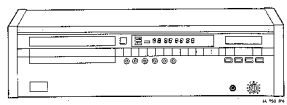
Marantz

Compact disc player 74CD80/02B/04B/05B
75CD80/06B

Service
Service
Service



Service Manual

COMPACT disc DIGITAL AUDIO

TABLE OF CONTENTS

CLASS 1
LASER PRODUCT

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

Documentation Technique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Servicio

Subject to modification
4822 725 22428
Printed in The Netherlands

Published by
Service Consumer Electronics

CS 23 119

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, MARANTZ company has created the ultimate in stereo sound.
Only **original MARANTZ parts** can insure that your MARANTZ product will continue to perform to the specifications for which it is famous.

Parts for your MARANTZ equipment are generally available to our National Marantz Subsidiary or Agent.

MARANTZ INTERNATIONAL
Vestdijk 9
5600 MD Eindhoven
The Netherlands
Phone: +31/40.758290
Telefax: +31/40.75.82.99
Telex: 35000 PHTC NL routing IND NLMTFAT

ORDERING PARTS:

Parts can be ordered either by mail or by telex. In both cases, correct part number has to be specified.
The following information must be supplied to eliminate delays in processing your order:

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature: any order form or telex must be signed otherwise such part order will be considered as null and void.

PARTS ORDERING

Parts may be ordered at the following addresses:

AUSTRIA
HORNYPHON
Vertriebsgesellschaft GmbH
Wiedergerstrasse 1
A 1101 Wien
Austria
Telex: 132.332

BELGIUM
SVD DIVISION MARANTZ
Industrialaan 1
1720 Groot-Bijgaarden
Belgium
Telex: 24466

CHILE
MARANTZ
DIVISION OF PHILIPS S.A.
AV. Santa Maria, 0760
Casilla 2687
Santiago
Telex: 240.229

DENMARK
MARANTZ
DIVISION OF PHILIPS
SERVICE A/S
Praags Boulevard 80
Postbox 1919
DK-2300 København S
Denmark
Telex: 31201

FINLAND
MARANTZ
DIVISION OF OY PHILIPS Ab
Kaivokatu 8
00100 Helsinki
Finland
Telex: 124811

FRANCE
MARANTZ FRANCE
4 Rue Bernard Palissy
92600 Asnières
France
Telex: 611651

GERMANY
MARANTZ GERMANY GmbH
Max-Planck-Strasse 22
6072 Dreieich 1
Germany
Telex: 529821

THE NETHERLANDS
Etoro Marantz
Wint Hontlaan 28
3526 KV Utrecht
The Netherlands
Telex: 4748

NORWAY
MARANTZ
DIVISION OF PHILIPS A/S
Sandstuveien 40
0680 Oslo 6
Norway
Telex: 72640

GREAT BRITAIN
MARANTZ AUDIO U.K. Ltd
Unit 15/16
Saxon Way Industrial Estate
Moor Lane
Harmondsworth UB7 OLW
Great Britain
Telex: 935196

GREECE
SHERTON ELECTRONICS S.A.
P.O.Box 21025
Hippocratus Street 188
Athens 11471
Greece
Telex: 216.795

JAPAN
MARANTZ JAPAN, Inc.
35-1, 7-chome, Sagamiono
Sagamihara-shi, Kanagawa
Japan

KUWAIT
AL ALAMIAH ELECTRONICS
Ussama Building
Fahd al Saleem Street
P.O.Box 23781
Safat-Kuwait
Telex: 22694

ITALY
MARANTZ ITALIANA S.P.A.
Via Chiese, 74
20126 Milano
Italy

SAUDI ARABIA
AL ALAMIAH ELECTRONICS
P.O.Box 5954
University Street
Riyadh 11432
Saudi Arabia
Telex: 401530

SOUTH AFRICA
MARANTZ
DIVISION OF PHILIPS S.A.
Main Road Martindale
P.O. Box. 58088
Newville 21114
South Africa

SPAIN
PHONO S.A.
Ignacio Iglesias 10
Badalona (Barcelona)
Spain
Telex: 59355

SWEDEN
MARANTZ
DIVISION OF PHILIPS
Försäljning AB
Tegeluddsvägen 1
S-115 84 Stockholm
Sweden
Telex: 14060

SWITZERLAND
DYNAVOX ELECTRONICS
Route de Villars 105
1701 Fribourg
Switzerland
Telex: 942377

TURKEY
DOGRUOL Ltd.
I.M.C.
6 Blok N°6310
Unkapani
Istanbul
Turkey
Telex: 22085

MALTA
CACHIA & GALEA
Republic Street, 68D
Valetta
Telex: 1682

PORTUGAL
MARANTZ
Divisao philips S.A. service
Outurela-carnaxide
2795 LinDA-A-VELHA
Telex: 43906

All of the above locations are fully equipped to take care of your total service needs. Because various countries have differing configuration requirements, it is necessary that you contact the service facility in your particular country. In the event that there is no service location listed for your country, please, contact the nearest facility for the necessary assistance.

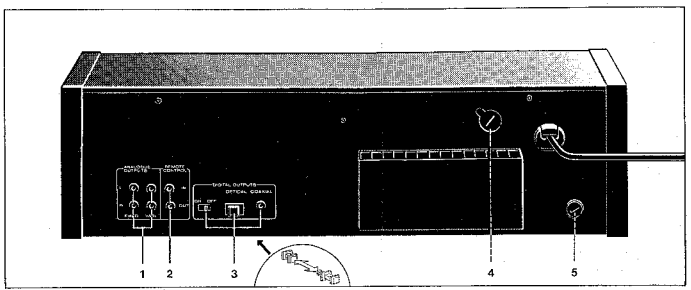
In case of difficulties, do not hesitate to contact the Technical Department at abovementioned address.

TECHNICAL DATA

Disc diameter		: 80 mm/120 mm
Mains voltage	/01	: 110 V, 127 V, 220 V ± 10% (to be changed by carousel switch)
	/02/05	: 110 V, 127 V, 220 V, 240 V, ± 10% (to be changed by transformer connections)
	/04	: 100 V ± 10 %
	/06	: 117 V ± 10 %
Mains frequencies		: 50, 60 Hz (no adaptations required)
Power consumption		: 30 W
Frequency range		: 5 Hz ÷ 20 kHz
Amplitude linearity		: max ± 0,05 dB [2] typical ± 0,01 dB
Output voltage fixed		: 2 V rms ± 2 dB [1]
Output impedance		: 200 Ω
Signal to noise ratio		: min. 95 dB typical 103 dB
Channel separation		: min. 93 dB [2] typical 100 dB
Channel difference		: ± 0,2 dB [1]
Total harmonic distortion		: min –90 dB [2] typical –92 dB
De-emphasis		: 0 or 15/50 µs (switched by the subcode on the disc)
Dimensions WxDxH		: 454x136x363 mm (tray closed)
Weight		: 15 kg
Variable line out		: motorized potentiometer controlled by remote control

[1] into 100 kΩ // 100 pF
[2] from 5 Hz ÷ 20 kHz into 100 kΩ // 100 pF

OPERATION



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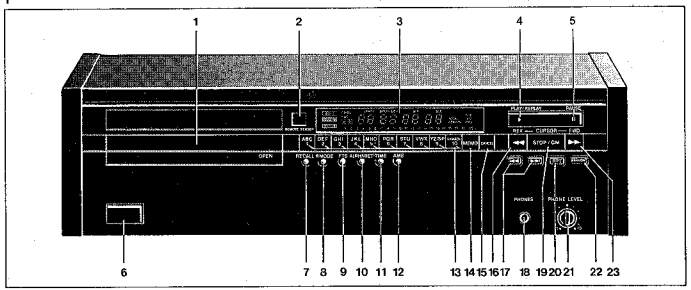


44 749 A11

Connections

1 Analogue outputs
2 Remote control in/out
3 Digital outputs
4 Mains fuse holder
5 Voltage selector

Operation

1 Open
2 Remote sensor
3 Display
4 Play-replay
5 Pause
6 On/off
7 Recall
8 Program mode
9 FTS
10 Alphabet
11 Time
12 Automatic Music Scan
13 Figure/Alphabet
14 Memo
15 Cancel
16 ◀◀ Rev cursor
17 ⏮ ⏭ Track selecting
18 Phones
19 Stop/CM
20 Repeat
21 Phone level
22 Random
23 Cursor FWD ▶▶

(GB) WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.
Keep components and tools also at this potential.

ESD

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(NL) WAARSCHUWING

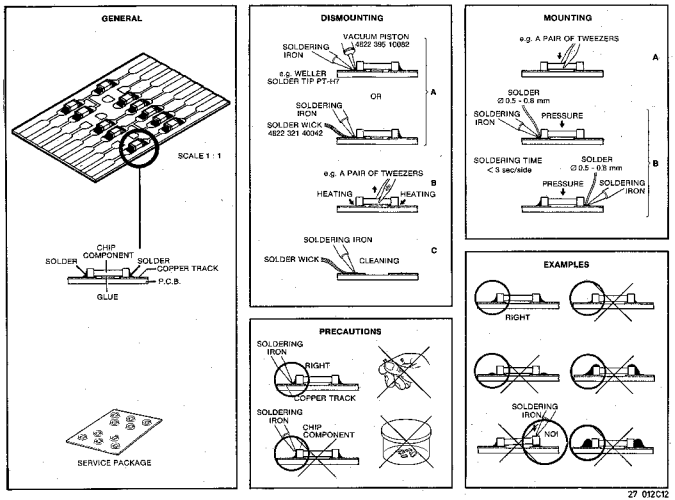
Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un bracciaietto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

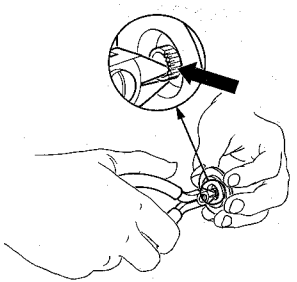
SERVICE HINTS

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



27 012C12

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, a separate service disc hold-down should be used.



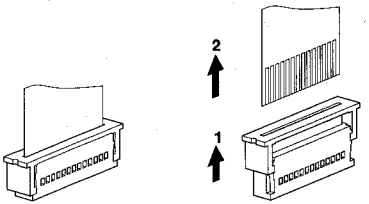
42 565 A12

A service disc hold-down can be composed in the following way.

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. below.
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.

SERVICE TOOLS

4822 395 90204	GLASS DISC
4822 397 30096	AUDIO TEST DISC 5+5A
4822 397 30155	AUDIO TEST DISC 1kHz
4822 397 30184	AUDIO SIGNALS DISC
4822 397 60141	AUDIO TEST MAX DIAM
4822 267 50676	SERVICE CONN (14P)
4822 322 40066	SERVICE CABLE (14P)
4822 321 21284	SERVICE CABLE (4P)
4822 395 50145	TORX SCREWDRIVERSET
4822 395 50132	TORX SCREW SQUARE
4822 395 30204	13TH ORDER TER
5322 130 32182	LED GREEN CQYG11



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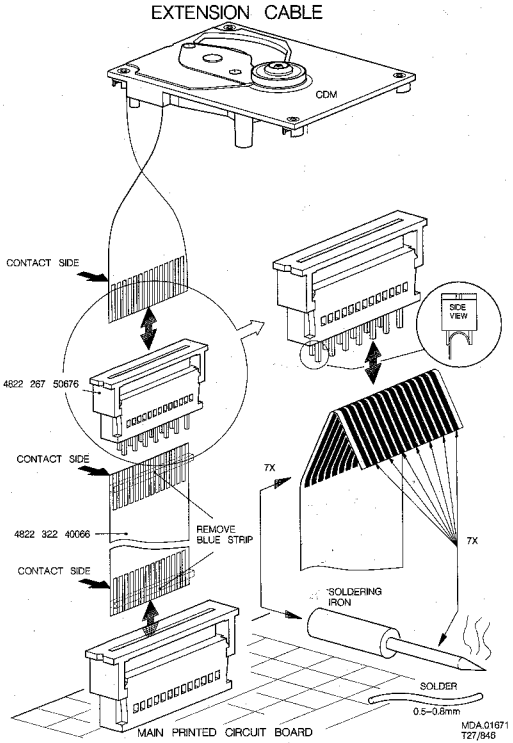
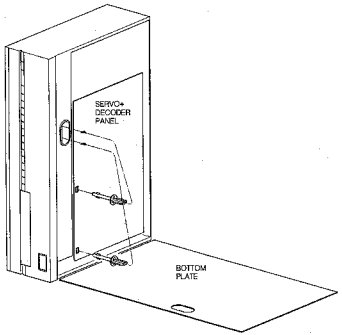
T28/822



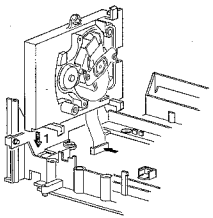
MDA.01671
T27/846

MEASURING AND ADJUSTMENT POSITION OF THE SET

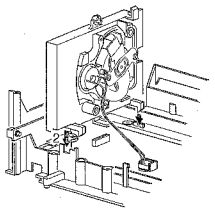


MDA.02138
916/T19

FOIL CONNECTION POSITION.



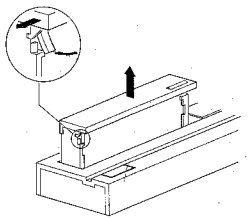
FLAY-SERVICE POSITION



EVA.00848
916/T19

CABINET DISASSEMBLY HINTS

A



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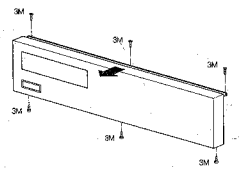
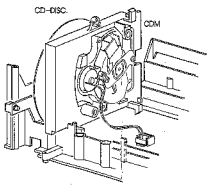
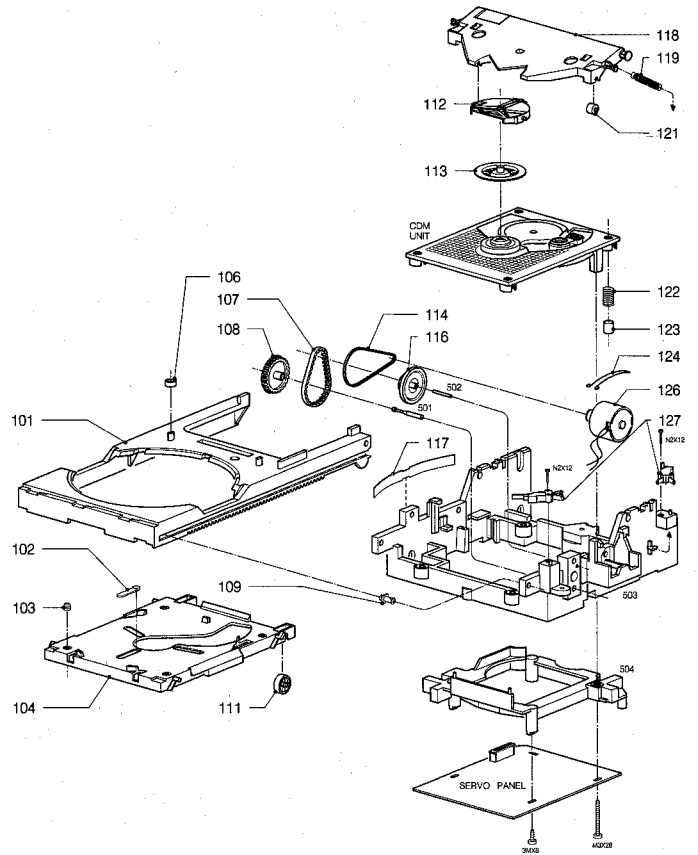


