

Service  
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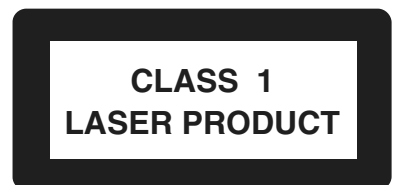


# Service Manual



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3139 785 30028

Version 1.0



# PHILIPS



**SPECIFICATIONS****GENERAL:**

Mains voltage : 110-127V/220-240V Switchable for /21  
220-230V for /22/34  
Mains frequency : 50/60Hz  
Power consumption : < 70W Active  
< 15W at Standby with Clock on  
< 0.5W at ECO Standby /22  
Clock accuracy : < 4 seconds per day  
Dimension centre unit : 265 x 310 x 365mm

**TUNER:****FM**

Tuning range : 87.5-108MHz  
Grid : 50kHz  
100kHz for /21  
IF frequency : 10.7MHz  $\pm$  20kHz  
Aerial input : 75 $\Omega$  coaxial  
Sensitivity at 26dB S/N : < 7 $\mu$ V  
Selectivity at 600kHz bandwidth : > 25dB  
IF rejection : > 60dB [80dB]  
Image rejection : > 25dB [75dB]  
Distortion at RF=1mV, dev. 75kHz : < 3%  
-3dB Limiting point : < 8 $\mu$ V  
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

**MW**

Tuning range : 531-1602kHz  
530-1700kHz for /21  
Grid : 9kHz  
10kHz for /21  
IF frequency : 450kHz  $\pm$  1kHz  
Aerial input : Frame aerial  
Sensitivity at 26dB S/N : < 4.4mV/M [4.0mV/M]  
Selectivity at 18kHz bandwidth : > 18dB  
IF rejection : > 45dB  
Image rejection : > 28dB  
Distortion at RF=50mV, m=80% : < 5%

**AMPLIFIER:**

Output power : 2 x 40W <sup>1)</sup> RMS  
Frequency response within -3dB : 50Hz-15kHz  
Dynamic Bass Boost : DBB ON, DBB 1, DBB 2, DBB 3 <sup>3)</sup>  
Digital Sound Control : Jazz, Techno, Optimal, Rock <sup>3)</sup>  
Headphone output, R<sub>LOAD</sub> = 32 $\Omega$  : 15mW  $\pm$  2dB  
Input sensitivity, R<sub>S</sub> = 600 $\Omega$   
Aux / CDR : 500mV / 1.0V  
Mic : {3.5mV}

**CASSETTE RECORDER:**

Number of track : 2 x 2 stereo  
Tape speed : 4.76 cm/sec +2.5/-1.5%  
Wow and flutter : < 0.4% DIN  
Fast-wind/rewind time C60 : 130 sec  
Bias system : 78kHz  $\pm$  10kHz  
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz  
Signal to noise ratio Type I : > 48dBA

**COMPACT DISC:**

Measurement done at output conn. of the CDC module.  
Frequency response within  $\pm$  1.5dB: 20Hz - 20kHz  
Output level (in Vrms) : 500mV  $\pm$  1dB, R<sub>out</sub> = 100 $\Omega$   
Signal/Noise ratio (A-weighted) : > 80dBA  
Distortion at 1kHz : < 0.003%  
Channel unbalance at 1kHz :  $\pm$ 1dB  
Channel separation at 1kHz : > 60dB  
De-emphasis : 0 or 15/50 mS (Switched by subcode  
on the disc)

{...} Values for /21/21M only

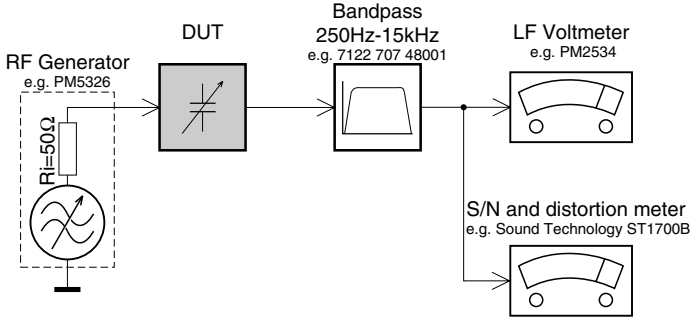
[...] Values for Genelec Tuner only

<sup>1)</sup> 6 $\Omega$ , 1kHz, 10% THD

<sup>2)</sup> Frequency response in each setting is software controlled.

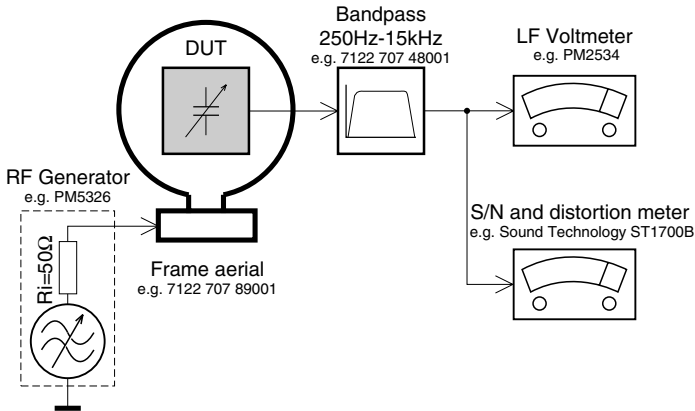
# MEASUREMENT SETUP

## Tuner FM



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

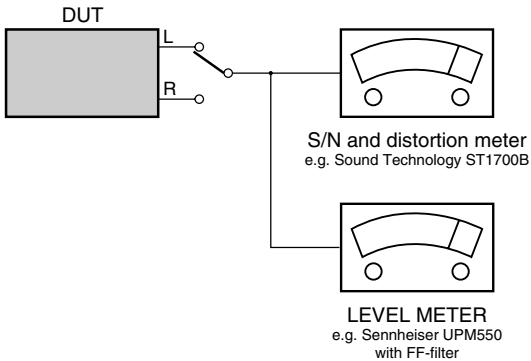
## Tuner AM (MW,LW)



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).

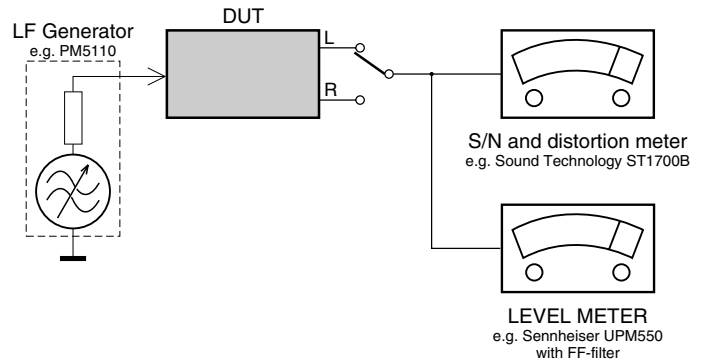
## CD

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

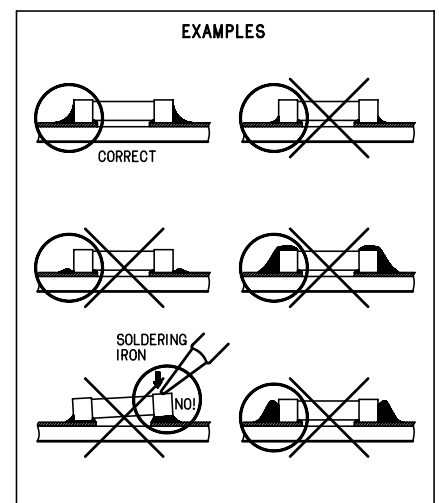
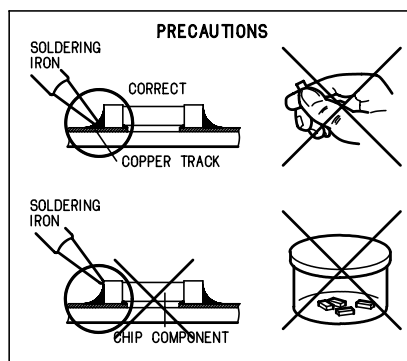
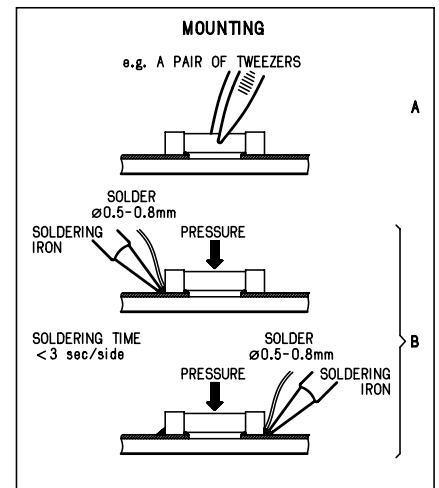
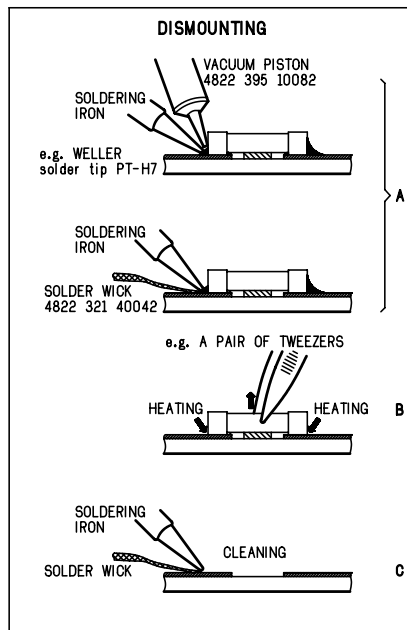
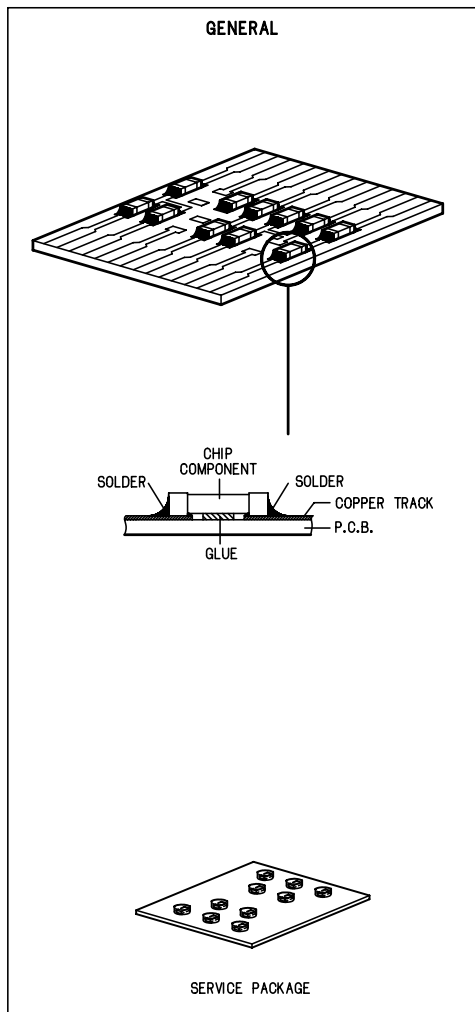
### Compact Disc:

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 (1M $\Omega$ ) .....	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



**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

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

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez 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).

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

**(I) AVVERTIMENTO**

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridotta 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.

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

**(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 utilisés les pièces de rechange identiques à celles spécifiées.

**(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 alltiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

**(D)**

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

**(DK) Advarse !**

Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålning.

**(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."

## DISMANTLING INSTRUCTIONS

### Dismantling the 3CDC Module

- 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 2 until the CDC tray starts to move out of the Front Cabinet (pos 101). The CDC tray is now disengage and can be pulled out completely.

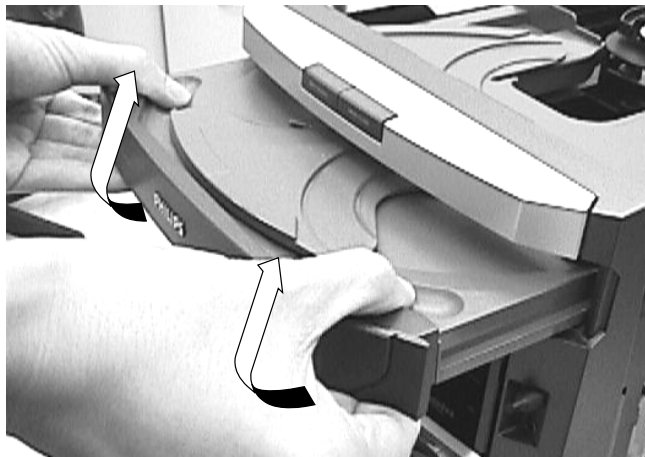


Figure 1

- 4) Remove the Cover Tray (pos 106) as shown in figure 1.
- 5) Loosen 4 screws A to remove the CDC Module (pos 1104) as shown in figure 2.

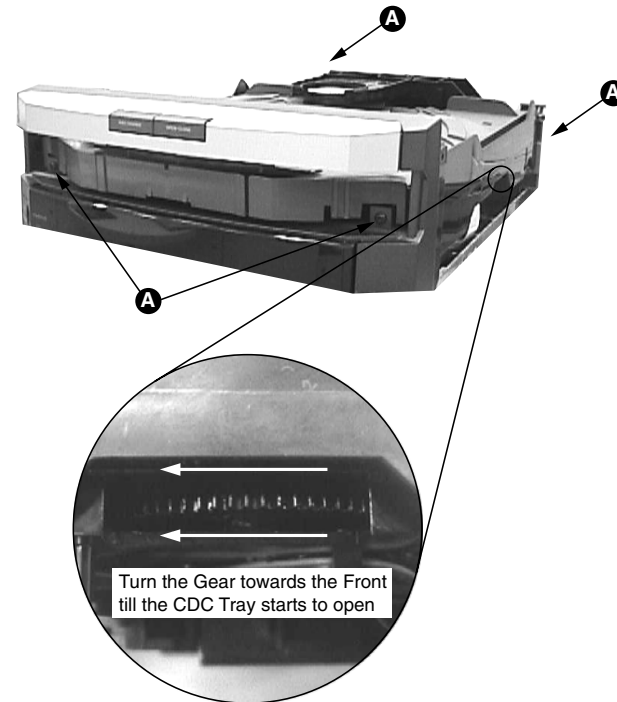


Figure 2

### Dismantling of the Volume & Jog Rotary knobs

- 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 3.
- 2) Place a small screw driver in between the tape & knob (see figure 3) to give more leverage in pulling out the knob as shown in figure 4.
- 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.



Figure 3

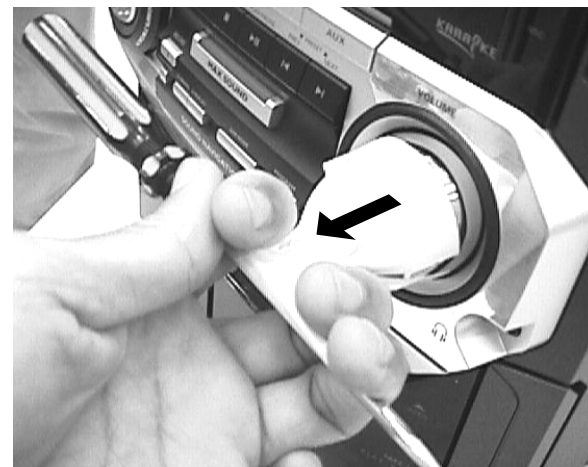


Figure 4

### Dismantling of the Front Panel assembly

- 1) Loosen 2 screws below the Front Panel (pos 101) mounting it to the Bottom plate (pos 265).
- 2) Release the 2 catches on the sides of the Front Panel to separate it from the Bottom plate.
- 3) Remove the Volume and Jog Rotary knob if the Front board needs to be dismantled. For Karaoke versions, the Karaoke knob (pos 133) also need to be removed.
- 4) Loosen 8 screws B to remove the Front board as shown in Figure 5.
- 5) Loosen 6 screws C and eject both cassette doors to remove the Tape mechanism (pos 1103) as shown in figure 6.

**Note: The Cassette door can be removed only after the removal of the Tape mechanism and buttons.**

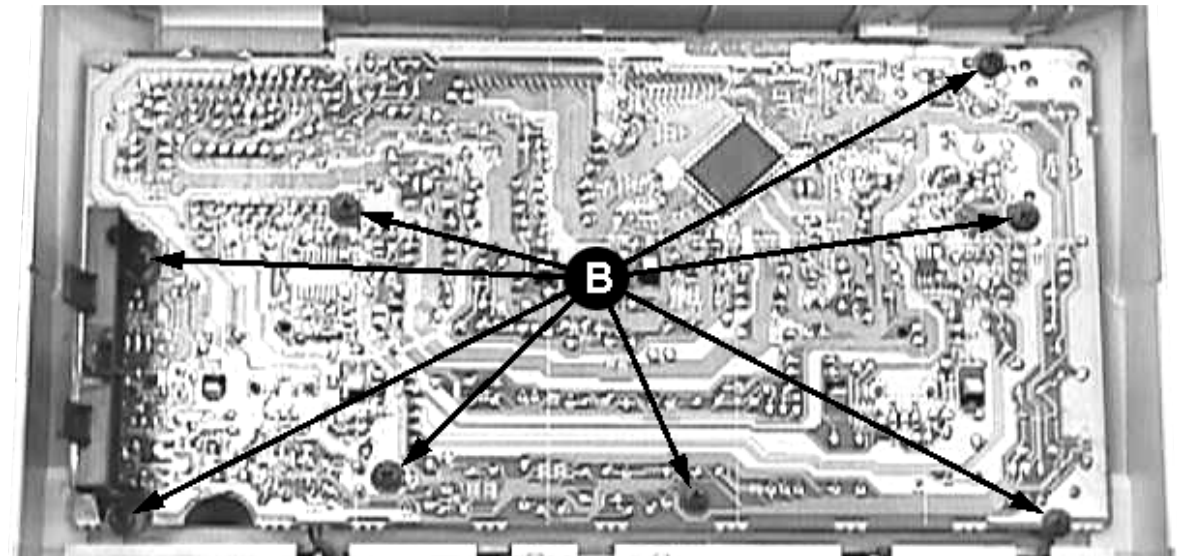


Figure 5

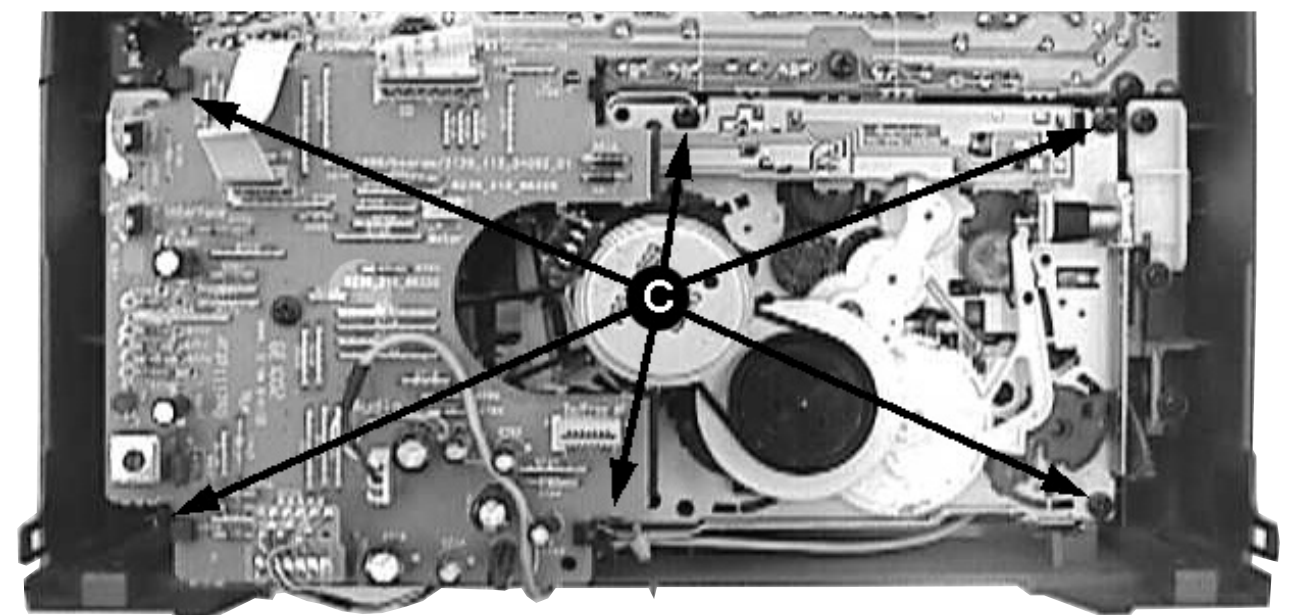


Figure 6

### Dismantling of the Bottom & Rear Panel assembly

- 1) Loosen 5 screws D mounting the Combi board to the Rear Panel (pos 256) as shown in figure 7.
- 2) Loosen 3 screws E and release the 2 catches on the sides of the Rear Panel to separate it from the Bottom plate (pos 265).
- 3) Loosen 4 screws G to remove the Mains Transformer as shown in figure 8.
- 4) Loosen 2 screws F to remove the Combi Board.

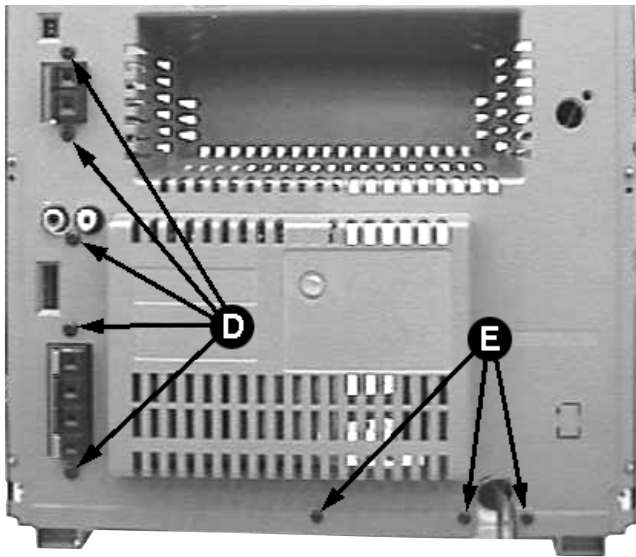
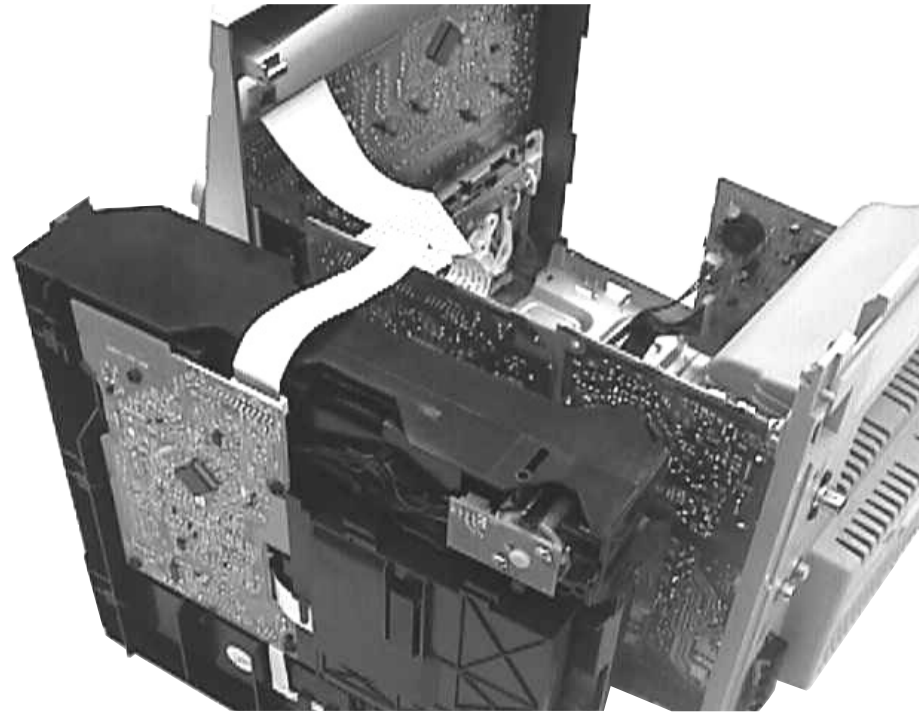


Figure 7

Service pos A



Service pos C

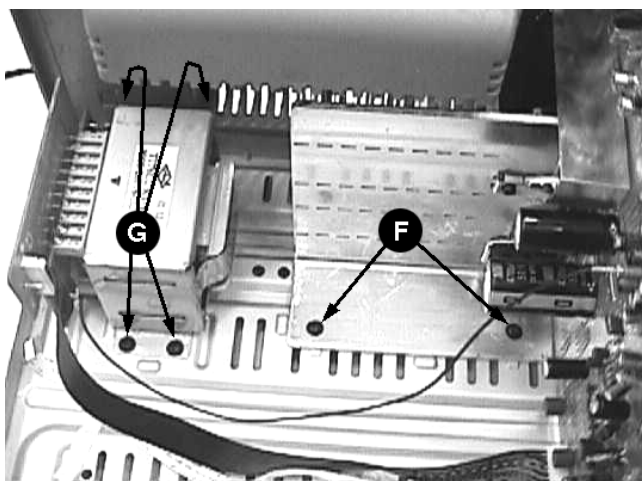
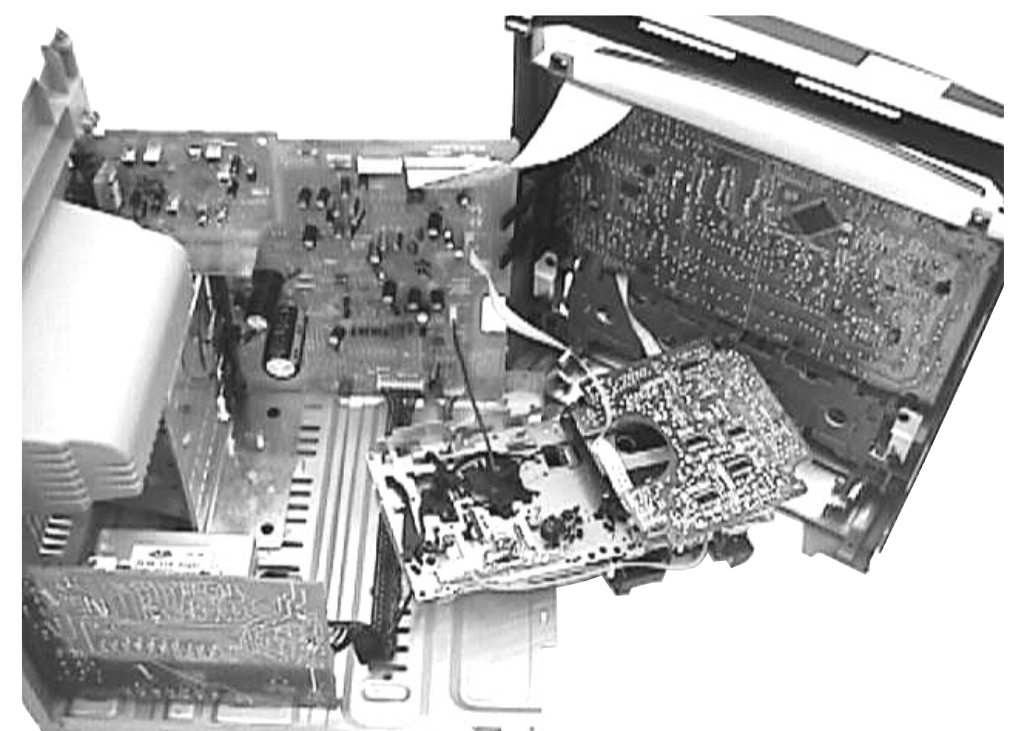
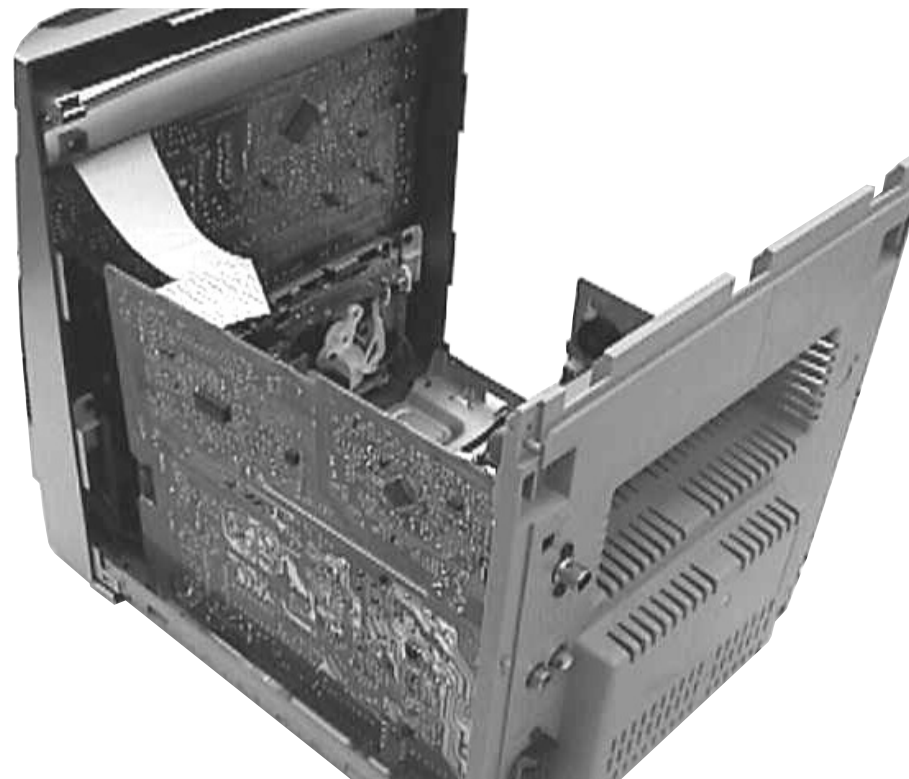


Figure 8

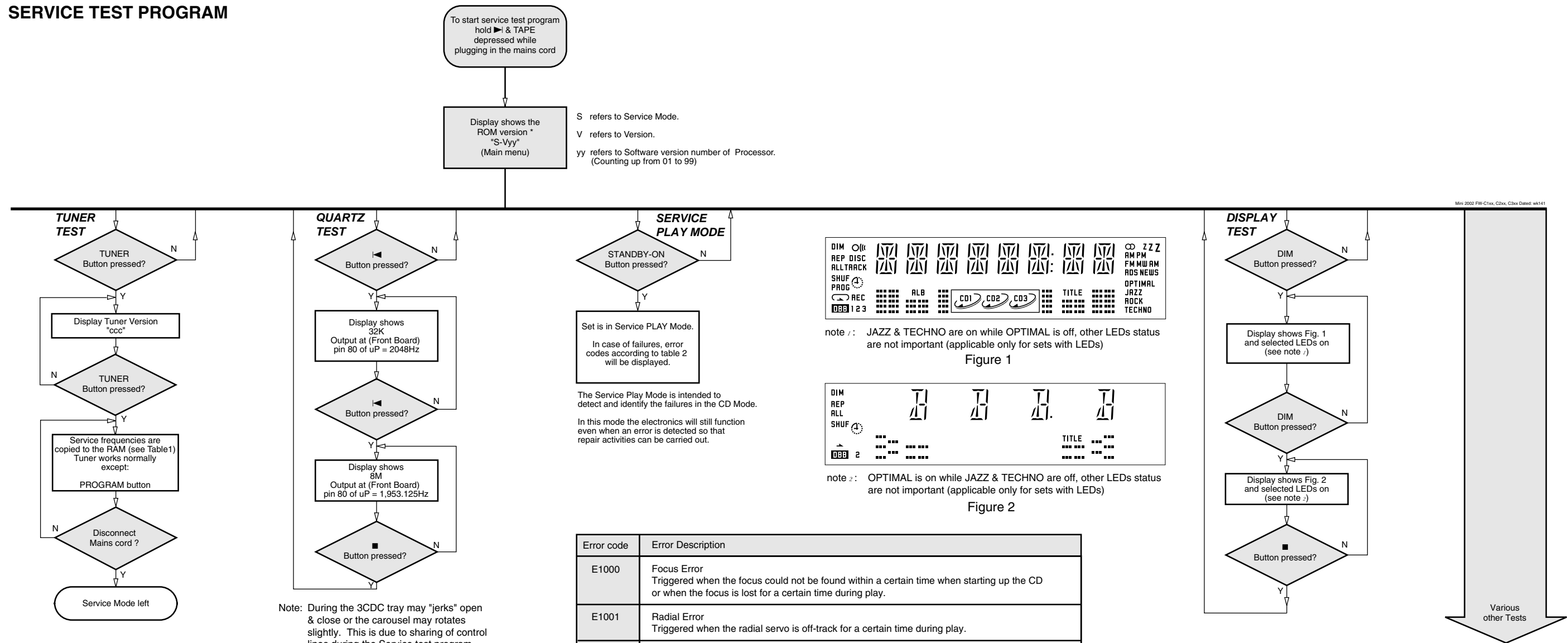
Service pos B



Note: After re-assembly, it is very important to ensure all wires are routed properly to ensure that they do not touch/obstruct all moving parts.

The 3CDC Module can be complete detached while repairing the other portion of the set.

# SERVICE TEST PROGRAM



Note: During the 3CDC tray may "jerk" open & close or the carousel may rotate slightly. This is due to sharing of control lines during the 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	87.5MHz	558kHz	87.5MHz	98MHz	98/87.5MHz*
8	87.5MHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	87.5MHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	87.5MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	98MHz	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 <TUNER> 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.

