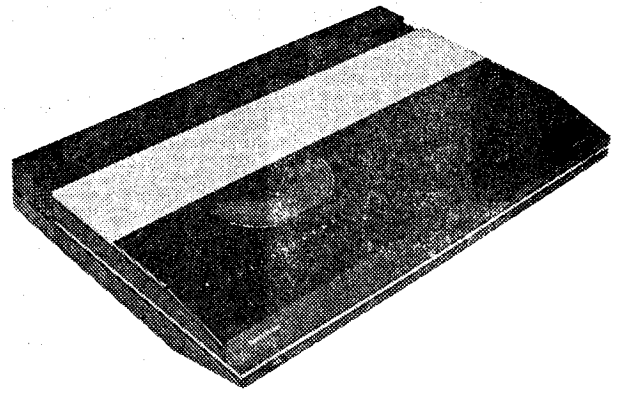


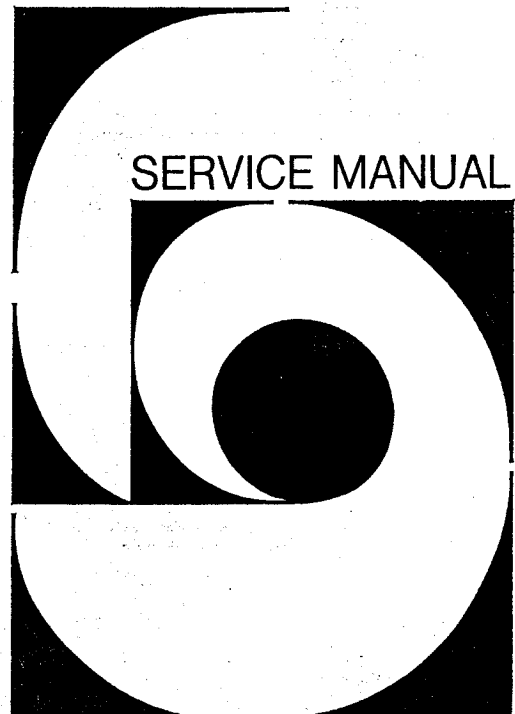
Bang & Olufsen



Beogram CDX Type 5121/22/23/25

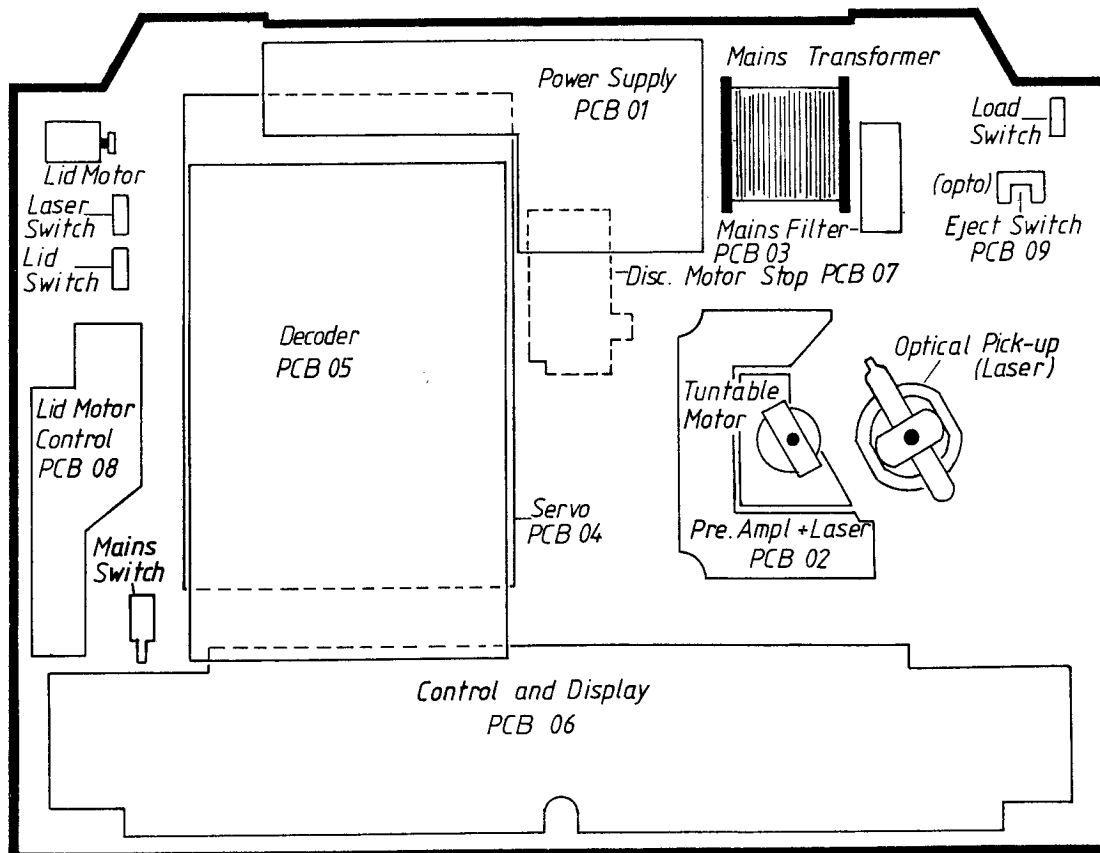
1056

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351894 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk



01 Power Supply	page 1-4	06 Control and Display	page 1-17
02 Pre. Ampl. & Laser	page 1-13	07 Motor Stop	page 1-15
03 Mains Filter	page 1-4	08 Motor Control	page 1-16
04 Servo	page 1-5, 1-8	09 Eject Switch	page 1-16
05 Decoder	page 1-9, 1-12		

BOTTOM WIEV



CAUTIONS

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.

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

Attention:

To prevent adjustments in the mechanism from changing, no screws other than those mentioned should be loosened.

Ensure that the player is not resting on the shaft of the turntable motor or the light pin during repairs and measurements.

Symbol for Safety Components



When replacing components with this symbol components with identical part numbers are to be used. The new component must be fitted in the same way as the one replaced.

**CLASS 1
LASER PRODUCT**

For order to make the product work when placed in service position, see page 7 dismantling.

DIAGRAM EXPLANATION

The respective diagrams are named, e.g. SERVO 1. The cable connections between the diagrams are described by the name of the diagram to which the connection goes, as well as by the socket and pin number (or a designation) on the diagram in question.

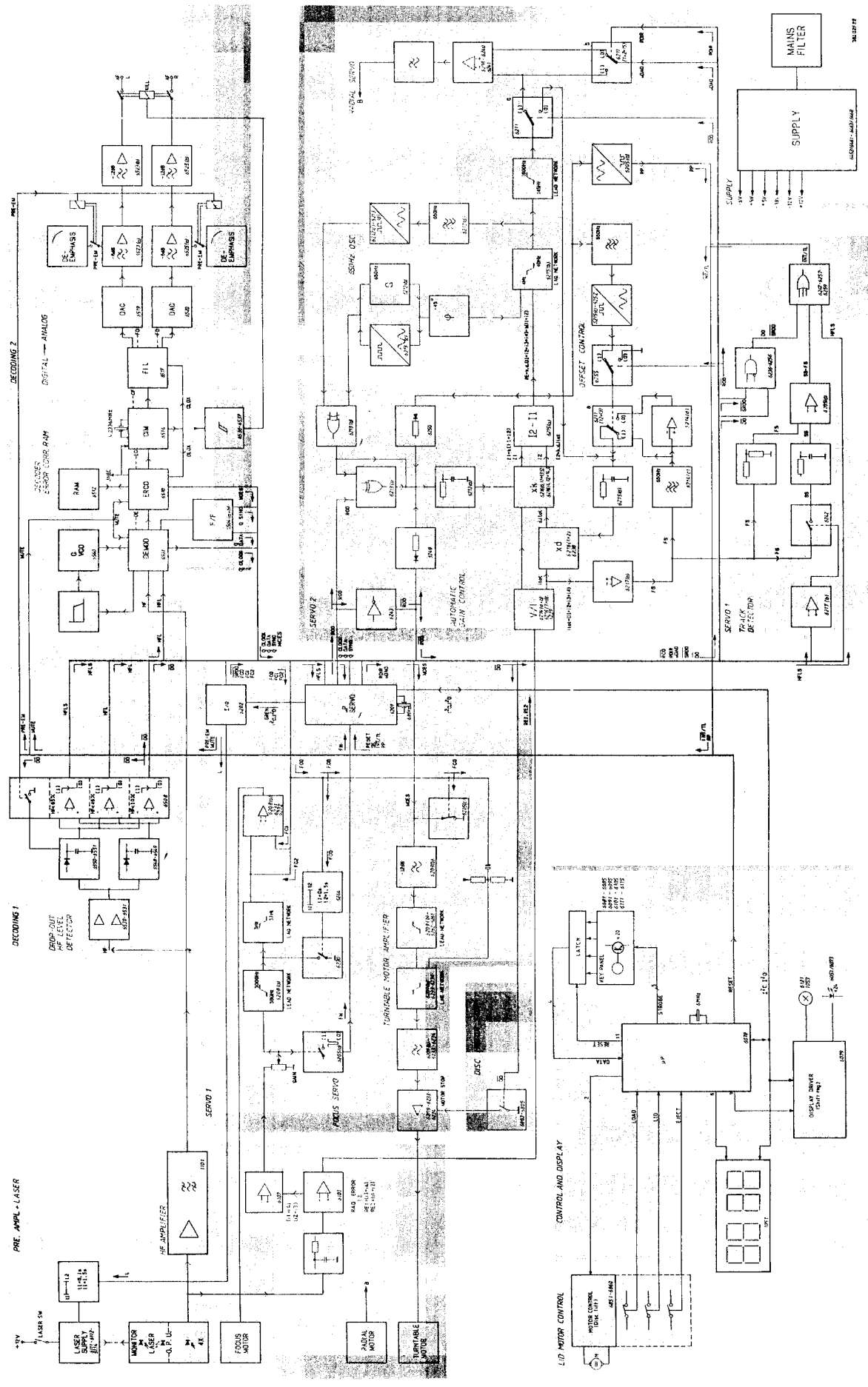
System of co-ordinates

The most closely written diagrams and PCB drawings are provided with a system of co-ordinates.

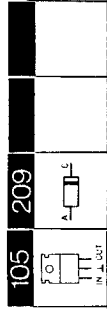
The position numbers with attached co-ordinate designation can be found at the top of the diagram pages and next to the PCB drawings.

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BLOCK DIAGRAM

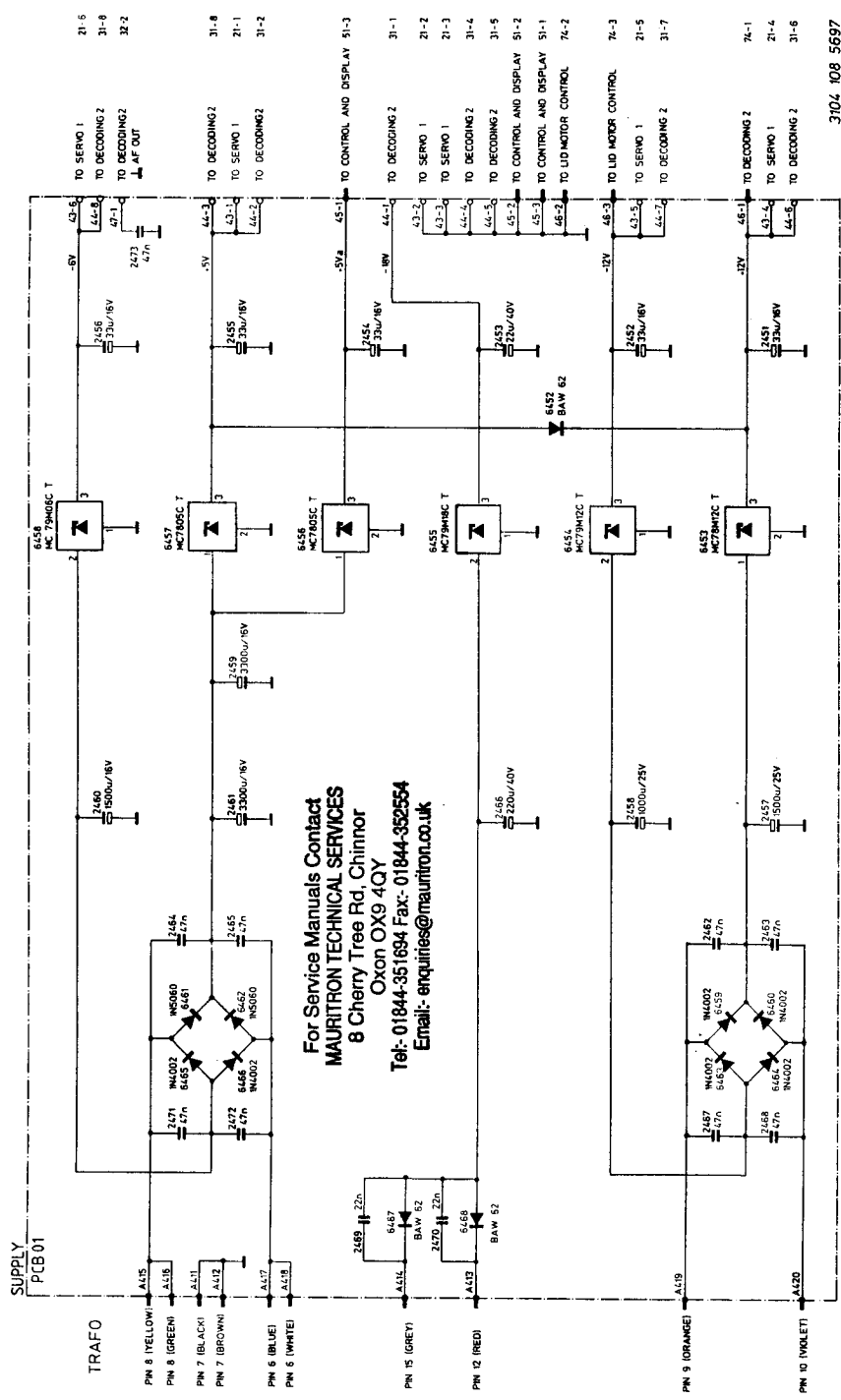
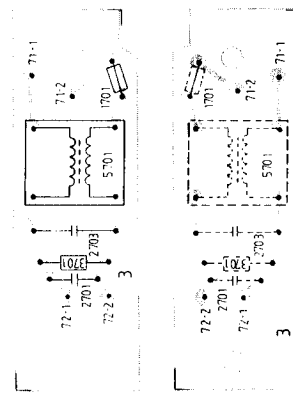
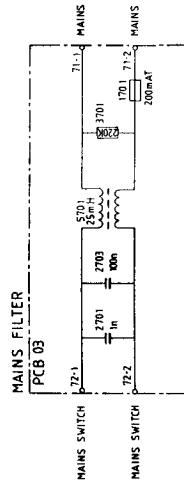


Semi-conductors



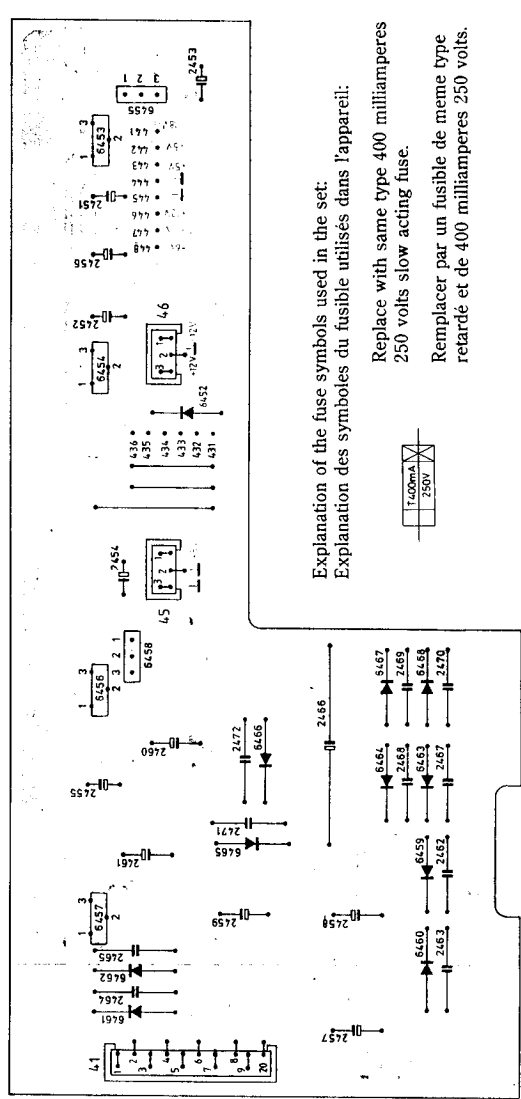
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6454	8340356	105	MC79M12C
6455	8340814	105	MC79M18C
6456	8340065	105	MC7805C
6457			
6458	8340815	105	MC79M064
6452	8300359	209	BAW 62
6459-	8300023	209	1N4002
6460			
6461	8300436	209	1N5060
6462			
6463-	8300023	209	1N4002
6466			
6467	8300359	209	BAW 62
6468			

Diodes



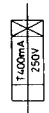
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3104 108 5697



Explanation of the fuse symbols used in the set.
 Explanation des symboles du fusible utilisés dans l'appareil:

Replace with same type 400 milliampères
 250 volts slow acting fuse.
 Remplacer par un fusible de même type
 retardé et de 400 milliampères 250 volts.

