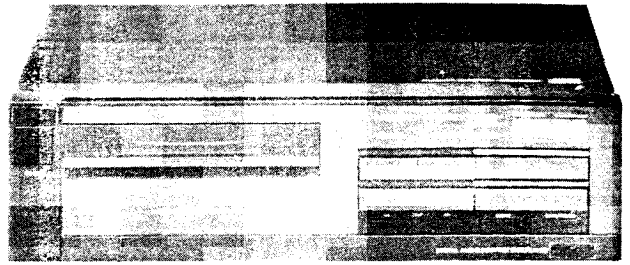


Service
Service



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37 891 A12

Service Manual

COMPACT
disc
DIGITAL AUDIO

CONTENTS

- 1 Elucidation subdivision and table of contents per page
- 2 Controls and technical specifications
- 3 Servicing hints
- 4 Measurements and adjustments
- 5 Exploded views and parts lists of mechanical components
- 6 Block diagram, circuit diagrams, PCB data, parts lists of electrical components and wiring diagram
- 7 Changes
- 8 Additional information

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

CLASS 1
LASER PRODUCT

3127 110 03420



1. ELUCIDATION ON THE LAYOUT OF THE DOCUMENTATION

The documentation consists of chapters.

The number of the chapter is indicated by the first digit of the page number.

The second digit of the page number is the sequence numbering.

If modifications or supplements require new supplementary or replacement pages, the page number is extended with a third part:

A digit behind the page number indicates that it concerns a supplementary page.

A replacement page is indicated by a letter behind the page number.

Example

3-6	is page 6 of chapter 3
3-6-1	is a supplementary page behind page 3-6
3-6-a	is the replacement page of page 3-6 (so page 3-6 can be removed from the documentation).

All pages are provided with a date of issue.

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TABLE OF CONTENTS PER PAGE

Chapter	Page	Contents
1	1-1	Elucidation of the subdivision of the documentation
	1-2	Table of contents per page
2	2-1	Controls
	2-2	Technical specification
3	3-1	Servicing hints
	3-2	Disassembly of top cover
		Replacement of glass fuse
		Replacement of transformer fuse
		Servicing of front panel
		Servicing of decoder + power supply PCB
		Servicing of servo + preamplifier PCB
		Servicing of tray mechanism
4	4-1	Electrical measurements and adjustments
		Detailed measuring method
	4-2	Detailed measuring method
	4-3	Detailed measuring method
	4-4	Detailed measuring method
	4-5	Detailed measuring method
5	5-1	Exploded view tray mechanism
		Parts list of mechanical components
	5-2	Exploded view of cabinet
6	6-1	Block diagram
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	6-3	PCB drawing of power supply + decoder circuit
		Parts list
	6-4	PCB drawing of power supply + decoder circuit
	6-5	Diagram of decoder circuit
	6-6	Diagram of control and display circuit
	6-7	PCB drawings of control and display PCB
		Parts list
	6-8	Diagram of mains switch circuit
		PCB drawing of mains switch PCB
		Parts list
		Survey standard symbols
	6-9	Wiring drawing
	6-10	Parts list chip components

With the use of the μ P 6805L3 (40 pins) instead of the MAB 8441P (28 pins) in the CONTROL + DISPLAY CIRCUIT there is second version now. In the manual this version has been stated under the description CONTROL + DISPLAY CIRCUIT B and CONTROL + DISPLAY PANEL B.

For this reason the pages enclosed should be added to the manual.

Additional pages:

6-7-1
6-7-2

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COMPACT
disc
DIGITAL AUDIO

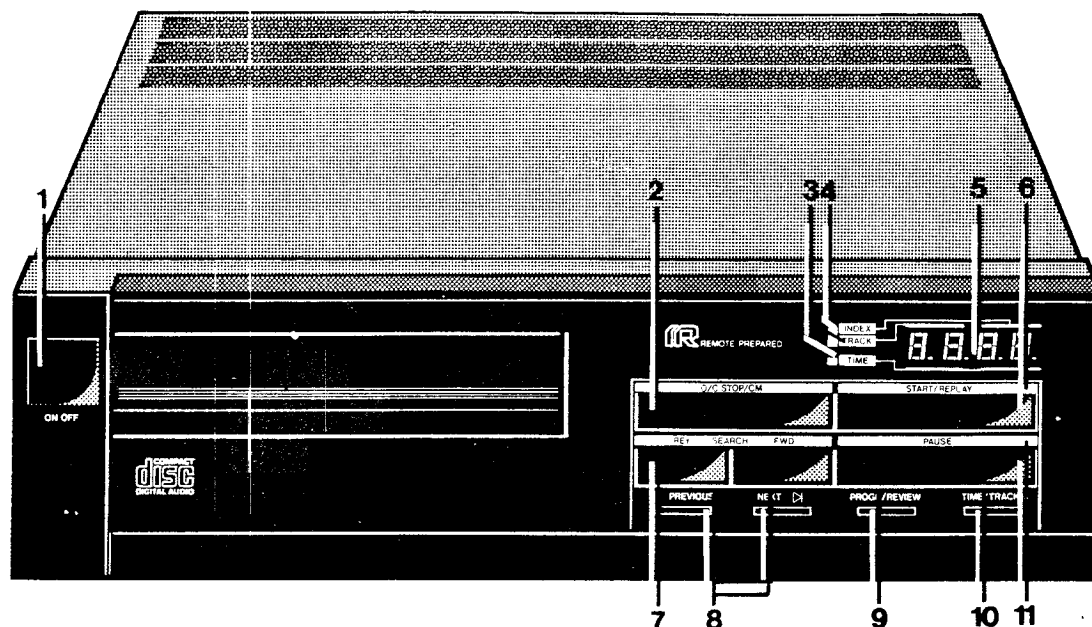


Fig. 1

37 925 A15

2 CONTROLS

- 1 ON/OFF key: for switching the player on and off.
- 2 O/C STOP/CM key: for opening and closing the disc tray (O/C=open/close), stopping play during playback (stop) and erasing a programme (CM=Clear Memory).
- 3 TIME LED: lights during display of playing time.
- 4 TRACK/INDEX LED: lights during display of track numbers and or index numbers.
- 5 Display: functions as on/off, stand-by, pause and error indicator; during play, indications which track is being played or the elapsed time; can also show the total number of tracks or the total playing time of the disc; when programming, it is used to indicate the track numbers to be stored and to display the numbers already stored.
- 6 START/REPLAY key: for starting play (START) and returning to the beginning of a track (REPLAY).
- 7 REV SEARCH FWD keys: for fast search to a particular passage (REV backwards, FWD forwards).
- 8 PREVIOUS and NEXT keys: for indicating the track and-where applicable-index number you want to begin with, and selecting track numbers when compiling a programme (PREVIOUS from high to low and NEXT from low to high); also for returning to a previous track or index number or moving on to a later one during play.
- 9 PROGR/REVIEW key: for storing the track numbers of a programme and producing the display of the programme stored.
- 10 TIME/TRACK key: for switching from track number to playing time indication and vice-versa. Also used for selecting index numbers.
- 11 PAUSE key: for holding play at the start of a track or passage and for interrupting play.

TECHNICAL SPECIFICATION

- | | | | |
|---------------------|--|------------------------------|--|
| ● System | : Compact Disc Digital Audio system | ● S/N ratio | : ≥ 96 dB |
| ● Mainsvoltages | : 110V, 127V, 220V, 240V
± 10% (to be changed by transformer connections)
: CD150/01
110V, 127V, 220V, 240V
adaptable by means of the voltage adapter
: CD150/07/17
117V (special transformer) | ● Channel separation | : ≥ 90 dB |
| ● Mains frequencies | : 50,60Hz(no adaption required) | ● Channel difference | : $\leq 0,6$ dB |
| ● Power consumption | : ≤ 20 W | ● Total harmonic distortion | : $\leq 0,005\%$ (at -86dB) |
| ● Frequency range | : 20 Hz + 20 kHz $\pm 0,5$ dB | ● Intermodulation distortion | : $\leq 0,005\%$ (at -86dB) |
| ● Output voltage | : max. 2 V _{rms} / ≥ 10 kOhms | ● Remote control | : 6-pole DIN bus for RC5 system (EM2000) |
| ● Output impedance | : 200 Ohms | ● De-emphasis | : 0 or 15/50 μ s (switched by the subcode on the disc) |
| | | ● Dimensions wxhxd | : 320 x 86 x 300 mm (tray closed)
320 x 86 x 450 mm (tray opened) |
| | | ● Weight | : approx 3 kg |

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3 SERVICING HINTS

For servicing hints of the CD mechanism and the servo + preamplifier PCB see Service Manual C.D.M.-2

The set consists of various MOS ICs. Because in general ICs are very sensitive to overloading and too high voltages, the highest care should be taken during servicing.

See the information enclosed in the packaging of the ICs for further instructions.

In the set chip components have been applied. For disassembly and assembly of chip components see the figure below.

The disc should always rest properly on the turntable. To achieve this a disc hold-down has been mounted in a bracket of the tray mechanism. If the tray mechanism has to be disassembled for servicing, one or more than one separate disc hold-downs should be used.

The set can function normally then.

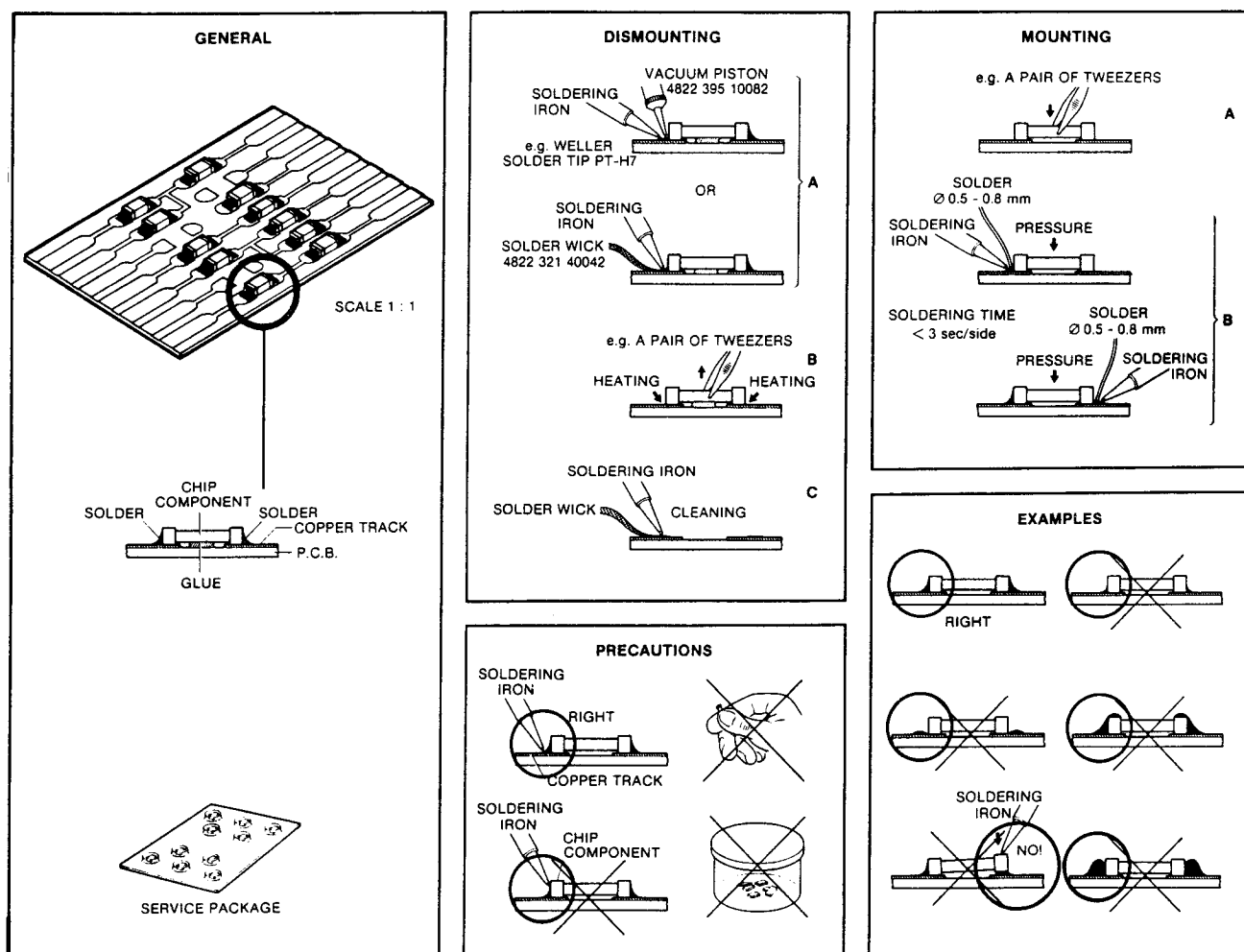
Code number of the disc hold-down is 4822 532 60906.

When the tray mechanism has been disassembled the player can be prepared for measurements via interconnection of connector pins 22-2 () and 22-3 (S) in) on the control + display PCB.

SERVICE AIDS

Audio test disc	4822 397 30085
Disc without errors + disc with DO errors, black spots and fingerprints	4822 397 30096
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
Disc hold-down	4822 582 60906
7th order filter	4822 395 30204

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Fig. 2

3-2
1985-07-01
DISASSEMBLY OF TOP COVER

- Remove the 4 screws out of side walls of top cover.
- Remove screw at rear of top cover.
- Take top cover cover from set.

REPLACEMENT OF GLASS FUSE 1701

- Remove top cover.
- The glass fuse is situated on the mains switch PCB in the left-hand rear corner of the set.

REPLACEMENT OF TRANSFORMER FUSE

- Remove top cover.
- Remove screening cap that has been placed over transformer.
- Now the transformer fuse is accessible.
- Reapply the screening cap after fuse exchange.

SERVICING OF THE FRONT PANEL

Disassembly of front panel

- Remove top cover.
- Remove the 3 fixing screws at upper side of front panel.
- Now the front panel can be taken off.
- Ensure during mounting that the 3 bosses of the set frame engage with the appropriate holes of the front panel.

Disassembly of control + display PCB

- The control + display PCB can be taken out after removal of the 5 screws.

SERVICING OF THE DECODER + POWER SUPPLY PCB

- Remove top cover.
- Remove the 2 screws on the decoder + power supply PCB.
- Remove the 2 screws at the upper side of the cooling bracket.
- Remove the screw in the backcover for fixation of the 2 CINCH sockets.
- After the connectors have been disconnected the decoder + power supply PCB can be slid forwards and be taken out of the player.

SERVICING OF THE SERVO + PREAMPLIFIER PCB
(see Fig. 3)

- Remove top cover.
- Remove the front panel.
- Remove screw 4Nx10 and ring item no. 222 (see exploded view of cabinet) at the rear of the tray mechanism.
- Now the tray mechanism/CDM/servo + pre-ampl. PCB assy can be taken out of the frame and can be placed vertically in the appropriate servicing supports in the frame (see Fig. 3).
- In this way measurements and adjustments can be performed on the servo + preampl. PCB.
- See Service Manual C.D.M.-2 for measurements and adjustments on the servo + preampl. PCB.
- Ensure during mounting of the tray mechanism/CDM/servo + preampl. PCB assy that the suspension rubbers and springs item no. 218 and 219 are present (see exploded view of cabinet).

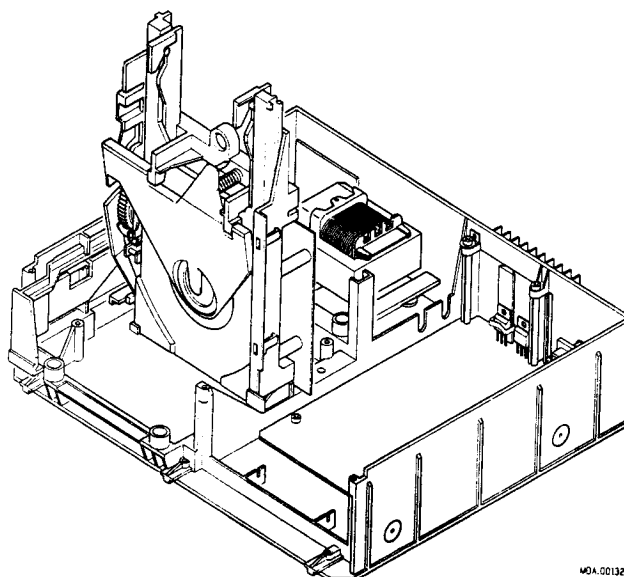


Fig. 3

SERVICING OF THE TRAY MECHANISM/CDM/SERVO + PREAMPL. PCB ASSY

- Disassemble top cover.
- Disassemble front panel.
- Remove screw 4Nx10 and ring item no. 222 (see exploded view cabinet) at the rear of the tray mechanism.
- Now the assy can be taken out of the set after the connectors have been disconnected.
- Remove screw N4x8 and bracket item no. 501 (see exploded view of tray mechanism).
- The CDM + servo + preampl. PCB is kept in place by a boss of the tray mechanism. If this boss, in the region of the foil connector is bent away the CDM + servo + preampl. PCB can be taken out of its support points of the tray mechanism.
- Ensure during mounting of the CDM/servo + preampl. PCB in the tray mechanism that the mechanical brake item no. 123 (see exploded view of tray mechanism) is positioned properly.

