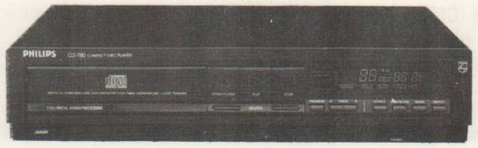
Compact disc player CD780/00R/05R

CD781/00R/05R

Service
Service
Service



44 318 A11

Remote control for CD781 is available under code no: 4822 218 20781.

Service Manual

COMPACT disc DIGITAL AUDIO

CONTENTS

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

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

CLASS 1
LASER PRODUCT
3122 110 03420

DocumentationTechnique Service Dokumentation Documentazione di Servizio Huolte-Ohje Manual de Servicio Manual de Serviçic
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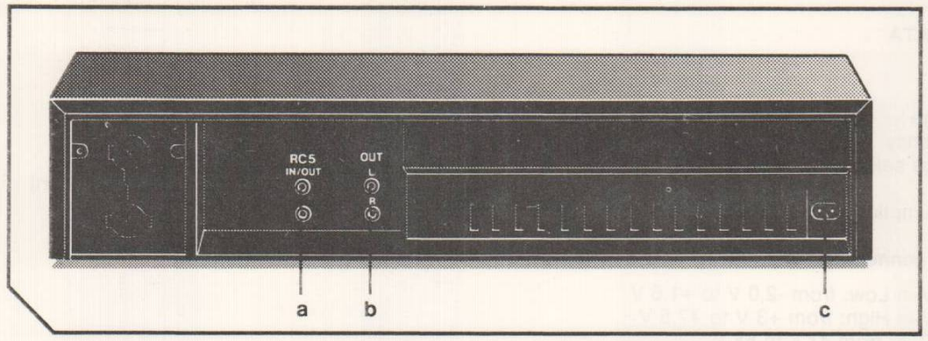
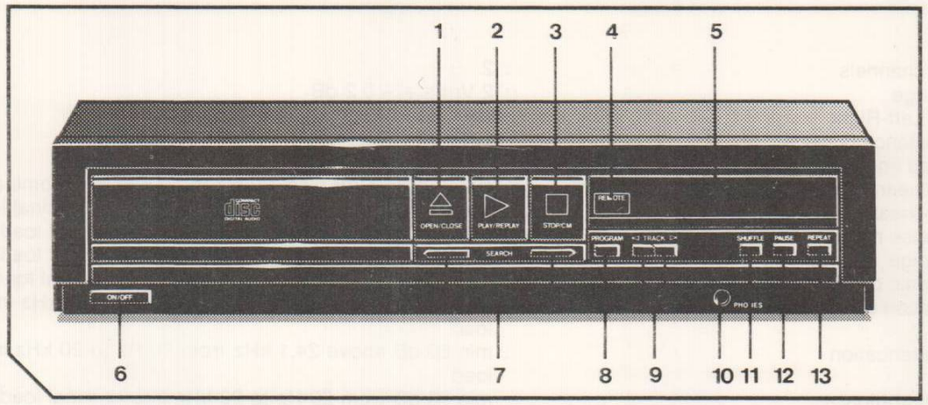




44 020 A11

OPERATION

Explanation of keys

1 Open/Close key
For opening and closing the disc tray.
2 Play/Replay key
For starting play (PLAY).
For returning to the beginning of a track (REPLAY).
3 Stop/CM key
For stopping play (STOP)
For erasing a programme (CM=Clear Memory).
4 Remote eye **(CD 781 only)**
Receives the signals from the remote control
5 Display
Informs you about the functioning of the player.
Displays details from the disc contents list.
See also: 'The indications on the display'.
6 On/Off key
For switching on and off.
7 ◀◀ SEARCH and **SEARCH ▶▶** keys
For fast search to a paricular passage during play.
(' ' backwards, ' ' forwards).
8 Program key
For storing track numbers in a programme.
For erasing track numbers from a programme.
For checking the programme.
9 ⏮ TRACK ⏭ keys
For selecting a previous or a later track during play.
For selecting the track number you want play to begin with.
For selecting track numbers when compiling a programme.
(⏮ from high to low and ⏭ from low to high).
10 Phones socket
For connection of headphones.
See also: 'Listening with headphones'.
11 Shuffle key
For playing all tracks on a disc in random order.
12 Pause key
For briefly interrupting play.
For holding play at the start of a disc, track or passage.
13 Repeat key
For repeating a disc or a programme.

CONNECTIONS

a RC 5 IN/OUT: for a remote control system.
Use this connection for:
– Connecting up the equipment when you are incorporating the player in a PHILIPS HiFi-system with remote control.
– Connecting the remote control receiver EM 2200.
b OUT L R: for the connecting cable to the amplifier.
- Insert a red plug into the 'R' socket (right-hand channel) and the other plug into the 'L' socket (left-hand channel).
- Insert the two other plugs into the corresponding sockets of the CD or AUX input of your amplifier. You can also use the TUNER or TAPE IN connection, but **never** the PHONO input. This is not suitable for Compact Disc reproduction.

c Connection for the mains lead.

TECHNICAL DATA

General

1. Mains voltage	: 220, 240 Volt (+/– 10%)
2. Mains frequency	: 50-60 Hz
3. Mains voltage selection	: By soldering (220/240 Volt-version) By changing transformer (110/127 Volt-version)
4. Power consumption mains, operated	: 25 W

External RC-5 connection

Specification: V-in Low: from -2,0 V to +1,6 V
V-in High: from +3 V to +7,5 V
R-in: from 47 k to 68 k

Line output

1. Number of channels	: 2
2. Output voltage	: 2 Vrms +/– 0,2 dB
3. Unbalance Left-Right	: max. +/– 0,2 dB
4. Output resistance	: 200 Ohm
5. Nominal load impedance	: 100 kOhm // 100 pF
6. Amplitude linearity	: max. +/– 0,1 dB from 20 Hz to 20 kHz into nominal load
7. Phase non-linearity	: max. +/– 1,0° from 20 Hz to 20 kHz into nominal load
8. Signal to noise ratio	: min 96 dB from 20 Hz to 20 kHz into nominal load
9. Dynamic range	: min 90 dB from 20 Hz to 20 kHz into nominal load
10. Total harmonic distortion + noise	: min -90 dB from 20 Hz to 20 kHz into nominal load
11. Intermodulation distortion	: max. 0.003% (min -90 dB) from 20 Hz to 20 kHz into nominal load
12. Out-band attenuation	: min 60 dB above 24,1 kHz from 20 Hz to 20 kHz into nominal load
13. Channel separation	: min 93 dB from 20 Hz to 20 kHz into nominal load
14. Muting during random access	: min 90 dB from 20 Hz to 20 kHz into nominal load
15. Automatic switched de-emphasis with time constants	15/50 us

Headphone (fixed)

1. Output voltage	: Max. 2 Vrms +/– 1 dB
2. Unbalance Left-right	: Max. +/– 0,5 dB
3. Output resistance	: 150 Ohm
4. Load impedance range	: 32 Ohm op 600 kOhm
5. Output power	: Max. 30 mW into 32 Ohm load Max. 50 mW into 150 Ohm load Max. 30 mW into 600 Ohm load
6. Amplitude linearity	: Max. +/– 0,1 dB from 20 Hz to 20 kHz into 600 Ohm
7. Phase non-linearity	: Max. +/–° from 20 Hz to 20 kHz into 600 Ohm
8. Signal to noise ratio	: Min 90 dB from 20 Hz to 20 kHz into 600 Ohm
9. Dynamic range	: Min 90 dB from 20 Hz to 20 kHz into 600 Ohm
10. Total harmonic distortion + noise	: Max 0,005% (min-86 dB) from 20 Hz to kHz
11. Intermodulation distortion	: max 0,005% (min-86 dB) from 20 Hz to 20 kHz
12. Channel separation	: min 65 dB from 20 Hz to 20 kHz into 600 Ohm

Dimensions ans weight

1. Place and height of feet acc. to Philips specification		
2. Apparatus tray closed	W×D×M	: 360 x 300 x 85 mm
3. Apparatus tray open	W×D×M	: 420 x 448 x 85 mm
4. Weight	3,5 kg	

SERVICING HINTS

ESD

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

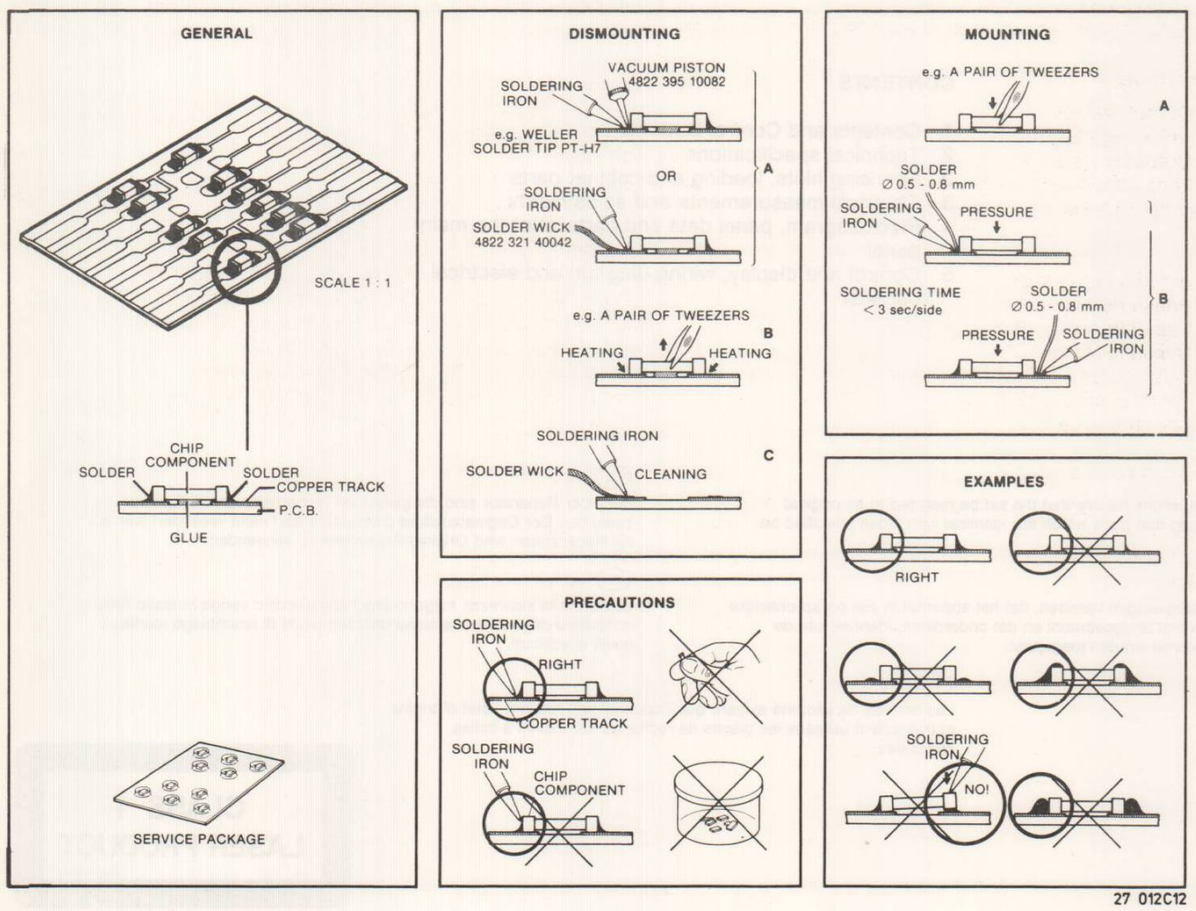
In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

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 seperate disc hold-downs should be used.
The set can function normally then.
Code number of the disc hold-down is 4822 462 50383.

When the tray mechanism has been disassembled the tray switch must be activated in order to ensure normal operation.

SERVICE TOOLS

Audio test disc (test disc 3)	4822 397 30085
Disc without errors (test disc 5) + disc with DO errors, black spots and fingerprints (test disc 5A)	4822 397 30096
Disc 65 min 1 kHz without pause	4822 397 30155
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676



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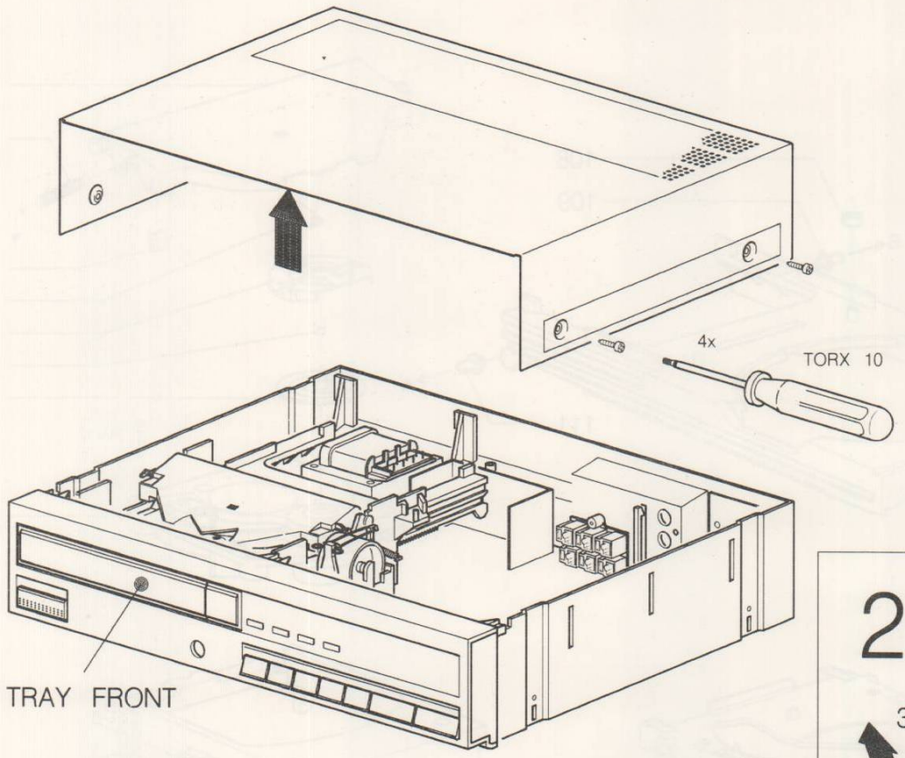

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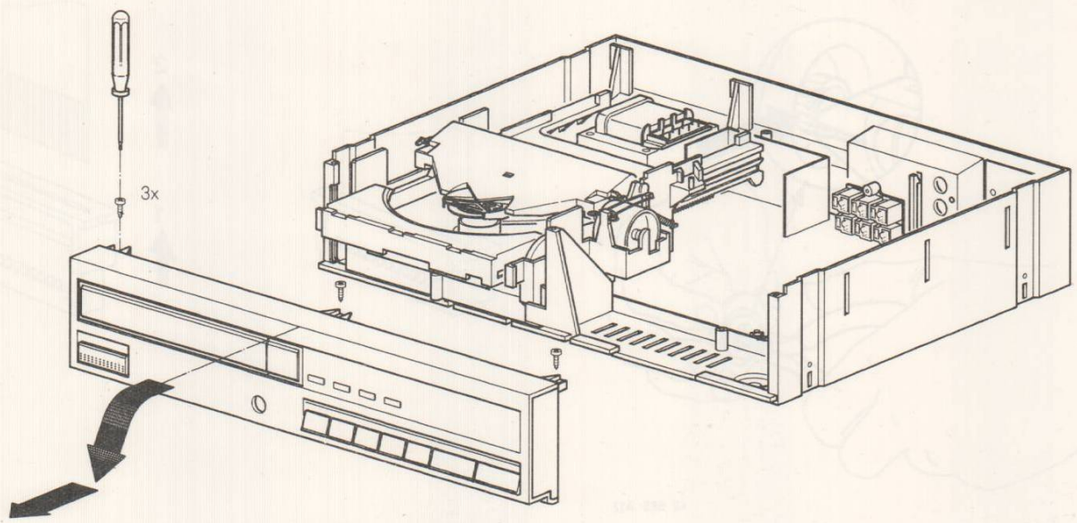

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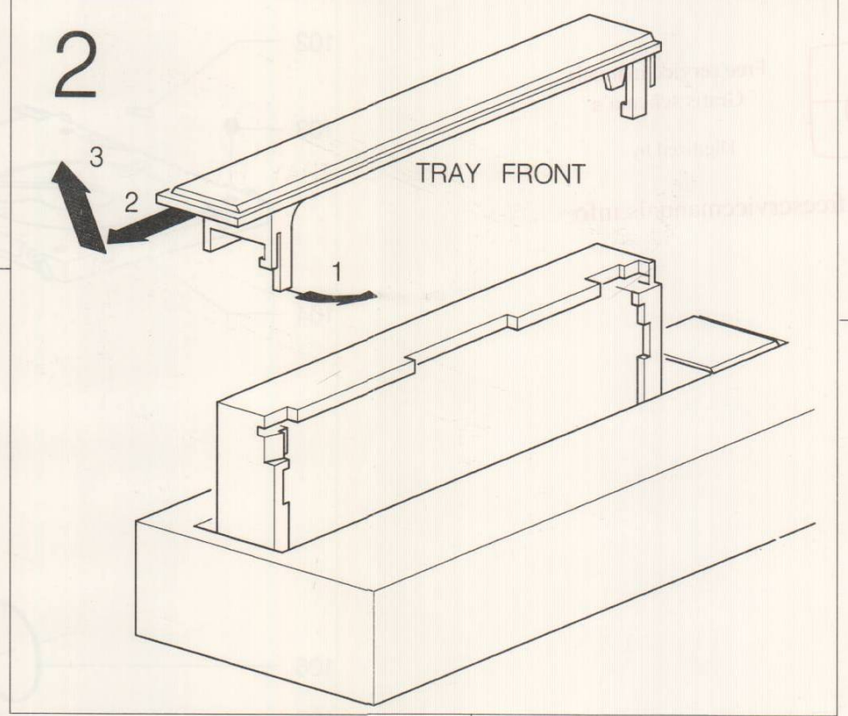

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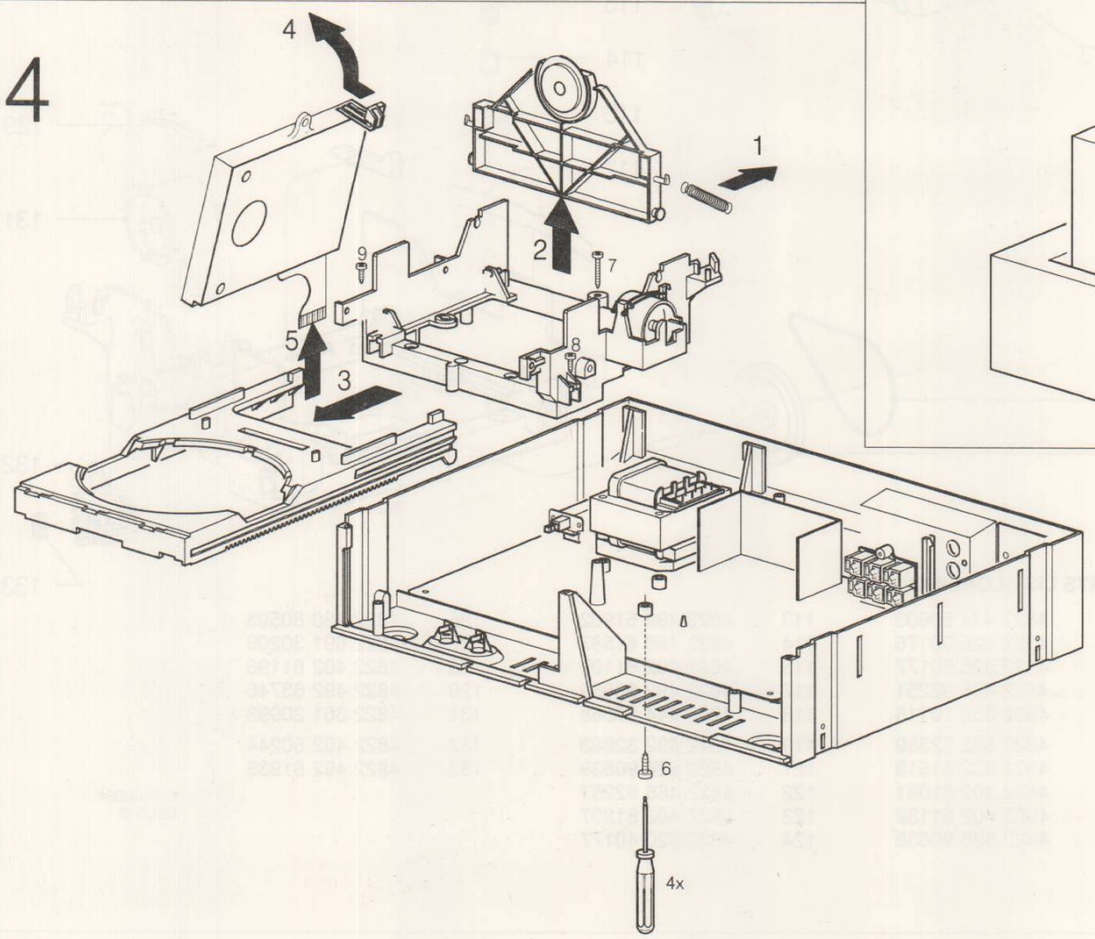

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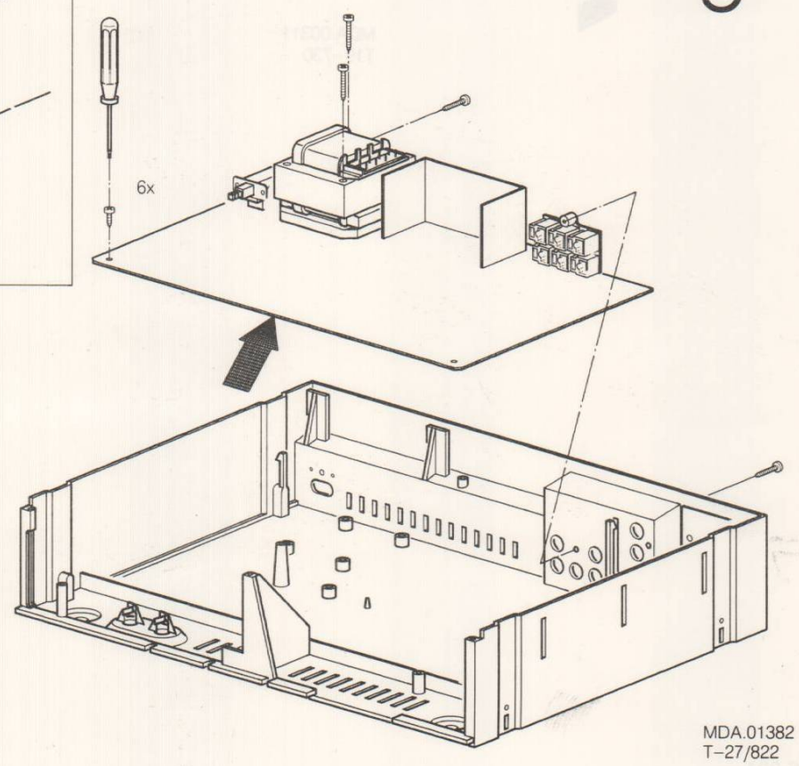
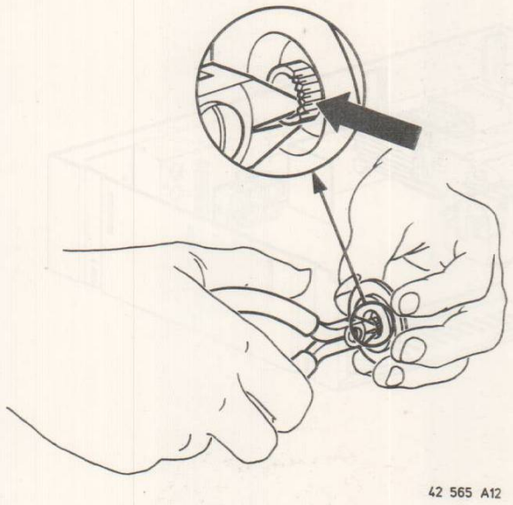


