

QUAD 44

service data

| Contents | page |
|--|-------------|
| Introduction | 3 |
| Test Procedure | 3 |
| Test Equipment | 3 |
| Anti RIAA Network | 5 |
| Fault Finding | 8 |
| 44 Functional Block Diagram | 9 |
| Input Selector M12428: | 10 |
| ISS 5 Overlay Diagram | 10 |
| ISS 4 & 5 Circuit Diagram | 10 |
| Modifications | 11 |
| ISS 4 & 5 Components List | 11 |
| Mother Board and Power Supply M12436 | 12 |
| ISS 4 Overlay Diagram | 12 |
| ISS 4 Circuit Diagram | 13 |
| ISS 5 Overlay Diagram | 14 |
| ISS 5 Circuit Diagram | 15 |
| Modifications | 16 |
| Components List | 17 |
| Disc Input M12515: | 18 |
| ISS 4 Overlay Diagram | 18 |
| ISS 4 Circuit Diagram | 18 |
| ISS 5 Overlay Diagram | 19 |
| ISS 5 Circuit Diagram | 19 |
| Modifications | 20 |
| Components List | 20 |
| Moving Coil Disc Input M12542: | 21 |
| ISS 3 Overlay Diagram | 21 |
| ISS 3 Circuit Diagram | 21 |
| Modifications | 22 |
| Components List | 22 |
| Tape Input M12496: | 23 |
| ISS 3 Overlay Diagram | 23 |
| ISS 3 Circuit Diagram | 23 |
| Modifications | 24 |
| Components List | 24 |
| Radio and Auxiliary Input M12511: | 25 |
| ISS 1 Radio Overlay Diagram | 25 |
| ISS 2 Radio Overlay Diagram | 26 |
| ISS 1 and 2 Radio Circuit Diagram | 25, 26 |
| ISS 2 Auxiliary Overlay Diagram | 27 |
| ISS 2 Auxiliary Circuit Diagram | 27 |
| Modifications | 28 |
| Components List | 28 |
| Tone Control Board M12512: | 29 |
| ISS 8 Circuit Diagram | 29 |
| ISS 8 Overlay Diagram | 30 |
| ISS 9 Circuit Diagram | 31 |
| ISS 9 Overlay Diagram | 32 |
| Modifications | 33 |
| Components List | 34 |
| Miscellaneous Modifications | 35 |
| Miscellaneous Components List | 36 |
| Completed Sub Assemblies List | 36 |

introduction

The Quad 44 control unit accepts the outputs from a variety of sources, pickup, tape recorder, radio tuner, and amplifies the selected source up to amplifier input level. At the same time the Quad 44 provides the listener with the means to compensate for certain effects of the listening environment and programme balance. The results obtained from almost any programme material can be improved by intelligent use of the Tilt, Bass and Filter controls. The Quad 44 retains all the beneficial characteristics of its predecessors, the Quad 33 and Quad 22, while incorporating a number of significant and worthwhile improvements in both performance and ergonomics.

test procedure

Complete testing of a 44 may most easily be carried out by using the equipment listed below and inter-connecting these units as illustrated in Fig. 1. Any signal cables used for inter-connecting should be screened.

TEST EQUIPMENT

- Sine/Square A.F. Signal Generator
- A.C. Microvoltmeter
- Oscilloscope
- Anti RIAA Network as shown in Fig. 5

- Mono Amplifier
- Headphones
- 6 x 5 pin Din Plugs

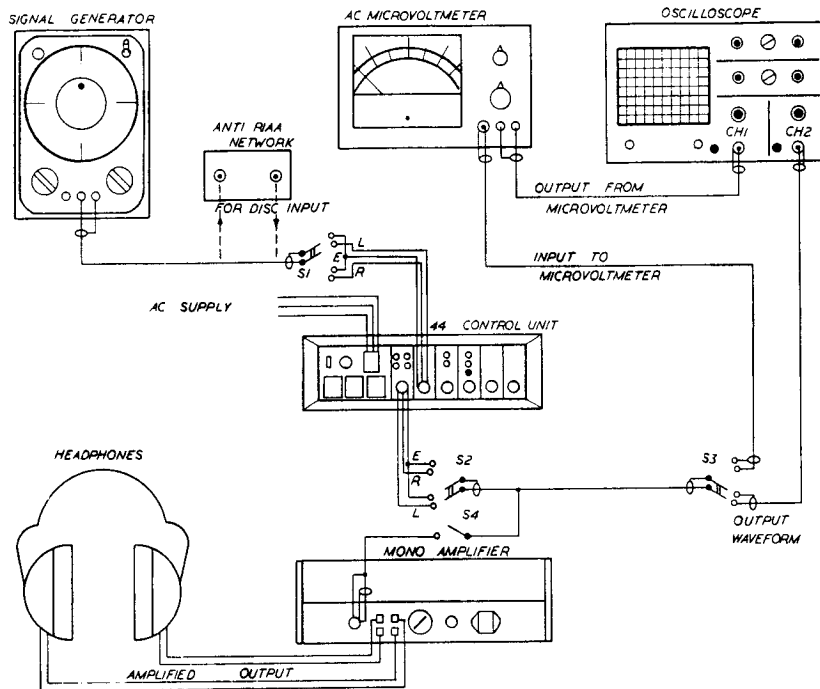
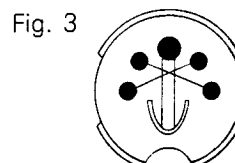
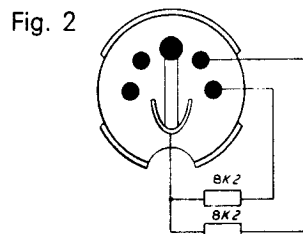


Fig. 1 Suggested Switching Arrangement for Testing

The test equipment should all be connected to a localised common earth point to minimise the effects of earth loop hum.

DIN PLUGS

Four of the DIN plugs should be made up to simulate 100mV loads, to be used in conjunction with noise testing. This is done by connecting two 8K2 Ω resistors as shown in Fig. 2. The other two DIN plugs should be used to link the record pins of each tape module to the replay pins such that the right channel record is connected to the left channel replay and vice versa, as shown in Fig. 3.



QUAD 44 service data

CONNECTIONS

S1 to Radio left channel input
0.5V output to S2
S2 to left channel output
S3 to oscilloscope ch2
S4 (Headphones) – off
AC supply to 44

CONTROLS

Signal Generator:
Mode – Square
Frequency – 650Hz
Output level – 100mV Rms

44:
Bass, Tilt, Slope – Zero
Filter Switch – Cancel
Bal-Mon – Bal
Volume – 22
Tape Replay – 0dB
Tape Record – 0dB Low Z
Disc – 3mV

Oscilloscope:
ch1 – 0.5V/cm
ch2 – 0.5V/cm
Timebase – 0.5mS/cm

Microvoltmeter:
Gain – 0dB

1. POWER SUPPLY

When turning the 44 on, the radio and cancel LEDs should illuminate. The AC supply outlet sockets may be checked by plugging a unit into each outlet. The power to the units should then be controlled by the 44 power switch.

2. OUTPUT

Observe the **oscilloscope ch2** beam which should show a square waveform trace as shown in Fig. 4. Switches S1 and S2 should then be adjusted to drive the **right channel input**, and monitor the **right channel output**, when a similar waveform should be displayed. This check should be repeated whilst monitoring the 1.6V and 5V output terminals, and adjusting the **oscilloscope ch2** sensitivity accordingly. Return the switches **S1** and **S2** to drive the **left channel input** and monitor the **left channel output** using the 0.5V output socket.

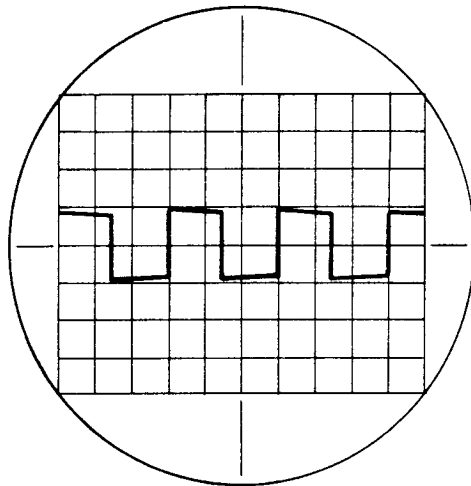


Fig. 4

3. CHANNEL BALANCE

When moving the **balance slider** towards the left, the waveform amplitude should progressively increase to a maximum at the extreme left. When moving the **balance slider** towards the right, the signal amplitude should decrease to zero at the right extreme.

Drive the **right channel input** and monitor the **right channel output** where the opposite to this should be obtained.

Select **mon** on the 44 and move the **balance slider** to the extreme right where the waveform amplitude should reach a maximum of 0.3V. When moving the **balance slider** towards the left the amplitude should progressively reduce to zero.

Drive the **left channel input** and monitor the **left channel output** when the opposite to this should be obtained.

Select **Bal** and by switching from channel to channel whilst observing the output waveform produced by each channel, set the **balance** so that the output level from each channel is the same.

4. INPUT SELECTOR AND OUTPUT LEVEL

In the following tests, 'full output' refers to the waveform trace shown in Fig. 4.

RADIO AND TAPE

- (a) Drive the **left channel input** and monitor the **left channel output** to obtain a full output waveform, then monitor the **right channel output** to obtain no output. Drive the **right channel input** and monitor the **right channel output** to obtain a full output waveform, then monitor the **left channel output** to obtain no output.

Insert the **tape link plugs** into the two tape input modules.

- (b) Drive the **left channel input** and monitor the **left channel output** with the **top monitor button** selected, to obtain no output. Monitor the **right channel output** to obtain a full output waveform. Select the **bottom monitor button** and repeat the test.

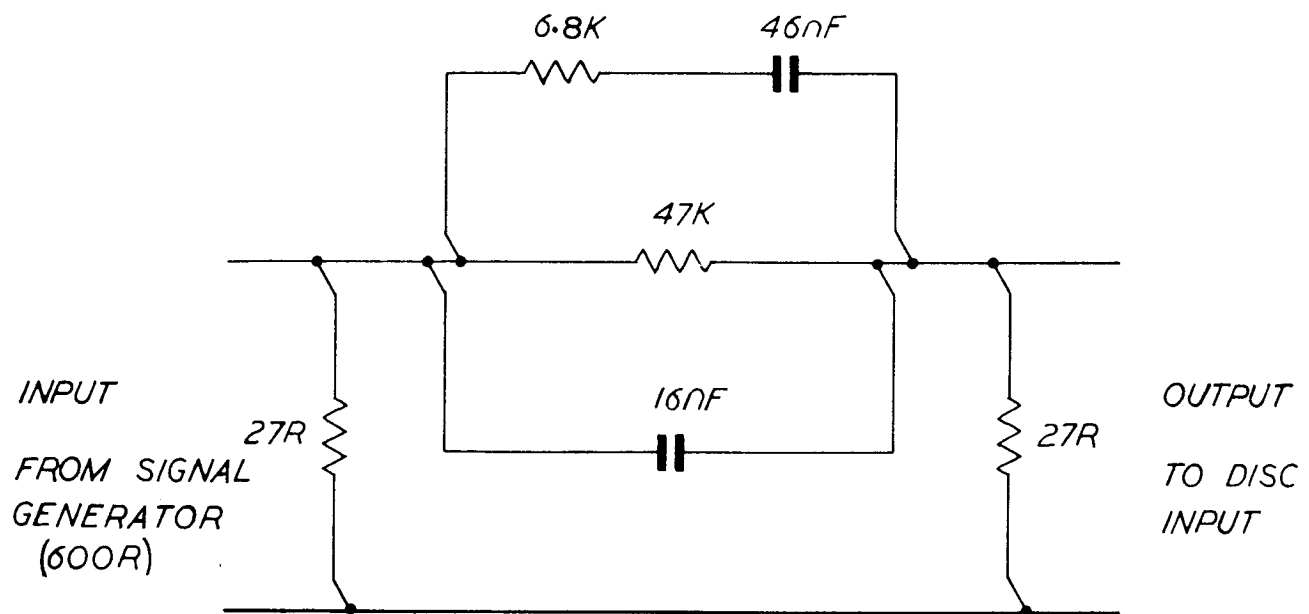
Drive the **right channel input** and monitor the **right channel output** with the **bottom monitor button** selected to obtain no output. Monitor the **left channel output** to obtain a full output waveform. Select the **top monitor button** and repeat the test.

AUXILIARY

Remove the **signal input** lead from the radio input module and adjust the **signal generator** output level to **500mV**. Plug the signal input lead into the auxiliary input module and select **auxiliary**. Repeat test (a) as carried out for radio.

DISC

Remove the **signal input** lead from the auxiliary input. The output from the **signal generator** should be connected to **S2** via the anti RIAA circuit. In order to overcome the 75dB attenuation of the anti RIAA circuit, the input to this circuit should be **16V** which will provide **3mV** to the disc input. It may be found necessary to amplify the signal generator output to achieve these levels. Select **disc** and repeat test (a) as carried out for radio. Where moving coil disc modules are being checked, C1 and C2 should be disconnected and appropriate signal levels should be used.



Anti RIAA Network

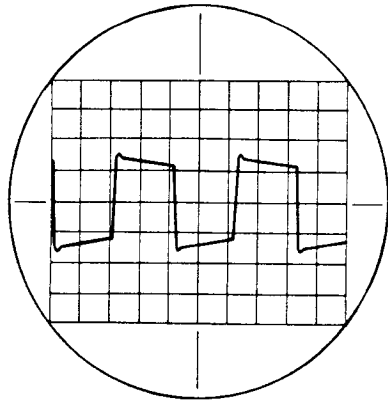
Fig. 5

5. TONE AND FILTERS

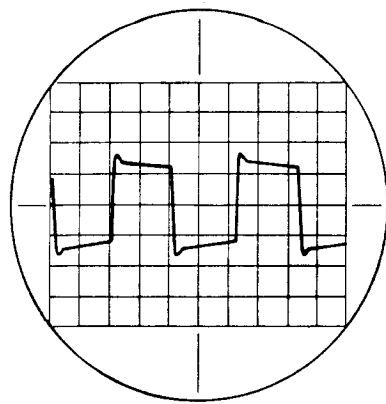
Remove the **signal input** lead from the disc input module and adjust the **signal generator** output level to **100mV**. Plug the **signal input** lead into the radio module and select **radio**.

Figs. 6 to 17 show how the output waveform is modified for each of the different tone and filter settings. The checks should be carried out for both channels. Figs. 6 to 17 were drawn using an uncalibrated timebase and sensitivity in order to illustrate more clearly the tone and filter effects.

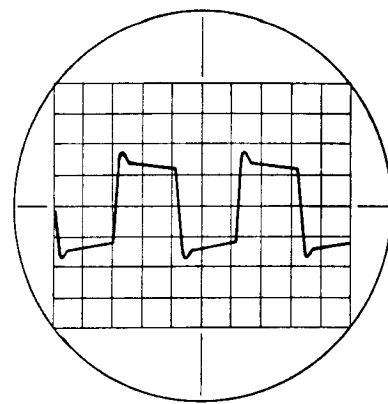
The cancel position may be checked by selecting **cancel** and any combination of tone settings. There should be no change in the output waveform.



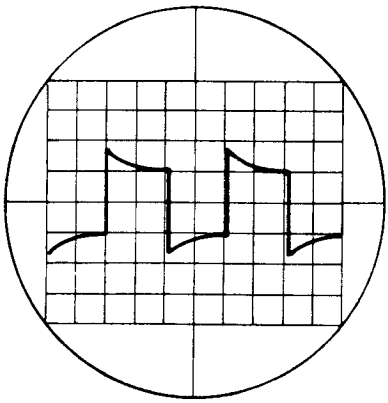
10K Full Slope



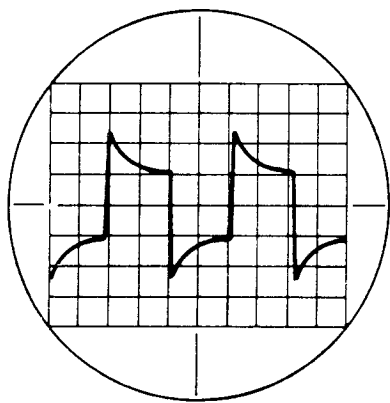
7K Full Slope



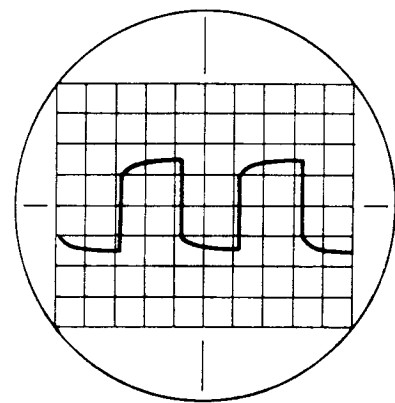
5K Full Slope



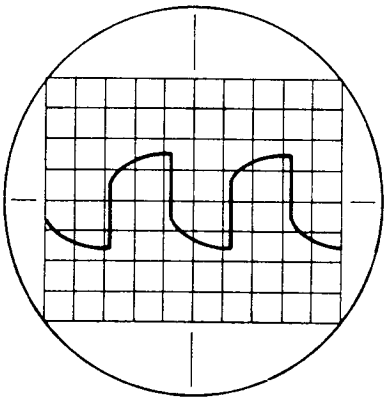
Tilt -1 +1



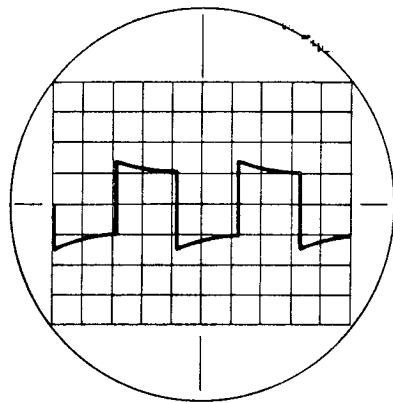
Tilt -2 +2



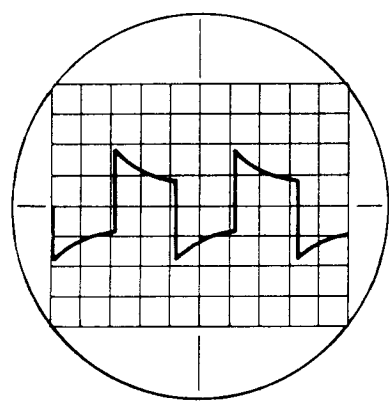
Tilt +1 -1



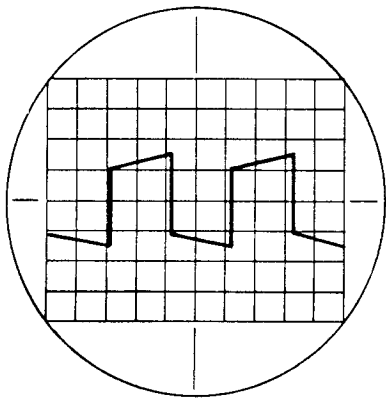
Tilt +2 -2



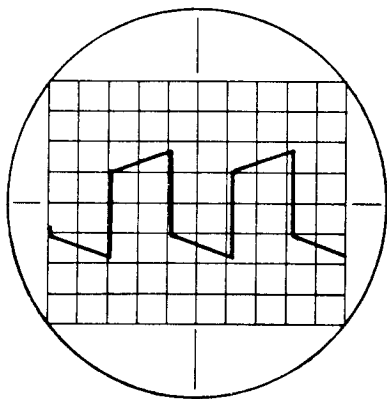
Bass 150 Hz



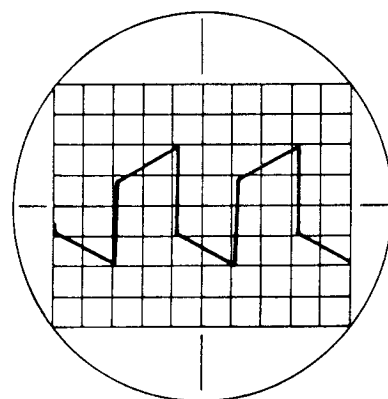
Bass 300 Hz



Bass 3dB



Bass 6dB



Bass 9dB

6. VOLUME POT

Return all the **tone and filters** to zero. Select a **sinewave** output from the **signal generator** and increase the **frequency** to **10KHz**. Switch **S3** from **oscilloscope** to **A.C. meter input**. Channel **1** of the **oscilloscope** may be used to observe an attenuated output signal if necessary.

