Mini System

FW-C399/21/21M/22/37

Service
Service
Service

Service Manual

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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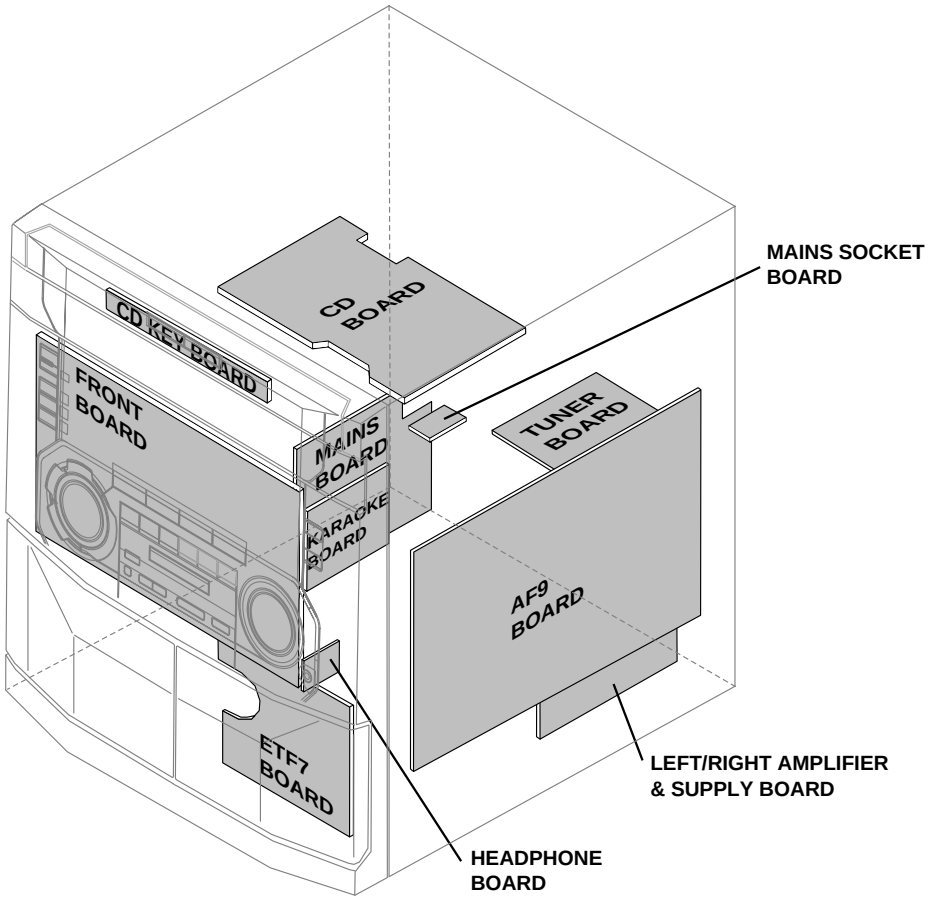
Version 1.0

PHILIPS

LOCATION OF PC BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	FW-C399							
	/21	/21M	/22	/30	/33	/34	/37	
Karaoke	x	x			x			
News			x			x		
RDS			x			x		
Rotary Encoder (volume control)	x	x	x	x	x	x	x	
Jog Shuttle	x	x	x	x	x	x	x	
Voltage Selector	x	x						
Aux Input	x	x	x	x	x	x	x	
Digital Output								
Headphone Socket	x	x	x	x	x	x	x	
Line Output								
Matrix Surround Loudspeakers								
Standby - FTD Clock Display	x	x	x	x	x	x	x	
ECO Standby - Dark	x	x	x	x	x	x	x	
ECO6 Tuner board - System Non-Cenelec	x	x		x	x	x	x	
ECO6 Tuner board - System Cenelec			x					
ETF7 Tape Module: Non-Autoreverse Ferro	x	x	x	x	x	x	x	
MMPWR 100W Module:								
100W Phase Inverse version	x	x	x	x	x	x	x	

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
120V for /37
230V for /22/30/33/34
Mains frequency : 50/60Hz
Power consumption : < 1W at ECO Standby (FTD off)
< 25W Standby (Demo off)
< 175W 1/8 Prated
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 381mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34 [1)]
Grid : 50kHz (& 30kHz for /34)
100kHz for /37
IF frequency : 10.7MHz ± 20kHz
Aerial input : 75Ω coaxial
300Ω click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 25dB
IF rejection : > 60dB [> 75dB]
Image rejection : > 25dB
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8µV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.0mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, m=80% : < 5%

LW

Tuning range : 153-279kHz for /22
Grid : 3kHz
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 7.0mV/M
Selectivity at 18kHz bandwidth : > 24dB
IF rejection : > 30dB
Image rejection : > 30dB
Distortion at RF=50mV, m=80% : < 5%

AMPLIFIER:

Output power (6Ω, 1 kHz, 10% THD) : 2 x 120W ± 1dB
2 x 100W FTC [3)]
Frequency response within -3dB : 60Hz-15kHz
Dynamic Bass Boost : DBB OFF, DBB 1, DBB 2, DBB 3 [2)]
Digital Sound Control : Jazz, Rock, Techno, Optimal [2)]
VEC Control : Cinema, Hall, Concert [2)]
Incredible Surround : Incr. Surround, IS off [2)]
Max Sound : Max Sound, Max off [2)]
Headphone output at 32Ω : 15mW ± 2dB
5mW ± 2dB (CD mode)
Input sensitivity
Aux / CDR : 500mV / 1.0V at 600Ω
Mic : {3.5mV} at 600Ω

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
Wow and flutter : < 0.4% DIN
Fast-wind/rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio Ferro : > 48dBA

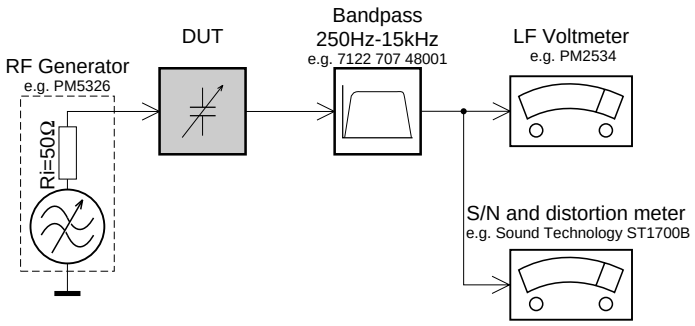
COMPACT DISC:

Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ±1dB, Z_{out} = 100Ω
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.003%
Channel unbalance at 1kHz : ±1dB
Channel separation at 1kHz : > 60dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are strictly for "Cenelec version" only
{....} Values for Karaoke version only
1) Default setting is OFF, to switch on please refer page 3-1.
2) Frequency response in each setting is software controlled.
3) 6Ω, 60Hz - 12,5 kHz, 10% THD for /37 only.

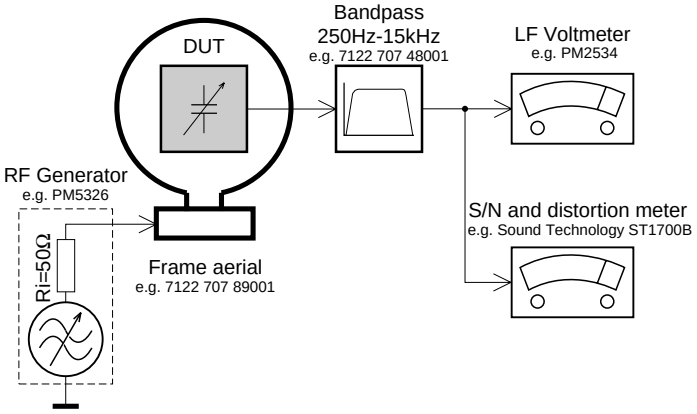
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

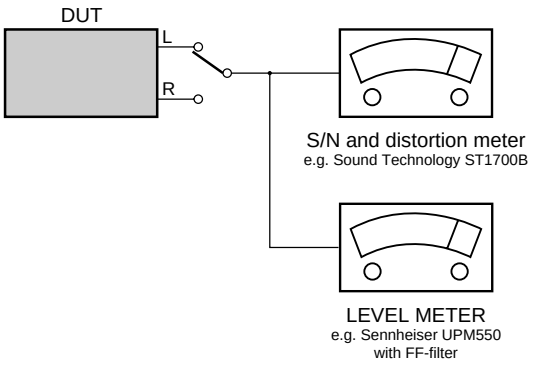
Tuner AM (MW,LW)



To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

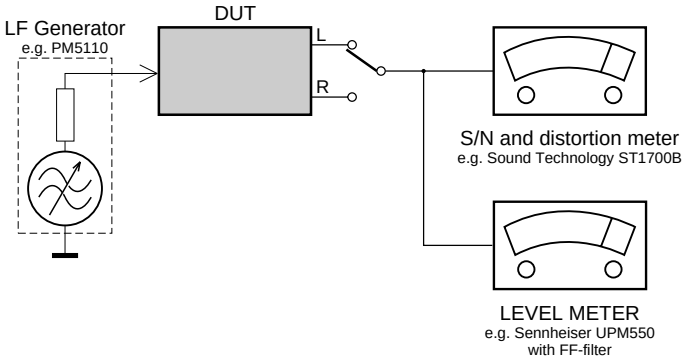
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder 4822 395 91019
Torx bit T10 150mm 4822 395 50456
Torx driver set T6 - T20 ..... 4822 395 50145
Torx driver T10 extended 4822 395 50423

Cassette:

SBC419 Test cassette CrO2 ..... 4822 397 30069
SBC420 Test cassette Fe 4822 397 30071
MTT150 Dolby level 200nWb/M 4822 397 30271

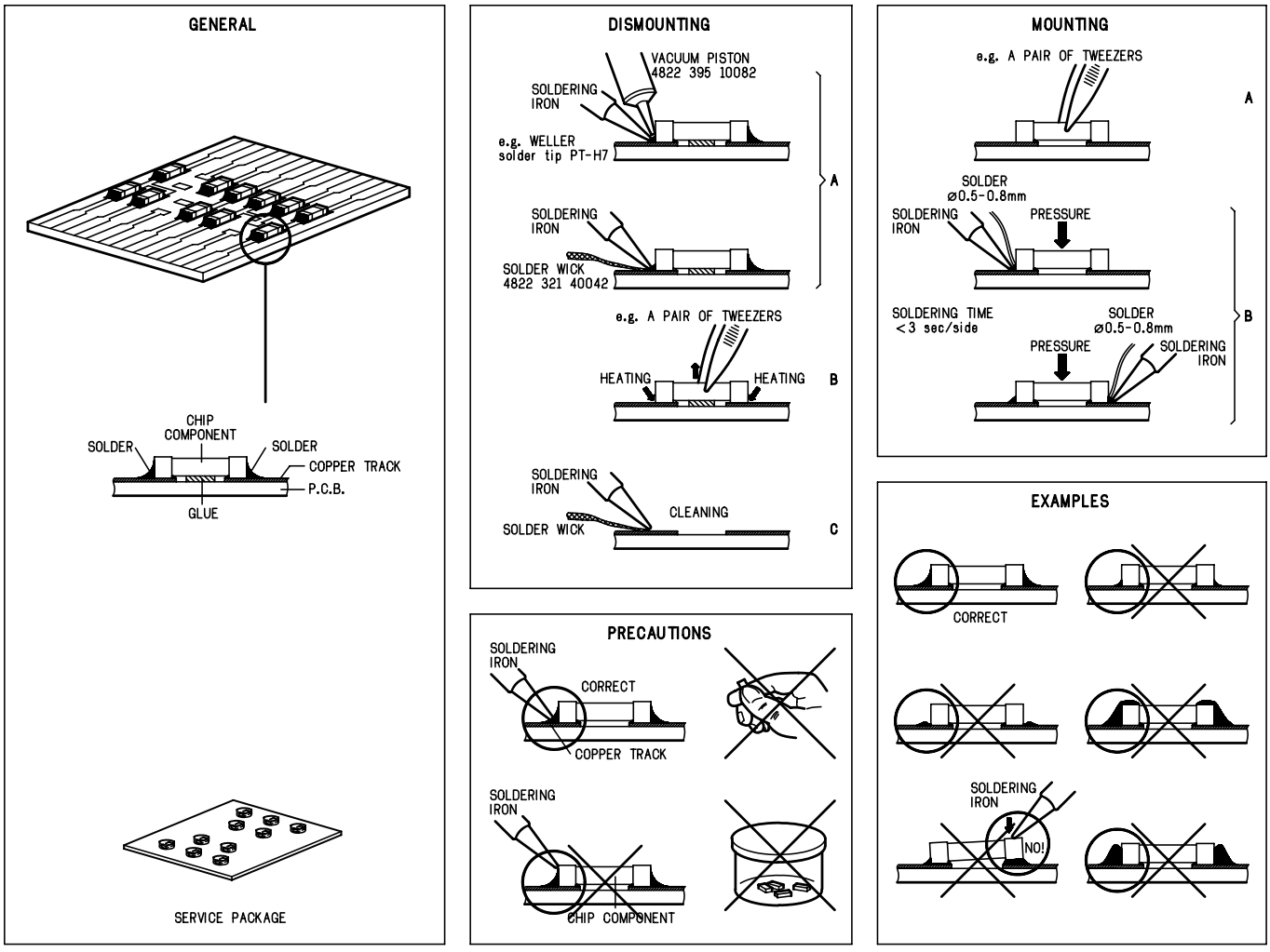
Compact Disc:

SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

ESD Equipment:

Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat to conn. box) 4822 320 11306
Earth cable (to connect product to mat or box) 4822 320 11308
Complete kit ESD3
(combining all above products) 4822 320 10671
Wristband tester 4822 344 13999

HANDLING CHIP COMPONENTS



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 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.

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 bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

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

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand 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 i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

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

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

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

SF Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover

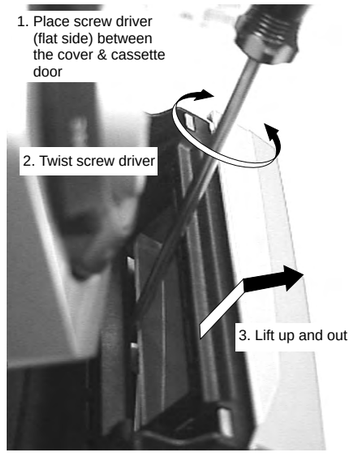


Figure 1

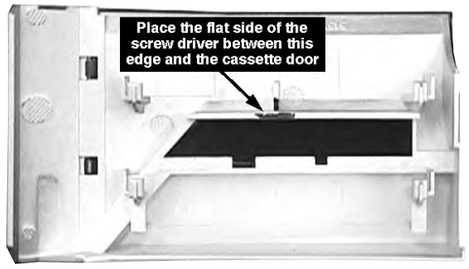


Figure 2

Dismantling the 3CDC Module and Tuner Board

1) Loosen the 4 screws, slide Cover top (pos 255) towards the rear and remove it upwards.
2) Loosen 3 screws, slide the Panel right (pos 254) towards the rear and remove it outwards. Do likewise for the Panel left (pos 253).
3) Push the gear slowly towards the front as shown in figure 3 until the CDC tray starts to move out of the Front Cabinet (pos 101). The CDC tray is now disengaged and can be pulled out completely.
4) Remove the Cover Tray (pos 106) as shown in figure 4.
5) Loosen 4 screws A to remove the CDC Module (pos 1105) as shown in figure 3.
6) Loosen 3 screws N (see figure 10) on the Panel Rear (pos 256) and release 2 catches C1 to remove the Tuner Board.

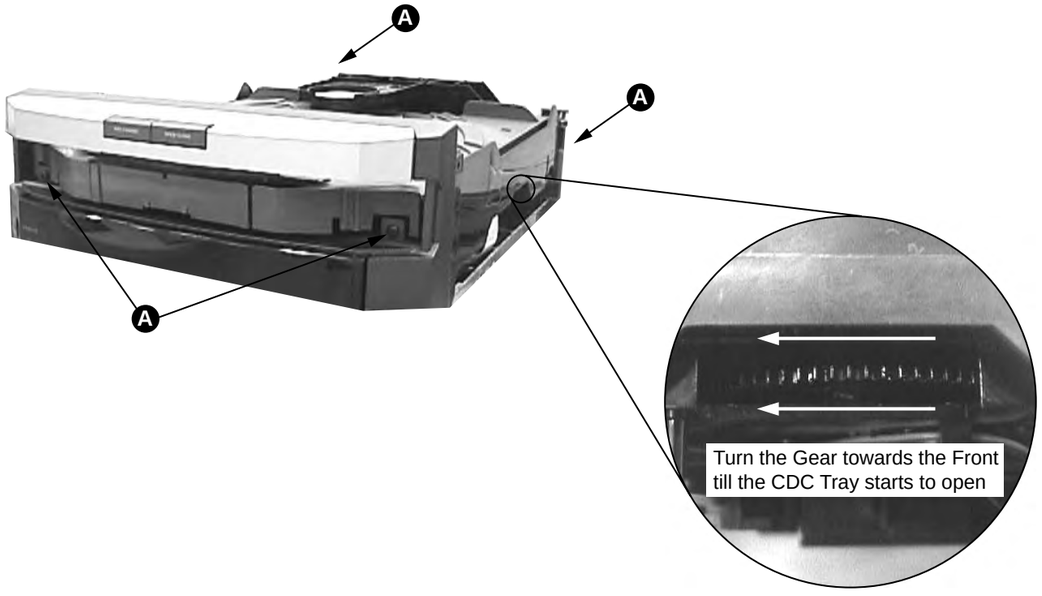


Figure 3

2-1

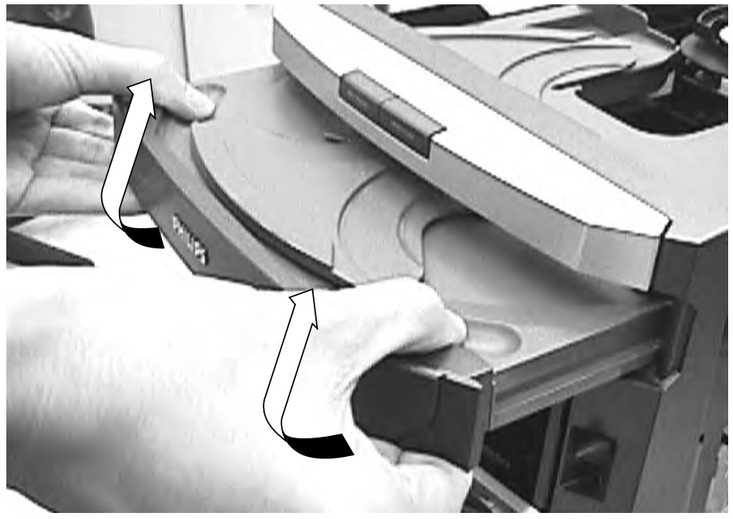


Figure 4

Dismantling of the Cover Front Display (pos 129) and Cover Front Ornamental (pos 130)

1) Cut a piece of packaging tape approximately 5cm width by 12cm length and tape its narrow side on to the top and bottom side of the Volume knob (pos 139) as shown in figure 5.
2) Place a small screw driver in between the tape & knob (see figure 5) to give more leverage in pulling out the knob as shown in figure 6.
3) Do likewise for the Jog Rotary knob (pos 138). You may have to rotate the knob to provide the most exposed area during application of the packaging tape.
4) Remove the Button Sound Control & Lightguide assembly (pos 136 & 140) by releasing 3 catches.
5) Remove the 2 screws behind the knobs' locations and release 4 catches to detach the Cover Front Display (pos 129).
6) Release 4 catches to detach the Cover Front Ornamental (pos 130).

Notes: ***There is nothing are sandwiched between the Front Cabinet (pos 101) and Cover Front Display (pos 129) but it has to be removed in order to reach the catches for the Cover Front Ornamental (pos 130) .***

Figure 5

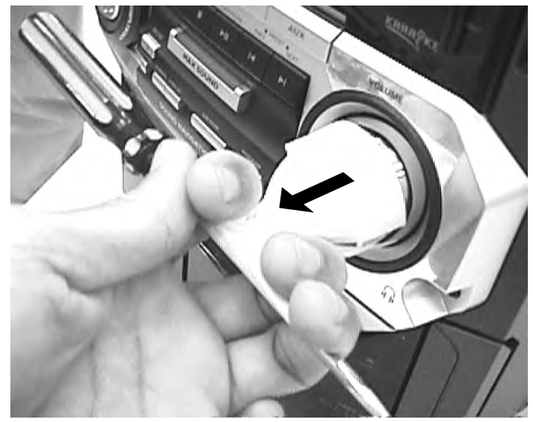


Figure 6

Detaching the AF9 board and Front Cabinet Assembly from the Bottom/Rear assembly

1) Release 2 catches C2 to free the AF9 board from the Front Cabinet Assembly as shown in figure 7.
2) Loosen 1 screw M on the Rear panel (pos 256) to remove the AF9 board as shown in figure 10.
3) Loosen 2 screws C at the bottom of the Front Cabinet on both sides of the set.
4) Release 2 catches C3 on both sides of the Front Cabinet (pos 101) and pull the Front Cabinet assembly out of the Bottom plate (pos 265).

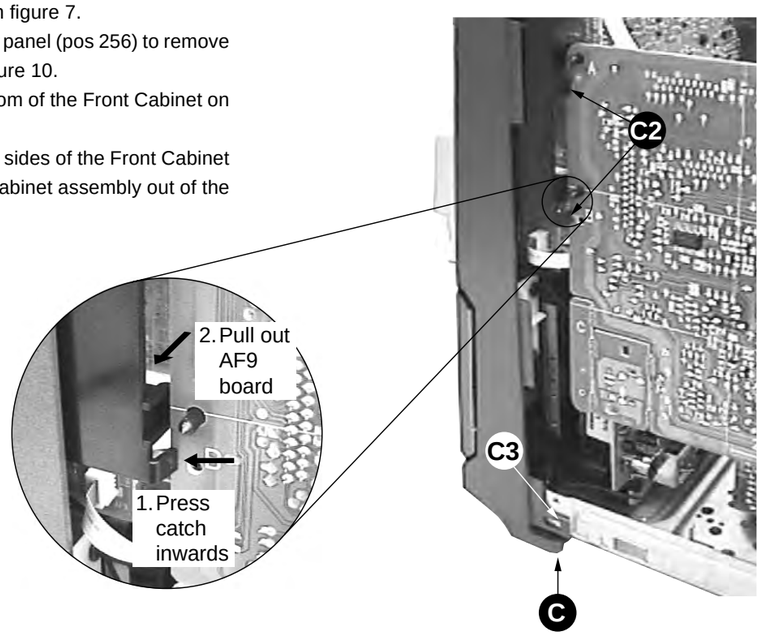


Figure 7

Dismantling of the Front Board and ETF7 module

1) Remove the Jog and Volume knobs (pos 138 & 139) as stated in Dismantling the Cover Front Display.
2) Loosen 3 screws D to remove the Bracket CDC Right (pos 252) as shown in figure 8.
3) Loosen 3 screws E to remove the Karaoke board and Headphone board.
4) Loosen 11 screw F to remove the Front Board.
5) Loosen 6 screws G to remove the ETF7 Module (pos 1104).

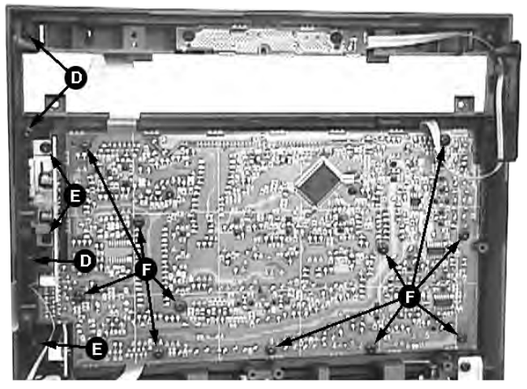


Figure 8

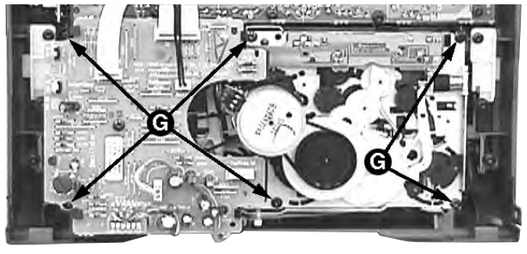


Figure 9

Dismantling of the Rear Panel

1) Loosen 5 screws H as shown in figure 10.
2) Release 2 catches C4 on the Mains Socket body to free the Mains Socket board.
3) Release 2 catches C5 on both sides of the Rear Panel (pos 256) with the help of a minus screw driver and pull out the Rear Panel.

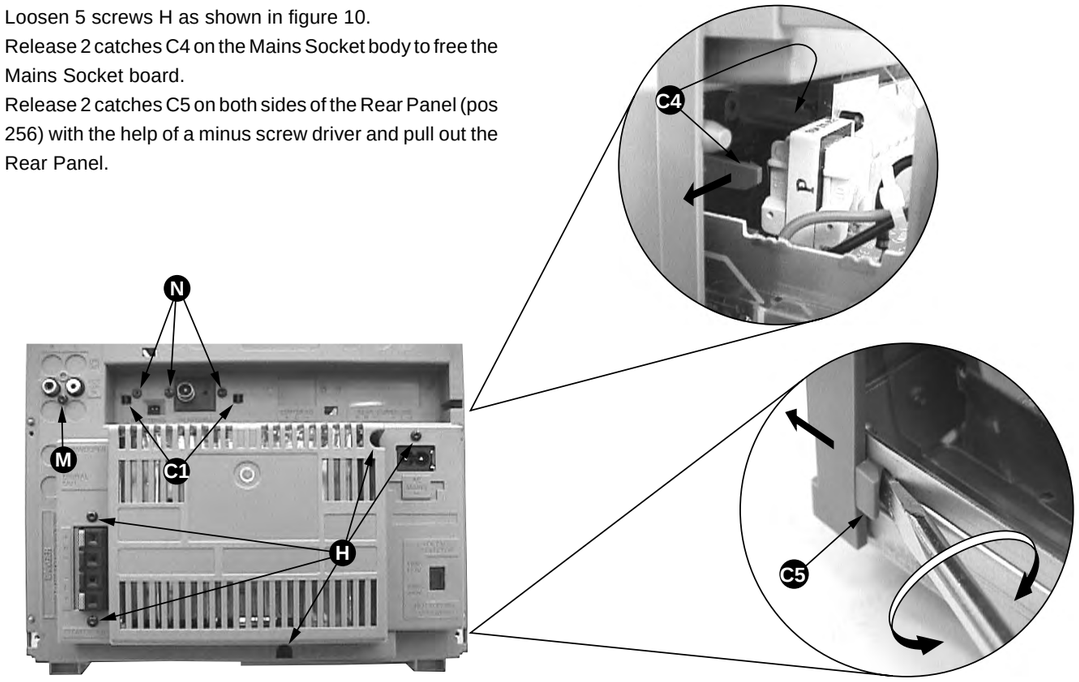


Figure 10

Dismantling of the Bottom assembly

1) Loosen 2 screws J and lift-up the Power Board / Heatsink assembly from the Bottom plate (pos 265) as shown in figure 11.
2) Loosen 2 screws K to remove the Fan / Bracket assembly as shown in figure 12.
3) Loosen 4 screws L for the Mains Transformer to remove the Mains Transformer / Mains Board assembly.

Note: ***During re-assembly care should be taken to ensure the fan blade and wires are in the right direction and position.***

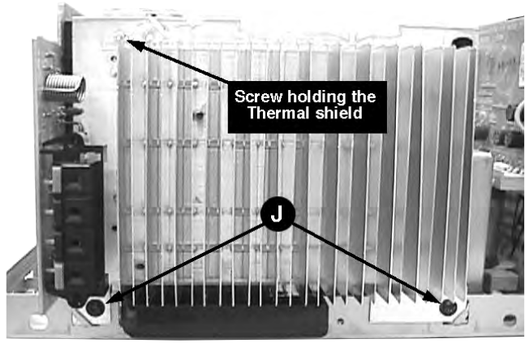


Figure 11

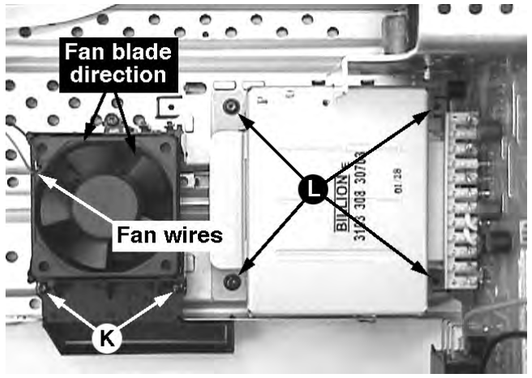
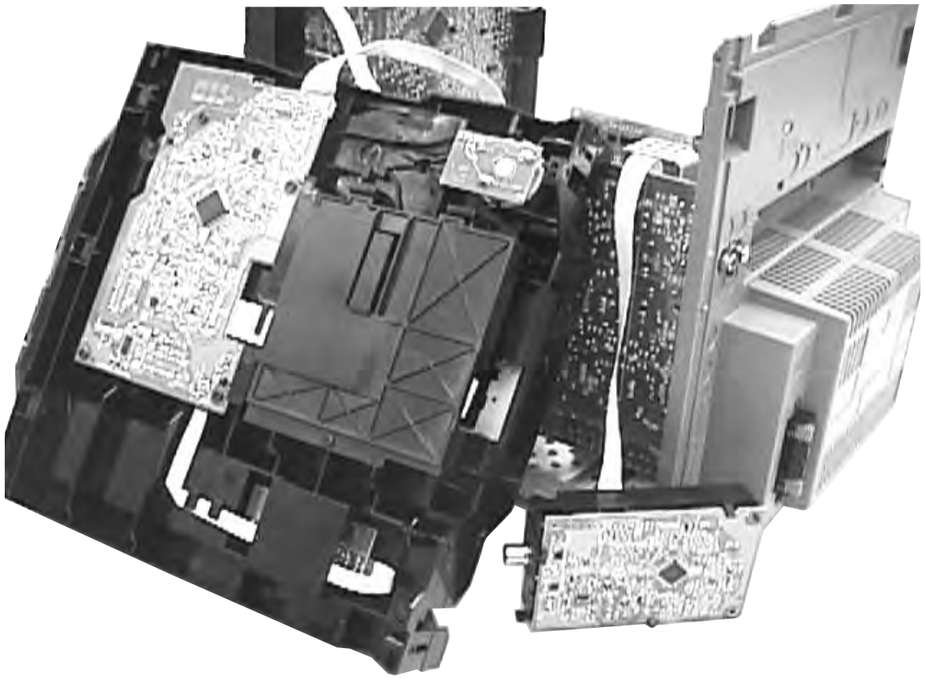


Figure 12

Service positions

Service position A

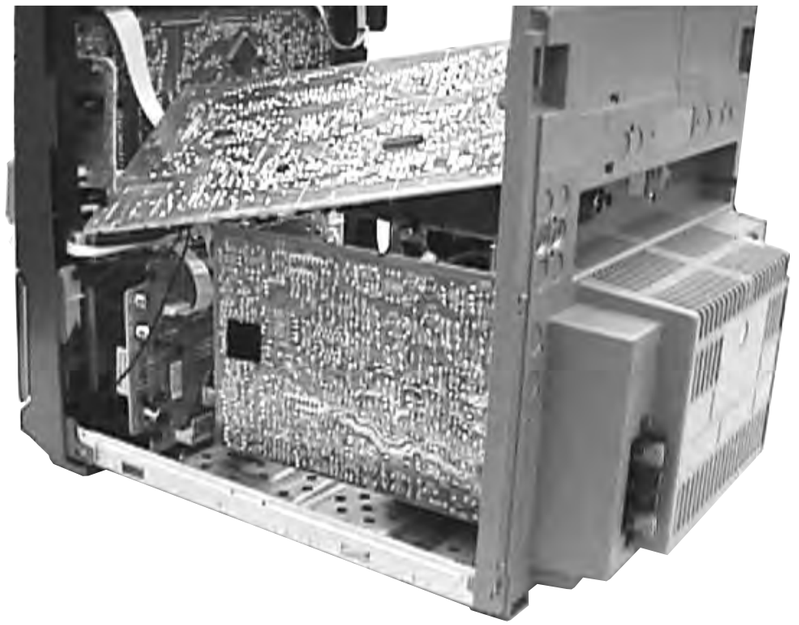
Service position B



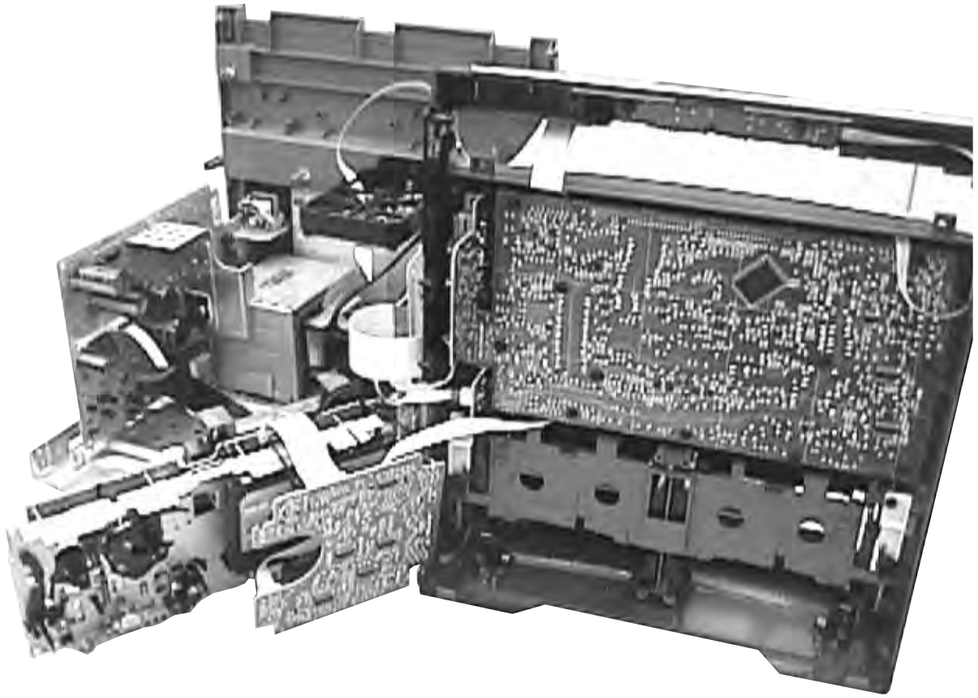
Note: After re-assembly, it is very important to ensure the wires are properly inserted into their respective sockets and routed not to touch or obstruct any moving parts.

2-3

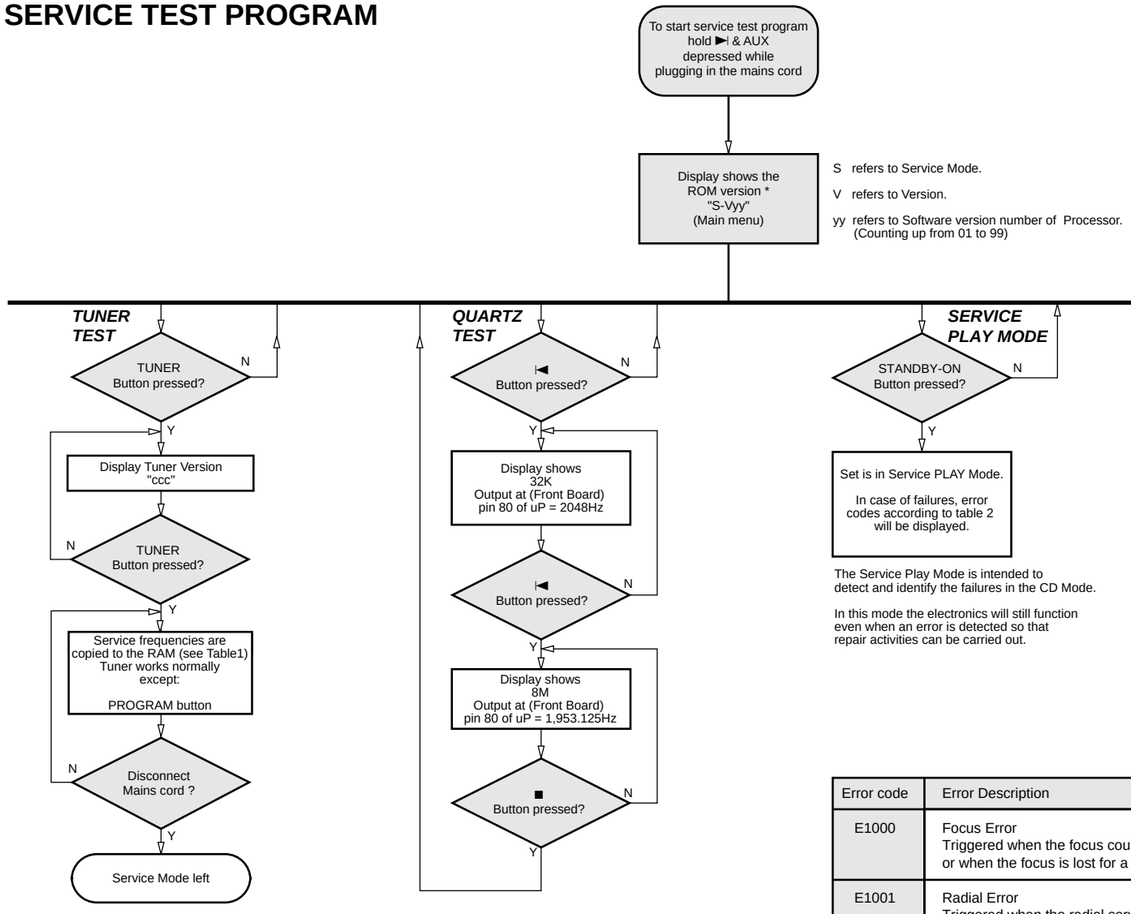
Service position C



Service position D



SERVICE TEST PROGRAM



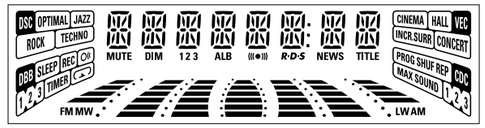
PRESET	Europe "EUR"	East Eur. Extended-band "EAS"	East Eur. "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	530/531kHz*
4	1602kHz	87.5MHz	1602kHz	1700kHz	1700/1602kHz*
5	558kHz	531kHz	558kHz	560kHz	560/558kHz*
6	1494kHz	1602kHz	1494kHz	1500kHz	1500/1494kHz*
7	153kHz	558kHz	87.5MHz	98MHz	98/87.5MHz*
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.81MHz	98MHz	87.5MHz	87.5/98MHz*

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

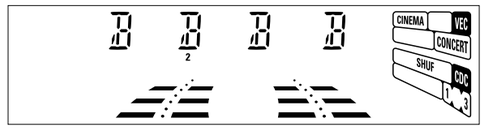
DEMO Mode

	ACTION
To Switch off	Hold the ■ button down for 5 seconds during the DEMO display, the set will confirm with "DEMO OFF" and switch to Standby.
To Switch on	Hold the ■ button down for 5 seconds during Standby, DEMO will begin.



note 1: All LEDs are on except ECO POWER.

Figure 1



note 2: Only DISC 2, TUNER, AUX, DSC, VEC & MAX SOUND are on.

Figure 2

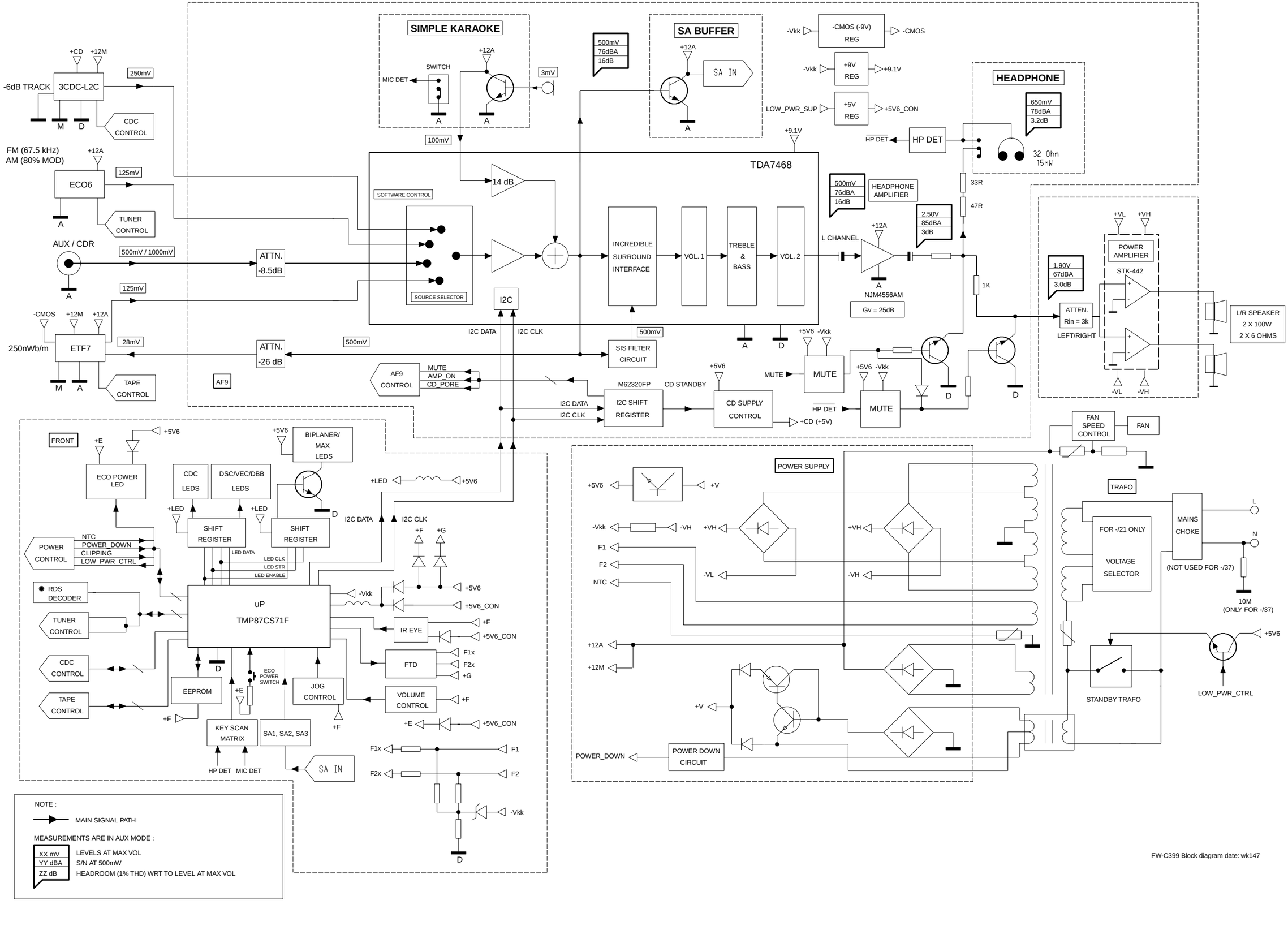
Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	This happens when the carousel switch is defective and closed all the time, or when the carousel is blocked when it is located exactly at a disc position.
E1071	This happens when the carousel switch is defective and does not closed electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not open or enter the inside position and is opening again. This happen when the drawer is blocked and cannot go fully inside or when the drawer switch is defective and does not close.

