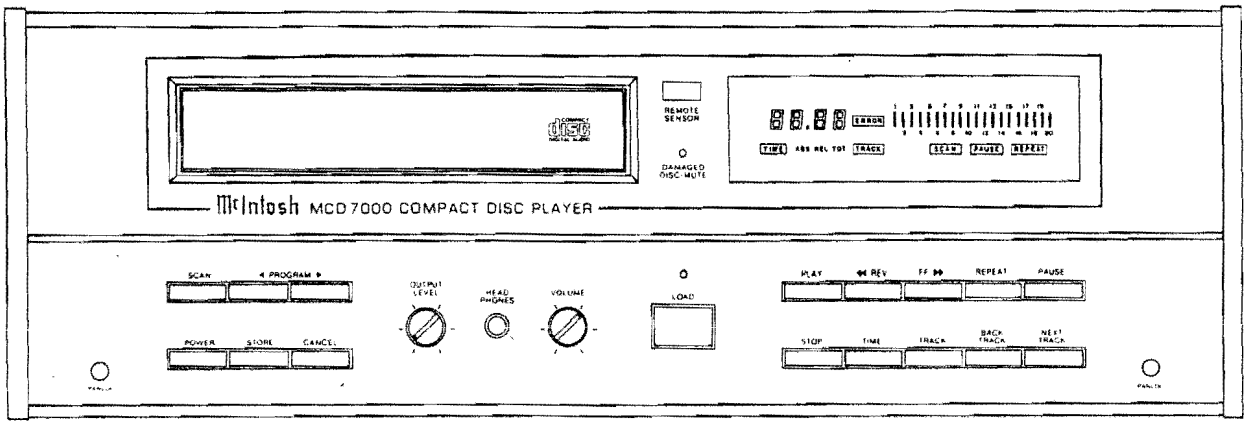
MCD 7000

COMPACT DISC PLAYER



CONTENTS

McIntosh® **Service Manual**

Performance Specifications

TYPICAL AUDIO PERFORMANCE
- Number of channels: 2 left and right.
- Frequency Range: 2-20,000 Hz, ±0.3 dB
- Dynamic Range: 96 dB
- Signal-to-Noise Ratio: 96 dB
- Channel Separation: 94 dB (at 1000 Hz)
- Total Harmonic Distortion: 0.003% (at 1000 Hz)
- Wow and Flutter; quartz crystal precision
- Sampling Rate: 176.4 kHz
- D/A Conversion: 16-bit equivalent through over-sampling with digital filter and 14-bit D/A conversion
- Error Correction System: Cross Interleave Reed Solomon Code (CIRC)
- Audio Output Level: 2 V
- Impedance Headphones: 8-1000 ohms

OPTICAL READOUT SYSTEM
- Laser: semi-conductor AlGaAs
- Wave length: 800 nm

SIGNAL FORMAT
- Sampling Frequency: 44.1 kHz
- Quantization: 16 bit linear/channel

DISC
- Diameter: 120 mm
- Thickness: 1.2 mm
- Rotation (see from reading side): counter-clockwise
- Scanning velocity: 1.2-1.4 m/s
- Rotation speed: 500-200 rpm
- Playing time (maximum): 74 min. (stereo)
- Track pitch: 1.6 μm
- Material: plastic

TOUCH-BUTTONS AND CONTROLS
- AC Power
- SCAN
- ◄ Program
- Program ►
- Store
- Stop
- Time
- Track
- Back Track
- Next Track
- Play
- ◄◄Rev
- FF►►
- Repeat
- Pause

CONTROLS
- Output Level
- Headphone Volume
- Front Panel Headphone Jack

SPECIAL FEATURE
- Damaged Disc/Mute Error Correction Indicator

POWER SUPPLY
- 120 V, 50/60 Hz, 33 watts

MECHANICAL INFORMATION
SIZE:

Front panel measures 16 1/8 inches wide (41 cm) by 5 7/16 inches high (13.8 cm) by 13 inches deep (33 cm), including connectors. Knob clearance required is 3/4 inches (1.9 cm) in front of mounting panel.

WEIGHT:

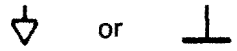
22 pounds (10 kg) net, 34 pounds (15.4 kg) in shipping carton.

General Notes

1. Unless otherwise noted, all voltages indicated on the schematics are measured under the following conditions:
   a. AC input at 120 volts, 50/60 Hz.
   b. All voltages are ±10% with respect to ground. A high impedance (10 megohm) voltmeter must be used.
   c. Front panel controls set at:
      POWER ..... ON
   d. Some voltages are made in the STOP or PLAY conditions. See the note on the schematic.

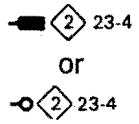
2. Unless otherwise specified:
   a. Resistor values are in ohms.
   b. Capacitor values smaller than 1 are in microfarads (μF), and capacitor values greater than 1 are in picofarads (pF). Capacitor values marked "p" are picofarads, and "n" are nanofarads, and "μ" are microfarads.

3. Symbols used in this manual are in conformance with IEEE standards and/or European standards. Some important symbols are described below:


or

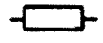
PC board ground


Chassis ground


Wire connection section number and connector reference. Wire connects to pin 4 of connector 23 of Section 2.


or

Test point designation on schematic or test point chart.


Resistors

Section Locations

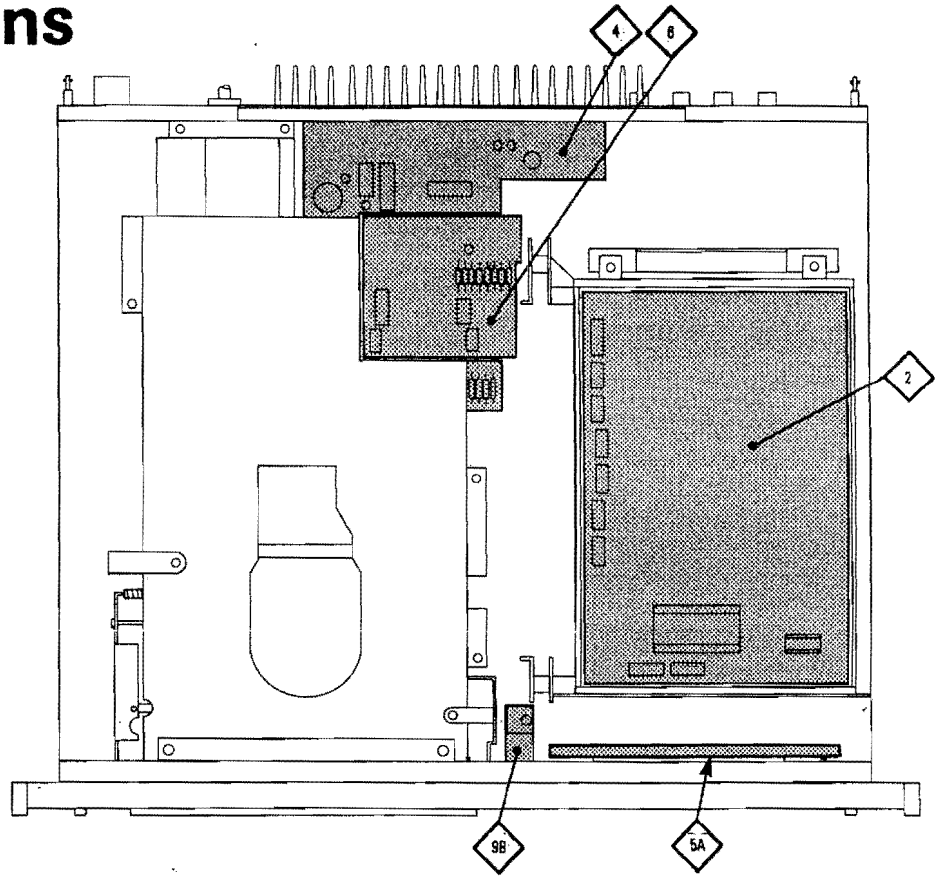


Fig. 1. Top view of unit with cover removed.

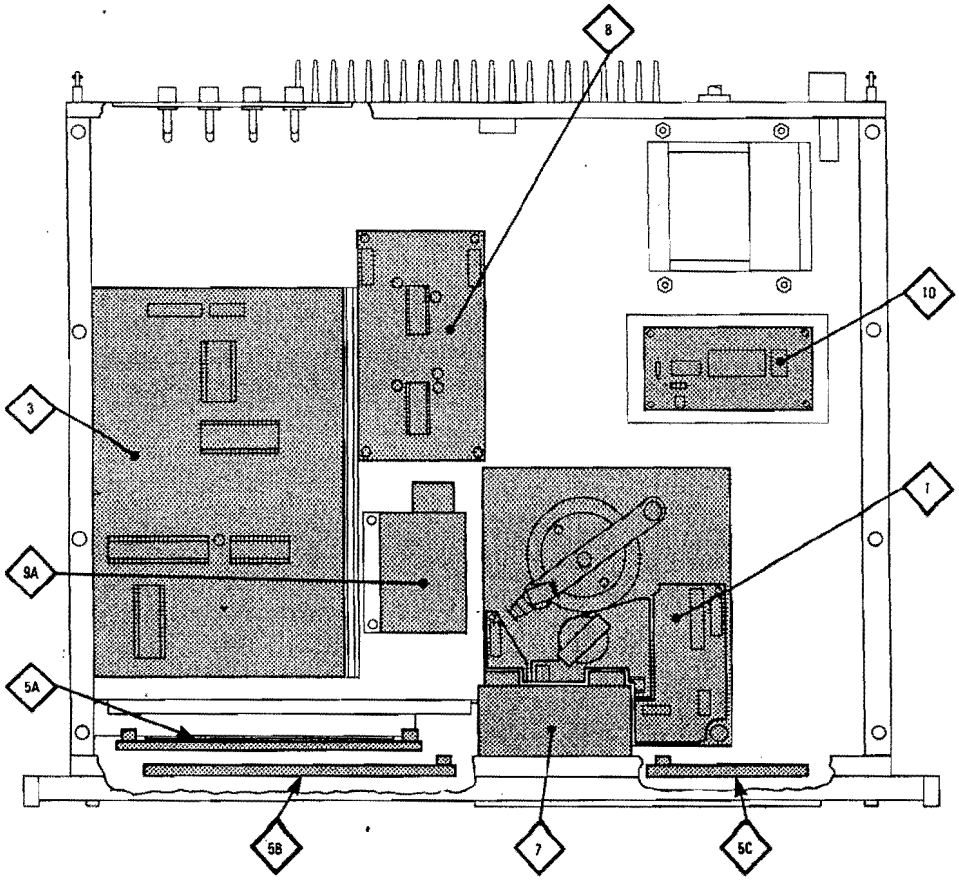
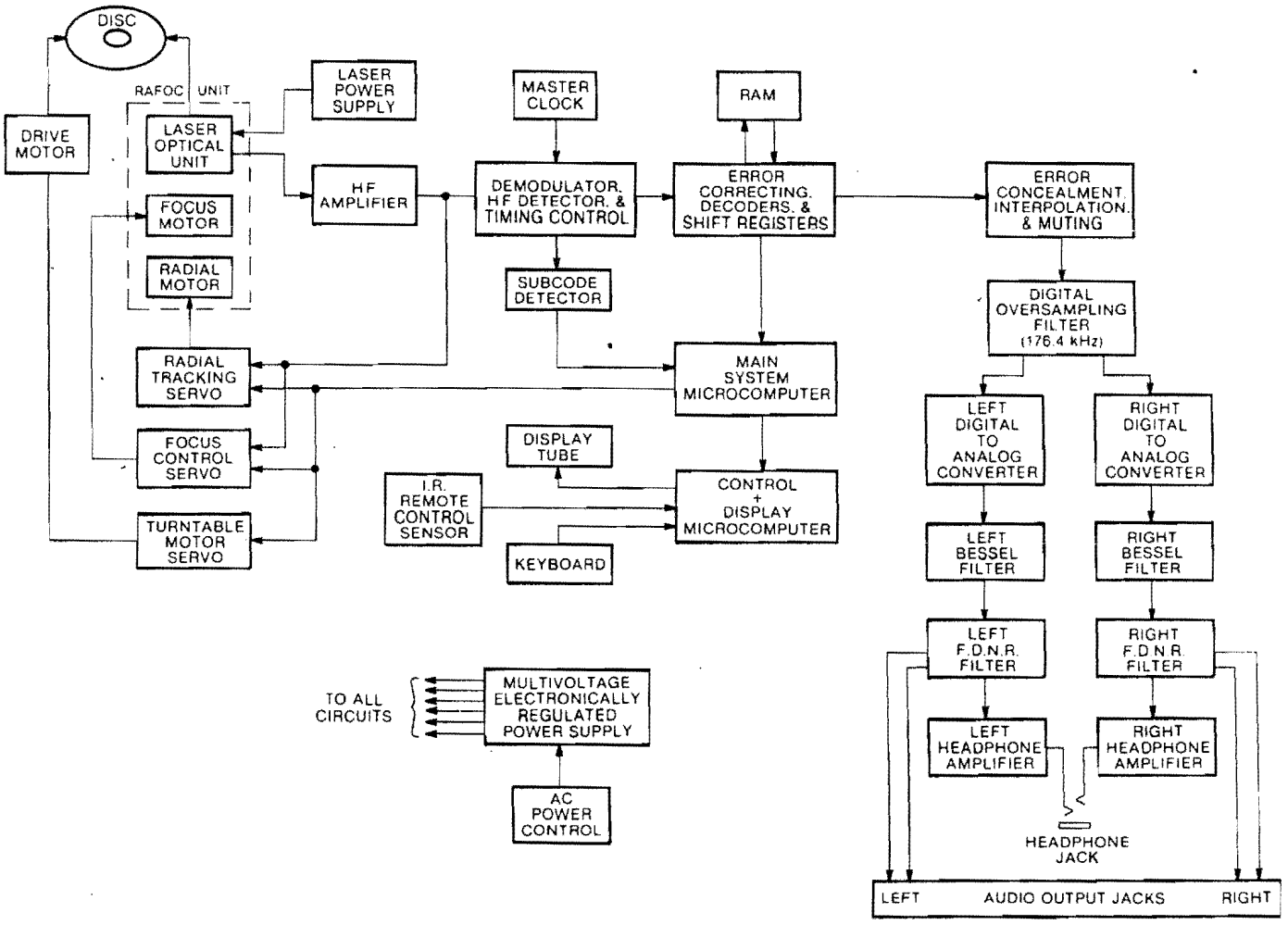


Fig. 2. Bottom view of unit with cover removed.

Block Diagram



0 Interconnection Diagram

INTERCONNECTION DIAGRAM PARTS LIST

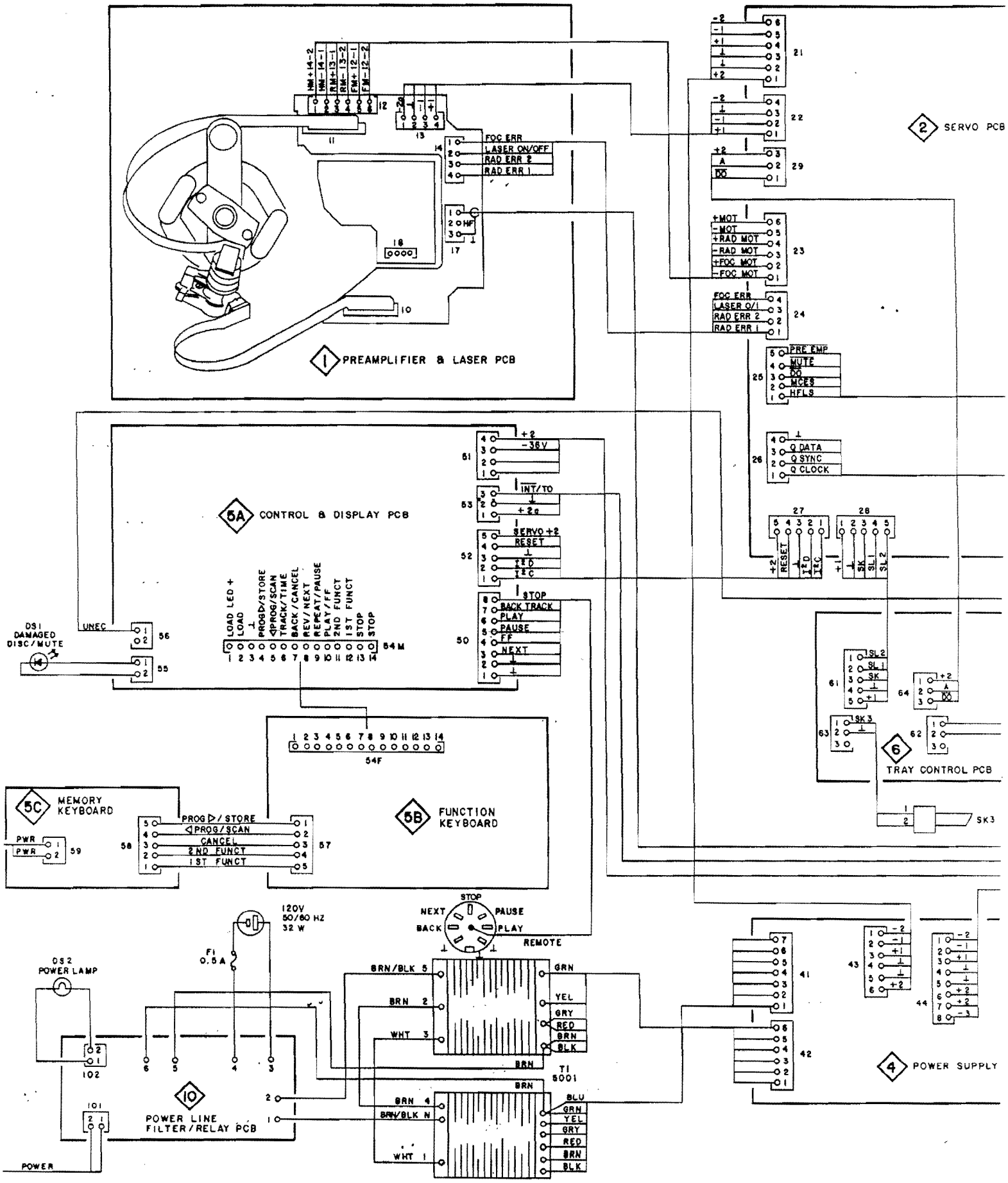
Symbol No.	Part No.	Description
DS1	070093	Led lamp, red
DS2	058069	Lamp, 6.3V
F1	089020	½ amp fuse, slo-blo
	178122	Fuseholder

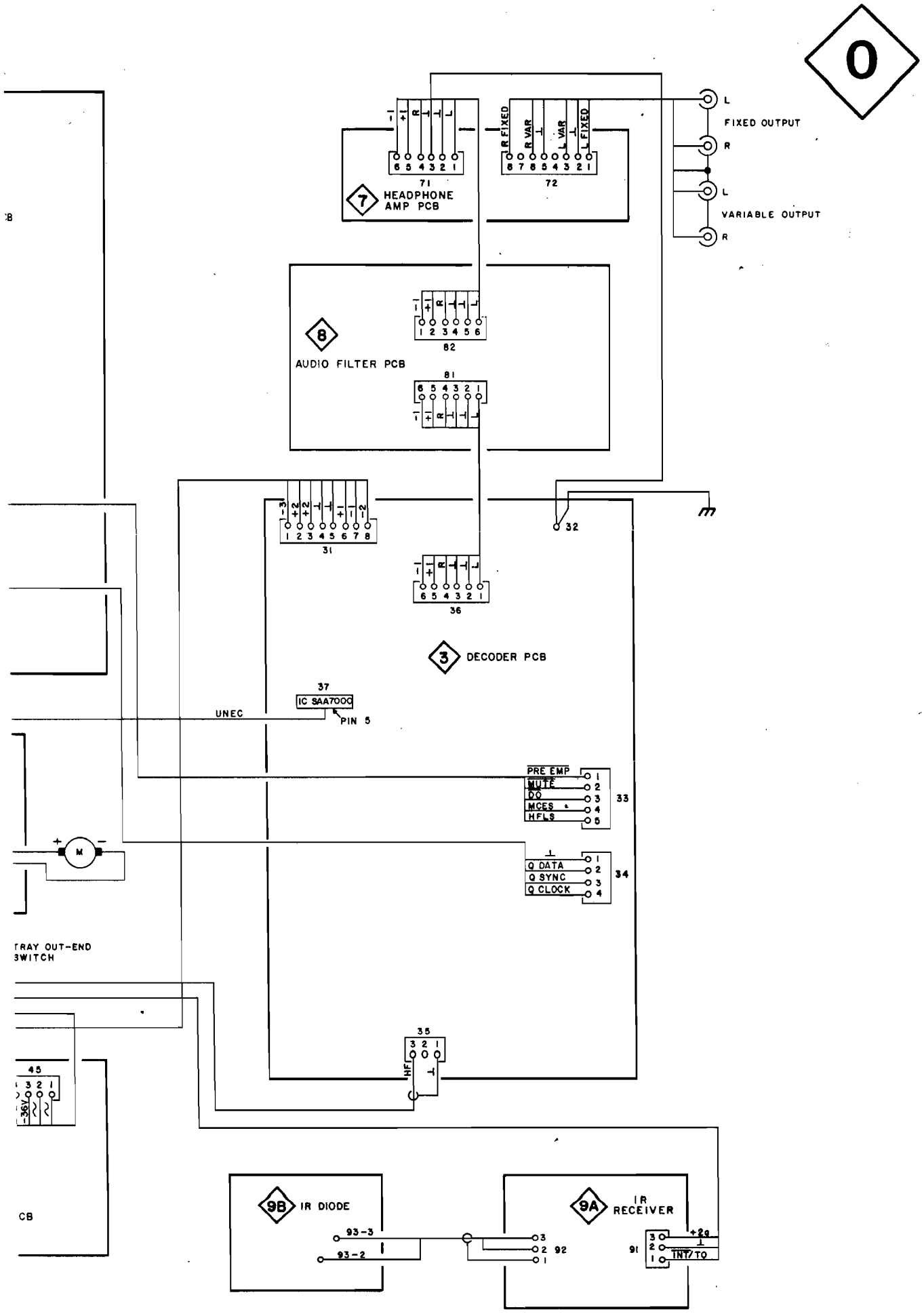
INSTALLATION HARDWARE PARTS LIST

Symbol No.	Part No.	Description
	038179	Mounting template
	043401	Mounting strips
	046451	Hardware package
	017156	Plastic foot, secure w/101106 screws
	046574	Panloc shelf bracket, right, complete
	046575	Panloc shelf bracket, left, complete
	114090	Panloc receptacle only
	100065	Player mechanism shipping screw, #4 x 2¾ (7 cm)
	101106	Sheetmetal screw, #8 x ½, to secure plastic feet

