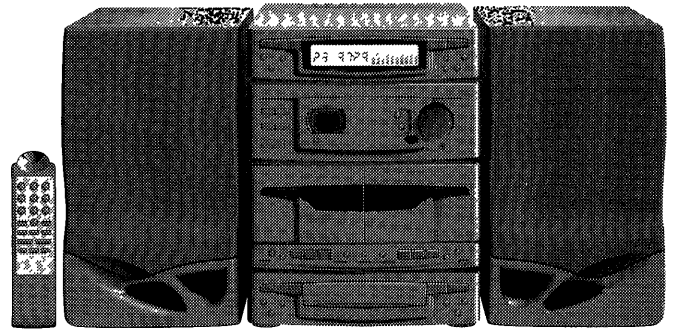


Service  
Service  
**Service**

←  
Volta ao Menu



# Service Manual

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## SPECIFICATIONS

### GENERAL

#### Mains voltage

Switchable 110-127V / 220-240V for -/21  
60Hz

#### Mains frequency

#### Mains breakdown protection

10 minutes

#### Clock Accuracy

< 4 sec/day

#### Power consumption

180W max

#### Dimension centre unit

**FW46** 240 x 309 5 x 273 5mm

**FW56** 240 x 352 5 x 273mm

### TUNER : FM SECTION

#### Tuning range

87.5MHz - 108MHz

#### IF frequency

10.7MHz

#### Aerial input

75Ω coaxial

#### Sensitivity at 26dB S/N

< 8μV {6.9μV}

#### Selectivity at 600kHz bandwidth

> 20dB {30dB}

#### IF rejection

> 50dB {60dB}

#### Image rejection

> 20dB {25dB}

### TUNER : AM SECTION

#### Tuning range

MW

530kHz - 1710kHz for /21

#### IF frequency

#### Sensitivity at 26dB S/N

MW

< 3.6mV/M {3.2mV/M}

#### Selectivity at 18kHz bandwidth

MW

> 16dB {20dB}

#### IF rejection

MW

> 24dB {24dB}

#### Image rejection

MW

> 28dB {28dB}

### AMPLIFIER

#### Output power at 10% distortion

2 x 27W -1dB

#### Speaker impedance

2 x 6Ω L/R

#### Frequency response within -3dB

63Hz - 15kHz

#### Dynamic bass boost

+6dB at 300Hz

#### Headphone output at 32Ω

25mV

#### Input sensitivity

Aux/TV

400mV at 47kΩ

MIC

1.5mV at 600Ω for -/21

### CASSETTE RECORDER

#### Number of track

2 x 2 stereo

#### Tape speed

4.76 cm/sec ± 2%

1.7 x 4.76 cm/sec

#### Wow and flutter

< 0.4%

#### Fast-wind time C60

130 sec

#### Bias system

90kHz ± 5kHz

#### Recording playback frequency response within -5dB

80Hz - 12.5kHz

#### Signal to noise ratio

IEC I

> 47dB

IEC II

> 47dB

Dubbing

> 47dB

#### Dolby Noise Reduction Factor

8.5dB

### COMPACT DISC

#### Frequency response within +2dB/-4dB

20Hz - 20kHz

#### Signal/Hiss ratio

> 75dB

#### Distortion at 1kHz

< 0.03%

#### Channel difference at 1kHz

< 2dB

#### Channel crosstalk at 1kHz

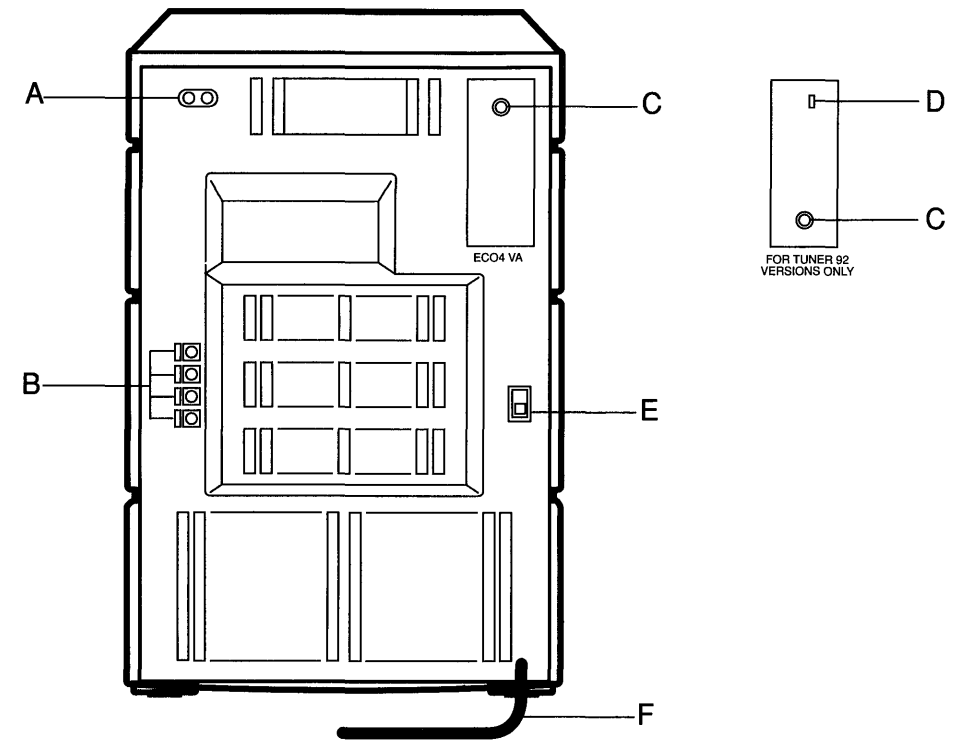
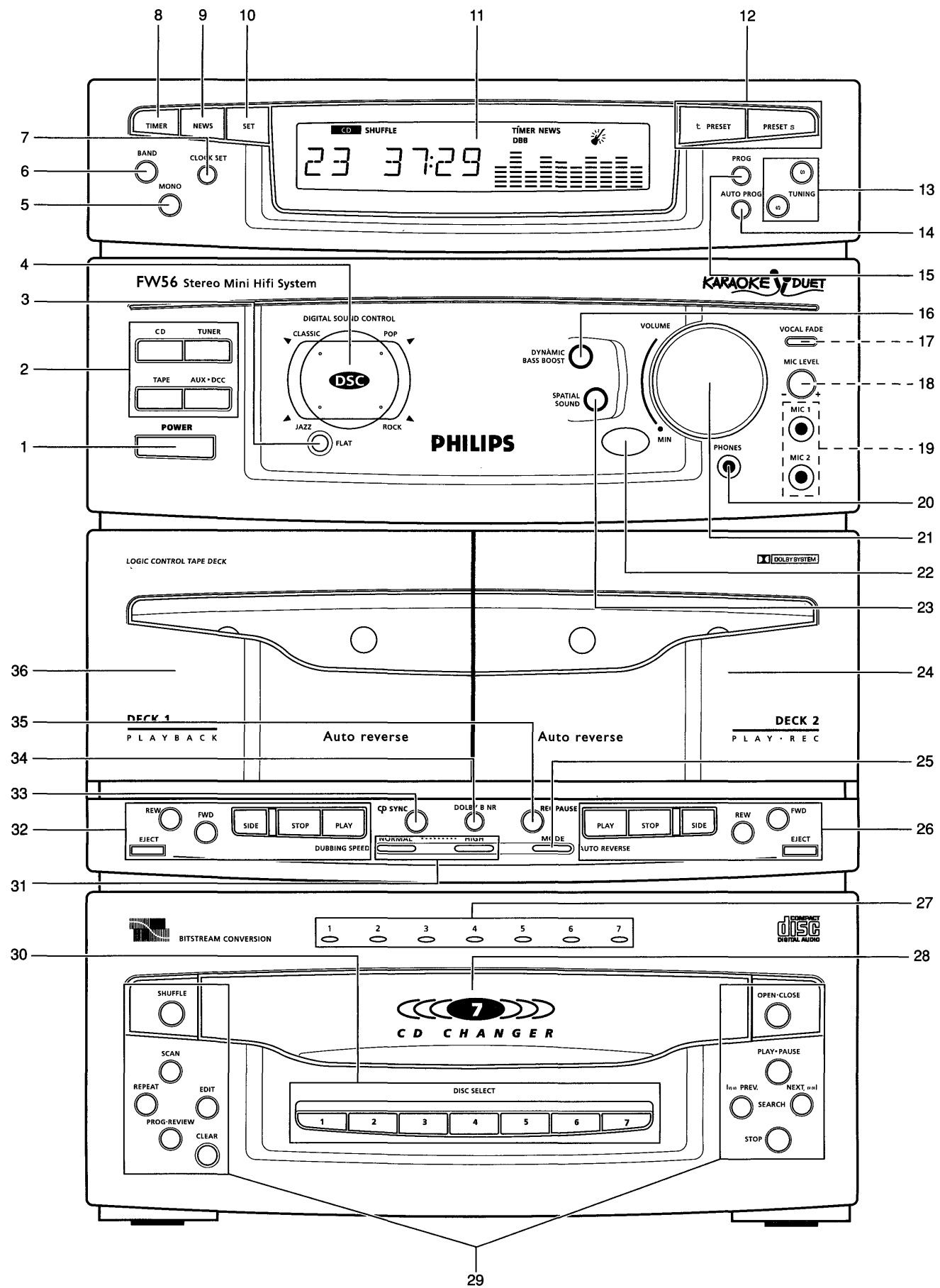
> 60dB

#### De-emphasis

0 or 15/50 μS (Switched by subcode on the disc)

{ } Values for /22 only

# CONNECTIONS & CONTROLS



## CONNECTIONS AND CONTROLS

1	Power	1414	27	Disc indicator	
2	Function controls	CD 1421	28	CDC Tray	
		Tuner 1426	29	CDC controls	Shuffle 1450
		Tape 1420			Scan 1451
		Aux-DCC 1410			Repeat 1459
3	Flat	1430			Program/Review 1458
4	Digital Sound Control	Classic 1431			Edit 1454
		Pop 1432			Clear 1455
		Jazz 1433			Stop 1456
		Rock 1434			Play/Pause 1460
5	Mono	1419			Open/Close 1452
6	Band	1425			Next 1461
7	Clock set	1418			Previous 1457
8	Timer	1424	30	Disc select	
9	News	1423	31	Dubbing speed	Normal 1472
10	Set	1422			High 1473
11	LCD display	1401	32	Play Deck controls	Eject 1476
12	Preset up/down	1428, 1429			Wind << 1479
13	Tuning up/down	1412, 1416			Wind >> 1478
14	Auto program	1417			Side 1481
15	Program	1413			Stop 1474
16	Dynamic bass boost	1411			Play 1480
17 *	Vocal fade	1553	33	CD Sync	1475
18 *	Mic level	3673	34	Dolby B NR	1477
19 *	Mic inputs	1551, 1562	35	Record/Pause	1476
20	Headphone socket	1550	36	Cassette compartment 1	
21	Volume	3629	A	Aux-TV input	1552
22	IR sensor	6406	B	Loudspeaker sockets	1304
23	Spatial Sound	1415	C	FM antenna socket	1101 or 1110
24	Cassette compartment 2		D	AM antenna socket	1111
25	Mode	1471	E	Voltage selector	1281
26	Rec/Pb Deck controls	Play 1468	F	Mains cord	
		Stop 1470			
		Side 1469			
		Wind << 1467			
		Wind >> 1466			
		Eject			

\* For Karaoke version only

**SERVICE TEST PROGRAM 1**

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program	<b>XX YY-S #</b> This is the main menu	where XX - Type no numeric YY - Master μP version S - Service mode	
Press "Program"	<b>PASS or P</b> Main menu reappears after 2 seconds	Eeprom test	Check IC if Display shows <b>ERR or N</b>
Press "Autoprogram"	<b>NEW or N</b> Main menu reappears after 2 seconds	Eeprom is now reset to default data	
Press "Clock Set"	<b>32K or 32</b>	The Alarm buzzer is turned on An output signal of 4096Hz is available at pin 37 of the main μProcessor	Check X'tal
Press "Clock Set"	<b>8M or 8</b>	The output signal at pin 37 is now 3906 25Hz	Check 8MHz oscillator
Press "Clock Set"	Main menu reappear		
Press "Set Timer/News"	<b>FAST or F</b> <b>NOM or N</b> Main menu reappears after 2 seconds	Pressing "Set Timer/News" key will alternate between Fast and Normal speed In the Fast mode the clock increases at 1 minute per second Leaving the test program now will allow quick customer checks on the clock/timer/alarm function	Ensure the clock is in normal speed before returning to customer
Press "Tuning Up"	<b>U</b>	Volume turns clockwise slowlt until maximum	
Press "Tuning Down"	<b>D</b>	Volume turns anti-clockwise until minimum	
Press "Mono" and followed by any key on the set or Remote control  Press "Mono" to return to Main menu	See key test Table 1 and 5		
Press "News"	See Table 2 and Main menu	Pressing the "News" key will scroll through the 4 different displays and the Main menu	
Press "Timer"	<b>AUX</b> <b>TAPE</b> <b>CD</b> <b>TUNER</b> Main menu reappears after 2 seconds	During source switching the set is not muted	
Disrupt the mains supply to exit the Service test program			Ending the Service test by pressing the "Power" key from the Main menu will render * CD error codes to be displayed * Tuner "Program" and "Autoprogram" keys are deactivated

# Note XX - Model model (eg 56 for FW56, etc )  
YY - Software verstion, counting down from 99

**TRADE MODE**

Operating sequence	Display shows	Remarks
At the standby mode, hold the "Program" key depressed for 2-3 seconds  To exit Trade mode repeat the above proceduure or activate the set with the Remote control	Commercial story	The set performs normally except the Commercial story will be displayed after 6 seconds whenever the set is placed into standby mode

**TABLE 1. SERVICE REMOTE CONTROL KEY TEST TABLE**

Function/Tuner keys	Display	CD keys	Display	Tape keys	Display
Standby	19 RC	CD	09 RC	Tape 1	70 RC
Sleep	28 RC	Previous	66 RC	Tape 2	71 RC
News	15 RC	Next	65 RC	Side	75 RC
DSC	76 RC	Search -	32 RC	Rewind	74 RC
Volume -	78 RC	Pause	27 RC	F Forward	73 RC
Volume +	77 RC	Search +	31 RC	Stop	67 RC
Tuner	20 RC	Stop	59 RC	Play	72 RC
Preset Down	17 RC	Play	26 RC		
Preset Up	18 RC	Disc Up	79 RC		
Tuning Down	06 RC				
Tuning Up	02 RC				

Note "RC" disappears when the key is released



**Table 2. Display and Disc indicators**

For all versions except /37		
Steps	LCD display	Disc indicator
1		Fully on
2		Red for odd numbers Green for even numbers
3		Green for odd numbers Red for even numbers
4		Fully off
For /37 only		
Steps	LCD display	Disc indicator
1		Fully on
2		Red for odd numbers Green for even numbers
3		Green for odd numbers Red for even numbers
4		Fully off

**SERVICE TEST PROGRAM 2**

Operating sequence	Display shows	Remarks	In case of problems check
<p>To perform CDC test press "CD" at the Main menu screen Service level 1 is now achieved</p> <p>Press "Next"</p> <p>Press "Prev"</p> <p>Press "Shuffle"</p> <p>Press "Scan"</p> <p>Press "Stop" will exit CDC test and return to Main menu</p>	<p><i>CDC AA</i></p> <p><i>SLED 0</i></p> <p><i>SLED 1</i></p> <p><i>PLAY</i></p> <p><i>STOP</i></p>	<p>The CDC servo version is display AA = version number</p> <p>The sledge will move outward</p> <p>The sledge will move inward</p> <p>Start the Turntable motor in the play direction</p> <p>Start the Turntable motor in the brake direction</p>	<p>Pressing "Power" key at the Main menu screen will to exit Service test and enter into Service Play mode The set will perform as normal except in the CD mode error codes will be displayed</p> <p>A list of error codes are found in Table 3</p>
<p>Press "Play" - Service level 2</p> <p>Press "Stop"</p>	<p><i>FOC 1</i></p>	<p>Laser is turned on and focus is achieved</p> <p>Return to Service level 1</p>	<p>Check the laser and focus circuits if the display shows <i>FOC 0</i></p>
<p>Press "Play" - Service level 3</p> <p>Press "Stop"</p>	<p><i>DISC</i></p>	<p>Disc motor start to turn</p> <p>Return to Service level 1</p>	
<p>Press "Play"</p> <p>Press "Stop"</p>	<p><i>RDL</i></p>	<p>The Radial servo turns on and music can be heard at the Loudspeakers</p> <p>Return to Service level 1</p>	
<p>To perform Tuner test press "Tuner" at the Main menu screen</p> <p>Use the "Preset Up" and "Preset down" to display the loaded frequencies</p>	<p><i>ZZZ</i></p> <p>See Table 4</p>	<p>Tuner version is display ZZZ = Tuner version</p> <p>Service frequencies are now loaded into the EEROM of the <math>\mu</math>Processor</p>	
<p>To end the Service test program disrupt the mains supply</p>			<p>Ending the Service test by pressing the "Power" key from the Main menu will render</p> <ul style="list-style-type: none"> <li>* CD error codes to be displayed</li> <li>* Tuner "Program" and "Autoprogram" keys are deactivated</li> </ul>

**TABLE 3. CD ERROR CODES TABLE**

Error codes		Error description
E 1002	F	Focus error
E 1008	W	Out of lead-in during reading TOC
E 1010	F	Radial error
E 1011	W	Sledge error
E 1012	F	Fatal sledge error
E 1013	F	Turntable motor error
E 1042	F	Internal stack overflow
E 1050	W	Edit calculation error
E 1070	F	Centering of the tray not finished on time
E 1071	F	Tray closing not finished within time
E 1072	F	Tray has not opened within time
E 1076	W	Desired disc position could not have been reached within time
E 1077	F	Pickup Switch SW1 or SW2 did not open as expected within a certain time
E 1078	F	Pickup Switch SW1 or SW2 did not close as expected within a certain time
E 1079	W	Tray open position not reached within time
E 1080	F	Miscounting of the stocker position occurred, position was correct at position 1

Note F = Fatal error and set stops operation  
W = Warning and set continues operation

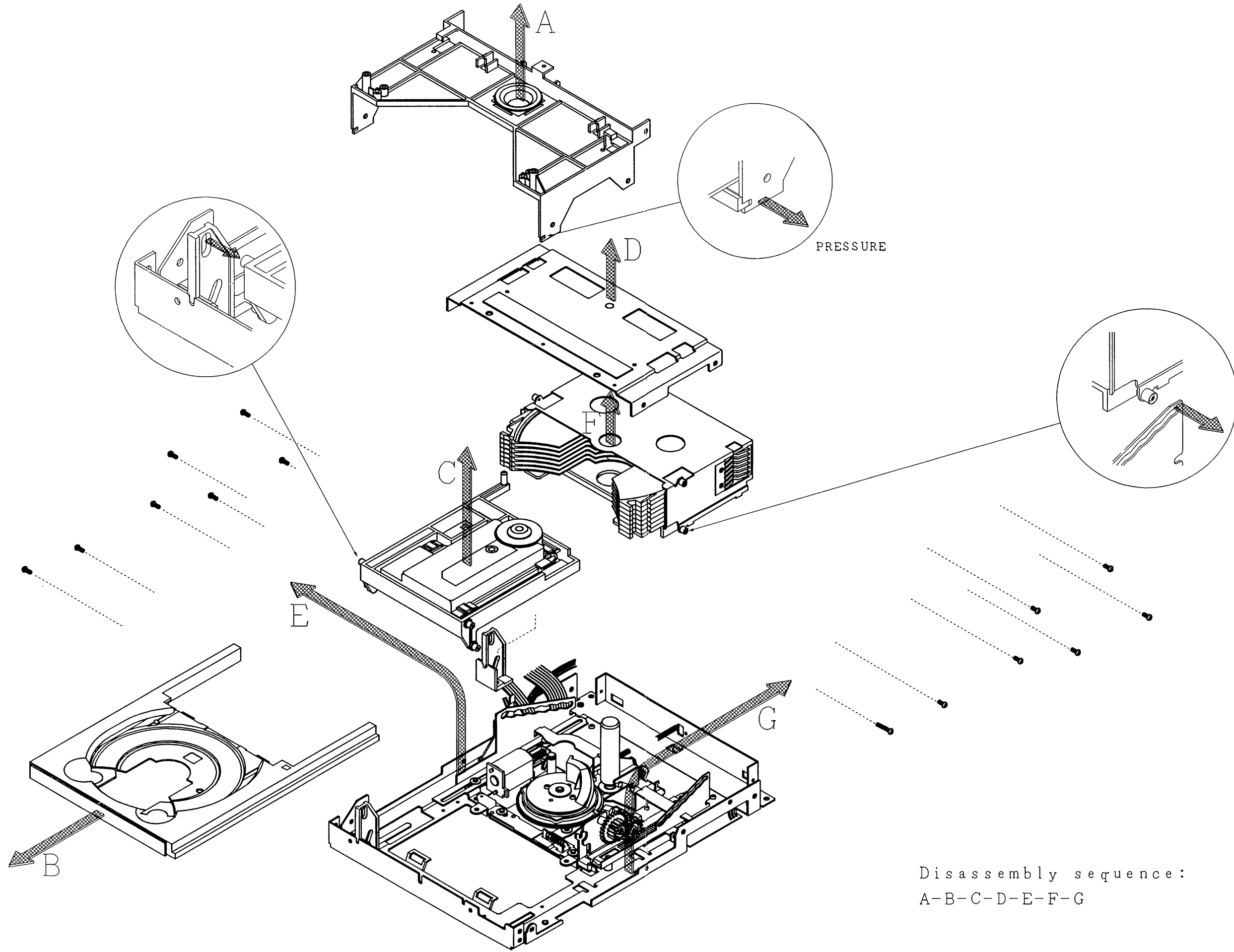
**TABLE 4. TUNER SERVICE TEST FREQUENCIES**

PRESET	Europe "EUR"	East Eur. "EAS"	USA "USA"	Oversea "OSC"	Japan "JAP"
1	108 00 MHz	108 00 MHz	108 00 MHz	108 00 MHz	90 00 MHz
2	87 50 MHz	65 81 MHz	87 50 MHz	87 50 MHz	76 00 MHz
3	1611 kHz	1611 kHz	1710 kHz	1710 kHz	1629 kHz
4	522 kHz	522 kHz	530 kHz	530 kHz	522 kHz
5	279 kHz	279 kHz	-	-	-
6	153 kHz	153 kHz	-	-	-
7	98 00 MHz	98 00 MHz	98 00 MHz	98 00 MHz	80 00 MHz
8	558 kHz	558 kHz	560 kHz	560 kHz	558 kHz
9	1494kHz	1494kHz	1500kHz	1500kHz	1494kHz
10	549kHz	549kHz	550kHz	550kHz	549kHz

**TABLE 5. SERVICE SET KEY TEST TABLE**

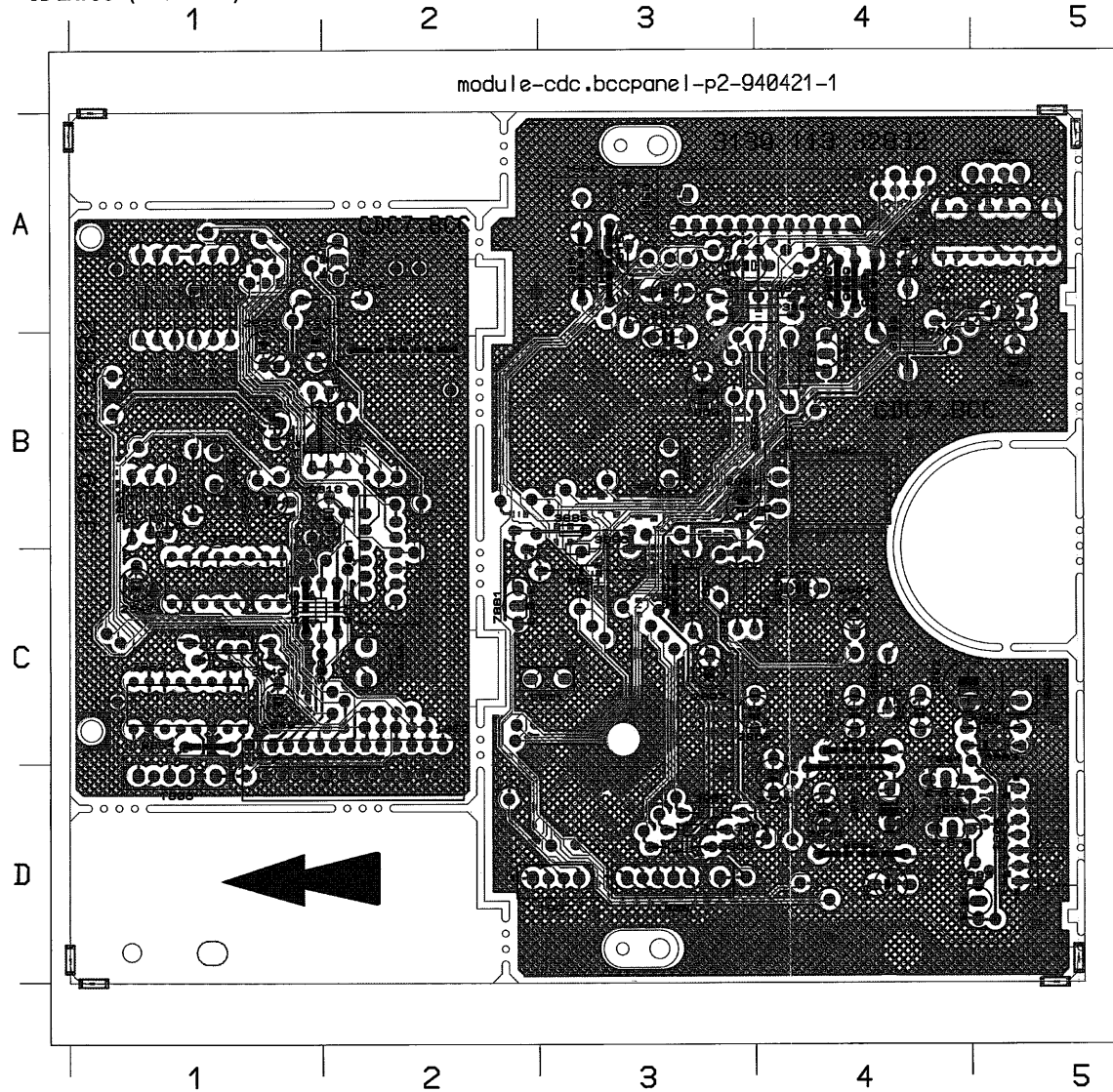
Timer/News/Tuner keys	Display	CD/Tape Keys	Display	CD Keys	Display
Timer	14	Wind A < <	34	Shuffle	61
News	15	Wind A > >	33	Scan	62
Set	16	Side A	36	Repeat	54
Band	13	Stop A	37	Prog/Review	53
Clock Set	12	Play A	35	Clear	58
Mono	11	CD Sync	38	Edit	57
Preset Down	17	Dolby B NR	40	Stop	59
Preset Up	18	Rec-Pause	39	Play-Pause	55
Prog	01	Normal Speed	43	Open-close	63
Autoprogram	05	High Speed	44	Next	56
Tuning Up	02	Mode	42	Previous	60
Tuning Down	06	Play B	47	Disc 1	49
CD	09	Stop B	41	Disc 2	50
Tuner	20	Side B	48	Disc 3	51
Tape	10	Wind B < <	46	Disc 4	52
Aux-DCC	04	Wind B > >	45	Disc 5	64
Power	08			Disc 6	29
Classic	23			Disc 7	30
Pop	22				
Jazz	21				
Rock	25				
Flat	24				
Dynamic Bass Boost	03				
Spatial Sound	07				

CDC DISASSEMBLY DRAWING

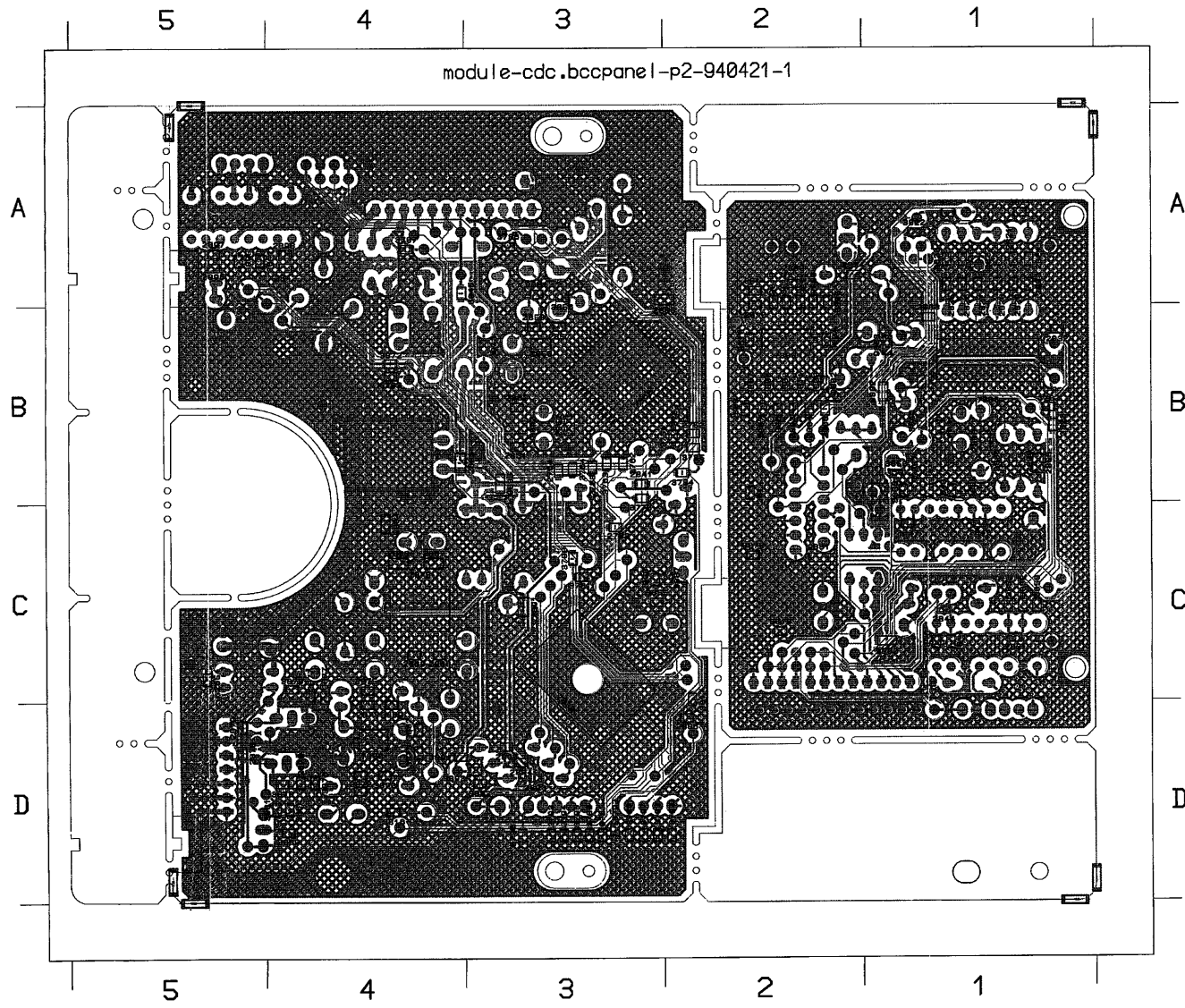


Disassembly sequence:  
A-B-C-D-E-F-G

CD LAYOUT (BITSTREAM)

