Compact disc player CD210

00R/05R/60R/61R/65R/70R

Service
Service
Service

44 722 A11

Service Manual

COMPACT disc DIGITAL AUDIO

Electrically: CD210/00R ≡ CD210/60R
CD210/05R ≡ CD210/65R ≡ CD210/70R
CD210/61R = CD210/60R with voltage selector

CONTENTS

(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.

CLASS 1
LASER PRODUCT
3122 110 03420

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

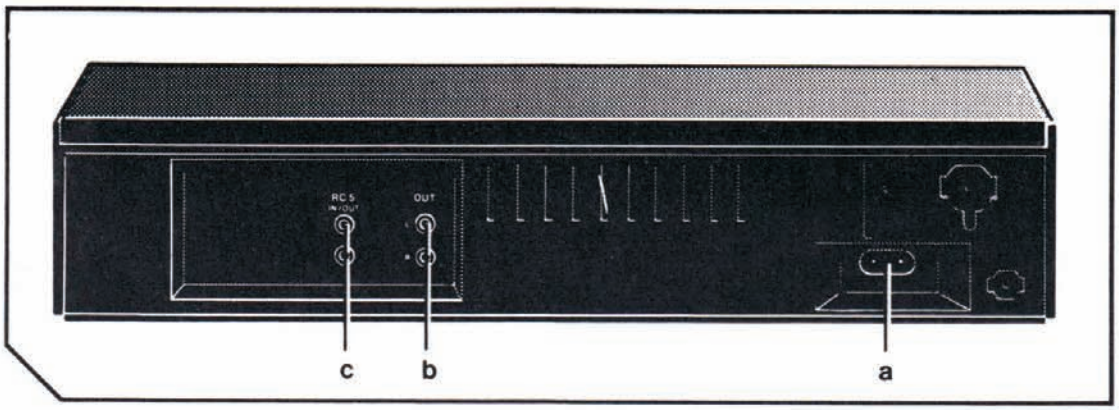
PHILIPS

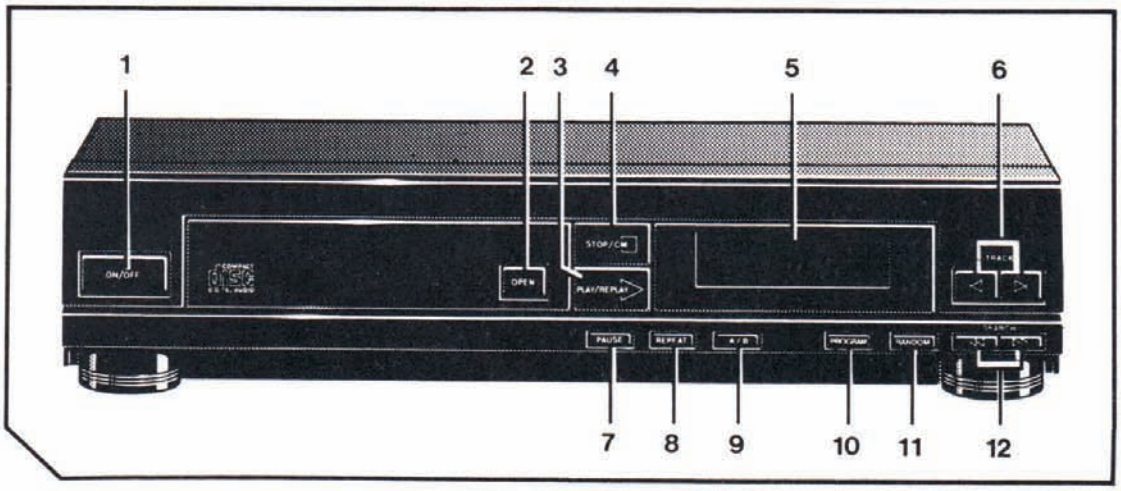
"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agrées, seuls habilités à réparer votre appareil en panne".

Subject to modification
4822 725 22382
Printed in The Netherlands

PHILIPS

Published by Service Consumer Electronics





44 723 A11

OPERATION

1 ON/OFF
2 OPEN
3 PLAY/REPLAY
4 STOP/CM
5 DISPLAY
6 ⏮ TRACK ⏭
7 PAUSE
8 REPEAT
9 A/B
10 PROGRAM
11 RANDOM
12 ⏪⏮SEARCH⏭⏩

a CONNECTIONS FOR THE MAINSLEAD
b OUT LEFT/RIGHT
c RC5 IN/OUT

TECHNICAL DATA

Typical Audio Performance

- Number of Channels: 2
- Frequency Range: 2-20 000 Hz
- Output resistance: 1 KΩ
- Nominal load impedance: 100 kΩ//100 pF
- Amplitude Linearity: ± 1 dB max. (20-20 000 Hz)
- Phase Linearity: ± 1.0° (20-20 000 Hz)
- Dynamic Range: 65 dB min. (20-20 000 Hz)
- Signal-to-Noise Ratio: 75 dB min. (20-20 000 Hz)
- Channel Separation: 60 dB (20-20 000 Hz)
- Total Harmonic Distortion: 65 dB/0.05% (20-20 000 Hz)
- Wow and Flutter: quartz crystal precision
- D/A Conversion: quadruple oversampling (176.4 kHz) with digital filter and two 16 bit D/A converters
- Error Correction System: Cross Interleaved Reed Solomon Code (CIRC)
- Audio Output Level: 2 $V_{rms.}$

Power Supply

- Mains Voltage: see type plate at rear of player
- Mains Frequencies: 50 and 60 Hz
- Power Consumption: 15 W approx.
- Safety Requirements: IEC

Cabinet, general

- Dimensions (wxhxd)
  cabinet with tray closed: 360 x 80/86 x 300 mm approx.
  cabinet with tray opened: 360 x 80/86 x 445 mm approx.

(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 separate disc hold-down should be used. For a service disc hold–down see drawing 42565 A12.
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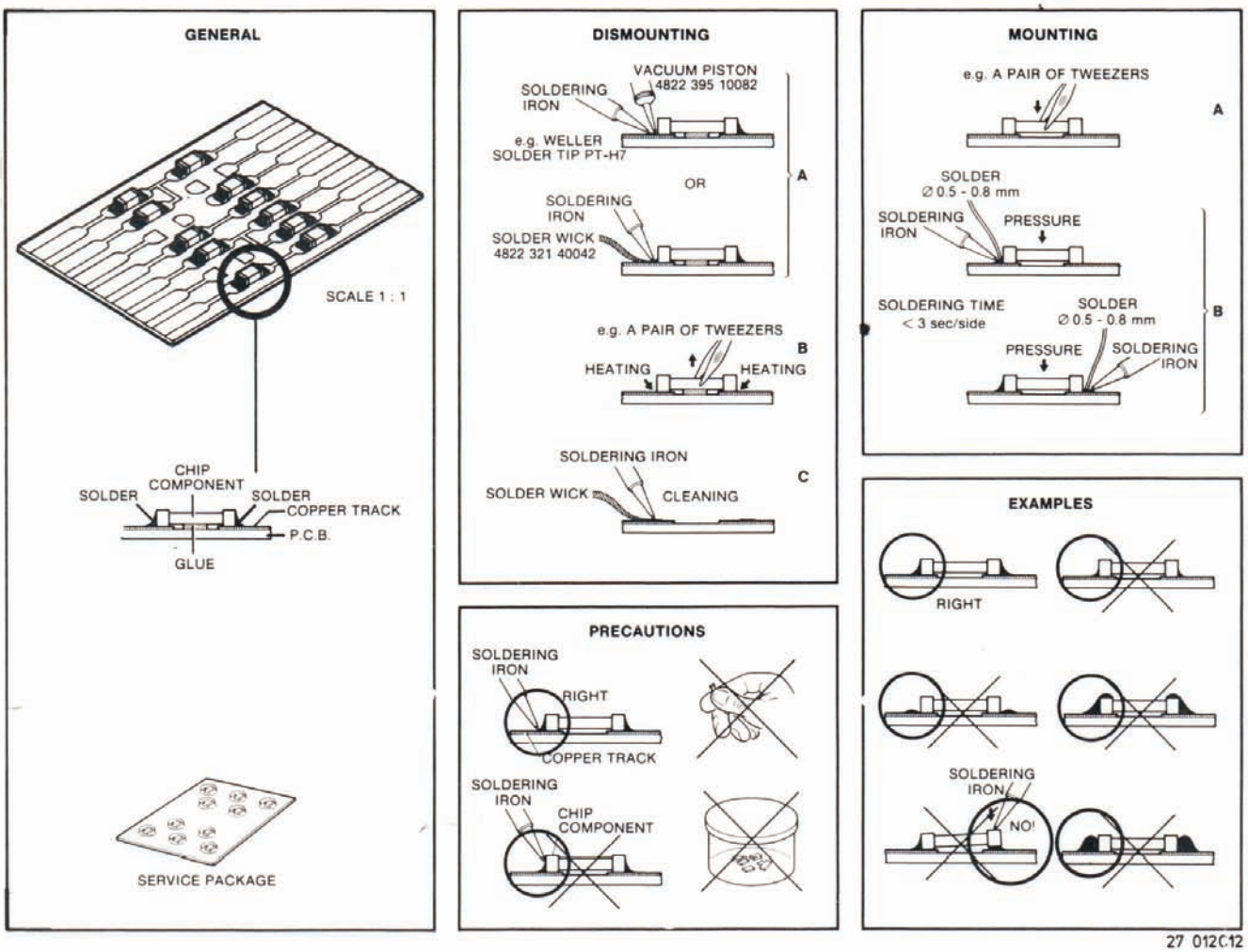
Test discs

It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

SERVICE TOOLS

Audio signal disc (1)	4822 397 30184
Disc without errors (5)+ disc with DO errors, black spots and fingerprints (5A)	4822 397 30096
Disc 65 min 1kHz without pause	4822 397 30155
Max diameter disc	4822 397 60141
Torx screwdrivers	
Set (straight)	4822 395 50145
Set (square)	4822 395 50132
13th order filter	4822 395 30204
Service cable (5p)	4822 321 21273
Service cable (14p)	4822 321 21598
Service flexfoil (14p)	4822 322 40066
Service connector (14p)	4822 267 50676
Glass disc	4822 395 90204



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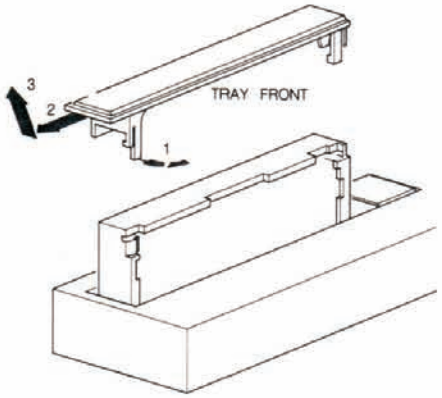
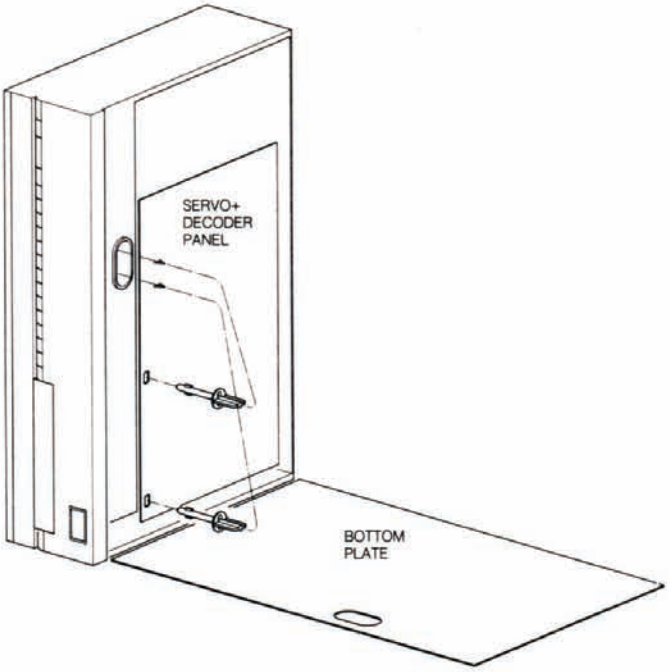
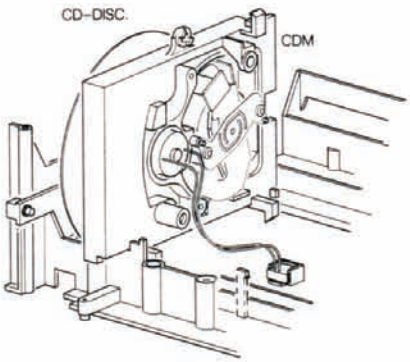


MEASURING AND ADJUSTMENT POSITION OF THE SET



MDA.02138
916/T19

SERVICE POSITION PLAY



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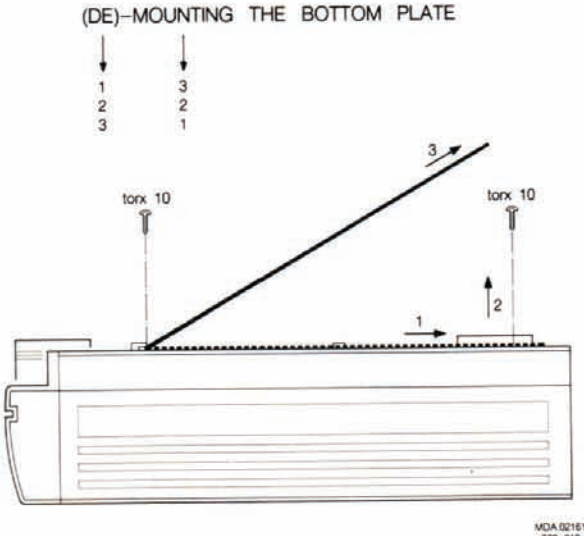
(DE)-MOUNTING THE BOTTOM PLATE



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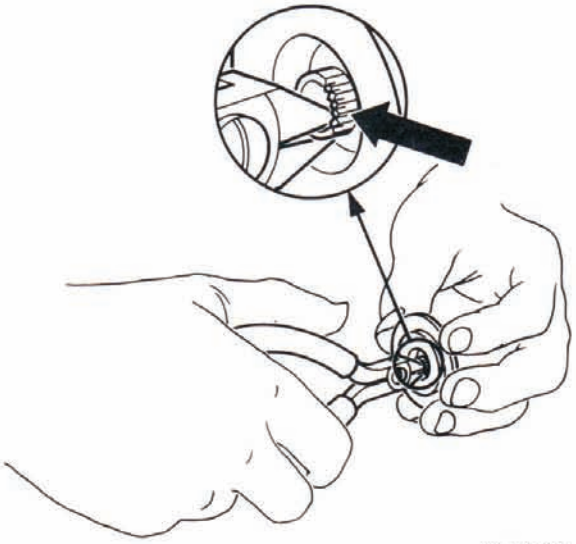
SERVICE DISC-HOLDDOWN