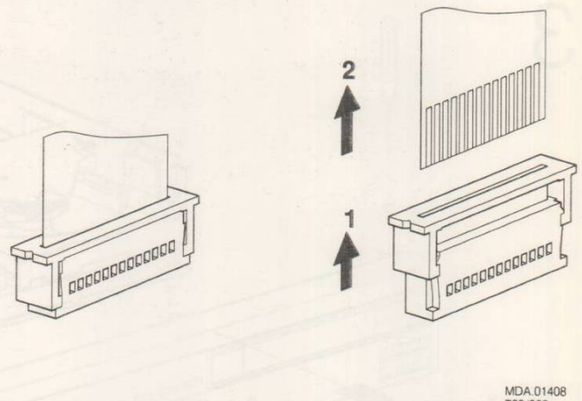
MDA.01382
T-27/822

SERVICE DISC-HOLDDOWN



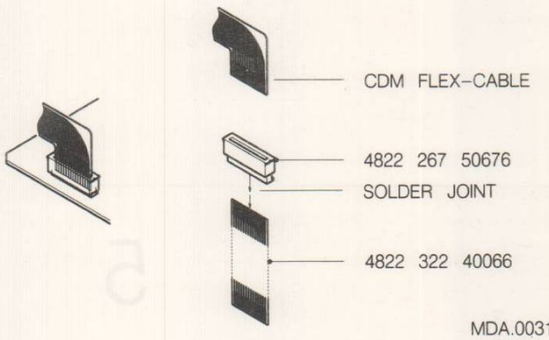
42 565 A12

DEMOUNTING FOIL CDM



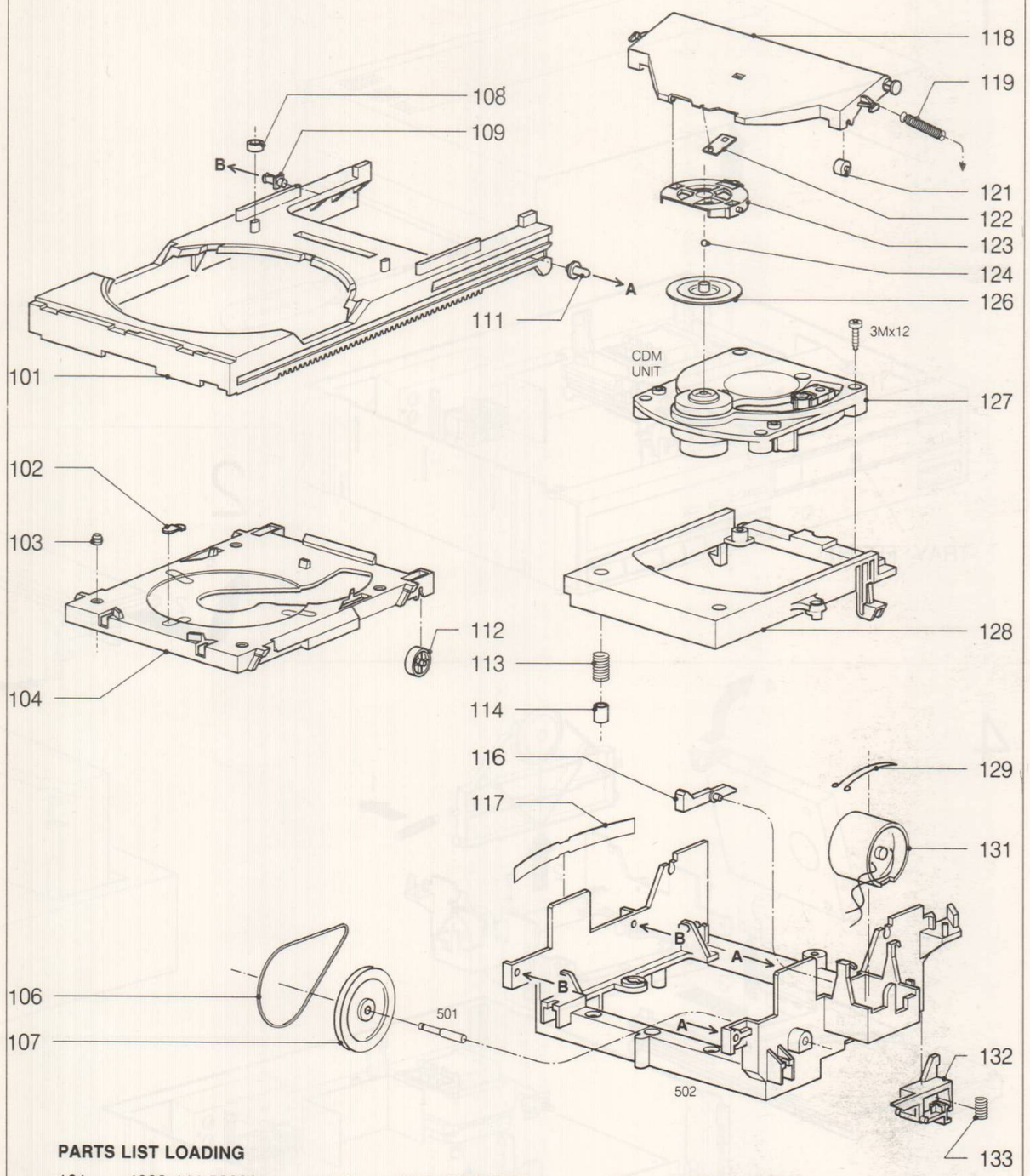
MDA.01408
T28/822

SERVICE CDM FOIL



MDA.00311
T19-730

LOADING



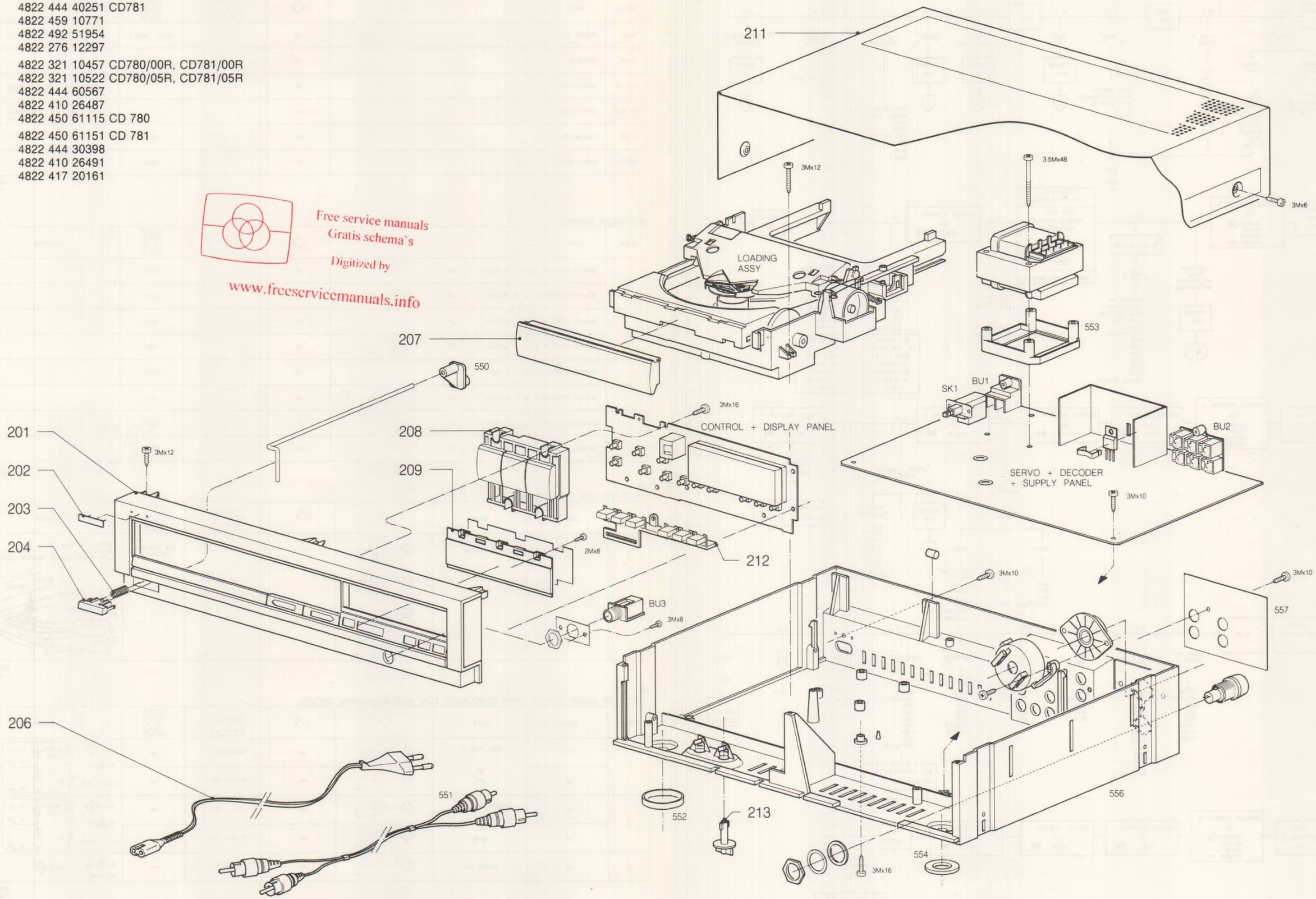
PARTS LIST LOADING

101	4822 444 50603	113	4822 492 51902	126	4822 530 80503
102	4822 325 50176	114	4822 466 61587	127	4822 691 30209
103	4822 325 50177	116	4822 402 61107	128	4822 402 61196
104	4822 466 92251	117	4822 492 63659	129	4822 492 63746
106	4822 358 10115	118	4822 444 60568	131	4822 361 20998
107	4822 522 32359	119	4822 492 32883	132	4822 402 50244
108	4822 532 51518	121	4822 528 90639	133	4822 492 51935
109	4822 402 61081	122	4822 466 92257		
111	4822 402 61132	123	4822 402 61207		
112	4822 528 90638	124	4822 520 40177		

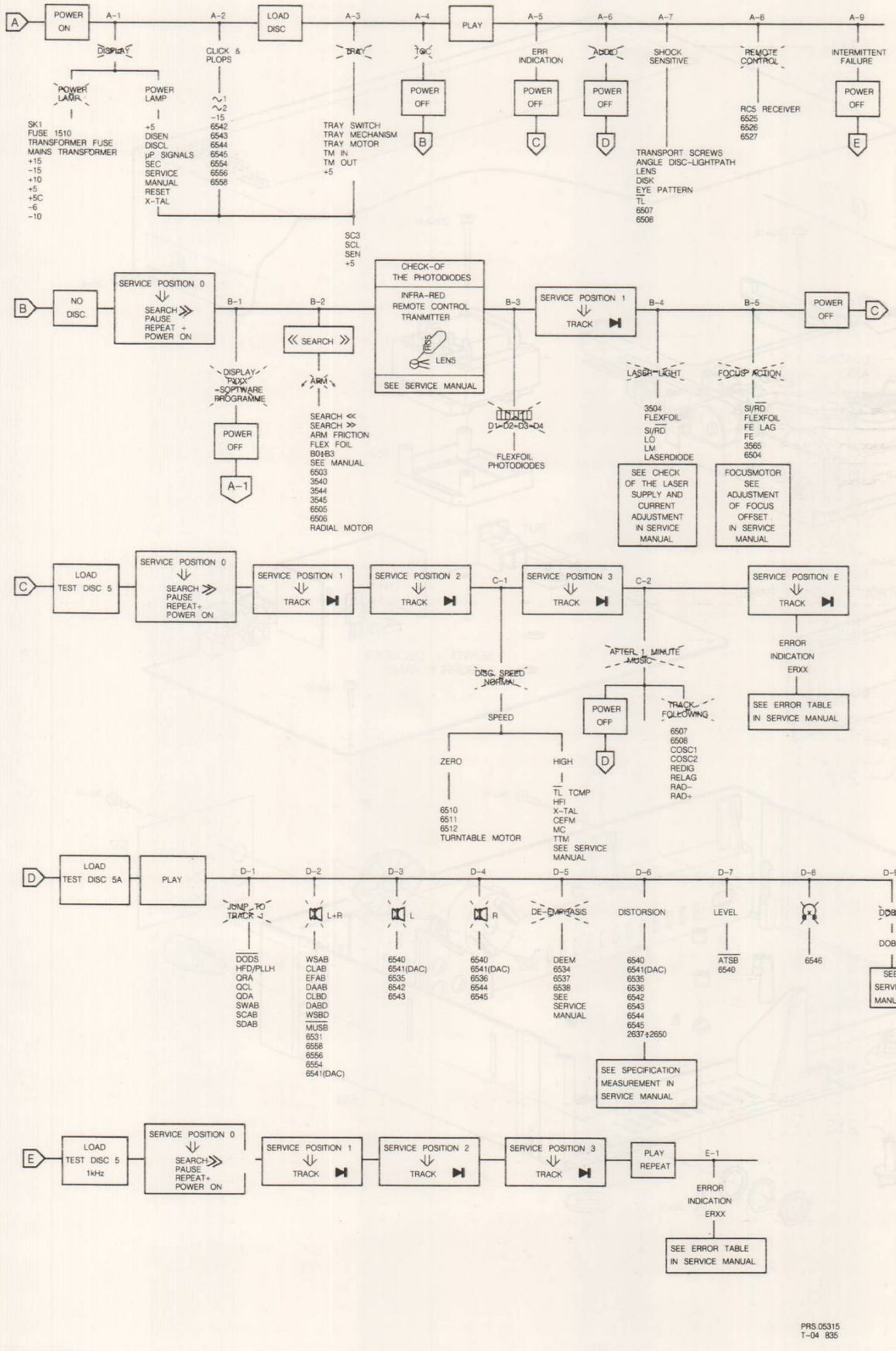
EVA.00594
821/T19

EXPLODED VIEW CABINET

201	4822 444 40247 CD 780
201	4822 444 40251 CD781
202	4822 459 10771
203	4822 492 51954
204	4822 276 12297
206	4822 321 10457 CD780/00R, CD781/00R
206	4822 321 10522 CD780/05R, CD781/05R
207	4822 444 60567
208	4822 410 26487
209	4822 450 61115 CD 780
209	4822 450 61151 CD 781
211	4822 444 30398
212	4822 410 26491
213	4822 417 20161



ELECTRICAL MEASUREMENTS AND ADJUSTMENTS



PRS.05315
T-04 835

A1
µP-SIGNALS

SIGNAL	MODE	◇			REMARKS
RESET	POWER ON	100		PULS HIGH	
X-TAL	STAND BY	101		4MHz	
TRAY IN	OPEN/CLOSE	83			HIGH WHEN TRAY IS CLOSING
TRAY OUT	OPEN/CLOSE	83A			LOW WHEN TRAY IS OPENING
$\overline{ATSB}$	DISC.SEARCH	89		LOW	
$\overline{MUTE}$	STAND BY,PLAY	67		HIGH	

MDA 01389
T-08 823

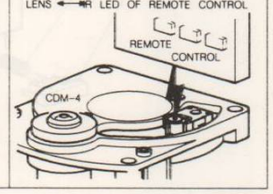
B2
B0,B1,B2,B3 SIGNALS

SIGNAL	MODE	◇			REMARKS
B0	SERVICE POSITION 0 OR 1: SEARCH ≫	36		LOW	
	SERVICE POSITION 0 OR 1: SEARCH ≪	36		LOW	
B1	SERVICE POSITION 0 OR 1: SEARCH ≫	34		HIGH	
	SERVICE POSITION 0 OR 1: SEARCH ≪	34		HIGH	
B2	SERVICE POSITION 0 OR 1: SEARCH ≫	33		LOW	
	SERVICE POSITION 0 OR 1: SEARCH ≪	33		HIGH	
B3	SERVICE POSITION 0 OR 1: SEARCH ≫	32		HIGH	
	SERVICE POSITION 0 OR 1: SEARCH ≪	32		HIGH	

MDA 01386
T-08 823

B3
CHECK OF THE PHOTODIODES

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER ON	4 6 7 8	–	–	SEE DRAWING 38314A12	SIGNAL DEPENDS ON DISTANCE LENS ← IR LED OF REMOTE CONTROL



MDA 01378
T-08 824

B4
CHECK OF LASER SUPPLY (WITH DEMOUNTED CDM AND ADDITIONAL CIRCUIT)

STEP	SIGNAL	MODE	◇				REMARKS
1	LO	SERV. POS. 2	9 V	–	1.8 < V < 2.3	–	Si=1 21 A K LITTLE LIGHT 33Ω GREEN LED to LO to LM SK 18Ω to CONNECTED DIRECTLY TO PANEL
	LM	SK	11 V	–	170 < mV < 220	–	
2	LO	SERV. POS. 2	9 V	–	1.8 < V < 2.3	–	Si=1 21 A K LITTLE LIGHT 33Ω GREEN LED to LO to LM SK 18Ω to CONNECTED DIRECTLY TO PANEL
	LM	SK	11 V	–	170 < mV < 220	–	
3	LO	POWER ON	9 V	–	0V ± 0.2V	–	A K NO LIGHT Si=0 21

MDA 01379
T-08 824

B4
LASER CURRENT ADJUSTMENT

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER OFF	11 — æ — GND	R3520	1kæ	–	PRE-ADJUSTMENT OHMIC VALUE
2	EYE-PATTERN HF	TEST DISC 5 PLAY	PIN 25 DECODER A (SAA7210) — 0V GND	–	–	SEE DRAWING 37017B8	IF NO SIGNAL SEE "START UP PROCEDURE"
3	LASER CURRENT ≙ VOLTAGE ACROSS R3501	TEST DISC 5 PLAY TRACK 1	1 — V — 2	R3520	50mV DC	–	–

MDA.01380
T-08 823

B5
ADJUSTMENT OF FOCUS-OFFSET

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER ON	–	R3569	–	–	ADJUST FOR OPTICAL MID-POSITION
2	FE LAG	PLAY TEST DISC 5 TRACK 1	27	R3569	400mV ±40mV DC	–	FINE ADJUSTMENT

MDA.01381
T-08 824

B5
FOCUS ACTION

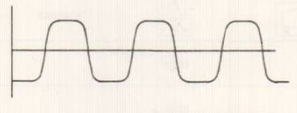
SIGNAL	MODE	◇			REMARKS
SI/$\overline{RD}$	SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	21		PULS "LOW"	SEE DRAWING: MDA.01403
FE	TEST DISC 5A, SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	26			SEE DRAWING: MDA.01413
FE-LAG	TEST DISC 5A,	27			SEE: ADJUSTMENT OF FOCUS-OFFSET

MDA.01384
T-08 823

C1
HIGH SPEED DISC ROTATION

SIGNAL	MODE	◇			REMARKS
$\overline{TL}$	TEST DISC 5, PLAY OR SERVICE POSITION 2	13		PULSES "LOW"	WHEN THE DISC IS SLOWLY BRAKED BY HAND
TCMP	TEST DISC 5, PLAY OR SERVICE POSITION 2	14	+5V		AFTER 4 $\overline{TL}$ PULSES
HFI	TEST DISC 5, PLAY OR SERVICE POSITION 2	65			SEE DRAWING: 37017B8
X-tal	TEST DISC 5A, PLAY OR SERVICE POSITION 2	69		11.28MHz	IF THIS FREQUENCY DEVIATES CHECK X-OUT ON FILTER-B
CEFM	TEST DISC 5A, PLAY OR SERVICE POSITION 2	68		4.32MHz	
MC	TEST DISC 5, PLAY OR SERVICE POSITION 2	81			SEE DRAWING: 38849A12
TTM-	TEST DISC 5A, PLAY OR SERVICE POSITION 2	16	APPROX -1V		

MDA.01385
T-08 823



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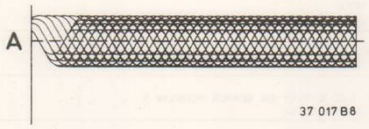
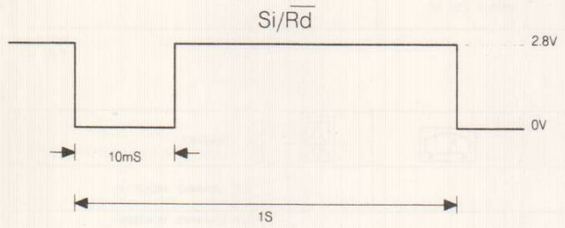
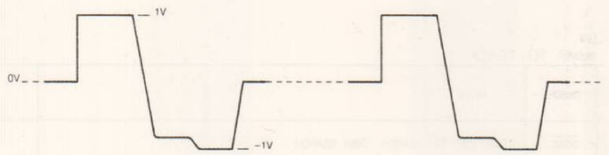


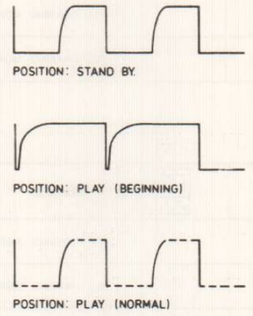
37 017 B8



MDA.01403
T33/821



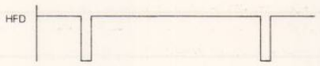
MDA.01413
T33/823



38 849 A12

POSITION PLAYER	POWER ON	SERVICE POSITION 3	PLAY	SEARCH, PAUSE
$\overline{DODS}$ SIGNAL	"LOW"	"HIGH"	"HIGH"	

MDA.01143
T12 -651



MDA.00240
T07-804

C2
TRACK FOLLOWING

SIGNAL	MODE	◇			REMARKS
C osc1	TEST DISC 5, PLAY OR SERVICE POSITION 3	30		650Hz	
C osc2	TEST DISC 5, PLAY OR SERVICE POSITION 3	31		650Hz	
RE dig	TEST DISC 5, PLAY OR SERVICE POSITION 3	37		PULSES "HIGH"	WHEN THE DISC IS SLOWLY BRAKED BY HAND
RE lag	TEST DISC 5, PLAY OR SERVICE POSITION 3	41	APPROX 2.5V DC		

MDA.01387
T-08 823

D1
JUMP TO TRACK 1

SIGNAL	MODE	◇			REMARKS
$\overline{DODS}$	TEST DISC 5A, SEARCH ≫ OR SEARCH ≪	19			SEE DRAWING: MDA.01143
HFD/$\overline{PLLH}$	TEST DISC 5A, TRACK 15, PLAY	23		PULSES "LOW"	SEE DRAWING: MDA.00240 WHEN THE DISC IS SLOWLY BRAKED BY HAND
QRA	TEST DISC 5A, PLAY	75			SEE DRAWING: MDA.00453
QDA	TEST DISC 5A, PLAY	77			
QCL	TEST DISC 5A, PLAY	76			
SWAB	TEST DISC 5A, PLAY	78			SEE DRAWING: MDA.00239
SCAB	TEST DISC 5A, PLAY	79			SEE DRAWING: MDA.00239
SDAB	TEST DISC 5A, PLAY	80			SEE DRAWING: MDA.00239

MDA.01388
T-08 823

D2
NO AUDIO OUTPUT LEFT + RIGHT

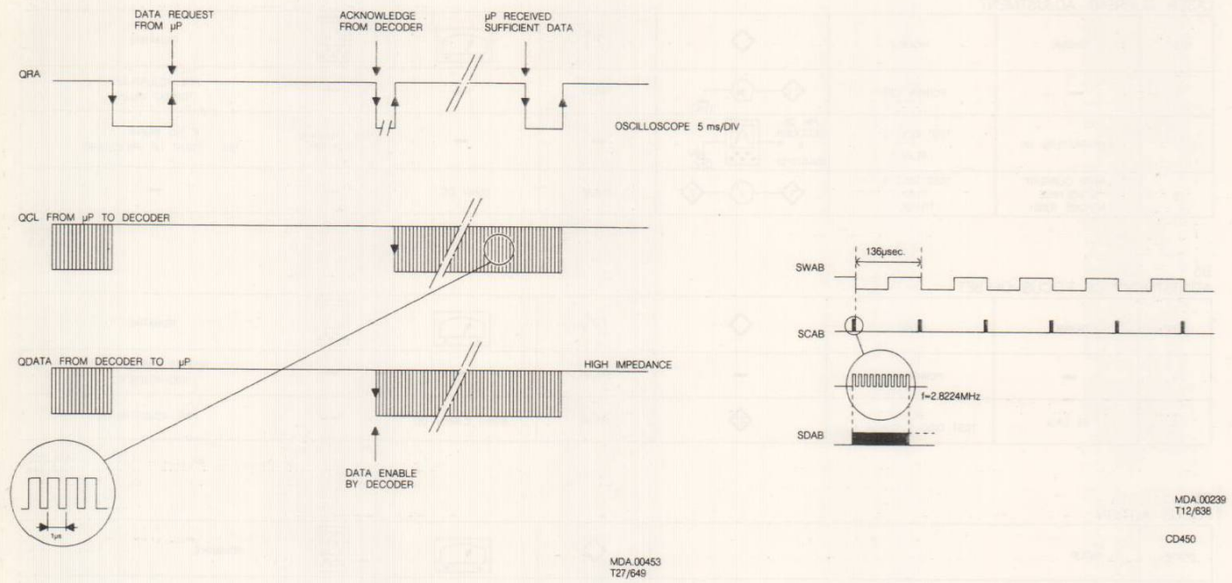
SIGNAL	MODE	◇			REMARKS
WSAB	DISC, PLAY	71			SEE DRAWING: 38847C12
CLAB	DISC, PLAY	72			SEE DRAWING: 38847C12
DAAB	DISC, PLAY	73		ACTIVITY	SEE DRAWING: 38847C12
EFAB	TEST DISC 5A,	74		PULSES	WHEN THE DISC IS SLOWLY BRAKED BY HAND
CLBD	DISC, PLAY	87			SEE DRAWING: 38848C12
DABD	DISC, PLAY	86		ACTIVITY	SEE DRAWING: 38848C12
WSBD	DISC, PLAY	85			SEE DRAWING: 38848C12
$\overline{MUSB}$	DISC, PAUSE, OR NEXT OR PREVIOUS	90		"LOW"	

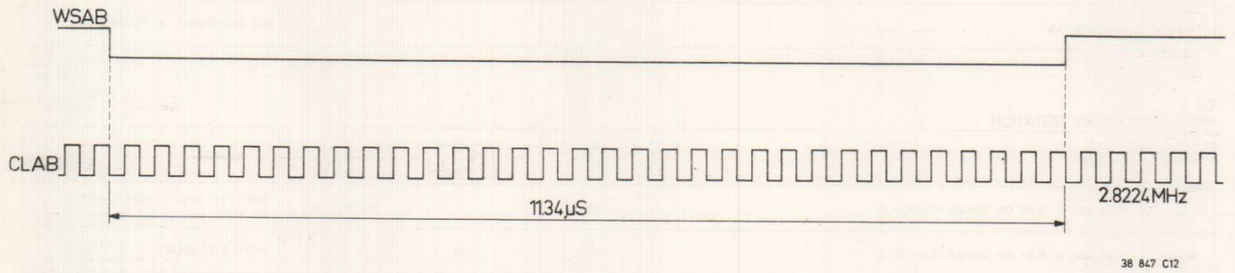
MDA.01390
T-08 823

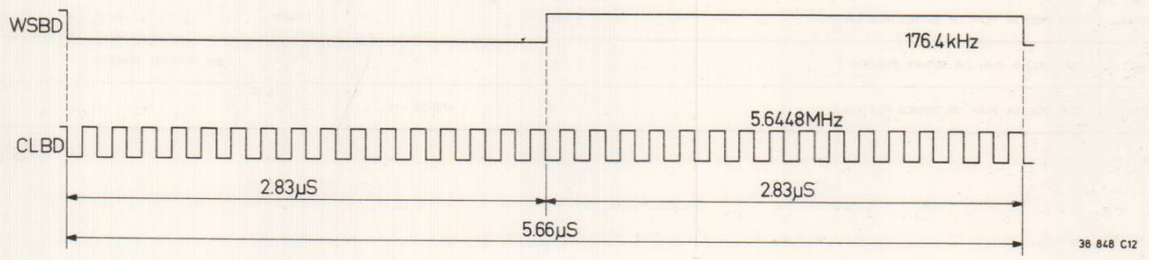
DAC IC

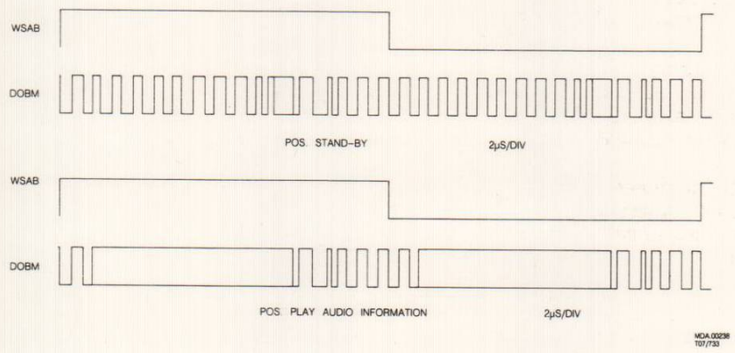
SIGNAL	MODE	◇			REMARKS
OUTPUT OF OP-AMP	DISC, PLAY	94		LF SIGNAL	LEFT CHANNEL
OUTPUT OF OP-AMP	DISC, PLAY	95		LF SIGNAL	RIGHT CHANNEL

MDA.01392
T-08 823









D5
DEEM CIRCUIT

SIGNAL	MODE	◇			REMARKS
DEEM	TEST DISC 5A: TRACK 14: PLAY TRACK 15: PLAY	84		"LOW" "HIGH"	SEE TESTPOINT 92 AND 91 ON DEEM CIRCUIT
TESTPOINT 92	TEST DISC 5A TRACK 14	92		LF SIGNAL	
TESTPOINT 92	TEST DISC 5A TRACK 15	92		NO SIGNAL	
TESTPOINT 91	TEST DISC 5A TRACK 14	91		LF SIGNAL	
TESTPOINT 91	TEST DISC 5A TRACK 15	91		NO SIGNAL	

MDA.01393
T-08 825

D6
SPECIFICATIONS MEASUREMENT

SIGNAL	MODE	◇			REMARKS
BU2-L	TEST DISC 3, PLAY, TOTAL HARMONIC DISTORSION	FILTER OUTPUT	0.003%		SEE DRAWING: 30459A12
BU2-R	TEST DISC 3, PLAY, TOTAL HARMONIC DISTORSION	FILTER OUTPUT	0.003%		SEE DRAWING: 30459A12
BU2-L	TEST DISC 3, PLAY, SIGNAL-TO-NOISE RATIO	FILTER OUTPUT	96dB		SEE DRAWING: 30459A12
BU2-R	TEST DISC 3, PLAY, SIGNAL-TO-NOISE RATIO	FILTER OUTPUT	96dB		SEE DRAWING: 30459A12

MDA.01395
T-08 823

D9
DOBM DIGITAL OUTPUT

SIGNAL	MODE	◇			REMARKS
DOBM	TEST DISC 5A, PLAY	88			SEE DRAWING: MDA.00238

MDA.01391
T-08 823

ERROR TABLE

System errors

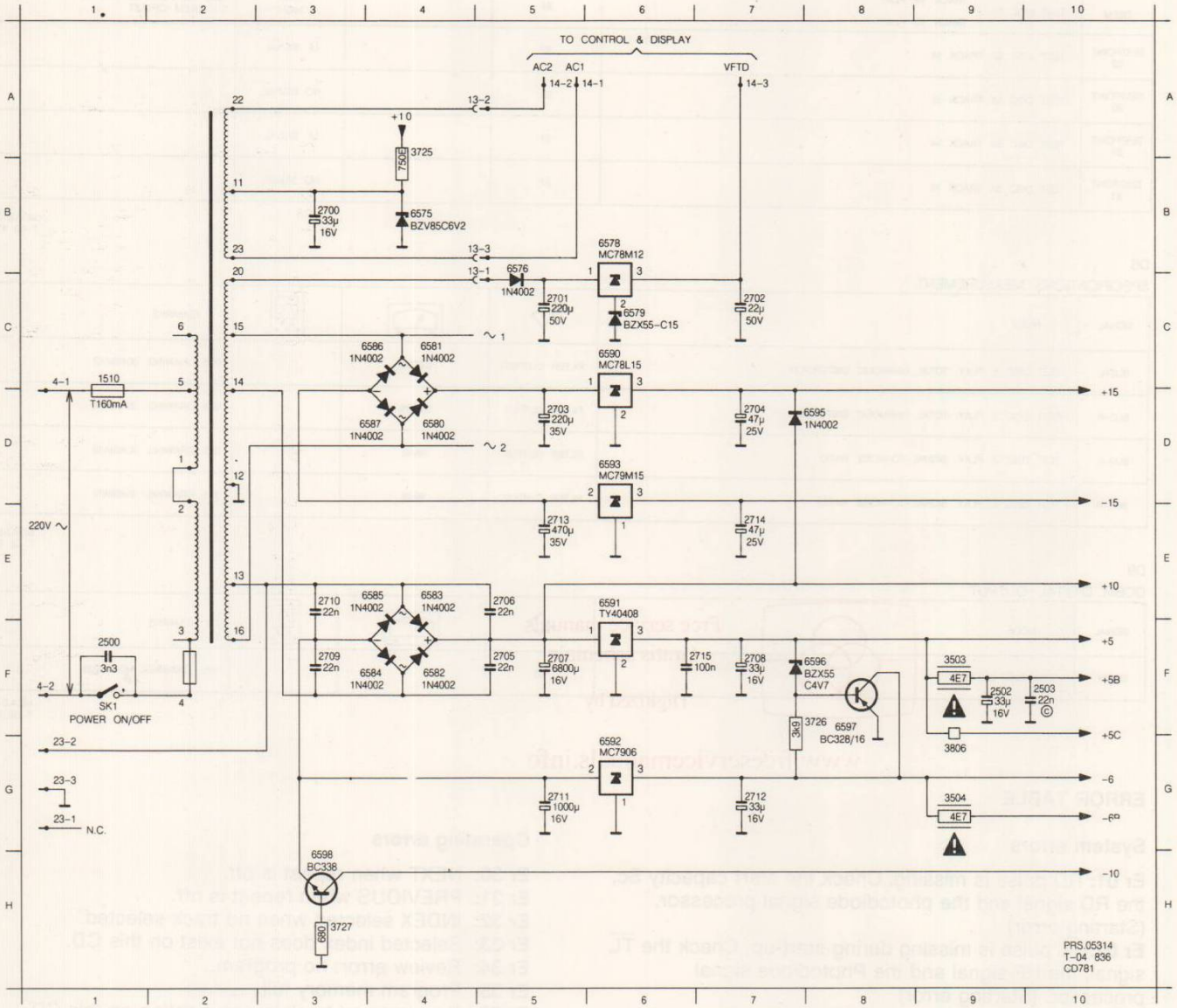
Er 01: RD pulse is missing. Check the start capacity Sc, the RD signal and the photodiode signal processor. (Starting error)
Er 02: $\overline{TL}$ pulse is missing during start-up. Check the $\overline{TL}$ signal, the HF-signal and the Photodiode signal processor. (Starting error)
Er 03: Lead-in track not found. Check the disc used. Check also that the radial arm rests against the inside. Check the RE-dig signal and the Radial error processor. (Starting error)
Er 04: Too many $\overline{TL}$ pulses during play. Check the quality of the disc used. Check the HFD signal. (Error during PLAY)
Er 05: $\overline{TL}$ pulse is low for more than 50 msec. Check the disc used. Check the HF-in signal and the photodiodes (Error during PLAY)
Er 06: No $\overline{TL}$ pulse received within 0.5 sec. in case of track jumping. Check the RE-lag circuit. (Error during SEARCH or NEXT/PREVIOUS)
Er 07: Subcode error. In case of track loss during play the information of the subcode is used to determine the place of the last information that was still well readable. In case of an interruption of HF or other signals, this will lead to Er 07. (Error during PLAY)
Er 08: TOC error (Table of Contents). Check the quality of the disc used. Check the initial speed of the turntable motor and the motor control. Check also that the radial arm rests against the inside. (Starting error)

