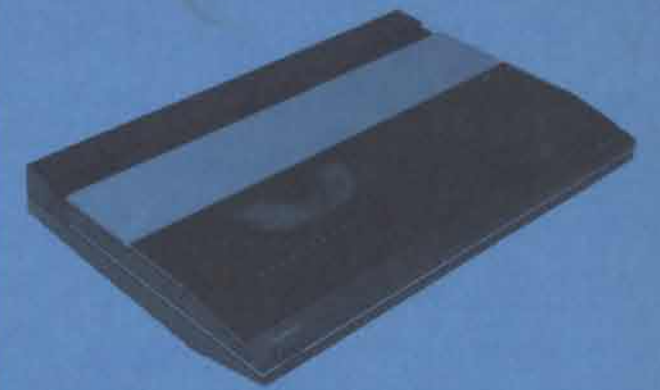


Bang & Olufsen



**Beogram CD X**  
Type 5121/22/23/25

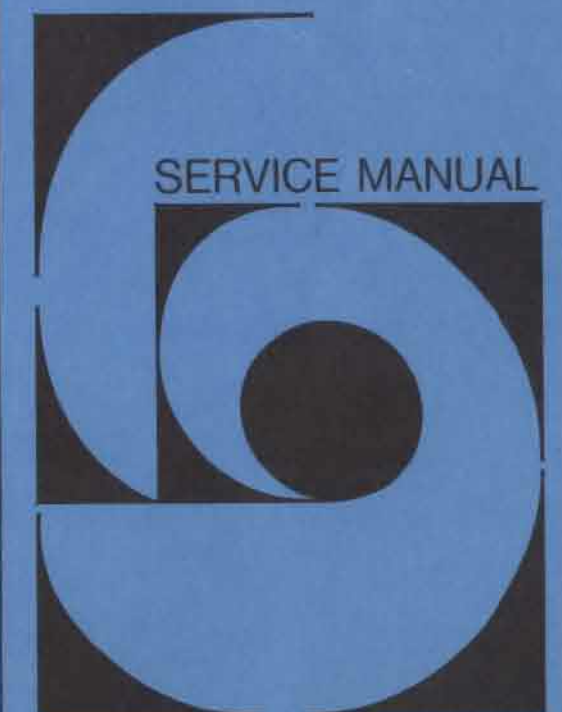


BANG & OLUFSEN  
DK - 7600 STRUER  
DENMARK

TELEPHONE 07 - 851122\* - TELEX 66549  
CABLE ADDRESS BANGOLUF  
TELEFAX 07 - 852650

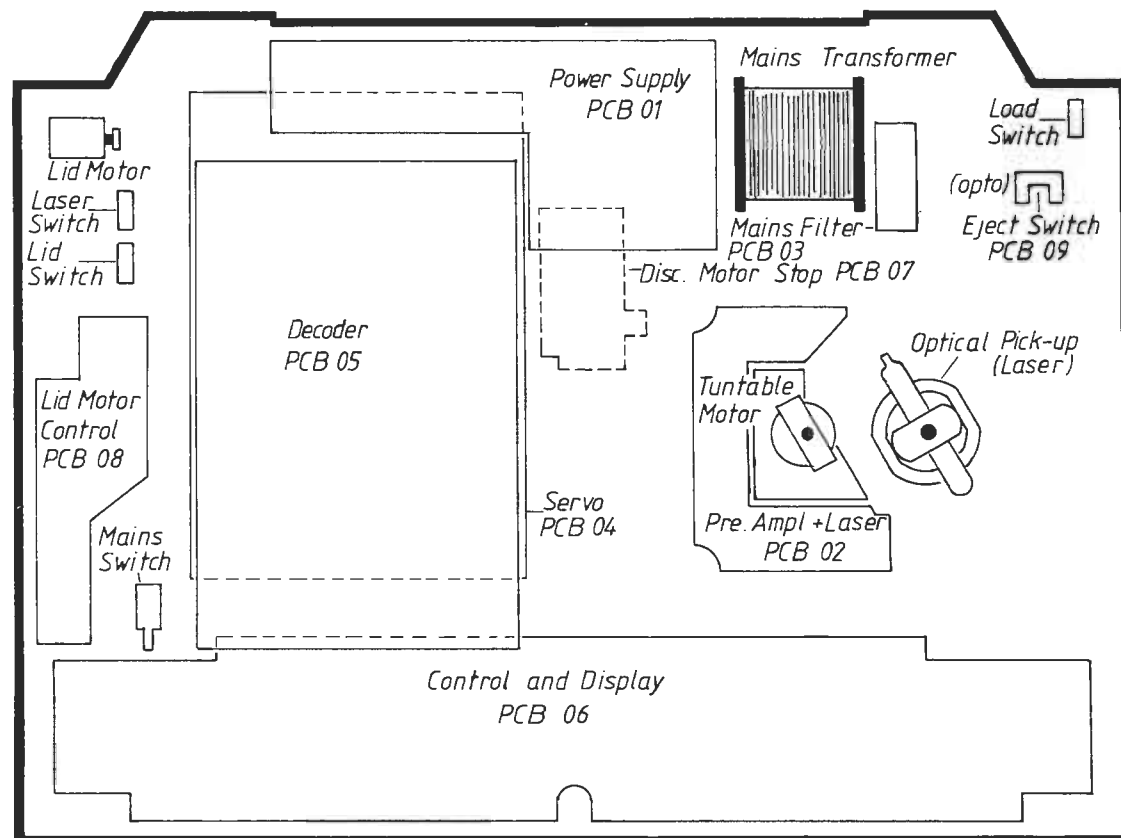
3538625 05-85

PRINTED IN DENMARK BY BOSTRYKKERHUSEN A/S, STRUER 84-85



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 VIEW



## 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

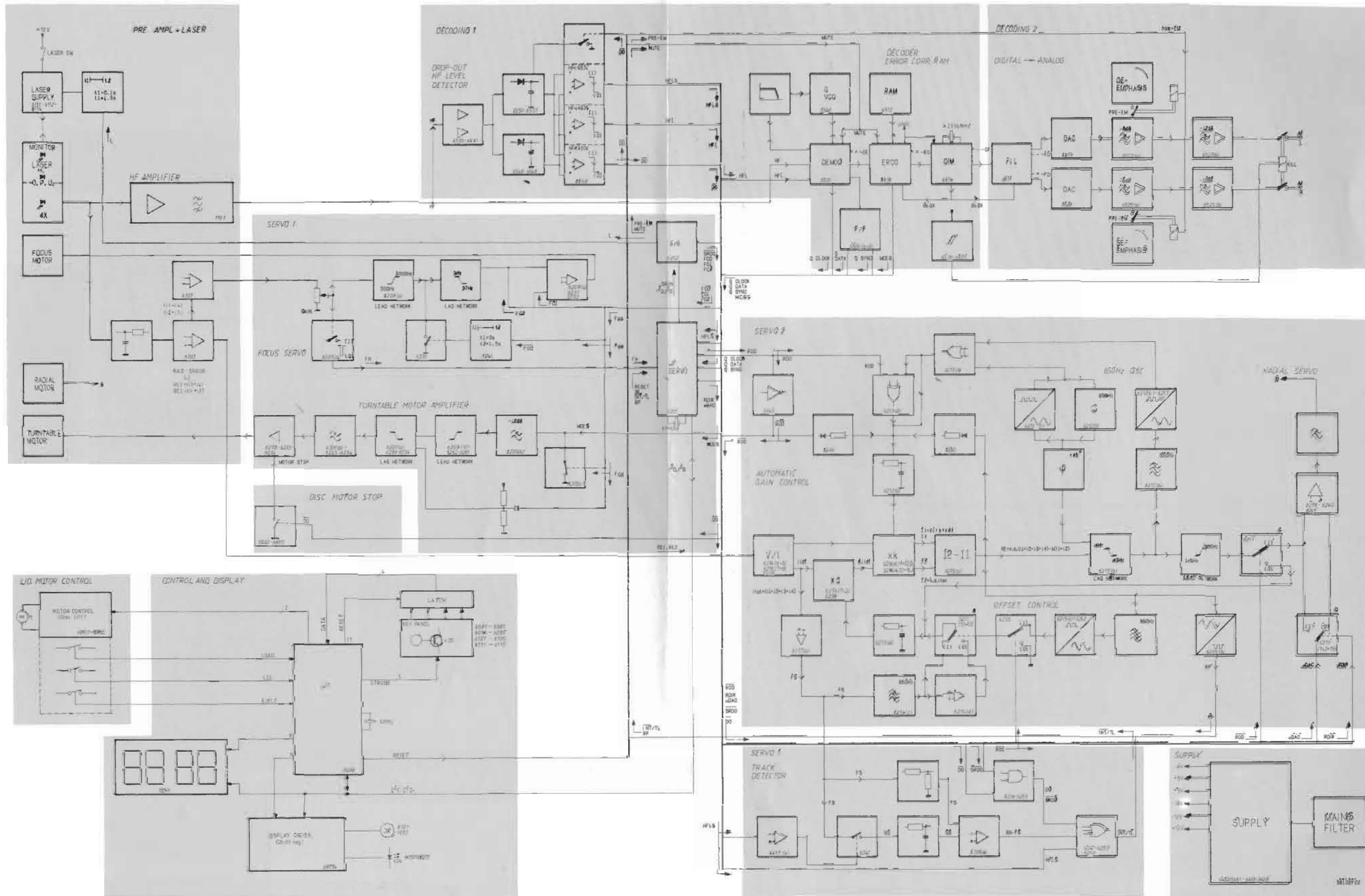
The respective diagrams are named, e.g. SERVO 1. The cable connections between the diagrams are described by the name of the diagram to which the connection goes, as well as by the socket and pin number (or a designation) on the diagram in question.

## 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.





Semi-conductors

105	209		

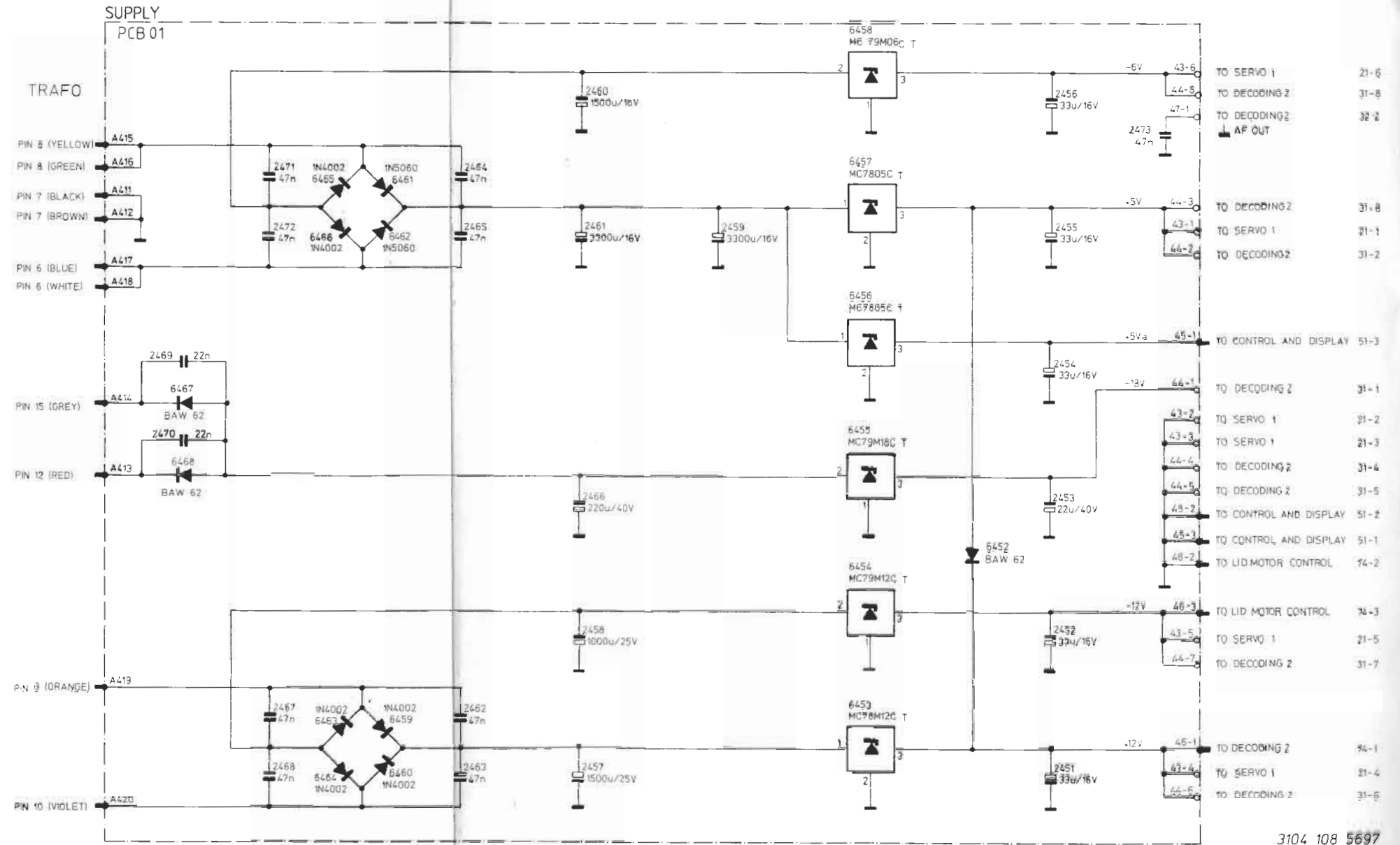
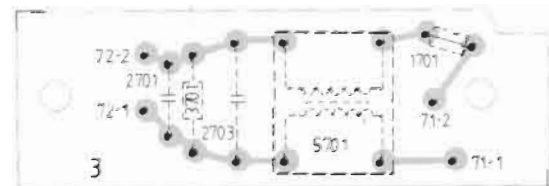
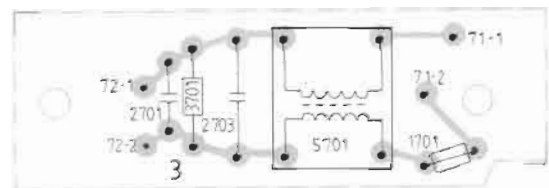
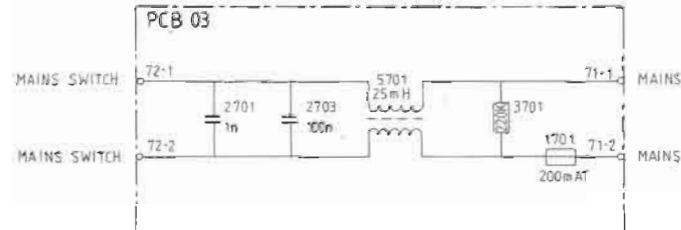
IC's

6453	8340049	105	MC78M12C
6454	8340356	105	MC79M12C
6455	8340814	105	MC79M18C
6456	8340065	105	MC7805C
6457			

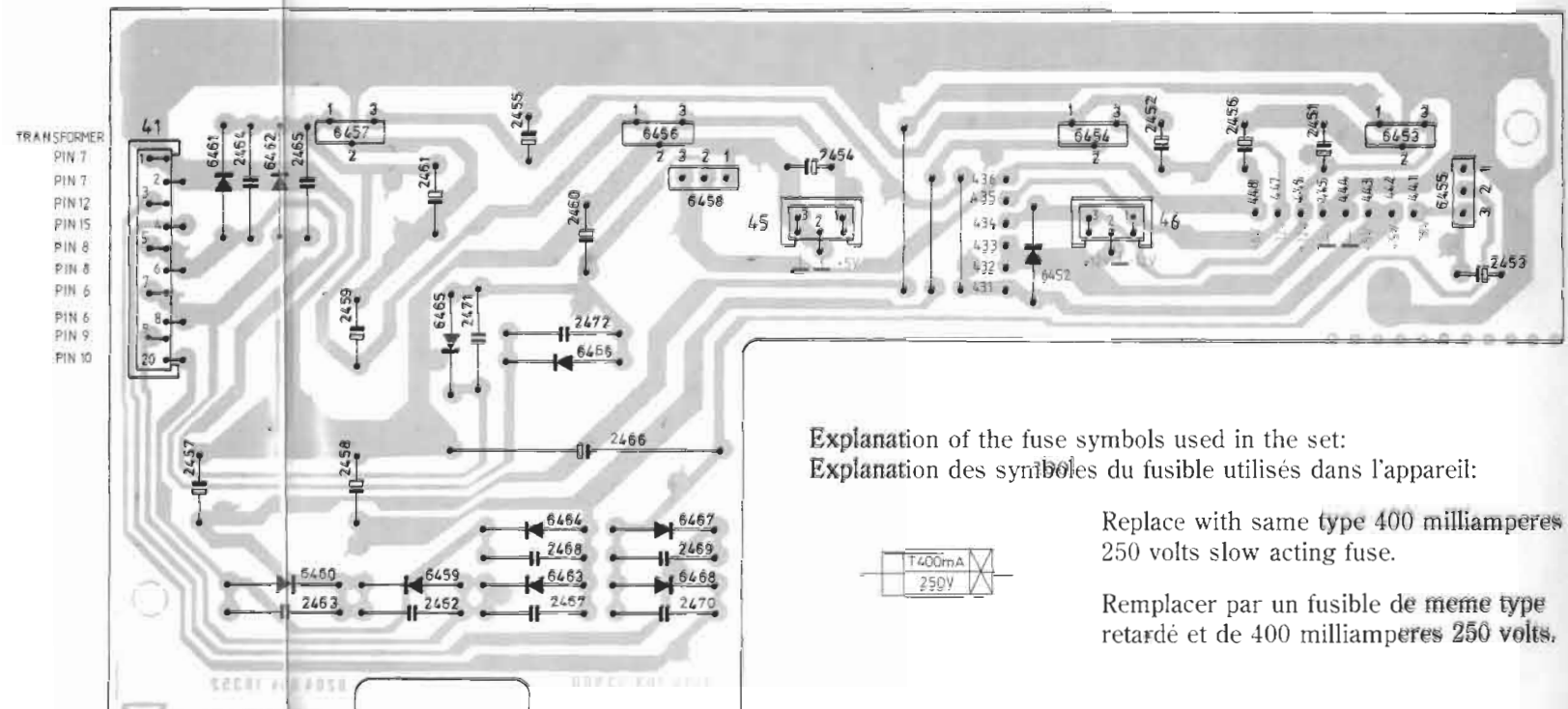
Diodes

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			

MAINS FILTER



3104 108 5697



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



Replace with same type 400 milliamperes 250 volts slow acting fuse.

Remplacer par un fusible de même type retardé et de 400 milliamperes 250 volts.

## SERVO 8005165 - PCB4

1201	C3	2208	B3	2216	H2	2228	E2	2237	I4	2246	G4	2257	H4	2265	G3	3203	B4	3210	B4	3215	B4
2203	D2	2209	E3	2217	I2	2229	B3	2238	I3	2247	H4	2259	H3	2266	G3	3205	B4	3211	B4	3216	C4
2204	H4	2211	E3	2218	H3	2230	C3	2239	I4	2250	I4	2261	D4	2267	G2	3207	D2	3212	B4	3217	C4
2205	O2	2214	H2	2219	H3	2233	I4	2243	G4	2251	G3	2262	C4	3201	B4	3208	D2	3213	B3	3219	D3
2207	B2	2215	H3	2220	E2	2236	I3	2244	H4	2256	H3	2264	E4	3202	B4	3209	B4	3214	B4	3220	E3
3221	E3	3229	E3	3235	C3	3240	E2	3250	I3	3255	H3	3260	H3	3268	B2	3279	I4	3284	G4	3291	H4
3222	F3	3230	E3	3236	C3	3242	E3	3251	I2	3256	I2	3261	H3	3273	I2	3280	I4	3285	B5	3292	H4
3223	F3	3232	B2	3237	C3	3243	E3	3252	H2	3257	I2	3265	C3	3274	H3	3281	G5	3286	D5	3293	E4
3227	C3	3233	F3	3238	E3	3245	F3	3253	I3	3258	I2	3266	C3	3275	H2	3282	H4	3287	E4	3294	H4
3228	E3	3234	C3	3239	E2	3246	E2	3254	I2	3259	I3	3267	I4	3276	I4	3283	H4	3288	E4	3298	E4
3299	O4	3305	O4	3312	G4	3320	E4	3327	I4	3341	C5	3350	H3	3357	G4	3363	B4	3372	H4	3380	G3
3300	D3	3306	D4	3313	F4	3323	E3	3328	I4	3342	C5	3351	G4	3358	H4	3364	B4	3373	I4	3381	G3
3301	O4	3307	D4	3316	H3	3324	I3	3335	F4	3345	H4	3352	G4	3359	H4	3365	B5	3375	G4	3382	G3
3302	O4	3308	E4	3318	E3	3325	I3	3336	G4	3346	I4	3353	G3	3360	G4	3367	C4	3376	G3	3384	G3
3304	C4	3311	G4	3319	E3	3326	I4	3340	C5	3349	G3	3356	G3	3362	A4	3370	H4	3379	E5	3385	G2
3386	G2	3394	E4	3399	D4	3907	I3	3913	H4	3918	E3	3924	I2	6201	B3	6211	F4	6216	E4	6232	E2
3387	O2	3395	D4	3901	D2	3909	B2	3914	C2	3919	E4	3925	H2	6202	C2	6212	I4	6217	B5	6233	H2
3391	C4	3396	E4	3904	B4	3910	B2	3915	D5	3920	E4	5201	B2	6205	B4	6213	H4	6218	G3	6234	H2
3392	O4	3397	F3	3905	C4	3911	E2	3916	D3	3921	G2	5202	H2	6208	F3	6214	O4	6230	F3	6236	D2
3393	O4	3398	D3	3906	B4	3912	H4	3917	G4	3923	B3	5203	H2	6209	H3	6215	G4	6231	F2	6238	E3
6239	E3	6247	B3	6252	G4	6257	C3	6262	I3												
6240	G3	6248	F1	6253	C3	6258	B3														
6241	G3	6249	G4	6254	C3	6259	B4														
6242	C4	6250	G5	6255	F4	6260	D2														
6243	E5	6251	E4	6256	C2	6261	I2														

