



DYNATRON

AUDIO EQUIPMENT FOR SRX26C CHASSIS SERVICE MANUAL AND N2505/10 TAPE DECK UNIT

INCORPORATING CAVALCADE/CASSETTE
MODEL HFC38

RG81 RG82 RG83

TRV26 . HFC31 HFC32 HFC38 HFC45 HFC46 HFC47

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INTRODUCTION

The models described in this manual are high fidelity instruments of advanced design incorporating the SRX26C Stereo Radio Tuner/Amplifier chassis, the radio tuner section of which 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, gramophone discs and tape recordings is accomplished by a dual channel audio amplifier system designed and built to high standards.

The record playing units are equipped with selected high quality high compliance stereo cartridges for first-class record reproduction. All LP styli fitted are polished diamonds. Sockets

are provided at the rear of each cabinet for connecting aeri-als, extension loudspeakers, tape recorders, etc., and also a 'shutter' protected mains outlet socket for tape recorder or other auxiliary equipment. All Radiogramophones have compartments for record or tape recorder storage.

Dynatron Stereo Headphones types SP2 or SP3 may be used with all these models.

The Cassette Record/Playback tape deck fitted to Model HFC38 is designed to enable high quality recordings to be made from microphone, radio or record sources and for playing back pre-recorded cassettes.

GENERAL NOTES

VHF FM broadcasts

The technique of Frequency Modulation (FM) is employed by the BBC for their VHF (Very High Frequency) broadcasts of the BBC Radio 2, Radio 3 and Radio 4 programmes. These broadcasts are less liable to the various forms of interference which are prevalent on the Medium and Long wavebands and offer an excellent standard of radio reception now enhanced by stereo radio transmissions of the Zenith/GE Pilot Tone system.

AERIALS

VHF reception

In models where an internal VHF aerial is provided, satisfactory monaural reception may be obtained in most locations due to the extreme sensitivity of the Dynatron Transpower SRX26C series receiver. However, to take full advantage of the excellent quality of the transmissions and the very low background noise level obtainable, we strongly recommend the use of the best aerial system that can be conveniently installed.

Because of the technicalities of stereo radio transmission and reception it is necessary to provide a stronger signal at the receiver for this type of broadcast than for normal monaural broadcasts.

The 'Stereo Signal' beacon may not be fully illuminated unless sufficient signal strength is available.

Long and Medium (AM) reception

An internal 'Ferrite' rod aerial is provided for Long and Medium wave reception and will prove adequate in most locations. Should the instrument be positioned so that signal pick up is not sufficient an external aerial should be connected to the socket marked 'AE' using the plug provided.

MAINS SUPPLY

These instruments are designed to operate from 220-250 volt, AC 50 Hz (cycles) mains supplies. They must NOT be connected to a DC supply. Export models are available for other supply voltages and frequencies.

INDICATOR AND SCALE LAMPS

The scale lamps are 6.5 volt 0.3 amp MES bulbs and should they fail we suggest that you ask your dealer to make replacement. The stereo signal indicator lamp is a 24 volt, 1 watt LES tubular type, and the mains indicator lamp on the tape unit is a 6 volt, 0.45 amp wired-in type.

SOCKETS

All instruments have a socket panel located at the rear of the cabinet and the layout is as shown in Fig. 1. Details as follows:

AM aerial for Long and Medium wave

High impedance long wire, etc. (switched, see page 4 under AFC). Connection should be made using the DIN style plug supplied and marked 'AM'. Note that the pins of this plug are arranged to ensure correct connection for aerial and ground wires.

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. (When using a co-axial feed cable it may be necessary, in some locations, to insert the plug so that the pin connected to the cable outer braid is nearest to the AM aerial socket.)

Tape

A standard 5-pin DIN pattern plug should be used with connections as shown in Fig. 2a or Fig. 2b for mono or stereo recorders.

Pick-up

This socket is only fitted on model TRV26.

Auxiliary mains outlet

This socket has a 'shutter' mechanism and will accept a 2-pin 5 amp type mains plug. The maximum loading is 200 watts, protected by an internal fuse of 1 amp rating. Suitable for tape recorders, record player units, etc. (Apparatus connected to this outlet socket will be earthed to the main instrument via

the screened audio signal connecting cable.) DO NOT make connections to this socket with the instrument connected to the supply mains.

External loudspeakers

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 to 8 ohms impedance and preferably a matching pair. Ensure correct polarity when wiring the plugs.

Stereo headphones

Dynatron Stereo Headphones SP2 and SP3 are high quality units of 8 ohms impedance and may be connected to these models using the jack socket marked 'Phones' on the front panel. When the stereo headphones jack plug is inserted into the socket the loudspeakers are automatically silenced.

Pick-up

(For TRV26 only). A standard 5-pin DIN pattern socket is provided and the plug to be used should be wired as shown in Fig. 2c and Fig. 2d for magnetic or ceramic cartridges. Both inputs are corrected for RIAA curve.

Note (RG models only) The DIN pattern external loudspeaker plugs may be inserted into the Ext LS 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.

SOCKETS—continued

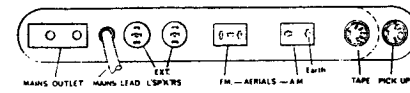


FIG. 1.

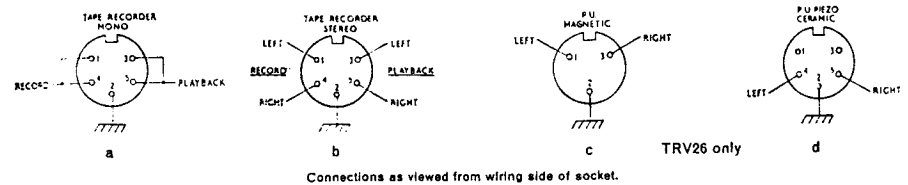


FIG. 2.

INSTALLATION NOTES

The particular Dynatron model should be installed by the Dynatron dealer and the following instructions are a guide as to what should be done before the instrument may be used.

- 1 Detachable legs are packed with the instrument (where applicable).
- 2 Remove all packing material.
- 3 The Garrard record player unit will be firmly held to the motor board by two transit screws. These screws should be turned fully clockwise so that the unit floats freely on its springs, not applicable to Goldring-Lenco units, see page 5.
- 4 Connect any external aerial or ground connections as necessary, and loudspeakers where applicable.

PLEASE NOTE CAREFULLY THIS PARAGRAPH

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 coloured wire must go to the 'L' or live pin of the plug. The LIGHT BLUE wire is the Neutral connection and must be attached to the 'N' pin. GREEN/YELLOW is the earth wire which must be attached to the 'E' or earth pin. If you intend to use only a 2-pin plug consult your dealer. UNDER NO CIRCUMSTANCES connect the GREEN/YELLOW wire to any point other than the 'E' or earth pin of a 3-pin plug.

FUSES

All Dynatron SRX26 series chassis are fitted with three fuses. One for mains voltage circuits and one for each stereo amplifier channel (see Fig. 3).

Only the correct type and rating must be used for replacement. To obtain access to fuses the underside of the chassis must be exposed and this is accomplished in the following manner for RG models:

- 1 Model RG81. Remove rear cover from chassis compartment. Locate and release the turnbutton to allow the chassis mounting frame to hinge fully forward. Remove four chromed screws holding chassis to frame and ease chassis clear.
- 2 Model RG82. Remove two screws at the rear of the receiver compartment and the two screws securing the front cover strip of the fascia panel. This panel may now be lifted upward and the fuses will be in view.
- 3 Model RG83. Remove the screws securing rear cover panel; also four screws from control panel and lift chassis unit upward.

Note For TRV26 and HFC models see chassis removal data on page 12.

WARNING Always DISCONNECT apparatus from SUPPLY MAINS before removing any panels from cabinets.

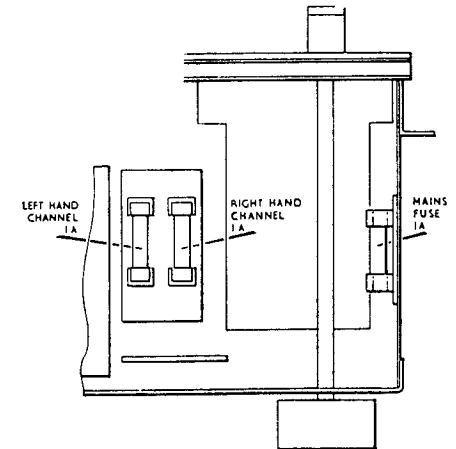


FIG. 3

The layout of the control panel is illustrated in Fig. 4, and the function of these controls is as follows:

Selector buttons (7-11)

These buttons when depressed select the appropriate input signals from GRAM, TAPE or RADIO for the dual channel stereo amplifier. Waveband coverage of each band is as follows:

VHF 87-108 MHz, MW 185-570 metres and LW 1100-2000 metres.

Balance control (1)

Provides adjustment of the relative volume level from each channel of the amplifier and will normally be set near a central position to produce equal level of sound from each loudspeaker. Turning the knob to the right will increase the sound from the right-hand loudspeaker and vice versa.

Bass control (2)

This dual control permits a variable increase or decrease of the lower register of each channel.

Treble control (3)

Provides a variable increase or decrease of the upper register of each channel.

Volume control (4)

A dual control is used for this function and clockwise rotation will simultaneously increase loudness of both channels. This control is specially designed to give smooth operation and also provides correction to preserve tonal balance at various volume levels.

Contour button (5)

At normal and lower volume levels this button brings into use additional circuits to provide a graduated amount of bass boost to preserve the overall tonal balance of the instrument and the

volume control action is modified to become a form of 'Loudness' control. If this tone correction is not required the button should be left OUT in the OFF position.

AFC button (12)

This button performs different functions on the VHF and the Long and Medium wavebands

- 1 The SRX26C chassis has Automatic Frequency Control (AFC) and when tuned to a station on the VHF waveband this system may be brought into use to maintain drift-free tuning of the station. Depress this button to introduce AFC.
- 2 When tuned to the Long and Medium waveband this button is used to connect or disconnect an external aerial if one is required and connected to the socket marked 'AE'. With the button depressed the external aerial is not connected and the 'Ferrite' bar aerial only will function.

S Filter (6)

Using this button enables the treble response to be cut by a pre-set amount for reduction of record surface noise or tape hiss and helps also to reduce background noise on radio when depressed.

Tuning control (13)

This control has a flywheel to assist its smooth action and is used to select the required station, the more popular of which are indicated on the scale.

Mains 'On-Off' switch (15)

Controls the mains supply to all sections of the instrument including the auxiliary mains socket at rear of cabinet.

Indicators

The Tuning Meter (16) has a precision movement and indicates optimum tuning of signals on all wavebands. The Stereo beacon lamp (17) will be illuminated when a VHF stereo broadcast is being received.

TO OPERATE THE SRX26C TUNER/AMPLIFIER

- 1 Switch on by moving the ON-OFF switch to the 'ON' position and the dial scale will be illuminated. For control reference turn to Fig. 4, page 4.
- 2 Radio reception Depress the appropriate button marked LW, MW or FM (9-11) for the waveband required, and turn the tuning control (13) until the dial cursor indicates the required stations wavelength or frequency and carefully adjust to give a maximum reading on the TUNING METER (16). When tuning VHF stations, especially stereo programmes, precise adjustment is necessary to avoid distortion of the signal. It will be found easier to tune stations on VHF if the AFC button is in the off position (ie OUT). When tuned correctly (ie maximum deflection of the tuning meter) the AFC may be brought into use to lock the tuning

OPERATION OF THE RECORD PLAYER UNITS

It is recommended that the relevant Manufacturers booklet be studied prior to operation and that reference be made to their service manual before making adjustments to the mechanism or carrying out repairs or replacements.

GARRARD SINGLE RECORD PLAYER UNIT MODEL SP25s Mk III

This unit is fitted with a Goldring Magnetic Stereo Cartridge type G850 having a diamond stylus of .0007-in radius designed to play mono and stereo microgroove records at 16, 33½ or 45 rpm. This should NOT be used to play 78 rpm records. The stylus pressure recommended is 2.5-3 g and this force should be set using a stylus pressure gauge if, for any reason, the setting has been disturbed.

For playing 78 rpm records, a suitable stylus (or complete spare cartridge assembly) can be purchased from your Dynatron dealer.

GARRARD AUTOMATIC CHANGER MODEL 40B

This unit is fitted with a Goldring Magnetic Stereo Cartridge type G850 having a diamond stylus of .0007-in radius designed to play mono and stereo microgroove records at 16, 33½ or 45 rpm. This stylus should NOT be used to play 78 rpm records. The stylus pressure recommended is 2.5-3 g and this force should be set using a stylus pressure gauge if, for any reason, the setting has been disturbed.

GARRARD AUTOMATIC CHANGER MODEL 2025TC

This unit is fitted with a high quality Sonotone ceramic stereo cartridge with a 'turnover' dual stylus for use with LP and 78 rpm records. With the stylus lever indicating the letters LP uppermost, a diamond stylus is selected designed to play mono or stereo microgroove recordings at 16, 33½ or 45 rpm. When the stylus lever indicates 78, a stylus is selected for playing 78 rpm records only.

A stylus pressure of 4-5 g should be set with the aid of a stylus pressure gauge if, for any reason, the stylus force adjustment has been disturbed.

HFC32—GOLDRING-LENCO GL75 TRANSCRIPTION UNIT

The Goldring-Lenco GL75 is a precision engineered transcription turntable unit incorporating many modern refinements and whilst it is very simple to operate it is important that certain items are correctly assembled and positioned before the unit is put into operation. This will normally be carried out by your dealer and is detailed in the instruction manual supplied

onto the station required by depressing the AFC button (12). Adjust the setting of the VOLUME (4), BASS (2) and TREBLE (3) controls as necessary to your requirements. The BALANCE control (1) may need adjustment to suit the position of the instrument in the listening room.

- 3 Gramophone use Depress button (7) and operate controls to give volume and tonal balance as required.
- 4 Tape replay Depress button (8) and adjust controls as required to give desired sound level and tonal quality.
- 5 Balance control setting (1) The correct position for this control may easily be set by listening to monaural programme material and adjusting the control so that the sounds appear to come from a point midway between the left and right-hand loudspeakers.

by Messrs Goldring Ltd which is enclosed with your Dynatron instrument.

The Goldring G800 Magnetic Stereo Cartridge fitted to this unit has a stylus tip radius of .0007 in designed to play mono or stereo records at 16, 33½ or 45 rpm. This stylus should NOT be used to play 78 rpm records. For normal use the recommended stylus pressure is 2.5 g. The stylus pressure is set as follows:

Having first balanced the pick-up arm (see section 9, page 8 of manual) the small counter weight should be slid forward to the fifth graduation of the outrider. (This small counterweight is illustrated as item 4 on page 6 of the manual.)

The anti-skating device should be set as detailed on pages 9, 10 and 11 of the manual, ie the 4 g weight should hang over the 3rd notch of the guide rod (item 2, Fig. 3, page 9 of manual).

IMPORTANT—GL75 UNIT

The turntable of this unit is very accurately machined and balanced; it weighs 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.

HFC 46 AND HFC47—GOLDRING-LENCO GL72 TRANSCRIPTION UNIT

See paragraph 1, GL75 unit. This also applies to the GL72 unit. The cartridge fitted is the Goldring G850 and paragraph 2, GL75 unit applies. The method of setting the stylus pressure and anti-skating adjustment is simplified. The large weight at the rear of the pick-up arm should be adjusted by releasing the locking screw and sliding the weight until the pick-up arm balances level, the weight should then be slid forward 2½ divisions (each division equals 1 g pressure) and the locking screw tightened, the stylus pressure is now set to 2.5 g. The sliding lever on the right of the pick-up arm should now be positioned at 2½, thus applying the correct anti-skating bias for 2.5 g stylus pressure.

RENEWAL OF PICK-UP STYLUS

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. Should this be suspected, **REPLACE AT ONCE. NEVER CONTINUE TO OPERATE THE INSTRUMENT WITH A WORN OR CHIPPED STYLUS.**

THE SRX26C TUNER/AMPLIFIER CONTROL PANEL

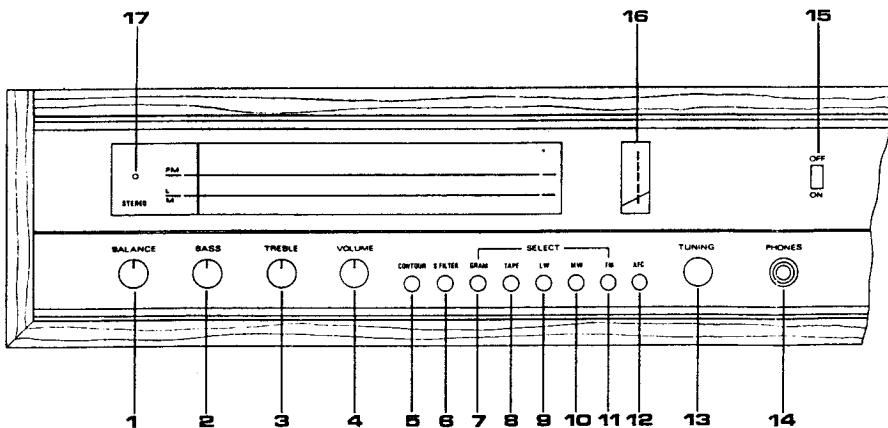


FIG. 4

USING AN EXTERNAL TAPE RECORDER—ALL MODELS

The tape recorder should be connected via a 5-pin DIN pattern plug to the socket marked 'TAPE' shown in Fig. 1, page 3. The method of wiring the plug for a mono machine is shown in Fig. 2a, and Fig. 2b shows the connections for a stereo tape recorder. (The 5-pin DIN pattern plugs are rapidly becoming a standard and many dealers stock suitable cables ready made up with plugs attached.)

When RECORDING from the SRX26C the output signals from the tape socket 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 SRX26C the SELECTOR button (8) should be depressed and the volume and tone controls adjusted for loudness and tonal balance to suit your requirements.

The Mains Outlet socket at the rear of the Dynatron instrument will conveniently provide mains power for operating the tape recorder.

MODEL HFC38 TAPE RECORDER SECTION

AMPLIFIER CONTROLS

TO RECORD

From radio

Select the appropriate button for the waveband required, i.e. LW, MW or VHF, and then adjust the tuning to select the station required as for normal loudspeaker listening.

From a gramophone record

Select the 'Gram' button and set the record player in operation.

From microphone

Plug the microphone into socket (1) (Fig. 6) and then follow the appropriate instructions.

Note The position of the volume and tone controls on the main amplifier front panel do not affect the recording level or tonal balance; should the operator wish to listen whilst recording, these controls should be adjusted to suit requirements.

NOT APPLICABLE TO MICROPHONE RECORDINGS.

If it is desired to record 'silently' then the volume control

should be set at minimum. WHEN MICROPHONE IS USED THIS CONTROL MUST BE SET AT MINIMUM TO PREVENT FEEDBACK.

TO PLAY-BACK

The 'Tape' button should be selected and the volume and tone controls adjusted to suit personal requirements.

TAPE SOCKET

This socket at the rear of the cabinet (Fig. 1) can be used for:

- Recording from radio or gram, if desired at the same time as re-recording on the internal recorder from the same source.
- Re-recording from ext. tape recorder to int. tape recorder. Tape button 8 (Fig. 4) to be depressed.
- Playback int. tape recorder and re-record on ext. tape recorder. Tape button depressed.

Note b and c can be monitored via headphone or loudspeakers.

TAPE UNIT OPERATING INSTRUCTIONS

CASSETTE RECORDER

This is a carefully designed piece of apparatus, which enables you both to record and play-back either stereophonically or monophonically.

The combination of the Compact Cassette system and all-transistor circuit techniques enables the recorder to record or play-back at any moment.

The layout of the controls ensures error-proof operation.

Playback

The recordings made can be reproduced through the amplifier in the same manner as radio or records.

Recording

With a suitable microphone you can record conversations, singing, instrumental music or other sounds of interest.

Recordings can also be made from radio or record player. (Note, however, that you should never record from a radio by holding a microphone in front of the radio loudspeaker. Results so obtained are invariably inferior and disappointing.)

The recording of radio programmes and copying of gramophone records is permissible only in so far as copyright or other rights of third parties are not thereby infringed.

Compact Cassettes

You can make stereophonic or monophonic recordings over the full length of the recording tape in these cassettes in two directions, each recording being approximately half the width of the tape. When one half is full, you can turn over the cassette in order to use the other half. The cassette identifies the recordings on each side by the figure 1 or 2.

Both ends of the tape are attached by a length of non-magnetic leader tape to the rotating hubs, threading of the tape therefore being unnecessary. This being so, the cassette is ready for immediate use. At any time, not only at the end of the tape, the cassette can be replaced by another or turned over in order to change from the one side to the other.

Compact Cassettes are available in three versions:

- C-60 : playing time 2 x 30 minutes;
- C-90 : playing time 2 x 45 minutes;
- C-120: playing time 2 x 60 minutes.

Note On account of the non-magnetic leader tape, it is necessary when starting at the very beginning of a tape to allow the cassette to wind on for about seven seconds before starting to record.

Pre-recorded Cassettes

These are Compact Cassettes containing pre-recorded music.

All types of music are available.

Pre-recorded Cassettes are safeguarded against accidental erasure of the tape and are usable on all Compact Cassette equipment.

STEREO

Listening to, say, an orchestra on your left, your left ear hears the sound reaching it from the left, a little earlier and louder than does your right ear. In the case of sound from the right, matters are reversed. Sound from directly in front of or behind you is heard simultaneously and equally loudly by both ears. Even with your eyes closed, therefore, you can 'see' the orchestra; in other words you can determine the direction in which the various instruments lie.