MDA.02137
916/T19

SERVICE POSITION PLAY



EVA.00849
916/T19



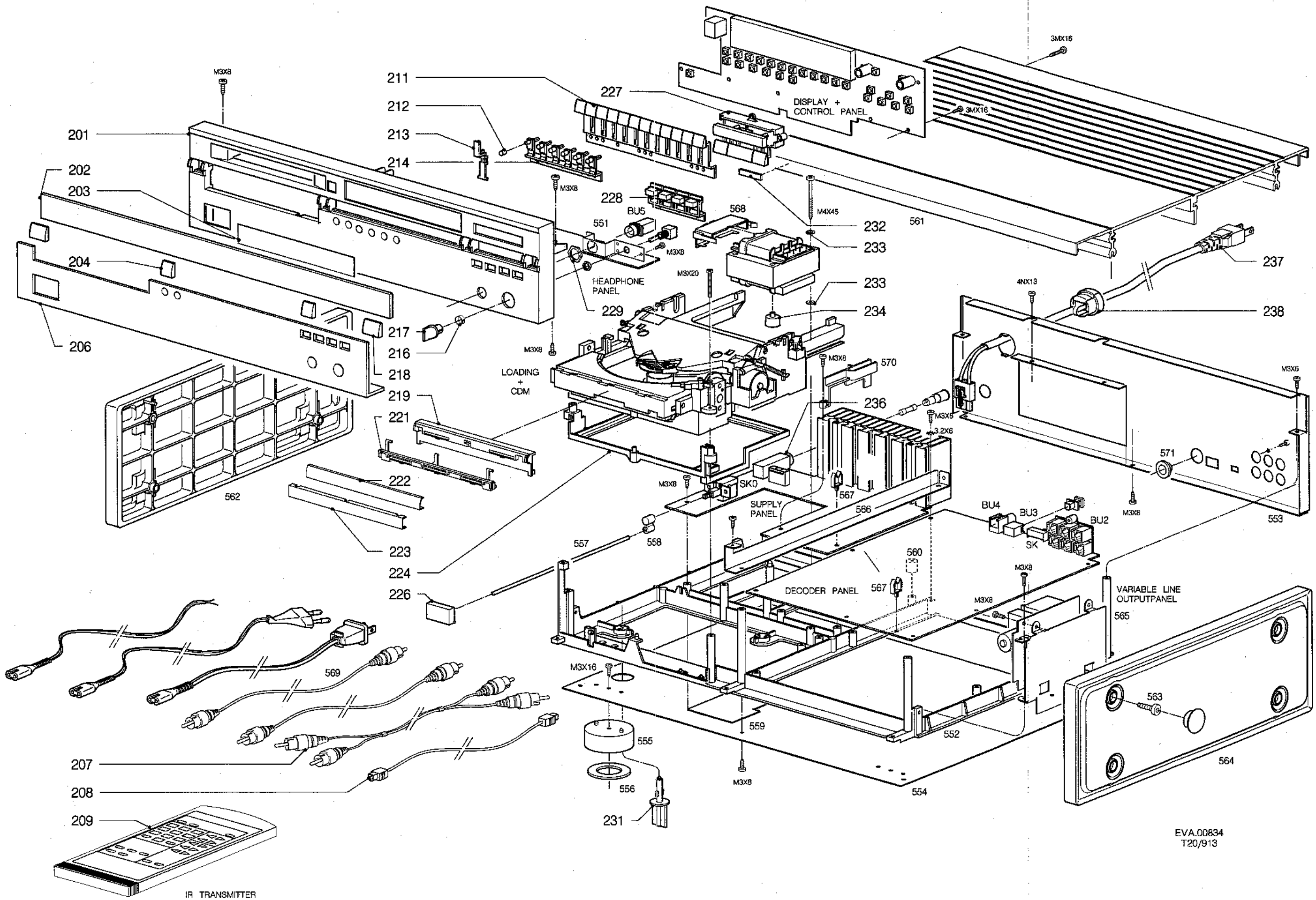
EVA.00507
T07–752

PARTSLIST TRAY MECHANISM

101	4822 444 50582	
102	4822 325 60317	
103	4822 325 60317	
104	4822 444 50607	
106	4822 532 51756	
107	4822 358 20262	
108	4822 522 32271	
109	4822 402 61081	
111	4822 528 90638	
112	4822 532 11547	
113	4822 462 50383	
114	4822 358 20116	
116	4822 528 81146	
117	4822 492 63659	
118	4822 444 60467	
119	4822 492 32687	
120	4822 691 20449	
121	4822 528 90639	
122	4822 492 51964	
123	4822 325 60318	
124	4822 492 63746	
126	4822 361 20998	
127	4822 276 11277	
	4822 361 21115	TURNTABLE MOTOR

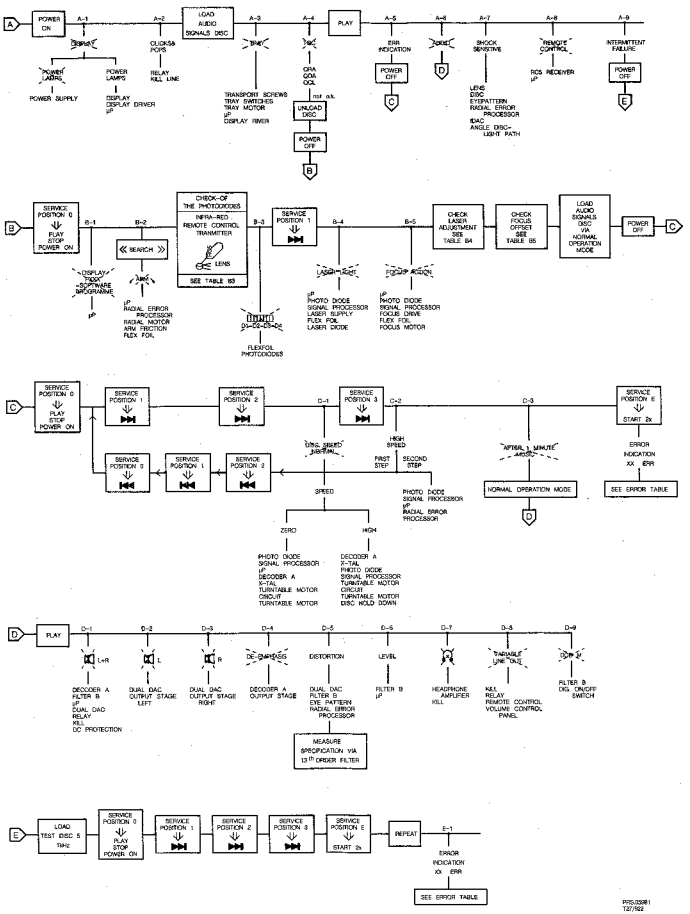
PARTLIST CABINET

201	4822 444 40309	
202	4822 450 61361	/02B/04B/05B
	4822 450 62445	/06B
203	4822 450 61362	
204	4822 460 20768	/02B/04B/05B
	4822 460 20771	/06B
206	4822 460 20765	/02B/04B/05B
	4822 460 20777	/06B
207	4822 321 23116	
208	4822 323 20182	
209	4822 218 10274	
211	4822 410 60332	/02B/05B
	4822 410 60117	/04B
	4822 410 60306	/06B
212	4822 410 50169	
213	4822 402 50277	
214	4822 410 60118	
216	4822 492 61974	
217	4822 410 60119	
218	4822 460 20769	/02B/04B/05B
	4822 460 20772	/06B
219	4822 402 61266	/02B/05B
	4822 402 61254	/04B
	4822 402 61303	/06B
221	4822 464 50764	/02B/04B/05B
	4822 464 50773	/06B
222	4822 460 20763	
223	4822 460 20766	
224	4822 466 92338	
226	4822 410 60121	
227	4822 276 30404	/02B/05B
	4822 276 30403	/06B
	4822 276 60304	/06B
228	4822 410 60116	/02B/04B/05B
	4822 410 60303	/06B
229	4822 505 10571	
231	4822 535 92907	
232	4822 459 10747	/02B/04B/05B
	4822 459 10887	/06B
233	4822 532 51504	
234	4822 466 61641	
236	4822 256 30402	
237	4822 321 10642	/02B/05B
	4822 321 10623	/04B
	4822 321 10639	/06B
238	4822 325 60329	
553	4822 444 60631	/02B/04B/05B
	4822 444 60648	/06B
	4822 600 10297	EPS CUSHION BELOW
	4822 600 10298	EPS CUSHION ABOVE
	4822 600 10299	A-BOX MARANTZ


3MX16
M3X8
201
202
203
204
206
211
212
213
214
227
DISPLAY + CONTROL PANEL
3MX16
M3X8
228
BU5
568
551
M3X8
M4X45
232
233
561
HEADPHONE PANEL
M3X20
233
237
229
234
4NX13
238
217
216
218
M3X8
LOADING + CDM
M3X8
570
219
236
M3X6
221
M3X6
3.2X6
571
222
M3X8
SK0
567
562
SUPPLY PANEL
566
BU4
BU3
BU2
SK
M3X8
553
223
557
558
224
560
M3X8
226
567
DECODER PANEL
M3X8
VARIABLE LINE OUTPUTPANEL
565
569
M3X16
563
559
552
555
207
564
556
M3X8
208
554
231
209
IR TRANSMITTER
EVA.00834
T20/913

3-1

TROUBLE SHOOTING



PRS03081
T27762

Working with the faultfinding tree

Follow the path of the faultfinding tree beginning at the top left. Perform the actions you come across in the various blocks.
Look at the various side branches to find out if the information you see there applies to your problem. If, for instance, you find the indication display this means that no picture appears on the display.

If you establish this fault, follow the branch and perform the recommended actions. Check the signals mentioned. In a number of branches further reference is made to measurements you could carry out.
These measurements are explained in several tables further on in this manual.

B-3 CHECK OF THE PHOTODIODES

Step	Signal	Mode	◇	∅			Remarks
1	D2 D1 D3 D4	power on	4 6 7 8	–	–	signal 4±6±7±8	Signal depends on Distance lens ⟷ IR LED of remote control

T-22407A

B-4 CHECK OF LASER SUPPLY

The rsupply plus the monitor diode form a feedback system.
A defect in the lasersupply may result in the destruction of the laser. If, in that case, the laser is replaced, (= complete D.C.M.-unit) the new laser will also become defective. However, it is impossible to check and repair a feedback system if a link is missing. For this reason the laser supply can be checked with teh replacement circuitser assembly.

Step	Signal	Mode	◇		Remarks
1	LO	serv. pos. 2 SK	8 V	1.8<V <2.3	
	LM		11 V	170<mV <220	PRS05539
2	LO	serv. pos. 2 SK	8 V	1.8<V <2.3	
	LM		11 V	170<mV <220	PRS05540
3	LO	Power on	8 V	0V ± 0.2V	No light

T-22407B

B-4 LASER CURRENT ADJUSTMENT

Step	Signal	Mode	◇	∅			Remarks
1	–	Power off	1 Ω	R3120	1kΩ	–	Pre-adjustment Ohmic value
2	Eye-pattern HF	Power on Test disc 5 play	7	–	–	Eye pattern	–
3		Test disc 5 play track 1	1 V 2	R3120	50 mV DC	–	fine adjustment

T-22428A

B-5
ADJUSTMENT OF FOCUS-OFFSET

Step	Signal	Mode					Remarks
1	–	Power on	–	R3169	–	–	adjust for optical mid-position of the focus motor
2	FE LAG	Play Test disc 5 Track 1	27	R3169	400mV ± 40 mV DC	–	fine adjustment

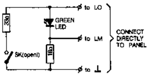
T-22428B

ERROR TABLE

Errors indicated in display when player is set in playmode in service position 3:

02 Err	Focus error	No track loss
03 Err	Radial start error	Minimum eccentricity point not found
06 Err	TL error during jump	No positive TL or RD edge during 60x8 ms
07 Err	Subcode error	No valid subcode within 3 sec.
08 Err	TOC error	Out of lead-in while reading TOC
09 Err	Eeprom cell error	Eeprom cell broken

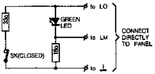
REPLACEMENT CIRCUIT FOR LASER ASSEMBLY



THE LED EMITS LITTLE LIGHT
LED GREEN e.g. CQY94 5322 130 32162

PRS.05539
T28/845

REPLACEMENT CIRCUIT FOR LASER ASSEMBLY

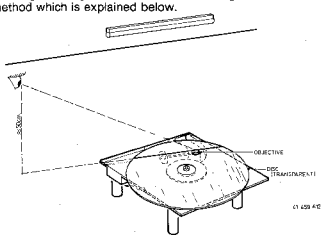


The feedback system sees to it that the same amount of current flows through the LED. When SK is open and when SK is closed the LED emits little light.

PRS.05540
T28/845

Checking the angle setting

The angle setting can be checked with the glass-disc method which is explained below.



Put glass disc 4822 395 90204 on the turntable.
Make sure that the glass disc beds down well on the turntable.
Place the CD mechanism under a light source, under which there is a straight line (e.g. under a fluorescent tube with grid).
Set the arm to mid-position of its radial track.
Turn the mechanism until the arm is parallel to the line under the light source (see figure below).
Look into the direction and in the extension of the line to the reflection there of on the glass disc and in the objective.
Locate the CDM in such a way that the line reflected by the glass disc runs across the centre of the objective.
The line reflected by the objective should fall just within the surface of the objective. If this is the case, the two lines are not more than 4 mm apart and squareness is correct.

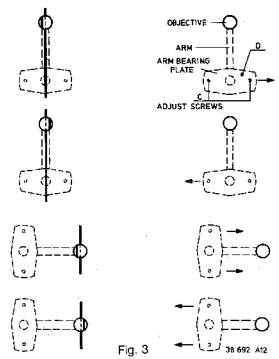


Fig. 3

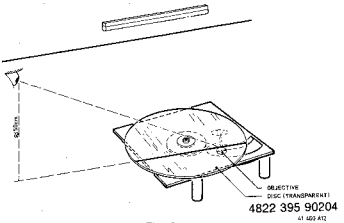


Fig. 6

Turn the CD mechanism through 90° relative to the previous position. The arm must be kept in mid-position (see figure above).
Repeat the previous check.

Adjusting the angle setting

For adjusting the angle setting one or both of the two locking knocks for the bearing plate on pos. 51 must be taken out.
If a check on the angle setting shows that the angle falls outside the tolerance, the angle should NOT be adjusted for minimum deviation, but it should be adjusted within the tolerance.
The new setting should lie between the old setting and the optimum setting. After adjusting the setting, the friction of the arm must be checked. This is done by means of a spring pressure gauge which is held against the magnet of the focusing unit.
The friction of the arm, measured over the entire meter reading, should not be greater than 25 mN.
When the friction appears to be too high, the RAFOC unit must be replaced and the angle between disc and light path adjusted.

The lock is adjusted as follows:

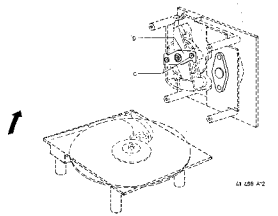
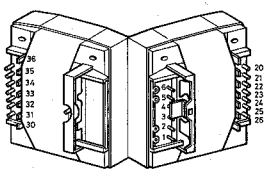


Fig. 7

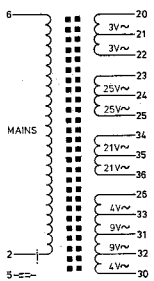
Loosen screws C (see figure above) until bearing plate D can be displaced. Correct the angle setting by moving the bearing plate into the direction shown in figure below. Tighten screws C, ensuring that the setting does not drift. Then double check the setting in two directions.

