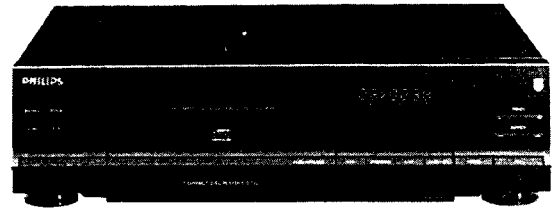


Service  
Service  
Service



45 708 810

# Service Manual

TABLE OF CONTENTS	PAGE
1. Technical specifications	1
2. Controls and connections	2
3. Warnings	3
4. Dismantling instructions	4
5. Servicing hints	5
6. Block diagram	8
7. Wiring diagram	9
8. Circuit diagrams and printed boards	
8.1. Power supply	9
8.2. Photo diode signal controller	10
8.3. Servo control circuit	11
8.4. Servo & decoder panel component side	12
8.5. Servo & decoder panel solder side	13
8.6. Decoder circuit	14
8.7. Control & Display	15
9. Start up procedure	15
10. Faultfinding guide	16
11. Service testprogram	16
12. Electrical adjustments	17
13. Exploded view	18
14. Mechanical partslist	18
15. Electrical partslist	19



**TECHNICAL SPECIFICATIONS****General**

- |                            |                                    |
|----------------------------|------------------------------------|
| 1. Mains voltage /00B      | : 220V ( $\pm 10\%$ )              |
| /05B                       | : 240V ( $\pm 10\%$ )              |
| 2. Mains frequency         | : 50 - 60 Hz                       |
| 3. Mains voltage selection | : See circuit diagram Power Supply |
| 4. Power consumption       | : 10W in Play mode                 |
| mains,operated             | : 5W in Standby                    |

**Line output**

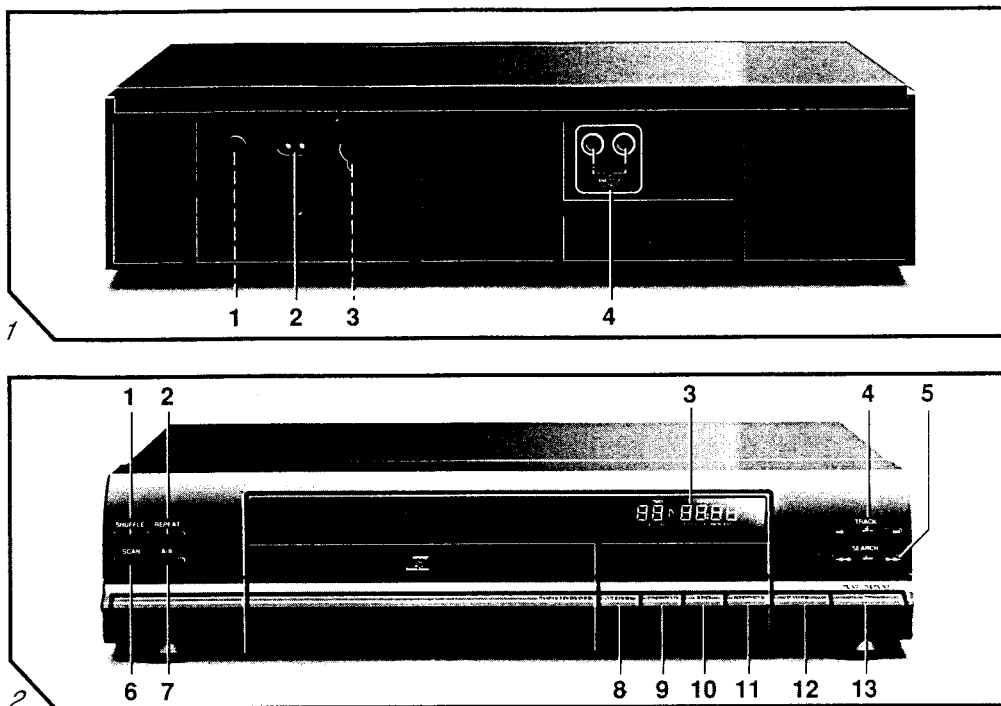
- |  |   |
|--|---|
| 1. Number of channels                                  | : 2   |
| 2. Output voltage                                      | : 2 Vrms $\pm$ 2dB                                |
| 3. Unbalance left-right                                | : max. $\pm$ 0,5dB                                |
| 4. Output resistance                                   | : 1 kOhm  |
| 5. Amplitude linearity                                 | : max. $\pm$ 0,15dB from 20 Hz to 18 kHz          |
| 6. Phase non-linearity                                 | : max. $\pm$ 1° from 20 Hz to 18 kHz              |
| 7. Signal to noise ratio                               | : min. 90dB from 20 Hz to 18 kHz                  |
| 8. Dynamic range (-60dB)                               | : min. 80dB from 20 Hz to 18 kHz<br>(max. 0,01 %) |
| 9. Total harmonic distortion + noise                   | : min. 66dB from 20 Hz to 18 kHz<br>(max. 0,05 %) |
| 10. Intermodulation distortion                         | : min. 66dB from 20 Hz to 18 kHz<br>(max. 0,05 %) |
| 11. Out-band attenuation                               | : min. 50dB above 24,8 kHz                        |
| 12. Channel separation                                 | : min. 80dB from 20 Hz to 18 kHz                  |
| 13. Muting during random access                        | : min. 90dB from 20 Hz to 18 kHz                  |
| 14. Automatic switched de-emphasis with time constants | : 15/50 $\mu$ s                                   |

**Dimensions and weight**

- |                          |                              |
|--------------------------|------------------------------|
| 1. Apparatus tray closed | : WxDxH 360 x 280 x 88/94 mm |
| 2. Apparatus tray open   | : WxDxH 360 x 445 x 88/94 mm |
| 3. Weight                | : 2,7 kg                     |

**Optical read-out system**

- |                        |                        |
|------------------------|------------------------|
| 1. Laser type          | : Semiconductor AlGaAs |
| 2. Wavelength          | : 780 nm $\pm$ 20 nm   |
| 3. Light output (c.w.) | : 0,4 mW $\pm$ 0,04 mW |



45 747 E12

**CONTROLS**

	Indication on App.	Indication in diagram
1.	<b>SHUFFLE</b>	1023
2.	<b>REPEAT</b>	1016
3.	<b>Display</b>	1030
4.	<b>&lt; TRACK &gt;</b>	1013 1020
5.	<b>&lt;&lt; SEARCH &gt;&gt;</b>	1027 1034
6.	<b>SCAN</b>	1022
7.	<b>A-B</b>	1015
8.	<b>OPEN/CL(ose)</b>	1031
9.	<b>PROGRAM</b>	1024
10.	<b>EDIT</b>	1035
11.	<b>STOP/CM</b>	1029
12.	<b>PAUSE</b>	1021
13.	<b>PLAY/REPLAY</b>	1014

**CONNECTIONS**

	Indication on App.	Indication in diagram
1.	<b>Mains fuse holder (not all versions)</b>	15
2.	<b>Mains socket</b>	BU-1
3.	<b>Voltage selector (not all versions)</b>	1077
4.	<b>ANALOGUE OUT</b>	BU-2

**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.  
When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

**ESD****(NL) WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).  
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.  
Houd componenten en hulpmiddelen ook op hetzelfde potentiaal.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).  
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.  
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le braceleterti d'une résistance de sécurité.  
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**(D) WARNUNG**

Alle ICs und viele andere Halbleiter sind empfindlich gegen elektrostatische Entladungen (ESD).  
Unsorgfältige Behandlung bei der Reparatur kann die Lebensdauer drastisch vermindern. Sorgen sie dafür, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind. halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).  
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.  
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.  
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB)**

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

**(NL)**

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde worden toegepast.

**(SF) Varo!**

Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

**(D)**

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden für Reparaturen sind Original-Ersatzteile zu verwenden.

**(I)**

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati pezzi di ricambio identici a quelli specificati.

**(S) Varning!**

Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

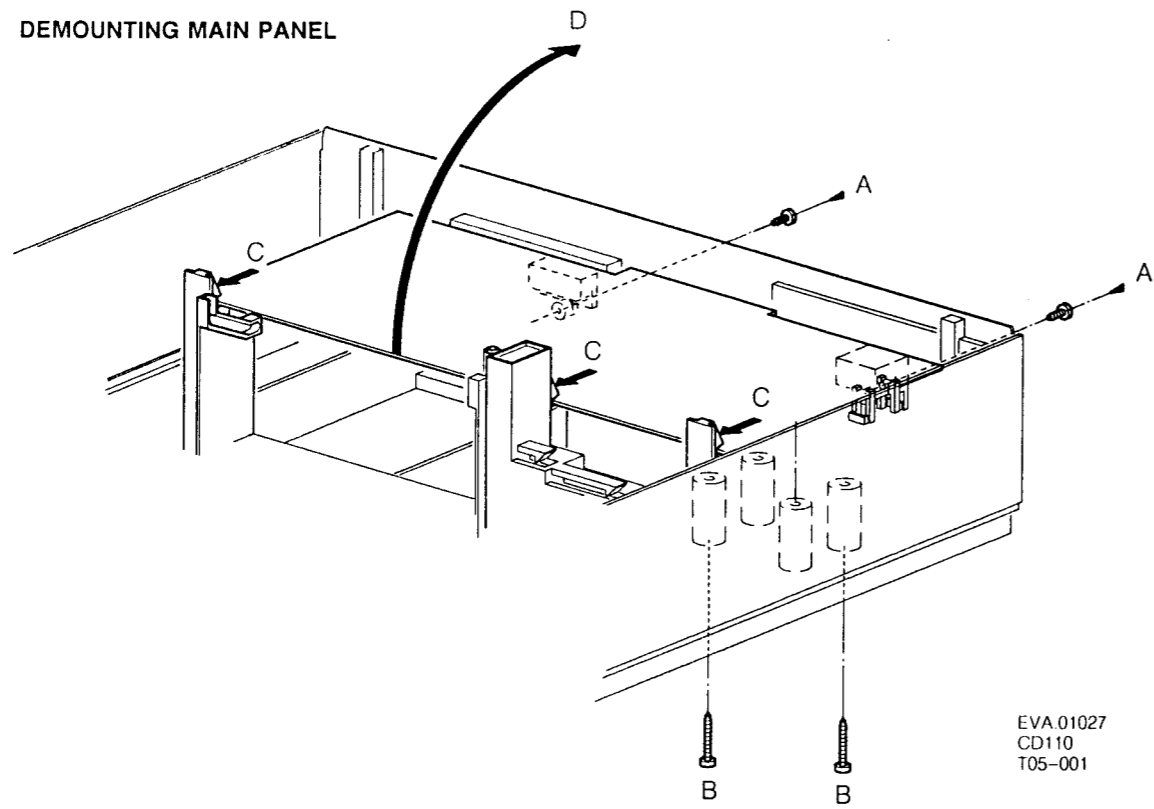
**(F)**

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

DISMANTLING INSTRUCTIONS

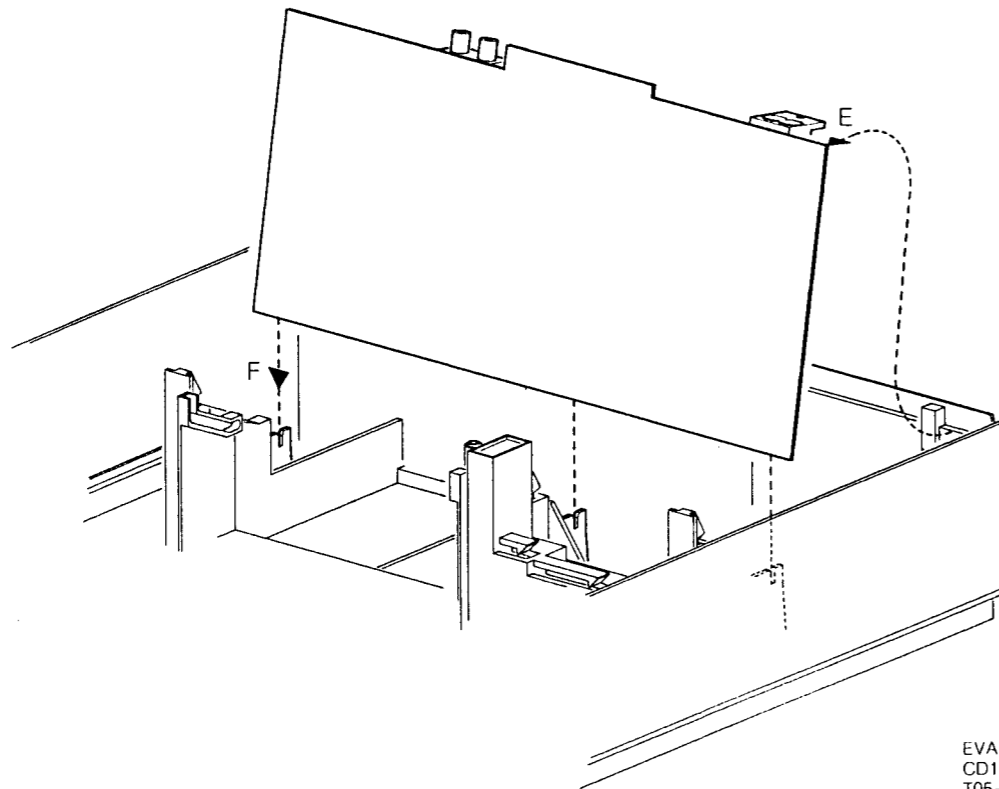
4

DEMOUNTING MAIN PANEL



EVA.01027  
CD110  
T05-001

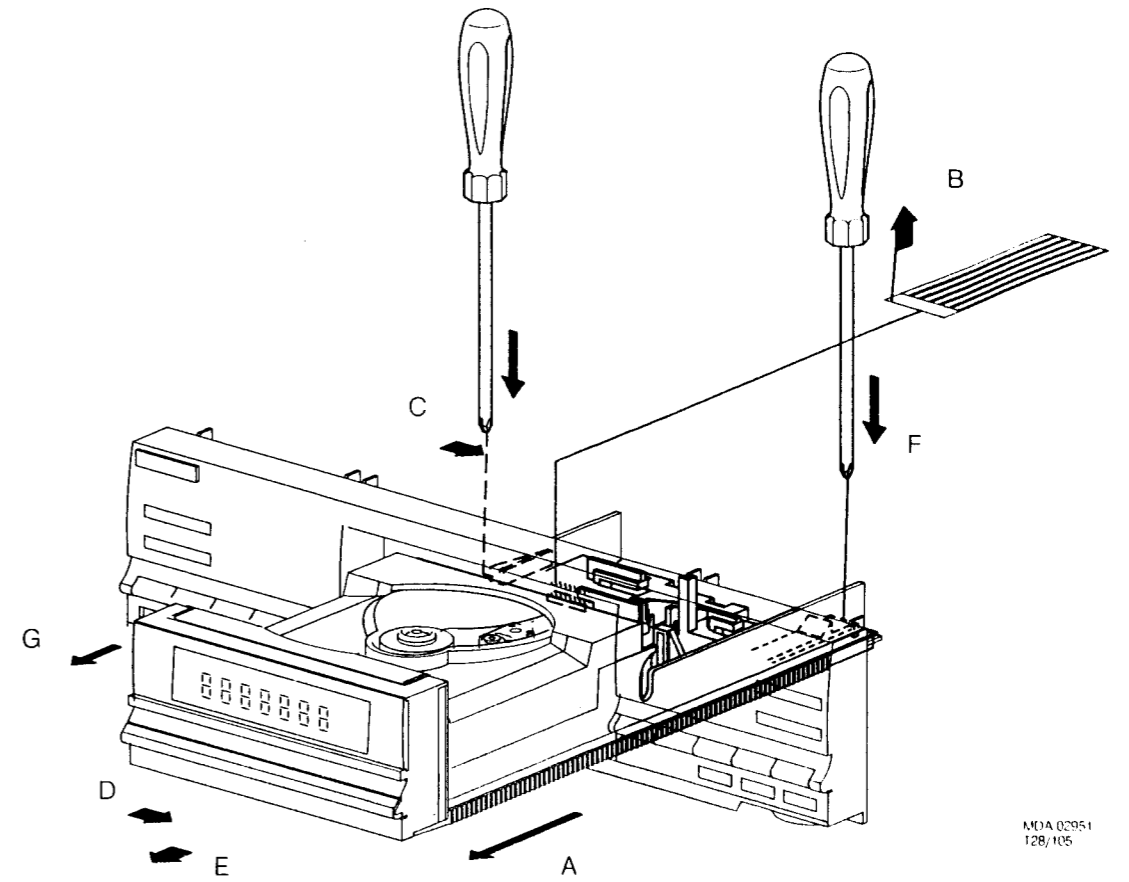
SERVICE POSITION MAIN PANEL



EVA.01029  
CD110  
T05-001

4

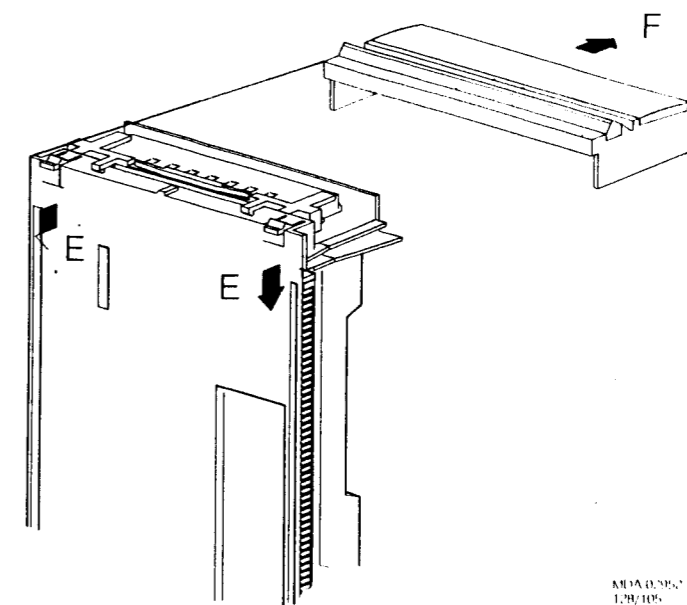
DEMOUNTING LOADING



M/A 02051  
128/105

HAS CD320 DEM-TRAY

DEMOUNTING TRAY FRONT

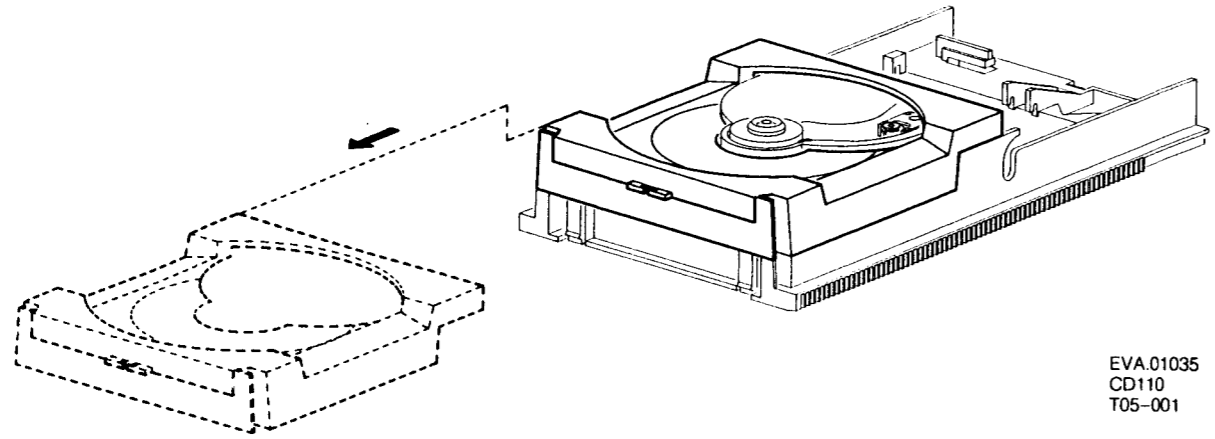


M/A 02051  
128/105

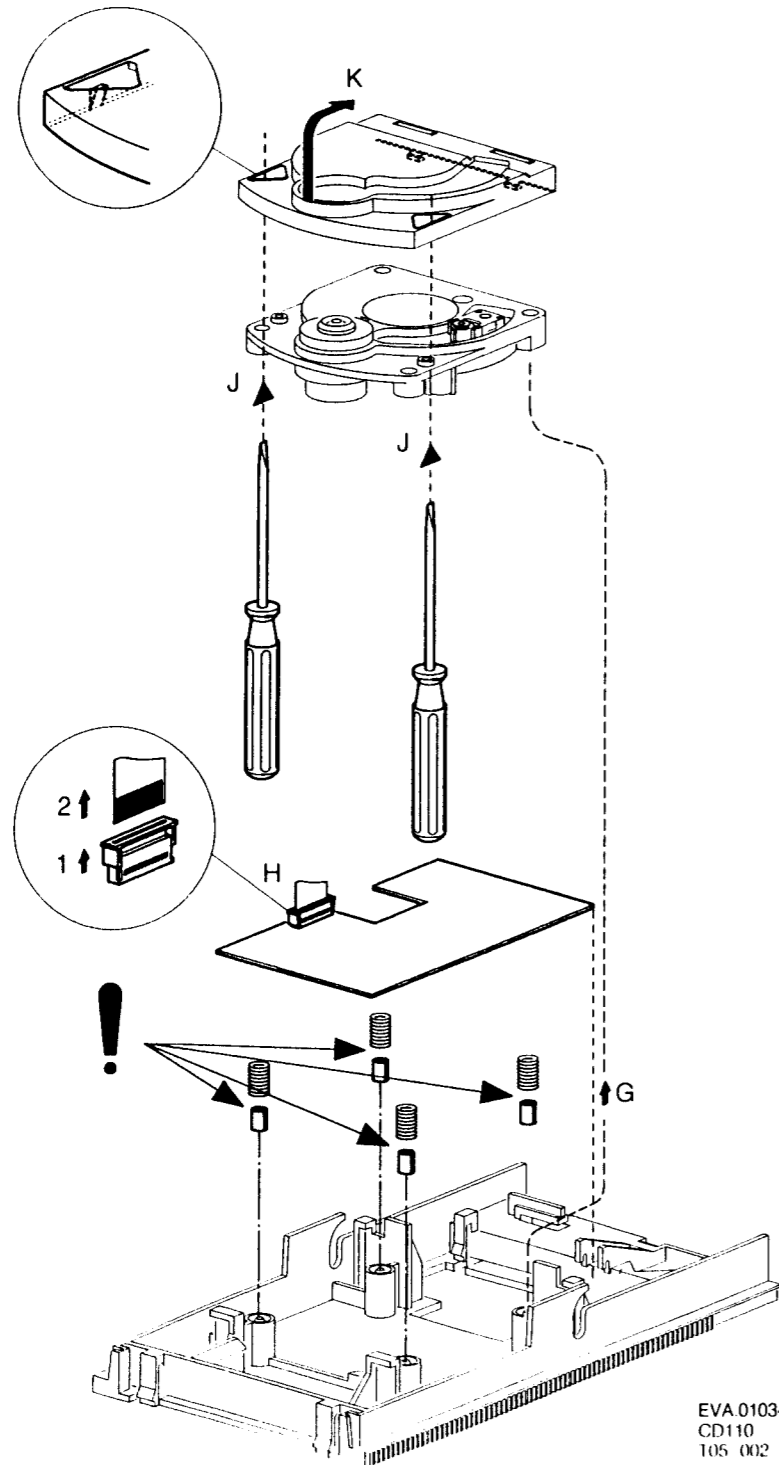
HAS CD320 DEM-TRAYFRONT

DEMOUNTING CDM

5



EVA.01035  
CD110  
T05-001



EVA 01034  
CD110  
T05 002

3. SERVICING HINTS

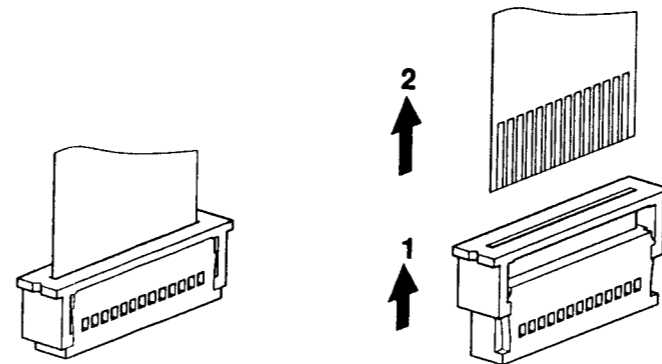
When the tray mechanism and CDM-unit has been disassembled the player can be prepared for measurements by bridging or activating the "laser safety switch" SK3 on the photo diode signal controller panel.