In making a stereo recording of an orchestra playing, two microphones are employed, each receiving its own sound in the same way as your ears do. The sound is recorded on two separate 'tracks', one track for the sound picked up by the left-hand microphone (left channel) and the other track for the sound picked up by the right-hand microphone (right channel).

In reproducing the same recording stereophonically, the two tracks are played back through separate loudspeakers positioned some distance apart, one speaker reproducing the left and the other the right channel. In this way the listener hears the orchestra as though it were playing in its actual presence.

With your new stereo recorder you yourself can make stereo recordings from radio broadcasts and gramophone records. All the stereo recordings you make can be reproduced stereophonically through the stereo amplifier.

It will be obvious of course, that a true stereo recording cannot be made of, say, a non-stereo radio programme or gramophone record.

CONTROLS AND CONNECTION SOCKET

(See Fig. 6)

- Microphone socket.
- Programme indicator with zero reset button—for rapidly locating the position of recordings on the tape.
- Cassette holder.
- Cassette holder release knob—pull this towards you to open the cassette holder (it will only operate if the start key 7 is not depressed).
- Record key—press to control (together with key 7).
- Rewind key—press to rewind at speed to the start of a recording or to the start of the tape (rewinding can be stopped with key 9)

- Start key—press to start recording and playback.
 - Wind key—press to wind at speed to the start of a recording or to the end of the tape (winding can be stopped with key 9).
 - Stop key—press to stop recording, playback and fast winding or rewinding.
 - Recording level indicator—for checking the recording level.
 - Pilot lamp—will light up when the recorder is switched on.
 - Mains switch—press to switch the recorder on and off.
 - Pause knob—pull this towards you for brief interruptions of recording and playback without having to release the record key 5 and/or the start key 7. The pause knob cannot be operated during fast winding and rewinding.
 - Recording level control—for adjusting the recording level during recording.
- Note** All keys except the stop key lock into position when pressed and are released by pressing the stop key 9. The pause knob 13 is released by pushing it back or by pressing the stop key.

SWITCHING ON AND OFF THE RECORDER

The HFC38 mains on/off switch No. 15 (Fig. 4) must be 'on' before the recorder will operate.

Switching on

Depress the on/off switch 12, the pilot lamp 11 will then light up.

Switching off

Depress the mains switch a second time. The pilot lamp will then be extinguished.

Note Never switch off the recorder when the tape is in motion without first pressing the stop key 9 since such action may result in damage to the tape and the recorder itself.

INSERTING AND REMOVING THE CASSETTE

The cassette holder can be opened and closed only if the start key 7 is not depressed. To release the start key, if necessary, press the stop key 9.

Inserting

Pull knob (4) towards you. The cassette holder (3) will now spring up and open.

With the desired side of the cassette uppermost, and with the open part towards the control panel, push the cassette into the holder (Fig. 7).

Press the cassette holder down at the front until the holder locks in position.

Removing

Pull knob (4) towards you. The cassette holder (3) will now spring up and open and the cassette can be removed.

PROGRAMME INDICATOR

Make it a habit to set the programme indicator 2 to '000', by pressing the zero reset button, immediately after inserting a cassette.

Note The programme indicator does not directly indicate playing time of the cassette.

Remove the index label from the cassette box and write the reading of the indicator at which the recording commences together with the title of each recording on the inner side. Later you will be able to locate any of your programmes rapidly by fast winding or rewinding to the same reading.

Additional notes can be made on the back of the label and on the cassette itself. Fold the index label the other way round and return it to the box. Any notes you have made can then be seen through the lid (Fig. 8).

Notes:

- If you have only used part of a cassette for recording, note the reading of the indicator at the end of the last recording before you remove the cassette. If this cassette is used again later on, the correct position to restart the recording can be located as follows:
 - Press the rewind key (6) and completely rewind the tape. Press the zero reset button of the programme indicator.
 - Press the wind key (8) and wind the tape at speed until you have almost reached the indicator reading previously noted and then press the stop key (9).
 - Press the start key (7) and play back the cassette until the end of the last recording is reached and then stop the tape

once more. You have now reached the blank portion of the tape and can continue recording.

2 The programme indicator can also serve in compiling an index for the contents of a cassette. To do this completely rewind the tape, press the zero reset button and note the reading of the indicator at the beginning of each item.

CONNECTIONS

Microphone

Insert the microphone plug into socket (1) (Fig. 6).

RECORDING (stereo and mono)

Introduction

During recording, previous recording on the same section of tape is automatically erased.

The strength at which the sound is recorded on the tape determines the quality of the sound obtainable on playback. If the 'recording level', as this is called, is too low, too much noise (hiss) will be heard on playback. If the recording level is too high, distortion will be heard on playback. The recording level is adjusted with the recording level control (14) and can be checked by reference to the recording level indicator (10). The recording level can be set prior to commencement of recording, but, should circumstances rule this out, the level may also be adjusted during recording. The recording is not affected by the position of the volume and tone controls on the front control panel.

Stereo microphone recordings can be made only if a stereo microphone is used.

A suitable stereo microphone can be purchased from your Dynatron dealer.

Recording

Insert cassette in the cassette holder (3). Pull the pause knob (13) towards you. Press the record key (5) and the start key (7) at the same time.

Speak or sing into the microphone or let the other equipment operate, sliding the recording level control (14) upwards to the point where, during the loudest passages, the pointer of the recording level indicator (10) just reaches 100% (Fig. 5A). The recording level is then correctly adjusted. Should the pointer fail to reach 100% (Fig. 5B) the recording level is too low, whilst if the pointer moves continuously past 100% (Fig. 5C), the level is too high.

Now start the recording by pushing the pause knob (13) back. Check the recording level from time to time and readjust it (gradually) as necessary.

For brief interruptions pull the pause knob (13) towards you. To stop, press the stop key (9).

Note At the end of the cassette the tape stops automatically and the motor of the recorder is switched off. Depressed keys, however, will remain in position; therefore, in this case, too, press the stop key in order to prevent the pressure roller in the driving mechanism from being distorted.

PLAYBACK

Insert a recorded cassette in the cassette holder (3). Depress the 'Tape' button on the front panel. Press the start key (7). Adjust the volume and tone controls to suit personal requirements.

For brief interruptions pull the pause knob (13) towards you. To stop, press the stop key (9).

ERASING WITHOUT RECORDING

A recording can be erased from the tape without a new recording being added. To do this:

Slide the recording level control (14) to '0'. Press the record key (15) and start key (7) at the same time. To stop, press the stop key (9).

SAFEGUARD AGAINST ACCIDENTAL ERASURE

You can prevent the accidental erasure of your recordings, some of which will hold great value for you, in the following way. With a screwdriver or other suitable object, break out the little flap on the back of the cassette opposite the 2 (Fig. 9) (for a recording on side 1) or that opposite the 1 (for a recording on side 2).

Thereafter, with the cassette in the recorder the record key (5) cannot be depressed, in consequence of which the cassette can only be played back.

MAINTENANCE

In normal circumstances the recorder will require no special attention in the way of maintenance. It is recommended, however, to remove from time to time the oxide dust which has collected on and around the magnetic heads. For this purpose a cleaning tape should be used. Furthermore, it is a good plan to examine the recorder perhaps once a year or after every 500 hours of operation. Then, the equipment can be cleaned, checked and adjusted where necessary, and parts subject to wear can be replaced in good time.

Note The driving mechanism must not be lubricated.

ACCESSORIES

Compact Cassettes C-60, C-90 and C-120.
Cleaning tape, 811/CCT.
C-30 postal pack For Compact Cassettes.

STORAGE OF CASSETTES

Protect your cassettes against dust, etc., by returning each cassette to its box immediately after use.
Store the cassettes at room temperature, not very close to loudspeakers or transformers (as damage may be caused to the recording by the magnetic field from these items) and away from sunshine.

RECORDING LEVEL METER ILLUSTRATIONS

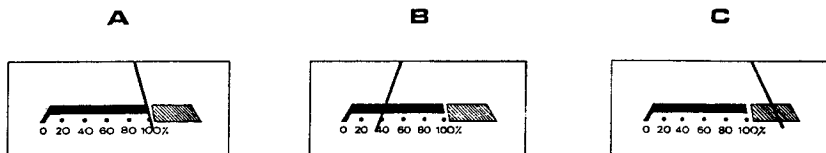


FIG. 5.

TOP VIEW OF CASSETTE TAPE UNIT

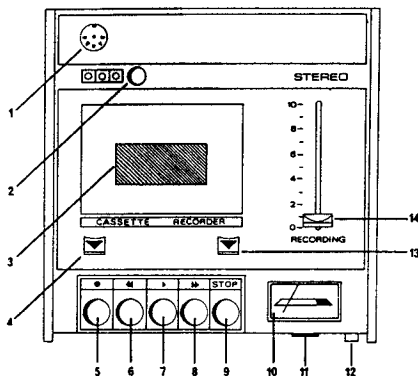


FIG. 6.

- 1 Microphone socket
- 2 Counter with zero reset
- 3 Cassette lid with window
- 4 Cassette ejecting knob
- 5 Record stand-by key
- 6 Fast rewind key
- 7 Start key
- 8 Fast forward key
- 9 Stop key
- 10 Illuminated meter
- 11 Red on/off indication lamp
- 12 On/off switch
- 13 Pause knob
- 14 Recording control

TECHNICAL DATA

Suitable for both stereo and mono recording and playback.
Fully transistorised.
Compact Cassette system.
Tape speed: $1\frac{1}{2}$ /sec (4.75 cm/sec).
Frequency range: 60-10,000 Hz (DIN and within 6 dB).
Signal/noise ratio: better than 45 dB (DIN).
Wow and flutter: $\leq 0.3\%$ (measured with EMT 420).

Maximum playing time: 2×60 minutes with the C-120 Compact Cassette.
Fast wind time per side:
80 sec for a C-60 Compact Cassette;
120 sec for a C-90 Compact Cassette;
160 sec for a C-120 Compact Cassette.
Permissible ambient temperature 5-45°C (41-113°F).

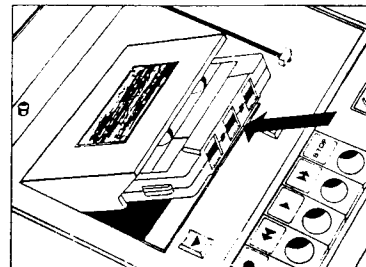


FIG. 7.

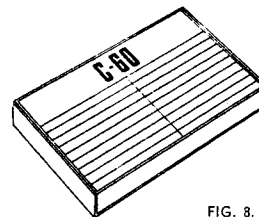


FIG. 8.

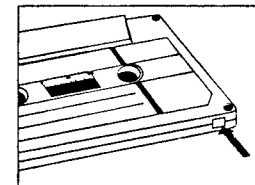


FIG. 9.

SPECIFICATION SRX26C TUNER/AMPLIFIER

AMPLIFIER SECTION

Semiconductors

16 transistors (10 Ge type, 6 Si type).
1 Se power bridge.

Rated power output 3 ohms load

16+16 watts total (music power).
10 watts ± 1 dB RMS single channel operating
8 watts ± 1 dB RMS both channels operating.
Power bandwidth -3 dB at 25 Hz and 20 kHz.
Damping factor 20 at 3 ohms load.

Distortion

Total harmonic distortion less than 0.35% at -2 dB on above rated outputs.

Noise level

Better than -65 dB (Ref. rated O/P) on tape input.
Better than -60 dB (Ref. rated O/P) on pick-up input.

Frequency response

Radio/tape input -3 dB at 20 Hz and 20 kHz.
Pick-up input corrected for RIAA curve ± 1.5 dB 40 Hz to 18 kHz.

Input sensitivities

Tape input	26 mV	} for rated O/P -1000 Hz.
Magnetic pick-up	4.5 mV	
Piezo PU (Ceramic)	60 mV	

Signal handling

+30 dB on specified sensitivities.

Tone controls

Bass ± 10 dB at 80 Hz relative 1 kHz.
Treble ± 10 dB at 12 kHz relative 1 kHz.

Contour filter

+10 dB at 100 Hz, +4 dB at 10 kHz (Ref. 1 kHz) Volume control
-30 dB from maximum.

'S' filter

-8 dB at 10 kHz.

Balance control

+6 dB to -2 dB, each channel.

Tape socket

Output 25 mV with 22 Kohms in series (input at specified level) unaffected by volume or tone control settings.

RADIO AM/FM TUNER SECTION Including Decoder

Separate RF and IF channels for AM and FM.

Semiconductors

14 transistors (11 Ge type, 3 Si type), 10 diodes.
1 Ge power diode.

FM sensitivity

2.5 μ V 10 dB quieting (S/N)	} Average over Band 87-108 MHz.
6 μ V 30 dB quieting (S/N)	
12 μ V 40 dB quieting (S/N)	

Limiting

At 16 μ V or better.

Stereo separation

Better than 23 dB.

AFC

Pull in range ± 300 kHz.
Hold in range ± 350 kHz.

Waveband coverage

VHF 87-108 MHz.
MW 185-570 m. 1620-525 kHz.
LW 1100-2000 m. 270-150 kHz.

AM usable sensitivity

10 μ V. For 20 dB S/N average. MW.
15 μ V. For 20 dB S/N average. LW.

AGC action

+70 dB for 6 dB change in audio

NOTE:
DRUM A.
 Fit drive cord with gang open.
DRUM B.
 Fit drive cord with gang closed.
NB. Ensure adequate tension on springs 1 and 2.

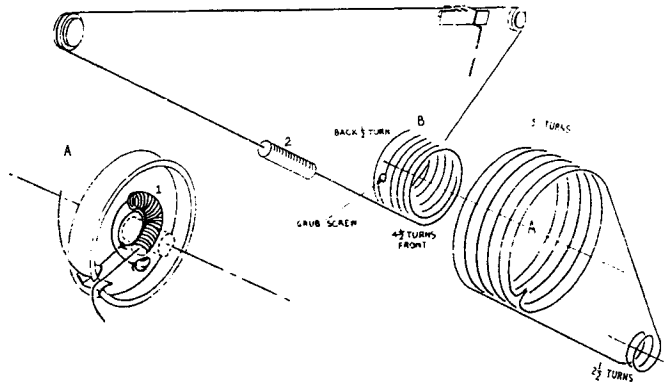


FIG. 10. DRIVE CORDING DETAILS VIEWED FROM FRONT—GANG OPEN.

TEST PROCEDURE DATA SRX26 SERIES

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 ± 300 kHz.
- 6 Valve voltmeter.
- 7 Oscilloscope.
- 8 Stereo encoder (Philips Service Coder or similar).
- 9 Output meter set to 3 ohms load.
- 10 Test cassette tape Philips code number 8945 600 11501.

Audio amplifier

- 1 Check mains supply voltage at 240 volts.
- 2 Check that HT voltage measured at HT fuse to earth is 32 volts ± 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 ± 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' (ie 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 ± 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.

AM tuner section—Alignment procedure AM

Note Check that the dial pointer is at zero on the logging scale with the tuning gang fully closed. The IF in use is 470 kHz. The IF amplifier is a Mullard module type LP 1159 which is pre-aligned and these adjustments should not be tampered with.

- 1 Select MW.
- 2 Set MW oscillator end stops as follows:
 - a Connect AM signal generator to external AM aerial socket (AFC button out).
 - b Set the signal generator to 530 kHz with an output of 1 mV.
 - c Tune to left-hand end of scale (fully closed gang) and adjust the dust core of T9 board A to tune the signal.
 - d Re-set the generator to 1630 kHz, set pointer to the right-hand end of the scale (gang fully open) and adjust TC3 board A to tune the signal.
 - e Repeat c and d above until the end stops are correctly set, then seal the cores and trimmers with approved adhesive (ie cellulose paint).
- 3 Set the generator to 600 kHz with reduced output and tune chassis to receive signal.
- 4 Check calibration on scale and trim L3, MW external aerial coil, for maximum output.
- 5 Set the generator to 1200 kHz and tune chassis to receive signal.

- 6 Check calibration on scale and trim C59 for maximum output.
- 7 Repeat 4 to 6 until no further improvement can be made.
- 8 Seal the cores, trimmers and dial pointer with approved adhesive (ie cellulose paint).
- 9 Set the generator to 200 kHz.
- 10 Switch to LW, set dial pointer to 200 kHz and trim LW oscillator trimmer C60 to generator signal.
- 11 Adjust the LW external aerial coil L5 for maximum output, with external aerial switched (ie AFC button out).
- 12 Disconnect the signal generator from the external aerial socket and connect a loop aerial to the signal generator output.
- 13 Switch to MW and depress the AFC button (in) and carry out alignment of the MW 'Ferrite' rod aerial coil and TC1 (using the same frequency points of 600 and 1200 kHz) adjusting L3 for maximum output at 600 kHz and TC1 for maximum output at 1200 kHz, repeating until no further improvement can be made.
- 14 Switch to LW, set signal generator to 200 kHz, tune receiver to signal and adjust L5 (LW 'Ferrite' rod aerial coil) for maximum output with AFC button IN. Seal the coils with adhesive.

Note In the UK the BBC2, 1500 m, 200 kHz signal can be used instead of the signal generator.
- 15 Check that the tuning meter indicates the signal strength.

Tuning of SCA filter coil

Note This applies only on certain export receivers when the SCA coil has been fitted specially.

- 1 Apply a 67 kHz signal to the output of the IF strip (pin 18 on circuit diagram).
- 2 Using the valve voltmeter connected to the decoder input (ie TR4 base), tune the SCA filter coil for minimum output.

Alignment procedure VHF IF

- 1 Inject 10.7 MHz sweep signal from the wobulator into pins A and B of VHF tuner front end.
- 2 Connect oscilloscope, set to suitable range, across pin 19 (earth) and pin 18.
- 3 Align front end IF coils 5 and 6 Fig. 14 and T1, T2 and T3 (board A) to produce symmetrical 'S' curve centred on 10.7 MHz, concurrent with maximum 'S' curve amplitude.

Alignment procedure VHF RF

- 1 Tune pointer to 88 MHz on scale.
- 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 88 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. 14 for maximum output.
- 5 Set pointer to 108 MHz and readjust signal generator to 108 MHz. Adjust trimmer 3 Fig. 14 for maximum output.
- 6 Repeat 3 to 5 above until optimum output at both frequencies is achieved.
- 7 Tune to 92 MHz on scale and inject 92 MHz signal at 10 μ V and tune 2 Fig. 14 for maximum output.
- 8 Tune to 102 MHz on scale and inject 102 MHz signal at 10 μ V and tune 1 Fig. 14 for maximum output.
- 9 Repeat 7 and 8 above until optimum output at both frequencies is achieved.

AM rejection

- 1 Set generator to AM modulation at 30% at 400 Hz and RF output at 92 MHz 10 μ V and trim RV1 (board A) for minimum output.
- 2 Connect valve voltmeter to either left-hand or right-hand loudspeaker socket.
- 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 and note that the output should fall by 40 dB (ie 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 button out, detune set until output reduces 6 dB, depress AFC button and note the output should rise to original level within 2 dB.
- 2 Check on both low and high side of tuning point.

Setting up of stereo decoder

- 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 T4, T5 and T6 (board A) fully clockwise.
- 6 Switch encoder to left-hand channel modulation only and tune T4, T5 and T6 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 T4, T5 and T6 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.

Miscellaneous

Check that the pointer has been properly affixed to the drive cord using an approved adhesive (ie cellulose paint) and that the tuning drive is smooth, positive and free in its action and that the 'V' pulleys are properly lubricated.

Important Certain models manufactured between November 1971 and February 1972 will be found to incorporate the same print panels 'A' and 'B' as shown in the previous issue covering same model numbers but with the improved layout as shown in Fig. 17, underside view of chassis (eg SRX26A and SRX26B specification, including a small number of model HFC38). Later models using SRX26C chassis are covered by this manual and are easily identified by the modified print panel 'A' and tag strip 'C'.

Loudspeaker sockets

These are of the 2 pin DIN type on audio separates units but 3 pin DIN switched type on radiogramophones. 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 speaker will operate, in the second position both internal and external loudspeakers will be in operation.

Phone jack socket

This is standard 6 mm stereo headphone socket with internal switching to cut off the loudspeaker circuits when the jack plug is inserted. The audio output at this socket is limited to a maximum of 0.5 watts at maximum setting of the volume control to prevent headphone damage.

Removal of front control panel (all models)

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

To facilitate replacement of all controls, dial drive cord, tuning meter, tuning scale 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 The tuning meter will now drop free, held only by its connecting leads, care must be taken on re-assembling to locate the meter into its aperture in the front panel.

Removal of the SRX26C chassis from the models indicated below

FIRST DISCONNECT FROM AC SUPPLY

RG81 RG82

- 1 Remove cross-head screws from front edge and rear of control panel facia.
- 2 Remove external plugs from sockets panel. Lift up front edge of facia to expose chassis and remove leads to gram motor, pick-up, loudspeaker and mains transformer.
- 3 Feed mains lead through aperture at rear of cabinet and withdraw facia and chassis together.

RG83

- 1 Remove sockets section cover panel from rear of cabinet after removing external plugs.
- 2 Remove mains transformer plug lead and disconnect loudspeaker leads. Release sockets panel from its mounting studs and lift clear.
- 3 Remove cross-head screws from top of facia and smaller screws from rear of facia edge.
- 4 Lift up chassis complete and remove leads to gram motor and pick-up.
- 5 Withdraw facia and chassis with sockets panel up through cabinet.

TRV26 HFC31 HFC32

- 1 Remove base of cabinet and release 4 screws holding main chassis to front of cabinet also 2 nuts holding sockets panel.
- 2 a HFC31 and HFC32—Release plugs connecting gram motor, pick-up and mains transformer.
b TRV26—Release mains transformer plug lead.
- 3 Withdraw chassis and sockets panel assembly forward through aperture in the front of the cabinet.

