Service Information

	1990-10-01
	CD600/CD610
	A90-120

Product Service Group CE Audio

(GB)

To adapt the service manual the following sheets hve been added/changed.

(NL)

Voor het aanpassen van de service manual zijn de onderstaande pagina's toegevoegd/gewijzigd.
Pagina:

(F)

Afin de pouvoir adapter le "manual service" les feuillets suivants ont été soit modifieés, soit ajoutés.
Pages:

(D)

Zür anpassung des Service Manual sind die nachstehenden Seiten hinzugefügt/geändert.
Seite:

(I)

Le seguenti pagine sono state cambiate/aggiunte allo scopo di adattare il Manuale di Servizio.
Pagine:

1-1b
2-1a
2-2a
2-3c
3-1c
3-2b
3-3b
3-4b
3-5b
3-6b
3-6-1a
3-6-2a
3-7b
3-8a
3-9c
3-10d
4-1c

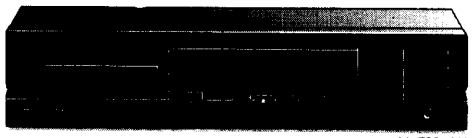
Service
Service
Service

4822 725 22973

Compact disc player CD600/00R/05R/07R/17R

CD610/00R/05R/07R/17R

Service
Service
Service



44 728 A11

Service Manual

CONTENTS

COMPACT disc DIGITAL AUDIO

(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.

(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 ricambiago identici a quelli specificati.

(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.

(SF) Varo!
Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

(S) Varning!
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

CLASS 1 LASER PRODUCT

3122 110 03420

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

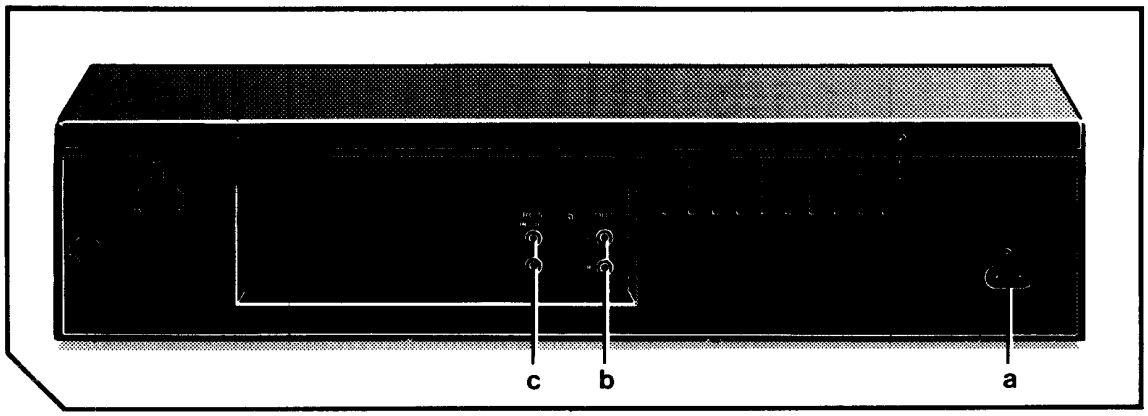
PHILIPS

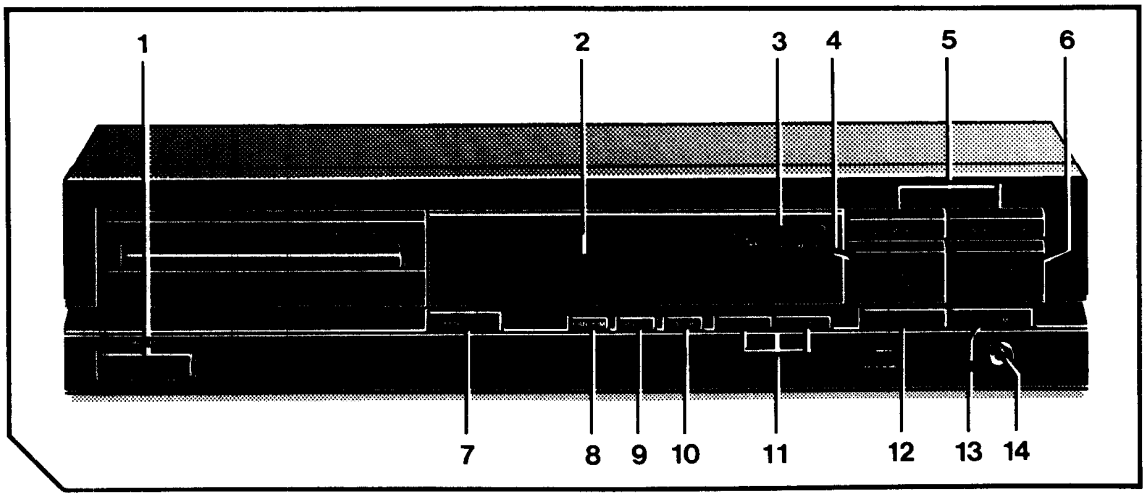
"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

Subject to modification
4822 725 22407
Printed in The Netherlands

PHILIPS

Published by Consumer Electronics





44 729 A11

OPERATION

Explanation of keys

1 ON/OFF
For switching on and off.

2 DISPLAY
Informs you about the functioning of the player.
Displays details from the disc contents list.

3 IR REMOTE (not for CD600)
Receives the signals from the remote control.

4 STOP/CM
For stopping play (STOP)
For erasing a programme (CM = Clear Memory).

5 PREVIOUS and **NEXT**
For selecting another track during play.
For selecting a track number to start play.
For selecting track numbers when compiling a programme.
(PREVIOUS from high to low and NEXT from low to high.)

6 PLAY/REPLAY
For starting play (PLAY)
For returning to the beginning of a track (REPLAY).

7 OPEN/CLOSE
For opening and closing the disc tray.

8 RANDOM
For playing in random order.

9 REPEAT
For repeating a disc or a programme.

10 'A-B'
For setting the starting and stopping point of a passage to be repeated.

11 '◁◁ ▷▷'
For fast search to a particular passage during play.
('◁◁' backwards and '▷▷' forwards.)

12 PAUSE
For interrupting play.
For holding play at the start of a disc, track or passage.

13 PROGRAM
For storing track numbers in a programme.
For erasing track numbers from a programme.
For checking a programme.

14 PHONES
For connection of headphones

CONNECTIONS

a. Connection for the mains lead.
b. **OUT L R**: for the connecting cable to the amplifier.
- Insert a red plug into the 'R' socket (right-hand channel) and the other plug into the 'L' socket (left-hand channel).
- Insert the two other plugs into the corresponding sockets of the CD or AUX input of your amplifier. You can also use the TUNER or TAPE IN connection, but **never** the PHONO input. This is not suitable for Compact Disc reproduction.

c. **RC5 IN/OUT**: for a remote control system.
Use this connection for:
- Connecting up the equipment when you are incorporating the player in a PHILIPS HiFi system with its own remote control system.
- Connecting the remote control receiver EM 2200, available as an accessory, if the siting of the player prevents its IR REMOTE eye from receiving the signals from the remote control directly.

TECHNICAL DATA

General

1. Mains voltage 00R	: 220V (±10%)
05R	: 240V (±10%)
07R/17R	: 117V (±10%)
2. Mains frequency 00R/05R	: 50 Hz
07R/17R	: 60 Hz
3. Mains voltage selection	: See circuit diagram
4. Power consumption mains, operated	: 15 W

External RC-5 connection

Specification: V-in Low: from -2,0 V to +1,6 V
V-in High: from +3 V to +7,5 V
R-in: from 47 kOhm to 68 kOhm

Line output

Number of channels	: 2
Output voltage	: 2 Vrms +/– 2 dB
Unbalance Left-Right	: max. +/– 0,5 dB
Output resistance	: 1kOhm
Amplitude linearity	: max. +/– 0,15 dB from 20 Hz to 20 kHz
Phase non-linearity	: max. +/– 1,0° from 20 Hz to 20 kHz
Signal to noise ratio	: min 90 dB from 20 Hz to 20 kHz
Dynamic range	: min 80 dB from 20 Hz to 20 kHz
Total harmonic distortion + noise	: min 66 dB from 20 Hz to 20 kHz
Intermodulation distortion	: max. 0.05% (min 66 dB) from 20 Hz to 20 kHz
Out-band attenuation	: min 50 dB above 24,8 kHz from 20 Hz to 20 kHz
Channel separation	: min 80 dB from 20 Hz to 20 kHz
Muting during random access	: min 90 dB from 20 Hz to 20 kHz
Automatic switched de-emphasis with time constants	: 15/50 µs

Headphone

Output voltage	: Max. 2 Vrms +/– 2 dB
Unbalance Left-right	: Max. +/– 0,5 dB
Output resistance	: 150 Ohm
Load impedance range	: 32 Ohm to 600 Ohm
Output power	: Max. 6 mW into 32 Ohm load Max. 10 mW into 150 Ohm load Max. 6 mW into 600 Ohm load

Dimensions and weight

Apparatus tray closed	WxDxH	: 420 x 280 x 90/104 mm
Apparatus tray open	WxDxH	: 420 x 423 x 90/104 mm
Weight		: 3,8 kg

Optical read-out system

Laser type	: semiconductor ALGaAs
Wave length	: 780 nm ± 20 nm
Light output (c.w.)	: 0,4 mW ± 0,04 mW

(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 ditzelfde 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 enfiler le bracelet serti 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 gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(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.

SERVICING HINTS

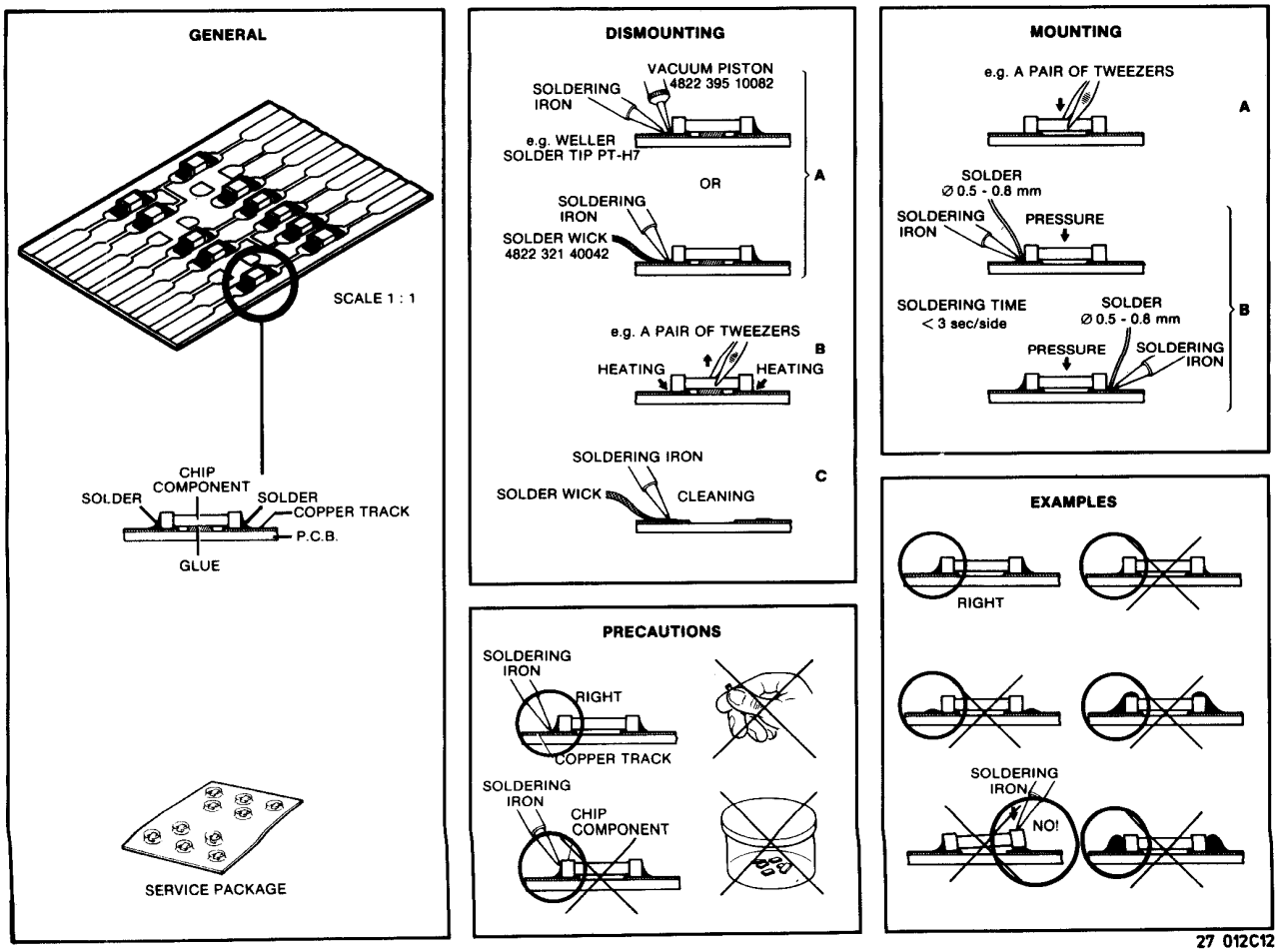
In the set chip components have been applied.
For disassembly and assembly of chip components see the figure below.

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 seperate disc hold-down should be used.
(See drawing "Service disc hold-down")
The set can function normally then.
Code number of the disc hold-down is 4822 462 50383.

When the tray mechanism has been disassembled, the tray switch must be activated immediatly after pressing the play button in order to ensure normal operation. By servicing the apparatus in the upside down position it is also possible to short cicuit points A and B temporarly instead of activating the switch.

SERVICE TOOLS

Audio signals 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 1 kHz 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
Insulation cover	4822 444 60655



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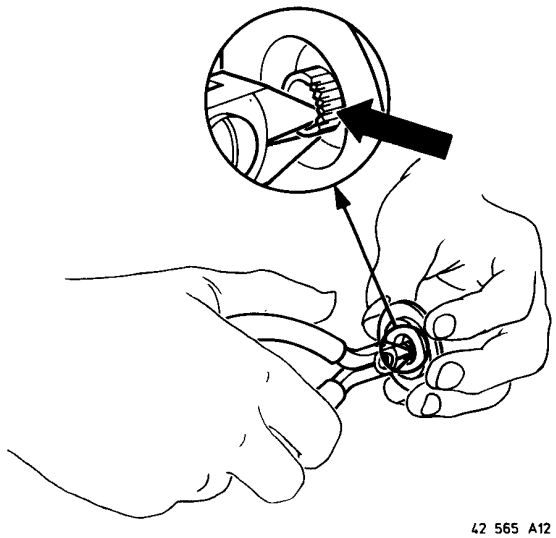
SERVICE DISC HOLDDOWN

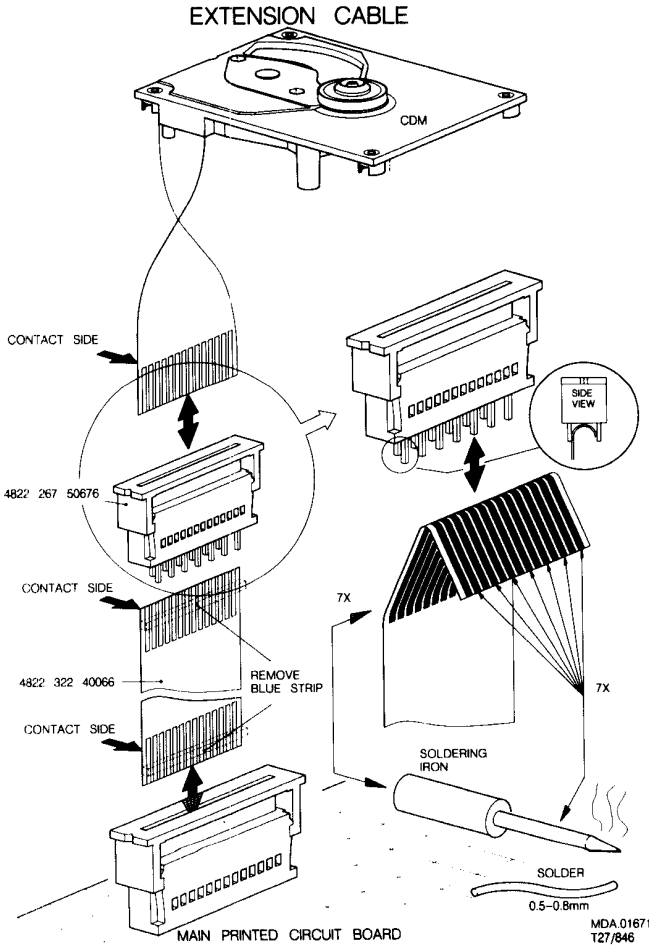


42 565 A12

Compose a service Disc hold-down in the following way

- Cut in the most inner ring of a disc hold-down (4822 462 50383) with small and sharp nippers, see fig. above.
- 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.

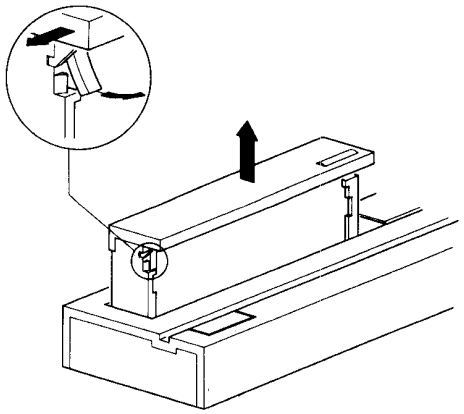
SERVICE FOIL FOR CDM



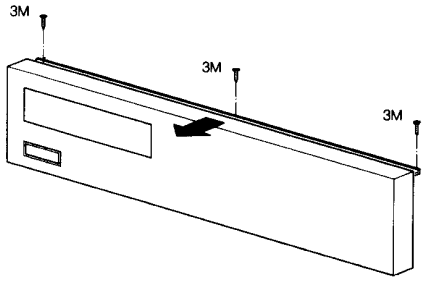
CABINET DISASSEMBLY HINTS

A Remove 2 front feet

B



C



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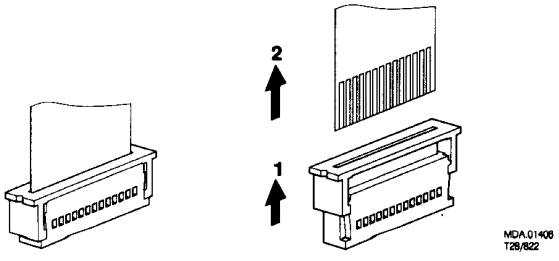
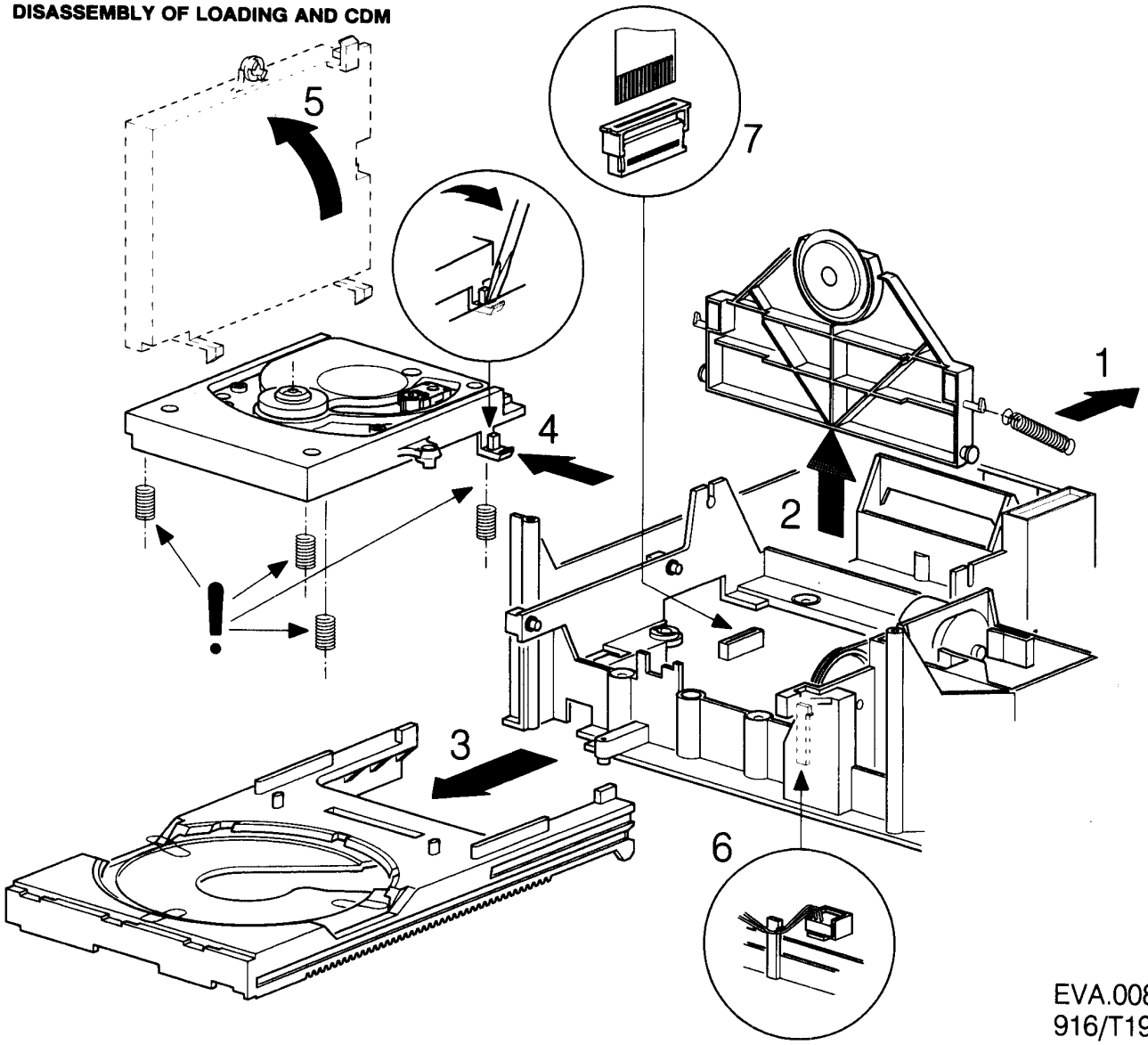
916/T19



DISASSEMBLY OF LOADING AND CDM



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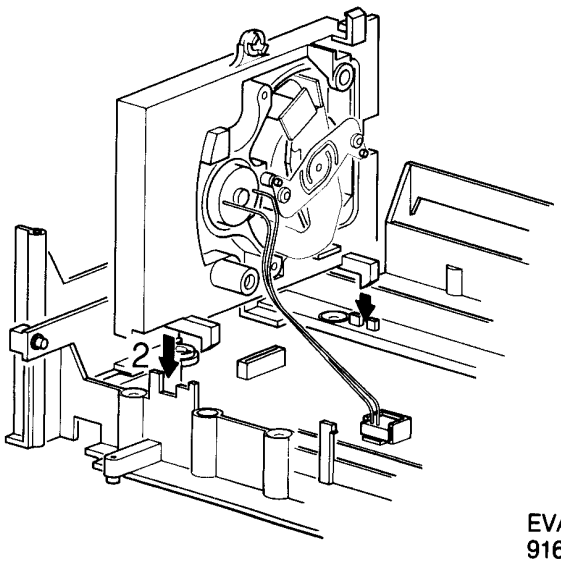
916/T19

