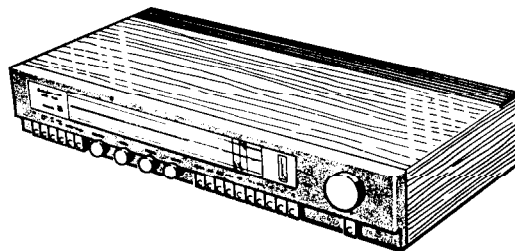


Goodmans

ONE-TEN

Stereo Radio-Amplifier



INSTALLATION NOTES

When used in conjunction with suitable ancillary equipment, the instrument provides high quality stereo or mono reproduction from gramophone records or VHF/FM broadcasts. A full performance specification is given on page 3.

Aerials

VHF-FM: A VHF aerial should be connected to the radio-amplifier via 240 Ω -300 Ω balanced twin-feeder or 60 Ω -80 Ω coaxial cable. Sockets for either type of feeder are incorporated on the rear panel, and suitable alternative plugs are provided for the cable terminations.

AM: The receiver has a built-in ferrite-rod aerial for long and medium waveranges and an AM aerial socket is provided for connecting a short wave aerial. Any short wave aerial connected will also be in circuit on medium and long waves and could affect the slightly directional properties of the ferrite-rod.

When balanced twin-feeder is used to connect the VHF-FM aerial it can also be utilised as an aerial on the AM ranges by means of the aerial linking switch adjacent to the aerial sockets. When used in this way it is not necessary to switch out the link when using the VHF-FM waverange.

Loudspeakers

A similar type loudspeaker of 4 Ω -15 Ω impedance is required for each left- and right-hand channel for good stereo reproduction. Electrostatic loudspeakers or systems of less than 4 Ω must not be connected.

Two pairs of sockets are provided for loudspeaker connections. The second pair permits connection of extension loudspeakers. Either pair of speakers are then selected by pressing the appropriate button.

GOODMANS LOUDSPEAKERS LIMITED

Downley Road, Havant, Hampshire,

PO9 2NL, England

ACCESS FOR SERVICE

Invert cabinet and from underside remove two screws and washers from each end to remove top cover. Place cabinet onto its feet then slide top cover off rearwards to expose chassis. For access to copper side of printed boards, remove ten screws securing metal base cover.

Escutcheon Removal

Pull off rotary control knobs, taking care not to lose 'D' shaped spacer, small friction spacer, and finger guard for tuning knob. Remove three screws from bottom front edge of escutcheon, then two screws at top of side rails securing escutcheon to chassis; compress nylon clips to release escutcheon. The scale is retained by two screws on to the diecast chassis front. The light diffuser is held by three screws to the rear of the diecast front.

Meter Replacement

Unsolder leads, release moulded spring clips and push meter from front to remove from escutcheon.

RF-IF Printed Board Removal

Detach bottom cover and front escutcheon assembly as described above then take out two PK screws securing flywheel frame to chassis end panel.

Remove two 4BA screws and shakeproof washers from each end of chassis front panel taking care not to lose nuts located in pockets in chassis end panels.

Pull off rotary controls and push-buttons (with exception of AFC push-button) then remove four PK screws and shakeproof washers securing push-button switches to front panel. Remove locking nuts, washers and plates securing rotary controls, then slide chassis front forward. Disconnect external wiring to printed board making a careful note of each connection.

Audio Printed Board Removal

Take out two 4BA screws and shakeproof washers from each end of chassis back panel taking care not to lose nuts located in pockets in chassis end panels.

Remove two PK screws and flat washers securing mains transformer mounting bracket to left-hand chassis end panel.

From chassis back panel take out two PK screws securing innermost end of inputs socket panel.

Remove 4BA output transistor fixing screws and shakeproof washers and also remove mica insulating washers.

Disconnect wiring, taking careful note of each connection, then pull printed board free of support clips.

