

Service
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Service Manual

COMPACT
disc
DIGITAL AUDIO

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CLASS 1
LASER PRODUCT



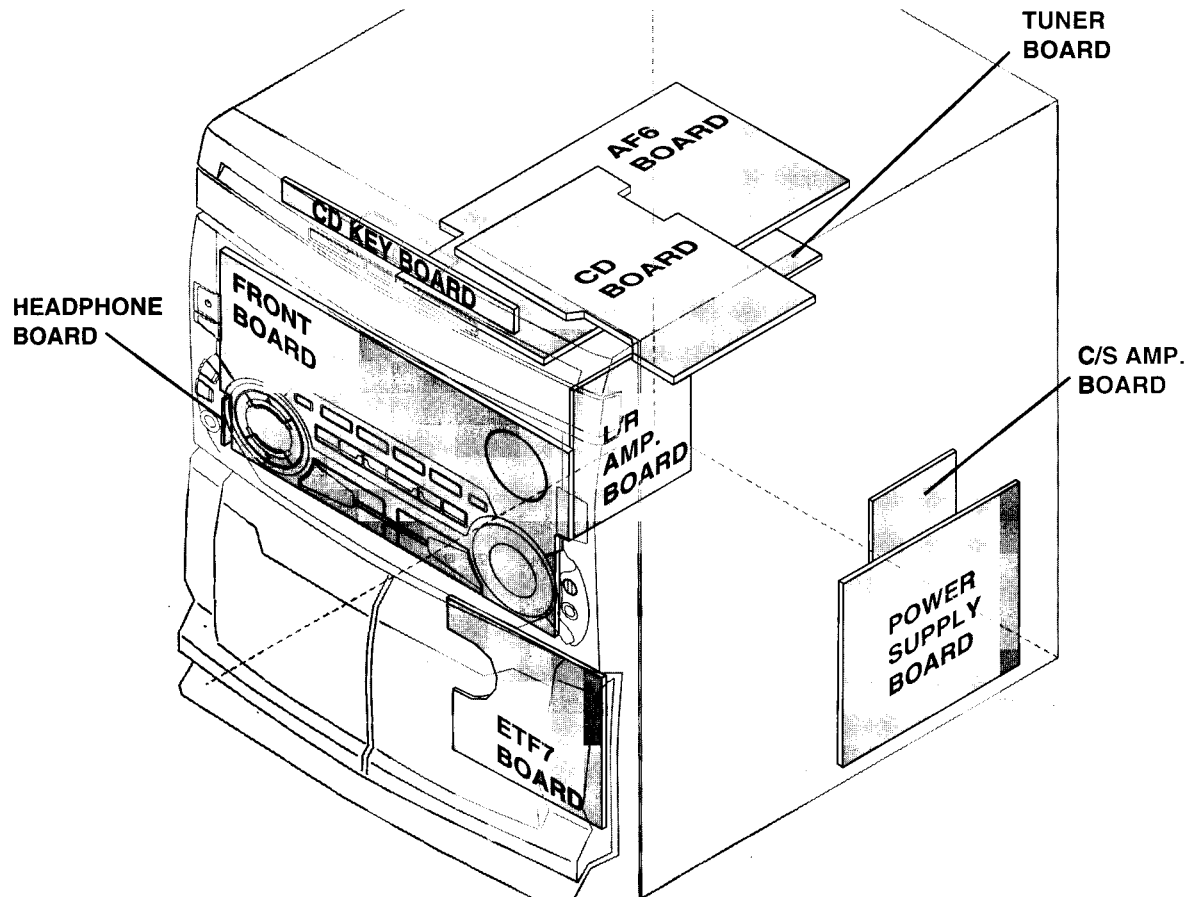
3139 785 22180

PCS 103 486



PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type / Versions:	FW-P75							
	/22	/34						
Features & Board in used:								
Aux In	x	x						
Line Out	x	x						
Surround Out								
Subwoofer Out	x	x						
Digital Out	x	x						
Matrix Surround								
CD Text								
Dolby B								
RDS								
News								
Dolby Prologic (DPL)	x	x						
Incredible Surround								
Karaoke Features								
Voltage Selector								
Low Power Standby (Clock Display Off)								
Tuner board - ECO5 Sys		x						
Tuner board - Tuner 95	x							
Surround speakers	x	x						
Center speaker	x	x						

SPECIFICATIONS

GENERAL:

Mains voltage	: 110-127V/220-240V Switchable for /21/21M
	120V for /37
	220V for /33
	220-230V for /22/34
	230V for /25
	230-240V for /30
Mains frequency	: 50/60Hz
Power consumption	: < 15W at Standby
	73W at 1/8 rated power out
Clock accuracy	: < 4 seconds per day
Dimension centre unit	: 265 x 310 x 390mm

TUNER:

FM

Tuning range	: 87.5-108MHz
	65.81-74MHz for /34
Grid	: 50kHz (& 30kHz for /34)
IF frequency	: 10.7MHz $\pm$ 25kHz
Aerial input	: 75ohm coaxial
	300ohm click fit for /37
Sensitivity at 26dB S/N	: < 7 μ V
Selectivity at 600kHz bandwidth	: > 50dB
Image rejection	: > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz	: < 3% [< 2%]
-3dB Limiting point	: < 7 μ V
Crosstalk at RF=1mV, dev. 40kHz	: > 18dB [> 26dB]

MW

Tuning range	: 531-1602kHz
	530-1700kHz for /21/21M/37
Grid	: 9kHz
	10kHz for /21/21M/37
IF frequency	: 450kHz $\pm$ 1kHz
Aerial input	: Frame aerial
Sensitivity at 26dB S/N	: < 4.0mV/M
Selectivity at 18kHz bandwidth	: > 18dB
IF rejection	: > 45dB
Image rejection	: > 28dB
Distortion at RF=50mV, m=80%	: < 5% [< 7%]

LW

Tuning range	153-279kHz
Grid	3kHz
IF frequency	450kHz $\pm$ 1kHz
Aerial input	Frame aerial
Sensitivity at 26dB S/N	[< 7.0mV/M]
Selectivity at 18kHz bandwidth	[> 24dB]
IF rejection	[> 26dB]
Image rejection	[> 35dB]
Distortion at RF=50mV, m=80%	[< 7%]

AMPLIFIER:

Output power (6ohms, 1kHz, 10% THD)	
L & R	: 2 x 30W
Surround	: 2 x 10W
Center	: 20W

Frequency response within -3dB : 40Hz-20kHz
 Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF
 Digital Sound Control :
 Optimal, Classic, Techno, Jazz, Rock, Vocal ¹⁾

Headphone output at 32 ohms: 15mW $\pm$ 2dB

Input sensitivity

Aux in	1V $\pm$ 2dB at 1 kohms
Output sensitivity	
Line out	500mV $\pm$ 2dB at 22 kohms
Subwoofer out (max. vol.	1.5V $\pm$ 2dB at 22 kohms

CASSETTE RECORDER:

Number of track	: 2 x 2 stereo
Tape speed	: 4.76 cm/sec $\pm$ 2%
Wow and flutter	: < 0.45% (IEC)
Fast-wind/Rewind time C60	: 130 sec
Bias system	: 75kHz $\pm$ 10kHz
Rec/Pb frequency response within 8dB	: 80Hz - 12.5kHz
Signal to noise ratio (unweighted):	> 43dB

COMPACT DISC:

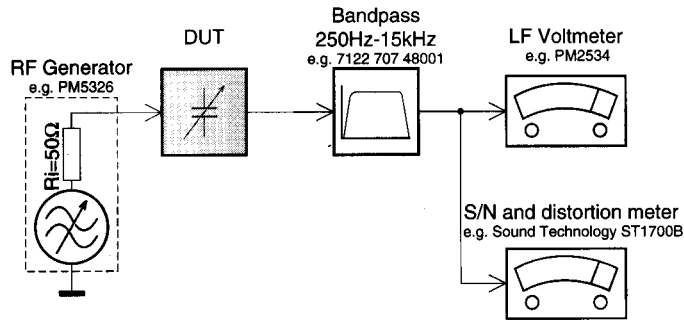
Measurement done at output conn. of the CDC module.	
Frequency response within $\pm$ 1.5dB	: 20Hz - 20kHz
Output level (in Vrms)	: 550mV $\pm$ 1dB unloaded
Signal/Noise ratio (A-weighted)	: > 80dBA
Distortion at 1kHz	: < 0.5%
Channel unbalance	: < $\pm$ 1dB
Channel separation at 1kHz	: > 60dB
De-emphasis	: 0 or 15/50 mS (Switched by subcode on the disc)

Values indicated are for "Tuner 95 Board" only

Frequency response in each setting is software controlled

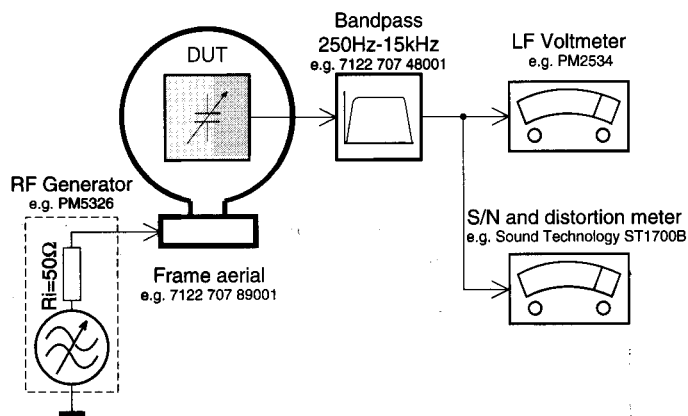
MEASUREMENT SETUP

Tuner FM



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

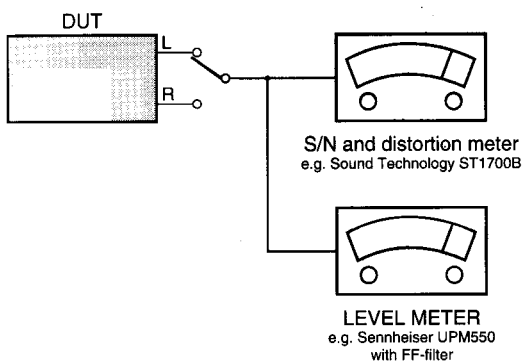
Tuner AM (MW, LW)



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

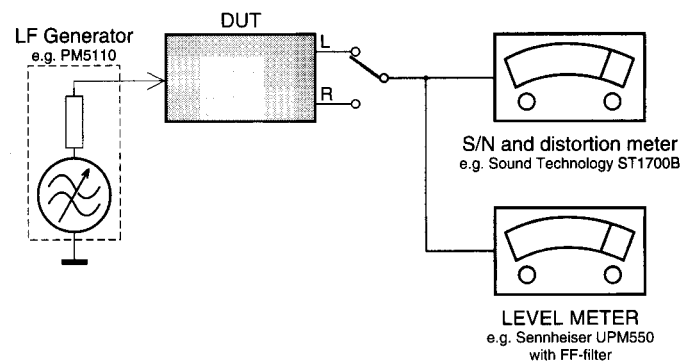
CD

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



Recorder

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



SERVICE AIDS

Service Tools:

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

Cassette:

SBC419 Test cassette CrO ₂	4822 397 30069
SBC420 Test cassette Fe	4822 397 30071
MTT150 Dolby level 200nWb/M	4822 397 30271

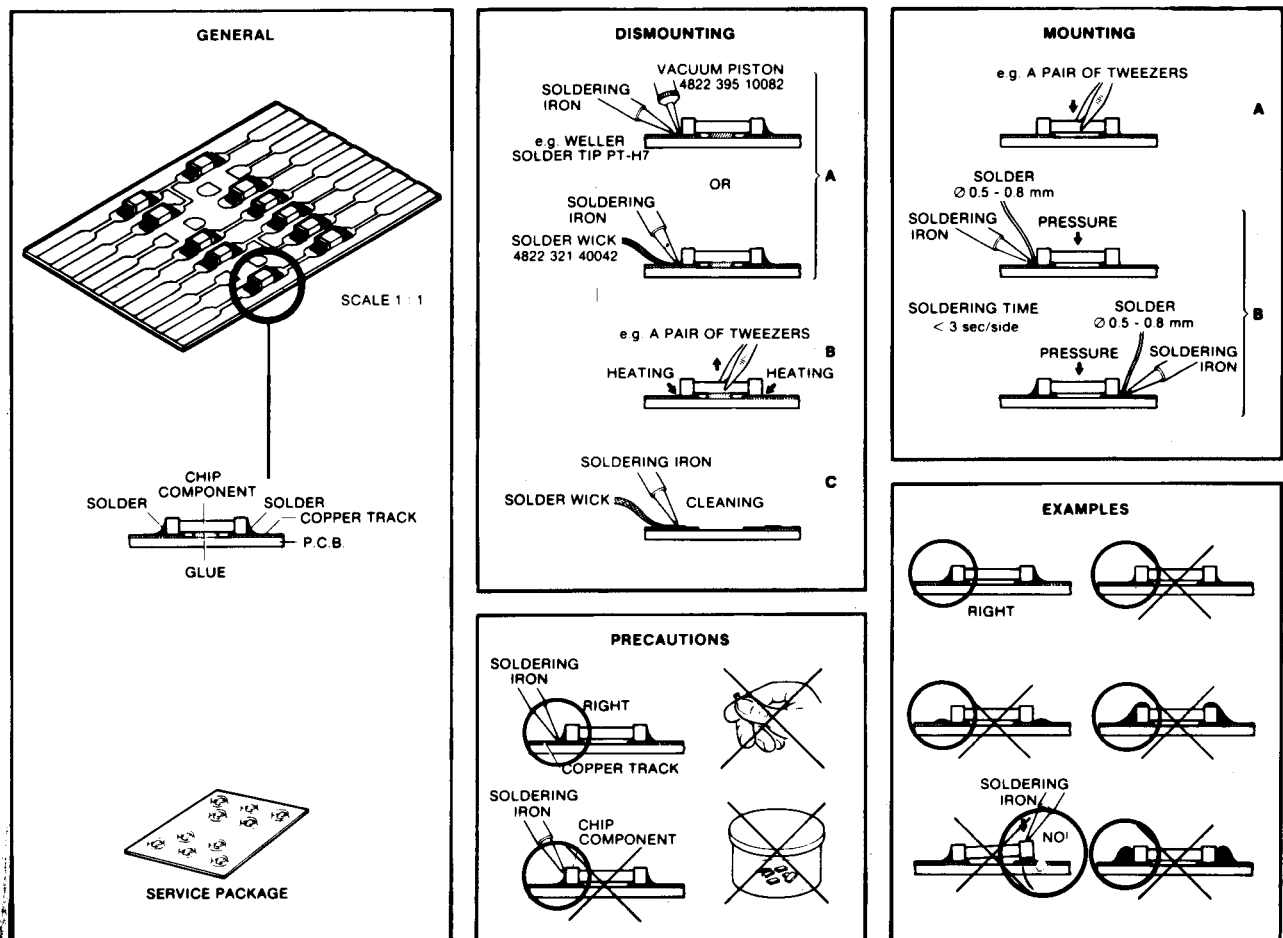
Compact Disc:

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

ESD Equipment:

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

HANDLING CHIP COMPONENTS



27 012C12

GENERAL INFORMATION

General Information

- The type plate (which contains the serial number) is located at the rear of the system.
- Recording is permissible if copyright or other rights of third parties are not infringed.
- This product complies with the radio interference requirements of the European Community.

Environmental Information

All unnecessary packaging has been omitted. We have tried to make the packaging easy to separate into three materials: cardboard (box), polystyrene foam (buffer) and polyethylene (bags, protective foam sheet).

Your system consists of materials which can be recycled and reused if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging materials, exhausted batteries and old equipment.

Acknowledgement



Dolby Pro-Logic and the double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation. Manufactured under license from Dolby Laboratories Licensing Corporation.

Accessories (Supplied)

- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- CS-120 speaker package (includes one pair of surround speakers and one center speaker)

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.

SAFETY INFORMATION

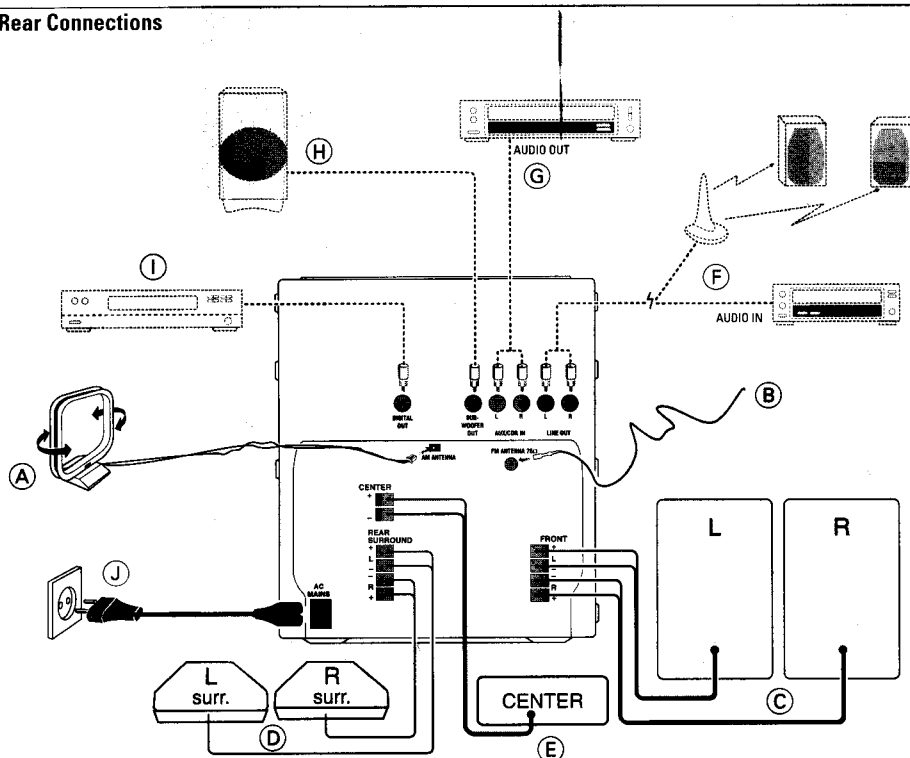
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system. Allow at least 10 cm clearance from the rear and the top of the unit and 5 cm from the each side.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

English

5

PREPARATION

Rear Connections



A AM Loop Antenna Connection

Connect the supplied loop antenna to the AM ANTENNA terminal. Place the AM loop antenna far away from the system and adjust its position for the best reception.

B FM Wire Antenna Connection

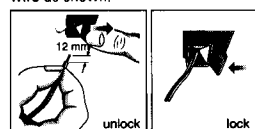
Connect the supplied FM wire antenna to the FM ANTENNA 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception connect an outdoor FM antenna to the FM ANTENNA 75 Ω terminal using a 75 Ω coaxial wire.

C Speakers Connection

- Connect the right speaker to Front terminal R, with the colored wire to + and the black wire to -.
- Connect the left speaker to Front terminal L, with the colored wire to + and the black wire to -.
- Clip the stripped portion of the speaker wire as shown.



CAUTION:

- For optimal sound performance, it is recommended to use the supplied speakers.
- Do not connect more than one speaker to any one pair of + / - speaker terminal.
- Do not connect speakers with impedance lower than the speakers supplied. Please refer to SPECIFICATION section of this manual.

D Rear Surround Speakers' Connection

Connect the black (non-marked) wires to the black REAR SURROUND terminals and the colored (marked) wires to the grey REAR SURROUND terminals.

E Center Speaker Connection

Connect the black (non-marked) wires to the black CENTER terminal and the blue (marked wires) to the blue CENTER terminal.

F Line Out Connection (wireless ready)

You can connect the audio left and right LINE OUT terminals to an optional CD Recorder ANALOG IN terminals. This allows you to record in an analogue format.

You can also install additional optional front active speakers away from the system (e.g. in another room) to reduce the inconvenience of running long speaker wires across rooms. You can place as many remote speakers as you like provided they operate at the same radio frequency. Connect the wireless radio frequency transmitter to the LINE OUT terminals. Place the active speakers at your preferred location. Be sure to follow the instructions supplied with the active speakers.

Note:

- Availability of wireless transmitter and its peripherals are subjected to the approval of local authorities. Please check with respective local safety or approving authority.

G Connecting other equipment to your system

You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the AUX/CDR IN terminals at the rear of the system.