Table 2

TEST	Activated with	ACTION
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
ROTARY ENCODER TEST	Volume Knob or Jog Shuttle knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

4-1

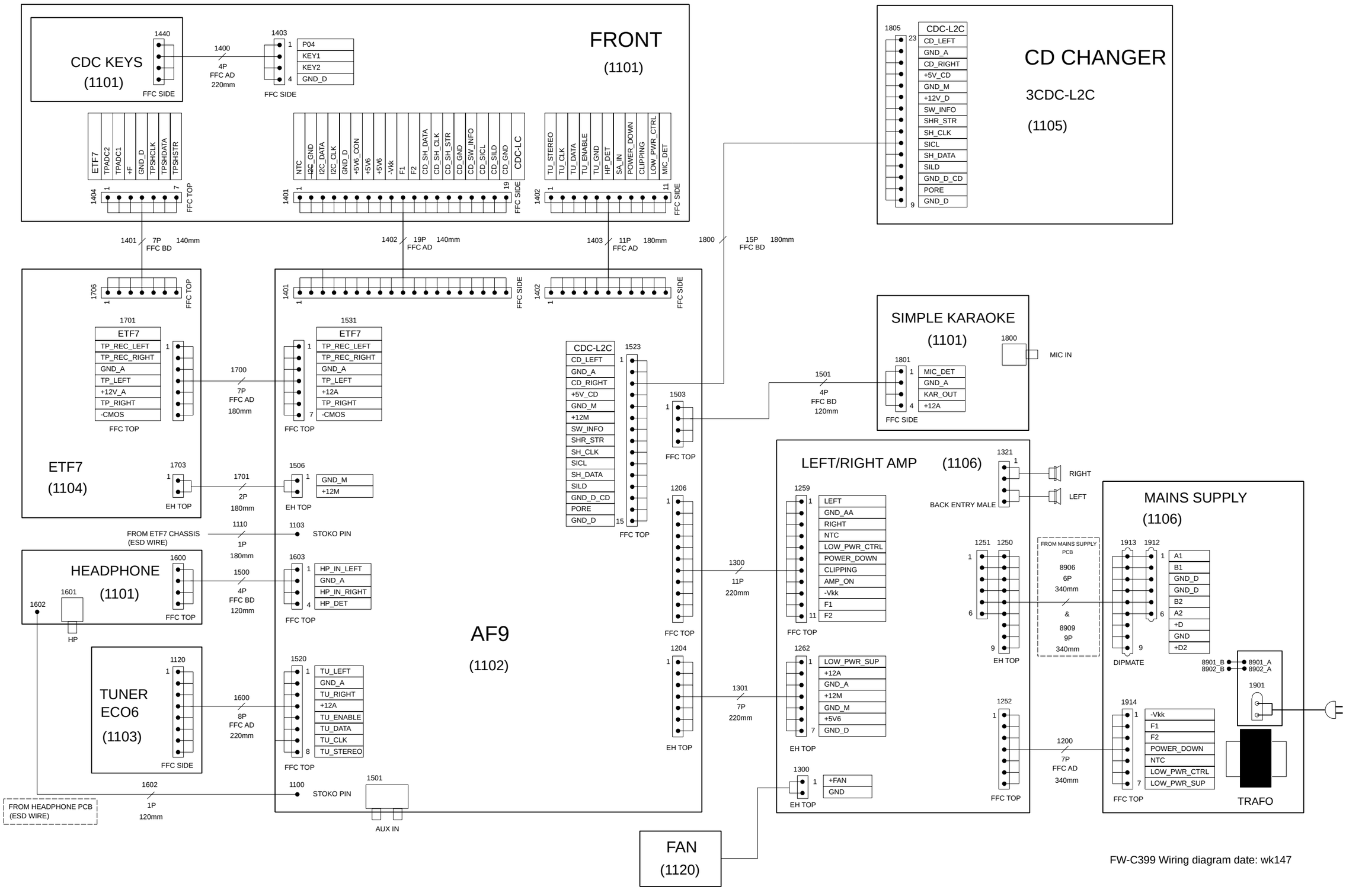
SET BLOCK DIAGRAM



FW-C399 Block diagram date: wk147

5-1

SET WIRING DIAGRAM

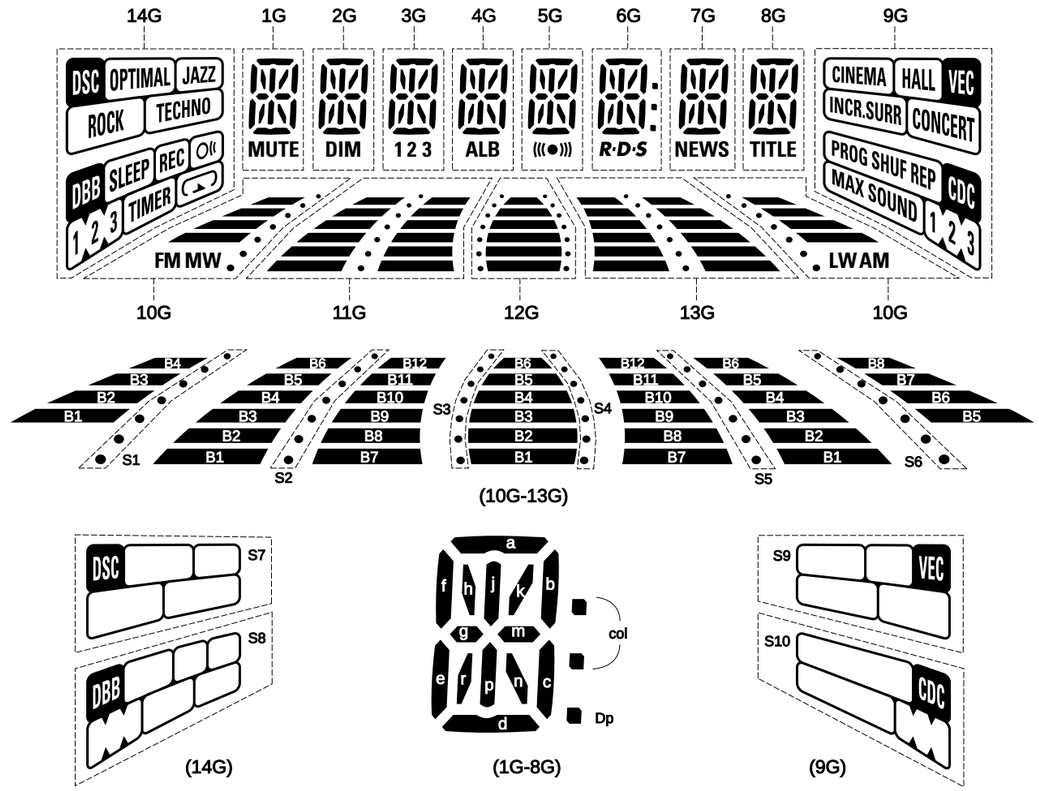


FW-C399 Wiring diagram date: wk147

FRONT BOARD

TABLE OF CONTENTS

FTD DISPLAY PIN CONNECTIONS



	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G
P1	a	a	a	a	a	a	a	a	CINEMA	B1	B1	B1	B1	S7
P2	h	h	h	h	h	h	h	h	HALL	B2	B2	B2	B2	OPTIMAL
P3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	S9	B3	B3	B3	B3	JAZZ
P4	k	k	k	k	k	k	k	k	INCR.SURR	B4	B4	B4	B4	ROCK
P5	b	b	b	b	b	b	b	b	CONCERT	S1	B5	B5	B5	TECHNO
P6	f	f	f	f	f	f	f	f	PROG	-	B6	B6	B6	S8
P7	m	m	m	m	m	m	m	m	SHUF	FM	S2	-	S5	SLEEP
P8	g	g	g	g	g	g	g	g	REP	MW	-	-	-	REC
P9	c	c	c	c	c	c	c	c	S10	B5	B7	-	B7	
P10	e	e	e	e	e	e	e	e	MAX SOUND	B6	B8	-	B8	1
P11	r	r	r	r	r	r	r	r	1	B7	B9	S3	B9	2
P12	n	n	n	n	n	n	n	n	2	B8	B10	S4	B10	3
P13	d	d	d	d	d	d	d	d	3	S6	B11	-	B11	TIMER
P14	MUTE	DIM	1	ALB		R·D·S	NEWS	TITLE	-	-	B12	-	B12	
P15	-	-	2	-	-	col	-	-	-	LW	-	-	-	
P16	-	-	3	-	-	Dp	-	-	-	AM	-	-	-	-

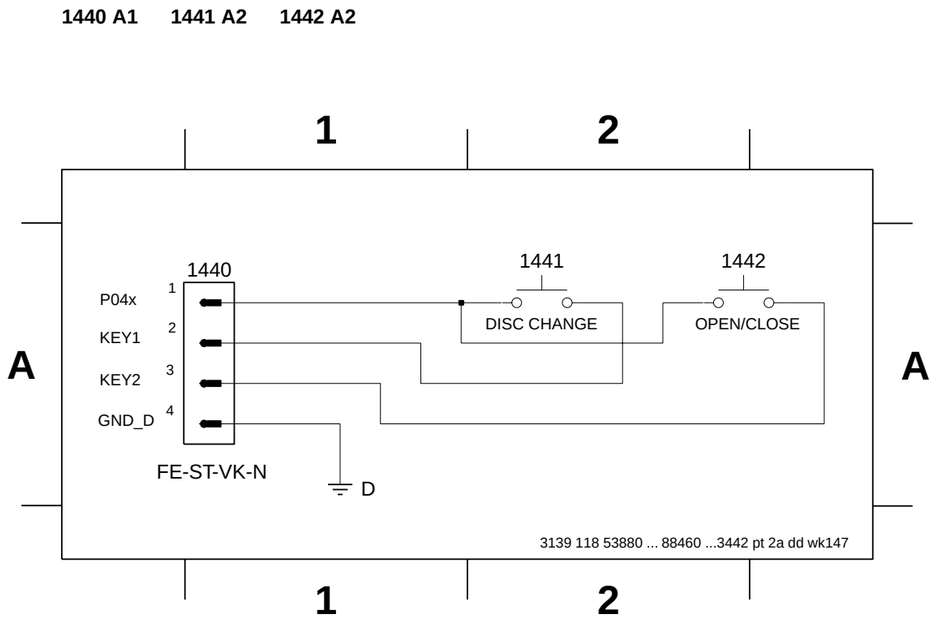
FTD DISPLAY PIN NO.	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
FUNCTION	F2	F2	-	-	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G	12G	13G	14G	-	-	-	-	-	-	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	-	-	F1	F1

VARIATION TABLE

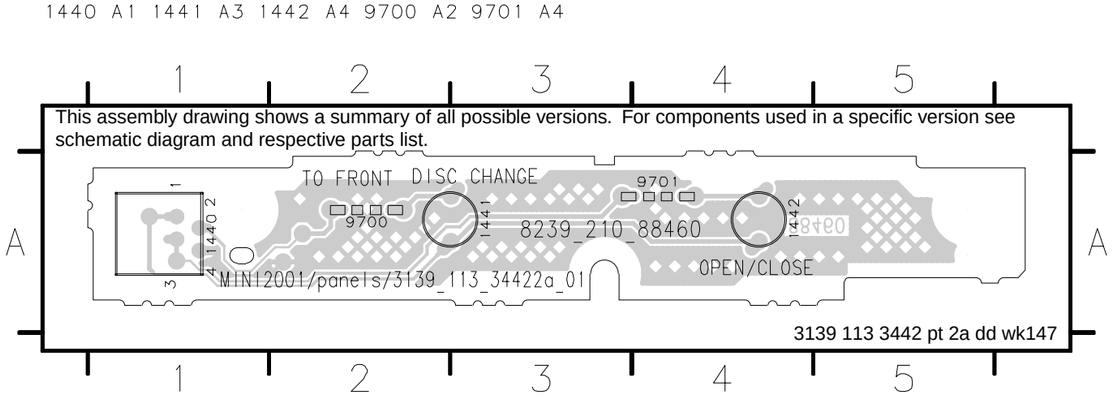
Item No / Features	FW-C399/30/37	FW-C399/21/21M/33	FW-C399/22/34
RDS / News	-	-	x
Simple Karaoke	-	x	-
Mic Detect	-	x	-
1409	x	x	x
1424	-	-	-
1425	-	-	x
1427	-	-	x
1437	-	-	-
3486	1k	1k	1k
3511	10k	10k	-
3530	-	-	330R
3531	10k	10k	10k
3581	10k	10k	-
3595	-	-	-
3808	-	-	820R
4402	-	-	-
4404	-	-	-
6400	x	x	x
6403	x	x	x
6426	-	-	x
6440	-	x	-
6441	x	x	x
6447	x	x	x
6448	x	x	x
9402	-	-	x
9404	-	-	x
9405	-	-	x
9406	-	-	x
9407	-	-	-
9408	x	x	x
9409	-	-	-
9410	x	x	x
9411	-	-	-
9462	-	-	-
9488	x	x	x
9505	-	-	-
9508	-	-	x
9509	-	-	x

x - item in use

KEY-CDC PART - CIRCUIT DIAGRAM



KEY-CDC PART - COMPONENT LAYOUT



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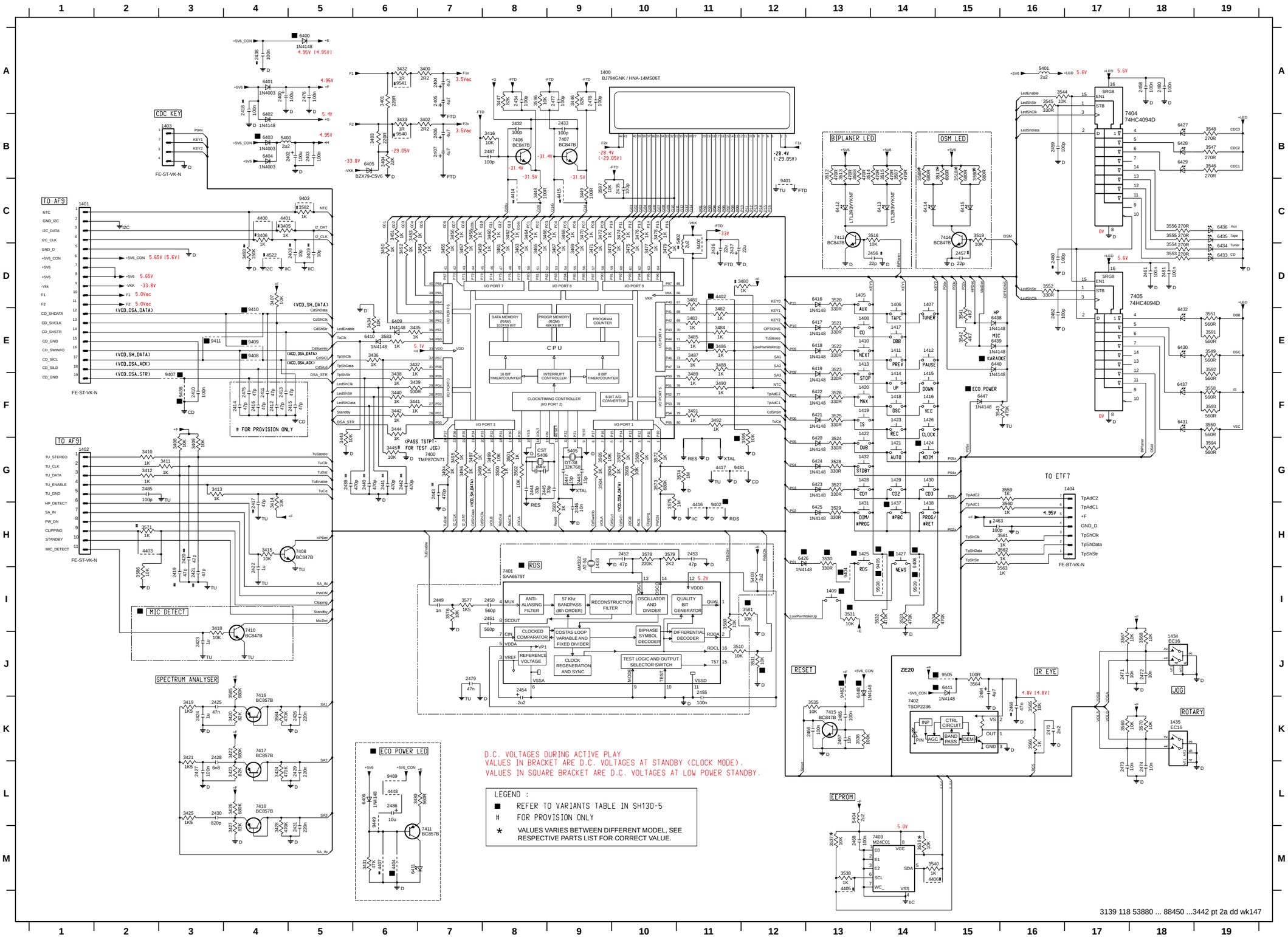
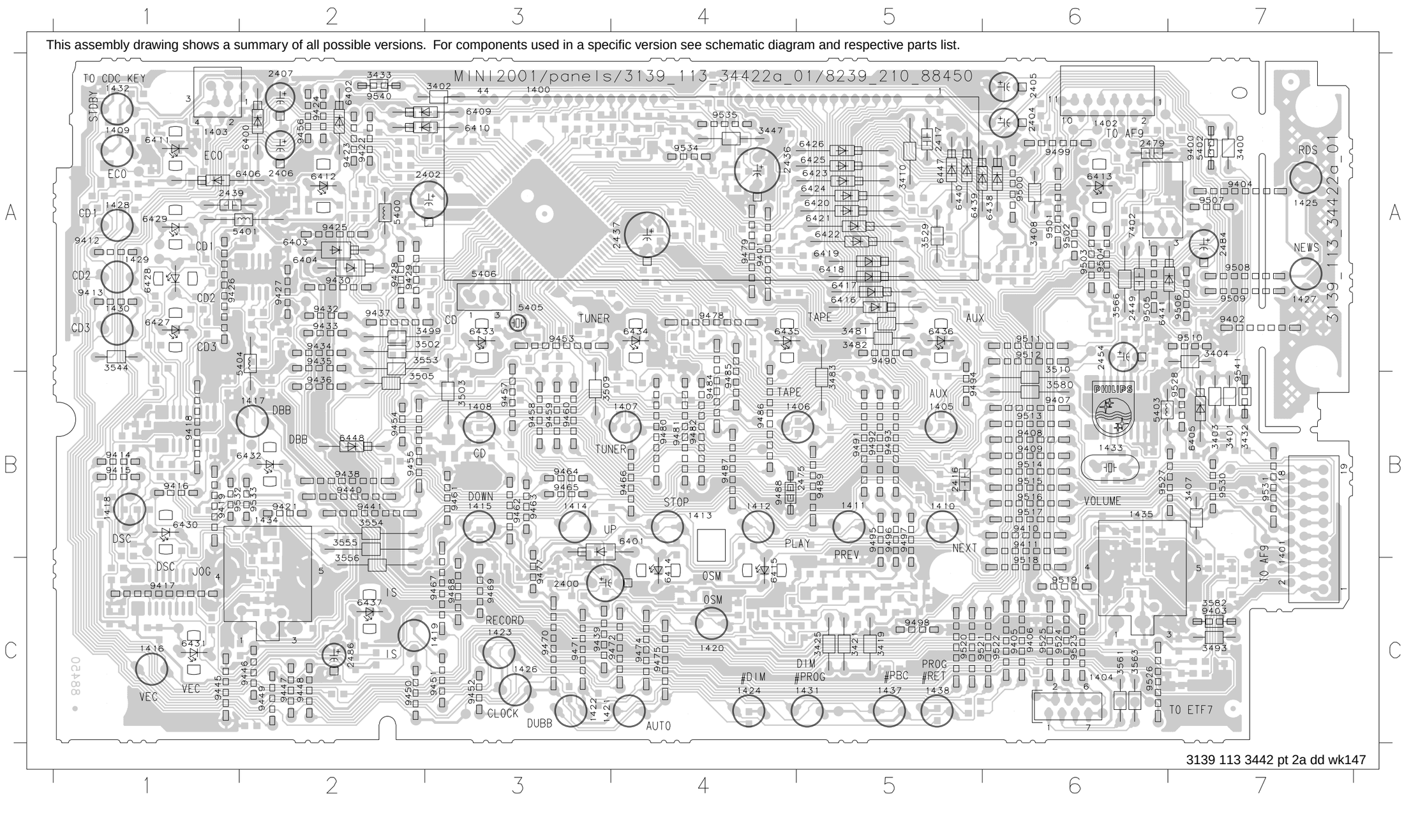
FRONT PART - CIRCUIT DIAGRAM



6-4

FRONT PART - COMPONENT LAYOUT

1400	A31412	B41424	C41437	C52439	A13407	B73493	C73556	C25406	A36413	A66425	A56437	C29404	A79416	B19429	A29445	C19457	B39469	C39484	B49496	B59508	A79520	C59533	B2
1401	B71413	B41425	A71438	C52449	A63408	A63499	A33561	C66400	A26414	C46426	A56438	A69405	C69417	C19430	A29446	C29458	B39470	C39485	B49497	B59509	A79521	C59534	A4
1402	A61414	B31426	C32400	C32454	A63410	A53502	A33563	C66401	B46415	C46427	A16439	A59406	C69418	B19432	A29447	C29459	B39471	C39486	B49498	C59510	A79522	C69535	A4
1403	A11415	B31427	A72402	A32475	B53419	C53503	B33566	A66402	A26416	A56428	A16440	A59407	B69419	B19433	A29448	C29460	B39472	C49487	B49499	A69511	A69523	C69540	A2
1404	C61416	C11428	A12404	A62479	A63421	C53505	B23580	B66403	A26417	A56429	A16441	A69408	B69421	B29434	A29449	C29461	B39474	C49488	B49500	A69512	A69524	C69541	A7
1405	B51417	B21429	A12405	A62484	A73425	C53509	B33582	C76404	A26418	A56430	B16447	A59409	B69422	A29435	A29450	C29462	B39475	C49489	B59501	A69513	B69525	C6	
1406	B51418	B11430	A12406	A22486	C23432	B73510	A65400	A26405	B76419	A56431	C16448	B29410	B69423	A29436	B29451	C39463	B39477	C39490	A59502	A69514	B69526	C6	
1407	B41419	C31431	C52407	A23400	A73433	A23529	A55401	A26406	A26420	A56432	B27402	A69411	B69424	A29437	A29452	C39464	B39478	A49491	B59503	A69515	B69527	B6	
1408	B31420	C41432	A12416	B53401	B73447	A43544	A15402	A76409	A36421	A56433	A39400	A79412	A19425	A29438	B29453	A39465	B39479	A49492	B59504	A69516	B69528	B7	
1409	A11421	C31433	B62417	A53402	A33481	A53553	A35403	B66410	A36422	A56434	A49401	A49413	A19426	A19439	C39454	B29466	B49480	B49493	B59505	A69517	B69530	B7	
1410	B51422	C31434	B22436	A43403	B73482	A53554	B25404	A26411	A16423	A56435	A49402	A79414	B19427	A29440	B29455	B29467	C39481	B49494	B59506	A79518	C69531	B7	
1411	B51423	C31435	B62437	A43404	A73483	B53555	B25405	A36412	A26424	A56436	A59403	C79415	B19428	A29441	B29456	A29468	C39482	B49495	B59507	A79519	C69532	B1	



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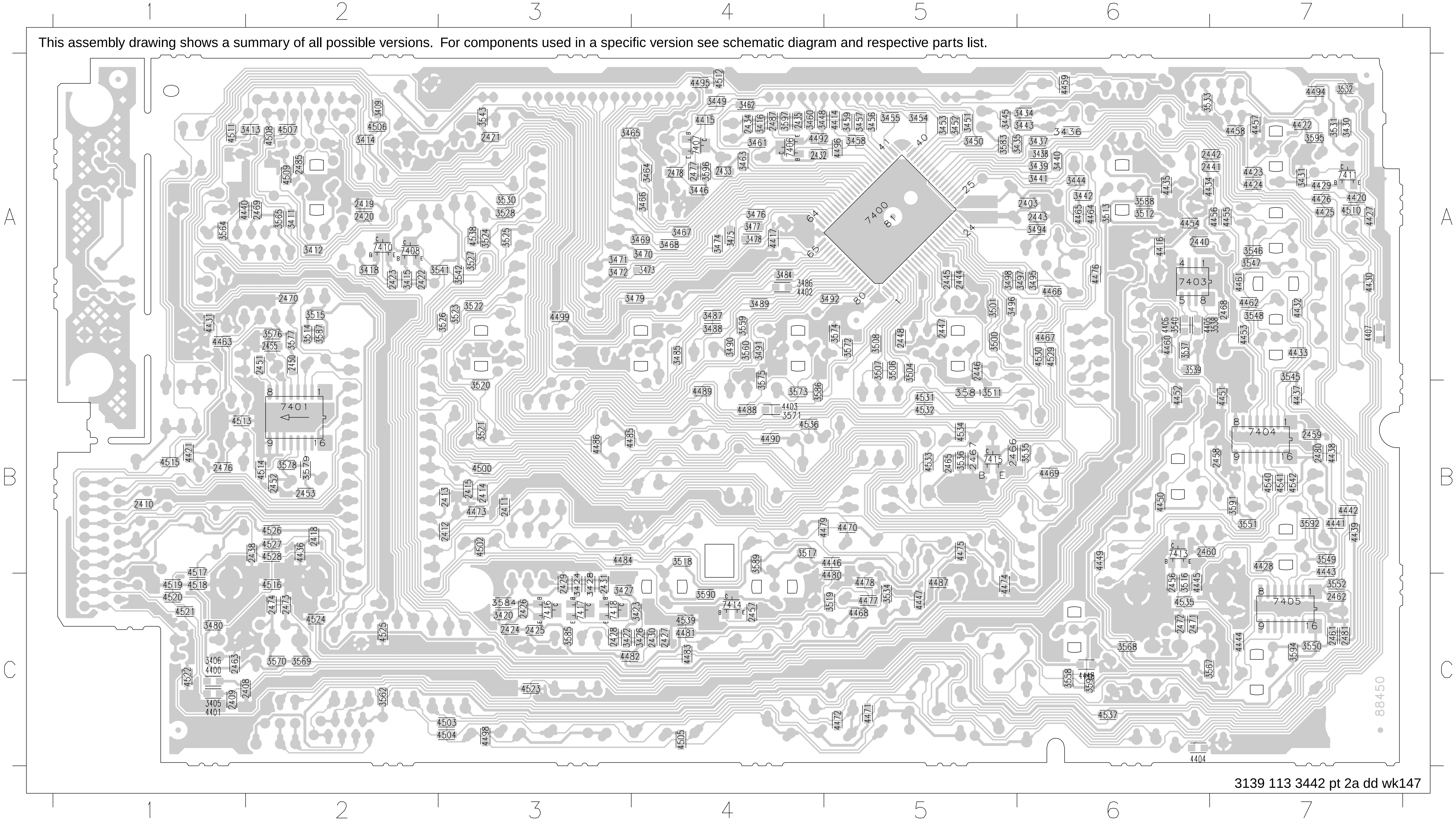
FRONT PART - CHIP LAYOUT

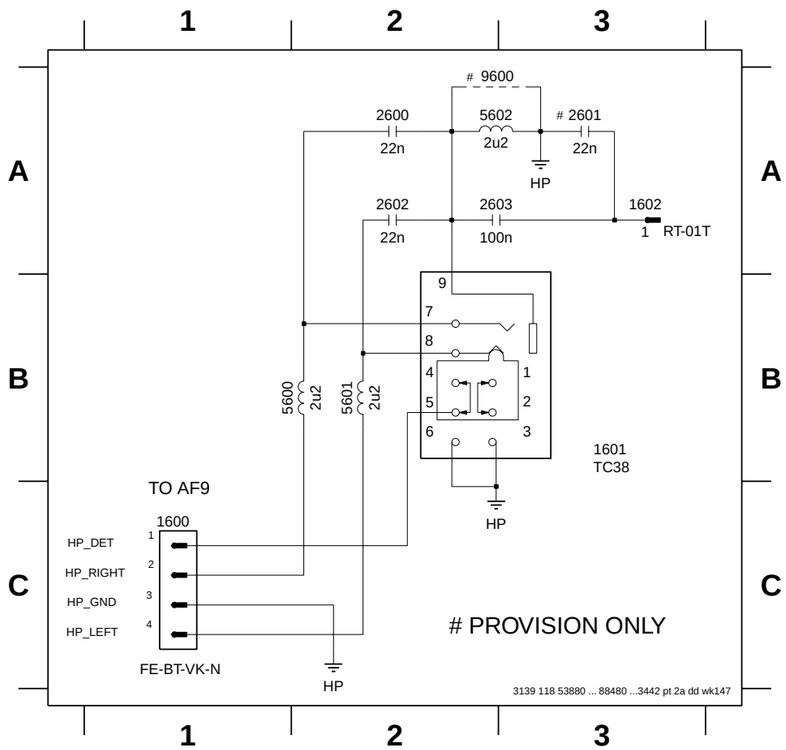
2403 A6	2425 C3	2444 A5	2462 C7	2481 C7	3424 C3	3444 A6	3461 A4	3477 A4	3497 A6	3519 C5	3536 B5	3558 C6	3577 A2	3595 A7	4421 B1	4437 B7	4453 A7	4469 B6	4485 B3	4505 C4	4521 C1	4537 C6	7413 B6
2408 C1	2426 C3	2445 A5	2463 C1	2485 A2	3426 C4	3445 A5	3462 A4	3478 A4	3498 A5	3520 B3	3537 A6	3559 A4	3578 B2	3596 A4	4422 A7	4438 B7	4454 A6	4470 B5	4486 B3	4506 A2	4522 C1	4538 A3	7414 C4
2409 C1	2427 C4	2446 A5	2465 B5	2487 A4	3427 C3	3446 A4	3463 A4	3479 A4	3500 A5	3521 B3	3538 A7	3560 A4	3579 B2	3597 A4	4423 A7	4439 B7	4455 A7	4471 C5	4487 C5	4507 A2	4523 C3	4539 C4	7415 B5
2410 B1	2428 C3	2447 A5	2466 B5	3405 C1	3428 C3	3448 A4	3464 A4	3480 C1	3501 A5	3522 A3	3539 A6	3562 C2	3581 B5	4400 C1	4424 A7	4440 A1	4456 A7	4472 C5	4488 B4	4508 A2	4524 C2	4540 B7	7416 C3
2411 B3	2429 C3	2448 A5	2467 B5	3406 C1	3430 A7	3449 A4	3465 A3	3484 A4	3504 A5	3523 A3	3540 A6	3564 A1	3583 A5	4401 C1	4425 A7	4441 B7	4457 A7	4473 B3	4489 B4	4509 A2	4525 C2	4541 B7	7417 C3
2412 B3	2430 C4	2450 A2	2468 A7	3409 A2	3431 A7	3450 A5	3466 A4	3485 A4	3506 A5	3524 A3	3541 A3	3565 A2	3584 C3	4402 A4	4426 A7	4442 B7	4458 A7	4474 C5	4490 B4	4510 A7	4526 B2	4542 B7	7418 C3
2413 B3	2431 C3	2451 A2	2469 A2	3411 A2	3434 A6	3451 A5	3467 A4	3486 A4	3507 A5	3525 A3	3542 A3	3567 C6	3585 C3	4403 B4	4427 A7	4443 B7	4459 A6	4475 B5	4492 A4	4511 A1	4527 B2	7400 A5	
2414 B3	2432 A4	2452 B2	2470 A2	3412 A2	3435 A5	3452 A5	3468 A4	3487 A4	3508 A5	3526 A3	3543 A3	3568 C6	3586 B4	4404 C6	4428 B7	4444 C7	4460 A6	4476 A6	4494 A7	4512 A4	4528 B2	7401 B2	
2415 B3	2433 A4	2453 B2	2471 C6	3413 A2	3436 A6	3453 A5	3469 A4	3488 A4	3511 B5	3527 A3	3545 A7	3569 C2	3587 A2	4405 A6	4429 A7	4445 C6	4461 A7	4477 C5	4495 A4	4513 B1	4529 A6	7403 A6	
2418 B2	2434 A4	2455 A2	2472 C6	3414 A2	3437 A6	3454 A5	3470 A4	3489 A4	3512 A6	3528 A3	3546 A7	3570 C2	3588 A6	4406 A6	4430 A7	4446 B5	4462 A7	4478 C5	4496 A5	4514 B2	4530 A6	7404 B7	
2419 A2	2435 A4	2456 C6	2473 C2	3415 A2	3438 A6	3455 A5	3471 A3	3490 A4	3513 A6	3530 A3	3547 A7	3571 B4	3589 B4	4407 A7	4431 A1	4447 C5	4463 A1	4479 B4	4498 C3	4515 B1	4531 B5	7405 C7	
2420 A2	2438 B2	2457 C4	2474 C2	3416 A4	3439 A6	3456 A5	3472 A3	3491 A4	3514 A2	3531 A7	3548 A7	3572 A5	3590 C4	4414 A5	4432 A7	4448 C6	4464 A6	4480 C5	4499 A3	4516 C2	4532 B5	7406 A4	
2421 A3	2440 A6	2458 B7	2476 B1	3418 A2	3440 A6	3457 A5	3473 A4	3492 A5	3515 A2	3532 A7	3549 B7	3573 B4	3591 B7	4415 A4	4433 A7	4449 B6	4465 A6	4481 C4	4500 B3	4517 B1	4533 B5	7407 A4	
2422 A2	2441 A7	2459 B7	2477 A4	3420 C3	3441 A6	3458 A5	3474 A4	3494 A6	3516 C6	3533 A6	3550 C7	3574 A5	3592 B7	4416 A6	4434 A6	4450 B6	4466 A6	4482 C3	4502 B3	4518 C1	4534 B5	7408 A2	
2423 A2	2442 A7	2460 B6	2478 A4	3422 C3	3442 A6	3459 A5	3475 A4	3495 A6	3517 B4	3534 C5	3551 B7	3575 A4	3593 C6	4417 A4	4435 A6	4451 B7	4467 A6	4483 C4	4503 C3	4519 C1	4535 C6	7410 A2	
2424 C3	2443 A6	2461 C7	2480 B7	3423 C4	3443 A6	3460 A4	3476 A4	3496 A5	3518 B4	3535 B6	3552 C7	3576 A2	3594 C7	4420 A7	4436 B2	4452 B6	4468 C5	4484 B3	4504 C3	4520 C1	4536 B4	7411 A7	

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.



3139 113 3442 pt 2a dd wk147

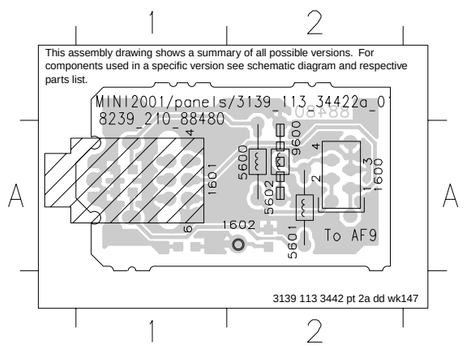
HEADPHONE PART - CIRCUIT DIAGRAM



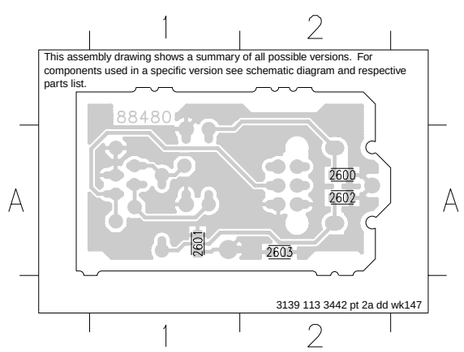
1600 C1
1601 B3
1602 A3
2600 A2
2601 A3
2602 A2
2603 A2
5600 B2
5601 B2
5602 A2
9600 A2

HEADPHONE PART - COMPONENT & CHIP LAYOUTS

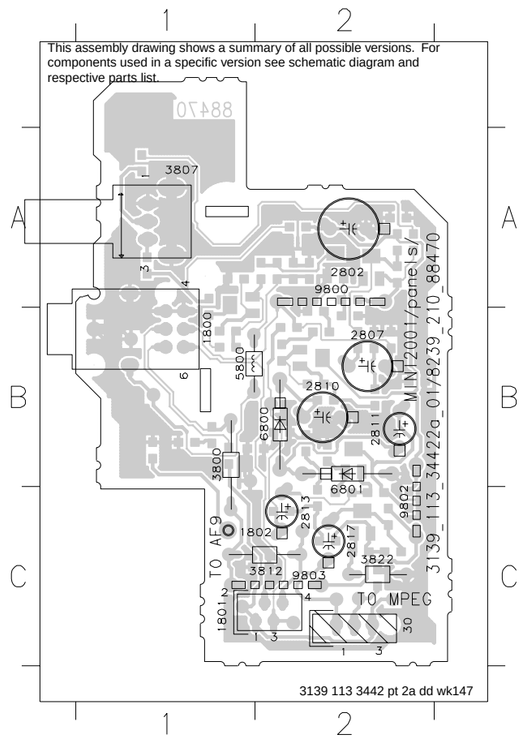
1600 A2 1602 A2 5601 A2 9600 A2
1601 A1 5600 A2 5602 A2



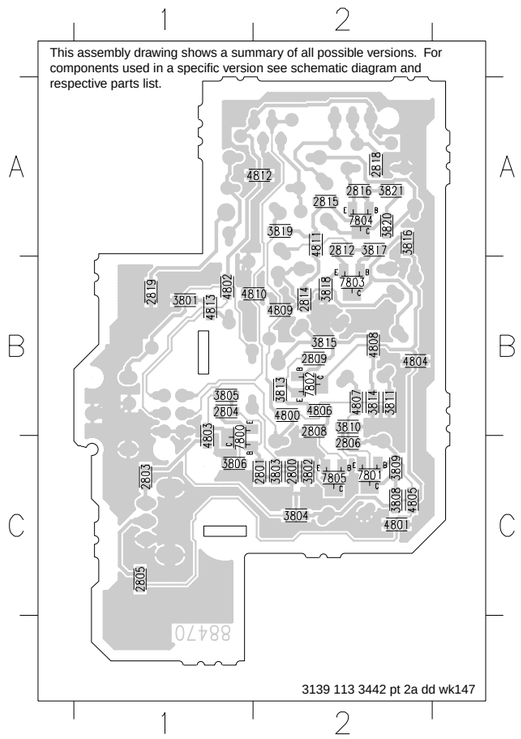
2600 A2 2601 A1 2602 A2 2603 A2



KARAOKE PART - COMPONENT & CHIP LAYOUTS



30 C2
1800 B1
1801 C1
2802 A2
2807 B2
2810 B2
2811 B2
2813 C2
2817 C2
3800 B1
3807 A1
3812 C2
3822 C2
5800 B1
6800 B2
6801 C2
9800 A2
9802 C2
9803 C2



2800 C2
2801 C2
2803 C1
2804 B1
2805 C1
2806 C2
2808 B2
2809 B2
2812 A2
2814 B2
2815 A2
2816 A2
2818 A2
2819 B1
3801 B1
3802 C2
3803 C2
3804 C2
3805 B1
3806 C1
3808 C2
3809 C2
3810 B2
3811 B2
3812 B2
3813 B2
3814 B2
3815 B2
3816 A2
3817 A2
3818 B2
3819 A2
3820 A2
3821 A2
4800 B2
4801 C2
4802 B1
4803 B1
4804 A2
4805 C2
4806 B2
4807 B2
4808 B2
4809 B2
4810 B2
4811 A2
4812 A2
4813 B1
7800 C1
7801 C2
7802 B2
7803 B2
7804 A2
7805 C2

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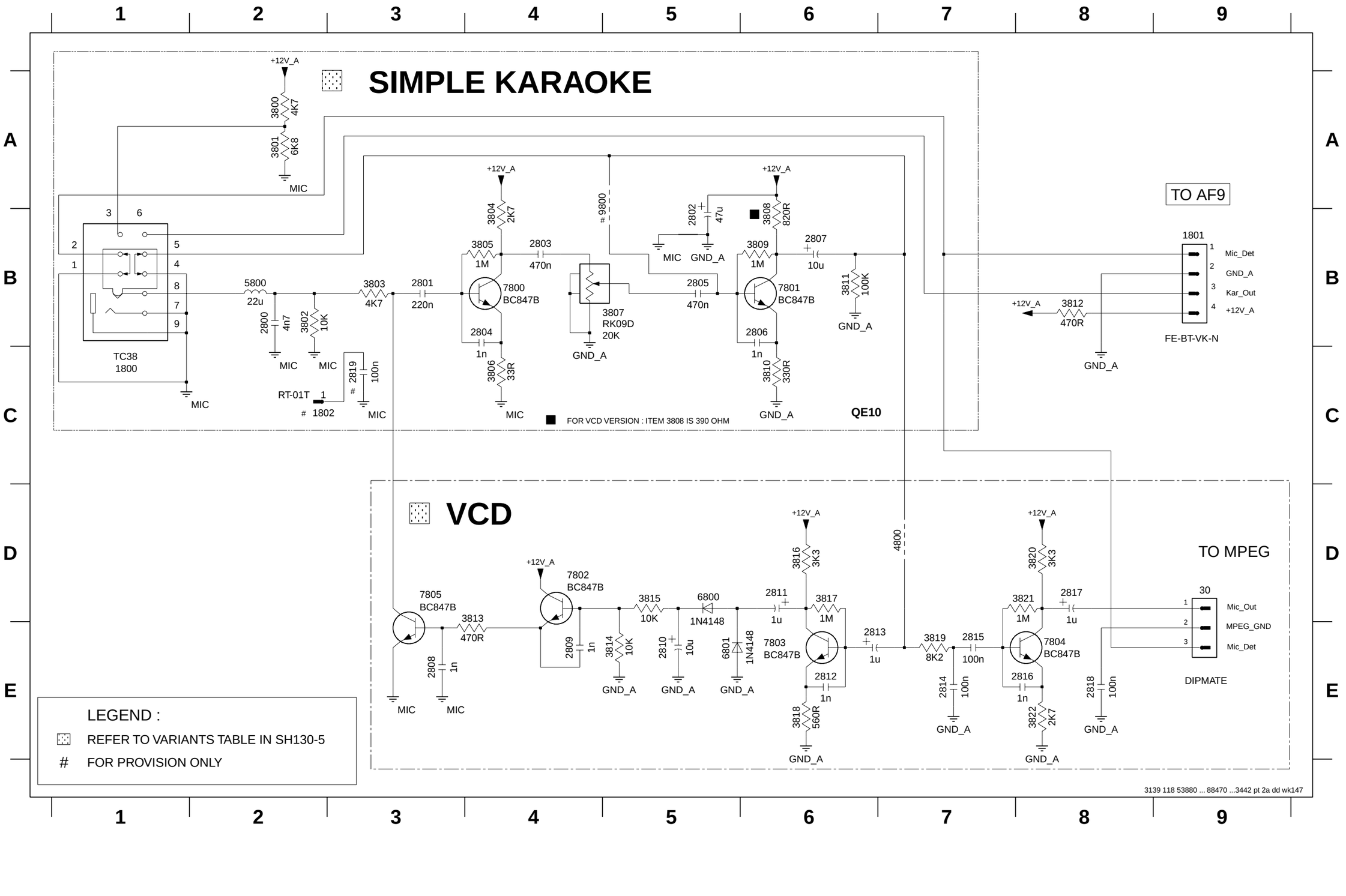
KARAOKE PART - CIRCUIT DIAGRAM

30 D9	1802 C2	2802 B5	2805 B5	2808 E3	2811 D6	2814 E7	2817 D8	3800 A2	3803 B3	3806 C4	3809 B6	3812 B8	3815 D5	3818 E6	3821 D8	5800 B2	7800 B4	7803 E6	9800 A5
1800 C1	2800 B2	2803 B4	2806 B6	2809 E4	2812 E6	2815 E7	2818 E8	3801 A2	3804 B4	3807 B4	3810 C6	3813 D4	3816 D6	3819 E7	3822 E8	6800 D5	7801 B6	7804 E8	
1801 B9	2801 B3	2804 B4	2807 B6	2810 E5	2813 E6	2816 E8	2819 C3	3802 B2	3805 B4	3808 B6	3811 B6	3814 E5	3817 D6	3820 D8	4800 D7	6801 E5	7802 D4	7805 D3	



6-8

ELECTRICAL PARTS LIST - FRONT BOARD

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	3139 110 52900	FTD Display HNA-14MS06T
1401	4822 265 11545	Flex Socket 19 Pin Hort.
1402	2422 025 14541	Flex Socket 11 Pin Hort.
1403	4822 265 11183	Flex Socket 4 Pin Hort.
1404	4822 267 10953	Flex Socket 7 Pin Vert.
1405	4822 276 13775	Tact Switch
1406	4822 276 13775	Tact Switch
1407	4822 276 13775	Tact Switch
1408	4822 276 13775	Tact Switch
1409	4822 276 13775	Tact Switch
1410	4822 276 13775	Tact Switch
1411	4822 276 13775	Tact Switch
1412	4822 276 13775	Tact Switch
1413	4822 276 13775	Tact Switch
1414	4822 276 13775	Tact Switch
1415	4822 276 13775	Tact Switch
1416	4822 276 13775	Tact Switch
1417	4822 276 13775	Tact Switch
1418	4822 276 13775	Tact Switch
1419	4822 276 13775	Tact Switch
1420	4822 276 13775	Tact Switch
1421	4822 276 13775	Tact Switch
1422	4822 276 13775	Tact Switch
1423	4822 276 13775	Tact Switch
1425	4822 276 13775	Tact Switch
1426	4822 276 13775	Tact Switch
1427	4822 276 13775	Tact Switch
1428	4822 276 13775	Tact Switch
1429	4822 276 13775	Tact Switch
1430	4822 276 13775	Tact Switch
1431	4822 276 13775	Tact Switch
1432	4822 276 13775	Tact Switch
1433	4822 242 11033	X'tal Resonator 4,332MHz
1434	2422 129 16385	Rotary Encoder 12P
1435	4822 273 10365	Rotary Encoder 24P
1438	4822 276 13775	Tact Switch
1440	4822 265 11183	Flex Socket 4 Pin Hort.
1441	4822 276 13775	Tact Switch
1442	4822 276 13775	Tact Switch
1600	4822 267 10733	Flex Socket 4 Pin Vert.
1601	4822 265 11529	Headphone Socket
1800	4822 265 11529	Karaoke Mic Socket
1801	4822 267 10733	Flex Socket 4 Pin Vert.

CAPACITORS

2400	4822 124 23432	100µF 20% 10V
2402	4822 124 23432	100µF 20% 10V
2403	4822 126 14305	100nF 10% 16V
2404	4822 124 12032	4,7µF 20% 50V
2405	4822 124 12032	4,7µF 20% 50V
2406	4822 124 12032	4,7µF 20% 50V
2407	4822 124 12032	4,7µF 20% 50V
2410	4822 126 14305	100nF 10% 16V
2422	3198 017 41050	1µF 10V
2423	3198 017 41050	1µF 10V
2424	3198 017 41050	1µF 10V
2425	3198 017 34730	47nF 16V
2426	4822 126 13879	220nF +80/-20% 16V
2427	4822 126 14305	100nF 10% 16V
2428	5322 126 11582	6,8nF 10% 63V
2429	4822 126 13879	220nF +80/-20% 16V
2430	3198 016 38210	820pF 25V
2431	4822 126 13879	220nF +80/-20% 16V
2432	4822 122 31765	100pF 2% 63V
2433	4822 122 31765	100pF 2% 63V
2434	4822 122 31765	100pF 2% 63V
2435	4822 122 31765	100pF 2% 63V
2436	3198 028 52290	22µF 20% 50V
2437	3198 028 52290	22µF 20% 50V
2444	2222 867 15339	33pF 5% 50V
2445	2222 867 15339	33pF 5% 50V
2446	5322 126 11583	10nF 10% 50V
2447	4822 122 33752	15pF 5% 50V
2448	4822 122 33752	15pF 5% 50V
2449	4822 122 33197	1nF 10% 50V
2450	4822 126 14249	560pF 10% 50V
2451	4822 126 14249	560pF 10% 50V
2452	4822 122 33777	47pF 5% 63V
2453	4822 122 33777	47pF 5% 63V
2454	4822 124 22652	2,2µF 20% 50V
2455	4822 126 14305	100nF 10% 16V
2458	4822 126 14305	100nF 10% 16V
2459	4822 122 31765	100pF 2% 63V
2461	4822 126 14305	100nF 10% 16V
2462	4822 122 31765	100pF 2% 63V
2465	4822 126 14305	100nF 10% 16V
2466	4822 126 14305	100nF 10% 16V
2467	5322 126 11583	10nF 10% 50V
2468	4822 126 14305	100nF 10% 16V
2470	4822 126 14238	2,2nF 50V
2471	5322 126 11583	10nF 10% 50V
2472	5322 126 11583	10nF 10% 50V
2473	5322 126 11583	10nF 10% 50V
2474	5322 126 11583	10nF 10% 50V
2476	4822 126 14305	100nF 10% 16V
2477	4822 122 31765	100pF 2% 63V
2478	4822 122 31765	100pF 2% 63V
2479	4822 126 12785	47nF 50V
2480	4822 126 14305	100nF 10% 16V
2481	4822 126 14305	100nF 10% 16V
2484	4822 124 40769	4,7µF 20% 100V
2485	4822 122 31765	100pF 2% 63V
2486	4822 124 40248	10µF 20% 63V
2487	4822 122 31765	100pF 2% 63V
2600	4822 126 14494	22nF 10% 25V
2602	4822 126 14494	22nF 10% 25V
2603	4822 126 14305	100nF 10% 16V
2800	4822 126 13193	4,7nF 10% 63V
2801	4822 126 13879	220nF +80/-20% 16V
2802	3198 028 44790	47µF 20% 35V
2803	4822 126 13482	470nF 80/20% 16V
2804	5322 126 11578	1nF 10% 50V
2805	4822 126 13482	470nF 80/20% 16V
2806	5322 126 11578	1nF 10% 50V
2807	4822 124 12255	10µF 20% 50V

RESISTORS

3400	4822 116 81154	2R2 5% 0,5W
3401	4822 116 83872	220R 5% 0,5W
3402	4822 116 81154	2R2 5% 0,5W
3403	4822 116 83872	220R 5% 0,5W
3404	4822 116 52257	22k 5% 0,5W
3407	4822 050 21003	10k 1% 0,6W
3408	4822 050 21003	10k 1% 0,6W
3409	4822 051 30103	10k 5% 0,062W
3410	4822 050 11002	1k 1% 0,4W
3411	4822 051 30102	1k 5% 0,062W
3412	4822 051 30102	1k 5% 0,062W
3413	4822 051 30102	1k 5% 0,062W
3414	4822 051 30103	10k 5% 0,062W
3415	4822 051 30103	10k 5% 0,062W
3416	4822 051 30103	10k 5% 0,062W
3418	4822 051 30103	10k 5% 0,062W
3419	4822 116 52243	1k5 5% 0,5W
3420	4822 117 12864	82k 5% 0,6W
3421	4822 116 52243	1k5 5% 0,5W
3422	4822 051 30684	680k 5% 0,062W
3423	4822 117 12864	82k 5% 0,6W
3424	4822 051 30474	470k 5% 0,062W
3425	4822 116 52243	1k5 5% 0,5W
3426	4822 051 30684	680k 5% 0,062W
3427	4822 117 12864	82k 5% 0,6W
3428	4822 051 30474	470k 5% 0,062W
3430	4822 051 30561	560R 5% 0,062W
3431	4822 117 12925	47k 1% 0,063W
3432	4822 116 80176	1R 5% 0,5W
3433	4822 116 80176	1R 5% 0,5W
3434	4822 051 30103	10k 5% 0,062W
3435	4822 051 30102	1k 5% 0,062W
3436	4822 051 30102	1k 5% 0,062W
3437	4822 051 30102	1k 5% 0,062W
3438	4822 051 30102	1k 5% 0,062W
3439	4822 051 30101	100R 5% 0,062W
3440	4822 051 30102	1k 5% 0,062W
3441	4822 051 30102	1k 5% 0,062W
3442	4822 051 30102	1k 5% 0,062W
3443	4822 051 30103	10k 5% 0,062W
3444	4822 051 30102	1k 5% 0,062W
3446	4822 117 12864	82k 5% 0,6W
3447	4822 116 52304	82k 5% 0,5W
3448	4822 051 30101	100R 5% 0,062W
3449	4822 051 30101	100R 5% 0,062W
3450	4822 051 30102	1k 5% 0,062W
3451	4822 051 30102	1k 5% 0,062W
3452	4822 051 30102	1k 5% 0,062W
3453	4822 051 30102	1k 5% 0,062W
3454	4822 051 30102	1k 5% 0,062W
3455	4822 051 30102	1k 5% 0,062W
3456	4822 051 30102	1k 5% 0,062W
3457	4822 051 30102	1k 5% 0,062W
3458	4822 051 30102	1k 5% 0,062W
3459	4822 051 30102	1k 5% 0,062W
3460	4822 051 30102	1k 5% 0,062W
3461	4822 051 30102	1k 5% 0,062W
3462	4822 051 30102	1k 5% 0,062W
3463	4822 051 30102	1k 5% 0,062W
3464	4822 051 30102	1k 5% 0,062W
3465	4822 051 30102	1k 5% 0,062W
3466	4822 051 30102	1k 5% 0,062W
3467	4822 051 30102	1k 5% 0,062W
3468	4822 051 30102	1k 5% 0,062W
3469	4822 051 30102	1k 5% 0,062W
3470	4822 051 30102	1k 5% 0,062W
3471	4822 051 30102	1k 5% 0,062W
3472	4822 051 30102	1k 5% 0,062W
3473	4822 051 30102	1k 5% 0,062W
3474	4822 051 30102	1k 5% 0,062W
3475	4822 051 30102	1k 5% 0,062W
3476	4822 051 30102	1k 5% 0,062W
3477	4822 051 30102	1k 5% 0,062W
3478	4822 051 30102	1k 5% 0,062W
3479	4822 051 30102	1k 5% 0,062W
3481	4822 050 11002	1k 1% 0,4W
3482	4822 050 11002	1k 1% 0,4W
3483	4822 050 11002	1k 1% 0,4W
3484	4822 051 30102	1k 5% 0,062W
3485	4822 051 30102	1k 5% 0,062W
3486	4822 051 30102	1k 5% 0,062W
3487	4822 051 30102	1k 5% 0,062W
3488	4822 051 30102	1k 5% 0,062W
3489	4822 051 30102	1k 5% 0,062W
3490	4822 051 30102	1k 5% 0,062W
3491	4822 051 30102	1k 5% 0,062W
3492	4822 051 30102	1k 5% 0,062W
3494	4822 051 30102	1k 5% 0,062W
3495	4822 051 30102	1k 5% 0,062W
3496	4822 051 30102	1k 5% 0,062W
3497	4822 051 30102	1k 5% 0,062W