SUPPLY PANEL

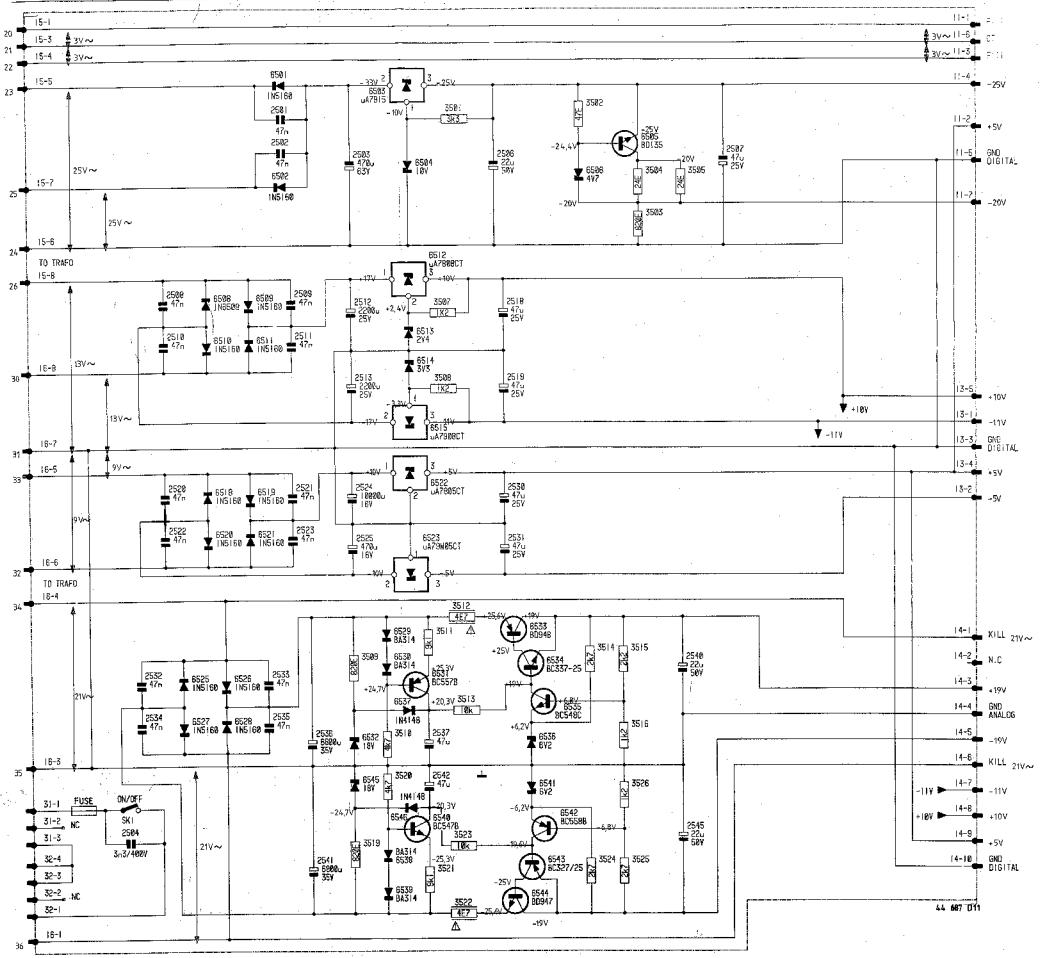
TRANSFORMER CONNECTIONS

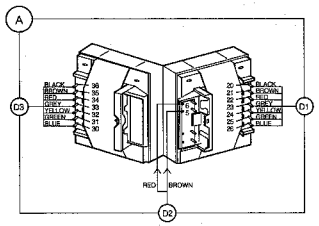


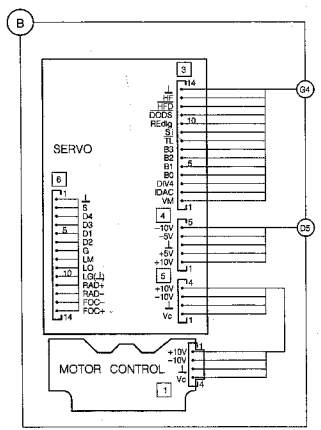
44 704 A11

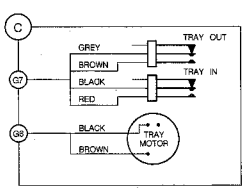


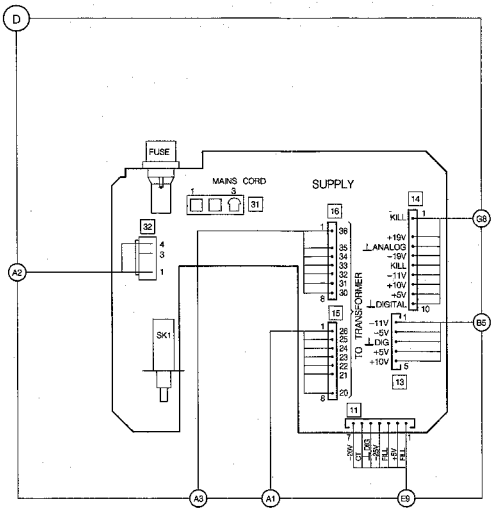
TRANSFORMER CONNECTIONS

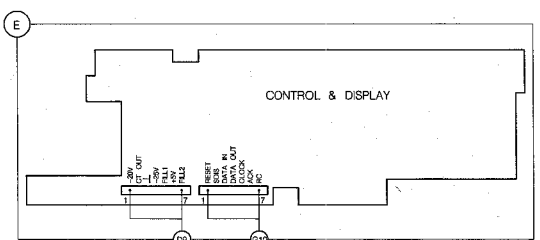


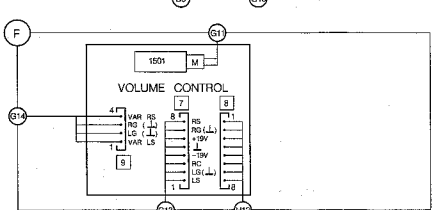


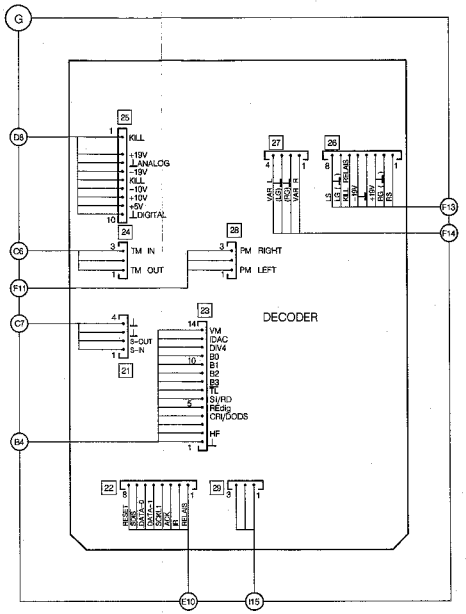


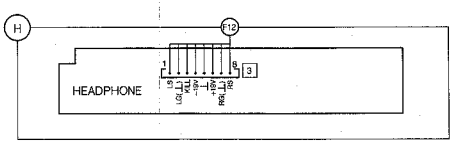


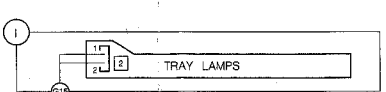




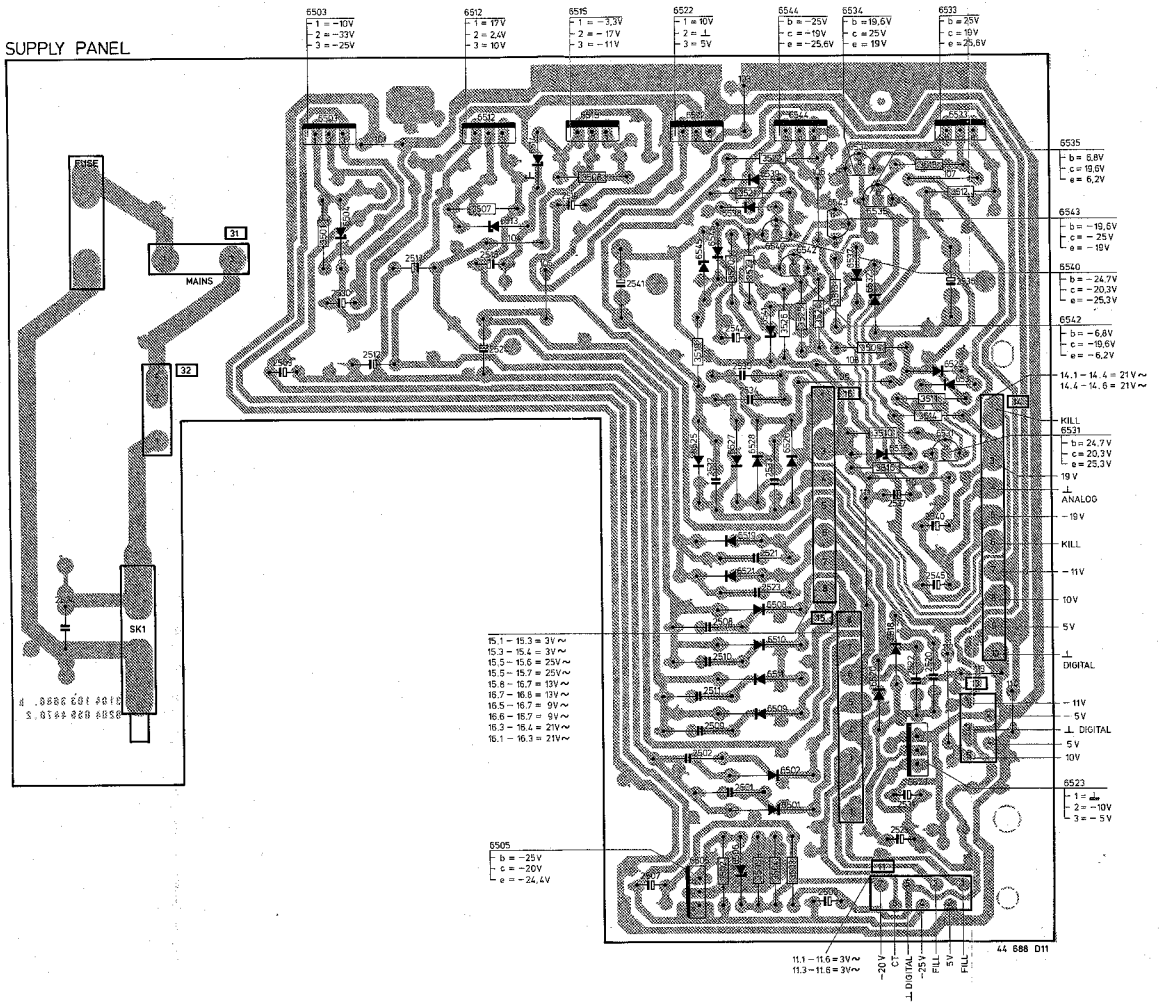


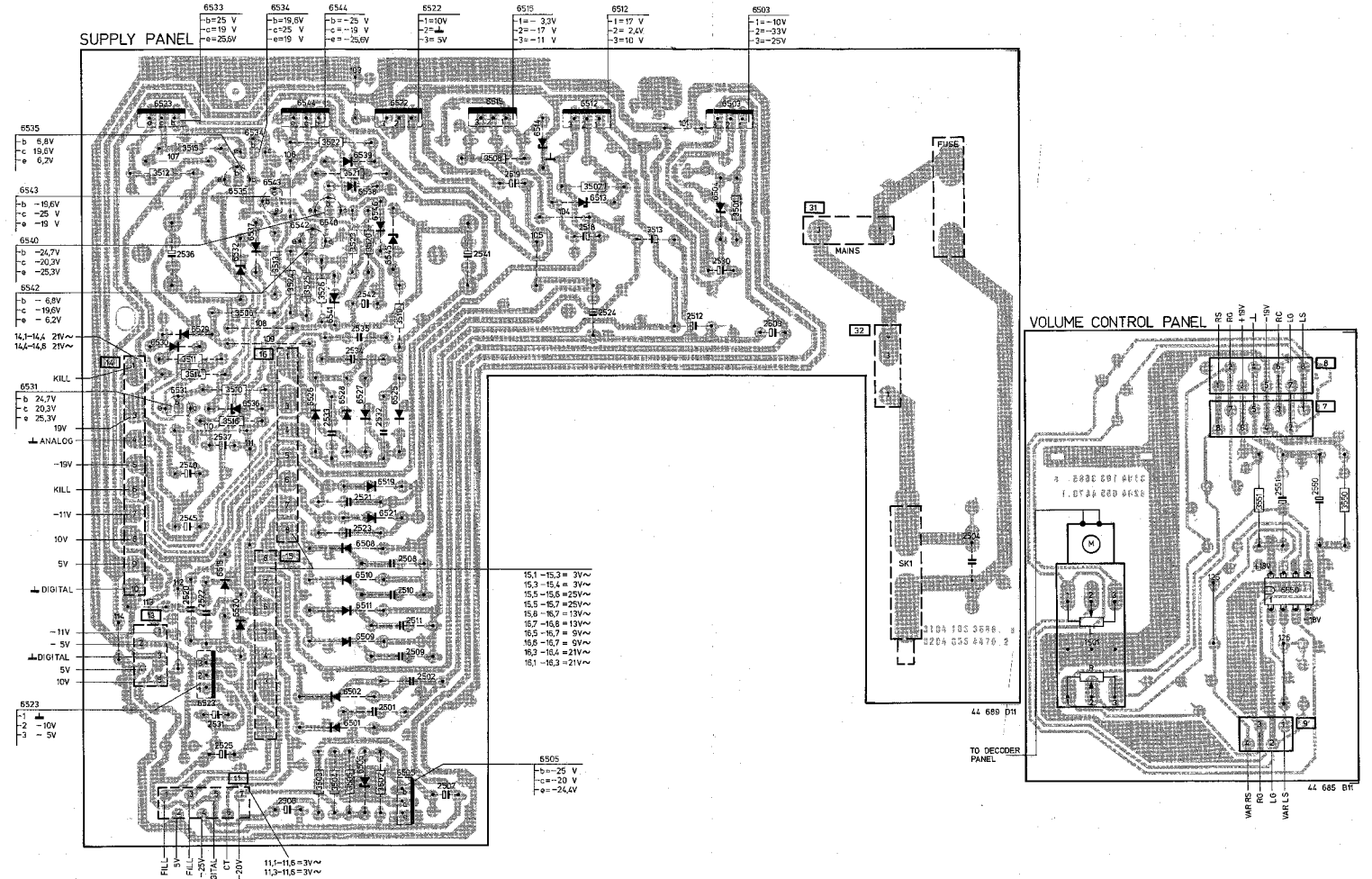






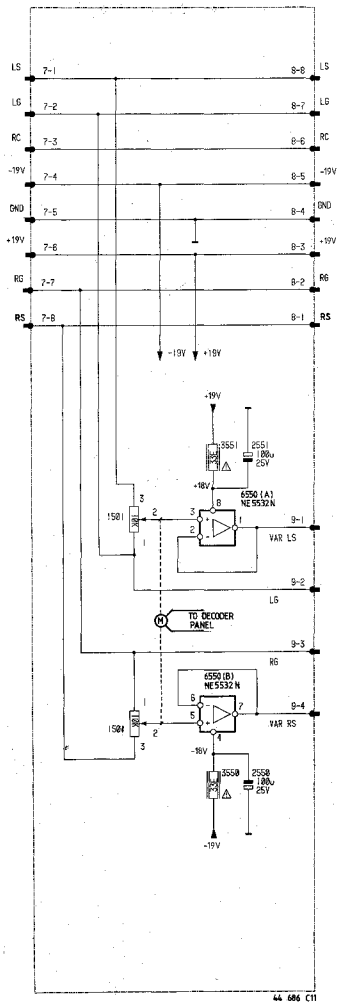
MDA 02128
T82-918


SUPPLY PANEL
6503
1 = −10V
2 = −33V
3 = −25V
6512
1 = 17V
2 = 2,4V
3 = 10V
6515
1 = −3,3V
2 = −17V
3 = −11V
6522
1 = 10V
2 = ⊥
3 = 5V
6544
b = −25V
c = −19V
e = −25,6V
6534
b = 19,6V
c = 25V
e = 19V
6533
b = 25V
c = 19V
e = 25,6V
6535
b = 6,8V
c = 19,6V
e = 6,2V
6543
b = −19,6V
c = −25V
e = −19V
6540
b = −24,7V
c = −20,3V
e = −25,3V
6542
b = −6,8V
c = −19,6V
e = −6,2V
14.1 − 14.4 = 21V~
14.4 − 14.6 = 21V~
KILL
6531
b = 24,7V
c = 20,3V
e = 25,3V
19V
⊥ ANALOG
−19V
KILL
−11V
10V
5V
⊥ DIGITAL
−11V
−5V
⊥ DIGITAL
5V
10V
6523
1 = ⊥
2 = −10V
3 = −5V
6505
b = −25V
c = −20V
e = −24,4V
15.1 − 15.3 = 3V ~
15.3 − 15.4 = 3V ~
15.5 − 15.6 = 25V ~
15.5 − 15.7 = 25V ~
15.6 − 16.7 = 13V ~
16.7 − 16.6 = 13V ~
16.5 − 16.7 = 9V ~
16.6 − 16.7 = 9V ~
16.3 − 16.4 = 21V ~
16.1 − 16.3 = 21V ~
11.1 − 11.6 = 3V ~
11.3 − 11.6 = 3V ~
−20V
⊥ DIGITAL
−25V
FILL
5V
FILL
44 688 D11
FUSE
MAINS
SK1


