

Service  
Service  
Service



# Service Manual

For reasons of production, several versions of the C.D. mechanism have been applied.

The C.D. mechanisms are in most cases marked with a round, yellow sticker provided with a letter impression.

The Table below indicates which exploded view and which HF pre-amplifier/laser supply PCB should be consulted.

COMPACT  
disc  
DIGITAL AUDIO

Sticker C.D.M.	Exploded view drawing	H.F. Pre-amp.+laser supply PCB +circuit diagram
Absent	A	I
A	See Service Manual CDM-0	See Service Manual CDM-0
B	See Service Manual CDM-0	See Service Manual CDM-0
C	A	II
D	A	I
E	See Service Manual CDM-0	See Service Manual CDM-0
F	See Service Manual CDM-0	See Service Manual CDM-0
G	A	II
H	A	II

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

**CLASS 1  
LASER PRODUCT**

3122 110 03420

## SERVICING HINTS

In order to prevent loose metal objects from getting in the CD mechanism it will be necessary to see to a clean repair station.

The objective can be cleaned with a blow brush.

**The CD-mechanism is provided with self-lubricating bearings and should thus NOT be lubricated.**

**Ensure that the player is not resting on the shaft of the turntable motor during repairs and measurements on the bottom.**

**Servicing the RAFOC unit (= Radial and Focusing unit pos. 61).**

The RAFOC unit supplied by Service is the same one as in CDM-0. In the CDM-1 the bottom plate of this RAFOC unit has been replaced by frame item number 503. If the RAFOC unit is replaced, **carefully** and accurately perform the following operations:

- Take the two flex PCBs out of the connectors on the preamplifier PCB.
- Disassemble the **defective** RAFOC unit by removing the 4 bolts M3x18 mm and shaft item number 504.
- Remove shaft item number 504 of the new RAFOC unit.  
Pay attention to the 3 intermediate washers item number 502 and spring washer item number 505, they should assume the same positions after assembly.

Loosen the 4 bolts M3x18 mm until the bottom plate can be removed.

Do not remove bolts M3x18 mm (they hold the new RAFOC unit together).

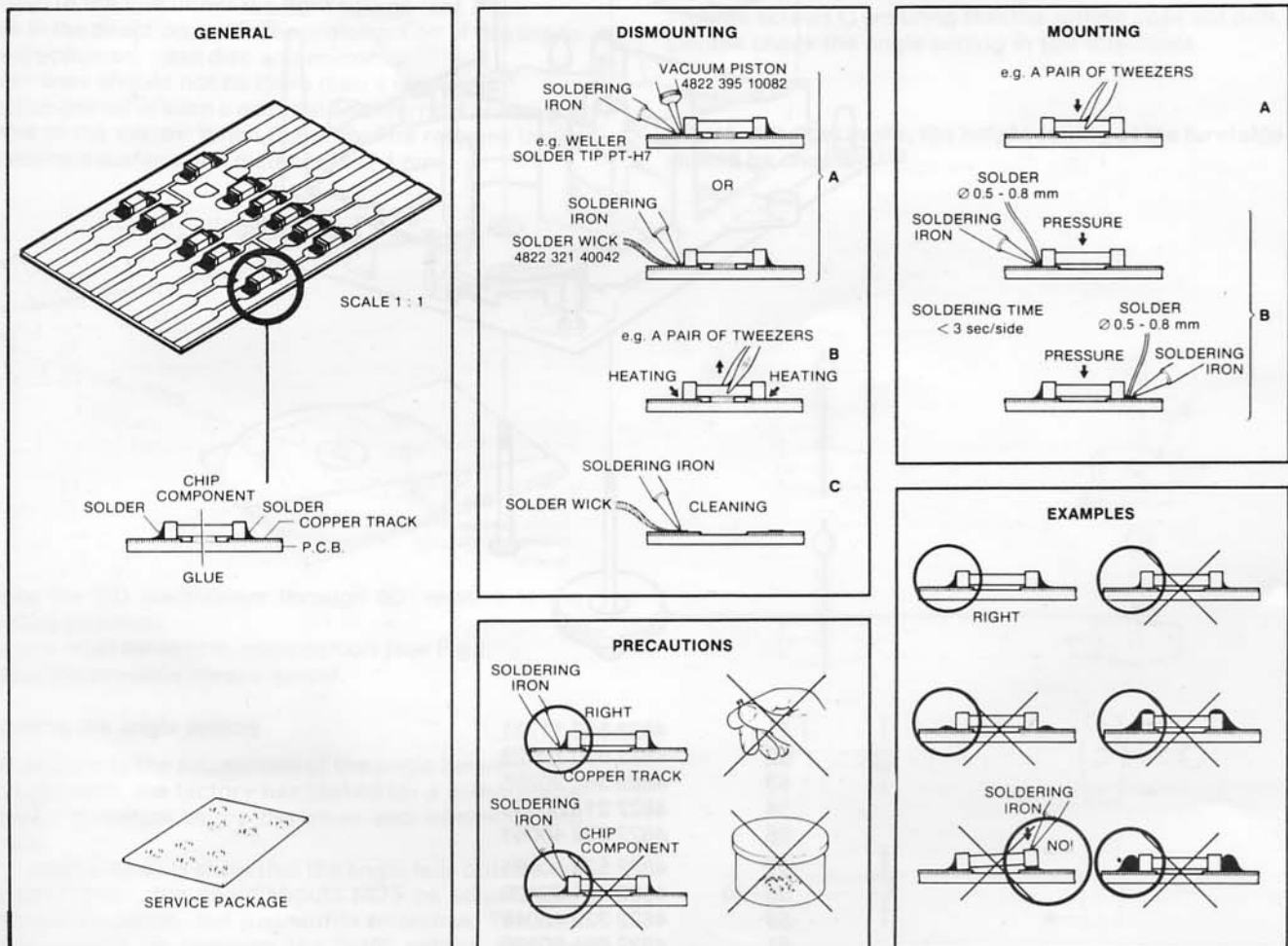
- Mount the new RAFOC unit on frame 503.  
Ensure that the 3 intermediate washers 502 and spring washer 505 are positioned correctly before fixing shaft item number 504.
- Check that the arm moves freely and the angle setting as well (see check and possible adjustment of angle setting).
- For replacing the light pin it is not necessary to remove the RAFOC unit.  
The light pin can be removed by turning it anti-clockwise by means of an open-ended spanner of 12 mm and afterwards pulling it out of the arm.  
During mounting, the light pin must be pushed into the arm as far as possible, and turned clockwise.

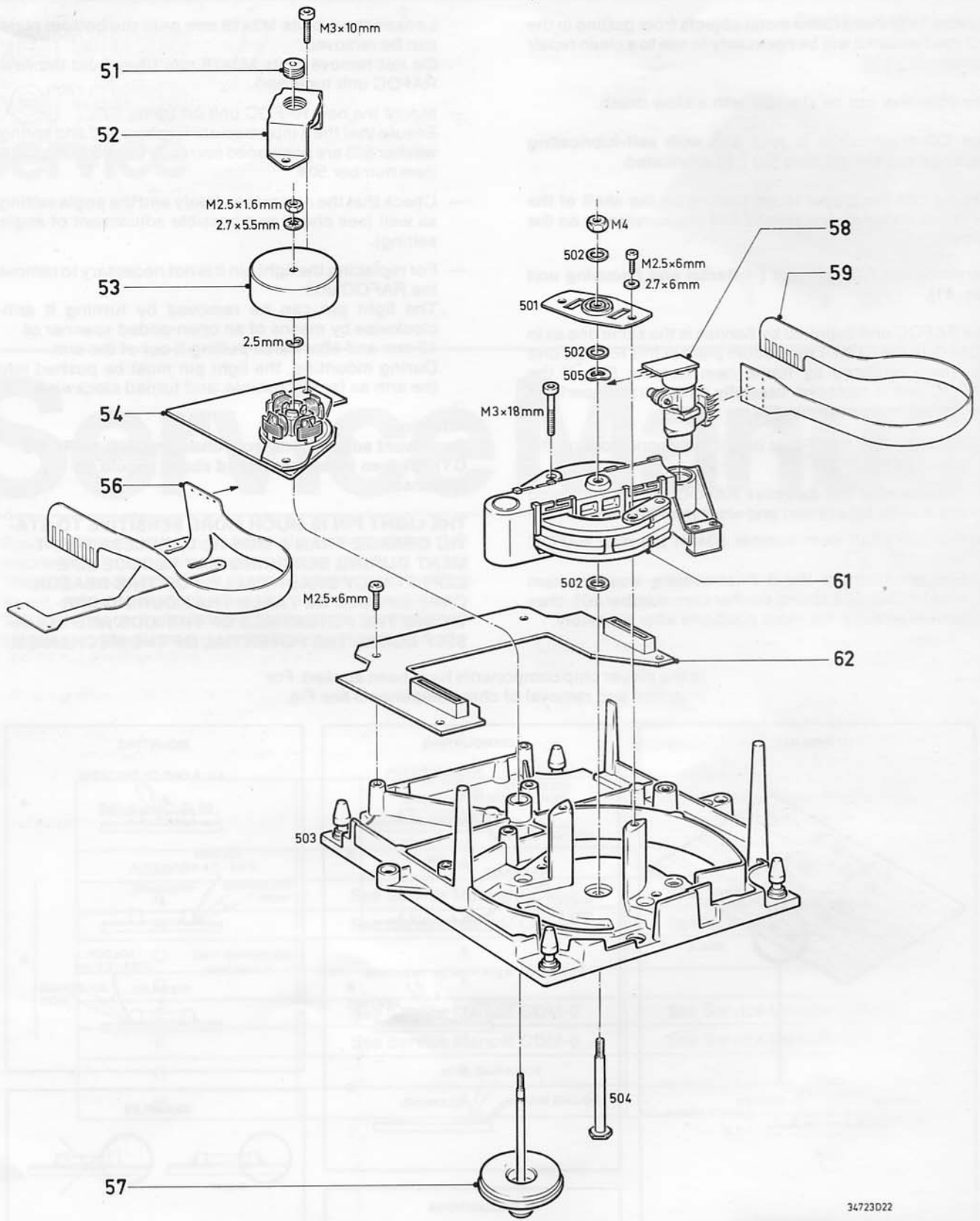
### Attention:

**To prevent adjustments from changing, NO SCREWS OTHER than those mentioned above should be loosened.**

**THE LIGHT PIN IS MUCH MORE SENSITIVE TO STATIC CHARGE THAN A MOS IC. CARELESS TREATMENT DURING SERVICING MAY REDUCE LIFE EXPECTANCY DRASTICALLY. FOR THIS REASON CARE SHOULD BE TAKEN THAT DURING SERVICING THE POTENTIALS OF THE AIDS AND YOURSELF EQUAL THE POTENTIAL OF THE MECHANISM.**

In the player chip components have been applied. For insertion and removal of chip components see Fig.





34723022

51	4822 502 11701
52	4822 520 10529
53	4822 362 20225
54	4822 214 50395
56	4822 322 40051
57	4822 528 10491
58+59	4822 691 30129
59	4822 322 40048
61	4822 691 30128
62	4822 214 50394

**MECHANICAL MEASUREMENTS AND ADJUSTMENTS**

**Height setting of the turntable**

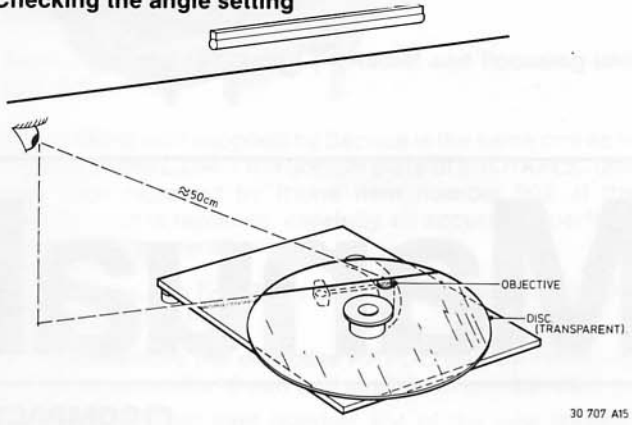
For this alignment the unit should be in the position of normal end use. The servicing supports 4822 395 30202 can be used here.

Playback track 1 of disc 4822 397 30096. (Disc without defects).

Connect a D.C. voltmeter between the **negative** of the focus motor and earth of the preamplifier print.

Adjust the height of the turntable with bearing screw 51 in such a way, that the voltage is 0 V +/- 100 mV. Seal hereafter the screw with sealing paint.