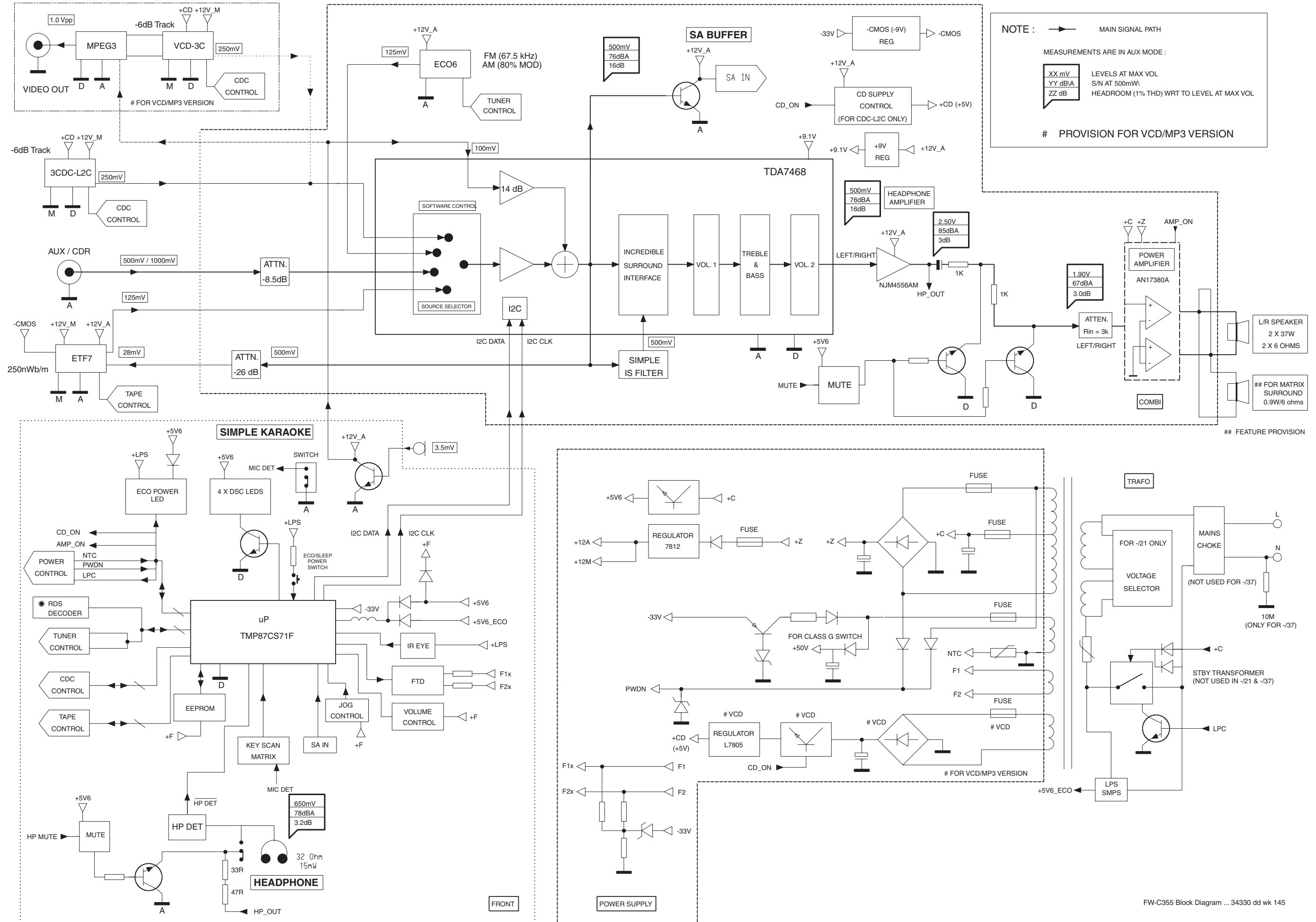
Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge 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

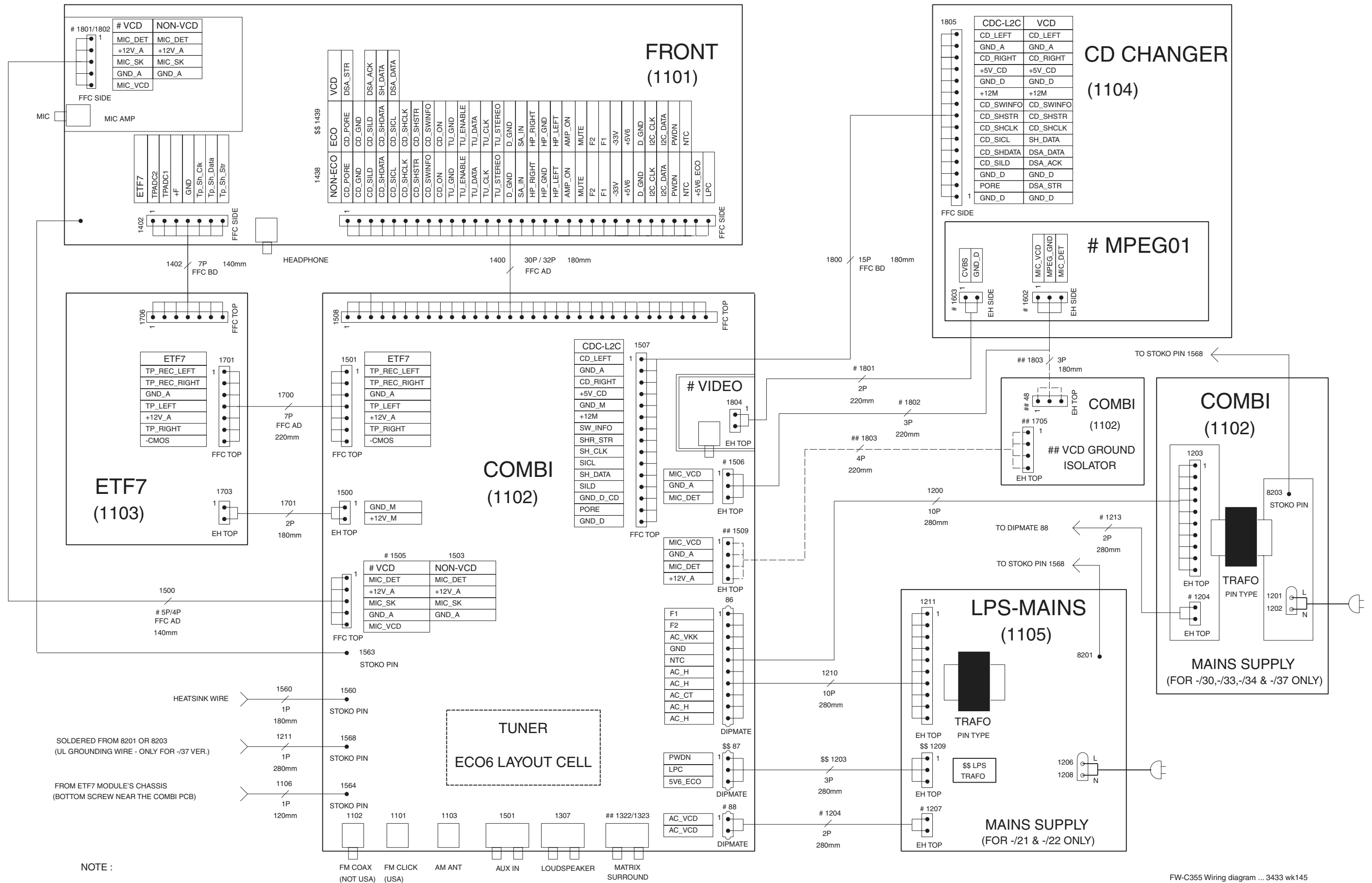
TEST	Activated with	ACTION
EEPROM TEST	<TUNER><TUNER>	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	<TUNER><TUNER>	Load default data. Display shows "NEW" for 1 second. <b>Caution!</b> <b>All presets from the customer will be lost!!</b>
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.
DEMO	DBB	DEMO will toggle on or off. The message: "DEMO ON" or "DEMO OFF" will scroll across the display to show the new status of the set.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	



# SET BLOCK DIAGRAM



# SET WIRING DIAGRAM







## Front Board application

A55470	FW-C355/21/33
A55480	FW-C355/22
A55490	FW-V355/21M
A55500	FW-C355/34
A55520	FW-M355/22
A55530	FW-M355/34
A55540	FW-M355/37

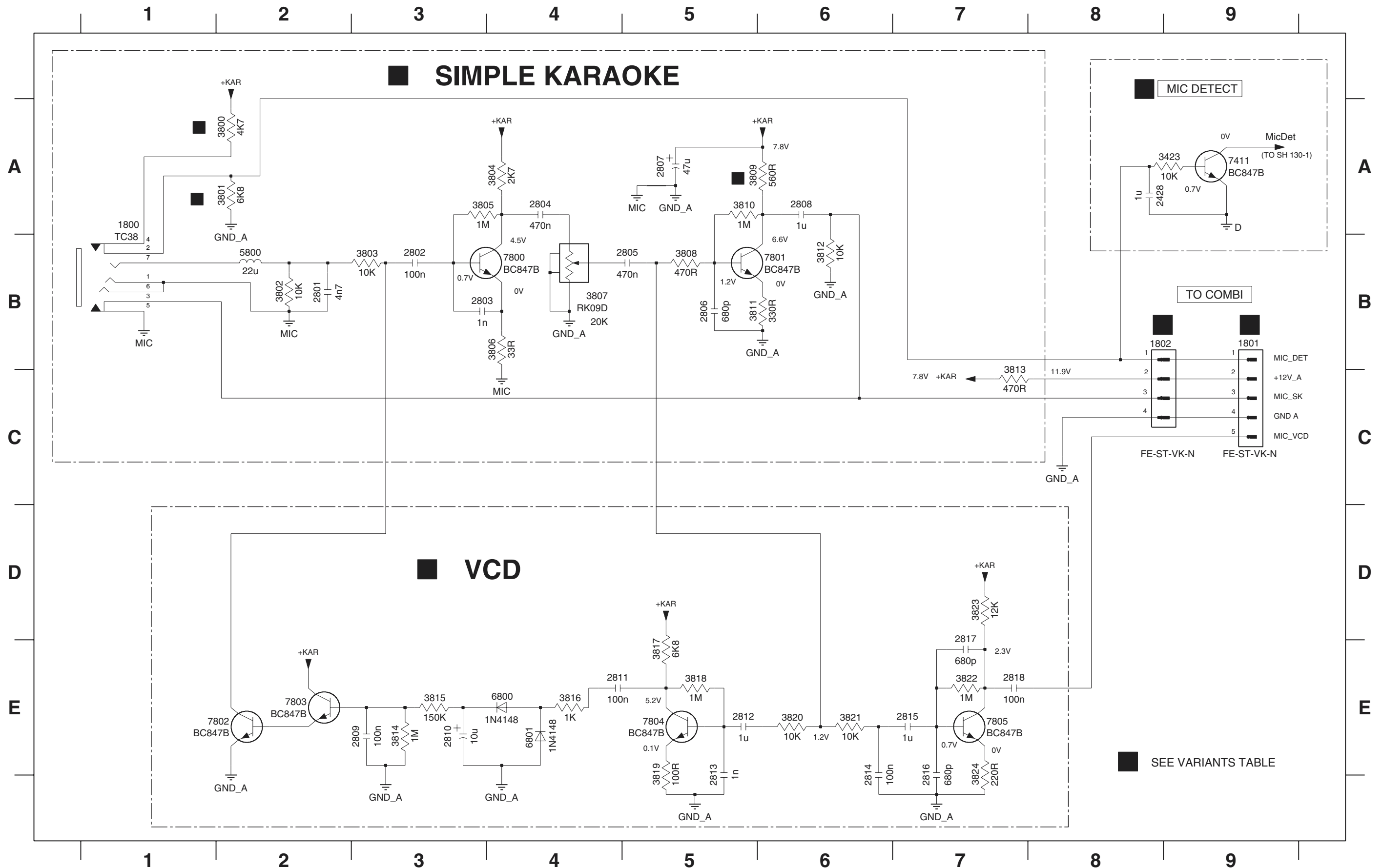
FEATURES:	A55470	A55480	A55490	A55500	A55520	A55530	A55540			
Karaoke / Mic Detect	x	-	x	-	-	-	-			
VCD	-	-	x	-	-	-	-			
RDS	-	x	-	x	x	x	-			
ECO Power LED	-	x	-	-	x	-	-			

ITEM NO.	A55470	A55480	A55490	A55500	A55520	A55530	A55540	Functions
1427	-	x	x	x	x	x	-	REC
1428	REC	AUTO	AUTO	AUTO	AUTO	AUTO	REC	
1432	AUTO	RDS	PBC	RDS	RDS	RDS	AUTO	
1433	-	NEWS	RETURN	NEWS	NEWS	NEWS	-	
1438	-	x	-	-	x	-	-	with LPC
1439	x	-	x	x	-	x	x	without LPC
1801	-	-	x	-	-	-	-	VCD & KARAOKE
1802	x	-	-	-	-	-	-	KARAOKE
3529	-	330R	330R	330R	330R	330R	-	P01
3546	10k	-	10k	-	-	-	10k	RDSClk
3548	10k	-	10k	-	-	-	10k	RDS DAT
3549	10k	-	10k	10k	-	10k	10k	RESET
3565	4R7	2R2	4R7	2R2	2R2	2R2	2R2	FTD Filament
3566	-	2R2	-	2R2	2R2	2R2	2R2	FTD Filament
3567	4R7	2R2	4R7	2R2	2R2	2R2	2R2	FTD Filament
3568	-	2R2	-	2R2	2R2	2R2	2R2	FTD Filament
3569	10k	-	10k	10k	-	10k	10k	LPC
3570	-	100k	-	-	100k	-	-	RESET
3800	4k7	-	1k	-	-	-	-	KARAOKE
3801	6k8	-	1k2	-	-	-	-	KARAOKE
3809	560R	-	680R	-	-	-	-	KARAOKE
4408	x	x	-	x	-	-	-	CDSICL
4409	x	-	x	x	-	x	x	+5V6
4410	-	-	x	-	x	x	x	SH_DATA
4411	-	x	-	x	x	x	x	HP_GND
4414	x	-	x	x	-	x	x	DLPC
4416	x	-	-	-	-	x	x	# AUTO
4417	-	x	x	x	x	x	-	AUTO
4419	x	-	x	x	-	x	x	RESET
4459	-	x	-	-	x	-	-	+5V6_ECO
4490	x	-	x	x	-	x	x	+5V6
4491	x	-	-	-	-	-	x	# REC
6401	-	x	-	-	x	-	-	+5V6_ECO
6417	-	x	x	x	x	-	-	P01
6429	x	-	x	-	-	-	-	KARAOKE
6430	-	x	-	-	x	-	-	ECO Power
9401	x	-	x	-	-	-	-	FTD Filament
9402	x	-	x	-	-	-	-	FTD Filament
9410	-	-	x	-	x	x	x	DSA_DATA
9411	-	x	-	-	x	-	-	+LPS
9416	x	x	-	x	-	-	-	CDSHDATA
9488	-	x	-	-	x	-	-	LPC
9506	-	x	-	-	x	-	-	+5V6_ECO
9514	-	x	-	-	x	-	-	+5V6_ECO

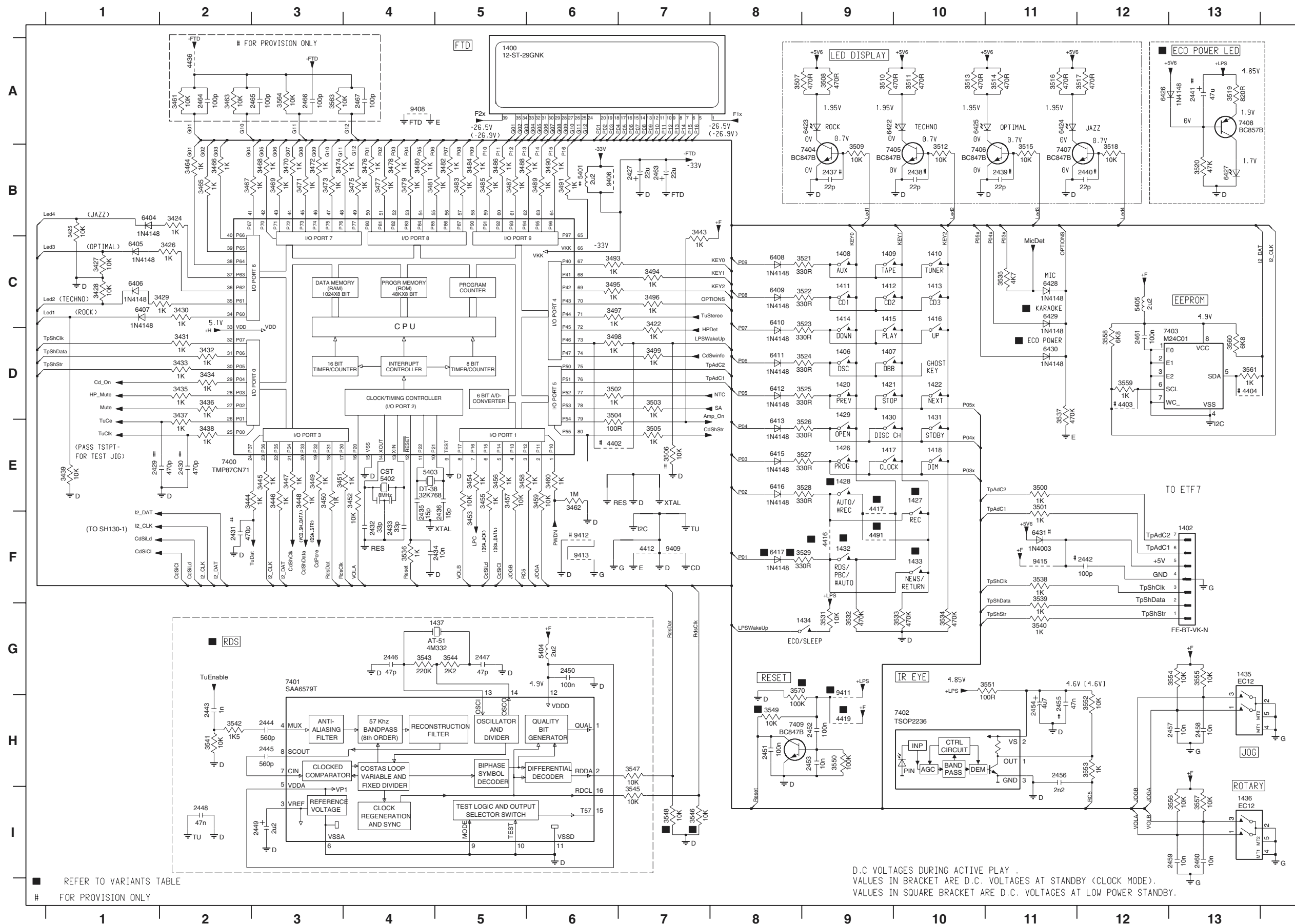
x = Item in use.

# CIRCUIT DIAGRAM - KARAOKE PART

1800 A1	2428 A8	2803 B3	2806 B5	2809 E3	2812 E5	2815 E7	2818 E7	3801 A2	3804 A4	3807 B4	3810 A5	3813 C7	3816 E4	3819 E5	3822 E7	5800 B2	7411 A9	7802 E2	7805 E7
1801 B9	2801 B2	2804 A4	2807 A5	2810 E3	2813 E5	2816 E7	3423 A9	3802 B2	3805 A3	3808 B5	3811 B5	3814 E3	3817 E5	3820 E6	3823 D7	6800 E4	7800 B4	7803 E2	
1802 B8	2802 B3	2805 B5	2808 A6	2811 E4	2814 E6	2817 E7	3800 A2	3803 B3	3806 B4	3809 A5	3812 B6	3815 E3	3818 E5	3821 E6	3824 E7	6801 E4	7801 B6	7804 E5	



# CIRCUIT DIAGRAM - MICROPROCESSOR PART



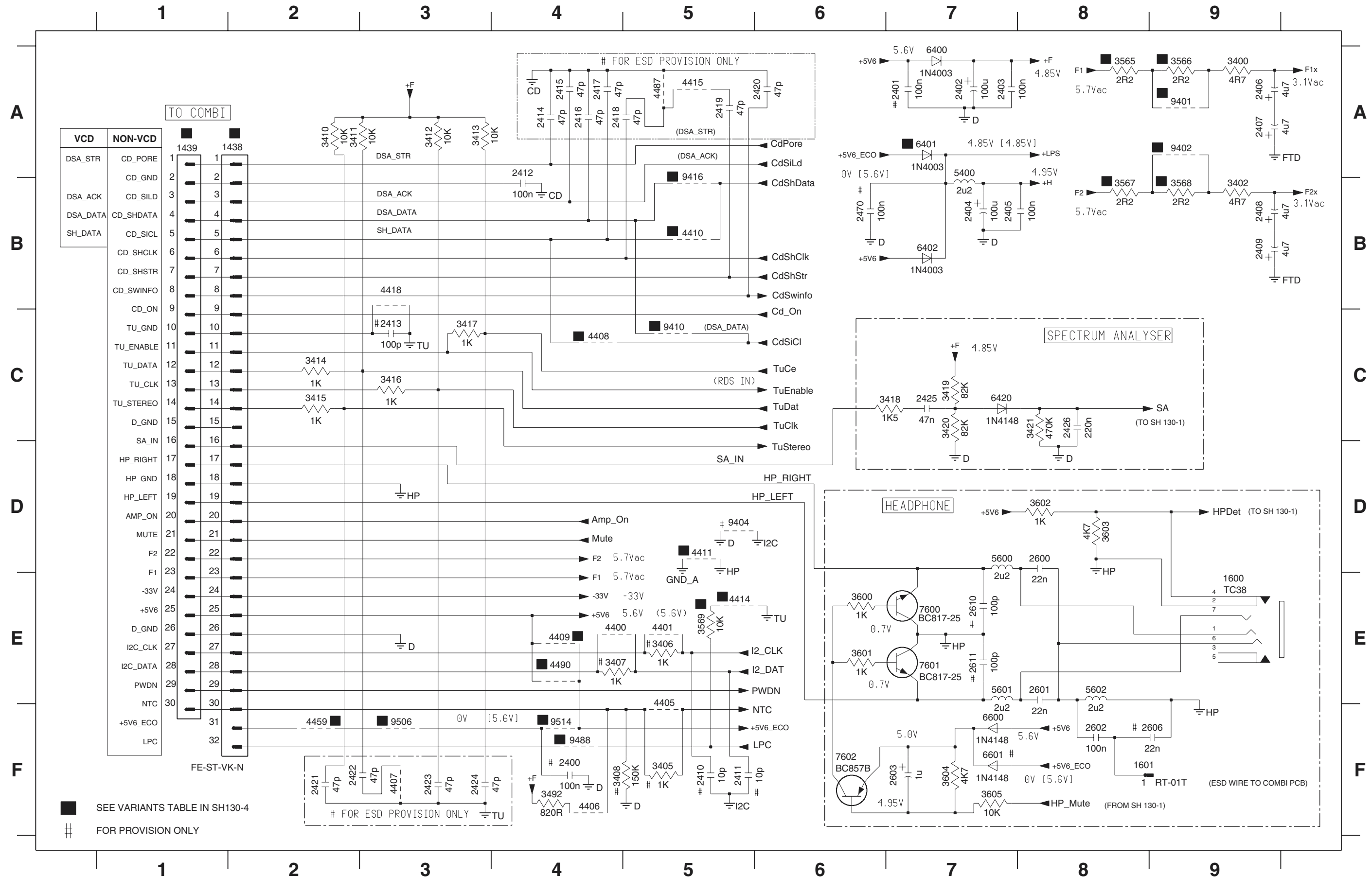
1400 A5	3471 B3	6412 D8
1402 F13	3472 B3	6413 E8
1406 D9	3473 B3	6415 E8
1407 D9	3474 B3	6416 E8
1408 C9	3475 B4	6417 F8
1409 C9	3476 B4	6422 A9
1410 C10	3477 B4	6423 A9
1411 C9	3478 B4	6424 A11
1412 C9	3479 B4	6425 A10
1413 C10	3480 B4	6426 A12
1414 C9	3481 B4	6427 B13
1415 C9	3482 B5	6428 C11
1416 C10	3483 B5	6429 C11
1417 E9	3484 B5	6430 D11
1418 E10	3485 B5	6431 F11
1420 D9	3486 B5	7402 H10
1421 D9	3487 B5	7403 D12
1422 D10	3488 B5	7404 B9
1426 E9	3489 B6	7405 B10
1427 E10	3490 B6	7406 B11
1428 E9	3491 B6	7407 B11
1429 D9	3493 C6	7408 A13
1430 E9	3494 C7	7409 H9
1431 E10	3495 C6	9406 B6
1432 F9	3496 C7	9408 A4
1433 F10	3497 C6	9409 F7
1434 G9	3498 D6	9411 H9
1435 G13	3499 D7	9412 F6
1436 H13	3500 E11	9413 F6
1437 G5	3501 E11	9415 F11
2427 B7	3502 D6	
2429 E1	3503 D7	
2430 E2	3504 D6	
2431 F2	3505 E7	
2432 F4	3506 E7	
2433 F4	3507 A8	
2434 F4	3508 A9	
2435 F4	3509 B9	
2436 F5	3510 A9	
2437 B9	3511 A10	
2438 B10	3512 B10	
2439 B11	3513 A10	
2440 B12	3514 A11	
2441 A13	3515 B11	
2442 F12	3516 A11	
2443 H2	3517 A12	
2444 H3	3518 B12	
2445 H3	3519 A13	
2446 G4	3520 B13	
2447 G5	3521 C9	
2448 I2	3522 C9	
2449 I3	3523 C9	
2450 G6	3524 D9	
2451 H8	3525 D9	
2452 H9	3526 E9	
2453 H9	3527 E9	
2454 H11	3528 E9	
2455 H11	3529 F9	
2456 H11	3531 G9	
2457 H13	3532 G9	
2458 H13	3533 C10	
2459 H13	3534 G10	
2460 H13	3535 C11	
2461 D12	3536 F4	
2463 B7	3537 D11	
2464 A2	3538 F11	
2465 A3	3539 F11	
2466 A3	3540 G11	
2467 A7	3541 H2	
3422 C7	3542 H2	
3424 B2	3543 G4	
3425 B1	3544 G5	
3426 C2	3545 I7	
3427 C1	3546 I7	
3428 C1	3547 H7	
3429 C2	3548 I7	
3430 C2	3549 H8	
3431 D2	3550 H9	
3432 D2	3551 G11	
3433 D2	3552 H12	
3434 D2	3553 H12	
3435 D2	3554 G13	
3436 D2	3555 G13	
3437 D2	3556 I3	
3438 E2	3557 I3	
3439 E1	3558 D12	
3443 B7	3559 D12	
3444 E2	3560 D13	
3445 E3	3561 D13	
3446 E3	3563 A3	
3447 E3	3564 A3	
3448 E3	3570 G8	
3449 E3	4402 E6	
3450 E3	4403 D12	
3451 E3	4404 D13	
3452 E4	4412 F7	
3453 F5	4416 F9	
3454 E5	4417 F9	
3455 E5	4419 H9	
3456 E5	4436 A2	
3457 E5	4491 F9	
3458 E5	5401 B6	
3459 E6	5402 E4	
3460 E6	5403 E4	
3461 A2	5404 G6	
3462 E6	5405 C12	
3463 A2	6404 B1	
3464 B2	6405 C1	
3465 B2	6406 C1	
3466 B2	6407 C1	
3467 B2	6408 C8	
3468 B3	6409 C8	
3469 B3	6410 C8	
3470 B3	6411 D8	

D.C. VOLTAGES DURING ACTIVE PLAY .  
 VALUES IN BRACKET ARE D.C. VOLTAGES AT STANDBY (CLOCK MODE).  
 VALUES IN SQUARE BRACKET ARE D.C. VOLTAGES AT LOW POWER STANDBY.

■ REFER TO VARIANTS TABLE  
 # FOR PROVISION ONLY

# CIRCUIT DIAGRAM - HEADPHONE / MISCELLANEOUS PART

1438 A1	2400 F4	2404 B7	2408 B9	2412 A4	2416 A4	2420 A6	2424 F3	2600 D8	2606 F9	3402 B9	3408 F4	3413 A3	3417 C3	3421 C8	3567 B8	3601 E6	3605 F7	4406 F4	4410 B5	4418 B3	5400 A7	6400 A7	6600 F7	7602 F6	9410 C5	9514 F4
1439 A1	2401 A7	2405 B7	2409 B9	2413 C3	2417 A4	2421 F2	2425 C7	2601 E8	2610 E7	3405 F5	3410 A2	3414 C2	3418 C7	3492 F4	3568 B9	3602 D8	4400 E4	4407 F3	4411 D5	4459 F2	5600 D7	6401 A7	6601 F7	9401 A9	9416 B5	
1600 E9	2402 A7	2406 A9	2410 F5	2414 A4	2418 A4	2422 F2	2426 C8	2602 F8	2611 E7	3406 E5	3411 A2	3415 C2	3419 C7	3565 A8	3569 E5	3603 D8	4401 E5	4408 C4	4414 E5	4487 A5	5601 E7	6402 B7	7600 E7	9402 A9	9488 F4	
1601 F9	2403 A7	2407 A9	2411 F5	2415 A4	2419 A5	2423 F3	2470 B6	2603 F7	3400 A9	3407 E4	3412 A3	3416 C3	3420 C7	3566 A9	3600 E6	3604 F7	4405 F5	4409 E4	4415 A5	4490 E4	5602 E8	6420 C7	7601 E7	9404 D5	9506 F3	









## ELECTRICAL PARTS LIST - FRONT BOARD

## MISCELLANEOUS

1400	3139 110 52850	FTD Display 12-ST-29GNK
1402	4822 267 10953	Flex Socket 7pin Vert.
1406	2422 128 02917	Tact Switch
1407	2422 128 02917	Tact Switch
1408	2422 128 02917	Tact Switch
1409	2422 128 02917	Tact Switch
1410	2422 128 02917	Tact Switch
1411	2422 128 02917	Tact Switch
1412	2422 128 02917	Tact Switch
1413	2422 128 02917	Tact Switch
1414	2422 128 02917	Tact Switch
1415	2422 128 02917	Tact Switch
1416	2422 128 02917	Tact Switch
1417	2422 128 02917	Tact Switch
1418	2422 128 02917	Tact Switch
1420	2422 128 02917	Tact Switch
1421	2422 128 02917	Tact Switch
1422	2422 128 02917	Tact Switch
1426	2422 128 02917	Tact Switch
1427	2422 128 02917	Tact Switch
1428	2422 128 02917	Tact Switch
1429	2422 128 02917	Tact Switch
1430	2422 128 02917	Tact Switch
1431	2422 128 02917	Tact Switch
1432	2422 128 02917	Tact Switch
1433	2422 128 02917	Tact Switch
1434	2422 128 02917	Tact Switch
1435	2422 129 16707	Rotary Encoder 24P
1436	2422 129 16708	Rotary Encoder 24P
1437	4822 242 11033	X'tal Resonator 4,332MHz
1438	2422 025 17413	Flex Socket 32pin Hort.
1439	2422 025 17414	Flex Socket 30pin Hort.
1600	2422 026 05059	Headphone Socket
1800	2422 026 05059	Mic Socket /21
1802	4822 265 11183	Flex Socket 4pin Hort.

## CAPACITORS

2402	4822 124 23432	100µF 20% 10V
2403	2238 586 59812	100nF +80/-20% 50V
2404	4822 124 23432	100µF 20% 10V
2405	2238 586 59812	100nF +80/-20% 50V
2406	4822 124 12032	4,7µF 20% 50V
2407	4822 124 12032	4,7µF 20% 50V
2408	4822 124 12032	4,7µF 20% 50V
2409	4822 124 12032	4,7µF 20% 50V
2412	2238 586 59812	100nF +80/-20% 50V
2425	3198 017 34730	47nF 16V
2426	4822 126 13879	220nF +80/-20% 16V
2427	3198 028 52290	22µF 20% 50V
2428	3198 017 41050	1µF 10V
2432	2222 867 15339	33pF 5% 50V
2433	2222 867 15339	33pF 5% 50V

2434	5322 126 11583	10nF 10% 50V
2435	4822 122 33752	15pF 5% 50V
2436	4822 122 33752	15pF 5% 50V
2443	4822 122 33197	1nF 10% 50V
2444	4822 126 14249	560pF 10% 50V
2445	4822 126 14249	560pF 10% 50V
2446	4822 122 33777	47pF 5% 63V
2447	4822 122 33777	47pF 5% 63V
2448	4822 126 12785	47nF +80/-20% 50V
2449	4822 124 22652	2,2µF 20% 50V
2451	2238 586 59812	100nF +80/-20% 50V
2452	2238 586 59812	100nF +80/-20% 50V
2453	5322 126 11583	10nF 10% 50V
2454	4822 124 12032	4,7µF 20% 50V
2456	4822 126 14238	2,2nF 50V
2457	5322 126 11583	10nF 10% 50V
2458	5322 126 11583	10nF 10% 50V
2459	5322 126 11583	10nF 10% 50V
2460	5322 126 11583	10nF 10% 50V
2461	2238 586 59812	100nF +80/-20% 50V
2463	3198 028 52290	22µF 20% 50V
2600	4822 126 14494	22nF 10% 25V
2601	4822 126 14494	22nF 10% 25V
2602	2238 586 59812	100nF +80/-20% 50V
2603	4822 124 22651	1,0µF 20% 50V
2801	4822 126 13193	4,7nF 10% 63V
2802	2238 586 59812	100nF +80/-20% 50V
2803	5322 126 11578	1nF 10% 50V
2804	3198 017 44740	470nF 10V
2805	3198 017 44740	470nF 10V
2806	4822 126 13909	680pF 10% 50V
2807	4822 124 81286	47µF 20% 16V
2808	3198 017 41050	1µF 10V

## RESISTORS

3400	4822 050 24708	4R7 1% 0,6W
3402	4822 050 24708	4R7 1% 0,6W
3410	4822 051 30103	10k 5% 0,062W
3411	4822 051 30103	10k 5% 0,062W
3412	4822 051 30103	10k 5% 0,062W
3413	4822 051 30103	10k 5% 0,062W
3414	4822 051 30102	1k 5% 0,062W
3415	4822 050 11002	1k 1% 0,4W
3416	4822 051 30102	1k 5% 0,062W
3417	4822 051 30102	1k 5% 0,062W
3418	4822 116 52243	1k5 5% 0,5W
3419	4822 117 12864	82k 5% 0,6W
3420	4822 117 12864	82k 5% 0,6W
3421	4822 051 30474	470k 5% 0,062W
3422	4822 051 30102	1k 5% 0,062W
3423	4822 051 30103	10k 5% 0,062W
3424	4822 051 30102	1k 5% 0,062W

## ELECTRICAL PARTS LIST - FRONT BOARD

3425	4822 051 30103	10k 5% 0,062W
3426	4822 051 30102	1k 5% 0,062W
3427	4822 051 30103	10k 5% 0,062W
3428	4822 051 30103	10k 5% 0,062W
3429	4822 051 30102	1k 5% 0,062W
3430	4822 051 30102	1k 5% 0,062W
3431	4822 051 30102	1k 5% 0,062W
3432	4822 051 30102	1k 5% 0,062W
3433	4822 051 30102	1k 5% 0,062W
3434	4822 051 30102	1k 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 30103	10k 5% 0,062W
3443	4822 051 30102	1k 5% 0,062W
3444	4822 051 30102	1k 5% 0,062W
3445	4822 051 30102	1k 5% 0,062W
3446	4822 051 30102	1k 5% 0,062W
3447	4822 051 30102	1k 5% 0,062W
3448	4822 051 30102	1k 5% 0,062W
3449	4822 050 11002	1k 1% 0,4W
3450	4822 051 30102	1k 5% 0,062W
3451	4822 051 30102	1k 5% 0,062W
3452	4822 050 21003	10k 1% 0,6W
3453	4822 051 30103	10k 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 050 21003	10k 1% 0,6W
3458	4822 051 30102	1k 5% 0,062W
3459	4822 050 21003	10k 1% 0,6W
3460	4822 051 30102	1k 5% 0,062W
3462	4822 051 30105	1M 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
3480	4822 051 30102	1k 5% 0,062W
3481	4822 051 30102	1k 5% 0,062W

3482	4822 051 30102	1k 5% 0,062W
3483	4822 051 30102	1k 5% 0,062W
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 117 12968	820R 5% 0,62W
3493	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
3498	4822 051 30102	1k 5% 0,062W
3499	4822 051 30102	1k 5% 0,062W
3500	4822 051 30102	1k 5% 0,062W
3501	4822 051 30102	1k 5% 0,062W
3502	4822 051 30102	1k 5% 0,062W
3503	4822 051 30102	1k 5% 0,062W
3504	4822 051 30101	100R 5% 0,062W
3505	4822 051 30102	1k 5% 0,062W
3507	4822 051 30471	470R 5% 0,062W
3508	4822 051 30471	470R 5% 0,062W
3509	4822 051 30103	10k 5% 0,062W
3510	4822 051 30471	470R 5% 0,062W
3511	4822 051 30471	470R 5% 0,062W
3512	4822 051 30103	10k 5% 0,062W
3513	4822 051 30471	470R 5% 0,062W
3514	4822 051 30471	470R 5% 0,062W
3515	4822 051 30103	10k 5% 0,062W
3516	4822 051 30471	470R 5% 0,062W
3517	4822 051 30471	470R 5% 0,062W
3518	4822 051 30103	10k 5% 0,062W
3519	4822 117 12968	820R 5% 0,62W
3520	4822 117 12925	47k 1% 0,063W
3521	4822 051 30331	330R 5% 0,062W
3522	4822 116 52219	330R 5% 0,5W
3523	4822 116 52219	330R 5% 0,5W
3524	4822 116 52219	330R 5% 0,5W
3525	4822 116 52219	330R 5% 0,5W
3526	4822 116 52219	330R 5% 0,5W
3527	4822 116 52219	330R 5% 0,5W
3528	4822 116 52219	330R 5% 0,5W
3529	4822 116 52219	330R 5% 0,5W
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 30472	4k7 5% 0,062W