ALIGNMENT DATA

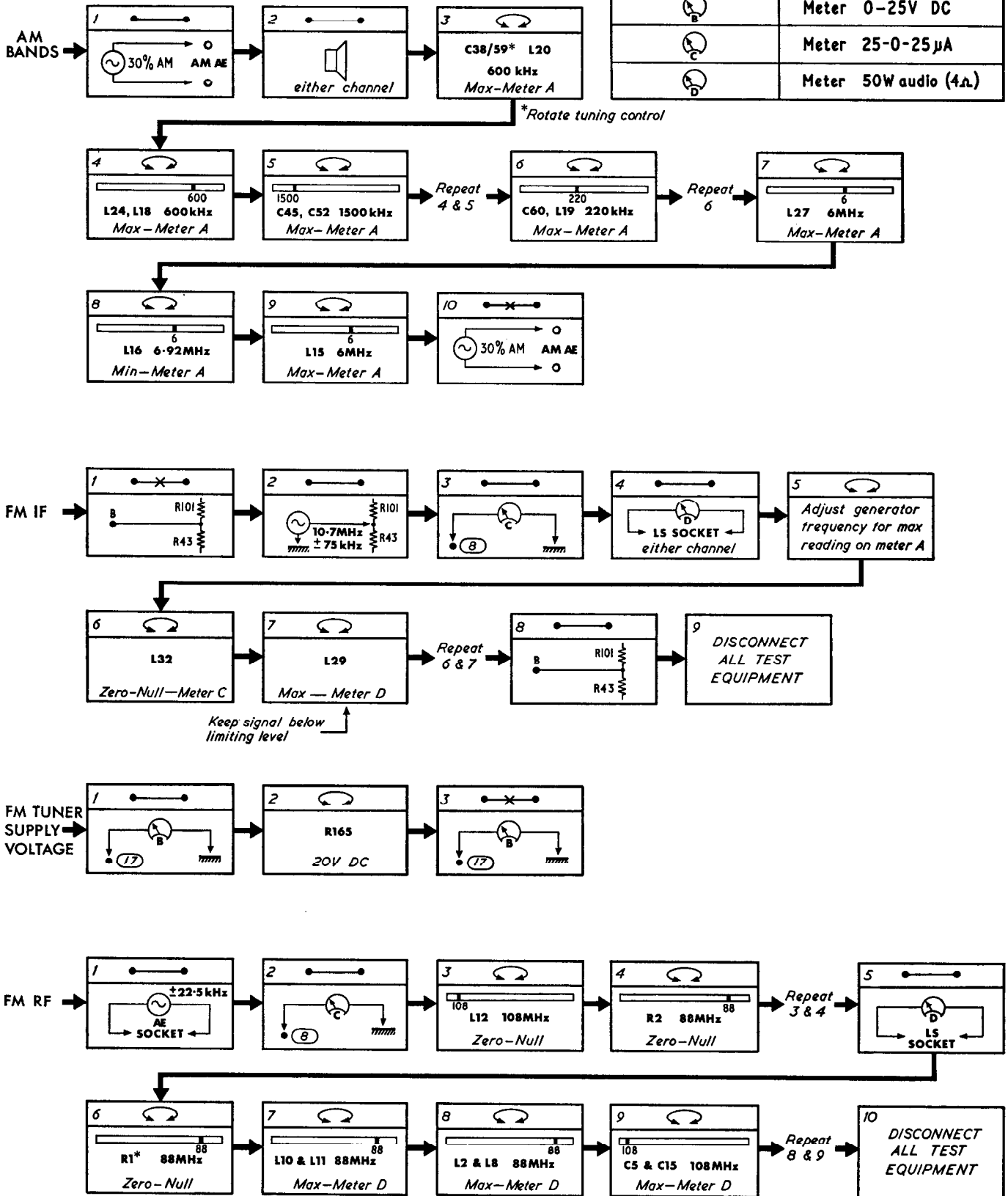
KEY

	Connect
	Disconnect
	Adjust
	Signal Generator
	Built-in tuning meter (M1)
	Meter 0-25V DC
	Meter 25-0-25µA
	Meter 50W audio (4Ω)

The procedure is shown in schematic form except for Multiplex Decoder Alignment which is described separately.

The tuning of the ferrite rod aerial is affected by the proximity of the lower cabinet fixing bracket. This effect must be compensated for during AM Alignment by fixing a piece of 16 S.W.G. aluminium of similar dimensions in the position normally occupied by the bracket.

During AM alignment adjust input signal so that Meter A does not exceed half full-scale deflection.



FM MULTIPLEX DECODER ALIGNMENT

Although alignment of the Decoder panel is quite straightforward, no attempt should be made at realignment unless suitable equipment is available. This should consist of an Encoder providing a crystal controlled 19 kHz pilot signal and also a *Composite* signal that may be switched to provide a *Difference* signal, a *Sum* signal, and an easily identified left- and right-hand signal (or preferably separate left-hand and right-hand signals). These signals should be available as a multiplex audio output and also a modulation of a VHF signal.

