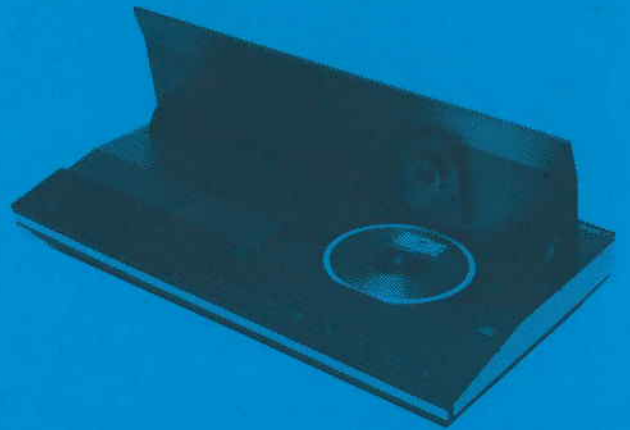


# Bang & Olufsen



## **Beogram CD4500**

Type 5171, 5172, 5173, 5174,  
5175

## **BEOGRAM CD 3500**

Type 5146-5147-5148-5149-5150

**CD-Mechanism Version II**  
**Beogram CD 4500**

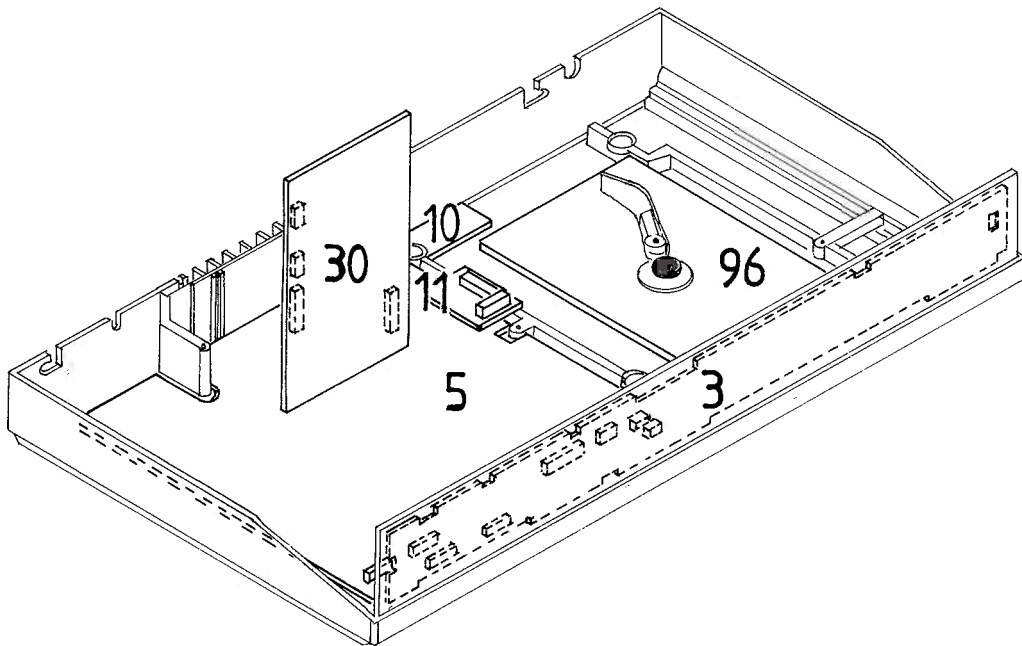
SERVICEMANVISNING  
SERVICE MANUAL



## Modules

3	Display .....	diagr. C page 2-5
5	Decoder .....	diagr. B page 2-4
10	Digital out .....	diagr. B page 2-4
11	Connections PCB .....	diagr. A page 2-2
30	Servo .....	diagr. A page 2-2
96	CD-mechanism .....	diagr. A page 2-2

CLASS 1  
LASER PRODUCT



## TECHNICAL SPECIFICATIONS

Frequency range	3-20,000 Hz $\pm$ 0.3 dB
Signal-to-noise ratio	>100 dB/110 dB A-weighted
Dynamic range	>96 dB
Harmonic distortion	<0.0025% at 0 dB <0.025% at -20 dB
Channel separation	>101 dB
Channel difference	<0.08 dB
Converter system	2 x 16 bit, 4 x oversampling 176.4 kHz
Low pass filter	Digital + Bessel/elliptical analog
Damping >20,000 Hz	>50 dB
Phase error between L and R	0 degree at 20-20,000 Hz
Output, analog	1.3 V RMS at 0 dB
Output, digital	For digital equipment
Power supply	Type no. 5171: 220 V Type no. 5172: 240 V Type no. 5173: 120 V Type no. 5174: 100 V Type no. 5175: 240 V
Power frequency	50-60 Hz
Power consumption	23 watts
Dimensions W x H x D	42 x 7 x 24.5 cm (16 <sup>1</sup> / <sub>2</sub> " x 2 <sup>3</sup> / <sub>4</sub> " x 9 <sup>1</sup> / <sub>2</sub> " )
Weight	4.5 kg (9,9 lbs)

**Subject to change without notice**

## OVERSIGHT OVER LEDNINGSMONTERING FOR NETTRANSFORMATOR SURVEY OF WIRE MOUNTING FOR MAINS TRANSFORMER

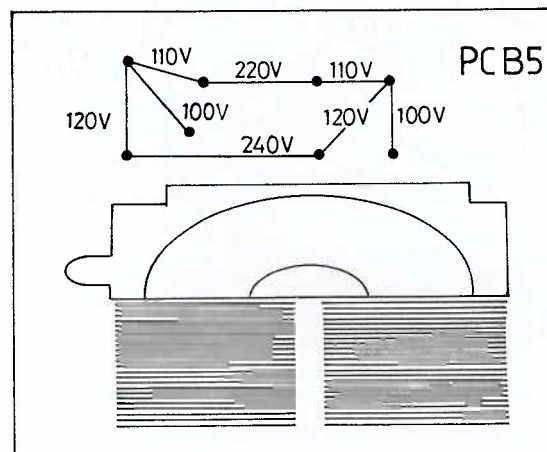
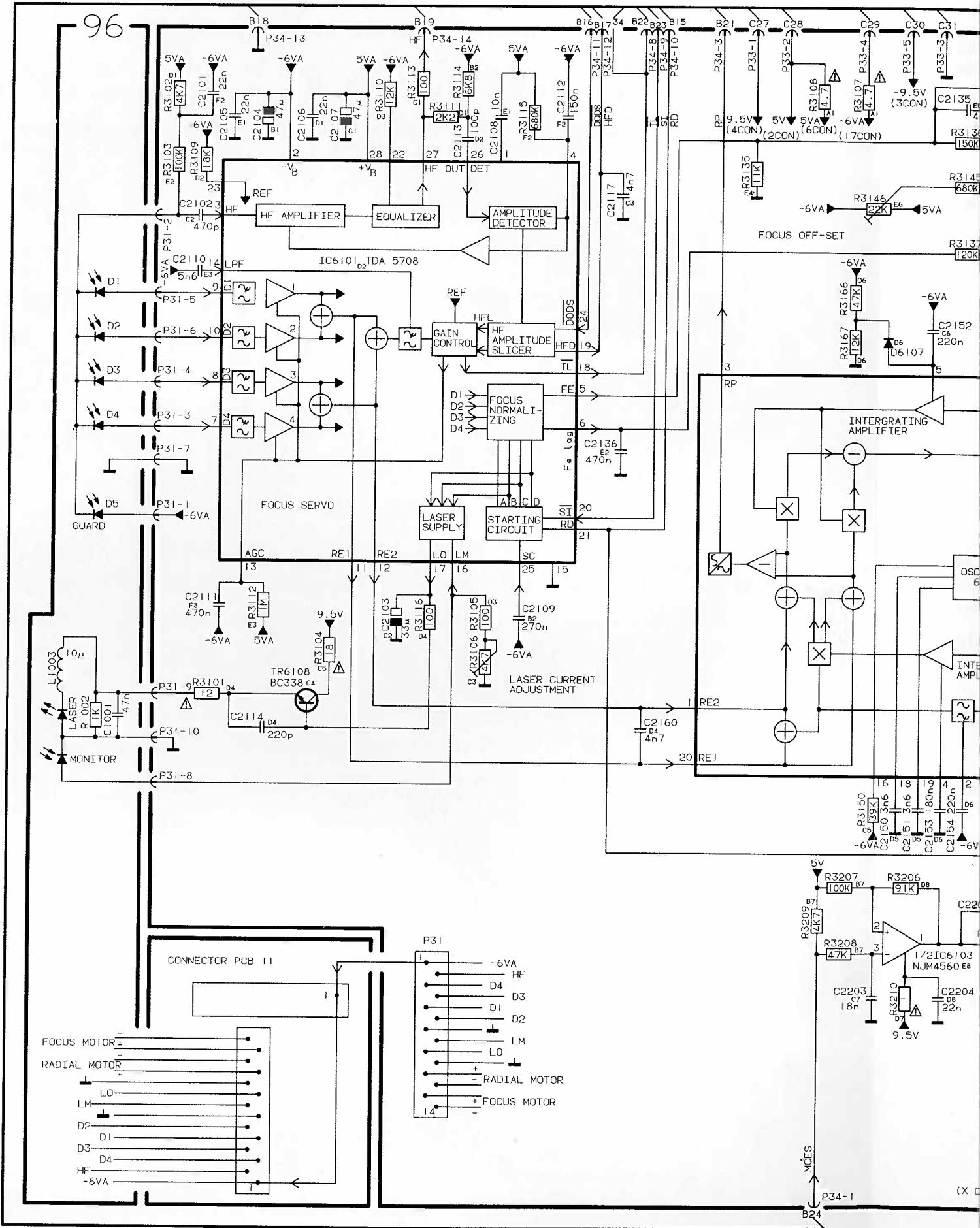
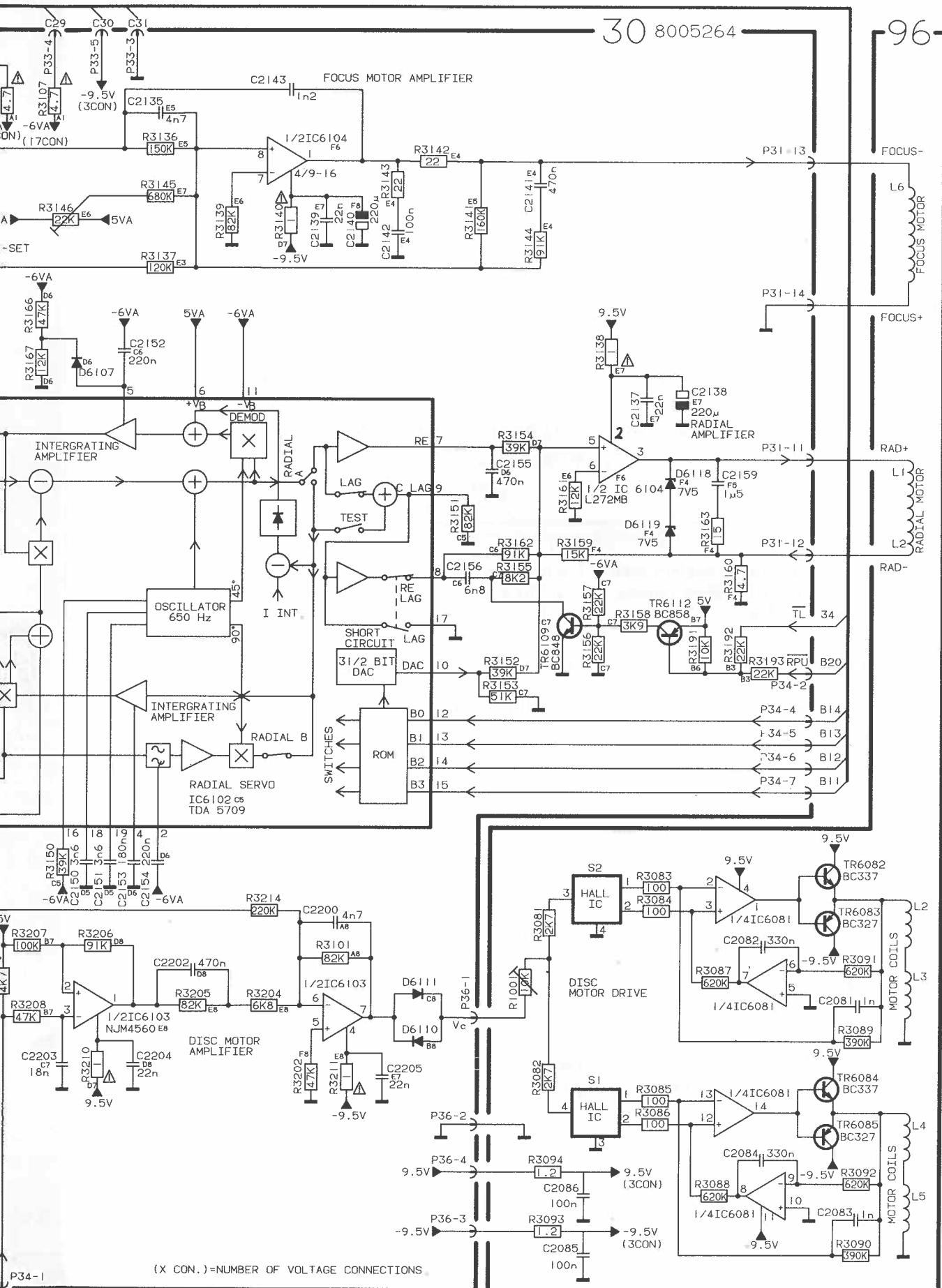