**ELECTRICAL PARTS LIST - FRONT BOARD****RESISTORS**

3536	4822 050 11002	1k 1% 0,4W	3812	4822 051 30103	10k 5% 0,062W
3537	4822 051 30474	470k 5% 0,062W	3813	4822 051 30471	470R 5% 0,062W
3538	4822 051 30102	1k 5% 0,062W	4400	4822 051 30008	0R Jumper 0603
3539	4822 051 30102	1k 5% 0,062W	4401	4822 051 30008	0R Jumper 0603
3540	4822 051 30102	1k 5% 0,062W	4405	4822 051 30008	0R Jumper 0603
3541	4822 051 30103	10k 5% 0,062W	4406	4822 051 30008	0R Jumper 0603
3542	4822 051 30152	1k5 5% 0,062W	4408	4822 051 30008	0R Jumper 0603
3543	4822 117 12891	220k 1% ERJ3E	4409	4822 051 30008	0R Jumper 0603
3544	4822 051 30222	2k2 5% 0,062W	4411	4822 051 30008	0R Jumper 0603
3545	4822 050 21003	10k 1% 0,6W	4412	4822 051 30008	0R Jumper 0603
3546	4822 051 30103	10k 5% 0,062W	4414	4822 051 30008	0R Jumper 0603
3547	4822 050 21003	10k 1% 0,6W	4416	4822 051 30008	0R Jumper 0603
3548	4822 051 30103	10k 5% 0,062W	4417	4822 051 30008	0R Jumper 0603
3549	4822 051 30103	10k 5% 0,062W /21/34	4418	4822 051 30008	0R Jumper 0603
3550	4822 117 13632	100k 1% 0,62W	4419	4822 051 30008	0R Jumper 0603
3551	4822 051 30101	100R 5% 0,062W	4420	4822 051 30008	0R Jumper 0603
3552	4822 051 30103	10k 5% 0,062W	4421	4822 051 30008	0R Jumper 0603
3553	4822 051 30102	1k 5% 0,062W	4422	4822 051 30008	0R Jumper 0603
3554	4822 051 30103	10k 5% 0,062W	4423	4822 051 30008	0R Jumper 0603
3555	4822 051 30103	10k 5% 0,062W	4424	4822 051 30008	0R Jumper 0603
3556	4822 051 30103	10k 5% 0,062W	4425	4822 051 30008	0R Jumper 0603
3557	4822 051 30103	10k 5% 0,062W	4426	4822 051 30008	0R Jumper 0603
3558	4822 051 30682	6k8 5% 0,062W	4427	4822 051 30008	0R Jumper 0603
3559	4822 051 30102	1k 5% 0,062W	4428	4822 051 30008	0R Jumper 0603
3560	4822 051 30682	6k8 5% 0,062W	4429	4822 051 30008	0R Jumper 0603
3561	4822 051 30102	1k 5% 0,062W	4430	4822 051 30008	0R Jumper 0603
3565	4822 050 24708	4R7 1% 0,6W /21	4431	4822 051 30008	0R Jumper 0603
3565	4822 116 81154	2R2 5% 0,5W /22	4432	4822 051 30008	0R Jumper 0603
3566	4822 116 81154	2R2 5% 0,5W /22	4433	4822 051 30008	0R Jumper 0603
3567	4822 050 24708	4R7 1% 0,6W /21	4434	4822 051 30008	0R Jumper 0603
3567	4822 116 81154	2R2 5% 0,5W /22	4435	4822 051 30008	0R Jumper 0603
3568	4822 116 81154	2R2 5% 0,5W /22	4437	4822 051 30008	0R Jumper 0603
3569	4822 051 30103	10k 5% 0,062W	4438	4822 051 30008	0R Jumper 0603
3570	4822 117 13632	100k 5% 0,063W /22	4439	4822 051 30008	0R Jumper 0603
3600	4822 051 30102	1k 5% 0,062W	4440	4822 051 30008	0R Jumper 0603
3601	4822 051 30102	1k 5% 0,062W	4441	4822 051 30008	0R Jumper 0603
3602	4822 050 11002	1k 1% 0,4W	4442	4822 051 30008	0R Jumper 0603
3603	4822 051 30472	4k7 5% 0,062W	4443	4822 051 30008	0R Jumper 0603
3604	4822 051 30472	4k7 5% 0,062W	4444	4822 051 30008	0R Jumper 0603
3605	4822 051 30103	10k 5% 0,062W	4445	4822 051 30008	0R Jumper 0603
3800	4822 116 52283	4k7 5% 0,5W	4446	4822 051 30008	0R Jumper 0603
3801	4822 051 30682	6k8 5% 0,062W	4447	4822 051 30008	0R Jumper 0603
3802	4822 051 30103	10k 5% 0,062W	4448	4822 051 30008	0R Jumper 0603
3803	4822 051 30103	10k 5% 0,062W	4449	4822 051 30008	0R Jumper 0603
3804	4822 051 30272	2k7 5% 0,062W	4450	4822 051 30008	0R Jumper 0603
3805	4822 051 30105	1M 5% 0,062W	4451	4822 051 30008	0R Jumper 0603
3806	4822 051 30339	33R 5% 0,062W	4452	4822 051 30008	0R Jumper 0603
3807	2120 366 90292	Potm Rotary 20k	4453	4822 051 30008	0R Jumper 0603
3808	4822 051 30471	470R 5% 0,062W	4454	4822 051 30008	0R Jumper 0603
3809	4822 051 30561	560R 5% 0,062W	4455	4822 051 30008	0R Jumper 0603
3810	4822 051 30105	1M 5% 0,062W	4456	4822 051 30008	0R Jumper 0603
3811	4822 051 30331	330R 5% 0,062W	4457	4822 051 30008	0R Jumper 0603



**ELECTRICAL PARTS LIST - FRONT BOARD****RESISTORS**

4458	4822 051 30008	OR Jumper 0603
4459	4822 051 30008	OR Jumper 0603
4460	4822 051 30008	OR Jumper 0603
4461	4822 051 30008	OR Jumper 0603
4462	4822 051 30008	OR Jumper 0603
4463	4822 051 30008	OR Jumper 0603
4464	4822 051 30008	OR Jumper 0603
4465	4822 051 30008	OR Jumper 0603
4466	4822 051 30008	OR Jumper 0603
4467	4822 051 30008	OR Jumper 0603
4468	4822 051 30008	OR Jumper 0603
4469	4822 051 30008	OR Jumper 0603
4470	4822 051 30008	OR Jumper 0603
4471	4822 051 30008	OR Jumper 0603
4472	4822 051 30008	OR Jumper 0603
4473	4822 051 30008	OR Jumper 0603
4474	4822 051 30008	OR Jumper 0603
4475	4822 051 30008	OR Jumper 0603
4476	4822 051 30008	OR Jumper 0603
4477	4822 051 30008	OR Jumper 0603
4478	4822 051 30008	OR Jumper 0603
4479	4822 051 30008	OR Jumper 0603
4480	4822 051 30008	OR Jumper 0603
4481	4822 051 30008	OR Jumper 0603
4482	4822 051 30008	OR Jumper 0603
4483	4822 051 30008	OR Jumper 0603
4484	4822 051 30008	OR Jumper 0603
4485	4822 051 30008	OR Jumper 0603
4486	4822 051 30008	OR Jumper 0603
4488	4822 051 30008	OR Jumper 0603
4490	4822 051 30008	OR Jumper 0603
4491	4822 051 30008	OR Jumper 0603
4601	4822 051 30008	OR Jumper 0603
4801	4822 051 30008	OR Jumper 0603
4802	4822 051 30008	OR Jumper 0603
4803	4822 051 30008	OR Jumper 0603
4804	4822 051 30008	OR Jumper 0603
4805	4822 051 30008	OR Jumper 0603
4806	4822 051 30008	OR Jumper 0603

**COILS & FILTERS**

5400	4822 157 62552	Coil 2,2 $\mu$ H 5%
5402	4822 242 72066	Ceram Resonator 8MHz
5403	2422 543 01069	X'tal Resonator 32,768kHz
5404	4822 157 62552	Coil 2,2 $\mu$ H 5%
5405	4822 157 62552	Coil 2,2 $\mu$ H 5%
5600	4822 157 62552	Coil 2,2 $\mu$ H 5%
5601	4822 157 62552	Coil 2,2 $\mu$ H 5%
5602	4822 157 62552	Coil 2,2 $\mu$ H 5%
5800	4822 157 11235	Coil 22 $\mu$ H 5%

**DIODES**

6400	4822 130 31878	1N4003G
6401	4822 130 31878	1N4003G
6402	4822 130 31878	1N4003G
6404	4822 130 30621	1N4148
6405	4822 130 30621	1N4148
6406	4822 130 30621	1N4148
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6417	4822 130 30621	1N4148
6420	4822 130 30621	1N4148
6422	9322 178 15676	LTL-8166FTNN
6423	9322 178 15676	LTL-8166FTNN
6424	9322 178 15676	LTL-8166FTNN
6425	9322 178 15676	LTL-8166FTNN
6426	4822 130 30621	1N4148
6427	9322 179 76676	LTL-816EELC
6428	4822 130 30621	1N4148
6429	4822 130 30621	1N4148
6430	4822 130 30621	1N4148
6600	4822 130 30621	1N4148

**TRANSISTORS & INTEGRATED CIRCUITS**

7400	3139 110 53221	TMP87CS71F "C355S53221"
7401	9352 679 67118	SAA6579T/V1/M4
7402	9322 155 22667	IR Receiver TSOP2236ZC1
7403	9965 000 04931	M24C01-WMN6
7404	4822 130 60511	BC847B
7405	4822 130 60511	BC847B
7406	4822 130 60511	BC847B
7407	4822 130 60511	BC847B
7408	4822 130 60373	BC857B
7409	4822 130 60511	BC847B
7411	4822 130 60511	BC847B
7600	4822 130 42804	BC817-25
7601	4822 130 42804	BC817-25
7602	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.

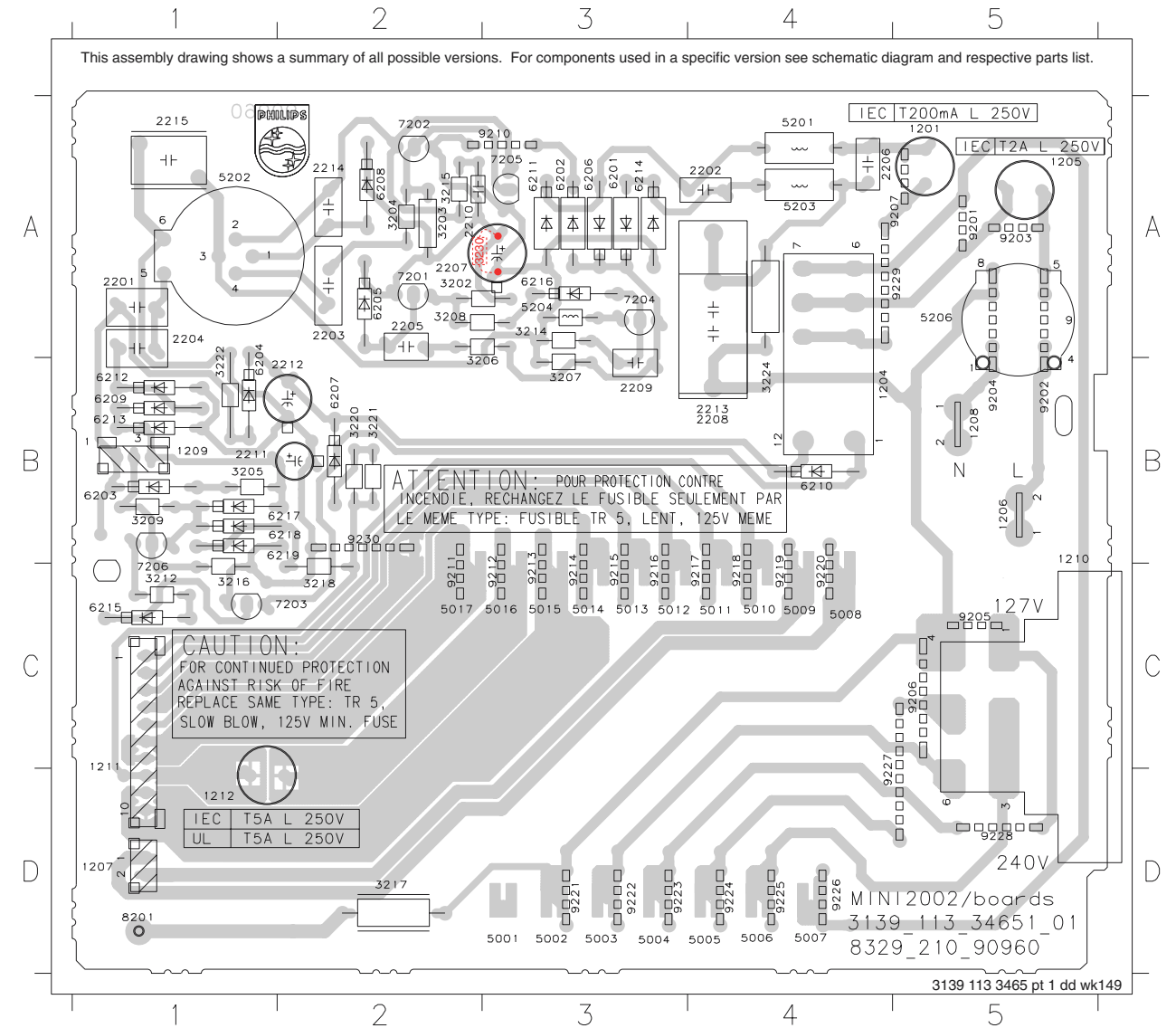
# MAINS BOARD

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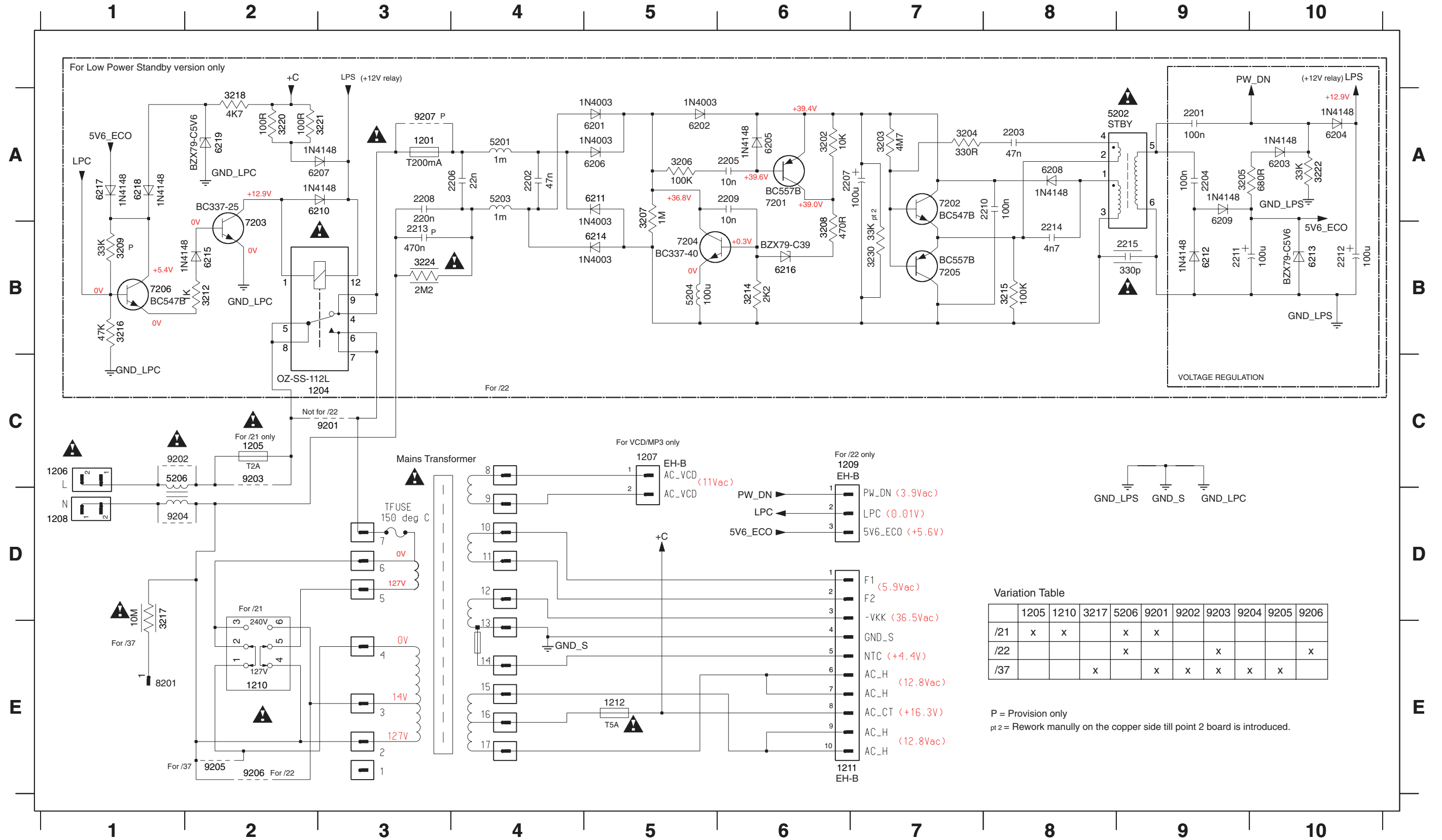
# COMPONENT LAYOUT

1201 A5 1211 C1 2207 A2 2215 A1 3209 B1 3221 B2 5006 D4 5014 C3 5206 A5 6208 A2 6216 A3 7205 A3 9206 C5 9216 C3 9224 D4  
 1204 B4 1212 D1 2208 B4 3202 A2 3212 C1 3222 B1 5007 D4 5015 C3 6201 A3 6209 B1 6217 B2 7206 C1 9207 A5 9217 C4 9225 D4  
 1205 A5 2201 A1 2209 B3 3203 A2 3214 A3 3224 B4 5008 C4 5016 C3 6202 A3 6210 B4 6218 B2 8201 D1 9210 A3 9218 C4 9226 D4  
 1206 B5 2202 A4 2210 A2 3204 A2 3215 A2 5001 D3 5009 C4 5017 C2 6203 B1 6211 A3 6219 B2 9201 A5 9211 C2 9219 C4 9227 D4  
 1207 D1 2203 A2 2211 B1 3205 B1 3216 C1 5002 D3 5010 C4 5201 A4 6204 B1 6212 B1 7201 A2 9202 B5 9212 C3 9220 C4 9228 D5  
 1208 B5 2204 A1 2212 B2 3206 B2 3217 D2 5003 D3 5011 C4 5202 A1 6205 A2 6213 B1 7202 A2 9203 A5 9213 C3 9221 D3 9229 A5  
 1209 B1 2205 A2 2213 B4 3207 B3 3218 C2 5004 D3 5012 C3 5203 A4 6206 A3 6214 A3 7203 C2 9204 B5 9214 C3 9222 D3 9230 B2  
 1210 B5 2206 A4 2214 A2 3208 A2 3220 B2 5005 D4 5013 C3 5204 A3 6207 B2 6215 C1 7204 A3 9205 C5 9215 C3 9223 D3



# MAINS CIRCUIT

- 1201 A3
- 1207 C5
- 1211 E6
- 2203 A8
- 2207 A6
- 2211 B9
- 2215 B9
- 3205 A9
- 3209 B1
- 3216 B1
- 3221 A2
- 5201 A4
- 5206 C1
- 6204 A10
- 6208 A8
- 6212 B9
- 6216 B6
- 7201 A6
- 7205 B7
- 9202 C1
- 9206 E2
- 1204 C3
- 1208 D1
- 1212 E5
- 2204 A9
- 2208 A3
- 2212 B10
- 3202 A6
- 3206 A5
- 3212 B2
- 3217 D1
- 3222 A10
- 5202 A8
- 6201 A5
- 6205 A6
- 6209 A9
- 6213 B10
- 6217 A1
- 7202 A7
- 7206 B1
- 9203 C2
- 9207 A3
- 1205 C2
- 1209 C6
- 2201 A9
- 2205 A6
- 2209 A6
- 2213 B3
- 3203 A7
- 3207 A5
- 3214 B6
- 3218 A2
- 3224 B3
- 5203 A4
- 6202 A5
- 6206 A5
- 6210 A3
- 6214 B5
- 6218 A1
- 7203 B2
- 8201 E1
- 9204 D1
- 1206 C1
- 1210 E2
- 2202 A4
- 2206 A4
- 2210 A8
- 2214 B8
- 3204 A7
- 3208 B6
- 3215 B8
- 3220 A2
- 3230 B7
- 5204 B5
- 6203 A10
- 6207 A3
- 6211 A5
- 6215 B2
- 6219 A2
- 7204 B5
- 8201 C3
- 9205 E2



**ELECTRICAL PARTS LIST - MAINS BOARD****MISCELLANEOUS**

1201	4822 071 52001	△ Fuse T200mA 250V	/22
1204	2422 132 07519	△ Relay 1P 12V 16A	
1205	9965 000 07788	△ Fuse T2A 250V	/21
1210	2422 129 16478	△ Voltage Selector	/21
1212	4822 071 55002	△ Fuse T5A 250V	

**CAPACITORS**

2201	5322 121 42386	100nF 5% 63V	
2202	4822 121 43526	47nF 5% 250V	
2203	4822 122 33449	47nF 30% 50V	
2204	5322 121 42386	100nF 5% 63V	
2205	4822 122 30043	10nF 80% 63V	
2206	4822 121 41856	22nF 5% 250V	
2207	4822 124 40255	100µF 20% 63V	
2208	4822 121 10512	220nF 20% 275V	
2209	4822 122 30043	10nF 80% 63V	
2210	2020 561 90365	100nF +80/-20% 50V	
2211	4822 124 41584	100µF 20% 10V	
2212	4822 124 40207	100µF 20% 25V	
2214	5322 122 32261	4,7nF 10% 100V	
2215	4822 126 13867	△ 330pF 20% 250V	

**RESISTORS**

3202	4822 050 21003	10k 1% 0,6W	
3203	4822 050 24705	4M7 1% 0,6W	
3204	4822 116 52219	330R 5% 0,5W	
3205	4822 116 52228	680R 5% 0,5W	
3206	4822 116 52234	100k 5% 0,5W	
3207	4822 116 83866	1M 5% 0,5W	
3208	4822 116 83883	470R 5% 0,5W	
3212	4822 050 11002	1k 1% 0,4W	
3214	4822 116 52256	2k2 5% 0,5W	
3215	4822 116 52234	100k 5% 0,5W	
3216	4822 116 83884	47k 5% 0,5W	
3218	4822 116 52283	4k7 5% 0,5W	
3220	4822 116 52175	100R 5% 0,5W	
3221	4822 116 52175	100R 5% 0,5W	
3222	4822 050 23303	33k 5% 1/6W	
3224	4822 053 21225	△ 2M2 5% 0,5W	
3230	4822 050 23303	33k 5% 1/6W	

**COILS & FILTERS**

5201	4822 157 53473	Coil 1000µH 10%	
5202	2422 549 45157	△ Standby Transformer	
5203	4822 157 53473	Coil 1000µH 10%	
5204	4822 157 52333	Coil 100µH 5%	
5206	4822 157 11832	△ Mains Filter 400µH 3A	

**DIODES**

6201	4822 130 31878	1N4003G	
6202	4822 130 31878	1N4003G	
6203	4822 130 30621	1N4148	

6204	4822 130 30621	1N4148	
6205	4822 130 30621	1N4148	
6206	4822 130 31878	1N4003G	
6207	4822 130 30621	1N4148	
6208	4822 130 30621	1N4148	
6209	4822 130 30621	1N4148	
6210	4822 130 30621	1N4148	
6211	4822 130 31878	1N4003G	
6212	4822 130 30621	1N4148	
6213	4822 130 34173	BZX79-B5V6	
6214	4822 130 31878	1N4003G	
6215	4822 130 30621	1N4148	
6216	4822 130 34145	BZX79-B39	
6217	4822 130 30621	1N4148	
6218	4822 130 30621	1N4148	
6219	4822 130 34173	BZX79-B5V6	

**TRANSISTORS & INTEGRATED CIRCUITS**

7201	4822 130 44568	BC557B	
7202	4822 130 40959	BC547B	
7203	4822 130 40981	BC337-25	
7204	4822 130 40855	BC337-40	
7205	4822 130 44568	BC557B	
7206	4822 130 40959	BC547B	

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

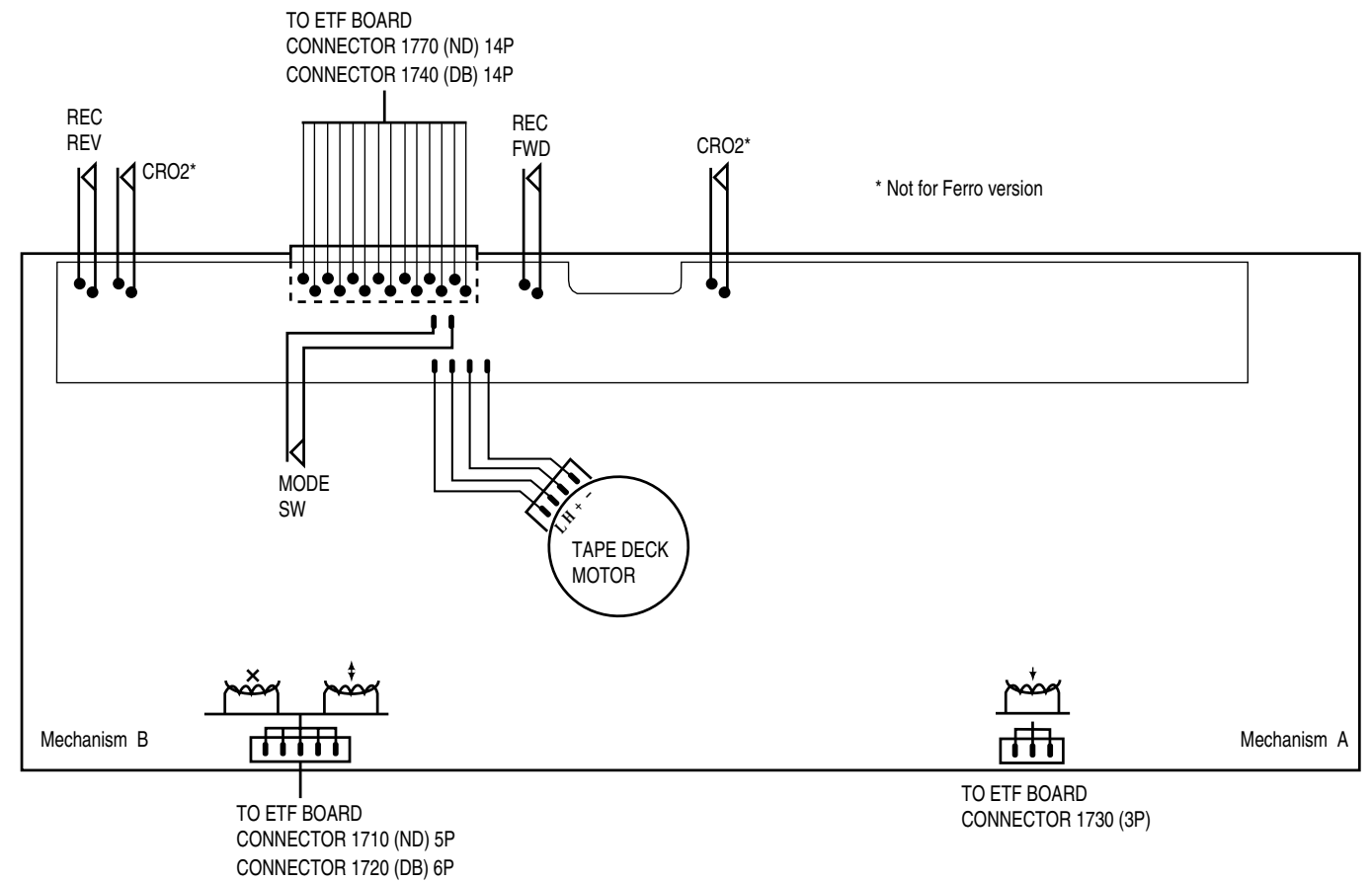
# ETF7 TAPE MODULE

## (Non-Dolby Version)

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**Tapedeck wiring (Double deck)**

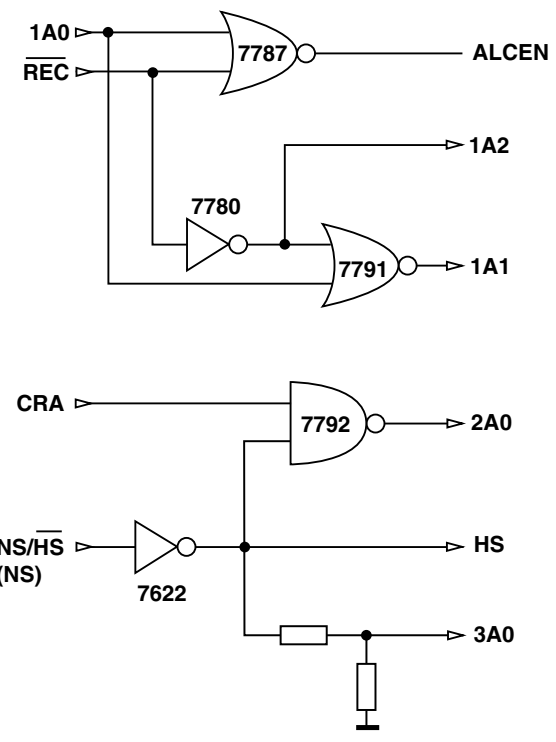
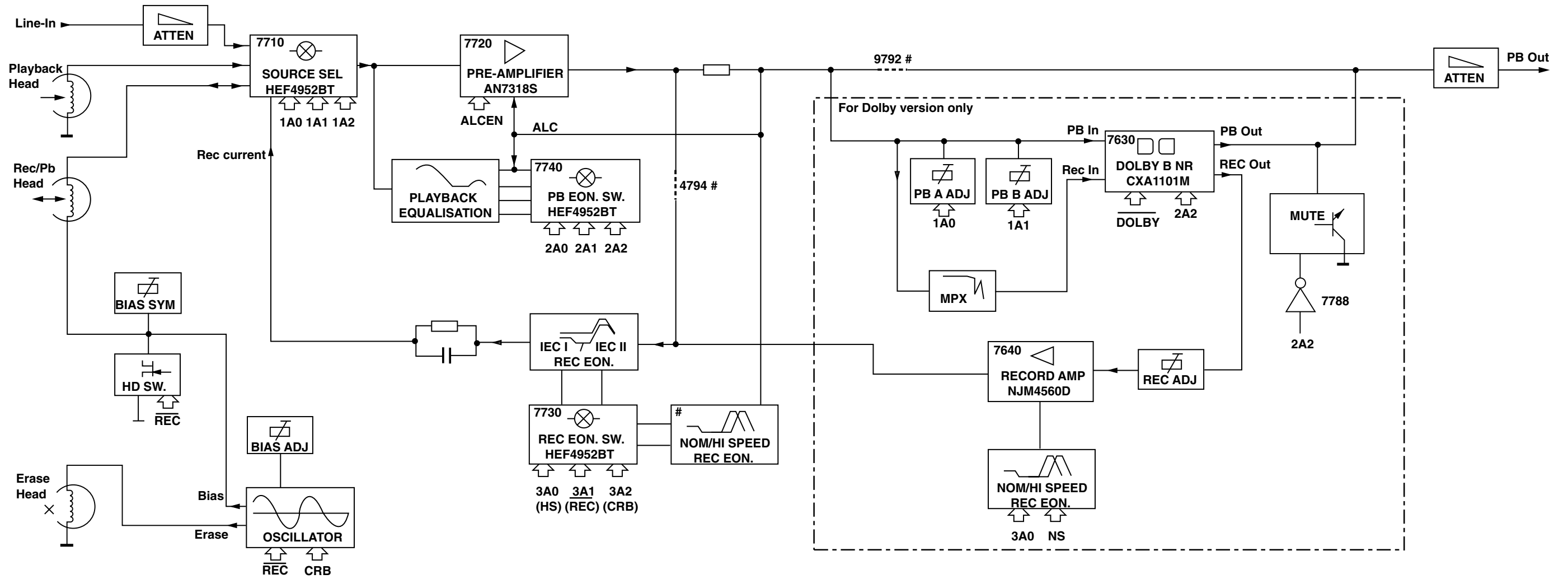


**Variations table for Analog Circuit**

	Autoreverse	Non-autoreverse	
	ND/DD/FR	ND/DD/FF	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	Non-autoreverse	
	ND/DD/FR	ND/DD/FF	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	-	-

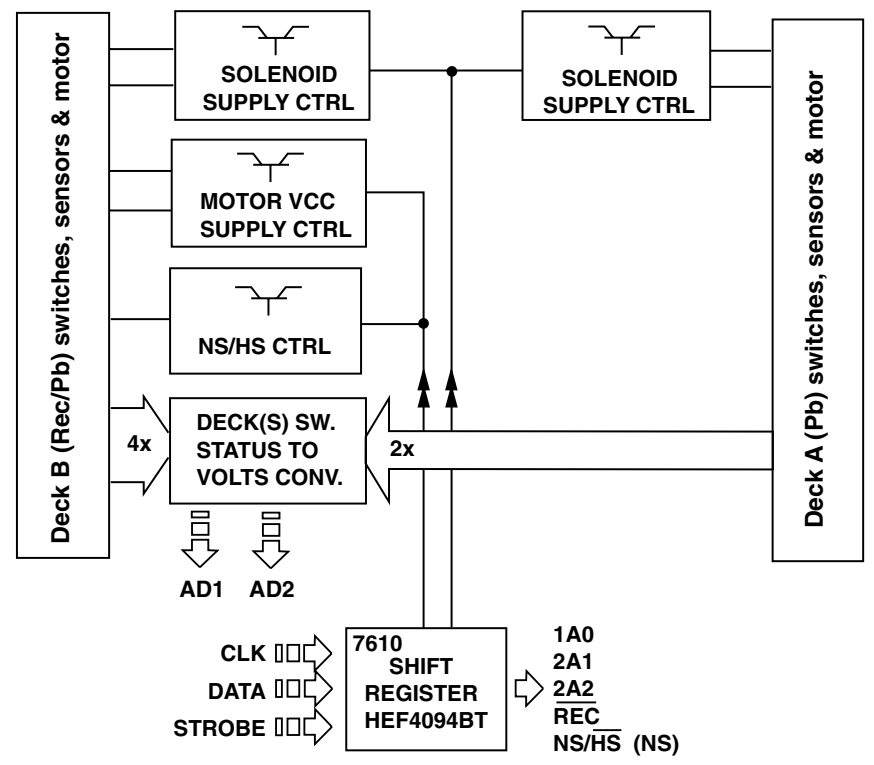
**BLOCK DIAGRAM**



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

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers



## 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 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

**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 CONNECTOR (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 CONNECTOR (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)**