Service disc hold-down

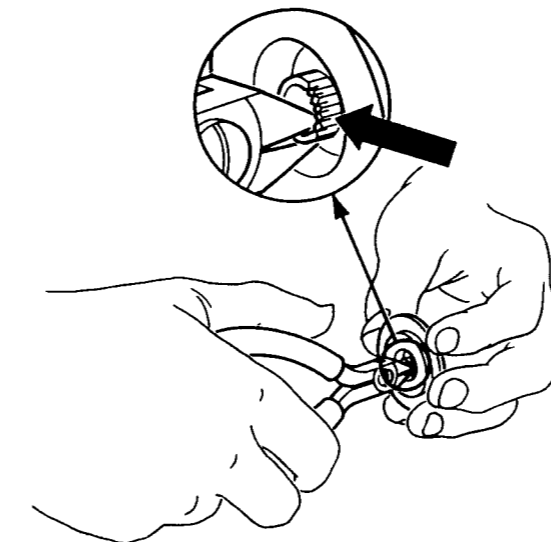
The disc should always rest properly on the turntable. To achieve this a disc hold-down has been mounted in a bracket of the tray mechanism.

If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used. For a service disc hold-down see the figure below. Compose a service Disc hold-down in the following way.

- Cut in the most inner ring of a disc holddown (4822 462 50383) with small and sharp nippers. See fig. below.
- Enlarge the diameter of the innermost ring slightly with the hind part of a pencil or ballpoint, so that it jams onto the turntable with sufficient force.
- If the jamming force decreases after certain time of use, the diameter has to be enlarged with a pencil or ballpoint again.



MDA 01408  
T28/B22



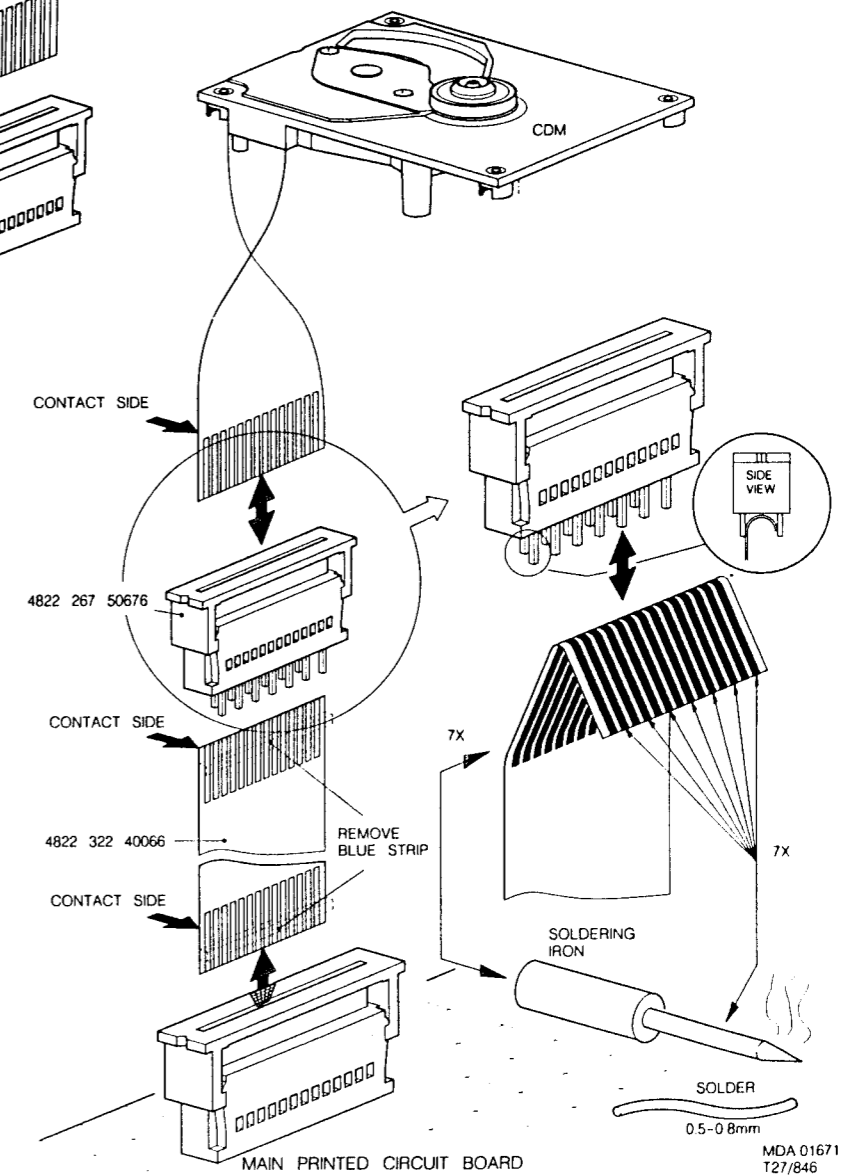
42 565 A12

5

SERVICE TOOLS

Audio signal disc	4822 397 30184
Disc without errors (test disc 5) + disc with DO errors, black spots and fingerprints (test disc 5A)	4822 397 30096
Disc (65 min 1kHz) without pause	4822 397 30155
Max. diameter disc (58.0 mm)	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (4p)	4822 321 21284
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Green LED CQY G11	5322 130 32182
Infra red remote control e.g.	4822 218 10324

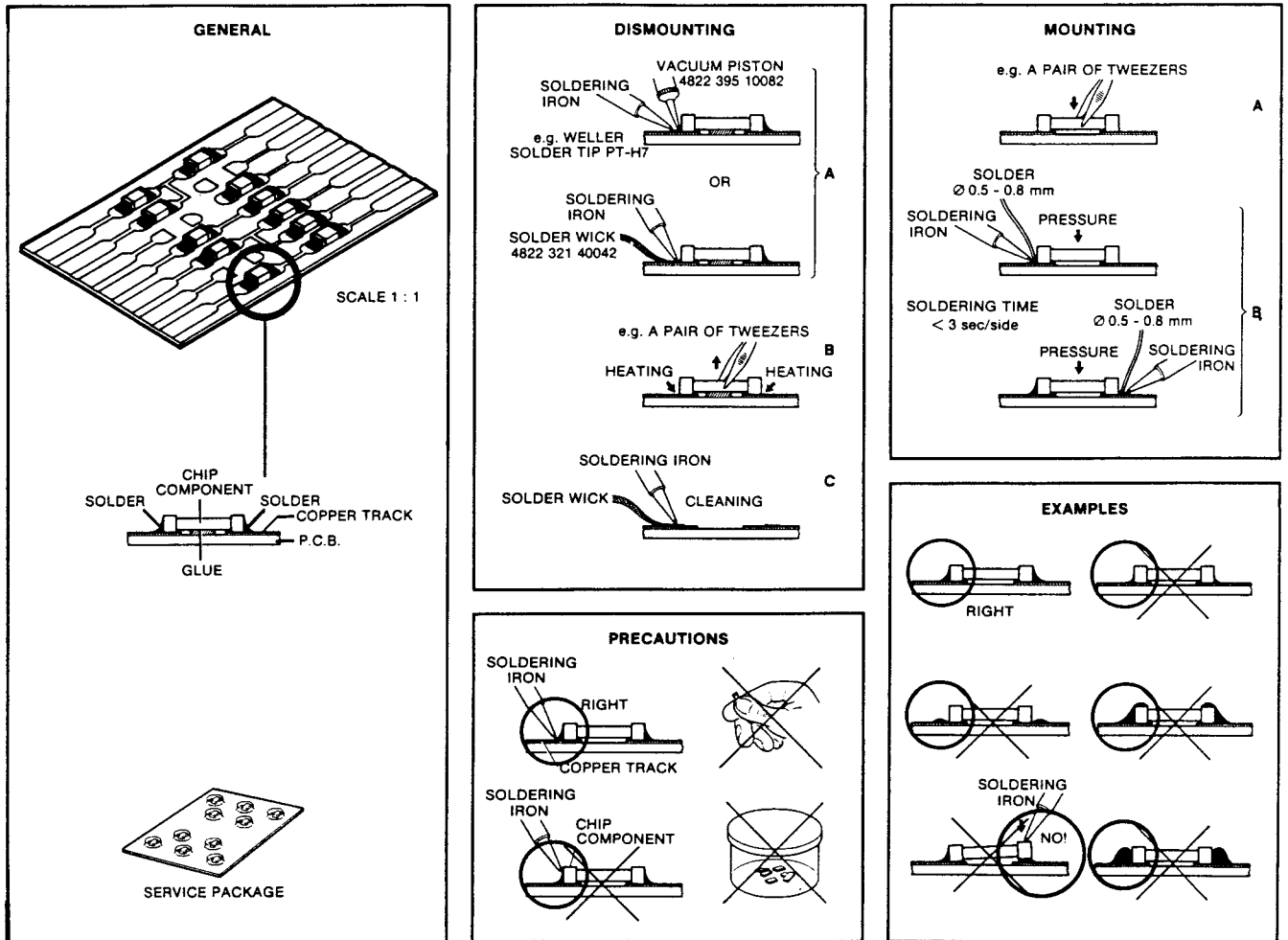
EXTENSION CABLE



MDA 01671  
T27/B46

**SERVICING HINTS**

In the set chip components have been applied. For disassembly and assembly of chip components see the figure below.

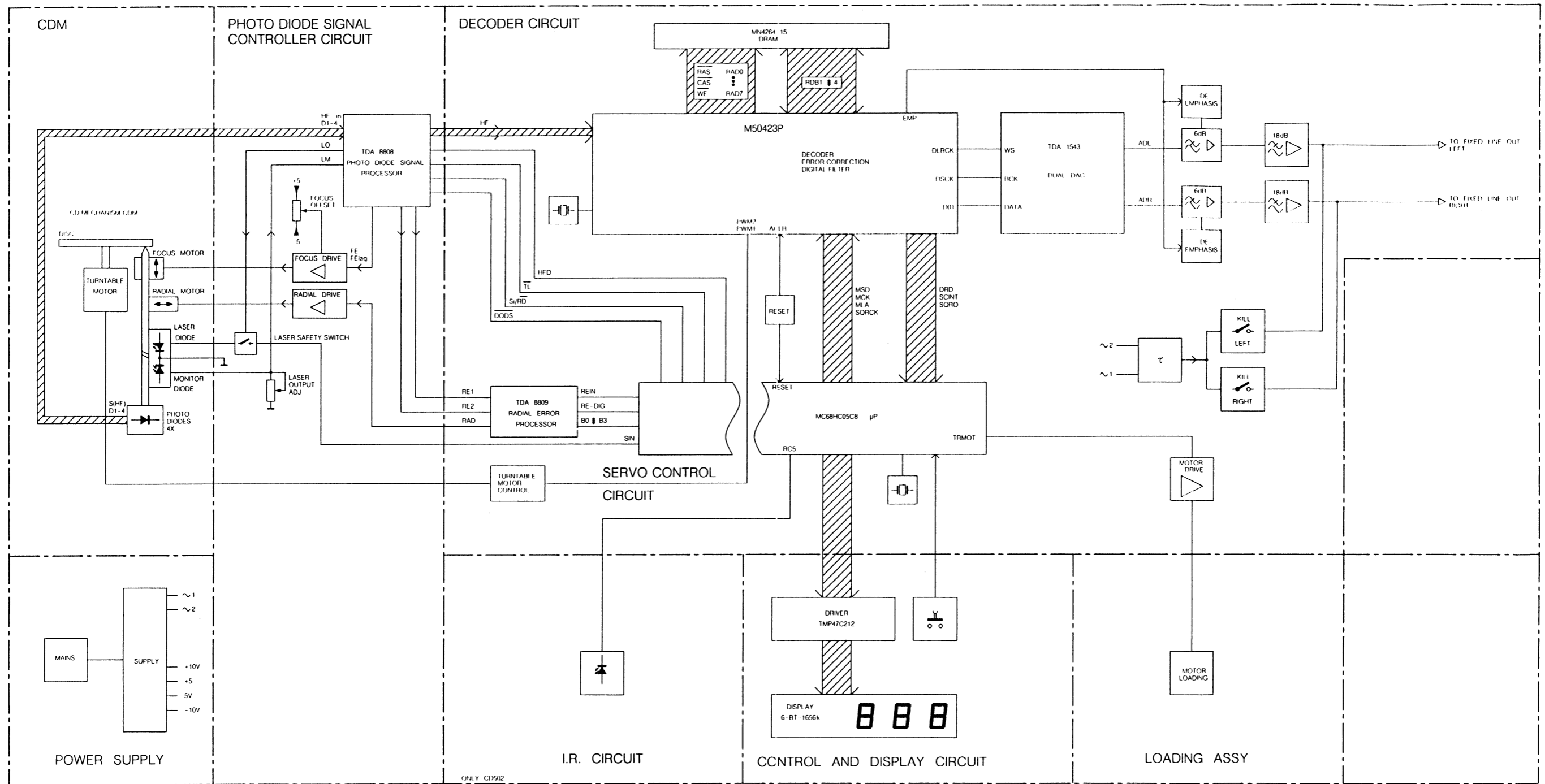


27 012C12

ACLR	- $\mu$ P interface register clear input	LPF	- PLL loop filter
AGC	- Automatic Gain Control	MCK	- $\mu$ P interface shift clock input
AOL-R	- Analogue output left-right	MLA	- $\mu$ P interface data latch clock input
B0-B3	- Control bits for radial circuit	MSD	- $\mu$ P interface serial data input
BCK	- Bit clock input	PLLH	- PLL on hold output
BEQ	- Equalizer reference current input	PWM	- Disk motor driving output
BGC	- DC and LF gain control reference input	RADO-7	- Address output
BPA-C	- Display backplane A-C	RAD	- Radial drive input
C16M1	- 1/2 divider input	RADout	- output of RE2-RE1 input
CAS	- Column address strobe signal output	RAS	- Row address strobe signal output
Cosc1	- Capacitor wobble oscillator	RDB1-4	- Data input/output
Cosc2	- Capacitor wobble oscillator	RE	- Radial error signal (Amplified RE <sub>2</sub> -RE <sub>1</sub> currents)
CS	- Chip select	RE1	- Radial error signal 1 (summation of amplified currents D <sub>3</sub> and D <sub>4</sub> )
D1-D4	- Photodiode currents	RE2	- Radial error signal 2 (summation of amplified currents D <sub>1</sub> and D <sub>2</sub> )
DASEL1-4	- DAC interface format select	RE dig	- Radial error digital
DATA	- Data input	REin	- Radial error input
DEC	- Decoupling input internal bypass	RE lag	- Radial error signal for LAG network
DET	- HF detector voltage input	Rosc	- Resistor wobble oscillator
DI	- Serial data input	Rwob	- Wobble generator input
DISBL	- Display blank	SA1-SC4	- 12 multiplexed outputs
DISENA-B	- Disenable A-B	Sc	- Starting up capacitor input
DISCLK	- Display clock	SCCK	- Shift clock input for serial subcode data output
DISDAT	- Display data	SCINT	- Interrupt output of subcode Q
DIV4	- Divide by 4 input	SCOE1	- Enable input of subcode T
DLRCK	- Left/right channel clock	SIN	- Tray switch
DO1	- Dual DAC Rch serial data output	Si/RD	- On/off control for laser supply and focus circuit. Ready signal, Starting up procedure succesfull.
DOBSEL	- Data bit select	SK	- Serial clock input
DODS	- Drop out detector suppression	SQRCK	- Subcode Q register
DRD	- 8/12 cm Disc detection	SQRO	- Subcode Q register output
DSCK	- Data shift clock to DAC	TEST1	- Test control input
EFFK	- EFM frame clock output	TL	- Track loss output signal
EMP	- Emphasis flag output	TLC	- Output from slice level control
EST2	- Error status 2	TTM	- Control voltage for turntable motor
FE	- Focus error signal	Vext+	- Supply connection
FE lag	- Focus error signal for LAG network	Vext-	- Supply connection
FS	- Focus starting current	VLCD	- Supply liquid crystal display
GCHF	- Gain control input of HF amplifier	WE	- Write enable output
GCLF	- Gain control input for AC and LF amplifiers	WS	- Word select input
HF	- HF output for DEMOD	XI	- Crystal oscillator input
HFD	- HF detector output for DEMOD	XO	- Crystal oscillator output
HF-out	- HF amplifier and equalizer voltage output		
IREF	- Current reference		
KBSCO-5	- Keyboard scanning 0-5		
LM	- Laser monitor diode input		
LO	- Laser amplifier current output		