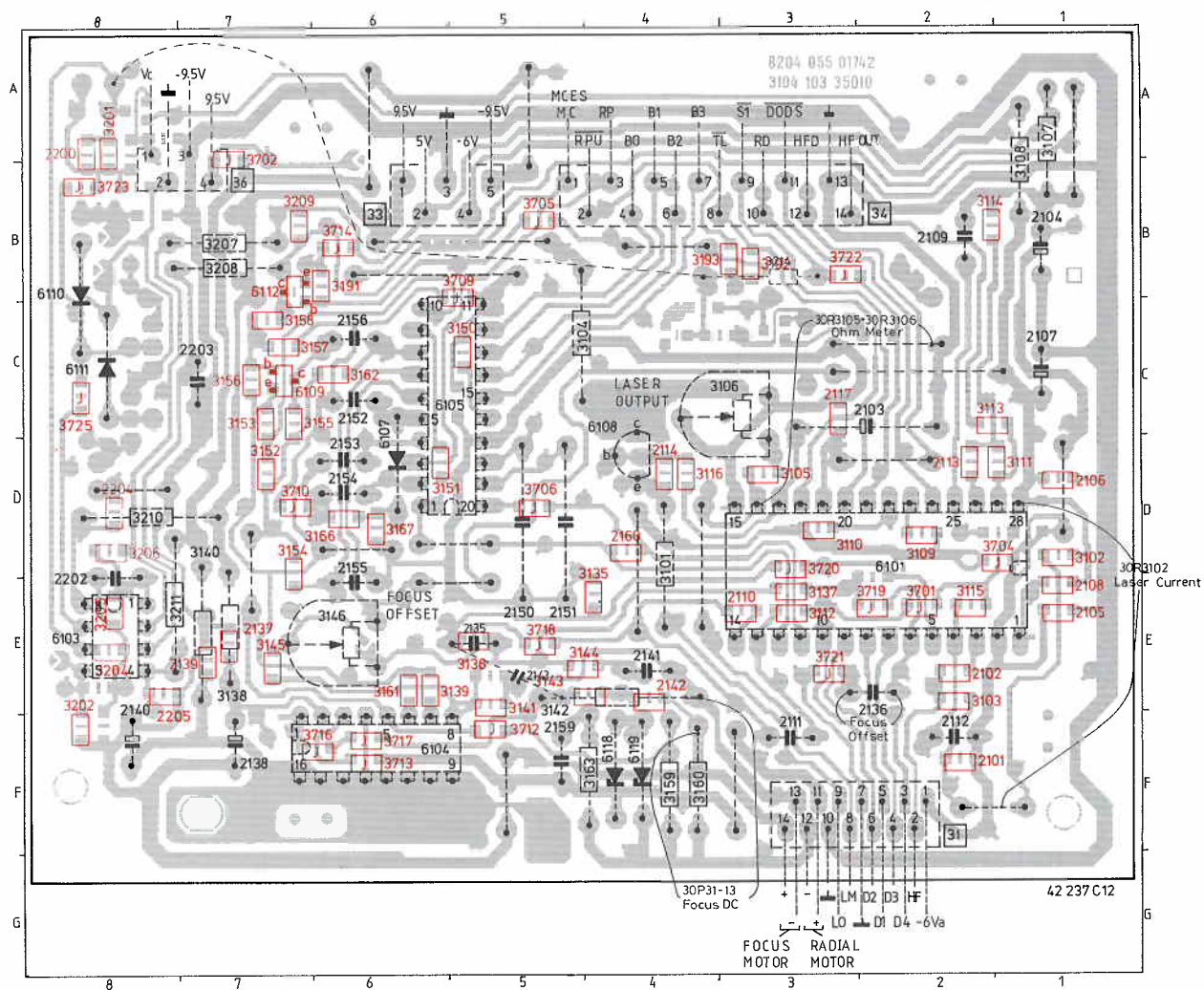
DIAGRAM A (Servo and Disc Motor System)



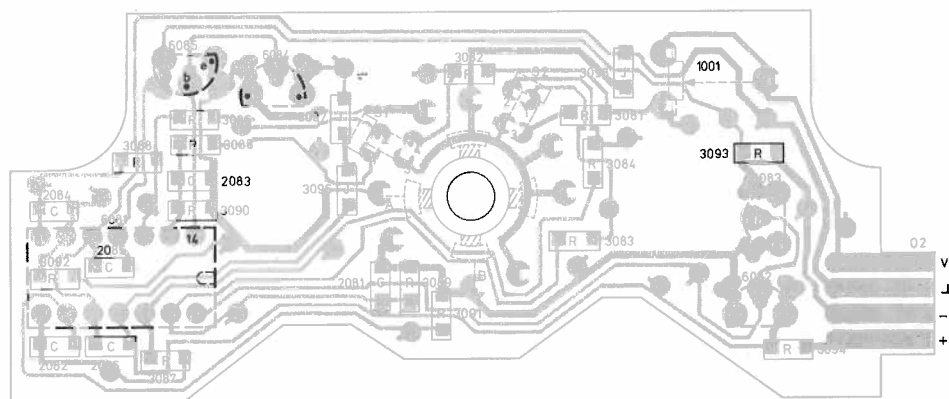


(X CON.)=NUMBER OF VOLTAGE CONNECTIONS.