### Semi-conductors

17	20	32	42	102	103	136	209	218

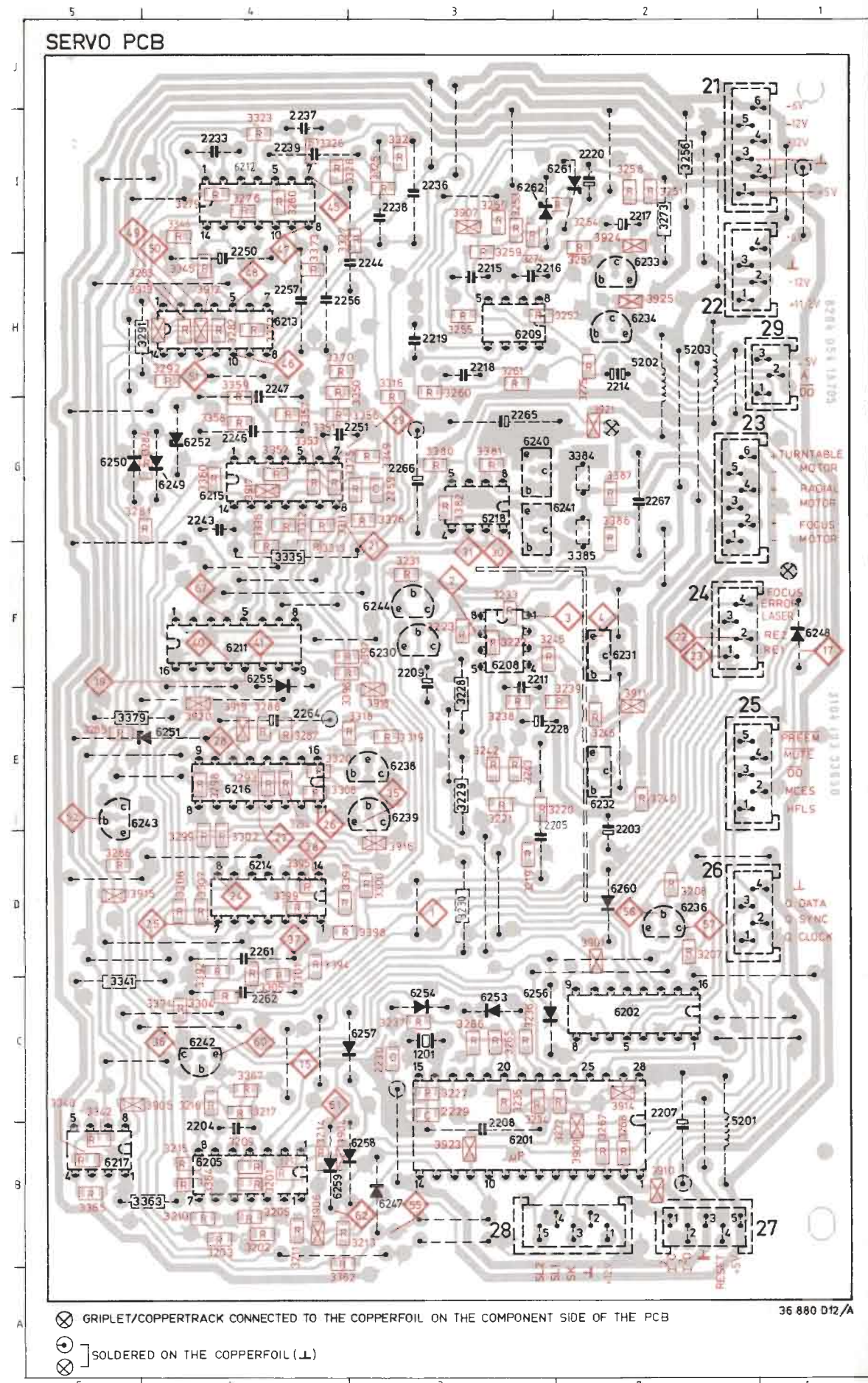
### Transistors

6230	8320285	20	BC 548C	6239	8320108	20	BC 548B
6231*	8320239	32	BD 135	6240*	8320240	32	BD 136
6232*	8320240	32	BD 136	6241*	8320239	32	BD 135
6233	8320378	17	BD 635	6242	8320104	20	BC 558B
6234	8320632	17	BC 636	6243	8320108	20	BC 548B
6236	8320108	20	BC 548B	6244	8320104	20	BC 558B
6238	8320089	42	BF 494				
6201Δ	8340843	136	MAB 8440	6213	8340346	136	HEF 4070B
6202	8340782	136	HEF 4094B	6214	8340157	102	LM 324
6205	8340317	102	LM 339	6215			
6208	8340048	103	MC 1458	6216	8340301	101	TCA 240
6209				6217	8340048	103	MC 1458
6211Δ	8340340	102	HEF 4053	6218	8340141	103	μA 741
6212	8340157	102	LM324				
6247-	8300359	209	BAW 62	6253-	8300359	209	BAW 62
6250	8300169	209	BZX79/C5V1	6259			
6251	8300438	209	BZX79/C2V4	6260	8300489	218	BAT 85
6252				6261	8300354	209	BZV46/2V0
				6262			

\*Specially selected or adapted sample.

### IC's

### Diodes



SERVO 8005165 - PCB4

1201	C3	2208	B3	2216	H2	2228	E2	2237	I4	2246	G4	2257	H4	2265	G3	3203	B4	3210	B4	3215	B4
2203	D2	2209	E3	2217	I2	2229	B1	2238	I3	2247	H4	2258	G3	2266	G3	3205	G4	3211	B4	3216	C4
2204	B4	2211	E3	2218	H3	2230	C3	2239	I4	2250	I4	2261	D4	2267	G2	3207	D2	3212	B4	3217	C4
2205	D2	2214	H2	2219	H3	2233	I4	2243	G4	2251	G3	2262	C4	2268	B4	3208	D2	3213	B3	3218	C3
2207	B2	2215	H3	2220	E2	2236	I3	2244	H3	2256	H4	2264	E4	2270	B4	3209	B4	3214	B4	3220	E3
3221	E3	3229	E3	3235	C3	3240	E2	3250	I3	3255	H3	3260	H3	3268	B2	3279	I4	3284	G4	3291	H4
3222	F3	3230	E3	3236	C3	3242	E3	3251	I2	3256	I2	3261	H3	3273	I2	3280	I4	3285	B3	3292	H4
3223	F3	3232	B2	3237	C3	3243	E3	3252	H2	3257	I2	3265	C3	3274	H3	3281	I4	3286	B3	3293	E4
3227	C3	3233	F3	3238	C3	3245	F3	3253	I3	3258	I2	3266	C3	3276	H2	3282	H4	3287	E4	3294	E4
3228	E3	3234	C3	3239	E2	3246	E2	3254	I2	3259	I3	3267	I4	3278	I4	3283	H4	3288	E4	3298	E4
3299	D4	3305	D4	3312	G4	3320	E4	3327	I4	3341	C5	3350	H3	3357	G4	3363	B4	3372	H4	3380	G3
3300	D3	3306	D4	3313	F4	3323	I4	3328	I4	3342	C5	3351	G4	3358	G4	3364	B4	3372	I4	3381	G3
3301	D4	3307	D4	3316	H3	3324	I3	3335	F4	3345	H4	3352	G4	3359	H4	3365	B5	3375	G4	3382	G3
3302	D4	3308	E4	3318	E3	3325	I3	3336	G4	3346	I4	3353	G4	3360	G4	3367	C4	3376	G3	3384	G3
3304	C4	3311	G4	3319	E3	3326	I4	3340	C5	3349	G3	3356	G3	3362	A4	3370	H4	3379	E3	3385	G2
3386	G2	3394	E4	3399	D4	3907	I3	3913	H4	3918	E3	3924	I2	6201	B3	6211	F4	6216	E4	6232	E3
3387	G2	3395	D4	3901	D2	3909	B2	3914	C2	3919	E4	3925	H2	6202	C2	6212	I4	6217	B5	6233	H2
3391	C4	3396	E4	3904	B4	3910	B2	3915	D5	3920	E4	3926	B2	6205	B4	6213	H4	6218	G3	6234	H2
3392	D4	3397	F3	3905	C4	3911	E2	3916	D3	3921	G2	3927	H2	6208	F3	6214	D4	6230	F3	6236	D2
3393	D4	3398	D3	3906	B4	3912	H4	3917	G4	3923	B3	3929	H2	6209	H3	6215	G4	6231	F2	6238	E3
6239	E3	6247	B3	6252	G4	6257	C3	6262	I3												
6240	G3	6248	F1	6253	C3	6258	B3														
6241	G3	6249	G4	6254	C3	6259	B4														
6242	C4	6250	G5	6255	F4	6260	D2														
6243	E5	6251	E4	6256	C2	6261	I2														

Semi-conductors

17	20	32	42	102	103	136	209	218

Transistors

6230	8320285	20	BC 548C	6239	8320108	20	BC 548B
------	---------	----	---------	------	---------	----	---------

6231*	8320239	32	BD 135	6240*	8320240	32	BD 136
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6232*	8320240	32	BD 136	6241*	8320239	32	BD 135
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6233	8320378	17	BD 635	6242	8320104	20	BC 558B
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6234	8320632	17	BC 636	6243	8320106	20	BC 548B
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6236	8320108	20	BC 548B	6244	8320104	20	BC 558B
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6238	8320089	42	BF 494				
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IC's

6201Δ	8340606	136	MAB 8440	6213	8340346	136	HEF 4070B
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6202	8340782	136	HEF 4094B	6214	8340157	102	LM 324
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6205	8340317	102	LM 339	6215			
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6208	8340048	103	MC 1458	6216	8340301	101	TCA 240
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6209				6217	8340048	103	MC 1458
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6211Δ	8340340	102	HEF 4053	6218	8340141	103	μA 741
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6212	8340157	102	LM324				
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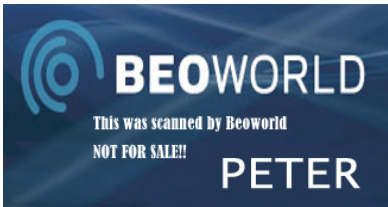
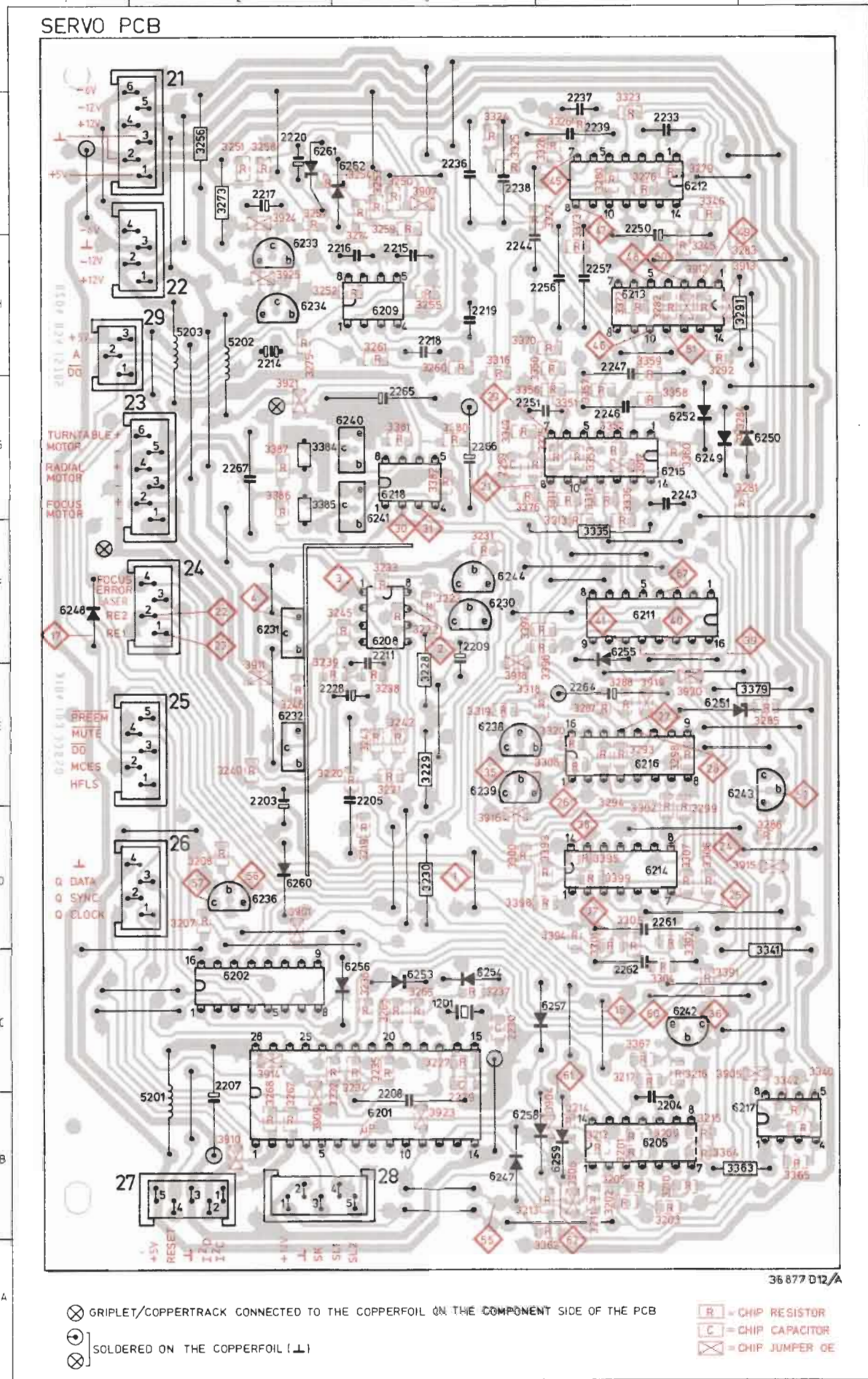
6247-	8300359	209	BAW 62	6253-	8300359	209	BAW 62
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6250	8300169	209	BZX79/C5V1	6256			
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6251	8300438	209	BZX79/C2V4	6260	8300489	218	BA7 65
------	---------	-----	------------	------	---------	-----	--------

6252				6261	8300354	209	BZV46/2V0
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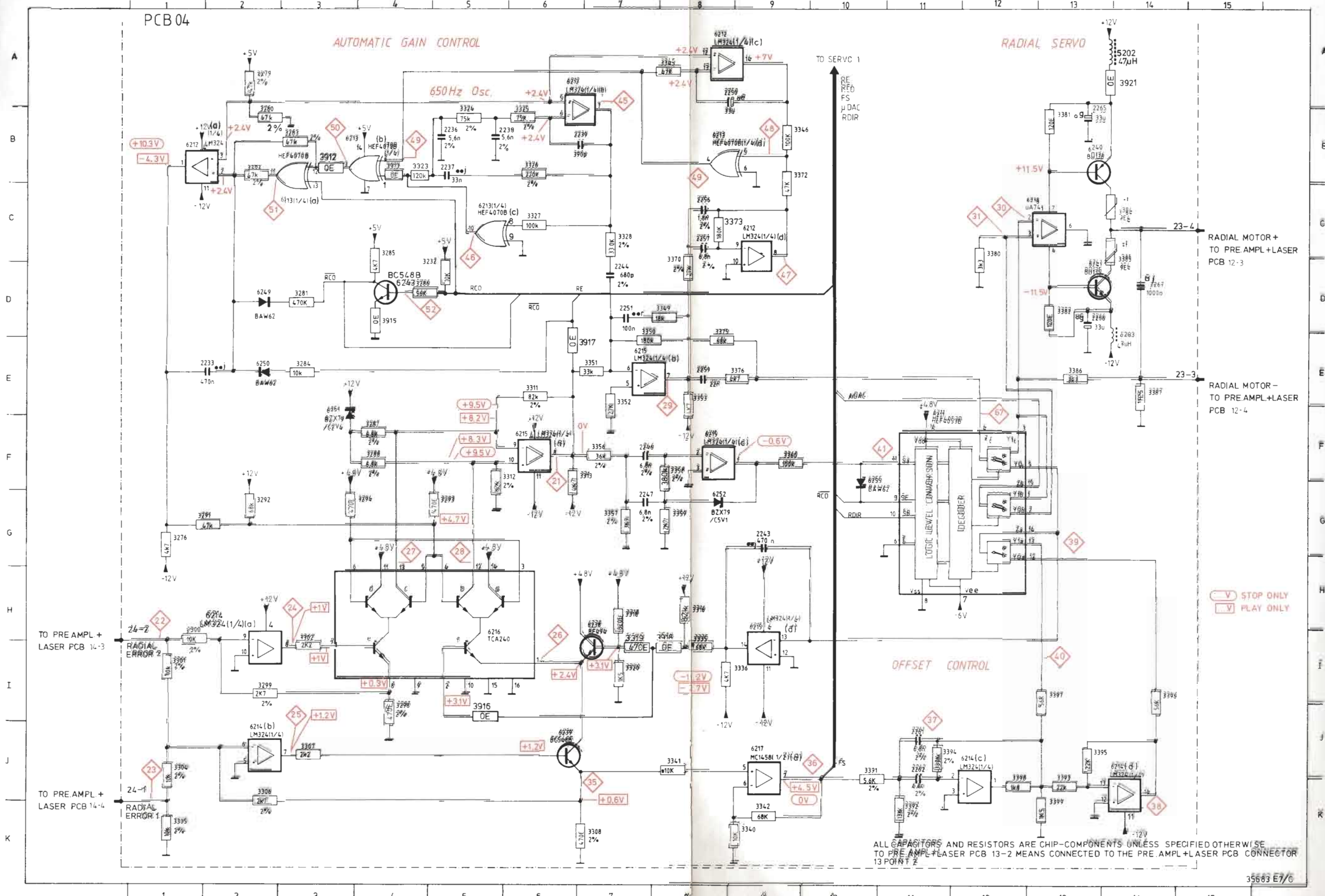
\*Specially selected or adapted sample.



**SERVO 2**

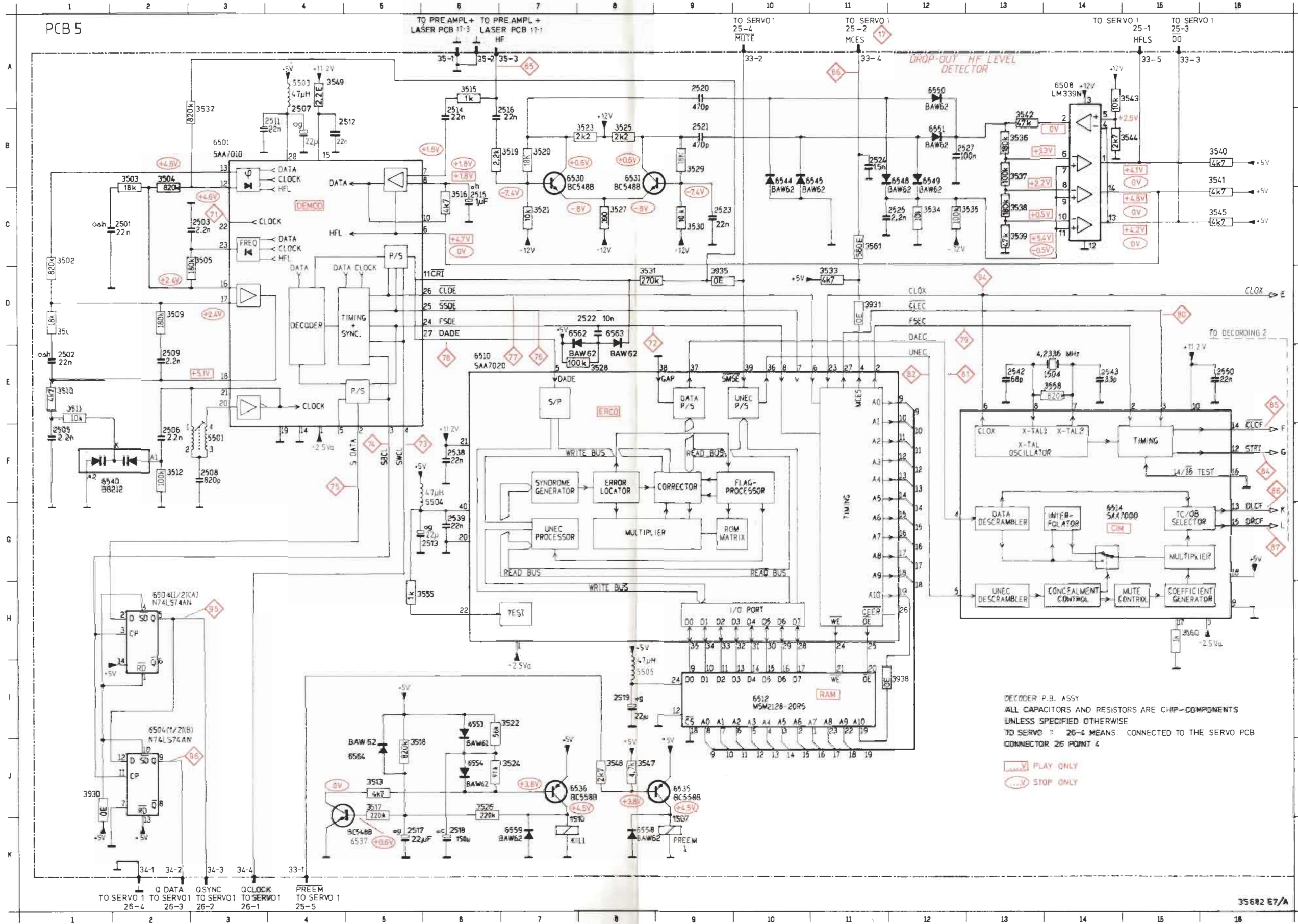
2233 E 2	2246 F 7	2251 J 11	3276 G 1	3284 E 3	3293 G 5	3304 J 1	3313 F 6	3324 B 5	3340 K 9	3351 E 7	3360 F 9	3380 C 12	3391 J 10	3398 J 12	6212 E 9	6214 H 2	6216 H 5	6243 D 4	3912 B 3
2236 B 5	2247 G 7	2262 M 1	3279 A 2	3285 D 4	3294 G 3	3305 K 1	3316 H 8	3325 B 6	3341 J 8	3352 E 8	3370 D 8	3381 B 13	3392 K 11	3399 M 13	6213 A 8	6214 J 2	6217 J 9	6249 D 2	3913 C 4
2239 B 5	2250 A 8	2260 A 8	3280 D 4	3286 D 4	3298 L 4	3306 K 2	3316 H 8	3326 B 6	3342 K 9	3353 E 8	3372 B 9	3382 D 13	3393 J 13	3399 E 13	6213 B 3	6214 J 2	6218 C 13	6250 E 2	3915 D 4
2239 B 5	2251 B 7	2265 B 13	3280 B 2	+3287 F 4	3299 I 2	3307 J 3	3318 H 7	3327 C 7	3345 A 8	3356 F 7	3373 C 8	3384 C 13	3394 J 13	3399 E 13	6213 C 5	6215 H 9	6238 I 7	6251 E 3	3915 D 4
2239 B 6	2256 C 8	2266 D 13	3281 D 3	3288 F 4	3300 H 1	3308 K 6	3319 I 7	3328 C 7	3346 B 9	3357 G 7	3373 C 8	3385 C 13	3395 J 13	3399 E 13	6213 D 4	6215 F 8	6239 J 6	6252 D 8	3916 E 5
2243 G 9	2257 C 8	2267 D 14	3282 B 2	3291 G 2	3301 I 1	+3311 E 6	3320 I 7	3335 I 8	3349 D 8	3358 F 8	3376 E 9	3386 E 13	3396 I 14	3399 E 13	6213 E 6	6215 F 6	6240 B 13	6252 F 10	3917 E 6
2244 D 7	2259 E 8	3232 D 5	3283 B 3	3292 G 2	3302 I 3	3312 F 6	3323 B 4	3336 I 8	3350 E 7	3359 G 8	3376 E 9	3387 E 14	3397 J 13	3399 E 13	6214 J 2	6215 F 7	6241 D 13	6255 F 10	3918 B 8