6-9

ELECTRICAL PARTS LIST - FRONT BOARD

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3498	4822 051 30102	1k 5% 0,062W
3499	4822 050 21003	10k 1% 0,6W
3500	4822 051 30102	1k 5% 0,062W
3501	4822 051 30102	1k 5% 0,062W
3502	4822 050 21003	10k 1% 0,6W
3503	4822 050 11002	1k 1% 0,4W
3504	4822 051 30102	1k 5% 0,062W
3505	4822 050 21003	10k 1% 0,6W
3506	4822 051 30102	1k 5% 0,062W
3507	4822 051 30102	1k 5% 0,062W
3508	4822 051 30103	10k 5% 0,062W
3509	4822 050 11002	1k 1% 0,4W
3510	4822 050 21003	10k 1% 0,6W
3511	4822 051 30103	10k 5% 0,062W
3512	4822 051 30471	470R 5% 0,062W
3513	4822 051 30471	470R 5% 0,062W
3514	4822 051 30471	470R 5% 0,062W
3515	4822 051 30471	470R 5% 0,062W
3516	4822 051 30103	10k 5% 0,062W
3517	4822 117 11817	1k2 1% 1/16W
3518	4822 117 11817	1k2 1% 1/16W
3519	4822 051 30103	10k 5% 0,062W
3520	4822 051 30331	330R 5% 0,062W
3521	4822 051 30331	330R 5% 0,062W
3522	4822 051 30331	330R 5% 0,062W
3523	4822 051 30331	330R 5% 0,062W
3524	4822 051 30331	330R 5% 0,062W
3525	4822 051 30331	330R 5% 0,062W
3526	4822 051 30331	330R 5% 0,062W
3527	4822 051 30331	330R 5% 0,062W
3528	4822 051 30331	330R 5% 0,062W
3529	4822 116 52219	330R 5% 0,5W
3530	4822 051 30331	330R 5% 0,062W
3531	4822 051 30103	10k 5% 0,062W
3532	4822 051 30474	470k 5% 0,062W
3533	4822 051 30474	470k 5% 0,062W
3534	4822 051 30474	470k 5% 0,062W
3535	4822 051 30103	10k 5% 0,062W
3536	4822 117 13632	100k 1% 0603 0,62W
3537	4822 051 30682	6k8 5% 0,062W
3538	4822 051 30102	1k 5% 0,062W
3539	4822 051 30682	6k8 5% 0,062W
3540	4822 051 30102	1k 5% 0,062W
3541	4822 051 30472	4k7 5% 0,062W
3542	4822 051 30472	4k7 5% 0,062W
3543	4822 051 30474	470k 5% 0,062W
3544	4822 050 21003	10k 1% 0,6W
3545	4822 051 30331	330R 5% 0,062W
3546	4822 051 30271	270R 5% 0,062W
3547	4822 051 30271	270R 5% 0,062W
3548	4822 051 30271	270R 5% 0,062W
3549	4822 051 30561	560R 5% 0,062W
3550	4822 051 30561	560R 5% 0,062W
3551	4822 051 30561	560R 5% 0,062W
3552	4822 051 30331	330R 5% 0,062W
3553	4822 116 83876	270R 5% 0,5W
3554	4822 116 83876	270R 5% 0,5W
3555	4822 116 83876	270R 5% 0,5W
3556	4822 116 83876	270R 5% 0,5W
3558	4822 051 30561	560R 5% 0,062W
3559	4822 051 30102	1k 5% 0,062W
3560	4822 051 30102	1k 5% 0,062W
3561	4822 050 11002	1k 1% 0,4W
3562	4822 051 30102	1k 5% 0,062W
3563	4822 050 11002	1k 1% 0,4W
3564	4822 051 30101	100R 5% 0,062W
3565	4822 051 30103	10k 5% 0,062W
3566	4822 050 11002	1k 1% 0,4W
3567	4822 051 30103	10k 5% 0,062W
3568	4822 051 30103	10k 5% 0,062W
3569	4822 051 30103	10k 5% 0,062W
3570	4822 051 30103	10k 5% 0,062W
3572	4822 051 30102	1k 5% 0,062W
3573	4822 051 30684	680k 5% 0,062W
3574	4822 051 30105	1M 5% 0,062W
3575	4822 051 30105	1M 5% 0,062W
3576	4822 051 30103	10k 5% 0,062W
3577	4822 051 30152	1k5 5% 0,062W
3578	4822 117 12891	220k 1% 0,062W
3579	4822 051 30222	2k2 5% 0,062W
3580	4822 050 21003	10k 1% 0,6W
3581	4822 051 30103	10k 5% 0,062W
3583	4822 051 30102	1k 5% 0,062W
3584	4822 051 30474	470k 5% 0,062W
3585	4822 051 30684	680k 5% 0,062W
3586	4822 051 30103	10k 5% 0,062W
3587	4822 051 30471	470R 5% 0,062W
3588	4822 051 30471	470R 5% 0,062W
3589	4822 117 11817	1k2 1% 1/16W
3590	4822 117 11817	1k2 1% 1/16W
3591	4822 051 30561	560R 5% 0,062W
3592	4822 051 30561	560R 5% 0,062W
3593	4822 051 30561	560R 5% 0,062W
3594	4822 051 30561	560R 5% 0,062W
3596	4822 051 30103	10k 5% 0,062W
3597	4822 051 30103	10k 5% 0,062W
3800	4822 116 52283	4k7 5% 0,5W
3801	4822 051 30682	6k8 5% 0,062W
3802	4822 051 30103	10k 5% 0,062W
3803	4822 051 30472	4k7 5% 0,062W
3804	4822 051 30272	2k7 5% 0,062W
3805	4822 051 30105	1M 5% 0,062W
3806	4822 051 30339	33R 5% 0,062W
3807	2120 366 90291	Potm Rotary 20K
3808	4822 117 12968	820R 5% 0,62W
3809	4822 051 30105	1M 5% 0,062W
3810	4822 051 30331	330R 5% 0,062W
3811	4822 117 13632	100k 1% 0,062W
3812	4822 116 83883	470R 5% 0,5W
4400	4822 051 30008	0R Jumper 0603
4401	4822 051 30008	0R Jumper 0603
4403	4822 051 30008	0R Jumper 0603
4416	4822 051 30008	0R Jumper 0603
4417	4822 051 30008	0R Jumper 0603
4420	4822 051 30008	0R Jumper 0603
4421	4822 051 30008	0R Jumper 0603
4422	4822 051 30008	0R Jumper 0603
4423	4822 051 30008	0R Jumper 0603
4424	4822 051 30008	0R Jumper 0603
4425	4822 051 30008	0R Jumper 0603
4426	4822 051 30008	0R Jumper 0603
4427	4822 051 30008	0R Jumper 0603
4428	4822 051 30008	0R Jumper 0603
4429	4822 051 30008	0R Jumper 0603
4430	4822 051 30008	0R Jumper 0603
4431	4822 051 30008	0R Jumper 0603
4432	4822 051 30008	0R Jumper 0603
4433	4822 051 30008	0R Jumper 0603
4434	4822 051 30008	0R Jumper 0603
4435	4822 051 30008	0R Jumper 0603
4436	4822 051 30008	0R Jumper 0603
4437	4822 051 30008	0R Jumper 0603
4438	4822 051 30008	0R Jumper 0603
4439	4822 051 30008	0R Jumper 0603
4440	4822 051 30008	0R Jumper 0603
4441	4822 051 30008	0R Jumper 0603
4442	4822 051 30008	0R Jumper 0603
4443	4822 051 30008	0R Jumper 0603
4444	4822 051 30008	0R Jumper 0603
4445	4822 051 30008	0R Jumper 0603
4446	4822 051 30008	0R Jumper 0603
4447	4822 051 30008	0R Jumper 0603
4448	4822 051 30008	0R Jumper 0603
4449	4822 051 30008	0R Jumper 0603
4450	4822 051 30008	0R Jumper 0603
4451	4822 051 30008	0R Jumper 0603
4452	4822 051 30008	0R Jumper 0603
4453	4822 051 30008	0R Jumper 0603
4454	4822 051 30008	0R Jumper 0603
4455	4822 051 30008	0R Jumper 0603
4456	4822 051 30008	0R Jumper 0603
4457	4822 051 30008	0R Jumper 0603
4458	4822 051 30008	0R Jumper 0603
4459	4822 051 30008	0R Jumper 0603
4460	4822 051 30008	0R Jumper 0603
4461	4822 051 30008	0R Jumper 0603
4462	4822 051 30008	0R Jumper 0603
4463	4822 051 30008	0R Jumper 0603
4464	4822 051 30008	0R Jumper 0603
4465	4822 051 30008	0R Jumper 0603
4466	4822 051 30008	0R Jumper 0603
4467	4822 051 30008	0R Jumper 0603
4468	4822 051 30008	0R Jumper 0603
4469	4822 051 30008	0R Jumper 0603
4470	4822 051 30008	0R Jumper 0603
4471	4822 051 30008	0R Jumper 0603
4472	4822 051 30008	0R Jumper 0603
4473	4822 051 30008	0R Jumper 0603
4474	4822 051 30008	0R Jumper 0603
4475	4822 051 30008	0R Jumper 0603
4476	4822 051 30008	0R Jumper 0603
4477	4822 051 30008	0R Jumper 0603
4478	4822 051 30008	0R Jumper 0603
4479	4822 051 30008	0R Jumper 0603
4480	4822 051 30008	0R Jumper 0603
4481	4822 051 30008	0R Jumper 0603
4482	4822 051 30008	0R Jumper 0603
4483	4822 051 30008	0R Jumper 0603
4484	4822 051 30008	0R Jumper 0603
4485	4822 051 30008	0R Jumper 0603
4486	4822 051 30008	0R Jumper 0603
4487	4822 051 30008	0R Jumper 0603
4488	4822 051 30008	0R Jumper 0603
4489	4822 051 30008	0R Jumper 0603
4490	4822 051 30008	0R Jumper 0603
4492	4822 051 30008	0R Jumper 0603
4494	4822 051 30008	0R Jumper 0603
4495	4822 051 30008	0R Jumper 0603
4496	4822 051 30008	0R Jumper 0603
4498	4822 051 30008	0R Jumper 0603
4499	4822 051 30008	0R Jumper 0603
4500	4822 051 30008	0R Jumper 0603
4502	4822 051 30008	0R Jumper 0603
4503	4822 051 30008	0R Jumper 0603
4504	4822 051 30008	0R Jumper 0603
4505	4822 051 30008	0R Jumper 0603
4506	4822 051 30008	0R Jumper 0603
4507	4822 051 30008	0R Jumper 0603
4508	4822 051 30008	0R Jumper 0603
4509	4822 051 30008	0R Jumper 0603
4510	4822 051 30008	0R Jumper 0603
4511	4822 051 30008	0R Jumper 0603
4512	4822 051 30008	0R Jumper 0603
4513	4822 051 30008	0R Jumper 0603
4514	4822 051 30008	0R Jumper 0603
4515	4822 051 30008	0R Jumper 0603
4516	4822 051 30008	0R Jumper 0603
4517	4822 051 30008	0R Jumper 0603

RESISTORS

4518	4822 051 30008	0R Jumper 0603
4519	4822 051 30008	0R Jumper 0603
4520	4822 051 30008	0R Jumper 0603
4521	4822 051 30008	0R Jumper 0603
4523	4822 051 30008	0R Jumper 0603
4524	4822 051 30008	0R Jumper 0603
4525	4822 051 30008	0R Jumper 0603
4526	4822 051 30008	0R Jumper 0603
4527	4822 051 30008	0R Jumper 0603
4528	4822 051 30008	0R Jumper 0603
4529	4822 051 30008	0R Jumper 0603
4530	4822 051 30008	0R Jumper 0603
4531	4822 051 30008	0R Jumper 0603
4532	4822 051 30008	0R Jumper 0603
4533	4822 051 30008	0R Jumper 0603
4534	4822 051 30008	0R Jumper 0603
4535	4822 051 30008	0R Jumper 0603
4536	4822 051 30008	0R Jumper 0603
4537	4822 051 30008	0R Jumper 0603
4538	4822 051 30008	0R Jumper 0603
4539	4822 051 30008	0R Jumper 0603
4540	4822 051 30008	0R Jumper 0603
4541	4822 051 30008	0R Jumper 0603
4542	4822 051 30008	0R Jumper 0603
4801	4822 051 30008	0R Jumper 0603
4802	4822 051 30008	0R Jumper 0603
4803	4822 051 30008	0R Jumper 0603
4804	4822 051 30008	0R Jumper 0603
4805	4822 051 30008	0R Jumper 0603
4806	4822 051 30008	0R Jumper 0603
4807	4822 051 30008	0R Jumper 0603
4808	4822 051 30008	0R Jumper 0603
4809	4822 051 30008	0R Jumper 0603
4810	4822 051 30008	0R Jumper 0603
4811	4822 051 30008	0R Jumper 0603
4812	4822 051 30008	0R Jumper 0603
4813	4822 051 30008	0R Jumper 0603

COILS & FILTERS

5400	4822 157 62552	Coil 2,2µH 5%
5401	4822 157 62552	Coil 2,2µH 5%
5403	4822 157 62552	Coil 2,2µH 5%
5404	4822 157 62552	Coil 2,2µH 5%
5405	2422 543 01069	X'tal Resonator 32,768kHz
5406	4822 242 72066	Ceram Resonator 8MHz
5600	4822 157 62552	Coil 2,2µH 5%
5601	4822 157 62552	Coil 2,2µH 5%
5602	4822 157 62552	Coil 2,2µH 5%
5800	4822 157 11235	Coil 22µH 5%

DIODES

6400	4822 130 30621	1N4148
6401	4822 130 31878	1N4003G
6402	4822 130 30621	1N4148
6403	4822 130 31878	1N4003G
6404	4822 130 31878	1N4003G
6405	4822 130 34173	BZX79-B5V6
6406	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	9322 167 73676	LTL-4221NLC-KA
6412	9322 161 99676	LTL-2R3VYKNT
6413	9322 161 99676	LTL-2R3VYKNT
6414	9322 172 75676	LTL-1CHKFK
6415	9322 172 75676	LTL-1CHKFK
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6419	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6421	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6424	4822 130 30621	1N4148
6425	4822 130 30621	1N4148
6426	4822 130 30621	1N4148
6427	4822 130 11589	LTL-1CHAE
6428	4822 130 11589	LTL-1CHAE
6429	4822 130 11589	LTL-1CHAE
6430	4822 130 11589	LTL-1CHAE
6431	4822 130 11589	LTL-1CHAE
6432	4822 130 11589	LTL-1CHAE
6433	4822 130 10791	LTL-1CHGE
6434	4822 130 10791	LTL-1CHGE
6435	4822 130 10791	LTL-1CHGE
6436	4822 130 10791	LTL-1CHGE
6437	4822 130 10791	LTL-1CHGE
6438	4822 130 30621	1N4148
6439	4822 130 30621	1N4148
6440	4822 130 30621	1N4148
6441	4822 130 30621	1N4148
6447	4822 130 30621	1N4148
6448	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7401	9352 679 67118	SAA6579T/V1/M4
7400	3139 110 52970	TMP87CS71F "C399S52971"
7402	9322 155 22667	IR Receiver TSOP2236ZC1
7403	9965 000 04931	M24C01-WMN6
7404	4822 209 15449	74HC4094D
7405	4822 209 15449	74HC4094D
7406	4822 130 60511	BC847B
7407	4822 130 60511	BC847B
7408	4822 130 60511	BC847B
7410	4822 130 60511	BC847B
7411	4822 130 60373	BC857B
7413	4822 130 60511	BC847B
7414	4822 130 60511	BC847B
7415	4822 130 60511	BC847B
7416	4822 130 60373	BC857B
7417	4822 130 60373	BC857B
7418	4822 130 60373	BC857B
7800	4822 130 60511	BC847B
7801	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.

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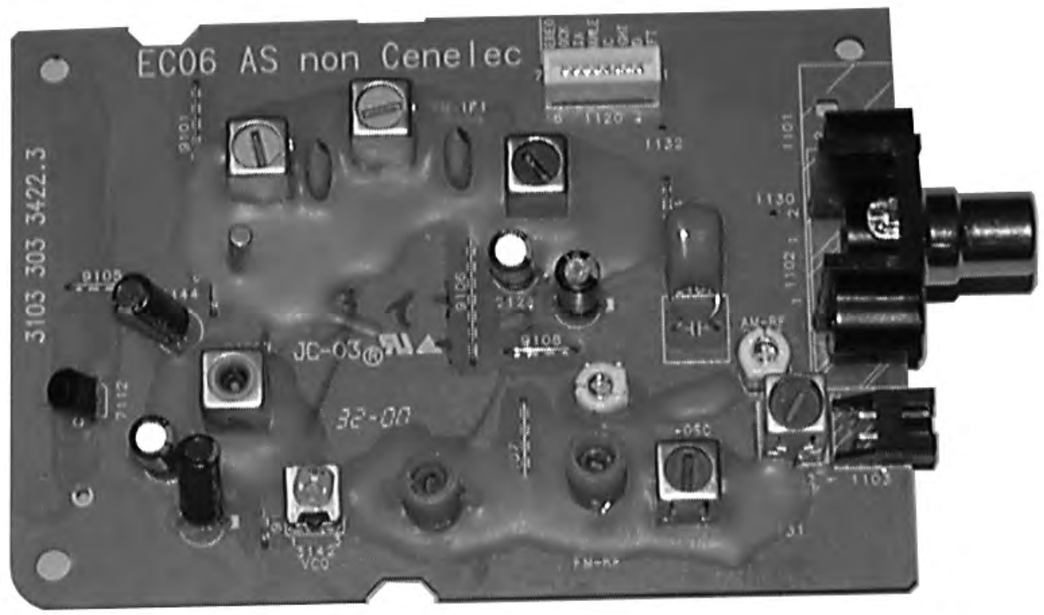
ELECTRICAL PARTS LIST - FRONT BOARD



ECO6 Tuner Board

version: ***SYSTEMS non-CENELEC***

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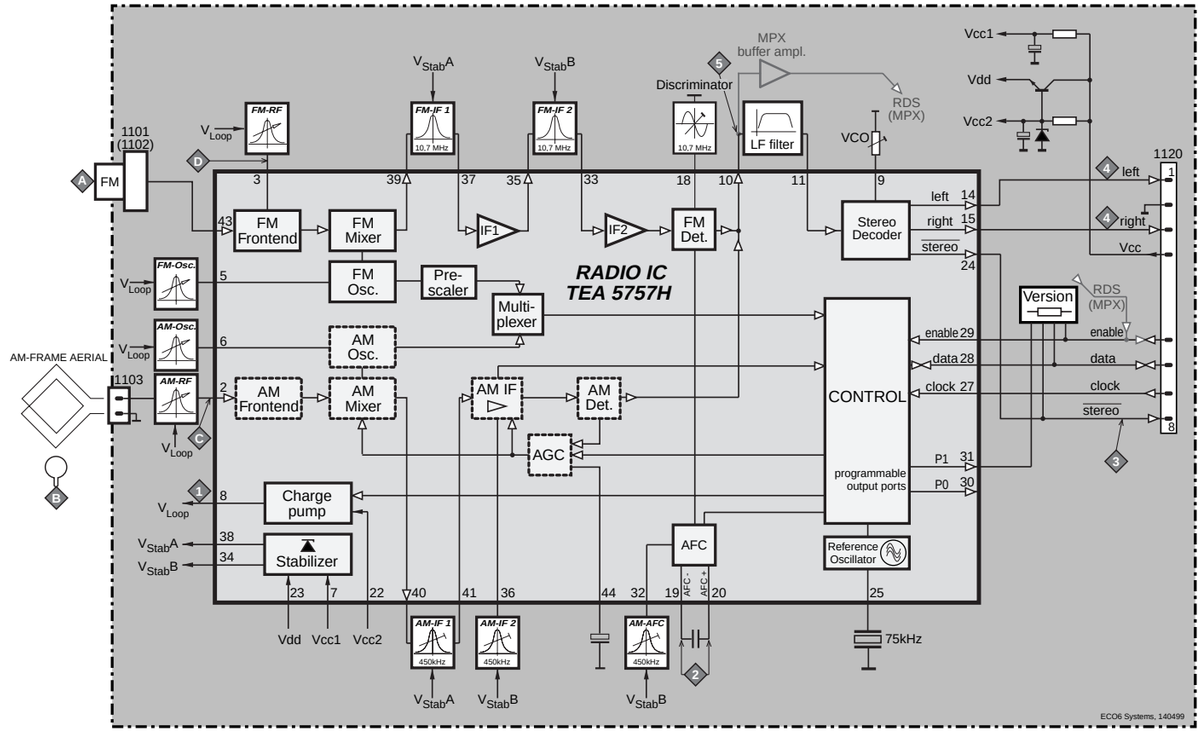
BLOCK DIAGRAM

TUNER BOARD
ECO 6 Systems



7A-2

TUNER BOARD ECO6 / SYSTEMS NON CENELEC

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	X				
/00 /02 FM/MW		X	X		X
/01 FM/MW		X	X	X	X
/14 FM-OIRT/MW		X	X	X	X
/17 FM/AM	X				
/06 FM-Japan/AM				X	

X component mounted

VERSION DETECTION

LEGEND

ⓟ...for provision only
USA ... for USA version only
E-EU ... for East European version only
J ... for Japanese version only

...V FM mode stereo
...V MW mode
...V LW mode
EVM
voltages measured while set is tuned to a strong transmitter

Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right

ECO6 Sys-non Cenelec, 000911

These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

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TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	◇D	IC 7101 21 — shortcircuit to block AFC — 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A mod=1kHz Δf=±22.5kHz	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)		87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	◇C Δf=±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 36 — 100nF — 220R	5111	◇5	max. / f_o symmetric
			IC 7101 40 — 100nF — 220R — see remark [2]	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 2mV		5114	◇2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇5	max. / f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO6, Sys + PA with frame aerial, 070799

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

[1] If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

[2] RC network serves for damping the IF-filter while adjusting the other one.

[3] For AM RF adjustments the original frame antenna has to be used !

[4] MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* *SYSTEMS NON-CENELEC*

7A-4

MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2101 ©	4822 126 13692	47pF	1%	63V	
2102 ©	4822 126 13838	100nF	10%	50V	not USA
2103 ©	5322 122 31647	1nF	10%	63V	
2104 ©	5322 122 32531	100pF	5%	50V	
2105 ©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1µF	20%	50V	
2120 ©	4822 126 13689	18pF	1%	63V	
2124 ©	5322 122 32654	22nF	10%	63V	
2125 ©	2020 552 96199	560pF	1%	50V	
2126 ©	5322 122 31863	330pF	5%	50V	
2127 ©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130 ©	5322 122 32654	22nF	10%	63V	
2131 ©	4822 126 13482	470nF	20%	16V	
2132 ©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134 ©	4822 126 13188	15nF	5%	63V	not USA
2134 ©	5322 122 32654	22nF	10%	63V	USA only
2135 ©	4822 126 13188	15nF	5%	63V	not USA
2135 ©	5322 122 32654	22nF	10%	63V	USA only
2136 ©	4822 126 14076	220nF	20%	25V	
2137 ©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139 ©	4822 126 14236	15pF	5%	50V	
2140 ©	4822 126 13695	82pF	1%	63V	
2141 ©	4822 126 13838	100nF	10%	50V	
2143 ©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145 ©	4822 122 33575	220pF	5%	50V	
2146 ©	4822 122 33575	220pF	5%	50V	
2147 ©	4822 122 33575	220pF	5%	50V	
2148 ©	4822 122 33127	2,2nF	10%	63V	
2149 ©	5322 122 32659	33pF	5%	50V	RDS only
2150 ©	4822 126 13838	100nF	10%	50V	
2152 ©	4822 126 12105	33nF	5%	63V	not for East Europe
2152 ©	5322 116 80853	560pF	5%	63V	for East Europe only
2153 ©	4822 126 13486	15pF	2%	63V	not for East Europe
2153 ©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159 ©	5322 122 32659	33pF	5%	50V	
2164 ©	4822 126 13482	470nF	20%	16V	
2165 ©	4822 126 13838	100nF	10%	50V	
2166 ©	5322 122 31647	1nF	10%	63V	
2167 ©	4822 122 33926	12pF	5%	50V	
2169 ©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101 ©	4822 051 20333	33kΩ	5%	0,1W	
3102 ©	4822 117 10837	100kΩ	1%	0,1W	
3103 ©	4822 051 20822	8,2kΩ	5%	0,1W	
3104 ©	4822 117 13577	330Ω	1%	0,1W	
3105 ©	4822 117 11503	220Ω	5%	0,1W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 11503	220Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181 ©	4822 051 10102	1kΩ	2%	0,25W	
4103 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			
4108 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS
5131	4822 157 11843	RF COIL 1,5 TURNS

DIODES

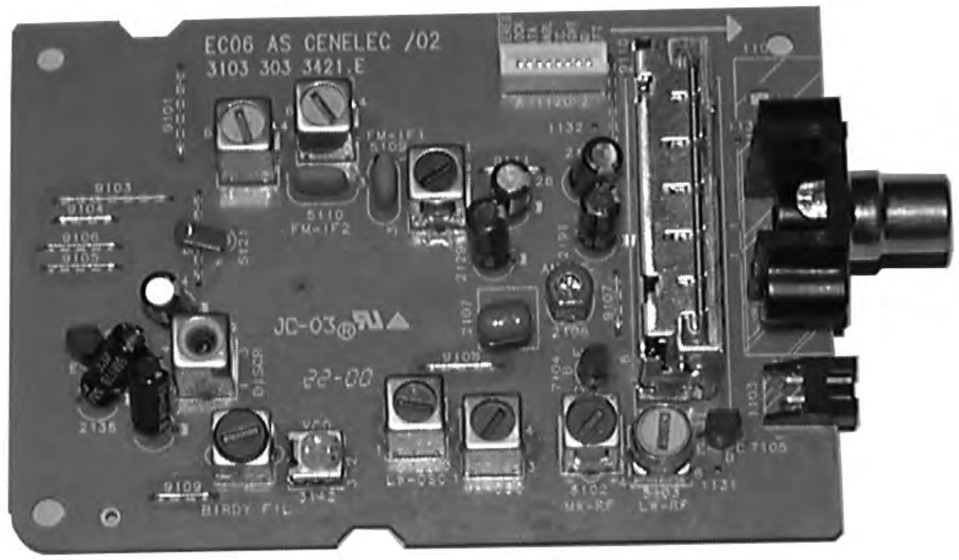
6103 ©	5322 130 34337	BAV99	
6105 ©	4822 130 83075	HN1V02H	
6106 ©	4822 130 83757	BAS216	
6107 ©	9340 386 90115	BZX284-C11	
6120 ©	4822 130 83757	BAS216	
6130 ©	4822 130 82833	1SV228	
6131 ©	4822 130 82833	1SV228	

TRANSISTORS

7102	4822 130 42131	BF550	
7103 ©	5322 130 42756	BC857C	RDS only
7111 ©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	

INTEGRATED CIRCUITS

7101 ©	9351 740 80557	TEA5757H/V1, RADIO IC



ECO6 Tuner Board

version: ***SYSTEMS CENELEC***

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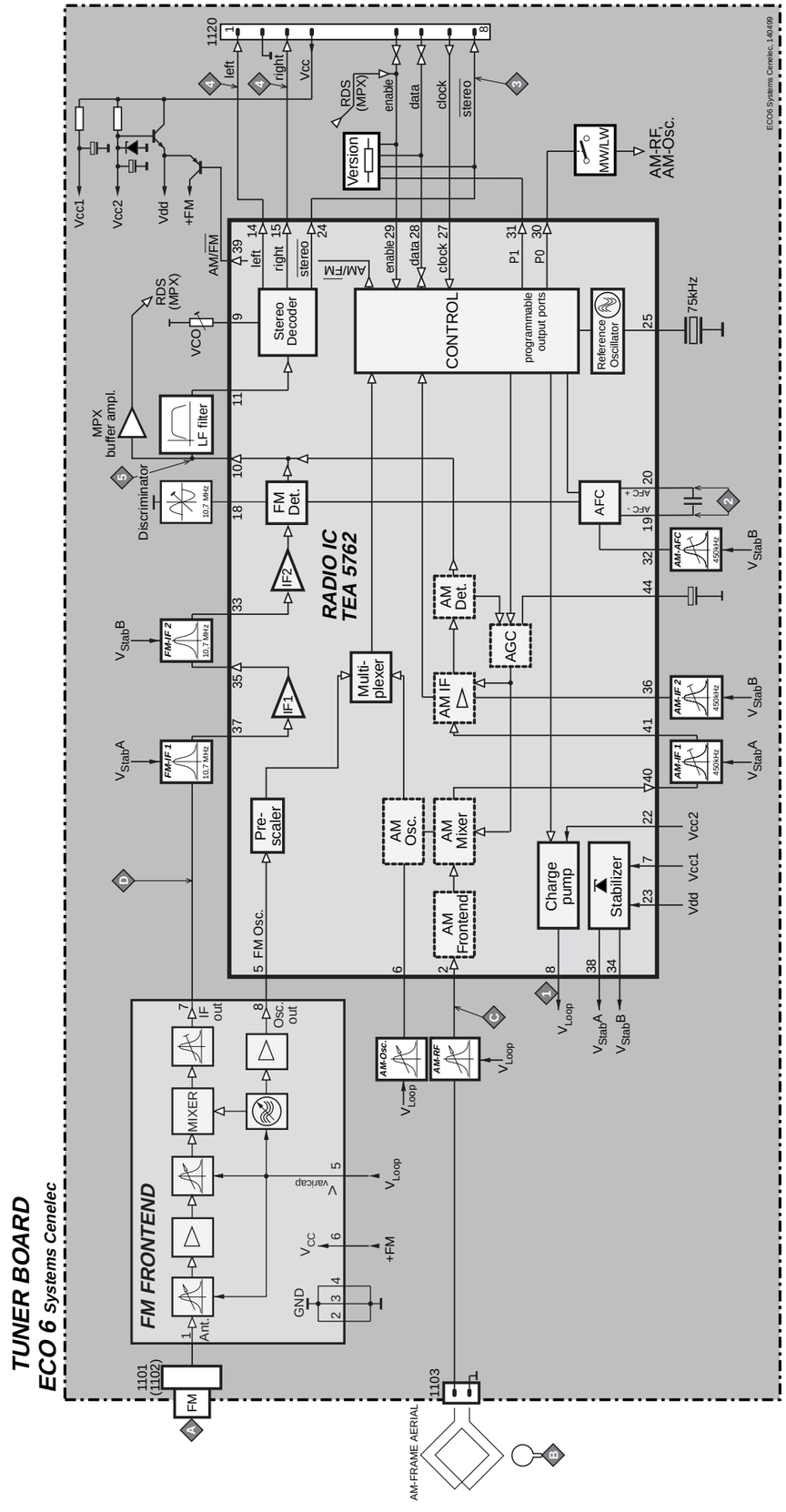


VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	☒				
/00 /02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-OIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒

☒ component mounted

1101	A2
1102	B1
1103	E2
1110	B2
1120	E14
1130	A2
1131	C2
1132	F13
2102	B1
2105	A2
2106	E3
2107	E4
2108	G3
2109	G3
2118	H6
2119	H6
2120	H6
2122	I6
2123	H6
2124	H6
2125	H6
2127	E7
2128	B8
2129	C7
2130	F11
2131	F8
2132	F8
2133	F8
2134	I8
2135	I9
2136	H14
2137	H13
2138	F9
2139	G9
2140	G9
2141	F10
2143	G12
2144	G11
2145	E11
2146	E12
2147	E12
2148	E12
2149	H7
2150	A10
2159	D5
2161	C11
2162	H12
2163	D11
2164	G10
2165	C7
2166	E11
2167	E11
2169	G8
2180	C4
2190	C3
2191	C3
3105	D5
3108	D2
3109	G4
3123	H3
3125	H2
3128	H3
3130	I9
3131	I9
3132	G4
3134	H6
3135	E7
3137	H7
3141	E7
3142	E6
3143	G7
3144	G8
3145	F8
3146	G13
3150	H12
3151	H12
3152	G14
3153	G13
3154	F13
3155	G12
3156	C12
3157	D12
3158	E13
3159	D13
3160	D13
3161	D13
3167	F12
3168	F11
3169	E11
3170	D12
3171	G12
3172	G12
3176	H7
3180	I3
3190	B6
3191	B7
3192	B6
3193	B4
3194	C4
3195	C3
4101	E2
4102	F3
4104	H5
5102	E3
5103	F2
5109	B9
5110	B10
5111	A9
5112	A11
5114	B11
5115	E7
5118	G9
5119	G9
5121	E11
5122	H5
5123	G5
6105-1	E4
6105-2	G6
6106	D4
6107	G13
6120	C13
7101	C8
7103	H8
7104	D2
7105	F4
7109	H3
7110	H12
7111	C13
7112	G12
7122	H4
7124	H7
T102	B2
T103	B2
T104	B6
T105	E2
T106	E2
T107	C3
T109	D5
T110	D5
T111	E5
T112	F7
T113	A9
T114	B11
T116	F10
T117	F13
T118	G11
T120	F13
T121	F13
T122	E13
T123	E13
T124	G14
T125	F14
T126	F13
T127	F13
T140	F11
T141	F10
T142	F10

LEGEND

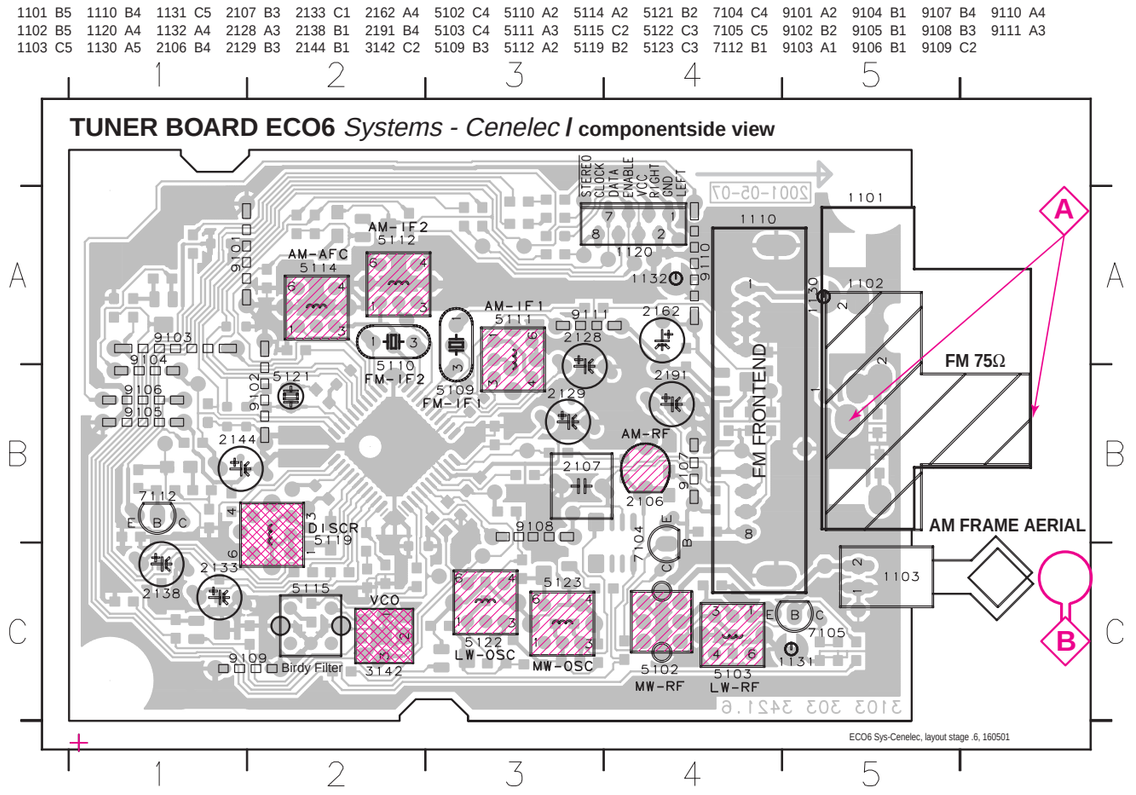
* ... only assembled in FM/AM-version
Ⓟ...for provision only
USA ... for USA version only
LW ... for LW version only

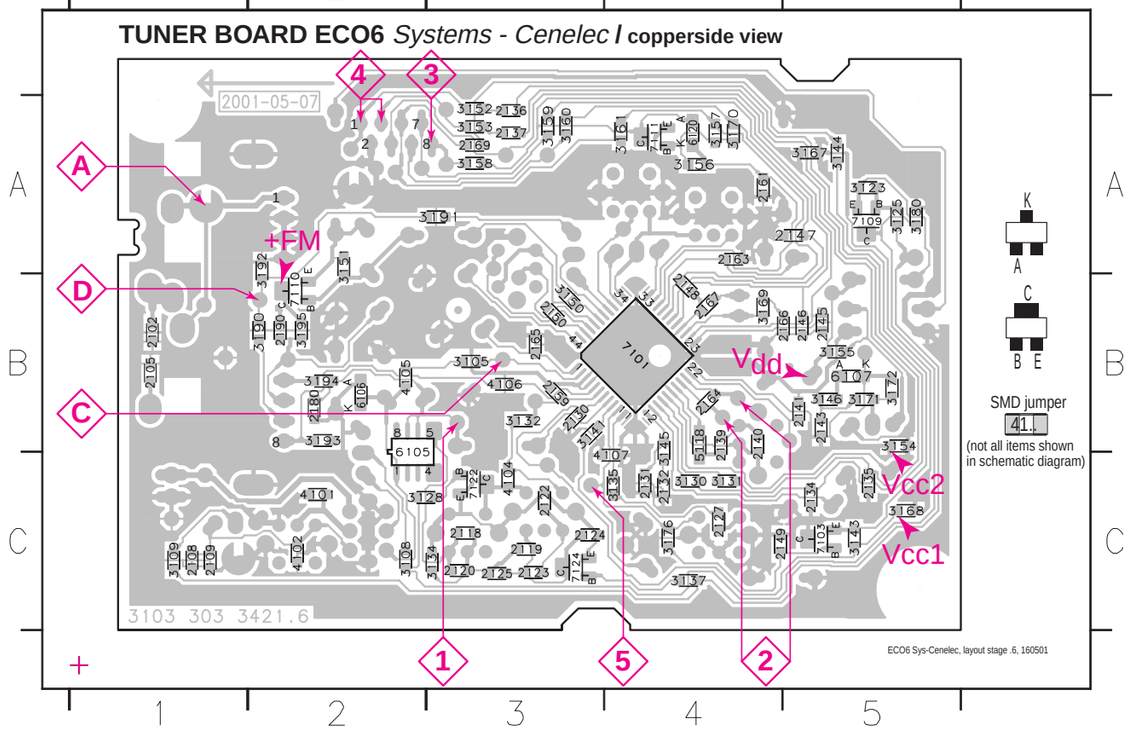
SMD jumper
41xx
0R

EVM

...V FM mode stereo
...V MW mode
...V LW mode
voltages measured while
set is tuned to a strong transmitter

Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right





These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

7B-3

TUNER ADJUSTMENT TABLE (**ECO6 Cenelec** FM/MW - and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	D	IC 7101 21 shortcircuit to block AFC 2141	5119	2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 36 220R 100nF	5111	5	max. f_o symmetric
			IC 7101 40 220R 100nF see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 2mV		5114	2	0mV ±2mV
AM RF 3)						
MW	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	5	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used! MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* SYSTEMS-CENELEC

7B-4

MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102 ©	4822 126 13838	100nF	10%	50V	not USA
2105 ©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750			LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450			FM/AM only
2107	4822 121 51319	1µF	20%	50V	
2108 ©	5322 122 32531	100pF	5%	50V	LW only
2109 ©	5322 122 32448	10pF	5%	50V	LW only
2120 ©	4822 126 13689	18pF	1%	63V	FM/AM only
2120 ©	5322 122 32658	22pF	5%	50V	LW only
2122 ©	4822 122 33891	3,3nF	10%	63V	LW only
2123 ©	2020 552 93494	390pF	1%	50V	LW only
2124 ©	4822 122 33177	10nF	20%	50V	FM/AM only
2125 ©	2020 552 96199	560pF	1%	50V	
2127 ©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130 ©	5322 122 32654	22nF	10%	63V	
2131 ©	4822 126 13482	470nF	20%	16V	
2132 ©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134 ©	3198 017 31530	15nF	10%	50V	not USA
2134 ©	5322 122 32654	22nF	10%	63V	USA only
2135 ©	3198 017 31530	15nF	10%	50V	not USA
2135 ©	3198 017 32230	22nF	10%	25V	USA only
2136 ©	4822 126 14076	220nF	20%	25V	
2137 ©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139 ©	4822 126 14236	15pF	5%	50V	
2140 ©	4822 126 13695	82pF	1%	63V	
2141 ©	4822 126 13838	100nF	10%	50V	
2143 ©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145 ©	4822 122 33575	220pF	5%	50V	
2146 ©	4822 122 33575	220pF	5%	50V	
2147 ©	4822 122 33575	220pF	5%	50V	
2148 ©	4822 122 33127	2,2nF	10%	63V	
2149 ©	5322 122 32659	33pF	5%	50V	RDS only
2150 ©	4822 126 13838	100nF	10%	50V	
2159 ©	5322 122 31151	22µF	20%	50V	
2163 ©	4822 126 13838	100nF	10%	50V	LW only
2164 ©	4822 126 13482	470nF	20%	16V	
2165 ©	4822 126 13838	100nF	10%	50V	
2166 ©	5322 122 31647	1nF	10%	63V	
2167 ©	4822 122 33926	12pF	5%	50V	
2169 ©	4822 122 33127	2,2nF	10%	63V	RDS only
2180 ©	3198 017 31030	10nF	10%	50V	
2190 ©	4822 126 13838	100nF	10%	50V	
2191	4822 124 40178	100µF	20%	10V	

RESISTORS

3105 ©	4822 117 11503	220Ω	5%	0,1W	
3108 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125 ©	4822 117 10833	10kΩ	1%	0,1W	LW only

RESISTORS

3128 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130 ©	3198 021 38210	820Ω	5%	0,06W	
3131 ©	3198 021 38210	820Ω	5%	0,06W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3135 ©	3198 021 31020	1kΩ	5%	0,06W	
3137 ©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3150 ©	4822 117 10833	10kΩ	1%	0,1W	
3151 ©	4822 051 20683	68kΩ	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 10353	150Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3171 ©	4822 117 10834	47kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180 ©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190 ©	4822 051 20121	120Ω	5%	0,1W	
3191 ©	4822 051 20121	120Ω	5%	0,1W	
3192 ©	4822 117 13577	330Ω	1%	0,1W	
3193 ©	4822 117 13577	330Ω	1%	0,1W	
3194 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3195 ©	4822 051 20101	100Ω	5%	0,1W	
4101 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW	
5103	2422 549 44107	RF-COIL LW	LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	
5114	4822 157 70302	AM-IF FILTER 450kHz	
5115	4822 157 71636	ANTI BIRDY FILTER	
5118 ©	2422 535 95881	100nH	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR	LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR	

DIODES

6105 ©	4822 130 83075	HN1V02H	
6106 ©	4822 130 83757	BAS216	
6107 ©	9340 386 90115	BZX284-C11	
6120 ©	4822 130 83757	BAS216	

TRANSISTORS

7103 ©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109 ©	4822 130 60373	BC856B	LW only
7110 ©	4822 130 60373	BC856B	
7111 ©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122 ©	5322 130 42755	BC847C	LW only
7124 ©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

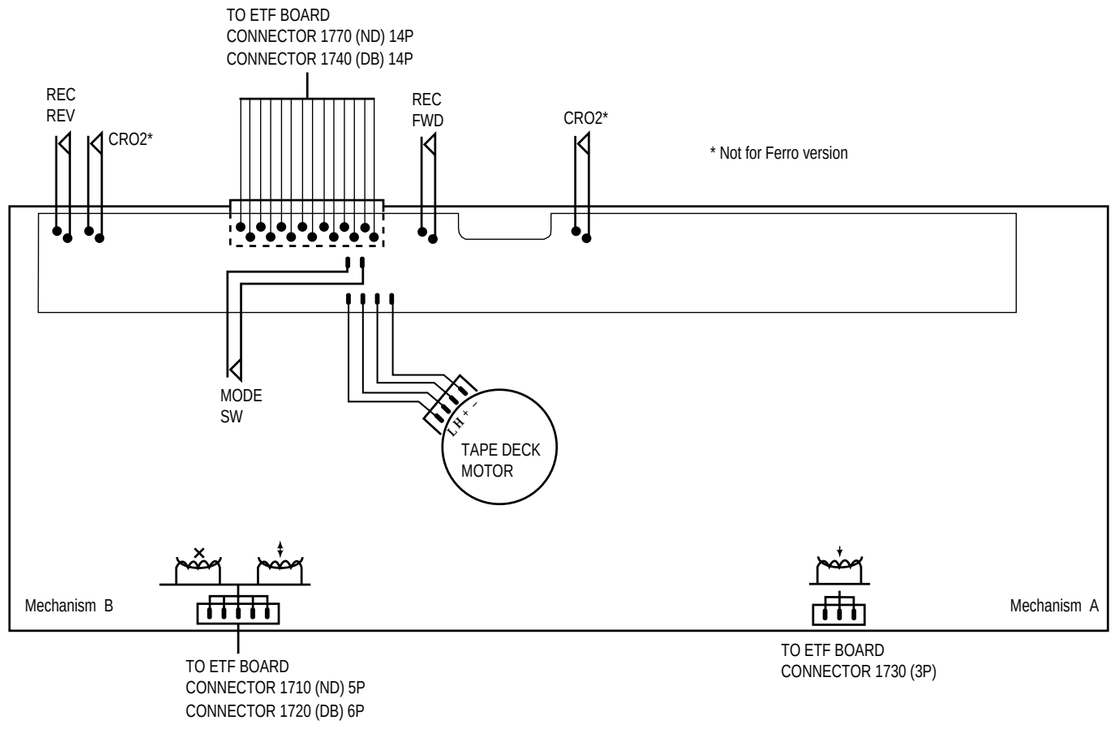
7101	4822 209 90315	TEA5762H/V1, RADIO IC

ETF7 TAPE MODULE

(Non-Dolby Version)

TABLE OF CONTENTS

Tapedeck wiring (Double deck)



Variations table for Analog Circuit

	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
2624	-	-	100nF
2701 , 2702	150pF	270pF	270pF
2703 , 2704	100pF	220pF	220pF
2717 , 2718	10nF	15nF	15nF
2721 , 2722	6,8nF	6,8nF	-
2727 , 2728	470pF	1nF	1nF
3616	10k	1k	1k
3618	6k8	-	-
3620	10k trimmer	-	-
3622	-	10k trimmer	10k trimmer
3672	4k7	-	-
3676	47k	-	-
3687	220R	220R	-
3688	680R	-	-
3723 , 3724	15k	18k	18k
3725 , 3726	10R	10R	-
3727 , 3728	5k6	6k8	6k8
3729 , 3730	3k3	4k7	4k7
3743 , 3744	1k5	2k2	2k2
3745 , 3746	3k3	5k6	5k6
3754 , 3755	1M	47R	47R

	Autoreverse ND/DD/FR	Non-autoreverse ND/DD/FF	
	Chrome/Ferro	Chrome/Ferro	Ferro
3769	12k	8k2	8k2
3772	6k8	5k6	5k6
4785	-	-	0R jumper
3774	15k	8k2	8k2
6614	1N4148	-	-
7616	BC857B	-	-
7622	BC847B	-	-

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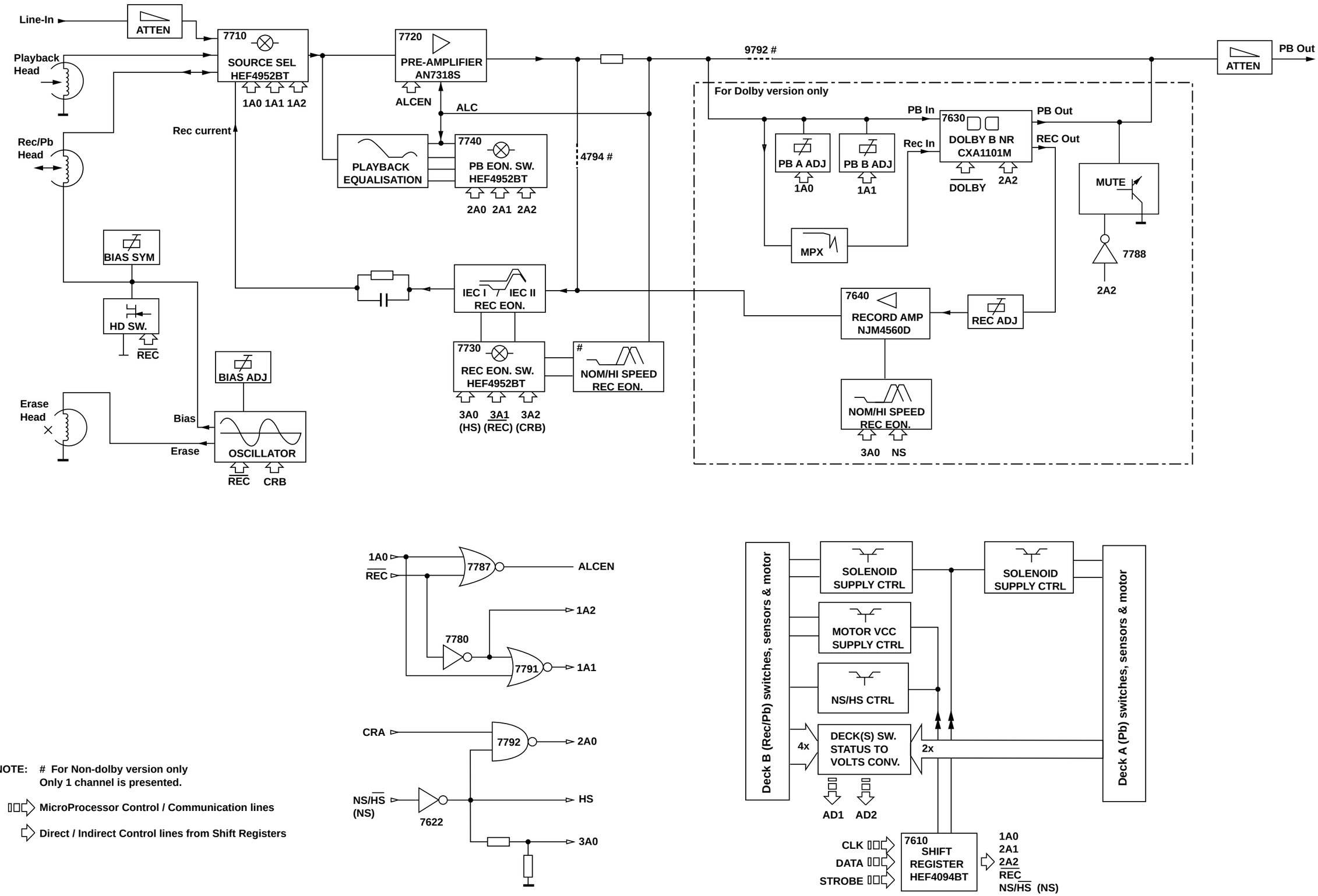
BLOCK DIAGRAM



NOTE: # For Non-dolby version only
Only 1 channel is presented.

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

9-3

Brief introduction

General

1. Playback Mode
   Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.

3. Dubbing Mode
   In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.

4. Mode Selector
   The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.

5. Amplifier PB/REC
   Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.

6. Automatic Level Control (ALC)
   ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762 , 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.

7. Muting Circuit (For Non-Dolby version only)
   Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952BT)
   The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.