SUPPLY PANEL
6533
b=25 V
c=19 V
e=25,6V
6534
b=19,6V
c=25 V
e=19 V
6544
b=-25 V
c=-19 V
e=-25,6V
6522
1=10V
2=⊥
3=-5V
6515
1=-3,3V
2=-17 V
3=-11 V
6512
1=17 V
2=2,4V
3=10 V
6503
1=-10V
2=-33V
3=-25V
6535
b 6,8V
c 19,6V
e 6,2V
6543
b -19,6V
c -25 V
e -19 V
6540
b -24,7V
c -20,3V
e -25,3V
6542
b -6,8V
c -19,6V
e -6,2V
14,1-14,4 21V~
14,4-14,8 21V~
KILL
6531
b 24,7V
c 20,3V
e 25,3V
19V
⊥ ANALOG
-19V
KILL
-11V
10V
5V
⊥ DIGITAL
-11V
-5V
⊥ DIGITAL
5V
10V
6523
1 ⊥
2 -10V
3 -5V
6505
b=-25 V
c=-20 V
e=-24,4V
11,1-11,5=3V~
11,3-11,5=3V~
FIL.
5V
FIL.
-5V
⊥ DIGITAL
-20V
15,1-15,3= 3V~
15,3-15,4= 3V~
15,5-15,6=25V~
15,5-15,7=25V~
15,8-16,7=13V~
16,7-16,8=13V~
16,5-16,7= 9V~
16,8-16,7= 9V~
16,3-16,4=21V~
16,1-16,3=21V~
FUSE
MAINS
SK1
44 689 D11
TO DECODER PANEL
VOLUME CONTROL PANEL
RS
RG
+15V
-15V
RC
LS
44 685 B11
VAR RS
RG
VAR LS

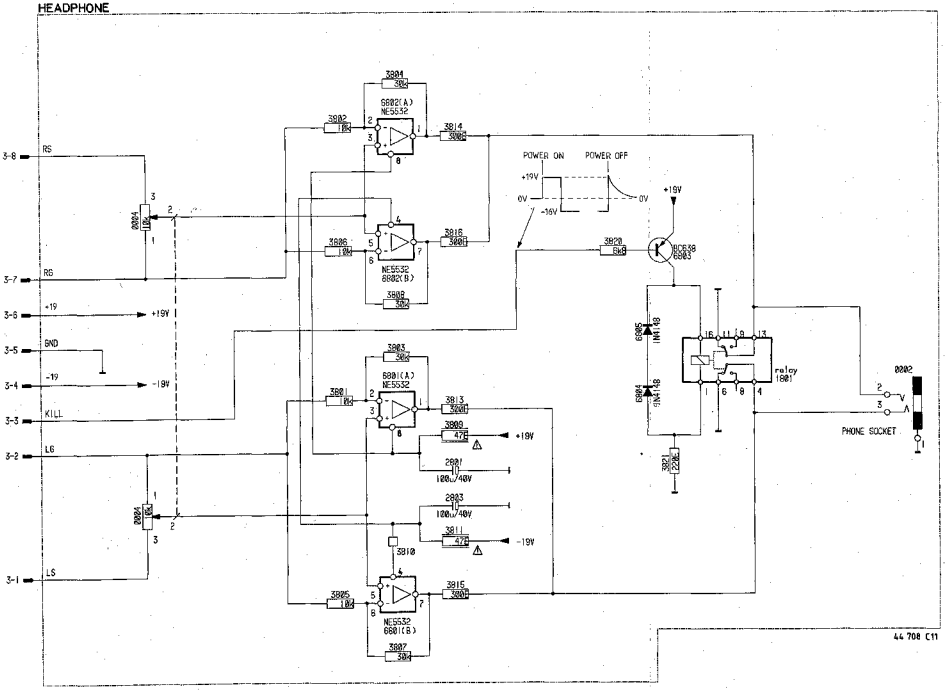
CS 23 131

VOLUME CONTROL PANEL



44 686 C11

HEADPHONE

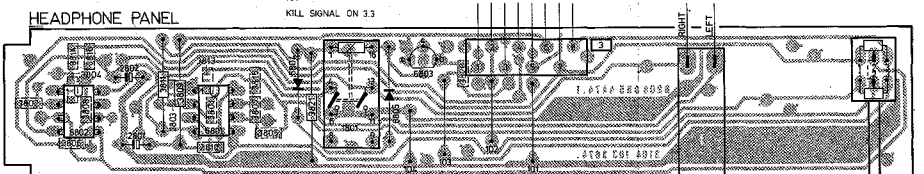


44 708 C11

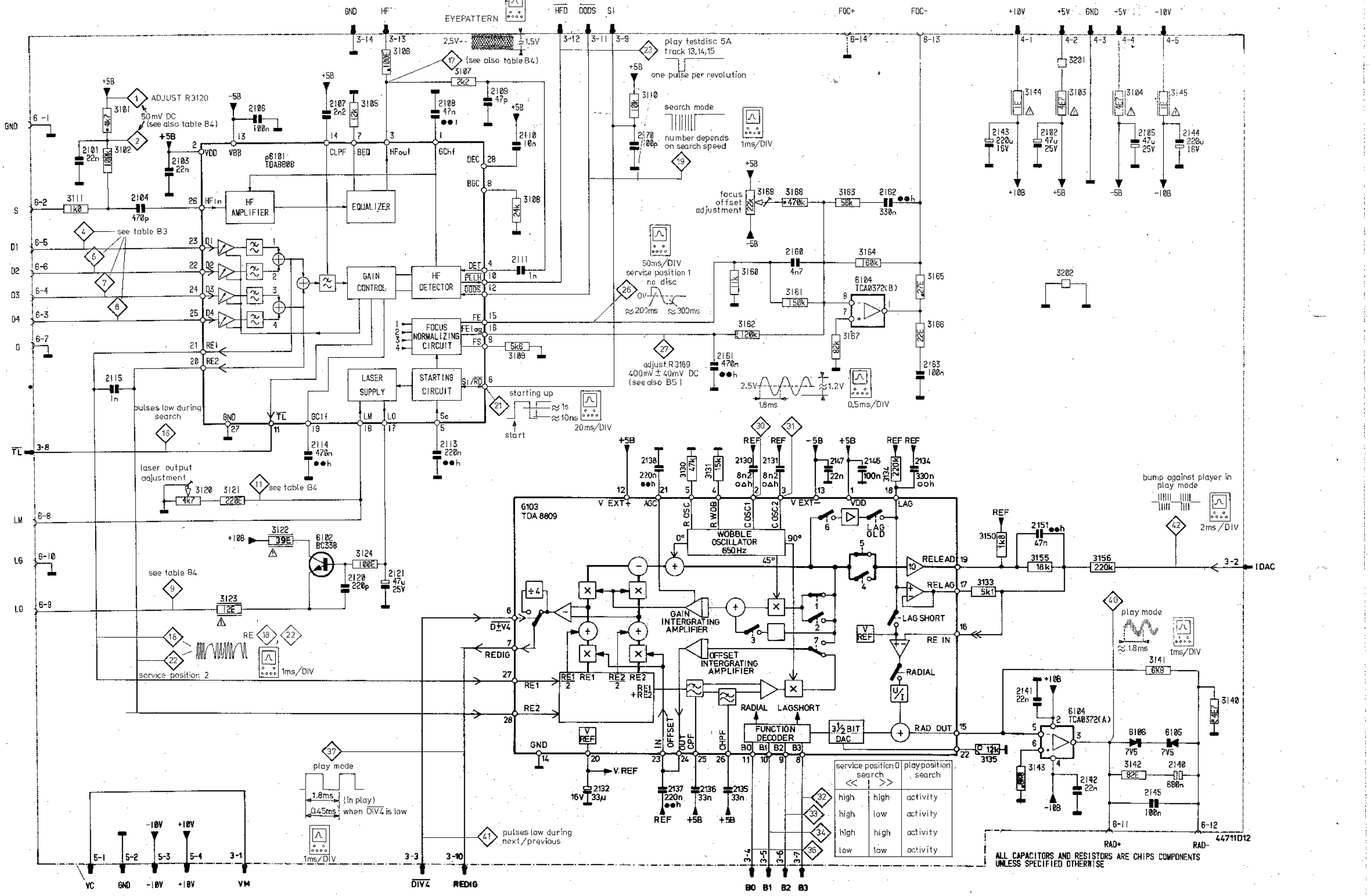
POWER ON
POWER OFF
+19V
0V
-16V
KILL SIGNAL ON 3.3

TO VOLUME CONTROL
LS LG KILL -19V +19V RG RS

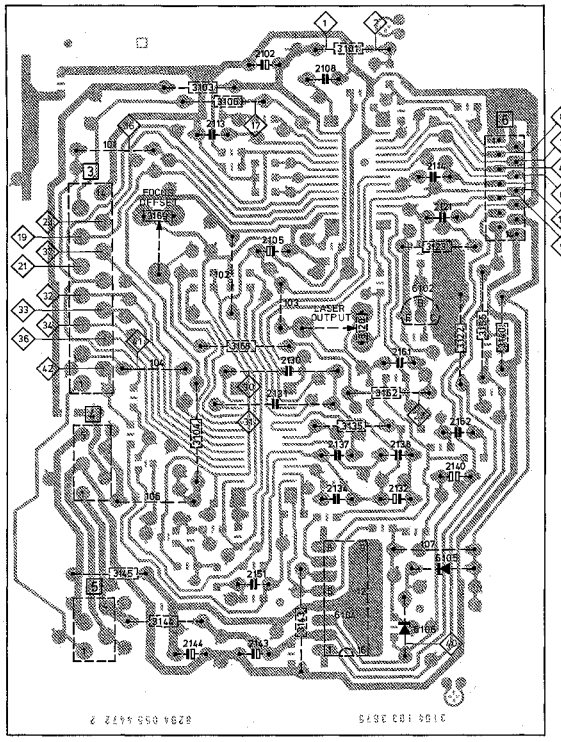
HEADPHONE PANEL



44 694 C11


EYEPATTERN
play testdisc 5A track 13,14,15
one pulse per revolution
ADJUST R3120
50mV DC (see also table B4)
(see also table B4)
search mode
number depends on search speed
see table B3
6101 TDA8808
HF AMPLIFIER
EQUALIZER
GAIN CONTROL
HF DETECTOR
FOCUS NORMALIZING CIRCUIT
LASER SUPPLY
STARTING CIRCUIT
focus offset adjustment
6104 TCA0372(B)
50ms/DIV service position 1 no disc
adjust R3169 400mV ± 40mV DC (see also B5)
starting up
start
20ms/DIV
0.5ms/DIV
pulses low during search
laser output adjustment
see table B4
6102 BC338
6103 TDA 8809
WOBBLE OSCILLATOR 650Hz
GAIN INTERGRATING AMPLIFIER
OFFSET INTERGRATING AMPLIFIER
LAG SHORT
RADIAL
FUNCTION DECODER
3½ BIT DAC
RAD OUT
6104 TCA0372(A)
bump against player in play mode
2ms/DIV
play mode
1ms/DIV
service position 2
pulses low during next/previous
(in play) when DIV4 is low
service position 0 search
play position search
high high activity
high low activity
high high activity
low low activity
ALL CAPACITORS AND RESISTORS ARE CHIPS COMPONENTS UNLESS SPECIFIED OTHERWISE
44711D12

SERVO PANEL



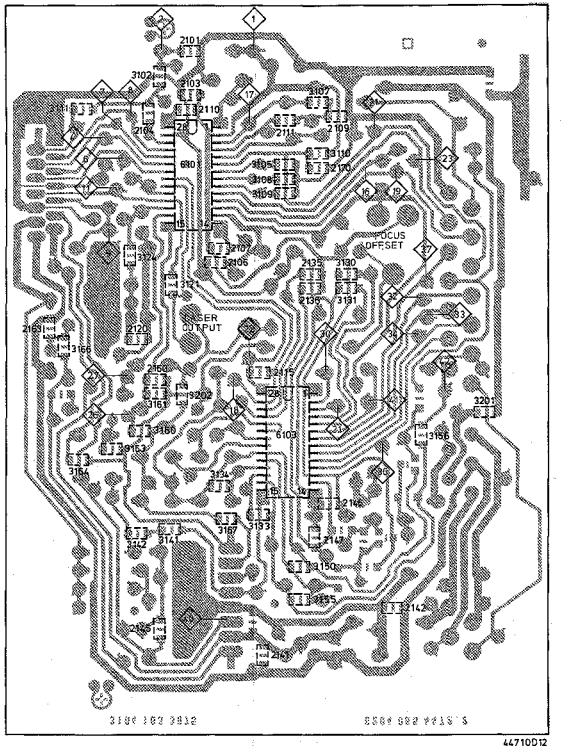
3
14 = ⏚
13 = HF
12 = $\overline{HFD}$
11 = $\overline{DODS}$
10 = RE dig
9 = SC/$\overline{RD}$
8 = $\overline{TL}$
7 = B3
6 = B2
5 = B1
4 = B0
3 = DIV 4
2 = IDAC
1 = VM

