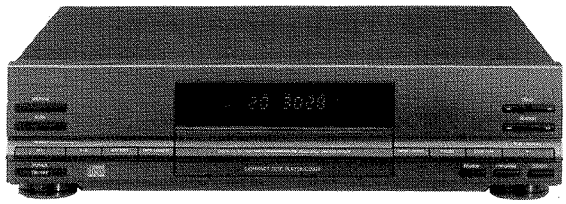
Compact disc player CD340/00B

96106

Service
Service
Service



45 661 A

Service Manual

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Published by Consumer Electronics Printed in The Netherlands

4822 725 24008

PHILIPS

PHILIPS

PCS 60 367

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TECHNICAL SPECIFICATIONS

General

1.Mains voltage	/00B	: 220V (±10%)
2.Mains frequency		: 50 Hz
3.Power consumption mains	in play mode	: 8W
	in stand by	: 4,5W

Line output

1.Number of channels	: 2
2.Output voltage	: 2 Vrms ± 3dB
3.Unbalance left-right	: max. ± 1,2dB at 1 kHz
4.Output resistance	: 1 kΩ
5.Amplitude linearity	: ± 0,5dB from 20 Hz to 20 kHz
6.Phase non-linearity	: max. ± 5° from 20 Hz to 20 kHz
7.Signal to noise ratio	: min. 89dB from 20 Hz to 20 kHz
8.Dynamic range	: min. 70dB from 20 Hz to 20kHz
	: min. 80dB at 1 kHz
9.Total harmonic distortion + noise	: min. 60dB from 20 Hz to 20 kHz
	: min. 70dB at 1 kHz
10.Out-band attenuation	: min. 35dB above 40 kHz
11.Channel separation	: min. 72dB from 20 Hz to 20 kHz
	: min. 85dB at 1kHz
12.Muting during random access	: min. 88dB from 20 Hz to 20 kHz
13.Automatic switched de-emphasis(simple) with time constants 15/50 µs	
14.Level non linearity at -90 dB	: ±3 dB

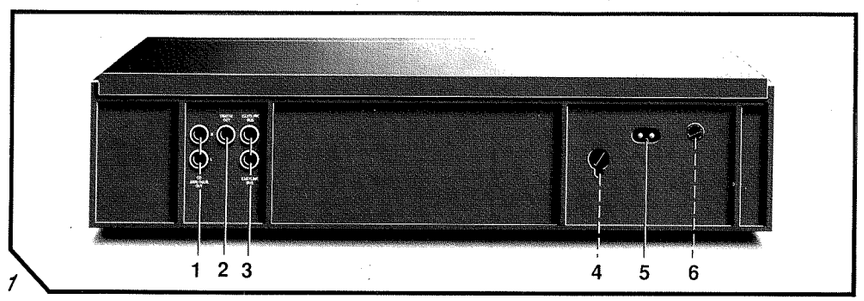
Dimensions and weight

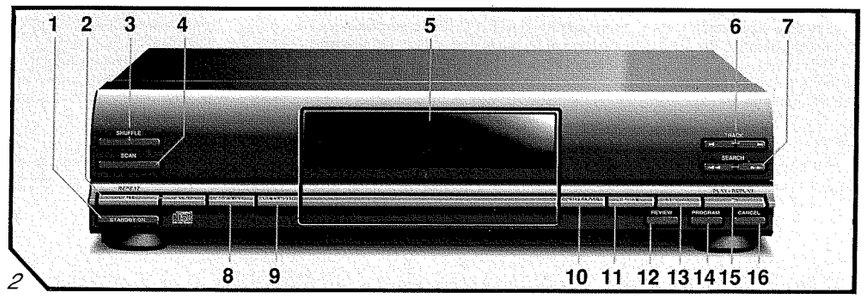
1.Apparatus tray closed	: WxDxH 360 x 300 x 88 mm
2.Apparatus tray open	: WxDxH 360 x 447 x 88 mm
3.Weight	: 2,860 kg

Optical read-out system

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

CONTROLS AND CONNECTIONS





CONTROLS

Indication on App.	Indication in diagram
1. STAND BY/ON	SK-1
2. REPEAT ALL	1986
A-B	1981
3. SHUFFLE	1982
4. SCAN	1984
5. DISPLAY	1989
6. < TRACK >	1972 1970
7. << SEARCH >>	1978 1975
8. ADV EDIT	1983
9. TAPE LENGTH	1985
10. OPEN/CLOSE	1980
11. PAUSE	1977
12. REVIEW	1971
13. STOP/CP	1976
14. PROGRAM	1974
15. PLAY/REPLAY	1979
16. CANCEL	1973

CONNECTIONS

Indication on App.	Indication in diagram
1. CD ANALOGUE OUT	BU-2
2. DIGITAL OUT	BU-2
3. EASY LINK BUS	BU-2
4. Voltage selector (not all versions)	1077
5. Mains socket	BU-1
6. Mains fuse holder (not all versions)	15

ESD

(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.

(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 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.

(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.

(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 ricambiago identici a quelli specificati.

(S) Varning!

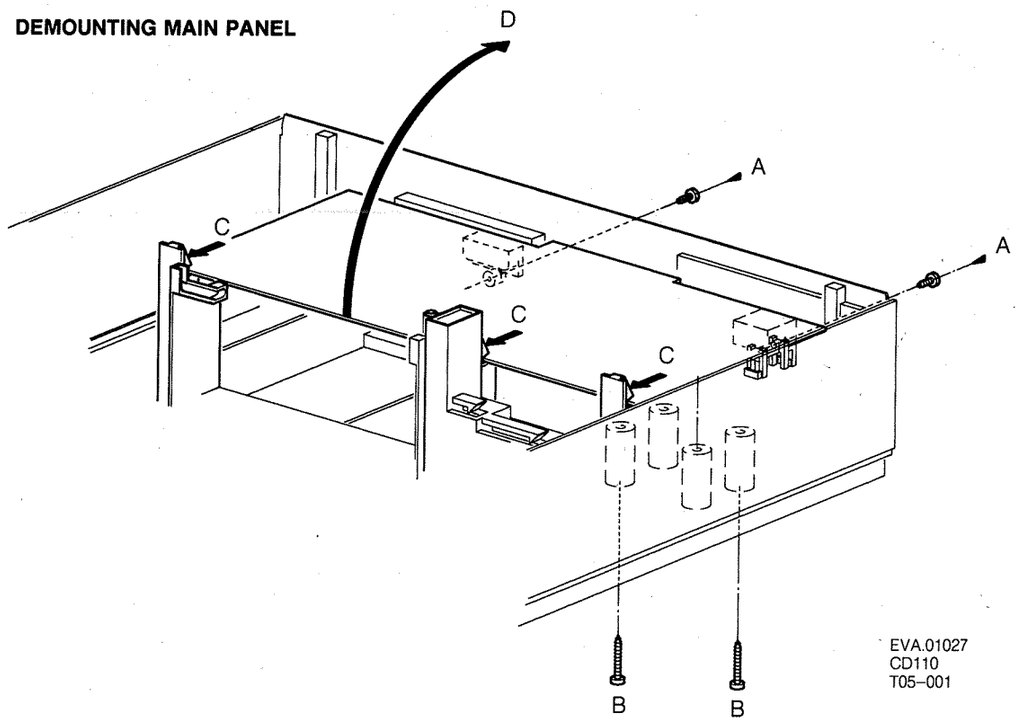
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

(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.

CLASS 1
LASER PRODUCT
3122 110 03420

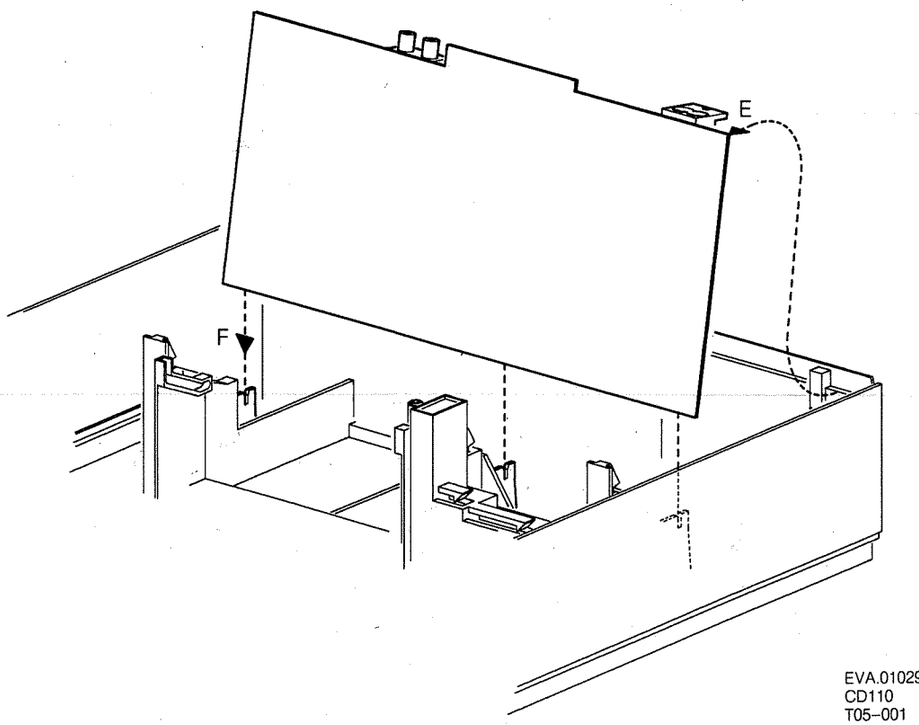
DISMANTLING INSTRUCTIONS

DEMOUNTING MAIN PANEL



EVA.01027
CD110
T05–001

SERVICE POSITION MAIN PANEL



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CD110
T05–001

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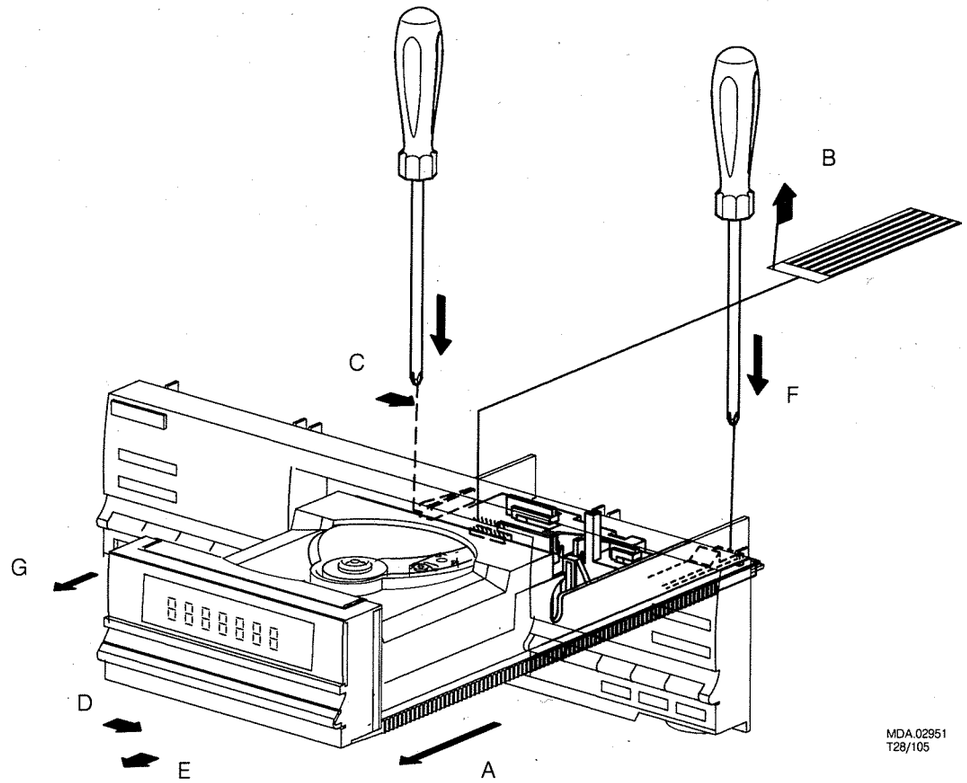
DEMOUNTING LOADING



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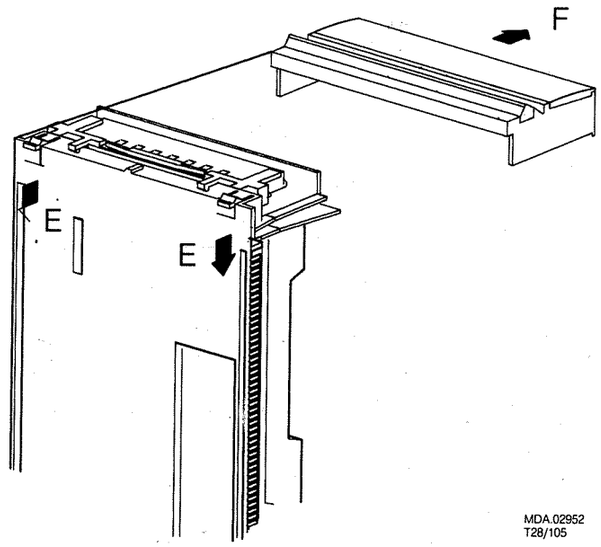
T28/105

HAS.CD320.DEM–TRAY

DEMONTING TRAY FRONT



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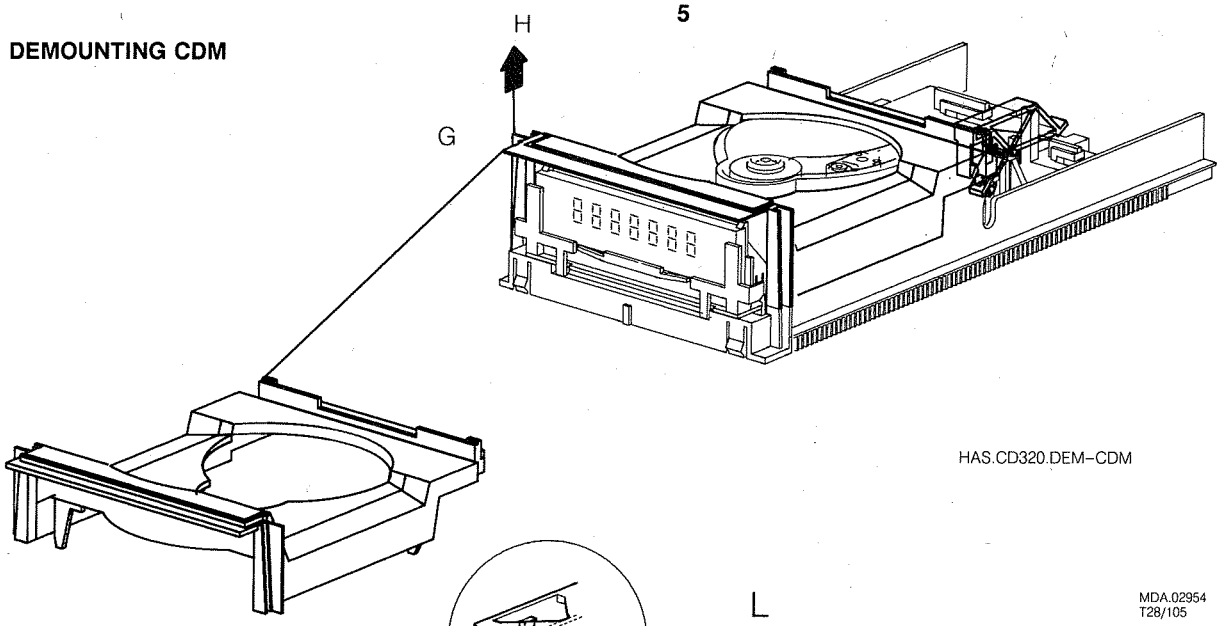
T28/105

HAS.CD320.DEM–TRAYFRONT

DEMOUNTING CDM



HAS.CD320.DEM–CDM

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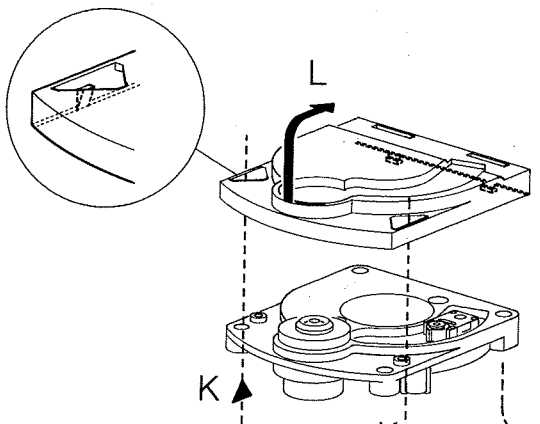
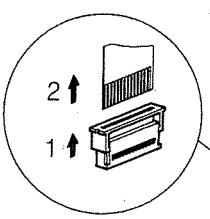
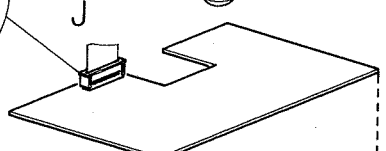
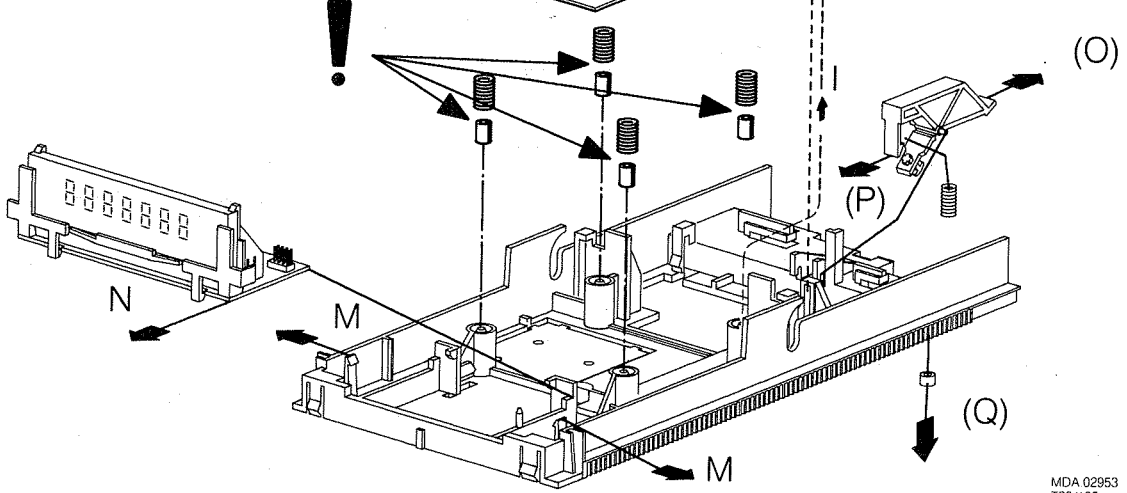
T28/105









MDA.02953
T28/105

HAS.CD320.DEM–FTD

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.