Observe the **AC meter** and set the **balance slider** such that the output levels of the **left channel** and **right channel** are equal. Decrease the **volume** one click at a time from **22** down to **1**, checking the attenuation levels for each setting (listed below) and adjusting the **AC meter** as necessary. Repeat the test for the **right channel**

| Numerical Setting | Attenuation in dBs | Numerical Setting | Attenuation in dBs |
|-------------------|--------------------|-------------------|--------------------|
| 22 | 0 | 11 | -22 |
| 21 | -2 | 10 | -24 |
| 20 | -4 | 9 | -26 |
| 19 | -6 | 8 | -28 |
| 18 | -8 | 7 | -30 |
| 17 | -10 | 6 | -33 |
| 16 | -12 | 5 | -37 |
| 15 | -14 | 4 | -42 |
| 14 | -16 | 3 | -50 |
| 13 | -18 | 2 | -60 |
| 12 | -20 | 1 | -70 |

7. CROSSTALK

Connect a **1KΩ resistor** between the **right channel** input and earth. Drive the **left channel** input and monitor the output from the **right channel**. Select **-50dB** on the **AC meter** and increase the **volume** setting to **22**. The meter should indicate a nominal crosstalk measurement of better than **-50dB**.

N.B. If test equipment leads are not screened or correctly routed, it may be found difficult to achieve this figure.

The same check should be carried out for driving the **right channel input** and monitoring the output from the **left channel**, with the **left channel input** connected to earth via a **1KΩ resistor**.

8. NOISE

Remove the **1KΩ resistor** and the **signal input** lead. Plug the **100mV load DIN plugs** into the radio and auxiliary input modules.

Adjust both **tape replay** and **record sensitivities** to **100mV** and **low Z** only respectively. The following checks should then be carried out on both channels. Figures quoted in this section are for unweighted noise over a 10Hz to 10KHz bandwidth.

- Select **auxiliary** and the **top monitor button**. The noise reading on the A.C. meter should be better than **-82dB**.
- Repeat (a) with **auxiliary** and the **bottom monitor button** selected.
- Remove the **link plugs** from the tape input modules and replace these with the **100mV DIN plugs**. The noise reading for **radio** and both **tape replay** modules should be better than **-85dB**. For **auxiliary** the reading should be better than **-82dB**.
- Reduce the **volume** to **1** and select **-90dB** on the **AC meter**. The noise reading should be better than **-95dB** for all inputs.
- Adjust the **AC meter** to **-50dB** and increase the **volume** to **22**. Select **disc** and the noise reading should be better than **57dB** for **1mV** setting, **67dB** for **3mV** setting and **76dB** for **10mV** setting.
- Adjust the **microvoltmeter** to **0dB** and switch **S4**, the headphones, on. With **disc** selected randomly switch all **tone** and **filter** buttons whilst listening for any clicks which may be caused by noisy switches. Switch **all inputs** randomly listening again for noisy switches on the input selector board. Remove the **disc source**.

9. RELAY CIRCUIT

The relay circuit may be checked by turning the **44** off, then turning on again whilst holding the **disc input** button in. After between 2 and 4 seconds noise should be heard through the headphones. This check should be carried out on both channels.

fault finding

The numbers in the following section correspond to the appropriate test check.

| | Symptom | Probable Cause |
|---|---|--|
| 1. Power | Selector and cancel LEDs do not illuminate, also there is no power output to other units. | Fault lies inside the AC supply box |
| | Selector and cancel LEDs do not illuminate but there is power output to other units. | Check Fuse. Check for positive and negative HT volts. If there are no negative HT volts suspect: TR403 TIP31 O/C R405 10Ω O/C |
| | 44 will not switch off. | Faulty A.C. switch |
| 2. Output | No output on either channel for any selected input. | Relay circuit faulty. Short circuit across output plate. Insecure Amp connectors. |
| | No output on one channel only for any selected input. | Open circuit connection on output plate. Short circuit across output plate. Faulty Relay. IC500 – IC503 U/S. Open circuit connection on the volume pot. Open circuit connection on the balance pot. Output phono socket loose. |
| 3. Balance Slider | When moving the balance slider the output becomes intermittent. | Broken balance slider tag. Break in resistance track. |
| 4. Input Selector and Output Level | No or low output when selecting a particular input. | Input module faulty, the integrated circuit is the most likely cause. Other causes: DIL switches O/C (where applicable). Transistors (where applicable). |
| | Output waveform hums on a particular input. | Input module board to rear panel earth broken. |
| | 44 randomly selects any input source, or reverts to the radio input. | IC400 – IC403 leaking. Selector switches intermittently short circuit. If the fault occurs very infrequently it may be cured by soldering a 0.1μF capacitor across the HT volt supply rails on the button board M12428. |
| | 44 will only select 1 input source despite switching for others. | IC100 – IC102 |
| 5. Tone and Filters | Cancel LED not working. | Cancel LED open circuit. |
| | Slope pot working intermittently. | Intermittent open circuit on slope pot. |

6. Volume Pot

Output becomes intermittent when volume knob is adjusted.

Intermittent open circuit joint between volume pot and tone board.

7. Crosstalk

Excessive crosstalk.

Open circuit earth connection particularly the screws securing the mother board which should be tight.

8. Noise

Noise figures excessive for all inputs with volume at 22.

IC500, IC501.

Noise figures excessive for all inputs with volume at 1.

IC502, IC503

Noise figures excessive for a particular input.

Input module faulty. Suspect integrated circuit or any associated transistors.

Switch clicks.

Switch contacts dirty. Use suitable switch cleaning lubricant.

This may be particularly applicable to volume pots and relays.

9. Relay Circuit

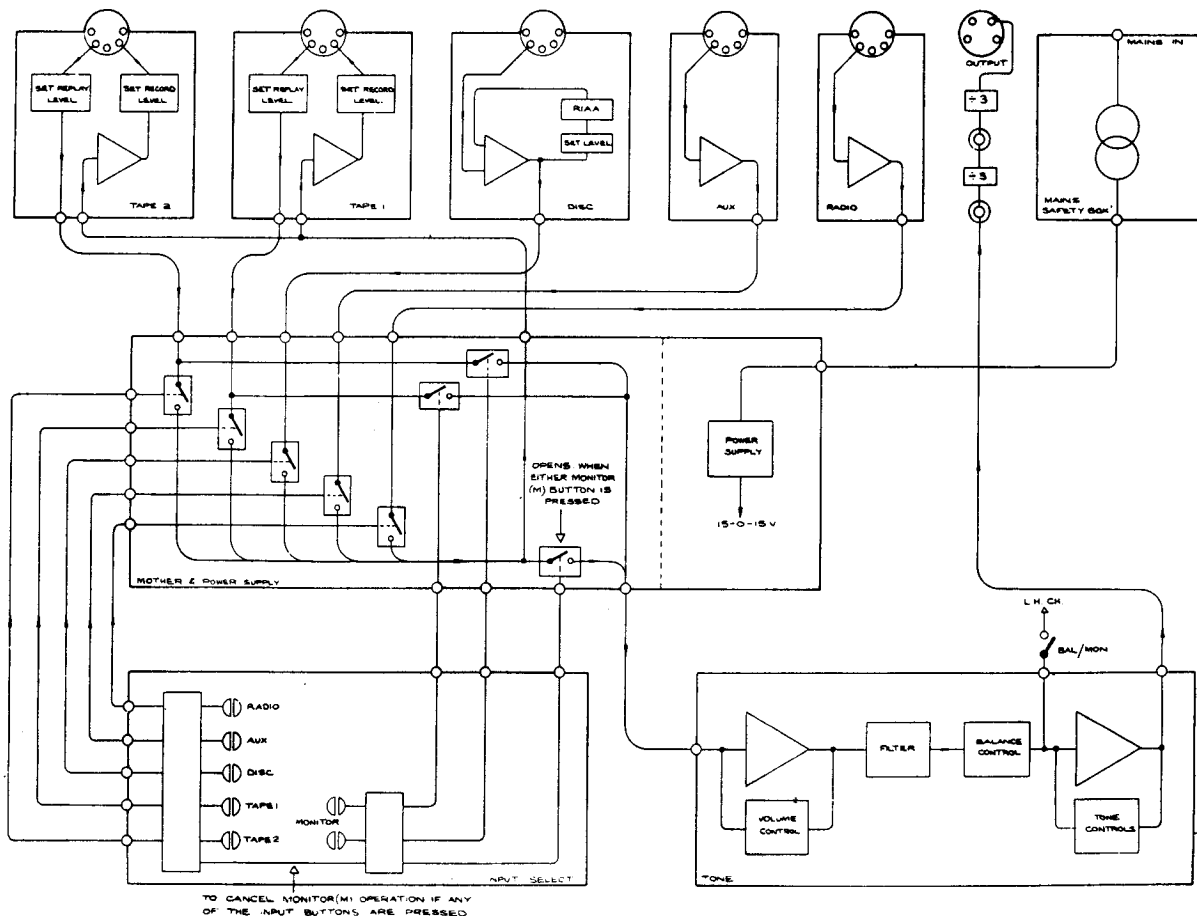
Relay Chatter

Low HT volts.

Speakers thump when 44 is turned off, on 44's where the relay is fitted to the tone board.

Relay switch off time too slow. Connect a $4.7\mu\text{F}$ capacitor from +15V to the base of TR501.

block diagram

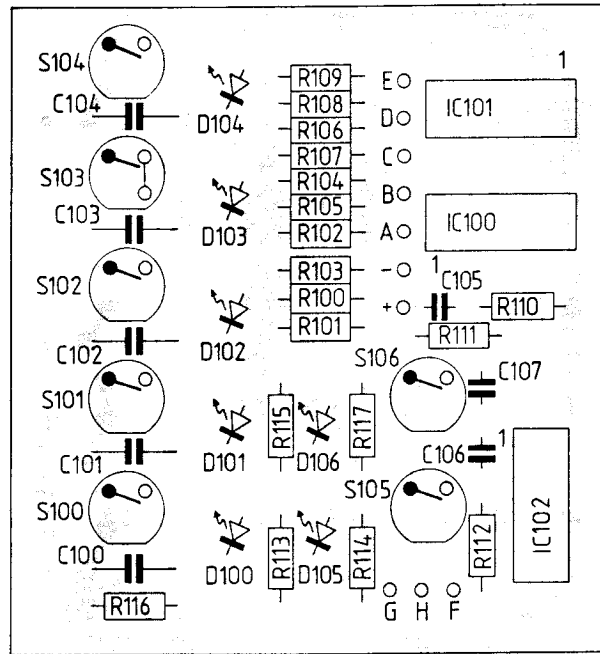
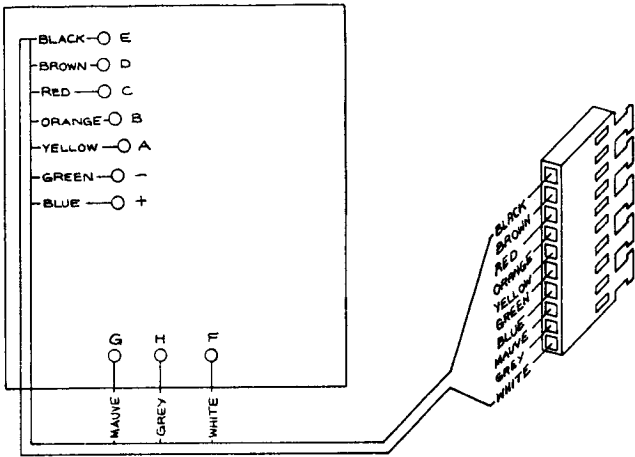


QUAD 44 service data

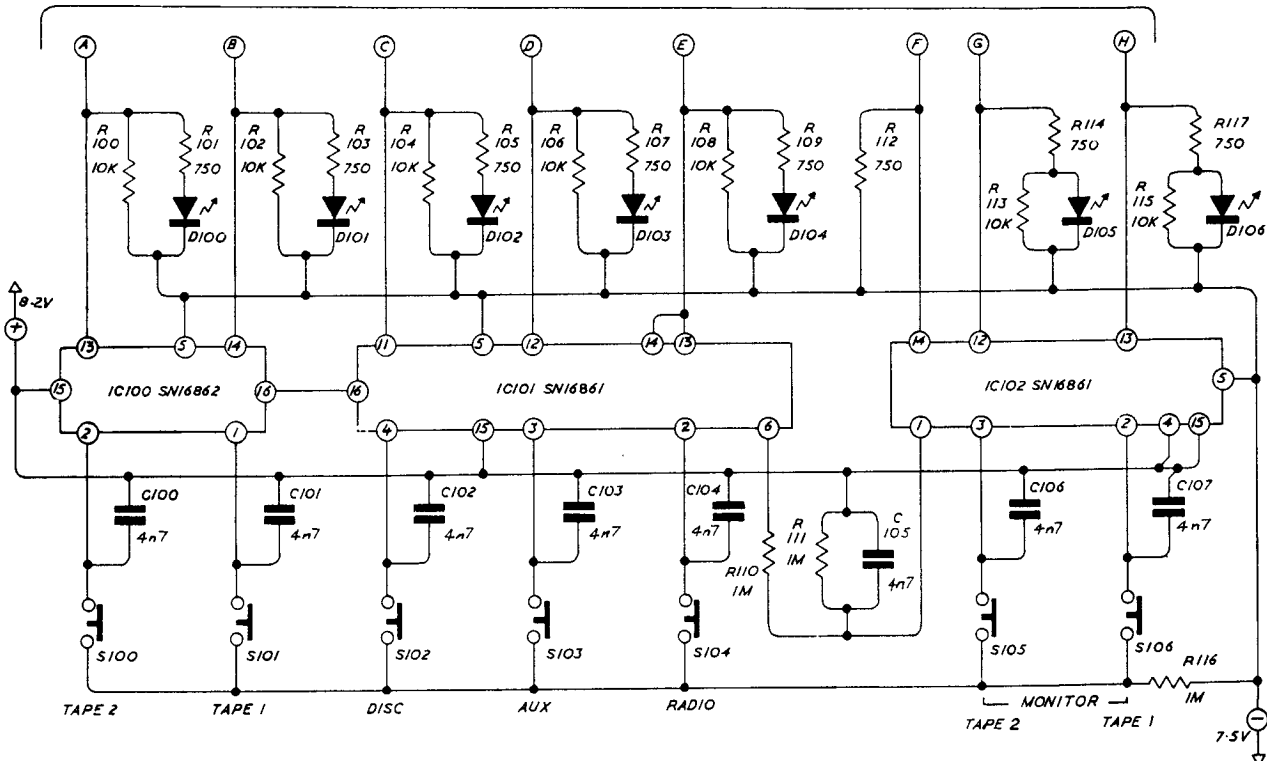
input selector

M12428 - ISS 5

| Qty | Ref. No. | Stock No. | Description |
|-----|--|-----------|---------------------------------|
| 7 | R100, R102, R104, R106, R108, R113, R115 | R10K0J1 | Resistor 10K ±5% |
| 8 | R101, R103, R105, R107, R109, R112, R114, R117 | R750RJ1 | Resistor 750 ±5% |
| 3 | R110, R111, R116 | R1M00J1 | Resistor 1M ±5% |
| 5 | C100-C104 | C4N705J | Capacitor 4n7 |
| 3 | C105-C107 | C4N705E | Capacitor 4n7 |
| 5 | D100-D104 | BL556G2 | LED green |
| 2 | D105-D106 | BL5053R | LED red |
| 7 | S100-S106 | S44INPA | Switch D6 |
| 1 | IC100 | D16862A | Integrated circuit SN16862 |
| 2 | IC101 IC102 | D16861N | Integrated circuit SN16861 |
| 1 | | 112428A | Printed wiring board DRG M1242H |



DC OUTPUT VOLTAGES TO OPERATE ELECTRONIC SWITCHES ON MOTHER BOARD



modifications

Original Issue board M12428 Issue 4.