3921 A13



DECODING 1

1504 E14	2501 C2	2506 F2	2512 B4	2517 K5	2522 D8	2538 F6	3507 D1	3513 J5	3519 B7	3524 J7	3529 B9	3534 C12	3539 C13	3544 B14	3555 H6	3931 D11	5504 F6	6508 A14	6531 B8	6544 B10	6551 B12	6562 D7	
1507 K9	2502 E1	2507 B4	2513 G6	2518 K6	2523 C9	2539 G6	3502 C1	3509 D2	3515 A6	3520 B7	3525 B8	3530 C9	3535 C12	3541 B16	3545 C16	3558 E14	3935 D9	5505 I8	6510 E6	6535 J9	6545 B11	6553 I6	6563 D8
1510 K7	2503 C3	2508 F2	2514 B6	2519 I8	2524 B11	2542 E13	3503 B2	3510 E1	3516 C6	3521 C7	3526 J6	3531 D8	3541 C16	3547 J8	3561 H15	3938 I12	6501 B3	6512 I10	6536 J7	6548 B12	6554 J6	6564 J5	
		2509 E3	2515 C6	2520 A9	2527 B12	2543 E13	3504 B2	3511 E1	3517 J5	3522 I7	3527 C8	3532 A3	3537 B11	3542 B13	3548 J8	3561 C11	5501 F3	6504 H2	6514 G14	6537 K5	6549 B12	6558 K8	
	2505 F1	2511 B3	2516 B7	2521 B9	2525 C12	2550 E16	3505 C3	3512 F2	3518 J5	3523 B8	3528 E7	3533 D11	3538 C13	3543 A14	3549 A4	3930 J1	5503 A4	6504 I2	6530 B7	6540 F1	6550 A12	6559 K7	



DECODER P.B. ASSY  
 ALL CAPACITORS AND RESISTORS ARE CHIP-COMPONENTS  
 UNLESS SPECIFIED OTHERWISE  
 TO SERVO 1: 26-4 MEANS: CONNECTED TO THE SERVO PCB  
 (CONNECTOR 26 POINT 4)

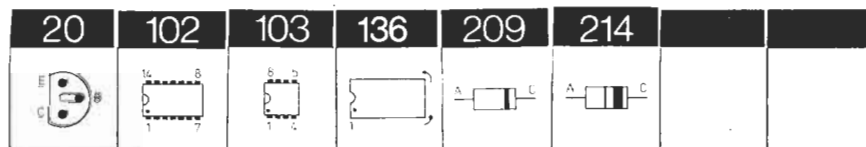
PLAY ONLY  
 STOP ONLY



DECODER 8005166 - PCB5

1504 C2	2503 A2	2508 B3	2514 B2	2519 C4	2524 C5	2542 C2	2559 E3	2567 E6	2575 F8
1507 D5	2504 D2	2509 B2	2515 A1	2520 A3	2525 A4	2543 D2	2560 E3	2568 E6	2580 E4
1510 F5	2505 B3	2511 B1	2516 A3	2521 A4	2527 A5	2550 D2	2562 E3	2570 E6	2581 E4
2501 B3	2506 B3	2512 A3	2517 D4	2522 B2	2538 C3	2555 E4	2564 E3	2571 E6	2582 E3
2502 B3	2507 B1	2513 C2	2518 D5	2523 A4	2539 C2	2558 E4	2566 D6	2573 E5	2583 E3
2584 E3	2589 E3	2597 E2	2605 E4	2618 E5	2625 F2	2632 E2	2637 E2	3503 A3	3510 B3
2585 E3	2591 E3	2599 E2	2606 E5	2619 E5	2627 E4	2633 E2	2638 E2	3504 A2	3511 B3
2586 E3	2593 E2	2601 D5	2608 E4	2620 D2	2628 F3	2634 E2	2639 E2	3505 A2	3512 B3
2587 E3	2594 E2	2602 E4	2610 F5	2623 D4	2630 E2	2635 E2	2641 E2	3507 A2	3513 D3
2588 E3	2595 E2	2603 E5	2617 E5	2624 E4	2631 E2	2636 E2	3502 A2	3509 B2	3515 A2
3516 A2	3521 B3	3526 D6	3531 B2	3536 B5	3541 A5	3547 D6	3558 C2	3566 D4	3572 E6
3517 D4	3522 D5	3527 B4	3532 B2	3537 B5	3542 B5	3548 D6	3560 D1	3567 D3	3573 D5
3518 D4	3523 B3	3528 B1	3533 C4	3538 B5	3543 A5	3549 A3	3561 C5	3569 E4	3574 E6
3519 A3	3524 D5	3529 A4	3534 A4	3539 B5	3544 A5	3550 D3	3564 D4	3570 E4	3576 E5
3520 A3	3525 B4	3530 B4	3535 B4	3540 A5	3545 A5	3555 C2	3565 D3	3571 E3	3577 E6
3579 F5	3584 E3	3593 E4	3598 E5	3603 E2	3931 C3	3941 E4	3505 C4	6512 C4	6523 E3
3580 F5	3585 E3	3594 D5	3599 E5	3606 E2	3935 C2	3944 D4	6501 B2	6514 D2	6525 E3
3581 F4	3590 D2	3595 E4	3600 F5	3607 D4	3936 D2	5501 B3	6504 B6	6517 D3	6530 A3
3582 E5	3591 E2	3596 E4	3601 F5	3608 D4	3937 E6	5503 B1	6508 A5	6519 D3	6531 A4
3583 E5	3592 E2	3597 E4	3602 F4	3930 A6	3938 C4	5504 C1	6510 C2	6520 D2	6535 D6
6536 D6	6548 A4	6554 C5	6563 B1						
6537 D5	6549 A4	6558 D5	6564 D5						
6540 B4	6550 A4	6559 F6							
6544 A4	6551 A4	6561 D4							
6545 A4	6553 C5	6562 B1							

Semi-conductors



Transistors

6530	8320108	20	BC 548B	6537	8320108	20	BC 548B
6531				6540			

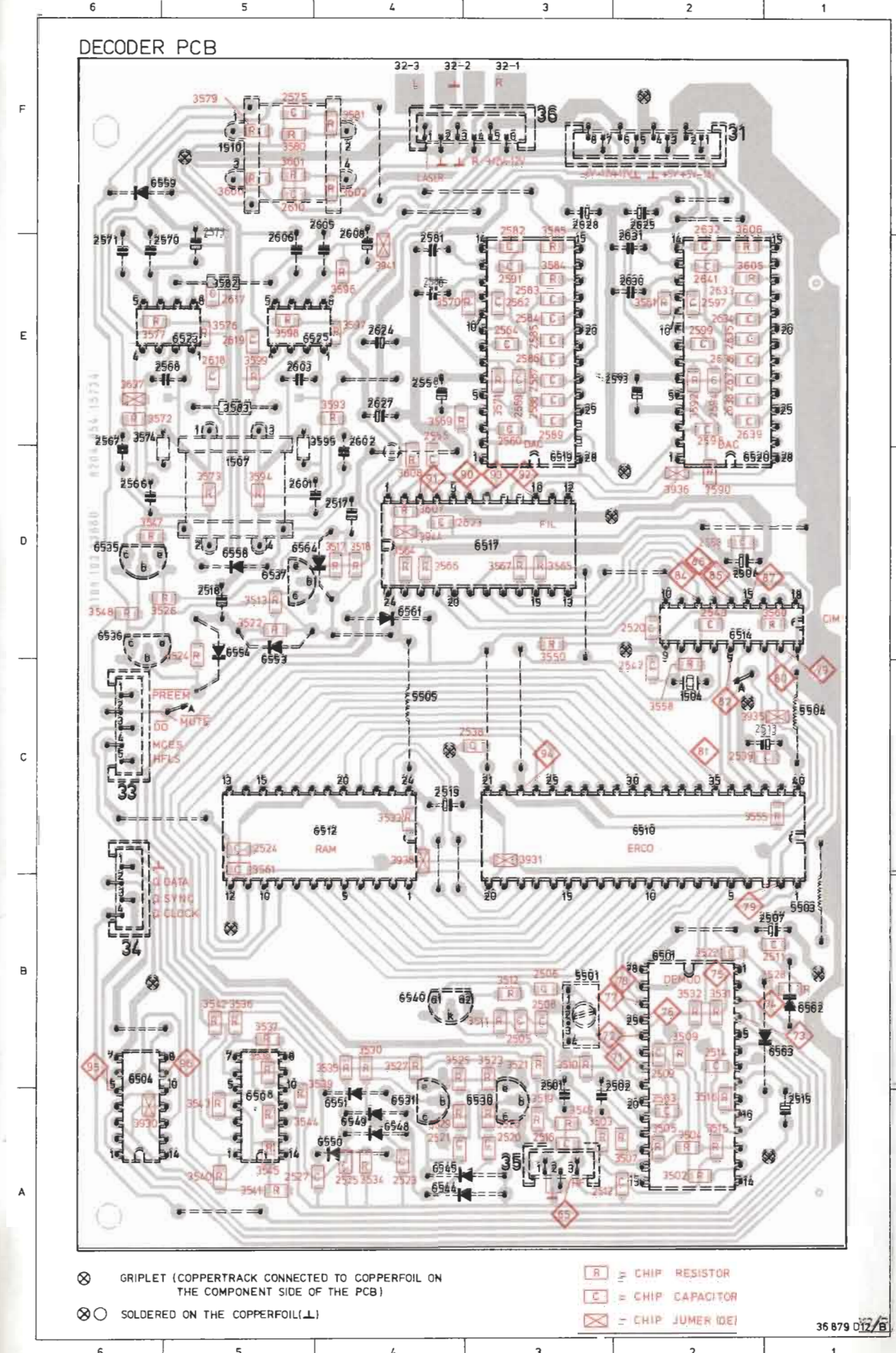
6535	8230104	20	BC 558B				
6536							

IC's

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

Diodes

6544-	8300359	209	BAW 62	6562-	8300359	209	BAW 62
6559				6564			
6561	8300245	214	BAX 18				



DECODER 8005166 - PCB5

1504 C2	2503 A2	2508 B3	2514 B2	2519 G4	2524 C5	2542 C2	2559 B3	2567 B6	2575 F5
1507 D5	2504 D2	2509 B2	2515 A1	2520 A3	2525 A4	2543 D2	2560 B3	2568 E6	2580 E4
1510 F3	2505 B3	2511 B1	2516 A3	2521 A4	2527 A5	2550 D2	2562 B3	2570 E6	2581 E4
2501 B3	2506 B3	2512 A3	2517 D4	2522 B2	2528 C3	2555 E4	2564 B3	2571 E6	2582 E3
2502 B3	2507 B1	2513 C2	2518 D5	2523 A4	2529 C2	2558 E4	2566 D6	2573 E5	2583 E3
2584 B3	2589 B3	2597 E2	2605 E4	2618 B5	2625 F2	2632 E2	2637 E2	3503 A3	3510 B3
2585 B3	2591 B3	2599 E2	2606 E5	2619 B5	2627 E4	2633 E2	2638 E2	3504 A2	3511 B3
2586 B3	2593 E2	2601 D5	2608 E4	2620 D2	2628 F3	2634 E2	2639 E2	3505 A2	3512 B3
2587 B3	2594 E2	2602 E4	2610 F5	2623 D4	2630 E2	2635 E2	2641 E2	3507 A2	3513 D5
2588 B3	2595 E2	2603 E5	2617 B5	2624 E4	2631 E2	2636 E2	3502 A2	3509 B2	3515 A2
3516 A2	3521 B3	3526 D6	3531 B2	3536 B5	3541 A5	3547 D6	3558 C2	3566 D4	3572 E6
3517 D4	3522 D5	3527 B4	3532 B2	3537 B5	3542 B5	3548 D6	3560 D1	3567 D3	3573 D5
3518 D4	3523 B3	3528 B1	3533 C4	3538 B5	3543 A5	3549 A3	3561 C5	3569 E4	3574 E6
3519 A3	3524 D5	3529 A4	3534 A4	3539 B5	3544 A5	3550 D3	3564 D4	3570 E4	3576 E5
3520 A3	3525 B4	3530 B4	3535 B4	3540 A5	3545 A5	3555 C2	3565 D3	3571 E3	3577 E6
3579 F5	3584 B3	3593 E4	3598 B5	3605 E2	3931 C3	3941 E4	5505 C4	6512 C4	6523 E5
3580 F5	3585 B3	3594 D5	3599 E5	3606 E2	3935 C2	3944 D4	6501 B2	6514 D2	6525 E5
3581 F4	3590 D2	3595 E4	3600 F5	3607 D4	3936 D2	5501 B3	6504 B6	6517 D3	6530 A3
3582 E5	3591 E2	3596 E4	3601 F5	3608 D4	3937 E6	5503 B1	6508 A5	6519 D3	6531 A4
3583 B3	3592 E2	3597 E4	3602 F4	3930 A6	3938 C4	5504 C1	6510 C2	6520 D2	6535 D6
6536 D6	6548 A4	6554 C5	6563 B1						
6537 D5	6549 A4	6558 D5	6564 D5						
6540 B4	6550 A4	6559 F6							
6544 A4	6551 A4	6561 D4							
6545 A4	6553 C5	6562 B1							

Semi-conductors

20	102	103	136	209	214		

Transistors

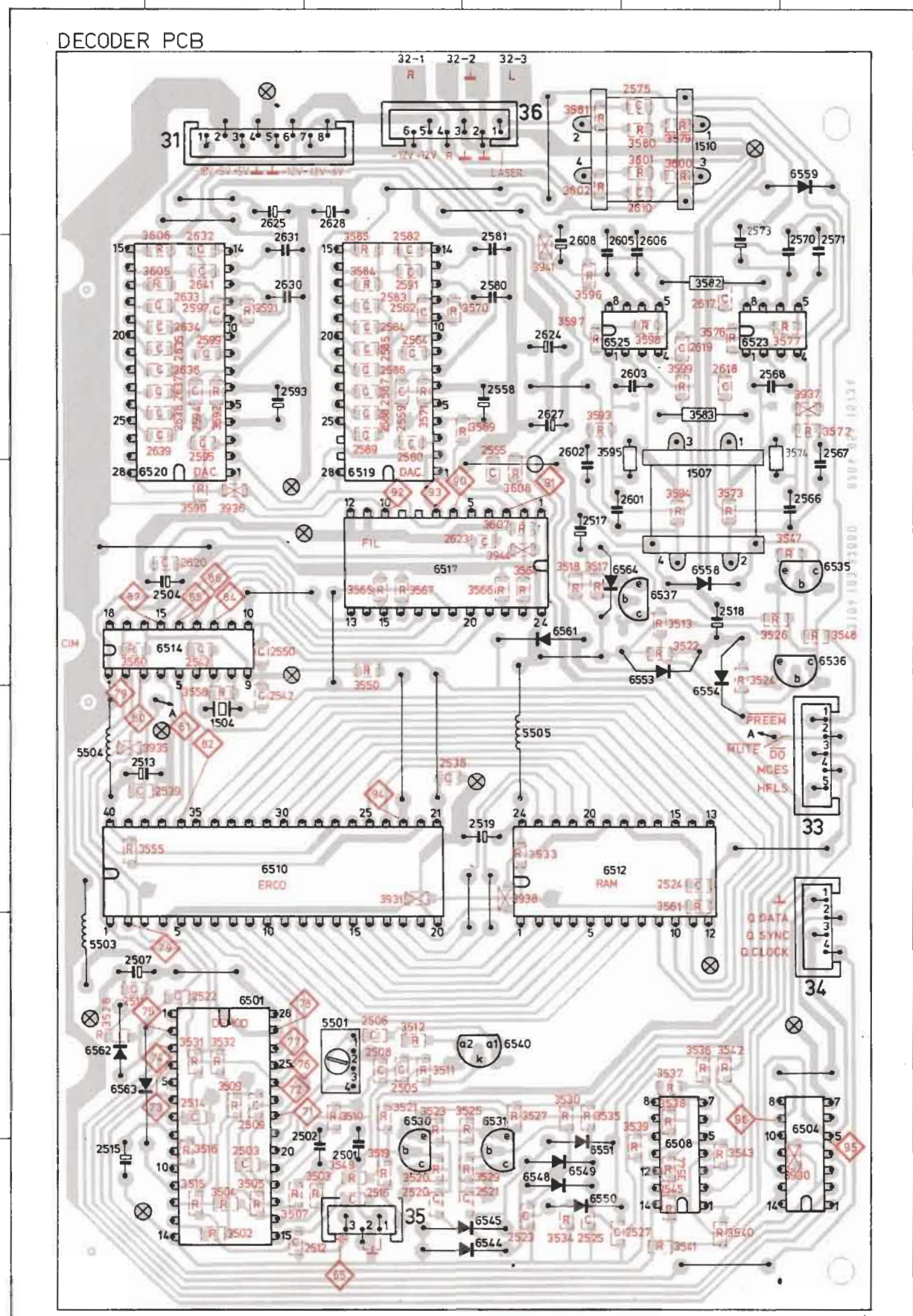
6530	8320108	20	BC 548B	6537	8320108	20	BC 548B
6531				6540			

IC's

6535	8230104	20	BC 558B				
6536							
6501Δ	8340807	136	SAA 7010	6514Δ	8340810	136	SAA 7000
6504	8340366	136	N74LS74AN	6517Δ	8340811	136	SAA 7030
6508	8340317	102	LM 339N	6519Δ	8340812	136	TDA 1540P
6510Δ	8340808	136	SAA 7020	6520			
6512Δ	8340809	136	MSM	6523	8340250	103	NL 5532N
			2128-20RS	6525			

Diodes

6544-	8300359	209	BAW 62	6562-	8300359	209	BAW 62
6559				6564			
6561	8300245	214	BAX 18				



⊗ GRIPLET (COPPERTRACK CONNECTED TO COPPERFOIL ON THE COMPONENT SIDE OF THE PCB)  
 ⊗ ⊕ SOLDERED ON THE COPPERFOIL (⊥)  
 [R] = CHIP RESISTOR  
 [C] = CHIP CAPACITOR  
 [X] = CHIP JUMPER (DE)