Operating errors

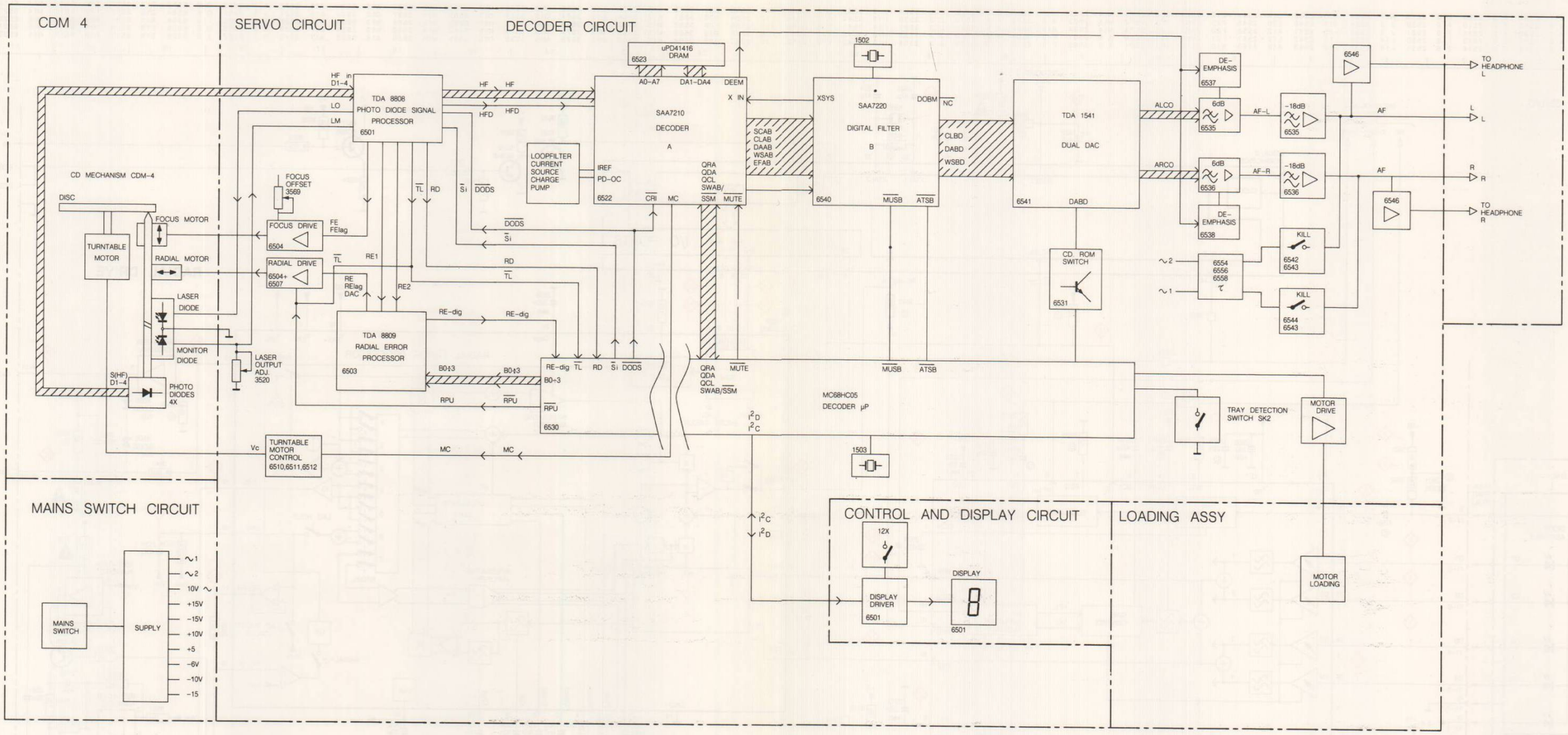
Er 30: NEXT when repeat is off.
Er 31: PREVIOUS when repeat is off.
Er 32: INDEX selected when no track selected.
Er 33: Selected index does not exist on this CD.
Er 34: Review error: no program.
Er 35: Program memory full.
Er 36: Programmed track is non existing on this CD.
Er 37: Selected track is non existing on this CD.
Er 60: Fast forward bound.
Er 61: Fast reverse bound.

POWER SUPPLY

1510	C 1	2700	B 3	2704	D 7	2708	F 7	2712	G 7	3503	F 9	3727	H 3	6578	B 6	6582	F 4	6586	C 4	6592	G 6	6597	F 8
2500	F 1	2701	C 5	2705	F 5	2709	F 3	2713	E 5	3504	G 9	3806	G 9	6579	C 6	6583	E 4	6587	D 4	6593	D 6	6598	H 3
2502	F 9	2702	C 7	2706	E 5	2710	E 3	2714	E 7	3725	A 4	6575	B 4	6580	D 4	6584	F 4	6590	C 6	6595	D 8	SK1	F 1
2503	F10	2703	D 5	2707	F 5	2711	G 5	2715	F 7	3726	F 8	6576	B 5	6581	C 4	6585	E 4	6591	E 6	6596	F 8		



BLOCK DIAGRAM



PRS.05151
T02-823

AGC	–	Automatic Gain Control
B0-B3	–	Control bits for radial circuit
BEQ	–	Equalizer reference current input
BGC	–	DC and LF gain control reference input
Cosc1	–	Capacitor wobble oscillator
Cosc2	–	Capacitor wobble oscillator
DEC	–	Decoupling input of inkruat bypass
DET	–	HF detector voltage input
DIV4	–	Divide by 4 input
DODS	–	Drop out detector suppression
D1÷4	–	Photodiode currents
FE	–	Focus error signal
FE lag	–	Focus error signal for LAG network
HF	–	HF output for DEMOD
HFD	–	HF detector output for DEMOD
HF-in	–	HF current input to HF amplifier
HF-out	–	HF amplifier and equalizer voltage output
LM	–	Laser monitor diode input
LO	–	Laser amplifier current output
MC	–	Motor control signal
offset IN	–	Offset control input
offset OUT	–	Offset control output
PLLH	–	PLL on hold output
RADout	–	output of RE2-RE1 input
RE	–	Radial error signal (Amplified RE_2-RE_1 currents)
Rosc	–	Resistor wobble oscillator
Rwob	–	Wobble generator input
RE1	–	Radial error signal 1 (summation of amplified currents D_3 and D_4
RE2	–	Radial error signal 2 (summation of amplified currents D_1 and D_2
RE dig	–	Radial error digital
RE lag	–	Radial error signal for LAG network
Sc	–	Starting up capacitor input
Si/RD	–	On/off control for laser supply and focus circuit. Ready signal, Starting up procedure succesful.
TL	–	Track loss output signal
TTM–	–	Control voltage for turntable motor
TTM+	–	Control voltage for turntable motor
Vext–	–	Supply connection
Vext+	–	Supply connection
TCMP	–	Turntable control motor pulse
ATSB	–	Attenuation of Audio level in Search position (Cueing)
CD RCM Switch	–	Digital Data information on disc signal
CEFM	–	Clock Eight-to-Fourteen Modulator
CLAB	–	Clock signal Decoder-A to Filter-B
CLBD	–	Clock signal Filter-B to DAC
CREF	–	Reference Current
CRI	–	Counter Reset Inhibit
DAAB	–	Data signal Decoder-A to Filter-B
DABD	–	Data signal Filter-B to DAC
DEEM	–	Deemphasis
DOBM	–	Digital out signal
EFAB	–	Error flag Decoder-A to Filter-B
MUTE	–	Mute signal
MUSB	–	Soft Mute signal
PD/OC	–	Phase detector - oscillator control
QCL	–	Q-channel Clock signal
QDA	–	Q-channel Data signal
QRA	–	Q-channel Request Aknowledge
SCAB	–	Subcode clock Decoder-A to Filter-B
SDAB	–	Subcode data Decoder-A to Filter-B
SWAB/SSM	–	Subcode Word/Start-stop motor signal
WSAB	–	Word select Decoder-A to Filter-B
WSBD	–	Word Select Filter-B to DAC
XIN	–	Oscillator signal in Decoder-A
XSYS	–	Oscillator signal out Filter-B

SERVO

DECODER-A IC6522

HF DODS HFD

6530A/ 2 MC68HC05C8

μP

CLOCK

RESET Vdd XTAL1 XTAL2 IRQ

CPU

I/O PORTS

INT/T0 T1 D6

0-6 0-4 0-7 0-5

Vss

DECODING 2 KILL

4M7 3627

3628 22k

2622 4μ7

2620 33μ

2621 22n

2623 47p 2624 47p

1503 4 MHz

3629 220k

RADIAL DRIVE

RADIAL ERROR PROCESSOR

ROM

3 1/2-BIT DAC

RADIAL LAG SHORT CIRCUIT

INTEGRATING AMPLIFIER

OSCILLATOR 650Hz

RAD OUT LEAD LAG RADIAL RELAG

LAG HOLD

LAG SHORT CIRCUIT

RE IN

U/I

RADIAL

6504-(1/2)B TCA0372(A)

6506 BZX55 7V5

6505 BZX55 7V5

3541 6k8

3543 6k8

2540 680n

2545 100n

3542 33

3540 4k7

RAD+ RAD-

TO RADIAL MOTOR VIA FLEX PRINT

6507-(1/2)A NJM4560D

6507-(1/2)B NJM4560D

6508 BC858

3553 1k5

3552 8k2

2550 6n8

3554 10k

3551 2k

3555 110k

2551 22n

3550 2k

3557 4k7

6527 BC858

3626 10k

3625 10k

3624 2k2

3620 18k

3621 18k

3622 47k

3623 18k

6525 BC848

6526 BC848

D-6 IR REC.

RC5 IN

RC5 OUT

6503 TDA8809

3535 12k

2538 220n

Cagc

V_{EXT+} V_{EXT-} V_{DD}

+5B -6B +5B

REdig DIV4

RE1 RE2

re1/2 re1 re2 re2/2

RADIAL

LEAD LAG

50μA

0° 45° 90°

GND

Rosc Rwob Cosc1 Cosc2 Cpf Chpf

2537 220n 3530 47k 3531 15k 2530 8n2 2531 8n2 2536 33n 2535 33n

2532 33μ

Vref

+5B

FOCUS DRIVE

6504 TCA0372(B)

2565 1n2

3544

2560 4n7

3561 150k

3560 11k

2543 220μ 2541 22n

3545

2544 220μ 2542 22n

3565 27

3566 22

2563 100n

3567 82k

3562 120k

3564 160k

3563 56k

2562 330n

3568 68k

3569 5k2 FOCUS OFFSET

+5A -5A

FOCUS NORMALIZING CIRCUIT

FE FS FElag

3509 5k6

FOC- FOC+

TO FOCUS MOTOR VIA FLEX PRINT

TURNTABLE MOTOR CONTROL

6512-(1/2)A NJM4560

6512-(1/2) NJM4560

6514 BZX55 C3V0

6515 BZX55 C3V0

6513 1N4148

6516 1N4148

2572 470n

3574 33k

3575 1k2

3576 68k

3579 130k

3580 56k

3581 56k

3582 7k5

3583

3584 91k

3585 100k

3586 180k

3587 5k6

3588 47k

3589 4k7

3578 27k

3577

2574 18n

2571 22n

2570 4n7

3573 100

TCMP DECODING 1 6530

6510 BC338

6511 BC328

3570 4R7

3571 4R7

TTM-

TO TURNTABLE MOTOR CIRCUIT

B-3 B-2 B-1

02-3 N.C 02-4

C.D.M.

FLEX PRINT (FOIL)

DIODE ASSEMBLY

D1 D2 D3 D4

GUARD RING PHOTODIODE

LASER ASSEMBLY

1002 LASER

MONITOR

1003 10μ 1001 1k 47n

6502 BC338

3522 18

3523 12

3524 100

2520 220p

2521 47μ oe

3521 220

3520 4k7

LASER OUTPUT ADJ

LASER SUPPLY

ref 6

6501

PHOTO DIODE SIGNAL PROCESSOR

TDA 8808 ©

HF AMPLIFIER

EQUALIZER

GAIN CONTROL

HF AMPLITUDE SLICERS

STARTING CIRCUIT

3506 100

3507 2k2

3505 12k

3508 24k

2505 33μ 16V

2506 22n

2507 2n2

2514 470n

2511 1n

2509 47p

2510 10n

3501 4k7

3502 100k

2501 22n

2504 470p

2508 47n

2515 1n

2513 220n

3510 10k

3802

3503 47k

3536 47k

3537 15k

3538 47k

3539 15k

3801

3805

3647 22k

3643 22k

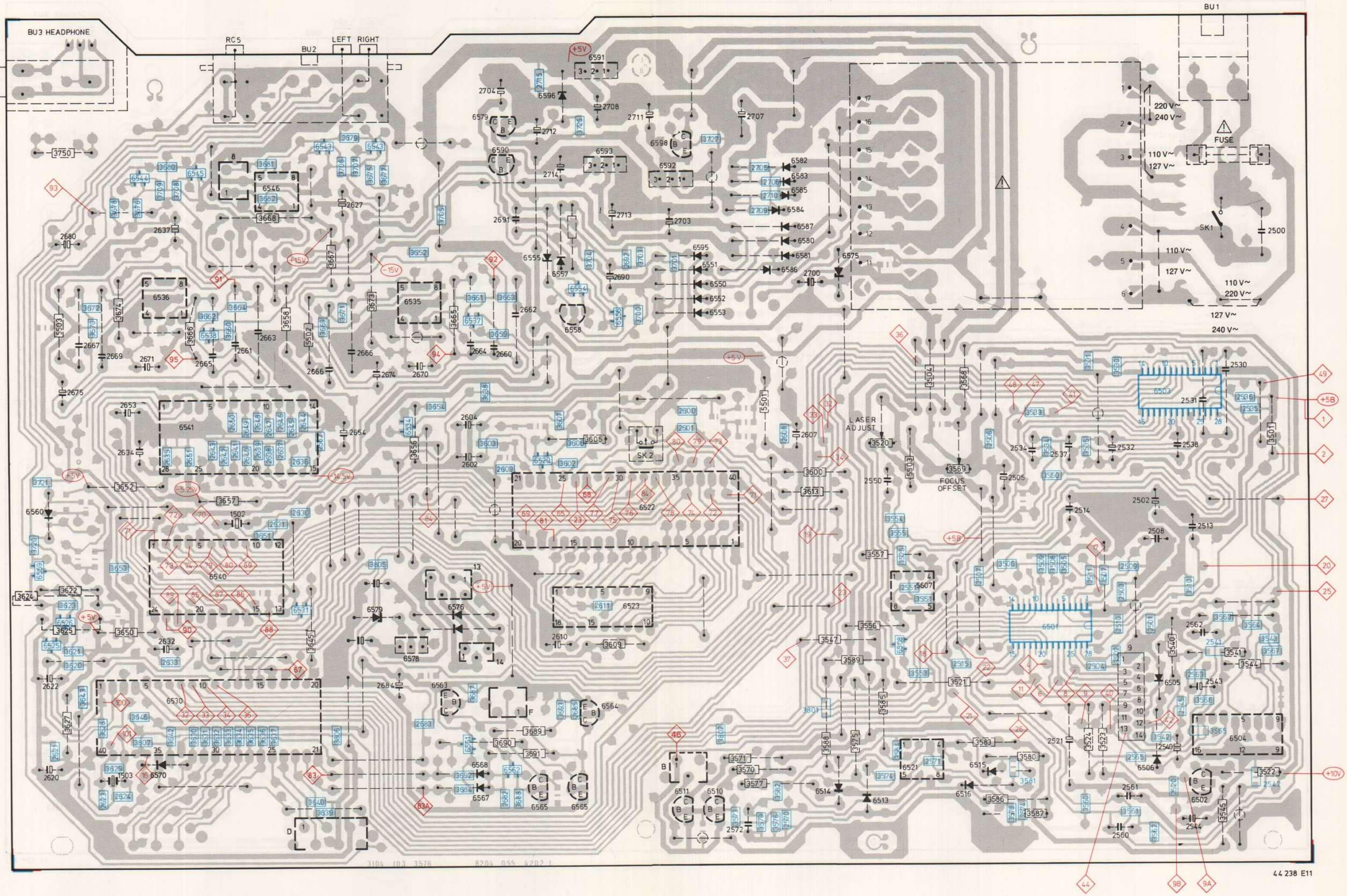
DECODER-A IC6522 MC

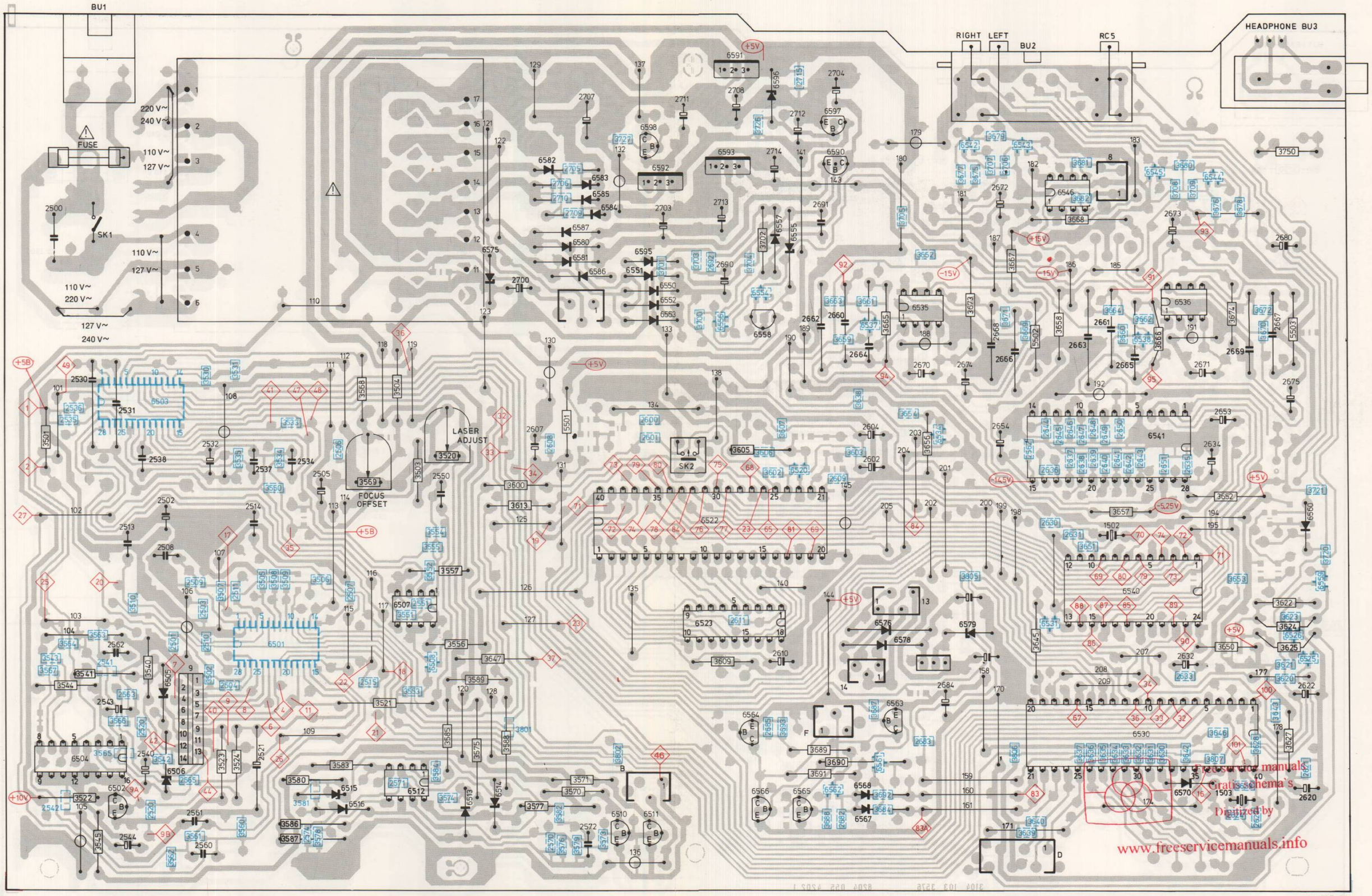
-CHIP JUMPER (0Ω)

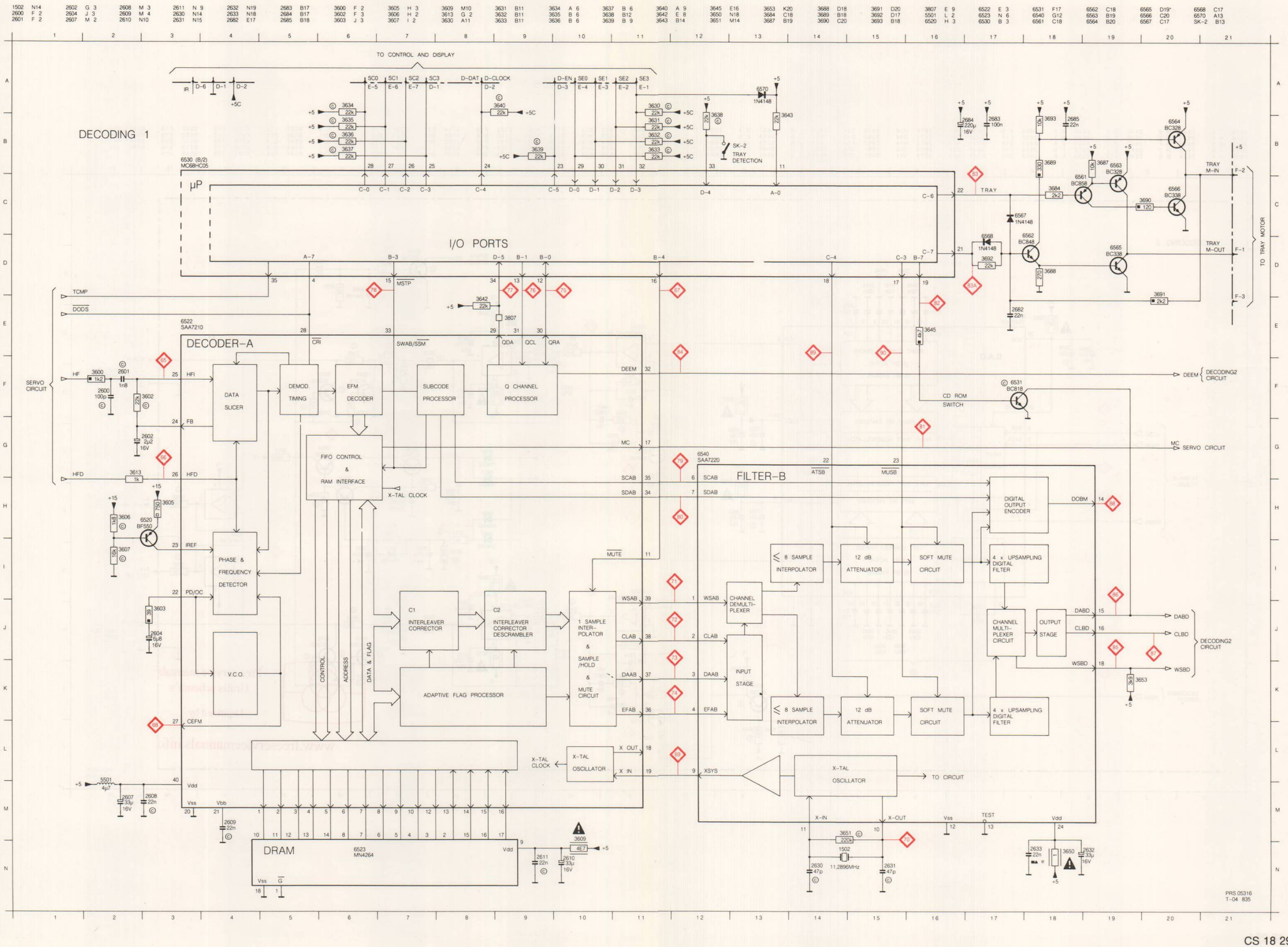
Free service manuals
Gratis schema's
Digitized by
www.freeservicemanuals.info