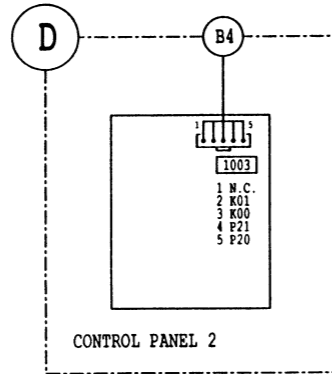
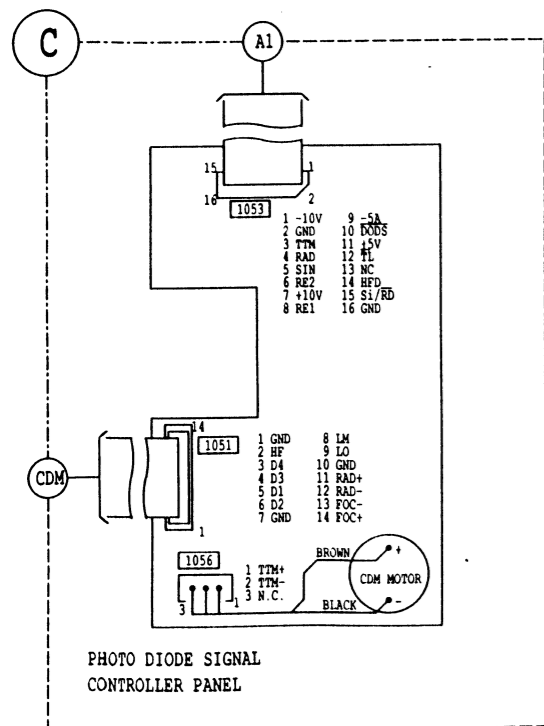
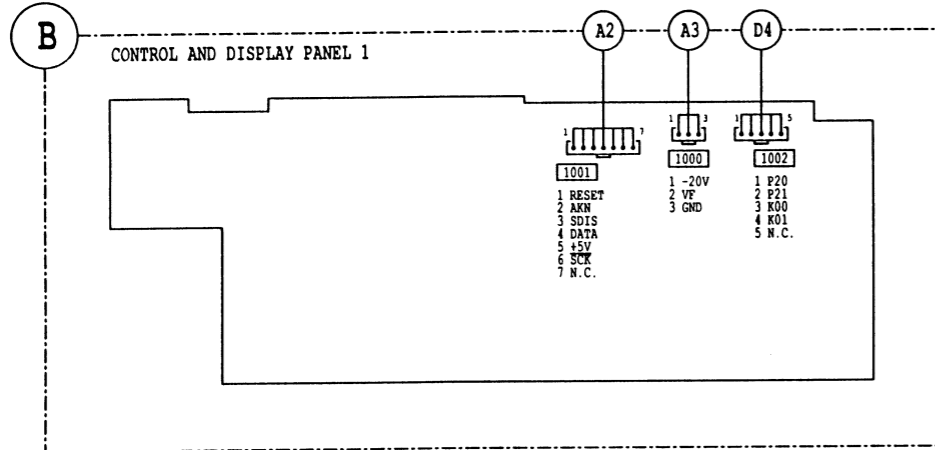
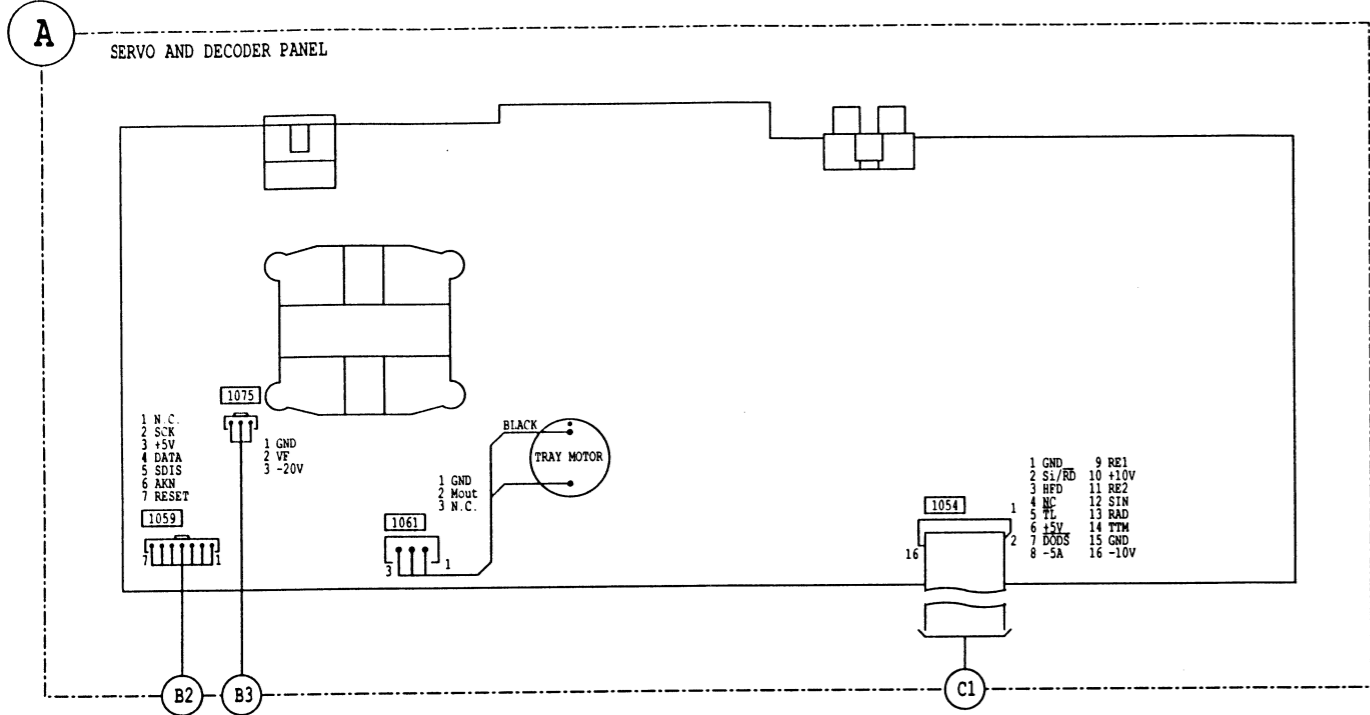
BLOCK DIAGRAM



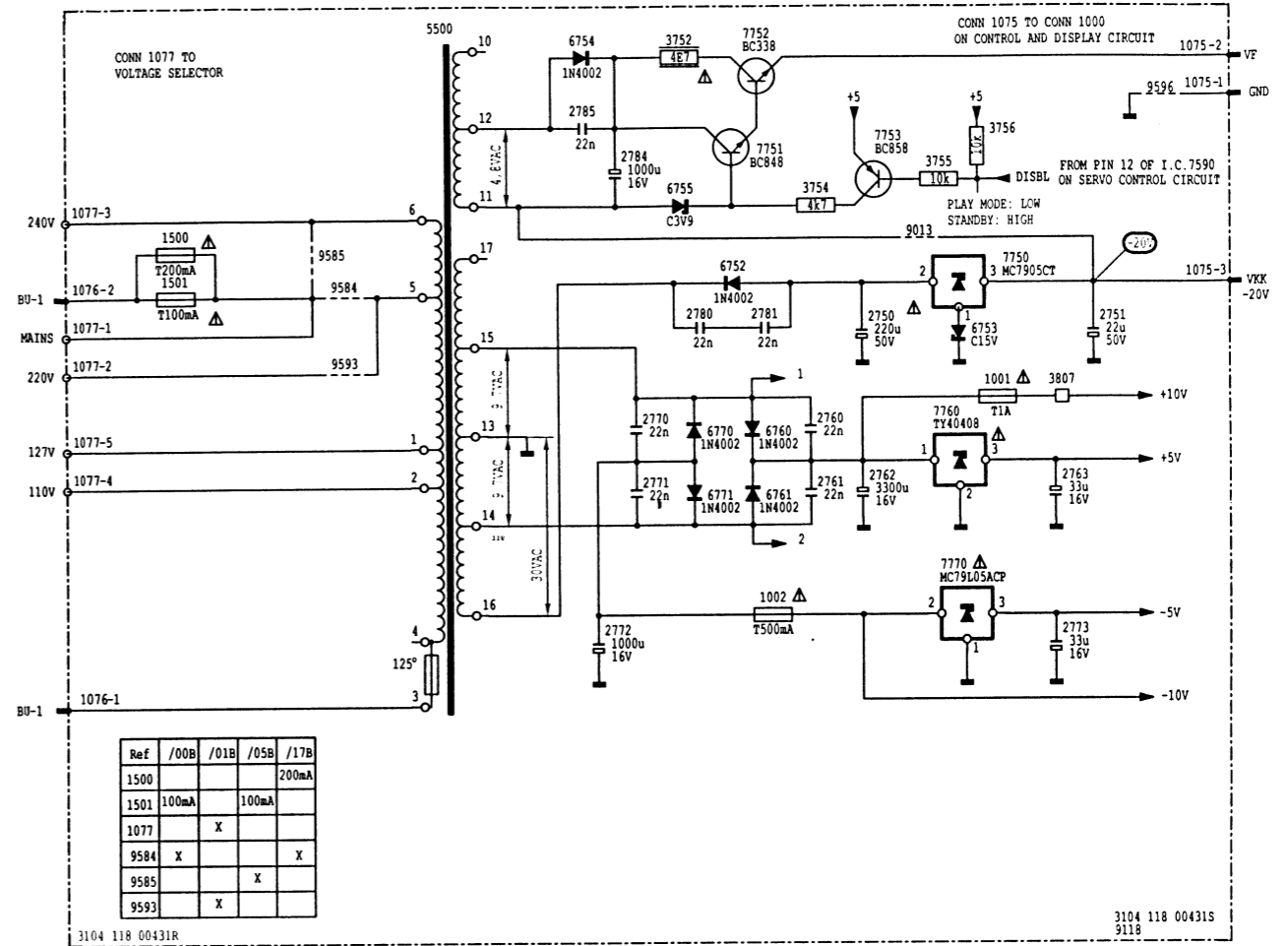
ONLY CD502

FRS/0004  
1-19-116

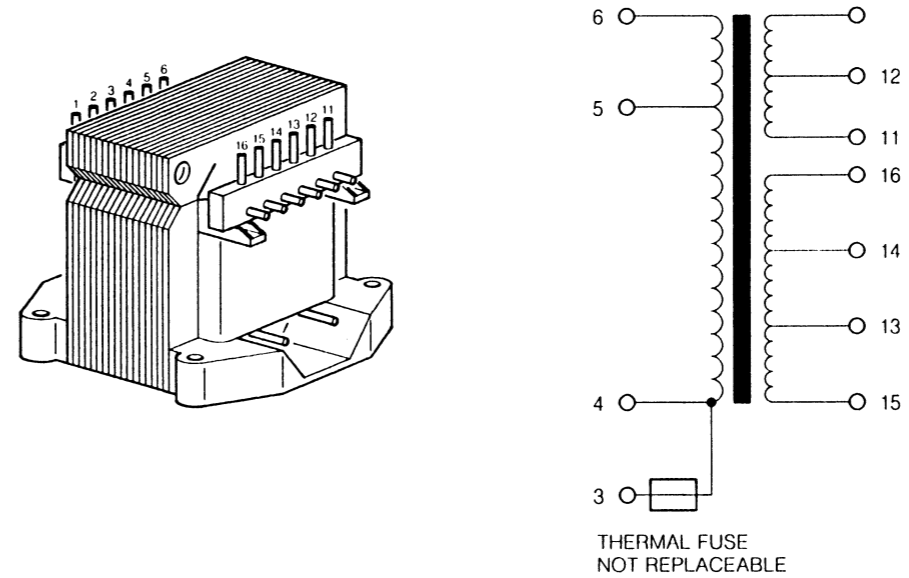
WIRING DIAGRAM



POWER SUPPLY



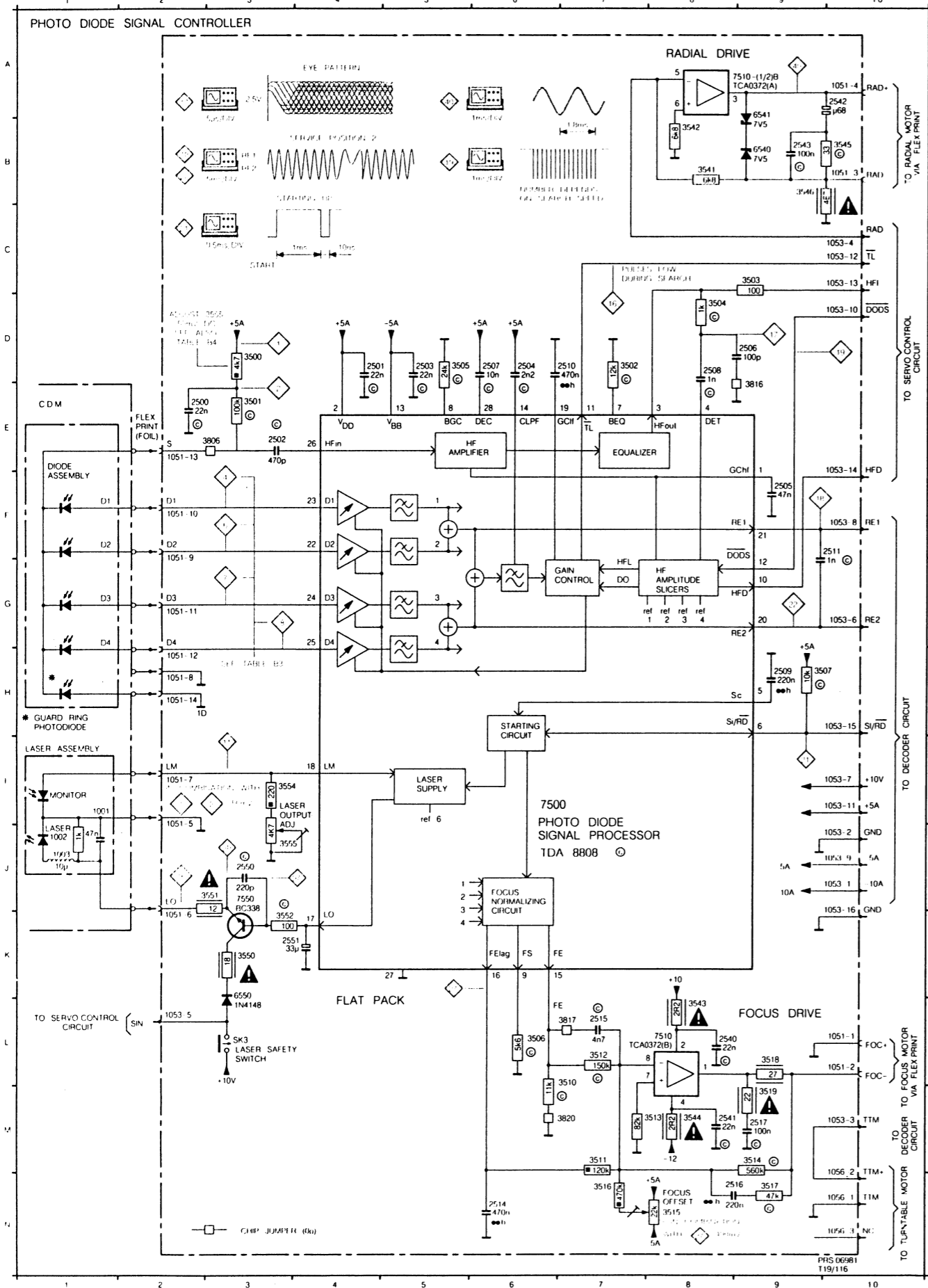
TRANSFORMER CONNECTIONS



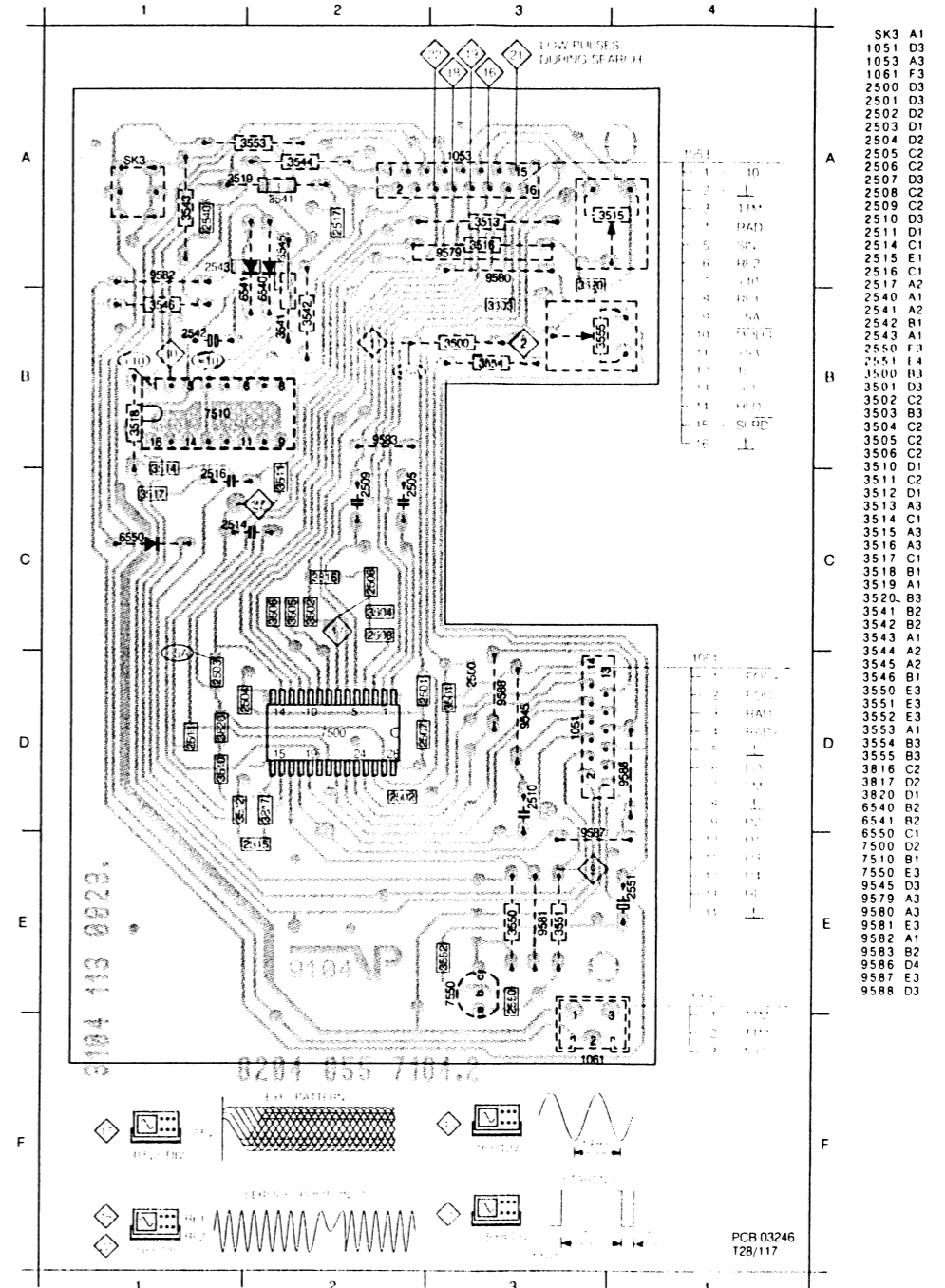
MDA.02994  
T05-117

PHOTO DIODE SIGNAL CONTROLLER

SK3 L3	2503 D5	2510 D6	2541 M8	3502 D7	3511 M7	3518 L9	3546 B9	3816 F9	7510 A8
1001 J1	2504 D6	2511 F9	2542 A10	3503 C9	3512 L7	3519 M9	3550 K3	3817 L7	7510 L8
1002 J1	2505 F9	2514 N6	2543 B9	3504 D8	3513 M7	3541 B8	3551 J3	3820 M7	7550 J3
1003 J1	2506 D9	2515 L7	2544 D8	3505 D5	3514 M8	3542 B8	3552 K3	6540 B9	
2500 E2	2507 D6	2516 N9	2551 K3	3506 L6	3515 N8	3543 L8	3554 J3	6541 B9	
2501 D4	2508 D8	2517 M9	3500 D3	3507 H9	3516 N7	3544 M8	3555 J4	6550 L3	
2502 E3	2509 H9	2540 L8	3501 E3	3510 M7	3517 N9	3545 B10	3806 E3	7500 L6	

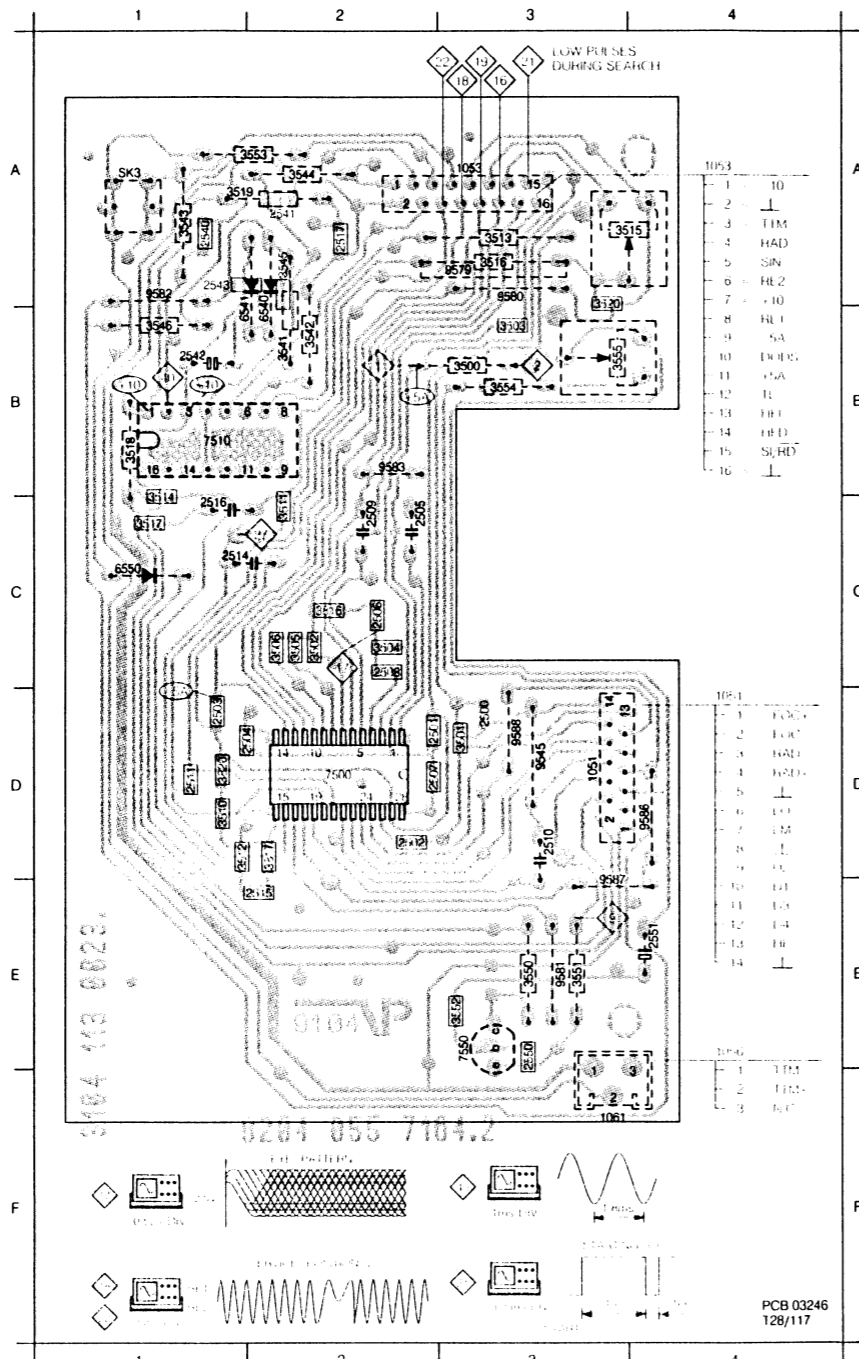
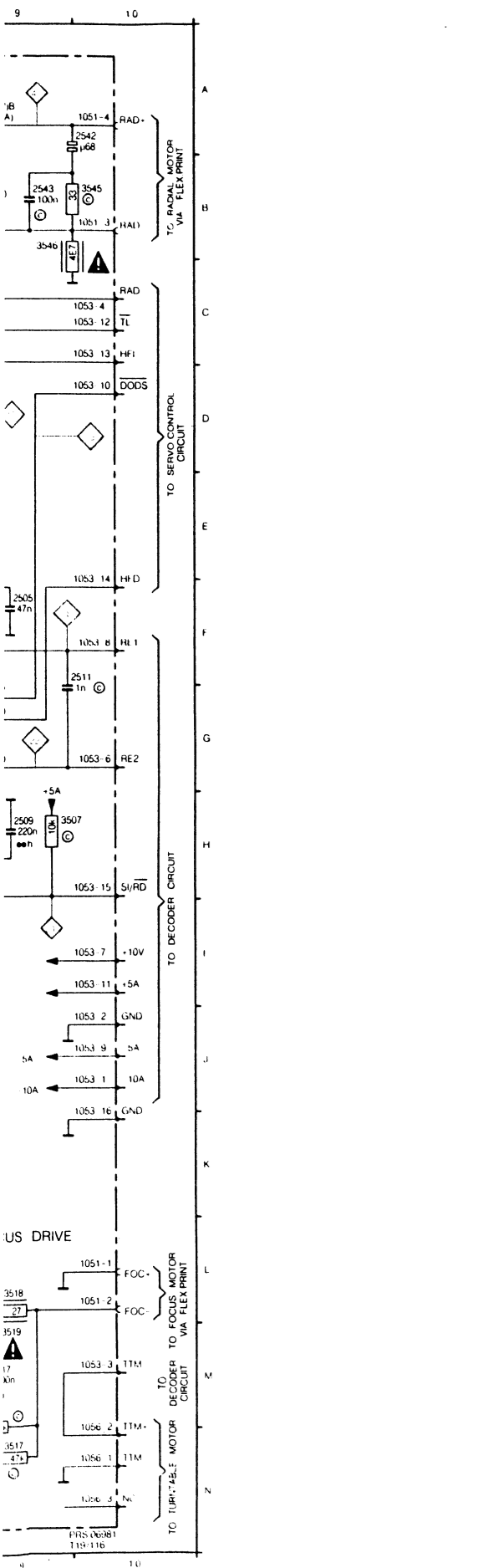