SERVICING OF THE TRAY MECHANISM

Disassembly of the tray mechanism

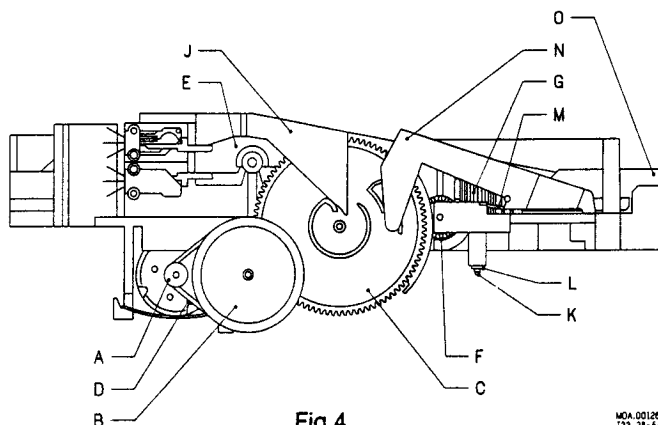


Fig. 4

- Remove disc hold-down holder J by disassembling coil spring at rear. Then holder J can be taken out of its hinge points.
- Remove belt D.

- Disassemble pulley B after clamping ring on shaft has been removed.
- Remove lifting bracket N by elevating lug M and sliding bracket out of its shaft guiding.
- Remove gearwheel G by removing shaft K after ring L has been taken away.
- Now disc carrier O can be taken out of the holder by lifting it at the front and sliding it out of the guiding.
- Next cog wheel C, switch bracket E and gearwheel F can be removed successively.
- The tray motor with belt wheel A can be taken out by removing the spring.

Assembly of tray mechanism

- Place disc carrier O in guiding and slide it in place (= disc carrier in position "close").
- Mount gearwheel F.
- Apply switch bracket E. The left-hand boss of the bracket should be positioned between the 2 switches.
- Ensure that the aperture in gearwheel F is vertical (see Fig. 4) and apply cog wheel C in the way described in Fig. 5.

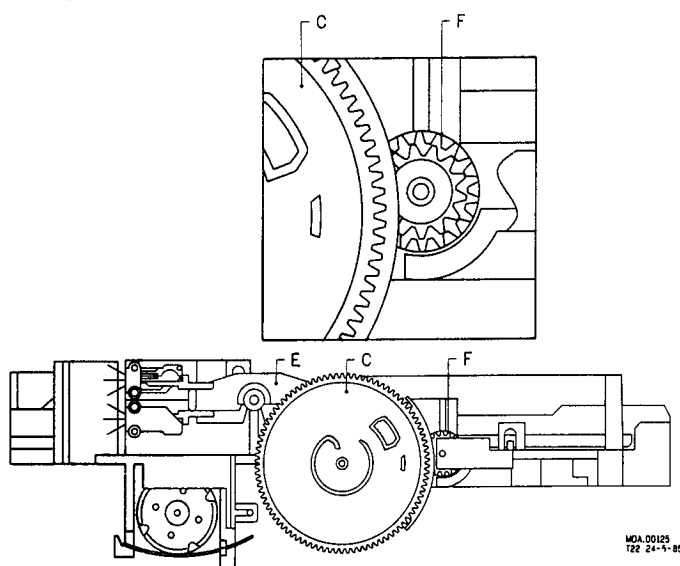


Fig. 5

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- Turn cog wheel C counterclockwise till its final position and ensure that the boss of switch bracket E engages with the guiding at the rear of the cog wheel. Turn the cog wheel counterclockwise and clockwise and check if both switches are switched on alternately.
- Turn cog wheel C counterclockwise so that the upper switch is operated and mount pulley B in this position. Next apply the clamping ring.
- Mount gearwheel G and apply shaft K and clamping ring L.
Ensure that gearwheel G is positioned before shaft and clamping ring are mounted.
- Apply lifting bracket N. Ensure that the fork at the right of the lifting bracket encloses the guide rail of the tray.
- Mount the motor with pulley A and apply belt D.
- Next hold-down holder J and the compression spring can be mounted.
- Check after mounting the working of the tray mechanism by turning pulley B counterclockwise and clockwise.

4 ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

For measurements and adjustments on the CD mechanism and the servo + preampl. PCB see the CDM-2 Service Manual.

Specification measurement

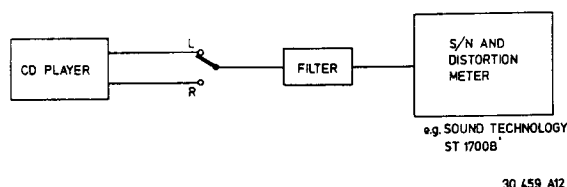


Fig. 6

To measure the specification use can be made of audio test disc 4822 397 30085.

Use 7th order filter 4822 395 30204 (see Fig. 5) to measure:

- Total harmonic distortion (THD)
- Intermodulation distortion
- Signal-to-noise ratio (S/N)

Changing the transformer connections

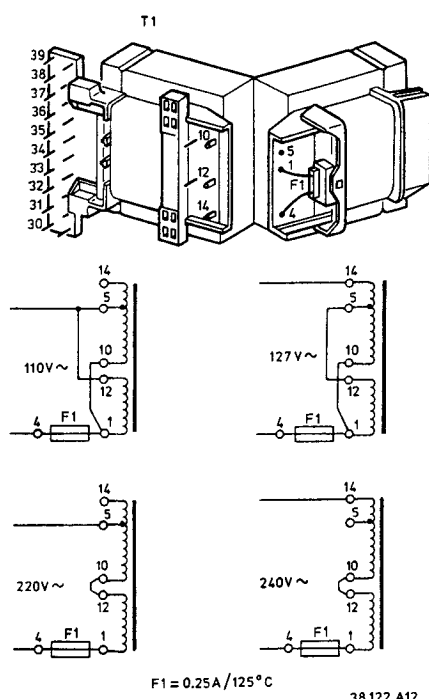


Fig. 7

If the set should be connected to a mains voltage that deviates from the voltage mentioned on the type plate, the transformer connections should be changed, as indicated in Fig. 7.

Attention

In case of a change to 110V or 127V the glass fuse on the mains switch PCB should be changed from 200 mA-T to 400 mA-T.

DETAILED MEASURING METHOD FOR THE DECODER CIRCUIT

HINTS

Test discs

It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

Measurements on op-amps

In the electronic circuits op-amps have been used frequently. Some of the applications are amplifiers, filters, inverters and buffers.

In those cases where in one way or the other feedback has been applied the voltage difference at the differential inputs converges to zero. This applies to both DC and AC signals. The cause can be traced to the properties of an ideal op-amp ($Z_i = \infty$, $G = \infty$, $Z_o = 0$). If one input of an op-amp is directly connected to ground it will be virtually impossible to measure at the inverting and the non-inverting inputs. In such cases only the output signal will be measurable.

That is why in most cases the AC voltage at the inputs will not be given. The DC voltages at the inputs are equal.

Stimulation with "0" and "1"

During troubleshooting sometimes certain points should be connect to ground or supply voltage. As a result certain circuits can be brought in a desired state thus shortening the diagnosis time. In a number of cases the related points are outputs of op-amps. These outputs are short-circuit-resistant, i.e. they can be brought to "0" or ground without problems.

The output of an op-amp, however, should never be connected directly to the power supply voltage.

Measurements on microprocessors

Inputs and outputs of microprocessors should **never** be connected directly to the power supply voltage. The inputs and outputs should only be brought to "0" or ground if this is stated explicitly.

Measurements with an oscilloscope

During measurements with an oscilloscope it is recommended to measure with a 1:10 test probe, since a 1:10 probe has a considerably smaller input capacitance than a 1:1 probe.

Selection of ground potential

It is very important to select a ground point that is as close as possible to the test point.

Conditions for injection

- Injection of levels or signals from an **external** source should **never** take place if the related circuit has no supply voltage.
- The injected levels or signals should **never** be greater than the supply voltage of the related circuit.

Continuous burning of the laser

- Bridge capacitor 2174 on the servo + preampl. PCB.
- Connect $\bar{S}_i$ (= pin 20 of IC6101 on the servo + preampl. PCB) to ground.
- Switch on the supply voltage.
- Now the laser will burn continuously.

Indication of test points

In the drawings of the diagrams and the PCBs the test points have been indicated by a number (e.g. 12) to which the measuring method refers. In the measuring method below, the symbol ($\diamond$) has been omitted for the test points indicated.

GENERAL CHECKPOINTS

In the detailed measuring method below a number of general conditions, required for a properly functioning set, will not be mentioned. Before the detailed measuring method is started, these general points should first be checked.

- a. Ensure that disc and objective are clean (remove dust, fingerprints, etc.) and work with undamaged discs.
- b. Check if all supply voltages are present and if they have the correct values.
- c. Check the good working of the two microprocessors by means of their built-in test programme and servicing programme.

Method:

Self-test of the servo μ P

With the self-test the following parts of the μ P are tested:

- RAM
- ROM
- TIMER
- serial I/O interface
- I/O gates

- Interrupt the I²C connection on connector 35-2 on the servo + preampl. PCB.
- Unsolder pins 1, 7, 26 and 27 of the servo μ P.
- Render pin 2 of the servo μ P "low" (ground) and switch on the supply voltage.
- The test starts if pin 2 is rendered "high" again (interrupt the connection to ground).
- If all tests are positive, pin 1 of the servo μ P will go low within 1s.

Self-test of the control and display μ P

With this self-test the following parts of the μ P are tested:

- RAM
- ROM
- TIMER
- serial I/O interface
- I/O gates

- Interrupt the I²C connection on connector pin 21-4 on the control + display PCB.
- Render pin 2 of the control display μ P "low" (ground) and switch on the supply voltage.
- The test starts if pin 2 is rendered "high" again (= interrupt the connection to ground).
- If all tests are positive, pin 1 of the control + display μ P will go "low" again within 1s.

Initiation of the servicing programme of the μ P

-Servicing position "0"

Simultaneously depress the PREVIOUS, NEXT and

TIME/TRACK keys. Keep these three keys depressed while the mains voltage is switched on.

This is the STAND-BY mode, "0" appears on the display.

In this state it is possible to move the arm by means of the SEARCH FORW and SEARCH REV keys with a minimum torque to the outside and the inside resp. This enables a check of the free motion of the arm across the disc.

-Servicing position "1"

From servicing position "0" the player can be brought in servicing position "1" by depressing the NEXT key.

In this state the laser emits light and the objective starts to focus. When the focal point has been reached, "1" appears on the display.

When no disc has been inserted the objective goes 16 x to and fro. Then the player reassumes servicing position "0".

As in servicing position "0" the arm can be moved across the diameter of the disc by means of the SEARCH FORW and SEARCH REV keys.

-Servicing position "2"

To be reached by depressing the NEXT key after servicing position "1" has been reached.

The turntable motor starts to run

On the display appears "2".

In preparation of the transition to servicing position "3" the arm is sent to the centre of the disc.

-Servicing position "3"

To be reached by depressing the NEXT key after servicing position "2" has been reached.

The radial control is switched on. The subcode information is ignored. MUTE is high so that the music information is released.

On the display appears "3".

(Dependent on the length of the lead-in track music will be reproduced after approx 1 min.)

In this state it is possible to move the arm by means of the SEARCH FORW and the SEARCH REV keys to the outside and to the inside resp. Now the motion is controlled by the μ P and the arm moves by steps of 64 tracks as long as the key is depressed.

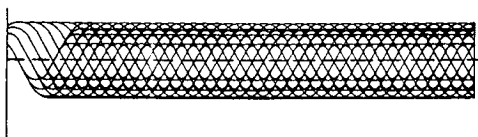
If one of the servicing positions 1, 2 or 3 is disturbed (e.g. braking or removing the disc) the player reassumes servicing position "0".

The servicing programme can be left by switching the mains switch (POWER ON/OFF) off and on. (Hardware reset).

- Check the **motor speed**.
See "turntable motor control" in C.D.M.-2 Service Manual, section III.
- Check the **HF signal** on **test point 65 (eye pattern)**
 - Insert a disc.
 - The HF signal should be present and be stable in the PLAY mode and in:
 - SERVICING POSITION 3 after the run-in track has been read.
- In SERVICING POSITION 2 and during reading of the lead-in track the RF signal is not stable.

Position of oscilloscope 0,5 μ s/DIV

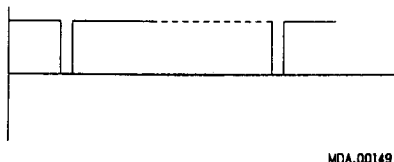
Amplitude $\approx 1,5V_{pp}$



- Check the **HFD signal** on **test point 97**

- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 the HFD signal is "high"; however, minor pulses may be present and in cause of disorders on the disc.
- In SERVICING POSITION 2 and during playback of track no. 15 of test disc 5A HFD pulses are visible.

Position of the oscilloscope 5ms/DIV



MDA.00149

- Check the **MUTE signal** on **test point 98**

- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 in the MUTE signal is "high".
- The MUTE signal is "low" in SERVICING POSITIONS 0, 1 and 2, in the STAND-BY (only mains switch depressed) and PAUSE modes and during jumping to a track after command NEXT or PREVIOUS.

- Check the **clock signal** on **test point 71**

- Insert a disc
- In the Stand-by mode (only mains switch depressed) the frequency of the clock signal is 1,88 MHz.
- In the PLAY mode or in SERVICING POSITIONS 2 or 3 the frequency of the clock signal is 4,32 MHz.

Remark: In SERVICING POSITION 2 the clock signal is unstable.

- Check the **timing signals** destined for the **ERCO IC**

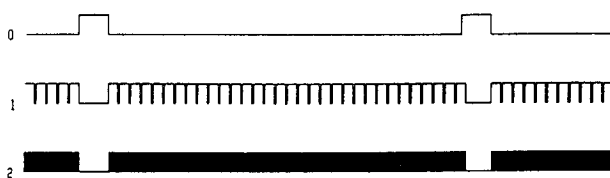
- Insert a disc.
 - Bring the player in one of the following positions
SERVICING POSITION 2 or 3 or the PLAY mode
- Remark:** In SERVICING POSITION 2 the timing signals are unstable.

- Trigger an oscilloscope with the **FSDE signal** on test point 72.
- Check signals

FSDE on test point 72
SSDE on test point 76
CLDE on test point 77

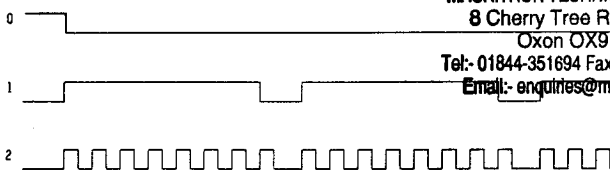
and their interrelations

Position of the oscilloscope 20 μ s/DIV
0 = FSDE, tp 72; 1 = SSDE, tp 76; 2 = CLDE, tp 77



MDA.00093

Position of the oscilloscope 1 μ s/DIV
0 = FSDE, tp 72; 1 = SSDE, tp 76; 2 = CLDE, tp 77



MDA.00094

Remark: The repetition time of the FSDE signal on tp 72 is in the Stand-by mode and in SERVICING positions 0 and 1 : 312 μ s in the PLAY mode and in SERVICING POSITIONS 2 and 3 : 136 μ s

- Check the **DADE signal** on **test point 78**

- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 activity should be present at test point 78 after the lead-in track has been read.

- Check the **subcode clock signals**

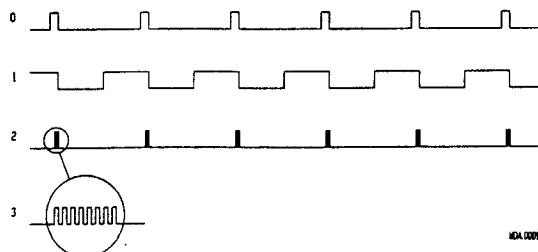
- Insert a disc.
- Bring the player in one of the following positions:
SERVICING POSITION 3 or PLAY mode
- Trigger an oscilloscope with the FSDE signal on test point 72.
- Check signals

FSDE on test point 72
SWCL/QCLOCK on test point 73
SBCL on test point 74

and measure their interrelations

Positions of the oscilloscope 0,1 ms/DIV

0 = FSDE tp 72
1 = SWCL/QCLOCK tp 73
2 = SBCL tp 74
3 = SBCL tp 74



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Remark: The repetition time of the FSDE signal on tp 72 is:
in the STAND-BY mode and in SERVICING POSI-
TIONS 0 and 1: 312 μ s
in the PLAY mode and in SERVICING POSITIONS
2 and 3 : 136 μ s

–Check the **subcode data signals**

- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 activity should be present at the following test points

S-DATA test point 75

Q-SYNC test point 95

Q-DATA test point 96

II ERCO IC

–Check the **timing signals coming from the DEMOD IC**

- SEE SUB "I DEMOD IC"

'Check the timing signals destined for the ERCO IC'

–Check the **DADE signal on test point 78**

- See sub "I DEMOD IC"

'Check the DADE signal on test point 78'

–Check the **CLOX signal on test point 94**

- In Stand-by mode (only mains switch depressed) the frequency of the CLOX signal should be 4,2336 MHz.