9. IC7730 (HEF4952BT)
   The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).

10. Bias Level
    Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.

11. Bias Symm (For Dolby B NR version only)
    Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.

12. PB Switch
    Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)
    During High speed dubbing, a feedback signal from the uP through pin 03 of the IC7610 (HEF4094BT) will trigger the transistors 7622 (BC847B) and 7616 (BC857B) to cause a change in the voltage level between High and Low, thus changing the speed of the motor.

14. IC7610 (HEF4094BT)
    IC7610 (HEF4094BT) is a Shift Register use for issues the logic for cmos switch ICs (HEF4952BT) via 1A0, 2A1 and 2A2. It also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is controlled via NS/HS.

Dolby Circuit (For sets with Dolby B NR version only)

15. IC7630 (CXA1551M)
    IC7630 (CXA1551M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

16. 19kHz Filter
    The 19kHz filters 5631 & 5632 (LXD-210) in the Dolby circuit is for the purpose of filtering the 19kHz Pilot Tone (for Tuner signal only) of the Recording signal.

17. Level Adjust
    The Variable resistor 3635, 3636,3641 and 3642 in the Dolby circuit is for adjusting the playback level of the Dolby reference (400Hz , 200nWb/m). Transistor 7631, 7632 are ON to enable adjustment of 3641, 3642 during Playback Deck A. Transistor 7633, 7634 and 3635, 3636 are active for Playback Deck B.

18. Amplifier IC7640 (NJM4560M)
    The Amplifiers 7640A & 7640B (NJM4560M) in the Dolby circuit is for the purpose of amplified the Recording signal.

19. Muting Circuit
    The muting circuit which consists of transistors 7788, 7789 and 7790 (BC847B) is for the purpose of muting the output during Recording mode.

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

CR	Chrome (IEC type II)
DB	Dolby NR type B
DD	Double Deck
DM	Double Motor
FE	Ferro (IEC type I)
FF	Non-Autoreverse
FR	Autoreverse Deck B
Gnd x	Ground x
HSD	High speed dubbing
ND	Non Dolby
NR	Noise Reduction
NSD	Normal speed dubbing
PB	Playback
REC	Record
S/A	Sub-assy
SD	Single Deck
SM	Single Motor

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CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF BOARD

1	REC-L	Record input left
2	REC-R	Record input right
3	GND A	AF Ground
4	TAPE-L	Playback output left
5	+12V	D.C. supply (+12V) for AF electronics
6	TAPE-R	Playback output right
7	-CMOS	Negative d.c. supply (-9V) for CMOS ICs

CONNECTOR 1703 — INTERCONNECTION TO AF BOARD

1	GND M	Motor Ground
2	+MOTOR	D.C. supply (+12V) for tape deck motor & solenoid

CONNECTOR 1706 — INTERCONNECTION TO FRONT BOARD

1	AD2	Deck sensing switches output voltage / Deck A EOT
2	AD1	Deck sensing switches output voltage / Deck B EOT
3	+5V	DC supply +5V for ADC network
4	GND P	Control & Oscillator Ground
5	CLK	HEF4094BT shift register Clock line
6	DATA	HEF4094BT shift register Data line
7	STROBE	HEF4094BT shift register Strobe line

CONNECTOR 1710 — DECK B HEADS CONNECTON ***(For Non-Dolby version only)***

1	B R/P HD L+	R/P Head left channel positive
2	GND A	R/P Head return ground
3	B R/P HD R+	R/P Head right channel positive
4	ERASE HEAD	Erase Head
5	GND A	Erase Head ground

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For Dolby B NR version only)***

1	B R/P HD L+	R/P Head left channel positive
2	B R/P HD L-	R/P Head left channel negative
3	B R/P HD R+	R/P Head right channel positive
4	B R/P HD R-	R/P Head right channel negative
5	ERASE HEAD	Erase Head
6	GND A	Erase Head ground

CONNECTOR 1730 — DECK A HEAD CONNECTIONS ***(For Double Deck versions only)***

1	A PB HD L+	Pb Head left channel positive
2	GND A	Pb Head return ground shield
3	A PB HD R+	Pb Head right channel positive

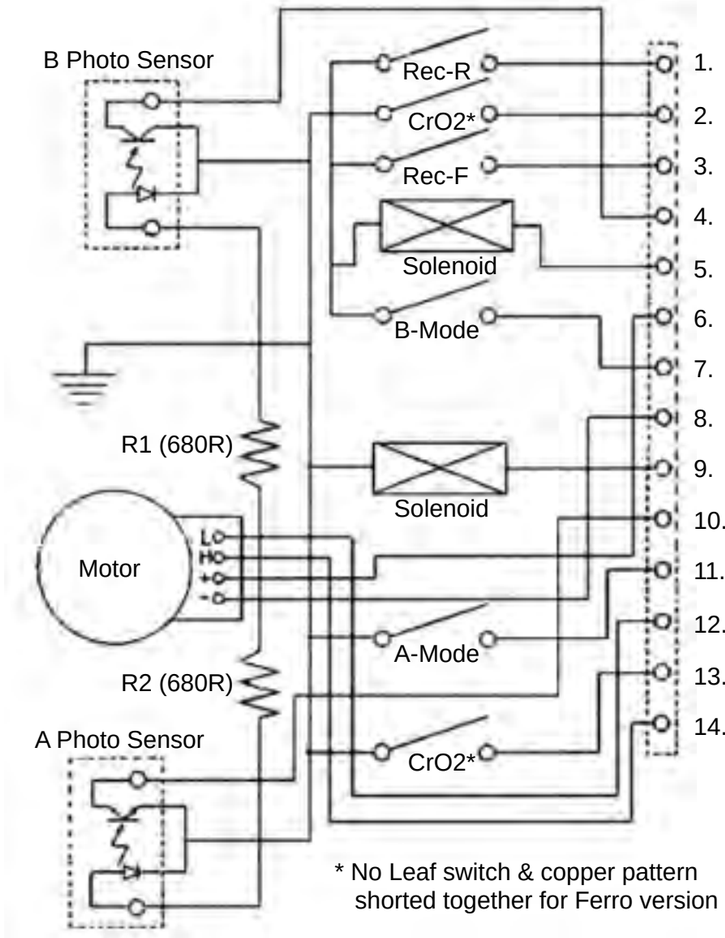
CONNECTOR 1740 — DECK A & B CONTROL INTERFACE ***(For Dolby B NR version only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

CONNECTOR 1770 — DECK A & B CONTROL INTERFACE ***(For Non-Dolby version only)***

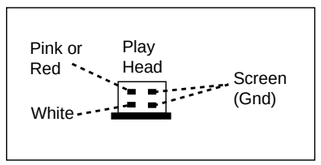
1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
4	PHOTO B	Photo sensor output (tape movement indication)	
5	SOL B	Solenoid supply for deck B	
6	Vcc	Deck / Motor supply	
7	MODE B	Mode switch (head engagement)	[open=off: close=engaged]
8	GND M	Deck / Motor ground	
9	SOL A	Solenoid supply for deck A	
10	PHOTO A	Photo sensor output (tape movement indication)	
11	MODE A	Mode switch (head engagement)	[open=off: close=engaged]
12	L	L pin for motor	
13	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
14	H	H pin for motor	

TAPE MECHANISM ELECTRONICS

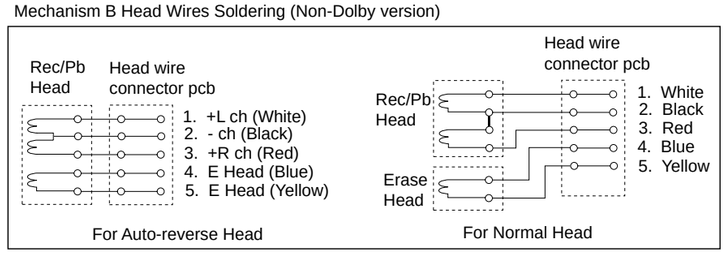


* No Leaf switch & copper pattern shorted together for Ferro version

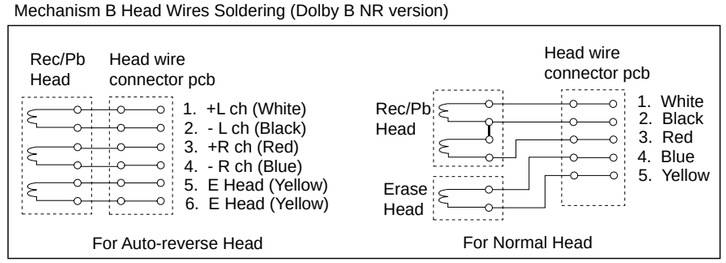
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2 LEFT RIGHT	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	<0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A^	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV +/- 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	<3% *

SBC419A^ : 4822 397 30069
SBC420 : 4822 397 30071

\# For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-meaure
^ Not applicable for Ferro version

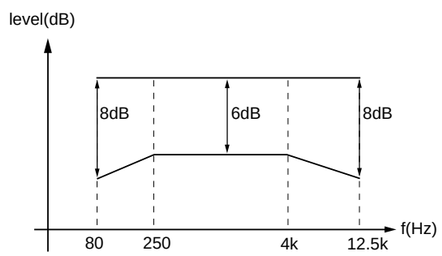


figure. 1

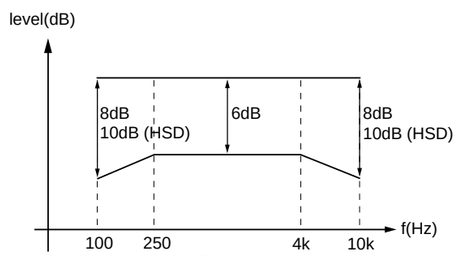
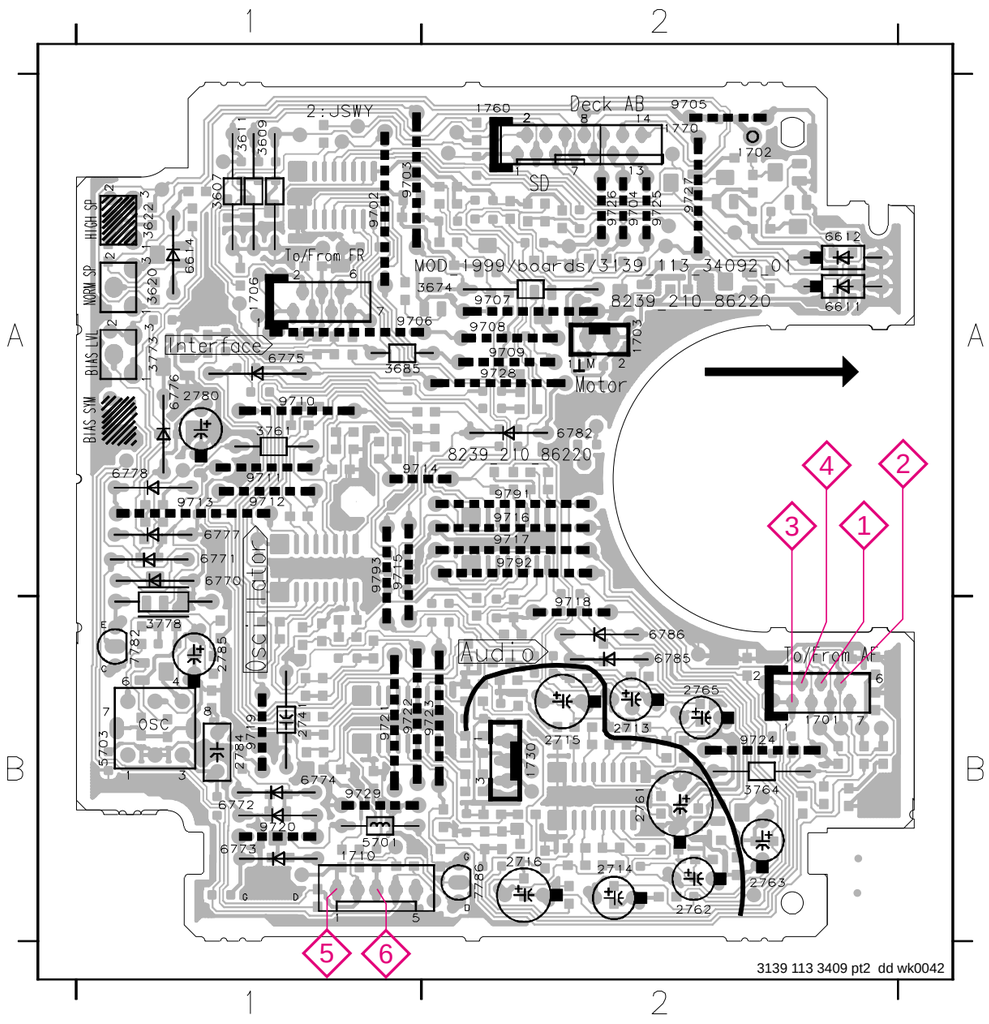


figure. 2

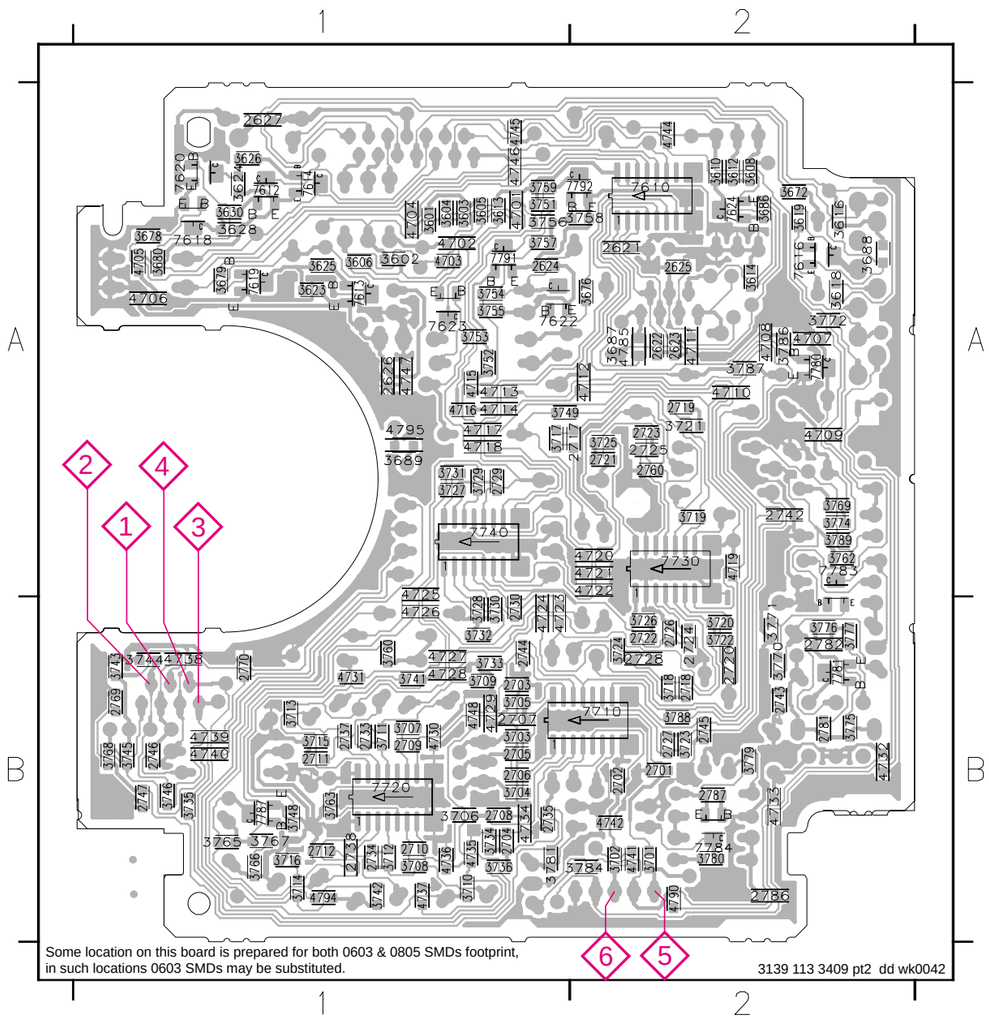
COMPONENT LAYOUT

1701	B2	2714	B2	2784	B1	3761	A1	6770	A1	6782	A2	9706	A1	9715	A1	9724	B2
1702	A2	2715	B2	2785	B1	3764	B2	6771	A1	6785	B2	9707	A2	9716	A2	9725	A2
1703	A2	2716	B2	3607	A1	3773	A1	6772	B1	6786	B2	9708	A2	9717	A2	9726	A2
1706	A1	2741	B1	3609	A1	3778	B1	6773	B1	7782	B1	9709	A2	9718	B2	9727	A2
1710	B1	2761	B2	3611	A1	5701	B1	6774	B1	7786	B2	9710	A1	9719	B1	9728	A2
1730	B2	2762	B2	3620	A1	5703	B1	6775	A1	9702	A1	9711	A1	9720	B1	9729	B1
1760	A2	2763	B2	3622	A1	6611	A2	6776	A1	9703	A1	9712	A1	9721	B1	9791	A2
1770	A2	2765	B2	3674	A2	6612	A2	6777	A1	9704	A2	9713	A1	9722	B1	9792	A2
2713	B2	2780	A1	3685	A1	6614	A1	6778	A1	9705	A2	9714	A1	9723	B2	9793	A1



CHIP LAYOUT

2621	A2	2724	B2	3602	A1	3688	A2	3725	A2	3757	A1	4701	A1	4727	B1	7612	A1
2622	A2	2725	A2	3603	A1	3689	A1	3726	B2	3758	A2	4702	A1	4728	B1	7613	A1
2623	A2	2726	B2	3604	A1	3701	B2	3727	A1	3759	A1	4703	A1	4729	B1	7614	A1
2624	A1	2727	B2	3605	A1	3702	B2	3728	B1	3760	B1	4704	A1	4730	B1	7616	A2
2625	A2	2728	B2	3606	A1	3703	B1	3729	A1	3762	A2	4705	A1	4731	B1	7618	A1
2626	A1	2729	A1	3608	A2	3704	B1	3730	B1	3763	B1	4706	A1	4732	B2	7619	A1
2627	A1	2730	B1	3610	A2	3705	B1	3731	A1	3765	B1	4707	A2	4733	B2	7620	A1
2701	B2	2733	B1	3612	A2	3706	B1	3732	B1	3766	B1	4708	A2	4734	B1	7622	A1
2702	B2	2734	B1	3613	A1	3707	B1	3733	B1	3767	B1	4709	A2	4735	B1	7623	A1
2703	B1	2735	B1	3614	A2	3708	B1	3734	B1	3768	B1	4710	A2	4736	B1	7624	A2
2704	B1	2737	B1	3616	A2	3709	B1	3735	B1	3769	A2	4711	A2	4737	B1	7710	B2
2705	B1	2738	B1	3618	A2	3710	B1	3736	B1	3770	B2	4712	A2	4738	B1	7720	B1
2706	B1	2742	A2	3619	A2	3711	B1	3741	B1	3771	B2	4713	A1	4739	B1	7730	A2
2707	B1	2743	B2	3623	A1	3712	B1	3742	B1	3772	A2	4714	A1	4740	B1	7740	A1
2708	B1	2744	B1	3624	A1	3713	B1	3743	B1	3774	A2	4715	A1	4741	B2	7780	A2
2709	B1	2745	B2	3625	A1	3714	B1	3744	B1	3775	B2	4716	A1	4742	B2	7781	B2
2710	B1	2746	B1	3626	A1	3715	B1	3745	B1	3776	B2	4717	A1	4744	A2	7783	A2
2711	B1	2747	B1	3628	A1	3716	B1	3746	B1	3777	B2	4718	A1	4745	A1	7784	B2
2712	B1	2760	A2	3630	A1	3717	A1	3748	B1	3779	B2	4719	A2	4746	A1	7787	B1
2717	A2	2769	B1	3672	A2	3718	B2	3749	A1	3780	B2	4720	A2	4747	A1	7791	A1
2718	B2	2770	B1	3676	A2	3719	A2	3751	A1	3781	B1	4721	A2	4748	B1	7792	A2
2719	A2	2781	B2	3678	A1	3720	B2	3752	A1	3784	B2	4722	A2	4785	A2		
2720	B2	2782	B2	3679	A1	3721	A2	3753	A1	3786	A2	4723	B1	4790	B2		
2721	A2	2786	B2	3680	A1	3722	B2	3754	A1	3787	A2	4724	B1	4794	B1		
2722	B2	2787	B2	3686	A2	3723	B2	3755	A1	3788	B2	4725	A1	4795	A1		
2723	A2	3601	A1	3687	A2	3724	B2	3756	A1	3789	A2	4726	B1	7610	A2		

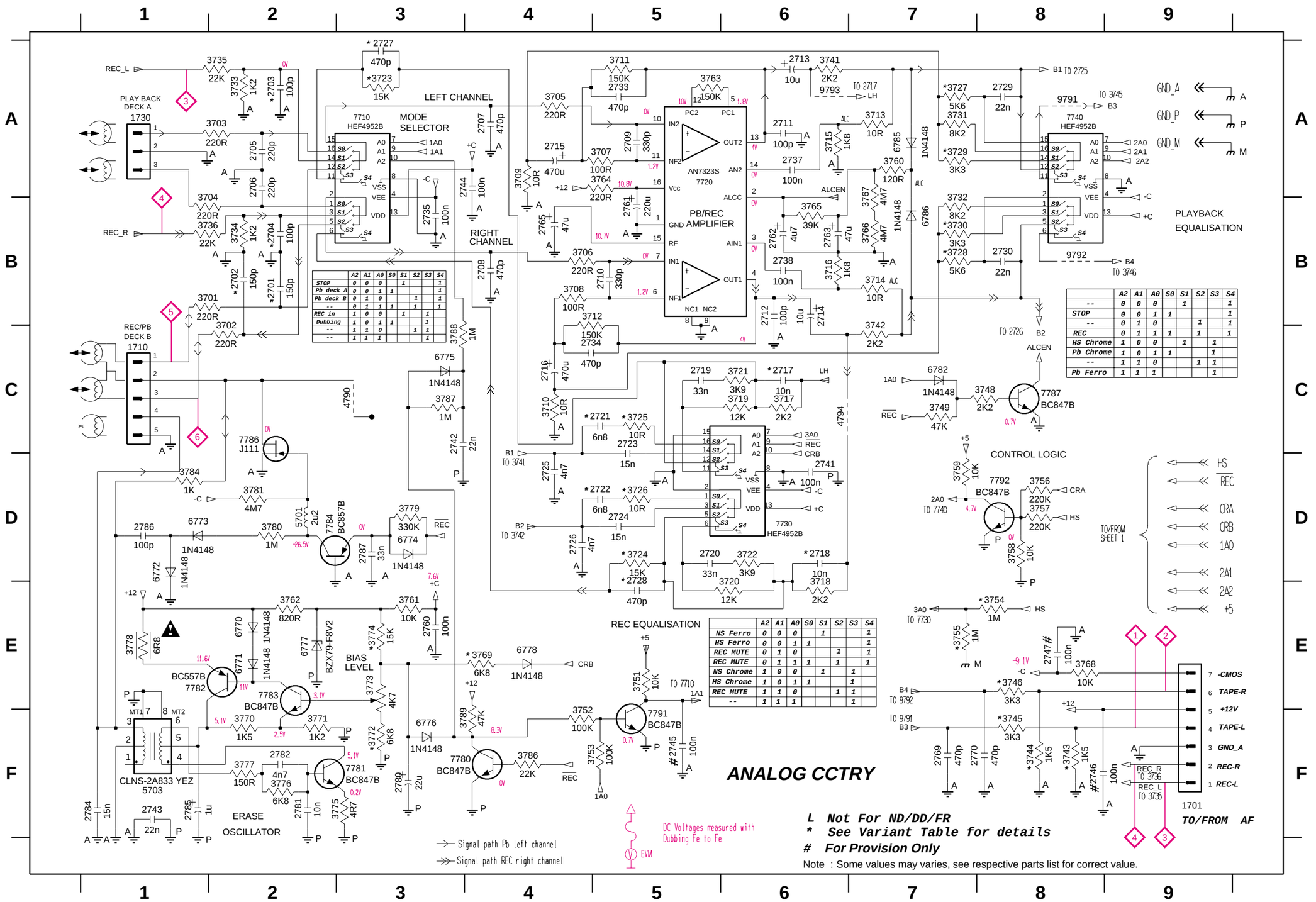


Some location on this board is prepared for both 0603 & 0805 SMDs footprint,
in such locations 0603 SMDs may be substituted.

9-7

ANALOG CIRCUIT

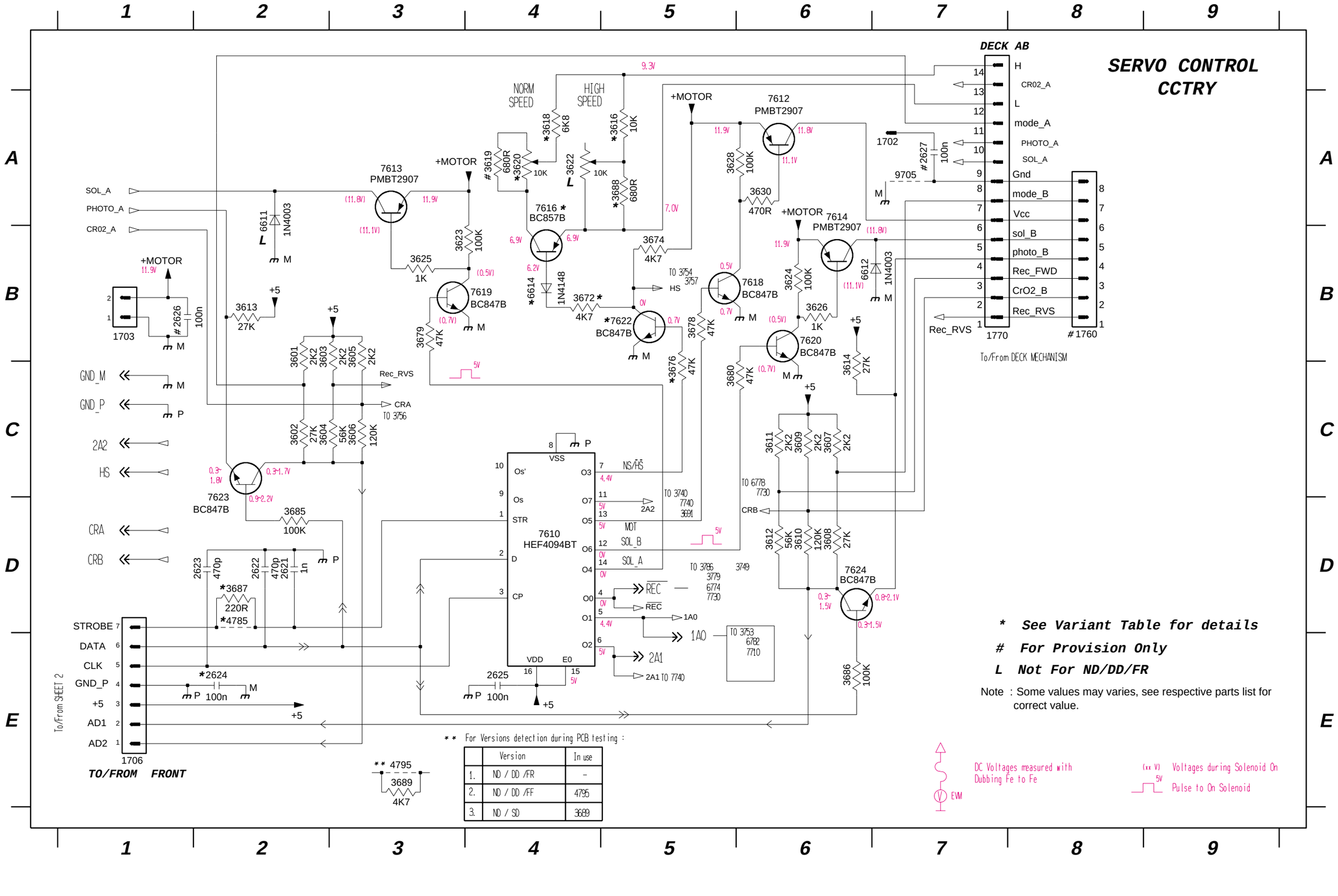
1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5	3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7	3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7	3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7	3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7	3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7	3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7	3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	

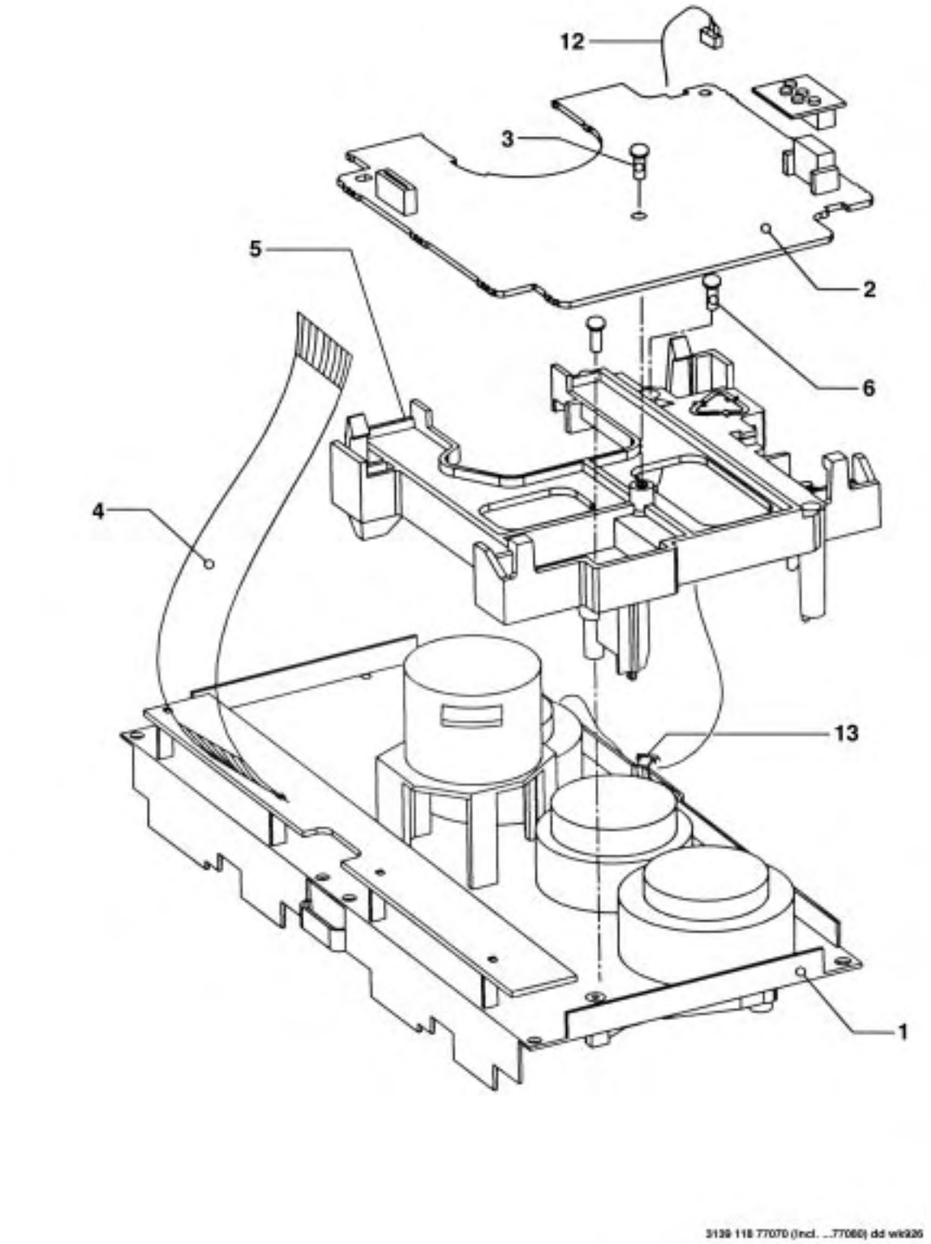


9-8

SERVO CONTROL CIRCUIT

1702 A7 1760 B8 2622 D2 2625 E4 3601 B2 3604 C2 3607 C6 3610 D6 3613 B2 3618 A4 3622 A4 3625 B3 3630 A6 3676 C5 3680 C5 3687 D2 4785 D2 6612 B6 7612 A6 7616 A4 7620 B6 7624 D6
1703 B1 1770 B7 2623 D2 2626 B1 3602 C2 3605 B3 3608 D6 3611 C6 3614 C6 3619 A4 3623 B3 3626 B6 3672 B4 3678 B5 3685 D2 3688 A5 4795 E3 6611 A2 6614 B4 7610 D4 7613 A3 7618 A6 7619 B4 7622 B6 9705 A7
1706 E1 2621 D2 2624 E2 2627 A7 3603 B2 3606 C3 3609 C6 3612 D6 3616 A5 3620 A4 3624 B6 3628 A5 3674 B5 3679 B3 3686 E6 3689 E3 6611 A2 6615 D4 7611 A4 7614 A6 7619 B4 7623 D2



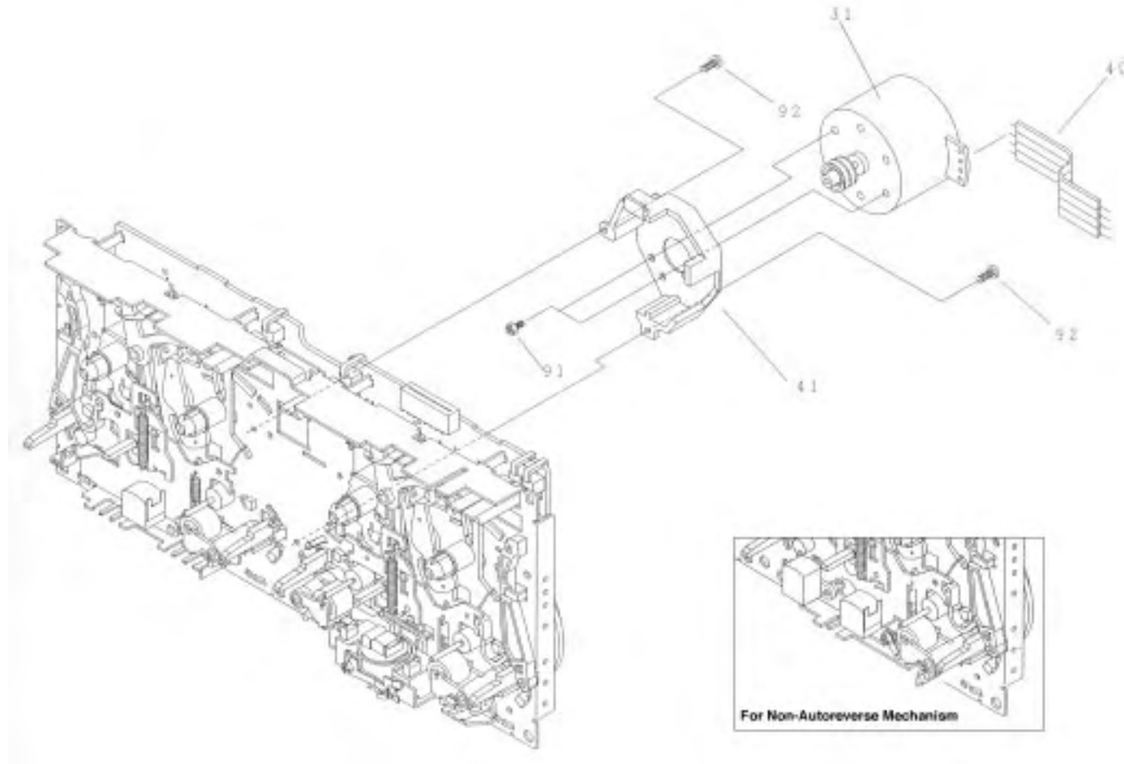


TAPE MODULE EXPLODED VIEW

1	3139 118 77130	Autoreverse Mech. CWE44FR01
1	3139 118 77140	Non-Autoreverse Mech. CWE44FF02 Chrome/Ferro
1	3139 118 77950	Non-Autoreverse Mech. CWE44FF05 Ferro
3	-	Screw D3 x 10
6	-	Screw M2 x 16
7	3139 110 34080	Flex Cable 14 pin 7,5 cm

Note: Only the parts mentioned in this list are normal service spare parts.

9-9



TAPE MECHANISM - MOTOR EXPLODED VIEW

31	4822 361 11055	Motor Assembly
91	-	Screw M2,6 x 5
92	-	Screw M2 x 5

Note: Only the parts mentioned in this list are normal service spare parts.

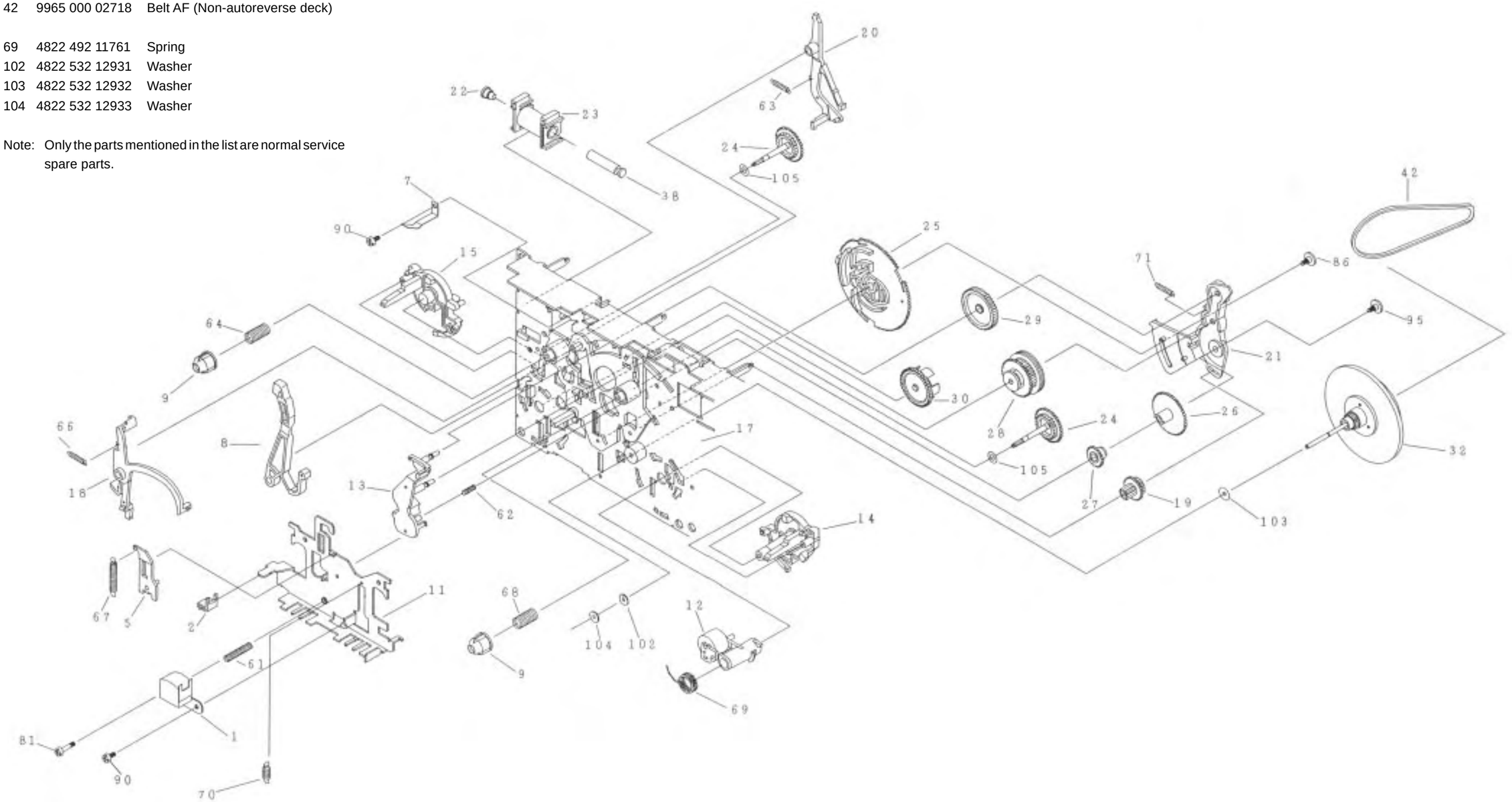
9-10

TAPE MECHANISM A - PLAY

MECHANICAL PARTS - PLAY MECHANISM

1	9965 000 02313	Play Head (Non-Autoreverse deck)
1	9965 000 02321	Play Head (Autoreverse deck)
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
42	9965 000 02315	Belt AF (Autoreverse deck)
42	9965 000 02718	Belt AF (Non-autoreverse deck)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



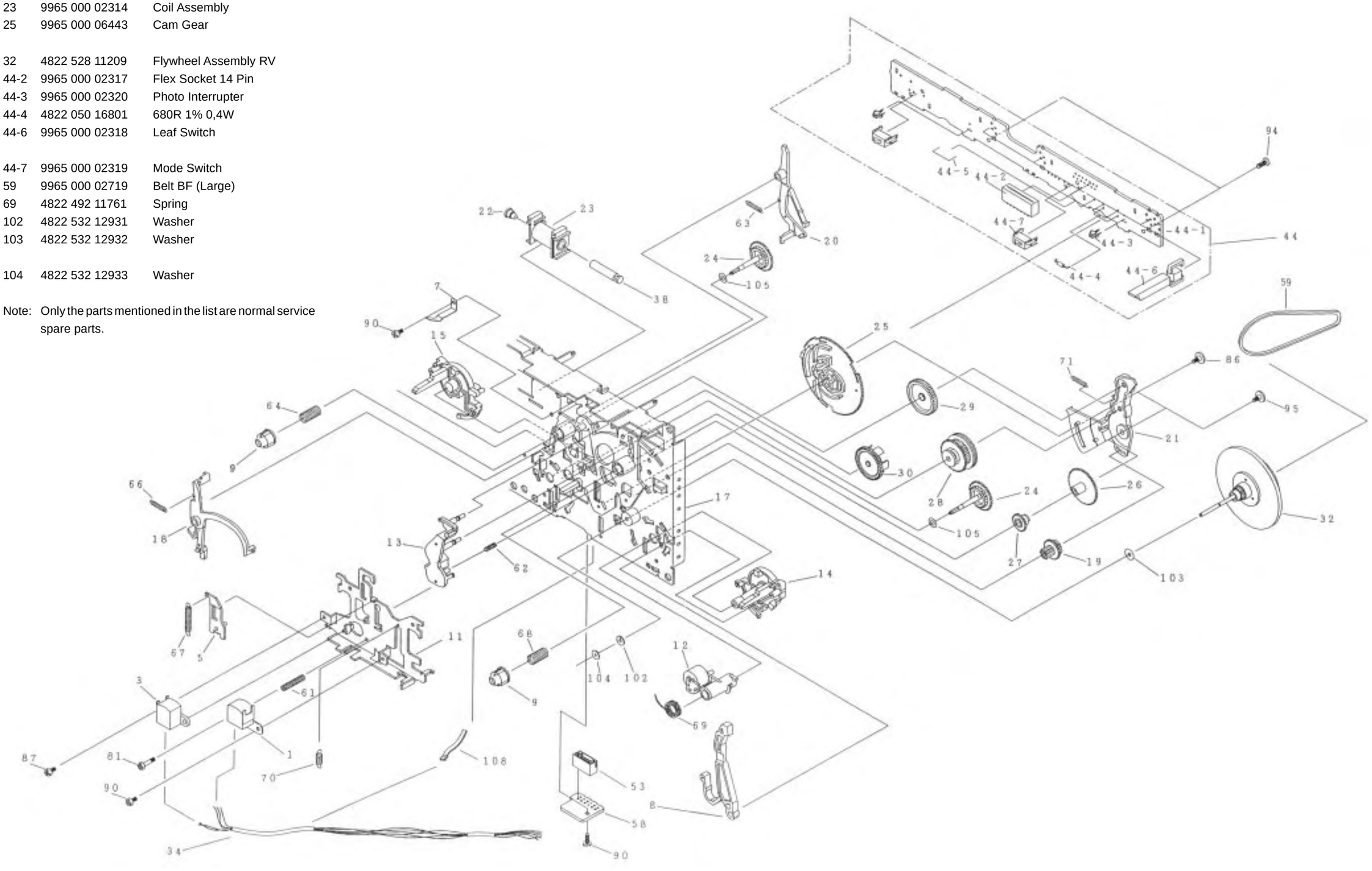
9-11

TAPE MECHANISM B - RECORD/PLAYBACK *(Non-Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

1	9965 000 02313	Play Head
3	9965 000 02600	Head, Erase
12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
59	9965 000 02719	Belt BF (Large)
69	4822 492 11761	Spring
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



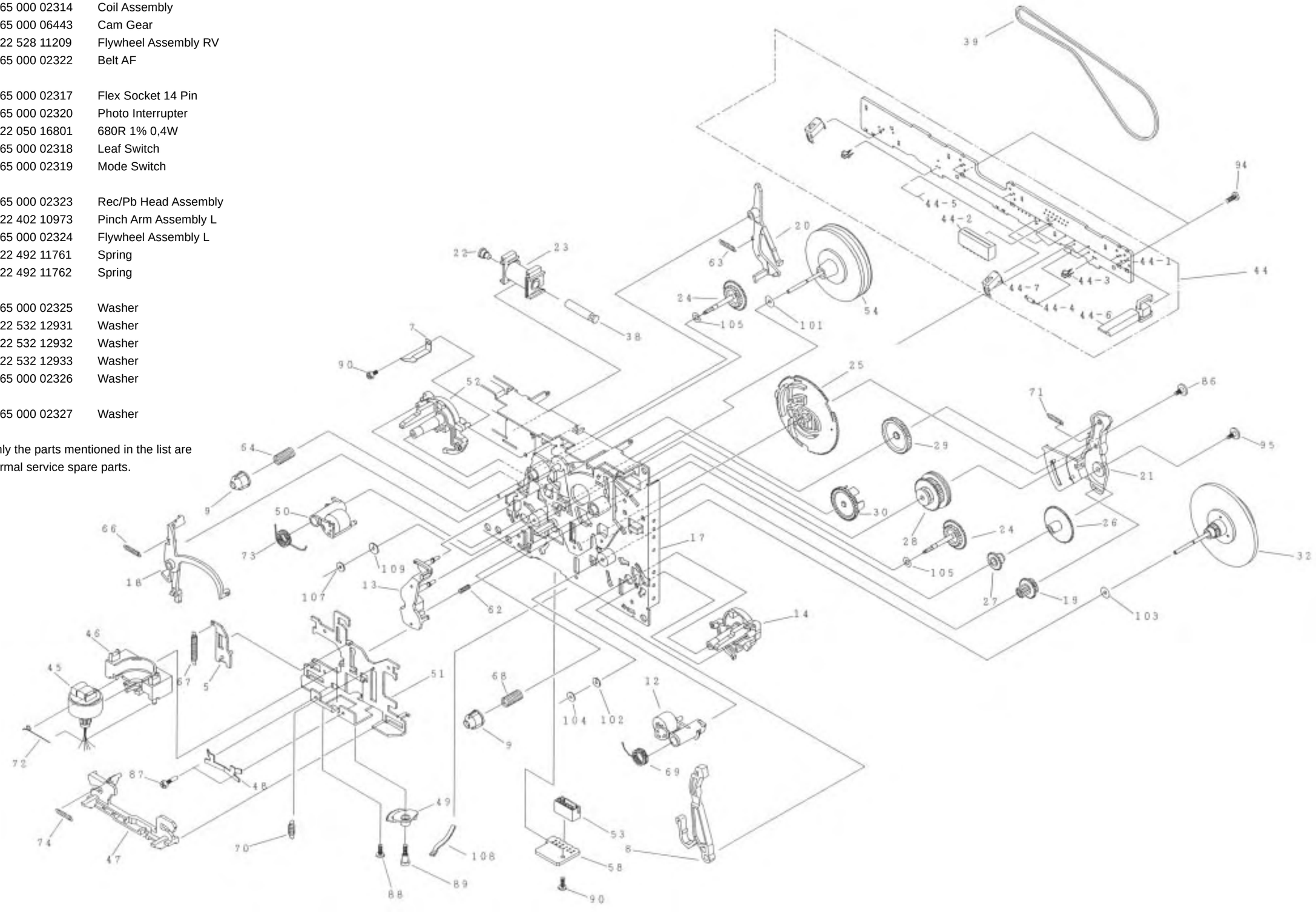
9-12

TAPE MECHANISM B - RECORD/PLAYBACK *(Autoreverse version)*

MECHANICAL PARTS - REC/PB MECHANISM

12	4822 402 10972	Pinch Arm Assembly R
23	9965 000 02314	Coil Assembly
25	9965 000 06443	Cam Gear
32	4822 528 11209	Flywheel Assembly RV
39	9965 000 02322	Belt AF
44-2	9965 000 02317	Flex Socket 14 Pin
44-3	9965 000 02320	Photo Interrupter
44-4	4822 050 16801	680R 1% 0,4W
44-6	9965 000 02318	Leaf Switch
44-7	9965 000 02319	Mode Switch
45	9965 000 02323	Rec/Pb Head Assembly
50	4822 402 10973	Pinch Arm Assembly L
54	9965 000 02324	Flywheel Assembly L
69	4822 492 11761	Spring
73	4822 492 11762	Spring
101	9965 000 02325	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
107	9965 000 02326	Washer
109	9965 000 02327	Washer

Note: Only the parts mentioned in the list are normal service spare parts.



9-13

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

MISCELLANEOUS

1701	482226710953	Flex Socket 7pin Vert.
1706	482226710953	Flex Socket 7pin Vert.
1770	482226751255	Flex Socket 14pin Vert.