PANEL COMPONENT SIDE



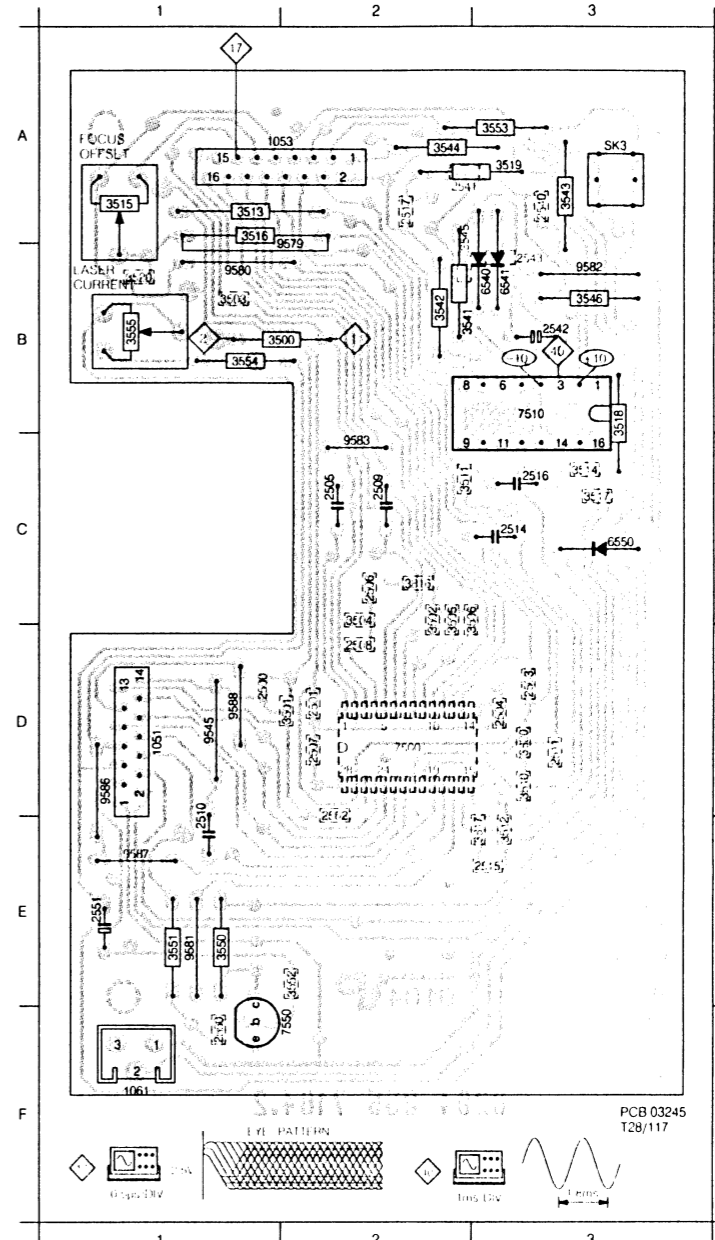
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PANEL COMPONENT SIDE

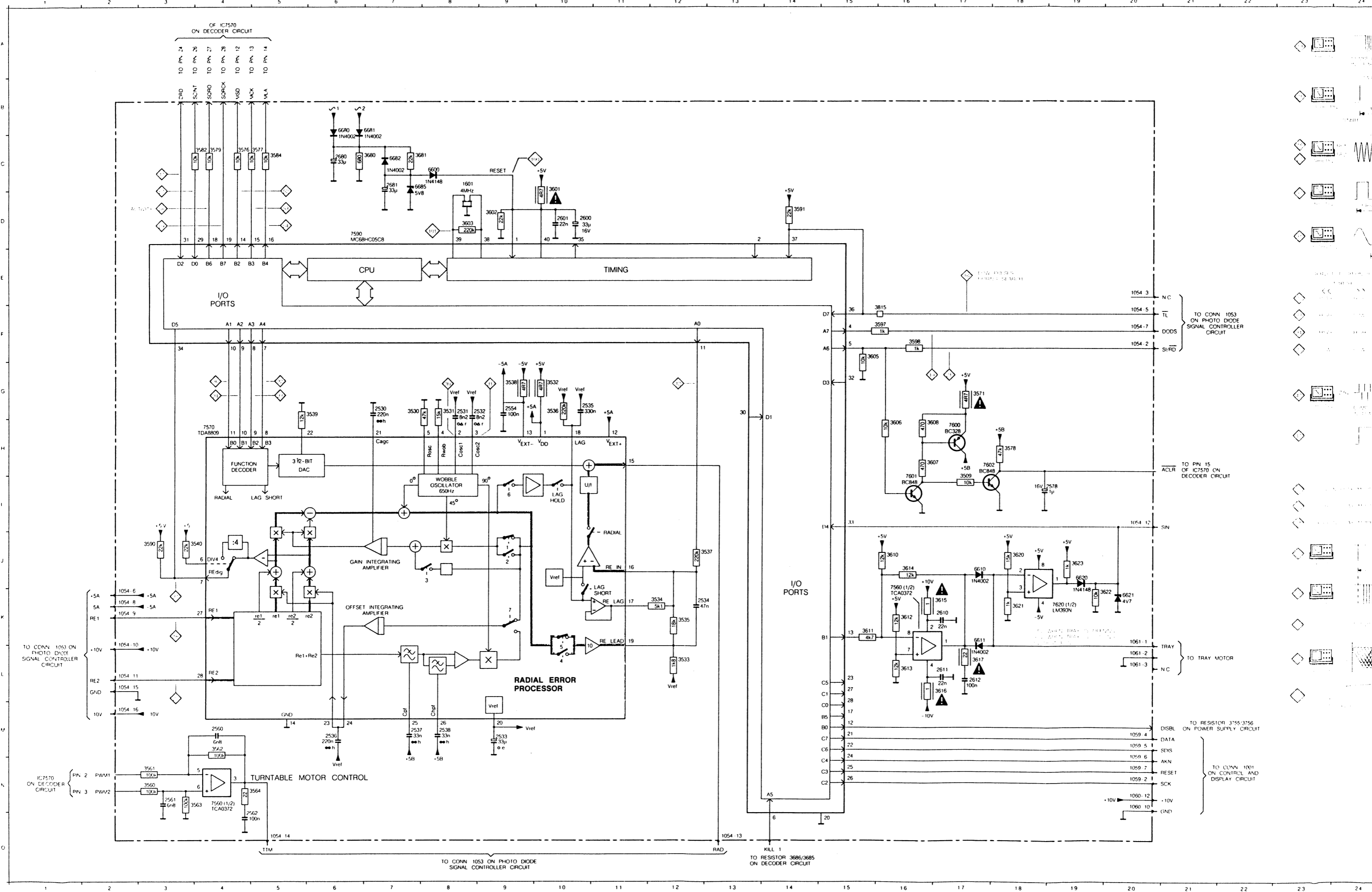


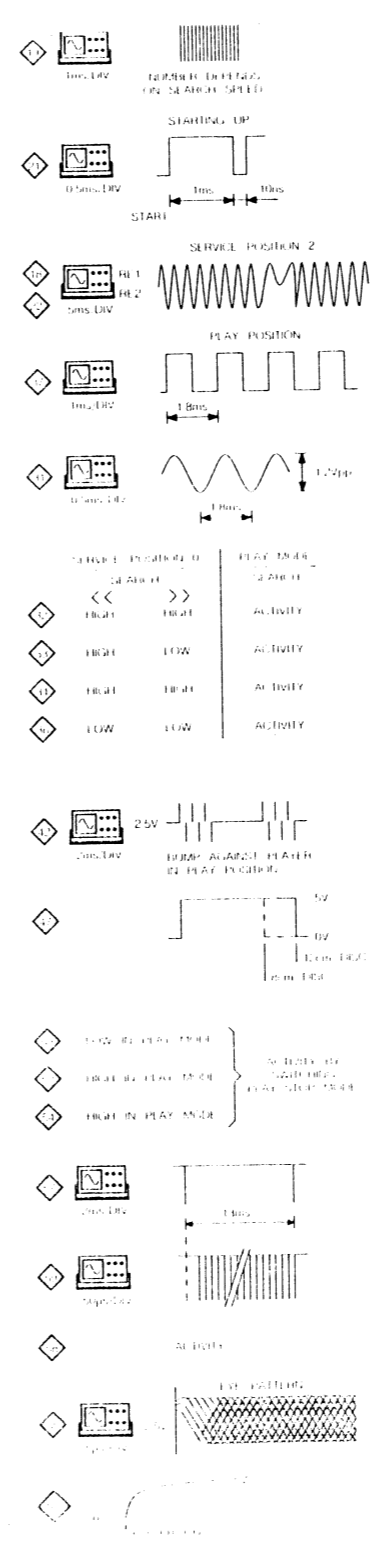
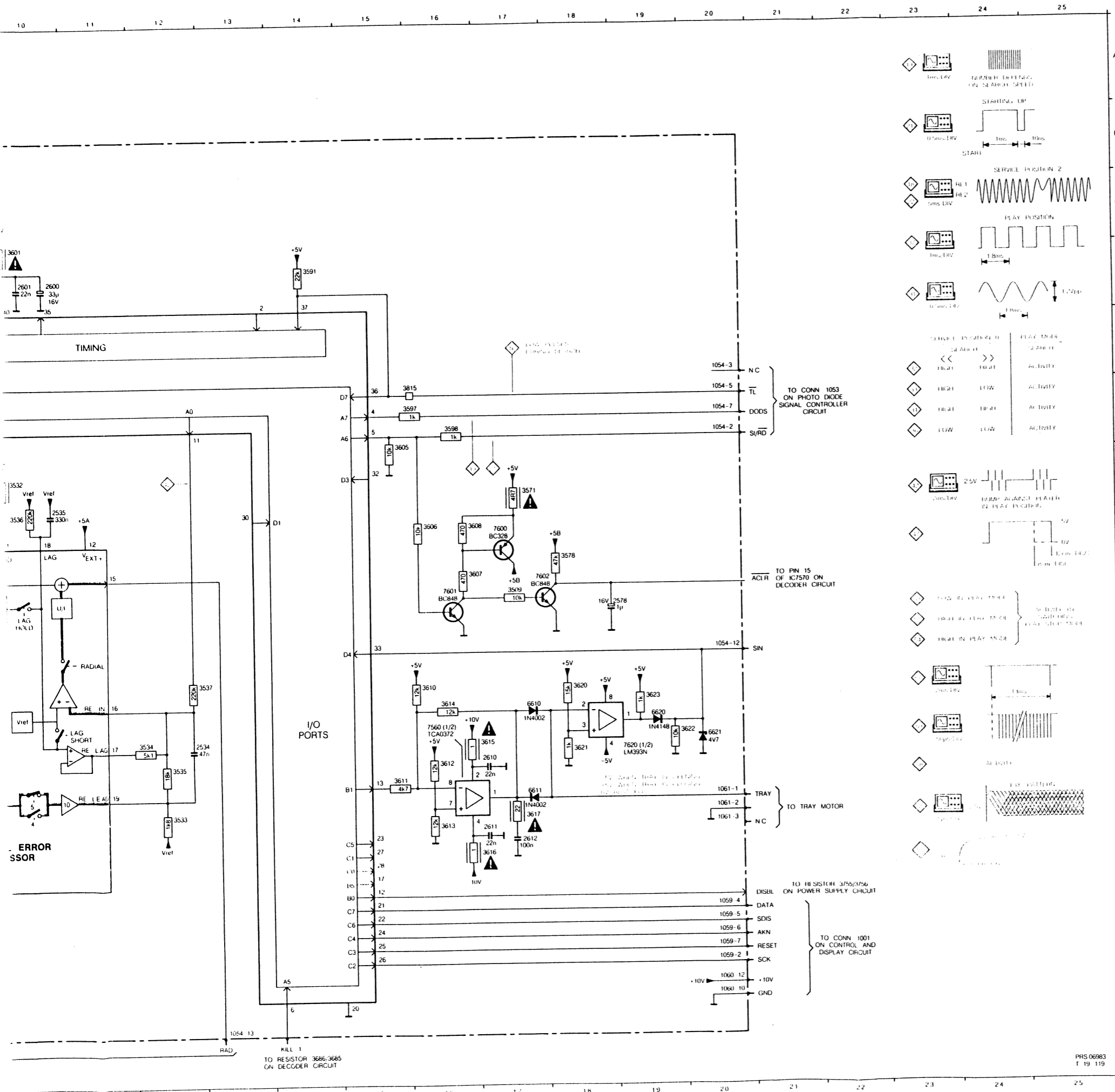
- SK3 A1
- 1051 D3
- 1053 A3
- 1061 F3
- 2500 D3
- 2501 D3
- 2502 D2
- 2503 D1
- 2504 D2
- 2505 C2
- 2506 C2
- 2507 D3
- 2508 C2
- 2509 C2
- 2510 D3
- 2511 D1
- 2514 C1
- 2515 E1
- 2516 C1
- 2517 A2
- 2540 A1
- 2541 A2
- 2542 B1
- 2543 A1
- 2550 F3
- 2551 E4
- 3500 B3
- 3501 D3
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- 3505 C2
- 3506 C2
- 3510 D1
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- 3512 D1
- 3513 A3
- 3514 C1
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- 3516 A3
- 3517 C1
- 3518 B1
- 3519 A1
- 3520 B3
- 3541 B2
- 3542 B2
- 3543 A1
- 3544 A2
- 3545 A2
- 3546 B1
- 3550 E3
- 3551 E3
- 3552 E3
- 3553 A1
- 3554 B3
- 3555 B3
- 3816 C2
- 3817 D2
- 3820 D1
- 6540 B2
- 6541 B2
- 6550 C1
- 7500 D2
- 7510 B1
- 7550 E3
- 9545 D3
- 9579 A3
- 9580 A3
- 9581 E3
- 9582 A1
- 9583 B2
- 9586 D4
- 9587 E3
- 9588 D3

PANEL SODER SIDE



- SK3 A3
- 1051 D1
- 1053 A1
- 1061 F1
- 2500 D1
- 2501 D2
- 2502 E2
- 2503 D3
- 2504 D3
- 2505 C2
- 2506 C2
- 2507 D2
- 2508 D2
- 2509 C2
- 2510 E1
- 2511 D3
- 2514 C3
- 2515 E3
- 2516 C3
- 2517 A2
- 2540 A3
- 2541 A2
- 2542 B3
- 2543 B3
- 2550 F1
- 2551 E1
- 3500 B1
- 3501 D2
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- 3504 D2
- 3505 D2
- 3506 D3
- 3510 D3
- 3511 C2
- 3512 E3
- 3513 A1
- 3514 C3
- 3515 A1
- 3516 A1
- 3517 C3
- 3518 C3
- 3519 A2
- 3520 B1
- 3541 B2
- 3542 B2
- 3543 A3
- 3544 A2
- 3545 B2
- 3546 B3
- 3550 E1
- 3551 E1
- 3552 E2
- 3553 A3
- 3554 B1
- 3555 B1
- 3816 C2
- 3817 E3
- 3820 D3
- 6540 B3
- 6541 B3
- 6550 C3
- 7500 D2
- 7510 B2
- 7550 F2
- 9545 D1
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- 9586 D1
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- 9588 D1