M12428 Issue 5

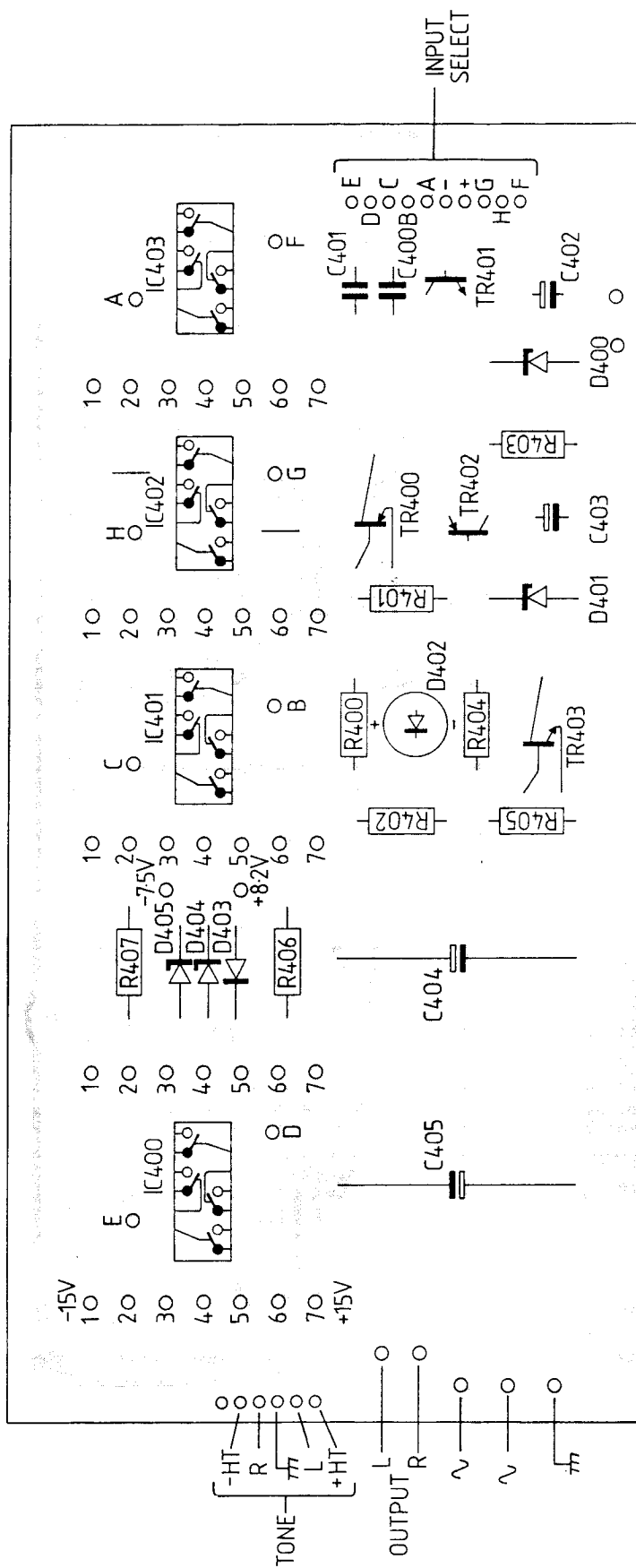
For production purposes, LED's no longer soldered to the board, but housed in gold connector sockets.

INPUT SELECTOR BOARD

| Part No. | Description | Circuit Reference |
|-----------------|-------------------------------|--|
| BL5053R | LED XC5053R Red | D105, D106 |
| BL556G2 | LED XC556G-2 Green | D100 to D104 |
| C4N70ZM | Capacitor 4.7n 629-06472 | C105, C106, C107 |
| S44INPA | Input Select Switch | S100 to S106 |
| C4N70SJ | Capacitor 4.7n UP125 U 472 KB | C100 to C104 |
| D16861N | Int Cct SN16861NG | IC101, IC102 |
| D16862A | Int Cct SN16862AN | IC100 |
| I12428A | PCB Input Selector M12428.5 | |
| R10K0J1 | Resistor 10K 5 050 | R100, R102, R104, R106, R108, R113, R115 |
| R1M00J1 | Resistor 1M 5 050 | R110, R111, R116 |
| R750RJ1 | Resistor 750 5 050 | R101, R103, R105, R107, R109, R112, R114, R117 |
| PAM8634 | Gold Board Socket | |

mother board and power supply

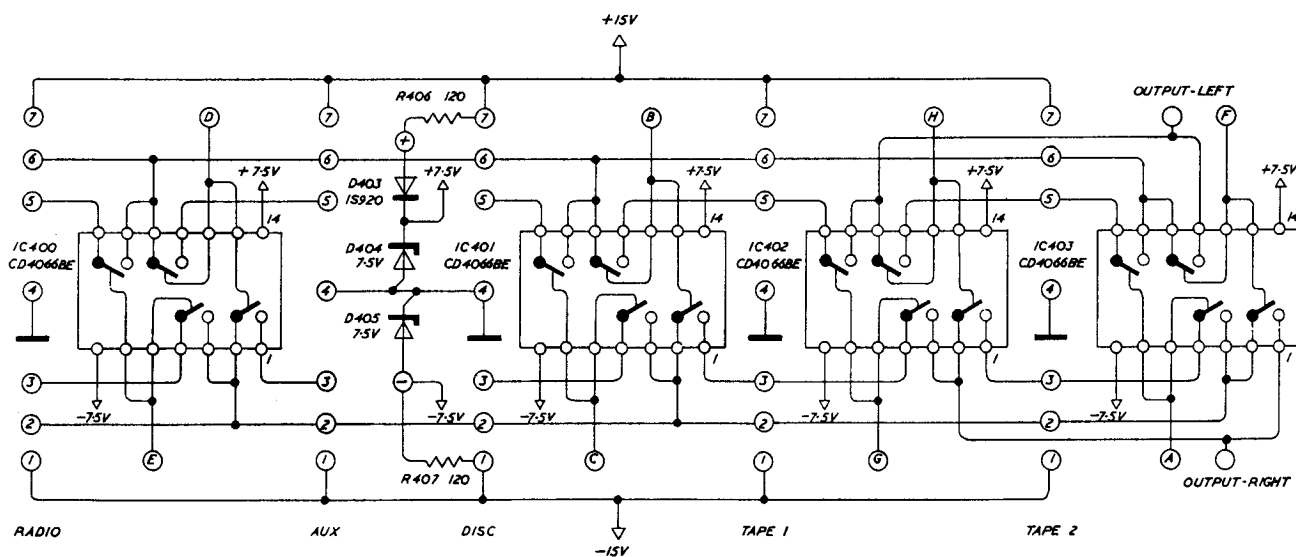
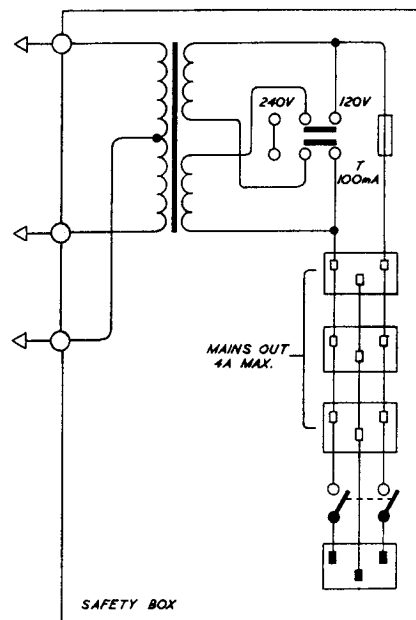
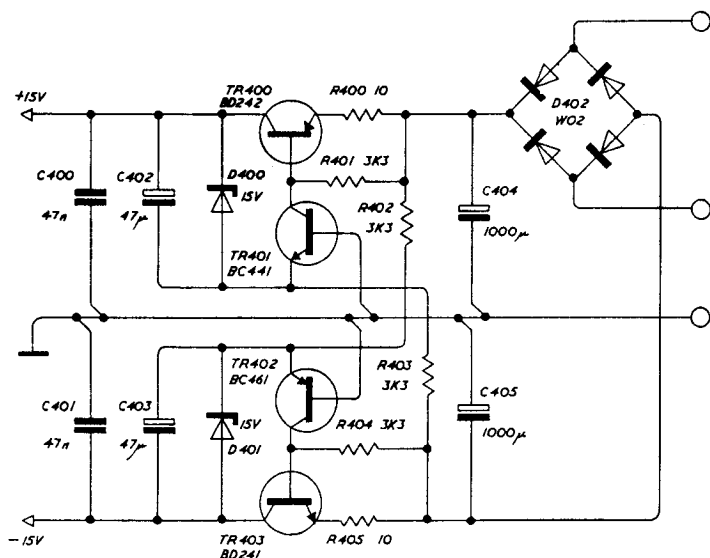
M12436 - ISS 4



mother board and power supply

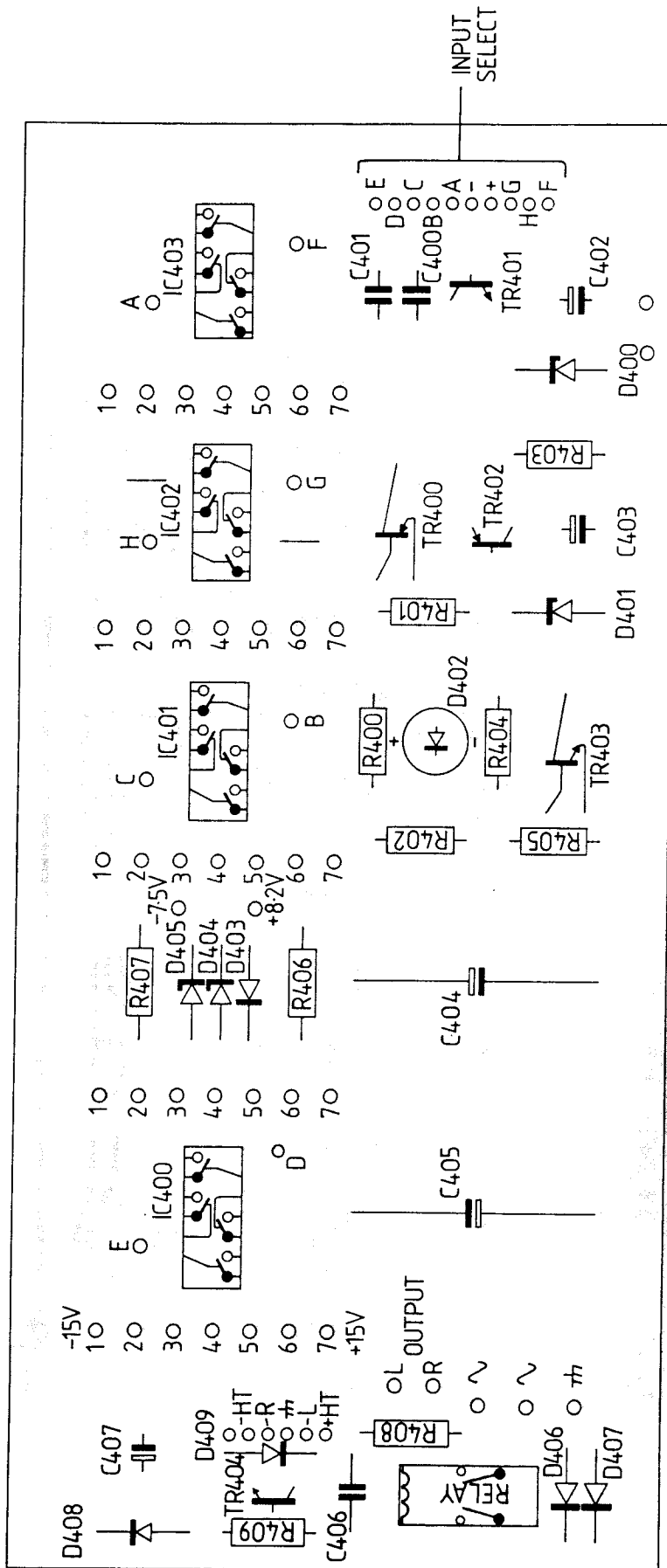
M12436 - ISS 4

| Qty | Ref. No. | Stock No. | Description |
|-----|----------------------------|-----------|-----------------------------|
| 4 | IC400, IC401, IC402, IC403 | D4066AA | Integrated circuit CD4066BE |
| 1 | TR400 | DTIP32X | Transistor BD242 |
| 1 | TR401 | DBC441X | Transistor BC441 |
| 1 | TR402 | DBC461X | Transistor BC461 |
| 1 | TR403 | DTIP31X | Transistor BD441 |
| 2 | D400, D401 | DZ15VAA | Zener diode BZY88C 15V |
| 2 | D404, D405 | DZ7V5AA | Zener diode BZY88C 7.5V |
| 1 | D403 | DIS920B | Diode IS920 |
| 1 | D402 | DW02XXX | Rectifier W02 |
| 4 | R401, R402, R403, R404 | R3K30J1 | Resistor 3k3 ±5% |
| 2 | R400, R405 | R10R0J1 | Resistor 10 ±5% |
| 2 | R406, R407 | R120RJA | Resistor 120 ±5% |
| 2 | C400, C401 | CU047ZL | Capacitor 47 n |
| 2 | C402, C403 | C47U0ZE | Capacitor 47µ 16V |
| 2 | C404, C405 | C1K0UTM | Capacitor 1000µ 25V |
| 1 | | | Printed board to DRG M12436 |



mother board and power supply

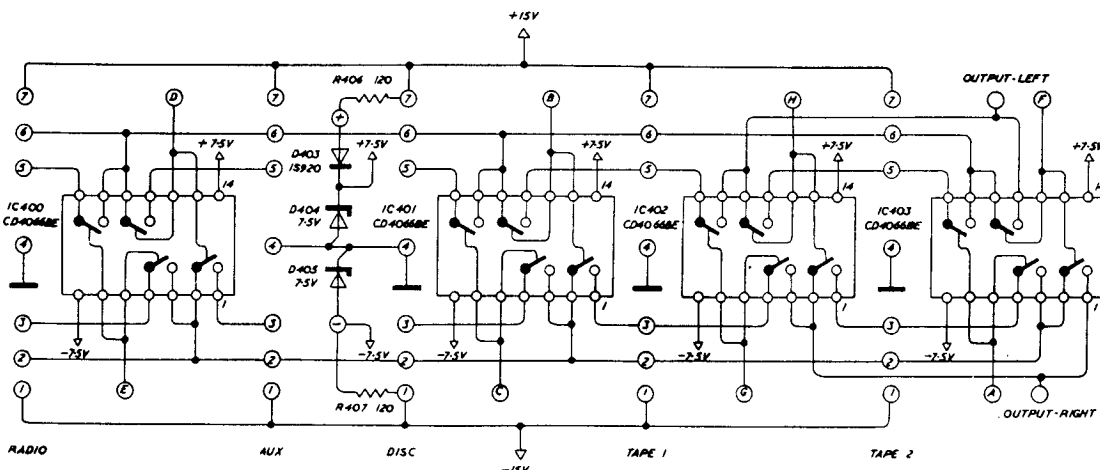
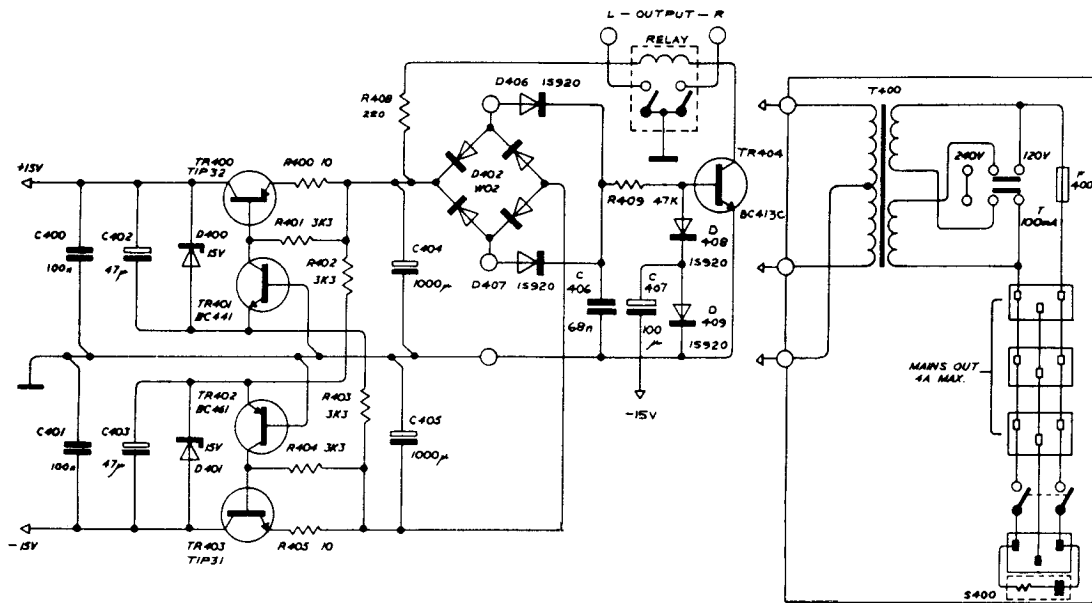
M12436 - ISS 5



mother board and power supply

M12436 - ISS 5

| Qty | Ref. No. | Stock No. | Description |
|-----|------------------------------|-----------|-----------------------------|
| 4 | IC400, IC401, IC402, IC403 | D4066AA | Integrated Circuit CD4066BE |
| 1 | TR404 | DBC413X | Transistor BC413C |
| 1 | TR400 | DTIP32X | Transistor TIP32 |
| 1 | TR401 | DBC441X | Transistor BC441 |
| 1 | TR402 | DBC461X | Transistor BC461 |
| 1 | TR403 | DTIP31X | Transistor TIP31 |
| 2 | D400, D401 | DZ15VAA | Zener Diode BZY88C 15V |
| 2 | D404, D405 | DZ7V5AA | Zener Diode BZY88C 7.5V |
| 5 | D403, D406, D407, D408, D409 | DIS920B | Diode IS920 |
| 1 | D402 | DW02XXX | Rectifier W02 |
| 4 | R401, R402, R403, R404 | R3K30J1 | Resistor 3K3 ±5% |
| 2 | R400, R405 | R10R0J1 | Resistor 10 ±5% |
| 2 | R406, R407 | R120RJA | Resistor 120 ±5% |
| 1 | R408 | R220RJ1 | Resistor 220 ±5% |
| 1 | R409 | R4K70J1 | Resistor 4K7 ±5% |
| 2 | C400, C401 | C100NKA | Capacitor 100n |
| 2 | C402, C403 | C47U0ZE | Capacitor 47µ 40V |
| 2 | C404, C405 | C1K0UTM | Capacitor 1000µ 25V |
| 1 | C406 | C68NOKS | Capacitor 68n |
| 1 | C407 | C100UZE | Capacitor 100µ |
| 1 | | I12436A | Printed Board to DRG M12436 |
| 1 | | SMG2V2A | Relay G2V2 12V |
| 1 | S400 | NPMR20A | Suppressor PMR 209M |
| 1 | F400 | UMA10DA | Fuse T100mA |
| 1 | T400 | L12527A | Mains Transformer |



modifications

ORIGINAL ISSUE BOARD M12436 ISS 3

M12436 ISSUE 4

The printed copper loop surrounding the board identification number has been turned into a large copper pad. This is to minimise the effects of earth loop hum.

