



DYNATRON

SERVICE MANUAL

MODEL RG86. 'BURLINGTON'

MODELS HFC 30A, HFC 30M. 'MAZURKA'

MODELS HFC 36, HFC 37. 'CARNIVAL'

MODELS HFC 39, HFC 40. 'VHF CARNIVAL'

MODELS HFC 41, HFC 42. 'CARNIVAL MAJOR'

MODELS HFC 43, HFC 44. 'VHF CARNIVAL MAJOR'

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INTRODUCTION

The Models described in this Manual are High Fidelity instruments of advanced design. HFC 39, HFC 40, HFC 43, HFC.44 and RG 86 incorporate a fully stereo radio tuner coupled with a stereo audio amplifier, and Models HFC 30A, HFC 30M, HFC 36, HFC 37, HFC 41 and HFC 42 incorporate the stereo audio amplifier only. The Radio Tuner is equipped with an automatic Multiplex decoder and will therefore reproduce stereo radio broadcasts without modification. A 'beacon' lamp shows when a stereo broadcast is being received. Reproduction of stereo radio, records and tape recordings is via the high quality dual-channel audio amplifier.

The Garrard SP25s Mark III record playing unit fitted in the 'Carnival' models is equipped with the Goldring G850 magnetic cartridge and stylus and the Goldring-Lenco record playing unit fitted in the 'Carnival Major' models is equipped with the Goldring G800 magnetic cartridge and stylus, both styli are polished diamonds. Sockets are provided at the rear of the cabinet for connecting FM aerial, Tape recorder, Radio tuner, and Loudspeakers, depending on the particular model. Loudspeakers chosen from the wide Dynatron range will complete the installation. A jack socket is provided on the front panel for the connection of Dynatron Stereo Headphones type SP2 or SP3, or alternative 4 ohm to 16 ohm Units.

HOW TO OPERATE THE DYNATRON 'MAZURKA'

Models HFC 30A and HFC 30M—Fig. 1

CONTROLS - AMPLIFIER

With reference to the illustration of the control panel the controls operate as follows:

Mains ON-OFF Switch (1) to Switch 'ON', turn knob clockwise and indicator (2) will light. To switch 'OFF' turn knob anti-clockwise.

Selector Switch (9) should be set for the appropriate function i.e., 'T' for tape replay, 'G' for record reproduction and 'R' when using a radio tuner input.

Volume Control (5) will simultaneously adjust the sound level from both amplifier channels and is arranged to correct the tonal response at various level settings in conjunction with the loudness switch.

Loudness Switch (4) will select or cancel the volume control tone compensation.

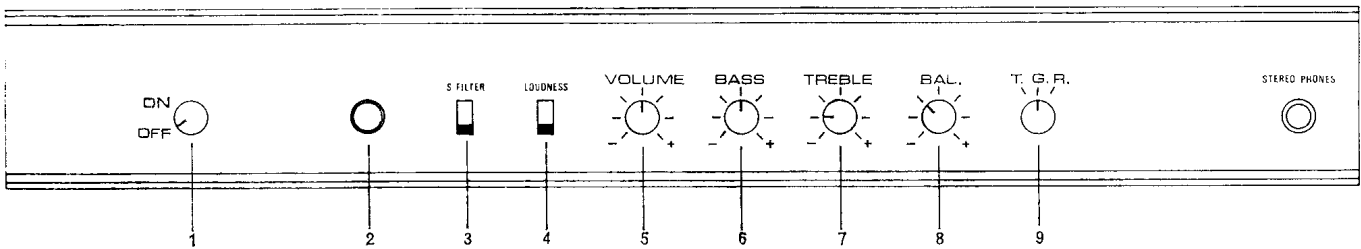
Bass Control (6) increases the low note response of the amplifier when turned clockwise and when turned anti-clockwise the low note response is reduced.

Treble Control (7) will increase and decrease the high note response in a similar manner.

S. Filter Switch (3) is designed to provide a fixed degree of treble attenuation and will prove useful in reducing the level of noise from poor record surfaces or tape recordings, etc.

Balance Control (8) should be initially set to its central position. For optimum balance a monaural record should be played and the control adjusted so that the sound appears to come from a point mid-way between the two loudspeakers.

Fig. 1
FRONT PANEL HFC 30A & M



HOW TO OPERATE THE DYNATRON 'CARNIVAL' AND 'CARNIVAL MAJOR'

Models HFC 36, HFC 37, HFC 39, HFC 40, HFC 41, HFC 42, HFC 43, HFC 44—Fig. 2

CONTROLS - AMPLIFIER

With reference to the illustration of the control panel the controls operate as follows:

Mains ON-OFF Button (1) to Switch 'ON', push button in and indicator (2) will light. To switch 'OFF', push button again, this will release the switch.

Selector Switch (9) should be set for the appropriate function i.e., 'TAPE' for tape replay, 'DISC' for record reproduction and 'RADIO' when using a radio tuner input.

Volume Control (5) will simultaneously adjust the sound level from both amplifier channels and is arranged to correct the tonal response at various level settings in conjunction with the loudness switch.

Contour Button (4) when depressed will select the volume control tone compensation.

Bass Control (6) increases the low note response of the amplifier when turned clockwise and when turned anti-clockwise the low note response is reduced.

Treble Control (7) will increase and decrease the high note response in a similar manner.

S. Filter Button (3) when depressed is designed to provide a fixed degree of treble attenuation and will prove useful in reducing the level of noise from poor record surfaces or tape recordings, etc.

Balance Control (8) should be initially set to its central position. For optimum balance a monaural record should be played and the control adjusted so that the sound appears to come from a point mid-way between the two loudspeakers.

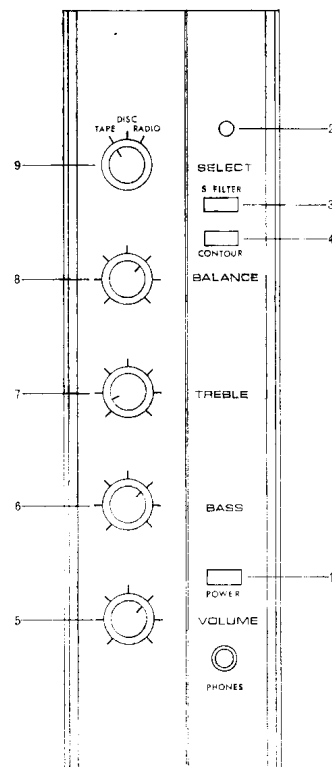


Fig 2 AMPLIFIER CONTROL PANEL

FOR OPERATION OF THE RADIO TUNER SECTION, VHF 'CARNIVAL' AND VHF 'CARNIVAL MAJOR' MODELS, See Fig. 4

HOW TO OPERATE THE DYNATRON 'BURLINGTON' RG86

NOTE:

This instrument has been designed to provide a full dynamic tone range at normal volume levels and consequently the Bass control should not be at maximum when operating at full volume to avoid acoustic feed back.

CONTROLS - AMPLIFIER

With reference to the illustration of the control panel the controls operate as follows:

Mains ON-OFF Button (A) to Switch 'ON', push button in and indicator (B) will light. To switch 'OFF', push button again, this will release the switch.

Selector Switch (C) should be set for the appropriate function, i.e., 'TAPE' for tape replay, 'DISC' for record reproduction and 'RADIO' when using a radio tuner input.

Volume Control (D) will simultaneously adjust the sound level from both amplifier channels and is arranged to correct the tonal response at various level settings in conjunction with the loudness switch.

Contour Button (E) when depressed will select the volume control tone compensation.

Bass Control (F) increases the low note response of the amplifier when turned clockwise and when turned anti-clockwise the low note response is reduced.

Treble Control (G) will increase and decrease the high note response in a similar manner.

S. Filter Button (H) when depressed is designed to provide a fixed degree of treble attenuation and will prove useful in reducing the level of noise from poor record surfaces or tape recordings, etc.

Balance Control (I) should be set initially to its central position. For optimum balance a monaural record should be played and the control adjusted so that the sound appears to come from a point mid-way between the two loudspeakers.

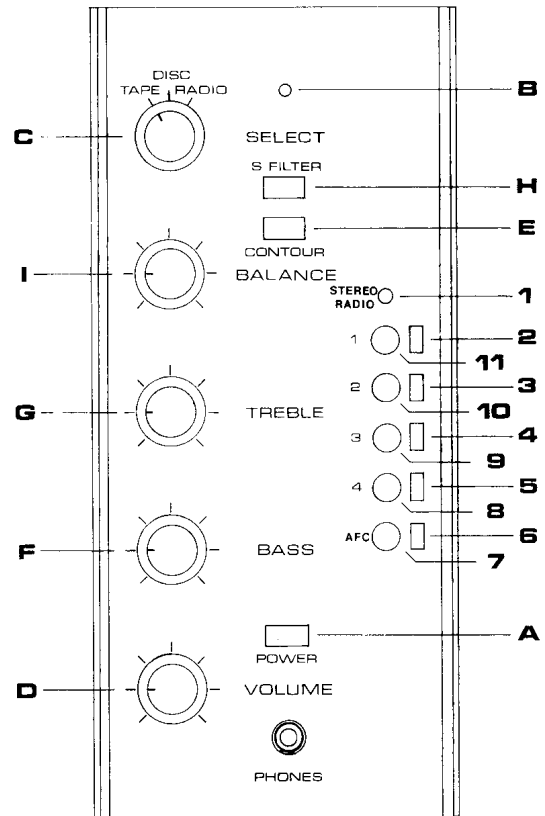
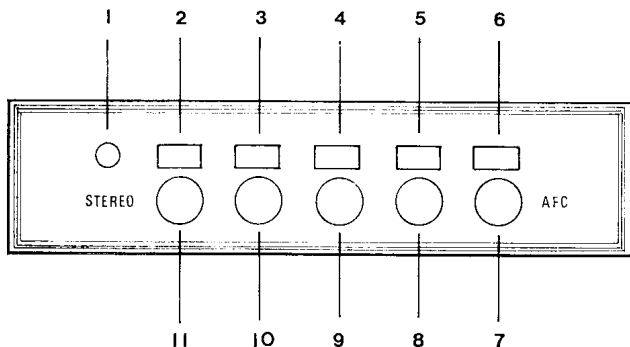


Fig. 3 CONTROL PANEL

RADIO TUNER, VHF 'CARNIVAL' MODELS AND 'BURLINGTON' RG86



TUNER CONTROL PANEL Fig. 4

Aerial. An internal mains capacity aerial is fitted but for best results an external FM aerial should be connected using the plug provided to the co-axial or DIN aerial socket at the rear of the cabinet.

Radio Tuner. Models HFC 39, HFC 40, HFC 43 and HFC 44 Control panel see Fig. 4; RG 86, see Fig. 3.

Having set the selector switch (9) Figs. 1-3 to Radio, depress the appropriate tuner button (8-11) Fig. 4 for the channel required. If a stereo signal is being received the Stereo lamp (1) will light up. To tune to the required channel the AFC switch (7) should be turned to off (Red and White showing in the window 6), button (8-11) should be depressed and turned to tune the signal required. An approximate indication of frequency, 87-104 MHz will show in the window (2-5) above the button depressed. After tuning, switch AFC on (Red in window 6)

Record Playing Units. Installation of the Garrard and Goldring-Lenco record playing units is fully detailed in the Manufacturer's Booklet supplied.