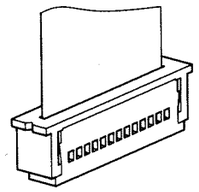
Service disc hold-down

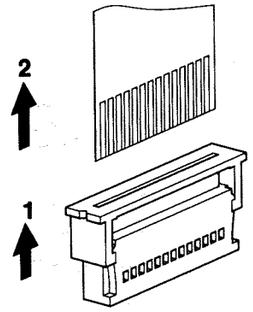
The disc should always rest properly on the turntable. To achieve this a disc hold-down has been mounted in a bracket of the tray mechanism.
If the tray mechanism has to be disassembled for servicing, a separate disc hold-down should be used. For a service disc hold-down see the figure below.
Compose 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.

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 10349





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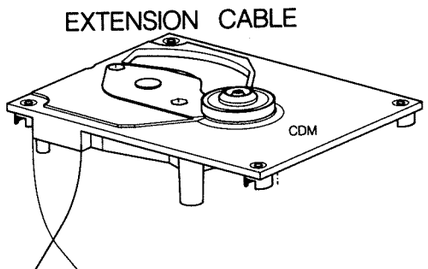
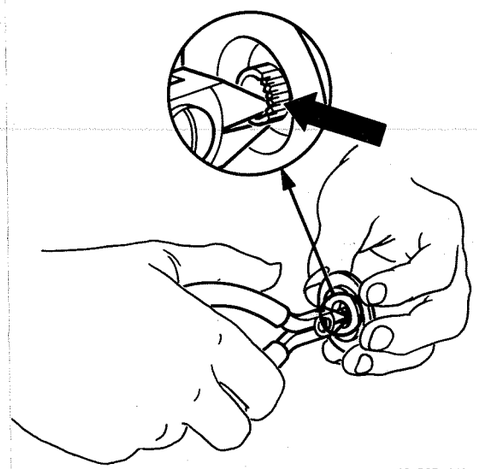
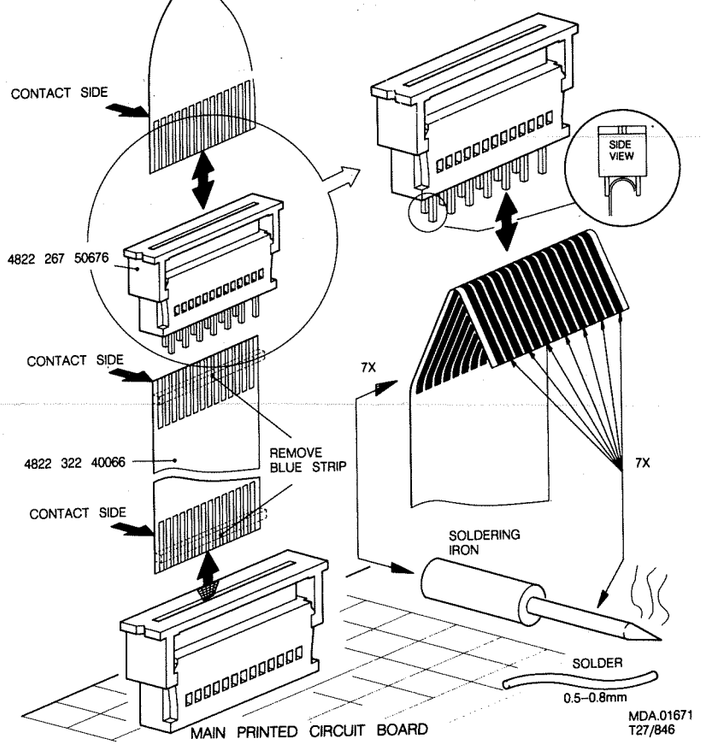
T28/822



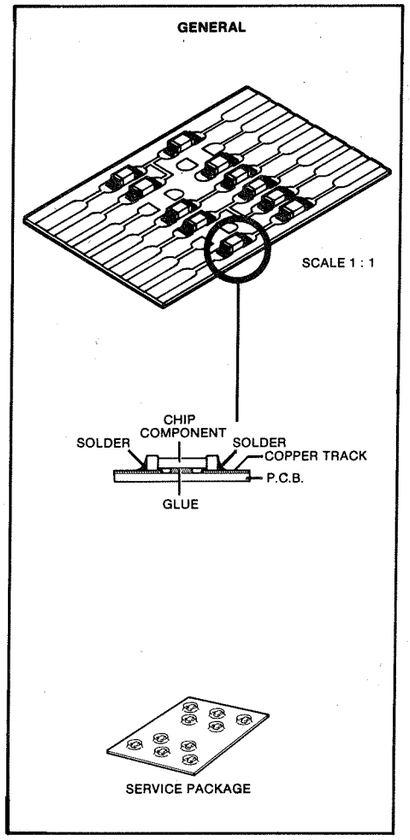


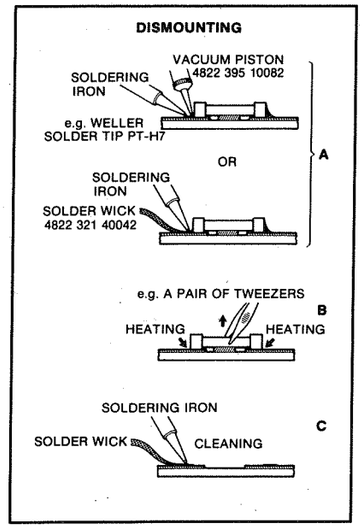
42 565. A12

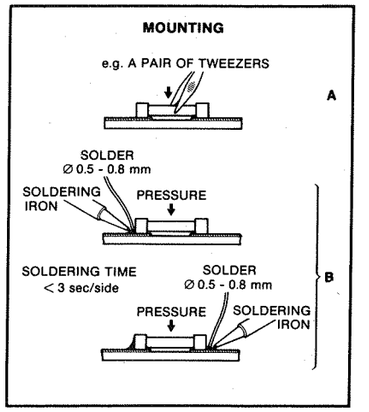


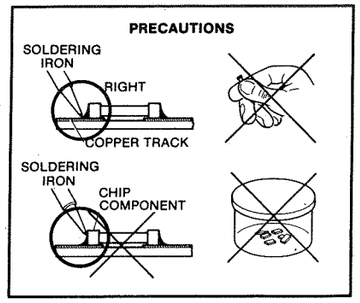
MDA.01671
T27/846

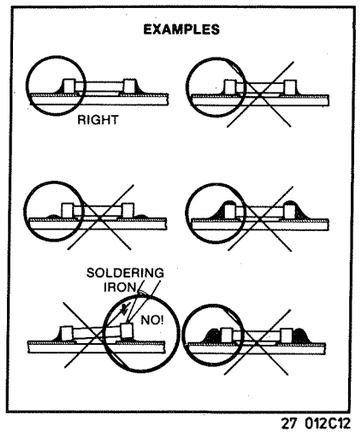
SERVICING HINTS











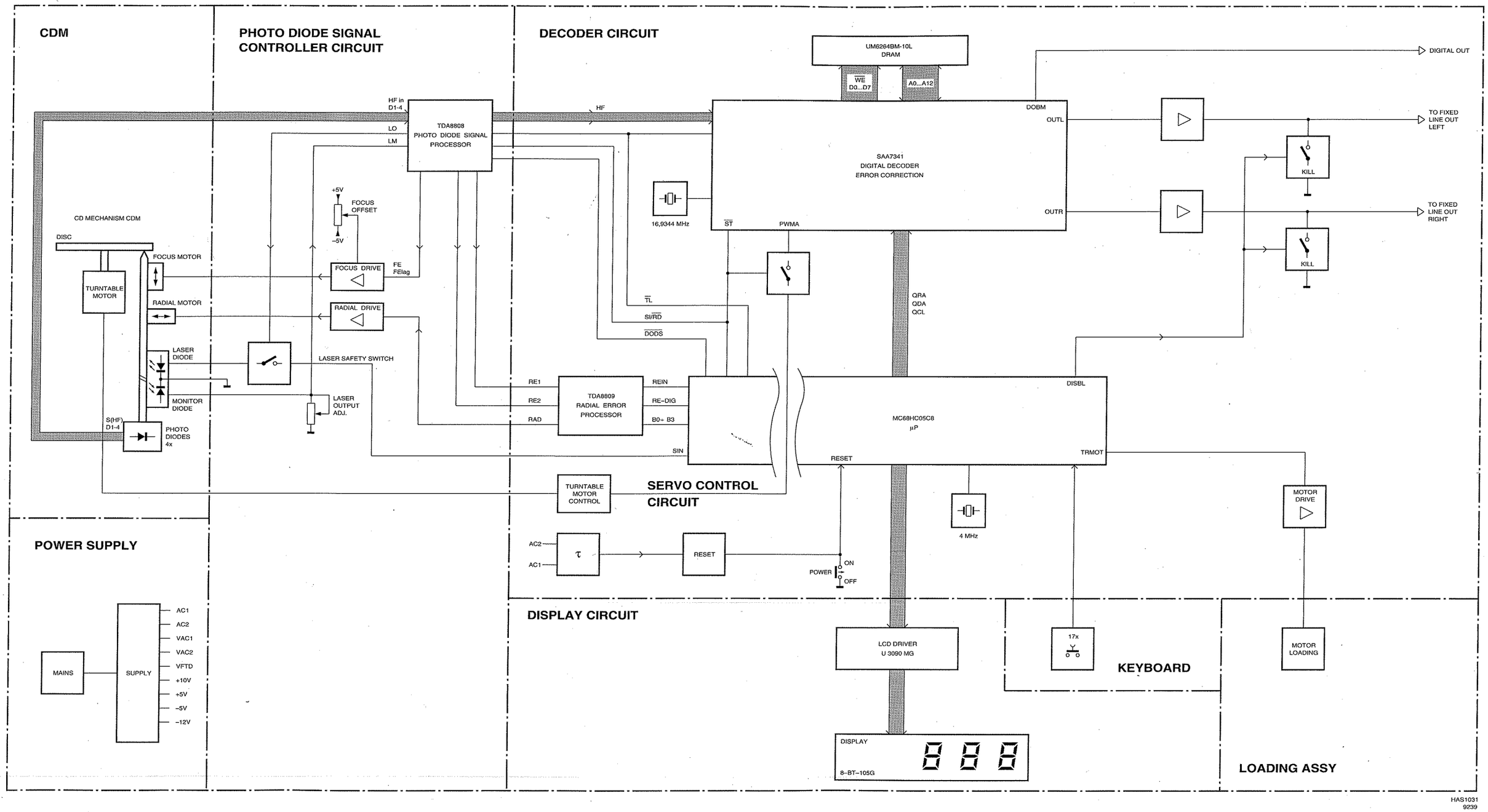
27 012C12

A0-A12 - Address outputs to external RAM
AGC - Automatic Gain Control
AM - Additional mute
B0-B3 - Control bits for radial circuit
BEQ - Equalizer reference current input
CL - Microprocessor interface clock input
Cosc1 - Capacitor wobble oscillator
Cosc2 - Capacitor wobble oscillator
D0-D7 - Data inputs/outputs to external RAM
D1-4 - Photodiode currents
DA - Microprocessor interface data input/putput line
DE1L - Pin 1 for external de-emphasis capacitor and resistor
DE1R - Pin 1 for external de-emphasis capacitor and resistor
DE2L - Pin 2 for external de-emphasis capacitor and resistor
DE2R - Pin 2 for external de-emphasis capacitor and resistor
DEC - Decoupling input internal bypass
DEEM - Output for external de-emphasis switches
DET - HF detector voltage input
DIV4 - Divide by 4 input
DMUTE - Digital mute
DOBM - Digital audio output
DODS - Drop out detector suppression
FE - Focus error signal
FE lag - Focus error signal for LAG network
HF - HF output for DEMOD
HF-in - HF current input to HF amplifier
HF-out - HF amplifier and equalizer voltage output
HFD - High-frequency detector
HFI - Inverting data slicer input
HFI - Non-inverting data slicer input
HM - Motor control signal
IREF - Current reference output

KO - Kill out
KTC - Kill time capacitor connection
LM - Laser monitor diode input
LO - Laser amplifier current output
MACC - Motor accelerate signal
MBRA - Motor brake signal
MHAL - Hall effect detector for motor
NRST - Reset input
OC - VCO control
OUTL - Left channel output
OUTR - Right channel output
PD - Phase detector
PLLH - PLL on hold reset
PWMA - Pulse width modulated motor control acceleration
PWMB - Pulse width modulated motor control brake signal
QCL - Q-channel clock signal
QRA - Q-channel request aknowledge
R/A - Request/acknowledge
RADout - Output of RE2-RE1 input
RE - Radial error signal (Amplified RE2-
RE dig - Radial error digital
RE lag - Radial error signal for LAG network
RE1 - Radial error signal 1
RE2 - Radial error signal 2
Rosc - Resistor wobble oscillator
RST - Device reset
Rwob - Wobble generator input
Sc - Starting up capacitor input
Si/RD - On/off control for laser supply and focus
ST - Standby mode
TL - Track loss output signal
WE - Write enable
XIN - Oscillator signal input
XOUT - Oscillator output