First check FM IF and RF alignment. Connect meter on 2.5V DC range across R87. Connect output meters to each channel (it is assumed that audio checks have been made to ensure correct operation of audio circuits).

Set Encoder to VHF output (1mV) with *Composite Sum* signal modulation. This signal is to be used to ensure accurate tuning of the receiver to the test signal; it is therefore injected into aerial sockets and receiver carefully tuned with AFC off. When tuning is accomplished, AFC may be switched on to ensure that signal remains in IF pass band during Decoder alignment.

Set Balance control to give equal output from both channels.

Peak L34 and L36 for maximum negative voltage across R87. This voltage should be approximately 1.4 volts.

Switch encoder to difference signal and peak L39 for maximum audio output. Switch off encoder audio modulation but leave 19

kHz pilot tone. Insert 115 kHz modulation at encoder SCA input socket and adjust L33 for minimum audible 1 kHz tone.

Remove 115 kHz modulation and switch encoder to give left-hand only modulation at 1 kHz and adjust R78 for minimum right-hand output.

Output Quiescent Current (R149 and R149*)

Insert current meter between tag 30 and supply lead. Disconnect any load from output sockets. Adjust R149 to give minimum resistance (i.e. fully anticlockwise) and note current reading on meter. R149 should now be adjusted to increase this current by 3mA.

Transfer the meter connections to tag 30* and repeat the procedure adjusting R149* for the left-hand channel.

Audio Scratch Filter (L40 and L40*)

Inject 9 kHz signal into auxiliary inputs of sufficient strength to produce 30 watts output per channel with Scratch button released. Press Scratch button and adjust L40 on both the left- and right-hand channels to give minimum output.

FM Muting Level (R68)

With no signal input, R68 should be adjusted so that the RF noise level is just muted.

PERFORMANCE SPECIFICATION

AUDIO AMPLIFIER

POWER OUTPUT (measured 1 kHz sine wave with both channels working)

50 watts per channel into 4Ω.

40 watts per channel into 8Ω.

25 watts per channel into 15Ω.

Total Harmonic Distortion: Typically less than 0.01% at 30 watts; Less than 0.1% at any power output up to quoted maximum.

Total Music Power: 110 watts.

OUTPUT IMPEDANCE: Less than 0.1Ω.

DAMPING FACTOR

40 into 4Ω, 80 into 8Ω, 150 into 15Ω.

POWER BANDWIDTH

Exceeds response band-width of amplifier.

SENSITIVITY (measured at 1 kHz for maximum output)

Magnetic Pickup: 2.5mV into 56kΩ (with RIAA equalization within 1dB 40 Hz–20 kHz).

Ceramic Pickup: 200mV into 1 MΩ.

Tape Playthrough: 200mV into 100kΩ.

Overload Capability: +30dB on above figures.

FREQUENCY RESPONSE

15 Hz–45 kHz ± 3 dB, 20 Hz–20 kHz ± 1 dB.

TONE CONTROLS

 (reference 0dB = 1 kHz)

Bass: Typically ± 18 dB at 35 Hz.

Treble: Typically ± 10 dB at 10 kHz.

LOUDNESS CONTOUR (at -30dB Volume control setting)

Typically: +13dB at 50 Hz; +10dB at 15 kHz.

SCRATCH FILTER

Typically: -3dB at 6 kHz; -35dB at 9 kHz.

RUMBLE FILTER

Typically: -3dB at 45 Hz; -36dB at 10 Hz.

HUM & NOISE (weighted with psophometric filter measured to DIN 45 500)

Ceramic Pickup and Tape Inputs: -80dB.

Magnetic Pickup Input: -70dB.

CROSSTALK (any input): -45dB.

RADIO

FREQUENCY COVERAGE

Long Wave: 150 kHz–265 kHz.

Medium Wave: 525 kHz–1605 kHz.

Short Wave: 5.9 MHz–6.25 MHz (Band-spread).

VHF-FM: 87.5 MHz–108 MHz.

FM AERIAL

Balanced: 240Ω–300Ω.

Unbalanced: 60Ω–80Ω.

AM AERIALS

Internal ferrite-rod (Long and Medium waves).

Balanced FM aerial feeder can be linked to AM by switch for SW and/or Long and Medium.

FM SENSITIVITY

Typically 2μV into 240Ω for 30dB signal-to-noise ratio.

Typically 1μV into 75Ω for 30dB signal-to-noise ratio.