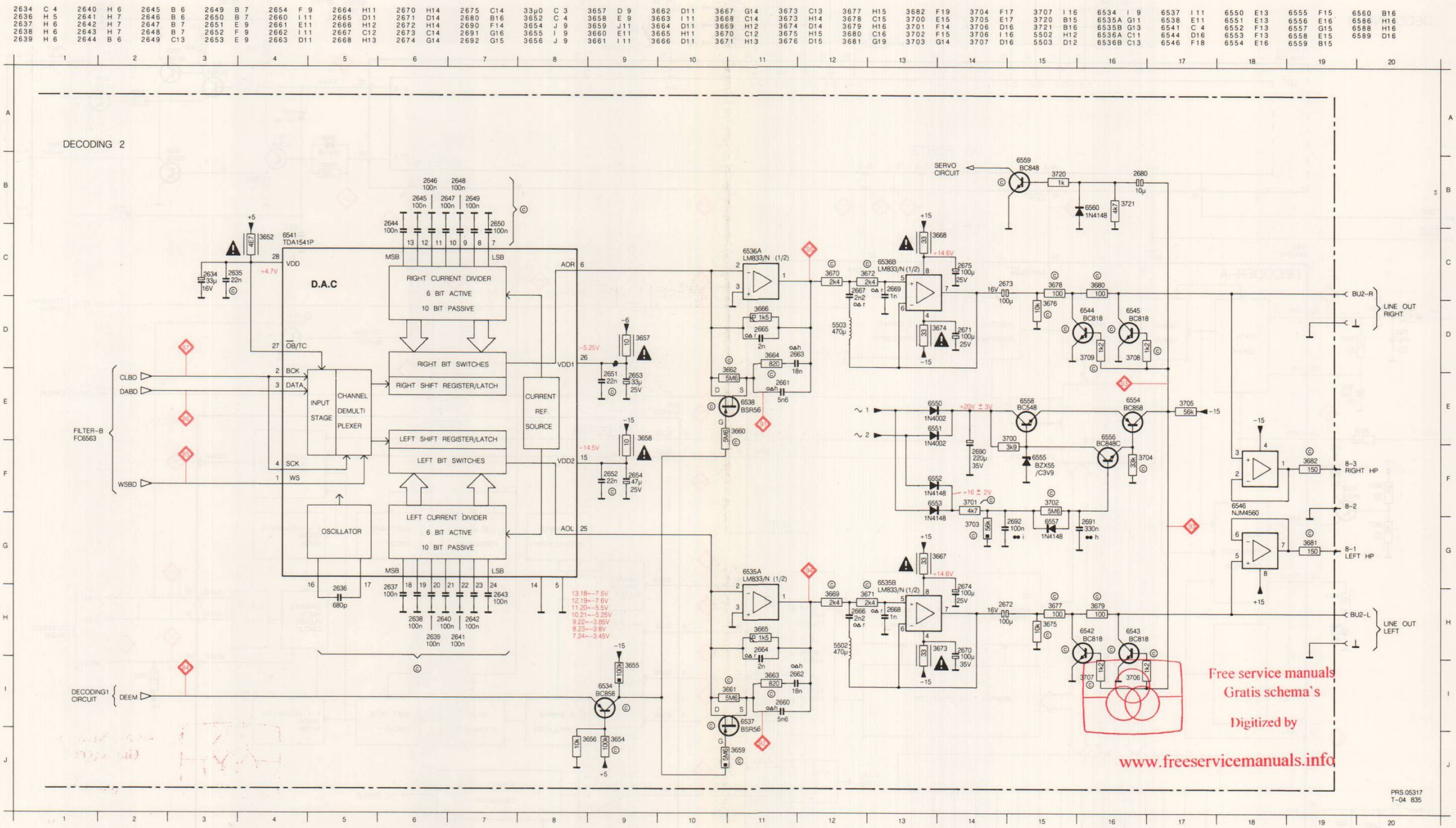
PRS.05318
T-04 836

MAIN PANEL

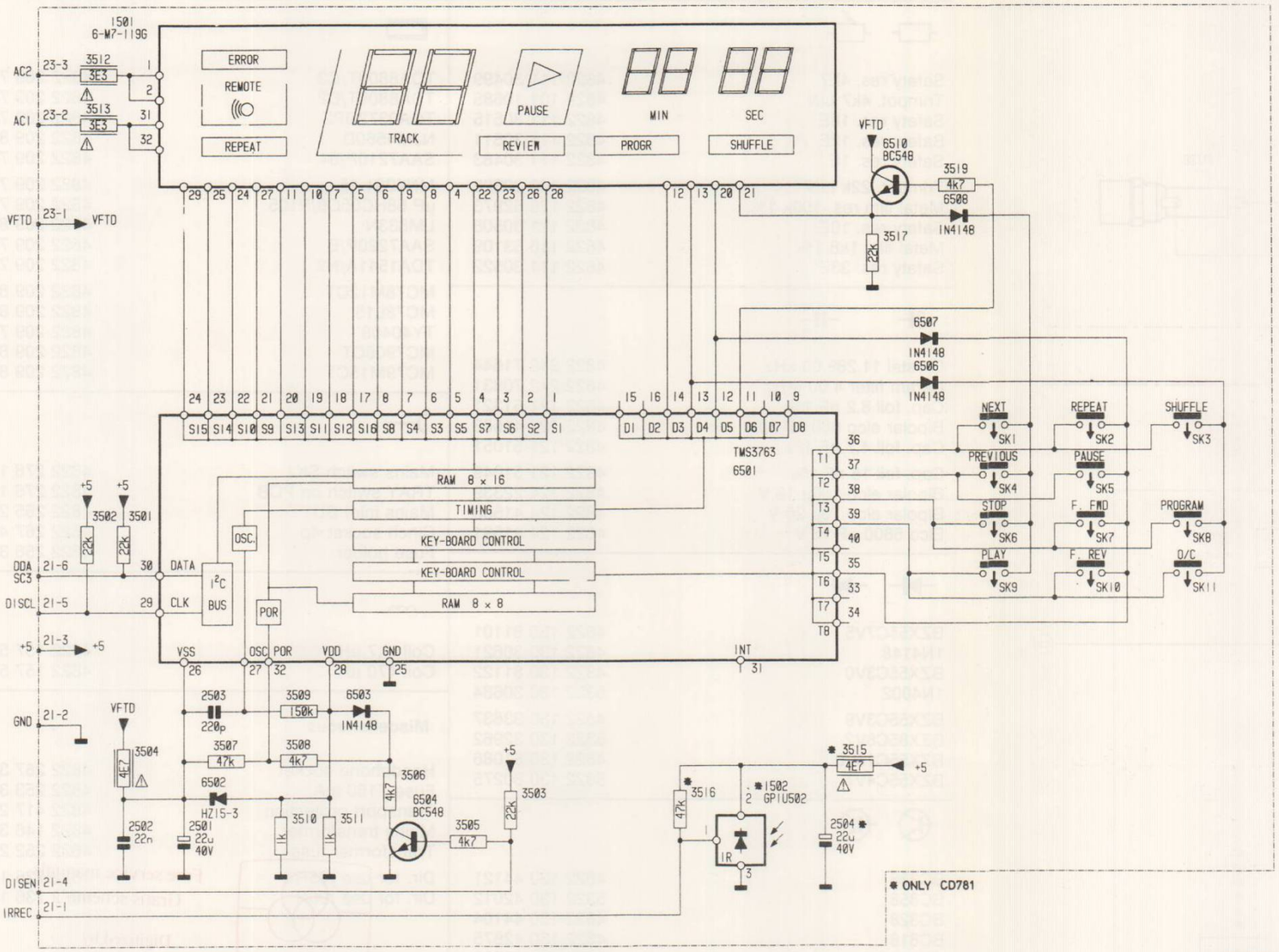




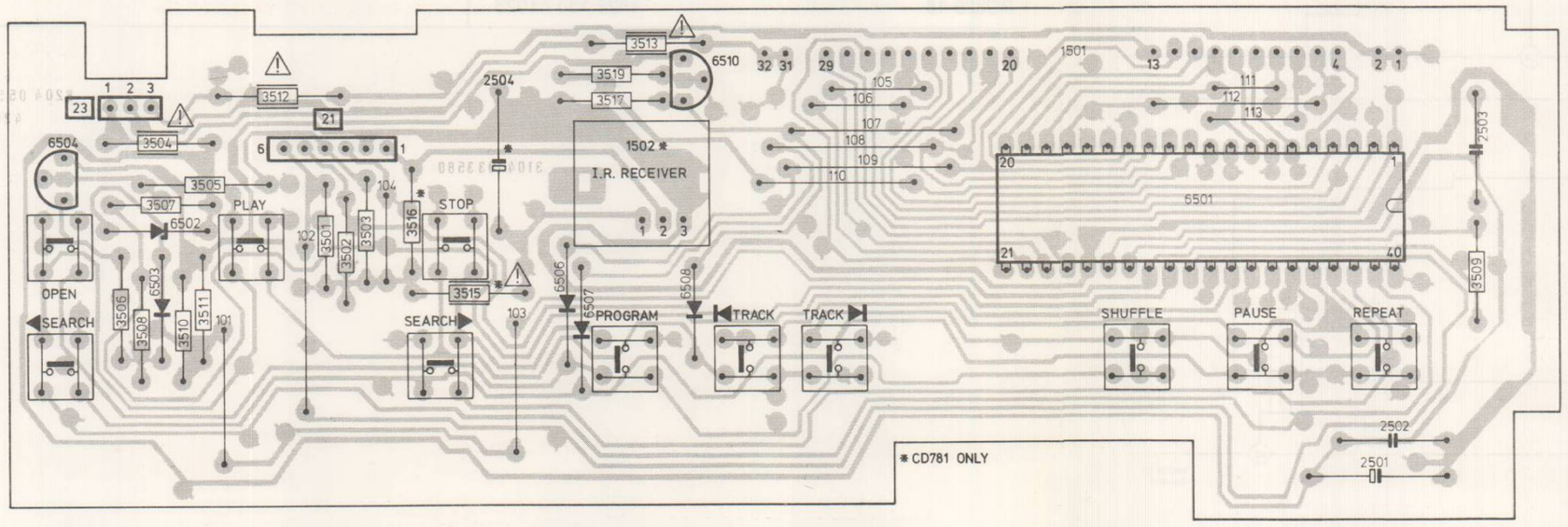




CONTROL & DISPLAY CIRCUIT DIAGRAM



CONTROL & DISPLAY PANEL

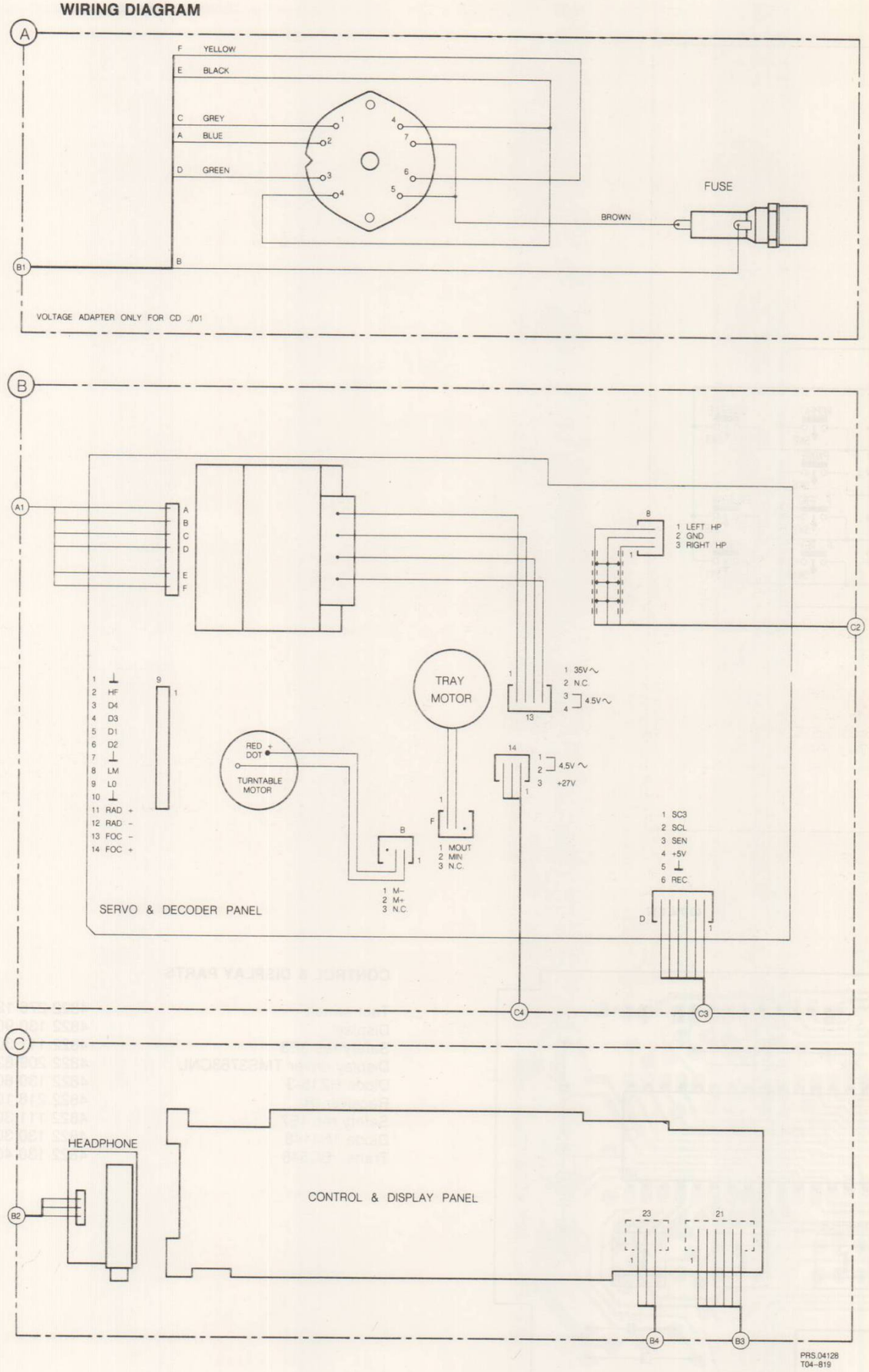


43 580 D12

CONTROL & DISPLAY PARTS

Tact switch	4822 276 12276
Display	4822 130 90542
Safety res 3E3	4822 111 30593
Display driver TMS3763CNL	4822 209 82385
Diode HZ15-3	4822 130 80138
Receiver IR	4822 218 10224
Safety res 4E7	4822 111 30499
Diode 1N4148	4822 130 30621
Trans. BC548	4822 130 40938

WIRING DIAGRAM



ELECTRICAL PARTSLIST SUPPLY SERVO & DECODER PANEL

Safety res. 4E7	4822 111 30499
Trimpot. 4k7 LIN	4822 101 10685
Safety res. 18E	4822 111 30515
Safety res. 12E	4822 111 30511
Safety res. 1E	4822 111 30483
Trimpot. 22k LIN	4822 100 20522
Metal film res. 100k 1%	4822 116 52973
Safety res. 10E	4822 111 30508
Metal film 1k8 1%	4822 116 53109
Safety res. 33E	4822 111 30522

Crystal 11.289,60 kHz	4822 242 71644
Ceram filter 4.00 MHz	4822 242 70831
Cap. foil 8,2 nF 1%	4822 121 51321
Bipolar elco 680 nF 50V	4822 124 41583
Cap. foil 4,7 nF 1%	4822 121 51051
Cap. foil 15 nF 1%	4822 121 51049
Bipolar elco 100µ 16 V	4822 124 22339
Bipolar elco 10µ 25 V	4822 124 41558
Elco 6800 µF 16 V	4822 124 41591

BZX55C7V5	4822 130 81101
1N4148	4822 130 30621
BZX55C3V0	4822 130 81122
1N4002	5322 130 30684
BZX55C3V9	4822 130 33637
BZX85C6V2	5322 130 32962
BZX55C15V0	4822 130 81086
BZX55C4V7	5322 130 80275

BC338	4822 130 44121
BC858	5322 130 42012
BC328	4822 130 44104
BC818	4822 130 42675
BC848C	5322 130 42136
BC548	4822 130 40938
BC848	5322 130 41981
BC328-16	4822 130 41023

TDA8808T/C3	4822 209 73234
TDA8809T/C2	4822 209 73235
TCA0372DP2	4822 209 72587
NJM4560D	4822 209 83274
SAA7210P/04	4822 209 71001
MN4264-15	4822 209 70422
µP 68HC05C8/P105	4822 209 73232
LM833N	4822 209 83163
SAA7220P/B	4822 209 72545
TDA1541A/N2	4822 209 72544
MC78M12CT	4822 209 86176
MC78L15	4822 209 80889
TY40408	4822 209 71579
MC7906CT	4822 209 82056
MC79M15CT	4822 209 86361

Mains switch SK1	4822 276 11309
TRAY switch on PCB	4822 276 11896
Mains inlet BU1	4822 265 20291
Cinch socket 4p	4822 267 40766
Fuse holder	4822 256 30274

Coil 4,7 µH	4822 157 53139
Coil 470 µH	4822 157 53141

Miscellaneous

Headphone socket	4822 267 30743
Fuse T160 mA	4822 253 30009
Transport protection	4822 417 20162
Mains transformer	4822 146 30702
Transformer fuse	4822 252 20017
Dir. for use /05R	4822 736 13935
Dir. for use /00R	4822 736 13919

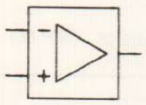
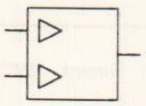
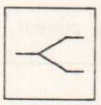
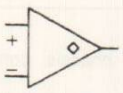
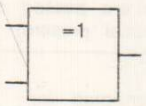
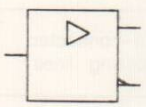
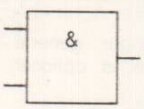
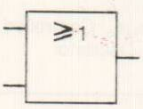
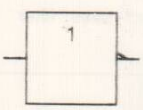
© Chips 50 V NP0 S1206			© Chips 0,125 W S1206			© Chips 0,125 W S1206			1U
1 pF	5%	4822 122 32479	4,7 E	5%	5322 111 90376	6,8 k	2%	4822 111 90544	
1,2 pF	5%	4822 122 33013	5,1 E	5%	4822 111 90393	7,5 k	2%	4822 111 90276	
1,5 pF	5%	4822 122 31792	5,6 E	5%	4822 111 90394	8,2 k	2%	5322 111 90118	
1,8 pF	5%	4822 122 32087	6,2 E	5%	4822 111 90395	9,1 k	2%	4822 111 90373	
2,2 pF	5%	4822 122 32425	6,8 E	5%	4822 111 90254	10 k	2%	4822 111 90249	
3,3 pF	5%	4822 122 32079	7,5 E	5%	4822 111 90396	11 k	2%	4822 111 90337	
3,9 pF	5%	4822 122 32081	8,2 E	5%	4822 111 90397	12 k	2%	4822 111 90253	
4,7 pF	5%	4822 122 32082	9,1 E	5%	4822 111 90398	13 k	2%	4822 111 90509	
5,6 pF	5%	4822 122 32506	10 E	2%	5322 111 90095	15 k	2%	4822 111 90196	
6,8 pF	5%	4822 122 32507	11 E	2%	4822 111 90338	16 k	2%	4822 111 90346	
8,2 pF	5%	4822 122 32083	12 E	2%	4822 111 90341	18 k	2%	4822 111 90238	
10 pF	5%	4822 122 31971	13 E	2%	4822 111 90343	20 k	2%	4822 111 90349	
12 pF	5%	4822 122 32139	15 E	2%	4822 111 90344	22 k	2%	4822 111 90251	
15 pF	5%	4822 122 32504	16 E	2%	4822 111 90347	24 k	2%	4822 111 90512	
18 pF	5%	4822 122 31769	18 E	2%	5322 111 90139	27 k	2%	4822 111 90542	
22 pF	10%	4822 122 31837	20 E	2%	4822 111 90352	30 k	2%	4822 111 90216	
27 pF	5%	4822 122 31966	22 E	2%	4822 111 90186	33 k	2%	5322 111 90267	
33 pF	5%	4822 122 31756	24 E	2%	4822 111 90355	36 k	2%	4822 111 90514	
39 pF	5%	4822 122 31972	27 E	2%	5322 111 90105	39 k	2%	5322 111 90108	
47 pF	5%	4822 122 31772	30 E	2%	4822 111 90356	43 k	2%	4822 111 90363	
56 pF	5%	4822 122 31774	33 E	2%	4822 111 90357	47 k	2%	4822 111 90543	
68 pF	5%	4822 122 31961	36 E	2%	4822 111 90359	51 k	2%	5322 111 90274	
82 pF	10%	4822 122 31839	39 E	2%	4822 111 90361	56 k	2%	4822 111 90573	
100 pF	5%	4822 122 31765	43 E	2%	5322 116 90125	62 k	2%	5322 111 90275	
120 pF	5%	4822 122 31766	47 E	2%	4822 111 90217	68 k	2%	4822 111 90202	
150 pF	5%	4822 122 31767	51 E	2%	4822 111 90365	75 k	2%	4822 111 90574	
180 pF	2%	4822 122 31794	56 E	2%	4822 111 90239	82 k	2%	4822 111 90575	
220 pF	5%	4822 122 31965	62 E	2%	4822 111 90367	91 k	2%	5322 111 90277	
270 pF	5%	4822 122 32142	68 E	2%	4822 111 90203	100 k	2%	4822 111 90214	
330 pF	10%	4822 122 31642	75 E	2%	4822 111 90371	110 k	2%	5322 111 90269	
390 pF	5%	4822 122 31771	82 E	2%	4822 111 90124	120 k	2%	4822 111 90568	
470 pF	5%	4822 122 31727	91 E	2%	4822 111 90375	130 k	2%	4822 111 90511	
560 pF	5%	4822 122 31773	100 E	2%	5322 111 90091	150 k	2%	5322 111 90099	
680 pF	5%	4822 122 31775	110 E	2%	4822 111 90335	160 k	2%	5322 111 90264	
820 pF	5%	4822 122 31974	120 E	2%	4822 111 90339	180 k	2%	4822 111 90565	
1 nF	10%	5322 122 31647	130 E	2%	4822 111 90164	200 k	2%	4822 111 90351	
1,2 nF	5%	4822 122 31807	150 E	2%	5322 111 90098	220 k	2%	4822 111 90197	
1,5 nF	10%	4822 122 31781	160 E	2%	4822 111 90345	240 k	2%	4822 111 90215	
1,8 nF	10%	4822 122 32153	180 E	2%	5322 111 90242	270 k	2%	4822 111 90302	
2,2 nF	10%	4822 122 31644	200 E	2%	4822 111 90348	300 k	2%	5322 111 90266	
2,7 nF	10%	4822 122 31783	220 E	2%	4822 111 90178	330 k	2%	4822 111 90513	
3,3 nF	10%	4822 122 31969	240 E	2%	4822 111 90353	360 k	2%	4822 111 90515	
3,9 nF	10%	4822 122 32566	270 E	2%	4822 111 90154	390 k	2%	4822 111 90182	
4,7 nF	10%	4822 122 31784	300 E	2%	4822 111 90156	430 k	2%	4822 111 90168	
5,6 nF	10%	4822 122 31916	330 E	2%	5322 111 90106	470 k	2%	4822 111 90161	
6,8 nF	10%	4822 122 31976	360 E	1%	4822 111 90288	510 k	2%	4822 111 90364	
10 nF	10%	4822 122 31728	360 E	2%	4822 111 90358	560 k	2%	4822 111 90169	
12 nF	10%	5322 122 31648	390 E	2%	5322 111 90138	620 k	2%	4822 111 90213	
15 nF	10%	4822 122 31782	430 E	2%	4822 111 90362	680 k	2%	4822 111 90368	
18 nF	10%	4822 122 31759	470 E	2%	5322 111 90109	750 k	2%	4822 111 90369	
22 nF	10%	4822 122 31797	510 E	2%	4822 111 90245	820 k	2%	4822 111 90205	
27 nF	10%	4822 122 32541	560 E	2%	5322 111 90113	910 k	2%	4822 111 90374	
33 nF	10%	4822 122 31981	620 E	2%	4822 111 90366	1 M	2%	4822 111 90252	
47 nF	10%	4822 122 32542	680 E	2%	4822 111 90162	1,1 M	5%	4822 111 90408	
56 nF	10%	4822 122 32183	750 E	2%	5322 111 90306	1,2 M	5%	4822 111 90409	
100 nF	10%	4822 122 31947	820 E	2%	4822 111 90171	1,3 M	5%	4822 111 90411	
180 nF	10%	4822 122 32915	910 E	2%	4822 111 90372	1,5 M	5%	4822 111 90412	
220 nF	20%	4822 122 32715	1 k	2%	5322 111 90092	1,6 M	5%	4822 111 90413	
			1,1 k	2%	4822 111 90336	1,8 M	5%	4822 111 90414	
			1,2 k	2%	5322 111 90096	2 M	5%	4822 111 90415	
			1,3 k	2%	4822 111 90244	2,2 M	5%	4822 111 90185	
			1,5 k	2%	4822 111 90151	2,4 M	5%	4822 111 90416	
			1,6 k	2%	5322 111 90265	2,7 M	5%	4822 111 90417	
			1,8 k	2%	5322 111 90101	3 M	5%	4822 111 90418	
			2 k	2%	4822 111 90165	3,3 M	5%	4822 111 90191	
			2,2 k	2%	4822 111 90248	3,6 M	5%	4822 111 90419	
			2,4 k	2%	4822 111 90289	3,9 M	5%	4822 111 90421	
			2,7 k	2%	4822 111 90569	4,3 M	5%	4822 111 90422	
			3 k	2%	4822 111 90198	4,7 M	5%	4822 111 90423	
			3,3 k	2%	4822 111 90157	5,1 M	5%	4822 111 90424	
			3,6 k	2%	5322 111 90107	5,6 M	5%	4822 111 90425	
			3,9 k	2%	4822 111 90571	6,2 M	5%	4822 111 90426	
			4,3 k	2%	4822 111 90167	6,8 M	5%	4822 111 90235	
			4,7 k	2%	5322 111 90111	7,5 M	5%	4822 111 90427	
			5,1 k	2%	5322 111 90268	8,2 M	5%	4822 111 90237	
			5,6 k	2%	4822 111 90572	9,1 M	5%	4822 111 90428	
			6,2 k	2%	4822 111 90545	10M	5%	5322 111 91141	

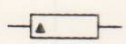
© Chips 0,125 W S1206 NP0		
0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90388
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392

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.

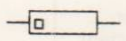
SYMBOL	DESCRIPTION
	Transistor (N.P.N.)
	Transistor (P.N.P.)
	Direct current (DC)
	Alternating current (AC)
	Earth (functional)
	Frame or chassis connection
	Direction in which AC voltages are passed on (optional present)
	Interrupted line
	Not-connected crossing lines
	Connected lines
	Cable tree with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

MDA.00083
T32-735

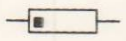
SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
	Exclusive OR gate
	True/complement amplifier with high input
	Flip Flop
	AND gate
	OR gate
	Inverter with high input



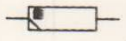
0.2W (CR 16) ⩽ 220k 5%
> 270k 10%



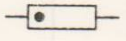
0.33W (CR 25) ⩽ 1M 5%
> 1M 10%



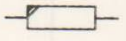
0.33W (SFR25) 5%



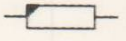
0.25W (VR 25) ⩽ 10M 5%
> 10M 10%



0.5W (CR 37) ⩽ 1M 5%
> 1M 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

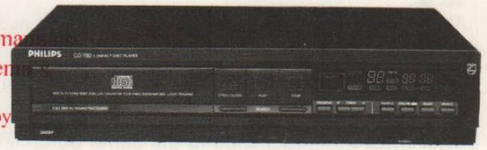
* a=2,5V
b=4V
c=6,3V
d=10V
e=16V
f=25V
g=40V
h=63V
i=100V
j=125V
l=125V
m=150V
n=160V
q=200V
r=250V
s=300V
t=350V
u=400V
v=500V
w=630V
x=1000V
A=1.6V
B=6V
C=12V
D=15V
E=20V
F=35V
G=50V
H=75V
I=80V

MDA.00084
T32–735

Compact disc player CD780/30R/31R/35R/37R/40R

CD781/30R/35R/37R/40R

Service
Service
Service



44 318 A11

Remote control for CD781 is available under code no: 4822 218 10233.

Service Manual

COMPACT disc DIGITAL AUDIO

CONTENTS

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

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambiago identici a quelli specificati.

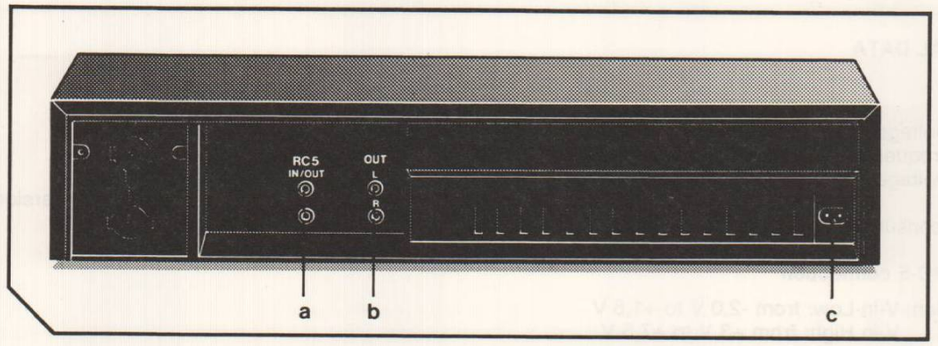
(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

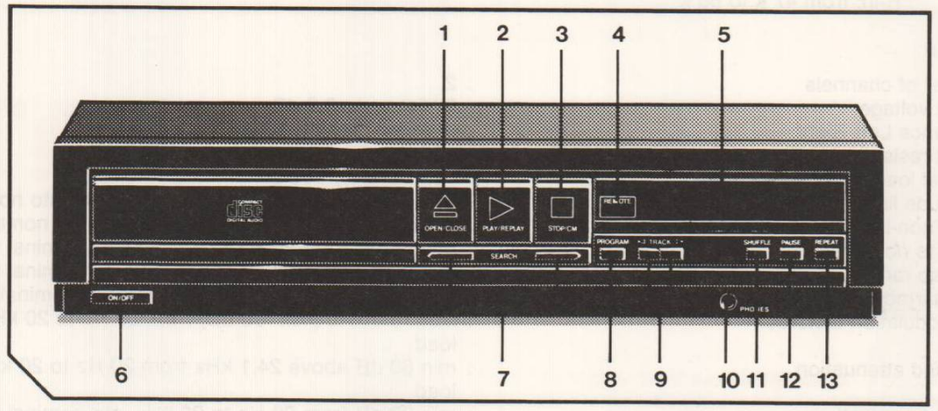
CLASS 1
LASER PRODUCT
3122 110 03420

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

Subject to modification
4822 725 22368
Printed in The Netherlands

PHILIPS
Published by Service Consumer Electronics





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CONTROL BUTTONS

Explanation of keys

1 Open/Close key
For opening and closing the disc tray.
2 Play/Replay key
For starting play (PLAY).
For returning to the beginning of a track (REPLAY).
3 Stop/CM key
For stopping play (STOP)
For erasing a programme (CM=Clear Memory).
4 Remote eye **(CD 781 only)**
Receives the signals from the remote control
5 Display
Informs you about the functioning of the player.
Displays details from the disc contents list.
See also: 'The indications on the display'.
6 On/Off key
For switching on and off.
7 ◀◀ SEARCH and **SEARCH ▶▶** keys
For fast search to a paricular passage during play.
('◁' backwards, '▷' forwards).
8 Program key
For storing track numbers in a programme.
For erasing track numbers from a programme.
For checking the programme.
9 ⏮ TRACK ⏭ keys
For selecting a previous or a later track during play.
For selecting the track number you want play to begin with.
For selecting track numbers when compiling a programme.
(⏮ from high to low and ⏭ from low to high).
10 Phones socket
For connection of headphones.
See also: 'Listening with headphones'.
11 Random key
For playing all tracks on a disc in random order.
12 Pause key
For briefly interrupting play.
For holding play at the start of a disc, track or passage.
13 Repeat key
For repeating a disc or a programme.