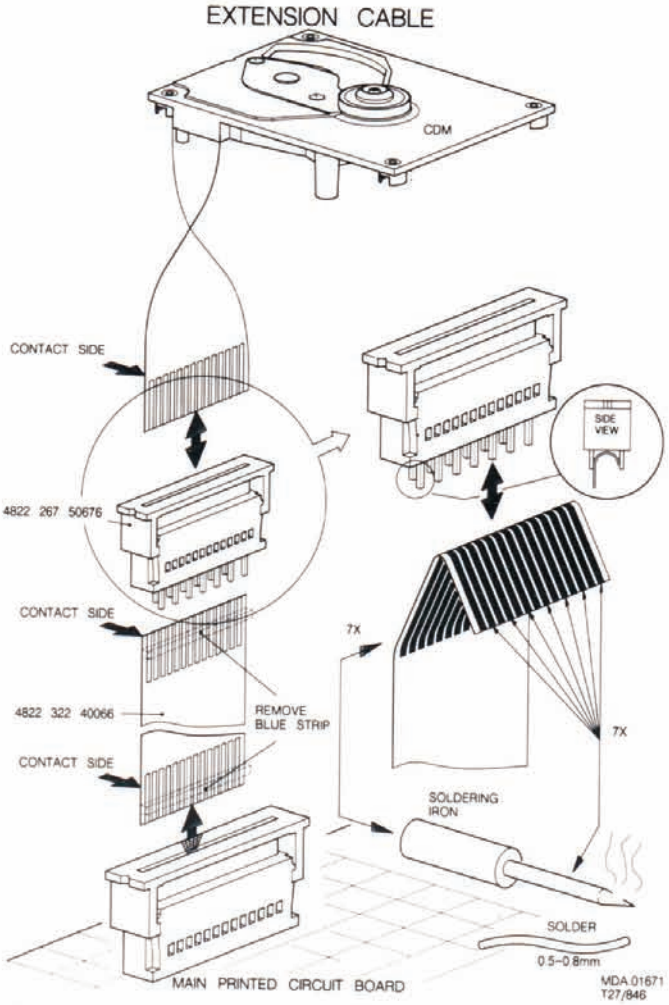


42 565 A12

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 CDM FOIL



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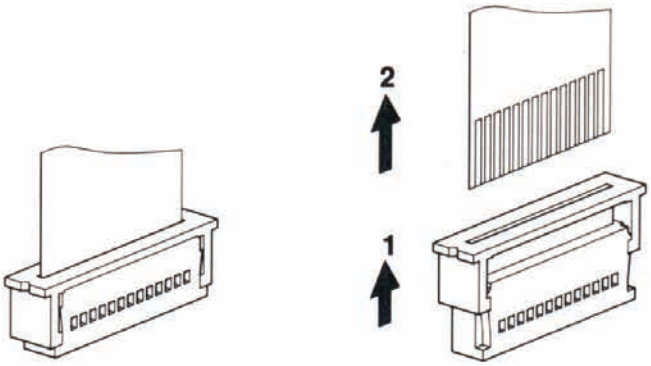
T27/846

DEMOUNTING FOIL CDM



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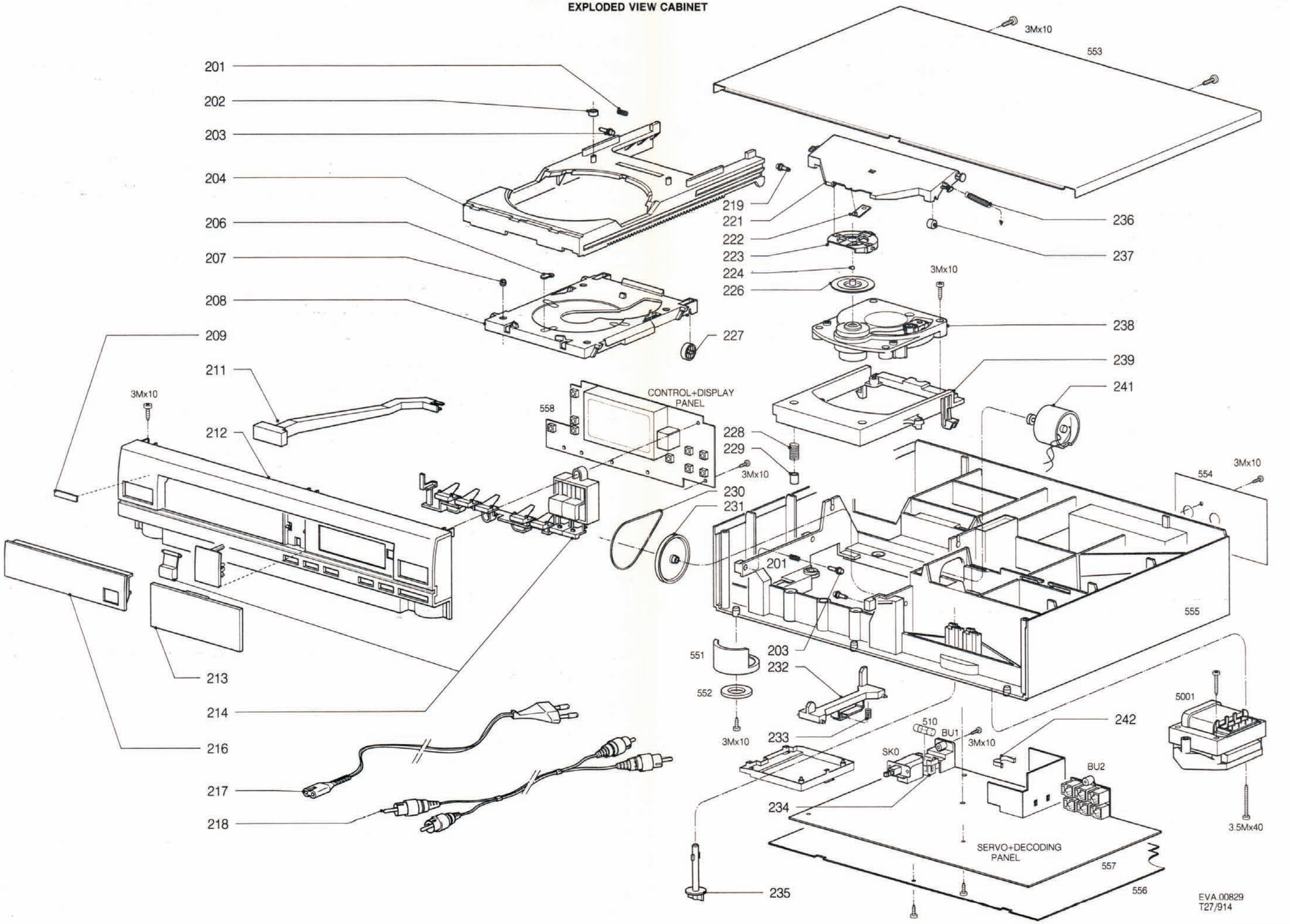
T28/822

CABINET PARTS

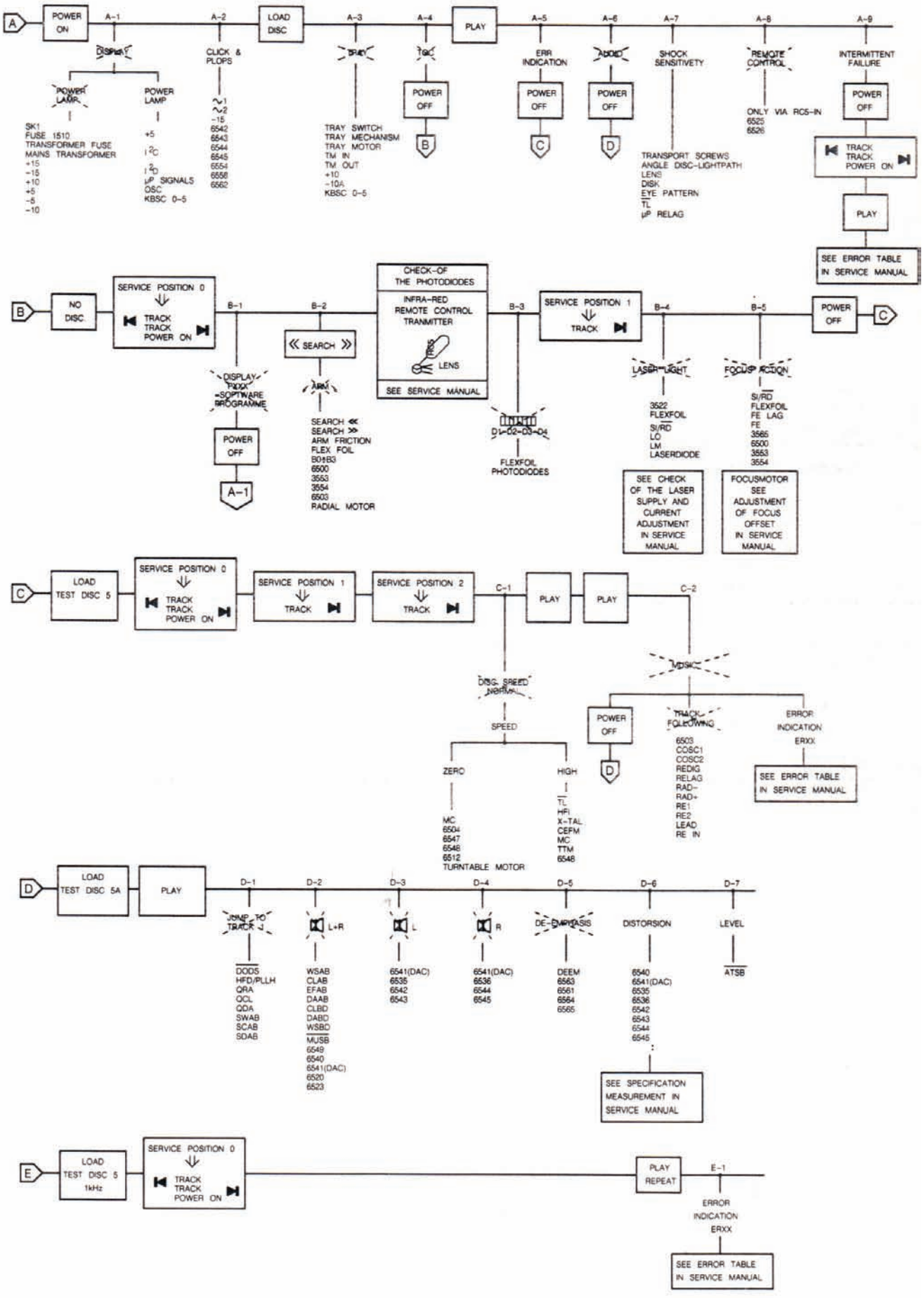
201	4822 492 52094	
202	4822 532 51756	
203	4822 402 61252	
204	4822 444 50603	
206	4822 325 50176	
207	4822 325 50177	
208	4822 466 92251	(+ pos. 206, 207, 227)
209	4822 459 10806	
211	4822 410 60107	/00R/05R
211	4822 410 60438	/60R/65R/70R
212	4822 444 40306	/00R/05R
212	4822 444 40337	/60R/65R/70R
213	4822 381 11053	/00R/05R
213	4822 450 61479	/60R/65R/70R
214	4822 410 60106	/00R/05R
214	4822 410 60437	/60R/65R/70R
216	4822 444 40307	/00R/05R
216	4822 444 40338	/60R/65R/70R
217	4822 321 10457	/00R/60R
217	4822 321 10522	/05R/65R
217	4822 321 10523	/70R
218	4822 321 22832	
219	4822 402 61253	
221	4822 444 60568	
222	4822 466 92257	
223	4822 401 61207	
224	4822 520 40177	
226	4822 530 80503	
227	4822 528 90638	
228	4822 492 51902	
229	4822 466 61587	
230	4822 358 10115	
231	4822 528 81329	
232	4822 402 50276	
233	4822 492 52123	
234	4822 256 30274	
235	4822 535 71262	
236	4822 492 32883	
237	4822 528 90639	
238	4822 691 30209	
239	4822 402 61196	
241	4822 361 20998	
242	4822 492 63076	

Spring under item 231 4822 492 70332

EXPLODED VIEW CABINET



ELECTRICAL MEASUREMENTS AND ADJUSTMENTS



PRS.05932
T27/918

A-1 µP - SIGNALS

Signal	Mode	◇			Remarks
Reset	Power on	14		Pulse "high"	
X-TAL	Stand-by	13		4 MHz	See frequency on x-tal
TRAY IN	Push tray	83		"high"	"high" when tray is closing
TRAY OUT	Open/close	83		"low"	"low" when tray is opening
$\overline{ATSB}$	DISC, SEARCH	89		"high"	"low" during search
I^2C	Power on, play	31		Activity	"high" when starting up

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B-2 B0, B1, B2, B3 SIGNALS

Signal	Mode	◇			Remarks
B0	Service position 0 or 1; search ≫	36		"low"	
	Service position 0 or 1; search ≪	36		"low"	
B1	Service position 0 or 1; search ≫	34		"high"	
	Service position 0 or 1; search ≪	34		"high"	
B2	Service position 0 or 1; search ≫	33		"low"	
	Service position 0 or 1; search ≪	33		"high"	
B3	Service position 0 or 1; search ≫	32		"high"	
	Service position 0 or 1; search ≪	32		"high"	

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B-3 CHECK OF THE PHOTODIODES

Step	Signal	Mode	◇				Remarks
1	–	power on	④ ⑥ ⑦ ⑧	–	–	See drawing 38314A12	Signal depends on Distance lens ⟷ IR LED of remote control

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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 the replacement circuit for laser assembly.

Step	Signal	Mode	◇				Remarks
1	LO	serv. pos. 2 SK	⑨ Ⓥ	–	1.8<V <2.3	–	PRS05539
	LM		⑪ Ⓥ	–	170<mV <220	–	
2	LO	serv. pos. 2 SK	⑨ Ⓥ	–	1.8<V <2.3	–	PRS05540
	LM		⑪ Ⓥ	–	170<mV <220	–	
3	LO	Power on	⑨ Ⓥ	–	0V ± 0.2V	–	No light

T-22382D

B-4 LASER CURRENT ADJUSTMENT

Step	Signal	Mode	◇	∅			Remarks
1	–	Power off	◇ Ω ⊥	R3520	1kΩ	–	Pre-adjustment Ohmic value
2	Eye-pattern HF	Power on Test disc 5 play	pin 32 decoder A (SAA7310)	–	–	See drawing 37017B8	If no signal see "start up procedure"
3	laser current ≙ voltage across R3508	Test disc 5 play track 1	◇ 1 V 2	R3520	50 mV DC	–	Use a high ohmic voltage meter

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B-5 ADJUSTMENT OF FOCUS-OFFSET

Step	Signal	Mode	◇	∅			Remarks
1	–	Power on	–	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-22382F

B-5 FOCUS ACTION

Signal	Mode	◇			Remarks
SI/$\overline{RD}$	Service position 1 when repeating start up procedure	21			See drawing MDA.01403
FE	Service position 1, no disc	26			See drawing MDA.01413
FE-LAG	Test disc 5A, play	27		pulse "high"	See adjustment of focus-offset

T-22382G

C-1 HIGH SPEED DISC ROTATION

Signal	Mode	◇			Remarks
HFI	Test disc 5, play or service position 2	65			See drawing: 37017B8
X-tal	Test disc 5A, play or service position 2	70		11.28 MHz	
MC	Test disc 5, play or service position 2	12			See drawing: 38849A12

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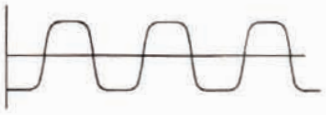
C-2 TRACK FOLLOWING

Signal	Mode	◇			Remarks
RE dig	Test disc 5, play or service position 3	37			Square wave
RE lag		41			DC level ± 2,5 Volt
RAD+	Test disc 5A, service position 1 ≪≫	40			Arm inside: 1V Arm outside: –1V
C osc1	Test disc 5, play or service position 3	30		650 Hz	
C osc2	Test disc 5, play or service position 3	31		650 Hz	
LEAD	Position stop	35		650 Hz	Sinus
LEAD	Position play	35			See drawing 30743B
IDAC	Position play	48			Pulses low and high when bumped against the CDM