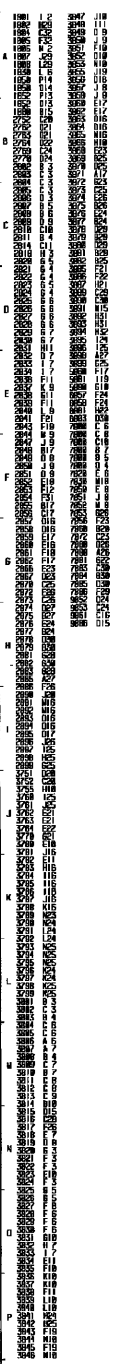
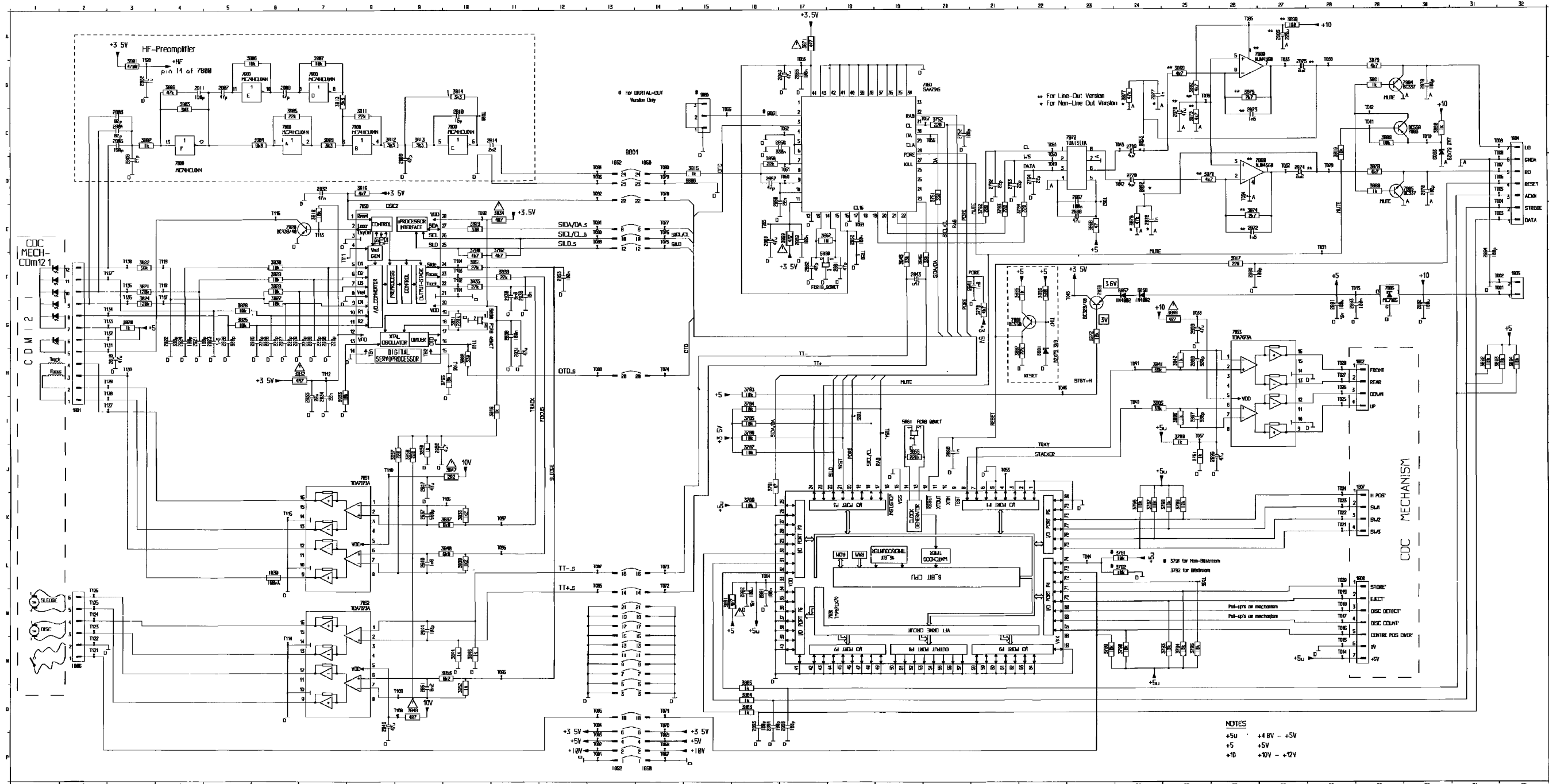


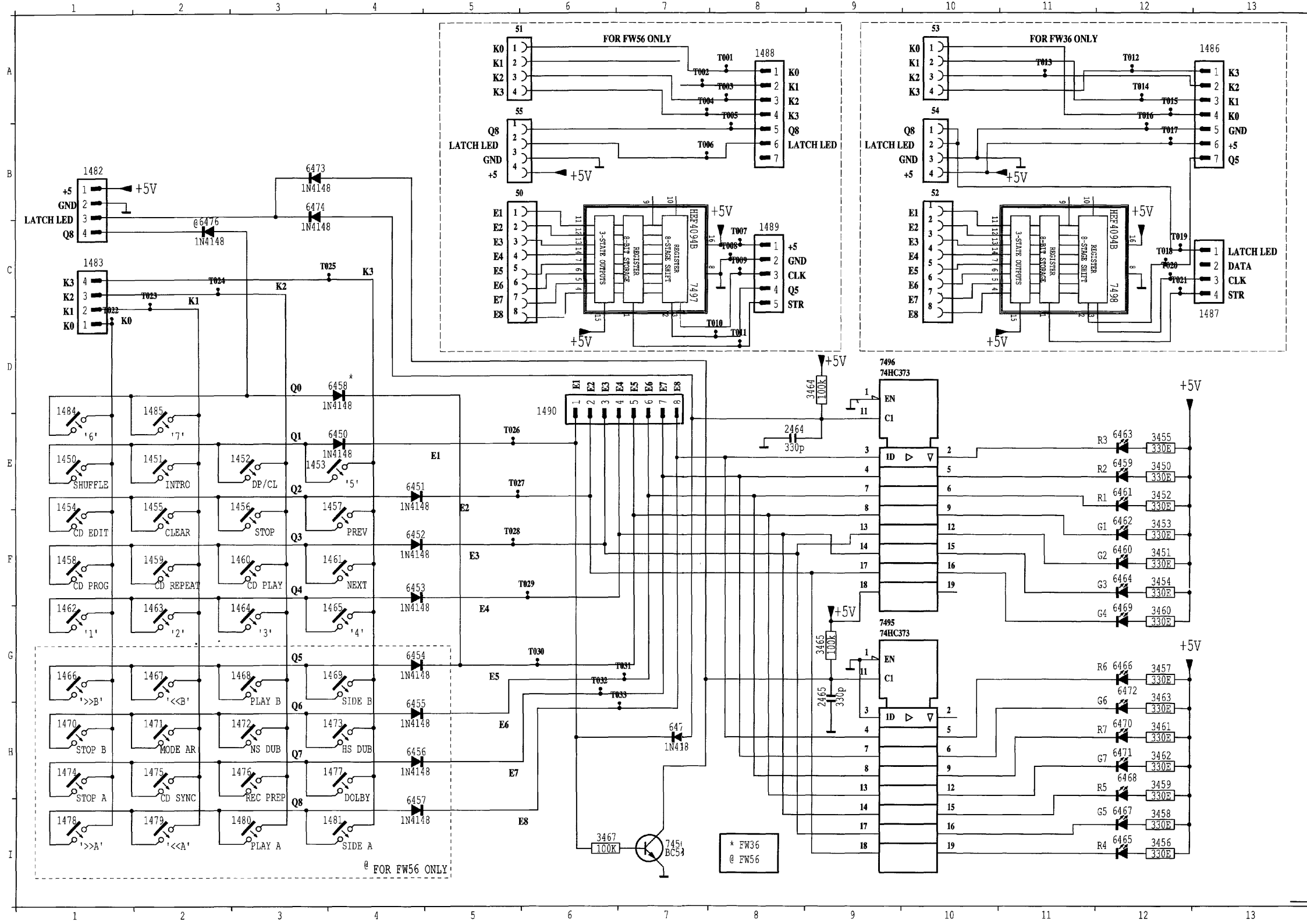
1801	C 2	3884	D 3
1802	A 5	3885	D 3
1804	D 5	3887	C 3
1805	C 5	3888	C 3
1806	D 1	3871	A 4
1807	D 3	3885	B 3
1808	D 3	3886	C 3
1830	C 2	3890	C 5
1850	A 4	3891	C 3
1852	C 2	3898	C 4
1880	A 3	3899	A 4
2769	C 4	5800	B 3
2770	D 4	5801	C 3
2802	B 1	5890	B 1
2818	B 2	6857	B 4
2831	B 1	6858	B 3
2833	B 1	6881	C 3
2843	A 3	6883	C 5
2847	C 1	7820	A 2
2848	A 3	7851	C 1
2849	C 1	7852	C 1
2850	B 1	7853	A 5
2856	B 3	7856	B 4
2860	B 3	7881	C 2
2864	C 4	7883	D 5
2885	C 3	7884	D 4
2886	C 4	7885	D 4
2870	D 4	7888	B 4
2874	D 4	9852	D 4
2875	C 4	9853	C 4
2881	B 3	9854	C 1
2882	C 4	9855	C 1
2885	D 4	9856	B 2
2892	C 3	9857	C 2
2896	B 5	9858	A 4
2899	A 4	9859	A 4
3760	A 5	9860	A 4
3761	A 5	9861	A 3
3801	B 2	9862	C 3
3815	A 3	9863	D 4
3818	A 2	9868	A 3
3820	C 1		
3825	A 1		
3826	A 1		
3827	A 1		
3828	A 1		
3829	A 1		
3830	A 1		
3832	B 2		
3834	B 1		
3835	B 1		
3838	B 1		
3847	C 1		
3848	B 1		
3849	C 1		
3851	B 1		
3880	A 4		
3883	D 3		



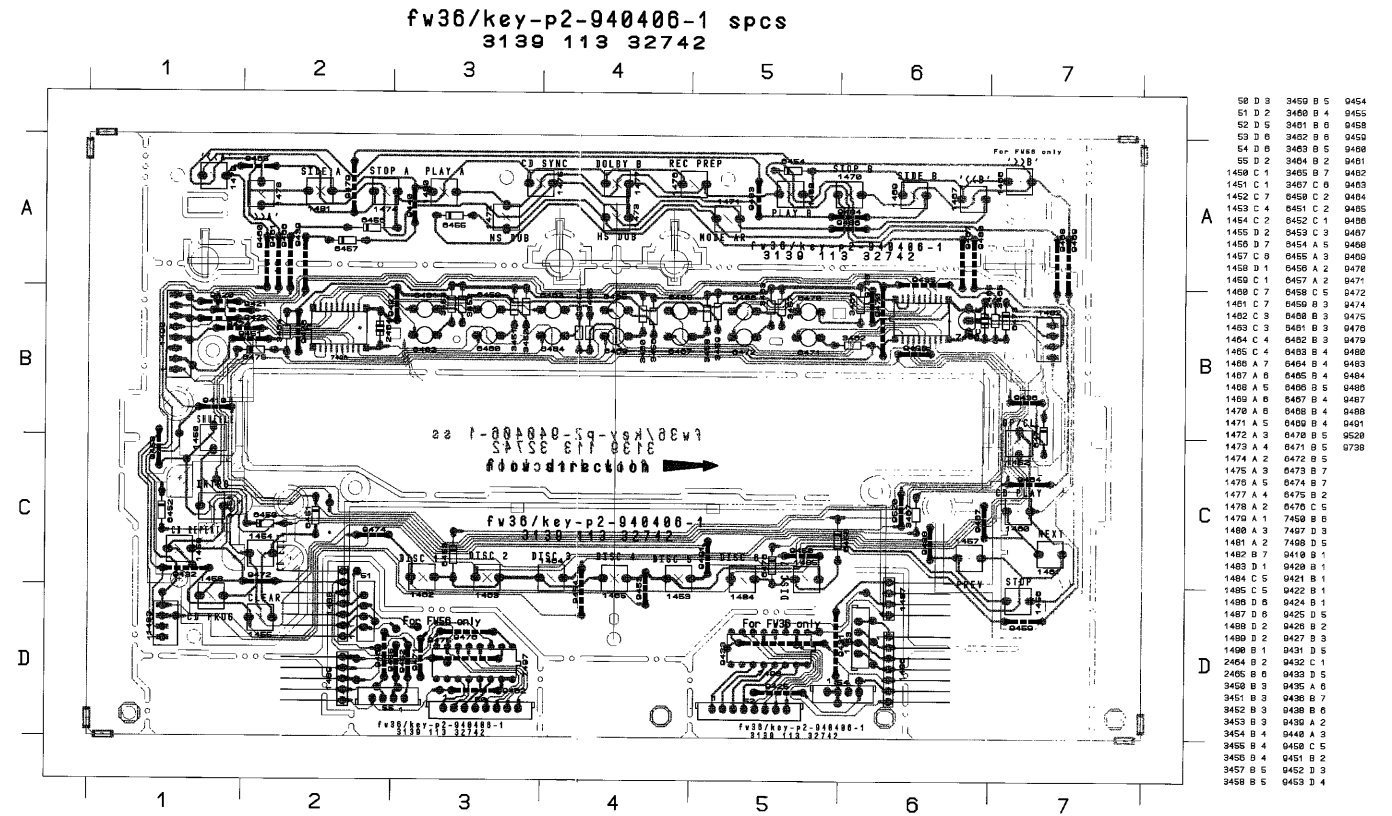
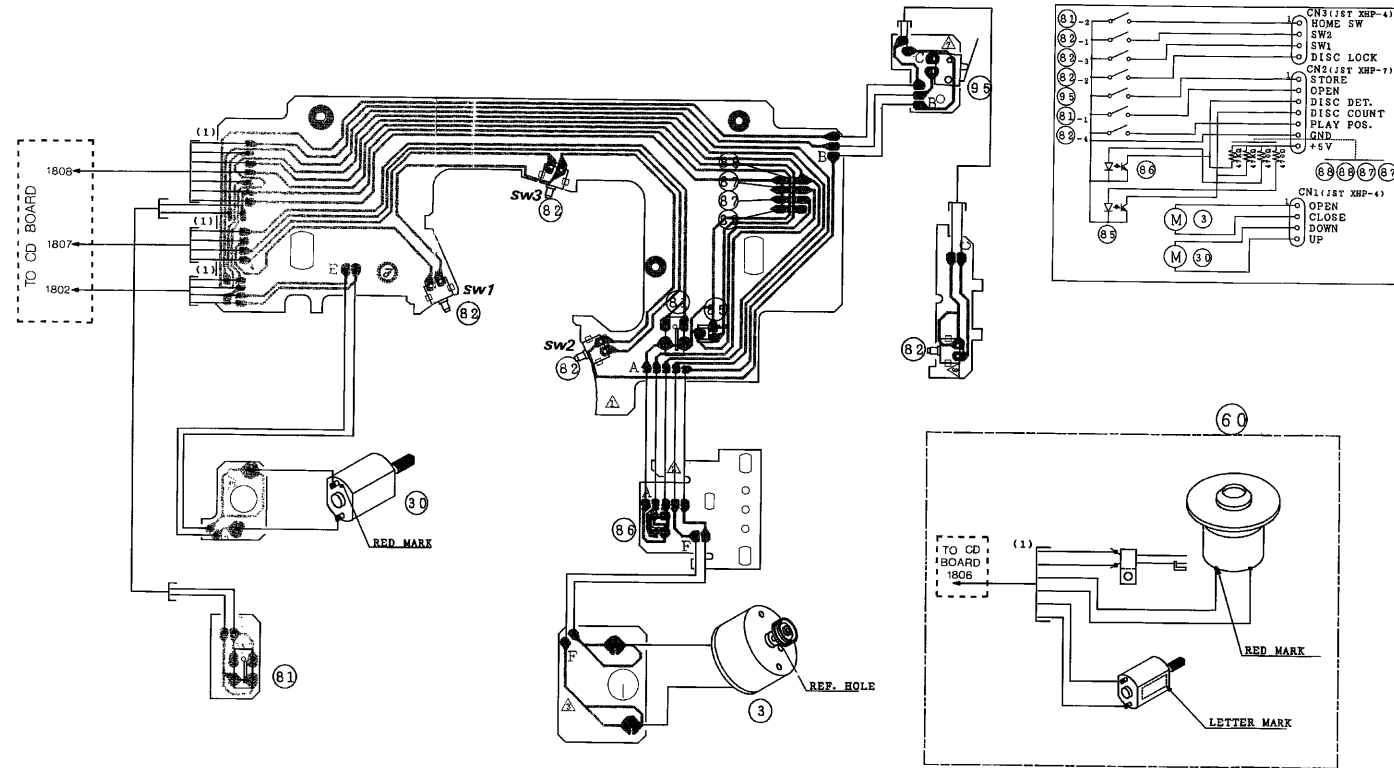
2752	B 2	3789	D 3
2762	C 3	3790	D 3
2763	B 3	3791	D 3
2764	B 3	3793	D 3
2803	B 2	3794	D 3
2804	B 2	3795	D 3
2805	B 2	3796	D 3
2806	B 2	3797	D 3
2807	B 2	3798	D 3
2808	B 2	3799	D 2
2809	A 2	3802	B 2
2810	B 2	3803	B 2
2811	B 2	3804	B 2
2814	B 2	3805	A 2
2820	A 1	3806	B 2
2821	A 1	3807	B 2
2822	A 1	3808	B 2
2823	A 1	3809	A 2
2824	A 1	3810	B 2
2825	A 1	3811	A 2
2826	A 1	3812	A 2
2827	A 1	3813	A 2
2828	A 1	3814	A 2
2829	A 1	3816	D 4
2830	A 1	3817	C 2
2832	B 1	3819	C 2
2834	A 2	3821	A 1
2836	B 1	3822	A 1
2837	C 1	3823	B 1
2838	B 1	3824	A 1
2839	B 1	3831	B 1
2840	C 1	3833	B 1
2841	B 3	3836	B 1
2844	C 1	3837	B 1
2851	C 1	3839	B 1
2852	B 3	3840	B 1
2853	B 1	3841	A 5
2854	C 5	3842	A 4
2855	A 2	3843	B 3
2857	B 3	3844	C 1
2858	B 3	3845	A 4
2859	B 3	3846	C 1
2861	B 3	3846	B 1
2862	B 3	3852	C 1
2863	C 4	3853	C 1
2867	C 4	3855	C 3
2898	C 4	3856	A 3
2899	C 4	3857	B 1
2872	D 4	3858	C 1
2876	D 4	3861	A 3
2877	C 4	3862	B 3
2878	D 5	3866	B 1
2879	D 5	3872	B 4
2883	B 4	3876	D 4
2886	D 2	3877	C 4
2890	C 3	3878	D 4
2891	C 3	3879	C 4
2893	D 3	3880	D 4
2894	D 3	3881	D 4
2895	D 3	3887	C 2
2897	A 5	3889	D 4
2898	A 4	3892	D 3
3751	B 2	3893	D 3
3752	B 2	3894	D 4
3755	B 1	3895	A 5
3762	B 3	3896	A 5
3763	B 3	7830	C 3
3764	B 3	7850	B 1
3770	B 3	7850	B 3
3780	B 1	7870	C 4
3781	C 3	7880	D 4
3782	B 1	9870	C 2
3783	B 4	9880	C 1
3784	B 2	9881	C 2
3785	B 2	9882	B 1
3786	A 3	9883	B 1
3787	A 4	9884	C 4
3788	C 3	9885	B 3

CD CIRCUIT (NON-BITSTREAM)





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# CONNECTIONS AND CONTROLS

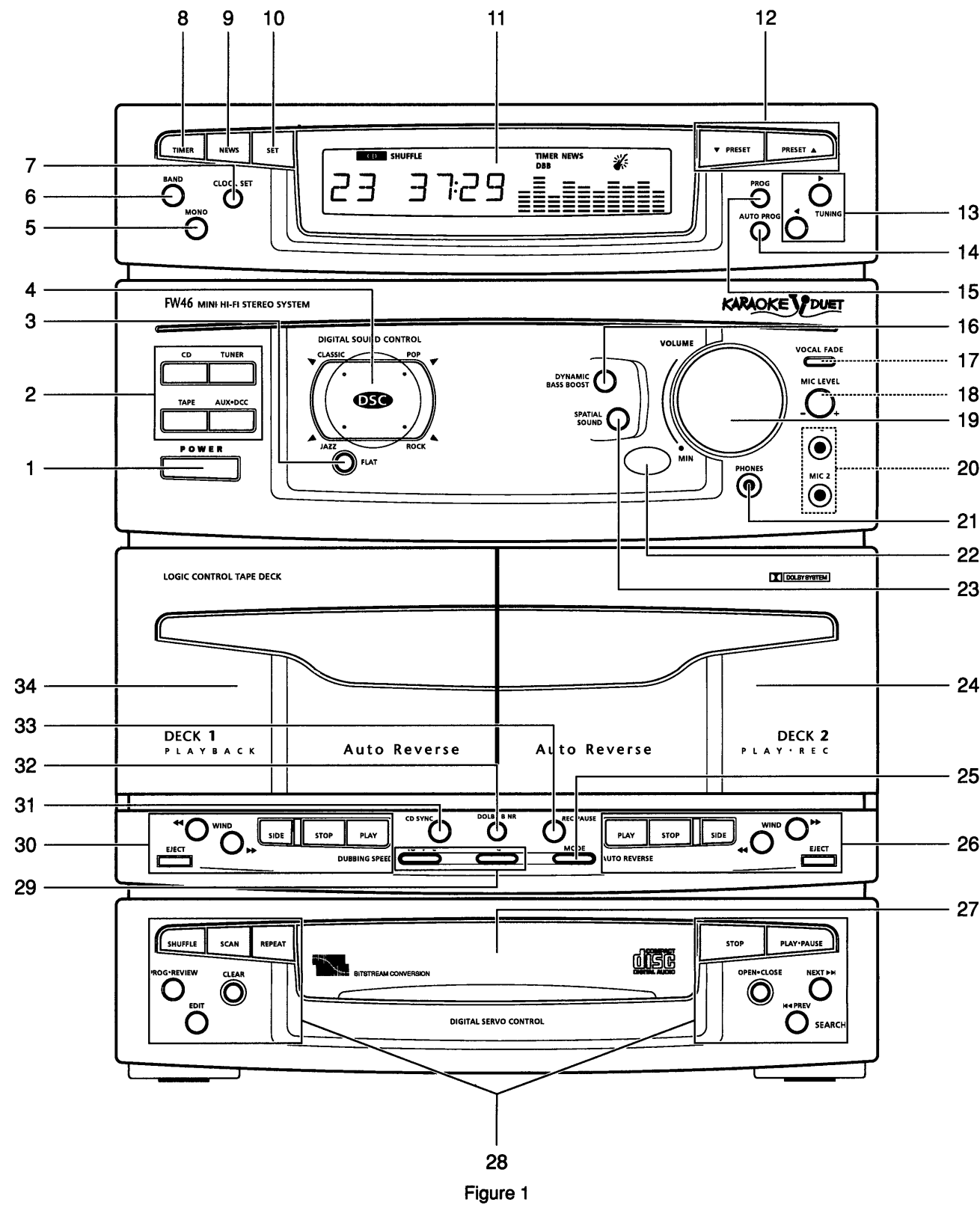


Figure 1

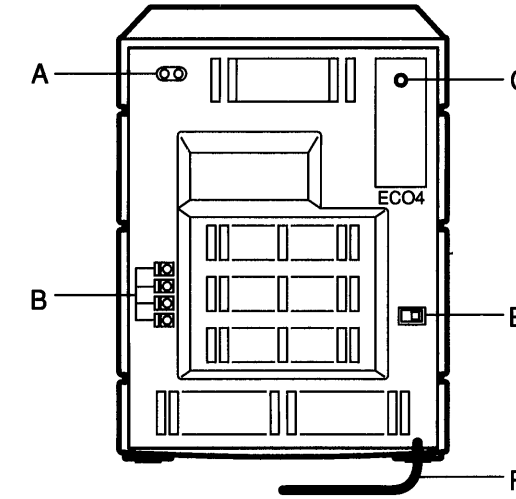


Figure 2

## CONNECTIONS AND CONTROLS

1	Power		1414		Wind <<	1467
2	Function controls	CD	1421		Wind >>	1466
		Tuner	1426		Eject	
		Tape	1420	27	CD Tray	
		Aux-DCC	1410	28	CD controls	
3	Flat		1430		Shuffle	1450
4	Digital Sound Control	Classic	1431		Scan	1451
		Pop	1432		Repeat	1459
		Jazz	1433		Program/Review	1458
		Rock	1434		Edit	1454
5	Mono		1419		Clear	1455
6	Band		1425		Stop	1456
7	Clock set		1418		Play/Pause	1460
8	Timer		1424		Open/Close	1452
9	News		1423		Next	1461
10	Set		1422	29	Previous	1457
11	LCD display		1401		Normal	1472
12	Preset up/down		1429, 1428	30	High	1473
13	Tuning up/down		1412, 1416		Eject	
14	Auto program		1417		Wind <<	1479
15	Program		1413		Wind >>	1478
16	Dynamic bass boost		1411		Side	1481
17 *	Vocal fade		1553		Stop	1474
18 *	Mic level		3673	31	Play	1480
19	Volume		3629	32	CD Sync	1475
20 *	Mic inputs		1551, 1562	33	Dolby B NR	1477
21	Headphone socket		1550	34	Record/Pause	1476
22	IR sensor		6406		Cassette compartment 1	
23	Spatial Sound		1415		Aux-TV input	1552
24	Cassette compartment 2				Loudspeaker sockets	1304
25	Mode		1471		FM antenna socket	1101 or 1110
26	Rec/Pb Deck controls	Play	1468		AM antenna socket	1111
		Stop	1470		Voltage selector	1281
		Side	1469		Mains cord	

\* For Karaoke version only

**SERVICE TEST PROGRAM 1**

Operating sequence	Display shows	Remarks	In case of problems check
Hold "Program" and "Preset Up" button down while Power on to enter Service test program.	<b>XX YY-S #</b> This is the main menu.	where: XX - Type no. numeric YY - Master μP version S - Service mode	
Press "Program"	<b>P</b> Main menu reappears after 2 seconds.	Eeprom test	Check IC if Display shows <b>ERR</b> or <b>N</b>
Press "Autoprogram"	<b>N</b> Main menu reappears after 2 seconds.	Eeprom is now reset to default data.	
Press "Clock Set"	<b>32</b>	The Alarm buzzer is turned on. An output signal of 4096Hz is available at pin 37 of μProcessor.	Check X'tal
Press "Clock Set"	<b>8</b>	The output signal at pin 37 is now 3906.25Hz.	Check 8MHz oscillator
Press "Clock Set"	Main menu reappear.		
Press "Set Timer/News"	<b>F</b> <b>N</b> Main menu reappears after 2 seconds.	Pressing "Set Timer/News" key will alternate between Fast and Normal speed. In the Fast mode the clock increases at 1 minute per second. Leaving the test program now will allow quick customer checks on the clock/timer/alarm function.	Ensure the clock is in normal speed before returning to customer.
Press "Mono" and followed by any key on the set or Remote control. Press "Mono" to return to Main menu	See key test Table 1 and 2.		
Press "Tuning Up"	<b>U</b>	Volume turns clockwise slowly until maximum.	
Press "Tuning Down"	<b>D</b>	Volume turns anti-clockwise until minimum.	
Press "News"	Figure 3-6 and Main menu.	Pressing the "News" key will scroll through the 4 different displays and the Main menu.	

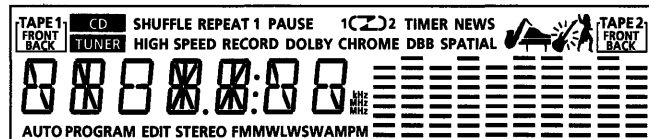


Figure 3

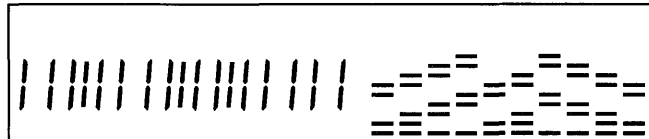


Figure 4

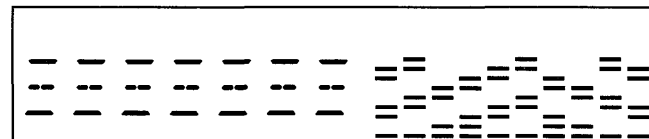


Figure 5

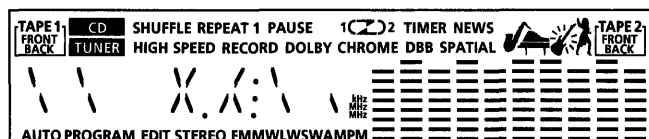


Figure 6

Press "Timer"	<b>AUX</b> TAPE <b>CD</b> <b>TUNER</b>  Main menu reappears after 2 seconds.	During source switching the set is not muted.	
Disrupt the mains supply to exit the Service test program.			Ending the Service test by pressing the "Power" key will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys non functioning.

# Note: XX - Model model (eg 46 for FW46, etc.)  
YY - Software version, counting down from 99

**SERVICE TEST PROGRAM 2**

Operating sequence	Display shows	Remarks	In case of problems check
To perform CD test press "CD" at the Main menu screen.	<b>CD AA</b>	The CD servo version is display. AA = version number	Press "Power" key at the Main menu screen to exit Service test. Enter CD mode and the set perform as normal except error codes will be displayed  A list of error codes are found in Table 4.
Press "Stop" - Service pos 0	<b>S</b>	During this test the sledge will move outward.	
Press "Next" - Service pos 1	<b>F</b>	Focus is switched on.	
Press "Next" - Service pos 2	<b>D</b>	Disc motor is switched on.	
Press "Next" - Service pos 3	<b>R</b>	Radial is switched on.	
Pressing "Previous" will bring the set to the previous service pos.			
To perform Tuner test press "Tuner" at the Main menu screen.	<b>ZZZ</b>	Tuner version is display. ZZZ = Tuner version	
Use the "Preset Up" and "Preset down" to display the loaded frequencies.	See Table 3.	Service frequencies are now loaded into the EEROM of the μProcessor.	
To end the Service test program disrupt the mains supply.			Ending the Service test by pressing the "Power" key will render: * CD error codes to be displayed. * Tuner "Program" and "Autoprogram" keys non functioning

**TABLE 1. SERVICE KEY TEST TABLE**

Timer/News/Tuner/ Function keys	Display	CD/Tape Keys	Display	CD keys	Display
Timer	14	Wind A <<	34	Shuffle	61
News	15	Wind A >>	33	Scan	62
Set	16	Side A	36	Repeat	54
Band	13	Stop A	37	Prog-Review	53
Clock Set	12	Play A	35	Clear	58
Mono	11	CD Sync	38	Edit	57
Preset Down	17	Dolby B NR	40	Stop	59
Preset Up	18	Rec-Pause	39	Play-Pause	55
Prog	01	Normal Speed	43	Open-Close	63
Autoprogram	05	High Speed	44	Next	56
Tuning Up	02	Mode	42	Previous	60
Tuning Down	06	Play B	47		
CD	09	Stop B	41		
Tuner	20	Side B	48		
Tape	10	Wind B <<	46		
Aux-DCC	04	Wind B >>	45		
Power	08				
Classic	23				
Pop	22				
Jazz	21				
Rock	25				
Flat	24				
Dynamic Bass Boost	03				
Spatial Sound	07				

**TABLE 2. SERVICE REMOTE CONTROL KEY TEST TABLE**

Function/Tuner keys	Display	CD keys	Display	Tape keys	Display
Standby		CD	09	Tape 1	50
Sleep	28	Previous	30	Tape 2	51
News	15	Next	29	Side	67
DSC	68	Search -	32	Rewind	66
Volume -	70	Pause	27	F. Forward	65
Volume +	69	Search +	31	Stop	64
Tuner	20	Stop	59	Play	52
Preset Down	17	Play	26		
Preset Up	18				
Tuning Down	06				
Tuning Up	02				

**TABLE 3. TUNER SERVICE TEST FREQUENCIES**

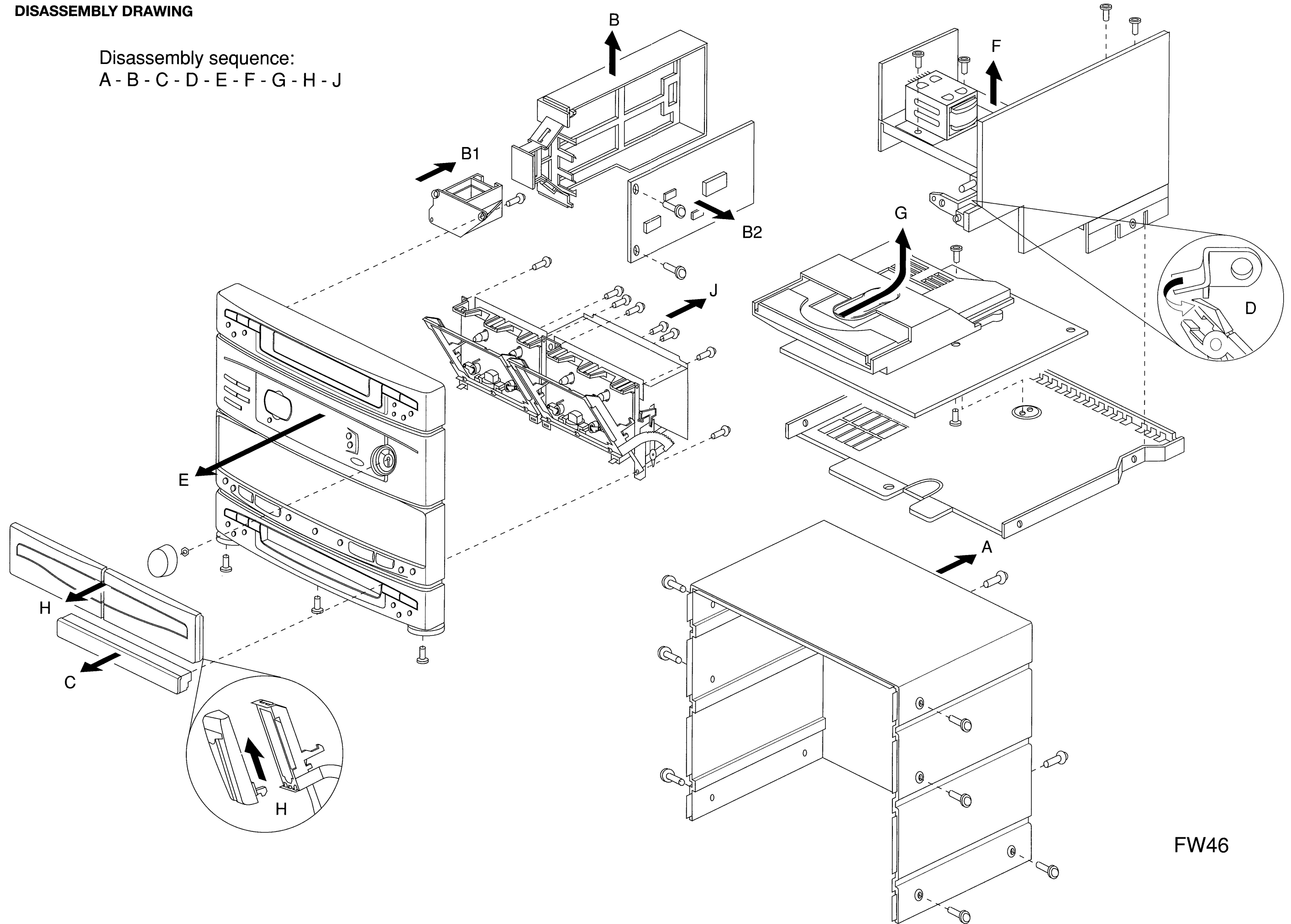
PRESET	Europe "EUR"	East Eur. "EAS"	USA "USA"	Oversea "OSC"	Japan "JAP"
1	108.00 MHz	108.00 MHz	108.00 MHz	108.00 MHz	90.00 MHz
2	87.50 MHz	65.81 MHz	87.50 MHz	87.50 MHz	76.00 MHz
3	1611 kHz	1611 kHz	1710 kHz	1710 kHz	1629 kHz
4	522 kHz	522 kHz	530 kHz	530 kHz	522 kHz
5	279 kHz	279 kHz	-	-	-
6	153 kHz	153 kHz	-	-	-
7	98.00 MHz	98.00 MHz	98.00 MHz	98.00 MHz	80.00 MHz
8	558 kHz	558 kHz	560 kHz	560 kHz	558 kHz
9	1494kHz	1494kHz	1500kHz	1500kHz	1494kHz
10	549kHz	549kHz	550kHz	550kHz	549kHz