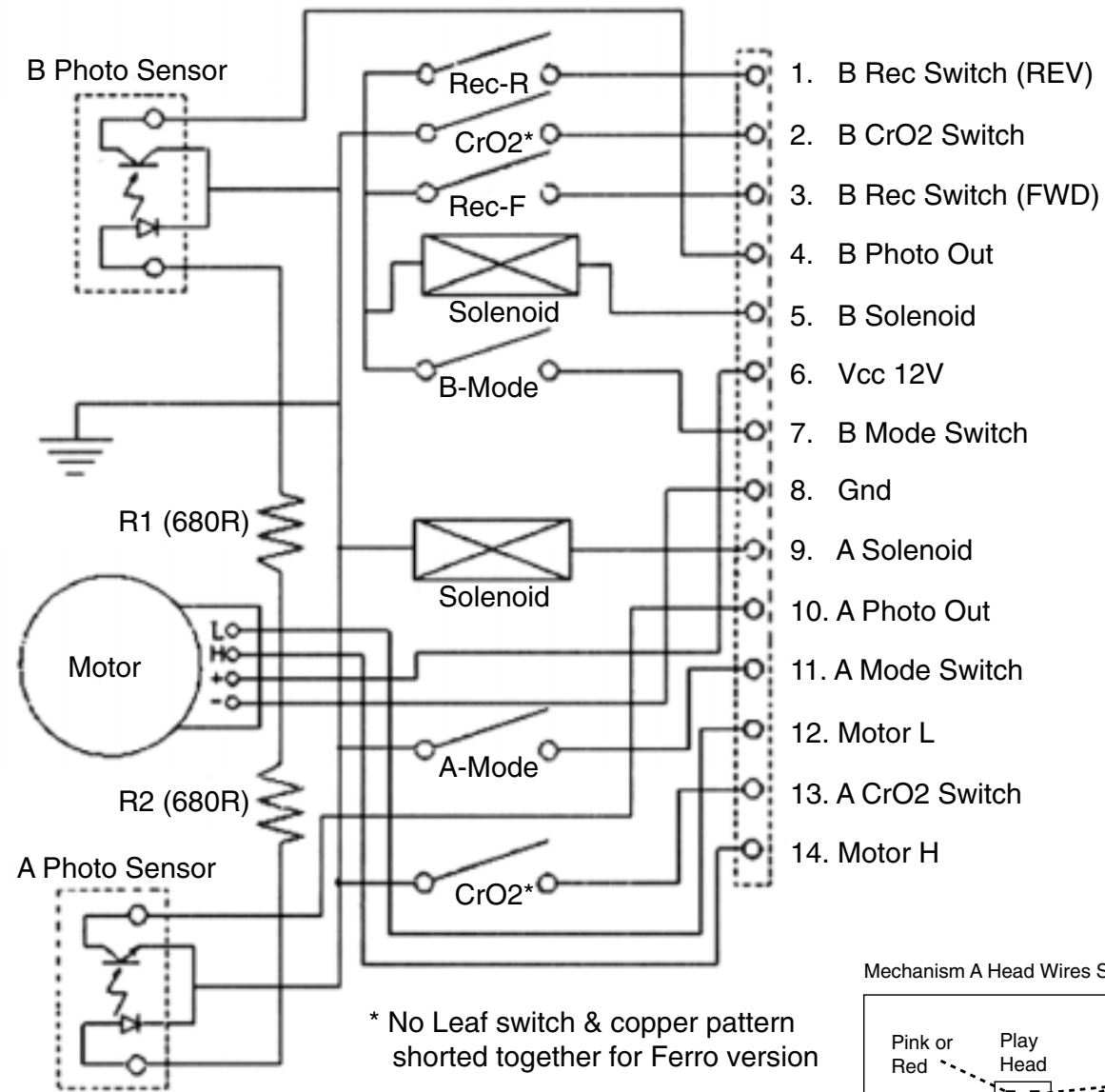
○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid 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)**

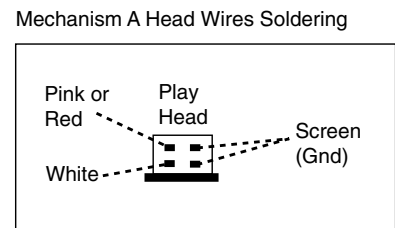
○	1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
○	2	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
○	3	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
○	4	PHOTO B	Photo sensor output (tape movement indication)	
○	5	SOL B	Solenoid 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	



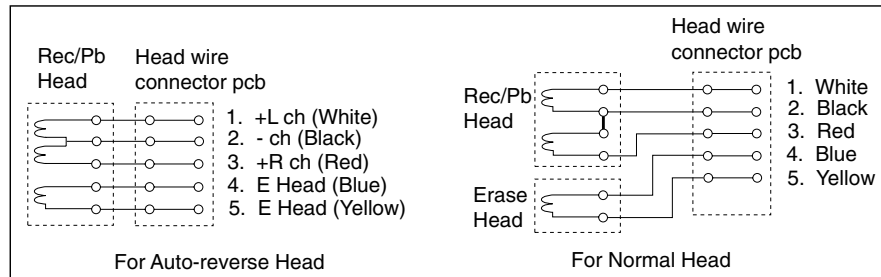
TAPE MECHANISM ELECTRONICS



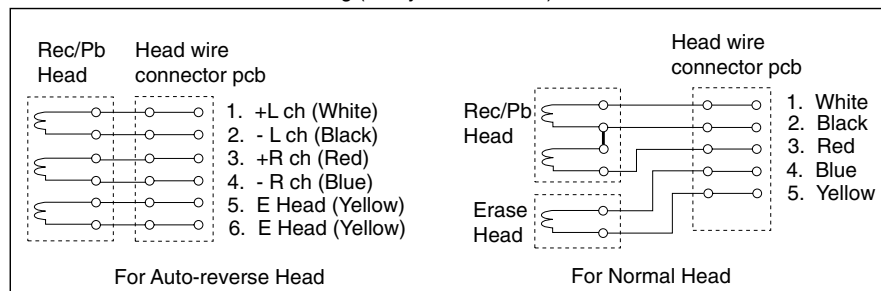
\* No Leaf switch & copper pattern shorted together for Ferro version



Mechanism 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	to
<b>ADJUST MOTOR SPEED</b>						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A	LEFT RIGHT		check	3150Hz -0.8/+1.8%
<b>CHECK WOW &amp; FLUTTER</b>						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	<0.4 % DIN
<b>ADJUST AZIMUTH</b>						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #	LEFT RIGHT		right hand screw	
<b>CHECK PLAYBACK FREQUENCY RESPONSE</b>						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
<b>ADJUST BIAS CURRENT</b>						
DECK B	SBC419A^	RECORD	5 or 6	mV-meter	3773	995mV
	SBC420		LEFT RIGHT		check	750mV +/- 1.5dB
<b>CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION</b>						
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-measure  
^ Not applicable for Ferro version

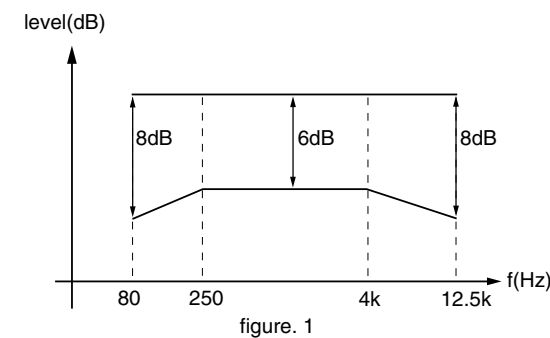


figure. 1

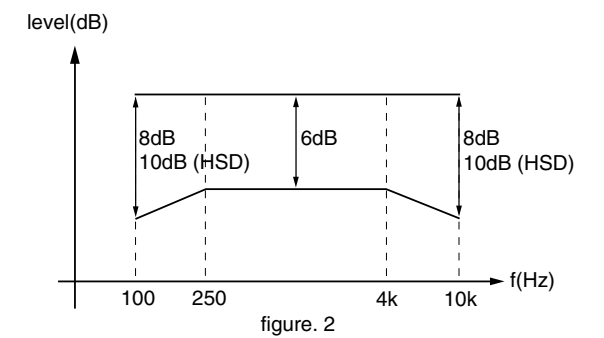
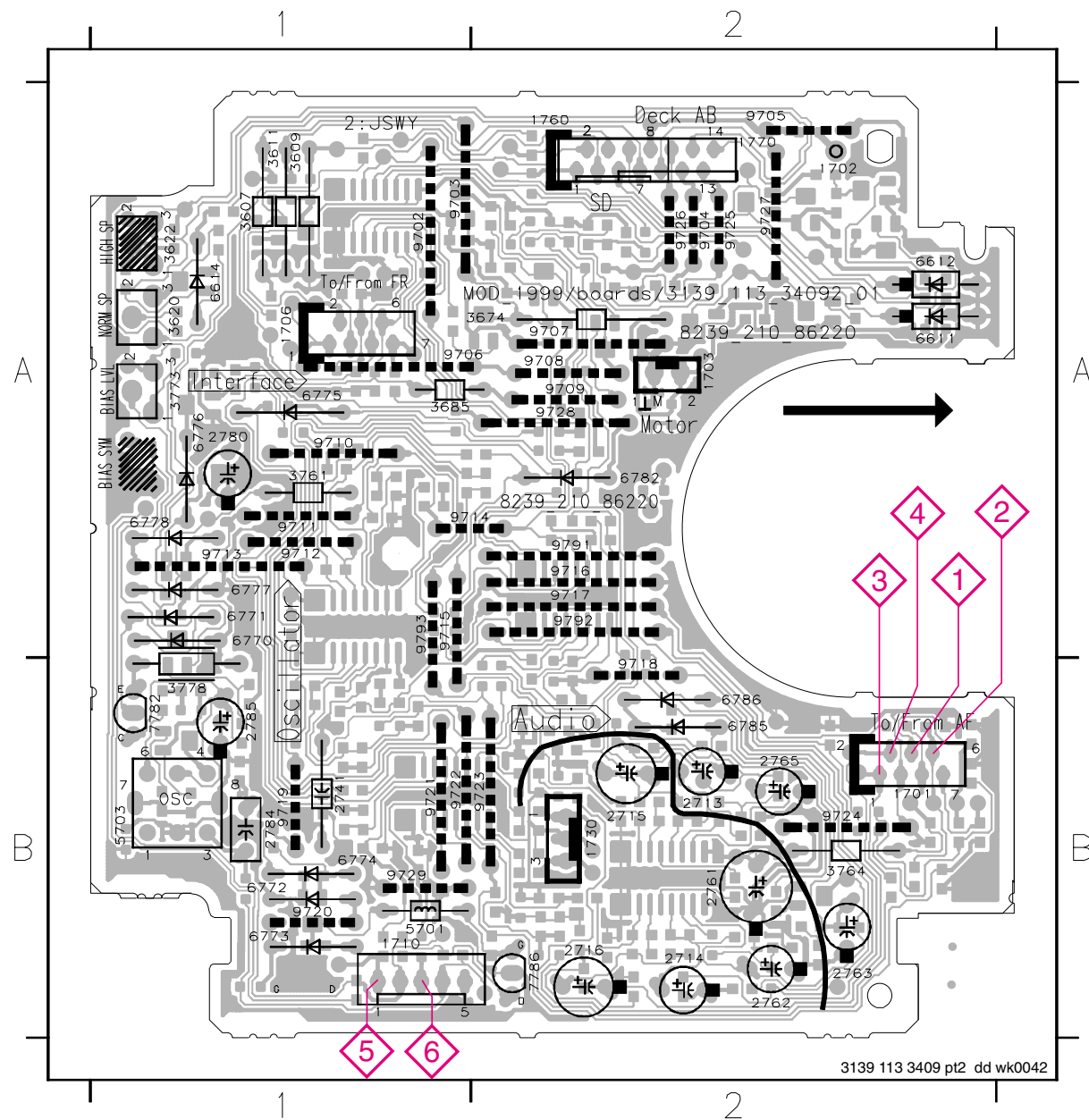


figure. 2

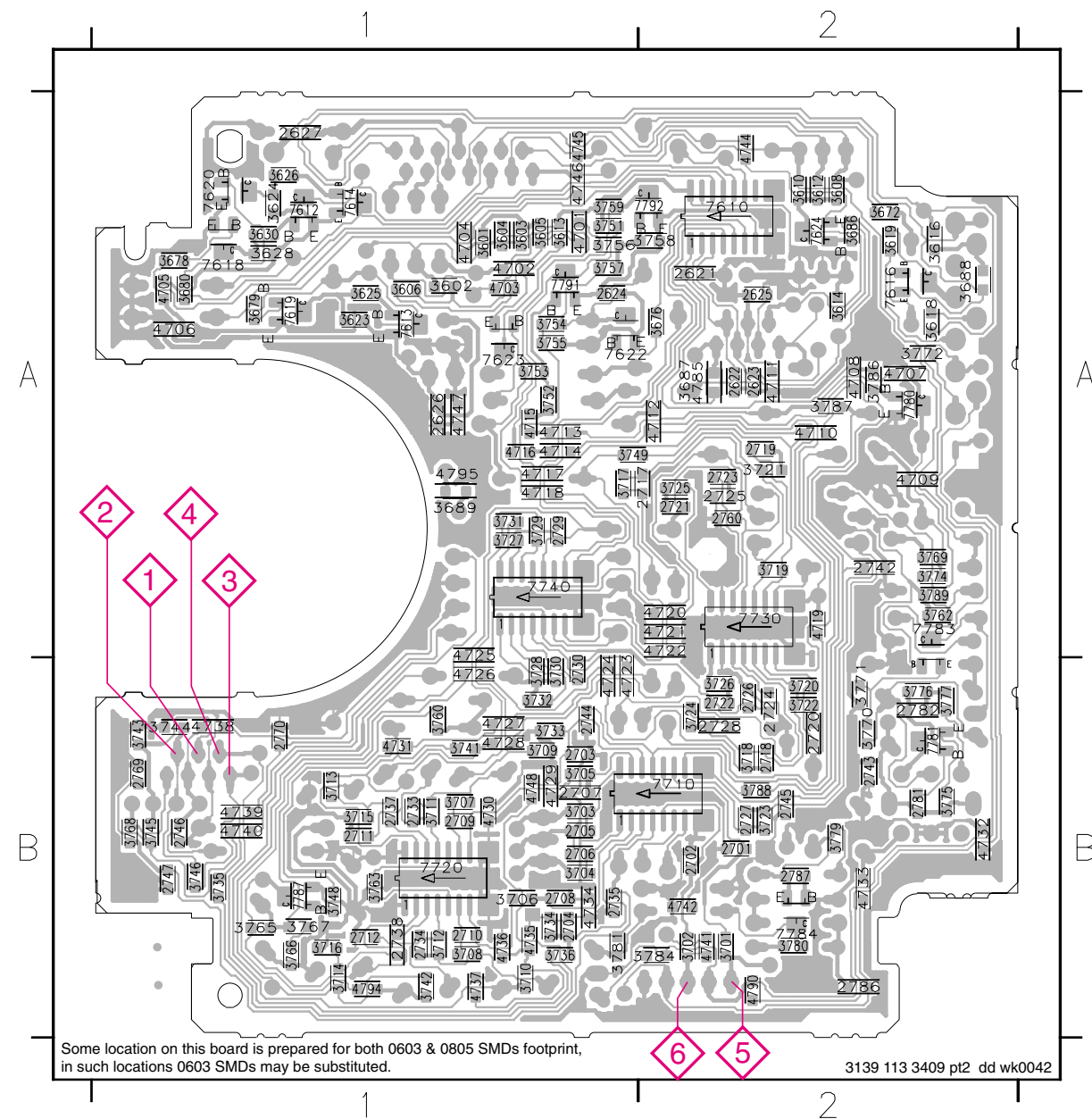
COMPONENT LAYOUT

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	A1	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



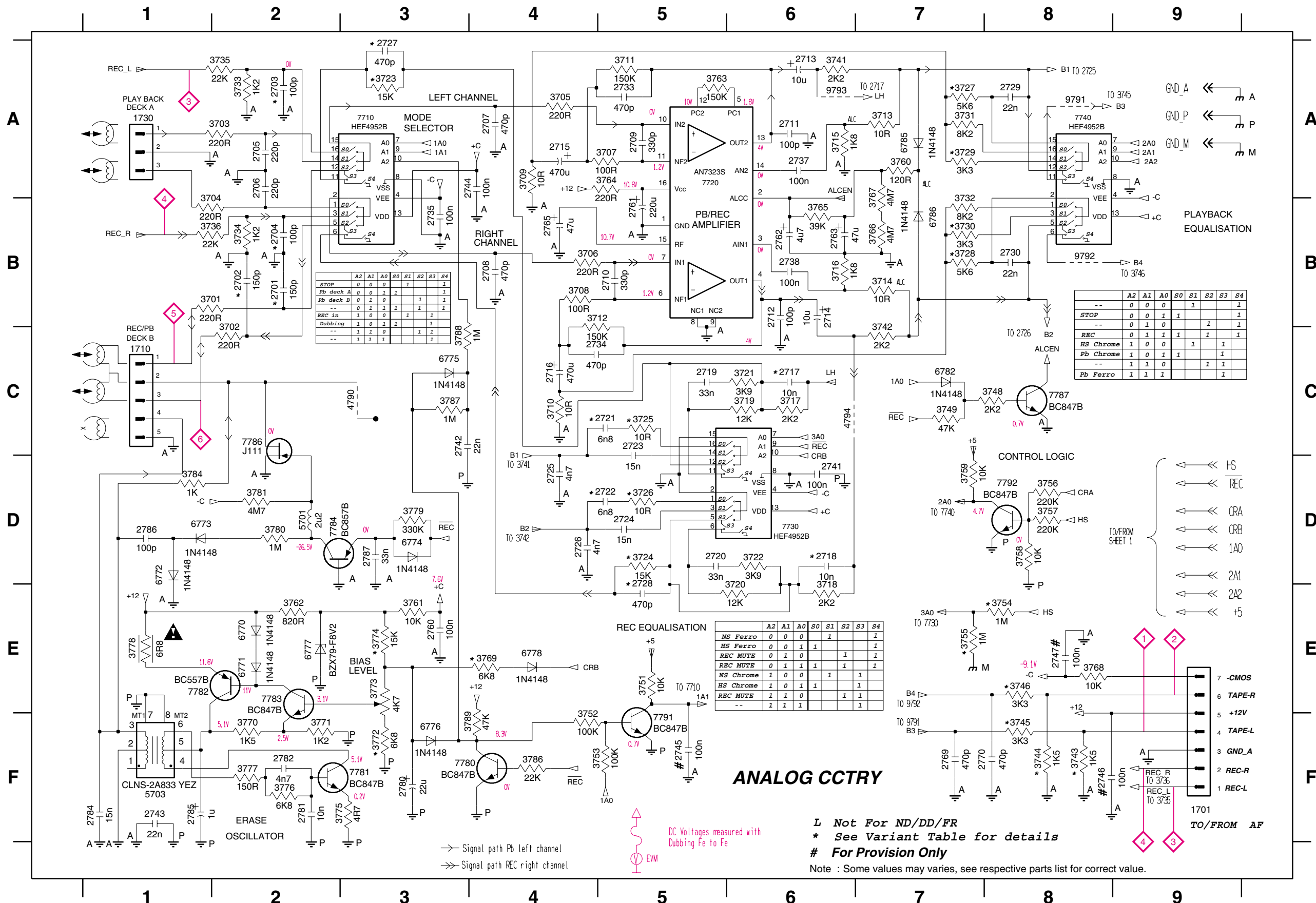
CHIP LAYOUT

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	3737	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	A1	4794	B1		
2722	B2	2787	B2	3686	A2	3723	B2	3755	A1	3788	B2	4725	B1	4795	A1		
2723	A2	3601	A1	3687	A2	3724	B2	3756	A1	3789	A2	4726	B1	7610	A2		



# 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	6787 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	6788 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	



STOP	A2	A1	A0	S0	S1	S2	S3	S4
Pb deck A	0	0	1	1	1	1	1	1
Pb deck B	0	1	1	1	1	1	1	1
REC In	1	0	0	1	1	1	1	1
Dubbing	1	1	0	1	1	1	1	1
--	1	1	1	1	1	1	1	1

STOP	A2	A1	A0	S0	S1	S2	S3	S4
--	0	0	0	1	1	1	1	1
REC	0	1	1	1	1	1	1	1
HS Chrome	1	0	0	1	1	1	1	1
Pb Chrome	1	0	1	1	1	1	1	1
--	1	1	0	1	1	1	1	1
Pb Ferro	1	1	1	1	1	1	1	1

REC EQUALISATION	A2	A1	A0	S0	S1	S2	S3	S4
NS Ferro	0	0	0	1	1	1	1	1
HS Ferro	0	0	1	1	1	1	1	1
REC MUTE	0	1	0	1	1	1	1	1
NS Chrome	1	0	0	1	1	1	1	1
HS Chrome	1	0	1	1	1	1	1	1
REC MUTE	1	1	0	1	1	1	1	1
--	1	1	1	1	1	1	1	1

## ANALOG CCTRY

L Not For ND/DD/FR  
 \* See Variant Table for details  
 # For Provision Only

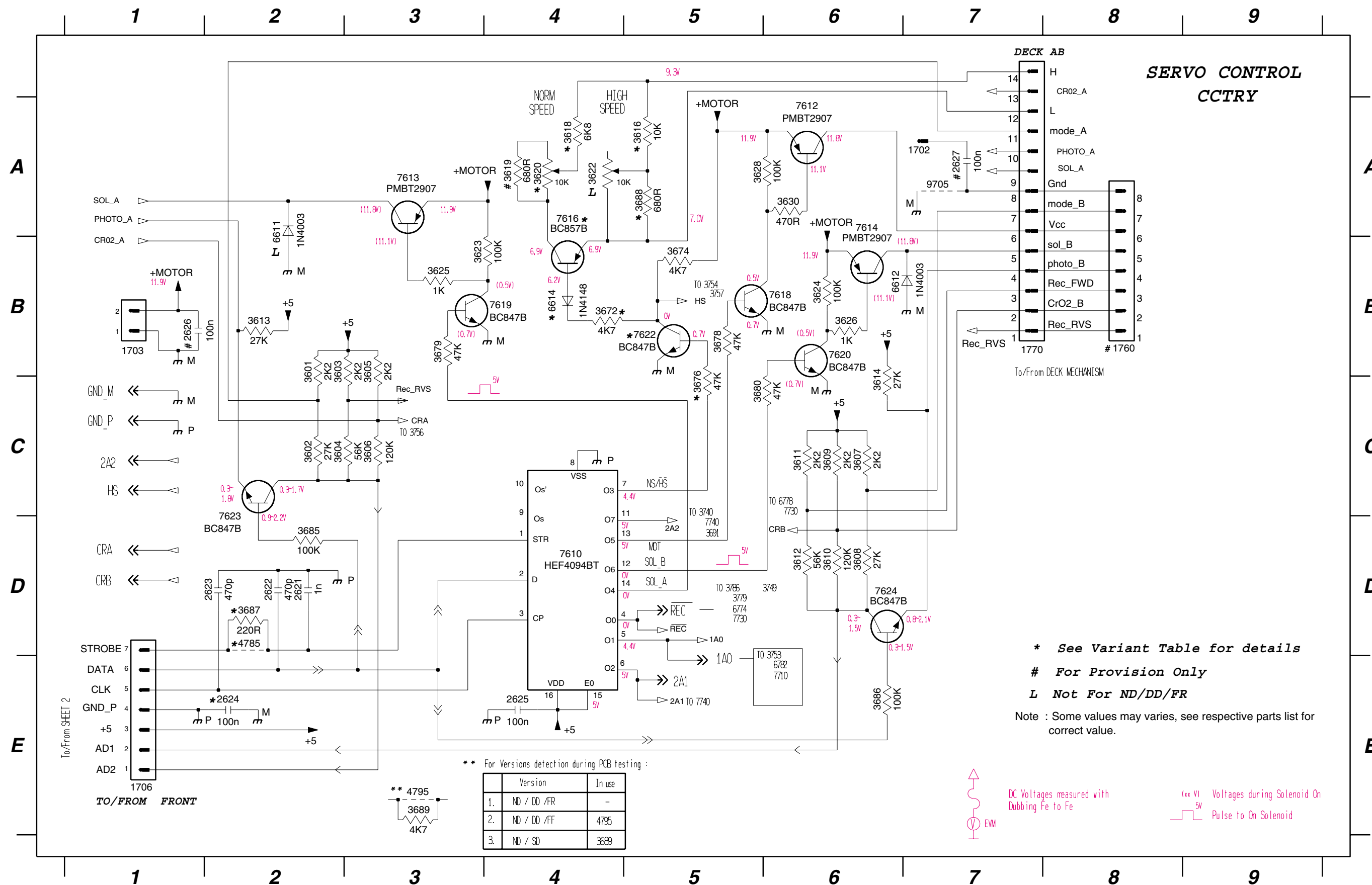
Note : Some values may varies, see respective parts list for correct value.

→ Signal path Pb left channel  
 ⇨ Signal path REC right channel

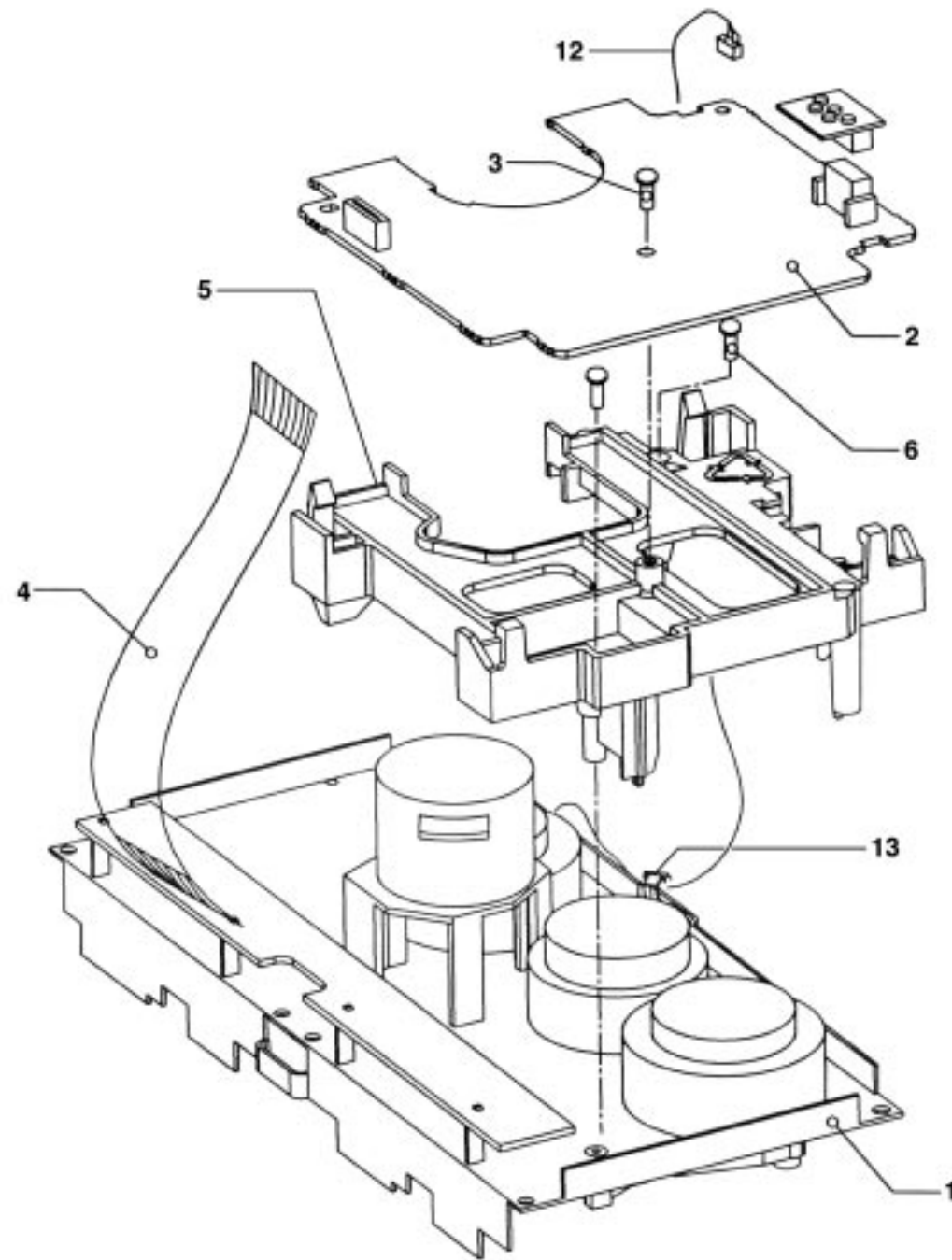
DC Voltages measured with  
 Dubbing Fe to Fe  
 EVM

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	6614 B4	7613 A3	7618 B6	7622 B5	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	7610 D4	7614 A6	7619 B4	7623 D2	





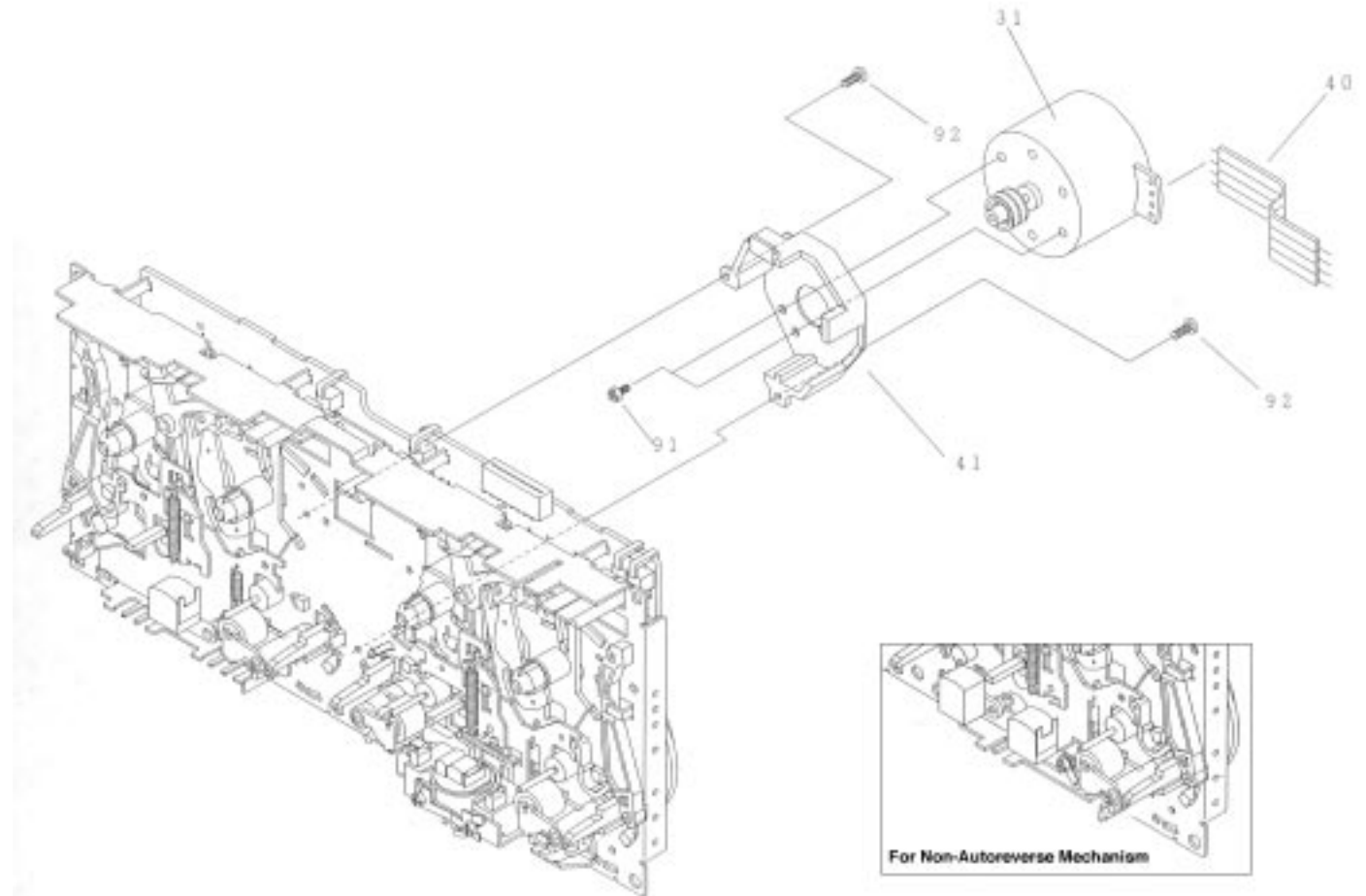


3139 118 77070 (incl. ...77080) dd wr226

**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.

**TAPE MECHANISM - MOTOR EXPLODED VIEW**

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

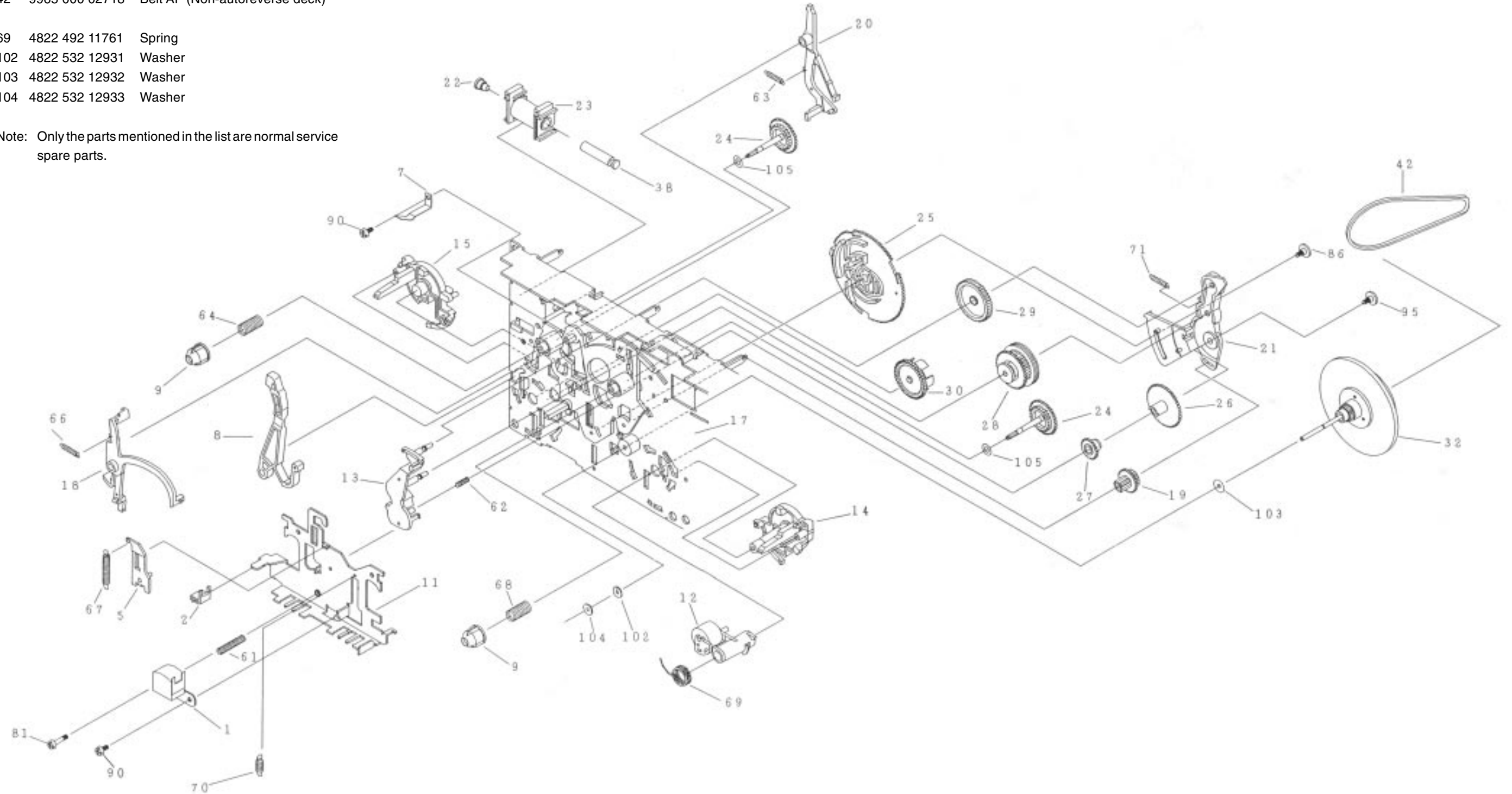
Note: Only the parts mentioned in this list are normal service spare parts.