–Check the **timing signals** destined for the **CIM IC**

- Bring the player in the Stand-by mode (only mains switch depressed).
- Trigger an oscilloscope with the FSEC signal on test point 79.

• Check signals

FSEC on test point 79

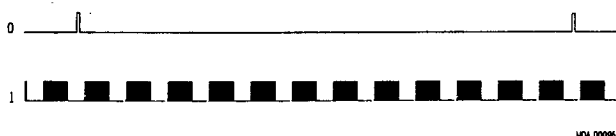
CLEC on test point 80

and their interrelations

Position of the oscilloscope 20 μ s/DIV

0 = FSEC tp 79

1 = CLEC tp 80



Remark: The repetition time of the FSEC signal is 136 μ s.

–Check the **MUTE signal on test point 98**

- See sub "I DEMOD IC"

'Check the MUTE signal on test point 98'

–Check the **DAEC signal on test point 81**

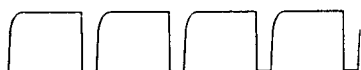
- Insert a disc.

- In the PLAY MODE or in SERVICING POSITION 3 activity should be present at test point 81 after reading of the lead-in track.

–Check the **MCES signal on test point 66**

- In the Stand-by mode the MCES signal is as indicated in the figure below.

Position of the oscilloscope 50 μ s/DIV



Remark:

The repetition time of the MCES signal is 140 μ s.

- Insert a disc.

- In the PLAY mode or in SERVICING POSITION 3 the MCES signal is as indicated in the figure below.



MDA.00135

Remark: The repetition time of the MCES signal is 140 μ s.

Duty cycle is 50%.

Also see "Measurement of turntable motor control" in C.D.M.-2 Service Manual, section III.

–Check the **UNEC signal on test point 82**

- Insert test disc 5A.

- During playback of track no. 17 UNEC flags should briefly be present at test point 82.

The UNEC flags are also present in case of soft braking of the disc and during fast forward or fast reverse (SEARCH FORW., SEARCH REV.).

Remark: If the UNEC signal at test point 82 remains continuously "high", either the DEMOD IC or the ERCO IC or the RAM IC is defective.

III CIM IC

–Check the **CLOX signal on test point 94.**

- See sub "II ERCO IC".

'Check the CLOX signal on test point 94'

–Check the **timing signals coming from the ERCO IC.**

- See sub "II ERCO IC".

'Check the timing signals destined for the CIM IC'

–Check the **DAEC signal on test point 81.**

- See sub "II ERCO IC".

'Check the DAEC signal on test point 81.'

–Check the **UNEC signal on test point 82.**

- See sub "II ERCO IC".

'Check the UNEC signal on test point 82'

–Check the **timing signals** destined for the **FIL IC.**

- Bring the player in the Stand-by mode (only mains switch depressed).

- Trigger an oscilloscope with the STR1 signal on test point 84.

- Check signals

CLECon test point 80

CLECFon test point 85

STR1on test point 84

and their interrelations

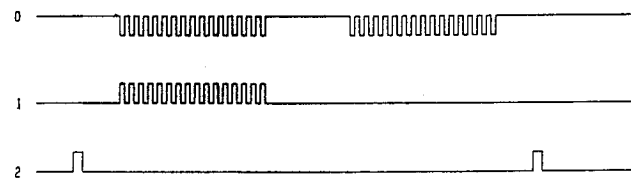
Position of the oscilloscope 5 μ s/DIV

0 = CLECon tp 80

1 = CLECF tp 85

2 = STR1 tp 84

Remark: The repetition time of the STR1 signal is 22 μ s (f=44,1 kHz).



MDA.00087

–Check the **DLCF signal** on test point 86 and the **DRCF signal** on test point 87

- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 activity should be present at test points 86 and 87 after reading of the lead-in track.

IV FIL IC

–First check all signals round the CIM IC (see "III").

–Check the timing signals

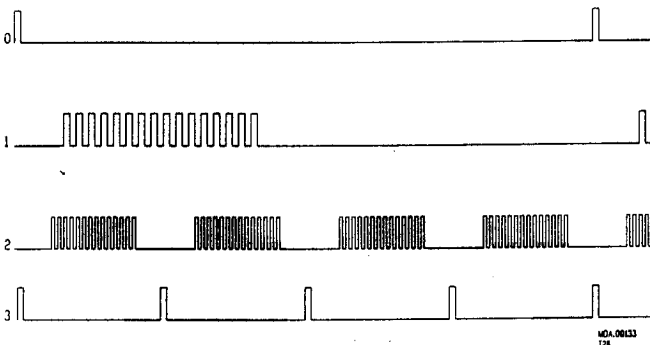
- Bring the player in the Stand-by mode (only the mains switch depressed).
- Trigger an oscilloscope with the STR1 signal at test point 84.
- Check signals

STR1 on test point 84
CLCF on test point 85
CLFD on test point 90
LAT on test point 93

and their interrelations.

Position of the oscilloscope 5µs/DIV

0 = STR1 tp 84
1 = CLCF tp 85
2 = CLFD tp 90
3 = LAT tp 93



MDA.00133
128

Remark: The repetition time of the LAT signal is 5,5 µs
(f = 176,4 kHz).

–Check the **DLFD signal** on test point 91 and the **DRFD signal** on test point 92

- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 activity should be present at test point 91 and 92 after reading of the lead-in track.

V DAC IC

–First check all signals round the FIL IC, see IV.

–Check the output of the OP-AMP after the DAC IC.

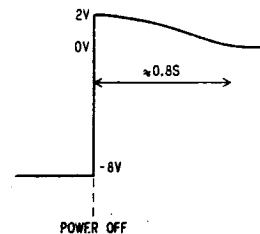
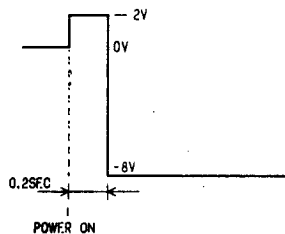
- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 the analog (=music) signal should be present on the output of the OP-AMP after reading of the run-in track.

VI DEEMPH CIRCUIT

- Insert test disc 5.
- During playback of track no. 14 (recorded without PRE-EMPH) the DEEMPH signal on connector 43-2 should be 'high'.
- During playback of track no. 15 (recorded with PRE-EMPH) the DEEMPH signal on connector 43-2 should be 'low'.
- During playback of track no. 14 the analog signal should be present at the source of 6320 (to be measured at resistor 3354, tp 67) and 6321 (to be measured at resistor 3355, tp 68).
- During playback of track no. 15 the analog signal should be 0 V at the source of 6320 (to be measured at resistor 3354) and 6321 (to be measured at resistor 3355).

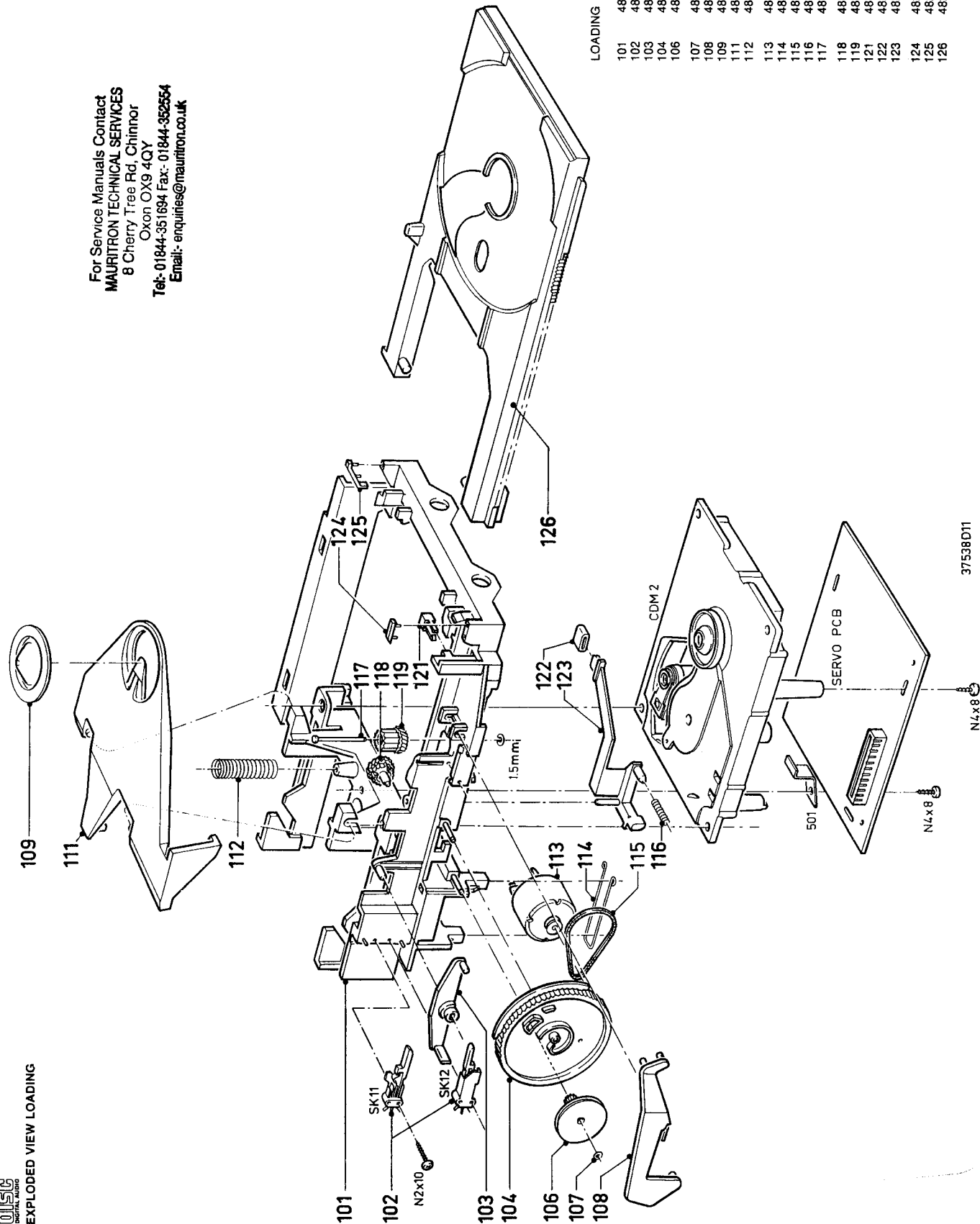
VII KILL CIRCUIT

–During switching on and off of the mains voltage the signal on the collector of 6327 (to be measured on a jumper, tp 69) should be as indicated in the figure below.



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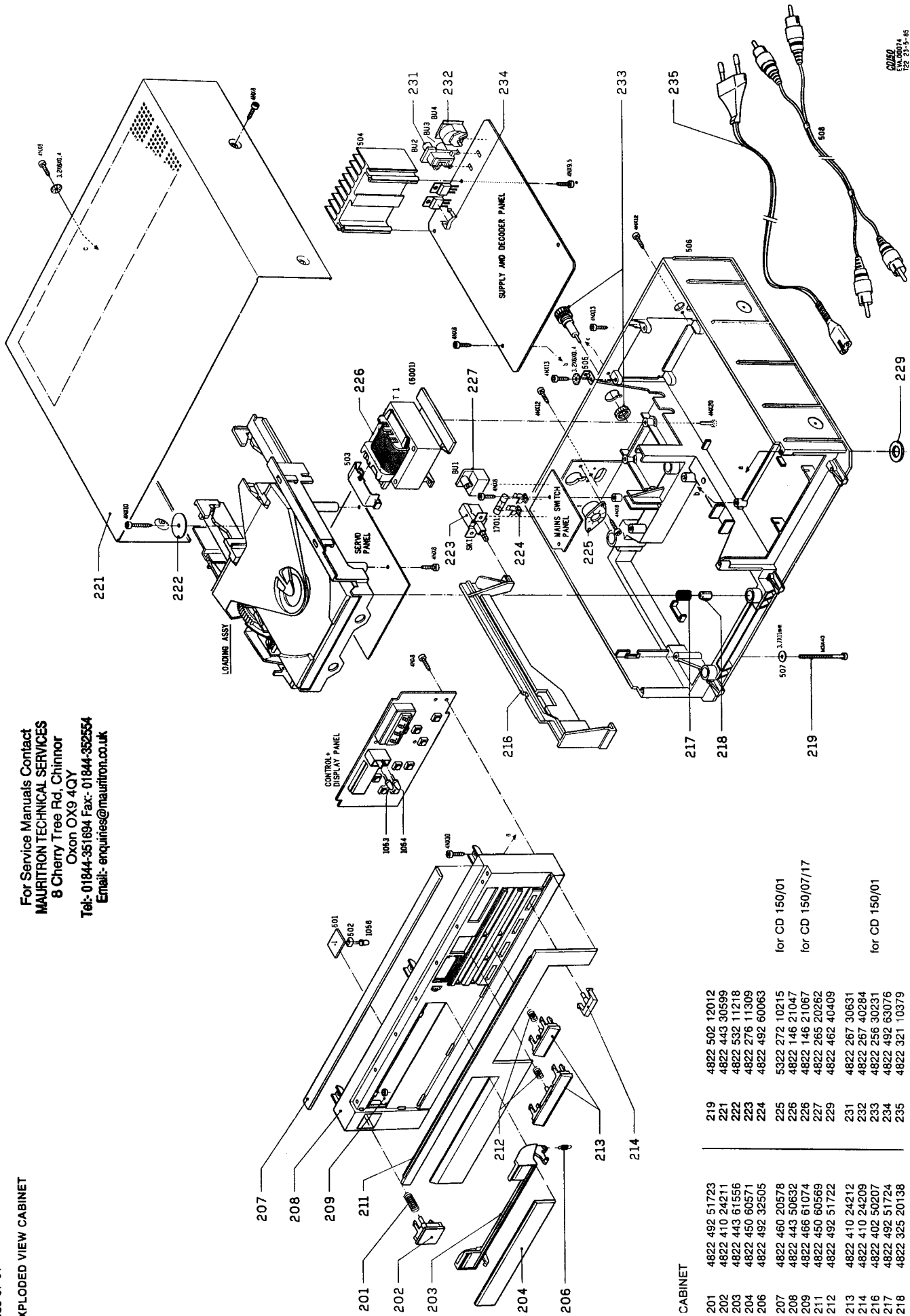


LOADING

101	4822 464 50401
102	4822 276 11277
103	4822 402 50208
104	4822 522 31905
106	4822 528 81046
107	4822 532 50262
108	4822 402 40045
109	4822 402 20096
111	4822 459 80268
112	4822 492 51725
113	4822 361 20576
114	4822 492 63218
115	4822 358 20116
116	4822 492 51726
117	4822 535 91857
118	4822 522 31907
119	4822 522 31908
121	4822 462 71375
122	4822 466 40176
123	4822 402 30143
124	4822 402 60928
125	4822 402 60927
126	4822 443 50633

EXPLODED VIEW CABINET

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Email:- enquiries@mauritron.co.uk