Overload Capability: 120dB FM signal strength above 1μV input.

Stereo Separation: 35dB at 1 kHz.

Pilot Tone Rejection (0dB at 75 kHz deviation): Better than -50dB.

Distortion: Typically 0.2% THD for 75 kHz deviation.

Scale Calibration Accuracy: Band ends within 0.1%, Mid-band within 0.3%.

Interstation Muting Level: 15μV stereo, 10μV mono.

IF Rejection: 90dB.

AM SENSITIVITY (for 20dB signal-to-noise ratio)

MW—Typically 20μV.

LW—Typically 40μV.

SW—Typically 20μV (Image rejection better than 55dB).

AGC RANGE: 10dB change in output for 80dB change in signal put level.

TAPE OUTPUT: 100mV into 100kΩ. (1mV per 1kΩ load impedance).

GENERAL

MAINS INPUT: 115–125V or 200–250V; 50–60 Hz. (as specified on back panel)

POWER CONSUMPTION: 180 Watts maximum.

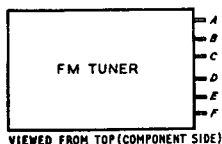
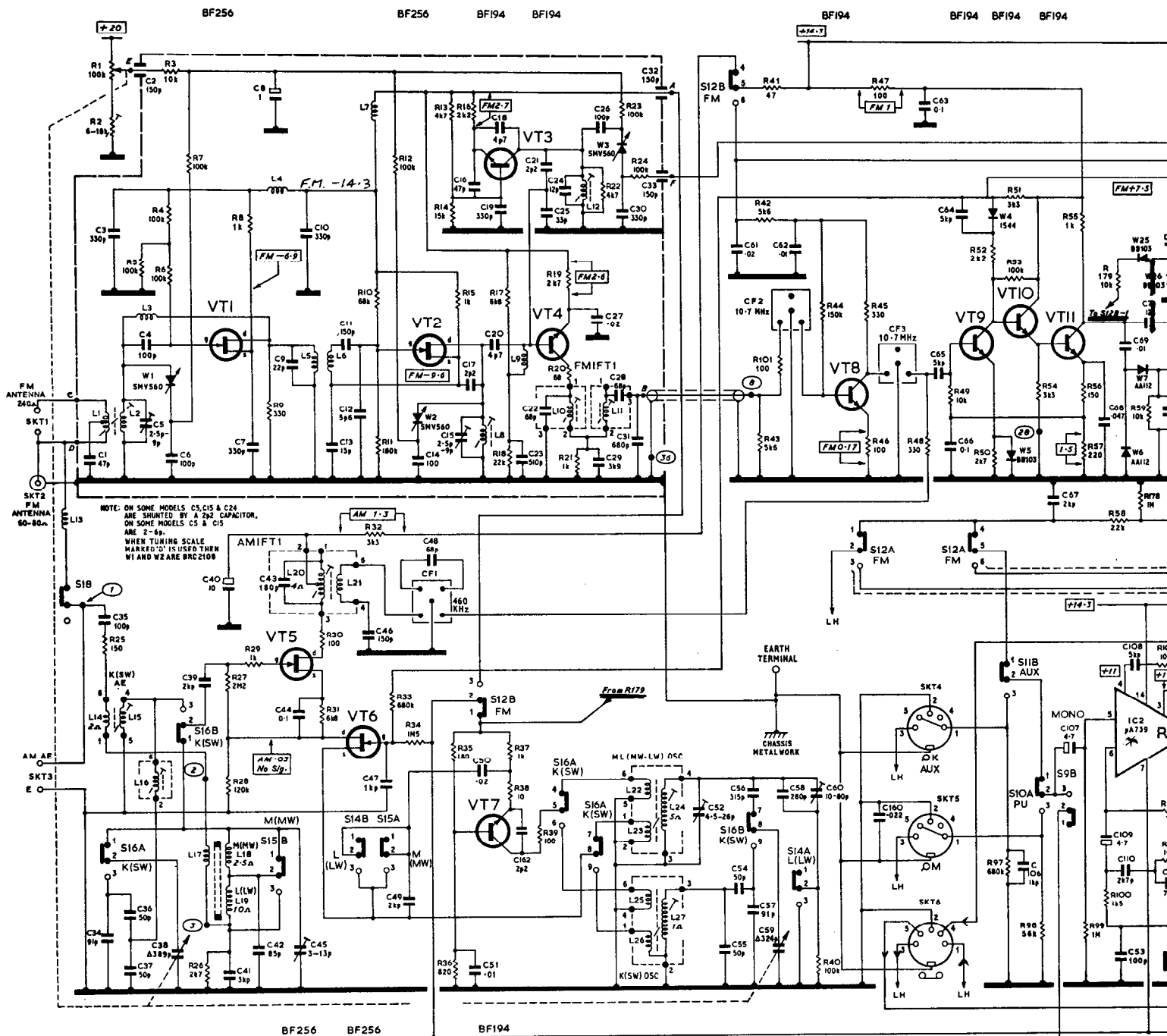
DIMENSIONS (OVERALL)