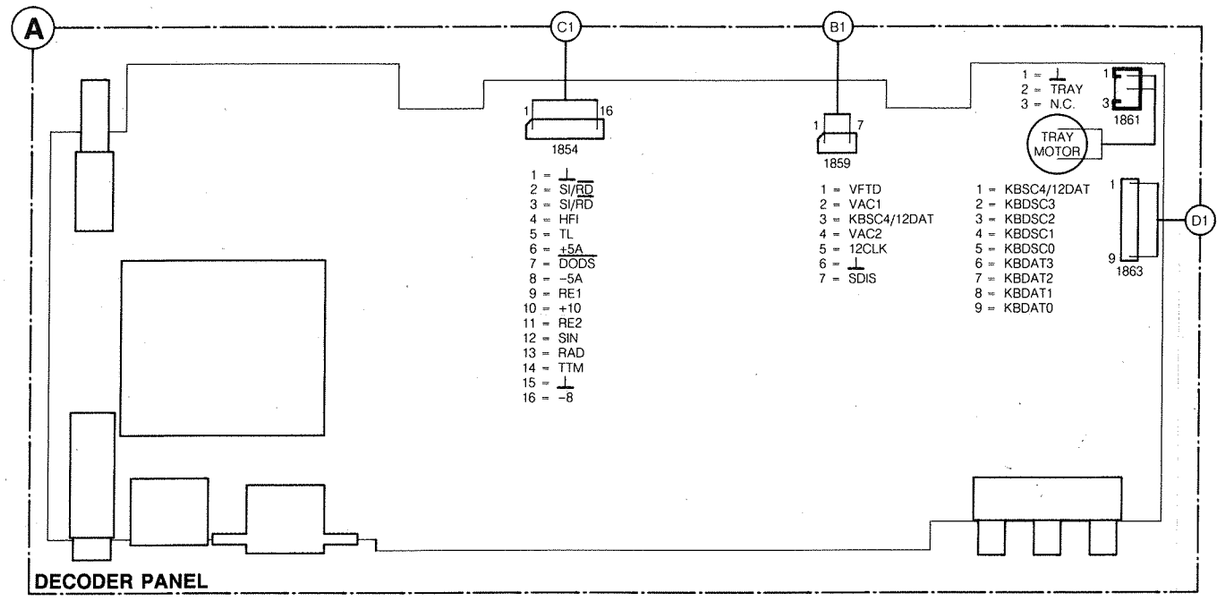
8

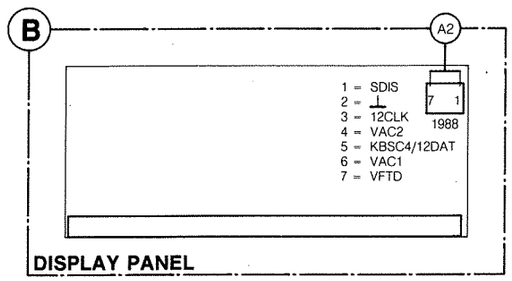
BLOCK DIAGRAM

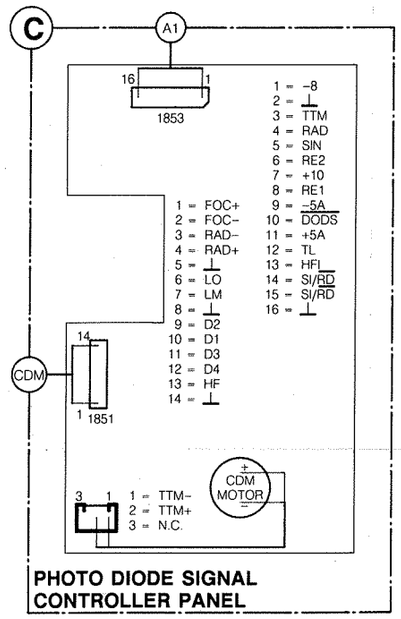


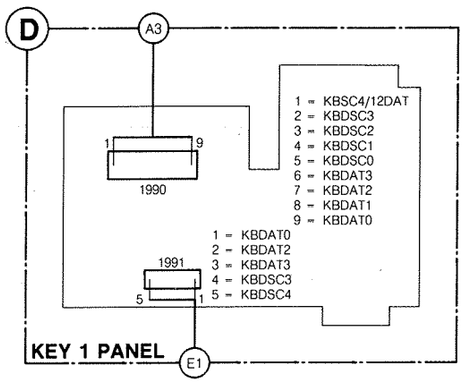
HAS1031
9239

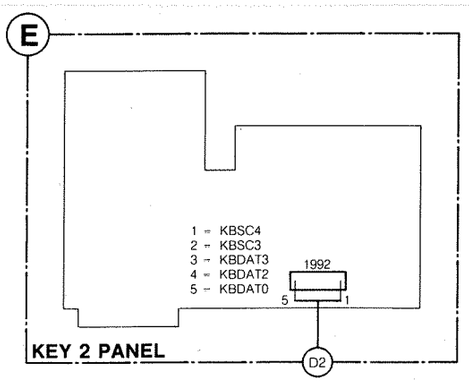
WIRING DIAGRAM









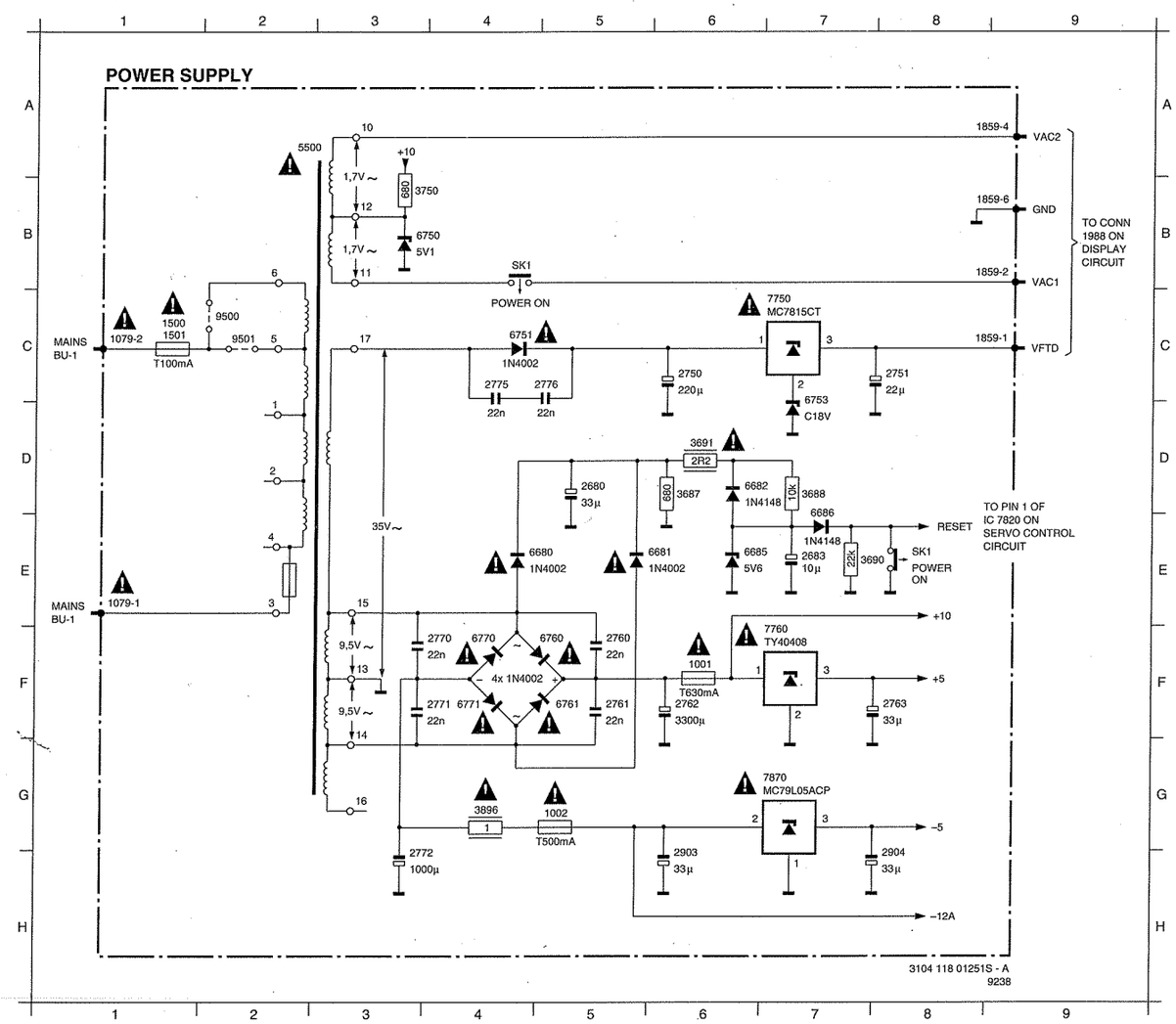


MDA.02944
T28/103

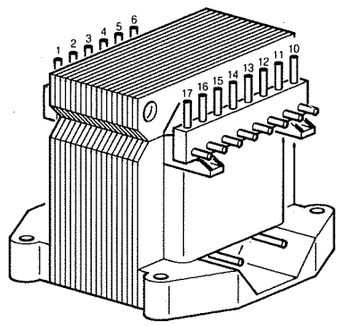
PCS 60 374

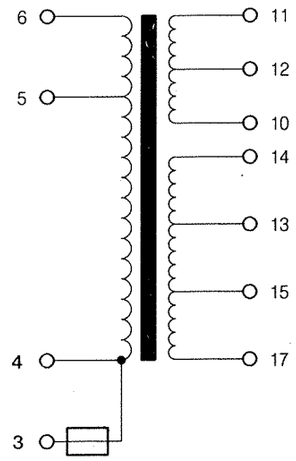
POWER SUPPLY

1001	F6	2680	D5	2760	F5	2770	F4	2776	C4	3688	D7	3896	G4	6682	D6	6751	C4	6770	F4	7870	G7	SK1	B4
1002	G5	2683	E7	2761	F5	2771	F4	2903	H6	3690	E7	5500	A2	6685	E6	6753	D7	6771	F4	9500	C2		
1500	C1	2750	C6	2762	F6	2772	H3	2904	H8	3691	D6	6680	E4	6686	E7	6760	F5	7750	C7	9501	C2		
1501	C1	2751	C8	2763	F8	2775	C4	3687	D6	3750	B3	6681	E5	6750	B3	6761	F5	7760	F7	SK1	E8		



TRANSFORMER CONNECTIONS





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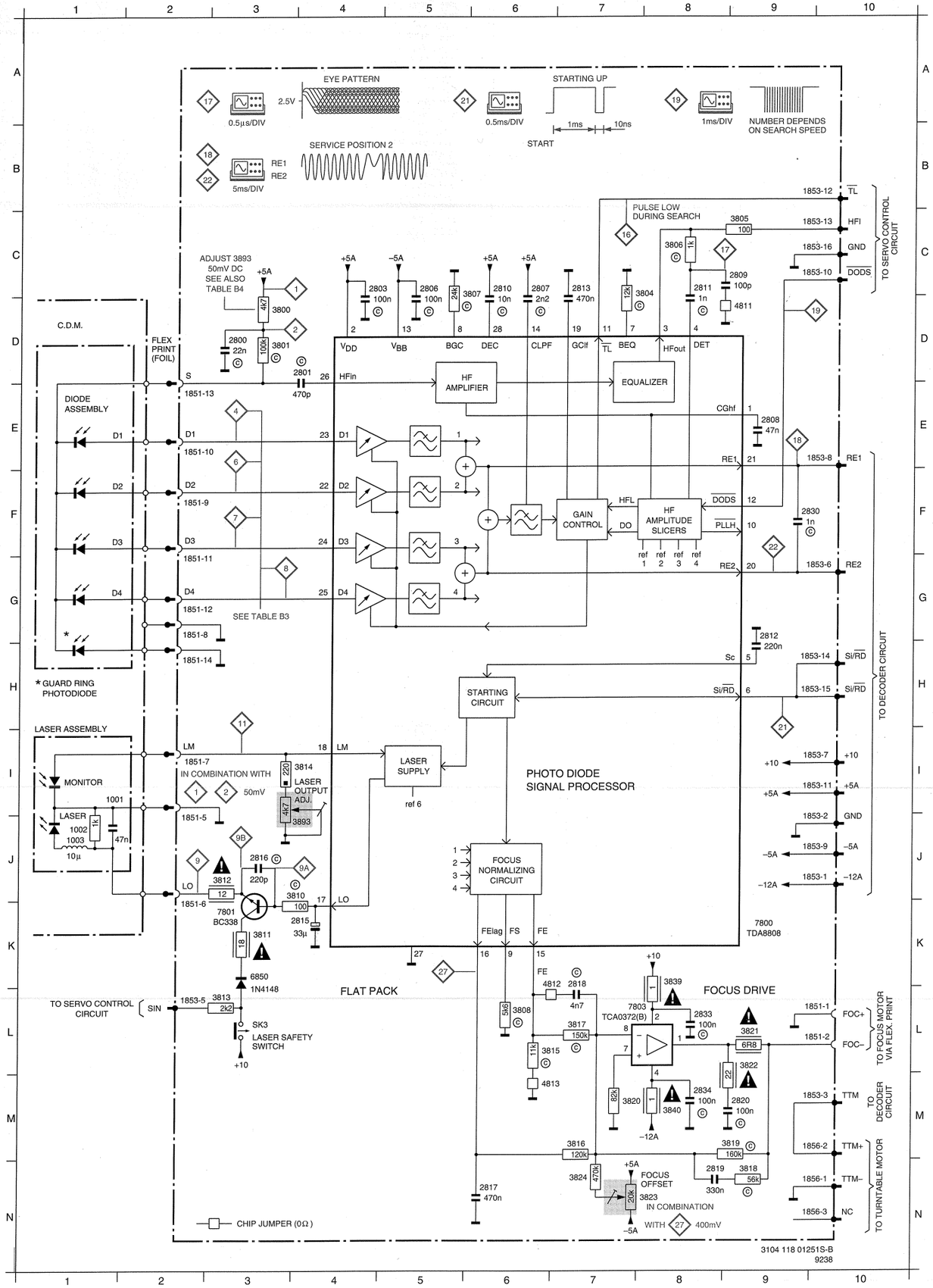
T07–9012

PHOTO DIODE SIGNAL CONTROLLER

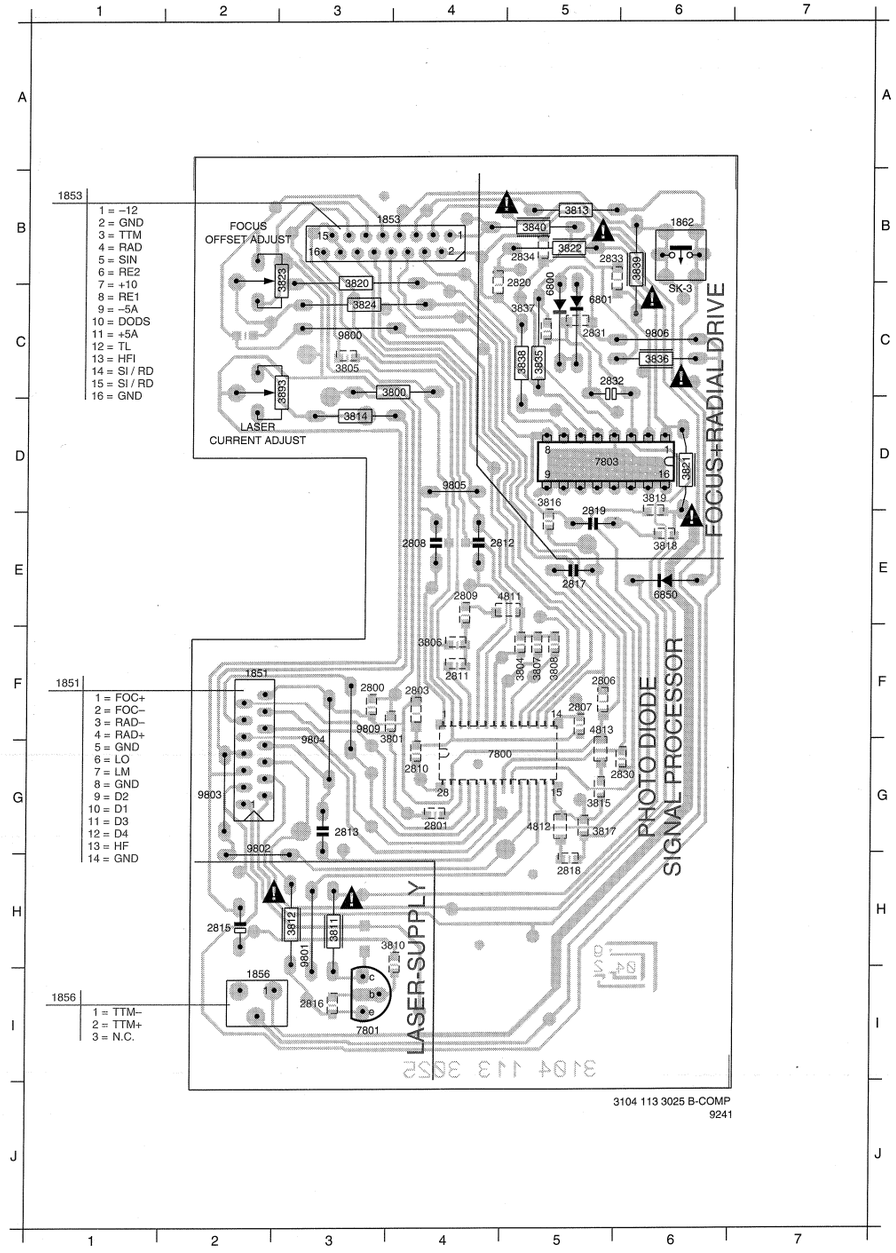
1001	I1	2801	D3	2808	E9	2812	G9	2817	N6	2830	F9	3801	D3	3807	D5	3812	J3	3816	M7	3820	M7
1002	J1	2803	C4	2809	C9	2813	C7	2818	K7	2833	L8	3804	D7	3808	L6	3813	L3	3817	L7	3821	L9
1003	J1	2806	C5	2810	C6	2815	K3	2819	N8	2834	M8	3805	C9	3810	J3	3814	I4	3818	N9	3822	L9
2800	D3	2807	C6	2811	C8	2816	J3	2820	M9	3800	D3	3806	C8	3811	K3	3815	L6	3819	M8	3823	N8

3824	N7	3839	K8	4811	D9	7800	K9														
3835	K8	4812	K6	7801	K3																
3893	J3	6850	K3	SK3	L3																



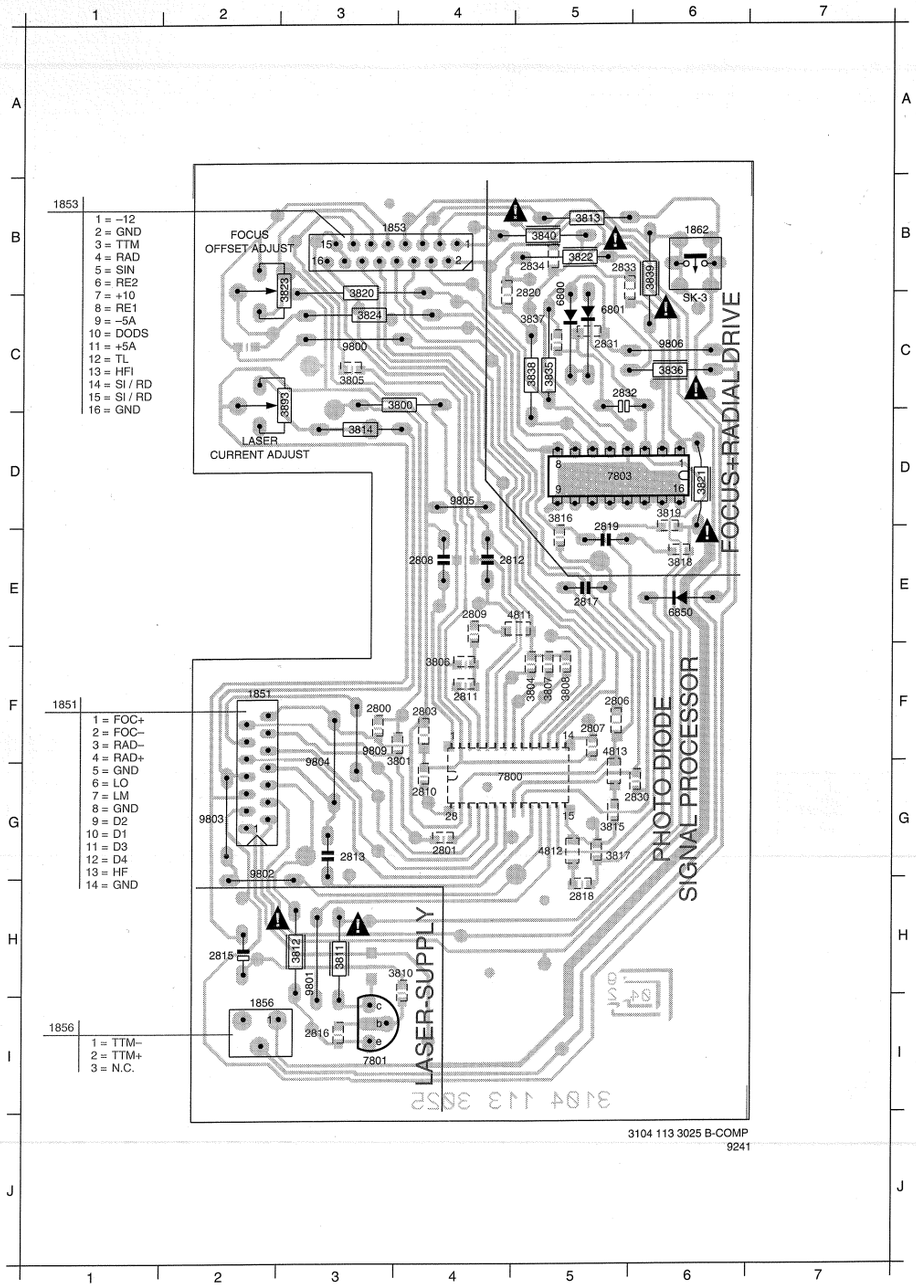
COMPONENT SIDE

1851	F2	2807	F5	2816	I3	2833	B5	3808	F5	3817	G5	3835	C5	4812	G5	9800	C3				
1853	B3	2808	E4	2817	E5	2834	B5	3810	H3	3818	E6	3836	C6	4813	F5	9801	H3				
1856	I2	2809	E4	2818	H5	3800	C3	3811	H3	3819	D6	3837	C5	6800	C5	9802	G2				
1862	B6	2810	G4	2819	E5	3801	G3	3812	H3	3820	C3	3838	C5	6801	C5	9803	G2				
2800	F3	2811	F4	2820	C5	3804	F5	3813	B5	3821	D6	3839	B6	6850	E6	9804	G3				
2801	G4	2812	E4	2830	G5	3805	C3	3814	D3	3822	B5	3840	B5	7800	G4	9805	D4				
2803	F4	2813	G3	2831	C5	3806	F4	3815	G5	3823	C3	3893	D3	7801	I3	9806	C6				
2806	F5	2815	H2	2832	C5	3807	F5	3816	D5	3824	C3	4811	E4	7803	D5	9809	F3				