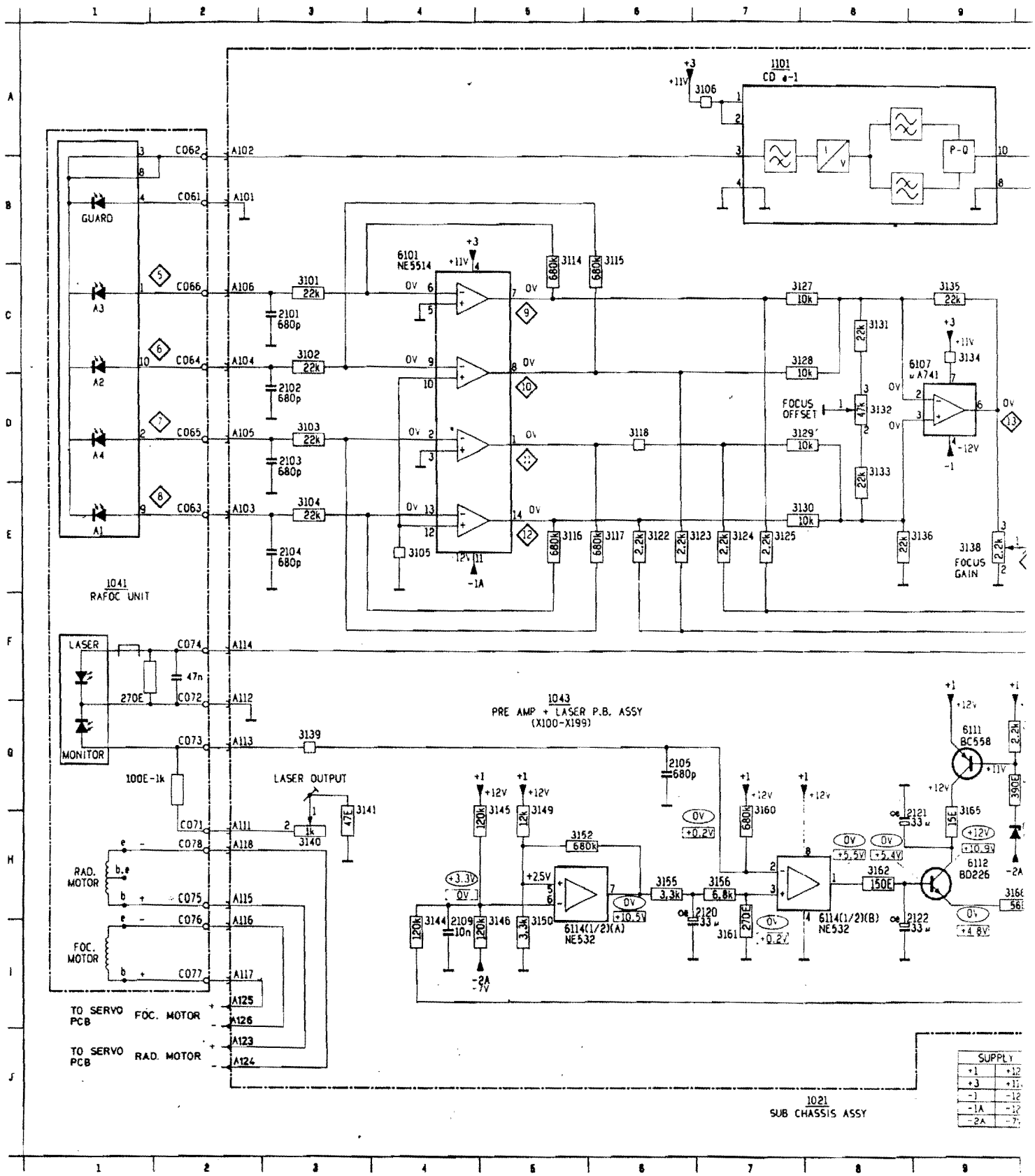
FRONT PANEL & TRIM PARTS LIST

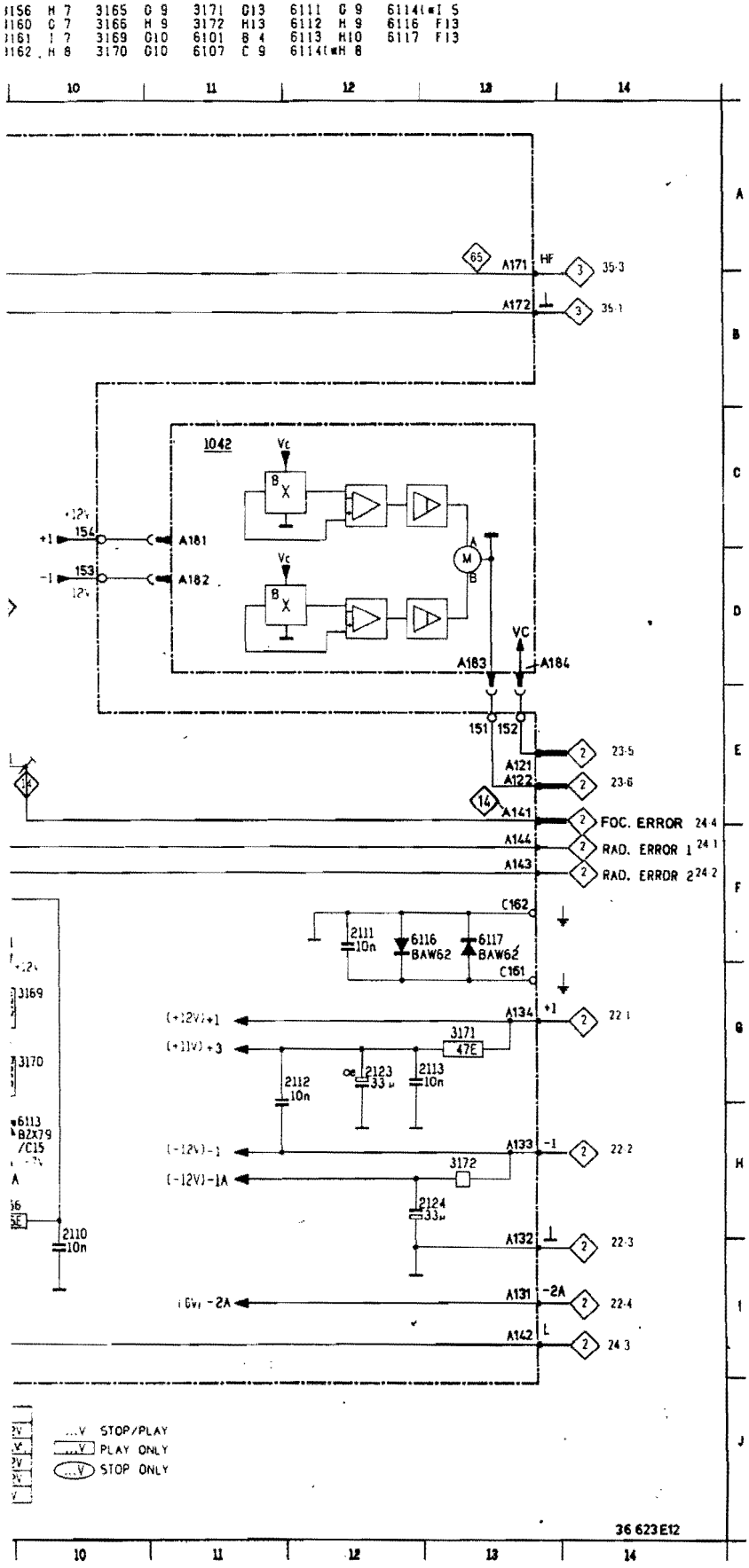
Symbol No.	Part No.	Description
	046453	Front panel, glass
	018239	Front panel, top extrusion
	018238	Front panel, bottom extrusion
	018232	Front panel, end cap
	046576	Front panel, complete
	018241	Front panel, drawer front
	046461	Remote control
	310003	Volume/level knob
	017340	Pushbutton, power (red)
	017341	Pushbutton, functions (black)
	017343	Pushbutton, load (black)


1 PREAMPLIFIER & LASER PCB
2 SERVO PCB
5A CONTROL & DISPLAY PCB
5B FUNCTION KEYBOARD
5C MEMORY KEYBOARD
6 TRAY CONTROL PCB
10 POWER LINE FILTER/RELAY PCB
4 POWER SUPPLY
FOC ERR
LASER ON/OFF
RAD ERR 2
RAD ERR 1
HF
PRE EMP
MUTE
MCES
HFLS
Q DATA
Q SYNC
Q CLOCK
SERVO +2
RESET
INT/TO
STOP
BACK TRACK
PLAY
PAUSE
FF
NEXT
LOAD LED +
LOAD
PROG▷/STORE
◁PROG/SCAN
TRACK/TIME
BACK/CANCEL
REV/NEXT
REPEAT/PAUSE
PLAY/FF
2ND FUNCT
1ST FUNCT
STOP
STOP
DS1 DAMAGED DISC/MUTE
DS2 POWER LAMP
120V 50/60 HZ 32 W
F1 0.5A
PROG▷/STORE
◁PROG/SCAN
CANCEL
2ND FUNCT
1ST FUNCT
PWR
REMOTE
TI 5001
POWER


0
L
FIXED OUTPUT
R
L
VARIABLE OUTPUT
R
7 HEADPHONE AMP PCB
71
72
8 AUDIO FILTER PCB
82
81
31
32
36
3 DECODER PCB
37
IC SAA7000
UNEC
PIN 5
PRE EMP
MUTE
DQ
MCES
HFLS
33
Q DATA
Q SYNC
Q CLOCK
34
TRAY OUT-END SWITCH
35
HF
45
-36V
9B IR DIODE
93-3
93-2
92
9A IR RECEIVER
91
+2g
INT/TO

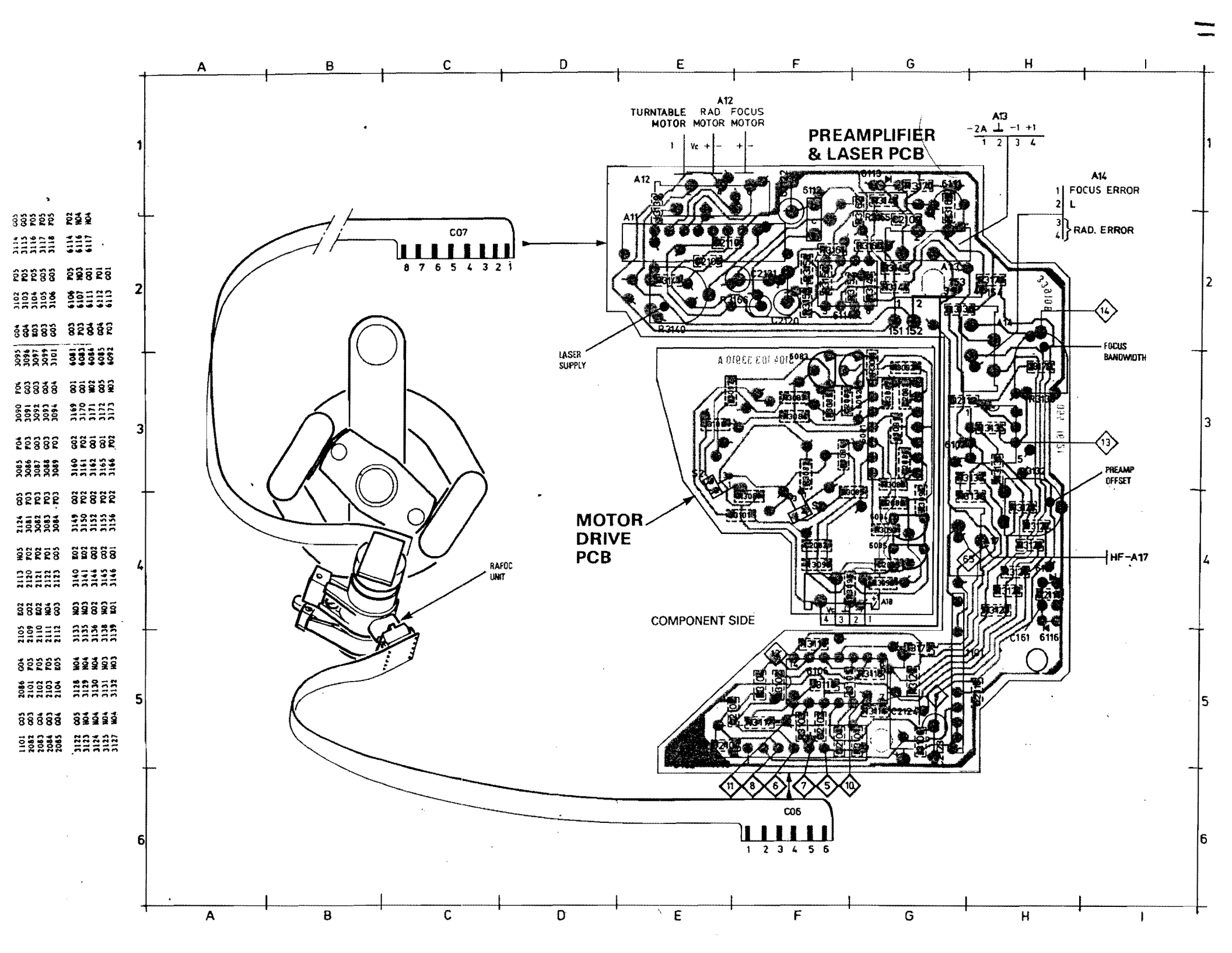
1 Preamplifier and Laser

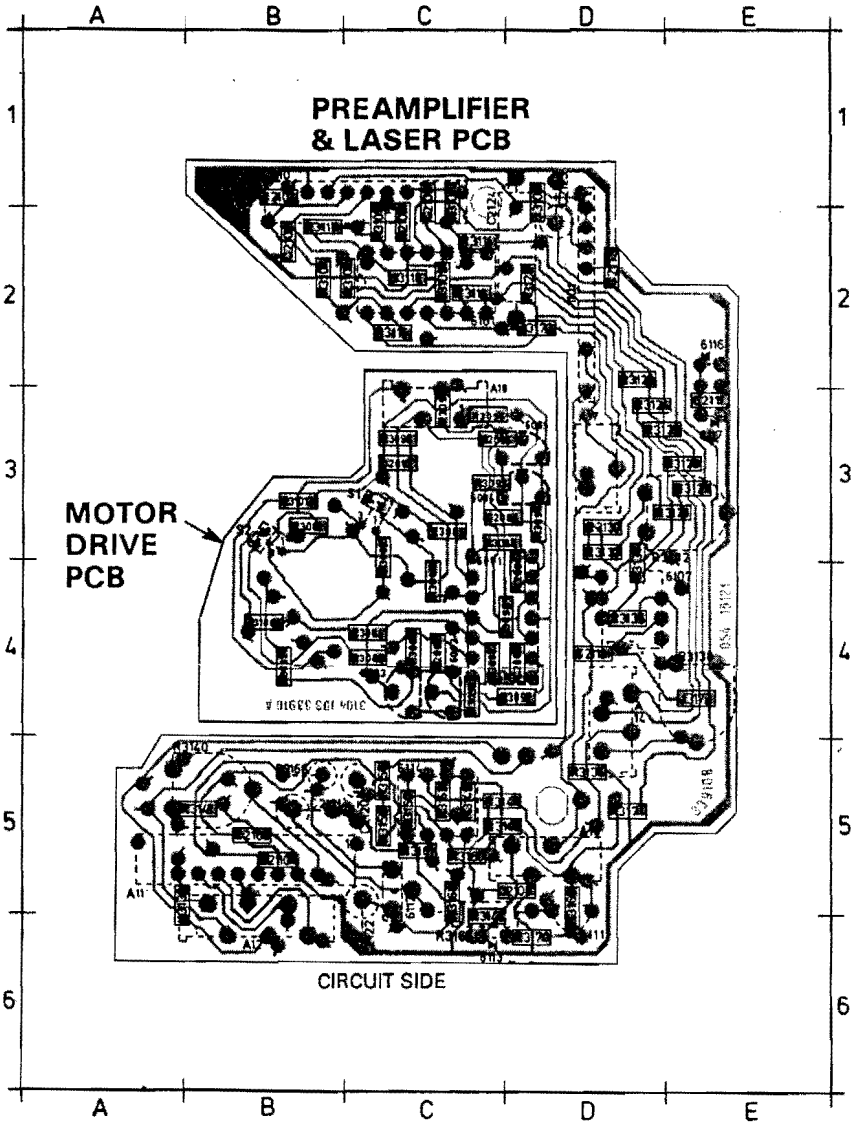




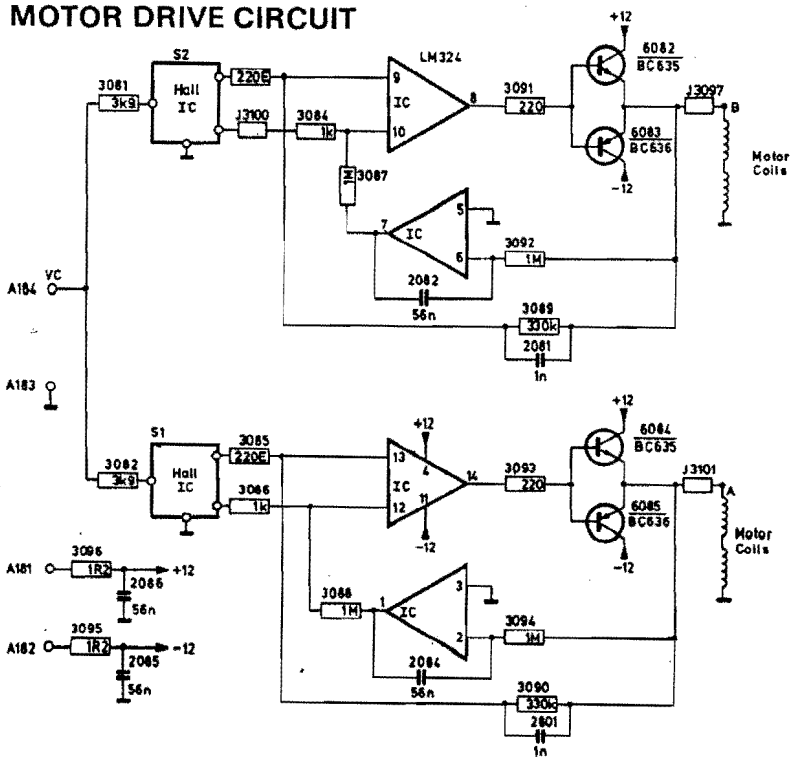
PREAMPLIFIER & LASER PARTS LIST

Symbol No.	Part No.	Description
COMPONENT MODULE		
1101	P586 4822 218 10157	Thick film unit HF
INTEGRATED CIRCUITS		
NE532N	P586 4822 209 80818	
NE5514N	P586 4822 209 81451	
µA714N	P586 4822 209 80617	
TRANSISTORS		
BC558	P586 4822 130 40941	
BD226	P586 5322 130 44244	
DIODES		
BZX79-C15	P586 4822 130 34281	
BAW62	P586 4822 130 30613	
POTENTIOMETERS		
3132	P586 4822 100 10583	47k
3138	P586 4822 100 20116	2k2
3140	P586 4822 100 20115	1k
RESISTORS		
3165	P586 5322 116 54914	15E MR30
3166	P586 5322 116 54929	56E PR37
PLAYER MECHANISM		
	P586 4822 691 30129	RAFOC Unit
	P586 4822 214 50395	Motor Coil Assy
	P586 4822 502 11701	Spindle Lower Bearing


A12
TURNTABLE MOTOR
RAD MOTOR
FOCUS MOTOR
PREAMPLIFIER & LASER PCB
A13
A14
FOCUS ERROR
L
RAD. ERROR
FOCUS BANDWIDTH
PREAMP OFFSET
HF-A17
LASER SUPPLY
MOTOR DRIVE PCB
COMPONENT SIDE
RAFOC UNIT
C07
C06



MOTOR DRIVE CIRCUIT



1101 D02
2081 C04
2082 C04
2083 C03
2084 C04

2085 C03
2086 C03
2101 C01
2102 B02
2103 C02

2104 B01
2105 B05
2109 D05
2110 B05
2111 E03

2112 D04
2113 D02
2120 C05
2121 B05
2122 C05

2123 D02
2124 D02
3081 C03
3082 C03
3083 C04

3084 C04
3085 C03
3086 C04
3087 C04
3088 C03

3090 C03
3091 C04
3092 C04
3093 C03
3094 D03

3095 C03
3096 C03
3097 B04
3098 C04
3099 C04

3101 C01
3102 C02
3103 C02
3104 B02
3105 C02

3106 D01
3113 C06
3114 C02
3115 C02
3116 C02

3117 B02
3118 C02
3122 D02
3123 D02
3124 D03

3125 D03
3127 E03
3128 E03
3129 E03
3130 D03

3131 D03
3132 E03
3133 D03
3135 D04
3138 E04

3139 B05
3140 B05
3141 B05
3144 C05
3145 C05

3146 C05
3149 C05
3150 C05
3152 C05
3155 C05

3156 C05
3160 C05
3161 C05
3162 C05
3165 C06

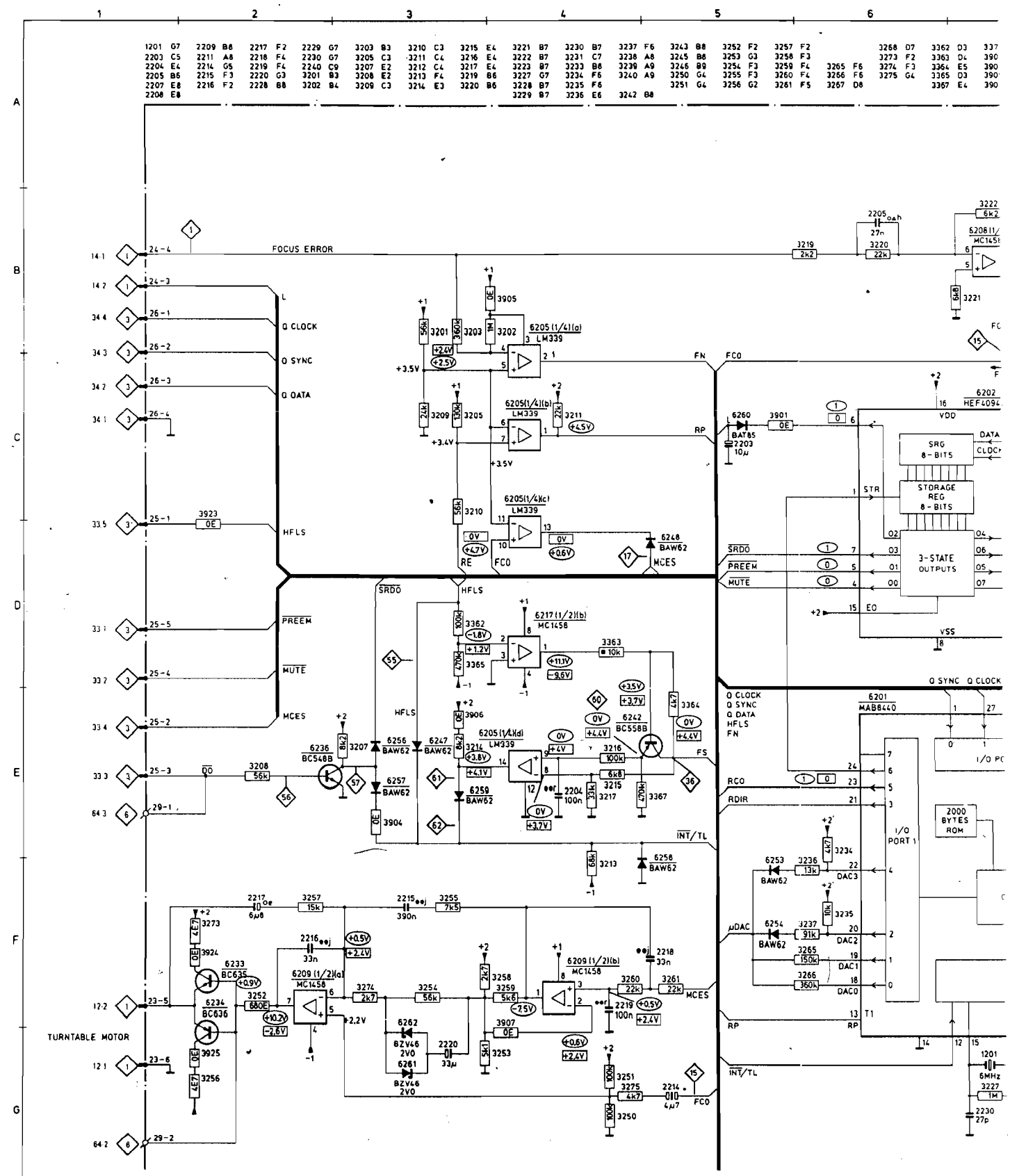
3166 B05
3169 D05
3170 D06
3171 D05
3172 D02

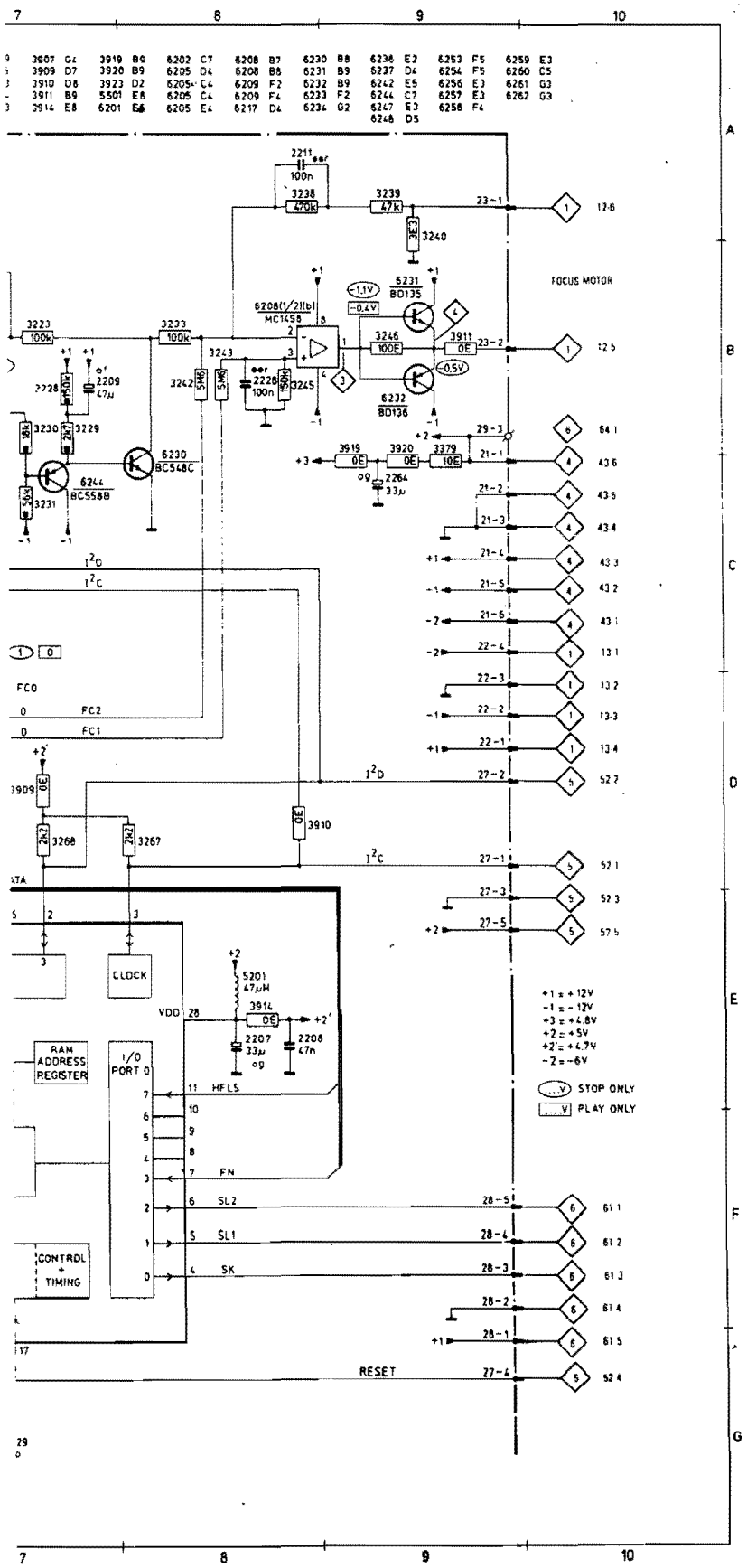
3173 E04
6081 C04
6082 C04
6083 C04
6084 C03

6085 C03
6101 C02
6107 D04
6111 D06
6112 C05

6114 C05
6116 E02
6117 E03

2 Servo


FOCUS ERROR
Q CLOCK
Q SYNC
Q DATA
HFLS
PREEM
MUTE
MCES
TURNTABLE MOTOR
SRDO
RCO
RDIR
μDAC
INT/TL
FN
FCO
RP
RE
FS
STR
EO
VDD
VSS
SRG 8-BITS
STORAGE REG 8-BITS
3-STATE OUTPUTS
I/O PORT 1
2000 BYTES ROM
DAC3
DAC2
DAC1
DAC0
6MHz


7
8
9
10
A
B
C
D
E
F
G
FOCUS MOTOR
6231 BD135
6232 BD136
6230 BC548C
6244 BC558B
6208(1/2)(b1) MC1458
2211 100n
3238 470k
3239 47k
3240 3E3
3223 100k
3233 100k
3243
3246 100E
3911 0E
2209 47µ
2228 100n
3242 5M6
3245 150k
3230 36k
3229 2k2
3231 36k
3919 0E
3920 0E
3379 10E
2264 33µ
I²O
I²C
FC0
FC2
FC1
3909 0E
3910 0E
3268 2k2
3267 2k2
I²D
I²C
CLOCK
5201 47µH
3914 0E
2207 33µ
2208 47n
VDD 28
RAM ADDRESS REGISTER
I/O PORT 0
11 HFLS
7 FN
6 SL2
5 SL1
4 SK
CONTRDL + TIMING
RESET
+1 = +12V
-1 = -12V
+3 = +4.8V
+2 = +5V
+2' = +4.7V
-2 = -6V
STOP ONLY
PLAY ONLY
23-1
23-2
29-3
21-1
21-2
21-3
21-4
21-5
21-6
22-4
22-3
22-2
22-1
27-2
27-1
27-3
27-5
28-5
28-4
28-3
28-2
28-1
27-4
12.6
12.5
64.1
43.6
43.5
43.4
43.3
43.2
43.1
13.1
13.2
13.3
13.4
52.2
52.1
52.3
57.5
61.1
61.2
61.3
61.4
61.5
52.4