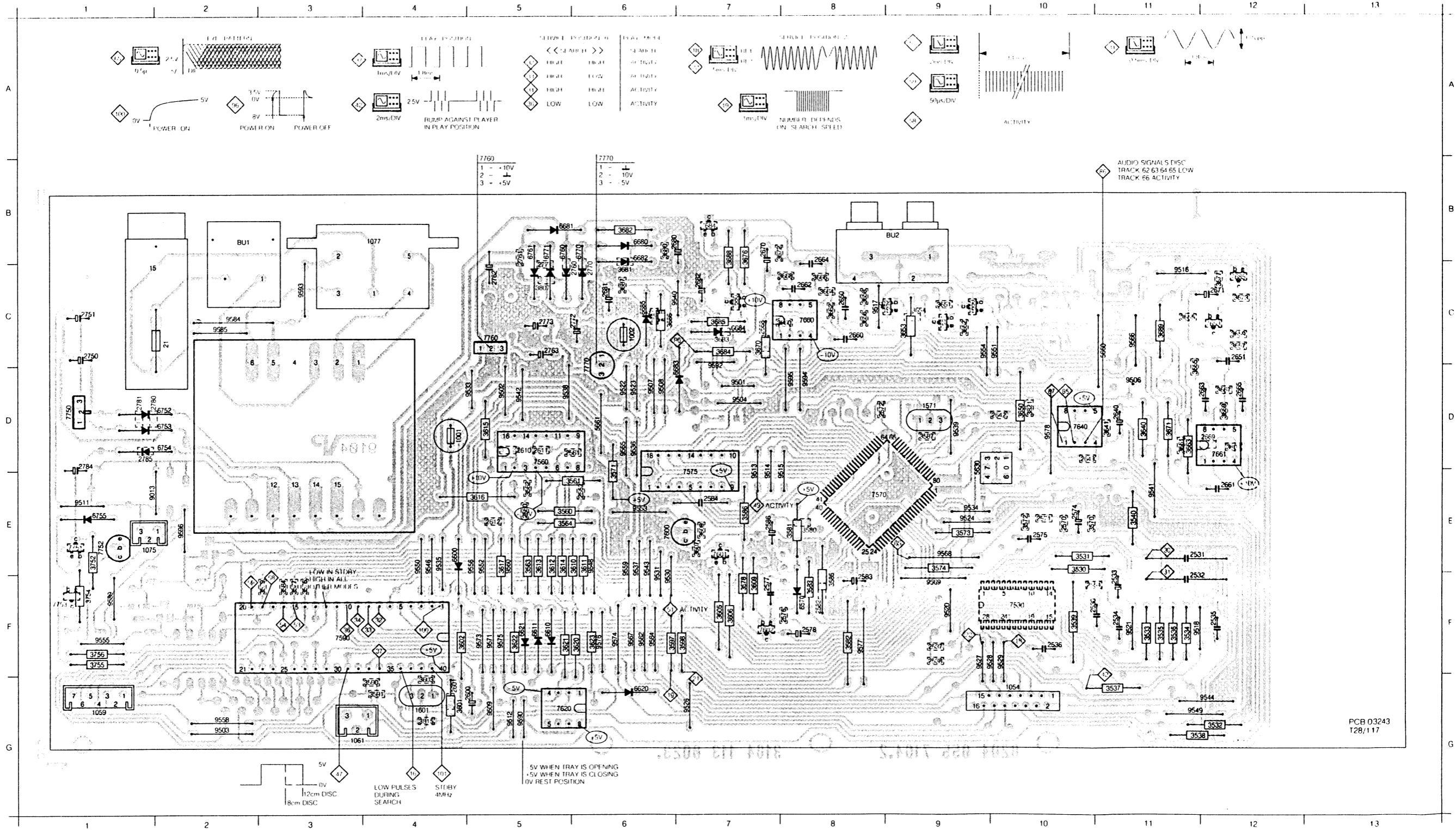




- 1601 C8
- 2530 G7
- 2531 G8
- 2532 G8
- 2533 M1
- 2534 K12
- 2535 G10
- 2536 M6
- 2537 M7
- 2538 M6
- 2554 G9
- 2560 M4
- 2561 N3
- 2562 O4
- 2578 I18
- 2600 D10
- 2601 D10
- 2610 K17
- 2611 L17
- 2612 L17
- 2680 C6
- 2681 C7
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- 3532 G10
- 3533 L12
- 3534 K12
- 3535 K12
- 3536 G10
- 3537 J12
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- 3539 G5
- 3540 J3
- 3560 N3
- 3561 N3
- 3562 M4
- 3563 N3
- 3564 N4
- 3571 G17
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- 3579 C4
- 3582 C4
- 3584 C5
- 3590 J3
- 3591 D14
- 3597 F16
- 3598 F16
- 3601 D10
- 3602 D9
- 3603 D8
- 3605 F15
- 3606 H16
- 3607 H16
- 3608 H16
- 3610 J16
- 3611 K15
- 3612 K16
- 3613 L16
- 3614 J16
- 3615 K17
- 3616 L17
- 3617 L17
- 3620 J18
- 3621 K18
- 3622 K19
- 3623 J19
- 3680 C6
- 3681 C7
- 3815 F16
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- 6610 J17
- 6611 K17
- 6620 J19
- 6621 K20
- 6680 B5
- 6681 B6
- 6682 C7
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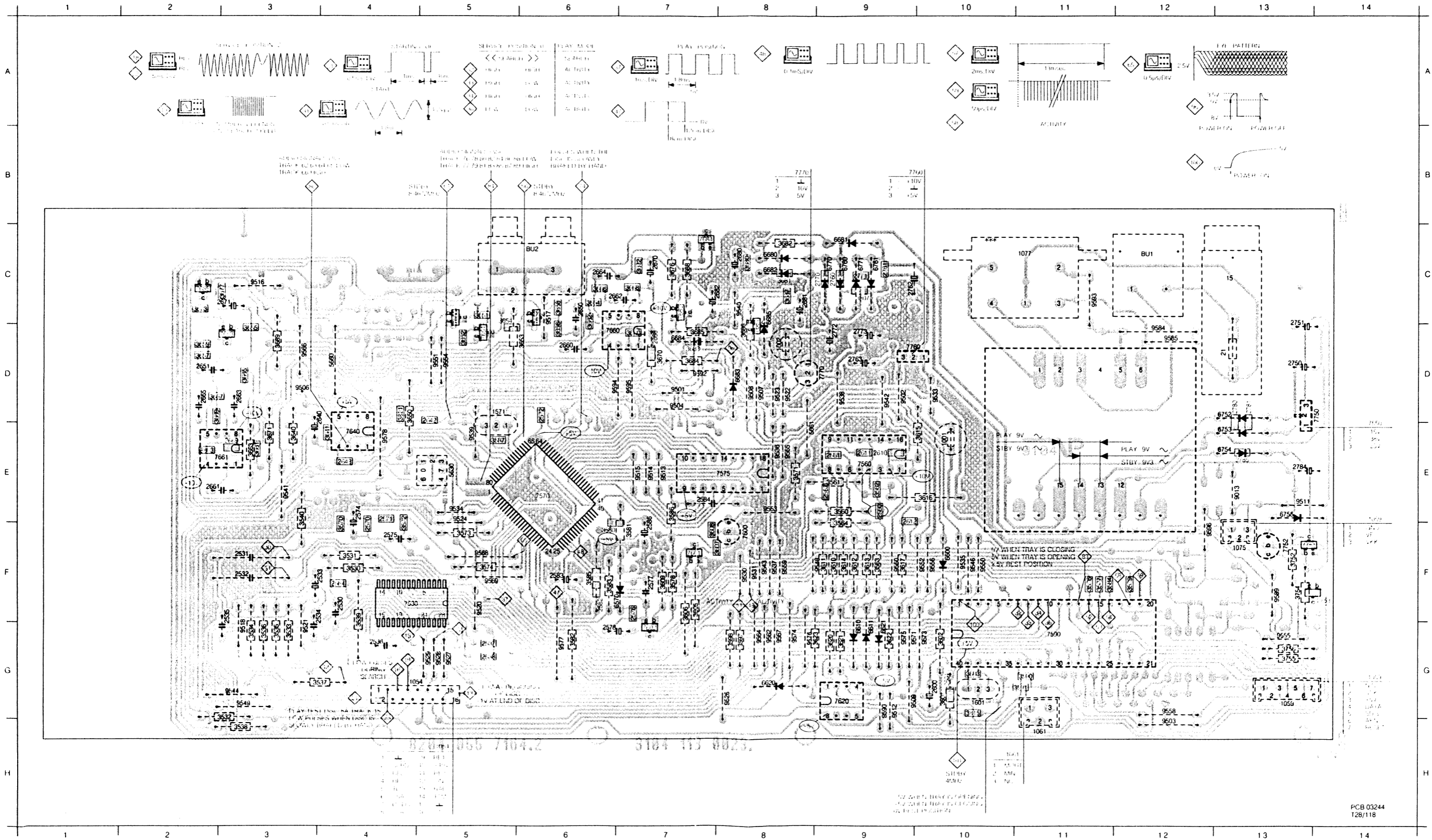
SERVO & DECODER PANEL component side

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21 C2	2534 F11	2578 F8	2661 E12	2762 C5	3536 F11	3577 F3	3602 F4	3621 F5	3661 D11	3681 C8	3821 D10	6752 D2	7620 G5	7760 C5	9516 C11	9535 E4	9553 E6	9574 F6
BU1 B2	2535 F12	2582 F8	2662 C8	2763 C5	3537 G11	3578 F7	3603 G4	3622 F5	3662 C8	3682 B6	5630 E9	6753 D2	7640 D10	7770 D6	9517 C8	9536 D6	9554 C9	9575 F5
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1002 C6	2537 F9	2584 E7	2664 C8	2771 C5	3539 F10	3580 F8	3606 F7	3624 D11	3664 C8	3684 C7	5661 D6	6755 E1	7651 C9	9501 D7	9520 F9	9538 D5	9556 E5	9577 F8
1054 G10	2538 F9	2586 E7	2665 D12	2772 C6	3540 E11	3581 F8	3607 E7	3641 D11	3665 D11	3685 C7	6570 F8	6760 B5	7652 C9	9502 D5	9521 F11	9539 D9	9558 G2	9578 D10
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1571 D9	2571 E10	2640 D11	2681 C6	2786 E10	3570 E10	3587 D9	3613 E5	3655 C11	3671 D11	3754 F1	6680 B6	7570 E8	7684 B7	9509 G5	9528 F10	9546 E4	9566 C11	9593 C3
1601 G4	2572 D8	2642 D10	2682 C7	2788 E10	3571 E6	3590 G4	3614 E5	3656 C8	3672 B8	3755 F1	6681 B5	7575 E7	7685 C12	9511 E1	9529 F10	9548 E6	9567 F6	9594 D8
2530 F10	2574 E10	2643 D10	2750 C1	2750 C1	3532 G12	3572 E10	3615 D5	3657 C12	3673 C12	3756 F1	6682 B6	7580 F3	7750 D1	9512 G5	9530 F6	9549 G11	9568 E8	9595 D8
2531 E11	2575 E10	2650 C8	2751 C1	2751 C1	3533 F11	3573 E9	3616 E5	3658 C8	3676 C7	3803 D12	6683 D7	7600 E6	7751 E1	9513 E7	9531 F6	9550 E4	9569 F9	9596 E2
2532 F11	2576 F8	2651 C12	2760 C6	2760 C6	3534 F11	3574 E9	3617 E5	3659 C12	3677 C12	3807 C5	6684 C7	7601 E7	7752 E1	9514 E7	9533 D5	9551 C10	9571 F5	

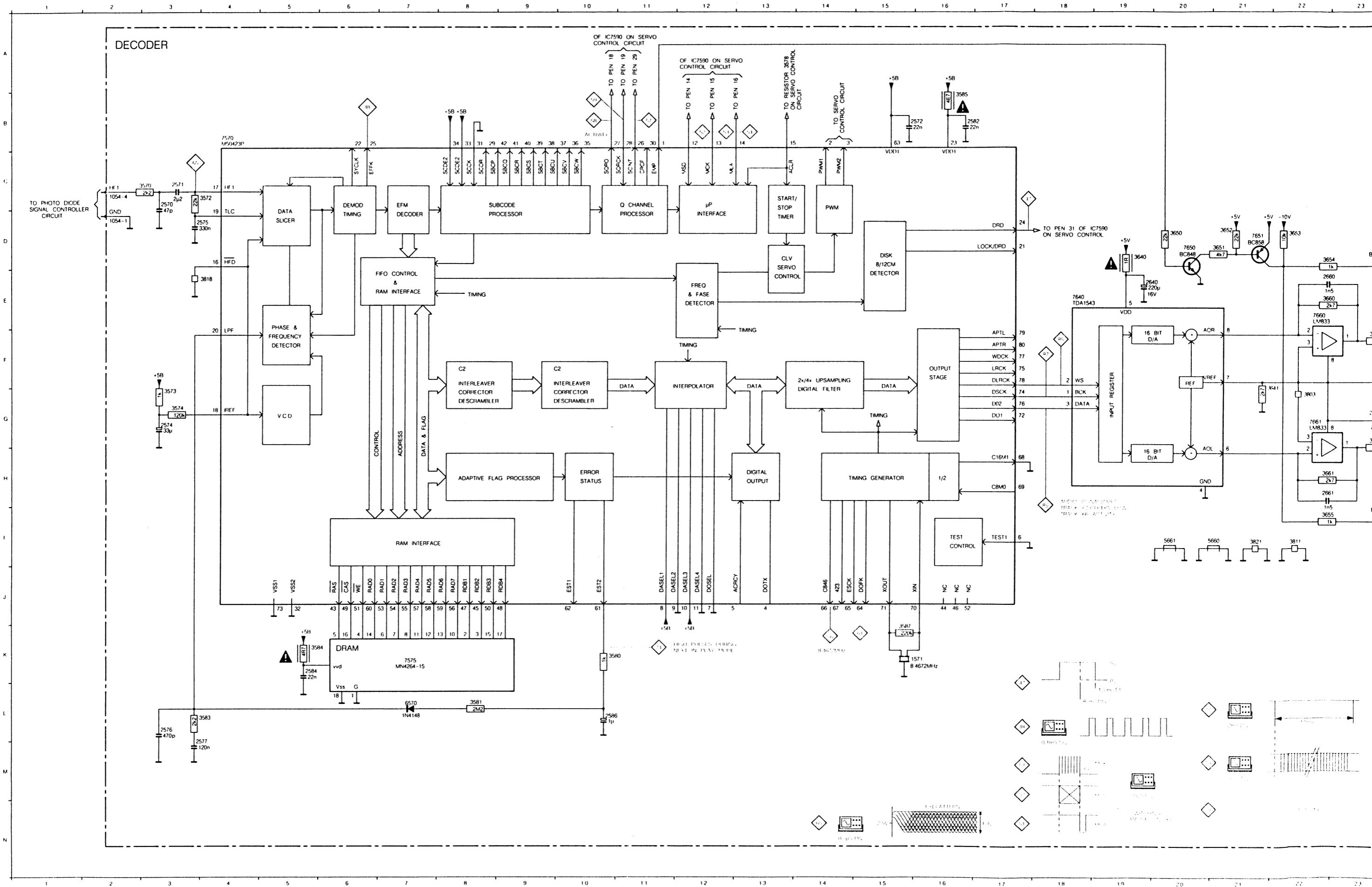


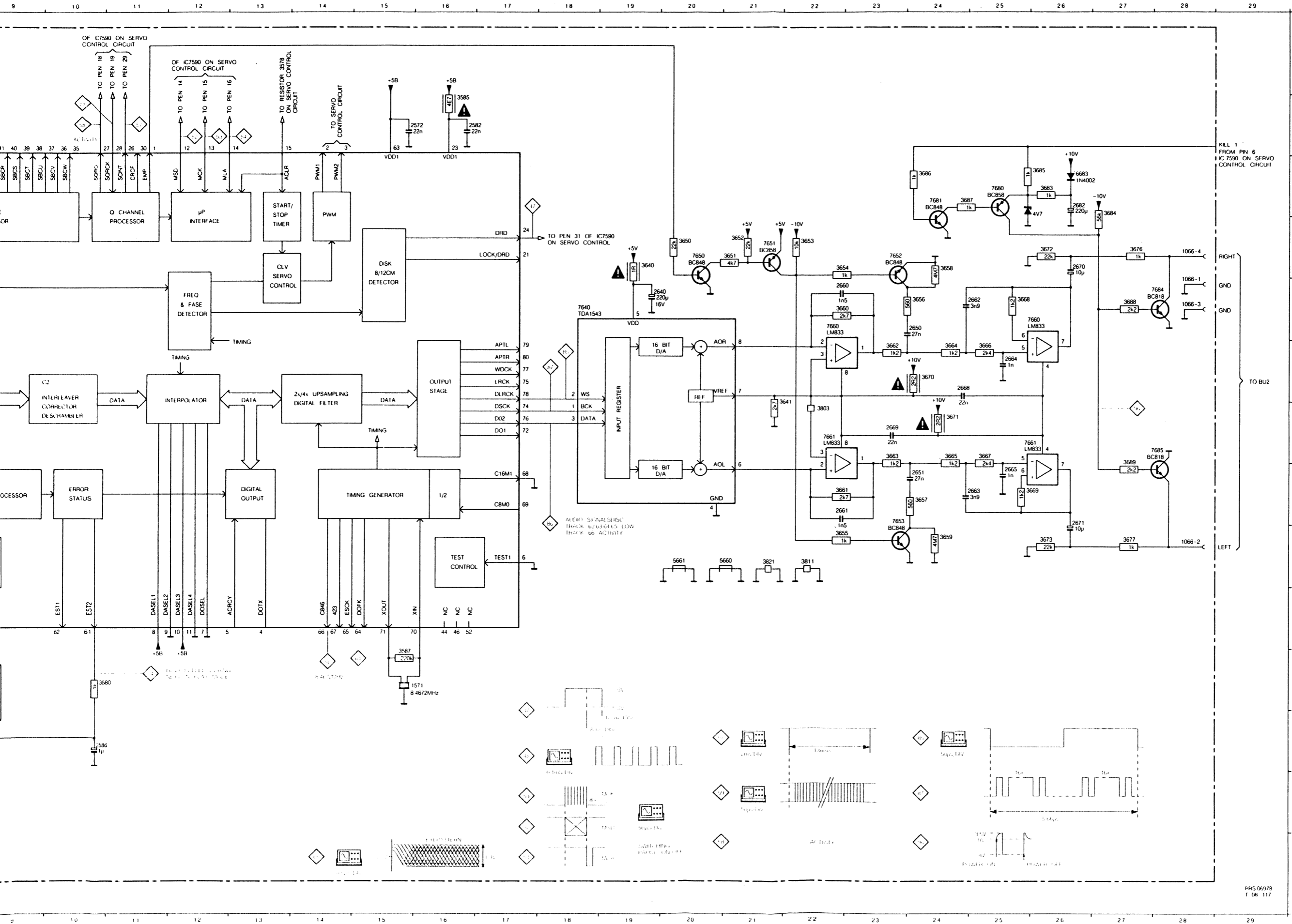
SERVO & DECODER PANEL solder side

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21 D13	2533 F4	2576 F7	2650 C6	2750 D13	3531 F4	3570 F4	3586 E7	3611 F9	3652 D5	3667 D2	3686 D8	6570 F7	6755 E13	7650 D5	7770 D9	9516 C3	9534 E5	9551 D5	9569 F5	9595 D7
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1001 E10	2536 G4	2582 F6	2661 E2	2761 C9	3534 G3	3573 F5	3591 G10	3614 F9	3655 D3	3670 D7	3689 D3	6611 G9	6770 C9	7653 D3	9502 D9	9520 F5	9537 F8	9554 D5	9574 G8	
1002 D8	2537 G5	2583 F6	2662 C6	2762 C9	3535 G3	3574 F5	3597 G8	3615 E10	3656 D6	3671 E3	3752 F13	6620 D8	6771 C9	7660 D6	9503 H12	9521 G3	9538 D9	9555 G13	9575 G9	
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1059 G13	2554 F4	2586 F7	2664 C6	2770 C9	3537 G3	3577 F11	3601 G10	3617 F9	3658 C6	3673 C2	3755 G13	6680 C8	7560 E9	7680 C7	9506 D3	9523 D8	9540 C8	9558 G12	9577 G6	
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1075 F13	2561 E9	2601 G10	2668 D7	2772 D9	3539 G4	3579 F12	3603 G10	3621 G9	3660 D7	3677 C3	3803 E2	6682 C8	7575 E7	7684 C7	9508 D8	9526 G8	9542 D9	9560 F9	9584 D12	
1077 C11	2562 E9	2610 E9	2669 E3	2773 D9	3540 F3	3580 F6	3605 F7	3622 G9	3661 E3	3680 C8	3807 C9	6683 D8	7580 G11	7685 C2	9509 G10	9527 G5	9543 F8	9562 G8	9585 D12	
1571 D5	2570 F4	2611 E9	2670 C7	2780 D13	3541 F9	3581 F7	3606 F7	3623 G9	3662 D6	3681 C8	3815 G10	6684 D7	7600 F8	7750 D14	9511 E13	9528 G5	9544 G3	9564 G8	9589 F13	
1601 G10	2571 E4	2612 F9	2671 C2	2781 D13	3561 E9	3582 G6	3607 F8	3640 E3	3663 C3	3682 C8	3821 D4	6685 D8	7601 F7	7751 F13	9512 G9	9529 G5	9546 F10	9565 E8	9590 G9	
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2531 F3	2574 E4	2642 E5	2681 C8	2785 E13	3563 F9	3584 F11	3609 F7	3650 E4	3665 D3	3684 D7	5660 D4	6753 E13	7620 G9	7753 F14	9514 E7	9531 F8	9549 G3	9567 G8	9593 C11	





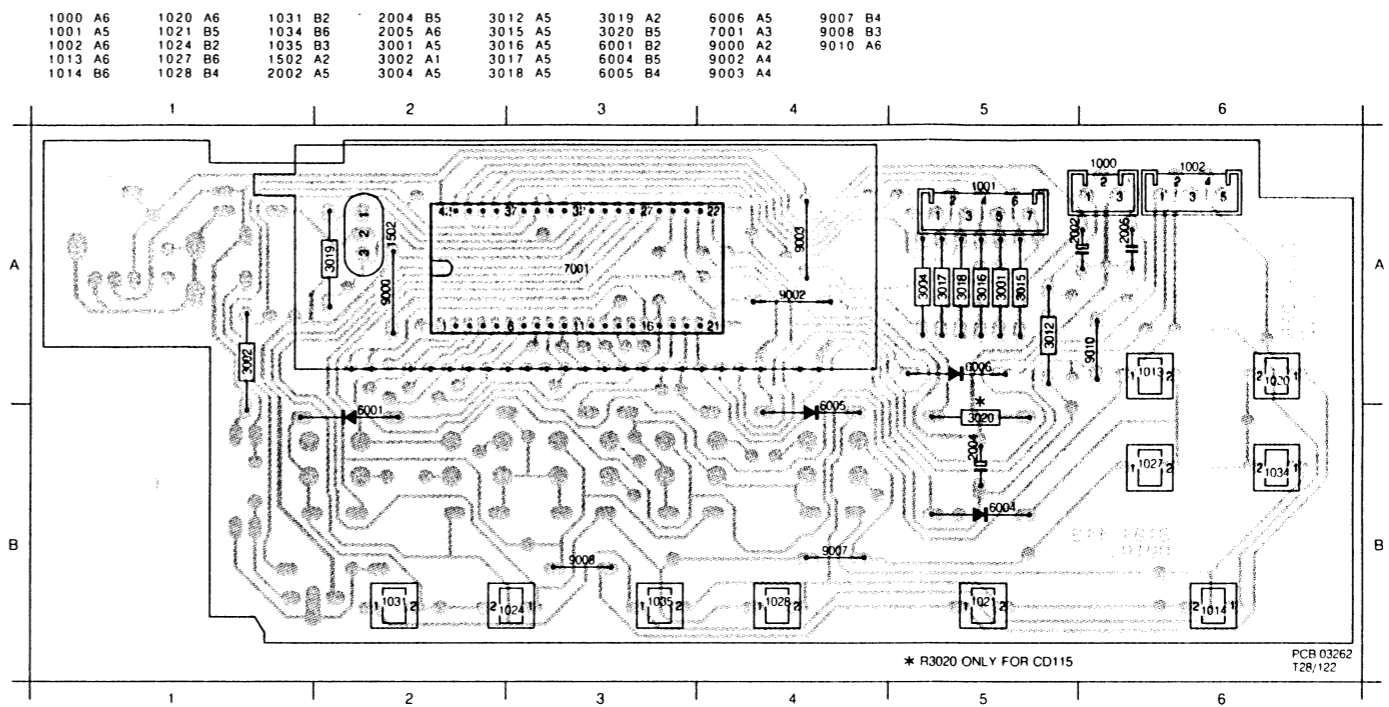
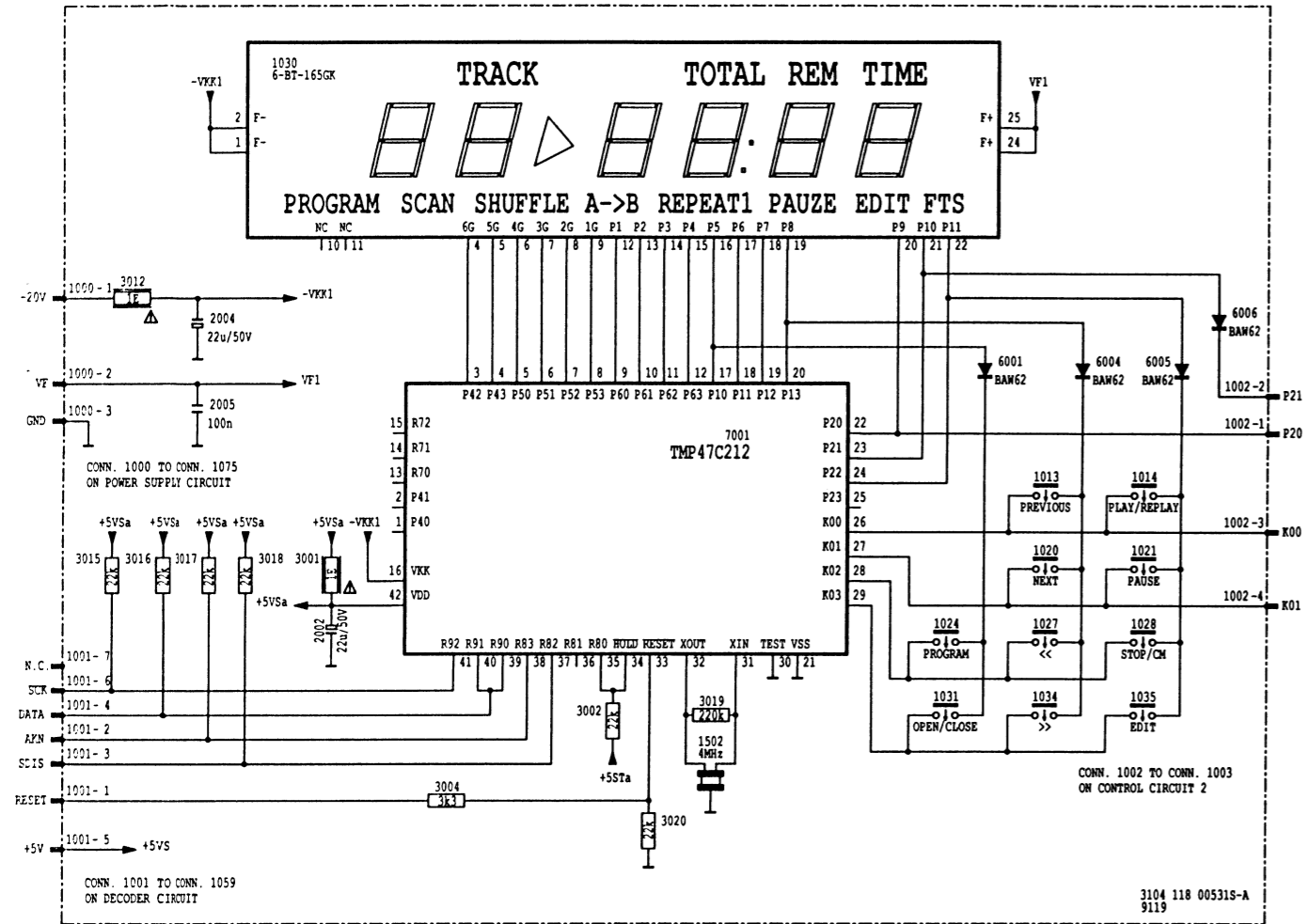