**Checking the angle setting**



Place mirror 4822 395 90205 on the objective and glass disc 4822 395 90204 (with disc hold-down 4822 532 60906) on the turntable.

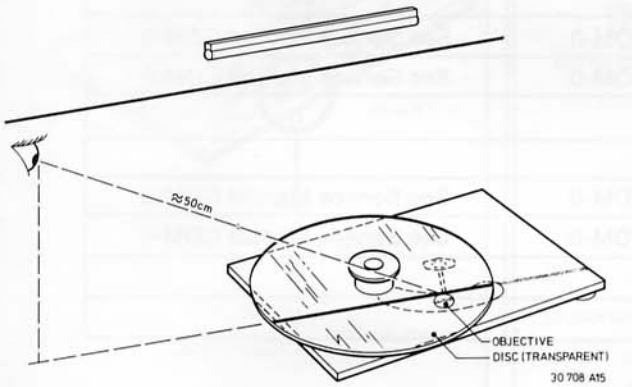
Locate the unit under a light source and under this light source a straight line should run (e.g. fluorescent tube with grid).

Set the arm to mid-position. Turn the unit until the arm is parallel to the line under the light source (see Fig.).

Look in the direction and in the prolongation of this line to its reflection on glass disc and mirror.

These lines should not be more than 4 mm apart:

Position the set in such a way that one line runs across the centre of the mirror. When the other line remains inside the mirror's surface, the distance is  $\leq 4$  mm.



Rotate the CD mechanism through 90° relative to the previous position.

The arm must be kept in mid-position (see Fig.).

Repeat the previous measurement.

**Adjusting the angle setting**

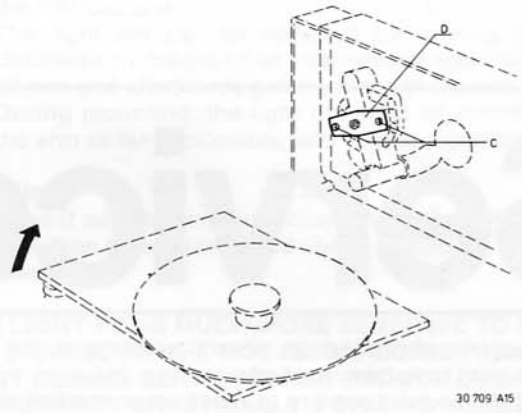
With respect to the adjustment of the angle between disc and light path, the factory has looked for a compromise between minimum angle deviation and minimum arm friction.

If the measurements show that the angle falls outside the tolerance given, the angle should NOT be adjusted for minimum deviation, but just within tolerance. The new setting should lie between the "old" setting and the optimum setting.

After adjustment, the friction of the arm should be checked. This is done by means of a spring-pressure gauge which is connected to the counterweight. The friction of the arm, measured over the total scanning deflection, is not allowed to exceed 30 mN.

When the friction appears to be too high, the angle should be reset to its old value. Then replace the arm by a new one and check the angle once more.

Adjustment of the angle is performed as follows:  
Place the set on the servicing supports 4822 395 30202.



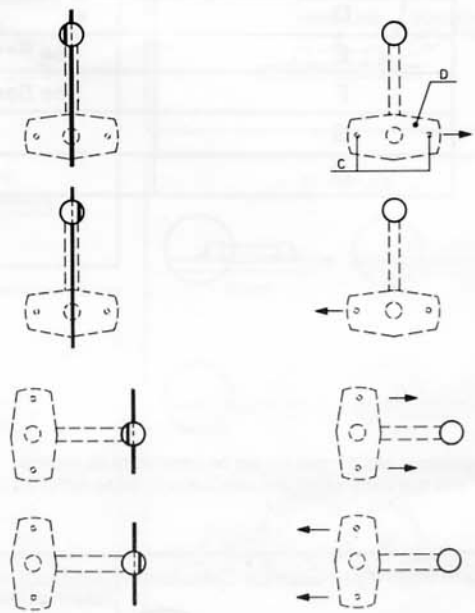
Loosen screws C (see Fig.) until bearing plate D can be shifted.

Correct the angle setting by shifting the bearing plate in the direction indicated on the Figure.

Tighten screws C ensuring that the setting does not drift. Double check the angle setting in two directions.

**Attention**

**After setting the angle, the height setting of the turntable should be checked.**

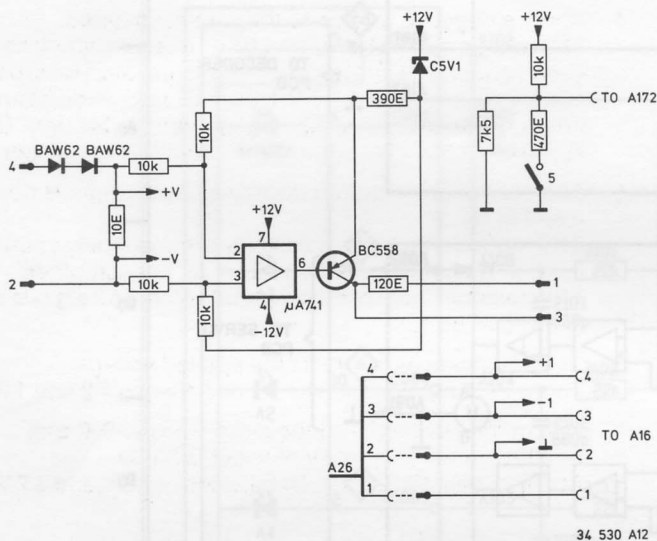


30 710 A15

## ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

### Laser power supply

Since the light pin is very sensitive to static charges, care should be taken that during measurements and adjustments of the laser power supply the potentials of aids and yourself equal the potential of the CD mechanism.



### Check

The laser simulator PCB nr. 3 (4822 395 30229) should be used here.

Take the flex PCB out of socket A11 and connect the switch simulator PCB with the socket.

Remove plug A16 and insert it in the socket on the simulator PCB.

Connect the plug with 4 wires to socket A16. Take out plug A17 and insert the plug with 1 wire in socket A17.

Set the switch on the simulator PCB in the OFF position and the mains switch in the ON position.

Turn trimming resistor 3140 clockwise (max. R) and measure the voltage between points +V and -V on the simulator PCB.

The voltage should be  $\leq 15$  mV.

### Check of laser supply control:

Set the switch on the simulator PCB in the ON position and measure the voltages between points +v and -v on the simulator PCB.

Resistor 3140 clockwise (max. R):

$U +v -v = 225 \text{ mV} \pm 45 \text{ mV}$ .

Resistor 3140 counterclockwise (min. R):

$U +v -v = 750 \text{ mV} \pm 150 \text{ mV}$ .

Set resistor 3140 in mid-position.

This is a preliminary adjustment. After the simulator PCB has been removed the laser current must be adjusted.

(see service manual CD player).

### Adjusting the focus bandwidth

(see service manual CD player).

### Checking the AGC and offset circuit

(see service manual CD player).

### Motor-control check (Hall)

- 1 Remove connector A09 from the motor PCB on the CDM.
- 2 Connect channel A of a dual-beam oscilloscope to the emitter of transistors 6082, 6083 and channel B to the emitter of transistors 6084, 6085.  
Position of oscilloscope: 2 V/div — 10 ms/div.
- 3 Connect pin 1 of connector A09 on the motor PCB to the ground of the set.
- 4 Switch the set on.
- 5 Apply a **negative** voltage to pin 2 of connector A09. The voltage may **not** be applied until **after** the circuit has been connected to power supply voltage. Start from 0 V and slowly proceed to -5 V. Now the motor should run.  
When the motor runs the voltage can be brought to approx -2.5 V. The motor should continue to run then.
- 6 The oscilloscope should display sinusoid signals now (see Fig. A).  
After approx 2 s they should lie symmetrically round the 0-axis and be shifted 90° relative to each other. The maximum ratio of the amplitudes of these 2 signals is allowed to be 1:2.
- 7 The amplitude depends on the applied voltage. The V-in/V-out pp ratio should lie between 1:2 and 1:3.
- 8 Determine at which V-in the motor runs at 600 rpm. At 600 rpm the frequency of V-out is 30 Hz. At this speed V-in should lie between -1.5 V and 3.7 V.

### Conclusion:

When all these conditions are present motor and PCB may be considered in order.

If points 5, 6 and 7 are not correct, the fault should most probably be found in the electronics.

If points 5, 6 and 7 are correct and the voltage to be applied at point 8 is e.g. -4.5 V to obtain a motor speed of 600 rpm, there will most probably be something wrong mechanically. E.g. the bearing friction is too high.

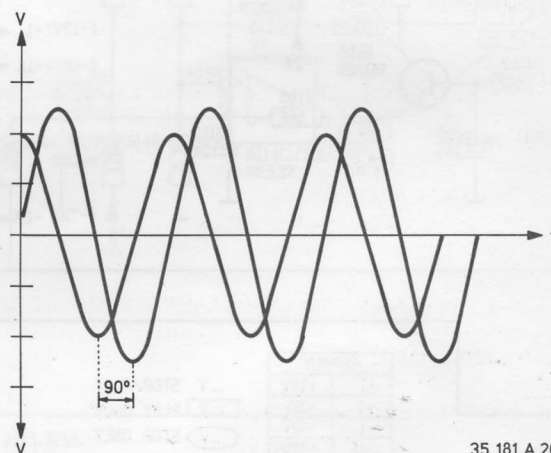
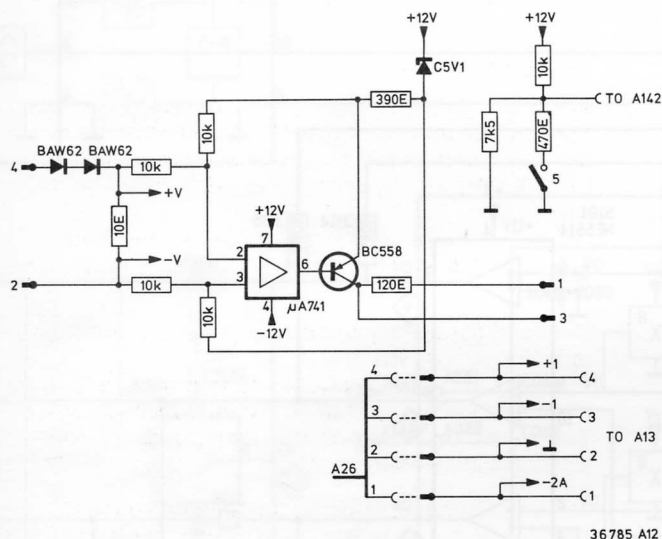


Fig. A

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

**Laser power supply**

Since the light pin is very sensitive to static charges, care should be taken that during measurements and adjustments of the laser power supply the potentials of aids and yourself equal the potential of the CD mechanism.



**Motor-control check (Hall)**

- Desolder the wire from point C152 on the preamplifier printed panel on the C.D.M.
- Connect channel A of a dual-beam oscilloscope to the emitter of transistors 6082, 6083 and channel B to the emitter of transistors 6084, 6085.  
Position of oscilloscope: 2 V/div — 10 ms/div.
- Switch the set on.
- Apply a **negative** voltage to the wire desoldered.  
The voltage may **not** be applied until **after** the circuit has been connected to power supply voltage. Start from 0 V and slowly proceed to  $-5$  V. Now the motor should run. When the motor runs the voltage can be brought to approx.  $-2.5$  V. The motor should continue to run then.
- The oscilloscope should display sinusoid signals now (see Fig. A).  
After approx. 2 s they should lie symmetrically round the 0-axis and be shifted  $90^\circ$  relative to each other. The maximum ratio of the amplitude of these 2 signals is allowed to be 1:2.
- The amplitude depends on the applied voltage.  
The V-in/V-out pp ratio should lie between 1:2 and 1:3.
- Determine at which V-in the motor runs at 600 rpm.  
At 600 rpm the frequency of V-out is 30 Hz.  
At this speed V-in should lie between  $-1.5$  V and 3.7 V.

**Conclusion:**

When all these conditions are present motor and PCB may be considered in order.  
If points 4, 5 and 6 are not correct, the fault should most probably be found in the electronics.  
If points 4, 5 and 6 are correct and the voltage to be applied at point 7 is e.g.  $-4.5$  V to obtain a motor speed of 60 rpm, there will most probably be something wrong mechanically. E.g. the bearing friction is too high.