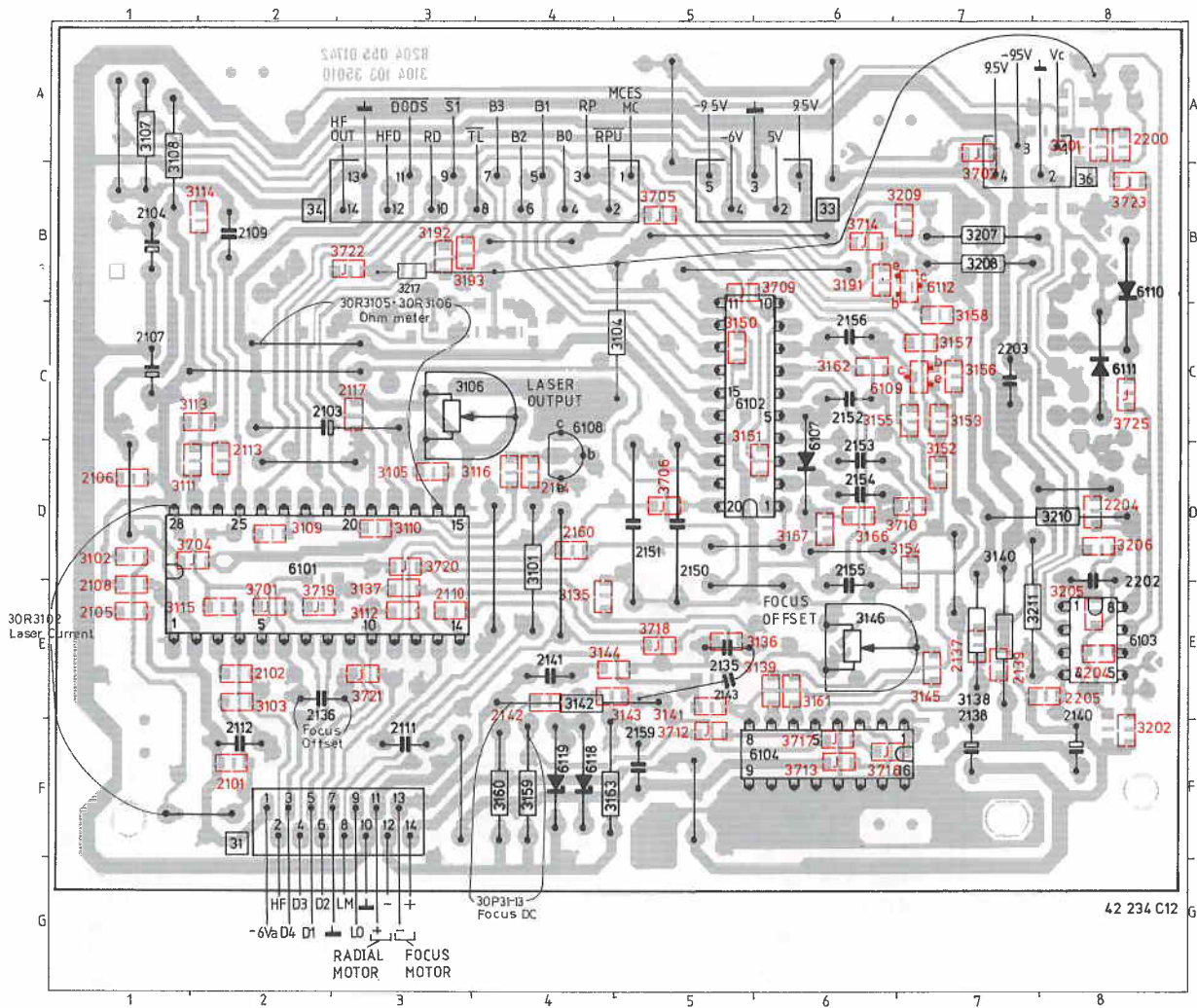
## SERVO PCB30



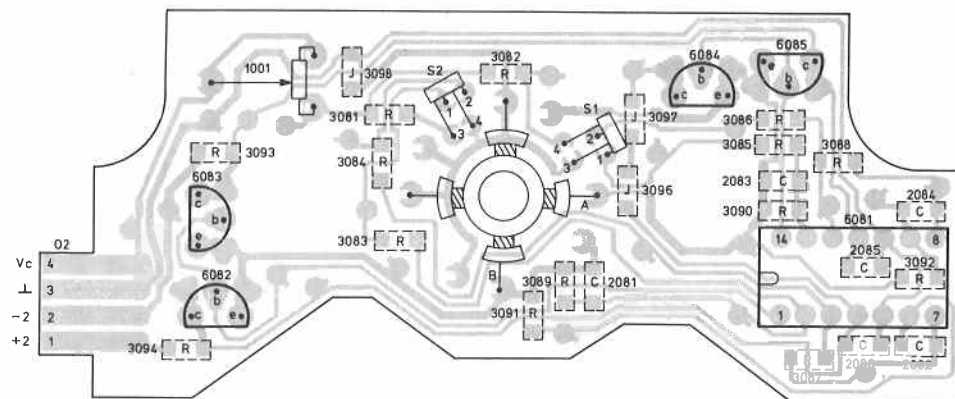
## DISC MOTOR CONTROL



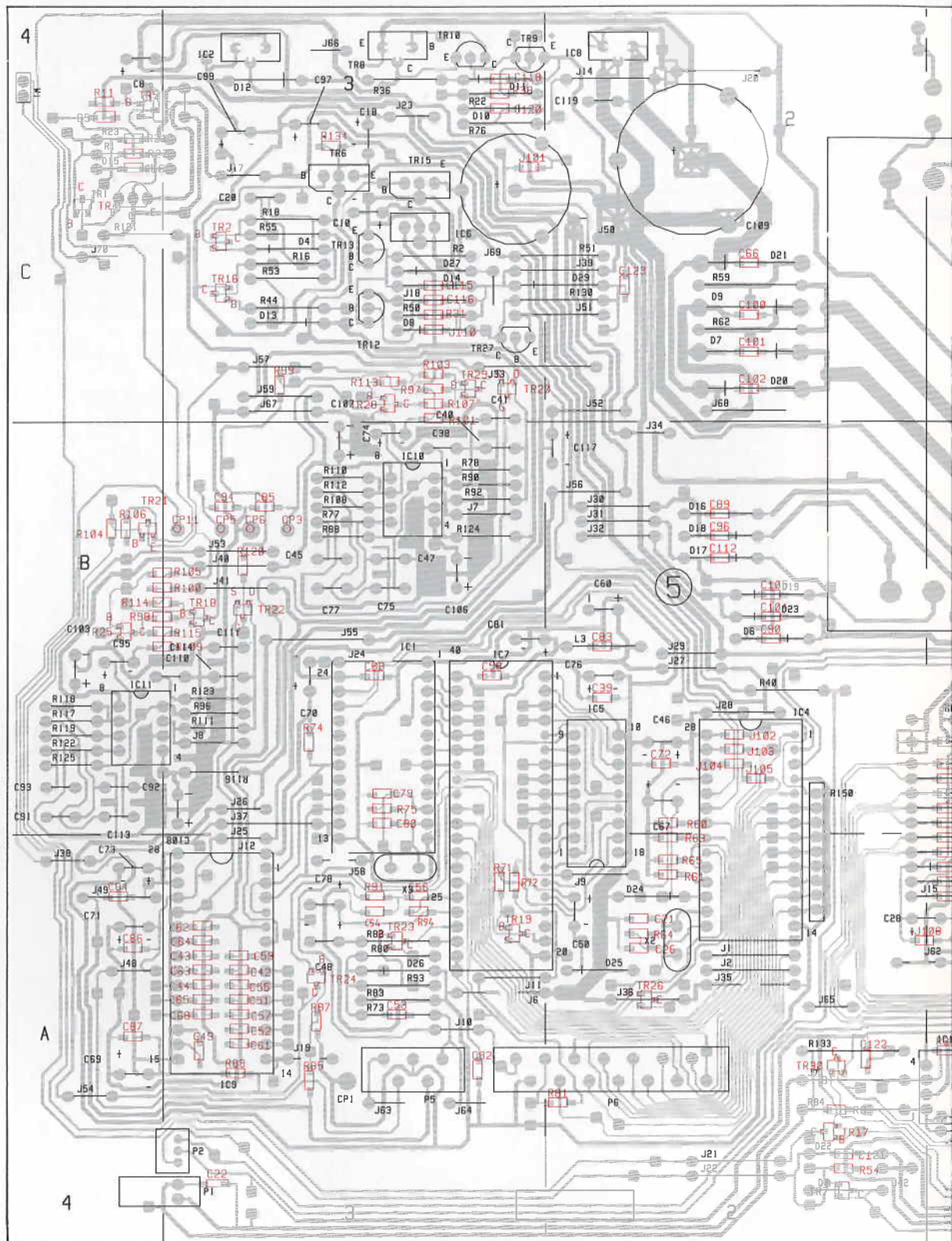
SERVO PCB30



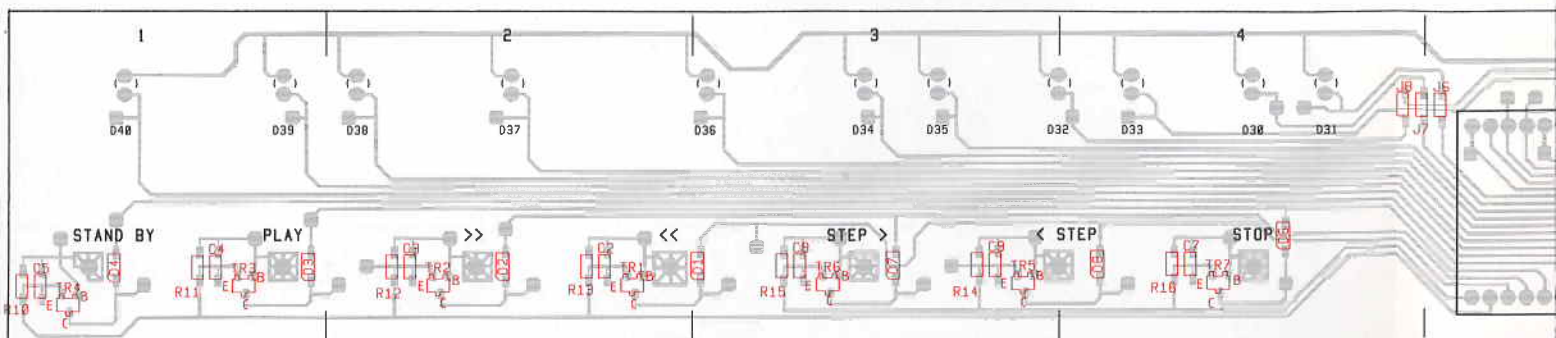
DISC MOTOR CONTROL



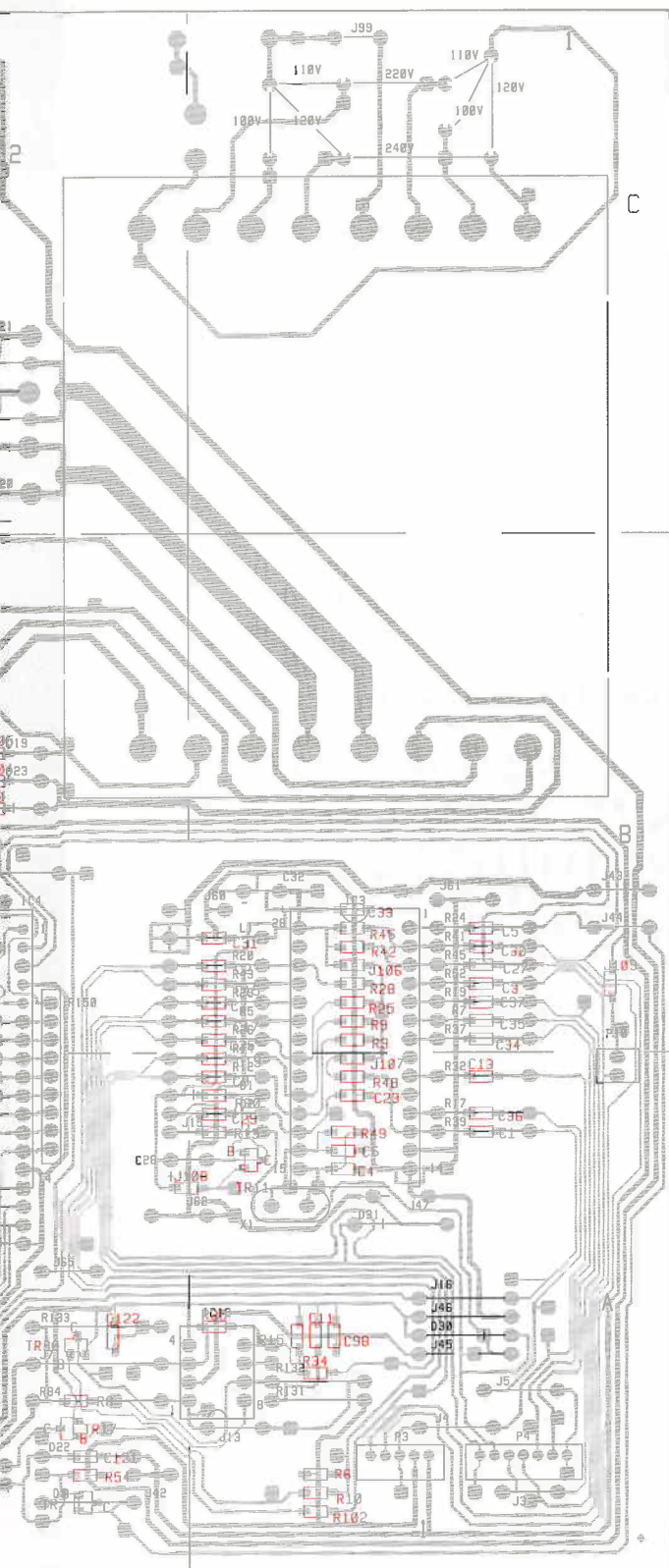
DECODER PCB5



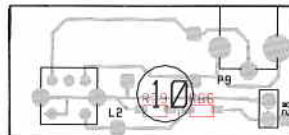
DISPLAY PCB3



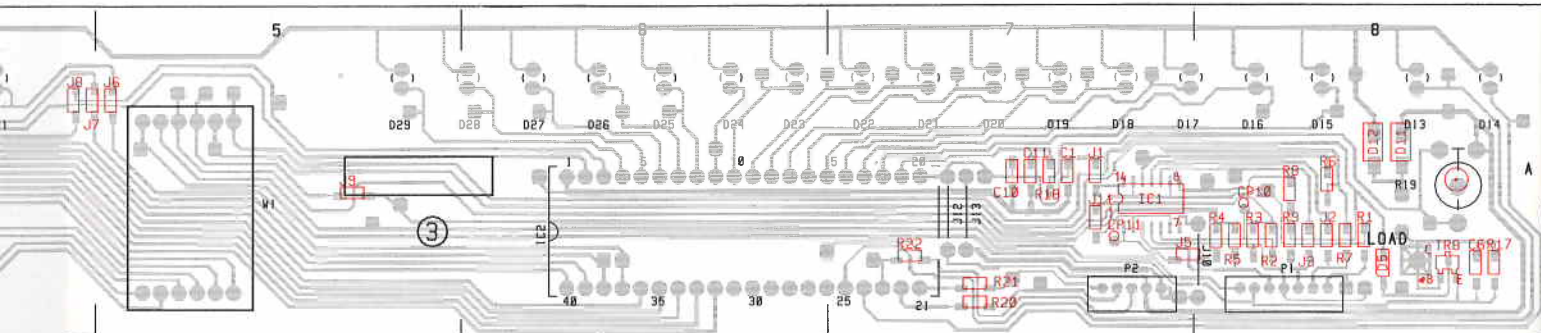
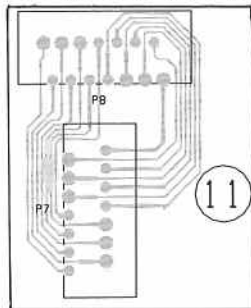