CABINET

201	4822 492 51723	219	4822 502 12012
202	4822 410 24211	221	4822 443 30599
203	4822 443 61556	222	4822 532 11218
204	4822 450 60571	223	4822 276 11309
206	4822 492 32505	224	4822 492 60063
207	4822 460 20578	225	5322 272 10215
208	4822 443 50632	226	4822 146 21047
209	4822 466 61074	228	4822 146 21067
211	4822 450 60569	227	4822 265 20262
212	4822 492 51722	229	4822 462 40409
213	4822 410 24212	231	4822 267 30631
214	4822 410 24209	232	4822 267 40284
216	4822 402 50207	233	4822 256 30231
217	4822 492 51724	234	4822 492 63076
218	4822 325 20138	235	4822 321 10379

for CD 150/01

for CD 150/07/17

for CD 150/01

1000

100

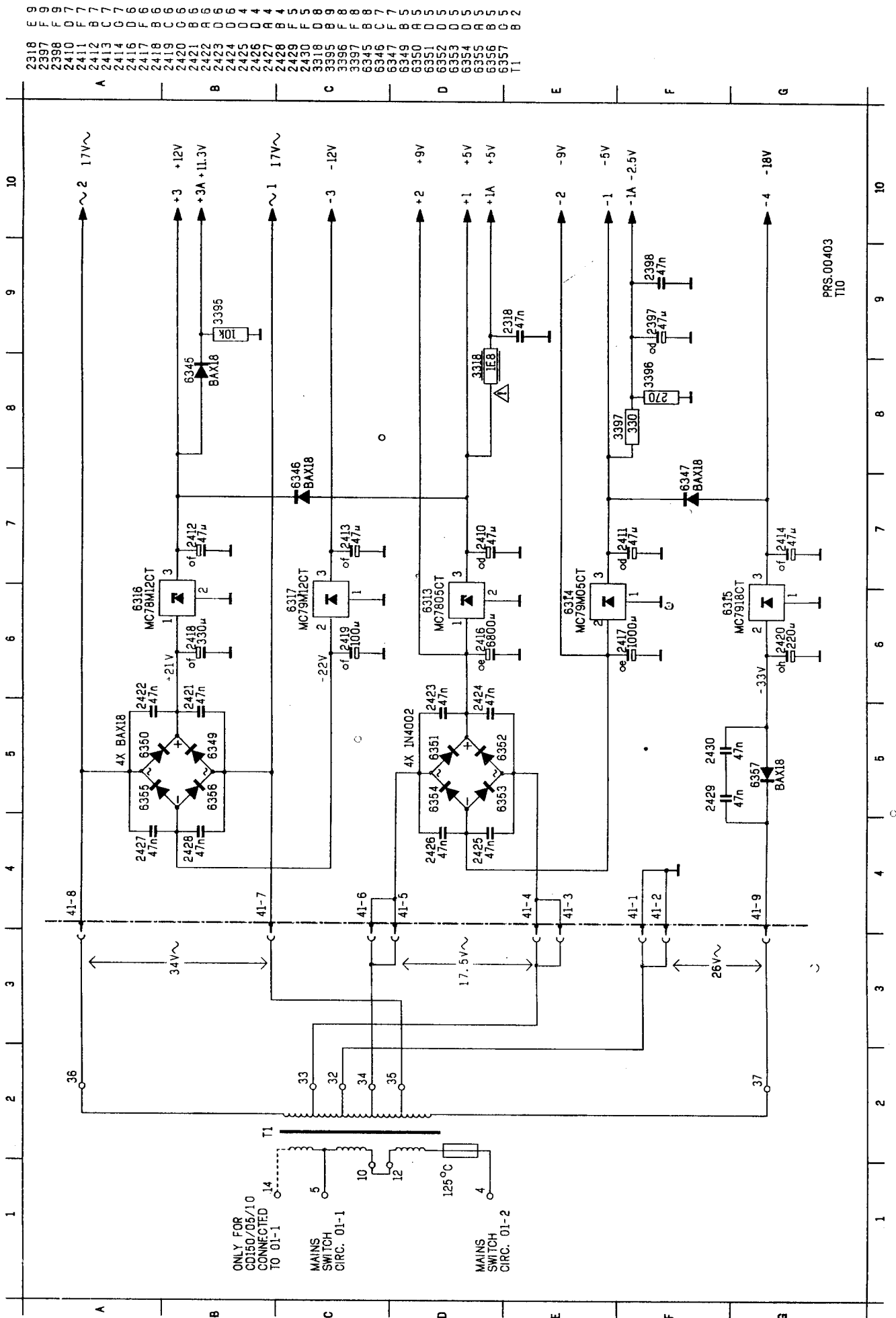


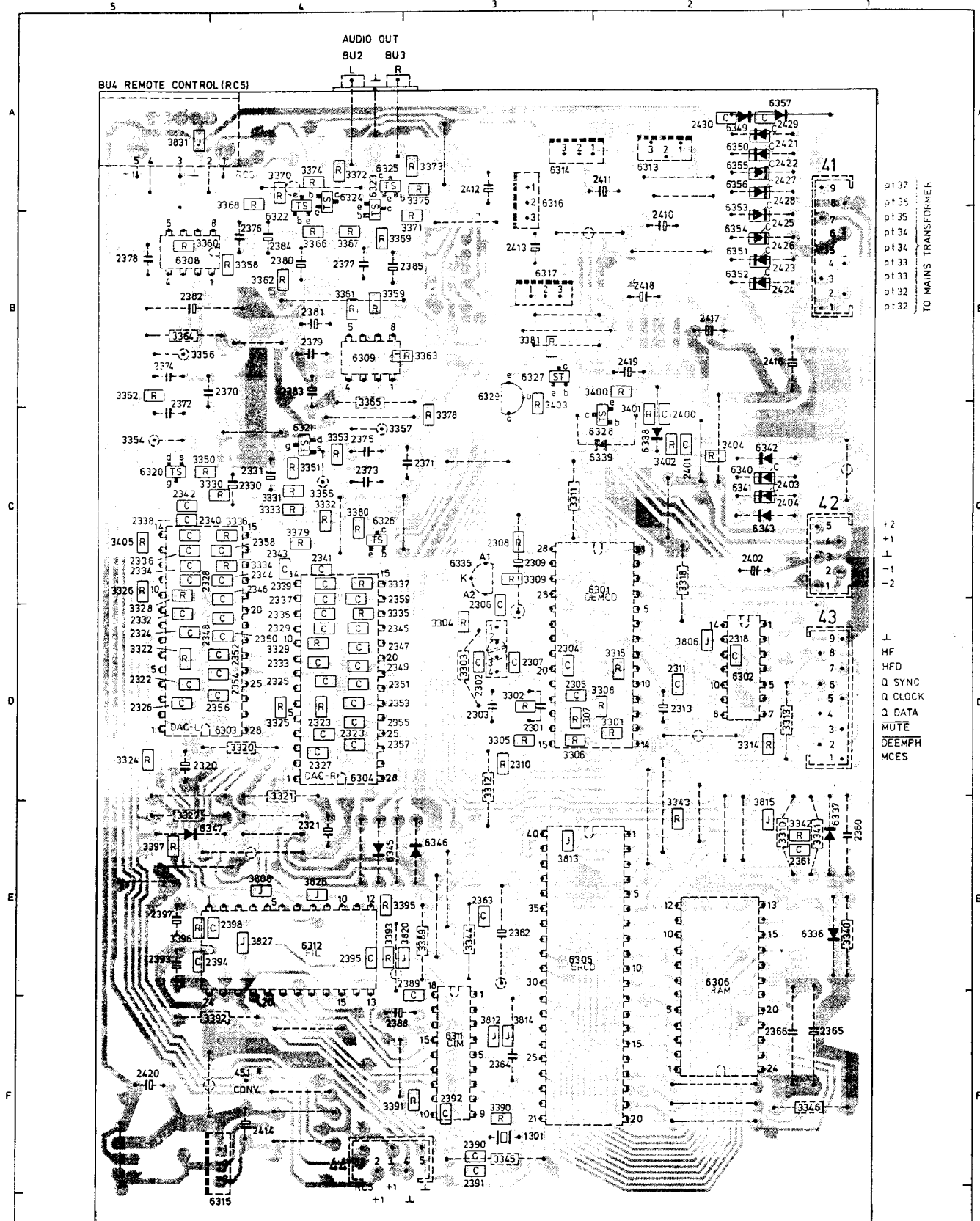
PRS.00499

PR\$ 00498

- | Signal | Function | Source | Destination |
|---------|--|---------|--|
| 30-B3 | Control bits for radial circuit | Q CLOCK | Subcode clock input for servo μP |
| 30-B4 | Current output for track jumping (Digital to Analogue Converter) | Q DATA | Subcode data input for servo μP |
| 30-B5 | Deemphasis | Q SYNC | Subcode synchronization input for servo μP |
| 30-B6 | Drop out detector suppression | RE | Radial error signal (amplified RE_2, RE_1 , currents) |
| 30-B7 | Photodiode currents | RE1 | Radial error signal 1 (summation of amplified currents D_3 and D_4) |
| 30-B8 | Focus error signal | RE2 | Radial error signal 2 (summation of amplified currents D_1 and D_2) |
| 30-B9 | Focus error signal for LAG network | RE dig | Radial error digital |
| 30-B10 | HF output for DEMOD | RE lag | Radial error signal for LAG network |
| 30-B11 | HF detector output for DEMOD | RD | Ready signal, starting up procedure finished |
| 30-B12 | HF current input | SI | On/off control for laser supply and focus circuit |
| 30-B13 | HF input | TL | Track loss signal |
| 30-B14 | HF input for DEMOD | Vc | Control voltage for turntable motor |
| 30-B15 | HF input for DEMOD | | |
| 30-B16 | HF input for DEMOD | | |
| 30-B17 | HF input for DEMOD | | |
| 30-B18 | HF input for DEMOD | | |
| 30-B19 | HF input for DEMOD | | |
| 30-B20 | HF input for DEMOD | | |
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| 30-B81 | HF input for DEMOD | | |
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| 30-B94 | HF input for DEMOD | | |
| 30-B95 | HF input for DEMOD | | |
| 30-B96 | HF input for DEMOD | | |
| 30-B97 | HF input for DEMOD | | |
| 30-B98 | HF input for DEMOD | | |
| 30-B99 | HF input for DEMOD | | |
| 30-B100 | HF input for DEMOD | | |

SUPPLY CIRCUIT





⊕ ⊖ = CONNECTED TO COPPERFOIL ON COMPONENT SIDE OF THE PCB

[C] = CHIP CAPACITOR [J] = CHIP JUMPER

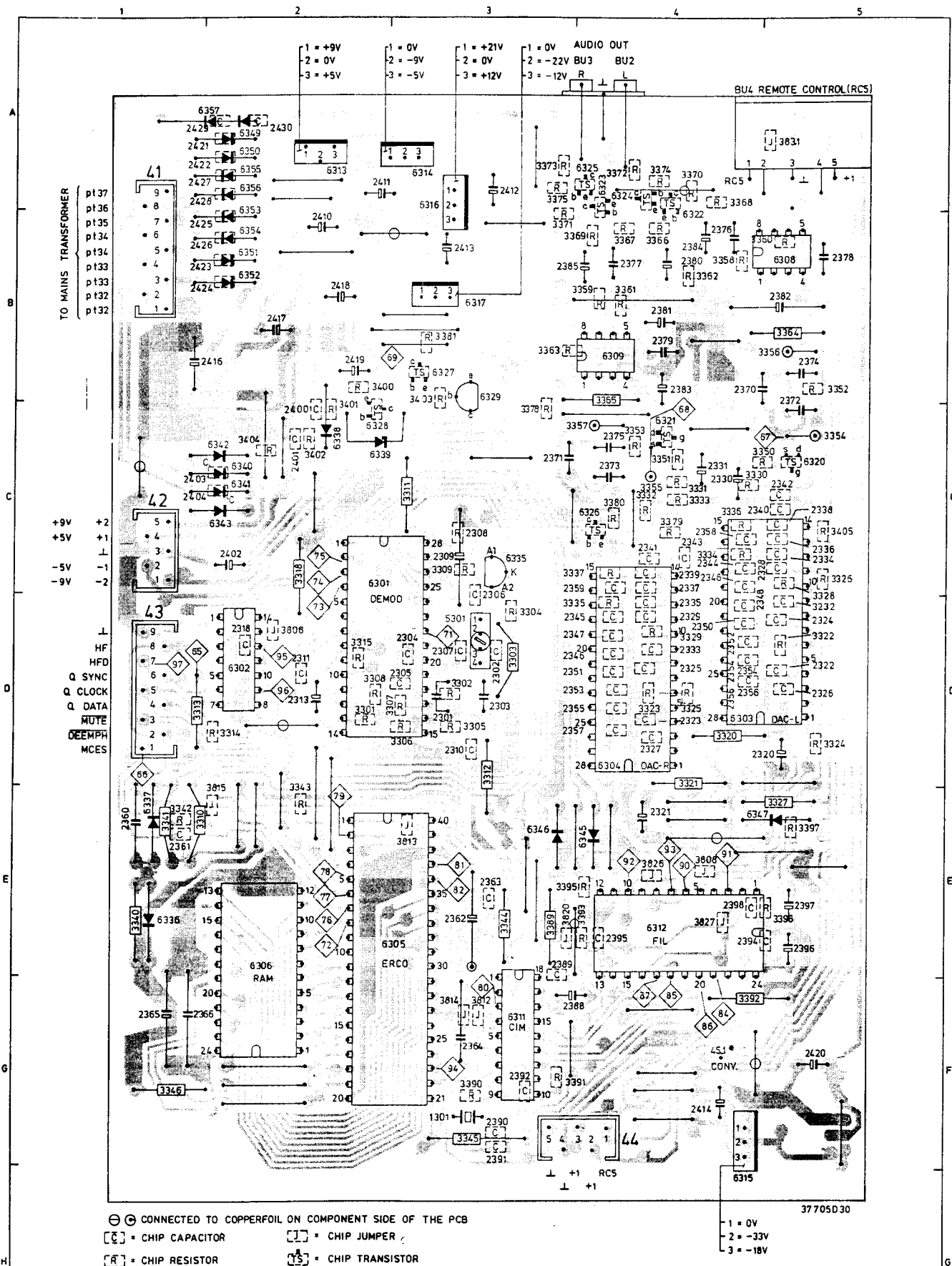
[R] = CHIP RESISTOR [TS] = CHIP TRANSISTOR

* FOR /00X AND /05X ONLY
(CONVENIENCE FEATURE)

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For non active chipcomponents see seperate list

2301	F3	2305	D3	2310	D3	2321	E4	2326	D5	2331	C4	2336	C5	2341	C4	2346	C4	2352	D4
2301	D3	2306	D3	2311	D2	2322	D5	2327	D4	2332	D5	2337	C4	2342	C5	2347	D4	2353	D4
2302	D3	2307	D3	2313	D2	2323	D4	2328	C5	2333	D4	2338	C5	2343	C4	2348	D4	2354	D4
2303	D3	2308	C3	2318	D2	2324	D5	2329	D4	2334	C5	2339	C4	2344	C4	2350	D4	2355	D4
2304	D3	2309	C3	2320	D5	2325	D4	2330	C4	2335	D4	2340	C5	2345	D4	2351	D4	2356	D4
2357	D4	2362	E3	2370	B5	2375	C4	2380	B4	2385	B4	2392	F3	2400	C2	2410	B2	2416	B1
2358	C4	2363	E3	2371	C3	2376	B4	2381	B4	2388	F3	2394	E5	2401	C2	2411	A2	2417	B2
2359	C4	2364	F3	2372	C5	2377	B4	2382	B5	2389	E4	2395	E4	2402	C2	2412	A3	2418	B2
2360	E1	2365	F1	2373	C4	2378	B5	2383	B4	2390	F3	2396	E5	2403	C2	2413	B3	2419	B2
2361	E1	2366	F1	2374	B5	2379	B4	2384	B4	2391	F3	2397	E5	2404	C2	2414	F4	2420	F5
2421	A2	2426	B2	2322	D5	2305	D3	2310	E1	2315	D2	2323	D4	2329	D4	2334	C4	2341	E1
2422	A2	2427	A2	2301	D2	2306	D3	2311	C3	2318	C2	2324	D5	2330	C4	2335	D4	2342	E1
2423	B2	2428	A2	2302	D3	2307	D3	2312	D3	2320	D4	2325	D4	2331	C4	2336	C4	2343	E2
2424	B2	2429	A1	2303	D3	2308	D2	2313	D1	2321	D4	2326	C5	2332	C4	2337	C4	2344	E3
2425	B2	2430	A2	2304	D3	2309	C3	2314	D2	2322	D5	2328	C5	2333	C4	2340	E1	2345	F3
3346	F1	3354	C5	3360	B5	3365	B4	3370	A4	3375	A3	3380	C4	3391	F3	3400	B2	3405	C5
3350	C5	3355	C4	3361	B4	3366	B4	3371	B3	3376	B3	3381	B3	3392	F4	3401	C2	3406	D2
3351	C4	3356	B5	3362	B4	3367	B4	3372	A4	3377	B3	3385	B4	3393	E4	3402	C2	3408	E4
3352	B5	3357	C4	3363	B3	3368	A4	3373	A3	3378	C3	3389	E3	3395	E4	3403	B3	3412	F3
3353	C4	3359	B4	3364	B5	3369	B4	3374	A4	3379	C4	3390	F3	3396	E5	3404	C2	3413	E3
3814	F3	3831	A5	6304	D4	6310	B3	6316	A3	6323	A4	6328	C2	6338	C2	6343	C2	6351	B2
3815	E2	3501	D3	6305	E3	6311	F3	6317	B3	6324	A4	6329	B3	6339	C2	6345	E4	6352	B2
3820	E3	6301	C2	6306	E2	6312	E4	6320	C5	6325	A4	6335	C3	6340	C2	6346	E3	6353	B2
3826	E4	6302	D2	6308	B5	6313	A2	6321	C4	6326	C4	6336	E1	6341	C2	6349	A2	6354	B2
3827	E4	6303	D4	6309	B4	6314	A3	6322	A4	6327	B3	6337	E1	6342	C2	6350	A2	6355	A2
6356	A2																		
6357	A2																		