PLAY SERVICE POSITION



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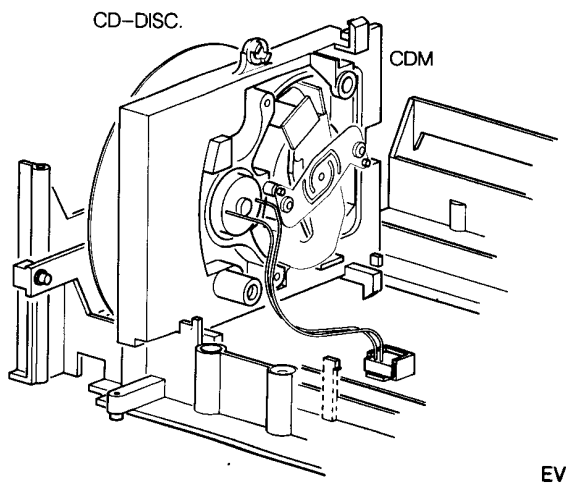
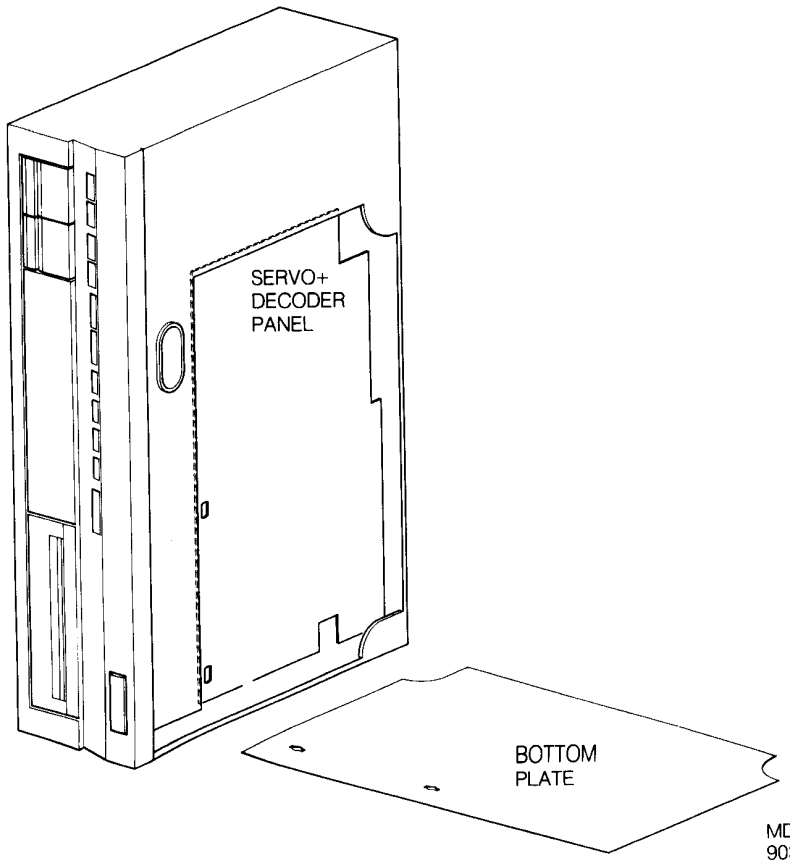
916/T19



EVA
916/

FOR ACCESS OF THE MAIN PCB, REMOVE THE BOTTOM PLATE

MEASURING AND ADJUSTMENT POSITION OF THE SET



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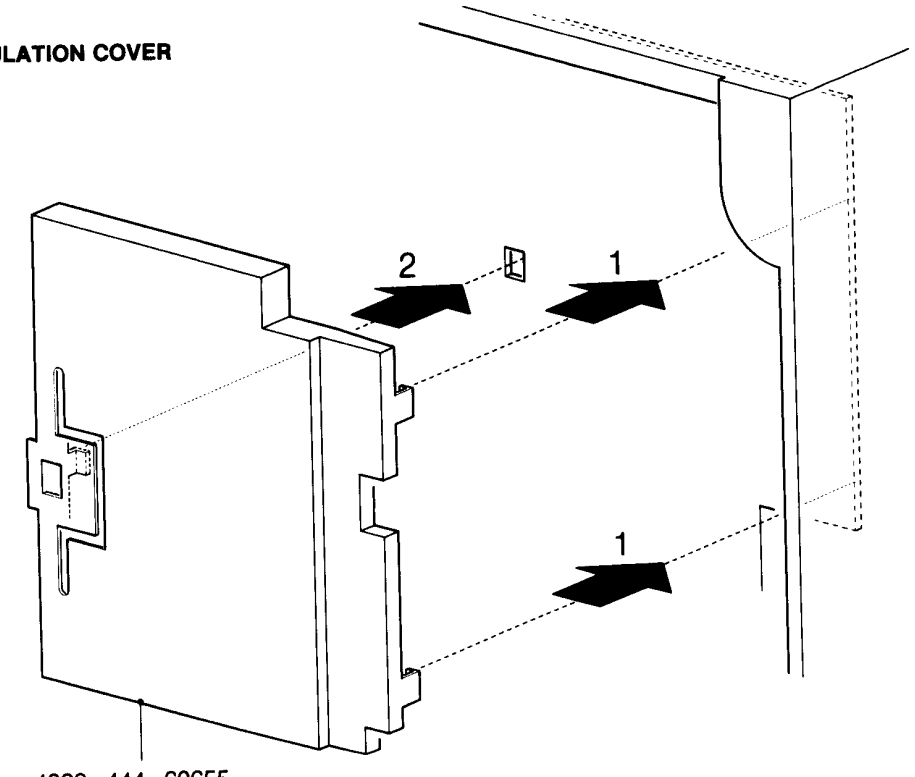
9034/T27

INSULATION COVER



4822 444 60655

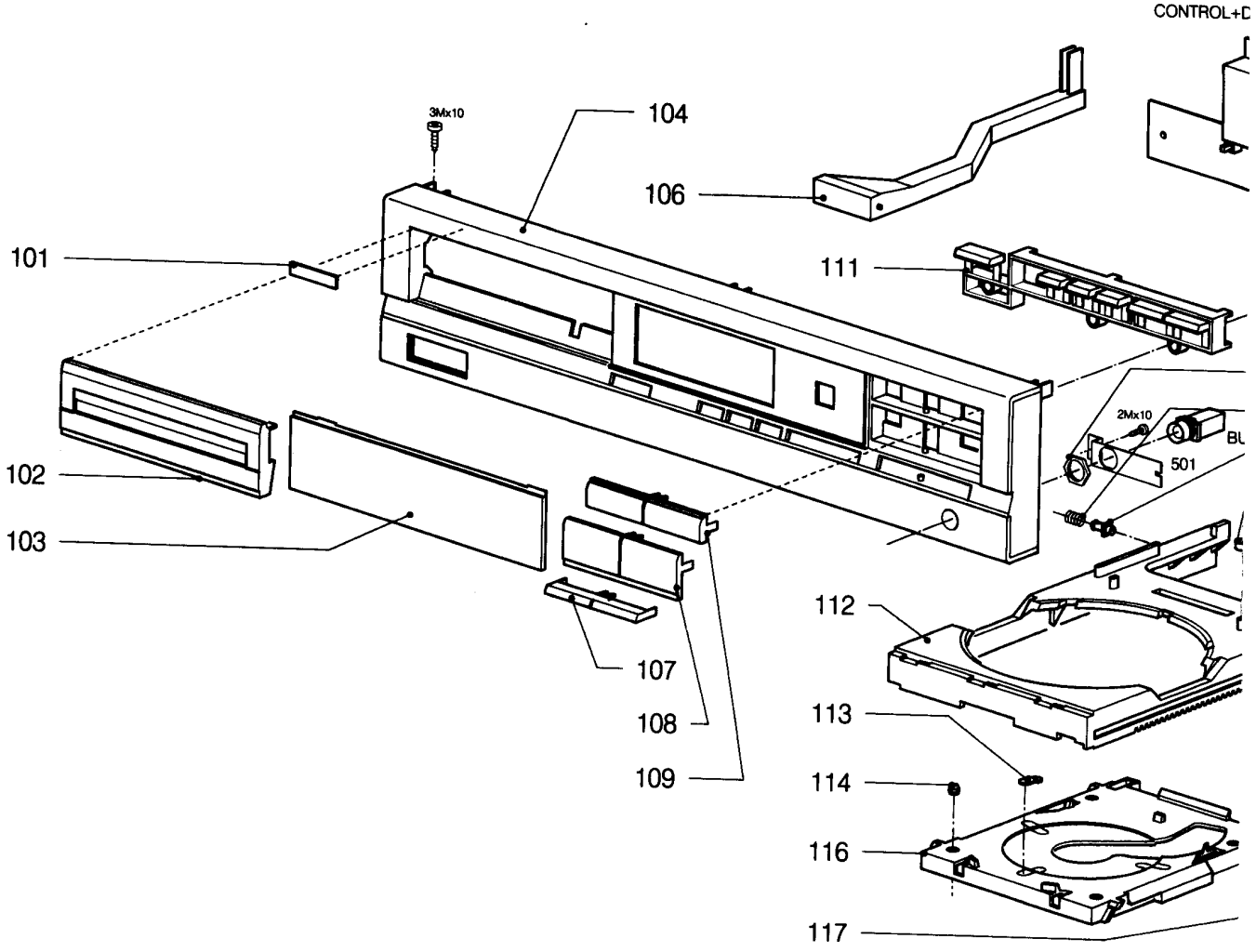
MDA.02548
T02/007

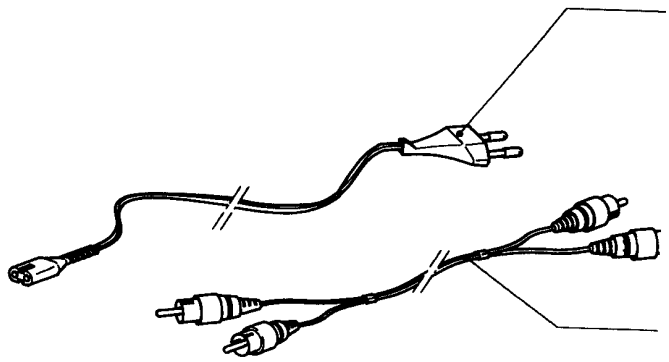
TO AVOID ELECTRIC SHOCK DURING SERVICING MOUNT INSULATION COVER OVER MAINS LEADS ON MAIN PANEL

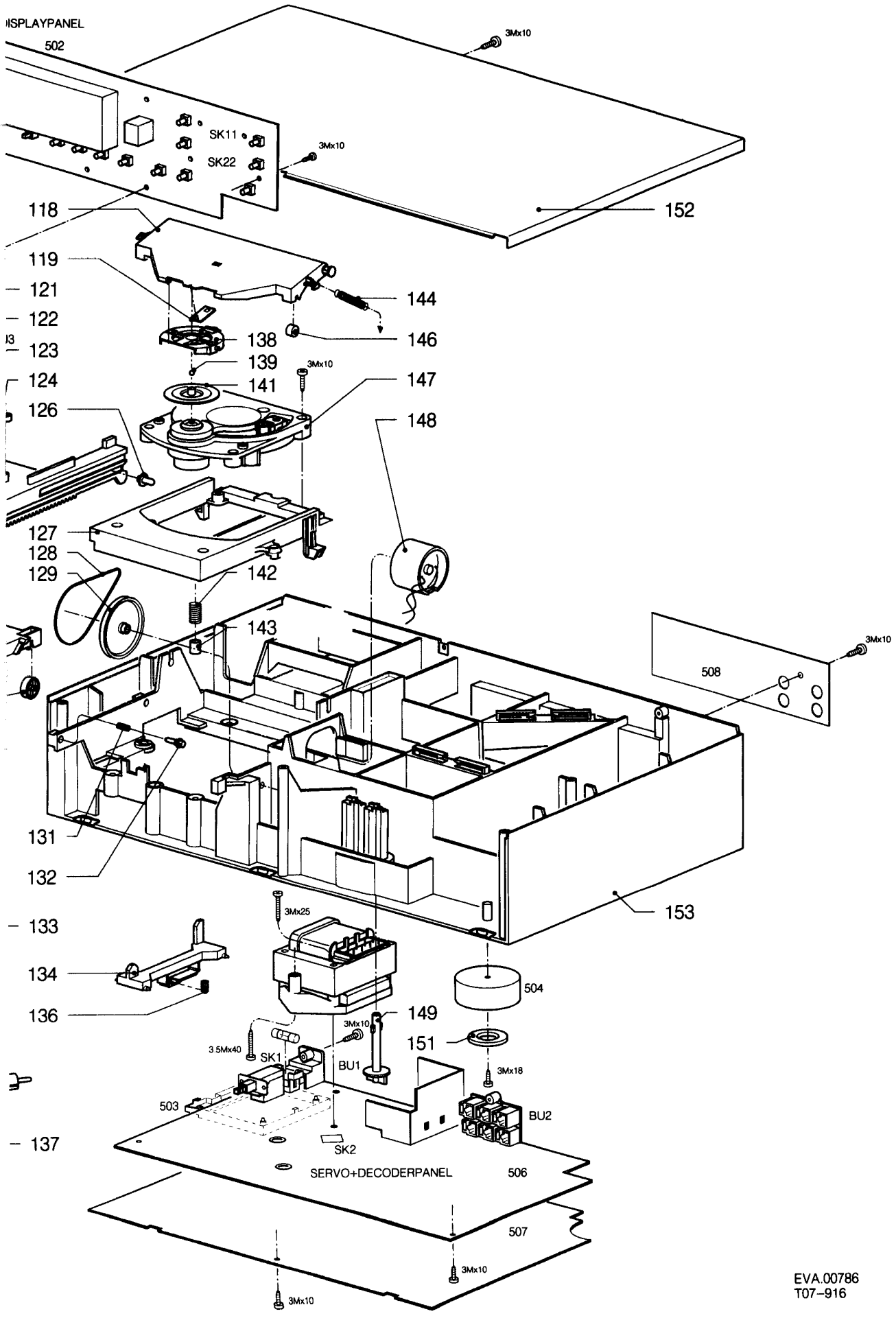
Mechanical parts

101	4822 459 10803	/00B/00R/05R
101	4822 459 10888	/07R/17R
102	4822 444 60625	
103	4822 450 61373	CD600
103	4822 450 61355	CD610
104	4822 444 40312	CD600/00R/05R
104	4822 444 40317	CD600/07R/17R
104	4822 444 40303	CD610/00R/05R
104	4822 444 40331	CD610/00B
104	4822 444 40318	CD610/07R/17R
106	4822 410 60105	
106	4822 410 60379	CD610/00B
107	4822 410 60103	
107	4822 410 60377	CD610/00B
108	4822 410 60095	
108	4822 410 60376	CD610/00B
109	4822 410 60094	
109	4822 410 60375	CD610/00B
111	4822 410 60097	
111	4822 410 60378	CD610/00B
112	4822 444 50603	
113	4822 325 50176	
114	4822 325 50177	
116	4822 466 92251	
117	4822 528 90638	
118	4822 444 60568	
119	4822 466 92257	
121	4822 505 10571	
122	4822 492 52094	
123	4822 402 61252	
124	4822 532 51756	
126	4822 402 61253	
127	4822 402 61196	
128	4822 358 10115	
129	4822 528 81329	
131	4822 492 52094	
132	4822 402 61252	
133	4822 321 10457	/00B/00R
133	4822 321 10522	/05R
133	4822 321 10445	/07R/17R
134	4822 402 50276	
136	4822 492 52123	
137	4822 321 22832	
138	4822 402 61207	
139	4822 520 40177	
141	4822 530 80503	
142	4822 492 51902	
143	4822 466 61587	
144	4822 492 32883	
146	4822 528 90639	
147	4822 691 30209	
148	4822 361 20998	
149	4822 535 80806	
151	4822 444 30404	
152	4822 444 30417	
153	4822 464 50805	
153	4822 464 50811	CD610/00B

EXPLODED VIEW







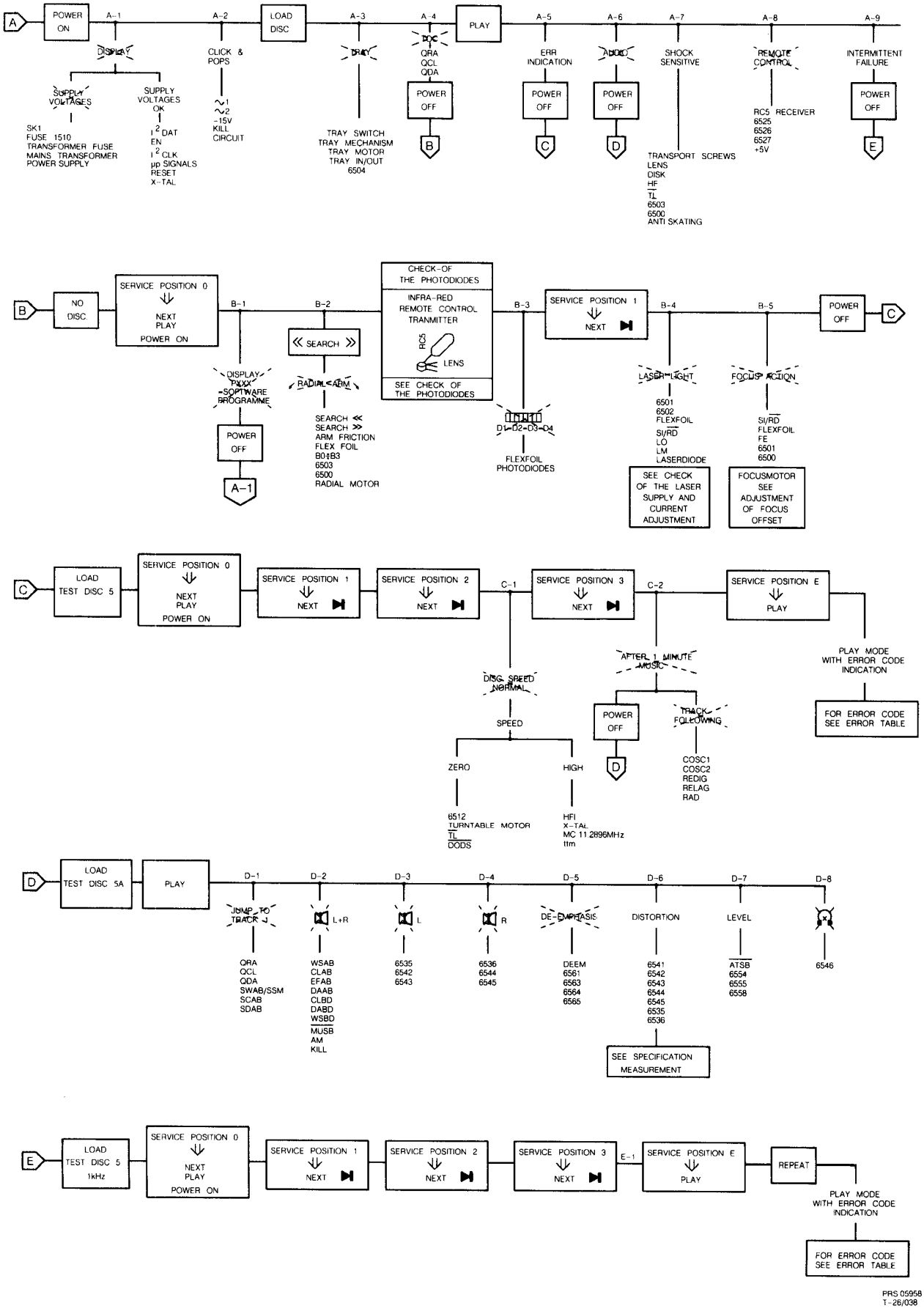
EVA.00786
T07-916

FAULT FINDING GUIDE

Follow the path of the faultfinding tree beginning at the top left. Perform the actions you come across in the various blocks. Look at the various side branches to find out if the information you see there applies to your problem. If, for instance, you find the indication ~~display~~ this means that no pictur appears on the display.

If you establish this fault, follow the branch and perform the recommended actions. Check the signals mentioned in a number of braches further reference is made to measurements you could carry out. These measurements are explained in several tables further on in this manual.