DIGITAL OUT PCB 10



CONNECTION PCB 11



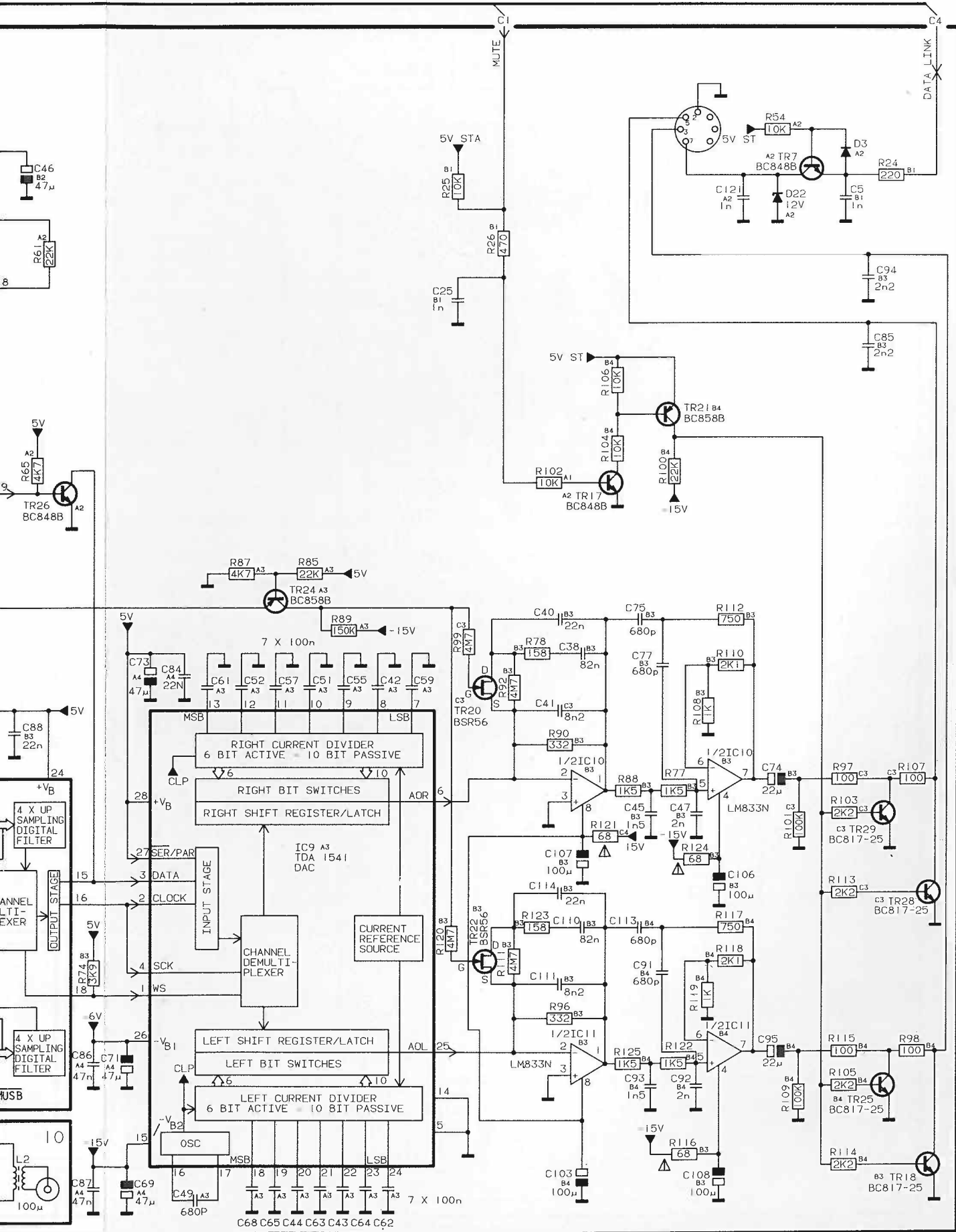
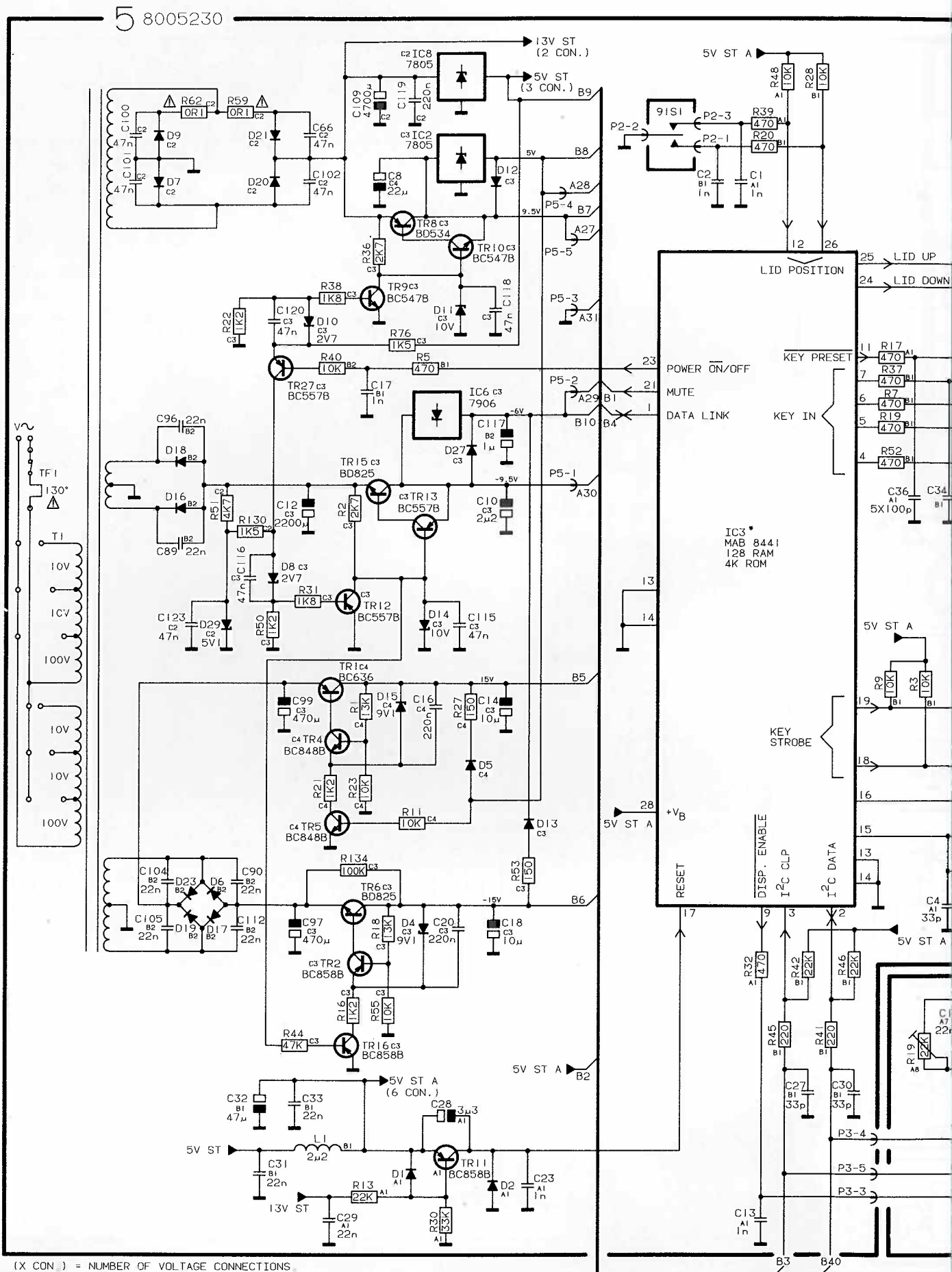
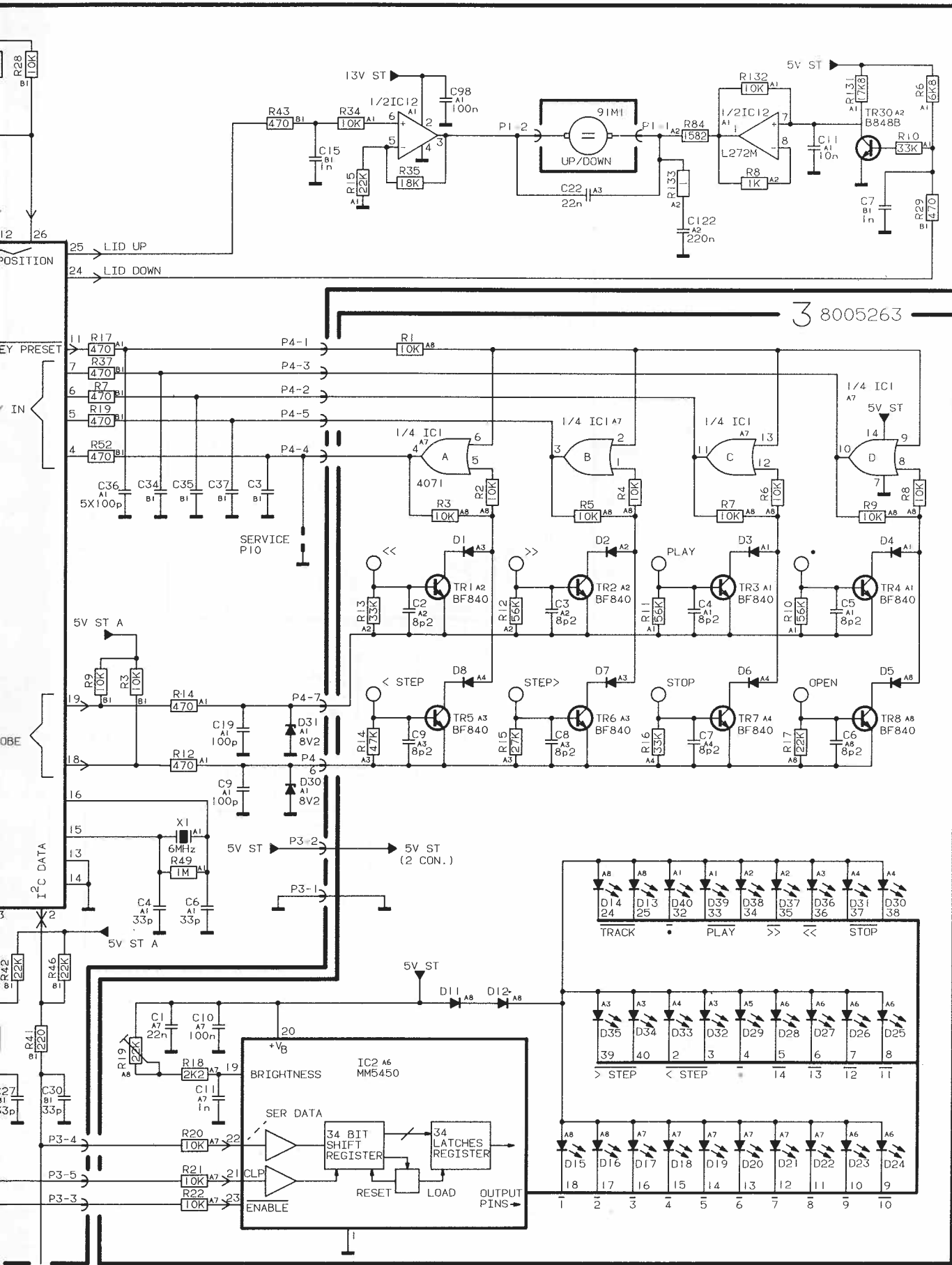
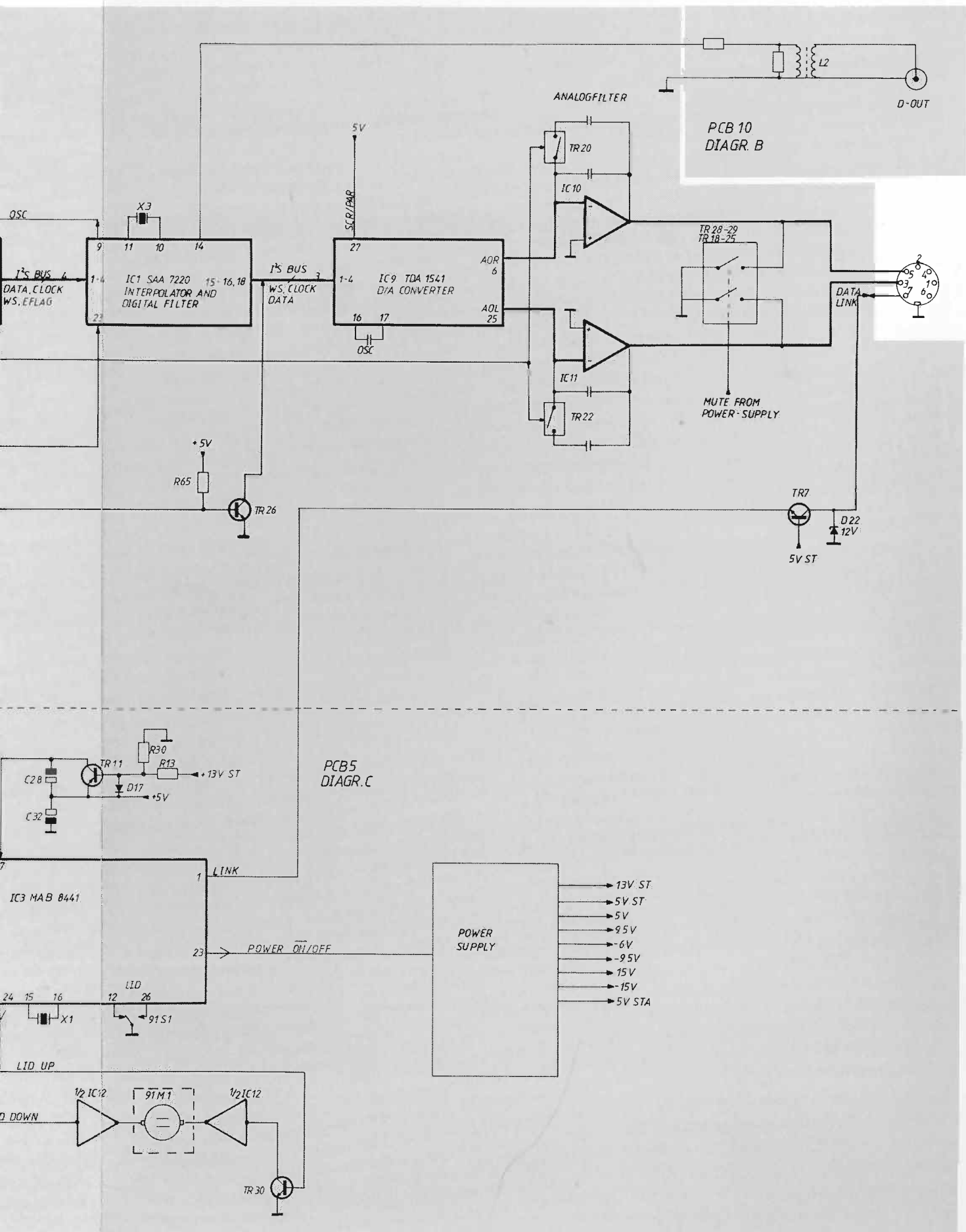