**TABLE 4. CD ERROR CODES TABLE**

Error codes	Check area	Remarks
E 1002	ICs 7000, 7060 and 7080	Focus error, no disc
E 1007	CDM 12 and Disc	Subcode error, no valid subcode
E 1008	Bad Disc and Lens	TOC error, out of lead-in area while reading TOC
E 1009	IC 7101 and 7102	CD4 + decoder error
E 1010	IC 7000 and 7080	Radial error
E 1012	ICs 7000 and 7660	Fatal sledge error
E 1013	ICs 7102, 7140, 7141 and 7660	Turntable motor error
E 1030	CDM 12 and IC 7000	Too many grooves to jump
E 1031	CDM 12 and IC 7000	Search error
E 1032	CDM 12 and IC 7000	Search binary error
E 1033	CDM 12 and IC 7000	Search index error
E 1034	CDM 12 and IC 7000	Search time error
E 1037	CDM 12 and IC 7000	Selection error
E 1050	Operating error	Edit calculation error
E 1051	Operating error	Edit track count error
E 1052	Operating error	Edit optimal error

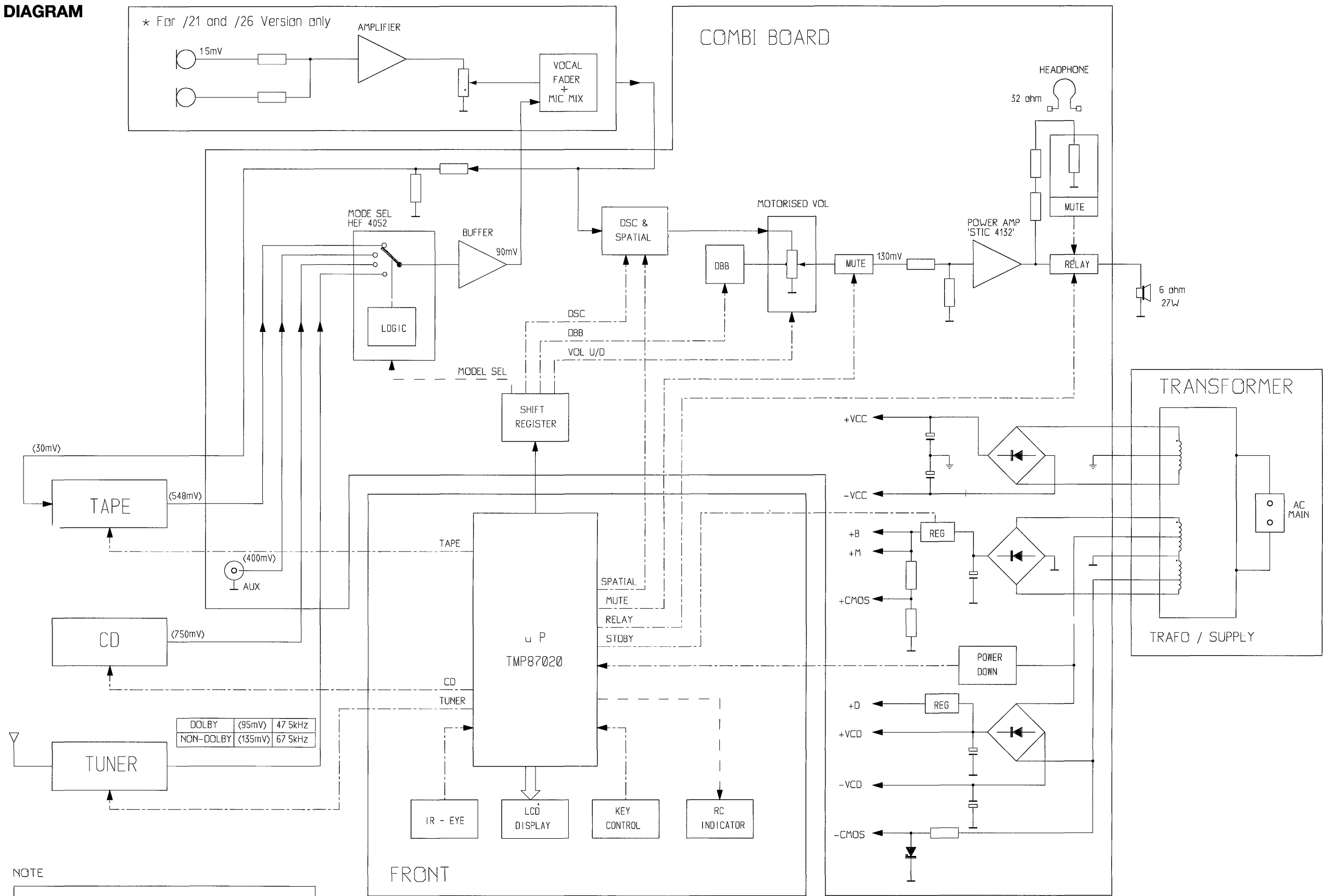
**DISASSEMBLY DRAWING**

Disassembly sequence:  
A - B - C - D - E - F - G - H - J



FW46

**BLOCK DIAGRAM**



NOTE

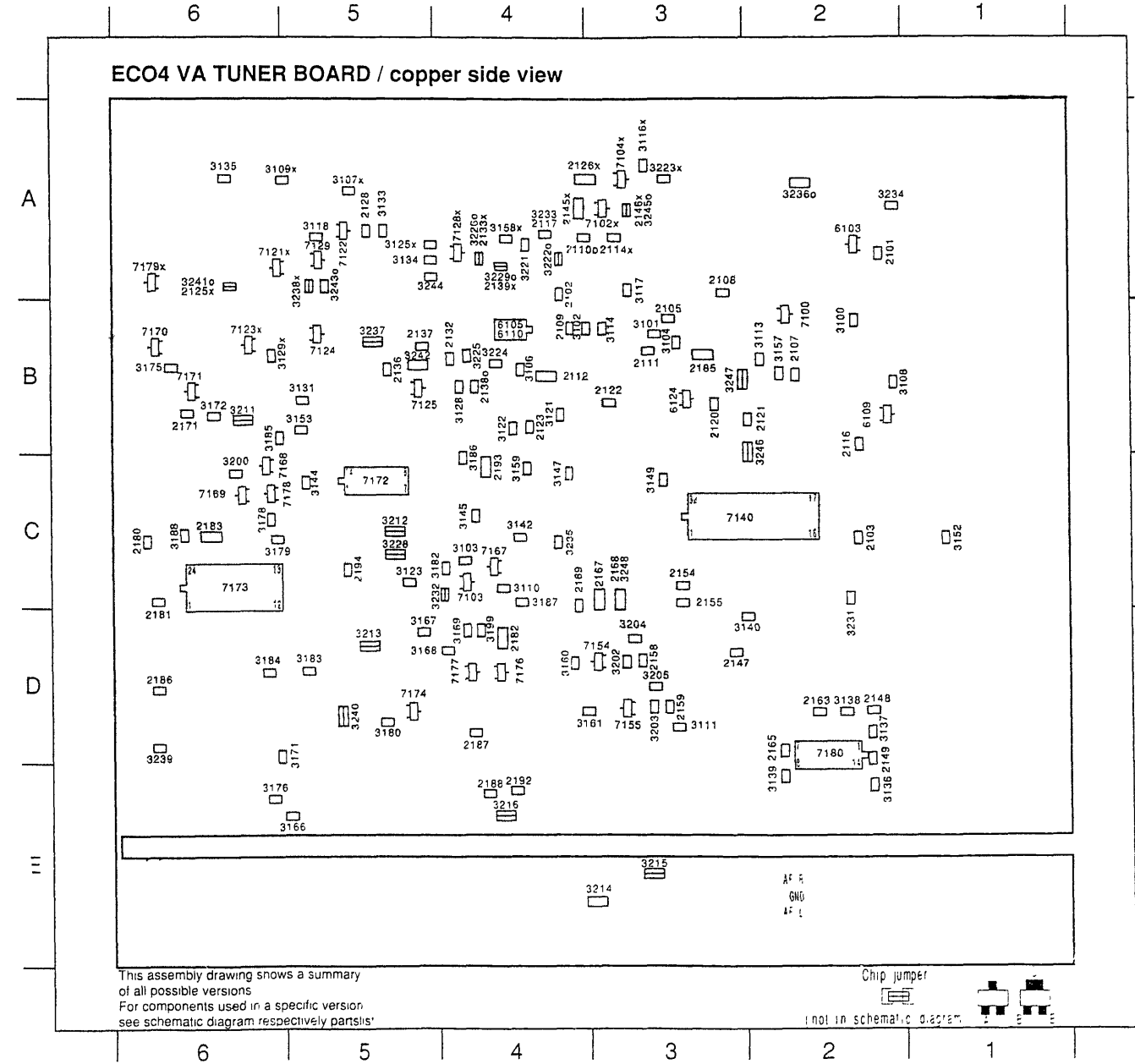
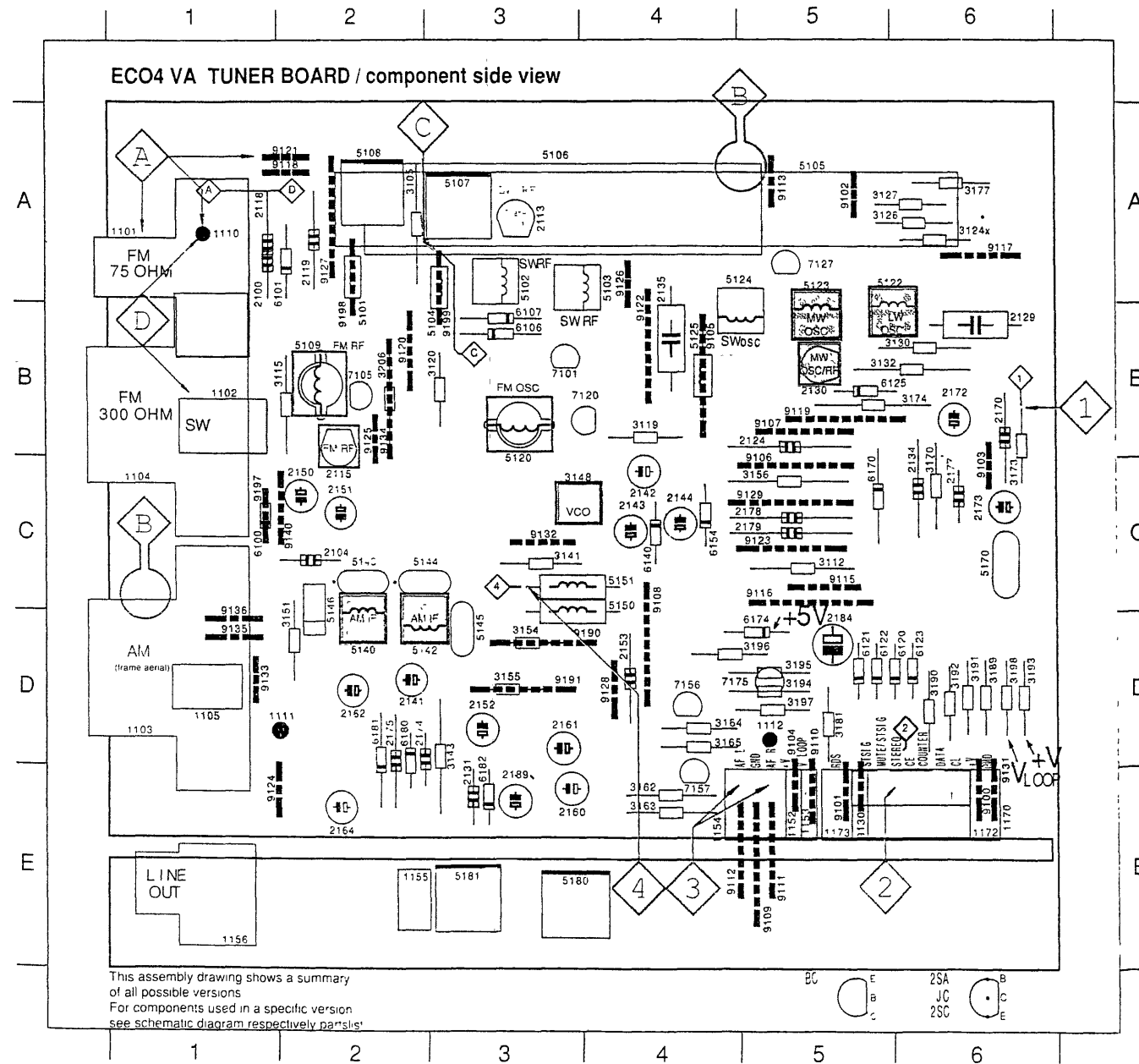
TUNER MODULE

ECC4 for all Version except  
 For /22, use TUNER 92 with FTZ Version and  
 For /26, use TUNER 92 JAPAN Version

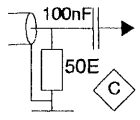
1101 A 1	1156 E 1	2100 A 1	2135 B 4	2164 F 2	2191 A 6	3143 D 3	3174 B 5	3198 D 6	5122 B 6	5170 C 6	6140 C 4	7157 E 4	9110 E 5	9123 C 5	9135 D 1
1102 B 1	1170 E 6	2104 C 2	2141 D 2	2170 B 6	3105 A 2	3148 C 3	3177 A 6	3206 B 2	5123 B 5	5180 E 3	6154 C 4	7175 D 5	9111 E 5	9124 F 1	9136 D 1
1103 D 1	1172 E 6	2106 B 4	2142 C 4	2172 B 6	3112 C 5	3151 D 2	3181 D 5	5101 A 2	5124 B 5	5181 E 3	6170 C 5	9100 E 6	9112 E 4	9125 B 2	9140 C 2
1104 B 1	1173 E 5	2113 A 3	2143 C 4	2173 C 6	3115 B 2	3154 D 3	3189 D 6	5102 A 3	5125 B 4	6100 C 1	6174 D 5	9101 E 5	9113 A 5	9126 A 4	9190 D 3
1105 D 1		2115 B 2	2144 C 4	2174 D 2	3119 B 4	3155 D 3	3190 D 6	5103 A 3	5140 D 2	6101 A 2	6180 D 2	9102 A 5	9115 C 5	9127 A 2	9191 D 3
1110 A 1		2118 A 1	2150 C 2	2175 D 2	3120 B 3	3156 C 5	3191 D 6	5104 A 3	5142 D 2	6106 B 3	6181 D 2	9103 C 6	9116 C 5	9128 D 4	9197 C 1
1111 D 2		2119 A 2	2151 C 2	2177 C 6	3124 A 6	3162 E 4	3192 D 6	5105 A 4	5143 C 2	6107 B 3	6182 E 3	9104 E 5	9117 A 6	9129 C 5	9198 A 2
1112 D 5		2124 B 5	2152 D 3	2178 C 6	3126 A 6	3163 E 4	3193 D 6	5106 A 4	5144 C 2	6120 D 6	7101 B 3	9105 B 4	9118 A 2	9130 E 5	9199 A 3
1152 E 5		2129 B 6	2153 D 4	2179 C 5	3127 A 6	3164 D 4	3194 D 5	5107 A 3	5145 D 3	6121 D 5	7105 B 2	9106 C 5	9119 B 5	9131 E 6	for AM version only
1153 E 5		2130 B 5	2160 E 3	2184 D 5	3130 B 6	3165 D 4	3195 D 5	5108 A 2	5146 D 2	6122 D 5	7120 B 4	9107 B 5	9120 B 2	9132 C 3	x for LW-version only
1154 E 4		2131 E 3	2161 D 3	2189 E 3	3132 E 6	3170 C 6	3196 D 4	5109 B 2	5150 D 3	6123 D 6	7127 A 5	9108 D 4	9121 A 2	9133 D 1	y for USA version only
1155 E 2		2134 C 6	2162 D 2	2190 A 2	3141 C 5	3173 B 6	3197 D 5	5120 B 3	5151 C 3	6125 B 5	7156 D 4	9109 E 5	9122 B 4	9134 B 2	z not for all versions

2101 A 2	2122 B 3	2149 D 2	2185 B 3	3109x A 5	3133 A 5	3157 B 2	3180 D 5	3212 C 5	3233 A 4	3248 C 3	7128x A 4	7178 C 6
2102 A 4	2123 B 4	2154 C 3	2186 D 6	3110 C 4	3134 A 5	3158x A 4	3182 C 4	3213 D 5	3234 A 2	3249 A 2	7129 A 5	7179x A 6
2103 C 2	2125x A 6	2155 C 3	2187 D 4	3111 D 3	3135 A 6	3159 C 4	3183 D 5	3214 E 3	3235 C 4	3248 B 2	7140 C 2	7180 D 2
2105 B 3	2126x A 3	2158 D 3	2188 E 4	3113 B 2	3136 E 2	3160 D 4	3184 D 6	3215 E 3	3236x A 2	3249 B 2	7154 D 3	
2107 B 2	2128 A 5	2159 D 3	2192 E 4	3114 B 3	3137 D 2	3161 D 3	3185 B 6	3216 E 4	3237 B 5	3249 C 4	7155 D 3	
2108 A 3	2132 B 4	2163 D 2	2193 C 4	3116x A 3	3138 D 2	3166 E 5	3186 C 4	3221 A 4	3238x A 5	3249 B 3	7167 C 4	
2109 B 4	2133x A 4	2165 E 2	2194 C 5	3117 A 3	3139 D 2	3167 D 5	3187 C 4	3222 A 4	3239 D 6	3249 B 2	7168 C 6	
2110x A 4	2136 B 5	2167 C 3	3100 B 2	3118 A 5	3140 D 2	3168 D 4	3188 C 6	3223x A 3	3240 D 5	3249 A 3	7169 C 6	
2111 B 3	2137 B 5	2168 C 3	3101 B 3	3121 B 4	3142 C 4	3169 D 4	3199 D 4	3224 B 4	3241 A 6	3249 B 6	7170 B 6	
2112 B 4	2138x B 4	2169 C 4	3102 B 3	3122 B 4	3144 C 5	3171 D 6	3200 C 6	3225 B 4	3242 B 5	3249 A 3	7171 B 6	
2114x A 3	2139x A 4	2171 B 6	3103 C 4	3123 C 5	3145 C 4	3172 B 6	3202 D 3	3226 A 4	3243 A 5	3249 A 6	7172 C 5	
2116 B 2	2145x A 4	2180 C 6	3104 B 3	3125x A 5	3147 C 4	3175 B 6	3203 D 3	3228 C 5	3244 A 5	3249 A 5	7173 C 6	
2117 A 4	2146x A 3	2181 C 6	3106 C 4	3126 A 4	3149 C 3	3176 E 6	3204 D 3	3229 A 4	3245 A 4	3249 B 6	7174 D 5	
2120 B 3	2147 D 3	2182 D 4	3107x A 5	3129x B 6	3152 C 1	3178 C 6	3205 D 3	3231 C 2	3246 B 2	3249 B 5	7176 D 4	
2121 B 2	2148 D 2	2183 C 6	3108 B 2	3131 B 5	3153 B 5	3179 C 6	3211 B 6	3232 C 4	3247 B 3	7125 B 5	7177 D 4	

o for AM-version only  
 x for LW-version only  
 y for USA version only  
 z not for all versions



**TUNER Adjustment table ( ECO4 VA FM/MW- and FM/MW/LW - versions with AM-ferrite antenna )**

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter	
<i>VARICAP ALIGNMENT * 1)</i>							
<b>FM</b> 87.5 - 108MHz			108 MHz	5120	◇ 1	8V ± 0.2V	
			87.5MHz	check		4.1V ± 0.5V	
<b>FM /14 East Europe</b> 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V	
			65.81 MHz	check		0.8V ± 0.4V	
<b>MW</b> 2-band version, 10kHz grid 530 - 1710kHz			1710kHz	5123		9V±0.1V (7.2±1.2V) <sup>1)</sup>	
			530kHz	check		1V±0.4V (1.1±0.5V) <sup>1)</sup>	
<b>LW</b> 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V) <sup>1)</sup>	
			153kHz	check		1V±0.4V (1.1±0.5V) <sup>1)</sup>	
<b>MW</b> 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.2±1.2V) <sup>1)</sup>	
			522kHz	check		1V±0.4V (1.1±0.5V) <sup>1)</sup>	
<i>FM - RF</i>							
<b>FM</b>	108MHz	◇ A mod=1kHz Δf=22.5kHz	108MHz	2115		◇ 3	MAX ↕
	87.5MHz		87.5MHz	5109			
<b>FM /14 East Europe</b>	108MHz		108MHz	2115			
	65.81MHz		65.81MHz	5109			
<i>VCO</i>							
<b>FM</b>	98 MHz, 1mV continuous wave	◇ A	98MHz	3148	◇ 2	152kHz ± 1kHz	
<i>AM - IF</i>							
<b>MW</b>	540kHz Δf = 10kHz as low as possible		540kHz	5142 5140	◇ 4	symmetrical and max height	
<i>AM - RF</i>							
<b>LW</b>	198kHz	◇ B mod=1kHz 30% AM	198kHz	5122	◇ 4	MAX	
<b>MW</b> 3-band version	1494kHz		1494kHz	2130			
	549kHz		549kHz	5123			
<b>MW</b> 2-band version, 10kHz grid	1500kHz		1500kHz	2130			
	550kHz		550kHz	5123			

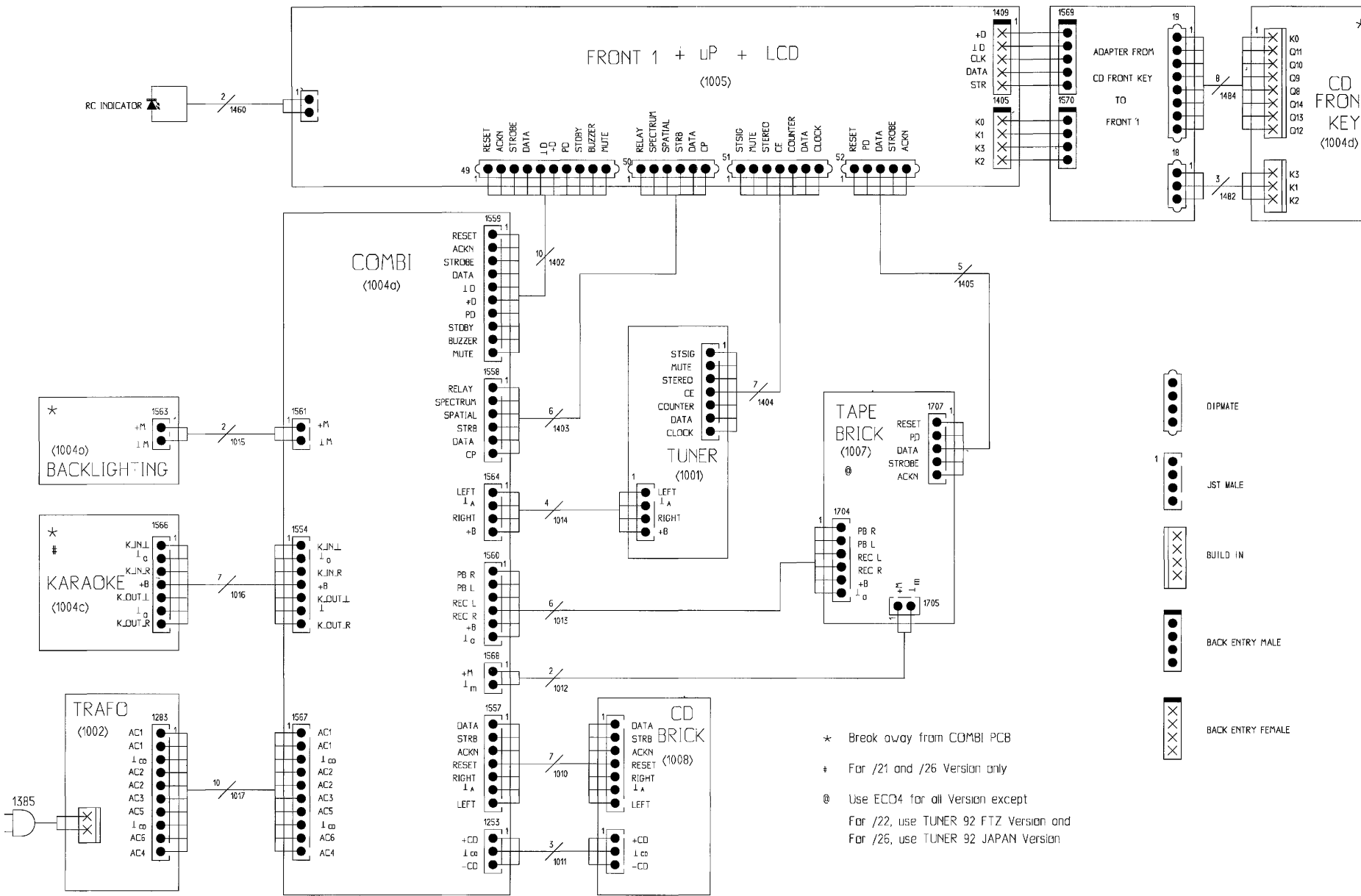
\* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ automatically. Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfills value stated within brackets after AM-RF adjustment.

↕  
repeat

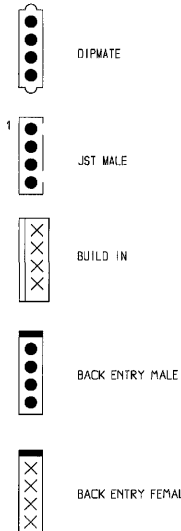




**WIRING DIAGRAM**



\* Break away from COMBI PCB  
 † For /21 and /26 Version only  
 @ Use ECO4 for all Version except  
 For /22, use TUNER 92 FTZ Version and  
 For /26, use TUNER 92 JAPAN Version



**(GB) WARNING**

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.  
 When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

**(F) ATTENTION**

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.  
 Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet sorti 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.

**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.

**(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 braccialeto a resistenza.  
 Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

**(GB)**

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

**(NL)**

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

**(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.

**(F)**

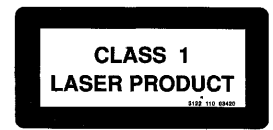
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisés les pièces de rechange identiques à celles spécifiées.

**(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.

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

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



**(GB) Warning !**

Invisible laser radiation when open  
 Avoid direct exposure to beam

**(S) Varning !**

Osynlig laserstrålning när apparaten är öppnad och spårren är urkopplad. Beträkta ej strålen.

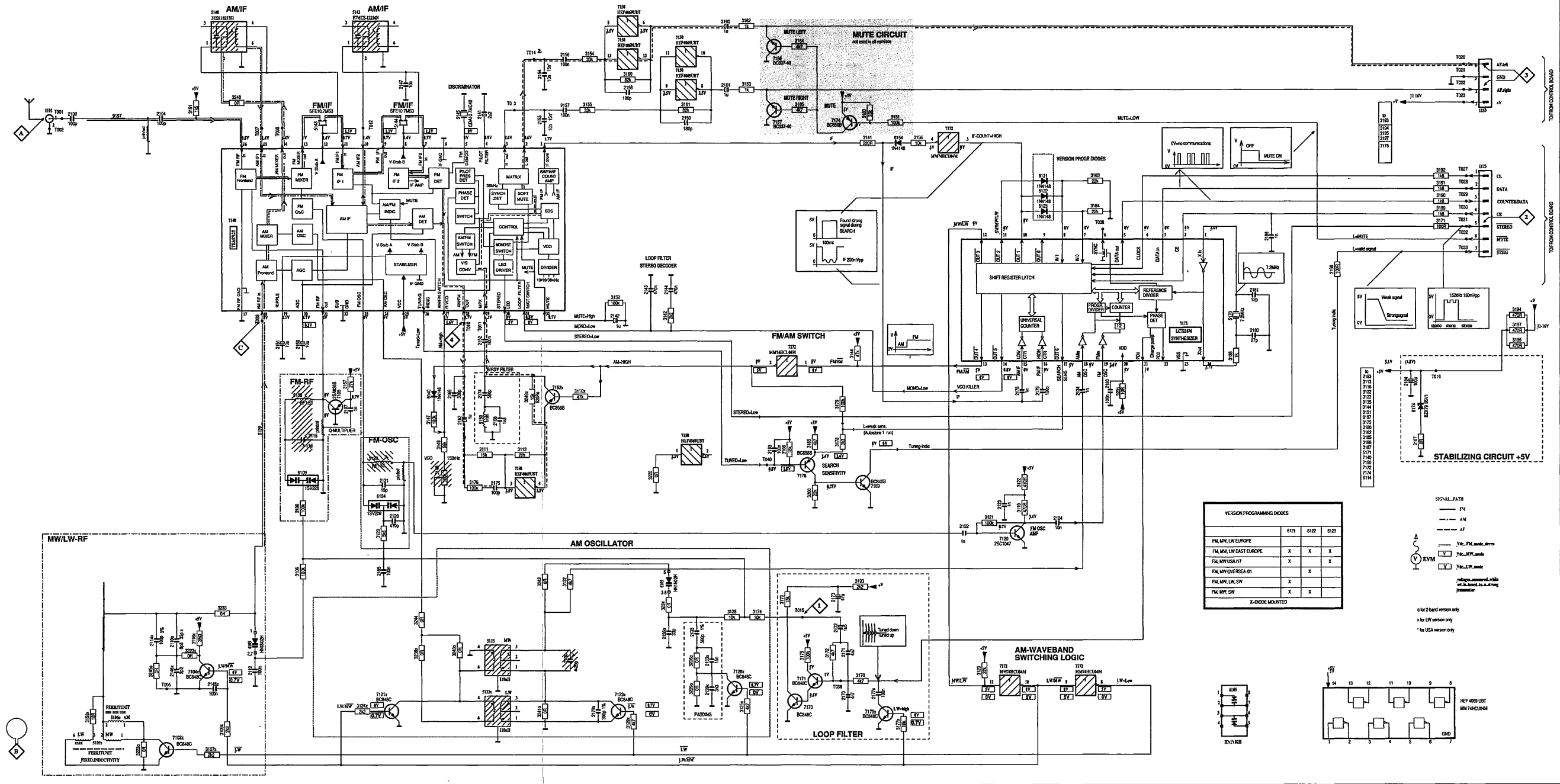
**(SF) Varoitus !**

Avatussa laitteessa ja suojalukituksen ohittautessa olet alttina näkymättömälle laserisäteilylle. Älä katso säteeseen!