The Green 3 way pin cluster has been removed and the holes enlarged to accommodate two spade type tags.

M12436 ISSUE 5 SERIAL NUMBER 12000

The board now incorporates a modified version of the relay circuit which had previously been fitted to the tone control board, M12512 ISS 8.

The two types of relay are not interchangeable.

The board is also fitted with modified connectors. C400, C401 change from 47n to 100n.

If a pre-serial number 12000 44 is to be fitted with an Issue 5 mother board the following instructions should be followed.

1. Remove and discard the relay HB2 24V and transistors TR500 and 501 from the tone control board. M12512 Issue 8 or earlier.
2. Remove and discard the 2-way and 5-way connections between the tone control board and the mother board. Replace with new connectors soldered to the tone control board, using the same colour coding. The new connectors complete with wiring may be ordered as Quad reference:
 - 2-way Q44CON2
 - 5-way Q44CON5

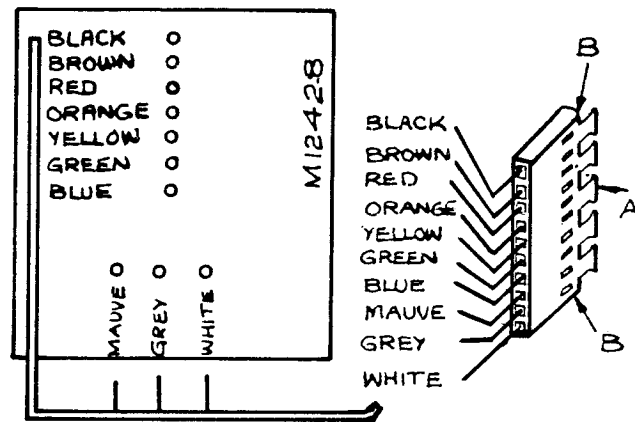


Fig. 18

3. Modify the existing 10-way connector by cutting off the five teeth marked A. Remove the sharp corners at B, to enable the connector to fit snugly into the mother board connector, with the white wire nearest the bottom of the 44.

When re-connecting the signal leads, maintain the channel identification, red is right and white is left. In the connection between the output socket and the mother board, the white wire should now occupy the eyelet closest to the 5-way connector.

COMPONENT ALTERNATIVES:

| | |
|-------|----------------|
| TR400 | TIP32, BD242 |
| TR401 | BC441, BC440-6 |
| TR402 | BC461, BC460-6 |
| TR403 | TIP31, BD241 |
| TR404 | E5270, BC413C |

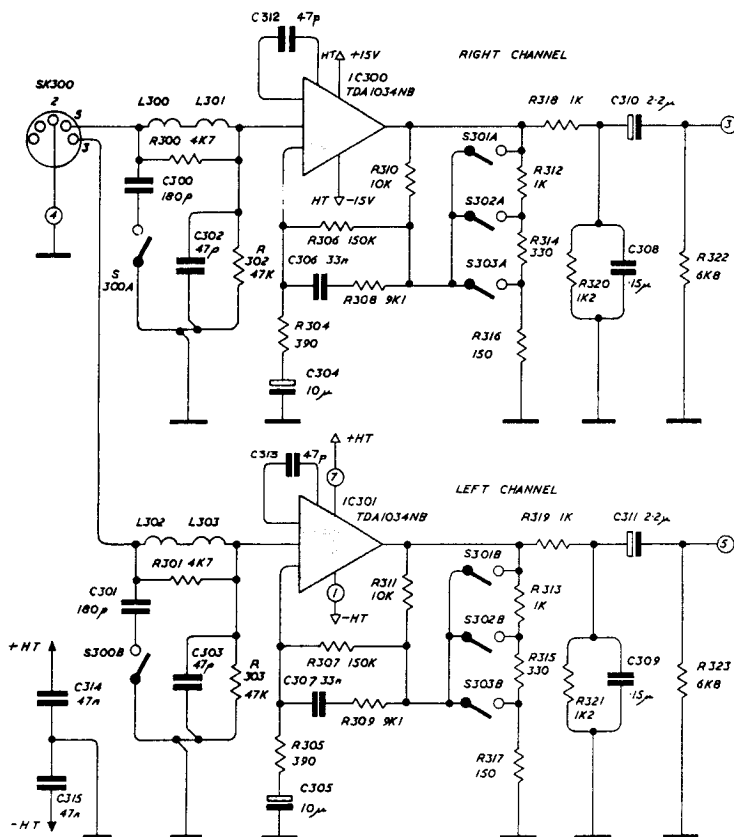
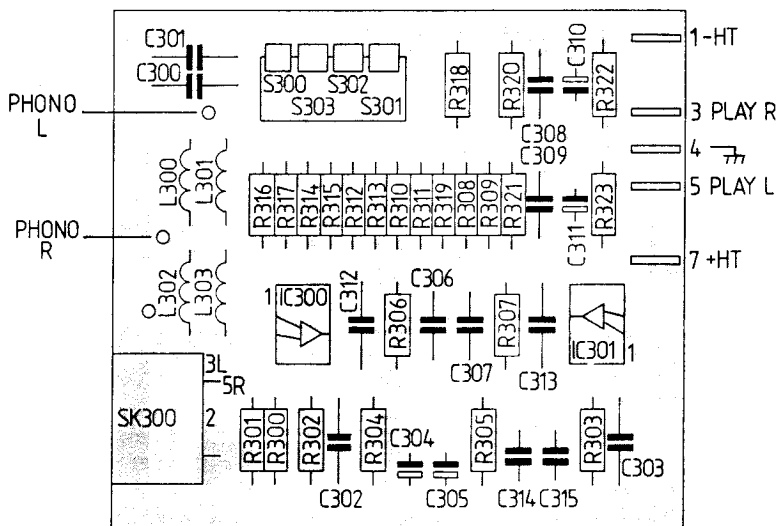
MOTHER BOARD

| Part No. | Description | Circuit Reference |
|----------|---------------------------------|--|
| C100NKS | Capacitor 100nF 10 100V B32510 | C400, C401 |
| C100UZB | Capacitor 100 μ F 16V EK | C407 |
| C1KOUTA | Capacitor 1000 μ 25V -10+50 | C404, C405 |
| C47U0ZB | Capacitor 47 μ 40V EK | C402, C403 |
| C68NOKS | Capacitor 68nF 10 400V B32561 | C406 |
| DBC4406 | Transistor BC440-6 | TR401 |
| DBC4606 | Transistor BC460-6 | TR402 |
| DE5270X | Transistor E5270 | TR404 |
| DTIP31X | Transistor TIP31 | TR403 |
| DTIP32X | Transistor TIP32 | TR400 |
| DW02XXX | Bridge Rectifier W02 | D402 |
| IWT05XX | Transistor Pad T05-009D | |
| PAM1872 | Male Tags | |
| PAM3702 | Black Pin Cluster – 2 way | |
| PAM3722 | Black Pin Cluster – 6 way | |
| PAM3742 | Black Pin Cluster – 10 way | |
| PAM4330 | Green Pin Cluster – 10 way | |
| PAM4333 | Green Pin Cluster – 3 way | |
| PAM4335 | Green Pin Cluster – 5 way | |
| SMG2V2A | Relay G2V2 12V DC | Do not use on Q44 earlier than serial number 12000 |
| TM306PA | Screw M3 6mm Sup. Pan. St. Bzp | |
| TM3FHPA | Nut M3 Full Hex St. Bzp | |
| D4066AA | Int. Cct. CD4066BCN | IC400, IC401, IC402, IC403 |
| DIS920B | Diode IS920TB | D403, D406, D407, D408, D409 |
| DZ15VAA | Zener Diode BZY88C15V | D400, D401 |
| DZ7V5AA | Zener Diode BZY88C7V5 | D404, D405 |
| I12436A | PCB Mother Board M12436 ISS 5 | |
| PAM0358 | Black Self-retaining Skt 2 way | |
| PAM0360 | Black Self-retaining Skt 6 way | |
| PAM0362 | Black Self-retaining Skt 10 way | |
| PAM3693 | Green Self-retaining Skt 3 way | |
| PAM3695 | Green Self-retaining Skt 5 way | |
| PAM3690 | Green Self-retaining Skt 10 way | |
| PAM9341 | Gold PINS | |
| R10ROK1 | Resistor 10 10 050 | R400, R405 |
| R120RJA | Resistor 120 5 075 | R406, R407 |
| R220RJ1 | Resistor 220 5 050 | R408 |
| R3K30J1 | Resistor 3K3 5 050 | R401, R402, R403, R404 |
| R4K70J1 | Resistor 4K7 5 050 | R409 |

disc input

M12515 - ISS 4

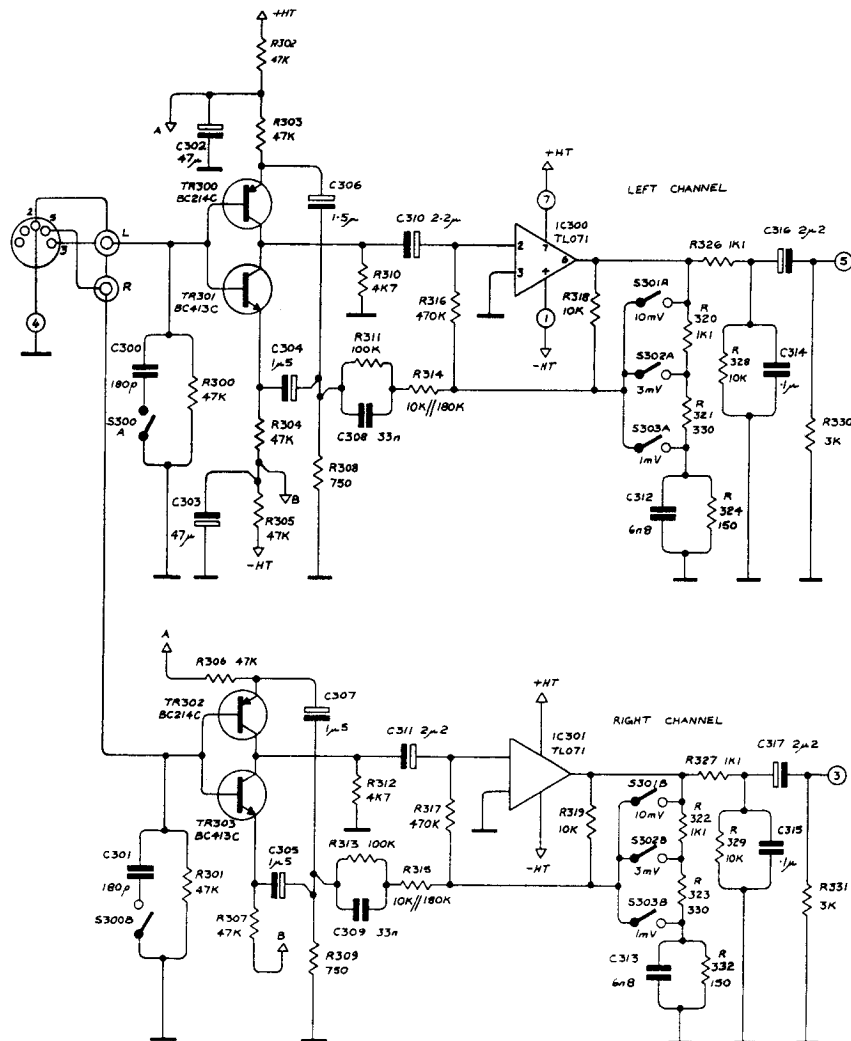
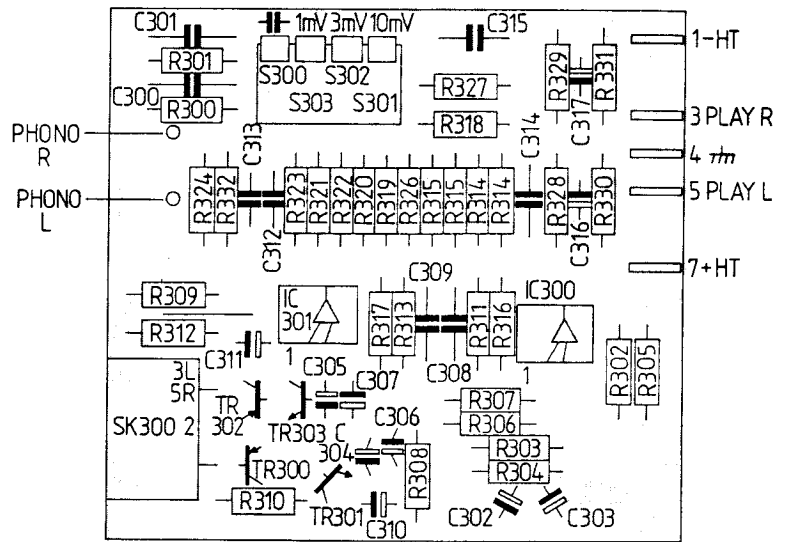
| Qty | Ref. No. | Stock No. | Description |
|-----|-----------------------------------|-----------|------------------------------|
| 2 | IC300, IC301 | D5534AX | Integrated circuit TDA1034NB |
| 2 | R300, R301 | R4K70J1 | Resistor 4K7 ±5% |
| 2 | R302, R303 | R47K0J1 | Resistor 47K ±5% |
| 2 | R304, R305 | R390RG1 | Resistor 390 ±2% |
| 2 | R306, R307 | R150KG1 | Resistor 150K ±2% |
| 2 | R308, R309 | R9K10G1 | Resistor 9K1 ±2% |
| 2 | R310, R311 | R10K0J1 | Resistor 10K ±5% |
| 4 | R312, R313, R1K00J1 R318, R319 | | Resistor 1K ±2% |
| 2 | R314, R315 | R330RG1 | Resistor 330 ±2% |
| 2 | R316, R317 | R150RG1 | Resistor 150 ±2% |
| 2 | R320, R321 | R1K20G1 | Resistor 1K2 ±2% |
| 2 | R322, R323 | R6K80G1 | Resistor 6K8 ±2% |
| 2 | C300, C301 | C180PHL | Capacitor 180p |
| 2 | C304, C305 | C10U0KT | Capacitor 10µ 16V |
| 2 | C306, C307 | CU033JS | Capacitor 33n |
| 2 | C308, C309 | CU150JS | Capacitor .15µ ±5% |
| 2 | C310, C311 | C2U20KT | Capacitor 2.2µ 16V |
| 4 | C312, C313, C47P0KJ C302, C303 | | Capacitor 47p |
| 2 | C314, C315 | CU047ZL | Capacitor 47n |
| 1 | SK300 | PS05DNB | 5 pin DIN socket |
| 4 | L300, L301, L302, L303 | LSC1001 | Choke 1mH |
| 1 | S300-S303 | S44DILA | DIL switch DYS-4DS |
| 5 | 1.3.4.5.7. | PAM8634 | Board socket |
| 1 | | I12515A | Printed board to DRG M12515 |



disc input

M12515 - ISS 5

| Qty | Ref. No. | Stock No. | Description |
|-----|--|-----------|-----------------------------|
| 8 | R300, R301, R302, R303, R304, R305, R306, R307 | R47K0J1 | Resistor 47K ±5% |
| 2 | R308, R309 | R750RG1 | Resistor 750 ±2% |
| 2 | R310, R312 | R4K70J1 | Resistor 4K7 ±5% |
| 2 | R311, R313 | R100KG1 | Resistor 100K ±2% |
| 2 | R314, R315 | R180KJ1 | Resistor 180K ±5% |
| 2 | R316, R317 | R470KG1 | Resistor 470K ±2% |
| 6 | R314, R315, R318, R319, R328, R329 | R10K0G1 | Resistor 10K ±2% |
| 4 | R320, R322, R326, R327 | R1K10G1 | Resistor 1K1 ±2% |
| 2 | R321, R323 | R330RG1 | Resistor 330 ±2% |
| 2 | R324, R332 | R150RG1 | Resistor 150 ±2% |
| 2 | R330, R331 | R3K00G1 | Resistor 3K ±2% |
| 2 | C300, C301 | C180PKE | Capacitor 180p ±10% |
| 2 | C302, C303 | C47U0MU | Capacitor 47µ ±20% 6V3 |
| 4 | C304, C305, C306, C307 | C1U50KT | Capacitor 1µ 5 ±10% |
| 2 | C308, C309 | C33N0JS | Capacitor 33n ±5% |
| 4 | C310, C311, C316, C317 | C2U20KU | Capacitor 2µ 2 ±10% |
| 2 | C314, C315 | C100NJS | Capacitor .1µ ±5% |
| 2 | C312, C313 | C6N80KS | Capacitor 6n8 ±10% |
| 2 | IC300, IC301 | D071CPX | Integrated circuit TL071 |
| 2 | TR300, TR302 | DBC214C | Transistor BC214C |
| 2 | TR301, TR303 | DBC413X | Transistor BC413C |
| 1 | S300-S303 | S44DILA | DIL switch |
| 1 | SK300 | PS05DNB | 5-pin DIN skt. |
| 5 | 1,3,4,5,7 | PAM8634 | Board skts. |
| 1 | | I12515B | Printed wiring board M12515 |



modifications

ORIGINAL ISSUE BOARD M12515 ISS 4

Equalisation is to IEC for which: t1 = 75µs
 t2 = 318µs
 t3 = 3180µs
 t4 = 7950µs

COMPONENT EQUIVALENTS

1C300 1C301 – TDA1034, NE5534.

M12515 ISS 5 SERIAL NUMBER 12000

The circuit has been completely re-designed for manufacturing purposes. This module should only be used on 44's fitted with mother board type M12436 ISS 5. Use with mother boards M12436 ISS 3 and 4 may result in severe switch off thumps.