Length 584 mm; Depth 305 mm (incl. heat sink); Height 115 mm.

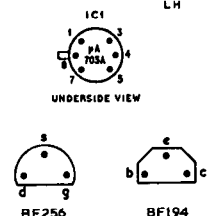
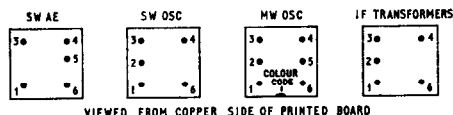
MAINS OUTLET: 1 Amp maximum.

WEIGHT: 27 lb (12.25kg).

FUSES: One 1AT, Four 2.5AT, Three 0.315AT.



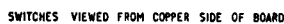
VOLTAGES MEASURED WITH A 20,000Ω/VOLT METER AND ARE WITH RESPECT TO CHASSIS UNLESS OTHERWISE INDICATED.



1/6/66 I & R. R. JAY JOINT 10250
 RH LH
 12.6mF 12.8mF
 16.6 15.8
 OFF OFFSET
 4.5mV -10mV

1/6/66 R125 1.2*
 R121 1.2*
 RETACED
 C130 1.2*
 C131 1.2*
 C132 1.2*

EN 76131N
 IC2 REPLACED 13/7/73
 R106, 106* CHANGED TO
 82K 13/7/73
 W23 REPLACED
 WITH 1CR40 20/4/95



CIRCUIT DIAGRAM

Figures in rectangles, except where otherwise indicated, show voltages with respect to the zero earth rail taken with a 20,000 ohm/volt meter with no signal input. Ringed figures indicate printed board tag connection points.

Note: In some models a 10Ω resistor (R180—not shown in circuit diagram) is fitted in series with C18 and collector of VT3.

COMPONENT DETAILS

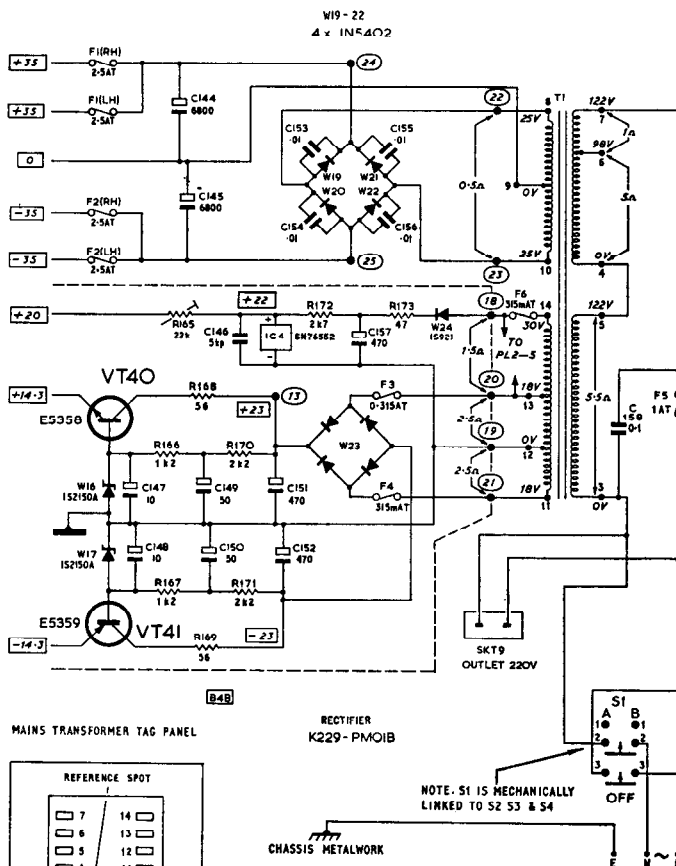
When ordering replacement capacitors and resistors for which no part numbers are given, please quote Model number and component details as stated below.