HFC38

- 1 Remove base of cabinet and release 4 screws holding main chassis to front of cabinet also 2 nuts holding sockets panel.
- 2 Release plugs connecting gram motor, pick-up, mains transformer, tape unit mains supply plug and audio DIN plug.
- 3 **Removal of tape deck** Release 2 screws at the rear of the top panel, raise the back of the tape deck to release, draw back to release front clips and lift out having disconnected leads as in 2 above.

HFC45

- 1 Remove external plugs from sockets panel.
- 2 Unscrew the 4 motor board retaining screws and lift up the board and playing deck assembly complete, unplug the 2 connections between the deck assembly and rear of chassis and lift clear.
- 3 Unplug the mains transformer connecting lead (Octal plug) from the sockets panel assembly.
- 4 Undo the 2 4BA nuts holding the sockets panel assembly and lift clear feeding mains lead through aperture at rear of cabinet.
- 5 Remove the 4 chassis retaining screws situated on the front panel.
- 6 Slide complete chassis and sockets panel assembly forward through aperture in the front of the cabinet.

HFC46 HFC47

- 1 Release fixing screws and lift motor board to gain access to rear sockets panel mountings and mains transformer plug.
- 2 Remove cross-head screws from tuner facia panel top and right-hand edge. Lift facia panel with main chassis attached and when all plugs are removed withdraw chassis and sockets panel up through cabinet.

NOTES

TECHNICAL DATA SRX26C CHASSIS

The SRX26C tuner/amplifier chassis is used throughout the Dynatron range of models as listed on the front cover of this service manual.

The model TRV26 has a pick-up socket provided at the rear sockets panel to accept either a Piezo ceramic or magnetic cartridge. Frequency compensation is to RIAA curve and is automatically applied for each type of cartridge depending on the manner in which the plug is wired.

CIRCUIT DESCRIPTION

Reference should be made to the diagram Fig. 19.

Radio tuner section AM

The AM and FM tuner sections are quite separate; consider first the AM section. Waveband selection is by SW6. The appropriate aerial coil is tuned by gang section VC1 with C59 trimmer for MW. External AM aerial coupling coil L1 is connected via contacts on SW8 AFC switch so that the external aerial, if connected to SKT7 can be selected at will by operating SW8. T9 oscillator coil is tuned by VC2; C60 trims LW and C61 MW. The IF amplification is carried out by module LP1159. This unit is factory aligned for accurate band pass characteristics and a factory replacement should be fitted if service is required. The detector load is provided by R71 and the tuning meter selected by SW7. AM audio signals obtained across R71 via C53 are selected by SW7 and passed to the selector switch SW4.

Radio section FM VHF

Dipole aerial input to VHF tuner unit AEO2119 feeds to RF amplifier TR201 and thence to mixer TR202. 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.

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 AC power supply connection and SKT5 is the shuttered mains outlet socket of 200 watts capacity fitted to the rear sockets

panel. All power is controlled by toggle switch SW9 via fuse F1 of 1 amp type F rating. Scale lamps are 6.5 volt 0.3 amp MES type. D201 diode and R204, C206 and C209 form a separate power supply for the radio tuner section.

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 $\frac{1}{10}$ th 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' R233 and R234.

CHASSIS LAYOUT AND PRINTED CIRCUIT BOARDS

MAIN CHASSIS

To work on underside of audio print panel, Fig. 17, first release the 2 screws holding the tag-strip, then release the 3 special studs securing board and lift up panel by hinging on the cable form immediately behind the control potentiometers (front of chassis).

To work on underside of receiver print panel, Fig. 15, release 4 special studs securing board and unsolder leads to 'Ferrite' aerial and tuning gang so that the board may be lifted and hinged on the cable form at front of chassis.

LAYOUT OF SOCKETS PANEL.

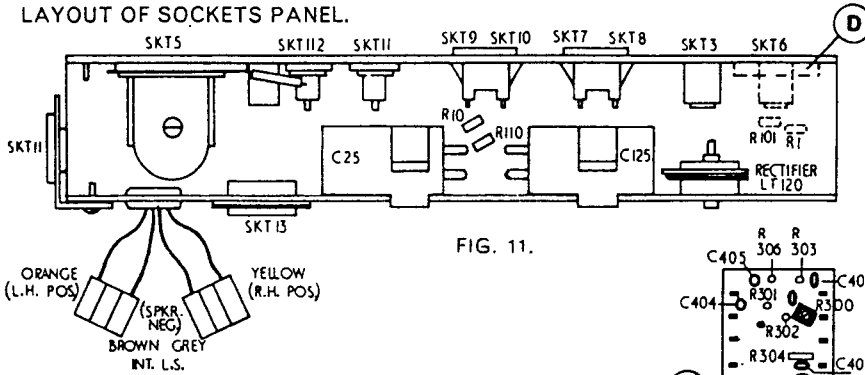


FIG. 11.

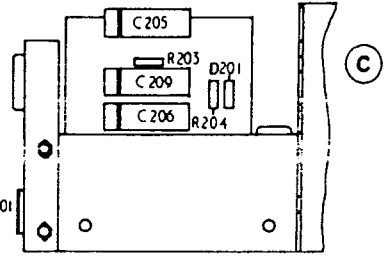


FIG. 13. TAG STRIP ASSEMBLY.

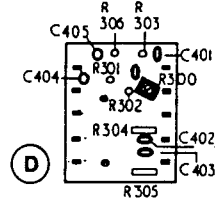


FIG. 12. LAYOUT OF RECORDER MATCHING PRINT PANEL.

Note SKT6 fitted on model TRV26 only. Print panel 'D' fitted in place of SKT6 on model HFC38 only. SKT11 fitted on model HFC38 only.

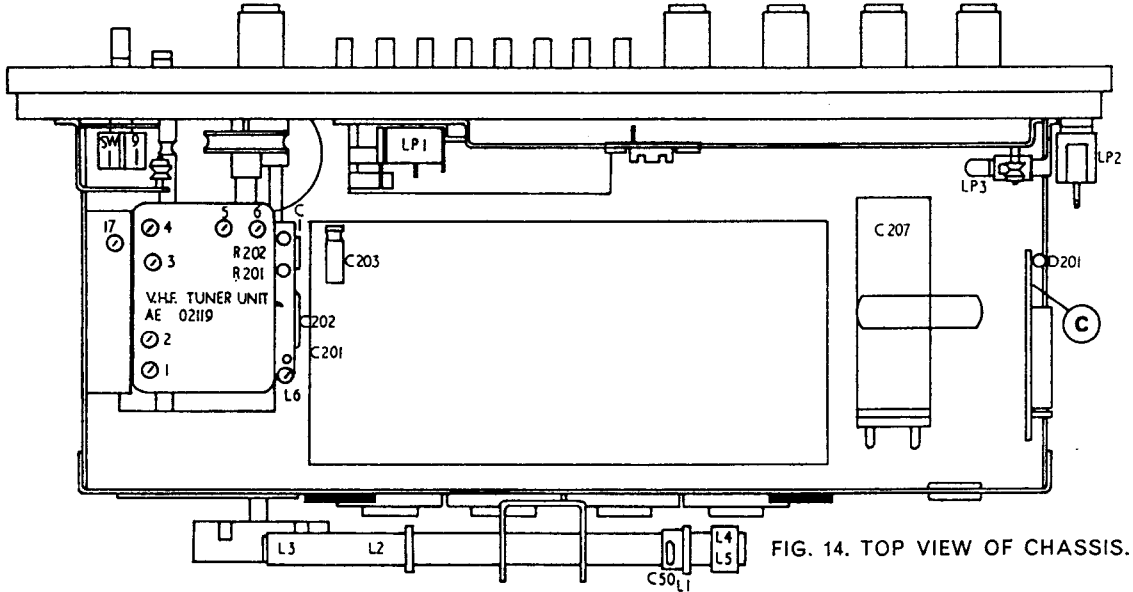
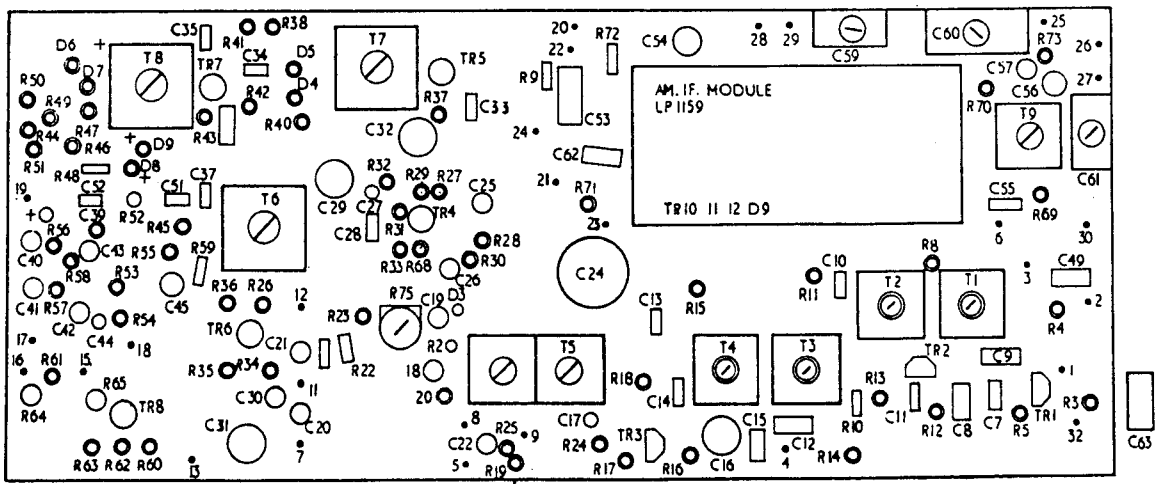


FIG. 14. TOP VIEW OF CHASSIS.

FIG. 15. LAYOUT OF RECEIVER PRINT PANEL.



Note TR9 and C63 are part of board 'A' but are mounted externally.

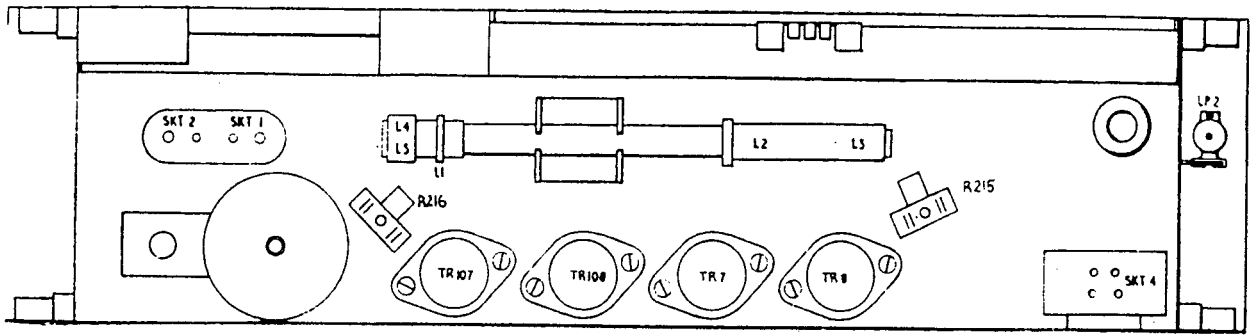


FIG. 16. REAR VIEW OF CHASSIS.

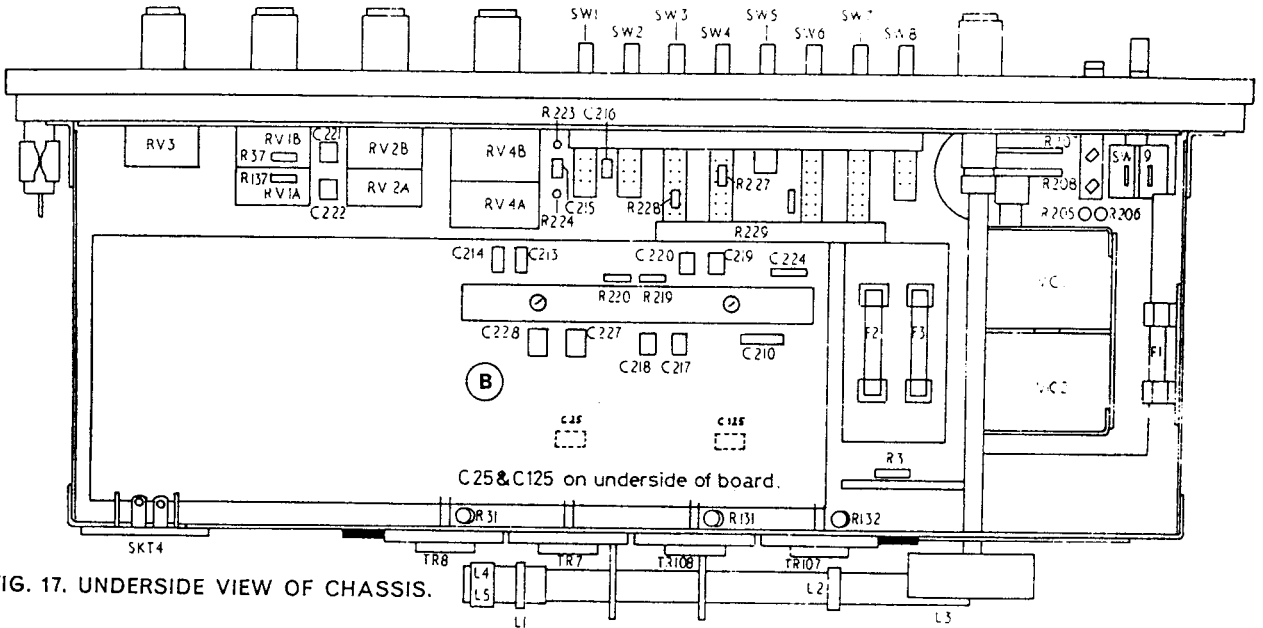
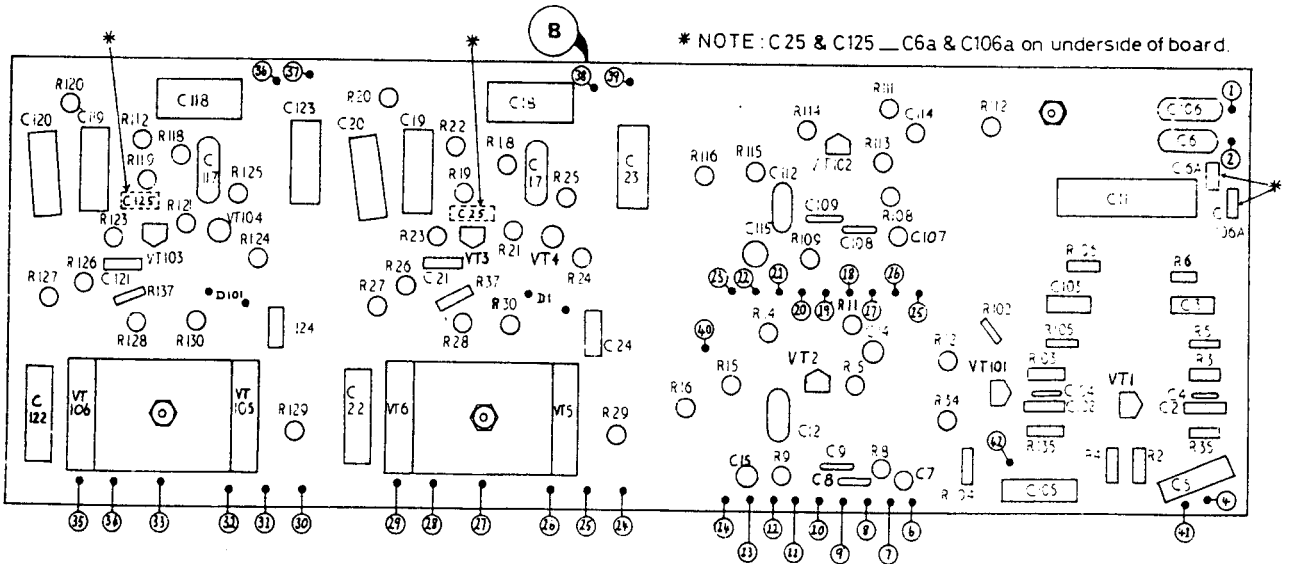


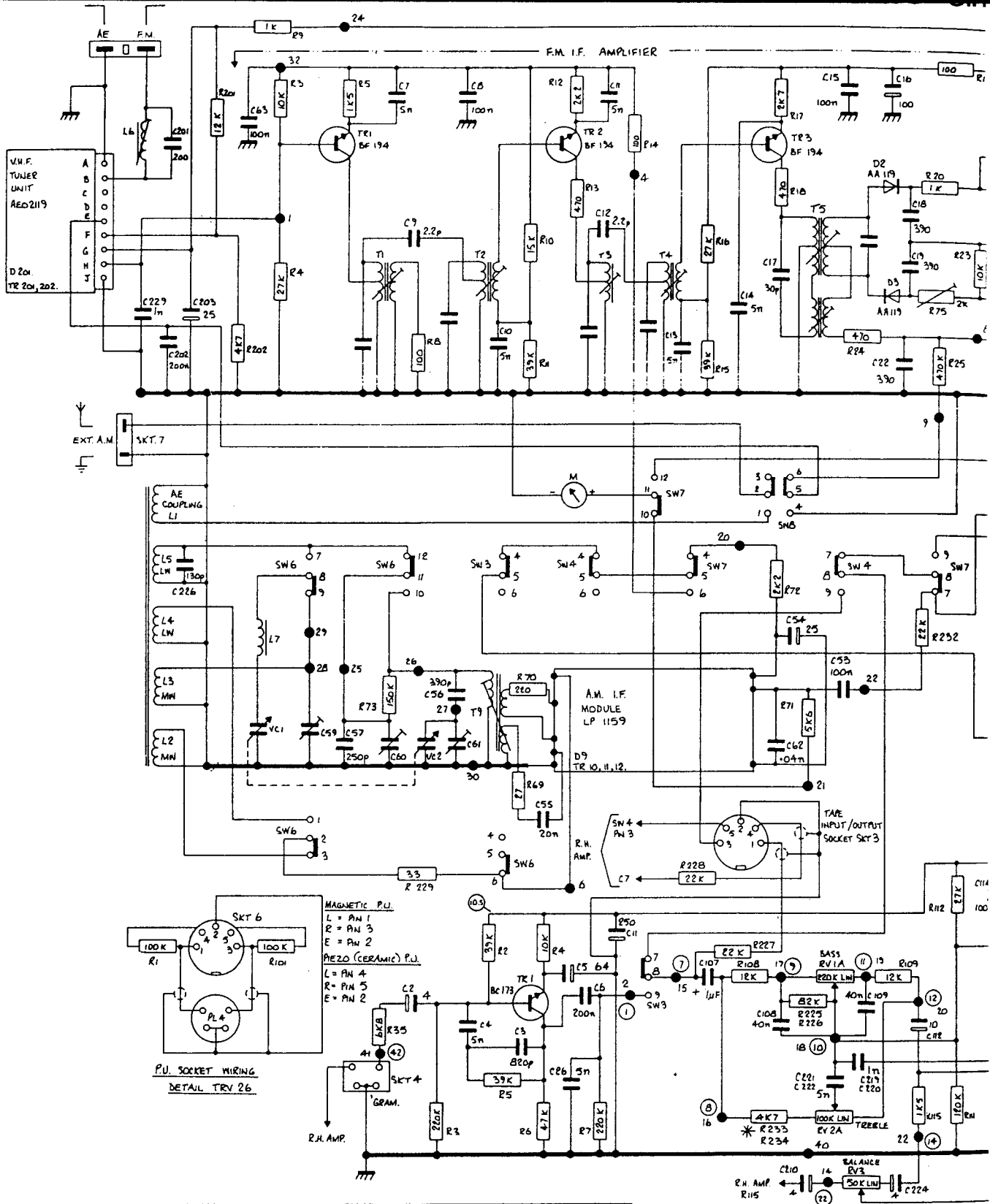
FIG. 17. UNDERSIDE VIEW OF CHASSIS.

FIG. 18. LAYOUT OF AUDIO PRINT PANEL.



