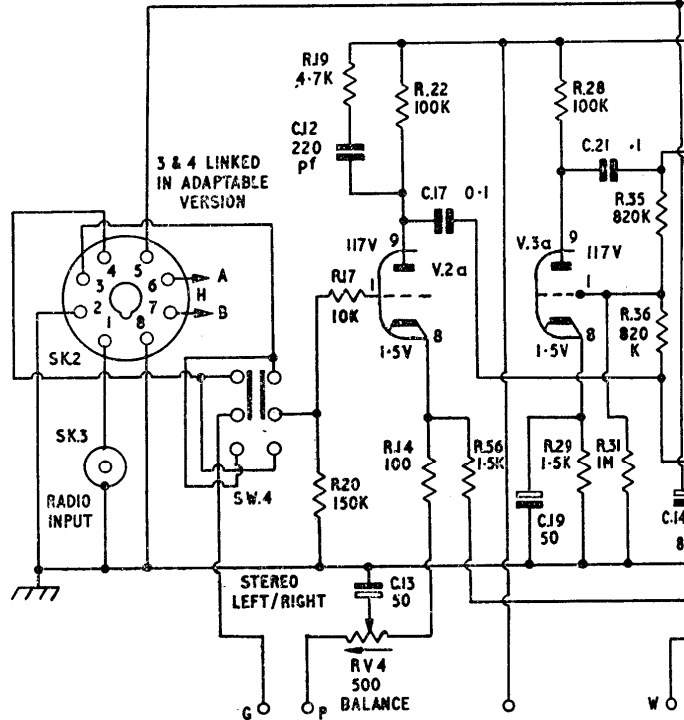
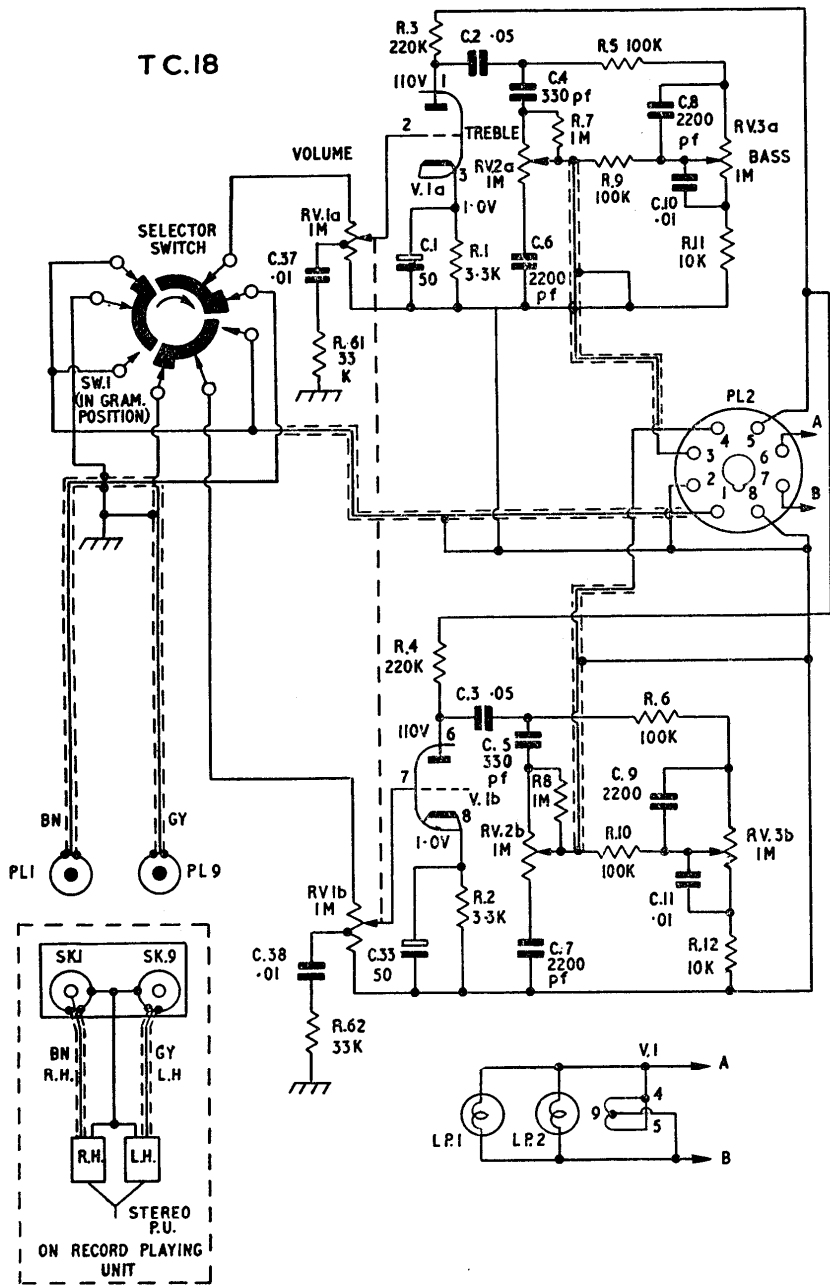
Stereo (ST) and Stereo-Adaptable (SA) Models
Voltage readings taken with an AVO Model 7