GENERAL NOTES

The G800 and G850 magnetic Stereo cartridge has a diamond stylus of .0007 in. radius designed to play either mono or stereo "microgroove" records of speeds 16, 33 $\frac{1}{3}$ or 45 r.p.m. The recommended stylus pressure is 3 gms. 78 r.p.m. records should NOT be played with this stylus. If it is desired to play 78 r.p.m. records we advise the user to consult their Dynatron Dealer.

Using a tape recorder with the Carnival models

The tape recorder should be connected via a 5 pin DIN pattern plug to the socket marked 'TAPE'. The method of wiring the plug for a stereo machine shown in Fig. 5A and Fig. 5B (right) shows connections for a mono tape recorder. (The 5 pin DIN pattern plugs and sockets are rapidly becoming a standard and many Dealers stock suitable leads ready made up.) When recording from the Dynatron instrument the output signals are independent of volume and tone control settings and the recording level should be adjusted using the tape recorder controls. When replaying a tape recording through the Dynatron instrument the SELECTOR switch should be set to TAPE and the volume and tone controls adjusted for loudness and tonal balance to suit your requirements.

Connections as viewed from wiring side of socket

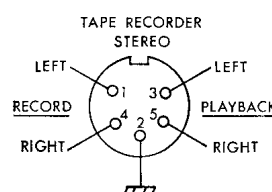


Fig. 5A

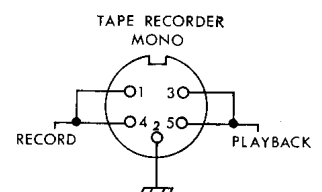


Fig. 5B

Stereo Headphones

Dynatron Stereo Headphones are high quality units of 8 ohm impedance and may be connected to these instruments using the socket fitted to the front control panel. When the Stereo Headphones Jack plug is inserted into the socket the loudspeakers are automatically silenced.

SOCKETS

SOCKETS PANEL RG86

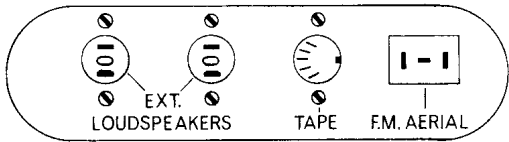


Fig. 6

All instruments have a socket panel located at the rear of the cabinet and the layout is as shown in Fig. 6 or as detailed in Note 2.

VHF (FM) Aerial. 70–80 ohms co-axial or 300 ohms twin feeder may be connected to this socket using the plug supplied and marked **FM**. (RG86 only: In some locations it may assist to try turning the plug to either position to ensure the best reception when using co-axial feeder cable.)

RG86 only

Note 1. The DIN pattern external loudspeaker plugs may be inserted into the EXT. L.S. sockets in two ways: In one position the external loudspeaker only will function and in the second position, with the plug turned through 180 degrees, both internal and external loudspeakers will operate.

Note 2. All other models

The L.S. sockets are 2 pin DIN pattern marked L.H. and R.H. respectively.

The FM/VHF aerial socket fitted to the VHF 'Carnival' Models is of the standard 75 ohm co-axial type.

Ext. L.S. External loudspeakers should be connected to the 2-pin DIN pattern sockets provided. All Dynatron Loudspeaker units are supplied with a suitable plug fitted to the connecting cable. If other types of loudspeaker are to be used they should be of 3 or 4 ohm impedance and preferably a matching pair. Ensure correct polarity when wiring the plugs.

Note 3. HFC 36, HFC 37, HFC 41 and HFC 42

Using an external Radio Tuner

The radio tuner should be connected to the socket marked 'RADIO'. The method of wiring the socket is shown in Figs. 7A and 7B. A suitable tuner unit should be self-powered and have an audio output greater than 20 millivolts but less than 650 millivolts. If it is a V.H.F. tuner with Stereo Decoder fitted it is important that the output should have better than 38 dB suppression of 19 kHz and/or 38 kHz Pilot tone signals.

Fig. 7A

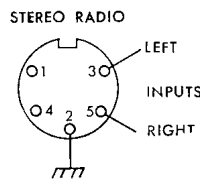
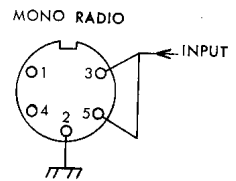


Fig. 7B



Connections as viewed from wiring side of socket

INSTALLATION NOTES

The following instructions are a guide as to what should be done before the instrument may be used.

IMPORTANT. GOLDRING-LENCO GL75 Unit.

The turntable of this unit is very accurately machined and balanced; it weighs approx. 9 lb. It is therefore imperative that **THIS UNIT SHOULD NOT BE TRANSPORTED WITH THE TURNTABLE IN PLAYING POSITION.** Please retain the packing for use when the turntable is removed.

Dynatron Radio Ltd cannot accept responsibility for damage that may occur if the turntable is left in position on the unit during transportation.

1. Remove all packing material.
2. Check voltage of the supply mains. The Model is despatched from the factory for Home Market use set to 220–250 volts operation at 50 Hz. Other voltages and frequencies are available for Export. Do NOT connect to a D.C. supply.
3. **DO NOT OPERATE THE RECORD PLAYING UNIT BEFORE CORRECTLY INSTALLING.**
4. Fit a suitable plug to the three core mains lead taking care that the colour coding of the three wires is strictly observed. The colour code used is to the new standard and the **BROWN** covered wire must go to the "L" or live pin of the plug. The **LIGHT BLUE** wire is the Neutral connection and should be attached to the "N" pin. **GREEN/YELLOW** is the colour of the Earth wire which must be attached to the "E" or Earth pin.
If you intend to use only a 2 pin plug cut off or tie back the Green/Yellow earth wire before connecting to the mains supply. **UNDER NO CIRCUMSTANCES** connect the **GREEN/YELLOW** wire to any point other than the "E" or Earth pin of a three pin plug.
5. Connect the loudspeakers chosen from the Dynatron L.S. range to their respective sockets. (This is not applicable to Model RG 86 which has built-in loudspeakers.)
6. If other loudspeakers are to be used take care that the DIN style plugs are correctly wired for phasing and the voice coil impedance is 3–4 ohms or higher. Avoid short circuit connections, or damage may result to the instrument. (This applies to RG 86 in respect of extension loudspeaker units.)

Fuses. See Fig. 8.

The Dynatron amplifier chassis is fitted with three fuses. One for mains voltage circuits and one for each stereo amplifier channel. These fuses are standard 1 amp type and only this rating must be used for replacement to Home Market models.

To obtain access to the fuses remove the 5 screws holding the base of the cabinet in place, remove the base and this will expose the fuses mounted on the chassis.

FUSE POSITION DIAGRAM

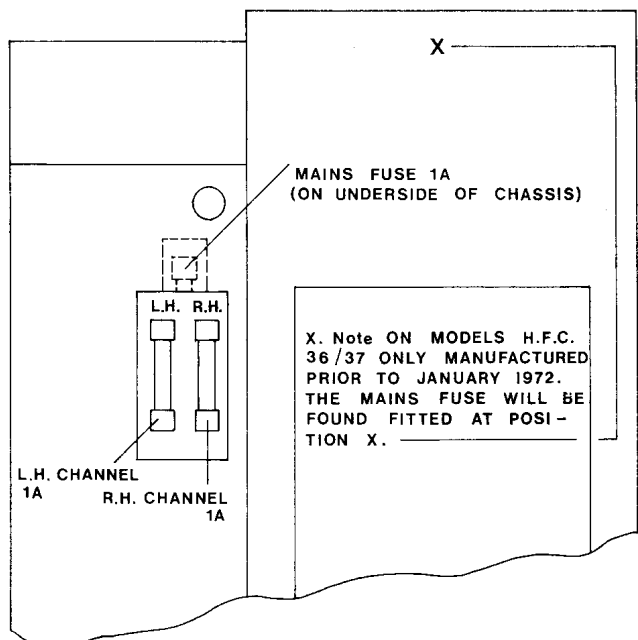


Fig. 8

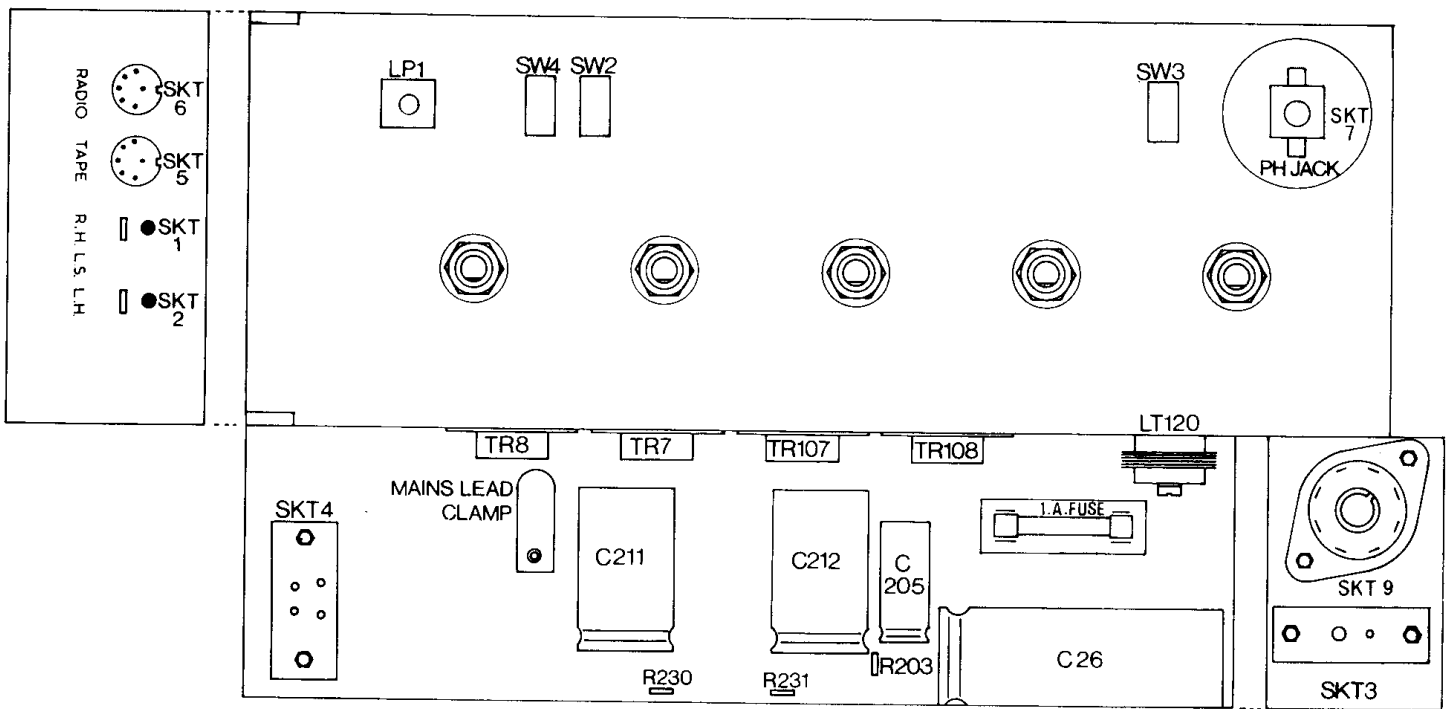


Fig. 9
 TOP VIEW OF AMPLIFIER CHASSIS
 (All Models except HFC 30A/M)