T-22382I



38 314 A12

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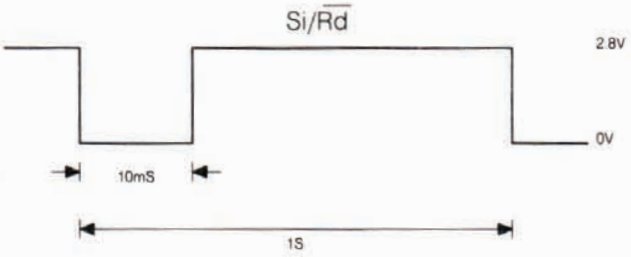

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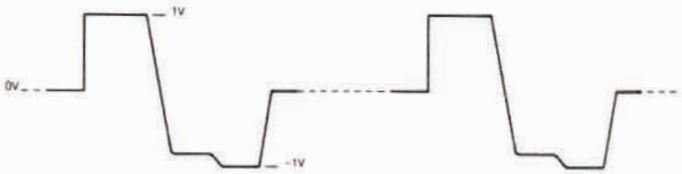

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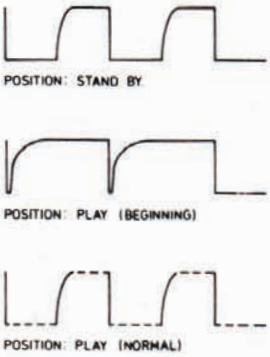
T33/823

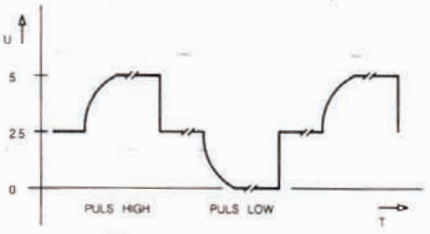


38 849 A12

POSITION PLAYER	POWER ON	SERVICE POSITION 3	PLAY	SEARCH PAUSE
$\overline{DOOS}$ SIGNAL	"LOW"	"HIGH"	"HIGH"	

MDA 01143
T12 -651

ANTI SKATING PULSES
TRISTATE I-O PORT OF µP



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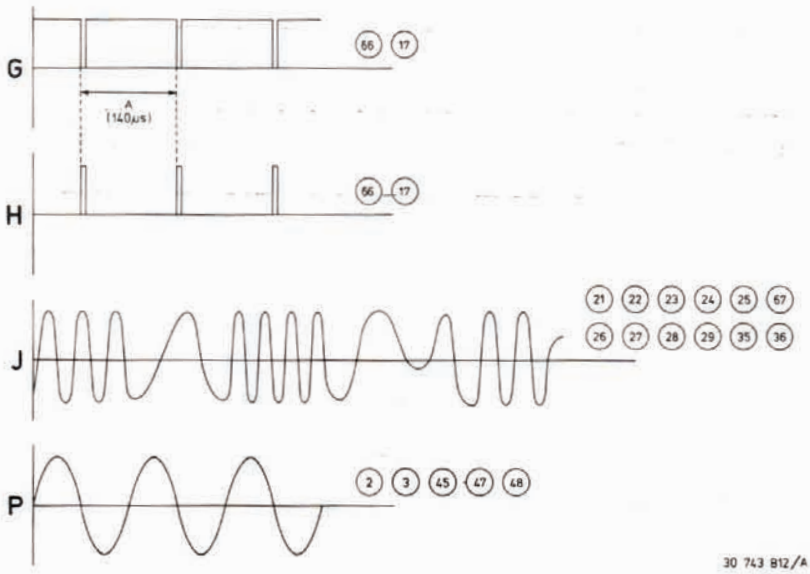

30 743 812/A

CS 22 187

D1 JUMP TO TRACK 1

Signal	Mode	◇			Remarks
$\overline{\text{DODS}}$	Test disc 5A search ≫ or search ≪	19			See drawing MDA.01143
QRA	Test disc 5A, play	75			See drawing MDA.00453
QDA	Test disc 5A, play	77			
QCL	Test disc 5A, play	76			
SWAB/SSM	Test disc 5A, play	78			See drawing MDA.00239
SCAB	Test disc 5A, play	79			See drawing MDA.00239
SDAB	Test disc 5A, play	80			See drawing MDA.00239

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D-2 NO AUDIO OUTPUT LEFT+RIGHT

Signal	Mode	◇			Remarks
CLAB	Disc, play	72			See drawing 38847C12
DAAB	Disc, play	73		activity	
EFAB	Testdisc 5A	74		pulses "high"	When the disc is slowly braked by hand
CLBD	Disc, play	87			See drawing 38848C12
DABD	Disc, play	86		activitiy	
WSBD	Disc, play	85			See drawing 38848C12
$\overline{\text{MUSB}}$	Disc, play	90		"high"	Pulse low when track ≪/≫

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D-5 DEEM CIRCUIT

Signal	Mode	◇			Remarks
DEEM	Test disc 5A: track 14 PLAY track 15 PLAY	84		"low" "high"	See testpoint 92 and 91 on DEEM circuit
Testpoint 92	Test disc 5A track 14	92		LF signal	
Testpoint 92	Test disc 5A track 15	92		No signal	
Testpoint 91	Test disc 5A track 14	91		LF signal	
Testpoint 91	Test disc 5A track 15	91		No signal	

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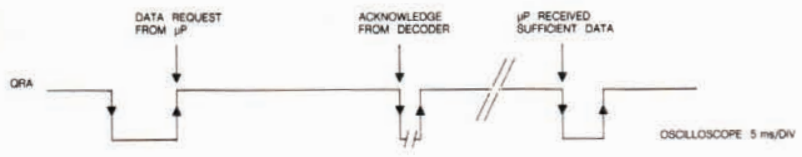
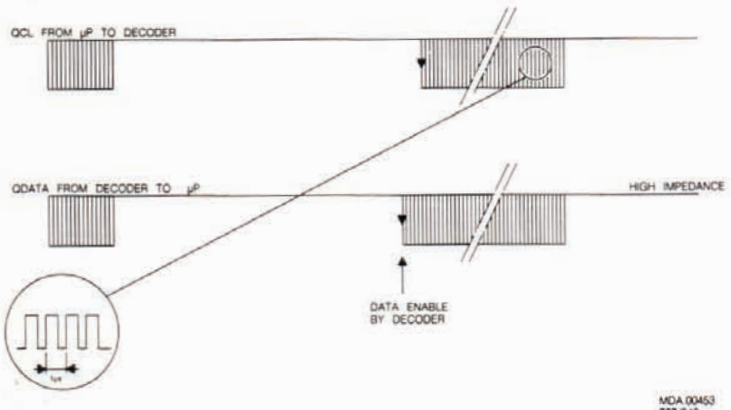
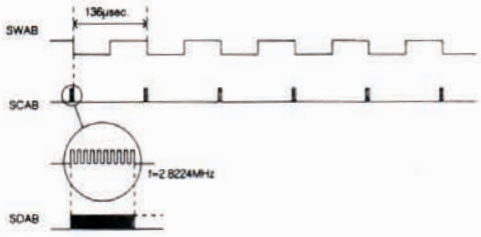


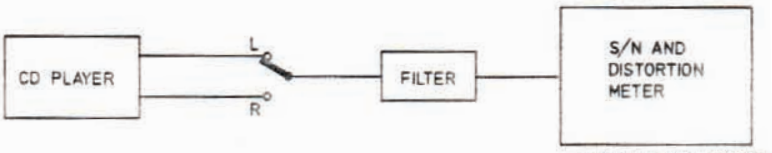




MDA.00239
T12/636

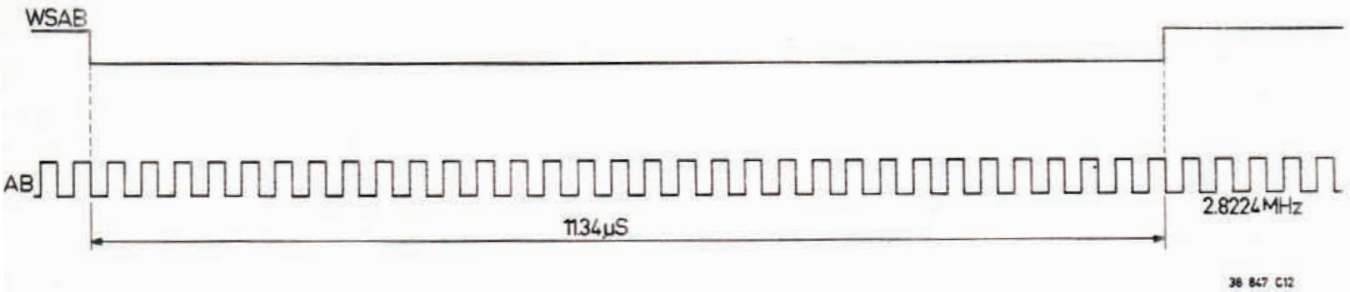
CD450

MDA.00453
T27/840

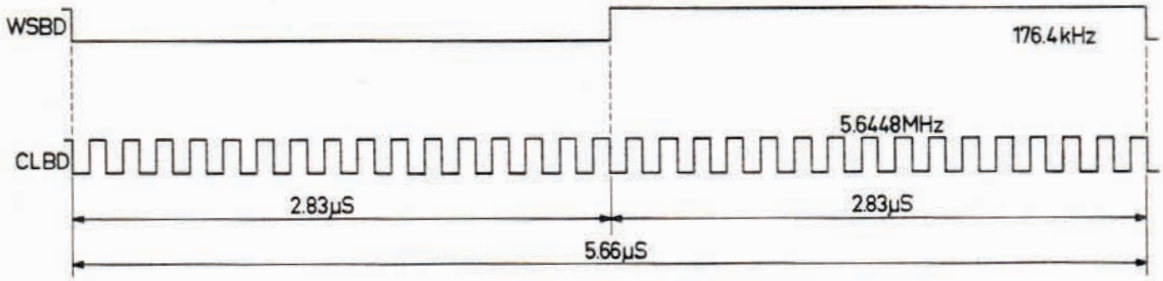


e.g. SOUND TECHNOLOGY ST 1700B

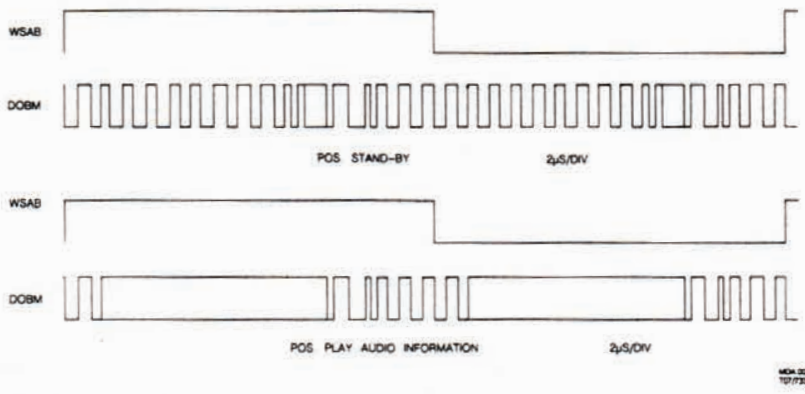
30 459 A12



36 847 C12



36 848 C12



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-22382M

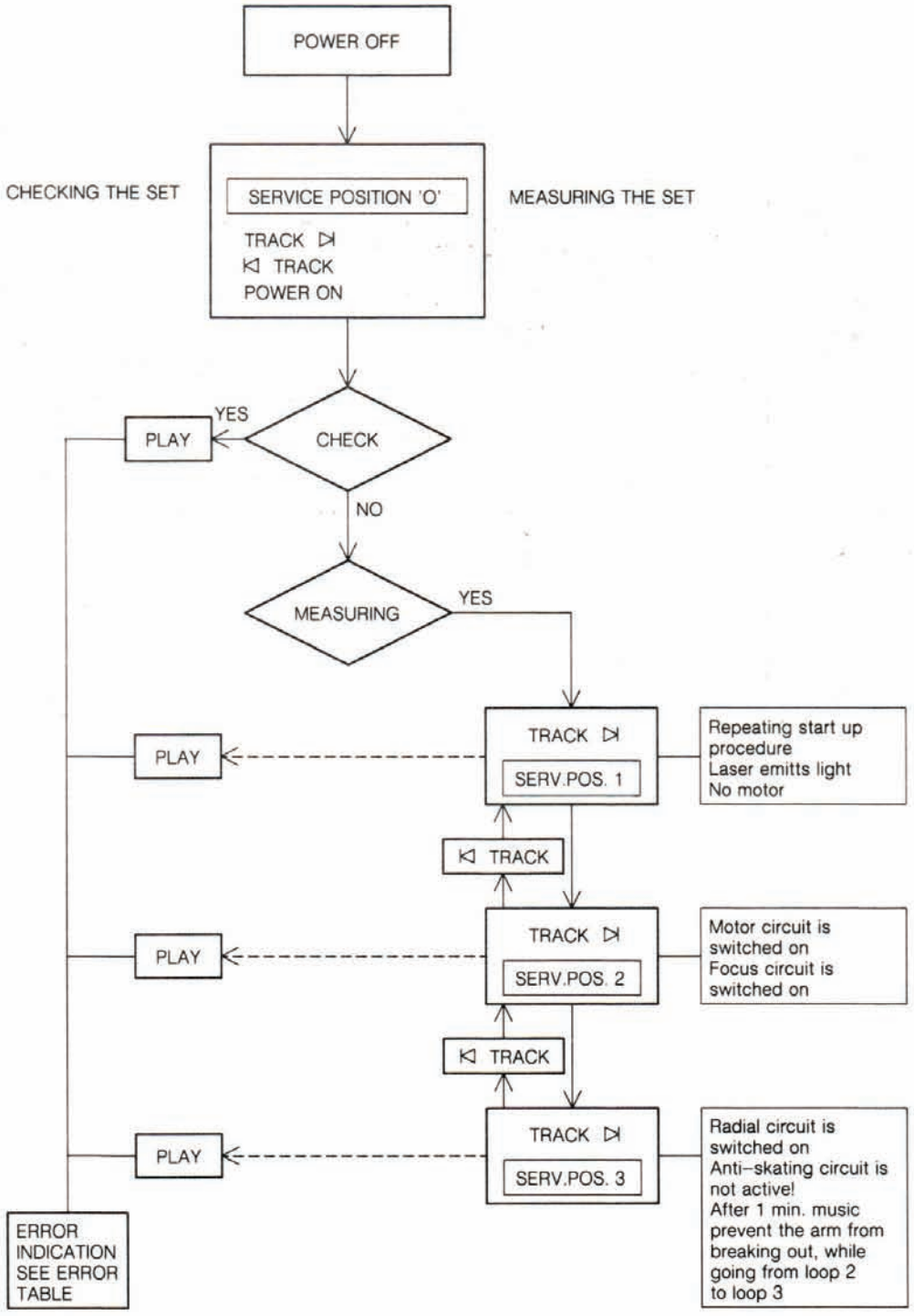
System errors

2 Focus error: no track loss
3 Radial start error: min excentricity point not found
6 TL error during jump: no positive TL or Rp edge during 60x8 milliseconds.
7 Subcode error: no valid subcode within 3 seconds.
8 TOC error: out of lead-in while reading TOC.

Operating errors

30 Next at a boarder when repeat is off.
31 Previous at a boarder when repeat is off.
34 No program.
35 Program memory full.
36 Programmed track is non excisting on this CD.
37 Selected track is non excisting on this CD.
40 Track key pressed when program of no valid track selection.
41 Track selected while program off.
56 AB key pressed while not in play mode.
60 Fast forward bound.
61 Fast reverse bound.