COMPONENT SIDE

1851	F2	2807	F5	2816	I3	2833	B5	3808	F5	3817	G5	3835	C5	4812	G5	9800	C3
1853	B3	2808	E4	2817	E5	2834	B5	3810	H3	3818	E6	3836	C6	4813	F5	9801	H3
1856	I2	2809	E4	2818	H5	3800	C3	3811	H3	3819	D6	3837	C5	6800	C5	9802	G2
1862	B6	2810	G4	2819	E5	3801	G3	3812	H3	3820	C3	3838	C5	6801	C5	9803	G2
2800	F3	2811	F4	2820	C5	3804	F5	3813	B5	3821	D6	3839	B6	6850	E6	9804	G3
2801	G4	2812	E4	2830	G5	3805	C3	3814	D3	3822	B5	3840	B5	7800	G4	9805	D4
2803	F4	2813	G3	2831	C5	3806	F4	3815	G5	3823	C3	3893	D3	7801	I3	9806	C6
2806	F5	2815	H2	2832	C5	3807	F5	3816	D5	3824	C3	4811	E4	7803	D5	9809	F3



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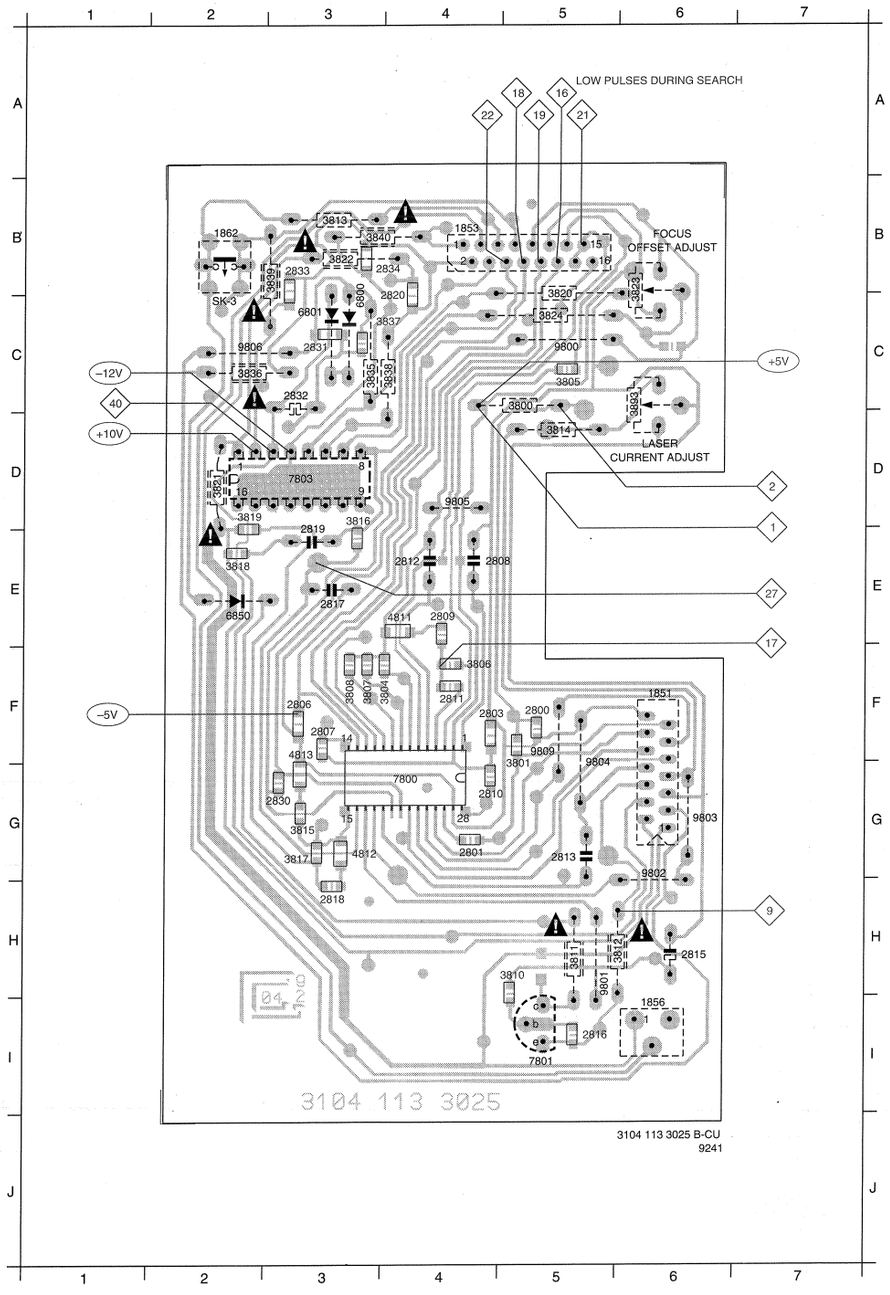
SOLDER SIDE

1851	F6	2807	F3	2816	I5	2833	B3	3808	F3	3817	G3	3835	C3	4812	G3	9800	C5
1853	B4	2808	E4	2817	E3	2834	B3	3810	H5	3818	E2	3836	C2	4813	F3	9801	H5
1856	I6	2809	E4	2818	H3	3800	C5	3811	H5	3819	D2	3837	C3	6800	C3	9802	G6
1862	B2	2810	G4	2819	E3	3801	G5	3812	H6	3820	C5	3838	C4	6801	C3	9803	G6
2800	F5	2811	F4	2820	C3	3804	F4	3813	B3	3821	D2	3839	B3	6850	E2	9804	G5
2801	G4	2812	E4	2830	G3	3805	C5	3814	D5	3822	B3	3840	B3	7800	G4	9805	D4
2803	F4	2813	G5	2831	C3	3806	F4	3815	G3	3823	C6	3893	D6	7801	I5	9806	C2
2806	F3	2815	H6	2832	C3	3807	F3	3816	D3	3824	C5	4811	E4	7803	D3	9809	F5



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SERVO CIRCUIT DIAGRAM

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TO R3847 ON DECODER CIRCUIT — X

OF IC7805 ON DECODER CIRCUIT — TO PIN 70 TO R3918 — E; TO PIN 28 — PWMA; TO PIN 25 — QCL; TO PIN 24 — QDA; TO PIN 23 — QRA

FROM POWER SUPPLY CIRCUIT — RESET

7820 MC68HC05C8

CPU

I/O PORTS

TIMING

XTAL1, XTAL2, V_{DD}, RESET, IRQ, TCAP

4MHz, 1802, 3902 220k, 2901 22n, 2900 33µ, 2911 100p

3963 10k, 3960 10k, 3961 10k, 4819, 3917

3925 10k, 7823 BC848, 3924 2k2, 3908 10k, 3894 100, 7822 BC858, 3922, 3921 4k7, 3923 10k

6891 1N4148

1866-1 RC5, 1866-7 RC5, 1866-2 GND, 1866-8 GND — BU-2; 3895 10

TO PIN 80 OF IC 7805 — ON DECODER CIRCUIT

LOW PULSES DURING SEARCH

1854-3 SI/$\overline{RD}$, 1854-5 $\overline{TL}$, 1854-7 DODS, 1854-2 SI/$\overline{RD}$, 1854-12 SIN — TO CONN. 1853 ON PHOTO DIODE SIGNAL CONTROLLER CIRCUIT

TRAY MOTOR DRIVE

7840 (1/2) LM393N; 6840 1N4002; 6842 1N4148; 6843 4V7; 6841 1N4002; 7825 (1/2) TCA0372

−5V WHEN TRAY IS OPENING
+5V WHEN TRAY IS CLOSING
0V REST POS.

1861-2 TRAY, 1861-1 N.C. — TO TRAY MOTOR

I/O PORTS

DISBL — TO DECODER CIRCUIT

1859-7 SDIS, 1859-5 12CLK, 1859-3 KBSC4 12DAT — TO CONN. 1988 ON DISPLAY CIRCUIT

1863-6 KBDAT3, 1863-7 KBDAT2, 1863-8 KBDAT1, 1863-9 KBDAT0, 1863-1 KBSC4 12DAT, 1863-2 KBSC3, 1863-3 KBSC2, 1863-4 KBSC1, 1863-5 KBSC0, 1859-10, 1859-11 — TO KEY-BOARD

7802 TDA8809

B0 B1 B2 B3; R DAC; Cag c; Rosc; Rwob; CosC1; CosC2; V_{EXT+}; V_{EXT-}; LAG; V_{DD}

FUNCTION DECODER — RADIAL, LAG SHORT

3½-BIT DAC

WOBBLE OSCILLATOR 640Hz — 0°, 45°, 90°

RAD OUT 15

U/I

RADIAL

LAG HOLD

LAG SHORT

RE IN 16

RE LAG 17

RE LEAD 19

Vref

GAIN INTEGRATING AMPLIFIER

OFFSET INTEGRATING AMPLIFIER

DIV4, REdig

re1/2, re1, re2/2, re2

Re1+Re2

RADIAL ERROR PROCESSOR

GND, OFFSET, IN, OUT, Clpf, Chpf

TO CONN. 1853 ON PHOTO DIODE SIGNAL CONTROLLER CIRCUIT — +5A, −5A, RE1, +10, RE2, GND, −12A

RADIAL DRIVE

7803-(1/2)B TCA0372(A)

1854-13 RAD — 1853-4

1851-4 RAD+, 1851-3 RAD− — TO RADIAL MOTOR VIA FLEX PRINT

THESE COMPONENTS CAN BE FOUND ON THE PHOTO DIODE SIGNAL CONTROLLER PANEL.

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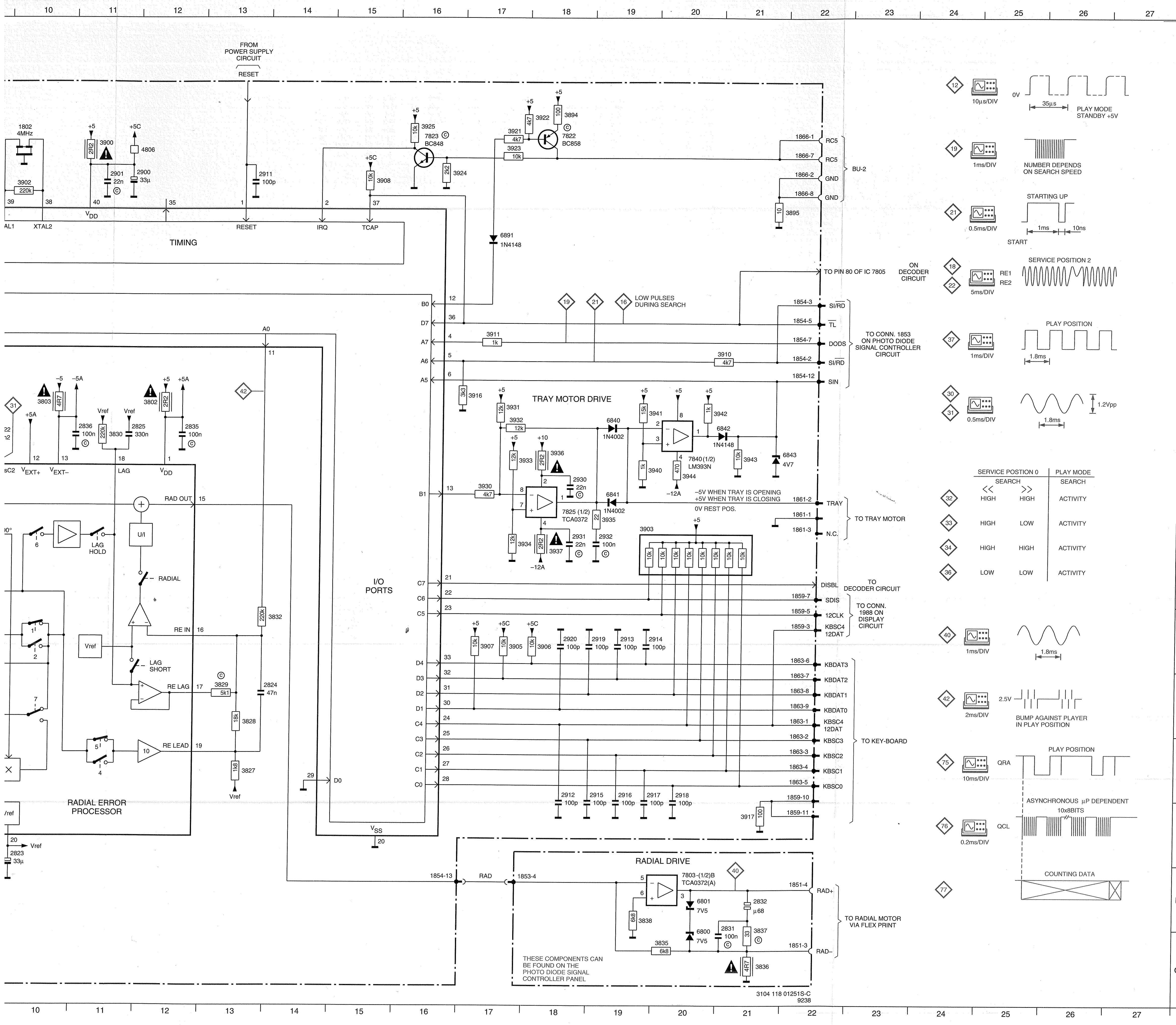

1802	B10
2821	G9
2822	G9
2823	M10
2824	K13
2825	G11
2826	M8
2827	M8
2828	M7
2829	G7
2831	N21
2832	N21
2835	G12
2836	G11
2900	C11
2901	C11
2911	C13
2912	L18
2913	J19
2914	J19
2915	L19
2916	L19
2917	L19
2918	L20
2919	J19
2920	J18
2930	H18
2931	H18
2932	H19
3802	F12
3803	F10
3809	J3
3825	G8
3826	G8
3827	L13
3828	K13
3829	K13
3830	G11
3831	G6
3832	J14
3833	J4
3835	O20
3836	O21
3837	O21
3838	N19
3894	B18
3895	C21
3900	B11
3902	C10
3903	H19
3905	J17
3906	J18
3907	J17
3908	C15
3910	F20
3911	E17
3916	F17
3917	M21
3917	C4
3921	B17
3922	B18
3923	B17
3924	C16
3925	B16
3930	H17
3931	F17
3932	G17
3933	G17
3934	I17
3935	H19
3936	G18
3937	I18
3938	F4
3940	G19
3941	G19
3942	G20
3943	G21
3944	H20
3960	B6
3961	B6
3963	B6
4806	B11
4819	B4
6800	O20
6801	N20
6840	G19
6841	H19
6842	G20
6843	G21
6891	D17
7802	G4
7803	N20
7820	C7
7822	B18
7823	B16
7825	H18
7840	G20

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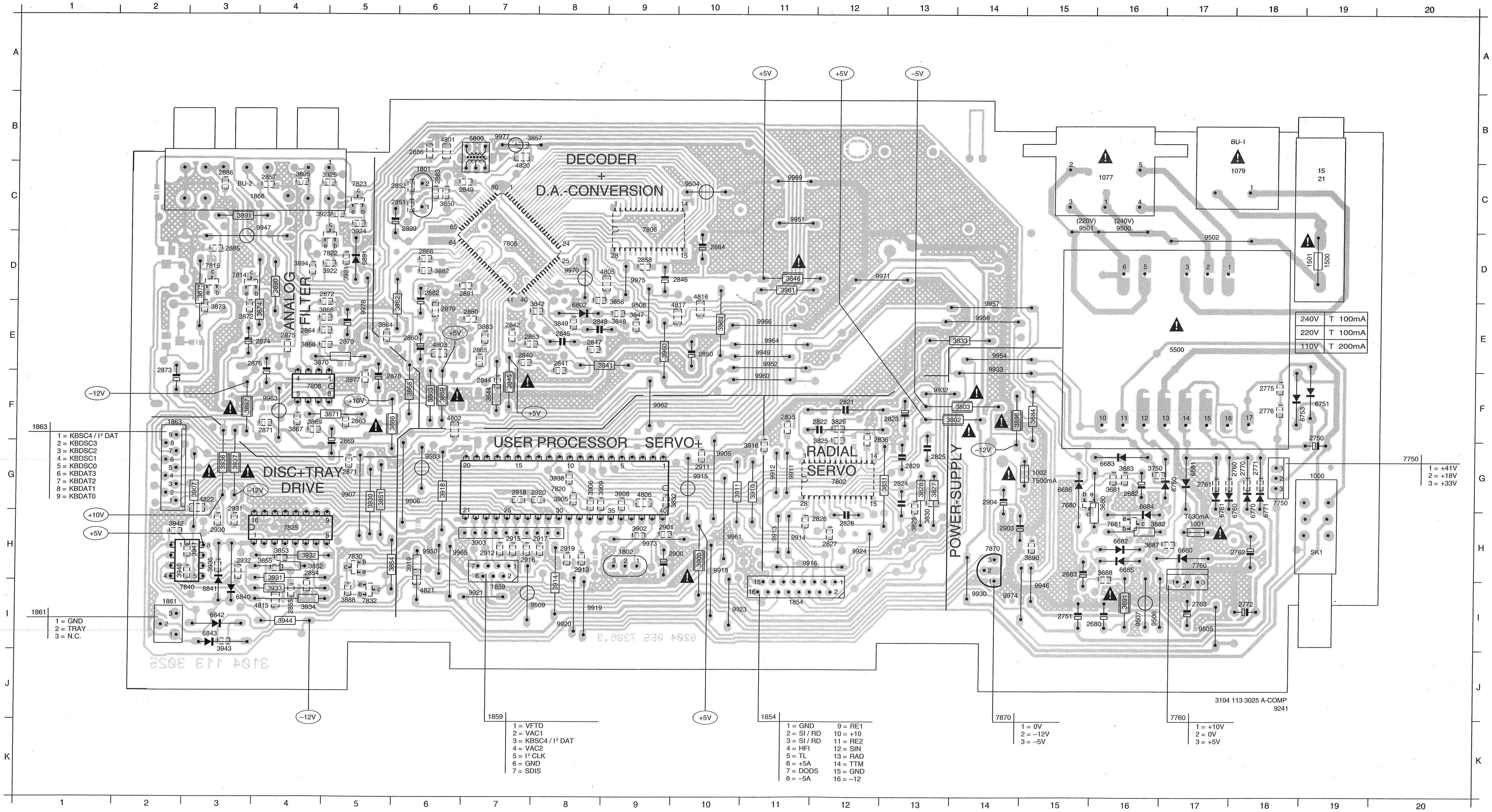
SERVO & DECODER PANEL COMPONENT SIDE