4
5 = −10V
4 = −5V
3 = ⏚
2 = +5V
1 = +10V

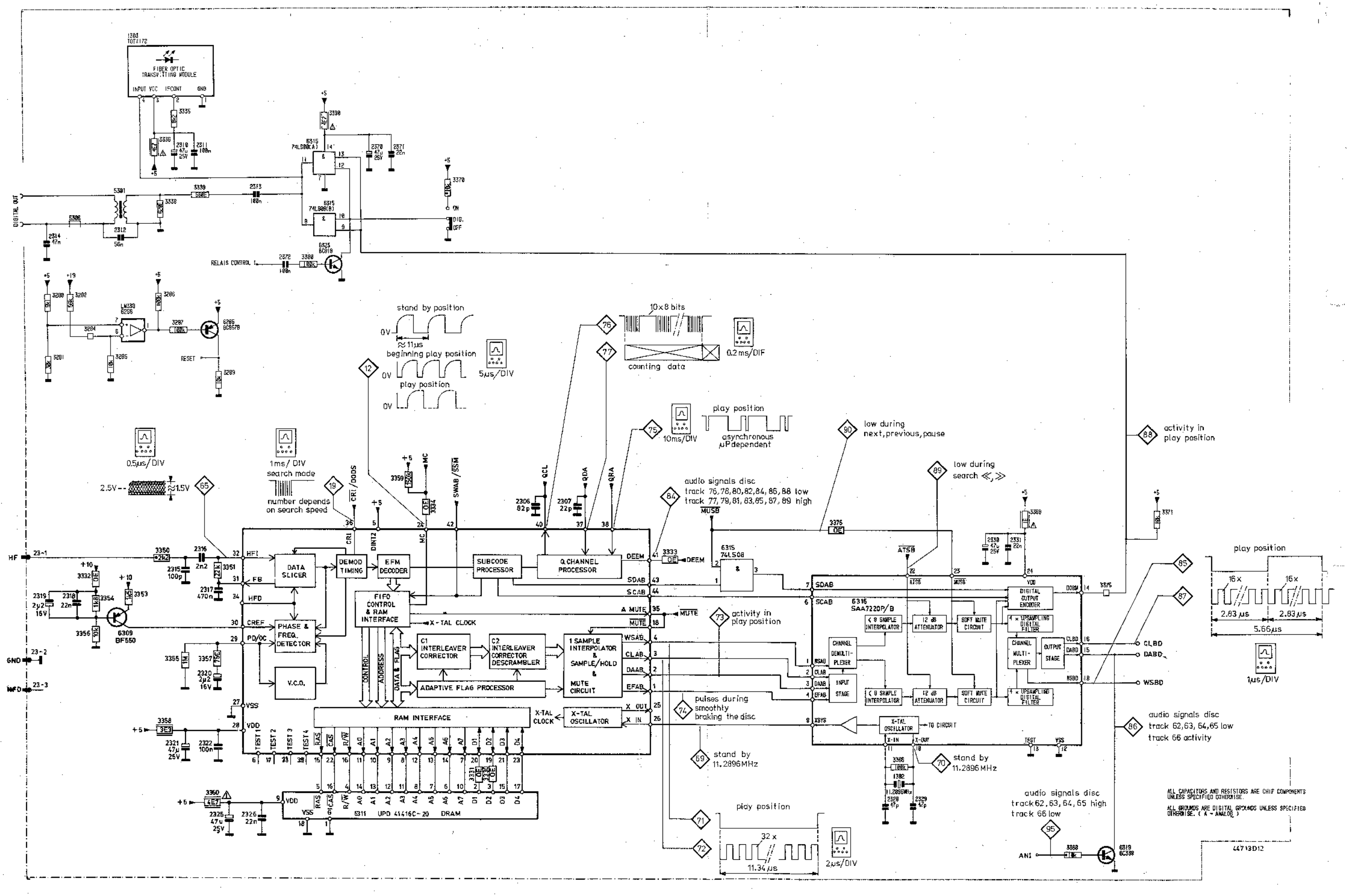
5
4 = +10V
3 = −10V
2 = ⏚
1 = VC

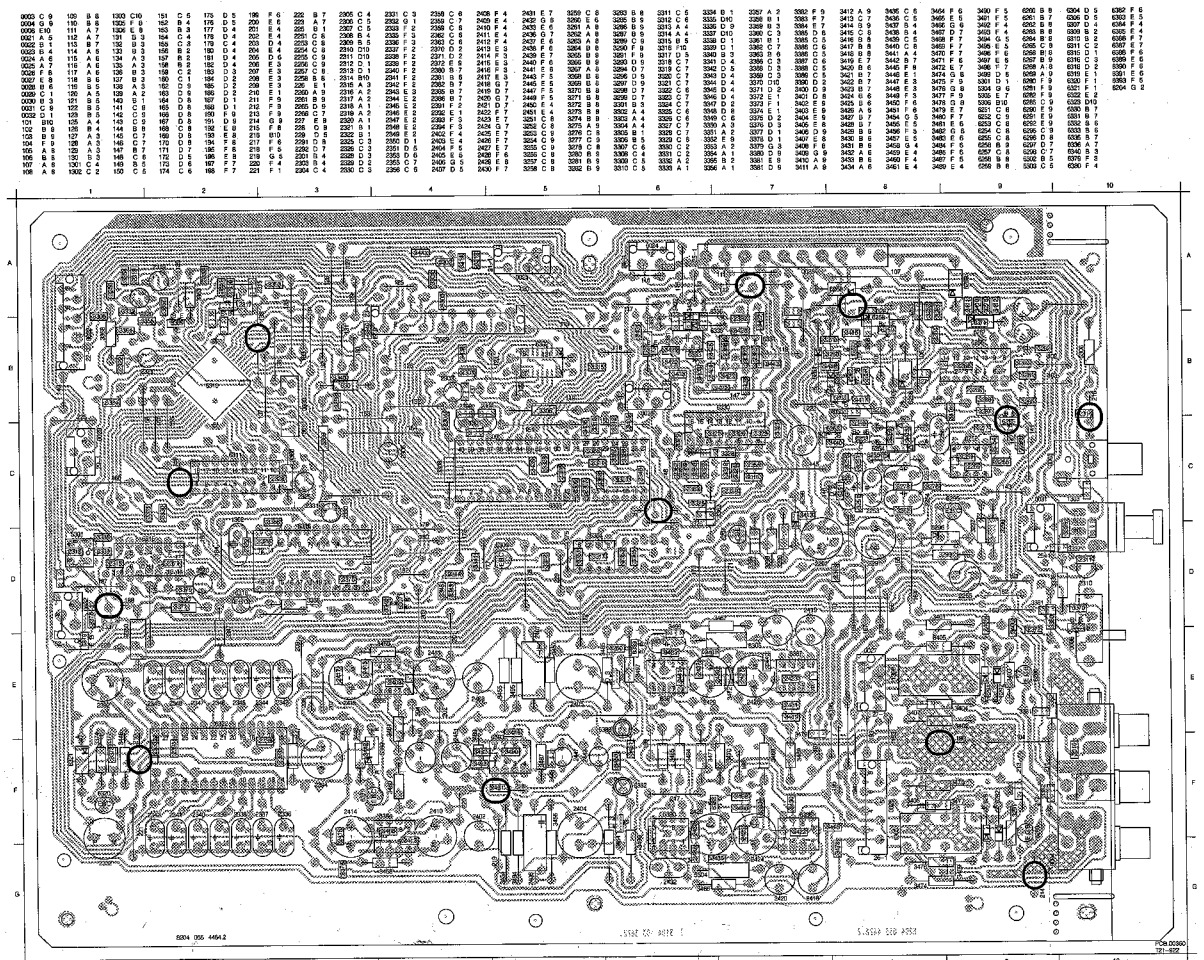
6
1 = ⏚
2 = S
3 = D4
4 = D3
5 = D1
6 = D2
7 = G
8 = LM
9 = LO
10 = LG
11 = RAD+
12 = RAD−
13 = FOC−
14 = FOC+