**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.

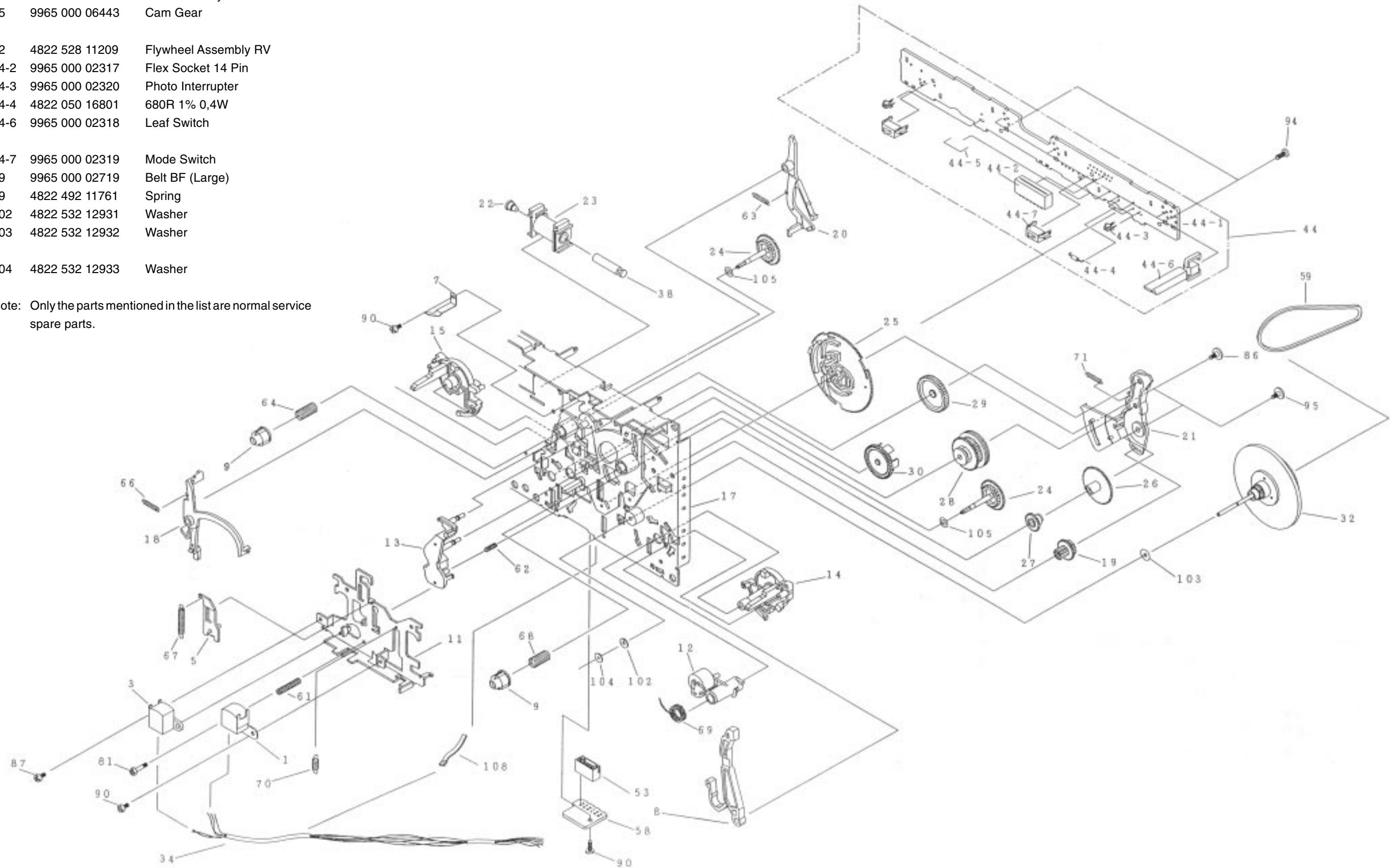


**TAPE MECHANISM B - RECORD/PLAYBACK (Non-Autoreverse version)**

**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.

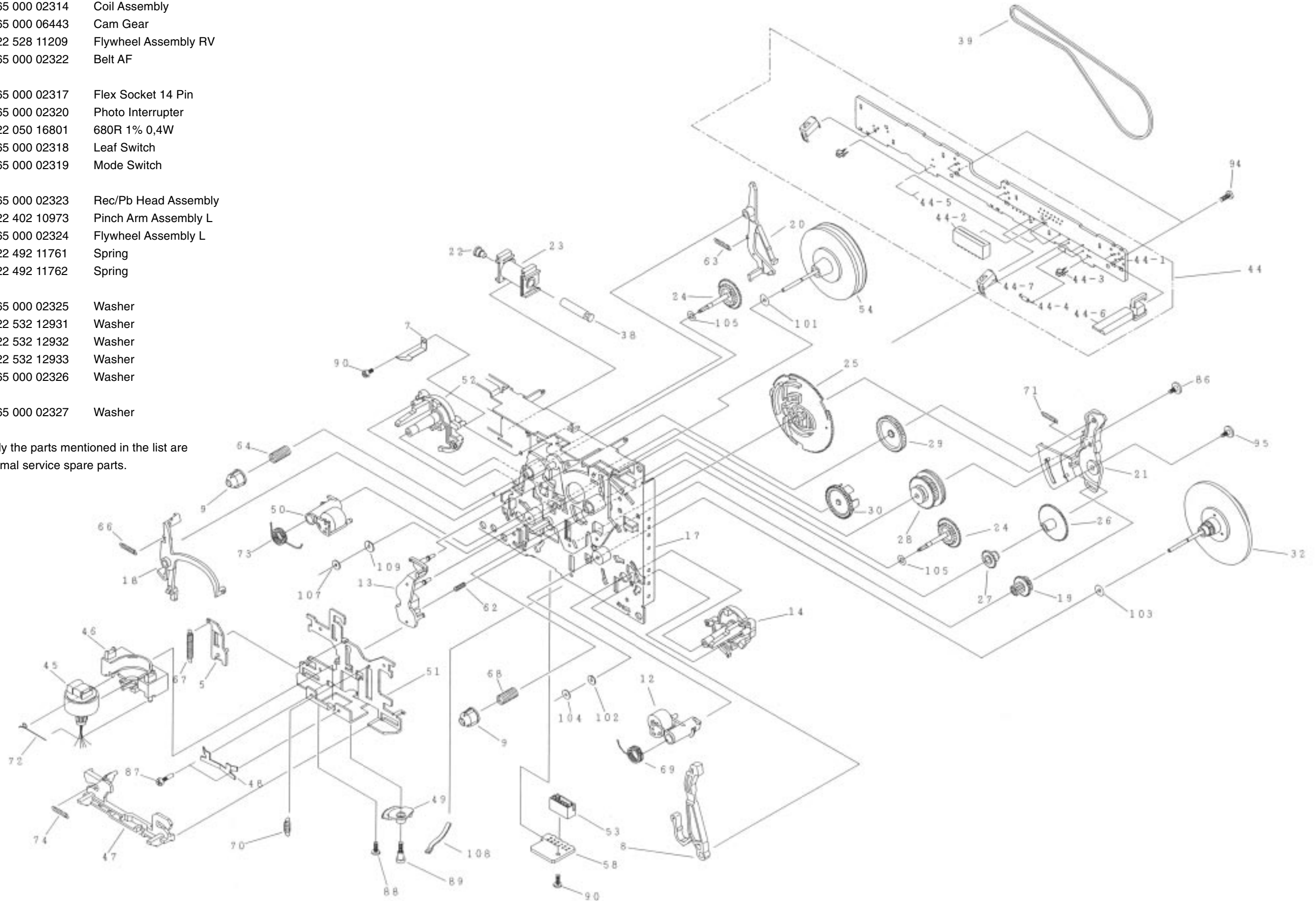


**TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)**

**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.





## 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

## ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

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	OR Jumper 0805
4702	482205120008	OR Jumper 0805
4703	482205120008	OR Jumper 0805
4704	482205120008	OR Jumper 0805
4705	482205120008	OR Jumper 0805

**ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD****RESISTORS**

4706	482205120008	OR Jumper 0805	6612	482213031878	1N4003G	
4707	482205120008	OR Jumper 0805	6614	482213030621	1N4148	Autoreverse
4708	482205120008	OR Jumper 0805	6770	482213030621	1N4148	
4709	482205120008	OR Jumper 0805	6771	482213030621	1N4148	
4710	482205120008	OR Jumper 0805	6772	482213030621	1N4148	
4711	482205120008	OR Jumper 0805	6773	482213030621	1N4148	
4712	482205120008	OR Jumper 0805	6774	482213030621	1N4148	
4713	482205120008	OR Jumper 0805	6775	482213030621	1N4148	
4714	482205120008	OR Jumper 0805	6776	482213030621	1N4148	
4715	482205120008	OR Jumper 0805	6777	482213034382	BZX79-F8V2	
4716	482205120008	OR Jumper 0805	6778	482213030621	1N4148	
4717	482205120008	OR Jumper 0805	6782	482213030621	1N4148	
4718	482205120008	OR Jumper 0805	6785	482213030621	1N4148	
4719	482205120008	OR Jumper 0805	6786	482213030621	1N4148	
4720	482205120008	OR Jumper 0805				
4721	482205120008	OR Jumper 0805				
4722	482205120008	OR Jumper 0805				
4723	482205120008	OR Jumper 0805				
4724	482205120008	OR Jumper 0805				
4725	482205120008	OR Jumper 0805				
4726	482205120008	OR Jumper 0805				
4727	482205120008	OR Jumper 0805				
4728	482205120008	OR Jumper 0805				
4729	482205120008	OR Jumper 0805				
4730	482205120008	OR Jumper 0805				
4731	482205120008	OR Jumper 0805				
4732	482205120008	OR Jumper 0805				
4733	482205120008	OR Jumper 0805				
4734	482205120008	OR Jumper 0805				
4735	482205120008	OR Jumper 0805				
4736	482205120008	OR Jumper 0805				
4737	482205120008	OR Jumper 0805				
4738	482205120008	OR Jumper 0805				
4739	482205120008	OR Jumper 0805				
4740	482205120008	OR Jumper 0805				
4741	482205120008	OR Jumper 0805				
4742	482205120008	OR Jumper 0805				
4744	482205120008	OR Jumper 0805				
4745	482205120008	OR Jumper 0805				
4746	482205120008	OR Jumper 0805				
4748	482205120008	OR Jumper 0805				
4785	482205120008	OR Jumper 0805 only for Ferro				
4790	482205120008	OR Jumper 0805				
4794	482205120008	OR Jumper 0805				
4795	482205120008	OR Jumper 0805				

**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.

**COILS & FILTERS**

5701	482215711477	Coil 2,2 $\mu$ H 5%
5703	482215620946	Osc Coil 100kHz

**DIODES**

6611	482213031878	1N4003G
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# **3CDC-LLC-MCD1**

## **(3 Disc Carousel Changer)**

Layout stage .3

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## Service hints

### CAUTION

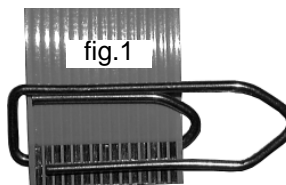
**CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE**

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

**ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.**

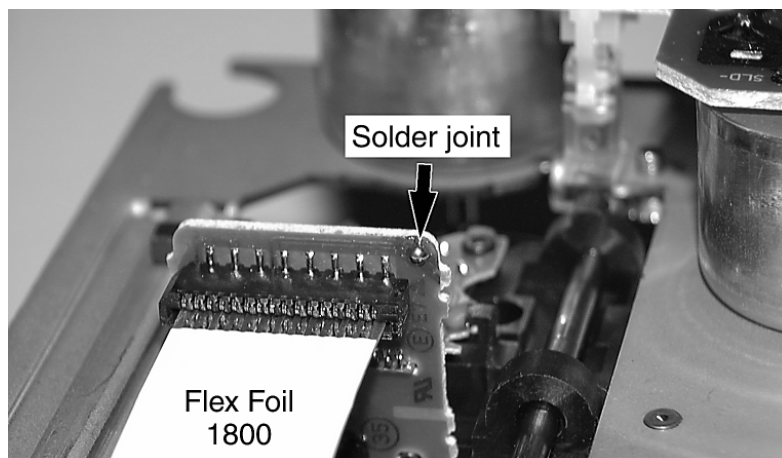
The following steps have to be done when replacing the CD mechanism:

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



**Attention:** The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.

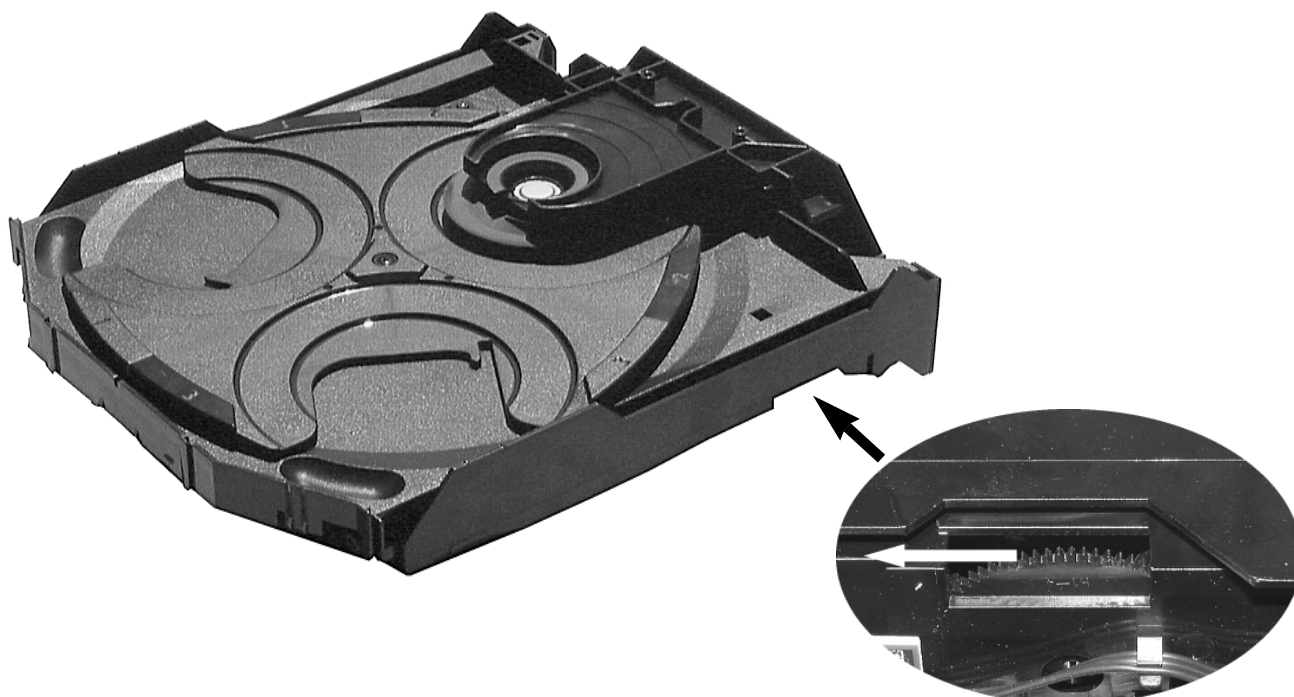
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



### Emergency open

In case of a Supply fault, the tray can be opened manually.

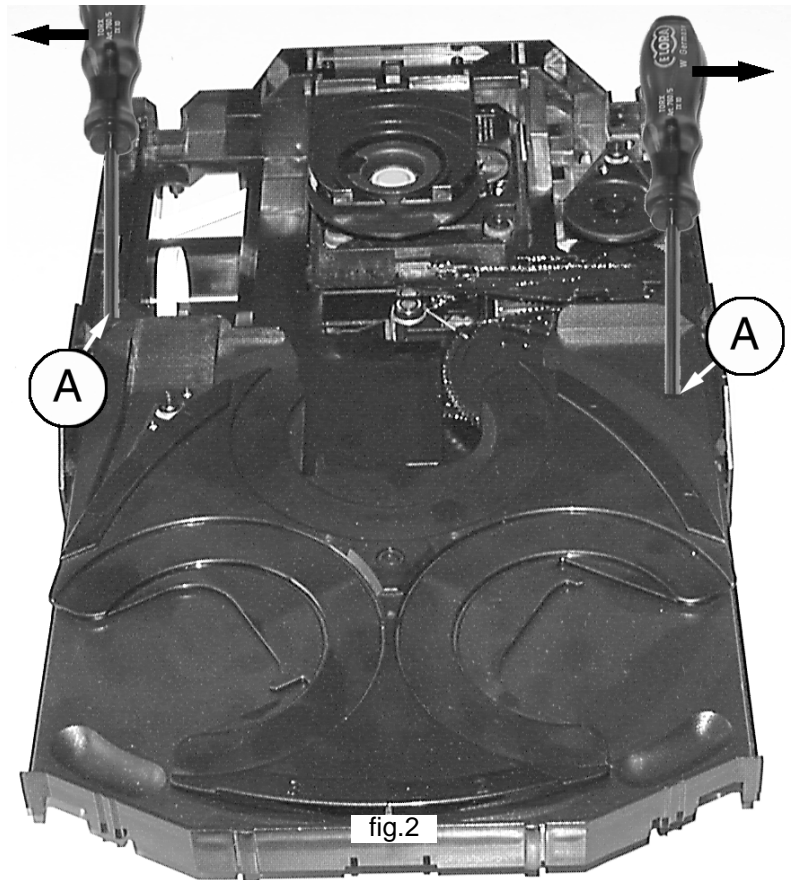
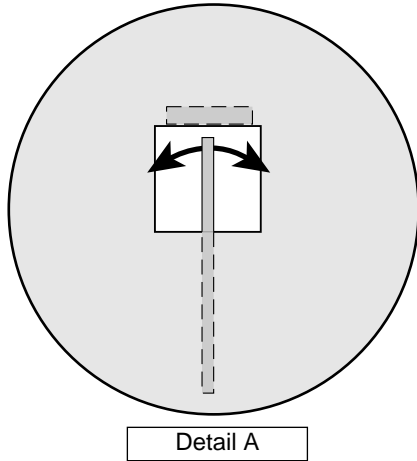
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



## Service hints

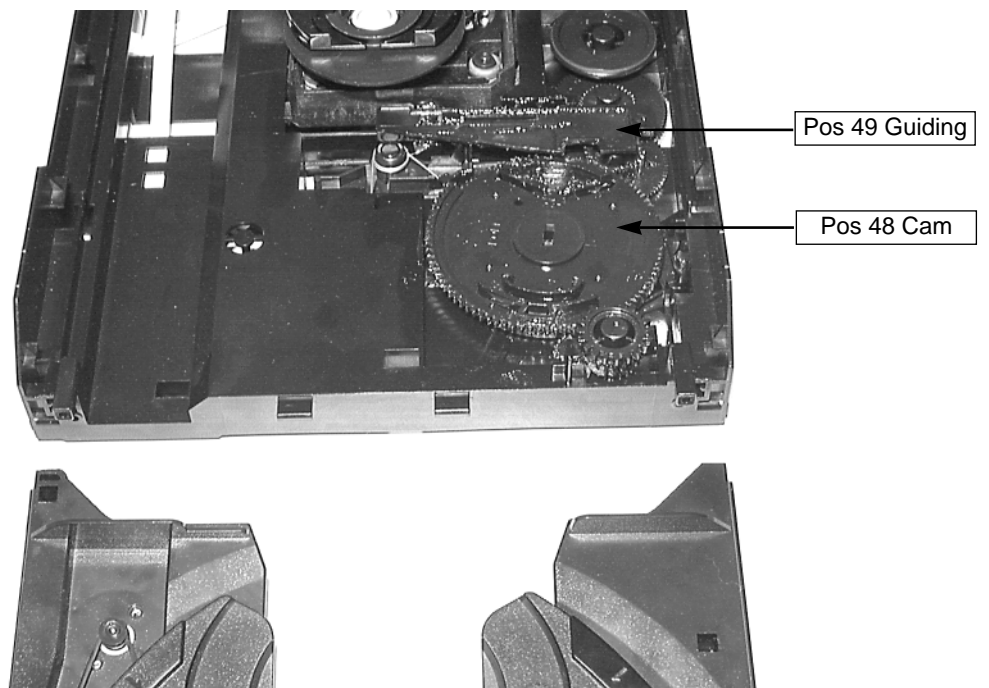
### Dismantling of Tray

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

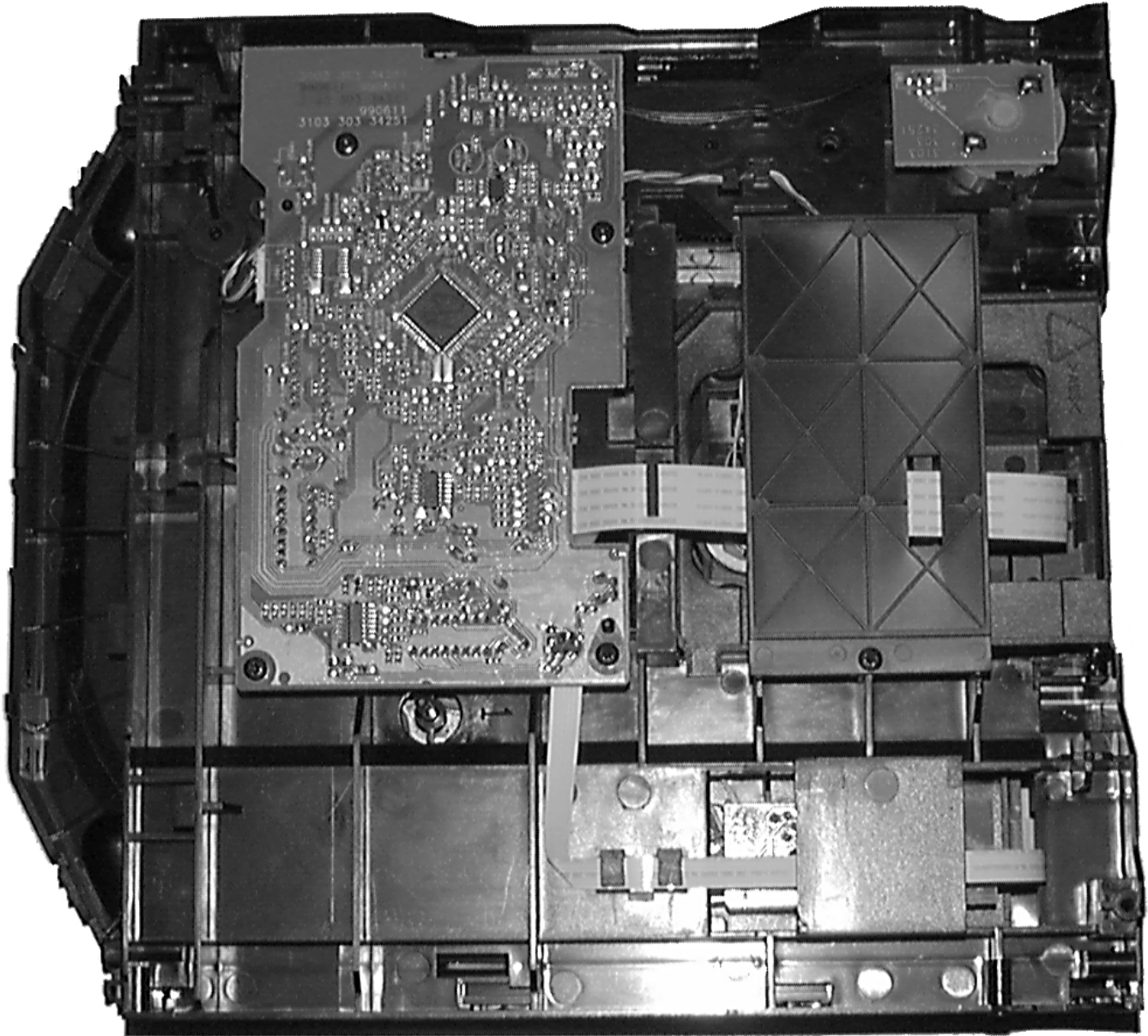


### Assembling of Tray

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.