TURNTABLES AND PICK-UPS

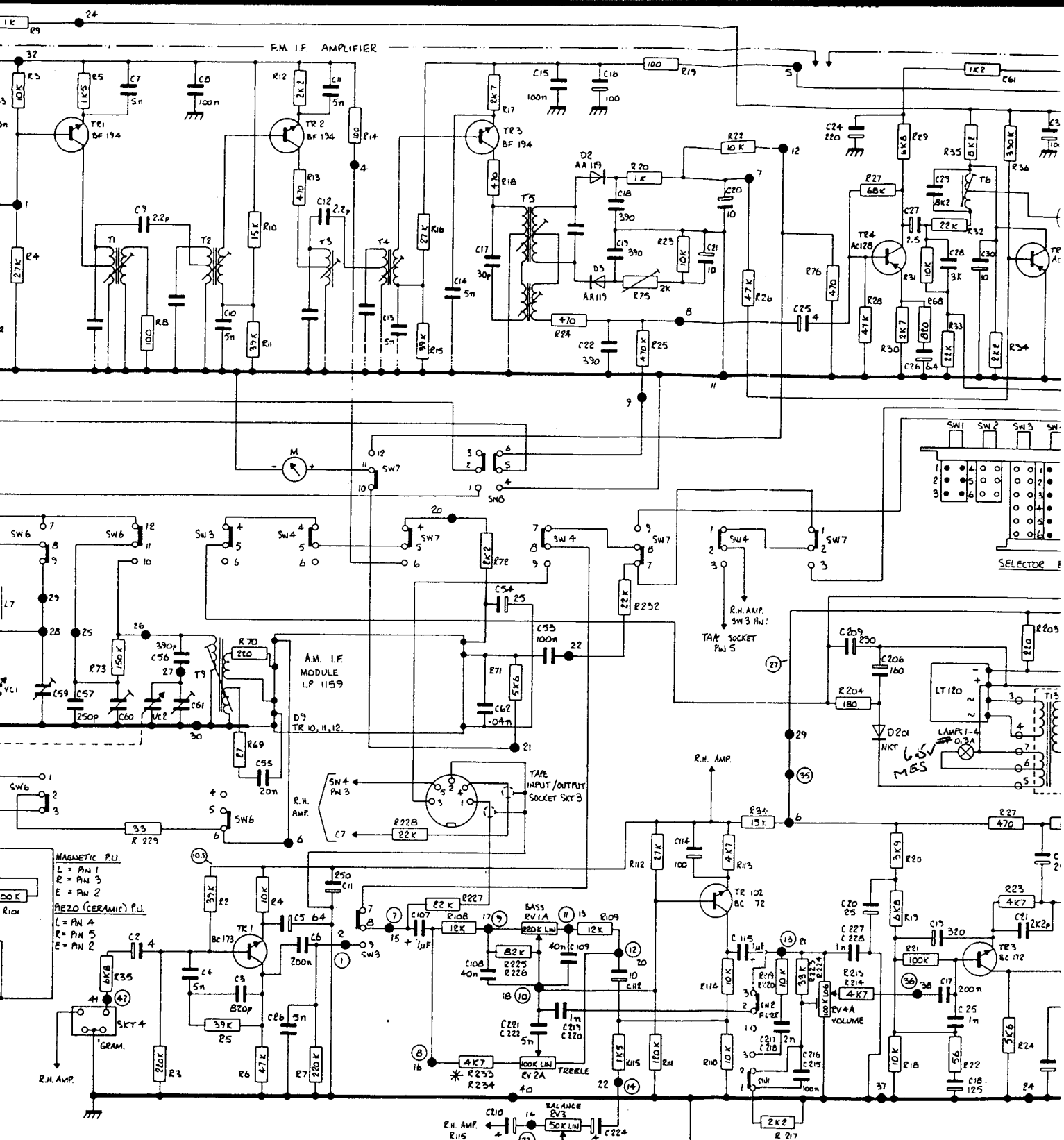
- HFC31A, RG81, Garrard Model 2025TC with Sonotone 3559 cartridge.
- HFC45, HFC46, HFC47, Goldring-Lenco GL72 with Goldring G850 cartridge.
- RG82, RG83, Garrard Model 40B with Goldring G850 cartridge.
- HFC32, Goldring-Lenco GL75 with Goldring G800 cartridge.
- HFC31M, Garrard SP25s Mark III with Sonotone 3559 cartridge.
- HFC38, Garrard SP25s Mark III with Goldring G850 cartridge.



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 12B	BEACON AMP.	-	-	9.5
2	BF 194	2nd F.M. I.F.	11.1	10.3	0.7	9	AC 12B	BEACON SWITCH	-	-	31
3	BF 194	3rd F.M. I.F.	9.5	8.5	1	10	AF 115		-	-	-
4	AC 12B	DECODER PRE-AMP.	4.6	4.5	13	11	AF 117	I.F. MODULE LP 1159	-	-	-
5	AC 12B	DECODER AMP. 19 Kc.	-	-	12.5	12	AF 117		-	-	-
6	AC 12B	DECODER GATE	-	-	201	10	AF 17B	R.F. AMP.	-	-	-
7	AC 12B	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 173	PRE. AMP. GRAM.	9.5	8.25	5	5	NKT 717	PHASE SPLITTER	15.25	15	-
102	BC 172	TONE CONTROL AMP.	9.2	7.5	6	6	NKT 212	DRIVERS	15.5	15.5	31
3	BC 172	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
 BOARD CONNECTOR PINS. (?) D.C. TEST VOL
 R.H. AMP. PIN NUMBERS.
 PUSHBUTTON SWITCH TO M.W. & A.F.C. ON
 NB. SKT 12 R.H. L.S. OUTPUT
 LOUSPEAKERS. RG'S ONLY
 RG B1 - 2 x 6 1/2" ROUND, DUAL CONE.
 RG B2 - 2 x 8" ROUND, 2 x 3 3/8" H.F.
 RG B3 - 2 x 8" ROUND.
 RG B5 - 2 x 6 1/2" ROUND, DUAL CONE.



FOR TUNER TRANSISTORS

e	b	c	TR	TYPE	FUNCTION	e	b	c
11.2	10.5	-	8	AC 12B	BEACON AMP.	-	-	9.5
11.1	10.3	0.7	9	AC 12B	BEACON SWITCH	-	-	31
9.5	8.5	1	10	AF 115	-	-	-	-
4.6	4.5	13	11	AF 117	I.F. MODULE LP 1159	-	-	-
-	-	12.5	12	AF 117	-	-	-	-
-	-	-	201	AF 178	R.F. AMP.	-	-	-
2.9	3	12.2	202	AF 115	OSC. MIXER	-	-	-

FOR AMPLIFIER TRANSISTORS

e	b	c	TR	TYPE	FUNCTION	e	b	c
9.5	8.25	5	5	NKT 717	PHASE SPLITTER	15.25	15	-
9.2	7.5	6	6	NKT 212	DRIVERS	15.5	15.5	31
14.25	13.5	1.2	7	AL 103	OUTPUT	-	-	15.5
1.1	1.2	15	8	AL 103	OUTPUT	15.5	-	31

L.H. AMPLIFIER ONLY SHOWN.
 COMPONENTS ON CASSIS WIRING - R201 & C201 ETC.
 BOARD CONNECTER PINS. (27) D.C. TEST VOLTAGES.
 R.H. AMP. PIN NUMBERS.
 PUSHBUTTON SWITCH TO M.W. & A.F.C. ON
 NB. SKT 12 R.H. L.S. OUTPUT.
LOUDSPEAKERS, RG'S ONLY
 RG B1 - 2 x 6 1/2" ROUND, DUAL CONE.
 RG B2 - 2 x 8" ROUND, 2 x 3 3/8" H.F.
 RG B3 - 2 x 8" ROUND.
 RG B5 - 2 x 6 1/2" ROUND, DUAL CONE.

NOTE: * R233/234 WILL BE FOUND ON MODELS MANUFACTURED

FIG. 19.

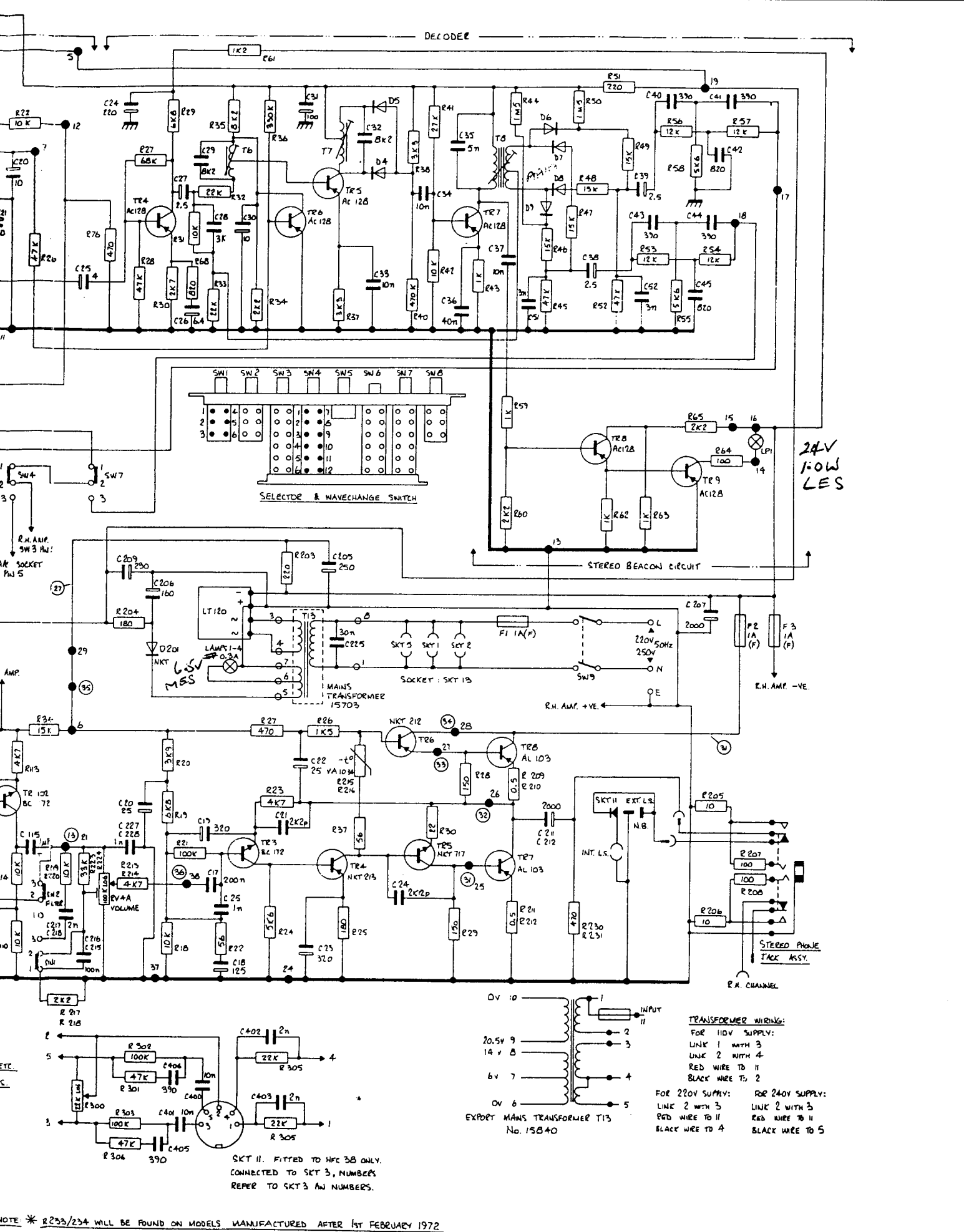


FIG. 19.

TECHNICAL DATA CASSETTE TAPE UNIT MODEL HFC38

TAPE DECK PHILIPS TYPE N2505/10

CHASSIS PARTS

Pos.	Part No.	Description
200	4822 443 60339	Cassette cover
201	4822 492 30652	Spring of cassette cover
202	4822 410 20983	Knob (pause/cassette cover)
203	4822 460 20057	Covering plate
204	4822 443 30226	Upper cabinet section
205	4822 403 50609	Slide
206	4822 502 30079	Self-tapping screw
207	4822 403 50494	Lever
208	4822 492 30651	Spring
209	4822 502 30063	Screw
210	4822 403 50485	Locking bracket
211	4822 530 70116	Retaining ring 4 dia.
212	4822 492 30651	Spring
213	4822 413 40492	Knob (volume control)
214	4822 403 50592	Slide for worm-wheel
215	4822 535 90784	Wormwheel assy
216	4822 410 21066	Knob (mains switch)
217	4822 466 90676	Slide
218	4822 347 10051	Recording level indicator

For front fastening system see Fig.27.

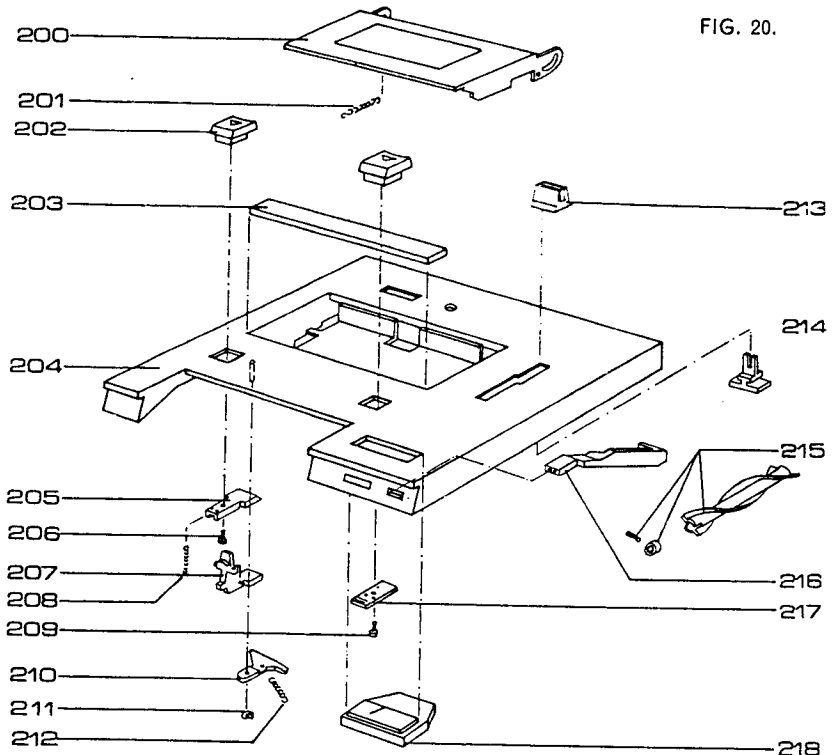


FIG. 20.

REPAIR INSTRUCTIONS

Removing from the cabinet

See notes on page 12 HFC38.
To remove the power section loosen screw A (if necessary, detach the on/off knob).
After sliding the mounting bracket at both ends out of the fixing cams, the complete power unit can be taken out of the upper section of the cabinet.
The recorder chassis can be taken off the upper cabinet after removal of screws B, C and D.

Replacing the wormshaft of the recording control

To gain better access to the wormshaft, it is recommended to remove the power unit (see above).
After removal of screws K and K' the bracket on which the potentiometer is mounted can be slid back and lifted out.
During refitting, set the slide knob to position '0' and turn the potentiometer with wormshaft fully clockwise.
Check that the slide control fits underneath the rib of the wormshaft.

Replacing the drive belt 92

Remove the bottom of the cabinet and cover screen.
Remove the bracket of flywheel bearing 123.
Replace belt 92.
After replacement, readjust the bracket of the flywheel bearing. See 'Mechanical adjustments and tests'.

Replacing flywheel 121 and winding friction clutch 108

Remove the bottom of the cabinet and cover screen.
Remove the bracket of flywheel bearing 123.
Remove nylon clamping ring 110.
Remove drive belt 92.
Remove the flywheel and the winding friction clutch at the same time.

Notes:

- 1 When assembling, be sure that the cam on friction bracket 108 engages the hook of spring 105.
- 2 Readjust the bracket of the flywheel bearing after assembly. See 'Mechanical adjustments and tests'.

Replacing right-hand reel disc 98

Uncase the recorder.
Remove cap 97.
Remove the reel disc from the reel-disc spindle.

Replacing the left-hand reel disc 83

Uncase the recorder and remove the pc board (screws E, E', F and L).
Remove clamping ring 11, counter belt 125, counter belt pulley 105 and clamping ring 104.
Remove the reel disc together with its spindle from the bearing.

Replacing the push-buttons

Uncase the recorder.
Remove spring 63.
Note When replacing the playback push-button, also remove the record and the rewind push-buttons. Straighten the bent part of bracket 76 (under the push-button).
Remove the push-button with a tilting movement.

Replacing collector 102

In the factory collector 102 is riveted onto the mounting-plate; the two rivet bushes also serve as terminals of the supply wires.
This method is less suitable for servicing. Therefore Philips Service supplies a special collector to which already two bushes with an insulating ring have been riveted (code number 4822 310 20218). This collector should now be glued to the mounting-plate with eg a two-component adhesive 4822 390 30014.
The supply wires can then be soldered to the 2 rivet bushes in the normal manner.

MECHANICAL PARTS DIAGRAM

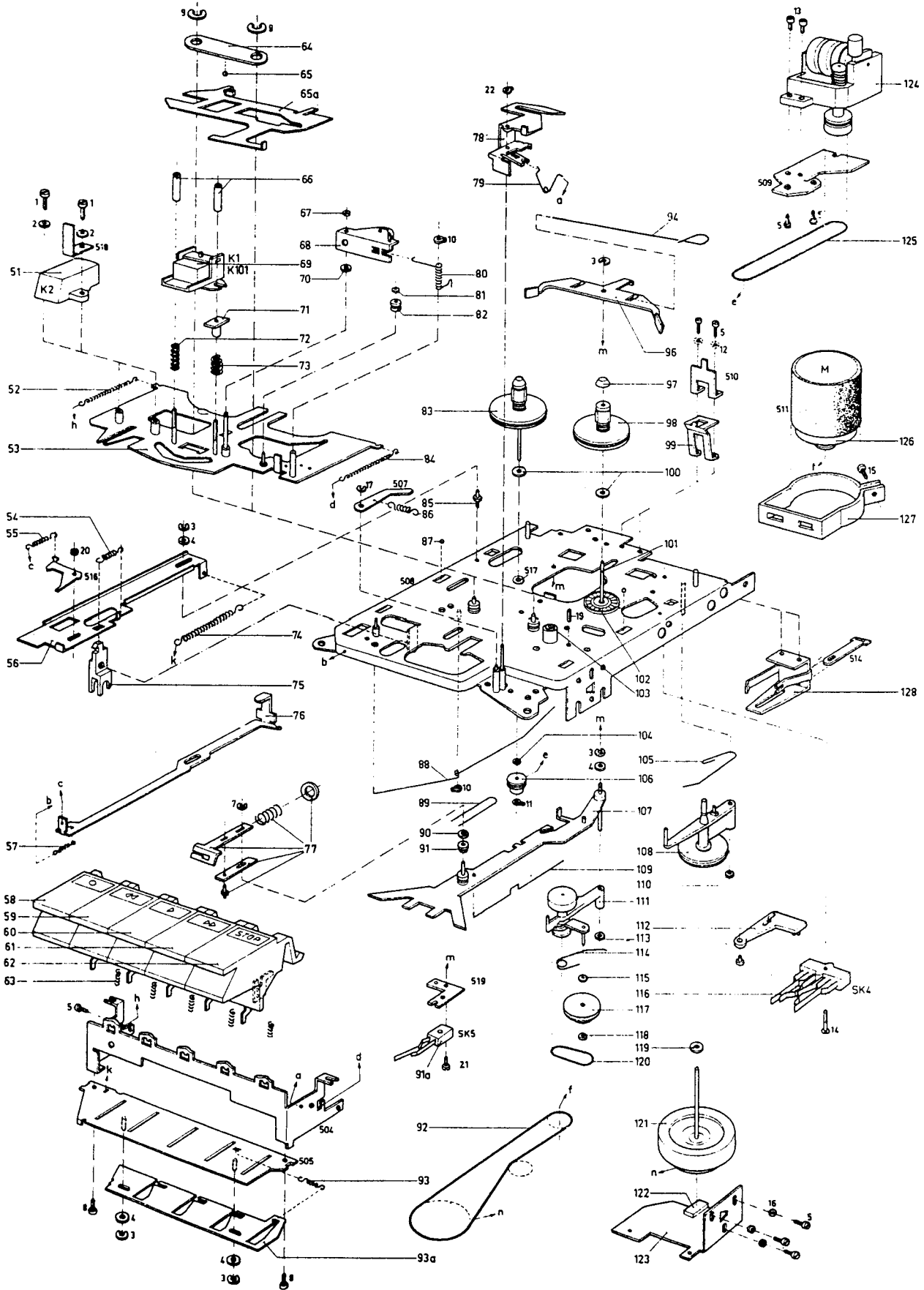


FIG. 21.