H Subwoofer Out Connection

Connect the optional active subwoofer to the SUBWOOFER OUT terminal. The subwoofer reproduces just the low bass sound effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

I Digital Out Connection

You can record the digital sound from the CD, through this output, on any audio equipment with digital input (e.g. CD Recorder, Digital Audio Tape (DAT) deck, Digital to Analog Converter and Digital Signal Processor).

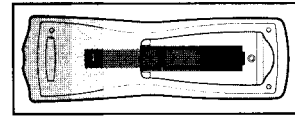
Connect one end of the cinch cable (not supplied) to the DIGITAL OUT socket and the other end to the audio equipment with digital input. When connecting the cinch cable, make sure it is fully inserted.

J AC Power Supply

After all other connections have been made, connect the AC power cord to the system and to the wall outlet.

Inserting batteries into the Remote Control

- Insert the batteries (Type R06 or AA) into the remote control as shown in the battery compartment.



- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

DOLBY PRO LOGIC**Dolby Pro Logic**

This state of the art Dolby Pro Logic mini system enables you to experience and enjoy a Home Cinema sound ambience. The Pro Logic system allows more accurate definition of the individual sound sources. It produces greater sound separation between channels and provides pinpoint sound localization. Pro Logic provides four sound outputs: Left, Center, Right and Surround (Rear). Front sounds are produced from the pair of Left and Right speakers and a Center speaker. The surround sound is reproduced by two speakers placed at the rear of the listening area. Although the surround sound is monaural (single-source), a pair of speakers is necessary to produce the correct diffused sound.

This Pro Logic decoder enables you to decode the following modes: **Dolby Surround, Center Phantom, Dolby 3 Stereo** or **normal Stereo**.

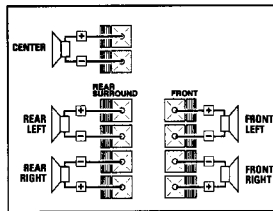
Setting up the Dolby Pro Logic system

You must set up the system properly in order to enjoy the Home Cinema sound to the fullest. First, connect the speakers.

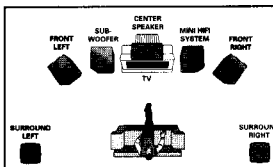
5-Speaker Connection

- Front speakers:** Connect the front speakers.
- Center speaker:** Connect the center speaker.

- Rear (surround) speakers:** Connect either the wired rear surround speakers or a pair of wireless rear speakers (not supplied) to the SURROUND OUT terminals.

**Positioning the Speakers**

To get the best surround sound effect, place the speakers as follows.

**Front Left and Right Speakers**

For the best sound, place the Left and Right speakers at an angle of approximately 45 degrees to the listener. If the speakers' magnetic field affects the television picture, increase the distance between the TV and the speakers.

Center Speaker

For the best sound, place the center speaker at the same height as the left and right speakers. Place the center speaker directly above or beneath the television.

Rear (surround) Speakers

The surround speakers should be placed at normal listening ear level or mounted on the wall at the back of the room. Most important, experiment when placing the surround speakers in order to obtain the best sound.

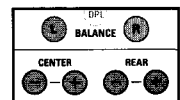
Test Tone

This feature enables you to adjust the Front Left, Front Right, Center and Surround Sound levels of the respective speakers in Dolby Pro Logic mode.

You must sit at the ideal sitting position and use the remote control to perform this operation.

- Press **CD, TUNER, TAPE** or **AUX** to switch on the system.
- Press **TEST TONE**.
 - A test signal is generated; it will move through the Left, Center, Right, and Surround speakers, in that order.
 - "TEST TONE" followed by "ADAPT BALANCE, CENTER AND REAR LEVEL" will be displayed.
 - The test signal will last for about 90 seconds.

- Press **BALANCE L** to adjust the sound of the front left speaker.



→ The display will show "BAL L+XX".

- Press **BALANCE R** to adjust the sound of the front right speaker.

→ The display will show "BAL R+XX".

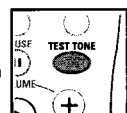
- Press **CENTER +** or **-** to adjust the sound of the center speaker.

→ The display will show either "CENT +XX" or "-XX".

- Press **REAR +** or **-** to adjust the sound of the surround speakers.

→ The display will show either "REAR +XX" or "-XX".

- Adjust the sound of all the speakers until they are equal. When you are satisfied with the setting, press **TEST TONE** again to switch off the test signal.

**Note:**

- It is advisable to set the speakers' level at normal listening level. "XX" denotes the sound level.

When you have completed the Dolby Pro Logic setup, you are ready to enjoy Home Cinema sound.

- Press **DPL (PRO LOGIC)** repeatedly to select and cycle through the various sound modes.



Dolby Surround → Center Phantom → Dolby 3 Stereo → Stereo → Dolby Surround ...

- The Dolby Pro Logic display panel will light up with the selection.

Dolby Surround

This setting is for a full Dolby Surround Pro Logic mode.

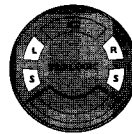
- Press **DPL** to select the Dolby Surround mode.
 - The message "DOLBY SURROUND" will be displayed.
 - The DPL display panel will light up.



Dolby Center Phantom

This setting is for use without the center speaker. It redistributes the center speaker sound to the left and right speakers, providing conventional stereo across the front.

- Press **DPL** to select the Dolby Pro Logic Center Phantom mode.
 - The message "CENTER PHANTOM" will be displayed.
 - The DPL display panel will light up.



Dolby 3 Stereo

Use this setting when full surround is not required, but a wide stereo sound is desired. It only requires the left, right and center speakers.

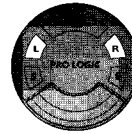
- Press **DPL** to select the Dolby 3 Stereo mode.
 - The message "DOLBY 3 STEREO" will be displayed.
 - The DPL display panel will light up.



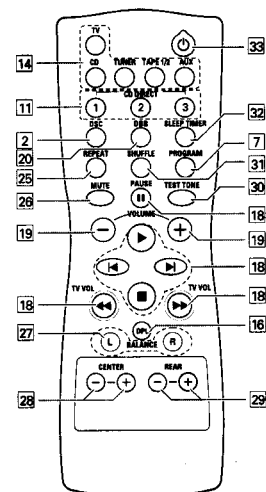
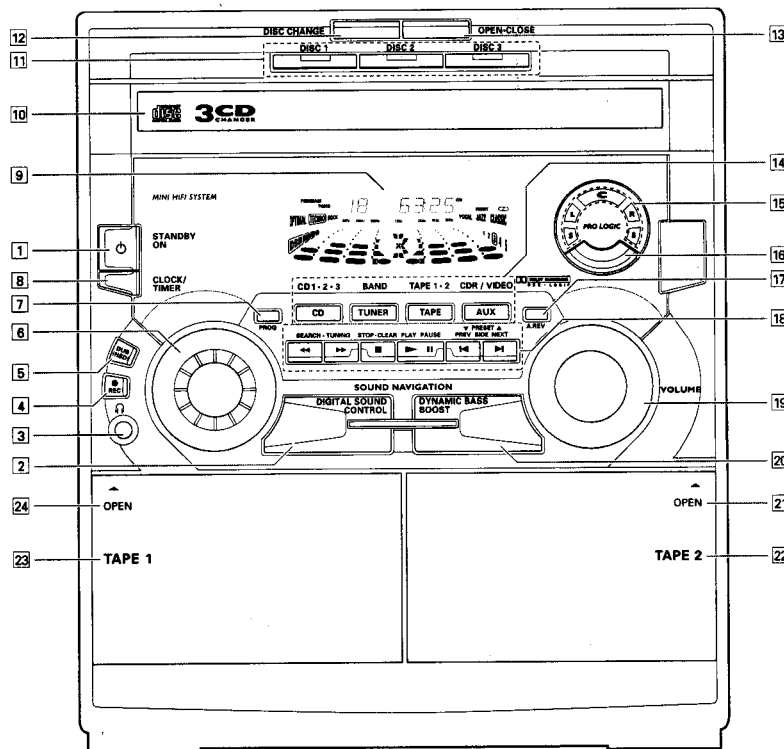
Normal Stereo

This setting is for normal stereo sound without Dolby Pro Logic. It only requires the left and right speakers.

- Press **DPL** to select the Stereo mode.
 - The message "STEREO" will be displayed.
 - The DPL display panel will light up.



CONTROLS



CONTROLS

English

Controls on the system and remote control

1 **STANDBY ON**

- to switch the system on or to standby mode.
- to use for EASY SET.

2 **DIGITAL SOUND CONTROL (DSC)**

- to select the desired sound effect : OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.

3

- to connect headphones.

4 **REC (RECORD)**

- to start recording on tape deck 2.

5 **DUB (HIGH SPEED DUBBING (HSD))**

- to dub a tape in normal or fast speed.

6 **JOG**

- to select the desired equalizer display.
- to select the desired DSC setting. You must select the DSC feature first.

7 **PROG (PROGRAM)**

- for CD to program CD tracks.
- for TUNER to program preset radio stations.
- for CLOCK to select 12 or 24 hour in clock setting mode *(on the system only)*.

8 **CLOCK/TIMER**

- to view the clock, set the clock or set the timer.

9 **DISPLAY SCREEN**

- to view the current setting of the system.

10 **CD CAROUSEL TRAY**11 **DISC 1 / DISC 2 / DISC 3 (CD DIRECT PLAY)**

- to select a CD tray for playback.

12 **DISC CHANGE**

- to change CD(s).

13 **OPEN•CLOSE**

- to open or close the CD carousel tray.

14 **SOURCE – to select the following: CD / (CD 1•2•3)**

- to select CD mode. When CD playback is stopped, press to select disc tray 1, 2 or 3.

15 **TUNER / (BAND)**

- to select Tuner mode. When in tuner mode; press to select the waveband: FM, MW or LW.

16 **TAPE / (TAPE 1•2)**

- to select Tape mode. When tape playback is stopped, press to select either tape deck 1 or 2.

17 **AUX / (CDR/VIDEO)**

- to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder). When in Aux mode, press to select either AUX or CDR.

18 **TV *(only on the remote control)***

- to select TV mode.

15 **DPL DISPLAY PANEL**

- to view the selected Dolby Pro Logic setting.

16 **DOLBY PRO LOGIC (DPL)**

- to select Dolby Surround, Dolby Center Phantom, Dolby 3 Stereo or Stereo mode.

17 **A. REV (AUTO REVERSE)**

- available in tape deck 2 only.
- to select the desired play modes ( /  / ).

18 **MODE SELECTION**19 **SEARCH << >> (TUNING << >>)**

- for CD to search backward/forward.

- for TUNER to tune to a lower or higher radio frequency.

- for TAPE to rewind or fast forward a tape.

- for CLOCK to set the hour *(on the system only)*.

- for TV VOL. to adjust the TV volume if the remote operates your TV.

20 **STOP•CLEAR ■**

- for CD to stop CD playback or to clear a program.

- for TUNER to stop programming.
- for TAPE to stop playback or recording.

- for DEMO *(on the system only)* to start or stop demonstration mode.

21 **PLAY ► / PAUSE ■**

- for CD to start or interrupt playback.

- for TAPE to start playback.

22 **◀ PREV / SIDE / NEXT ▶ (PRESET ▼▲)**

- for CD to skip to the beginning of the current, previous, or next track.

- for TUNER to select a preset station in memory.

- for TAPE to select tape side (back or front) in tape deck 2 only.

- for CLOCK to set the minute *(on the system only)*.

19 **VOLUME**

- to increase or decrease the volume.

20 **DYNAMIC BASS BOOST (DBB)**

- to select a bass boost level or to switch off bass boost.

21 **OPEN**

- to open tape deck 2.

22 **TAPE DECK 2**23 **TAPE DECK 1**24 **OPEN**

- to open tape deck 1.

25 **REPEAT**

- to repeat a CD track, a disc, or all available discs.

26 **MUTE**

- to switch off the sound temporarily.

CONTROLS

English

27 **BALANCE L/R**

- to balance the sound level of the Front Left and Right speakers.

28 **CENTER + / -**

- to adjust the sound level of the center speaker.

29 **REAR + / -**

- to adjust the sound level of the surround speakers.

30 **TEST TONE**

- to check the sound level of the Front Left, Front Right, Center and Surround speakers.

31 **SHUFFLE**

- to play all the available discs and their tracks in random order.

32 **SLEEP TIMER**

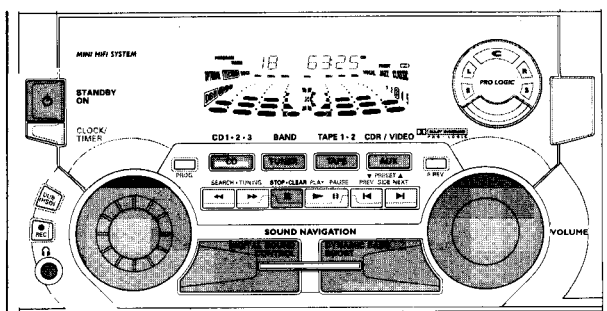
- to switch the system to standby mode at a selected time.

33

- to switch the system to standby mode.

Notes for remote control:

- First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD, TUNER, etc.).
- Then select the desired function (►, ◀, ▶, etc.).



Important:
Before you operate the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. **When the system is switched on for the first time, the demonstration mode will start automatically.**

Notes:

- During the demonstration, if you press any source (or standby-on) button, the system will switch to the respective mode (or standby).
- When the system is switched to standby mode, the demonstration will resume 5 seconds later.

To stop the demonstration mode

- Press and hold **■** (on the system only) for **5 seconds** when the system is in demonstration mode.
 - The demonstration will stop.
 - "**DEMO OFF**" is displayed.
 - The system will switch to standby mode.

Notes:

- When the system is switched on from the main power outlet, the CD carousel tray may open and close again to initialize the set.
- Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.

To start the demonstration mode

- Press and hold **■** (on the system only) for **5 seconds** when the system is in standby mode.
 - The demonstration will begin.

Easy Set

EASY SET allows you to store all available radio stations automatically.

- Press and hold **STANDBY ON** (on the system only) for **5 seconds**, when the system is in standby or demonstration mode.
 - "**EASY SET**" will be displayed, and followed by "**TUNER**" and then "**AUTO**".
 - EASY SET will start searching for all radio on FM band and then followed by radio stations on MW and LW bands.
 - All available radio stations with sufficient signal strength will be stored. Up to 40 presets may be stored.

Notes:

- EASY SET will start with the FM band, if there are still presets available, the system will continue to store the MW and LW bands respectively.
- When EASY SET is used, all previously stored radio stations will be replaced.
- The last preset radio station will appear on the display when EASY SET is completed.

OPERATING THE SYSTEM

Switching the system ON

- Press **CD, TUNER, TAPE** or **AUX**.

You can also switch on the system by pressing any one of the CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY ON** or **⏻** on the remote control.
 - The system will switch to standby mode.

Selecting the Source

- Press the respective source selection button: **CD, TUNER, TAPE** or **AUX**.
 - The display indicates the selected source.

Notes:

- For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX/CDR IN terminals.

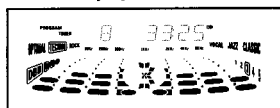
OPERATING THE SYSTEM

Selecting the Equalizer Display

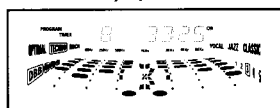
You can select the desired equalizer display for the system. You must not press the DSC button on the system before using the JOG control.

- Adjust the JOG control to select the desired Equalizer Display, NORMAL, TOP DOWN, or NITE MODE.
 - The selected display will be shown.

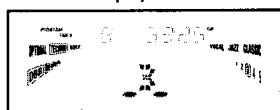
NORMAL Display



TOP DOWN Display



NITE MODE Display



Note:

- In NITE MODE, all lights will be switched off and the display brightness will be dimmed.

Sound Control

VOLUME ADJUSTMENT

Adjust **VOLUME** to increase or decrease the sound level.

For Personal Listening

Connect the headphones plug to the socket at the front of the system. The speakers will be muted.

DIGITAL SOUND CONTROL (DSC)

The DSC feature enables you to adjust the system to suit your type of music.

- Press **DIGITAL SOUND CONTROL (DSC)** to select OPTIMAL, CLASSIC, TECHNO, JAZZ, ROCK or VOCAL.
 - The selected digital sound is encircled.
 - "**OPTIMAL X, CLASSIC, TECHNO X, JAZZ X, ROCK X** or **VOCAL X**" will be displayed. "X" is the pre-selected level.

With the JOG control, you can change the level of any DSC setting except CLASSIC.

- First select the DSC feature, then adjust the JOG control until the desired digital sound setting level is reached.
 - The digital sound setting level will increase or decrease between level 1 and 5.

Note:

- For neutral setting, select **CLASSIC** and switch off **DBB**.

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

- Press **DBB** briefly to select a bass boost level.
 - The respective DBB level will be encircled and lit.
 - "**BEAT**", "**PUNCH**" or "**BLAST**" will be displayed.

To switch off DBB

- Press **DBB** briefly until "**DBB OFF**" is displayed.

Note:

- Some CDs or tapes might be recorded in high modulation, which causes a distortion at high volume. If this occurs, switch off **DBB** or reduce the volume.



Notes:

- If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM display also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.
- REPEAT DISC mode is not available when program playback begins.

Erasing the program (when playback is stopped)

- Press **■**.
→ "PROGRAM CLEARED" will be displayed.

Note:

- The program will be erased when the system is disconnected from the power supply or when the CD carousel tray is opened.

Shuffle (only on remote control)

In shuffle mode, the system plays all the available discs and their tracks in random order. Shuffle may be used also when tracks are programmed.

To shuffle all the discs and tracks

- 1 Press **SHUFFLE**.
→ "SHUFFLE" will be displayed.
→ The **SHUFFLE**, the disc and the track selected at random appear on the display.
- The discs and the tracks will be played in random order until you press **■**.
- If you press **REPEAT** during shuffling, the current track or all available discs will be played repeatedly.
→ "TRACK" or "ALL" will be displayed.
→ The **REPEAT** and **SHUFFLE** appear on the display.
- 2 Press **SHUFFLE** again to resume normal playback.
→ The **SHUFFLE** disappears from the display.

Note:

- REPEAT DISC mode is not available when shuffle is selected.

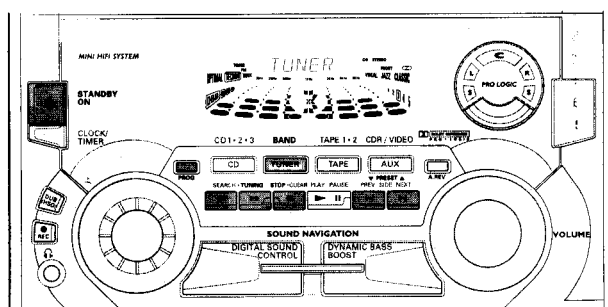
Repeat (only on remote control)

You can play the current track, a disc or all available discs repeatedly.

- 1 Press **REPEAT** on the remote control to select the various repeat modes.
→ "TRACK", "DISC", "ALL" or "OFF" will be displayed.
→ The **REPEAT** appears on the display.
- The selected track, selected disc or all available discs will now be played repeatedly until you press **■**.
- 2 Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
→ The **REPEAT** disappears from the display.

Notes:

- REPEAT DISC mode is not available during program play or shuffle mode.
- You can also repeat shuffling a program.
→ "TRACK" or "PROGRAM" will be displayed.
- The **REPEAT**, **PROGRAM** and **SHUFFLE** appear on the display.

TUNER**Note:**

- For 'EASY SET' feature, please refer to page 13.

Tuning to radio stations

- 1 Press **TUNER** (BAND) to select TUNER mode.
→ "TUNER" will be displayed.
A few seconds later, the current radio frequency will be displayed.
- 2 Press **TUNER** (BAND) again to select the desired waveband: FM, MW or LW.
- 3 Press **◀** or **▶** for more than one second, then release.
→ The display will show "SEARCH" until a radio station with sufficient signal strength is found.

- Repeat this procedure until the desired station is reached.
- To tune to a weak station, briefly press **◀** or **▶** repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

You can store up to 40 radio stations in the memory. When a preset radio station is selected, the preset number appears next to the frequency on the display.

Automatic programming

- 1 Press **TUNER** (BAND).
- 2 Press **PROG** for more than one second.
→ The **PROGRAM** starts flashing and "AUTO" will be displayed.

- The system will search for every available station in the FM waveband first, then search the MW and LW wavebands respectively.
- All available stations will be stored automatically. The frequency and preset number will be displayed briefly.
- The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
- The system will remain tuned to the last stored preset radio station.

Notes:

- You can cancel the automatic programming by pressing **PROG** or **■** (on the system only).
- If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming, only the preset numbers 10 to 40 will be programmed.