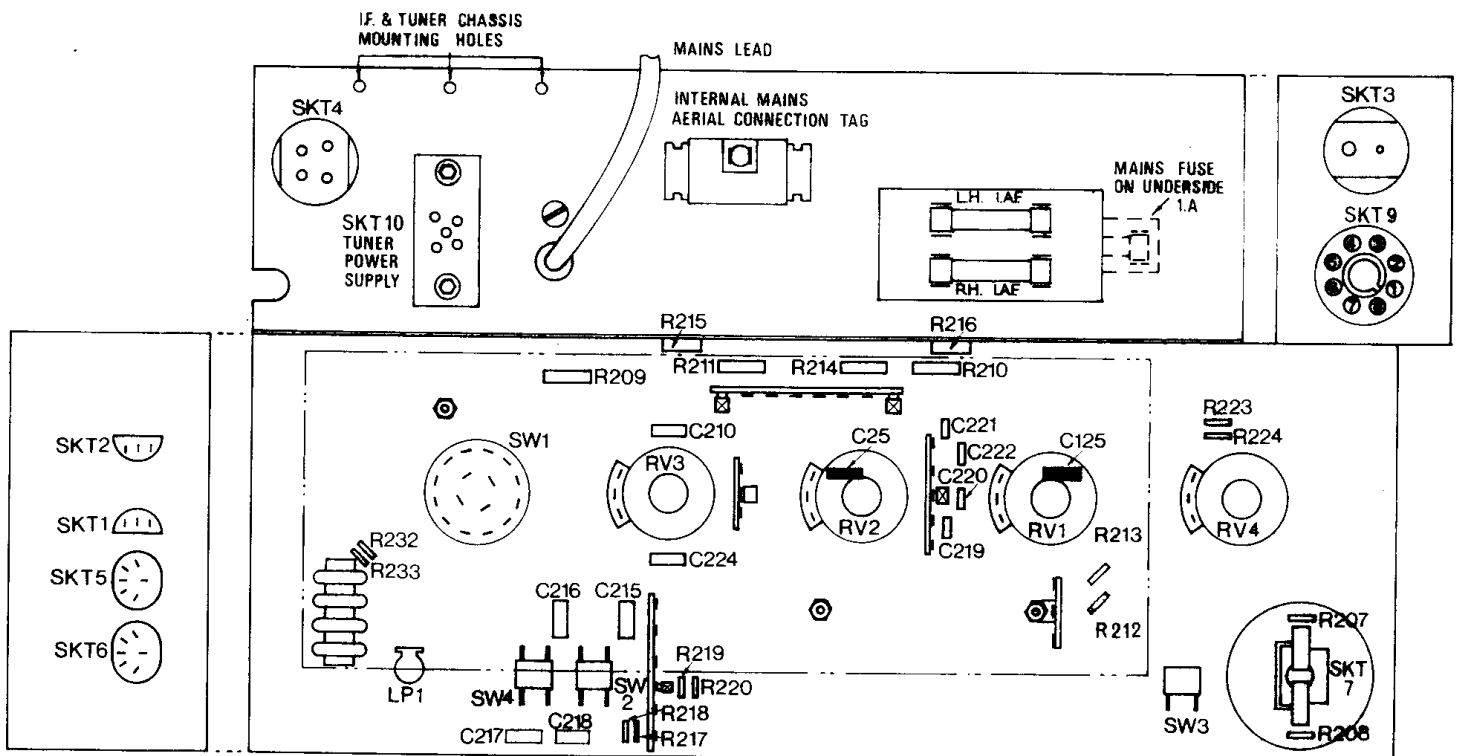


Fig. 10
 UNDERSIDE VIEW OF AMPLIFIER CHASSIS
 PRINT BOARD (B) REMOVED
 (All Models except HFC 30A/M)

Fig. 11
TOP VIEW OF CHASSIS
HFC 30A AND M
Note: C25 and C125 under board

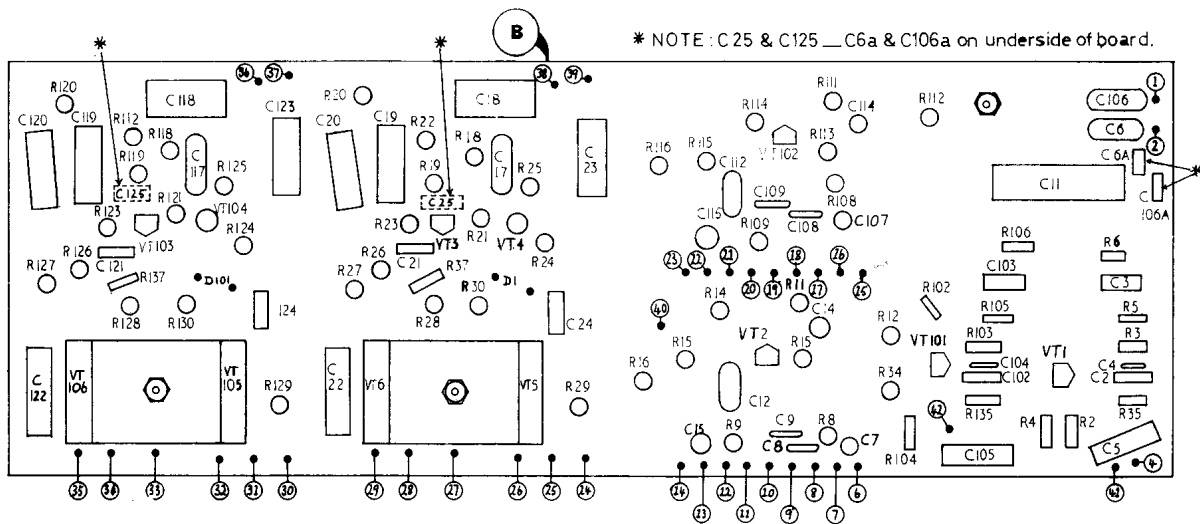
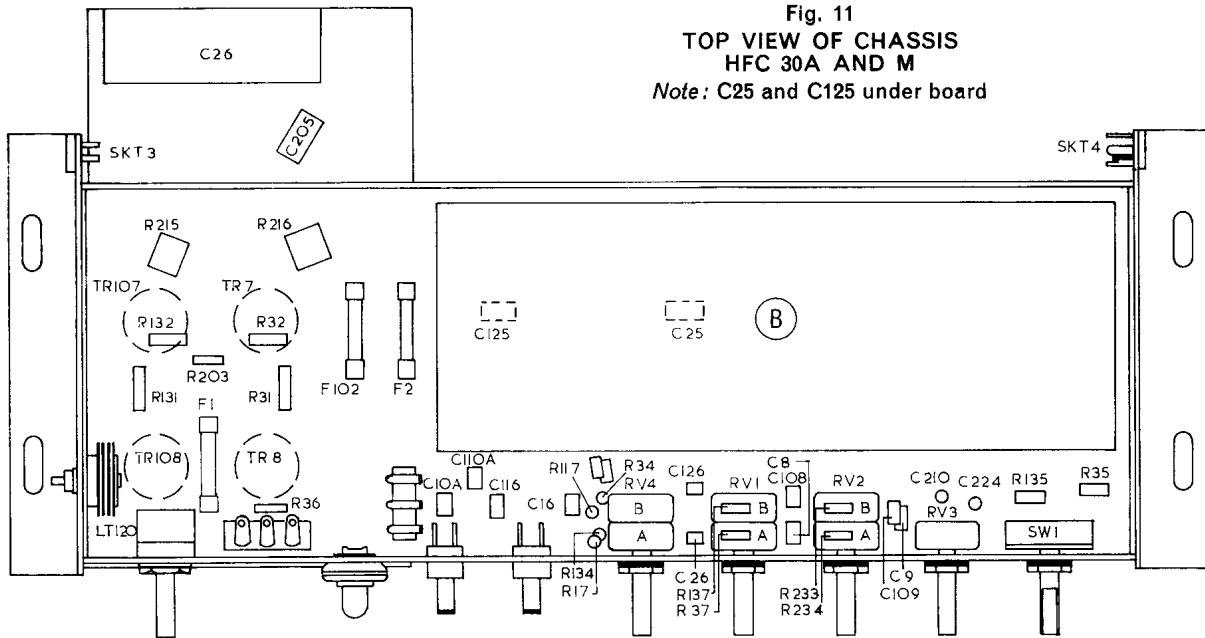