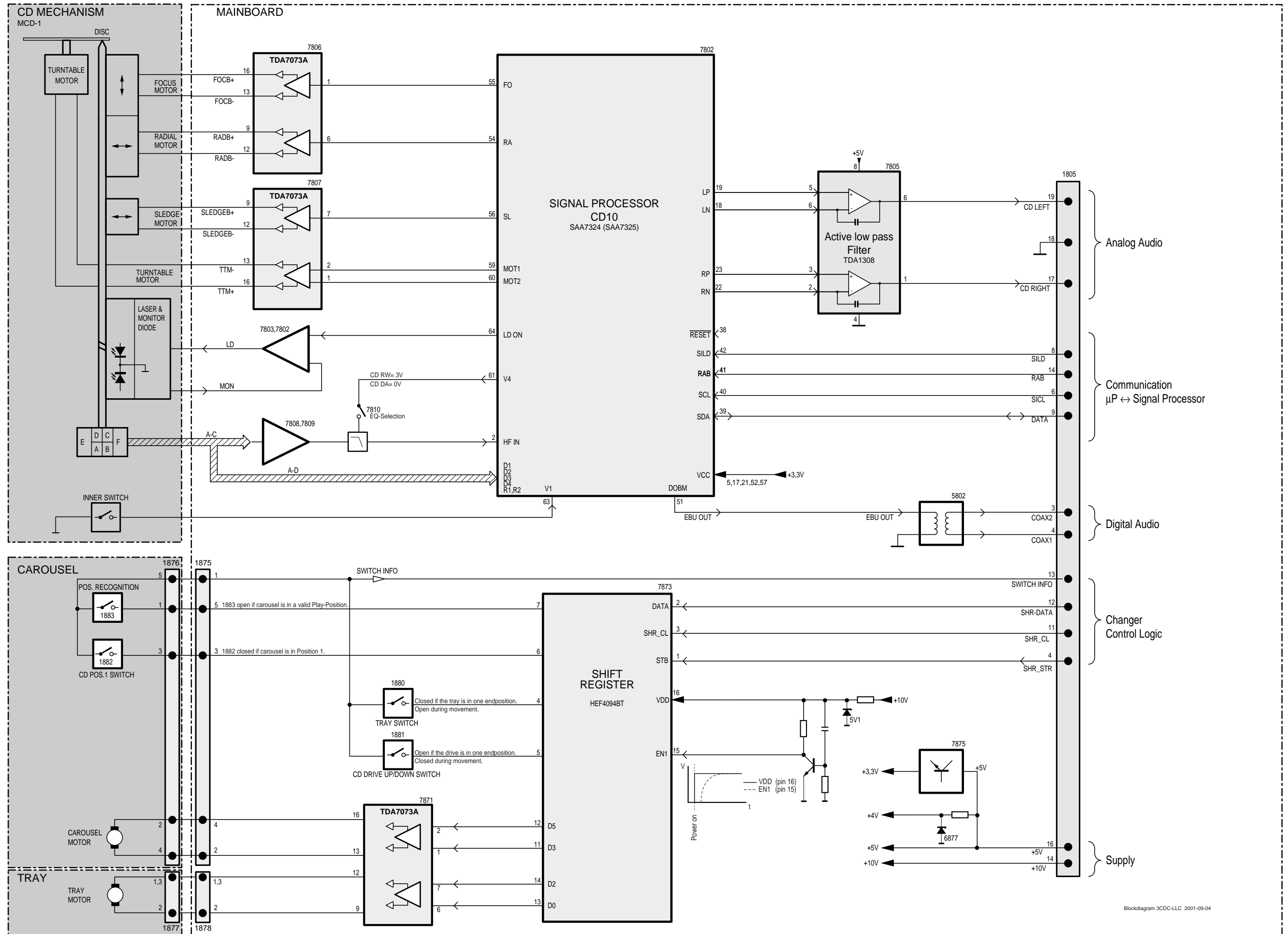


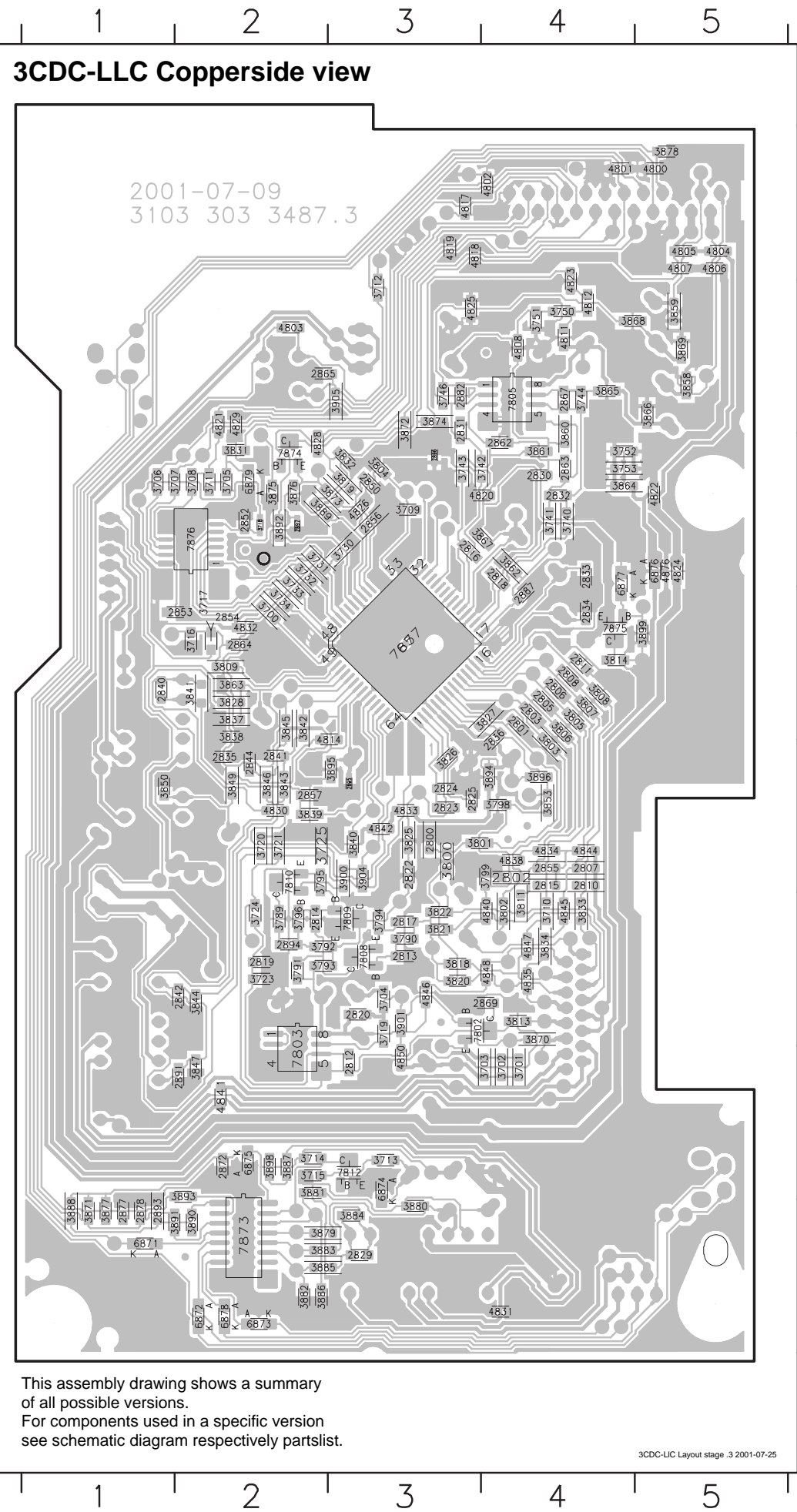
**Service Position**





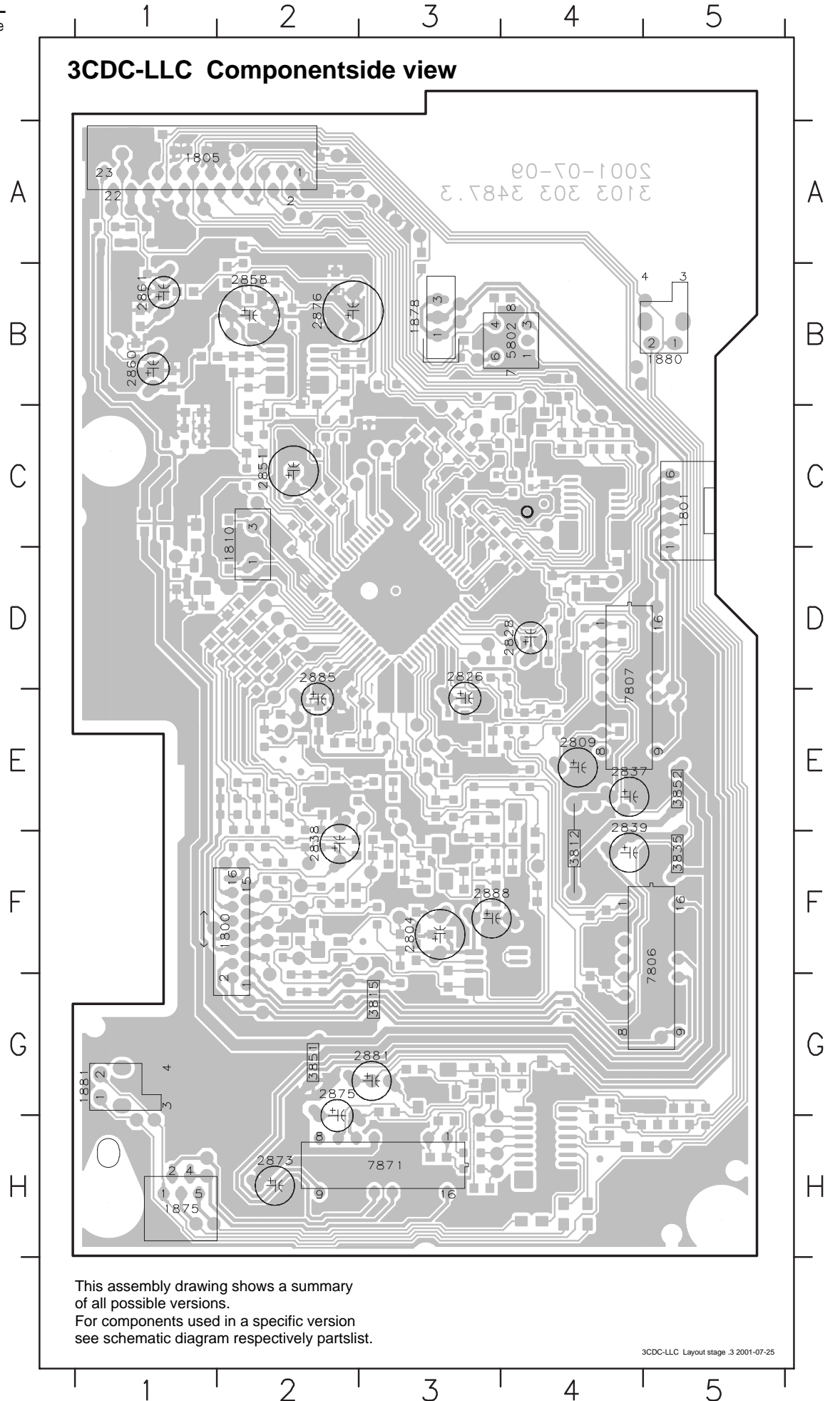
# BLOCK DIAGRAM 3CDC-LLC-MCD1



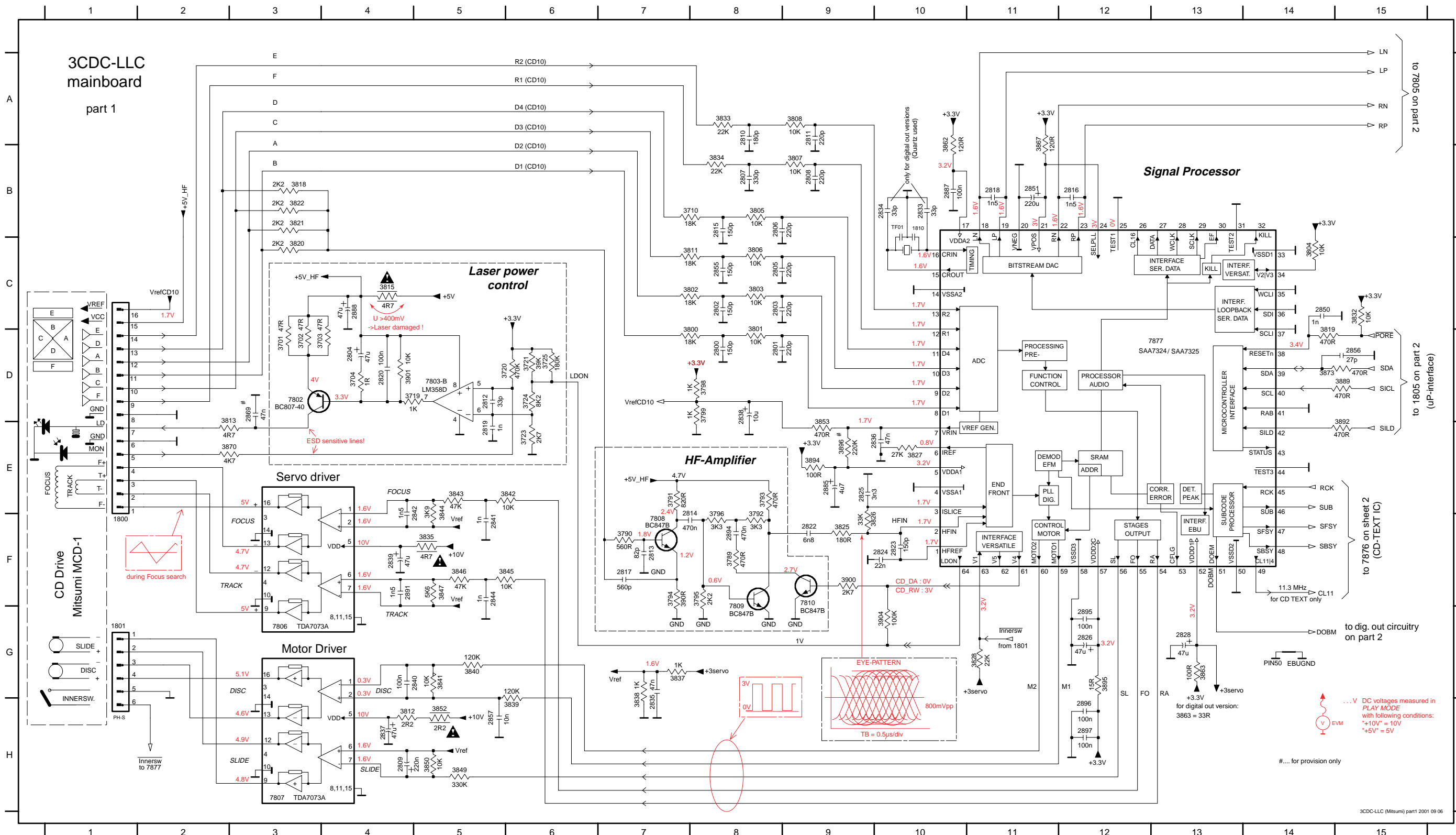


### Mapping

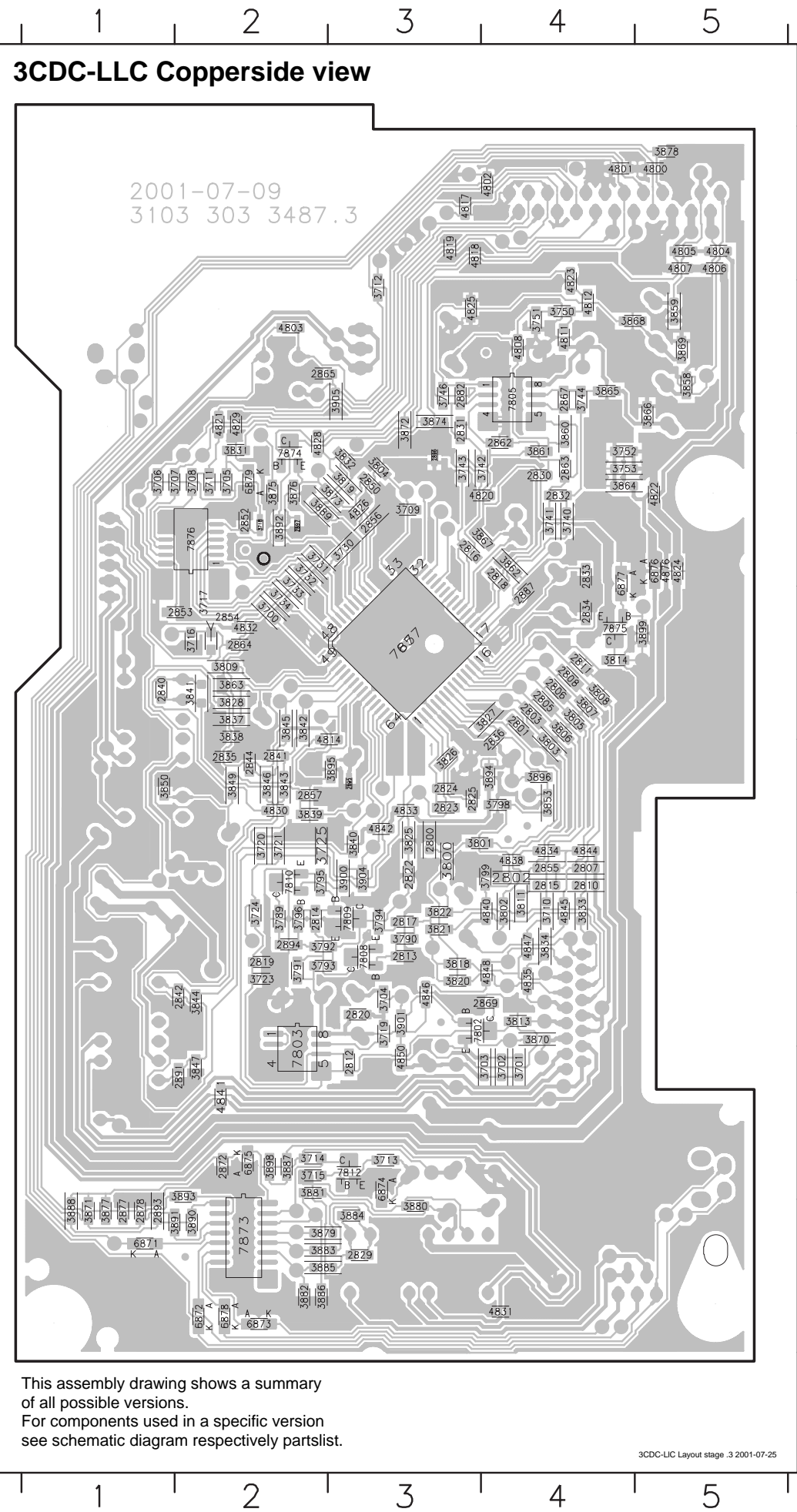
Copperside		Componentside	
2800 E3	3741 C4	3889 C2	1800 F2
2801 D4	3742 C4	3890 H2	1801 C5
2802 E4	3743 C3	3891 H2	1805 A2
2803 D4	3744 B4	3892 C2	1810 C2
2805 D4	3746 B3	3893 G2	1875 H1
2806 D4	3750 B4	3894 E4	1878 B3
2807 E4	3751 B4	3895 E3	1880 B5
2808 D4	3752 C4	3896 E4	1881 G1
2810 E4	3753 C4	3898 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		



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	

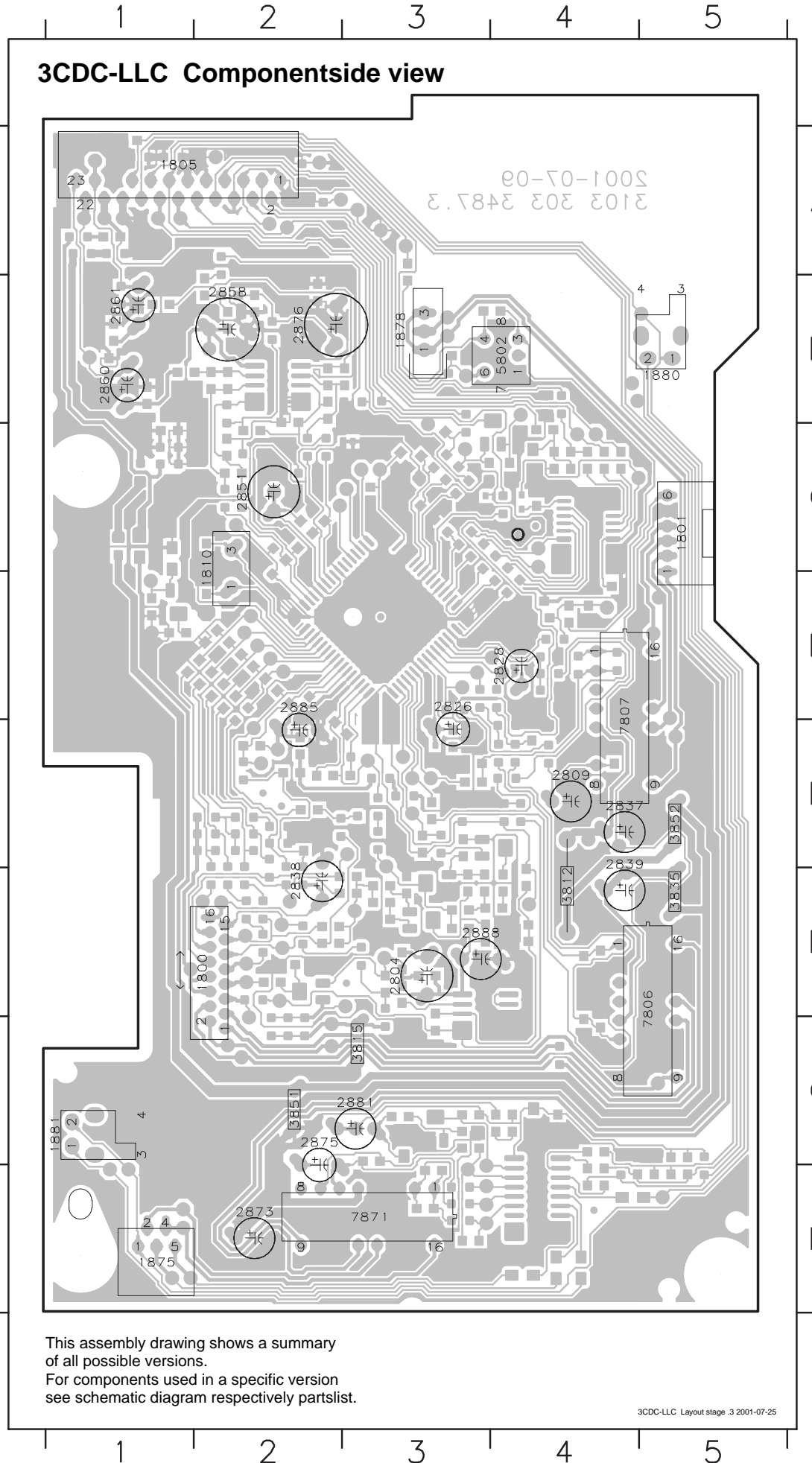




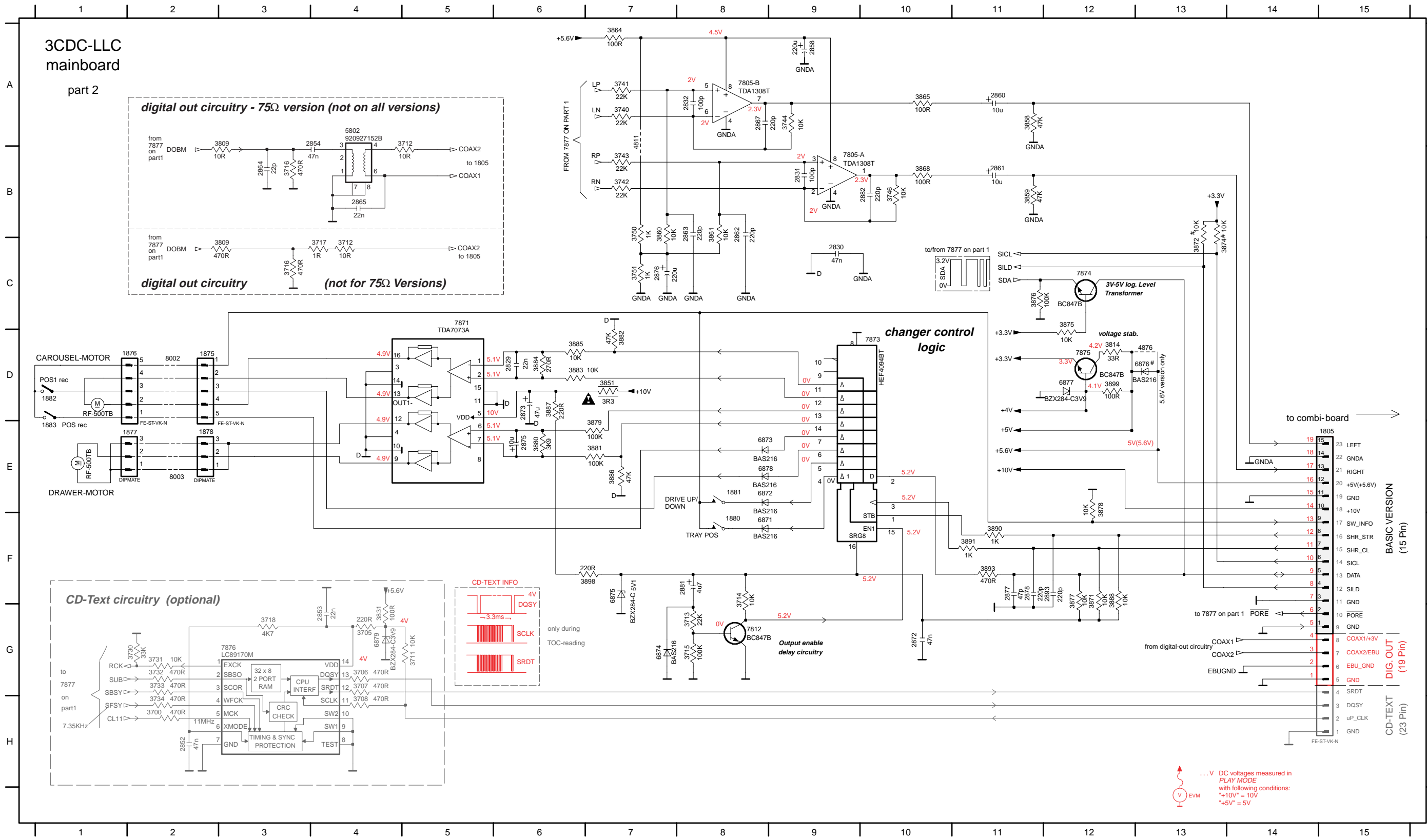


Mapping

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		



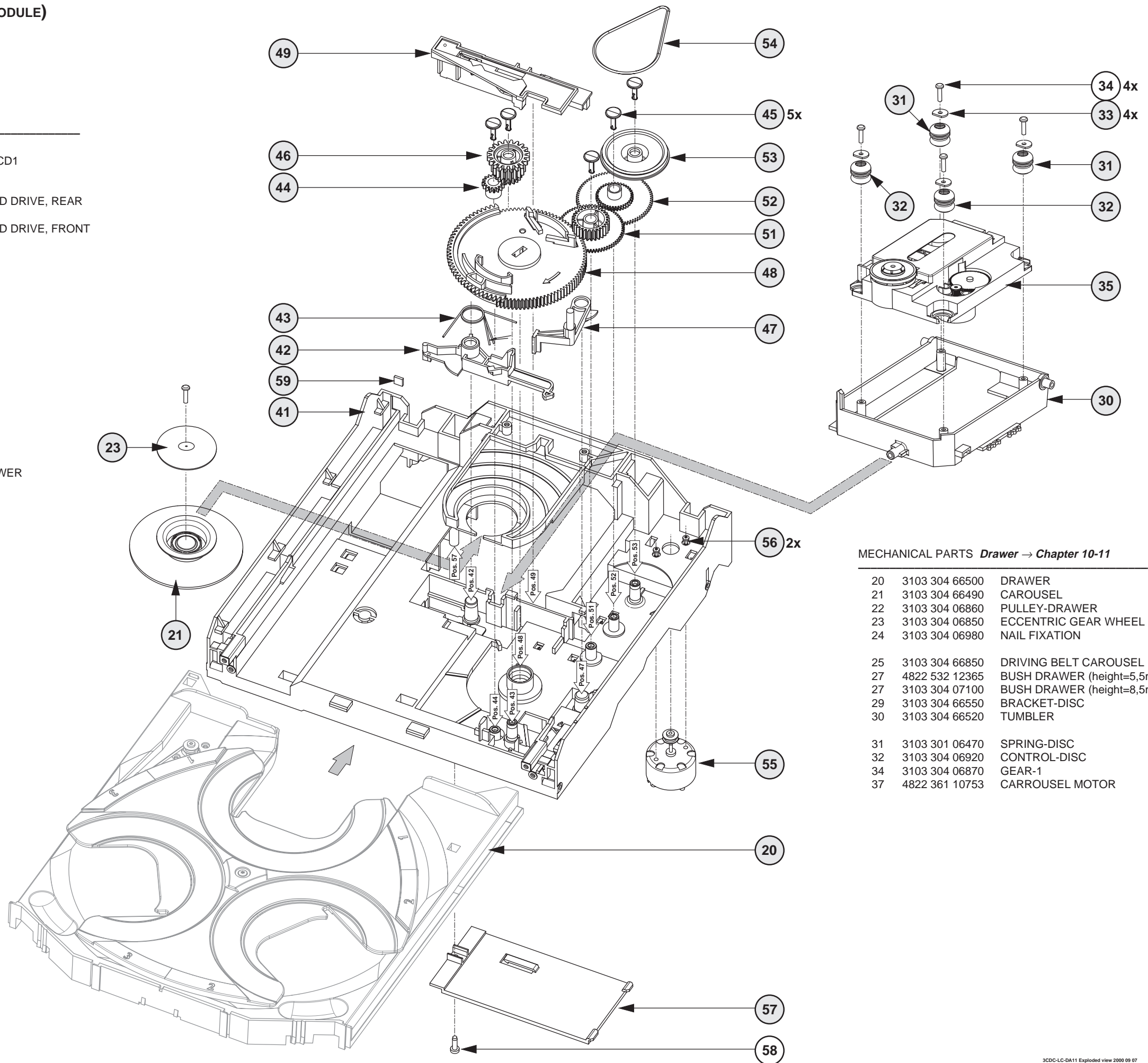
1805 E15	2830 C9	2858 A9	2865 C4	2877 F11	3705 G4	3713 G8	3730 G2	3741 A7	3751 C7	3851 D7	3865 A10	3874 C13	3880 E6	3886 E7	3898 F7	4876 D13	6875 F7	7805-B A8	7876 G3	MP726 D8	MP804 G14	MP811 F14	MP832 G9	MP863 C11	MP871 D6	MP888 G5	MP898 E13	
1875 D2	2831 B9	2860 A11	2867 A8	2878 F11	3706 G4	3714 F8	3731 G2	3742 B7	3752 A6	3858 A11	3866 A10	3875 C12	3881 E7	3887 D6	3899 D12	5802 B4	6876 D13	7812 G8	7812 G8	MP721 C8	MP740 H14	MP805 F13	MP822 E3	MP865 D11	MP874 D12	MP889 G5	MP899 E14	
1878 E2	2832 A8	2861 B11	2872 G10	2881 F8	3707 G4	3715 G8	3732 G2	3743 B7	3753 A6	3859 B11	3868 B10	3876 C11	3882 D7	3888 F12	3905 C5	6871 F8	6877 D12	7871 C5	7871 C5	MP722 E8	MP742 G14	MP806 F13	MP823 E3	MP835 F14	MP866 E8	MP881 G2	MP890 B3	
1880 F8	2852 H2	2862 B8	2873 D6	2882 B10	3708 H4	3716 B3	3733 G2	3744 A9	3809 B2	3860 B7	3869 B10	3877 F12	3883 D6	3890 F11	4803 B4	6872 E8	6878 E8	6878 E8	7873 D10	7873 D8	MP723 D8	MP742 G14	MP807 F14	MP824 D4	MP854 A13	MP867 E8	MP882 G2	MP891 B5
1881 E8	2853 G4	2863 B8	2875 E6	2883 F12	3711 G5	3717 B3	3734 H2	3746 B10	3814 D12	3861 B8	3871 F12	3878 E12	3884 D6	3891 F11	4811 A7	6873 E8	6879 G4	7874 C12	7874 C12	MP724 D8	MP801 E12	MP808 F13	MP825 D4	MP856 E14	MP868 F8	MP886 G3	MP892 B5	
2829 D6	2854 B3	2864 B3	2876 C7	3700 H2	3712 B4	3718 G3	3740 A7	3750 B7	3831 G4	3864 A7	3872 C13	3879 D7	3885 D6	3893 F11	4812 B7	6874 G7	7805-A B9	7875 D12	7875 D12	MP725 D8	MP803 F10	MP810 F13	MP830 A7	MP857 B13	MP869 C12	MP887 H5	MP897 E13	



**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



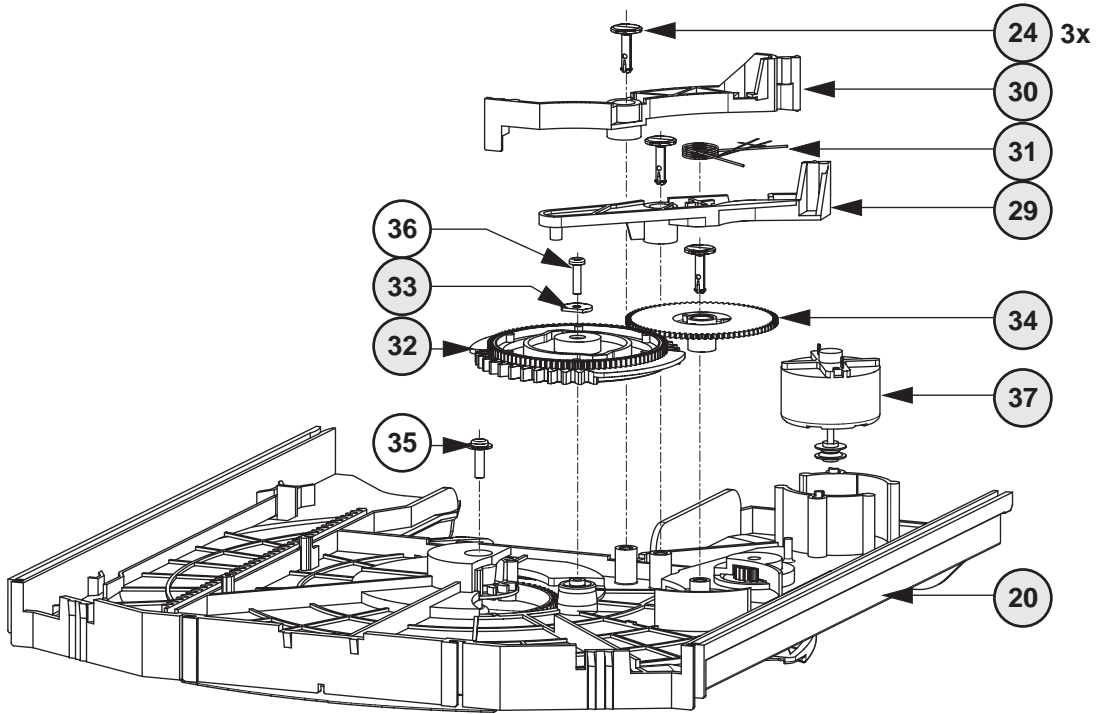
**MECHANICAL PARTS Drawer → Chapter 10-11**

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

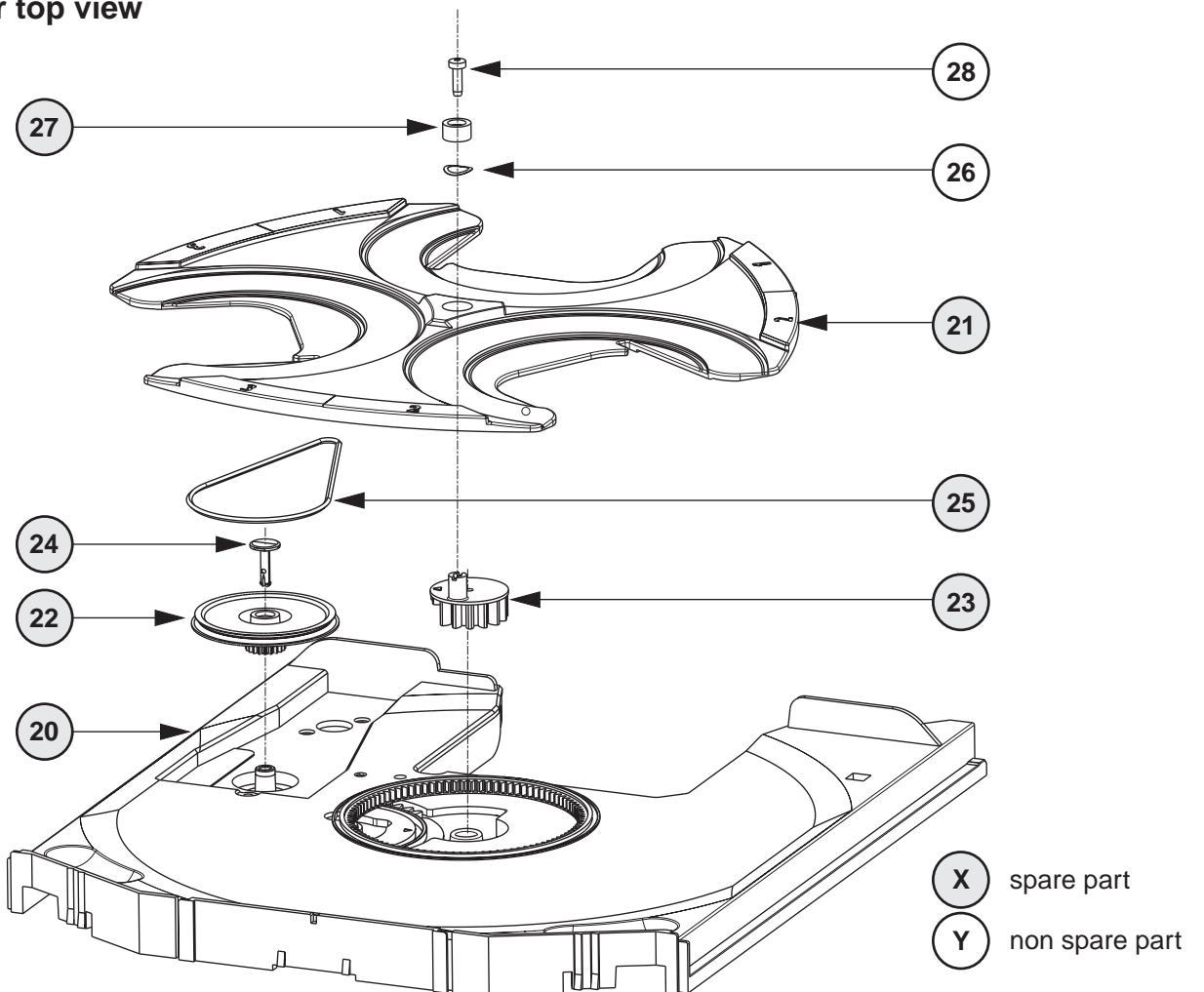
- X** spare part
- Y** non spare part



**Drawer bottom view**



**Drawer top view**



**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
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4842	© 4822 051 20008			CHIP JUMPER 0805
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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**


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 1810 4822 242 73557 CERAMIC RES. 8,46MHz
**DIODES**


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 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**


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 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**


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 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.

# COMBI BOARD

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## Brief introduction of the Combi Board

### A. TRANSFORMER PRIMARY PART

Transformer Primary Circuit provide connection for AC mains supply and primary wires of transformer.

### B. POWER SUPPLY PART

Power Supply Circuit consists of rectifiers, capacitive filters and voltage regulators. Regulated voltage include +5V6, +LED, +12A, +12M, -32V, PWDN. The +C supply to the power amplifier is not regulated. F1-F2 is the ac supply voltage to the FTD Display filament.

### C. SOURCE SELECT & AMPLIFIER PART

#### a) SHIFT REGISTER (AF CONTROL)

This shift register deliver commands from the  $\mu$ P to control the AF functions which include source selection (A0 & A1 control lines), DSC modes, DBB, IS and CD\_STBY. Other control lines such as MUTE, AMPON, STBY and PWM are coming directly from the  $\mu$ P on the Front board.

#### b) SOURCE SELECTION

One of the 4 sources, namely AUX, TAPE, TUNER, CD, can be selected via A0 & A1 lines which control the IC 7501 (HEF4052BT). Karaoke mic. mixing is connected to the selected source before the signal is amplified with a buffer amplifier (Tr 7503 & 7504). The source signal is then split into recording path (for recording on tape) and main signal path (to the PWM volume control).

#### c) PWM VOLUME CONTROL

The discrete volume control makes use of 4 Transistors 7505, 7506, 7507 & 7508 (ON4986 or selected BC557B) and PWM control signal from  $\mu$ P. For good performance transistors for the left and right channels should be paired for gain characteristics.

#### d) SOUND FEATURES

Sound Features include the DBB, IS and 4 DSC modes. The sound features are realised with a hex-inverter IC 7530 (HEF4069UBT) as analog buffer/amplifier and transistors as electronic switches controlled by the shift registers (AF control).

#### e) POWER AMPLIFIER

IC 7391 (AN7125) is used as power amplifier.

#### f) CD\_STBY CONTROL

This Transistor 7401 (BC337-25) switches on the supply +CD supply (derived from +12A) to CD servo control, HF circuit and the laser light pen on the CD Module during the CD mode only.

#### g) MATRIX SURROUND OUTPUT

The matrix surround feature is provided on board. This feature is only optional on certain type version.

### D. KARAOKE PART

This simple Karaoke consists of a 1-mic. mono amplifier using discrete components. It has a level control using a rotary potmeter. This feature is available for some version only.

### E. HEADPHONE PART

The headphone output is derived from the power amplifier output after the attenuation resistors which are tailored to deliver 18mW output power into a 32 ohm headphone.

### F. CDC KEY PART

The CDC key buttons and LEDs are provided on this board.



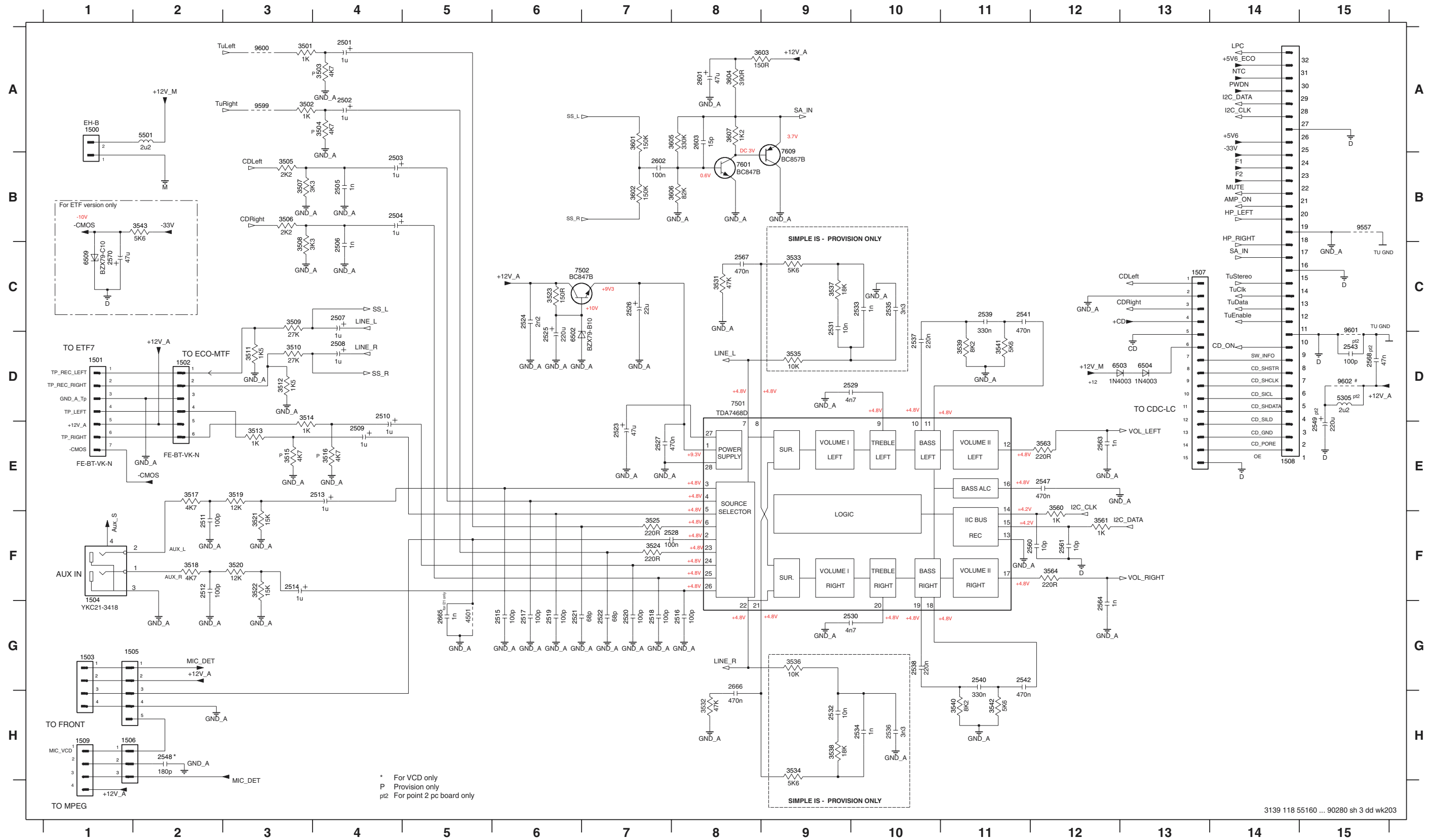






# SOURCE SELECTION CIRCUIT

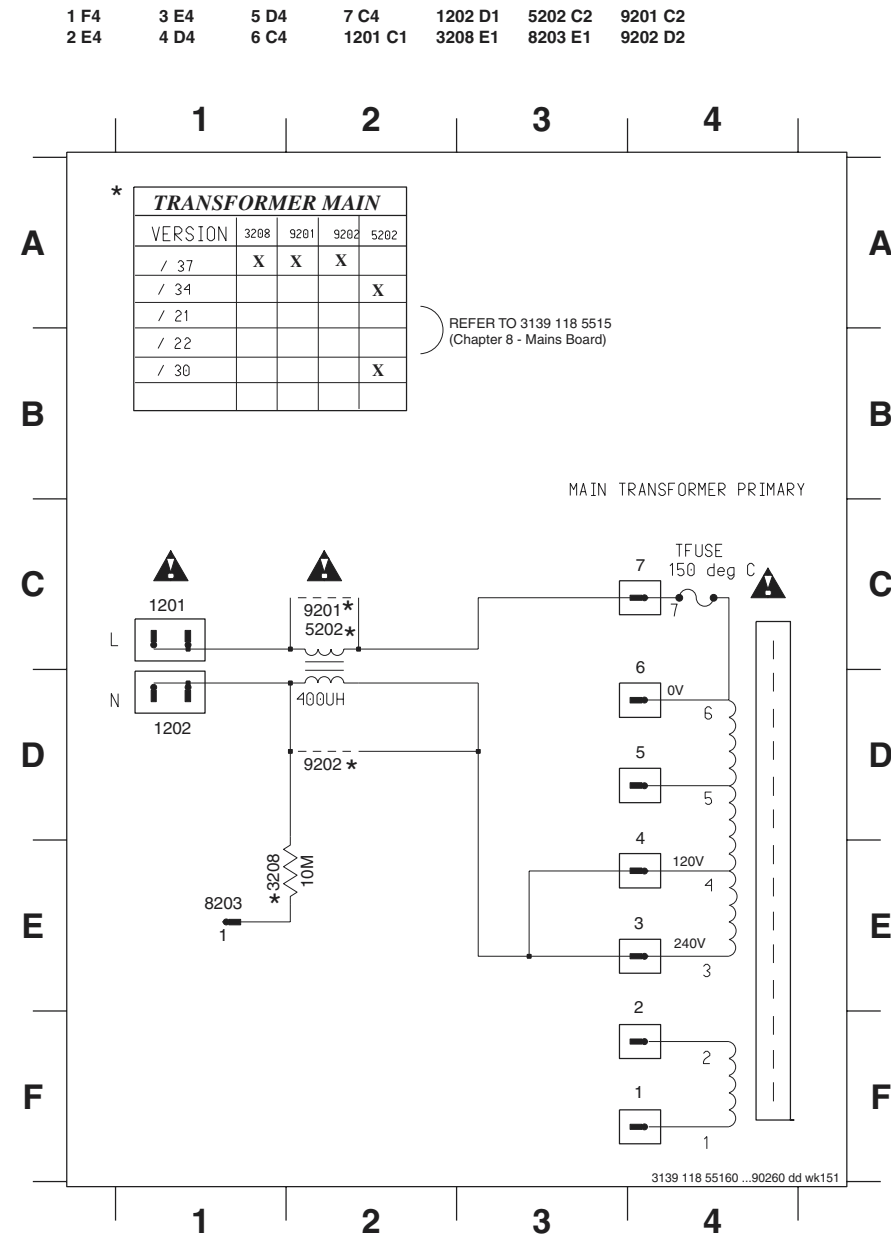
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C4 E15	C11 A3	1502 D2	1508 E14	2505 B4	2511 F2	2517 G6	2523 E7	2529 D9	2535 C10	2541 C11	2560 F12	2570 C1	2666 G8	3506 B3	3512 E3	3518 F2	3524 F7	3535 D9	3541 D11	3564 F12	3606 B8	6503 D12	7609 B9	9603 E15
C5 D15	C13 A3	1503 G1	1509 H1	2506 C4	2512 F2	2518 G7	2524 C6	2530 G9	2536 H10	2542 G11	2561 F12	2601 A8	3507 B3	3513 E3	3519 E3	3525 F7	3536 G9	3542 H11	3561 A7	3607 A8	6504 D13	7609 B9	9603 E15	
C6 C15	C14 C15	1504 F1	2501 A4	2507 C4	2513 E4	2519 G6	2525 D6	2531 C9	2537 D10	2543 D15	2562 E12	2601 A8	3508 C3	3514 D3	3520 F3	3531 C8	3537 C9	3543 B2	3602 B7	4501 G5	6509 C1	7501 D8	9599 A3	
C7 C15	T_E D14	1505 G2	2502 A4	2508 D4	2514 F3	2520 G7	2526 C7	2532 H9	2538 G11	2547 E12	2564 G12	2602 B7	3509 C3	3515 E3	3521 H9	3532 H9	3538 H9	3544 B2	3603 A9	5305 D15	6501 D8	7501 D8	9600 A3	
C8 C15	1500 A1	1506 H1	2503 B4	2509 E4	2515 G6	2521 G6	2527 E7	2533 C10	2539 C11	2548 H2	2567 C8	2603 A8	3504 A4	3510 D3	3516 E4	3522 F3	3533 C9	3539 D11	3561 F12	3604 A8	5501 A2	6502 C7	7501 D8	9601 D15