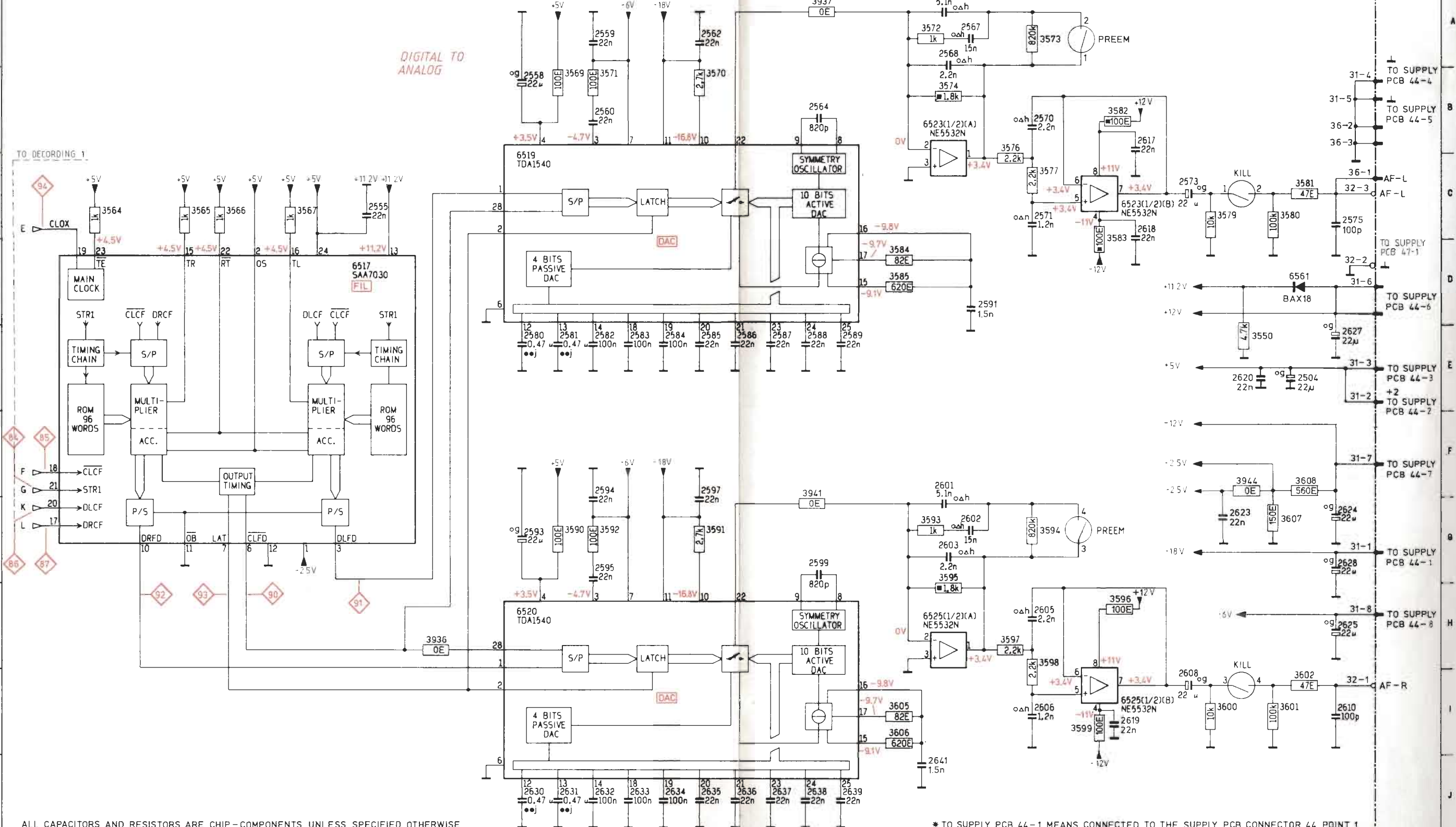
36 876 D12/B

## DECODING 2

2504 E15	2555 C4	2560 B7	2568 A11	2580 E6	2585 E8	2591 E11	2599 G10	2606 H2	2620 E15	2630 J6	2635 J8	2641 J11	3567 C4	3573 A12	3580 C15	3591 G8	3597 H12	3605 I11	6519 C6	6525 I13	3936 H5
		2562 A8	2570 B12	2581 E7	2586 E9	2593 G6	2601 G11	2608 H4	2623 G14	2631 J7	2636 J9	3550 E15	3569 B7	3574 B11	3581 C15	3592 G7	3598 H12	3606 I11	6520 H6	6561 D15	3937 A10
		2564 B10	2571 C12	2582 E7	2587 E9	2594 G7	2602 G11	2610 H6	2624 G16	2632 J7	2637 J9	3564 C1	3570 B8	3576 B12	3582 B13	3593 G11	3599 I13	3607 G15	6523 B11		3941 F10
	2558 B6	2566 A11	2573 C14	2583 E7	2588 E9	2595 G7	2603 G11	2617 B13	2625 H16	2633 J7	2638 J9	3565 C2	3571 B7	3577 C12	3583 D13	3594 G12	3600 H4	3608 F15	6523 C13		3944 F14
	2559 A7	2567 A11	2575 C16	2584 E8	2589 E10	2597 G8	2605 H12	2618 C13	2627 E16	2634 J8	2639 J10	3566 C3	3572 A11	3579 C14	3584 D11	3595 G11	3601 I15	6517 D4	6525 H11		
								2619 H3	2628 G16						3585 D11	3596 H13	3602 I15				
															3590 G7						

PCB 05

DIGITAL TO ANALOG

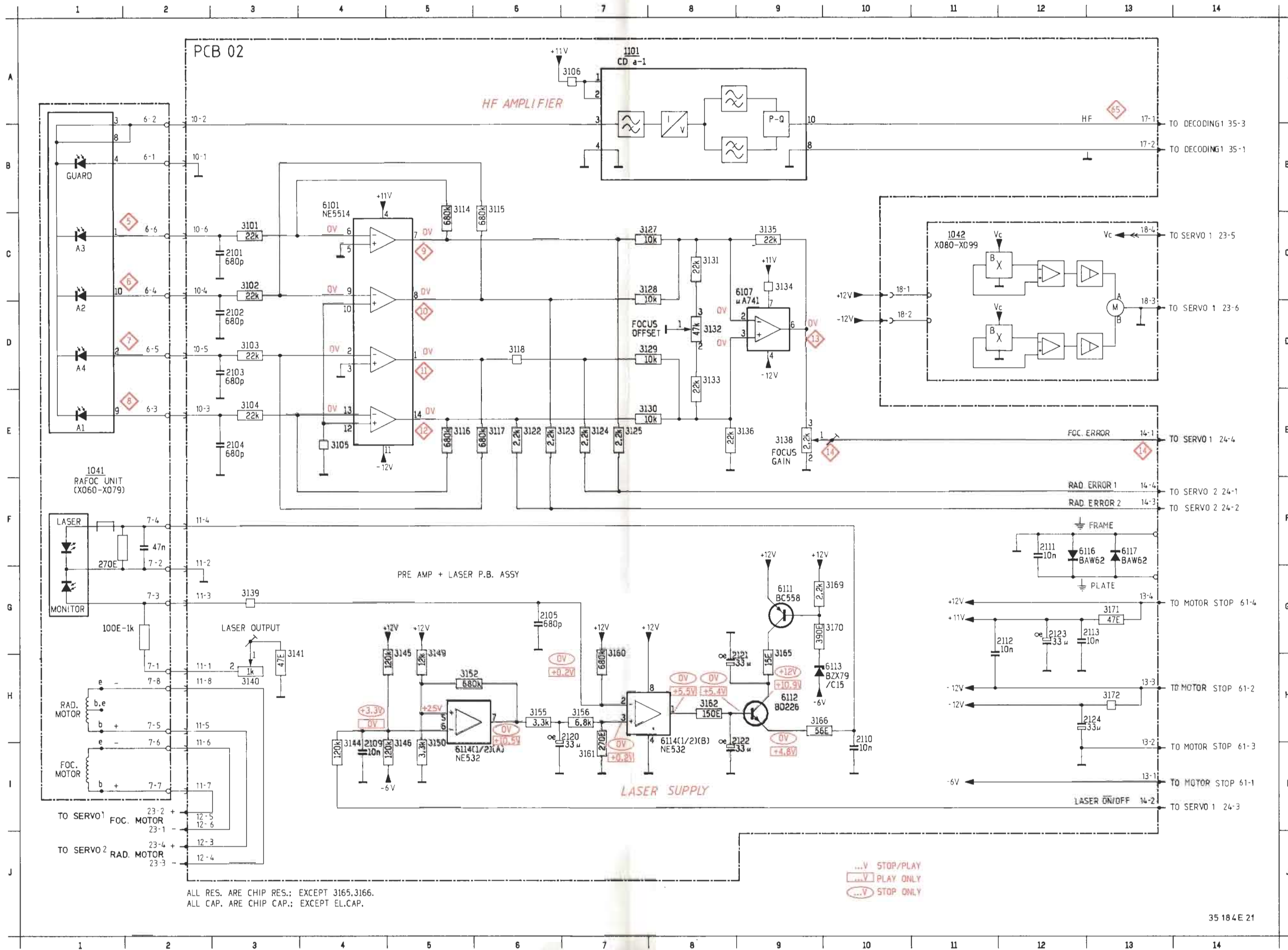


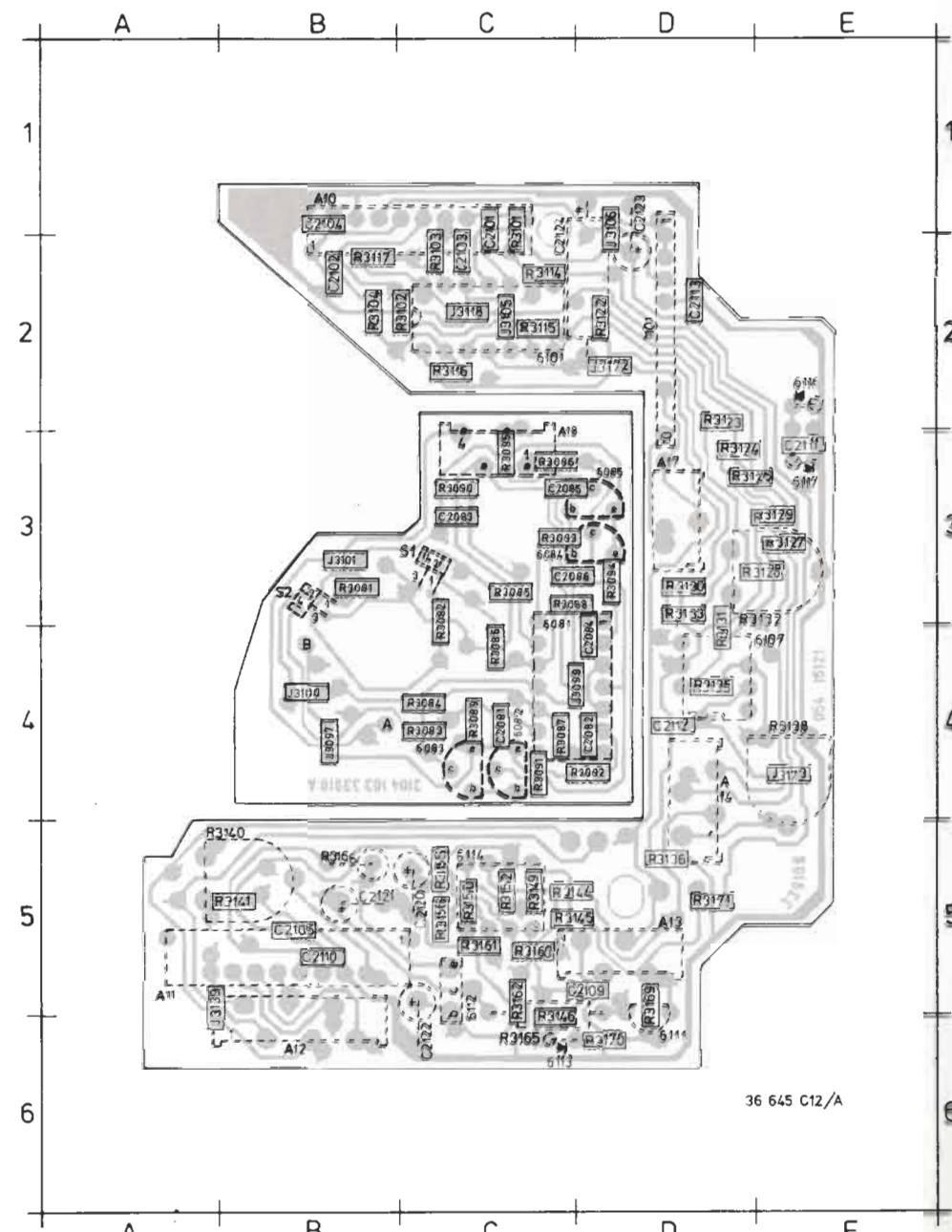
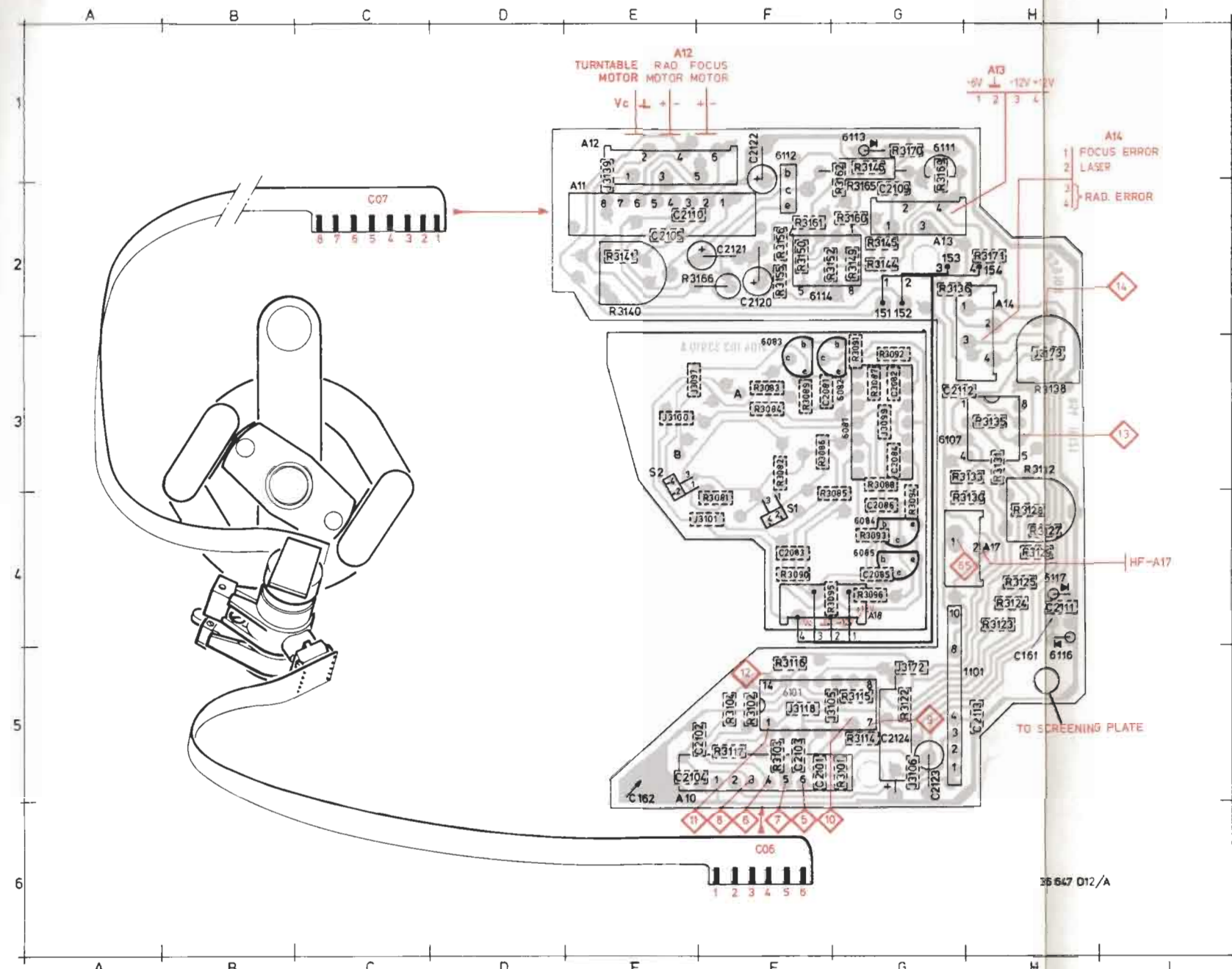
ALL CAPACITORS AND RESISTORS ARE CHIP-COMPONENTS UNLESS SPECIFIED OTHERWISE

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

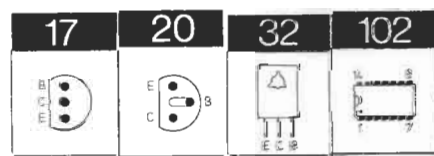
PRE. AMPL. + LASER

1101	R 7	2104	E 3	2111	F12	2121	H 9	3101	C 3	3105	F 4	3116	E 5	3123	F 7	3128	C 8	3132	D 8	3136	E 9	3141	G 3	3149	G 5	3156	H 7	3165	G 9	3171	G13	6111	G 9	6114	I 5
2101	C 3	2105	G 6	2112	G12	2122	H 9	3102	C 3	3106	F 7	3117	F 6	3124	F 7	3129	D 8	3133	D 8	3138	F 9	3144	I 4	3150	I 5	3160	G 7	3166	H 9	3172	H13	6112	H 9	6116	F13
2102	D 3	2109	I 4	2113	G13	2123	G12	3103	D 3	3114	B 5	3118	D 6	3125	F 7	3130	F 8	3134	C 9	3139	G 3	3145	G 5	3152	H 5	3161	I 7	3169	G10	6101	B 4	6113	H10	6117	F13
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	H 3	3146	I 5	3155	H 6	3162	H 8	3170	G10	6107	C 9	6114	H 8		





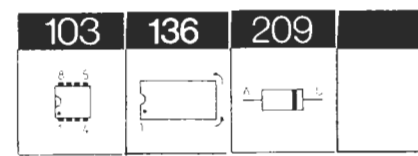
Semi-conductors



1101	G5	3089	F3	3132	H4	6085	G4
2081	F3	3090	F4	3133	H3	6101	G5
2082	G3	3091	F3	3135	H3	6107	H3
2083	F4	3092	G3	3136	G2	6111	G1
2084	G3	3093	G4	3138	H3	6112	F1
2085	G4	3094	G4	3139	F2	6113	G1
2086	G4	3095	G4	3140	E2	6114	F2
2101	F5	3096	G4	3141	E2	6116	H5
2102	F5	3097	E3	3144	G2	6117	H4
2103	F5	3099	G3	3145	G2		
2104	E5	3101	F5	3146	G2		
2105	F2	3102	F5	3149	G2		
2109	G2	3103	F5	3150	G2		
2110	E2	3104	F5	3152	G2		
2111	H4	3105	G5	3155	F2		
2112	G3	3106	G5	3156	F2		
2113	G5	3114	G5	3160	G2		
2120	F2	3115	G5	3161	F2		
2121	F2	3116	F5	3162	G2		
2122	F1	3117	F5	3165	G1		
2123	G5	3118	F5	3166	F2		
2124	G5	3122	G5	3169	G1		
3081	F4	3123	H4	3170	G1		
3082	F3	3124	H4	3171	H2		
3083	F3	3125	H4	3172	G5		
3084	F3	3127	H4	3173	H3		
3085	F4	3128	H4	6081	G3		
3086	F3	3129	H4	6082	G3		
3087	G3	3130	H4	6083	F3		
3088	G3	3131	H3	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

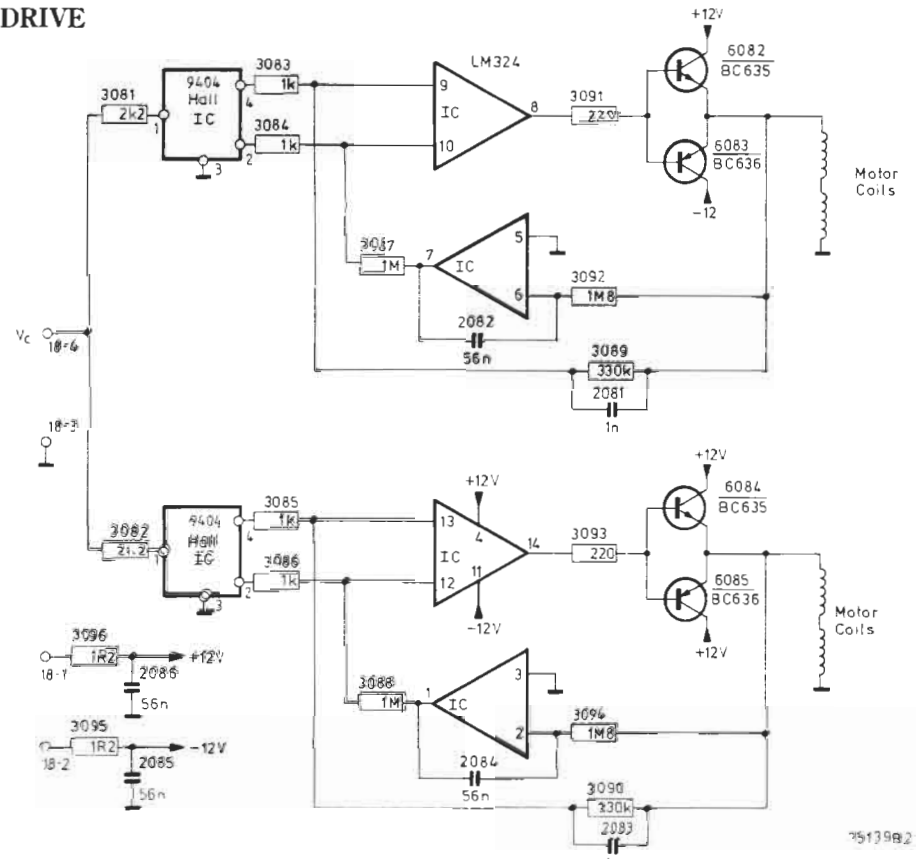


6101	8340813	136	NE 5514
6107	8340141	102	µA 741
6114	8340313	103	NE 532N
9404	3351000		Hall IC
6113	8300313	209	BZX79/C15
6116	8300359	209	BAW 62
6117			