Equalisation is to RIAA for which: t1 = 75µs
 t2 = 318µs
 t3 = 3180µs

DISC MODULE M12515 ISS 4

| Part No. | Description | Circuit Reference |
|----------|-------------------------------|------------------------|
| C180PHL | Capacitor 180p | C300, C301 |
| C10U0KT | Capacitor 10µ 16V | C304, C305 |
| CU033JS | Capacitor 33n | C306, C307 |
| CU150JS | Capacitor .15µ ±5% | C308, C309 |
| C2U20KT | Capacitor 2.2µ 16V | C310, C311 |
| C47POKJ | Capacitor 47p | C312, C313, C302, C303 |
| CU047ZL | Capacitor 47n | C314, C315 |
| R4K70J1 | Resistor 4K7 5% | R300, R301 |
| R47K0J1 | Resistor 47K 5% | R302, R303 |
| R390RG1 | Resistor 390 2% | R304, R305 |
| R150KG1 | Resistor 150K 2% | R306, R307 |
| R9K10G1 | Resistor 9K1 2% | R308, R309 |
| R10K0J1 | Resistor 10K 5% | R310, R311 |
| R1K00J1 | Resistor 1K 2% | R312, R313, R318, R319 |
| R330RG1 | Resistor 330 2% | R314, R315 |
| R150RG1 | Resistor 150 2% | R316, R317 |
| R1K20G1 | Resistor 1K2 2% | R320, R321 |
| R6K80G1 | Resistor 6K8 2% | R322, R323 |
| D5534AX | Integrated Circuit NE5534AN | IC300, IC301 |
| PS05DNB | 5 Pin DIN socket | SK300 |
| LSC1001 | Choke 1mH | L300, L301, L302, L303 |
| S44DILA | DIL Switch DYS-4DS | S300 – S303 |
| PAM8634 | Gold Board Socket | 1, 3, 4, 5, 7 |
| I12515A | PCB Disc 12515 ISS 4 | |
| M12443A | Disc Input Plate | |
| PQ1124A | Terminal Screw + Earth Symbol | |
| PSPHON2 | Socket Phono Red AT700NP | |
| PSPHON9 | Socket Phono White AT700NP | |
| TC205PF | Drive Screw 3/16 2Z Sup Black | |

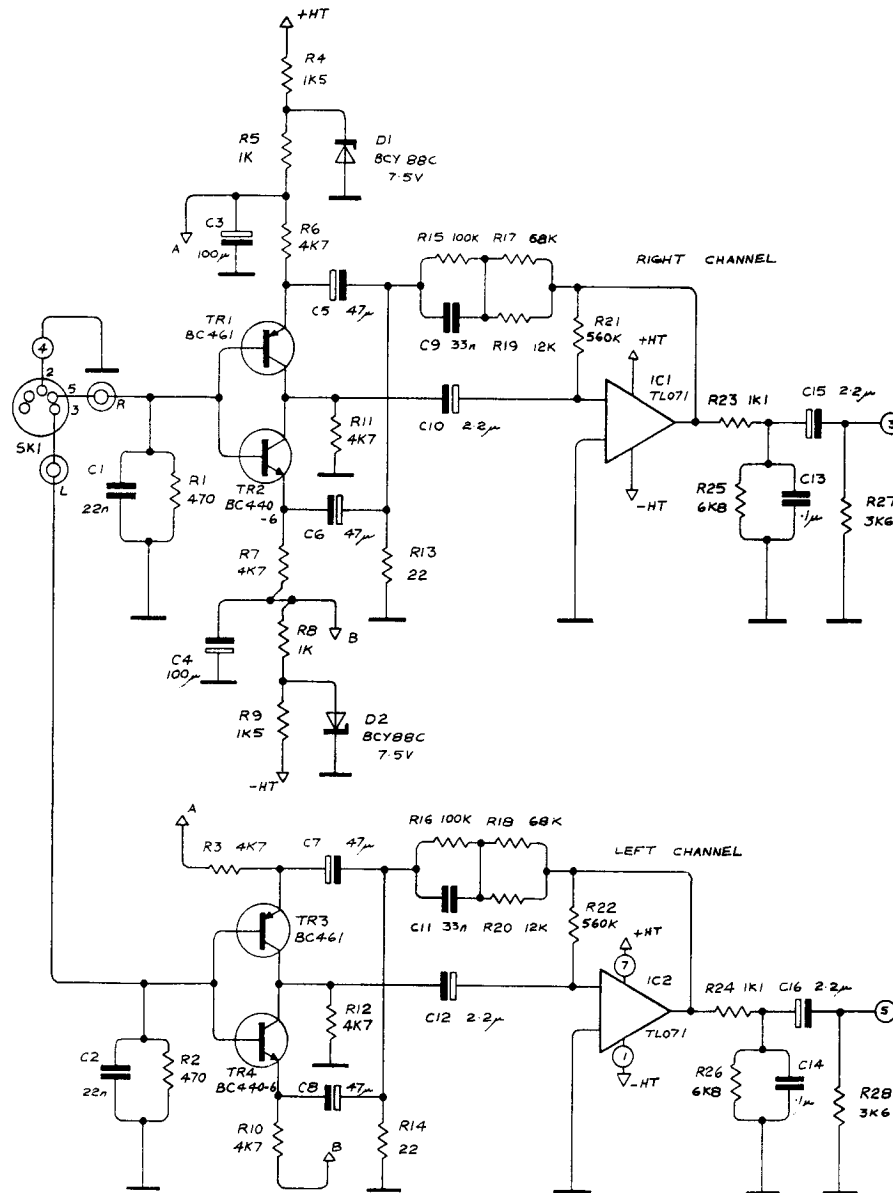
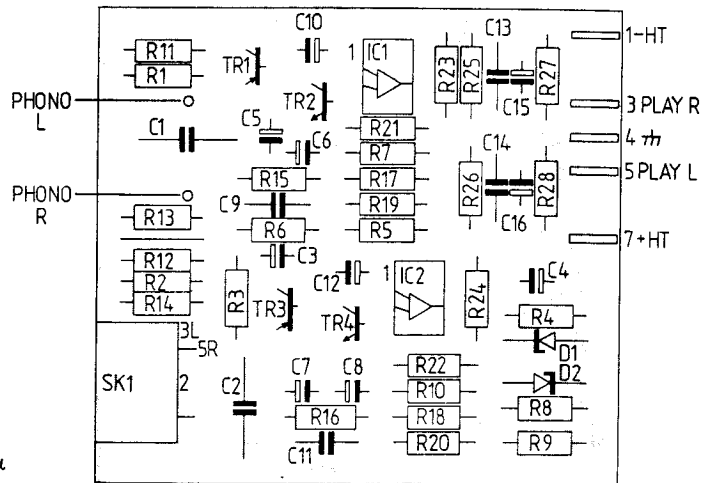
DISC MODULE M12515 ISS 5

| Part No. | Description | Circuit Reference |
|----------|--------------------------------|------------------------------------|
| C100NJS | Capacitor 100nF 5 250V B32561 | C314, C315 |
| C1U50KT | Capacitor 1.5µ 10 Tant | C304, C305, C306, C307 |
| C2U20KT | Capacitor 2.2µ 10 16V Tant | C310, C311 |
| C2U20TM | Capacitor 2.2µ 25V | C316, C317 |
| C33NOJS | Capacitor 33nF 5 250V B32561 | C308, C309 |
| C47U0MT | Capacitor 47µ 20 6.3V Tant | C302, C303 |
| C6N80KS | Capacitor 6.8nF 10 400V B32560 | C312, C313 |
| DBC214C | Transistor BC214C | TR300, TR302 |
| DE5270X | Transistor E5270 | TR301, TR303 |
| C180PKJ | Capacitor 180p UP125 B181KB | C300, C301 |
| DO71CPX | Int Cct TL071CP | IC300, IC301 |
| I12515B | PCB Disc 12515 ISS 5 | |
| M12443A | Disc Input Plate | |
| PAM8634 | Gold Board Socket | 1, 3, 4, 5, 7 |
| PQ1124A | Terminal Screw + Earth Symbol | |
| PS05DNB | Socket 5 pin DIN Angle Panel | |
| PSPHON2 | Socket Phono Red AT700NP | |
| PSPHON9 | Socket Phono White AT700NP | |
| R100KG1 | Resistor 100K 2 050 | R311, R313 |
| R10K0G1 | Resistor 10K 2 050 | R314, R315, R318, R319, R328, R329 |
| R150RG1 | Resistor 150 2 050 | R324, R332 |
| R180KJ1 | Resistor 180K 5 050 | R314, R315 |
| R1K10G1 | Resistor 1K1 2 050 | R320, R322, R326, R327 |
| R330RG1 | Resistor 330 2 050 | R321, R323 |
| R3K00G0 | Resistor 3K 2 033 | R330, R331 |
| R470KG1 | Resistor 470K 2 050 | R316, R317 |
| R47K0J1 | Resistor 47K 5 050 | R300 to R307 inc. |
| R4K70J1 | Resistor 4K7 5 050 | R310, R312 |
| R750RG1 | Resistor 750 2 050 | R308, R309 |
| S44DILA | Switch 44 DIL DYS-4DS | S300 to 303 inc. |
| TC205PF | Drive Screw 3/16 2Z Sup Black | |

moving coil disc input

M12542 - ISS 3

| Type | Sensitivity | Impedance | Modification |
|------|-------------|-----------|--|
| A | 300μ V | 470Ω | As circuit diagram |
| B | 100μ V | 100Ω | R1, R2 = 100n, R13, R14 = 6Ω, R17, R18 = 100K, R21, R22 = IM2, C1, C2 = 68n, C5, C6, C7, C8 = 68μ |
| C | 300μ V | 100Ω | R1, R2 = 100Ω, C1, C2 = 68n |
| D | 100μ V | 470Ω | R13, R14 = 6Ω, R17, R18 = 100K, R21, R22 = IM2, C5, C6, C7, C8 = 68μ |
| E | 100μ V | 100Ω | R1, R2 = 100Ω, R13, R14 = 6Ω, R17, R18 = 100K, R21, R22 = IM2, C1, C2 = 1.5μ, C5, C6, C7, C8 = 68μ |
| F | 300μ V | 100Ω | R1, R2 = 100Ω, C1, C2 = 1.5μ |



modifications

ORIGINAL ISSUE BOARD – M12542 ISS 3

On moving coil module types A, C and F, R17 changes from 68K to 91K. The circuit shown is with equalisation to RIAA. For equalisation to IEC values of R15, R17 and R21 change as follows:

| | Types A, C and F | Types B, D and E |
|-----|------------------|------------------|
| R15 | 100K | 91K |
| R17 | 82K | 82K |
| R21 | 330K | 680K |

MOVING COIL DISC MODULE

| Part No. | Description | Circuit Reference |
|----------|--------------------------------------|---------------------------|
| C100NJS | Capacitor 100nF 5 250V B32561 | C13, C14 |
| C100UME | Capacitor 100 μ F 20% 6.3V K Mat | C3, C4 |
| C2U20KT | Capacitor 2.2 μ 10 16V Tant | C10, C12, C15, C16 |
| C33NOJS | Capacitor 33nF 5 250V B32561 | C9, C11 |
| DO71CPX | Int CCT TL071CP | IC1, IC2 |
| DBC4406 | Transistor BC440-6 | TR2, TR4 |
| DBC4606 | Transistor BC460-6 | TR1, TR3 |
| DZ7V5AA | Zener Diode BZY88C7V5 | D1, D2 |
| FPS907A | Screen Pin | |
| I12542A | PCB Disc Moving Coil Module | |
| IWT05XX | Transistor Pad T05-009D | |
| M12235A | Screen | |
| M12443A | Disc Input Plate | |
| PAM8634 | Gold Board Socket | 1, 3, 4, 5, 7 |
| PQ1124A | Terminal Screw + Earth Symbol | |
| PS05DNB | Socket 5 pin DIN Angle Panel | SK1 |
| R100KG1 | Resistor 100K 2 050 | R15, R16 |
| R12K0G1 | Resistor 12K 2 050 | R19, R20 |
| R1K00J1 | Resistor 1K 5 050 | R5, R8 |
| R1K10G1 | Resistor 1K1 2 050 | R23, R24 |
| R1K50J1 | Resistor 1K5 5 050 | R4, R9 |
| R3K60G1 | Resistor 3K6 2 050 | R27, R28 |
| R4K70J1 | Resistor 4K7 5 050 | R3, R6, R7, R10, R11, R12 |
| R6K80J1 | Resistor 6K8 5 050 | R25, R26 |
| TC205PF | Drive Screw 3/16 2Z Sup Black | |
| PSPHON2 | Socket Phono Red | |
| PSPHON9 | Socket Phono White | |

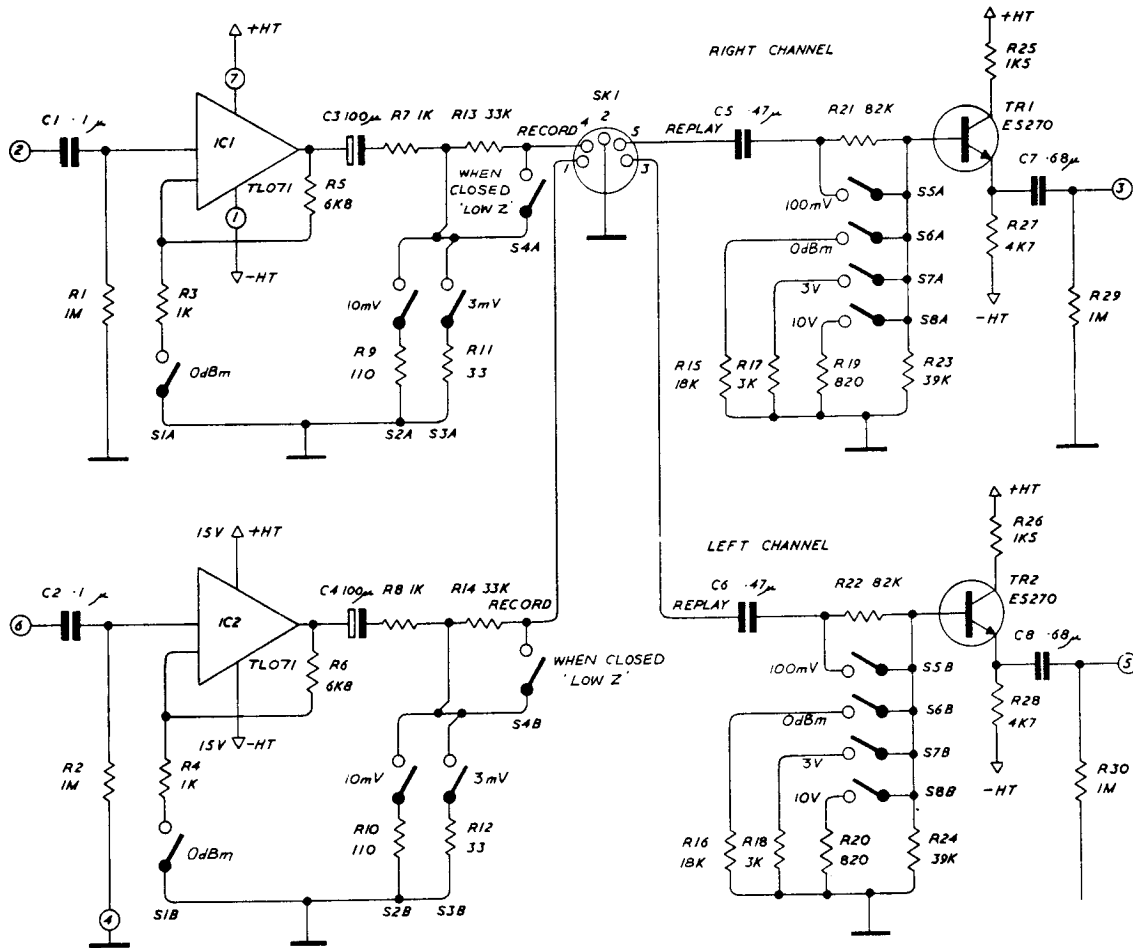
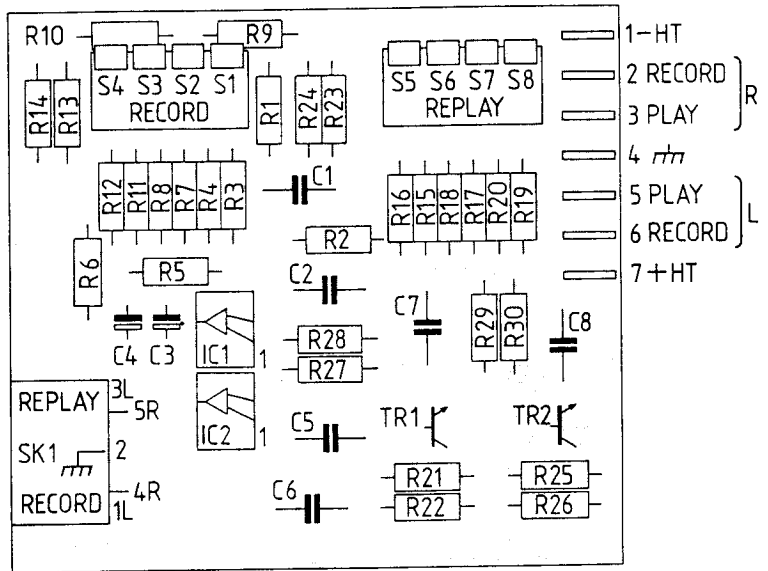
Varying Capacitance & Resistance Values

| | | |
|---------|-------------------------------|-----------------------------|
| R6R80G1 | Resistor 6.8 2 | M/C B, D, E, R13, R14 |
| R22R0G1 | Resistor 22 2 | M/C A, C, F, R13, R14 |
| R100RJ1 | Resistor 100 5 | M/C B, C, E, F, R1, R2 |
| R470RJ1 | Resistor 470 5 | M/C A, D, R1, R2 |
| R68K0J1 | Resistor 68K 5 | M/C A, C, F, R17, R18 |
| R100KJ1 | Resistor 100K 5 | M/C B, D, E, R17, R18 |
| R560KG1 | Resistor 560K 2 | M/C A, C, F, R21, R22 |
| RIM20G1 | Resistor IM2 2 | M/C B, D, E, R17, R18 |
| C1U50KS | Capacitor 1.5 μ F 10 100V | M/C E, F, C1, C2 |
| C22NOJS | Capacitor 22nF 10 250V | M/C A, D, C1, C2 |
| C68NOKS | Capacitor 68n 10 400V | M/C B, C, C1, C2 |
| C47UOKT | Capacitor 47 μ 10 3V | M/C A, C, F, C5, C6, C7, C8 |
| C68UOKT | Capacitor 68 μ 10 3V | M/C B, D, E, C5, C6, C7, C8 |

tape input/output

M12496 ISS 3

| Qty | Ref. No. | Stock No. | Description |
|-----|------------------|-----------|------------------------------|
| 2 | TR1, TR2 | DE5270X | Transistor E5270 |
| 2 | IC1, IC2 | D071CPX | Integrated circuit TL071 |
| 2 | S1-S8 | S44DILA | 'DIL' Switch DYS-4DS |
| 4 | R1, R2, R29, R30 | RIM00J1 | Resistor 1M \pm 5% |
| 4 | R3, R4, R7, R8 | RIK00J1 | Resistor 1K \pm 5% |
| 2 | R5, R6 | R6K80J1 | Resistor 6K8 \pm 5% |
| 2 | R9, R10 | R110RJ1 | Resistor 110 \pm 5% |
| 2 | R11, R12 | R33ROJ1 | Resistor 33 \pm 5% |
| 2 | R13, R14 | R33KOJ1 | Resistor 33K \pm 5% |
| 2 | R15, R16 | R18KOJ1 | Resistor 18K \pm 5% |
| 2 | R17, R18 | R3K00J1 | Resistor 3K \pm 5% |
| 2 | R19, R20 | R820RJ1 | Resistor 820 \pm 5% |
| 2 | R21, R22 | R82KOJ1 | Resistor 82K \pm 5% |
| 2 | R23, R24 | R39KOJ1 | Resistor 39K \pm 5% |
| 2 | R25, R26 | RIK50J1 | Resistor 1K5 \pm 5% |
| 2 | R27, R28 | R4K70J1 | Resistor 4K7 \pm 5% |
| 2 | C1, C2 | C100NKS | Capacitor .1 μ 100V |
| 2 | C3, C4 | C100UKU | Capacitor 100 μ 3V |
| 2 | C5, C6 | C470NKS | Capacitor .47 μ 100V |
| 2 | C7, C8 | C680NKS | Capacitor .68 μ 100V |
| 1 | SK1 | P05DNSB | 5 pin DIN socket |
| 1 | | I12496A | Printed board to Drg. M12496 |
| 7 | 1-7 | PAM8634 | Board socket AMP 85863-4 |



modifications

ORIGINAL ISSUE BOARD M12496 – ISS 3 COMPONENT ALTERNATIVES

IC1 IC2 – LM351, TL071.