**Check**

The laser simulator PCB nr. 4 (4822 395 30244) should be used here.  
Take the flex PCB out of socket A11 and connect the switch simulator PCB with the socket.  
Remove plug A13 and insert it in the socket on the simulator PCB.  
Connect the plug with 4 wires to socket A13. Take out plug A14 and insert the plug with 1 wire in socket A14.  
Set the switch on the simulator PCB in the OFF position and the mains switch in the ON position.  
Turn trimming resistor 3140 clockwise (max. R) and measure the voltage between points +V and  $-V$  on the simulator PCB.  
The voltage should be  $\leq 15$  mV.

**Check of laser supply control**

Set the switch on the simulator PCB in the ON position and measure the voltages between points +v and  $-v$  on the simulator PCB.  
Resistor 3140 clockwise (max. R):  
 $U +v -v = 225 \text{ mV} \pm 45 \text{ mV}$ .  
R3140 counterclockwise (min. R):  
 $U +v -v = 750 \text{ mV} \pm 150 \text{ mV}$ .  
Set resistor 3140 in the mid-position.  
This is a preliminary adjustment. After the simulator PCB has been removed the laser current must be adjusted. (See Service Manual CD player).

**Adjusting the focus bandwidth**

(See Service Manual CD player).

**Checking the AGC and offset circuit**

(See Service Manual CD player).

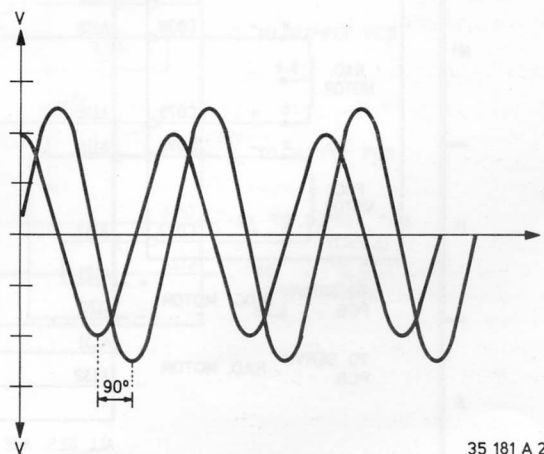
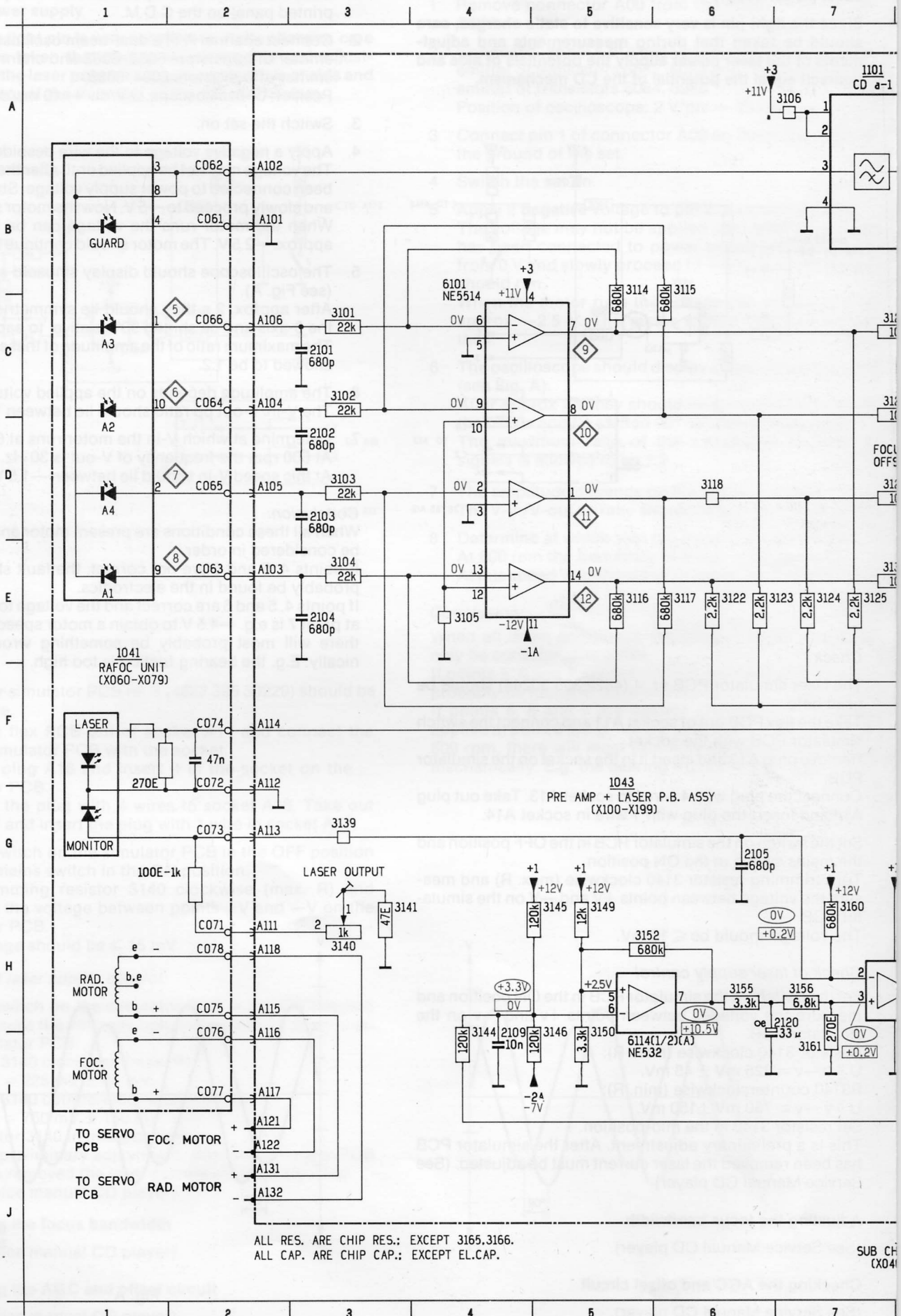


Fig. A

35 181 A 20

1101	A 7	2104	E 3	2111	F12	2121	H 9	3101	C 3	3105	E 4	3116	E 5	3123	E 7	3128	C 8	3132	D 8	313
2101	C 3	2105	G 6	2112	G12	2122	H 9	3102	C 3	3106	A 7	3117	E 6	3124	E 7	3129	D 8	3133	D 8	313
2102	D 3	2109	I 4	2113	G13	2123	G12	3103	D 3	3114	B 5	3118	D 6	3125	E 7	3130	E 8	3134	C 9	313
2103	D 3	2110	H10	2120	H 7	2124	H13	3104	E 3	3115	B 6	3122	E 6	3127	C 8	3131	C 8	3135	C 9	314

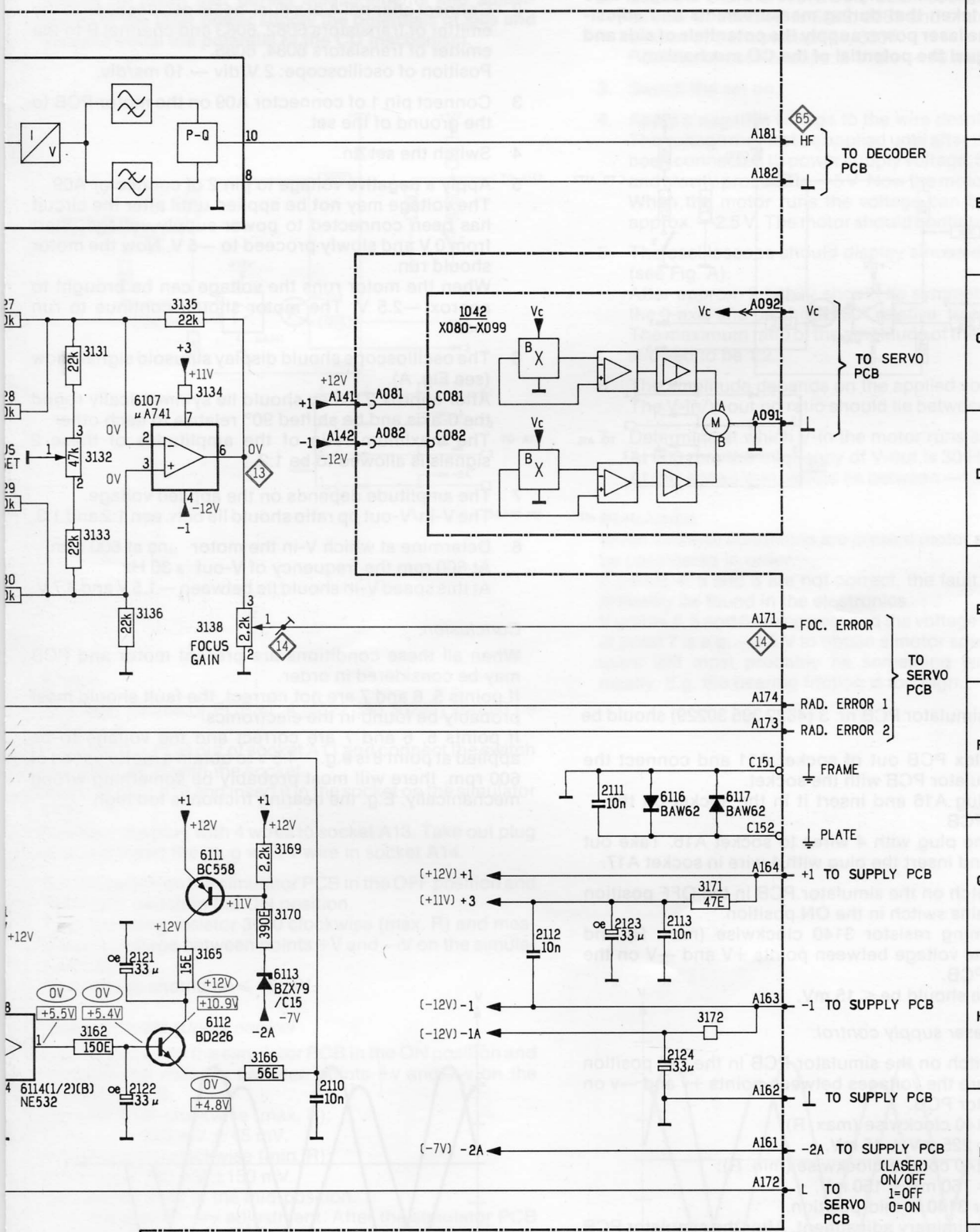


ALL RES. ARE CHIP RES.; EXCEPT 3165, 3166.  
ALL CAP. ARE CHIP CAP.; EXCEPT EL.CAP.

SUB CH  
(X04)

5 E 9 3141 G 3 3149 G 5 3156 H 7 3165 G 9 3171 G13 6111 G 9 6114(\*I 5  
 3 E 9 3144 I 4 3150 I 5 3160 G 7 3166 H 9 3172 H13 6112 H 9 6116 F13  
 9 G 3 3145 G 5 3152 H 5 3161 I 7 3169 G10 6101 B 4 6113 H10 6117 F13  
 0 H 3 3146 I 5 3155 H 6 3162 H 8 3170 G10 6107 C 9 6114(\*H 8