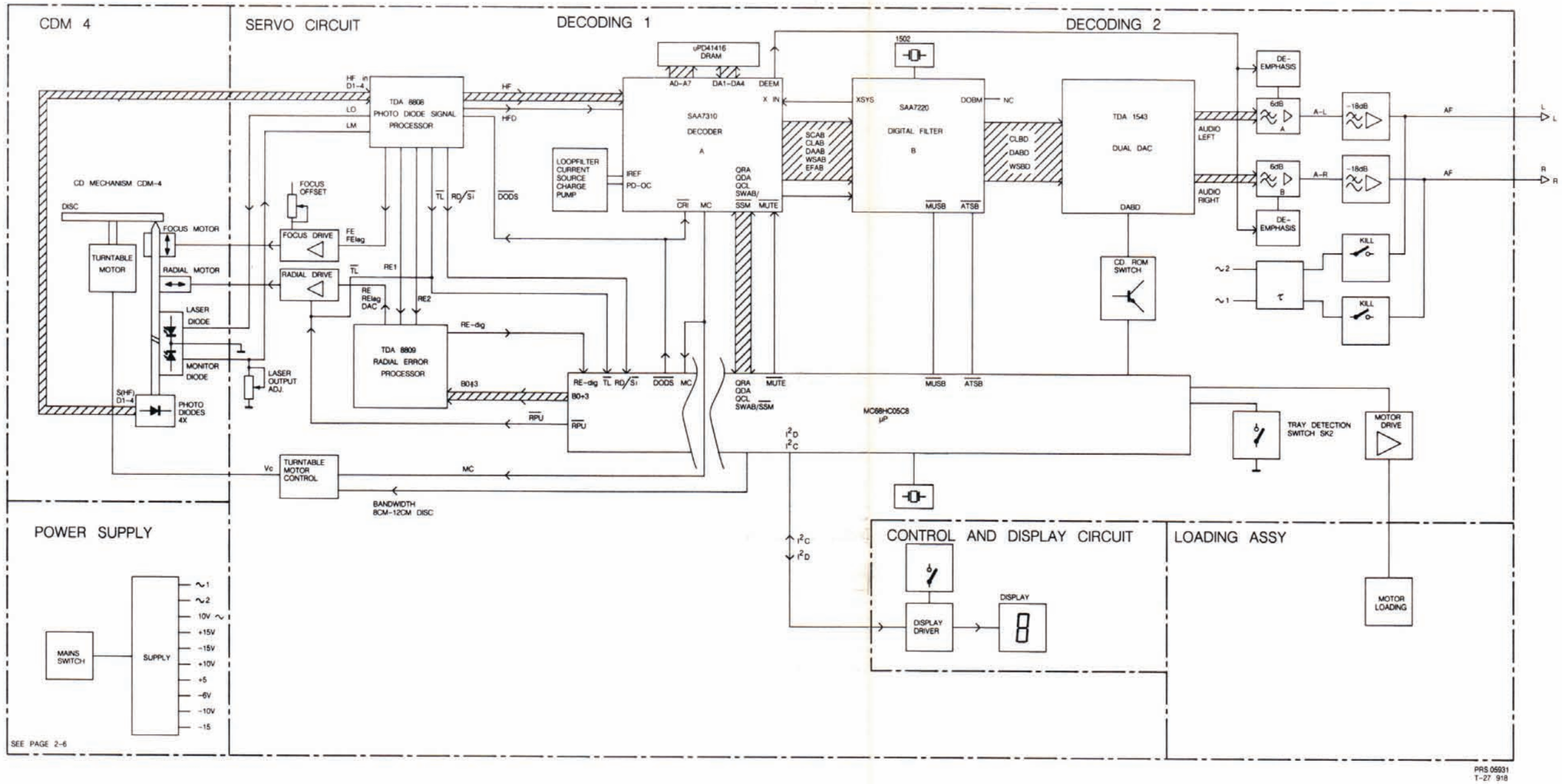
SERVICE LOOP



MDA.02157
T27/918

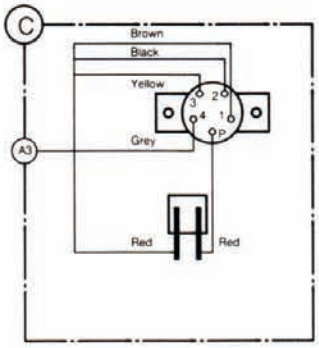
4-1

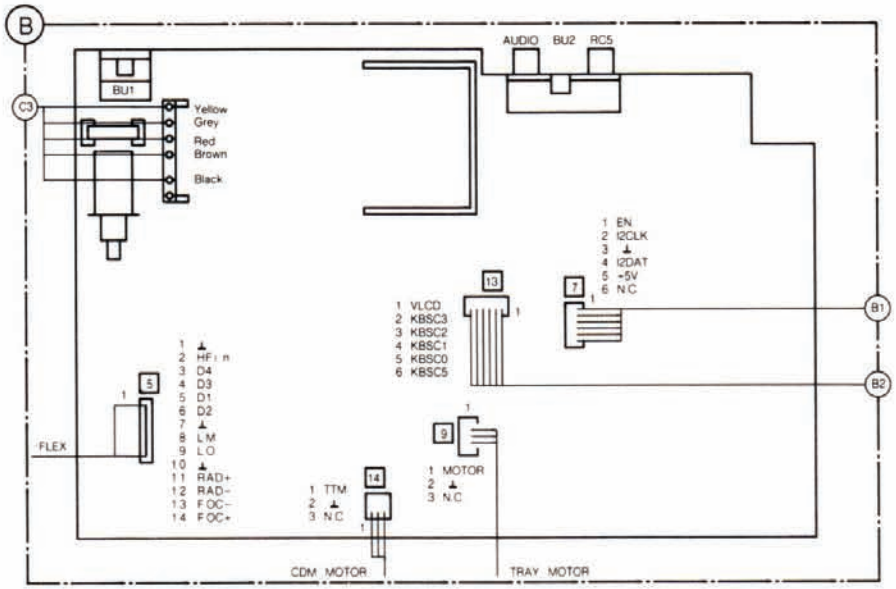
BLOCK DIAGRAM

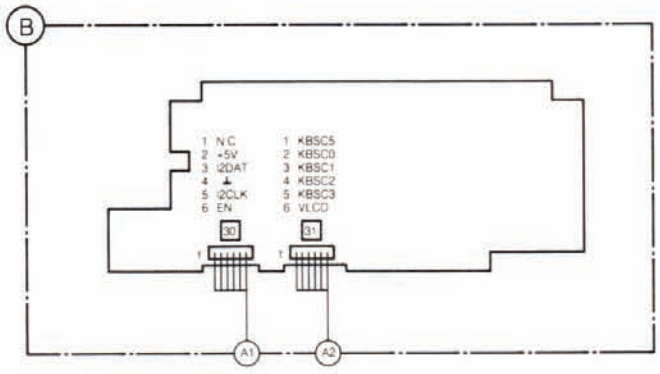


AGC	–	Automatic Gain Control
B0-B3	–	Control bits for radial circuit
BEQ	–	Equalizer reference current input
BGC	–	DC and LF gain control reference input
Cosc1	–	Capacitor wobble oscillator
Cosc2	–	Capacitor wobble oscillator
DEC	–	Decoupling input internal bypass
DET	–	HF detector voltage input
DIV4	–	Divide by 4 input
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/RD	–	On/off control for laser supply and focus circuit. Ready signal, Starting up procedure succesful.
TL	–	Track loss output signal
TTM–	–	Control voltage for turntable motor
TTM+	–	Control voltage for turntable motor
Vext–	–	Supply connection
Vext+	–	Supply connection
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
CREF	–	Reference Current
CRI	–	Counter Reset Inhibit
DAAB	–	Data signal Decoder-A to Filter-B
DABD	–	Data signal Filter-B to DAC
DEEM	–	Deemphasis
DOBM	–	Digital out signal
EFAB	–	Error flag Decoder-A to Filter-B
MUTE	–	Mute signal
MUSB	–	Soft Mute signal
PD/OC	–	Phase detector - oscillator control
KBSC..	–	Key board scan
VLCD	–	Voltage liquid cristal display
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/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