Manual programming

- 1 Press **TUNER** (BAND).
- 2 Press **TUNER** (BAND) again to select the desired waveband: FM, MW or LW.
- 3 Press **PROG** for less than one second.
→ The **PROGRAM** starts flashing.
→ The next available preset number will be displayed for selection.
- 4 Press **◀** or **▶** to tune to the desired frequency.

- If you wish to store the radio station to another preset number, press **▼** or **▲** to select the desired preset number.
- 5 Press **PROG** again.
→ The **PROGRAM** disappears and the radio station will be stored.
- Repeat **steps 3 – 5** to store other preset radio stations.

Notes:

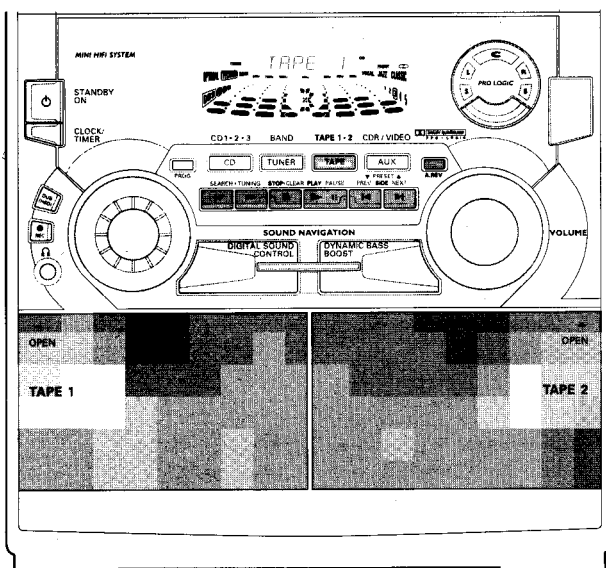
- When 40 radio stations are stored and you attempt to store another radio station, the display will show "FULL". If you want to change an existing preset number, repeat steps 3 – 5.
- You can cancel manual programming by pressing **■** (on the system only).
- During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.

Tuning to Preset Radio Stations

- Press **▼** or **▲** to select the desired preset number.
→ The preset number, radio frequency, and waveband appear on the display.

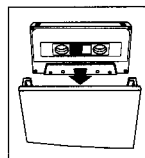
TAPE

English



Loading a tape

- 1 Press **OPEN**.
- 2 The tape deck door opens.
- 3 Load the tape with the open side downward and the full spool to the left.



- 4 Close the tape deck door.

Tape Side (only on tape deck 2)

- Press **◀** or **▶** to select the tape side for playback or recording.
 - The **BACK** or **FRONT** appear on the display, depending on the tape side selected.
 - "T2 <<<" or "T2 >>>" will be displayed.
 - When recording, the **BACK** or **FRONT** display will be flashing.

Auto Reverse Playback (only on tape deck 2)

- Press **A. REV** to select the different playback modes.
 - ◻ to record or playback on one side of the tape. The tape stops at the end of one side.
 - ◻ to record or playback on both sides of the tape. The tape then stops.
 - ◻ to playback continuously on both sides of the tape up to a maximum of 10 times per side unless you press **■**.

Tape Playback

- 1 Press **TAPE** (TAPE 1•2) to select TAPE mode.
 - "TAPE 1" or "TAPE 2" will be displayed, and followed by "T 1" or "T2" with "<<<" or ">>>".
- Press **TAPE** (TAPE 1•2) again to select either tape deck 1 or tape deck 2.
- 2 Load the tape into the desired tape deck.
- 3 Press **▶** to start playback.
 - If tape 1 is selected for playback;
 - "T 1" with ">" scrolling right will be displayed.
 - If tape 2 is selected for playback;
 - "T2" with "<" or ">" scrolling left or right will be displayed depending on the tape side selected.

19

TAPE

3a(for playback on tape deck 2 only)

- Press **◀** or **▶** to select tape side (see Tape Side).
- Press **A. REV** to select the different type of playback mode (see Auto Reverse Playback).
- 4 Press **■** to end playback.
 - "T 1" or "T2" with "<<<" or ">>>" will be displayed.

Rewind/Fast Forward

When playback is stopped

- 1 You can rewind or fast forward the tape by pressing **◀◀** or **▶▶** respectively.
 - If rewinding, "T 1 <" or "T2 <" with "<" scrolling left will be displayed.
 - If fast forwarding, "T 1 >" or "T2 >" with ">" scrolling right will be displayed.
 - The tape will stop automatically at the end of the rewinding or fast forwarding.
- 2 Press **■** to stop rewinding or fast forwarding.

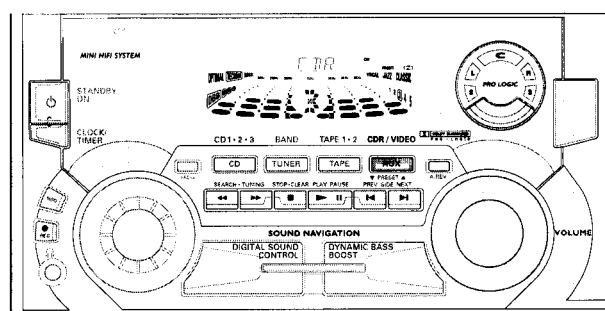
During playback

- Press and hold **◀◀** or **▶▶** until the desired passage is located.
 - "T 1" or "T2" with "<<<" or ">>>" scrolling left or right will be displayed depending on which button is pressed.
 - During searching, the sound is reduced to a low volume.
 - When you release **◀◀** or **▶▶**, the tape continues playing.

Notes:

- During rewinding or fast forwarding of a tape, it is also possible to select another source (e.g. CD, TUNER, or AUX).
- Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.
- C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.
- Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV, or speaker).

AUX/CDR



Selecting External Equipment

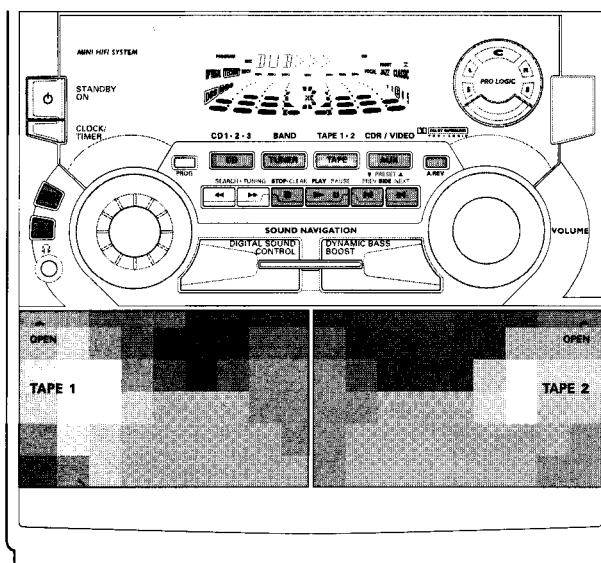
If you have connected the audio out terminals of the external equipment (TV, VCR, Laser Disc player, DVD player, or CD Recorder) to the AUX/CDR IN terminals, you can hear the enhanced sound from the system.

- 1 Press **AUX** to select CDR mode.
 - "CDR" will be displayed.
- 2 Press **AUX** again to select the external (normal AUX) mode.
 - "AUX" will be displayed.

Notes:

- There are two Auxiliary modes:
 - i. the normal AUX mode.
 - ii. the CDR mode, where the LINE OUT of this mini system is muted. You will not be able to record or listen to the sound from the LINE OUT.
- You are advised not to listen to and record from the same source simultaneously.
- All the sound control features (e.g. DSC, DBB, etc.) are available for selection.

RECORDING

SWITCH OFF DOLBY PRO LOGIC
WHEN RECORDING

Notes:

- It is not possible to change tape side during recording.
- For recording, use only tape of IEC type I (normal tape) or IEC type II (Cr02).
- The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.
- The recording level is set automatically, regardless of the position of Volume, DBB or DSC.
- To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.
- If "CHECK TAPE" is displayed, the protection tab has been broken. Put a piece of clear adhesive tape over the opening. Do not cover the Cr02 tape detection hole when covering the tab opening.

Recording from other sources
(only on tape deck 2)

- Press **TAPE** (TAPE 1•2) to select tape deck 2.
- Load a blank tape into tape deck 2 with the open side downward.
- Press **◀** or **▶** to select the recording tape side (see *Tape Side* under **TAPE** section).
- Press **CD**, **TUNER** or **AUX**.
 - Start playback of the selected source.
- Press **REC** to start recording.
 - The **REC** starts flashing.
- Press **■** to stop recording.

Notes:

- Only **◀** or **▶** mode is available during recording.
- During recording, it is not possible to listen to another source.

Dubbing tapes (from tape deck 1 to tape deck 2)

- Press **TAPE** (TAPE 1•2) to select tape deck 2.
- Load the prerecorded tape into tape deck 1 with full spool to the left and a blank tape into tape deck 2 with full spool aside.
- Press **◀** or **▶** to select the recording tape side (see *Tape Side* under **TAPE** section).

Digital Recording via Digital Out

For CD digital recording, please refer to the Instructions Manual of the CD Recorder, digital audio equipment, etc.

RECORDING

- Press **DUB (HSD)** once for normal speed dubbing or **twice** (within 2 seconds) for high speed dubbing.
 - "NORMAL" (normal speed) or "FAST" (high speed) will be displayed, followed by "DUB" with "<" or ">" scrolling left or right depending on the tape side selected.
 - The **HSD** appears on the display during high speed dubbing.
- Dubbing will start immediately.
 - The **REC** starts flashing.
- Press **■** to stop dubbing.

Notes:

- Only **◀** mode is available during dubbing.
- At the end of side A, flip the tapes to side B and repeat the procedure.
- Dubbing of tapes is only possible from tape deck 1 to tape deck 2.
- To ensure good dubbing, use tapes of the same length.
- During high speed dubbing in Tape mode, the sound is reduced to a low volume.
- You can listen to another source while dubbing.

CD Synchro Start Recording

- Load a blank tape into tape deck 2 and a disc into a disc tray.
- Press **CD** to select CD mode.
 - You can program the tracks in the order you want them to be recorded (see Programming Tracks). If not, select the disc by pressing **CD** (CD 1•2•3) and the tracks are recorded according to the order on the selected disc.
- Press **REC** to start recording.
 - The **REC** starts flashing.
 - CD will start playback automatically.
- Press **■** to stop recording.

One Touch Recording

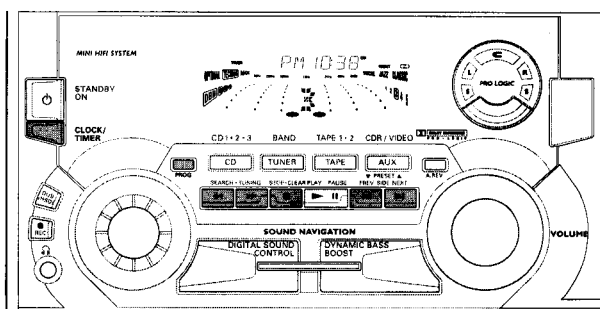
- For One Touch Recording, as soon as you press **REC**, the current source (CD, TUNER or AUX) will be recorded on tape deck 2.

- Load a blank tape in tape deck 2.
- Press **REC** to start recording.
 - The **REC** starts flashing.
- Press **■** to stop recording.

Note:

When you press **RECORD** while in **TAPE** mode, "SELECT SOURCE" will be displayed. One Touch Recording is not possible in **TAPE** mode.

CLOCK



View Clock

You can view the clock (if it is set) if the system is in Standby mode or when any sound source is selected (CD, TUNER, etc.). The clock will be displayed for about 7 seconds.

- Press **CLOCK/TIMER** briefly.
 - "PM 10:38" or "22:38" (the current time) will be displayed depending on whether you have selected 12- or 24-hour mode.
 - "--:--" will be displayed if the clock is not set.

Clock Setting

The clock can be set in either 12- or 24-hour mode, e.g. "AM 12:00" or "00:00". Before setting the clock, you must be in the View Clock mode.

- Press **CLOCK/TIMER** to select clock mode.
- Press **PROG** (on the system only) to select 12- and 24- hour mode.
 - If 12-hour mode is selected, "AM 12:00" starts flashing.
 - If 24-hour mode is selected, "00:00" starts flashing.
- Set the hour with **◀** or **▶** on the system.
- Set the minute with **◀** or **▶** on the system.

TROUBLESHOOTING

English

Tape Deck Operation

Recording or playback cannot be made or there is a decrease in audio level.

- Dirty tape heads, capstans or pressure rollers.
- See section on tape deck maintenance (page 25).
- Magnetic build-up in the record/playback head.
- Use demagnetizing tape.

Tape deck door cannot open.

- Power failure or AC power plug disconnect from the wall outlet during tape playback.
- Reconnect the AC power plug and switch on the system again.

Recorded material sounds strange.

- Tape was recorded in one of the Dolby Pro Logic modes.
- Switch off Dolby Pro Logic mode when recording.

General

System does not react when any button is pressed.

- Electrostatic discharge.
- Press **STANDBY ON** to switch the system off. Remove the AC power plug from the wall outlet, then reconnect the power plug and switch on the system again.

No or poor sound.

- Volume is not turned up.
- Adjust **VOLUME**.
- The headphones are connected.
- Disconnect the headphones.
- Speakers are not connected or are connected wrongly.
- Check that the speakers are connected correctly.
- Make sure the stripped speaker wire is clamped.

Reversed left and right sound.

- Speakers are connected wrongly.
- Check the speaker connections and location.

Lack of bass sound or apparently imprecise physical location of musical instruments.

- Speakers are connected wrongly.
- Check the speaker connection for proper phasing, colored/black wires to colored/black terminals.

Remote control has no effect on the system.

- Wrong source is selected.
- Select the source (CD, TUNER, etc.) before pressing the function button (▶, ◀, ►, etc.).
- The distance to the system is too large.
- Reduce the distance.
- Batteries are inserted incorrectly.
- Insert the batteries with their polarities (+/- signs) as indicated.
- Batteries are exhausted.
- Replace the batteries.

Timer is not working.

- Clock is not set.
- Set the clock.
- Timer is not switched on.
- Press **CLOCK/TIMER** to switch on the timer.
- Recording is in progress.
- Stop recording.

Clock setting is erased.

- There was a power failure.
- Reset the clock.

System displays features automatically; buttons flash continuously.

- Demonstration mode is switched on.
- Press and hold ■ (on the system) for 5 seconds to switch off the demonstration.

There is a howling sound at the external source.

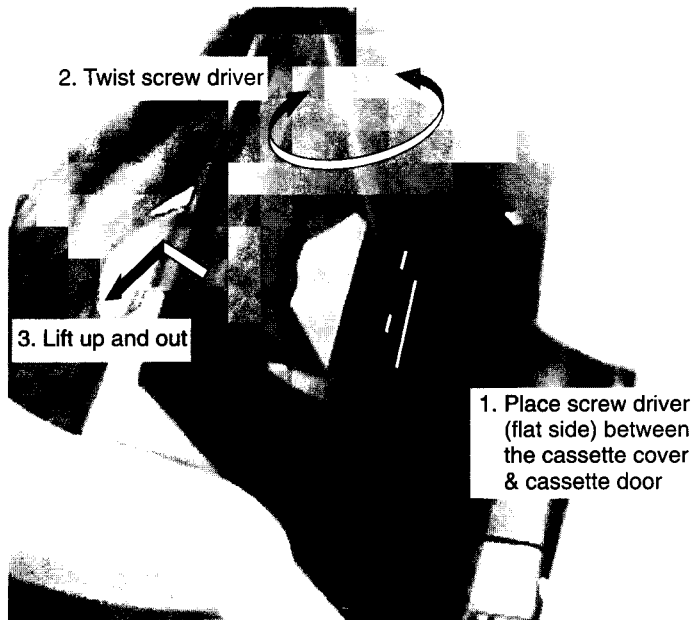
- You hear feedback when you are listening from the AUX mode.
- Press **AUX** to select CDR mode.

All lighted buttons are not lit.

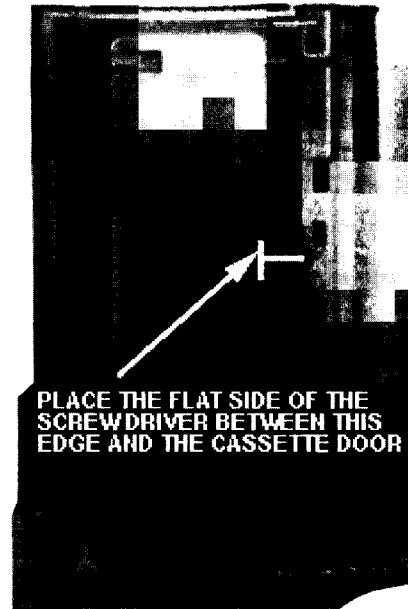
- Equalizer Display is switched on in NITE mode.
- Adjust **JOG** to select other Equalizer Display.

DISMANTLING INSTRUCTIONS

Dismantling of the Cassette Cover



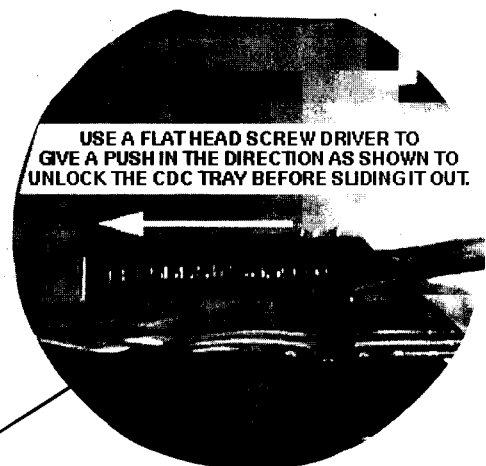
Remove Cassette Cover



Cassette Cover

Dismantling of the CDC Module and Front Panel

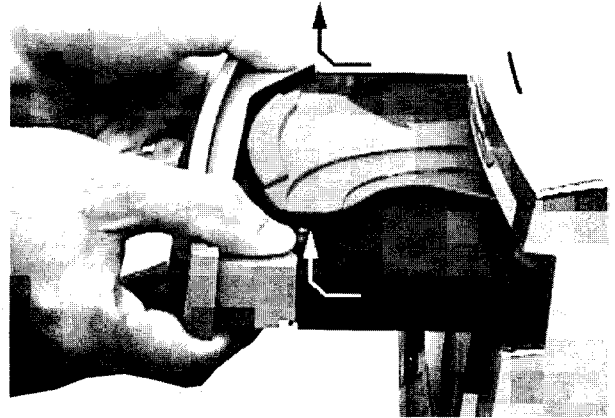
- 1) Loosen 18 screws to remove the Cabinet Rear (pos 259) of the set :-
 - 5 screws each on the left side & right side of the Cabinet Rear.
 - 8 screws at the rear of the Cabinet Rear.
- 2) Slide out the CDC Tray as shown in the diagram below with the help of a flat head screw driver.



Sliding Out The CDC Tray

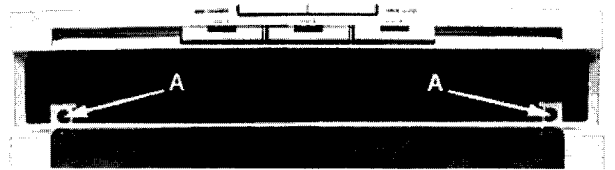
Dismantling of the CDC Module and Front Panel

- 3) Remove the Cover Tray CDC (pos 107) as indicated.



Remove Cover Tray CDC

- 4) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
5) Remove 1 screw (pos 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 231).