15	C19	1854	I11	2761	G17	2824	G13	2844	F7	2855	I4	2871	G5
21	C19	1859	I7	2762	H17	2825	G13	2845	E8	2856	B6	2871	F4
1000	G19	1861	I2	2763	I17	2826	H12	2846	D9	2857	C4	2872	D4
1001	H17	1863	F2	2770	G18	2827	H12	2847	E8	2858	D9	2873	F2
1002	G15	1866	C3	2771	G18	2828	H12	2848	E8	2860	E6	2874	E3
1077	C16	2680	I15	2772	I18	2829	G13	2849	C6	2863	F5	2875	E4
1079	C17	2682	G16	2775	F18	2835	F11	2850	E10	2864	E4	2876	E3
1500	D19	2683	H15	2776	F18	2836	F12	2851	C5	2865	E7	2877	F5
1501	D19	2750	F19	2821	F12	2840	E7	2852	C5	2866	D6	2878	F5
1801	C6	2751	I15	2822	F11	2841	E8	2853	E7	2869	G5	2879	E6
1802	H9	2760	G18	2823	F13	2842	E7	2854	H4	2870	E5	2880	E6

2881	D6	2911	G10	2932	H3	3802	F13	3841	E8	3853	H4	3867	F4
2882	D6	2912	H7	3680	G16	3803	F14	3842	E7	3854	H6	3868	E4
2883	C6	2913	H8	3681	G16	3825	G12	3844	F7	3855	H4	3869	F4
2884	D10	2915	H7	3682	H16	3826	F12	3845	F7	3856	E9	3870	E4
2885	D3	2916	H7	3683	G16	3827	G13	3846	D11	3857	B7	3871	F4
2886	C3	2917	H8	3684	F15	3828	G13	3847	E9	3859	F6	3872	E3
2899	C6	2918	G7	3687	H16	3829	H13	3848	E9	3862	E6	3873	E3
2900	H9	2919	H8	3688	H16	3830	H13	3849	E8	3863	F6	3874	E4
2901	H9	2920	G7	3690	H15	3831	G13	3850	C6	3864	E5	3875	D3
2903	H14	2930	H3	3691	I16	3832	G10	3851	G5	3865	F6	3882	D6
2904	G14	2931	H3	3750	G16	3833	E13	3852	H4	3866	E4	3883	E7

3886	F5	3905	G8	3921	D5	3936	G3	4801	B6	5500	E17	6753	F19
3887	F3	3906	G8	3922	D4	3937	G3	4802	F6	5800	B7	6760	H18
3888	I5	3907	G3	3923	C4	3938	G8	4803	E6	6680	H17	6761	H17
3890	D4	3908	G9	3924	D5	3940	H2	4805	D8	6681	G17	6770	H18
3891	C3	3909	G8	3925	C4	3941	H3	4806	G9	6682	H16	6771	H18
3894	D4	3910	G11	3930	G5	3942	H2	4815	I4	6683	G16	6802	E8
3895	C4	3911	G10	3931	I4	3943	J3	4816	D10	6684	G16	6840	I3
3896	F14	3914	I8	3932	H4	3944	I4	4817	E9	6685	H16	6841	I3
3900	H10	3916	G11	3933	I4	3960	E9	4820	C7	6686	G15	6842	I3
3902	H9	3918	G6	3934	I4	3961	D11	4821	I6	6750	G17	6843	I3
3903	H7	3919	H6	3935	H3	3963	E10	4822	G3	6751	F19	6891	D5

7680	G15	7822	D4	9504	C10	9913	H11	9932	F13	9960	F11	9974	I14
7681	H16	7823	C5	9505	I17	9914	H11	9933	E14	9961	H10	9975	D9
7750	G18	7825	H4	9506	I16	9915	G10	9946	I15	9962	F9	9977	B7
7760	H17	7830	H5	9507	I16	9916	H11	9947	C3	9963	F4	9978	E5
7802	G12	7832	I5	9508	E9	9918	H10	9949	E11	9964	E11		
7805	D7	7840	I2	9509	I7	9919	I8	9950	H6	9965	H6		
7806	C9	7870	H14	9905	G10	9920	I8	9951	C11	9966	E11		
7808	F4	9500	C16	9906	G6	9921	I7	9952	E11	9969	C11		
7814	D3	9501	C15	9907	G5	9923	I10	9954	E14	9970	D8		
7815	D3	9502	D17	9911	G11	9924	H12	9956	E14	9971	D12		
7820	G8	9503	G6	9912	G11	9930	I14	9957	E14	9973	H9		



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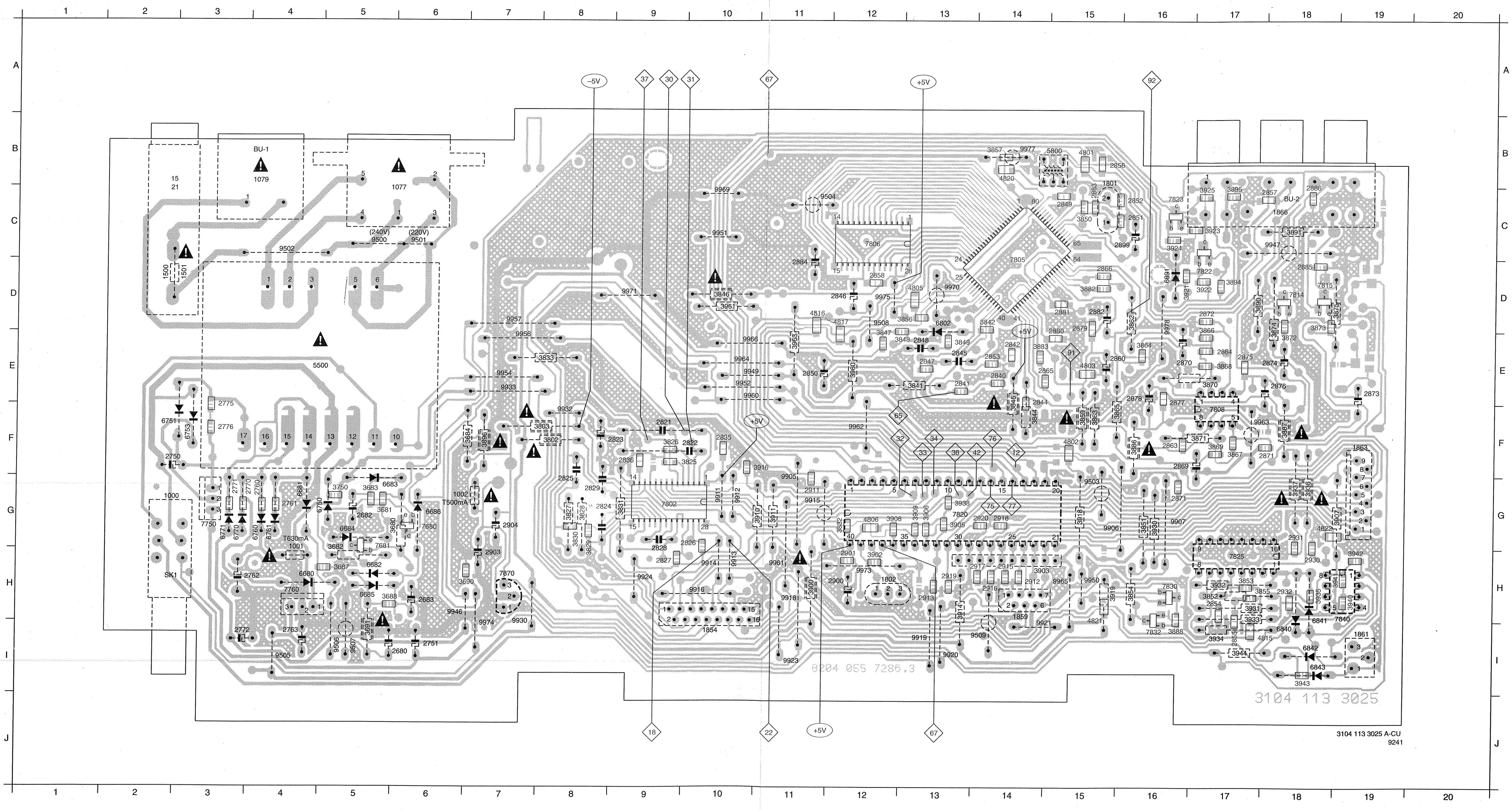
SERVO & DECODER PANEL SOLDER SIDE

15	B2	1854	I10	2761	G4	2824	G8	2844	E14	2855	I17	2871	G16	2881	D15	2911	G11	2932	H18	3802	F8	3841	E13	3853	H17	3867	F17	3886	F16	3905	G13	3921	D16	3936	G18	4801	B15	5500	E4	6753	F3	7680	G6	7822	D17	9504	C11	9913	H10	9932	F8	9960	E10	9974	I7
21	C2	1859	H14	2762	H3	2825	G8	2845	E13	2856	B15	2871	F17	2882	D15	2912	H14	3680	G6	3803	F7	3842	D14	3854	H16	3868	E17	3887	F18	3906	G13	3922	D17	3937	G18	4802	F15	5800	B14	6760	G4	7681	H5	7823	C16	9505	I4	9914	H10	9933	E7	9961	H11	9975	D12
1000	G2	1861	I19	2763	I4	2826	G9	2846	D12	2857	C17	2872	D17	2883	C15	2913	H13	3681	G5	3825	F9	3844	F14	3855	H17	3869	F17	3888	I16	3907	G19	3923	C17	3938	G13	4803	E15	6680	H4	6761	G4	7750	G3	7825	H17	9506	I5	9915	G11	9946	H6	9962	F12	9977	B14
1001	H4	1863	F19	2770	G4	2827	H9	2847	E13	2858	D12	2873	E19	2884	D11	2915	H14	3682	H5	3826	F9	3845	F14	3856	D12	3870	E17	3890	D17	3908	G12	3924	C16	3940	H19	4805	D13	6681	G4	6770	G3	7760	H4	7830	H16	9507	I5	9916	H10	9947	C17	9963	F17	9978	E16
1002	G6	1866	C18	2771	G3	2828	H9	2848	E13	2860	E15	2874	E17	2885	D18	2916	H14	3683	G5	3827	G8	3846	D10	3857	B14	3871	F16	3891	C18	3909	G13	3925	C17	3941	H19	4806	G12	6682	H5	6771	G3	7802	G9	7832	I16	9508	D12	9918	H11	9949	E10	9964	E10		
1077	C5	2680	I6	2772	I3	2829	G8	2849	C15	2863	F16	2875	E17	2886	C18	2917	H13	3684	F7	3828	G8	3847	E12	3859	F15	3872	E18	3894	D17	3910	G11	3930	G16	3942	H19	4815	I17	6683	G5	6802	D13	7805	D14	7840	H19	9509	I13	9919	I13	9950	H15	9965	H15		
1079	B4	2682	G5	2775	F3	2835	F10	2850	E11	2864	E17	2876	E18	2899	C15	2918	G14	3687	H5	3829	H8	3848	E12	3862	D16	3873	D18	3895	C17	3911	G11	3931	H17	3943	I18	4816	D11	6684	G5	6840	I18	7806	C12	7870	H7	9905	G11	9920	I13	9951	C10	9966	E10		
1500	D2	2683	H6	2776	F3	2836	F9	2851	C16	2865	E14	2877	E16	2900	H12	2919	H13	3688	H5	3830	G8	3849	E13	3863	F15	3874	E18	3896	F7	3914	H13	3932	H17	3944	I17	4817	D12	6685	H5	6841	H18	7808	F17	9500	C5	9906	G15	9921	I14	9952	E10	9969	C10		
1501	D3	2750	F2	2821	F9	2840	E14	2852	C16	2866	D15	2878	E16	2901	H12	2920	G14	3690	H6	3831	G9	3850	C15	3864	E16	3875	D19	3900	H11	3916	F10	3933	H17	3960	E12	4820	B14	6686	G6	6842	I18	7814	D18	9501	C6	9907	G16	9923	I11	9954	E7	9970	D13		
1801	B15	2751	I6	2822	F9	2841	E13	2853	E14	2869	F16	2879	D15	2903	H7	2930	H18	3691	I5	3832	G12	3851	G16	3865	F15	3882	D15	3902	H12	3918	G15	3934	I17	3961	D10	4821	I15	6750	G5	6843	I18	7815	D18	9502	C4	9911	G10	9924	H9	9956	E7	9971	D9		
1802	H12	2760	G4	2823	F8	2842	E14	2854	H17	2870	E16	2880	E15	2904	G7	2931	G18	3750	G5	3833	E7	3852	H17	3866	D17	3883	E14	3903	H14	3919	H15	3935	H18	3963	E11	4822	G18	6751	F2	6891	D16	7820	G13	9503	G15	9912	G10	9930	I7	9957	D7	9973	H12		



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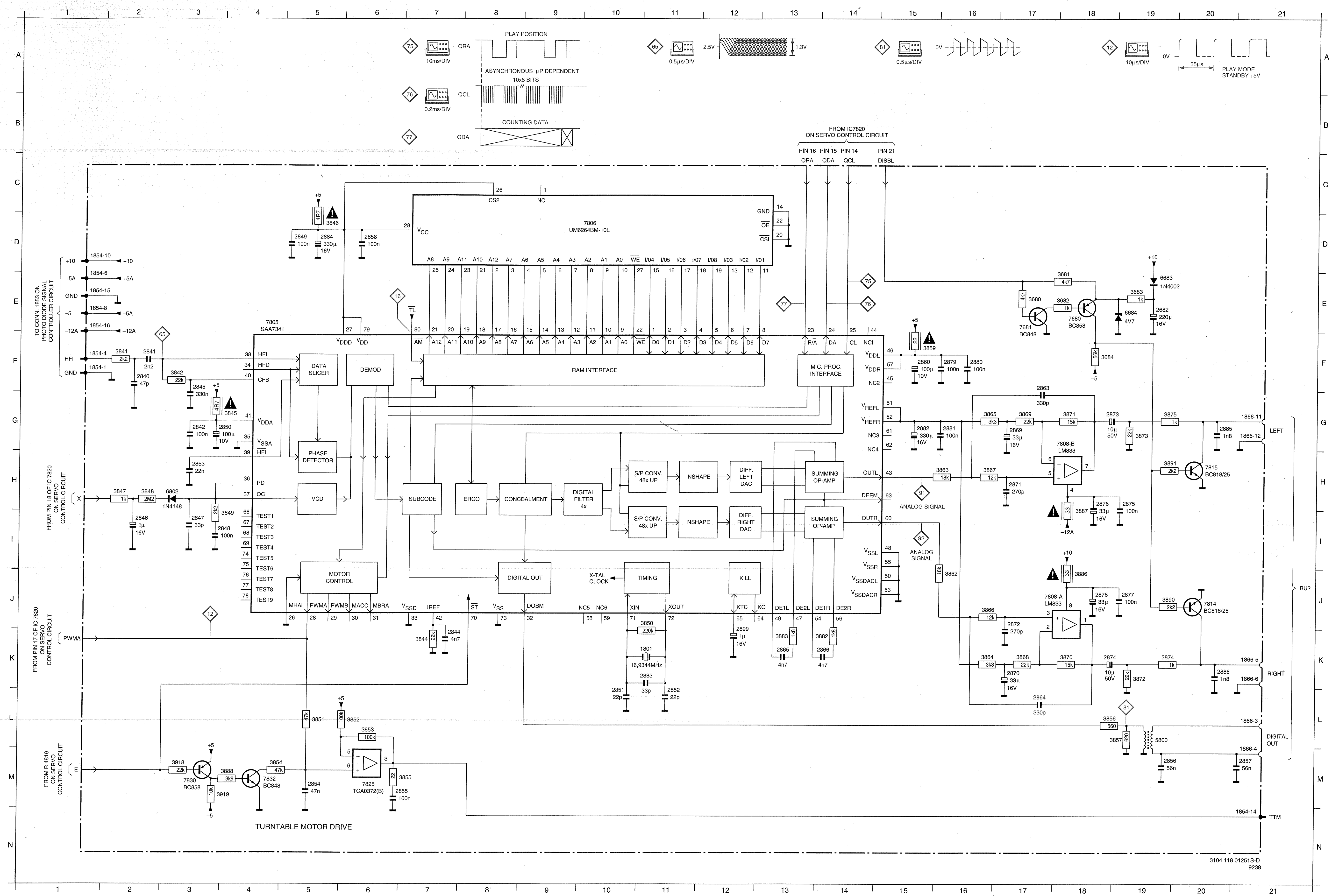
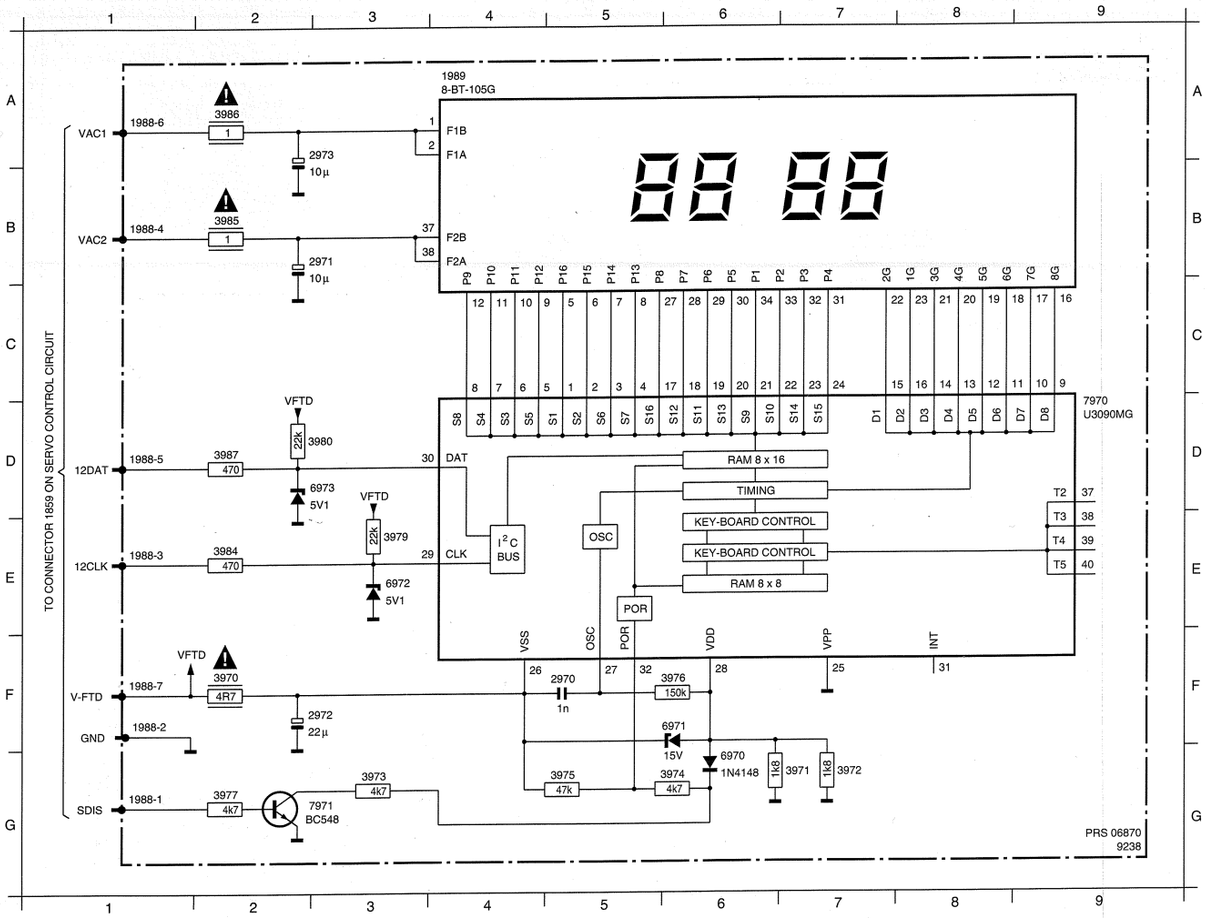
DECODER CIRCUIT DIAGRAM