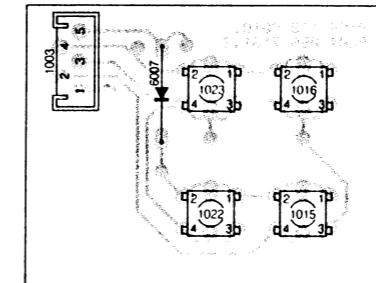
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- 2577 M3
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- 2584 K5
- 2586 L10
- 2640 E19
- 2650 E24
- 2651 H24
- 2660 E22
- 2661 H22
- 2662 E24
- 2663 H24
- 2664 F25
- 2665 H25
- 2668 F24
- 2669 G23
- 2670 D26
- 2671 I26
- 2682 C26
- 3570 C3
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- 3574 G3
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- 3581 L8
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- 3587 K15
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- 3664 F24
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- 3666 F25
- 3667 G25
- 3668 E25
- 3669 H25
- 3670 F24
- 3671 I27
- 3672 D26
- 3673 I26
- 3676 D27
- 3677 I27
- 3683 C26
- 3684 C27
- 3685 C26
- 3686 C24
- 3687 C24
- 3688 E27
- 3689 H27
- 3803 G22
- 3811 I22
- 3818 E4
- 3821 I21
- 5660 I21
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- 7660 E22
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PHS 06/78  
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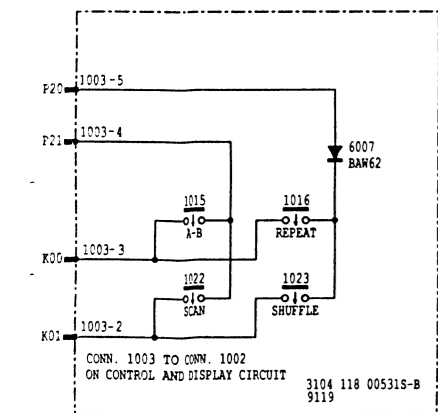
CONTROL & DISPLAY



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1002 A6	1024 B2	1035 B3	3001 A5	3016 A5	6001 B2	9000 A2	9010 A6
1013 A6	1027 B6	1502 A2	3002 A1	3017 A5	6004 B5	9002 A4	
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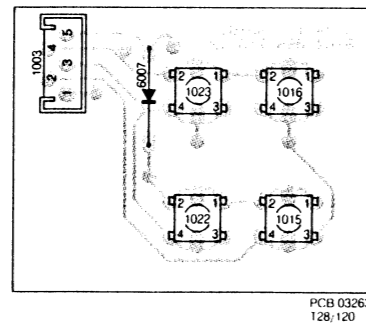
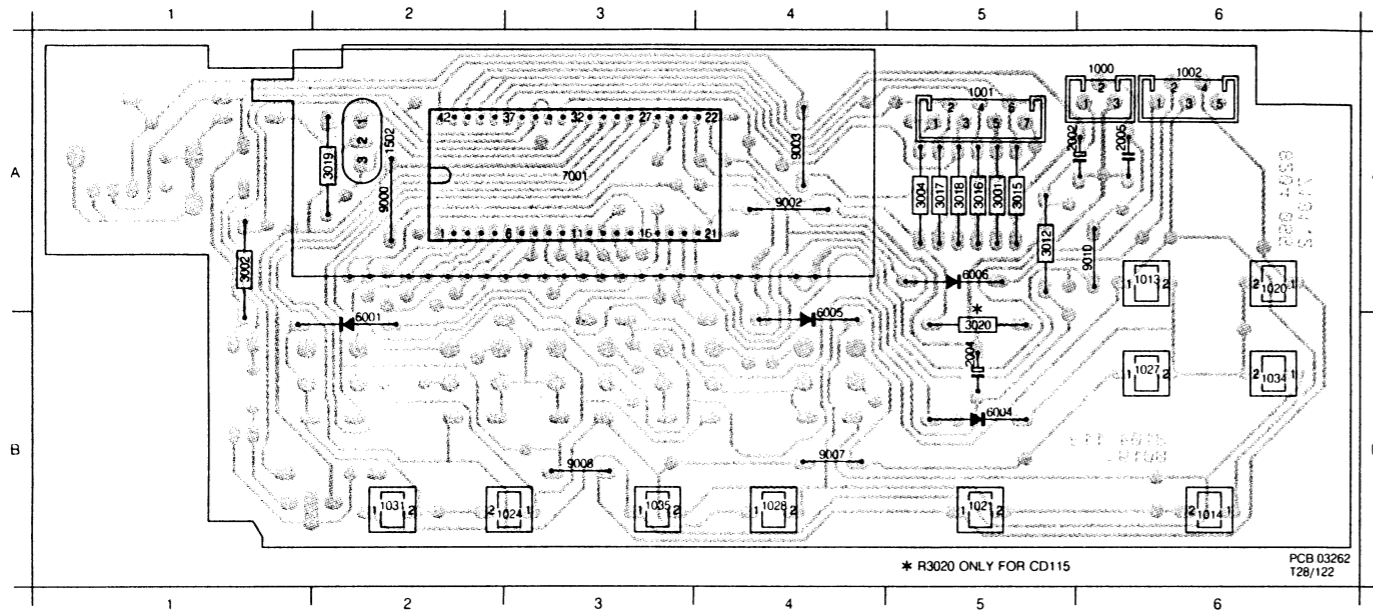
CONTROL 2



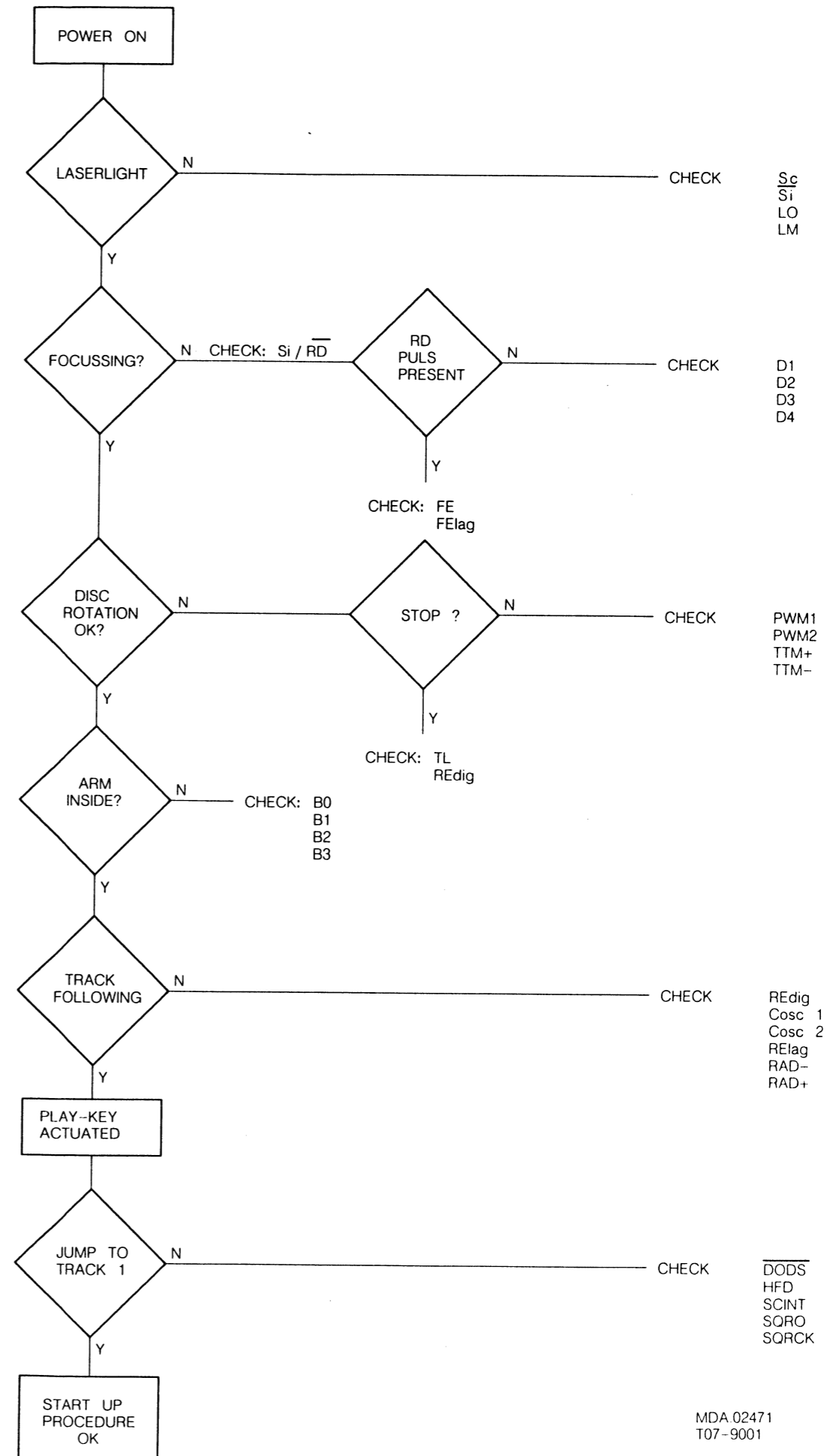
START UP PROCEDURE



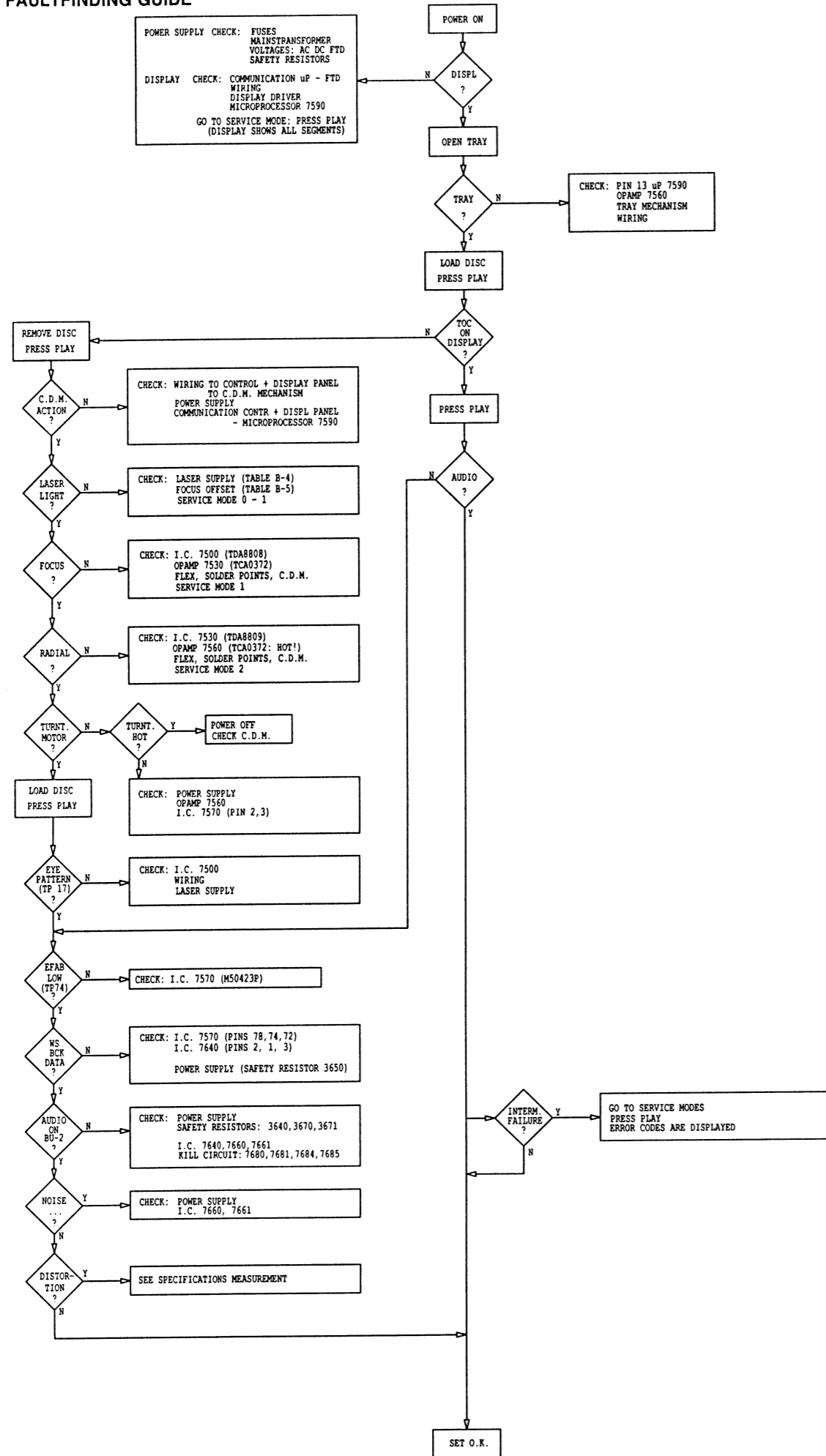
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1001 A5	1021 B5	1034 B6	2005 A6	3015 A5	3020 B5	7001 A3	9008 B3
1002 A6	1024 B2	1035 B3	3001 A5	3016 A5	6001 B2	9000 A2	9010 A6
1013 A6	1027 B6	1502 A2	3002 A1	3017 A5	6004 B5	9002 A4	
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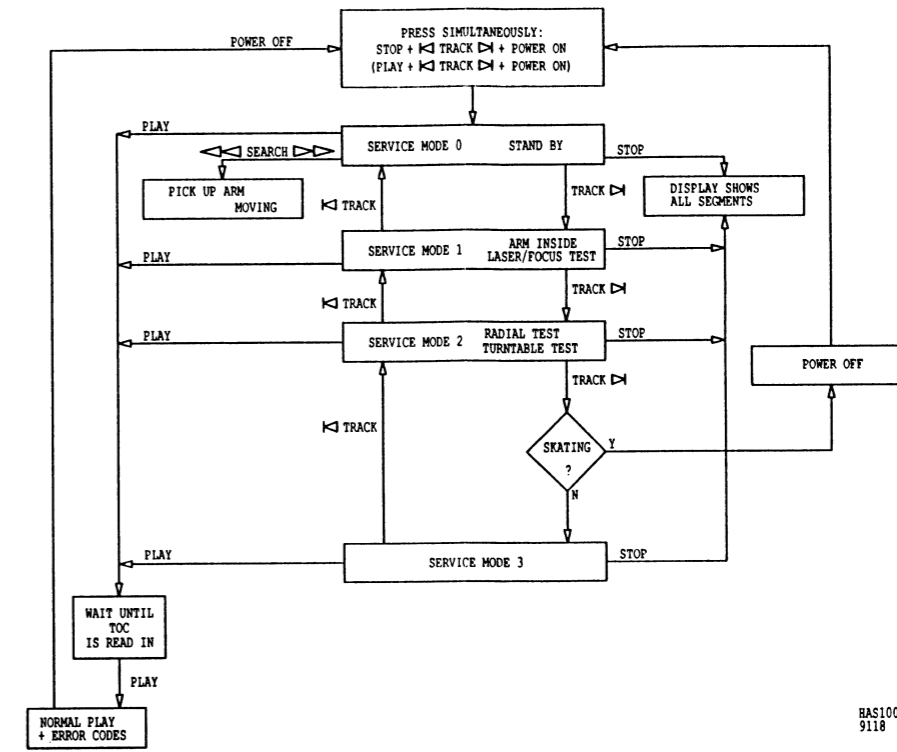
START UP PROCEDURE



**FAULTFINDING GUIDE**



**SERVICE TESTPROGRAM**



HAS1007  
9118

**ERROR CODE TABLE**

**SYSTEM ERRORS**

- ERROR 01 Tray error
- ERROR 02 Focus error
- ERROR 03 Radial error
- ERROR 04 Disc error : DRD becomes not low
- ERROR 05 TL low to long
- ERROR 06 Jump error
- ERROR 07 Subcode error
- ERROR 08 TOC error

**OPERATING ERRORS**

- ERROR 09 FF/FR pressed in scan
- ERROR 31 Search time out error
- ERROR 32 Binary search time out error
- ERROR 33 Index not found
- ERROR 34 Relative time not found
- ERROR 36 Programmed track is not existing on this CD
- ERROR 37 Selected track is not existing on this CD
- ERROR 38 Next at a border when repeat is off
- ERROR 39 Previous at a border when repeat is off
- ERROR 40 Finding error
- ERROR 41 Review error
- ERROR 42 Program memory full
- ERROR 47 A-B pressed while not in play
- ERROR 48 A-B pressed in scan
- ERROR 49 Edit pressed in play mode

HAS1006  
9118

**B-3 CHECK OF THE PHOTODIODES**

Step	Signal	Mode					Remarks
1	D2 D1 D3 D4	power on		-	-	signal 4=6=7=8	Signal depends on Distance lens $\leftrightarrow$ IR LED of remote control

T-23366A

**B-4 CHECK OF LASER SUPPLY**

The laser, the lasersupply plus the monitor diode form a feedback system. A defect in the lasersupply may result in the destruction of the laser. If, in that case, the laser is replaced, (= complete C.D.M.-unit) the new laser will also become defective. However, it is impossible to check and repair a feedback system if a link is missing. For this reason the laser supply can be checked with teh replacement circuit for laser assembly.

Step	Signal	Mode			Remarks	
1	LO	serv. pos. 2			1.8<V <2.3	
	LM	SK			170<mV <220	
2	LO	serv. pos. 2			1.8<V <2.3	
	LM	SK			170<mV <220	
3	LO	Power on			0V $\pm$ 0.2V	No light

After opening SK, the led will emit more light for a short moment.