The second location column refers to LH channel components—marked * on locations diagram.

TRANSISTORS AND DIODES

REF	DESCRIPTION	LOC
VT1	BF256, FM RF amplifier	B4
VT2	BF256, FM RF amplifier	C4
VT3	BF194, FM oscillator	C4
VT4	BF194, FM mixer	C4,5
VT5	BF256, AM mixer	C3
VT6	BF256, Mixer degeneration (AGC)	C2,3
VT7	BF194, AM oscillator	D2
VT8	BF194, FM IF amplifier	D3
VT9	BF194, FM-AM amplifier	DE3
VT10	BF194, FM-AM amplifier	E3
VT11	BF194, FM-AM amplifier	E3,4
VT12	BC148C, AGC amplifier and tuning meter amplifier	E3
VT13	BC148C, FM muting	F3
VT14	BC149, 19 kHz amplifier	G3
VT15	BC148, 19 kHz amplifier	GH3
VT16	BC148, Emitter follower	G3,4
VT17	BC148, Part doubler and 38 kHz amplifier	H3
VT18	BC148, Part doubler and 38 kHz amplifier	H3
VT19	BC147, Stereo lamp switching	H3
VT20	BC149, Emitter follower	F2; F2
VT21	BC159, Audio preamplifier and filter	H2; H2
VT22	BC148, Audio preamplifier and filter	H2; H2
VT23	BC147C, } Long-tailed pair	E4; G4
VT24	BC147C, }	D4; G4
VT25	BC147, Constant current generator (for VT23, VT24)	D4; G4
VT26	BC158, Drive current limiter	E5; H5
VT27	C1143, Driver	E4,5; H4
VT28	BC300, Emitter follower	E4,5; GH5
VT29	BC148, Part constant current generator (VT25, VT30)	D4; FG4
VT30	BC300 Constant current generator (for VT28)	D4,5; FG5
VT31	BC148, Bias for output transistors	D5; G5
VT32	BC158, } Part overload protection	E4,5; G4,5
VT33	BC148, } (connected as thyristors)	E5; G5
VT34	BC158, } Part overload protection	D5; D5
VT35	BC148, } (connected as thyristors)	D4,5; G4
VT36	BC300, Part output compound pair (positive half cycle)	E5; GH5
VT37	BC303, Part output compound pair (negative half cycle)	D5; F5
VT38	MJE2955, Part output compound pair (positive half cycle)	E5; GH5
VT39	MJE3055, Part output compound pair (negative half cycle)	D5; G5
VT40	E5358, 14-3V positive supply line stabilizing	J3
VT41	E5359, 14-3V negative supply line stabilizing	J3
W1	Type BRC2108, FM aerial tuning (used with scales marked 'D')	B4
W2	Type SMV560/2, FM aerial tuning	B4
W3	Type BRC2108, FM RF amplifier tuning (used with scales marked 'D')	C4
W4	Type SMV560/2, FM RF amplifier tuning	C4
W5	Type BRC2108, FM oscillator tuning (used with scales marked 'D')	D3,4
W6	Type SMV560/2, FM oscillator tuning	D3,4
W7	Type IS44, IF AGC limiting	DE3
W8	Type BB103, VT9 emitter degeneration bypass (AGC system)	D3
W9	Type AA112, Part AM detector voltage doubler and AGC	E3
W10	Type F094, Part FM AFC limiting	E3
W11	Type IS44, Part ratio detector	D3,4
W12	Type IS44, Part ratio detector	F3
W13	2 × Type F094, LH and RH channel MPX switching diodes	H3,4
W14		H3,4
W15		H3
W16	Type IS2150A, Voltage stabilizing zener diode	J3
W17	Type IS2150A, Voltage stabilizing zener diode	J3
W19		E5
W20	4 × Type 1N5402, 35V supply line rectifier	F5
W21		F5
W22		F5
W23	Type K229-PM01B, 14-3V supply bridge rectifier	J3
W24	Type IS921, 20V supply rectifier	J3
W25	Type BB103, Part diode switch, AGC decoupling	D2
W26	Type BB103, Part diode switch, AGC decoupling	E3

continued on page 7



Above: Power Supply circuit as fitted in later production models, showing four fuses in the Power Amplifier DC supply rails.

Below: Alternative fusing arrangement in some models, with two fuses in the AC feed side of the Power Amplifier supply rectifier. The fuses are rated at 5 AT.