VALVE	ANODE			SCREEN			CATHODE		
	Pin	SA V	ST V	Pin	SA V	ST V	Pin	SA V	ST V
V1A	1	120	110	—	—	—	3	1.3	1.0
V1B	6	120	110	—	—	—	8	1.3	1.0
V2A	9	130	117	—	—	—	8	1.8	1.5
V2B	6	295	260	7	290	255	2	28.0	22.0
V3A	9	130	117	—	—	—	8	1.8	1.5
V3B	6	295	260	7	290	255	2	28.0	22.0
V4A	9	—	117	—	—	—	8	—	1.5
V4B	6	—	260	7	—	255	2	—	22.0
V5A	9	—	117	—	—	—	8	—	1.5
V5B	6	—	260	7	—	255	2	—	22.0
V6	1	—	245	—	—	—	—	—	—
	7	250	—	—	—	—	3	300	270

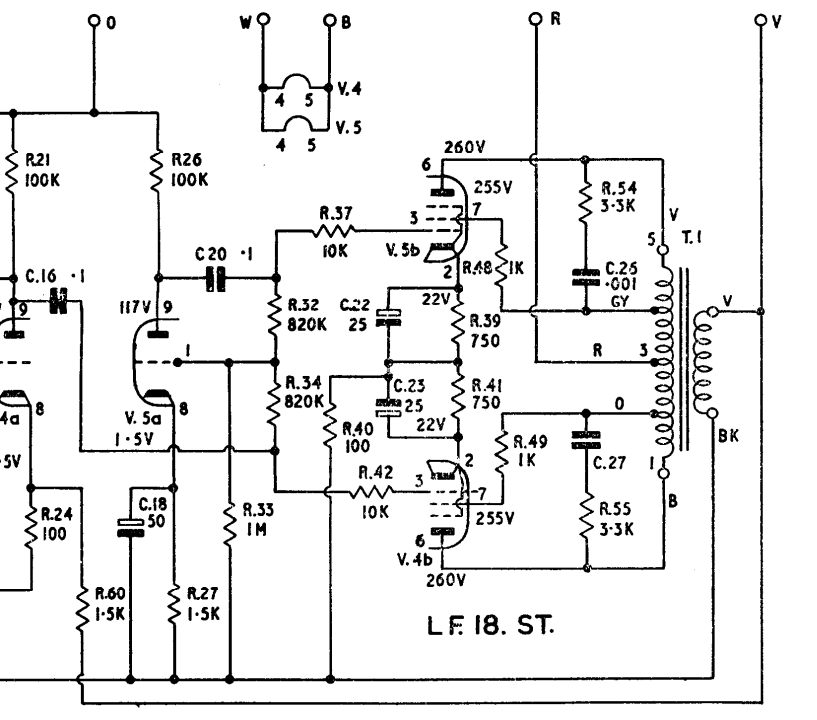
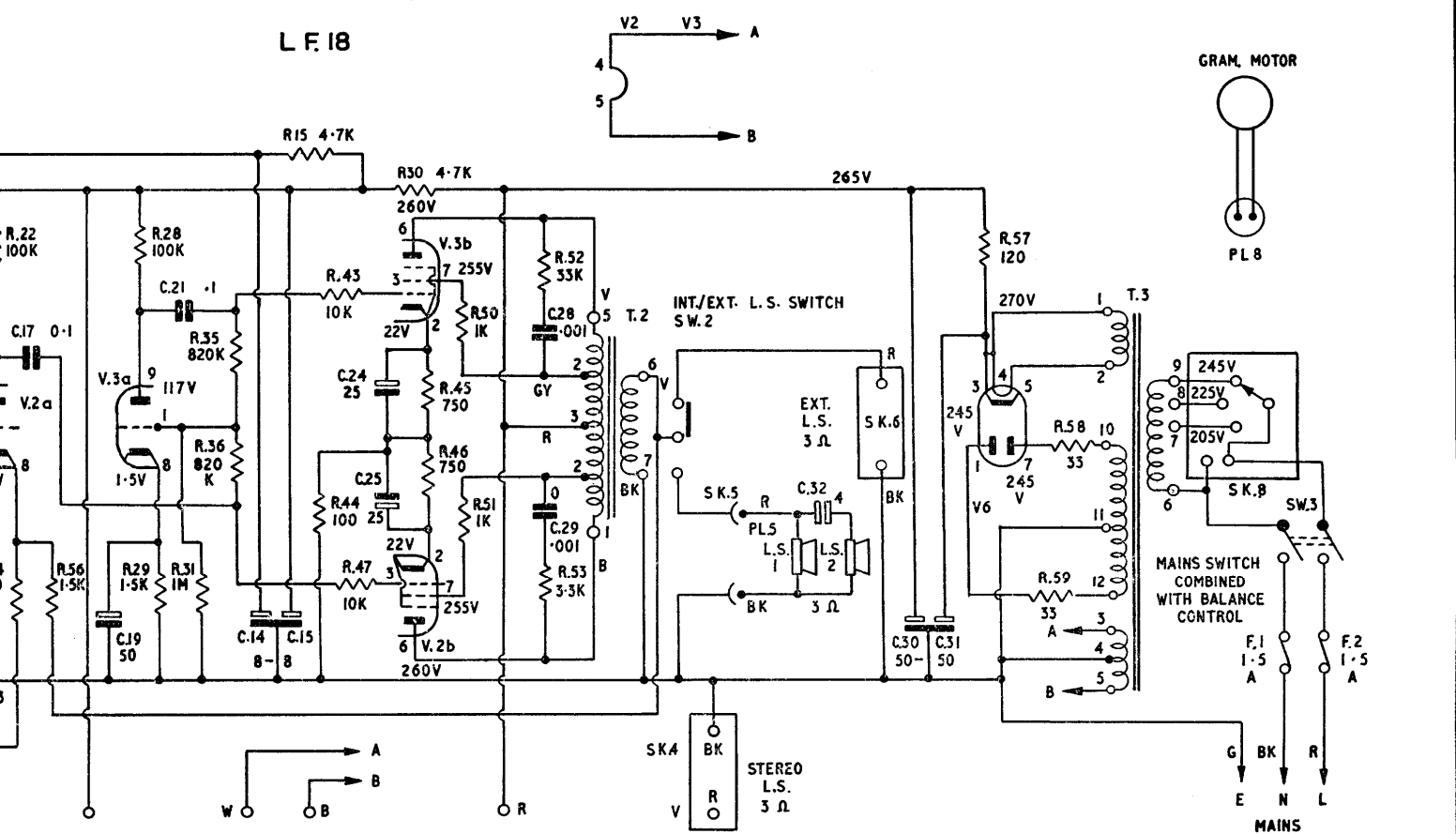
R.	3	1	7	5	11	13	20	19	14	56	28	29	3
	4	2	8	9	10	12		17	22	60	26	27	3
C.	1	2	3	4	5	8	10	12	13	17	19	21	14
	33	5	6	7		9	11		34	16	18	20	14

MISC.	PL1 SK1	SW1 PL9 SK9	RV1a RV1b	V1a V1b LP1	RV2a RV2b LP2	RV3a PL2 RV3b	SK2 SK3	SW 4	RV4 V2a V4a	V 3a V 5a
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T.C.18