T-23366B

**B-4 LASER CURRENT ADJUSTMENT**

Step	Signal	Mode					Remarks		
1	-	Power off	-	-	-	-	Check if FLEX-FOIL is properly connected		
2	-	Power off			R3555	1kΩ +10% -0	Pre-adjustment Ohmic value		
3	-	Power off	-	-	R3515	-	Set to mid-position		
4	laser current = voltage across R3500	Test disc 5A play				mV DC	≥ 15mV	If < 15mV then go to step 3 and set R3515 to 1/4 or 3/4. Try again.	
5	laser current = voltage across R3500	Test disc 5A play				mV DC	R3555	50mV	-
6	FE-LAG	Test disc 5A track 1 play					R3515	400mV	Fine adjustment

T-23366C

**B-5 ADJUSTMENT OF FOCUS-OFFSET**

Step	Signal	Mode					Remarks
1	-	Power on no disc	-	-	R3515	-	adjust for optical mid-position of the focus motor
2	FE LAG	Play Test disc 5 Track 1	27	-	R3515	400mV $\pm$ 40 mV DC	fine adjustment

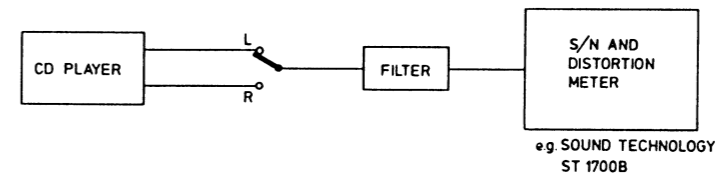
T-23366D

**D-6 SPECIFICATIONS MEASUREMENT**

Signal	Mode				Remarks
BU2-L	Test disc 3, play, total harmonic distortion	filter output	See technical data		See drawing 30459A12
BU2-R	Test disc 3, play, total harmonic distortion	filter output	See technical data		See drawing 30459A12
BU2-L	Test disc 3, play signal-to-noise ratio	filter output	See technical data		See drawing 30459A12
BU2-R	Test disc 3, play signal-to-noise ratio	filter output	See technical data		See drawing 30459A12

T-23366M

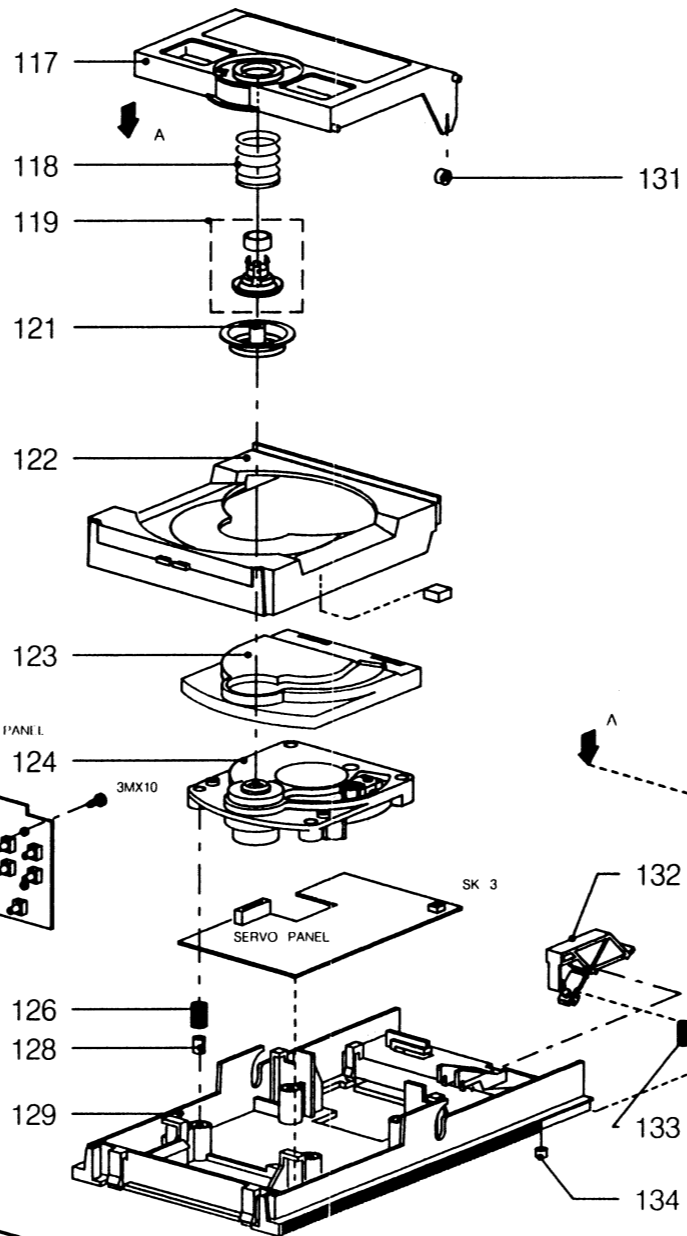
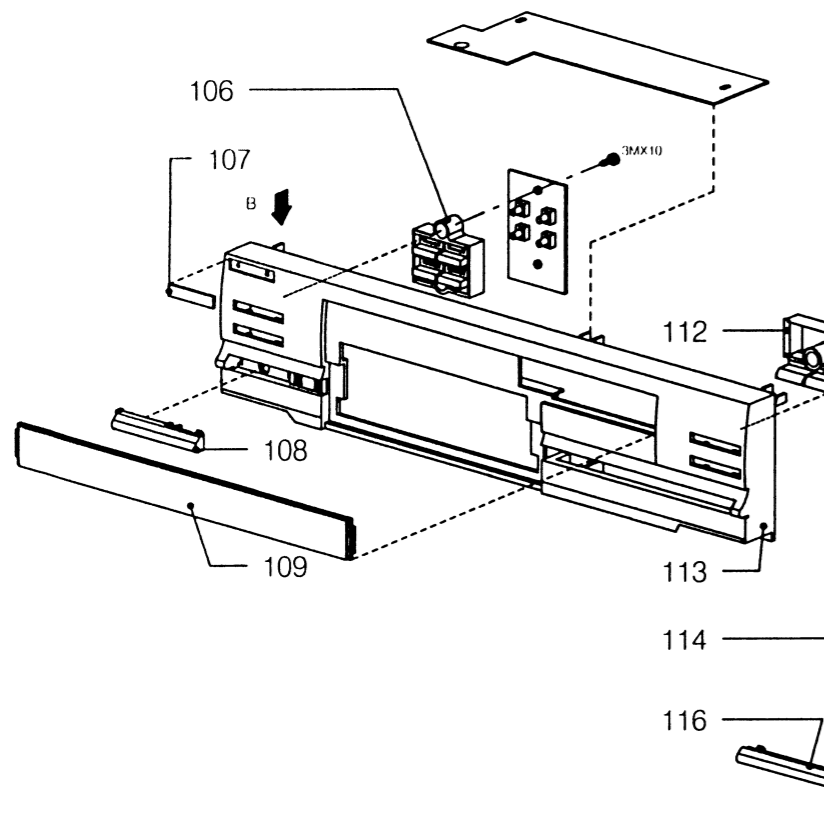
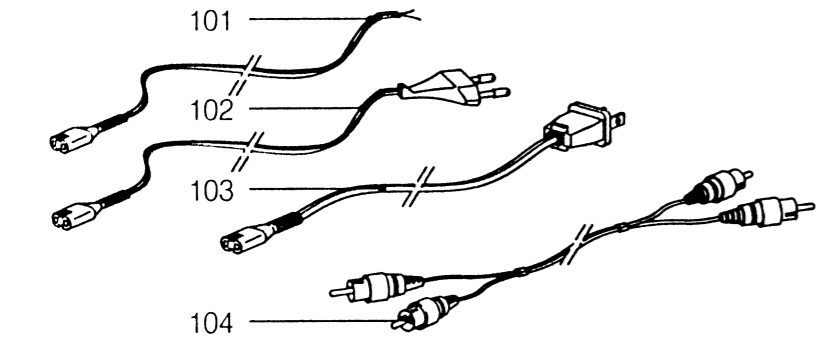
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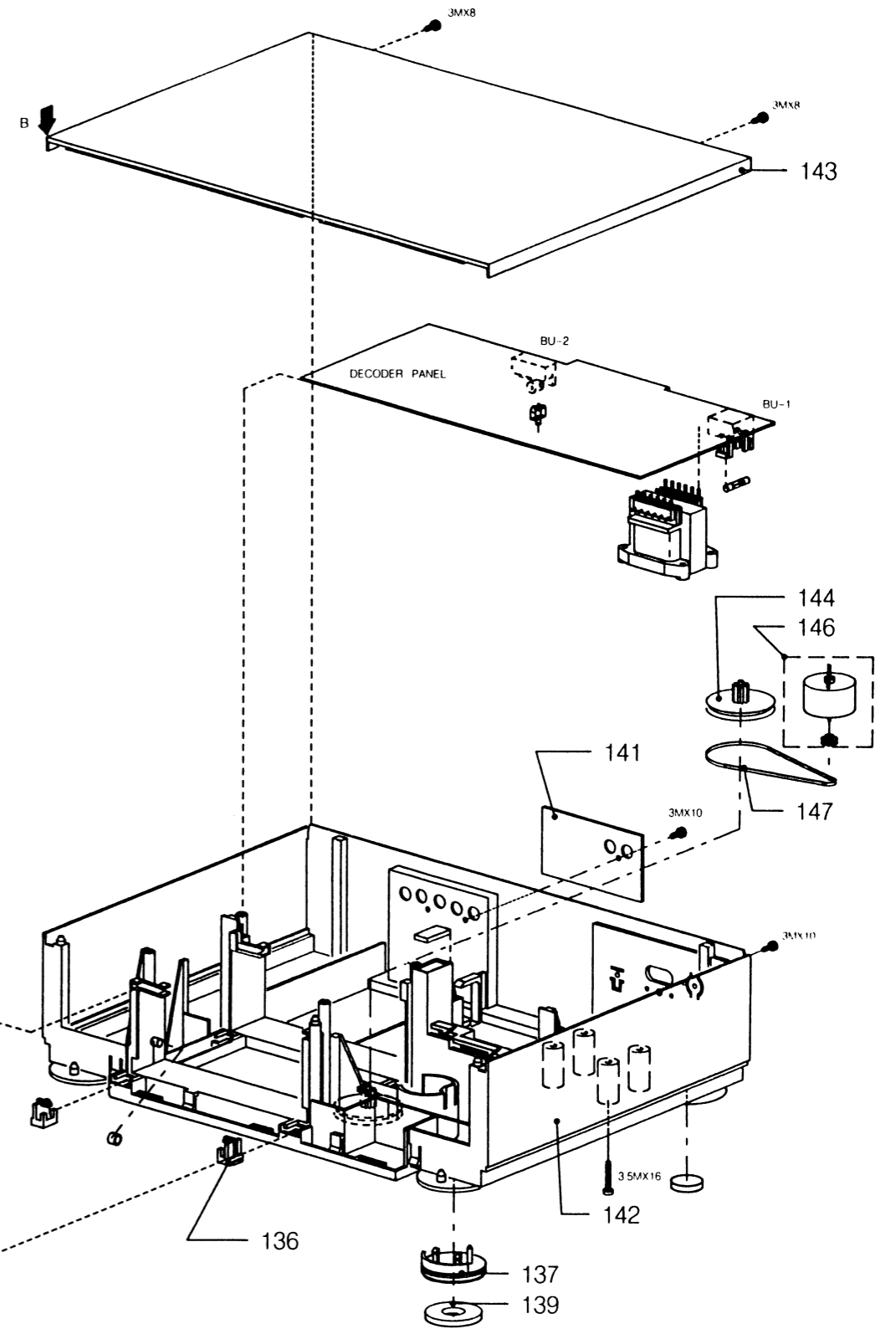
30 459 A12

EXPLODED VIEW

18



18



HAS CD115 00B

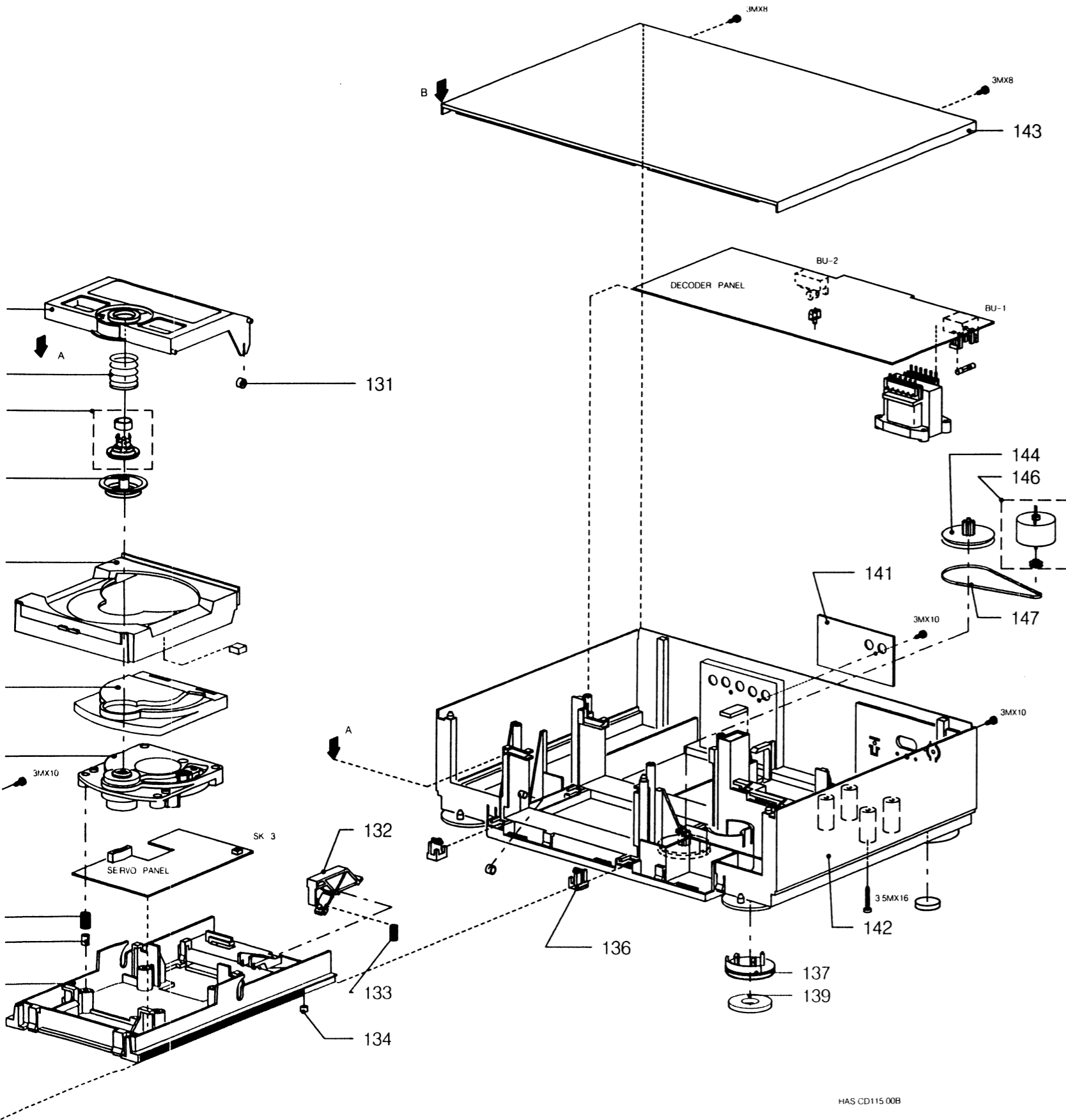
EVA 01263  
128/115

MEC

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MECHANICAL PARTSLIST


101	4822 321 10719	
102	4822 321 10249	SBC1201
104	4822 321 22832	SBC1072
106	4822 410 61333	
107	4822 459 10887	
108	4822 454 12739	
109	4822 381 11256	
112	4822 410 61334	
113	4822 444 40456	
114	4822 444 40457	
116	4822 454 30449	
117	4822 466 92841	
118	4822 492 52159	
119	4822 535 93054	
121	4822 492 33145	
122	4822 444 60681	
123	4822 454 30438	
124	4822 691 30209	
126	4822 492 51902	
128	4822 466 61587	
129	4822 444 50628	
131	4822 528 90639	
132	4822 402 61322	
133	4822 492 52123	
134	4822 532 51756	
136	4822 402 61323	
137	4822 462 41829	
139	4822 462 41783	
141	4822 444 60679	
142	4822 464 50846	
143	4822 444 60678	
144	4822 528 81329	
146	4822 361 21258	
147	4822 358 10115	
	4822 321 61026	16P FLEXFOIL





EVA O1263  
T28/115







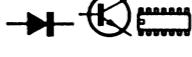
			
3640	4822 052 10108	1R 5% 0,33W	
3641	4822 051 20272	2k7 5% 0,1W	
3650	4822 050 22203	22k 1% 0,6W	
3651	4822 051 20472	4k7 5% 0,1W	
3652	4822 051 20223	22k 5% 0,1W	
3653	4822 050 21003	10k 1% 0,6W	
3654	4822 051 10102	1k 2% 0,25W	
3655	4822 051 10102	1k 2% 0,25W	
3656	4822 051 20561	560R 5% 0,1W	
3657	4822 051 20561	560R 5% 0,1W	
3658	4822 051 20475	4M7 5% 0,1W	
3659	4822 051 20475	4M7 5% 0,1W	
3660	4822 051 20272	2k7 5% 0,1W	
3661	4822 051 20272	2k7 5% 0,1W	
3662	4822 051 20122	1k2 5% 0,1W	
3663	4822 051 10122	1k2 2% 0,25W	
3664	4822 051 20122	1k2 5% 0,1W	
3665	4822 051 20122	1k2 5% 0,1W	
3666	4822 051 20242	2k4 5% 0,1W	
3667	4822 051 20242	2k4 5% 0,1W	
3668	4822 051 20122	1k2 5% 0,1W	
3669	4822 051 20122	1k2 5% 0,1W	
3670	4822 052 10228	2R2 5% 0,33W	
3671	4822 052 10228	2R2 5% 0,33W	
3672	4822 051 20223	22k 5% 0,1W	
3673	4822 051 20223	22k 5% 0,1W	
3676	4822 050 21002	1k 1% 0,6W	
3677	4822 051 10102	1k 2% 0,25W	
3680	4822 051 20681	680R 5% 0,1W	
3681	4822 051 20223	22k 5% 0,1W	
3682	4822 052 10228	2R2 5% 0,33W	
3683	4822 051 10102	1k 2% 0,25W	
3684	4822 050 25603	56k 1% 0,6W	
3685	4822 050 24702	4k7 1% 0,6W	
3686	4822 050 21002	1k 1% 0,6W	
3687	4822 051 10102	1k 2% 0,25W	
3688	4822 050 22202	2k2 5% 0,125W	
3689	4822 050 22202	2k2 1% 0,6W	
3752	4822 052 10478	4R7 5% 0,33W	
3754	4822 050 24702	4k7 5% 0,125W	
3755	4822 050 21003	10k 1% 0,6W	
3756	4822 050 21003	10k 1% 0,6W	
3803	4822 051 10008	jumper	
3807	4822 051 10008	jumper	
3815	4822 051 10008	jumper	
3821	4822 051 10008	jumper	

		
5660	4822 157 60363	
5661	4822 157 60363	




			
6570	4822 130 30621	1N4148	
6600	4822 130 30621	1N4148	
6610	5322 130 30684	1N4002	
6611	5322 130 30684	1N4002	
6620	4822 130 30621	1N4148	
6621	4822 130 34174	BZX79-C4V7	
6680	5322 130 30684	1N4002	
6681	5322 130 30684	1N4002	
6682	5322 130 30684	1N4002	
6683	5322 130 30684	1N4002	
6684	4822 130 34174	BZX79-C4V7	
6685	4822 130 34173	BZX79-C5V6	
6752	5322 130 30684	1N4002	
6753	4822 130 34281	BZX79-C15	
6754	5322 130 30684	1N4002	
6755	4822 130 31981	BZX79-C3V9	
6760	5322 130 30684	1N4002	
6761	5322 130 30684	1N4002	
6770	5322 130 30684	1N4002	
6771	5322 130 30684	1N4002	
7530	4822 209 73235	TDA8809T/C2	
7560	4822 209 72587	TCA0372DP2	
7570	4822 209 62112	M50423FP	
7575	4822 209 70422	MN4264-15	
7590	4822 209 63915	MC68HC05C8/ZC99892	
7600	4822 130 44104	BC328	
7601	4822 130 61207	BC848	
7602	4822 130 61207	BC848	
7620	4822 209 80797	LM393N	
7640	4822 209 73236	TDA1543/N2	
7650	4822 130 61207	BC848	
7651	5322 130 42012	BC858	
7652	4822 130 61207	BC848	
7653	4822 130 61207	BC848	
7660	4822 209 83163	LM833N	
7661	4822 209 83163	LM833N	
7680	5322 130 42012	BC858	
7681	4822 130 61207	BC848	
7684	4822 130 42696	BC818-25	
7685	4822 130 42696	BC818-25	
7750	5322 209 11222	MC7905CT	
7751	4822 130 61207	BC848	
7752	4822 130 44121	BC338	
7753	5322 130 42012	BC858	
7760	4822 209 71579	TY40408	
7770	4822 209 73233	MC79L05ACP	

PHOTODIODE SIGNAL CONTROLLER PANEL

<b>Miscellaneous</b>			
SK3	4822 276 13106		
			
2500	4822 122 33809	22nF 20% 50V	
2501	4822 122 33496	100nF 10% 63V	
2502	5322 122 32268	470pF 10% 50V	
2503	4822 122 33496	100nF 10% 63V	
2504	4822 122 33175	2,2nF 20% 50V	
2505	4822 121 43526	47nF 5% 100V	
2506	5322 122 32531	100pF 5% 50V	
2507	4822 122 33177	10nF 20% 50V	
2508	5322 122 34123	1nF 10% 50V	
2509	4822 121 42408	220nF 5% 63V	
2510	4822 121 51252	470nF 5% 63V	
2511	5322 122 34123	1nF 10% 50V	
2514	4822 121 51252	470nF 5% 63V	
2515	4822 122 33339	4,7nF 10% 50V	
2516	4822 121 42408	220nF 10% 63V	
2517	4822 122 33496	100nF 10% 63V	
2540	4822 122 33496	100nF 10% 63V	
2541	4822 122 33496	100nF 10% 63V	
2542	4822 124 41583	0,68µF 20% 50V Bipolar	
2543	4822 122 33496	100nF 10% 63V	
2550	4822 122 32575	220pF 10% 500V	
2551	4822 124 40272	33µF 20% 16V	
			
3500	4822 050 24702	4k7 1% 0,6W	
3501	4822 051 20104	100k 5% 0,1W	
3502	4822 051 20123	12k 5% 0,1W	
3503	4822 051 20101	100R 5% 0,1W	
3504	4822 051 10102	1k 2% 0,25W	
3505	4822 051 20243	24k 5% 0,1W	
3506	4822 051 20562	5k6 5% 0,1W	
3510	4822 051 20113	11k 5% 0,1W	
3511	4822 051 20124	120k 5% 0,1W	
3512	4822 051 20154	150k 5% 0,1W	
3513	4822 050 28203	82k 1% 0,6W	
3514	4822 051 20564	560k 5% 0,1W	
3515	4822 100 11193	22k 20%LIN 0,05W	
3516	4822 050 24704	470k 5% 0,125W	
3517	4822 051 20473	47k 5% 0,1W	
3518	4822 052 10279	27R 5% 0,33W	
3519	4822 052 10229	22R 5% 0,33W	
3541	4822 050 26802	6k8 1% 0,6W	
3542	4822 050 26802	6k8 1% 0,6W	
3543	4822 052 10228	2R2 5% 0,33W	
3544	4822 052 10228	2R2 5% 0,33W	
3545	4822 051 20339	33R 5% 0,1W	
3546	4822 052 10478	4R7 5% 0,33W	
3550	4822 052 10189	18R 5% 0,33W	
3551	4822 052 10129	12R 5% 0,33W	
3552	4822 051 20101	100R 5% 0,1W	
3553	4822 050 22202	2k2 1% 0,6W	
3554	4822 050 22201	220R 1% 0,6W	
3555	4822 101 10685	4k7 20%LIN 0,05W	
3816	4822 051 10008	jumper	
3817	4822 051 10008	jumper	
3820	4822 051 10008	jumper	

			
6540	4822 130 30861	BZX79-C7V5	
6541	4822 130 30861	BZX79-C7V5	
6550	4822 130 30621	1N4148	
7500	4822 209 73234	TDA8808T/C3	
7510	4822 209 72587	TCA0372DP2	
7550	4822 130 44121	BC338	

## CONTROL AND DISPLAY PANEL

<b>Miscellaneous</b>		
	4822 256 91782	DISPLAY HOLDER
1001	4822 071 51002	FUSE T1A
1002	4822 071 55001	FUSE T500mA
1013	4822 276 13104	TACT SWITCH
1014	4822 276 13104	TACT SWITCH
1015	4822 276 13104	TACT SWITCH
1016	4822 276 13104	TACT SWITCH
1020	4822 276 13104	TACT SWITCH
1021	4822 276 13104	TACT SWITCH
1022	4822 276 13104	TACT SWITCH
1023	4822 276 13104	TACT SWITCH
1024	4822 276 13104	TACT SWITCH
1027	4822 276 13104	TACT SWITCH
1028	4822 276 13104	TACT SWITCH
1030	4822 130 90994	DISPLAY 6-BT165Gk
1031	4822 276 13104	TACT SWITCH
1034	4822 276 13104	TACT SWITCH
1035	4822 276 13104	TACT SWITCH
<b>Crystal</b>		
1502	4822 242 72527	4.00MHz CERAMIC
		
2002	4822 124 41596	22µF 20% 50V
2004	4822 124 41596	22µF 20% 50V
2005	5322 121 42386	100nF 5% 63V
		
3001	4822 052 10108	1R 5% 0,33W
3002	4822 050 22203	22k 1% 0,6W
3004	4822 050 23302	3k3 1% 0,6W
3012	4822 052 10108	1R 5% 0,33W
3015	4822 050 22203	22k 1% 0,6W
3016	4822 050 22203	22k 1% 0,6W
3017	4822 050 22203	22k 1% 0,6W
3018	4822 050 22203	22k 1% 0,6W
3019	4822 050 22204	220k 1% 0,6W
3020	4822 050 22203	22k 1% 0,6W
		
6001	4822 130 30613	BAW62
6004	4822 130 30613	BAW62
6005	4822 130 30613	BAW62
6006	4822 130 30613	BAW62
6007	4822 130 30613	BAW62
7001	4822 209 30249	47C212
<b>MISCELLANEOUS</b>		
1501	4822 070 31001	FUSE T100mA
5500	4822 146 30986	MAINSTRANSFORMER



vorh.