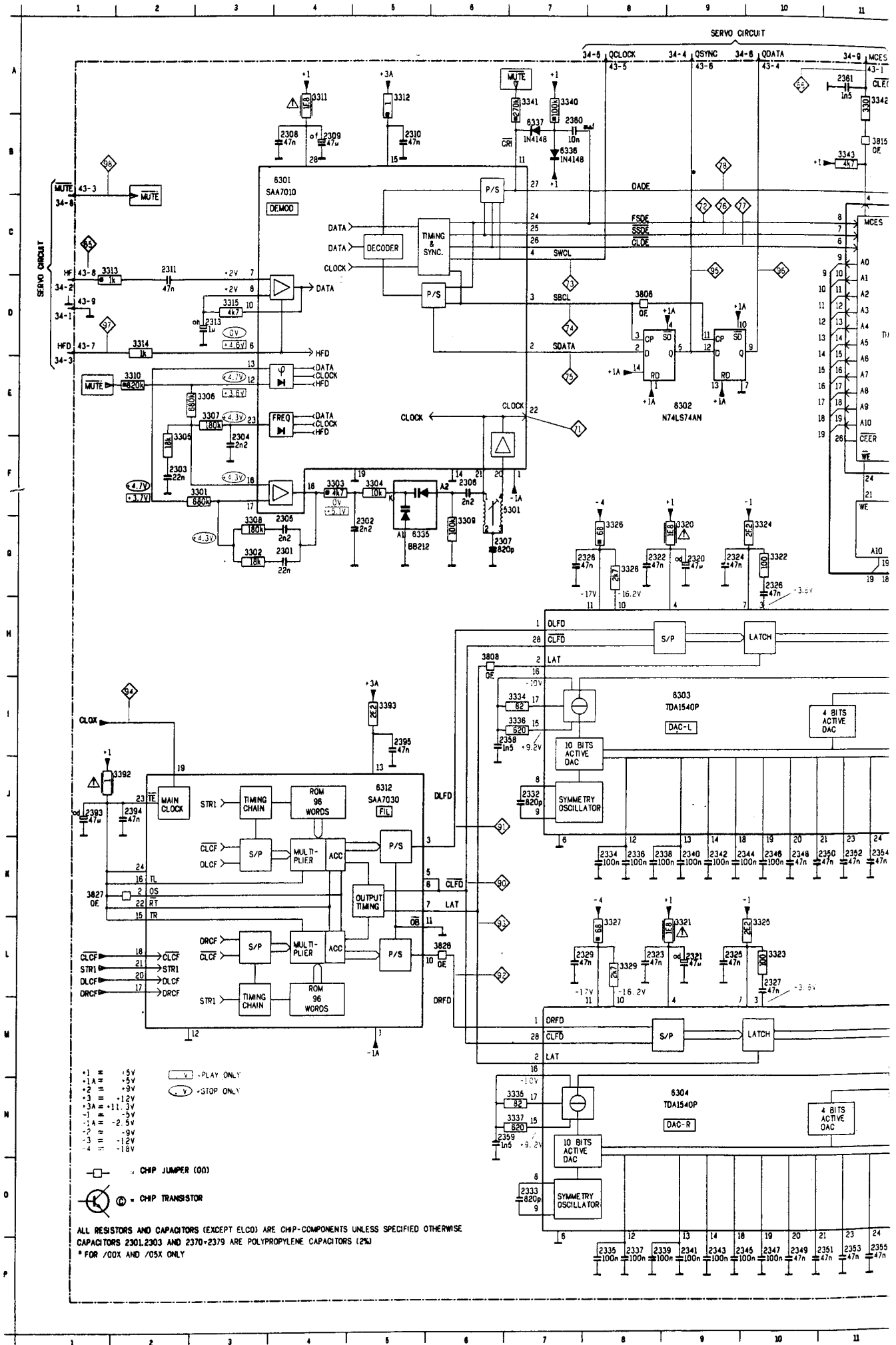
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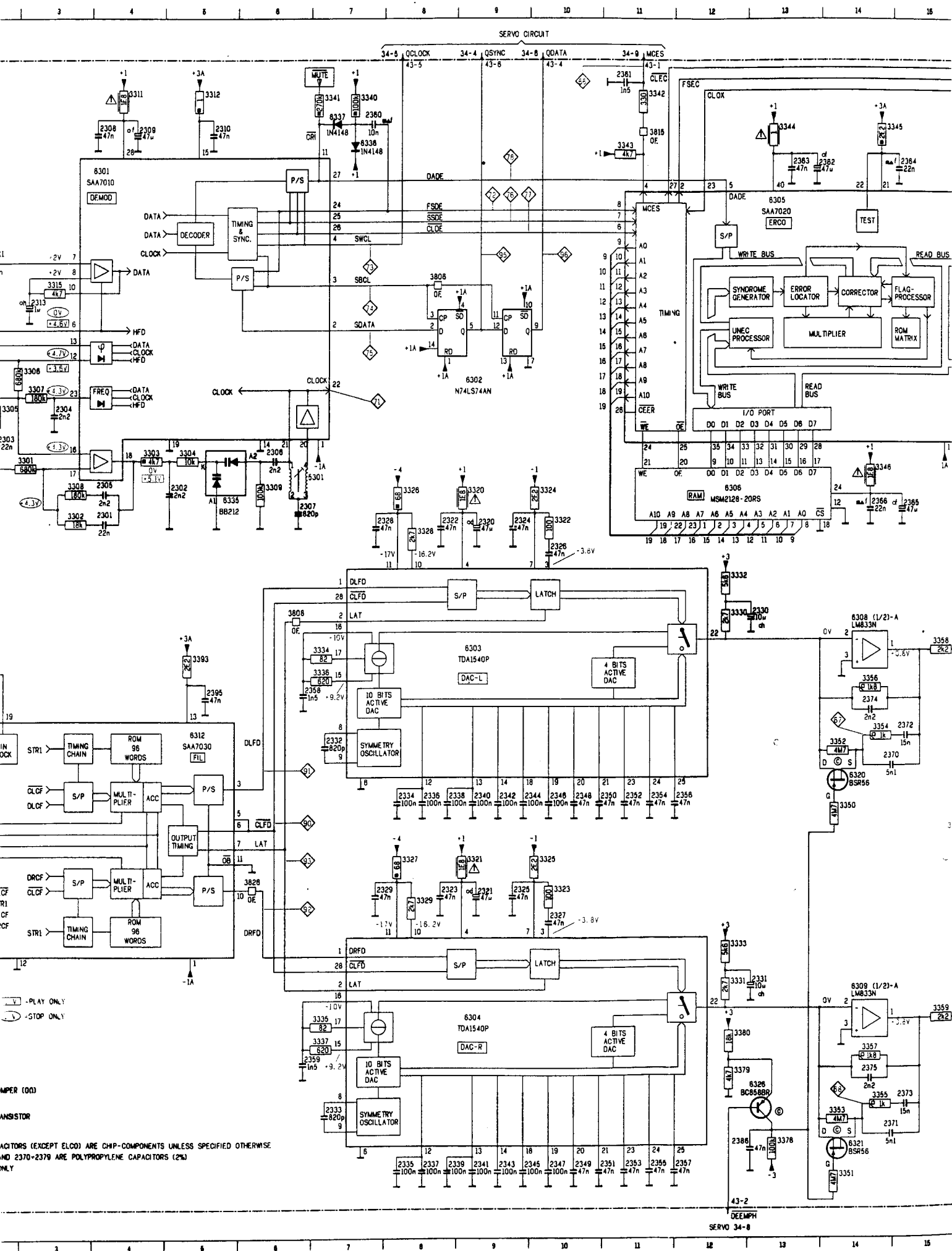
SUPPLY + DECODER

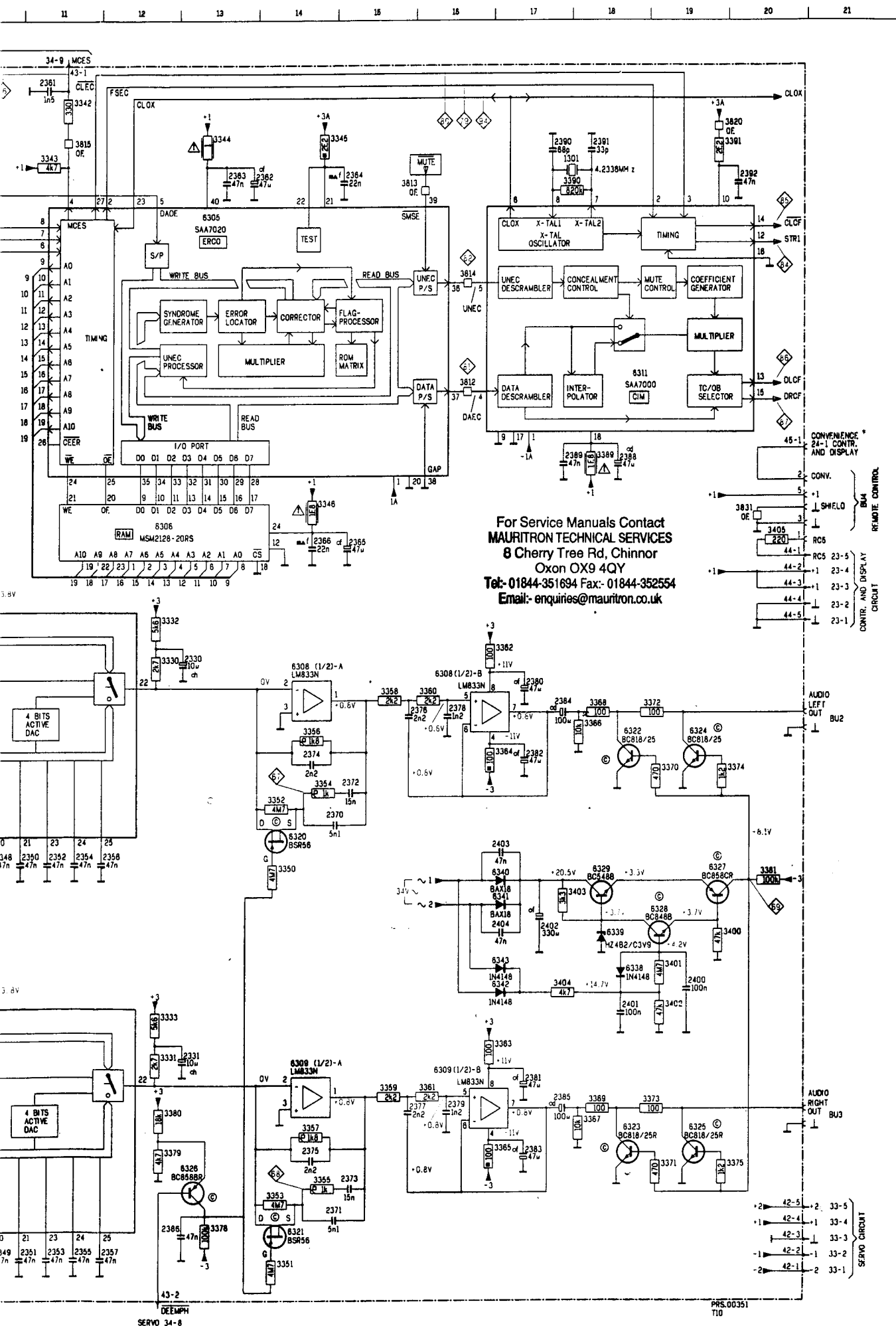
For non active chipcomponents see seperate list

					
SAA7000	CIM	4822 209 10375	1301	X-tal 4,2336 MHz	4822 242 70663
SAA7010	DEM0D	4822 209 10857			
SAA7020	ERCO	4822 209 10377	5301		4822 156 21155
SAA7030	FIL	4822 209 10378			
TDA1540	DAC	4822 209 81453	2301,2303	22nF-2%	4822 121 50609
MSM2128-20RS	RAM	4822 209 10379	2370,2371	5,1nF-2%	4822 121 50976
LM833N		4822 209 83163	2372,2373	1,5nF-2%	4822 121 50432
SN74LS74AN		4822 209 80782	2374+2377	2,2nF-2%	4822 121 50841
MC7805CT		4822 209 80891	2378,2379	1,2nF-2%	5322 121 54135
MC78M12CT		5322 209 86176			
MC79M05CT		4822 209 83164			
MC7912CT		4822 209 82065			
MC7918CT		4822 209 83165			
					
BC548B		4822 130 40937	3311,3318,3320	} 1,8 Ω-NFR25	4822 111 30489
BC818/25 ©		4822 130 42696	3321,3346,3389		
BC818/25R ©		4822 130 42697	3344,3392	1 Ω-NFR25	4822 111 30483
BC848B ©		5322 130 41982			
BC858BR ©		4822 130 42134			
BC858CR ©		4822 130 42634			
BSR56 ©		4822 130 42633			
			BU2,3	CINCH-socket	4822 267 30631
			BU4	DIN-socket	4822 267 40284
IN4002		5322 130 30684	Miscellaneous		
IN4148		4822 130 30621	Spring clip		
BAX18		4822 130 34121	Transformer fuse		
HZ4B2/C3V9		4822 130 32843	Mains transf.		
BB212		4822 130 31129	Mains transf. (only for 07/17)		
			4822 492 63076		
			4822 252 20007		
			4822 146 21047		
			4822 146 21067		