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	532212234099	470pF 10% 63V
2624	482212614585	100nF 10% 50V only for Ferro
2625	482212614585	100nF 10% 50V
2701	532212233538	150pF 2% 63V Autoreverse
2701	482212233216	270pF 5% 63V Non-autoreverse
2702	532212233538	150pF 2% 63V Autoreverse
2702	482212233216	270pF 5% 63V Non-autoreverse
2703	532212232531	100pF 5% 50V Autoreverse
2703	482212233575	220pF 5% 63V Non-autoreverse
2704	532212232531	100pF 5% 50V Autoreverse
2704	482212233575	220pF 5% 63V Non-autoreverse
2705	482212233575	220pF 5% 63V
2706	482212233575	220pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233177	10nF 20% 50V Autoreverse
2717	482212613188	15nF 5% 63V Non-autoreverse
2718	482212233177	10nF 20% 50V Autoreverse
2718	482212613188	15nF 5% 63V Non-autoreverse
2719	482212612105	33nF 5% 50V
2720	482212612105	33nF 5% 50V
2721	532212231866	6,8nF 10% 63V not for Ferro
2722	532212231866	6,8nF 10% 63V not for Ferro
2723	482212613188	15nF 5% 63V
2724	482212613188	15nF 5% 63V
2725	532212610223	4,7nF 10% 63V
2726	532212610223	4,7nF 10% 63V
2727	532212234099	470pF 10% 63V Autoreverse
2727	532212231647	1nF 10% 63V Non-autoreverse
2728	532212234099	470pF 10% 63V Autoreverse
2728	532212231647	1nF 10% 63V Non-autoreverse
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V
2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	532212232654	22nF 10% 63V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 20% 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482211710833	10k 1% 0,1W Autoreverse
3616	482205110102	1k 2% 0,25W Non-autoreverse
3618	482211711507	6k8 1% 0,1W Autoreverse
3620	482210011141	Trim. 10k 30% Autoreverse
3622	482210011141	Trim. 10k 30% Non-autoreverse
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3672	482205120472	4k7 5% 0,1W Autoreverse
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W Autoreverse
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W
3685	482211652234	100k 5% 0,5W
3686	482211710837	100k 1% 0,1W
3687	482211711503	220R 1% 0,1W not for Ferro
3688	482211710361	680R 1% 0,1W Autoreverse
3701	482211711503	220R 1% 0,1W
3702	482211711503	220R 1% 0,1W
3703	482211711503	220R 1% 0,1W
3704	482211711503	220R 1% 0,1W
3705	482211711503	220R 1% 0,1W
3706	482211711503	220R 1% 0,1W
3707	482205120101	100R 5% 0,1W
3708	482205120101	100R 5% 0,1W
3709	482205120109	10R 5% 0,1W
3710	482205120109	10R 5% 0,1W
3711	482205120154	150k 5% 0,1W
3712	482205120154	150k 5% 0,1W
3713	482205120109	10R 5% 0,1W
3714	482205120109	10R 5% 0,1W
3715	482205120182	1k8 5% 0,1W
3716	482205120182	1k8 5% 0,1W
3717	482211711449	2k2 1% 0,1W
3718	482211711449	2k2 1% 0,1W
3719	482211711383	12k 1% 0,1W
3720	482211711383	12k 1% 0,1W
3721	482205120392	3k9 5% 0,1W
3722	482205120392	3k9 5% 0,1W
3723	482211683933	15k 1% 0,1W Autoreverse
3723	482211710965	18k 1% 0,1W Non-autoreverse
3724	482211683933	15k 1% 0,1W Autoreverse
3724	482211710965	18k 1% 0,1W Non-autoreverse
3725	482205120109	10R 5% 0,1W not for Ferro
3726	482205120109	10R 5% 0,1W not for Ferro
3727	482205120562	5k6 5% 0,1W Autoreverse
3727	482211711507	6k8 1% 0,1W Non-autoreverse
3728	482205120562	5k6 5% 0,1W Autoreverse
3728	482211711507	6k8 1% 0,1W Non-autoreverse
3729	482205120332	3k3 5% 0,1W Autoreverse
3729	482205120472	4k7 5% 0,1W Non-autoreverse
3730	482205120332	3k3 5% 0,1W Autoreverse
3730	482205120472	4k7 5% 0,1W Non-autoreverse
3731	482205120822	8k2 5% 0,1W
3732	482205120822	8k2 5% 0,1W
3733	482205120122	1k2 5% 0,1W
3734	482205120122	1k2 5% 0,1W
3735	482205120223	22k 5% 0,1W
3736	482205120223	22k 5% 0,1W
3741	482211711449	2k2 1% 0,1W
3742	482211711449	2k2 1% 0,1W
3743	482211711139	1k5 1% 0,1W Autoreverse
3743	482211711449	2k2 1% 0,1W Non-autoreverse
3744	482211711139	1k5 1% 0,1W Autoreverse
3744	482211711449	2k2 1% 0,1W Non-autoreverse
3745	482205120332	3k3 5% 0,1W Autoreverse
3745	482205120562	5k6 5% 0,1W Non-autoreverse
3746	482205120332	3k3 5% 0,1W Autoreverse
3746	482205120562	5k6 5% 0,1W Non-autoreverse
3748	482211711449	2k2 1% 0,1W
3749	482211710834	47k 1% 0,1W
3751	482211710833	10k 1% 0,1W
3752	482211710837	100k 1% 0,1W
3753	482211710837	100k 1% 0,1W
3754	482205120105	1M 5% 0,1W Autoreverse
3754	482205120479	47R 5% 0,1W Non-autoreverse
3755	482205120105	1M 5% 0,1W Autoreverse
3755	482205120479	47R 5% 0,1W Non-autoreverse
3756	482211713579	220k 1% 0,1W
3757	482211713579	220k 1% 0,1W
3758	482211710833	10k 1% 0,1W
3759	482211710833	10k 1% 0,1W
3760	482205120121	120R 5% 0,1W
3761	482205021003	10k 1% 0,6W
3762	482211711454	820R 1% 0,1W
3763	482205120154	150k 5% 0,1W
3764	482211683872	220R 5% 0,5W
3765	482205120393	39k 5% 0,1W
3766	482205120475	4M7 5% 0,1W
3767	482205120475	4M7 5% 0,1W
3768	482211710833	10k 1% 0,1W
3769	482211711383	12k 1% 0,1W Autoreverse
3769	482205120822	8k2 5% 0,1W Non-autoreverse
3770	482211711139	1k5 1% 0,1W
3771	482205120122	1k2 5% 0,1W
3772	482211711507	6k8 1% 0,1W Autoreverse
3772	482205120562	5k6 5% 0,1W Non-autoreverse
3773	482210012227	Trimmer 4k7 30% 0,1W
3774	482211683933	15k 1% 0,1W Autoreverse
3774	482205120822	8k2 5% 0,1W Non-autoreverse
3775	482205120478	4R7 5% 0,1W
3776	482211711507	6k8 1% 0,1W
3777	482211710353	150R 1% 0,1W
3778	482205210688	⚠ 6R8 5% 0,33W
3779	482205120334	330k 5% 0,1W
3780	482205120105	1M 5% 0,1W
3781	482205120475	4M7 5% 0,1W
3784	482205110102	1k 2% 0,25W
3786	482205120223	22k 5% 0,1W
3787	482205120105	1M 5% 0,1W
3788	482205120105	1M 5% 0,1W
3789	482211710834	47k 1% 0,1W
4701	482205120008	0R Jumper 0805
4702	482205120008	0R Jumper 0805
4703	482205120008	0R Jumper 0805
4704	482205120008	0R Jumper 0805
4705	482205120008	0R Jumper 0805

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ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

RESISTORS

4706	482205120008	0R Jumper 0805	
4707	482205120008	0R Jumper 0805	
4708	482205120008	0R Jumper 0805	
4709	482205120008	0R Jumper 0805	
4710	482205120008	0R Jumper 0805	
4711	482205120008	0R Jumper 0805	
4712	482205120008	0R Jumper 0805	
4713	482205120008	0R Jumper 0805	
4714	482205120008	0R Jumper 0805	
4715	482205120008	0R Jumper 0805	
4716	482205120008	0R Jumper 0805	
4717	482205120008	0R Jumper 0805	
4718	482205120008	0R Jumper 0805	
4719	482205120008	0R Jumper 0805	
4720	482205120008	0R Jumper 0805	
4721	482205120008	0R Jumper 0805	
4722	482205120008	0R Jumper 0805	
4723	482205120008	0R Jumper 0805	
4724	482205120008	0R Jumper 0805	
4725	482205120008	0R Jumper 0805	
4726	482205120008	0R Jumper 0805	
4727	482205120008	0R Jumper 0805	
4728	482205120008	0R Jumper 0805	
4729	482205120008	0R Jumper 0805	
4730	482205120008	0R Jumper 0805	
4731	482205120008	0R Jumper 0805	
4732	482205120008	0R Jumper 0805	
4733	482205120008	0R Jumper 0805	
4734	482205120008	0R Jumper 0805	
4735	482205120008	0R Jumper 0805	
4736	482205120008	0R Jumper 0805	
4737	482205120008	0R Jumper 0805	
4738	482205120008	0R Jumper 0805	
4739	482205120008	0R Jumper 0805	
4740	482205120008	0R Jumper 0805	
4741	482205120008	0R Jumper 0805	
4742	482205120008	0R Jumper 0805	
4744	482205120008	0R Jumper 0805	
4745	482205120008	0R Jumper 0805	
4746	482205120008	0R Jumper 0805	
4748	482205120008	0R Jumper 0805	
4785	482205120008	0R Jumper 0805	only for Ferro
4790	482205120008	0R Jumper 0805	
4794	482205120008	0R Jumper 0805	
4795	482205120008	0R Jumper 0805	

COILS & FILTERS

5701	482215711477	Coil 2,2µH 5%
5703	482215620946	Osc Coil 100kHz

DIODES

6611	482213031878	1N4003G
6612	482213031878	1N4003G
6614	482213030621	1N4148 Autoreverse
6770	482213030621	1N4148
6771	482213030621	1N4148
6772	482213030621	1N4148
6773	482213030621	1N4148
6774	482213030621	1N4148
6775	482213030621	1N4148
6776	482213030621	1N4148
6777	482213034382	BZX79-F8V2
6778	482213030621	1N4148
6782	482213030621	1N4148
6785	482213030621	1N4148
6786	482213030621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT	
7612	482213011201	PMBT2907	
7613	482213011201	PMBT2907	
7614	482213011201	PMBT2907	
7616	482213060373	BC857B	Autoreverse
7618	482213060511	BC847B	
7619	482213060511	BC847B	
7620	482213060511	BC847B	
7622	482213060511	BC847B	Autoreverse
7623	482213060511	BC847B	
7624	482213060511	BC847B	
7710	482220932919	HEF4952BT	
7720	932214000668	AN7323S	
7730	482220932919	HEF4952BT	
7740	482220932919	HEF4952BT	
7780	482213060511	BC847B	
7781	482213042804	BC817-25	
7782	482213044568	BC557B	
7783	482213060511	BC847B	
7784	482213060373	BC857B	
7786	482213063494	J111	
7787	482213060511	BC847B	
7791	482213060511	BC847B	
7792	482213060511	BC847B	

Note: Only the parts mentioned in this list are normal service spare parts.

3CDC-LLC-MCD1

(3 Disc Carousel Changer)

Layout stage .3

TABLE OF CONTENTS

Service hints

CAUTION

CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
• SWITCH OFF POWER SUPPLY
• ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip on the flexfoil to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil and connect it to the new drive
5. Position the new CD drive in its studs
6. Remove solder joint from the Laserunit

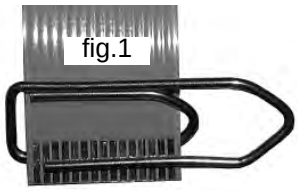
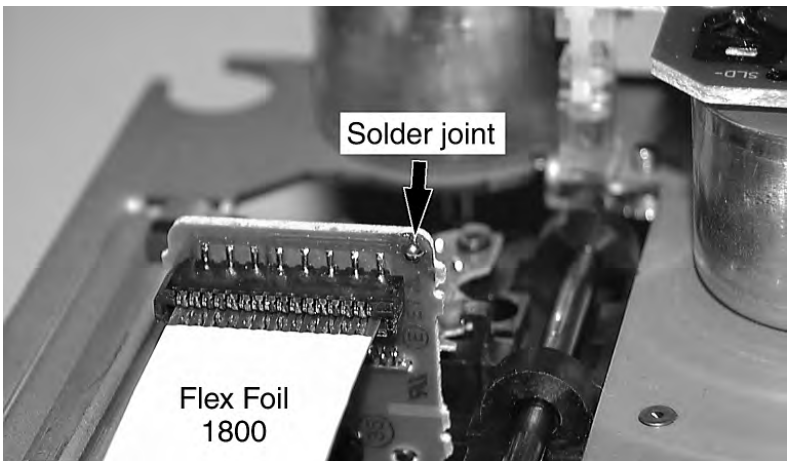


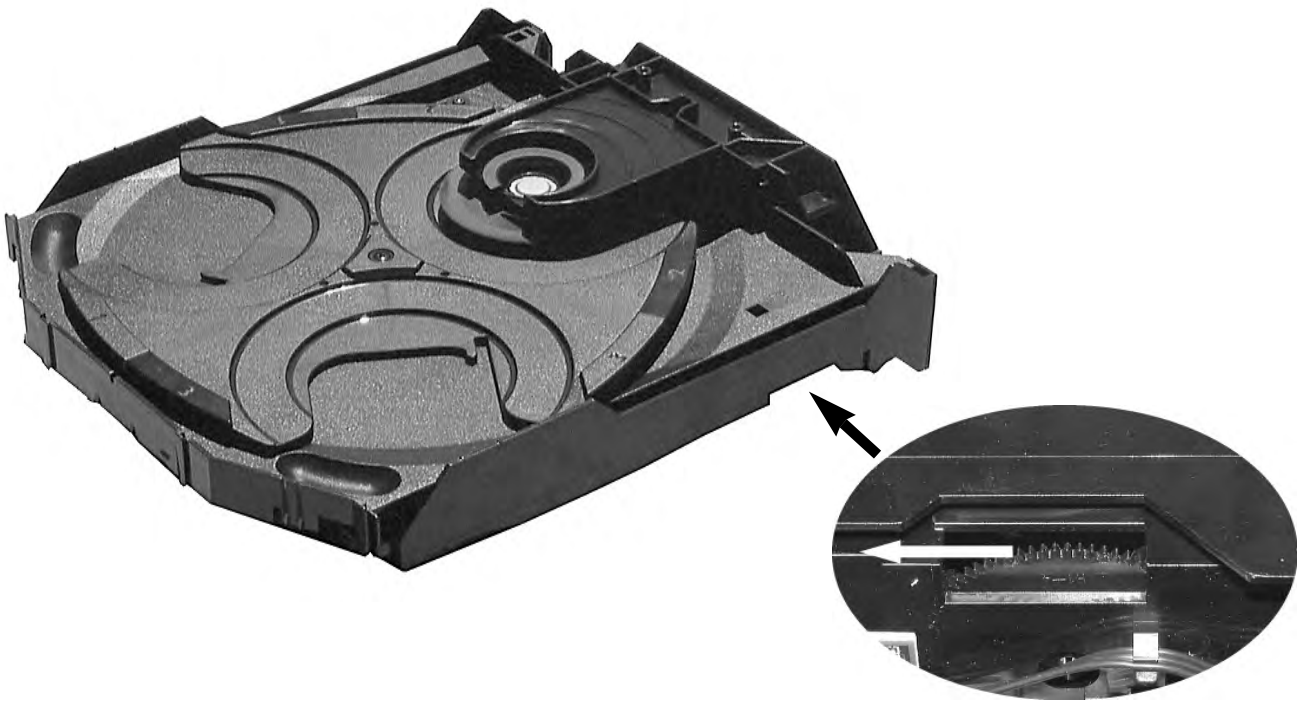
fig.1

Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



Emergency open

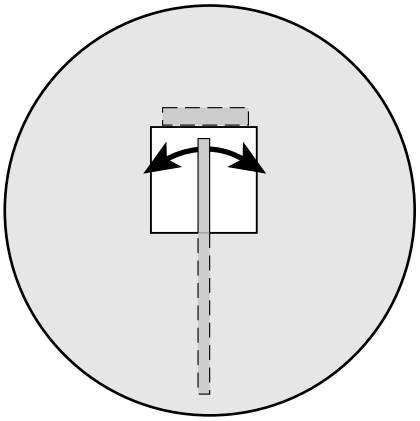
In case of a Supply fault, the tray can be opened manually.
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



Service hints

Dismantling of Tray

1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.



Detail A

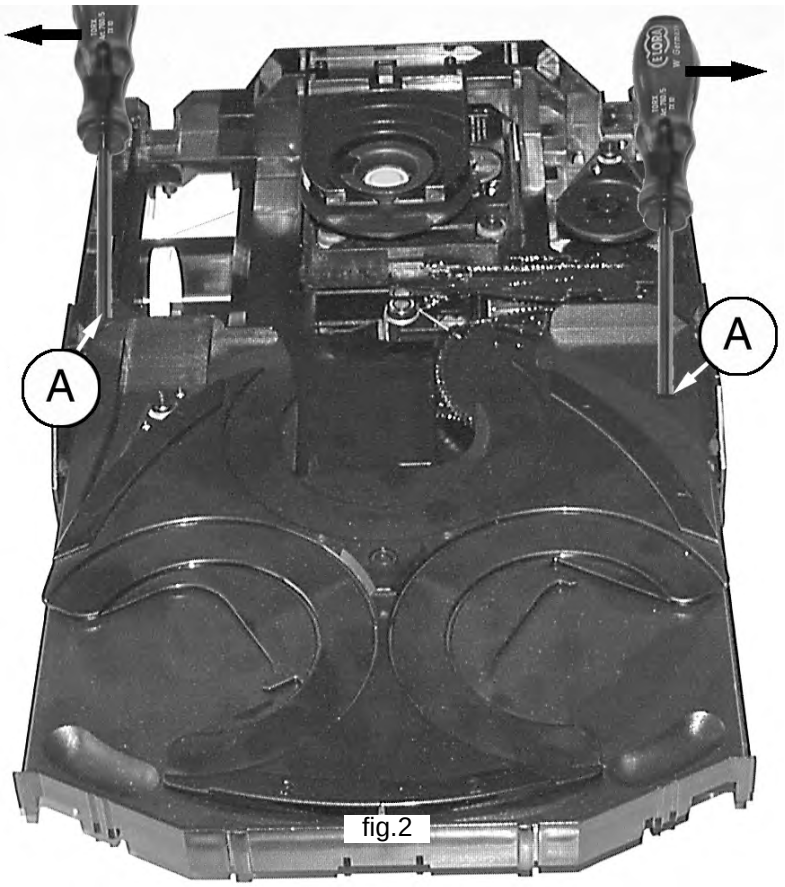
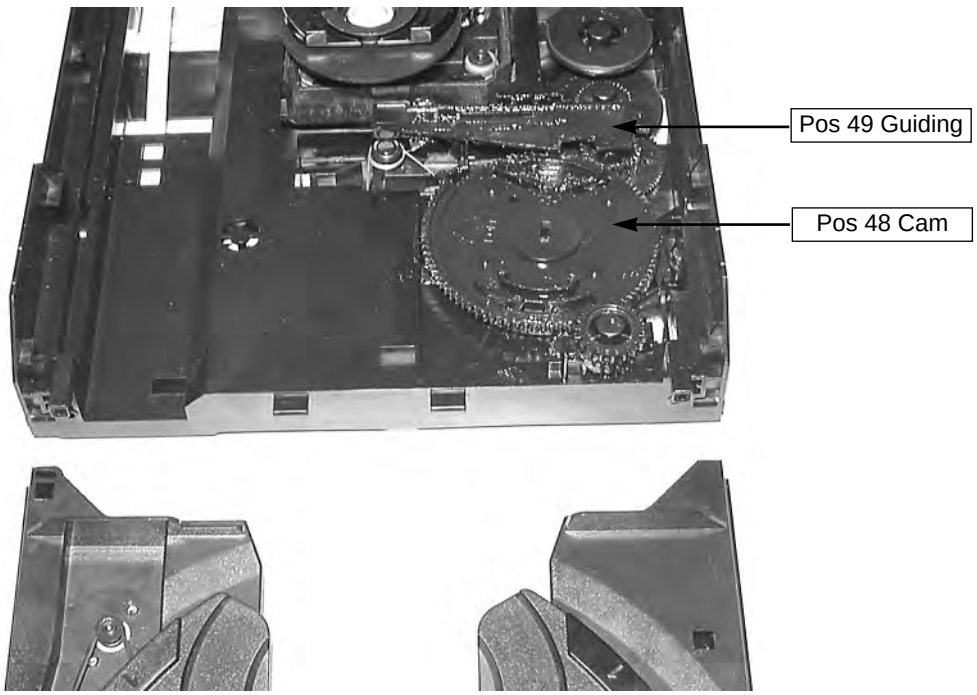


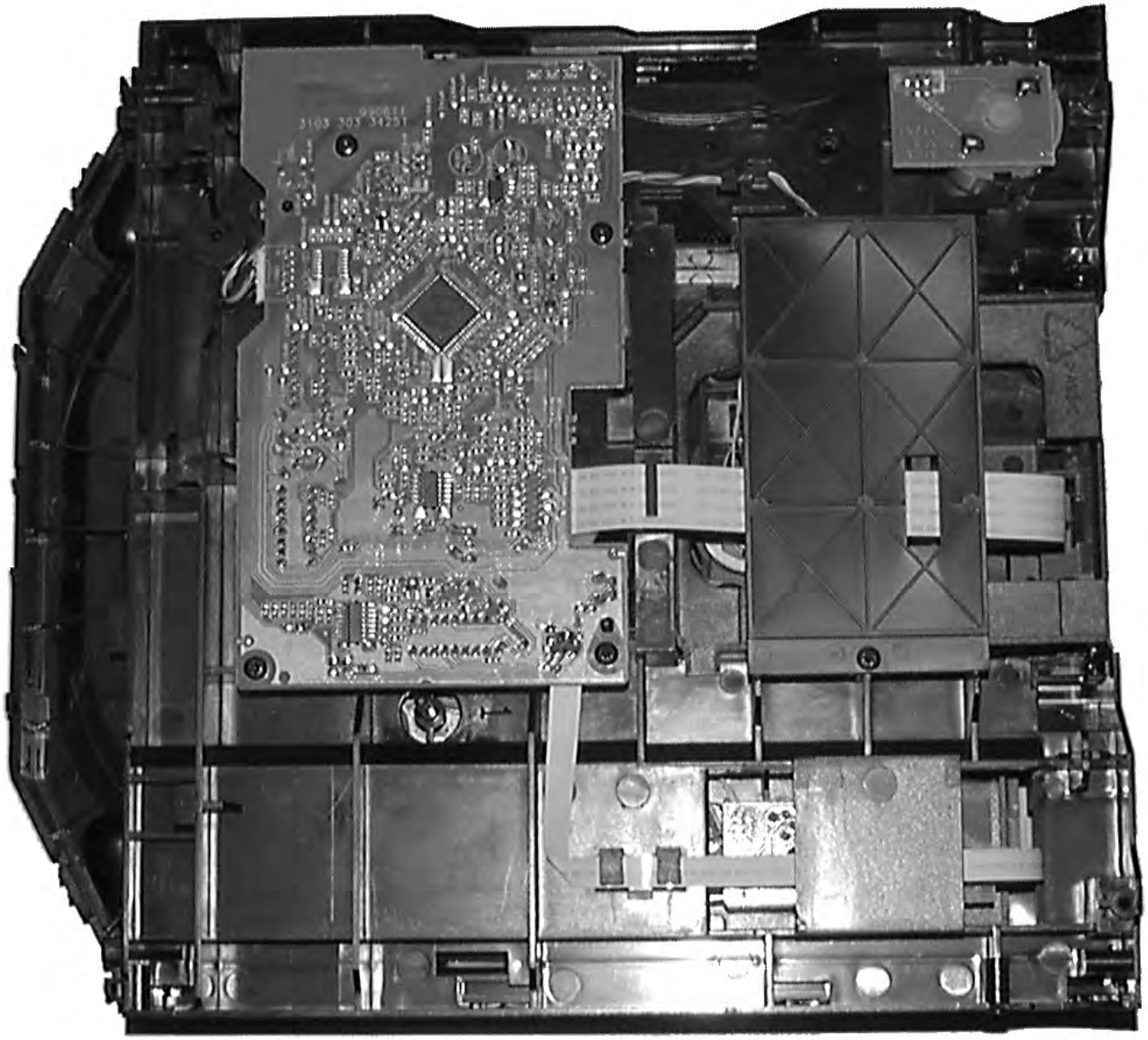
fig.2

Assembling of Tray

1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.



Service Position



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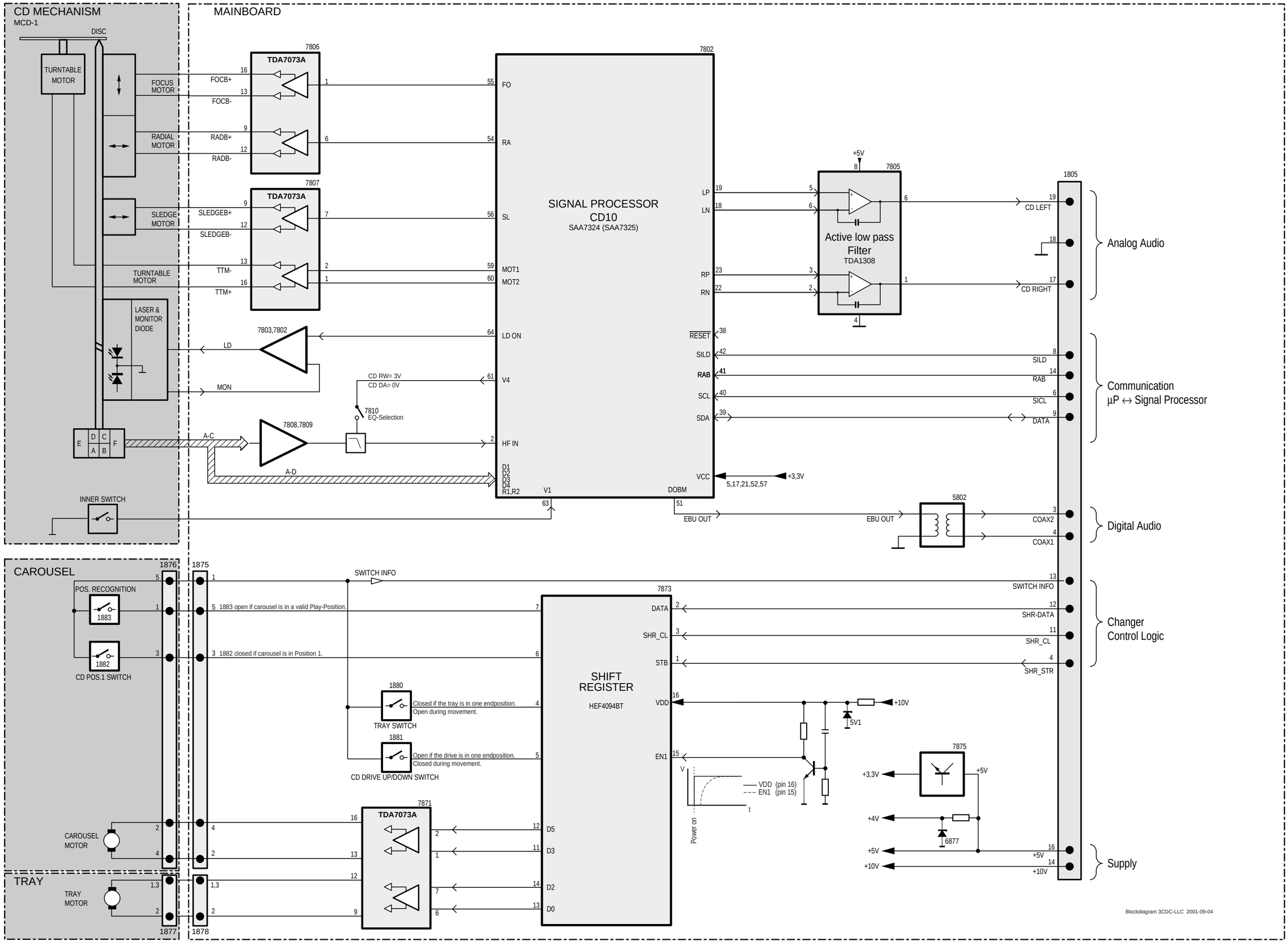
BLOCK DIAGRAM 3CDC-LLC-MCD1



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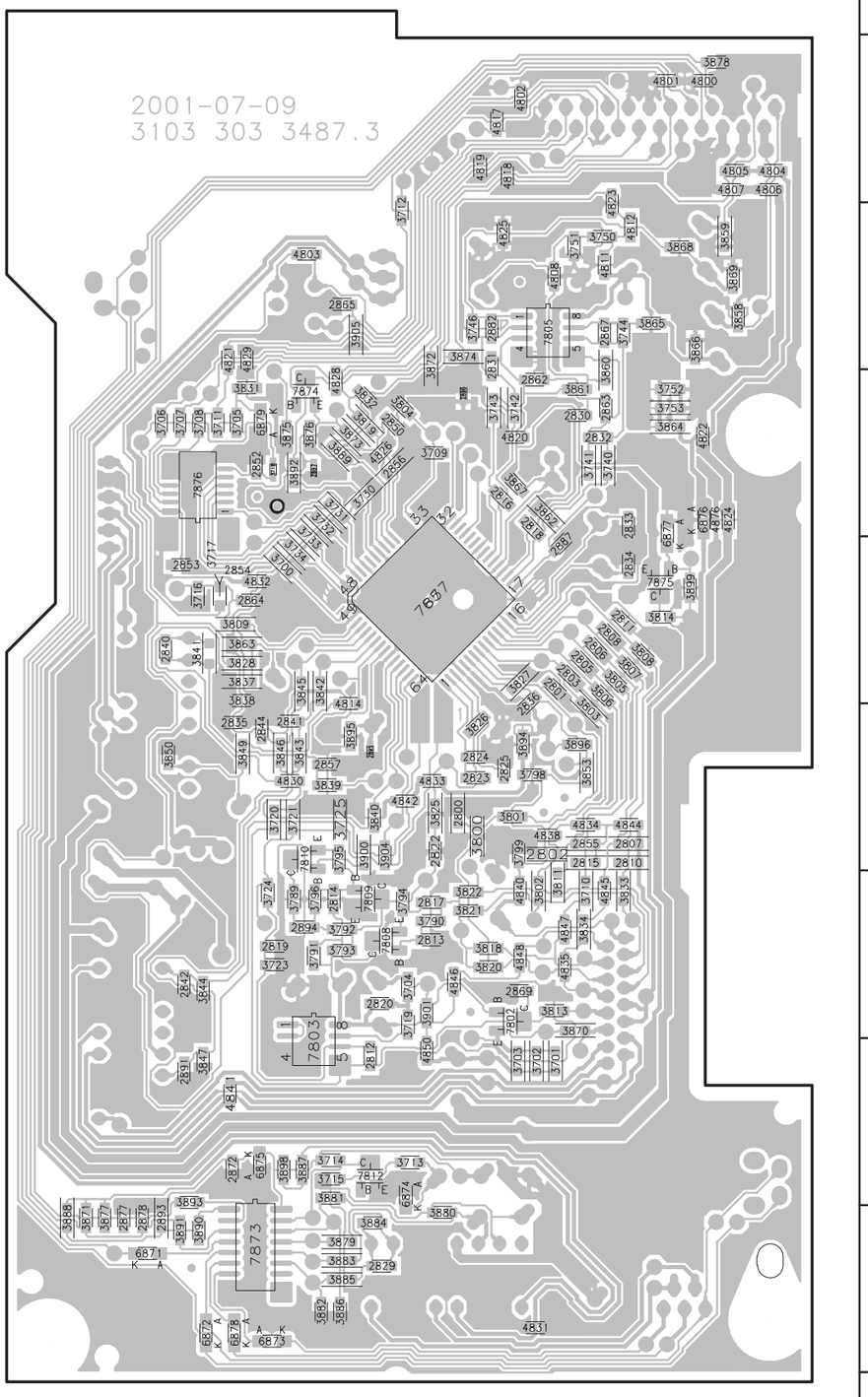
3CDC-LLC Copperside view



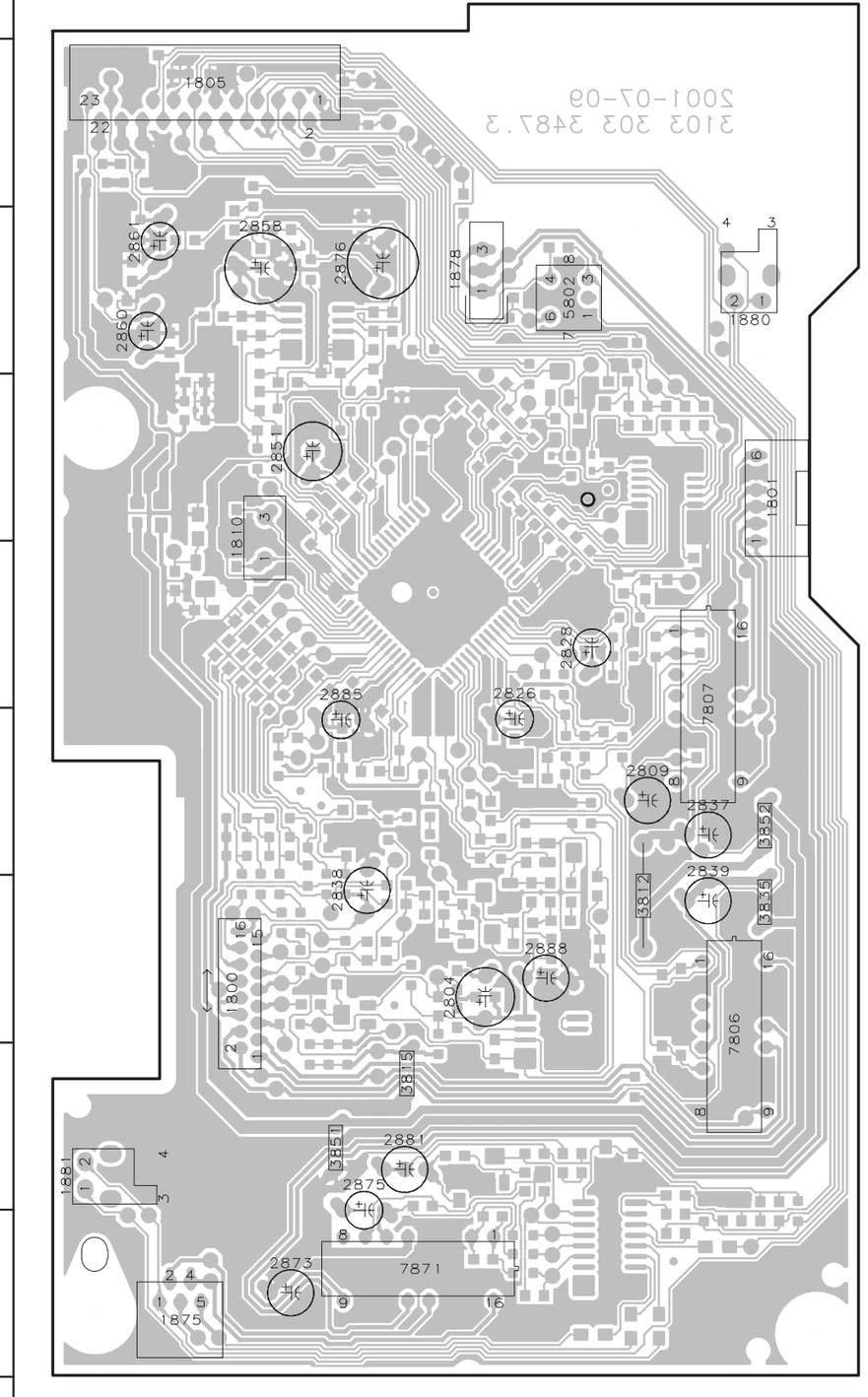
This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LIC Layout stage .3 2001-07-25

Mapping

Copperside						Componentside
2800	E3	3741	C4	3889	C2	1800 F2
2801	D4	3742	C4	3890	H2	1801 C5
2802	E4	3743	C3	3891	H2	1805 A2
2803	D4	3744	B4	3892	C2	1810 C2
2805	D4	3746	B3	3893	G2	1875 H1
2806	D4	3750	B4	3894	E4	1878 B3
2807	E4	3751	B4	3895	E3	1880 B5
2808	D4	3752	C4	3896	E4	1881 G1
2810	E4	3753	C4	3898	G2	2804 F3
2811	D4	3789	F2	3899	D5	2809 E4
2812	G3	3790	F3	3900	E3	2826 D3
2813	F3	3791	F2	3901	F3	2828 D4
2814	F2	3792	F3	3904	E3	2837 E5
2815	E4	3793	F3	3905	B3	2838 F2
2816	C3	3794	F3	4800	A5	2839 E5
2817	F3	3795	E2	4801	A4	2851 C2
2818	C4	3796	F2	4802	A4	2858 B2
2819	F2	3798	E4	4803	B2	2860 B1
2820	F3	3799	E4	4804	A5	2861 B1
2822	E3	3800	E3	4805	A5	2873 H2
2823	E3	3801	E4	4806	A5	2875 G3
2824	E3	3802	F4	4807	A5	2876 B2
2825	E3	3803	D4	4808	B4	2881 G3
2829	H3	3804	C3	4811	B4	2885 D2
2830	C4	3805	D4	4812	B4	2888 F4
2831	B3	3806	D4	4814	D3	3812 F4
2832	C4	3807	D4	4817	A3	3815 G3
2833	C4	3808	D4	4818	A3	3835 F5
2834	D4	3809	D2	4819	A3	3851 G2
2835	E2	3811	F4	4820	C4	3852 E5
2836	D4	3813	F4	4821	B2	5802 B4
2840	D1	3814	D4	4822	C5	7806 F5
2841	E2	3818	F3	4823	A4	7807 D5
2842	F2	3819	C3	4824	C5	7871 H3
2844	E2	3820	F3	4825	B3	
2850	C3	3821	F3	4826	C3	
2852	C2	3822	F3	4828	C2	
2853	D2	3825	E3	4829	B2	
2854	D2	3826	E3	4830	E2	
2855	E4	3827	D4	4831	H4	
2856	C3	3828	D2	4832	D2	
2857	E2	3831	C2	4833	E3	
2862	C4	3832	C3	4834	E4	
2863	C4	3833	F4	4835	F4	
2864	D2	3834	F4	4838	E4	
2865	B3	3837	D2	4840	F4	
2867	B4	3838	D2	4841	G2	
2869	F4	3839	E2	4842	E3	
2872	G2	3840	E3	4844	E4	
2877	H1	3841	D2	4845	F4	
2878	H1	3842	D2	4846	F3	
2882	B3	3843	E2	4847	F4	
2887	C4	3844	F2	4848	F4	
2891	G2	3845	D2	4850	G3	
2893	H1	3846	E2	4876	C5	
2894	F2	3847	G2	6871	H1	
2895	E3	3849	E2	6872	H2	
2896	C3	3850	E1	6873	H2	
2897	C2	3853	E4	6874	G3	
3700	D2	3858	B5	6875	G2	
3701	G4	3859	B5	6876	C5	
3702	G4	3860	B4	6877	C4	
3703	G4	3861	C4	6878	H2	
3704	F3	3862	C4	6879	C2	
3705	C2	3863	D2	7802	F4	
3706	C1	3864	C4	7803	F2	
3707	C2	3865	B4	7805	B4	
3708	C2	3866	B5	7808	F3	
3709	C3	3867	C4	7809	F3	
3710	F4	3868	B5	7810	E2	
3711	C2	3869	B5	7812	G3	
3712	A3	3870	F4	7873	H2	
3713	G3	3871	H1	7874	C2	
3714	G2	3872	B3	7875	D4	
3715	G2	3873	C3	7876	C2	
3716	D2	3874	B3	7877	D3	
3717	D2	3875	C2			
3718	C2	3876	C2			
3719	F3	3877	H1			
3720	E2	3878	A5			
3721	E2	3879	H3			
3723	F2	3880	G3			
3724	F2	3881	G2			
3725	E2	3882	H2			
3730	C3	3883	H3			
3731	C2	3884	H3			
3732	C2	3885	H3			
3733	C2	3886	H2			
3734	D2	3887	G2			
3740	C4	3888	H1			

3CDC-LLC Componentside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LLC Layout stage .3 2001-07-25

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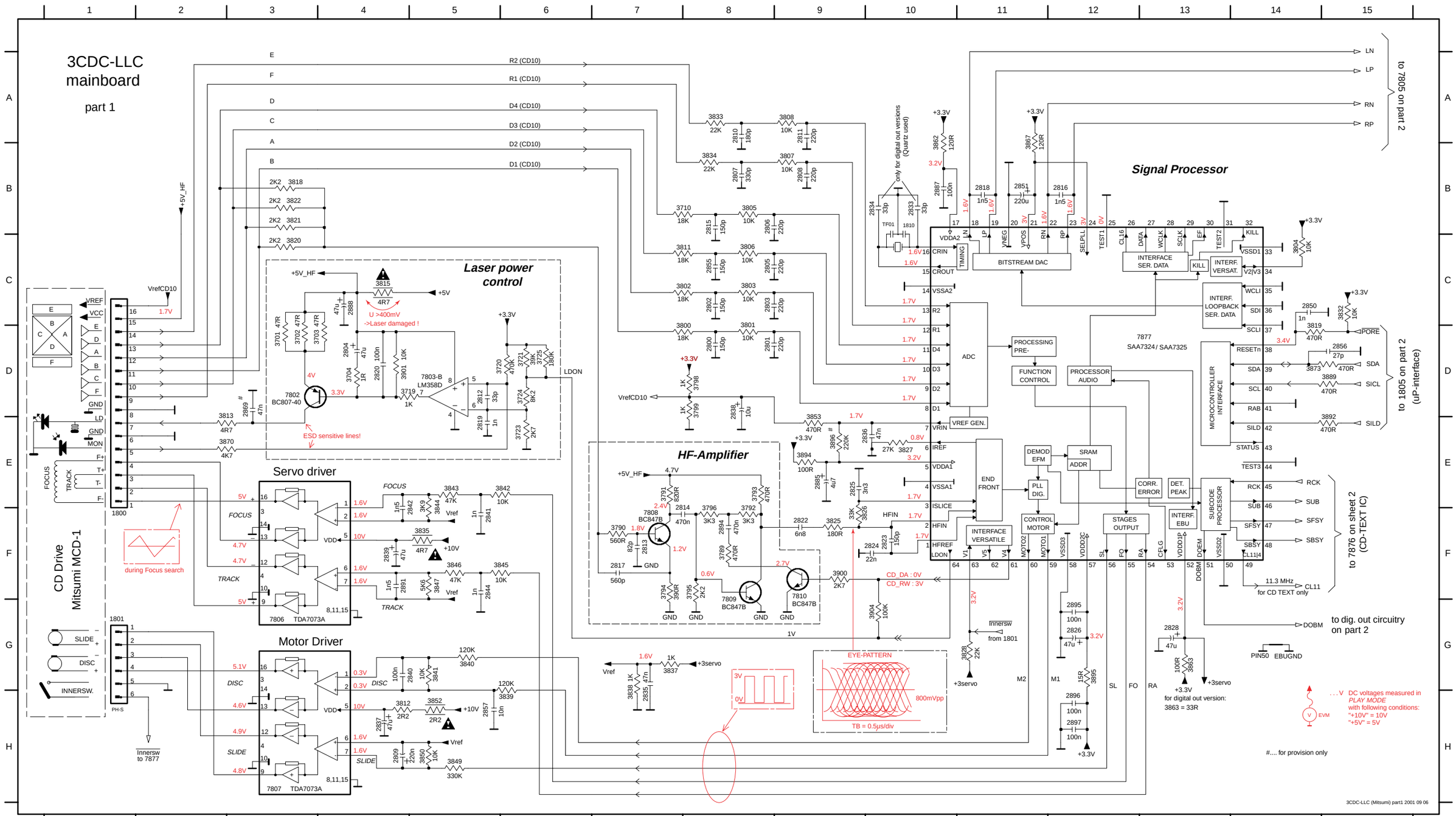
1800 F1	2804 D4	2811 A9	2818 B11	2826 G12	2838 D8	2851 B11	2888 C4	3702 D3	3721 D6	3792 F8	3800 D8	3807 B9	3819 D14	3828 G11	3839 H6	3846 F5	3863 G13	3895 G12	7803-B D5	MP713 C9	MP743 D2	MP813 B3	MP820 F8	MP837 D4	MP844 E9	MP851 E2	MP873 H4	MP884 C5
1801 G1	2805 C8	2812 D5	2819 E5	2828 G13	2839 F4	2855 C8	2891 F4	3703 D3	3723 E6	3793 E8	3801 D8	3808 A9	3820 C3	3832 C15	3840 G5	3847 F5	3867 A11	3896 E9	7806 G3	MP715 D9	MP744 C2	MP814 G2	MP821 C15	MP838 G6	MP845 F4	MP852 G2	MP875 F13	MP893 F10
1810 B10	2806 B8	2813 F7	2820 D4	2833 B10	2840 G4	2856 D15	2894 F8	3704 D4	3724 D6	3794 F7	3802 C8	3811 C8	3821 B3	3833 A8	3841 G5	3849 H5	3870 E2	3900 F9	7807 H3	MP716 B9	MP745 E2	MP815 B3	MP827 B10	MP839 G6	MP846 H2	MP853 G2	MP876 E2	
2800 D8	2807 B8	2814 F7	2822 F9	2834 B10	2841 F5	2857 H5	2895 G12	3709 C14	3725 D6	3795 F8	3803 C8	3812 H4	3822 B3	3834 B8	3842 E6	3850 H5	3873 D14	3901 D4	7808 F7	MP717 A9	MP800 E2	MP816 A3	MP828 G11	MP840 E6	MP847 H2	MP858 G8	MP877 E3	
2801 D8	2808 B9	2815 B8	2823 F10	2835 H7	2842 E5	2869 D3	2896 H12	3710 B8	3789 F8	3796 F8	3804 C14	3813 E2	3825 F9	3835 F5	3843 E5	3852 H5	3889 D15	3904 G10	7809 G8	MP729 B9	MP802 B15	MP817 A3	MP829 A3	MP841 F6	MP848 E2	MP859 E10	MP878 B13	
2802 C8	2809 H4	2816 B12	2824 F10	2836 E10	2844 F5	2885 E9	2897 H12	3719 D4	3790 F7	3798 D8	3805 B8	3815 C4	3826 F9	3837 G7	3844 E5	3853 E9	3892 E15	7802 D3	7810 F9	MP730 C9	MP809 D10	MP818 C4	MP831 A4	MP842 H6	MP849 E2	MP860 C2	MP879 B11	
2803 C8	2810 A8	2817 F7	2825 E9	2837 H4	2850 C14	2887 B10	3701 D3	3720 D5	3791 E7	3799 D8	3806 C8	3818 B3	3827 E10	3838 H7	3845 F6	3862 A10	3894 E9	7803-A B5	7877 D12	MP731 B13	MP812 G2	MP819 F10	MP836 D3	MP843 G7	MP850 E2	MP872 C15	MP883 C4	



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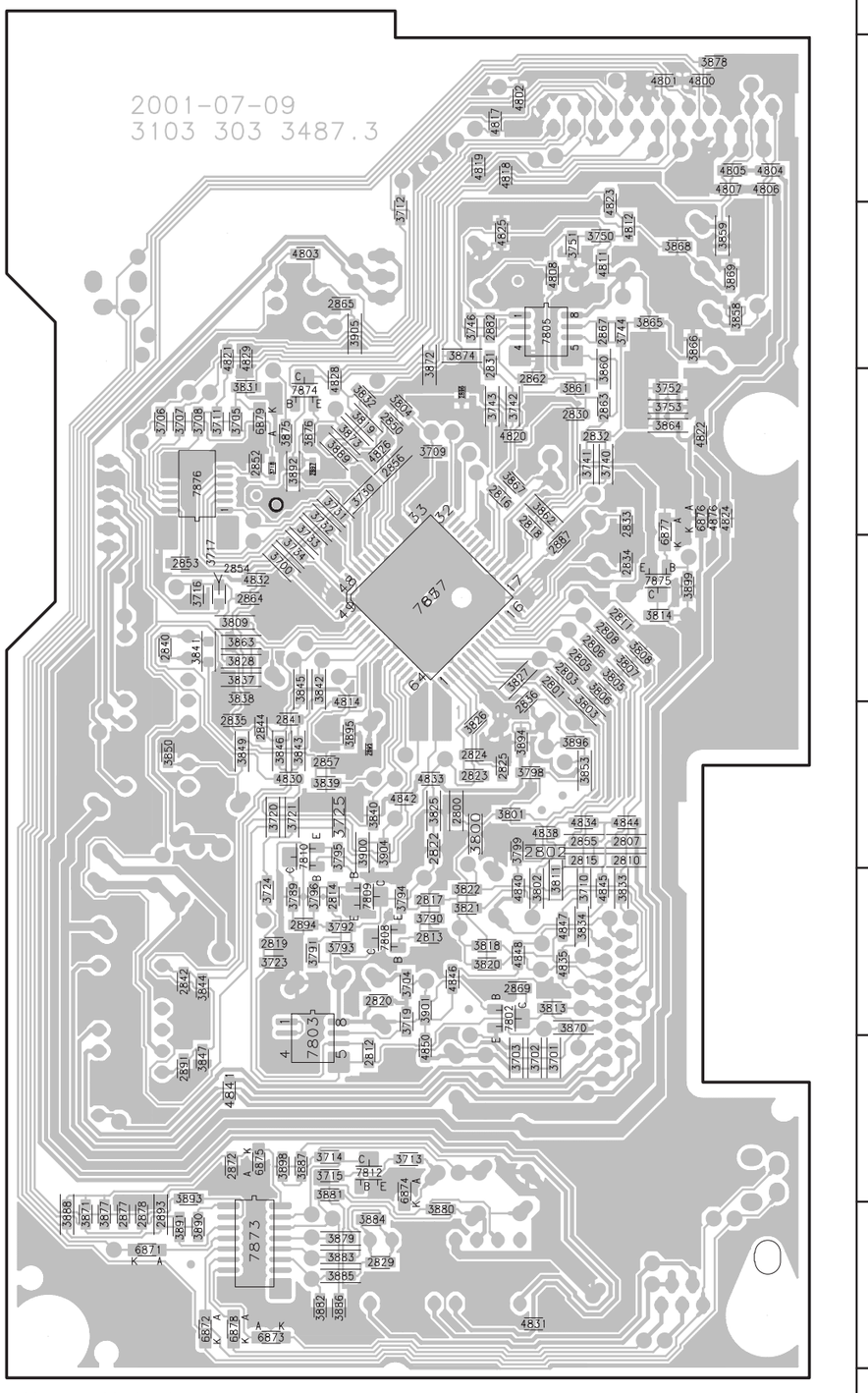
3CDC-LLC Copperside view