WIRING DIAGRAM

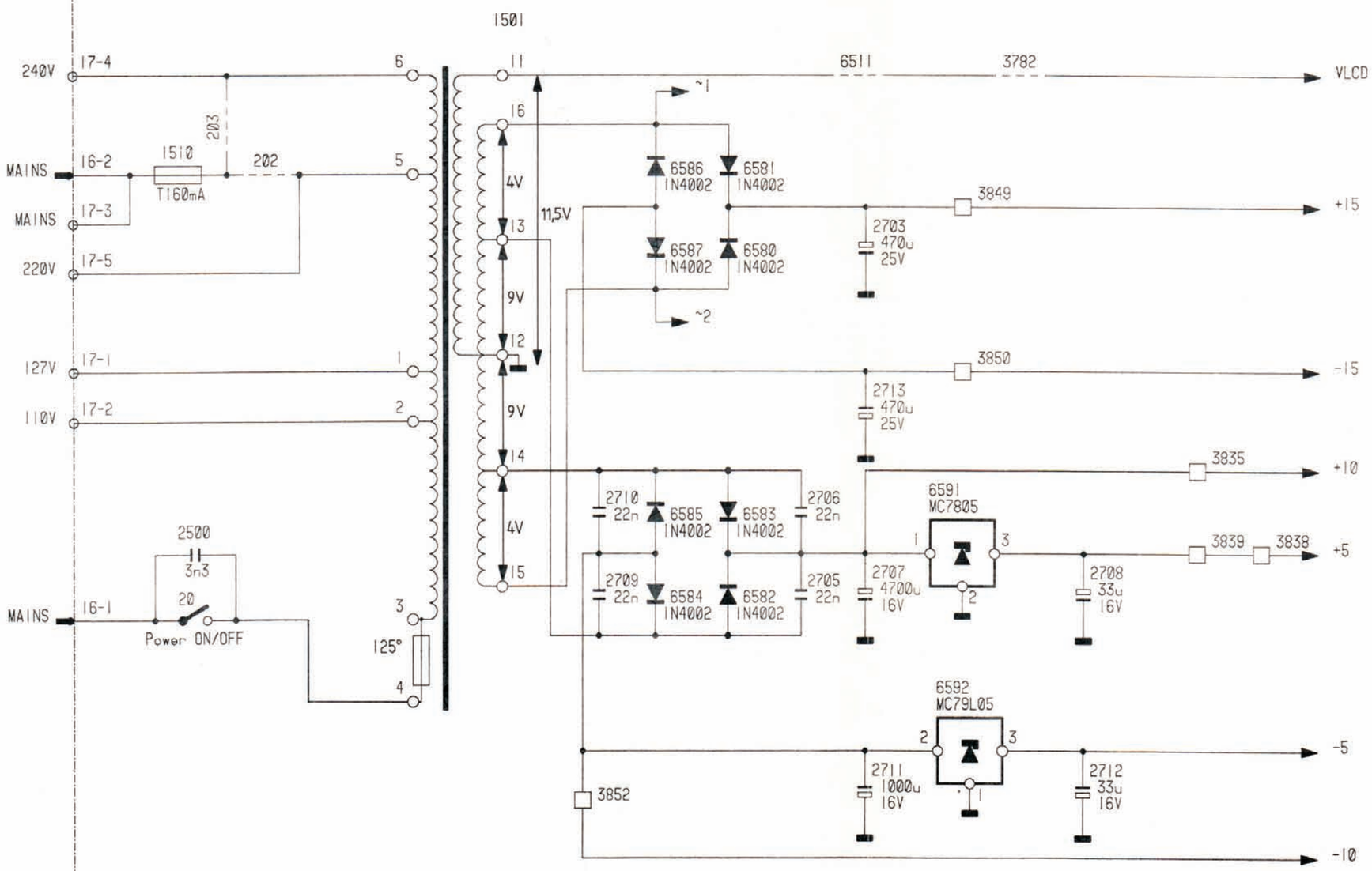






MDA 02380
T02/945

POWER SUPPLY

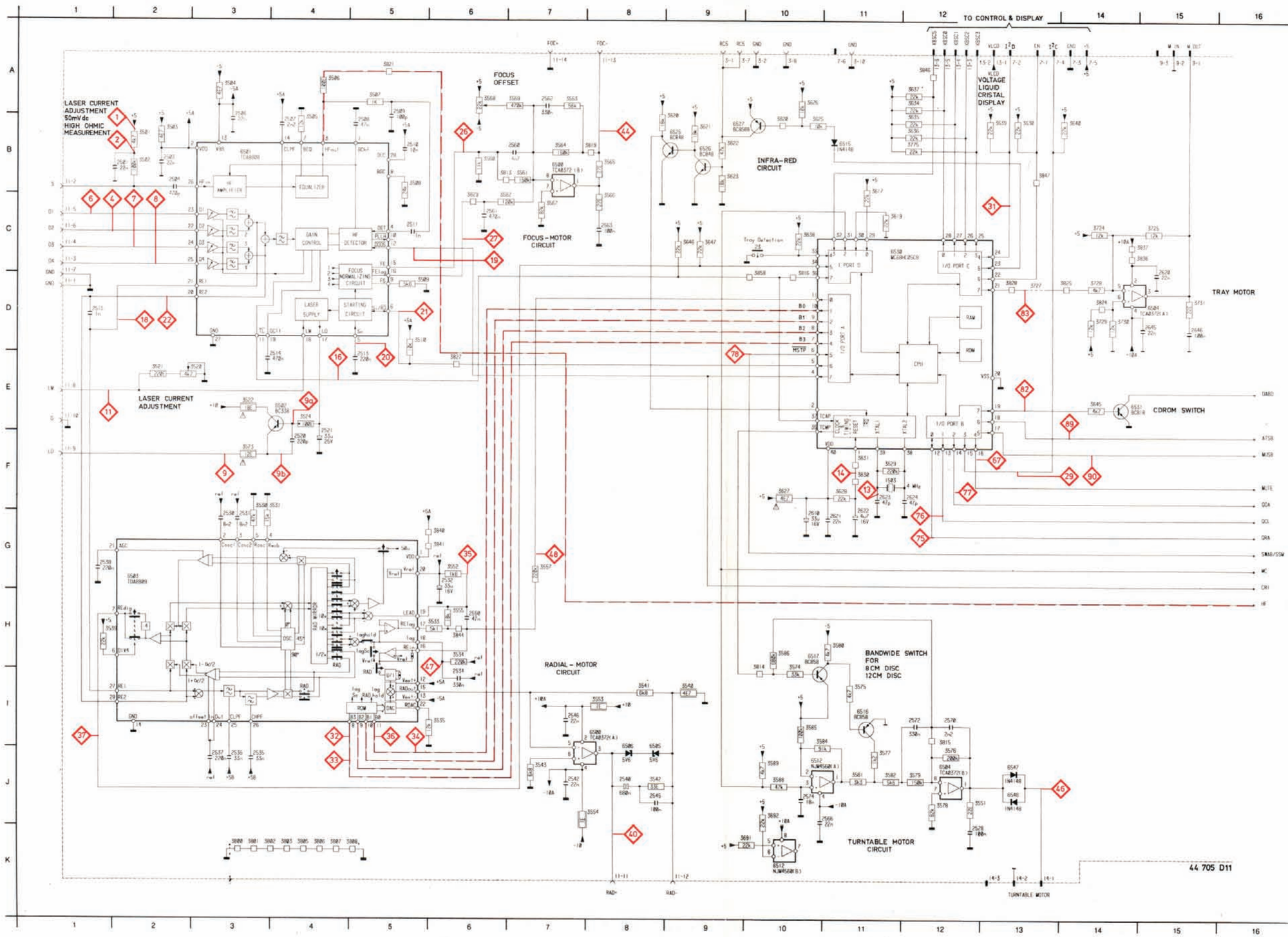


	/00R /60R	/05R /65R /70R
202	X	–
203	–	X

3999
220E

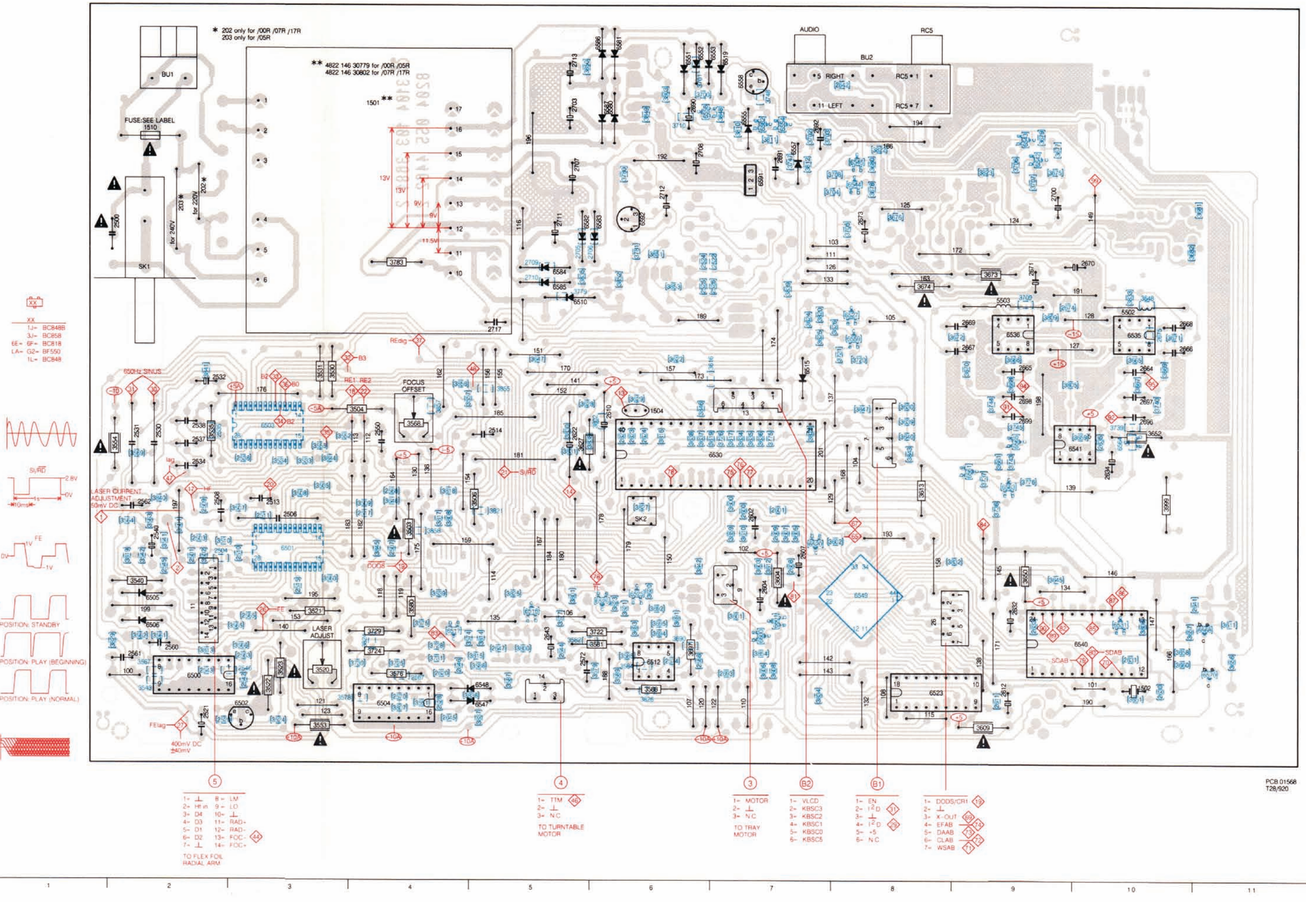
Resistor 3999 is an identification resistor for automatic measuring program selection.

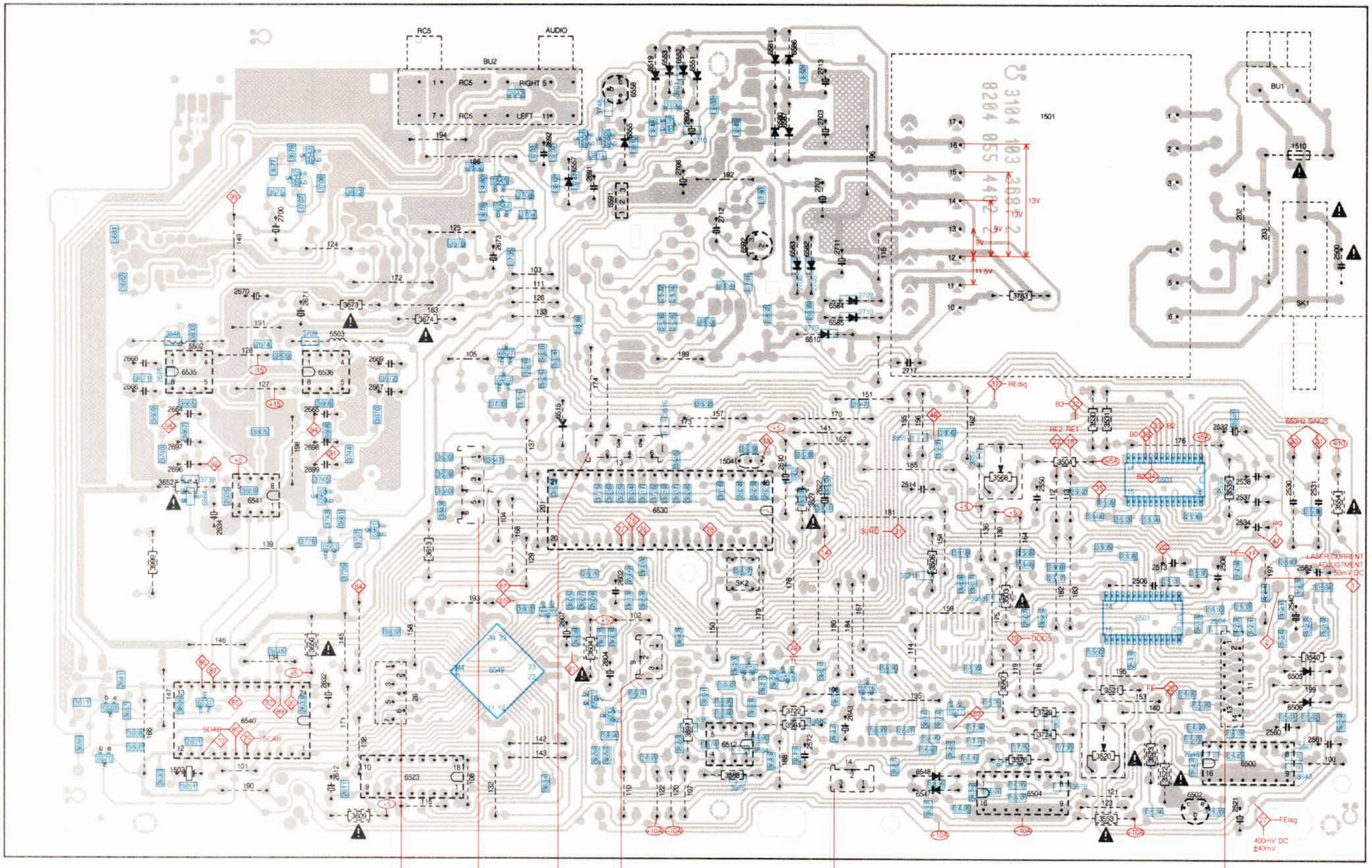
44 680 C11

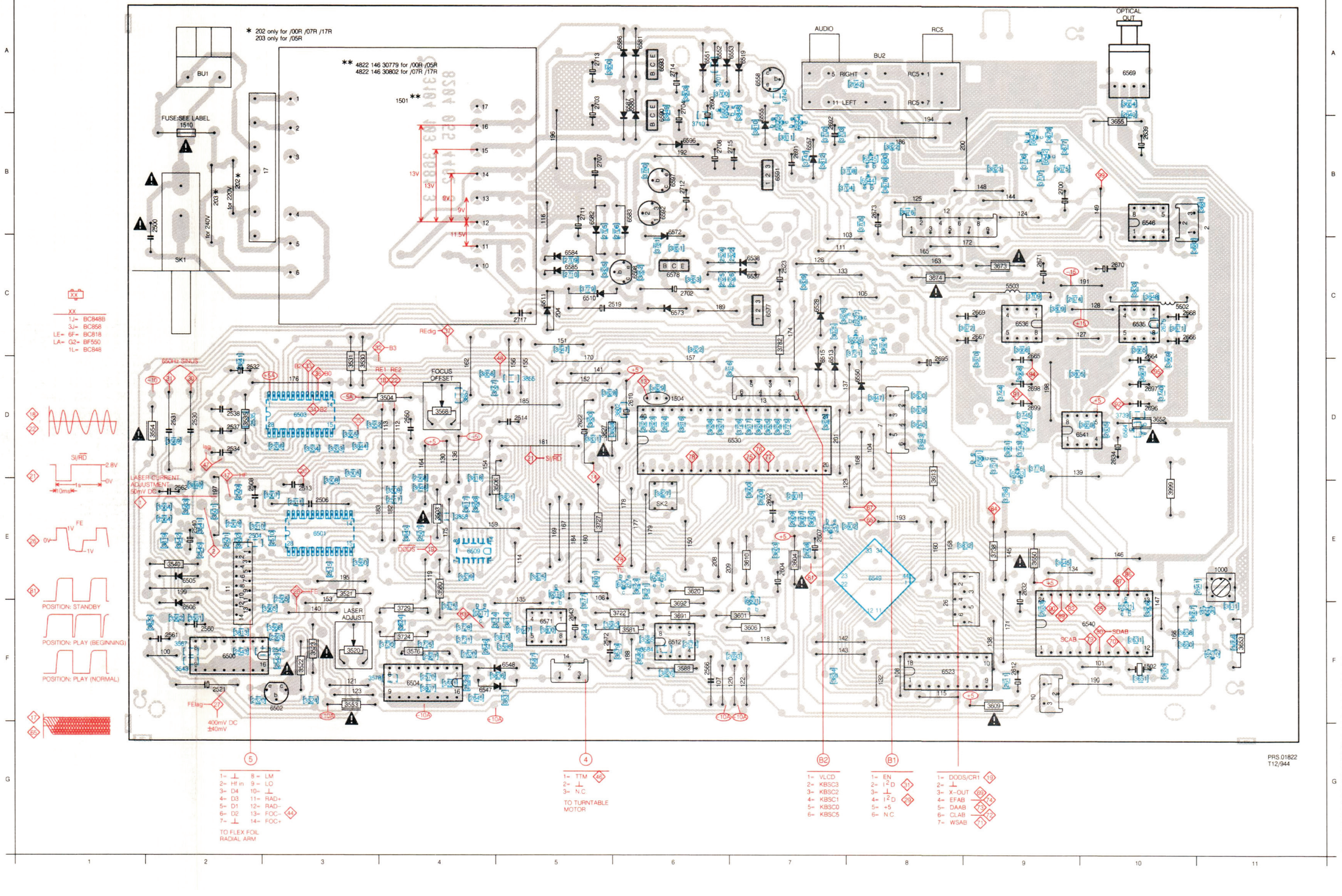


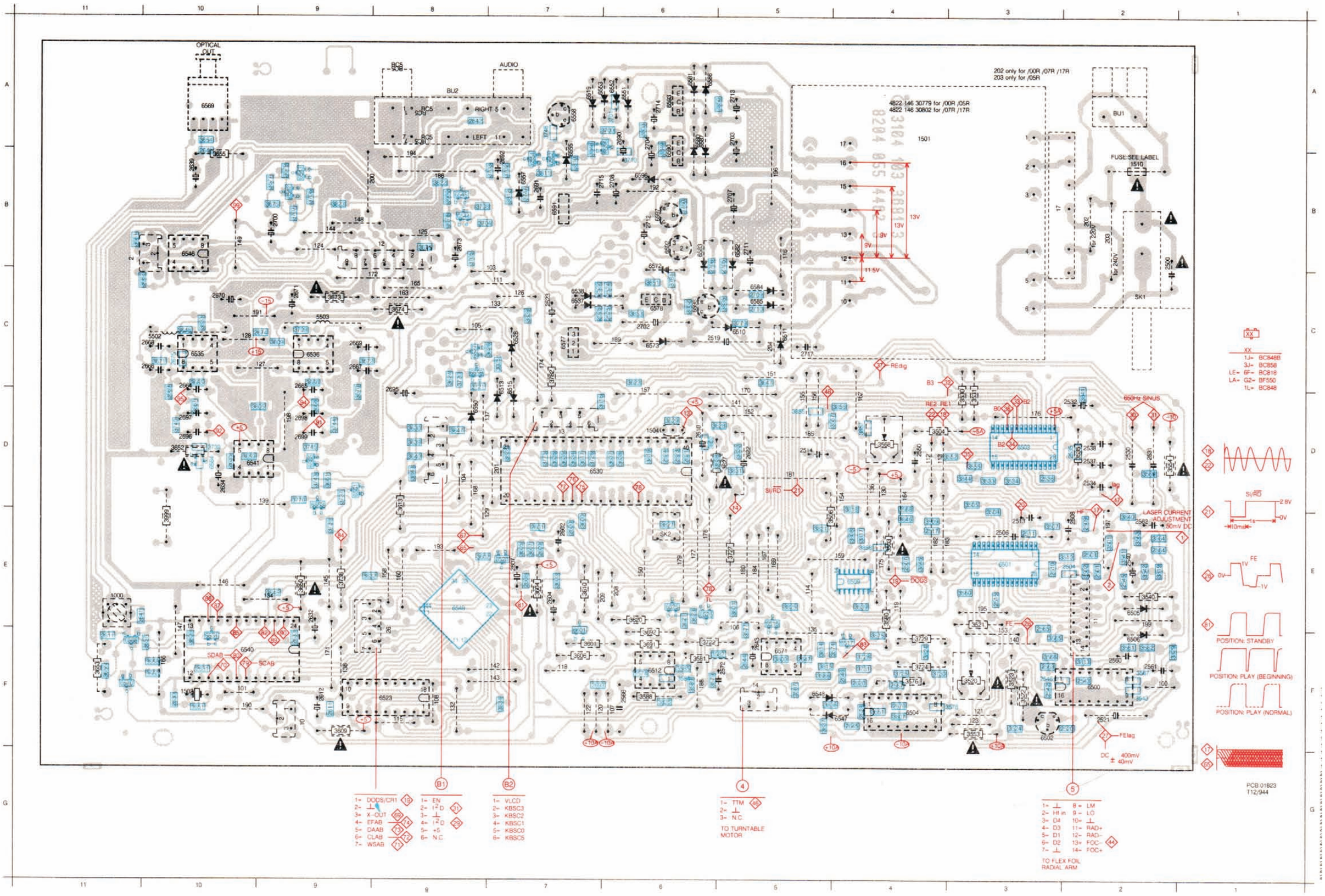
	1503	F11	3628	F11
	2501	B 2	3629	F11
	2503	B 2	3630	A13
	2504	B 2	3634	A12
	2506	A 3	3635	A12
	2507	A 4	3636	B12
A	2508	A 5	3637	A12
	2509	A 5	3638	C10
	2510	B 5	3639	A13
	2511	C 5	3640	A14
	2513	D 5	3645	E14
	2514	D 4	3646	C 9
	2515	D 1	3647	C 9
	2520	E 4	3691	K10
	2521	E 4	3692	J10
B	2528	J12	3724	C14
	2530	F 3	3725	C15
	2531	F 3	3727	D13
	2532	G 6	3728	C14
	2534	I 6	3729	D14
	2535	J 3	3730	D14
	2536	J 3	3731	D15
	2537	J 3	3775	B12
	2538	G 1	3800	K 3
	2540	J 8	3801	K 3
C	2542	J 7	3802	K 3
	2545	J 8	3803	K 4
	2546	I 7	3805	K 4
	2550	H 6	3806	K 4
	2560	B 7	3807	K 4
	2561	C 6	3808	K 5
	2562	A 7	3813	B 6
	2563	C 8	3814	H10
	2566	J11	3815	I 12
D	2570	I 12	3816	C10
	2572	I 12	3819	B 8
	2574	J10	3820	A10
	2610	F10	3821	A 5
	2620	C15	3824	D14
	2621	F11	3825	C14
	2622	F11	3827	D 6
	2623	F11	3828	C13
	2624	F12	3829	B 6
	2645	D15	3830	F11
E	2646	D15	3831	F11
	3501	B 2	3836	C15
	3502	B 2	3837	C15
	3503	B 2	3840	G 6
	3504	A 3	3841	G 6
	3505	A 4	3844	H 6
	3506	A 4	3846	A12
	3507	A 5	3847	B13
	3508	B 5	3858	C10
F	3509	C 5	6500	B 7
	3510	D 5	6500	I 8
	3520	E 3	6501	B 3
	3521	E 2	6502	E 4
	3522	E 3	6503	G 2
	3523	F 3	6504	D15
	3524	E 4	6504	J12
	3530	F 3	6505	I 8
	3531	F 4	6506	I 8
	3533	H 6	6512	J10
G	3534	H 6	6512	K10
	3535	I 6	6515	B11
	3539	H 1	6516	I 11
	3540	I 9	6517	H10
	3541	I 8	6525	B 9
	3542	J 8	6526	B 9
	3543	J 7	6527	A 9
	3551	J13	6530	C11
	3552	G 6	6531	E15
H	3553	I 8	6547	J13
	3554	J 8	6548	J13
	3555	H 6		
	3557	G 7		
	3560	B 6		
	3561	B 7		
	3562	B 7		
	3563	A 7		
	3564	B 7		
	3565	B 8		
I	3566	B 8		
	3567	B 7		
	3568	A 6		
	3569	A 7		
	3574	H10		
	3575	I 11		
	3576	I 12		
	3578	J12		
	3579	J12		
J	3580	H11		
	3581	J11		
	3582	J11		
	3584	I 11		
	3585	I 10		
	3586	H10		
	3588	J10		
	3589	J10		
	3617	B11		
K	3619	C11		
	3620	A 9		
	3621	A 9		
	3622	B 9		
	3623	B 9		
	3625	A10		
	3626	A10		
	3627	F10		