8 9 10 11 12 13 14

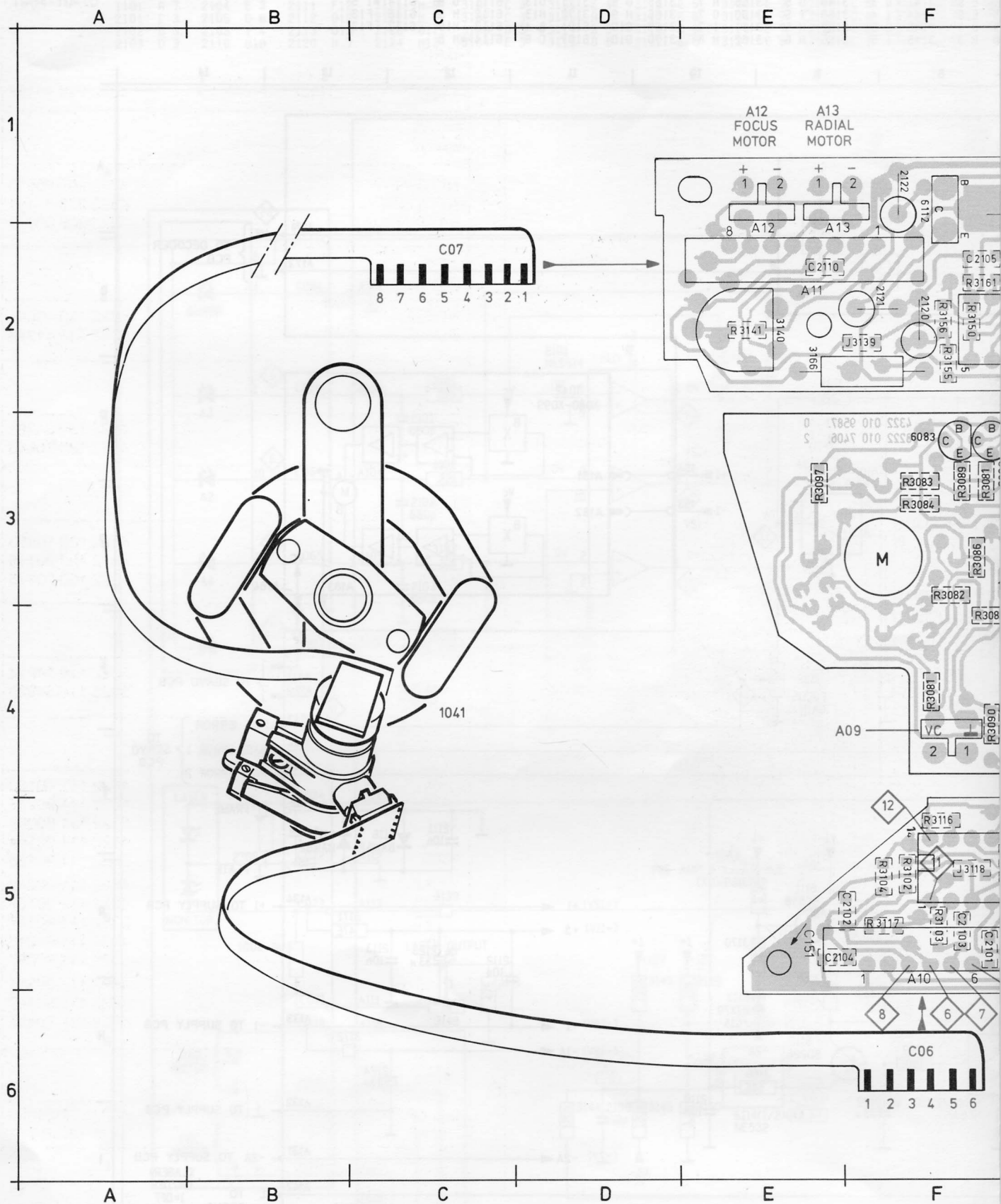


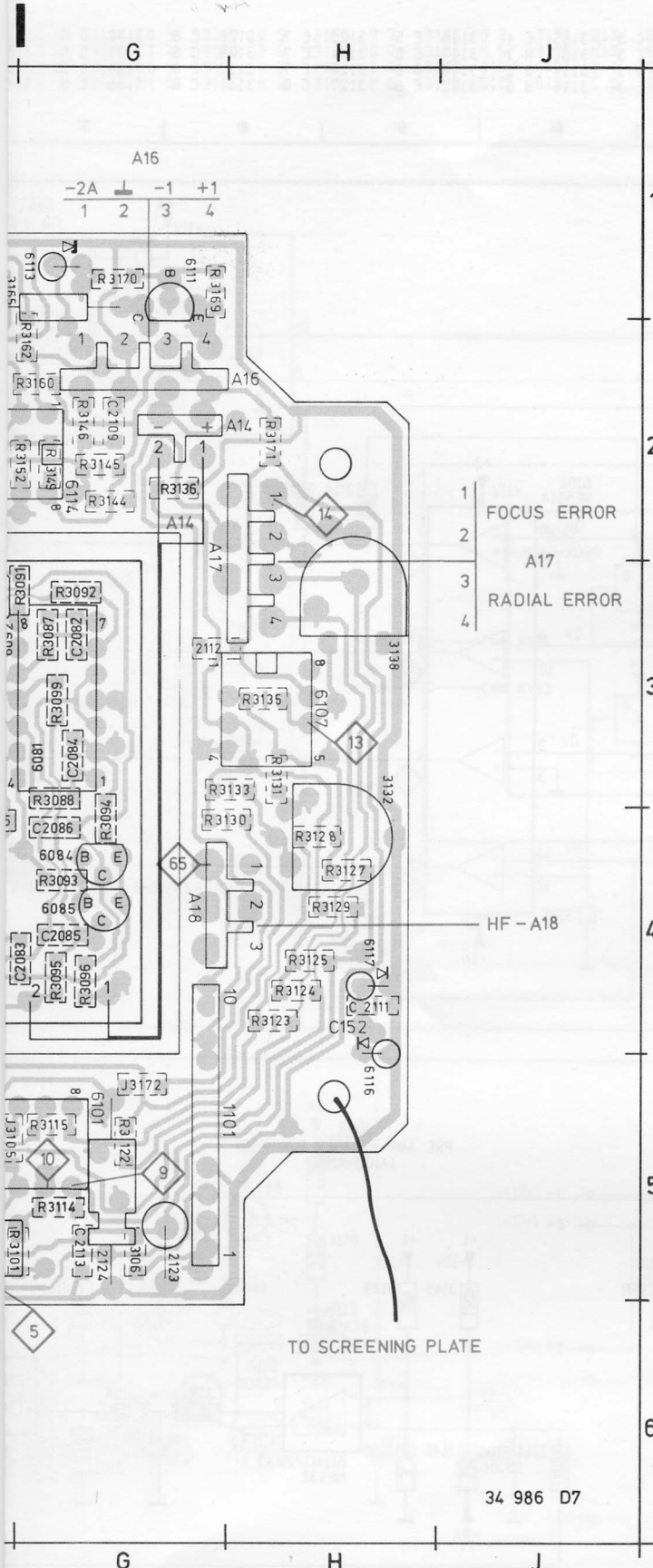
SUPPLY		
+1	+12V	...V STOP/PLAY
+3	+11V	...V PLAY ONLY
-1	-12V	(...V) STOP ONLY
-1A	-12V	
-2A	-7V	

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8 9 10 11 12 13 14



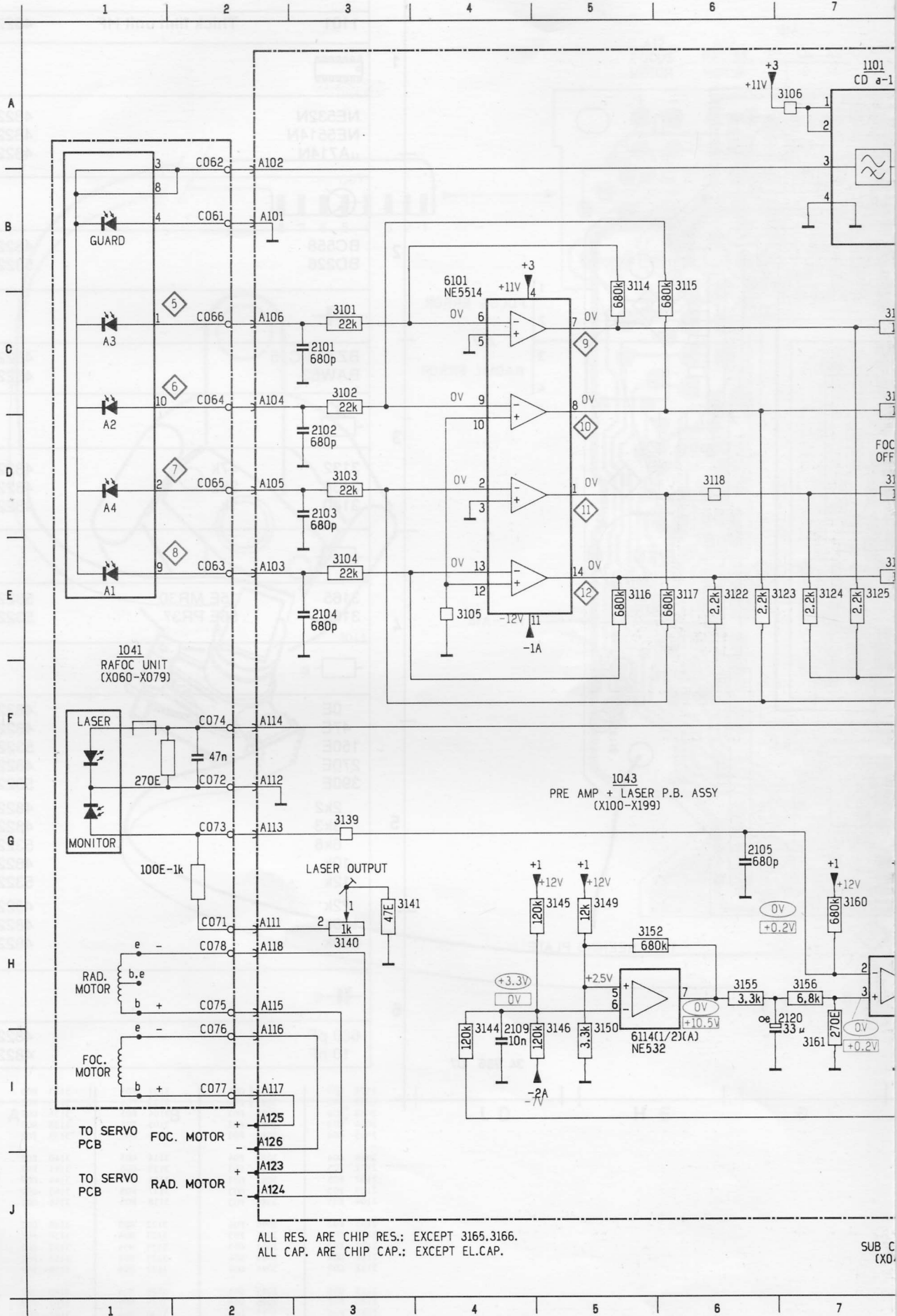




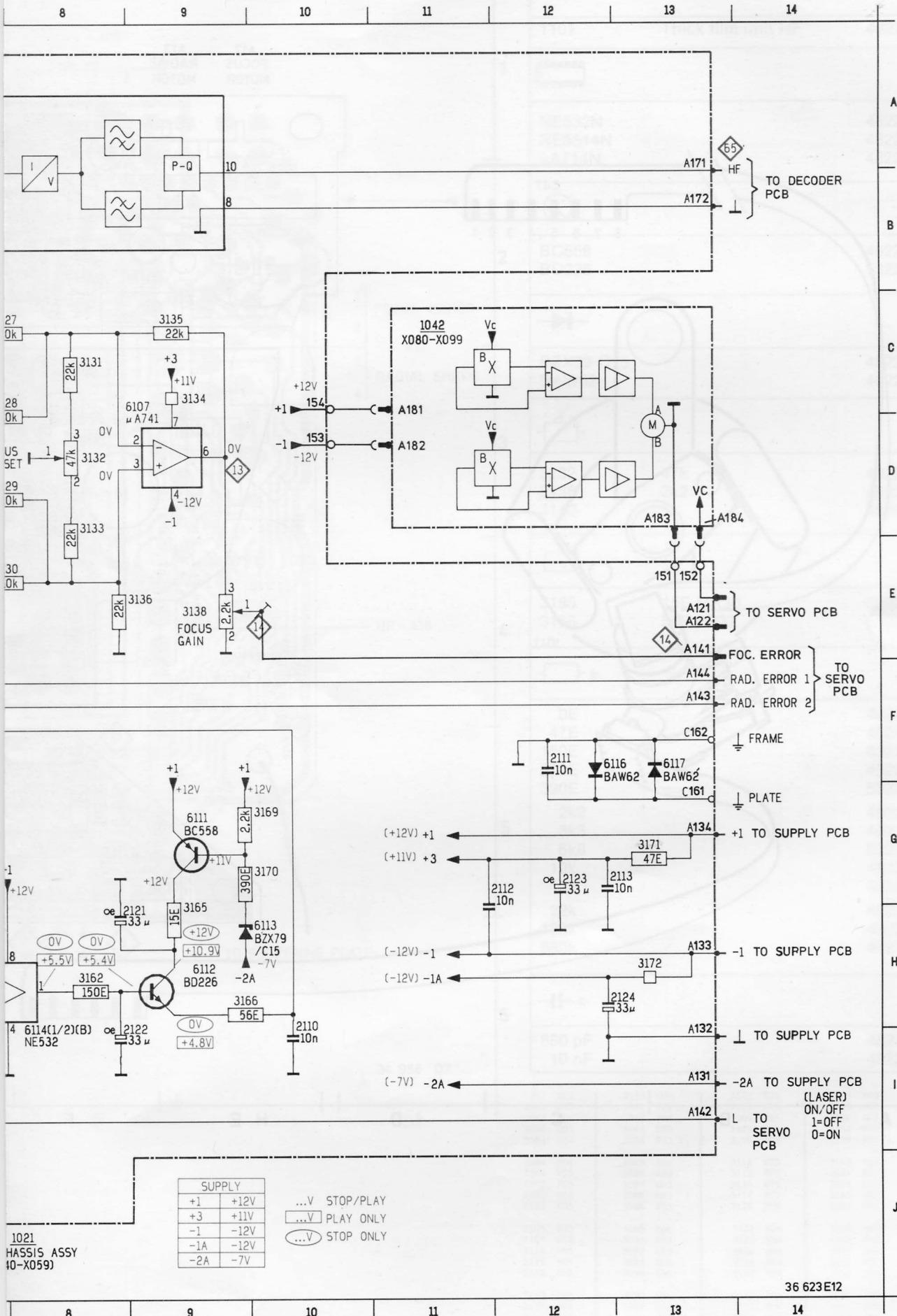
UNIT		
1101	Thick film unit HF	4822 218 10157
NE532N		4822 209 80818
NE5514N		4822 209 81451
μA714N		4822 209 80617
BC558		4822 130 40941
BD226		5322 130 44244
BZX79-C15		4822 130 34281
BAW62		4822 130 30613
3132	47k	4822 100 10583
3138	2k2	4822 100 20116
3140	1k	4822 100 20115
3165	15E MR30	5322 116 54914
3166	56E PR37	5322 116 54929
0E		4822 111 90163
47E		4822 111 90217
150E		5322 111 90098
270E		4822 111 90154
390E		5322 111 90138
2k2		4822 111 90249
3k3		4822 111 90157
6k8		5322 111 90117
10k		4822 111 90249
12k		5322 111 90097
22k		4822 111 90251
120k		4822 111 90149
680k		4822 111 90488
680 pF		4822 122 31809
10 nF		4822 122 31728