**(DK) Advarse !**

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

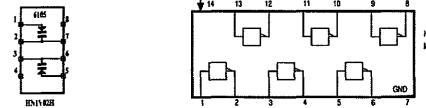
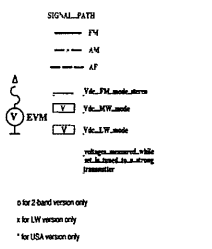
TUNER UNIT ECO4 (MIDI)



VERSION PROGRAMMING DIODES

	6121	6122	6123
FM MW, LW EUROPE			
FM MW, LW EAST EUROPE	X	X	X
FM MW USA/7	X	X	X
FM MW OVERSEA/01		X	
FM MW, LW, SW	X	X	
FM MW, SW	X	X	

X-DIODE MOUNTED



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- 1102 C3
- 1103 C4
- 1104 C5
- 1105 C6
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- 1111 C12
- 1112 C13
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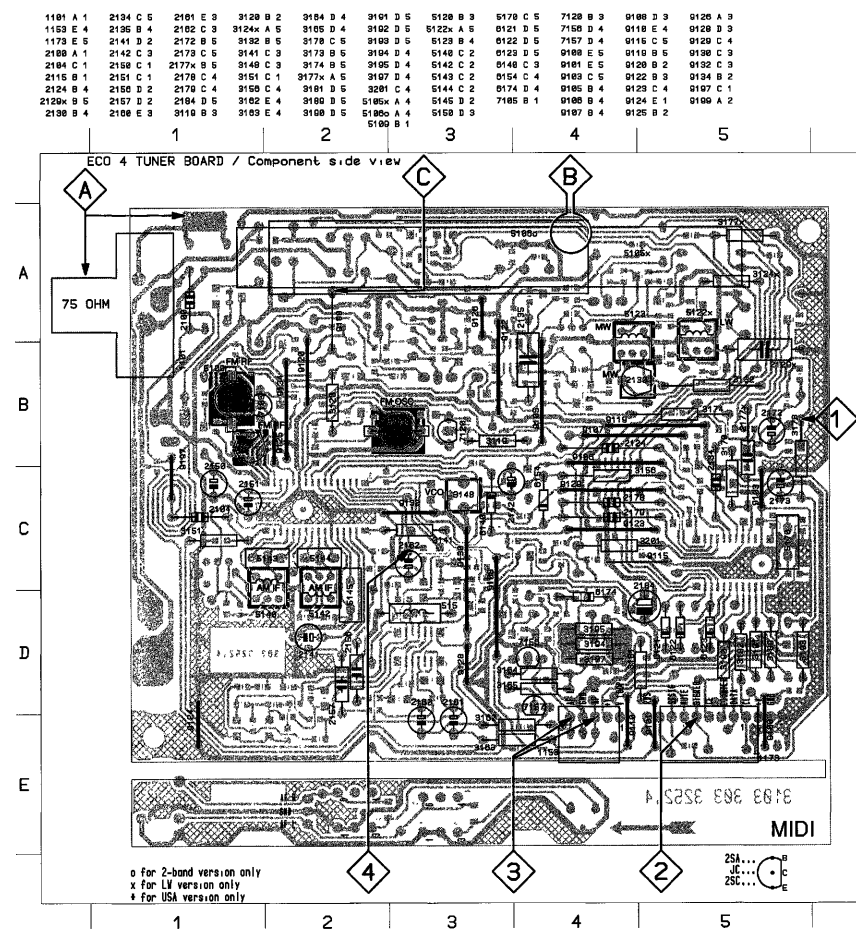
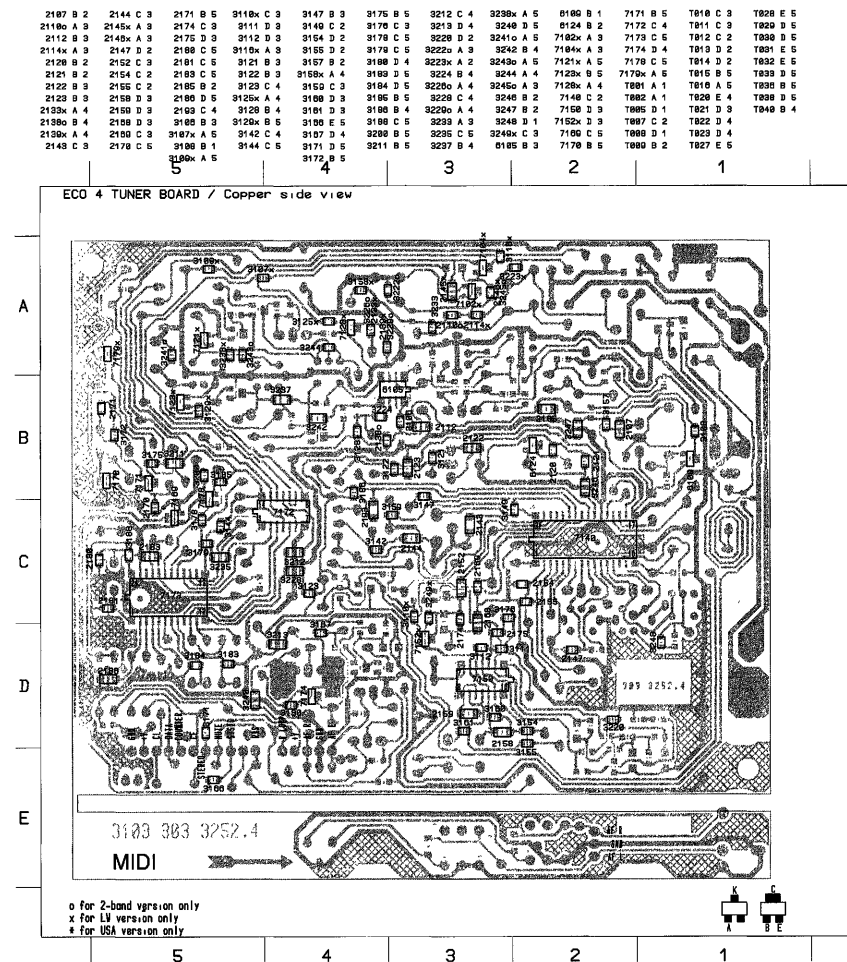
**TUNER Adjustment table ( ECO 4 FM/MW- and FM/MW/LW - versions with AM-ferrite antenna )**

Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
<b>VARICAP ALIGNMENT * 1)</b>						
<b>FM</b> 87.5 - 108MHz			108 MHz	5120		8V ± 0.2V
			87.5MHz	check		4.1V ± 0.5V
<b>FM /14 East Europe</b> 65.81 - 108MHz			108 MHz	5120		8V ± 0.2V
			65.81 MHz	check		0.8V ± 0.4V
<b>MW</b> 2-band version, 10kHz gnd 530 - 1710kHz			1710kHz	5123	1	9V±0.1V (7.5±0.7V) <sup>1)</sup>
			530kHz	check		1V±0.4V (1.1±0.5V) <sup>1)</sup>
<b>LW</b> 153 - 279kHz			279kHz	5122		8V±0.2V (7.5±1.5V) <sup>1)</sup>
			153kHz	check		1V±0.4V (1.1±0.5V) <sup>1)</sup>
<b>MW</b> 3-band version 522 - 1611kHz			1611kHz	5123		8V±0.1V (7.5±0.5V) <sup>1)</sup>
			522kHz	check		1V±0.4V (1.1±0.5V) <sup>1)</sup>
<b>FM - RF</b>						
<b>FM</b>	108MHz	A	108MHz	2115	3	MAX
	87.5MHz		87.5MHz	5109		
<b>FM /14 East Europe</b>	108MHz	mod=1kHz Δf=22.5kHz	108MHz	2115		
	65.81MHz		65.81MHz	5109		
<b>VCO</b>						
<b>FM</b>	98 MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ± 1kHz
<b>AM - IF</b>						
<b>MW</b>	540kHz Δf = 10kHz as low as possible	100nF 50E	540kHz	5142 5140	4	symmetrical and max height
<b>AM - RF</b>						
<b>LW</b>	198kHz	B	198kHz	5122	4	MAX
<b>MW</b> 3-band version	1494kHz		1494kHz	2130		
	549kHz		549kHz	5123		
<b>MW</b> 2-band version, 10kHz gnd	1500kHz		1500kHz	2130		
	550kHz	mod=1kHz 30% AM	550kHz	5123		

\* Use Service Test Program. By selecting the TUNER TEST, test frequencies will be stored as preset frequ. automatically.  
 1) Adjustment of AM-RF stage influences the varicap voltage. Therefore check if varicap voltage fulfils value stated within brackets after AM-RF adjustment.

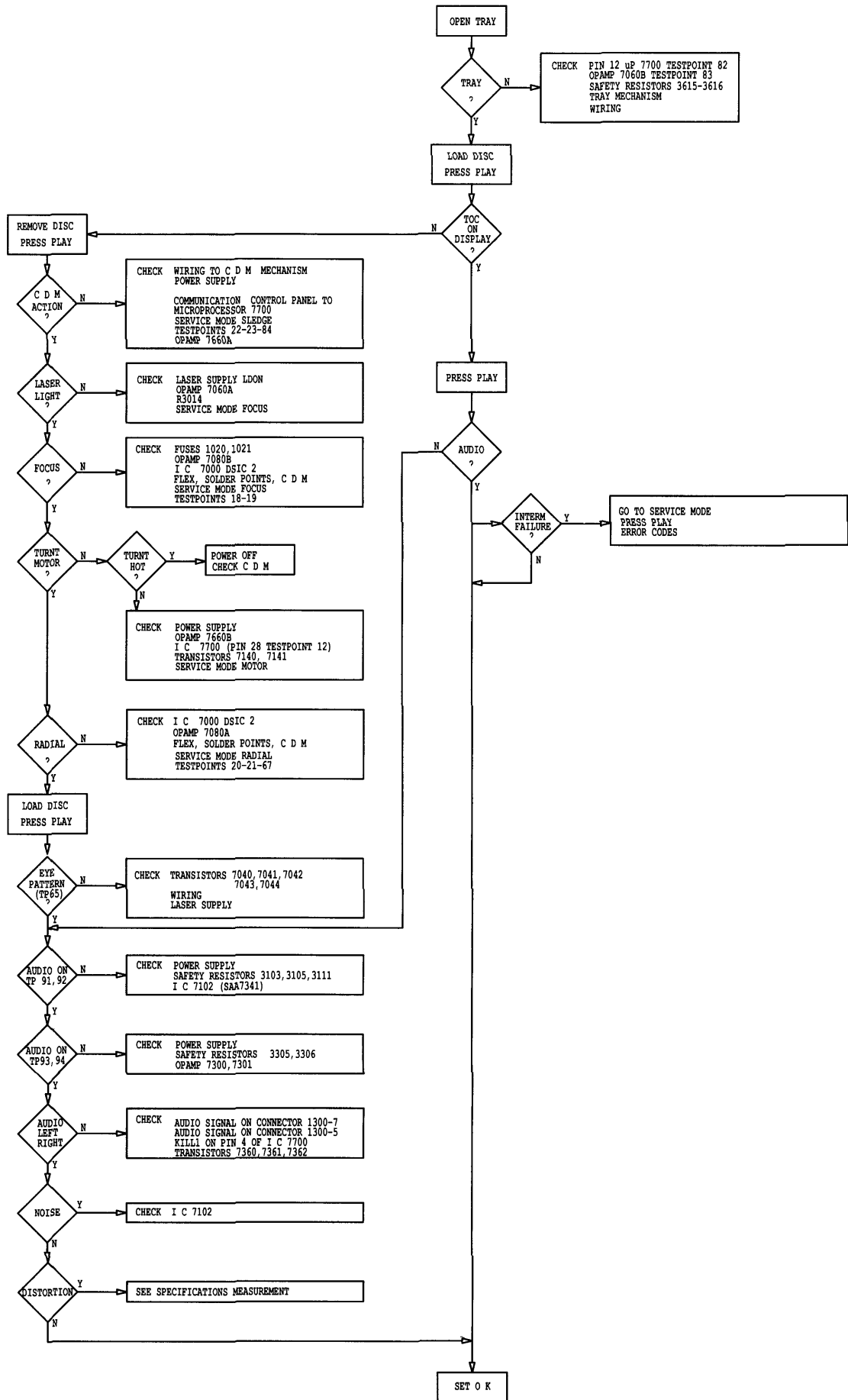
repeat

**ECO4 (MIDI) LAYOUT (Not for /22/26)**

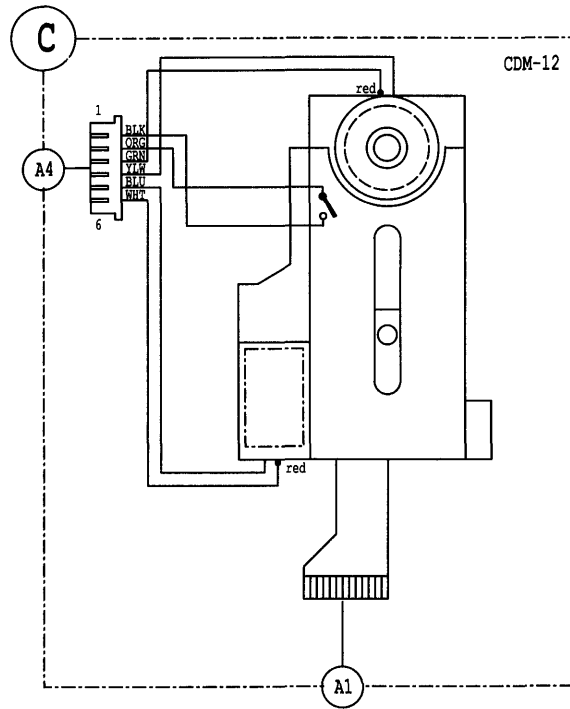
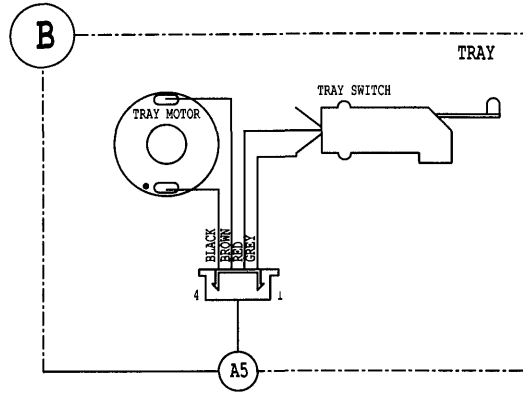
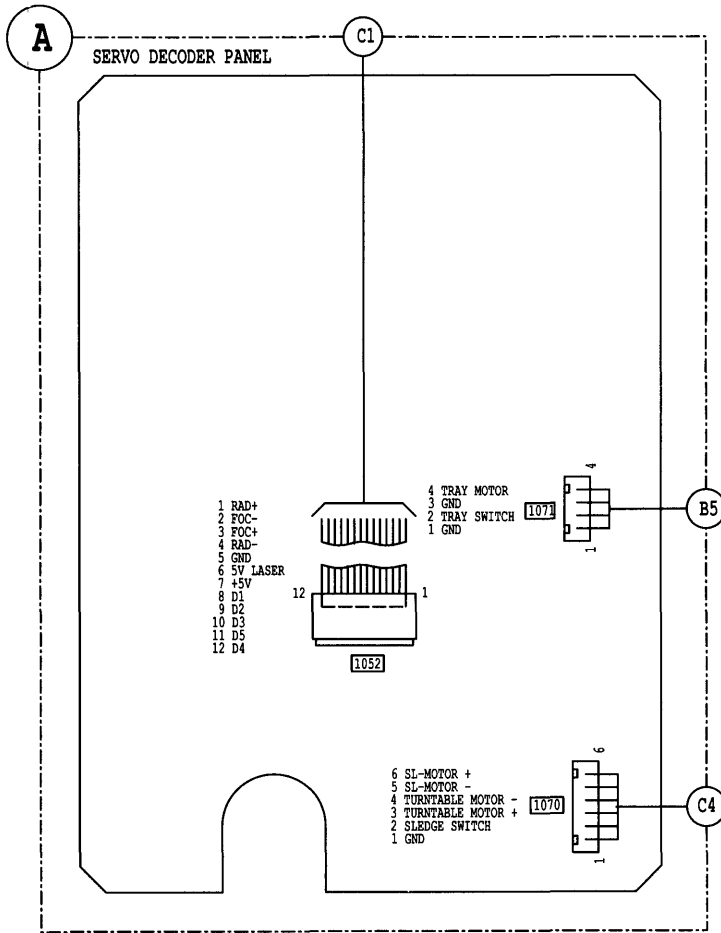




# CD REPAIR CHART



# CD WIRING

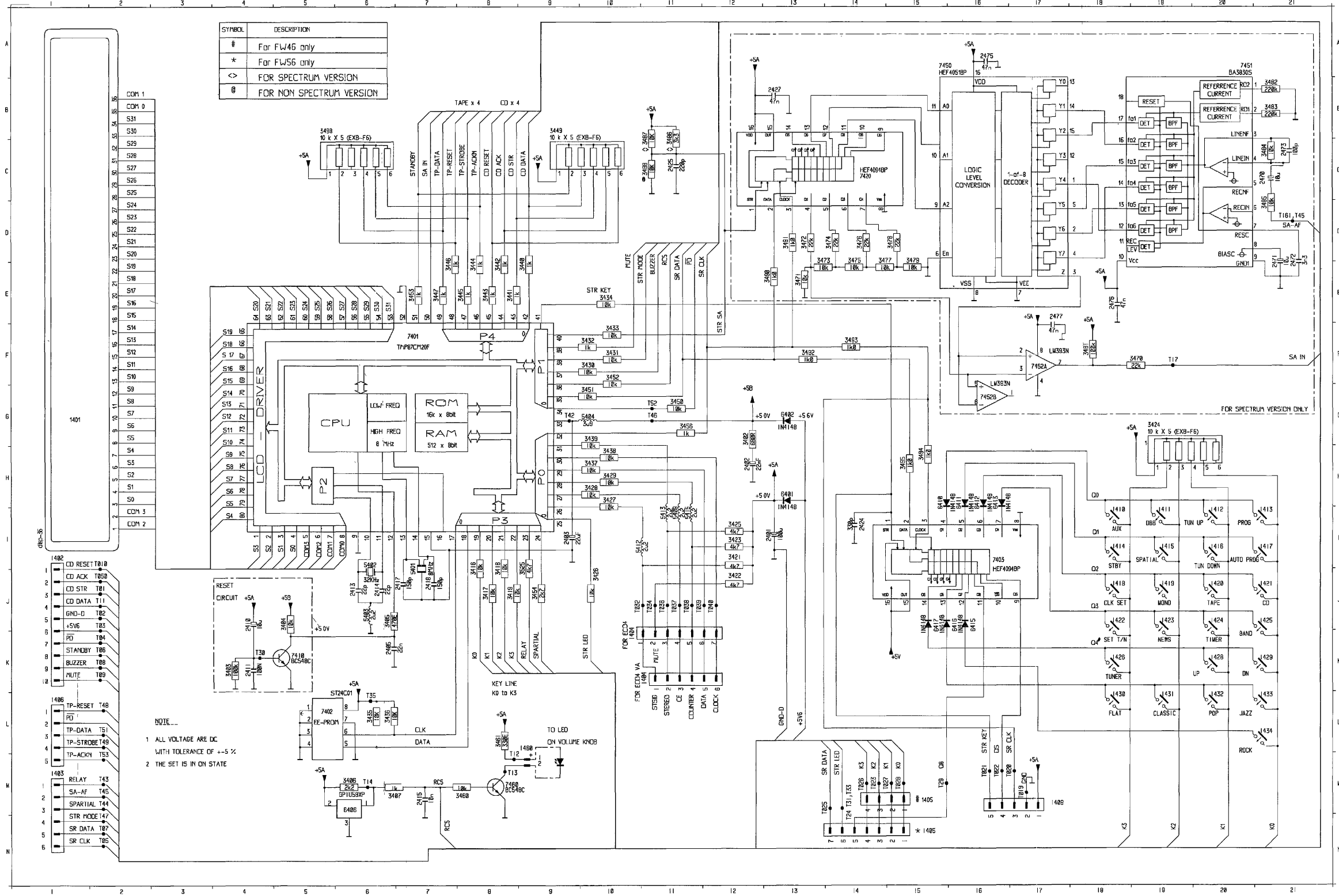


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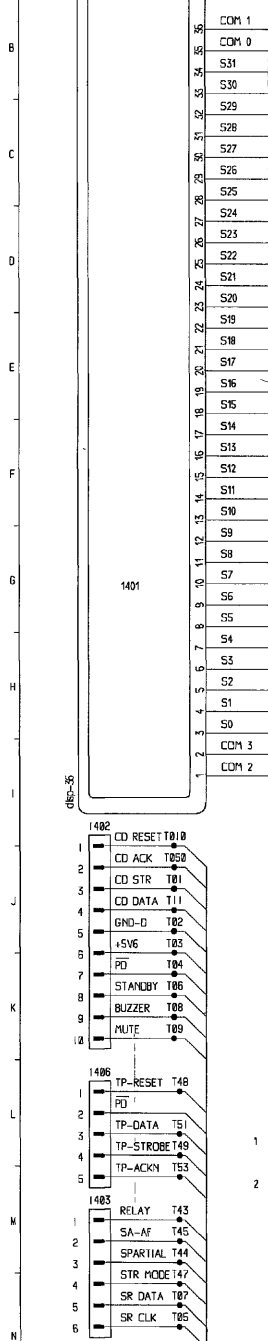




FRONT CIRCUIT

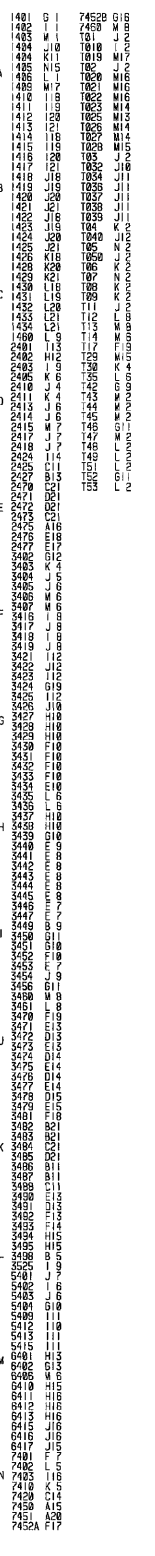


SYMBOL	DESCRIPTION
#	For FW46 only
*	For FW56 only
<>	FOR SPECTRUM VERSION
⊕	FOR NON SPECTRUM VERSION



NOTE...

- 1 ALL VOLTAGE ARE DC WITH TOLERANCE OF  $\pm 5\%$
- 2 THE SET IS IN ON STATE



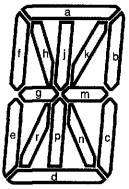
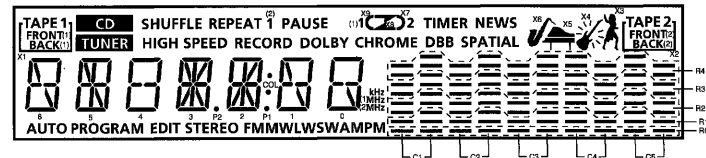


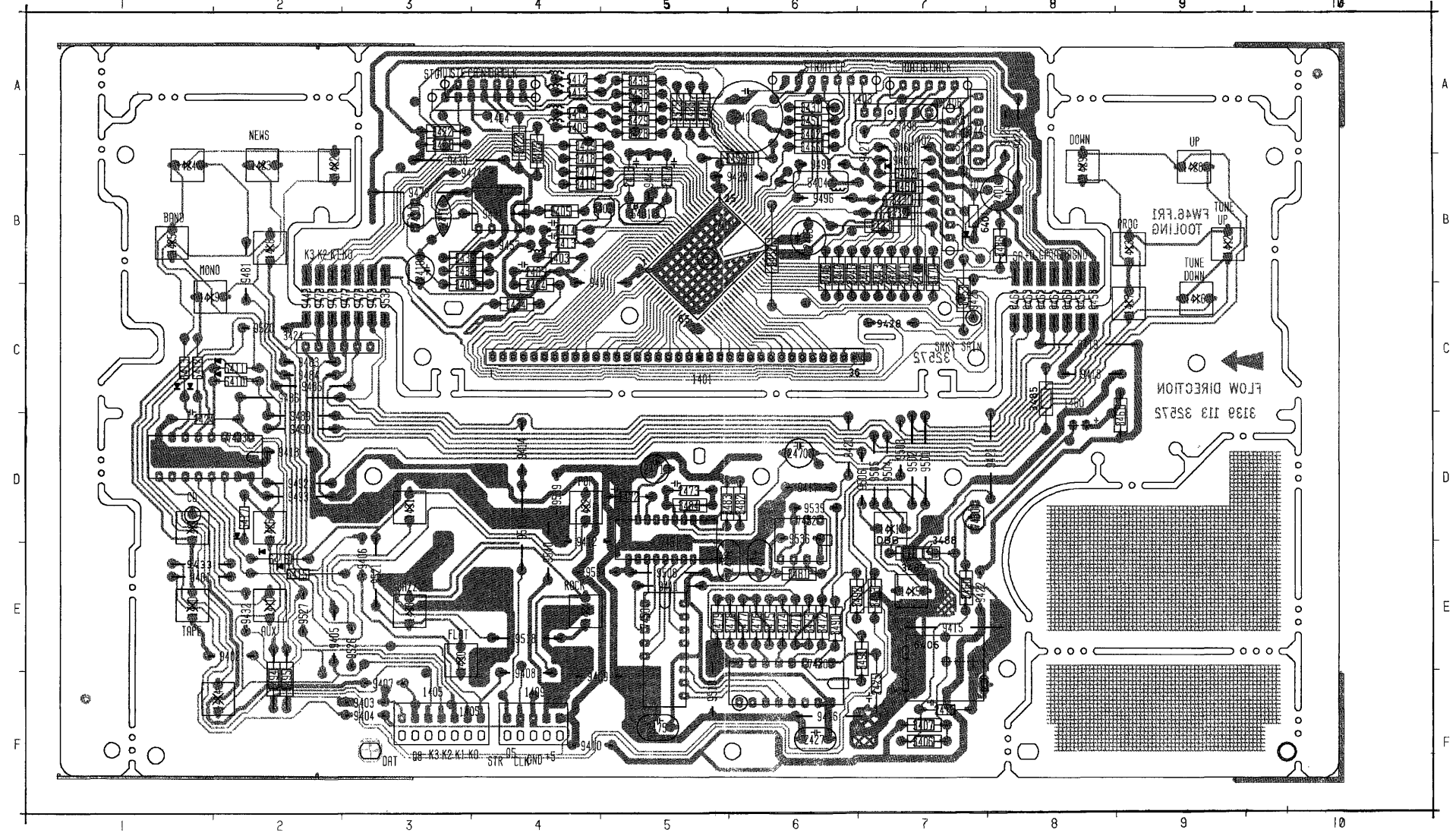
Figure 7. LCD pin connections

LCD DISPLAY PINS CONNECTIONS

PIN NO.	COM 0	COM 1	COM 2	COM 3
1	-	-	COM 2	-
2	-	-	-	COM 3
3	6gm	6f	6e	6n
4	6b	6a	6c	6d
5	FRONT (1)	6h	BACK (1)	TAPE 1,X1
6	SHUFFLE	CD	HIGH SPEED	AUTO
7	5g	5f	5e	PROGRAM
8	5b	5a	5c	5d
9	TUNER	5hn	5m	5jp
10	1 (1), 2	TIMER	RECORD	REPEAT
11	4gm	4f	4e	EDIT
12	4b	4a	4c	4d
13	X7	X9	X8	1 (2)
14	FRONT (2)	X6	BACK (2)	TAPE 2,X2
15	3g	3f	3e	3n
16	3b	3a	3c	3d
17	3k	3h	3m	3jp
18	3r	DBB	PAUSE	STEREO
19	2gm	2f	2e	2n
20	2b	2a	2c	2d
21	2kr	CHROME	DOLBY	2jp
22	LW	-	MW	R0
23	1gm	1f	1e	1n
24	1b	1a	1c	1d
25	COL	1h	FM,P1,MHz (1)	SW,P2,MHz (2)
26	X4	kHz	PM	AM
27	0gm	0f	0e	0n
28	0b	0a	0c	0d
29	X3	X5	SPATIAL	NEWS
30	C1R1	C1R2	C1R3	C1R4
31	C2R1	C2R2	C2R3	C2R4
32	C3R1	C3R2	C3R3	C3R4
33	C4R1	C4R2	C4R3	C4R4
34	C5R1	C5R2	C5R3	C5R4
35	COM 0	-	-	-
36	-	COM 1	-	-

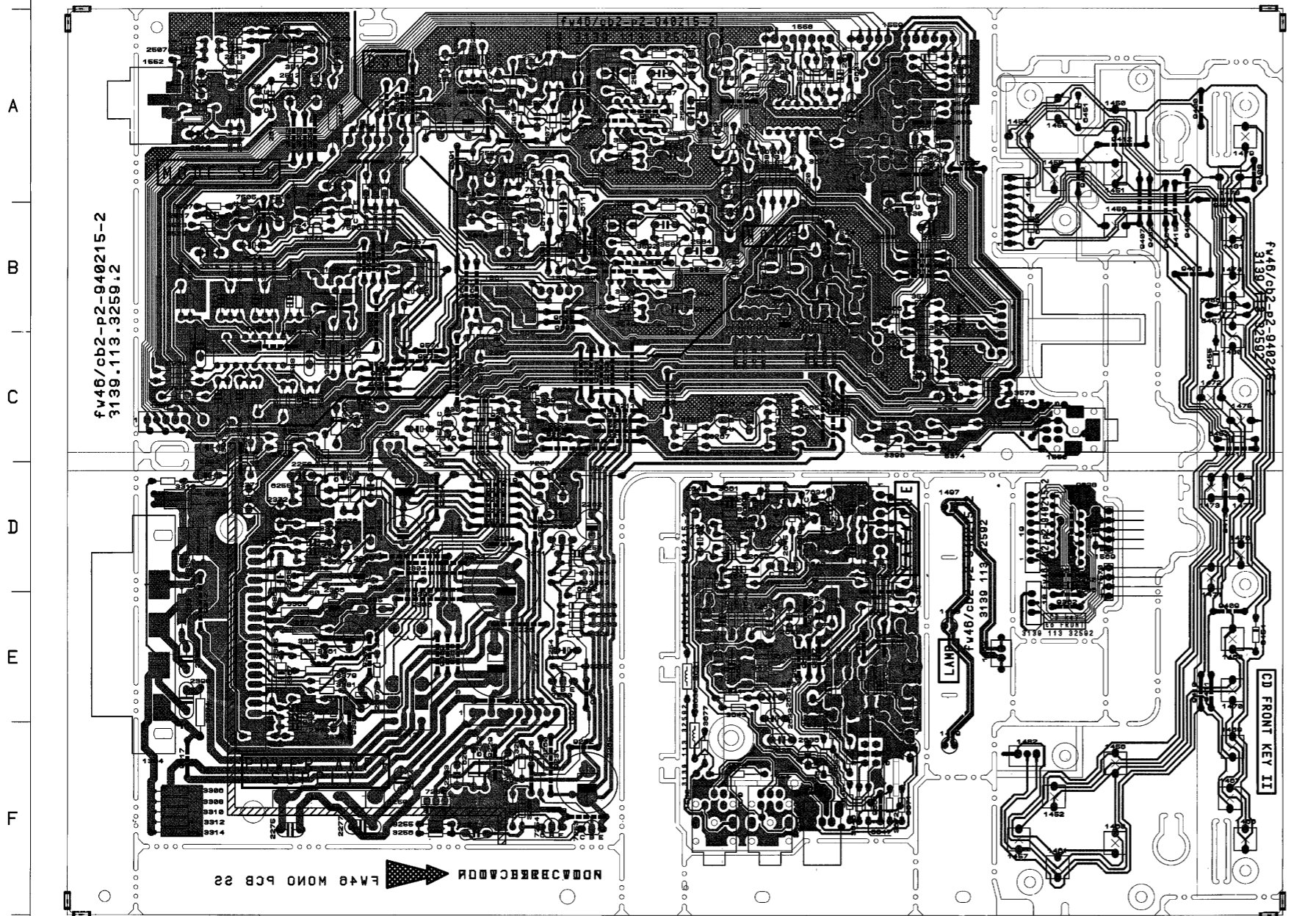
FRONT COMPONENT LAYOUT

- 1401 C5 1412 B9 1421 D1 1431 D3 2410 B3 2427 F6 3403 C4 3421 B3 3430 B7 3439 A5 3449 A7 3470 C7 3479 E5 3490 E6 5402 B5 6406 E7 7402 B4 9402 E2 9411 E5 9420 D6 9430 B4 9461 C8 9475 C3 9486 C2 9503 D7 9521 E9
- 1402 A7 1413 B9 1422 B3 1432 D4 2411 B3 2470 D6 3404 C4 3422 A3 3431 A6 3440 C7 3450 B7 3471 E6 3481 E6 3491 F6 5403 B4 6410 C2 7403 D2 9403 F3 9412 E4 9421 D8 9431 B4 9462 C8 9476 C3 9489 D2 9504 D7 9526 F2
- 1403 A7 1414 F2 1423 B2 1433 E3 2413 B4 2471 D5 3405 B4 3423 A4 3432 B7 3441 C7 3451 A6 3472 E6 3482 D5 3492 E6 5404 B6 6411 C2 7410 B3 9404 F3 9413 D2 9422 E7 9432 E2 9463 C8 9477 C2 9490 D2 9505 D7 9527 E2
- 1404 A4 1415 E7 1424 B1 1434 E4 2414 B4 2472 D5 3406 F7 3424 C2 3433 B7 3442 C7 3452 B6 3473 E6 3483 D5 3493 E7 5409 A4 6412 C1 7420 F6 9405 F2 9414 D4 9424 A8 9445 C2 9464 C8 9478 C2 9492 D2 9506 D6 9530 C3
- 1405 F3 1416 C9 1425 B1 1460 C8 2415 F7 2473 D5 3407 F7 3425 A4 3434 C4 3443 C7 3453 B7 3474 E6 3484 D5 3494 F2 5412 A4 6413 C1 7450 E5 9406 E3 9415 E7 9425 B8 9446 B5 9466 B7 9479 C2 9493 D2 9508 E5 9534 E5
- 1406 A7 1417 C9 1426 D2 2401 B8 2417 B5 2475 F5 3416 B4 3426 A5 3435 B4 3444 C6 3454 B6 3476 E6 3485 D8 3495 F2 5413 A4 6415 E2 7451 D5 9407 F3 9416 F6 9426 C7 9457 B4 9467 B7 9481 B2 9495 B6 9510 F5 9535 D6
- 1409 A4 1418 B2 1428 B9 2402 A6 2418 B5 2476 E6 3417 B4 3427 A5 3436 C4 3445 C6 3456 B6 3476 E6 3486 B7 3498 A7 5415 A4 6416 E2 7452 D6 9408 F4 9417 D6 9427 A7 9458 C8 9471 C5 9483 C2 9496 B6 9516 E4 9536 E6
- 1410 E2 1419 C2 1429 B8 2403 B6 2424 D2 2477 E6 3418 B4 3428 A5 3437 A5 3446 C6 3460 E7 3477 E6 3487 E7 3525 A5 6401 B7 6417 D2 7460 E7 9409 F5 9418 C8 9428 C7 9459 C8 9473 B3 9484 C2 9501 D7 9518 E4 9539 D4
- 1411 D7 1420 E1 1430 F4 2405 C4 2425 E7 3402 A6 3419 B4 3429 A5 3438 A5 3447 C6 3461 D8 3478 E5 3488 E7 5401 B5 6402 B7 7401 B5 9401 E2 9410 F4 9419 C8 9429 B6 9480 C8 9474 B4 9485 C2 9502 D7 9520 C2 9540 D4