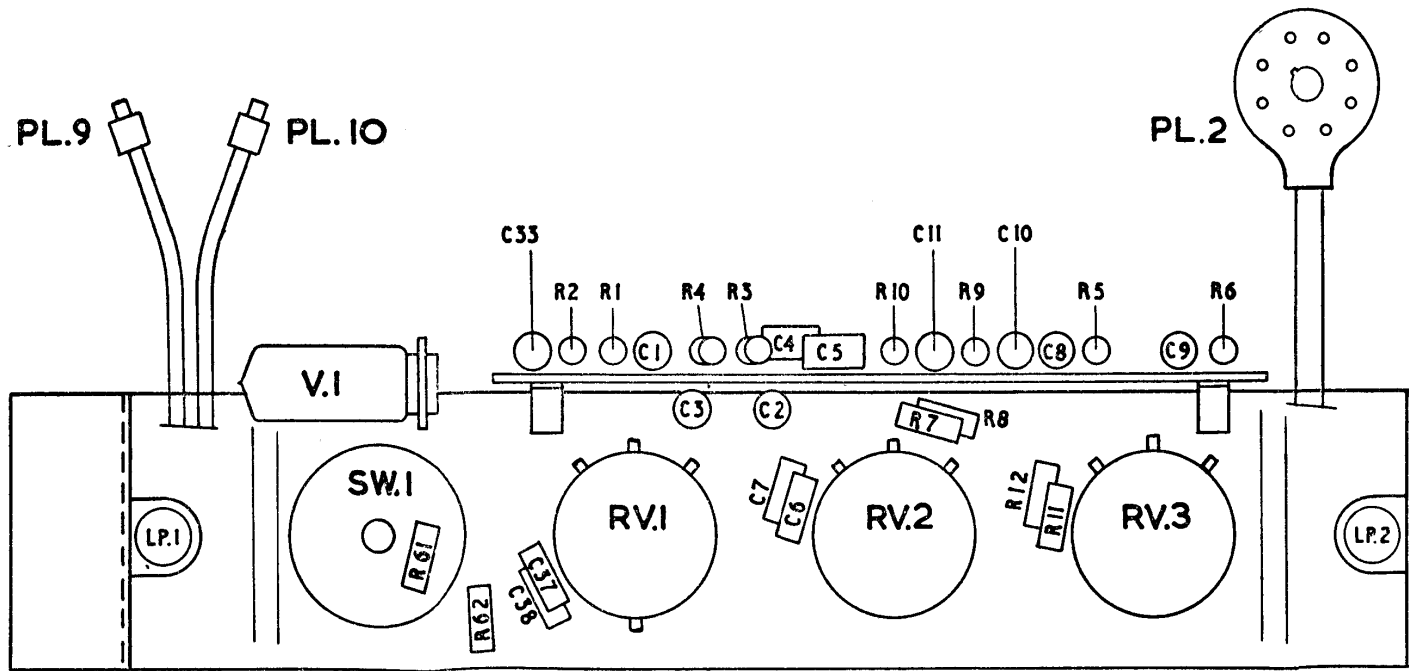
14	56	28	29	32	43	47	30	45	50	39	48	52	54	57	58				
21	60	26	27	34	40	42	46	51	41	49	53	55							
17	19	21				22	24				28	26							
16	18	20	14	15		23	25				29	27							
	V 3a			V 4		V 3b	V 5b	T 2	SW 2	SK 5	LS 1	SK 6	V 6	T 3	SK 8	PL 8	FI	SW 3	F 2
	V 5a			V 5		V 2b	V 4b	T 1	SK 4	PL 5	LS 2								



RESISTANCES OF TRANSFORMER WINDINGS

MAINS TRANSFORMER:		
	TAP	RESISTANCE
PRIMARY	6-7	21 Ω
	7-8	2.2 Ω
	8-9	2.0 Ω
SECONDARY	1-2	0.2 Ω
	3-4	0.1 Ω
	4-5	0.1 Ω
	10-11	100 Ω
	11-12	100 Ω
OUTPUT TRANSFORMER:		
PRIMARY	1-T2	57 Ω
	T2-3 (C.T.)	40 Ω
	3-T1	38 Ω
SECONDARY	T1-5	47 Ω
		0.25 Ω