1101 G05	2133 G05	3102 F05	3133 H03	3169 G01
2082 G03	3081 F04	3103 F05	3135 H03	3170 G01
2083 F04	3082 F03	3104 F05	3136 G02	3171 H02
2084 G03	3083 F03	3105 F05	3138 H03	3172 G05
2085 G04	3084 F03	3106 G05	3139 F02	6081 G03
2086 G04	3085 F04	3114 G05	3140 E02	6083 F03
2101 F05	3086 F03	3115 G05	3141 E02	6084 G04
2102 F05	3087 G03	3116 F05	3144 G02	6085 G04
2103 F05	3088 G03	3117 F05	3145 G02	6092 F03
2104 E05	3089 F03	3118 F05	3146 G02	6101 G05
2105 F02	3090 F04	3122 G05	3149 G02	6107 H03
2109 G02	3091 F03	3123 H04	3150 F02	6111 G01
2110 F02	3092 G03	3124 H04	3152 G02	6112 F01
2111 H04	3093 G04	3125 H04	3155 F02	6113 G01
2112 G03	3094 G04	3127 H04	3156 F02	6116 H05
2113 G05	3095 G04	3128 H04	3160 G02	6117 H04
2120 F02	3096 G04	3129 H04	3161 F02	
2121 F02	3097 E03	3130 H04	3162 G02	
2122 F01	3099 G03	3131 H03	3165 G01	
2124 G05	3101 F05	3132 H04	3166 F02	

1101	A 7	2104	E 3	2111	F 12	2121	H 9	3101	C 3	3105	E 4	3116	E 5	3123	E 7	3128	C 8	3132	D 8	313
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2103	D 3	2110	H 10	2120	H 7	2124	H 13	3104	E 3	3115	B 6	3122	E 6	3127	C 8	3131	C 8	3135	C 9	314



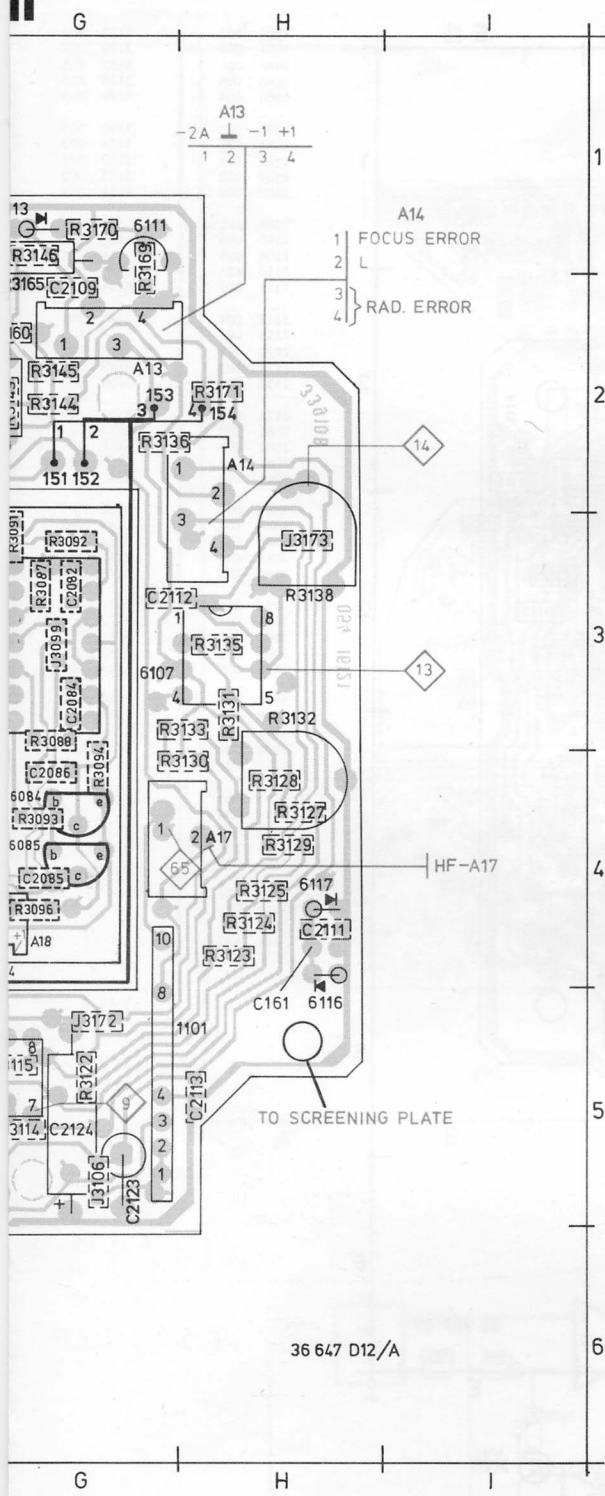
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 8 E 9 3144 I 4 3150 I 5 3160 G 7 3166 H 9 3172 H 13 6112 H 9 6116 F 13  
 9 G 3 3145 G 5 3152 H 5 3161 I 7 3169 G 10 6101 B 4 6113 H 10 6117 F 13  
 0 H 3 3146 I 5 3155 H 6 3162 H 8 3170 G 10 6107 C 9 6114(\*H 8



SUPPLY		
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-1	-12V	...V STOP ONLY
-1A	-12V	
-2A	-7V	

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 HASSIS ASSY  
 10-X059)



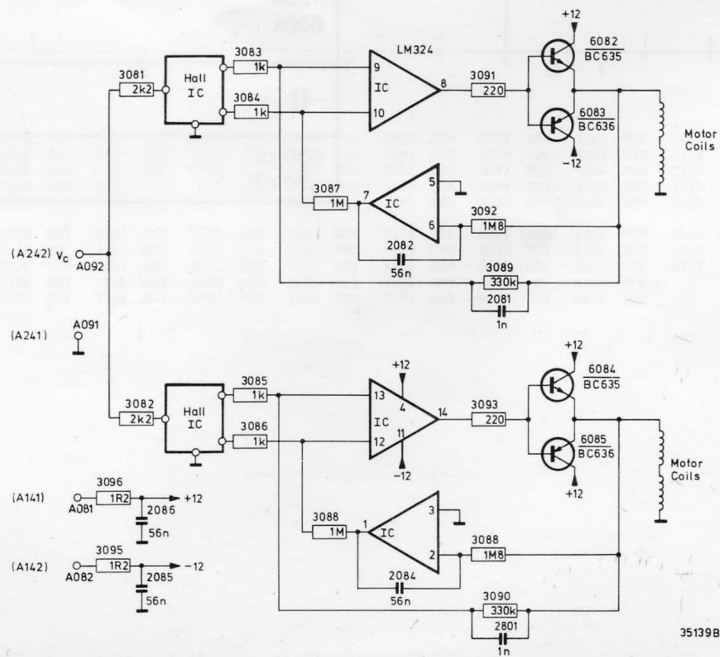


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3165	15E MR30	5322 116 54914
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150E		5322 111 90098
270E		4822 111 90154
390E		5322 111 90138
2k2		4822 111 90249
3k3		4822 111 90157
6k8		5322 111 90117
10k		4822 111 90249
12k		5322 111 90097
22k		4822 111 90251
120k		4822 111 90149
680k		4822 111 90488
680 pF		4822 122 31809
10 nF		4822 122 31728



34 987 C7

1101	D02	3123	D02
2081	C04	3124	D02
2082	C04	3127	E03
2083	C03	3128	E03
2084	C04	3129	E03
2085	C03	3130	D03
2086	C03	3131	D03
2101	C01	3132	E03
2102	B02	3133	D03
2103	C01	3135	D04
2104	B01	3136	D05
2105	C05	3138	E04
2109	D05	3139	B05
2110	B05	3140	B05
2111	E02	3141	B05
2112	D04	3144	D05
2113	C01	3145	D05
2120	C05	3146	C05
2121	B05	3149	C05
2123	D01	3150	C05
2124	D02	3152	C05
3081	C03	3155	C05
3082	C03	3156	C05
3083	C04	3160	C05
3084	C04	3161	C05
3085	C03	3162	C05
3086	C04	3165	B05
3087	C04	3166	B05
3088	C03	3169	D06
3090	C03	3170	D06
3091	C04	3171	D05
3092	C04	3172	D02
3093	C03	6081	C04
3095	C03	6082	C04
3096	C03	6083	C04
3097	B04	6084	C03
3098	B04	6085	C03
3099	C04	6101	C02
3101	C01	6107	D04
3102	C02	6111	D06
3103	C01	6112	C06
3104	B02	6113	C06
3105	C02	6116	E02
3106	D01	6117	E03
3114	C02		
3115	C02		
3116	C02		
3117	B02		
3118	C02		
3122	D02		



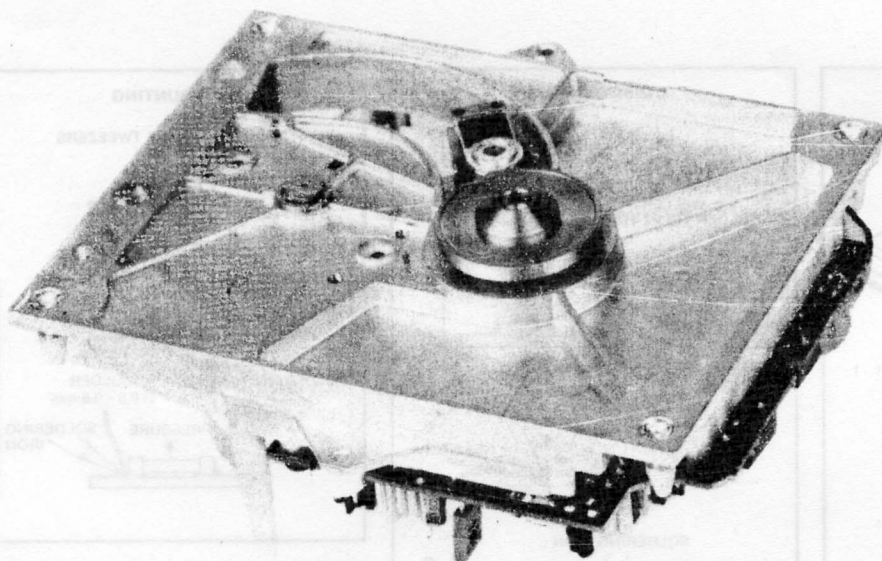




Service  
Service  
Service

# Service Manual

COMPACT  
**disc**  
DIGITAL AUDIO



35 367 A

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

**CLASS 1  
LASER PRODUCT**

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

Subject to modification  
**GB** 4822 725 20127

Printed in The Netherlands

**SERVICING HINTS**

In order to prevent loose metal objects from getting in the CD mechanism it will be necessary to see to a clean repair station.

The objective can be cleaned with a blow brush.