CONNECTIONS

a RC 5 IN/OUT: for a remote control system.
Use this connection for:
– Connecting up the equipment when you are incorporating the player in a PHILIPS HiFi-system with remote control.
– Connecting the remote control receiver EM 2200.
b OUT L R: for the connecting cable to the amplifier.
- Insert a red plug into the 'R' socket (right-hand channel) and the other plug into the 'L' socket (left-hand channel).
- Insert the two other plugs into the corresponding sockets of the CD or AUX input of your amplifier. You can also use the TUNER or TAPE IN connection, but **never** the PHONO input. This is not suitable for Compact Disc reproduction.

c Connection for the mains lead.

TECHNICAL DATA

General

1. Mains voltage	: 220, 240 Volt (+/– 10%)
2. Mains frequency	: 50-60 Hz
3. Mains voltage selection	: By soldering (220/240 Volt-version) By changing transformer (110/127 Volt-version)
4. Power consumption mains, operated	: 25 W

External RC-5 connection

Specification: V-in Low: from -2,0 V to +1,6 V
V-in High: from +3 V to +7,5 V
R-in: from 47 k to 68 k

Line output

1. Number of channels	: 2
2. Output voltage	: 2 Vrms +/– 0,2 dB
3. Unbalance Left-Right	: max. +/– 0,2 dB
4. Output resistance	: 200 Ohm
5. Nominal load impedance	: 100 kOhm // 100 pF
6. Amplitude linearity	: max. +/– 0,1 dB from 20 Hz to 20 kHz into nominal load
7. Phase non-linearity	: max. +/– 1,0° from 20 Hz to 20 kHz into nominal load
8. Signal to noise ratio	: min 96 dB from 20 Hz to 20 kHz into nominal load
9. Dynamic range	: min 90 dB from 20 Hz to 20 kHz into nominal load
10. Total harmonic distortion + noise	: min -90 dB from 20 Hz to 20 kHz into nominal load
11. Intermodulation distortion	: max. 0.003% (min -90 dB) from 20 Hz to 20 kHz into nominal load
12. Out-band attenuation	: min 60 dB above 24,1 kHz from 20 Hz to 20 kHz into nominal load
13. Channel separation	: min 93 dB from 20 Hz to 20 kHz into nominal load
14. Muting during random access	: min 90 dB from 20 Hz to 20 kHz into nominal load
15. Automatic switched de-emphasis with time constants 15/50 us	

Headphone (fixed)

1. Output voltage	: Max. 2 Vrms +/– 1 dB
2. Unbalance Left-right	: Max. +/– 0,5 dB
3. Output resistance	: 150 Ohm
4. Load impedance range	: 32 Ohm tp 600 kOhm
5. Output power	: Max. 30 mW into 32 Ohm load Max. 50 mW into 150 Ohm load Max. 30 mW into 600 Ohm load
6. Amplitude linearity	: Max. +/– 0,1 dB from 20 Hz to 20 kHz into 600 Ohm
7. Phase non-linearity	: Max. +/–° from 20 Hz to 20 kHz into 600 Ohm
8. Signal to noise ratio	: Min 90 dB from 20 Hz to 20 kHz into 600 Ohm
9. Dynamic range	: Min 90 dB from 20 Hz to 20 kHz into 600 Ohm
10. Total harmonic distortion + noise	: Max 0,005% (min-86 dB) from 20 Hz to kHz
11. Intermodulation distortion	: max 0,005% (min-86 dB) from 20 Hz to 20 kHz
12. Channel separation	: min 65 dB from 20 Hz to 20 kHz into 600 Ohm

Dimensions ans weight

1. Place and height of feet acc. to Philips specification		
2. Apparatus tray closed	WxDxH	: 360 × 300 × 85 mm
3. Apparatus tray open	WxDxH	: 420 × 448 × 85 mm
4. Weight	3,5 kg	

SERVICING HINTS

ESD

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

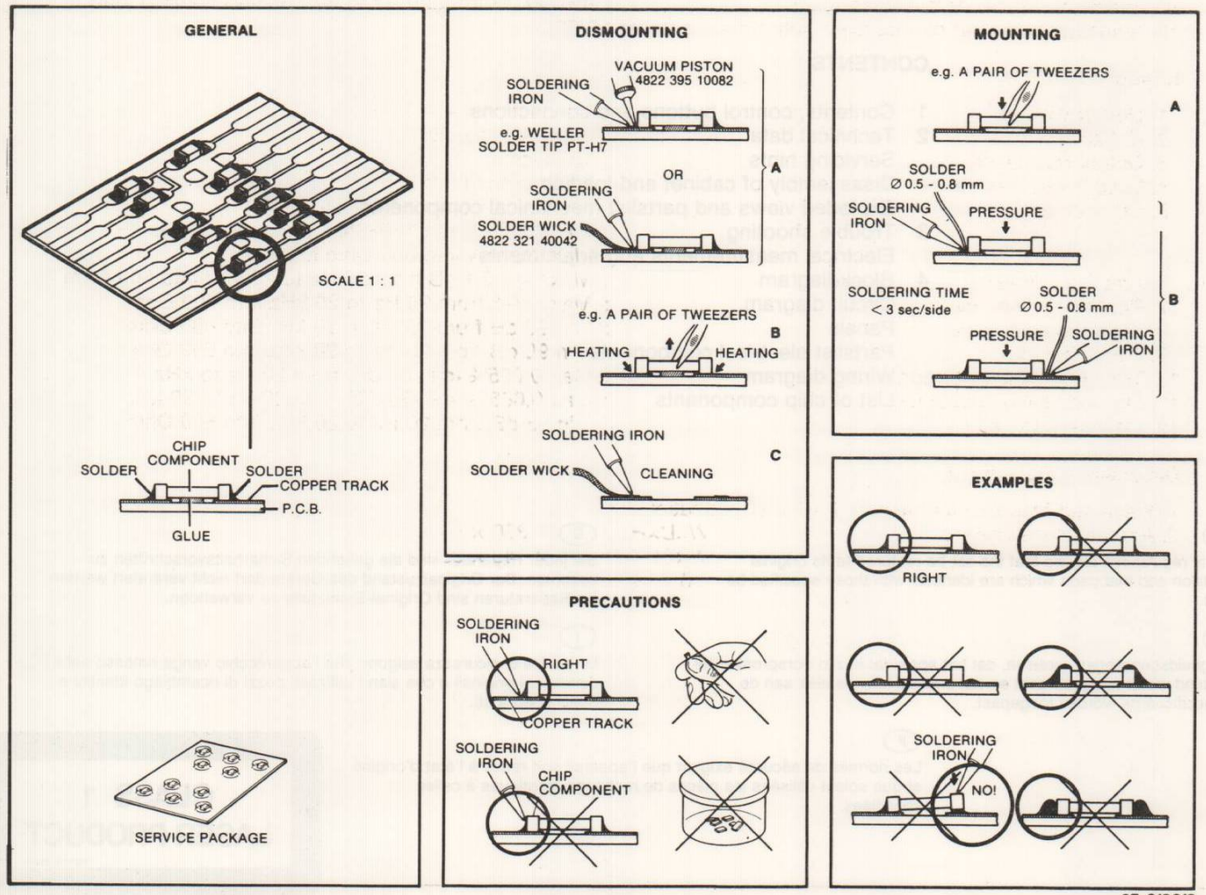
In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

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 seperate disc hold-downs should be used.
The set can function normally then.
Code number of the disc hold-down is 4822 462 50383.

When the tray mechanism has been disassembled the tray switch must be activated immediately after pressing the play button in order to ensure normal operation.

SERVICE TOOLS

Audio signals disc	4822 397 30185
Disc without errors (test disc 5) + disc with DO errors, black spots and fingerprints (test disc 5A)	4822 397 30096
Disc 65 min 1 kHz without pause	4822 397 30155
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676



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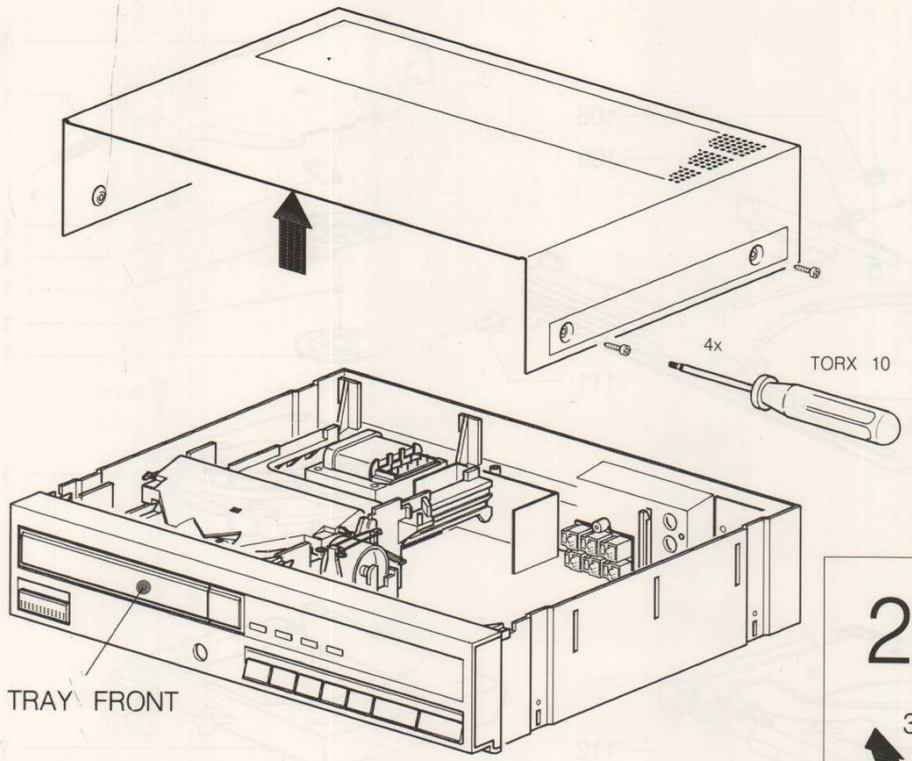
1



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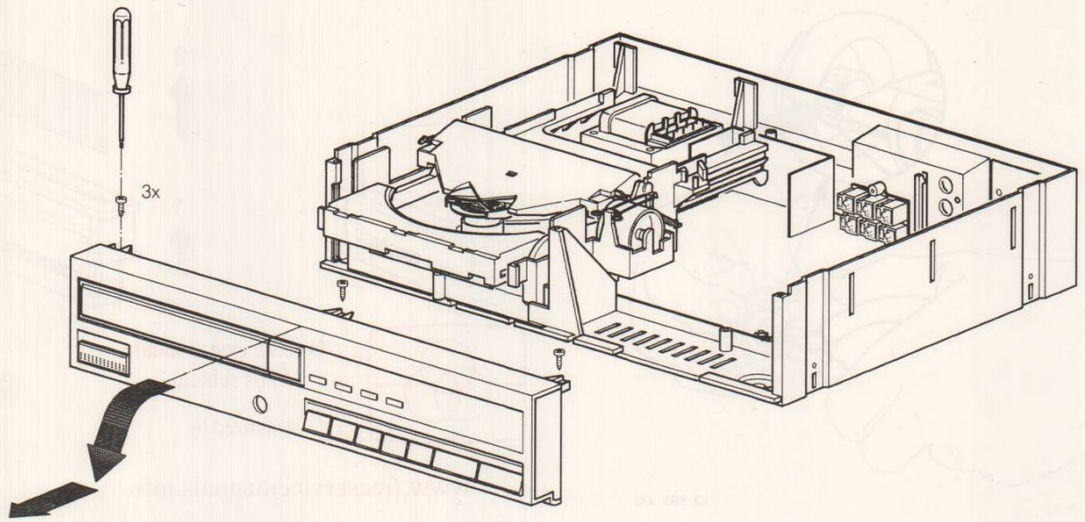

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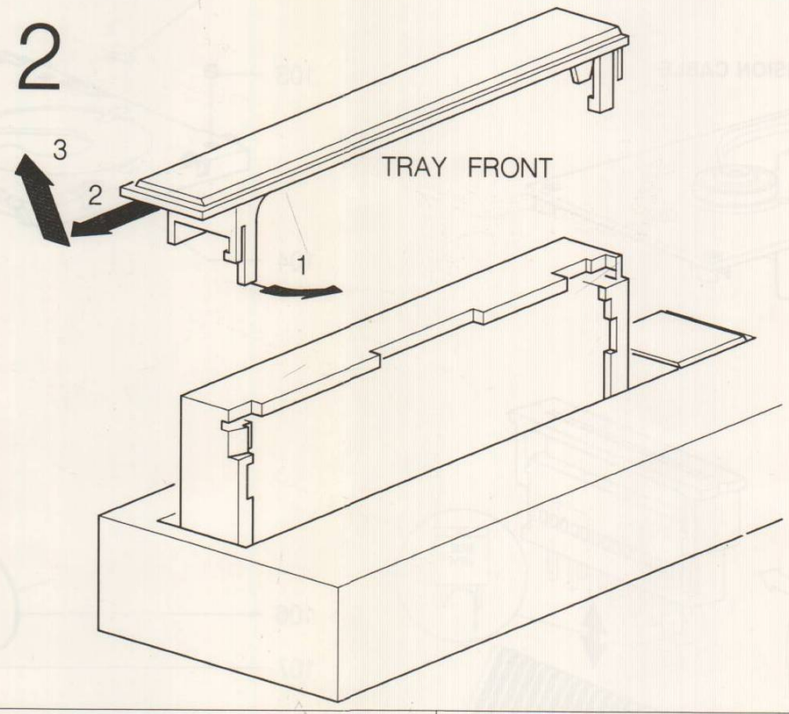

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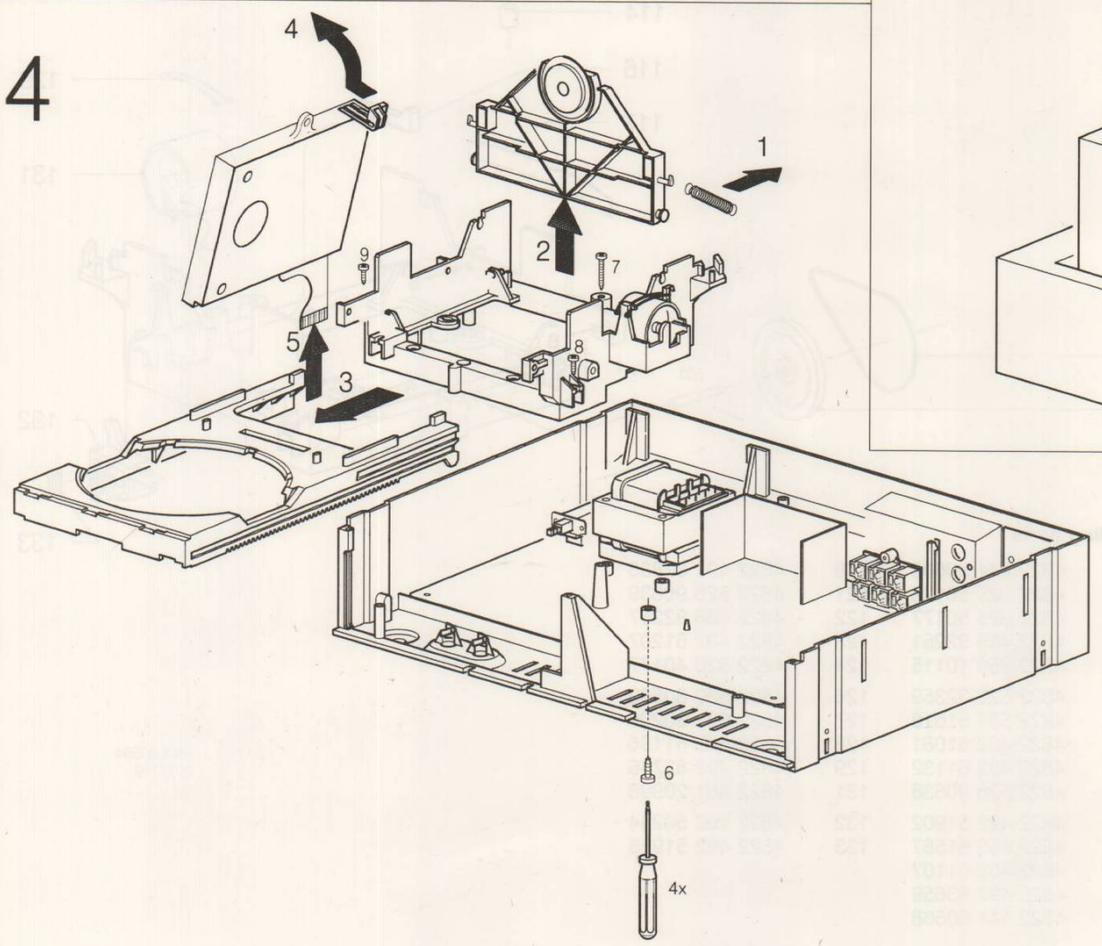

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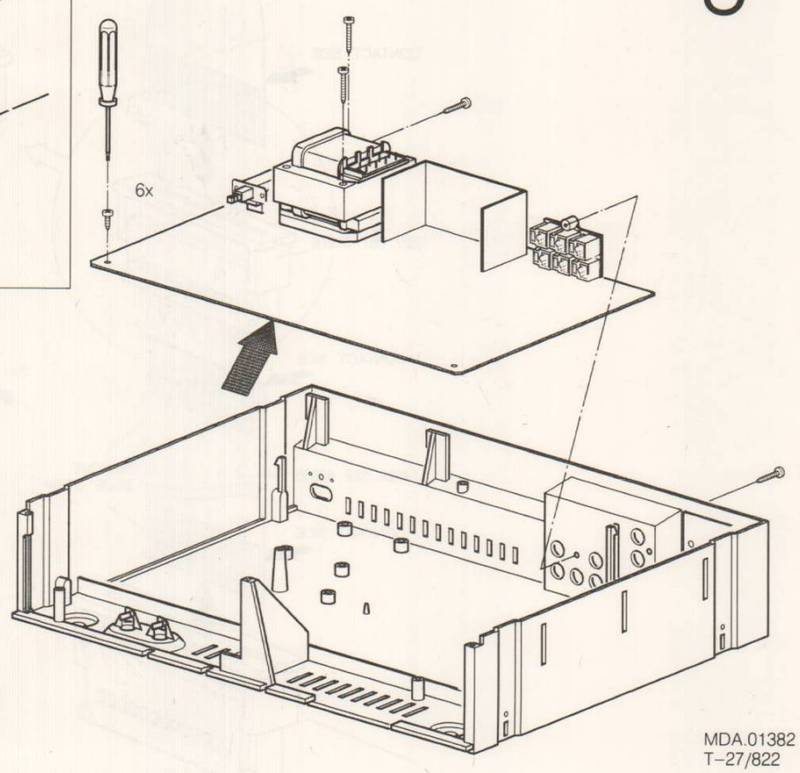

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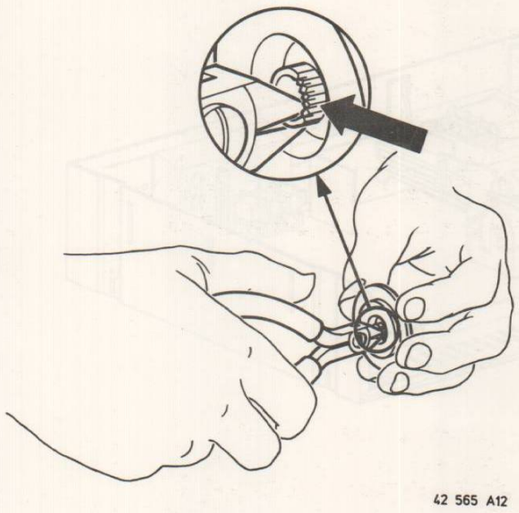
T-27/822

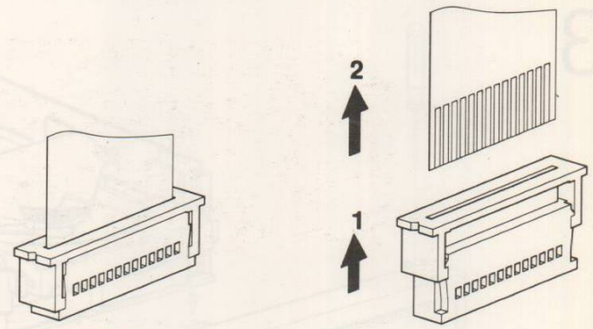
SERVICE DISC-HOLDDOWN



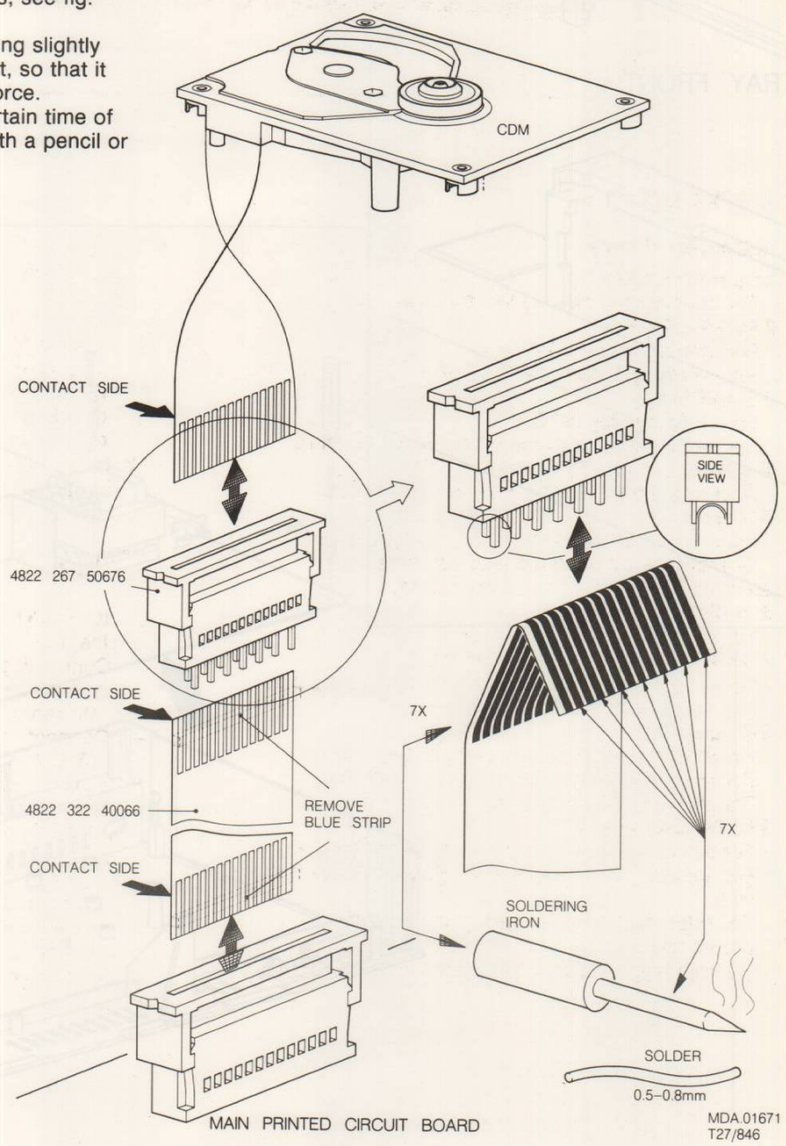
Compose a service Disc hold-down in the following way

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above
- 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.

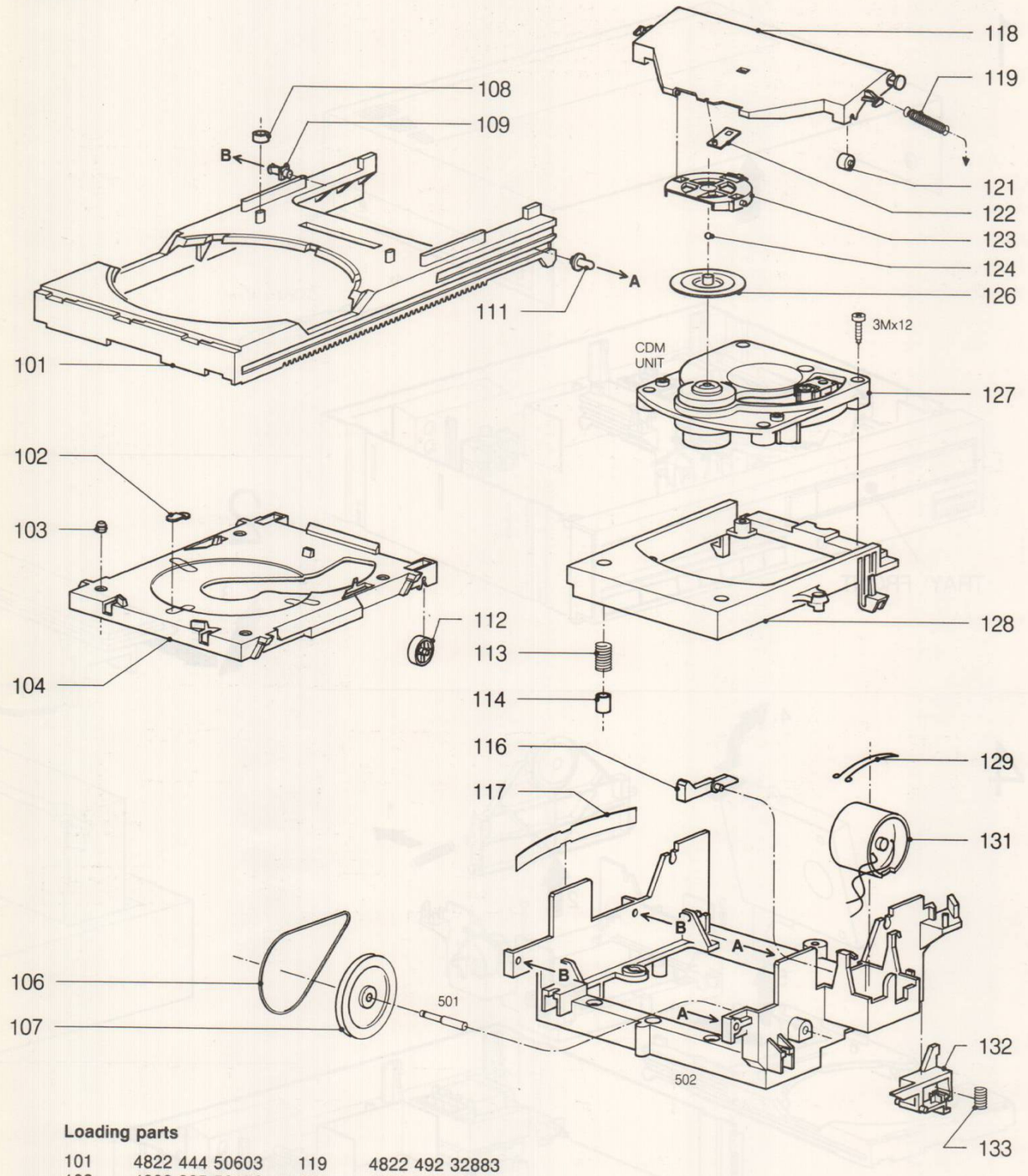
DEMOUNTING FOIL CDM



EXTENSION CABLE



LOADING



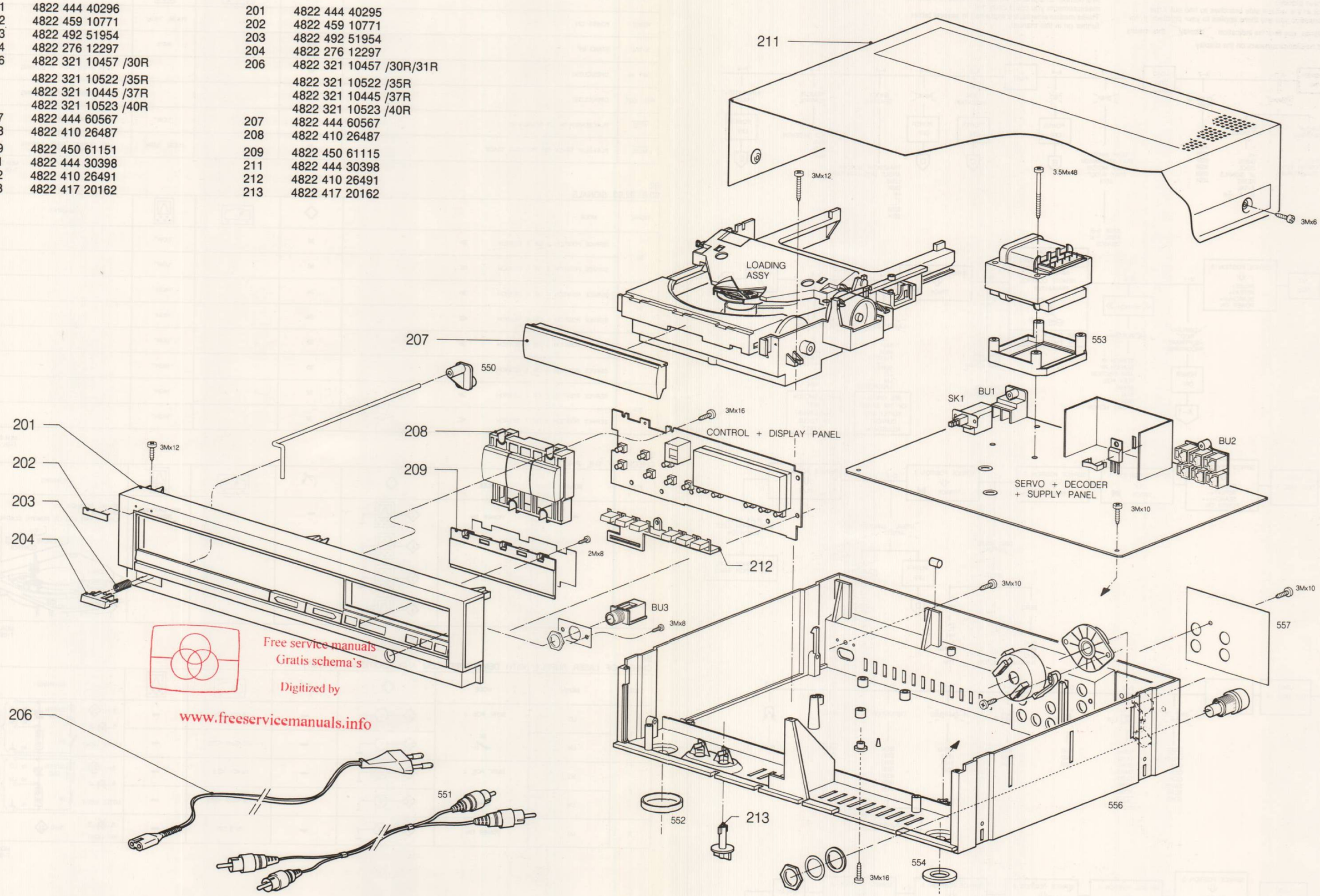
Loading parts

101	4822 444 50603	119	4822 492 32883
102	4822 325 50176	121	4822 528 90639
103	4822 325 50177	122	4822 466 92257
104	4822 466 92251	123	4822 402 61207
106	4822 358 10115	124	4822 520 40177
107	4822 522 32359	126	4822 530 80503
108	4822 532 51518	127	4822 691 30209
109	4822 402 61081	128	4822 402 61196
111	4822 402 61132	129	4822 492 63746
112	4822 528 90638	131	4822 361 20998
113	4822 492 51902	132	4822 402 50244
114	4822 466 61587	133	4822 492 51935
116	4822 402 61107		
117	4822 492 63659		
118	4822 444 60568		