Fig. 12
LAYOUT OF AUDIO PRINT PANEL. (B) ALL MODELS

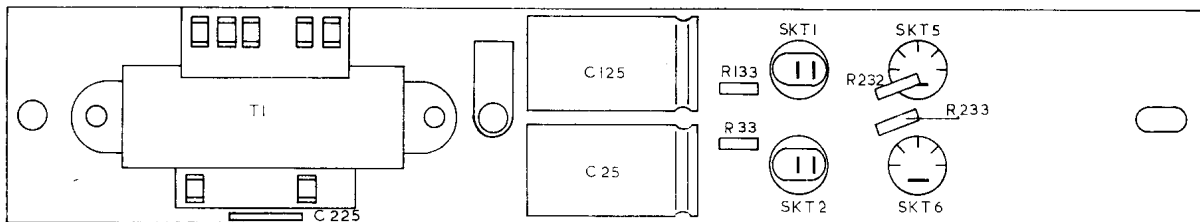


Fig. 13
POWER AND SOCKETS PANEL LAYOUT HFC 30A AND M

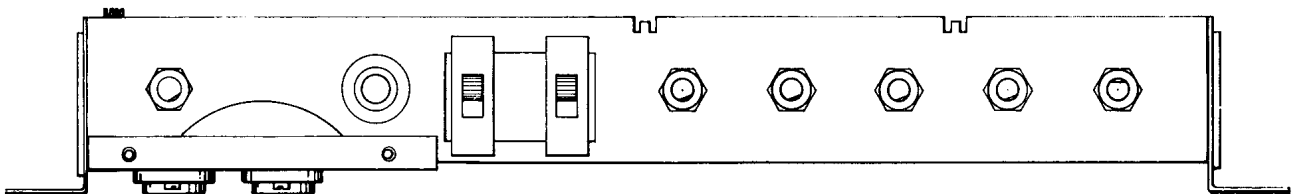
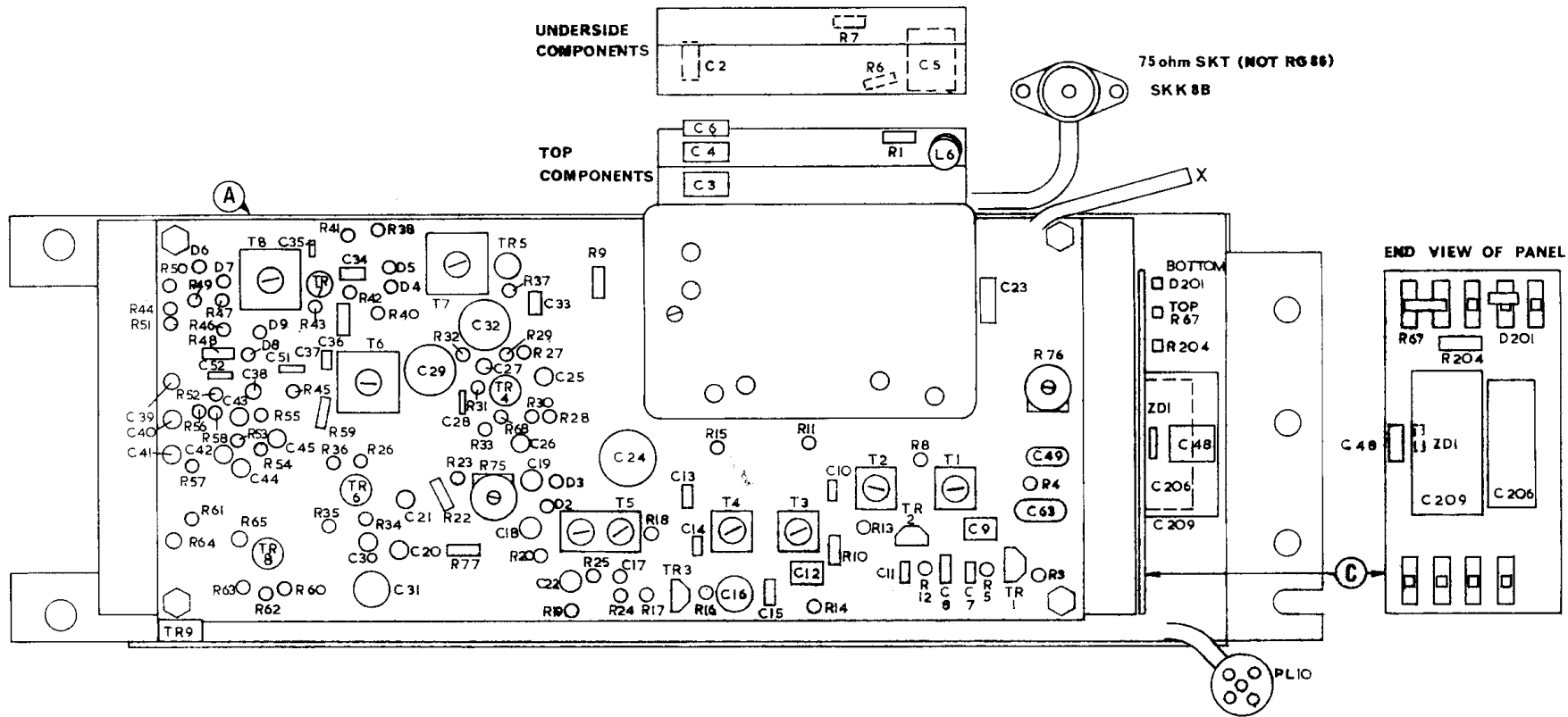


Fig. 14
FRONT VIEW OF CHASSIS HFC 30A AND M

IF AND TUNER UNIT PRINTED CIRCUIT BOARD 'A'
 MODELS HFC 39, HFC 40, HFC 43, HFC 44, RG86

Fig. 15



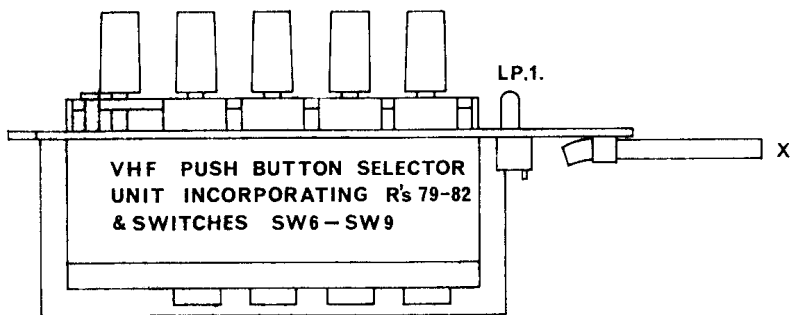
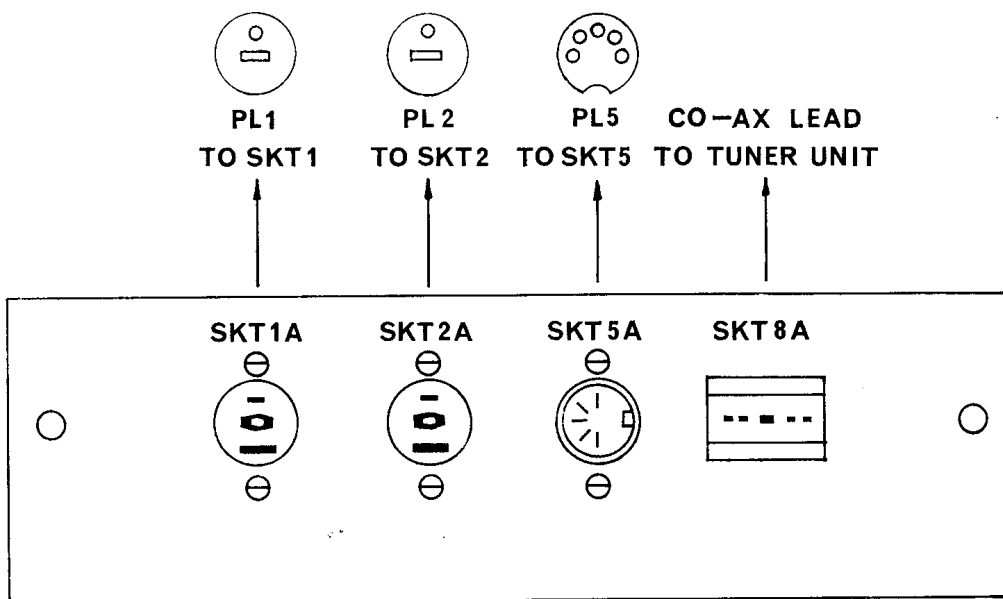


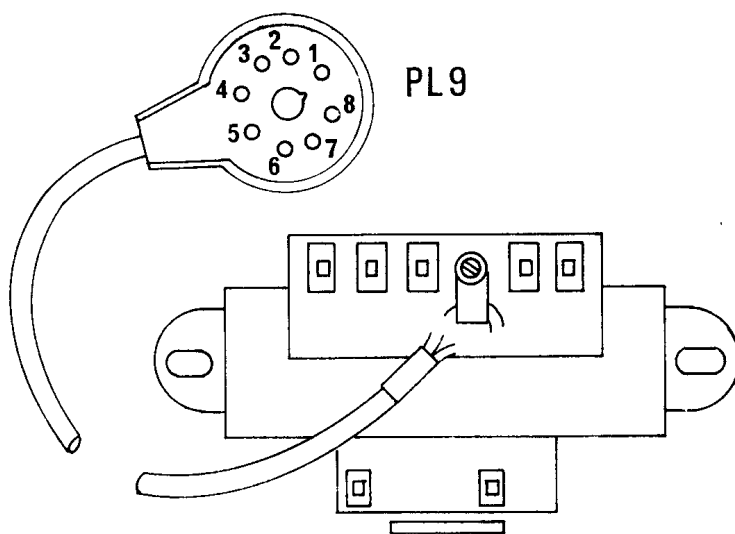
Fig. 16



EXT. SOCKET PANEL RG 86 ONLY

CONNECTING TO SOCKETS SKT.1.A & SKT.2.A ARE THE INTERNAL LOUDSPEAKER CONNECTING LEADS

Fig. 17



**SEPARATE MAINS TRANSFORMER
(NOT MODELS HFC 30A & HFC 30M)**

Fig. 18

TECHNICAL SPECIFICATION — ALL MODELS

AMPLIFIER SPECIFICATION:

Semiconductors:

16 Transistors (10 Ge types, 6 Si types).
1 Se power bridge.

Rated Power Output into 3 ohms load:

Music power 16 watts each channel (32 watts total).
10.5 watts RMS \pm 1 dB continuous rating (one channel operating).
8 watts RMS per channel (both channels operating).

Distortion:

1% at Rated output – 1000 Hz. Typically less than 0.35% at normal operating level.

Signal to noise ratio:

Radio/Tape Input better than –65 dB relative to rated output
Disc Input better than –60 dB relative to rated output.

Frequency Response:

Radio and tape inputs: –2 dB at 20 Hz and 20 kHz.
Magnetic P.U. input corrected for RIAA Curve \pm 1.5 dB,
40 Hz to 20kHz.

Input Sensitivities:

Radio/Tape Inputs: 26 mV \pm 2 dB for rated output into
12K ohms at 1 kHz, 650 mV maximum.
Magnetic Pickup Input: 4.3 mV \pm 2 dB for rated output.
105 mV maximum.

Loudness Contour:

+ 12 dB at 60 Hz, also + 4 dB at 10 kHz.

'S' Filter:

–8 dB at 10 kHz.

Tone Controls:

Bass \pm 10 dB at 70 Hz.
Treble \pm 10 dB at 12kHz.

Balance Control:

Each channel + 6 dB to –2 dB.

Tape Socket:

Output 26 mV with 22K ohms in series. (Input at specified level.) Unaffected by volume or tone control settings.

FM RADIO TUNER SPECIFICATION:

Semiconductors:

9 Transistors (6 Ge types, 3 Si types, 8 diodes, 1 Ge Power diode, 1 Zener diode.

FM Sensitivity:

3 μ V 10 dB quieting (S/N)	} Average over band 87–104 MHz
8 μ V 30 dB quieting (S/N)	
12.5 μ V 40 dB quieting (S/N)	

Limiting at 16 μ V.

Stereo Separation better than 23 dB.

A.F.C. Pull-in Range:

\pm 300 kHz.

A.F.C. Hold-in Range:

\pm 350 kHz.

Waveband Coverage:

VHF 87–104 MHz.

RENEWAL OF PICK-UP STYLI

The diamond LP stylus fitted to the instrument will have a long life with careful handling. Wear on the stylus will be indicated by a deterioration of quality of reproduction from records known to be in good condition. Never continue to operate the instrument with a worn or chipped stylus.

Note 1. It is good practice to replace the stylus guard when not in use as it is very easy to accidentally catch and thus possibly damage the stylus point when dusting the mechanism.

'MAZURKA' MODELS HFC 30A & HFC 30M

'CARNIVAL' MODELS HFC 36 & HFC 37

'CARNIVAL MAJOR' MODELS HFC 41 & HFC 42

General Description

These Models are fully transistorised stereo record reproducers containing a Dynatron transpower stereo amplifier with an output of 16 Watts per channel (32 Watts total) IHFM rating and a comprehensive tone control network in each pre-amplifier channel.

There is provision for connecting a self-powered tuner unit and either Mono or Stereo tape recorder/playback units may be used with these Models.

Standard DIN pattern sockets are provided for these inputs and also for loudspeaker connections. Dynatron 4 ohm loudspeakers are recommended for use with these instruments but other loudspeakers of 4 ohms impedance may be used for full power use although higher impedance speakers may be considered at reduced power output.

Model HFC 30A is fitted with the Garrard Type 40B Manual/Auto unit.

Model HFC 30M is fitted with the Garrard SP25s Mk III single player unit.