**The CD-mechanism is provided with self-lubricating bearings and should thus NOT be lubricated.**

**Ensure that the player is not resting on the shaft of the turntable motor during repairs and measurements on the bottom.**

**Servicing the RAFOC unit (= Radial and Focusing unit pos. 61).**

The RAFOC unit supplied by Service is the same one as in CDM-0. In the CDM-1 the bottom plate of this RAFOC unit has been replaced by frame item number 503. If the RAFOC unit is replaced, **carefully** and accurately perform the following operations:

- Take the two flex PCBs out of the connectors on the preamplifier PCB.
- Disassemble the **defective** RAFOC unit by removing the 4 bolts M3x18 mm and shaft item number 504.
- Remove shaft item number 504 of the new RAFOC unit. Pay attention to the 3 intermediate washers item number 502 and spring washer item number 505, they should assume the same positions after assembly.

Loosen the 4 bolts M3x18 mm until the bottom plate can be removed.

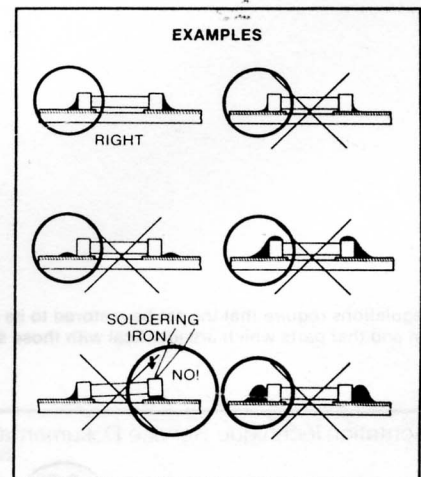
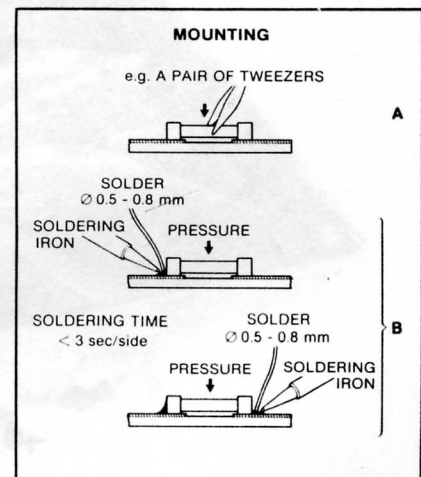
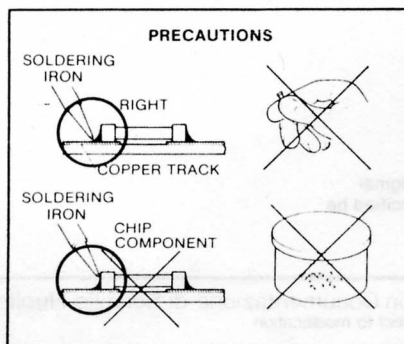
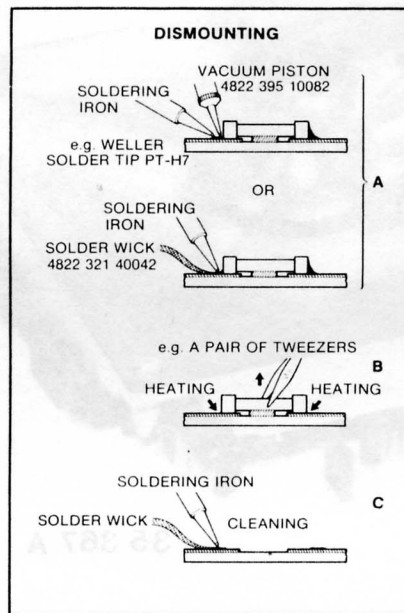
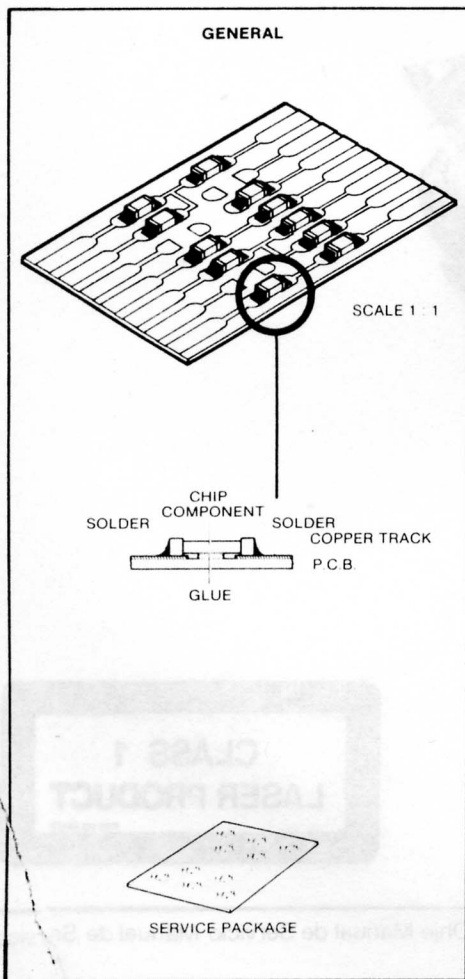
Do not remove bolts M3x18 mm (they hold the new RAFOC unit together).

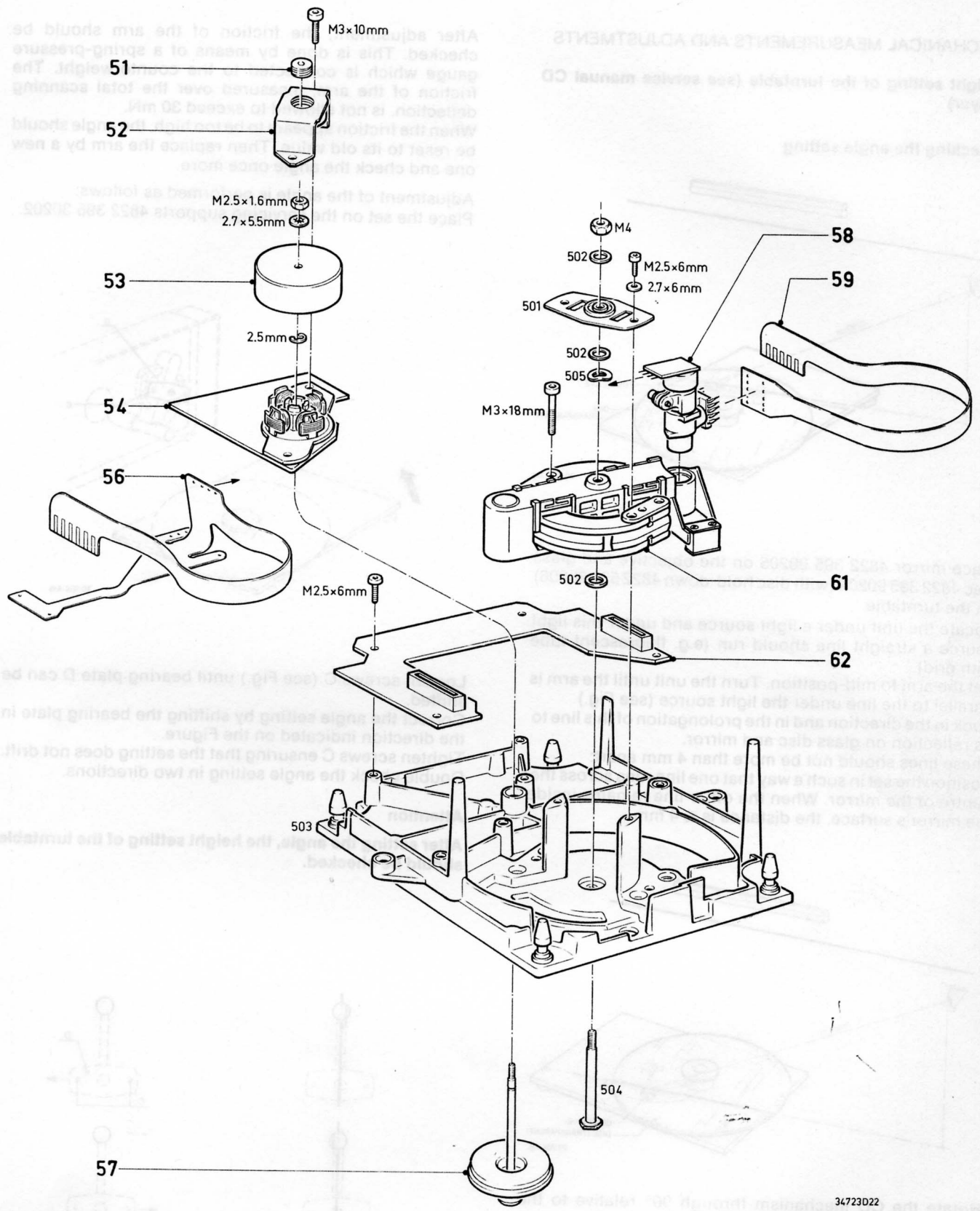
- Mount the new RAFOC unit on frame 503. Ensure that the 3 intermediate washers 502 and spring washer 505 are positioned correctly before fixing shaft item number 504.
- Check that the arm moves freely and the angle setting as well (see check and possible adjustment of angle setting).

**Attention:**

**To prevent adjustments from changing, NO SCREWS OTHER than those mentioned above should be loosened.**

**THE LIGHT PIN IS MUCH MORE SENSITIVE TO STATIC CHARGE THAN A MOS IC. CARELESS TREATMENT DURING SERVICING MAY REDUCE LIFE EXPECTANCY DRASTICALLY. FOR THIS REASON CARE SHOULD BE TAKEN THAT DURING SERVICING THE POTENTIALS OF THE AIDS AND YOURSELF EQUAL THE POTENTIAL OF THE MECHANISM.**





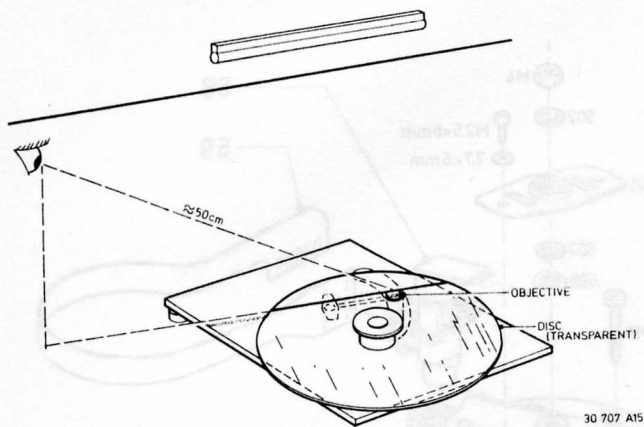
34723022

- |       |  |
|-------|--|
| 51    | 4822 502 11701                         |
| 52    | 4822 520 10529                         |
| 53    | 4822 362 20225                         |
| 54    | 4822 214 50395 - 2 PIN PLUG + 2 LEADS. |
| 56    | 4822 322 40051                         |
| 57    | 4822 528 10491                         |
| 58+59 | 4822 691 30129                         |
| 59    | 4822 322 40048                         |
| 61    | 4822 691 30128                         |
| 62    | 4822 214 50394 - 2 PIN PLUG + 2 LEADS. |
| 54    | 4822 - 214 - 50446 - 4 PIN PLUG.       |
| 62    | - 4 PIN PLUG                           |

## MECHANICAL MEASUREMENTS AND ADJUSTMENTS

### Height setting of the turntable (see service manual CD player)

#### Checking the angle setting



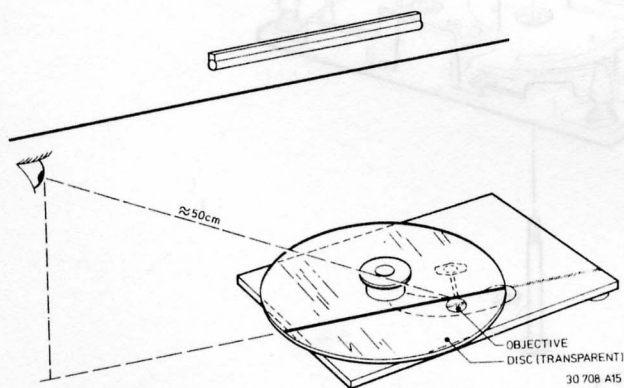
Place mirror 4822 395 90205 on the objective and glass disc 4822 395 90204 (with disc hold-down 4822 532 60906) on the turntable.

Locate the unit under a light source and under this light source a straight line should run (e.g. fluorescent tube with grid).