EVA.00594
907/T19

EXPLODED VIEW CABINET

	CD781	CD780
201	4822 444 40296	4822 444 40295
202	4822 459 10771	4822 459 10771
203	4822 492 51954	4822 492 51954
204	4822 276 12297	4822 276 12297
206	4822 321 10457 /30R	4822 321 10457 /30R/31R
	4822 321 10522 /35R	4822 321 10522 /35R
	4822 321 10445 /37R	4822 321 10445 /37R
	4822 321 10523 /40R	4822 321 10523 /40R
207	4822 444 60567	4822 444 60567
208	4822 410 26487	4822 410 26487
209	4822 450 61151	4822 450 61115
211	4822 444 30398	4822 444 30398
212	4822 410 26491	4822 410 26491
213	4822 417 20162	4822 417 20162

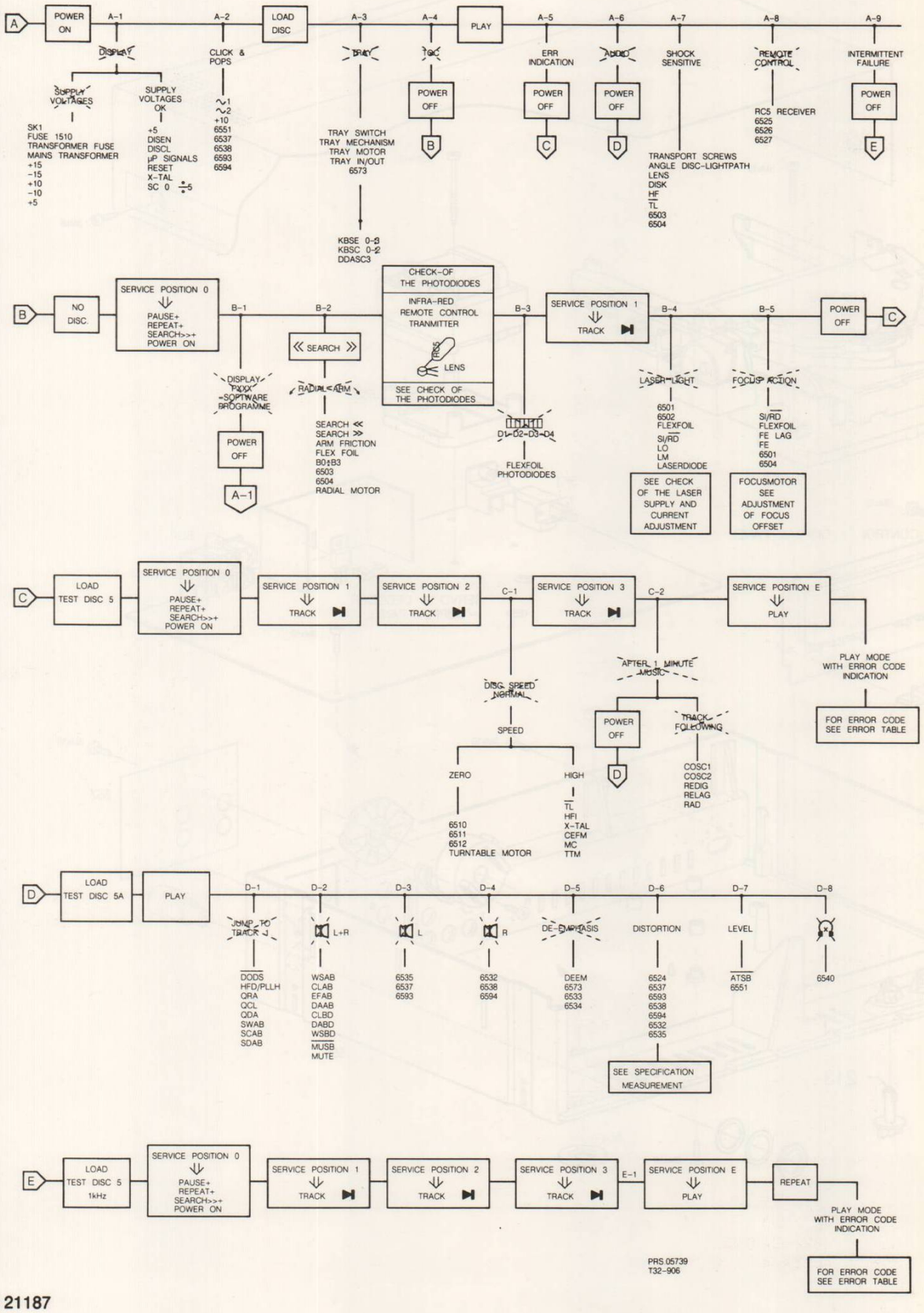


TROUBLE SHOOTING

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.



PRS.05739
T32-906

CS 21187

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

A1
µP-SIGNALS

SIGNAL	MODE	◇			REMARKS
RESET	POWER ON	100		PULSE "HIGH"	
X-TAL	STAND BY	101		4MHz	
TRAY IN	OPEN/CLOSE	83			HIGH WHEN TRAY IS CLOSING
TRAY OUT	OPEN/CLOSE	83			LOW WHEN TRAY IS OPENING
$\overline{ATSB}$	PLAY,SEARCH ➤ OR SEARCH ➤	89		"LOW"	LOW DURING SEARCH
$\overline{MUTE}$	PLAY,NEXT TRACK OR PREVIOUS TRACK	67		PULSE "LOW"	LOW DURING TRACK JUMPING

MDA.01779
T-08 903

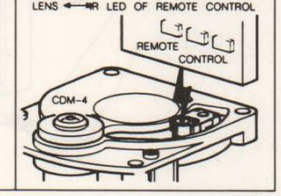
B2
B0,B1,B2,B3 SIGNALS

SIGNAL	MODE	◇			REMARKS
B0	SERVICE POSITION 0 OR 1: SEARCH ≫	36		"LOW"	
	SERVICE POSITION 0 OR 1: SEARCH ≪	36		"LOW"	
B1	SERVICE POSITION 0 OR 1: SEARCH ≫	34		"HIGH"	
	SERVICE POSITION 0 OR 1: SEARCH ≪	34		"HIGH"	
B2	SERVICE POSITION 0 OR 1: SEARCH ≫	33		"LOW"	
	SERVICE POSITION 0 OR 1: SEARCH ≪	33		"HIGH"	
B3	SERVICE POSITION 0 OR 1: SEARCH ≫	32		"HIGH"	
	SERVICE POSITION 0 OR 1: SEARCH ≪	32		"HIGH"	

MDA.01386
T-08 823

B3
CHECK OF THE PHOTODIODES

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER ON	4 6 7 8	–	–	SEE DRAWING 38314A12	SIGNAL DEPENDS ON DISTANCE LENS ⟷ IR LED OF REMOTE CONTROL



MDA.01378
T-08 824

B4
CHECK OF LASER SUPPLY (WITH DEMOUNTED CDM AND ADDITIONAL CIRCUIT)

STEP	SIGNAL	MODE	◇				REMARKS
1	LO	SERV. POS. 2	9 V	–	1.8<V<2.3	–	Si=1 21 GREEN LED 33 to LO to LM 18 to ⊥ SK LITTLE LIGHT CONNECTED DIRECTLY TO PANEL
	LM	SK	11 V	–	170<mV<220	–	
2	LO	SERV. POS. 2	9 V	–	1.8<V<2.3	–	Si=1 21 GREEN LED 33 to LO to LM 18 to ⊥ SK LITTLE LIGHT CONNECTED DIRECTLY TO PANEL
	LM	SK	11 V	–	170<mV<220	–	
3	LO	POWER ON	9 V	–	0V ± 0.2V	–	A K NO LIGHT Si=0 21

MDA.01379
T-08 824

B4
LASER CURRENT ADJUSTMENT

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER OFF	11 Ω GND	R3520	1k	–	PRE-ADJUSTMENT OHMIC VALUE
2	EYE-PATTERN HF	TEST DISC 5 PLAY	PIN 32 DECODER A (SAA7310) 0V GND	–	–	SEE DRAWING 37017B8	IF NO SIGNAL SEE: "START UP PROCEDURE"
3	LASER CURRENT ≙ VOLTAGE ACROSS R3501	TEST DISC 5 PLAY TRACK 1	1 V 2	R3520	50mV DC	–	HIGH-OHMIC MEASUREMENT

MDA.01778
T28/901

B5
ADJUSTMENT OF FOCUS-OFFSET

STEP	SIGNAL	MODE	◇				REMARKS
1	–	POWER ON	–	R3569	–	–	ADJUST FOR OPTICAL MID-POSITION
2	FE LAG	PLAY TEST DISC 5 TRACK 1	27	R3569	400mV ±40mV DC	–	FINE ADJUSTMENT

MDA.01381
T-08 824

B5
FOCUS ACTION

SIGNAL	MODE	◇			REMARKS
SI/$\overline{RD}$	SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	21		PULSE "LOW"	SEE DRAWING: MDA.01403 NO DISC ON TURNTABLE
FE	SERVICE POSITION 1 WHEN REPEATING START UP PROCEDURE	26			SEE DRAWING: MDA.01413 NO DISC ON TURNTABLE
FE-LAG	TEST DISC 5A	27			SEE: ADJUSTMENT OF FOCUS-OFFSET

MDA.01780
T28/901

C1
HIGH SPEED DISC ROTATION

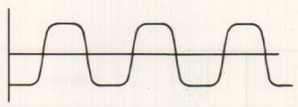
SIGNAL	MODE	◇			REMARKS
$\overline{TL}$	TEST DISC 5, PLAY + NEXT OR PREVIOUS	13		PULSES "LOW"	PULSES "LOW" DURING TRACK JUMPING
BSW	TEST DISC 5, PLAY	14			ONLY "HIGH" WHEN 8cm DISC (CD-SINGLE) IS PLAYED
HFI	TEST DISC 5, PLAY	65			SEE DRAWING: 37017B8
X-tal	TEST DISC 5A, PLAY OR SERVICE POSITION 2	69		11.28MHz	IF THIS FREQUENCY DEVIATES CHECK X-OUT ON FILTER-B
MC	TEST DISC 5, PLAY	81			SEE DRAWING: 38849A12
TTM-	TEST DISC 5A, PLAY OR SERVICE POSITION 2	16	APPROX -1V		

MDA.01781
T28/901

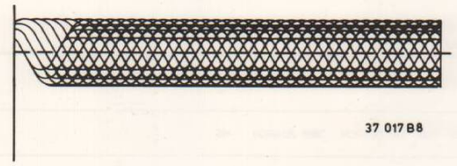
C2
TRACK FOLLOWING

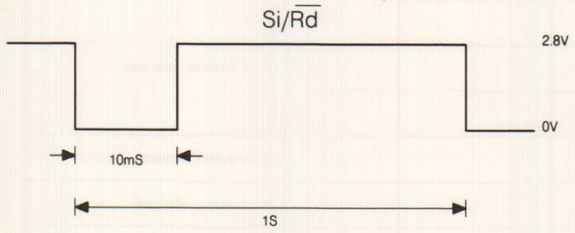
SIGNAL	MODE	◇			REMARKS
RE dig	TEST DISC 5, PLAY	37		ACTIVITY	
RE lag	TEST DISC 5, PLAY OR SERVICE POSITION 3	41	APPROX 2.5V DC		
C osc1	TEST DISC 5, PLAY OR SERVICE POSITION 3	30		650Hz	
C osc2	TEST DISC 5, PLAY OR SERVICE POSITION 3	31		650Hz	

MDA.01777
T28/903



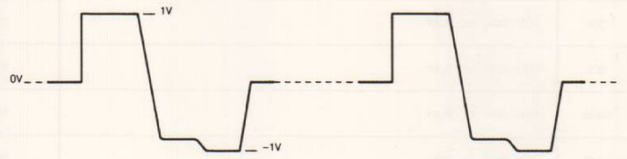
HF-SIGNAL





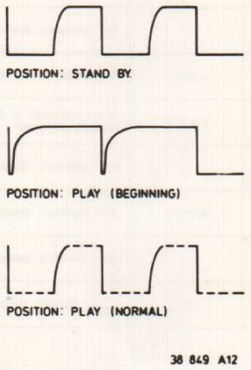
MDA.01403
T33/821

FE-SIGNAL



MDA.01413
T33/823

MC-SIGNAL



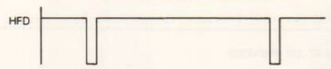
38 849 A12

$\overline{DOSD}$-SIGNAL

POSITION PLAYER	POWER ON	SERVICE POSITION 3	PLAY	SEARCH, PAUSE
$\overline{DOSD}$ SIGNAL	"LOW"	"HIGH"	"HIGH"	

MDA.01143
T12 -651

HFD, $\overline{PLLH}$-SIGNAL



MDA.00240
T07-804

D1
JUMP TO TRACK 1

SIGNAL	MODE	◇			REMARKS
$\overline{DODS}$	TEST DISC 5A, SEARCH ≫ OR SEARCH ≪	19			SEE DRAWING: MDA.01143
$\overline{PLLH}$	TEST DISC 5A: TRACK 15, PLAY	23		PULSES "LOW"	SEE DRAWING: MDA.00240 WHEN THE DISC IS SLOWLY BRAKED BY HAND
QRA	TEST DISC 5A, PLAY	75			SEE DRAWING: MDA.00453
QDA	TEST DISC 5A, PLAY	77			
QCL	TEST DISC 5A, PLAY	76			
SWAB	TEST DISC 5A, PLAY	78			SEE DRAWING: MDA.00239
SCAB	TEST DISC 5A, PLAY	79			SEE DRAWING: MDA.00239
SDAB	TEST DISC 5A, PLAY	80			SEE DRAWING: MDA.00239

MDA.02021
T28/905

D2
NO AUDIO OUTPUT LEFT + RIGHT

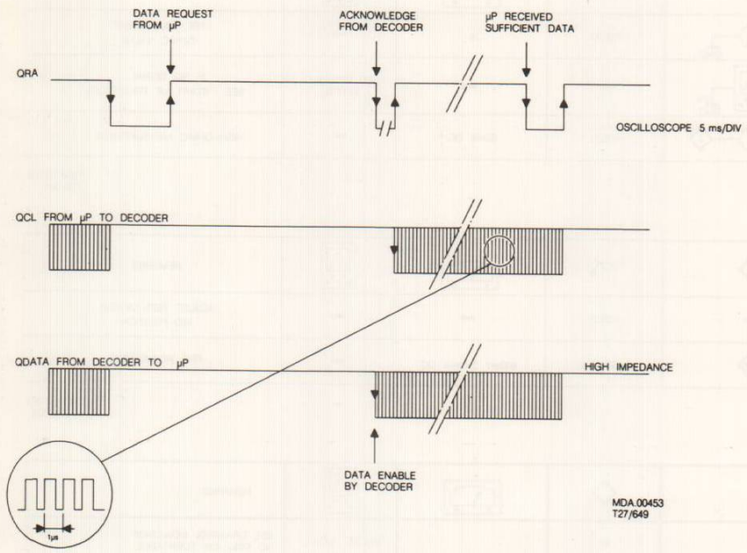
SIGNAL	MODE	◇			REMARKS
WSAB	DISC. PLAY	71			SEE DRAWING: 38847C12
CLAB	DISC. PLAY	72			SEE DRAWING: 38847C12
DAAB	DISC. PLAY	73		ACTIVITY	SEE DRAWING: 38847C12
EFAB	TEST DISC 5A	74		PULSES	WHEN THE DISC IS SLOWLY BRAKED BY HAND
CLBD	DISC. PLAY	87			SEE DRAWING: 38848C12
DABD	DISC. PLAY	86		ACTIVITY	SEE DRAWING: 38848C12
WSBD	DISC. PLAY	85			SEE DRAWING: 38848C12
$\overline{MUSB}$	DISC. PLAY + NEXT OR PREVIOUS	90		"LOW"	"LOW" DURING TRACK JUMPING

MDA.01782
T28/901

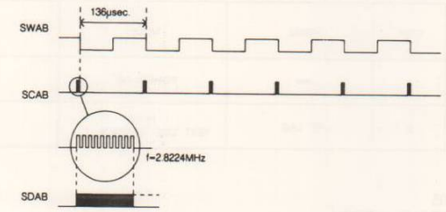
DAC IC

SIGNAL	MODE	◇			REMARKS
OUTPUT OF OP-AMP	DISC. PLAY	94		LF SIGNAL	LEFT CHANNEL
OUTPUT OF OP-AMP	DISC. PLAY	95		LF SIGNAL	RIGHT CHANNEL

MDA.01392
T-08 823

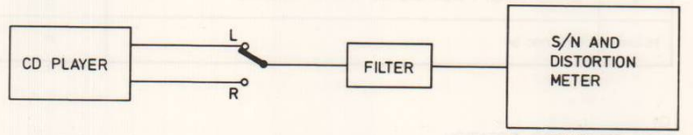


MDA.00453
T27/649



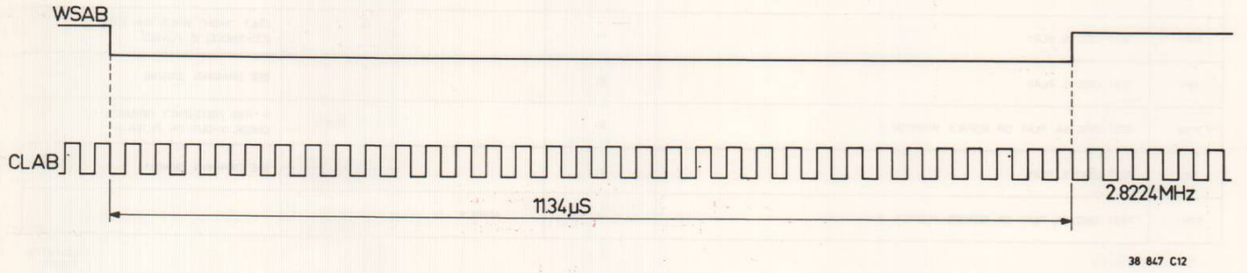
MDA.00239
T12/638

CD450

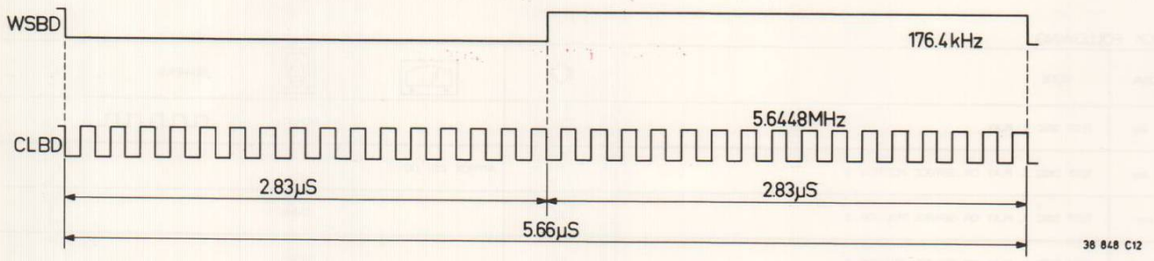


e.g. SOUND TECHNOLOGY ST 1700B

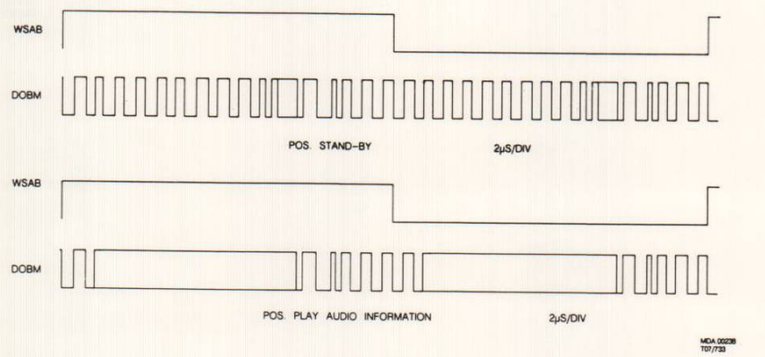
30 459 A12



38 847 C12



38 848 C12



MDA.00238
T07/733

D5
DEEM CIRCUIT

Signal	Mode	◇			Remarks
DEEM	Test disc 5A track 14 PLAY track 15 PLAY	84		"low" "high"	See testpoint 92 and 91 on DEEM circuit
Testpoint 92	Test disc 5A track 14	92		LF signal	
Testpoint 92	Test disc 5A track 15	92		No signal	
Testpoint 91	Test disc 5A track 14	91		LF signal	
Testpoint 91	Test disc 5A track 15	91		No signal	

T-22255N

D6
SPECIFICATIONS MEASUREMENT

Signal	Mode	◇			Remarks
BU2-L	Test disc 3, play total harmonic distorsion	filter output	See spec.		See drawing 30459A12
BU2-R	Test disc 3, play total harmonic distorsion	filter output	See spec.		See drawing 30459A12
BU2-L	Test disc 3, play signal-to-noise ratio	filter output	See spec.		See drawing 30459A12
BU2-R	Test disc 3, play signal-to-noise ratio	filter output	See spec.		See drawing 30459A12

T-22255O

ERROR CODE INDICATION TABLE
See also trouble shooting

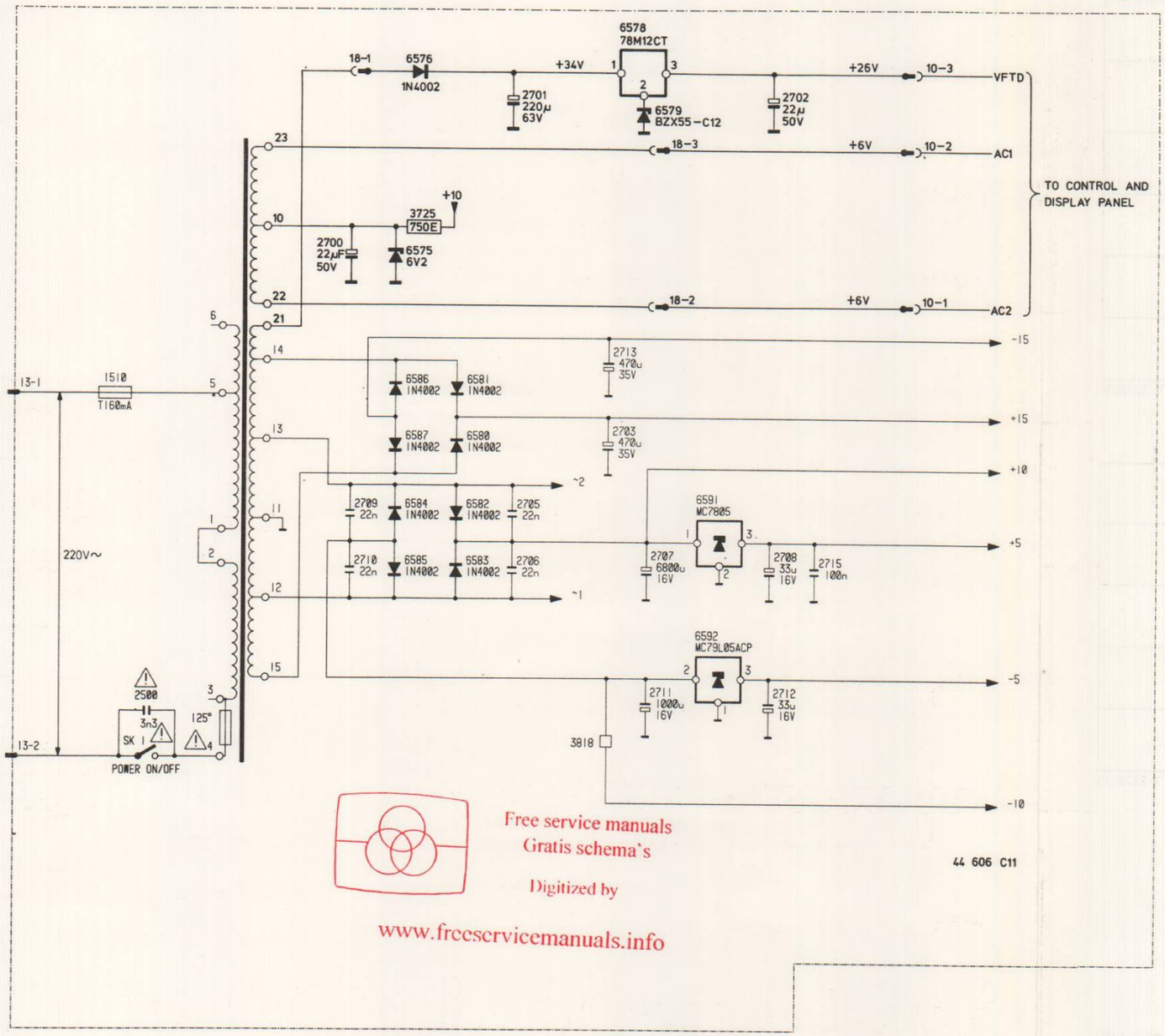
System errors

Indication	Cause	Check
Er 02	No $\overline{TL}$ pulse at start-up	$\overline{Si}$, Sc, RD, Photodiode signal processor
		$\overline{TL}$, HF, CD disc present
Er 03	No lead-in track found	CD disc, radial arm position, REdig, Radial error processor
Er 04	Too many $\overline{TL}$ pulses in PLAY	CD disc, $\overline{HFD}$
Er 05	$\overline{TL}$ pulse > 50 msec. in PLAY	CD disc, HF in, photodiodes
Er 06	No $\overline{TL}$ pulse within 0.5 sec. during track jumping	RE-lag circuit
Er 07	Subcoding error during PLAY	HF
Er 08	TOC error	CD disc, turntable motor control, radial arm position

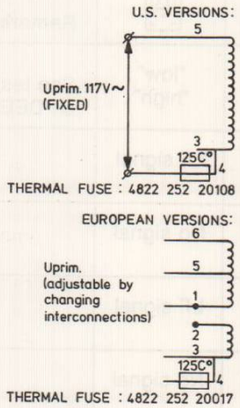
Operating errors

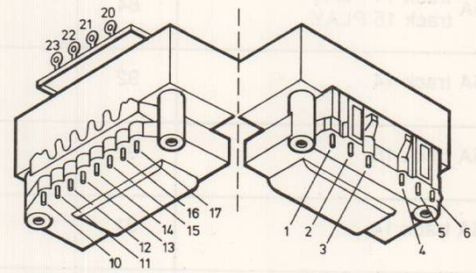
Er 30 "NEXT" key operated during the last track, with "REPEAT" turned off.
Er 31 "PREVIOUS" key operated during the first track, with "REPEAT" turned off.
Er 32 Index selected before a track has been selected.
Er 33 The selected index number does not exist on this disc.
Er 34 Programme survey requested; no programme present.
Er 35 The programme memory is full.
Er 36 The progammed track is not present on this CD disc.
Er 37 The selected track is not present on this CD disc.
Er 60 End of the "FAST FORWARD" search motion.
Er 61 End of the "FAST REVERSE" search motion.