1801	K11	2842	G3	2847	I3	2851	L10	2855	M6	2860	F15	2866	K14	2872	J17	2876	H18	2880	F16	2884	D5	3680	E17	3684	F18	3845	G4	3849	I3	3853	L6	3857	L18	3864	K16	3868	K17	3872	K19	3882	K13	3888	M4	3919	M3	6802	H3	7806	D10	7815	H20
2682	E19	2844	K7	2848	I3	2852	L11	2856	M19	2863	F17	2869	G17	2873	G18	2877	J19	2881	G16	2885	G20	3681	E17	3841	F2	3846	D5	3850	J11	3854	M4	3859	F15	3865	G16	3869	G17	3873	G19	3883	K13	3890	J19	5800	L19	7680	E18	7808-A	J17	7825	M6
2840	F2	2845	F3	2849	D5	2853	H3	2857	M21	2864	L17	2870	K17	2874	K18	2878	J18	2882	G15	2886	K20	3682	E17	3842	F3	3847	H2	3851	L5	3855	M7	3862	J16	3866	J16	3870	K18	3874	K19	3886	J18	3891	H19	6683	E19	7681	E17	7808-B	G18	7830	M3
2841	F2	2846	I2	2850	G3	2854	M5	2858	D6	2865	K13	2871	H17	2875	H19	2879	F16	2883	K11	2899	K12	3683	E19	3844	K7	3848	H2	3852	L6	3856	L18	3863	H15	3867	H16	3871	G18	3875	G19	3887	I18	3918	M3	6684	E19	7805	E4	7814	J20	7832	M4

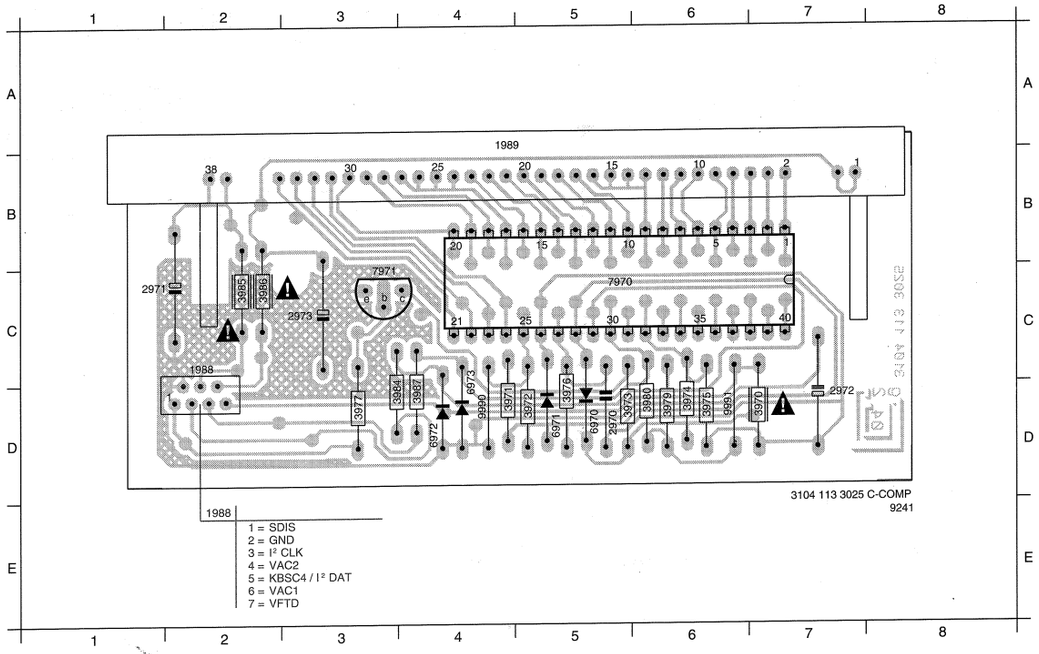


DISPLAY & KEYBOARD

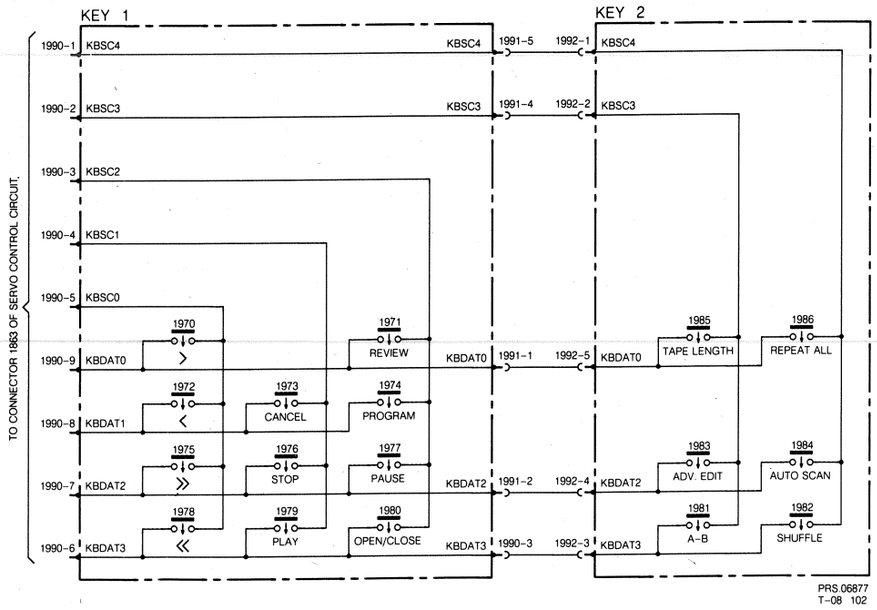
1989 A4 2971 B2 2973 A2 3971 G7 3973 G3 3975 G5 3977 G2 3980 D2 3985 B2 3987 D2 6971 F5 6973 D2 7971 G2
2970 F5 2972 F2 3970 F2 3972 G7 3974 G5 3976 F5 3979 E3 3984 E2 3986 A2 6970 G6 6972 E3 7970 D9



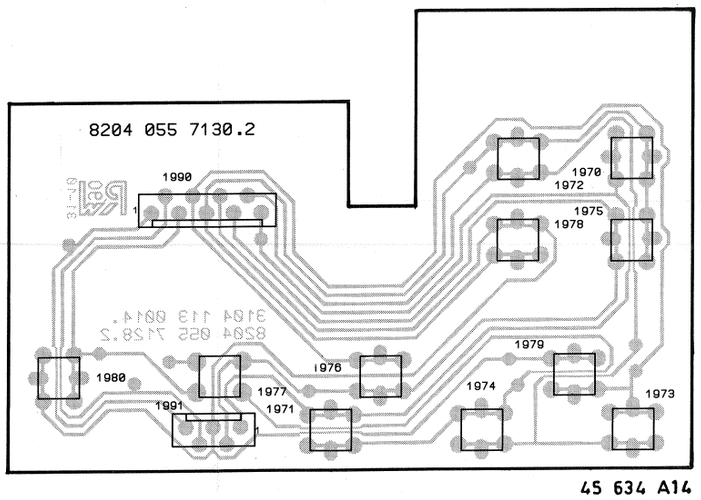
1988 C2 2971 C1 3970 D7 3973 D5 3976 D5 3980 D6 3986 C2 6971 D5 7970 C5 9991 D6
1989 A4 2972 D7 3971 D4 3974 D6 3977 D3 3984 D4 3987 D4 6972 D4 7971 C3
2970 D5 2973 C3 3972 D5 3975 D6 3979 D6 3985 C2 6970 D5 6973 D4 9990 D4



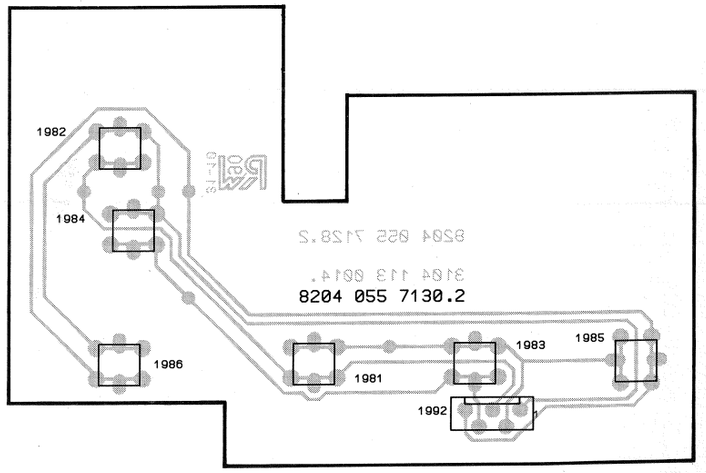
KEYBOARD



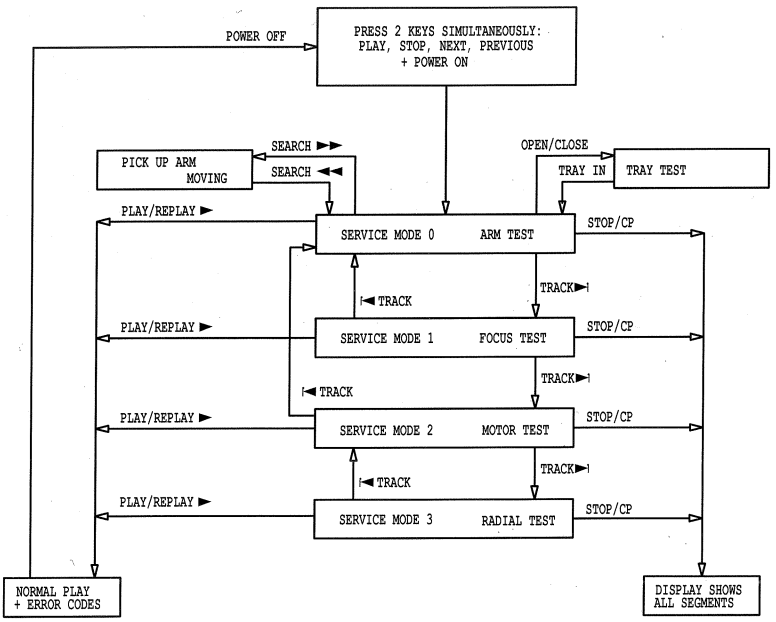
KEY 1



KEY 2



SERVICE TEST PROGRAM



ERROR CODE TABLE

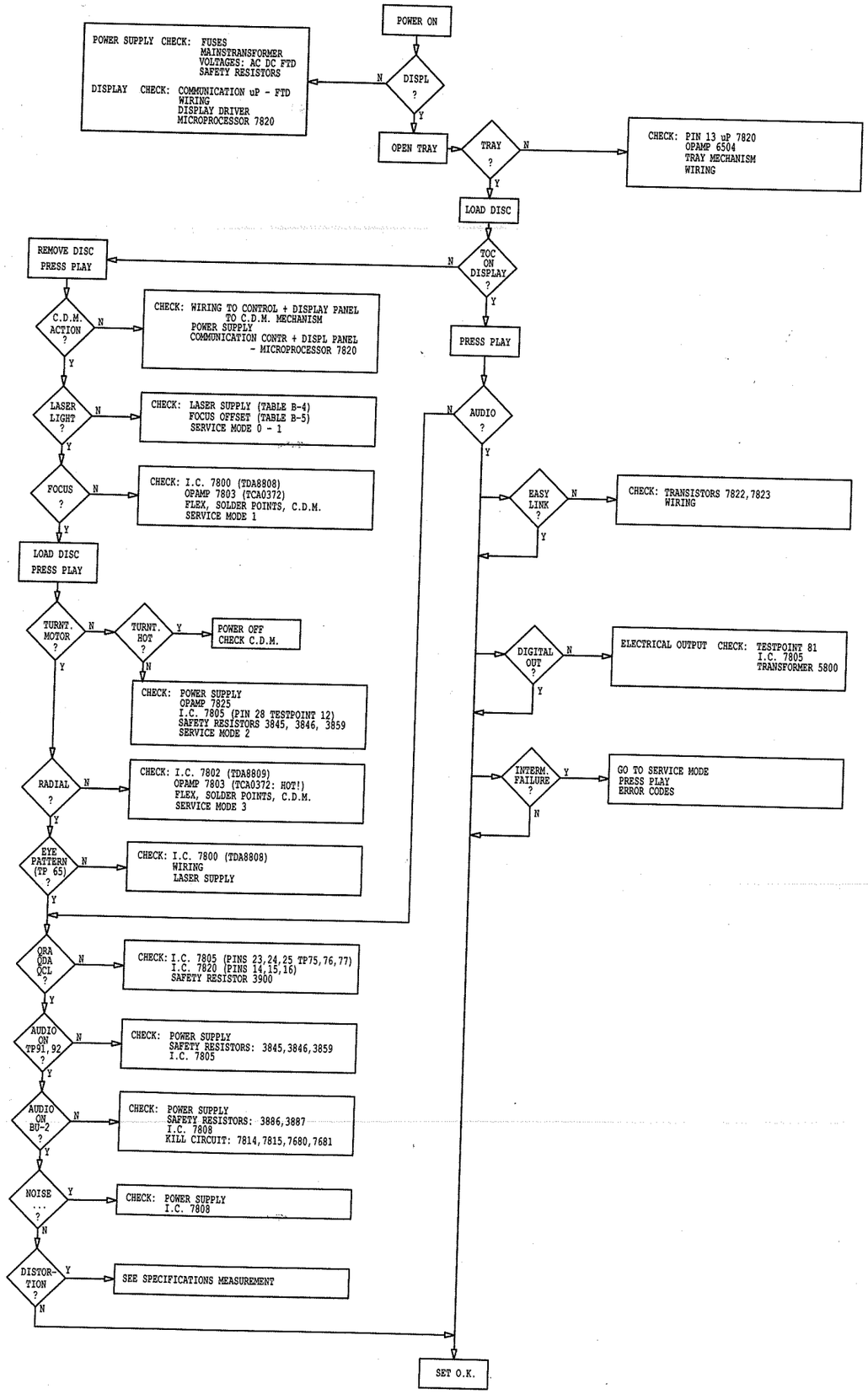
SYSTEM ERRORS

ER01	Tray error
ER02	Focus error
ER03	Radial error
ER04	Disc error : DRD becomes not low
ER05	TL low to long
ER06	Jump error
ER07	Subcode error
ER08	TOC error
ER09	Decoder SAA7341(CD4+) error

OPERATING ERRORS

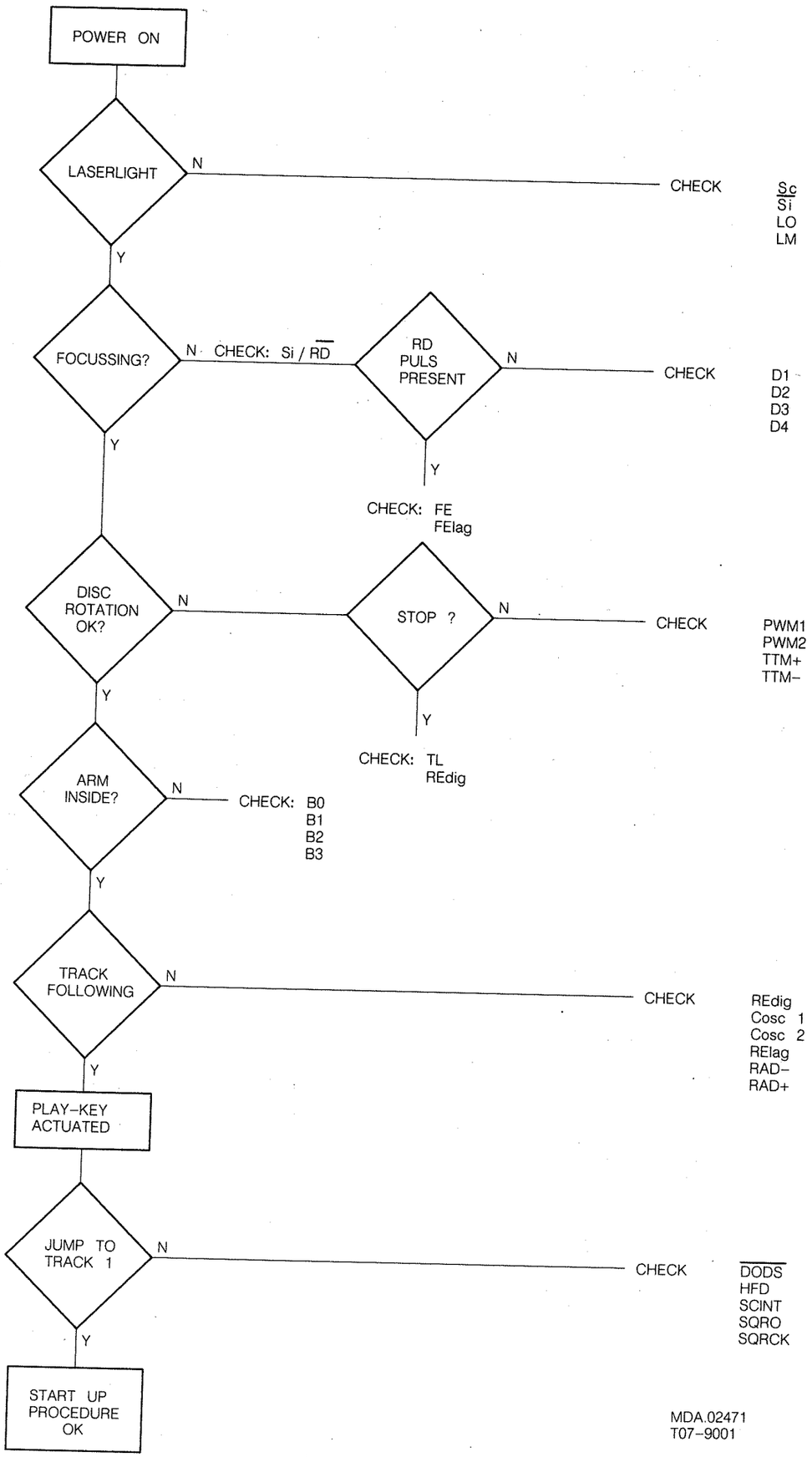
ER31	Search time out error
ER32	Binary search time out error
ER33	Index not found
ER34	Relative time not found
ER35	Next/Previous when scanning
ER36	Programmed track is not existing on this CD
ER37	Selected track is not existing on this CD
ER38	Next at a border when repeat is off
ER39	Previous at a border when repeat is off
ER40	Finding error
ER41	Review error
ER42	Program memory full
ER43	Program pressed while playing
ER44	Cancel pressed while not in review
ER45	Program pressed while no track selected
ER46	Program pressed while scanning program
ER47	A-B pressed while not in play
ER48	A-B pressed in scan
ER49	Search pressed in scan
ER50	Edit pressed in play mode
ER51	No track possible to play in edit mode
ER52	Tape pressed while not in time-input mode
ER53	Not allowed key pressed in CD-dubbing
ER54	Not allowed keys pressed in edit-play/pause
ER55	Not allowed key pressed in edit time-input
ER56	Not allowed key pressed in standby
ER57	Fast forward pressed while not in play
ER58	Fast reverse pressed while not in play
ER59	EOT received while playing edit