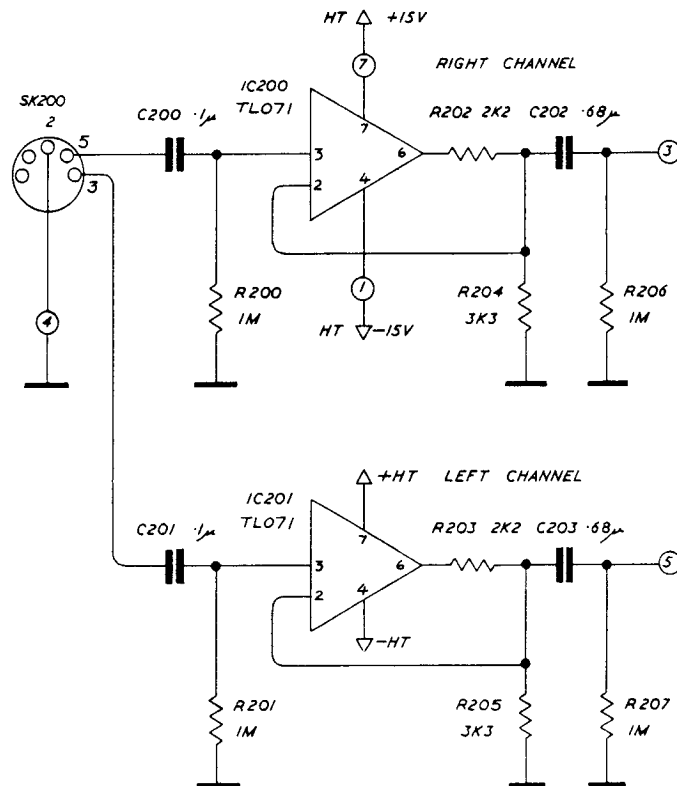
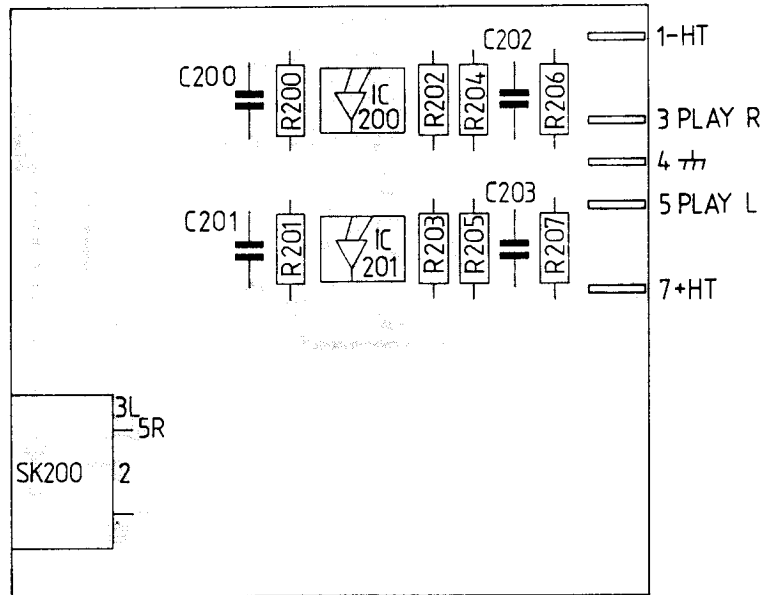
TAPE MODULE

| Part No. | Description | Circuit Reference |
|----------|----------------------------------|---------------------|
| C100NKC | Capacitor 100nF 10 250V B32561 | C1, C2 |
| C100UKT | Capacitor 100 μ F 10 3V Tant | C3, C4 |
| C470NKS | Capacitor 470nF 10 100V B32561 | C5, C6 |
| C680NKS | Capacitor 680nF 10 100V B32561 | C7, C8 |
| DE5270X | Transistor E5270 | TR1, TR2 |
| PSO5DNB | Socket 5 pin DIN Angle Panel | SK1 |
| D071CPX | Int Cct TL071CP | IC1, IC2 |
| I12496A | PCB Tape Module M12496-3 | |
| M12445A | Tape Input Plate | |
| PAM8634 | Gold Board Socket | 1, 2, 3, 4, 5, 6, 7 |
| R110RJ1 | Resistor 110 5 050 | R9, R10 |
| R18KQJ1 | Resistor 18K 5 050 | R15, R16 |
| R1K0OG1 | Resistor 1K 2 050 | R3, R4, R7, R8 |
| R1K5OJ1 | Resistor 1K5 5 050 | R25, R26 |
| R1M0OJ1 | Resistor 1M 5 050 | R1, R2, R29, R30 |
| R33KQJ1 | Resistor 33K 5 050 | R13, R14 |
| R33ROJ1 | Resistor 33 5 050 | R11, R12 |
| R39KQJ1 | Resistor 39K 5 050 | R23, R24 |
| R3K0OJ1 | Resistor 3K 5 050 | R17, R18 |
| R4K7OJ1 | Resistor 4K7 5 050 | R27, R28 |
| R6K8OJ1 | Resistor 6K8 5 050 | R5, R6 |
| R82ORJ1 | Resistor 820 5 050 | R19, R20 |
| R82KOJ1 | Resistor 82K 5 050 | R21, R22 |
| S44DILA | Switch DIL DYS-4DS | S1 to S4, S5 to S8 |
| TC205PF | Drive Screw 3/16 2Z Sup Black | |

radio input

M12511 - ISS 1

| Qty | Ref. No. | Stock No. | Description |
|-----|------------------------|-----------|-----------------------------|
| 2 | IC200, IC201 | D071CPX | Integrated circuit TL071 |
| 4 | R200, R201, R206, R207 | R1M00J1 | Resistor 1M $\pm 5\%$ |
| 2 | R202, R203 | R2K20J1 | Resistor 2K2 $\pm 5\%$ |
| 2 | R204, R205 | R3K30J1 | Resistor 3K3 $\pm 5\%$ |
| 2 | C200, C201 | C100NKS | Capacitor $.1\mu$ |
| 2 | C202, C203 | C680NKS | Capacitor $.68\mu$ |
| 1 | SK200 | PS05DNB | 5 pin DIN socket |
| 5 | 1.3.4.5.7. | PAM8634 | Board socket |
| 1 | | I12511A | Printed board to DRG M12511 |

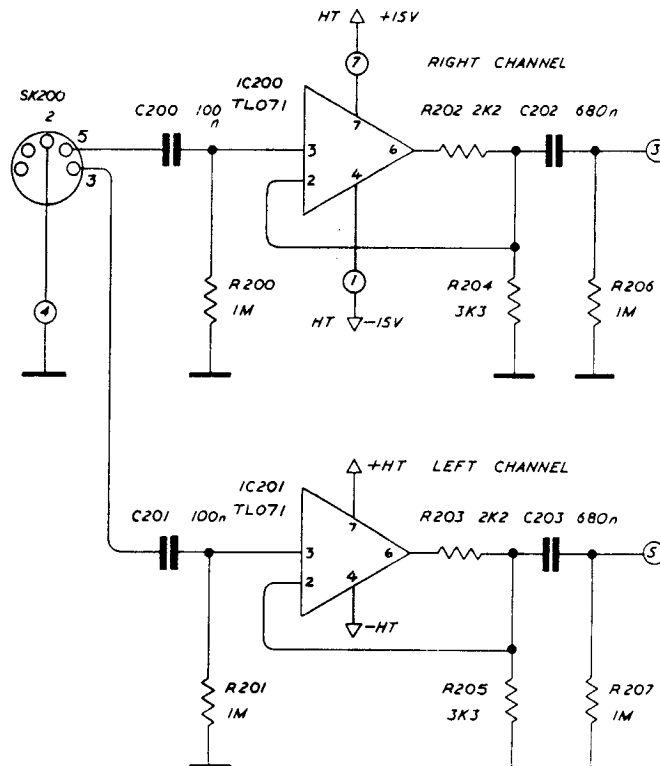
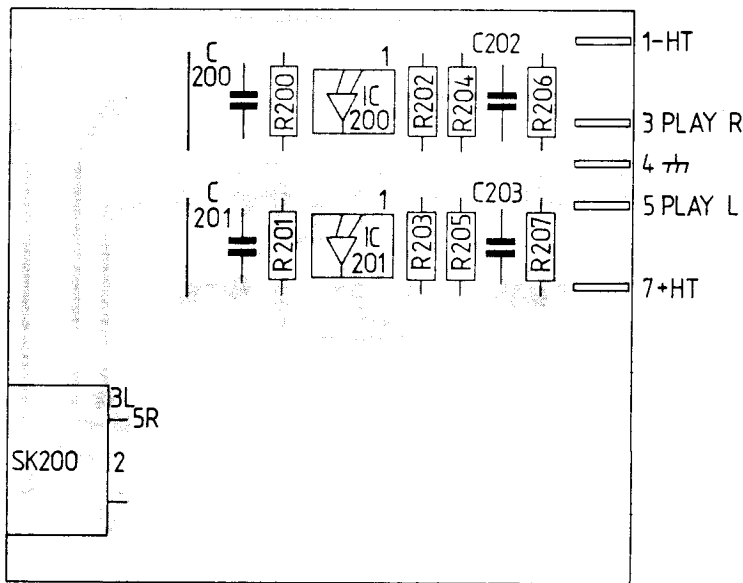


QUAD 44 service data

radio input

M12511 – ISS 2

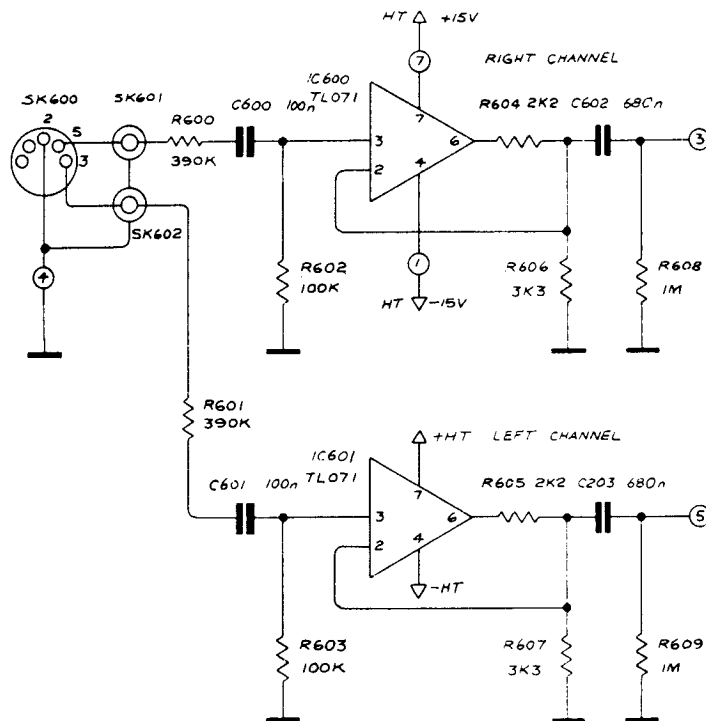
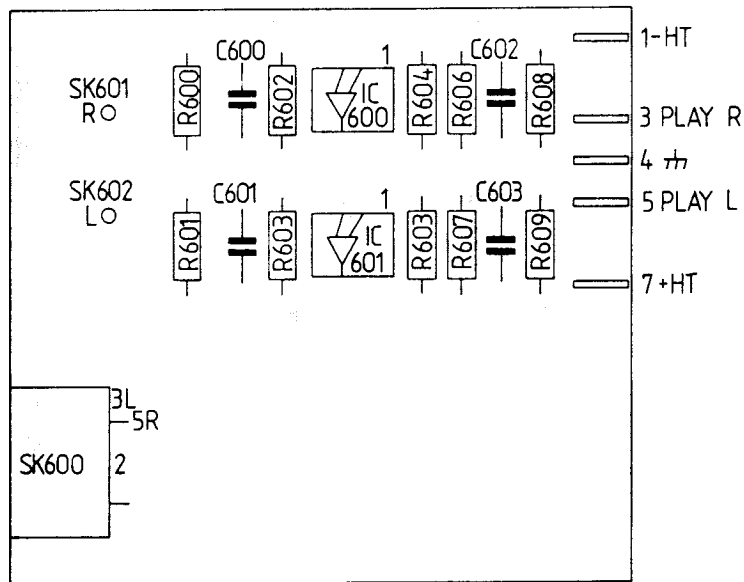
| Qty | Ref. No. | Stock No. | Description |
|-----|------------------------|-----------|-----------------------------|
| 2 | IC200, IC201 | D071CPX | Integrated circuit TL071 |
| 4 | R200, R201, R206, R207 | R1M00J1 | Resistor 1M $\pm 5\%$ |
| 2 | R202, R203 | R2K20J1 | Resistor 2K2 $\pm 5\%$ |
| 2 | R204, R205 | R3K3J1 | Resistor 3K3 $\pm 5\%$ |
| 2 | C200, C201 | C100NKS | Capacitor 100n |
| 2 | C202, C203 | C680NKS | Capacitor 680n |
| 1 | SK200 | P05DNSB | 5 pin DIN socket |
| 5 | 1.3.4.5.7 | PAM8634 | Board socket |
| 1 | | I12511A | Printed board to DRG M12511 |



auxiliary input

M12511 – ISS 2

| Qty | Ref. No. | Stock No. | Description |
|-----|--------------|-----------|-----------------------------|
| 2 | IC600, IC601 | D071CPX | Integrated Circuit TL071 |
| 2 | R600, R601 | R390KJ1 | Resistor 390K ±5% |
| 2 | R602, R603 | R100KJ1 | Resistor 100K ±5% |
| 2 | R604, R605 | R2K20J1 | Resistor 2K2 ±5% |
| 2 | R606, R607 | R3K30J1 | Resistor 3K3 ±5% |
| 2 | R608, R609 | R1M00J1 | Resistor 1M ±5% |
| 2 | C600, C601 | C100NKS | Capacitor 100n |
| 2 | C602, C603 | C680NKS | Capacitor 680n |
| 1 | SK600 | PO5DNSB | 5 Pin DIN Socket |
| 2 | SK601, SK602 | PHONSRJ | 'Phono' Socket |
| 5 | 1.3.4.5.7 | PHONSWJ | Board Socket |
| 1 | | PAM8634 | Printed Board to DRG M12511 |
| | | I12511A | |



modifications

ORIGINAL ISSUE BOARD M12511 – ISS 1 M12511 ISS 2 at serial number 12000.

44's before serial number 12,000 were fitted with two radio input modules. One of the radio input modules has been replaced by an auxiliary input module. The same printed circuit board is used for both radio and auxiliary modules although the values of some of the components are different.
The auxiliary input module accommodates two types of input connector, DIN and PHONO.

ALTERNATIVE COMPONENTS

IC 200, 201, 600, 601 – LM351 or TL071.