The 'Carnival' Models HFC 36 and HFC 37 are both fitted with the Garrard SP25s Mk III single player unit.

The 'Carnival Major' Models HFC 41 and HFC 42 are both fitted with the Goldring-Lenco GL 75 transcription unit.

'CARNIVAL' MODELS HFC 39 & HFC 40

'CARNIVAL MAJOR' MODELS HFC 43 & HFC 44

These Models are identical with the 'Carnival' and 'Carnival Major' Models described above, but have a built-in VHF/FM pre-set push button tuner unit.

'BURLINGTON' MODEL RG86

This Model is identical in specification with Models HFC 39 and HFC 40 but has built-in Loudspeakers, the paragraph above re Loudspeakers is applicable to Model RG86 in respect of extension Loudspeakers used additional to those fitted, either for enhanced stereo effect or for use in a separate situation.

PICK-UP CARTRIDGES

Cartridge: MODELS HFC 30A, HFC 30M, HFC 36, HFC 37, HFC 39 and HFC 40.

Goldring G850 Stereo. Diamond stylus. Tracking force 3 gms. maximum.

Cartridge: MODELS HFC 41, HFC 42, HFC 43 and HFC 44

Goldring G800 Stereo. Diamond stylus. Tracking force 2 gms. maximum.

FOR MICROGROOVE RECORDS ONLY. NOT 78 R.P.M.

If 78 r.p.m. records are to be used it is recommended that a replacement head shell be obtained and a turnover cartridge such as the Sonotone 9TAHC fitted. For correct matching 100K ohms should be inserted in series with each channel within the head shell. The pick-up arm should be balanced and the tracking force set to 5 gms. when using this cartridge.

Technical Data

Mains Voltage Requirement: (for Export see below.)
200-240 V. 50 Hz.

Controls:

Mains On-Off, Bass Boost (Loudness network).
Input selector switch, Volume, Balance, Bass and Treble.

Indicator Lamp:

Long life neon lamp. HFC 30A and HFC 30M.
24V, 0.04 A. LES bulb. All other Models.
See Note 5. Other mains supplies.

Fuses:

3 at 1 amp.

Chassis Removal

Much service work can be undertaken without removing chassis from cabinet by merely releasing motor board mounting screws and lifting motor board. Should complete removal be required then proceed as follows:

HFC 30A and HFC 30M.

1. Remove pick-up and motor supply plugs from chassis.
2. Remove rotary control knobs by pulling off.
3. CAREFULLY unscrew knurled ring-nut holding the stereo headphone jack socket, GREAT CARE MUST BE TAKEN NOT TO LET PLIERS, ETC., SCRATCH THE PANEL'S ANODISED SURFACE.
4. Release 4 BA nuts securing power/sockets panel to rear wall of cabinet.
5. Release 4 BA nuts from chassis mounting brackets and withdraw complete unit from cabinet.

HFC 36, HFC 37, HFC 39, HFC 40, HFC 41, HFC 42, HFC 43, HFC 44.

1. Remove pick-up, motor supply and octal transformer plugs from chassis.
2. Remove rotary control knobs by pulling off.
3. Undo the four 4 BA chassis fixing nuts and withdraw from cabinet.

N.B. - (It is not necessary to remove stand ST16 if fitted to cabinet).

HFC 39, HFC 40, HFC 43, HFC 44.

Additional to the notes above it is necessary to undo the 2 x 4 BA nuts securing the VHF/FM PB unit, the 2 x 6 BA nuts securing the VHF AE socket and the 2 x 4 BA nuts and 2 x self-tapping screws securing the IF chassis to both the cabinet and main amplifier chassis.

If the chassis are being split as above it is also necessary to disconnect the Mains aerial lead from the amplifier chassis.

N.B. - The two chassis can be removed as one unit or separately as required.

RG86

On this model it is also necessary to unplug the leads to the extension socket panel which can be left in the cabinet.

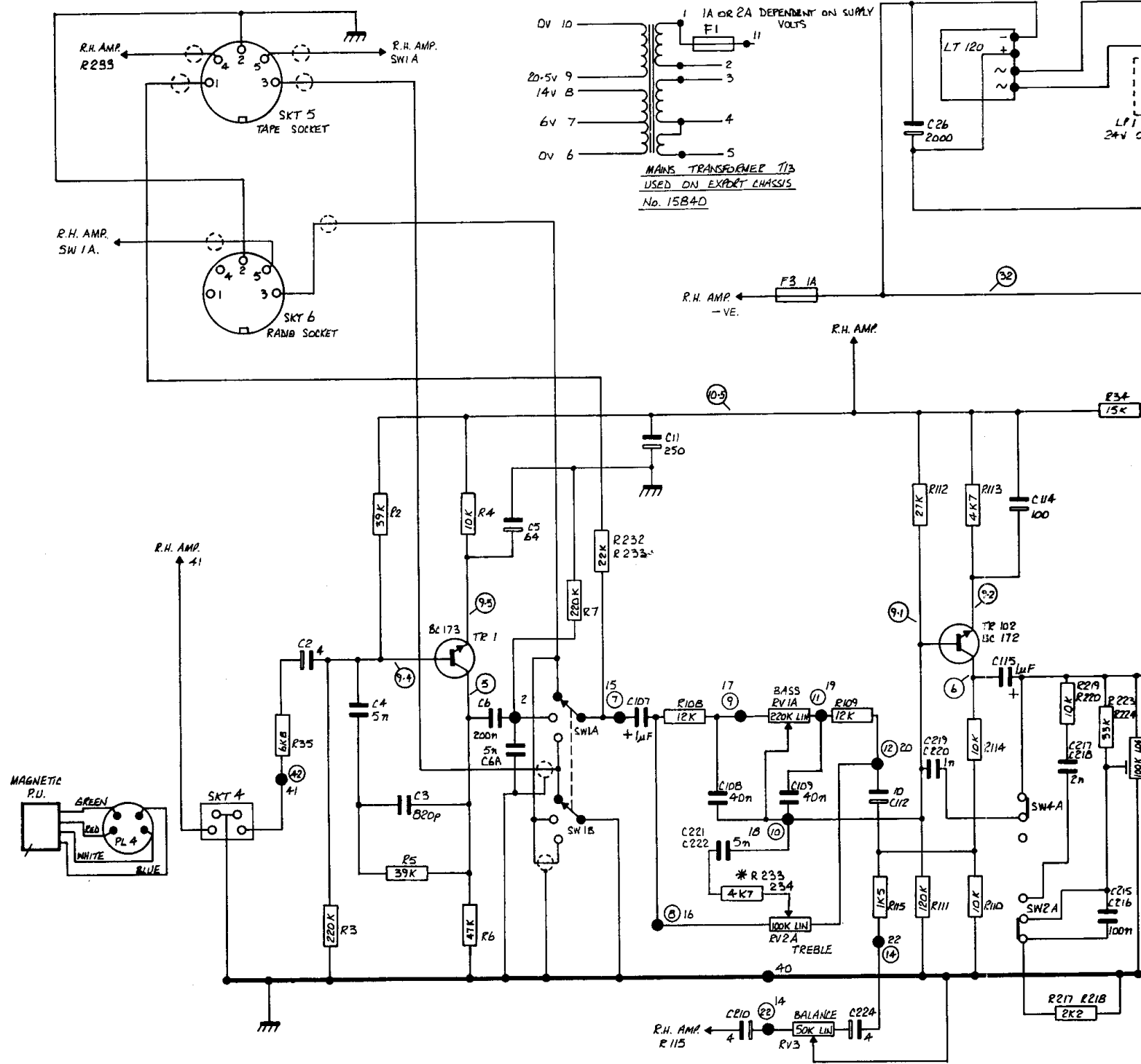
To operate on other Mains Supplies

(EXPORT MODELS ONLY)

1. Change tappings on mains transformer.
 2. Change record player motor tappings.
 3. Change motor drive-pulley for 60 Hz or 50 Hz.
 4. Change mains fuse as necessary. *See 4 below.
1. **Transformer Wiring:**

<i>For 110 V Supply</i>	<i>For 240 V Supply</i>	<i>For 220 V Supply</i>
Link 1 with 3	Link 2 with 3	Link 2 with 3
Link 2 with 4	Red Wire to 11	Red Wire to 11
Red Wire to 11	Black Wire to 5	Black Wire to 4
Black Wire to 2		
 2. **Record Player Motor:**
Connect links on voltage tapping plate as shown on motor terminal block cover, or back of motor.
 3. **Drive Pulley, Garrard Motors:**
Remove turntable and fit correct drive pulley
for 50 Hz, base dia. less than 78 step.
for 60 Hz, base dia. more than 78 step.
Goldring-Lenco fit 50 Hz or 60 Hz rotor unit.
- *4. **Mains Fuse:**
Locate and change mains fuse if necessary.
Use 1 amp rating for 220 and 240 V supply.
Use 2 amp rating for 110 V supply.
- NOTE: Export Transformer No. 15840 is fitted with integral thermal fuse, F4.
5. **Indicator Neon:**
Fitted to Models HFC 30A and HFC 30M only.