MECHANICAL PARTS LIST

Pos.	Part No.	Description	Pos.	Part No.	Description
1	4822 502 10679	Screw M2 x 5	78	4822 402 60322	Bracket
2	4822 532 10331	Ring, dia 2,2	79	4822 492 40416	Spring
3	4822 530 70043	Clamping ring, dia 2,3	80	4822 492 40117	Torsion spring
4	4822 532 10332	Ring, dia 3,2	81	4822 532 50268	Plastic clamping ring
5	4822 502 10951	Screw M2,5 x 5	82	4822 528 80409	Roller
6	4822 530 70114	Clamping ring, dia 2	83	4822 528 10227	Left-hand turntable
7	4822 530 70121	Clamping ring, dia 1,5	84	4822 492 30655	Tension spring
8	4822 502 10689	Screw M3 x 8	85	4822 500 10137	Screw
9	4822 530 70124	Clamping ring dia 4	86	4822 492 30777	Tension spring
10	4822 530 70115	Clamping ring dia 3	87	4822 520 40005	Ball bearing
11	4822 530 70174	Clamping ring dia 1,5	88	4822 492 40374	Spring
12	4822 530 80081	Ring, dia 2,8	89	4822 492 60344	Spring
13	4822 502 10558	Screw M3 x 5	90	4822 532 50265	Ring
14	4822 502 10682	Screw M2,5 x 12	91	4822 528 90081	Roller
15	4822 502 10672	Screw M2,5 x 8	91a	4822 278 90008	Switch SK6
16	4822 532 10215	Ring, dia 2,5	92	4822 358 30152	Belt
17	4822 530 70122	Clamping ring dia 1,9	93	4822 492 30778	Spring
18	4822 530 70116	Clamping ring dia 4	93a	4822 403 50591	Bracket
19	4822 535 80461	Setting screw M2,5 x 5	94	4822 492 40438	Spring
20	4822 530 70123	Clamping ring dia 3	96	4822 403 10112	Brake bracket
21	4822 502 10889	Screw M2,5 x 3	97	4822 462 70107	Cap of turntable
22	4822 530 70114	Clamping ring dia 2	98	4822 528 10225	Right-hand turntable
51	4822 249 40046	Erase head K2	99	4822 492 61534	Pressure spring
52	4822 492 30655	Tension spring	100	4822 532 50648	Ring
53	4822 403 50584	Slide	101	4822 535 90062	Turntable spindle
54	4822 492 50265	Tension spring	102	4822 310 20218	Collector SK3
55	4822 492 30251	Spring	103	4822 520 30225	Bearing bush of capstan
56	4822 403 10115	Bracket assembly	104	4822 530 70119	Ring
57	4822 492 30836	Tension spring	105	4822 492 60345	Spring
58	4822 410 20988	Push-button (recorder)	106	4822 528 90173	Pulley
59	4822 410 20985	Push-button (rewind)	107	4822 403 50576	Bracket
60	4822 410 20986	Push-button (play)	108	4822 528 20022	Wind friction
61	4822 410 20987	Push-button (wind)	109	4822 492 60912	Spring
62	4822 410 21059	Push-button (stop)	110	4822 532 50265	Plastic clamping ring
63	4822 492 50676	Tension spring	111	4822 403 20083	Bracket with idler wheel
64	4822 492 61314	Leaf spring	112	4822 403 30089	Switch bracket
65	4822 520 40005	Ball bearing	113	4822 532 50265	Plastic clamping ring
65a	4822 402 60321	Bracket	114	4822 492 60345	Spring
66	4822 520 30226	Bushing	115	4822 532 50262	Ring
67	4822 532 50268	Plastic retaining ring	116	4822 278 90223	Switch SK4
68	4822 403 40039	Pressure roller	117	4822 528 80147	Pulley
69	4822 249 10059	Rec/PB head K1/K101	118	4822 532 50262	Ring
70	4822 532 50043	Plastic ring	119	4822 532 50043	Ring
71	4822 532 10544	Bushing	120	4822 358 30077	Belt
72	4822 492 50273	Tension spring	121	4822 528 10228	Flywheel
73	4822 492 50808	Tension spring	122	4822 520 10219	Bearing plate
74	4822 492 30653	Spring	123	4822 520 10292	Bearing bracket
75	4822 403 50009	Lever	124	4822 349 50048	Counter
76	4822 403 50431	Bracket	125	4822 358 30148	Counter belt
77	4822 402 60587	Bracket (assembly)	126	4822 361 20063	Motor

MAINTENANCE

Lubricating instructions

Shell Alvania 2 (4822 390 20001)

Is used for lubricating the ball bearings; for example, the ball bearings between the mounting plate and slide 53.

Lubricant 10 (4822 390 10003)

Is used for lubricating the contact surfaces; for example, brackets 505, 107, 56.

After 500 working hours, clean the recorder and lubricate the most important lubrication points.

Tellus 33 (4822 390 10006)

Is used for lubricating spindles and bearings; for example, spindles of reel discs, bearings of idler wheels, the capstan bearing.

Silicone grease (4822 390 20011)

Is used for greasing plastic components; for example, knob 218, slides 205 and 219, bracket 210.

Clean with alcohol or methylated spirit

Erase head.

Record/playback head.

Cords.

Reel discs.

Idler wheels.

Capstan.

Pressure roller.

Required service tools

Jig for adjustment of the height of the record/playback head 4822 402 6

Test cassette for azimuth alignment of the record/playback head and checking the tape speed 8945 600 1

Spring pressure gauge 3-55 gm 4822 395 8

Spring pressure gauge 50-500 gm 4822 395 8

Pliers for retaining rings (with a straight nose) 4822 395 4

Suction soldering iron (220 V) 4822 395 1

Suction soldering iron (110 V) 4822 395 1

MECHANICAL PARTS LIST

MOI

Description	Pos.	Part No.	Description
Screw M2×5	78	4822 402 60322	Bracket
Ring, dia 2,2	79	4822 492 40416	Spring
Clamping ring, dia 2,3	80	4822 492 40117	Torsion spring
Ring, dia 3,2	81	4822 532 50268	Plastic clamping ring
Screw M2,5×5	82	4822 528 80409	Roller
Clamping ring, dia 2	83	4822 528 10227	Left-hand turntable
Clamping ring, dia 1,5	84	4822 492 30655	Tension spring
Screw M3×8	85	4822 500 10137	Screw
Clamping ring dia 4	86	4822 492 30777	Tension spring
Clamping ring dia 3	87	4822 520 40005	Ball bearing
Clamping ring dia 1,5	88	4822 492 40374	Spring
Ring, dia 2,8	89	4822 492 60344	Spring
Screw M3×5	90	4822 532 50265	Ring
Screw M2×12	91	4822 528 90081	Roller
Screw M2,5×8	91a	4822 278 90008	Switch SK6
Ring, dia 2,5	92	4822 358 30152	Belt
Clamping ring dia 1,9	93	4822 492 30778	Spring
Clamping ring dia 4	93a	4822 403 50591	Bracket
Setting screw M2,5×5	94	4822 492 40438	Spring
Clamping ring dia 3	96	4822 403 10112	Brake bracket
Screw M2,5×3	97	4822 462 70107	Cap of turntable
Clamping ring dia 2	98	4822 528 10225	Right-hand turntable
Erase head K2	99	4822 492 61534	Pressure spring
Tension spring	100	4822 532 50648	Ring
Slide	101	4822 535 90062	Turntable spindle
Tension spring	102	4822 310 20218	Collector SK3
Spring	103	4822 520 30225	Bearing bush of capstan
Bracket assembly	104	4822 530 70119	Ring
Tension spring	105	4822 492 60345	Spring
Push-button (recorder)	106	4822 528 90173	Pulley
Push-button (rewind)	107	4822 403 50576	Bracket
Push-button (play)	108	4822 528 20022	Wind friction
Push-button (wind)	109	4822 492 60912	Spring
Push-button (stop)	110	4822 532 50265	Plastic clamping ring
Tension spring	111	4822 403 20083	Bracket with idler wheel
Leaf spring	112	4822 403 30089	Switch bracket
Ball bearing	113	4822 532 50265	Plastic clamping ring
Bracket	114	4822 492 60345	Spring
Bushing	115	4822 532 50262	Ring
Plastic retaining ring	116	4822 278 90223	Switch SK4
Pressure roller	117	4822 528 80147	Pulley
Rec/PB headK1/K101	118	4822 532 50262	Ring
Plastic ring	119	4822 532 50043	Ring
Bushing	120	4822 358 30077	Belt
Tension spring	121	4822 528 10228	Flywheel
Tension spring	122	4822 520 10219	Bearing plate
Spring	123	4822 520 10292	Bearing bracket
Lever	124	4822 349 50048	Counter
Bracket	125	4822 358 30148	Counter belt
Bracket (assembly)	126	4822 361 20063	Motor

Pause me
When the buttons, b
Besides, b
reel disc. I
short-circu
is prevente
Stop push
This brack
position w
To ensure
winding, a
These con
and 'Playb

During prc
replaced b
The new w
removing t
example, tl
The code n
Item Des
300 Cor
301 Ret
302 Nyl
303 Spr
304 Pul
305 Felt

MAINTENANCE

(0001)
ball bearings; for example, the ball
mounting plate and slide 53.

(03)
the contact surfaces; for example,
clean the recorder and lubricate the
points.

indles and bearings; for example,
rings of idler wheels, the capstan

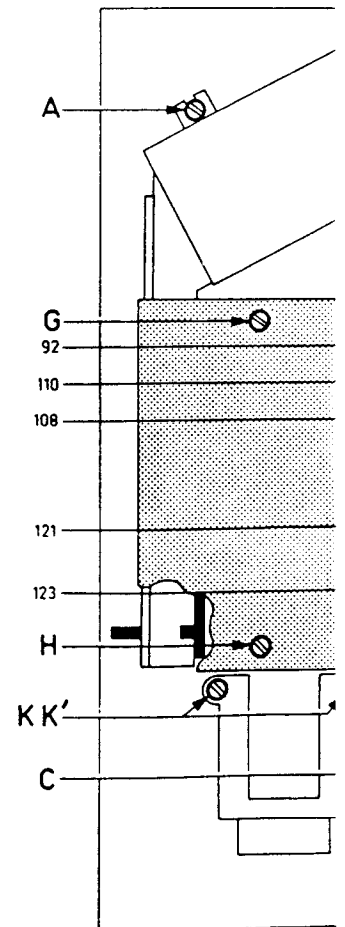
(20011)
ic components; for example, knob
cket 210.

ethylated spirit

Reel discs.
Idler wheels.
Capstan.
Pressure roller.

Required service tools

Jig for adjustment of the height of the record/playback head	4822 402 60245
Test cassette for azimuth alignment of the record/playback head and checking the tape speed	8945 600 11301
Spring pressure gauge 3-55 gm	4822 395 80029
Spring pressure gauge 50-500 gm	4822 395 80028
Pliers for retaining rings (with a straight nose)	4822 395 40006
Suction soldering iron (220 V)	4822 395 10018
Suction soldering iron (110 V)	4822 395 10019



MODIFIED MECHANICAL PARTS

Pause mechanism (see Fig. 21)

When the pause knob is pushed in the direction of the push-buttons, bracket 78 lifts pressure roller 68 off capstan 121. Besides, bracket 65a lifts friction clutch 108 off the right-hand reel disc. Bracket 65a also operates switch SK6. This switch short-circuits the automatic stop circuit. In this way the motor is prevented from stopping in position 'Pause'.

Stop push-button 62 is provided with an additional bracket. This bracket causes the pause knob to return to its original position when the stop push-button is depressed.

To ensure that the motor will stop after winding or fast rewinding, a contact SKC2 is connected in series with SK6. These contacts (501-502) are closed only in positions 'Record' and 'Playback'.

During production the winding friction 4822 528 20022 will be replaced by a winding friction of another type.

The new winding friction (see Fig. 23H) can be disassembled by removing the retaining ring. It is then possible to replace, for example, the felt ring only.

The code numbers of the parts of the winding friction are:

Item	Description	Code number
300	Complete winding friction	4822 528 20162
301	Retaining ring	4822 530 70119
302	Nylon ring	4822 532 50262
303	Spring	4822 492 50911
304	Pulley	4822 528 70231
305	Felt ring	4822 532 50855

UNDERSIDE OF CHASSIS

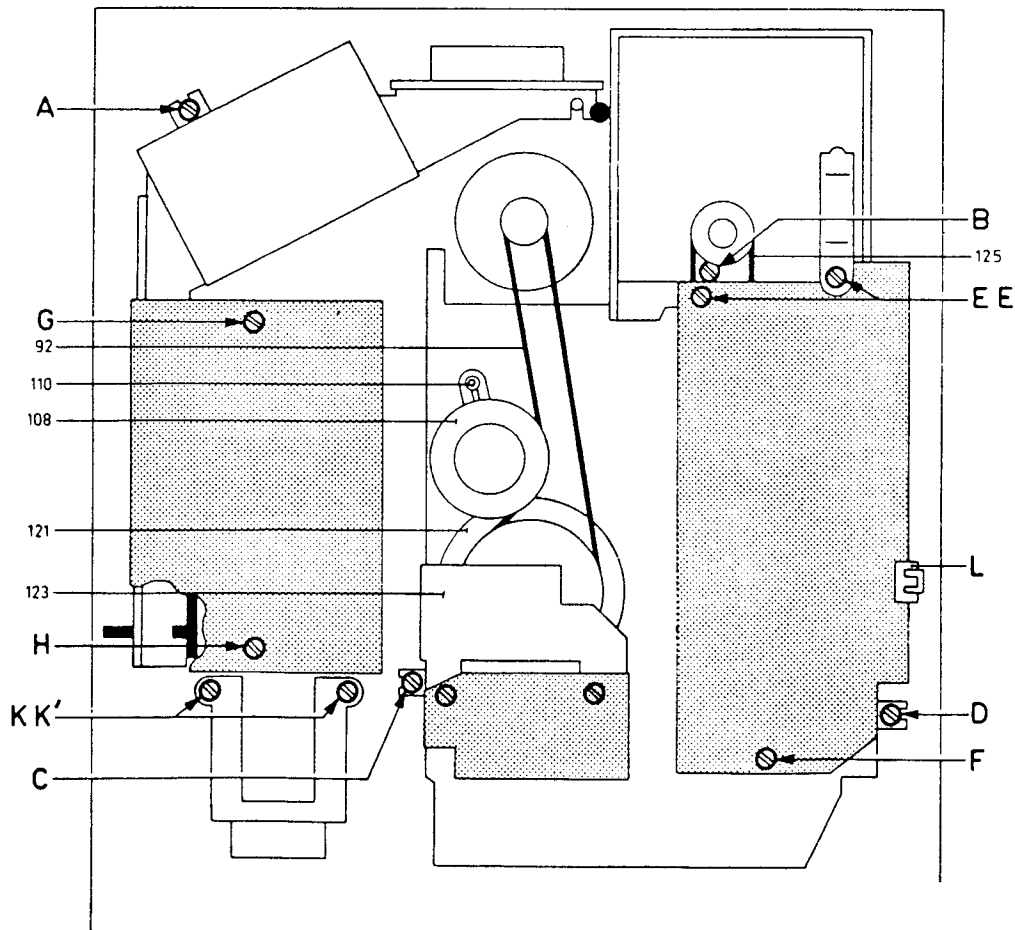


FIG. 22.

60245

11501

80029

80028

40006

10018

10019

MECHANICAL ADJUSTMENT DIAGRAMS

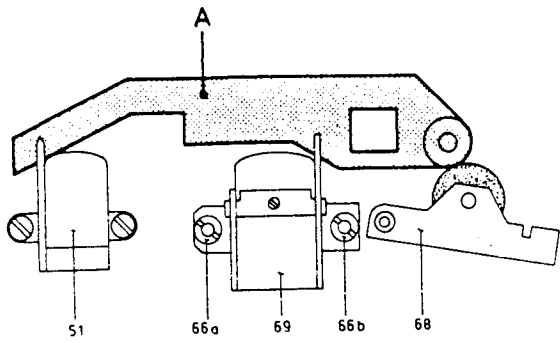


Fig. 23A.

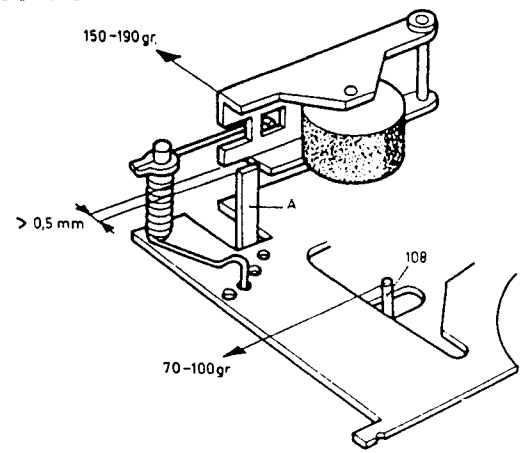


Fig. 23B.

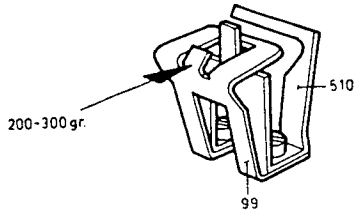


Fig. 23C.

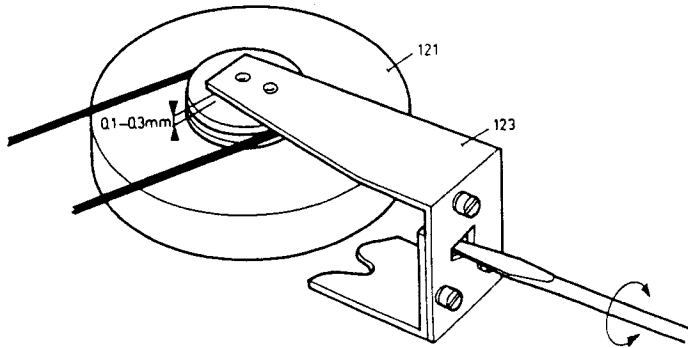


Fig. 23E.

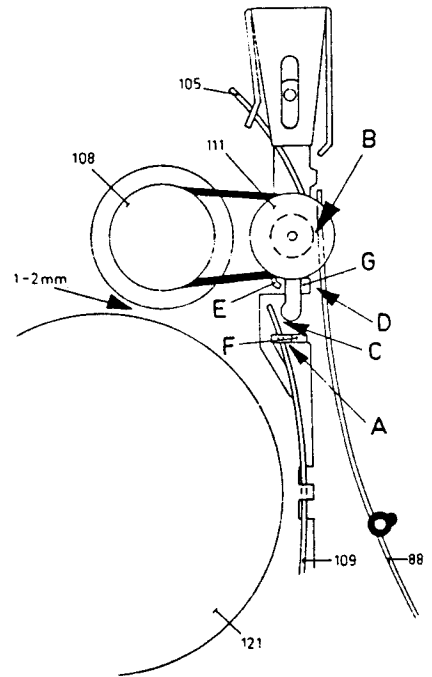


Fig. 23D.

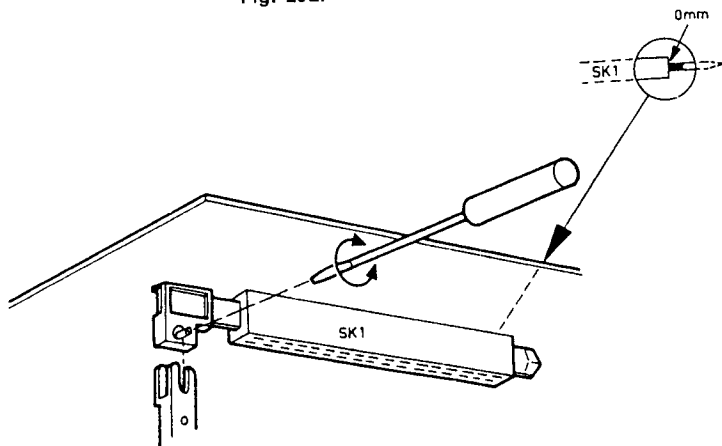


Fig. 23F.

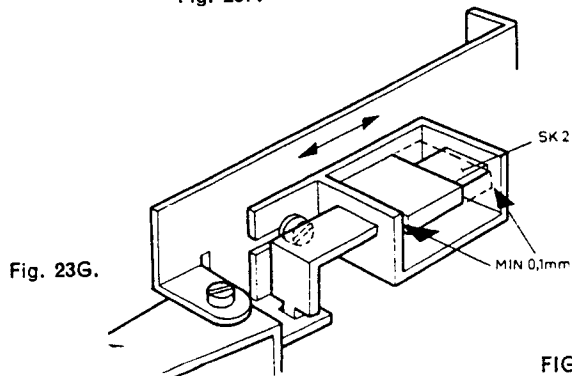


Fig. 23G.

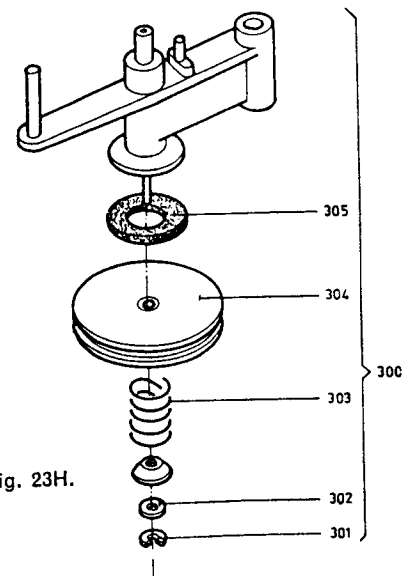


Fig. 23H.

FIG. 23.

MECHANICAL ADJUSTMENTS AND TESTS

TAPE ADJUSTMENTS

Adjustment of record/playback head 69 (see Fig. 23A)

a Height adjustment of right-hand side

For this adjustment, a special jig is used (see A in Fig. 23A). Uncase the recorder.

It is assumed that the capstan is in a perpendicular position. Set the recorder to position 'Playback'.

Slide jig A over the capstan while pressure roller 68 is pulled back. The jig must be slid over the capstan so far that the capstan is precisely in line with the tape guides of the erase head and the record/playback head.

If the record/playback head has been adjusted to the correct height, the jig will be slid exactly between the tape guides of the above-mentioned heads. If this is not the case (the record/playback head is too high or too low) the head may be adjusted with nut 66B. (After that, lockpaint nut 66B.)

b Azimuth alignment (left-hand side)

Insert a test cassette (6300 Hz); code number 8945 600 11501. Connect a valve voltmeter to diode output BU1 between points 3 and 2.

Set the recorder to position 'Playback'.

Adjust the record/playback head with nut 66A so that a maximum output voltage is measured. (Make a note of this value.)

Connect the valve voltmeter to points 5 and 2 of BU1.

Measure the output voltage and adjust for maximum value with nut 66A. (Make a note of this value, too.)

Adjust the record/playback head to the average of the two values referred to above so that the output voltages of the two channels are equally high. (After that, lockpaint nut 66A.)

Note For the azimuth alignment the tape deck need not be removed. Nut 66A is accessible after dust cover 203 has been removed.

Checking the winding friction 108 (see Fig. 23B)

It may occur that the tape in the cassette is irregularly or not wound onto the right-hand turntable, causing the tape to be damaged.

This fault may be caused by:

a Incorrect pressure of the pulley of idler bracket 108 onto the right-hand turntable

This force must be between 70 and 100 g, depending on the winding friction.

This is measured as follows:

Make the auto-stop circuit inoperative by short-circuiting the collector and emitter of TS472.

Connect an mA-meter between point 8 of SK4 and the motor control board (B36 in wiring diagram).

Set the recorder without cassette to position 'Play' and read the current consumption.