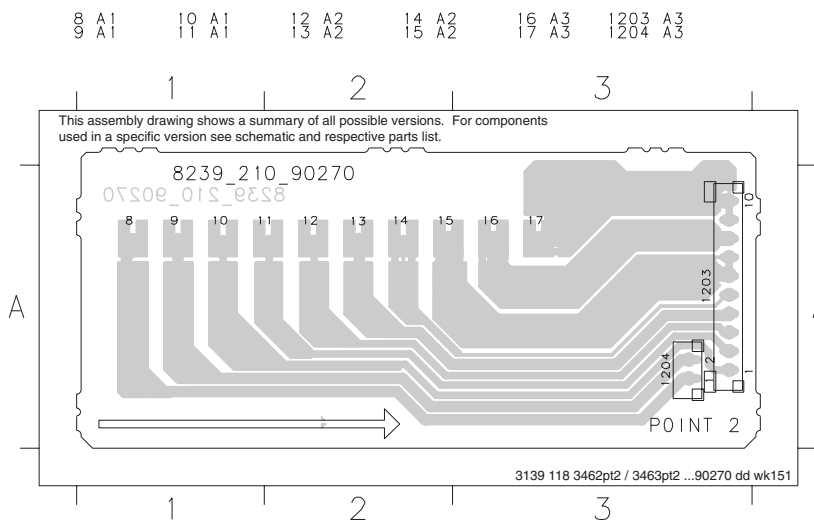
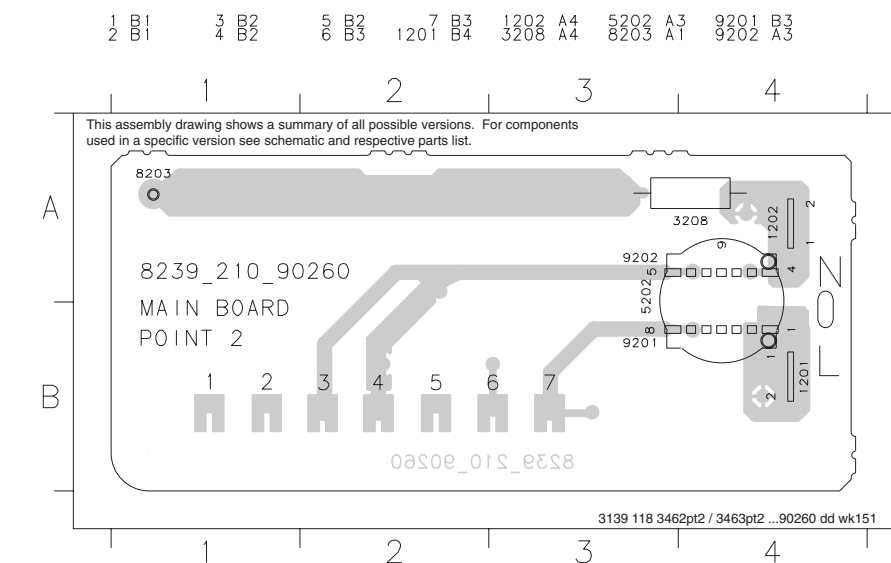
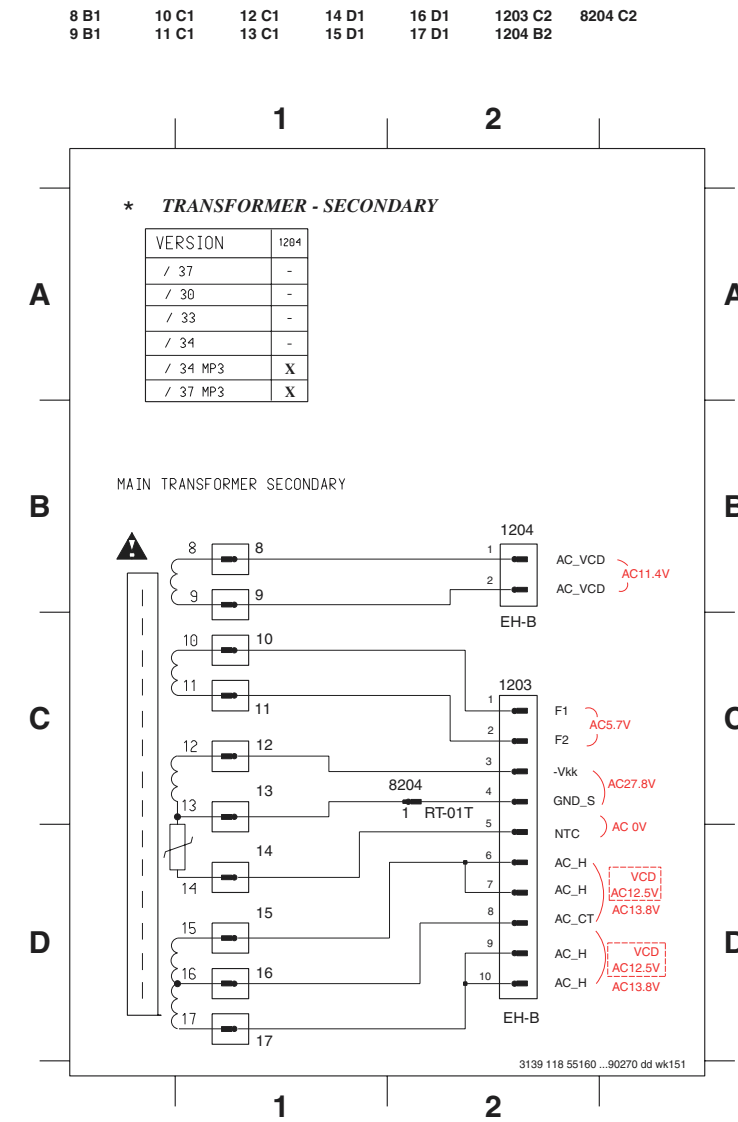




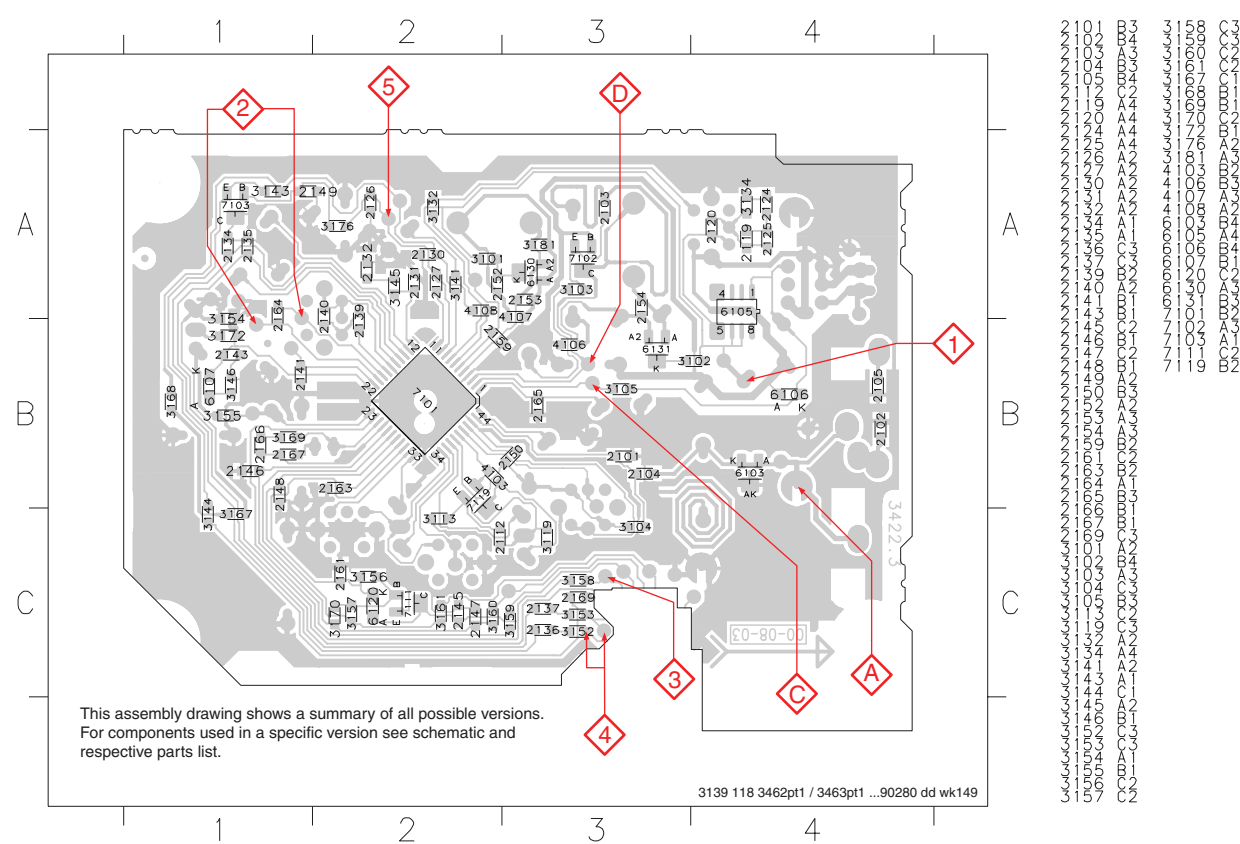
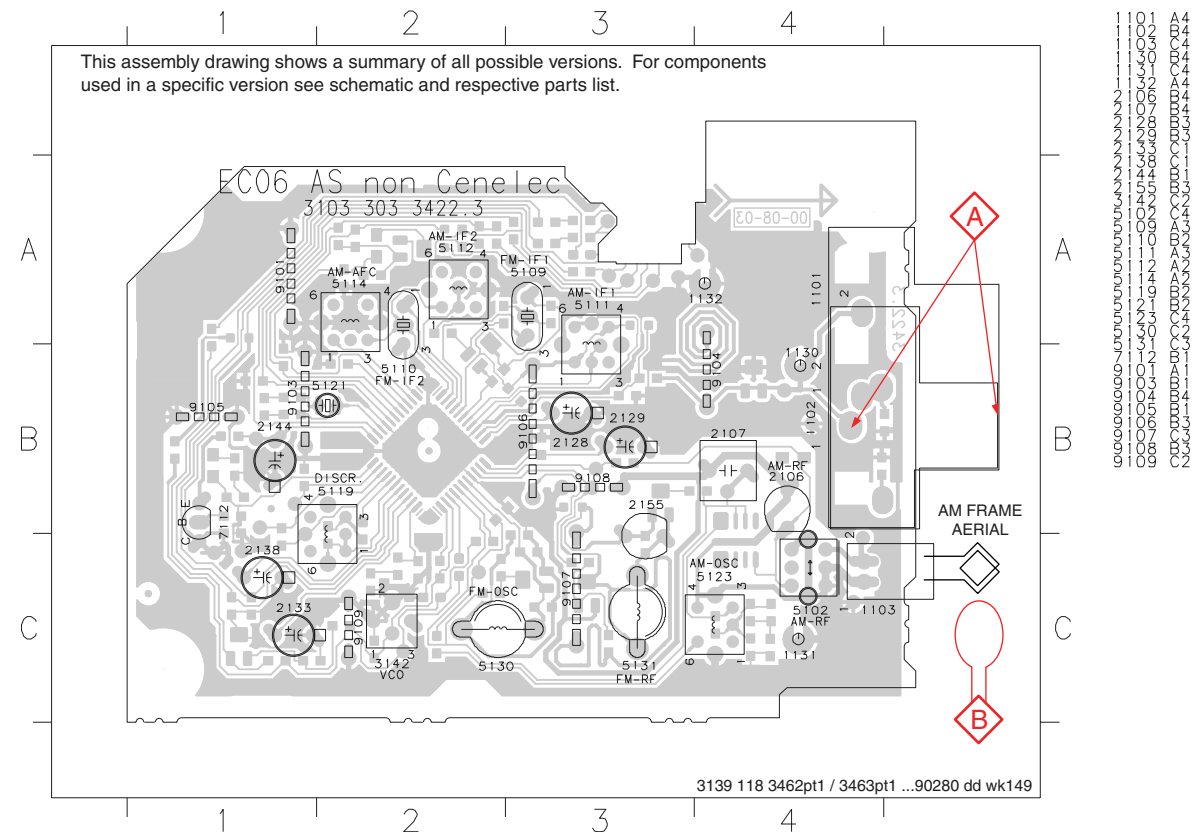
TRANSFORMER PRIMARY PART - CIRCUIT & LAYOUT (except /21/22 version)



TRANSFORMER SECONDARY PART - CIRCUIT & LAYOUT (except /21/22 version)



### NON-CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



Note: This layout drawings are applicable for both pt 1 and pt 2 pc board.

### 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
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
<b>MW</b> 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	1	6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>LW</b> 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
<b>MW</b> FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
<b>FM IF</b>						
<b>FM</b>	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
<b>FM RF</b>						
<b>FM</b> 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		
<b>VCO</b>						
<b>FM</b>	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz <sup>1)</sup>
<b>AM IF</b>						
<b>MW</b>	450kHz  connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C  Δf=±10kHz V <sub>RF</sub> = 0.5mV (as low as possible)		5111	5	
				5112		
<b>AM AFC</b>		C		5114	2	0 ± 2 mV DC
<b>MW</b>		C				
<b>AM RF<sup>3)</sup></b>						
<b>MW<sup>4)</sup></b> FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	5	
	558kHz		558kHz	5102		
<b>LW</b>	198kHz		198kHz	5103		
<b>MW</b> FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	B	1500kHz	2106	5	
	560kHz		560kHz	5102		

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.

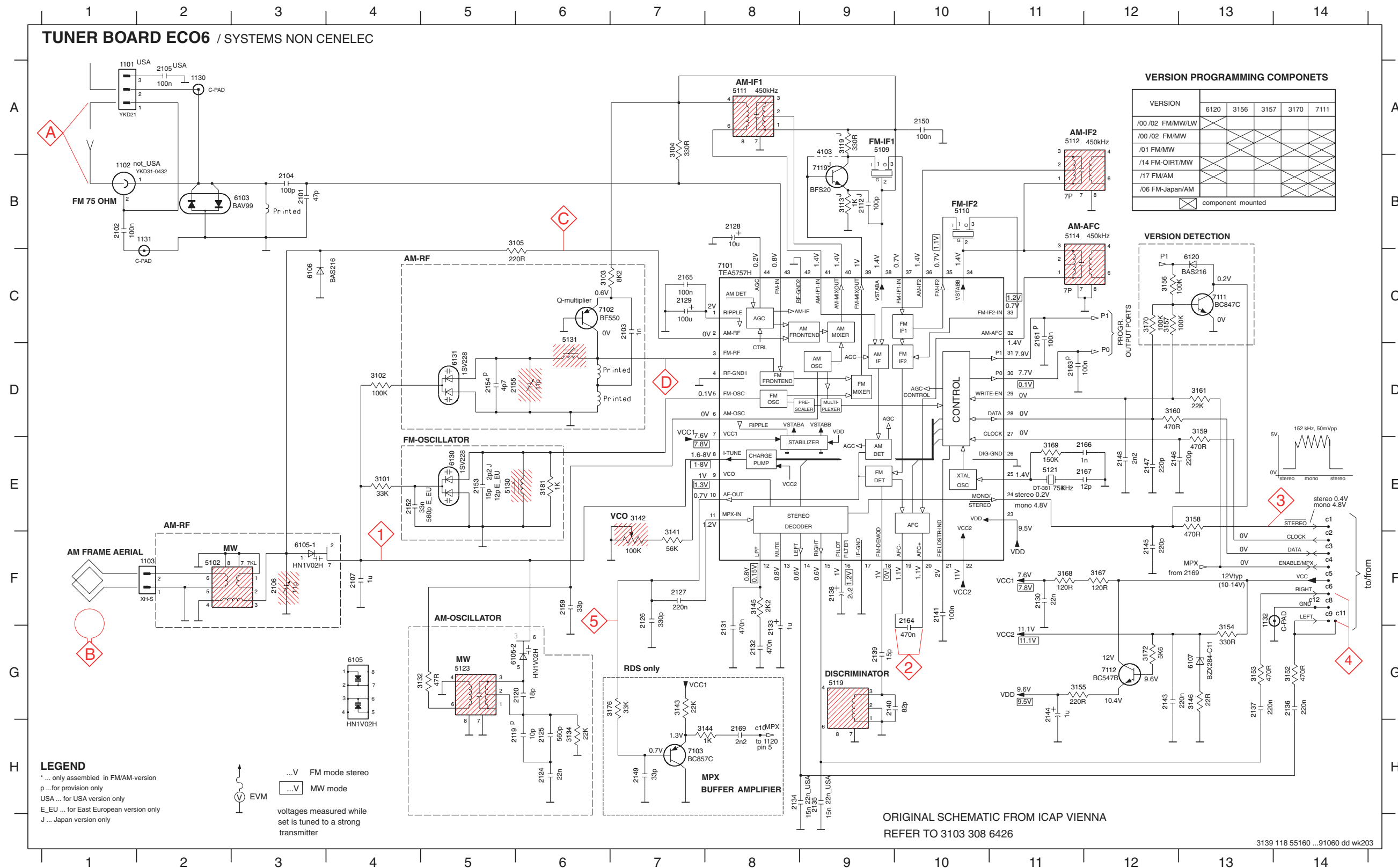
3) For AM RF adjustments the original frame antenna has to be used!

4) MW has to be aligned before LW.

↑ Repeat



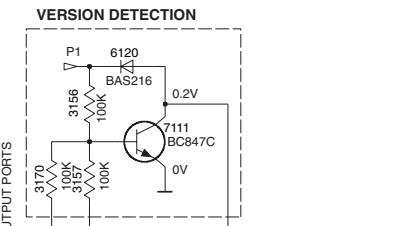
# NON-CENELEC TUNER CIRCUIT



**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					
/06 FM-Japan/AM					

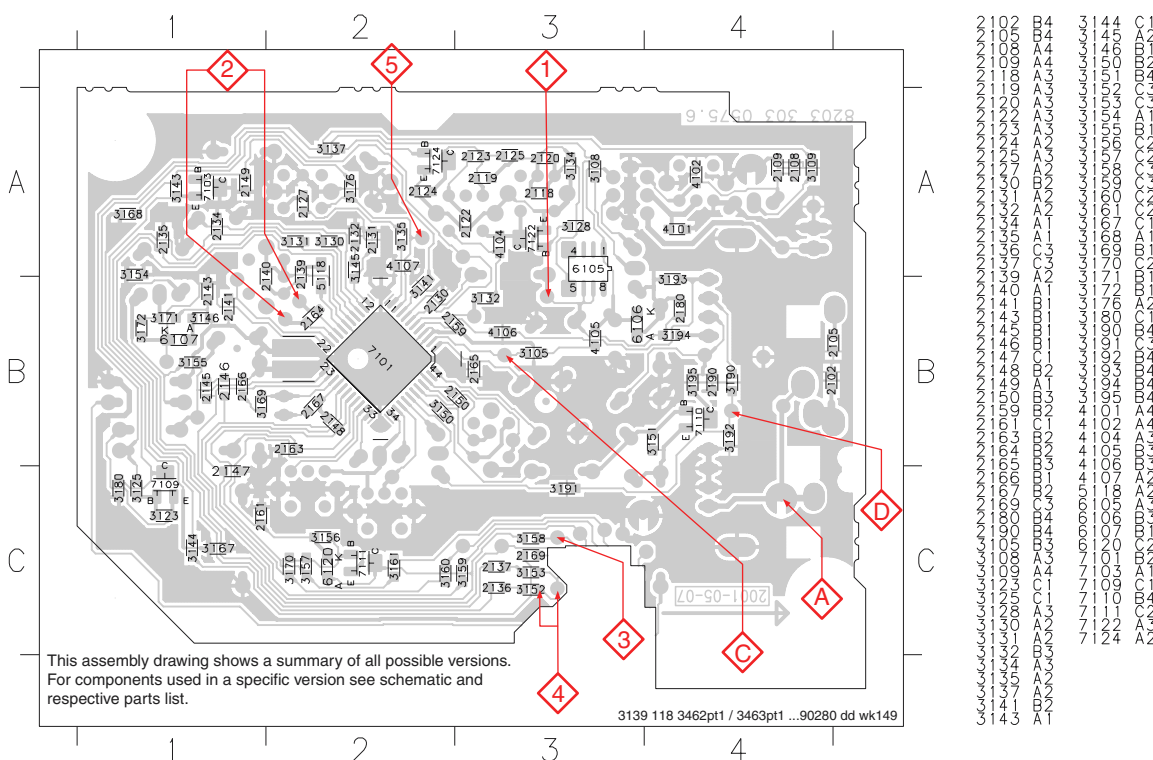
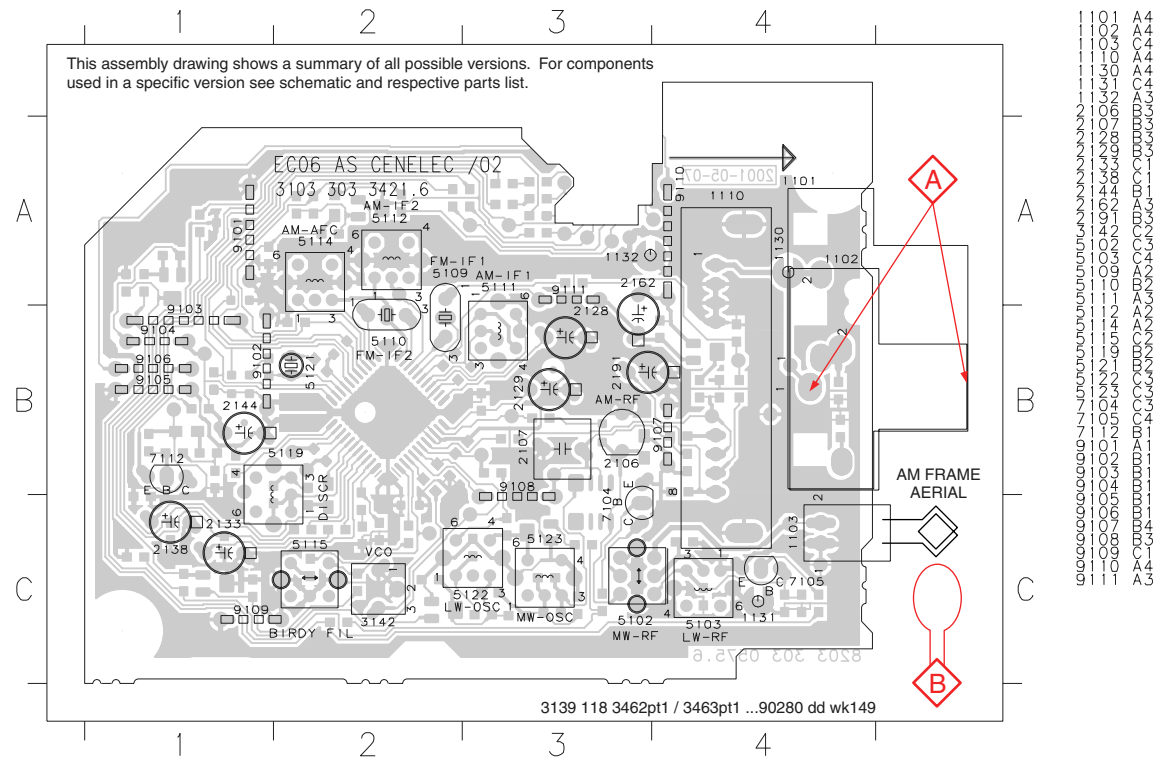
component mounted



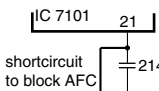
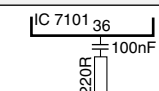
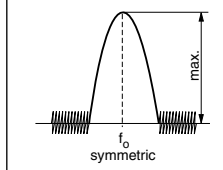
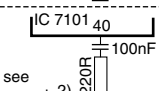
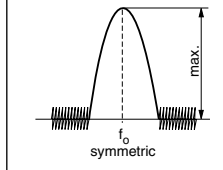
- c1 E14
- c2 F14
- c3 F14
- c4 F14
- c5 F14
- c6 F14
- c8 F14
- c9 F14
- c10 H8
- c11 F14
- c12 F14
- c11 A1
- c11 B1
- c11 C1
- c11 D1
- c11 E1
- c11 F1
- c11 G1
- c11 H1
- c11 I1
- c11 J1
- c11 K1
- c11 L1
- c11 M1
- c11 N1
- c11 O1
- c11 P1
- c11 Q1
- c11 R1
- c11 S1
- c11 T1
- c11 U1
- c11 V1
- c11 W1
- c11 X1
- c11 Y1
- c11 Z1
- c11 AA1
- c11 AB1
- c11 AC1
- c11 AD1
- c11 AE1
- c11 AF1
- c11 AG1
- c11 AH1
- c11 AI1
- c11 AJ1
- c11 AK1
- c11 AL1
- c11 AM1
- c11 AN1
- c11 AO1
- c11 AP1
- c11 AQ1
- c11 AR1
- c11 AS1
- c11 AT1
- c11 AU1
- c11 AV1
- c11 AW1
- c11 AX1
- c11 AY1
- c11 AZ1
- c11 BA1
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- c11 BD1
- c11 BE1
- c11 BF1
- c11 BG1
- c11 BH1
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- c11 BL1
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- c11 BY1
- c11 BZ1
- c11 CA1
- c11 CB1
- c11 CC1
- c11 CD1
- c11 CE1
- c11 CF1
- c11 CG1
- c11 CH1
- c11 CI1
- c11 CJ1
- c11 CK1
- c11 CL1
- c11 CM1
- c11 CN1
- c11 CO1
- c11 CP1
- c11 CQ1
- c11 CR1
- c11 CS1
- c11 CT1
- c11 CU1
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- c11 CZ1
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- c11 EA1
- c11 EB1
- c11 EC1
- c11 ED1
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- c11 FF1
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- c11 IH1
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- c11 IM1
- c11 IN1
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- c11 ZS1
- c11 ZT1
- c11 ZU1
- c11 ZV1
- c11 ZW1
- c11 ZX1
- c11 ZY1
- c11 ZZ1

ORIGINAL SCHEMATIC FROM ICAP VIENNA  
REFER TO 3103 308 6426

### CENELEC TUNER PORTION - COMPONENT & CHIP LAYOUTS



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

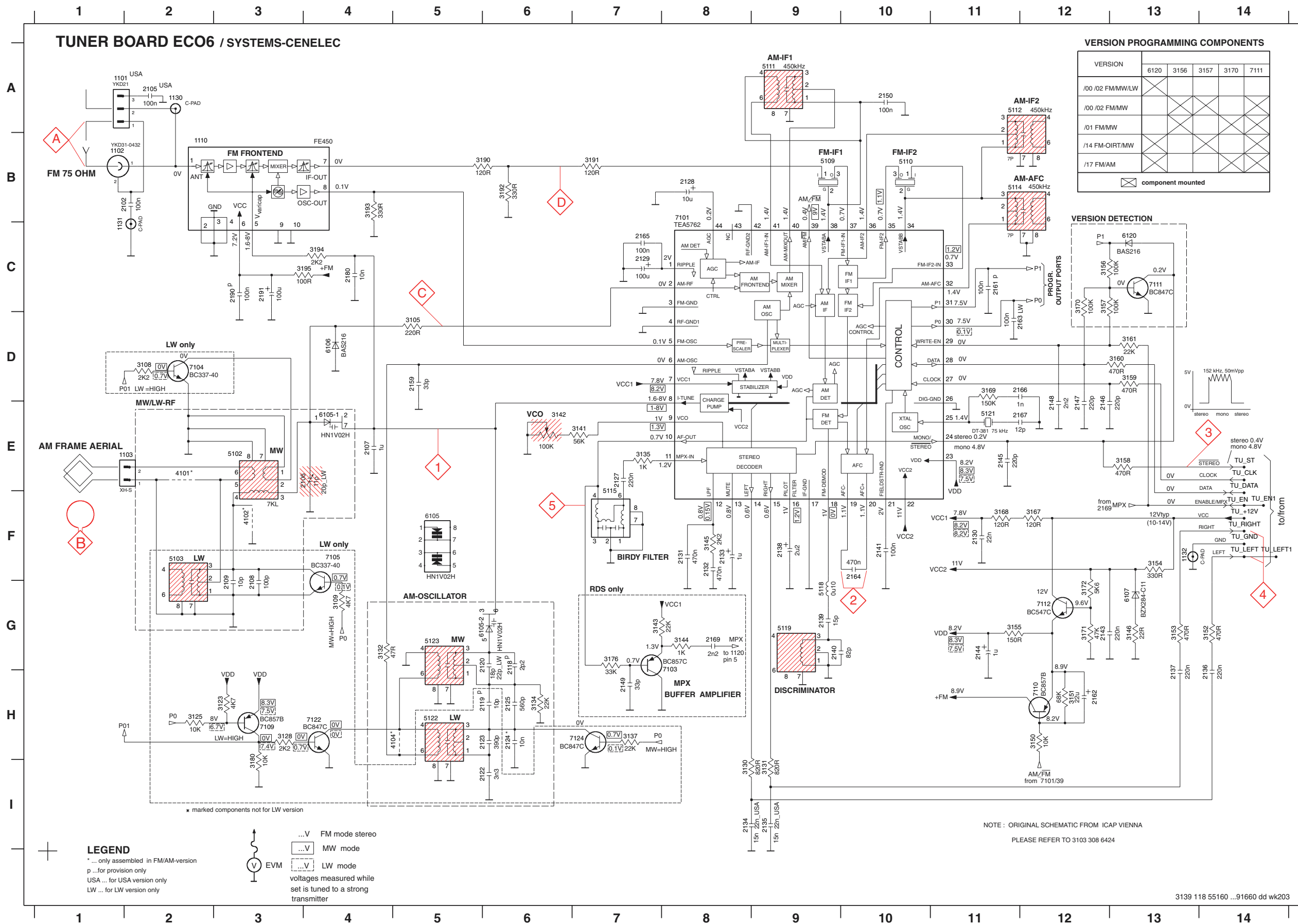
Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
<b>VARICAP ALIGNMENT</b>						
<b>FM</b> 87.5 - 108MHz (50kHz grid)			108MHz	check		8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
<b>MW</b> 531 - 1602kHz (9kHz grid)			1602kHz	5123	◇1	8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V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

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

# CENELEC TUNER CIRCUIT



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

VERSION	6120	3156	3157	3170	7111
AM G13					
FM G13					
1101 A2					
1102 B1					
1103 E2					
1103 G5					
1110 B2					
1130 A2					
1131 C1					
1132 F13					
2102 B2					
2105 A2					
2106 E3					
2107 E4					
2108 G3					
2109 G3					
2118 G6					
2119 H6					
2120 G6					
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 F10					
2165 C7					
2166 D12					
2167 E12					
2169 G8					
2180 C4					
2190 C3					
2191 C3					
3105 D5					
3108 D2					
3109 G4					
3123 H3					
3125 H2					
3128 H3					
3130 I8					
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 G11					
3155 C12					
3157 C12					
3158 E13					
3159 D13					
3160 D13					
3161 D13					
3167 F12					
3168 F11					
3169 D11					
3170 C12					
3171 G12					
3172 G12					
3176 G7					
3180 I3					
3190 B6					
3191 B7					
3192 B6					
3193 B4					
3194 C4					
3195 C4					
4101 E2					
4102 F3					
4104 H5					
5102 E3					
5103 F2					
5109 B9					
5110 B10					
5111 A9					
5112 A11					
5114 B11					
5115 F7					

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

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

NOTE: ORIGINAL SCHEMATIC FROM ICAP VIENNA  
 PLEASE REFER TO 3103 308 6424

**ELECTRICAL PARTS LIST - COMBI BOARD (excluding Tuner portion)**

## MISCELLANEOUS

1214	4822 071 55002	Fuse T5A 250V	/34	2510	4822 124 22466	1μF 20% 50V
1215	4822 071 55002	Fuse T5A 250V		2511	4822 122 31765	100pF 2% 63V
1216	9965 000 07788	Fuse T2A 250V		2512	4822 122 31765	100pF 2% 63V
1217	4822 071 53151	Fuse T315mA 250V		2513	4822 124 22466	1μF 20% 50V
1300	4822 267 31176	Loudspeaker Socket 4P		2514	4822 124 22466	1μF 20% 50V
1501	4822 267 10953	Flex Socket 7pin Vert.		2515	4822 122 31765	100pF 2% 63V
1503	4822 267 10733	Flex Socket 4pin Vert.	/21	2516	4822 122 31765	100pF 2% 63V
1504	4822 265 20553	Cinch Socket, Aux-in		2517	4822 122 31765	100pF 2% 63V
1507	4822 265 10981	Flex Socket 15pin Vert.		2518	4822 122 31765	100pF 2% 63V
1508	2422 025 17411	Flex Socket 30pin Vert.	/21/34	2519	4822 122 31765	100pF 2% 63V
1508	2422 025 17412	Flex Socket 32pin Vert.	/22	2520	4822 122 31765	100pF 2% 63V
				2521	4822 126 13956	68pF 5% 63V
				2522	4822 126 13956	68pF 5% 63V
				2523	4822 124 40433	47μF 20% 25V
				2524	4822 126 14238	2,2nF 50V
				2525	4822 124 40196	220μF 20% 16V
				2526	4822 124 81151	22μF 50V
				2527	3198 017 44740	470nF 10V
				2528	2238 586 59812	100nF +80/-20% 50V
				2529	4822 126 13193	4,7nF 10% 63V
				2530	4822 126 13193	4,7nF 10% 63V
				2537	4822 121 42408	220nF 5% 63V
				2538	4822 121 42408	220nF 5% 63V
				2539	5322 121 42661	330nF 5% 63V
				2540	5322 121 42661	330nF 5% 63V
				2541	4822 121 51252	470nF 5% 63V
				2542	4822 121 51252	470nF 5% 63V
				2543	4822 122 31765	100pF 2% 63V
				2546	2238 586 59812	100nF +80/-20% 50V
				2547	3198 017 44740	470nF 10V
				2549	4822 124 80144	220μF 20% 25V
				2560	4822 122 33741	10pF 10% 50V
				2561	4822 122 33741	10pF 10% 50V
				2563	3198 016 31020	1nF 25V
				2564	3198 016 31020	1nF 25V
				2567	3198 017 44740	470nF 10V
				2568	3198 017 34730	47nF 16V
				2570	4822 124 40433	47μF 20% 25V
				2601	4822 124 40433	47μF 20% 25V
				2602	2238 586 59812	100nF +80/-20% 50V
				2603	4822 122 33752	15pF 5% 50V
				2604	4822 122 31765	100pF 2% 63V
				2605	4822 126 13881	470pF 5% 50V
				2606	4822 126 13881	470pF 5% 50V
				2607	4822 126 13883	220pF 5% 50V
				2608	4822 126 13883	220pF 5% 50V
				2609	4822 124 81151	22μF 50V
				2610	4822 124 81151	22μF 50V
				2611	4822 122 31765	100pF 2% 63V
				2612	4822 122 31765	100pF 2% 63V
				2613	4822 124 41584	100μF 20% 10V
				2614	4822 126 14494	22nF 10% 25V