FAULT FINDING GUIDE



PRS 05958
T-26/038

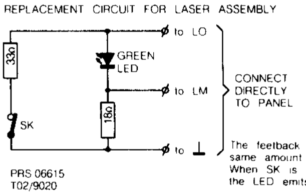
B-3 CHECK OF THE PHOTODIODES

Step	Signal	Mode	◇				Remarks
1	D2 D1 D3 D4	power on	4 6 7 8	–	–	signal 4≡6≡7≡8	Signal depends on Distance lens ⟷ IR LED of remote control

T-22811A

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 SK (open)	9 (V)	1.8<V <2.3	 The feetback system sees to it that the same amount of current flows through the LED When SK is open and when SK is closed the LED emits little light
	LM		11 (V)	170<mV <220	
2	LO	serv. pos. 2 SK (closed)	9 (V)	1.8<V <2.3	
	LM		11 (V)	170<mV <220	
3	LO	Power on	9 (V)	0V ± 0.2V	No light

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

T-22811B

B-4 LASER CURRENT ADJUSTMENT

STEP	SIGNAL	MODE	◇				REMARKS
1	--	POWER OFF	--	--	--	--	CHECK IF FLEX–FOIL IS PROPERLY CONNECTED
2	--	POWER OFF	11 (Ω)	R3520	1kΩ +10% −0	--	PRE ADJUSTMENT OHMIC VALUE
3	--	POWER OFF	--	R3568	--	--	SET TO MID–POSITION
4	LASER CURRENT ≙ VOLTAGE ACROSS R3500	TEST DISC 5A PLAY	1 (V) 2 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	1 (V) 2 mV DC	R3520	50mV	--	--
6	FE–LAG	N TEST DISC 5A TRACK 1 PLAY	27 (V) mV DC	R3568	400mV	--	FINE ADJUSTMENT

MDA 02673
T28/020

B-5
ADJUSTMENT OF FOCUS-OFFSET

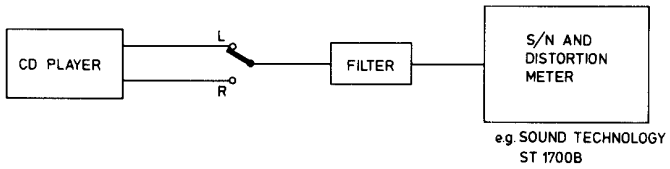
Step	Signal	Mode	◇				Remarks
1	-	Power on no disc	-	R3568	-	-	adjust for optical mid-position of the focus motor
2	FE LAG	Play Test disc 5 Track 1	27	R3568	400mV ± 40 mV DC	-	fine adjustment

T-22811D

SPECIFICATIONS MEASUREMENT

Signal	Mode	◇			Remarks
BU2-L	Test disc 3, play total harmonic distorsion	filter output	See spec.		See drawing 30459A12
BU2-R	Test disc 3, play total harmonic distorsion	filter output	See spec.		See drawing 30459A12
BU2-L	Test disc 3, play signal-to-noise ratio	filter output	See spec.		See drawing 30459A12
BU2-R	Test disc 3, play signal-to-noise ratio	filter output	See spec.		See drawing 30459A12

T-22255O



ERROR TABLE

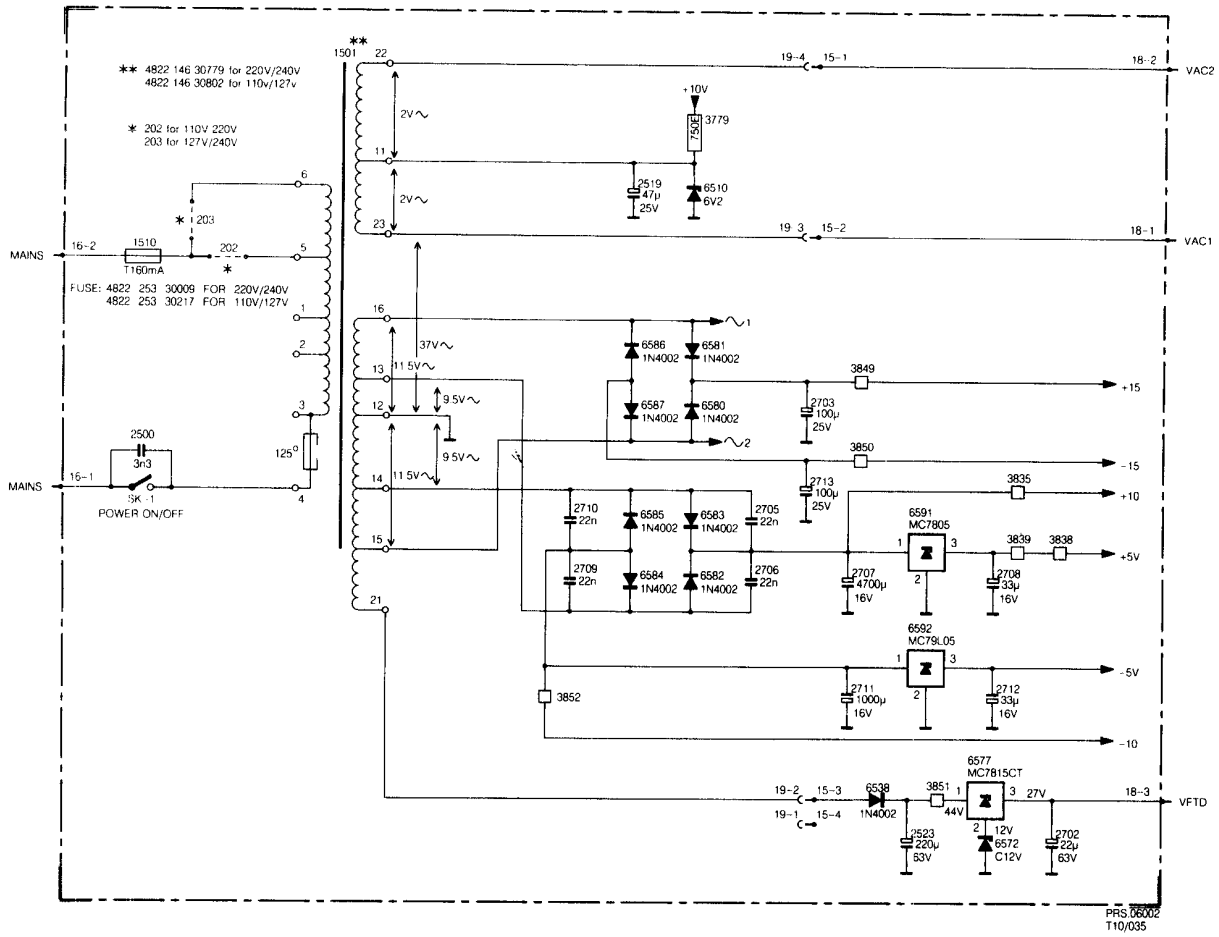
System errors

Er 02: $\overline{TL}$ pulse is missing during start-up. Check the $\overline{TL}$ signal, the HF-signal and the Photodiode signal processor. (Starting error)
Er 03: Lead-in track not found. Check the disc used. Check also that the radial arm rests against the inside. Check the RE-dig signal and the Radial error processor. (Starting error)
Er 05: $\overline{TL}$ pulse is low for more than 50 msec. Check the disc used. Check the HF-in signal and the photodiodes (Error during PLAY)
Er 06: No $\overline{TL}$ pulse received within 0.5 sec. in case of track jumping. Check the RE-lag circuit. (Error during SEARCH or NEXT/PREVIOUS)
Er 07: Subcode error. In case of track loss during play the information of the subcode is used to determine the place of the last information that was still well readable. In case of an interruption of HF or other signals, this will lead to Er 07. (Error during PLAY)
Er 08: TOC error (Table of Contents). Check the quality of the disc used. Check the initial speed of the turntable motor and the motor control. Check also that the radial arm rests against the inside. (Starting error)

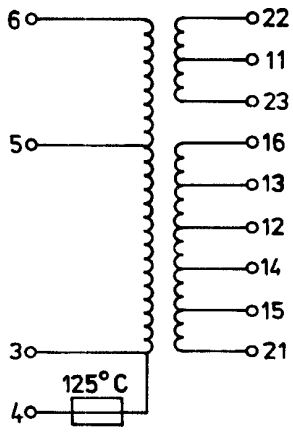
Operating errors

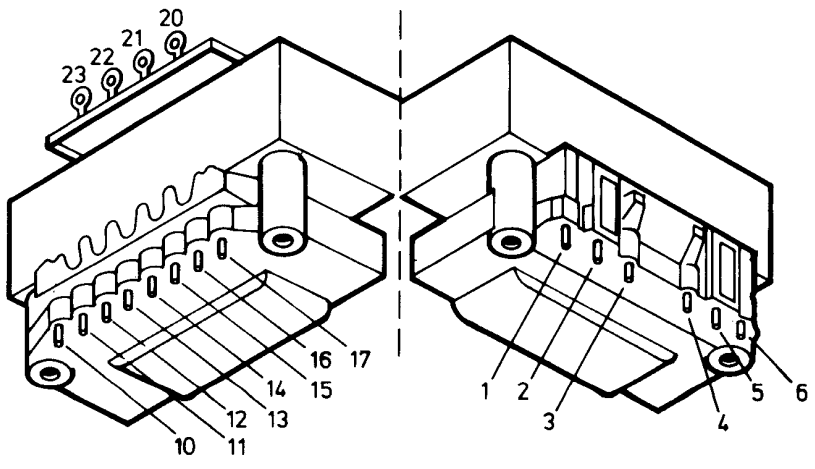
Er 30: NEXT when repeat is off.
Er 31: PREVIOUS when repeat is off.
Er 32: INDEX selected when no track selected.
Er 33: Selected index does not exist on this CD.
Er 34: Review error: no program.
Er 35: Program memory full.
Er 36: Programmed track is non existing on this CD.
Er 37: Selected track is non existing on this CD.
Er 60: Fast forward bound.
Er 61: Fast reverse bound.

POWER SUPPLY



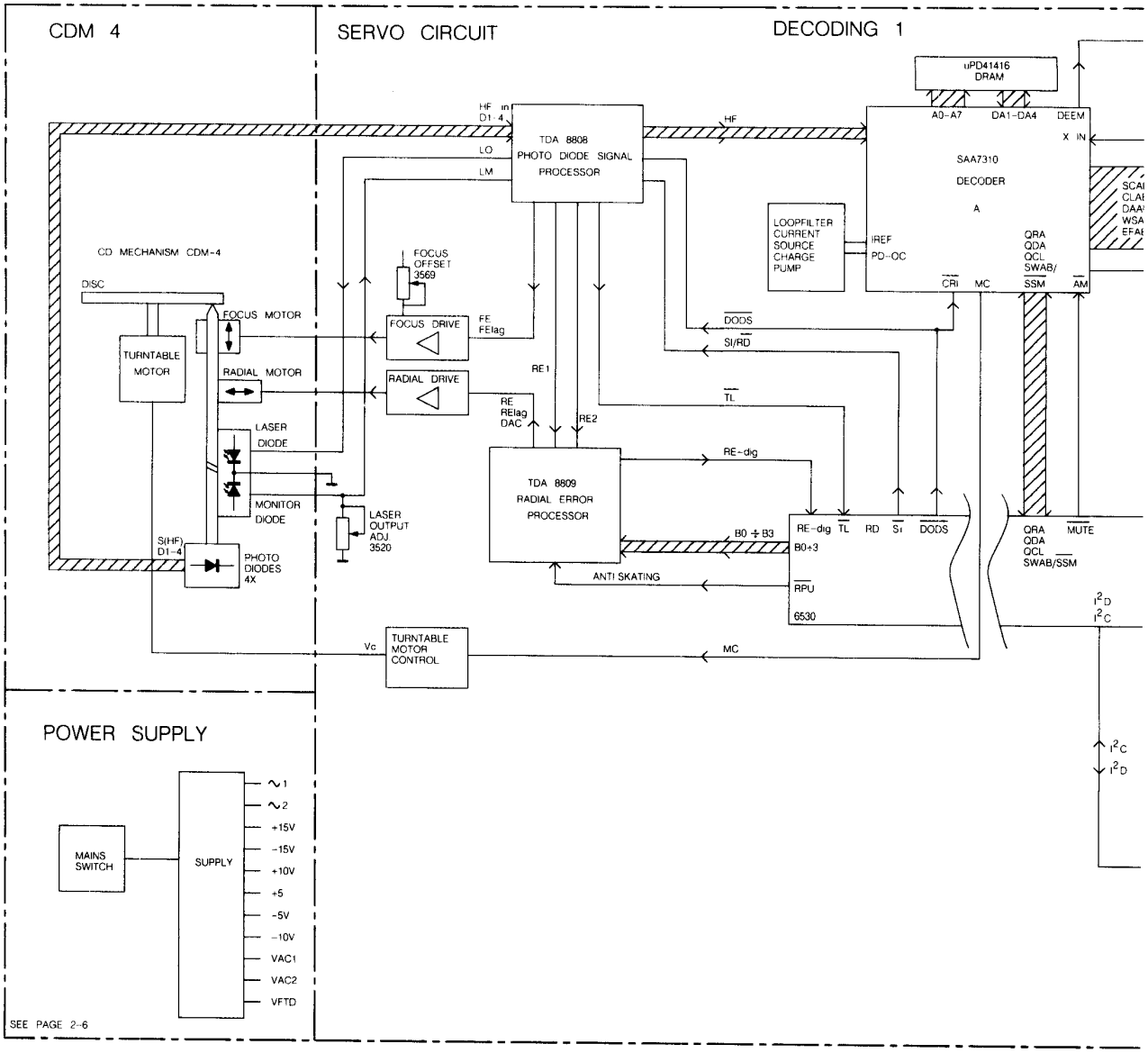
TRANSFORMER CONNECTIONS



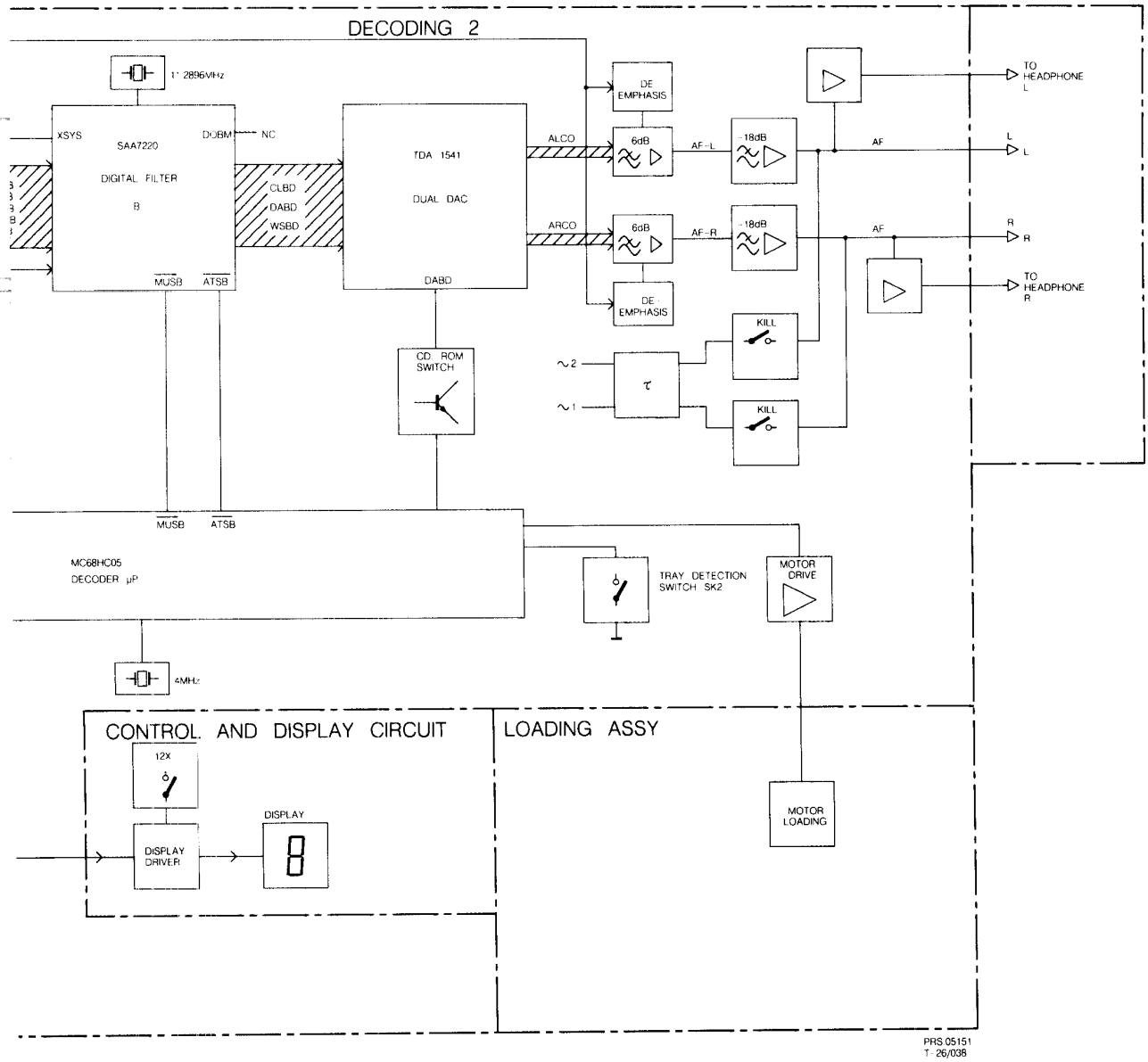


44 737 A11

BLOCK DIAGRAM



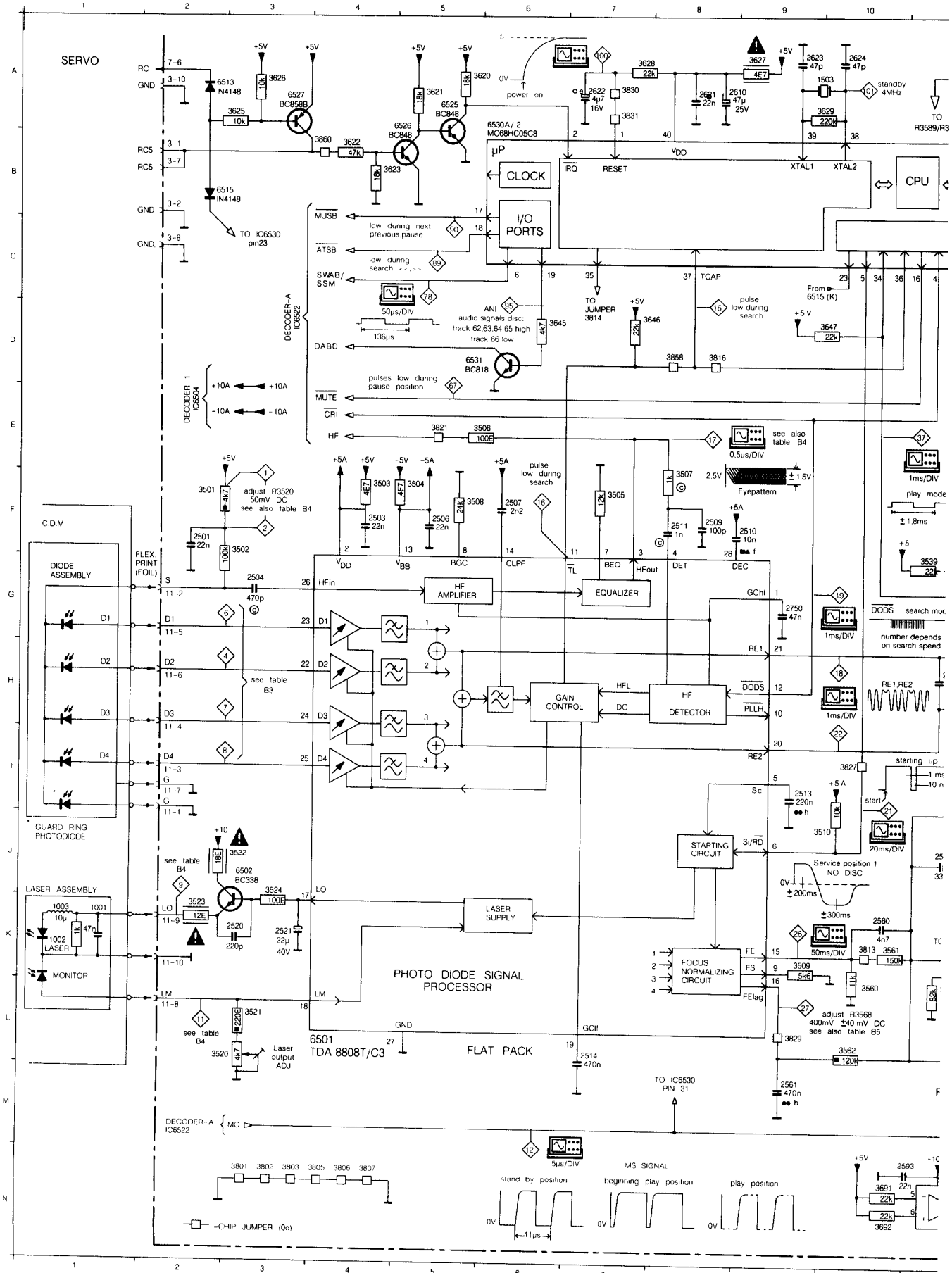
AGC – Automatic Gain Control
B0-B3 – Control bits for radial circuit
BEQ – Equalizer reference current input
BGC – DC and LF gain control reference input
Cosc1 – Capacitor wobble oscillator
Cosc2 – Capacitor wobble oscillator
DEC – Decoupling input of inkruat bypass
DET – HF detector voltage input
DIV4 – Divide by 4 input
$\overline{DODS}$ – Drop out detector suppression
D1÷4 – Photodiode currents
FE – Focus error signal
FE lag – Focus error signal for LAG network
HF – HF output for DEMOD
HFD – HF detector output for DEMOD
HF-in – HF current input to HF amplifier
HF-out – HF amplifier and equalizer voltage output
LM – Laser monitor diode input
LO – Laser amplifier current output
MC – Motor control signal
offset IN – Offset control input
offset OUT – Offset control output
PLLH – PLL on hold output
RADout – output of RE2-RE1 input
RE – Radial error signal (Amplified RE_2-RE_1 currents)
Rosc – Resistor wobble oscillator
Rwob – Wobble generator input
RE1 – Radial error signal 1 (summation of amplified currents D_3 and D_4
RE2 – Radial error signal 2 (summation of amplified currents D_1 and D_2
RE dig – Radial error digital
RE lag – Radial error signal for LAG network
Sc – Starting up capacitor input
Si/$\overline{RD}$ – On/off control for laser supply and focus circuit. Ready signal, Starting up procedure succesful.
$\overline{TL}$ – Track loss output signal
TTM– – Control voltage for turntable motor
TTM+ – Control voltage for turntable motor
Vext– – Supply connection
Vext+ – Supply connection
TCMP – Turntable control motor pulse



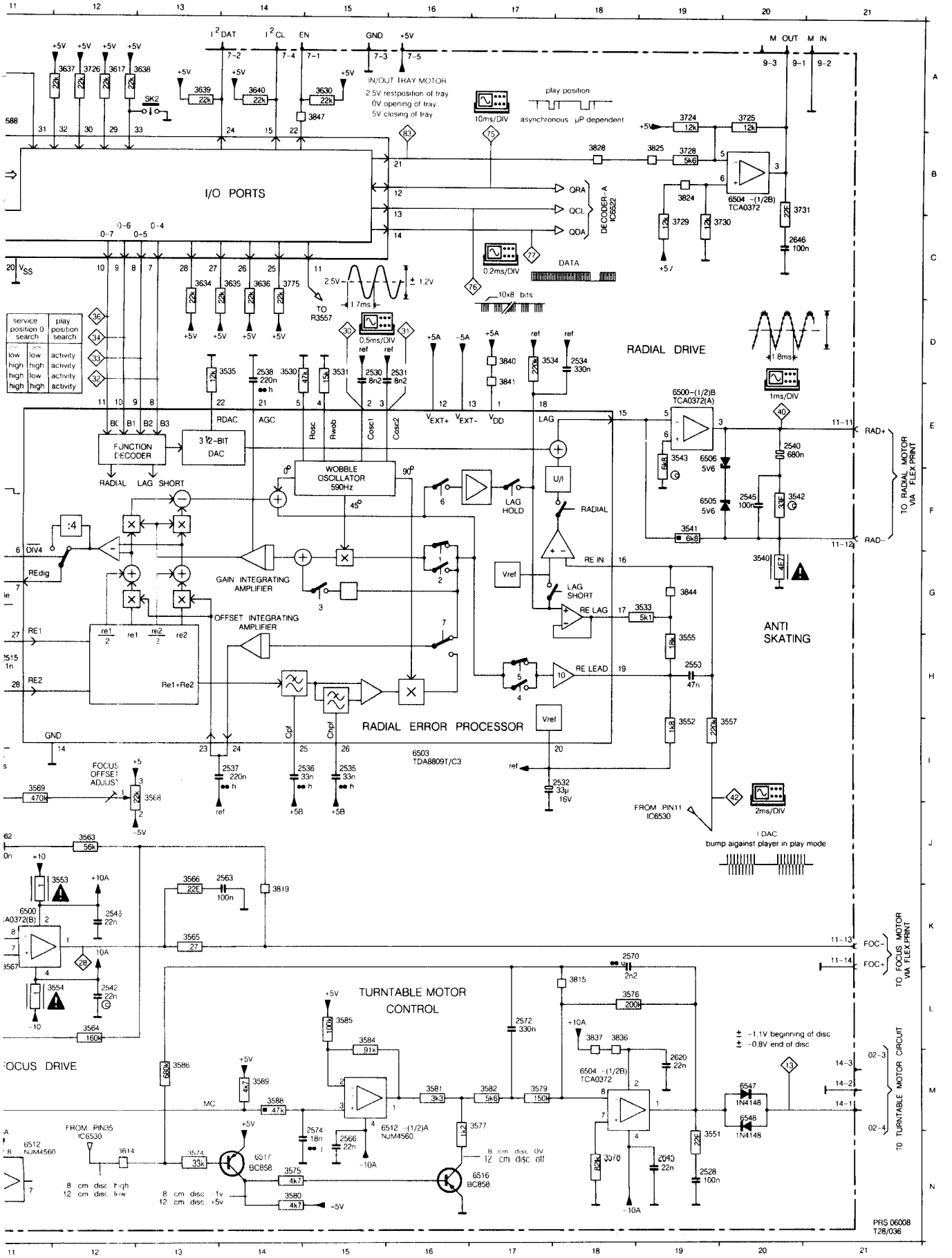
$\overline{\text{ATSB}}$	–	Attenuation of Audio level in Search position (Cueing)
CD ROM Switch	–	Digital Data information on disc signal
CEFM	–	Clock Eight-to-Fourteen Modulator
CLAB	–	Clock signal Decoder-A to Filter-B
CLBD	–	Clock signal Filter-B to DAC
$\overline{\text{CREF}}$	–	Reference Current
$\overline{\text{CRI}}$	–	Counter Reset Inhibit
DAAB	–	Data signal Decoder-A to Filter-B
$\overline{\text{DABD}}$	–	Data signal Filter-B to DAC
$\overline{\text{DEEM}}$	–	Deemphasis
DOBM	–	Digital out signal
$\overline{\text{EFAB}}$	–	Error flag Decoder-A to Filter-B
$\overline{\text{MUTE}}$	–	Mute signal
$\overline{\text{MUSB}}$	–	Soft Mute signal
PD/OC	–	Phase detector - oscillator control
QCL	–	Q-channel Clock signal
QDA	–	Q-channel Data signal
QRA	–	Q-channel Request Aknowledge
SCAB	–	Subcode clock Decoder-A to Filter-B
SDAB	–	Subcode data Decoder-A to Filter-B
SWAB/$\overline{\text{SSM}}$	–	Subcode Word/Start-stop motor signal
WSAB	–	Word select Decoder-A to Filter-B
WSBD	–	Word Select Filter-B to DAC
XIN	–	Oscillator signal in Decoder-A
XSYS	–	Oscillator signal out Filter-B