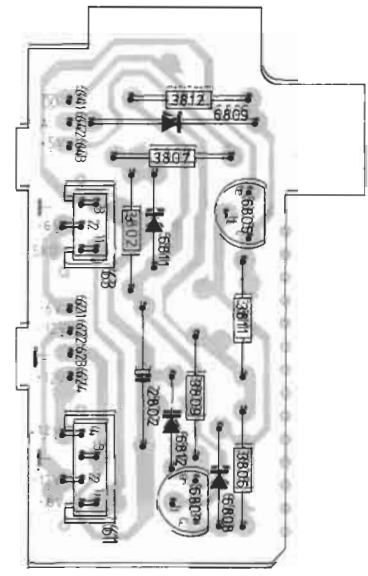
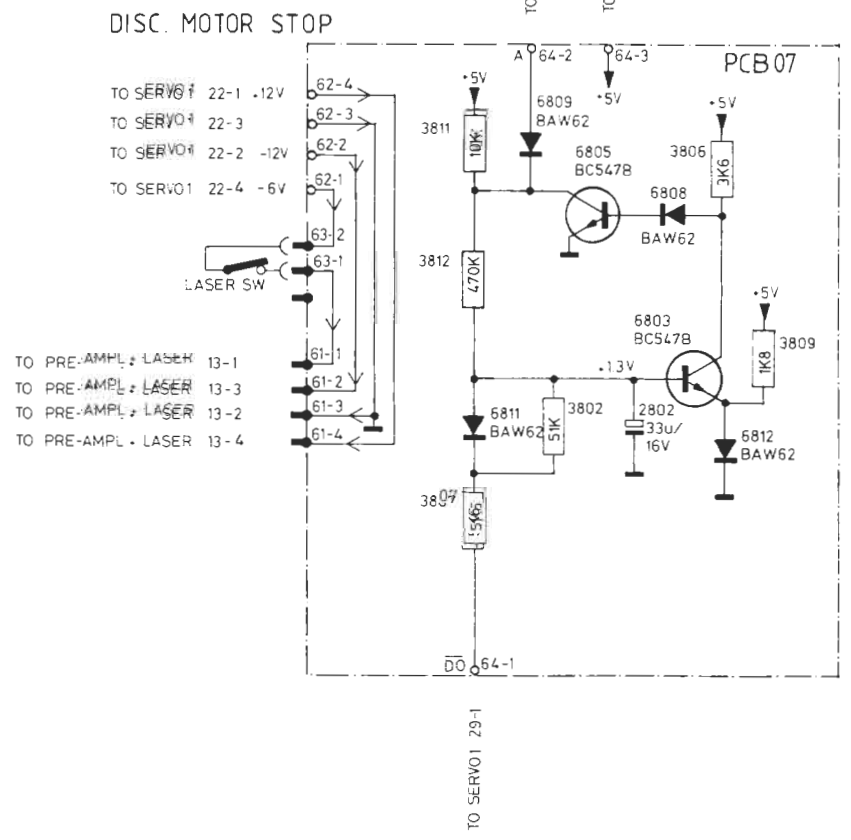
Diodes

1101	D2	3089	C4	3132	E3	6085	C3
2081	C4	3090	C3	3133	D3	6101	C2
2082	C4	3091	C4	3135	D4	6107	D4
2083	C3	3092	C4	3136	D5	6111	D6
2084	C3	3093	C3	3138	E4	6112	C6
2085	C3	3094	D3	3139	D5	6113	C6
2086	C3	3095	C3	3140	D5	6114	C5
2101	C1	3096	C3	3141	D6	6116	E2
2102	B2	3097	B4	3144	D6	6117	E3
2103	C1	3099	C4	3145	D6		
2104	B1	3101	C1	3146	C5		
2105	C5	3102	C2	3149	C6		
2109	D5	3103	C1	3150	C6		
2110	B5	3104	B2	3152	C6		
2111	E2	3105	C4	3155	C5		
2112	D4	3106	D1	3156	C5		
2113	C1	3114	C2	3160	C5		
2120	C5	3115	C3	3161	C5		
2121	B5	3116	C3	3162	C5		
2122	C5	3117	D2	3165	C5		
2123	D1	3118	C2	3166	D5		
2124	D2	3122	D2	3169	D5		
3081	C3	3123	D2	3170	D6		
3082	C3	3124	D2	3171	D5		
3083	C4	3125	D2	3172	D2		
3084	C4	3127	E3	3173	E4		
3085	C3	3128	E3	6081	C4		
3086	C4	3129	E3	6082	C4		
3087	C4	3130	D3	6083	C4		
3088	C3	3131	D3	6084	C3		

DISC MOTOR DRIVE



MOTOR STOP 8005172 - PCB7



Semi-conductors

20	209		

Transistors

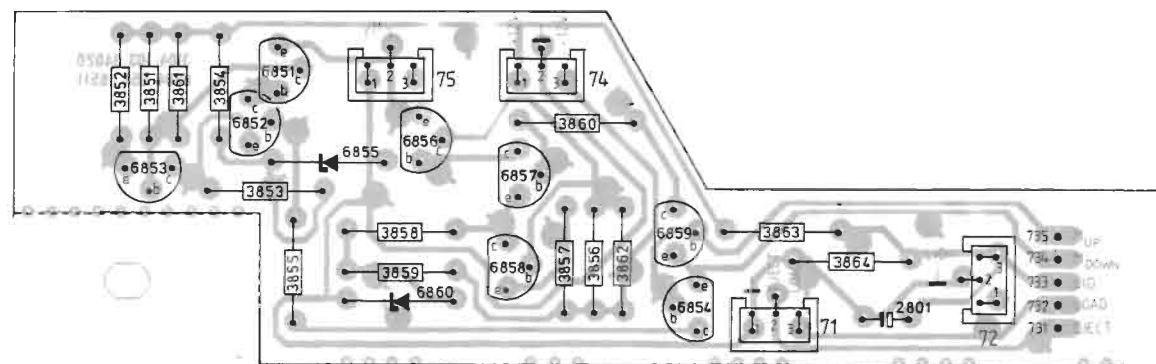
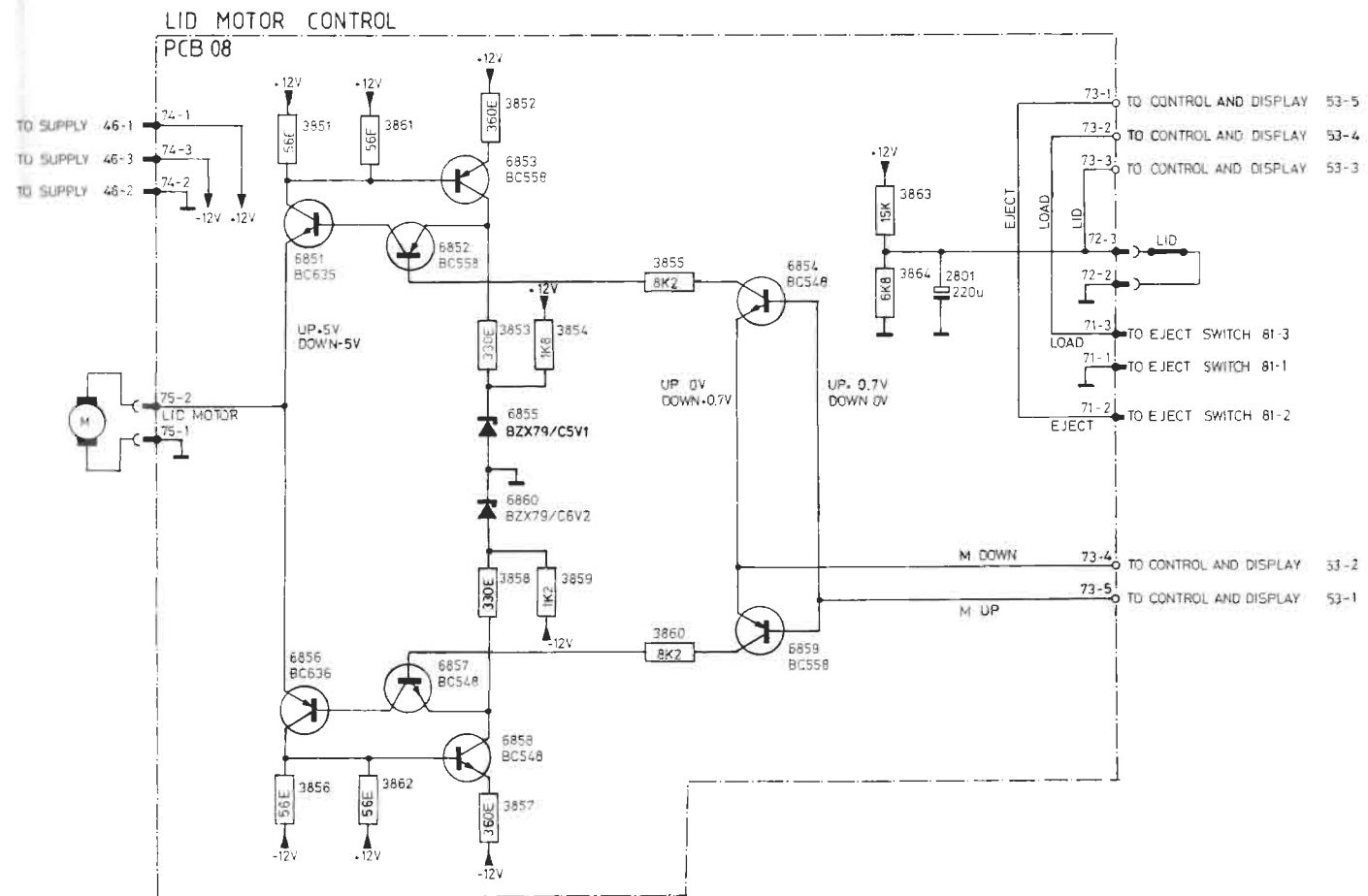
6803	8320097	20	BC 547C
6805			

Diodes

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



MOTOR CONTROL 8005170 - PCB8



Semi-conductors

17	20	209				

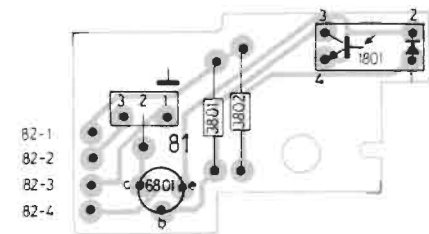
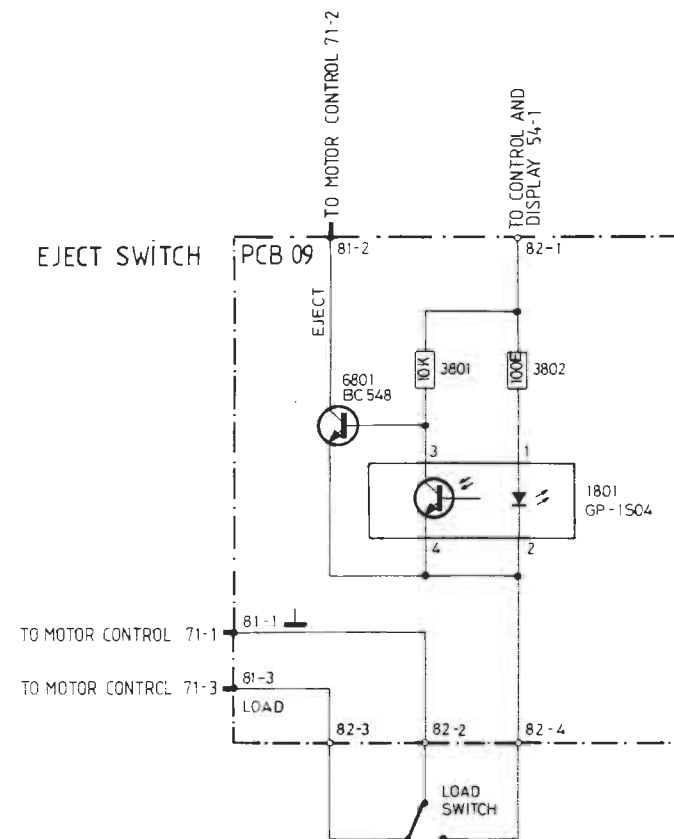
Transistors

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	6559	8320104	20	BC 558B

Diodes

6855	8300169	209	BZX79/C5V1	6850	8300201	209	BZX79/C6V2
------	---------	-----	------------	------	---------	-----	------------

EJECT SWITCH 8005174 - PCB9



Transistors

6801	8320108	20	BC 548B
------	---------	----	---------

Opto.

1801	8330156		GP-IS04
------	---------	--	---------

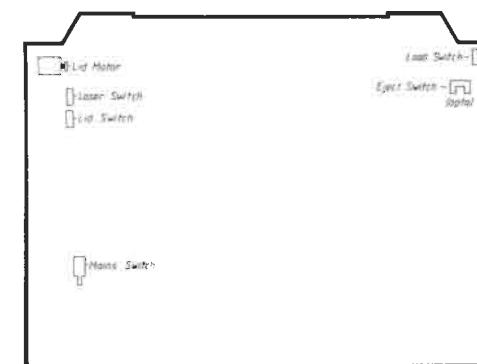
Switch survey

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

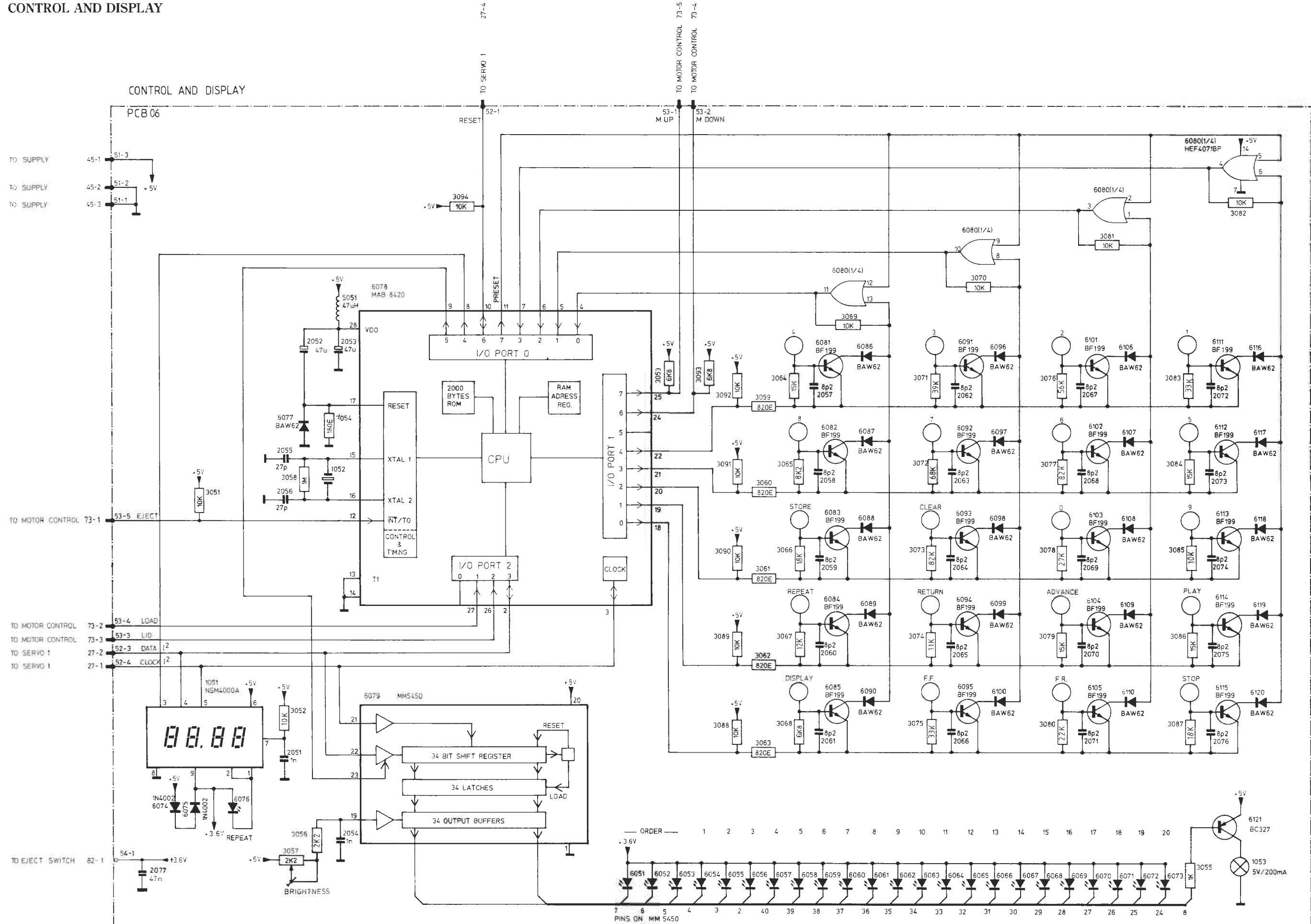
- LOAD is off
- LASER is on
- LID is on
- EJECT pin 12 of IC6078 is high

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.

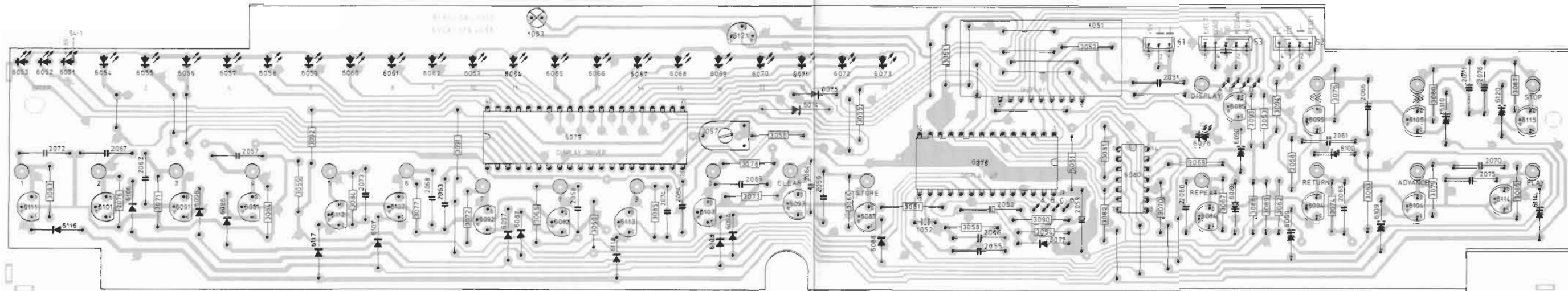


CONTROL AND DISPLAY





CONTROL AND DISPLAY 8005167 - PCB6



Semi-conductors

20	42	124	136	209	230		

Transistors

6081- 6085	8320281 42	BF 199		6111 6115	8320281 42	BF 199	
6091- 6095	8320281 42	BF 199		6121	8320316 20	BC 327	
6101 6105	8320281 42	BF 199					