## CAPACITORS

2201	4822 124 40248	10μF 20% 63V	
2207	4822 121 43526	47nF 5% 250V	/21/34
2208	3198 017 34730	47nF 16V	/21/34
2209	5322 126 11578	1nF 10% 50V	/21/34
2211	4822 124 42367	3300μF 20% 35V	
2213	5322 121 42386	100nF 5% 63V	
2214	5322 121 42386	100nF 5% 63V	
2216	4822 124 80415	4700μF 20% 50V	
2218	4822 124 80144	220μF 20% 25V	
2220	4822 124 80144	220μF 20% 25V	
2221	5322 121 42386	100nF 5% 63V	
2222	2020 012 93547	100μF 20% 63V	
2224	4822 124 21913	1μF 20% 63V	
2225	4822 124 21913	1μF 20% 63V	
2226	4822 121 43526	47nF 5% 250V	
2232	4822 126 14494	22nF 10% 25V	
2233	4822 124 41751	47μF 20% 50V	
2361	3198 016 36810	680pF 25V	
2362	3198 016 36810	680pF 25V	
2365	4822 121 43526	47nF 5% 250V	
2366	4822 121 43526	47nF 5% 250V	
2367	4822 121 42408	220nF 5% 63V	
2368	4822 121 42408	220nF 5% 63V	
2369	4822 121 42408	220nF 5% 63V	
2370	4822 121 42408	220nF 5% 63V	
2371	4822 124 40769	4,7μF 20% 100V	
2372	4822 124 40769	4,7μF 20% 100V	
2373	4822 122 33777	47pF 5% 63V	
2377	4822 124 81151	22μF 50V	
2378	4822 126 13883	220pF 5% 50V	
2501	4822 124 22466	1μF 20% 50V	
2502	4822 124 22466	1μF 20% 50V	
2503	4822 124 22466	1μF 20% 50V	
2504	4822 124 22466	1μF 20% 50V	
2505	3198 016 31020	1nF 25V	
2506	3198 016 31020	1nF 25V	
2507	4822 124 22466	1μF 20% 50V	
2508	4822 124 22466	1μF 20% 50V	
2509	4822 124 22466	1μF 20% 50V	

**ELECTRICAL PARTS LIST - COMBI BOARD (excluding Tuner portion)**

2615	4822 124 41751	47μF 20% 50V		3368	4822 117 13608	4R7 5% 0,062W
2616	4822 126 14494	22nF 10% 25V		3369	4822 117 13608	4R7 5% 0,062W
2617	4822 124 40248	10μF 20% 63V		3370	4822 117 13608	4R7 5% 0,062W
2618	4822 122 31765	100pF 2% 63V		3371	4822 117 13608	4R7 5% 0,062W
2662	4822 124 22652	2,2μF 20% 50V		3372	4822 117 13608	4R7 5% 0,062W
2663	4822 124 22652	2,2μF 20% 50V		3373	4822 116 52283	4k7 5% 0,5W
2664	4822 122 31765	100pF 2% 63V		3374	4822 116 83883	470R 5% 0,5W
2665	5322 126 11578	1nF 10% 50V	/21	3376	4822 051 30123	12k 5% 0,062W
2666	3198 017 44740	470nF 10V		3377	4822 051 30331	330R 5% 0,062W
2667	2020 012 93547	100μF 20% 63V		3378	4822 051 30222	2k2 5% 0,062W
				3379	4822 051 30103	10k 5% 0,062W
				3384	4822 051 30152	1k5 5% 0,062W
				3385	4822 051 30154	150k 5% 0,062W
				3386	4822 051 30101	100R 5% 0,062W
				3387	4822 051 30103	10k 5% 0,062W
				3388	4822 051 30103	10k 5% 0,062W
				3389	4822 051 30123	12k 5% 0,062W
				3390	4822 051 30123	12k 5% 0,062W
				3392	4822 051 30102	1k 5% 0,062W
				3501	4822 051 30102	1k 5% 0,062W
				3502	4822 051 30102	1k 5% 0,062W
				3505	4822 051 30222	2k2 5% 0,062W
				3506	4822 051 30222	2k2 5% 0,062W
				3507	4822 051 30332	3k3 5% 0,062W
				3508	4822 051 30332	3k3 5% 0,062W
				3509	4822 051 30273	27k 5% 0,062W
				3510	4822 051 30273	27k 5% 0,062W
				3511	4822 051 30152	1k5 5% 0,062W
				3512	4822 051 30152	1k5 5% 0,062W
				3513	4822 051 30102	1k 5% 0,062W
				3514	4822 051 30102	1k 5% 0,062W
				3517	4822 051 30472	4k7 5% 0,062W
				3518	4822 051 30472	4k7 5% 0,062W
				3519	4822 051 30123	12k 5% 0,062W
				3520	4822 051 30123	12k 5% 0,062W
				3521	4822 051 30153	15k 5% 0,062W
				3522	4822 051 30153	15k 5% 0,062W
				3523	4822 051 30151	150R 5% 0,062W
				3524	4822 051 30221	220R 5% 0,062W
				3525	4822 051 30221	220R 5% 0,062W
				3531	4822 117 12925	47k 1% 0,063W
				3532	4822 117 12925	47k 1% 0,063W
				3539	4822 117 12902	8k2 1% 0,063W
				3540	4822 117 12902	8k2 1% 0,063W
				3541	4822 051 30562	5k6 5% 0,063W
				3542	4822 051 30562	5k6 5% 0,063W
				3543	4822 116 52289	5k6 5% 0,5W
				3560	4822 051 30102	1k 5% 0,062W
				3561	4822 051 30102	1k 5% 0,062W
				3563	4822 051 30221	220R 5% 0,062W
				3564	4822 051 30221	220R 5% 0,062W
				3570	4822 051 30222	2k2 5% 0,062W
				3210	4822 050 24708	4R7 1% 0,6W
				3211	4822 050 24708	4R7 1% 0,6W
				3212	4822 116 52175	100R 5% 0,5W
				3213	4822 116 52175	100R 5% 0,5W
				3214	4822 116 83872	220R 5% 0,5W
				3215	4822 116 83872	220R 5% 0,5W
				3216	4822 116 52175	100R 5% 0,5W
				3218	4822 116 52199	68R 5% 0,5W
				3219	4822 116 83872	220R 5% 0,5W
				3220	4822 116 83872	220R 5% 0,5W
				3221	4822 116 52176	10R 5% 0,5W
				3222	4822 051 30102	1k 5% 0,062W
				3223	4822 050 24708	4R7 1% 0,6W
				3224	4822 050 24708	4R7 1% 0,6W
				3225	4822 051 30101	100R 5% 0,062W
				3226	4822 051 30392	3k9 5% 0,063W
				3227	4822 116 52199	68R 5% 0,5W
				3228	4822 050 11002	1k 1% 0,4W
				3229	4822 116 52176	10R 5% 0,5W
				3230	4822 116 52176	10R 5% 0,5W
				3232	4822 116 52207	1k2 5% 0,5W
				3233	4822 116 52206	120R 5% 0,5W
				3235	4822 116 52289	5k6 5% 0,5W
				3236	4822 116 52256	2k2 5% 0,5W
				3237	4822 050 21003	10k 1% 0,6W
				3238	4822 050 21003	10k 1% 0,6W
				3239	4822 116 52283	4k7 5% 0,5W
				3249	4822 051 30103	10k 5% 0,062W
				3250	4822 051 30472	4k7 5% 0,062W
				3251	4822 116 52283	4k7 5% 0,5W
				3252	4822 116 83872	220R 5% 0,5W
				3253	4822 116 83872	220R 5% 0,5W
				3254	4822 116 52257	22k 5% 0,5W
				3361	4822 117 12864	82k 5% 0,6W
				3362	4822 117 12864	82k 5% 0,6W
				3363	4822 117 12902	8k2 1% 0,063W

**ELECTRICAL PARTS LIST - COMBI BOARD (excluding Tuner portion)****RESISTORS**

3601	4822 051 30154	150k 5% 0,062W	4526	4822 051 30008	OR Jumper 0603	
3602	4822 051 30154	150k 5% 0,062W	4527	4822 051 30008	OR Jumper 0603	
3603	4822 051 30151	150R 5% 0,062W	4528	4822 051 30008	OR Jumper 0603	
3604	4822 051 30391	390R 5% 0,062W	4529	4822 051 30008	OR Jumper 0603	
3605	4822 051 30334	330k 5% 0,062W	4530	4822 051 30008	OR Jumper 0603	
3606	4822 117 12864	82k 5% 0,6W	4531	4822 051 30008	OR Jumper 0603	
3607	4822 117 11817	1k2 1% 1/16W	4532	4822 051 30008	OR Jumper 0603	
3608	4822 051 30273	27k 5% 0,062W	4533	4822 051 30008	OR Jumper 0603	
3609	4822 051 30102	1k 5% 0,062W	4534	4822 051 30008	OR Jumper 0603	
3610	4822 051 30102	1k 5% 0,062W	4535	4822 051 30008	OR Jumper 0603	
3611	4822 051 30102	1k 5% 0,062W	4536	4822 051 30008	OR Jumper 0603	
3612	4822 051 30102	1k 5% 0,062W	4537	4822 051 30008	OR Jumper 0603	
3613	4822 051 30102	1k 5% 0,062W	4538	4822 051 30008	OR Jumper 0603	
3614	4822 051 30102	1k 5% 0,062W	4539	4822 051 30008	OR Jumper 0603	
3615	4822 051 30102	1k 5% 0,062W	4540	4822 051 30008	OR Jumper 0603	
3616	4822 051 30102	1k 5% 0,062W	4541	4822 051 30008	OR Jumper 0603	
3617	4822 051 30339	33R 5% 0,062W	4542	4822 051 30008	OR Jumper 0603	
3618	4822 051 30339	33R 5% 0,062W	4543	4822 051 30008	OR Jumper 0603	
3619	4822 051 30479	47R 5% 0,062W	4544	4822 051 30008	OR Jumper 0603	
3620	4822 051 30479	47R 5% 0,062W	4545	4822 051 20008	OR Jumper 0805	/22
3621	4822 051 30472	4k7 5% 0,062W	4546	4822 051 30008	OR Jumper 0603	
3622	4822 051 30472	4k7 5% 0,062W	4547	4822 051 30008	OR Jumper 0603	
3623	4822 052 10109	10R 5% 0,33W	4548	4822 051 30008	OR Jumper 0603	
3624	4822 051 30103	10k 5% 0,062W	4549	4822 051 30008	OR Jumper 0603	
3625	4822 051 30103	10k 5% 0,062W	4508	4822 051 30008	OR Jumper 0603	
3626	4822 051 30102	1k 5% 0,062W	4550	4822 051 30008	OR Jumper 0603	/22
3627	4822 051 30562	5k6 5% 0,063W	4551	4822 051 30008	OR Jumper 0603	/22
3628	4822 051 30472	4k7 5% 0,062W	4553	4822 051 30008	OR Jumper 0603	
3629	4822 051 30472	4k7 5% 0,062W	4554	4822 051 30008	OR Jumper 0603	
3630	4822 051 30123	12k 5% 0,062W	4555	4822 051 30008	OR Jumper 0603	
3631	4822 051 30123	12k 5% 0,062W	4556	4822 051 30008	OR Jumper 0603	
3632	4822 051 30109	10R 5% 0,062W	4557	4822 051 30008	OR Jumper 0603	
3633	4822 051 30109	10R 5% 0,062W	4558	4822 051 30008	OR Jumper 0603	
3634	4822 051 30273	27k 5% 0,062W	4559	4822 051 30008	OR Jumper 0603	
3635	4822 051 30682	6k8 5% 0,062W	4560	4822 051 30008	OR Jumper 0603	
3636	4822 051 30682	6k8 5% 0,062W	4561	4822 051 30008	OR Jumper 0603	
4216	4822 051 30008	OR Jumper 0603	4562	4822 051 30008	OR Jumper 0603	/22
4501	4822 051 30008	OR Jumper 0603	4563	4822 051 30008	OR Jumper 0603	/22/34
4508	4822 051 30008	OR Jumper 0603	4564	4822 051 30008	OR Jumper 0603	
4509	4822 051 30008	OR Jumper 0603	4567	4822 051 30008	OR Jumper 0603	
4514	4822 051 30008	OR Jumper 0603	4569	4822 051 30008	OR Jumper 0603	
4515	4822 051 30008	OR Jumper 0603	4572	4822 051 30008	OR Jumper 0603	
4516	4822 051 30008	OR Jumper 0603	4573	4822 051 30008	OR Jumper 0603	
4517	4822 051 30008	OR Jumper 0603	4574	4822 051 30008	OR Jumper 0603	
4518	4822 051 30008	OR Jumper 0603	4575	4822 051 30008	OR Jumper 0603	
4519	4822 051 30008	OR Jumper 0603	4576	4822 051 30008	OR Jumper 0603	
4520	4822 051 30008	OR Jumper 0603	4578	4822 051 30008	OR Jumper 0603	
4521	4822 051 30008	OR Jumper 0603	4588	4822 051 30008	OR Jumper 0603	
4522	4822 051 30008	OR Jumper 0603				
4523	4822 051 30008	OR Jumper 0603				
4524	4822 051 30008	OR Jumper 0603				
4525	4822 051 30008	OR Jumper 0603				

**COILS & FILTERS**

5202	4822 157 11832	Mains Filter 100µH 3A	/34
5301	4822 157 62255	Coil 1µH 18,5 Turns	

**ELECTRICAL PARTS LIST - COMBI BOARD (excluding Tuner portion)**

5302	4822 157 62255	Coil 1µH 18,5 Turns	7304	4822 130 60511	BC847B
5303	4822 157 62255	Coil 1µH 18,5 Turns	7501	9322 150 74668	TDA7468D
5304	4822 157 62255	Coil 1µH 18,5 Turns	7502	4822 130 60511	BC847B
5305	4822 157 62552	Coil 2,2µH 5%	7504	4822 130 41246	BC327-25
5501	4822 157 62552	Coil 2,2µH 5%	7600	4822 209 31378	NJM4556MB
5601	4822 157 62552	Coil 2,2µH 5%	7601	4822 130 60511	BC847B

**DIODES**

6207	4822 130 34173	BZX79-B5V6	7602	4822 130 42804	BC817-25
6210	4822 130 10944	GBU6D	7603	4822 130 42804	BC817-25
6245	4822 130 31878	1N4003G	7604	4822 130 42804	BC817-25
6246	4822 130 31878	1N4003G	7605	4822 130 60511	BC847B
6247	4822 130 31878	1N4003G	7606	4822 130 60511	BC847B
6248	4822 130 31878	1N4003G	7607	4822 130 60373	BC857B
6249	4822 130 31878	1N4003G	7608	4822 130 42804	BC817-25
6250	4822 130 31878	1N4003G	7609	4822 130 60373	BC857B
6251	4822 130 34174	BZX79-B4V7			
6255	4822 130 31878	1N4003G			
6256	4822 130 31878	1N4003G			
6257	4822 130 34142	BZX79-B33			
6258	4822 130 30621	1N4148			
6259	4822 130 30621	1N4148			
6260	4822 130 34173	BZX79-B5V6			
6266	4822 130 30621	1N4148	/22		
6267	4822 130 34173	BZX79-B5V6			
6371	4822 130 31878	1N4003G			
6372	4822 130 31878	1N4003G			
6373	3198 010 53980	BZX79-B3V9			
6374	4822 130 30621	1N4148			
6375	4822 130 30621	1N4148			
6376	4822 130 31878	1N4003G			
6377	4822 130 31878	1N4003G			
6378	4822 130 31878	1N4003G			
6379	4822 130 31878	1N4003G			
6380	3198 010 52290	BZX79-B22			
6502	4822 130 61219	BZX79-B10			
6503	4822 130 31878	1N4003G			
6504	4822 130 31878	1N4003G			
6509	4822 130 61219	BZX79-B10			

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

**TRANSISTORS & INTEGRATED CIRCUITS**

7209	4822 130 40981	BC337-25
7210	4822 130 40981	BC337-25
7211	4822 130 40981	BC337-25
7212	4822 130 40981	BC337-25
7213	4822 130 40981	BC337-25
7214	4822 209 33575	L7812CP
7217	4822 130 41246	BC327-25
7219	4822 130 60511	BC847B
7301	9322 174 32682	AN17830A
7302	4822 130 11578	STP16NE06
7303	4822 130 60373	BC856B



**ELECTRICAL PARTS LIST - COMBI BOARD (Non-Cenelec Tuner portion only)****MISCELLANEOUS**

1101	2422 015 19376	Socket 2P Clickfit	/37
1102	4822 267 10283	Socket Coaxial 75R	/21/34
1103	4822 265 31184	JST Connector 2P	

**CAPACITORS**

2101	4822 122 33777	47pF 5% 63V	
2102	2238 586 59812	100nF +80/-20% 50V	
2103	5322 126 11578	1nF 10% 50V	
2104	4822 122 31765	100pF 2% 63V	
2105	4822 126 13838	100nF 10% 50V	/37
2106	2020 800 00191	Trimmer 3-11pF 100V	
2107	4822 121 51319	1µF 10% 63V	
2120	4822 126 14507	18pF 5% 50V	
2124	4822 126 14494	22nF 10% 25V	
2125	2238 861 18561	560pF 1% 50V	
2126	4822 126 14241	330pF 1% 50V	
2127	4822 126 13879	220nF +80/-20% 16V	
2128	4822 124 40248	10µF 20% 63V	
2129	4822 124 41584	100µF 20% 10V	
2130	4822 126 14494	22nF 10% 25V	
2131	3198 017 44740	470nF 10V	
2132	3198 017 44740	470nF 10V	
2133	4822 124 21913	1µF 20% 63V	
2134	3198 017 31530	15nF 50V	/21/34
2134	5322 122 32654	22nF 10% 63V	/37
2135	3198 017 31530	15nF 50V	/21/34
2134	5322 122 32654	22nF 10% 63V	/37
2136	4822 126 13879	220nF +80/-20% 16V	
2137	4822 126 13879	220nF +80/-20% 16V	
2138	4822 124 22652	2,2µF 20% 50V	
2139	4822 122 33752	15pF 5% 50V	
2140	4822 126 14226	82pF 5% 50V	
2141	2238 586 59812	100nF +80/-20% 50V	
2143	4822 126 13879	220nF +80/-20% 16V	
2144	4822 124 21913	1µF 20% 63V	
2145	4822 126 13883	220pF 5% 50V	
2146	4822 126 13883	220pF 5% 50V	
2147	4822 126 13883	220pF 5% 50V	
2148	4822 126 14238	2,2nF 50V	
2149	2222 867 15339	33pF 5% 50V	/34
2150	4822 126 14585	100nF 10% 50V	
2152	4822 126 14549	33nF 16V	/21/37
2152	4822 126 14249	560pF 10% 63V	/34
2153	4822 122 33752	15pF 5% 50V	/21/37
2153	4822 126 11663	12pF 50V	/34
2155	2020 800 00191	Trimmer 3-11pF 100V	
2159	2222 867 15339	33pF 5% 50V	
2164	3198 017 44740	470nF 10V	
2165	2238 586 59812	100nF +80/-20% 50V	
2166	5322 126 11578	1nF 10% 50V	
2167	4822 126 11663	12pF 50V	
2169	4822 126 14238	2,2nF 50V	

**RESISTORS**

3101	4822 051 30333	33k 5% 0,062W	
3102	4822 117 13632	100k 1% 0,62W	
3103	4822 117 12902	8k2 1% 0,063W	
3104	4822 117 13577	330R 1% 0,1W	
3105	4822 051 30221	220R 5% 0,062W	
3132	4822 051 30479	47R 5% 0,062W	
3134	4822 051 30223	22k 5% 0,062W	
3141	4822 051 30563	56k 5% 0,062W	
3142	4822 100 12159	Trim-pot 100k 30%	
3143	4822 051 30223	22k 5% 0,062W	/34
3144	4822 051 30102	1k 5% 0,062W	/34
3145	4822 051 30222	2k2 5% 0,062W	
3146	4822 117 12139	22R 5% 0,062W	
3152	4822 051 30471	470R 5% 0,062W	
3153	4822 051 30471	470R 5% 0,062W	
3154	4822 051 30331	330R 5% 0,062W	
3155	4822 051 30221	220R 5% 0,062W	
3156	4822 117 13632	100k 1% 0,062W	/21
3157	4822 117 13632	100k 1% 0,062W	/34
3158	4822 051 30471	470R 5% 0,062W	
3159	4822 051 30471	470R 5% 0,062W	
3160	4822 051 30471	470R 5% 0,062W	
3161	4822 051 20223	22k 5% 0,1W	
3167	4822 051 20121	120R 5% 0,1W	
3168	4822 051 30121	120R 5% 0,062W	
3169	4822 051 30154	150k 5% 0,062W	
3170	4822 117 13632	100k 1% 0,62W	/21/37
3172	4822 051 30562	5k6 5% 0,063W	
3176	4822 051 30333	33k 5% 0,062W	/34
3181	4822 051 30102	1k 5% 0,062W	
4103	4822 051 30008	0R Jumper 0603	
4106	4822 051 20008	0R Jumper 0805	
4107	4822 051 30008	0R Jumper 0603	
4108	4822 051 30008	0R Jumper 0603	

**COILS & FILTERS**

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-B	
6106	9340 255 30115	BAS216	

**ELECTRICAL PARTS LIST - COMBI BOARD (Non-Cenelec Tuner portion only)**

6107	9340 386 90115	BZX284-C11	
6120	9340 255 30115	BAS216	/34/37
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

**TRANSISTORS & INTEGRATED CIRCUITS**

7101	9351 740 80557	TEA5757H/V1	
7102	4822 130 42131	BF550	
7103	5322 130 42756	BC857C	/34
7111	5322 130 42755	BC847C	
7112	4822 130 40959	BC547B	



**ELECTRICAL PARTS LIST - COMBI BOARD (Cenelec Tuner portion only)****MISCELLANEOUS**

1102	4822 267 10283	Socket Coaxial 75R
1103	4822 265 31184	JST Connector 2P
1110	2422 542 90071	FM Frontend FE450-G01

**CAPACITORS**

2102	2238 586 59812	100nF +80/-20% 50V	
2106	2020 800 00191	Trimmer 3-11pF 100V	
2107	4822 121 51319	1 $\mu$ F 10% 63V	
2120	4822 126 14507	18pF 5% 50V	
2124	5322 126 11583	10nF 10% 50V	AM/FM only
2125	2238 861 18561	560pF 1% 50V	
2127	4822 126 13879	220nF +80/-20% 16V	
2128	4822 124 40248	10 $\mu$ F 20% 63V	
2129	4822 124 41584	100 $\mu$ F 20% 10V	
2130	4822 126 14494	22nF 10% 25V	
2131	3198 017 44740	470nF 10V	
2132	3198 017 44740	470nF 10V	
2133	4822 124 21913	1 $\mu$ F 20% 63V	
2134	3198 017 31530	15nF 50V	
2135	3198 017 31530	15nF 50V	
2136	4822 126 13879	220nF +80/-20% 16V	
2137	4822 126 13879	220nF +80/-20% 16V	
2138	4822 124 22652	2,2 $\mu$ F 20% 50V	
2139	4822 122 33752	15pF 5% 50V	
2140	4822 126 14226	82pF 5% 50V	
2141	2238 586 59812	100nF +80/-20% 50V	
2143	4822 126 13879	220nF +80/-20% 16V	
2144	4822 124 21913	1 $\mu$ F 20% 63V	
2145	4822 126 13883	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 63V	
2147	4822 122 33575	220pF 5% 63V	
2148	4822 126 14238	2,2nF 50V	
2149	2222 867 15339	33pF 5% 50V	
2150	4822 126 14585	100nF 10% 50V	
2159	2222 867 15339	33pF 5% 50V	
2162	4822 124 81151	22 $\mu$ F 50V	
2164	3198 017 44740	470nF 10V	
2165	2238 586 59812	100nF +80/-20% 50V	
2166	5322 122 31647	1nF 10% 63V	
2167	4822 126 11663	12pF 50V	
2169	4822 126 14238	2,2nF 50V	
2180	5322 126 11583	10nF 10% 50V	
2191	4822 124 41584	100 $\mu$ F 20% 10V	

**RESISTORS**

3105	4822 051 30221	220R 5% 0,062W
3130	4822 117 12968	820R 5% 0,62W
3131	4822 117 12968	820R 5% 0,62W
3132	4822 051 30479	47R 5% 0,062W
3134	4822 051 30223	22k 5% 0,062W
3135	4822 051 30102	1k 5% 0,062W
3141	4822 051 30563	56k 5% 0,062W

3142	4822 100 12159	Trimpot 100k 30%
3143	4822 051 30223	22k 5% 0,062W
3144	4822 051 30102	1k 5% 0,062W
3145	4822 051 30222	2k2 5% 0,062W
3146	4822 117 12139	22R 5% 0,062W
3150	4822 051 30103	10k 5% 0,062W
3151	4822 051 30683	68k 5% 0,062W
3152	4822 051 30471	470R 5% 0,062W
3153	4822 051 30471	470R 5% 0,062W
3154	4822 051 30331	330R 5% 0,062W
3155	4822 051 30151	150R 5% 0,062W
3156	4822 117 13632	100k 1% 0,62W
3157	4822 117 13632	100k 1% 0,62W
3158	4822 051 30471	470R 5% 0,062W
3159	4822 051 30471	470R 5% 0,062W
3160	4822 051 30471	470R 5% 0,062W
3161	4822 051 30223	22k 5% 0,062W
3167	4822 051 20121	120R 5% 0,1W
3168	4822 051 30121	120R 5% 0,062W
3169	4822 051 30154	150k 5% 0,062W
3171	4822 117 12925	47k 1% 0,063W
3172	4822 051 30562	5k6 5% 0,063W
3176	4822 051 30333	33k 5% 0,062W
3190	4822 051 30121	120R 5% 0,062W
3191	4822 051 30121	120R 5% 0,062W
3192	4822 051 30331	330R 5% 0,062W
3193	4822 051 30331	330R 5% 0,062W
3194	4822 051 30222	2k2 5% 0,062W
3195	4822 051 30101	100R 5% 0,062W
4101	4822 051 30008	0R Jumper 0603
4102	4822 051 30008	0R Jumper 0603
4104	4822 051 30008	0R Jumper 0603
4105	4822 051 20008	0R Jumper 0805
4106	4822 051 30008	0R Jumper 0603
4107	4822 051 20008	0R Jumper 0805

**COILS & FILTERS**

5102	4822 157 71634	RF-Coil MW
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	Birdie Coil
5118	2422 535 95881	Coil 0,1 $\mu$ H 5%
5119	4822 157 11443	Discriminator Coil
5121	4822 242 10261	Quartz 75kHz
5123	2422 549 44108	RF-Coil AM-Oscillator

**DIODES**

6105	4822 130 83075	HN1V02H-B
6106	9340 255 30115	BAS216

AM/FM only

AM/FM only

***ELECTRICAL PARTS LIST - COMBI BOARD (Cenelec Tuner portion only)***

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**DIODES**

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6107	9340 386 90115	BZX284-C11
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**TRANSISTORS & INTEGRATED CIRCUITS**

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7101	9351 772 20557	TEA5762H/V1
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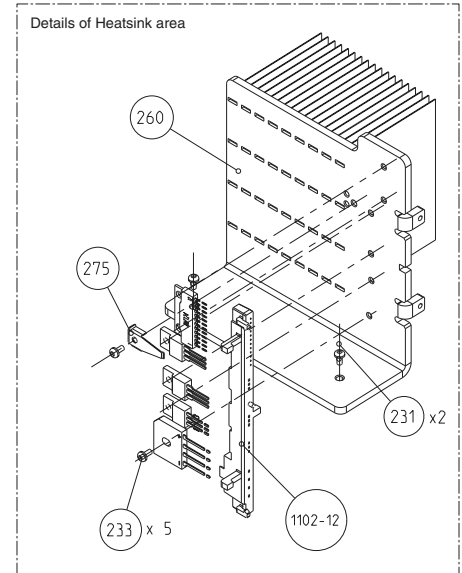
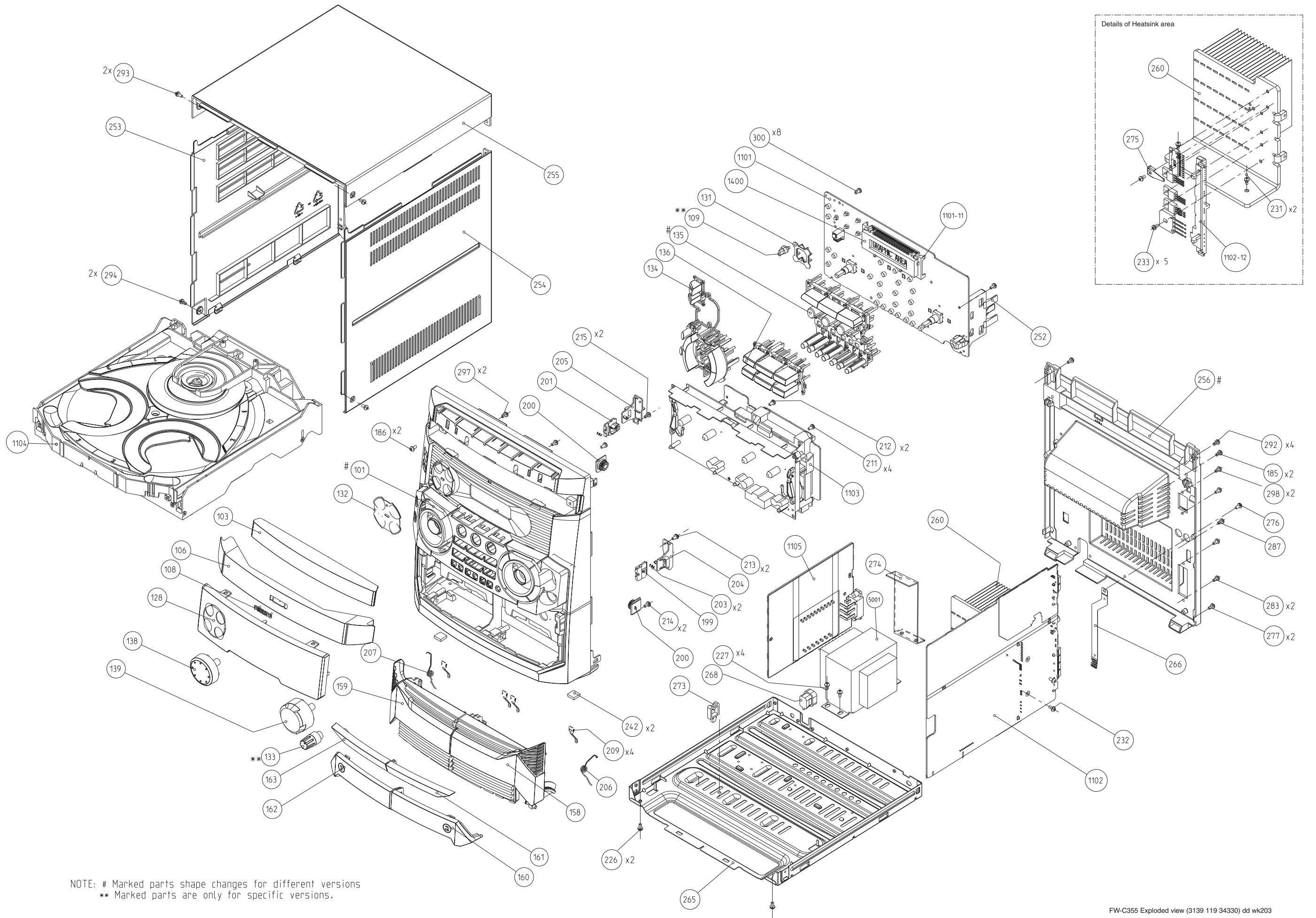
7103	5322 130 42756	BC857C
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7110	4822 130 60373	BC857B
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7111	5322 130 42755	BC847C
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7112	4822 130 44503	BC547C
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# EXPLODED VIEW - MAIN UNIT



NOTE: # Marked parts shape changes for different versions  
 \*\* Marked parts are only for specific versions.

**MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT****SCREW LISTS - MAIN UNIT**

101	3139 118 17211	Cabinet Front	/21	1400	3139 110 35940	Flex Cable 30pin 18cm AD	/21/34	185	D3 x 12
101	3139 118 16860	Cabinet Front	/22	1400	3139 110 35930	Flex Cable 32pin 18cm AD	/22	186	D3 x 12
101	3139 118 17300	Cabinet Front	/34	1402	4822 320 12703	Flex Cable 7pin 14cm BD		211	D3 x 12
103	3139 118 16961	Cover CDC Panel		1500	3139 110 35920	Flex Cable 4pin 14cm AD	/21	212	D3 x 12
106	3139 118 16871	Cover Tray CDC		1700	4822 320 12654	Flex Cable 7pin 22cm AD		213	D3 x 12
108	4822 454 13408	Badge Philips		1800	3139 110 35880	Flex Cable 15pin 18cm BD		214	D3 x 12
128	3139 118 17220	Window Display	/21	5001	3139 118 32490	Mains Transformer	/21	215	D3 x 12
128	3139 118 16880	Window Display	/22	5001	3139 118 32481	Mains Transformer	/22/34	226	M3 x 6
128	3139 118 17290	Window Display	34					227	M3 x 6
133	3139 118 16390	Knob Karaoke	/21	Note: Only the parts mentioned in this list are normal service spare parts.				231	M3 x 10
134	3139 118 16890	Button Set Power						232	M3 x 10
135	3139 118 17230	Button Set Source	/21					233	M3 x 10
135	3139 118 16900	Button Set Source	/22/34					276	M3 x 6
136	3139 118 16910	Button Set Control						277	M3 x 10
138	3139 118 16350	Knob Jog Rotary						283	D3 x 12
139	3139 118 16360	Knob Volume Rotary						287	D3 x 12
158	3139 118 16940	Cover Cassette Right						292	D3 x 12
159	3139 118 16950	Cover Cassette Left						293	D3 x 12
160	3139 114 74280	Lens Cassette Right						294	D3 x 10
161	3139 114 74570	Lens Cassette Right Top						297	D3 x 12
162	3139 114 74290	Lens Cassette Left						298	D3 x 12
163	3139 114 74560	Lens Cassette Left Top						300	D3 x 12
199	4822 402 10621	Push-Catch							
200	4822 529 10322	Damper Assembly							
201	3139 114 68640	Push Catch Left							
203	4822 492 11344	Spring Compression							
204	4822 402 11246	Bracket Right							
205	4822 402 11245	Bracket Left							
206	3139 111 01380	Spring Torsion Right							
207	3139 111 01390	Spring Torsion Left							
209	4822 492 70231	Spring Leaf							
242	4822 462 40683	Foot Rubber SQ							
268	3139 114 74620	Grommet, Mains Cord							
275	4822 492 11735	Spring Trans							
350	3139 118 79050	LS Box Package							
	9965 000 11640	Left LS Box							
	9965 000 11641	Right LS Box							
351	4822 303 50063	FM Aerial							
356	3139 118 79300	Remote Control FW-C255							
384	2422 549 45067	AM Antenna Loop							
385	2422 070 98145	Mains Cord 1,6M							
386	4822 263 21092	Adapter Plug	/21						
387	3139 115 21381	Instruction For Use	/21						
387	3139 115 21341	Instruction For Use	/22						
387	3139 115 21391	Instruction For Use	/34						