POWER SUPPLY



TRANSFORMER CONNECTIONS (not /31R)



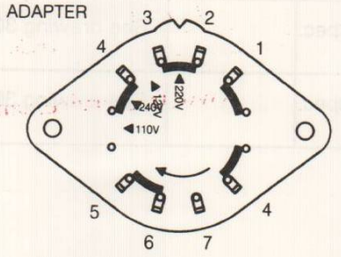


44 241 A11

Uprim. (V) ~	Winding	Inter-connect
110	4-1	3-1/5-2
127	4-6	3-1/5-2
220	4-5	1-2
240	4-6	1-2

VOLTAGE SELECTOR (only /31R)

VOLTAGE ADAPTER



REAR VIEW

CONNECTIONS INSIDE VOLTAGE ADAPTER

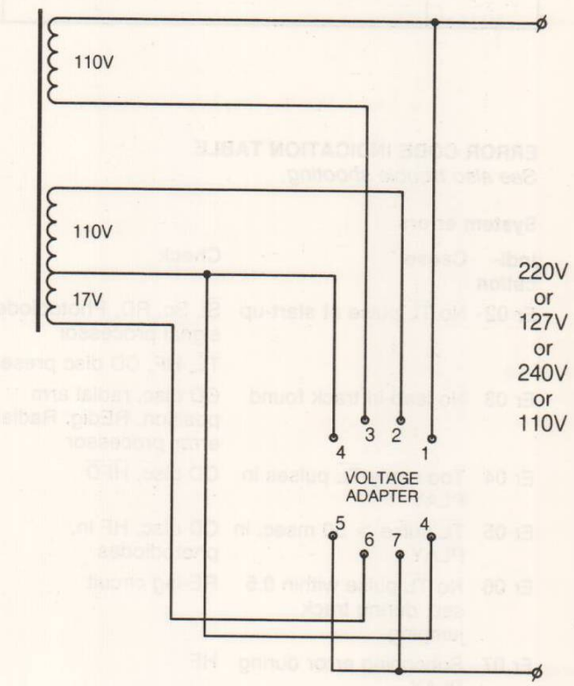
A

B

C

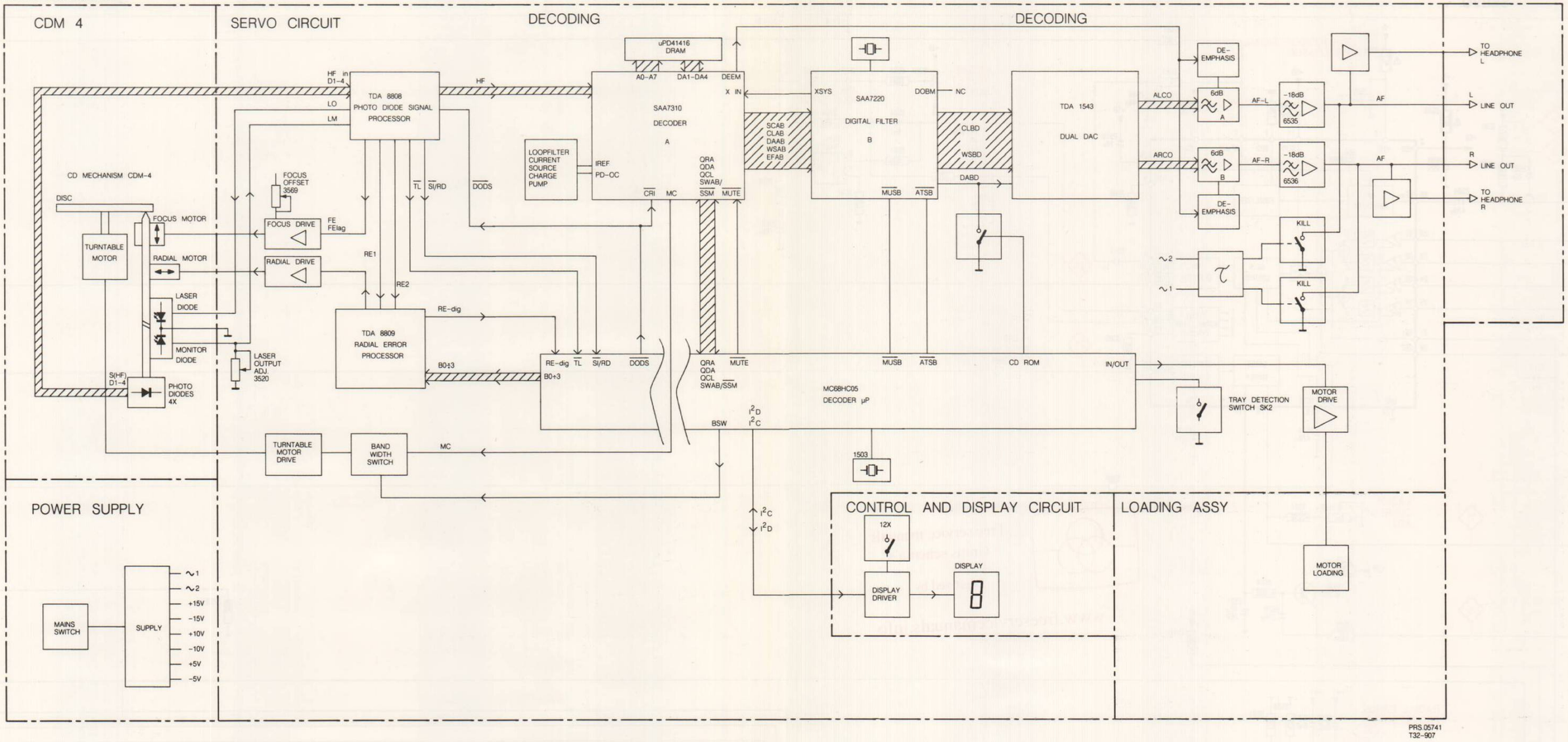
D

TRANSFORMER PRIMAIRY CIRCUIT



MDA.01601
T28/840

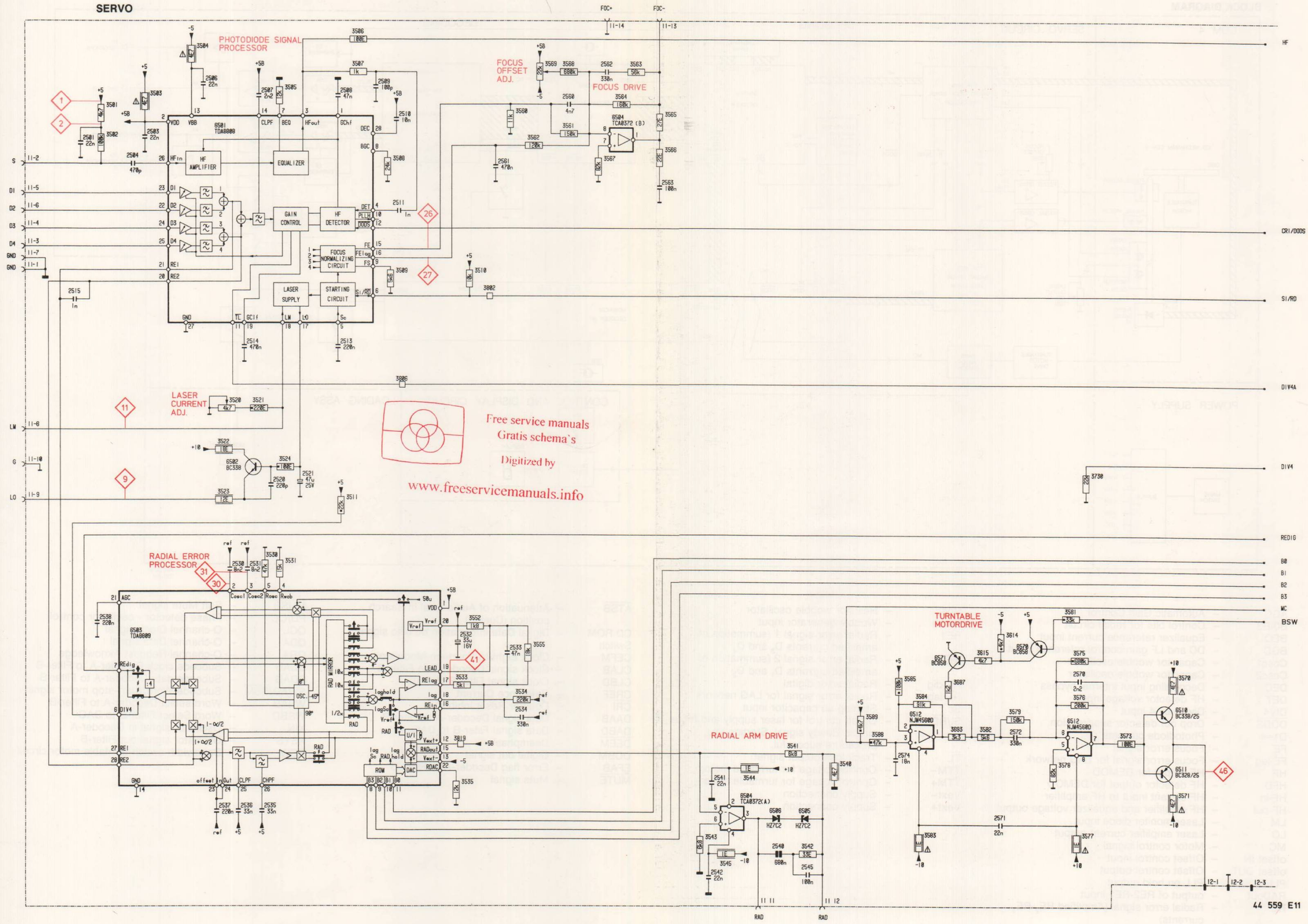
BLOCK DIAGRAM



AGC – Automatic Gain Control
B0-B3 – Control bits for radial circuit
BEQ – Equalizer reference current input
BGC – DC and LF gain control reference input
Cosc1 – Capacitor wobble oscillator
Cosc2 – Capacitor wobble oscillator
DEC – Decoupling input internal bypass
DET – HF detector voltage input
DIV4 – Divide by 4 input
$\overline{DODS}$ – Drop out detector suppression
D1÷4 – Photodiode currents
FE – Focus error signal
FE lag – Focus error signal for LAG network
HF – HF output for DEMOD
HFD – HF detector output for DEMOD
HF-in – HF current input to HF amplifier
HF-out – HF amplifier and equalizer voltage output
LM – Laser monitor diode input
LO – Laser amplifier current output
MC – Motor control signal
offset IN – Offset control input
offset OUT – Offset control output
PLLH – PLL on hold output
RADout – output of RE2-RE1 input
RE – Radial error signal (Amplified RE_2-RE_1 currents)
Rosc – Resistor wobble oscillator
Rwob – Wobble generator input
RE1 – Radial error signal 1 (summation of amplified currents D_3 and D_4
RE2 – Radial error signal 2 (summation of amplified currents D_1 and D_2
RE dig – Radial error digital
RE lag – Radial error signal for LAG network
Sc – Starting up capacitor input
Si/RD – On/off control for laser supply and focus circuit. Ready signal, Starting up procedure succesful.
$\overline{TL}$ – Track loss output signal
TTM– – Control voltage for turntable motor
TTM+ – Control voltage for turntable motor
Vext– – Supply connection
Vext+ – Supply connection

$\overline{ATSB}$ – Attenuation of Audio level in Search position (Cueing)
CD ROM Switch – Digital Data information on disc signal
CEFM – Clock Eight-to-Fourteen Modulator
CLAB – Clock signal Decoder-A to Filter-B
CLBD – Clock signal Filter-B to DAC
$\overline{CREF}$ – Reference Current
$\overline{CRI}$ – Counter Reset Inhibit
DAAB – Data signal Decoder-A to Filter-B
$\overline{DABD}$ – Data signal Filter-B to DAC
$\overline{DEEM}$ – Deemphasis
DOBM – Digital out signal
$\overline{EFAB}$ – Error flag Decoder-A to Filter-B
$\overline{MUTE}$ – Mute signal
$\overline{MUSB}$ – Soft Mute signal
PD/OC – Phase detector - oscillator control
QCL – Q-channel Clock signal
QDA – Q-channel Data signal
QRA – Q-channel Request Aknowledge
SCAB – Subcode clock Decoder-A to Filter-B
SDAB – Subcode data Decoder-A to Filter-B
SWAB/$\overline{SSM}$ – Subcode Word/Start-stop motor signal
WSAB – Word select Decoder-A to Filter-B
WSBD – Word Select Filter-B to DAC
XIN – Oscillator signal in Decoder-A
XSYS – Oscillator signal out Filter-B
BSW – Bandwidth switch turntable motor circuit

SERVO



44 559 E11

CS 21193

MAIN PANEL

101	D10	124	D 7	143	B 5	162	F 2	185	F 2	206	F 7	2506	E 8	2535	D10	2574	G 8	2622	F 1	2659	E 3	2704	A 4	3505	E 9	3543	F10	3571	G 6	3605	D 5	3628	F 1	3650	D 2	3675	B 4	3709	G 8	3730	G 5	3818	B 6	6512	G 7	6550	E 1	6576	D 6	6597	B 4
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103	E10	126	E 7	145	E 5	164	D 3	187	G 2	208	E 4	2508	E 9	2537	D 9	2601	D 4	2624	G 2	2661	D 3	2706	B 6	3507	E 9	3545	G10	3574	D 5	3607	D 6	3630	F 2	3652	D 3	3680	D 3	3687	G 8	3711	E 1	3732	B 2	3820	F10	6522	E 5	6552	C 5	6578	G 4	BU-1	A10
104	E10	127	E 7	146	C 4	165	D 3	188	G 3	209	F10	2509	E 9	2538	D 9	2602	D 4	2625	E 9	2662	C 3	2707	B 6	3508	E 8	3550	D 7	3575	G 8	3609	F 4	3631	F 3	3653	D 3	3687	G 8	3712	E 1	3750	B 1	3821	D 8	6523	E 4	6553	C 5	6579	D 6	BU-2	A 1
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121	B 7	140	F 5	159	D 5	182	B 4	202	E 3	2503	E 9	2532	D 9	2570	G 7	2617	D 1	2657	C 4	2700	C 7	3502	F 9	3536	D 5	3568	D 8	3601	D 5	3625	F 1	3646	G 5	3672	B 3	3706	B 3	3727	B 6	3815	F 3	6508	E 8	6542	E 1	6573	D 2	6594	B 4		
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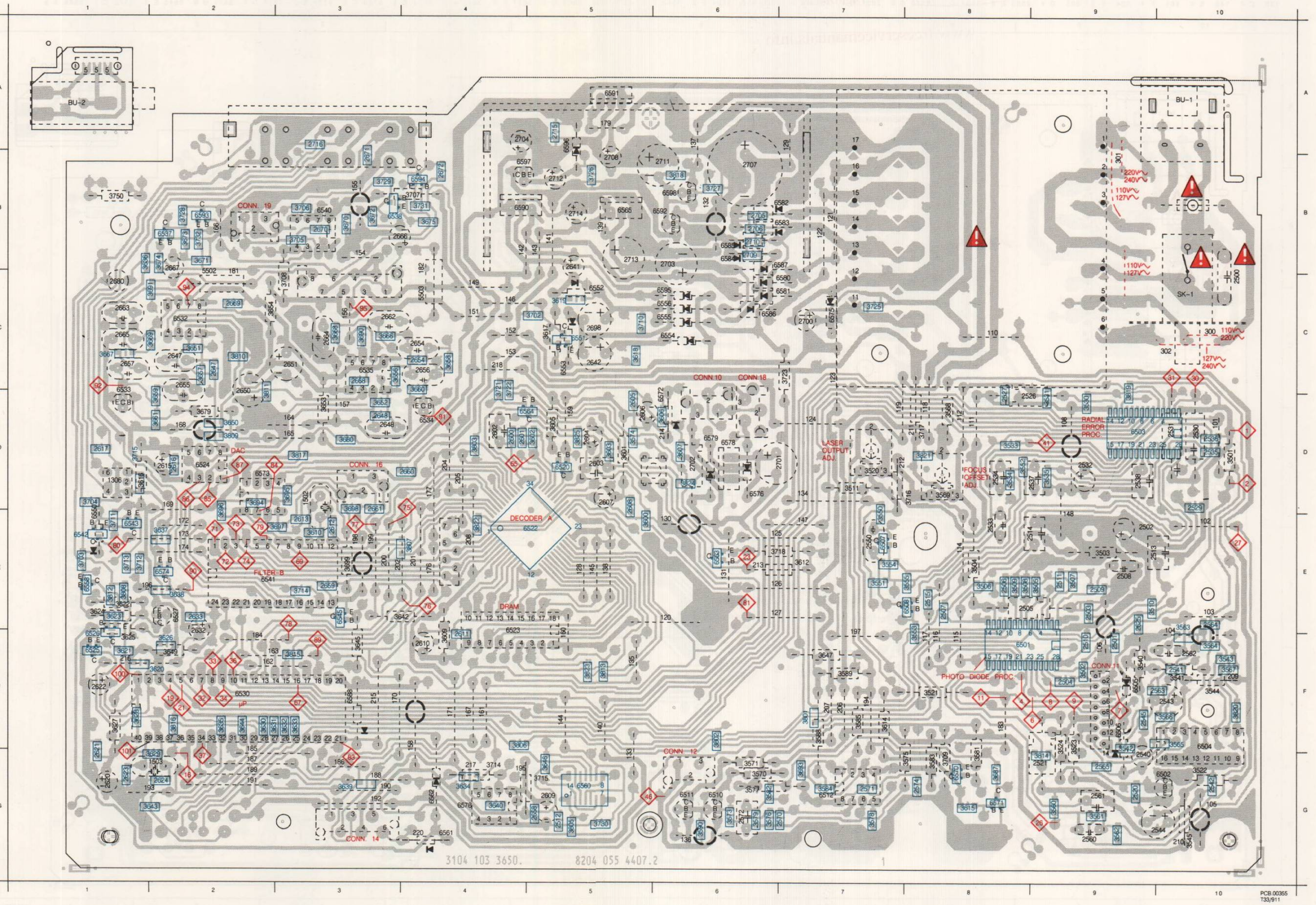

MAIN PANEL

101	D10	124	D 7	143	B 5	162	F 2	185	F 2	206	F 7	2506	E 8	2535	D10	2574	G 8	2622	F 1	2659	E 3	2704	A 4	3505	E 9	3543	F10	3571	G 6	3605	D 5	3628	F 1	3650	D 2	3675	B 4	3709	G 8	3730	G 5	3818	B 6	6512	G 7	6550	E 1	6576	D 6	6597	B 4
102	E10	125	E 7	144	F 5	163	F 3	186	G 3	207	F 7	2507	E 8	2536	D10	2600	D 4	2623	G 1	2660	D 4	2705	B 6	3506	E 8	3544	F10	3573	G 6	3606	D 6	3629	G 2	3651	C 2	3679	D 2	3710	C 5	3731	B 4	3819	C 9	6520	D 5	6551	C 5	6578	D 6	6598	B 6
103	E10	126	E 7	145	E 5	164	D 3	187	G 2	208	E 4	2508	E 9	2537	D 9	2601	D 4	2624	G 2	2661	D 3	2706	B 6	3507	E 9	3545	G10	3574	D 5	3607	D 6	3630	F 2	3652	D 3	3680	D 3	3711	E 1	3732	B 2	3820	F10	6522	E 5	6552	C 5	6578	G 4	BU-1	A10
104	E10	127	E 7	146	C 4	165	D 3	188	G 3	209	F10	2509	E 9	2538	D 9	2602	D 4	2625	E 9	2662	C 3	2707	B 6	3508	E 8	3550	D 7	3575	G 8	3609	F 4	3631	F 3	3653	D 3	3687	G 8	3712	E 1	3750	B 1	3821	D 8	6523	E 4	6553	C 5	6579	D 6	BU-2	A 1
105	G10	128	E 5	147	E 7	166	B 2	189	G 2	210	G10	2510	F 9	2540	G 9	2603	D 5	2632	F 2	2663	C 1	2708	B 5	3509	E 8	3551	E 7	3576	G 6	3610	E 3	3632	F 3	3654	C 2	3690	C 3	3713	E 1	3801	F 7	3822	E 4	6524	D 2	6554	C 6	6580	C 7	SK-1	C10
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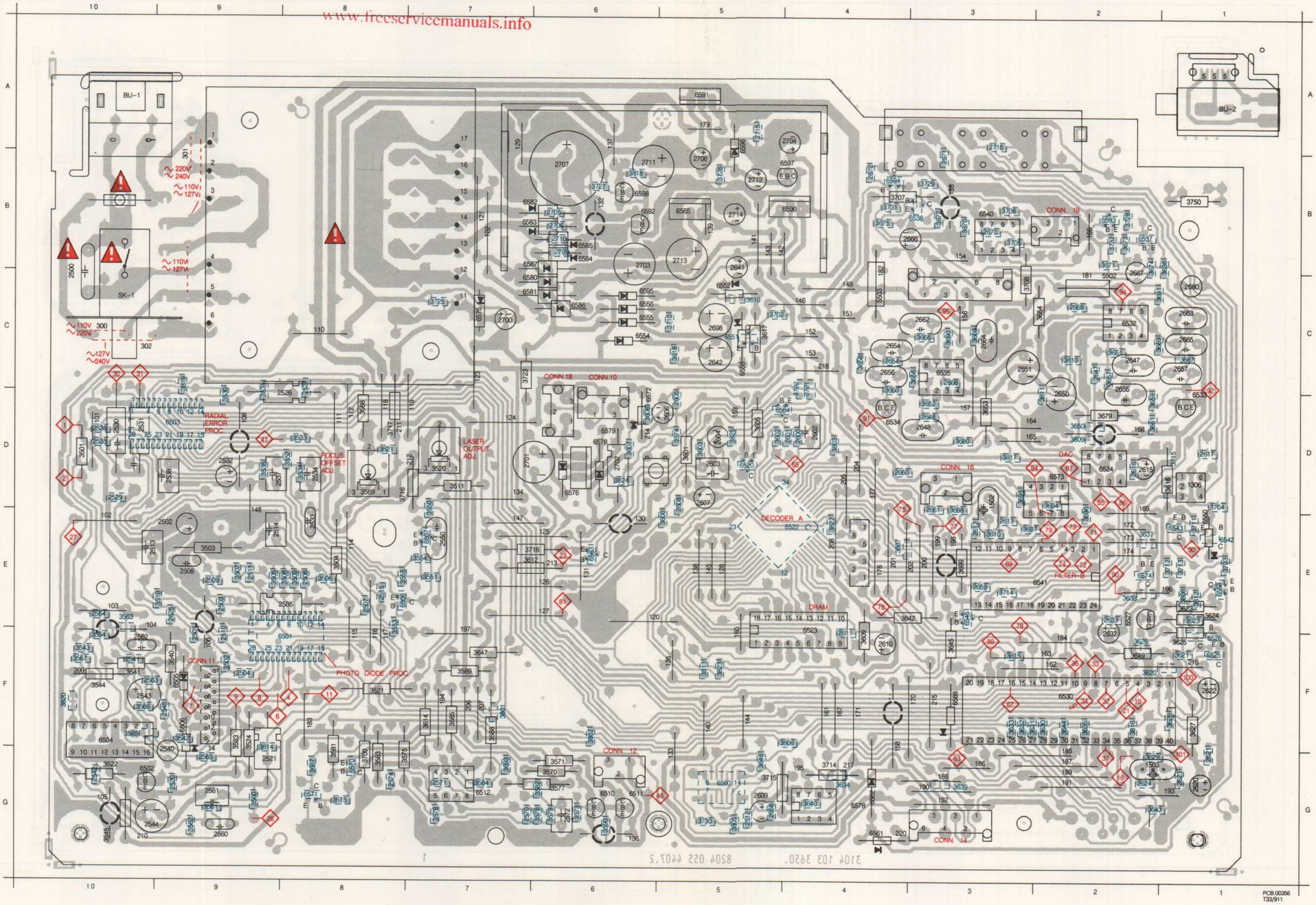
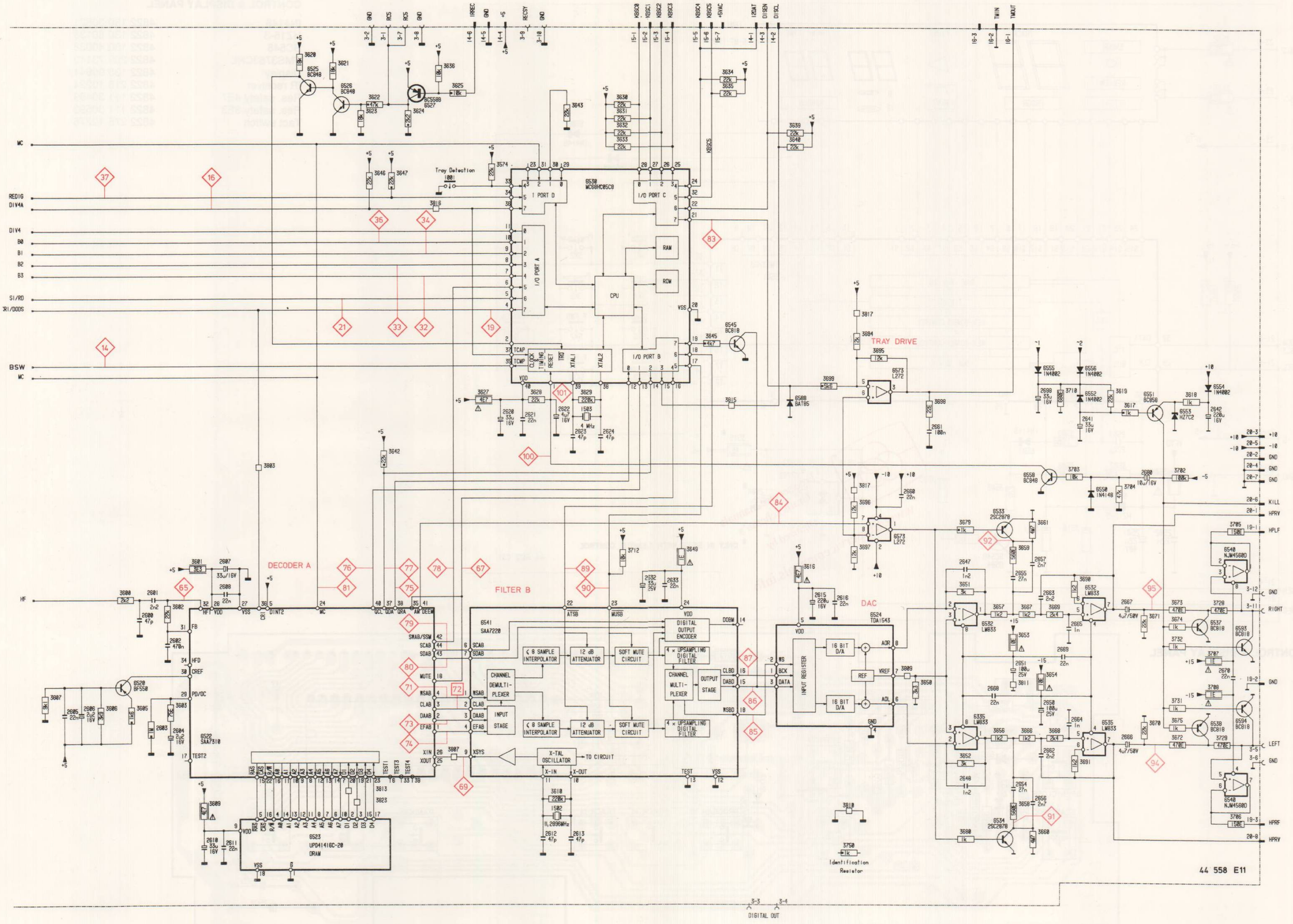
121	B 7	140	F 5	159	D 5	182	B 4	202	E 3	2503	E 9	2532	D 9	2570	G 7	2617	D 1	2656	C 4	2701	D 7	3502	F 9	3540	F 9	3568	D 8	3601	D 5	3625	F 1	3646	G 5	3672	B 3	3706	B 3	3727	B 6	3815	F 3	6508	E 8	6542	E 1	6573	D 2	6594	B 4		
122	B 7	141	B 5	160	E 5	183	F 8	204	D 4	2504	F 9	2533	E 8	2571	G 7	2620	G 1	2657	C 1	2702	D 6	3503	E 9	3541	F10	3569	D 8	3602	D 5	3626	F 2	3647	F 7	3673	B 2	3707	B 4	3728	B 2	3816	F 2	6510	G 6	6543	E 1	6574	E 2	6595	C 6		
123	C 7	142	B 4	161	F 4	184	F 2	205	D 4	2505	E 8	2534	D 8	2572	G 6	2621	G 1	2658	G 5	2703	B 6	3504	E 8	3542	F 9	3570	G 6	3603	D 5	3627	F 1	3649	F 2	3674	B 2	3708	C 3	3729	B 3	3817	D 3	6511	G 6	6545	E 3	6575	C 7	6596	A 5		