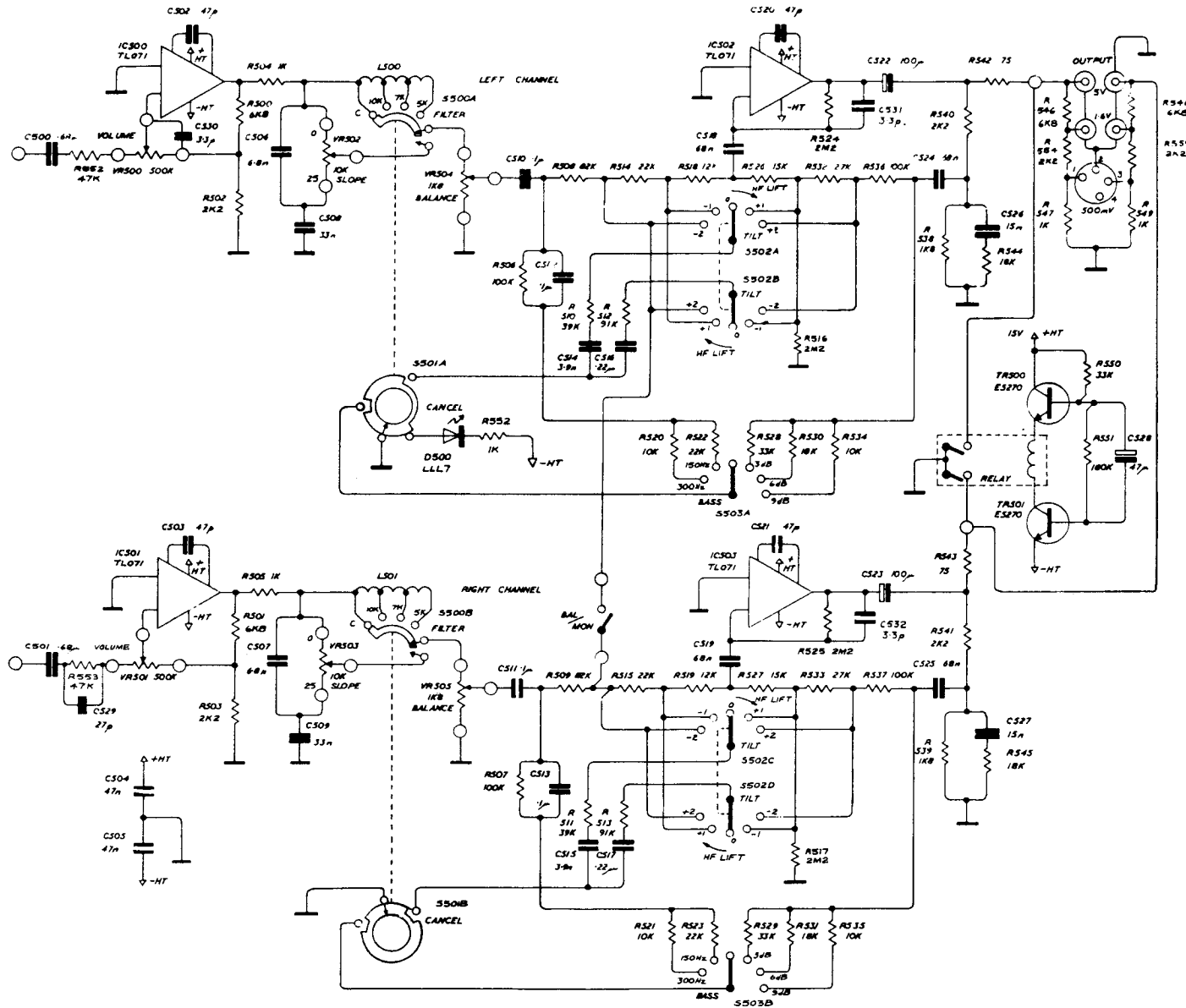
RADIO/AUX. INPUT MODULE

| Part No. | Description | Circuit Reference |
|----------|----------------------------------|------------------------------------|
| C100NKC | Capacitor 100nF 10 250V B32561 | C600, C601, C200, C201 |
| C680NKS | Capacitor 680nF 10 100V B32561 | C602, C603, C202, C303 |
| PS05DNB | Socket 5 pin DIN Angle Panel | SK600, SK200 |
| PSPHON2 | Phono Socket Red | SK601 |
| PSPHON9 | Phono Socket White | SK602 |
| D071CPX | Int Cct TL071CP | IC200, IC201, IC600, IC601 |
| I12511A | PCB Radio/Aux Board M12511 ISS 2 | |
| M12563A | Aux. Module Front Plate | |
| M12445A | Radio Module Front Plate | |
| PAM8634 | Gold Board Socket | 1, 3, 4, 5, 7 |
| R100KJ1 | Resistor 100K 5 050 | R602, R603 |
| R1M00J1 | Resistor 1M 5 050 | R608, R609, R200, R201, R206, R207 |
| R2K20J1 | Resistor 2K2 5 050 | R604, R605, R202, R203 |
| R390KJ1 | Resistor 390K 5 050 | R600, R601 |
| R3K30J1 | Resistor 3K3 5 050 | R606, R607, R204, R205 |
| TC205PF | Drive Screw 3/16 2Z Sup Black | |

tone control

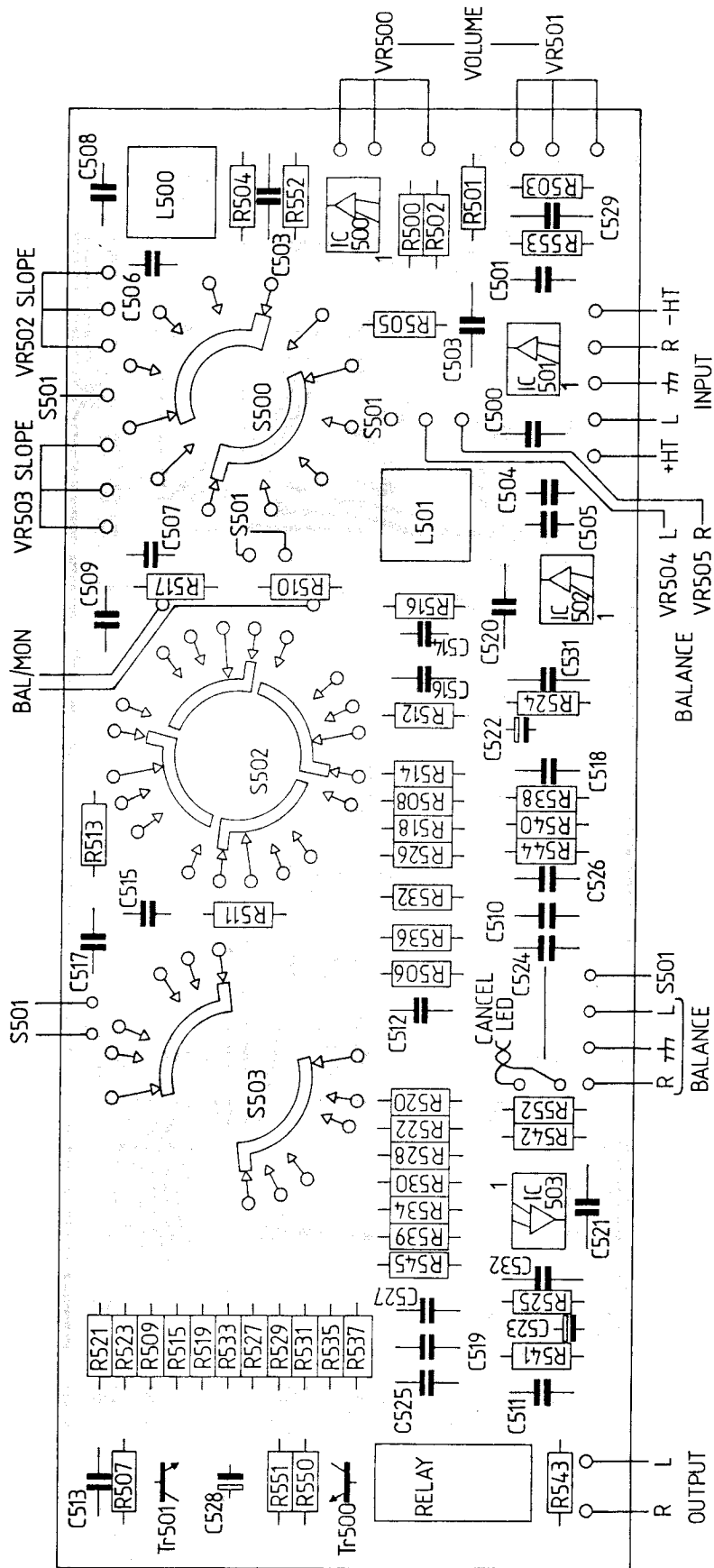
M12512 - ISS 8

| Qty | Ref. No. | Stock No. | Description |
|-----|----------------------------|-----------|--------------------------|
| 4 | IC500, IC502, IC503, IC501 | D071CPX | Integrated circuit TL071 |
| 2 | TR500, TR501 | DE5270X | Transistor E5270 |
| 2 | C531, C532 | C3P30KE | Capacitor 3.3p |
| 2 | C504, C505 | CU047ZL | Capacitor 47n 63V |
| 4 | C502, C503, C520, C521 | C47P0KE | Capacitor 47p |
| 2 | C500, C501 | C680NKS | Capacitor 68μ |
| 4 | C518, C519, C524, C525 | C68N0KS | Capacitor 68n |
| 2 | C506, C507 | C6N80KS | Capacitor 6.8n |
| 2 | C508, C509 | C33N0JS | Capacitor 33n |
| 4 | C510, C511, C512, C513 | C100NKS | Capacitor 1μ |
| 2 | C514, C515 | C3N90KS | Capacitor 3.9n |
| 2 | C516, C517 | C220NKS | Capacitor 22μ |
| 2 | C526, C527 | C15N0KS | Capacitor 15n |
| 2 | C522, C523 | C100UKU | Capacitor 100 |
| 1 | C528 | C47U0ZB | Capacitor 47μ 40V |
| 1 | C529 | C27P0KE | Capacitor 27p |
| 1 | C530 | C3P30CI | Capacitor 3.3p |
| 1 | D500 | BLLLL7X | LED LLL7 |
| 4 | R514, R515, R522, R523 | R22K0J1 | Resistor 22K ±5% |
| 4 | R500, R501, R546, R548 | R6K80G1 | Resistor 6K8 ±2% |
| 3 | R504, R505, R556 | R1K00J1 | Resistor 1K ±5% |
| 4 | R506, R507, R536, R537 | R100KJ1 | Resistor 100K ±5% |
| 2 | R508, R509 | R82KJ1 | Resistor 82K ±5% |
| 2 | R510, R511 | R39KJ1 | Resistor 39K ±5% |
| 4 | R516, R517, R524, R525 | R2M20J1 | Resistor 2M2 ±5% |
| 2 | R518, R519 | R12K0J1 | Resistor 12K ±5% |
| 4 | R520, R521, R534, R535 | R10K0J1 | Resistor 10K ±5% |
| 2 | R546, R548 | R9K10G1 | Resistor 9K1 ±2% |
| 2 | R526, R527 | R15K0J1 | Resistor 15K ±5% |
| 3 | R528, R529, R550 | R33K0J1 | Resistor 33K ±5% |
| 4 | R530, R531, R544, R545 | R18K0J1 | Resistor 18K ±5% |
| 2 | R532, R533 | R27K0J1 | Resistor 27K ±5% |
| 2 | R538, R539 | R1K80J1 | Resistor 1K8 ±5% |
| 2 | R540, R541 | R2K20J1 | Resistor 2K2 ±5% |
| 4 | R554, R555, R502, R503 | R2K20G1 | Resistor 2K2 ±2% |
| 2 | R542, R543 | R75R0J1 | Resistor 75 ±5% |
| 2 | R547, R549 | R1K00G1 | Resistor 1K ±2% |
| 1 | R551 | R180KJ1 | Resistor 180K ±5% |
| 2 | R552, R553 | R47K0J1 | Resistor 47K ±5% |
| 2 | R512, R513 | R91K0J1 | Resistor 91K ±5% |
| 2 | L500, L501 | Q44FLPA | Filter coil |
| 1 | VR500/1 | R44VOLA | Volume control |
| 1 | VR502/3 | R44SL0A | Slope control |
| 1 | VR504/5 | R44BALA | Balance control |
| 1 | S500/1 | S44FILA | Filter cancel switch |
| 1 | S502 | S44TILA | Tilt switch |
| 1 | S503 | S44BASA | Bass switch |
| 1 | | I12512A | Printed wiring board |