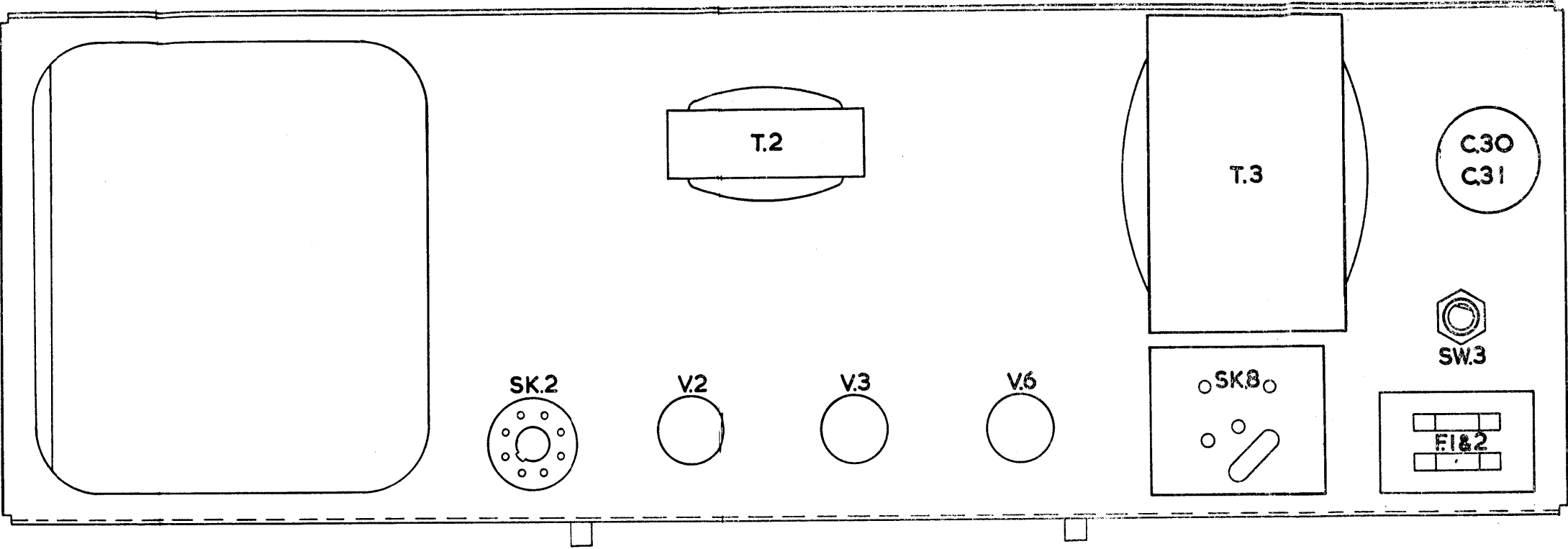
ALL VOLTAGES TAKEN WITH AVO MODEL 7 AND WITH L.F. 18 ST. CONNECTED. FOR SA MODELS SEE TEST SPECIFICATION