IC's

6078Δ	8340844 136	MAB 8440		6080Δ	8340816 136	HEF 4071 BP	
6079Δ	8340467 124	MM 5450N					

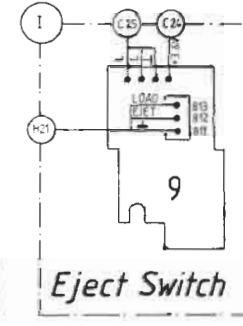
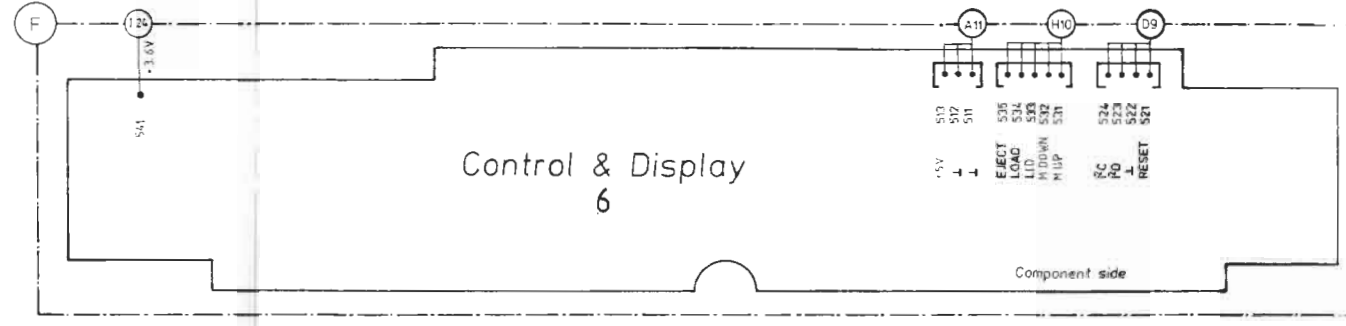
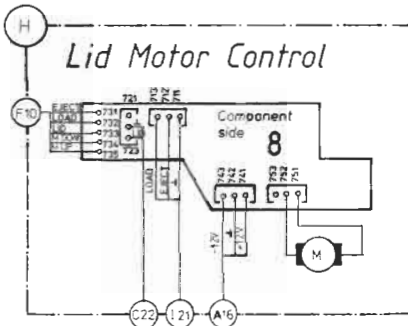
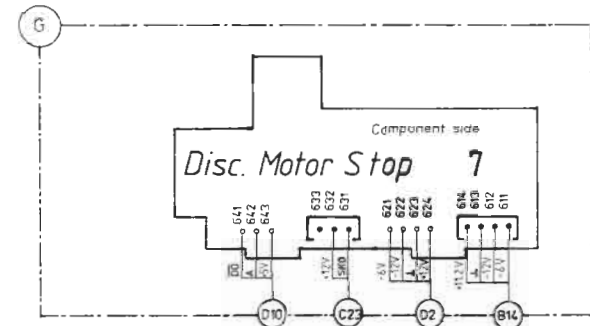
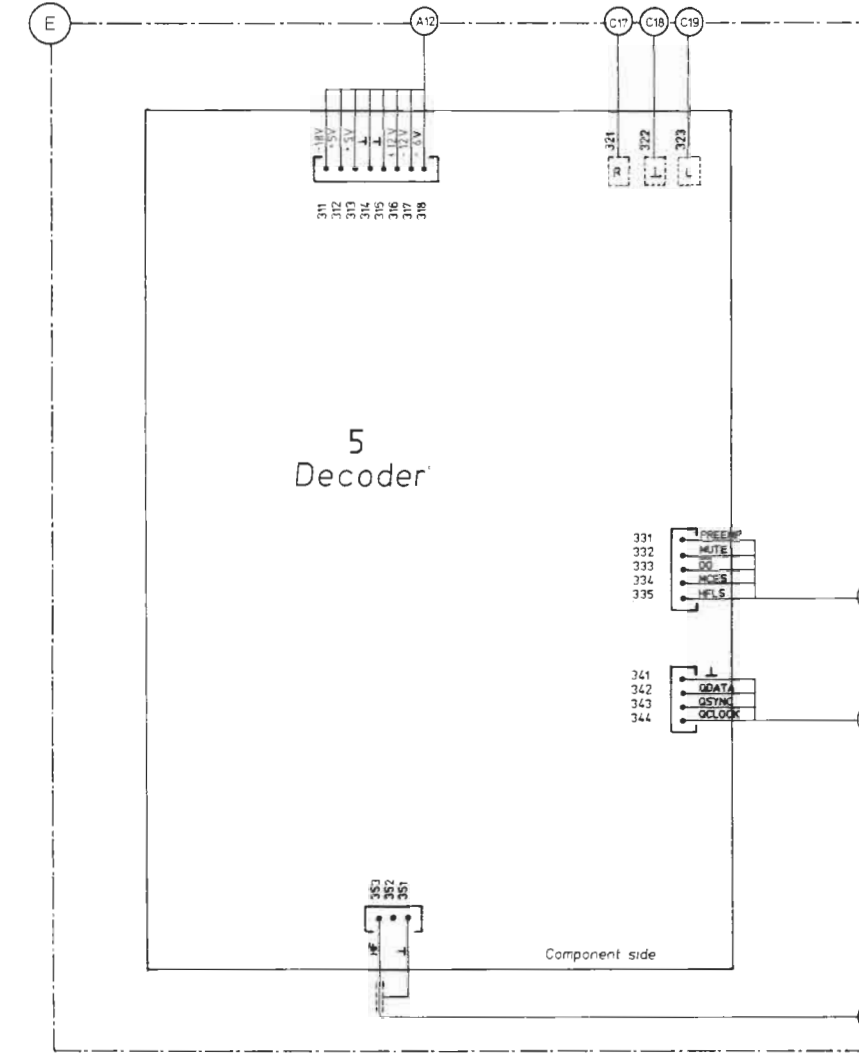
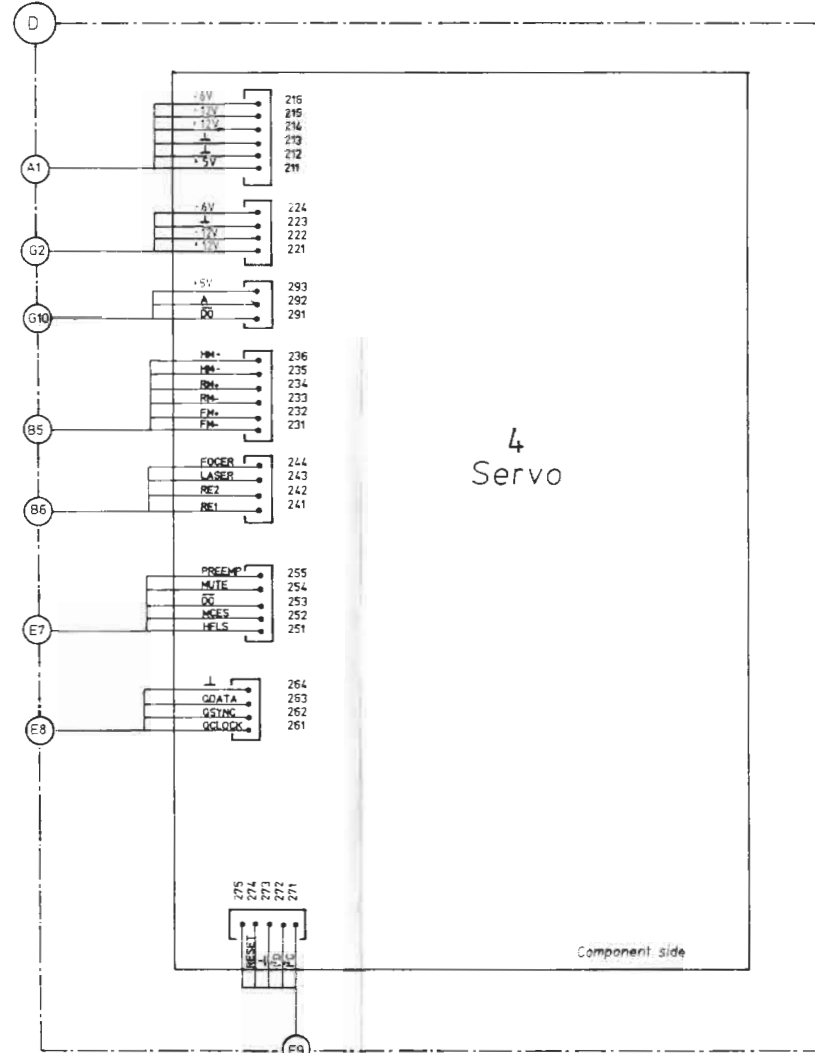
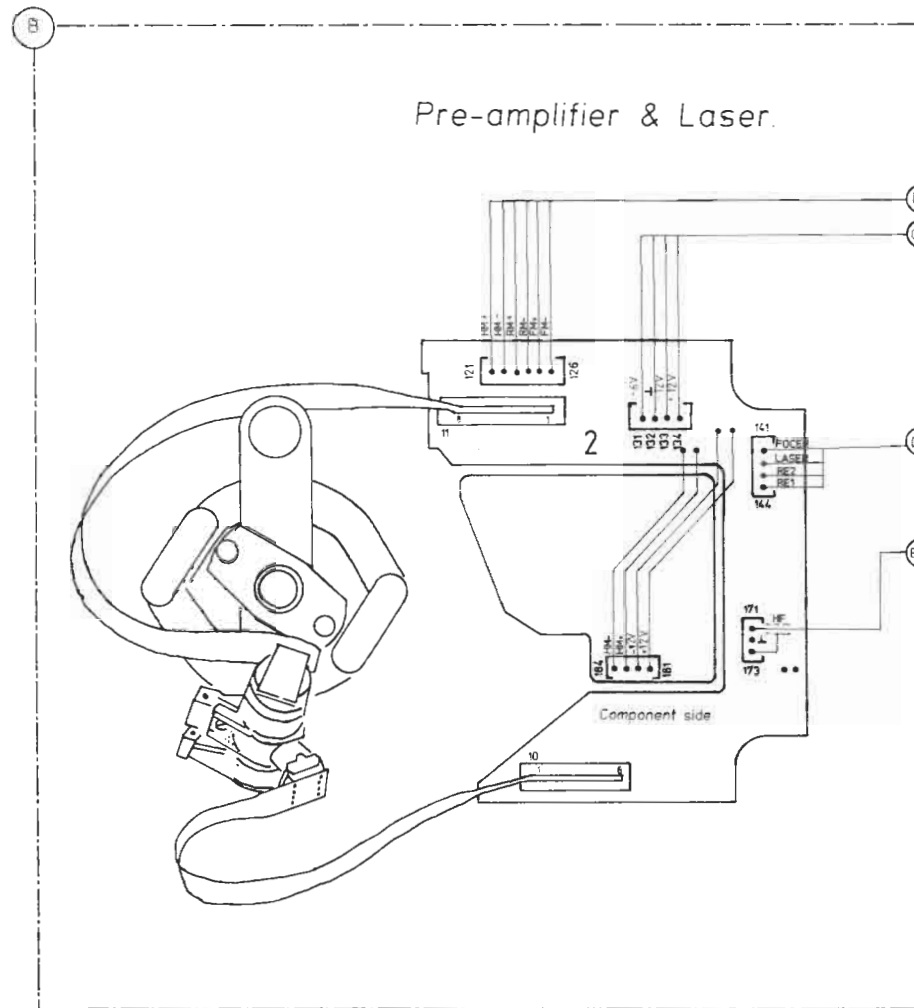
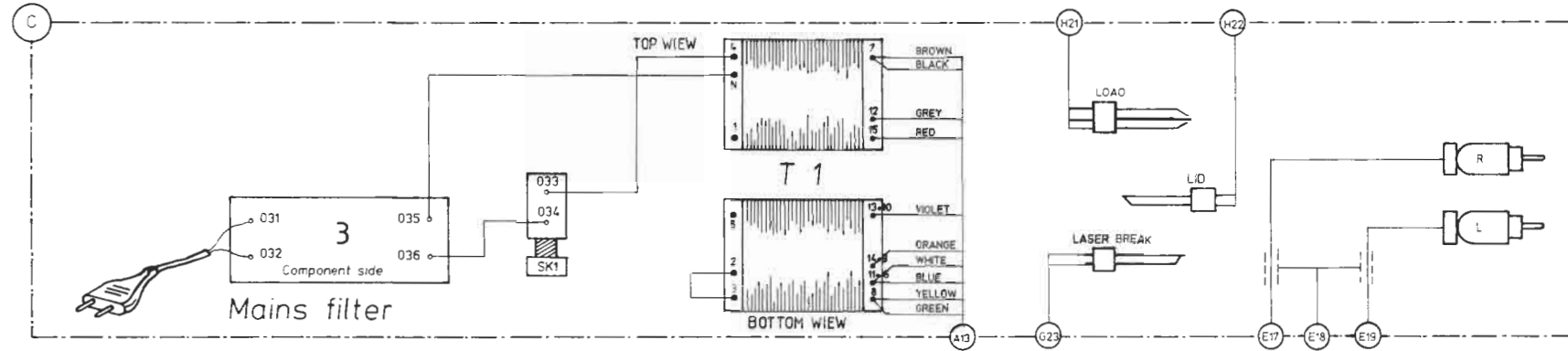
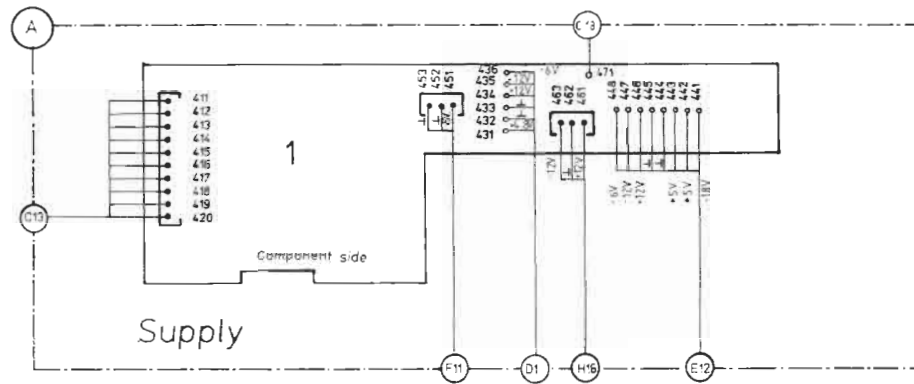
Diodes

6051- 6053	8330143 30	Red		6086- 6090	8300359 209	BAW 62	
6054- 6073	8330144 230	Green		6096- 6100	8300359 209	BAW 62	
6074 6075	8300023 209	1N4002		6106- 6110	8300359 209	BAW 62	
6076 6077	8330143 230	Reed		6116- 6120	8300359 209	BAW 62	
	8300359 209	BAW 62					

Display

1051	8330146	NSM 4000A					
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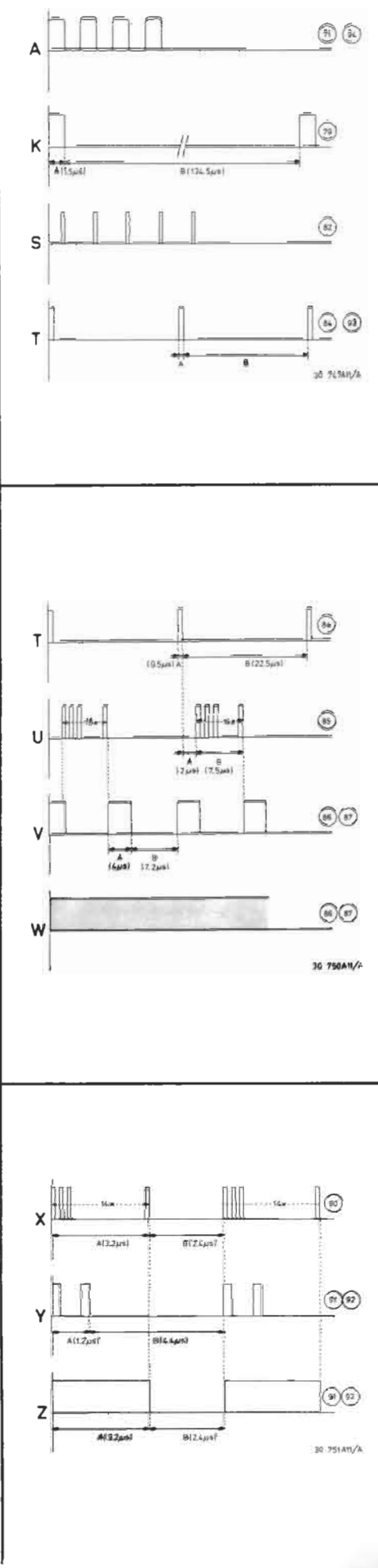
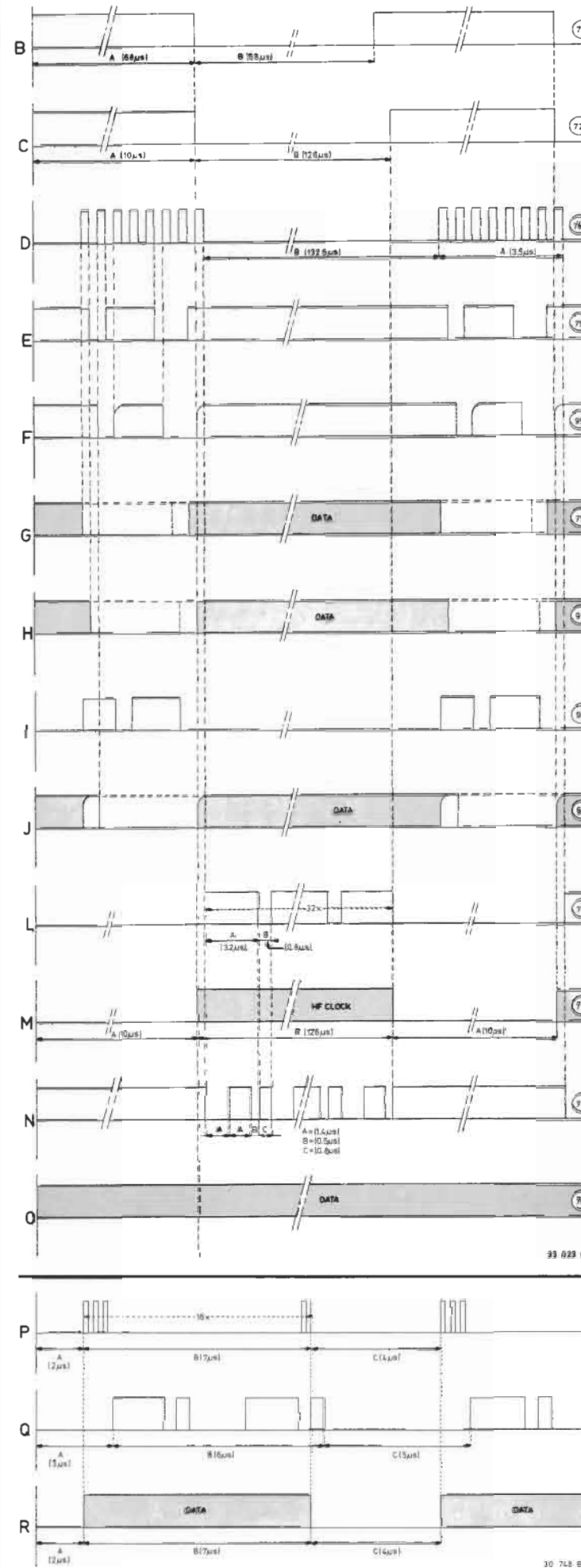
WIRING DIAGRAM



DECODING

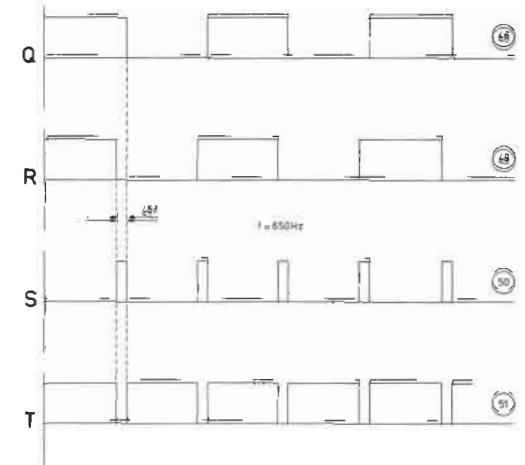
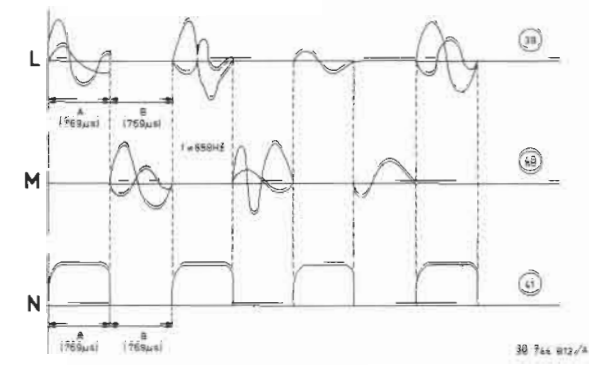
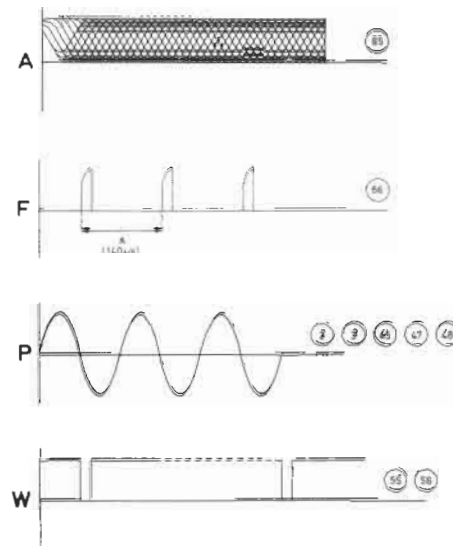
Test Point	See	Position	Amplitude	f	Time base
71	A	pause/play	0-5 V	4,32 MHz	
72	C	pause/play	0-5 V		A = 10 <sup>*</sup> μs B = 126 μs
73	B	pause/play*	0-5 V	7,35 KHz	A = 68 μs B = 68 μs
74	D	pause/play	5-0 V		A = 3,5 μs B = 132,5 μs
75	E	pause	5-0 V		A = 3,5 μs B = 132,5 μs
75	G	play	0-5 V	DATA	
76	L	pause/play	0-5 V		A = 3,2 μs B = 0,8 μs
77	M	pause/play	0-5 V		A = 10 μs B = 126 μs
78	N	pause	0-5 V		A = 1,4 μs B = 0,5 μs C = 0,8 μs
78	O	play	5 V	DATA	
79	K	pause/play	0-5 V		A = 1,5 μs B = 134,5 μs
80	P	pause/play	0-5 V		A = 2 μs B = 7 μs C = 4 μs
81	Q	pause/play	0-5 V		A = 3 μs B = 6 μs C = 5 μs
81	R	play	0-5 V		A = 2 μs B = 7 μs C = 4 μs
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 μs B = 22,5 μs
85	U	pause/play	0-5 V		A = 2 μs B = 7,5 μs
86	V	pause/play	0-5 V		A = 4 μs B = 7,2 μs
86	W	pause/play	0-5 V	DATA	
87	V	pause/play	5 V		A = 4 μs B = 7,2 μs
87	W	play	5 V	DATA	
90	X	pause/play	0-5		A = 3,2 μs B = 2,4 μs
91	Y	pause	0-5 V		A = 1,2 μs B = 4,4 μs
91	Z	play	0-5 V		A = 3,2 μs B = 2,4 μs
92	Y	pause	0-5 V		A = 1,2 μs B = 4,4 μs
92	Z	play	0-5 V		A = 3,2 μs B = 2,4 μs
93	T	pause/play	0-5 V		A = 0,4 μs B = 5,5 μs
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.