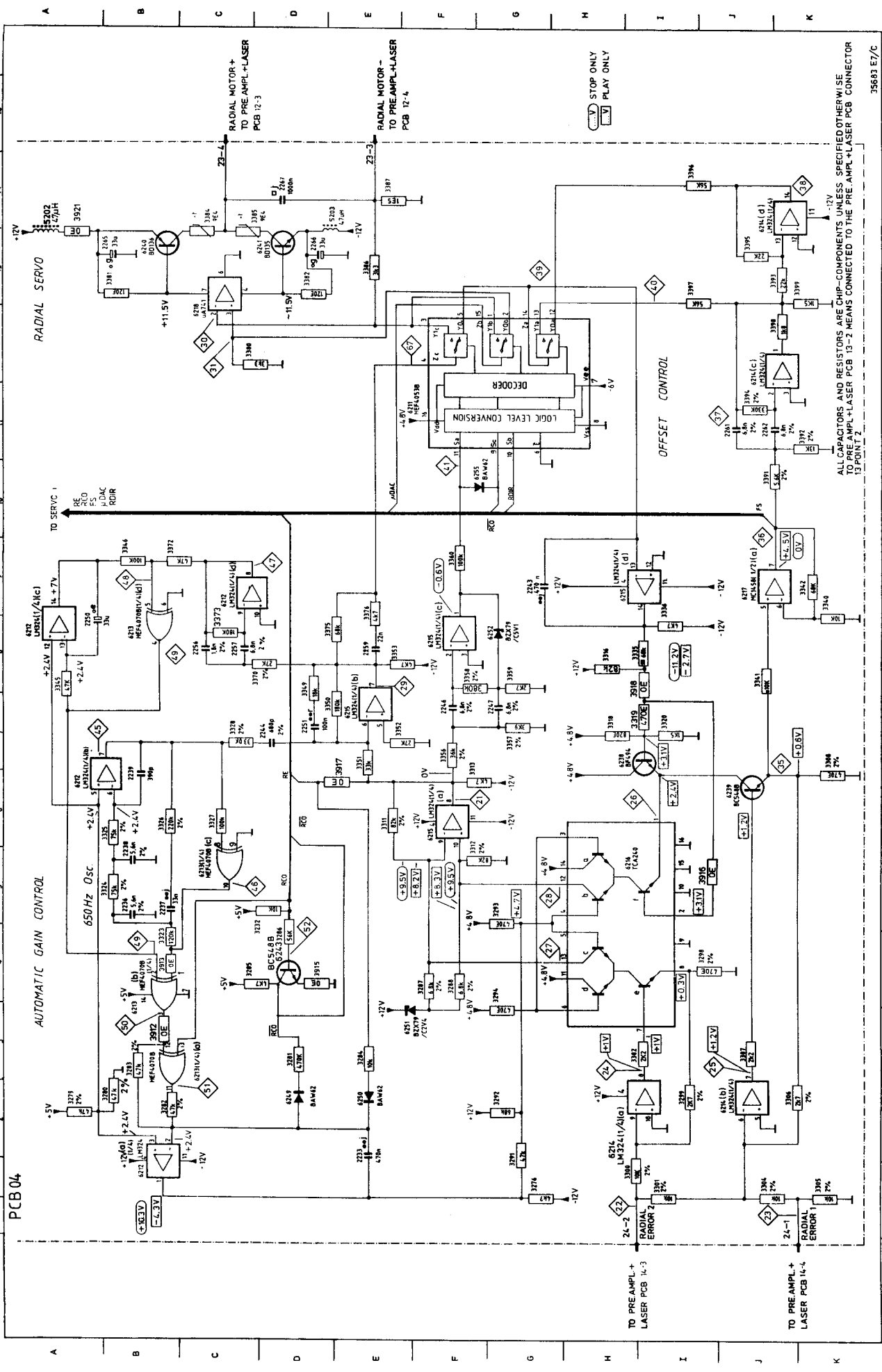


SERVO 8005165 - PCB4

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SERVO 2

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TO SERVO 1
 TO PRE-AMPL+ LASER PCB 14-3
 TO PRE-AMPL+ LASER PCB 14-4
 TO PRE-AMPL+ LASER PCB 13-2
 TO PRE-AMPL+ LASER PCB 13-2

STOP ONLY
 PLAY ONLY

ALL CAPACITORS AND RESISTORS ARE CHIP-COMPONENTS UNLESS SPECIFIED OTHERWISE TO PRE-AMPL+ LASER PCB 13-2 MEANS CONNECTED TO THE PRE-AMPL+ LASER PCB CONNECTOR 13 POINT 2

35683 E7/C

PCB 04

TO PRE-AMPL+ LASER PCB 14-3
 TO PRE-AMPL+ LASER PCB 14-4

TO SERVO 1
 TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

TO PRE-AMPL+ LASER PCB 13-2

DECODER 8005166 - PCB5

1506	C5	3200	A5	3208	B3	3214	B2	3218	B1	3224	A2	3230	C2	3236	C1	3242	C3	3248	E3	3254	E4	3260	E5	3266	E6	3272	E7	3278	E8	3284	E9	3290	B4	3296	B5	3302	B6	3308	B7	3314	B8	3320	B9	3326	B0	3332	C4	3338	C5	3344	C6	3350	C7	3356	C8	3362	C9	3368	D4	3374	D5	3380	D6	3386	D7	3392	D8	3398	D9	3404	D0	3410	E1	3416	E2	3422	E6	3428	E7	3434	E8	3440	E9	3446	F4	3452	F5	3458	F6	3464	F7	3470	F8	3476	F9	3482	F0	3488	G4	3494	G5	3500	G6	3506	G7	3512	G8	3518	G9	3524	H4	3530	H5	3536	H6	3542	H7	3548	H8	3554	H9	3560	I4	3566	I5	3572	I6	3578	I7	3584	I8	3590	I9	3596	J4	3602	J5	3608	J6	3614	J7	3620	J8	3626	J9	3632	K4	3638	K5	3644	K6	3650	K7	3656	K8	3662	K9	3668	L4	3674	L5	3680	L6	3686	L7	3692	L8	3698	L9	3704	M4	3710	M5	3716	M6	3722	M7	3728	M8	3734	M9	3740	N4	3746	N5	3752	N6	3758	N7	3764	N8	3770	N9	3776	O4	3782	O5	3788	O6	3794	O7	3800	O8	3806	O9	3812	P4	3818	P5	3824	P6	3830	P7	3836	P8	3842	P9	3848	Q4	3854	Q5	3860	Q6	3866	Q7	3872	Q8	3878	Q9	3884	R4	3890	R5	3896	R6	3902	R7	3908	R8	3914	R9	3920	S4	3926	S5	3932	S6	3938	S7	3944	S8	3950	S9	3956	T4	3962	T5	3968	T6	3974	T7	3980	T8	3986	T9	3992	U4	3998	U5	4004	U6	4010	U7	4016	U8	4022	U9	4028	V4	4034	V5	4040	V6	4046	V7	4052	V8	4058	V9	4064	W4	4070	W5	4076	W6	4082	W7	4088	W8	4094	W9	4100	X4	4106	X5	4112	X6	4118	X7	4124	X8	4130	X9	4136	Y4	4142	Y5	4148	Y6	4154	Y7	4160	Y8	4166	Y9	4172	Z4	4178	Z5	4184	Z6	4190	Z7	4196	Z8	4202	Z9
------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----	------	----

Semi-conductors

20	102	103	136	209	214

Transistors

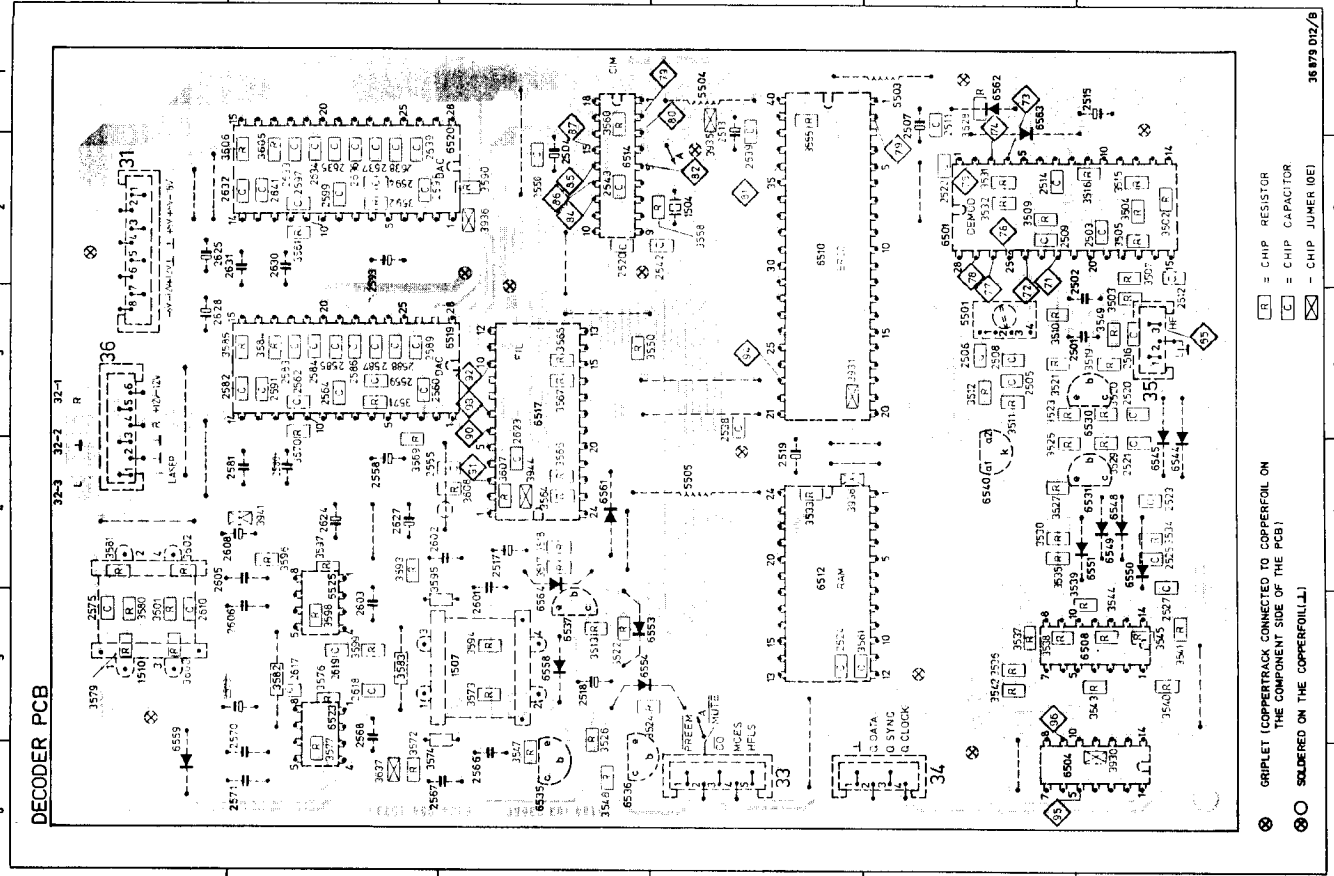
6530	8320108 20	BC 548B	6537	8320108 20	BC 548B
6531			6540		
6535	8230104 20	BC 558B			
6536					

IC's

6501A	8340807 136	SAA 7010	6514A	8340810 136	SAA 7000
6504	8340366 136	N74LS74AN	6517A	8340811 136	SAA 7030
6508	8340317 102	LM 339N	6519A	8340812 136	TDA 1540P
6510A	8340808 136	SAA 7020	6520		
6512A	8340809 136	MSM 2128-20RS	6523	8340250 103	NL 5532N
			6525		
6544-	8300359 209	BAW 62	6562-	8300359 209	BAW 62
6559			6564		
6561	8300245 214	BAX 18			

Diodes

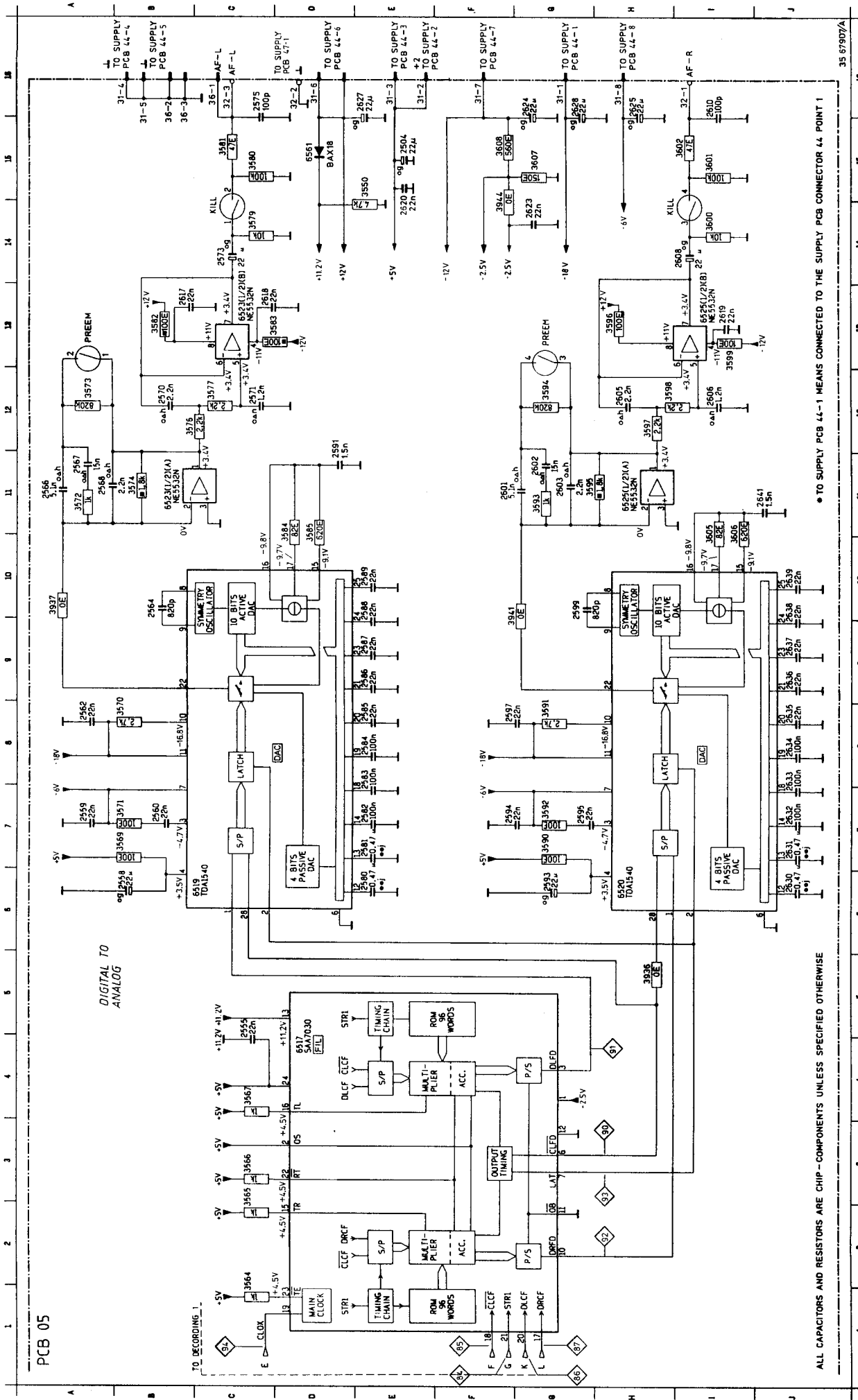
6559			6562-	8300359 209	BAW 62
6561	8300245 214	BAX 18	6564		



= CHIP RESISTOR
 = CHIP CAPACITOR
 = CHIP DIODE
 = IC
 = GRIPLET (COPPERTRACK CONNECTED TO COPPERFOIL ON THE COMPONENT SIDE OF THE PCB)
 = SOLDERED ON THE COPPERFOIL(L)

DECODING 2

2504 E15	2555 C4	2560 B7	2568 A11	2580 E6	2585 E8	2591 E11	2599 G10	2606 I12	2620 E15	2630 J6	2635 J8	2641 J11	3573 A12	3580 C15	3591 G8	3597 H2	3605 H11	6590 C6	6525 I12	3936 H5
2581 E7	2586 E9	2593 G6	2601 G11	2608 I14	2610 I6	2624 G16	2631 J7	2636 J9	2637 J9	2638 J9	2639 J10	2643 J8	3567 C4	3574 B11	3581 C15	3592 G7	3598 H2	6520 H6	6525 I12	3937 A10
2582 E7	2587 E7	2594 G7	2602 G11	2610 I6	2624 G16	2632 J7	2637 J9	2638 J9	2639 J10	2643 J8	2647 E16	2653 C3	3567 C4	3574 B12	3582 B13	3593 G11	3599 H3	6522 G11	6525 I12	3941 F10
2583 E7	2588 E9	2595 G7	2603 G11	2617 B13	2625 H16	2633 J7	2638 J9	2639 J10	2643 J8	2647 E16	2654 C13	2658 C13	3571 B11	3583 D13	3594 G12	3600 I14	3601 I5	6522 G11	6525 I12	3944 F14
2584 E8	2589 E10	2597 G8	2605 H12	2619 I13	2627 E16	2634 J8	2639 J10	2643 J8	2647 E16	2654 C13	2658 C13	2661 I3	3572 A11	3584 D11	3595 G11	3601 I5	3602 I5	6525 I12	6525 I12	3945 F14
2585 A11	2575 C16	2587 A11	2597 G8	2605 H12	2619 I13	2627 E16	2634 J8	2639 J10	2647 E16	2654 C13	2658 C13	2661 I3	3572 A11	3584 D11	3595 G11	3601 I5	3602 I5	6525 I12	6525 I12	3945 F14
2586 A11	2573 C14	2583 E7	2588 E9	2595 G7	2603 G11	2617 B13	2633 J7	2638 J9	2639 J10	2643 J8	2647 E16	2654 C13	3571 B11	3583 D13	3594 G12	3600 I14	3601 I5	6522 G11	6525 I12	3944 F14
2587 A11	2575 C16	2587 A11	2597 G8	2605 H12	2619 I13	2627 E16	2634 J8	2639 J10	2647 E16	2654 C13	2658 C13	2661 I3	3572 A11	3584 D11	3595 G11	3601 I5	3602 I5	6525 I12	6525 I12	3945 F14
2588 A11	2573 C14	2583 E7	2588 E9	2595 G7	2603 G11	2617 B13	2633 J7	2638 J9	2639 J10	2643 J8	2647 E16	2654 C13	3571 B11	3583 D13	3594 G12	3600 I14	3601 I5	6522 G11	6525 I12	3944 F14
2589 E10	2597 G8	2605 H12	2619 I13	2627 E16	2634 J8	2639 J10	2643 J8	2647 E16	2654 C13	2658 C13	2661 I3	2661 I3	3572 A11	3584 D11	3595 G11	3601 I5	3602 I5	6525 I12	6525 I12	3945 F14
2590 G7	3590 G7	3596 H3	3602 I5	3605 H11	6590 C6	6525 I12	3936 H5	3937 A10	3941 F10	3944 F14	3945 F14	3945 F14	3945 F14	3945 F14	3945 F14	3945 F14	3945 F14	3945 F14	3945 F14	3945 F14