Block the right-hand turntable and read the correct consumption. This must be 8–16 mA.

If the current increase is less than 8 mA, the pressure of the pulley of idler bracket 108 onto the right-hand turntable must be reduced to min 70 g (see Fig. 23B).

If the current increase is more than 16 mA the pressure must be increased to max 100 g (see Fig. 23B).

The pressure can be adjusted by slightly bending wire spring 105.

If no current increase of 8–16 mA can be obtained in this way, the probable cause of the fault is:

b Winding friction too low

It is recommended to replace the friction felt or, if necessary, also the spring and the friction wheel (see Fig. 23H).

If the friction unit cannot be disassembled, replace the complete winding friction (see Repair Instructions).

c Too much friction in the cassette

When the current increase stated under para a is between 8 and 16 mA, the fault is caused by too high a friction of the tape in the cassette.

Checking the pressure force of pressure roller 68 (see Fig. 23B)

In position 'Playback', the force required to lift the pressure roller just off the capstan is between 150 and 190 g. This force is adjusted when the torsion spring is hooked in another mounting hole.

In position 'Playback', the clearance between the pressure roller lever and cam A must be at least 0.5 mm. This clearance is adjusted when cam A is bent.

Checking hold-down spring 99 (see Fig. 23C)

The force with which the cassette is held down, should be between 200 and 300 g. This is measured with a spring pressure gauge (see Fig. 23C).

CHECKING AND ADJUSTING THE DRIVE MECHANISM

Checking the rewind mechanism (see Fig. 23D)

a In position 'Playback' the clearance between the flywheel and idler wheel 108 should be 1–2 mm. Adjust this clearance by bending tag E.

b In position 'Rewind' the clearances A and B should be at least 0.2 mm. Adjust these clearances by bending tags F and G.

c In position 'Wind' the clearances C and D should be at least 0.2 mm. Adjust these clearances by bending tags F and G.

d In the positions 'Playback', 'Wind' and 'Rewind' the brake bracket must abut on the two stop tags on the mounting plate. The clearance between the reel discs and the brake bracket should then be at least 0.3 mm.

Adjusting the flywheel (see Fig. 23E)

Place the recorder upside down.

In this position the clearance between the underside of the capstan and the bearing plate should be 0.1–0.3 mm.

Adjust this clearance by displacing bracket 123 with a screwdriver.

Adjusting the motor

The height of the motor must be so adjusted that the motor pulley, the belt grooves of the flywheel and the friction clutch are flush.

ADJUSTMENTS OF THE SWITCHES

Switch SK1 (see Fig. 23F)

Uncase the recorder.

Depress the push-button 'Record'.

Adjust the slide of switch SK1 so that the clearance between the first marking spot on the slide and the casing of the switch is 0 mm.

(The marking spot is visible through a hole in the pc board.)

Adjust this clearance by turning the spindle of the slide switch with the aid of a screwdriver.

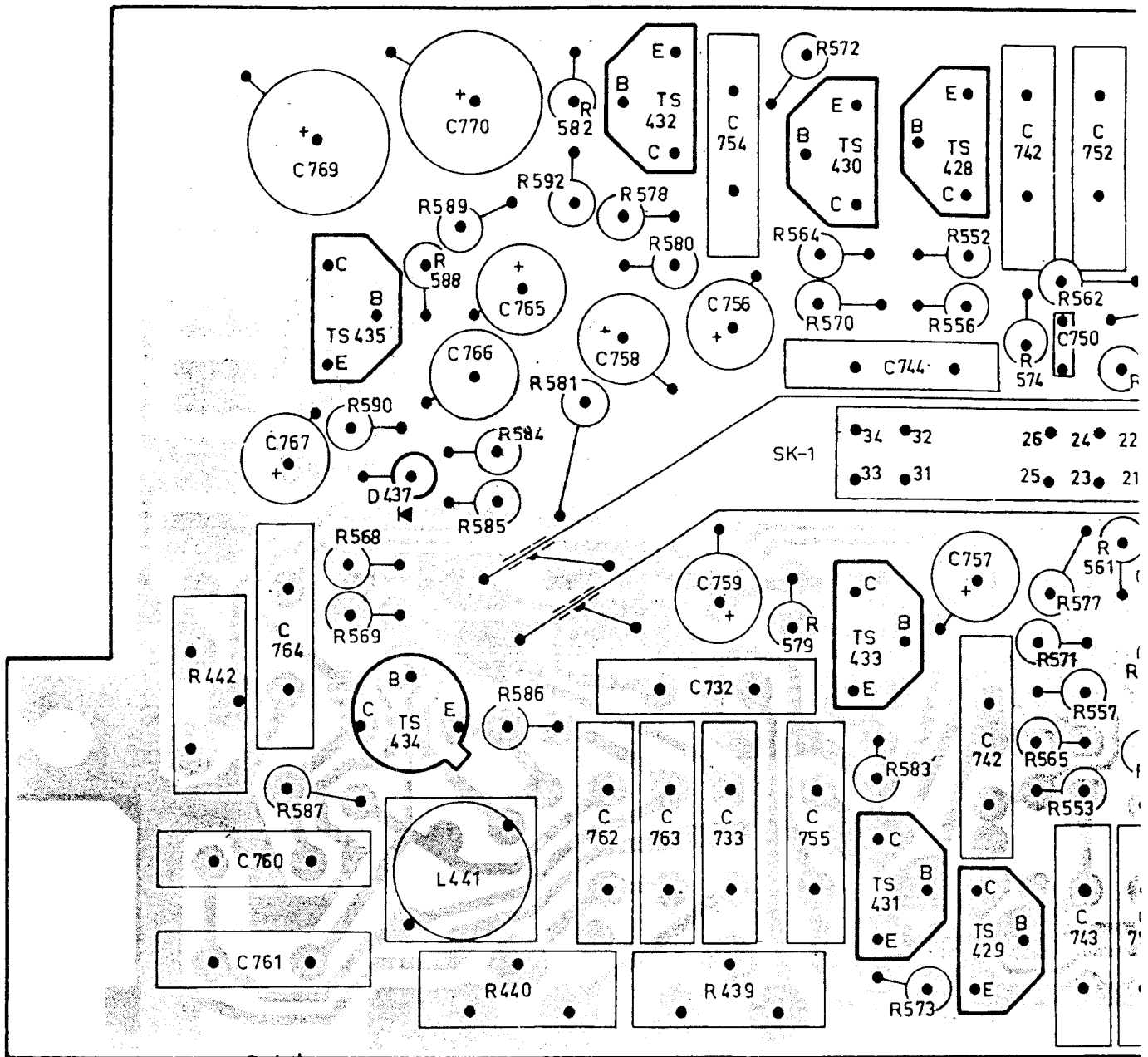
Switch SK2 (see Fig. 23G)

Set the recorder to rest position (no button depressed).

The clearance between the casing of the switch (front part) and the slide should be at least 0.1 mm.

Set the recorder to position 'Playback'.

The clearance between the casing of the switch (back part) and the slide should now also be at least 0.1 mm. Adjust this clearance by displacing the casing of the switch.



ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment of bias current

When adjusting the bias current, a compromise between the frequency range and the distortion must be made. If the bias current is too small, the result will be distortion. On the other hand, the high tones will be attenuated too much if the bias current is too large.

Set the recorder to position 'Record'.

The voltage on test points 6BU1 and 6BU2 should be between 7.5-25 mV. The value can be adjusted with trimming potentiometers R439 (R440).

The bias current is mostly adjusted in a correct way if the voltage on the test points is about 17 mV.

Checking the erase oscillator voltage

Set the recorder to position 'Record'.

The voltage across the erase head should be at least 15 V at a frequency ranging from 50 to 70 kHz.

Adjusting the record indicator

Set the recorder to position 'Record'.

Switch off the oscillator by connecting the base of TS434 to earth.

Interconnect PU inputs 3BU2 and 5BU2.

Connect a tone generator (frequency 1000 Hz) to the inter-connected PU inputs.

Adjust the output voltage of the tone generator so that the voltage on the test points (6BU1 and 6BU2) is 3.3 mV.

If the gain factors of the two channels are unequal, the voltage on the two test points are, of course, also unequal.

In this case the output voltage of the tone generator should be so adjusted that the average of the voltages on the two test points is 3.3 mV.

Adjust with potentiometer R442 the pointer deflection of ME403 so that the pointer is positioned on the separation between the red and the white plane of the scale graduation.

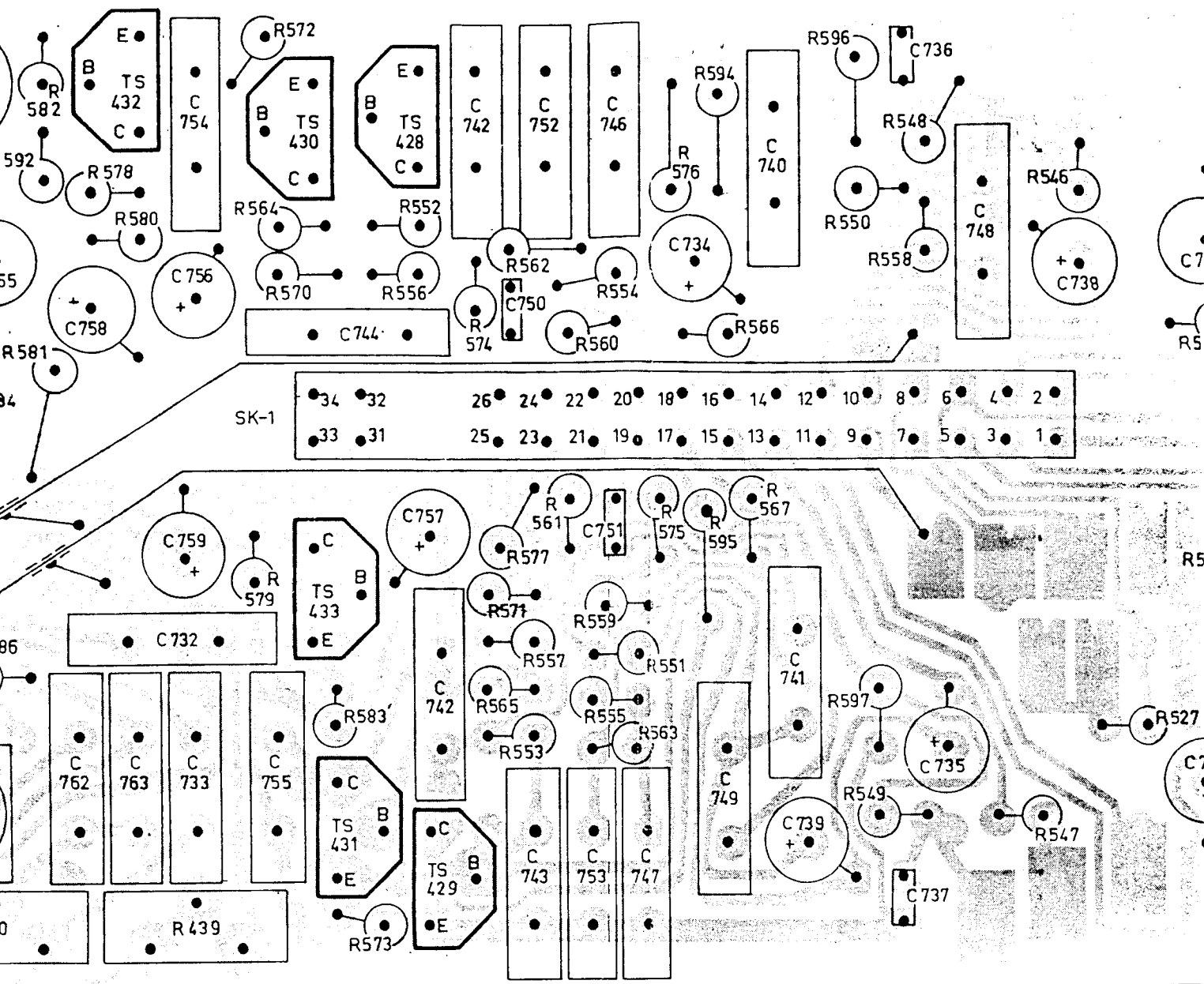
Checking the line-output sensitivity (left-hand channel)

Set the recorder to position 'Playback'.

Connect a tone generator via a resistor of $39 \text{ k}\Omega \pm 1\%$ to test point 6BU1, and apply a 15 mV signal (frequency 1000 Hz).

On line output 3BU1 there should be a voltage of 16-27 mV.

The line output of the right-hand channel is checked in the same way. The tone generator is then connected to 6BU2, and the voltage is measured on line output 5BU1.



PHYSICAL MEASUREMENTS

AND ADJUSTMENTS

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Connect a tone generator (frequency 1000 Hz) to the inter-connected PU inputs.

Adjust the output voltage of the tone generator so that the voltage on the test points (6BU1 and 6BU2) is 3-3 mV.

If the gain factors of the two channels are unequal, the voltages on the two test points are, of course, also unequal.

In this case the output voltage of the tone generator should be so adjusted that the average of the voltages on the two test points is 3-3 mV.

Adjust with potentiometer R442 the pointer deflection of ME403 so that the pointer is positioned on the separation between the red and the white plane of the scale graduation.

Checking the line-output sensitivity (left-hand channel)

Set the recorder to position 'Playback'.

Connect a tone generator via a resistor of $39\text{ k}\Omega \pm 1\%$ to test point 6BU1, and apply a 15 mV signal (frequency 1000 Hz).

On line output 3BU1 there should be a voltage of 16-27 mV.

The line output of the right-hand channel is checked in the same way. The tone generator is then connected to 6BU2, and the voltage is measured on line output 5BU1.

Checking the recording sensitivity (left-hand channel)

Set the recorder to position 'Record'.

Connect a tone generator to PU input 3BU2, and apply a 70 mV signal (frequency 1000 Hz).

On test point 6BU1 there should be a voltage of 2.5-4 V

The recording sensitivity of the right-hand channel is checked in the same way. The tone generator is then connected to 5BU2, and the voltage is measured on test point 6BU2.

Checking the automatic stop circuit

When the automatic stop circuit does not function properly, first check whether the electronic part or the rotating switch is defective, by measuring the voltage on junction C826, R667.

On this test point there should be a voltage of 3-4 V. If this value is measured, the collector and the rotating switch are performing well; the fault must then be traced in the electronic part. Should the value measured differ from the above-mentioned value, the collector and the rotating switch must be checked and, if necessary, replaced.

Checking the tape speed

The tape speed may be checked with a test cassette on which at every other 4.76 m an 800 Hz signal has been modulated; code number 8945 600 11501.

Method

Put a test cassette in the recorder.

Set the recorder to position 'Playback'.

Between two successive signals 98-102 seconds should elapse.

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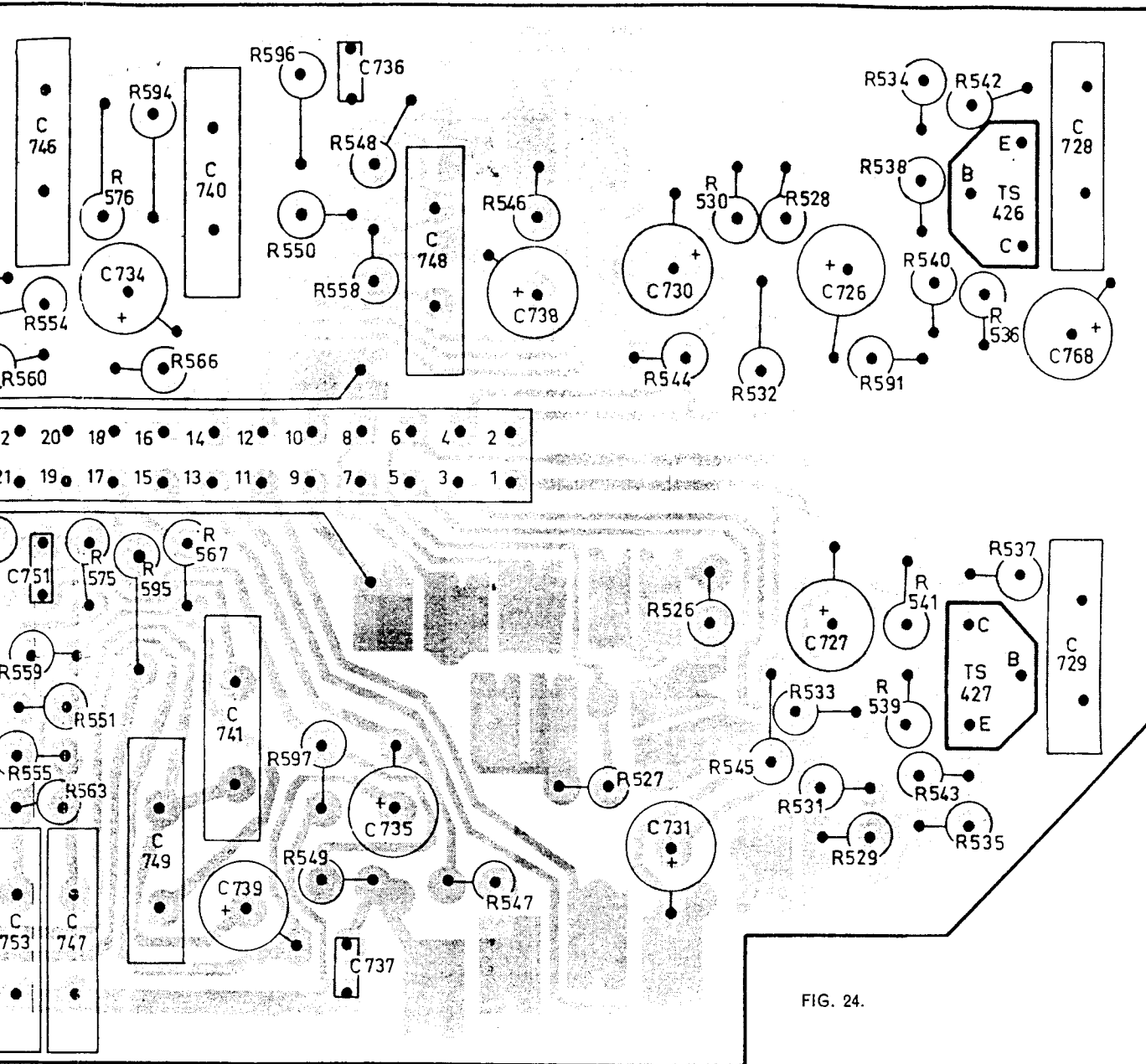


FIG. 24.

Checking the recording sensitivity (left-hand channel)

Set the recorder to position 'Record'.
 Connect a tone generator to PU input 3BU2, and apply a 70 mV signal (frequency 1000 Hz).
 On test point 6BU1 there should be a voltage of 2.5-4 V
 The recording sensitivity of the right-hand channel is checked in the same way. The tone generator is then connected to 5BU2, and the voltage is measured on test point 6BU2.

Checking the automatic stop circuit

When the automatic stop circuit does not function properly, first check whether the electronic part or the rotating switch is defective, by measuring the voltage on junction C826, R667.

On this test point there should be a voltage of 3-4 V. If this value is measured, the collector and the rotating switch are performing well; the fault must then be traced in the electronic part. Should the value measured differ from the above-mentioned value, the collector and the rotating switch must be checked and, if necessary, replaced.

Checking the tape speed

The tape speed may be checked with a test cassette on which at every other 4.76 m an 800 Hz signal has been modulated; code number 8945 600 11501.

Method

Put a test cassette in the recorder.
 Set the recorder to position 'Playback'.
 Between two successive signals 98-102 seconds should elapse.

When the tape speed is too low, first check whether pressure roller, winding friction clutch, flywheel, etc. run freely. If so, the speed can be adjusted with R481 on the motor control pc board.