SERVO PARTS LIST

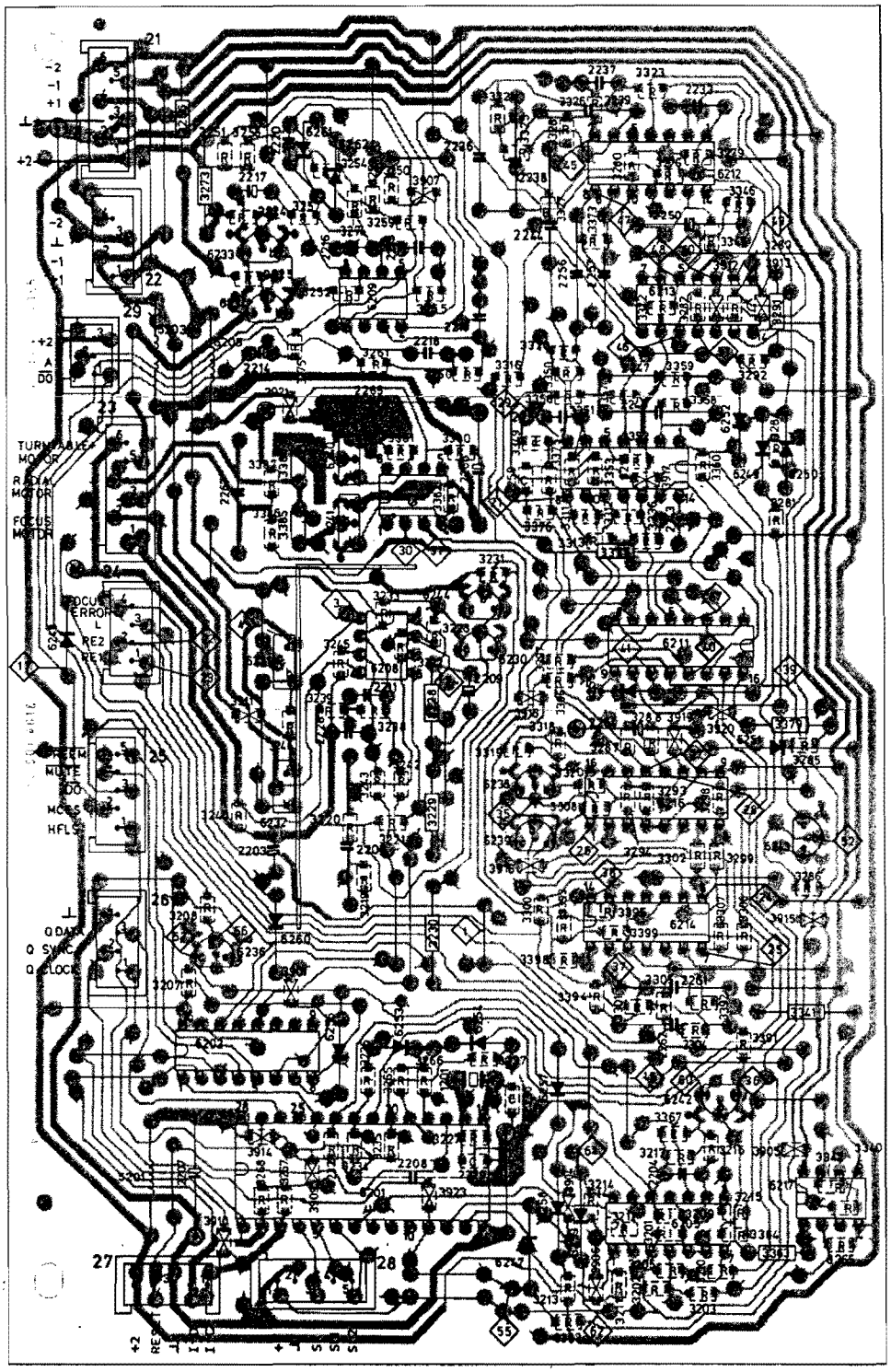
Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
HEF40538P	P586 5322 209 14121	
HEF4070BP	P586 4822 209 10265	
HEF4094BP	P586 5322 209 14485	
LM324N	P586 4822 209 80587	
LM339N	P586 4822 209 80631	
MAB8440P/C042	P586 4822 209 10921	
MC1458N	P586 4822 209 81349	
TCA240	P586 4822 209 80629	
μA741CN	P586 4822 209 80617	
TRANSISTORS		
BC548B	P586 4822 130 40947	
BC548C	P586 4822 130 44196	
BC558B	P586 4822 130 44197	
BC635	P586 5322 130 44349	
BC636	P586 4822 130 44283	
BD135	P586 4822 130 40823	
BD136	P586 4822 130 40824	
BF494	P586 4822 130 44195	
DIODES		
BAT85	P586 4822 130 31983	
BAW62	P586 4822 130 30613	
BZV46-C2V0	P586 4822 130 31248	
BZX79-C2V4	P586 4822 130 31253	
BZX79-C5V1	P586 4822 130 34233	
CRYSTALS		
1201	P586 4822 242 70392	6 MHz
COILS		
5201		
5202	P586 4822 156 20966	47 mH
5203		
CAPACITORS		
2203	P586 5322 124 14066	10 μF - 10 V
2205	P586 4822 121 50607	27 nF - 63 V-2%
2217	P586 4822 124 21538	6,8 μF - 16 V
2220	P586 4822 124 20945	33 μF - 10 V
2236 2238	P586 4822 121 50543	5,6 nF - 63 V-2%
2239	P586 5322 121 54128	390 pF - 630 V-2%
2244	P586 5322 121 54174	680 pF - 250 V-2%
2246		
2247		
2257	P586 4822 121 50538	6,8 nF - 63 V-2%
2261		
2262		
2256	P586 5322 121 54087	1,8 nF -160 V-2%
RESISTORS		
3256,3273	P586 4822 111 50483	
3384,3385	P586 4822 116 40031	PTC 9E4-60 V
MISCELLANEOUS		
	P586 4822 255 40133	Mica washer for 6231/6232
	P586 4822 255 40128	Spring clip for 6231/6232
	P586 4822 255 40156	28 pin socket

2 Servo

1201	C3	2208	B3	2216	H2	2228	E2	2237	I4	2246	G4	2257	H4	2265	G3	3203	B4	3210	B4
2203	E2	2209	F3	2217	I2	2229	B3	2238	I3	2247	H4	2259	G3	2266	G3	3205	B4	3211	B4
2204	B4	2211	F3	2218	H3	2230	C3	2239	I4	2250	I4	2261	D4	2267	G2	3207	D2	3212	B4
2205	E3	2214	H2	2219	H3	2233	I4	2243	G4	2251	G3	2262	C4	3201	B4	3208	D2	3213	B3
2207	B2	2215	H3	2220	I2	2236	I3	2244	H3	2256	H4	2264	E4	3202	B4	3209	B4	3214	B4
3215	B4	3221	E3	3229	E3	3234	C3	3239	E2	3246	E2	3254	I2	3259	I3	3267	B2	3276	I4
3216	C4	3222	F3	3230	D3	3235	C3	3240	E2	3250	I3	3255	H3	3260	H3	3268	B2	3279	I4
3217	C4	3223	F3	3231	F3	3236	C3	3242	E3	3251	I2	3256	I2	3261	H3	3273	I2	3280	I4
3219	D3	3227	C3	3232	B2	3237	C3	3243	E3	3252	H2	3257	I2	3265	C3	3274	I3	3281	G5
3220	E3	3228	E3	3233	F3	3238	E3	3245	F3	3253	I3	3258	I2	3266	C3	3275	H2	3282	H4
3283	H4	3288	E4	3300	D3	3306	D4	3313	F4	3323	I4	3328	I4	3342	C5	3351	G4	3358	G4
3284	G4	3291	H4	3301	D4	3307	D4	3316	H3	3324	I3	3335	F4	3345	H4	3352	G4	3359	H4
3285	E5	3292	H4	3302	D4	3308	E4	3318	E3	3325	I3	3336	G4	3346	I4	3353	G4	3360	G4
3286	D5	3298	E4	3304	C4	3311	G4	3319	E3	3326	I4	3340	C5	3349	G3	3356	G3	3362	A4
3287	E4	3299	D4	3305	D4	3312	G4	3320	E4	3327	I4	3341	C5	3350	H3	3357	G4	3363	B4
3364	B4	3373	I4	3381	G3	3387	G2	3395	D4	3901	D2	3909	B2	3914	C2	3919	E4	5201	B2
3365	B5	3375	G4	3382	G3	3391	C4	3396	F4	3904	B4	3910	B2	3915	D5	3920	E4	5202	H2
3367	C4	3376	G3	3384	G2	3392	D4	3397	F3	3905	C4	3911	E2	3916	D3	3921	G2	5203	H2
3370	H4	3379	E5	3385	G2	3393	E4	3398	D3	3906	B4	3912	H4	3917	G4	3923	B3	6201	B3
3372	H4	3380	G3	3386	G2	3394	D4	3399	D4	3907	I3	3913	H4	3918	E3	3924	I2	6202	C2
6205	B4	6213	H4	6218	G3	6234	H2	6241	G3	6248	F1	6253	C3	6258	B3				
6208	F3	6214	D4	6230	F3	6236	D2	6242	C4	6249	G4	6254	C3	6259	B4				
6209	H3	6215	G4	6231	F2	6238	E3	6243	E5	6250	G5	6255	F4	6260	D2				
6211	F4	6216	E4	6232	E2	6239	E3	6244	F3	6251	E4	6256	G2	6261	I2				
6212	I4	6217	B5	6233	H2	6240	G3	6247	B3	6252	G4	6257	C3	6262	I3				

SERVO PCB

COMPONENT SIDE



⊗ GRIPLET/COPPERTRACK CONNECTED TO THE COPPERFOIL ON THE COMPONENT SIDE OF THE PCB

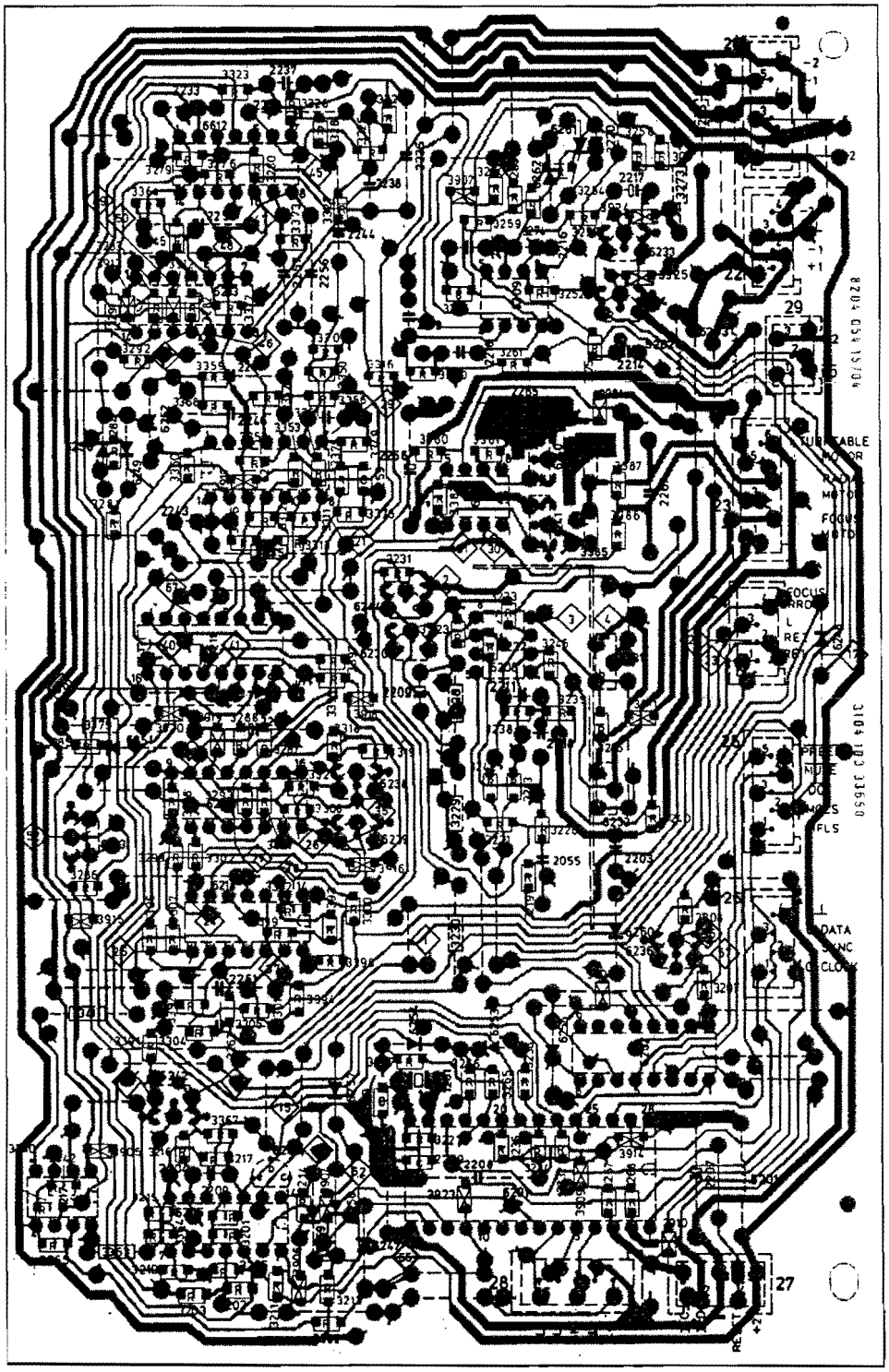
⊕⊗ SOLDERED ON THE COPPERFOIL (↓)

R = CHIP RESISTOR.
C = CHIP CAPACITOR.
⊠ = CHIP JUMPER OE

2 Servo

SERVO PCB

CIRCUIT SIDE

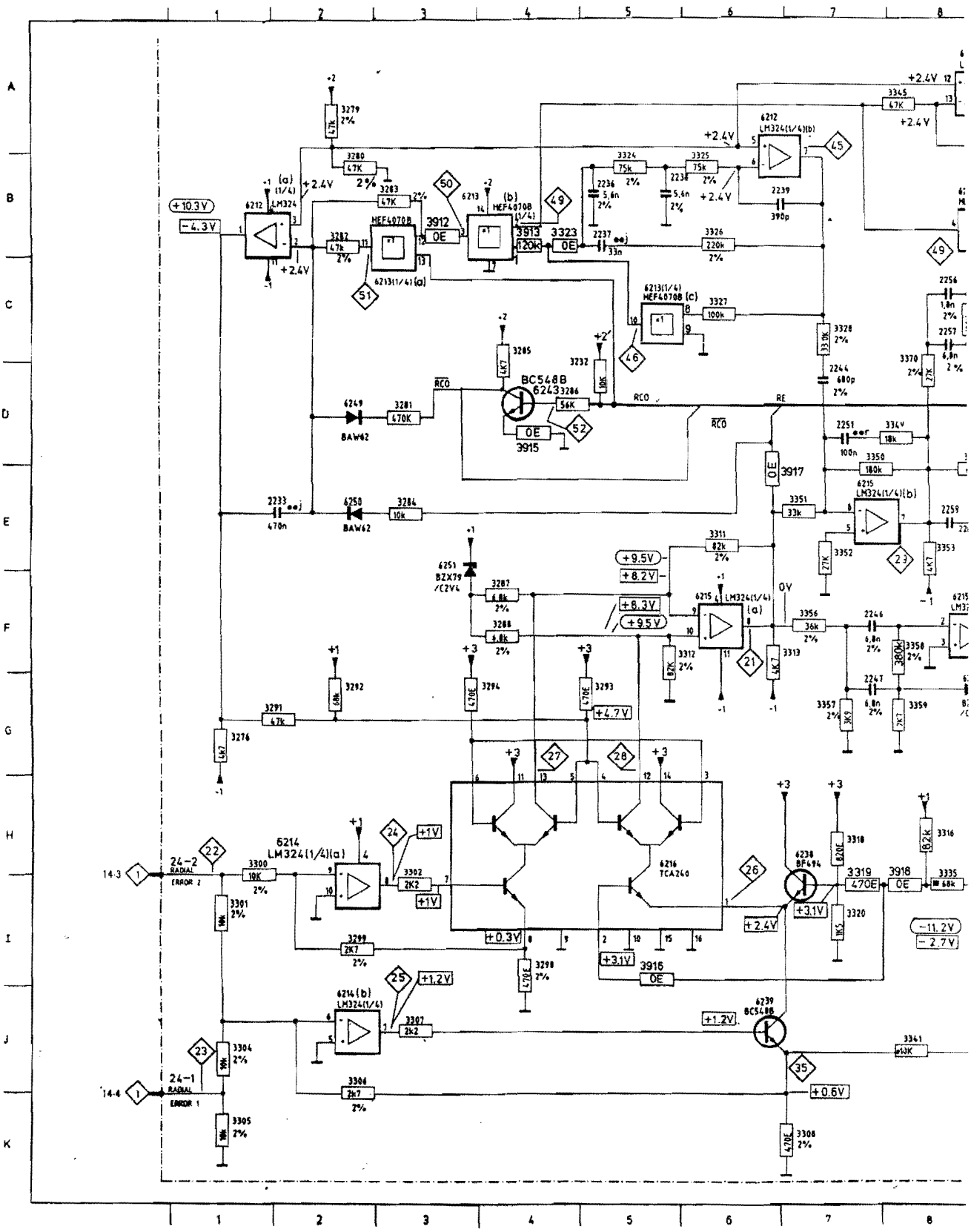


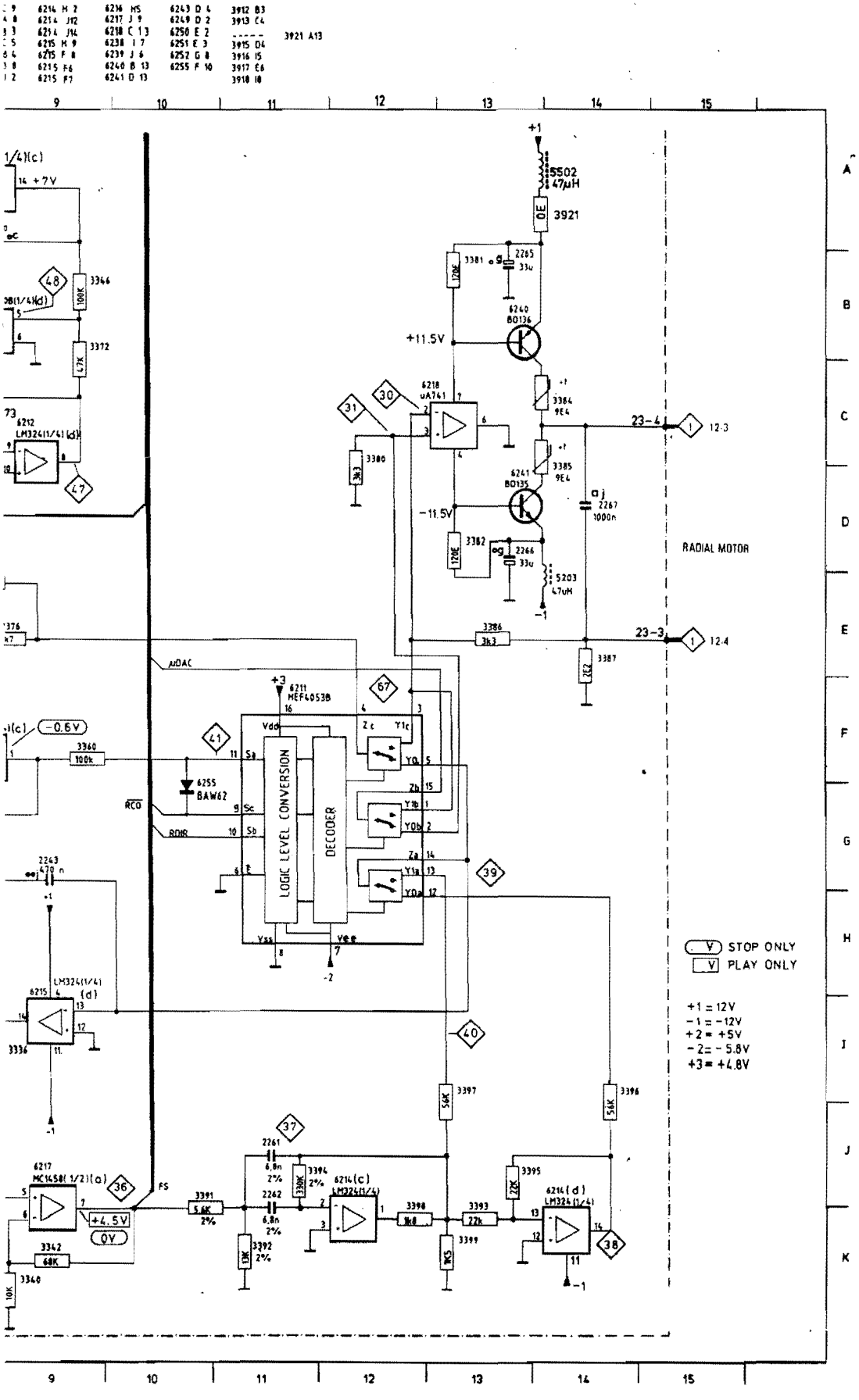
⊗ GRIPLET/COPPERTRACK CONNECTED TO THE COPPERFOIL ON THE COMPONENT SIDE OF THE PCB

⊖ ⊗] SOLDERED ON THE COPPERERFOIL (1)

SERVO 2

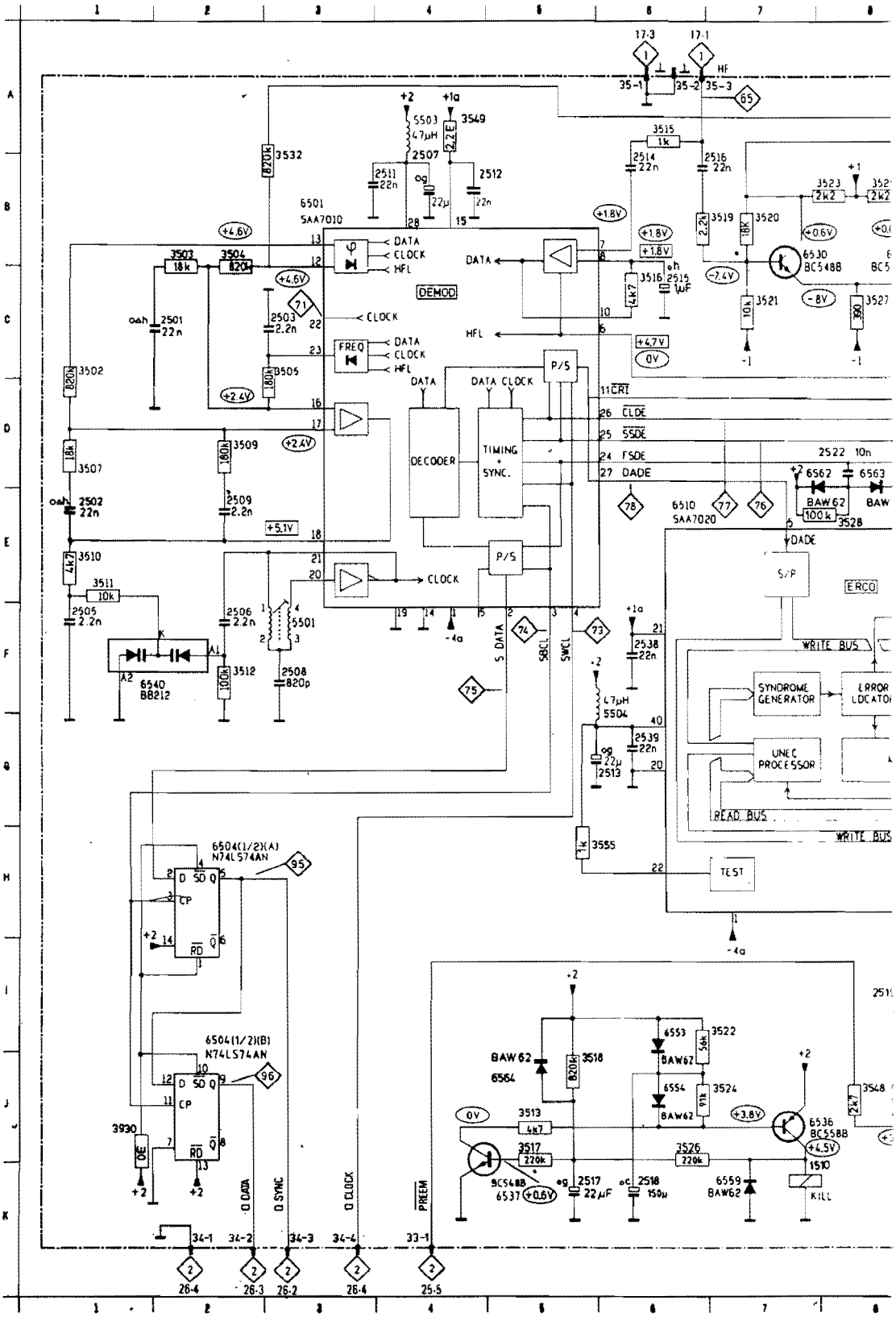
2233 E 2	2246 F 7	2261 J11	3276 G 1	3284 E 3	3293 G 5	3304 J 1	3313 F 6	3324 B 5	3340 K 9	3351 E 7	3360 F 9	3380 C 12	3391 J 10	3398 J 12
2236 B 5	2247 G 7	2262 J11	3279 A 2	3285 D 4	3294 G 3	3305 K 1		3325 B 6	3341 J 6	3352 E 7	3370 D 8	3381 B 13	3392 K 11	3399 K 13
2237 B 5	2250 A 6		3232 D 5	3286 D 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	5502 A 13
2238 B 5	2251 D 7	2265 B13	3280 B 2	3287 F 4	3307 J 3	3318 H 7	3327 C 6	3345 A 8	3356 F 7	3373 C 8	3383 C 13	3394 J 11	5503 E 13
2239 B 6	2256 C 8	2266 D13	3281 D 3	3288 F 4	3308 K 6	3319 I 7	3328 C 7	3346 B 9	3357 G 7	3375 E 8	3384 C 13	3395 J 13	6211 F 11
2243 G 9	2257 C 8	2267 D14	3282 B 2	3291 G 2	3311 E 6	3320 I 7	3335 I 8	3349 D 8	3358 F 8	3376 E 9	3385 C 13	3396 I 14	6212 A 6
2244 D 7	2259 E 8		3283 B 3	3292 G 2	3312 F 5	3323 B 4	3336 I 8	3350 E 7	3359 G 8		3387 E 14	3397 I 13	6212 B 1