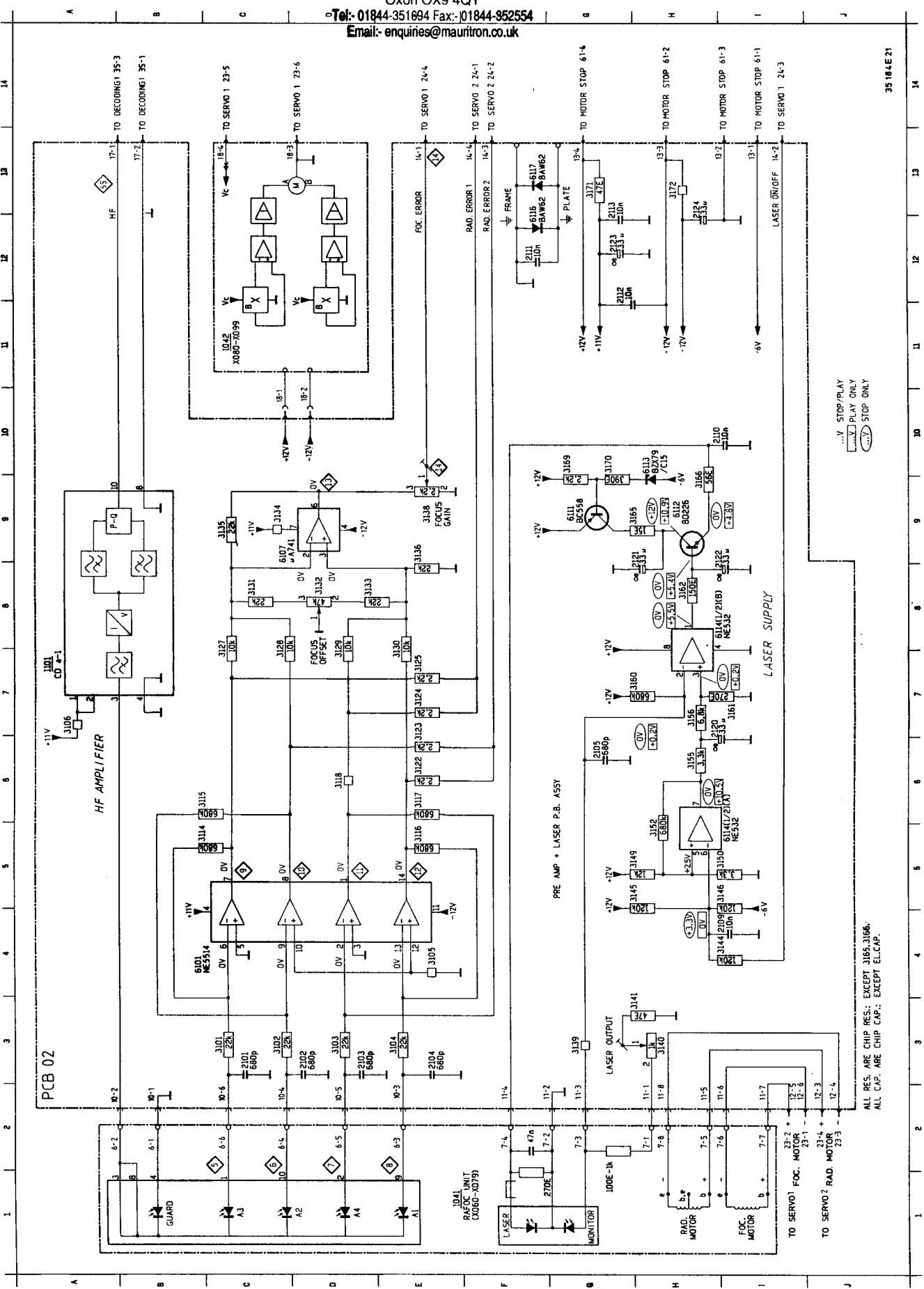


ALL CAPACITORS AND RESISTORS ARE CHIP - COMPONENTS UNLESS SPECIFIED OTHERWISE

* TO SUPPLY PCB 44-1 MEANS CONNECTED TO THE SUPPLY PCB CONNECTOR 44 POINT 1

PRE-AMPL. + LASER

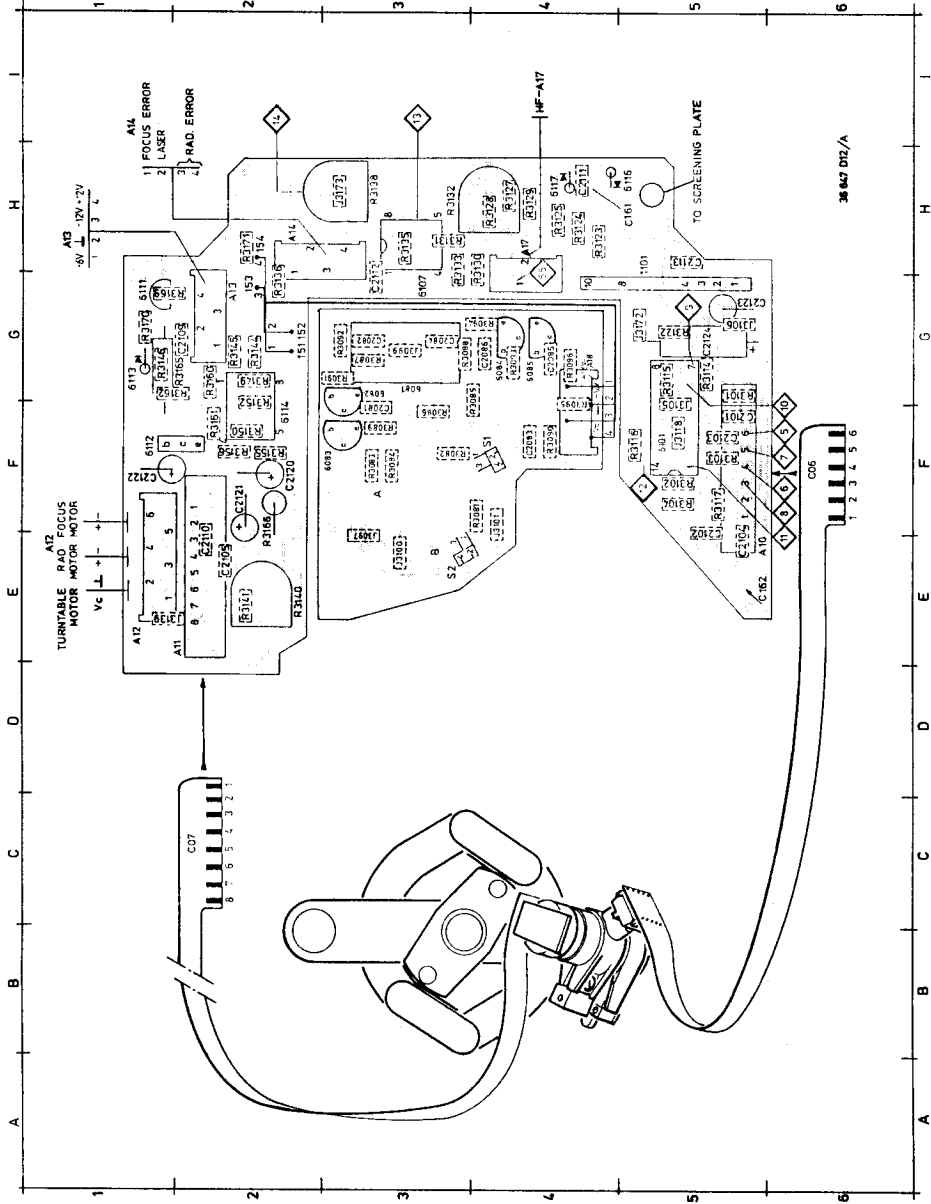
- 1101 A 7 2104 E 3
- 2101 C 3 2105 G 6
- 2102 D 3 2109 I 4
- 2103 E 3 2110 H 0
- 3101 C 3 3105 E 4
- 3102 C 3 3106 A 7
- 3103 D 3 3108 B 5
- 3104 E 3 3115 G 6
- 3105 E 5 3123 E 7
- 3106 E 6 3124 E 7
- 3107 D 6 3125 E 7
- 3108 D 6 3127 C 8
- 3109 E 8 3134 C 9
- 3110 H 0 3135 C 9
- 3111 H 9 3136 C 8
- 3112 G 12 3137 D 8
- 3113 G 12 3138 E 9
- 3114 H 0 3139 E 8
- 3115 G 6 3140 H 3
- 3116 H 9 3141 C 3
- 3117 E 6 3144 I 4
- 3118 D 6 3145 G 5
- 3119 D 6 3146 H 3
- 3120 D 8 3147 E 7
- 3121 C 3 3148 H 3
- 3122 E 6 3149 O 5
- 3123 E 7 3150 I 5
- 3124 E 7 3151 H 9
- 3125 E 7 3152 H 7
- 3126 E 6 3153 H 0
- 3127 C 8 3154 H 8
- 3128 C 8 3155 H 6
- 3129 D 8 3156 H 7
- 3130 E 8 3157 H 9
- 3131 C 8 3158 H 8
- 3132 C 9 3159 C 9
- 3133 C 9 3160 G 7
- 3134 C 9 3161 I 7
- 3135 C 9 3162 H 8
- 3136 C 8 3163 H 3
- 3137 D 8 3164 H 9
- 3138 E 9 3165 G 9
- 3139 E 8 3166 H 9
- 3140 H 3 3167 F 13
- 3141 C 3 3168 H 0
- 3142 G 12 3169 C 10
- 3143 G 12 3170 G 10
- 3144 H 0 3171 G 13
- 3145 G 6 3172 H 3
- 3146 H 3 3173 H 9
- 3147 E 7 3174 H 0
- 3148 H 3 3175 H 0
- 3149 O 5 3176 C 9
- 3150 I 5 3177 C 9
- 3151 H 9 3178 C 9
- 3152 H 7 3179 G 9
- 3153 H 0 3180 G 9
- 3154 H 8 3181 H 8
- 3155 H 6 3182 H 8
- 3156 H 7 3183 H 8
- 3157 H 9 3184 H 8
- 3158 H 8 3185 H 8
- 3159 C 9 3186 H 8
- 3160 G 7 3187 H 8
- 3161 I 7 3188 H 8
- 3162 H 8 3189 H 8
- 3163 H 3 3190 H 8
- 3164 H 9 3191 H 8
- 3165 G 9 3192 H 8
- 3166 H 9 3193 H 8
- 3167 F 13 3194 H 8
- 3168 H 0 3195 H 8
- 3169 C 10 3196 H 8
- 3170 G 10 3197 H 8
- 3171 G 13 3198 H 8
- 3172 H 3 3199 H 8
- 3173 H 9 3200 H 8



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

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

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
 8 Cherry Tree Rd, Chinnor
 Oxon OX9 4QY
 Tel: 01844-351694 Fax: 01844-352554
 Email: enquiries@mauritron.co.uk



Semi-conductors

17	20	32	102

1101	G5	3089	F3	3132	H4	6085	G4
2083	G3	3090	F4	3133	H3	6101	G5
2084	F4	3092	G3	3138	H2	6111	G1
	F3	3093	G4	3138	H3	6112	F1
	G4	3094	F2	3139	E2	6113	G1
	F5	3096	G4	3140	E2	6116	H5
	F2	3097	G3	3144	G2	6117	H4
	F5	3100	F5	3149	G2		
	G2	3102	F5	3149	G2		
	F2	3103	F5	3150	F2		
	H4	3105	G5	3155	F2		
	G5	3106	G5	3155	F2		
	G6	3114	G5	3160	G2		
	F2	3116	F5	3162	G2		
	F2	3117	F5	3165	G1		
	F5	3118	F5	3166	F2		
	G1	3122	H4	3170	G1		
	H4	3124	H4	3171	H2		
	H4	3125	H4	3172	G5		
	H3	3127	H4	3173	H3		
	H4	3128	H4	6082	G3		
	H4	3129	H4	6083	G4		
	G3	3131	H4	6084	G4		

6082	8320378	17	BC 635
6083	8320632	17	BC 636
6084	8320378	17	BC 635
6085	8320632	17	BC 636
6111	8320104	20	BC 558
6112	8320296	32	BD 226
6081	8340157	102	LM 324

IC's

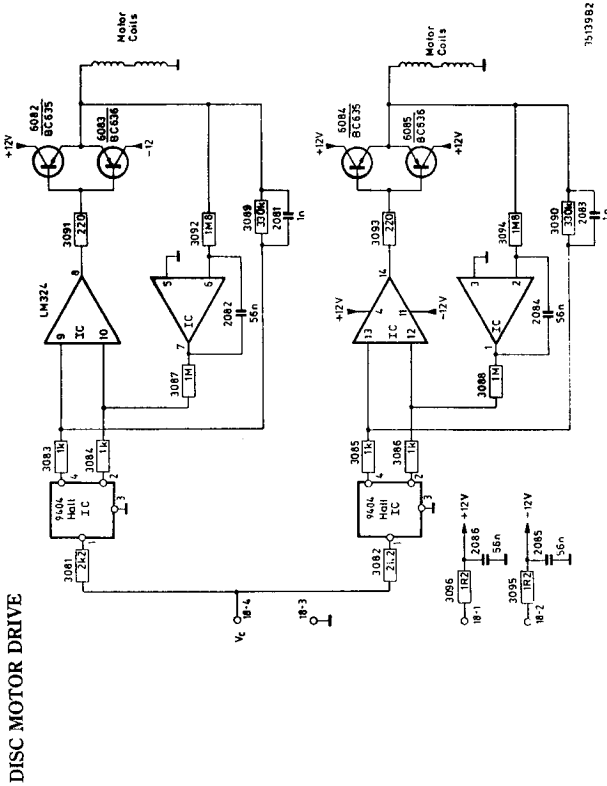
103	136	209

6101	8340813	136	NE 5514
6107	8340141	103	μA 741
6114	8340313	103	NE 532N
9404	3351000		Hall IC
6113	8300313	209	BZX79/C15
6116	8300359	209	BAW 62
6117			

Diodes

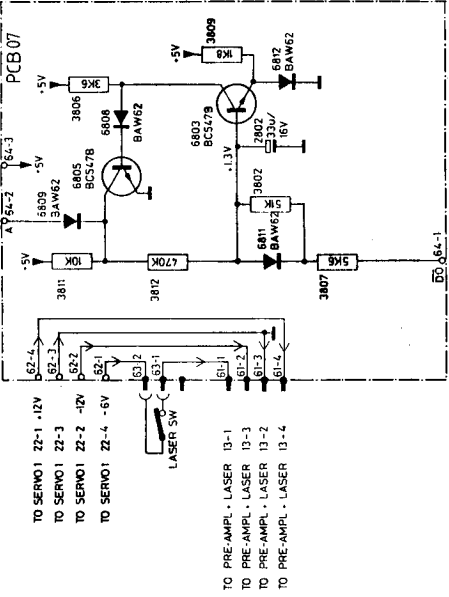
1101	D2	3089	C3	3132	E3	6085	C2
2083	C4	3090	C3	3133	E3	6101	D4
2084	C3	3092	C4	3138	D5	6111	D6
	C4	3093	C3	3138	E4	6112	D6
	C3	3094	C3	3139	E5	6113	C6
	C4	3096	C4	3141	E5	6116	C6
	C2	3097	C4	3144	D5	6117	E3
	C5	3100	C5	3149	D5		
	D5	3102	C2	3149	C5		
	D5	3103	C1	3150	C5		
	D5	3105	C2	3155	C5		
	D5	3106	C2	3155	C5		
	D4	3106	D1	3156	C5		
	D1	3114	C1	3160	C5		
	D1	3116	C2	3162	C5		
	D1	3117	C2	3165	C5		
	D1	3118	C1	3166	E5		
	D1	3122	D2	3170	D5		
	D1	3124	D2	3171	D5		
	D1	3125	D2	3172	D5		
	C4	3127	E3	3173	F4		
	C4	3128	E3	6082	C4		
	C3	3129	E3	6083	C4		
	C3	3131	E3	6084	C3		