CIRCUIT DIAGRAM MODELS HFC30A, HFC30M



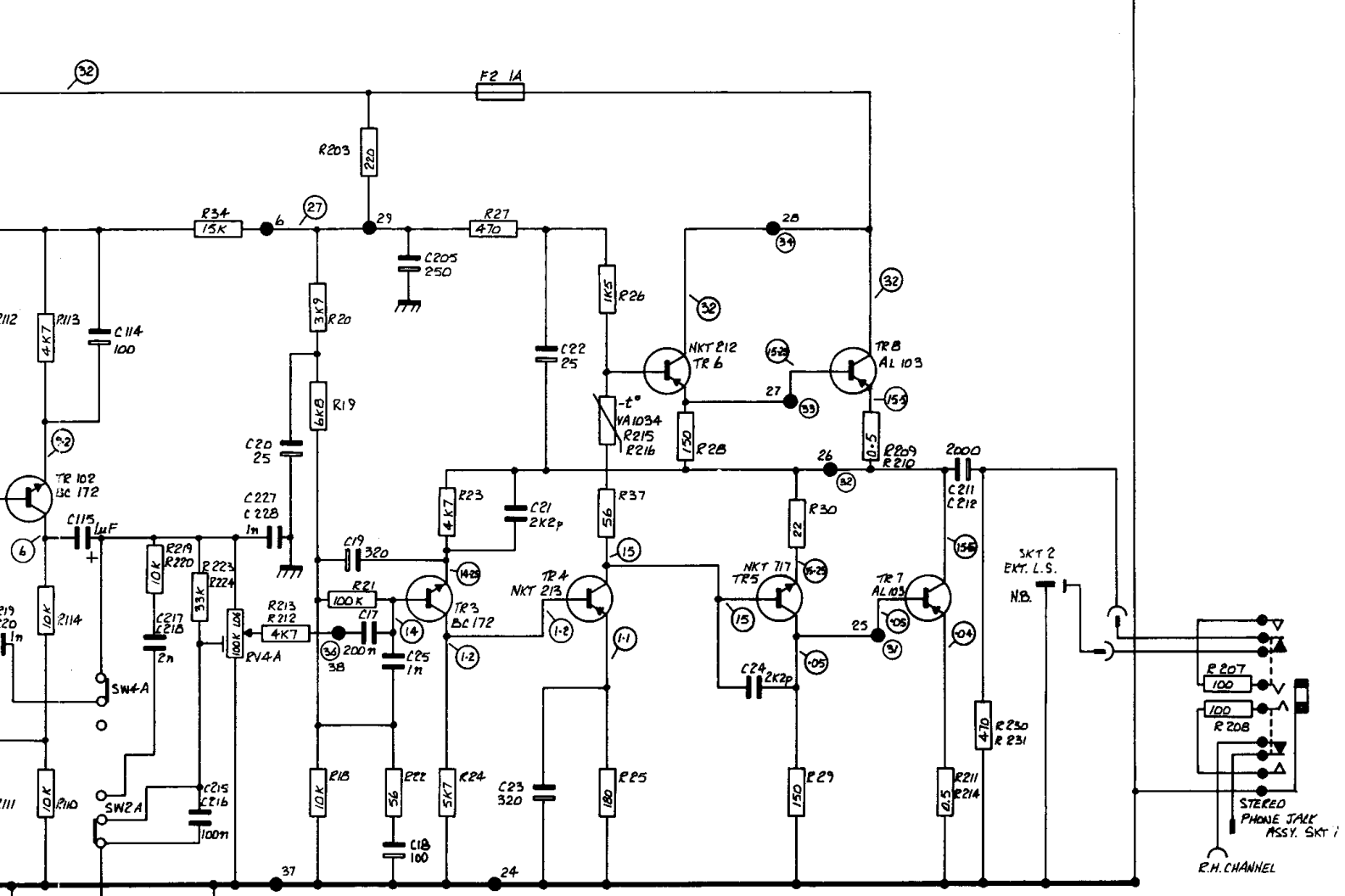
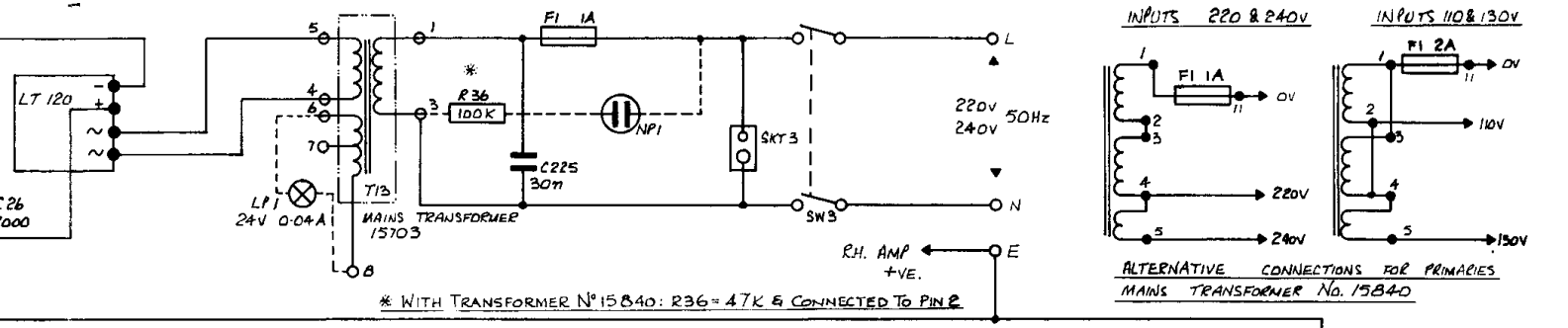
NOTE: * R 233/234 WILL BE FOUND ON MODELS MANUFACTURE AFTER 1ST FEBRUARY 1972

N.B. SKT 1 R.H. L.S. OUTPUT

IMPORTANT. ON THE CIRCUIT DIAGRAMS... ARE DESIGNATED BY... WHEREAS ON THE PCB... BOARDS A "VT" REFERENCE... NUMBERS REMAINING THE... TRS READ VT8 AND V1

Fig. 19

HFC30A, HFC30M, HFC36, HFC37, HFC41, HFC42



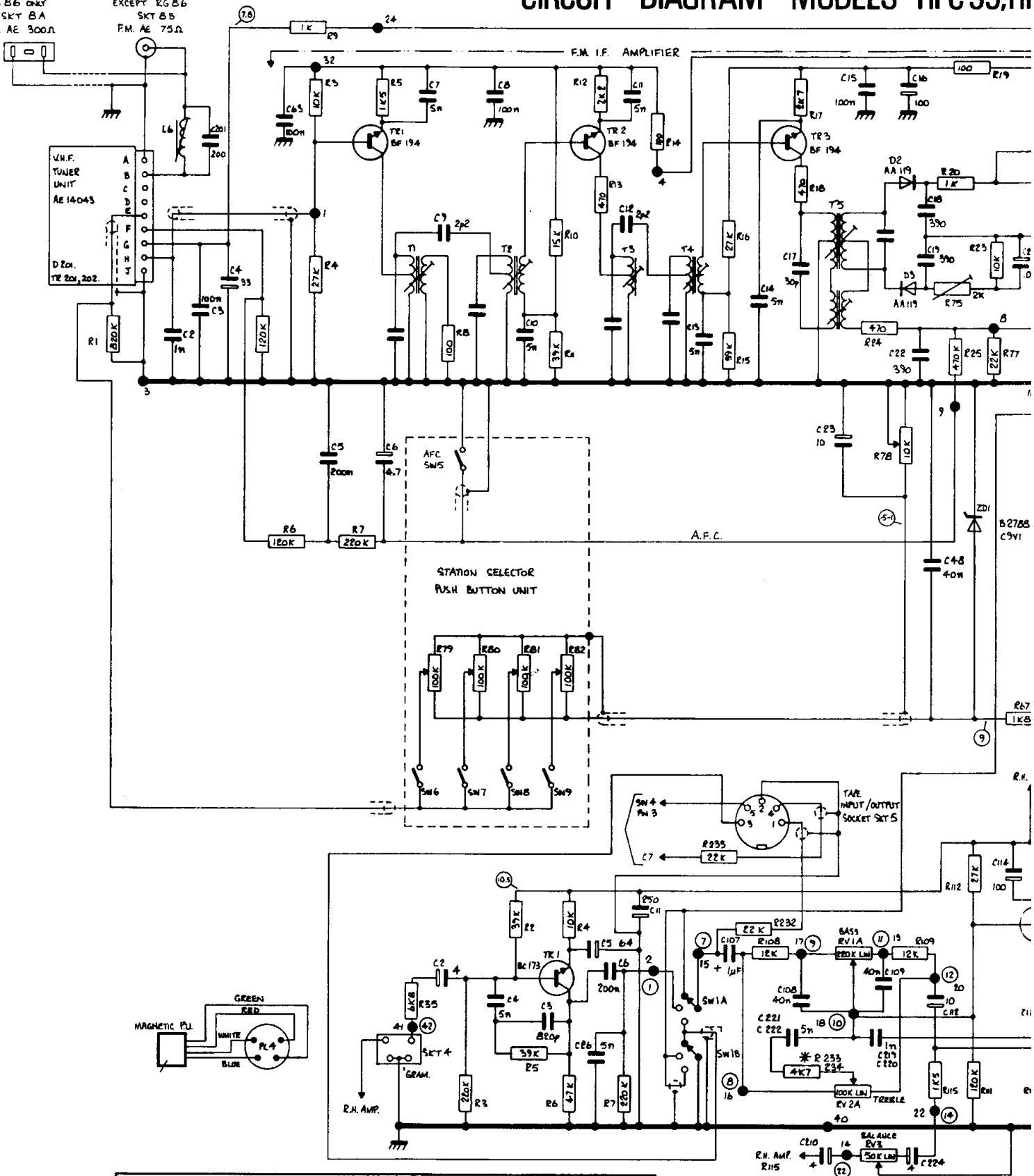
IMPORTANT.
ON THE CIRCUIT DIAGRAM TRANSISTORS ARE DESIGNATED BY A 'TR' REFERENCE WHEREAS ON THE PRINTED CIRCUIT BOARD'S A 'VT' REFERENCE IS USED, THE NUMBERS REMAINING THE SAME. EG: FOR TR8 READ VT8 AND VICE VERSA.

Fig. 19 NOTE: * R233/234 (4K7 and Note) should read R234/235.

ALTERNATIVE DIN SOCKET
 RG B6 ONLY
 SKT BA
 FM. AE 300Ω

ALL MODELS
 EXCEPT RG B6
 SKT BB
 FM. AE 75Ω

CIRCUIT DIAGRAM MODELS HFC 39, HI



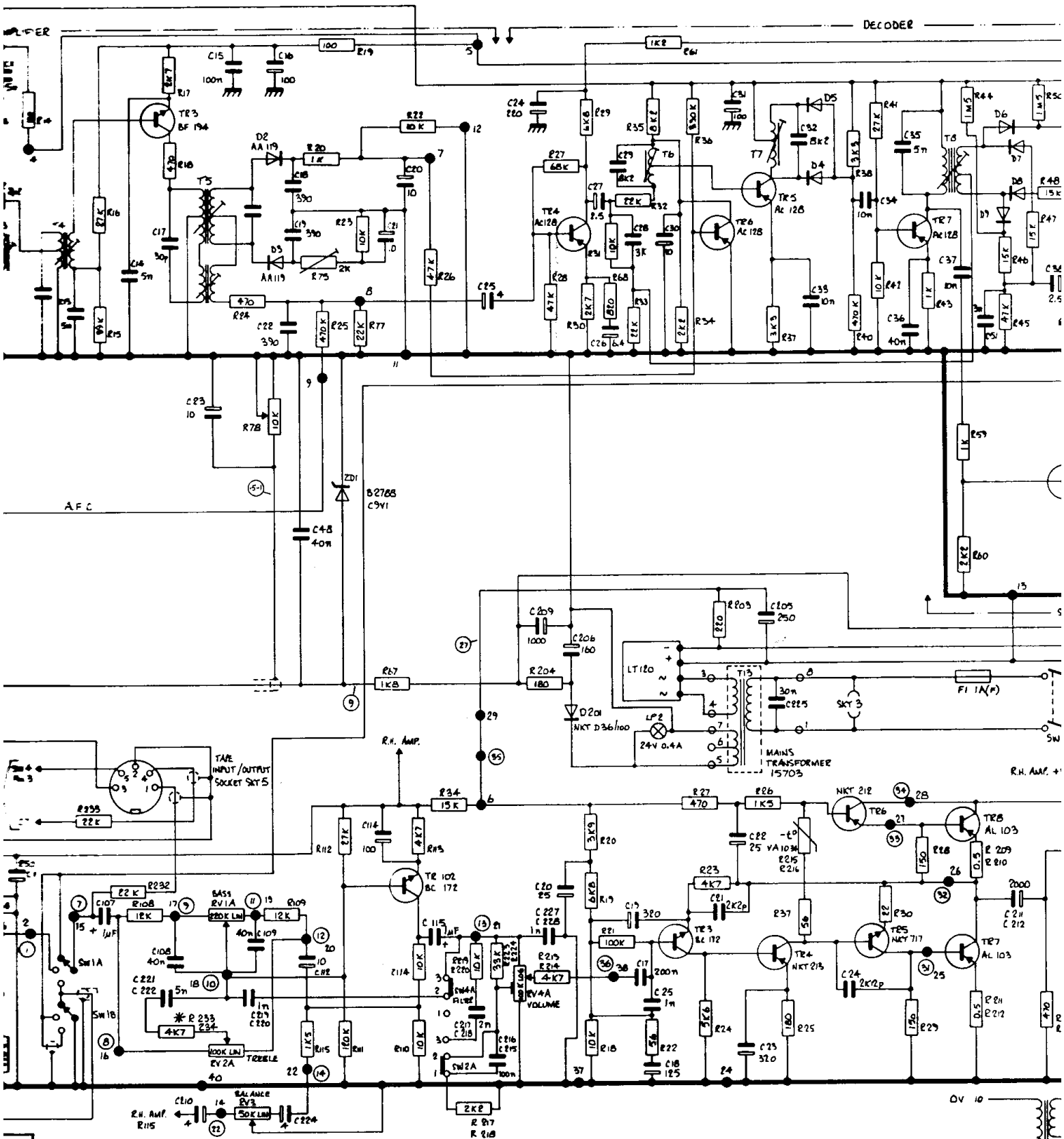
D.C. TEST VOLTAGES FOR TUNER TRANSISTORS											
TR	TYPE	FUNCTION	e	b	c	TR	TYPE	FUNCTION	e	b	c
1	BF 194	1st F.M. I.F.	11.2	10.5	-	8	AC 128	BEACON AMP.	-	-	9.5
2	BF 194	2nd F.M. I.F.	11.1	10.3	0.7	9	AC 128	BEACON SWITCH	-	-	31
3	BF 194	3rd F.M. I.F.	9.5	8.5	1	10	AF 115	-	-	-	-
4	AC 128	DECODER PRE-AMP.	4.6	4.5	13	11	AF 117	I.F. MODULE LP 1159	-	-	-
5	AC 128	DECODER AMP.	19 Kc.	-	-	12	AF 117	-	-	-	-
6	AC 128	DECODER GATE	-	-	-	201	AF 178	R.F. AMP.	-	-	-
7	AC 128	DECODER AMP.	38 Kc.	2.9	3	12.2	202	AF 115	OSC. MIXER	-	-