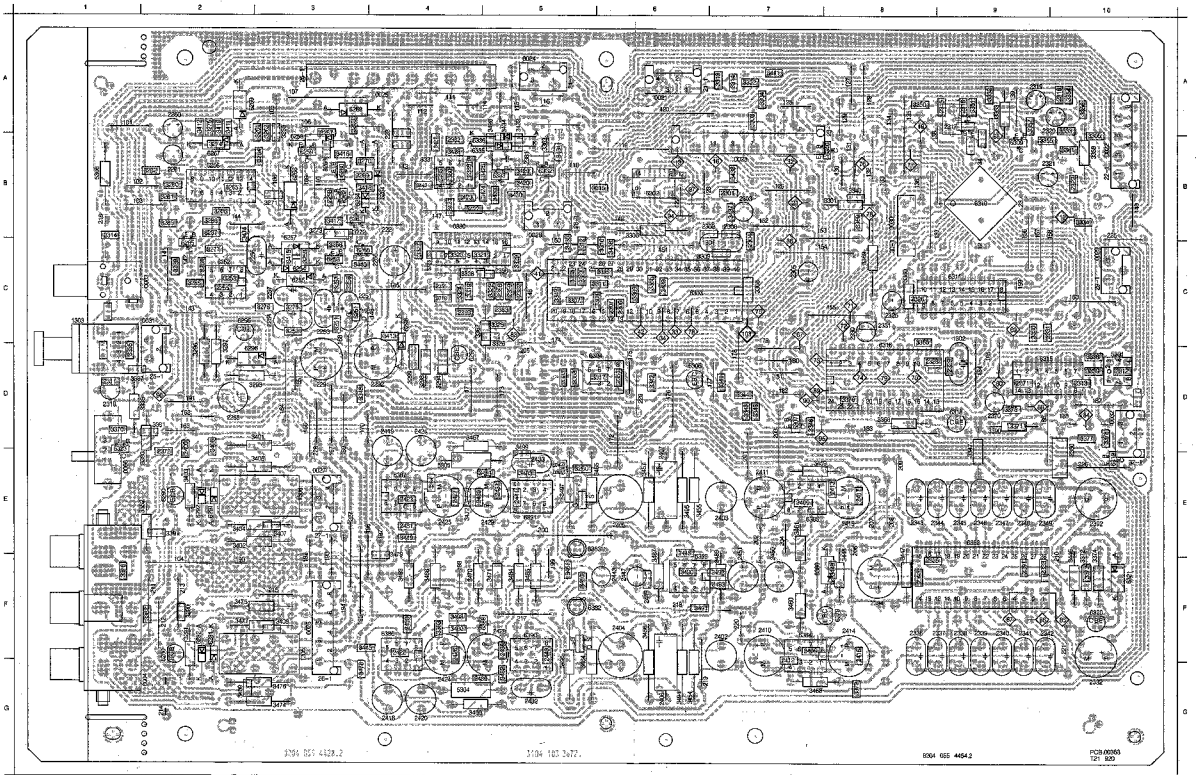
SERVO PANEL

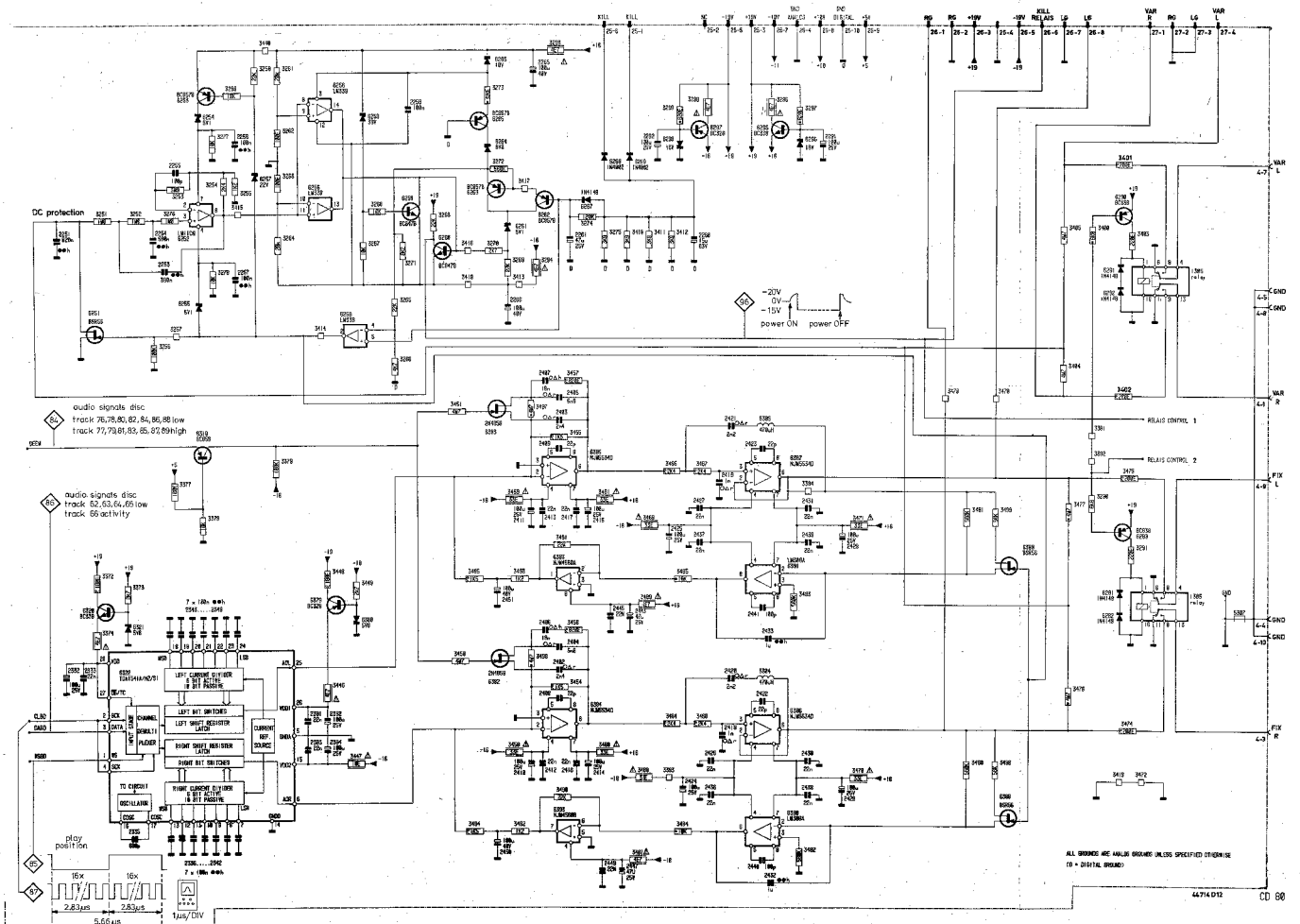


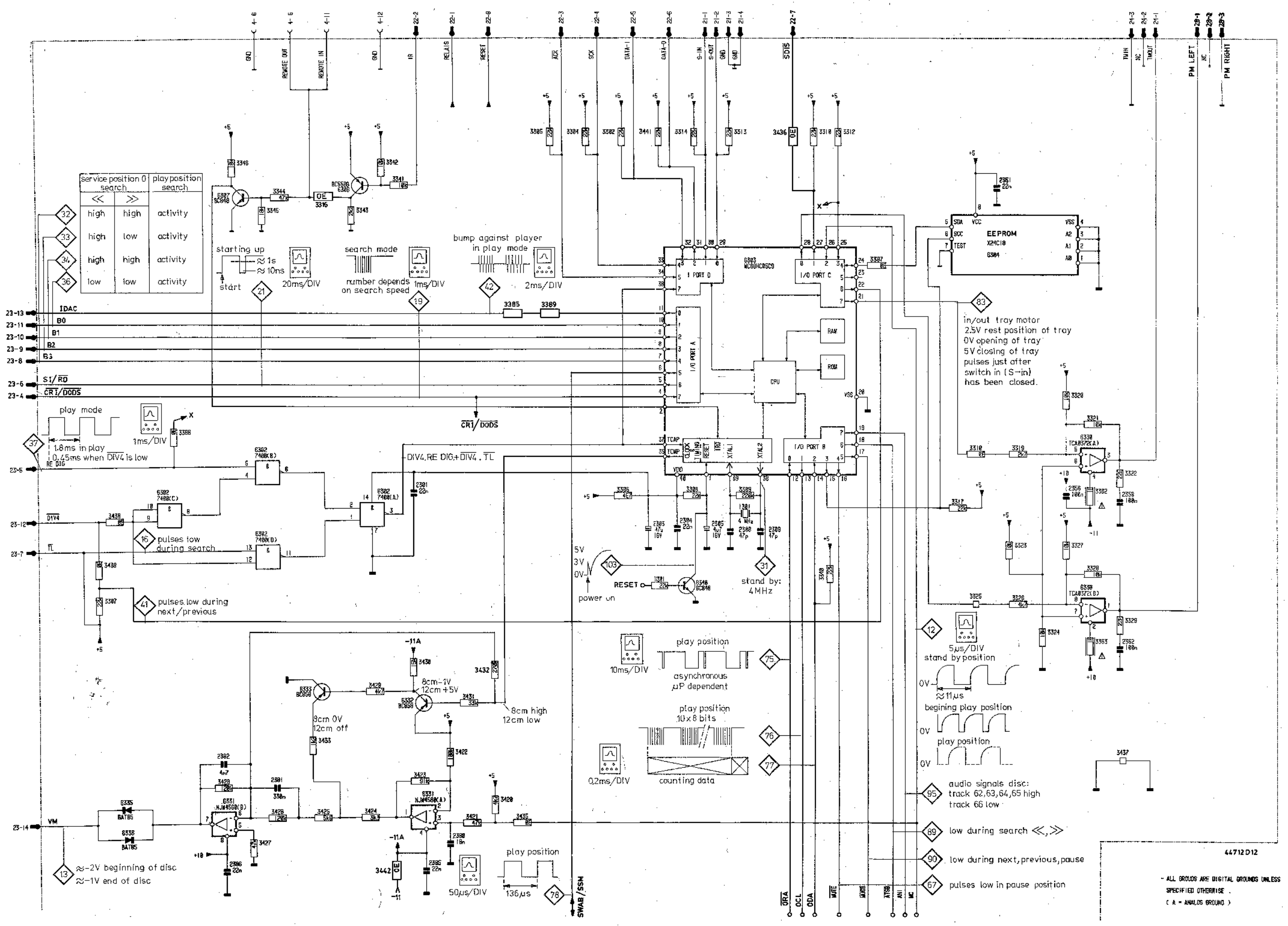
44710D12


FIBER OPTIC TRANSMITTING MODULE
DIGITAL OUT
RELAIS CONTROL
RESET
stand by position
beginning play position
play position
5µs/DIV
10x8 bits
counting data
0.2 ms/DIF
10ms/DIV
asynchronous µP dependent
low during next,previous,pause
low during search
activity in play position
0.5µs/DIV
1ms/ DIV search mode
number depends on search speed
audio signals disc track 76,78,80,82,84,86,88 low track 77,79,81,83,85,87,89 high
DATA SLICER
DEMOD TIMING
EFM DECODER
SUBCODE PROCESSOR
Q CHANNEL PROCESSOR
FIFO CONTROL & RAM INTERFACE
X-TAL CLOCK
PHASE & FREQ. DETECTOR
V.C.O.
C1 INTERLEAVER CORRECTOR
C2 INTERLEAVER CORRECTOR DESCRAMBLER
ADAPTIVE FLAG PROCESSOR
1 SAMPLE INTERPOLATOR & SAMPLE/HOLD & MUTE CIRCUIT
RAM INTERFACE
X-TAL OSCILLATOR
UPD 41416C-20 DRAM
SAA7220P/B
DIGITAL OUTPUT ENCODER
12 dB ATTENUATOR
SOFT MUTE CIRCUIT
4 x UPSAMPLING DIGITAL FILTER
CHANNEL DEMULTIPLEXER
INPUT STAGE
CHANNEL MULTIPLEXER
OUTPUT STAGE
play position
2.83 µs
5.66µs
1µs/DIV
activity in play position
pulses during smoothly braking the disc
stand by 11.2896MHz
audio signals disc track 62,63,64,65 low track 66 activity
audio signals disc track 62,63,64,65 high track 66 low
play position
11.34 µs
2µs/DIV
ALL CAPACITORS AND RESISTORS ARE CHIP COMPONENTS UNLESS SPECIFIED OTHERWISE
ALL GROUNDS ARE DIGITAL GROUNDS UNLESS SPECIFIED OTHERWISE. (A = ANALOG)
4471 3D12



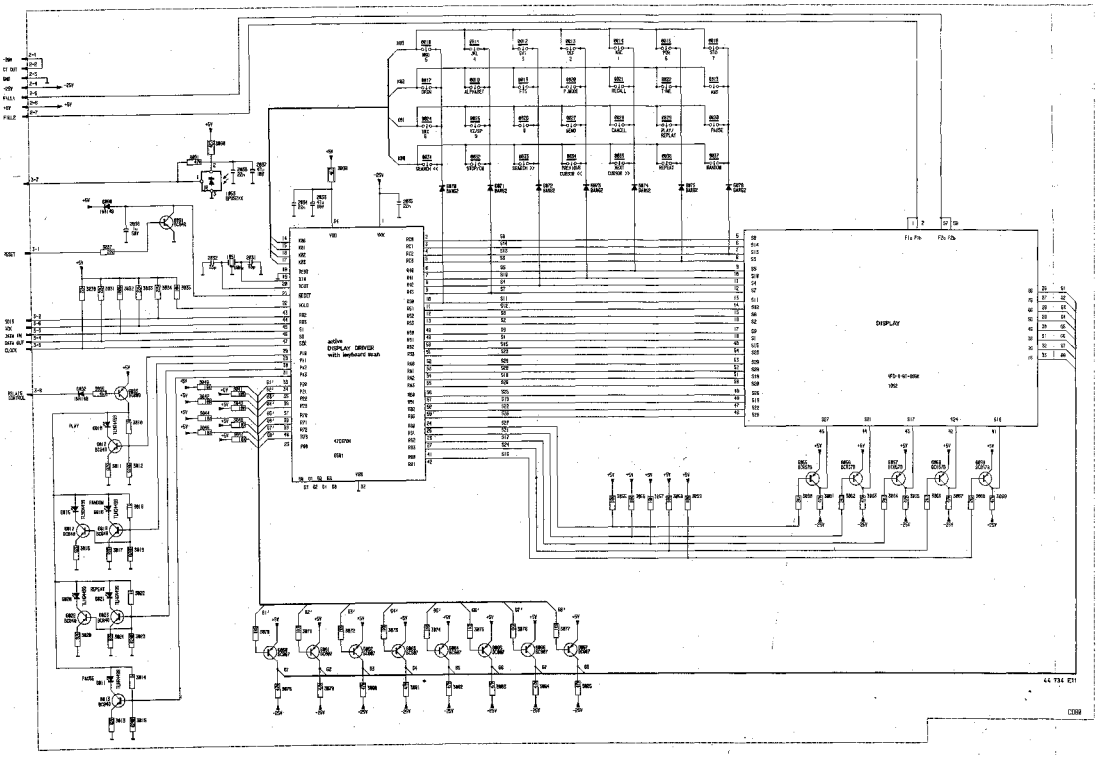


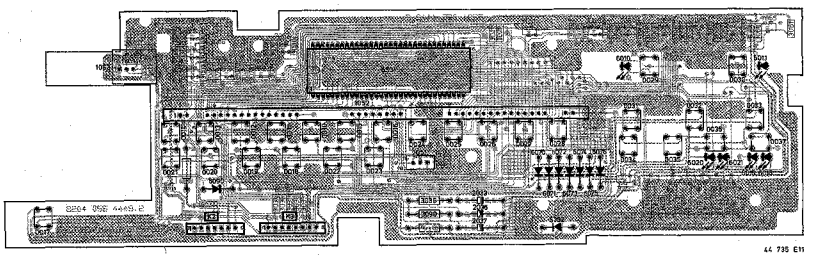

DC protection
audio signals disc
track 76,78,80,82,84,86,88 low
track 77,79,81,83,85,87,89 high
audio signals disc
track 62,63,64,65 low
track 66 activity
play position
16x
16x
2.83µs
2.83µs
5.66µs
1µs/DIV
-20V
0V
-15V
power ON
power OFF
RELAIS CONTROL 1
RELAIS CONTROL 2
ALL GROUNDS ARE ANALOG GROUNDS (UNLESS SPECIFIED OTHERWISE
(D = DIGITAL GROUND)
44714 012
CD 80



GND
REMOTE OUT
REMOTE IN
IR
RELAIS
RESET
ACK
SCK
DATA-I
DATA-O
S-IN
S-OUT
SDIS
TWIN
TWOUT
PM LEFT
PM RIGHT
service position 0 search
play position search
high
low
activity
starting up
≈1s
≈10ns
start
20ms/DIV
search mode
number depends on search speed
1ms/DIV
bump against player in play mode
2ms/DIV
6303 MC68HC05C9
I PORT D
I/O PORT C
I/O PORT A
I/O PORT B
RAM
ROM
CPU
EEPROM
X24C18
6304
in/out tray motor
2.5V rest position of tray
0V opening of tray
5V closing of tray
pulses just after switch in (S-in) has been closed.
IDAC
B0
B1
B2
B3
SI/RD
CR1/DODS
play mode
1.8ms in play
0.45ms when DIV4 is low
RE DIG
DIV4.RE DIG+DIV4.TL
DIV4
TL
pulses low during search
pulses low during next/previous
TCAP
TCMP
TIMING
RESET
IRQ
XTAL1
XTAL2
VDD
VSS
stand by: 4MHz
RESET
power on
TCA0372(A)
TCA0372(B)
8cm-1V
12cm+5V
8cm 0V
12cm off
8cm high
12cm low
NJM4560(A)
NJM4560(B)
BAT85
VM
≈-2V beginning of disc
≈-1V end of disc
play position
136μs
50μs/DIV
0,2ms/DIV
10ms/DIV
play position
asynchronous μP dependent
play position
10x8 bits
counting data
5μs/DIV
stand by position
≈11μs
begining play position
play position
audio signals disc: track 62,63,64,65 high track 66 low
low during search ≪,≫
low during next, previous, pause
pulses low in pause position
SWAB/SSM
DRA
DCL
DDA
MUTE
44712D12
- ALL GROUNDS ARE DIGITAL GROUNDS UNLESS SPECIFIED OTHERWISE.
(A = ANALOG GROUND)

CS 23 139


DISPLAY
44 734 E11


44 735 E11

2031	4822 122 32444	33pF 5% 50V
2032	4822 122 32444	33pF 5% 50V
2033	4822 124 22027	47µF 20% 25V
2034	4822 122 33147	22nF 20%
2035	4822 122 33147	22nF 20%
2036	4822 124 22028	1µF 20% 63V
2037	4822 124 22027	47µF 20% 25V
2082	4822 122 33064	330nF 20% 25V
2084	4822 122 33064	330nF 20% 25V
2085	4822 122 33104	100nF 10% 63V
2086	4822 122 33104	100nF 10% 63V
2101	4822 122 33147	22nF 20%
2102	4822 124 41527	47µF 25V
2103	4822 122 33147	22nF 20%
2104	4822 122 31727	470pF 5% 63V
2105	4822 124 41527	47µF 25V
2106	4822 122 33104	100nF 10% 63V
2107	4822 122 31644	2,2nF 10% 63V
2108	5322 121 42491	47nF 5% 100V
2109	4822 122 31772	47pF 5% 50V
2110	4822 122 32442	10nF 50V
2111	4822 122 31746	1000pF 5% 50V
2113	4822 121 42245	220nF 10% 63V
2114	4822 121 51252	470nF 5% 100V
2115	4822 122 31746	1000pF 5% 50V
2120	4822 122 31965	220pF 5% 63V
2121	4822 124 41527	47µF 25V
2130	4822 121 51321	8,2mF 1% 63V
2131	4822 121 51321	8,2mF 1% 63V
2132	4822 124 40272	33µF 20% 16V
2134	5322 121 42661	330nF 5% 63V
2135	5322 122 31848	33nF 10% 63V
2136	5322 122 31848	33nF 10% 63V
2137	4822 121 42245	220nF 10% 63V
2138	4822 121 42245	220nF 10% 63V
2140	4822 124 41583	0,68µF 20% 50V
2141	4822 122 33147	22nF 20%
2142	4822 122 33147	22nF 20%
2143	4822 124 40196	220µF 20% 16V
2144	4822 124 40196	220µF 20% 16V
2145	4822 122 33104	100nF 10% 63V
2146	4822 122 33104	100nF 10% 63V
2147	4822 122 33147	22nF 20%
2151	5322 121 42491	47nF 5% 100V
2160	4822 122 31784	4,7nF 10% 50V
2161	4822 121 51252	470nF 5% 100V
2162	5322 121 42661	330nF 5% 63V
2163	4822 122 33104	100nF 10% 63V
2170	4822 122 31765	100pF 5% 50V
2251	4822 121 51436	820nF 10% 63V
2253	4822 121 51393	390nF 10% 63V
2254	4822 121 51412	560nF 10% 63V
2255	4822 122 31765	100pF 5% 50V
2256	5322 121 42386	100nF 5% 63V
2257	5322 121 42386	100nF 5% 63V
2258	4822 122 33104	100nF 10% 63V
2260	4822 124 41714	15µF 20% 63V
2261	4822 124 40433	47µF 20% 25V
2265	5322 124 21189	100µF 20% 40V
2266	5322 124 21189	100µF 20% 40V
2291	4822 124 22473	100µF 20% 40V
2292	4822 124 22473	100µF 20% 40V
2301	4822 122 33147	22nF 20%
2303	4822 124 40433	47µF 20% 25V
2304	4822 122 33147	22nF 20%
2305	4822 124 40246	4,7µF 20% 63V
2306	4822 122 31839	82pF 10% 50V
2307	4822 122 32482	22pF 5% 63V
2308	4822 122 31772	47pF 5% 50V
2309	4822 122 31772	47pF 5% 50V
2310	4822 124 40433	47µF 20% 25V
2311	4822 122 33104	100nF 10% 63V
2312	4822 122 32183	56nF 10% 50V
2313	4822 122 33104	100nF 10% 63V
2314	4822 122 32542	47nF 10% 63V
2315	4822 122 31772	47pF 5% 50V
2316	4822 122 31644	2,2nF 10% 63V
2317	5322 121 42979	470nF 5% 63V
2318	4822 122 33147	22nF 20%
2319	4822 124 40244	2,2µF 20% 63V
2320	4822 124 40244	2,2µF 20% 63V
2321	4822 124 40433	47µF 20% 25V
2322	4822 122 33104	100nF 10% 63V
2325	4822 124 40433	47µF 20% 25V
2326	4822 122 33147	22nF 20%
2328	4822 122 31772	47pF 5% 50V
2329	4822 122 31772	47pF 5% 50V
2330	4822 124 40433	47µF 20% 25V
2331	4822 122 33147	22nF 20%
2332	4822 124 22473	100µF 20% 40V
2333	4822 122 33147	22nF 20%
2335	4822 122 31775	680pF 5% 50V
2336	5322 121 42386	100nF 5% 63V
2337	5322 121 42386	100nF 5% 63V
2338	5322 121 42386	100nF 5% 63V
2339	5322 121 42386	100nF 5% 63V
2340	5322 121 42386	100nF 5% 63V
2341	5322 121 42386	100nF 5% 63V
2342	5322 121 42386	100nF 5% 63V
2343	5322 121 42386	100nF 5% 63V
2344	5322 121 42386	100nF 5% 63V
2345	5322 121 42386	100nF 5% 63V
2346	5322 121 42386	100nF 5% 63V
2347	5322 121 42386	100nF 5% 63V
2348	5322 121 42386	100nF 5% 63V
2349	5322 121 42386	100nF 5% 63V
2351	4822 122 33147	22nF 20%
2352	4822 122 33147	22nF 20%
2355	4822 122 33104	100nF 10% 63V
2356	4822 122 33104	100nF 10% 63V
2358	4822 122 33104	100nF 10% 63V
2362	4822 122 33104	100nF 10% 63V
2370	4822 124 40433	47µF 20% 25V
2371	4822 122 33147	22nF 20%
2372	4822 122 33104	100nF 10% 63V
2380	4822 122 31759	18nF 10%
2381	5322 121 42661	330nF 5% 63V
2382	4822 122 31784	4,7nF 10% 50V
2385	4822 122 33147	22nF 20%
2386	4822 122 33147	22nF 20%
2391	4822 122 33147	22nF 20%
2392	4822 124 22473	100µF 20% 25V
2393	4822 122 33147	22nF 20%
2394	4822 124 22473	100µF 20% 25V
2402	4822 121 51227	2,4nF 2% 160V
2403	4822 121 51227	2,4nF 2% 160V
2404	4822 121 51437	5,6nF 2% 160V
2405	4822 121 51437	5,6nF 2% 160V
2406	4822 121 51225	18nF 2% 63V
2407	4822 121 51225	18nF 2% 63V
2408	4822 122 32482	22pF 5% 63V
2409	4822 122 32482	22pF 5% 63V
2410	4822 124 22473	100µF 20% 25V
2411	4822 124 22473	100µF 20% 25V