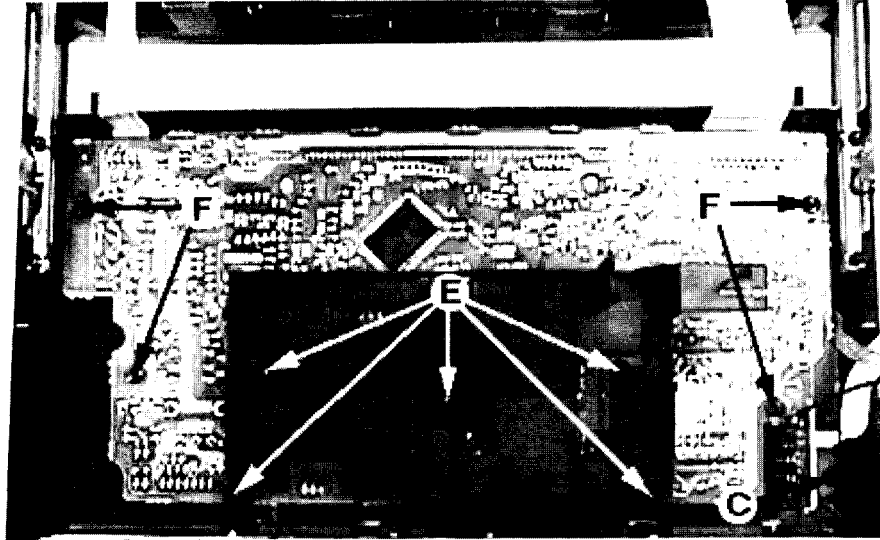
Front View CDC



Remove CDC Module

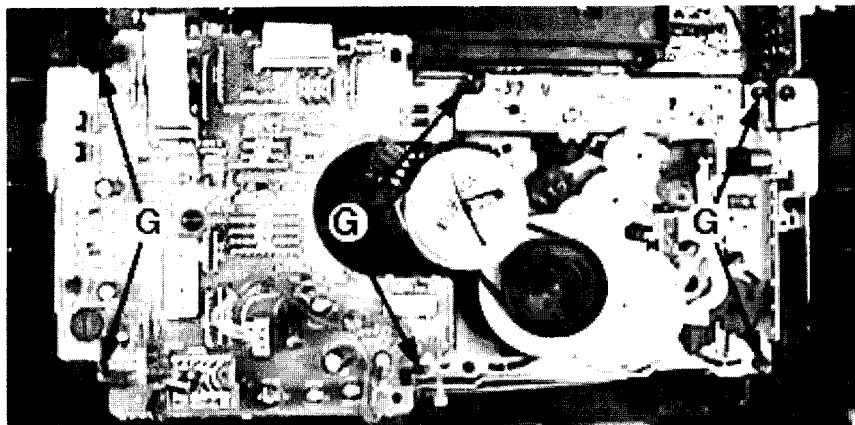
Dismantling of the Front Board

- 1) Remove 1 screw C as indicated to loosen the Headphone Board (pos 1101-A).
- 2) Remove 5 screws E as indicated to loosen the Plate Front (pos 254).
- 3) Remove 4 screws F as indicated to loosen the Front Board (pos 1102-A).



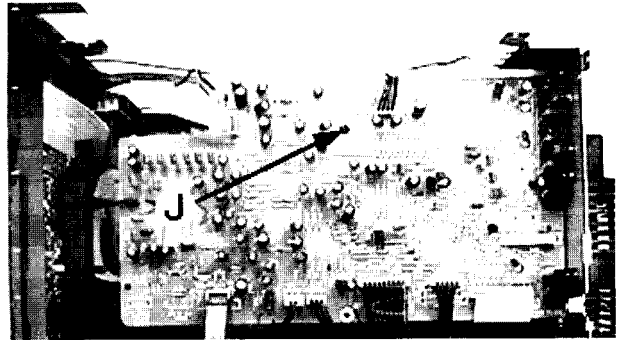
Dismantling of the ETF Tape Module

- 1) Remove 6 screws G as indicated to loosen the ETF Tape Module (pos 1105).

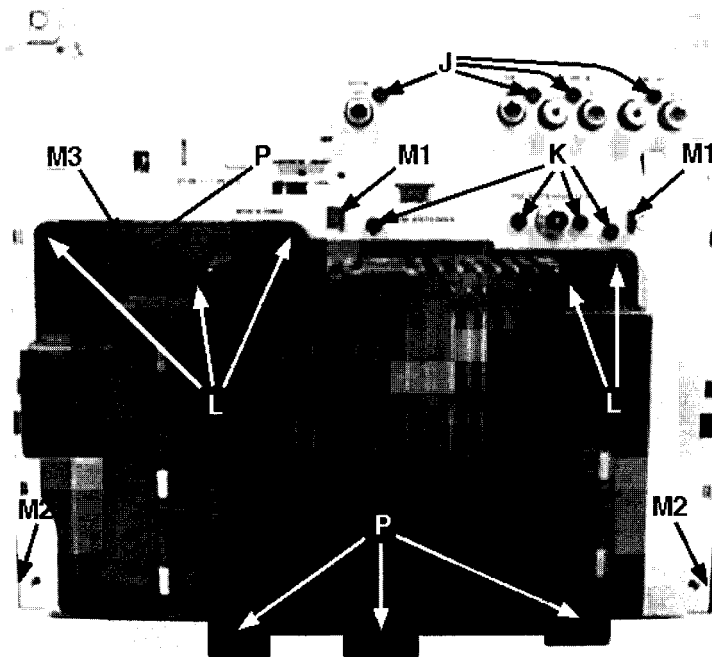


Dismantling of Rear Portion

- 1) Remove 5 screws J as indicated to loosen the AF Board (pos 1101-B).
- 2) Remove 4 screws K and uncatch M1 as indicated to loosen the Tuner Board (pos 1100).
- 3) Remove 5 screws L and uncatch M2 as indicated to take out the Plate Rear(pos 229).
- 4) Remove 4 screws P and uncatch M3 as indicated to free the Power Module (pos 1103) from the Bottom Plate assembly.



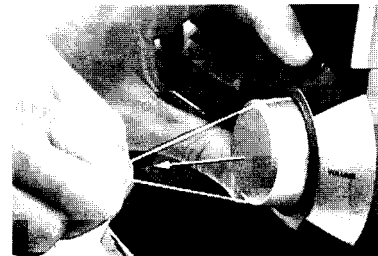
AF Board Top View



Repair Hints

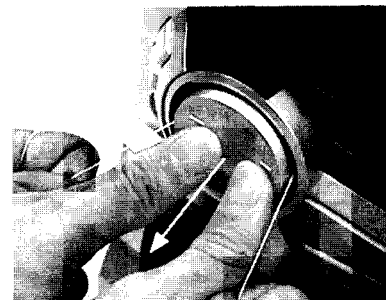
- 1) The Knob Volume Rotary (pos 140) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 1.

Picture 1



- 2) The Jog Rotary (pos 142) can be remove by inserting a strong string into the slot and pull it out in the direction as indicated. See picture 2.

Picture 2



Repair Hints

- 3) During re-assembly of the Power Module, place the Bracket Mains Socket (pos 232) behind the Mains Socket and catch it onto the Rucksack (pos 1103-201) of the Power Module. See pictures 3 and 4.
- 4) During repair it is possible to disconnect the Tuner board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.
- 5) Due to the short flex cable wires in the ETF Module, the pc board should be disconnected and reconnected on the reverse side of the tape mechanism to keep it electrically connected during repair. See picture 5.

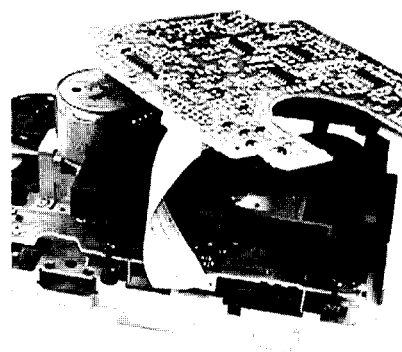
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occur.



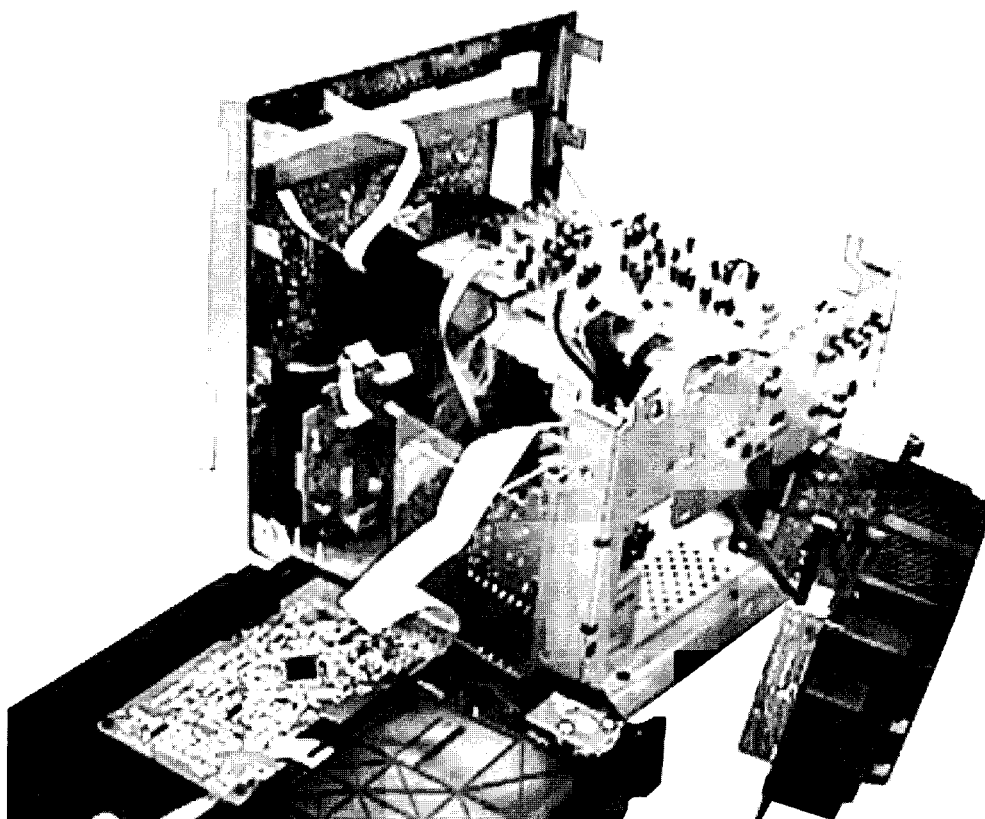
Picture 3

Picture 4

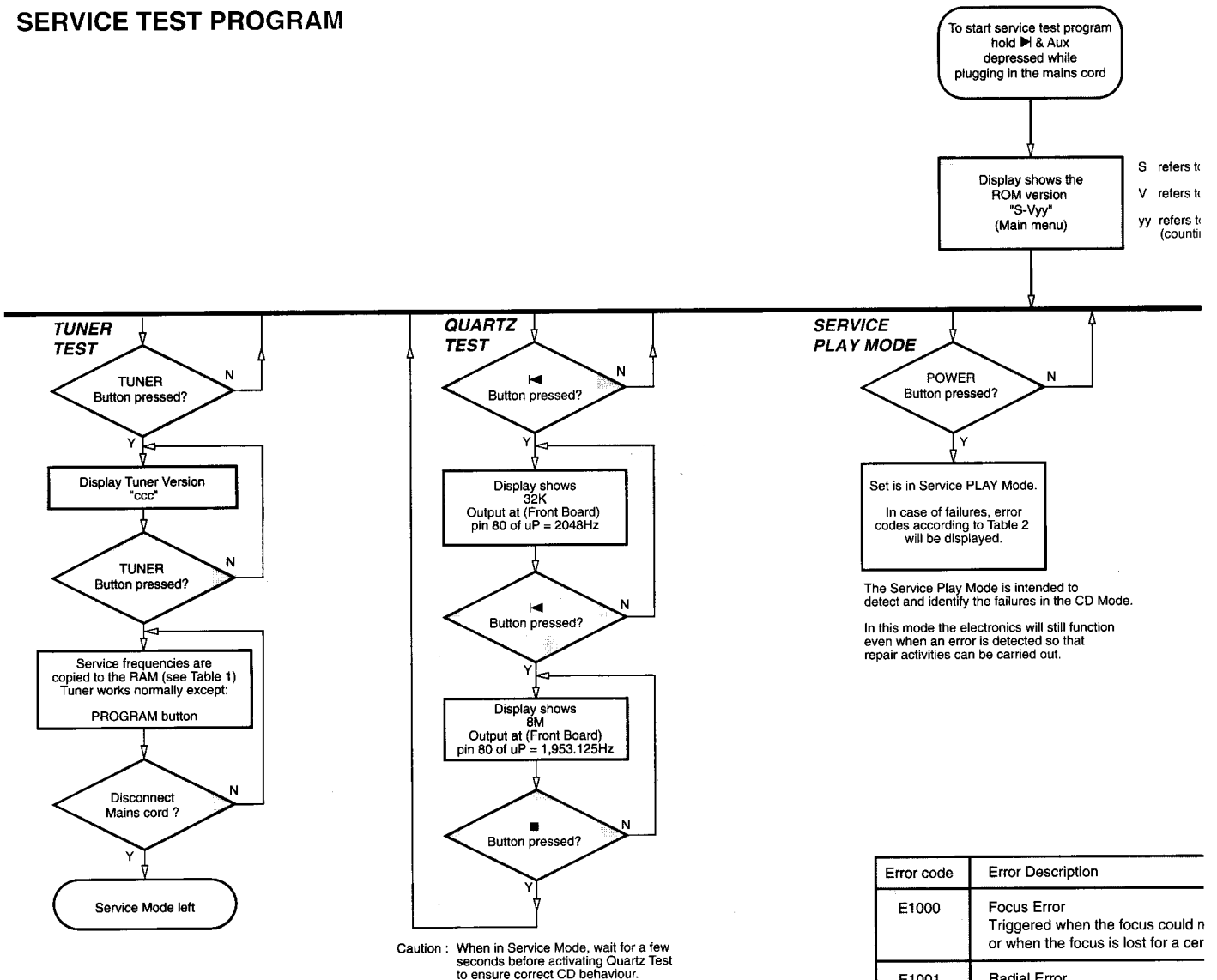
Picture 5



Service pos A



SERVICE TEST PROGRAM



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

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz)

By holding the TUNER and **▶▶** buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:

- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

Error code	Error Description
E1000	Focus Error Triggered when the focus could not be achieved or when the focus is lost for a certain period.
E1001	Radial Error Triggered when the radial servo is not working correctly.
E1002	Sledge In Error The sledge did not reach its inner position within 6 Sec. have passed by. Inner-servo error.
E1003	Sledge Out Error The sledge did not come out of its inner position within 250 mSec. have passed by. Inner-servo error.
E1005	Jump-offtrack error Triggered in normal play when the sledge jumps off the track. When this error occurred, software will try to recover the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was not received within the expected time.
E1007	PLL Error The Phase Lock Loop could not lock the signal.
E1008	Turntable Motor Error Generated when the CD could not be rotated. Discmotor problem.
E1020	Focus Search Error The focus point has not been found after 4000 attempts.
E1070	The carousel switch is not open or is defective and closed all the time, disc position.
E1071	The carousel position switch did not work or is defective and never closed. The time-out is 10 seconds.
E1079	The drawer could not enter the disc tray. The drawer is blocked by something and does not close.

Service Mode

Version

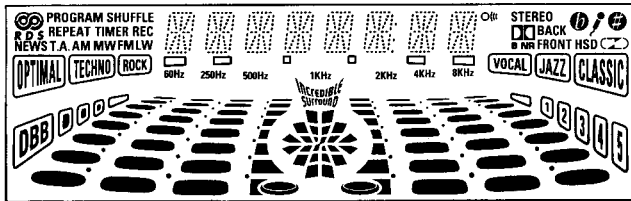
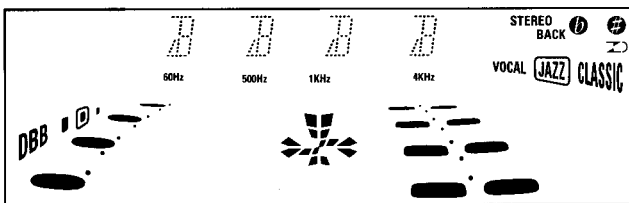
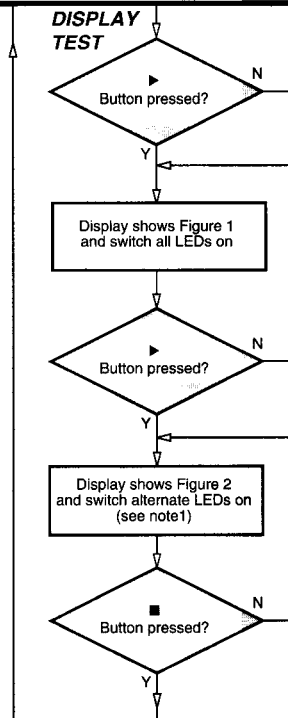
Software version number of the μ Processor
(going up from 01 to 99)

Figure 1



note 1 : DISC1, DISC3, CD, TAPE, Stereo Right, DPL Surround Left, DPL Centre Left.
Figure 2



Various other Tests

not be found within a certain time when starting up the CD
main time during play.

s off-track for a certain time during play.

position (inner-switch is still close) before approximately
switch or sledge motor problem.

inner position (inner-switch is still open) before approximately
r-switch or sledge motor problem.

jump destination could not be found within a certain time.
e will try to recover by initiating the jump command again.
ntinue to play.

as missing for a certain time during play.

ck within a certain time.

t reached 75% of speed during startup within a certain time.

nd within a certain time.

within certain time. This can happen when either the switch is
or when the carousel is blocked when located exactly at a

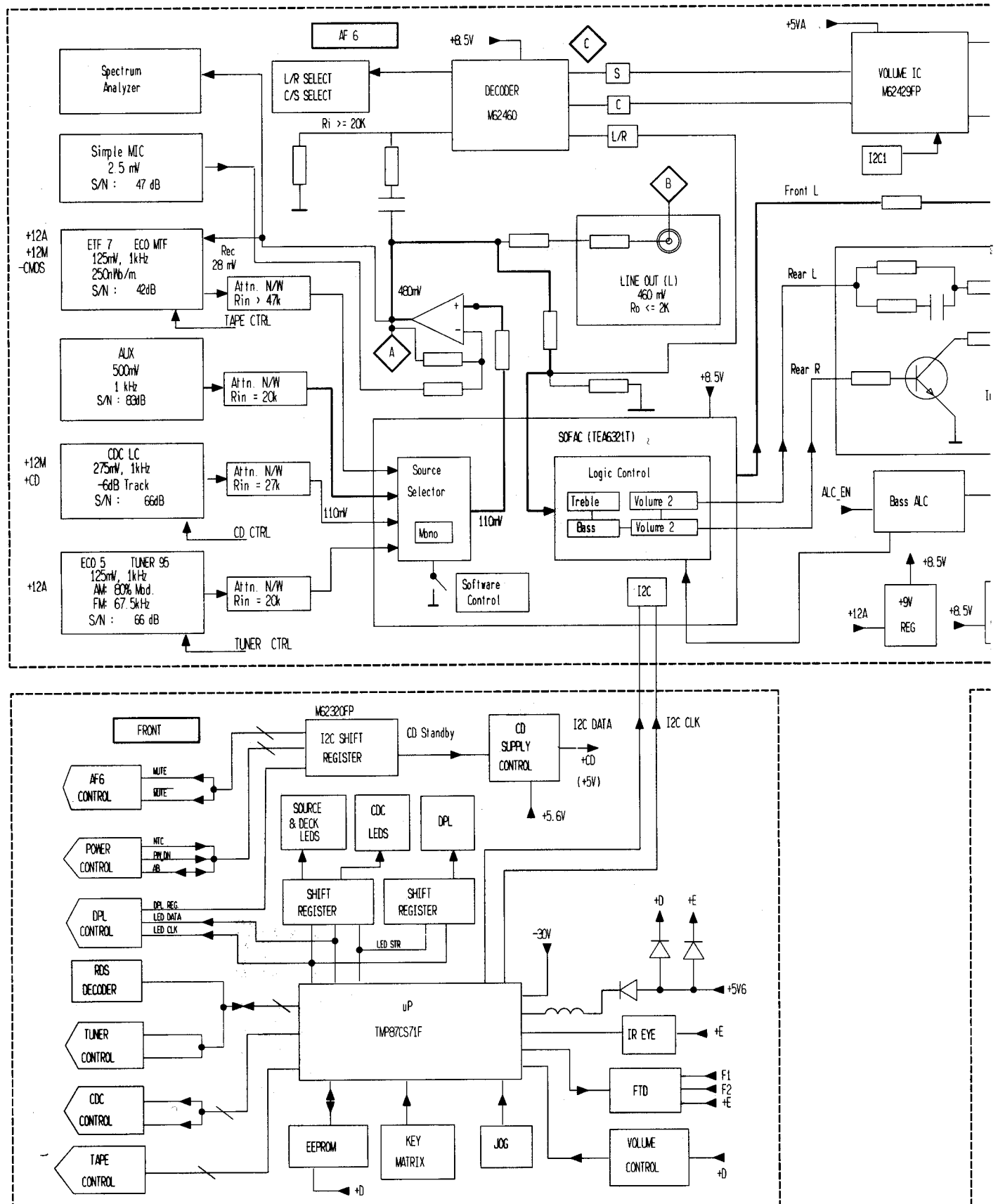
not close within a certain time. This can happen when the
es electrically, or when the carousel is blocked in between
s approximately 5 Sec.