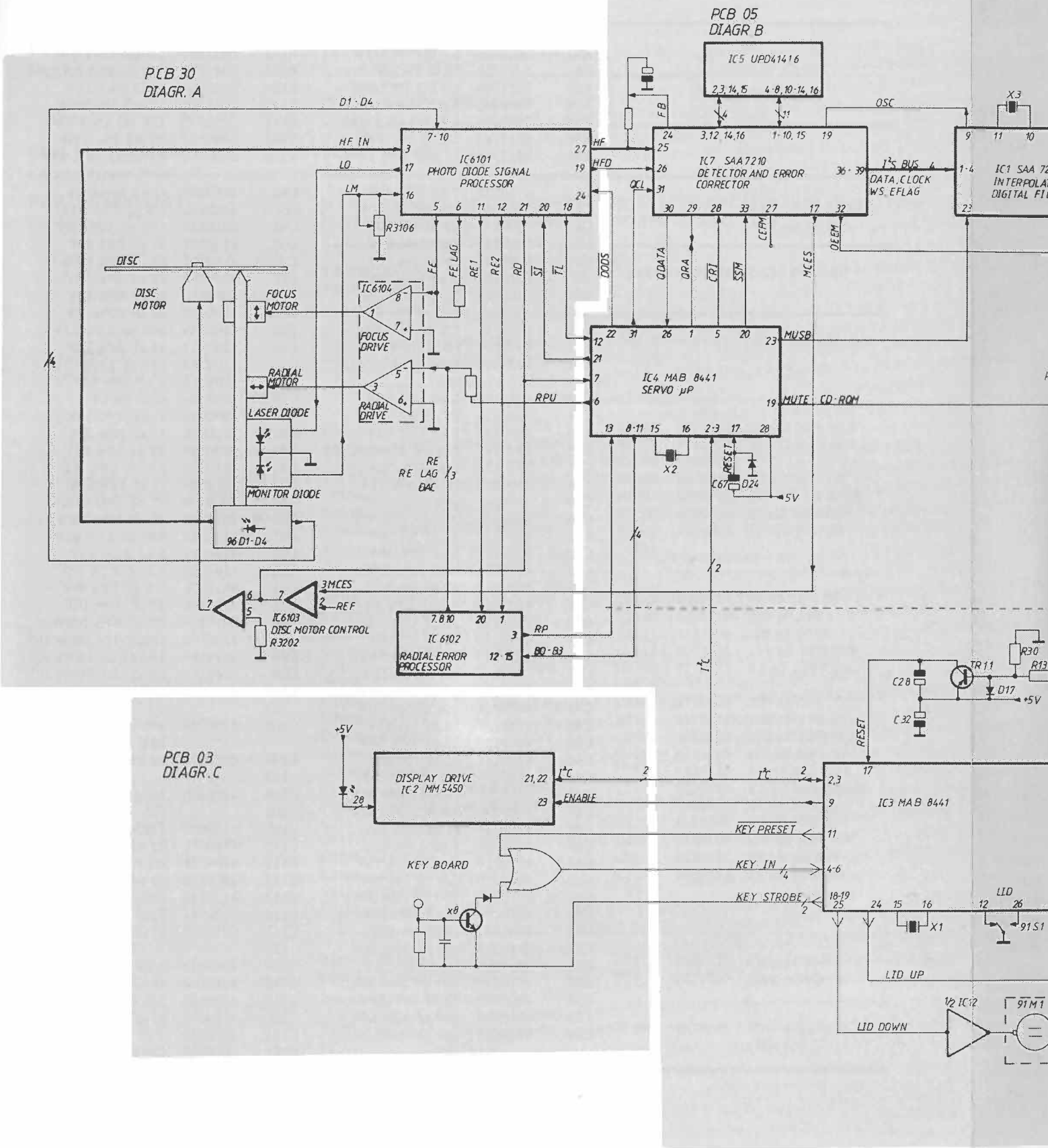
DIAGRAM C (Power Supply, Control and Display)



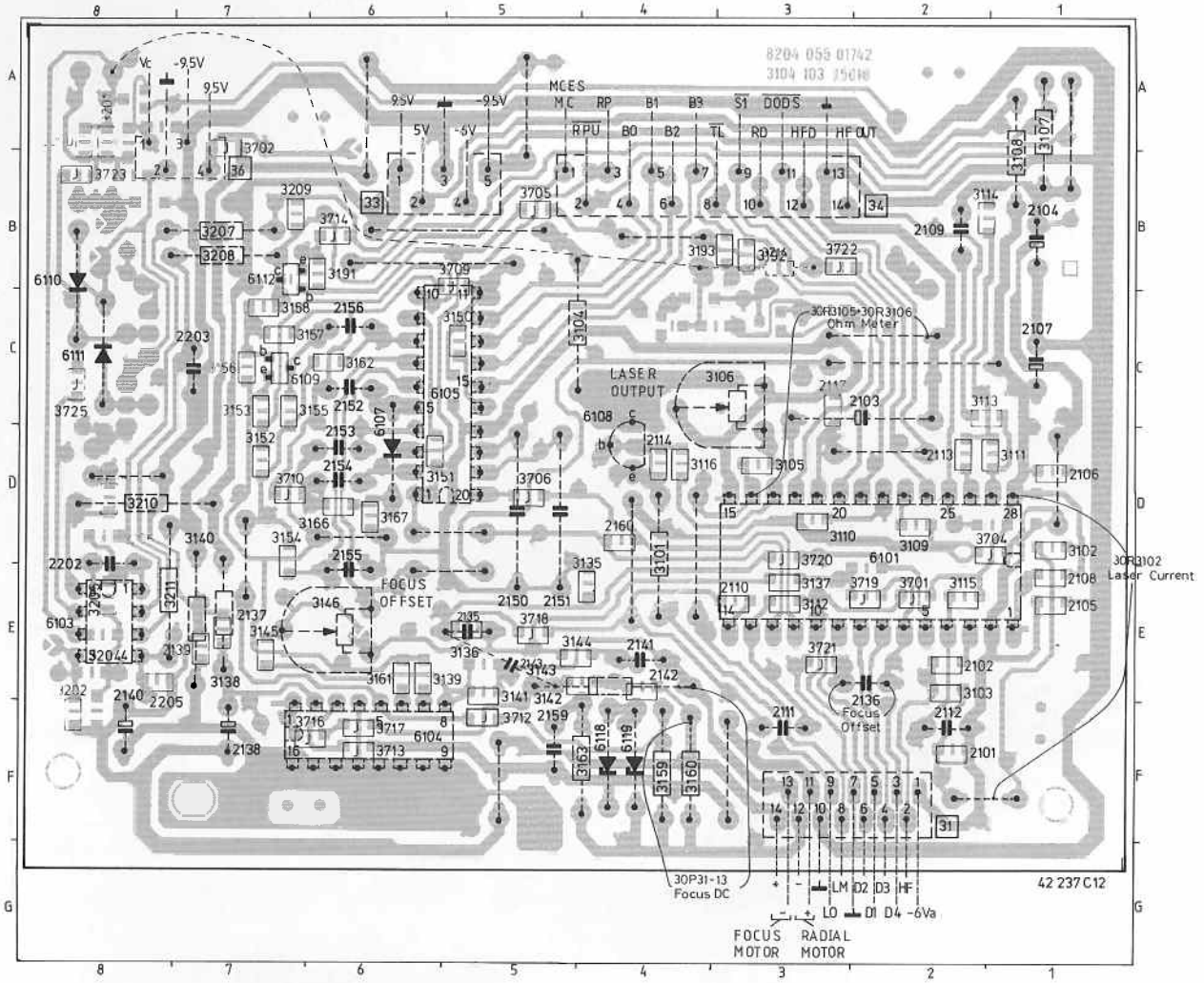




## BLOCK DIAGRAM



SERVO PCB30





## JUSTERINGER

## Laserstrøm

*Vigtigt:*

Efter udskiftning af CD løbeværket eller servo-PCB30 skal laserstrøm-potentiometeret 30R3106 forjusteres, inden apparatet tilsluttes lysnettet.