MOTOR STOP 8005172 - PCB7



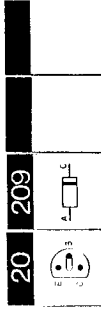
7913982

DISC. MOTOR STOP



TO SERVO 1 Z9-1

Semi-conductors



Transistors

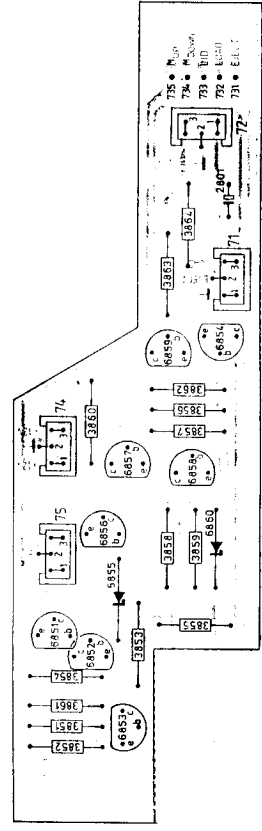
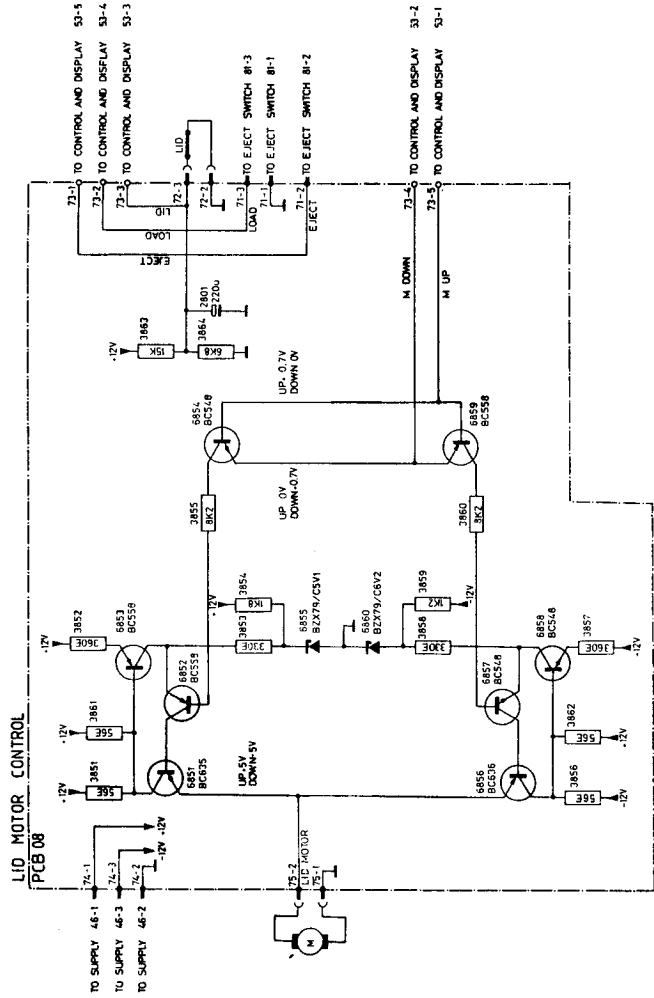
6803	8320097 20	BC 547C
6805		

Diodes

6808	8300359 209	BAW 62
6809		
6811	8300359 209	BAW 62
6812		

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
 8 Cherry Tree Rd, Chinnor
 Oxon OX9 4QY
 Tel:- 01844-351694 Fax:- 01844-352554
 Email:- enquiries@mauritron.co.uk

MOTOR CONTROL 8005170 - PCB8



Semi-conductors

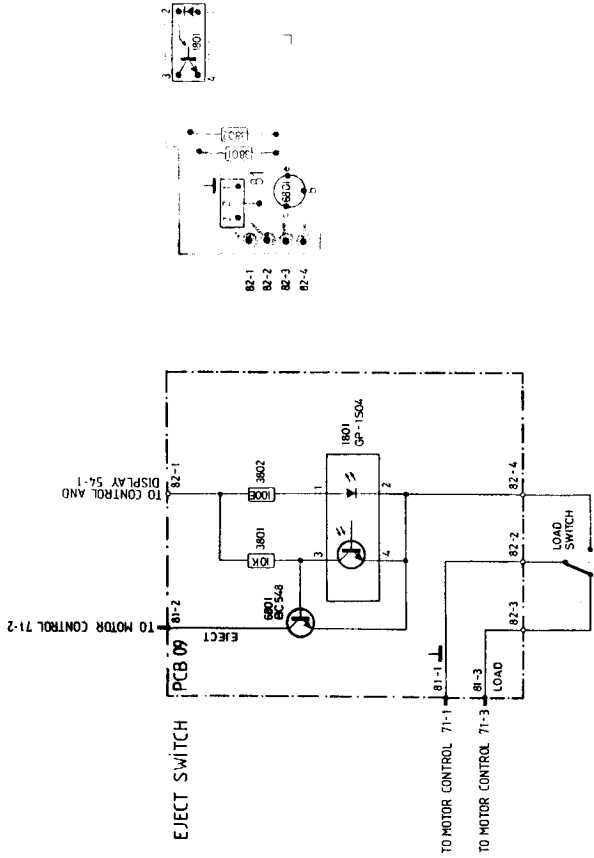
17	20	209				

Transistors

6851	8320378 17	BC 635	6856	8320632 17	BC 636
6852	8320104 20	BC 558B	6857	8320108 20	BC 548B
6853			6858		
6854	8320108 20	BC 548B	6859	8320104 20	BC 558B
6855	8300169 209	BZK79/CSV1	6850	8300201 209	BZK79/CSV2

Diodes

EJECT SWITCH 8005174 - PCB9



Transistors

6801	8320108 20	BC 548B
1801	8330156	GP-ISO4

Opto.

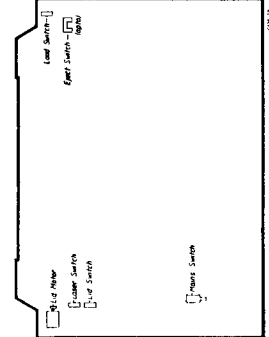
Switch survey

When the top lid is closed, the switches are in the following positions:

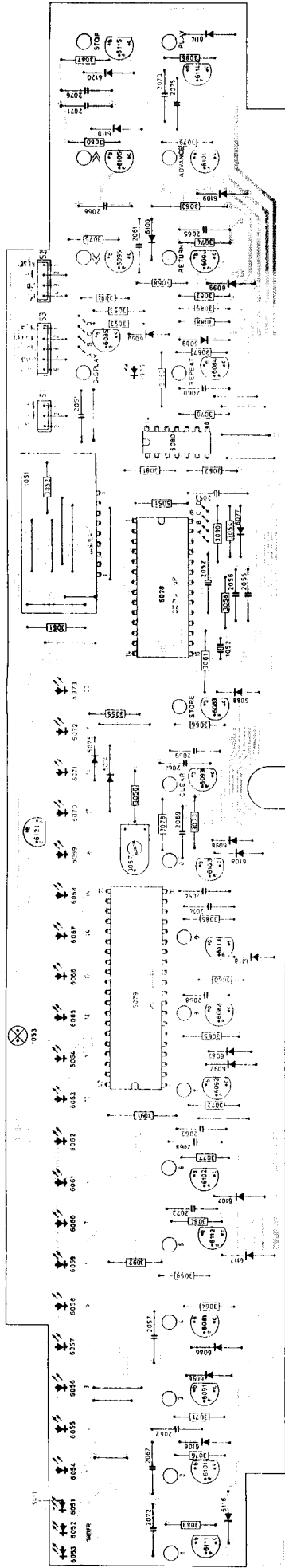
- LOAD is off
- LASER is on
- LID is on
- EJECT pin 12 of IC6078 is high

When the button EJECT is pressed, the following things happen:

- LOAD goes on, then EJECT pin 12 of IC6078 goes low as long as the button is pressed. As the lid opens, LASER goes off, and when the lid is in its upper position, LID goes off.



CONTROL AND DISPLAY 8005167 - PCB6



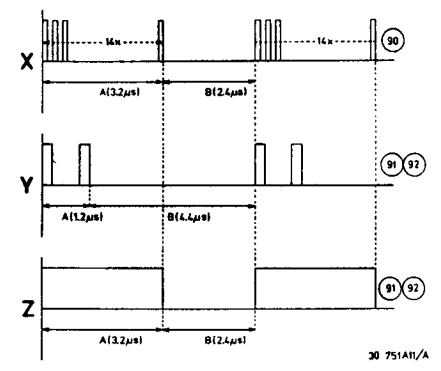
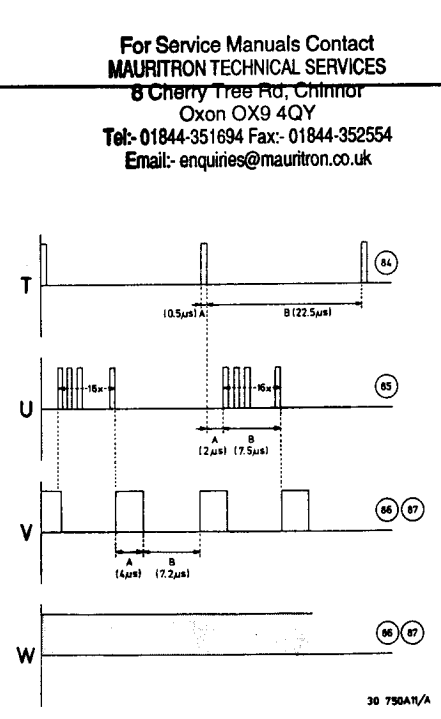
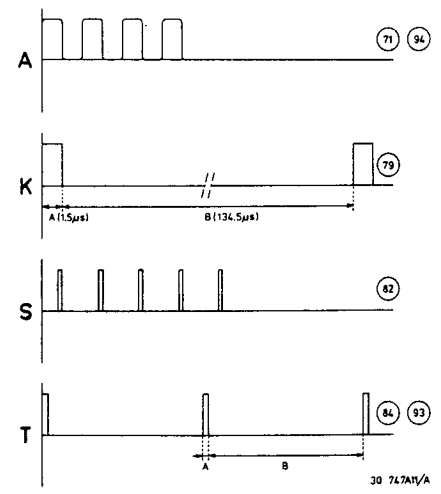
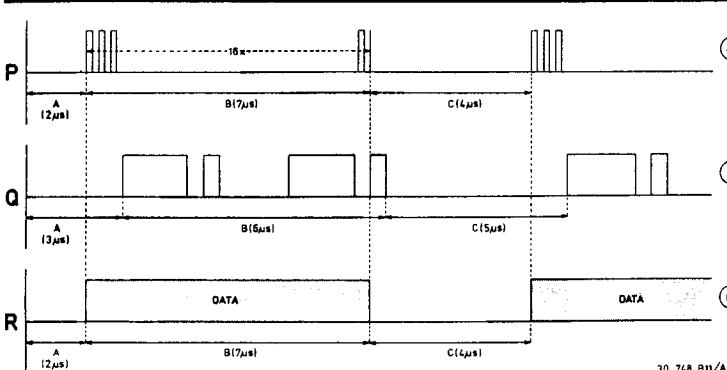
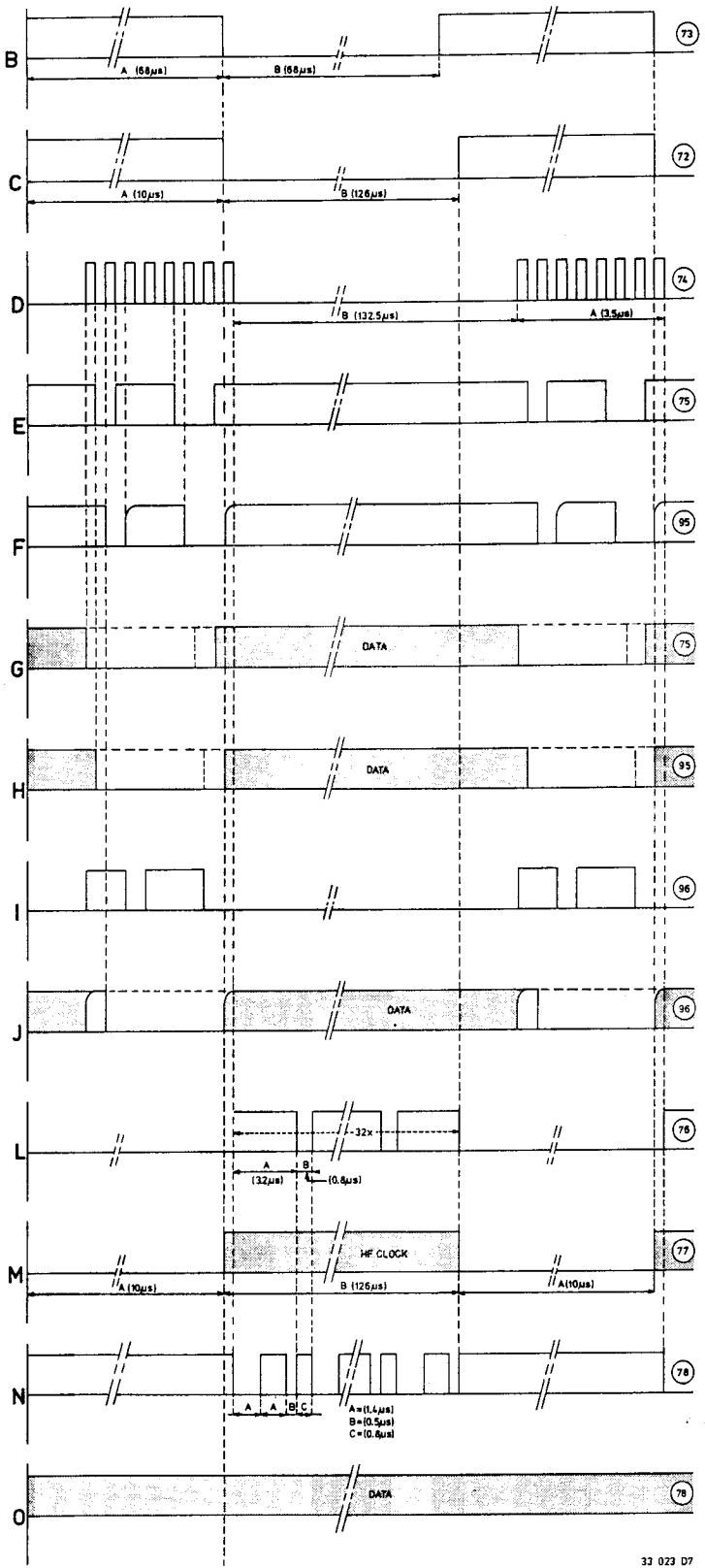
Semi-conductors

	20	42	124	136	209	230	
Transistors	6081-	8320281 42	BF 199				6111 8320281 42 BF 199
	6085						6115
	6091-	8320281 42	BF 199				6121 8320316 20 BC 327
	6095						
	6101	8320281 42	BF 199				
IC's	6105						
	6078A	8340844 136	MAB 8440				6080Δ 8340816 136 HEF 4071 BP
	6079A	8340467 124	MM 5450N				
	6051-	8330143 30	Red				6086- 8300359 209 BAW 62
	6053						6090
Diodes	6054-	8330144 230	Green				6096- 8300359 209 BAW 62
	6073						6100
	6074	8300023 209	1N4002				6106- 8300359 209 BAW 62
	6075						6110
	6076	8330143 230	Reed				6116- 8300359 209 BAW 62
Display	6077	8300359 209	BAW 62				6120
	1051	8330146	NSM 4000A				

DECODING

Test Point	See	Position	Amplitude	f	Time base
71	A	pause/play	0-5 V	4,32 MHz	
72	C	pause/play	0-5 V		A = 10* μ s B = 126 μ s
73	B	pause/play*	0-5 V	7,35 KHz	A = 68 μ s B = 68 μ s
74	D	pause/play	5-0 V		A = 3,5 μ s B = 132,5 μ s
75	E	pause	5-0 V		A = 3,5 μ s B = 132,5 μ s
75	G	play	0-5 V	DATA	
76	L	pause/play	0-5 V		A = 3,2 μ s B = 0,8 μ s
77	M	pause/play	0-5 V		A = 10 μ s B = 126 μ s
78	N	pause	0-5 V		A = 1,4 μ s B = 0,5 μ s C = 0,8 μ s
78	O	play	5 V	DATA	
79	K	pause/play	0-5 V		A = 1,5 μ s B = 134,5 μ s
80	P	pause/play	0-5 V		A = 2 μ s B = 7 μ s C = 4 μ s
81	Q	pause/play	0-5 V		A = 3 μ s B = 6 μ s C = 5 μ s
81	R	play	0-5 V		A = 2 μ s B = 7 μ s C = 4 μ s
82		pause	5 V	DC	
82	S	play with Drop-out test record	0-5 V		
84	T	pause/play	0-5 V		A = 0,5 μ s B = 22,5 μ s
85	U	pause/play	0-5 V		A = 2 μ s B = 7,5 μ s
86	V	pause/play	0-5 V		A = 4 μ s B = 7,2 μ s
86	W	pause/play	0-5 V		DATA
87	V	pause/play	5 V		A = 4 μ s B = 7,2 μ s
87	W	play	5 V		DATA
90	X	pause/play	0-5		A = 3,2 μ s B = 2,4 μ s
91	Y	pause	0-5 V		A = 1,2 μ s B = 4,4 μ s
91	Z	play	0-5 V		A = 3,2 μ s B = 2,4 μ s
92	Y	pause	0-5 V		A = 1,2 μ s B = 4,4 μ s
92	Z	play	0-5 V		A = 3,2 μ s B = 2,4 μ s
93	T	pause/play	0-5 V		A = 0,4 μ s B = 5,5 μ s
94	A	pause/play	0-5 V	4,23 MHz	
95	F	pause	5-0 V		
95	H	play	5-0 V		
96	I	pause	0-5 V		
96	J	play	5-0 V		

* In pos. pause, signal is only present **after** the set was brought in play mode.