SERVO CIRCUIT DIAGRAM

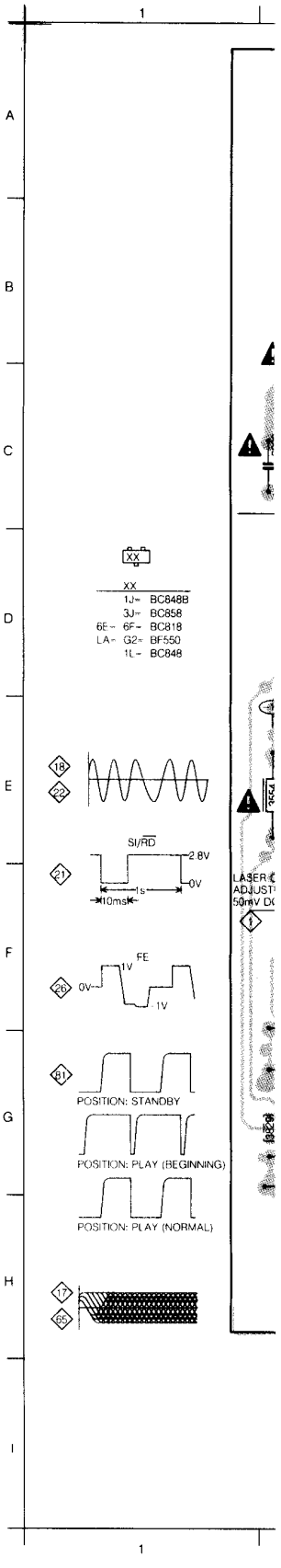
SK2 A13	2504 G3	2514 L7	2532 I18	2542 L12	2563 J14	2620 M19	2750 G9	3507 F8	3523 K2	3539 G11	3553 J12	3563 J12	35
1001 K1	2506 F5	2515 H11	2534 D18	2545 F20	2566 N15	2621 A8	3501 F2	3508 F5	3524 J3	3540 G20	3554 L11	3564 L12	35
1002 K1	2507 F6	2520 K3	2535 I15	2546 K12	2570 K18	2622 A7	3502 F3	3509 K9	3530 D14	3541 F19	3555 H19	3565 K13	35
1003 K1	2509 F8	2521 K3	2536 I14	2550 H19	2572 L17	2623 A9	3503 F4	3510 J9	3531 D15	3542 F20	3557 I20	3566 J13	35
1503 A9	2510 F9	2528 N19	2537 I14	2560 K10	2574 N15	2624 A10	3504 F5	3520 L3	3533 G19	3543 E19	3560 L10	3567 L11	35
2501 F2	2511 F8	2530 D15	2538 D14	2561 M9	2593 N11	2645 N19	3505 F7	3521 L3	3534 D17	3551 N19	3561 K10	3568 I13	35
2503 F4	2513 I9	2531 D16	2540 E20	2562 J11	2610 A8	2646 C20	3506 E5	3522 J3	3535 D14	3552 I19	3562 L10	3569 I11	35



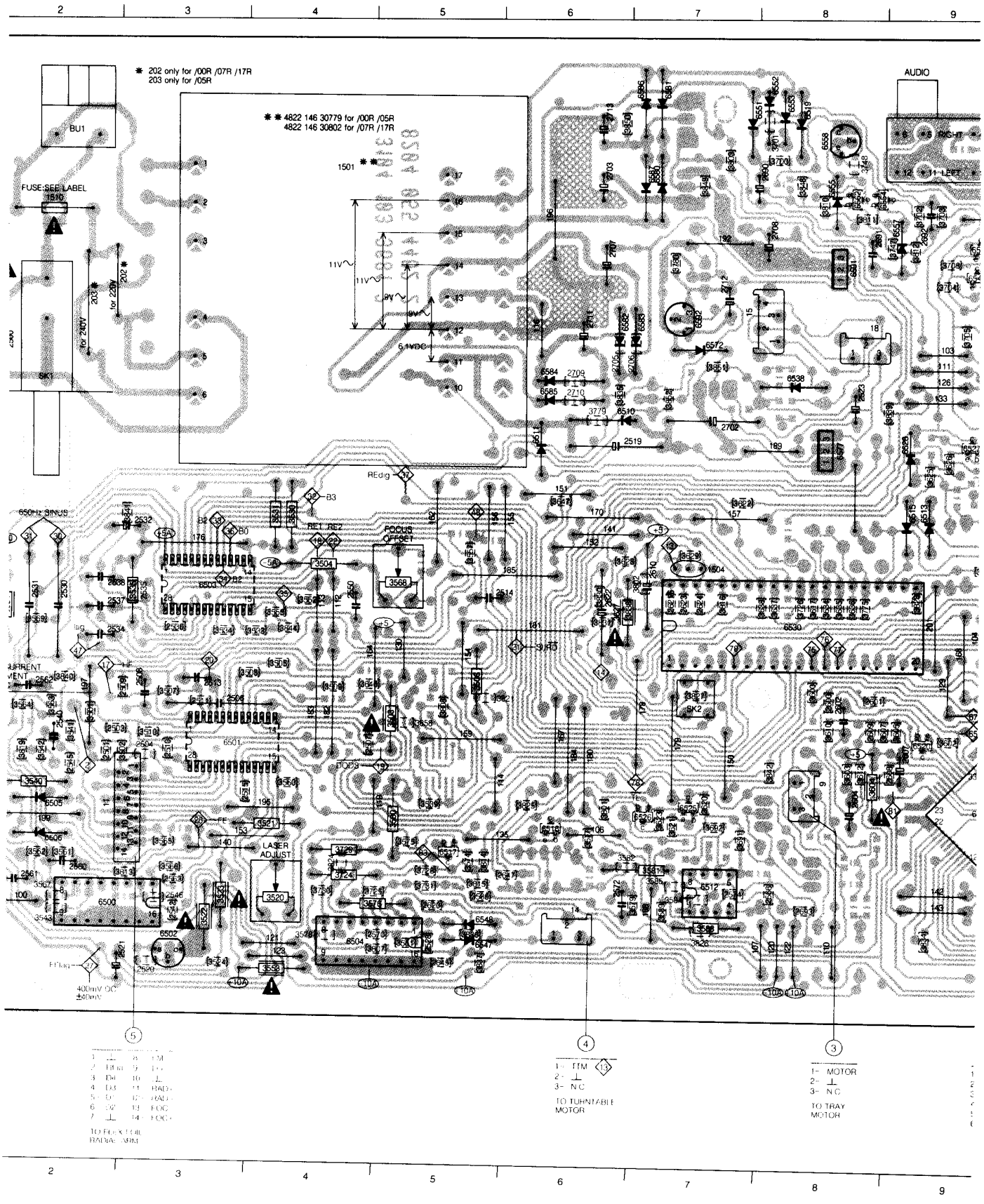
74 N13	3581 M16	3617 A12	3627 A9	3637 A12	3691 N10	3730 C19	3806 N4	3821 E5	3831 A7	3858 D8	6504 M18	6516 N17	6547 M20
75 N14	3582 M17	3620 A5	3628 A7	3638 A12	3692 N10	3731 B20	3807 N4	3824 B19	3836 L18	3860 B4	6505 F19	6517 N14	6548 M20
76 L18	3584 L15	3621 A5	3629 A9	3639 A13	3724 A19	3775 C14	3813 K10	3825 B19	3837 L18	6500 E19	6506 E19	6525 A5
77 M17	3585 L15	3622 B4	3630 A15	3640 A14	3725 A20	3801 N3	3814 N12	3827 I 10	3840 D17	6500 K11	6512 N11	6526 A5
78 N18	3586 M13	3623 B4	3634 C13	3645 D6	3726 A12	3802 N3	3815 L18	3828 B18	3841 E17	6502 J3	6512 N15	6527 A3
79 M17	3588 M14	3625 A3	3635 C14	3646 D7	3728 B19	3803 N3	3816 D8	3829 L9	3844 G19	6503 I 16	6513 A2	6530 A6
80 N14	3589 M14	3626 A3	3636 C14	3647 D10	3729 C19	3805 N4	3819 K14	3830 A7	3847 A15	6504 B20	6515 B2	6531 D5

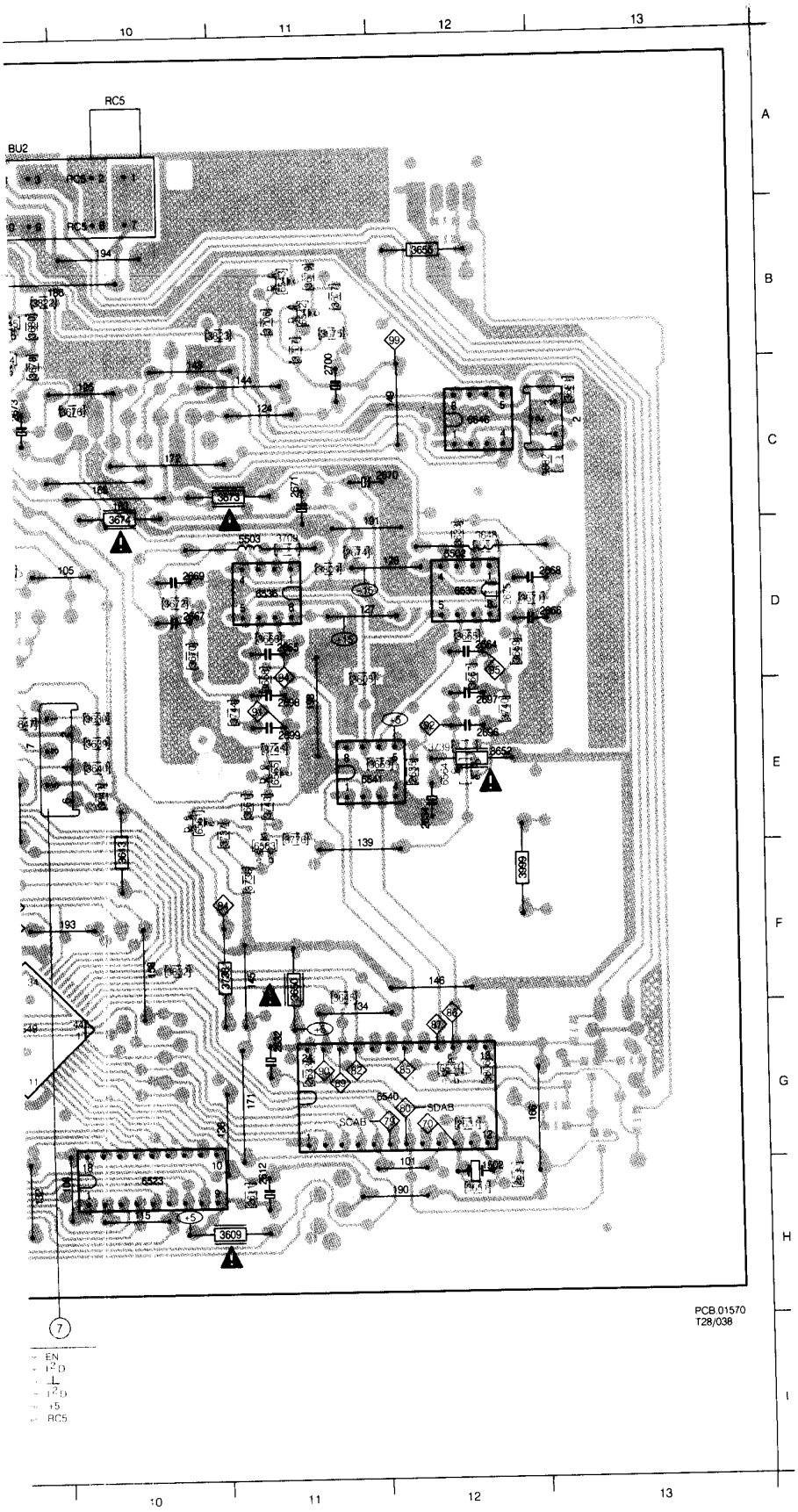


MAIN PANEL COMPONEI



NT SIDE FOR PANELS MARKED WITH 3104 103 3681.2





2	C13	2537	E2	3603	F8	3844	E4
7	E9	2538	E2	3604	F8	3847	E9
9	G8	2540	F2	3605	F9	3848	B8
11	G2	2542	H3	3607	F8	3849	B7
14	G6	2545	F2	3609	H10	3850	A6
15	C7	2546	G3	3610	F8	3851	C7
18	C8	2550	E4	3612	F8	3852	C7
100	G2	2560	G2	3613	F10	3858	F5
101	H12	2561	G2	3617	E8	3999	F12
103	C9	2562	F2	3620	G7	5502	D12
104	E9	2563	G3	3621	G7	5503	D11
105	D9	2566	G8	3622	D7	6500	G2
106	G6	2570	H4	3623	G7	6501	F3
107	H8	2572	G6	3625	D9	6502	H3
108	H10	2574	G7	3626	D9	6503	E3
110	H8	2600	F8	3627	E6	6504	H4
111	C9	2601	F8	3628	E6	6505	G2
112	E4	2602	F8	3629	E7	6506	G2
113	E4	2604	G8	3630	E10	6510	D6
114	G6	2607	F9	3634	E8	6511	D6
115	H10	2608	F9	3635	E8	6512	G7
116	C6	2609	F8	3636	E8	6513	D9
119	G5	2610	E7	3637	E8	6515	D9
120	H8	2611	H11	3638	E8	6516	G6
121	H4	2612	H11	3639	E10	6517	G5
122	H8	2620	G5	3640	E10	6519	A8
123	H4	2621	E7	3645	F11	6520	F9
124	C11	2622	E6	3646	F4	6523	H10
125	C10	2623	E7	3647	D6	6525	G7
126	C9	2624	E7	3648	D12	6526	G7
127	D11	2630	H12	3650	F11	6527	D9
128	D11	2631	G12	3651	H12	6528	D9
129	F9	2632	G11	3652	E12	6530	E8
130	E5	2633	G11	3655	B12	6531	G12
132	H9	2634	E12	3659	E11	6535	D12
133	C9	2635	E12	3661	E11	6536	D11
134	G11	2645	H5	3665	D12	6538	C8
135	G5	2647	G5	3666	D11	6540	G11
138	G10	2664	D12	3667	E12	6541	E11
139	F11	2665	D11	3668	E11	6542	B11
140	G3	2666	D13	3669	D12	6543	B11
141	D6	2667	D10	3670	D10	6544	B9
142	G9	2668	D13	3671	D12	6545	B9
143	G9	2669	D10	3672	D10	6546	C12
144	C11	2670	C12	3673	C11	6547	H5
145	F11	2671	C11	3674	C10	6548	H5
146	F12	2673	C9	3675	B11	6549	G9
148	C10	2674	D11	3676	C10	6551	A7
149	C12	2675	D12	3677	B11	6552	A8
150	F7	2690	B8	3678	C9	6553	A8
151	D6	2691	B8	3679	B11	6554	B8
152	E6	2692	B9	3680	B9	6555	B8
153	G3	2693	G8	3681	C13	6557	B9
154	F5	2696	E12	3682	C13	6558	A8
155	D6	2697	E12	3691	G7	6561	E10
156	D5	2698	E11	3692	G7	6562	B8
157	D7	2699	E11	3700	B8	6563	F11
158	F10	2700	C11	3701	A8	6564	E12
159	F5	2702	G7	3702	B9	6565	E11
162	D5	2703	B6	3703	B9	6572	C7
163	C10	2705	C6	3704	C9	6577	D8
164	F4	2706	C7	3705	C9	6580	B7
165	C10	2707	B6	3706	B11	6581	A7
166	G12	2708	B8	3707	B11	6582	C6
167	F6	2709	C6	3708	B9	6583	C7
168	E9	2710	C6	3709	D11	6584	C6
170	D6	2711	C6	3724	G4	6585	C6
171	G11	2712	C7	3725	G4	6586	A7
172	C10	2713	A6	3726	E8	6587	B7
176	E3	3501	F2	3728	G5	6591	B8
178	F7	3502	F3	3729	G4	6592	C7
179	F7	3503	F5	3730	G4		
180	F6	3504	E4	3731	G5		
181	E6	3505	F4	3736	F11		
182	F4	3506	F5	3737	F11		
183	F4	3507	F3	3738	F11		
184	F6	3508	F3	3739	E12		
185	E5	3509	F4	3740	E12		
186	B9	3510	F3	3743	E11		
188	H7	3520	G4	3744	E11		
189	D8	3521	G4	3745	E11		
190	H11	3522	H3	3747	B9		
191	D11	3523	G3	3748	B8		
192	B7	3524	H3	3775	E8		
193	F9	3530	D4	3776	E11		
194	B10	3531	D4	3779	D6		
195	G4	3533	E3	3780	B7		
196	B6	3534	E3	3801	G6		
197	F2	3535	E3	3802	E7		
198	E11	3539	G5	3803	B7		
199	G2	3540	G2	3805	D11		
201	E9	3541	F2	3806	G12		
202	C3	3542	F2	3807	H4		
203	C2	3543	H2	3808	F5		
BU1	A2	3551	H5	3809	D11		
BU2	A9	3552	E4	3810	B8		
SK1	C2	3553	H4	3811	B8		
SK2	F7	3554	E2	3812	B9		
1501	B4	3555	E4	3813	G2		
1502	H12	3557	E5	3814	G5		
1504	E7	3560	F4	3815	G5		
1510	B2	3561	G2	3816	E7		
2500	C2	3562	G2	3819	F2		
2501	F2	3563	F2	3821	F5		
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2506	F3	3566	G3	3824	G4		
2507	F4	3567	G2	3825	G6		
2508	F3	3568	E5	3826	H7		
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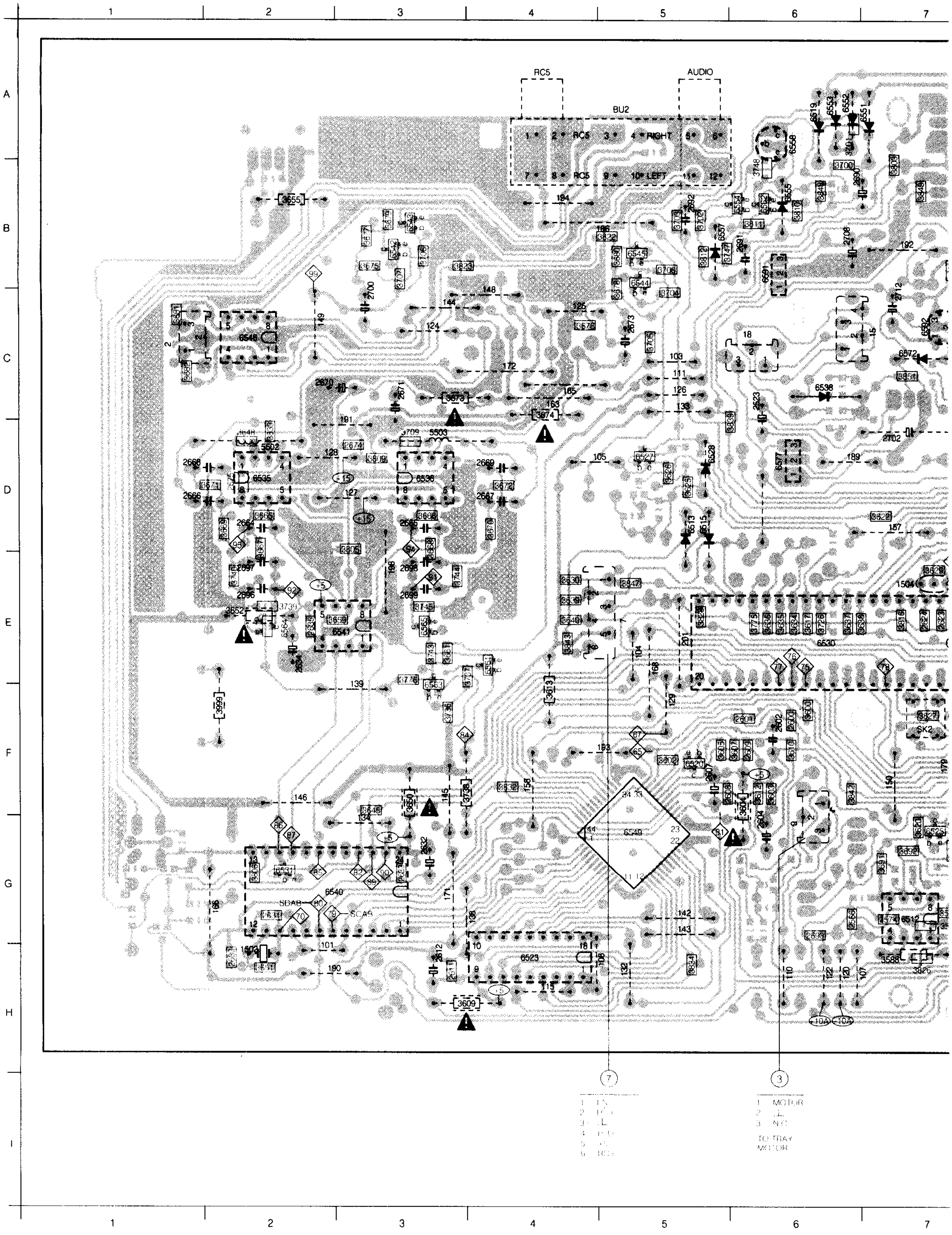
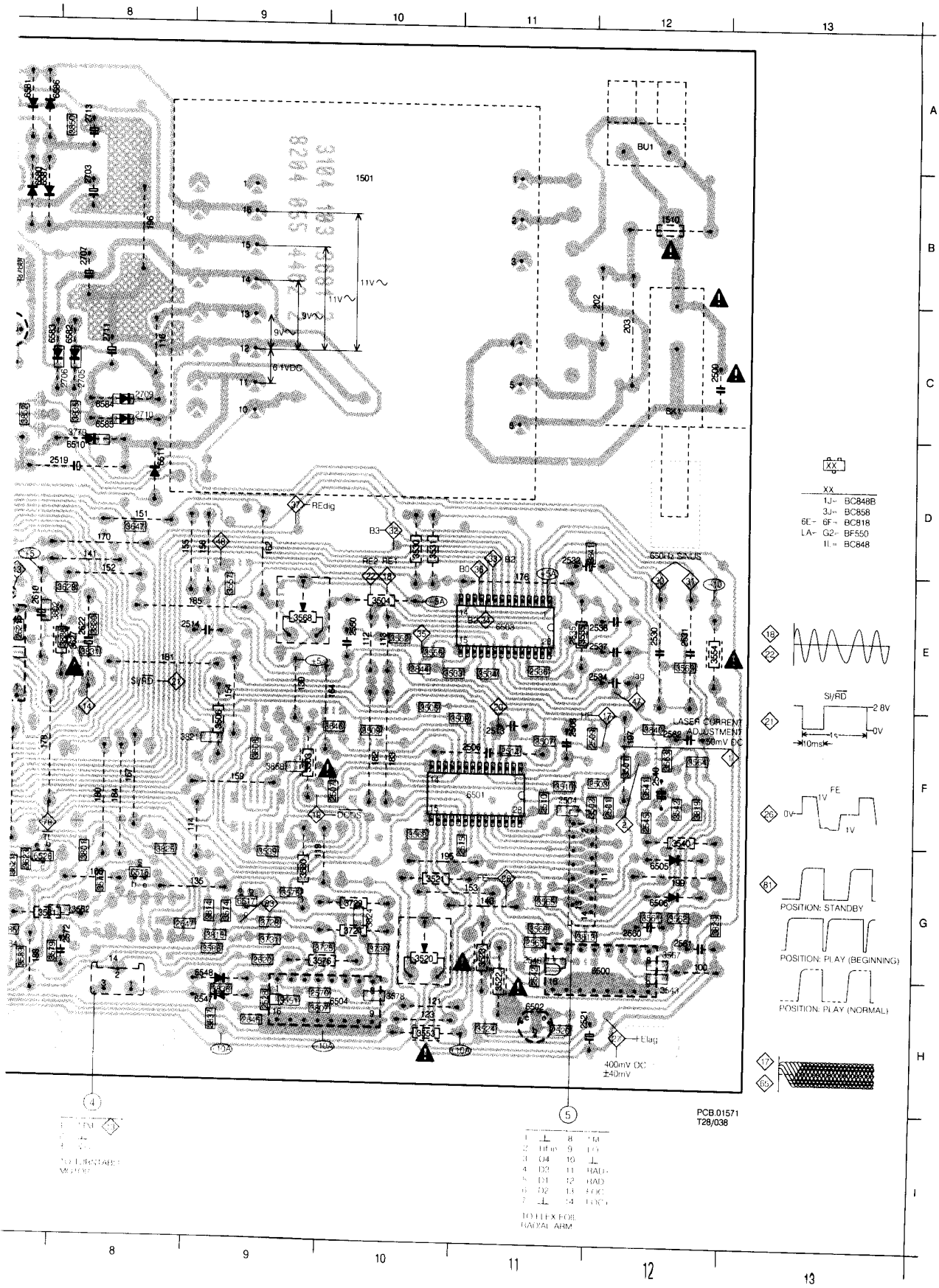
2514	E5	3577	G6	3831	E6		
2515	G3	3578	H4	3832	F10		
2519	D6	3579	G7	3833	D12		
2520	H3	3580	G5	3834	H9		
2521	H3	3581	G7	3835	C6		
2523	C8	3582	G6	3836	H5		
2528	H5	3584	G7	3837	H5		
2530	E2	3585	G7	3838	E6		
2531	E2	3586	G5	3839	D9		
2532	D3	3588	H7	3840	F2		
2534	E2	3589	H7	3841	D3		
2535	E3	3600	F8	3842	F8		
2536	E3	3602	F9	3843	E10		