**SI** **Wichtig für die Werkstatt!**  
Sachgebiet: **AC 52 Compact Disc** Nummer: **52069**  
Datum: **03.12.91**

### Service Information

Betrifft: **Compact-Disc-Spieler  
CD 115  
Service-Hinweise**

Verteiler: **INTERN UND EXTERN**

Bei Geräten aus einem eng begrenzten Fertigungszeitraum kann es geschehen, daß das Inhaltsverzeichnis einer CD nicht gelesen wird und daß der Spieler nicht in Play-Funktion geht. Das Display zeigt ERROR.


Ursache ist Schwergängigkeit des Rafoc-Arms infolge der Verwendung eines zu steifen Fetts. Zur Abhilfe des o.g. Fehlers muß das Laufwerk gewechselt werden.

Betroffene Laufwerke CDM4/19 sind zu erkennen an der Fertigungswoche:

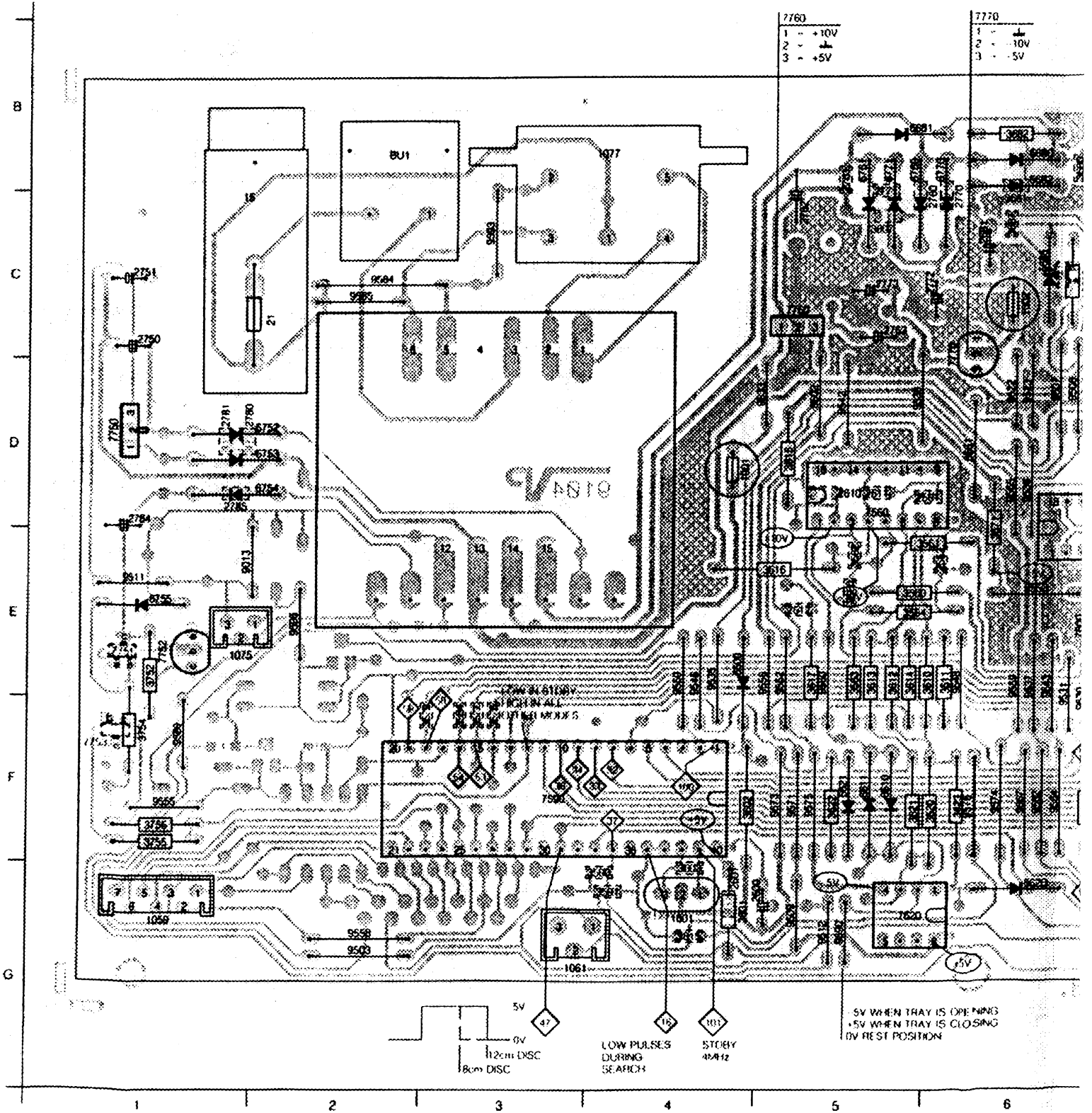
- Aufdruck 9135 bis 9138 bei Laufwerkaufkleber

CDM- 4/19 <sup>101 108 76511</sup> 9139 AH E-43611   
DANGER INVISIBLE LASER RADIATION WHEN  
OPEN. AVOID DIRECT EXPOSURE TO BEAM

- Aufdruck 9134.4A bis 9138.4A bei Laufwerkaufkleber

 CDM4/19 E43611-13-39  
7651 AH 01/9141.4B

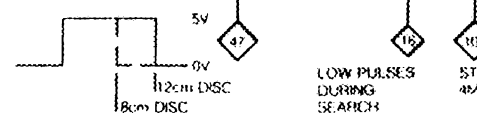
4812 829 52069



7760	
1	+10V
2	-10V
3	+5V

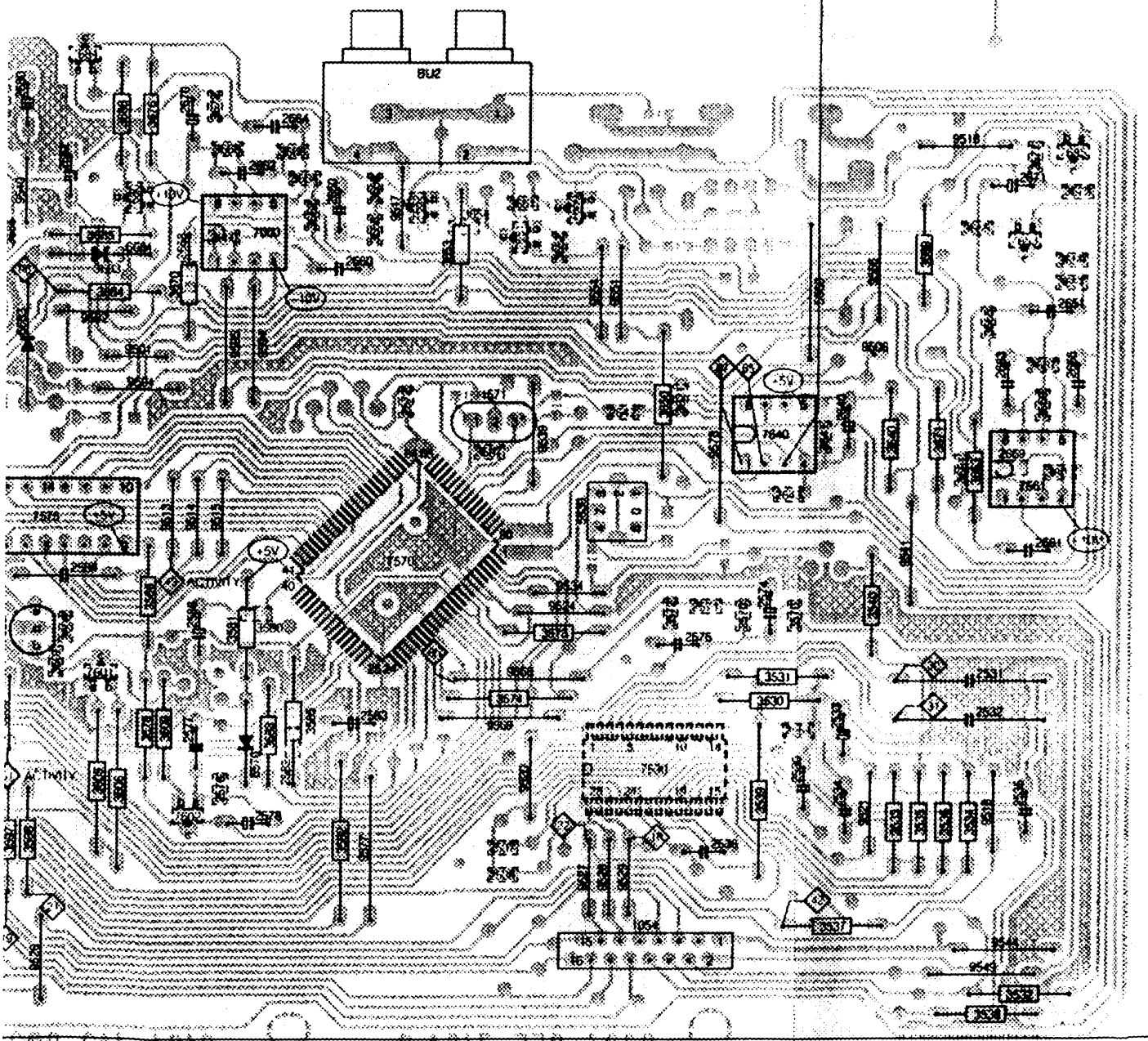
7770	
1	-10V
2	-10V
3	-5V

CONVERTER  
12cm DSC  
18cm DSC



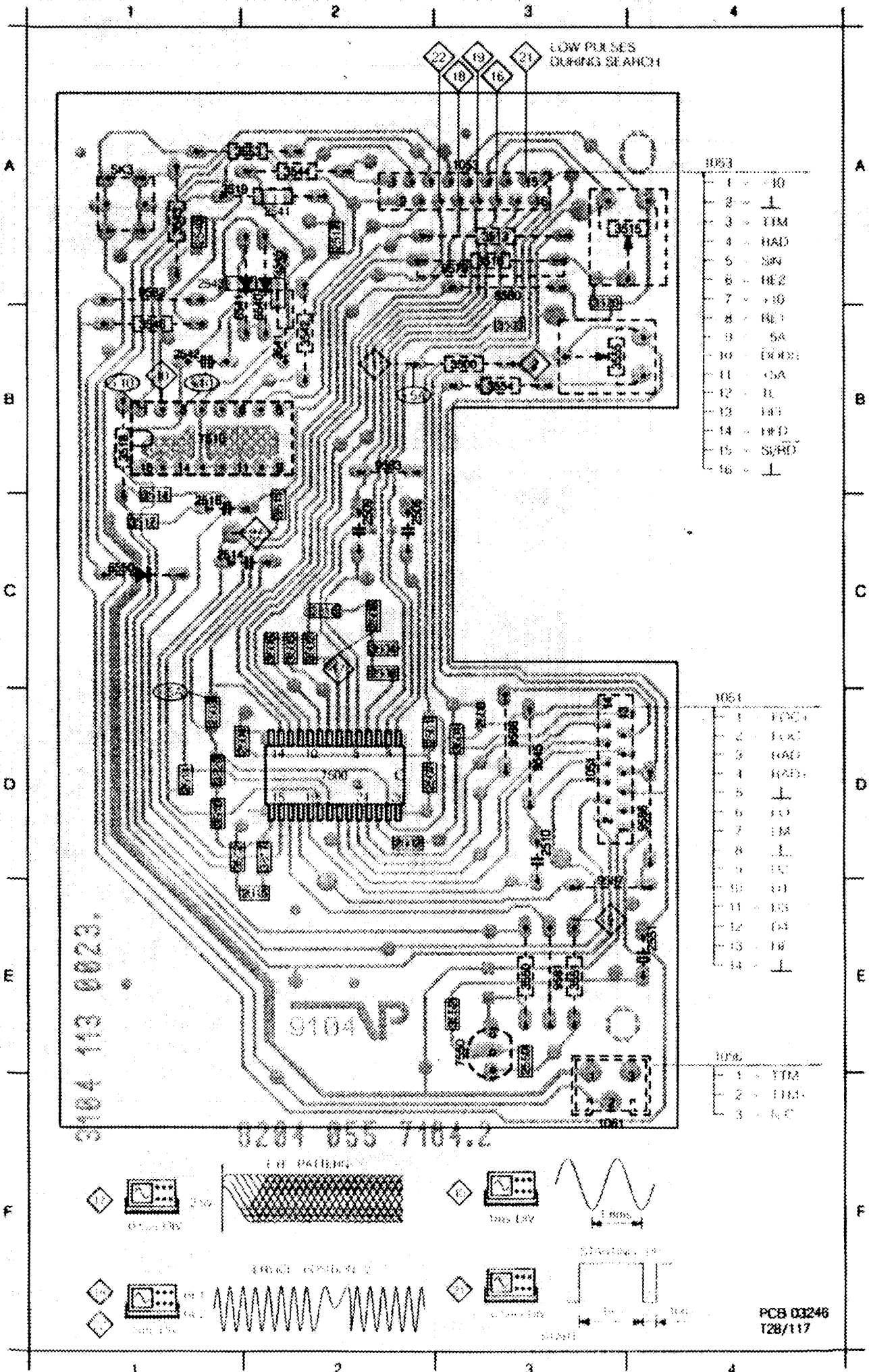
5V WHEN TRAY IS OPENING  
+5V WHEN TRAY IS CLOSING  
0V REST POSITION

ALERO SIGNALS DISC  
TRACK 62 63 64 65 LOW  
TRACK 66 ACTIVITY



3104 113 005 0504 022 11045

PANEL COMPONENT SIDE



LOW PULSES DURING SEARCH

1053

1	10
2	1
3	TIM
4	HAD
5	SN
6	HE2
7	10
8	HE3
9	5A
10	DRD1
11	GA
12	IL
13	HF
14	HRD
15	SUPD
16	1

1054

1	FNC
2	FNC
3	GAO
4	HAD
5	1
6	10
7	IM
8	1
9	10
10	11
11	13
12	14
13	18
14	1

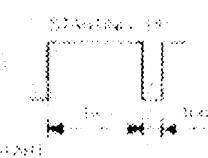
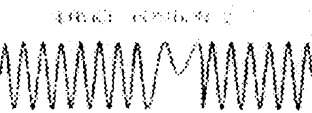
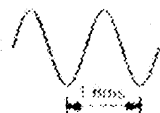
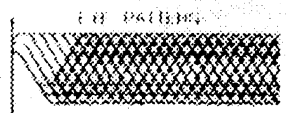
1056

1	TTM
2	TTM
3	10

3104 113 0023.

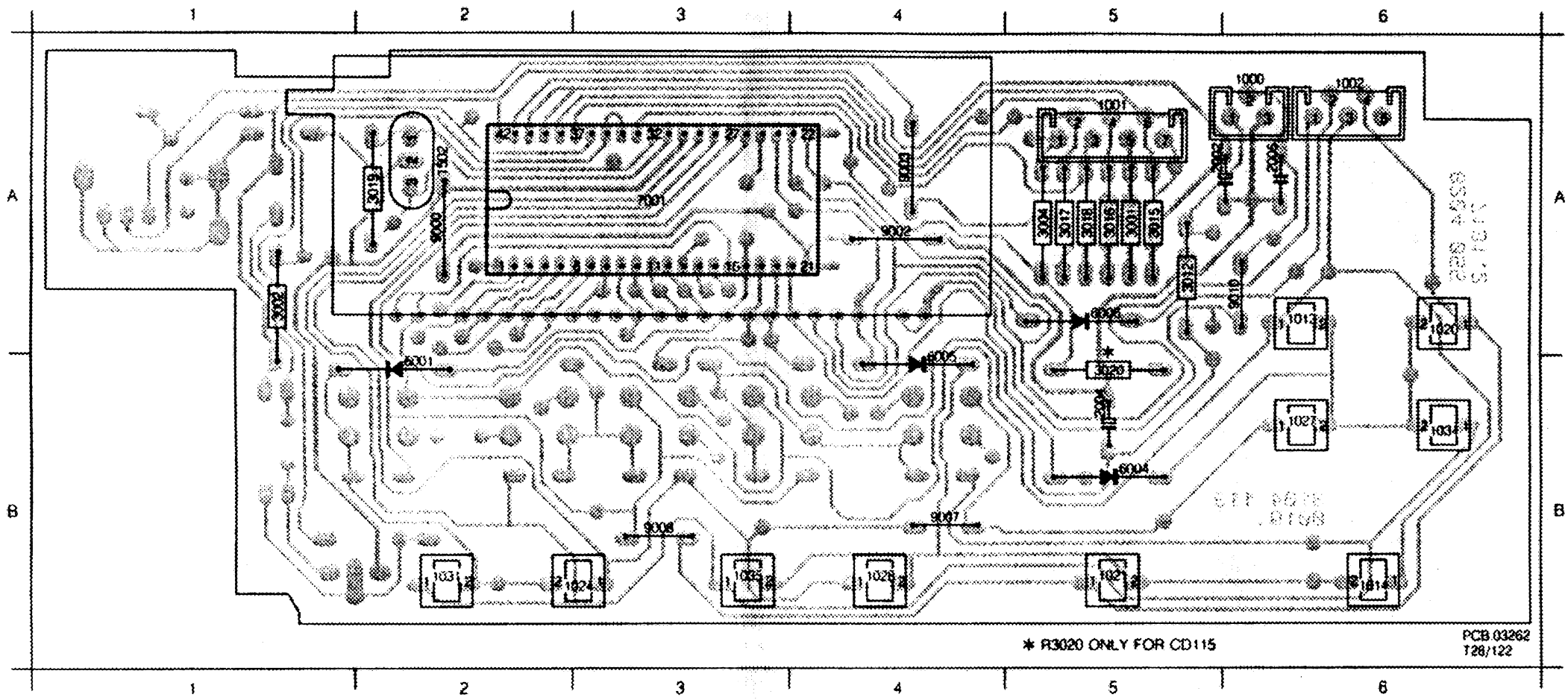
8204 055 7104.2

10 PRELIM



PCB 03246  
T28/117

1000 A6	1020 A6	1031 B2	2004 B5	3012 A5	3019 A2	6006 A5	9007 B4
1001 A5	1021 B5	1034 B6	2005 A6	3015 A5	3020 B5	7001 A3	9008 B3
1002 A6	1024 B2	1035 B3	3001 A5	3016 A5	6001 B2	9000 A2	9010 A6
1013 A6	1027 B6	1502 A2	3002 A1	3017 A5	6004 B5	9002 A4	
1014 B6	1028 B4	2002 A5	3004 A5	3018 A5	6005 B4	9003 A4	





1000 A6	1020 A6	1031 B2	2004 B5	3012 A5	3019 A2	6006 A5	9007 B4
1001 A5	1021 B5	1034 B6	2005 A6	3015 A5	3020 B5	7001 A3	9008 B3
1002 A6	1024 B2	1035 B3	3001 A5	3016 A5	6001 B2	9000 A2	9010 A6
1013 A6	1027 B6	1502 A2	3002 A1	3017 A5	6004 B5	9002 A4	
1014 B6	1028 B4	2002 A5	3004 A5	3018 A5	6005 B4	9003 A4	