SPECIFICATION NOTES

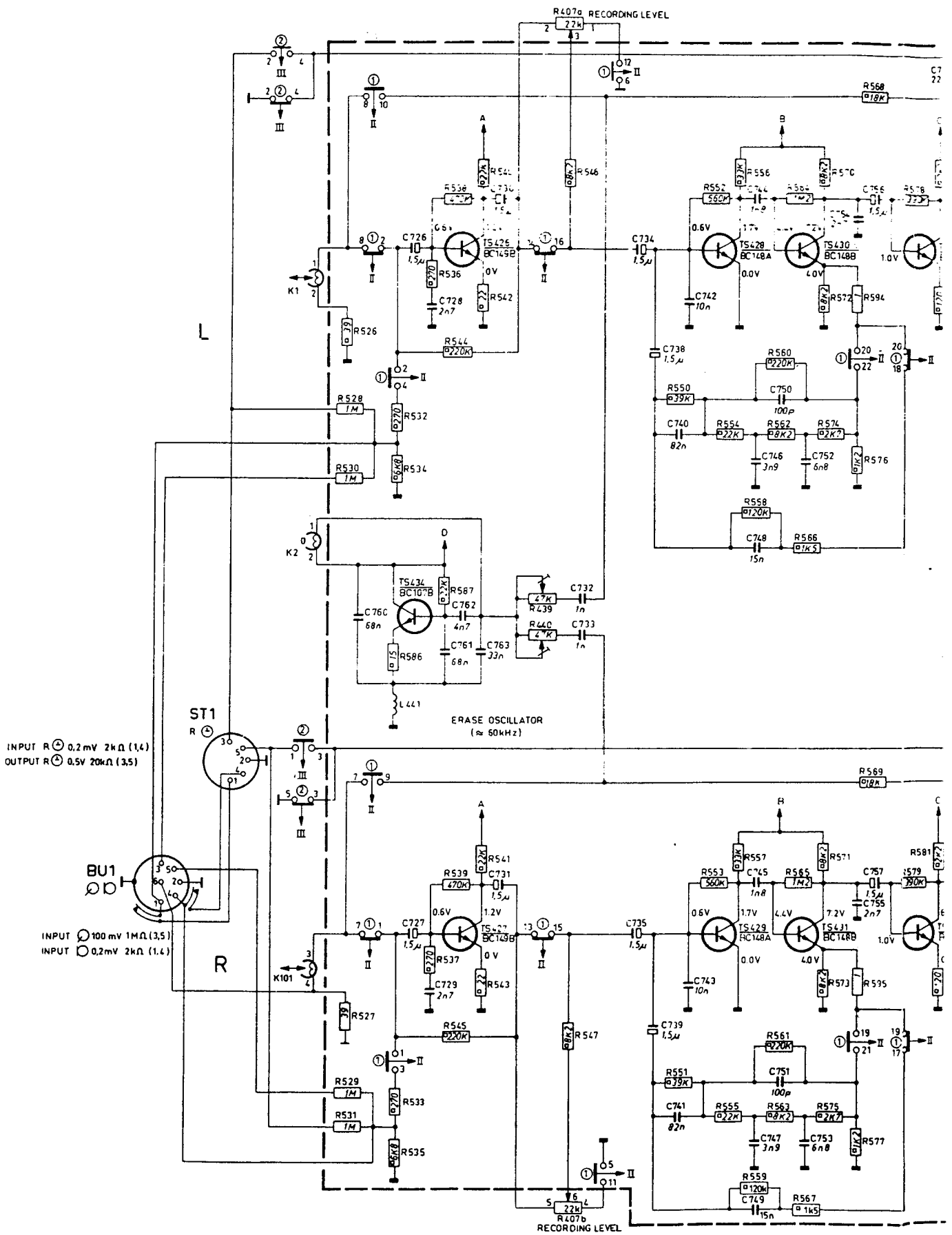
N2505/10 is a stereo cassette recorder chassis with pre-amplifier, suited for horizontal and vertical mounting.

TECHNICAL DATA

Mains voltage	110-127-220-240 V.
Mains frequency	50-60 Hz.
Power consumption	5 W
Tape speed	4.75 cm/sec (1 7/8 ips) ±2%.
Number of tracks	2 x 2 (stereo).
Track width	2 x 0.6 mm.
Tape width	3.81 mm (in compact cassette).
Frequency response	60-10,000 Hz within 6dB.
Diode-output voltage	≥0.5 V (20 kΩ).

Note The voltages indicated have been measured with a valve voltmeter with respect to chassis.

R	526	527	528	532	536	544	538	540	439	407a	551	550	552	554	556	562	564	572	573	570	568	578	571	580
	528	529	534	533	537	545	539	541	440	407b		553	558	557	563	565	575	574	571	569	576	582		
	530	531	535	587	542	543	527			546		555	559	561	560	567	594	577			595			583
C:			726	728		730				732	734	738		742	748	744	750	752		754	756			
			760	727		761	762	763		733	735	739		743	749	745	751	753		755	757			
						729	731							740	741	746	747							
MISC:	BU1	ST1	K1	R2	K101	L441	TS434	TS426	TS427			TS428	TS429					TS430	TS431			TS43	TS43	



526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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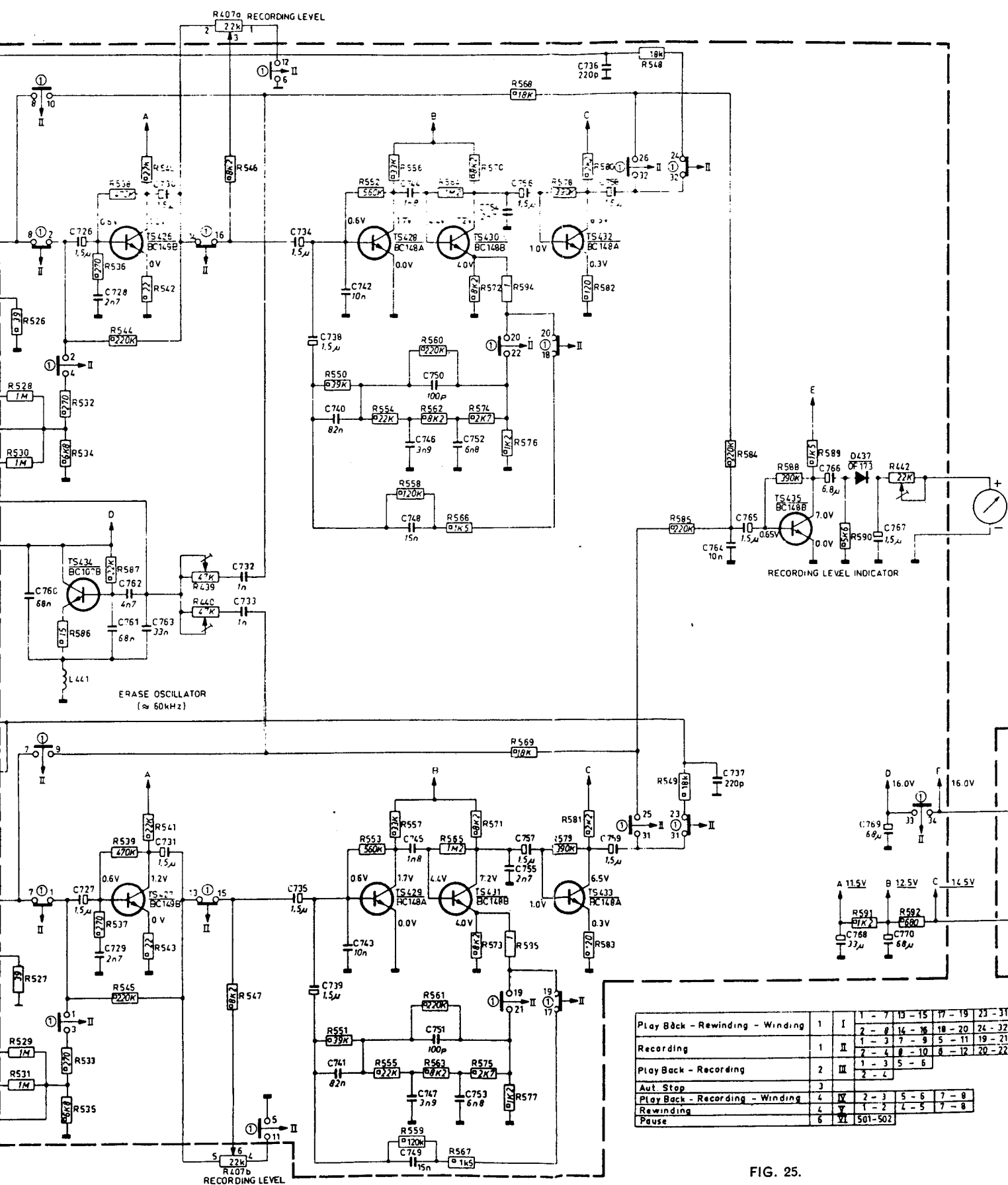
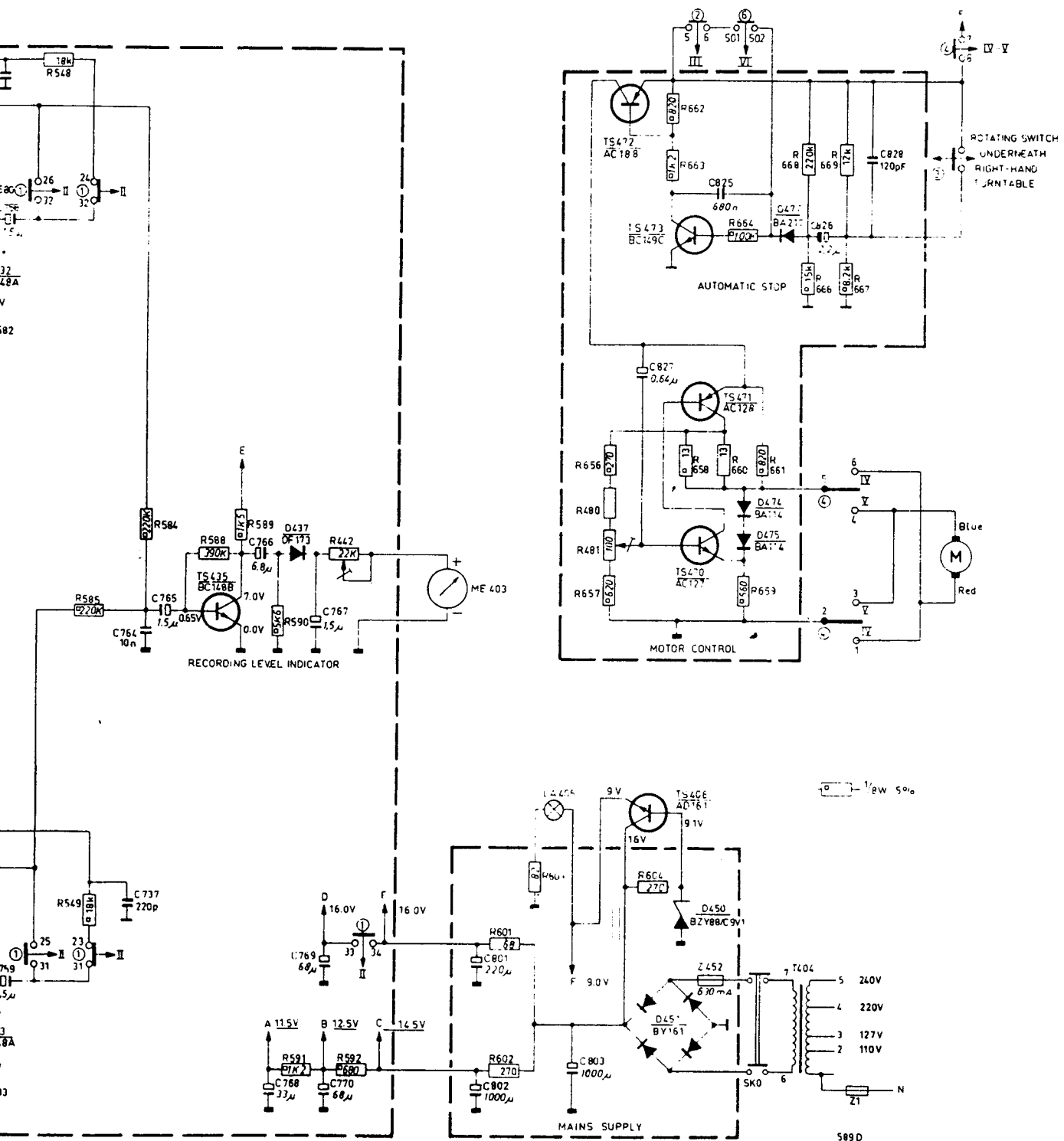


FIG. 25.

581	548	584	588	589	590	447	601	603	656 480	662 663 664	668 666	669 667	
	585	549		591	592		602		657 481	604 658 660 659	661		
58	736	764 765	766	769	770		801	803	827			826 828	
59		737	768	769	770		802						
			TS 435	D 437			ME 403	LA 405	TS 472	TS 473	TS 471	D 477	T 404
									TS 470	TS 406	TS 470	D 450	D 474
									D 451	SK0	Z 452	D 475	Z1
													M

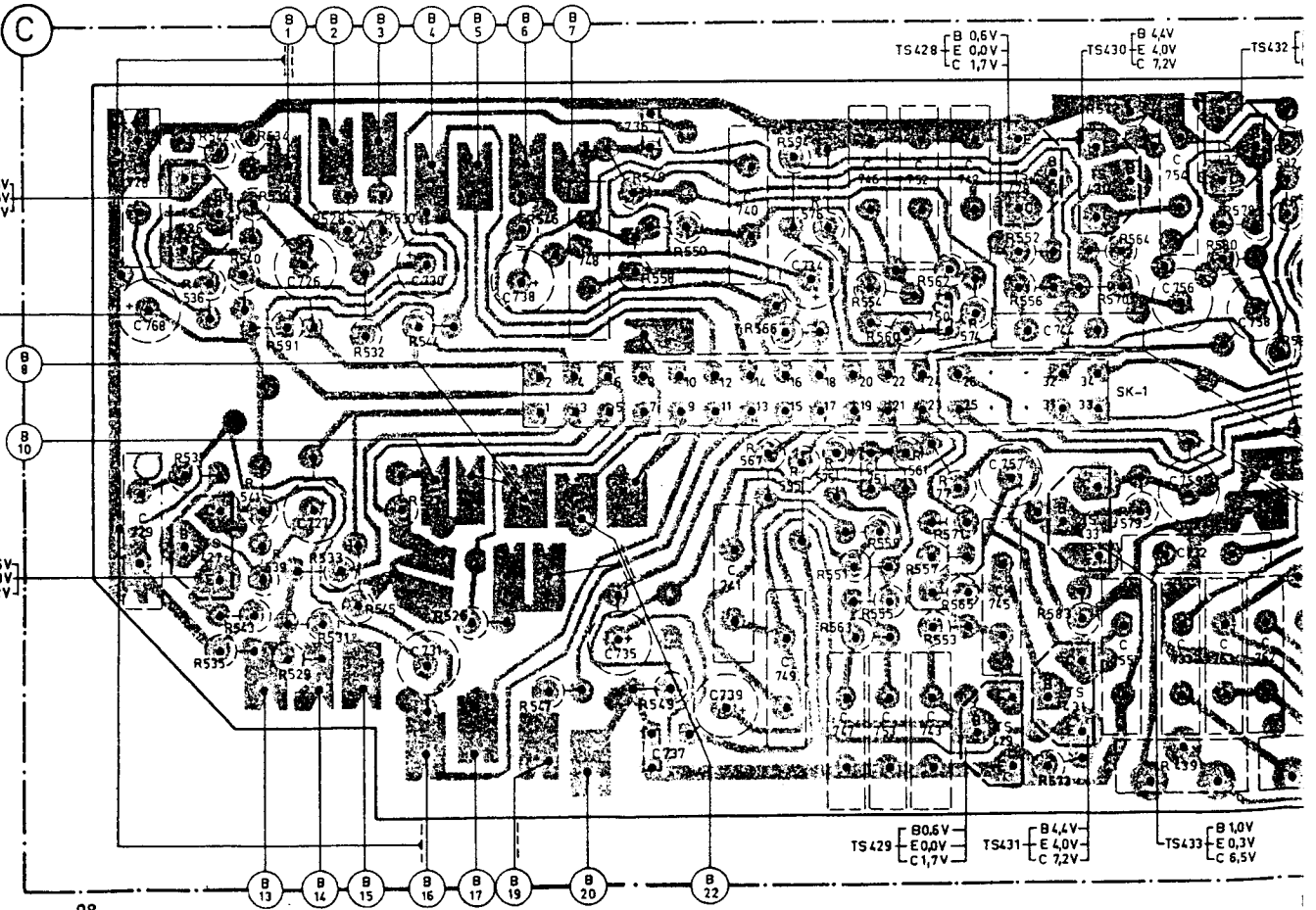
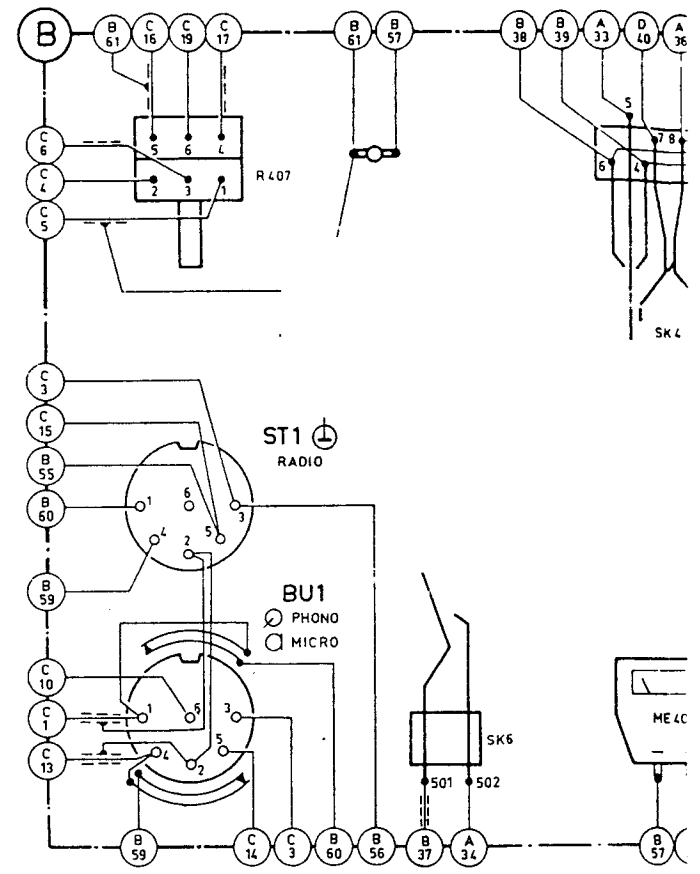
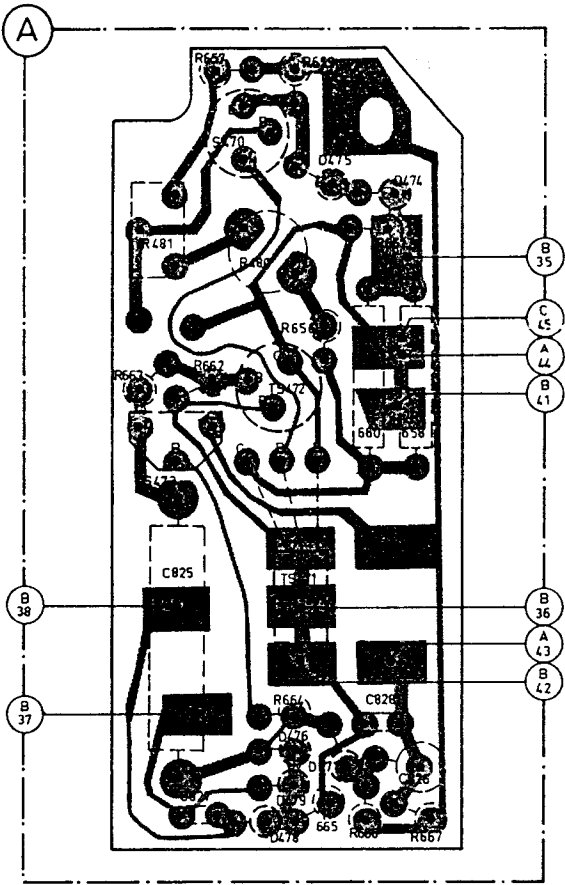


Play Back - Rewinding - Winding	1	I	1 - 7	13 - 15	17 - 19	23 - 31	
Recording	1	II	2 - 8	14 - 16	18 - 20	24 - 32	
			1 - 3	7 - 9	5 - 11	19 - 21	25 - 31
Play Back - Recording	2	III	2 - 4	8 - 10	6 - 12	20 - 22	28 - 32
Aut. Stop	3		1 - 3	5 - 6			
Aut. Stop	3		2 - 4				
Play Back - Recording - Winding	4	IV	2 - 3	5 - 6	7 - 8		
Rewinding	4	V	1 - 2	4 - 5	7 - 8		
Pause	6	VI	501 - 502				

FIG. 25.

Note The voltages indicated have been measured with a valve voltmeter with respect to chassis.