MAIN PANEL SOLDER SIDE FOR PANELS MARKED WITH 3104 103 3681.2





2 C1
7 E5
9 G6
11 G12
14 G8
15 C7
18 C6
100 G12
101 H2
103 C5
104 E5
105 D4
106 G8
107 H7
108 H5
110 H6
111 C5
112 E10
113 E10
114 G9
115 H4
116 C8
119 G9
120 H6
121 H10
122 H6
123 H10
124 C3
125 C4
126 C5
127 D3
128 D2
129 F5
130 E9
132 H5
133 C5
134 G3
135 G8
138 G4
139 F3
140 G11
141 D8
142 G5
143 G5
144 C3
145 F3
146 F2
148 C4
149 C2
150 F7
151 D8
152 E8
153 G11
154 F9
155 D8
156 D9
157 D7
158 F4
159 F9
162 D9
163 C4
164 F10
165 C4
166 G2
167 F8
168 E5
170 D8
171 G3
172 C4
176 E11
178 F7
179 F7
180 F8
181 E8
182 F10
183 F10
184 F8
185 E8
186 B4
188 H7
189 D6
190 H2
191 D2
192 B7
193 F4
194 B4
195 G10
196 B8
197 F12
198 E3
199 G12
201 E5
202 C12
203 C12
BU1 A12
BU2 A5
SK1 C12
SK2 F7
1501 B10
1502 H2
1504 E7
1510 B12
2500 C12
2501 F12
2503 F11
2504 F11
2506 F11
2507 F10
2508 F11
2509 F12
2510 F11
2511 F11
2513 F11
2514 E8
2515 G11
2519 D7
2520 H11
2521 H12
2523 C6
2528 H9
2530 E12
2531 E12
2532 D11
2534 E11
2535 E11

1536	E11	3600	F6	3841	D11
1537	E11	3602	F5	3842	F6
1538	E11	3603	F6	3843	E4
1540	F12	3604	F6	3844	E10
1542	H11	3605	F5	3847	E5
1545	F12	3607	F6	3848	B6
1546	G11	3609	H3	3849	B7
1550	E10	3610	F6	3850	A8
1560	G12	3612	F6	3851	C7
1561	G12	3613	F4	3852	C7
1562	F12	3617	E6	3858	F9
1563	G11	3620	G7	3999	F2
1566	G6	3621	G7	5502	D2
1570	H9	3622	D7	5503	D3
1572	G8	3623	G7	6500	G12
1574	G7	3625	D5	6501	F11
1600	F6	3626	D5	6502	H11
1601	F6	3627	E8	6503	E11
1602	F6	3628	E7	6504	H10
1604	G6	3629	E7	6505	G12
1607	F5	3630	E4	6506	G12
1608	F6	3634	E6	6510	D8
1609	F6	3635	E6	6511	D8
1610	E7	3636	E6	6512	G7
1611	H3	3637	E6	6513	D5
1612	H3	3638	E7	6515	D5
1620	G9	3639	E4	6516	G8
1621	E7	3640	E4	6517	G9
1622	E8	3645	F3	6519	A6
1623	E7	3646	F9	6520	F5
1624	E7	3647	D8	6523	H4
1630	H2	3648	D2	6525	G7
1631	G2	3650	F3	6526	G7
1632	G3	3651	H2	6527	D5
1633	G3	3652	E2	6528	D5
1634	E2	3655	B2	6530	E6
1635	E2	3659	E2	6531	G2
1645	H9	3661	E3	6535	D2
1647	G8	3665	D2	6536	D3
1664	D2	3666	D3	6538	C6
1665	D3	3667	E2	6540	G2
1666	D1	3668	E3	6541	E2
1667	D4	3669	D2	6542	B3
1668	D1	3670	D4	6543	B3
1669	D4	3671	D1	6544	B5
1670	C2	3672	D4	6545	B5
1671	C3	3673	C3	6546	C2
1673	C5	3674	C4	6547	H9
1674	D3	3675	B3	6548	H9
1675	D2	3676	C4	6549	G5
1690	B6	3677	B3	6551	A7
1691	B6	3678	C5	6552	A6
1692	B5	3679	B3	6553	A6
1693	G6	3680	B5	6554	B6
1696	E2	3681	C1	6555	B6
1697	E2	3682	C1	6557	B5
1698	E3	3691	G7	6558	A6
1699	E3	3692	G7	6561	E4
1700	C3	3700	B6	6562	B6
1702	D7	3701	A6	6563	F3
1703	B8	3702	B5	6564	E2
1705	C8	3703	B5	6565	E3
1706	C8	3704	C5	6572	C7
1707	B8	3705	C5	6577	D6
1708	B6	3706	B3	6580	B7
1709	C8	3707	B3	6581	A7
1710	C8	3708	B5	6582	C8
1711	C8	3709	D3	6583	C7
1712	C7	3724	G10	6584	C8
1713	A8	3725	G9	6585	D8
1501	F12	3726	E6	6586	A7
1502	F12	3728	G9	6587	B7
1503	F9	3729	G10	6591	B6
1504	E10	3730	G10	6592	C7
1505	F10	3731	G9		
1506	F9	3736	F3		
1507	F11	3737	F4		
1508	F10	3738	F4		
1509	F10	3739	E2		
1510	F11	3740	E2		
1520	G10	3743	E3		
1521	G10	3744	E3		
1522	H11	3745	E3		
1523	G11	3747	B6		
1524	H11	3748	B6		
1530	D10	3775	E6		
1531	D10	3776	E3		
1533	E10	3779	D8		
1534	E11	3780	B7		
1535	E11	3801	G8		
1539	G9	3802	E8		
1540	G12	3803	B7		
1541	F12	3805	D3		
1542	F12	3806	G2		
1543	H12	3807	H9		
1551	H9	3808	F9		
1552	E10	3809	D3		
1553	H10	3810	B6		
1554	E12	3811	B6		
1555	E10	3812	B5		
1557	E9	3813	G11		
1560	F10	3814	G9		
1561	G12	3815	G9		
1562	G12	3816	E7		
1563	F12	3819	F12		
1564	F12	3821	F8		
1565	G11	3822	B4		
1566	G11	3823	B3		
1567	G12	3824	G10		
1568	E9	3825	G8		
1569	E12	3826	H7		
1574	G9	3827	F7		
1575	G9	3828	E5		
1576	G9	3829	G12		
1577	G8	3830	E8		
1578	H10	3831	E8		
1579	G8	3832	F4		
1580	G9	3833	D2		
1581	G7	3834	H5		
1582	G8	3835	C8		
1584	G7	3836	H9		
1585	G7	3837	H9		
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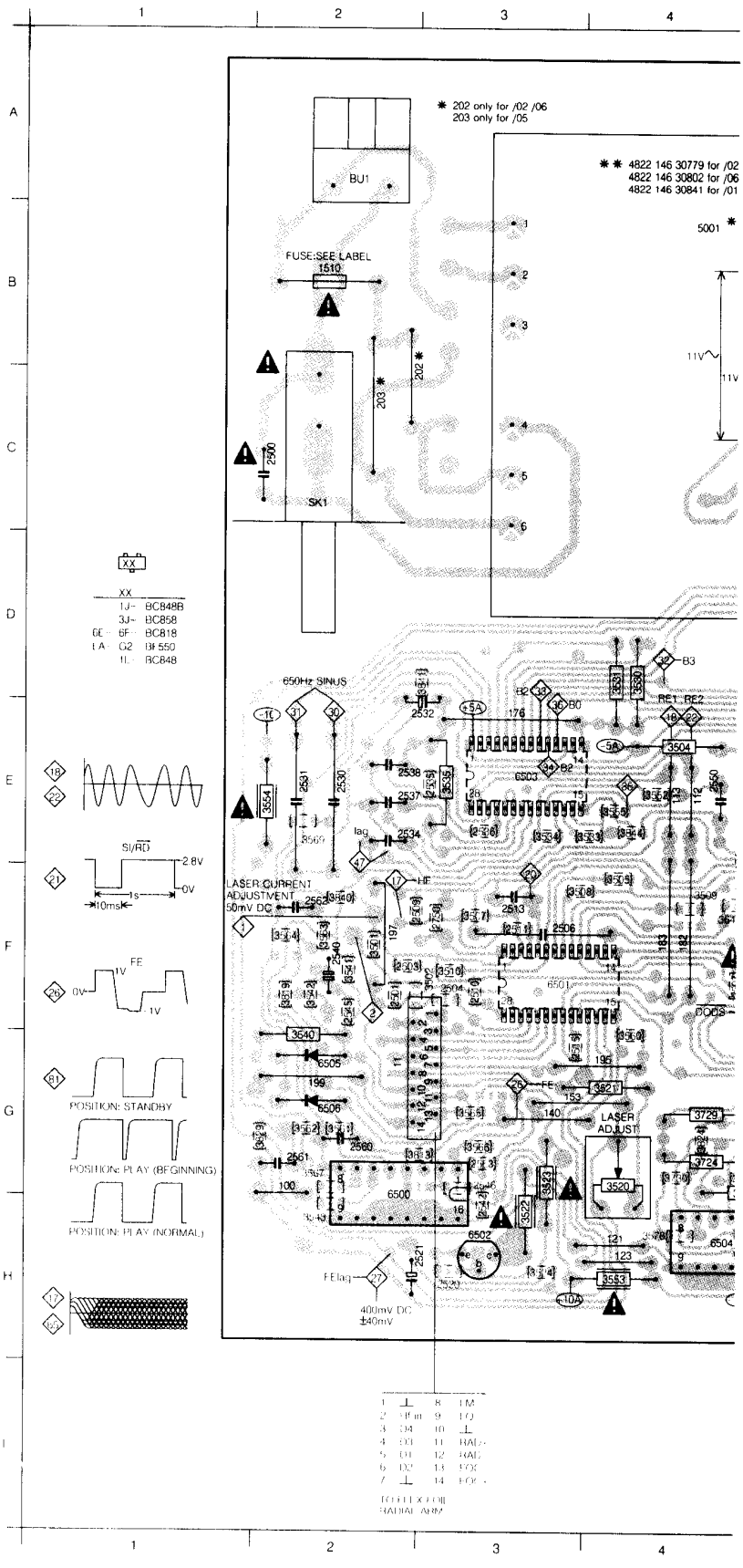
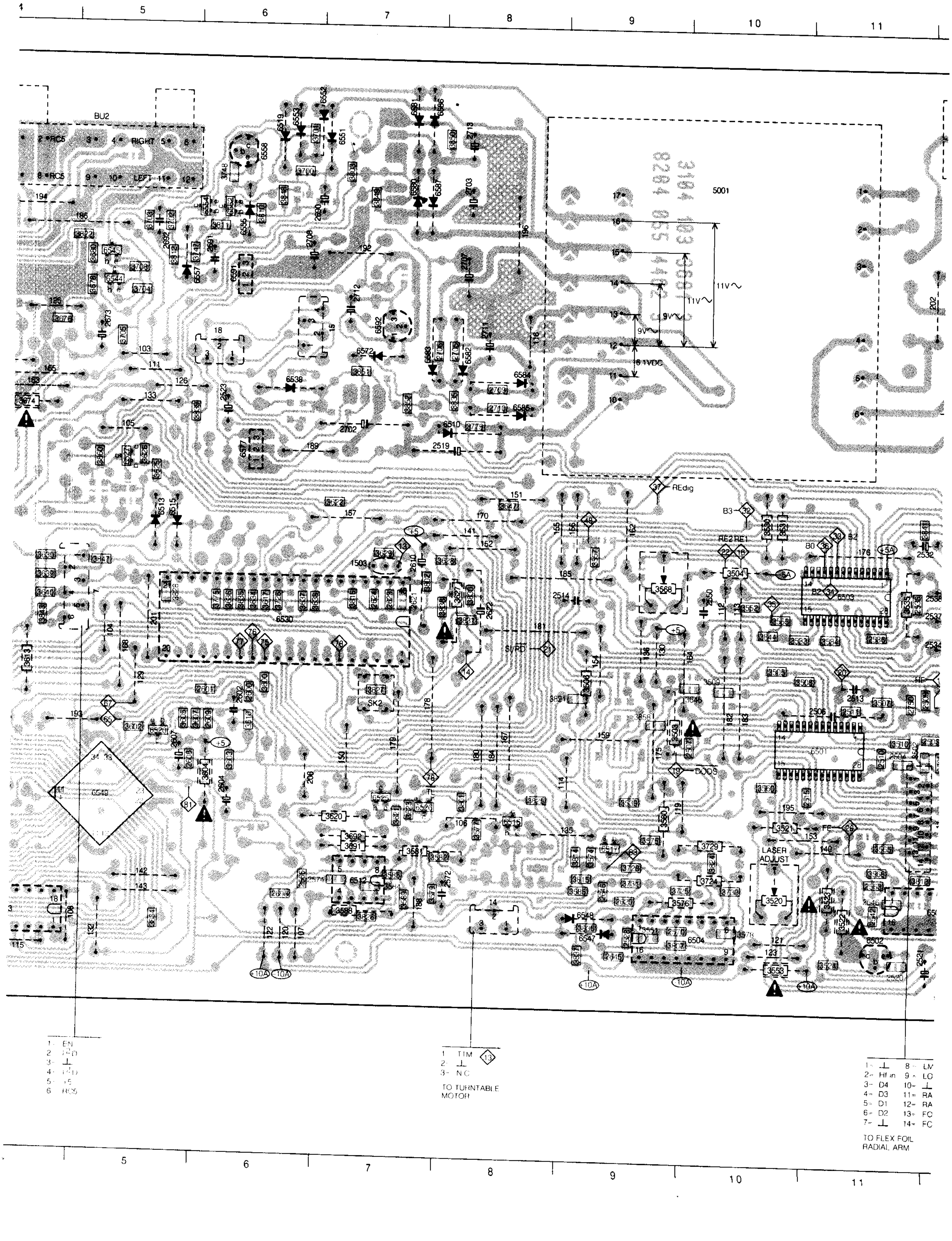
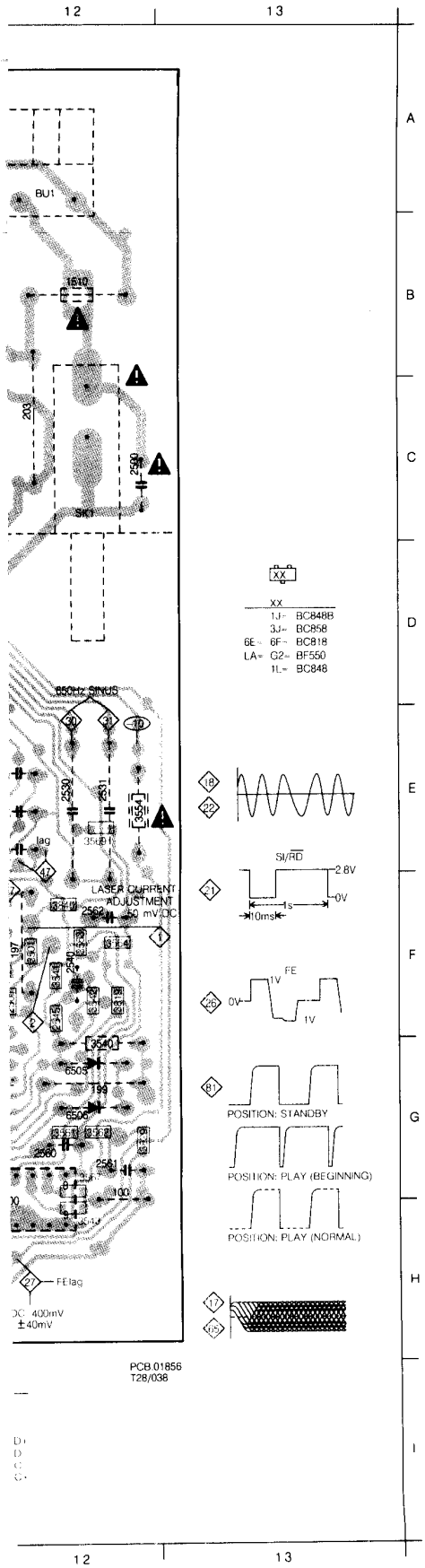
1588	H7	3839	D6		
1589	H7	3840	F12		

MAIN PANEL COMPONENT SIDE FOR PANELS M




BU2
RIGHT
LEFT
5001
11V~
9V~
6.1VDC
REdig
DODS
LASER ADJUST
SK2
1 - TTM
2 - ⊥
3 - N.C
TO TURNTABLE MOTOR
1 - ⊥
2 - Hf in
3 - D4
4 - D3
5 - D1
6 - D2
7 - ⊥
8 - LM
9 - LC
10 - ⊥
11 - RA
12 - RA
13 - FC
14 - FC
TO FLEX FOIL RADIAL ARM