DECODER CIRCUIT



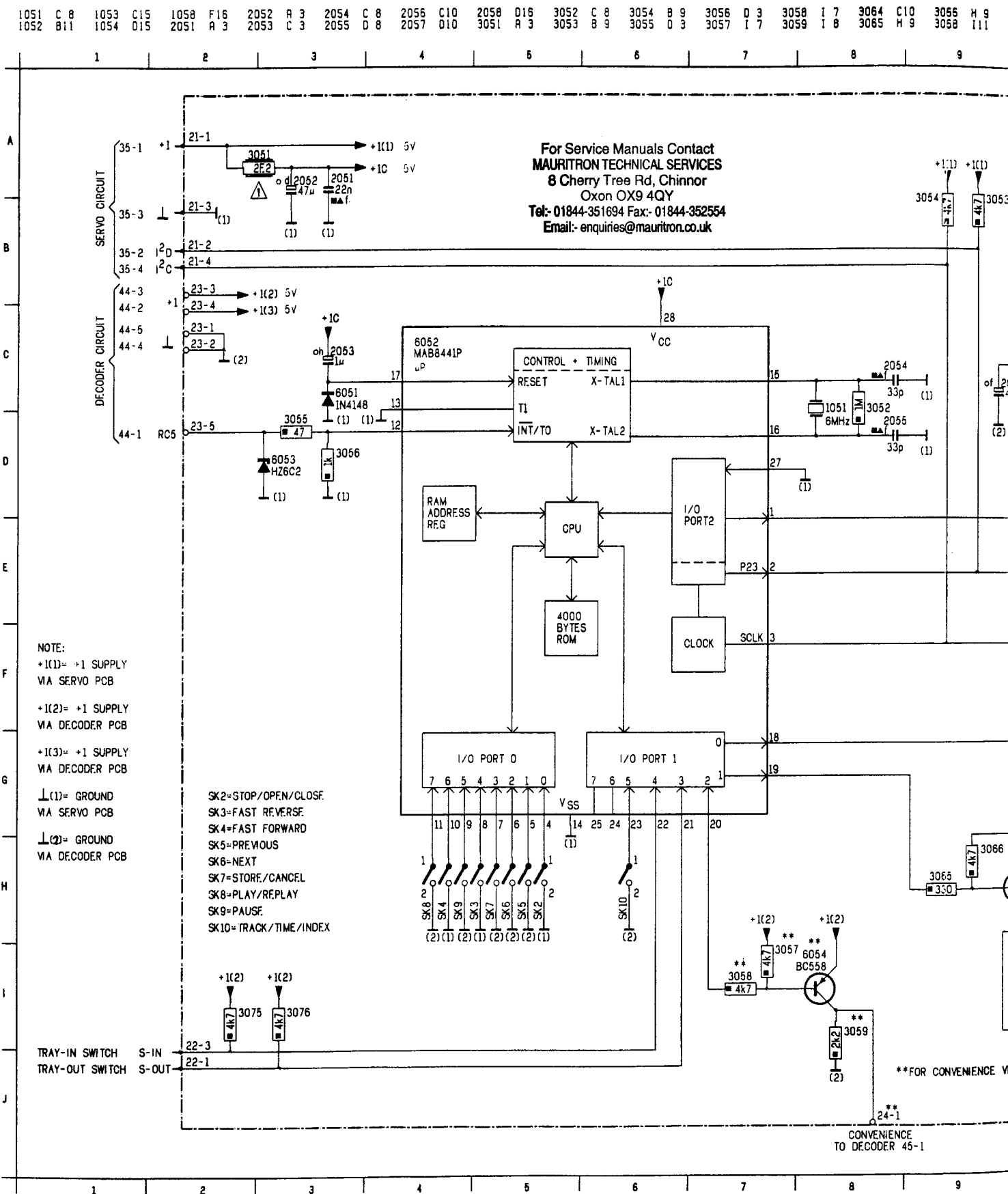


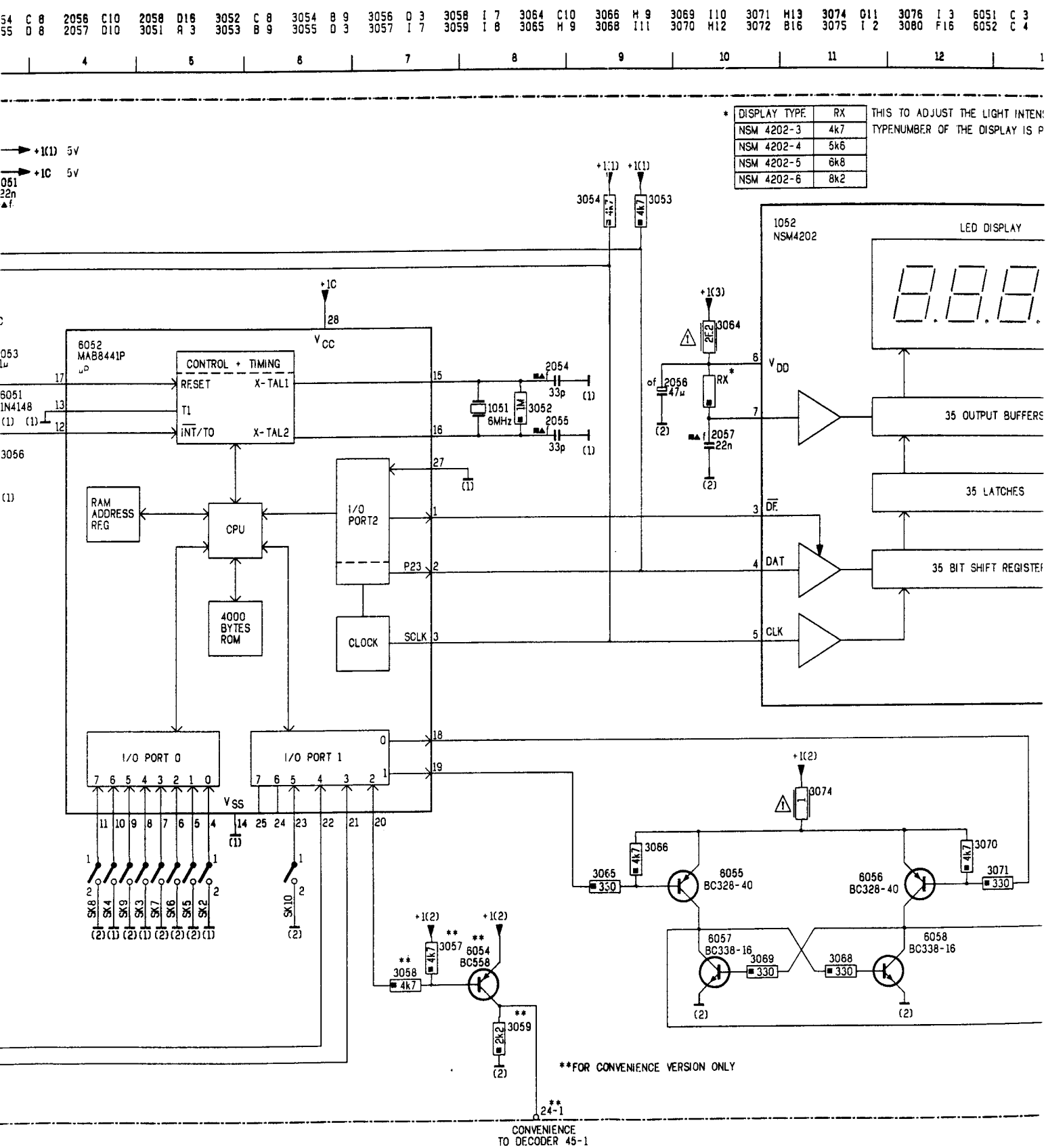


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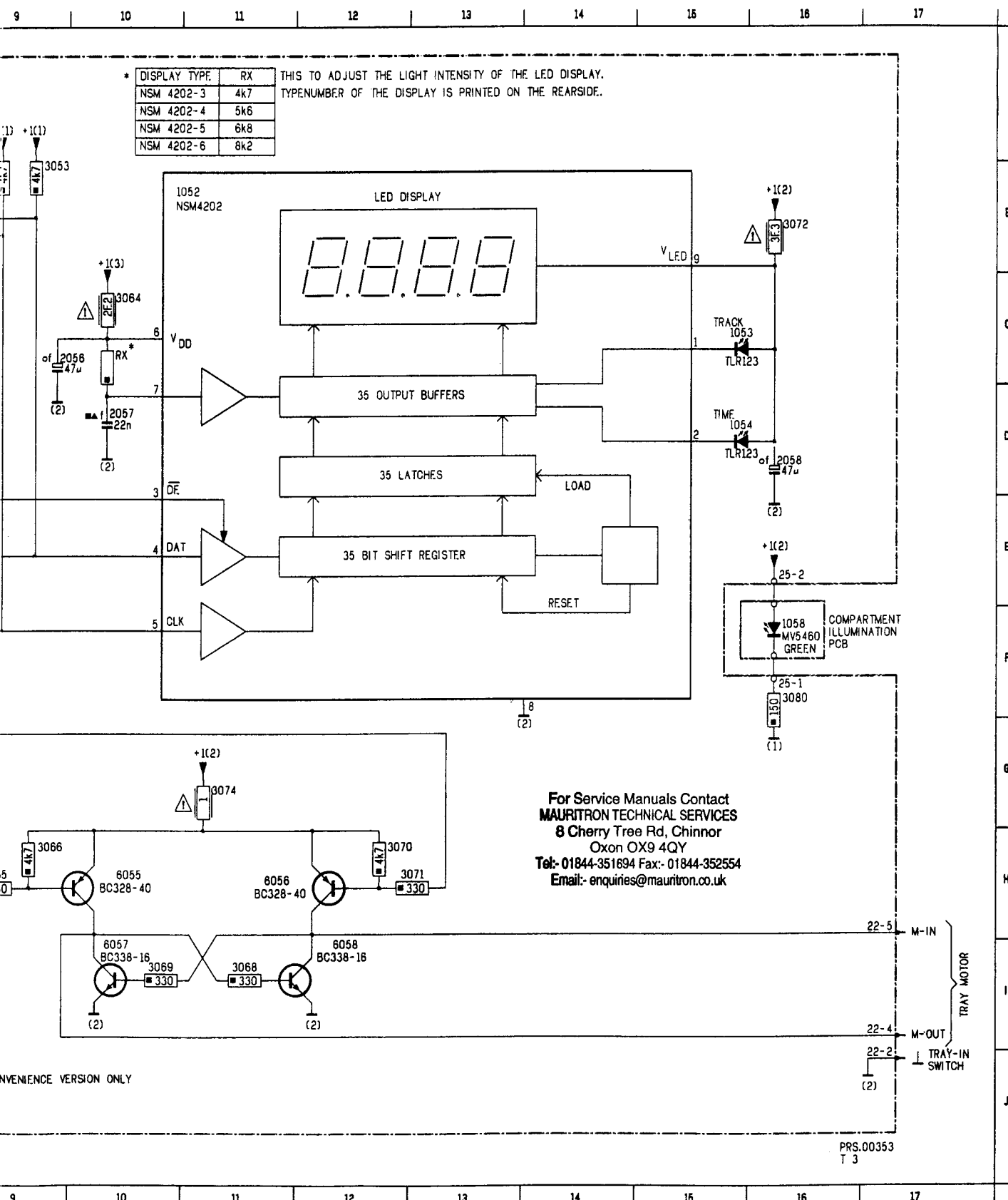
6311	E18	3378	Q13
1301	B18	3379	Q12
2301	G4	3380	N12
2302	G5	3381	K20
2303	F2	3389	F18
2304	F3	3390	B17
2305	G4	3391	B20
2306	F5	3392	2
2307	G6	3393	15
2308	B4	3400	L20
2309	B4	3401	L19
2310	B5	3402	M19
2311	C2	3403	K18
2313	D3	3404	L17
2320	G9	3405	O20
2321	L9	3806	D8
2322	G8	3808	H8
2323	L8	3812	E16
2324	G9	3813	B15
2325	L9	3814	C16
2326	G10	3815	B11
2327	L10	3820	B20
2328	G8	3826	L6
2329	L8	3827	K1
2330	H13	3831	F20
2331	M13	5301	F7
2332	J7	6301	B4
2333	O7	5302	E9
2334	K8	6303	I9
2335	P8	6304	N9
2336	K9	6305	C13
2337	P8	6306	G12
2338	K9	6308	H16
2339	P9	6308	H14
2340	K9	6308	H16
2341	K9	6308	H14
2342	K9	6312	J5
2343	P9	6320	J14
2344	K10	6321	O14
2345	P10	6322	L8
2346	K10	6323	N18
2347	P10	6324	I19
2350	K11	6325	N19
2351	P11	6326	O13
2352	P11	6327	K19
2353	P11	6328	K19
2354	K11	6329	K18
2355	P11	6335	G5
2356	K12	6336	B7
2357	P12	6337	B7
2358	I7	6338	L18
2359	N7	6339	L18
2360	B7	6340	K17
2361	R11	6341	K17
2362	B14	6342	L17
2363	B13	6343	L17
2364	B15		
2365	G15		
2366	G15		
2367	J14		
2371	O14		
2372	J15		
2373	O15		
2374	I14		
2375	N14		
2376	I16		
2377	N16		
2378	I16		
2379	N16		
2380	I17		
2381	N17		
2382	I17		
2383	N17		
2384	I17		
2385	N17		
2386	O12		
2387	I18		
2388	I18		
2389	I18		
2390	B17		
2391	B18		
2392	B20		
2393	J1		
2394	J2		
2395	J5		
2400	L19		
2401	N18		
2402	L17		
2403	K17		
2404	L17		
3301	F3		
3302	G3		
3303	F4		
3304	F5		
3305	F2		
3306	E3		
3307	E3		
3308	G6		
3310	E2		
3311	R4		
3312	R4		
3313	C1		
3314	O2		
3315	D3		
3320	G9		
3321	L9		
3322	G10		
3323	L10		
3324	G10		
3325	L10		
3326	G8		
3327	L8		
3328	G8		
3329	L8		
3330	H12		
3331	H12		
3332	H12		
3333	H12		
3334	I7		
3335	N7		
3336	N7		
3337	N7		
3340	R7		
3341	R7		
3342	R11		
3343	B11		
3344	B13		
3345	B15		
3346	F14		
3350	K14		
3351	P14		
3352	J14		
3353	O14		
3354	J14		
3355	O14		
3356	L14		
3357	N14		
3358	I15		
3359	N15		
3360	I16		
3361	N16		
3362	M17		
3363	N17		
3364	M17		
3365	M17		
3366	I18		
3367	N18		
3368	I18		
3369	N18		
3370	J19		
3371	O19		
3372	I19		
3373	N19		
3374	J20		
3375	O20		

CONTROL + DISPLAY CIRCUIT

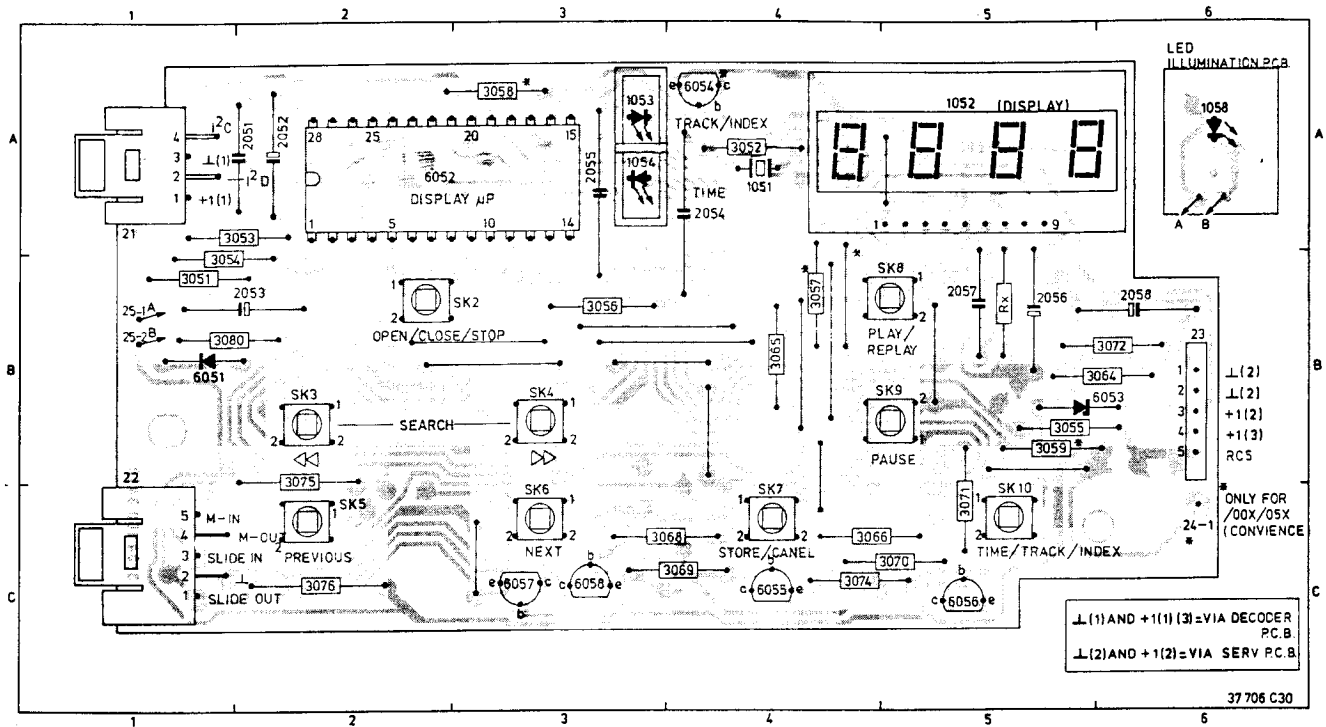




66 H 9 3069 I10 3071 H13 3074 C11 3076 I 3 6051 C 3 6053 D 3 6055 H10 6057 I10 RX C10
68 I11 3070 H12 3072 B16 3075 I 2 3080 F16 6052 C 4 6054 I 9 6056 H11 6058 I12



CONTROL + DISPLAY PCB



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	6052	μP MAB8441P/T0144822 209 11063
	BC328-40 BC338-16 BC558	4822 130 41715 4822 130 40892 4822 130 44197
	IN4148 HZ6C2 (6V2)	4822 130 30621 4822 130 32698
	1053,1054 1058	TLR123 (RED) 5322 130 34957 MV5460 (GREEN) 4822 130 32842
	3051,3064 3072 3074	2,2Ω-NFR25 4822 111 30492 3,3Ω-NFR25 4822 111 30593 1Ω-NFR25 4822 111 30483
	1051	X-tal 6MHz 4822 242 70392
	Display	
	1052	NSM4202 4822 130 90141
	SK2+10	TACT SWITCH 4822 276 11276