R:	537 481 480 657 541 659 656 665 661 658 660 526 527	546	548	558 550	594 407 576 554 560 562	574 561 552	579 572	578 586 587			
	662 663 664 538 539 528 666	530 667	566	575 551 559 557 577 565	556	579 572	580 440 597	581			
	542 534 540 591	533	547	567 595	563 555 553 571	573 583	570 439				
	535 536 543 529	531 532 545 544									
C:	728 768	825 727	826 730	738	735	736 741 740	734 751 746	752 750 745	744	759 732 754	758 76
	729 892	827 726	731		737	739 749	747 753	743	757	755 733	756 763
MISC:	TS 471	TS 470	D 475	D 474		BU1	TS 428	SK 6	TS 430	TS 432	SK 4
	TS 426	TS 472	TS 473	D 477		ST 1	TS 429	TS 431	TS 433		ME 403
	TS 427	D 478	D 476								



547	549	558 550	566 575 551 558 557 577 565	567 595	563 555 553 571	573 583	570 439	579 572	580 440 592 588 568	581 584 585	587 442
730	738	735	736 741 740	734 751 746	752 750 745	744	759 732 754	758 762	755 770	769 767	771
731	737	739 749	747 753 743	757	755 733 756	763	766	764 760			
	BU1	TS 428	SK 6	TS 430	TS 432	SK 4	TS 435	TS 406	SK 0		
	ST 1	TS 429	TS 431	TS 433		ME 403	L 441	TS 434			

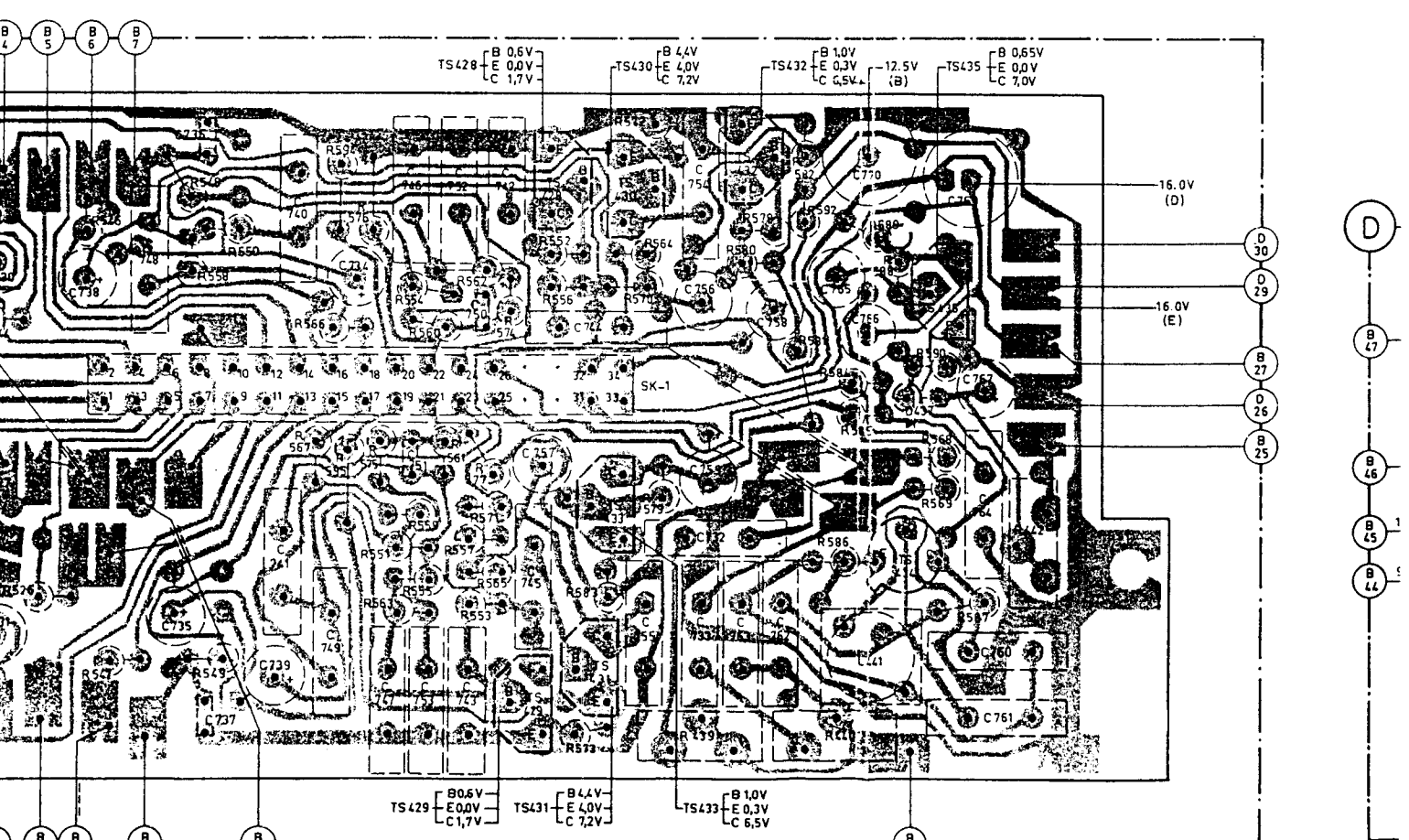
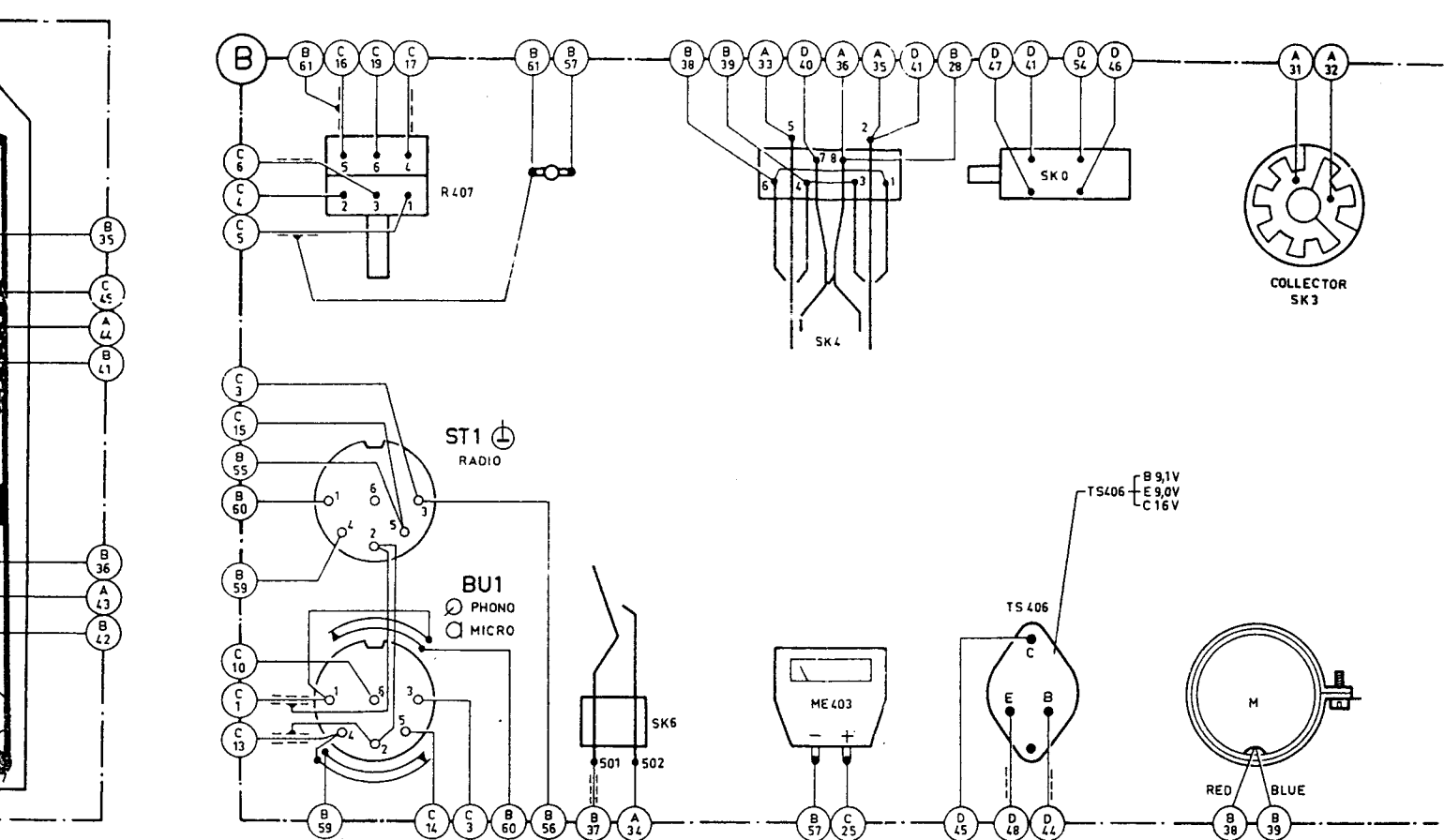
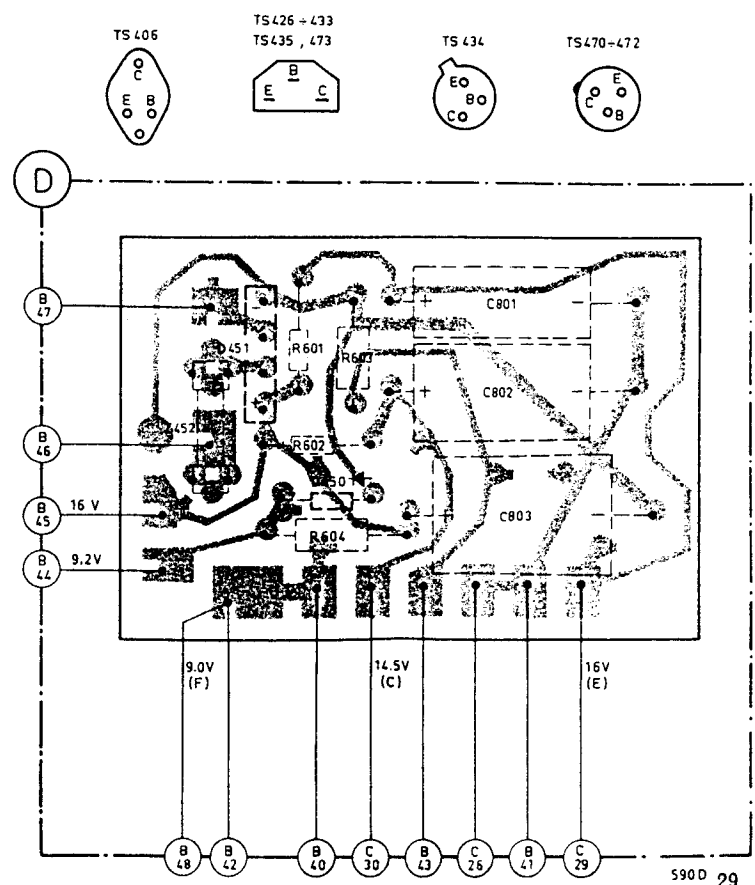
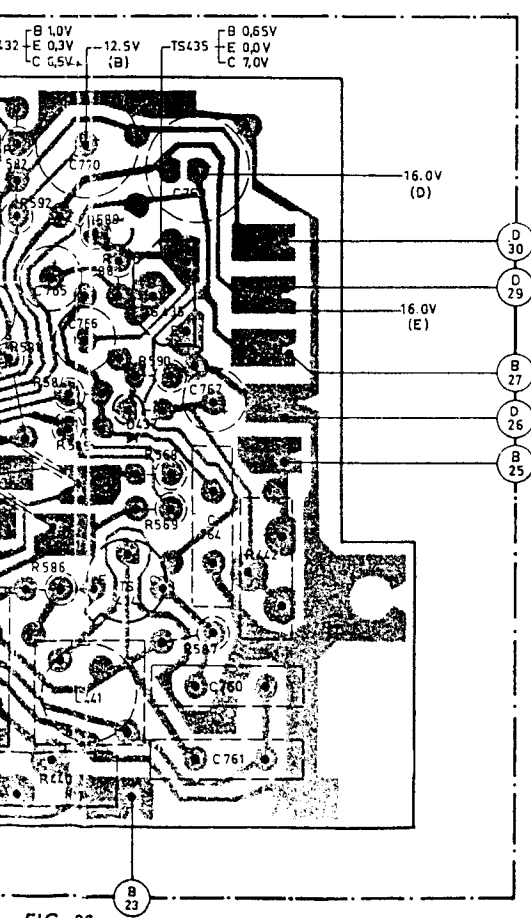
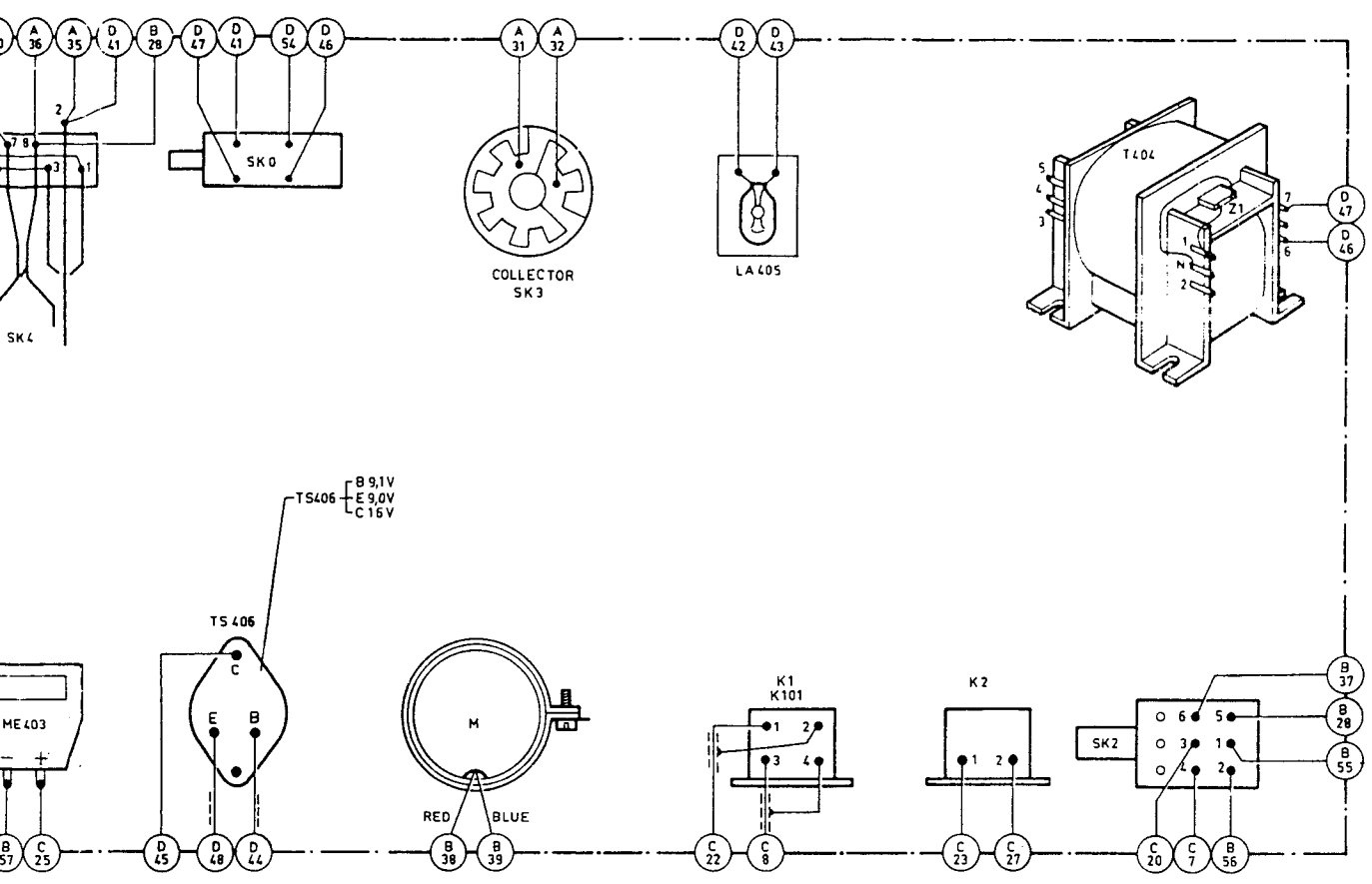


FIG. 26.

58 762 763	765 766	769 764	767 760	801 802 803
SK4	TS435 D437 TS434	TS406	SK0	LA405 K1 K101
ME403	L441			D451 Z452
				K2 D450
				T404 Z1 SK2



LIST OF ELECTRICAL COMPONENTS

Transistors		Part No.		Part No.	
TS406	AD161	4822 130 40212	C758	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342
TS426	BC149B	4822 130 40313	C759	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342
TS427	BC149B	4822 130 40313	C765	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342
TS428	BC148A	4822 130 40317	C767	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342
TS429	BC148A	4822 130 40317	C728	Polyester capacitor 2.7 nF	4822 121 40271
TS430	BC148B	4822 130 40318	C729	Polyester capacitor 2.7 nF	4822 121 40271
TS431	BC148B	4822 130 40318	C732	Polyester capacitor 1 nF	4822 121 40269
TS432	BC148A	4822 130 40317	C733	Polyester capacitor 1 nF	4822 121 40269
TS433	BC148A	4822 130 40317	C740	Polyester capacitor 82 nF	4822 121 40058
TS434	BC107B	4822 130 40332	C741	Polyester capacitor 82 nF	4822 121 40058
TS435	BC148B	4822 130 40318	C742	Polyester capacitor 10 nF	4822 121 40047
TS470	AC127	4822 130 40096	C743	Polyester capacitor 10 nF	4822 121 40047
TS471	AC128	4822 130 40095	C744	Polyester capacitor 1.8 nF	4822 121 40299
TS472	AC188	4822 130 40456	C745	Polyester capacitor 1.8 nF	4822 121 40299
TS473	BC149C	4822 130 40216	C746	Polyester capacitor 3.9 nF	4822 121 40169
Diodes			C747	Polyester capacitor 3.9 nF	4822 121 40169
D437	OF173	4822 130 30301	C748	Polyester capacitor 15 nF	4822 121 40049
D450	BZY88/C9V1	4822 130 30294	C749	Polyester capacitor 15 nF	4822 121 40049
D451	BY164	4822 130 30414	C750	Ceramic capacitor 100 pF	4822 122 30021
D474	BA114	4822 130 30189	C751	Ceramic capacitor 100 pF	4822 122 30021
D475	BA114	4822 130 30189	C752	Polyester capacitor 6.8 nF	4822 121 40222
D477	BA217	4822 130 30703	C753	Polyester capacitor 6.8 nF	4822 121 40222
Coil			C754	Polyester capacitor 2.7 nF	4822 121 40271
L441	Erase oscillator coil	4822 156 20459	C755	Polyester capacitor 2.7 nF	4822 121 40271
Resistors			C760	Polyester capacitor 68 nF	4822 121 40057
R407	Potentiometer 2 × 22 kΩ	4822 102 30152	C761	Polyester capacitor 68 nF	4822 121 40057
R439	Preset potentiometer 47 kΩ	4822 100 10076	C762	Polyester capacitor 4.7 nF	4822 121 40168
R440	Preset potentiometer 47 kΩ	4822 100 10076	C763	Polyester capacitor 33 nF	4822 121 40054
R442	Preset potentiometer 22 kΩ	4822 100 10086	C764	Polyester capacitor 10 nF	4822 121 40047
R480	Wire-wound resistor	4822 157 50013	C766	Electrolytic capacitor 6.8 μF	4822 124 20351
R528	1 MΩ, 1/8 W, 5%	4822 110 61187	C768	Electrolytic capacitor 33 μF	4822 124 20368
R529	1 MΩ, 1/8 W, 5%	4822 110 61187	C769	Electrolytic capacitor 68 μF	4822 124 20376
R530	1 MΩ, 1/8 W, 5%	4822 110 61187	C770	Electrolytic capacitor 68 μF	4822 124 20376
R531	1 MΩ, 1/8 W, 5%	4822 110 61187	C801	Electrolytic capacitor 220 μF	4822 124 20398
R538	470 kΩ, 1/8 W, 5%	4822 110 61178	C802	Electrolytic capacitor 1000 μF	4822 124 20417
R539	470 kΩ, 1/8 W, 5%	4822 110 61178	C803	Electrolytic capacitor 1000 μF	4822 124 20419
R552	560 kΩ, 1/8 W, 5%	4822 110 61181	C825	Polyester capacitor 680 nF	4822 121 40268
R553	560 kΩ, 1/8 W, 5%	4822 110 61181	C826	Electrolytic capacitor 2.2 μF	4822 124 20344
R564	1.2 MΩ, 1/8 W, 5%	4822 110 60189	C827	Electrolytic capacitor 0.64 μF	4822 124 20092
R565	1.2 MΩ, 1/8 W, 5%	4822 110 60189	C828	Ceramic capacitor 120 pF	4822 122 30093
R578	390 kΩ, 1/8 W, 5%	4822 110 61176	Miscellaneous		
R579	390 kΩ, 1/8 W, 5%	4822 110 61176	ME403	Recording level indicator	4822 347 10051
R588	390 kΩ, 1/8 W, 5%	4822 110 61176	T404	Mains transformer	4822 145 50049
R594	1 Ω, 1/4 W, 5%	4822 116 60005	L405	Indicator lamp, 6 V, 45 mA	4822 134 40032
R595	1 Ω, 1/4 W, 5%	4822 116 60005	SK0	Mains switch	4822 276 10429
Capacitors			SK1	Slide switch	4822 277 30459
C730	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342	SK2	Playback switch	4822 276 10376
C731	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342	SK4	Motor switch	4822 278 90223
C734	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342	SK6	Pause switch	4822 278 90008
C735	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342	BU2	Socket—micro/PU	4822 267 40162
C738	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342	Z1	Transformer fuse 138°C, 1.5-A	4822 252 20007
C739	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342	Z452	Glass fuse 630 mA	4822 253 30018
C756	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342		Spring for glass fuse	4822 492 60063
C757	Electrolytic capacitor 1.5 μF, 63 V	4822 124 20342		Motor control/aut. stop pc board	4822 214 50086
				Contact spring for socket	4822 268 20032
				Nylon bracket on slide of SK1	4822 528 20153
				Pen in nylon bracket	4822 528 30138

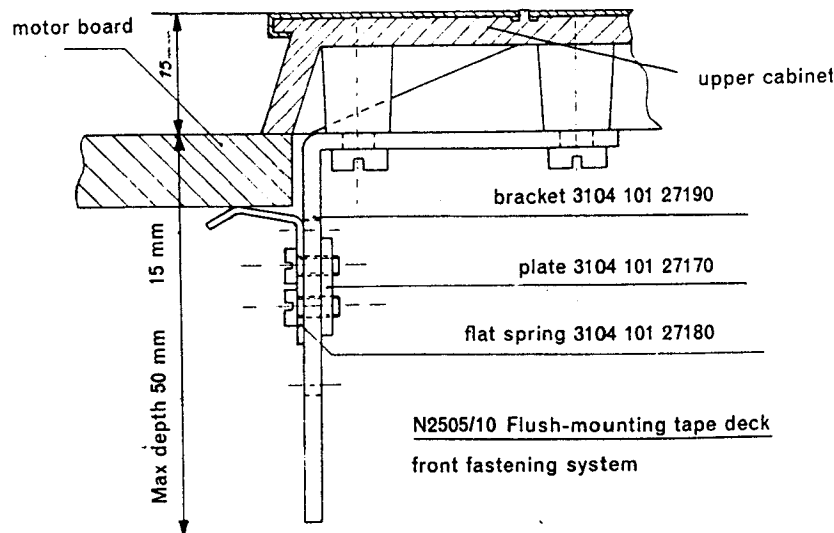


FIG. 27.