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11	G12	2560	G12	3623	G7	6510	D8
14	H8	2561	G12	3625	D5	6512	G7
15	C7	2562	F12	3626	D5	6513	D5
18	C6	2563	G11	3627	E8	6515	D5
100	G12	2566	G6	3628	E7	6516	G8
101	H2	2570	H9	3629	E7	6517	G9
103	C5	2572	G8	3630	E4	6519	A6
104	E5	2574	G6	3634	E6	6520	F5
105	D5	2600	F6	3635	E6	6523	H4
106	G8	2601	F6	3636	E6	6525	G7
107	H6	2602	F6	3637	E6	6526	G7
108	H5	2604	G6	3638	E6	6527	D5
111	C5	2607	F5	3639	E4	6530	E6
112	E10	2608	F5	3640	E4	6531	G2
113	E10	2609	F6	3645	G3	6535	D2
114	G9	2610	E7	3646	F10	6536	D3
115	H4	2611	H3	3647	D8	6538	C6
116	C8	2612	H3	3648	D2	6540	G2
119	G9	2620	G9	3650	G3	6541	E2
120	H6	2621	E7	3651	H2	6542	B3
121	H10	2622	E8	3652	E2	6543	B3
122	H6	2623	E7	3653	G1	6544	C5
123	H10	2624	E7	3659	E2	6545	B5
124	C3	2630	H2	3661	E3	6546	C2
125	C4	2631	G2	3665	D2	6547	H9
126	C5	2632	G3	3666	D3	6548	H9
127	D3	2633	G3	3667	E2	6549	G5
128	D2	2634	E2	3668	E3	6551	A7
129	F5	2635	E2	3669	D2	6552	A6
130	F9	2645	H9	3670	D4	6553	A6
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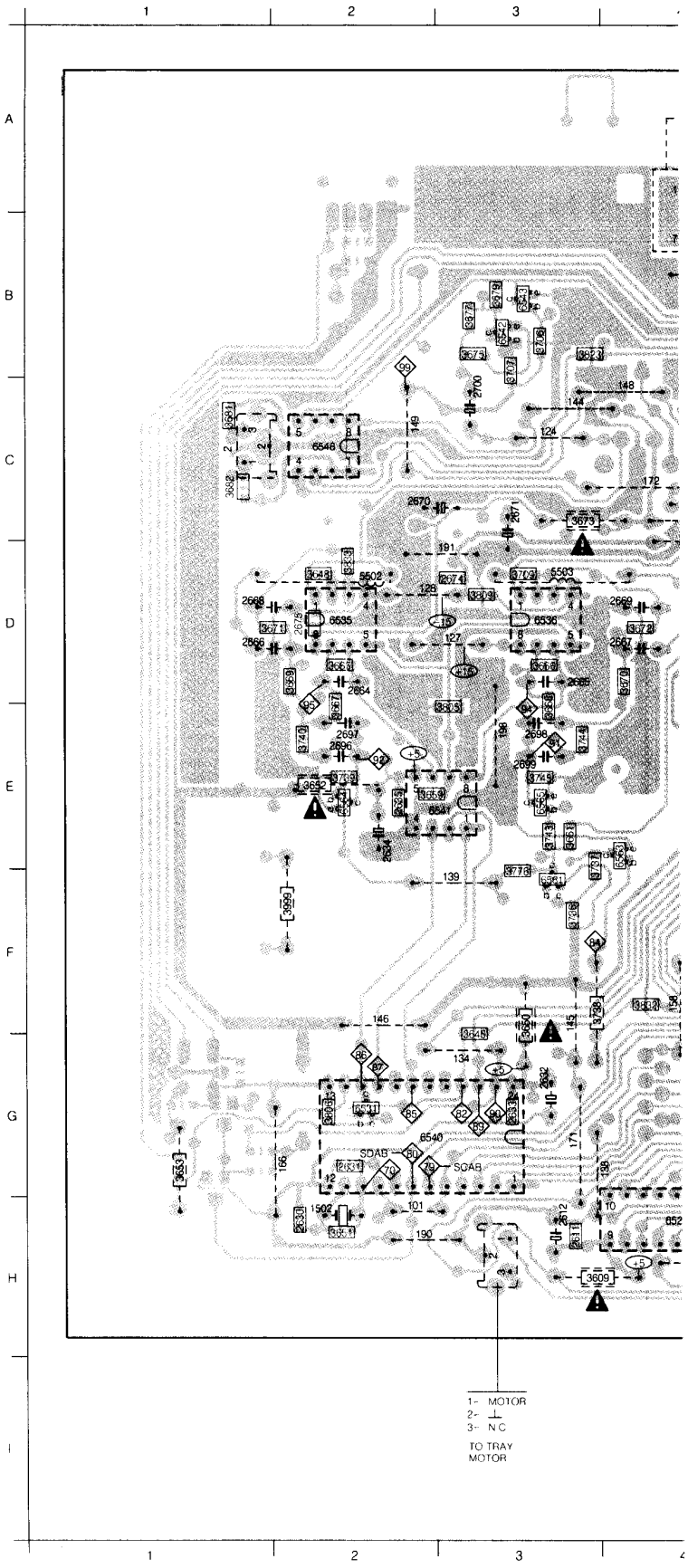
133	C5	2664	D2	3672	D4	6555	B6
134	G3	2665	D3	3673	C3	6557	C5
135	G8	2666	D1	3674	D4	6558	A6
136	E9	2667	D4	3675	B3	6561	F3
138	G4	2668	D1	3676	C4	6562	B6
139	F2	2669	D4	3677	B3	6563	E4
140	G11	2670	C2	3678	C5	6564	E2
141	D8	2671	C3	3679	B3	6565	E3
142	G5	2673	C5	3680	B5	6572	C7
143	G5	2674	D3	3681	C1	6577	D6
144	C3	2675	D2	3682	C1	6580	B7
145	G3	2690	B6	3691	G7	6581	A7
146	F2	2691	B6	3692	G7	6582	C8
148	C4	2692	B5	3700	B6	6583	C7
149	C2	2693	G6	3701	A6	6584	C8
150	F7	2696	E2	3702	B5	6585	C8
151	D8	2697	E2	3703	B5	6586	A7
152	E8	2698	E3	3704	C5	6587	B7
153	G10	2699	E3	3705	C5	6591	B6
154	F9	2700	C3	3706	B3	6592	C7
155	E8	2702	D7	3707	C3		
156	E9	2703	B8	3708	B5		
157	D7	2705	C8	3709	D3		
158	F4	2706	C7	3724	G10		
159	F9	2707	B8	3725	G9		
162	E9	2708	B6	3726	E6		
163	C4	2709	C8	3728	G9		
164	F10	2710	C8	3729	G10		
165	C4	2711	C8	3730	G10		
166	G2	2712	C7	3731	G9		
167	F8	2713	A8	3736	F3		
168	F5	2750	F11	3737	F4		
170	D8	3501	F12	3738	F4		
171	G3	3502	F11	3739	E2		
172	C4	3503	F9	3740	E2		
175	F9	3504	E10	3743	E3		
176	E11	3505	F10	3744	E3		
177	F7	3506	F9	3745	E3		
178	F7	3507	F11	3747	B5		
179	F7	3508	F10	3748	B6		
180	F8	3509	F10	3775	E6		
181	E8	3510	F11	3776	F3		
182	F10	3520	G10	3779	D8		
183	F10	3521	G10	3801	G8		
184	F8	3522	H11	3802	E7		
185	E8	3523	G11	3803	B7		
186	B4	3524	H11	3805	E3		
188	H7	3530	D10	3806	G2		
189	D6	3531	D10	3807	H9		
190	H2	3533	E10	3809	D3		
191	D2	3534	E11	3810	B6		
192	B7	3535	E11	3811	B6		
193	F4	3539	G9	3812	B5		
194	B4	3540	G12	3813	G11		
195	G10	3541	F12	3814	G9		
196	B8	3542	F12	3815	G9		
197	F12	3543	H12	3816	E7		
198	E3	3551	H9	3819	F12		
199	G12	3552	E10	3821	F8		
201	E5	3553	H10	3822	B4		
202	C12	3554	E12	3823	B3		
203	C12	3555	E10	3824	G10		
208	G6	3557	E9	3825	G8		
BU1	A12	3560	G10	3826	H7		
BU2	A5	3561	G12	3827	F7		
SK0	C12	3562	G12	3828	E5		
SK2	F7	3563	F12	3829	G12		
1502	H2	3564	F12	3830	E8		
1503	E7	3565	G11	3831	E8		
1510	B12	3566	G11	3832	F4		
2500	C12	3567	G12	3833	D2		
2501	F12	3568	E9	3834	H5		
2503	F11	3569	E12	3835	C8		
2504	F11	3574	G9	3836	H9		
2506	F11	3575	G9	3837	H9		
2507	F10	3576	G9	3838	E8		
2509	F12	3577	G8	3839	D6		
2510	F11	3578	H10	3840	F12		
2511	F11	3579	H7	3841	D11		
2513	F11	3580	G9	3843	E4		
2514	E8	3581	G7	3844	E10		
2515	G11	3582	G7	3847	E5		
2519	D7	3584	G7	3848	B6		
2520	H11	3585	G7	3849	B7		
2521	H11	3586	G9	3850	A8		
2523	C6	3588	H7	3851	C7		
2528	H9	3589	H7	3852	D7		
2530	E12	3600	F6	3858	F9		
2531	E12	3602	F5	3860	D5		
2532	E11	3603	F6	3999	F2		
2534	E11	3604	G6	5001	B10		
2535	E11	3605	F5	5502	D2		
2536	E11	3607	F6	5503	D3		
2537	E11	3609	H3	6500	H12		
2538	E11	3610	F6	6501	F11		
2540	F12	3613	F4	6502	H11		
2542	H11	3617	E6	6503	E11		
2545	F12	3620	G7	6504	H10		

MAIN PANEL SOLDER SIDE FOR PANELS MARKED WITH 3104 103



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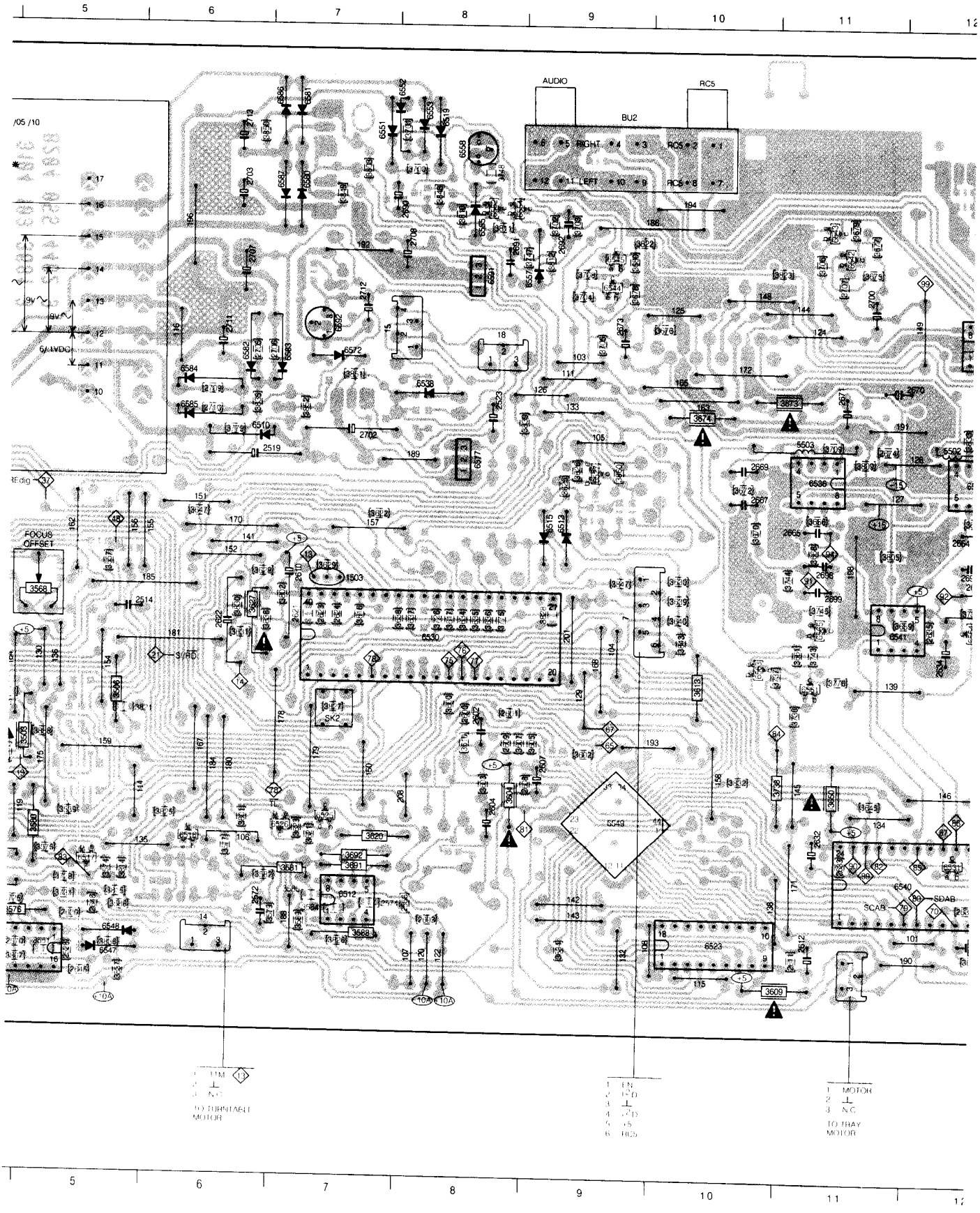
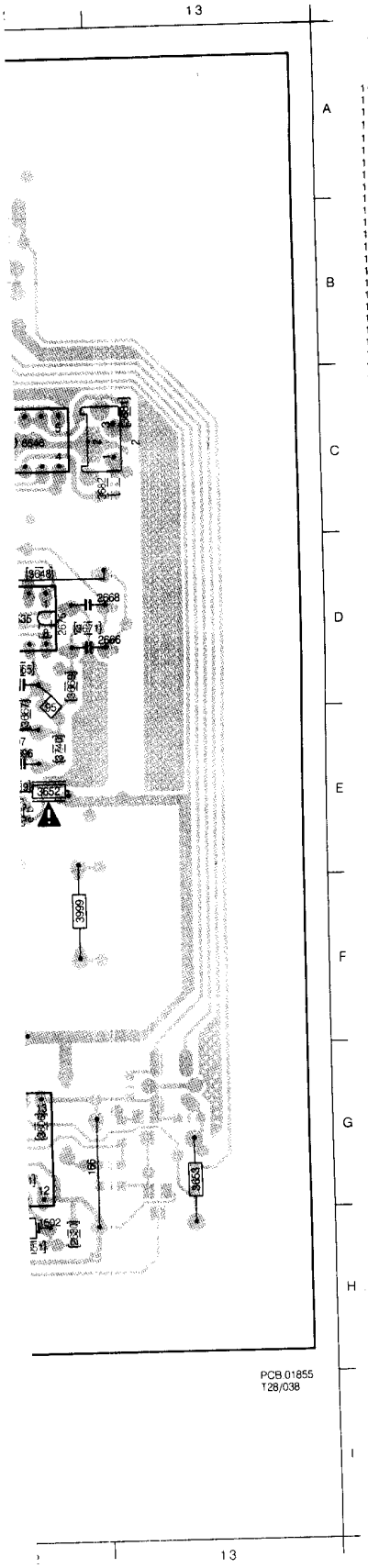


3-6-1a



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14	H6	2546	G3	3610	F8	3860	D9
15	C7	2550	E4	3613	F10	3999	F12
18	C8	2560	G2	3617	E8	5001	B4
100	G2	2561	G2	3620	G7	5502	D12
101	H11	2562	F2	3621	G7	5503	D11
103	C9	2563	G3	3622	D7	6500	H2
104	E9	2566	G8	3623	G7	6501	F3
105	D9	2570	H4	3625	D9	6502	H3
106	G6	2572	G6	3626	D9	6503	E3
107	H8	2574	G7	3627	E6	6504	H4
108	H9	2600	F8	3628	E6	6505	G2
111	C9	2601	F8	3629	E7	6506	G2
112	E4	2602	F8	3630	E10	6510	D6
113	E4	2604	G8	3634	E8	6512	G7
114	G5	2607	F9	3635	E8	6513	D9
115	H10	2608	F9	3636	E8	6515	D9
116	C6	2609	F8	3637	E8	6516	G6
119	G5	2610	E7	3638	E8	6517	G5
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121	H4	2612	H11	3640	E10	6523	H10
122	H8	2620	G5	3645	G11	6525	G7
123	H4	2621	E7	3646	F4	6526	G7
124	C11	2622	E6	3647	D6	6527	D9
125	C10	2623	E7	3648	D12	6530	E8
126	C9	2624	E7	3650	G11	6531	G12
127	D11	2630	H12	3651	H12	6535	D12
128	D11	2631	G12	3652	E12	6536	D11
129	F9	2632	G11	3653	G13	6538	C8
130	F5	2633	G11	3659	E11	6540	G11
132	H9	2634	E12	3661	E11	6541	E11
133	C9	2635	E12	3665	D12	6542	B11
134	G11	2645	H5	3666	D11	6543	B11
135	G5	2646	G5	3667	E12	6544	C9
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141	D6	2668	D13	3672	D10	6549	G9
142	G9	2669	D10	3673	C11	6551	A7
143	G9	2670	C12	3674	D10	6552	A8
144	C11	2671	C11	3675	B11	6553	A8
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148	C10	2675	D12	3678	C9	6557	C9
149	C12	2690	B8	3679	B11	6558	A8
150	F7	2691	B8	3680	B9	6561	F11
151	D6	2692	B9	3681	C13	6562	B8
152	E6	2693	G8	3681	C13	6563	E10
153	G3	2696	E12	3682	C13	6564	E12
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162	E5	2705	C6	3704	C9	6583	C7
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176	E3	3502	F3	3730	G4		
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179	F7	3504	E4	3736	F11		
180	F6	3505	F4	3737	F11		
181	E6	3506	F5	3738	F11		
182	F4	3507	F3	3739	E12		
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188	H7	3521	G4	3747	B9		
189	D8	3522	H3	3748	B8		
190	H11	3523	G3	3775	E8		
191	D11	3524	H3	3776	F11		
192	B7	3530	D4	3779	D6		
193	F9	3531	D4	3801	G6		
194	B10	3533	E3	3802	E7		
195	G4	3534	E3	3803	B7		
196	B6	3535	E3	3805	E11		
197	F2	3539	G5	3806	G12		
198	E11	3540	G2	3807	H4		
199	G2	3541	F2	3809	D11		
201	E9	3542	F2	3810	B8		
202	C3	3543	H2	3811	B8		
203	C2	3551	H5	3812	B9		
208	G8	3552	E4	3813	G2		
BU1	A2	3553	H4	3814	G5		
BU2	A9	3554	E2	3815	G5		
SK1	C2	3555	E4	3816	E7		
SK2	F7	3557	E5	3819	F2		
1502	H12	3560	G4	3821	F5		
1503	E7	3561	G2	3822	B9		
1510	B2	3562	G2	3822	B9		
2500	C2	3563	F2	3823	B10		
2501	F2	3564	F2	3824	G4		
2503	F2	3565	G3	3825	G6		
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2510	F3	3574	G5	3830	E6		
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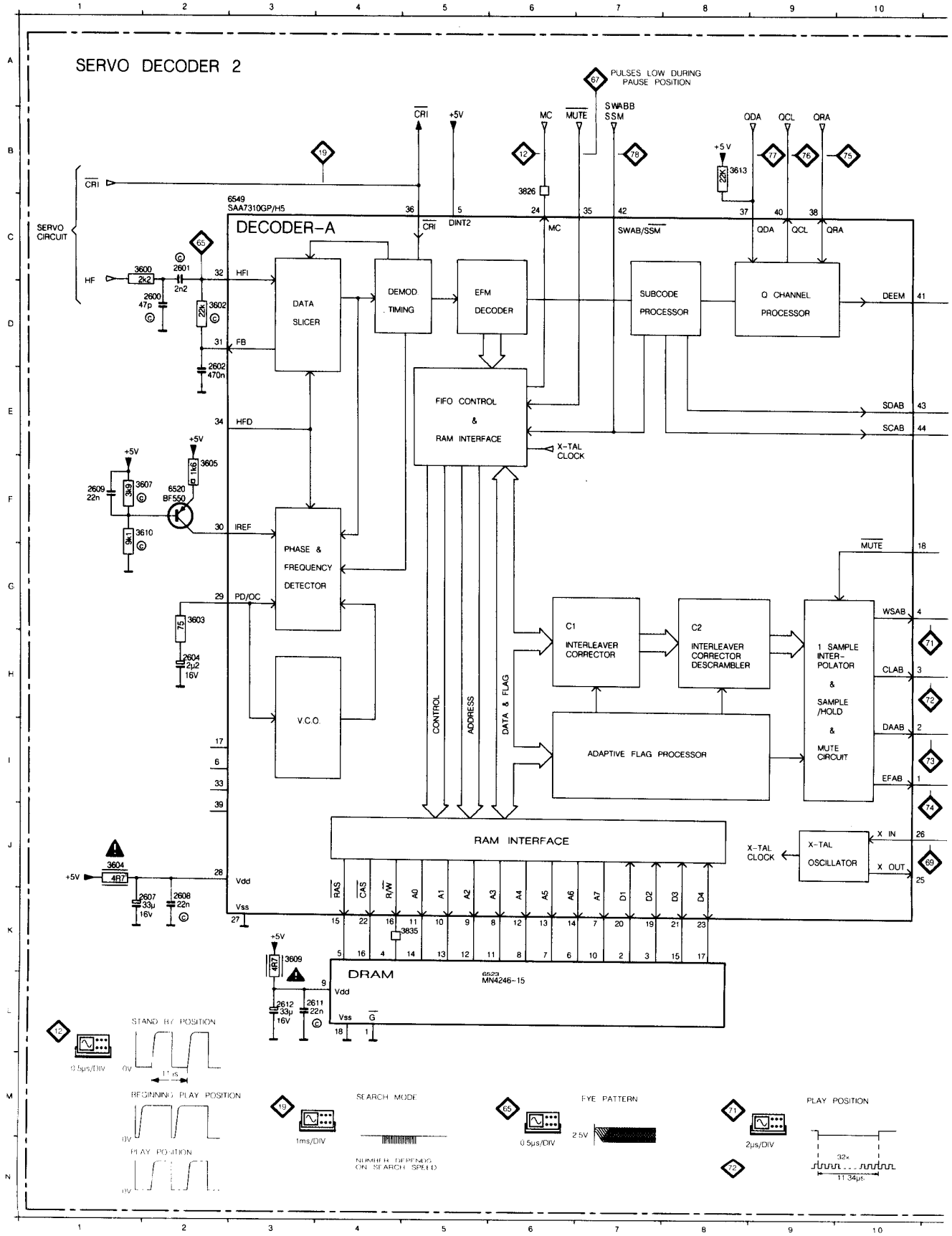
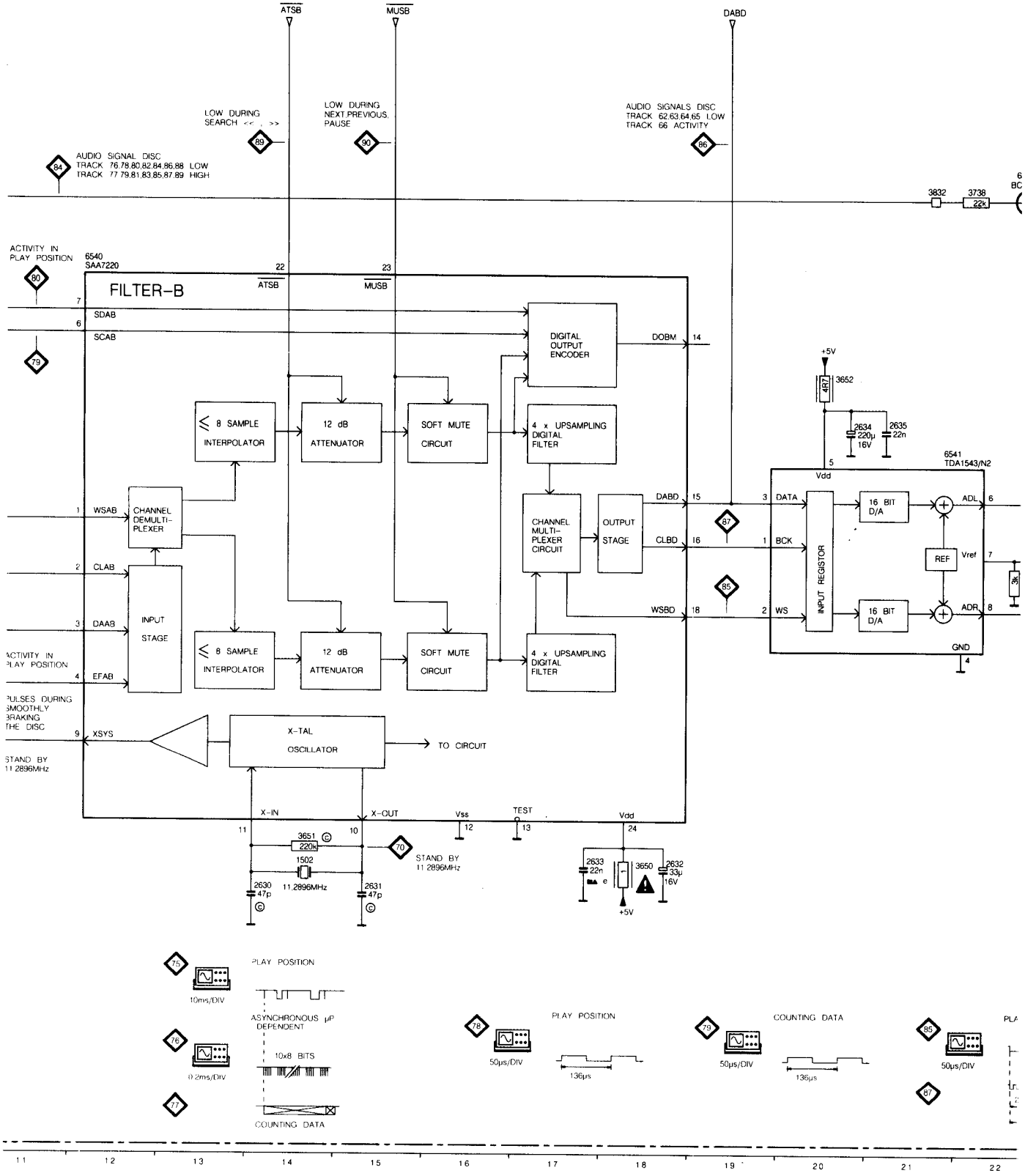
2513	F3	3576	G4	3832	F10		
2514	E5	3577	G6	3833	D12		
2515	G3	3578	H4	3834	H9		
2519	D6	3579	H7	3835	C6		
2520	H3	3580	G5	3836	H5		
2521	H3	3581	G7	3837	H5		
2523	C8	3582	G6	3838	E6		
2528	H5	3584	G7	3839	D9		
2530	E2	3585	G7	3840	F2		
2531	E2	3586	G5	3841	D3		
2532	E2	3588	H7	3843	E10		
2534	E2	3589	H7	3844	E4		
2535	E3	3600	F8	3847	E9		
2536	E3	3602	F9	3848	B8		
2537	E2	3603	F8	3849	B7		
2538	E2	3604	G8	3850	A6		