Tilslut et ohmmeter over 30R3105 + 30R3106. Juster 30R3106, indtil 30R3105 og 30R3106 tilsammen har en værdi på 1 kohm.

Tilslut et DC-voltmeter over 30R3102.

Tilslut et oscilloskop til ben 27 på 30IC6101.

Ilæg testplade nr. 5 (plade uden fejl, bestillingsnr. 3634031) og tryk PLAY.

Kontroller på oscilloskopet, om der er HF signal. Hvis der ikke er HF signal, slukkes apparatet, og fejlen findes.

Hvis der er HF signal, spilles spor 1 på testplade 5, og 30R3106 justeres, til der måles  $50\text{mV} \pm 5\text{mV}$  med DC-voltmeteret.

**Fokus offset.**

Ilæg testplade nr. 5A (bestillingsnr. 3634031).

Sæt apparatet i service-position 2 ved at kortslutte service-stikket på PCB5 samtidig med, at netstikket sættes i. Kortslutningen på service-stikket fjernes.

Tryk STEP> 2 gange.

Hvis »2« i displayet bliver ved med at blinke, justeres 30R3146, indtil »2« lyser konstant.

Sæt apparatet i serviceposition 4 ved at trykke STEP> 2 gange (»4« i displayet skal lyse, og pladen skal rotere).

Tilslut et DC-voltmeter over 30C2136.

Juster 30R3146, indtil der måles  $400\text{ mV} \pm 40\text{ mV}$ .

**Vinkel-indstilling på laserarm**

Før justeringen skal vinkel-indstillingen på laserarmen kontrolleres, se side 7.1.

Hvis kontrol af vinkel-indstillingen viser, at vinklen er uden for tolerance, skal den *ikke* justeres til minimum afvigelse men blot justeres inden for tolerance.

Efter justering af vinkel-indstillingen skal laserarmens friktion kontrolleres. Dette kan gøres med en trykfjedermåler, som holdes mod magneten på fokusenheten.

## ADJUSTMENTS

## Laser current

*Important:*

When replacing the CD mechanism or the servo PCB30, the laser current potentiometer 30R3106 must be preadjusted before the set is connected to mains.

Connect an ohmmeter across 30R3105 + 30R3106. Adjust 30R3106 until the combined value of 30R3105 and 30R3106 is 1 kohm.

Connect a DC voltmeter across 30R3102.

Connect an oscilloscope to pin 27 of 30IC6101.

Load test disc no. 5 (disc without faults, part no. 3634031) and press PLAY.

Check on the oscilloscope whether there is any HF signal. If not, switch off the CD player and locate the fault.

If there is an HF signal, play track 1 of test disc 5 and adjust 30R3106 until a reading of  $50\text{ mV} \pm 5\text{ mV}$  is obtained on the DC voltmeter.

**Focus offset**

Load test disc 5A (part no. 3634031)

Set the unit in service position 2 by short-circuiting the service plug on PCB5 and simultaneously connecting the player to mains. Remove the short-circuit on the service plug.

Press STEP> twice.

If '2' in the display keeps flashing, adjust 30R3146 until '2' is lit constantly.

Set the unit in service position 4 by pressing STEP> twice ('4' in the display must be lit and the disc rotate).

Connect a DC voltmeter across 30C2136.

Adjust 30R3146 until a reading of  $400\text{ mV} \pm 40\text{ mV}$  is obtained.

**Angle setting of laser arm**

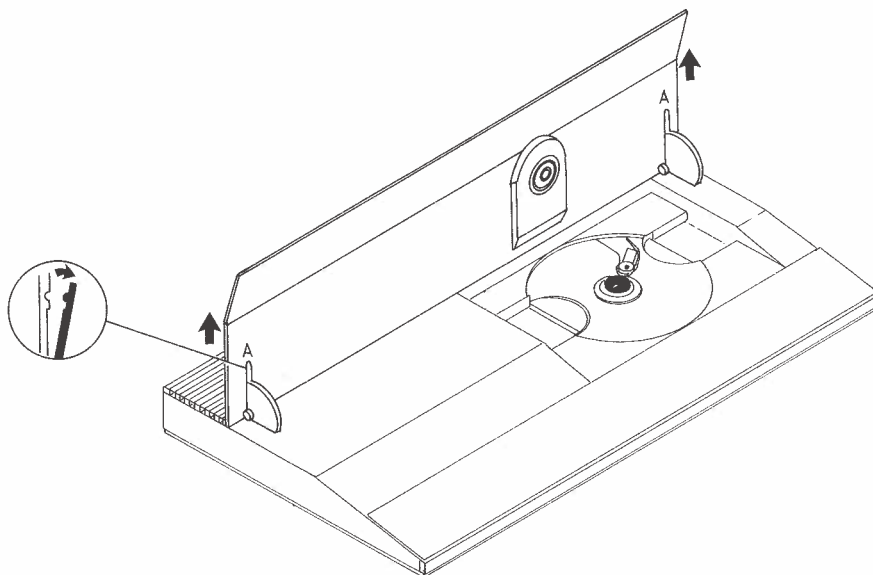
Before carrying out the adjustment, check the angle setting of the laser arm, see page 7.1.

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 should be adjusted within the tolerance.

After adjusting the angle setting, check the friction of the laser arm. This is done by means of a spring pressure gauge which is held against the magnet of the focusing unit.

ADSKILLELSE

DISASSEMBLY

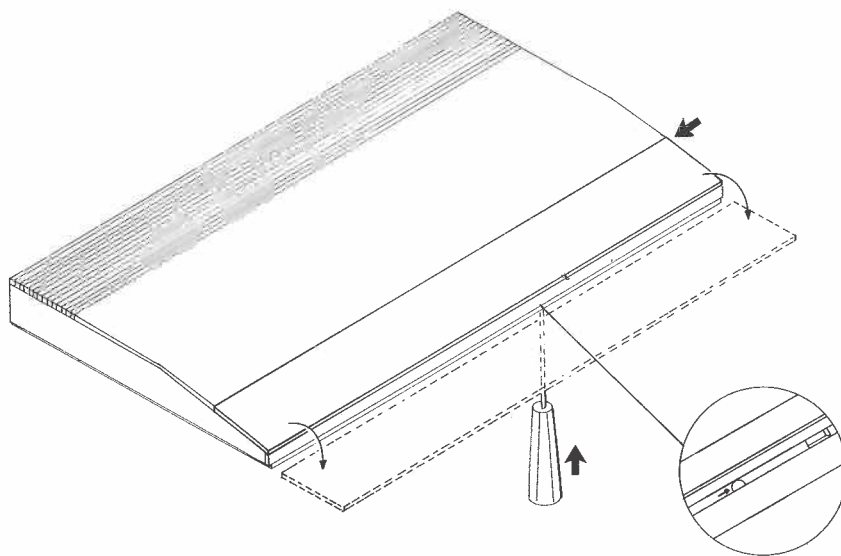


### Låg

Lågholderne A i begge sider vippes udad.  
Låget kan nu løftes op og fjernes.

### Lid

Pull outwards the lid arms A in both sides.  
The lid can now be removed by pulling it upwards.

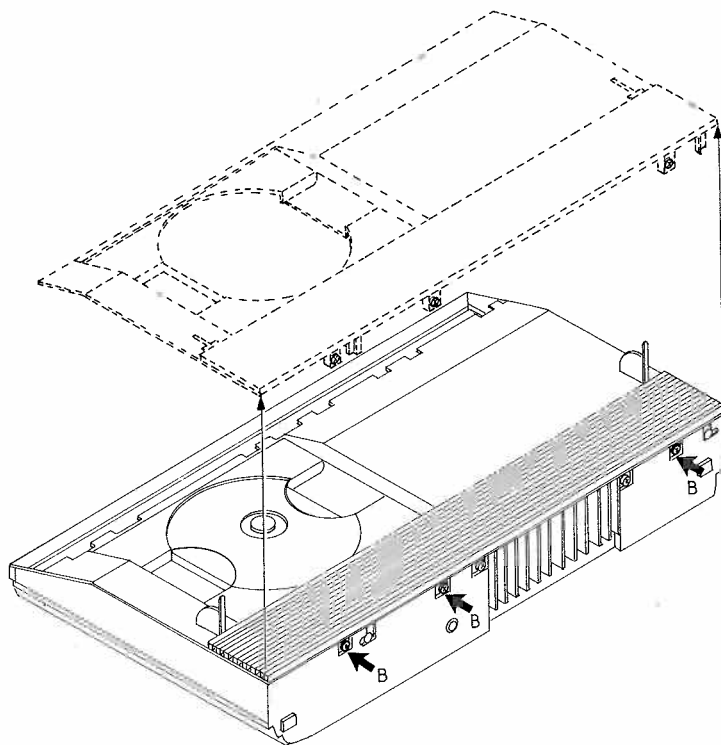


### Betjeningspanel

En tynd genstand presses op i hullet mærket med en pil i bunden.  
Samtidig presses betjeningspanelet mod venstre.

### Operation panel

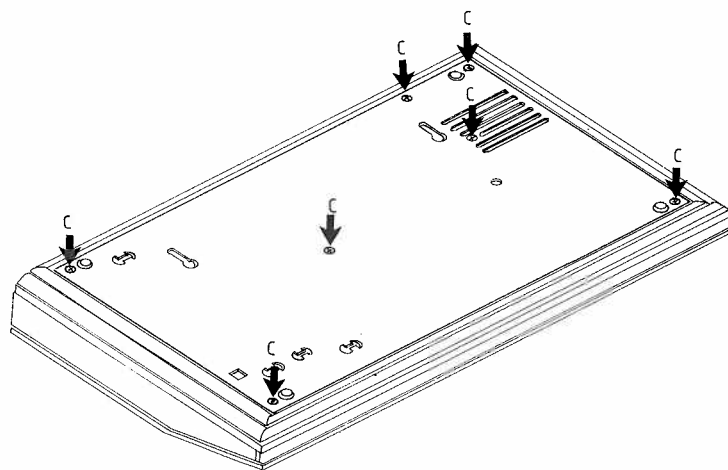
Insert a thin object in the hole in the bottom marked with an arrow.  
At the same time, push the operation panel towards the left.