MAINS PANEL COMPONENT SIDE FOR PANELS MARKED WITH 3104 103 3681.2



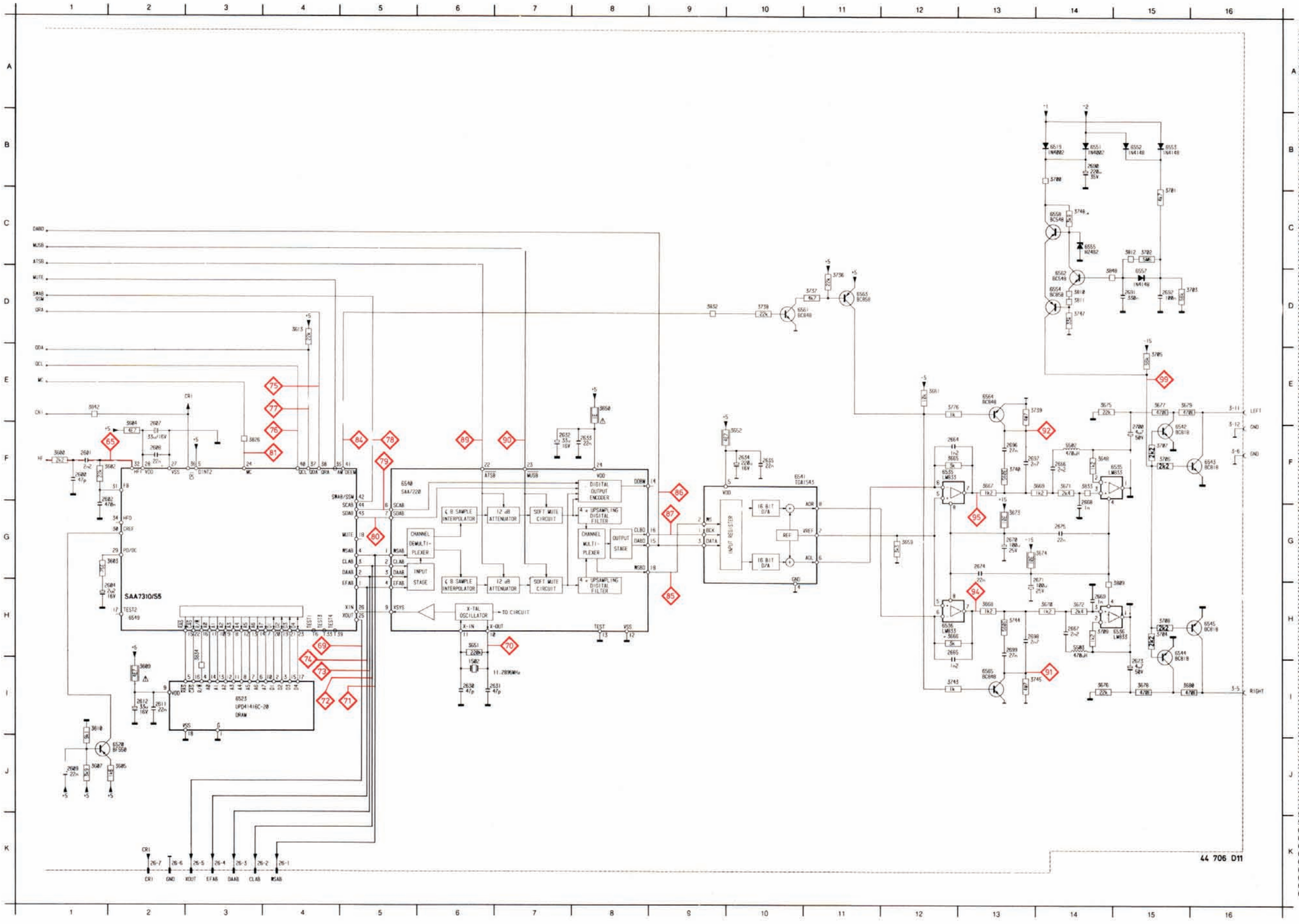

BU2
RC5
AUDIO
RIGHT 5
LEFT 11
BU1
1501
1510
SK1
SK2
13V
9V
3V
11.5V
REdig
650Hz SINUS
LASER CURRENT ADJUSTMENT 50mV DC
FE
FEdig
400mV DC ±40mV
SDAB
SCAB
DOD3
B1
B2
3
4
5
1= DODS/CRT
2= ⊥
3= X-OUT
4= EFAB
5= DAAB
6= CLAB
7= WSAB
1= EN
2= I²D
3= ⊥
4= I²D
5= +5
6= N.C
1= VLCD
2= KBSC3
3= KBSC2
4= KBSC1
5= KBSC0
6= KBSC5
1= MOTOR
2= ⊥
3= N.C
TO TRAY MOTOR
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= LO
10= ⊥
11= RAD-
12= RAD+
13= FOC-
14= FOC+
TO FLEX FOIL RADIAL ARM
XX
1J= BC848B
3J= BC858
6E= 6F= BC818
LA= G2= BF550
1L= BC848
Si/RD
2.8V
0V
1s
≈10ms
FE
1V
0V
-1V
POSITION: STANDBY
POSITION: PLAY (BEGINNING)
POSITION: PLAY (NORMAL)
PRS.01569
T28/920


* 202 only for /00R /07R /17R
203 only for /05R
** 4822 146 30779 for /00R /05R
4822 146 30802 for /07R /17R
BU1
FUSE: SEE LABEL
1510
SK1
for 240V
for 220V
AUDIO
RC5
BU2
RIGHT
LEFT
OPTICAL OUT
6569
3655
2639
FOCUS OFFSET
LASER CURRENT ADJUSTMENT 50mV DC
LASER ADJUST
SK2
SCAB
SDAB
REdig
FEdig
FElag
400mV DC ±40mV
50Hz SINUS
SI/RD
2.8V
0V
1s
10ms
FE
1V
0V
-1V
POSITION: STANDBY
POSITION: PLAY (BEGINNING)
POSITION: PLAY (NORMAL)
XX
1J= BC848B
3J= BC858
LE= 6F= BC818
LA= G2= BF550
1L= BC848
5 (1= ⊥ 2= Hf in 3= D4 4= D3 5= D1 6= D2 7= ⊥ 8= LM 9= LO 10= ⊥ 11= RAD+ 12= RAD- 13= FOC- 14= FOC+)
TO FLEX FOIL RADIAL ARM
4 (1= TTM 2= ⊥ 3= N.C.)
TO TURNTABLE MOTOR
B2 (1= VLCD 2= KBSC3 3= KBSC2 4= KBSC1 5= KBSC0 6= KBSC5)
B1 (1= EN 2= I²D 3= ⊥ 4= I²D 5= +5 6= N.C.)
(1= DODS/CR1 2= ⊥ 3= X-OUT 4= EFAB 5= DAAB 6= CLAB 7= WSAB)
PRS.01822
T12/944


OPTICAL OUT
6569
BCS SCS
AUDIO
BU2
RIGHT 5
LEFT 11
202 only for /00R /07R /17R
203 only for /05R
4822 146 30779 for /00R /05R
4822 146 30802 for /07R /17R
1501
BU1
FUSE:SEE LABEL
1510
5K1
13V
9V
11.5V
REdig
650Hz SINUS
SI/RD
2.8V
0V
10ms
LASER CURRENT ADJUSTMENT
50mV DC
FE
1V
-1V
DOOS
POSITION: STANDBY
POSITION: PLAY (BEGINNING)
POSITION: PLAY (NORMAL)
FElag
DC ± 400mV 40mV
SDAB
SCAB
PCB 01823
T12/944
1= DOOS/CR1
2= ⊥
3= X-OUT
4= EFAB
5= DAAB
6= CLAB
7= WSAB
B1
1= EN
2= I²D
3= ⊥
4= I²D
5= +5
6= N.C.
B2
1= VLCD
2= KBSC3
3= KBSC2
4= KBSC1
5= KBSC0
6= KBSC5
4
1= TTM
2= ⊥
3= N.C.
TO TURNTABLE MOTOR
5
1= ⊥
2= HI in
3= D4
4= D3
5= D1
6= D2
7= ⊥
8= LM
9= LO
10= ⊥
11= RAD+
12= RAD-
13= FOC-
14= FOC+
TO FLEX FOIL RADIAL ARM
XX
1J= BC848B
3J= BC858
LE= 6F= BC818
LA= G2= BF550
1L= BC848