4-14

PARTSLIST ELECTRICAL COMPONENTS & TOOLS

2412	4822 122 33147	22nF 20%
2413	4822 122 33147	22nF 20%
2414	4822 124 22473	100µF 20% 25V
2415	4822 124 22473	100µF 20% 25V
2416	4822 122 33147	22nF 20%
2417	4822 122 33147	22nF 20%
2418	4822 121 51135	1nF 2% 160V
2419	4822 121 51135	1nF 2% 160V
2420	4822 121 51126	2,2nF 2% 10V
2421	4822 121 51126	2,2nF 2% 10V
2422	4822 122 32482	22pF 5% 63V
2423	4822 122 32482	22pF 5% 63V
2424	4822 124 22473	100µF 20% 25V
2425	4822 124 22473	100µF 20% 25V
2426	4822 122 33147	22nF 20%
2427	4822 122 33147	22nF 20%
2428	4822 124 22473	100µF 20% 25V
2429	4822 124 22473	100µF 20% 25V
2430	4822 122 33147	22nF 20%
2431	4822 122 33147	22nF 20%
2432	5322 121 42114	1µF 5% 63V
2433	5322 121 42114	1µF 5% 63V
2436	4822 122 33147	22nF 20%
2437	4822 122 33147	22nF 20%
2438	4822 122 33147	22nF 20%
2439	4822 122 33147	22nF 20%
2440	4822 122 31765	100pF 5% 50V
2441	4822 122 31765	100pF 5% 50V
2443	4822 124 40433	47µF 20% 25V
2445	4822 122 33147	22nF 20%
2447	4822 124 40433	47µF 20% 25V
2449	4822 122 33147	22nF 20%
2450	5322 124 21189	100µF 20% 40V
2451	5322 124 21189	100µF 20% 40V
2503	4822 124 41184	470µF 20% 50V
2504	4822 122 40327	3,3nF 20% 400V
2506	4822 124 40741	22µF 20% 40V
2507	4822 124 40433	47µF 20% 25V
2512	4822 124 21511	2200µF 20% 25V
2513	4822 124 21511	2200µF 20% 25V
2518	4822 124 40433	47µF 20% 25V
2519	4822 124 40433	47µF 20% 25V
2524	4822 124 41727	10000µF 20% 16V
2525	4822 124 41725	470µF 20% 16V
2530	4822 124 40433	47µF 20% 25V
2531	4822 124 40433	47µF 20% 25V
2536	4822 124 41726	6800µF 20% 35V
2537	4822 124 40433	47µF 20% 25V
2540	4822 124 22473	100µF 20% 25V
2541	4822 124 41726	6800µF 20% 35V
2542	4822 124 40433	47µF 20% 25V
2545	4822 124 22473	100µF 20% 25V
2550	5322 124 21711	100µF 20% 25V
2551	5322 124 21711	100µF 20% 25V
2801	5322 124 21189	100µF 20% 40V
2802	5322 124 21189	100µF 20% 40V

3010	5322 111 90092	1k 2% 0,125W
3011	4822 111 90124	82Ω 2% 0,125W
3012	4822 111 90366	620Ω 5%
3013	4822 111 90124	82Ω 2% 0,125W
3014	5322 111 90092	1k 2% 0,125W
3015	4822 111 90366	620Ω 2% 0,125W
3016	4822 111 90124	82Ω 2% 0,125W
3017	4822 111 90124	82Ω 2% 0,125W
3018	5322 111 90092	1k 2% 0,125W
3019	4822 111 90366	620Ω 2% 0,125W
3020	4822 111 90124	82Ω 2% 0,125W
3021	4822 111 90124	82Ω 2% 0,125W
3022	5322 111 90092	1k 2% 0,125W
3023	4822 111 90366	620Ω 2% 0,125W
3030	4822 111 90251	22k 2% 0,125W
3031	4822 111 90251	22k 2% 0,125W
3032	4822 111 90214	100k 2% 0,125W
3033	4822 111 90251	22k 2% 0,125W
3034	4822 111 90251	22k 2% 0,125W
3035	4822 111 90249	10k 2% 0,125W
3036	4822 111 30499	4Ω7 5% 0,33W
3037	4822 111 90251	22k 2% 0,125W
3040	4822 111 90249	10k 2% 0,125W
3041	4822 111 90249	10k 2% 0,125W
3042	4822 111 90249	10k 2% 0,125W
3043	4822 111 90249	10k 2% 0,125W
3044	4822 111 90249	10k 2% 0,125W
3045	4822 111 90249	10k 2% 0,125W
3046	4822 111 90249	10k 2% 0,125W
3047	4822 111 90249	10k 2% 0,125W
3055	4822 111 90249	10k 2% 0,125W
3056	4822 111 90249	10k 2% 0,125W
3057	4822 111 90249	10k 2% 0,125W
3058	4822 111 90249	10k 2% 0,125W
3059	4822 111 90249	10k 2% 0,125W
3060	4822 111 90248	2k2 2% 0,125W
3061	4822 111 90543	47k 2% 0,125W
3062	4822 111 90248	2k2 2% 0,125W
3063	4822 111 90543	47k 2% 0,125W
3064	4822 111 90248	2k2 2% 0,125W
3065	4822 111 90543	47k 2% 0,125W
3066	4822 111 90248	2k2 2% 0,125W
3067	4822 111 90543	47k 2% 0,125W
3068	4822 111 90248	2k2 2% 0,125W
3069	4822 111 90543	47k 2% 0,125W
3070	5322 111 90101	1k8 2% 0,125W
3071	5322 111 90101	1k8 2% 0,125W
3072	5322 111 90101	1k8 2% 0,125W
3073	5322 111 90101	1k8 2% 0,125W
3074	5322 111 90101	1k8 2% 0,125W
3075	5322 111 90101	1k8 2% 0,125W
3076	5322 111 90101	1k8 2% 0,125W
3077	5322 111 90101	1k8 2% 0,125W
3078	4822 111 90543	47k 2% 0,125W
3079	4822 111 90543	47k 2% 0,125W
3080	4822 111 90543	47k 2% 0,125W
3081	4822 111 90543	47k 2% 0,125W
3082	4822 111 90543	47k 2% 0,125W
3083	4822 111 90543	47k 2% 0,125W
3084	4822 111 90543	47k 2% 0,125W
3085	4822 111 90543	47k 2% 0,125W
3090	4822 111 30499	4Ω7 5% 0,33W
3091	4822 111 90543	47k 2% 0,125W
3095	5322 111 90111	4k7 2% 0,125W
3101	4822 116 52426	4k7 5% 0,5W
3102	4822 111 90214	100k 2% 0,125W
3103	4822 111 30499	4Ω7 5% 0,33W
3104	4822 111 30499	4Ω7 5% 0,33W
3105	4822 111 90253	12k 2% 0,125W
3106	4822 116 52389	100Ω 5% 0,5W
3107	4822 111 90248	2k2 2% 0,125W
3108	4822 111 90512	24k 2% 0,125W
3109	4822 111 90572	5k6 2% 0,125W
3110	4822 111 90249	10k 2% 0,125W
3111	5322 111 90092	1k 2% 0,125W

3120	4822 101 10685	4k7 20% LIN 0,05W
3121	4822 111 90178	220Ω 2% 0,125W
3122	4822 111 30515	18Ω 5% 0,33W
3123	4822 111 30511	12Ω 5% 0,33W
3124	5322 111 90091	100Ω 2% 0,125W
3130	4822 111 90543	47k 2% 0,125W
3131	4822 111 90344	15kΩ 2%
3133	5322 111 90268	5k1 2% 0,125W
3134	4822 111 90197	220k 2% 0,125W
3135	4822 116 53081	12k 1% 0,6W
3140	4822 116 52858	4Ω7 1% 0,6W
3141	4822 111 90544	6k8 2% 0,125W
3142	4822 111 90124	82Ω 2% 0,125W
3143	4822 116 52441	6k8 5% 0,5W
3144	4822 111 30483	1Ω 5% 0,33W
3145	4822 111 30483	1Ω 5% 0,33W
3150	5322 111 90101	1k8 2% 0,125W
3155	4822 111 90238	18kΩ 2%
3156	4822 116 52509	220k 5% 0,5W
3160	4822 111 91494	11kΩ 2%
3161	4822 116 90417	150kΩ 2%
3162	4822 116 52845	120k 1% 0,6W
3163	4822 111 90573	56k 2% 0,125W
3164	4822 111 91495	160kΩ 2%
3165	4822 116 52354	27Ω 5% 0,5W
3166	4822 111 90186	22Ω 2% 0,125W
3167	4822 111 90575	82k 2% 0,125W
3168	4822 116 52527	470k 5% 0,5W
3169	4822 100 20522	22k 20% LIN 0,05W
3201	4822 111 90163	jumper
3202	4822 111 90163	jumper
3251	5322 111 90094	1M 5% 0,125W
3252	5322 111 90094	1M 5% 0,125W
3253	4822 111 90421	3M9 5% 0,125W
3254	4822 116 90271	2,4kΩ 2%
3255	4822 116 90418	1,2kΩ 2%
3256	4822 111 90214	100k 2% 0,125W
3257	4822 111 90163	jumper
3258	4822 111 90249	10k 2% 0,125W
3259	4822 111 90251	22k 2% 0,125W
3261	4822 116 80746	20k 1% 0,125W
3262	5322 116 90091	100Ω 2%
3263	5322 116 90091	100Ω 2%
3264	4822 116 80746	20k 1% 0,125W
3265	4822 111 90251	22k 2% 0,125W
3266	4822 111 90543	47k 2% 0,125W
3267	4822 111 90249	10k 2% 0,125W
3268	4822 111 90249	10k 2% 0,125W
3269	4822 111 90251	22k 2% 0,125W
3270	4822 111 90569	2k7 2% 0,125W
3271	5322 111 90118	8k2 2% 0,125W
3272	4822 111 90169	560k 2% 0,125W
3273	4822 116 52421	390Ω 5% 0,5W
3274	4822 111 90568	120k 2% 0,125W
3275	4822 111 90571	3k9 2% 0,125W
3276	5322 111 90094	1M 5% 0,125W
3277	4822 111 90249	10k 2% 0,125W
3278	4822 111 90249	10k 2% 0,125W
3280	4822 111 90373	9,1kΩ 2%
3281	4822 111 90216	30k 2% 0,125W
3282	4822 111 90573	56k 2% 0,125W
3283	4822 111 90251	22k 2% 0,125W
3284	4822 111 90163	jumper
3285	4822 111 90249	10k 2% 0,125W
3286	4822 111 90214	100k 2% 0,125W
3287	4822 111 90214	100k 2% 0,125W
3289	4822 111 90249	10k 2% 0,125W
3290	4822 111 90544	6k8 2% 0,125W
3291	4822 116 52407	220Ω 5% 0,5W
3293	4822 111 30499	4Ω7 5% 0,33W
3294	4822 111 30499	4Ω7 5% 0,33W
3296	4822 111 30499	4Ω7 5% 0,33W
3297	4822 116 52429	620Ω 5% 0,5W
3298	4822 111 30499	4Ω7 5% 0,33W
3299	4822 116 52429	620Ω 5% 0,5W
3301	4822 111 90251	22k 2% 0,125W
3302	4822 111 90251	22k 2% 0,125W
3303	4822 111 90251	22k 2% 0,125W
3304	4822 111 90251	22k 2% 0,125W
3305	4822 111 90251	22k 2% 0,125W
3306	4822 111 30499	4Ω7 5% 0,33W
3307	4822 111 90251	22k 2% 0,125W
3308	4822 111 90251	22k 2% 0,125W
3309	4822 111 90197	220k 2% 0,125W
3310	4822 111 90251	22k 2% 0,125W
3311	4822 111 90251	22k 2% 0,125W
3312	4822 111 90251	22k 2% 0,125W
3313	4822 111 90251	22k 2% 0,125W
3314	4822 111 90251	22k 2% 0,125W
3315	5322 111 90111	4k7 2% 0,125W
3316	4822 111 90249	10k 2% 0,125W
3317	4822 111 90251	22k 2% 0,125W
3319	4822 111 90248	2k2 2% 0,125W
3320	4822 111 90249	10k 2% 0,125W
3321	4822 111 90249	10k 2% 0,125W
3322	4822 111 90186	22Ω 2% 0,125W
3323	4822 111 90249	10k 2% 0,125W
3324	4822 111 90249	10k 2% 0,125W
3325	4822 111 90163	jumper
3326	5322 111 90111	4k7 2% 0,125W
3327	4822 111 90249	10k 2% 0,125W
3328	4822 111 90249	10k 2% 0,125W
3329	4822 111 90186	22Ω 2% 0,125W
3330	4822 111 90163	jumper
3331	4822 111 90163	jumper
3332	4822 111 90163	jumper
3333	4822 111 90163	jumper
3334	4822 111 90163	jumper
3335	5322 111 90118	8k2 2% 0,125W
3336	4822 111 30499	4Ω7 5% 0,33W
3338	4822 111 90366	620Ω 2% 0,125W
3339	5322 111 90113	560Ω 2% 0,125W
3340	4822 111 90251	22k 2% 0,125W
3341	4822 111 90249	10k 2% 0,125W
3342	4822 111 90249	10k 2% 0,125W
3343	4822 111 90248	2k2 2% 0,125W
3344	4822 111 90543	47k 2% 0,125W
3345	4822 111 90238	180k 5% 0,25W
3346	4822 111 90238	180k 5% 0,25W
3350	4822 111 90248	2k2 2% 0,125W
3351	4822 111 90251	22k 2% 0,125W
3352	5322 111 90092	1k 2% 0,125W
3353	4822 116 52399	1k5 5% 0,5W
3354	5322 111 90101	1k8 2% 0,125W
3356	4822 111 90249	10k 2% 0,125W
3357	4822 116 52377	75Ω 5% 0,5W
3358	4822 111 30593	3Ω3 5% 0,33W
3359	5322 111 90099	150k 2% 0,125W
3360	4822 111 30499	4Ω7 5% 0,33W
3362	4822 111 30483	1Ω 5% 0,33W
3363	4822 111 30483	1Ω 5% 0,33W
3364	4822 111 90543	47k 2% 0,125W
3365	4822 111 90161	470k 2% 0,125W
3366	4822 111 90214	100k 2% 0,125W