RX B5
 SK2 B2
 SK3 B2
 SK4 B3
 SK5 C2

 SK6 C3
 SK7 C4
 SK8 B5
 SK9 B5
 1051 A4

 1052 A5
 1053 A3
 1054 A3
 1058 A6
 2051 A2

 2052 A2
 2053 B2
 2054 A4
 2055 A3
 2056 B5

 2057 B5
 2058 B6
 3051 B1
 3052 A4
 3053 A1

 3054 B1
 3055 B5
 3056 B3
 3057 B4
 3058 A3

 3059 B5
 3064 B6
 3065 B4
 3066 C4
 3068 C3

 3069 C4
 3070 C5
 3071 C5
 3072 B6
 3074 C4

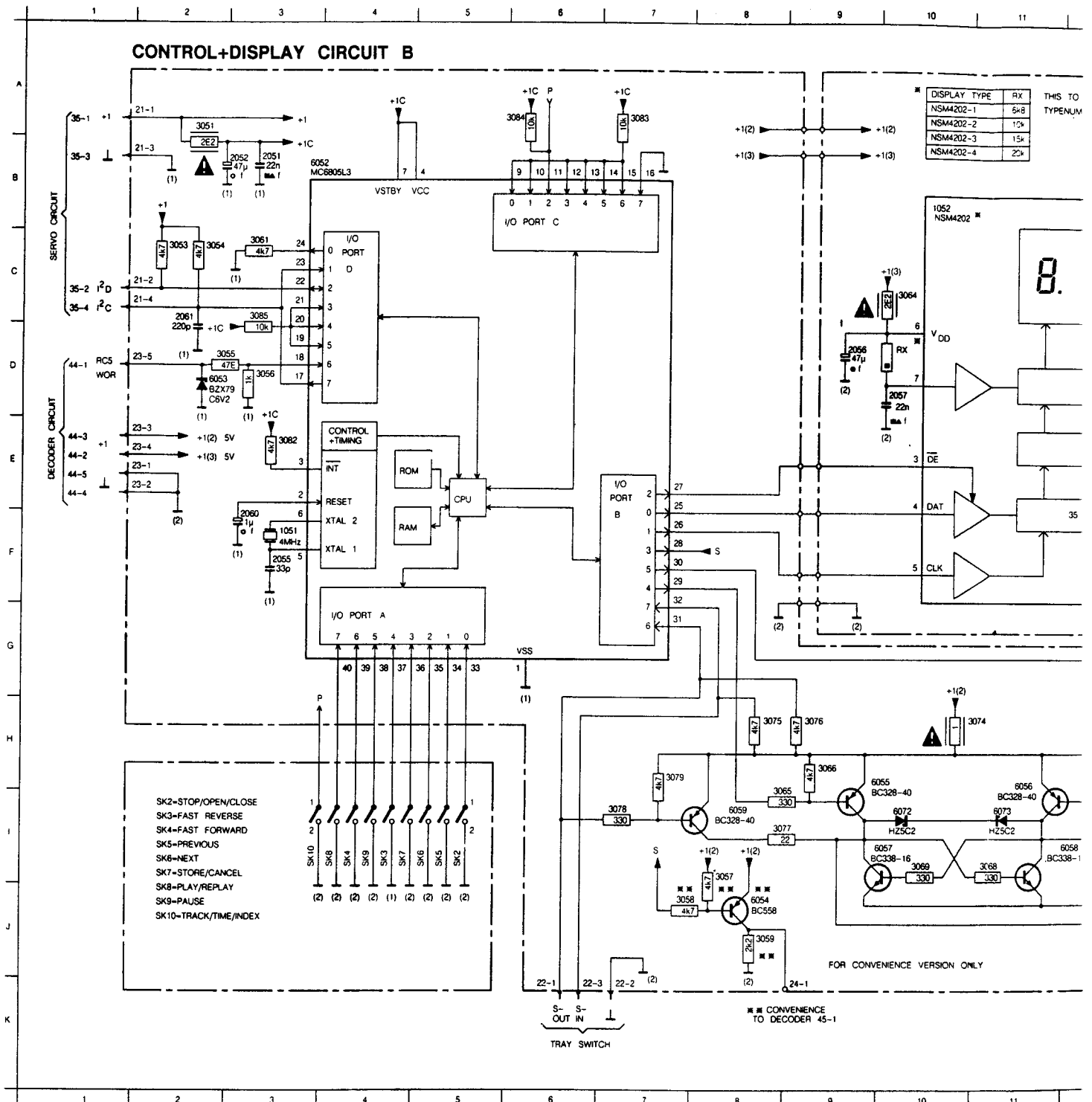
 3075 B2
 3076 C2
 3080 B1
 6051 B1
 6052 A2

 6053 B5
 6054 A4
 6055 C4
 6056 C5
 6057 C3

 6058 C3
 SK10 C5

CS 102 225

1051 F 3 1054 D15 2052 B 3 2057 D10 2061 C 2 3054 C 2 3057 I 8 3061 C 3 3066 H 9 3070 H12 3074 H11 3077 I 8 3080 F16 3084 A 6 6053 D 2 6056
 1052 B10 1058 G16 2055 F 3 2058 E18 3051 A 2 3055 D 2 3058 J 7 3064 C10 3068 I11 3071 H12 3075 H 8 3078 I 7 3082 E 3 3085 C 3 6054 J 8 6057
 1053 D15 2051 B 3 2056 D 9 2060 F 3 3053 C 2 3056 D 3 3059 J 8 3065 H 8 3069 I10 3072 C16 3076 H 9 3079 H 7 3083 A 7 6052 B 3 6055 H10 6056

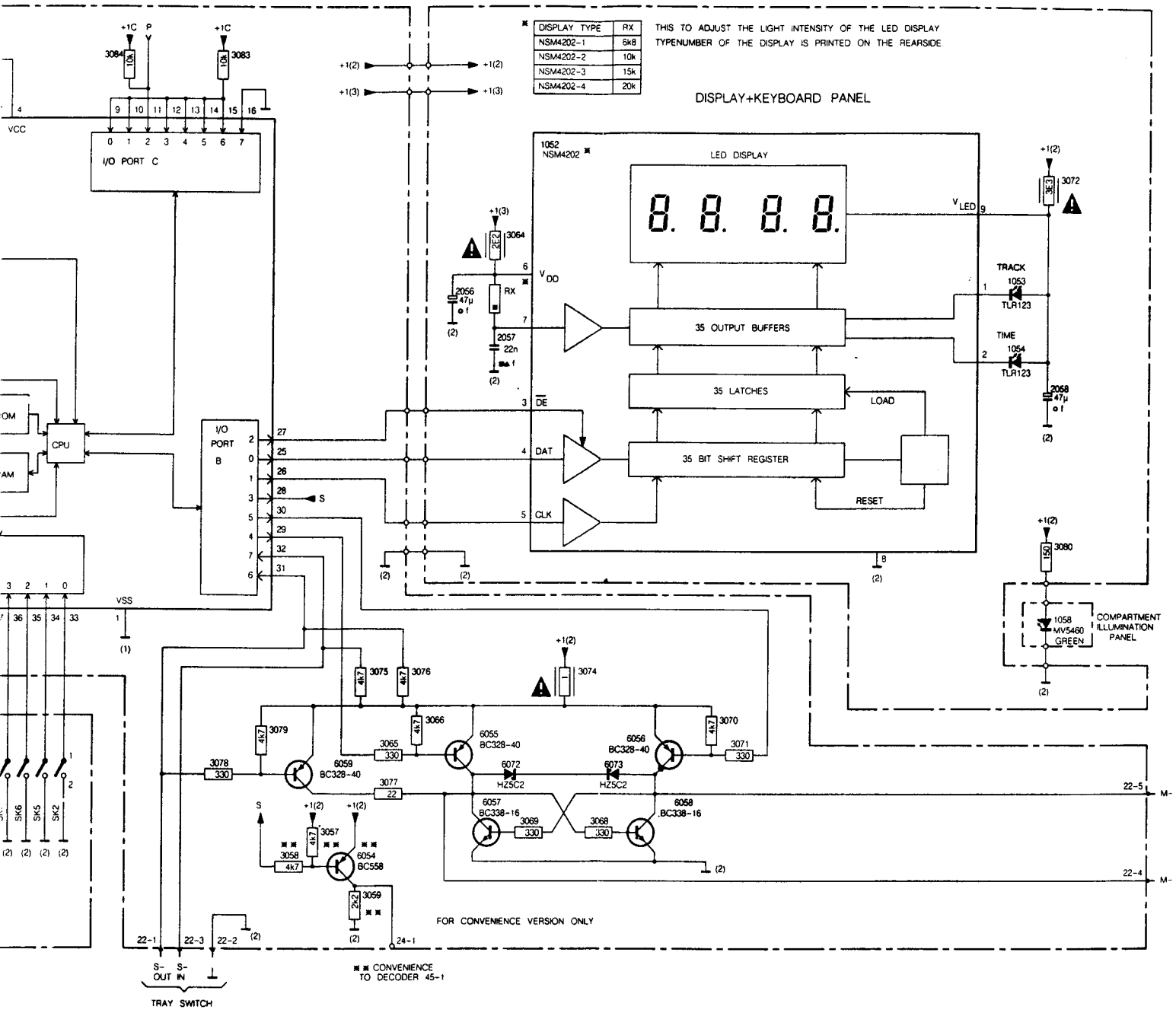


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C 2 3057 I 8 3061 C 3 3086 H 9 3070 H12 3074 H11 3077 I 8 3080 F16 3084 A 6 6053 D 2 6056 H11 6059 I 8
D 2 3058 J 7 3064 C10 3088 I11 3071 H12 3075 H 8 3078 I 7 3082 E 3 3085 C 3 6054 J 8 6057 I10 6072 I10
D 3 3059 J 8 3065 H 8 3069 I10 3072 C16 3076 H 9 3079 H 7 3083 A 7 6052 B 3 6055 H10 6058 I12 6073 I11

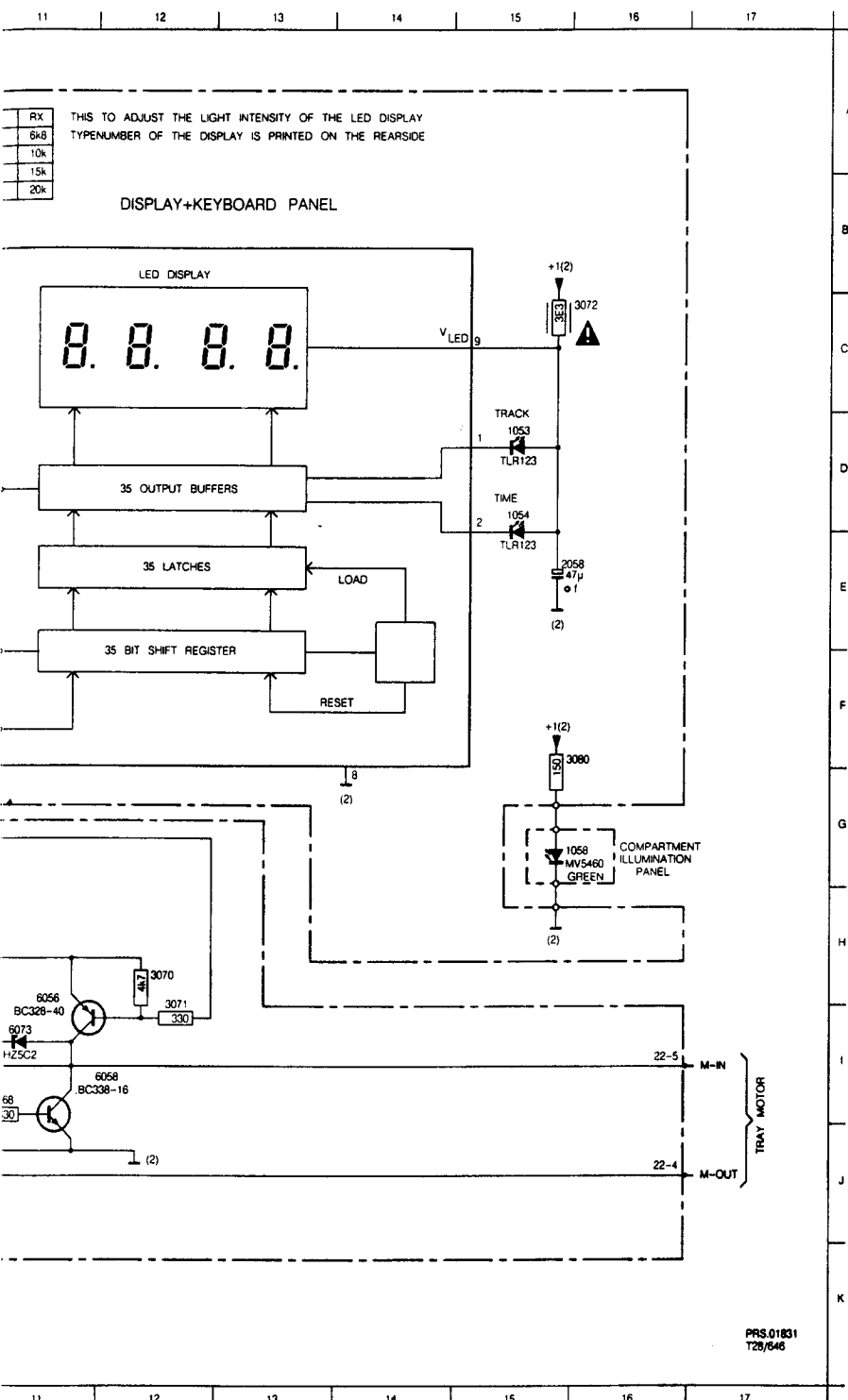
5 6 7 8 9 10 11 12 13 14 15 16

3



5 6 7 8 9 10 11 12 13 14 15 16

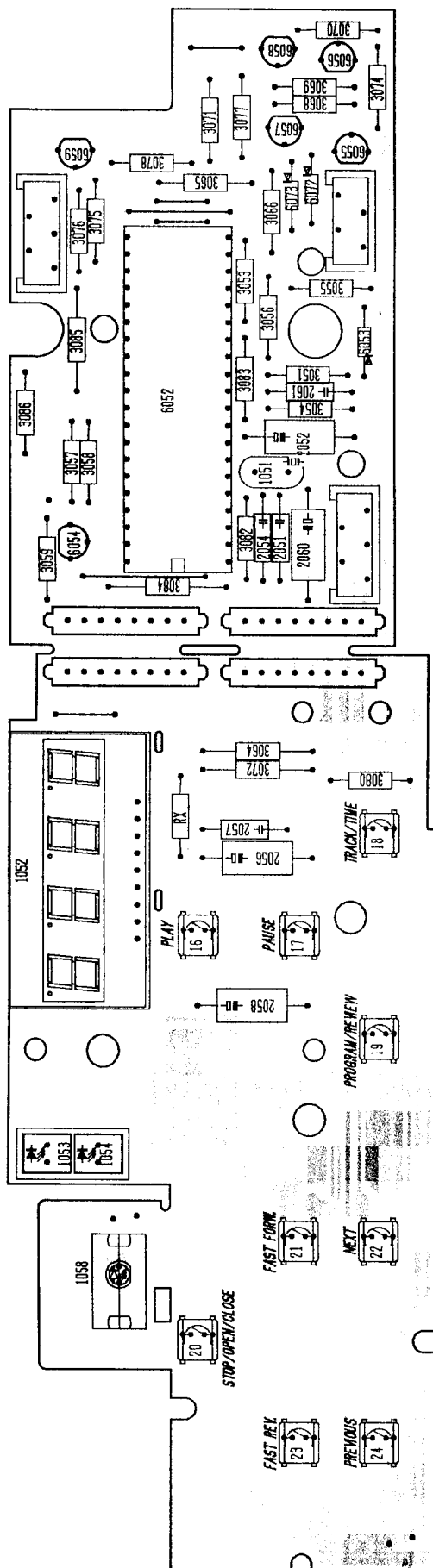
053 D 2 6056 H11 6059 1 8
 054 J 8 6057 110 6072 110
 055 H10 6058 112 6073 111



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CONTROL AND DISPLAY PANEL - B