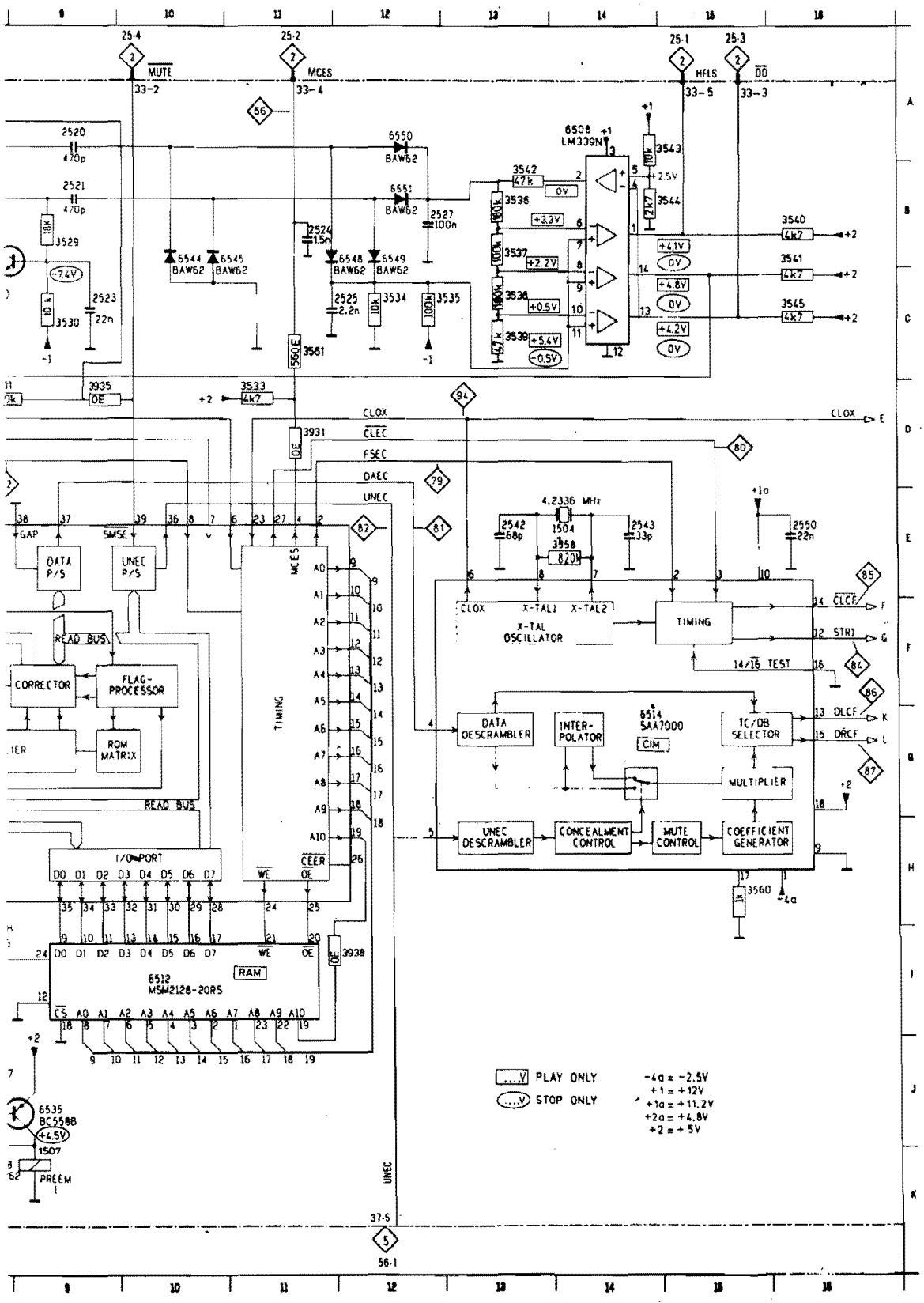

LOGIC LEVEL CONVERSION
DECODER
RADIAL MOTOR
STOP ONLY
PLAY ONLY
+1 = 12V
-1 = -12V
+2 = +5V
-2 = -5.8V
+3 = +4.8V
+11.5V
-11.5V
+4.5V
0V
-0.6V
+7V
FS
RCO
RDIR
µDAC

3 Decoder

1504 E14	2501 C2	2506 F2	2512 B4	2517 K5	2522 D8	2538 F6		3507 D1	3513 J5	3519 B7	3524 J7
1507 K9	2502 E1	2507 B4	2513 G6	2518 K6	2523 C9	2539 G6	3502 C1	3509 D2	3515 A6	3520 B7	3525 B8
1510 K7	2503 C3	2508 F3	2514 B6	2519 I8	2524 B11	2542 E13	3503 B2	3510 E1	3516 C6	3521 C7	3526 J6
		2509 E2	2515 C6	2520 A9	2527 B12	2543 E14	3504 B2	3511 E1	3517 J5	3522 I7	3527 C8
	2505 F1	2511 B3	2516 B7	2521 B9	2525 C12	2550 E16	3505 C3	3512 F2	3518 J5	3523 B8	3528 E7



9 B9	3534 C12	3539 C13	3544 B14	3555 H6	3931 D11	5504 F6	6508 A14	6531 B8	6544 B10	6551 B12	6562 D7		
0 C9	3535 C12	3542 B16	3545 C16	3558 E14	3935 D9	5505 I8	6510 E6	6535 J9	6545 B11	6553 I6	6563 D8		
1 D8	3536 B13	3541 C16	3547 I8	3560 H15	3938 I12	6501 B3	6512 I10	6536 J7	6548 B12	6554 J6	6564 J5		
2 A5	3537 B13	3542 B13	3548 I8	3561 C11	5501 F3	6504 H2	6514 G14	6537 K5	6549 B12	6558 K8			
3 D11	3538 C13	3543 A14	3549 A4	3930 J1	5503 A4	6504 I2	6530 B7	6540 F1	6550 A12	6559 K7			



DECODER PARTS LIST

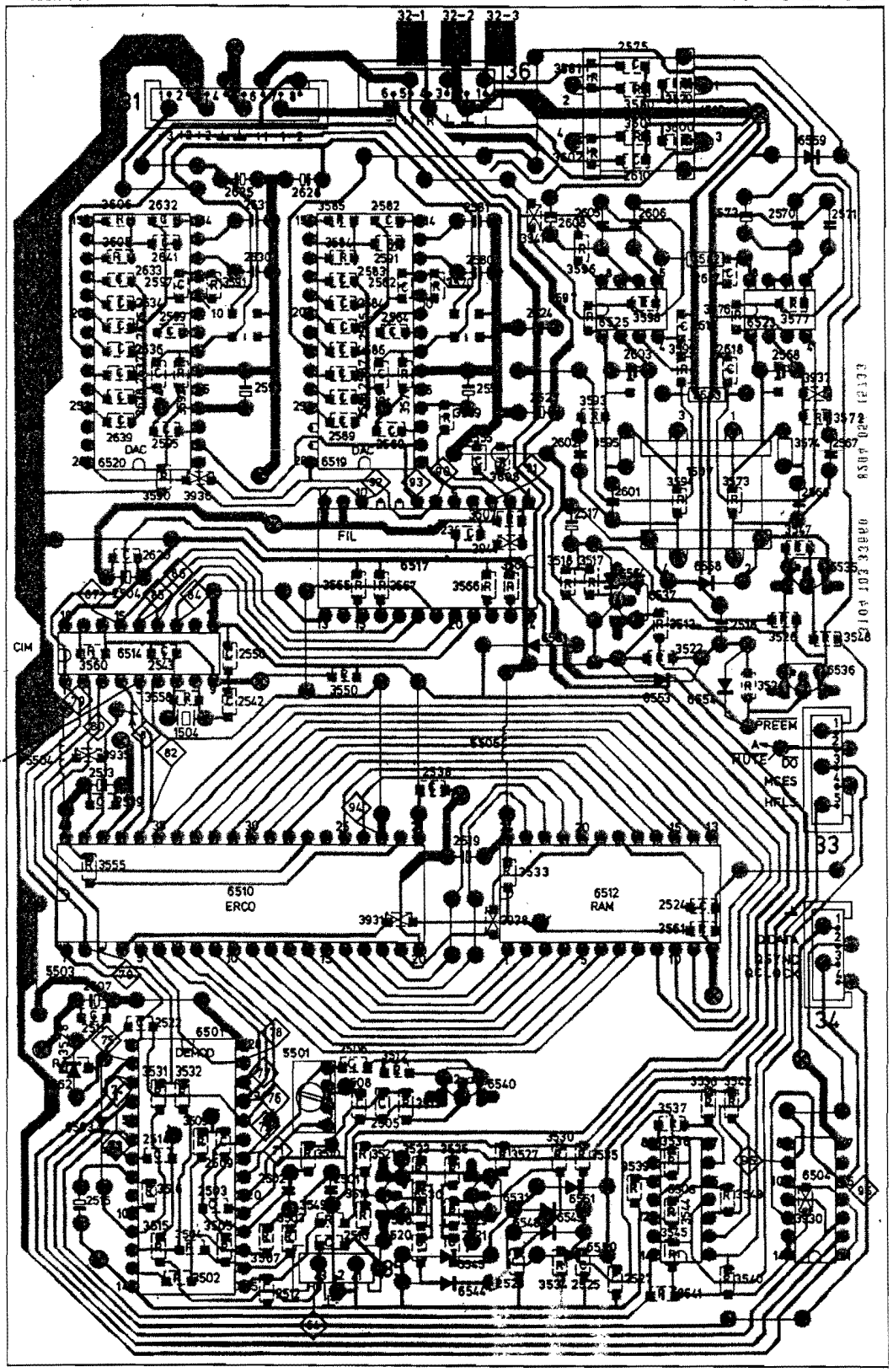
Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
SAA7000	P586 4822 209 10375	CIM
TDA1540P	P586 4822 209 81453	DAC
SAA7010	P586 4822 209 10857	DEMOD
SAA7020	P586 4822 209 10377	ERCO
NE5532N	P586 5322 209 86234	
LM339N	P586 4822 209 80631	
MSM2128-20RS RAM	P586 4822 209 10379	
N74LS74AN	P586 4822 209 80782	
TRANSISTORS		
BC548B	P586 4822 130 40937	
BC558B	P586 4822 130 44197	
DIODES		
BAW62	P586 4822 130 30613	
BAX18	P586 4822 130 34121	
BB212	P586 4822 130 31129	
CRYSTALS		
1504	P586 4822 242 70643	X-tal 4.2336 MHz
RELAYS		
1507,1510	P586 4822 280 20115	Reed relay
COILS		
5501	P586 4822 156 21155	
5503,5504 5505	P586 4822 156 20966	47μH

3 Decoder

1504	C2	2503	A2	2508	B3	2514	B2	2519	C4	2524	C5	2542	C2	2559	E3	2567	E6	2575	F5
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	D5
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	3605	E2	3931	C3	3941	E4	5505	C4	6512	C4	6523	E5
3580	F5	3585	E3	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	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														

DECODER PCB

COMPONENT SIDE



⊗ GRIPLET (COPPERTRACK CONNECTED TO COPPERFOIL ON THE COMPONENT SIDE OF THE PCB)

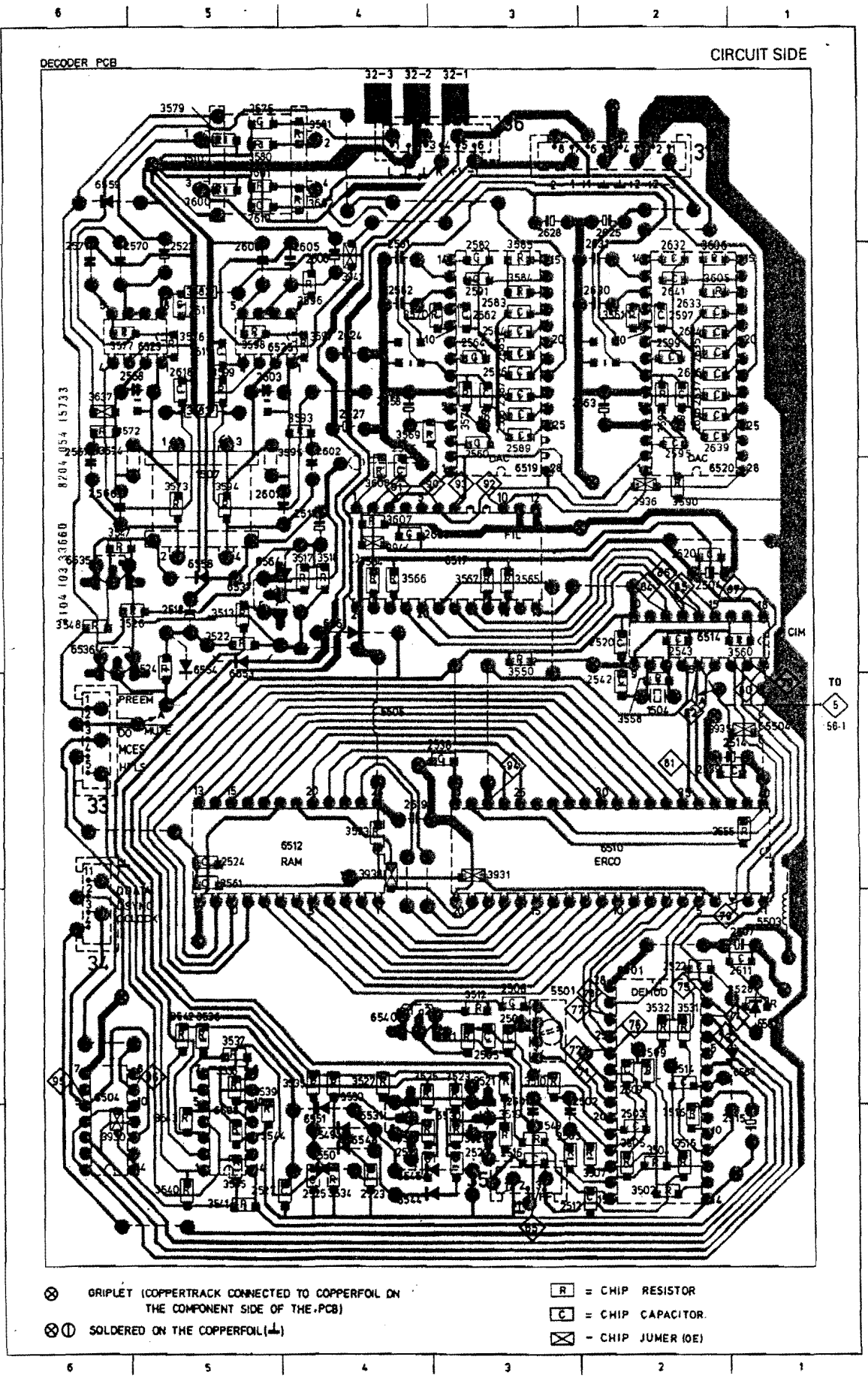
⊗ ◯ SOLDERED ON THE COPPERFOIL (⊥)

R = CHIP RESISTOR

C = CHIP CAPACITOR

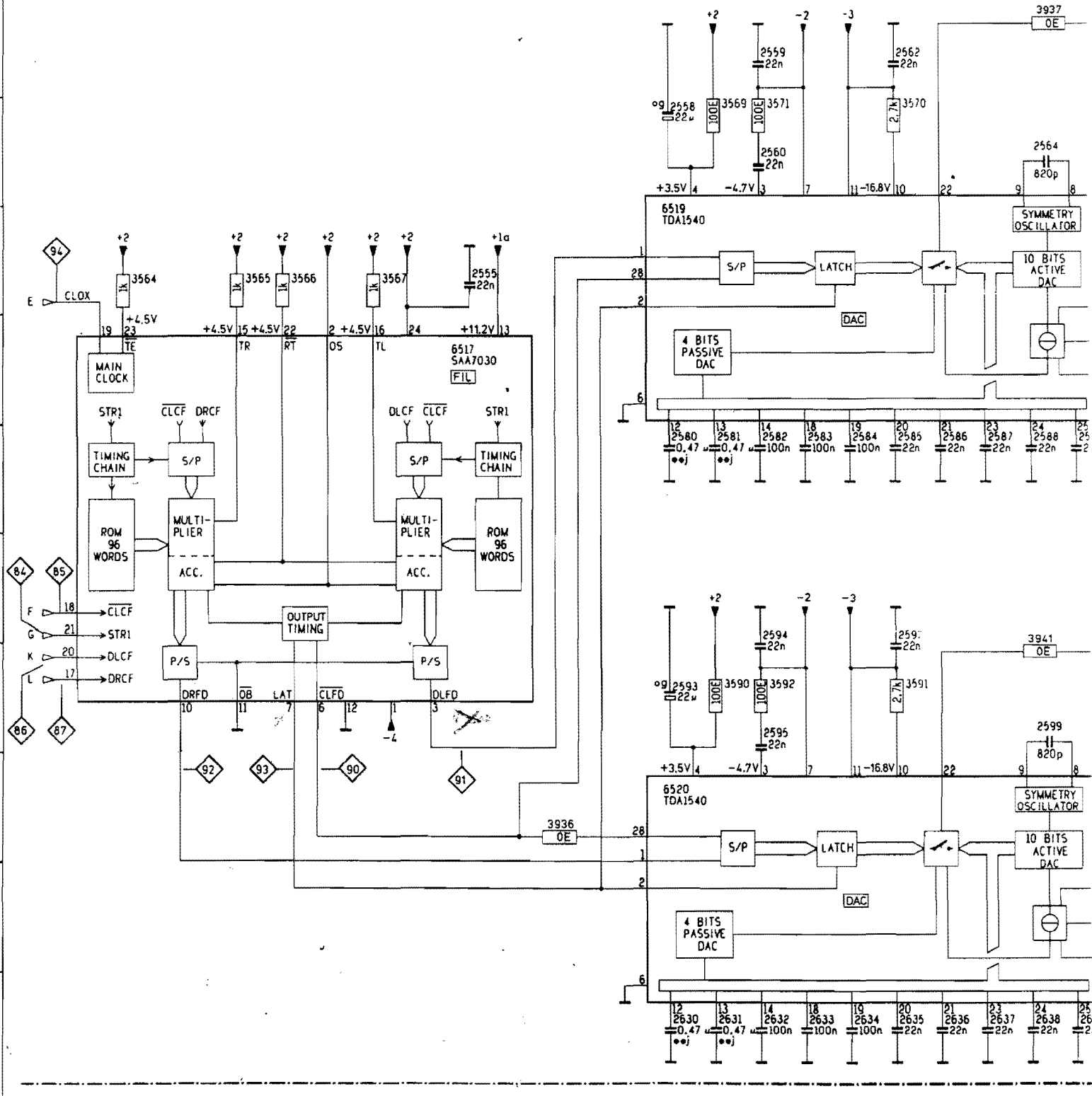
⊠ = CHIP JUMPER (0E)

3 Decoder

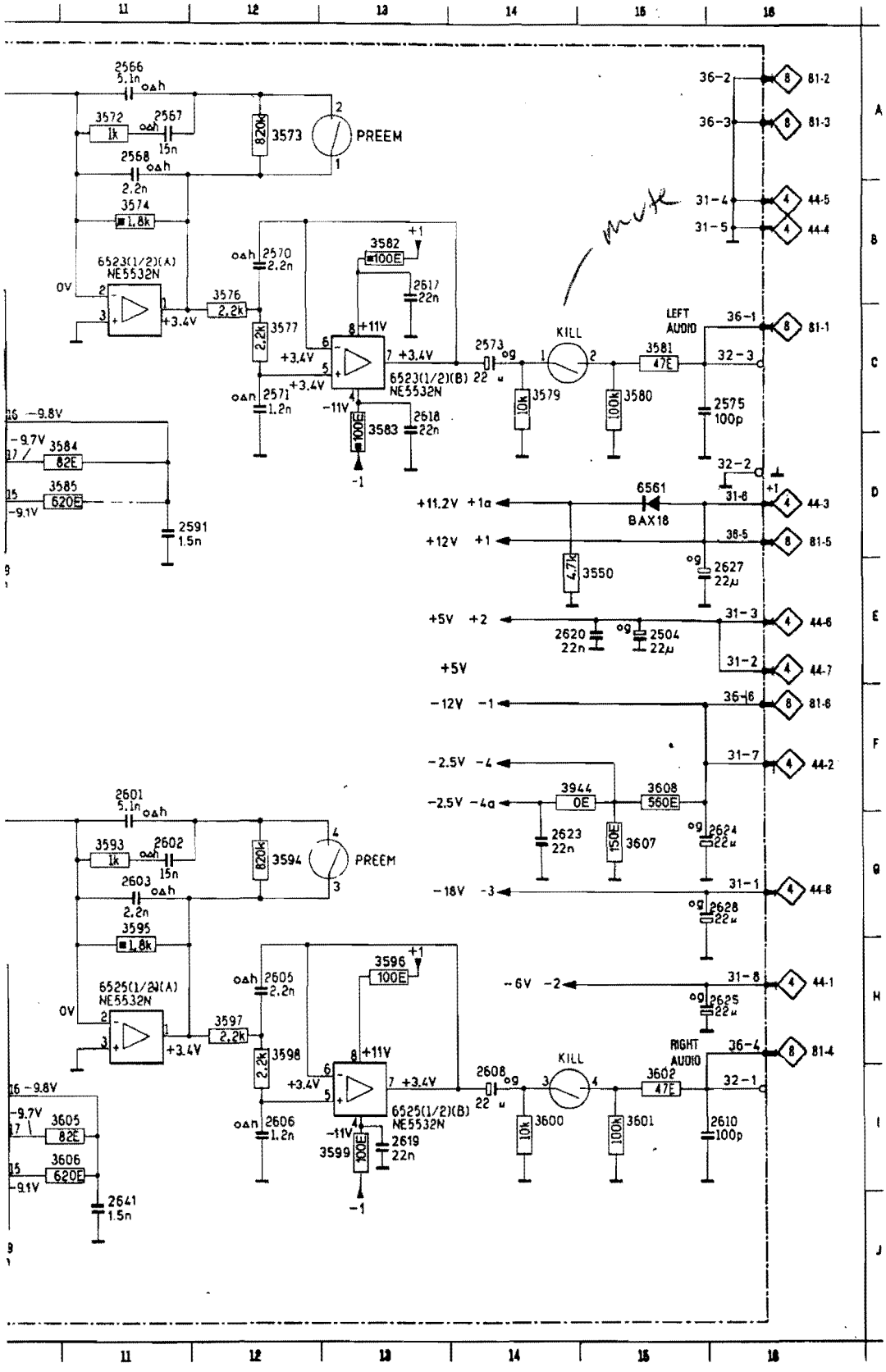

DECODER PCB
CIRCUIT SIDE
32-3 32-2 32-1
6512 RAM
6510 ERCO
DEMOD
CIM
TO 5 56-1
PREEM
DAC
FIL
GRIPLET (COPPERTRACK CONNECTED TO COPPERFOIL ON THE COMPONENT SIDE OF THE PCB)
SOLDERED ON THE COPPERFOIL
R = CHIP RESISTOR
C = CHIP CAPACITOR
= CHIP JUMER (0E)