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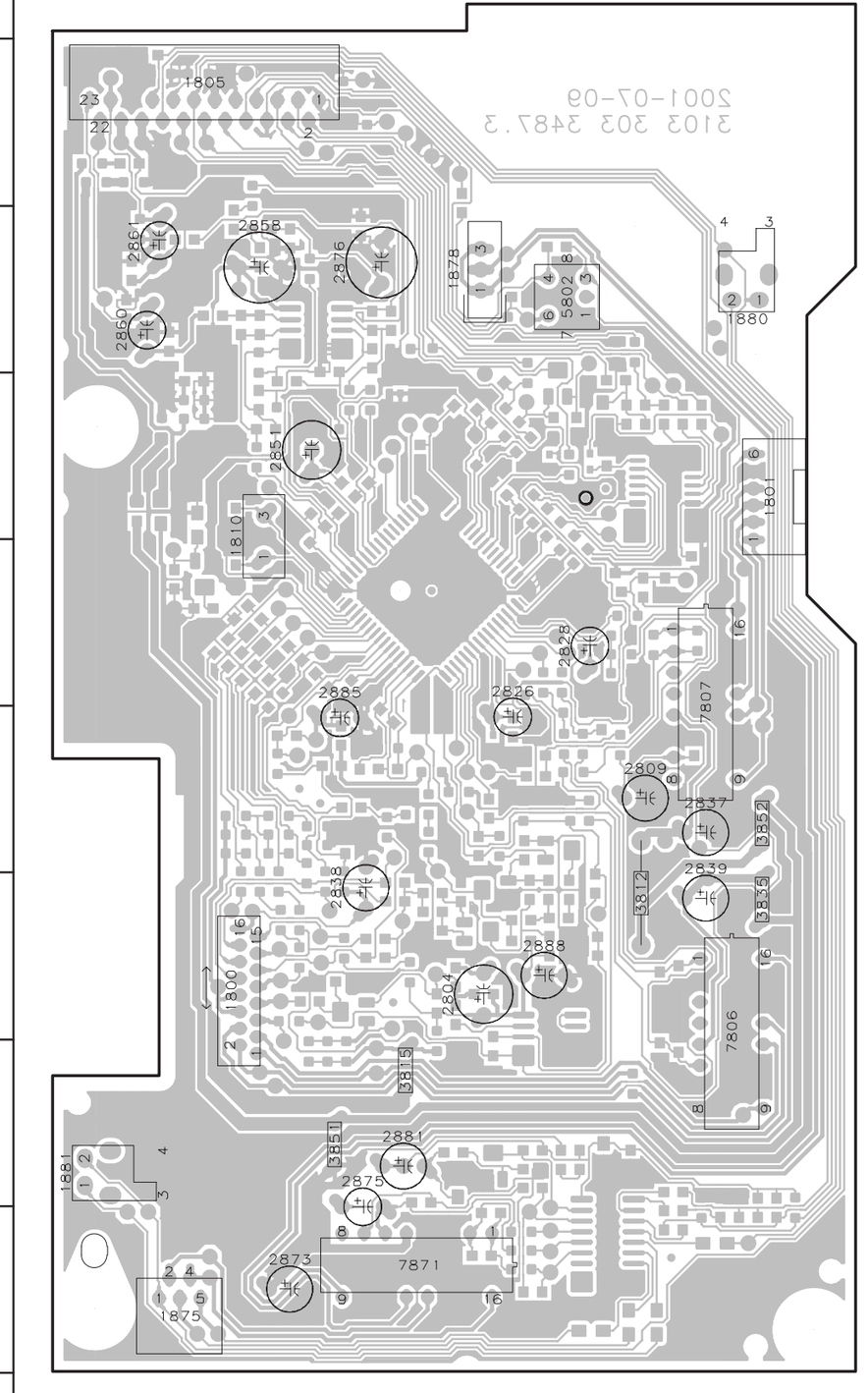
3CDC-LIC Layout stage .3 2001-07-25

Mapping

Copperside						Componentside
2800	E3	3741	C4	3889	C2	1800 F2
2801	D4	3742	C4	3890	H2	1801 C5
2802	E4	3743	C3	3891	H2	1805 A2
2803	D4	3744	B4	3892	C2	1810 C2
2805	D4	3746	B3	3893	G2	1875 H1
2806	D4	3750	B4	3894	E4	1878 B3
2807	E4	3751	B4	3895	E3	1880 B5
2808	D4	3752	C4	3896	E4	1881 G1
2810	E4	3753	C4	3898	G2	2804 F3
2811	D4	3789	F2	3899	D5	2809 E4
2812	G3	3790	F3	3900	E3	2826 D3
2813	F3	3791	F2	3901	F3	2828 D4
2814	F2	3792	F3	3904	E3	2837 E5
2815	E4	3793	F3	3905	B3	2838 F2
2816	C3	3794	F3	4800	A5	2839 E5
2817	F3	3795	E2	4801	A4	2851 C2
2818	C4	3796	F2	4802	A4	2858 B2
2819	F2	3798	E4	4803	B2	2860 B1
2820	F3	3799	E4	4804	A5	2861 B1
2822	E3	3800	E3	4805	A5	2873 H2
2823	E3	3801	E4	4806	A5	2875 G3
2824	E3	3802	F4	4807	A5	2876 B2
2825	E3	3803	D4	4808	B4	2881 G3
2829	H3	3804	C3	4811	B4	2885 D2
2830	C4	3805	D4	4812	B4	2888 F4
2831	B3	3806	D4	4814	D3	3812 F4
2832	C4	3807	D4	4817	A3	3815 G3
2833	C4	3808	D4	4818	A3	3835 F5
2834	D4	3809	D2	4819	A3	3851 G2
2835	E2	3811	F4	4820	C4	3852 E5
2836	D4	3813	F4	4821	B2	5802 B4
2840	D1	3814	D4	4822	C5	7806 F5
2841	E2	3818	F3	4823	A4	7807 D5
2842	F2	3819	C3	4824	C5	7871 H3
2844	E2	3820	F3	4825	B3	
2850	C3	3821	F3	4826	C3	
2852	C2	3822	F3	4828	C2	
2853	D2	3825	E3	4829	B2	
2854	D2	3826	E3	4830	E2	
2855	E4	3827	D4	4831	H4	
2856	C3	3828	D2	4832	D2	
2857	E2	3831	C2	4833	E3	
2862	C4	3832	C3	4834	E4	
2863	C4	3833	F4	4835	F4	
2864	D2	3834	F4	4838	E4	
2865	B3	3837	D2	4840	F4	
2867	B4	3838	D2	4841	G2	
2869	F4	3839	E2	4842	E3	
2872	G2	3840	E3	4844	E4	
2877	H1	3841	D2	4845	F4	
2878	H1	3842	D2	4846	F3	
2882	B3	3843	E2	4847	F4	
2887	C4	3844	F2	4848	F4	
2891	G2	3845	D2	4850	G3	
2893	H1	3846	E2	4876	C5	
2894	F2	3847	G2	6871	H1	
2895	E3	3849	E2	6872	H2	
2896	C3	3850	E1	6873	H2	
2897	C2	3853	E4	6874	G3	
3700	D2	3858	B5	6875	G2	
3701	G4	3859	B5	6876	C5	
3702	G4	3860	B4	6877	C4	
3703	G4	3861	C4	6878	H2	
3704	F3	3862	C4	6879	C2	
3705	C2	3863	D2	7802	F4	
3706	C1	3864	C4	7803	F2	
3707	C2	3865	B4	7805	B4	
3708	C2	3866	B5	7808	F3	
3709	C3	3867	C4	7809	F3	
3710	F4	3868	B5	7810	E2	
3711	C2	3869	B5	7812	G3	
3712	A3	3870	F4	7873	H2	
3713	G3	3871	H1	7874	C2	
3714	G2	3872	B3	7875	D4	
3715	G2	3873	C3	7876	C2	
3716	D2	3874	B3	7877	D3	
3717	D2	3875	C2			
3718	C2	3876	C2			
3719	F3	3877	H1			
3720	E2	3878	A5			
3721	E2	3879	H3			
3723	F2	3880	G3			
3724	F2	3881	G2			
3725	E2	3882	H2			
3730	C3	3883	H3			
3731	C2	3884	H3			
3732	C2	3885	H3			
3733	C2	3886	H2			
3734	D2	3887	G2			
3740	C4	3888	H1			

3CDC-LLC Componentside view



This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

3CDC-LLC Layout stage .3 2001-07-25

10-9

1805 E15 1875 D2 1878 E2 1880 F8 1881 E8 2829 D6
2830 C9 2831 B9 2832 A8 2852 H2 2853 G4 2854 B3
2858 A9 2860 A11 2861 B11 2862 B8 2863 B8 2864 B3
2865 C4 2867 A8 2872 G10 2873 D6 2875 E6 2876 C7
2877 F11 2878 F11 2881 F8 2882 B10 2893 F12 3700 H2
3705 G4 3706 G4 3707 G4 3708 H4 3711 G5 3712 B4
3713 G8 3714 F8 3715 G8 3716 B3 3717 B3 3718 G3
3730 G2 3731 G2 3732 G2 3733 G2 3734 H2 3740 A7
3741 A7 3742 B7 3743 B7 3744 A9 3746 B10 3750 B7
3751 C7 3752 A6 3753 A6 3809 B2 3814 D12 3831 G4
3851 D7 3858 A11 3859 B11 3860 B7 3861 B8 3864 A7
3865 A10 3866 A10 3868 B10 3869 B10 3871 F12 3872 C13
3874 C13 3875 C12 3876 C11 3877 F12 3878 E12 3879 D7
3880 E6 3881 E7 3882 D7 3883 D6 3884 D6 3885 F11
3886 E7 3887 D6 3888 F12 3890 F11 3891 F11 3893 F11
3898 F7 3899 D12 3903 C5 4803 B4 4811 A7 4812 B7
4876 D13 5802 B4 6872 E8 6873 E8 6874 G7 6875 F7
6876 D13 6877 D12 6878 E8 6879 G4 7805-A B9 7805-B A8
7812 G8 7871 C5 7873 D10 7874 C12 7875 D12 7876 G3
MP721 C8 MP722 E8 MP723 D8 MP724 D8 MP725 D8 MP726 D8
MP740 H14 MP741 G14 MP742 G14 MP801 E12 MP803 F10 MP804 G14
MP805 F13 MP806 F13 MP807 F14 MP808 F13 MP810 F13 MP811 F14
MP822 E3 MP823 E3 MP824 D4 MP825 D4 MP830 A7 MP832 G9
MP833 F14 MP835 F14 MP854 A13 MP856 E14 MP857 B13 MP863 C11
MP865 D11 MP866 E8 MP867 E8 MP868 F8 MP869 C12 MP871 D6
MP874 D12 MP881 G2 MP882 G2 MP887 H5 MP888 G5 MP889 G5
MP890 B3 MP891 B5 MP892 B5 MP897 E13 MP898 E13 MP899 E14

3CDC-LLC mainboard

part 2

digital out circuitry - 75Ω version (not on all versions)

from 7877 on part1 DOBM — 3809 10R — 2854 47n — 5802 920927152B — 3712 10R — COAX2 / to 1805 / COAX1
2864 22p — 3716 470R — 2865 22n

digital out circuitry (not for 75Ω Versions)

from 7877 on part1 DOBM — 3809 470R — 3717 1R — 3712 10R — COAX2 to 1805
3716 470R

FROM 7877 ON PART 1

+5.6V — 3864 100R — 4.5V — 220u 2858 — GNDA

LP 3741 22K — 2832 100p — 7805-B TDA1308T — 3865 100R — 2860 10u — 3858 47K — GNDA
LN 3740 22K — 4811
RP 3743 22K — 2831 100p — 7805-A TDA1308T — 3868 100R — 2861 10u — 3859 47K — GNDA
RN 3742 22K

2867 220p — 3744 10K
2882 220p — 3746 10K
2V / 2.3V

3750 1K — 3860 10K — 2863 220p — 3861 10K — 2862 220p
3751 1K — 2876 220u — GNDA GNDA GNDA GNDA

2830 47n — D — GNDA

to/from 7877 on part 1: 3.2V SDA 0V

+3.3V — 3872 #10K — 3874# 10K
SICL
SILD
SDA

7874 BC847B — 3876 100K — *3V-5V log. Level Transformer*

+3.3V — 3875 10K — *voltage stab.*

+3.3V — 7875 BC847B — 4.2V 3814 33R — 4876 — 6876# BAS216 — 3.3V — 6877 BZX284-C3V9 — 4.1V 3899 100R — 5.6V version only

+4V
+5V
+5.6V — 5V(5.6V)
+10V

CAROUSEL-MOTOR

1876 — 8002 — 1875 — FE-ST-VK-N
POS1 rec 1882 — RF-500TB — 1883 POS rec

DRAWER-MOTOR

1877 — DIPMATE — 8003 — 1878 — DIPMATE
RF-500TB

7871 TDA7073A

4.9V — OUT1- — VDD 10V — 5.1V
2829 22n — 3884 270R — 3885 10K — 47K 3882 — D
3883 10K — 3851 3R3 — +10V
2873 47u — 3887 220R — D
3879 100K — 3881 100K — 2875 10u — 3880 3K9
3886 47K — D

changer control logic

7873 HEF4094BT — STB — EN1 — SRG8
6873 BAS216 — 6878 BAS216 — 6872 BAS216 — 6871 BAS216
DRIVE UP/DOWN — 1881
TRAY POS — 1880
5.2V

3890 1K — 3891 1K — 3893 470R
10K 3878
2877 47n — 2878 47n — 2893 220p — 2220p
3877 10K — 3871 10K — 3888 10K

220R 3898 — 6875 BZX284-C 5V1

2881 47n — 3714 10K — 3713 22K — 3715 100K — 6874 BAS216 — 7812 BC847B — 0V
Output enable delay circuitry
2872 47n

to combi-board

1805 — BASIC VERSION (15 Pin)

19	23	LEFT	
18	22	GNDA	
17	21	RIGHT	
16	20	+5V(+5.6V)	
15	19	GND	
14	18	+10V	
13	17	SW_INFO	
12	16	SHR_STR	
11	15	SHR_CL	
10	14	SICL	
9	13	DATA	
8	12	SILD	
7	11	GND	
6	10	PORE	to 7877 on part 1
5	9	GND	

from digital-out circuitry: COAX1, COAX2, EBUGND

DIG. OUT (19 Pin)

4	8	COAX1/+3V	
3	7	COAX2/EBU	
2	6	EBU_GND	
1	5	GND	

CD-TEXT (23 Pin)

	4	SRDT	
	3	DQSY	
	2	uP_CLK	
	1	GND	

FE-ST-VK-N

CD-Text circuitry (optional)

to 7877 on part1 — 7.35KHz
RCK — SUB — SBSY — SFSY — CL11
3730 33K — 3731 10K — 3732 470R — 3733 470R — 3734 470R — 3700 470R

7876 LC89170M
EXCK — SBSO — SCOR — WFCK — MCK — XMODE — GND
32 x 8 2 PORT RAM — CPU INTERF — CRC CHECK — TIMING & SYNC PROTECTION
11MHz — 2852 47n
VDD — DQSY — SRDT — SCLK — SW2 — SW1 — TEST
3706 470R — 3707 470R — 3708 470R

3718 4K7 — 2853 22n — 220R 3705 — 3831 100R — 6879 BZX284-C3V9 — 3711 10K — +5.6V — 4V

CD-TEXT INFO

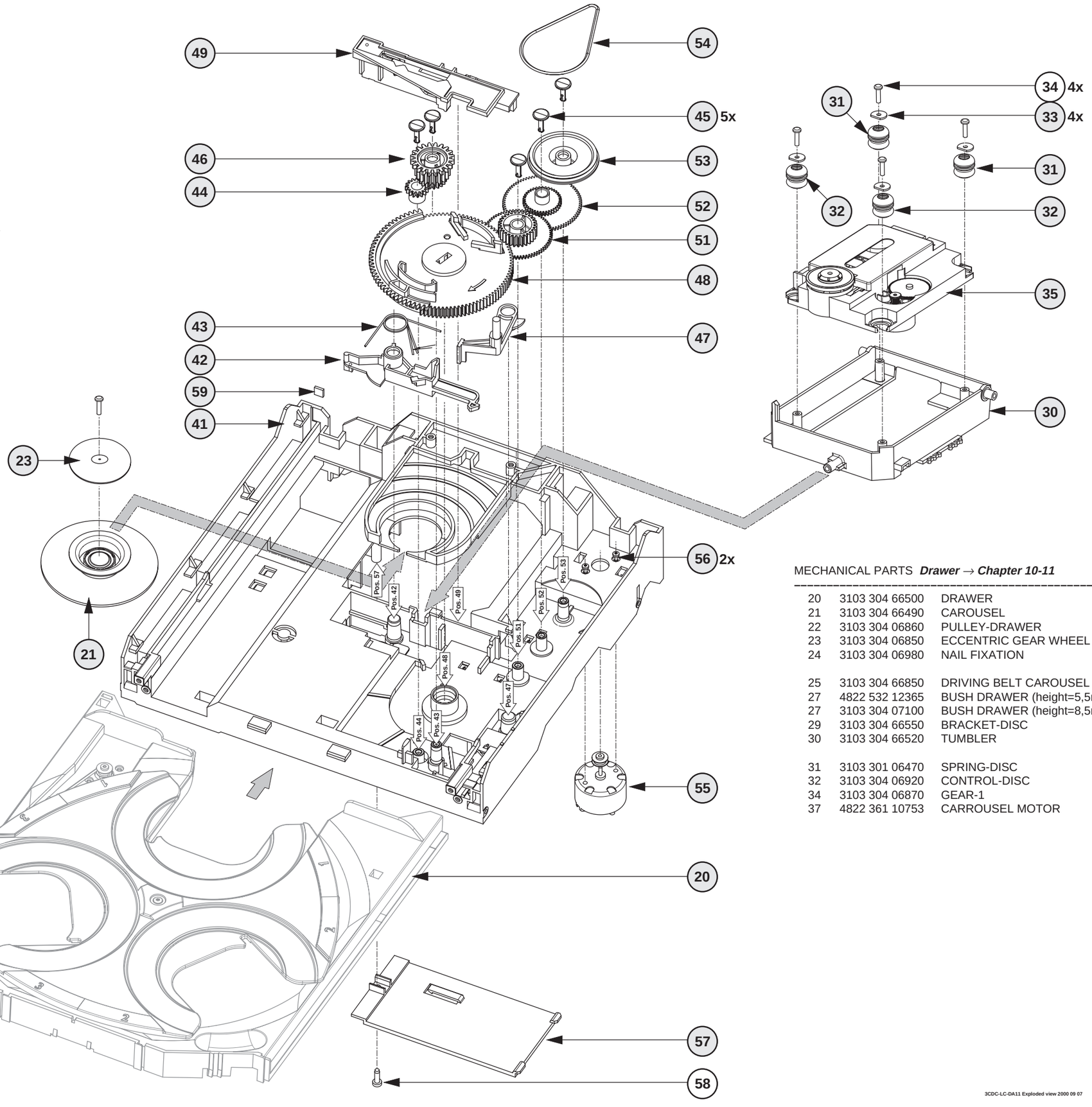
4V — DQSY — 3.3ms — SCLK — SRDT
only during TOC-reading

. . . V DC voltages measured in *PLAY MODE* with following conditions: "+10V" = 10V "+5V" = 5V
EVM

EXPLODED VIEW (3CDC-LC MODULE)

MECHANICAL PARTS ***Loader → this page***

20	3103 304 66500	DRAWER
21	3140 114 29070	PRESSURE RING-MCD1
23	3140 111 21270	METAL RING-MCD1
30	3103 304 66560	SUPPORT
31	4822 529 10386	RUBBER DAMPER CD DRIVE, REAR
32	4822 529 10387	RUBBER DAMPER CD DRIVE, FRONT
33	3103 304 06970	WASHER
35	3103 309 05350	CD DRIVE MCD1B
41	3103 304 66480	FRAME
42	3103 304 66540	BRACKET-GUIDING
43	3103 301 06460	SPRING-GUIDING
44	3103 304 06890	GEAR-3
45	3103 304 06980	NAIL FIXATION
46	3103 304 06880	GEAR-2
47	3103 304 66530	BRACKET-LOAD
48	3103 304 06910	CAM
49	3103 304 66510	GUIDING
51	3103 304 06900	GEAR-4
52	3103 304 06870	GEAR-1
53	3103 304 06960	PULLEY-FRAME
54	3103 304 66910	DRIVING-BELT-DRAWER
55	4822 361 10753	TRAY MOTOR
56	4822 502 12548	SCREW M2,6X3,5
57	3103 304 69880	COVER-MCD1
59	4822 466 12146	RUBBER



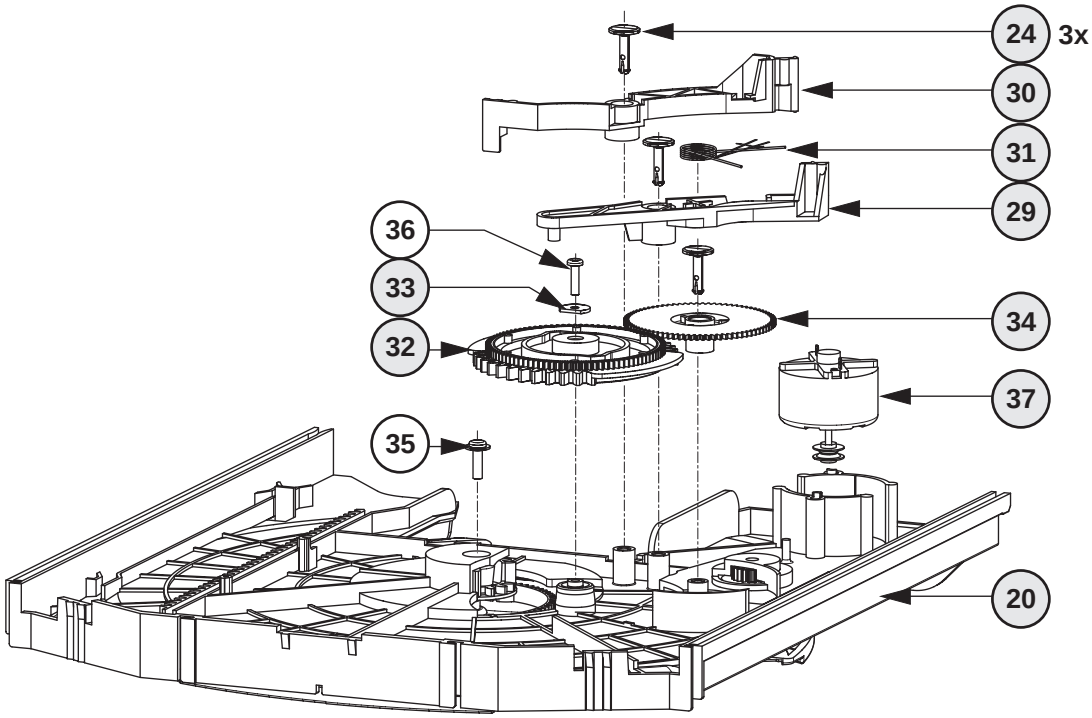
X spare part

Y non spare part

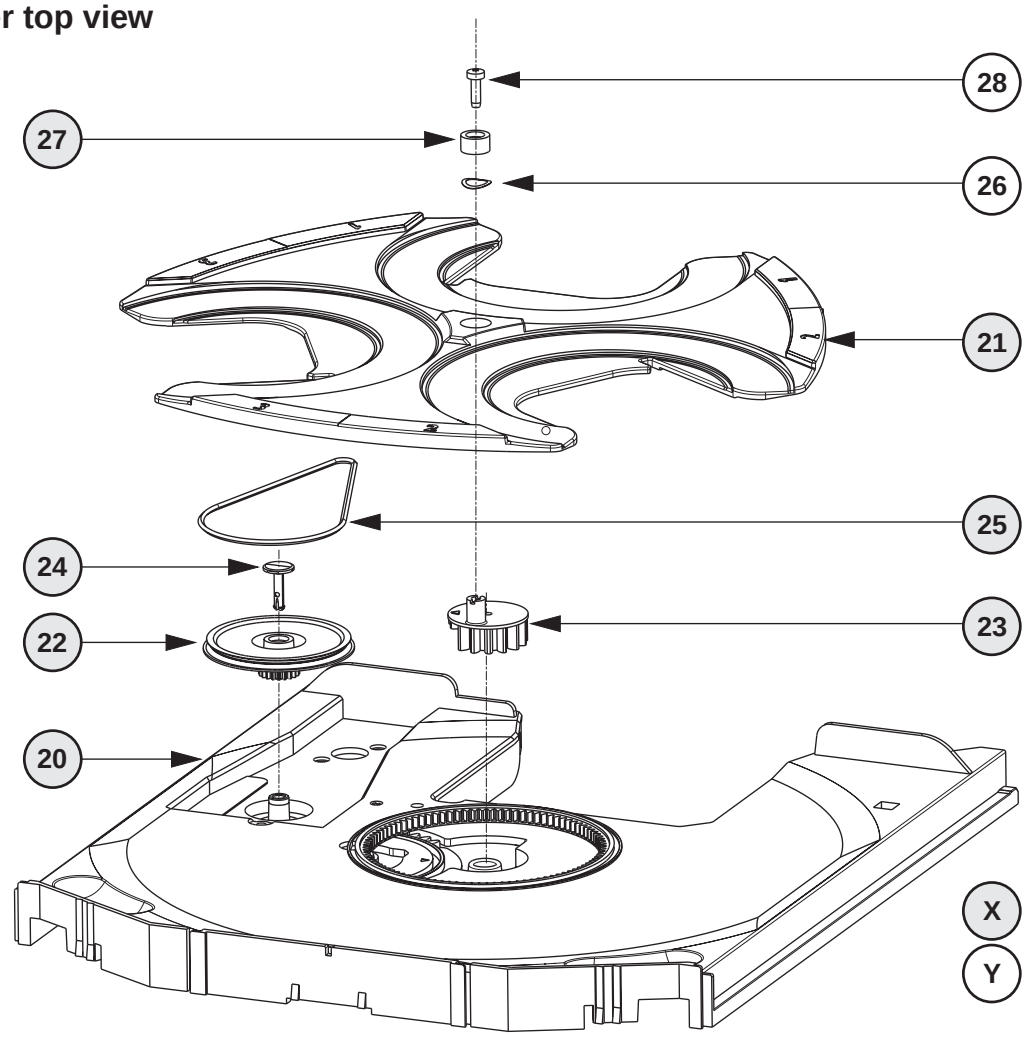
MECHANICAL PARTS ***Drawer → Chapter 10-11***

20	3103 304 66500	DRAWER
21	3103 304 66490	CAROUSEL
22	3103 304 06860	PULLEY-DRAWER
23	3103 304 06850	ECCENTRIC GEAR WHEEL
24	3103 304 06980	NAIL FIXATION
25	3103 304 66850	DRIVING BELT CAROUSEL
27	4822 532 12365	BUSH DRAWER (height=5,5mm,d=9,4mm)
27	3103 304 07100	BUSH DRAWER (height=8,5mm,d=16mm)
29	3103 304 66550	BRACKET-DISC
30	3103 304 66520	TUMBLER
31	3103 301 06470	SPRING-DISC
32	3103 304 06920	CONTROL-DISC
34	3103 304 06870	GEAR-1
37	4822 361 10753	CARROUSEL MOTOR

Drawer bottom view



Drawer top view



X spare part

Y non spare part

ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE

MISCELLANEOUS

35	3103 309 05350	CD DRIVE MCD1B
37	4822 361 10753	CAROUSEL MOTOR
55	4822 361 10753	TRAY MOTOR
1800	2422 025 17389	FLEX FOIL CONNECTOR 16Pin
1805	4822 265 10979	FLEX FOIL CONNECTOR 15Pin
1805	4822 265 11545	FLEX FOIL CONNECTOR 19Pin
1875	4822 267 10958	FLEX FOIL CONNECTOR 5Pin
1876	2422 025 08332	FLEX FOIL CONNECTOR 5Pin
1880	4822 276 13503	SWITCH, Tray switch
1881	4822 276 13503	SWITCH, Drive UP/DOWN
1882	4822 276 13503	SWITCH, CD Pos.1 recognized
1883	4822 276 13503	SWITCH, valid CD Play position
8002	3103 308 91990	FLEX FOIL CABLE 5P, 200mm 1:n
8005	3103 308 92930	FLEX FOIL CABLE 16P 170mm 1:n

CAPACITORS

2800 ©	4822 122 33172	390pF	5%	50V
2801 ©	4822 126 13883	220pF	5%	50V
2802 ©	4822 122 33172	390pF	5%	50V
2803 ©	4822 126 13883	220pF	5%	50V
2804	4822 124 41751	47µF	20%	16V
2805 ©	4822 126 13883	220pF	5%	50V
2806 ©	4822 126 13883	220pF	5%	50V
2807 ©	5322 122 31863	330pF	5%	50V
2808 ©	4822 126 13883	220pF	5%	50V
2809	4822 124 40746	0,22µF	20%	63V
2810 ©	4822 126 10326	180pF	5%	
2811 ©	4822 126 13883	220pF	5%	50V
2812 ©	2222 867 15339	33pF	5%	50V
2813 ©	4822 126 14226	82pF		50V
2814 ©	2238 246 59858	450nF	20%	10V
2815 ©	4822 122 33172	390pF	5%	50V
2816 ©	4822 126 14247	1,5nF	10%	50V
2817 ©	4822 126 14249	560pF	10%	50V
2818 ©	4822 126 13344	1,5nF	5%	63V
2819 ©	5322 126 11578	1nF	10%	63V
2820 ©	4822 126 14305	100nF	10%	16V
2822 ©	5322 122 31866	6,8nF	10%	63V
2823 ©	3198 016 31510	150pF	10%	50V
2824 ©	5322 122 32654	22nF	10%	63V
2825 ©	4822 122 33891	3,3nF	10%	63V
2826	4822 124 12362	47µF	20%	4V
2828	4822 124 12362	47µF	20%	4V
2829 ©	3198 017 42230	22nF	10%	50V
2830 ©	4822 126 13751	47nF	10%	50V
2831 ©	4822 122 31765	100pF	5%	50V
2832 ©	4822 122 31765	100pF	5%	50V
2835 ©	3198 024 44730	47nF	5%	50V
2836 ©	3198 024 44730	47nF	5%	50V
2837	4822 124 40433	47µF	20%	25V
2838	4822 124 40248	10µF	20%	63V
2839	4822 124 40433	47µF	20%	25V
2840 ©	4822 126 14585	100nF	10%	50V
2841 ©	5322 126 10511	1nF	5%	50V
2842 ©	4822 126 14247	1,5nF	10%	50V
2844 ©	3198 016 31020	1nF	5%	25V
2850 ©	5322 126 11578	1nF	10%	63V
2851	4822 124 42383	220µF	20%	4V
2855 ©	4822 122 33172	390pF	5%	50V
2856 ©	4822 126 13691	27pF	1%	63V
2857 ©	5322 126 11583	10nF	10%	63V
2858	4822 124 12245	220µF	20%	16V

CAPACITORS

2860	4822 124 11947	10µF	20%	16V
2861	4822 124 11947	10µF	20%	16V
2862 ©	4822 126 13883	220pF	5%	50V
2863 ©	4822 126 13883	220pF	5%	50V
2865 ©	4822 126 14494	22nF	10%	25V
2867 ©	4822 126 13883	220pF	5%	50V
2872 ©	3198 024 44730	47nF	5%	50V
2873	4822 124 80231	47µF	20%	16V
2875	4822 124 11947	10µF	20%	16V
2876	4822 124 12245	220µF	20%	16V
2877 ©	4822 122 33777	47pF	5%	63V
2878 ©	4822 126 13883	220pF	5%	50V
2881	4822 124 40769	4,7µF	20%	100V
2882 ©	4822 126 13883	220pF	5%	50V
2885	4822 124 40769	4,7µF	20%	100V
2887 ©	4822 126 14585	100nF	10%	50V
2888	4822 124 80231	47µF	20%	16V
2891 ©	4822 126 14247	1,5nF	10%	50V
2893 ©	4822 122 33575	220pF	5%	50V
2894 ©	3198 017 44740	470nF	20%	10V
2895 ©	4822 126 14305	100nF	10%	16V
2896 ©	4822 126 14305	100nF	10%	16V
2897 ©	4822 126 14305	100nF	10%	16V

RESISTORS

3701 ©	4822 051 20479	47Ω	5%	0,1W
3702 ©	4822 051 20479	47Ω	5%	0,1W
3703 ©	4822 051 20479	47Ω	5%	0,1W
3704 ©	4822 117 12917	1Ω	5%	0,06W
3710 ©	4822 051 51831	18kΩ	5%	0,1W
3712 ©	4822 051 30109	10Ω	5%	0,06W
3713 ©	4822 051 30223	22kΩ	5%	0,06W
3714 ©	4822 051 30103	10kΩ	5%	0,06W
3715 ©	4822 117 13632	100kΩ	1%	0,06W
3716 ©	4822 051 30471	470Ω	5%	0,06W
3717 ©	4822 117 12917	1Ω	5%	0,06W
3719 ©	4822 051 30102	1kΩ	5%	0,06W
3720 ©	4822 051 20474	470kΩ	5%	0,1W
3721 ©	4822 051 20393	39kΩ	5%	0,1W
3723 ©	4822 051 30272	2,7kΩ	5%	0,06W
3724 ©	4822 117 12902	8,2kΩ	1%	0,06W
3725 ©	4822 051 30184	180kΩ	5%	0,06W
3730 ©	4822 051 20333	33kΩ	5%	0,1W
3740 ©	4822 051 20223	22kΩ	5%	0,1W
3741 ©	4822 051 20223	22kΩ	5%	0,1W
3742 ©	4822 051 20223	22kΩ	5%	0,1W
3743 ©	4822 051 20223	22kΩ	5%	0,1W
3744 ©	4822 051 30103	10kΩ	5%	0,06W
3746 ©	4822 051 30103	10kΩ	5%	0,06W
3750 ©	4822 051 30102	1kΩ	5%	0,06W
3751 ©	4822 051 30102	1kΩ	5%	0,06W
3789 ©	4822 051 30471	470Ω	5%	0,06W
3790 ©	4822 051 30561	560Ω	5%	0,06W
3791 ©	4822 117 12968	820Ω	5%	0,06W
3792 ©	4822 051 30332	3,3kΩ	5%	0,06W
3793 ©	4822 051 20471	470Ω	5%	0,1W
3794 ©	4822 051 30391	390Ω	5%	0,06W
3795 ©	4822 051 30222	2,2kΩ	5%	0,06W
3796 ©	4822 051 30332	3,3kΩ	5%	0,06W
3798 ©	4822 051 30102	1kΩ	5%	0,06W
3799 ©	4822 051 30102	1kΩ	5%	0,06W
3800 ©	4822 051 51831	18kΩ	5%	0,1W

ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE

RESISTORS

3801 ©	4822 051 30103	10kΩ	5%	0,06W	
3802 ©	4822 051 51831	18kΩ	5%	0,1W	
3803 ©	4822 117 10833	10kΩ	1%	0,1W	
3804 ©	4822 051 30103	10kΩ	5%	0,06W	
3805 ©	4822 051 30103	10kΩ	5%	0,06W	
3806 ©	4822 051 30103	10kΩ	5%	0,06W	
3807 ©	4822 051 30103	10kΩ	5%	0,06W	
3808 ©	4822 051 30103	10kΩ	5%	0,06W	
3809 ©	4822 051 20471	470Ω	5%	0,1W	
3811 ©	4822 051 51831	18kΩ	5%	0,1W	
3812	4822 053 10228	2,2Ω	5%	1W	
3813 ©	4822 117 13608	4,7Ω	5%	0,06W	
3814 ©	4822 051 30339	33Ω	5%	0,06W	
3815	4822 052 10478	4,7Ω	5%	NFR	
3818 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3819 ©	4822 051 20471	470Ω	5%	0,1W	
3820 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3821 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3822 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3825 ©	4822 051 20181	180Ω	5%	0,1W	
3826 ©	4822 051 30333	33kΩ	5%	0,06W	
3827 ©	4822 051 20273	27kΩ	5%	0,1W	
3828 ©	4822 051 20223	22kΩ	5%	0,1W	
3831 ©	4822 051 30101	100Ω	5%	0,06W	
3832 ©	4822 051 30103	10kΩ	5%	0,06W	
3833 ©	4822 051 30223	22kΩ	5%	0,06W	
3834 ©	4822 051 20223	22kΩ	5%	0,1W	
3835	4822 052 10478	4,7Ω	5%	NFR	
3837 ©	4822 051 10102	1kΩ	2%	0,25W	
3838 ©	4822 051 30102	1kΩ	5%	0,06W	
3839 ©	4822 051 20124	120kΩ	5%	0,1W	
3840 ©	4822 051 30124	120kΩ	5%	0,06W	
3841 ©	4822 117 10833	10kΩ	1%	0,1W	
3842 ©	4822 117 10833	10kΩ	1%	0,1W	
3843 ©	4822 117 10834	47kΩ	1%	0,1W	
3844 ©	4822 051 20392	3,9kΩ	5%	0,1W	
3845 ©	4822 117 10833	10kΩ	1%	0,1W	
3846 ©	4822 117 10834	47kΩ	1%	0,1W	
3847 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3849 ©	4822 051 20334	330kΩ	5%	0,1W	
3850 ©	4822 051 30103	10kΩ	5%	0,06W	
3851	4822 052 10338	3,3Ω		NFR25	
3852	4822 052 10228	2,2Ω	5%	0,33W	
3853 ©	4822 051 20471	470Ω	5%	0,1W	
3858 ©	4822 117 12925	47kΩ	1%	0,06W	
3859 ©	4822 117 10834	47kΩ	1%	0,1W	
3860 ©	4822 117 10833	10kΩ	1%	0,1W	
3861 ©	4822 051 30103	10kΩ	5%	0,06W	
3862 ©	4822 051 20121	120Ω	5%	0,1W	
3863 ©	4822 117 11373	100Ω	1%	0,1W	
3864 ©	4822 117 11373	100Ω	1%	0,1W	
3865 ©	4822 051 30101	100Ω	5%	0,06W	
3867 ©	4822 051 30121	120Ω	5%	0,06W	
3868 ©	4822 051 30101	100Ω	5%	0,06W	
3870 ©	4822 051 20472	4,7kΩ	5%	0,1W	
3871 ©	4822 051 30103	10kΩ	5%	0,06W	
3873 ©	4822 051 20471	470Ω	5%	0,1W	
3875 ©	4822 051 30103	10kΩ	5%	0,06W	
3876 ©	4822 117 13632	100kΩ	1%	0,06W	
3877 ©	4822 051 30103	10kΩ	5%	0,06W	
3878 ©	4822 051 30103	10kΩ	5%	0,06W	
3879 ©	4822 117 10837	100kΩ	1%	0,1W	

RESISTORS

3880 ©	4822 051 30392	3,9kΩ	5%	0,06W	
3881 ©	4822 117 13632	100kΩ	1%	0,06W	
3882 ©	4822 117 12925	47kΩ	1%	0,06W	
3883 ©	4822 117 10833	10kΩ	1%	0,1W	
3884 ©	4822 051 30271	270Ω	5%	0,06W	
3885 ©	4822 117 10833	10kΩ	1%	0,1W	
3886 ©	4822 117 12925	47kΩ	1%	0,06W	
3887 ©	4822 051 30221	220Ω	5%	0,06W	
3888 ©	4822 117 10833	10kΩ	1%	0,1W	
3889 ©	4822 051 20471	470Ω	5%	0,1W	
3890 ©	4822 051 30102	1kΩ	5%	0,06W	
3891 ©	4822 051 30102	1kΩ	5%	0,06W	
3892 ©	4822 051 20471	470Ω	5%	0,1W	
3893 ©	4822 051 30471	470Ω	5%	0,06W	
3894 ©	4822 051 30101	100Ω	5%	0,06W	
3895 ©	4822 117 12971	15Ω	5%	0,06W	
3898 ©	4822 051 30221	220Ω	5%	0,06W	
3899 ©	4822 051 30101	100Ω	5%	0,06W	
3900 ©	4822 117 12955	2,7kΩ	1%	0,1W	
3901 ©	4822 117 10833	10kΩ	1%	0,1W	
3904 ©	4822 117 13632	100kΩ	1%	0,06W	
4800 ©	4822 051 20008	CHIP JUMPER 0805			
4801 ©	4822 051 20008	CHIP JUMPER 0805			
4802 ©	4822 051 20008	CHIP JUMPER 0805			
4803 ©	4822 051 30008	CHIP JUMPER 0603			
4804 ©	4822 051 20008	CHIP JUMPER 0805			
4805 ©	4822 051 30008	CHIP JUMPER 0603			
4806 ©	4822 051 20008	CHIP JUMPER 0805			
4807 ©	4822 051 20008	CHIP JUMPER 0805			
4808 ©	4822 051 20008	CHIP JUMPER 0805			
4811 ©	4822 051 20008	CHIP JUMPER 0805			
4814 ©	4822 051 20008	CHIP JUMPER 0805			
4817 ©	4822 051 20008	CHIP JUMPER 0805			
4818 ©	4822 051 20008	CHIP JUMPER 0805			
4819 ©	4822 051 20008	CHIP JUMPER 0805			
4820 ©	4822 051 20008	CHIP JUMPER 0805			
4821 ©	4822 051 20008	CHIP JUMPER 0805			
4822 ©	4822 051 20008	CHIP JUMPER 0805			
4823 ©	4822 051 20008	CHIP JUMPER 0805			
4824 ©	4822 051 30008	CHIP JUMPER 0603			
4825 ©	4822 051 30008	CHIP JUMPER 0603			
4826 ©	4822 051 20008	CHIP JUMPER 0805			
4828 ©	4822 051 20008	CHIP JUMPER 0805			
4829 ©	4822 051 20008	CHIP JUMPER 0805			
4830 ©	4822 051 20008	CHIP JUMPER 0805			
4831 ©	4822 051 20008	CHIP JUMPER 0805			
4832 ©	4822 051 30008	CHIP JUMPER 0603			
4833 ©	4822 051 20008	CHIP JUMPER 0805			
4834 ©	4822 051 20008	CHIP JUMPER 0805			
4835 ©	4822 051 20008	CHIP JUMPER 0805			
4838 ©	4822 051 30008	CHIP JUMPER 0603			
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4841 ©	4822 051 30008	CHIP JUMPER 0603			
4842 ©	4822 051 20008	CHIP JUMPER 0805			
4844 ©	4822 051 20008	CHIP JUMPER 0805			
4845 ©	4822 051 20008	CHIP JUMPER 0805			
4846 ©	4822 051 20008	CHIP JUMPER 0805			
4847 ©	4822 051 20008	CHIP JUMPER 0805			
4848 ©	4822 051 20008	CHIP JUMPER 0805			
4850 ©	4822 051 20008	CHIP JUMPER 0805			
4876 ©	4822 051 20008	CHIP JUMPER 0805			

ELECTRICAL PARTSLIST 3CDC-LLC-MCD1 MODULE

COILS

1810	4822 242 73557	CERAMIC RES. 8,46MHz

DIODES

6871 ©	4822 130 11397	BAS316
6872 ©	4822 130 11397	BAS316
6873 ©	4822 130 11397	BAS316
6874 ©	4822 130 11397	BAS316
6875 ©	9340 548 52115	BZX284-C5V1
6877 ©	9322 129 34685	BZX284-C3V9
6878 ©	4822 130 11397	BAS316
6879 ©	9322 129 34685	BZX284-C3V9

TRANSISTORS

7802 ©	5322 130 60123	BC807-40
7808 ©	4822 130 60511	BC847B
7809 ©	4822 130 60511	BC847B
7810 ©	4822 130 60511	BC847B
7812 ©	4822 130 60511	BC847B
7874 ©	4822 130 60511	BC847B
7875 ©	4822 130 60511	BC847B

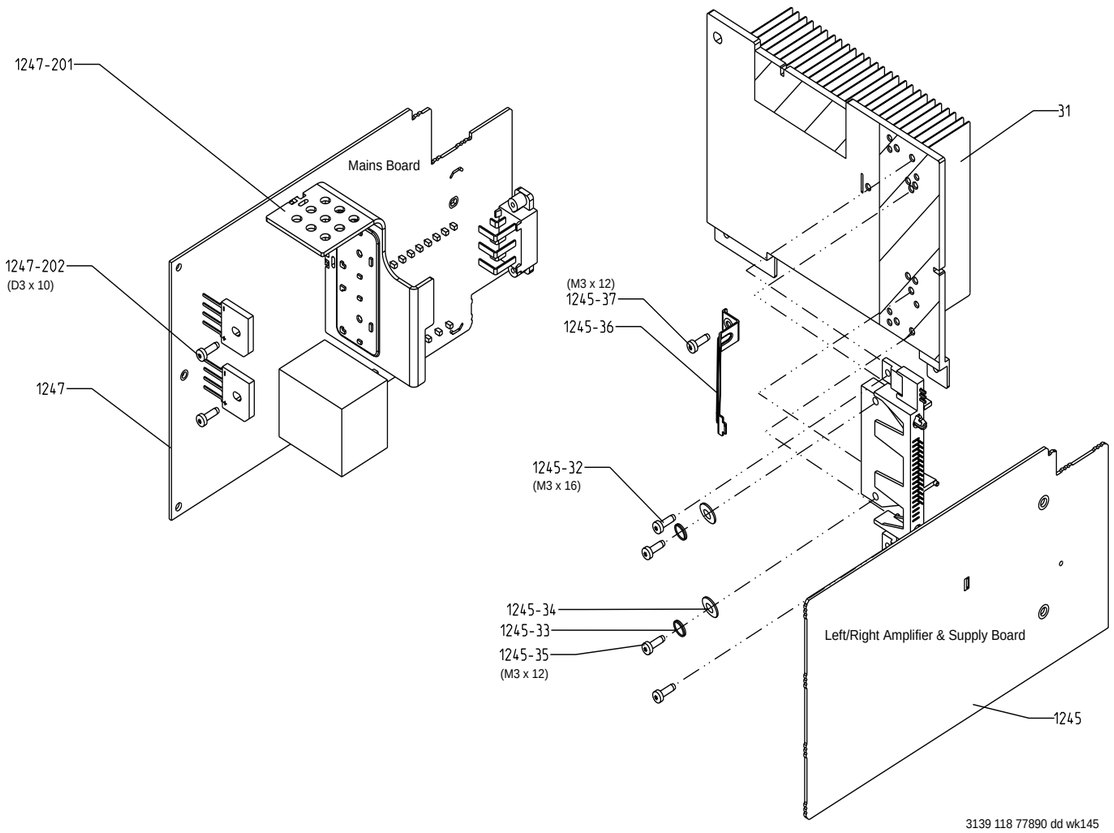
INTEGRATED CIRCUITS

7803 ©	5322 209 82941	LM358D, Dual Opamp
7805 ©	4822 209 33165	TDA1308T/N1
7806	4822 209 32852	TDA7073A/N2
7807	4822 209 32852	TDA7073A/N2
7871	4822 209 32852	TDA7073A/N2
7873 ©	5322 209 11306	HEF4094BT, SHIFT REGISTER
7877 ©	9352 641 80557	SAA7324H/M2B,“CD10“ SIGN.PROC.