**COMBI COMPONENT LAYOUT**

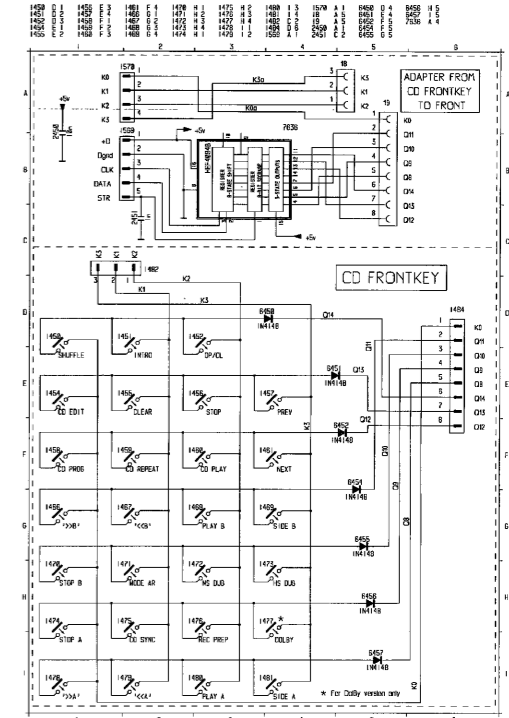
3139 113 3259 2  
FW48 MONO PCB 22

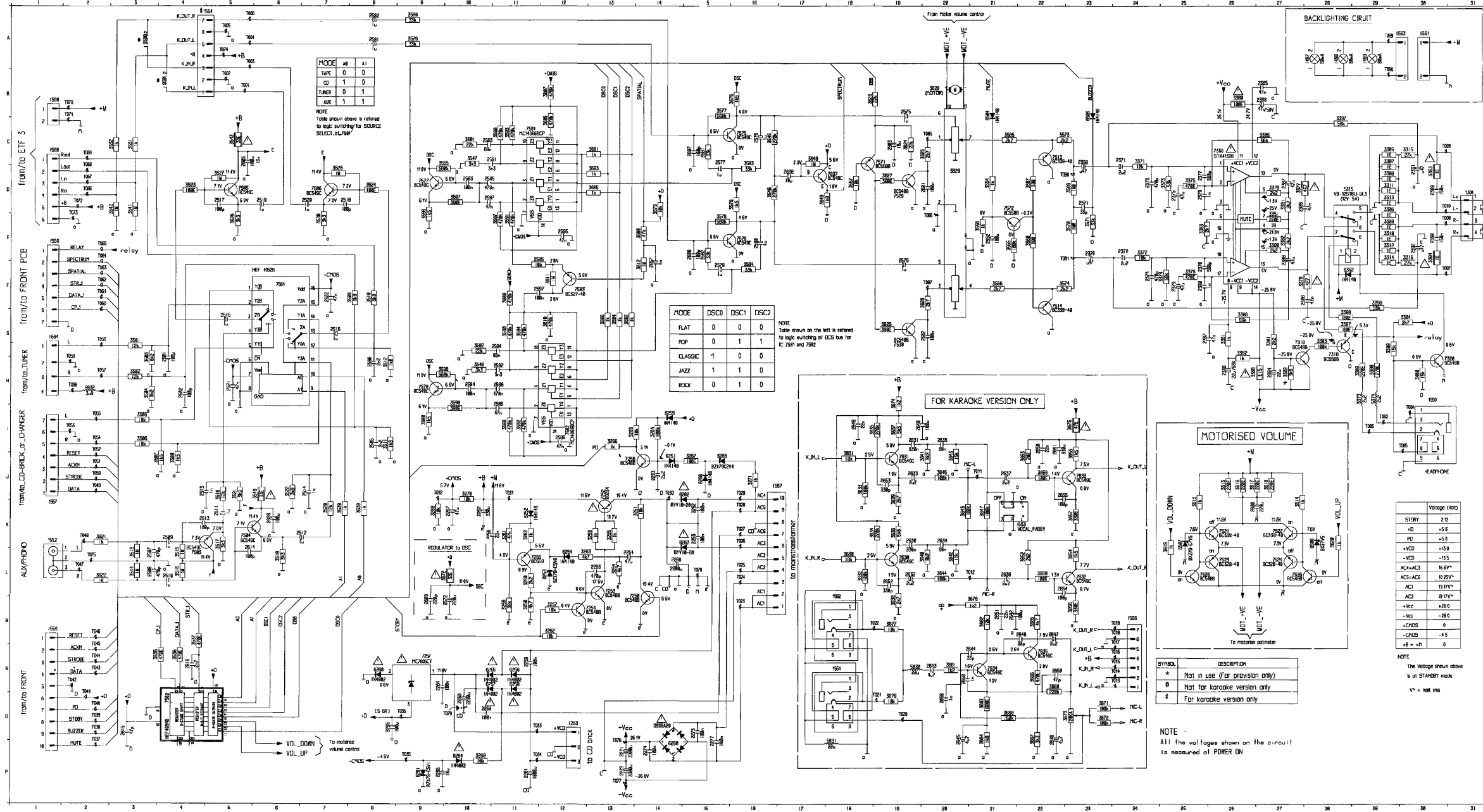


NOTE: THIS LAYOUT IS COMPLETE FOR ALL VERSIONS/OPTIONS  
FOR DIFFERENCES PLEASE REFER TO SCHEMATIC DIAGRAM

18 E 0	2389 D 3	3254 E 4	3536 A 6	3649 A 8	7530 A 7	9509 B 3
10 D 8	2389 E 1	3255 F 3	3537 A 0	3652 F 6	7571 A 7	9501 B 3
1253 C 3	2390 E 1	3256 F 3	3538 C 1	3653 E 6	7572 A 7	9502 B 3
1304 E 1	2391 C 1	3257 F 4	3539 C 1	3654 E 6	7575 A 4	9503 B 2
1450 A 8	2392 D 1	3258 F 4	3541 A 3	3655 E 6	7576 B 4	9504 C 2
1451 A 8	2450 D 8	3259 D 4	3542 A 3	3656 E 6	7577 A 5	9505 C 2
1452 F 8	2451 D 8	3260 F 4	3543 B 3	3657 E 7	7578 B 5	9506 C 2
1454 A 8	2501 B 2	3261 D 4	3545 A 5	3658 F 6	7581 A 5	9507 C 3
1455 A 8	2502 D 4	3262 D 4	3546 A 5	3659 F 7	7582 B 5	9508 C 3
1456 F 8	2505 D 2	3263 E 4	3547 A 5	3660 F 7	7583 A 5	9509 C 3
1457 F 8	2506 C 2	3264 C 5	3548 B 5	3662 D 8	7586 E 6	9511 C 3
1458 A 8	2507 A 1	3265 C 6	3549 A 2	3663 D 5	7591 E 5	9512 C 3
1459 B 8	2508 A 2	3266 C 6	3554 A 7	3664 D 5	7592 E 6	9508 A 3
1460 F 8	2509 A 1	3267 C 5	3555 A 7	3665 D 5	7593 E 7	9501 A 3
1461 F 8	2510 A 1	3268 C 3	3556 A 7	3666 D 5	7634 D 6	9502 A 3
1466 F 9	2511 A 2	3269 C 2	3567 A 6	3667 D 5	7695 D 8	9504 A 3
1467 F 9	2512 A 2	3270 C 3	3566 C 7	3668 D 6	7696 D 8	9505 A 4
1468 E 9	2513 B 2	3271 D 4	3566 B 7	3669 D 5	7697 A 5	9506 A 4
1469 F 9	2514 C 1	3268 C 3	3567 A 7	3671 F 7	9280 C 4	9507 A 4
1470 E 9	2515 B 1	3262 C 3	3568 A 7	3672 F 7	9281 C 4	9508 A 4
1471 D 9	2516 B 2	3263 C 3	3569 C 7	3673 F 8	9282 C 4	9509 A 5
1472 C 9	2517 B 1	3264 C 4	3570 C 7	3674 D 6	9283 C 4	9508 A 5
1473 D 9	2518 B 2	3265 D 1	3571 A 7	3675 E 7	9284 C 4	9501 A 3
1474 B 9	2519 B 2	3266 F 1	3572 A 3	3676 D 6	9285 C 4	9502 A 4
1475 C 9	2520 A 2	3267 D 1	3573 C 7	3677 F 5	9286 C 4	9503 B 4
1476 D 9	2521 C 1	3268 F 1	3574 B 7	3678 F 5	9288 C 3	9504 B 4
1477 D 9	2522 C 2	3269 D 1	3575 A 4	3679 A 6	9289 C 3	9507 B 4
1478 A 9	2522 A 7	3270 F 1	3576 A 3	3680 A 6	9210 C 5	9508 B 5
1479 A 9	2571 C 8	3271 D 1	3577 A 4	3681 A 6	9211 C 4	9509 B 5
1480 C 9	2572 A 3	3272 F 1	3578 A 4	3682 A 6	9212 C 5	9508 B 3
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1505 D 7	2586 B 4	3284 E 3	3590 B 5	5378 F 5	9224 D 4	9517 B 7
1506 B 4	2587 B 4	3285 E 3	3591 A 5	5379 F 5	9225 D 4	9518 B 7
1507 E 4	2588 B 4	3286 E 3	3592 B 5	5380 F 5	9226 D 4	9519 B 7
1508 B 4	2589 B 5	3287 E 3	3593 A 5	5381 F 5	9227 E 4	9520 B 8
1509 B 4	2591 A 5	3288 E 3	3594 B 5	5382 F 5	9228 E 4	9521 B 8
1510 B 4	2592 B 5	3289 E 3	3595 A 5	5383 F 5	9229 E 4	9522 B 8
1511 B 4	2593 A 5	3290 E 3	3596 B 5	5384 F 5	9230 F 4	9523 B 8
1512 A 1	2594 B 5	3291 E 3	3597 A 5	5385 F 5	9231 F 4	9524 B 8
1513 F 7	2595 A 4	3292 E 3	3598 B 5	5386 F 5	9232 F 4	9525 B 8
1514 A 3	2596 B 4	3293 E 3	3599 A 5	5387 F 5	9233 F 4	9526 B 8
1515 C 1	2597 B 4	3294 E 3	3600 B 5	5388 F 5	9234 D 3	9527 B 8
1516 A 6	2598 B 4	3295 E 3	3601 A 5	5389 F 5	9235 D 3	9528 B 8
1517 B 7	2599 B 5	3296 E 3	3602 B 5	5390 F 5	9236 D 3	9529 B 8
1518 D 8	2602 A 7	3297 E 3	3603 A 5	5391 F 5	9237 D 3	9530 B 8
2252 F 4	2603 A 6	3298 E 3	3604 B 4	5392 F 5	9238 D 3	9531 B 8
2253 F 3	2605 B 3	3299 D 2	3605 A 4	5393 F 5	9239 D 3	9532 B 8
2254 E 4	2607 A 3	3300 C 7	3606 B 4	5394 F 5	9240 D 3	9533 B 8
2255 F 3	2608 A 4	3301 C 7	3607 B 4	5395 F 5	9241 D 3	9534 B 8
2256 D 4	2609 A 3	3302 C 7	3608 B 4	5396 F 5	9242 D 3	9535 B 8
2259 D 2	2613 A 2	3303 C 7	3609 B 4	5397 F 5	9243 D 3	9536 B 8
2258 D 3	2614 A 2	3304 C 2	3610 B 4	5398 F 5	9244 D 3	9537 B 8
2261 D 2	2618 A 6	3305 C 2	3611 B 4	5399 F 5	9245 D 3	9538 B 8
2262 D 4	2620 A 2	3306 C 4	3612 B 4	5400 F 5	9246 D 3	9539 B 8
2263 C 6	2630 E 6	3307 C 2	3613 B 4	5401 F 5	9247 D 3	9540 B 8
2264 D 4	2631 E 6	3308 C 2	3614 B 4	5402 F 5	9248 D 3	9541 B 8
2265 D 4	2632 E 6	3309 C 2	3615 B 4	5403 F 5	9249 D 3	9542 B 8
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2274 F 3	2638 A 5	3315 C 3	3621 B 4	5409 F 5	9255 D 3	9548 B 8
2275 F 2	2640 D 5	3316 C 2	3622 A 7	5410 F 5	9256 D 3	9549 B 8
2277 F 3	2641 E 7	3317 C 2	3623 A 7	5411 F 5	9257 D 3	9550 B 8
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2385 D 2	2643 D 5	3319 A 1	3625 B 7	5413 F 5	9259 D 3	9552 B 8
2386 E 2	2644 D 5	3320 A 1	3626 B 7	5414 F 5	9260 D 3	9553 B 8
2387 E 2	2645 D 5	3321 A 1	3627 B 7	5415 F 5	9261 D 3	9554 B 8
2378 C 7	2648 D 5	3322 A 1	3628 B 7	5416 F 5	9262 D 3	9555 B 8
2371 D 2	2649 D 5	3323 A 1	3629 B 7	5417 F 5	9263 D 3	9556 B 8
2372 D 2	2650 E 7	3324 C 1	3630 B 7	5418 F 5	9264 D 3	9557 B 8
2373 F 2	2651 D 5	3325 B 2	3631 B 7	5419 F 5	9265 D 3	9558 B 8
2374 D 2	2652 E 5	3326 C 2	3632 B 7	5420 F 5	9266 D 3	9559 B 8
2375 E 2	2653 E 5	3327 B 1	3633 B 7	5421 F 5	9267 D 3	9560 B 8
2376 D 2	2654 E 5	3328 B 1	3634 B 7	5422 F 5	9268 D 3	9561 B 8
2377 E 2	2655 E 7	3329 B 1	3635 B 7	5423 F 5	9269 D 3	9562 B 8
2378 D 2	2656 D 5	3330 B 1	3636 B 7	5424 F 5	9270 D 3	9563 B 8
2379 E 2	2657 B 5	3331 B 1	3637 B 7	5425 F 5	9271 D 3	9564 B 8
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2385 E 3	2659 D 5	3333 A 3	3639 B 7	5427 F 5	9273 D 3	9566 B 8
2386 D 3	3251 F 4	3532 A 3	3640 B 7	5428 F 5	9274 D 3	9567 B 8
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**COMBI CIRCUIT I**





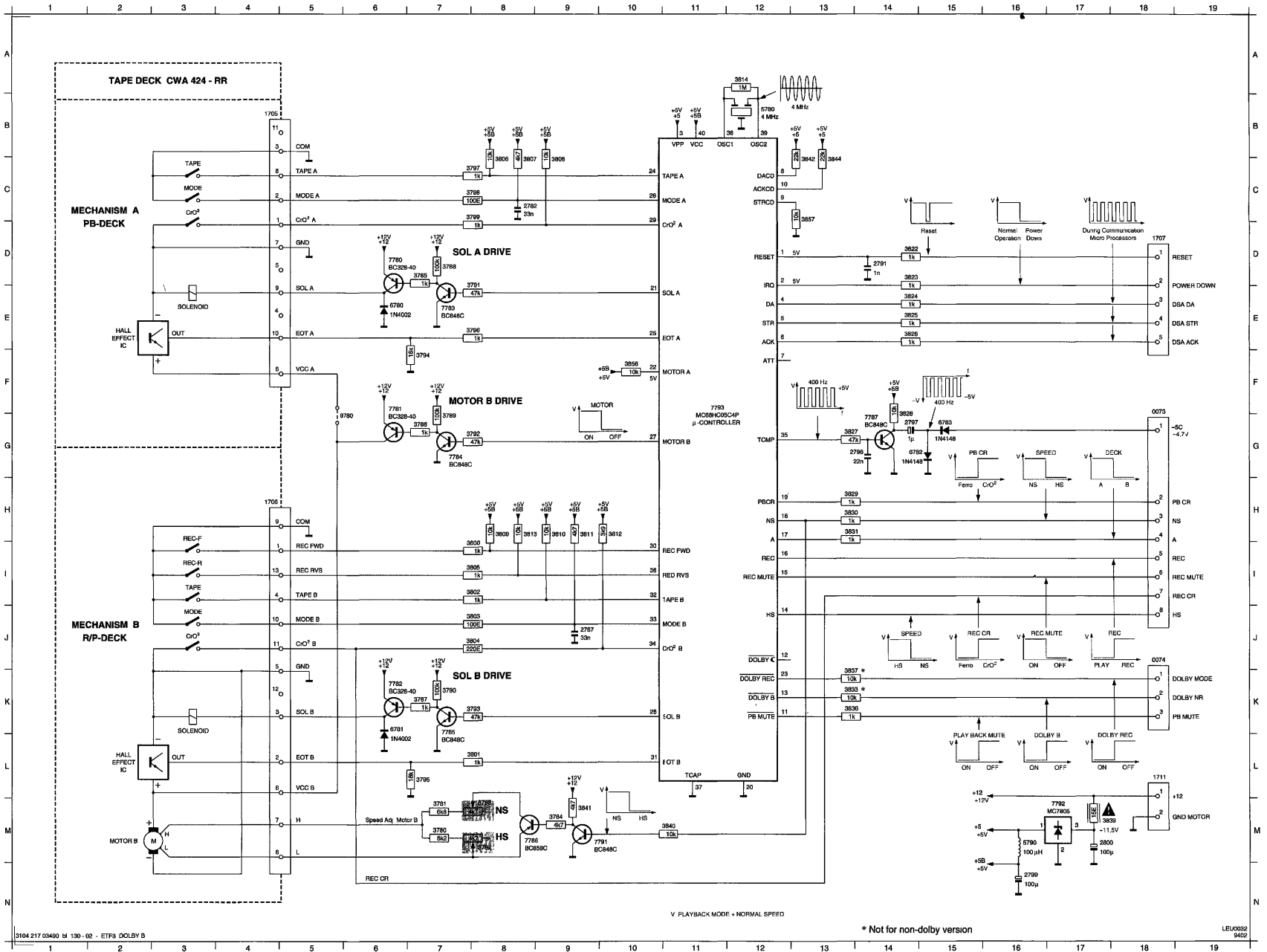
**EXPLANATION OF ABBREVIATIONS**

A	Deck A or B	PB Lever ADJ L	Playback Lever Adjustment Left
CRO2	Chrome	PB CR	Playback Chrome
Dolby NR	Dolby Noise Reduction	PB mute	Playback mute
Dolby Mode	Dolby Mode (Rec or Play)	PB Lever ADJ R	Playback Lever Adjustment Right
DSA STR	DSA Strobe	PBL	Playback Left
DSA DA	DSA Data	PBR	Playback Right
DSA ACK	DSA Acknowledge	Rec Mute	Recording Mute
EOT A	End of Tape A	Rec R	Recording Right
EOT B	End of Tape B	Rec L	Recording Left
FE	Ferro	Rec CR	Recording Chrome
HS	High Speed	REC RVS	Recording Reverse
MODE A	Slide Deck A Up / Down	REC	Recording
MODE B	Slide Deck B Up / Down	REC FWD	Recording Forward
NC	Not Connect	SOL A	Solenoid A
NS	Normal Speed	SOL B	Solenoid B
PB CR	Playback Chrome	VCC B	VCC Motor B
PB mute	Playback mute		

**µProcessor 7793 pinning , values , In- Output Port**

Pin	Discription	I/O PORT	Values
1	Reset	I	Must be driven by external reset circuitry
2	IRQ	I	0 = Power down 1 = normal operation
3	VPP	-	+5V
4	Date	I/O	DSA bus data line
5	Strobe	I/O	DSA bus clock line
6	Acknowledge	I/O	DSA bus acknowledge line
7	Attenuate	O	0 = Off 1 = On
8	DSA CD Data	I/O	DSA CD bus data line
9	DSA CD Strobe	I/O	DSA Bus strobe line
10	DSA CD Acknowledge	I/O	DSA CD bus Acknowledge line
11	Playback Mute	O	0 = Playback mute On
12	Dolby C	O	1 = Dolby C Off 0 = Dolby C On
13	Dolby B	O	1 = Dolby B Off 0 = Dolby B On
14	High Speed	O	0 = Normal speed 1 = High speed
15	Record Mute	O	1 = Record mute On
16	Play / Record	O	0 = Play 1 = Record
17	Playback A/B	O	1 = Deck A 0 = Deck B
18	Normal Speed	O	0 = High speed 1 = Normal speed
19	Playback Fe/CrO2	O	0 = Ferro 1 = CrO2
20	GND	-	Ground
21	Solenoid Deck A	O	Solenoid Deck A
22	Motor deck A	O	Not used
23	Dolby Record	O	0 = Record 1 = Play
24	Tape Detect Deck A	I	0 = Tape present in deck A
25	Halle IC Deck A	I	4 Pulses per rotation of winding wheel
26	Mode Deck A	I	0 = Slide up 1 = Slide down
27	Main Motor	O	Motor B
28	Solenoid Deck B	O	Solenoid Deck B
29	CrO2 Deck A	I	0 = Ferro Tape 1 = CrO2
30	Record Frontside Deck B	I	0 = Record enabled on frontside
31	Hall IC Deck B	I	4 Pulses per rotation of winding wheel
32	Tape Detect Deck B	I	0 = Tape present in deck B
33	Mode Deck B	I	0 = Slide up 1 = Slide down
34	CrO2 Deck B	I	0 = Ferro Tape 1 = CrO2
35	TCMP	O	400 Hz oscillator
36	Record Rearside Deck B	I	0 = Record enable on rearside
37	TCAP	I	Not used
38	OSC 1	-	4 MHz
39	OSC 2	-	4 MHz
40	VCC	-	+5V

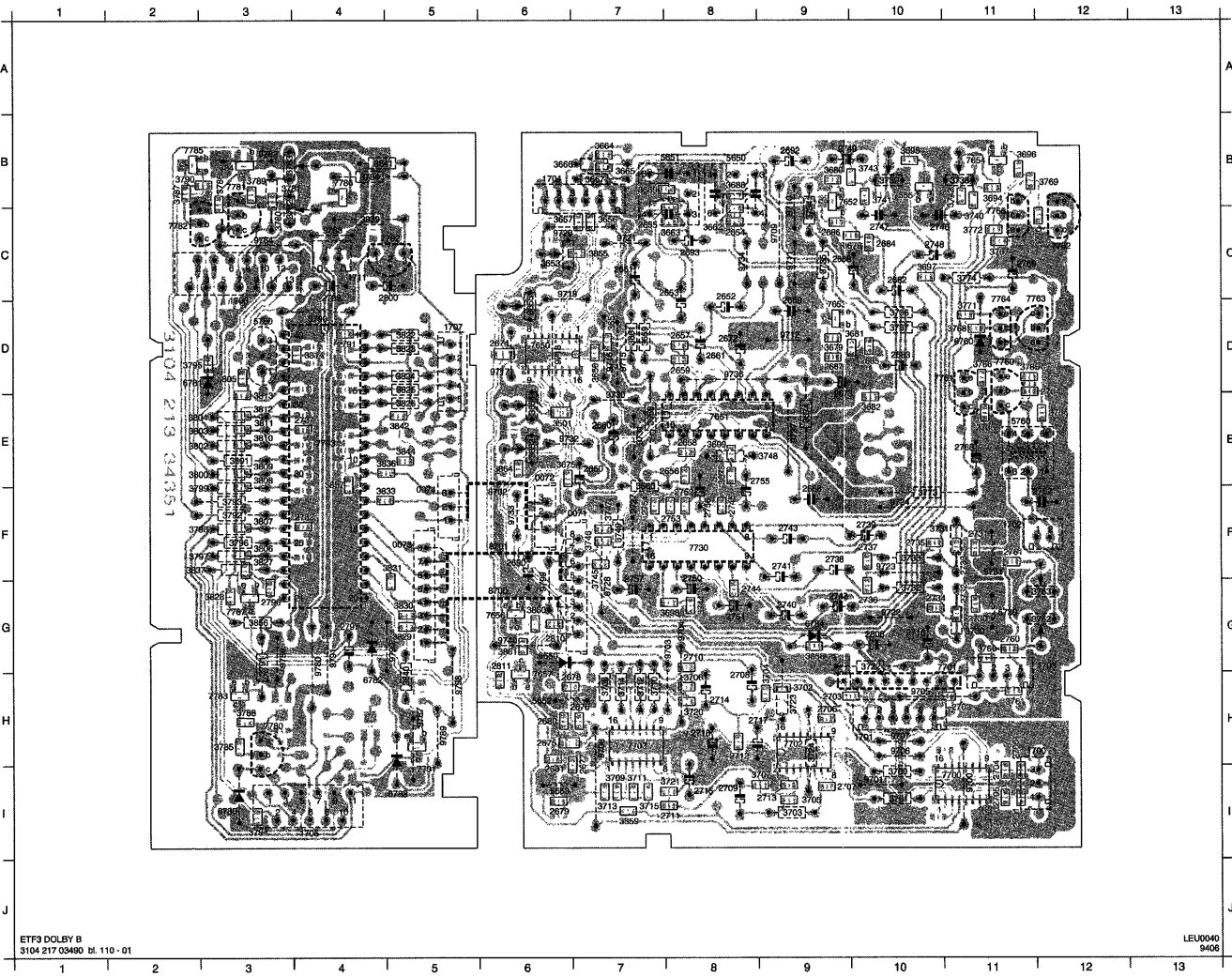
**ETF3 CONTROL PART (DOLBY B & NON-DOLBY)**





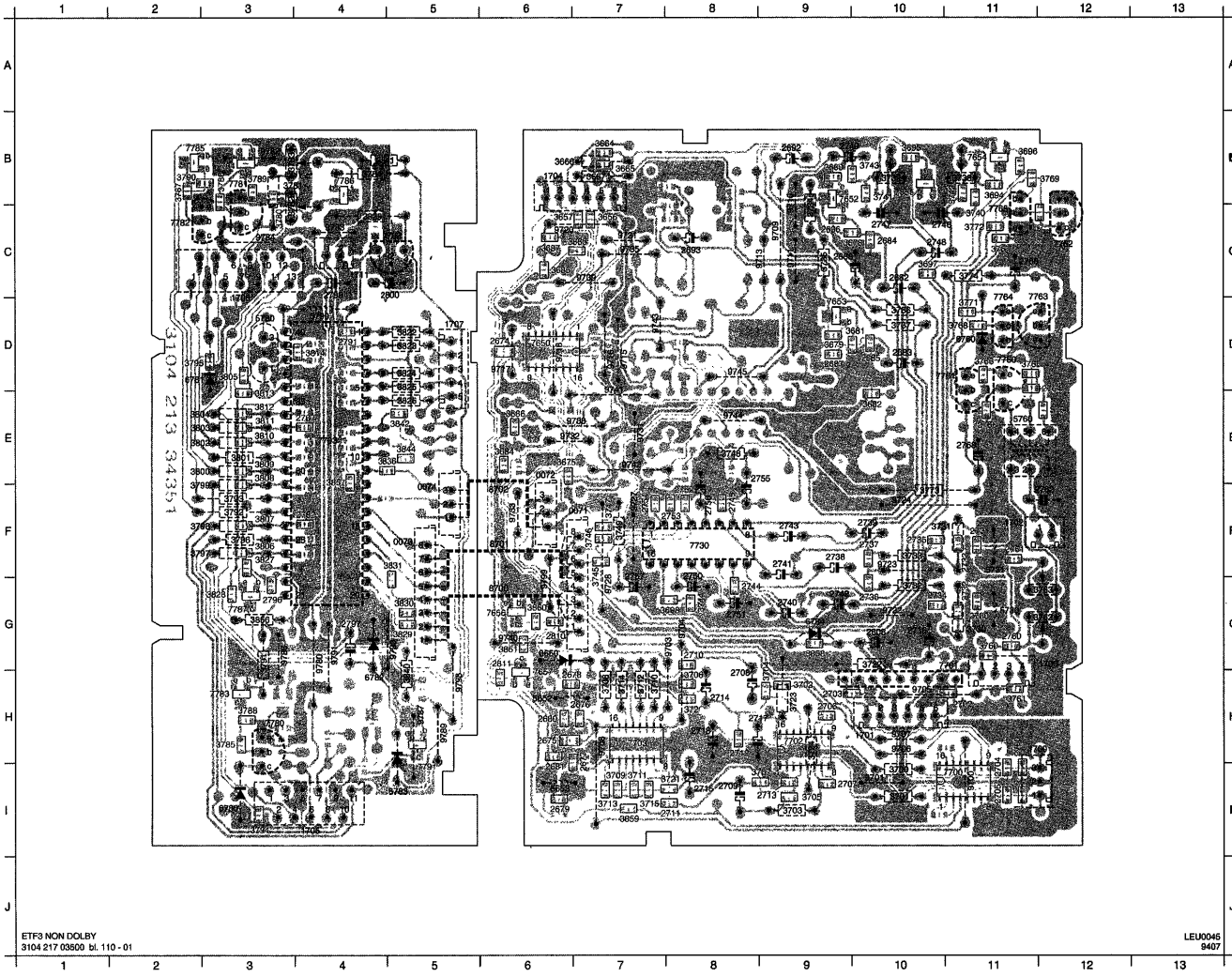
ETF3 DOLBY B (for all versions except /21)

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0072	E6	2658	E8	2686	C9	2714	H8	2745	F8	2782	F4	3659	D7	3695	B10	3716	I7	3744	G6	3774	C11	3799	F2	3826	E3	3864	E6	7852	B9	7783	H3	9710	C9	9735	D8
0073	F5	2659	D8	2687	C9	2715	I8	2746	C10	2787	E4	3660	F7	3696	B11	3720	H8	3745	G7	3780	C3	3800	E2	3827	F3	3865	C7	7853	D9	7784	B3	9711	C9	9737	E9
0074	F5	2660	E7	2688	C9	2716	G10	2747	C10	2791	D4	3661	D7	3697	C10	3721	I7	3746	F7	3781	B3	3801	E3	3828	G3	3866	B6	7854	B11	7785	B2	9712	D9	9740	G6
1700	H11	2661	D8	2690	F6	2717	H8	2748	C10	2796	G3	3662	C8	3698	G7	3722	G10	3747	F7	3782	C4	3802	E2	3829	G5	3867	B7	7855	B10	7786	B4	9715	D7	9780	H4
1701	H10	2668	F9	2692	B9	2718	H8	2749	B9	2797	G4	3663	C7	3699	E8	3723	H8	3748	E9	3783	B4	3803	E2	3830	G5	3868	G5	7856	G6	7787	G3	9716	D7	9782	B3
1702	F11	2669	D9	2693	C8	2720	G11	2750	G8	2798	D4	3664	B7	3700	I10	3734	H8	3749	F7	3784	B4	3804	E2	3831	F4	3869	I6	7857	H6	7789	I5	9717	D8	9783	C4
1703	G12	2672	D8	2700	H11	2721	F11	2751	G8	2800	D4	3665	B7	3701	I10	3730	G11	3760	G11	3795	H3	3805	D3	3832	F4	3870	G11	7790	I10	7792	C4	9718	D8	9784	C3
1704	B6	2673	E9	2701	I11	2732	G11	2752	F8	2808	G10	3666	B6	3702	H9	3731	F10	3761	H11	3796	B3	3806	F3	3833	E4	3871	F11	7791	G10	7793	E4	9719	C8	9786	G3
1705	I4	2674	D6	2702	H11	2733	F11	2753	F7	2810	G6	3667	B7	3703	I9	3732	G10	3762	G11	3797	B2	3807	F3	3837	F2	3872	E11	7792	H9	9720	G6	9787	H5		
1706	D3	2675	H6	2703	H9	2734	G10	2754	F7	2811	G6	3673	E8	3704	H9	3733	F10	3763	G11	3798	H3	3808	E3	3838	C4	3873	D3	7793	H7	9721	C7	9788	H5		
1707	D5	2676	H6	2704	I11	2735	F10	2755	E8	2812	G6	3674	E8	3705	I9	3734	C9	3764	E12	3799	B3	3809	E3	3840	H3	3874	D4	7794	F8	9722	G10	9790	G5		
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2650	E7	2676	H6	2705	H9	2737	F10	2757	G7	2814	G6	3676	C9	3707	I8	3736	D10	3766	D11	3791	H3	3811	E3	3842	E5	3876	D11	7796	D10	9724	F10	9792	H4		
2651	C7	2679	I6	2707	I9	2738	F9	2760	G11	2815	G6	3679	D9	3708	H7	3737	D10	3767	C11	3792	F3	3812	E3	3844	E5	3878	I4	7797	C12	9725	G6	9797	F7	9799	G6
2652	C8	2680	H6	2708	H8	2739	F10	2761	F11	2816	G6	3680	B9	3709	I7	3738	B11	3768	D11	3793	F3	3813	E3	3845	G5	3879	D2	7798	D11	9726	G7	9798	F5		
2653	C7	2681	I6	2709	I8	2740	G8	2762	F11	2817	G6	3681	D9	3710	H7	3739	B10	3769	B12	3794	I3	3814	D4	3846	H3	3880	I4	7799	D11	9727	H10	9799	G6		
2654	C8	2682	C10	2710	G8	2741	F9	2764	E12	2818	G6	3682	E10	3711	I7	3740	C11	3770	C12	3795	D2	3822	D5	3858	G9	3881	I4	7799	D11	9728	H10	9799	G6		
2655	C7	2683	D10	2711	I7	2742	G9	2765	E11	2819	G6	3683	B8	3712	H7	3741	B10	3771	D11	3796	F3	3823	D5	3859	I7	3882	I4	7799	D11	9729	H10	9799	G6		
2656	E7	2684	C10	2712	H8	2743	F9	2766	C11	2820	G6	3684	B7	3713	I7	3742	C11	3772	C11	3797	F2	3824	D5	3860	G6	3883	D6	7799	D11	9730	H7	9799	G6		