Set the arm to mid-position. Turn the unit until the arm is parallel to the line under the light source (see Fig.). Look in the direction and in the prolongation of this line to its reflection on glass disc and mirror.

These lines should not be more than 4 mm apart:

Position the set in such a way that one line runs across the centre of the mirror. When the other line remains inside the mirror's surface, the distance is  $\leq 4$  mm.



Rotate the CD mechanism through 90° relative to the previous position.

The arm must be kept in mid-position (see Fig.).

Repeat the previous measurement.

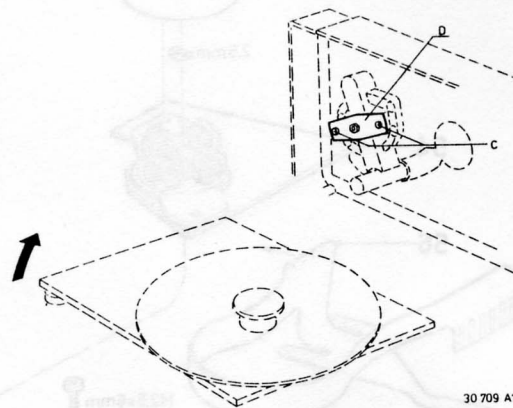
#### Adjusting the angle setting

With respect to the adjustment of the angle between disc and light path, the factory has looked for a compromise between minimum angle deviation and minimum arm friction.

If the measurements show that the angle falls outside the tolerance given, the angle should NOT be adjusted for minimum deviation, but just within tolerance. The new setting should lie between the "old" setting and the optimum setting.

After adjustment, the friction of the arm should be checked. This is done by means of a spring-pressure gauge which is connected to the counterweight. The friction of the arm, measured over the total scanning deflection, is not allowed to exceed 30 mN. When the friction appears to be too high, the angle should be reset to its old value. Then replace the arm by a new one and check the angle once more.

Adjustment of the angle is performed as follows:  
Place the set on the servicing supports 4822 395 30202.



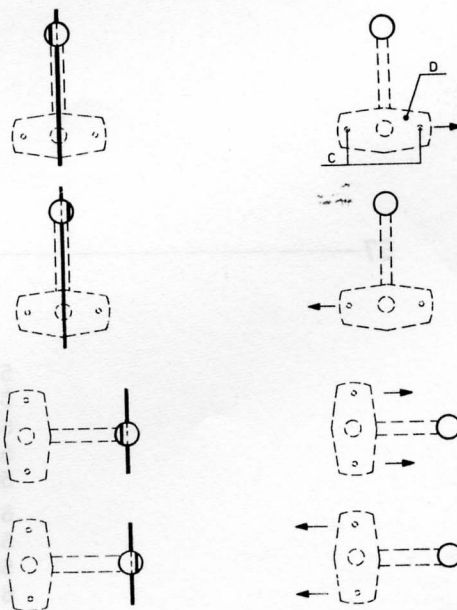
Loosen screws C (see Fig.) until bearing plate D can be shifted.

Correct the angle setting by shifting the bearing plate in the direction indicated on the Figure.

Tighten screws C ensuring that the setting does not drift. Double check the angle setting in two directions.

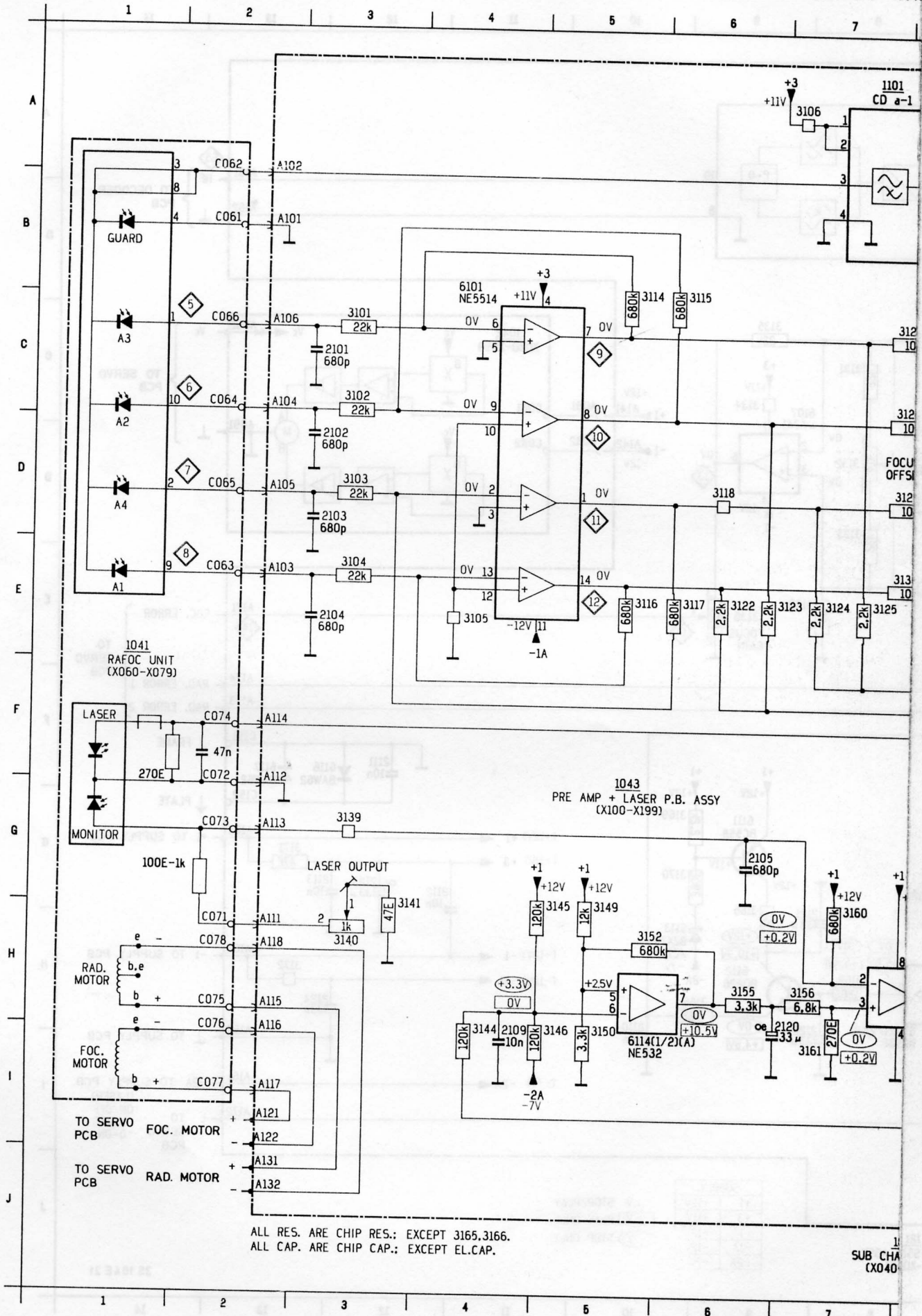
#### Attention

**After setting the angle, the height setting of the turntable should be checked.**



30 710 A15

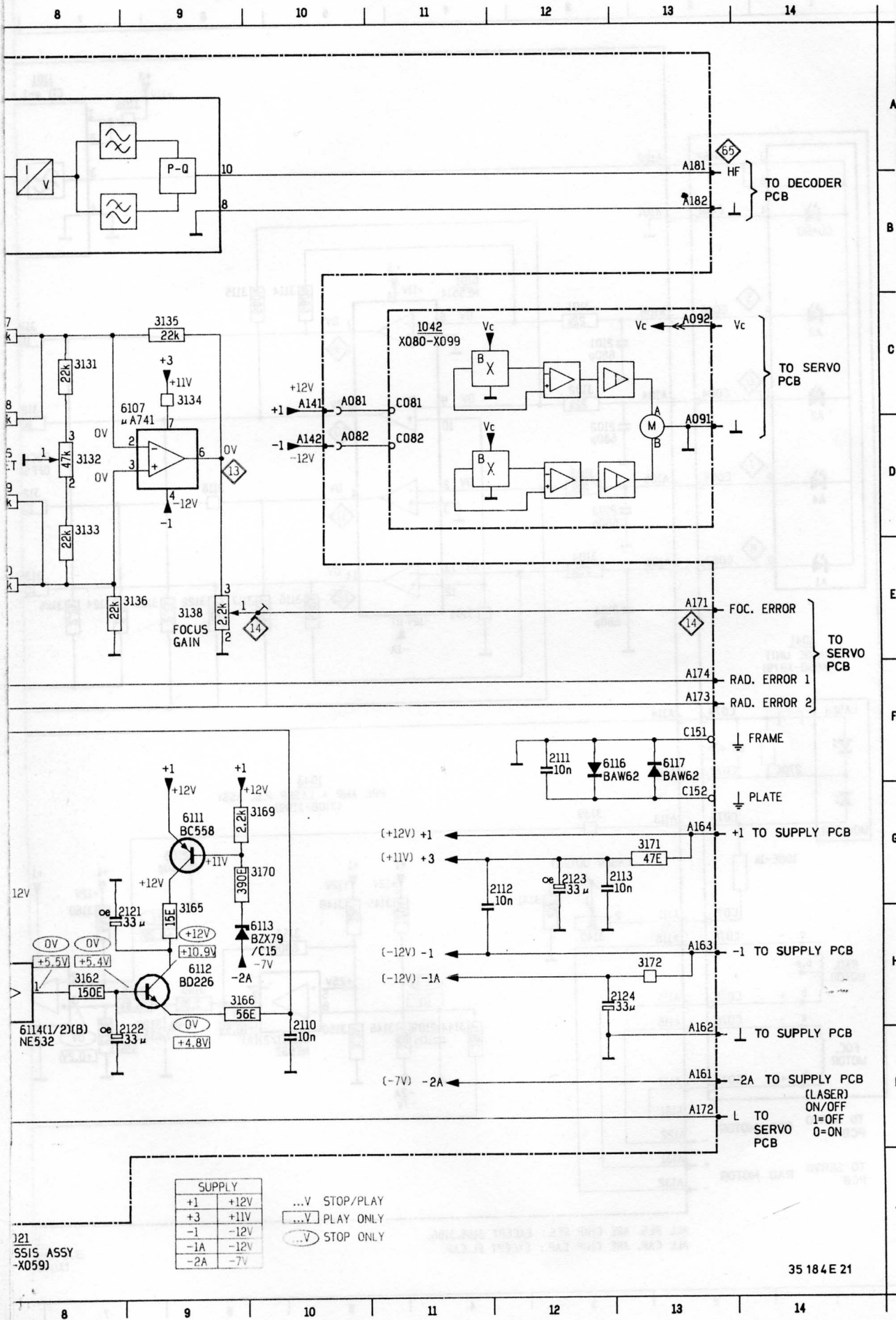
1101	A 7	2104	E 3	2111	F12	2121	H 9	3101	C 3	3105	E 4	3116	E 5	3123	E 7	3128	C 8	3132	D 8	3136
2101	C 3	2105	G 6	2112	G12	2122	H 9	3102	C 3	3106	A 7	3117	E 6	3124	E 7	3129	D 8	3133	D 8	3138
2102	D 3	2109	I 4	2113	G13	2123	G12	3103	D 3	3114	B 5	3118	D 6	3125	E 7	3130	E 8	3134	C 9	3139
2103	D 3	2110	H10	2120	H 7	2124	H13	3104	E 3	3115	B 6	3122	E 6	3127	C 8	3131	C 8	3135	C 9	3140



ALL RES. ARE CHIP RES.: EXCEPT 3165, 3166.  
 ALL CAP. ARE CHIP CAP.: EXCEPT EL.CAP.