MMPWR 100W MODULE

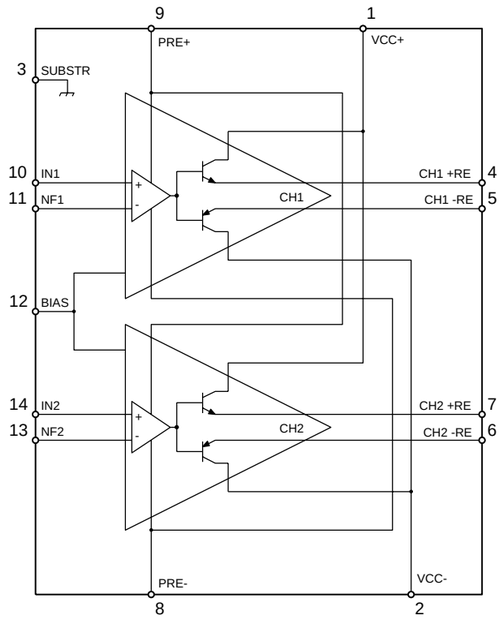
TABLE OF CONTENTS

Module Exploded view



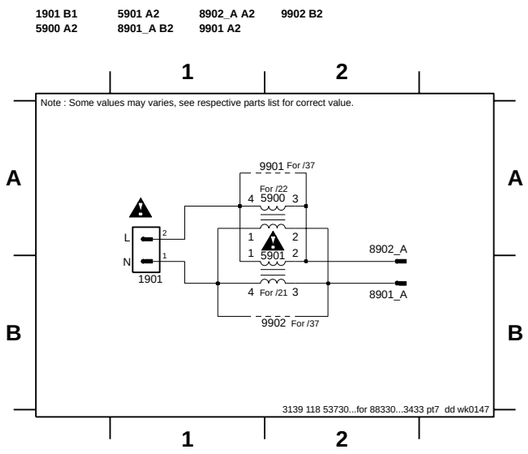
3139 118 77890 dd wk145

STK442-110 Internal Block diagram

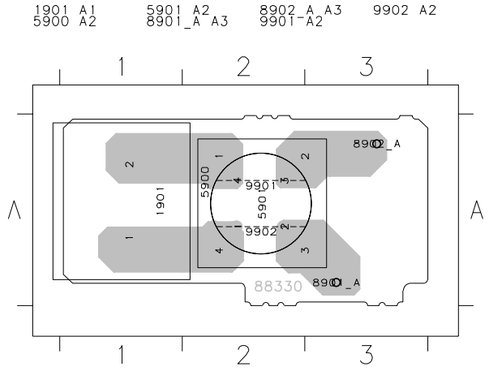


11-2

MAINS SOCKET - CIRCUIT DIAGRAM



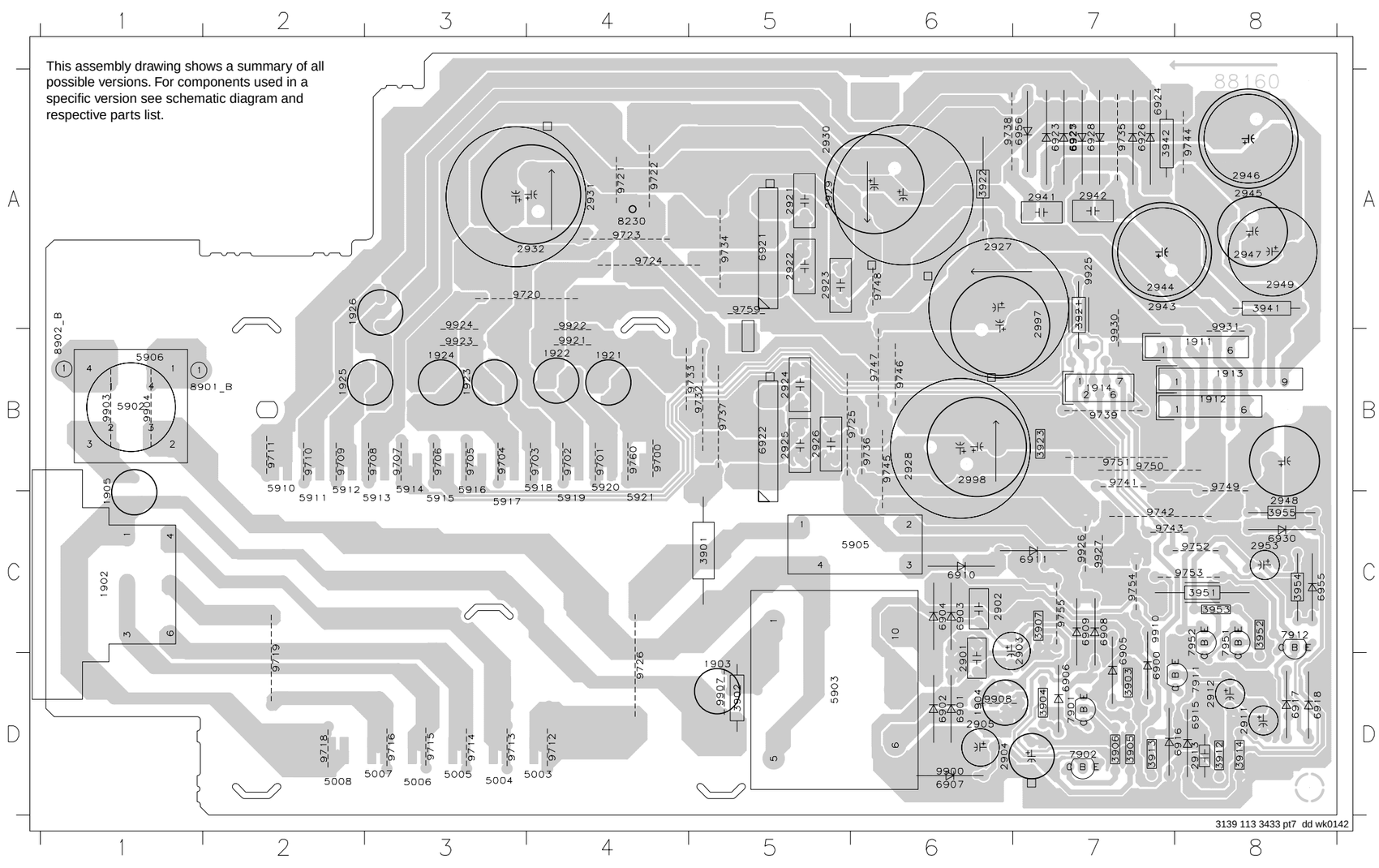
MAINS SOCKET - COPPER SIDE VIEW



MAINS BOARD - COPPER SIDE VIEW

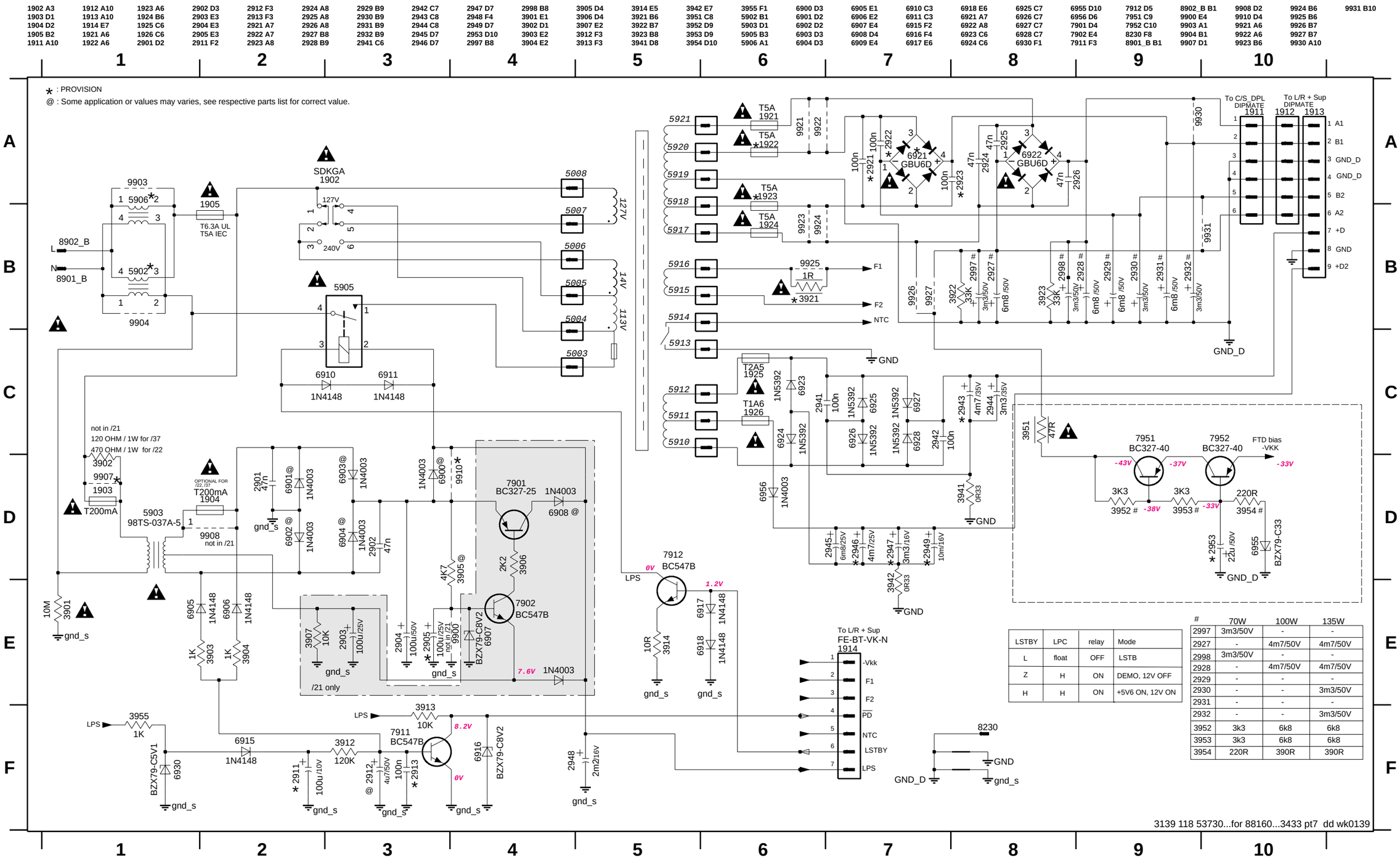
1902 C1 1903 D5 1904 D6 1905 C1 1911 B8 1912 B8 1913 B8 1914 B7 1921 B4 1922 B4 1923 B3 1924 B3 1925 B2
1926 A2 2901 D6 2902 C6 2903 C7 2904 D6 2905 D6 2911 D8 2912 D8 2913 D8 2921 A5 2922 A5 2923 A5 2924 B5
2925 B5 2926 B5 2927 A6 2928 B6 2929 A5 2930 A5 2931 A4 2932 A4 2941 A7 2942 A7 2943 A7 2944 A7 2945 A8
2946 A8 2947 A8 2948 C8 2949 A8 2953 C8 2997 A7 2998 B6 3901 C5 3902 D5 3903 D7 3904 D7 3905 D7 3906 D7
3907 C7 3912 D8 3913 D7 3914 D8 3921 A7 3922 A6 3923 B7 3941 A8 3942 A7 3951 C8 3952 C8 3953 C8 3954 C8
3955 C8 5003 D4 5004 D3 5005 D3 5006 D3 5007 D3 5008 D2 5902 B1 5903 D5 5905 C6 5906 B1 5910 B2 5911 C2
5912 B2 5913 C3 5914 B3 5915 C3 5916 B3 5917 C3 5918 B4 5919 C4 5920 B4 5921 C4 6900 D7 6901 D6 6902 D6
6903 C6 6904 C6 6905 C7 6906 D7 6907 D6 6908 C7 6909 C7 6910 C6 6911 C7 6915 D8 6916 D8 6917 D8 6918 D8
6921 A5 6922 B5 6923 A7 6924 A7 6925 A7 6926 A7 6927 A7 6928 A7 6930 C8 6955 C8 6956 A7 7901 D7 7902 D7
7911 D8 7912 C8 7951 C8 7952 C8 8230 A4 8901_B B2 8902_B B1 9700 B4 9701 B4 9702 B4 9703 B4 9704 B3
9705 B3 9706 B3 9707 B3 9708 B3 9709 B2 9710 B2 9711 B2 9712 D4 9713 D3 9714 D3 9715 D3 9716 D3 9718 D2
9719 D2 9720 A3 9721 A4 9722 A4 9723 A4 9724 A4 9725 B6 9726 D4 9732 B5 9733 B5 9734 A5 9735 A7 9736 B6
9737 B5 9738 A6 9739 B7 9741 B7 9742 C7 9743 C7 9744 A8 9745 B6 9746 B6 9747 B6 9748 A6 9749 B8 9750 B7
9751 B7 9752 C8 9753 C8 9754 C7 9755 C7 9759 A5 9760 B4 9900 D6 9903 B1 9904 B1 9907 D5 9908 D6 9910 C7
9921 B4 9922 A4 9923 B3 9924 A3 9925 A7 9926 C7 9927 C7 9930 A7 9931 A8

This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.



11-3

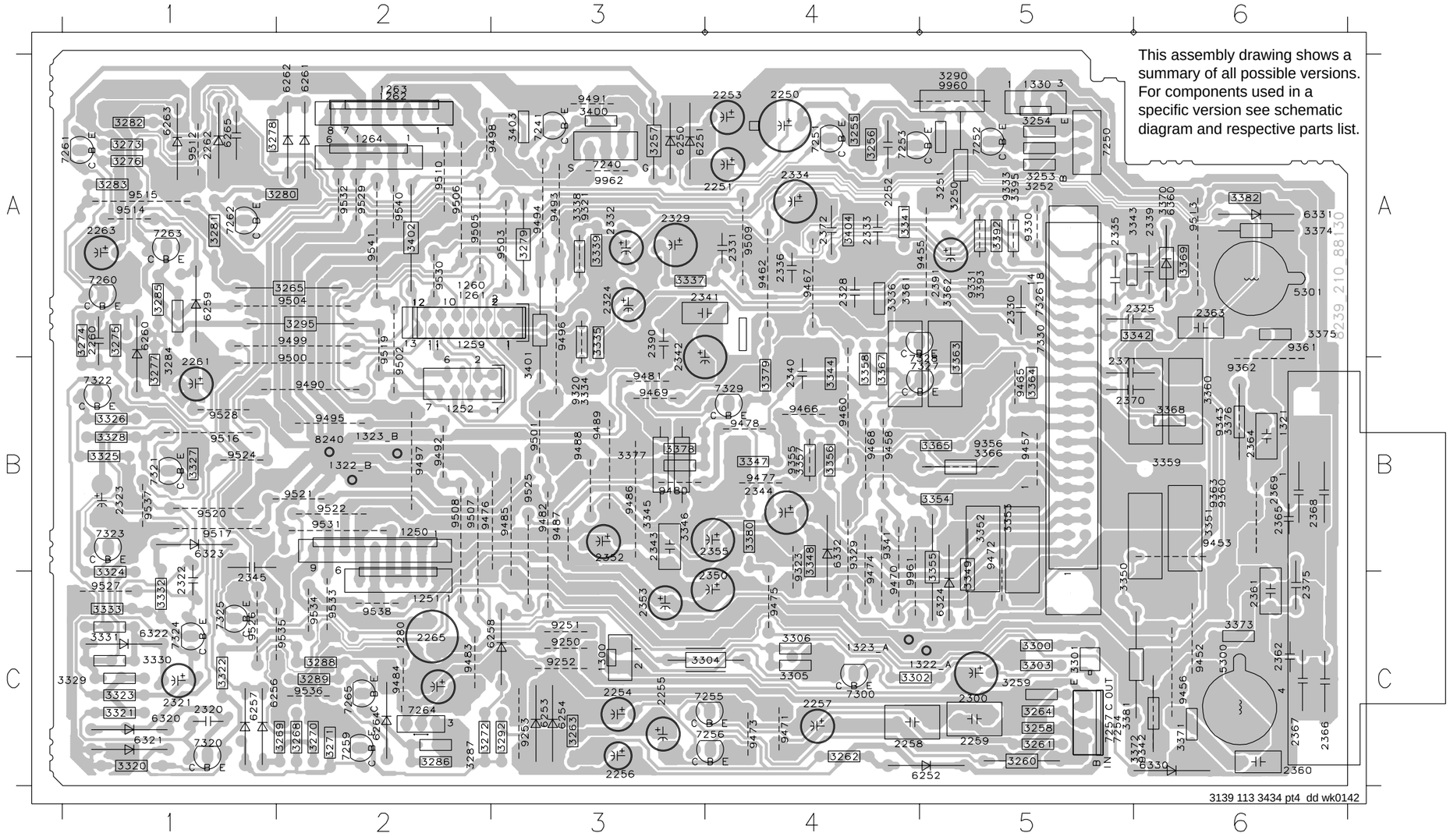
MAINS BOARD - CIRCUIT DIAGRAM



11-4

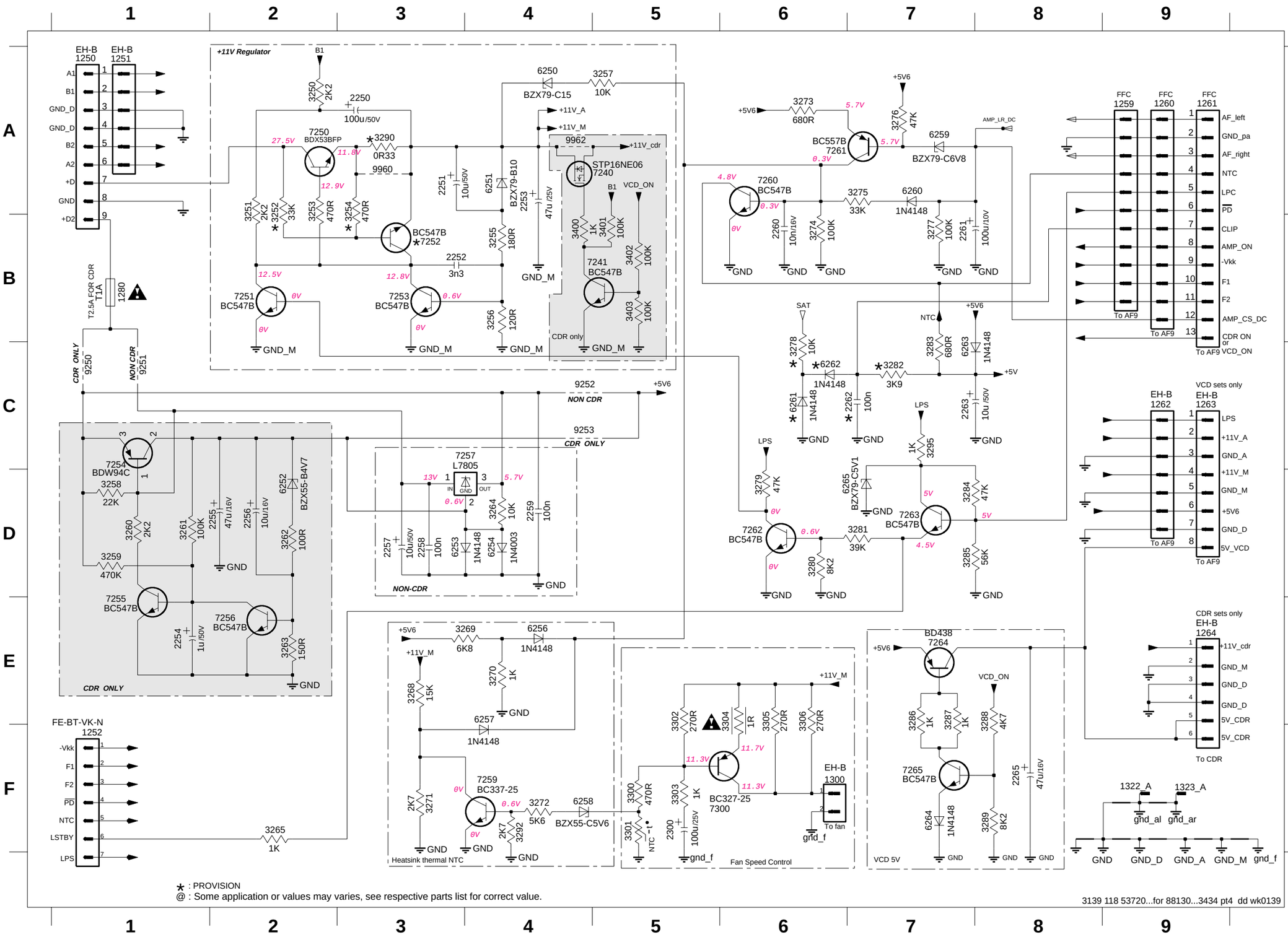
LEFT/RIGHT AMPLIFIER & SUPPLY BOARD - COPPER SIDE VIEW

1250 B2
1251 C2
1252 B2
1259 A2
1260 A2
1261 A2
1262 A2
1263 A2
1264 A2
1280 C2
1300 C3
1321 B6
1322_A C5
1322_B B2
1323_A C4
1323_B B2
1330 A5
2250 A4
2251 A4
2252 A4
2253 A4
2254 C3
2255 C3
2256 C3
2257 C4
2258 C4
2259 C5
2260 A1
2261 B1
2262 A1
2263 A1
2265 C2
2300 C5
2320 C1
2321 C1
2322 C1
2323 B1
2324 A3
2325 A6
2328 A4
2329 A3
2330 A5
2331 A4
2332 A3
2333 A4
2334 A4
2335 A5
2336 A4
2339 A6
2340 B4
2341 A3
2342 A3
2343 B3
2344 B4
2345 C1
2350 C4
2352 B3
2353 C3
2355 B4
2360 C6
2361 C6
2362 C6
2363 A6
2364 B6
2365 B6
2366 C6
2367 C6
2368 B6
2369 B6
2370 B5
2371 B5
2372 A4
2375 C6
2390 A3
2391 A5
3250 A5
3251 A5
3252 A5
3253 A5
3254 A5
3255 A4
3256 A4
3257 A3
3258 C5
3259 C5
3260 C5
3261 C6
3262 C4
3263 C3
3264 C5
3265 A2
3268 C2
3269 C2
3270 C2
3271 C2
3272 C2
3273 A1
3274 A1
3275 A1
3276 A1
3277 B1
3278 A1
3279 A3
3280 A2
3281 A1
3282 A1
3283 A1
3284 B1
3285 A1
3286 C2
3287 C2
3288 C2
3289 C5
3290 A5
3292 C3
3295 A2
3300 C5
3301 C5
3302 C4
3303 C5
3304 C4
3305 C4
3306 C4
3320 C1
3321 C1
3322 C1
3323 C1
3324 C1
3325 B1
3326 B1
3327 B1
3328 B1
3329 C1
3330 C1
3331 C1
3332 C1
3333 C1
3334 B3
3335 A3
3336 A4
3337 A3
3338 A3
3339 A3
3341 A4
3342 A6
3343 A5
3344 B4
3345 B3
3346 B4
3347 B4
3348 B4
3349 C5
3350 C5
3351 B6
3352 B5
3353 B5
3354 B5
3355 B5
3356 B4
3357 B4
3358 B4
3359 B6
3360 B6
3361 A4
3362 A5
3363 A6
3364 B5
3365 B5
3366 B5
3367 B4
3368 B6
3369 A6
3370 A6
3371 C6
3372 C6
3373 C6
3374 A6
3375 A6
3376 B6
3377 A6
3378 B6
3379 B4
3380 B4
3381 C5
3382 A6
3392 C6
3393 A5
3395 A5
3400 A3
3401 B3
3402 A2
3403 A3
3404 A4
5300 C6
5301 A6
6250 A3
6251 A3
6252 C5
6253 C3
6254 C3
6256 C1
6257 C1
6258 C3
6259 A1
6260 A1
6261 A2
6262 A2
6263 A1
6264 C2
6265 A1
6320 C1
6321 C1
6322 C1
6323 B1
6324 C5
6330 C6
6331 A6
6332 B4
6360 A6
7240 A3
7241 A3
7250 A5
7251 A4
7252 A5
7253 A4
7254 C5
7255 C4
7256 C4
7257 C5
7259 C2
7260 A1
7261 A1
7262 A1
7263 A1
7264 C2
7265 C2
7300 C4
7320 C1
7321 B1
7322 B1
7323 B1
7324 C1
7325 C1
7326 A5
7327 B5
7328 B5
7329 B4
7330 A5
8240 B2
9250 C3
9251 C3
9252 C3
9253 C3
9320 B3
9321 A3
9323 B4
9329 B4
9330 A5
9331 A5
9333 A5
9341 B4
9342 C6
9343 B6
9355 B4
9356 B5
9360 B6
9361 A6
9362 B6
9363 B6
9452 C6
9453 B6
9455 A5
9456 C6
9457 B5
9458 B4
9460 B4
9462 A4
9465 B5
9466 B4
9467 A4
9468 B4
9469 B3
9470 C4
9471 C4
9472 B5
9473 C4
9474 B4
9475 C4
9476 B2
9477 B4
9478 B4
9480 B3
9481 B3
9482 B3
9483 C2
9484 C2
9485 B3
9486 B3
9487 B3
9488 B3
9489 B3
9490 B3
9491 B3
9492 B3
9493 B3
9494 B3
9495 B2
9496 A3
9497 B2
9498 A3
9499 A2
9500 B2
9501 B3
9502 B2
9503 A3
9504 A2
9505 A2
9506 A2
9507 B2
9508 B2
9509 A4
9510 A2
9512 A1
9513 A6
9514 A1
9515 A1
9516 B1
9517 B1
9519 A2
9520 B1
9521 B2
9522 B2
9524 B1
9525 B3
9526 C1
9527 C1
9528 B1
9529 A2
9530 A2
9531 B2
9532 A2
9533 C2
9534 C2
9535 C2
9536 C2
9537 B1
9538 C2
9540 A2
9541 A2
9960 A5
9962 A3



11-5

LEFT/RIGHT AMPLIFIER & SUPPLY BOARD - CIRCUIT DIAGRAM (PART 1)



✱ : PROVISION
@ : Some application or values may varies, see respective parts list for correct value.

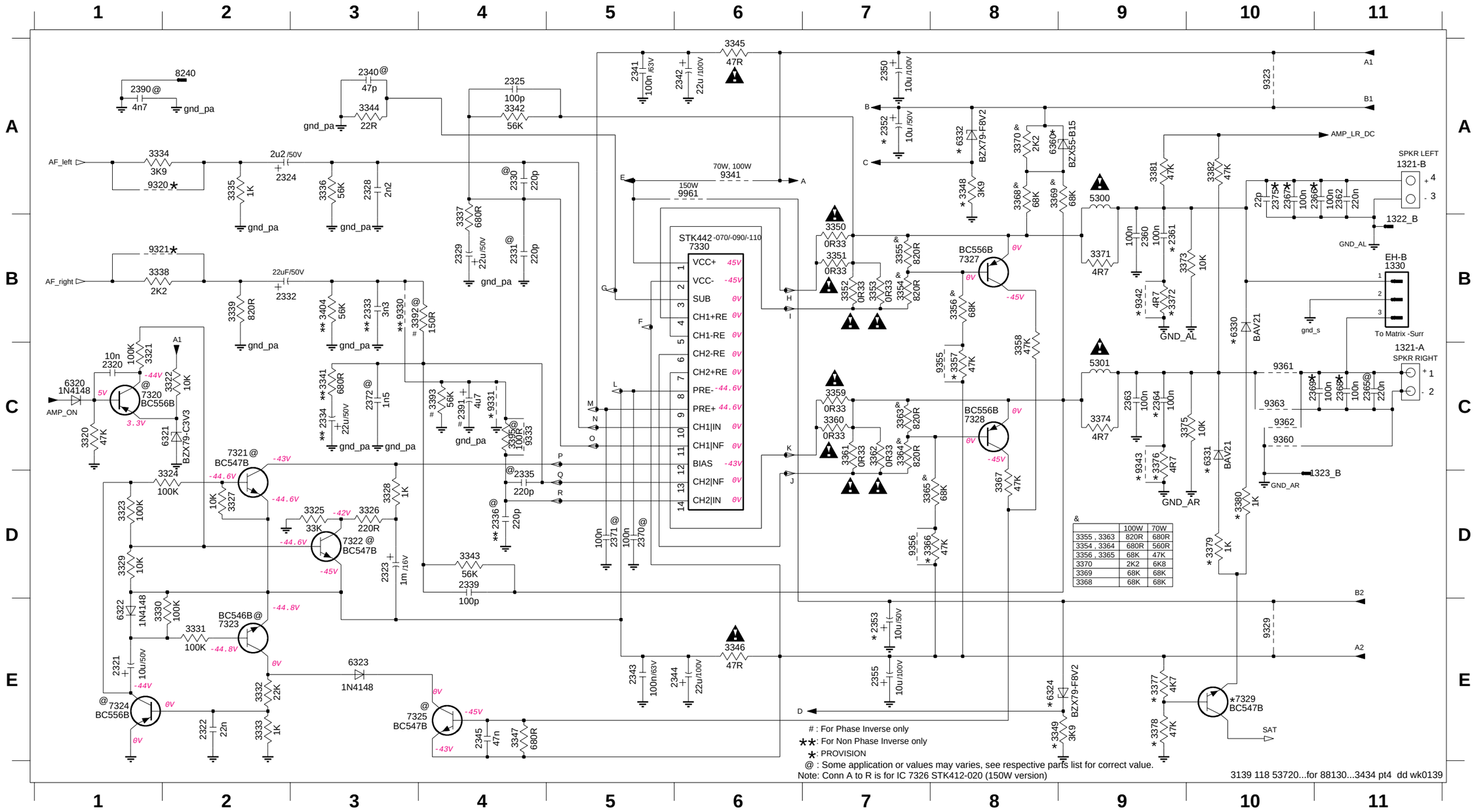
3139 118 53720...for 88130...3434 pt4 dd wk0139

1250 A1
1251 A1
1252 F1
1259 A9
1260 A9
1261 A9
1262 C9
1263 C9
1264 E9
1280 B1
1300 F6
1322_A F9
1323_A F9
2250 A3
2251 A3
2252 B3
2253 A4
2254 E1
2255 D1
2256 D2
2257 D3
2258 D3
2259 D4
2260 B6
2261 B7
2262 C7
2263 C7
2265 F8
2300 F5
3250 A2
3251 A2
3252 A2
3253 A2
3254 A3
3255 B4
3256 B4
3257 A5
3258 D1
3259 D1
3260 D1
3261 D1
3262 D2
3263 E2
3264 D4
3265 F2
3268 E3
3269 E4
3270 E4
3271 F3
3272 F4
3273 A6
3274 B6
3275 A7
3276 A7
3277 B7
3278 C6
3279 D6
3280 D6
3281 D7
3282 C7
3283 C7
3284 D7
3285 D7
3286 E7
3287 E7
3288 E8
3289 F8
3290 A3
3292 F4
3295 C7
3300 F5
3301 F5
3302 E5
3303 F5
3304 E6
3305 E6
3306 E6
3400 B4
3401 B5
3402 B5
3403 B5
6250 A4
6251 A4
6252 D2
6253 D3
6254 D4
6256 E4
6257 E4
6258 F4
6259 A7
6260 A7
6261 C6
6262 C6
6263 C7
6264 F7
6265 D6
7240 A5
7241 B5
7250 A2
7251 B2
7252 B3
7253 B3
7254 C1
7255 E1
7256 E2
7257 C4
7259 F4
7260 A6
7261 A6
7262 D6
7263 D7
7264 E7
7265 F8
7300 F5
9250 C1
9251 C1
9252 C4
9253 C4
9960 A3
9962 A4

11-6

LEFT/RIGHT AMPLIFIER & SUPPLY BOARD - CIRCUIT DIAGRAM (PART 2)

1321-A C11	2323 D3	2333 B3	2343 E5	2361 B9	2369 C11	3321 C1	3329 D1	3337 B4	3346 E6	3354 B7	3362 C7	3370 A8	3378 E9	3404 B3	6330 B10	7324 E1	9321 B1	9343 C9
1321-B A11	2324 A2	2334 C3	2344 E6	2362 A11	2370 D5	3322 C2	3330 E1	3338 B1	3347 E4	3355 B7	3363 C7	3371 B9	3379 D10	5300 A9	6331 C10	7325 E4	9323 A10	9355 C8
1322_B B11	2325 A4	2335 D4	2345 E4	2363 C9	2371 D5	3323 D1	3331 E2	3339 B2	3348 A8	3356 B8	3364 C7	3372 B9	3380 D10	5301 C9	6332 A8	7327 B8	9329 E10	9356 D7
1323_B D11	2328 A3	2336 D4	2350 A7	2364 C9	2372 C3	3324 D2	3332 E2	3340 C3	3349 E8	3357 C8	3365 D8	3373 B10	3381 A9	6320 C1	6360 A8	7328 C8	9330 B3	9360 C10
1330 B11	2329 B4	2339 D4	2352 A7	2365 C11	2375 A10	3325 D3	3333 E2	3342 A4	3350 B7	3358 C8	3366 D8	3374 C9	3382 A10	6321 C1	7320 C1	7329 E10	9331 C4	9361 C10
2320 C1	2330 A4	2340 A3	2353 E7	2366 A10	2390 A1	3326 D3	3334 A1	3343 D4	3351 B7	3359 C7	3367 D8	3375 C10	3392 B3	6322 E1	7321 C2	7330 B6	9333 C4	9362 C10
2321 E1	2331 B4	2341 A5	2355 E7	2367 A10	2391 C4	3327 D2	3335 A2	3344 A3	3352 B7	3360 C7	3368 A8	3376 C9	3393 C4	6323 E3	7322 D3	8240 A2	9341 A6	9363 C10
2322 E2	2332 B2	2342 A6	2360 B9	2368 C11	3320 C1	3328 D3	3336 A3	3345 A6	3353 B7	3361 C7	3369 A8	3377 E9	3395 C4	6324 E8	7323 E2	9320 A1	9342 B9	9961 A6



ELECTRICAL PARTS LIST - MAINS BOARD

MISCELLANEOUS

1901	4822 265 31015	⚠	Mains Socket
1901	2422 030 00328	⚠	Mains Socket /37
1902	2422 129 16478	⚠	Voltage Selector /21/21M
1903	4822 071 52001	⚠	Fuse T200mA 250V /21/21M
1904	4822 071 52001	⚠	Fuse T200mA 250V /21/21M
1905	2422 086 10963	⚠	Fuse T5A 250V
1905	4822 252 51123	⚠	Fuse T6,3A 250V /37
1914	4822 267 10953		Flex Socket 7 Pin Vert.
1921	4822 071 55002	⚠	Fuse T5A 250V
1924	4822 071 55002	⚠	Fuse T5A 250V
1925	4822 071 52502	⚠	Fuse T2,5A 250V
1926	4822 071 51602	⚠	Fuse T1,6A 250V

CAPACITORS

2901	4822 121 43526	47nF 5% 250V
2902	4822 121 43526	47nF 5% 250V
2903	4822 124 40207	100µF 20% 25V /21/21M
2904	4822 124 40255	100µF 20% 63V
2912	4822 124 21913	1µF 20% 63V
2924	4822 121 43526	47nF 5% 250V
2925	4822 121 43526	47nF 5% 250V
2926	4822 121 43526	47nF 5% 250V
2927	4822 124 80415	4700µF 20% 50V
2928	4822 124 80415	4700µF 20% 50V
2941	5322 121 42386	100nF 5% 63V
2942	5322 121 42386	100nF 5% 63V
2944	4822 124 42367	3300µF 20% 35V
2945	4822 124 12328	6800µF 25V
2948	4822 123 14025	2200µF 20% 16V

RESISTORS

3901	4822 053 21106	⚠	10M 5% 0,5W /37
3902	4822 053 10471		470R 5% PR01 /22/30/34
3902	4822 053 10121		120R 5% PR01 /37
3903	4822 050 11002		1k 1% 0,4W
3904	4822 050 11002		1k 1% 0,4W
3905	4822 116 52244		15k 5% 0,5W
3905	4822 116 52283		4k7 5% 0,5W /21/21M
3906	4822 116 52256		2k2 5% 0,5W /21/21M
3907	4822 050 21003		10k 1% 0,6W /21/21M
3912	4822 116 52234		100k 5% 0,5W
3913	4822 050 21003		10k 1% 0,6W
3914	4822 116 52176		10R 5% 0,5W
3922	4822 050 23303		33k 1% 0,6W
3923	4822 050 23303		33k 1% 0,6W
3941	4822 117 11342		0R33 5% 2W
3942	4822 117 11342		0R33 5% 2W
3951	4822 052 10479	⚠	47R 5% 0,33W
3952	4822 116 83961		6k8 5%
3953	4822 116 83961		6k8 5%
3954	4822 116 83881		390R 5% 0,5W
3955	4822 050 11002		1k 1% 0,4W

COILS & FILTERS

5900	4822 157 11832	⚠	Mains Filter 400µH 3A /22/30/34
5901	4822 157 11628	⚠	Mains Choke /21/21M
5903	3103 308 30600	⚠	Standby Transformer /21/21M
5903	3103 308 30610	⚠	Standby Transformer /22/30/34
5903	3103 308 30800	⚠	Standby Transformer /37
5905	4822 280 10382	⚠	Relay 1P 9V 10/80A SDT-SS

DIODES

6900	4822 130 31878	1N4003G not for /21/21M
6901	4822 130 31878	1N4003G
6901	5322 130 81917	SB140 /21/21M
6902	5322 130 81917	SB140 /21/21M
6902	4822 130 31878	1N4003G
6903	4822 130 31878	1N4003G
6903	5322 130 81917	SB140 /21/21M
6904	5322 130 81917	SB140 /21/21M
6904	4822 130 31878	1N4003G
6905	4822 130 30621	1N4148
6906	4822 130 30621	1N4148
6907	4822 130 34382	BZX79-B8V2 /21/21M
6908	5322 130 81917	SB140 /21/21M
6909	4822 130 31878	1N4003G /21/21M
6910	4822 130 30621	1N4148
6911	4822 130 30621	1N4148
6915	4822 130 30621	1N4148
6916	4822 130 34382	BZX79-B8V2
6917	4822 130 30621	1N4148
6918	4822 130 30621	1N4148
6922	4822 130 10944	GBU6D
6923	4822 130 31878	1N5392
6924	4822 130 31878	1N5392
6925	4822 130 31878	1N5392
6926	4822 130 31878	1N5392
6927	4822 130 31878	1N5392
6928	4822 130 31878	1N5392
6930	4822 130 34233	BZX79-B5V1
6955	4822 130 34142	BZX79-B33
6956	4822 130 31878	1N4003G

TRANSISTOR & INTEGRATED CIRCUITS

7901	4822 130 41246	BC327-25 /21/21M
7902	4822 130 40959	BC547B /21/21M
7911	4822 130 40959	BC547B
7912	4822 130 40959	BC547B
7951	4822 130 41327	BC327-40
7952	4822 130 41327	BC327-40

Note: Only the parts mentioned in this list are normal service spare parts.

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ELECTRICAL PARTS LIST - LEFT/RIGHT AMPLIFIER & SUPPLY BOARD

MISCELLANEOUS

28	3139 114 70800		Holder STK IC
1252	4822 267 10953		Flex Socket 7 Pin Vert.
1259	4822 267 11039		Flex Socket 11 Pin Vert.
1280	4822 071 51002	⚠	Fuse T1A 250V
1321	4822 267 31176		Loudspeaker Socket 4P

CAPACITORS

2250	4822 124 40255	100µF 20% 63V
2251	4822 124 40248	10µF 20% 63V
2252	4822 122 10577	3,3nF 10% 16V
2253	4822 124 40433	47µF 20% 25V
2257	4822 124 40248	10µF 20% 63V
2258	5322 121 42386	100nF 5% 63V
2259	5322 121 42386	100nF 5% 63V
2260	4822 121 51387	10nF 20% 16V
2261	4822 124 41584	100µF 20% 10V
2263	4822 124 40248	10µF 20% 63V
2300	4822 124 40207	100µF 20% 25V
2320	4822 121 43693	10nF 100V
2321	4822 124 22652	2,2µF 20% 50V
2322	4822 121 41856	22nF 5% 250V
2323	4822 124 81144	1000µF 16V
2324	4822 124 22652	2,2µF 20% 50V
2325	4822 122 33195	100pF 10% 50V
2328	5322 122 32818	2,2nF 10% 100V /21/21M
2329	4822 124 81151	22µF 50V
2330	4822 126 14316	680pF 10% 50V /21/21M
2330	4822 122 33519	470pF 10% 50V
2331	4822 126 13461	680pF 10% 50V /21/21M
2332	4822 124 81151	22µF 50V
2335	4822 126 14316	680pF 10% 50V /21/21M
2335	4822 122 33519	470pF 10% 50V
2336	4822 126 13461	680pF 10% 50V /21/21M
2339	4822 122 33195	100pF 10% 50V
2340	4822 126 12726	47pF 50V not for /21/21M
2341	5322 121 42386	100nF 5% 63V
2342	4822 124 40764	22µF 100V
2343	5322 121 42386	100nF 5% 63V
2344	4822 124 40764	22µF 100V
2345	4822 126 12785	47nF 50V
2350	5322 124 40641	10µF 20% 100V
2355	5322 124 40641	10µF 20% 100V
2360	5322 121 42386	100nF 5% 63V
2362	4822 121 42868	220nF 5% 50V
2363	5322 121 42386	100nF 5% 63V
2365	2020 308 90054	270nF 5% 50V /21/21M
2365	4822 121 42868	220nF 5% 50V
2370	2020 561 90365	100nF +80/-20% 50V not for /21/21M
2371	2020 561 90365	100nF +80/-20% 50V not for /21/21M
2372	4822 126 12878	1,5nF 10% 16V not for /21/21M
2390	4822 122 33449	47nF 30% 50V /21/21M
2390	5322 122 32261	4,7nF 50V
2391	4822 124 40769	4,7µF 20% 100V

RESISTORS

3250	4822 116 52256	2k2 5% 0,5W
3251	4822 116 52256	2k2 5% 0,5W
3253	4822 116 83883	470R 5% 0,5W
3255	4822 116 52213	180R 5% 0,5W
3256	4822 116 52206	120R 5% 0,5W
3257	4822 050 21003	10k 1% 0,6W
3264	4822 050 21003	10k 1% 0,6W
3265	4822 050 11002	1k 1% 0,4W
3268	4822 116 52244	15k 5% 0,5W
3269	4822 116 83961	6k8 5%
3270	4822 050 11002	1k 1% 0,4W
3271	4822 116 52263	2k7 5% 0,5W
3272	4822 116 52289	5k6 5% 0,5W
3273	4822 116 52228	680R 5% 0,5W
3274	4822 116 52234	100k 5% 0,5W
3275	4822 050 23303	33k 1% 0,6W
3276	4822 116 83884	47k 5% 0,5W
3277	4822 116 52234	100k 5% 0,5W
3279	4822 116 83884	47k 5% 0,5W
3280	4822 116 52303	8k2 5% 0,5W
3281	4822 116 83882	39k 5% 0,5W
3283	4822 116 52228	680R 5% 0,5W
3284	4822 116 83884	47k 5% 0,5W
3285	4822 116 52291	56k 5% 0,5W
3292	4822 116 52263	2k7 5% 0,5W
3295	4822 050 11002	1k 1% 0,4W
3300	4822 116 83883	470R 5% 0,5W
3301	4822 117 12063	NTC DC 5W 10K 5%
3302	4822 116 83876	270R 5% 0,5W
3303	4822 050 11002	1k 1% 0,4W
3304	4822 052 10108	⚠ 1R 5% 0,33W
3305	4822 116 83876	270R 5% 0,5W
3306	4822 116 83876	270R 5% 0,5W
3320	4822 116 83884	47k 5% 0,5W
3321	4822 116 52234	100k 5% 0,5W
3322	4822 050 21003	10k 1% 0,6W
3324	4822 116 52234	100k 5% 0,5W
3325	4822 050 23303	33k 1% 0,6W
3326	4822 116 83872	220R 5% 0,5W
3327	4822 050 21003	10k 1% 0,6W
3328	4822 050 11002	1k 1% 0,4W
3329	4822 050 21003	10k 1% 0,6W
3330	4822 116 52234	100k 5% 0,5W
3331	4822 116 52234	100k 5% 0,5W
3332	4822 116 52257	22k 5% 0,5W
3333	4822 050 11002	1k 1% 0,4W
3334	4822 116 52276	3k9 5% 0,5W
3335	4822 050 11002	1k 1% 0,4W
3336	4822 116 52291	56k 5% 0,5W

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ELECTRICAL PARTS LIST - LEFT/RIGHT AMPLIFIER & SUPPLY BOARD

RESISTORS

3337	4822 116 52228		680R 5% 0,5W
3338	4822 116 52256		2k2 5% 0,5W
3339	4822 116 52231		820R 5% 0,5W
3342	4822 116 52291		56k 5% 0,5W
3343	4822 116 52291		56k 5% 0,5W
3344	4822 116 52186		22R 5% 0,5W
3345	3198 012 14790	⚠	RST POW 47R 5% 1W
3346	3198 012 14790	⚠	RST POW 47R 5% 1W
3347	4822 116 52228		680R 5% 0,5W
3350	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3351	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3352	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3353	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3354	4822 116 52228		680R 5% 0,5W
3355	4822 116 52231		820R 5% 0,5W
3356	4822 116 52297		68k 5% 0,5W
3358	4822 116 83884		47k 5% 0,5W
3359	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3360	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3361	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3362	2322 194 96001	⚠	RST MFLM 0R33 5% PR02
3363	4822 116 52231		820R 5% 0,5W
3364	4822 116 52228		680R 5% 0,5W
3365	4822 116 52297		68k 5% 0,5W
3367	4822 116 83884		47k 5% 0,5W
3368	4822 116 52297		68k 5% 0,5W
3369	4822 116 52297		68k 5% 0,5W
3370	4822 116 52256		2k2 5% 0,5W
3371	4822 050 24708		4R7 1% 0,6W
3373	4822 050 21003		10k 1% 0,6W
3374	4822 050 24708		4R7 1% 0,6W
3375	4822 050 21003		10k 1% 0,6W
3381	4822 116 83884		47k 5% 0,5W
3382	4822 116 83884		47k 5% 0,5W
3392	4822 116 52175		100R 5% 0,5W
3393	4822 116 52291		56k 5% 0,5W
3395	4822 116 52175		100R 5% 0,5W not for /21/21M

COILS & FILTERS

5300	4822 157 70599	⚠	Ind. Fixed Bead EMI
5301	4822 157 70599	⚠	Ind. Fixed Bead EMI

DIODES

6250	4822 130 34281	BZX79-B15
6251	4822 130 61219	BZX79-B10
6253	4822 130 30621	1N4148
6254	4822 130 31878	1N4003G
6256	4822 130 30621	1N4148
6257	4822 130 30621	1N4148
6258	4822 130 34173	BZX79-B5V6
6259	4822 130 34278	BZX79-B6V8
6260	4822 130 30621	1N4148
6263	4822 130 30621	1N4148
6265	4822 130 34233	BZX79-B5V1
6320	4822 130 30621	1N4148
6321	5322 130 31504	BZX79-B3V3
6322	4822 130 30621	1N4148
6323	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7250	9322 139 23687	BDX53BFP
7251	4822 130 40959	BC547B
7253	4822 130 40959	BC547B
7257	4822 209 31841	L7805CP
7259	4822 130 40981	BC337-25
7260	4822 130 40959	BC547B
7261	4822 130 44568	BC557B
7262	4822 130 40959	BC547B
7263	4822 130 40959	BC547B
7300	4822 130 41246	BC327-25
7320	4822 130 44568	BC557B
7321	4822 130 40959	BC547B
7322	4822 130 40959	BC547B
7323	4822 130 40959	BC547B
7324	4822 130 41691	BC556B
7325	4822 130 40959	BC547B
7327	4822 130 41691	BC556B
7328	4822 130 41691	BC556B
7330	9322 160 21682	STK442-110

Note: Only the parts mentioned in this list are normal service spare parts.

AF9 BOARD

TABLE OF CONTENTS

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BRIEF INTRODUCTION OF THE AF9 BOARD

The AF9 Board consists of the following features :

a. TDA7468D

TDA7468D (7501) provides the basic sound processing - loudness, bass, treble, volume & mute controls and source selection - TUNER, TAPE, CD & AUX including Mic mixing for the set.
Sound features such as ALC, DBB, DSC and IS are controlled by the microprocessor IC on the Front Board via I²C Bus.
Undesirable noise during source switching are muted off by via the software of the microprocessor IC on the Front Board.

b. MIC MIXING

Simple Mic mixing is provided by pin 2 of TDA7468D. During Mic mixed a 1nF capacitor is connected across this pin to ground instead of a chip connector(0R).

c. DOLBY PRO LOGIC (DPL) INTERFACE

The AF9 Board has provisions to cater for DPL. External DPL Board would be required.

d. LINE OUT

Line out cinch socket (1504) is catered including tranistors muting circuitry.

e. SUB-WOOFER OUT

Sub-woofer out cinch socket (691) for connection to active sub-woofer speaker is catered.

f. INCREDIBLE SURROUND (IS)

The AF9 provides 2 possible IS namely:

a) Simple IS using TDA7468D with addition of passive network.
b) Full IS using transistor circuitry to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER

Headphone amplifier NJM4556AM (7601) is provided after the Sound processor (7501) to drive 32 ohm to 1kohm headphone.

h. M62320FP

The M62320FP (7403) I²C Expander provides additional controls reqired.

i. CD STANDBY CONTROL

Transistors 7401 & 7402 ensures the +5V_CD supply is switched only during CD mode.

j. CD DIGITAL OUT

CD Digital out cinch socket (1801) for connection to external digital audio decoders.