MCD 7000 DAC

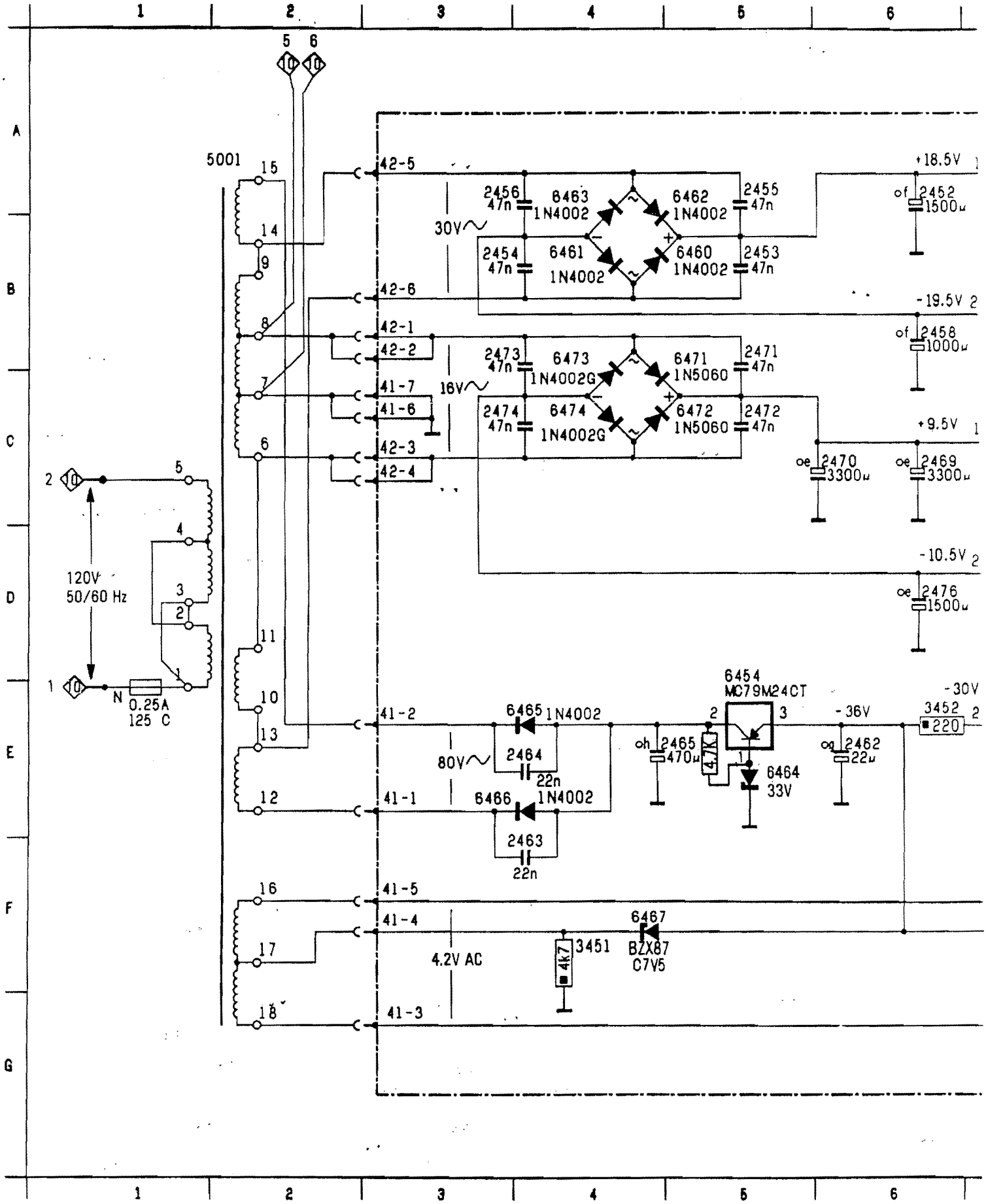
2504 E15 2555 C4 2560 B7 2562 A8 2564 B10 2568 A11 2570 B12 2571 C12 2573 C14 2575 C16 2580 E6 2581 E7 2582 E7 2583 E7 2584 E8 2585 E8 2586 E9 2587 E9 2588 E9 2589 E10 2591 E11 2593 G6 2594 G7 2595 G7 2597 G8 2599 G10 2601 G11 2602 G11 2603 G11 2605 H12 2606 I12 2608 I14 2610 I16 2617 B13 2618 C13 2619 I13 2620 E15 2623 G14 2624 G16 2625 H16 2627 E16 2628 G16 2630 J6 2631 J7 2632 J7 2633 J7 2634 J8 2635 J8 2636 J9 2637 J9 2638 J9 2639 J10 2641 J11 3550 E15 3564 C1 3565 C2 3566 C3 3567 C4 3569 B7 3570 B8 3571 B7 3572 A11 3573 A12 3574 B11 3576 B12 3577 C12 3579 C14

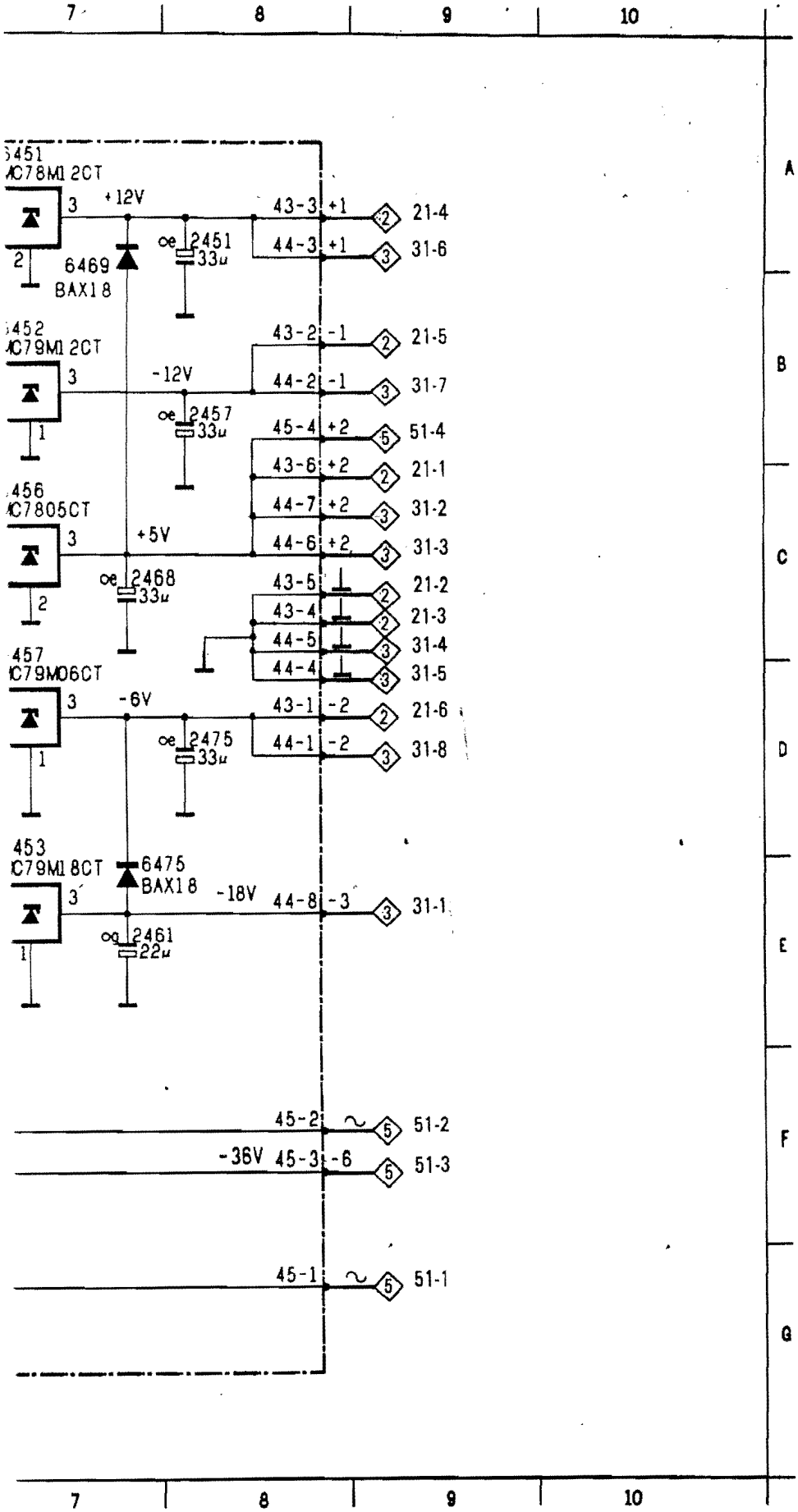


0 C15	3591 G8	3597 M12	3605 I11	6519 C6	6525 I13	3936 H5
1 C15	3592 G7	3598 M12	3606 I11	6520 H6	6561 D15	3937 A10
12 B13	3593 G11	3599 I13	3607 G15	6523 B11		3941 F10
13 D13	3594 G12	3600 I14	3608 F15	6523 C13		3944 F14
14 D11	3595 G11	3601 I15	6517 D4	6525 H11		
15 D11	3596 H13	3602 I15				
10 G7						

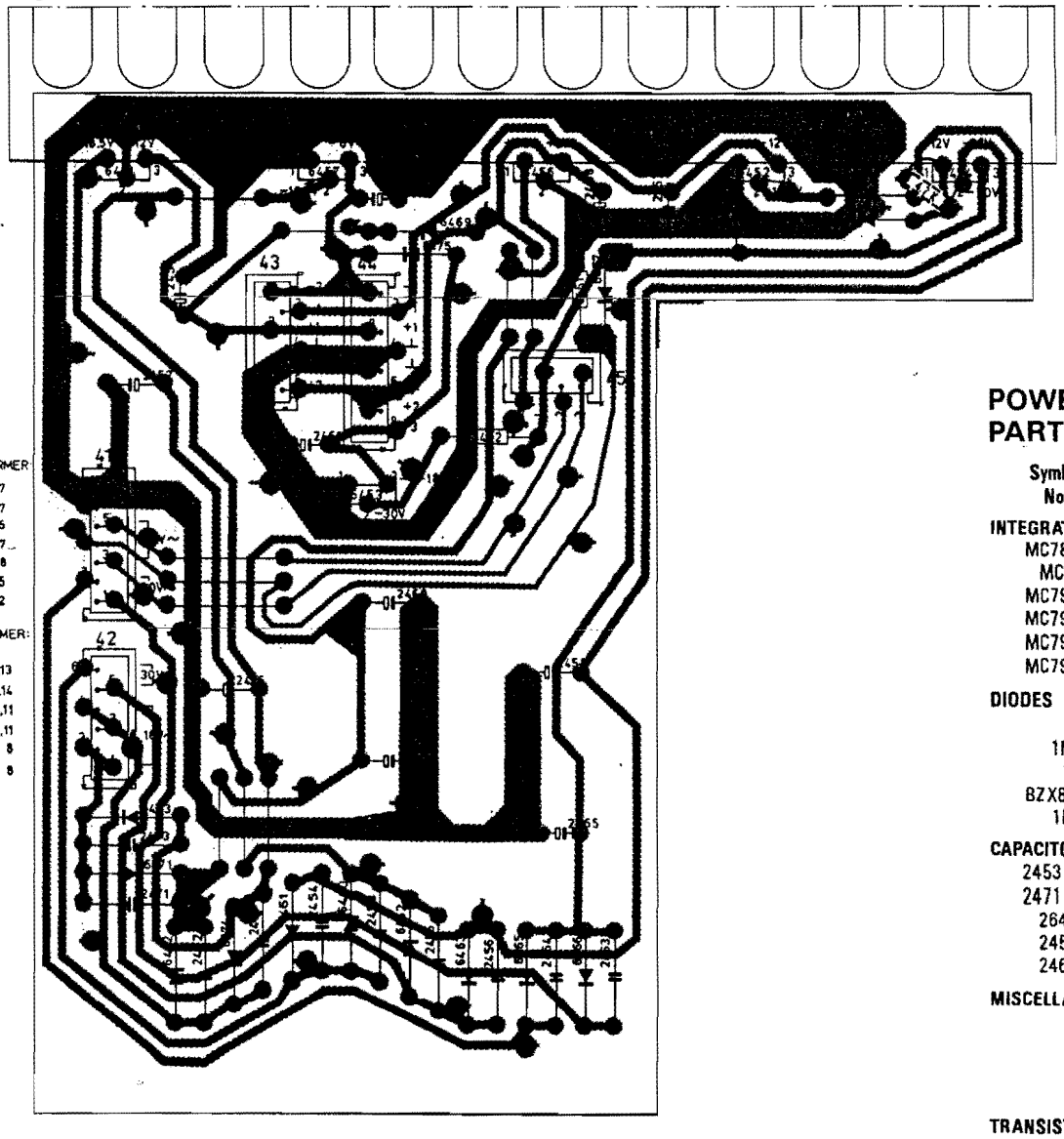


4 Power Supply




7
8
9
10
3451
MC78M12CT
3
+12V
2
6469
BAX18
2451
33µ
43-3 +1
44-3 +1
21-4
31-6
3452
MC79M12CT
3
-12V
1
2457
33µ
43-2 -1
44-2 -1
21-5
31-7
3456
MC7805CT
3
+5V
2
2468
33µ
45-4 +2
43-6 +2
44-7 +2
44-6 +2
51-4
21-1
31-2
31-3
3457
MC79M06CT
3
-6V
1
2475
33µ
43-5 +2
43-4 +2
44-5 +3
44-4 +3
43-1 -2
44-1 -2
21-2
21-3
31-4
31-5
21-6
31-8
3453
MC79M18CT
3
6475
BAX18
-18V
1
2461
22µ
44-8 -3
31-1
45-2
-36V 45-3 -6
45-1
51-2
51-3
51-1
A
B
C
D
E
F
G
2451 A 8
2452 A 6
2453 A 5
2454 A 3
2455 B 5
2456 B 3
2457 B 8
2458 B 6
2461 E 7
2462 E 6
2463 F 4
2464 E 4
2465 E 5
2468 C 7
2469 C 6
2470 C 6
2471 B 5
2472 C 5
2473 B 3
2474 C 3
2475 D 8
2476 D 6
3451 F 4
3452 E 6
6460 A 5
6461 A 4
6462 B 5
6463 B 4
6464 E 5
6465 E 4
6466 E 3
6467 F 4
6469 A 7
6471 B 5
6472 C 5
6473 B 4
6474 C 4
6475 E 8

POWER SUPPLY PCB

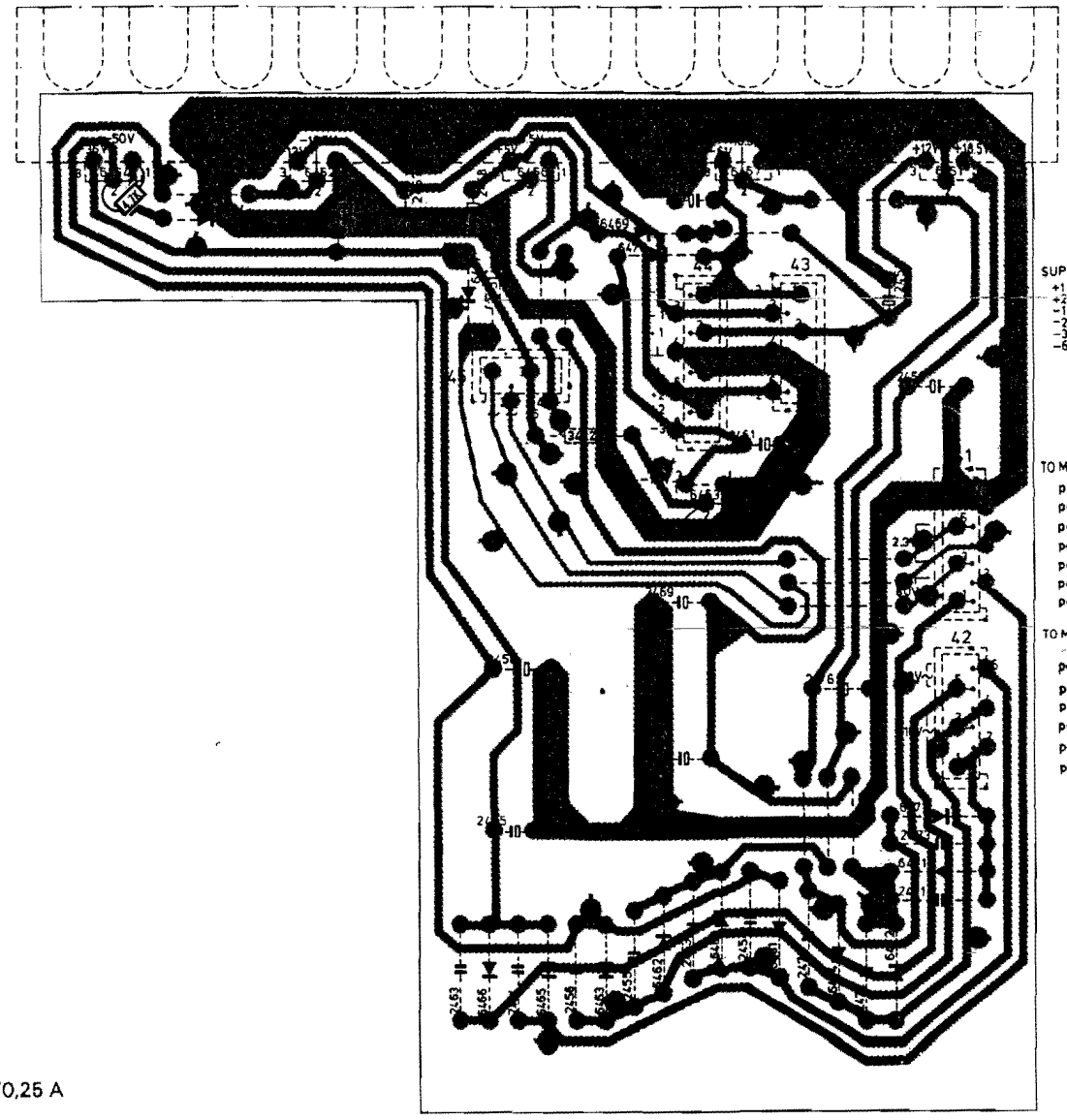


COMPONENT SIDE

POWER SUPPLY PARTS LIST

Symbol No.	Part No.
INTEGRATED CIRCUITS	
MC78M12CT	P586 5322 209 86176
MC7805CT	P586 4822 209 80891
MC79M06CT	P586 4822 209 82056
MC79M12CT	P586 4822 209 82065
MC79M18CT	P586 4822 209 82054
MC79M24CT	P586 4822 209 82055
DIODES	
BAX18	P586 4822 130 34121
1N4002G	P586 5322 130 30684
1N5060	P586 4822 130 31164
BZX87-C7V5	P586 5322 130 34596
1N5257B	070121
CAPACITORS	
2453 ÷ 2456 2471 ÷ 2474	P586 4822 122 10288
2643,2464	P586 4822 122 10289
2452,2476	P586 4822 124 21471
2469,2470	P586 4822 124 21469
MISCELLANEOUS	
	P586 4822 255 40181
	P586 4822 492 63039
	P586 4822 146 20904
	P586 4822 252 20007
TRANSISTORS	
MJE 2955	132173

POWER SUPPLY PCB



Description

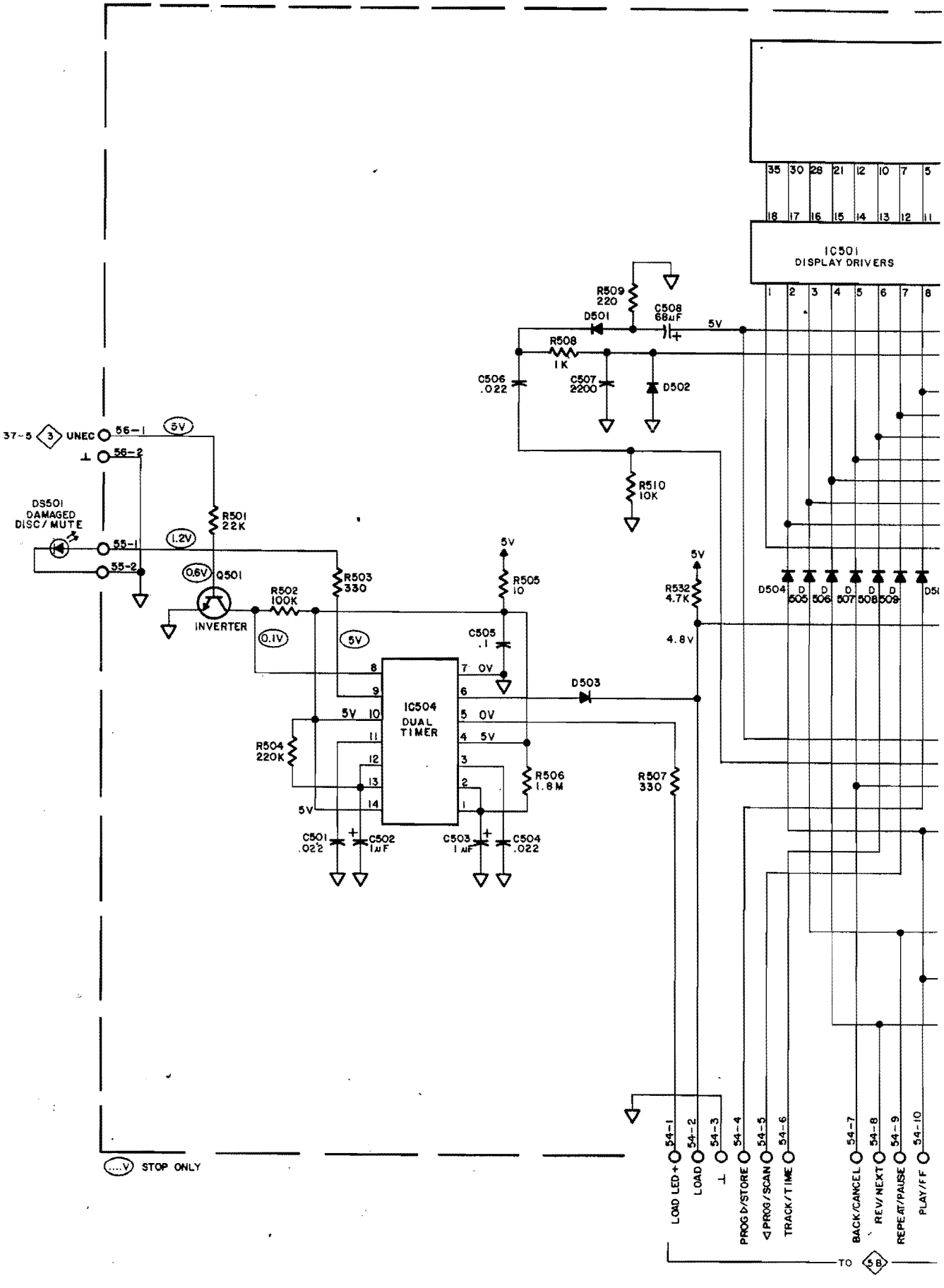
33 V Zener

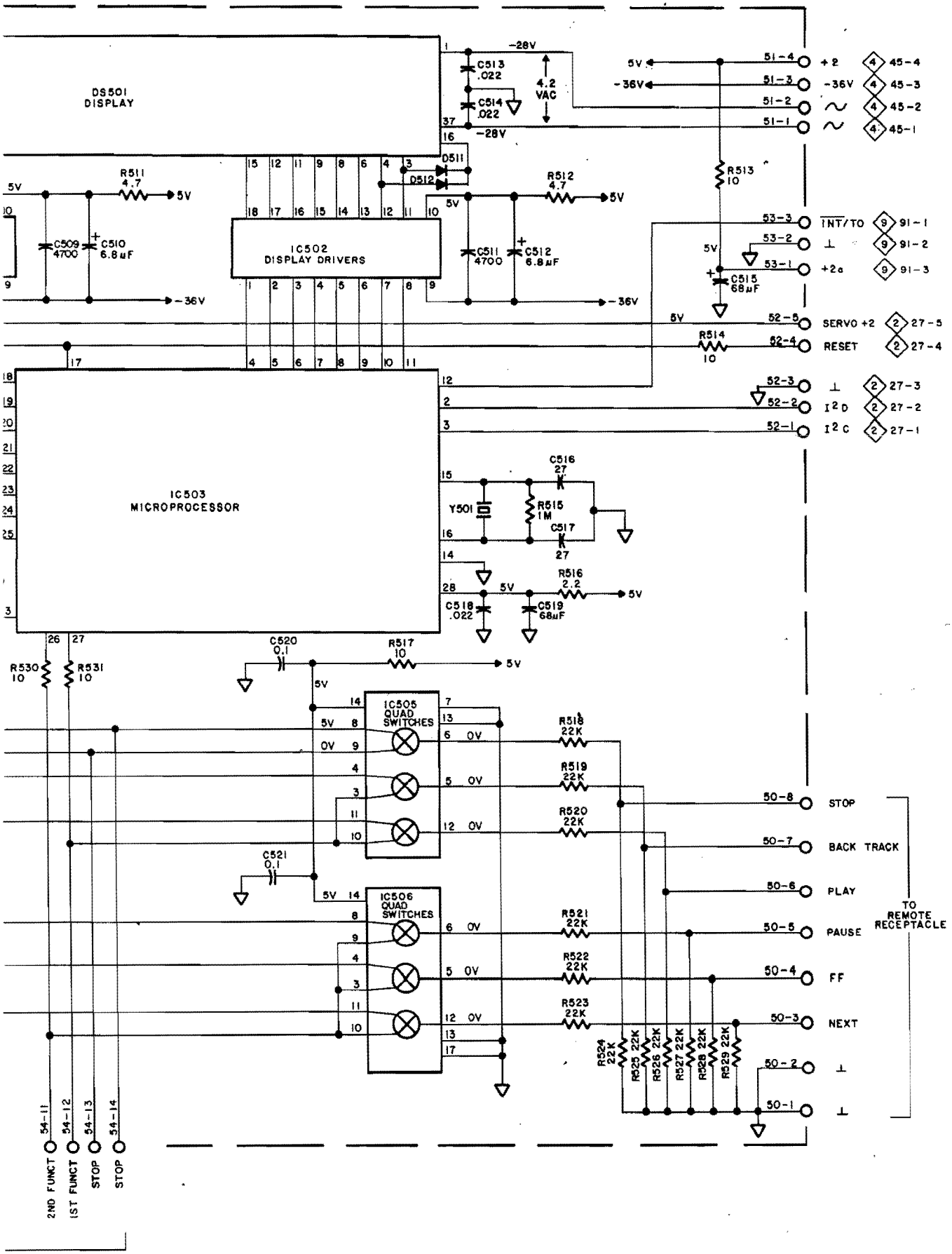
47 nF - 50 V

22 nF - 100 V
1500 μF - 25 V
3300 μF - 16 V

Mica washer
Spring clip
Mains transformer 5001
Transformer fuse 125°C/0,25 A

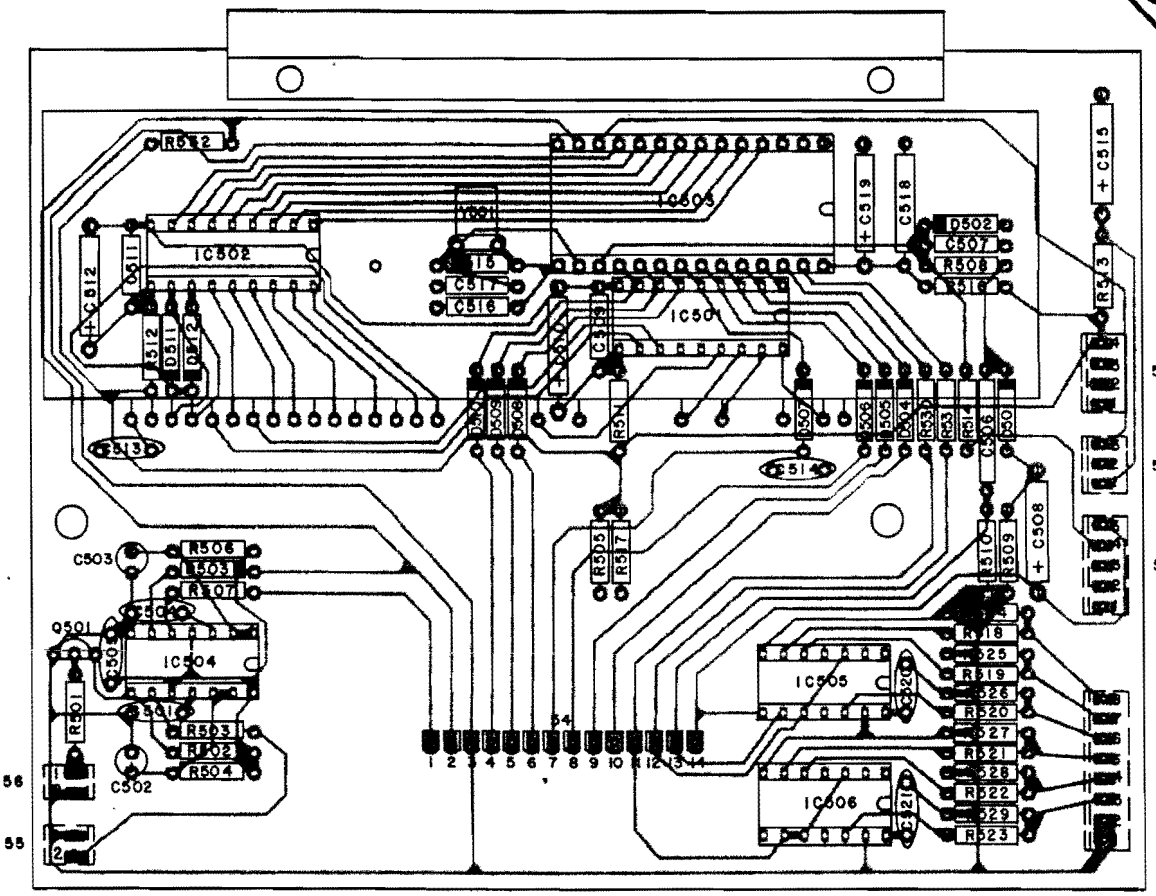
5A Control and Display




DS501
DISPLAY
IC502
DISPLAY DRIVERS
IC503
MICROPROCESSOR
IC505
QUAD
SWITCHES
IC506
QUAD
SWITCHES
-28V
4.2
VAC
C513
.022
C514
.022
R511
4.7
R512
4.7
R513
10
R514
10
C509
4700
C510
6.8µF
C511
4700
C512
6.8µF
C515
68µF
C516
27
C517
27
R515
1M
Y501
R516
2.2
C518
.022
C519
68µF
C520
0.1
C521
0.1
R517
10
R518
22K
R519
22K
R520
22K
R521
22K
R522
22K
R523
22K
R524
22K
R525
22K
R526
22K
R527
22K
R528
22K
R529
22K
R530
10
R531
10
D511
D512
5V
-36V
0V
51-4 +2
51-3 -36V
51-2
51-1
53-3 INT/TO
53-2 ⊥
53-1 +2a
52-5 SERVO +2
52-4 RESET
52-3 ⊥
52-2 I²D
52-1 I²C
50-8 STOP
50-7 BACK TRACK
50-6 PLAY
50-5 PAUSE
50-4 FF
50-3 NEXT
50-2 ⊥
50-1 ⊥
TO
REMOTE
RECEPTACLE
54-11 2ND FUNCT
54-12 1ST FUNCT
54-13 STOP
54-14 STOP
45-4
45-3
45-2
45-1
91-1
91-2
91-3
27-5
27-4
27-3
27-2
27-1