D.C. TEST VOLTAGES FOR AMPLIFIER TRANSISTORS											
TR	TYPE	FUNCTION	e	b	c	TR	TYPE	FUNCTION	e	b	c
1	BC 179	PRE. AMP. GRAM.	9.5	8.25	5	5	NKT 717	PHASE SPLITTER	15.25	15	-
102	BC 178	TONE CONTROL AMP.	9.2	7.5	6	6	NKT 212	DRIVERS	15.5	15.5	31
3	BC 178	A.F. AMP.	14.25	13.5	1.2	7	AL 103	OUTPUT	-	-	15.5
4	NKT 213	DRIVER	1.1	1.2	15	8	AL 103	OUTPUT	15.5	-	31

L.H. AMPLIFIER ONLY SHOWN.
 COMPONENTS ON CHASSIS WIRING - R 201 & C 201 E
 37 BOARD CONNECTOR PINS. 27 D.C. TEST VOLTAGE
 14 R.H. AMP. PIN NUMBERS.
 SELECTOR SWITCH TO RADIO.
 NB. SKT 1 R.H. L.S. OUTPUT.
 NOTE: * R 233/234 WILL BE FOUND ON MODELS
 MANUFACTURED AFTER 1st FEBRUARY 1972

Fig.

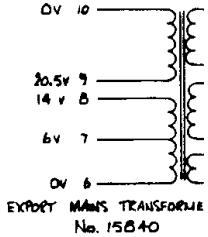
DIAGRAM MODELS HFC 39, HFC 40, HFC 43, HFC 44, RG86



L.H. AMPLIFIER ONLY SHOWN.
COMPONENTS ON CHASSIS WRINGS - R201 & C201 ETC.
● BOARD CONNECTOR PINS. (27) D.C. TEST VOLTAGES.
(14) R.H. AMP. PIN NUMBERS.
SELECTOR SWITCH TO RADIO.
N.B. SKT 1 R.H. L.S. OUTPUT.

NOTE:
 ON RG86 ONLY, L.S. & TAPK SOCKETS ARE DUPLICATED ON EXTENSION CABLES TO A PANEL ON REAR OF CABINET. THE L.S. SOCKETS ON THE PANEL ARE OF THE SWITCHED TYPE TO PROVIDE INT./INT.-EXT./EXT. L.S. SWITCHING BY SUITABLE PLUG ORIENTATION.
IMPORTANT.
 ON THE CIRCUIT DIAGRAM TRANSISTORS ARE DESIGNATED BY A 'TR' REFERENCE WHEREAS ON THE AMPLIFIER P/C BOARD'S A 'VT' REFERENCE IS USED, THE NUMBERS REMAINING THE SAME. E.G. FOR TR8 READ VT8 AND VICE VERSA.

NOTE: * R233/234 WILL BE FOUND ON MODELS MANUFACTURED AFTER 1ST FEBRUARY 1972

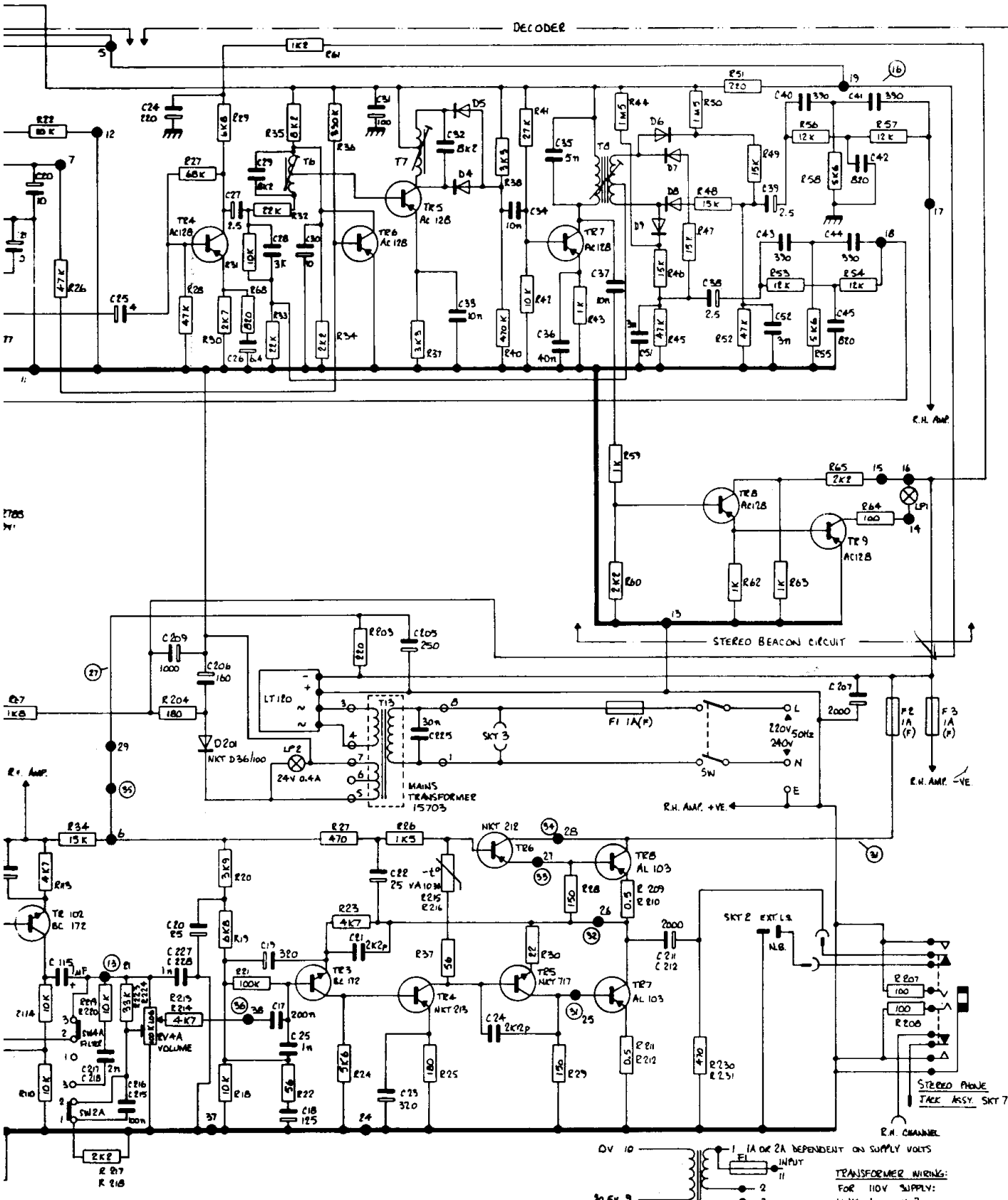


C
9.5
31
-
-
-
-
C
-
31
15.5
31

Fig. 20

NOTE: * R233/234 (4K7 and NOTE) should read R234/235.

HFC40, HFC43, HFC44, RG86



NOTE:
 ON RG86 ONLY, L.S. & TAPE SOCKETS ARE DUPLICATED ON EXTENSION CABLES TO A PANEL ON REAR OF CABINET. THE L.S. SOCKETS ON THE PANEL ARE OF THE SWITCHED TYPE TO PROVIDE INT./EXT. - EXT./EXT. L.S. SWITCHING BY SUITABLE PLUG ORIENTATION.

IMPORTANT:
 ON THE CIRCUIT DIAGRAM TRANSISTORS ARE DESIGNATED BY A "TR" REFERENCE WHEREAS ON THE AMPLIFIER PCB BOARD/S A "VT" REFERENCE IS USED, THE NUMBERS REMAINING THE SAME. E.G. FOR TR8 READ VT8 AND VICE VERSA.

LS 372

TRANSFORMER WIRING:
 FOR 110V SUPPLY:
 LINK 1 WITH 3
 LINK 2 WITH 4
 RED WIRE TO 11
 BLACK WIRE TO 2

FOR 220V SUPPLY:
 LINK 2 WITH 3
 RED WIRE TO 11
 BLACK WIRE TO 4

FOR 240V SUPPLY:
 LINK 2 WITH 3
 RED WIRE TO 11
 BLACK WIRE TO 5

EXPTD MAINS TRANSFORMER T13
 No. 15B40

Fig. 20 NOTE: * R233/234 (4K7 and NOTE) should read R234/235.

TEST PROCEDURE DATA ALL MODELS

Test equipment required

1. Multi-range testmeter, Avo 8 or similar, 20,000 ohms/volt.
2. Audio signal generator, 20 Hz–20 kHz, output 1 mV – 6 volts (600 ohms) sine wave.
3. FM signal generator, 87–108 MHz FM and AM modulation with 75 ohm dummy load.
4. AM signal generator 200–1620 kHz.
5. IF wobulator with 10.7 MHz output and deviation \pm 300 kHz.
6. Valve voltmeter.
7. Oscilloscope.
8. Stereo encoder (Philips Service Coder or similar).
9. Output meter set to 3 ohms load.