FAULTFINDING GUIDE



HAS1099
9239

START UP PROCEDURE



MDA.02471
T07–9001

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-23267A

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	9 V	1.8<V <2.3	REPLACEMENT CIRCUIT FOR LASER ASSEMBLY to LO 33Ω GREEN LED to LM CONNECT DIRECTLY TO PANEL SK 18Ω to ⊥ 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. PRS.06615 T02/9020
	LM		11 V	170<mV <220	
2	LO	serv. pos. 2 SK	9 V	1.8<V <2.3	
	LM		11 V	170<mV <220	
3	LO	Power on	9 V	0V ± 0.2V	No light

T-23267B

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

B-4 LASER CURRENT ADJUSTMENT

Step	Signal	Mode	◇	∅	▭	⊓	Remarks
1	–	Power off	–	–	–	–	Check if FLEX-FOIL is properly connected
2	–	Power off	11 Ω	R3893	1kΩ +10% −0	–	Pre-adjustment Ohmic value
3	–	Power off	–	R2823	–	–	Set to mid-position
4	laser current ≙ voltage across R3800	Test disc 5A play	1 V 2 mV DC	–	⩾ 15mV	–	If < 15mV then go to step 3 and set R3823 to 1/4 or 3/4. Try again.
5	laser current ≙ voltage across R3800	Test disc 5A play	1 V 2 mV DC	R3893	50mV	–	–
6	FE-LAG	Test disc 5A track 1 play	27 V	R3823	400mV	–	Fine adjustment

T-23267C

B-5 ADJUSTMENT OF FOCUS-OFFSET

Step	Signal	Mode	◇	∅	▭	⊓	Remarks
1	–	Power on no disc	–	R2823	–	–	adjust for optical mid-position of the focus motor
2	FE LAG	Play Test disc 5 Track 1	27	R2823	400mV ± 40 mV DC	–	fine adjustment

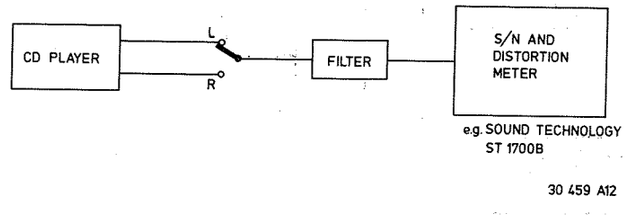
T-23267D

D-6 SPECIFICATIONS MEASUREMENT

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

T-23267M

Filter = 13th order filter 4822 395 30204



30 459 A12

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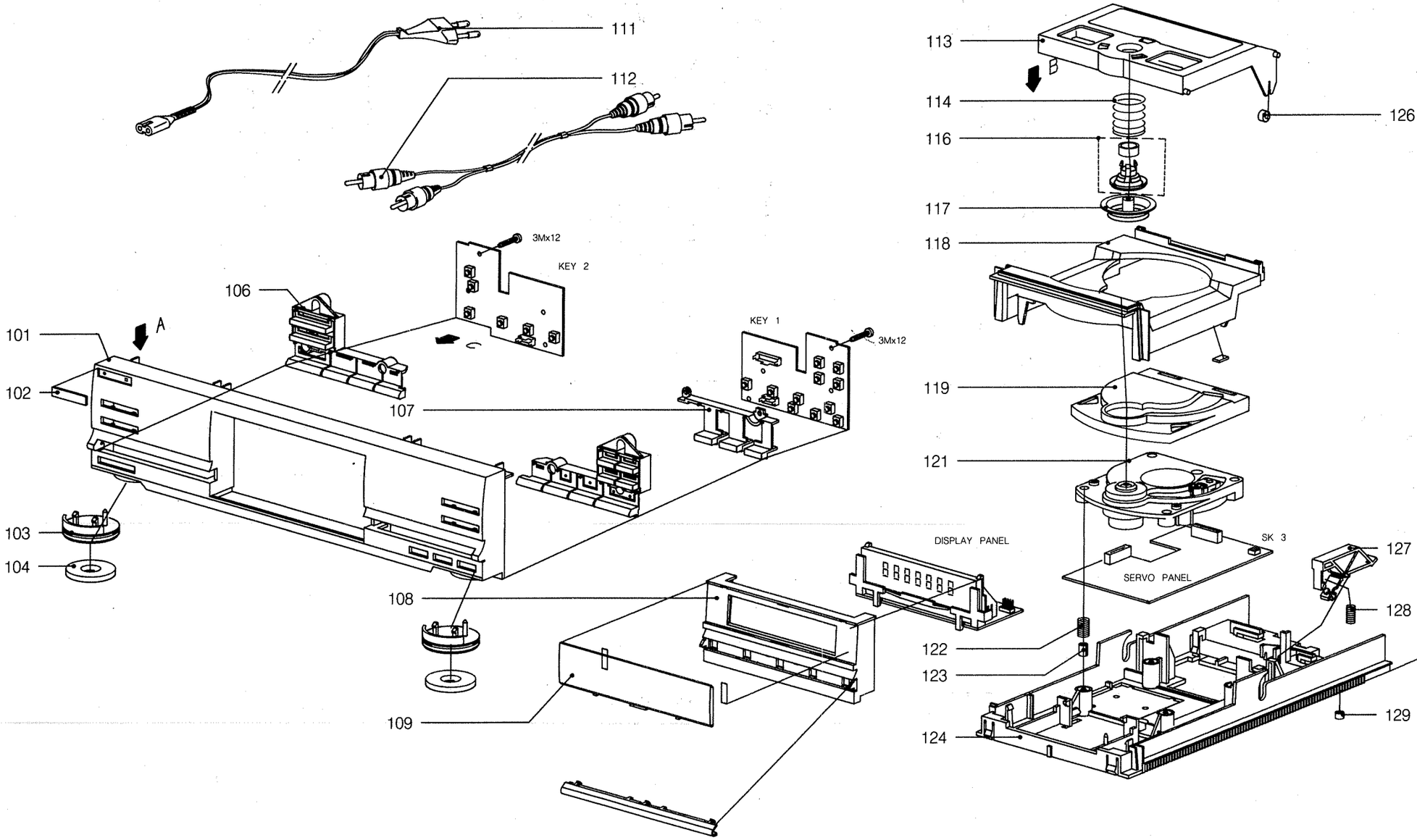
EXPLODED VIEW



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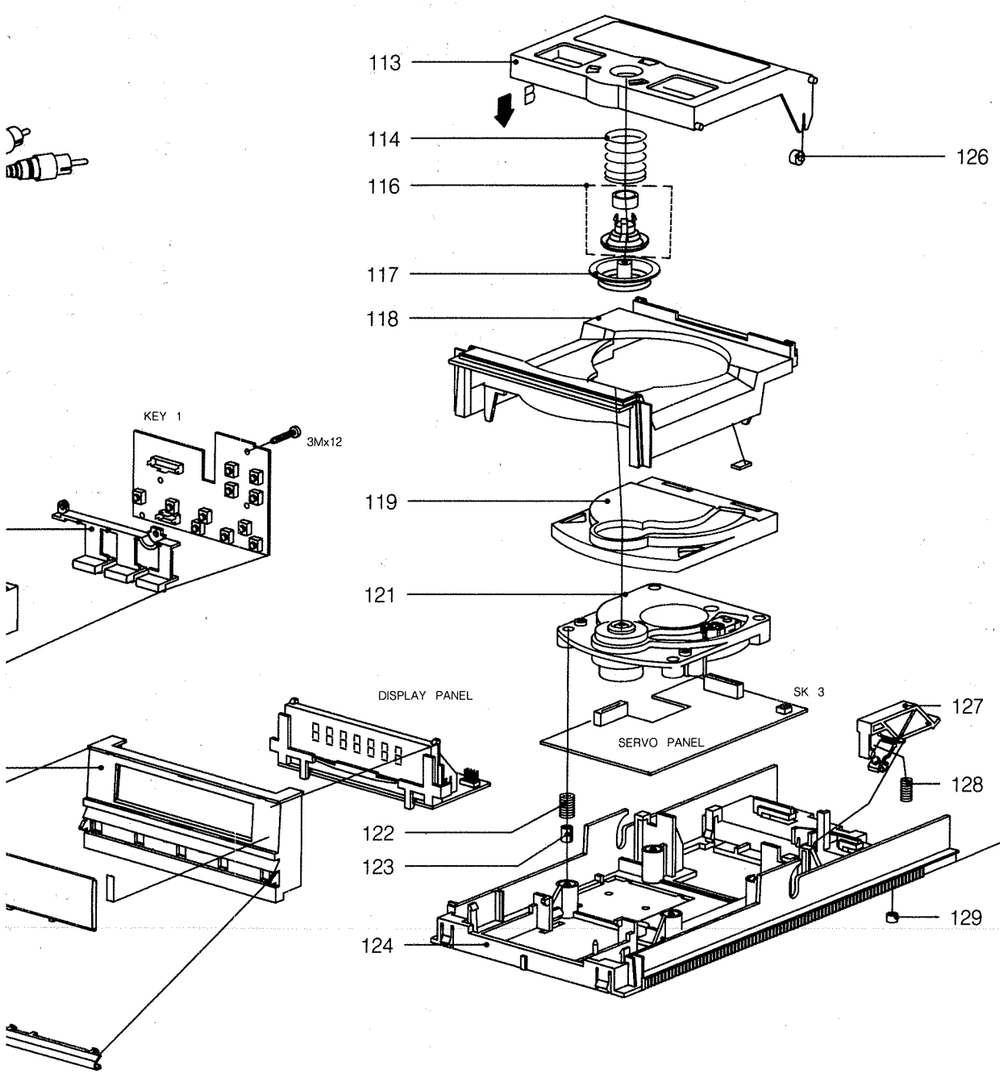

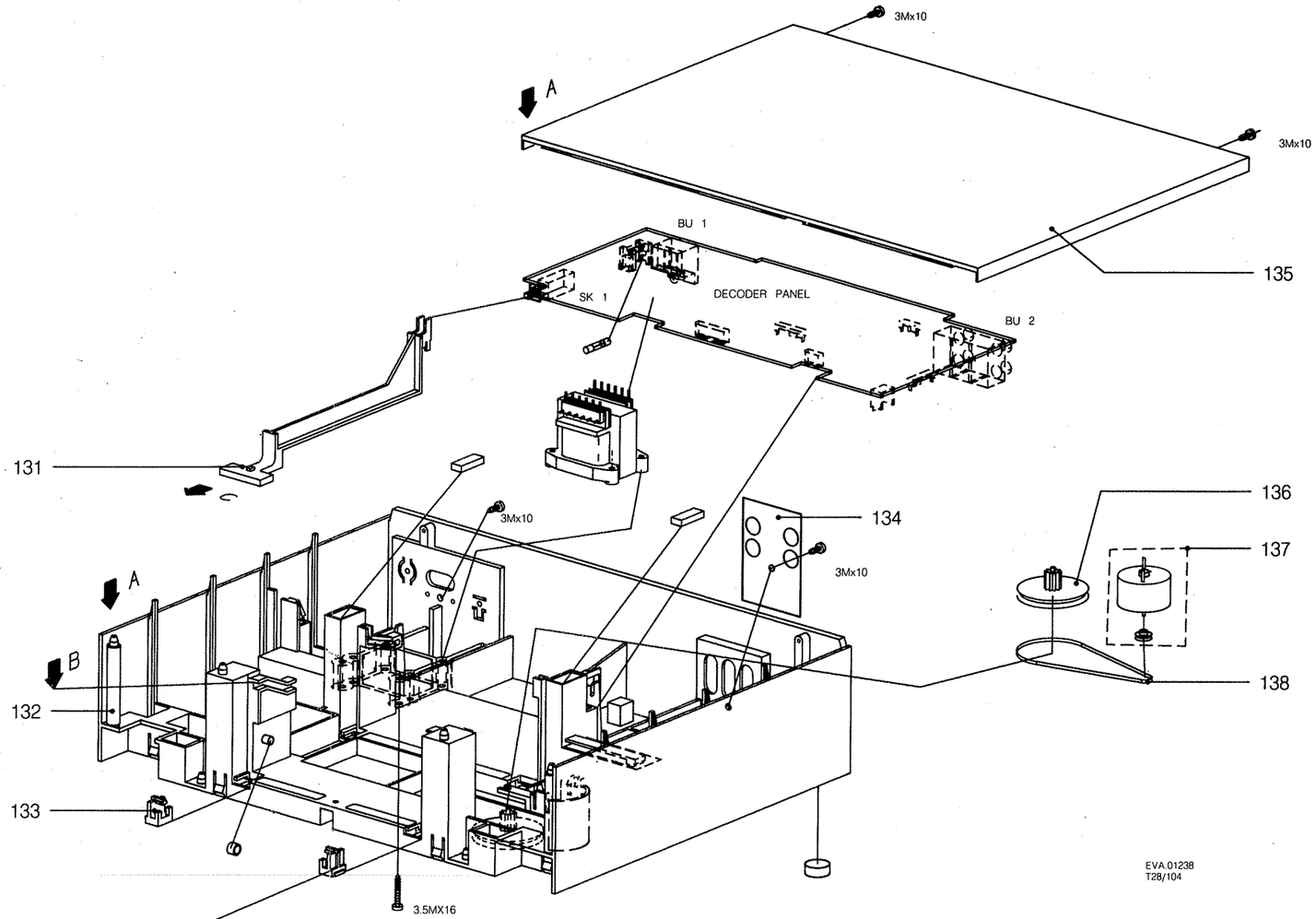

MECHANICAL PARTS LIST

101	4822 444 40615	FRONT	121	4822 691 30286	CDM4 MECHANISM
102	4822 459 10887	WORDMARK	122	4822 492 51902	COMPRESSION SPRING
103	4822 462 41979	FOOT	123	4822 466 61587	FOAM
104	4822 462 41783	FELT	124	4822 444 50645	TRAY
106	4822 410 62381	PUSHBUTTON	126	4822 528 90639	ROLLER
107	4822 410 61171	PUSHBUTTON	127	4822 402 61322	BRACKET
108	4822 444 40587	TRAY FRONT	128	4822 492 52123	COMPRESSION SPRING
109	4822 444 40437	WINDOW	129	4822 532 51756	GROMMET
111	4822 321 10249	MAINS CORD	131	4822 410 62379	POWER BUTTON
112	4822 321 22832	CINCH CABLE SBC1072	132	4822 464 50943	FRAME
113	4822 466 92841	PRESSURE PLATE	133	4822 402 61323	GUIDE
114	4822 492 52159	COMPRESSION SPRING	134	4822 444 60828	COVER PLATE
116	4822 535 93054	PIVOT	136	4822 528 81329	PULLEY
117	4822 492 33145	PRESSURE RING	137	4822 361 21423	MOTOR
118	4822 444 60735	COVER	138	4822 358 10115	DRIVING BELT
119	4822 454 30438	ORNAMENTAL PLATE			

SERVO & DECODER PANEL

MISCELLANEOUS

BU-1 ⚠	4822 265 20291	MAINS INLET
BU-2	4822 267 41054	CINCH SOCKET 5P
SK-1	4822 276 13077	SWITCH
1001 ⚠	4822 071 56301	FUSE 630mA
1002 ⚠	4822 071 55001	FUSE 500mA
1801	4822 242 81151	CRYSTAL 16,9344 MHz
1802	4822 242 72527	RESONATOR 4,00 MHz
1856	4822 264 40207	CONNECTOR 3P
1861	4822 264 40207	CONNECTOR 3P
1863	4822 267 50721	CONNECTOR 9P