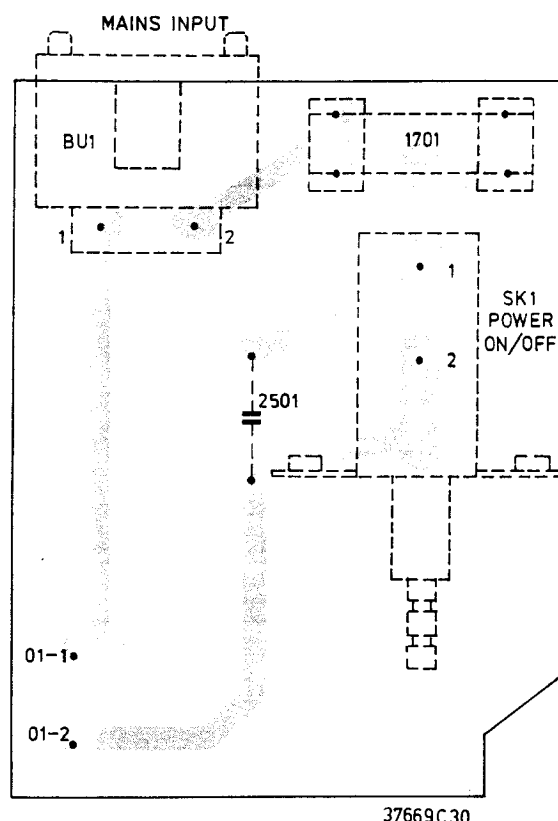
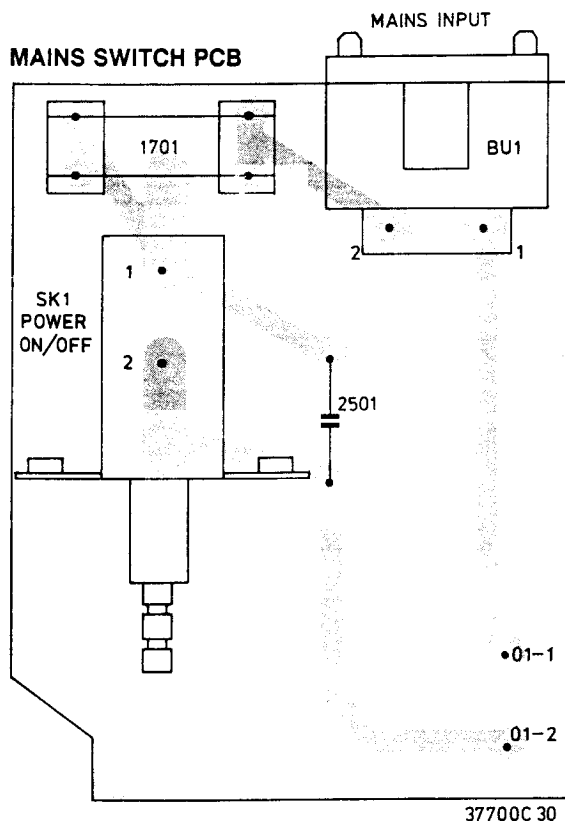
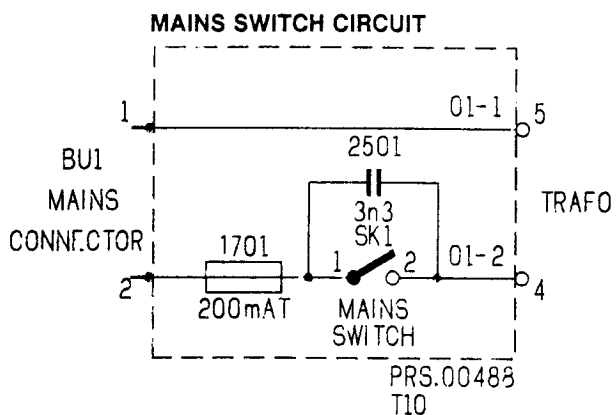


				
6052	μP MC6805L3P	4822 209 11445		3051,3064 3072 3074
				2.2Ω-NFR25 3.3Ω-NFR25 2Ω-NFR25
BC328-40 BC338-16 BC558		4822 130 41715 4822 130 40892 4822 130 44197		
				— —
				1051
				X-tal 4 MHz
				4822 242 70831
				Display
IN4148 HZ5C2 (5V1)		4822 130 30621 4822 130 33293		1052
				NSM4202
				4822 130 90141
1053, 1054 1058	TLR123 (RED) MV5460 (GREEN)	5322 130 34957 4822 130 32842		
				SK+10
				TACT SWITCH
				4822 276 11276

SK2	= pos. 20
SK3	= pos. 23
SK4	= pos. 21
SK5	= pos. 24
SK6	= pos. 22
SK7	= pos. 19
SK8	= pos. 16
SK9	= pos. 17
SK10	= pos. 18

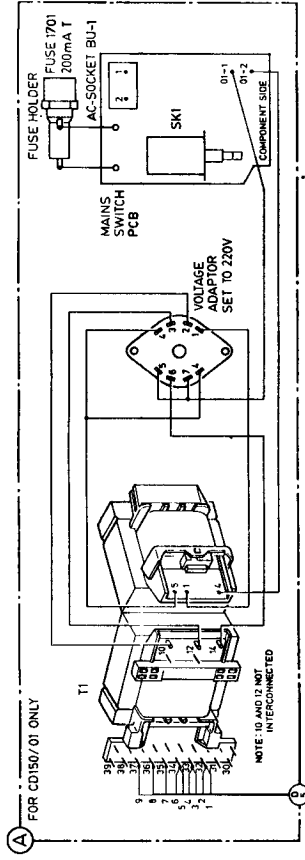
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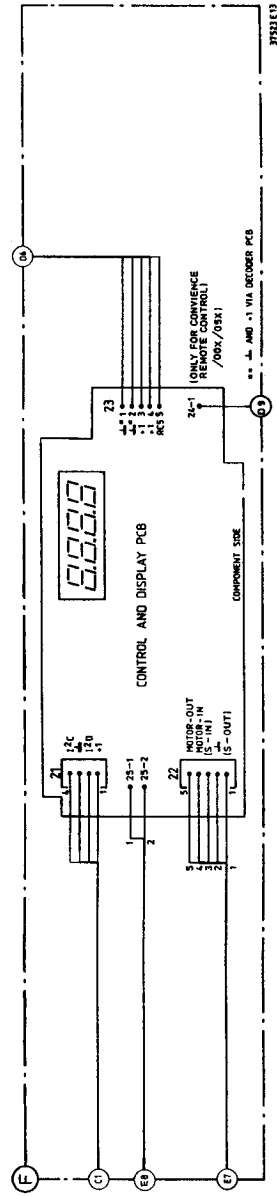
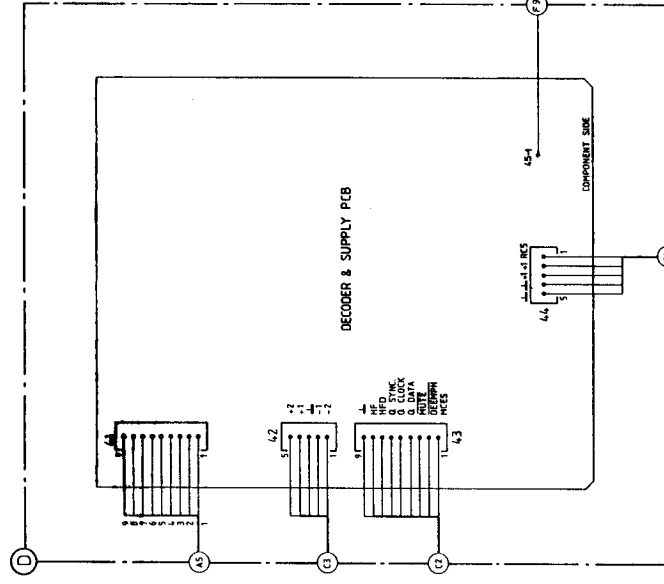


		
SK1	MAINS SWITCH	4822 276 11309
		
2701	3,3 nF-400V	4822 122 40327
		
1701	220/240V version	4822 253 30012
	200 mA	
	110/127V version	4822 253 30016
	400 mA	
Miscellaneous		
Fuse holder		4822 492 60063
BU-1 mains inlet		4822 265 20262

Ⓢ Chips 50 V NP0 S1206	Ⓢ Chips 0,125 W S1206	Ⓢ Chips 0,125 W S1206
1 pF 5% 4822 122 32279	6,8 E 5% 4822 111 90254	7,5 k 2% 4822 111 90276
1,5 pF 5% 4822 122 31792	7,5 E 5% 4822 111 90396	8,2 k 2% 5322 111 90118
1,8 pF 5% 4822 122 32087	8,2 E 5% 4822 111 90397	9,1 k 2% 4822 111 90373
3,3 pF 5% 4822 122 32079	9,1 E 5% 4822 111 90398	10 k 2% 4822 111 90249
3,9 pF 5% 4822 122 32081	10 E 2% 5322 111 90095	11 k 2% 4822 111 90337
4,7 pF 5% 4822 122 32082	11 E 2% 4822 111 90338	12 k 2% 4822 111 90253
8,2 pF 5% 4822 122 32083	12 E 2% 4822 111 90341	13 k 2% 4822 111 90509
10 pF 5% 4822 122 31971	13 E 2% 4822 111 90343	15 k 2% 4822 111 90196
12 pF 5% 4822 122 32139	15 E 2% 4822 111 90344	16 k 2% 4822 111 90346
18 pF 5% 4822 122 31769	16 E 2% 4822 111 90347	18 k 2% 4822 111 90238
22 pF 10% 4822 122 31837	18 E 2% 5322 111 90139	20 k 2% 4822 111 90349
27 pF 5% 4822 122 31966	20 E 2% 4822 111 90352	22 k 2% 4822 111 90251
33 pF 5% 4822 122 31756	22 E 2% 4822 111 90186	24 k 2% 4822 111 90512
39 pF 5% 4822 122 31972	24 E 2% 4822 111 90355	27 k 2% 4822 111 90542
47 pF 5% 4822 122 31772	27 E 2% 5322 111 90375	30 k 2% 4822 111 90216
56 pF 5% 4822 122 31774	30 E 2% 4822 111 90356	33 k 2% 5322 111 90267
68 pF 5% 4822 122 32267	33 E 2% 4822 111 90357	36 k 2% 4822 111 90514
82 pF 10% 4822 122 31839	36 E 2% 4822 111 90359	39 k 2% 5322 111 90108
100 pF 5% 4822 122 31765	39 E 2% 4822 111 90361	43 k 2% 4822 111 90363
120 pF 5% 4822 122 31766	43 E 2% 5322 116 90125	47 k 2% 4822 111 90543
150 pF 5% 4822 122 31767	47 E 2% 4822 111 90217	51 k 2% 5322 111 90274
180 pF 2% 4822 122 31794	51 E 2% 4822 111 90365	56 k 2% 4822 111 90573
220 pF 5% 4822 122 31965	56 E 2% 4822 111 90239	62 k 2% 5322 111 90275
270 pF 5% 4822 122 32142	62 E 2% 4822 111 90367	68 k 2% 4822 111 90202
330 pF 10% 4822 122 31642	68 E 2% 4822 111 90203	75 k 2% 4822 111 90574
390 pF 5% 4822 122 31771	75 E 2% 4822 111 90371	82 k 2% 4822 111 90575
470 pF 5% 4822 122 31727	82 E 2% 4822 111 90124	91 k 2% 5322 111 90277
560 pF 5% 4822 122 31773	91 E 2% 4822 111 90375	100 k 2% 4822 111 90214
680 pF 5% 4822 122 31775	100 E 2% 5322 111 90091	110 k 2% 5322 111 90269
820 pF 5% 4822 122 31974	110 E 2% 4822 111 90335	120 k 2% 4822 111 90568
1 nF 10% 5322 122 31647	120 E 2% 4822 111 90339	130 k 2% 4822 111 90511
1,2 nF 5% 4822 122 31807	130 E 2% 4822 111 90164	150 k 2% 5322 111 90099
1,5 nF 10% 4822 122 31781	150 E 2% 5322 111 90098	160 k 2% 5322 111 90264
2,2 nF 10% 4822 122 31644	160 E 2% 4822 111 90345	180 k 2% 4822 111 90565
2,7 nF 10% 4822 122 31783	180 E 2% 5322 111 90242	200 k 2% 4822 111 90351
3,3 nF 10% 4822 122 31969	200 E 2% 4822 111 90348	220 k 2% 4822 111 90197
3,9 nF 10% 4822 122 32566	220 E 2% 4822 111 90178	240 k 2% 4822 111 90215
4,7 nF 10% 4822 122 31784	240 E 2% 4822 111 90353	270 k 2% 4822 111 90302
5,6 nF 10% 4822 122 31916	270 E 2% 4822 111 90154	300 k 2% 5322 111 90266
6,8 nF 10% 4822 122 31976	300 E 2% 4822 111 90156	330 k 2% 4822 111 90513
10 nF 10% 4822 122 31728	330 E 2% 5322 111 90106	360 k 2% 4822 111 90515
12 nF 10% 5322 122 31648	360 E 1% 4822 111 90288	390 k 2% 4822 111 90182
15 nF 10% 4822 122 31782	360 E 2% 4822 111 90358	430 k 2% 4822 111 90168
18 nF 10% 4822 122 31759	390 E 2% 5322 111 90138	470 k 2% 4822 111 90161
22 nF 10% 4822 122 31797	430 E 2% 4822 111 90362	510 k 2% 4822 111 90364
27 nF 10% 4822 122 32541	470 E 2% 5322 111 90109	560 k 2% 4822 111 90169
33 nF 10% 4822 122 31981	510 E 2% 4822 111 90245	620 k 2% 4822 111 90213
56 nF 10% 4822 122 32183	560 E 2% 5322 111 90113	680 k 2% 4822 111 90368
100 nF 20% 4822 122 31947	620 E 2% 4822 111 90366	750 k 2% 4822 111 90369
	680 E 2% 4822 111 90162	820 k 2% 4822 111 90205
	750 E 2% 5322 111 90306	910 k 2% 4822 111 90374
	820 E 2% 4822 111 90171	1 M 2% 4822 111 90252
	910 E 2% 4822 111 90372	1,1 M 5% 4822 111 90408
	1 k 2% 5322 111 90092	1,2 M 5% 4822 111 90409
	1,1 k 2% 4822 111 90336	1,3 M 5% 4822 111 90411
	1,2 k 2% 5322 111 90096	1,5 M 5% 4822 111 90412
	1,3 k 2% 4822 111 90244	1,6 M 5% 4822 111 90413
	1,5 k 2% 4822 111 90151	1,8 M 5% 4822 111 90414
	1,6 k 2% 5322 111 90265	2 M 5% 4822 111 90415
	1,8 k 2% 5322 111 90101	2,2 M 5% 4822 111 90185
	2 k 2% 4822 111 90165	2,4 M 5% 4822 111 90416
	2,2 k 2% 4822 111 90248	2,7 M 5% 4822 111 90417
	2,4 k 2% 4822 111 90289	3 M 5% 4822 111 90418
	2,7 k 2% 4822 111 90569	3,3 M 5% 4822 111 90191
	3 k 2% 4822 111 90198	3,6 M 5% 4822 111 90419
	3,3 k 2% 4822 111 90157	3,9 M 5% 4822 111 90421
	3,6 k 2% 5322 111 90107	4,3 M 5% 4822 111 90422
	3,9 k 2% 4822 111 90571	4,7 M 5% 4822 111 90423
	4,3 k 2% 4822 111 90167	5,1 M 5% 4822 111 90424
	4,7 k 2% 5322 111 90111	5,6 M 5% 4822 111 90425
	5,1 k 2% 5322 111 90268	6,2 M 5% 4822 111 90426
	5,6 k 2% 4822 111 90572	6,8 M 5% 4822 111 90235
	6,2 k 2% 4822 111 90545	7,5 M 5% 4822 111 90427
	6,8 k 2% 4822 111 90544	8,2 M 5% 4822 111 90237
		9,1 M 5% 4822 111 90428



C.D.M. -2 MOTOR PCB



SYMBOL	DESCRIPTION
	Capacitor, general
	Electrolytic capacitor (+ and - may be omitted)
	Bipolar electrolytic capacitor (+ may be omitted)
	Resistor, general
	N.T.C. resistor
	P.T.C. resistor
	Voltage divider with preset adjustment
	Chip jumper
	Pin contact
	Bus contact
	Coil, self-induction
	Transformer with electrically poor conducting core and adjustable pre-magnetization
	Diode
	Zener diode
	Stabistor
	Double variable capacity diode (in one envelope)
	Photo conductive diode
	L.E.D.

SYMBOL	DESCRIPTION
	Transistor (N.P.N.)
	Transistor (P.N.P.)
	Direct current (DC)
	Alternating current (AC)
	Earth (functional)
	Frame or chassis connection
	Direction in which AC voltages are passed on (optional present)
	Interrupted line
	Not-connected crossing lines
	Connected lines
	Cable tree with lead-outs
	Changer, general (arrow is optional)
	Voltage Controlled Oscillator
	Band-pass filter
	Phase changing network
	Delay element
	Amplifier, general

SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
	Exclusive OR gate
	True/complement amplifier with high input
	Flip Flop
	AND gate
	OR gate
	Inverter with high input

	0.2W (CR 16)	$\leq 220k\Omega$ $> 270k\Omega$	5% 10%
	0.33W (CR 25)	$\leq 1 M\Omega$ $> 1 M\Omega$	5% 10%
	0.33W (SFR25)		5%
	0.25W (VR 25)	$\leq 10M\Omega$ $> 10M\Omega$	5% 10%
	0.5W (CR 37)	$\leq 1 M\Omega$ $> 1 M\Omega$	5% 10%
	0.67W (CR 52)		5%
	1.15W (CR 68)		5%

	Ceramic plate
	Polyester flat foil
	Polyester mepolesco
	Mylar (Polyester flat foil small sized)
	Micropoco
	Tubular ceramic (body colour pink or yellow/green)
	Miniature single elco
	Subminiature tantalum

a	= 2.5 V
b	= 4 V
c	= 6.3 V
d	= 10 V
e	= 16 V
f	= 25 V
g	= 40 V
h	= 63 V
i	= 100 V
j	= 125 V
k	= 125 V
m	= 150 V
n	= 160 V
q	= 200 V
r	= 250 V
s	= 300 V
t	= 350 V
u	= 400 V
v	= 500 V
w	= 630 V
x	= 1000 V
A	= 1.6 V
B	= 6 V
C	= 12 V
D	= 15 V
E	= 20 V
F	= 35 V
G	= 50 V
H	= 75 V
I	= 80 V

MDA.00084

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