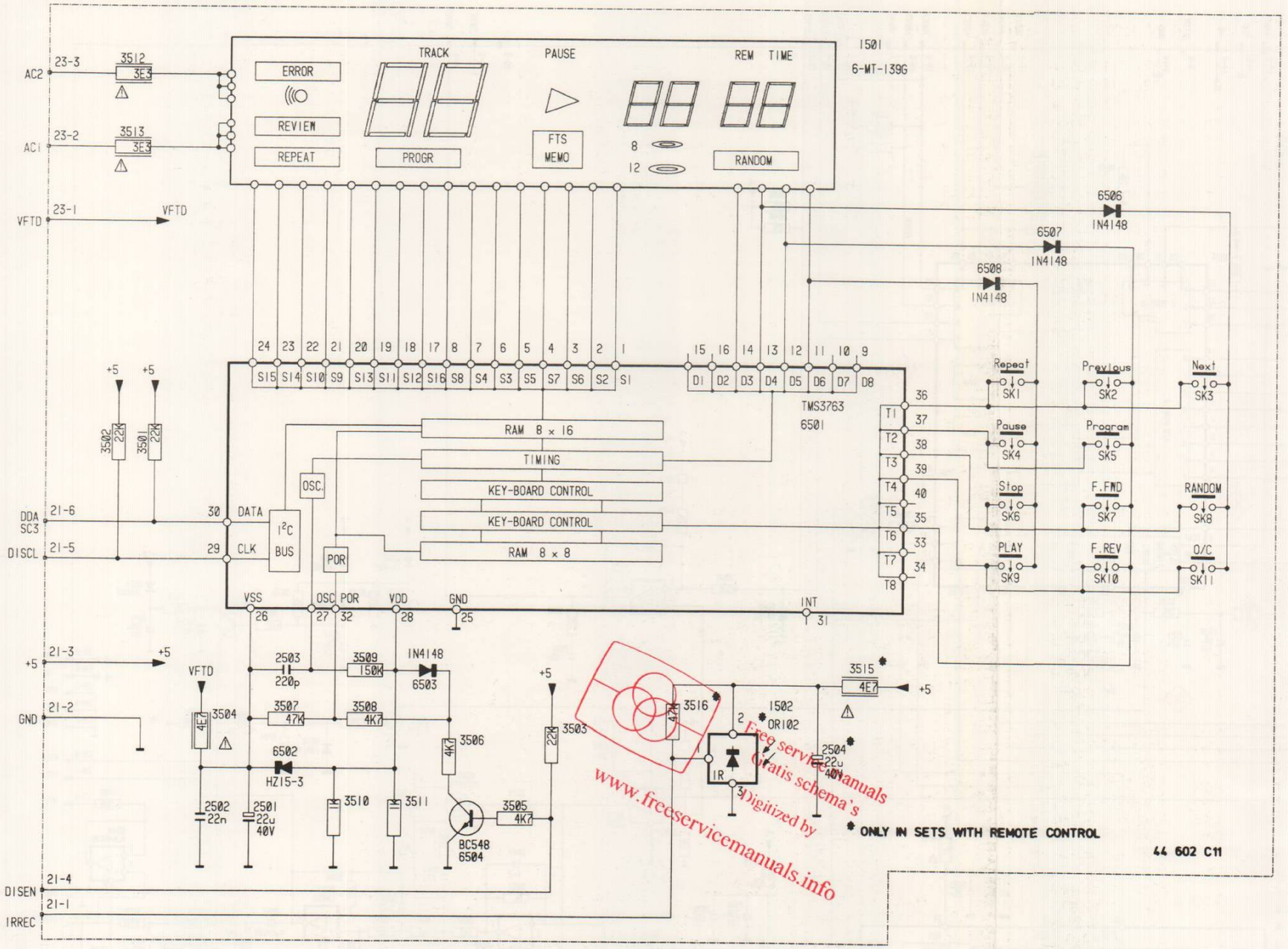


PCB 00356
T33/911

DECODING



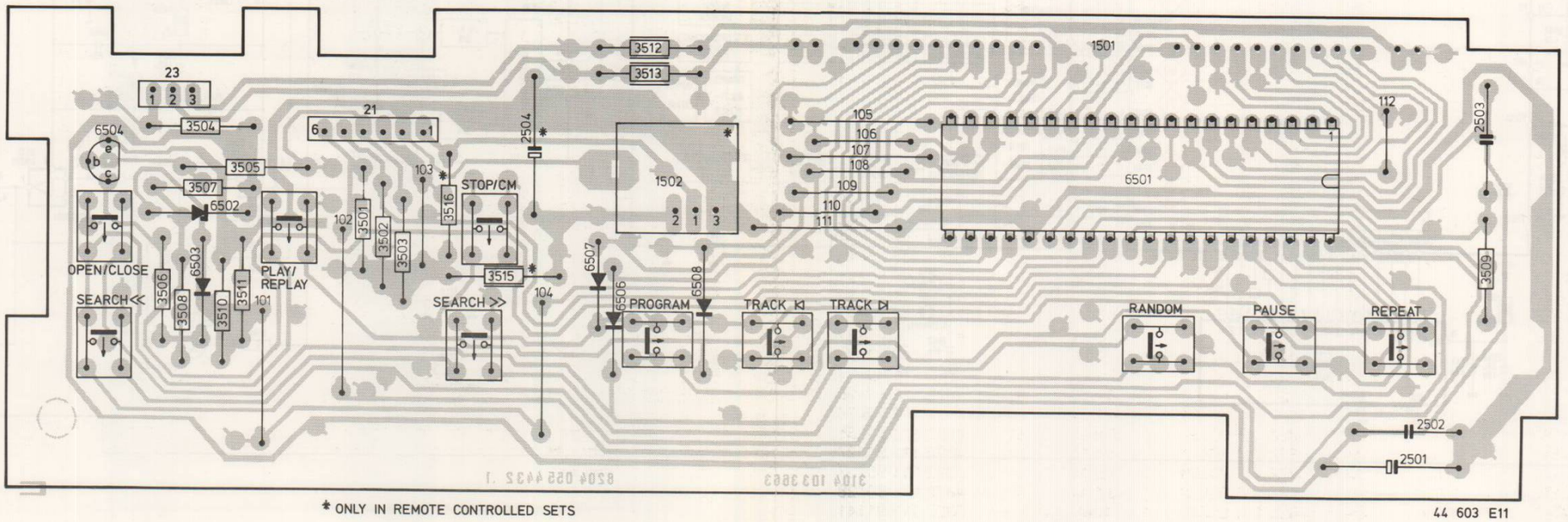
CONTROL & DISPLAY CIRCUIT DIAGRAM



ELECTRICAL PARTSLIST
CONTROL & DISPLAY PANEL

IN4148	4822 130 30621
HZ15-3	4822 130 80138
BC548	4822 130 40938
TMS3763CNL	4822 209 73149
Display	4822 130 90641
IR receiver	4822 218 10224
Res. safety 4E7	4822 111 30499
Res. safety 3E3	4822 111 30593
Tact switch	4822 276 12276

CONTROL & DISPLAY PANEL

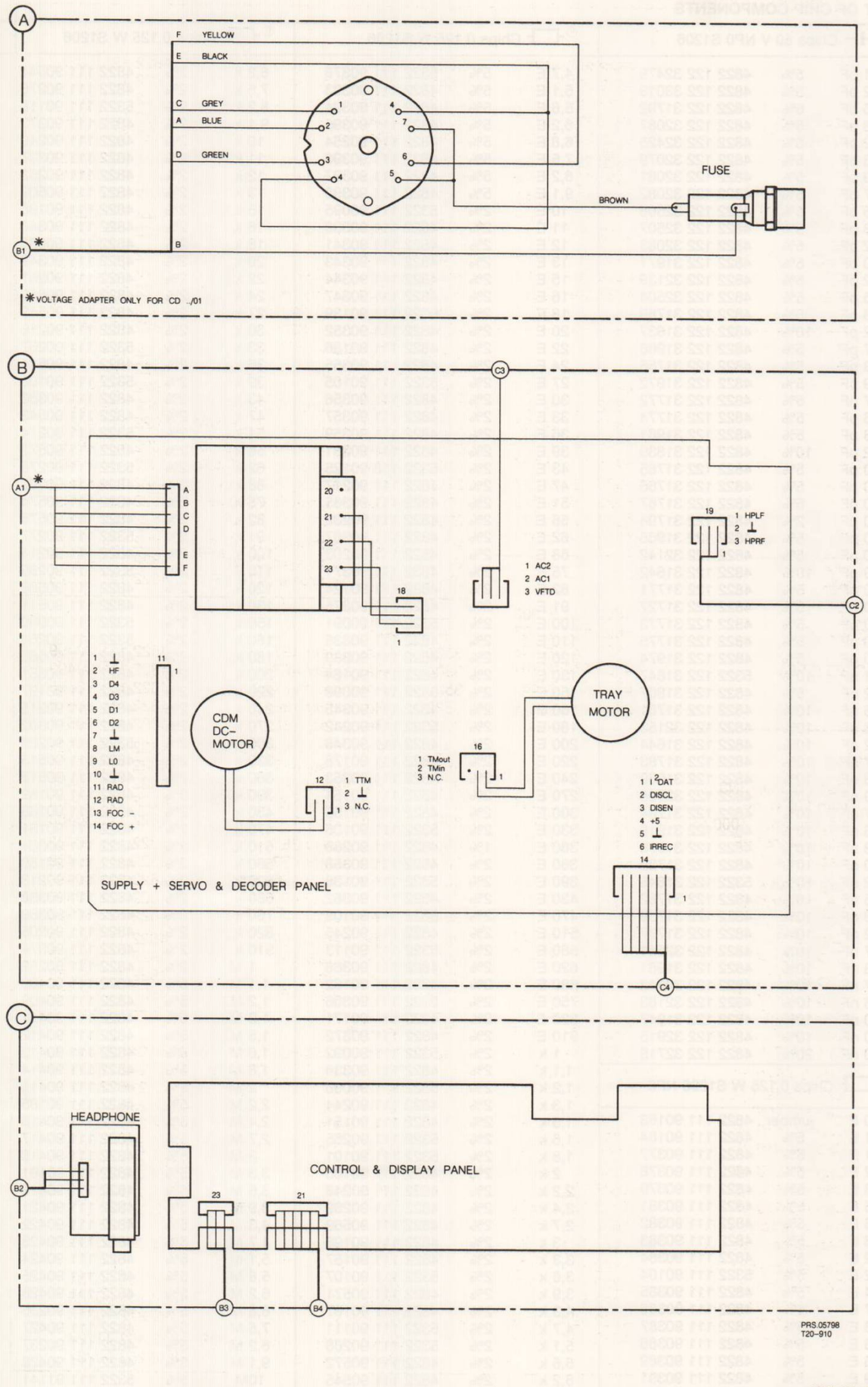


ELECTRICAL PARTSLIST MAIN PANEL

MC7812CT		4822 209 81726
LM833N		4822 209 83163
L272MH		4822 209 70705
MC68HC05C8P/581		4822 209 60287
MC79L05ACPRE		4822 209 73233
MN4264-15		4822 209 70422
NJM4560D		4822 209 83274
SAA7220		4822 209 72545
SAA7310GP/03		4822 209 60289
TCA0372DP2		4822 209 72587
TDA1543 (SEL)		4822 209 60288
TDA8808T/C3		4822 209 73234
TDA8809T/C2		4822 209 73235
TY40408		4822 209 71579
BC328		4822 130 44104
BC338		4822 130 44121
BC558B		4822 130 44197
BC818		4822 130 42675
BC818-25		4822 130 42696
BC848		4822 130 61207
BC858		5322 130 42012
BF550		4822 130 42131
2SC2878		4822 130 42022
BZX55-C15		4822 130 81086
BZV85-C6V2		4822 130 34167
BAT85		4822 130 31983
BZX55-C7V5 (TEG)		4822 130 81101
1N4002		5322 130 30684
1N4148		4822 130 30621
2500	Cap ceramic 3N3	4822 122 40327
2508	Cap foil 47 nF	5322 121 42491
2511	Cap ceramic 1000 pF	4822 122 31746
2513	Cap foil 220 nF	4822 121 42245
2514	Cap foil 470 nF	4822 121 51252
2515	Cap ceramic 1000 pF	4822 122 31746
2521	Cap electrolytic 47 µF	4822 124 22027
2530	Cap foil 8.2 nF	4822 121 51321
2531	Cap foil 8.2 nF	4822 121 51321
2532	Cap electrolytic 33 µF	4822 124 40272
2533	Cap foil 47 nF	5322 121 42491
2534	Cap foil 330 nF	5322 121 42661
2535	Cap ceramic 33 nF	5322 122 31848
2536	Cap ceramic 33 nF	5322 122 31848
2537	Cap foil 220 nF	4822 121 42245
2538	Cap foil 220 nF	4822 121 42245
2540	Cap bipolar 0µ68	4822 124 41583
2560	Cap foil 4N7	4822 121 51314
2561	Cap foil 470 nF	4822 121 51252
2562	Cap foil 330 nF	5322 121 42661
2572	Cap foil 330 nF	5322 121 42661
2561	Cap foil 470 nF	4822 121 51252
2602	Cap foil 470 nF	4822 121 51252
2604	Cap electrolytic 2.2 µF	4822 124 41576
2606	Cap electrolytic 2.2 µF	4822 124 41576
2607	Cap electrolytic 33 µF	4822 124 40272
2610	Cap electrolytic 33 µF	4822 124 40272
2615	Cap electrolytic 220 µF	4822 124 40196
2620	Cap electrolytic 33 µF	4822 124 40272
2622	Cap electrolytic 4.7 µF	4822 124 41577
2632	Cap electrolytic 33 µF	4822 124 40272
2641	Cap electrolytic 33 µF	4822 124 40272
2642	Cap electrolytic 220 µF	4822 124 41572
2647	Cap foil 1N2	4822 121 51309
2648	Cap foil 1N2	4822 121 51309
2650	Cap electrolytic 100 µF	4822 124 41528
2651	Cap electrolytic 100 µF	4822 124 41528
2654	Cap foil 27N	4822 121 42888
2655	Cap foil 27N	4822 121 42888
2656	Cap foil 2N7	4822 121 51312
2657	Cap foil 2N7	4822 121 51312
2662	Cap foil 2N2	4822 121 51325
2663	Cap foil 2N2	4822 121 51325
2664	Cap foil 2N2	4822 121 51324
2665	Cap foil 1N	4822 121 51324
2666	Cap electrolytic 4.7 µF	4822 124 41577
2667	Cap electrolytic 4.7 µF	4822 124 41577
2680	Cap bipolar 10 µF	4822 124 41558
2698	Cap electrolytic 33 µF	4822 124 40272
2700	Cap electrolytic 22µF 50V	4822 124 41596
2701	Cap electrolytic 220µF 63V	4822 124 40257
2702	Cap electrolytic 47µF 40V	4822 124 22806
2703	Cap electrolytic 470 µF	4822 124 41573
2707	Cap electrolytic 6800 µF	4822 124 41591
2708	Cap electrolytic 33 µF	4822 124 40272
2711	Cap electrolytic 1000 µF	4822 124 41571
2712	Cap electrolytic 33 µF	4822 124 40272
2713	Cap electrolytic 470 µF	4822 124 41573
3503	Res safety 4E7	4822 111 30499
3504	Res safety 4E7	4822 111 30499
3520	Potm trimmer 4k7	4822 101 10685
3522	Res safety 18E	4822 111 30515
3523	Res safety 12E	4822 111 30511
3569	Potm carb track 22k	4822 100 20522
3570	Res safety 4E7	4822 111 30499
3571	Res safety 4E7	4822 111 30499
3577	Res safety 1R	4822 111 30483
3583	Res safety 1R	4822 111 30483
3601	Res safety 3E3	4822 111 30593
3609	Res safety 4E7	4822 111 30499
3616	Res safety 4E7	4822 111 30499
3627	Res safety 4E7	4822 111 30499
3649	Res safety 1R	4822 111 30483
3653	Res safety 10E	4822 111 30508
3654	Res safety 10E	4822 111 30508
3707	Res safety 1R	4822 111 30483
3708	Res safety 1R	4822 111 30483

Miscellaneous

1502	Crystal 11.289600 MHz	4822 242 71349
1503	Ceram filter CSA4.00 MHz	4822 242 70831
	Remote control	4822 218 10233
	Fuse T160mA	4822 253 30009
	Fuse T300mA	4822 253 30217
	Mains switch	4822 276 11309
	Tray switch	4822 276 12523
	Mains inlet	4822 265 20291
	Cinch socket	4822 267 40766
	Fuse holder (not /31R)	4822 256 30274
	Phones socket	4822 267 30743
	Mains transformer /30R/31R/35R/40R	4822 146 30751
	Mains transformer /37R	4822 146 30789
	Voltage adaptor/31R	5322 272 10215
	Cover voltage adaptor /31R	4822 462 41124
	Fuse holder /31R	4822 256 30231



LIST OF CHIP COMPONENTS

© Chips 50 V NP0 S1206			© Chips 0,125 W S1206			© Chips 0,125 W S1206			1U
1 pF	5%	4822 122 32479	4,7 E	5%	5322 111 90376	6,8 k	2%	4822 111 90544	
1,2 pF	5%	4822 122 33013	5,1 E	5%	4822 111 90393	7,5 k	2%	4822 111 90276	
1,5 pF	5%	4822 122 31792	5,6 E	5%	4822 111 90394	8,2 k	2%	5322 111 90118	
1,8 pF	5%	4822 122 32087	6,2 E	5%	4822 111 90395	9,1 k	2%	4822 111 90373	
2,2 pF	5%	4822 122 32425	6,8 E	5%	4822 111 90254	10 k	2%	4822 111 90249	
3,3 pF	5%	4822 122 32079	7,5 E	5%	4822 111 90396	11 k	2%	4822 111 90337	
3,9 pF	5%	4822 122 32081	8,2 E	5%	4822 111 90397	12 k	2%	4822 111 90253	
4,7 pF	5%	4822 122 32082	9,1 E	5%	4822 111 90398	13 k	2%	4822 111 90509	
5,6 pF	5%	4822 122 32506	10 E	2%	5322 111 90095	15 k	2%	4822 111 90196	
6,8 pF	5%	4822 122 32507	11 E	2%	4822 111 90338	16 k	2%	4822 111 90346	
8,2 pF	5%	4822 122 32083	12 E	2%	4822 111 90341	18 k	2%	4822 111 90238	
10 pF	5%	4822 122 31971	13 E	2%	4822 111 90343	20 k	2%	4822 111 90349	
12 pF	5%	4822 122 32139	15 E	2%	4822 111 90344	22 k	2%	4822 111 90251	
15 pF	5%	4822 122 32504	16 E	2%	4822 111 90347	24 k	2%	4822 111 90512	
18 pF	5%	4822 122 31769	18 E	2%	5322 111 90139	27 k	2%	4822 111 90542	
22 pF	10%	4822 122 31837	20 E	2%	4822 111 90352	30 k	2%	4822 111 90216	
27 pF	5%	4822 122 31966	22 E	2%	4822 111 90186	33 k	2%	5322 111 90267	
33 pF	5%	4822 122 31756	24 E	2%	4822 111 90355	36 k	2%	4822 111 90514	
39 pF	5%	4822 122 31972	27 E	2%	5322 111 90105	39 k	2%	5322 111 90108	
47 pF	5%	4822 122 31772	30 E	2%	4822 111 90356	43 k	2%	4822 111 90363	
56 pF	5%	4822 122 31774	33 E	2%	4822 111 90357	47 k	2%	4822 111 90543	
68 pF	5%	4822 122 31961	36 E	2%	4822 111 90359	51 k	2%	5322 111 90274	
82 pF	10%	4822 122 31839	39 E	2%	4822 111 90361	56 k	2%	4822 111 90573	
100 pF	5%	4822 122 31765	43 E	2%	5322 116 90125	62 k	2%	5322 111 90275	
120 pF	5%	4822 122 31766	47 E	2%	4822 111 90217	68 k	2%	4822 111 90202	
150 pF	5%	4822 122 31767	51 E	2%	4822 111 90365	75 k	2%	4822 111 90574	
180 pF	2%	4822 122 31794	56 E	2%	4822 111 90239	82 k	2%	4822 111 90575	
220 pF	5%	4822 122 31965	62 E	2%	4822 111 90367	91 k	2%	5322 111 90277	
270 pF	5%	4822 122 32142	68 E	2%	4822 111 90203	100 k	2%	4822 111 90214	
330 pF	10%	4822 122 31642	75 E	2%	4822 111 90371	110 k	2%	5322 111 90269	
390 pF	5%	4822 122 31771	82 E	2%	4822 111 90124	120 k	2%	4822 111 90568	
470 pF	5%	4822 122 31727	91 E	2%	4822 111 90375	130 k	2%	4822 111 90511	
560 pF	5%	4822 122 31773	100 E	2%	5322 111 90091	150 k	2%	5322 111 90099	
680 pF	5%	4822 122 31775	110 E	2%	4822 111 90335	160 k	2%	5322 111 90264	
820 pF	5%	4822 122 31974	120 E	2%	4822 111 90339	180 k	2%	4822 111 90565	
1 nF	10%	5322 122 31647	130 E	2%	4822 111 90164	200 k	2%	4822 111 90351	
1,2 nF	5%	4822 122 31807	150 E	2%	5322 111 90098	220 k	2%	4822 111 90197	
1,5 nF	10%	4822 122 31781	160 E	2%	4822 111 90345	240 k	2%	4822 111 90215	
1,8 nF	10%	4822 122 32153	180 E	2%	5322 111 90242	270 k	2%	4822 111 90302	
2,2 nF	10%	4822 122 31644	200 E	2%	4822 111 90348	300 k	2%	5322 111 90266	
2,7 nF	10%	4822 122 31783	220 E	2%	4822 111 90178	330 k	2%	4822 111 90513	
3,3 nF	10%	4822 122 31969	240 E	2%	4822 111 90353	360 k	2%	4822 111 90515	
3,9 nF	10%	4822 122 32566	270 E	2%	4822 111 90154	390 k	2%	4822 111 90182	
4,7 nF	10%	4822 122 31784	300 E	2%	4822 111 90156	430 k	2%	4822 111 90168	
5,6 nF	10%	4822 122 31916	330 E	2%	5322 111 90106	470 k	2%	4822 111 90161	
6,8 nF	10%	4822 122 31976	360 E	1%	4822 111 90288	510 k	2%	4822 111 90364	
10 nF	10%	4822 122 31728	360 E	2%	4822 111 90358	560 k	2%	4822 111 90169	
12 nF	10%	5322 122 31648	390 E	2%	5322 111 90138	620 k	2%	4822 111 90213	
15 nF	10%	4822 122 31782	430 E	2%	4822 111 90362	680 k	2%	4822 111 90368	
18 nF	10%	4822 122 31759	470 E	2%	5322 111 90109	750 k	2%	4822 111 90369	
22 nF	10%	4822 122 31797	510 E	2%	4822 111 90245	820 k	2%	4822 111 90205	
27 nF	10%	4822 122 32541	560 E	2%	5322 111 90113	910 k	2%	4822 111 90374	
33 nF	10%	4822 122 31981	620 E	2%	4822 111 90366	1 M	2%	4822 111 90252	
47 nF	10%	4822 122 32542	680 E	2%	4822 111 90162	1,1 M	5%	4822 111 90408	
56 nF	10%	4822 122 32183	750 E	2%	5322 111 90306	1,2 M	5%	4822 111 90409	
100 nF	10%	4822 122 31947	820 E	2%	4822 111 90171	1,3 M	5%	4822 111 90411	
180 nF	10%	4822 122 32915	910 E	2%	4822 111 90372	1,5 M	5%	4822 111 90412	
220 nF	20%	4822 122 32715	1 k	2%	5322 111 90092	1,6 M	5%	4822 111 90413	
			1,1 k	2%	4822 111 90336	1,8 M	5%	4822 111 90414	
© Chips 0,125 W S1206 NP0			1,2 k	2%	5322 111 90096	2 M	5%	4822 111 90415	
			1,3 k	2%	4822 111 90244	2,2 M	5%	4822 111 90185	
0 E	jumper	4822 111 90163	1,5 k	2%	4822 111 90151	2,4 M	5%	4822 111 90416	
1 E	5%	4822 111 90184	1,6 k	2%	5322 111 90265	2,7 M	5%	4822 111 90417	
1,1 E	5%	4822 111 90377	1,8 k	2%	5322 111 90101	3 M	5%	4822 111 90418	
1,2 E	5%	4822 111 90378	2 k	2%	4822 111 90165	3,3 M	5%	4822 111 90191	
1,3 E	5%	4822 111 90379	2,2 k	2%	4822 111 90248	3,6 M	5%	4822 111 90419	
1,5 E	5%	4822 111 90381	2,4 k	2%	4822 111 90289	3,9 M	5%	4822 111 90421	
1,6 E	5%	4822 111 90382	2,7 k	2%	4822 111 90569	4,3 M	5%	4822 111 90422	
1,8 E	5%	4822 111 90383	3 k	2%	4822 111 90198	4,7 M	5%	4822 111 90423	
2 E	5%	4822 111 90384	3,3 k	2%	4822 111 90157	5,1 M	5%	4822 111 90424	
2,2 E	5%	5322 111 90104	3,6 k	2%	5322 111 90107	5,6 M	5%	4822 111 90425	
2,4 E	5%	4822 111 90385	3,9 k	2%	4822 111 90571	6,2 M	5%	4822 111 90426	
2,7 E	5%	4822 111 90386	4,3 k	2%	4822 111 90167	6,8 M	5%	4822 111 90235	
3 E	5%	4822 111 90387	4,7 k	2%	5322 111 90111	7,5 M	5%	4822 111 90427	
3,3 E	5%	4822 111 90388	5,1 k	2%	5322 111 90268	8,2 M	5%	4822 111 90237	
3,6 E	5%	4822 111 90389	5,6 k	2%	4822 111 90572	9,1 M	5%	4822 111 90428	
3,9 E	5%	4822 111 90391	6,2 k	2%	4822 111 90545	10M	5%	5322 111 91141	
4,3 E	5%	4822 111 90392							

SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
=1	Exclusive OR gate
	True/complement amplifier with high input
F.F.	Flip Flop
&	AND gate
≥1	OR gate
1	Inverter with high input

0.2W (CR 16)	≤ 220kΩ > 270kΩ	5% 10%
0.33W (CR 25)	≤ 1MΩ > 1MΩ	5% 10%
0.33W (SFR25)		5%
0.25W (VR 25)	≤ 10MΩ > 10MΩ	5% 10%
0.5W (CR 37)	≤ 1MΩ > 1MΩ	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=2,5V
b=4V
c=6,3V
d=10V
e=16V
f=25V
g=40V
h=63V
i=100V
j=125V
l=125V
m=150V
n=160V
q=200V
r=250V
s=300V
t=350V
u=400V
v=500V
w=630V
x=1000V
A=1.6V
B=6V
C=12V
D=15V
E=20V
F=35V
G=50V
H=75V
I=80V

MDA.00084
T32-735