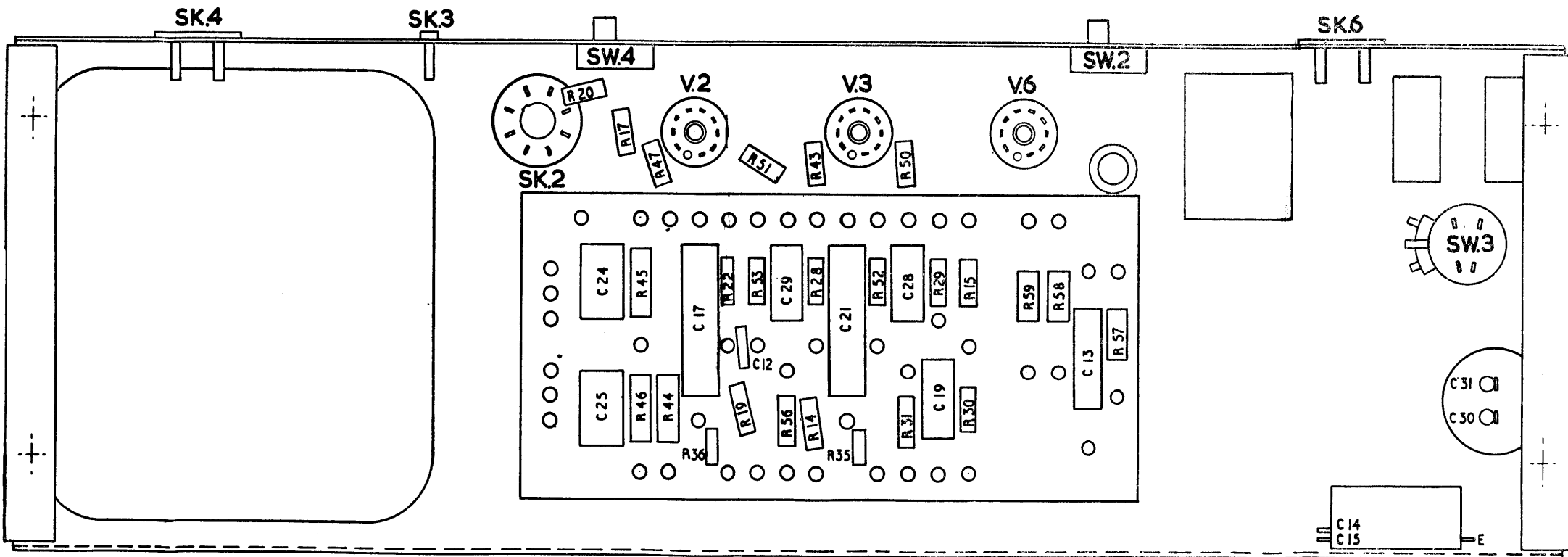
TC 18 Tone Control Unit

PLUG PL 2
Wiring Connections

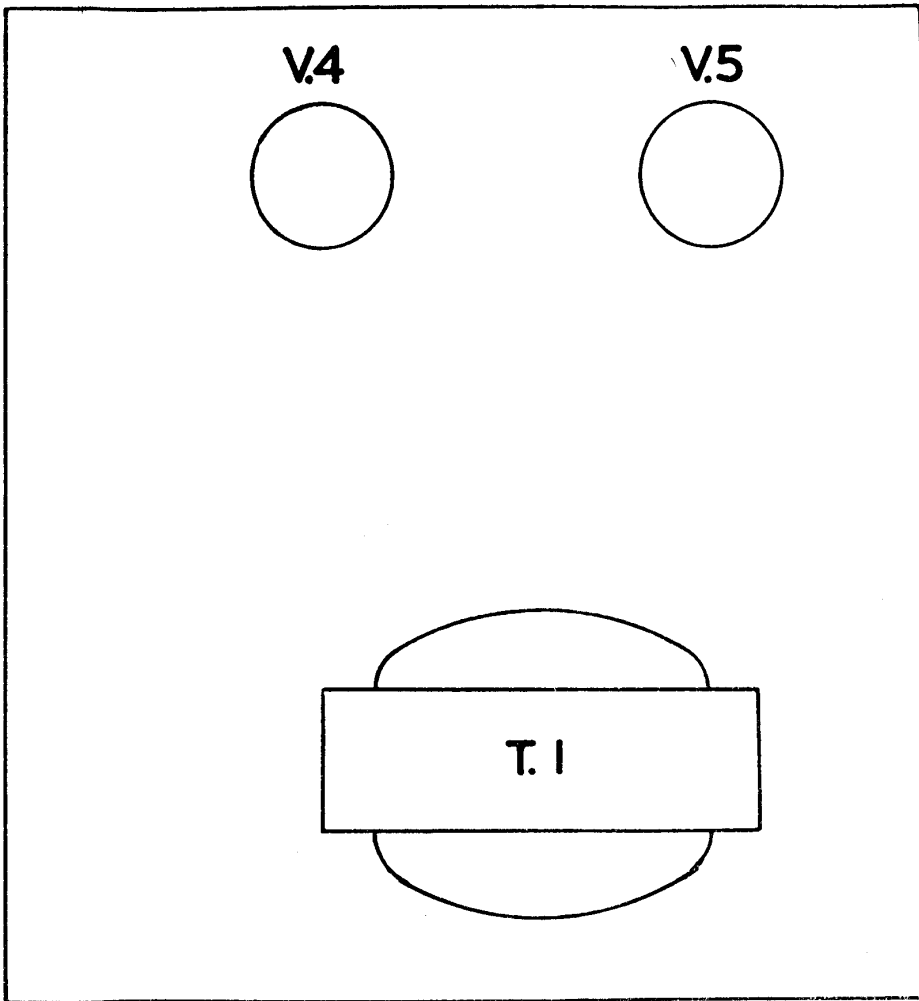
- | | |
|------------------|------------------|
| 1 Radio | 5 H.T. |
| 2 Chassis | 6 Heaters |
| 3 A.F. | 7 Heaters |
| 4 A.F. | 8 Chassis |