ETF3 NON-DOLBY (For /21 only)

0071	F6	2679	I6	2706	H8	2735	F10	2763	F7	2800	D4	3686	E6	3711	I7	3738	B11	3766	D11	3789	B3	3807	F3	3836	E4	3780	D3	7792	H9	7792	C4	9716	D7	9742	E7
0072	E6	2680	H6	2707	I9	2736	G10	2754	F7	2808	G10	3687	C6	3712	H7	3739	B10	3767	C11	3790	B2	3808	E3	3839	C4	3790	D4	7793	H7	7793	E4	9717	D6	9743	D7
0073	F5	2681	I6	2708	H8	2737	F10	2755	E8	2810	G6	3688	B11	3713	I7	3740	C11	3768	D11	3791	H3	3809	E3	3840	H5	3790	F8	9700	G6	9718	D6	9744	E8		
0074	F5	2682	C10	2709	I8	2738	F9	2756	F8	2811	G6	3689	B10	3714	H7	3741	B10	3769	B12	3792	F3	3810	E3	3841	B4	3790	D11	7793	D10	9701	F6	9720	C8	9745	D8
1700	H11	2683	D10	2710	G8	2739	F10	2757	G7	2812	G6	3690	B11	3715	I7	3742	C11	3770	C12	3793	F3	3811	E3	3842	E5	3790	D10	7793	D10	9702	F6	9721	C7	9780	H4
1701	H10	2684	C10	2711	I7	2740	G9	2760	G11	2813	G6	3691	C10	3716	I8	3743	B10	3771	D11	3794	I3	3812	E3	3844	E5	3790	D10	7793	D10	9703	I11	9722	G10	9782	B3
1702	F11	2685	D10	2712	H8	2741	F9	2761	F11	2814	G6	3692	G7	3717	I7	3744	G8	3772	C11	3795	D2	3813	E3	3845	G3	3790	D10	7793	D10	9704	I10	9723	F10	9783	C4
1703	G12	2686	C9	2713	I8	2742	G9	2762	F11	2815	G6	3693	B7	3718	I8	3745	G7	3773	F10	3796	F3	3814	D4	3857	F4	3790	D10	7793	D10	9705	G8	9724	F10	9784	C3
1704	B6	2687	D9	2714	H8	2743	F9	2763	E12	2816	G6	3694	B6	3719	I10	3746	F7	3774	C11	3797	F2	3822	D5	3858	G9	3790	D10	7793	D10	9706	G8	9725	F7	9785	G3
1705	I4	2688	C9	2715	I8	2744	G8	2764	E11	2817	G6	3695	B7	3720	H9	3747	F7	3775	C10	3798	F2	3823	D5	3859	I7	7850	D6	7790	H3	9706	H10	9726	G7	9787	H5
1706	D3	2692	B9	2716	G10	2745	F8	2766	C11	2818	G6	3696	C9	3721	I9	3748	E8	3781	B3	3799	F2	3824	D5	3860	G6	7852	B9	7791	B3	9706	H10	9727	E7	9789	H5
1707	D5	2693	C8	2717	H8	2746	C10	2768	E11	2819	G6	3697	C9	3722	H9	3749	F7	3782	C4	3800	E2	3825	D5	3861	G6	7853	D9	7792	C2	9707	H10	9728	E7	9790	G5
1711	C4	2700	H11	2718	H8	2747	G10	2762	F4	2820	G6	3699	D9	3723	G10	3750	G11	3783	B4	3801	E3	3826	E5	3865	C8	7854	B11	7793	H3	9708	H7	9729	F6	9791	G4
2674	D6	2701	I11	2720	G11	2748	C10	2763	F4	2821	G6	3700	H8	3724	G10	3751	G11	3784	B4	3802	E2	3827	F3	3866	C8	7855	B10	7794	B3	9709	C9	9730	C7	9792	H5
2675	H6	2702	H11	2721	F11	2749	B9	2791	D4	2822	G6	3701	H8	3725	G10	3752	G11	3785	H3	3803	E2	3828	G3	3867	C8	7856	G6	7795	D2	9710	C8	9738	E8	9799	G6
2676	H6	2703	H8	2722	G11	2750	G8	2796	G3	2823	E10	3702	H7	3726	C10	3753	G11	3786	B3	3804	E2	3829	G5	3868	G6	7857	H11	7796	B4	9711	C8	9739	C7	9799	G6
2677	I7	2704	I11	2723	F11	2751	G6	2797	G4	2824	E8	3703	H7	3727	D10	3754	E12	3787	B2	3805	D3	3830	G6	3869	G6	3859	F11	7797	G3	9712	C9	9740	G6	9799	G6
2678	H6	2705	I11	2724	G10	2752	F9	2799	D4	2825	C8	3704	H7	3728	D10	3755	D11	3788	H3	3806	F3	3831	F4	3870	E11	7797	G3	7791	I5	9715	D7	9741	E7		





## EXPLANATION OF ABBREVIATIONS

A	Deck A or B
CRO2	Chrome
Dolby NR	Dolby Noise Reduction
Dolby Mode	Dolby Mode (Rec or Play)
DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

## SERVICE SOLUTION for RIF INTERFERENCE

Re-adjust oscillator coil 5760 (half a turn)  
so that the interference is gone.



## ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Deck A High Speed HS	SBC419 3150Hz	High Speed dubbing	Test point TP 1	Counter	3782	5,4kHz ±0,5%	see #1
Deck A Norm Speed NS	SBC419 3150Hz	Play in forward direction	Test point TP 2	Counter	3783	3,15 kHz ±0,5%	
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP 2	Wow and Flutter meter	check	< 0,4%	
Deck A Playback DolbyLevel	Dolby 200 N Wb/m	Play in forward direction	TP 2 left ch TP 3 right ch	AC mV meter	3652 3653	548mV ±0,5dB	see #2
Deck B Playback DolbyLevel	Dolby 200 N Wb/m	Play in forward direction	TP 2 left ch TP 3 right ch	AC mV meter	3654 3655	548mV ±0,5dB	
Deck A Azimuth	SBC 419 12kHz	Play in forward direction or Play in reverse direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm Dir (>) Right screw Rev Dir (<)	max output left=right	
Deck B Azimuth	SBC 419 12kHz	Play in forward direction or Play in reverse direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm Dir (>) Right screw Rev Dir (<)	max output left=right	
Bias current Chrome	-	Record mode and Chrome mode	TP 4 5 L ch TP 6 7 R ch	AC mV meter	3762 3763	7 mV	see #3
Bias current Ferro	-	Record mode and Ferro mode	TP 4 5 L ch TP 6 7 R ch	AC mV meter	check check	4,4mV ±0,5dB	
Recording current	Dolby 200N Wb/m (deck A) and Chrome cass (deck B) Dolby 200N Wb/m (deck A) and Ferro cass (deck B)	Record mode and Chrome mode Record mode and Ferro mode	TP 4 5 L ch TP 6 7 R ch TP 4 5 L ch TP 6 7 R ch	AC mV meter	3738 3739 check check	0,68mV Rec/PB Level within ±1 dB of 548 mV 0,45mV Rec/PB Level within ±1 dB of 548 mV	Filter out osc with audio filter see also #4
Multiplex Filter		Record mode Inject 19kHz at line in	TP 2 left ch TP 3 right ch	AC mV meter	5650 5651	Min output Typ Attenuation >40dB Min Attenuation >30dB	
Oscillator Frequency		Record mode	TP 4 5 L ch	Counter	5760	88kHz ±6kHz	

#1 Motor must be aligned for HS before NS H.S ratio = 1,7

#2 Dolby level to be tested in reverse direction within same tolerance

#3 Bias current must be aligned for Chrome position

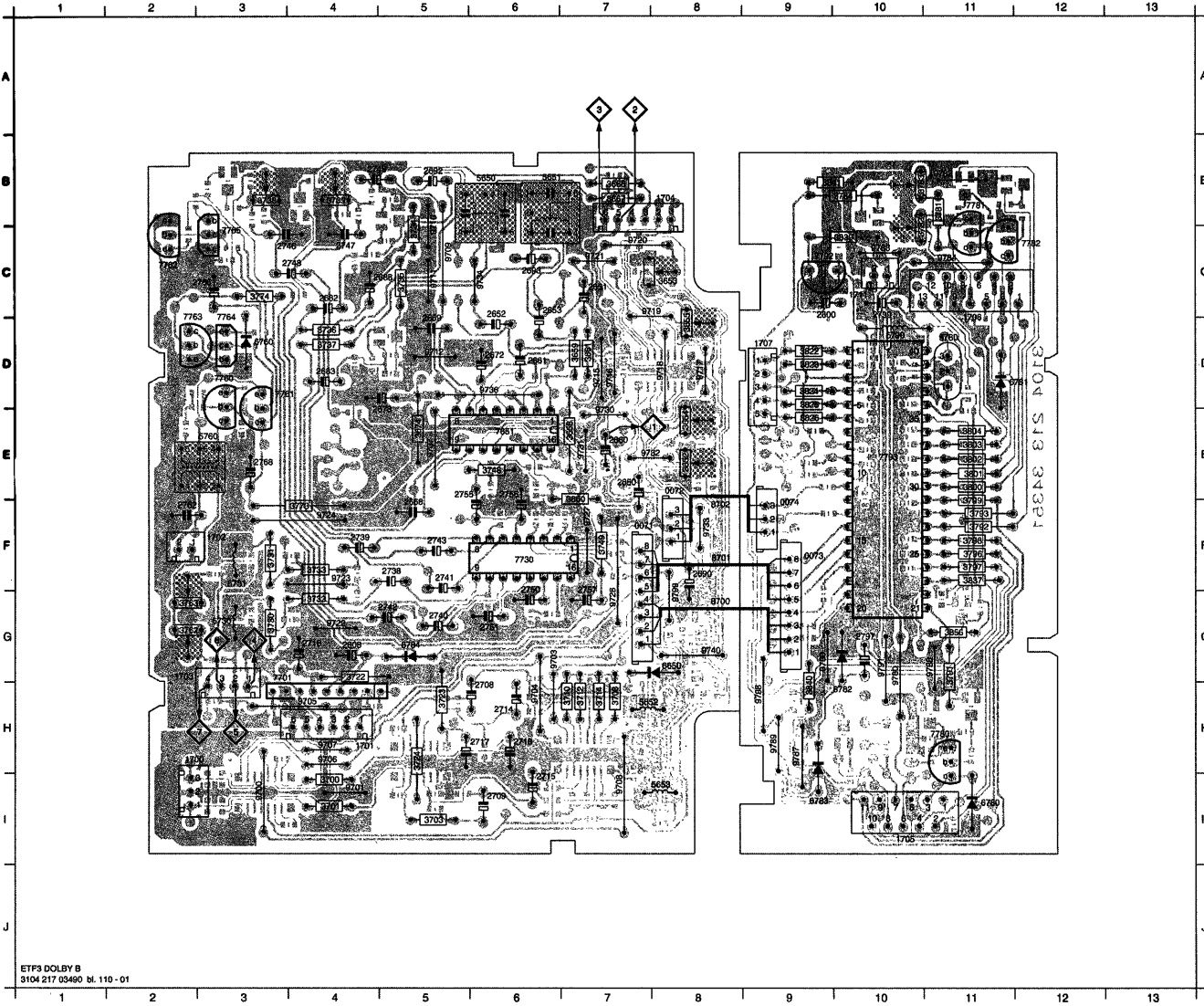
#4 Recording current should be aligned using an iterative method Perform a dubbing using test tape Dolby 200 N Wb/m as source, and Ferro tape or Chrome tape as target blank tapes Check that the output t p gives 548 mV during dubbing Then playback the recorded tape The record/playback level should also be 548 mV ± 0 5 dB If not, adjust 3738 (L) and 3739 (R) accordingly

ETF3 DOLBY B - COMPONENTS

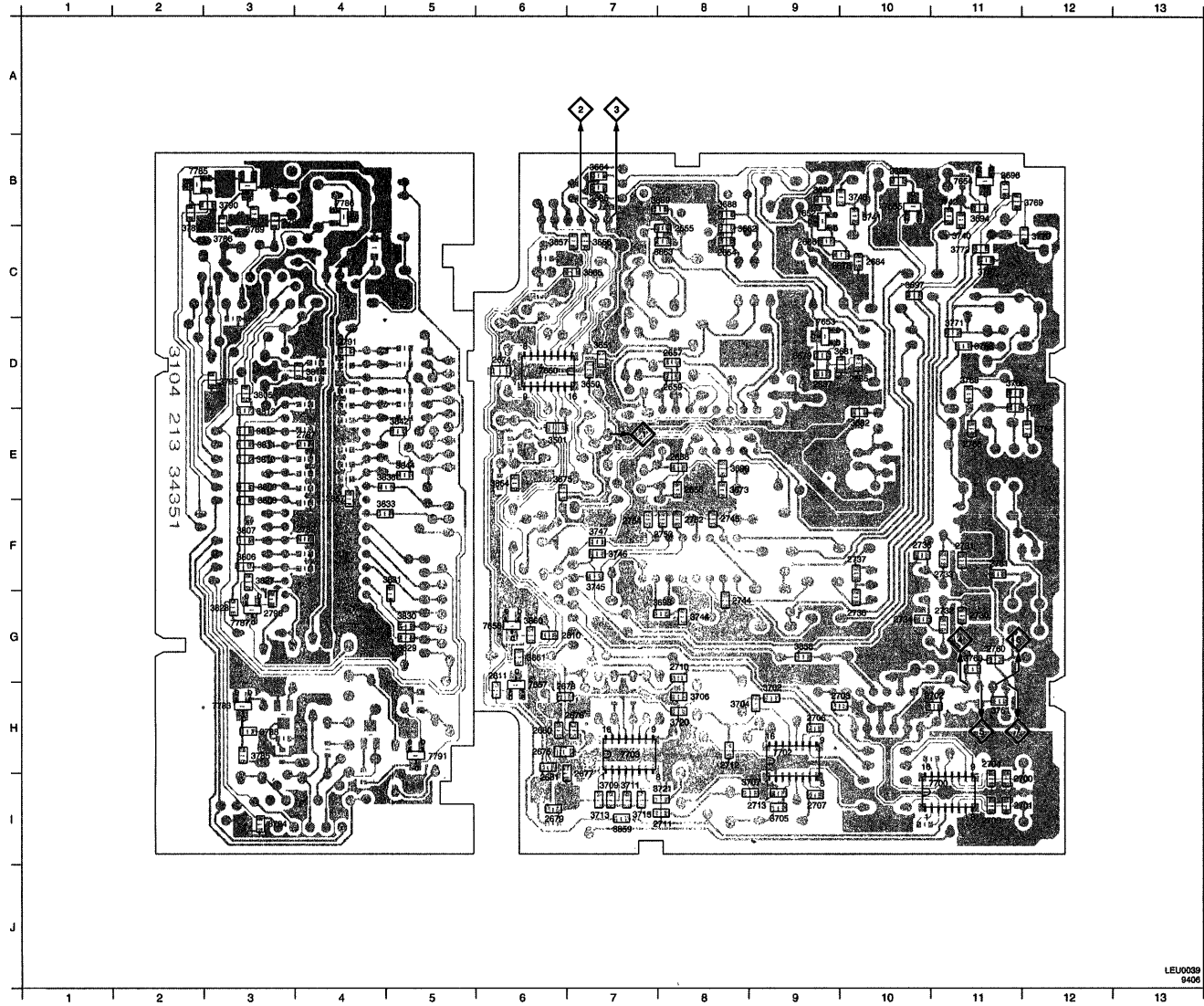
ETF3 DOLBY B - CHIPS

0071	F7	1707	D9	2673	E4	2716	G4	2748	C3	2790	D10	3686	B7	3723	H5	3730	B4	3791	H11	3804	E11	5550	B6	6780	H11	7763	D2	9700	J3	9712	D5	9727	F7	9782	B11
0072	E8	1711	C10	2682	C4	2717	H6	2749	B4	2800	D9	3667	B7	3724	H5	3748	E6	3792	F11	3822	D9	5551	B6	6781	D11	7764	D3	9701	I4	9715	D7	9728	G7	9783	C10
0073	F9	2650	E7	2683	D4	2718	H6	2750	G6	2808	G4	3674	E5	3730	G3	3749	F7	3793	F11	3823	D9	5552	H7	6782	H9	7765	C3	9703	G6	9716	D7	9730	E7	9784	C11
0074	F9	2651	C7	2684	C4	2738	F5	2751	G6	3652	E8	3700	H4	3731	F3	3762	G2	3796	F11	3824	D9	5553	I7	6783	H9	7766	H11	9704	H6	9717	D8	9731	E7	9785	G11
1700	H2	2652	C8	2690	F8	2739	F4	2755	E5	3653	C8	3701	I4	3732	G4	3763	G2	3797	F11	3825	D9	5740	G3	6784	G5	7767	B11	9705	H4	9718	D8	9732	E7	9786	H9
1701	H4	2653	C6	2692	B5	2740	G5	2756	E6	3654	E8	3703	I5	3733	F4	3773	F4	3798	F11	3826	E9	5731	F3	6785	E6	7762	C12	9706	H4	9719	C7	9733	F8	9789	H9
1702	F3	2660	E7	2693	C6	2741	F5	2757	G7	3655	D8	3708	H7	3734	C5	3774	C3	3799	F11	3827	F11	5760	E3	7701	G3	7762	C9	9707	H4	9720	C7	9734	C6	9790	G9
1703	G2	2661	D6	2706	H6	2742	G4	2762	F2	3656	E7	3710	H7	3735	C5	3781	B11	3800	E11	3839	C10	5760	D11	7730	F6	7763	E10	9708	I7	9721	C7	9736	D6	9791	G10
1704	D8	2665	F5	2709	I6	2743	F5	2766	C2	3659	D7	3712	H7	3736	D4	3782	C11	3801	E11	3840	H9	5760	D10	7760	D3	8700	G8	9709	C5	9722	G4	9737	E5	9798	H9
1706	H0	2666	D5	2714	H6	2746	C3	2768	C6	3660	F7	3714	H7	3737	D4	3783	B11	3802	E11	3841	D9	6550	G6	7761	D3	8701	F8	9710	C5	9723	F4	9740	G8	9799	G8
1706	D11	2672	D6	2715	I6	2747	C4	2797	G10	3661	D7	3722	G4	3738	B3	3784	B10	3803	E11	3858	G11	6780	D3	7762	C2	8702	F6	9711	C5	9724	F4	9790	H10		

2654	C8	2677	I7	2700	I11	2711	I7	2736	G10	2764	E12	3650	D7	3675	E6	3695	B10	3707	I8	3742	B11'	3765	D11	3785	H3	3806	F3	3827	F3	3857	F4	7653	D9	7784	B3
2655	C8	2678	H8	2701	H11	2712	H8	2737	F10	2765	E11	3651	D7	3676	C9	3696	B11	3709	I7	3743	B10	3766	D11	3786	C3	3807	F3	3828	G3	3858	G9	7654	B11	7785	B2
2656	E8	2679	I9	2702	H10	2713	I8	2738	G8	2766	F4	3656	C7	3679	D9	3697	C10	3711	I7	3744	G8	3767	C11	3787	C2	3808	F3	3829	G5	3859	I7	7655	B10	7786	B4
2657	D8	2680	H6	2703	H8	2730	G11	2745	F8	2767	E4	3657	C6	3680	B9	3698	G7	3713	I7	3745	F7	3768	D11	3788	H3	3809	E3	3830	G5	3860	G6	7656	G6	7787	G3
2658	E8	2681	I6	2704	H11	2731	F11	2752	F8	2791	D4	3662	C8	3681	D9	3699	E8	3715	I7	3746	F7	3769	B12	3789	C3	3810	E3	3831	F4	3861	G6	7657	H6	7791	H5
2659	D8	2684	C10	2705	I11	2732	G11	2753	F7	2796	G3	3663	C7	3682	E10	3702	H8	3720	H8	3747	F7	3770	C12	3790	B3	3811	E3	3833	F4	3864	E8	7700	H0		
2674	D8	2685	D10	2706	H8	2733	F11	2754	F7	2810	G6	3664	B7	3683	G8	3704	H8	3721	I7	3760	G11	3771	D11	3794	I3	3812	E3	3836	E4	3865	C7	7702	H9		
2675	H6	2686	C9	2707	I9	2734	G10	2760	G11	2811	G6	3665	B7	3684	B7	3705	I9	3740	C11	3761	H11	3772	C11	3795	D3	3813	E3	3842	E5	7650	D6	7703	H7		
2676	H6	2687	D9	2710	G8	2735	F10	2761	F11	3501	E6	3673	E8	3694	B11	3706	H8	3741	B10	3764	E12	3780	B3	3805	D3	3814	D4	3844	E5	7652	B9	7783	H3		

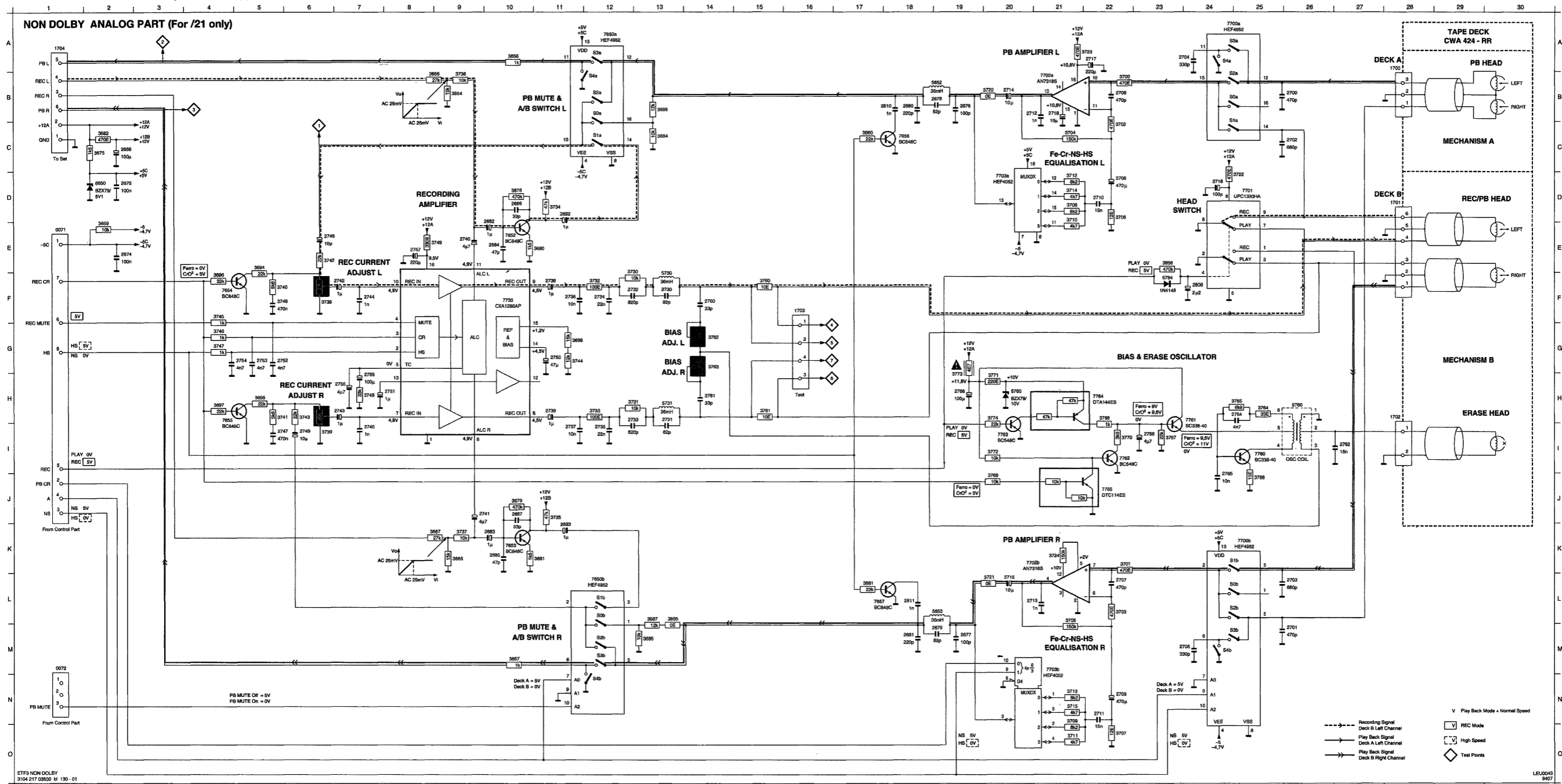


ETF3 DOLBY B  
3104 217 03490 bl. 110 - 01



LEU0289  
9406

NON DOLBY ANALOG PART (For /21 only)



0071	E1	3700	F12
0072	M1	3731	H12
1700	A28	3736	F12
1701	C28	3732	H12
1702	H28	3734	O11
1703	F16	3736	J11
1704	A1	3738	S6
2674	E2	3737	K9
2675	D2	3738	F8
2676	B19	3738	S6
2677	M19	3740	F5
2678	B18	3741	H6
2679	M18	3742	S6
2680	B18	3743	H6
2681	M18	3744	O11
2682	E3	3745	F4
2683	K9	3746	G4
2684	E10	3747	G4
2685	I10	3748	H7
2686	D10	3749	E8
2687	J10	3750	F15
2688	C2	3751	H15
2689	D11	3752	G14
2690	K11	3753	G14
2700	S28	3754	H25
2701	M28	3755	H24
2702	C26	3756	J25
2703	L28	3757	E3
2704	A23	3758	H22
2705	M23	3759	J20
2706	S22	3770	S22
2707	L22	3771	H20
2708	D22	3772	S20
2709	H22	3773	H18
2710	D22	3774	H20
2711	H22	3658	E23
2712	S20	3659	E2
2713	L20	3860	C17
2714	B20	3901	L17
2715	L20	3902	L13
2716	D24	3652	B18
2717	A22	3653	L18
2718	S21	3720	F13
2719	F13	3731	H13
2720	H13	3730	H28
2721	F12	3656	O11
2722	H12	3657	O11
2723	H12	3670	H20
2724	F12	3674	F23
2725	H12	3658	B11
2726	F11	3659	M11
2727	F11	3655	E10
2728	F11	3653	K10
2729	H11	3654	F4
2730	E9	3655	H4
2731	J8	3656	C18
2732	F6	3657	L17
2733	H8	3658	A24
2734	J7	3659	C18
2735	I7	3659	D25
2736	F5	3659	E21
2737	S	3659	K20
2738	E6	3659	D20
2739	B	3659	M21
2740	B	3659	F10
2741	H8	3659	I5
2742	G5	3659	H24
2743	G5	3659	I22
2744	G5	3659	I20
2745	H7	3659	H22
2746	H7	3659	J22
2747	H7	3659	J22
2748	E7	3659	K24
2749	F14	3659	L24
2750	H14	3659	L24
2751	H14	3659	L24
2752	E7	3659	S12
2753	H24	3659	S24
2754	J24	3659	S24
2755	I23	3659	S24
2756	I23	3659	S24
2757	H19	3659	S24
2758	H19	3659	S24
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2797	O21	3659	S24
2798	O21	3659	S24
2799	O21	3659	S24
2800	O21	3659	S24
2801	O21	3659	S24
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2818	O21	3659	S24
2819	O21	3659	S24
2820	O21	3659	S24
2821	O21	3659	S24
2822	O21	3659	S24
2823	O21	3659	S24
2824	O21	3659	S24

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DSA STR	DSA Strobe
DSA DA	DSA Data
DSA ACK	DSA Acknowledge
EOT A	End of Tape A
EOT B	End of Tape B
FE	Ferro
HS	High Speed
MODE A	Slide Deck A Up / Down
MODE B	Slide Deck B Up / Down
NC	Not Connect
NS	Normal Speed
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ L	Playback Lever Adjustment Left
PB CR	Playback Chrome
PB mute	Playback mute
PB Lever ADJ R	Playback Lever Adjustment Right
PBL	Playback Left
PBR	Playback Right
Rec Mute	Recording Mute
Rec R	Recording Right
Rec L	Recording Left
Rec CR	Recording Chrome
REC RVS	Recording Reverse
REC	Recording
REC FWD	Recording Forward
SOL A	Solenoid A
SOL B	Solenoid B
VCC B	VCC Motor B

## SERVICE SOLUTION for RIF INTERFERENCE

Re-adjust oscillator coil 5760 (half a turn)  
so that the interference is gone.

## ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

Adjustment	Cassette	Recorder in position	Measure on	Read on	Adjust with	Value	Remarks
Deck A High Speed HS	SBC419 3150Hz	High Speed dubbing	Test point TP 1	Counter	3782	5,4kHz ±0,5%	see #1
Deck A Norm Speed NS	SBC419 3150Hz	Play in forward direction	Test point TP 2	Counter	3783	3,15 kHz ±0,5%	
Wow and Flutter	SBC419 3150Hz	Play in forward direction	Test point TP 2	Wow and Flutter meter	check	< 0,4%	
Deck A Azimuth	SBC 419 12kHz	Play in forward direction or Play in reverse direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm Dir (>) Right screw Rev Dir (<)	max output left=right	
Deck B Azimuth	SBC 419 12kHz	Play in forward direction or Play in reverse direction	TP 2 left ch or TP 3 right ch	AC mV meter	Left screw Norm.Dir.(>) Right screw Rev.Dir.(<)	max. output left=right	
Bias current Chrome	-	Record mode and Chrome mode	TP 4 5 L.ch TP 6 7 R.ch	AC mV meter	3762 3763	7 mV	see #2
Bias current Ferro	-	Record mode and Ferro mode	TP 4 5 L ch TP 6 7 R ch	AC mV meter	check check	4,4mV ±0,5dB	
Recording current	Dolby 200N Wb/m (deck A) and Chrome.cass (deck B) Dolby 200N Wb/m (deck A) and Ferro.cass (deck B)	Record mode and Chrome mode Record mode and Ferro mode	TP 4 5 L ch TP 6 7 R ch TP 4 5 L ch TP 6 7 R ch	AC mV meter	3738 3739 check check	0,68mV Rec/PB Level within ±1 dB of 548 mV 0,45mV Rec/PB Level within ±1 dB of 548 mV	Filter out osc with audio filter see also #3
Oscillator Frequency		Record mode	TP 4 5 L.ch	Counter	5760	88kHz ±6kHz	

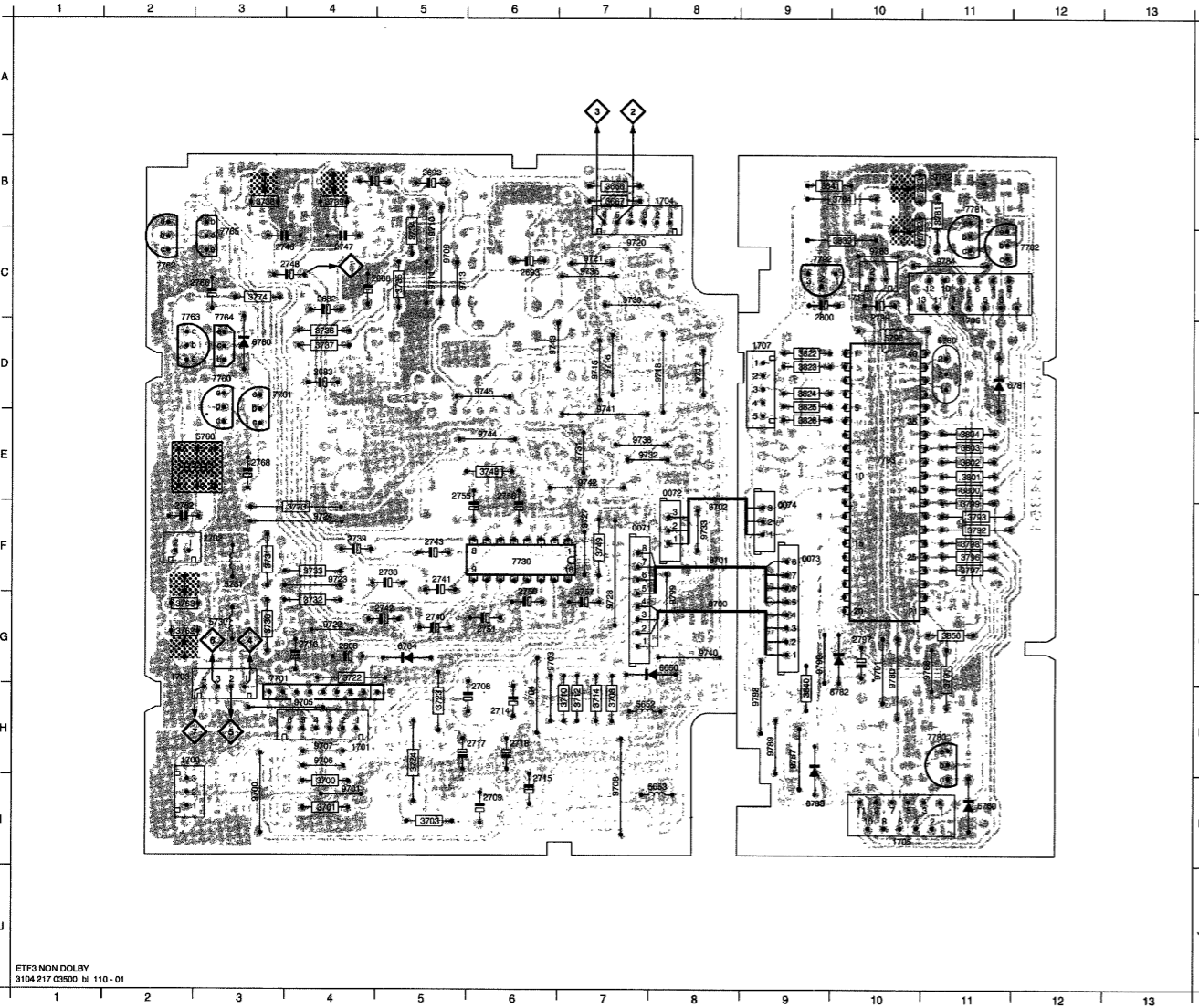
#1 Motor must be aligned for HS before NS. H.S. ratio = 1,7

#2 Bias current must be aligned for Chrome position.