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 $\mu$ s B = 769 $\mu$ s
40	M	play	0-4 Vp-p		A = 769 $\mu$ s B = 769 $\mu$ s
41	N	play	6 Vp-p		A = 769 $\mu$ s B = 769 $\mu$ s
45	P	stop	9 Vp-p	650 Hz	
46	Q	stop	0-5 V	650 Hz	A = 769 $\mu$ s B = 769 $\mu$ 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 $\mu$ s



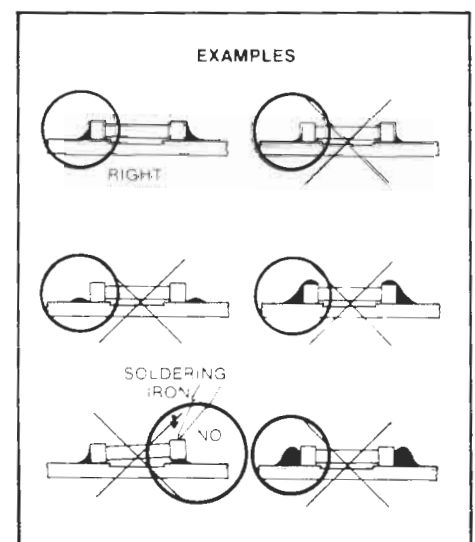
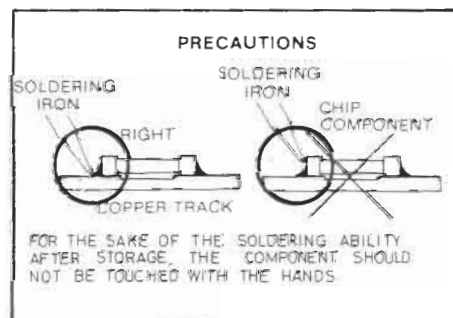
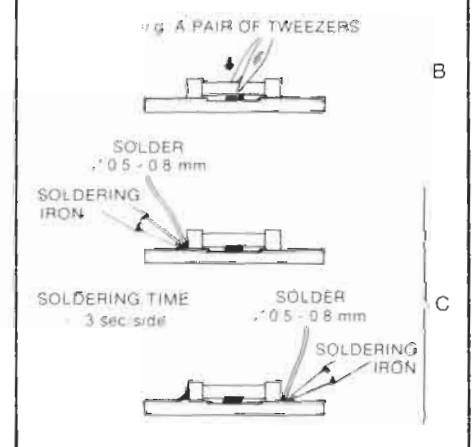
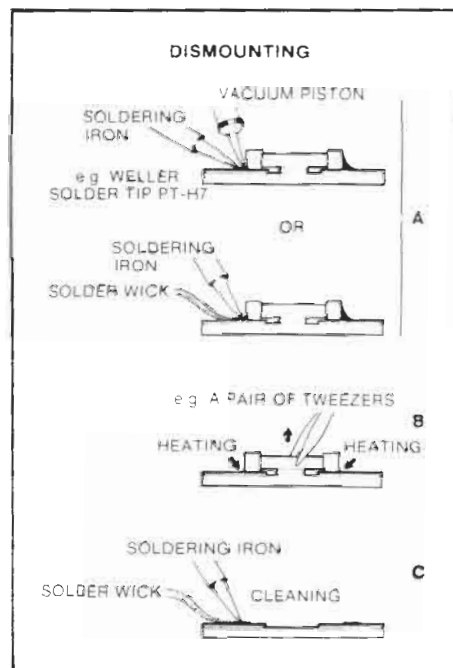
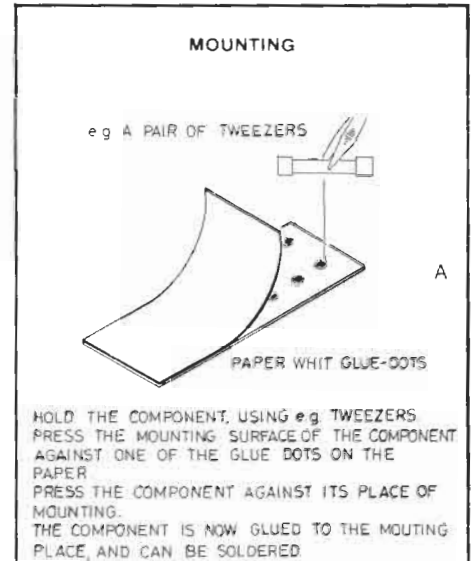
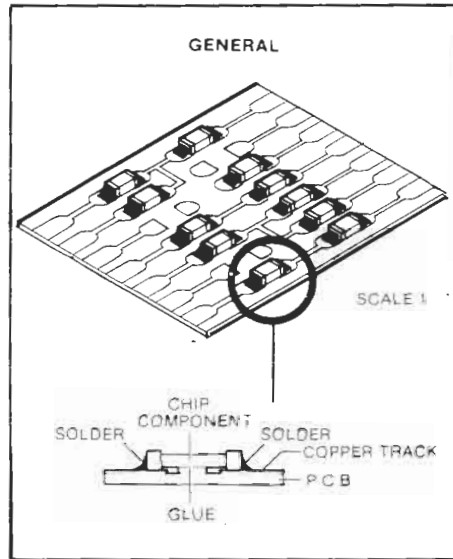
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## LIST OF ELECTRICAL PARTS

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





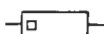



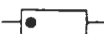








### Chip capacitor

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

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

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

	Carbon film 0.2 W 70°C 5%		Ceramic plate Tuning ≤ 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 i = 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	
	Chip component		Miniature single	
			Subminiature tantalum ± 20%	

## Power Supply 8005168 - PCB1

2451	4200220	33 μF 16V	2463	4010162	47 nF 50V
2452	4200220	33 μF 16V	2464	4010162	47 nF 50V
2453	4200121	22 μF 40V	2465	4010162	47 nF 50V
2454	4200220	33 μF 16V	2466	4010169	220 μF 25V
2455	4200220	33 μF 16V	2467	4010162	47 nF 50V
2456	4200220	33 μF 16V	2468	4010162	47 nF 50V
2457	4200642	1500 μF 25V	2469	4010163	22 nF 100V
2458	4200612	1000 μF 25V	2470	4010163	22 nF 100V
2459	4200641	3300 μF 16V	2471	4010162	47 nF 50V
2460	4200642	1500 μF 16V	2472	4010162	47 nF 50V
2461	4200641	3300 μF 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 $\Omega$ 20%	3146	5010047	120 k $\Omega$ 5% 1/4W
3138	5370006	2.2 k $\Omega$ 20%	3166	5020580	56 $\Omega$ 5% 1W
3140	5370050	1 k $\Omega$ 20%			

2120	4200414	33 $\mu$ F 16V	2123	4200414	33 $\mu$ F 16V
2121	4200414	33 $\mu$ F 16V	2124	4200414	33 $\mu$ F 16V
2122	4200414	33 $\mu$ F 16V			

1101 8005175 Thick film

A11 7220472 Plug 8pol. A12 7220471 Plug 6pol.

## Mains Filter 8005169 - PCB3

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 $\Omega$ SFR 16T	3335	5010062	68 k $\Omega$ 5% 1/4W
3229	5011278	2.7 k $\Omega$ SFR 16T	3341	5010935	10 k $\Omega$ 5% 1/4W
3230	5010135	18 k $\Omega$ 5% 1/4W	3363	5010935	10 k $\Omega$ 5% 1/4W
3256	5020761	4.7 $\Omega$ 5% 1/4W	3379	5010935	10 k $\Omega$ 5% 1/4W
3273	5020761	4.7 $\Omega$ 5% 1/4W	3384	5011277	9.4 $\Omega$ PTC 60V
3291	5011279	47 k $\Omega$ SFR 16T	3385	5011277	9.4 $\Omega$ PTC 60V

2203	4200632	10 $\mu$ 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 $\mu$ F 40V	2243	4130293	470 nF 10% 63V
2208	4010159	47 nF 50V	2244	4100259	680 pF 2% 250V
2209	4200639	47 $\mu$ 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 $\mu$ F 50V	2250	4200414	33 $\mu$ 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 $\mu$ 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 $\mu$ F 10V	2264	4200640	33 $\mu$ F 40V
2228	4200638	1 $\mu$ F 25V	2265	4200640	33 $\mu$ F 40V
2233	4130293	470 nF 10% 63V	2266	4200640	33 $\mu$ F 40V
2236	4100114	5.6 nF 2% 63V	2267	4130155	1000 nF 10% 100V

1201 8090022 6.000MHz

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

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 8pot.	P35	7220254	Plug 3pot.
P33	7220256	Plug 5pot.	P36	7220257	Plug 6pot.
P34	7220255	Plug 4pot.			

Control and Display  
8005167 - PCB6

3057	5370006	2.2 k $\Omega$ 20%			
2051	4200645	1 nF 20% 50V	2064	4200643	8.2 pF 10% 50V
2052	4200364	47 $\mu$ F 10V	2065	4200643	8.2 pF 10% 50V
2053	4200364	47 $\mu$ 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 3pot.	P53	7220256	Plug 5pot.
P52	7220255	Plug 4pot.			

## Motor Stop 8005172 - PCB7

2802	4200414	33 $\mu$ F 16V			
P61	7220255	Plug 4pot.	P63	7220254	Plug 3pot.

## Motor Control 8005170 - PCB8

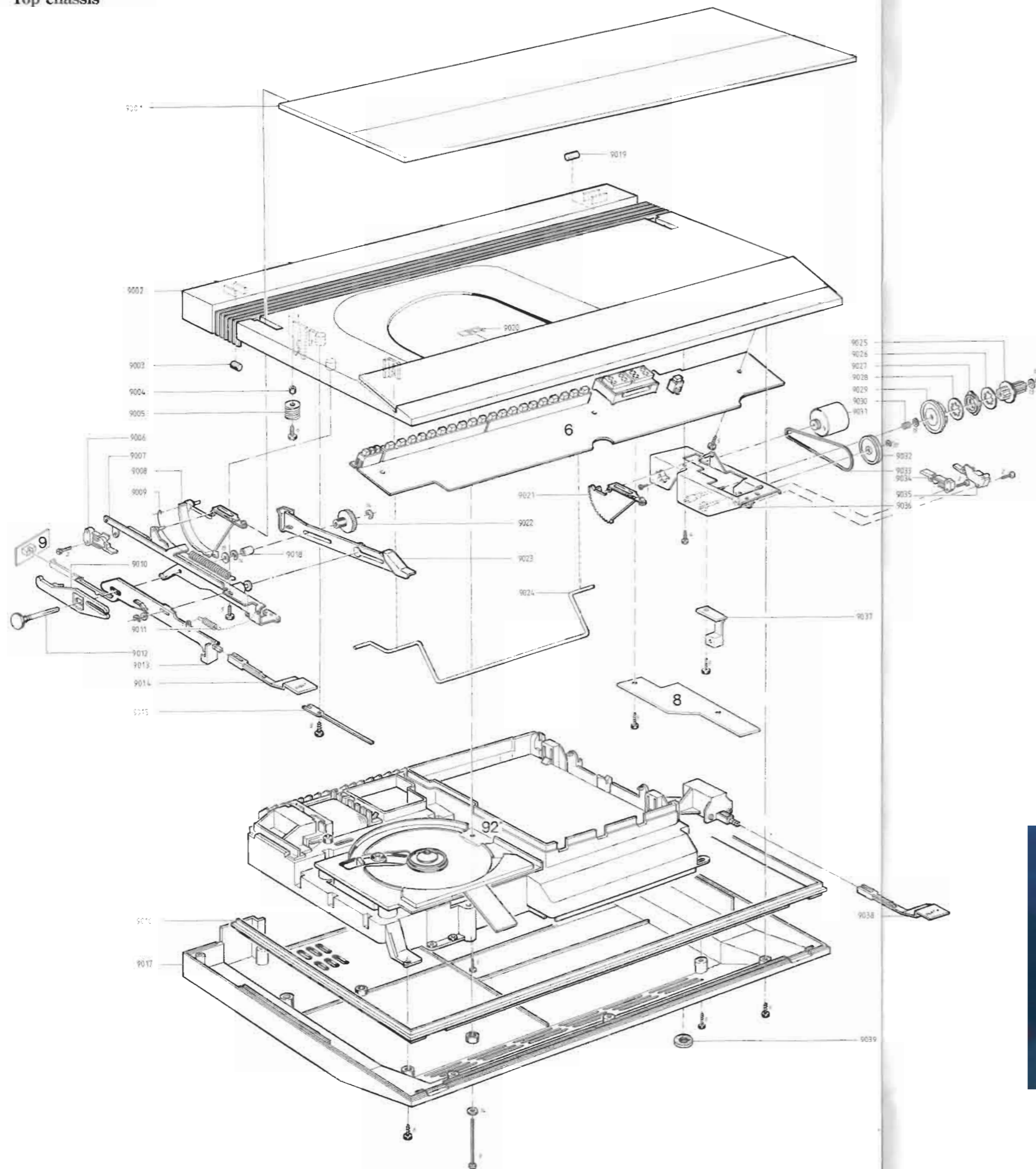
2801	4200122	220 $\mu$ F 10V			
P71	7220254	Plug 3pot.	P74	7220254	Plug 3pot.
P72	7220254	Plug 3pot.	P75	7220254	Plug 3pot.

## Eject Switch 8005174 - PCB9

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



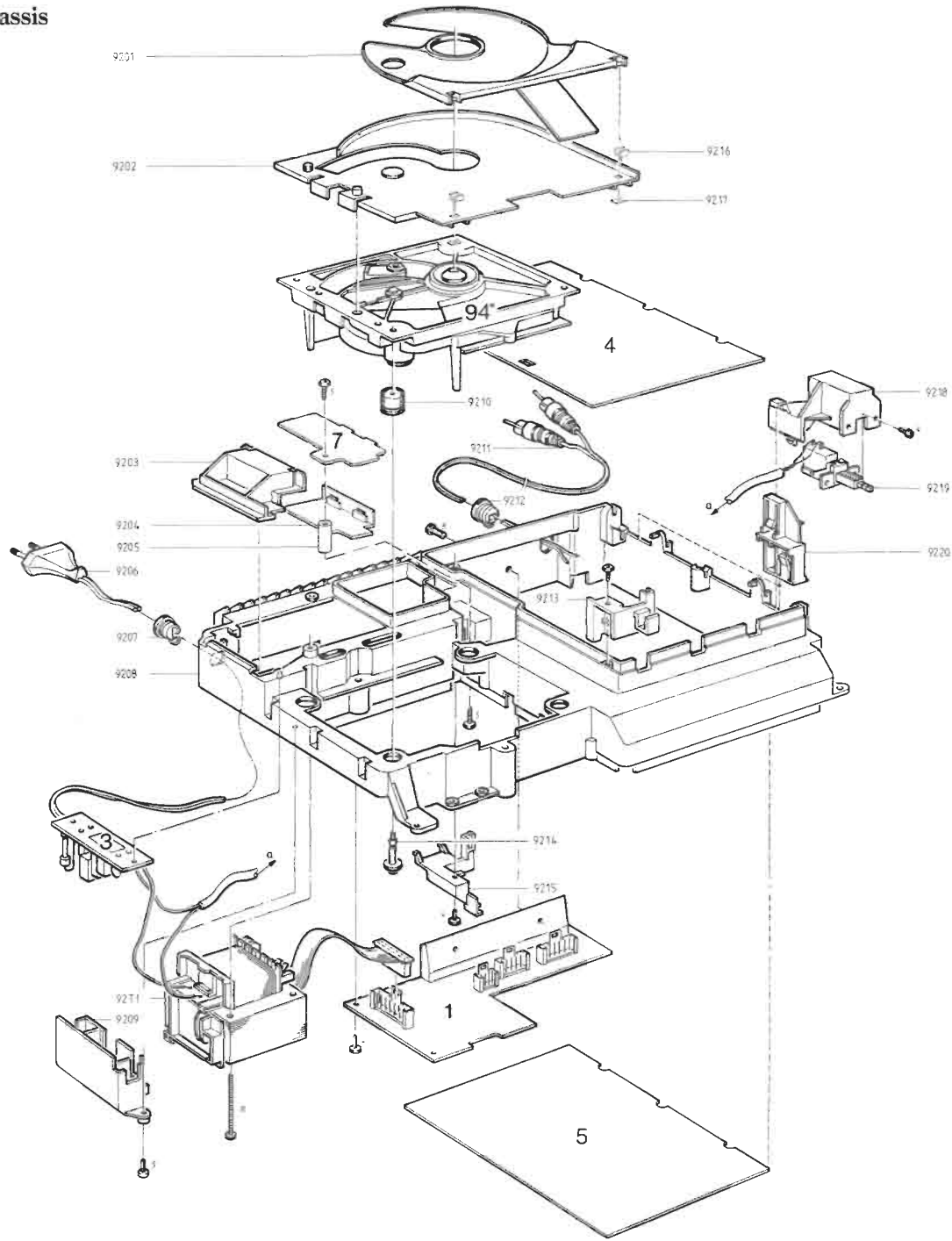
06Modul 8005167 Control PCB

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

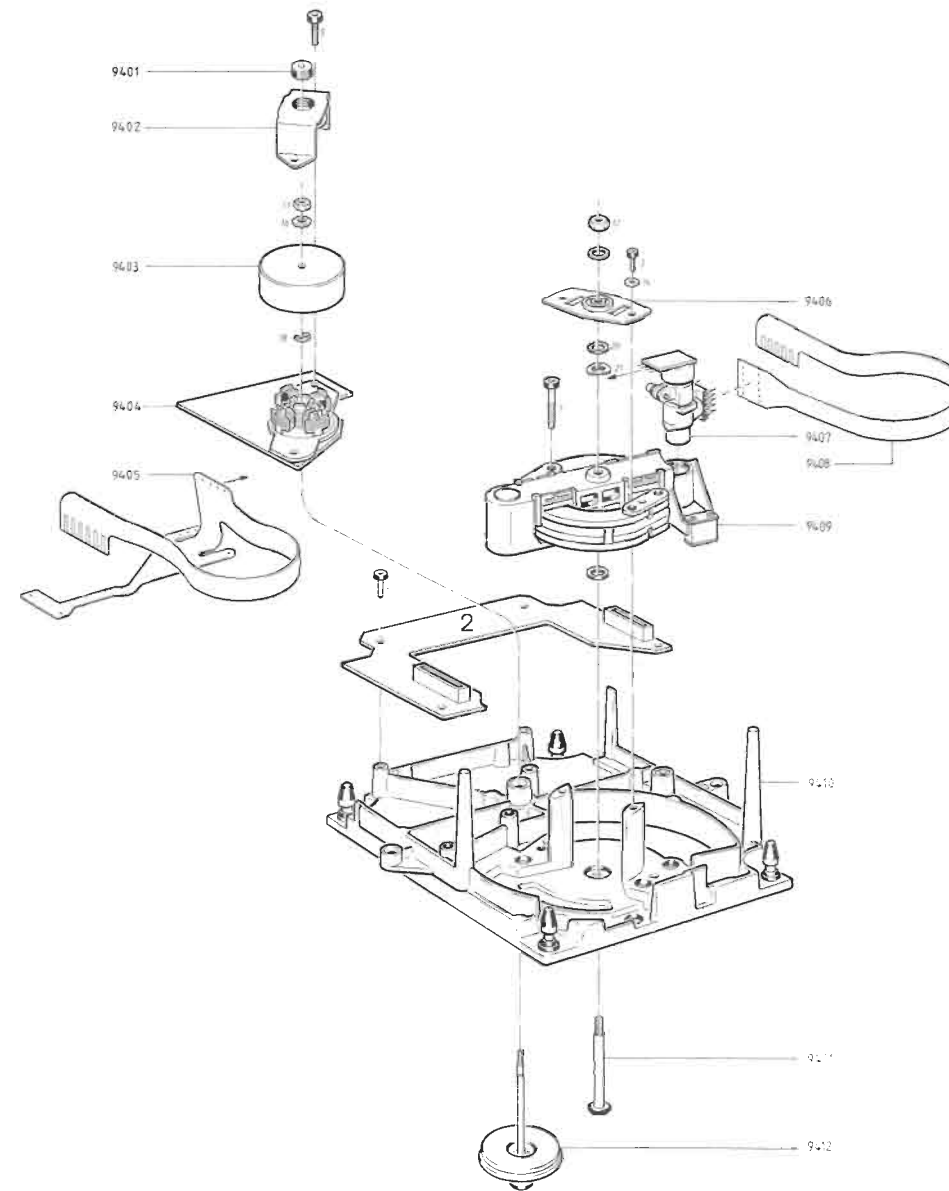


01Modul	8005168	Supply PCB			
03Modul	8005169	Main Filter PCB			
04Modul	8005165	Servo PCB			
05Modul	8005166	Decoder PCB			
07Modul	8005166	Motor stop PCB			
09Modul	8005174	Eject Switch PCB			
9201	3458401	Disc. platte	9206	6271102	Mains cable 5122/22
9202	3458399	Top plate		6270251	Mains cable 5123
9203	3162249	Cover		6271091	Mains cable 5125
9204	3152491	Holder	9207	2641119	Holder
9205	2938244	Distance bushing	9208	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*Δ	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

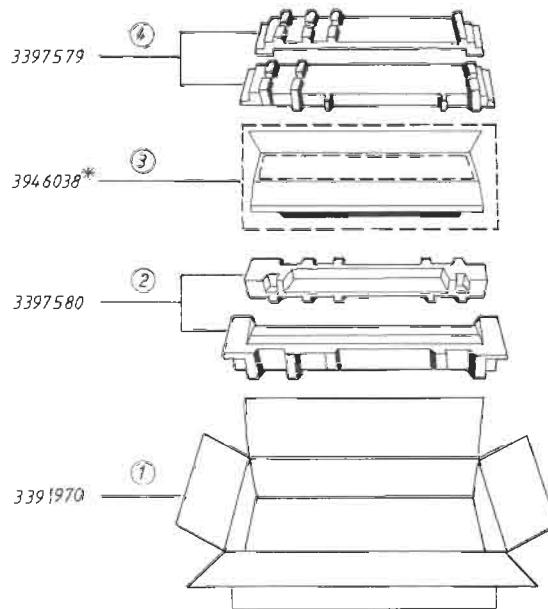
## Parts not shown

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

## Packing procedure



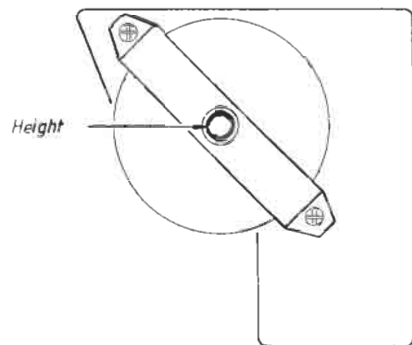
*\*Foile 3946038 is sold by the metre*

## Lubrication

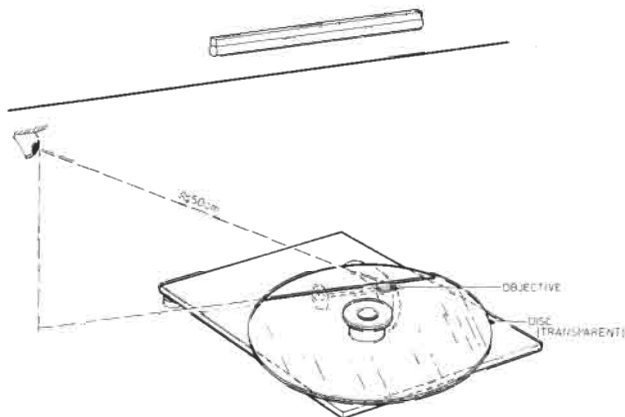
1. Arm 9011 sliding surface towards 9013  
Bracket 9007 sliding surface towards 9013  
Silicone paste P4
2. Arm 9008 sliding surface towards 9007 Isoflex PDL250

**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.

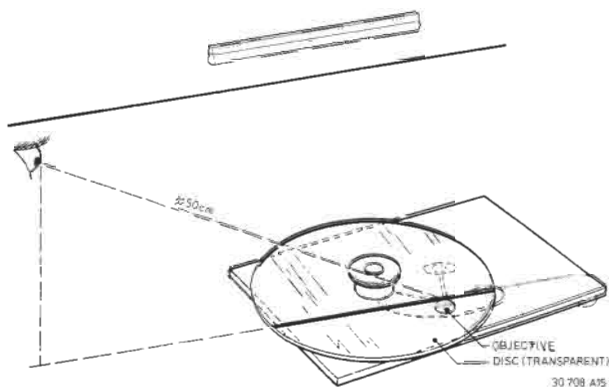


**Checking the angle setting**



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 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  $\leq 4\text{ mm}$ .