Audio Amplifier

1. Check mains supply voltage at 240 volts.
2. Check that HT voltage measured at HT fuse to earth is 32 volts \pm 1 volt.
3. Remove HT fuses.
4. Connect test meter set to 100 mA range across left-hand HT fuse holder.
5. Switch AC supply on. Measure DC current to be 28 mA \pm 12 mA.
6. Repeat 4 and 5 for the right-hand channel.
7. Switch off AC supply.
8. Remove test meter and re-insert the two 1 amp fuses in the fuse holder.
9. Connect AF signal generator between earth and pin 3 of socket 3 (tape socket) and output meter across the left-hand channel loudspeaker socket with oscilloscope in parallel.
10. Set both bass and treble controls to 'Flat' (i.e., central) and balance control to centre. Contour and 'S' filter buttons out and volume control at maximum.
11. Switch on AC supply.
12. Set signal generator to 1 kHz and adjust output to 22 mV.
13. The reading on the output meter should be 10 watts \pm 1 dB RMS.
14. Re-connect AF signal generator between earth and pin 5 of socket 3 and output meter and oscilloscope to the right-hand loudspeaker socket and repeat 12 and 13 above.

Alignment Procedure VHF IF

1. *Setting up*

2. Inject 10.7 MHz sweep signal from the wobulator into pins A and B of VHF tuner front end.
3. Connect oscilloscope, set to suitable range, across pin 8 and pin 11 (earth).
4. Align front end IF coils 5 and 6, Fig. 15, and T1, T2, T3, T4 and T5 (board A, Fig. 15) to produce symmetrical 'S' curve centred on 10.7 MHz, concurrent with maximum 'S' curve amplitude.
5. Tune L6 for maximum 10.7 MHz rejection.

Alignment Procedure VHF RF

1. Tune PB (push button) to 87 MHz.
2. Connect FM signal generator to FM external aerial socket with the 75 ohm dummy load connected across the socket.
3. Set the generator to 87 MHz with the output set at 50 μ V, FM modulation on and set to 22.5 kHz deviation.
4. Tune VHF oscillator coil 4, Fig. 15, for maximum output.
5. Tune PB to 104 MHz and readjust signal generator to 104 MHz, adjust trimmer 3, Fig. 15, for maximum output.
6. Repeat 3 to 5 above until optimum output at both frequencies is achieved.
7. Tune PB to 92 MHz and inject 92 MHz signal at 10 μ V and tune 2, Fig. 15, for maximum output.
8. Tune PB to 102 MHz and inject 102 MHz signal at 10 μ V and tune 1, Fig. 15, for maximum output.
9. Repeat 7 and 8 above until optimum output at both frequencies is achieved.

NOTE: The above can be carried out using any one of the four push buttons.

AM Rejection

1. Connect valve voltmeter to either left-hand or right-hand loudspeaker socket.

2. Set generator to AM modulation at 30% at 400 Hz and RF output at 92 MHz, 10 μ V and trim R75 (board A) for minimum output.
3. Increase signal to 100 μ V, switch to FM modulation at 22.5 kHz deviation and adjust volume control to give a reading of 1 V.
4. Switch to AM modulation as 1 above, the output should fall by 40 dB (i.e., to 10 mV).

AFC Action

1. Inject 92 MHz signal, FM modulation, 22.5 kHz deviation at 100 μ V, and tune to signal. With AFC switch off, Fig. 4, switch 7, detune set until output reduces 6 dB. With AFC switch on (red flag shown), the output should rise to original level within 2 dB.
2. Check on both low and high side of tuning point.

Setting up Stereo Decoder. See Note Page 16.

1. Connect the output of the stereo encoder to the FM aerial socket.
2. Set encoder to a suitable modulation frequency (around 1 kHz), left-hand and right-hand channel; pilot tone on; pre-emphasis in; RF carrier on.
3. Tune receiver to the signal.
4. Connect the oscilloscope and valve voltmeter across left-hand loudspeaker socket.
5. Tune the cores of T6, T7 and T8 (board A) fully clockwise.
6. Switch encoder to left-hand channel modulation only and tune T6, T7 and T8 for maximum output on oscilloscope and valve voltmeter. At this point the stereo beacon lamp should be illuminated.
7. Switch encoder to right-hand channel and tune T6, T7 and T8 for minimum output, the lamp should still be illuminated.
8. Switch encoder back to left-hand channel and set output from amplifier to 1 V. Switch encoder to right-hand channel and observe that the output should fall by at least 23 dB.
9. Re-connect oscilloscope and valve voltmeter to right-hand loudspeaker socket and repeat 8 above and observe that the reading is similar.
10. Switch off pilot tone and observe that the stereo beacon lamp goes out.

Loudspeaker Sockets

These are of the 2-pin DIN type on audio separates units but 3-pin DIN switched type on RG86 model. On RG models, if the 2-pin loudspeaker plugs are inserted in one of the two possible positions, the internal speakers will be silenced and only the external speakers will operate, in the second position both internal and external loudspeakers will be in operation.

Removal of Top or Front Control Panels (all models)

(After removal of chassis and sockets assembly from its cabinet)

To facilitate replacement of all controls and headphone jack socket assembly.

1. Carefully unscrew knurled ring-nut holding the stereo headphone jack socket, great care must be taken not to let pliers, etc., scratch the panel's anodised surface.
2. Remove all five knobs by simply pulling off.
3. Remove five felt washers behind knobs.
4. The panel can now be lifted free, care being taken not to foul the on/off switch toggle and push buttons.

NOTE: Top Control Panel is fixed by double-sided adhesive tape.

TECHNICAL DATA AND CIRCUIT DESCRIPTION ALL MODELS

Audio Amplifier Section

The circuit diagram shows the LH channel only since the RH channel is identical. TR1 is equalised PU pre-amplifier stage with sensitivity suitable for magnetic cartridges of medium output (5 mV will fully drive the amplifier). Piezo cartridges must have a series resistor to the order of 100K ohms to give the cartridge constant velocity output. Function switch SW3 selects either PU, tape or radio input and feeds signal to tone control amplifier TR102, the output passing to volume/loudness control RV4A. SW1 is bass boost or loudness correction switch and SW2 switches the scratch filter capacitor C219 to the base of TR102. From RV4A signal passes to TR3 where base bias is set by network R18, R19 and R20 to give correct centre point voltage at board connector point 26. TR4 is class A driver feeding complementary phase splitting drivers TR5 and TR6. These in turn drive class B output stages TR7 and TR8 whose forward bias is set up and maintained by R215 and R37. Supply volts are provided by T13 and rectifier LT120, C207 being the reservoir. Fuses F2 and F3 of 1 amp type F rating provide protection for RH and LH channel output stages. Sockets SKT1 and SKT2 are for turntable motor and tape deck. All power is controlled by a switch via fuse F1 of 1 amp type F rating. D201 diode and R204, C206 and C209 form a separate power supply for the radio tuner section.

RADIO SECTION FM VHF and DECODER

Dipole aerial input to VHF tuner unit AE 13043 feeds to RF amplifier TR201 and thence to mixer TR202. RF and oscillator frequency are controlled by Varicap Diodes. (The DC supply voltage is stabilised by the zener diode ZD1). AFC voltage is applied to capacitor diode D201 via point E decoupled by C202. IF output from tuner is fed to 10.7 MHz IF amplifier, TR1, TR2 and TR3, which feeds the ratio detector transformer T5 and associated diodes D2 and D3. The operating conditions of TR3 are chosen to enable adequate drive to occur at an aerial input signal of less than 10 μ V to improve AM rejection. R75 part of D3 load is for detector balance and R23 forms remainder of D3 load. Load of D2 is composed of R20 and R22. The tuning meter is selected by SW7 and is in series with R22. From the tertiary winding of T3 demodulated FM signals pass to the decoder unit.

Decoder

Here let us assume that a stereo signal is being received so that a 19 kHz pilot tone will be present in the output from the detector circuit and fed to TR4 base. TR4 is a pre-amplifier and provides two outputs—the first passing to the secondary of demodulator transformer T8 and the second to T6 tuned to 19 kHz in base of TR5. In the collector circuit of TR5 is T7 with diodes D4 and D5 forming a frequency doubler to provide a switching signal at 38 kHz feeding to TR7. T8 and diodes D6, D7, D8 and D9 perform the demodulation and switching functions to provide correctly phased left- and right-hand signals via C38 and C39 to the filter and de-emphasis networks terminating at points 17 and 18 respectively. 38 kHz from TR7 via C37 is fed to TR8 to switch on TR9. TR9 collector current lights stereo beacon LP1, a 24 volt, 1 watt LES tubular lamp. To prevent spurious triggering of the stereo decoder by noise and also to ensure that a satisfactory channel separation is obtained there must be a large enough voltage available from the detector diode D2 load, R20 and R22 to turn 'off' gating transistor TR6. An adequate aerial signal must therefore be made available. If TR6 continues to conduct, its collector current through R35 will keep the base bias of TR5 too low for proper operation and there will be no 38 kHz signal generated. Therefore the demodulator switching will be inoperative and there will not be any 38 kHz signal from TR7 collector to the stereo beacon circuit and LP1 will not light.

When receiving a monaural broadcast VHF signal there will be no pilot tone signal and the audio signals will pass directly from TR4 to the secondary of T8. The absence of 19 kHz tone means that the 38 kHz switching voltages will not be generated and the demodulator diodes will not be switched. The decoder unit is thus automatic in operation.

Note: Re-alignment of the decoder circuits should NOT be attempted unless complete encoding equipment is available.

IF frequencies

AM nominally 470 kHz.
FM 10.70 MHz.

Note: On Models manufactured after 1.2.72 a 4-7K one-tenth watt resistor will be found in series with either the Wiper or the end of the treble control, between the control and pins 8 and 16 on PC board 'B' R234 and R235.

FOR ENGINEERS' NOTES

DETAILS OF DYNATRON OWNER'S GUARANTEE

Dynatron Radio Limited (hereinafter referred to as Dynatron) guarantee this instrument for twelve months from the date of delivery and during this time will supply a replacement for, or repair any component of the Dynatron instrument which is faulty or below standard by reasons of inferior construction or material. Labour involved in removing and/or replacing parts supplied free of charge under this guarantee may be chargeable. Your Authorised Dynatron Dealer will observe our guarantee terms and has a similar claim to charges for labour and the cost of packing and despatch.

CONDITIONS OF GUARANTEE

1. The attached Record Card must be completed and returned to Dynatron within seven days of purchase.
2. Dynatron shall not be liable for consequential damage or in respect of any faults arising in the instrument caused by accident, misuse, neglect, tampering with or unauthorised modification of the instrument, or any attempt at internal adjustment or repair by any person other than an Authorised Dynatron Dealer.
3. This Guarantee does not cover valves, transistors, Colour-screen Picture Tubes or Monochrome cathode ray tubes which are guaranteed by the manufacturers thereof for periods of three months, twelve months, twelve months and two years respectively, from the date of purchase. Claims under such guarantee will be considered only if the component concerned is returned to the manufacturer, preferably through a Dynatron Authorised Dealer.
4. Claims under this Guarantee must be made to the Authorised Dynatron Dealer who supplied the instrument.

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No responsibility can be accepted for damage or loss in transit to or from the Dynatron Service Department.

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If an estimate of the cost be required before repairs are commenced, this should be made clear when the instrument is returned.

A detailed description of the symptoms is of considerable help in ensuring that the instrument is serviced satisfactorily.

All correspondence must quote the model number and serial number and should also name the Dealer.

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