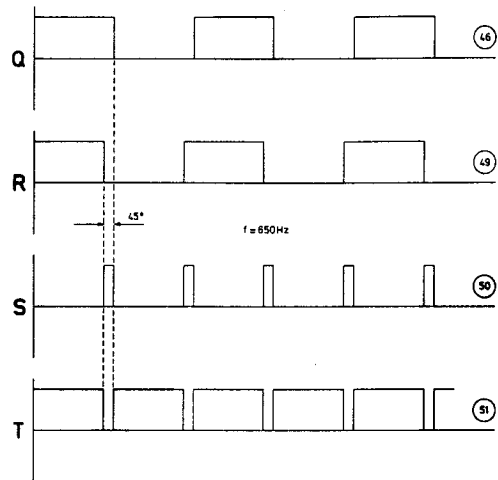
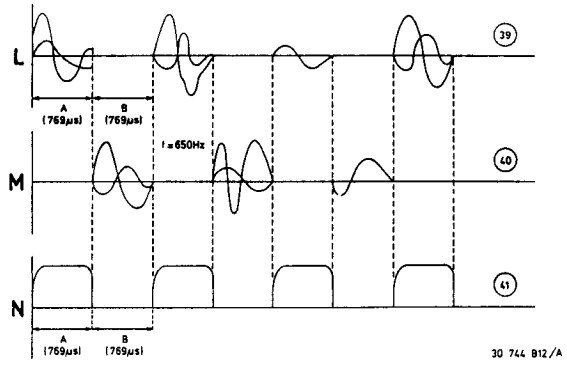
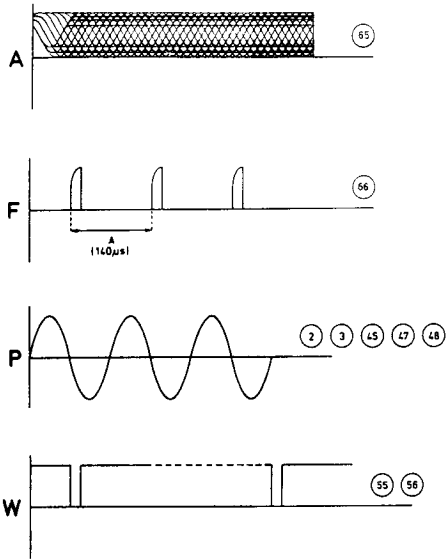


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SERVO

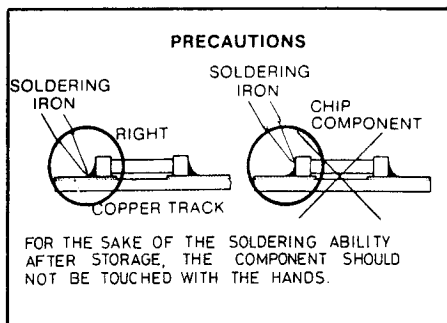
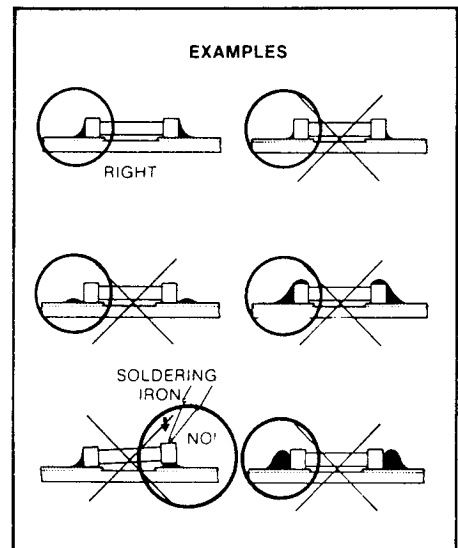
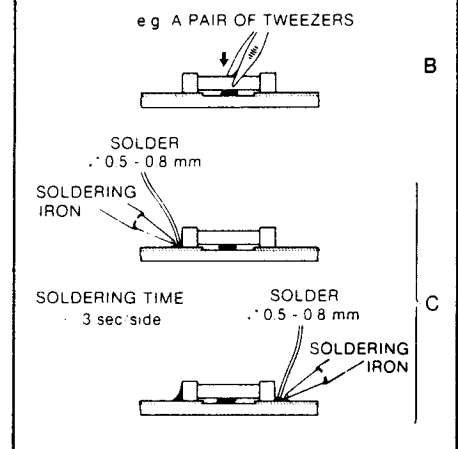
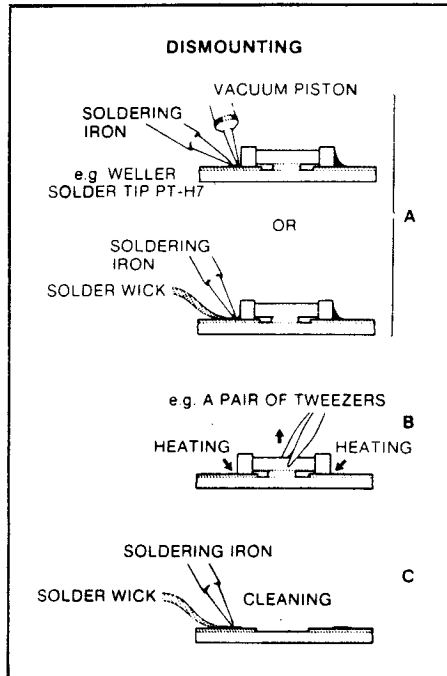
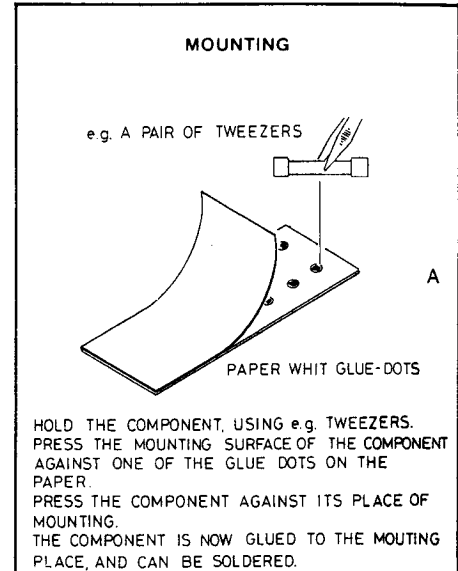
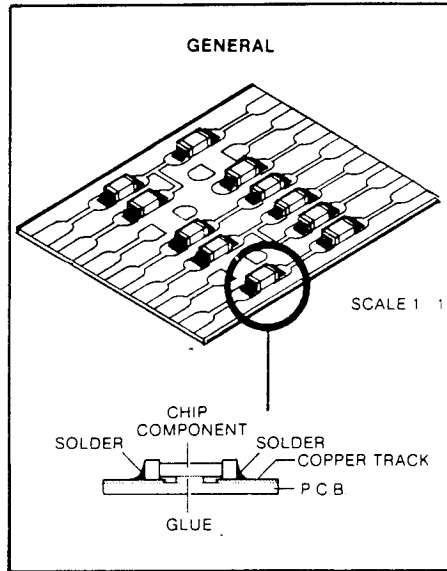
Test point	See	Position	Amplitude	f	Time base
29	P	stop	0.3 Vp-p		
39	L	play	0-4 Vp-p		A = 769 μ s B = 769 μ s
40	M	play	0-4 Vp-p		A = 769 μ s B = 769 μ s
41	N	play	6 Vp-p		A = 769 μ s B = 769 μ s
45	P	stop	9 Vp-p	650 Hz	
46	Q	stop	0-5 V	650 Hz	A = 769 μ s B = 769 μ s
47	P	stop	1.5 Vp-p	650 Hz	
48	P	stop	1 Vp-p	650 Hz	
49	R	stop	0-5 V	650 Hz	
50	S	stop	0-5 V	650 Hz	
51	T	stop	5-0 V	650 Hz	
55	W	play	5-0 V		
56	W	play (with drop out test record)	5-0 V		
65	A	play	1 Vp-p		
66	F	play	0.25-2.5 V		A = 140 μ s

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LIST OF ELECTRICAL PARTS

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



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Chip capacitor


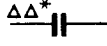
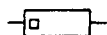
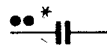



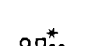


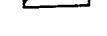
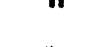
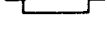
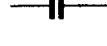

27pF	4000244	1.5nF	4000251
33pF	4000245	2.2nF	4000252
39pF	4000246	5.6nF	4000253
68pF	4000247	10nF	4000254
100pF	4000248	22nF	4000255
470pF	4000249	100nF	4000256
820pF	4000250		

Chip resistor 2% 0,125W 1206

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2.2 Ω	5011216	13 k Ω	5011242
3.3 Ω	5011217	15 k Ω	5011243
47 Ω	5011269	18 k Ω	5011244
82 Ω	5011270	22 k Ω	5011245
100 Ω	5011218	24 k Ω	5011246
120 Ω	5011219	27 k Ω	5011247
150 Ω	5011220	33 k Ω	5011248
390 Ω	5011221	36 k Ω	5011249
470 Ω	5011222	47 k Ω	5011250
560 Ω	5011223	56 k Ω	5011251
620 Ω	5011224	68 k Ω	5011252
680 Ω	5011225	75 k Ω	5011253
820 Ω	5011226	82 k Ω	5011254
1 k Ω	5011227	91 k Ω	5011255
1.5 k Ω	5011228	100 k Ω	5011256
1.8 k Ω	5011229	120 k Ω	5011257
2.2 k Ω	5011230	130 k Ω	5011258
2.7 k Ω	5011231	150 k Ω	5011259
3.3 k Ω	5011232	180 k Ω	5011260
3.9 k Ω	5011233	220 k Ω	5011261
4.7 k Ω	5011234	270 k Ω	5011262
5.1 k Ω	5011235	330 k Ω	5011263
5.6 k Ω	5011236	360 k Ω	5011264
6.2 k Ω	5011237	470 k Ω	5011265
6.8 k Ω	5011238	820 k Ω	5011266
7.5 k Ω	5011239	1 M Ω	5011267
8.2 k Ω	5011240	5.6 M Ω	5011268
10 k Ω	5011241		

Each parts number for chip component includes 10 pieces and glue dots.

	Carbon film 0.2 W 70°C 5%		Ceramic plate Tuning \leq 120 pF NP.0 2% Others -20/+80%	*a = 2.5 V b = 4 V c = 6.3 V d = 10 V e = 16 V f = 25 V g = 40 V h = 63 V j = 100 V l = 125 V m = 150 V n = 160 V q = 200 V r = 250 V s = 300 V t = 350 V u = 400 V v = 500 V w = 630 V x = 1000 V A = 1.6 V B = 6 V C = 12 V D = 15 V E = 20 V F = 35 V G = 50 V H = 75 V I = 80 V
	Carbon film 0.33 W 70°C 5%		Polyester flat foil 10%	
	Metal film 0.33 W 70°C 5%		Metalized polyester flat film 10%	
	Carbon film 0.5 W 70°C 5%		Polyester flat foil small size (Mylar) 10%	
	Carbon film 0.67 W 70°C 5%		Polysterene film/foil 1%	
	Carbon film 1.15 W 70°C 5%		Tubular ceramic	
			Miniature single	
			Subminiature tantalum \pm 20%	
	Chip component			

Power Supply 8005168 - PCB1

2451	4200220	33 μ F 16V	2463	4010162	47 nF 50V
2452	4200220	33 μ F 16V	2464	4010162	47 nF 50V
2453	4200121	22 μ F 40V	2465	4010162	47 nF 50V
2454	4200220	33 μ F 16V	2466	4010169	220 μ F 25V
2455	4200220	33 μ F 16V	2467	4010162	47 nF 50V
2456	4200220	33 μ F 16V	2468	4010162	47 nF 50V
2457	4200642	1500 μ F 25V	2469	4010163	22 nF 100V
2458	4200612	1000 μ F 25V	2470	4010163	22 nF 100V
2469	4200641	3300 μ F 16V	2471	4010162	47 nF 50V
2460	4200642	1500 μ F 16V	2472	4010162	47 nF 50V
2461	4200641	3300 μ F 16V	2473	4030020	1 nF 30V
2462	4010162	47 nF 50V			

Pre. Ampl. & Laser 8005173 - PCB2

P41	7220316	Plug 10 pol.			
3132	5370061	47 k Ω 20%	3146	5010047	120 k Ω 5% 1/4W
3138	5370006	2.2 k Ω 20%	3166	5020580	56 Ω 5% 1W
3140	5370050	1 k Ω 20%			
2120	4200414	33 μ F 16V	2123	4200414	33 μ F 16V
2121	4200414	33 μ F 16V	2124	4200414	33 μ F 16V
2122	4200414	33 μ F 16V			

1101	8005175	Thick film			
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Mains Filter 8005169 - PCB3

A11	7220472	Plug 8pol.		A12	7220471	Plug 6pol.	
2701	4010123	1 nF 400V	2703	4100253	100 nF 250V		
1701	6600037	Fuse 200mA	7500214	Fuse holder			
	6600059	Fuse 400mA					
5451	6850162	Coil 2x25mH					
92T1	8013352	Transformer 5121/22/25	92F1	6609021	Thermal fuse 5121/22/25		
	8013372	Transformer 5123		6609022	Thermal fuse 5123		

Servo 8005165 - PCB4

3228	5011280	150 k Ω SFR 16T	3335	5010062	68 k Ω 5% 1/4W
3229	5011278	2.7 k Ω SFR 16T	3341	5010935	10 k Ω 5% 1/4W
3230	5010135	18 k Ω 5% 1/4W	3363	5010935	10 k Ω 5% 1/4W
3256	5020761	4.7 Ω 5% 1/4W	3379	5010935	10 k Ω 5% 1/4W
3273	5020761	4.7 Ω 5% 1/4W	3384	5011277	9.4 Ω PTC 60V
3291	5011279	47 k Ω SFR 16T	3385	5011277	9.4 Ω PTC 60V
2203	4200632	10 μ F 10V	2237	4130302	33 nF 10% 63V
2204	4130224	100 nF 10% 63V	2238	4100114	5.6 nF 2% 63V
2205	4100048	27 nF 1% 63V	2239	4100042	390 pF 2% 630V
2207	4200640	33 μ F 40V	2243	4130293	470 nF 10% 63V
2208	4010159	47 nF 50V	2244	4100259	680 pF 2% 250V
2209	4200639	47 μ F 25V	2246	4100025	6.8 nF 2% 63V
2211	4130224	100 nF 10% 63V	2247	4100025	6.8 nF 2% 63V
2214	4200486	4.7 μ F 50V	2250	4200414	33 μ F 16V
2215	4100262	390 nF 10% 100V	2251	4130224	100 nF 10% 63V
2216	4130302	33 nF 10% 63V	2256	4100195	1.8 nF 2% 63V
2217	4200633	6.8 μ F 16V	2257	4100025	6.8 nF 2% 63V
2218	4130302	33 nF 10% 63V	2261	4100025	6.8 nF 2% 63V
2219	4130224	100 nF 10% 63V	2262	4100025	6.8 nF 2% 63V
2220	4200634	33 μ F 10V	2264	4200640	33 μ F 40V
2228	4200638	1 μ F 25V	2265	4200640	33 μ F 40V
2233	4130293	470 nF 10% 63V	2266	4200640	33 μ F 40V
2236	4100114	5.6 nF 2% 63V	2267	4130155	1000 nF 10% 100V

1201	8090022	6.000MHz			
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5201	6850160	Coil 47uH	5203	6850160	Coil 47uH
5202	6850160	Coil 47uH			

P21	7220257	Plug 6pol.	P26	7220255	Plug 4pol.
P22	7220255	Plug 4pol.	P27	7220256	Plug 5pol.
P23	7220257	Plug 6pol.	P28	7220256	Plug 5pol.
P24	7220255	Plug 4pol.	P29	7220254	Plug 3pol.
P25	7220256	Plug 5pol.			

2391066	Spring for TR	7200056	Socket for IC
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Decoder 8005166 - PCB5

3574	5010066	1.8 k Ω 5% 1/4W	2583	5010065	100 Ω 5% 1/4W
3582	5010065	100 Ω 5% 1/4W	3595	5010066	1.8 k Ω 5% 1/4W
2501	4200646	22 nF 1% 63V	2580	4130293	0.47 μ F 10% 63V
2502	4200646	22 nF 1% 63V	2581	4130293	0.47 μ F 10% 63V
2504	4200121	22 μ F 40V	2593	4200121	22 μ F 40V
2507	4200121	22 μ F 40V	2601	4200648	5.1 nF 1% 63V
2513	4200121	22 μ F 40V	2602	4200649	15 nF 1% 63V
2515	4200426	1 μ F 50V	2603	4100146	2.2 nF 1% 63V
2517	4200121	22 μ F 40V	2605	4100146	2.2 nF 1% 63V
2518	4200647	150 μ F 6.3V	2606	4200650	1.2 nF 1% 63V
2519	4200121	22 μ F 40V	2608	4200121	22 μ F 40V
2558	2400121	22 μ F 40V	2624	4200121	22 μ F 40V
2566	4200648	5.1 nF 1% 63V	2625	4200121	22 μ F 40V
2567	4200649	15 nF 1% 63V	2627	4200121	22 μ F 40V
2568	4100146	2.2 nF 1% 63V	2628	4200121	22 μ F 40V
2570	4100146	2.2 nF 1% 63V	2630	4130293	0.47 μ F 10% 100V
2571	4200650	1.2 nF 1% 160V	2631	4130293	0.47 μ F 10% 100V
2573	4200121	22 μ F 40V			

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1504	8090047	4.2336MHz	1510	7600086	Relay
1507	7600086	Relay			

5501	6850161	Coil	5504	6850160	Coil 47uH
5503	6850160	Coil 47uH	5505	6850160	Coil 47uH

P31	7220328	Plug 8pol.	P35	7220254	Plug 3pol.
P33	7220256	Plug 5pol.	P36	7220257	Plug 6pol.
P34	7220255	Plug 4pol.			

Control and Display
8005167 - PCB6

3057	5370006	2.2 k Ω 20%			
2051	4200645	1 nF 20% 50V	2064	4200643	8.2 pF 10% 50V
2052	4200364	47 μ F 10V	2065	4200643	8.2 pF 10% 50V
2053	4200364	47 μ F 10V	2066	4200643	8.2 pF 10% 50V
2054	4200645	1 nF 20% 50V	2067	4200643	8.2 pF 10% 50V
2055	4200644	27 pF 5% 50V	2068	4200643	8.2 pF 10% 50V
2056	4200644	27 pF 5% 50V	2069	4200643	8.2 pF 10% 50V
2057	4200643	8.2 pF 10% 50V	2070	4200643	8.2 pF 10% 50V
2058	4200643	8.2 pF 10% 50V	2071	4200643	8.2 pF 10% 50V
2059	4200643	8.2 pF 10% 50V	2072	4200643	8.2 pF 10% 50V
2060	4200643	8.2 pF 10% 50V	2073	4200643	8.2 pF 10% 50V
2061	4200643	8.2 pF 10% 50V	2074	4200643	8.2 pF 10% 50V
2062	4200643	8.2 pF 10% 50V	2075	4200643	8.2 pF 10% 50V
2063	4200643	8.2 pF 10% 50V	2076	4200643	8.2 pF 10% 50V

1052	8090022	6.000MHz	5051	6850160	Coil 47uH
1053	8230089	200mA - 5V			

P51	7220254	Plug 3pol.	P53	7220256	Plug 5pol.
P52	7220255	Plug 4pol.			