1  
 SUB CHA  
 (X040)

E 9	3141	G 3	3149	G 5	3156	H 7	3165	G 9	3171	G13	6111	G 9	6114(I 5
E 9	3144	I 4	3150	I 5	3160	G 7	3166	H 9	3172	H13	6112	H 9	6116 F13
G 3	3145	G 5	3152	H 5	3161	I 7	3169	G10	6101	B 4	6113	H10	6117 F13
H 3	3146	I 5	3155	H 6	3162	H 8	3170	G10	6107	C 9	6114(H 8		



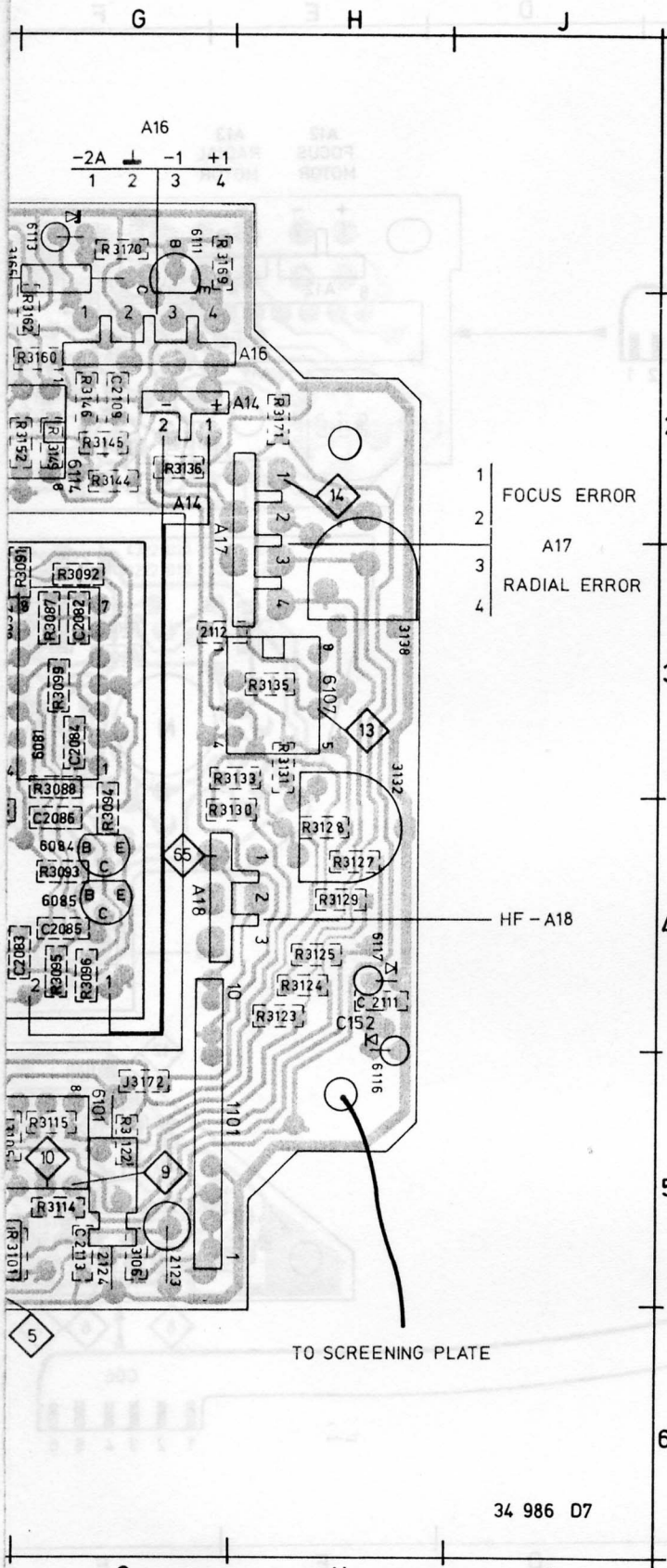
SUPPLY	
+1	+12V
+3	+11V
-1	-12V
-1A	-12V
-2A	-7V

...V STOP/PLAY  
 ...V PLAY ONLY  
 ...V STOP ONLY

121  
 5515 ASSY  
 -X059)

35 184 E 21





UNIT		
1101	Thick film unit HF	4822 218 10157
NE532N		4822 209 80818
NE5514N		4822 209 81451
μA714N		4822 209 80617
BC558		4822 130 40941
BD226		5322 130 44244
BZX79-C15		4822 130 34281
BAW62		4822 130 30613
3132	47k	4822 100 10583
3138	2k2	4822 100 20116
3140	1k	4822 100 20115
3165	15E MR30	5322 116 54914
3166	56E PR37	5322 116 54929
0E		4822 111 90163
47E		4822 111 90217
150E		5322 111 90098
270E		4822 111 90154
390E		5322 111 90138
2k2		4822 111 90249
3k3		4822 111 90157
6k8		5322 111 90117
10k		4822 111 90249
12k		5322 111 90097
22k		4822 111 90251
120k		4822 111 90149
680k		4822 111 90488
680 pF		4822 122 31809
10 nF		4822 122 31728

34 986 D7

CONNECTORS

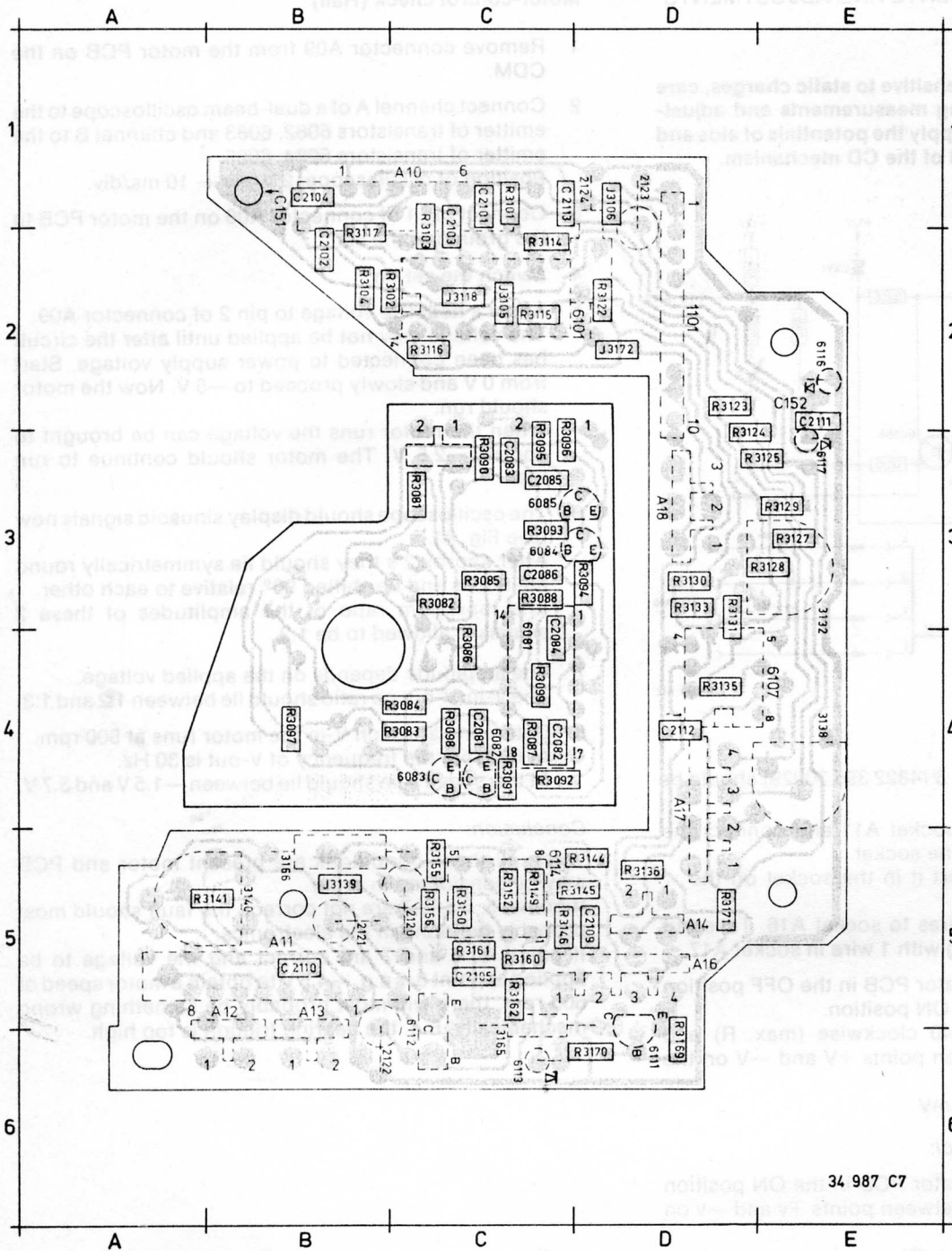
A10 4822-267-50412  
 A11 4822-267-50413

1101 G05	2133 G05	3102 F05	3133 H03	3169 G01
2082 G03	3081 F04	3103 F05	3135 H03	3170 G01
2083 F04	3082 F03	3104 F05	3136 G02	3171 H02
2084 G03	3083 F03	3105 F05	3138 H03	3172 G05
2085 G04	3084 F03	3106 G05	3139 F02	6081 G03
2086 G04	3085 F04	3114 G05	3140 E02	6083 F03
2101 F05	3086 F03	3115 G05	3141 E02	6084 G04
2102 F05	3087 G03	3116 F05	3144 G02	6085 G04
2103 F05	3088 G03	3117 F05	3145 G02	6092 F03
2104 E05	3089 F03	3118 F05	3146 G02	6101 G05
2105 F02	3090 F04	3122 G05	3149 G02	6107 H03
2109 G02	3091 F03	3123 H04	3150 F02	6111 G01
2110 E02	3092 G03	3124 H04	3152 G02	6112 F01
2111 H04	3093 G04	3125 H04	3155 F02	6113 G01
2112 G03	3094 G04	3127 H04	3156 F02	6116 H05
2113 G05	3095 G04	3128 H04	3160 G02	6117 H04
2120 F02	3096 G04	3129 H04	3161 F02	
2121 F02	3097 F03	3130 H04	3162 G02	
2122 F01	3099 G03	3131 H03	3165 G01	
2124 G05	3101 F05	3132 H04	3166 F02	

FINE PINS

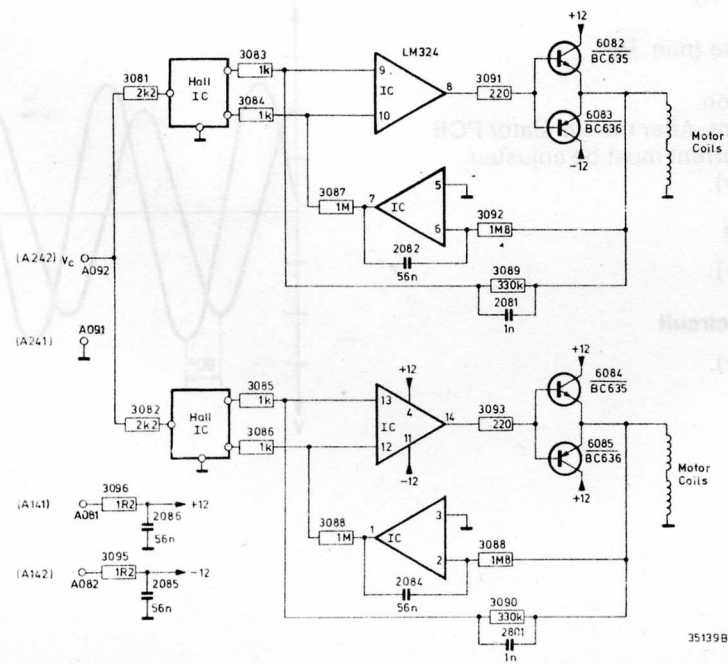






1101	D02	3123	D02
2081	C04	3124	D02
2082	C04	3127	E03
2083	C03	3128	E03
2084	C04	3129	E03
2085	C03	3130	D03
2086	C03	3131	D03
2101	C01	3132	E03
2102	D02	3133	D03
2103	C01	3135	D04
2104	B01	3136	D05
2105	C05	3138	E04
2109	D05	3139	B05
2110	B05	3140	B05
2111	E02	3141	B05
2112	D04	3144	D05
2113	C01	3145	D05
2120	C05	3146	C05
2121	B05	3149	C05
2123	D01	3150	C05
2124	D02	3152	C05
3081	C03	3155	C05
3082	C03	3156	C05
3083	C04	3160	C05
3084	C04	3161	C05
3085	C03	3162	C05
3086	C04	3165	C05
3087	C04	3166	B05
3088	C03	3169	D06
3090	C03	3170	D06
3091	C04	3171	D05
3092	C04	3172	D02
3093	C03	6081	C04
3095	C03	6082	C04
3096	C03	6083	C04
3097	B04	6084	C03
3098	C04	6085	C03
3099	C04	6101	C02
3101	C01	6107	D04
3102	C02	6111	D06
3103	C01	6112	C06
3104	B02	6113	C06
3105	C02	6116	E02
3106	D01	6117	E03
3114	C02		
3115	C02		
3116	C02		
3117	B02		
3118	C02		
3122	D02		

34 987 C7



**MOTOR NOT STARTING**  
 FIT 100nF ACROSS PINS  
 1+2 AND 6+7 ON  
 IC6081  
 (WILL START IF YOU  
 GIVE IT A PUSH).