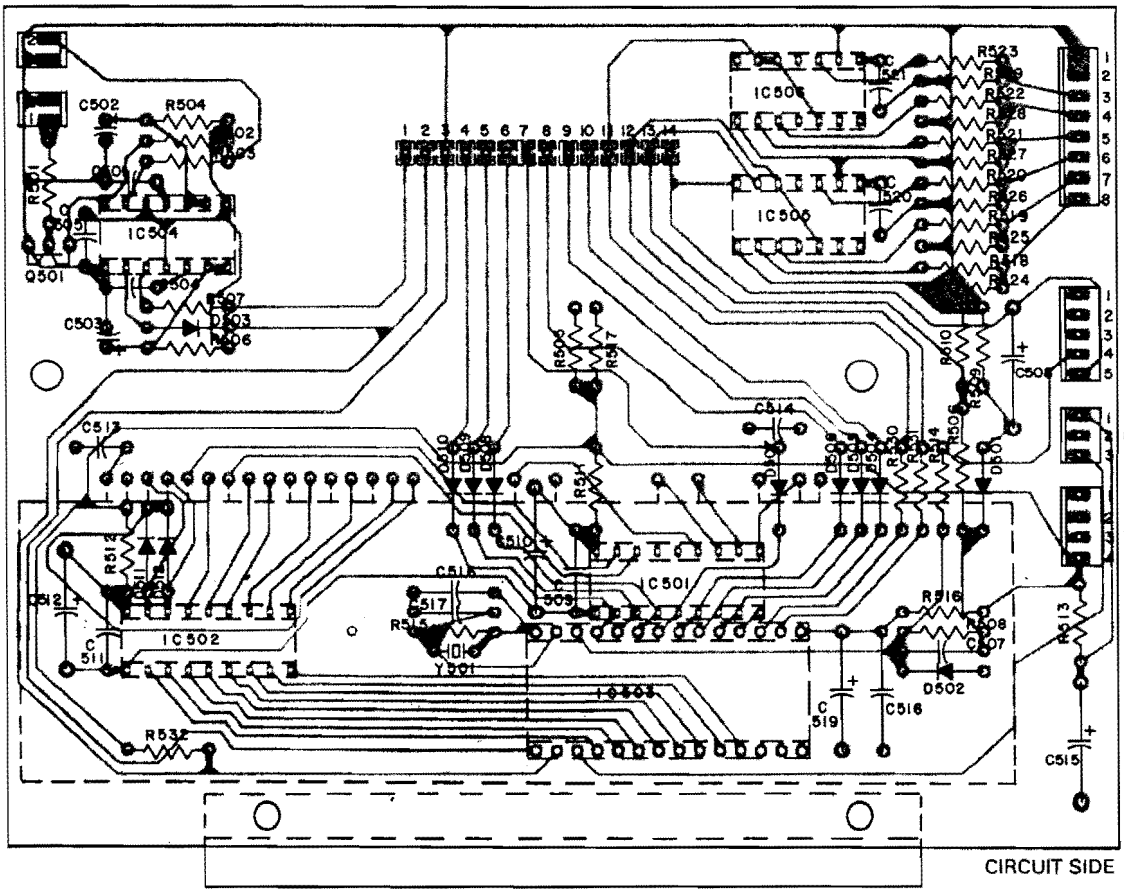
CONTROL AND DISPLAY

5A



COMPONENT SIDE

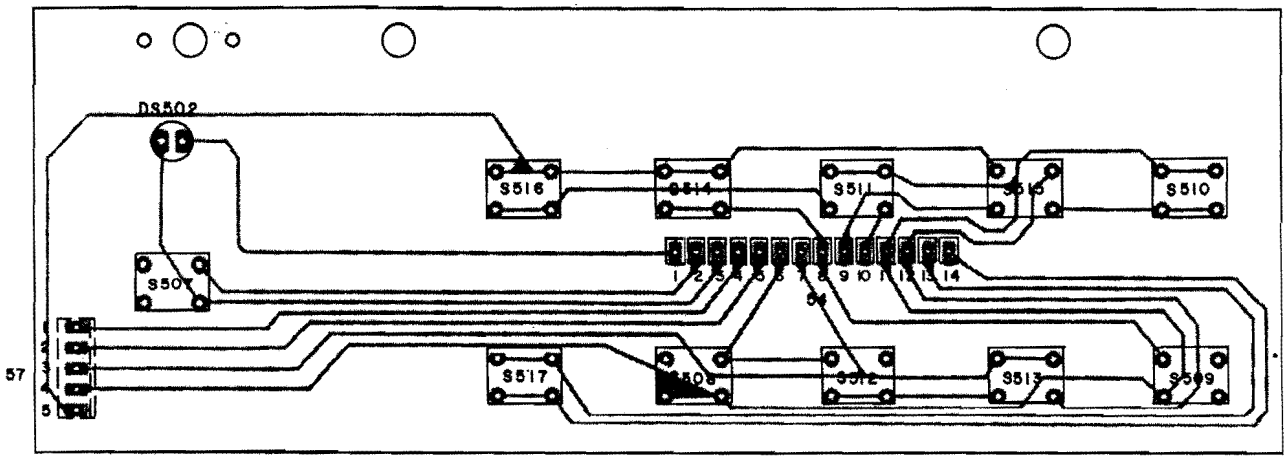
CONTROL AND DISPLAY



CIRCUIT SIDE

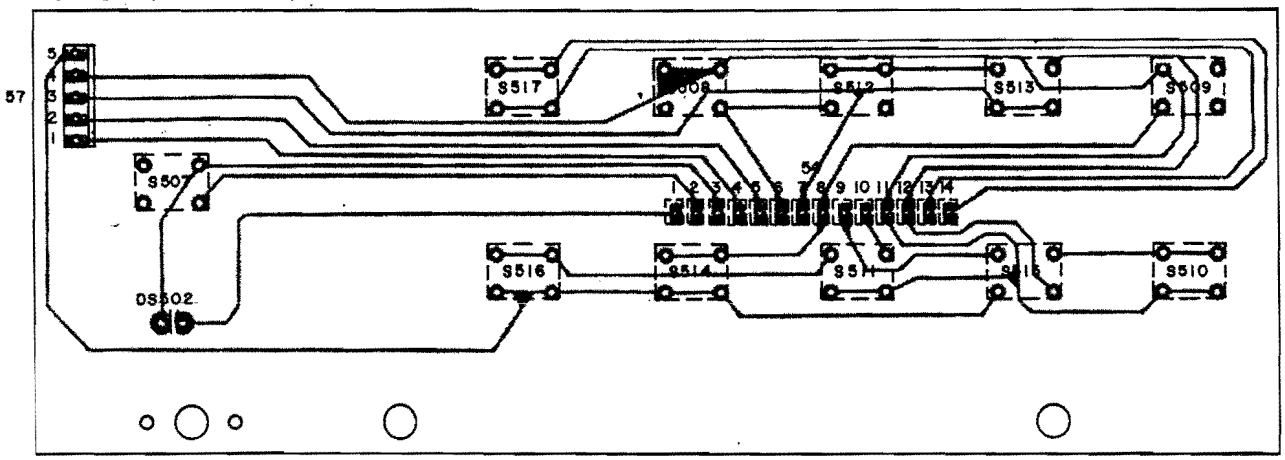
5B Function Keyboard

FUNCTION KEYBOARD



COMPONENT SIDE

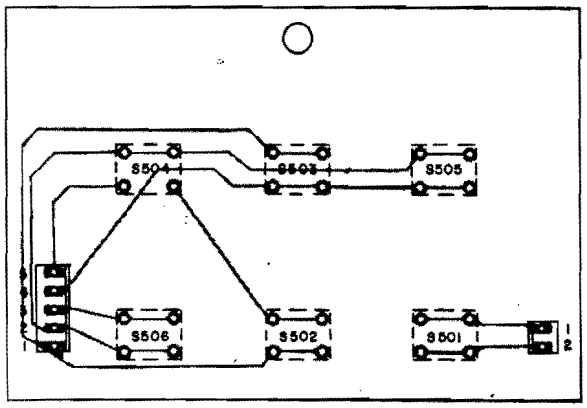
FUNCTION KEYBOARD



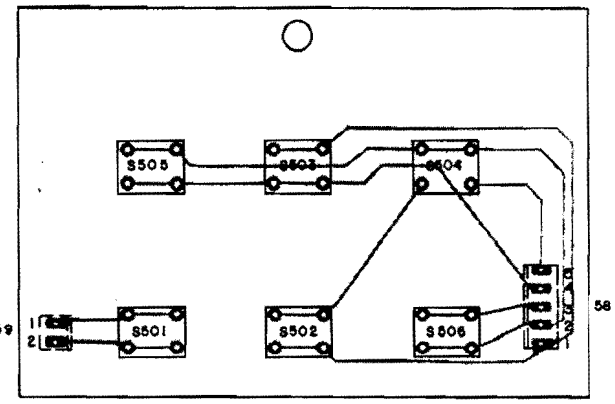
CIRCUIT SIDE

5C

MEMORY KEYBOARD



COMPONENT SIDE

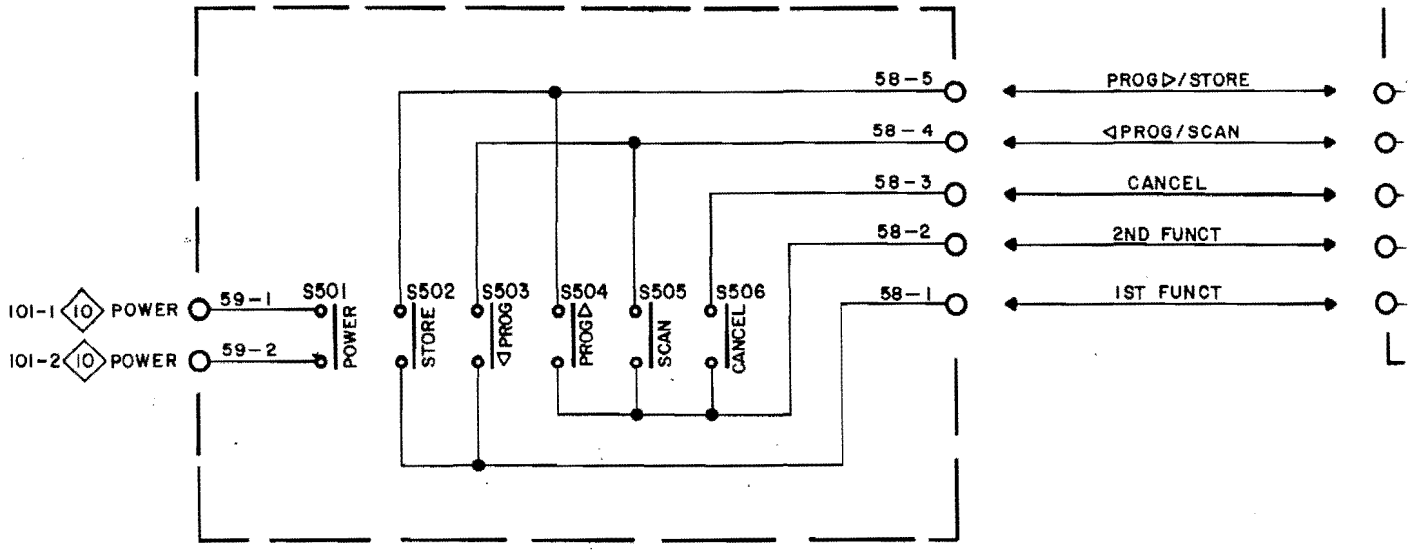


CIRCUIT SIDE

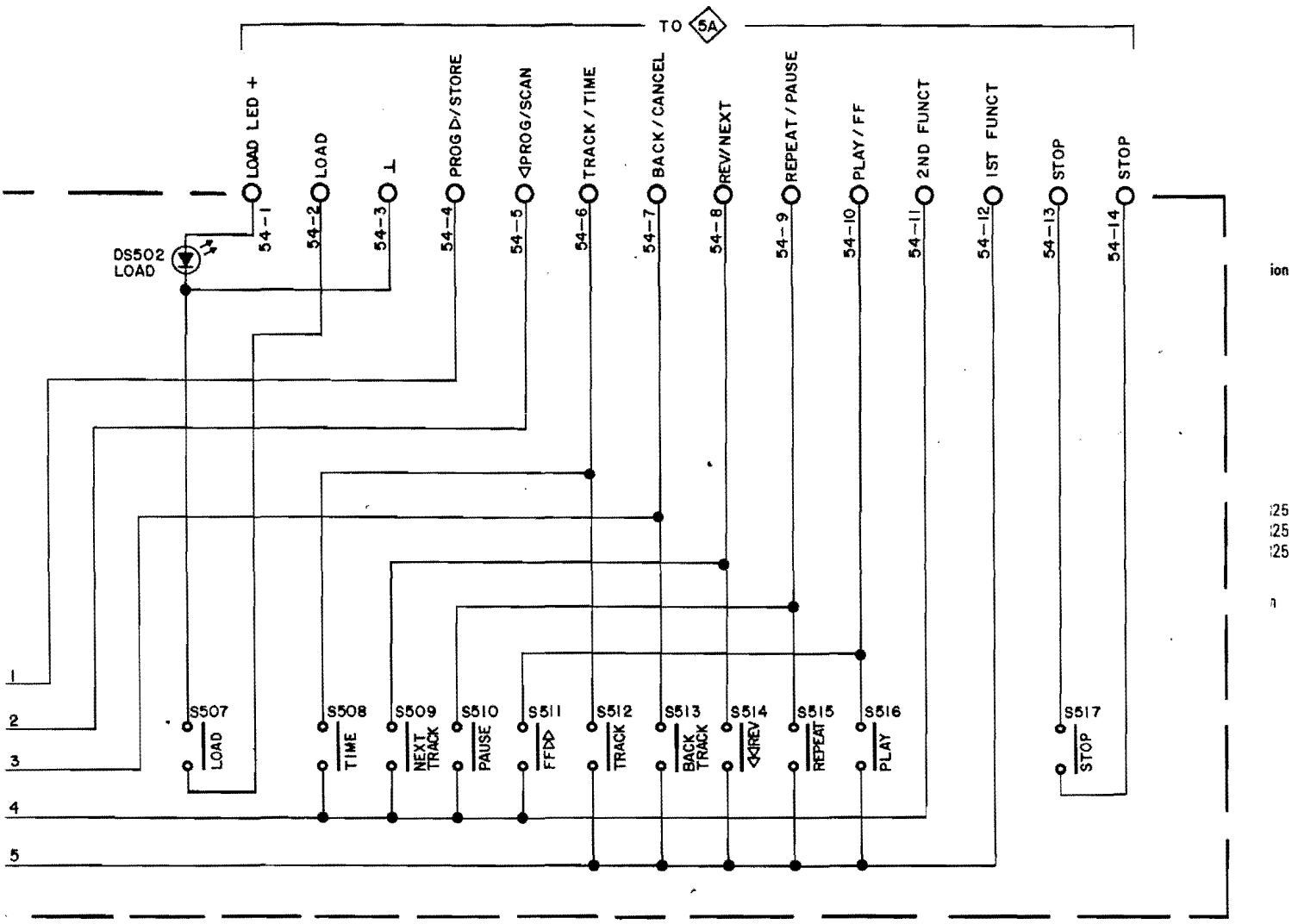
Memory Keyboard 5C

CONTROL/DISPLAY/KEYBOARD PARTS LIST

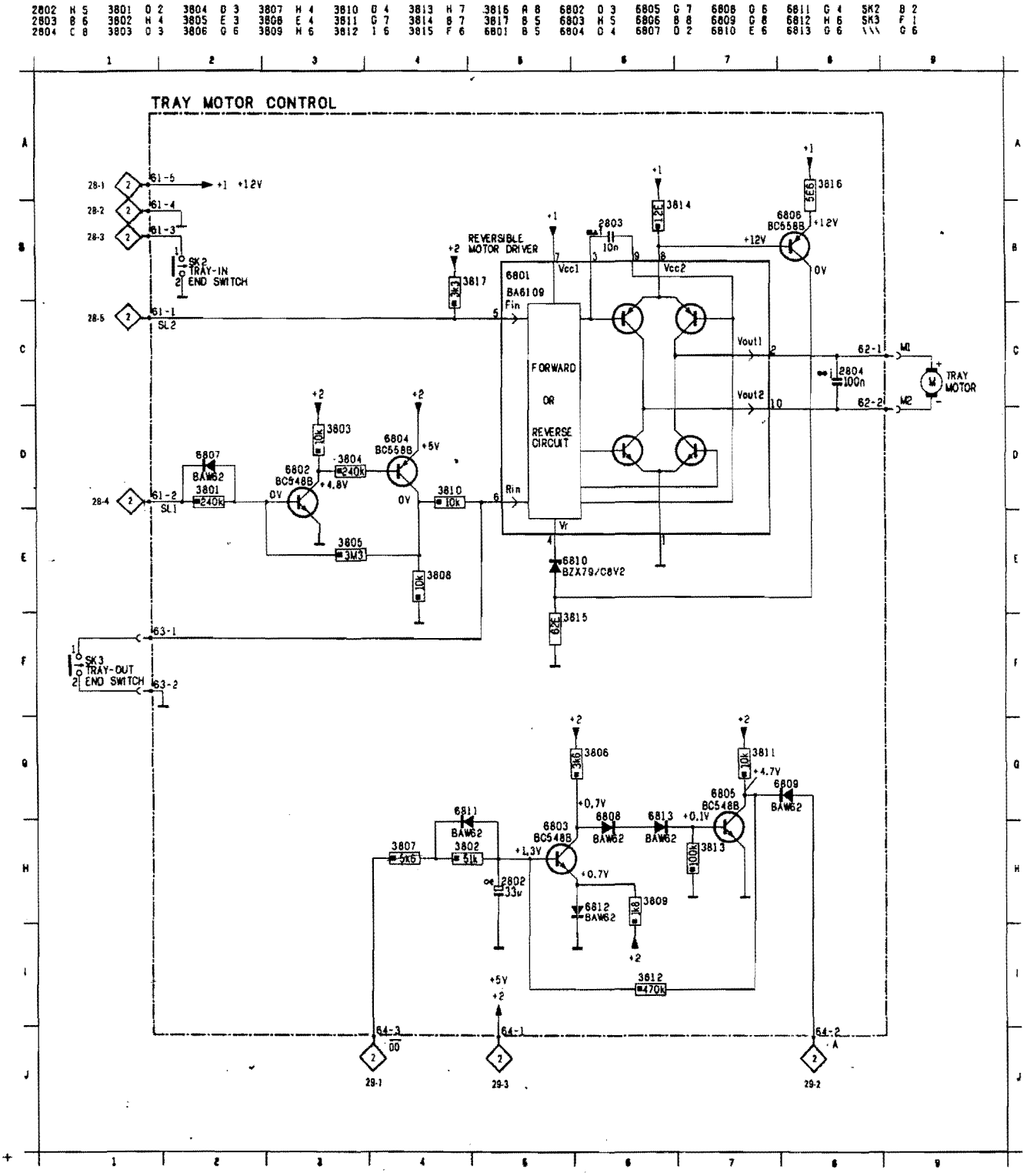
Symbol No.	Part No.	Description
CRYSTAL		
Y501	P586 4822 242 70392	6 MHz
DISPLAY		
DS501	P586 4822 130 90203	FIP20AW18Y
DS502	058078	LED SLP144B red
SWITCHES		
S501 through S517	150050	Tact switch
DIODES		
D501 through D511	070047	IN 4148
INTEGRATED CIRCUITS		
IC501, IC502	P586 5322 209 81493	MSL 915R
IC503	P586 4822 209 10919	MAB 8420P/C033
IC504	133116	NE 556
IC505, IC506	133117	CD 4066



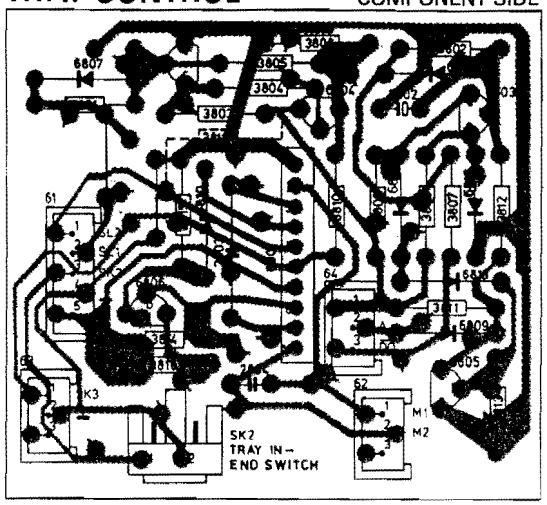
5B Function Keyboard



6 Tray Control

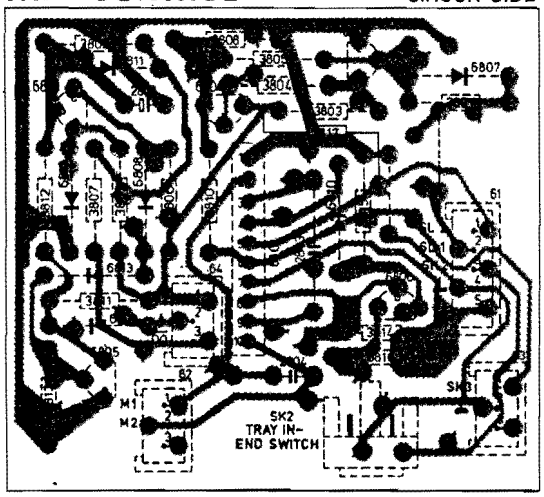


TRAY CONTROL COMPONENT SIDE



SK2	B01
SK3	A01
2802	C03
2803	B02
2804	B01
3801	A03
3802	C03
3803	B03
3804	B03
3805	B03
3806	B02
3807	C02
3808	B03
3809	C02
3810	B02
3811	C02
3812	C02
3813	C01
3814	B02
3815	B02
3816	B02
3817	B03
6801	B02
6802	B03
6803	C03
6804	B03
6805	C01
6806	A02
6807	A03
6808	C02
6809	C02
6810	B02
6811	C03
6812	C02
6813	C02