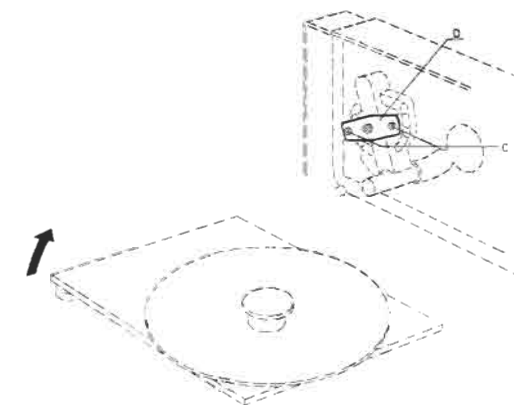
Rotate the CD mechanism through  $90^\circ$  relative to the previous position. The arm must be kept in mid-position (see fig.). Repeat the previous measurement.

**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.

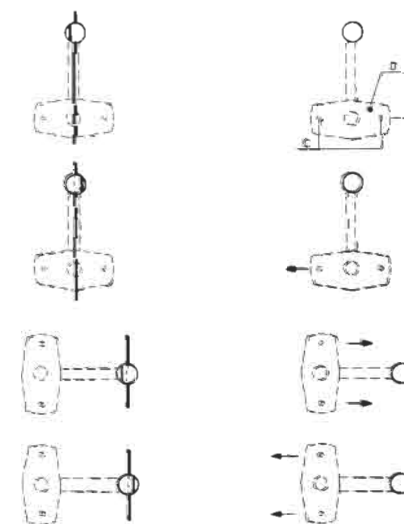
After adjustment, the friction of the arm should be checked. This is done by means of a spring-pressure gauge which is connected to the counterweight. The friction of the arm, measured over the total scanning deflection, is not allowed to exceed 30 mN. When the friction appears to be too high, the angle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



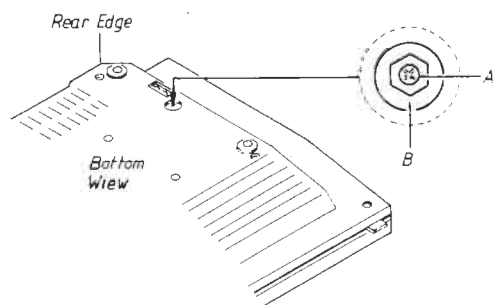
Loosen screws C (see fig.) until bearing plate D can be shifted. Correct the angle setting by shifting the bearing plate in the direction indicated on the figure. Tighten screws C ensuring that the setting does not drift. Double check the angle setting in two directions.

**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.



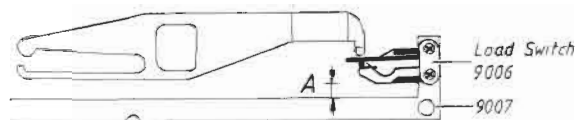
Loosen holding screw A.

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

Tighten the screw A.

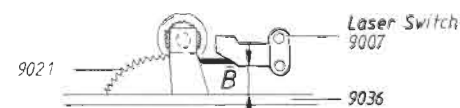
In case the adjustment is not within the tolerance range, this may cause failure of function in the eject system.

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



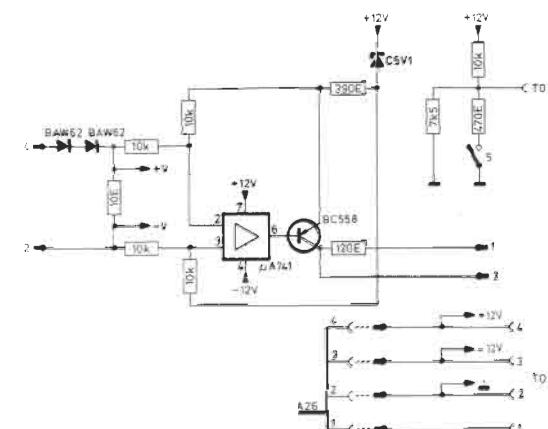
When fastening the laser switch 9034 make sure the distance B between the lower part of the switch and the bracket 9036 is 6.8 mm.

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.



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  $\leq 15$  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):

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

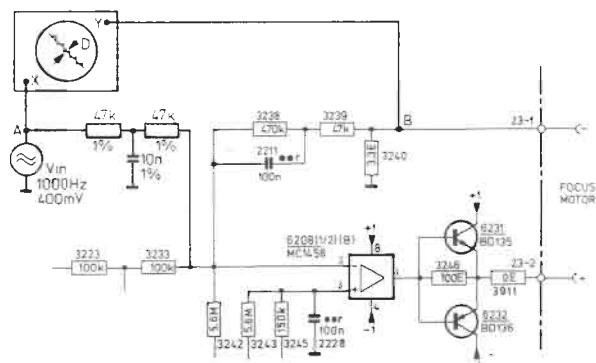
Set resistor 3140 in mid-position.

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  $575 \pm 75$  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  $180^\circ$  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)

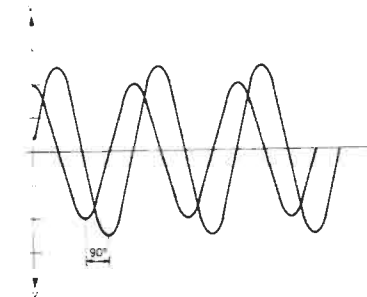
1. Disconnect the wire from PRE.AMPL. + LASER PCB to connector A18 pin 4 on the Hall motor control.
2. Connect channel A of a dual-beam oscilloscope to the emitter of transistor 6082, 6083 and channel B to the emitter of transistor 6084, 6085.  
Position of oscilloscope: 2 V/div - 10 ms/div.
3. Switch 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  $90^\circ$  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  $-4 \text{ V} \pm 2 \text{ V}$ .

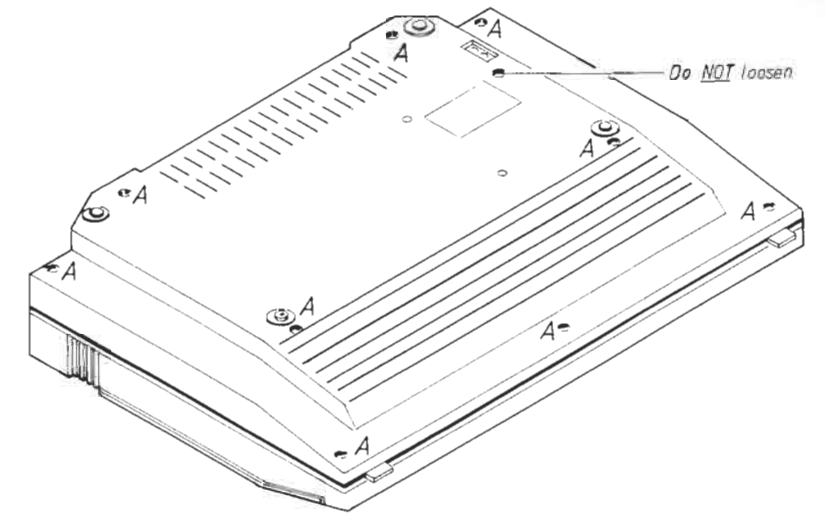
The voltage between pin 14 of IC6215 and  $\perp$  should be  $-2.5 \text{ V} \pm 2 \text{ V}$ .

TECHNICAL SPECIFICATIONS

Frequency range	3-20,000 Hz ±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 9/16")
Weight	6 kg (13.2 lbs)

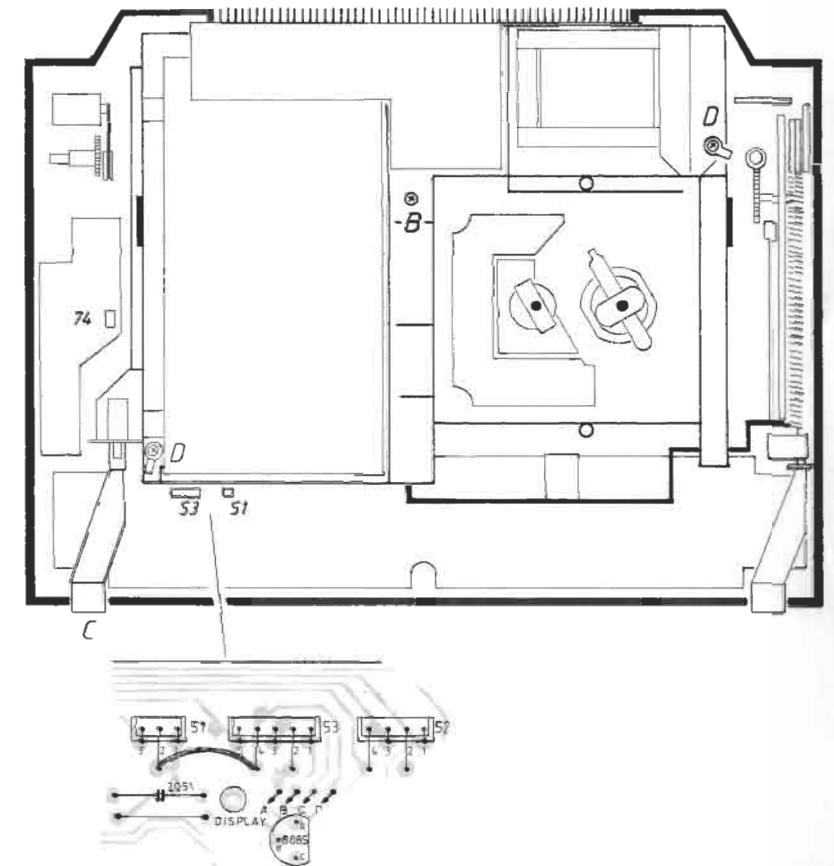
Subject to change without notice

DISMANTLING  
Bottom



Remove the screws A.

Top plate



Top Plate

Remove the screw B.

Remove the PLAY button C.

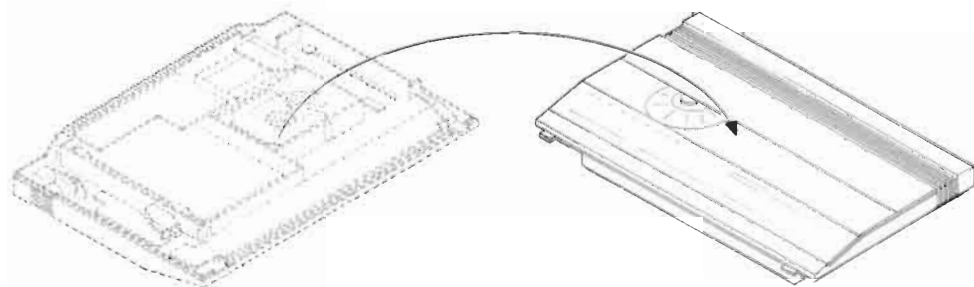
**NB! The ON/OFF switch must be in position OFF when removing the button in order to avoid damaging the switch.**

Remove the two ground connections D.

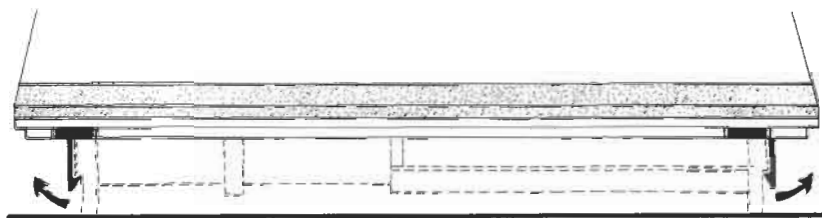
Remove plug 74 on the lid motor control PCB.

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

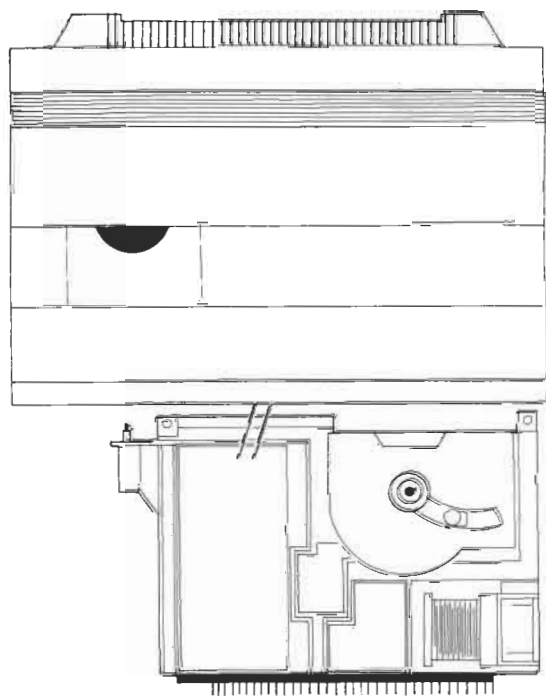
**NB! When plug 74 is removed and a short-circuit has been introduced between 53 pin 4 and ground, the dust cover functions cannot be operated.**



Turn over the set while supporting the chassis frame.

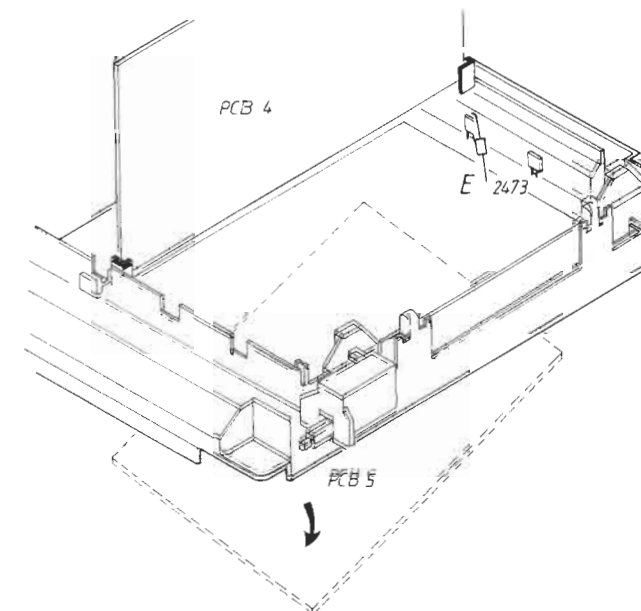


Tip out the two plastic tags.  
Carefully lift off the top plate.  
NB! Be aware of the cable connection between the top plate and the chassis frame.



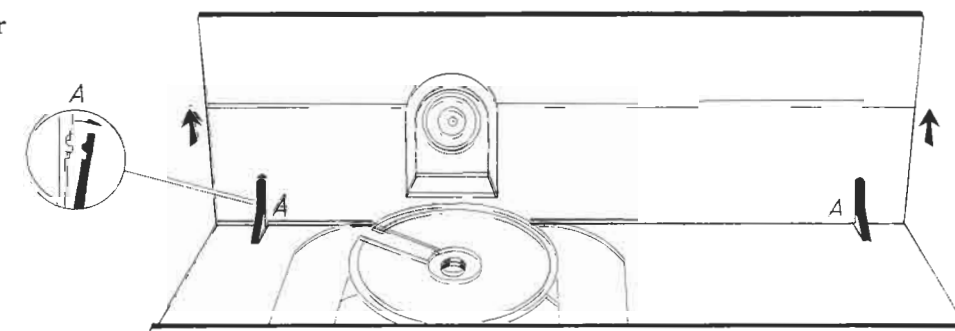
Place the top plate in front of the chassis frame as illustrated.

PCB4 and PCB5.



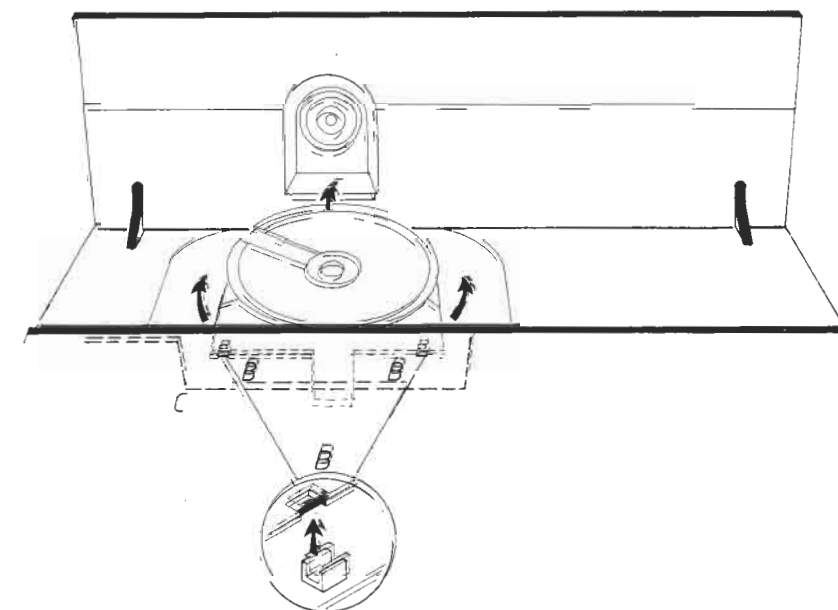
Tip up PCB4 and place in service position.  
PCB5 cannot be tipped up until the capacitor E is desoldered.

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.

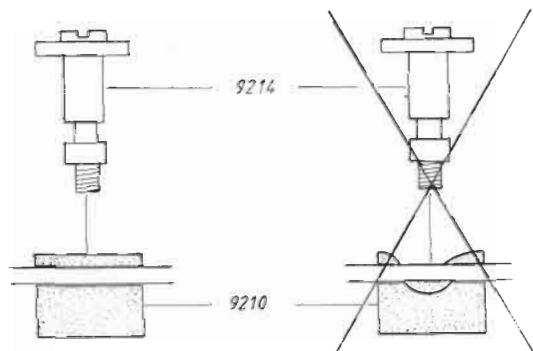
In the player chip components have been applied. For insertion and removal of chip components see page 2-1.

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



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.

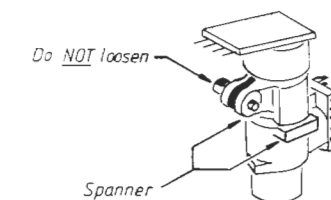
- Take the two flex PCBs out of the connectors on the preamplifier PCB.
- Disassemble the defective RAFOC unit by removing the 4 bolts no. 7 and shaft item number 9411.
- Remove shaft item number 9411 of the new RAFOC unit. Pay attention to the 3 intermediate washers item number 20 and spring washer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



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.

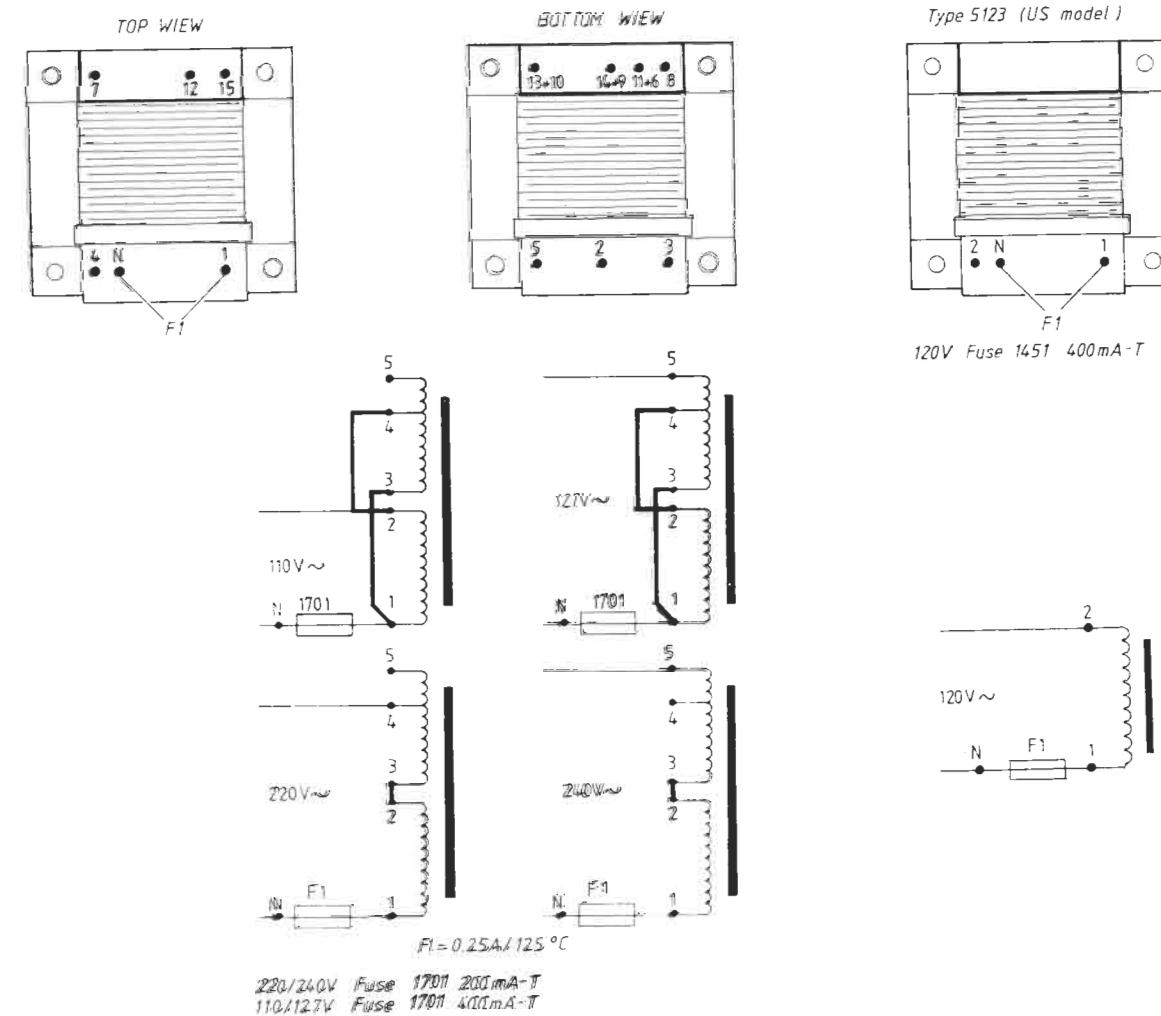
The CD-mechanism is provided with self-lubricating bearings and should thus not be lubricated.

### 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.**