Motor Stop 8005172 - PCB7

2802	4200414	33 μ F 16V			
P61	7220255	Plug 4pol.	P63	7220254	Plug 3pol.

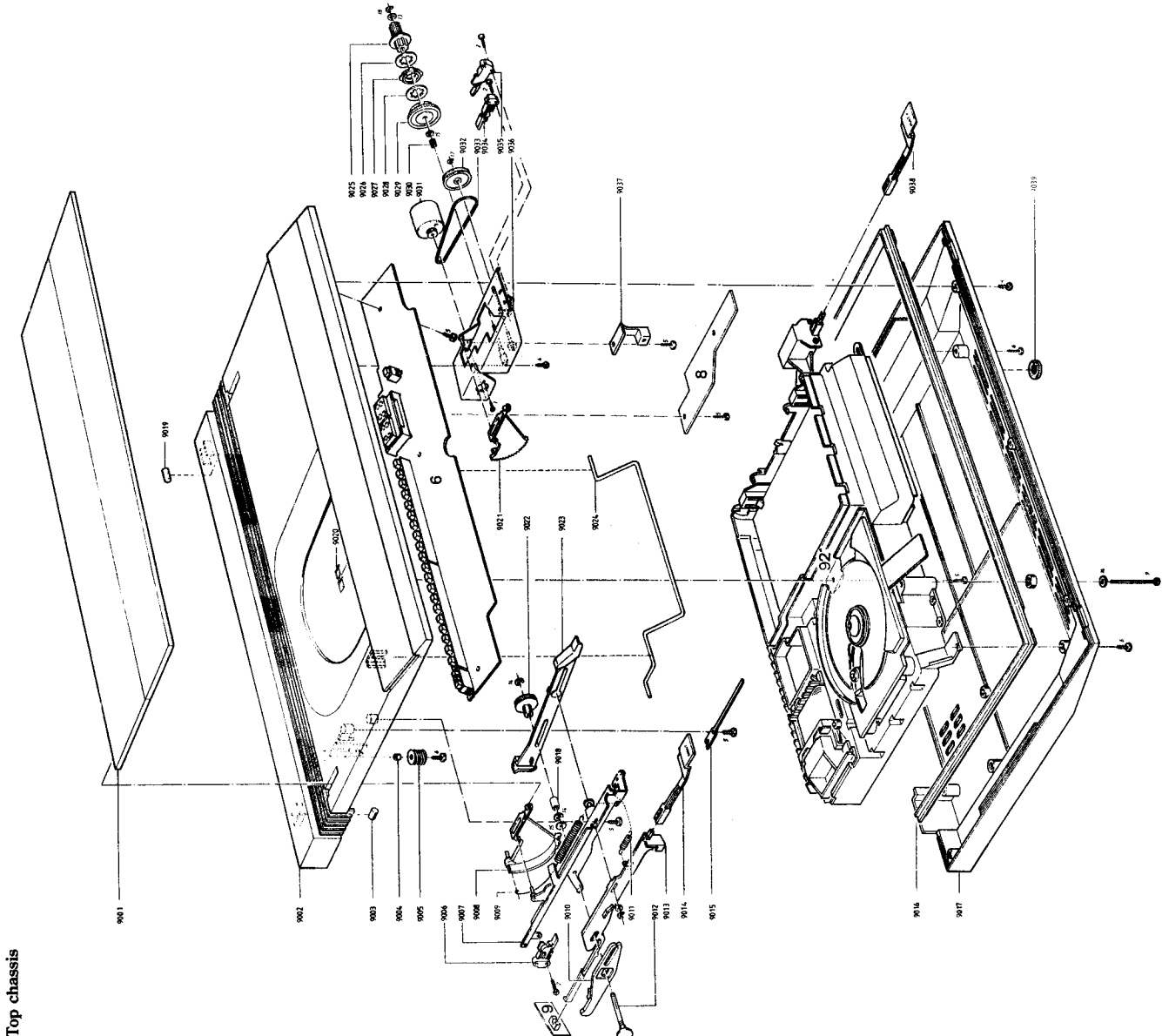
Motor Control 8005170 - PCB8

2801	4200122	220 μ F 10V			
P71	7220254	Plug 3pol.	P74	7220254	Plug 3pol.
P72	7220254	Plug 3pol.	P75	7220254	Plug 3pol.

Eject Switch 8005174 - PCB9

P82	7220254	Plug 3 pol.			
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LIST OF MECHANICAL PART
Top chassis



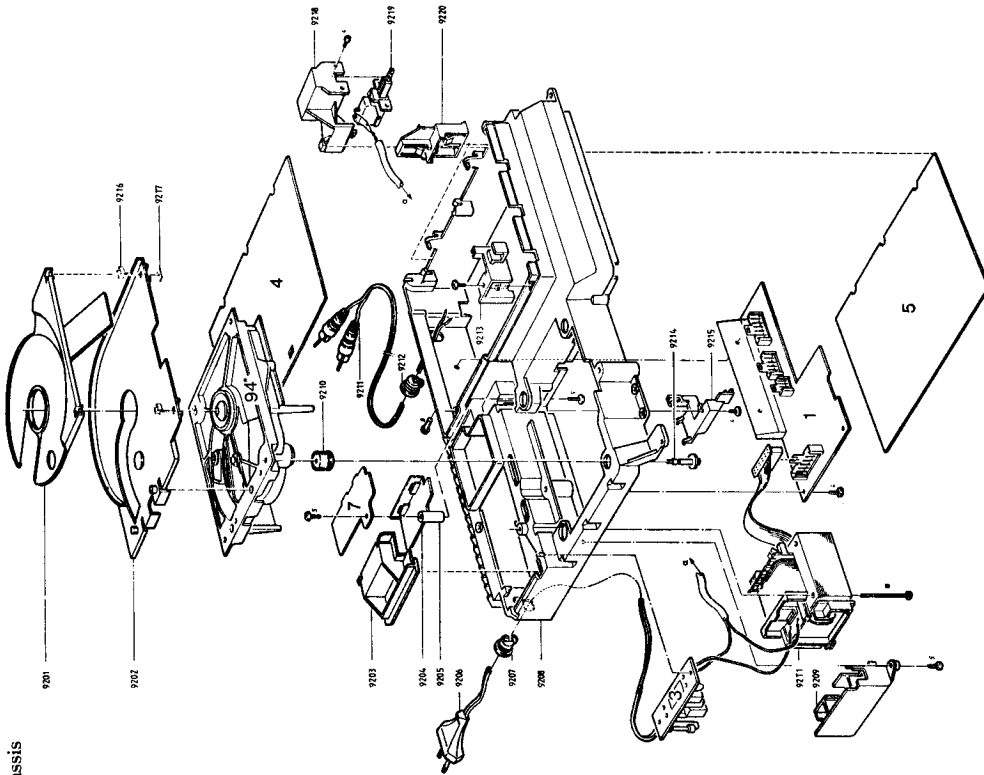
06Modul 8005167 Control PCB

08Modul 8005170 Motor Control PCB

9001	3162248	Dust cover
9002	3430353	Cabinet
9003	3341052	Plug
9004	2930094	Bushing
9005	2709006	Worm
9006	7400320	Switch
9007	3124103	Mount, plate
9008	3030089	Hinge, plate
9009	2810202	Spring, long
9010	2854113	Arm
9011	2810201	Spring, short
9012	2834092	Shaft
9013	2854112	Arm
9014	2854116	Arm
9015	2815018	Leaf spring
9016	3430354	Frame
9017	3454403	Bottom
9018	2930095	Bushing
9019	3341052	Plug
9020	3370151	Window
9021	3030090	Hinge, plate
9022	2700043	Gear wheel
9023	2854114	Arm
9024	2514053	Bracket
9025	2700045	Gear wheel
9026	2802045	Ring
9027	2802046	Ring
9028	2802045	Ring
9029	2700044	Gear wheel
9030	2812109	Spring
9031	8400143	Motor
9032	2722037	Pulley
9033	2732078	Belt
9034	7400320	Switch
9035	7400320	Switch
9036	3174102	Mount, plate
9037	3152508	Holder
9038	2854115	Arm
9039	3035045	Foot
9040	3370151	Window

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Main chassis



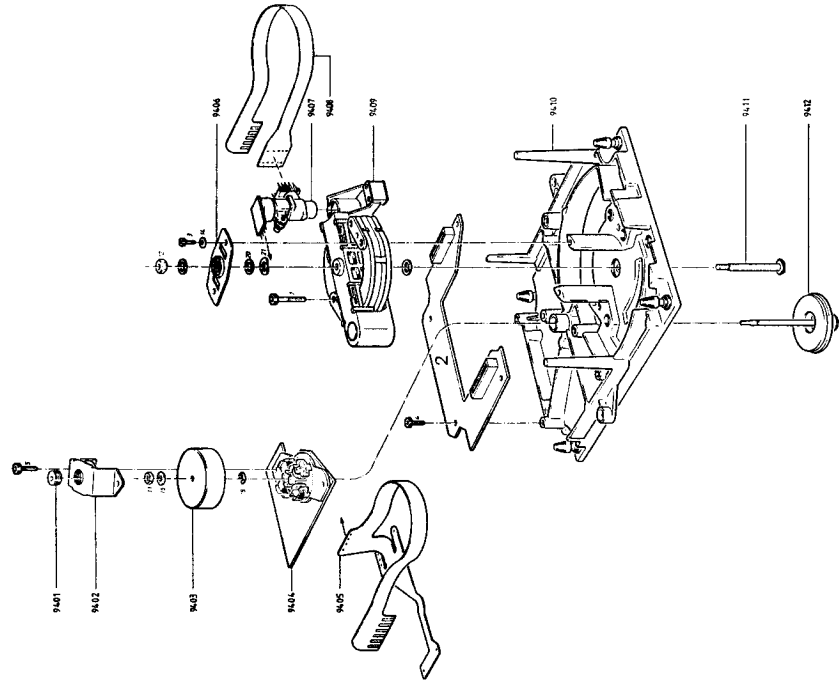
01	Modul 8005168	Supply PCB
03	Modul 8005169	Main Filter PCB
04	Modul 8005165	Servo PCB
05	Modul 8005166	Decoder PCB
07	Modul 8005166	Motor stop PCB
09	Modul 8005174	Eject Switch PCB
9201	3458401	Disc plate
9202	3458399	Top plate
9203	3162249	Cover
9204	3162491	Holder
9205	2938244	Distance bushing
9206	6271102	Mains cable 5122/22
9207	6270251	Mains cable 5123
9208	6271091	Mains cable 5125
9209	2641119	Holder
9210	3114259	Chassis

9209	3131263	Housing	9215	3152490	Holder
9210*	2938239	Rubber bushing	9216	3030094	Hinge
9211	6270274	Signal lead	9217	2395051	Locking plate
9212	2641119	Holder	9218	3131262	Housing
9213	3152489	Holder	9219	7400321	Switch
9214	2039077	Screw	9220	3152488	Holder

92T1	8013352	Transformer 5121/22/25	92F1	6609021	Thermal fuse 5121/22/25
	8013372	Transformer 5123		6609022	Thermal fuse 5123

*Upon replacement see servicetips page 8-1

Mechanism



02Modul 8005173 Pre. ampl. laser

9401	2072107	Adjustment screw	9407*	8330149	Light pin
9402	2510154	Bracket	9408	6141141	Flex print
9403	2871000	Rotor	9409	3131272	Housing
9404	3351000	Stator	9410	3114260	Chassis
9405	6141142	Flex print	9411	2038093	Bearing screw
9406	2905114	Spring	9412	2726153	Platter

*Upon replacement see service tips page 8-2

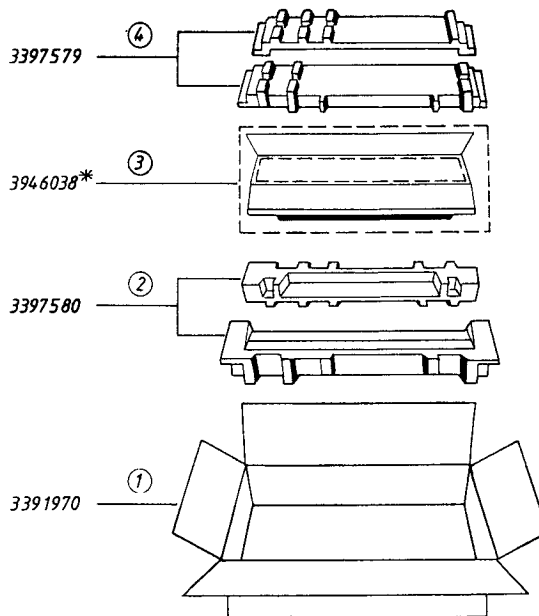
Parts not shown

3397579	Foam packing, upper	3634028	Laser simulator
3397580	Foam packing, bottom	3634029	Mirror
3391970	Wrapper	3634030	Glass disc
3629107	Blade T6 short	3634031	Test disc
3629037	Blade T8 short	3634032	Disc hold-down
3629102	Blade T10 long	3505412	Owner's Manual DK
3629038	Blade T10 short	3505413	Owner's Manual S
3629103	Blade T20 short	3505414	Owner's Manual SF
3629109	Screw driver T6	3505415	Owner's Manual GB
3629108	Screw driver T8	3505416	Owner's Manual D
3629047	Screw driver T10	3505417	Owner's Manual NL
3629104	Screw driver T20	3505418	Owner's Manual F
3634027	Support		

Screws, washers, etc.

1	2034073	Screw 2x3 DIN 84	11	2380129	Nut M2.5
2	2034074	Screw AM 2x3 DIN 7985	12	2380016	Nut M4
			13	2622348	Washer 2.2
3	2036058	Screw 2.5x6	14	2622218	Washer 3.2
4	2013126	Screw 2.9x8	15	2622390	Washer 4.3
5	2013127	Screw 2.9x9.5	16	2622035	Washer 2.7
6	2013130	Screw 2.9x13	17	2390094	Locking ring 1.5
7	2039078	Screw 2.9x18	18	2390001	Locking ring 2.5
8	2038220	Screw 3x12 DIN 84	19	2390002	Locking ring 3.0
9	2013131	Screw 2.9x45	20	2622399	Washer 3.5
10	2043036	Screw 4x35	21	2623002	Washer 3.5

Packing procedure



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*Foile 3946038 is sold by the metre

Lubrication

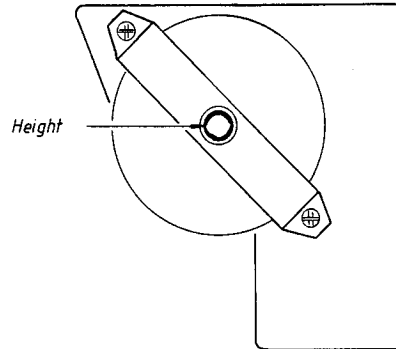
1. Arm 9011 sliding surface towards 9013
 Bracket 9007 sliding surface towards 9013
 Silocone paste P4
2. Arm 9008 sliding surface towards 9007 Isoflex PDL250

MECHANICAL ADJUSTMENTS

Height setting of the turntable

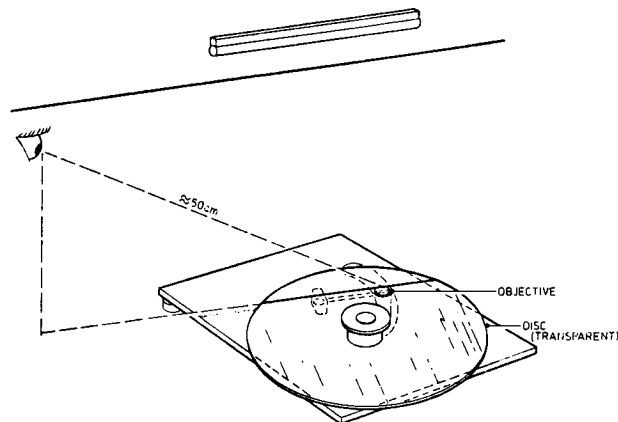
For this alignment the unit should be in the position of normal end use. The servicing supports 3634027 can be used here. Playback track 1 of disc 3634031. (Disc without defects). Connect a DC voltmeter between the *negative* of the focus motor and earth of the preamplifier print.

Adjust the height of the turntable with bearing screw in such a way, that the voltage is $0\text{ V} \pm 100\text{ mV}$. Seal hereafter the screw with sealing paint.



Checking the angle setting

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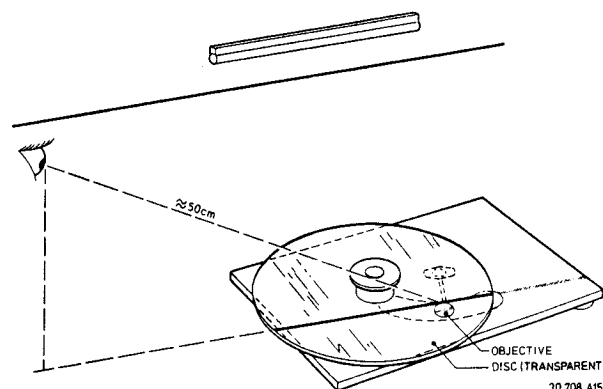
Place mirror 3634029 on the objective and glass disc 3634040 (with disc hold-down 3634032) on the turntable.

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 discs 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 $\leq 4\text{ mm}$.



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.

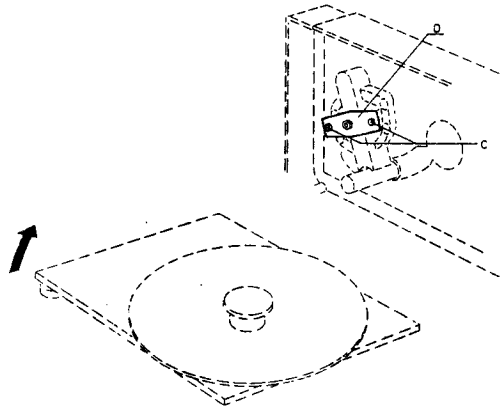
In the measurements show that the angle falls outside the tolerance given, the angle should *not* be adjusted for minimum deviation, but just within tolerance. The new setting should lie between the "old" setting and the optimum setting.