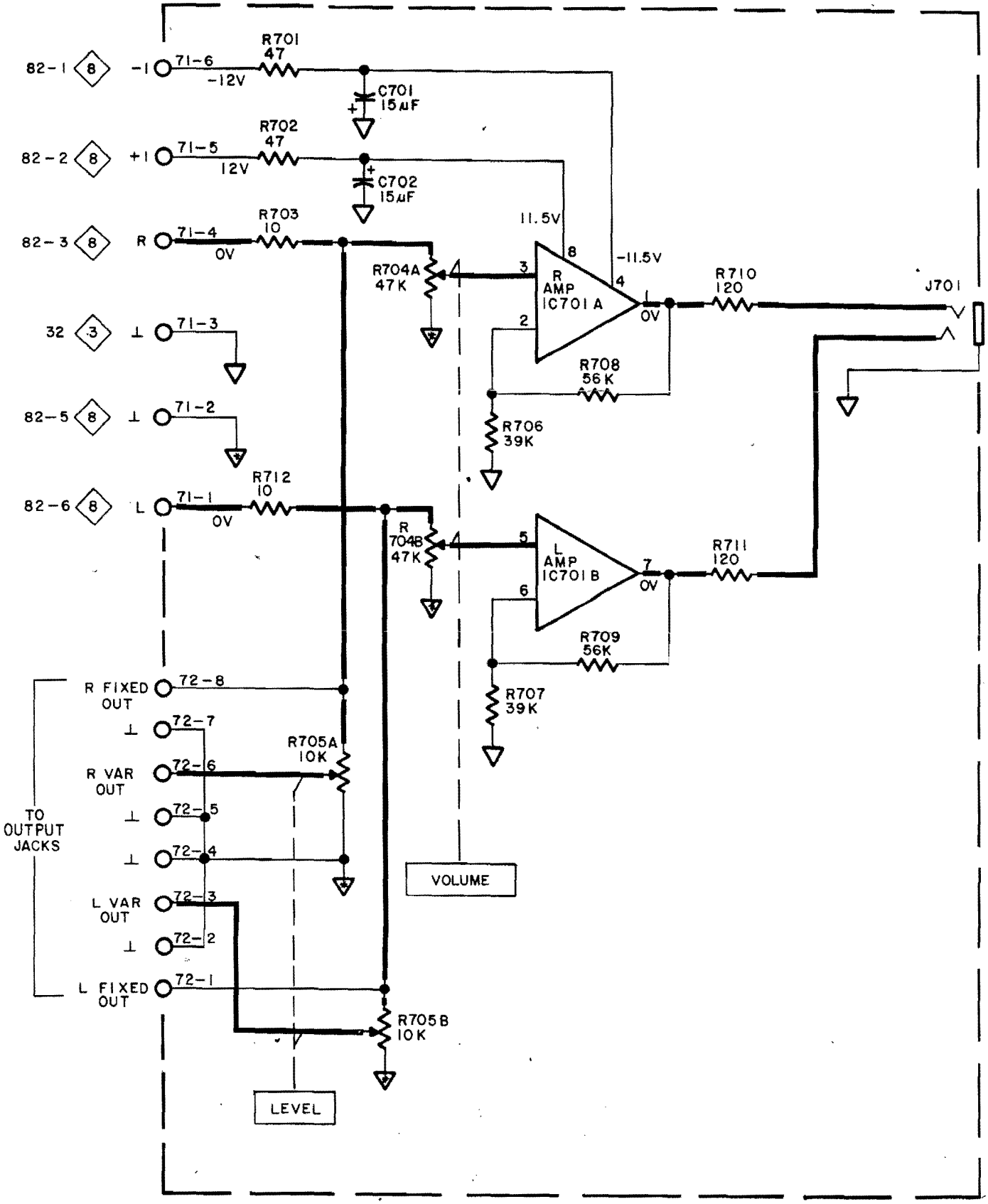
TRAY CONTROL CIRCUIT SIDE



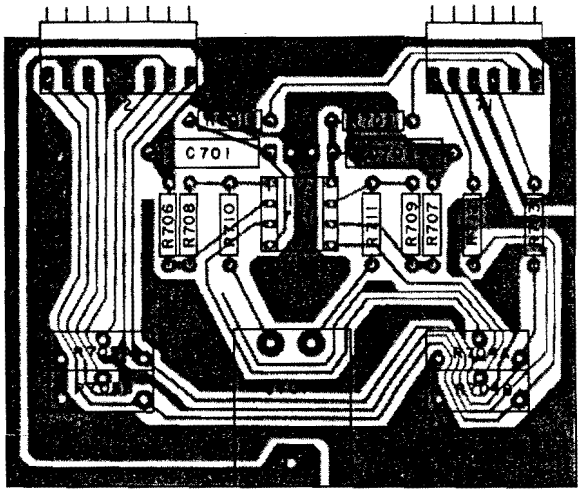
TRAY CONTROL PARTS LIST

Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
6801	P586 4822 209 82059	BA6109
TRANSISTORS		
BC548B	P586 4822 130 40937	
BC558B	P586 4822 130 44197	
DIODES		
BAW62	P586 4822 130 30613	
BZX79-C8V2	P586 4822 130 34382	
RESISTORS		
3814	P586 4822 111 30511	12E - NFR25
3815	P586 4822 111 30529	62E - NFR25
3816	P586 4822 111 30502	5E6 - NFR25
SWITCHES		
SK2	P586 4822 276 10863	Tact switch

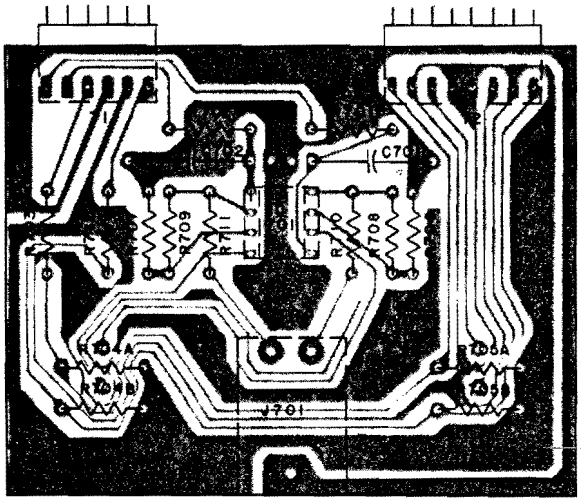
Headphone Amp 7



HEADPHONE AMP



COMPONENT SIDE

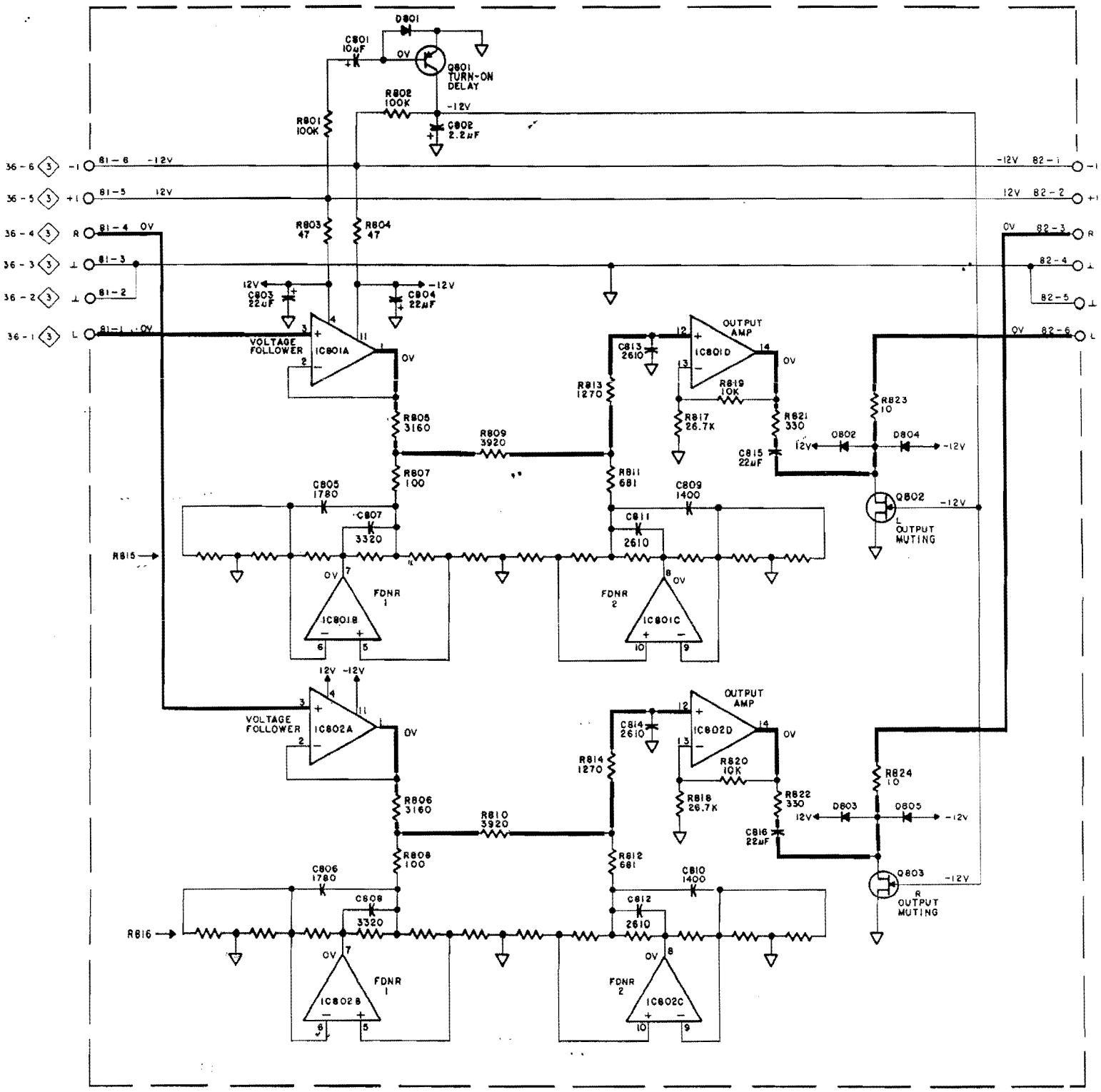


CIRCUIT SIDE

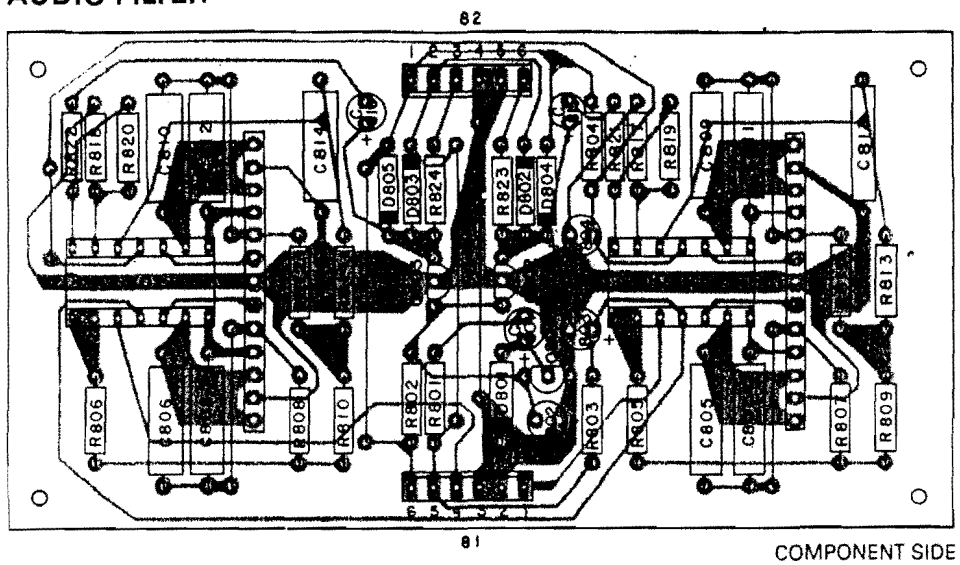
HEADPHONE AMP
PARTS LIST

Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
IC701	P586 4822 209 82362	NJM 4556D
RESISTORS		
R704	P586 4822 101 30527	47k log pot
R705	P586 4822 101 30526	10k log pot

8 Audio Filter

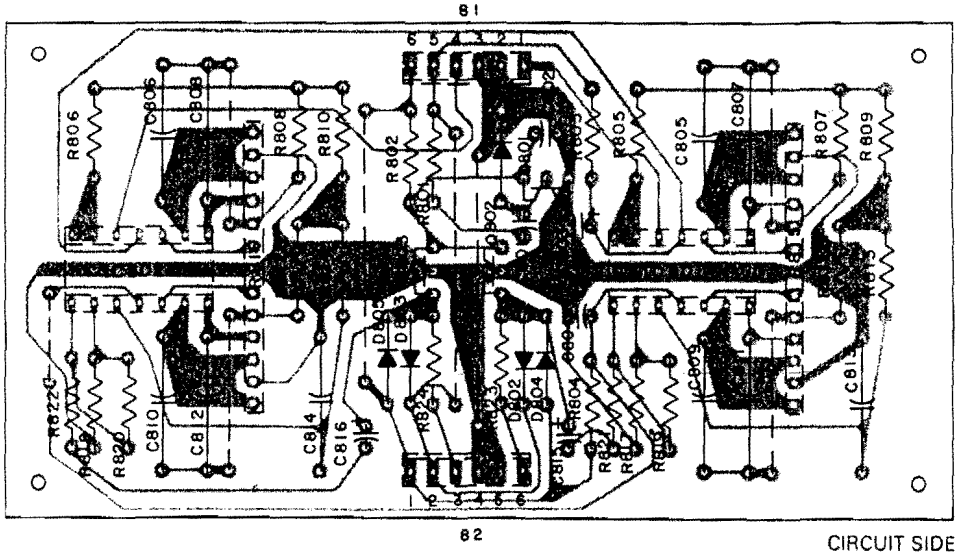


AUDIO FILTER



COMPONENT SIDE

AUDIO FILTER



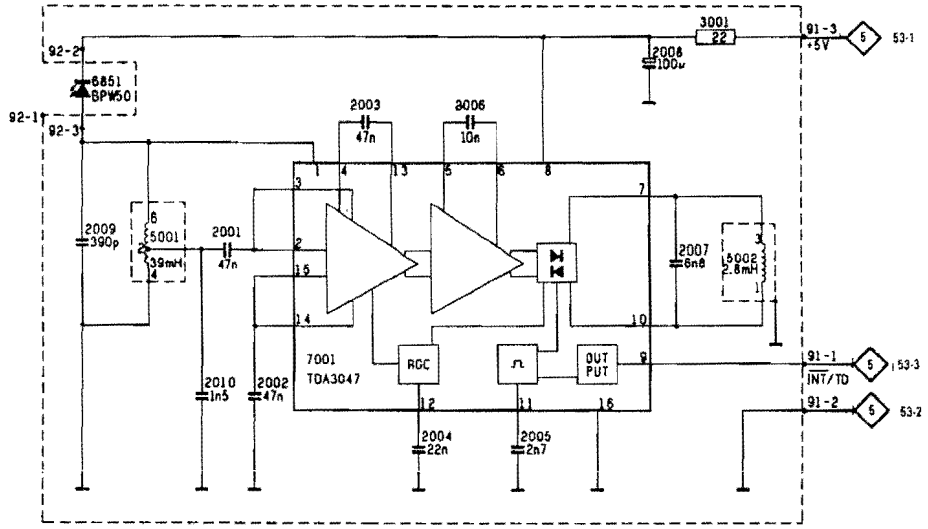
CIRCUIT SIDE

AUDIO FILTER PARTS LIST

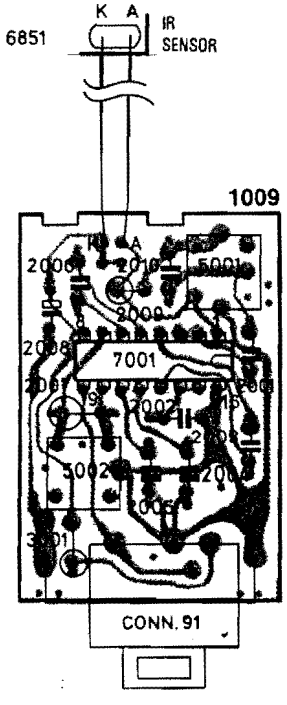
Symbol No.	Part No.	Description
CAPACITORS		
C805, C806	064348	1.78 mF, 2%
C807, C808	064349	3.32 mF, 2%
C809, C810	064351	1.40 mF, 2%
C811, C812, C813, C814	064350	2.61 mF, 2%
DIODES		
D801 to D805	070047	IN4148
INTEGRATED CIRCUITS		
IC801, IC802	133115	TL074CN
RESISTORS		
R805, R806	144199	3160 ohm 1% ¼w
R807, R808	144196	100 ohm 1% ¼w
R809, R810	144198	3920 ohm 1% ¼w
R811, R812	144195	681 ohm 1% ¼w
R813, R814	144197	1270 ohm 1% ¼w
R815, R816	144194	Network
R817, R818	144105	26.7k 1% ¼w
R819, R820	144053	10.0k 1% ¼w
TRANSISTORS		
Q801	132172	MPS A55
Q802, Q803	132222	FET J108

IR Receiver 9

IR RECEIVER CIRCUIT



IR RECEIVER P.C.B.

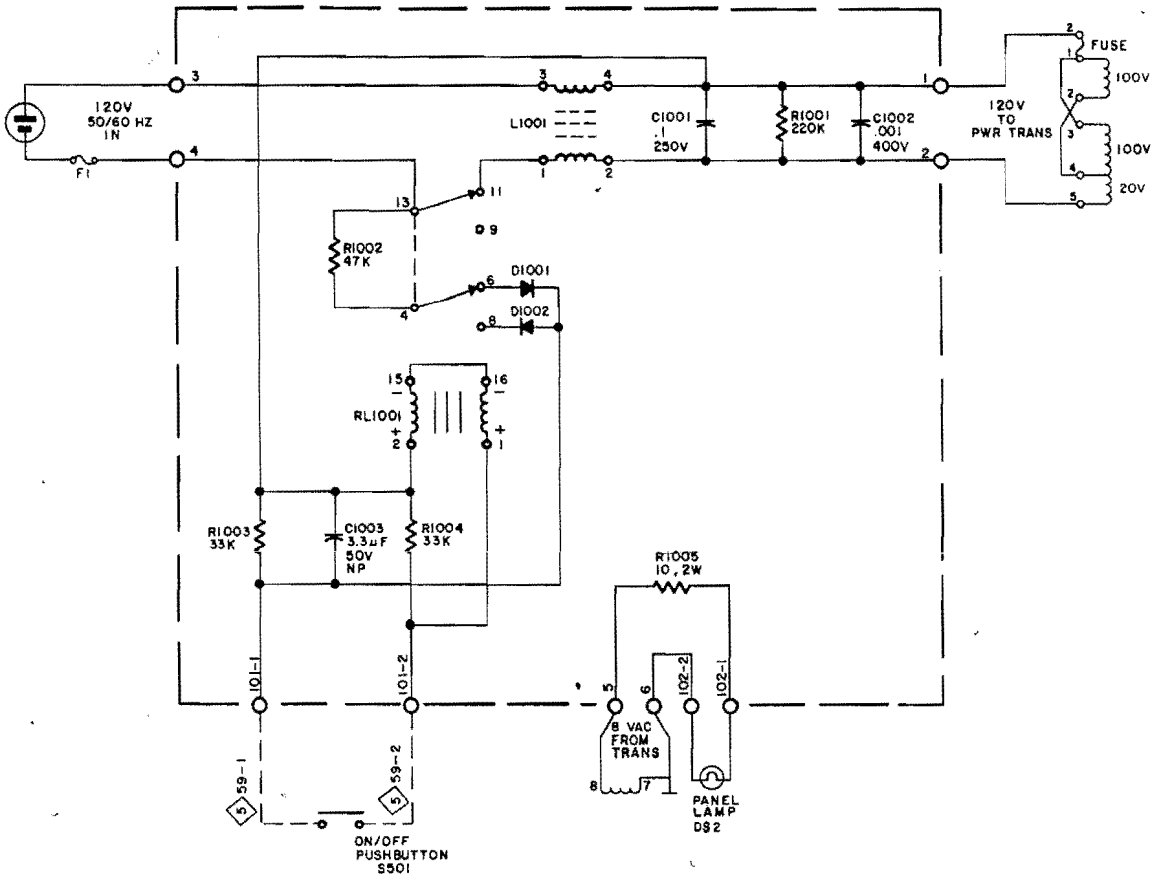


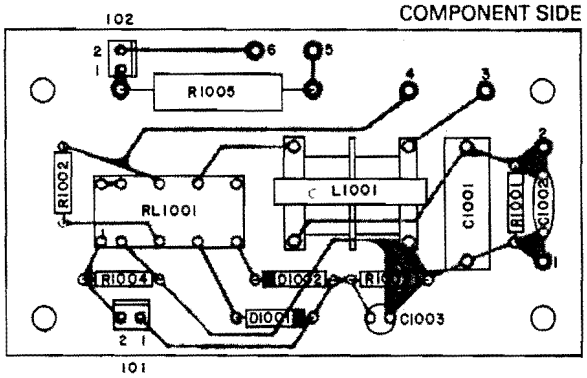
COMPONENT SIDE

IR RECEIVER PARTS LIST

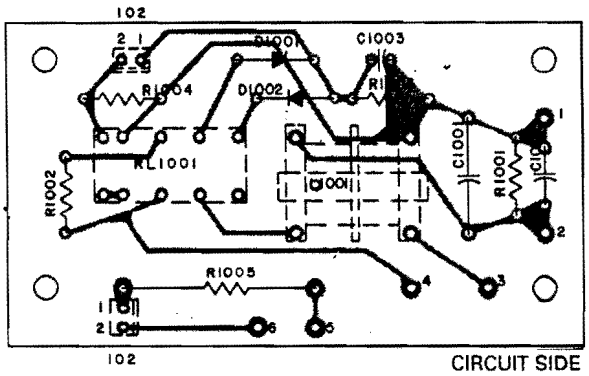
Symbol No.	Part No.	Description
COMPLETE ASSEMBLY		
1009	P586 4822 212 21449	Receiver unit complete
DIODES		
6851	P586 4822 130 32376	BPW 50 Photodiode

10 Power Line Filter/Relay





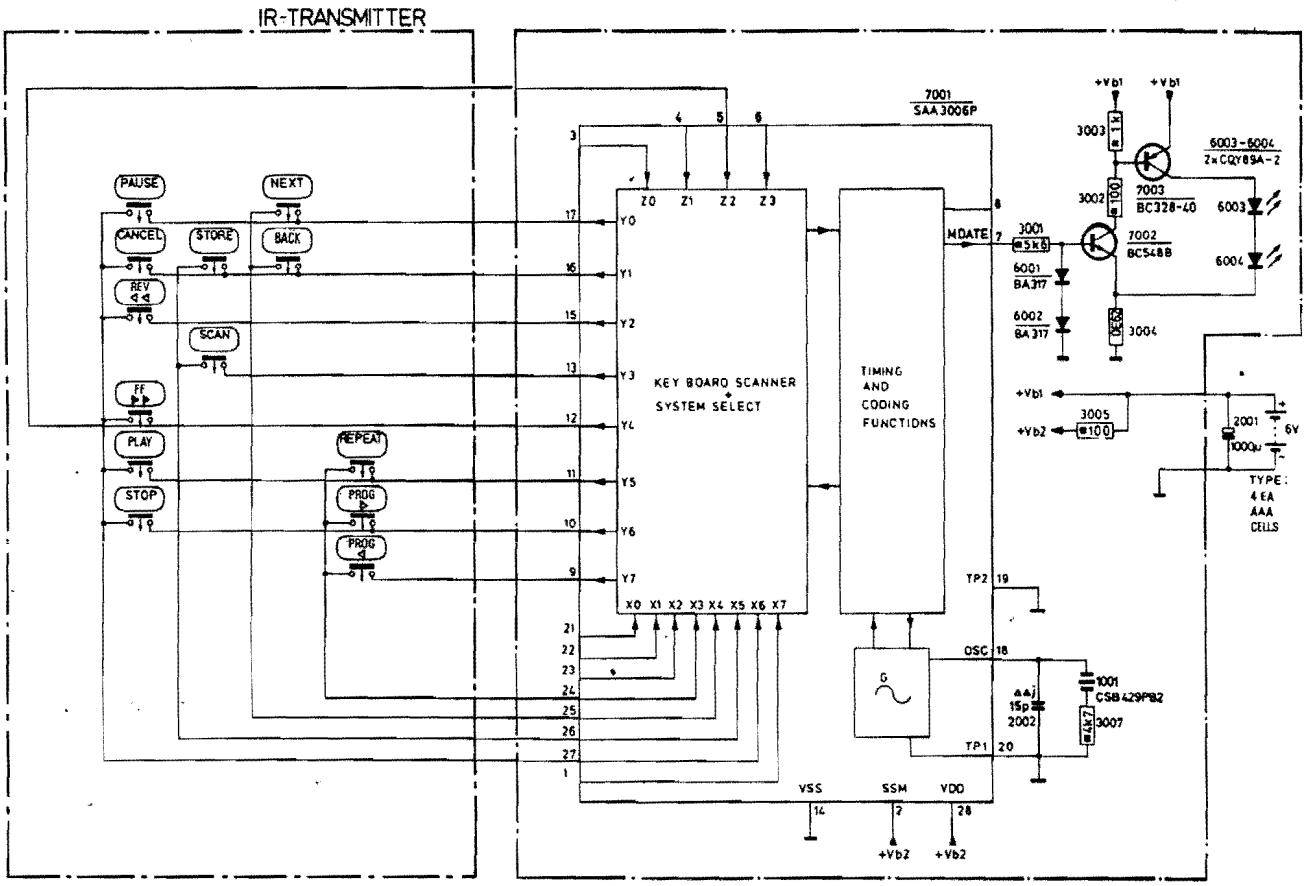
POWER LINE FILTER/RELAY

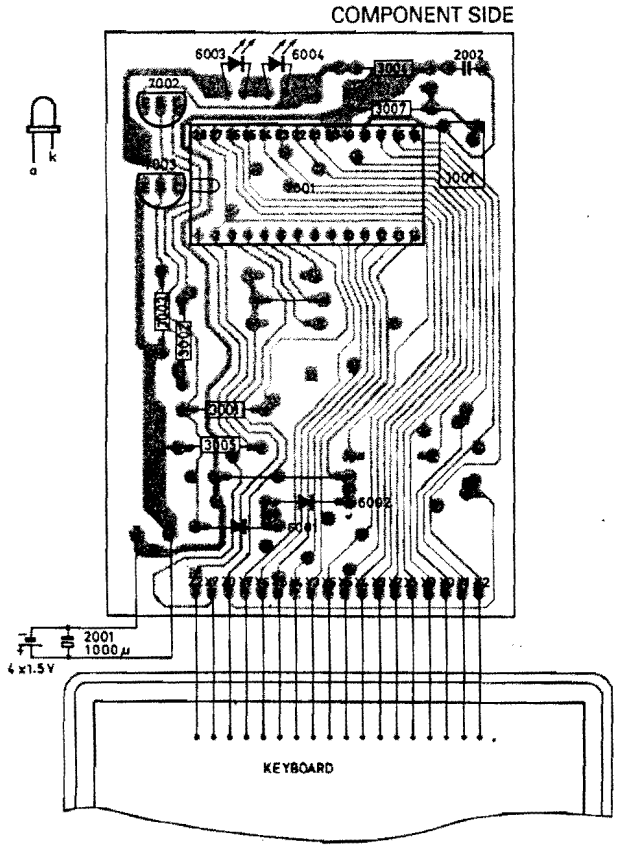


POWER LINE FILTER/RELAY PARTS LIST

Symbol No.	Part No.	Description
CAPACITORS		
C1001	P586 5322 121 44302	100 mF 250V
C1002	P586 4822 122 40368	1 mF 400V
C1003	066277	3.3 μF 50V Non-polar elec.
COIL		
L1001	P586 4822 157 51576	2 x 25 mH
DIODES		
D1001, D1002	070031	400 PIV 1.5A
RELAY		
RL1001	087037	Latching relay

Remote Control Transmitter 11





TRANSMITTER PARTS LIST

Symbol No.	Part No.	Description
INTEGRATED CIRCUITS		
SAA3006P	P586 4822 209 81891	
TRANSISTORS		
BC328-40	P586 4822 130 41715	
BC548B	P586 4822 130 40937	
DIODES		
BA317	P586 4822 130 30847	
CQY89A/11	P586 4822 130 31332	
CAPACITORS		
2001	P586 4822 124 21341	100µF 8 V
CRYSTALS		
1001	P586 4822 242 70675	CSB429PB2

Service Tests and Adjustments

A. CONTROL PERFORMANCE TEST (See page 51 for disk 5A ordering information)

	ACTION	NORMAL RESPONSE
1.	Press POWER	• All 20 track bars light in display • DD/M (DAMAGED DISC/MUTE) lights
2.	Press LOAD and load DISC 5A	• Load light operates on open and close • Timer reads 59.42 • TIME block lights • TOT (total) lights • All 20 track bars light
3.	Press PLAY	• Track bar 1 brightens • Timer starts counting • DD/M light goes off • TOT changes to REL (relative)
4.	Press and hold ◀◀ REV	• Timer starts counting downward • DD/M light lights • ERROR block lights when timer reaches 0.
5.	Press and hold ▶▶ FF until track 5 is bright	• Timer starts counting upward • As higher track bar goes bright, lower track bar goes off
6.	Press REPEAT Press REPEAT again to resume	• REPEAT block lights • Lower track bars go on
7.	Press PAUSE Press PAUSE again to resume	• PAUSE block lights • Timer stops counting • Audio mutes
8.	Press NEXT TRACK	• Next higher track bar brightens • Timer starts count from 0
9.	Press BACK TRACK	• Next lower track bar brightens • Timer starts count from 0
10.	Press TRACK	• Timer displays track number • TIME block goes off • TRACK block goes on
11.	Press TIME three times	• Timer displays time three different ways: ABS (absolute) — Time from start of disc REL (relative) — Time from start of track TOT (total) — Total playing time on disc
12.	Press STOP	• Display goes off except for 20 track bars • DD/M lights
13.	Press PROGRAM ▶	• Bar 1 flashes for a few seconds then stops

14.	Press STORE while bar 1 is flashing	• Bar 1 lights • Bar 2 flashes • All other bars go off
15.	Press ◀ PROGRAM	• Bar 1 flashes
16.	Press CANCEL	• All 20 track bars light
17.	Press SCAN	• SCAN block lights • Bar 1 flashes, plays 10 seconds • Bar 2 flashes, plays 10 seconds (Continues for all tracks)
18.	Press STOP	• Display goes off except for 20 track bars

B. DISC 5A TEST (See page 51 for disc 5A ordering information)

1. Load DISC 5A and play track 9. Track 9 plays with a slight "tick" sound while the DD/M light flashes occasionally about 26 seconds on the timer, then plays normally.