DECODING CIRCUIT DIAGRAM

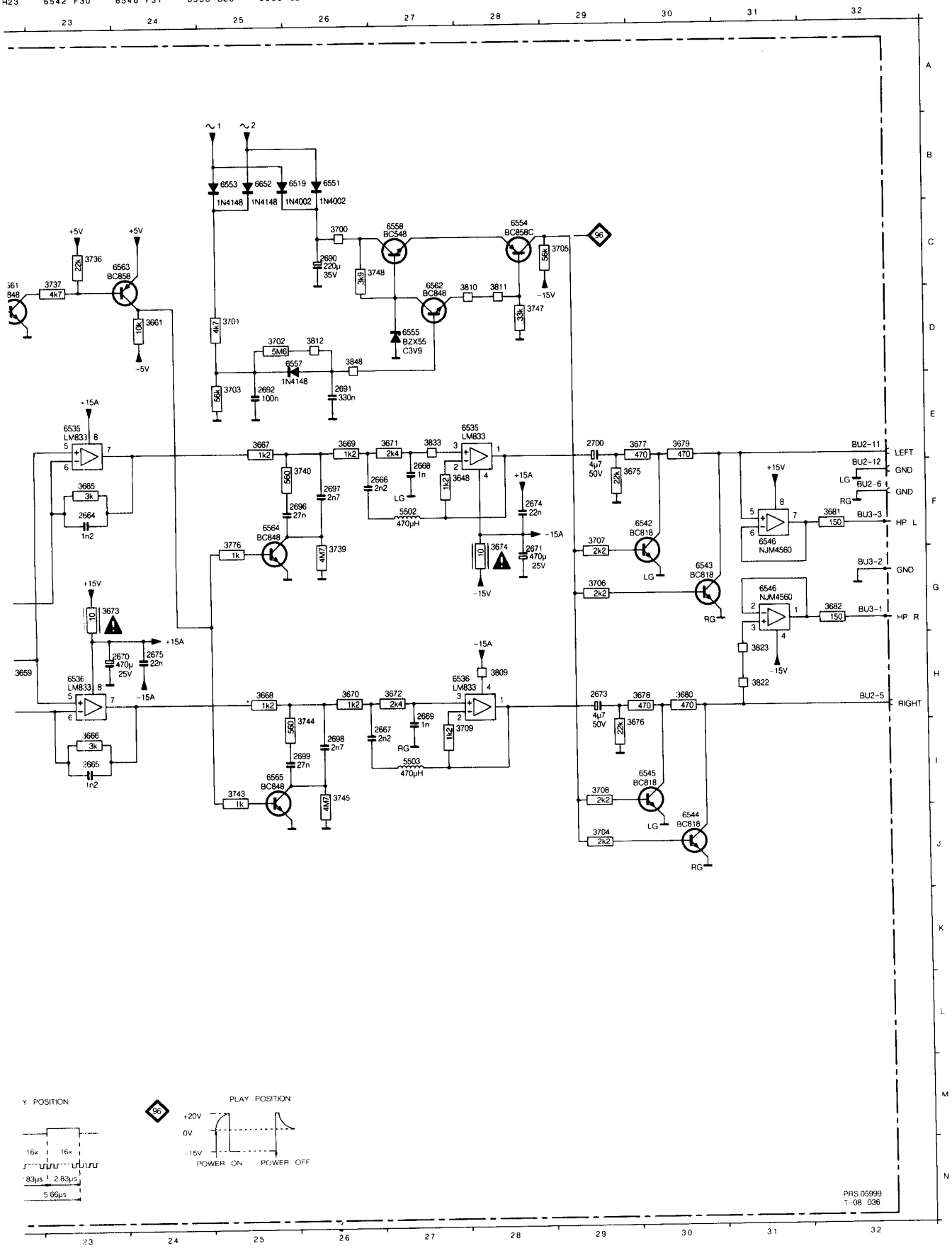
1502 K14	2604 H2	2611 L3	2632 K18	2664 F23	2668 F27	2673 H29	2691 E26	2698 I 26	3602 D2	3607 F1	3648 F27	3659 H22
2600 D2	2607 K1	2612 L3	2633 K17	2665 I 23	2669 H27	2674 F28	2692 E25	2699 I 26	3603 G2	3609 K3	3650 K18	3661 D24
2601 C2	2608 K2	2630 L14	2634 F20	2666 F26	2670 H23	2675 H24	2696 F26	2700 E29	3604 J1	3610 F1	3651 K14	3665 F23
2602 E2	2609 F1	2631 L15	2635 F21	2667 I 26	2671 G28	2690 C26	2697 F26	3600 C1	3605 F2	3613 B8	3652 F20	3666 I 23



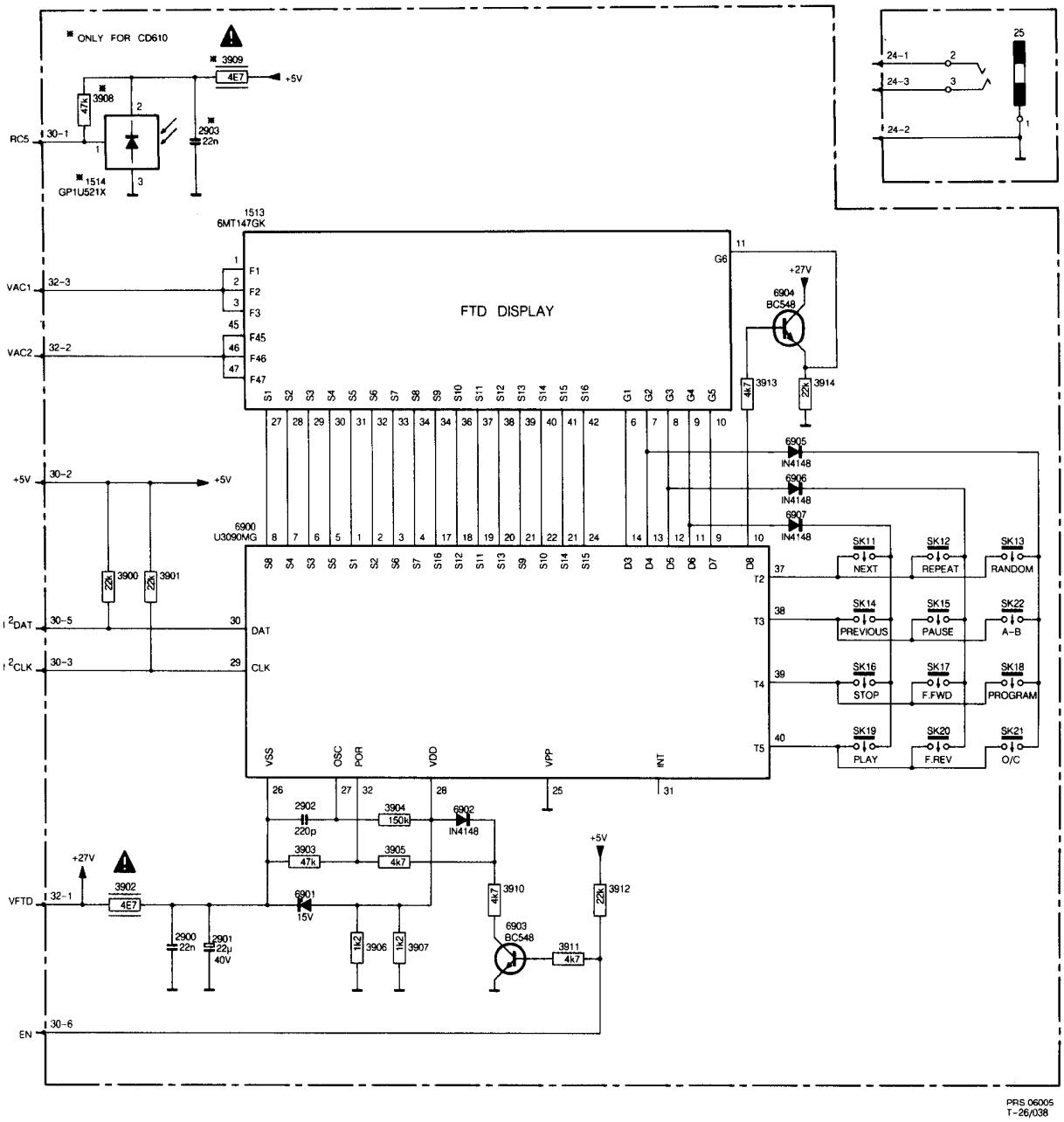
3667 E25	3671 E27	3675 F29	3679 E30	3700 C26	3704 J29	3708 I 29	3738 D22	3744 I 26	3776 F25	3812 D26	3832 D21	5502 F27	6523
3668 H25	3672 H27	3676 I 29	3680 H30	3701 D25	3705 C29	3709 I 27	3739 G26	3745 I 26	3809 H28	3822 H31	3833 E27	5503 I 27	6535
3669 E26	3673 G23	3677 E30	3681 F32	3702 D25	3706 G29	3736 C23	3740 F26	3747 D28	3810 C28	3823 H31	3835 K5	6519 B26	6535
3670 H26	3674 F28	3678 H30	3682 G32	3703 E25	3707 F29	3737 C23	3743 I 25	3748 C26	3811 C28	3826 B6	3848 D26	6520 F2	6536



L5	6536 H27	6543 G30	6546 G31	6554 C28	6561 C22	6565 I25
E23	6540 D12	6544 J30	6549 C2	6555 D27	6562 C27	6652 B25
E28	6541 G21	6545 I30	6551 B26	6557 D26	6563 C24	
H23	6542 F30	6546 F31	6553 B25	6558 C27	6564 F25	

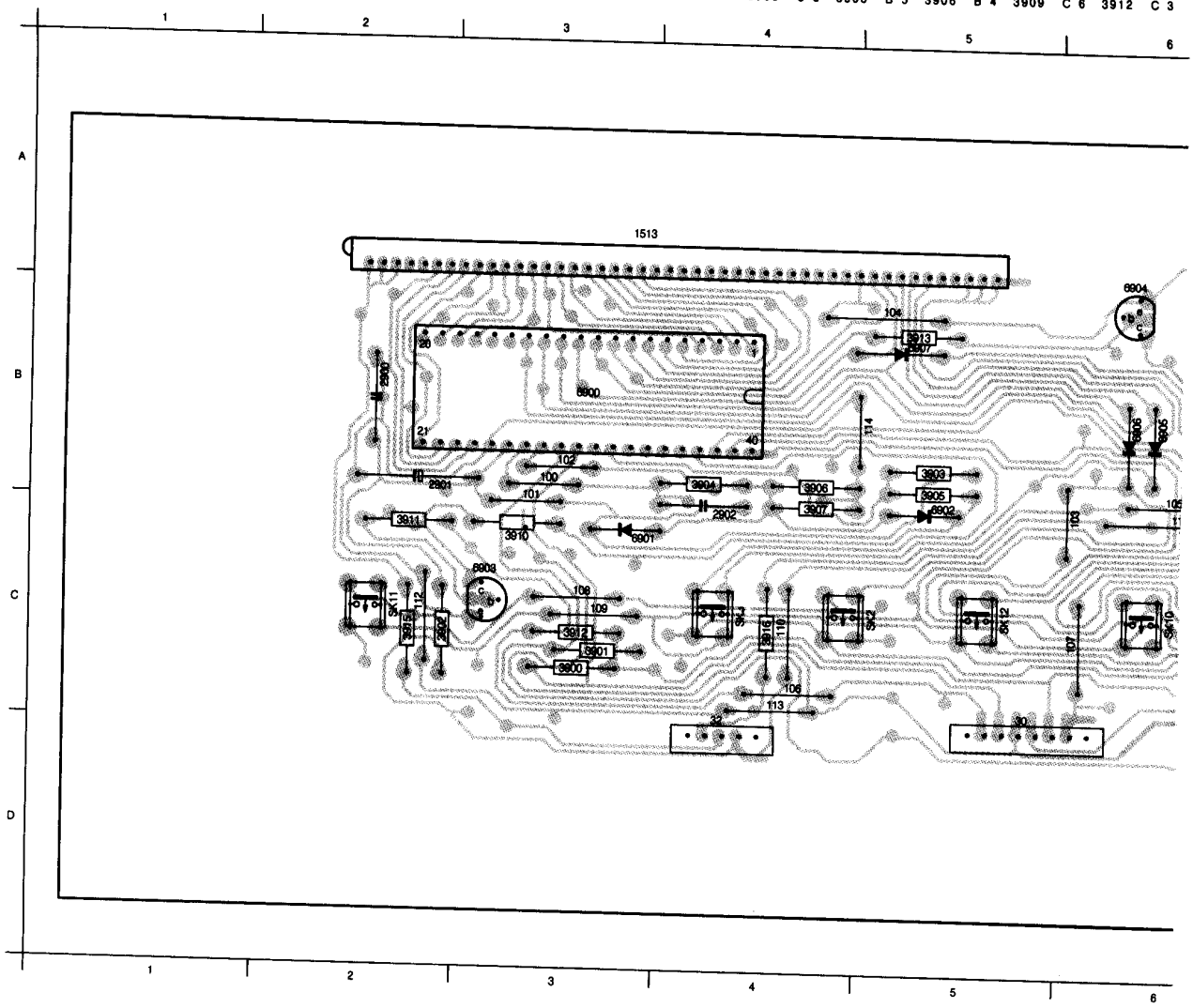


DISPLAY CIRCUIT DIAGRAM

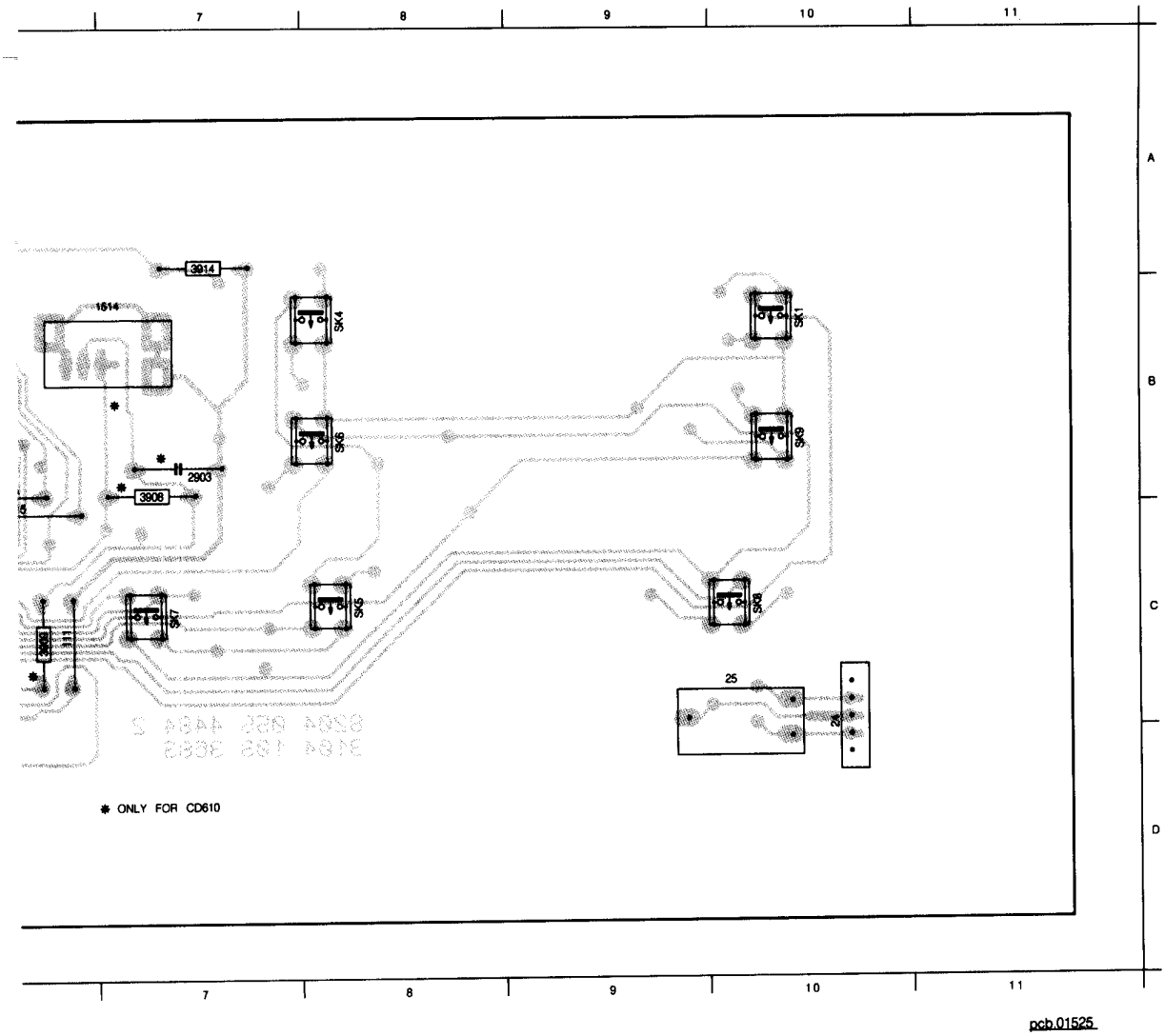


DISPLAY PANEL

100	B 3	103	C 6	106	C 4	109	C 3	112	C 2	115	B 6	24	C10	2901	B 2	30	C 5	3901	C 3	3904	B 4	3907	B 4	3910	C 3
101	B 3	104	B 5	107	C 6	110	C 4	113	C 4	1513	A 3	25	C10	2902	C 4	32	C 4	3902	C 2	3905	B 5	3908	B 7	3911	C 2
102	B 3	105	B 6	108	C 3	111	C 6	114	B 5	1514	B 7	2900	B 2	2903	B 7	3900	C 3	3903	B 5	3906	B 4	3909	C 6	3912	C 3