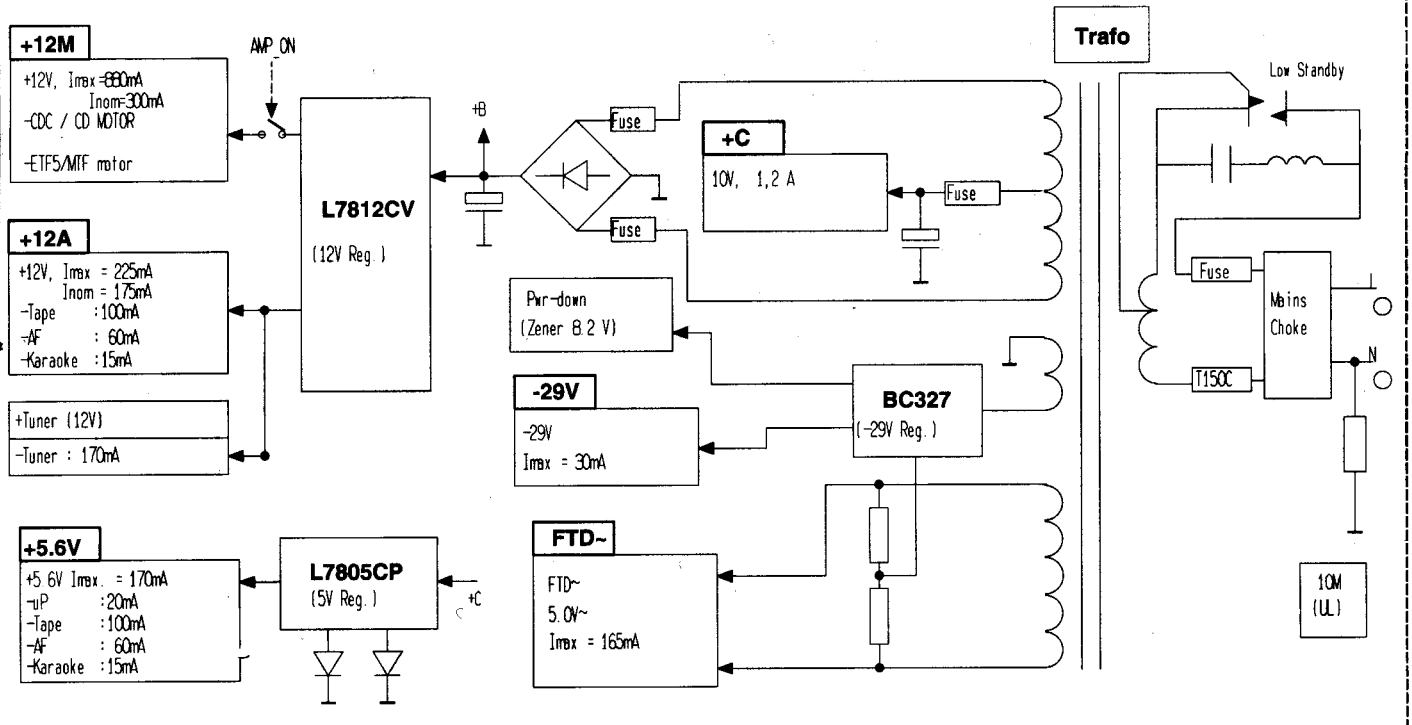
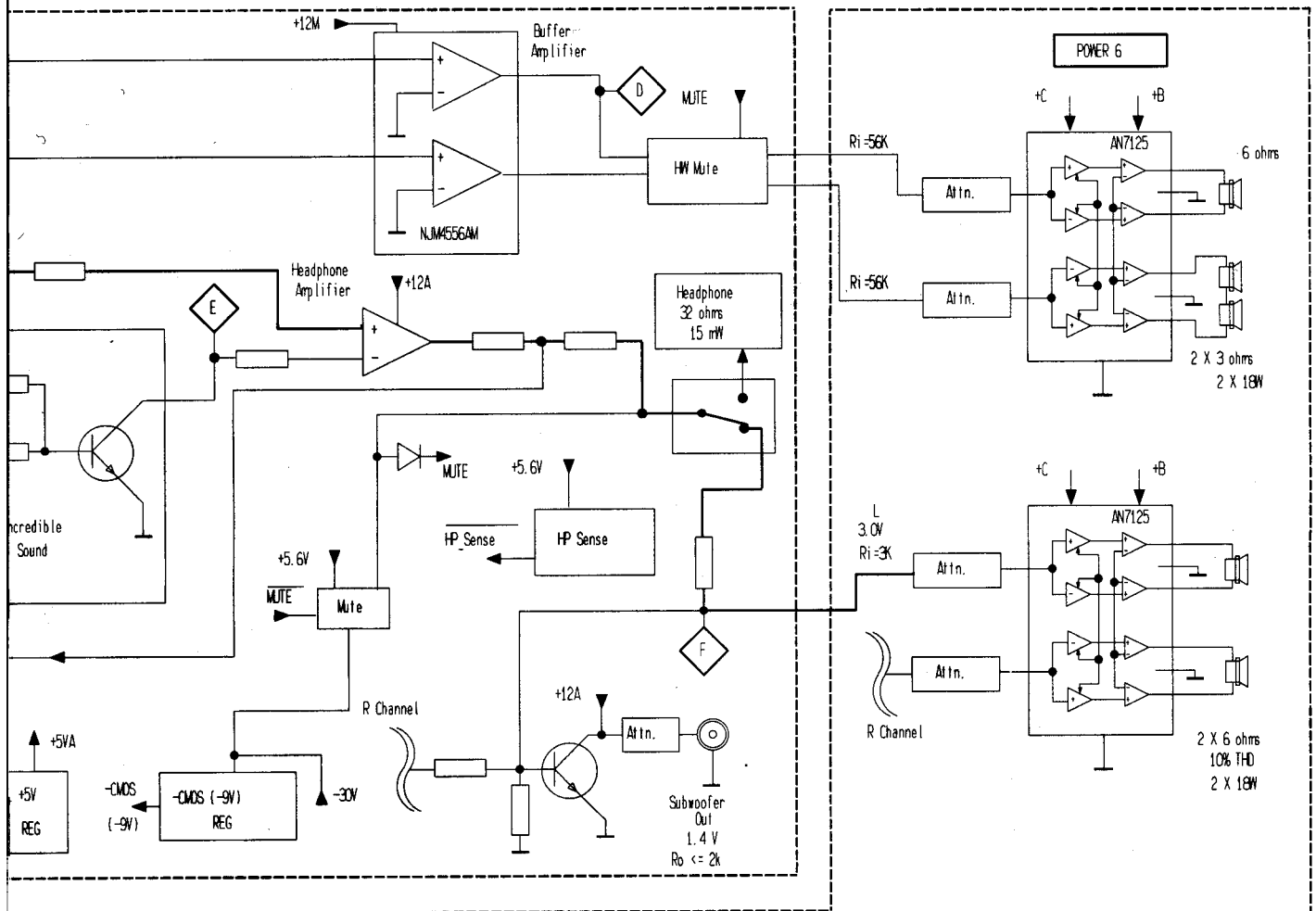
side position is opening again. This can be caused because
ng and cannot go fully inside, or the drawer switch is defective

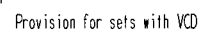
TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the μ Processor read back the test pattern correctly, otherwise "ERROR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. Caution! All presets from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