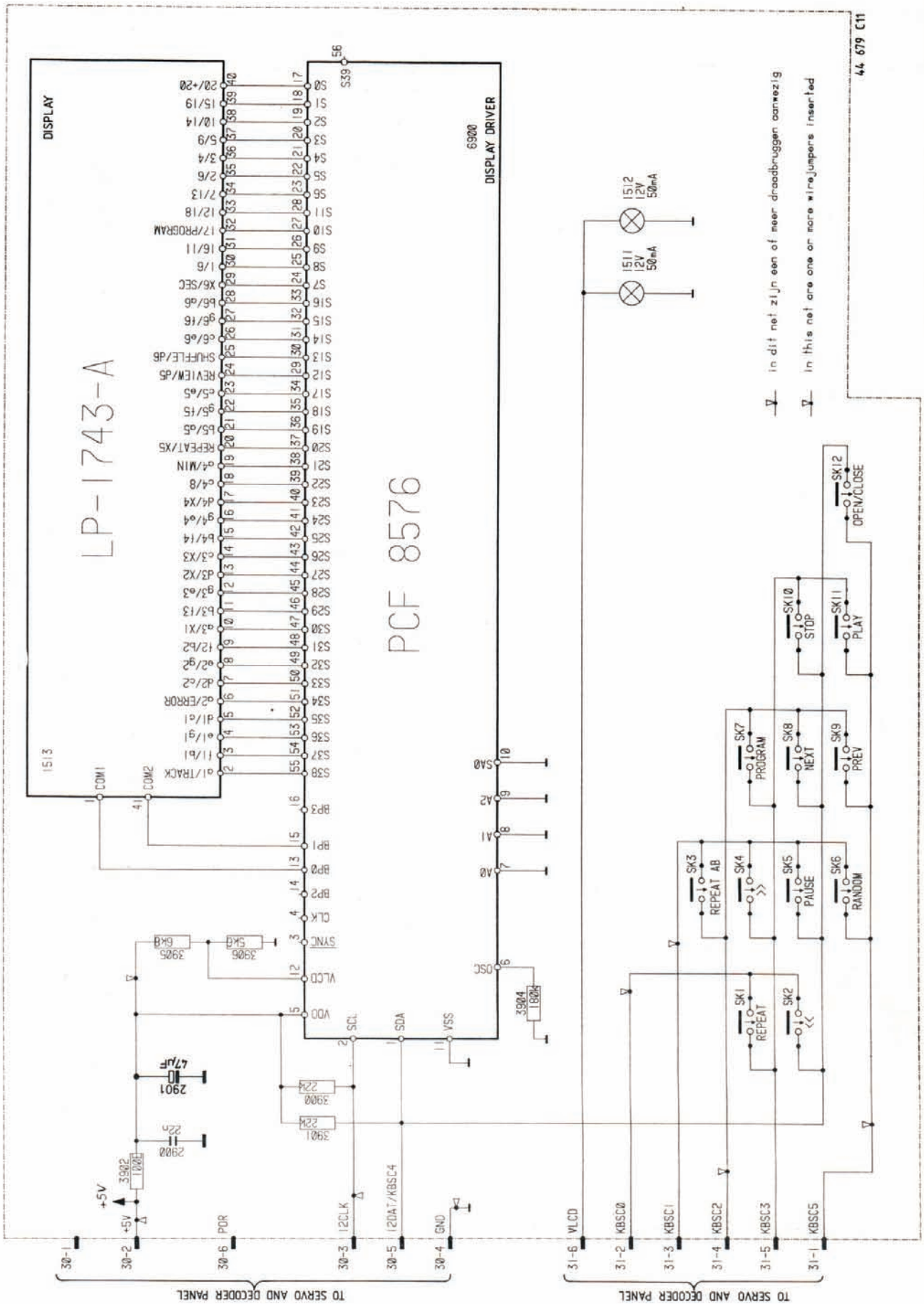
100	F 2	2531	D 2	3567	F 2	3779	C 5	6592	B 6		
101	F10	2532	D 2	3568	D 4	3780	B 6	6600	F 7		
102	E 7	2534	D 2	3569	D 2	3781	C 6	6601	F 7		
103	B 8	2535	D 2	3574	F 4	3783	C 4	7	D 8		
104	D 8	2536	D 3	3575	F 4	3800	F 5	9	E 7		
105	C 8	2537	D 2	3576	F 4	3801	E 5	BU1	A 2		
106	E 5	2538	D 2	3577	E 5	3802	D 6	BU2	A 8		
107	F 6	2540	E 2	3578	F 3	3803	A 6	SK1	C 2		
108	F 8	2542	F 3	3579	F 6	3805	D10	SK2	E 6		
110	F 7	2543	F 2	3580	E 4	3806	F10				
111	C 7	2545	E 2	3581	F 6	3807	F 4				
112	D 4	2546	F 3	3582	F 5	3808	E 4				
113	D 4	2550	D 4	3584	F 6	3809	C 9				
114	E 5	2560	F 2	3585	F 6	3810	B 7				
115	F 8	2561	F 2	3586	F 5	3811	B 7				
116	B 5	2562	E 2	3587	F 5	3812	B 7				
118	E 4	2563	F 3	3588	F 6	3813	F 2				
119	E 4	2565	E 3	3589	F 6	3814	F 5				
120	F 6	2566	F 6	3600	E 7	3815	F 5				
121	F 3	2567	F 4	3601	E 7	3816	D 6				
122	F 7	2568	D 4	3602	E 8	3817	E 4				
123	F 3	2570	F 4	3603	E 7	3818	D 4				
124	B 9	2572	F 5	3604	E 7	3819	E 2				
125	B 8	2574	F 6	3605	E 7	3820	C 7				
126	C 7	26	E 8	3606	F 7	3821	E 5				
127	C10	2600	E 7	3607	E 7	3822	B 8				
128	C10	2601	E 7	3608	F 7	3823	B 9				
129	E 7	2602	E 7	3609	F 9	3824	F 4				
130	D 4	2604	E 7	3610	E 7	3825	E 5				
132	F 8	2607	E 7	3611	F11	3826	F 6				
133	C 7	2608	E 7	3612	E 7	3827	E 6				
134	E 9	2609	E 7	3613	D 8	3828	D 7				
135	E 5	2610	D 6	3616	C 7	3829	F 2				
136	D 4	2611	F 9	3617	D 7	3830	D 5				
137	D 7	2612	F 9	3619	D 7	3831	D 5				
138	F 9	2620	F 4	3620	E 6	3832	E 9				
139	D 9	2621	D 6	3621	E 6	3833	C10				
140	F 3	2622	D 5	3622	C 6	3834	F 7				
141	D 5	2623	D 6	3623	E 6	3835	C 5				
142	F 7	2624	D 6	3624	C 7	3836	F 5				
143	F 7	2630	F10	3625	C 7	3837	F 5				
145	E 9	2631	F10	3626	C 8	3838	D 6				
146	E10	2632	E 9	3627	D 5	3839	C 7				
147	F10	2633	F 9	3628	D 6	3840	E 2				
149	B10	2634	D10	3629	D 6	3841	D 2				
150	E 6	2635	D10	3630	D 8	3842	E 6				
151	C 5	2641	E11	3634	D 7	3843	D 8				
152	D 5	2642	A 8	3635	D 7	3844	D 3				
153	E 3	2643	F 5	3636	D 7	3845	E 4				
154	D 4	2644	F 5	3637	D 6	3846	D 6				
155	D 5	2645	F 4	3638	D 6	3847	D 8				
156	D 5	2646	F 4	3639	D 8	3848	A 7				
157	D 6	2647	F 5	3640	D 8	3849	A 6				
158	E 8	2664	C10	3645	E 9	3850	A 5				
159	E 4	2665	C 9	3646	E 4	3851	C 6				
162	D 4	2666	C10	3647	C 5	3852	C 6				
163	C 8	2667	C 9	3648	C10	3853	C 6				
164	D 4	2668	C10	3650	E 9	3854	F 7				
166	F10	2669	C 9	3651	F10	3855	D 5				
167	E 5	2670	C10	3652	D10	3856	D 4				
168	D 8	2671	C 9	3656	F11	3857	D 4				
170	D 5	2673	B 8	3657	F10	3858	E 4				
171	F 9	2674	C 9	3658	F10	3859	E 7				
172	C 9	2675	C10	3659	D10	3999	E10				
173	D 6	2690	A 6	3660	F10	5502	C10				
174	C 7	2691	B 7	3661	D 9	5503	C 9				
175	E 4	2692	B 7	3665	C10	6500	F 2				
176	D 3	2693	F 7	3666	C 9	6501	E 3				
178	E 6	2696	D10	3667	D10	6502	F 3				
179	E 6	2697	D10	3668	D 9	6503	D 3				
180	E 5	2698	D 9	3669	C10	6504	F 4				
181	D 5	2699	D 9	3670	C 9	6505	E 2				
182	E 4	2700	B 9	3671	C10	6506	F 2				
183	E 3	2703	A 5	3672	C 9	6510	C 5				
184	E 5	2705	C 5	3673	C 9	6512	F 6				
185	D 5	2706	C 6	3674	C 8	6515	C 7				
186	B 8	2707	B 5	3675	B 9	6516	E 5				
188	F 6	2708	B 6	3676	B 8	6517	F 4				
189	C 6	2709	C 5	3677	B 9	6519	A 7				
190	F10	2710	C 5	3678	B 8	6520	E 7				
191	C10	2711	B 5	3679	B 9	6523	F 8				
192	B 6	2712	B 6	3680	B 8	6525	E 6				
193	E 8	2713	A 5	3681	B11	6526	E 6				
194	B 8	2717	C 5	3682	C10	6527	C 8				
195	E 3	3501	E 2	3690	F 6	6530	D 7				
196	B 5	3502	E 2	3691	E 6	6531	F10				
197	E 2	3503	E 4	3692	E 6	6535	C10				
198	D 9	3504	D 4	3693	F 6	6536	C 9				
199	E 2	3505	D 3	3694	F 6	6540	F10				
201	D 7	3506	E 5	3695	F 6	6541	D10				
202	B 2	3507	E 3	3697	F 6	6542	B 9				
203	B 2	3508	E 3	3700	A 6	6543	B 9				
11	E 2	3509	E 4	3701	A 6	6544	B 8				
13	D 7	3510	E 2	3702	B 7	6545	B 8				
14	F 5	3520	F 3	3703	B 7	6547	F 5				
1501	A 4	3521	E 3	3704	B 8	6548	F 5				
1502	F10	3522	F 3	3705	B 8	6549	E 8				
1504	D 6	3523	F 3	3706	B 9	6551	A 6				
1510	B 2	3524	F 3	3707	B 9	6552	A 6				
2500	B 2	3530	D 3	3708	B 8	6553	A 7				
2501	E 2	3531	D 3	3709	C 9	6554	B 7				
2503	E 2	3533	D 3	3710	B 6	6555	A 7				
2504	E 2	3534	D 3	3720	C 8	6556	A 6				
2506	E 3	3535	D 2	3721	C 8	6557	B 7				
2507	E 4	3539	E 4	3722	F 6	6558	A 7				
2508	E 2	3540	E 2	3724	F 4	6559	C 8				
2509	E 2	3541	E 2	3725	F 4	6561	D 9				
2510	E 3	3542	E 2	3726	D 7	6562	B 7				
2511	E 3	3543	F 2	3728	F 4	6563	D 9				
2513	E 3	3551	F 4	3729	F 4	6564	D10				
2514	D 5	3552	D 3	3730	F 4	6565	D 9				
2515	E 3	3553	F 3	3731	F 4	6568	F11				
2517	E 4	3554	D 2	3736	E 9	6570	F11				
2520	F 2	3555	D 3	3737	D 9	6580	A 6				
2521	F 2	3557	D 4	3739	D10	6581	A 6				
2522	C 7	3560	E 3	3740	D10	6582	B 5				
2524	C 6	3561	F 2	3743	D 9	6583	B 6				
2525	C 6	3562	F 2	3744	D 9	6584	C 5				
2526	C 7	3563	E 2	3745	D 9	6585	C 5				
2528	F 4	3564	E 2	3747	B 7	6586	A 6				
2530	D 2	3565	F 3	3748	A 7	6587	A 6				
		3566	F 3	3775	D 7	6591	B 7				
				3776	D 9						

100	F 2	2515	E 3	3534	D 3	3728	F 4	6558	A 7		
101	F10	2517	E 4	3535	D 2	3729	F 4	6559	C 8		
103	B 8	2519	C 6	3539	E 4	3730	F 4	6561	D 9		
104	D 8	2520	F 2	3540	E 2	3731	F 4	6562	B 7		
105	C 8	2521	F 2	3541	E 2	3736	E 9	6563	D 9		
106	E 5	2522	C 7	3542	E 2	3737	D 9	6564	D10		
107	F 6	2523	C 7	3543	F 2	3738	E 9	6565	D 9		
108	F 8	2524	C 6	3551	F 4	3739	D10	6568	F11		
111	C 7	2525	C 6	3552	D 3	3740	D10	6569	A10		
112	D 4	2526	C 7	3553	F 3	3743	D 9	6570	F11		
113	D 4	2528	F 4	3554	D 2	3744	D 9	6571	F 5		
114	E 5	2530	D 2	3555	D 3	3745	D 9	6572	B 6		
115	F 8	2531	D 2	3557	D 4	3747	B 7	6573	C 6		
116	B 5	2532	D 2	3560	E 3	3748	A 7	6577	C 7		
119	E 4	2534	D 2	3561	F 2	3775	D 7	6578	C 6		
120	F 7	2535	D 2	3562	F 2	3776	D 9	6580	A 6		
121	F 3	2536	D 3	3563	E 2	3779	C 5	6581	A 6		
122	F 7	2537	D 2	3564	E 2	3780	B 6	6582	B 5		
123	F 3	2538	D 2	3565	F 3	3781	C 6	6583	B 6		
124	B 9	2540	E 2	3566	F 3	3782	C 7	6584	C 5		
125	B 8	2542	F 3	3567	F 2	3800	F 5	6585	C 5		
126	C 7	2543	F 2	3568	D 4	3801	E 5	6586	A 6		
127	C10	2545	E 2	3569	D 2	3802	D 6	6587	A 6		
128	C10	2546	F 3	3574	F 4	3803	A 6	6590	A 6		
129	E 7	2550	D 4	3575	F 4	3805	D10	6591	B 7		
130	D 4	2560	F 2	3576	F 4	3806	F10	6592	B 6		
132	F 8	2561	F 2	3577	E 5	3807	F 4	6593	A 6		
133	C 7	2562	E 2	3578	F 3	3808	E 4	6593	A 6		
134	E 9	2563	F 3	3579	F 5	3809	C 9	6596	B 6		
135	E 5	2564	E 2	3580	E 4	3810	B 7	6597	B 6		
136	D 4	2565	E 3	3581	F 6	3811	B 7	6598	C 6		
137	D 7	2566	F 6	3582	F 6	3812	B 7	6601	F 7		
138	F 9	2567	F 4	3584	F 6	3813	F 2	7	D 8		
139	D 9	2568	D 4	3585	F 6	3814	F 5	BU1	A 2		
140	F 3	2570	F 4	3586	F 5	3815	F 5	BU2	A 8		
141	D 5	2572	F 5	3587	F 5	3816	D 6	SK1	C 2		
142	F 7	2574	F 6	3588	F 6	3817	E 4	SK2	E 6		
143	F 7	26	E 8	3589	F 6	3818	D 4				
144	B 9	2600	E 7	3600	E 7	3819	E 2				
145	E 9	2601	E 7	3601	F 7	3821	E 5				
146	E10	2602	E 7	3602	E 8	3822	B 8				
147	F10	2604	E 7	3603	E 7	3823	B 9				
148	B 9	2607	E 7	3604	E 7	3824	F 4				
149	B10	2608	E 7	3605	E 7	3825	E 5				
150	E 6	2609	E 7	3606	F 7	3826	F 6				
151	C 5	2610	D 6	3607	E 7	3827	E 6				
152	D 5	2611	F 9	3609	F 9	3828	D 7				
153	E 3	2612	F 9	3610	E 7	3829	F 2				
154	D 4	2620	F 4	3611	F11	3830	D 5				
155	D 5	2621	D 6	3613	D 8	3831	D 5				
156	D 5	2622	D 5	3616	D 7	3832	E 9				
157	D 6	2623	D 6	3617	D 7	3833	C10				
158	E 8	2624	D 6	3620	E 6	3834	F 7				
159	E 4	2630	F10	3621	E 6	3835	C 5				
160	E 8	2631	F10	3622	C 6	3836	F 5				
162	D 4	2632	E 9	3623	E 6	3837	F 5				
163	C 8	2633	F 9	3624	C 8	3838	D 6				
164	D 4	2634	D10	3626	C 7	3839	C 7				
165	C 8	2635	D10	3627	D 5	3840	E 2				
166	F10	2639	B10	3628	D 6	3841	D 2				
167	E 5	2640	B10	3629	D 6	3843	D 8				
168	D 8	2641	E11	3630	D 8	3844	D 3				
169	E 5	2642	A 8	3634	D 7	3845	E 4				
170	D 5	2643	F 5	3635	D 7	3847	D 8				
171	F 9	2644	F 5	3636	D 7	3848	A 7				
172	C 9	2645	F 4	3637	D 6	3849	A 6				
174	C 7	2646	F 4	3638	D 6	3850	A 5				
175	E 4	2647	F 5	3639	D 8	3851	C 6				
176	D 3	2664	C10	3640	D 8	3852	C 6				
177	E 6	2665	C 9	3645	E 9	3853	C 6				
178	E 6	2666	C10	3646	E 4	3855	D 5				
179	E 6	2667	C 9	3647	C 5	3856	D 4				
180	E 5	2668	C10	3648	C10	3857	D 4				
181	D 5	2669	C 9	3650	E 9	3858	E 4				
182	E 4	2670	C10	3651	F10	3999	E10				
183	E 3	2671	C 9	3652	D10	5502	C10				
184	E 5	2673	B 8	3653	F11	5503	C 9				
185	D 5	2674	C 9	3654	A10	6500	F 2				
186	B 8	2675	C10	3655	B10	6501	E 3				
188	F 6	2690	A 6	3656	F11	6502	F 3				
189	C 6	2691	B 7	3657	F10	6503	D 3				
190	F10	2692	B 7	3658	F10	6504	F 4				
191	C10	2693	F 7	3659	D10	6505	E 2				
192	B 6	2695	D 8	3660	F10	6506	F 2				
193	E 8	2696	D10	3661	D 9	6509	E 4				
194	B 8	2697	D10	3665	C10	6510	C 5				
195	E 3	2698	D 9	3666	C 9	6511	C 5				
196	B 5	2699	D 9	3667	D10	6512	F 6				
197	E 2	2700	B 9	3668	D 9	6513	C 7				
198	D 9	2702	C 6	3669	C10	6515	C 7				
199	E 2	2703	A 5	3670	C 9	6516	E 5				
200	B 9	2704	A 6	3671	C10	6517	F 4				
201	D 7	2705	B 5	3672	C 9	6519	A 7				
202	B 2	2706	B 6	3673	C 9	6520	E 7				
203	B 2	2707	B 5	3674	C 8	6523	F 8				
10	F 9	2708	B 6	3675	B 9	6525	E 6				
1000	E11	2709	C 5	3676	B 8	6526	E 6				
11	E 2	2710	C 5	3677	B 9	6527	C 8				
118	F 7	2711	B 5	3678	B 8	6528	C 7				
12	B 8	2712	B 6	3679	B 9	6530	D 7				
13	D 7	2713	A 5	3680	B 8	6531	F10				
14	F 5	2714	A 6	3681	B11	6535	C10				
1501	A 4	2715	B 7	3682	C10	6536	C 9				
1502	F10	2717	C 5	3691	F 6	6537	C 7				
1504	D 6	3025	C 7	3692	F 6	6538	C 7				
1510	B 2	3501	E 2	3700	A 6	6540	F10				
17	B 3	3502	E 2	3701	A 6	6541	D10				
2	B11	3503	E 4	3702	B 7	6542	B 9				
204	C 5	3504	D 4	3703	B 7	6543	B 9				
208	E 6	3505	D 3	3704	B 8	6544	B 8				
209	E 6	3506	E 5	3705	B 8	6545	B 8				
2500	B 2	3507	E 3	3706	B 9	6546	B10				
2501	E 2	3508	E 3	3707	B 9	6547	F 4				
2503	E 2	3509	E 4	3708	B 8	6548	F 5				
2504	E 2	3510	E 2	3709	C 9	6549	E 8				
2506	E 3	3520	F 3	3710	B 6	6550	D 8				
2507	E 4	3521	E 3	3720	C 8	6551	A 6				
2508	E 2	3522	F 3	3721	C 8	6552	A 6				
2509	E 2	3523	F 3	3722	F 6	6553	A 7				
2510	E 3	3524	F 3	3724	F 4	6554	B 7				
2511	E 3	3530	D 3	3725	F 4	6555	A 7				
2513	E 3	3531	D 3	3726	D 7	6556	A 6				
2514	D 5	3533	D 3	3727	E 5	6557	B 7				