**Topplade**

Skruerne B i bagkanten af toppanelet løsnes.  
Toppladen kan nu løftes op og fjernes.

**Top panel**

Loosen the screws B in the rear side of the top panel.  
The top panel can now be removed by lifting it.

**Bund**

Skruerne C i bunden fjernes.  
Bunden kan nu aftages.

**Bottom**

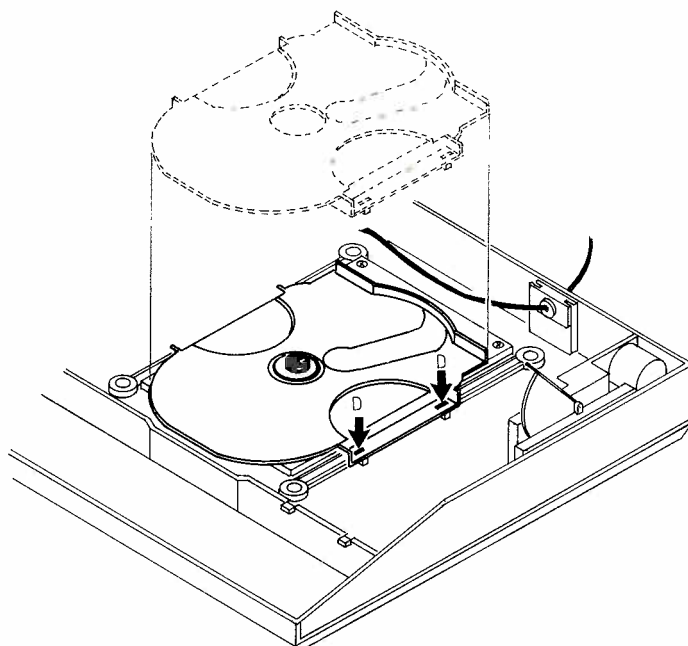
Remove the screws C in the bottom.  
The bottom can now be removed.

## CD løbeværk

Pres de to plastikflige (D) ud, løft samtidig plastdækslet op i samme side.

## CD Mechanism

Push the two plastic flaps (D) outwards, and lift the plastic cover on the same side simultaneously.



Fjern de fire skruer (E)

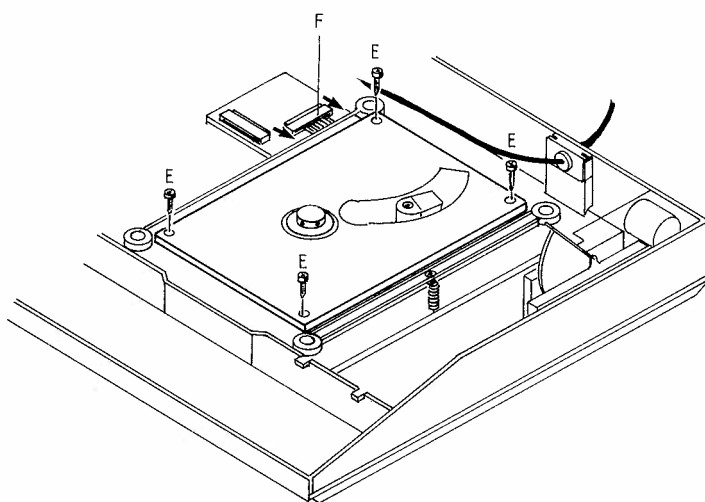
Flexprintet i stikket F løsnes.

CD løbeværket kan nu forsigtigt løftes op.

Remove the four screws (E).

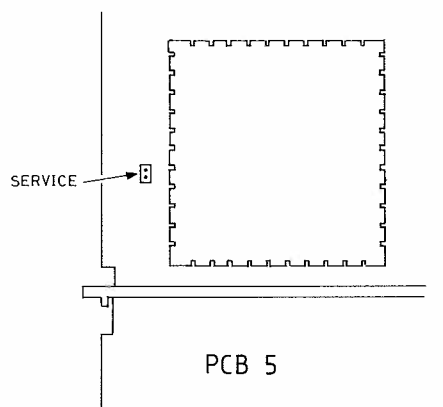
Loosen the flexible PCB in the socket F.

The CD drive unit can now be lifted out carefully.



## Serviceprogram

Kortslut servicestikket på PCB5, samtidig med at netstikket sættes i. Kortslutningen i servicestikket fjernes.



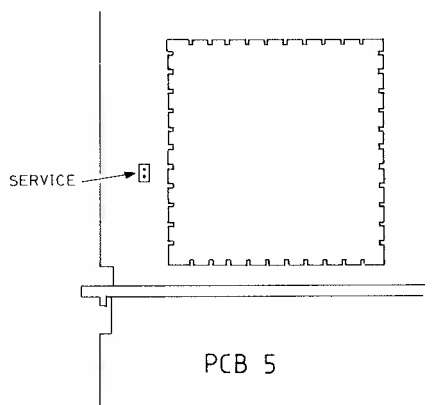
Tast STEP>	Display viser 1 (= serviceposition 1).	
Tast >>	Laserarm svinger ud.	<i>Hvis arm bliver stående:</i> Er fleks-PCB rigtigt placeret? Går radialspole imod? Er trægheden i armlejet for stor?
Tast <<	Laserarm svinger ind.	<i>Hvis arm bliver stående:</i> Er fleks-PCB rigtig placeret? Går radialspole imod? Er trægheden i armlejet for stor?
Ilæg CD-plade		
Tast STEP>	Display viser 2. Laser tænder og søger focus.  Hvis display lyser 2 konstant: Focussøgning i orden.	<i>Hvis 2 i displayet blinker:</i>  CD bliver ved med at søge i focus, indtil der tastes STEP>.  Tændes laser? Regulerer FE-udgangen til focus motoramplifier? Regulerer focusmotor?
Tast STEP>	Display viser 3.  CD-motor starter rotation og laser placeres mod centrum.	<i>Hvis CD-plade ikke roterer:</i> Starter RD-udgangen turntable motoramplifier? Er MCES-pulsen tilstede?
Tast STEP>	Display viser 4.  Radialsøgning startes.  Hvis display viser 4 konstant.  Radial søgning i orden.	<i>Hvis 4 i displayet blinker:</i>  Regulerer RE-udgangen til radial motoramplifier?  Subcode info er ignoreret. Musik kan høres, fordi MUSB er høj men er afhængig af lead-in sporets længde. Kan vare op til 1 min.

Tast >>	Display viser 4 konstant.	<i>Hvis 4 i displayet blinker.</i>
	Laserarm springer ud over spor.	Kontroller radialservo.
Tast <<	Display viser 4 konstant.	<i>Hvis 4 i displayet blinker.</i>
	Laserarm springer ind over spor.	Kontroller radialservo.

Serviceprogrammet kan gentages ved at taste STEP>. Displayet viser da kort efter service-position 1. Serviceprogrammet afsluttes ved kortvarigt at fjerne netstikket.

### Service program

Short-circuit the service plug on PCB5 and simultaneously connect the CD player to mains. Remove the short-circuit on the service plug.



Press STEP>	Display indicates service position 1.	
Press >>	Laser arm swings out.	<i>If arm doesn't move:</i> Is flex-PCB placed correctly? Does radial coil touch anything? Is arm bearing inertia excessive?
Press <<	Laser arm swings in.	<i>If arm doesn't move:</i> Is flex-PCB placed correctly? Does radial coil touch anything? Is arm bearing inertia excessive?
Load compact disc		
Press STEP>	Display indicates 2.  Laser switches on and searches for focus  If display indicates 2 constantly.  Focus search is OK.	<i>If 2 in the display flashes:</i>  CD continues to search for focus until STEP> is pressed. Does laser switch on?  Does FE output regulate the focus motor amplifier? Does focus motor regulate?

# Bang & Olufsen

## Beogram CD 3500

Type 5146-5147-5148-5149-5150

3538741

Indklæbes i serviceanvisning nr. 3538721/3538722, Beogram CD 4500 type 51XX.  
To paste into Servicemanual no. 3538721/3538722, Beogram CD 4500 type 51XX.  
In Serviceanleitung Nr. 3538721/3538722, Beogram CD 4500 Typ 51XX einkleben.  
A coller le Manuel d'entretien No. 3538721/3538722, Beogram CD 4500 Type 51XX.



**BEOGRAM CD 3500, TYPE 514X**

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*See drawings on pages 4-1*

**List of Mechanical parts**

9006 3114308 Chassis  
9019 3162313 Cover  
9027 3458710 Top Plate



## CD-Mechanism Version II Beogram CD 4500

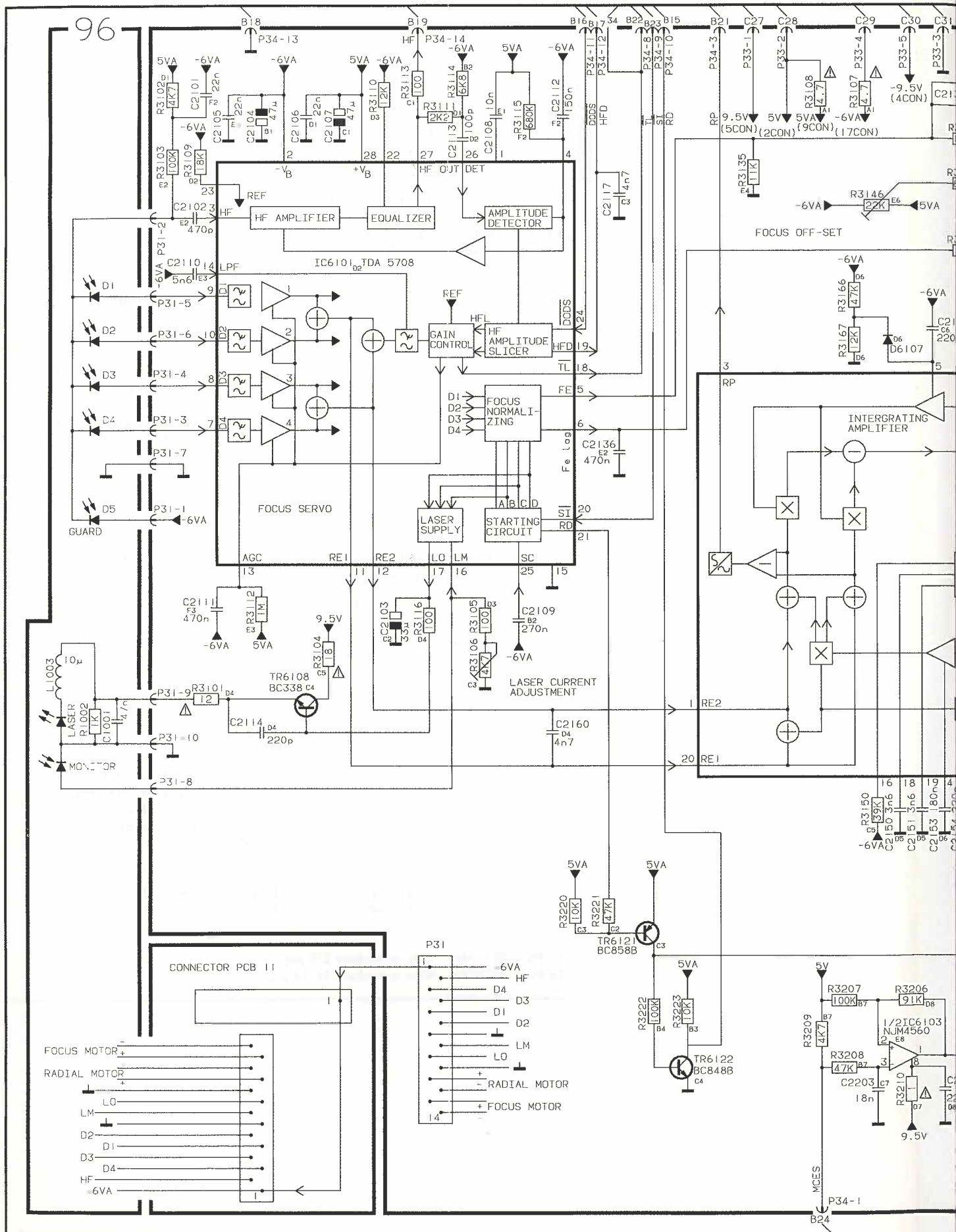
Indklæbes i Serviceanvisningen Beogram CD 4500 (3538721/3538722)  
Paste into Service Manual Beogram CD 4500 (3538721/3538722)  
In Serviceanleitung Beogram CD 4500 (3538721/3538722) einkleben  
A coller le Manual d'entretien pour Beogram CD 4500 (3538721/3538722)