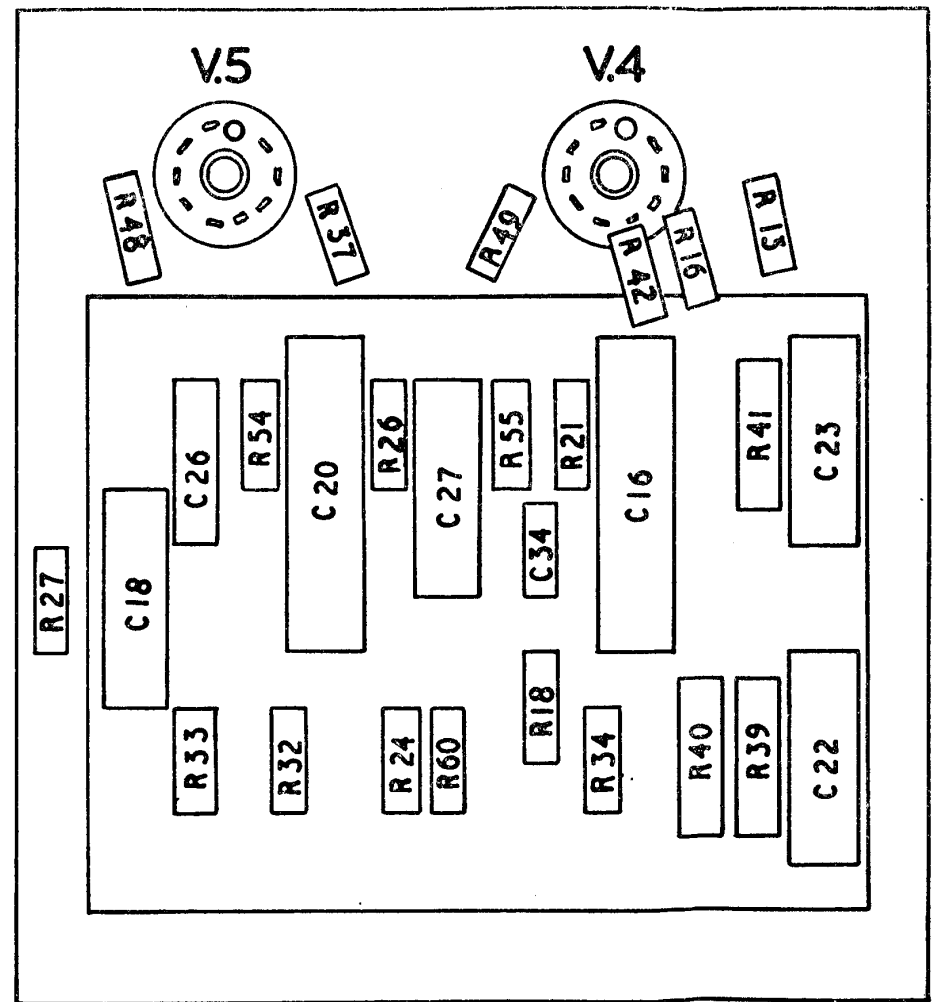
LF18 Amplifier—Top View



LF18 Amplifier—Underside View



LF18ST Amplifier—Top View



LF18ST Amplifier—Underside View