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 3634027.

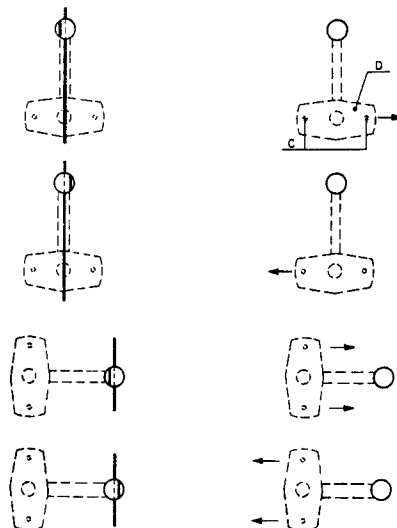
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Loosen screws C (see fig.) until bearing plate D can be shifted. Correct the angle setting by shifting the bearing plate in the direction indicated on the figure. Tighten screws C ensuring that the setting does not drift. **Double check** the angle setting in two directions.

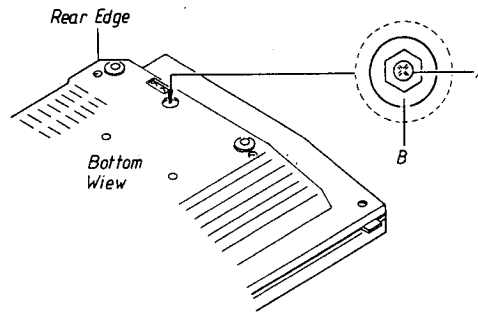
ATTENTION!

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



Height adjustment of lid

Before undertaking the height adjustment the set must be *fully* assembled, and the adjustment is made through a hole in the bottom plate of the set.



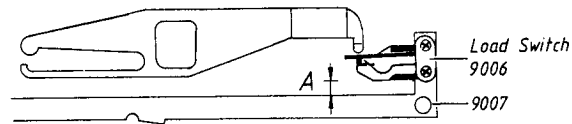
Loosen holding screw A.

Adjust the bushing B, using a 6 mm hexagon spanner, until the lid is flush with the upper edge of the control panel (± 0.5 mm).

Tighten the screw A.

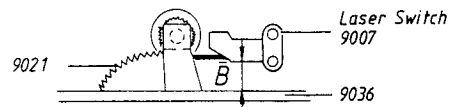
In case the adjustment is not within the tolerance range, this may cause failure of function in the eject system.

Load Switch



When fastening the load switch 9006, make sure the distance A between the lower part of the switch and the bracket 9007 is 3.4 mm.

Laser Switch



When fastening the laser switch 9034 make sure the distance B between the lower part of the switch and the bracket 9036 is 6.8 mm.

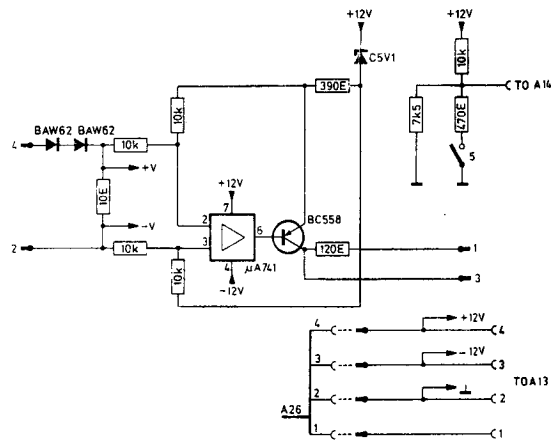
Spring 9009

When fitting spring 9009 in the bracket 9007, **always** mount the spring in the middle hole.

ELECTRICAL ADJUSTMENT 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.

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Check

The laser simulator PCB 3634028 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 ≤ 15 mV.

Check of laser supply control:

Set the switch on the simulator PCB in the ON position and measure the voltage 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.

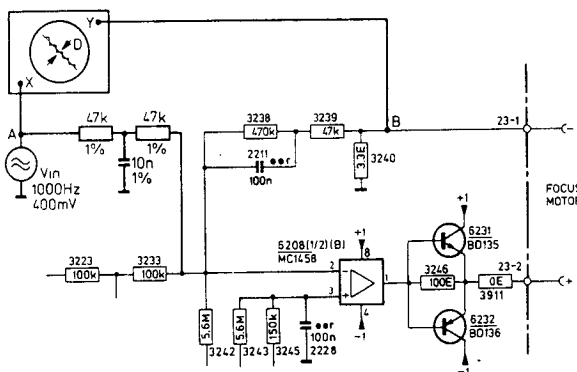
Adjusting the laser supply

Play track 1 of test disc 3634031 (disc without defects).

Connect a DC voltmeter across resistor 3308 on the servo PCB (= on emitter of transistor 6239 and ground).

Adjust the laser power supply with resistor 3140 until the voltage across resistor 3308 is 575 ± 75 mV.

Adjusting the focus bandwidth



Make a measuring arrangement according to the figure. Play track 1 of test disc 3634031 (disc without defects).

Adjust trimming resistor 3138 on PRE.AMPL. + LASER PCB for a 180° phase difference between signals A and B.

This corresponds with a minimum distance D in the Lissajous pattern.

$$R = 47 \text{ k}\Omega - 1\%$$

$$C = 10 \text{ nF} - 1\%$$

Focus offset

Trimming resistor 3132 should be in mid position.

Motor-control check (Hall)

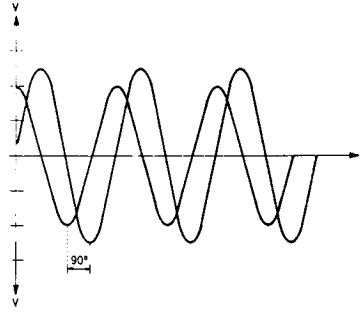
1. Disconnect the wire from PRE.AMPL. + LASER PCB to connector A18 pin 4 on the Hall motor control.
2. Connect channel A of a dual-beam oscilloscope to the emitter of transistor 6082, 6083 and channel B to the emitter of transistor 6084, 6085.
Position of oscilloscope: 2 V/div – 10 ms/div.
3. Switch the set on.
4. Apply a *negative* voltage to pin 4 of connector A18.
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 -5V. 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.
5. 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.
6. The amplitude depends on the applied voltage.
The V-in/V-out pp ratio should lie between 1:2 and 1:3.
7. 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 -1.5V and 3.7V.

Conclusion:

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



Check of the AGC and
offset circuits

(See SERVO PCB).

Play track 1 of test disc 3634031 (Disc without defects).

The voltage between pin 1 of IC6212 and \perp should be $-4 \text{ V} \pm 2 \text{ V}$.

The voltage between pin 14 of IC6215 and \perp should be $-2.5 \text{ V} \pm 2 \text{ V}$.

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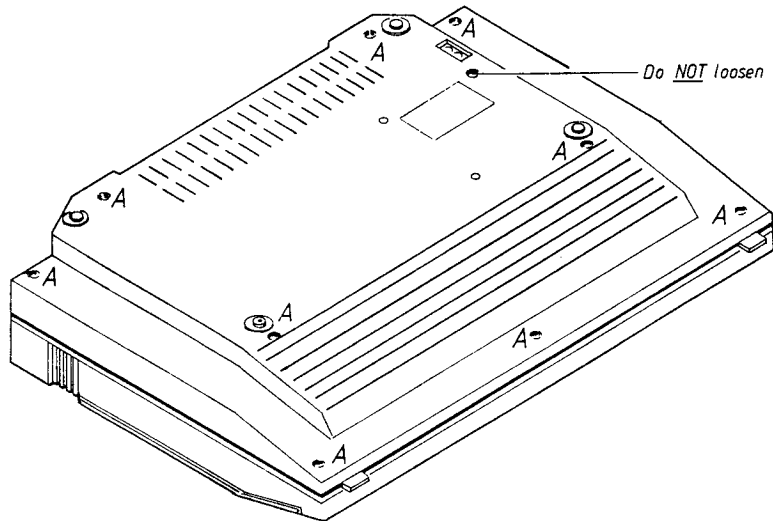
TECHNICAL SPECIFICATIONS

Frequency range	3-20,000 Hz \pm 0.3 dB
Signal-to-noise ratio	>96 dB
Dynamic range	>96 dB
Harmonic distortion	0.003% at 0 dB
Channel separation	>94 dB 20-20,000 Hz
Channel difference	<0.5 dB
Converter system	14 bit, oversampling 176.4 kHz
Low pass filter	Digital + analogue
Damping >20,000 Hz	>50 dB
Output	2 V RMS at 0 dB
Power supply	Type no. 5121: 220 V
	Type no. 5122: 240 V
	Type no. 5123: 120 V
	Type no. 5125: 240 V
Power frequency	50-60 Hz
Power consumption	25 watts
Dimensions W x H x D	42 x 7.5 x 31 cm (16 ¹ / ₂ " x 3" x 12 ³ / ₁₆ "
Weight	6 kg (13.2 lbs)

Subject to change without notice

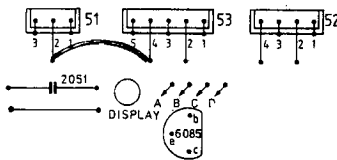
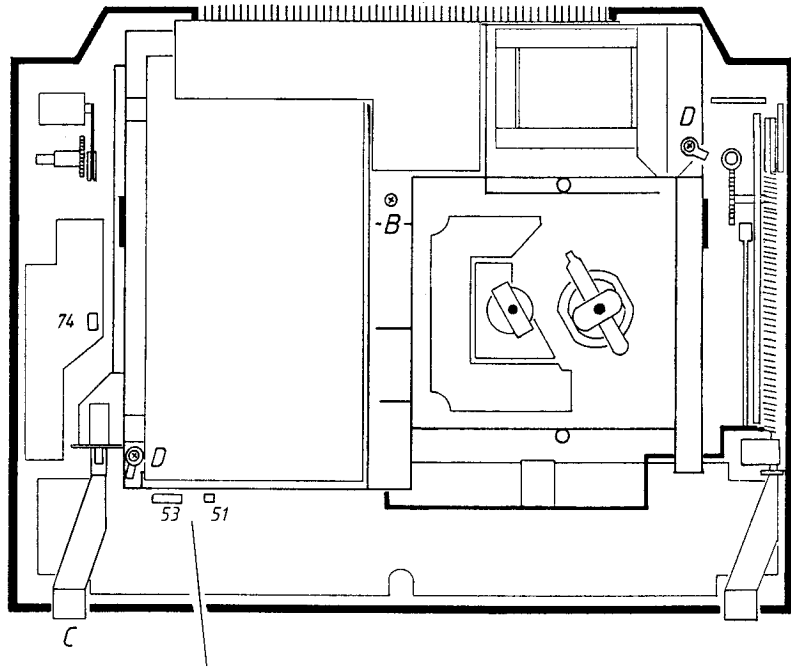
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DISMANTLING Bottom



Remove the screws A.

Top plate



Top Plate

Remove the screw B.

Remove the PLAY button C.

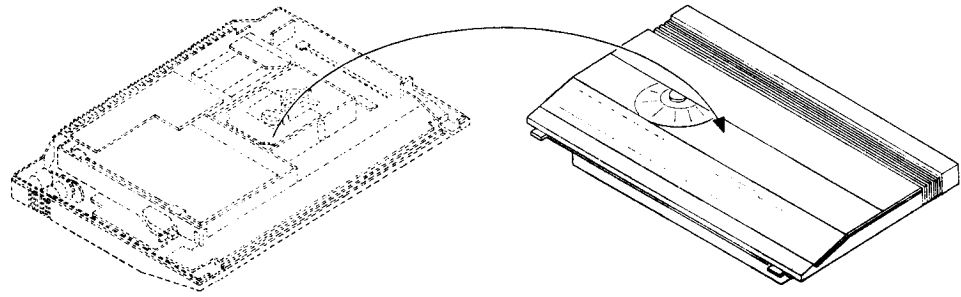
NB! The ON/OFF switch must be in position OFF when removing the button in order to avoid damaging the switch.

Remove the two ground connections D.

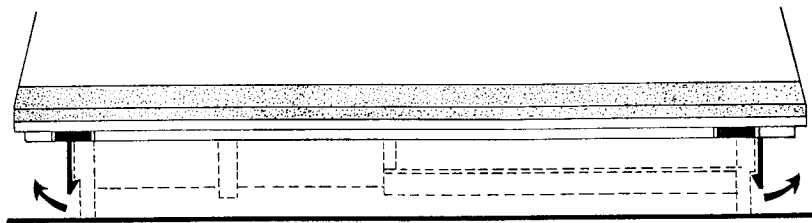
Remove plug 74 on the lid motor control PCB.

Then introduce a short-circuit from socket 53 pin 4 to 51 pin 1 ground on the control and display PCB.

NB! When plug 74 is removed and a short-circuit has been introduced between 53 pin 4 and ground, the dust cover functions cannot be operated.

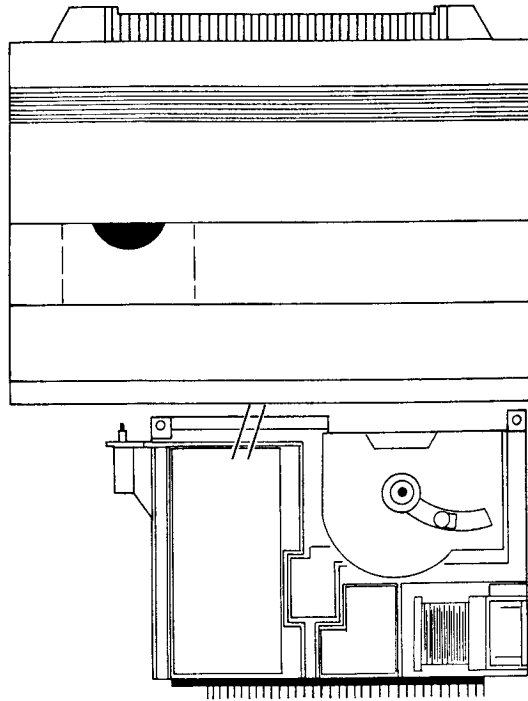


Turn over the set while supporting the chassis frame.



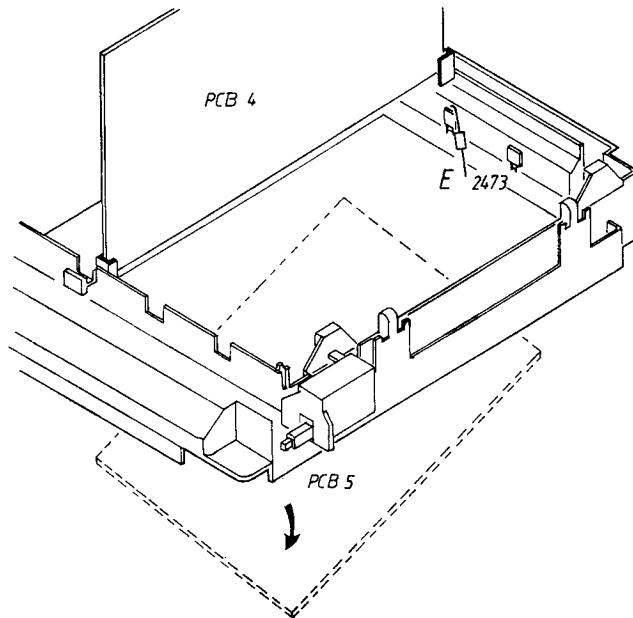
Tip out the two plastic tags.
Carefully lift off the top plate.
NB! Be aware of the cable connection between the top plate and the chassis frame.

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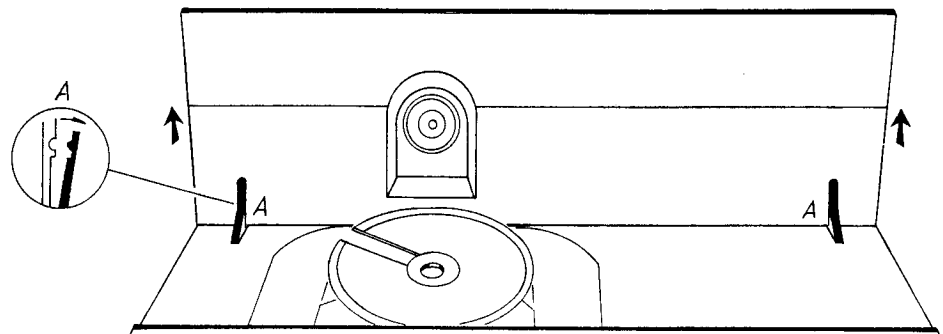
Place the top plate in front of the chassis frame as illustrated.

PCB4 and PCB5.



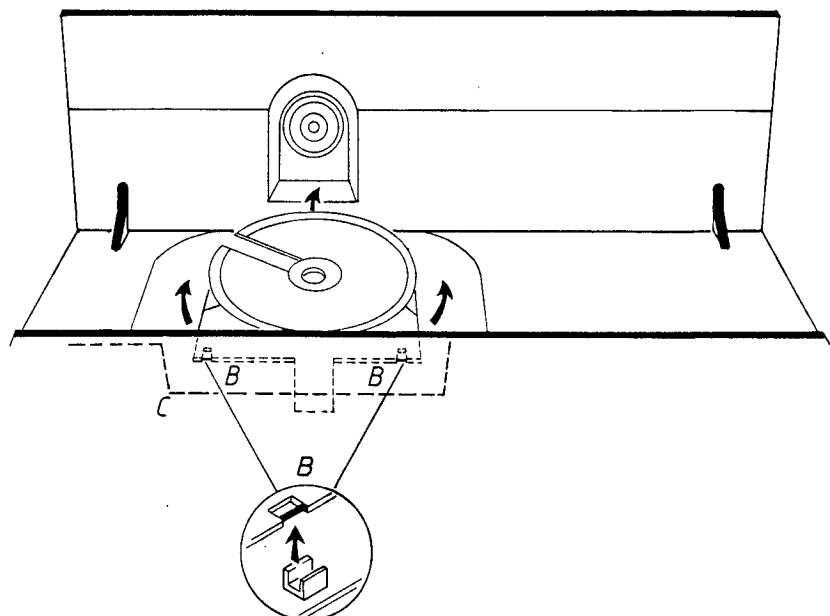
Tip up PCB4 and place in service position.
PCB5 cannot be tipped up until the capacitor E is desoldered.