10-91 3538798

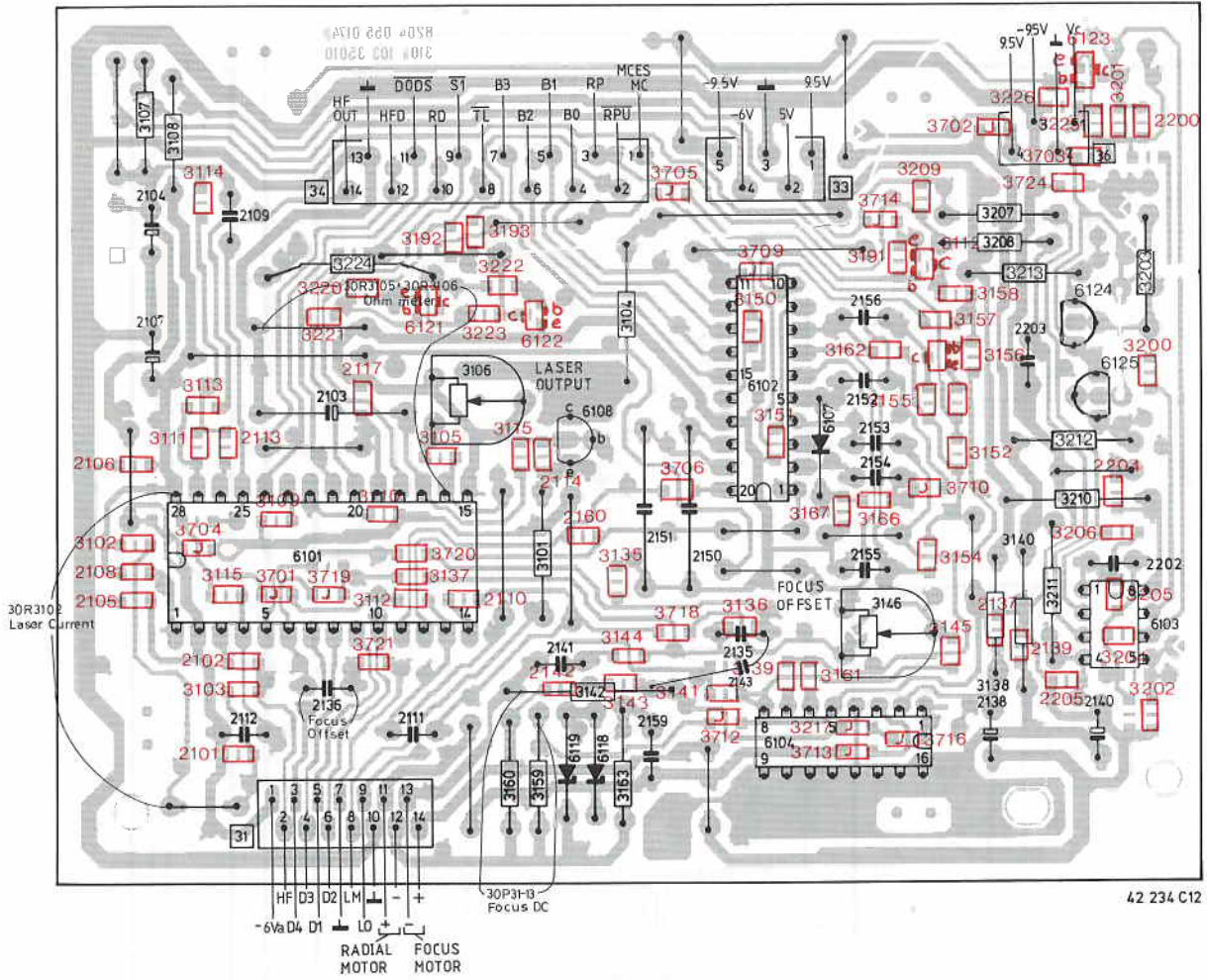




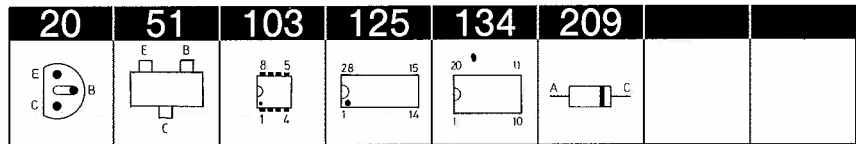
## DIAGRAM A (Servo and Disc Motor System)



Servo PCB 30



LIST OF ELECTRICAL PARTS



Δ indicates that static electricity may destroy the component.

Resistors not referred to are standard, see page 3-2

PCB 30, 8005288  
Servo

IC6101Δ 8340991	125	TDA 5708 C3	IC6103 8340993	103	NJM 4560D
IC6102Δ 8340992	134	TDA 5709	IC6104 8340683	103	L 272BH

TR6108 8320721	20	BC 338-16	TR6122- 8320615	51	BC 848B
TR6109 8320615	51	BC 848B	TR6123		
TR6112 8320616	51	BC 858B	TR6125 8320523	20	BC 328-25
TR6121 8320616	51	BC 858B			

D6107 8300058	209	1N 4148	D6118- 8300570	209	HZ 7C2 7V5
			D6119		

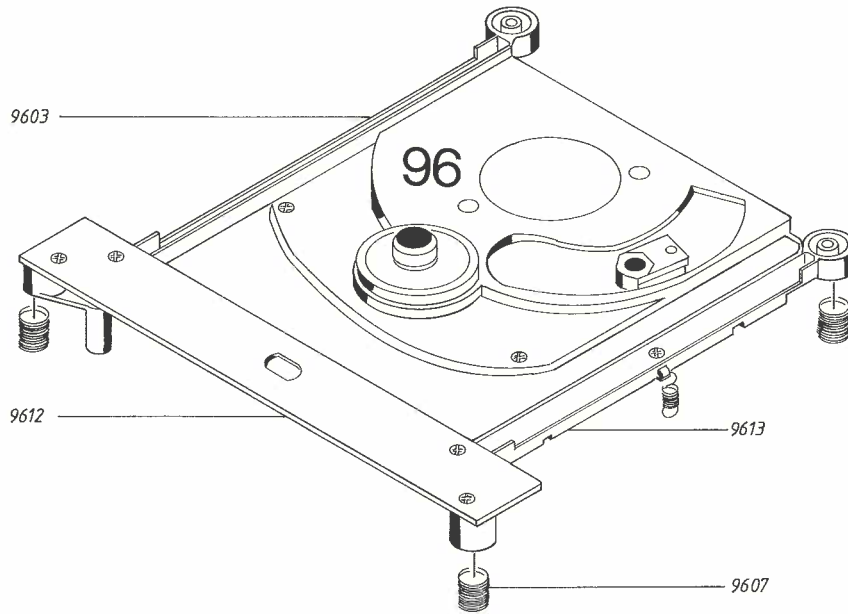
R3101 5020966	12Ω 5% 1/3W	R3146 5370327	22kΩ 20% 0.1W
R3104 5020967	18Ω 5% 1/3W	R3160 5020971	4.7Ω 1% 1/4W
R3106 5370324	4.7kΩ 20% 0.1W	R3207 5020263	100kΩ 1% 1/4W
R3107- 5020965	4.7Ω 2% 1/3W	R3208 5020969	47kΩ 1% 1/4W
R3108		R3210- 5020964	1.0Ω 2% 1/3W
R3138 5020964	1.0Ω 2% 1/3W	R3211	
R3140 5020964	1.0Ω 2% 1/3W	R3212- 5020489	10Ω 10% 0,30W
R3141 5011587	160kΩ 1% 1/8W	R3213	

C2101 4000255	22nF 10% 50V	C2139 4000255	22nF 10% 50V
C2102 4000249	470pF 5% 50V	C2140 4200745	220μ 16V
C2103 4200414	33μ -10+50% 16V	C2141 4130405	470nF 50V
C2104 4200482	47μ 20% 10V	C2142 4000256	100nF 10% 50V
C2105- 4000255	22nF 10% 50V	C2143 4100283	1.2nF 2% 250V
C2106		C2150- 4130424	3.6nF 1% 160V
C2107 4200482	47μ 20% 10V	C2151	
C2108 4000254	10nF 10% 50V	C2152 4130206	220nF 10% 100V
C2109 4130379	270nF 5% 63V	C2153 4130314	180nF 10% 63V
C2110 4000253	5.6nF 10% 50V	C2154 4130206	220nF 10% 100V
C2111 4130405	470nF 10% 50V	C2155 4130405	470nF 10% 50V
C2112 4130406	150nF 5% 50V	C2156 4130338	6.8nF 5% 100V
C2113 4000248	100pF 5% 50V	C2159 4200746	1.5μ 50V Bipolar
C2114 4000233	220pF 5% 50V	C2160 4010173	4.7nF 10% 50V
C2117 4010173	4.7nF 10% 50V	C2200 4010173	4.7nF 10% 50V
C2135 4130370	4.7nF 5%	C2202 4130405	470nF 10% 50V
C2136 4130405	470nF 10% 50V	C2203 4130221	18nF 5% 63V
C2137 4000255	22nF 10% 50V	C2204- 4000255	22nF 10% 50V
C2138 4200745	220μ 16V	C2205	

P31 7210614	Socket, 14 pol	P34 7220657	Plug, 14 pole
P33 7220652	Plug, 5 pole	P36 7220651	Plug, 4 pole

To P5 6275746	Wire w/sockets 5/5 pin
To P6 6275745	Wire w/sockets 14/14 pin

## LIST OF MECHANICAL PARTS



8420178 CD Mechanism with servo  
 8420179 CD Mechanism without servo  
 8005288 Servo PCB

---

9603 3152841 Holder, left  
 9612 3342053 Weight load  
 9613 3152840 Holder, right  
 9607 2812140 Spring

---

6276561 Wire bundle

60D

H

B

-25

7V5

W

V

4W

W

V

0W

V

0V

0V

0V

00V

3V

.00V

60V

0V

olar

0V

0V

60V

V

0V

e