CAPACITORS

2680	4822 124 40272	33µF 20% 16V
2682	4822 124 40196	220µF 20% 16V
2683	4822 124 40248	10µF 20% 63V
2750	5322 124 22094	220µF 20% 50V
2751	4822 124 41596	22µF 20% 50V
2760	4822 122 33809	22nF 20% 50V
2761	4822 122 33809	22nF 20% 50V
2762	4822 124 23268	3300µF 20% 16V
2763	4822 124 40272	33µF 20% 16V
2770	4822 122 33809	22nF 20% 50V
2771	4822 122 33809	22nF 20% 50V
2772	4822 124 41853	1000µF 16V
2775	4822 122 33809	22nF 20% 50V
2776	4822 122 33809	22nF 20% 50V
2821	4822 121 51321	8,2nF 1% 63V
2822	4822 121 51321	8,2nF 1% 63V
2823	4822 124 40272	33µF 20% 16V
2824	4822 121 43526	47nF 5% 100V
2825	5322 121 42661	330nF 5% 63V
2826	4822 122 33342	33nF 10% 63V
2827	4822 122 33342	33nF 10% 63V
2828	4822 121 42408	220nF 5% 63V
2829	4822 121 42408	220nF 5% 63V
2835	4822 122 33496	100nF 10% 63V
2836	4822 122 33496	100nF 10% 63V
2840	5322 122 32452	47pF 5% 63V
2841	4822 122 33175	2,2nF 20% 50V
2842	4822 122 33496	100nF 10% 63V
2844	5322 126 10223	4,7nF 10% 63V
2845	5322 121 42661	330nF 5% 63V
2846	4822 124 40242	1µF 20% 63V
2847	5322 122 32659	33pF 5% 50V
2848	5322 121 42386	100nF 5% 63V
2849	4822 122 33496	100nF 10% 63V
2850	4822 124 41584	100µF 20% 10V
2851	5322 122 32658	22pF 5% 50V
2852	5322 122 32658	22pF 5% 50V
2853	5322 122 32654	22nF 10% 63V
2854	4822 122 32542	47nF 10% 63V
2855	4822 122 33496	100nF 10% 63V
2856	4822 122 33105	56nF 10% 63V
2857	4822 122 33105	56nF 10% 63V
2858	4822 122 33496	100nF 10% 63V
2860	4822 124 41584	100µF 20% 10V
2863	5322 122 31863	330pF 5% 50V
2864	5322 122 31863	330pF 5% 50V
2865	5322 126 10223	4,7nF 10% 63V
2866	5322 126 10223	4,7nF 10% 63V
2869	4822 124 40272	33µF 20% 16V
2870	4822 124 40272	33µF 20% 16V
2871	4822 122 33216	270pF 5% 50V
2872	4822 122 33216	270pF 5% 50V
2873	4822 124 40248	10µF 20% 63V
2874	4822 124 40248	10µF 20% 63V
2875	4822 122 33496	100nF 10% 63V
2876	4822 124 40272	33µF 20% 16V
2877	4822 122 33496	100nF 10% 63V
2878	4822 124 40272	33µF 20% 16V
2879	4822 122 33496	100nF 10% 63V
2880	4822 122 33496	100nF 10% 63V
2881	4822 122 33496	100nF 10% 63V
2882	4822 124 40849	330µF 20% 16V
2883	5322 122 32659	33pF 5% 50V
2884	4822 124 40849	330µF 20% 16V
2885	4822 122 33219	1,8nF 10% 50V
2886	4822 122 33219	1,8nF 10% 50V
2899	4822 124 40242	1µF 20% 63V
2900	4822 124 40272	33µF 20% 16V
2901	4822 122 33809	22nF 20% 50V
2903	4822 124 40272	33µF 20% 16V
2904	4822 124 40272	33µF 20% 16V
2911	5322 122 32531	100pF 5% 50V
2912	5322 122 32531	100pF 5% 50V
2913	5322 122 32531	100pF 5% 50V
2914	5322 122 32531	100pF 5% 50V
2915	5322 122 32531	100pF 5% 50V
2916	5322 122 32531	100pF 5% 50V
2917	5322 122 32531	100pF 5% 50V
2918	5322 122 32531	100pF 5% 50V
2919	5322 122 32531	100pF 5% 50V
2920	5322 122 32531	100pF 5% 50V
2930	4822 122 33809	22nF 20% 50V
2931	4822 122 33809	22nF 20% 50V
2932	4822 122 33496	100nF 10% 63V

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RESISTORS

3680	4822 050 24702	4k7 1% 0,6W
3681	4822 051 20472	4k7 5% 0,1W
3682	4822 050 21002	1k 1% 0,6W
3683	4822 051 10102	1k 2% 0,25W
3684	4822 050 25603	56k 1% 0,6W
3687	4822 051 20681	680Ω 5% 0,1W
3688	4822 051 20103	10k 5% 0,1W
3690	4822 051 20223	22k 5% 0,1W
3691 ⚠	4822 052 10228	2Ω2 5% 0,33W
3750	4822 051 20681	680Ω 5% 0,1W
3802 ⚠	4822 052 10228	2Ω2 5% 0,33W
3803 ⚠	4822 052 10478	4Ω7 5% 0,33W
3825	4822 051 20473	47k 5% 0,1W
3826	4822 051 20153	15k 5% 0,1W
3827	4822 050 21802	1k8 1% 0,6W
3828	4822 050 21803	18k 1% 0,6W
3829	4822 116 83706	5k1 2% 0,2W
3830	4822 051 20224	220k 5% 0,1W
3831	4822 050 21203	12k 1% 0,6W
3832	4822 051 20224	220k 5% 0,1W
3833	4822 050 22203	22k 1% 0,6W
3841	4822 050 22202	2k2 1% 0,6W
3842	4822 051 20223	22k 5% 0,1W
3844	4822 050 22203	22k 1% 0,6W
3845 ⚠	4822 052 10228	2Ω2 5% 0,33W
3846 ⚠	4822 052 10228	2Ω2 5% 0,33W
3847	4822 051 10102	1k 2% 0,25W
3848	4822 051 20225	2M2 5% 0,1W
3849	4822 051 20222	2k2 5% 0,1W
3850	4822 051 20224	220k 5% 0,1W
3851	4822 050 24703	47k 1% 0,6W
3852	4822 116 52234	100k 5% 0,5W
3853	4822 051 20104	100k 5% 0,1W
3854	4822 050 24703	47k 1% 0,6W
3855	4822 051 20229	22Ω 5% 0,1W
3856	4822 051 20561	560Ω 5% 0,1W
3857	4822 051 20681	680Ω 5% 0,1W
3859 ⚠	4822 052 10229	22Ω 5% 0,33W
3862	4822 050 21803	18k 1% 0,6W
3863	4822 050 21803	18k 1% 0,6W
3864	4822 051 20332	3k3 5% 0,1W
3865	4822 050 23302	3k3 1% 0,6W
3866	4822 051 20123	12k 5% 0,1W
3867	4822 051 20123	12k 5% 0,1W
3868	4822 051 20223	22k 5% 0,1W
3869	4822 051 20223	22k 5% 0,1W
3870	4822 116 52244	15k 5% 0,5W
3871	4822 116 52244	15k 5% 0,5W
3872	4822 051 20223	22k 5% 0,1W
3873	4822 051 20223	22k 5% 0,1W
3874	4822 050 21002	1k 1% 0,6W
3875	4822 050 21002	1k 1% 0,6W
3882	4822 051 20182	1k8 5% 0,1W
3883	4822 051 20182	1k8 5% 0,1W
3886 ⚠	4822 052 10339	33Ω 5% 0,33W
3887 ⚠	4822 052 10339	33Ω 5% 0,33W
3888	4822 051 20392	3k9 5% 0,1W
3890	4822 050 22202	2k2 1% 0,6W
3891	4822 050 22202	2k2 1% 0,6W
3894	4822 051 20101	100Ω 5% 0,1W
3895	4822 051 20109	10Ω 5% 0,1W
3896 ⚠	4822 052 10108	1Ω 5% 0,33W
3900 ⚠	4822 052 10228	2Ω2 5% 0,33W
3902	4822 051 20224	220k 5% 0,1W
3903	5322 111 90473	8X10k 2% NETWORK
3905	4822 051 20103	10k 5% 0,1W
3906	4822 051 20103	10k 5% 0,1W
3907	4822 050 21003	10k 1% 0,6W
3908	4822 051 20103	10k 5% 0,1W
3909	4822 051 20103	10k 5% 0,1W
3910	4822 050 24702	4k7 1% 0,6W
3911	4822 050 21002	1k 1% 0,6W
3914	4822 050 21003	10k 1% 0,6W
3916	4822 051 20332	3k3 5% 0,1W
3917	4822 050 23302	3k3 1% 0,6W
3918	4822 050 22203	22k 1% 0,6W
3919	4822 050 21003	10k 1% 0,6W
3921	4822 051 20472	4k7 5% 0,1W
3922	4822 051 20472	4k7 5% 0,1W
3923	4822 051 20104	100k 5% 0,1W
3924	4822 051 20223	22k 5% 0,1W
3925	4822 051 20103	10k 5% 0,1W
3930	4822 050 24702	4k7 1% 0,6W
3931	4822 050 21203	12k 1% 0,6W
3932	4822 050 21203	12k 1% 0,6W
3933	4822 050 21203	12k 1% 0,6W
3934	4822 050 21203	12k 1% 0,6W
3935	4822 051 20229	22Ω 5% 0,1W
3936 ⚠	4822 052 10228	2Ω2 5% 0,33W
3937 ⚠	4822 052 10228	2Ω2 5% 0,33W
3938	4822 051 20103	10k 5% 0,1W
3940	4822 051 10102	1k 2% 0,25W
3941	4822 051 20153	15k 5% 0,1W
3942	4822 051 10102	1k 2% 0,25W
3943	4822 051 20103	10k 5% 0,1W
3944	4822 116 52224	470Ω 5% 0,5W
3960	4822 050 21003	10k 1% 0,6W
3961	4822 050 21003	10k 1% 0,6W
3963	4822 050 21003	10k 1% 0,6W
48..	4822 051 10008	JUMPER

COILS

5800	4822 1

DIODES

6680 ⚠	5322 1
6681 ⚠	5322 1
6682	4822 1
6683	5322 1
6684	4822 1
6685	4822 1
6686 ⚠	4822 1
6750	4822 1
6751 ⚠	5322 1
6753	4822 1
6760 ⚠	5322 1
6761 ⚠	5322 1
6770 ⚠	5322 1
6771 ⚠	5322 1
6802	4822 1
6840	5322 1
6841	5322 1
6842	4822 1
6843	4822 1
6891	4822 1

TRANSISTORS &

7680	5322 1
7681	4822 1
7750 ⚠	5322 2
7760 ⚠	4822 2
7802	4822 2
7805	4822 2
7806	4822 2
7808	4822 2
7814	4822 1
7815	4822 1
7820	4822 2
7822	5322 1
7823	4822 1
7825	4822 2
7830	5322 1
7832	4822 1
7840	4822 2
7870 ⚠	4822 2

COILS

5800	4822 148 80281	DIG.OUT TRANSFORMER

DIODES

6680 ⚠	5322 130 30684	1N4002GP
6681 ⚠	5322 130 30684	1N4002GP
6682	4822 130 30621	1N4148
6683	5322 130 30684	1N4002GP
6684	4822 130 34174	BZX79-C4V7
6685	4822 130 34173	BZX79-C5V6
6686 ⚠	4822 130 30621	1N4148
6750	4822 130 31456	BZV85-C5V1
6751 ⚠	5322 130 30684	1N4002
6753	4822 130 31024	BZX79-C18
6760 ⚠	5322 130 30684	1N4002GP
6761 ⚠	5322 130 30684	1N4002GP
6770 ⚠	5322 130 30684	1N4002GP
6771 ⚠	5322 130 30684	1N4002GP
6802	4822 130 30621	1N4148
6840	5322 130 30684	1N4002GP
6841	5322 130 30684	1N4002GP
6842	4822 130 30621	1N4148
6843	4822 130 34174	BZX79-C4V7
6891	4822 130 30621	1N4148

TRANSISTORS & IC's

7680	5322 130 42012	BC858
7681	4822 130 61207	BC848
7750 ⚠	5322 209 71759	MC7815CT
7760 ⚠	4822 209 80891	MC7805CT
7802	4822 209 31973	TDA8809T/C2/S1/13
7805	4822 209 30388	SAA7341GP
7806	4822 209 32036	UM6264BM-10L
7808	4822 209 83163	LM833N
7814	4822 130 42696	BC818-25
7815	4822 130 42696	BC818-25
7820	4822 209 32018	MC68HC05D9/ZC40002
7822	5322 130 42012	BC858
7823	4822 130 61207	BC848
7825	4822 209 72587	TCA0372
7830	5322 130 42012	BC858
7832	4822 130 61207	BC848.
7840	4822 209 80797	LM393N
7870 ⚠	4822 209 73233	MC79L05ACP

PHOTO DIODE SIGNAL CONTROLLER PANEL

MISCELLANEOUS

SK-3	4822 276 13106	LASER SAFETY SWITCH

CAPACITORS

2800	4822 122 33809	22nF 20% 50V
2801	5322 122 32268	470pF 10% 50V
2803	4822 122 33496	100nF 10% 63V
2806	4822 122 33496	100nF 10% 63V
2807	4822 122 33175	2,2nF 20% 50V
2808	4822 121 43526	47nF 5% 100V
2809	5322 122 32531	100pF 5% 50V
2810	4822 122 33177	10nF 20% 50V
2811	5322 122 34123	1nF 10% 50V
2812	4822 121 42408	220nF 5% 63V
2813	4822 121 51252	470nF 5% 63V
2815	4822 124 40272	33µF 20% 16V
2816	4822 122 32575	220pF 10% 500V
2817	4822 121 51252	470nF 5% 63V
2818	5322 126 10223	4,7nF 10% 63V
2819	5322 121 42661	330nF 5% 63V
2820	4822 122 33496	100nF 10% 63V
2830	5322 122 34123	1nF 10% 50V
2831	4822 122 33496	100nF 10% 63V
2832	4822 124 41583	0,68µF 20% 50V Bipolar
2833	4822 122 33496	100nF 10% 63V
2834	4822 122 33496	100nF 10% 63V

RESISTORS

3800	4822 050 24702	4k7 1% 0,6W
3801	4822 051 20104	100k 5% 0,1W
3804	4822 116 83704	12k 2% 0,2W
3805	4822 051 20101	100Ω 5% 0,1W
3806	4822 051 10102	1k 2% 0,25W
3807	4822 116 83705	24k 2% 0,2W
3808	4822 051 20562	5k6 5% 0,1W
3810	4822 051 20101	100Ω 5% 0,1W
3811 ⚠	4822 052 10189	18Ω 5% 0,33W
3812 ⚠	4822 052 10129	12Ω 5% 0,33W
3813	4822 050 22202	2k2 1% 0,6W
3814	4822 050 22201	220Ω 1% 0,6W
3815	4822 051 20113	11k 5% 0,1W
3816	4822 051 20124	120k 5% 0,1W
3817	4822 051 20154	150k 5% 0,1W
3818	4822 051 20563	56k 5% 0,1W
3819	4822 051 20164	160k 5% 0,1W
3820	4822 050 28203	82k 1% 0,6W

3821 ⚠	4822 052 11688	6Ω8 5% 0,5W
3822 ⚠	4822 052 10229	22Ω 5% 0,33W
3823	4822 100 11869	POTM 20k 0,1W LIN
3824	4822 050 24704	470k 1% 0,6W
3835	4822 050 26802	6k8 1% 0,6W
3836 ⚠	4822 052 10478	4Ω7 5% 0,33W
3837	4822 051 20339	33Ω 5% 0,1W
3838	4822 050 26802	6k8 1% 0,6W
3839 ⚠	4822 052 10108	1Ω 5% 0,33W
3840 ⚠	4822 052 10108	1Ω 5% 0,33W
3893	4822 100 11679	POTM 4,7k 30% LIN 0,2W
48..	4822 051 10008	JUMPER

DIODES & IC's

6800	4822 130 30861	BZX79-C7V5
6801	4822 130 30861	BZX79-C7V5
6850	4822 130 30621	1N4148
7800	4822 209 73234	TDA8808T/C3
7801	5322 130 44779	BC338/40
7803	4822 209 72587	TCA0372

KEYBOARD PANEL

1970	4822 276 13114	TACT SWITCH
1971	4822 276 13114	TACT SWITCH
1972	4822 276 13114	TACT SWITCH
1973	4822 276 13114	TACT SWITCH
1974	4822 276 13114	TACT SWITCH
1975	4822 276 13114	TACT SWITCH
1976	4822 276 13114	TACT SWITCH
1977	4822 276 12465	TACT SWITCH
1978	4822 276 13114	TACT SWITCH
1979	4822 276 13114	TACT SWITCH
1980	4822 276 13114	TACT SWITCH
1981	4822 276 13114	TACT SWITCH
1982	4822 276 13114	TACT SWITCH
1983	4822 276 13114	TACT SWITCH
1984	4822 276 13114	TACT SWITCH
1985	4822 276 13114	TACT SWITCH
1986	4822 276 13114	TACT SWITCH
1990	4822 267 50721	SOCKET 9-FOLD
1991	4822 267 40624	SOCKET 5-FOLD
1992	4822 267 40624	SOCKET 5-FOLD

CONTROL & DISPLAY PANEL

MISCELLANEOUS

	4822 256 91764	FTD HOLDER
1989	4822 130 90964	DISPLAY 8-BT-105G

CAPACITORS

2970	4822 122 10158	1nF 10% 50V
2971	5322 124 21749	10µF 20% 63V
2972	5322 124 21643	22µF 20% 40V
2973	5322 124 21749	10µF 20% 63V

RESISTORS

3970 ⚠	4822 052 10478	4Ω7 5% 0,33W
3971	4822 050 21802	1k8 1% 0,6W
3972	4822 050 21802	1k8 1% 0,6W
3973	4822 050 24702	4k7 1% 0,6W
3974	4822 050 24702	4k7 1% 0,6W
3975	4822 050 24703	47k 1% 0,6W
3976	4822 050 21504	150k 1% 0,6W
3977	4822 050 24702	4k7 1% 0,6W
3979	4822 050 22203	22k 1% 0,6W
3980	4822 050 22203	22k 1% 0,6W
3984	4822 116 52224	470Ω 5% 0,5W
3985 ⚠	4822 052 10108	1Ω 5% 0,33W
3986 ⚠	4822 052 10108	1Ω 5% 0,33W
3987	4822 116 52224	470Ω 5% 0,5W

DIODES, TRANSISTOR & IC

6970	4822 130 30621	1N4148
6971	4822 130 34281	BZX79-C15
6972	4822 130 34233	BZX79-C5V1
6973	4822 130 34233	BZX79-C5V1
7970	4822 209 72226	U3090
7971	4822 130 40938	BC548

MISCELLANEOUS

	4822 321 61026	16P FLEX
	4822 321 61222	7P FLEX
	4822 256 30274	FUSE HOLDER
1501 ⚠	4822 070 31001	FUSE 100 mA
5500 ⚠	4822 146 30859	MAINS TRANSFORMER