Replacement of dust cover



Tip out the hinges A in both sides as illustrated.
The dust cover may now be pushed upwards.

Replacement of disc platter



Lift out the disc platter from the two clips B.
Pull the disc platter towards the dust cover. It is thereby disengaged.
NB! When mounting the disc platter, the tongue must be placed under the eject bar.

SERVICE TIPS

In order to prevent loose metal objects from getting in the CD mechanism it will be necessary to see to a clear repair station. Before the player is being used or service, the transportation screws should be removed. These screws have to be reapplied after servicing.

Ensure that the player is not resting on the shaft of the turntable motor or the light pin during repairs and measurements.

The player consists of various MOS ICs. Since MOS ICs are generally very sensitive to overload and overvoltage, servicing operations should be performed with the utmost care.

In the player chip components have been applied. For insertion and removal of chip components see page 2-1.

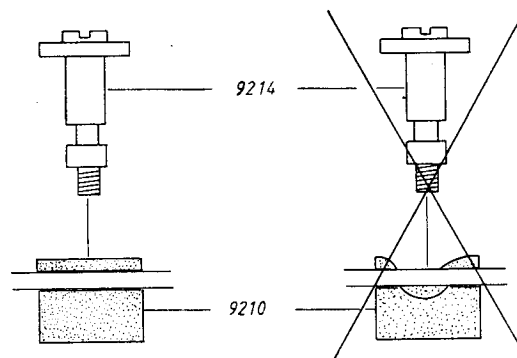
When the top part with the lid mechanism has to be demounted for repair, a loose hold-down should be employed.

Part no. for the disc hold down is 3634032.

For normal function of the set, when the top part is demounted the lid on the top part have to be closed.

Rubber bushing

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When replacing rubber bushings (pos. 9210) make sure the rubber is not stuck in the hole in the chassis.

Mechanism

Servicing the Radial and Focusing unit pos. 9409.

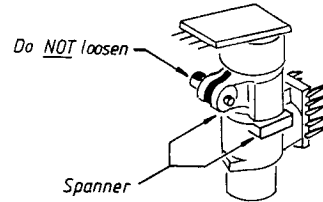
- Take the two flex PCBs out of the connectors on the preamplifier PCB.
- Disassemble the *defective* RAFOC unit by removing the 4 bolts no. 7 and shaft item number 9411.
- Remove shaft item number 9411 of the new RAFOC unit. Pay attention to the 3 intermediate washers item number 20 and spring washer item number 21 they should assume the same positions after assembly.

Mount the Radial and Focusing unit.

- Loosen the 4 bolts no. 7 until the bottom plate can be removed. Do not remove bolts no. 7 (they hold the new Radial and Focusing unit together).
- Mount the new Radial and Focusing unit on frame 9410. Ensure that the 3 intermediate washers 20 and spring washer 21 are positioned correctly before fixing shaft item number no. 7.
- Check that the arm moves freely and the angle setting as well (see check and possible adjustment of angle setting).

Replacing light-pin

- For replacing the light pin it is not necessary to remove the Radial and Focusing unit.



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The light pin can be removed by turning it anticlockwise 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.

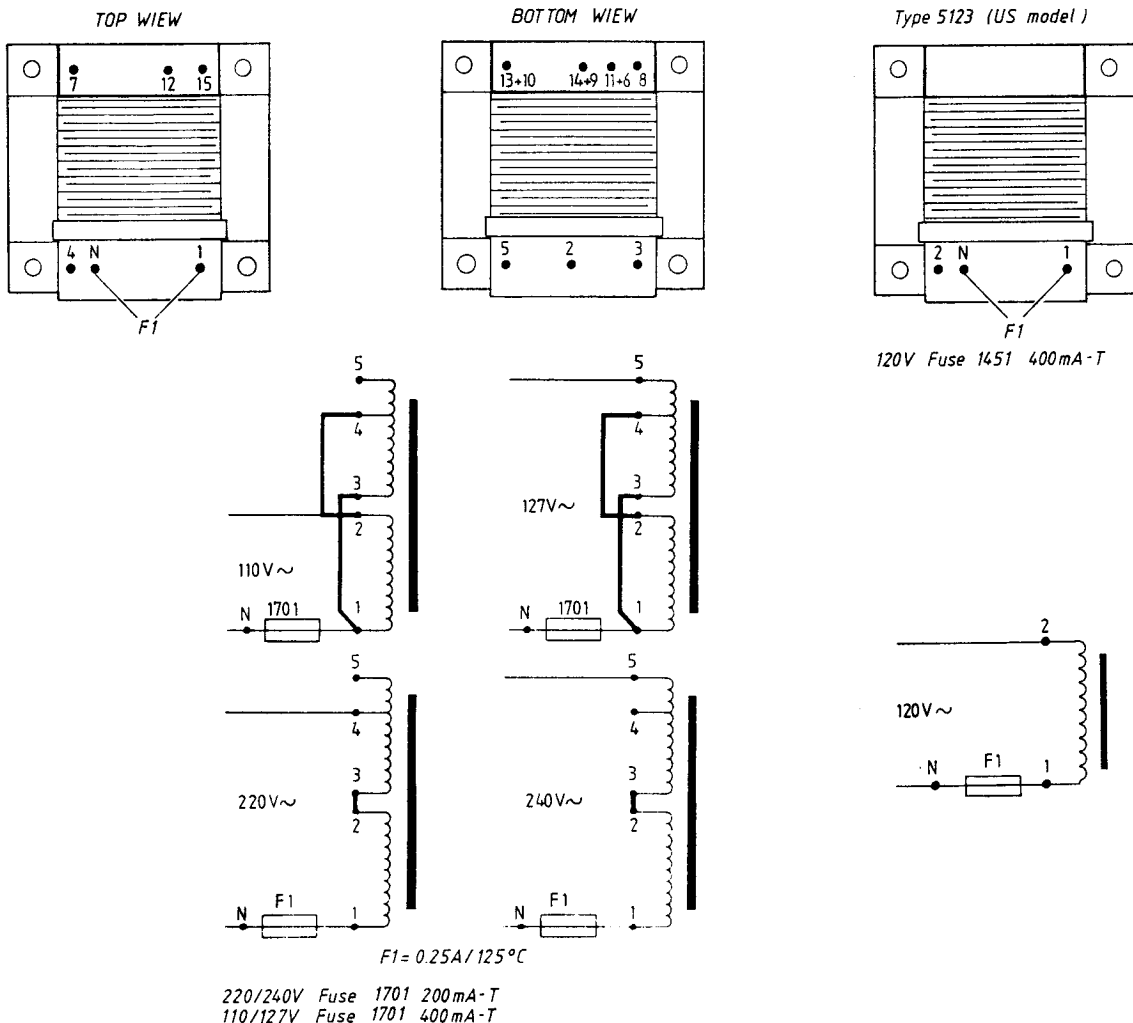
The CD-mechanism is provided with self-lubricating bearings and should thus not be lubricated.

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.

Mains Transformer Wiring



INSULATION TEST

Each set **must** be insulation tested after having been dismantled. The test is to be made when the record player has been reassembled completely and is ready for delivery to the customer (with the transis screws tightened).

Make the insulation test as follows:

Short-circuit the two pins of the mains plug and connect one of the terminals of the insulation tester.

Set the mains switch in position ON.

Connect the other terminal of the insulation tester to one of the two screws placed on the heat sink on the back of the unit.

NOTE!

To avoid ruining the set it is essential that both insulation tester terminals are in really good mechanical contact.

Now slowly turn the voltage control of the insulation tester until a voltage of 15.2 kV is obtained. Hold it there for 1 second, then turn the voltage down again.

At no point during the testing procedure any flashovers are permissible.

TROUBLE SHOOTING GUIDE CDX

General checkpoints

In the detailed troubleshooting method which follows a number of general conditions, required for proper functioning of the player, will not be repeated.

Before starting the detailed troubleshooting method these general points should be checked.

- a: Ensure that disc and objective are clean (remove dust, fingerprints, etc.) and use undamaged discs.
- b: Check whether all power supply voltages are presents and have the correct level.

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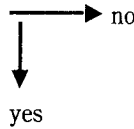
3538625

TO PAST INTO SERVICE MANUAL: BEOGRAM CD X

03-86

3538642

TROUBLE SHOOTING GUIDE FOR BEOGRAM CDX



Before starting trouble shooting, place the CD in service position

Place a compact disc in the player and press play:

1.
Lid closes?

→ Check all switches - OK? → Repair switches

↓
Check that 6IC6078 pin 24 goes high and pin 25 stays low → Check control and display circuit

↓
Check motor control circuit (PCB8), and lid mechanism

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2.
Disc starts turning?

→ Does laser emit light? → Does 4IC6202 pin 6 supply a low level? → Check functions around 4IC6202, 4IC6201, control and display circuit

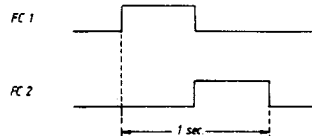
↓
Does laser emit sufficient light? (see service man. page. 5-1) → Check laser supply unit (PCB 02) Check laser.

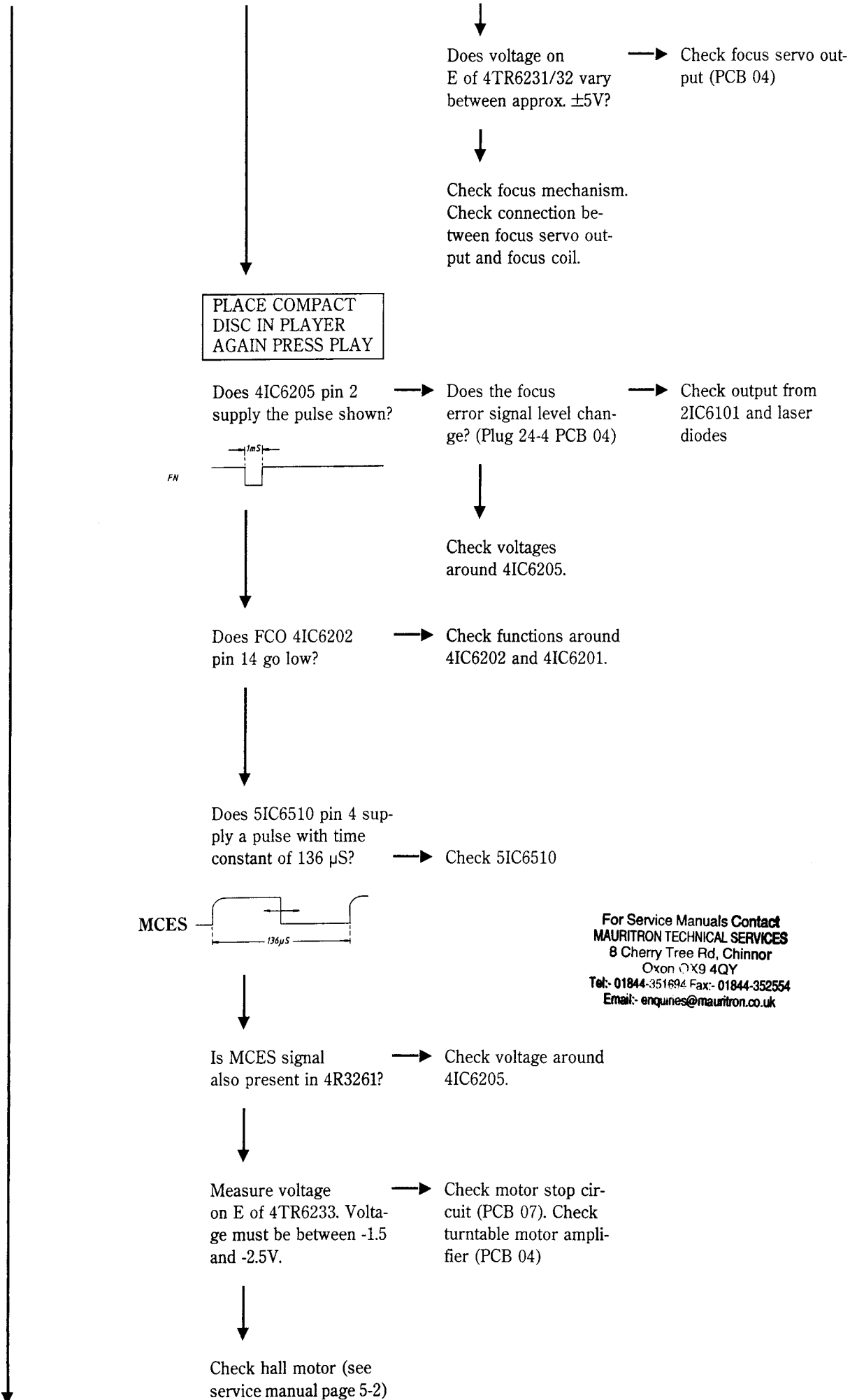
↓
Is laser angle correct in relation to disc? (see service manual page 4-2).

↓
REMOVE COMPACT-DISC. PRESS PLAY.

↓
Note if laser moves up and down approx. 3 times. Does the laser move?

→ Does 4IC6202 pins 12 and 13 supply the pulses shown? → Check functions around 4IC6202





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CAN ONLY BE MEASURED WHILE COMPACT DISC TURNS

3.

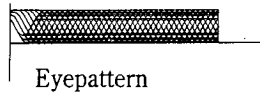
IF DISC STOPS TURNING, ACTIVATE PLAY AGAIN

COMPACT DISC
STARTS TURNING

(In some cases the disc
stops again)

Do green digits
light?

→ Can an eyepattern
signal (approx. 1 Vpp)
be measured in test
point 65 (5IC6501
pin 7)?



↓

Do HFLS, HFL and
 \overline{DO} (5IC6508) go high?
If no constant high signal
is measured it is
probably due to radial
servo circuit being defective.

↓

Does \overline{RCO}
(4IC6211 Pin 9) go
high? Must remain con-
stantly high.

→ Does laser move
towards center of disc
when starting up?
(lead in area)

↓

Check h.f. amplifier

→ Check automatic gain
control and offset control,
as follows:
Measure voltage on pin
14 of 4IC6215, voltage
must be $-2.7V \pm 2V$.
If this is kept the offset
control circuit is declared
OK.
If not check offset control.
Measure voltage of pin
1 of 4IC6212 to be $-4.3V \pm 2V$.
If this is kept the auto-
matic gain control circuit
is declared OK.
If not, check gain control.
If voltages are measured
in both circuits beyond
the tolerances indicated,
faults must be found in
circuits with influence
on both control circuits,
e.g. 650 Hz OSC or ser-
vo signal paths loop.

→ Check radial servo out-
put (PCB 04).
Check control signals
for radial start up, e.g.
 μ DAC, RDIR, and RCO
4IC6211.
If OK

↓

Try manually to lead la-
ser to spot on the disc
where there is certainly
a signal. Hold laser
around this spot while
simultaneously measu-
ring HFLS (5IC6508 pin
1): Is it now possible to
measure pulses on
HFLS. If not, check
drop-out HF level detec-
tor (PCB05).

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel: 01844-351694 Fax: 01844-352554
Email: enquiries@mauritron.co.uk

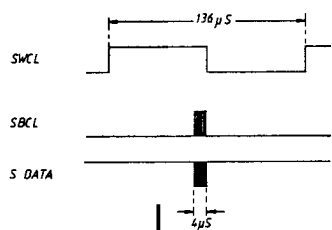
Does P-data (5IC6501 pin 5) go low?

→ Is the PLL circuit locked in? (5IC6501 pin 22 must change from approx. 1.8MHz in stop mode to 4.3 MHz in play mode).

→ Check eye-pattern
Check functions around 5IC6501.

Check functions around 5IC6501.

Are Q-data transmitted from 5IC6501 pins 2, 3, 4 to 4IC6201 pins 26, 27, 1?



→ Check functions around 5IC6501, 5IC6504, 4IC6201.

Check functions around display IC (6IC6078)

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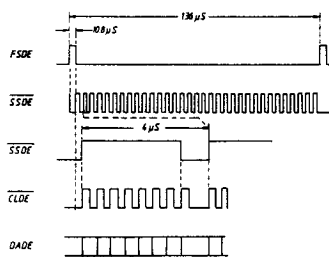
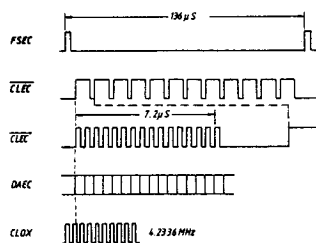
In order to see the signal sequences in an oscilloscope it is necessary to trigger on the signal shown at the top of the oscillogram.

The signals within each oscillogram must synchronize in order to consider the signal communication between the IC's to be OK.

Is signal present on the output of CD player?

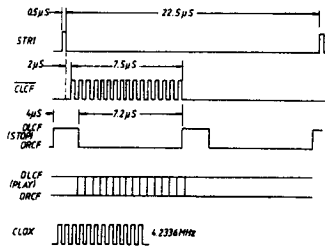
→ Is the UNEC flag between 5IC6510 and 5IC6514 low? (Data from ERCO to CIM OK?)

→ Check data transmission between DEMOD and ERCO. Are they OK?

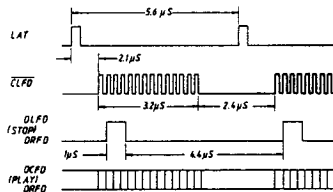


↓
Check data transmission
between ERCO/RAM.

↓
Check data transmission
between CIM and FIL.
Are they OK?



↓
Check data transmission
between FIL and DAC.
Are they OK?



↓
Check functions around
analogue output

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