PARTSLIST ELECTRICAL COMPONENTS & TOOLS

3368	4822 116 52452	10k 5% 0,5W
3369	4822 111 30483	1Ω 5% 0,33W
3370	4822 116 52452	10k 5% 0,5W
3371	4822 111 90249	10k 2% 0,125W
3372	5322 116 53285	180Ω 1% 0,6W
3373	4822 111 90569	2k7 2% 0,125W
3374	4822 111 30499	4Ω7 5% 0,33W
3375	4822 111 90163	jumper
3376	4822 111 90163	jumper
3377	4822 111 90214	100k 2% 0,125W
3378	4822 111 90249	10k 2% 0,125W
3379	4822 111 90214	100k 2% 0,125W
3380	4822 116 52453	100k 5% 0,5W
3381	4822 111 90163	jumper
3382	4822 111 90163	jumper
3383	4822 111 90163	jumper
3384	4822 111 90163	jumper
3385	4822 111 90163	jumper
3386	4822 111 90163	jumper
3387	4822 111 90163	jumper
3390	4822 111 30499	4Ω7 5% 0,33W
3400	4822 111 90544	6k8 2% 0,125W
3401	5322 116 53731	200Ω 1% 0,6W
3402	5322 116 53731	200Ω 1% 0,6W
3403	4822 116 52407	220Ω 5% 0,5W
3404	4822 116 52528	4M7 5% 0,5W
3405	4822 116 52528	4M7 5% 0,5W
3410	4822 111 90571	3k9 2% 0,125W
3411	4822 111 90571	3k9 2% 0,125W
3412	4822 111 90571	3k9 2% 0,125W
3413	4822 111 90163	jumper
3414	4822 111 90163	jumper
3415	4822 111 90163	jumper
3416	4822 111 90163	jumper
3417	4822 111 90163	jumper
3418	4822 111 90163	jumper
3419	4822 111 90163	jumper
3420	5322 111 90111	4k7 2% 0,125W
3421	4822 111 90543	47k 2% 0,125W
3422	4822 111 90214	100k 2% 0,125W
3423	5322 111 90277	91k 2% 0,125W
3424	4822 111 90157	3k3 2% 0,125W
3425	4822 111 90572	5k6 2% 0,125W
3426	4822 111 90568	120k 2% 0,125W
3427	4822 111 90543	47k 2% 0,125W
3428	4822 111 90568	120k 2% 0,125W
3429	5322 111 90111	4k7 2% 0,125W
3430	4822 111 90196	15k 2% 0,125W
3431	5322 111 90267	33k 2% 0,125W
3432	4822 111 90302	270k 2% 0,125W
3433	5322 111 90096	1k2 2% 0,125W
3435	4822 111 90163	jumper
3436	4822 111 90163	jumper
3437	4822 111 90163	jumper
3438	4822 111 90163	jumper
3439	4822 111 90163	jumper
3440	4822 111 90163	jumper
3441	4822 111 90163	jumper
3442	4822 111 90163	jumper
3443	4822 111 90163	jumper
3446	4822 111 30499	4Ω7 5% 0,33W
3447	4822 111 30508	10Ω 5% 0,33W
3448	5322 116 53285	180Ω 1% 0,6W
3449	4822 111 90569	2k7 2% 0,125W
3450	4822 111 90423	4M7 5% 0,125W
3451	4822 111 90423	4M7 5% 0,125W
3454	5322 116 53478	1k5 1% 0,6W
3455	5322 116 53478	1k5 1% 0,6W
3456	4822 116 52864	820Ω 1% 0,6W
3457	4822 116 52864	820Ω 1% 0,6W
3458	4822 111 30522	33Ω 5% 0,33W
3459	4822 111 30522	33Ω 5% 0,33W
3460	4822 111 30522	33Ω 5% 0,33W
3461	4822 111 30522	33Ω 5% 0,33W
3464	4822 116 52851	2k4 1% 0,6W
3465	4822 116 52851	2k4 1% 0,6W
3466	4822 116 52851	2k4 1% 0,6W
3467	4822 116 52851	2k4 1% 0,6W
3468	4822 111 30522	33Ω 5% 0,33W
3469	4822 111 30522	33Ω 5% 0,33W
3470	4822 111 30522	33Ω 5% 0,33W
3471	4822 111 30522	33Ω 5% 0,33W
3472	4822 111 90163	jumper
3474	5322 116 53731	200Ω 1% 0,6W
3475	5322 116 53731	200Ω 1% 0,6W
3476	4822 116 52528	4M7 5% 0,5W
3477	4822 116 52528	4M7 5% 0,5W
3478	4822 111 90163	jumper
3479	4822 111 90163	jumper
3480	4822 111 90169	560kΩ 2%
3481	4822 111 90169	560kΩ 2%
3482	4822 111 90169	560kΩ 2%
3483	4822 111 90169	560kΩ 2%
3484	4822 116 52452	10k 5% 0,5W
3485	4822 116 52452	10k 5% 0,5W
3487	4822 111 30499	4Ω7 5% 0,33W
3489	4822 111 30499	4Ω7 5% 0,33W
3490	4822 111 90251	22k 2% 0,125W
3491	4822 111 90251	22k 2% 0,125W
3492	4822 116 90418	1,2kΩ 2%
3493	4822 116 90418	1,2kΩ 2%
3494	5322 116 53478	1k5 1% 0,6W
3495	5322 116 53478	1k5 1% 0,6W
3496	4822 116 52528	33Ω 5% 0,33W
3801	4822 111 90249	10k 2% 0,125W
3802	4822 111 90249	10k 2% 0,125W
3803	4822 111 90216	30k 2% 0,125W
3804	4822 111 90216	30k 2% 0,125W
3805	4822 111 90249	10k 2% 0,125W
3806	4822 111 90249	10k 2% 0,125W
3807	4822 111 90216	30k 2% 0,125W
3808	4822 111 90216	30k 2% 0,125W
3809	4822 111 30526	47Ω 5% 0,33W
3811	4822 111 30526	47Ω 5% 0,33W
3813	4822 111 90156	300Ω 2%
3814	4822 111 90156	300Ω 2%
3815	4822 111 90156	300Ω 2%
3816	4822 111 90156	300Ω 2%
3820	4822 111 90544	6k8 2% 0,125W
3821	4822 116 52407	220Ω 5% 0,5W

6010	4822 130 80848	TLHG4499
6011	4822 130 80849	TLHR4499
6012	4822 130 61207	BC848
6013	4822 130 61207	BC848
6015	4822 130 80848	TLHG4499
6016	4822 130 80848	TLHG4499
6017	4822 130 61207	BC848
6018	4822 130 61207	BC848
6020	4822 130 80848	TLHG4499
6021	4822 130 80848	TLHG4499

PARTSLIST ELECTRICAL COMPONENTS & TOOLS

6022	4822 130 61207	BC848
6023	4822 130 61207	BC848
6051	4822 209 60771	TMP47C670N-1361
6055	5322 130 60508	BC857B
6056	5322 130 60508	BC857B
6057	5322 130 60508	BC857B
6058	5322 130 60508	BC857B
6059	5322 130 60508	BC857B
6060	4822 130 42132	BC807
6061	4822 130 42132	BC807
6062	4822 130 42132	BC807
6063	4822 130 42132	BC807
6064	4822 130 42132	BC807
6065	4822 130 42132	BC807
6066	4822 130 42132	BC807
6067	4822 130 42132	BC807
6070	4822 130 30613	BAW62
6071	4822 130 30613	BAW62
6072	4822 130 30613	BAW62
6073	4822 130 30613	BAW62
6074	4822 130 30613	BAW62
6075	4822 130 30613	BAW62
6076	4822 130 30613	BAW62
6083	4822 130 40854	BC327
6085	4822 130 40854	BC327
6090	4822 130 30621	1N4148 (FSC)
6091	4822 130 61207	BC848
6092	4822 130 30621	1N4148 (FSC)
6093	5322 130 41979	BC808
6101	4822 209 73234	TDA8808T/C3
6102	4822 130 44121	BC338
6103	4822 209 73235	TDA8809T/C2
6104	4822 209 72587	TCA0372DP2
6105	4822 130 81101	BZX55-C7V5
6106	4822 130 81101	BZX55-C7V5
6251	4822 130 42633	BSR56
6252	4822 209 60278	LM11CN
6253	5322 130 60508	BC857B
6254	4822 130 80512	BZX55--C5V1
6255	4822 130 80512	BZX55--C5V1
6256	4822 209 80631	LM339N (MTLA)
6257	4822 130 34441	BZX55-C22
6258	4822 130 34145	BZX55-C39
6259	4822 130 60511	BC847B
6260	4822 130 60511	BC847B
6261	4822 130 80512	BZX55--C5V1
6262	5322 130 60508	BC857B
6263	5322 130 60508	BC857B
6264	4822 130 34278	BZX55-F6V8
6265	5322 130 60508	BC857B
6266	4822 130 34297	BZX55-C10
6267	4822 130 30621	1N4148 (FSC)
6268	5322 130 30684	1N4002
6269	5322 130 30684	1N4002
6280	4822 130 41087	BC638
6281	4822 130 30621	1N4148 (FSC)
6282	4822 130 30621	1N4148 (FSC)
6285	5322 130 60508	BC857B
6290	4822 130 41087	BC638
6291	4822 130 30621	1N4148 (FSC)
6292	4822 130 30621	1N4148 (FSC)
6295	4822 130 44121	BC338
6296	4822 130 34268	BZX55-C16
6297	4822 130 44104	BC328
6298	4822 130 34268	BZX55-C16
6302	5322 209 60299	PC74HCT00T
6303	4822 209 60773	MC68HC05C9P/7781
6304	4822 209 60772	X24C16
6306	4822 130 44197	BC558B
6307	4822 130 61207	BC848
6309	4822 130 42131	BF550
6310	4822 209 60775	SAA7310GP/05
6311	4822 209 70422	MN4264-15
6312	4822 130 61207	BC848
6313	4822 130 61207	BC848
6315	5322 209 81626	SN74LS08N (MTLA)
6316	4822 209 72545	SAA7220
6318	4822 130 44121	BC338
6319	5322 130 42012	BC858
6320	4822 130 44121	BC338
6321	4822 130 34173	BZX55-F5V6
6322	4822 209 72969	TDA1541
6323	4822 130 42675	BC818
6330	4822 209 72587	TCA0372DP2
6331	4822 209 83274	NJM4560D
6332	5322 130 42012	BC858
6333	5322 130 42012	BC858
6335	4822 130 31983	BAT85
6336	4822 130 31983	BAT85
6340	4822 130 61207	BC848
6379	4822 130 44104	BC328
6380	4822 130 34173	BZX55-F5V6
6382	4822 130 60933	2N4859
6383	4822 130 60933	2N4859
6384	4822 209 70226	NJM5534D
6385	4822 209 70226	NJM5534D
6386	4822 209 70226	NJM5534D
6387	4822 209 70226	NJM5534D
6388	4822 130 42633	BSR56
6389	4822 130 42633	BSR56
6390	5322 209 86056	LM308AN
6391	5322 209 86056	LM308AN
6393	4822 209 83274	NJM4560D
6501	4822 130 31164	1N5060
6502	4822 130 31164	1N5060
6503	5322 130 41899	MC7915CT
6504	4822 130 34297	BZX55-C10
6505	4822 130 40823	BD135
6506	4822 130 34174	BZX55-C4V7
6508	4822 130 31164	1N5060
6509	4822 130 31164	1N5060
6510	4822 130 31164	1N5060
6511	4822 130 31164	1N5060
6512	4822 209 72554	MC7808CT
6513	4822 130 31253	BZX55-C2V4
6514	5322 130 31504	BZX55--C3V3
6515	4822 209 82112	MC7908CT
6518	4822 130 31164	1N5060
6519	4822 130 31164	1N5060
6520	4822 130 31164	1N5060
6521	4822 130 31164	1N5060
6522	4822 209 71579	TY40408
6523	5322 209 11222	MC7905CT
6525	4822 130 31164	1N5060
6526	4822 130 31164	1N5060
6527	4822 130 31164	1N5060
6528	4822 130 31164	1N5060
6529	4822 130 30879	BA314
6530	4822 130 30879	BA314
6531	4822 130 44568	BC557B
6532	4822 130 31024	BZX55-C18
6533	4822 130 60935	BD948F
6534	4822 130 40981	BC337-25
6535	4822 130 44196	BC548C

PARTSLIST ELECTRICAL COMPONENTS & TOOLS

6536	4822 130 32698	BZX55-F6V2
6537	4822 130 30621	1N4148 (FSC)
6538	4822 130 30879	BA314
6539	4822 130 30879	BA314
6540	4822 130 40959	BC547B
6541	4822 130 32698	BZX55-F6V2
6542	4822 130 44197	BC558B
6543	4822 130 41246	BC327-25
6544	4822 130 60934	BD947F
6545	4822 130 31024	BZX55-C18
6546	4822 130 30621	1N4148 (FSC)
6550	5322 209 86234	NE5532N
6801	5322 209 86234	NE5532N
6802	5322 209 86234	NE5532N
6803	4822 130 41087	BC638
6804	4822 130 30621	1N4148 (FSC)
6805	4822 130 30621	1N4148 (FSC)

MISCELLANEOUS

1010	4822 253 30021	FUSE 1A 250V D
1051	4822 242 71508	CERAMIC FILTER 6MHz
1052	4822 130 90664	FTD FOR CD80
1053	4822 214 51772	RECEIVER
1301	4822 242 70831	CERAMIC FILTER 4MHz
1302	4822 242 71349	X-TAL 11.289 600 MHz
1303	4822 218 20752	TRANSMITTER TOTX172
1305	4822 280 70362	RELAY G2VN237P-12VDC
1306	4822 280 70362	RELAY G2VN237P-12VDC
1701	4822 134 40945	LAMP 12V 100mA
1702	4822 134 40945	LAMP 12V 100mA
1703	4822 134 40945	LAMP 12V 100mA
1801	4822 280 70362	RELAY G2VN237P-12VDC
5001	4822 146 30783	MAINSTRANSFORMER
5301	4822 148 80281	TRANSFORMER DIG. OUT
5304	4822 157 53141	COIL 470µH
5305	4822 157 53141	COIL 470µH
5306	4822 526 10433	BEAD
5307	4822 526 10433	BEAD
	4822 102 10398	HEADPHONE POTENTIOMETER
	4822 256 30403	FUSE HOLDER
	4822 265 20374	SOCKET DIG OUT
	4822 265 30598	SOCKET RC, AUDIO OUT
	4822 267 31065	SOCKET HEADPHONE BOARD
	4822 276 11309	SWITCH SUPPLY BOARD
	4822 276 12339	SWITCH DIG ON/OFF
	4822 276 12465	SWITCH C&D BOARD
	4822 492 63076	CLAMPING SPRING SUPPLY BOARD