VARIATION TABLE:

Type /Versions: / Features:	FW-C399							
	/21	/21M	/22	/30	/33	/34	/37	
Line In	x	x	x	x	x	x	x	
Line Out	-	-	-	-	-	-	-	
Sub-woofer Out	-	-	-	-	-	-	-	
Digital Out	-	-	-	-	-	-	-	
Video Out	-	-	-	-	-	-	-	
Mic mix / Mic Detect	x	x	-	-	x	-	-	
Simple IS	x	x	x	x	x	x	x	
Full IS	-	-	-	-	-	-	-	
Dolby ProLogic (DPL)	-	-	-	-	-	-	-	
Voice Control (VC)	-	-	-	-	-	-	-	

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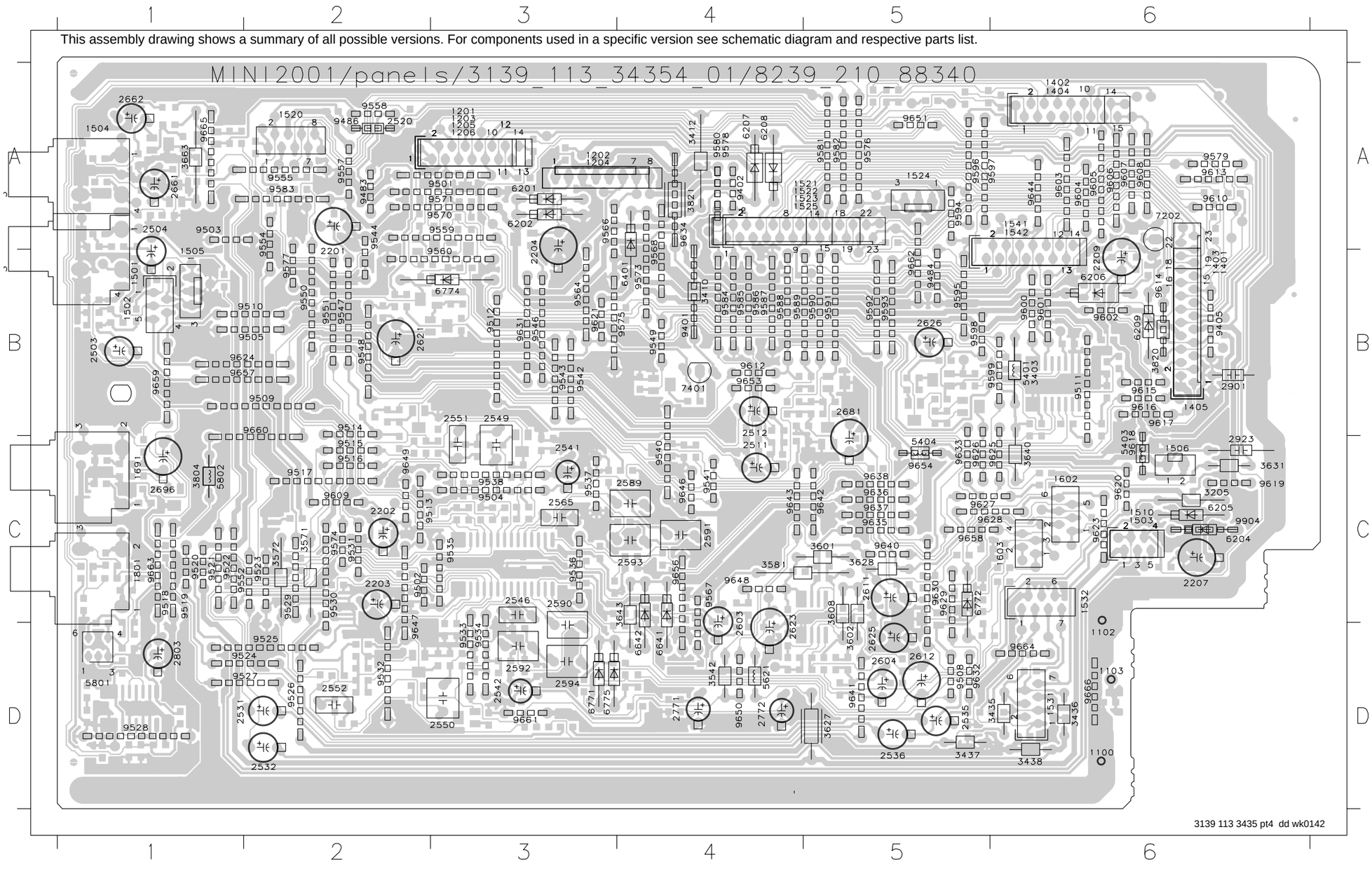
CHIP LAYOUT

2205	A4	2523	C4	2567	C4	2641	C3	2805	D6	3202	A4	3521	A5	3552	D5	3591	C4	3624	B2	3654	B4	3676	D3	3803	D6	4124	C4	4148	A5	4904	C1	7501	C4	7693	C6
2206	C5	2524	C5	2568	D4	2642	C4	2806	D6	3401	B1	3522	A5	3553	C4	3592	D4	3625	B2	3655	B5	3677	D3	3805	C6	4125	C5	4149	C6	4905	B3	7585	C4	7802	D6
2208	B1	2533	C4	2581	D3	2653	A5	2807	C6	3402	B1	3523	A5	3554	D5	3593	C3	3626	B2	3656	A4	3678	D3	3806	C6	4126	A2	4150	C6	4906	A6	7586	D4	7803	B4
2210	B1	2534	D4	2582	D2	2654	A4	2808	C6	3404	B1	3524	A5	3555	C4	3594	D4	3629	C2	3657	A4	3683	B3	3807	D6	4127	B2	4151	A2	4907	A1	7601	C2		
2211	B1	2543	C4	2583	C3	2663	A6	2809	D6	3405	B1	3525	C4	3556	D5	3605	C1	3630	C1	3658	A4	3684	B2	3808	D6	4128	C3	4152	A2	4908	A1	7603	C2		
2401	B1	2544	D4	2584	D2	2664	A6	2810	D6	3406	B1	3526	C4	3557	C4	3606	D2	3633	B5	3659	C2	3685	B3	3809	D6	4130	C2	4153	B1	4909	C6	7604	C2		
2402	B1	2547	C4	2585	C3	2665	A6	2902	D1	3408	B3	3531	D1	3558	D5	3607	C2	3634	B5	3660	D2	3687	B2	3822	B1	4132	C1	4403	B1	4910	C6	7621	B2		
2403	B1	2548	D4	2586	D2	2666	A6	2904	A6	3409	B3	3532	D1	3559	B5	3609	C2	3635	C3	3661	A6	3688	B2	4100	A4	4133	C1	4404	A4	4911	C6	7622	B2		
2404	B2	2553	C4	2587	C3	2667	A6	2905	C2	3501	B6	3533	D2	3560	D5	3610	D2	3636	B4	3662	A6	3689	C2	4101	C6	4134	D4	4405	B3	4912	B1	7623	B2		
2501	B6	2554	D5	2588	D2	2669	B6	2908	C3	3502	A6	3534	D1	3561	B5	3611	C2	3637	C3	3664	A6	3690	C6	4104	B6	4135	C2	4406	B1	4913	B1	7635	B5		
2502	A6	2555	C4	2601	D3	2682	B2	2921	C6	3503	B6	3541	C3	3562	D5	3612	D2	3638	B4	3665	A6	3692	B3	4108	C5	4137	D1	4407	C3	4914	B3	7636	C3		
2505	C4	2556	D4	2602	C3	2683	B3	2922	C1	3504	A6	3543	C4	3563	C5	3613	C2	3639	B5	3666	A6	3694	B1	4110	C5	4138	D2	4501	C5	4915	A1	7651	A5		
2506	C5	2557	C5	2605	C3	2691	B4	2924	C6	3505	B6	3544	D4	3564	D5	3614	C2	3641	D3	3667	A6	3699	C6	4111	C6	4139	B1	4641	D3	4920	C6	7652	A4		
2507	C5	2558	D5	2606	D3	2697	C6	2950	A1	3506	B6	3545	C4	3565	C4	3615	C2	3642	D3	3668	A6	3700	C6	4112	D4	4141	B1	4642	D3	4921	C6	7653	A4		
2513	C3	2559	C4	2607	C3	2698	C6	2951	A2	3507	B6	3546	D4	3566	D5	3616	C2	3644	A2	3669	A6	3707	C3	4113	D4	4142	B1	4801	D6	7201	A4	7654	A5		
2514	C3	2560	D5	2608	D3	2707	C4	2952	A2	3508	B6	3547	C4	3567	C4	3619	C2	3645	C4	3671	D4	3708	C3	4114	C2	4143	A4	4802	A2	7402	B3	7661	A6		
2515	C4	2561	B5	2609	C2	2708	C4	2953	A2	3511	B3	3548	D4	3568	D4	3620	C1	3646	C4	3672	D3	3711	B3	4115	D4	4144	B4	4811	C3	7403	B1	7662	A6		
2516	D4	2562	D5	2610	D2	2801	C6	2954	A5	3512	B3	3549	C4	3569	B4	3621	B2	3651	B4	3673	D4	3712	A6	4116	B5	4145	A1	4812	D2	7404	B1	7663	A6		
2521	A5	2563	C3	2622	B2	2802	D6	2955	B1	3513	C3	3550	D4	3570	D4	3622	B2	3652	C1	3674	D3	3801	C6	4119	D4	4146	A4	4813	C6	7485	B5	7681	B2		
2522	A5	2564	D4	2624	D3	2804	D6	3201	A5	3514	C3	3551	C4	3582	D2	3623	B2	3653	A4	3675	D3	3802	D6	4122	C2	4147	A1	4903	A1	7488	D5	7682	B2		

12-3

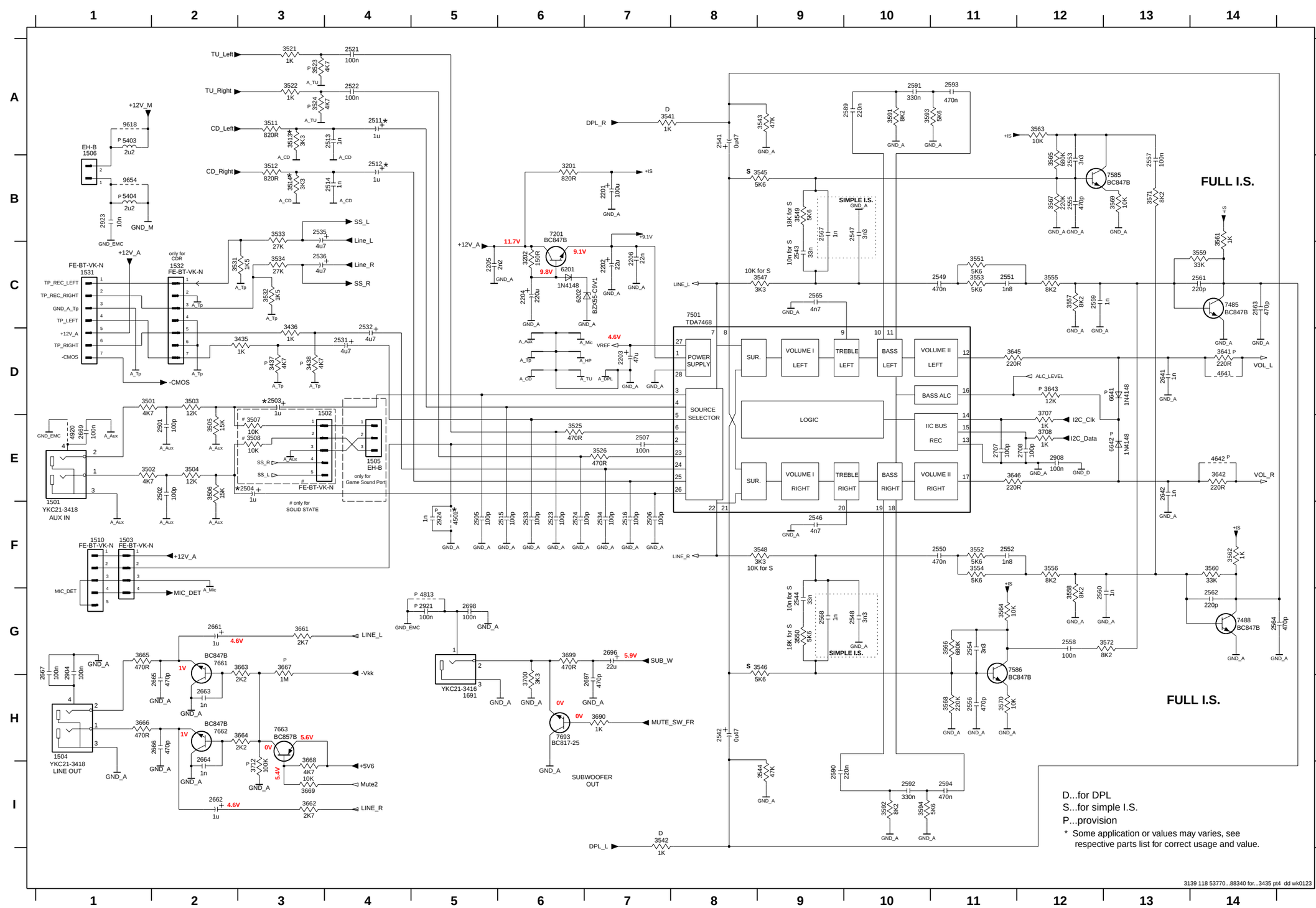
COMPONENT LAYOUT

1100	D6	1503	C6	1603	C6	2535	D5	2603	D4	2923	C6	3627	D5	6202	A3	9401	B4	9513	C2	9529	C2	9547	B2	9570	A3	9587	B4	9603	A6	9620	C6	9637	C5	9657	B1
1102	D6	1504	A1	1691	C1	2536	D3	2604	D5	3205	C6	3628	C5	6204	C6	9402	A4	9514	B2	9530	C2	9548	B2	9571	A3	9588	B4	9604	A6	9621	B2	9638	C5	9658	C5
1103	D6	1505	B1	1801	C1	2541	C3	2611	C5	3403	B6	3629	C6	6205	C6	9403	B6	9515	C2	9531	C2	9549	B4	9572	C2	9589	B4	9605	A6	9623	C6	9639	C5	9659	B2
1201	A3	1506	C6	2201	B2	2542	C3	2612	D5	3410	B4	3640	C6	6206	B6	9483	A5	9516	C2	9532	C2	9550	B2	9573	C2	9590	B4	9606	A6	9624	B1	9640	C5	9660	D2
1202	A3	1510	C6	2202	C2	2543	C3	2621	D2	3412	A4	3642	C4	6207	A4	9484	B5	9517	C2	9533	D3	9551	C2	9574	C2	9591	B5	9607	A6	9625	C6	9641	C5	9661	D3
1203	A3	1520	A5	2203	C2	2544	B3	2623	D4	3435	D6	3643	A1	6208	A4	9486	A2	9518	C2	9534	C1	9552	C1	9575	C2	9592	B5	9608	A6	9626	C5	9642	C4	9662	B5
1204	A3	1521	A5	2204	B3	2550	D3	2625	D5	3436	D6	3804	C1	6209	B6	9501	A3	9519	C1	9535	C3	9553	A2	9576	C2	9593	B5	9609	A6	9627	C5	9643	A6	9663	C1
1205	A3	1522	A5	2207	C6	2551	B3	2626	B5	3437	D5	3820	B6	6401	B4	9502	C2	9520	C1	9536	C3	9554	A2	9577	B2	9594	A5	9610	A6	9628	C5	9644	C4	9664	D6
1206	A3	1523	A5	2209	B6	2552	D2	2661	A1	3438	D6	3821	A4	6641	D4	9503	A1	9521	C1	9537	C3	9555	A2	9578	A4	9595	B5	9612	B4	9629	C5	9646	C4	9665	A1
1401	B6	1524	A5	2503	B1	2565	C3	2662	A1	3542	D4	5401	B6	6642	D4	9504	C3	9522	C2	9538	C3	9556	A2	9579	A6	9596	A5	9613	A6	9630	C5	9647	D2	9666	D6
1402	A6	1525	A5	2504	A1	2589	C4	2681	B5	3571	C2	5403	C6	6771	D3	9505	B2	9523	C2	9539	C3	9557	A2	9580	A4	9597	A6	9614	B6	9631	B3	9648	C2	9904	C6
1403	B6	1531	D6	2511	C4	2590	C3	2696	C1	3572	C2	5404	C5	6772	C5	9508	D5	9524	D2	9540	C3	9558	A2	9581	A4	9598	B5	9615	B6	9632	D5	9650	D4		
1404	A6	1532	C6	2512	B4	2591	C4	2771	D4	3581	C4	5621	D4	6774	B3	9509	B2	9525	D2	9541	C4	9559	A3	9582	A4	9599	B6	9616	B6	9633	C5	9651	A5		
1405	B6	1541	A6	2520	A2	2592	D3	2772	D4	3601	C5	5801	D1	6775	D3	9510	B2	9526	D2	9542	B3	9560	B3	9583	A5	9600	B6	9617	B6	9634	A4	9653	B4		
1501	B1	1542	A6	2531	D1	2593	C4	2803	D1	3602	D5	5802	C1	7202	A6	9511	B6	9527	D2	9543	B3	9566	A3	9584	A4	9601	B6	9618	C6	9635	C5	9654	C5		
1502	B1	1602	C6	2532	D2	2594	D3	2901	B6	3608	C5	6201	A3	7401	B4	9512	B3	9528	D1	9546	B3	9567	C4	9585	B4	9602	B6	9619	C6	9636	C5	9656	C4		



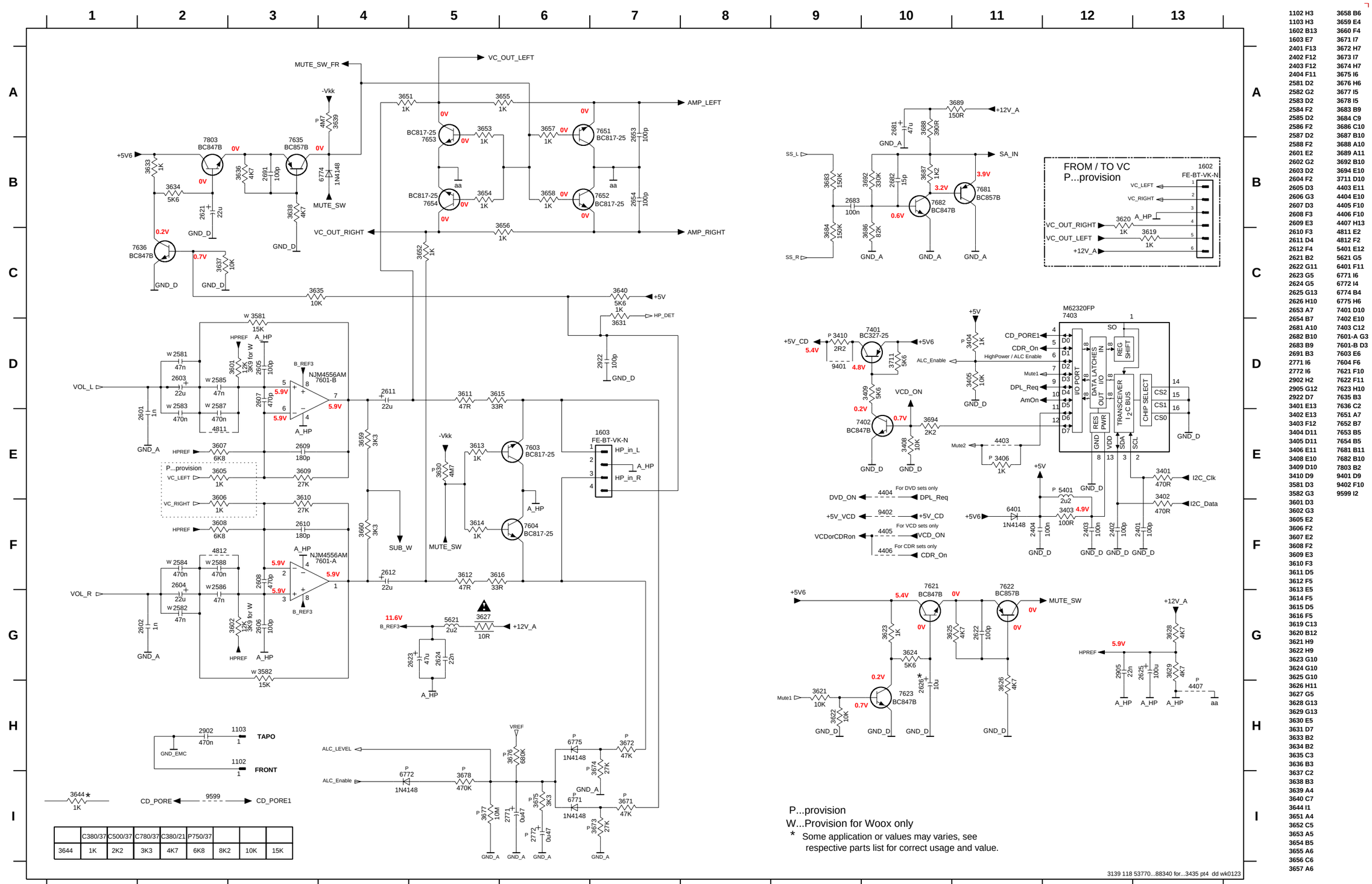
12-4

SOURCE SELECTION & SOUND PROCESSING CIRCUIT



12-5

HEADPHONE AMPLIFIER & I²C EXPANDER CIRCUIT



	C380/37	C500/37	C780/37	C380/21	P750/37			
3644	1K	2K2	3K3	4K7	6K8	8K2	10K	15K

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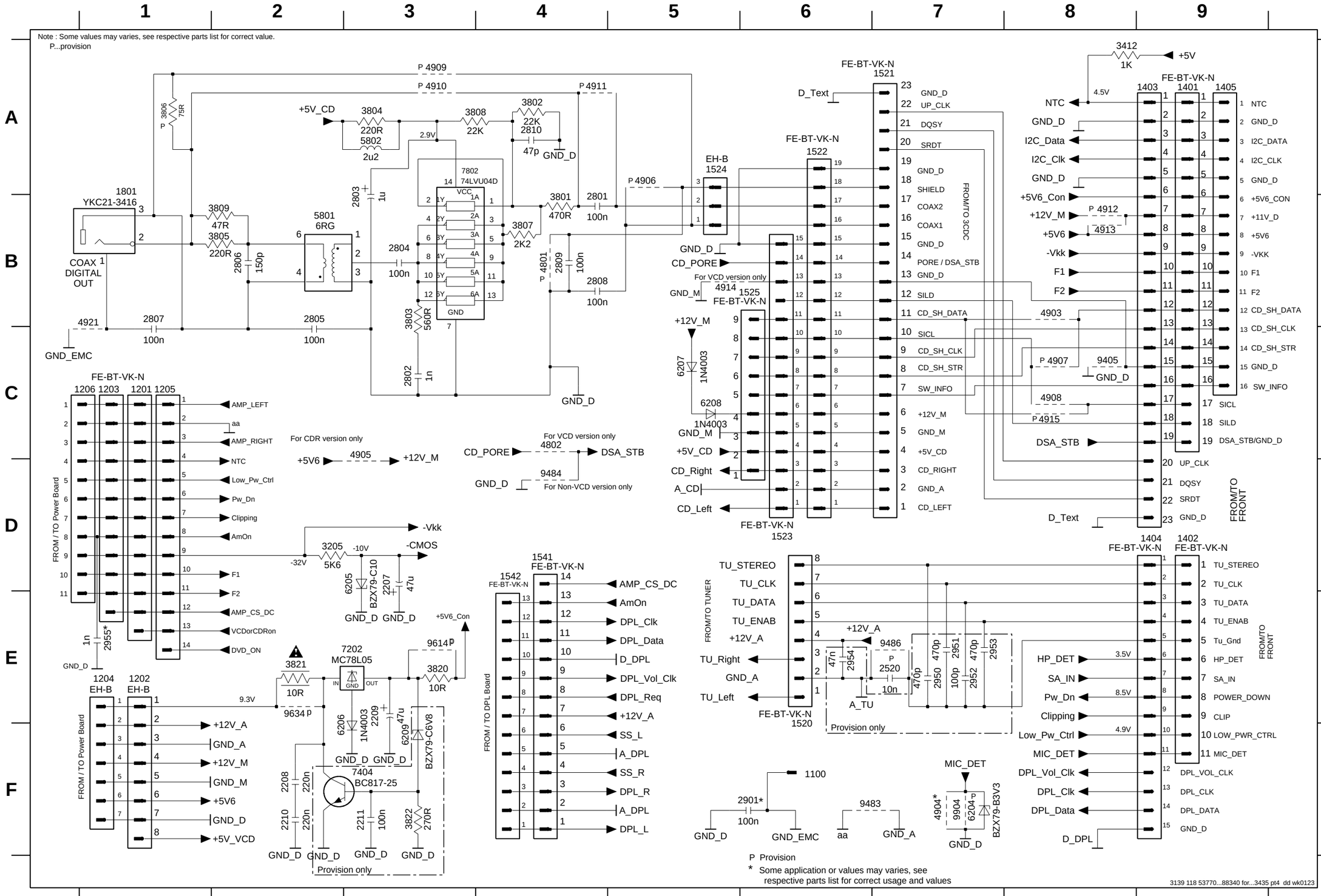
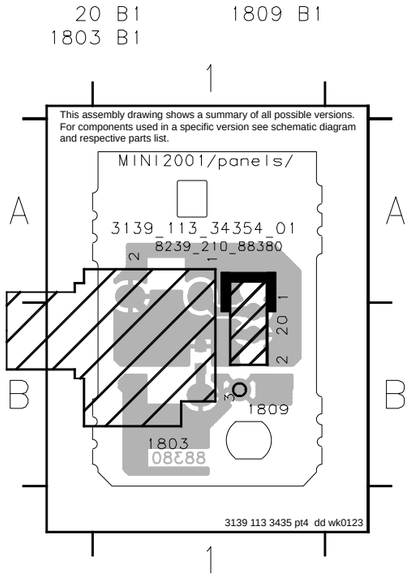
DIGITAL OUT & INTERCONNECTION CIRCUIT

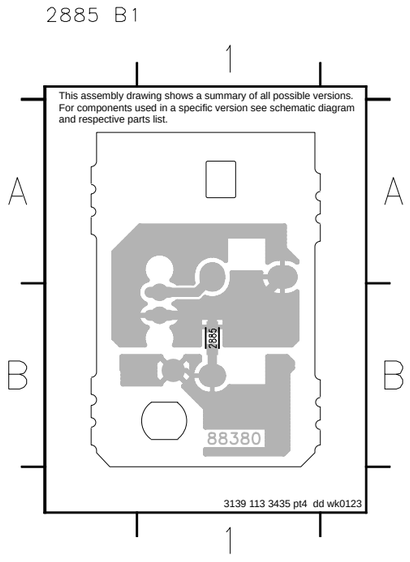
Note : Some values may varies, see respective parts list for correct value.
P...provision



P Provision
* Some application or values may varies, see respective parts list for correct usage and values

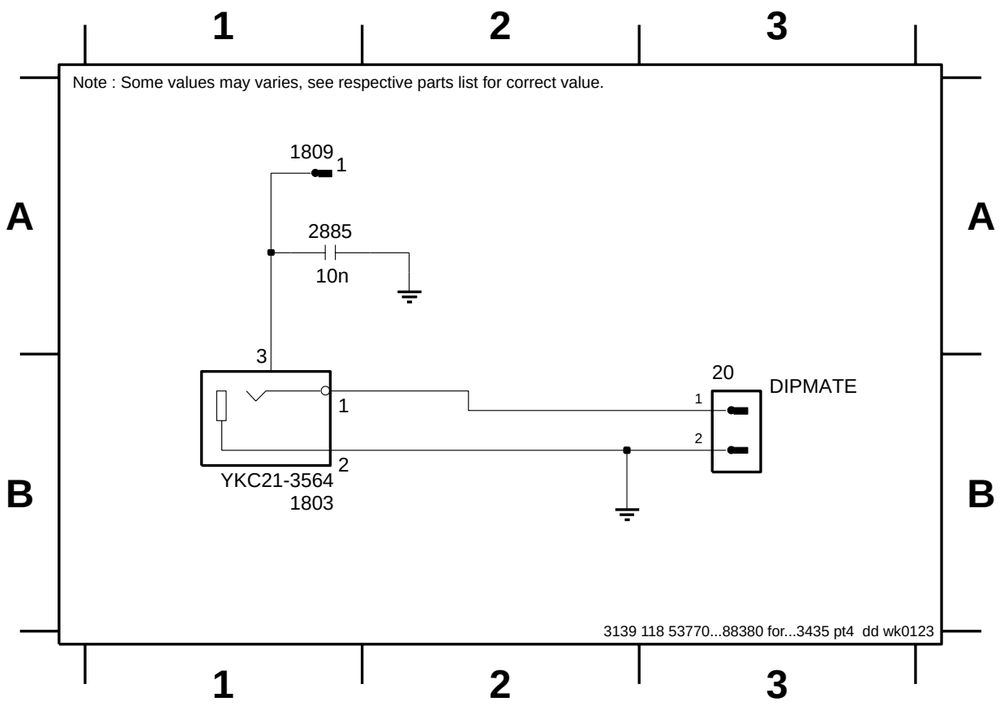
VIDEO OUT PART - COMPONENT & CHIP LAYOUTS





CIRCUIT DIAGRAM - VIDEO OUT PART

20 B3 1803 B1 1809 A1 2885 A1



ELECTRICAL PARTS LIST - AF9 BOARD

MISCELLANEOUS

1206	4822 267 11039	Flex Socket 11 Pin Vert.
1401	4822 265 11553	Flex Socket 19 Pin Vert.
1402	4822 267 11039	Flex Socket 11 Pin Vert.
1501	4822 265 20553	Cinch Socket 2P
1503	4822 267 10733	Flex Socket 4 Pin Vert. /21/21M
1520	4822 265 11515	Flex Socket 8 Pin Vert.
1523	4822 265 10981	Flex Socket 15 Pin Vert.
1531	4822 267 10953	Flex Socket 7 Pin Vert.
1603	4822 267 10733	Flex Socket 4 Pin Vert.

CAPACITORS

2201	4822 124 40207	100µF 20% 25V
2202	4822 124 81151	22µF 50V
2203	4822 124 40433	47µF 20% 25V
2204	4822 124 40196	220µF 20% 16V
2205	4822 126 14238	2,2nF 50V
2206	4822 126 14494	22nF 10% 25V
2207	4822 124 40433	47µF 20% 25V
2208	4822 126 13879	220nF +80/-20% 16V
2209	4822 124 41751	47µF 20% 50V
2210	4822 126 13879	220nF +80/-20% 16V
2401	4822 122 31765	100pF 2% 63V
2402	4822 122 31765	100pF 2% 63V
2403	4822 126 14305	100nF 10% 16V
2404	4822 126 14305	100nF 10% 16V
2501	4822 122 31765	100pF 2% 63V
2502	4822 122 31765	100pF 2% 63V
2503	4822 121 51252	470nF 5% 63V
2504	4822 121 51252	470nF 5% 63V
2505	4822 122 31765	100pF 2% 63V
2506	4822 122 31765	100pF 2% 63V
2507	4822 126 14305	100nF 10% 16V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	3198 016 31020	1nF 25V
2514	3198 016 31020	1nF 25V
2515	4822 122 31765	100pF 2% 63V
2516	4822 122 31765	100pF 2% 63V
2521	4822 126 14305	100nF 10% 16V
2522	4822 126 14305	100nF 10% 16V
2523	4822 122 31765	100pF 2% 63V
2524	4822 122 31765	100pF 2% 63V
2531	4822 124 40769	4,7µF 20% 100V
2532	4822 124 40769	4,7µF 20% 100V
2533	4822 122 31765	100pF 2% 63V
2534	4822 122 31765	100pF 2% 63V
2535	4822 124 40769	4,7µF 20% 100V
2536	4822 124 40769	4,7µF 20% 100V
2541	4822 124 41407	0,47µF 20% 63V
2542	4822 124 41407	0,47µF 20% 63V
2543	5322 126 11583	10nF 10% 50V
2544	5322 126 11583	10nF 10% 50V
2546	4822 121 43856	4,7nF 5% 250V
2547	5322 126 11579	3,3nF 10% 63V
2548	5322 126 11579	3,3nF 10% 63V
2565	4822 121 43856	4,7nF 5% 250V
2567	3198 016 31020	1nF 25V
2568	3198 016 31020	1nF 25V
2589	4822 121 42408	220nF 5% 63V
2590	4822 121 42408	220nF 5% 63V
2591	5322 121 42661	330nF 5% 63V
2592	5322 121 42661	330nF 5% 63V
2593	4822 121 51252	470nF 5% 63V
2594	4822 121 51252	470nF 5% 63V
2601	3198 016 31020	1nF 25V
2602	3198 016 31020	1nF 25V
2603	4822 124 81151	22µF 50V
2604	4822 124 81151	22µF 50V
2605	4822 122 31765	100pF 2% 63V
2606	4822 122 31765	100pF 2% 63V
2607	4822 126 13881	470pF 5% 50V
2608	4822 126 13881	470pF 5% 50V
2609	4822 126 14508	180pF 5% 50V
2610	4822 126 14508	180pF 5% 50V
2611	4822 124 81151	22µF 50V
2612	4822 124 81151	22µF 50V
2621	4822 124 81151	22µF 50V
2622	4822 122 31765	100pF 2% 63V
2623	4822 124 40433	47µF 20% 25V
2624	3198 017 42230	22nF 50V
2625	4822 124 40207	100µF 20% 25V
2626	4822 124 40769	4,7µF 20% 100V
2641	3198 016 31020	1nF 25V
2642	3198 016 31020	1nF 25V
2653	4822 122 31765	100pF 2% 63V
2654	4822 122 31765	100pF 2% 63V
2669	4822 126 14305	100nF 10% 16V
2681	4822 124 40433	47µF 20% 25V
2682	4822 122 33752	15pF 5% 50V
2683	4822 126 14305	100nF 10% 16V
2691	4822 122 31765	100pF 2% 63V
2707	4822 122 31765	100pF 2% 63V
2708	4822 122 31765	100pF 2% 63V
2771	4822 124 41407	0,47µF 20% 63V
2902	3198 017 44740	470nF 10V
2905	3198 017 42230	22nF 50V
2908	4822 126 14305	100nF 10% 16V
2922	4822 122 31765	100pF 2% 63V
2923	4822 121 51387	10nF 20% 16V

RESISTORS

3201	4822 117 12968	820R 5% 0,62W
3202	4822 051 30151	150R 5% 0,062W
3205	4822 116 52289	5k6 5% 0,5W

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ELECTRICAL PARTS LIST - AF9 BOARD

ELECTRICAL PARTS LIST - AF9 BOARD

RESISTORS

3401	4822 051 30471	470R 5% 0,062W
3402	4822 051 30471	470R 5% 0,062W
3403	4822 116 52175	100R 5% 0,5W
3405	4822 051 30103	10k 5% 0,062W
3408	4822 051 30103	10k 5% 0,062W
3409	4822 051 30562	5k6 5% 0,063W
3412	4822 050 11002	1k 1% 0,4W
3435	4822 050 11002	1k 1% 0,4W
3436	4822 050 11002	1k 1% 0,4W
3501	4822 051 30472	4k7 5% 0,062W
3502	4822 051 30472	4k7 5% 0,062W
3503	4822 051 30123	12k 5% 0,062W
3504	4822 051 30123	12k 5% 0,062W
3505	4822 051 30153	15k 5% 0,062W
3506	4822 051 30153	15k 5% 0,062W
3511	4822 117 12968	820R 5% 0,62W
3512	4822 117 12968	820R 5% 0,62W
3513	4822 117 12903	1k8 1% 0,063W
3514	4822 117 12903	1k8 1% 0,063W
3521	4822 051 30102	1k 5% 0,062W
3522	4822 051 30102	1k 5% 0,062W
3525	4822 051 30471	470R 5% 0,062W
3526	4822 051 30471	470R 5% 0,062W
3531	4822 051 30152	1k5 5% 0,062W
3532	4822 051 30152	1k5 5% 0,062W
3533	4822 051 30273	27k 5% 0,062W
3534	4822 051 30273	27k 5% 0,062W
3543	4822 117 12925	47k 1% 0,063W
3544	4822 117 12925	47k 1% 0,063W
3545	4822 051 30562	5k6 5% 0,063W
3546	4822 051 30562	5k6 5% 0,063W
3547	4822 051 30103	10k 5% 0,062W
3548	4822 051 30103	10k 5% 0,062W
3549	4822 051 30183	18k 5% 0,062W
3550	4822 051 30183	18k 5% 0,062W
3591	4822 117 12902	8k2 1% 0,063W
3592	4822 117 12902	8k2 1% 0,063W
3593	4822 051 30562	5k6 5% 0,063W
3594	4822 051 30562	5k6 5% 0,063W
3601	4822 116 52238	12k 5% 0,5W
3602	4822 116 52238	12k 5% 0,5W
3607	4822 051 30682	6k8 5% 0,062W
3608	4822 116 83961	6k8 5%
3609	4822 051 30273	27k 5% 0,062W
3610	4822 051 30273	27k 5% 0,062W
3611	4822 051 30479	47R 5% 0,062W
3612	4822 051 30479	47R 5% 0,062W
3613	4822 051 30102	1k 5% 0,062W
3614	4822 051 30102	1k 5% 0,062W
3615	4822 051 30339	33R 5% 0,062W
3616	4822 051 30339	33R 5% 0,062W
3621	4822 051 30103	10k 5% 0,062W
3622	4822 051 30103	10k 5% 0,062W
3623	4822 051 30102	1k 5% 0,062W
3624	4822 051 30562	5k6 5% 0,063W
3625	4822 051 30472	4k7 5% 0,062W
3626	4822 051 30472	4k7 5% 0,062W
3627	4822 052 10109 ⚠	10R 5% 0,33W
3628	4822 116 52283	4k7 5% 0,5W
3629	4822 051 30472	4k7 5% 0,062W
3631	4822 050 11002	1k 1% 0,4W
3633	4822 051 30102	1k 5% 0,062W
3634	4822 051 30562	5k6 5% 0,063W
3635	4822 051 30103	10k 5% 0,062W
3636	4822 051 30472	4k7 5% 0,062W
3637	4822 051 30103	10k 5% 0,062W
3638	4822 051 30472	4k7 5% 0,062W
3640	4822 116 52289	5k6 5% 0,5W
3644	4822 051 30102	1k 5% 0,062W
3645	4822 051 30221	220R 5% 0,062W
3646	4822 051 30221	220R 5% 0,062W
3651	4822 051 30102	1k 5% 0,062W
3652	4822 051 30102	1k 5% 0,062W
3653	4822 051 30102	1k 5% 0,062W
3654	4822 051 30102	1k 5% 0,062W
3655	4822 051 30102	1k 5% 0,062W
3656	4822 051 30102	1k 5% 0,062W
3657	4822 051 30102	1k 5% 0,062W
3658	4822 051 30102	1k 5% 0,062W
3683	4822 051 30154	150k 5% 0,062W
3684	4822 051 30154	150k 5% 0,062W
3686	4822 117 12864	82k 5% 0,6W
3687	4822 117 11817	1k2 1% 1/16W
3688	4822 051 30391	390R 5% 0,062W
3689	4822 051 30151	150R 5% 0,062W
3692	4822 051 30334	330k 5% 0,062W
3694	4822 051 30222	2k2 5% 0,062W
3707	4822 051 30102	1k 5% 0,062W
3708	4822 051 30102	1k 5% 0,062W
3711	4822 051 30562	5k6 5% 0,063W
3820	4822 116 52176	10R 5% 0,5W
3821	4822 052 10109 ⚠	10R 5% 0,33W
4100	4822 051 30008	0R Jumper 0603
4101	4822 051 30008	0R Jumper 0603
4104	4822 051 30008	0R Jumper 0603
4108	4822 051 30008	0R Jumper 0603
4110	4822 051 30008	0R Jumper 0603
4111	4822 051 30008	0R Jumper 0603
4112	4822 051 30008	0R Jumper 0603
4113	4822 051 30008	0R Jumper 0603
4114	4822 051 30008	0R Jumper 0603
4115	4822 051 30008	0R Jumper 0603
4116	4822 051 30008	0R Jumper 0603
4119	4822 051 30008	0R Jumper 0603
4122	4822 051 30008	0R Jumper 0603
4124	4822 051 30008	0R Jumper 0603
4125	4822 051 30008	0R Jumper 0603
4126	4822 051 30008	0R Jumper 0603
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4134	4822 051 30008	0R Jumper 0603
4135	4822 051 30008	0R Jumper 0603
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4139	4822 051 30008	0R Jumper 0603
4141	4822 051 30008	0R Jumper 0603
4142	4822 051 30008	0R Jumper 0603
4143	4822 051 30008	0R Jumper 0603
4144	4822 051 30008	0R Jumper 0603
4145	4822 051 30008	0R Jumper 0603
4146	4822 051 30008	0R Jumper 0603
4147	4822 051 30008	0R Jumper 0603
4148	4822 051 30008	0R Jumper 0603
4151	4822 051 30008	0R Jumper 0603
4152	4822 051 30008	0R Jumper 0603
4153	4822 051 30008	0R Jumper 0603
4501	4822 051 30008	0R Jumper 0603 /22/30/34/37
4641	4822 051 30008	0R Jumper 0603
4642	4822 051 30008	0R Jumper 0603
4811	4822 051 30008	0R Jumper 0603
4812	4822 051 30008	0R Jumper 0603
4903	4822 051 30008	0R Jumper 0603
4904	4822 051 30008	0R Jumper 0603 /22/30/34/37
4908	4822 051 30008	0R Jumper 0603
4913	4822 051 30008	0R Jumper 0603
4920	4822 051 30008	0R Jumper 0603

COILS & FILTERS

5621	4822 157 62552	Coil 2,2µH 5%

DIODES

6201	4822 130 30621	1N4148
6202	4822 130 30862	BZX79-B9V1
6205	4822 130 61219	BZX79-B10
6206	4822 130 31878	1N4003G
6207	4822 130 31878	1N4003G
6208	4822 130 31878	1N4003G
6401	4822 130 30621	1N4148
6774	4822 130 30621	1N4148

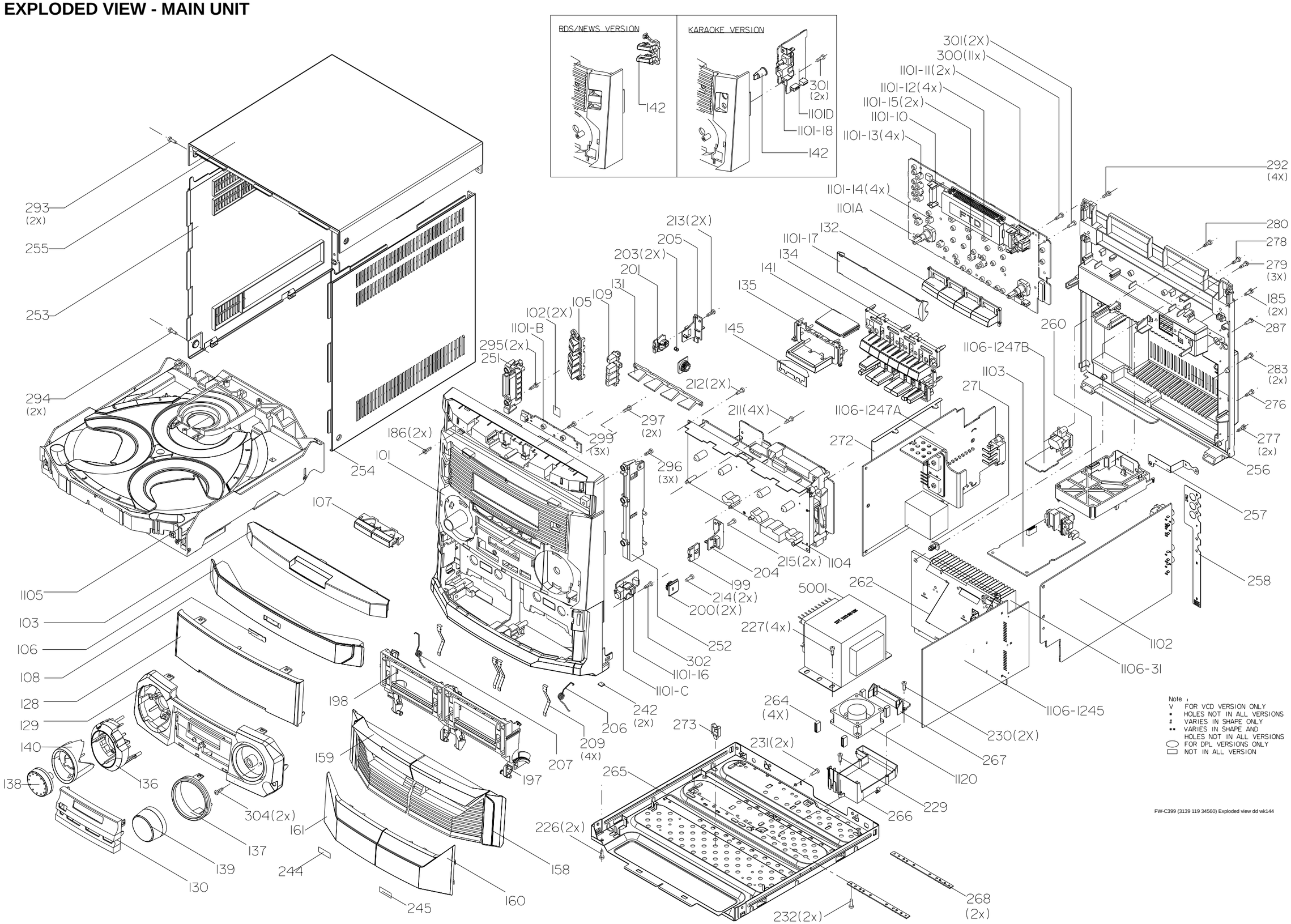
TRANSISTORS & INTEGRATED CIRCUITS

7201	4822 130 60511	BC847B
7202	4822 209 72042	L78L05ACZ
7401	4822 130 41246	BC327-25
7402	4822 130 60511	BC847B
7403	4822 209 17345	M62320FP
7501	9322 150 74668	TDA7468D
7601	4822 209 31378	NJM4556MB
7603	4822 130 42804	BC817-25
7604	4822 130 42804	BC817-25
7621	4822 130 60511	BC847B
7622	4822 130 60373	BC857B
7623	4822 130 60511	BC847B
7635	4822 130 60373	BC857B
7636	4822 130 60511	BC847B
7651	4822 130 42804	BC817-25
7652	4822 130 42804	BC817-25
7653	4822 130 42804	BC817-25
7654	4822 130 42804	BC817-25
7681	4822 130 60373	BC857B
7682	4822 130 60511	BC847B
7803	4822 130 60511	BC847B

Note: Only the parts mentioned in this list are normal service spare parts.

13-1

EXPLODED VIEW - MAIN UNIT



13-2

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

101	3139 118 16480	Cabinet Front /21/21M	254	3139 114 74790		Panel Right Grey V2 /37
101	3139 118 16580	Cabinet Front /22	255	3139 114 73590		Cover Top Grey /21/21M/22
101	3139 118 16100	Cabinet Front /37	255	3139 114 74800		Cover Top Grey V2 /37
103	3139 118 16110	Cover Front CDC	256	3139 114 73140		Panel Rear /21
105	3139 118 16500	Button Set CDC LPS	256	3139 114 73880		Panel Rear /21M/22
106	3139 118 16130	Cover Tray CDC	256	3139 114 74850		Panel Rear V2 /37
107	3139 118 16140	Button Set Open/Close	271	3139 114 71010		Stopper Heat sink
108	4822 454 13408	Badge Philips	350	3139 118 79070		Loudspeaker Box /21/21M/22
128	3139 118 16490	Window Display /21/21M	350	3139 118 79080		Loudspeaker Box /37
128	3139 118 16590	Window Display /22	351	4822 303 50063		FM Antenna /21/21M/22
128	3139 118 16150	Window Display /37	351	4822 320 11094		FM Antenna /37
129	3139 118 16160	Cover Front Display	356	3139 228 89680		Remote Control RC282432/01
130	3139 118 16170	Cover Front Ornamental	384	2422 549 45067		AM Loop Antenna
131	3139 114 71350	Light guide Source Select	385	2422 070 98151	⚠	Mains Cord /21/21M/22
132	3139 118 16180	Button Set Source	385	2422 070 98152	⚠	Mains Cord /37
134	3139 118 16190	Button Set Control & VCD	386	4822 263 21092	⚠	Adapter Plug /21
135	3139 118 16200	Button Max	387	3139 115 21120		Instruction For Use /21/21M
136	3139 118 16210	Button DSC/DBB/VEC/IS	387	3139 115 21220		Instruction For Use /22
137	3139 118 16220	Ring Volume	387	3139 115 21070		Instruction For Use /37
138	3139 118 16230	Knob Rotary	1120	4822 361 11161		Fan KD1206PTS3
139	3139 118 13190	Knob Volume	1200	3139 110 35010		Flex Cable 7 Pin 34cm AD
140	3139 114 71330	Light guide DSC/DBB/VEC/IS	1300	3139 110 35350		Flex Cable 11 Pin 22cm AD
142	3139 114 74610	Knob Karaoke /21/21M	1400	3139 110 35110		Flex Cable 4 Pin 22cm AD
142	3139 118 16600	Button Set RDS/News /22	1401	4822 320 12703		Flex Cable 7 Pin 14cm BD
158	3139 118 16250	Cover Cassette Right	1402	3139 110 35100		Flex Cable 19 Pin 14cm AD
159	3139 118 16260	Cover Cassette Left	1403	3139 110 34610		Flex Cable 11 Pin 18cm AD
160	3139 118 13900	Lens Cassette Right	1500	3139 110 33960		Flex Cable 4 Pin 12cm BD
161	3139 118 13890	Lens Cassette Left	1501	3139 110 33960		Flex Cable 4 Pin 12cm BD /21/21M
197	3139 114 68630	Door Cassette Right ETF				
198	3139 114 68620	Door Cassette Left ETF	1600	3139 110 35050		Flex Cable 8 Pin 22cm AD
199	4822 402 10621	Push-Catch	1700	4822 320 12752		Flex Cable 7 Pin 18cm AD
200	4822 529 10322	Damper Assembly	1800	3139 110 35880		Flex Cable 15 Pin 18cm BD
201	3139 114 68640	Push Catch Left	5001	3103 308 30700	⚠	Mains Transformer /21/21M
203	4822 492 11344	Spring Compression	5001	3103 308 30690	⚠	Mains Transformer /22
204	4822 402 11246	Bracket Right	5001	3103 308 30680	⚠	Mains Transformer /37
205	4822 402 11245	Bracket Left				
206	3139 111 01380	Spring Torsion Right				
207	3139 111 01390	Spring Torsion Left				
209	4822 492 42787	Spring Cassette				
242	4822 462 40683	Foot Rubber (SQ)				
251	3139 114 70970	Bracket CDC Left				
252	3139 114 70980	Bracket CDC Right				
253	3139 114 73570	Panel Left Grey /21/21M/22				
253	3139 114 74780	Panel Left Grey V2 /37				
254	3139 114 73580	Panel Right Grey /21/21M/22				

Note: Only the parts mentioned in this list are normal service spare parts.

SCREW LISTS - MAIN UNIT

185	D3 x 12
186	D3 x 12
211	D3 x 12
212	D3 x 12
213	D3 x 12
214	D3 x 12
215	D3 x 12
226	M3 x 6
227	M3 x 10
229	M3 x 10
230	D3 x 10
231	M3 x 10
232	M3 x 6
276	M3 x 6
277	M3 x 10
278	D3 x 16
279	D3 x 12
280	D3 x 12
283	D3 x 12
287	D3 x 12
292	D3 x 12
293	D3 x 12
294	M3 x 10
295	D3 x 12
296	D3 x 12
297	D3 x 12
299	D3 x 12
300	D3 x 12
301	D3 x 12
302	D3 x 12
304	D3 x 12