2. Push NEXT TRACK until track 17 plays. Track 17 plays with an intermittent DD/M light to about 22 seconds, then flashes regularly to about 33 seconds, then intermittently to about 39 seconds, then plays normally. The music should have no interruption.

C. DISC 3 TEST (See page 51 for disc 3 ordering information)

1. Load DISC 3, connect Distortion Analyzer to LEFT FIXED OUTPUT, and play track 2.

2. With output level at 2 volts and frequency at 997 Hz, the total harmonic distortion should be less than .006%.

3. Press PLAY to return to start of track 2 if necessary, since 997 Hz tone only lasts 15 seconds.

4. Press PAUSE; noise should measure at least -90 dB.

5. Connect Analyzer to RIGHT FIXED OUTPUT and play track 3. Repeat measurements of steps 2 through 4.

6. Connect Analyzer to LEFT VARIABLE OUTPUT, turn OUTPUT LEVEL fully CW, and play track 2. Output level should be 1.8 to 2 volts. Level from 30 to 60 seconds should stay ± 0.5dB.

7. Play track 3. Output should be down at least 90dB with headphone VOLUME fully CCW.

8. Return to start of track 2, set OUTPUT LEVEL to 1.0 volt, and press PAUSE.

9. Connect Analyzer to RIGHT VARIABLE OUTPUT, release PAUSE, and play track 3. Output level should be 1.0 volt ± .05 volt. Turn OUTPUT LEVEL fully CW. Output level should be 1.8 to 2 volts. Level from 30 to 60 seconds should stay ± .05dB.

10. Play track 2. Output should be down at least 90dB with headphone VOLUME fully CCW.

D. SERVICE ADJUSTMENTS — Perform the following only if necessary.

1. LASER PEN OPTICAL ALIGNMENT. Refer to figure 3 for adjustment location.

   This procedure requires the use of three devices: laser lens mirror, glass disc, and magnetic hold-down. See page 51 for ordering information.

   Remove the motor mechanism from the player. The motor mechanism is the entire motor-laser-preamp assembly. Place the mirror over the laser lens. Place the glass disc on the turntable and use the magnetic hold-down to secure in place.

   Using a light source having a straight line configuration, for example a fluorescent ceiling lamp, set the laser arm to mid-position, position the motor mechanism so the laser arm is parallel to the light source, then observe the reflection of the straight line as it is reflected by the glass disc and mirror. The line in the mirror should be within 4 mm of the line in the glass disc. Position the motor mechanism so one line runs through the center of the mirror. The other line should remain inside the mirrors surface for the alignment to be within 4 mm.

   Rotate the mechanism 90°, keep the arm at mid-position and repeat the above measurement.

   If the alignment is outside the 4 mm limit, place the motor mechanism right side up and loosen the two screws at the ends of the bearing plate. Slide the plate for proper alignment.

   After the alignment, test for friction or binding of the laser arm. If there is binding, readjust the plate so there is a compromise between the old position and the new position that is within the 4 mm alignment, but does not cause binding. When testing for binding, test through the whole arm rotation range. The friction should be less than 30 mN measured at the counterweight.

2. MOTOR FRICTION TEST. Refer to figure 4 for the connection location.

   Disconnect connector A12 and feed a variable negative DC voltage source from pin 2 and ground. Starting from 0V, slowly proceed to -5V. The motor should be running. Decrease the voltage to -2.5V; the motor should continue to run.

   When the motor runs at 600 RPM, the voltage should measure between -1.5V and -3.7V. The 600 RPM speed can be determined by measuring the frequency of the signal at either motor coil. At 30 Hz frequency, the speed is 600 RPM.

3. POWER SUPPLY VOLTAGE TEST. Refer to figure 6 for the measurement locations.

   Measure the DC voltages at pin 3 of each IC voltage regulator. Should the display not light, check for 4.2 VAC between pins 1 and 2 of connector 45.

4. PREAMP OFFSET ADJUSTMENT. Refer to figure 4 for the adjustment location.

   This adjustment should be necessary only if IC6101 or the laser pen is replaced. The player should be ON in the STOP position. Measure the voltage from pin 6 of IC6107 to ground and adjust pot R3132 for 0V ± .03V.

5. TURNTABLE HEIGHT. Refer to figure 7 for the measurement location and figure 3 for the adjustment location.

   Measure the DC voltage from pin 1 of connector 23 to ground. While playing TEST DISC 5, the voltage should be less than ± .01 VDC. Adjust the set screw on the motor bottom if necessary. WARNING —the screw is of soft powdered iron. Remove as much sealant as possible and use a good fitting #10 TORQ screwdriver.

6. LASER SUPPLY ADJUSTMENT. Refer to figure 7 for the measurement location and figure 4 for the adjustment location.

Make this adjustment only if player operates normally and will play discs. Play track 1 on TEST DISC 5. The voltage form the emitter of transistor 6239 to ground should be .575 ± .075 VDC. Adjust pot 3140 if necessary. Player must be upright in normal position.

7. FOCUS BANDWIDTH ADJUSTMENT. Refer to figure 5 for the schematic of the adjustment procedure, figure 7 for the measurement locations, and figure 4 for the adjustment location.

   Feed a 0.40 volt, 1000 Hz signal to the X axis of the scope and to the test network. Feed the signal from pin 1 of connector 23 to the Y axis of the scope. Play track 1 on TEST DISC 5. Touch the output of the test network to pin 2 of IC6208 and adjust pot 3138 for a 180° phase display. This is a diagonal line sloping from the top-left to the lower-right.

8. TEST OF RADIAL AGC AND OFFSET CIRCUITS. Refer to figure 7 for the measurement locations.

   Play track 1 on TEST DISC 5. The voltage from pin 1 of IC6212 to ground should be -4V ± 2V. The voltage from pin 14 of IC6215 to ground should be 0V ± 2V.

The following devices used in these service tests and adjustments are available from:

NAP Consumer Electronics
Product Services
P.O. Box 555
Old Andrew Jackson Highway
Jefferson City, Tennessee 37760

Device	Part Number
Disc 5A	4822 397 30096
Disc 3	4822 397 30085
Laser lens mirror	4822 395 90205
Glass disc	4822 395 90204
Magnetic hold-down	4822 532 60906

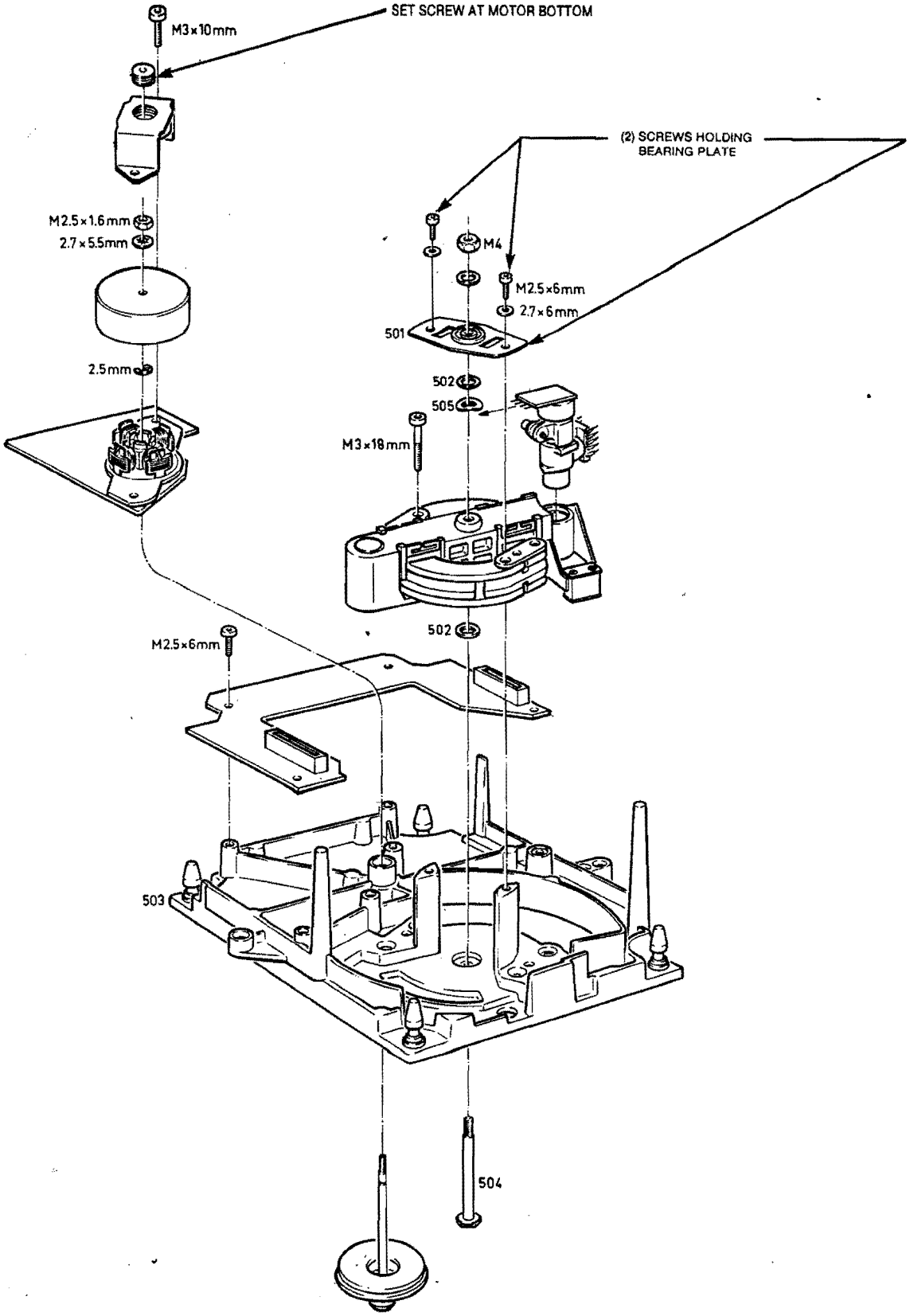


Fig. 3. Exploded View of Motor Mechanism

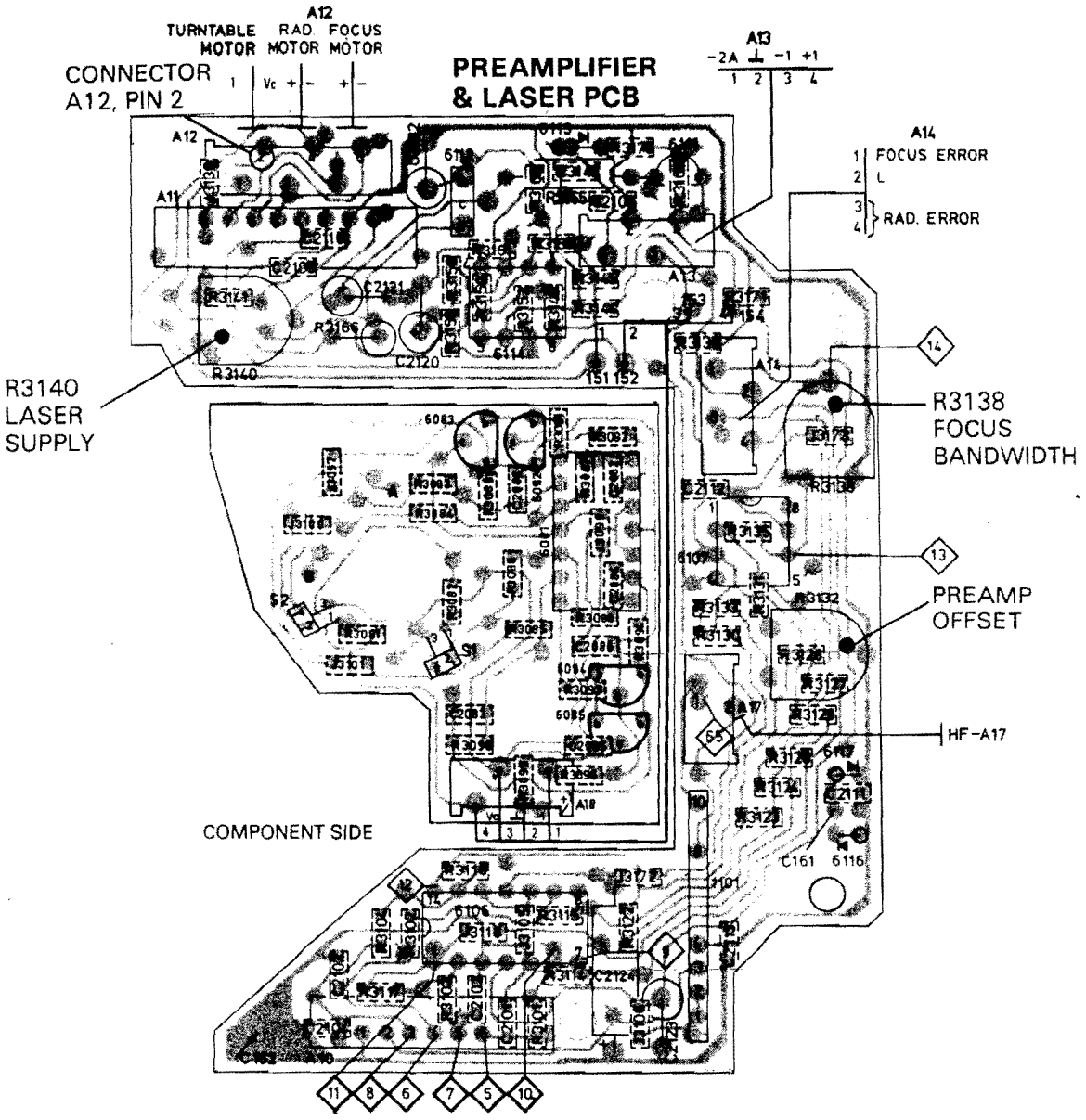


Fig. 4. Component Side of Preamplifier and Laser PCB

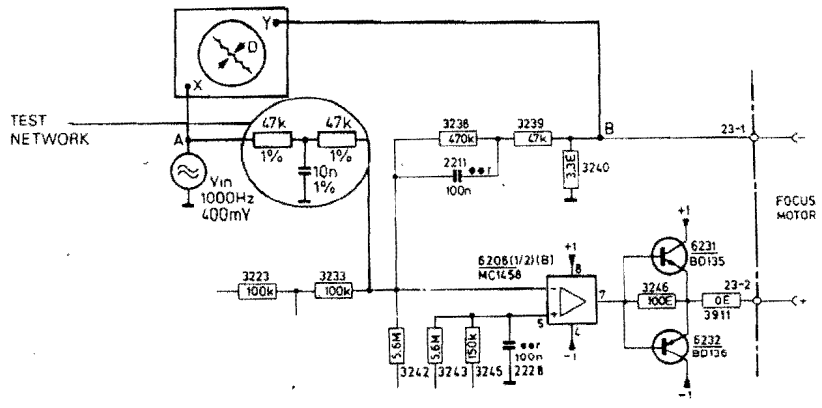


Figure 5. Adjustment of Focus Bandwidth

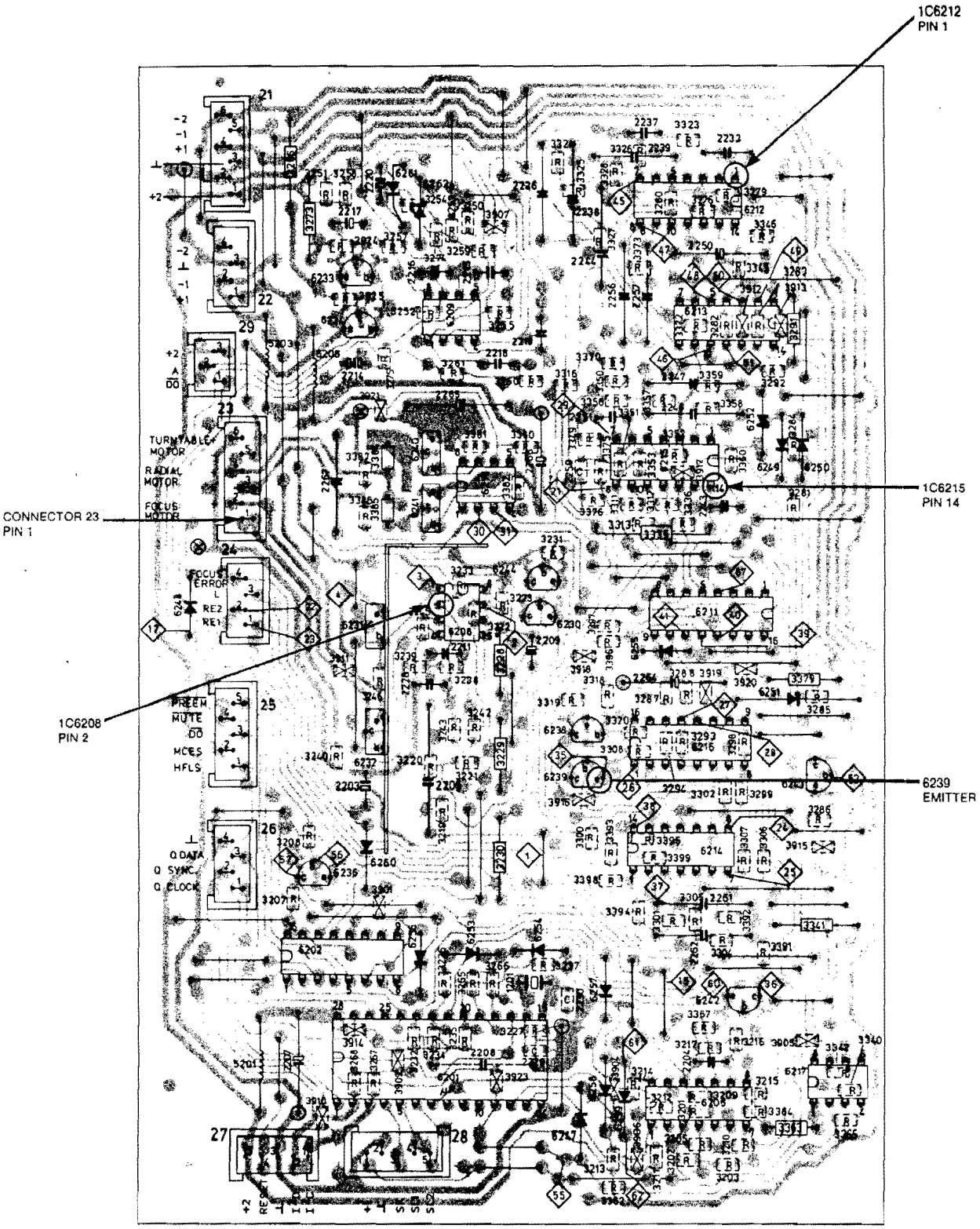


Fig. 7. Component Side of Servo PC Board

Repacking Instructions

IMPORTANT - Two screws 4 x 2¾ (7 cm) long must be installed on the bottom cover to lock the player mechanism during transportation. The proper holes are identified on the bottom cover.

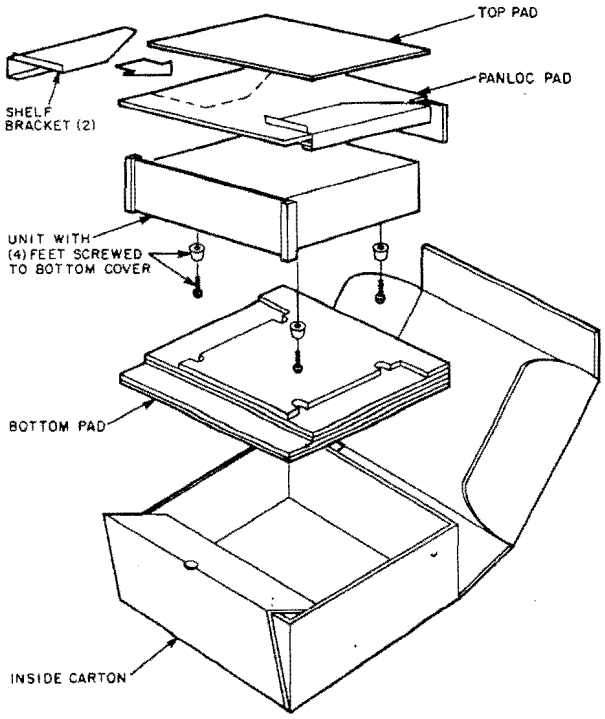
In the event it is necessary to return the MCD 7000 to McIntosh Laboratory for service, the unit must be packed exactly as shown below. It is not necessary to return the shelf brackets, although their position in the carton is shown.

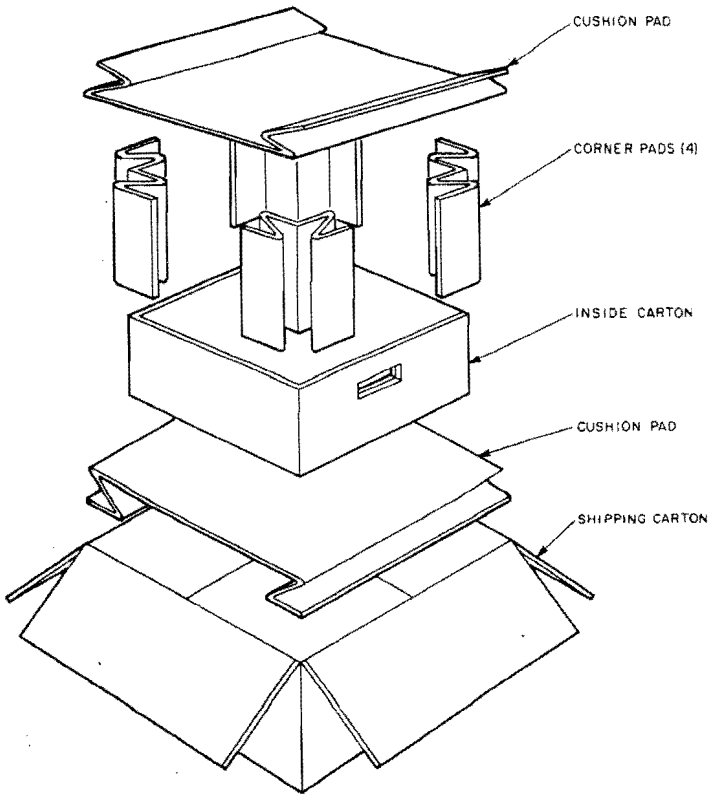
The four plastic feet must be attached to the bottom of the MCD 7000 so they will locate in the four holes of the base pad.

If a shipping carton is needed, please call or write the Customer Service Department of McIntosh Laboratory. Order using the part numbers on the accompanying list.

Use the original shipping carton only if all pads and cartons are in good serviceable condition.

QTY	PART NO.	DESCRIPTION
1	033466	Shipping carton only
1	033331	Top pad
1	033330	Panloc pad
1	033456	Bottom pad
2	033332	Cushion pad
4	033333	Corner pad
4	017156	Bottom cover feet
4	101106	#8 x ½ screw for 017156
1	033118	Inside carton only
1	046573	Shipping carton (complete)





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