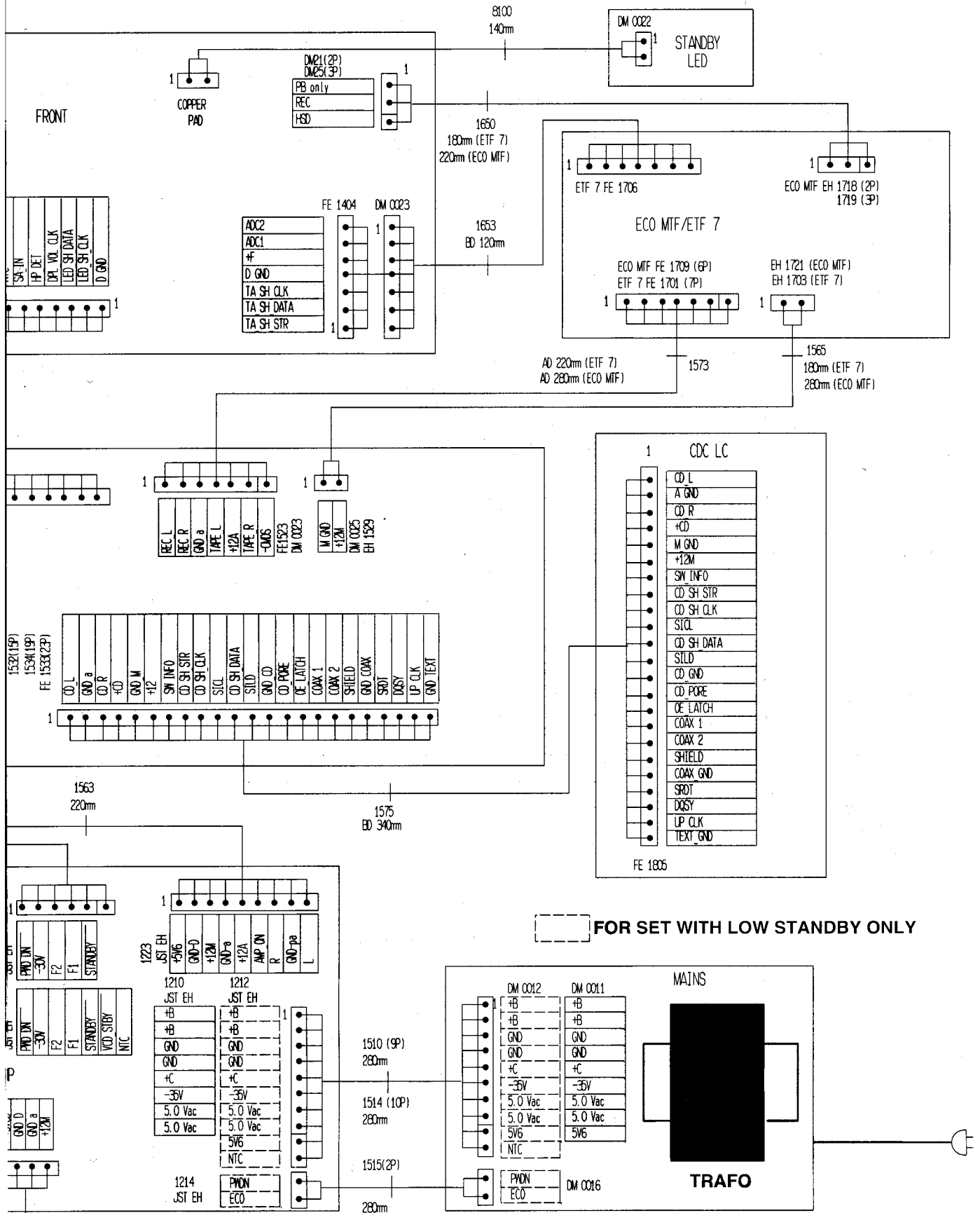
Table 2

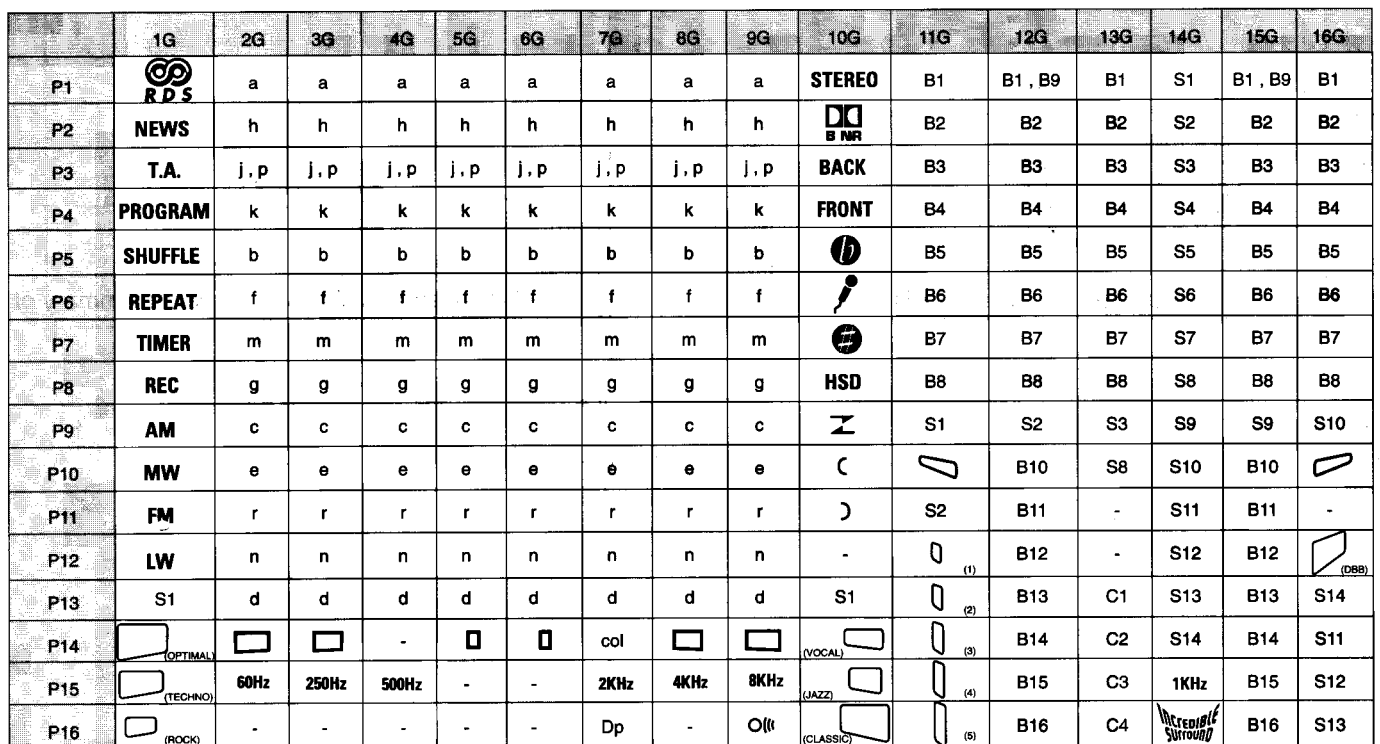
SET BLOCK DIAGRAM





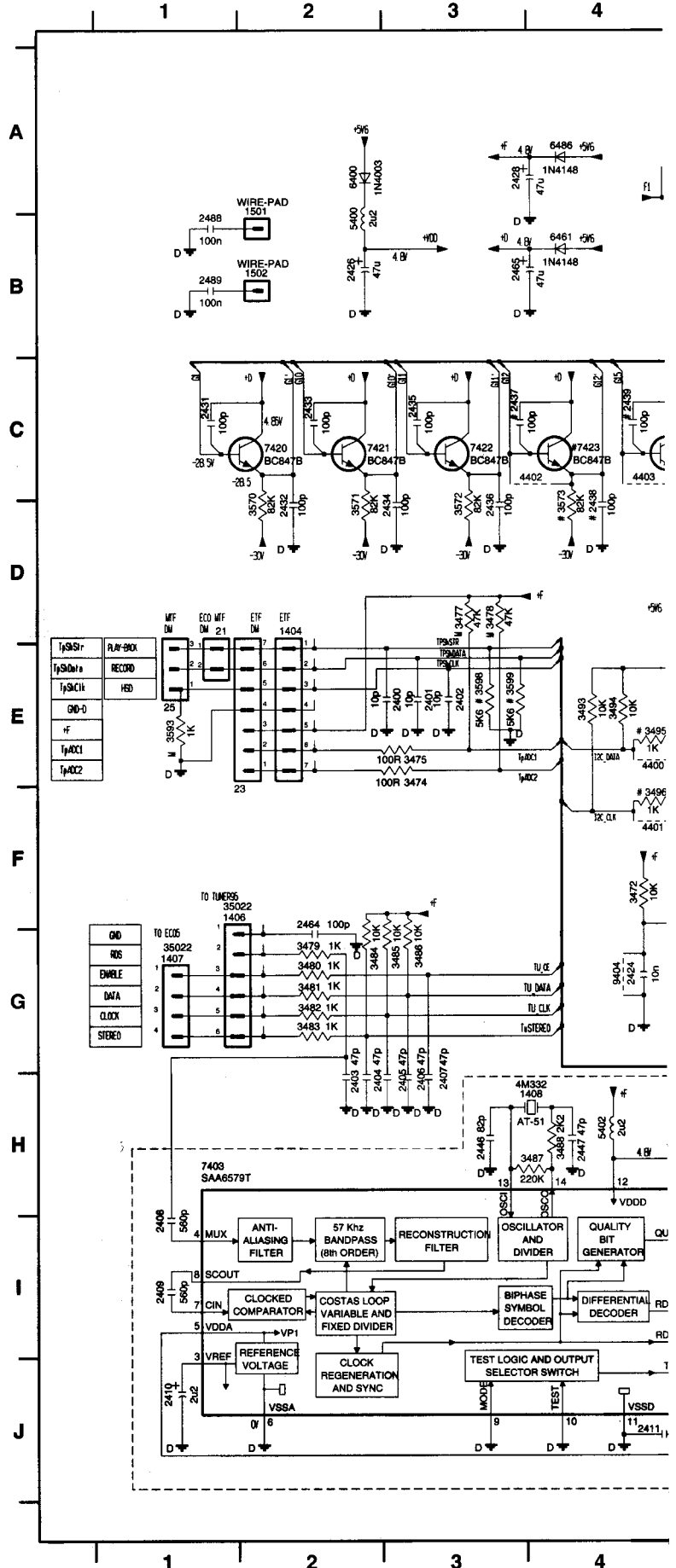




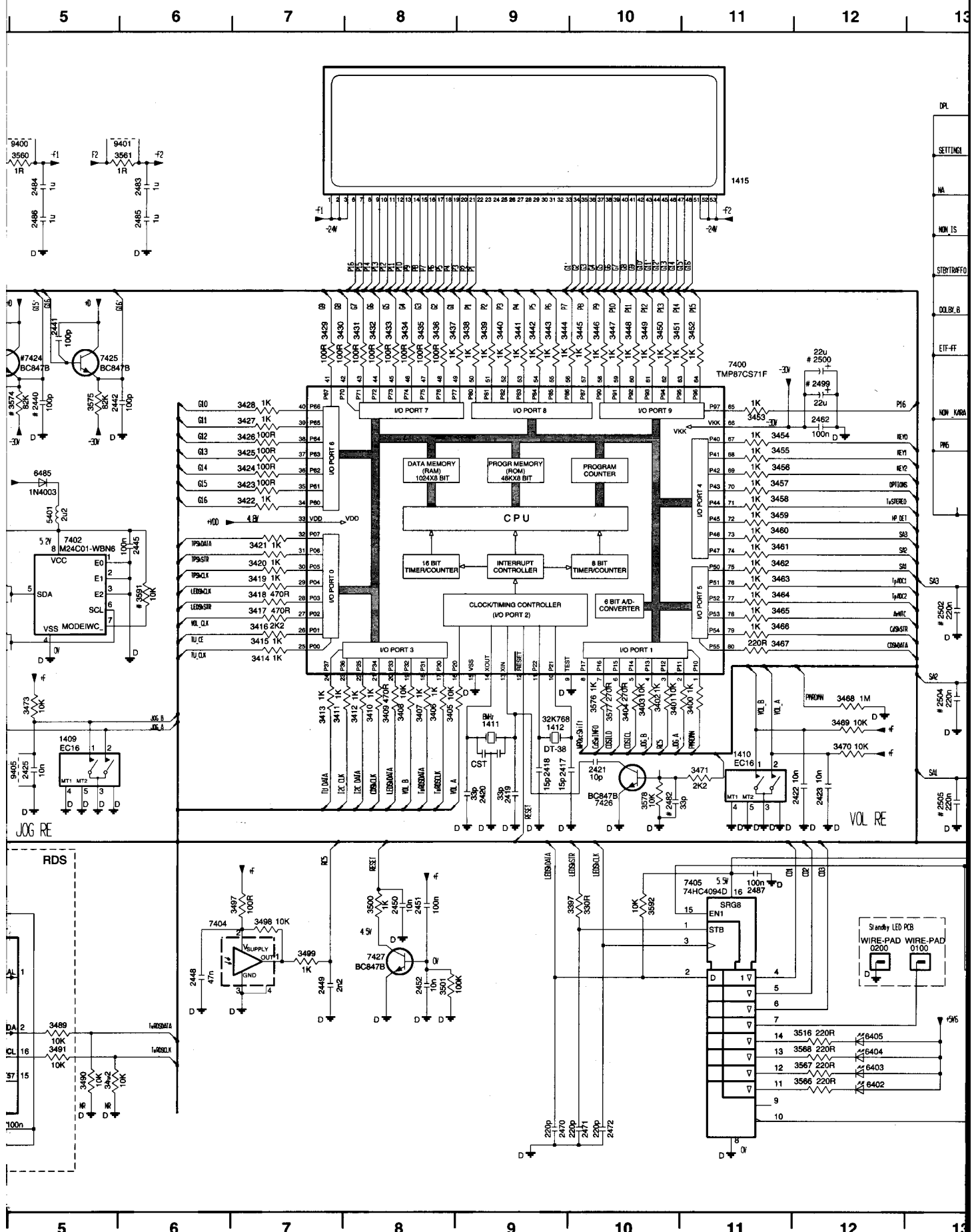


FRONT BOARD - CIRCUIT DIAGRAM

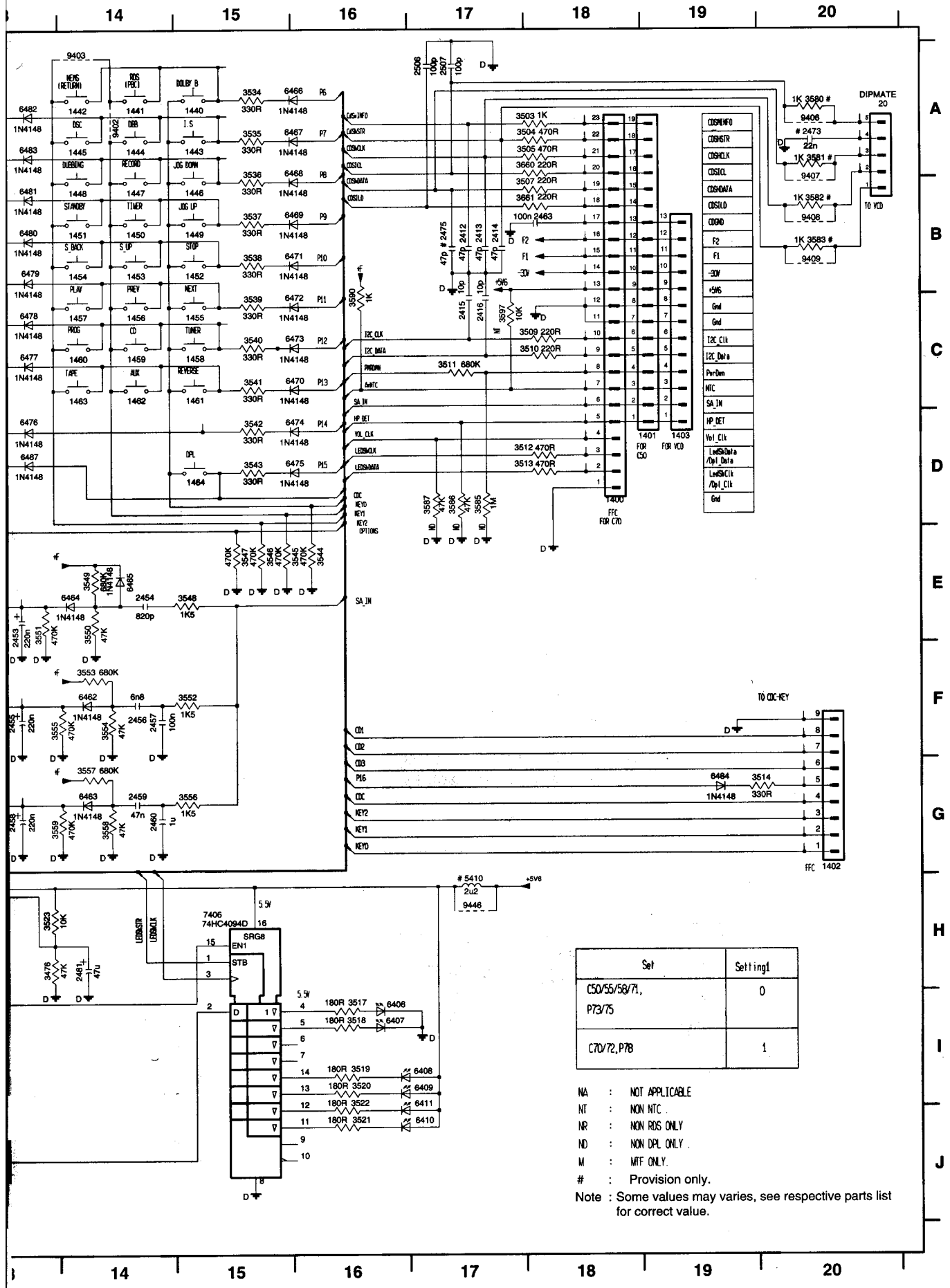
20 A20	1402 G20	1411 F9	1445 A14	1453 B14	1461 C15	2402 E3	2410 J1	2418 G9	2426 B2	24
21 D1	1403 D19	1412 F9	1446 B15	1454 B14	1462 C14	2403 H2	2411 J4	2419 G9	2428 A3	24
23 E1	1404 D2	1415 B11	1447 B14	1455 C15	1463 C14	2404 H2	2412 B17	2420 G9	2431 C1	24
25 E1	1406 F1	1440 A15	1448 B14	1456 C14	1464 D15	2405 H3	2413 B17	2421 G10	2432 D2	24
0100 H13	1407 G1	1441 A14	1449 B15	1457 C14	1501 B2	2406 H3	2414 B17	2422 G12	2433 C2	24
0200 H12	1408 H4	1442 A14	1450 B14	1458 C15	1502 B2	2407 H3	2415 C17	2423 G12	2434 D3	24
1400 D18	1409 G5	1443 A15	1451 B14	1459 C14	2400 E3	2408 I1	2416 C17	2424 G4	2435 C3	24
1401 D18	1410 G11	1444 A14	1452 B15	1460 C14	2401 E3	2409 I1	2417 G9	2425 G5	2436 D3	24



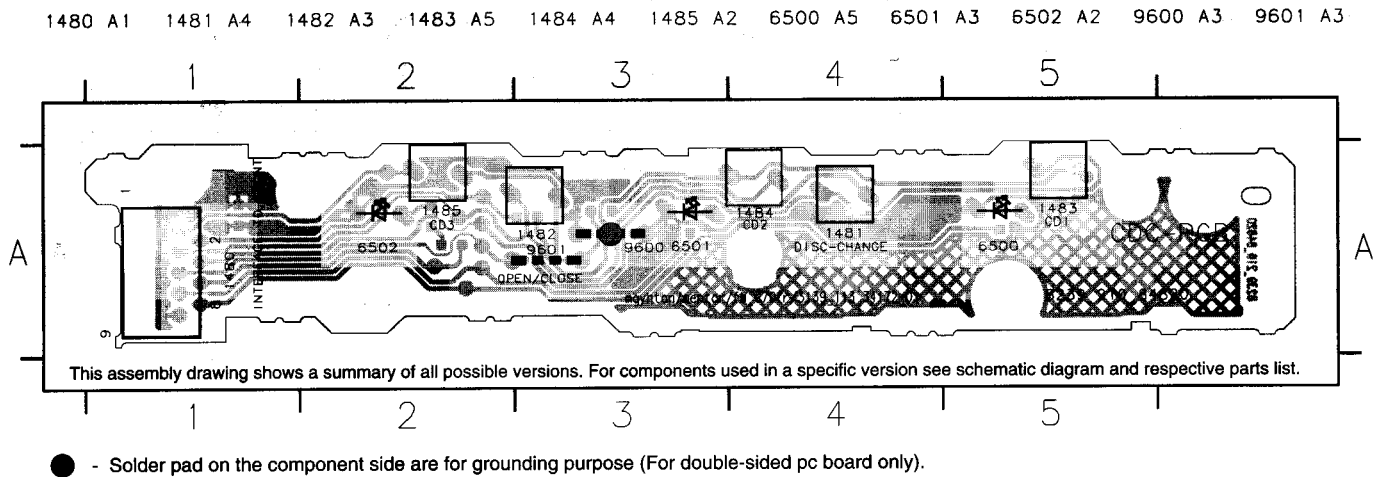
37 C3	2447 H4	2455 F13	2464 F2	2482 G10	2499 C12	3400 F11	3408 F8	3416 F7	3424 D7	3432 C8	3440 C9	3448 C10	3456 D11	3464 E11	3472 F4	3480 G2	3488 H4	3496 F4	3505 A18	35
38 D4	2448 I6	2456 F14	2465 B3	2483 B6	2500 C12	3401 F10	3409 F8	3417 E7	3425 D7	3433 C8	3441 C9	3449 C10	3457 D11	3465 E11	3473 F5	3481 G2	3489 I5	3497 H7	3507 B18	35
39 C4	2449 I7	2457 F14	2470 J9	2484 B5	2502 E13	3402 F10	3410 F8	3418 E7	3426 D7	3434 C8	3442 C9	3450 C10	3458 D11	3466 F11	3474 E3	3482 G2	3490 J5	3498 H7	3509 C18	35
40 D5	2450 H8	2458 G13	2471 J10	2485 B6	2504 F13	3403 F10	3411 F7	3419 E7	3427 D7	3435 C8	3443 C9	3451 C10	3459 D11	3467 F11	3475 E3	3483 G2	3491 I5	3499 H7	3510 C18	35
41 C5	2451 H8	2459 G14	2472 J10	2486 B5	2505 G13	3404 F10	3412 F8	3420 E7	3428 D7	3436 C8	3444 C9	3452 C11	3460 E11	3468 F12	3476 H13	3484 G2	3492 J5	3500 H8	3511 C17	35
42 D5	2452 I8	2460 G14	2473 A20	2487 H11	2506 A17	3405 F8	3413 F7	3421 E7	3429 C7	3437 C8	3445 C10	3453 D11	3461 E11	3469 F12	3477 D3	3485 G3	3493 E4	3501 I8	3512 D17	35
45 E6	2453 E13	2462 D12	2475 B17	2488 B1	2507 A17	3406 F8	3414 F7	3422 D7	3430 C7	3438 C9	3446 C10	3454 D11	3462 E11	3470 G12	3478 D3	3486 G3	3494 E4	3503 A18	3513 D17	35
46 H3	2454 E14	2463 B18	2481 H14	2489 B1	3397 H10	3407 F8	3415 F7	3423 D7	3431 C8	3439 C9	3447 C10	3455 D11	3463 E11	3471 G11	3479 G2	3487 H4	3495 E4	3504 A18	3514 G20	35



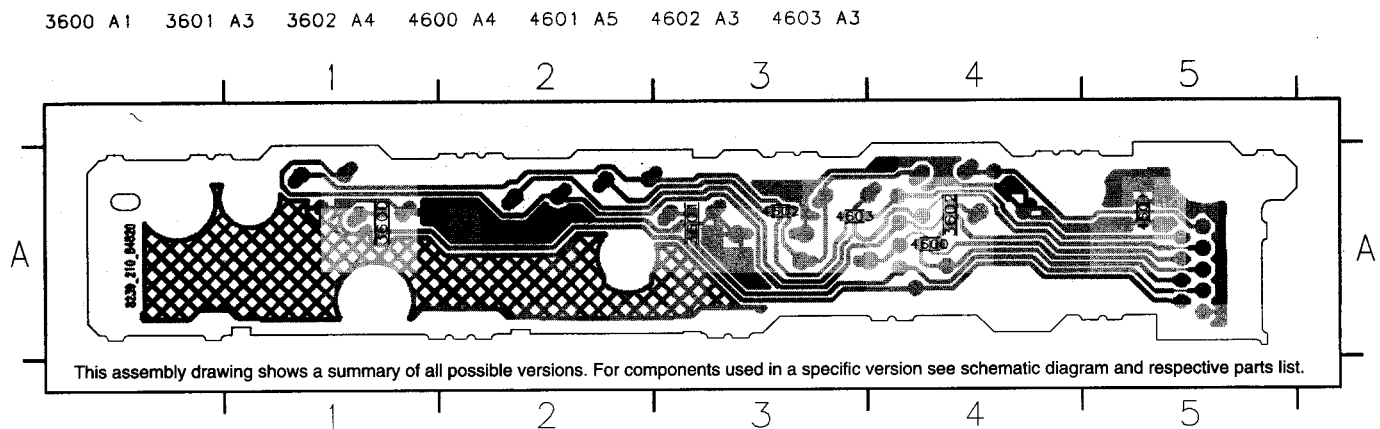
16 I12 3534 A15 3542 D15 3550 E14 3558 G14 3571 D2 3580 A20 3591 E6 4400 E4 6400 A2 6409 I17 6466 A16 6474 D16 6482 A13 7403 H1 7424 C5 9404 G4
 17 I16 3535 A15 3543 D15 3551 E13 3559 G13 3572 D3 3581 A20 3592 H10 4401 F4 6402 J12 6410 J17 6467 A16 6475 D16 6483 A13 7404 H6 7425 C5 9405 G5
 18 I16 3536 A15 3544 E16 3552 F15 3560 A5 3573 D4 3582 B20 3593 E1 4402 C4 6403 J12 6411 I17 6468 A16 6476 D13 6484 G19 7405 H11 7426 G10 9406 A20
 19 I16 3537 B15 3545 E16 3553 F14 3561 A6 3574 D5 3583 B20 3597 C17 4403 C4 6404 I12 6461 B4 6469 B16 6477 C13 6485 D5 7406 H15 7427 I8 9407 B20
 20 I16 3538 B15 3546 E16 3554 F14 3566 J12 3575 D5 3585 D17 3598 E3 5400 B2 6405 I12 6462 F14 6470 C16 6478 C13 6486 A4 7420 C2 9400 A5 9408 B20
 21 J16 3539 C15 3547 E15 3555 F13 3567 I12 3576 F10 3586 D17 3599 E3 5401 E5 6406 I16 6463 G14 6471 B16 6479 B13 6487 D13 7421 C2 9401 A6 9409 B20
 22 I16 3540 C15 3548 E15 3556 G15 3568 I12 3577 F10 3587 D17 3600 A18 5402 H4 6407 I16 6464 E14 6472 C16 6480 B13 7400 C11 7422 C3 9402 A14 9446 H17
 23 H13 3541 C15 3549 E14 3557 G14 3570 D2 3578 G10 3590 C16 3661 B18 5410 H17 6408 I17 6465 E14 6473 C16 6481 B13 7402 E5 7423 C4 9403 A14