tone control

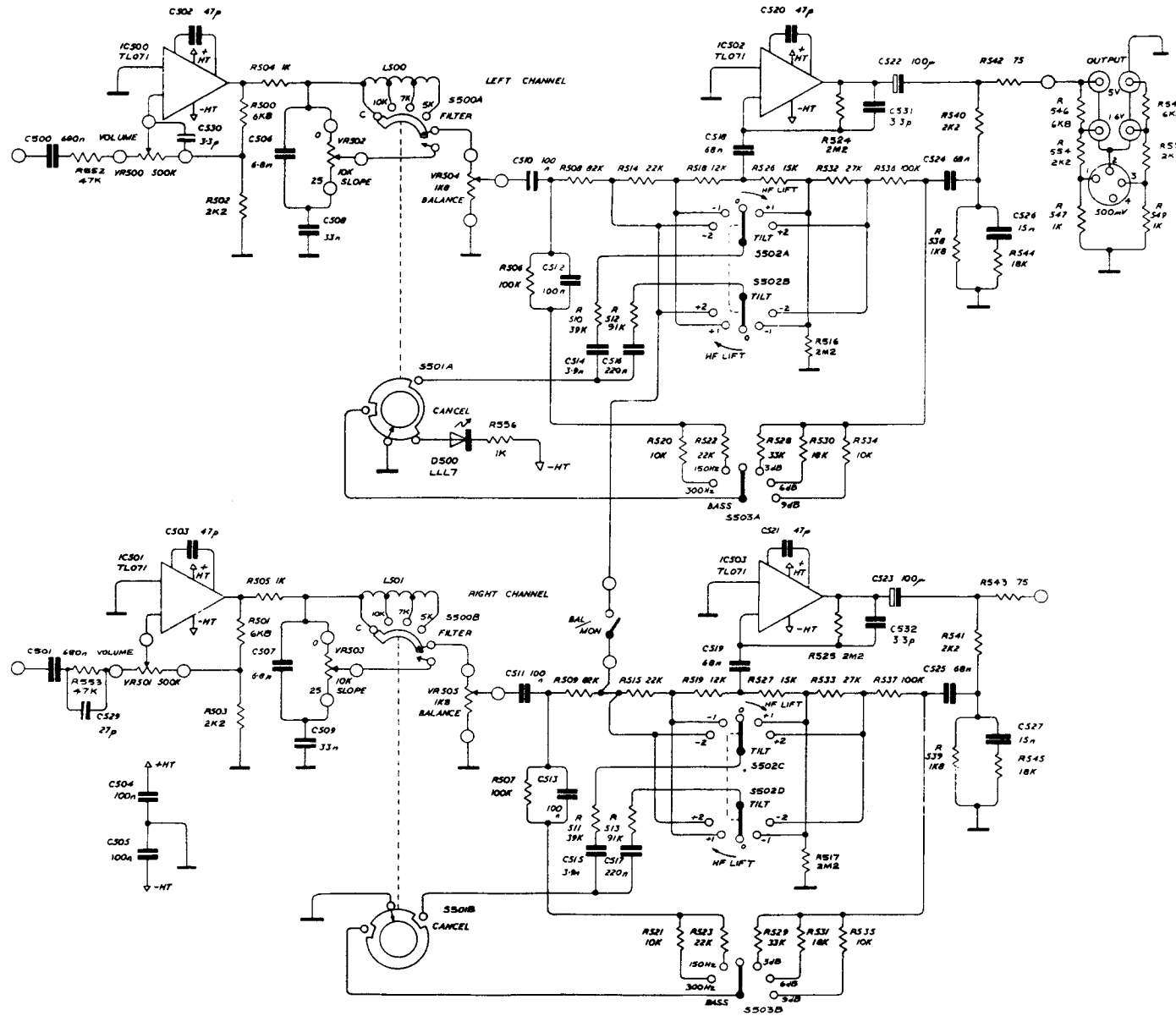
M12512 - ISS 8



tone control

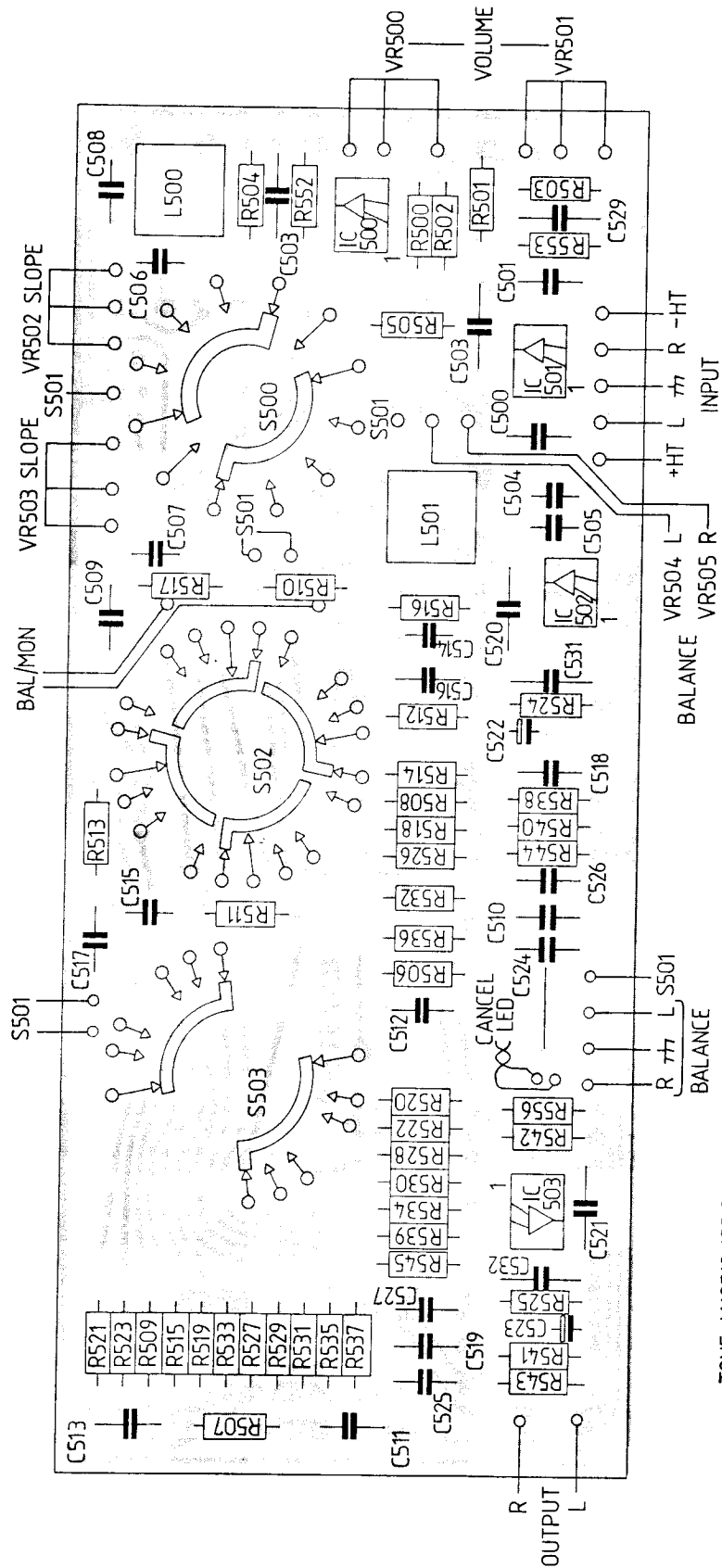
M12512 - ISS 9

| Qty | Ref. No. | Stock No. | Description |
|-----|----------------------------|-----------|-----------------------------|
| 4 | IC500, IC502, IC503, IC501 | D071CPX | Integrated circuit TL071 |
| 2 | C531, C532 | C3P30KE | Capacitor 3.3p |
| 2 | C504, C505 | C100NKA | Capacitor 100n |
| 4 | C502, C503, C520, C521 | C47POKE | Capacitor 47p |
| 2 | C500, C501 | C68NOKS | Capacitor 680n |
| 4 | C518, C519, C524, C525 | C68NOKS | Capacitor 68n |
| 2 | C506, C507 | C68NOKS | Capacitor 6.8n |
| 2 | C508, C509 | C33NOJS | Capacitor 33n |
| 4 | C510, C511, C512, C513 | C100NKS | Capacitor 100n |
| 2 | C514, C515 | C3N9OKS | Capacitor 3.9n |
| 2 | C516, C517 | C220NKS | Capacitor 220n |
| 2 | C526, C527 | C15NOKS | Capacitor 15n |
| 2 | C522, C523 | C100UKU | Capacitor 100µ |
| 1 | C529 | C27POKE | Capacitor 27p |
| 1 | C530 | C3P30CI | Capacitor 3.3p |
| 1 | D500 | BLLL7X | LED LLL7 |
| 4 | R514, R515, R522, R523 | R22K0J1 | Resistor 22K ±5% |
| 4 | R500, R501, R546, R548 | R6K80G1 | Resistor 6K8 ±2% |
| 3 | R504, R505, R556 | R1K00J1 | Resistor 1K ±5% |
| 4 | R506, R507, R536, R537 | R100KJ1 | Resistor 100K ±5% |
| 2 | R508, R509 | R82KJ1 | Resistor 82K ±5% |
| 2 | R510, R511 | R39KJ1 | Resistor 39K ±5% |
| 4 | R516, R517, R524, R525 | R2M20J1 | Resistor 2M2 ±5% |
| 2 | R518, R519 | R12K0J1 | Resistor 12K ±5% |
| 4 | R520, R521, R534, R535 | R10K0J1 | Resistor 10K ±5% |
| 2 | R546, R548 | R9K10G1 | Resistor 9K1 ±2% |
| 2 | R526, R527 | R15K0J1 | Resistor 15K ±5% |
| 2 | R528, R529 | R33K0J1 | Resistor 33K ±5% |
| 4 | R530, R531, R544, R545 | R18K0J1 | Resistor 18K ±5% |
| 2 | R532, R533 | R27K0J1 | Resistor 27K ±5% |
| 2 | R538, R539 | R1K80J1 | Resistor 1K8 ±5% |
| 2 | R540, R541 | R2K20J1 | Resistor 2K2 ±5% |
| 4 | R554, R555, R502, R503 | R2K20G1 | Resistor 2K2 ±2% |
| 2 | R542, R543 | R75R0J1 | Resistor 75 ±5% |
| 2 | R547, R549 | R1K00G1 | Resistor 1K ±2% |
| 2 | R552, R553 | R47K0J1 | Resistor 47K ±5% |
| 2 | R512, R513 | R91K0J1 | Resistor 91K ±5% |
| 1 | L500, L501 | Q44F1P1 | Filter coil |
| 1 | VR500/1 | R44VOLA | Volume control |
| 1 | VR502/3 | R44SL0A | Slope control |
| 1 | VR504/5 | R44BALA | Balance control |
| 1 | S500/1 | S44FILA | Filter/cancel switch |
| 1 | S502 | S44TILA | Tilt switch |
| 1 | S503 | S44BASA | Bass switch |
| 1 | | I12512A | Printed wiring board M12512 |



tone control

M12512 - ISS 9



TONE M12512 ISS.9

modifications

ORIGINAL ISSUE BOARD M12512 ISSUE 5

C529 – 27pf added at a later stage in production.

M12512 ISS 6

As issue 5 except that the top side of the printed circuit board has an earth screen.

Changes made at serial number 2401

R500 and R501 changed from 22K to 6K8

R502 and R503 changed from 6K8 to 2K2

This increases the ultimate attenuation of the volume control to -72dB.

M12512 ISS 8

C531 and C532 added to improve stability. Other changes made at various stages in production:

1. C529-27pf removed.
2. 4.7 μ F capacitor added to the relay circuit from the +15V HT to the base of TR501, in order to increase the relay switch off time.

M12512 ISS 9 SERIAL NUMBER 12000

The board does not accommodate the relay circuit which has been modified and fitted to the mother board M12436 – ISS 5.

For 44's pre-serial number 12000 replacement relays are National HB2 - DC24V stock number SMHB2TA. These are not interchangeable with the type of relay fitted to the mother board.

C504, C505 change from 47n to 100n.

COMPONENT ALTERNATIVES

IC500, 501, 502, 503 – LM351 or TL071.

QUAD44 service data

TONE CONTROL BOARD

| Part No. | Description | Circuit Reference |
|----------|----------------------------------|--|
| C100NKC | Capacitor 100nF 10 250V B32561 | C510, C511, C512, C513 |
| C100NKS | Capacitor 100nF 10 100V B32510 | C504, C505 |
| C100UKT | Capacitor 100 μ F 10 3V Tant | C522, C523 |
| C15NOKS | Capacitor 15nF 10 400V B32561 | C526, C527 |
| C220NKB | Capacitor 220nF 0 250V B32561 | C516, C517 |
| C33NQJS | Capacitor 33nF 5 250V B32561 | C508, C509 |
| C3N9OKS | Capacitor 3.9nF 10 400V B32545 | C514, C515 |
| C3P30KJ | Capacitor 3.3p UP125 CH 3R3 KB | C531, C532 |
| C47P0KJ | Cap 47p 10 UP125-SL 470MB | C502, C503, C520, C521 |
| C680NKS | Capacitor 680nF 10 100V B32561 | C500, C501 |
| C68NOKS | Capacitor 68nF 10 400V B32561 | C518, C519, C524, C525 |
| C6N8OKS | Capacitor 6.8nF 10 400V B32560 | C506, C507 |
| C3P30CI | Capacitor 3.3p | C530 |
| CU047ZL | Capacitor 47n | C504, C505 |
| C27P0KE | Capacitor 27p | C529 |
| C47U0ZB | Capacitor 47 μ 40V EK | C528 |
| C4U70ZA | Capacitor 4.7 μ 63V | |
| PAM1872 | Male Tags | |
| PAM3702 | Black Pin Cluster - 2 way | |
| DO71CPX | Int Cct TL071CP | IC500, IC501, IC502, IC503 |
| I12512A | PCB Tone Board M12512 ISS 9 | |
| M12484A | Pillar | |
| M12485A | Slope Control Bracket | |
| PAM0358 | Black Self-retaining Skt 2 way | |
| P19308A | I C Holder C930802 | |
| R100KJ1 | Resistor 100K 5 050 | R506, R507, R536, R537 |
| R10K0J1 | Resistor 10K 5 050 | R520, R521, R534, R535 |
| R12K0J1 | Resistor 12K 5 050 | R518, R519 |
| R15K0J1 | Resistor 15K 5 050 | R526, R527 |
| R180KJ1 | Resistor 180K 5 050 | R551 |
| R18K0J1 | Resistor 18K 5 050 | R530, R531, R544, R545 |
| R1K00J1 | Resistor 1K 5 050 | R504, R505, R556 |
| R1K80J1 | Resistor 1K8 5 050 | R538, R539 |
| R22K0J1 | Resistor 22K 5 050 | R514, R515, R522, R523 |
| R27K0J1 | Resistor 27K 5 050 | R532, R533 |
| R2K20G1 | Resistor 2.2K 2 050 | R502, R503, R554, R555 |
| R2K20J1 | Resistor 2K2 5 050 | R540, R541 |
| R2M20KI | Resistor 2.2M 10 050 | R516, R517, R524, R525 |
| R33K0J1 | Resistor 33K 5 050 | R528, R529, R550 |
| R39K0J1 | Resistor 39K 5 050 | R510, R511 |
| R44SLOA | Potentiometer Slope Control | VR502, VR503 |
| R47K0J1 | Resistor 47K 5 050 | R552, R553 |
| R6K80G1 | Resistor 6K8 2 050 | R500, R501, R546, R548 |
| R75R0J1 | Resistor 75 5 050 | R542, R543 |
| R82K0J1 | Resistor 82K 5 050 | R508, R509 |
| R91K0J1 | Resistor 91K 5 050 | R512, R513 |
| S44BASA | Switch Bass Control | S503 |
| S44FILA | Switch Filter | S500 |
| S44TILA | Switch Tilt Control | S502 |
| TM206PA | Screw M2.5 6mm Sup. Pan. St. BZP | |
| R44BALA | Potentiometer Balance Control | VR504 |
| R44VOLA | Potentiometer Volume Control | VR500 |
| Q44FLPA | Filter Coil | L500, L501 |
| SMHB2TA | Relay HB2 24D.C. | Do not use on Q44 after Serial Number 12,000 |
| DE5270X | Transistor E5270 | TR500, TR501 |

miscellaneous modifications

From serial number 2400 to 3175, some 44's used improved connectors on the red and white twined wires, between the mother board and tone-control board.

The wires on 44's pre-serial number 2400 had been soldered to the tone control board, and semi permanently fixed to the mother board using a green 3-way pin and socket cluster.

On some 44's between serial number 2,400 and 3175 the wires were soldered to the mother board, and semi-permanently fixed to the tone control board using spade type connectors.

Co-incident with the introduction of the Issue 4 mother board M12436, the wires were again soldered to the tone control board, and semi-permanently fixed to the mother board using spade type connectors.

SERIAL NUMBER 4851

A 1.6V output level is now fitted to the output panel alongside the 5V output.

Fig. 19 shows how to convert pre-serial number 4851 44's from 5V to 1.6V.

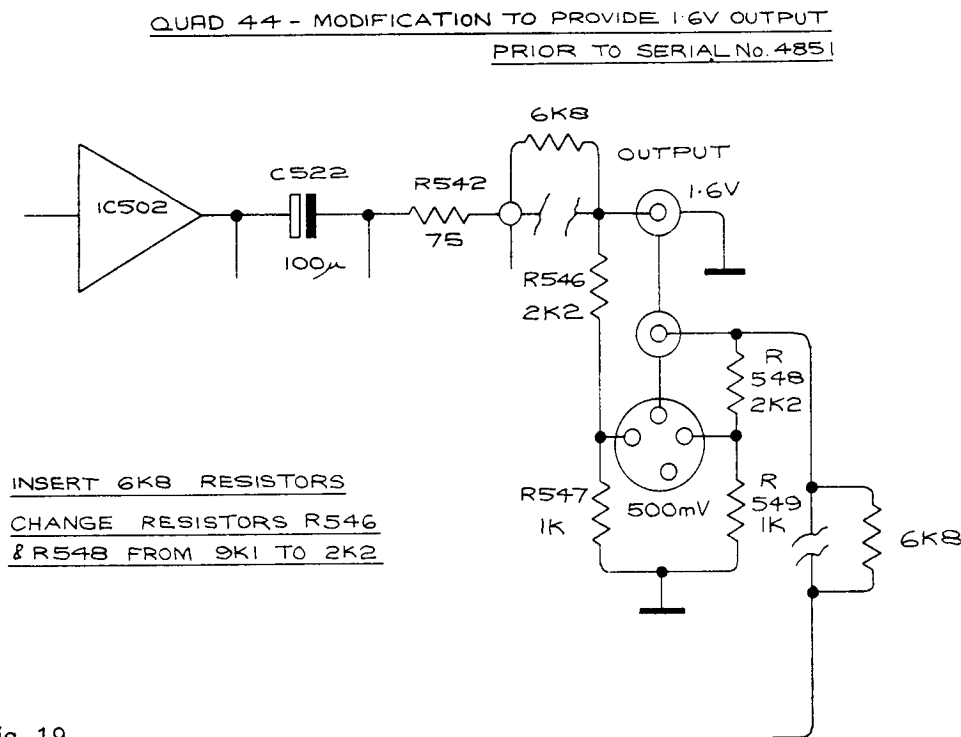


Fig. 19

SERIAL NUMBER 7001

A suppressor is now fitted across the power switch.

SERIAL NUMBER 12,000

Spade connectors and, green pin and socket clusters throughout the 44 have been replaced with an improved black pin and socket cluster.

SERIAL NUMBER 19,000

Switched AC connectors have been changed to conform with European standards. The outlets have been changed to type CEE22 moated sockets. It is important NOT to use the old type unshrouded male connector in the new type unshuttered socket. It is possible to insert the earth pin of the plug into the live output of the socket, with obvious consequences.

| Part No. | Description | Circuit Reference |
|----------|----------------------------------|-------------------|
| AF588AA | Rubber Feet B8/588 | |
| FE1210A | Eyelet LS1210 Med. Brass Yellow | |
| FF123ZF | Push-on Fix HPW 123 ZF | |
| FF1722A | Quad Insert Securing Clip | |
| FP70271 | Card Securing Clip | |
| I12514A | PCB LED 12514 | |
| IFVF88A | Sponge Strip | |
| M12430A | Pushbutton Caps | |
| M12435P | Front Panel | |
| M12439A | Side Panel | |
| M12440A | Top Chassis Rail | |
| M12440B | Bottom Chassis Rail | |
| M12448P | Knob Vol. Contr. | |
| M12449P | Knob Slope Con. | |
| BLLLL7X | Cancel LED | D500 |
| M12450P | Knob Tone Con. | |
| M12451P | Knob Filter | |
| M12452P | Sub Panel | |
| M12471P | Cover | |
| M12472A | Spacer | |
| M12474A | Mains Sw. Conn. Link | |
| M12477A | Balance Control Knob | |
| M12478P | Bal-Mon Plate | |
| M12479A | Quad Insert | |
| M12480A | Cover Escutcheon | |
| M12481A | Cover Lid | |
| M12490A | Dil Cover Card | |
| M12510A | Transf. Shield | |
| M12537A | Balance Slider Screen | |
| M12562A | Cover Chassis Supports | |
| N36325A | Mains Switch Knob 36325 | |
| TC306PA | Screw M3 6mm Thread Forming | |
| TC406PC | Drive Screw 1/4 4Z Sup Pan | |
| TDM4SPA | Washer M4 9 ST BZP | |
| TM206CA | Screw M2.5 6mm Sup. Csk. ST. BZP | |
| TM303GC | Grubscrew M3 3mm Socket | |
| TM310GC | Screw M3 10mm Grub Skt Flat | |
| TM408PA | Screw M4 8mm Sup. Pan ST. BZP | |
| TM416PA | Screw M4 16mm Sup. Pan ST. BZP | |
| PAM5302 | Wire End Sockets Gold | |
| FTB6SS5 | Soldertag 6BA SS5 | |
| M12438A | Front Plate | |
| S44BALA | Bal-Mon Switch | |
| TM306PA | Screw M3 6mm Sup. Pan. ST. BZP | |
| TM312PA | Screw M3 12mm Sup. Pan. ST. BZP | |
| TM3FHPA | Nut M3 Full Hex ST. BZP | |

| Part No. | Description | Circuit Reference |
|----------|----------------------------------|--|
| FF2938A | Spire Clip SFO 2938/17/00 | |
| M12453A | 44 Mains Transformer Chassis | |
| M12526A | 44 Transformer Shroud | |
| N39159A | 44 Mains Switch Coupling Link | |
| NPMR20A | Suppressor PMR209M-547-100 D N | |
| PF5234A | Fuseholder 5234 | |
| PPP579A | Plug 3 pin AC Eur. Input - Panel | Use on units before Serial Number 19,000 |
| PSP680A | Skt 3 pin AC Outlet Panel P680 | Use on units before Serial Number 19,000 |
| S44MVSA | AC Voltage Selector | |
| S44OFFA | AC On Off Switch 240V | |
| TC406PC | Drive Screw 1/4 4Z Sup Pan | |
| TM308CA | Screw M3 8mm Sup. Csk. ST. BZP | |
| TM316PA | Screw M3 16mm Sup. Pan. ST. BZP | |
| UMA10DA | Fuse 20mm 100mA Delay 570A | F400 |
| PPR0331 | Plug 3 pin AC Eur. Input | Use on units from Serial Number 19,000 |
| PSR0431 | Skt 3 pin AC Outlet | Use on units from Serial Number 19,000 |
| L12527A | Transf. 44 AC Supply A4/12527 | T400 |
| M12447A | 44 AC Supply Box and Cover | |
| FFL0KAB | Lokut Nut 212-110302-00 | |
| PS04DNA | Socket 4 pin DIN Panel Mntg | |
| PSPHON2 | Socket Phono Red AT700NP | |
| PSPHON9 | Socket Phono White AT700NP | |
| R1K00G1 | Resistor 1K 2 050 | R547, R549 |
| R2K20J1 | Resistor 2K2 5 050 | R554, R555 |
| R6K80G1 | Resistor 6K8 2 050 | R546, R548 After Serial Number 4850 |
| TM206PB | Screw M2.5 6mm Sup. Pan. ST. BLK | |
| TM2FHPA | Nut M2.5 Full Hex ST. BZP | |
| R9K10J1 | Resistor 9K1 5 050 | R546, R548 Up to Serial Number 4850 |

COMPLETED SUB ASSEMBLIES

| Part No. | Description | Circuit Reference |
|----------|--------------------------------------|---|
| Q44TOPA | P.C.B. Tone Control M12512 ISS 8 | Use only on units before Serial Number 12,000 |
| Q44TOPB | P.C.B. Tone Control M12512 ISS 9 | Use only on units after Serial Number 12,000 |
| Q44MOPB | P.C.B. Mother Board M12436 ISS 5 | Use only on units after Serial Number 12,000 |
| Q44RAPA | P.C.B. Radio Board M12511 ISS 2 | |
| Q44AUPA | P.C.B. Aux Board M12511 ISS 2 | |
| Q44TAPA | P.C.B. Tape Board M12496 ISS 3 | |
| Q44DSPA | P.C.B. Disc Board M12515 ISS 4 | |
| Q44DSP5 | P.C.B. Disc Board M12515 ISS 5 | |
| Q44DAPA | P.C.B. Disc M/C Board A M12542 ISS 3 | |
| Q44DBPA | P.C.B. Disc M/C Board B M12542 ISS 3 | |
| Q44DCPA | P.C.B. Disc M/C Board C M12542 ISS 3 | |
| Q44DDPA | P.C.B. Disc M/C Board D M12542 ISS 3 | |
| Q44DFPA | P.C.B. Disc M/C Board F M12542 ISS 3 | |
| Q44BAPA | P.C.B. Bal-Mon Board | |
| Q44LEPA | P.C.B. LED Board | |
| Q44OPPA | Output Assembly | |