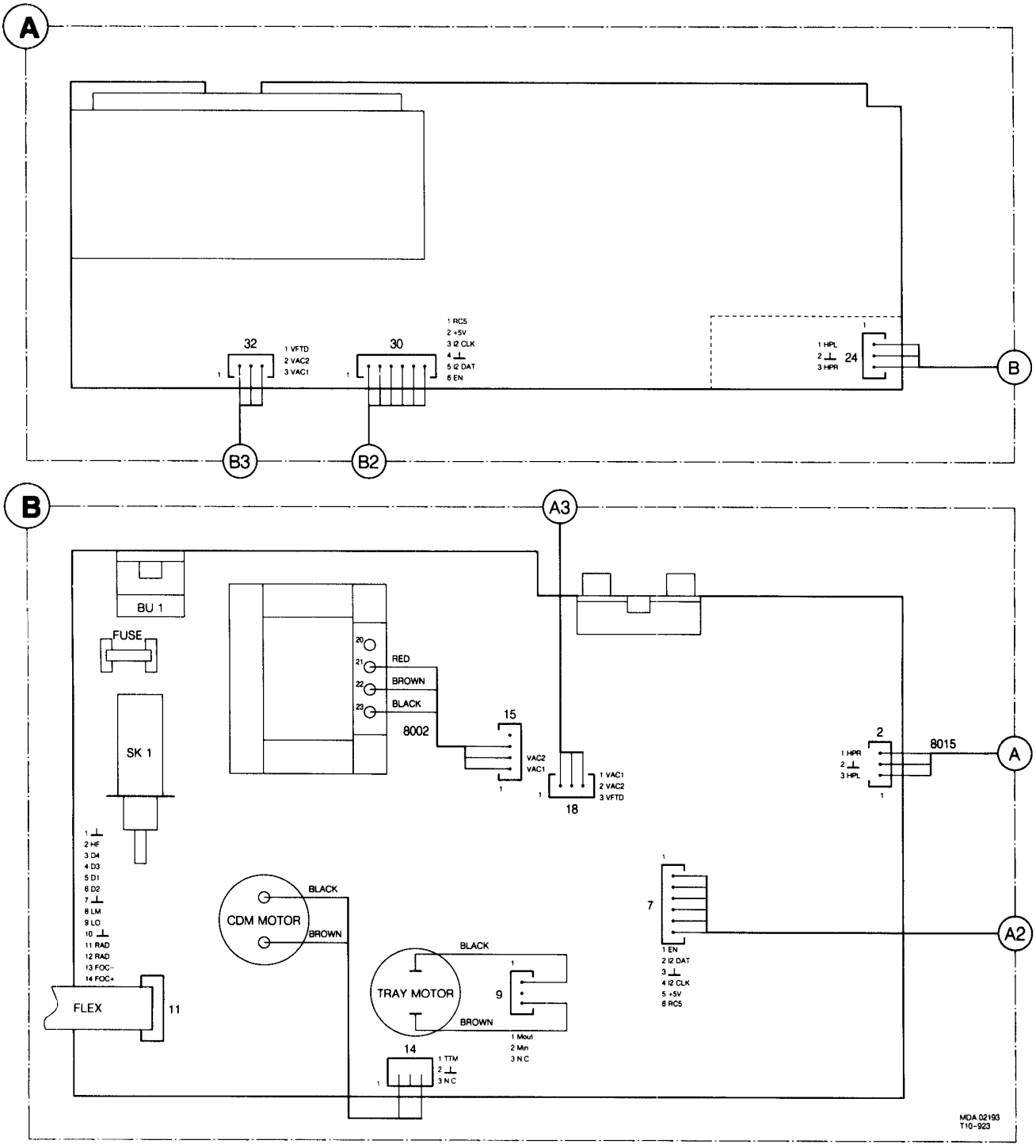


3913	B 5	3916	C 4	6902	B 5	6905	B 6	SK1	B10	SK12	C 5	SK4	B 8	SK7	C 7
3914	A 7	6900	B 3	6903	C 3	6906	B 6	SK10	C 6	SK2	C 5	SK5	C 8	SK8	C10
3915	C 2	6901	C 3	6904	A 6	6907	B 5	SK11	C 2	SK3	C 4	SK6	B 8	SK9	B10



pcb.01525

WIRING DIAGRAM



ELECTRICAL PARTS LIST

2500	4822 126 10005	3,3nF 20% 400V
2501	4822 122 33147	22nF 20%
2503	4822 122 33147	22nF 20%
2504	4822 122 31727	470pF 5% 63V
2506	4822 122 10166	22nF 30% 16V
2507	4822 122 31644	2,2nF 10% 63V
2509	4822 122 31765	100pF 5% 50V
2510	4822 122 32442	10nF 10% 50V
2511	4822 122 31746	1nF 5% 50V
2513	4822 121 42245	220nF 10% 63V
2514	4822 121 51252	470nF 5% 100V
2515	4822 122 31746	1nF 5% 50V
2519	4822 124 22027	47µF 20% 25V
2520	4822 122 31965	220pF 5% 63V
2521	5322 124 21643	22µF 20% 40V
2523	4822 124 41595	220µF 20% 50V
2528	4822 122 33104	100nF 10% 63V
2530	4822 121 51321	8,2mF 1% 63V
2531	4822 121 51321	8,2mF 1% 63V
2532	4822 124 40272	33µF 20% 16V
2534	5322 121 42661	330nF 5% 63V
2535	5322 122 31848	33nF 10% 63V
2536	5322 122 31848	33nF 10% 63V
2537	4822 121 42245	220nF 10% 63V
2538	4822 121 42245	220nF 10% 63V
2540	4822 124 41583	680nF 20% 50V
2542	4822 122 33147	22nF 20%
2545	4822 122 33104	100nF 10% 63V
2546	4822 122 33147	22nF 20%
2550	5322 121 42604	47nF 5% 63V
2560	4822 121 51314	4,7nF 5% 50V
2561	4822 121 51252	470nF 5% 100V
2562	5322 121 42661	330nF 5% 63V
2563	4822 122 33104	100nF 10% 63V
2566	4822 122 33147	22nF 20% (SMD)
2566	4822 122 10166	22nF 30% 16V
2570	4822 122 31644	2,2nF 10% 63V
2572	5322 121 42661	330nF 5% 63V
2574	4822 122 31759	18nF 10%
2600	4822 122 31772	47pF 5% 50V
2601	4822 122 31644	2,2nF 10% 63V
2602	4822 121 51252	470nF 5% 100V
2604	4822 124 41576	2,2µF 20% 50V
2607	4822 124 40272	33µF 20% 16V
2608	4822 122 33147	22nF 20%
2609	4822 122 33147	22nF 20%
2610	4822 124 22027	47µF 20% 25V
2611	4822 122 33147	22nF 20%
2612	4822 124 40272	33µF 20% 16V
2620	4822 122 33147	22nF 20%
2621	4822 122 33147	22nF 20%
2622	4822 124 22031	4,7µF 20% 63V
2623	4822 122 31772	47pF 5% 50V
2624	4822 122 31772	47pF 5% 50V
2630	4822 122 31772	47pF 5% 50V
2631	4822 122 31772	47pF 5% 50V
2632	4822 124 40272	33µF 20% 16V
2633	4822 122 33147	22nF 20%
2634	4822 124 40196	220µF 20% 16V
2635	4822 122 33147	20nF 20%
2645	4822 122 33147	20nF 20%
2646	4822 122 33104	100nF 10% 63V
2664	4822 121 51309	1,2nF 5% 50V
2665	4822 121 51309	1,2nF 5% 50V
2666	4822 121 51325	2,2nF 5% 50V
2667	4822 121 51325	2,2nF 5% 50V
2668	4822 121 51324	1,2nF 5% 50V
2669	4822 121 51324	1,2nF 5% 50V
2670	4822 124 23184	470µF 20% 25V
2671	4822 124 23184	470µF 20% 25V
2703	4822 125 41525	100µF 20% 25V
2713	4822 125 41525	100µF 20% 25V
2673	4822 124 41577	4,7µF 20% 50V
2674	4822 122 33147	22nF 20%
2675	4822 122 33147	22nF 20%
2690	4822 124 41572	220µF 20% 35V
2691	5322 121 42661	330nF 5% 63V
2692	5322 121 42386	100nF 5% 63V
2693	4822 122 33147	22nF 20%
2696	4822 121 42888	27nF 5% 50V
2697	4822 121 51312	2,7nF 5% 50V
2698	4822 121 51312	2,7nF 5% 50V
2699	4822 121 42888	27nF 5% 50V
2700	4822 124 41577	4,7µF 20% 50V
2702	4822 124 22337	22µF 20% 63V
2703	4822 125 41525	100µF 20% 25V
2713	4822 125 41525	100µF 20% 25V
2705	4822 122 33147	22nF 20%
2706	4822 122 33147	22nF 20%
2707	4822 124 41458	4700µF 20% 16V
2708	4822 124 40272	33µF 20% 16V
2709	4822 122 33147	22nF 20%
2710	4822 122 33147	22nF 20%
2711	4822 124 41571	1000µF 20% 16V
2712	4822 124 40272	33µF 20% 16V
2713	4822 125 41525	100µF 20% 25V
2750	4822 122 32542	47nF 10%
2900	4822 122 10166	22nF 30% 16V
2901	4822 124 22027	47µF 20% 25V
2902	4822 122 31465	270pF 10% 50V
2903	4822 122 10166	22nF 30% 16V

3501	5322 116 80445	4,7k 1% 0,125W
3502	5322 116 80429	100k 1% 0,125W
3503	4822 111 30499	4,7Ω 5% 0,33W
3504	4822 111 30499	4,7Ω 5% 0,33W
3505	4822 111 90253	12k 2% 0,125W
3506	4822 116 52389	100Ω 5% 0,5W
3507	5322 116 80427	1k 1% 0,125W
3508	4822 111 90512	24k 2% 0,125W
3509	4822 116 81208	5,6k 1% 0,125W
3510	4822 111 90249	10k 2% 0,125W
3520	4822 101 10685	Trimpot. LIN 4k7 20% 0.05W
3521	4822 116 52407	220Ω 5% 0,5W
3522	4822 111 30515	18Ω 5% 0,33W
3523	4822 111 30511	12Ω 5% 0,33W
3524	5322 116 80426	100Ω 1% 0,125W
3530	4822 050 24703	47K 1%
3531	4822 050 21503	15K 1%
3533	5322 111 90268	5,1k 2% 0,125W
3534	4822 111 90197	220k 2% 0,125W
3535	4822 116 53081	12k 1% 0,6W
3539	4822 111 90251	22k 2% 0,125W
3540	4822 111 30499	4,7Ω 5% 0,33W
3541	4822 111 90544	6,8k 2% 0,125W
3542	4822 116 90539	33Ω 5% 0,125W
3543	4822 111 90544	6,8k 2% 0,125W
3551	4822 116 81206	22Ω 1% 0,4W
3552	5322 111 90101	1,8k 2% 0,125W
3553	4822 111 30483	1Ω 5% 0,33W
3554	4822 111 30483	1Ω 5% 0,33W
3555	4822 111 90238	18k 2%
3557	4822 111 90197	220k 2% 0,125W
3560	4822 111 91494	11k 2%
3561	4822 116 90417	150k 2%

3562	4822 111 90568	120k 2% 0,125W
3563	4822 111 90573	56k 2% 0,125W
3564	4822 111 91495	160k 2%
3565	5322 111 90105	27Ω 2% 0,125W
3566	4822 116 81206	22Ω 1% 0,4W
3567	4822 111 90575	82k 2% 0,125W
3568	4822 100 20522	Trimpot. LIN 22k 20% 0,05W
3569	5322 116 80447	470k 1% 0,125W
3574	5322 116 80441	33k 1% 0,125W
3575	5322 116 80445	4,7k 1% 0,125W
3576	4822 116 52848	200k 1% 0,6W
3577	4822 116 90418	1,2k 2%
3578	4822 111 90575	82k 2% 0,125W
3579	4822 116 90417	150k 2%
3580	4822 116 52426	4,7k 5% 0,5W
3581	4822 116 53105	3,3k 1% 0,6W
3582	4822 111 90572	5,6k 2% 0,125W
3584	4822 111 91492	91k 2%
3585	4822 111 90214	100k 2% 0,125W
3586	4822 111 90368	680k 2% 0,125W
3588	4822 116 52472	47k 5% 0,5W
3589	5322 116 80445	4,7k 1% 0,125W
3600	4822 111 90248	2,2k 2% 0,125W
3602	4822 111 90251	22k 2% 0,125W
3603	4822 111 90371	75Ω 2% 0,125W
3604	4822 111 30499	4,7Ω 5% 0,33W
3605	5322 111 90265	1,6k 2% 0,125W
3607	4822 111 90571	3,9k 2% 0,125W
3609	4822 111 30499	4,7Ω 5% 0,33W
3610	4822 111 90373	9,1k 2% 0,125W (SMD)
3610	4822 116 52436	9,1kΩ 5%
3613	4822 111 90251	22k 2% 0,125W
3617	4822 111 90251	22k 2% 0,125W
3620	4822 050 21803	18K 1% 0,6W
3621	4822 051 10183	18K 2% 0,25W
3622	5322 116 80446	47k 1% 0,125W
3623	4822 051 10183	18K 2% 0,25W
3624	4822 111 90248	2,2k 2% 0,125W
3625	4822 111 90249	10k 2% 0,125W
3626	4822 111 90249	10k 2% 0,125W
3627	4822 111 30499	4,7Ω 5% 0,33W
3628	4822 111 90251	22k 2% 0,125W
3629	4822 111 90197	220k 2% 0,125W
3630	4822 111 90251	22k 2% 0,125W
3634	4822 111 90251	22k 2% 0,125W
3635	4822 111 90251	22k 2% 0,125W
3636	4822 111 90251	22k 2% 0,125W
3637	4822 111 90251	22k 2% 0,125W
3638	4822 111 90251	22k 2% 0,125W
3639	4822 111 90251	22k 2% 0,125W
3640	4822 111 90251	22k 2% 0,125W
3645	5322 116 80445	4,7k 1% 0,125W
3646	4822 111 90251	22k 2% 0,125W
3647	4822 111 90251	22k 2% 0,125W
3648	5322 111 90096	1,2k 2% 0,125W
3650	4822 111 30483	1Ω 5% 0,33W
3651	4822 111 90197	220k 2% 0,125W
3652	4822 111 30499	4,7Ω 5% 0,33W
3659	4822 051 10302	3K0 2%
3661	4822 111 90249	10k 2% 0,125W
3665	4822 116 90416	3k 2%
3666	4822 116 90416	3k 2%
3667	4822 116 90418	1,2k 2%
3668	4822 116 90418	1,2k 2%
3669	4822 116 90418	1,2k 2%
3670	4822 116 90418	1,2k 2%
3671	4822 116 90271	2,4k 2%
3672	4822 116 90271	2,4k 2%
3673	4822 111 30508	10Ω 5% 0,33W
3674	4822 111 30508	10Ω 5% 0,33W
3675	4822 111 90251	22k 2% 0,125W
3676	4822 111 90251	22k 2% 0,125W
3677	5322 116 80444	470Ω 1% 0,125W
3678	5322 116 80444	470Ω 1% 0,125W
3679	5322 116 80444	470Ω 1% 0,125W
3680	5322 116 80444	470Ω 1% 0,125W
3681	5322 116 80431	150Ω 5%
3682	5322 116 80431	150Ω 5%
3691	4822 111 90251	22k 2% 0,125W (SMD)
3691	4822 116 52463	22kΩ 5%
3692	4822 111 90251	22k 2% 0,125W (SMD)
3692	4822 116 52463	22kΩ 5%
3700	4822 111 90163	jumper
3701	5322 116 80445	4,7k 1% 0,125W
3702	4822 111 90425	5,6M 5% 0,125W
3703	4822 116 90541	56k 5% 0,125W
3704	4822 051 10222	2K2 2% 0,125W
3706	4822 051 10222	2K2 2% 0,125W
3707	4822 051 10222	2K2 2% 0,125W
3708	4822 051 10222	2K2 2% 0,125W
3709	5322 111 90096	1,2k 2% 0,125W
3724	4822 116 53081	12k 1% 0,6W
3725	4822 111 90253	12k 2% 0,125W
3726	4822 111 90251	22k 5%
3728	4822 051 10562	5K6 5%
3729	4822 116 53081	12k 1% 0,6W
3730	4822 111 90253	12k 2% 0,125W
3731	4822 116 81206	22Ω 1% 0,4W
3736	4822 111 90251	22k 2% 0,125W
3737	5322 116 80445	4,7k 1% 0,125W
3738	4822 111 90251	22k 2% 0,125W
3739	4822 111 90423	4,7M 5% 0,125W
3740	5322 111 90113	560Ω 2%
3743	5322 116 80427	1k 1% 0,125W
3744	5322 111 90113	560Ω 2%
3745	4822 111 90423	4,7M 5% 0,125W
3747	5322 116 80441	33k 1% 0,125W
3748	4822 111 90571	3,9k 2% 0,125W
3775	4822 111 90251	22k 2% 0,125W
3776	5322 116 80427	1k 1% 0,125W
3779	5322 111 90306	750Ω 5%
3800	4822 111 90163	jumper
3801	4822 111 90163	jumper
3802	4822 111 90163	jumper
3803	4822 111 90163	jumper
3804	4822 111 90163	jumper
3805	4822 111 90163	jumper
3806	4822 111 90163	jumper
3807	4822 111 90163	jumper
3808	4822 111 90163	jumper
3809	4822 111 90163	jumper
3810	4822 111 90163	jumper
3811	4822 111 90163	jumper
3812	4822 111 90163	jumper
3813	4822 111 90163	jumper
3814	4822 111 90163	jumper
3815	4822 111 90163	jumper
3816	4822 111 90163	jumper
3817	4822 111 90163	jumper
3818	4822 111 90163	jumper
3819	4822 111 90163	jumper
3820	4822 111 90163	jumper
3821	4822 111 90163	jumper
3822	4822 111 90163	jumper
3823	4822 111 90163	jumper
3824	4822 111 90163	jumper
3825	4822 111 90163	jumper
3826	4822 111 90163	jumper

3827	4822 111 90163	jumper
3828	4822 111 90163	jumper
3829	4822 111 90163	jumper
3830	4822 111 90163	jumper
3831	4822 111 90163	jumper
3832	4822 111 90163	jumper
3833	4822 111 90163	jumper
3834	4822 111 90163	jumper
3835	4822 111 90163	jumper
3851	4822 111 90163	jumper
3860	4822 111 90163	jumper
3900	4822 116 52463	22k 5% 0,5W
3901	4822 116 52463	22k 5% 0,5W
3902	4822 116 52366	4,7Ω 5% 0,5W
3903	4822 116 52472	47k 5% 0,5W
3904	4822 116 52501	150k 5% 0,5W
3905	4822 116 52426	4,7k 5% 0,5W
3906	4822 116 52433	820Ω 5% 0,5W
3907	4822 116 52433	820Ω 5% 0,5W
3910	4822 116 52426	4,7k 5% 0,5W
3911	4822 116 52426	4,7k 5% 0,5W
3912	4822 116 52463	22k 5% 0,5W
3913	4822 116 52426	4,7k 5% 0,5W
3914	4822 116 52463	22k 5% 0,5W

6500	4822 209 72587	TCA0372DP2
6501	4822 209 73234	TDA8808T/C3
6502	4822 130 44121	BC338
6503	4822 209 73235	TDA8809T/C2
6504	4822 209 72587	TCA0372DP2
6505	4822 130 34173	BZX79-B5V6
6506	4822 130 34173	BZX79-B5V6
6510	5322 130 32962	BZV85-C6V2
6512	4822 209 83274	NJM4560D
6513	4822 130 30621	1N4148
6515	4822 130 30621	1N4148
6516	5322 130 42012	BC858
6517	5322 130 42012	BC858
6519	5322 130 30684	1N4002
6520	4822 130 42131	BF550
6523	4822 209 70422	MN4264-15
6525	4822 130 61207	BC848
6526	4822 130 61207	BC848
6527	5322 130 41983	BC858B
6530	4822 209 61011	MC68HC05C8P/ZC99684
6531	4822 130 42675	BC818
6535	4822 209 83163	LM833N
6536	4822 209 83163	LM833N
6538	5322 130 30684	1N4002
6540	4822 209 11157	SAA7220
6541	4822 209 73236	TDA1543
6542	4822 130 42675	BC818
6543	4822 130 42675	BC818
6544	4822 130 42675	BC818
6545	4822 130 42675	BC818
6546	4822 209 83274	NJM4560D
6547	5322 130 30684	1N4002
6548	5322 130 30684	1N4002
6549	4822 209 61759	SAA7310GP/S5
6551	5322 130 30684	1N4002
6552	4822 130 30621	1N4148
6553	4822 130 30621	1N4148
6554	5322 130 42012	BC858
6555	4822 130 31981	BZX55-C3V9
6557	4822 130 30621	1N4148
6558	4822 130 40938	BC548
6561	4822 130 61207	BC848
6562	5322 130 42136	BC848C
6563	5322 130 42012	BC858
6564	4822 130 61207	BC848
6565	4822 130 61207	BC848
6572	4822 130 34197	BZX55-C12
6577	4822 209 80808	MC7815CT
6580	5322 130 30684	1N4002
6581	5322 130 30684	1N4002
6582	5322 130 30684	1N4002
6583	5322 130 30684	1N4002
6584	5322 130 30684	1N4002
6585	5322 130 30684	1N4002
6586	5322 130 30684	1N4002
6587	5322 130 30684	1N4002
6591	4822 209 71579	TY40408
6592	4822 209 73233	MC79L05ACPRE
6900	4822 209 72226	U3090MG
6901	4822 130 81086	BZX55-C15
6902	4822 130 30621	1N4148
6903	4822 130 40938	BC548
6904	4822 130 40938	BC548
6905	4822 130 30621	1N4148
6906	4822 130 30621	1N4148
6907	4822 130 30621	1N4148

Miscellaneous

BU3	4822 267 30743	HEADPHONE SOCKET
SK11	4822 276 12276	TACT SWITCH
SK12	4822 276 12276	TACT SWITCH
SK13	4822 276 12276	TACT SWITCH
SK14	4822 276 12276	TACT SWITCH
SK15	4822 276 12276	TACT SWITCH
SK16	4822 276 12276	TACT SWITCH
SK17	4822 276 12276	TACT SWITCH
SK18	4822 276 12276	TACT SWITCH
SK19	4822 276 12276	TACT SWITCH
SK20	4822 276 12276	TACT SWITCH
SK21	4822 276 12276	TACT SWITCH
SK22	4822 276 12276	TACT SWITCH
1502	4822 242 71349	11,2896 MHz X-TAL
1503	4822 242 70831	4 MHz CER. RES.
1510	4822 253 30009	FUSE 160mA T
1510	4822 253 30217	FUSE 300mA T
1513	4822 130 90661	DISPLAY 6-MT-147GK
1514	4822 214 51772	IR RECEIVER
5001	4822 146 30778	MAINS TRANSFORMER
5001	4822 146 30802	MAINS TRANSFORMER
5502	4822 157 53141	470µH 10%
5503	4822 157 53141	470µH 10%
	4822 218 10257	RC CD630
	4822 218 10293	RC NEUTRAL
	4822 267 40766	CINCH SOCKET 4P
	4822 492 63076	SPRING CLIP
	4822 265 20291	MAINS INLET
	4822 276 11309	MAINS SWITCH
	4822 256 30274	FUSE HOLDER
	4822 276 12523	TACT SWITCH
	4822 444 60606	SAFETY CAP
	4822 401 10895	CLAMP

Tools

4822 322 40066	SERVICE CABLE (14P)
4822 397 30184	CD AUDIO SIGNALS
4822 267 50676	SERVICE CONN (14P)
4822 397 30096	AUDIO TEST DISC 5+5A
5322 130 32182	LED GREEN CQYG11
4822 397 30184	AUDIO TEST DISC 1kHz
4822 321 21284	SERVICE CABLE (4P)
4822 397 60141	AUDIO TEST MAX DIAM
4822 395 50145	TORX SCREWDRIVERSET
4822 395 50132	TORX SCREW SQUARE
4822 395 30204	13TH ORDER TER

MODIFICATIONS

With A89-117

Page	reason
1-1a	/00B added
2-3a	Partslist adapted
3-10a	Headphone socket for /00B added

with A89-120

Page	reason
2-3b	Partslist adapted
3-1a	Check of lasersupply adapted
3-2a	Error tabel adapted Changed value in powersupply on position 2523
3-7a	Value of kill-resistors changed
3-9a	Partslist adapted
3-10b	Partslist adapted

with A89-123

Page	reason
3-1b	Laser current adjustment adapted
3-3a	Block diagram adapted
3-4a	Servo diagram adapted
3-5a	Due to change of main panel
3-6a	Due to change of main panel
3-6-1	Due to change of main panel
3-6-2	Due to change of main panel
3-7a	New version of SAA 7310
3-9b	Partslist adapted
3-10c	Partslist adapted

with A90-120

Page	reason
1-1b	Frontpage adapted
2-1a	Laser specifications added
2-2a	Page updated
2-3c	New lay-out
3-1c	Fault finding guide adapted
3-2b	Specification measurements added
3-3b	Block diagram adapted
3-4b	Circuit diagram adapted
3-5b	Drawing of panel adapted
3-6b	Drawing of panel adapted
3-6-1a	Drawing of panel adapted
3-6-2a	Drawing of panel adapted
3-7b	Circuit diagram adapted
3-8a	Circuit diagram adapted
3-9c	Partslist adapted
3-10d	Partslist adapted