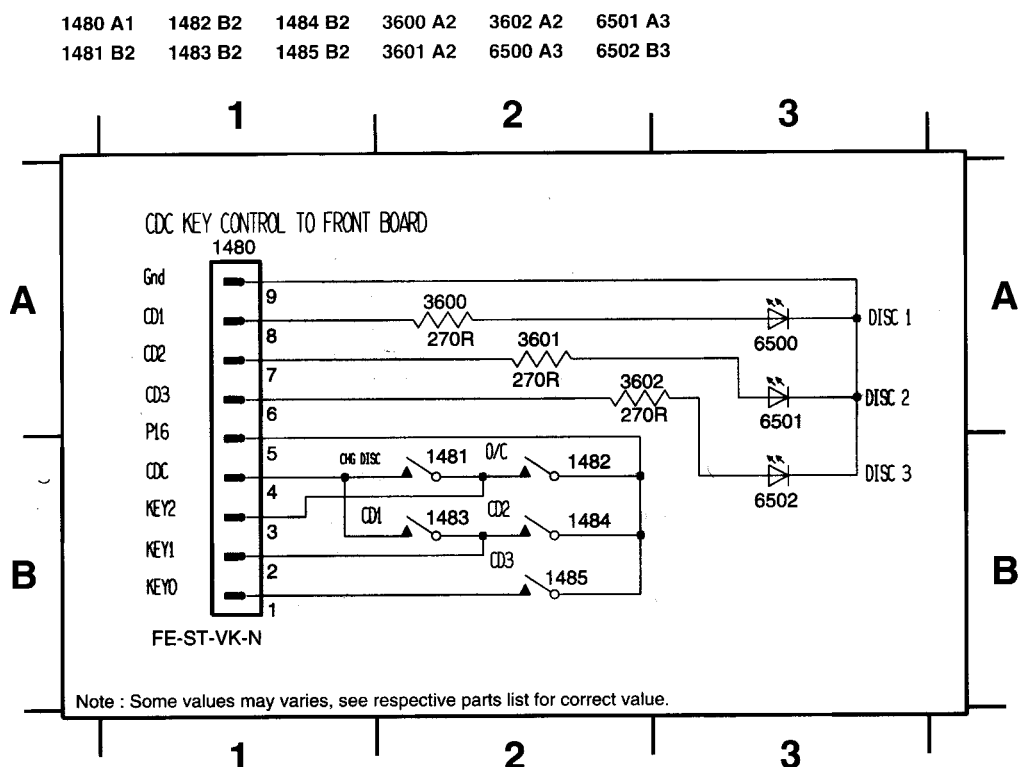
KEY-CDC BOARD - COMPONENT LAYOUT



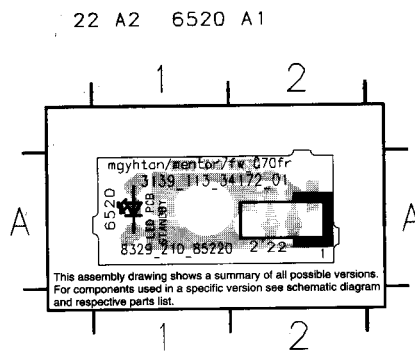
KEY-CDC BOARD - CHIP LAYOUT



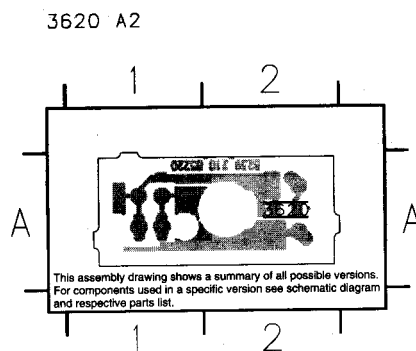
KEY-CDC PART - CIRCUIT DIAGRAM



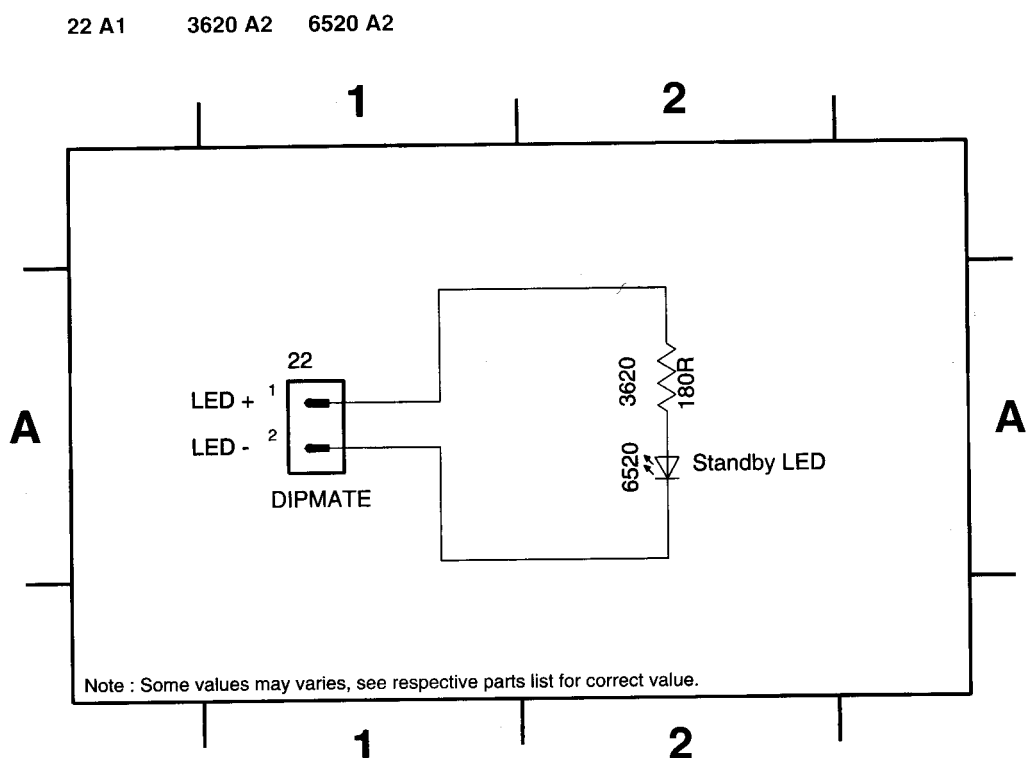
STANDBY LED BOARD - COMPONENT LAYOUT



STANDBY LED BOARD - CHIP LAYOUT

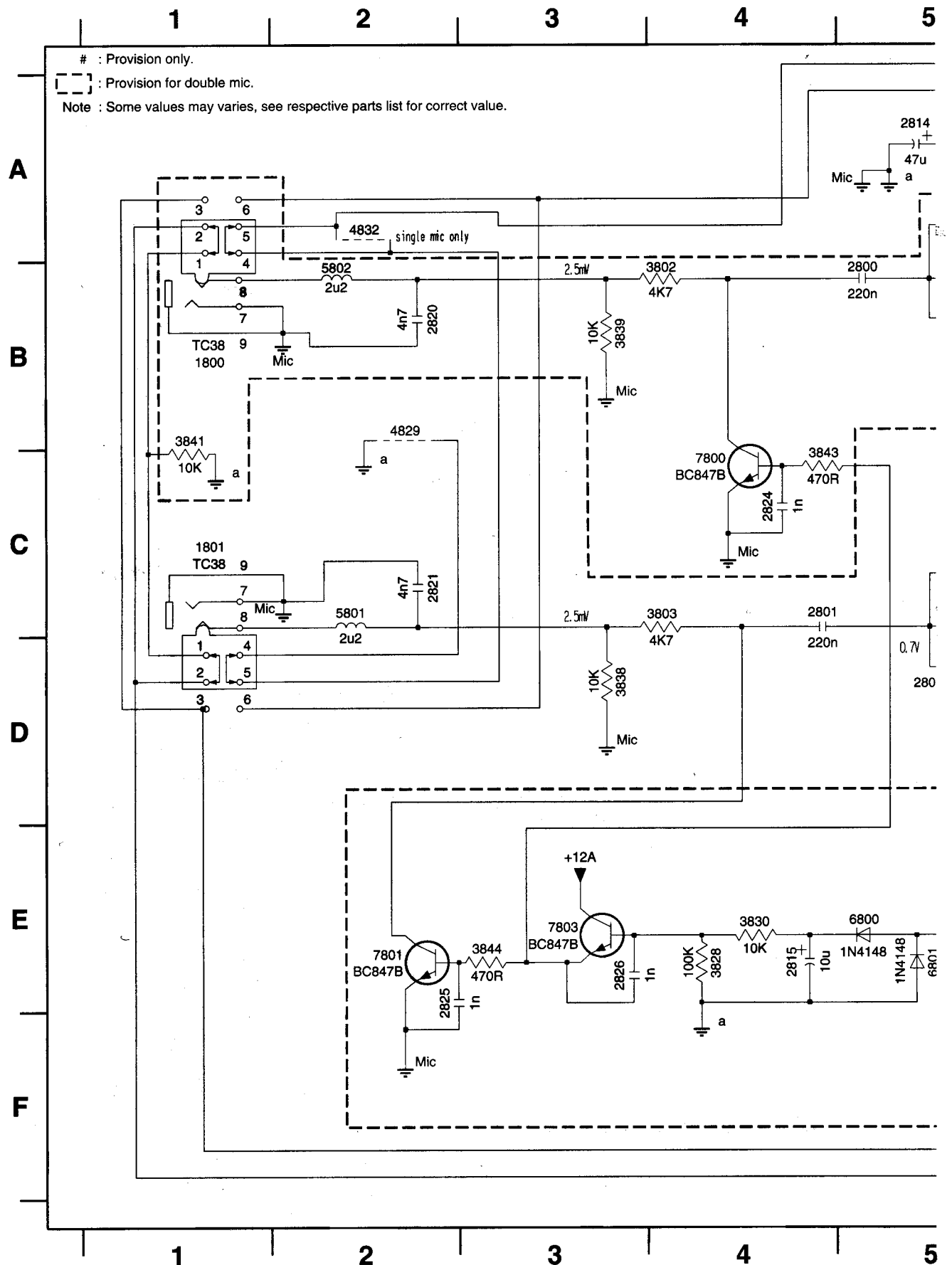


STANDBY LED PART - CIRCUIT DIAGRAM



KARAOKE PART - CIRCUIT DIAGRAM

0029 C9	1810 E9	2803 C6	2807 C7	2811 D6	2815 E4	2819 E5	2823 F7	2827 A8	3803 C4	3807 C5	3811 C6	381
1800 B1	2800 B5	2804 B6	2808 B5	2812 E6	2816 E7	2820 B2	2824 C4	2828 D8	3804 A5	3808 B5	3812 A7	381
1801 C1	2801 C4	2805 C6	2809 D5	2813 E7	2817 F9	2821 C2	2825 E2	2829 E9	3805 C5	3809 D5	3813 C7	381
1804 B9	2802 A6	2806 A7	2810 B6	2814 A5	2818 E8	2822 F6	2826 E3	3802 B4	3806 A5	3810 A6	3814 A7	382





1400	482226511182	Flex Connector 23P
1402	482226511531	Flex Connector 9P
1404	482226710953	Flex Connector 7P
1409	482227310366	Rotary Encoder 24P
1410	482227310365	Rotary Encoder 24P
1411	482224272066	Ceramic Resonator
1412	242254301069	RES XTL 32kHz768
1415	313911052230	FTD Display
1444	482227613775	Tact Switch
1445	482227613775	Tact Switch
1447	482227613775	Tact Switch
1448	482227613775	Tact Switch
1450	482227613775	Tact Switch
1451	482227613775	Tact Switch
1452	482227613775	Tact Switch
1453	482227613775	Tact Switch
1454	482227613775	Tact Switch
1455	482227613775	Tact Switch
1456	482227613775	Tact Switch
1457	482227613775	Tact Switch
1458	482227613775	Tact Switch
1459	482227613775	Tact Switch
1460	482227613775	Tact Switch
1461	482227613775	Tact Switch
1462	482227613775	Tact Switch
1463	482227613775	Tact Switch
1464	482227613775	Tact Switch
1480	482226511531	Flex Connector 9P
1481	482227613775	Tact Switch
1482	482227613775	Tact Switch
1483	482227613775	Tact Switch
1484	482227613775	Tact Switch
1485	482227613775	Tact Switch

2400	532212232448	10pF 5% 63V
2401	532212232448	10pF 5% 63V
2402	532212232448	10pF 5% 63V
2404	482212613692	47pF 1% 63V
2405	482212613692	47pF 1% 63V
2406	482212613692	47pF 1% 63V
2407	482212613692	47pF 1% 63V
2412	482212613692	47pF 1% 63V
2413	482212613692	47pF 1% 63V
2414	482212613692	47pF 1% 63V
2415	532212232448	10pF 5% 63V
2416	532212232448	10pF 5% 63V
2417	482212613486	15pF 2% 63V
2418	482212613486	15pF 2% 63V
2419	532212232659	33pF 5% 50V
2420	532212232659	33pF 5% 50V
2421	532212232448	10pF 5% 63V

RESISTORS

3397	482211713577	330R 1% 1,25W
3400	482205110102	1k 2% 0,25W
3401	482211710833	10k 1% 0,1W
3402	482205110102	1k 2% 0,25W
3403	482211710833	10k 1% 0,1W
3404	482211711504	270R 1% 0,1W

ELECTRICAL PARTS LIST - FRONT BOARD

3405	482211710833	10k 1% 0,1W	3457	482205110102	1k 2% 0,25W
3406	482205110102	1k 2% 0,25W	3458	482205110102	1k 2% 0,25W
3407	482205110102	1k 2% 0,25W	3459	482205110102	1k 2% 0,25W
3408	482211710833	10k 1% 0,1W	3460	482205110102	1k 2% 0,25W
3409	482205120471	470R 5% 0,1W	3461	482205110102	1k 2% 0,25W
3410	482205110102	1k 2% 0,25W	3462	482205110102	1k 2% 0,25W
3411	482205110102	1k 2% 0,25W	3463	482205110102	1k 2% 0,25W
3412	482205110102	1k 2% 0,25W	3464	482205110102	1k 2% 0,25W
3413	482205110102	1k 2% 0,25W	3465	482205110102	1k 2% 0,25W
3414	482205110102	1k 2% 0,25W	3466	482205110102	1k 2% 0,25W
3415	482205110102	1k 2% 0,25W	3467	482211711503	220R 1% 0,1W
3416	482211711449	2k2 1% 0,1W	3468	482205120105	1M 5% 0,1W
3417	482205120471	470R 5% 0,1W	3469	482211710833	10k 1% 0,1W
3418	482205120471	470R 5% 0,1W	3470	482211710833	10k 1% 0,1W
3419	482205110102	1k 2% 0,25W	3471	482211711449	2k2 1% 0,1W
3420	482205110102	1k 2% 0,25W	3472	482211710833	10k 1% 0,1W
3421	482205110102	1k 2% 0,25W	3473	482211710833	10k 1% 0,1W
3422	482205110102	1k 2% 0,25W	3474	482211652175	100R 5% 0,5W
3423	482205120101	100R 5% 0,1W	3475	482211652175	100R 5% 0,5W
3424	482205120101	100R 5% 0,1W	3476	482211710837	100k 1% 0,1W
3425	482205120101	100R 5% 0,1W	3480	482205110102	1k 2% 0,25W
3426	482205120101	100R 5% 0,1W	3481	482205110102	1k 2% 0,25W
3427	482205110102	1k 2% 0,25W	3482	482205110102	1k 2% 0,25W
3428	482205110102	1k 2% 0,25W	3483	482205110102	1k 2% 0,25W
3429	482205120101	100R 5% 0,1W	3484	482211710833	10k 1% 0,1W
3430	482205120101	100R 5% 0,1W	3485	482211710833	10k 1% 0,1W
3431	482205120101	100R 5% 0,1W	3486	482205021003	10k 1% 0,6W
3432	482205120101	100R 5% 0,1W	3490	482211710833	10k 1% 0,1W
3433	482205120101	100R 5% 0,1W	3492	482211710833	10k 1% 0,1W
3434	482205120101	100R 5% 0,1W	3493	482211710833	10k 1% 0,1W
3435	482205120101	100R 5% 0,1W	3494	482211710833	10k 1% 0,1W
3436	482205120101	100R 5% 0,1W	3497	482205120101	100R 5% 0,1W
3437	482205110102	1k 2% 0,25W	3498	482211710833	10k 1% 0,1W
3438	482205110102	1k 2% 0,25W	3499	482205110102	1k 2% 0,25W
3439	482205110102	1k 2% 0,25W	3500	482205110102	1k 2% 0,25W
3440	482205110102	1k 2% 0,25W	3501	482211710837	100k 1% 0,1W
3441	482205110102	1k 2% 0,25W	3503	482205110102	1k 2% 0,25W
3442	482205110102	1k 2% 0,25W	3504	482205120471	470R 5% 0,1W
3443	482205110102	1k 2% 0,25W	3505	482205120471	470R 5% 0,1W
3444	482205110102	1k 2% 0,25W	3507	482211711503	220R 1% 0,1W
3445	482205110102	1k 2% 0,25W	3509	482211711503	220R 1% 0,1W
3446	482205110102	1k 2% 0,25W	3510	482211711503	220R 1% 0,1W
3447	482205110102	1k 2% 0,25W	3511	482211652298	680k 5% 0,5W
3448	482205110102	1k 2% 0,25W	3512	482205120471	470R 5% 0,1W
3449	482205110102	1k 2% 0,25W	3513	482205120471	470R 5% 0,1W
3450	482205110102	1k 2% 0,25W	3514	482211713577	330R 1% 1,25W
3451	482205110102	1k 2% 0,25W	3516	482211711503	220R 1% 0,1W
3452	482205110102	1k 2% 0,25W	3517	482211652213	180R 5% 0,5W
3453	482205110102	1k 2% 0,25W	3518	482211652213	180R 5% 0,5W
3454	482205110102	1k 2% 0,25W	3519	482211652213	180R 5% 0,5W
3455	482205110102	1k 2% 0,25W	3520	482211652213	180R 5% 0,5W
3456	482205110102	1k 2% 0,25W	3521	482211652213	180R 5% 0,5W

ELECTRICAL PARTS LIST - FRONT BOARD**RESISTORS**

3522	482211652213	180R 5% 0,5W	4421	482205120008	0R Jumper 0805
3523	482211710833	10k 1% 0,1W	4422	482205120008	0R Jumper 0805
3535	482211713577	330R 1% 1,25W	4423	482205120008	0R Jumper 0805
3536	482211713577	330R 1% 1,25W	4424	482205120008	0R Jumper 0805
3537	482211713577	330R 1% 1,25W	4425	482205120008	0R Jumper 0805
3538	482211713577	330R 1% 1,25W	4426	482205120008	0R Jumper 0805
3539	482211713577	330R 1% 1,25W	4427	482205120008	0R Jumper 0805
3540	482211713577	330R 1% 1,25W	4428	482205120008	0R Jumper 0805
3541	482211713577	330R 1% 1,25W	4429	482205120008	0R Jumper 0805
3542	482211713577	330R 1% 1,25W	4430	482205120008	0R Jumper 0805
3543	482211713577	330R 1% 1,25W	4431	482205120008	0R Jumper 0805
3544	482205120474	470k 5% 0,1W	4432	482205120008	0R Jumper 0805
3545	482205120474	470k 5% 0,1W	4433	482205120008	0R Jumper 0805
3546	482205120474	470k 5% 0,1W	4434	482205120008	0R Jumper 0805
3547	482205120474	470k 5% 0,1W	4435	482205120008	0R Jumper 0805
3548	482211711139	1k5 1% 0,1W	4436	482205120008	0R Jumper 0805
3549	482205120684	680k 5% 0,1W	4437	482205120008	0R Jumper 0805
3550	482211710834	47k 1% 0,1W	4438	482205120008	0R Jumper 0805
3551	482205120474	470k 5% 0,1W	4439	482205120008	0R Jumper 0805
3552	482211711139	1k5 1% 0,1W	4440	482205120008	0R Jumper 0805
3553	482205120684	680k 5% 0,1W	4441	482205120008	0R Jumper 0805
3554	482211710834	47k 1% 0,1W	4442	482205120008	0R Jumper 0805
3555	482205120474	470k 5% 0,1W	4443	482205120008	0R Jumper 0805
3556	482211711139	1k5 1% 0,1W	4445	482205120008	0R Jumper 0805
3557	482205120684	680k 5% 0,1W	4446	482205120008	0R Jumper 0805
3558	482211710834	47k 1% 0,1W	4447	482205120008	0R Jumper 0805
3559	482205120474	470k 5% 0,1W	4448	482205120008	0R Jumper 0805
3560	482211681154	2R2 5% 0,5W	4449	482205120008	0R Jumper 0805
3561	482211681154	2R2 5% 0,5W	4450	482205120008	0R Jumper 0805
3566	482211711503	220R 1% 0,1W	4451	482205120008	0R Jumper 0805
3567	482211711503	220R 1% 0,1W	4452	482205120008	0R Jumper 0805
3568	482211711503	220R 1% 0,1W	4453	482205120008	0R Jumper 0805
3570	482211711149	82k 1% 0,1W	4454	482205120008	0R Jumper 0805
3571	482211711149	82k 1% 0,1W	4455	482205120008	0R Jumper 0805
3572	482211711149	82k 1% 0,1W	4456	482205120008	0R Jumper 0805
3575	482211711149	82k 1% 0,1W	4457	482205120008	0R Jumper 0805
3576	482205110102	1k 2% 0,25W	4458	482205120008	0R Jumper 0805
3577	482211711504	270R 1% 0,1W	4459	482205120008	0R Jumper 0805
3578	482211710833	10k 1% 0,1W	4460	482205120008	0R Jumper 0805
3590	482211710833	10k 1% 0,1W	4461	482205120008	0R Jumper 0805
3592	482205021003	10k 1% 0,6W	4462	482205120008	0R Jumper 0805
3593	482205110102	1k 2% 0,25W	4463	482205120008	0R Jumper 0805
3600	482211711504	270R 1% 0,1W	4464	482205120008	0R Jumper 0805
3601	482211711504	270R 1% 0,1W	4465	482205120008	0R Jumper 0805
3602	482211711504	270R 1% 0,1W	4466	482205120008	0R Jumper 0805
3660	482211711503	220R 1% 0,1W	4467	482205120008	0R Jumper 0805
3661	482211711503	220R 1% 0,1W	4468	482205120008	0R Jumper 0805
4400	482205120008	0R Jumper 0805	4469	482205120008	0R Jumper 0805
4401	482205120008	0R Jumper 0805	4471	482205120008	0R Jumper 0805
4402	482205120008	0R Jumper 0805	4473	482205120008	0R Jumper 0805
4403	482205120008	0R Jumper 0805	4474	482205120008	0R Jumper 0805
4420	482205120008	0R Jumper 0805	4475	482205120008	0R Jumper 0805

ELECTRICAL PARTS LIST - FRONT BOARD**RESISTORS**

4476	482205120008	0R Jumper 0805
4477	482205120008	0R Jumper 0805
4478	482205120008	0R Jumper 0805
4479	482205120008	0R Jumper 0805
4480	482205120008	0R Jumper 0805
4481	482205120008	0R Jumper 0805
4482	482205120008	0R Jumper 0805
4484	482205120008	0R Jumper 0805
4485	482205120008	0R Jumper 0805
4490	482205120008	0R Jumper 0805
4492	482205120008	0R Jumper 0805
4493	482205120008	0R Jumper 0805
4494	482205120008	0R Jumper 0805
4495	482205120008	0R Jumper 0805
4496	482205120008	0R Jumper 0805
4497	482205120008	0R Jumper 0805
4600	482205120008	0R Jumper 0805
4601	482205120008	0R Jumper 0805
4602	482205120008	0R Jumper 0805
4603	482205120008	0R Jumper 0805

COILS & FILTERS

5400	482215762552	Coil 2,2μH 5%
5401	482215762552	Coil 2,2μH 5%

DIODES

6400	482213031878	1N4003G
6402	482213011589	LTL-1CHAE
6403	482213011589	LTL-1CHAE
6404	482213011589	LTL-1CHAE
6405	482213011589	LTL-1CHAE
6406	482213011589	LTL-1CHAE
6407	482213011589	LTL-1CHAE
6408	482213011589	LTL-1CHAE
6409	482213011589	LTL-1CHAE
6410	482213011589	LTL-1CHAE
6411	482213011589	LTL-1CHAE
6461	482213030621	1N4148
6462	482213030621	1N4148
6463	482213030621	1N4148
6464	482213030621	1N4148
6465	482213030621	1N4148
6467	482213030621	1N4148
6468	482213030621	1N4148
6469	482213030621	1N4148
6470	482213030621	1N4148
6471	482213030621	1N4148
6472	482213030621	1N4148
6473	482213030621	1N4148
6474	482213030621	1N4148
6475	482213030621	1N4148
6476	482213030621	1N4148

6480	482213030621	1N4148
6482	482213030621	1N4148
6484	482213030621	1N4148
6485	482213031878	1N4003G
6486	482213030621	1N4148
6500	482213011589	LTL-1CHAE
6501	482213011589	LTL-1CHAE
6502	482213011589	LTL-1CHAE