#3 Recording current should be aligned using an iterative method. Perform a dubbing using test tape Dolby 200 N. Wb/m as source, and Ferro tape or Chrome tape as target blank tapes. Check that the output t.p. gives 548 mV during dubbing. Then playback the recorded tape. The record/playback level should also be 548 mV ± 0.5 dB. If not, adjust 3738 (L) and 3739 (R) accordingly.

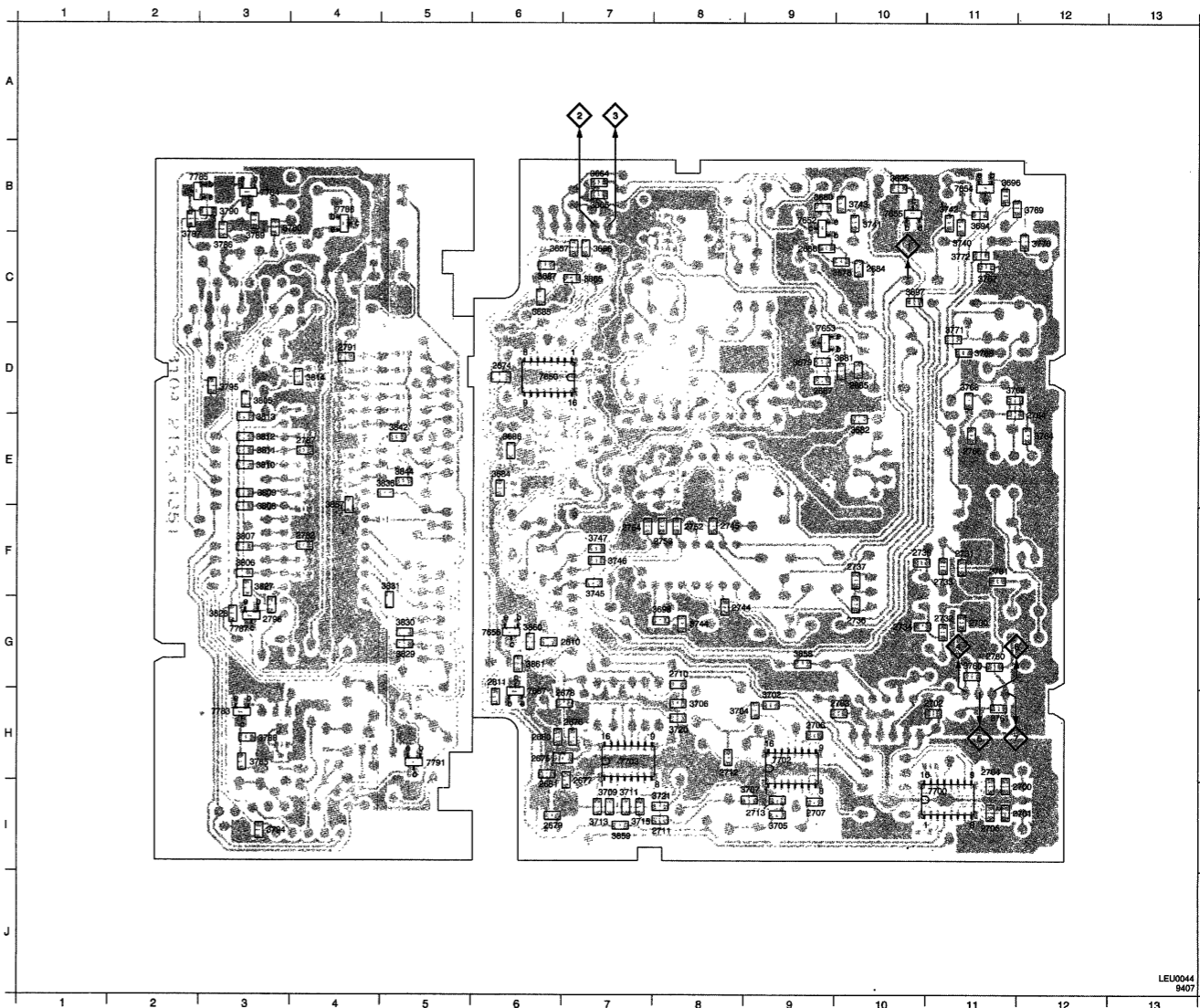
ETF3 NON-DOLBY - COMPONENTS

0071	F7	1706	D11	2714	H6	2743	F5	2762	F2	3701	I4	3731	F3	3749	F7	3782	F11	3804	E11	5652	H7	6781	D11	7764	D3	8700	I3	9711	C5	9724	F4	9741	E7	9787	H9
0072	E8	1707	D9	2715	I6	2746	C3	2766	C2	3703	I5	3732	G4	3762	G2	3793	F11	3822	D9	5730	G3	6783	I9	7780	H11	8703	G8	9715	D7	9728	G7	9743	D6	9790	G9
0073	F9	1711	C10	2716	G4	2747	C4	2768	E3	3708	H7	3733	F4	3763	G2	3794	F11	3823	D9	5731	F3	6784	G5	7781	B11	8704	H6	9716	D7	9731	E7	9744	E8	9791	G10
0074	F9	2682	C4	2717	H8	2748	C3	2767	G10	3710	H7	3734	C5	3764	F4	3795	F11	3824	D9	5732	F3	6785	G5	7782	C12	8705	H4	9717	D8	9732	E7	9745	D6	9792	H9
1700	H2	2683	D4	2718	H6	2749	B4	2769	D10	3712	H7	3735	C5	3774	C3	3796	F11	3825	D9	5733	G3	6786	G5	7783	F6	8706	H4	9718	D8	9733	F8	9746	D6	9793	G8
1701	H4	2688	C4	2738	F5	2750	G6	2800	D9	3714	H7	3736	D4	3781	B11	3799	F11	3826	E9	5780	D11	7730	F6	7792	C9	8707	H4	9720	C7	9735	C7	9782	B11		
1702	F3	2692	B5	2739	F4	2751	G6	2808	G4	3722	G4	3737	D4	3782	C11	3800	E11	3838	C10	5790	D10	7760	D3	7793	E10	8707	H4	9720	C7	9735	C7	9782	B11		
1703	G2	2693	C8	2740	G5	2755	E5	2806	B7	3723	H5	3738	B3	3783	B11	3801	E11	3840	H9	6550	G8	7761	D3	7793	G8	8708	I7	9721	C7	9736	E7	9783	C10		
1704	B8	2708	H6	2741	F5	2756	E6	2807	B7	3724	H5	3739	B4	3784	B10	3802	E11	3841	B9	6760	D3	7762	C2	7794	F8	8709	C5	9722	G4	9739	C7	9784	C11		
1705	I10	2709	I8	2742	G4	2757	G7	2700	I4	3730	G3	3748	E6	3761	H11	3803	E11	3856	G11	6760	I11	7763	D2	8702	F8	8710	C5	9723	F4	9740	G8	9786	G11		

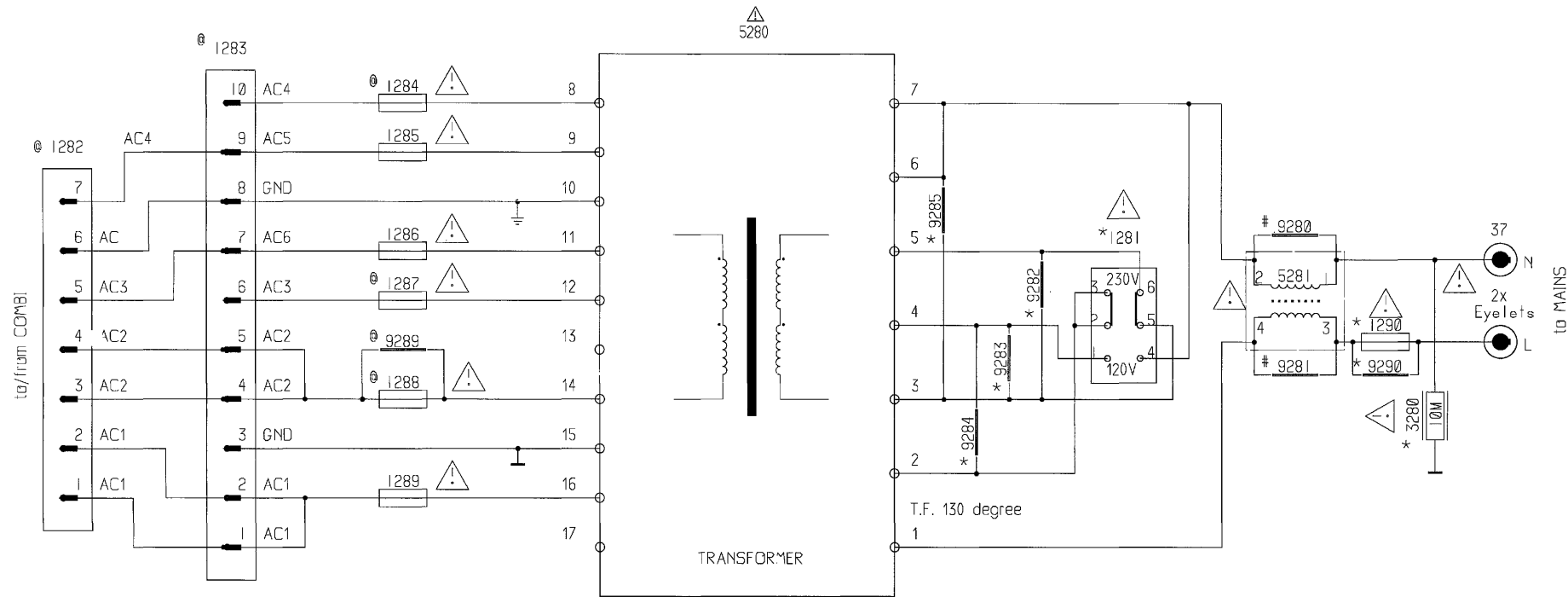


ETF3 NON-DOLBY - CHIPS

2674	D6	2684	C10	2704	H11	2730	G11	2744	G8	2785	E11	3657	C6	3684	E8	3696	G7	3713	I7	3744	G8	3766	D11	3785	H3	3805	D3	3813	E3	3842	E5	7650	D6	7702	H9
2675	H6	2685	D10	2705	I11	2731	F11	2745	F8	2782	F4	3684	B7	3685	C6	3702	H9	3715	I7	3745	F7	3767	C11	3786	C3	3806	F9	3814	D4	3844	E5	7652	D9	7703	H7
2676	H7	2686	C9	2706	H9	2732	G11	2752	F8	2787	E4	3685	B7	3686	E6	3704	H8	3720	H8	3746	F7	3768	D11	3787	C2	3807	F3	3827	F3	3857	F4	7653	D8	7789	H3
2677	I7	2687	D9	2707	I9	2733	F11	2753	F8	2791	D4	3678	C9	3687	C6	3705	I9	3721	I7	3747	F7	3769	B12	3788	H3	3808	F3	3828	G3	3858	G8	7654	B11	7784	B3
2678	H6	2700	I11	2710	G8	2734	G10	2754	F7	2796	G3	3679	D9	3684	B11	3706	H8	3740	C11	3760	G11	3770	C12	3789	C3	3809	E3	3829	G5	3859	I7	7655	B10	7785	B2
2679	I6	2701	I11	2711	I7	2735	F10	2760	G11	2810	G6	3680	B6	3685	B10	3707	I8	3741	B10	3761	H11	3771	D11	3790	B3	3810	E3	3830	G5	3860	G6	7656	G6	7786	B4
2680	H8	2702	H10	2712	H8	2736	G10	2761	F11	2811	G6	3681	D9	3696	B11	3709	I7	3742	B11	3764	E12	3772	C11	3794	I3	3811	E3	3831	F5	3861	G6	7657	H8	7787	G3
2681	I6	2703	H9	2713	I9	2737	F10	2764	E12	2856	C7	3682	E10	3697	C10	3711	I7	3743	B10	3765	D11	3780	E3	3795	D3	3812	E3	3836	E4	3866	C7	7700	I11	7791	H5



**TRAF0 CIRCUIT**



# NOT IN USE (FOR PROVISION ONLY)

Note for items marked @

ITEM	MODEL	FW26	FW46
1282		Use	Not use
1283		Not use	Use
1284		Not use	Use
1287		Not use	Use
1288		Not use	Use
9289		Use	Not use
9282		Not use	UseX
9283		Not use	UseX

NOTE FOR ITEMS MARKED \*

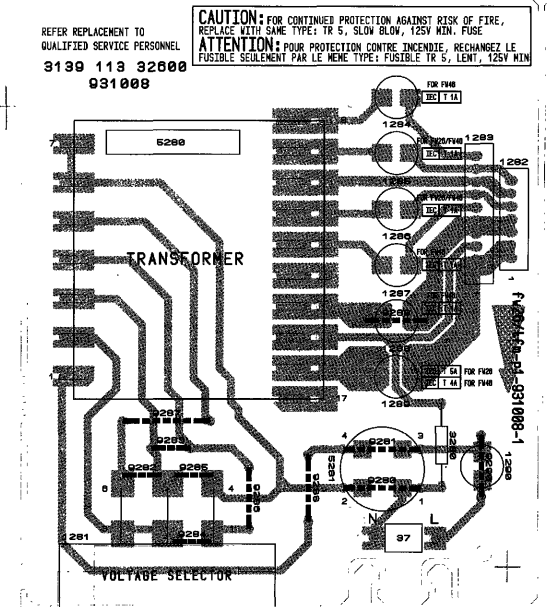
VOLTAGE ITEM	VOLTAGE				
	220-230V	110-127/ 220-240V	230-240V	120V	100V
1281	Not use	Use	Not use	Not use	Not use
9282	Use@	Not use	Not use	Not use	Not use
9283	Not use	Not use	Use@	Not use	Not use
9284	Not use	Not use	Not use	Use	Not Use
9285	Not use	Not use	Not use	Use	Not Use
3280	Not use	Not use	Not use	Use	Not Use
1290	Not use	Not use	Not use	Use	Not Use
9290	Use	Use	Use	Not Use	Use

Remark

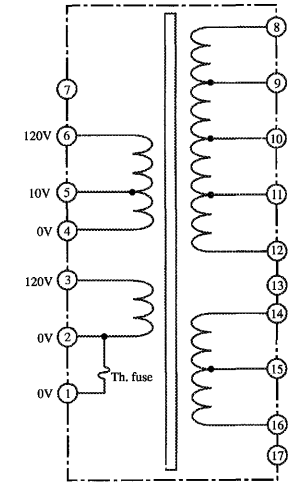
For the exact value of fuses, refer to partlist

	FW26	FW46
1284	Not use	Use
1285	Use	Use
1287	Not use	Use
1288	Not use	Use
1289	Use	Use

**TRAF0 COMPONENT LAYOUT**



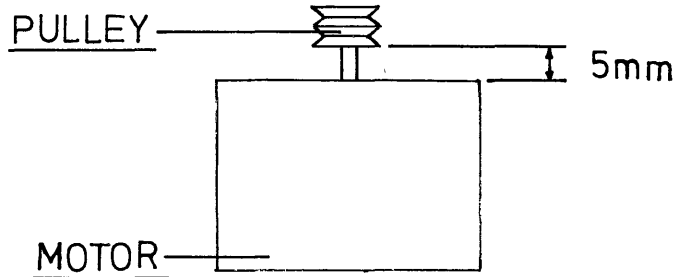
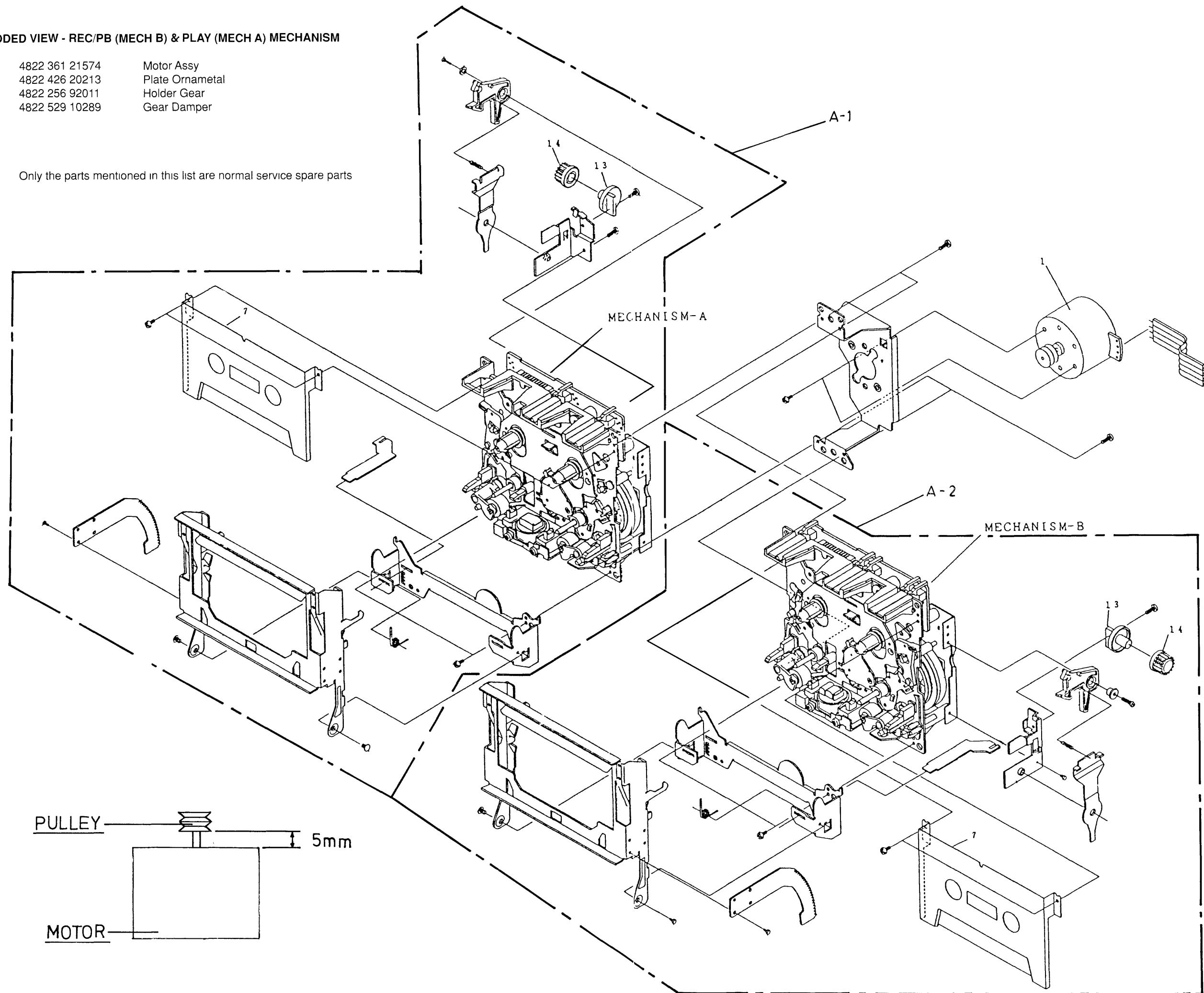
FW46 (except /26 and /37)



**EXPLODED VIEW - REC/PB (MECH B) & PLAY (MECH A) MECHANISM**

1	4822 361 21574	Motor Assy
7	4822 426 20213	Plate Ornametal
13	4822 256 92011	Holder Gear
14	4822 529 10289	Gear Damper

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





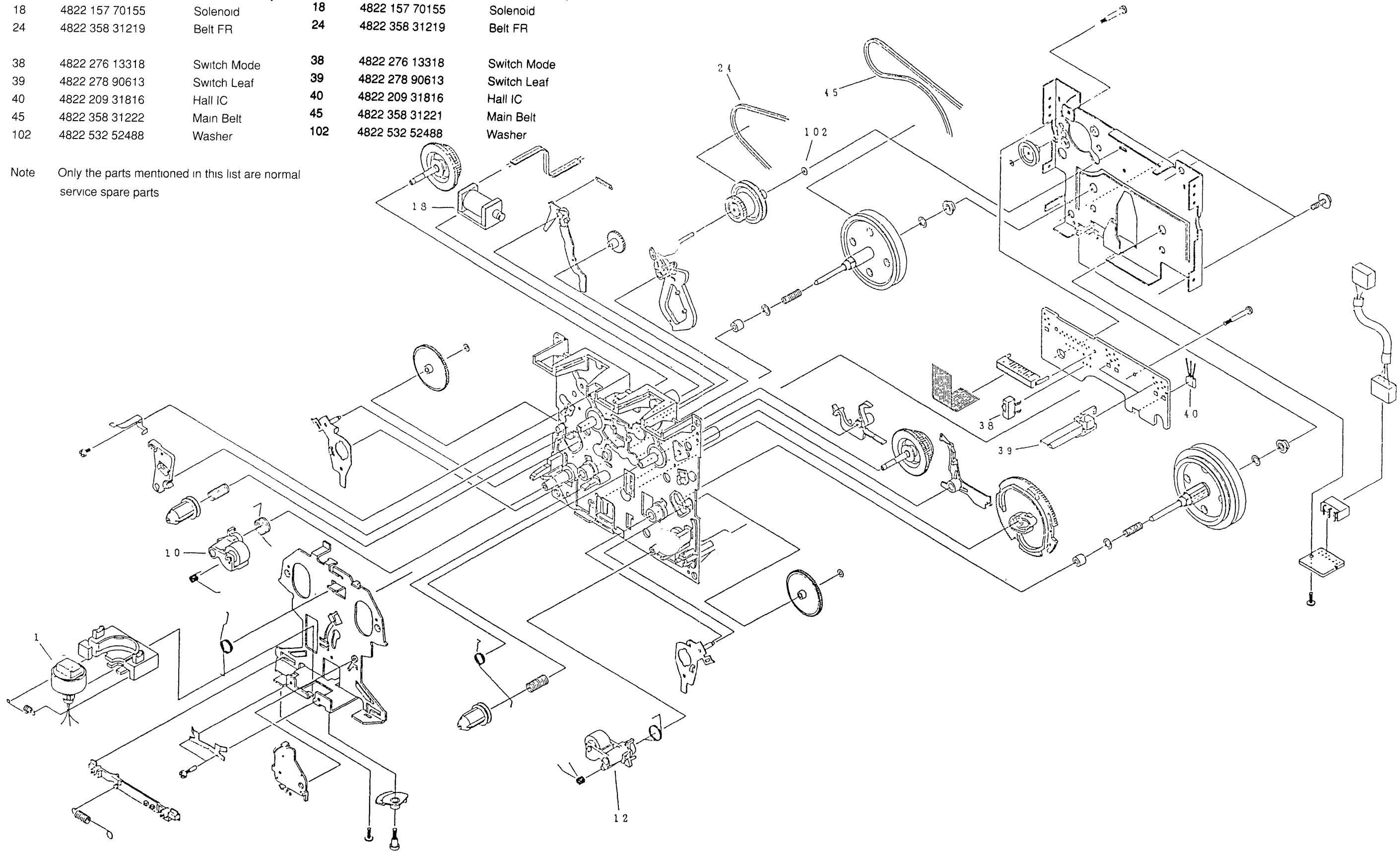
**EXPLODED VIEW - PLAY (MECH A) MECHANISM**

1	4822 249 30189	Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31222	Main Belt
102	4822 532 52488	Washer

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

**EXPLODED VIEW - REC/PB (MECH B) MECHANISM**

1	4822 249 10472	Rec/Play Head Assy
10	4822 403 70729	Pinch Arm Assy L
12	4822 403 70731	Pinch Arm Assy R
18	4822 157 70155	Solenoid
24	4822 358 31219	Belt FR
38	4822 276 13318	Switch Mode
39	4822 278 90613	Switch Leaf
40	4822 209 31816	Hall IC
45	4822 358 31221	Main Belt
102	4822 532 52488	Washer



## Procedure to replace belts/mechanisms

1. Remove the damper gear assembly (pos 13 + 14) and gear lever (pos 9).
2. Remove 4 screws (pos 5) and Playback mechanism (pos A-1) and Rec/Pb mechanism pos (A-2) can now be separated.

Note: The assembly of main belt for the Rec/Pb mechanism must always be done before that of Playback mechanism.

### 3A. Record/Pb Mechanism A-2

- i) Unscrew 4 screws (pos 85 + 86) and remove the cover bracket (pos 41).
- ii) Route the belt as shown in figure 1 around the temporary pins (see arrow).
- iii) Assemble the cover bracket (pos 41), care should be taken not to loosen the belt.
- iv) Assemble the motor bracket assembly (pos 1 + 3) onto the Rec/Pb mechanism.
- v) Use a wire with a hook end (see figure 3), transfer the belt from the temporary position onto the motor pulley (pos 1) as in figure 5 & 6.

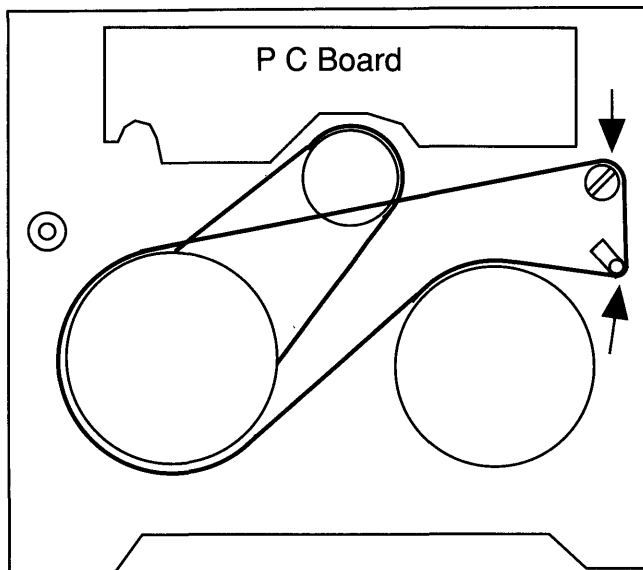


Figure 1. Rec/Pb mechanism A-2

### 2B. Playback Mechanism A-1

- i) Place a piece of tape to hold the eject lever (pos 11) to bracket (pos 16) and remove the door catch (pos 12).
  - ii) Unscrew 4 screws (pos 85 + 86) and remove the cover bracket (pos 41).
  - iii) Route the belt as shown in figure 2 around the temporary pins (see arrow).
  - iv) Assemble the cover bracket (pos 41), care should be taken not to loosen the belt.
  - v) Assemble the Playback mechanism A-1 onto the rest of the tape mechanism.
  - vi) Use a wire with a hook end (see figure 3), transfer the belt from the temporary position onto the motor pulley (pos 1) and the small pulley (pos 42) on cover bracket as in figure 4 - 6.
  - vii) Remove the tape on the eject lever and assemble door catch (pos 12).
3. Assemble the damper gear assembly (pos 13 + 14) and gear lever (pos 9).
  4. After completion, perform the tape adjustment to ensure no mis-alignment due to handling.

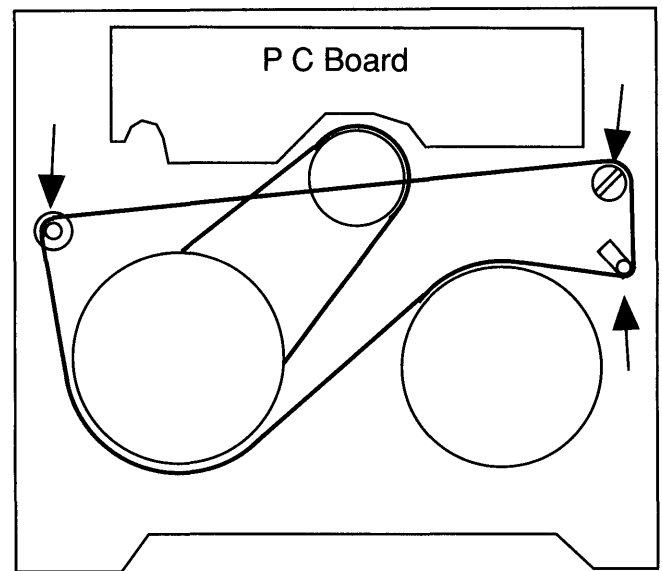


Figure 2. Play mechanism A-1



Figure 3. Wire with hook at the end

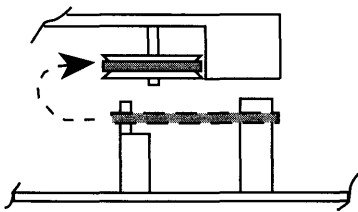


Figure 4. Hook belt onto pulley

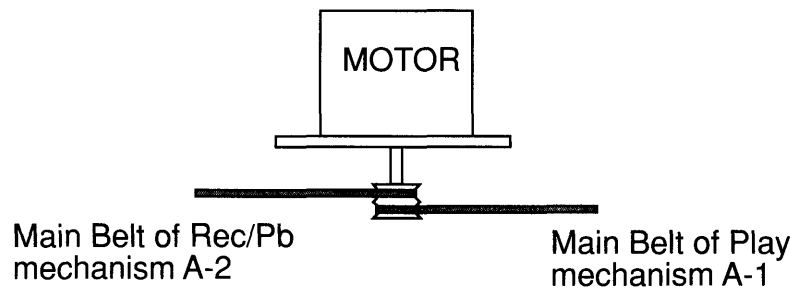


Figure 5. Motor pulley Belt hooking

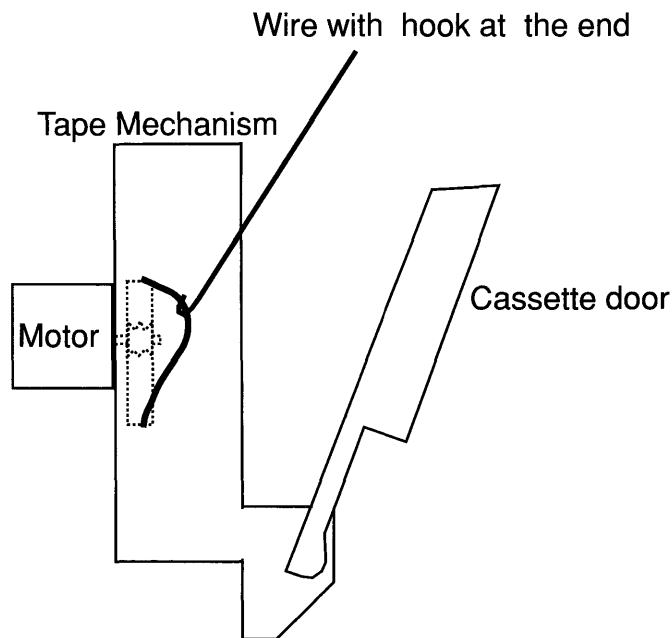
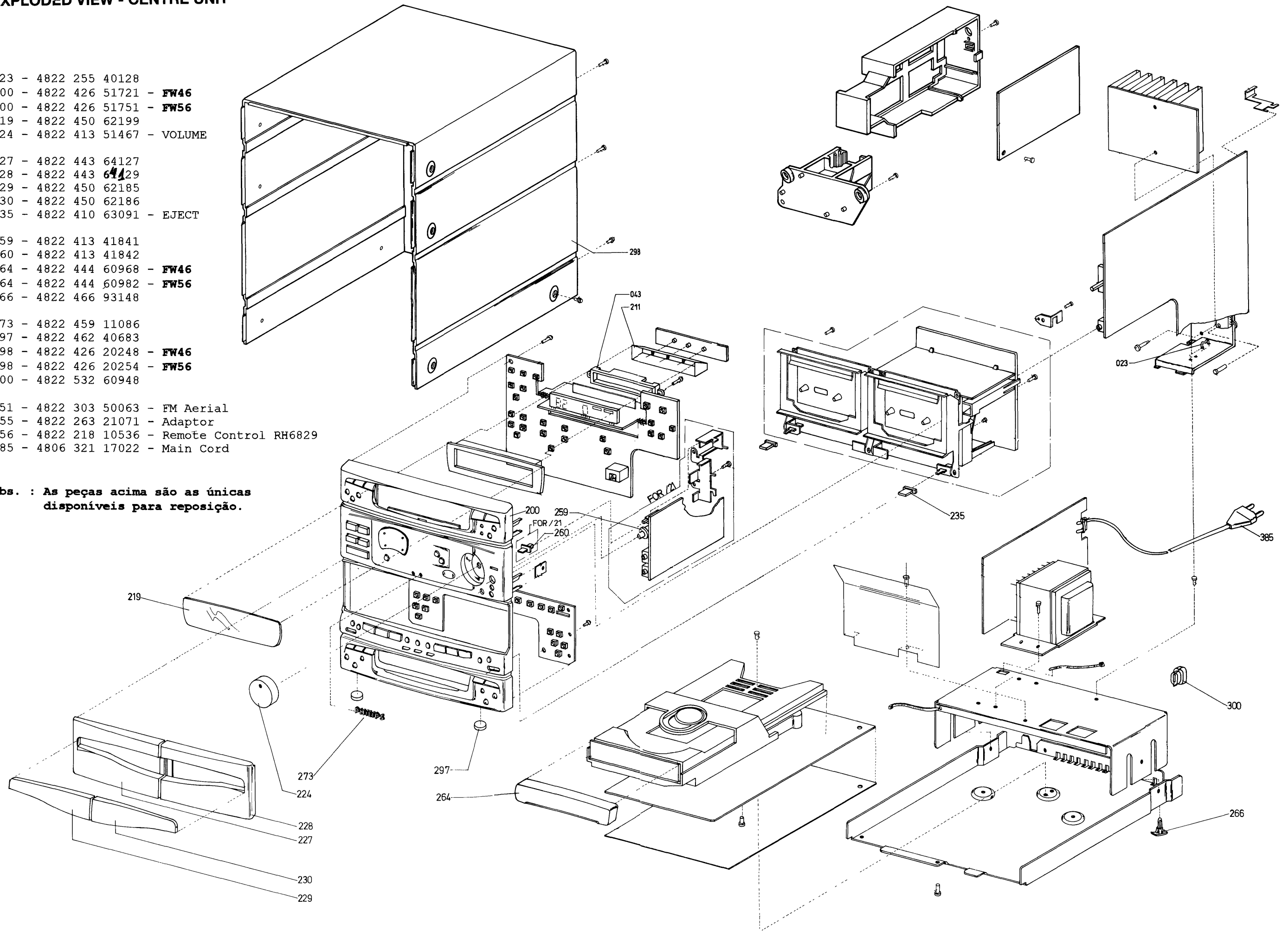