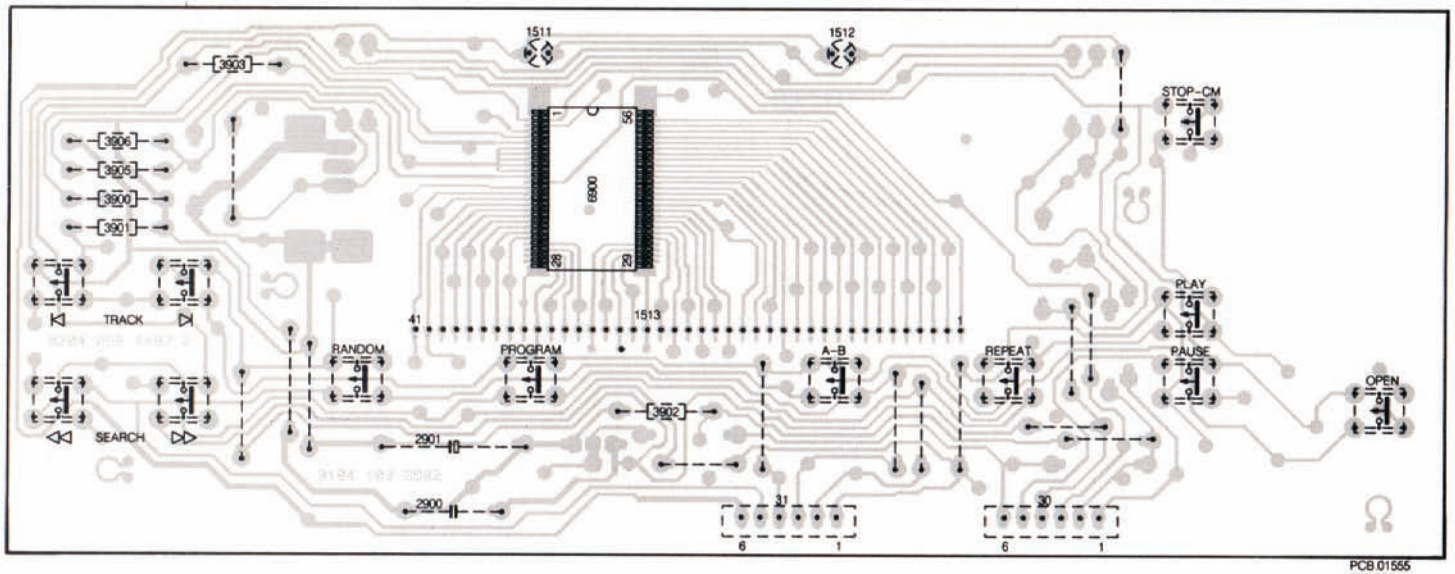


	1502	I 6	6542	E15
	2600	F 1	6543	F16
	2601	F 1	6544	H15
	2602	F 2	6545	H16
	2604	H 2	6549	H 2
	2607	E 2	6551	B14
A	2608	F 2	6552	B15
	2609	J 1	6553	B15
	2611	I 2	6554	D14
	2612	I 2	6555	C14
	2630	I 6	6557	C15
	2631	I 7	6558	C14
	2632	F 7	6561	D11
	2633	F 8	6562	D14
	2634	F10	6563	D11
	2635	F10	6564	E13
B	2664	F12	6565	I 13
	2665	H12		
	2666	F14		
	2667	H14		
	2668	F14		
	2669	H14		
	2670	G13		
	2671	G14		
	2673	H15		
C	2674	G13		
	2675	G14		
	2690	B14		
	2691	D15		
	2692	D15		
	2696	F13		
	2697	F14		
	2698	H14		
	2699	H13		
	2700	E15		
D	3600	F 1		
	3602	F 2		
	3603	G 2		
	3604	F 2		
	3605	J 2		
	3607	J 1		
	3609	I 2		
	3610	I 1		
	3613	D 4		
E	3648	F14		
	3650	E 8		
	3651	H 6		
	3652	F10		
	3659	G12		
	3661	E12		
	3665	F12		
	3666	H12		
	3667	F13		
	3668	H13		
F	3669	F14		
	3670	H14		
	3671	F14		
	3672	H14		
	3673	G13		
	3674	G14		
G	3674	G14		
	3675	E14		
	3676	I 14		
	3677	E15		
	3678	I 15		
	3679	E15		
	3680	I 16		
	3700	B14		
	3701	B15		
	3702	C15		
	3703	D16		
	3704	H15		
	3705	E15		
	3706	F15		
H	3707	F15		
	3708	H15		
	3709	H14		
	3736	D11		
	3737	D11		
	3738	D10		
	3739	E14		
	3740	F13		
	3743	I 12		
	3744	H13		
I	3745	I 14		
	3747	D14		
	3748	C14		
	3776	E12		
	3809	H15		
	3810	D14		
	3811	D14		
	3812	C15		
	3824	E 1		
J	3826	F 3		
	3832	D 9		
	3833	F14		
	3834	H 3		
	3848	C14		
	5502	F14		
	5503	H14		
	6519	B14		
	6520	J 2		
	6523	I 3		
K	6535	F12		
	6535	F15		
	6536	H12		
	6536	H15		
	6540	F 5		
	6541	F10		

CONTROL AND DISPLAY CIRCUIT



CONTROL AND DISPLAY PANEL



CONTROL & DISPLAY PARTS

ICPCF8576T	5322 209 11129
Tackt switch	4822 276 12465
Lamp 12V-50mA	4822 134 40944
Display	4822 130 90662
47µF 25V	4822 124 22027
22nF 16V	4822 122 10166
22K	4822 116 52463
100E	4822 116 52389
180K	4822 116 52502
6k8	4822 116 52441
5k6	4822 116 53027

ELECTRICAL PARTSLIST SERVO + DECODER PANEL

For non active chip components see separate list

MN4264-15	4822 209 70422
MC79L09AC	4822 209 73233
MC79M15CT	5322 209 86361
MC7905CT	4822 209 73233
TY40408 (+5V)	4822 209 71579
MC78M15	4822 209 80808
TDA8808T	4822 209 73234
TDA8809T/C2	4822 209 73235
SAA7310GP/S5	4822 209 61759
µPD41416C-20	4822 209 50582
SAA7220	4822 209 11157
TDA1543	4822 209 73236
LM833N	4822 209 83163
NJM4560D	4822 209 83274
TCA0372DP2	4822 209 72587
MC68HC05C8P	4822 209 61011

BC858	5322 130 41983
BC848C	5322 130 42136
BC848	4822 130 61207
BC328-16	4822 130 41023
BC328	4822 130 44104
BC338	4822 130 44121
BC558B	4822 130 44197
BC858 Ⓒ	5322 130 42012
BC848	5322 130 41981
BC818	4822 130 42675
BF550	4822 130 42131
BC548	4822 130 40938

Miscellaneous

Spring clip	4822 255 40179
Cinch socket	4822 267 40766
Switch (tray)	4822 276 12523
Mains switch	4822 276 11309
Mains inlet	4822 265 20291
Phone socket	4822 267 30743
Fuse holder	4822 256 30274
Mains transformer	4822 146 30701
Fuse T160mA	4822 253 30009
Voltage selector	4822 277 21366
Safety cover	4822 462 41505
Fuse carrier	4822 255 41023
Mains transformer/61R	4822 146 21489

3,3nF	400 V ⚠	4822 122 40327
3,3nF		4822 126 10005
22nF		4822 122 10166
1nF		4822 122 31746
220nF	63V	4822 121 42245
470nF	100V	4822 121 51252
8,2µF	63V	4822 121 51321
3,3nF	63V	5322 122 31848
4,7nF		4822 121 51314
1,2nF		4822 121 51309
330nF		5322 121 42661
4,7µF	50V	4822 124 41577
6,8µF	50V	4822 124 41578
33µF	16V	4822 124 40272
47µF	25V	4822 124 41527
100µF	25V	4822 124 41528
220µF	16V	4822 124 40196
220µF	35V	4822 124 41572
470µF	35V	4822 124 41573
4700µF	16V	4822 124 41458
1000µF	16V	4822 124 41571
6800µF	16V	4822 124 41591

Bipolair elco

0.68µF	16V	4822 124 41583
10µF	25V	4822 124 41558
100µF	16V	4822 124 22339

BZV85-C6V2	5322 130 32962
BZX55-C3V9	4822 130 31981
BZX55-C12	4822 130 34197
BZX79-B5V6	4822 130 34173
1N4002	5322 130 30684
1N4148	4822 130 30621
HZ7C2/7V2	4822 130 32862
BA314	4822 130 30879
HZ3B2	4822 130 32831
HZ7A3	4822 130 33523
BAT85	4822 130 31983

CSA4.000 mHz	4822 242 70831
11289.6 kHz	4822 242 71349

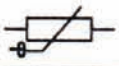
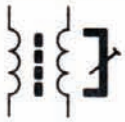
Coil 4.7 mH	4822 157 53141

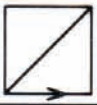
	1/3 Watt
4,7Ω	4822 116 52858
12Ω	4822 111 30511
18Ω	4822 111 31515
100Ω	4822 116 52389
120Ω	4822 116 52394
220Ω	4822 116 52407
330Ω	4822 116 52416
750Ω	4822 116 52432
1kΩ	4822 116 52391
1,2kΩ	4822 116 52395
1,8kΩ	4822 116 53109
2,2kΩ	4822 116 52408
4,7kΩ	4822 116 52426
5,6kΩ	4822 116 52438
6,8kΩ	4822 116 52925
10kΩ	4822 116 52452
22kΩ	4822 116 52463
47kΩ	4822 116 52472
100kΩ	4822 116 52973
180kΩ	4822 116 52505
5,6MΩ	4822 116 52533
680kΩ	4822 116 52536

Non flammable safety resistors ⚠

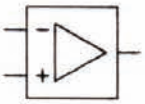
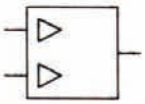
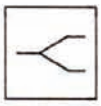
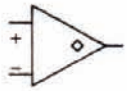
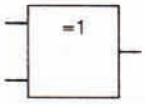
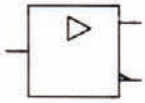
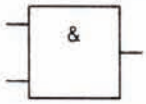
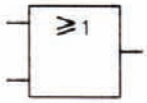
12Ω	4822 111 30511
1Ω	4822 111 30483
4,7Ω	4822 111 30499
10Ω	4822 111 30508
33Ω	4822 111 30522
1,8kΩ	4822 116 53109
18Ω	4822 111 30515

4,7kΩ	4822 101 10685
22kΩ	4822 100 20522

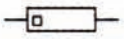
SYMBOL	DESCRIPTION
	Capacitor, general
	Electrolytic capacitor (+ and − may be omitted)
	Bipolar electrolytic capacitor (+ may be omitted)
	Resistor, general
	N.T.C. resistor
	P.T.C. resistor
	Voltage divider with preset adjustment
	Chip jumper
	Pin contact
	Bus contact
	Coil, self-induction
	Transformer with electrically poor conducting core and adjustable pre-magnetization
	Diode
	Zener diode
	Stabistor
	Double variable capacity diode (in one envelope)
	Photo conductive diode
	L.E.D.

SYMBOL	DESCRIPTION
	Transistor (N.P.N.)
	Transistor (P.N.P.)
	Direct current (DC)
	Alternating current (AC)
	Earth (functional)
	Frame or chassis connection
	Direction in which AC voltages are passed on (optional present)
	Interrupted line
	Not-connected crossing lines
	Connected lines
	Cable tree with lead-outs
	Changer, general (arrow is optional)
	Voltage Controlled Oscillator
	Band-pass filter
	Phase changing network
	Delay element
	Amplifier, general

MDA.00083
T32-735

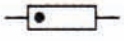
SYMBOL	DESCRIPTION
	Operational amplifier
	Differential amplifier
	Splitter
	Operational amplifier with open output
	Exclusive OR gate
	True/complement amplifier with high input
	Flip Flop
	AND gate
	OR gate
	Inverter with high input


0.2W ⩽ 220k 5%
(CR 16) > 270k 10%

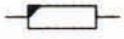

0.33W ⩽ 1M 5%
(CR 25) > 1M 10%


0.33W '5%
(SFR25)


0.25W ⩽ 10M 5%
(VR 25) > 10M 10%


0.5W ⩽ 1M 5%
(CR 37) > 1M 10%


0.67W 5%
(CR 52)


1.15W 5%
(CR 68)


Ceramic plate


Polyester flat foil


Polyester mepolesco


Mylar
(Polyester flat foil small sized)


Micropoco


Tubular ceramic
(body colour pink or yellow/green)


Miniature single elco


Subminiature tantalum

* a=2,5V
b=4V
c=6,3V
d=10V
e=16V
f=25V
g=40V
h=63V
i=100V
j=125V
l=125V
m=150V
n=160V
q=200V
r=250V
s=300V
t=350V
u=400V
v=500V
w=630V
x=1000V
A=1.6V
B=6V
C=12V
D=15V
E=20V
F=35V
G=50V
H=75V
I=80V

MDA.00084
T32-735

Chips 50 V NP0 S1206

1 pF	5%	4822 122 32479
1,2 pF	5%	4822 122 33013
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
5,6 pF	5%	4822 122 32506
6,8 pF	5%	4822 122 32507
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
15 pF	5%	4822 122 32504
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 31961
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
1,8 nF	10%	4822 122 32153
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947
180 nF	10%	4822 122 32915
220 nF	20%	4822 122 32715

Chips 0,125 W S1206 NP0

0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90388
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392

Chips 0,125 W S1206

4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394
6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90105
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545

Chips 0,125 W S1206

6,8 k	2%	4822 111 90544
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428
10M	5%	5322 111 91141

CHANGES

Changed pages
Introductions with A89-119

Page	Reason
Frontpage	/60R/65R and /70R added
2-1-a	Max. diameter added
2-3-a	Partslist adapted for /60R, /65R and /70R
4-2-a	Drawing corrected
	Table adapted for /60R, /65R and /70R
4-3-a	Mapping added
4-6-a	Mapping added
5-1-a	Circuit diagram corrected
	Correct printed circuit board given

CHANGES

Changed pages
Introductions with A89-121

Page	Reason
Frontpage	/61R added
2-3b	Partslist adapted
4-1-1	Wiring diagram added
4-4a	Due to change of main panel
4-5a	Due to change of main panel
4-5-1	Due to change of main panel
4-5-2	Due to change of main panel
4-6b	Schematic diagram adapted
5-2a	Partslist adapted