Figure 6. Hooking of the belt onto the motor pulley

# EXPLODED VIEW - CENTRE UNIT

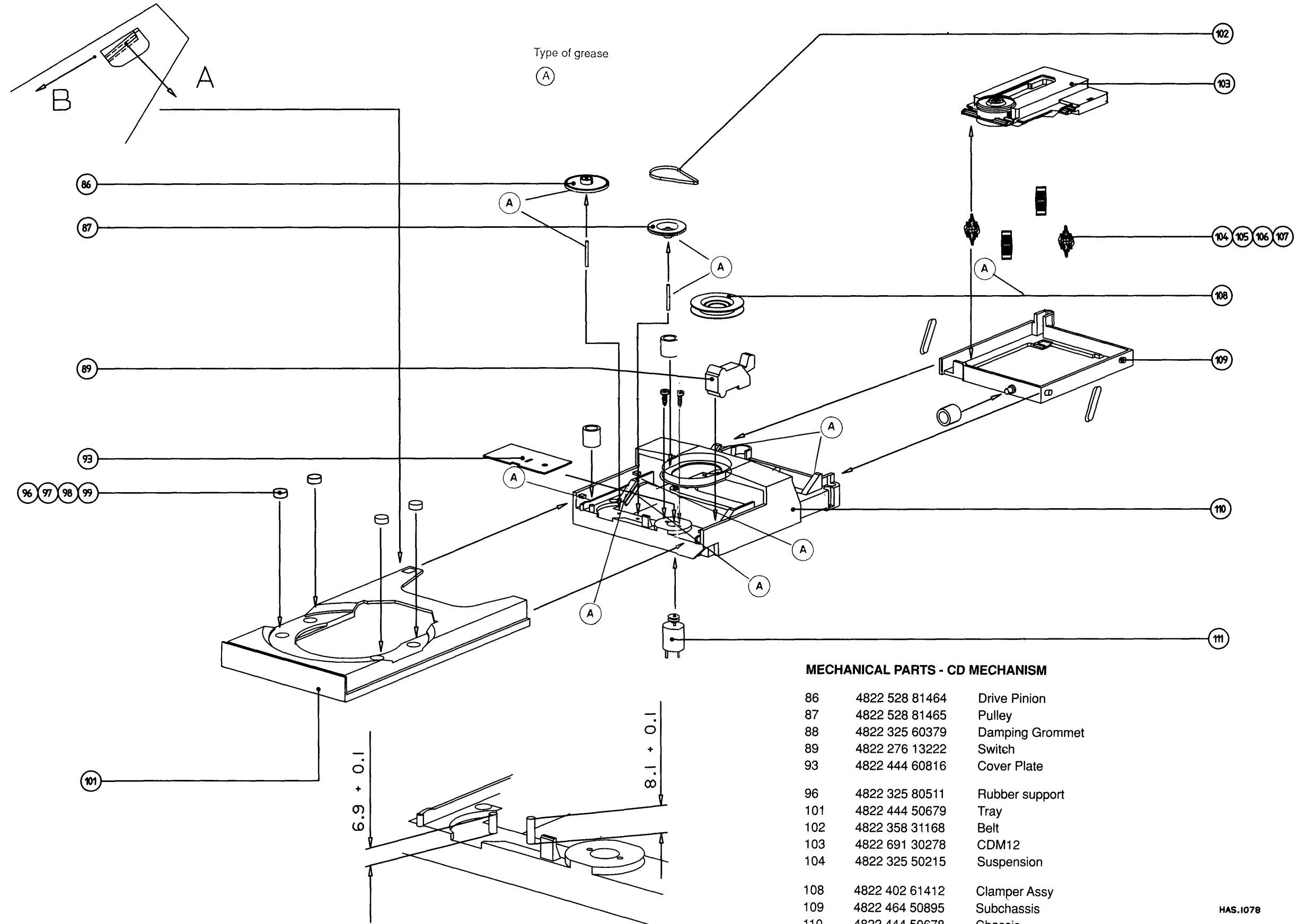
- 023 - 4822 255 40128
- 200 - 4822 426 51721 - **FW46**
- 200 - 4822 426 51751 - **FW56**
- 219 - 4822 450 62199
- 224 - 4822 413 51467 - VOLUME
  
- 227 - 4822 443 64127
- 228 - 4822 443 64429
- 229 - 4822 450 62185
- 230 - 4822 450 62186
- 235 - 4822 410 63091 - EJECT
  
- 259 - 4822 413 41841
- 260 - 4822 413 41842
- 264 - 4822 444 60968 - **FW46**
- 264 - 4822 444 60982 - **FW56**
- 266 - 4822 466 93148
  
- 273 - 4822 459 11086
- 297 - 4822 462 40683
- 298 - 4822 426 20248 - **FW46**
- 298 - 4822 426 20254 - **FW56**
- 300 - 4822 532 60948
  
- 351 - 4822 303 50063 - FM Aerial
- 355 - 4822 263 21071 - Adaptor
- 356 - 4822 218 10536 - Remote Control RH6829
- 385 - 4806 321 17022 - Main Cord

Obs. : As peças acima são as únicas disponíveis para reposição.



CD EXPLODED VIEW

DETAIL I



MECHANICAL PARTS - CD MECHANISM

86	4822 528 81464	Drive Pinion
87	4822 528 81465	Pulley
88	4822 325 60379	Damping Grommet
89	4822 276 13222	Switch
93	4822 444 60816	Cover Plate
96	4822 325 80511	Rubber support
101	4822 444 50679	Tray
102	4822 358 31168	Belt
103	4822 691 30278	CDM12
104	4822 325 50215	Suspension
108	4822 402 61412	Clamper Assy
109	4822 464 50895	Subchassis
110	4822 444 50678	Chassis
111	4822 361 21492	Motor

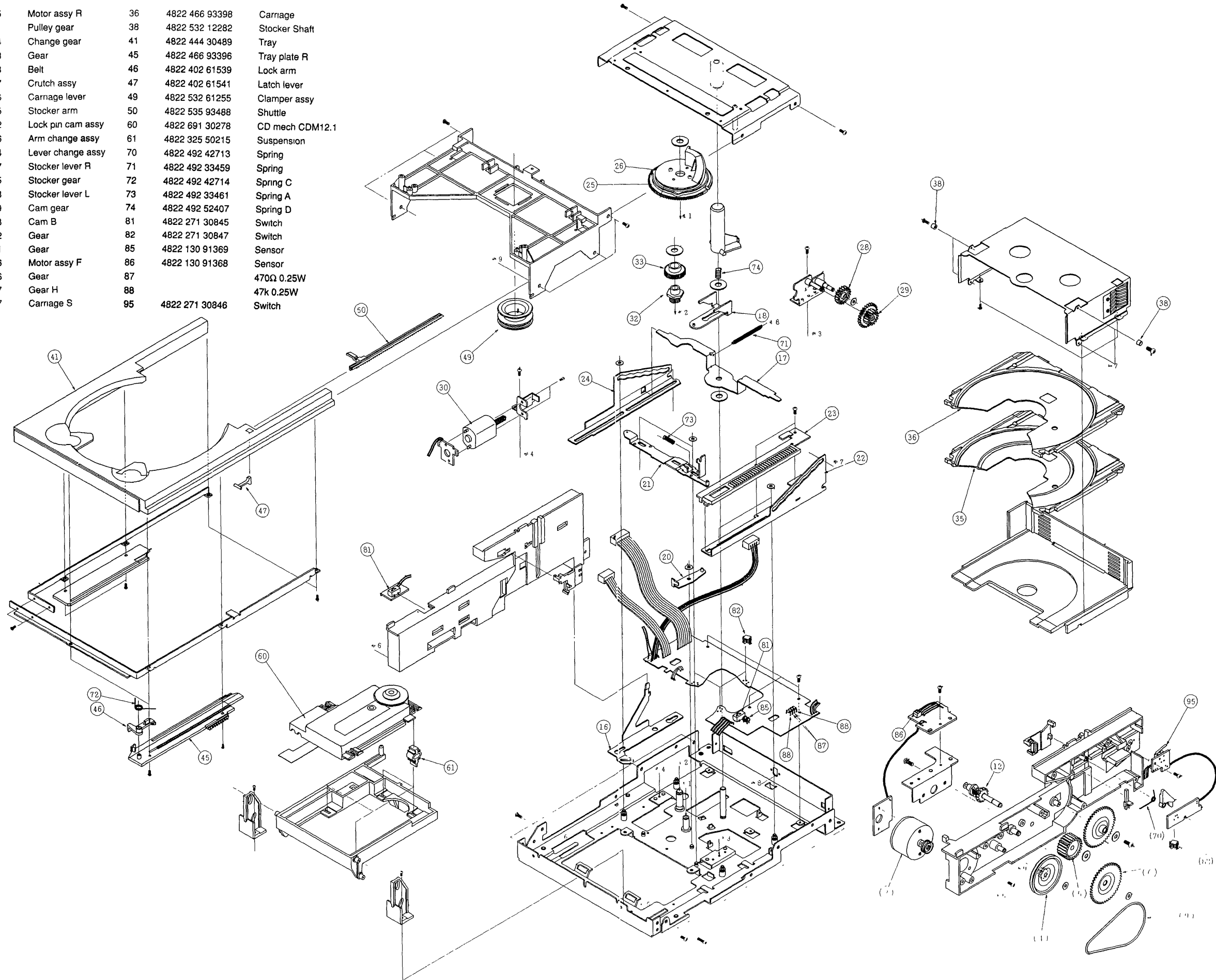
HAS.1078

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

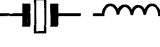


# CDC EXPLODED VIEW FW56

## MECHANICAL PARTS - CDC MECHANISM

3	4822 361 21725	Motor assy R	36	4822 466 93398	Carrige
4	4822 528 70861	Pulley gear	38	4822 532 12282	Stocker Shaft
5	4822 522 33484	Change gear	41	4822 444 30489	Tray
6	4822 522 33483	Gear	45	4822 466 93396	Tray plate R
9	4822 358 10148	Belt	46	4822 402 61539	Lock arm
12	4822 522 20457	Crutch assy	47	4822 402 61541	Latch lever
16	4822 402 50316	Carrige lever	49	4822 532 61255	Clamper assy
17	4822 402 50315	Stocker arm	50	4822 535 93488	Shuttle
18	4822 402 61542	Lock pin cam assy	60	4822 691 30278	CD mech CDM12.1
20	4822 402 61536	Arm change assy	61	4822 325 50215	Suspension
21	4822 402 50314	Lever change assy	70	4822 492 42713	Spring
22	4822 402 61537	Stocker lever R	71	4822 492 33459	Spring
23	4822 522 33485	Stocker gear	72	4822 492 42714	Spring C
24	4822 402 61538	Stocker lever L	73	4822 492 33461	Spring A
25	4822 522 33479	Cam gear	74	4822 492 52407	Spring D
26	4822 522 33478	Cam B	81	4822 271 30845	Switch
28	4822 522 33482	Gear	82	4822 271 30847	Switch
29	4822 522 33481	Gear	85	4822 130 91369	Sensor
30	4822 361 21726	Motor assy F	86	4822 130 91368	Sensor
32	4822 522 33476	Gear	87		470Ω 0.25W
33	4822 522 33477	Gear H	88		47k 0.25W
35	4822 466 93397	Carrige S	95	4822 271 30846	Switch




ELECTRICAL PARTS - CDC BOARD

MISCELLANEOUS		
1830	4822 071 51601	Fuse T160mA 250V
1850	4822 267 60383	Flex socket 24P
1852	4822 267 60383	Flex socket 24P
8801	4822 321 62522	Flex cable 24P
		
5860	4822 242 81151	Crystal 16.9334MHz
5861	5322 242 73697	Ceramic resonator 8MHz
5890	4822 242 73557	Resonator 8 467MHz
		
6857		1N4002GP
6858		1N4002GP
6881	4806 130 37190	BZX79-C3V9
6883	4806 130 37314	BZX79-C2V7
		
7800	4822 209 30704	MC74HCU04D
7820	4806 130 47332	BC338-40
7830	4822 209 33407	TMP87CC70
7850	4822 209 31064	TDA1301T/N1
7851	4822 209 32852	TDA7073A/N2
7852	4822 209 32852	TDA7073A/N2
7853	4822 209 32852	TDA7073A/N2
7856	4806 130 47227	BC328-40
7860	4822 209 33339	SAA7345GP/M5
7870 #	4822 209 33252	TDA1549T/N1
7872 *	4822 209 32421	TDA1311A/N2
7881		BC558C
7883		BC558C
7884	4806 130 47030	BC337
7885		BC337
7886	4822 209 80891	MC7805CT


# For Bitstream versions only

\* For Non-bitstream versions only

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

		
7450	4806 130 47041	BC548B
7495	5322 209 71555	74HC373D
7496	5322 209 71555	74HC373D
7498	4806 209 87164	HEF4094BP


ELECTRICAL PARTS - CDC KEY BOARD


MISCELLANEOUS		
1450	4822 276 13114	Tact switch
1451	4822 276 13114	Tact switch
1452	4822 276 13114	Tact switch
1453	4822 276 13114	Tact switch
1454	4822 276 13114	Tact switch
1455	4822 276 13114	Tact switch
1456	4822 276 13114	Tact switch
1457	4822 276 13114	Tact switch
1458	4822 276 13114	Tact switch
1459	4822 276 13114	Tact switch
1460	4822 276 13114	Tact switch
1461	4822 276 13114	Tact switch
1462	4822 276 13114	Tact switch
1463	4822 276 13114	Tact switch
1464	4822 276 13114	Tact switch
1465	4822 276 13114	Tact switch
1466	4822 276 13114	Tact switch
1467	4822 276 13114	Tact switch
1468	4822 276 13114	Tact switch
1469	4822 276 13114	Tact switch
1470	4822 276 13114	Tact switch
1471	4822 276 13114	Tact switch
1472	4822 276 13114	Tact switch
1473	4822 276 13114	Tact switch
1474	4822 276 13114	Tact switch
1475	4822 276 13114	Tact switch
1476	4822 276 13114	Tact switch
1478	4822 276 13114	Tact switch
1479	4822 276 13114	Tact switch
1480	4822 276 13114	Tact switch
1481	4822 276 13114	Tact switch
1484	4822 276 13114	Tact switch
1485	4822 276 13114	Tact switch
		
	<b>4806 130 37078</b>	1N4148
6459	4822 130 82978	LTL-16KPE
6460	4822 130 83363	LTL-16KGE
6461	4822 130 82978	LTL-16KPE
6462	4822 130 83363	LTL-16KGE
6463	4822 130 82978	LTL-16KPE
6464	4822 130 83363	LTL-16KGE
6465	4822 130 82978	LTL-16KPE
6466	4822 130 82978	LTL-16KPE
6467	4822 130 83363	LTL-16KGE
6468	4822 130 82978	LTL-16KPE
6469	4822 130 83363	LTL-16KGE
6470	4822 130 82978	LTL-16KPE
6471	4822 130 83363	LTL-16KGE
6472	4822 130 83363	LTL-16KGE

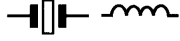
MECHANICAL PARTS - CDC MECHANISM


3	4822 361 21725	Motor assy R
4	4822 528 70861	Pulley gear
5	4822 522 33484	Change gear
6	4822 522 33483	Gear
9	4822 358 10148	Belt
12	4822 522 20457	Crutch assy
16	4822 402 50316	Carriage lever
17	4822 402 50315	Stocker arm
18	4822 402 61542	Lock pin cam assy
20	4822 402 61536	Arm change assy
21	4822 402 50314	Lever change assy
22	4822 402 61537	Stocker lever R
23	4822 522 33485	Stocker gear
24	4822 402 61538	Stocker lever L
25	4822 522 33479	Cam gear
26	4822 522 33478	Cam B
28	4822 522 33482	Gear
29	4822 522 33481	Gear
30	4822 361 21726	Motor assy F
32	4822 522 33476	Gear
33	4822 522 33477	Gear H
35	4822 466 93397	Carriage S
36	4822 466 93398	Carriage
38	4822 532 12282	Stocker Shaft
41	4822 444 30489	Tray
45	4822 466 93396	Tray plate R
46	4822 402 61539	Lock arm
47	4822 402 61541	Latch lever
49	4822 532 61255	Clamper assy
50	4822 535 93488	Shuttle
60	4822 691 30278	CD mech CDM12.1
61	4822 325 50215	Suspension
70	4822 492 42713	Spring
71	4822 492 33459	Spring
72	4822 492 42714	Spring C
73	4822 492 33461	Spring A
74	4822 492 52407	Spring D
81	4822 271 30845	Switch
82	4822 271 30847	Switch
85	4822 130 91369	Sensor
86	4822 130 91368	Sensor
87		470Ω 0.25W
88		47k 0.25W
95	4822 271 30846	Switch


**ELECTRICAL PARTS - ECO4 MIDI BOARD**

MISCELLANEOUS		
1101	4822 267 10283	Coaxial Socket 75Ω
1101	4822 265 20598	F-connector Coaxial 75Ω
		
2100		100pF 10% 50V
2104		100pF 10% 50V
2107		1nF 2% 63V
2110		33pF 5% 50V for LW version
2110		6.8pF 5% 50V
2112		100nF 10% 63V
2114		100pF 5% 50V for LW version
2115	4822 125 60101	Trimmer 3-11pF 100V
2120		470pF 10% 50V
2121		15pF 5% 50V
2122		1nF 2% 63V
2123		1nF 2% 63V
2124		10nF 20% 16V
2129		390pF 1% 160V for LW version
2130	4822 125 50355	Trimmer 4-20pF 100V

		
3148	4822 100 11163	Trimmer 100k 30% 0.2W

		
5106	4822 158 60642	Ferrite antenna MW for 2-band version
5109	4806 156 37045	RF Coil 1.5T
5120	4806 156 37045	RF Coil 1.5T
5122	4822 157 60517	Coil 110μH 8% for LW version
5123	4822 157 60517	Coil 110μH 8%
5140	4822 158 60511	AM IF Coil 450kHz
5142	4822 157 70302	AM IF Coil 450kHz
5143	4822 242 70665	Ceramic Filter 10.7MHz
5144	4822 242 70665	Ceramic Filter 10.7MHz
5145	4806 242 77124	Ceramic Discriminator
5150		Coil 1mH 10%
5170	4822 242 72976	Ceramic Resonator 7.2MHz

		
6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6121	4806 130 37078	1N4148 (refer to circuit)
6122		1N4148 (refer to circuit)
6123		1N4148 (refer to circuit)
6124	4822 130 82833	1SV228
6140		1N4148
6154		1N4148
6174	4822 130 34233	BZX79-B5V1

		
7105	4806 130 47337	2SA838B
7120	4806 130 47316	2SC1047
7140	4822 209 32011	TEA5712T/N2 (RF IC)
7150	5322 209 14482	HEF4096UBT (6 x Inverter)
7156	4806 130 47234	BC337-40
7157		BC337-40
7169	4806 130 47321	BC848C
7170		BC848C
7171		BC848C
7172	5322 209 11517	MM74HCU04M (6 x Inverter)
7173	4822 209 31998	LC7218M (Synthesizer)
7174	4806 130 47269	BC858B
7178		BC858B

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

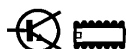


**ELECTRICAL PARTS - CD BOARD**

MISCELLANEOUS		
1002	4822 242 73557	Ceramic Resonator 8.46MHz
1020	4822 071 51601 Δ	Fuse T160mA 250V
1021	4822 071 51601 Δ	Fuse T160mA 250V
1570	4822 242 80997	Resonator 16.93MHz
1700	4822 242 72527	Ceramic Resonator 4MHz



6103	4806 130 37078	1N4148
6550	4806 130 37190	BZX79-C3V9



7000	4822 209 31064	TDA1301T/N1
7040	4822 130 60887	BF840
7041	4806 130 47321	BC848B
7042	4806 130 47269	BC858B
7043		BC848B
7044		BC848B
7060	4822 209 72587	TCA0372DP2
7080	4822 209 72587	TCA0372DP2
7101	4822 209 32036	UM6264BM-10L
7102	4806 209 87619	SAA7341GP
7140	4806 130 47322	BC858
7141		BC848
7300	4806 209 87373	NJM4560D
7301		NJM4560D
7500	4822 209 80891 Δ	MC78M05CT
7550		BC858
7660	4822 209 72587	TCA0372DP2
7700	4806 209 87374	MC68HC05C8/ SERVO-S22

**ELECTRICAL PARTS - FRONT BOARD**

7401	4822 209 33236	TMP87CM20F
7402	4822 209 31508	ST24C01
7403		HEF4094BP
7410		BC548C
7420		HEF4094BP
7450	4806 209 87279	HEF4051BP
7451	4822 209 31515	BA3830S
7452	4822 209 80797	LM393N
7460		BC548C

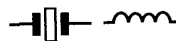
Note: Only the parts mentioned in this list are normal service spare parts.

**ELECTRICAL PARTS - FRONT BOARD**

MISCELLANEOUS		
1401	4822 130 91324	LCD Display
1410	4822 276 13114	Tact Switch
1411	4822 276 13114	Tact Switch
1412	4822 276 13114	Tact Switch
1413	4822 276 13114	Tact Switch
1414	4822 276 13114	Tact Switch
1415	4822 276 13114	Tact Switch
1416	4822 276 13114	Tact Switch
1417	4822 276 13114	Tact Switch
1418	4822 276 13114	Tact Switch
1419	4822 276 13114	Tact Switch
1420	4822 276 13114	Tact Switch
1421	4822 276 13114	Tact Switch
1422	4822 276 13114	Tact Switch
1423	4822 276 13114	Tact Switch
1424	4822 276 13114	Tact Switch
1425	4822 276 13114	Tact Switch
1426	4822 276 13114	Tact Switch
1427	4822 276 13114	Tact Switch
1428	4822 276 13114	Tact Switch
1429	4822 276 13114	Tact Switch



3424	4822 116 90836	Resistor network 5 x 10k
3498	4822 116 90836	Resistor network 5 x 10k
3449	4822 116 90836	Resistor network 5 x 10k
3507	4822 105 11107	Potm Slide 50k x 2
3508	4822 105 11107	Potm Slide 50k x 2
3509	4822 105 11107	Potm Slide 50k x 2
3510	4822 105 11107	Potm Slide 50k x 2
3511	4822 105 11107	Potm Slide 50k x 2



5401	5322 242 73697	Ceram Resonator 8MHz
5402	4822 242 70938	Crystal 32.768kHz
	4822 157 62552	Coil 2.2μH 20%
5404	4822 156 21125	Coil 3.9μH 10%



	4806 130 37078	1N4148
6420	4822 130 82978	LTL-16KPE
6406	4822 214 52009	GP1U58XP



7402	4822 209 31508	ST24C01
7403	4806 209 87164	HEF4094BP
7539	4806 209 87373	NJM4560D

**ELECTRICAL PARTS - COMBI BOARD**

**MISCELLANEOUS**

1304	4822 267 31176	Loudspeaker Socket
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1455	4822 276 13114	Tact Switch
1456	4822 276 13114	Tact Switch
1457	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1497	4822 134 41171	Lamp Assy blue
1498	4822 134 41171	Lamp Assy blue
1499	4822 134 41171	Lamp Assy blue
1550	4822 267 40898	Headphone Socket
1551 *	4822 267 40898	Mic Socket
1552	4806 267 37060	AUX/TV Socket
1553 *	4822 276 12571	Vocal Fade Switch



3629	4822 102 10414	Potm 20k x 2 w/motor
3673	4822 101 21204	Potm Rotary 20KA



5313	4822 280 80777	Relay 2P 12V 7A
5373	4822 157 62552	Coil 2.2μH 20%
5374	4822 157 62552	Coil 2.2μH 20%
5630 @	<b>4822 157 50961</b>	Coil 22μH 10%
5631 @	<b>4822 157 50961</b>	Coil 22μH 10%
5632	4822 156 21125	Coil 3.9μH 10%



6250	4822 130 82078 Δ	D5SBA20
6251		1N4148
6252	4806 130 37078	1N4148
6253	4822 130 34173	BZX79-C5V6
6254		1N4148
6255	4806 130 37501 Δ	1N4002
6256		Δ 1N4002
6257		Δ 1N4002
6258		Δ 1N4002



6259	4806 130 37078	1N4148
6260	4806 130 37501	1N4002
6261	4822 130 34233	BZX79-C5V1
6262	4822 130 31631 Δ	BYV10-20
6263	4822 130 31631 Δ	BYV10-20
6264		Δ 1N4002
6265	4806 130 37198	BZX79-C2V4
6266		1N4148
6352		1N4148
6450		1N4148
6451		1N4148
6452		1N4148
6454		1N4148
6455		1N4148
6456		1N4148
6457		1N4148
6504		1N4148
6505		1N4148
6507	4806 130 37053	BZX79-C7V5
6508		BZX79-C7V5
6714		1N4148
6716		1N4148
6719		1N4148
6720		1N4148
6721		1N4148
6724		1N4148
6728		1N4148
6729		1N4148
6730		1N4148
6732		1N4148
6734		1N4148
6735		1N4148
6736		1N4148
6738		1N4148
6739		1N4148
6740		1N4148
6741		1N4148



7250	4806 130 47078	BC548B
7252	4806 130 47066 Δ	BD234
7253		BC548B
7254		BC548B
7255	4806 130 47050	BC558B
7256		BC548B
7257	4822 209 80891 Δ	MC7805CT
7501	4822 209 10263	HEF4052B
7502	4806 209 87164	HEF4094BP

\* For Karaoke version only

## ELECTRICAL PARTS - COMBI BOARD




7503	4806 130 47045	BC549C
7504		BC549C
7505		BC549C
7506		BC549C
7507	4806 130 47041	BC548B
7508		BC548B
7509		BC548B
7511		BC549C
7512		BC549C
7513	4806 130 47332	BC338-40
7514		BC338-40
7521		BC338-40
7522		BC338-40
7523		BC328-40
7524	4806 130 47227	BC328-40
7525		BC548B
7526		BC548B
7529		BC548B
7530		BC548B
7571		BC558B
7572		BC558B
7575		BC549C
7576		BC549C
7577		BC549C
7578		BC549C
7581	5322 209 14865	MC14066BCP
7582	5322 209 14865	MC14066BCP
7583	4806 130 47153	BC327-40
7630 @		BC549C
7631 @		BC549C
7632 @		BC549C
7633 @		BC549C
7634 @		BC549C
7635 @		BC549C
7636		HEF4094BD
7637		BC549C

@ For Karaoke version only

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

## ELECTRICAL PARTS - TRAF0 BOARD

### MISCELLANEOUS

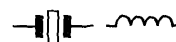
1281	4822 272 10269	△	Voltage Selector for -/21 only
1284	4822 071 51002	△	Fuse T1A 250V
1285	4822 071 51002	△	Fuse T1A 250V
1286	4822 071 51002	△	Fuse T1A 250V
1287	4822 071 51002	△	Fuse T1A 250V
1288	4822 071 54002	△	Fuse T4A 250V
1289	4822 071 54002	△	Fuse T4A 250V
			
5280	4822 146 31377		Mains Transformer FW56
5280	4822 146 31335	△	Mains Transformer FW46
5281	4822 157 70003	△	Mains Choke Coil

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

**ELECTRICAL PARTS - ETF3 BOARD**



3709		8k2 5% 0 1W
3710		4k7 5% 0 5W
3711		4k7 5% 0 1W
3712		8k2 5% 0 5W
3713		8k2 5% 0 1W
3714		4k7 5% 0 5W
3715		4k7 5% 0 1W
3720		0Ω Jumper (0805)
3721		0Ω Jumper (0805)
3722		470Ω 5% 0 5W
3723		470Ω 5% 0 5W
3724		150k 5% 0 5W
3730		10k 5% 0 5W
3731		10k 5% 0 5W
3732		100Ω 5% 0 5W
3733		100Ω 5% 0 5W
3734		47k 5% 0 5W
3735		47k 5% 0 5W
3736		10k 5% 0.5W
3737		10k 5% 0 5W
3738	4822 100 11771	Trimmer 20k 30% 0 1W
3739	4822 100 11771	Trimmer 20k 30% 0 1W
3740		5k6 5% 0 1W
3741		5k6 5% 0 1W
3742		22k 5% 0 1W
3743		22k 5% 0 1W
3744		12k 5% 0 1W
3745		1k 2% 0 25W
3746		1k 2% 0 25W
3747		1k 2% 0 25W
3748		33k 5% 0 5W
3749		330Ω 5% 0.5W
3760		10Ω 5% 0.1W
3761		10Ω 5% 0 1W
3762	4822 100 11163	Trimmer 100k 30% 0 1W
3763	4822 100 11163	Trimmer 100k 30% 0 1W
3764		33Ω 5% 0 1W
3765		6k8 5% 0 1W
3766		15Ω 5% 0 1W
3767		22k 5% 0 1W
3768		1k 2% 0 25W
3769		10k 1% 0 1W
3770		3k9 5% 0.1W
3771		220Ω 5% 0 1W
3772		10k 1% 0 1W
3773		△ 4Ω 7 5% 0.33W
3774		22k 5% 0 5W
3780		8k2 5% 0 1W
3781		6k8 5% 0 5W
3782	4822 100 11319	Trimmer 4k7 30% 0 1W
3783	4822 100 11319	Trimmer 4k7 30% 0 1W
3784		4k7 5% 0.5W
3785		1k 2% 0 25W
3786		1k 2% 0 25W



5650 *	4822 156 21725	MPX Filter
5651 *	4822 156 21725	MPX Filter
5652	4822 156 20811	Coil 36mH 5%
5653	4822 156 20811	Coil 36mH 5%
5730	4822 156 20811	Coil 36mH 5%
5731	4822 156 20811	Coil 36mH 5%
5760	4822 156 20946	Osc coil 100kHz
5780	4822 242 72527	Cer Resonator 4MHz
5790		Coil 100μH 10%



6650	4822 130 34233	BZX79-C5V1
6760	4806 130 37041	BZX79-C10V
6780	4806 130 37501	1N4002
6781		1N4002
6782	4806 130 37078	1N4148
6783		1N4148
6784		1N4148
7650	4822 209 32919	HEF4952BT
7652	4806 130 47321	BC848C
7653		BC848C
7654		BC848C
7655		BC848C
7656		BC848C
7657		BC848C
7700	4822 209 32919	HEF4952BT
7701	4806 209 87486	UPC1330HA
7702	4822 209 32918	AN7318S
7703	5322 209 11102	HEF4052BT
7730	4822 209 31505	CXA1298AP
7760	4806 130 47332	BC338-40
7761		BC338-40
7762	4806 130 47078	BC548C
7763		BC548C
7764	4822 130 42682	DTA144ES
7765	4822 130 60588	DTC114ES
7780	4806 130 47227	BC328-40
7781		BC328-40
7782		BC328-40
7783		BC848C
7784		BC848C
7785		BC848C
7786	4806 130 47269	BC858C
7787		BC848C
7791		BC848C
7792	4806 209 87639	MC78L05ACP
7793	4822 209 12612	MC68HC05C4P

\* For Dolby B version only  
# For Non-Dolby version only

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