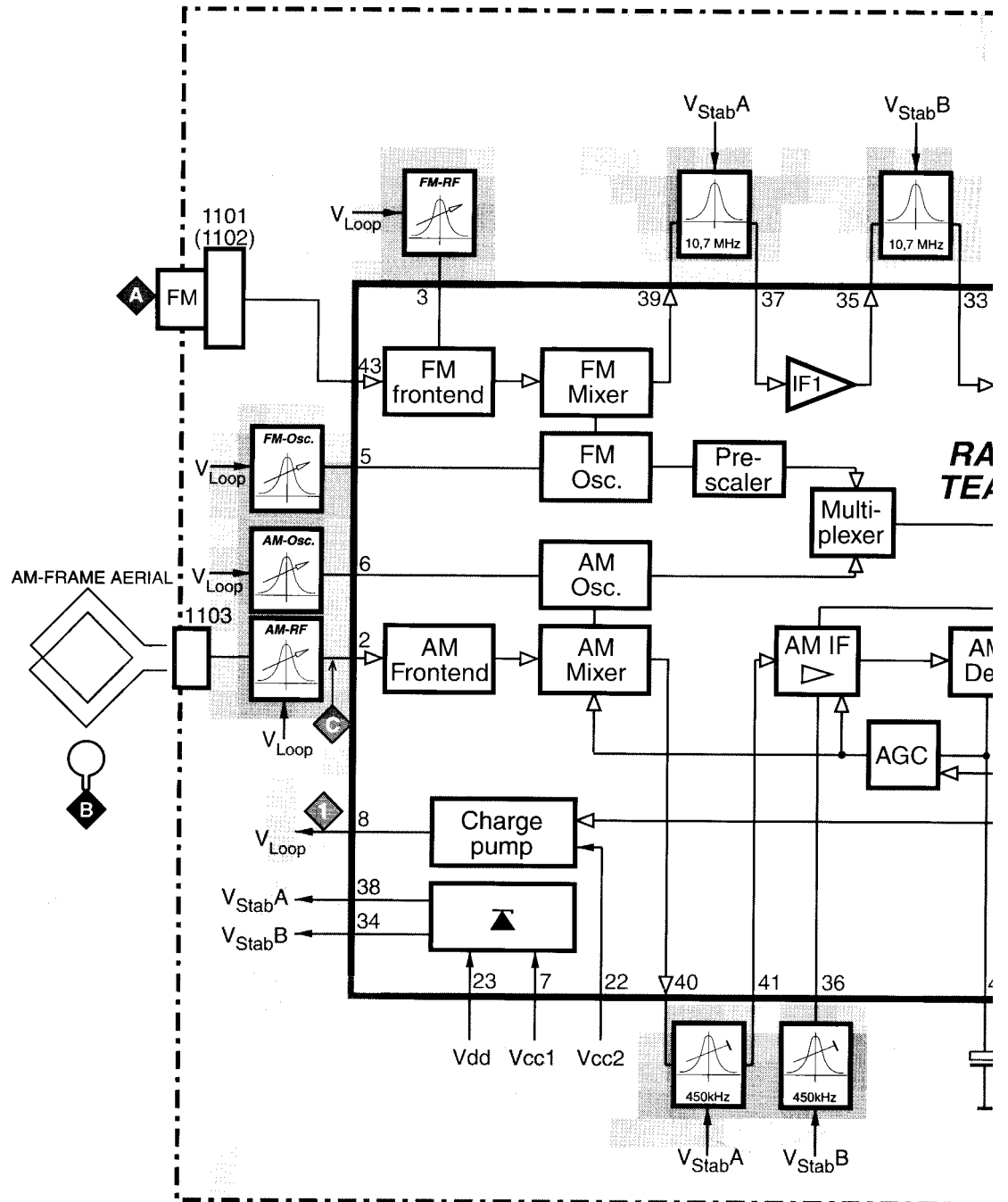
TRANSISTORS & INTEGRATED CIRCUITS

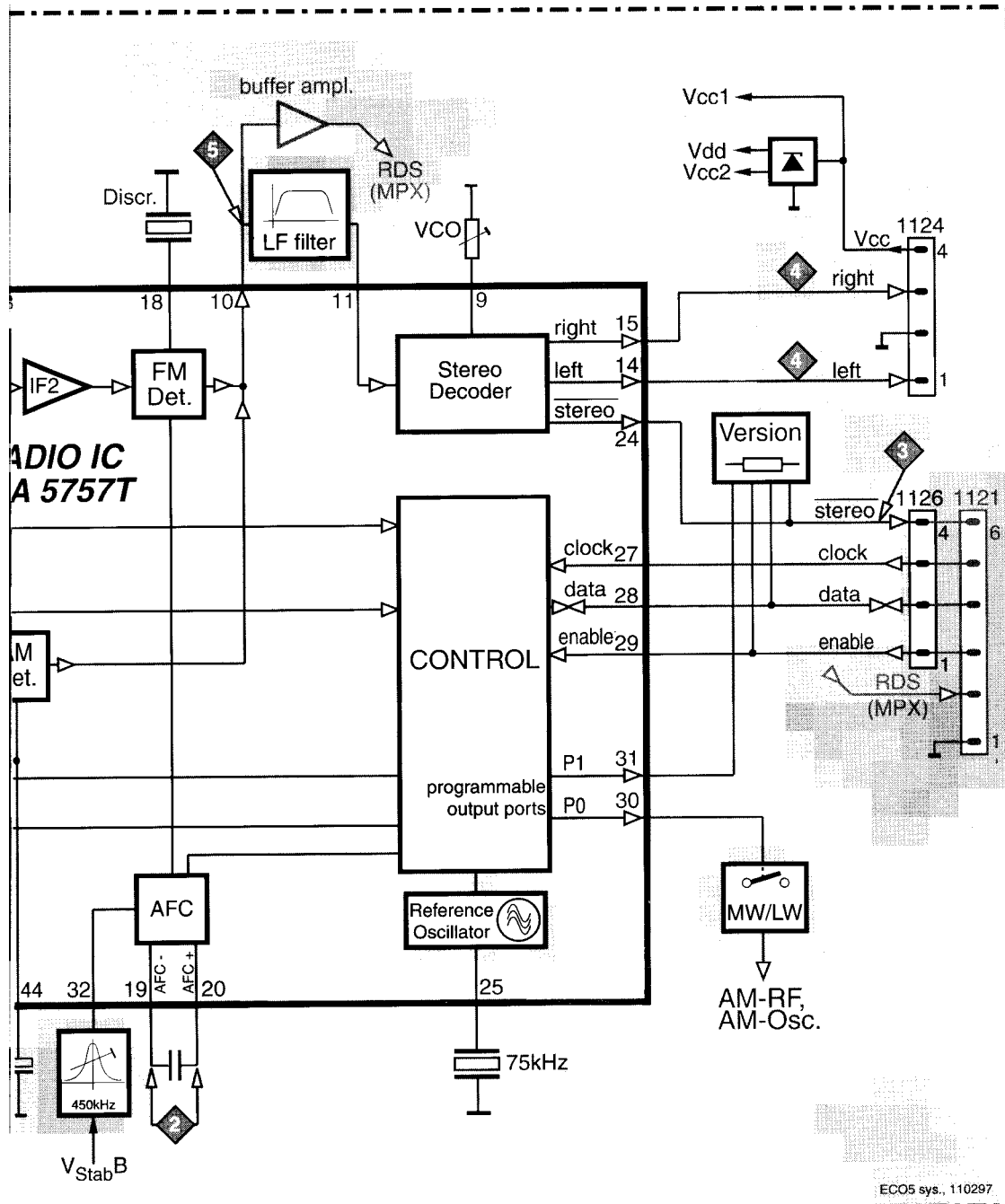
7400	313911052200	TMP87CS71F - 'P78S52201'
7402	932214319682	M24C01-WBN6
7404	482213010165	GR1U28XP
7405	482220915449	74HC4094D
7406	482220915449	74HC4094D
7420	482213060511	BC847B
7421	482213060511	BC847B
7422	482213060511	BC847B
7425	482213060511	BC847B
7426	482213060511	BC847B
7427	482213060511	BC847B

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

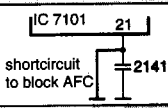
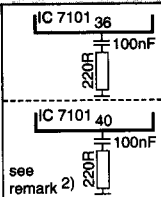
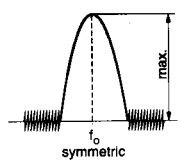
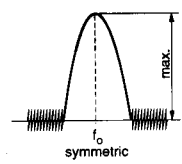
BLOCKDIAGRAM

TUNER BOARD **ECO 5 systems**





TUNER ADJUSTMENT TABLE (ECO5 FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V $\pm$ 0.2V
			87.5MHz (65.81MHz)	check		4.3V $\pm$ 0.5V (1.2V $\pm$ 0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V $\pm$ 0.2V
			530kHz	check		1.1V $\pm$ 0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V $\pm$ 0.2V
			531kHz	check		1.1V $\pm$ 0.4V
LW			279kHz	5122		8V $\pm$ 0.2V
			153kHz	check		1.1V $\pm$ 0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V $\pm$ 0.2V
			531kHz	check		1.1V $\pm$ 0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F		5119	2	0 $\pm$ 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz $\Delta f = \pm 22.5$ kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz $\pm$ 1kHz ¹⁾
AM IF						
MW	450kHz	C		5111	4	
	connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	$\Delta f = \pm 15$ kHz $V_{RF} = 3$ mV		5112		
AM AFC MW		C		5114	2	0 $\pm$ 2 mV DC
		continuous wave $V_{RF} = 10$ mV				
AM RF ³⁾						
MW ⁴⁾ FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	4	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz	$\Delta f = \pm 30$ kHz V_{RF} as low as possible	560kHz	5102		

ECO5, diacr. coil, 090797

Use service test program. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

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

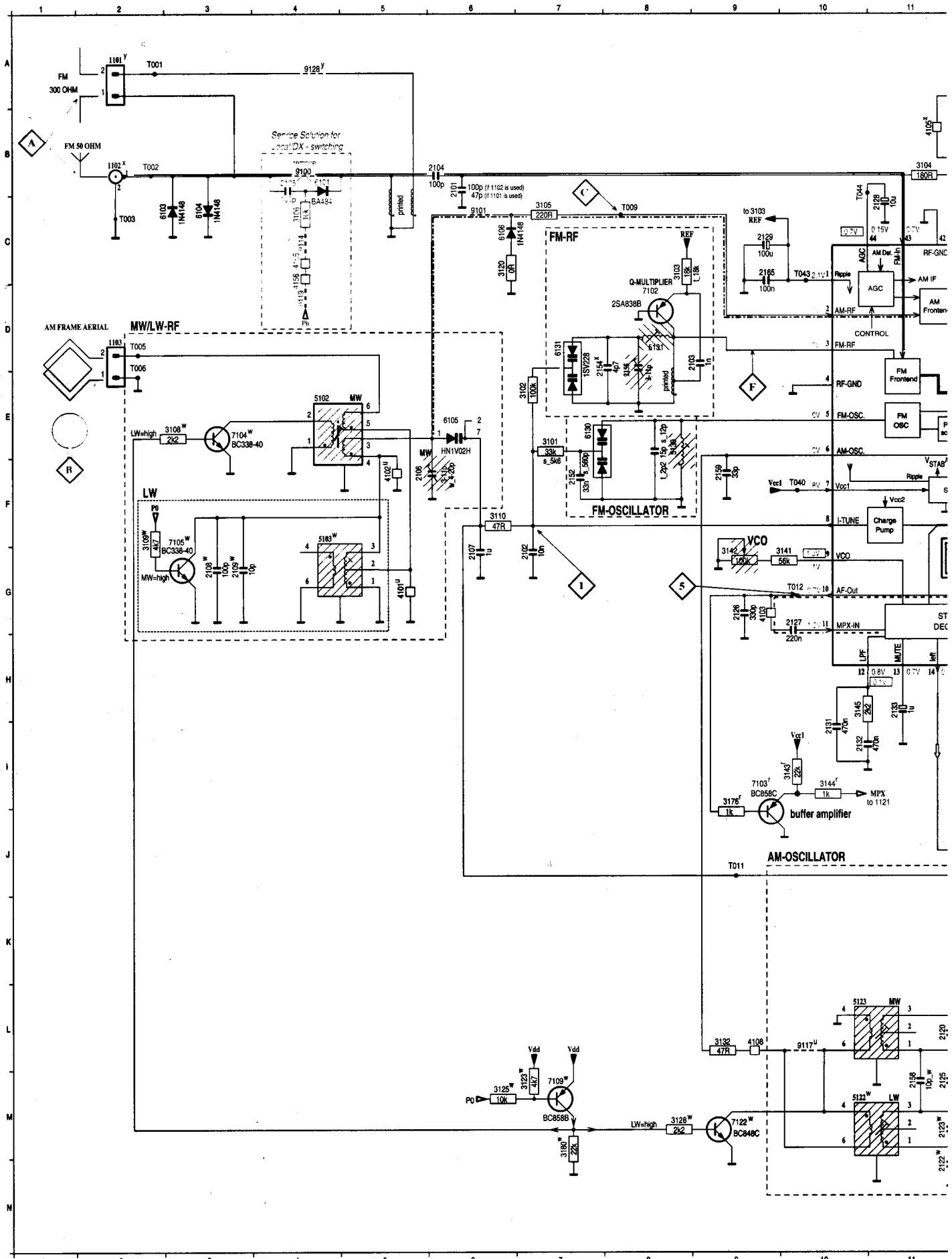
²⁾ RC network serves for damping the IF-filter while adjusting the other one.

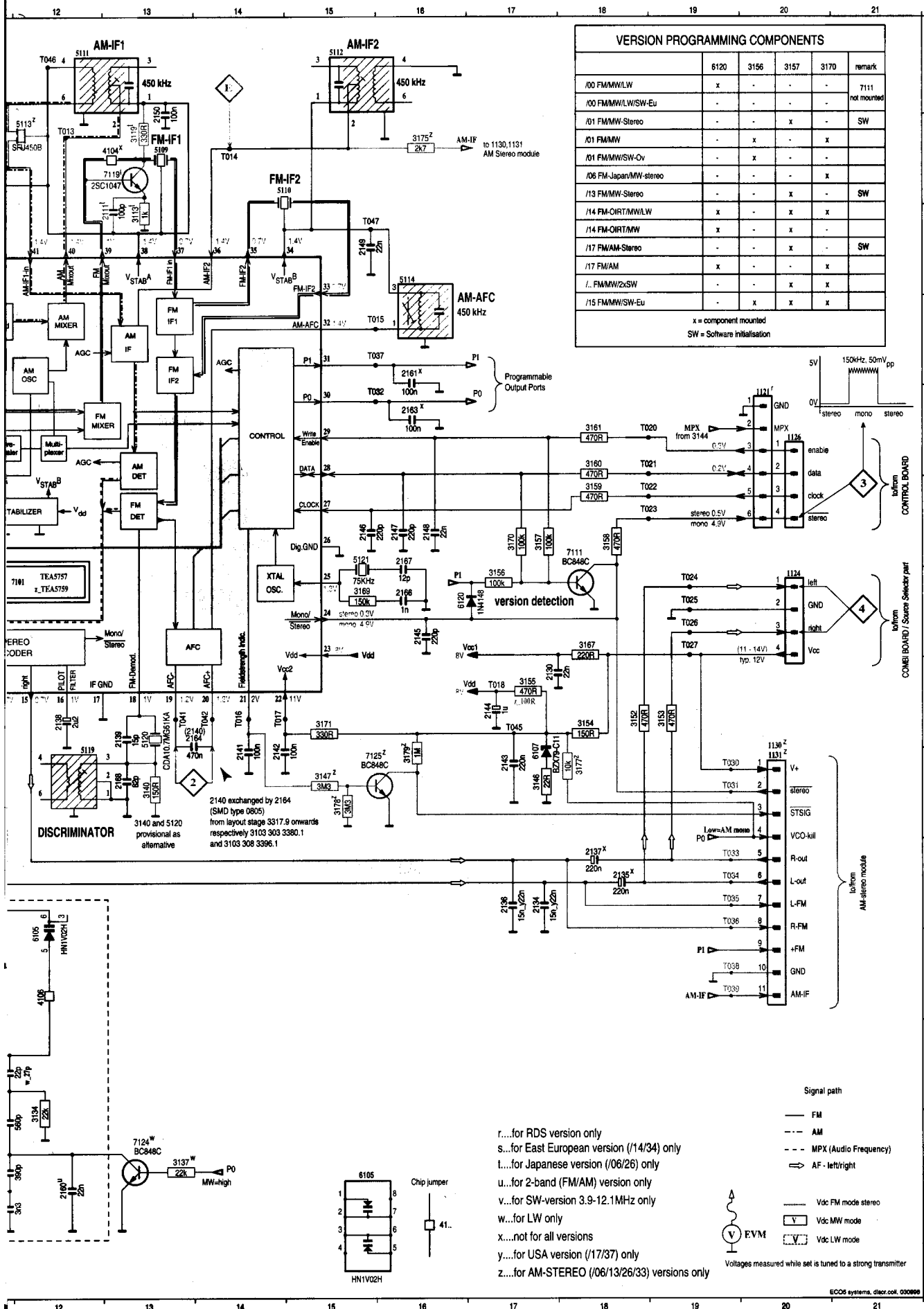
³⁾ For AM RF adjustments the original frame antenna has to be used !

⁴⁾ MW has to be aligned before LW.

↑ Repeat

TUNER BOARD ECO5 / Systems





1101 A 1
1102 B 2
1103 D 2
1121 E20
1124 G20
1126 E20
1130 D20
1131 D20
2101 C 6
2102 G 7
2103 D 9
2104 B 6
2106 F 5
2107 G 6
2108 G 3
2109 G 3
2111 C13
2120 L11
2122 N11
2123 M11
2125 M11
2126 G 9
2127 G10
2128 C11
2130 H17
2131 H10
2132 H10
2133 H11
2134 J17
2135 J18
2136 J17
2137 J18
2138 H12
2139 H13
2140 H14
2141 H14
2142 H14
2143 H17
2144 H17
2145 G16
2146 F16
2147 F16
2148 F16
2149 G15
2150 B13
2152 F 7
2153 E 8
2154 E 7
2155 D 9
2156 M11
2159 F 9
2160 M12
2161 D16
2163 E18
2164 H14
2165 C 9
2166 G18
2167 F16
2168 H13
3101 E 7
3102 E 7
3103 C 8
3104 B11
3105 C 7
3106 E 3
3108 F 2
3110 F 6
3113 C13
3118 B13
3120 C 7
3123 M 7
3125 M 6
3126 M 8
3132 L 9
3134 M12
3137 M13
3140 H13
3141 G10
3142 G 9
3143 H10
3144 H10
3145 H10
3146 H17
3147 H15
3152 H18
3153 H19
3154 H18
3155 H17
3156 G17
3157 F17
3158 F18
3159 F18
3160 E18
3161 E18
3167 G18
3168 G15
3170 F17
3171 H15
3175 B16
3176 J 9
3177 H18
3178 H15
3179 H15
3180 M7
4101 G 5
4102 F 5
4103 G 9
4104 B13
4105 B11
4106 K12
4108 L 9
5102 E 4
5103 F 4
5109 B13
5110 B14
5111 A13
5112 A15
5113 B12
5114 C16
5119 I12
5120 H13
5121 F15
5122 M11
5123 L11
5130 E 7
6103 C 2
6104 C 3
6105 K12
6106 E 6
6106 C 6
6107 H17
6120 G18
6130 E 7
6131 D 7
7101 G11
7102 D 7
7103 J 9
7104 E 3
7105 F 2
7109 M 7
7111 F18
7119 B13
7122 M 9
7124 M13
7125 H6
8105 E 4
9101 C 6
9117 L10
9128 A 4

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD**MISCELLANEOUS**

1101	4822 267 31505	Antenna Socket 300R	
1102	4822 267 10283	Antenna Socket Coax IEC 75R	

CAPACITORS

2101	5322 122 32531	100pF 5% 50V	
2101	4822 126 13692	47pF 1% 63V	for USA
2102	4822 122 33177	10nF 20% 50V	
2103	5322 122 34123	1nF 10% 50V	
2104	4822 122 33195	100pF 10% 50V	
2106	4822 125 50355	Trimmer 4-20pF	for LW version
2106	4822 125 60101	Trimmer 3-11pF 100V	
2107	4822 121 51319	1μF 10% 63V	
2108	5322 122 32531	100pF 5% 50V	for LW version
2109	5322 122 32448	10pF 5% 50V	for LW version
2120	4822 126 13691	27pF 1% 63V	for LW version
2120	5322 122 32658	22pF 5% 50V	
2122	4822 122 33891	3,3nF 10% 63V	for LW version
2125	4822 121 51381	560pF 5% 400V	
2126	5322 122 31863	330pF 5% 50V	
2127	4822 126 13473	220nF +80/-20% 50V	
2128	4822 124 41579	10μF 20% 50V	
2129	4822 124 41584	100μF 20% 10V	
2130	4822 126 11585	22nF+80/- 20% 25V	
2131	4822 122 33325	470nF 16V	
2132	4822 122 33325	470nF 16V	
2131	4822 126 13482	470nF +80/- 20% 16V	
2132	4822 126 13482	470nF +80/- 20% 16V	
2133	4822 124 40242	1μF 20% 63V	
2134	4822 126 13188	15nF 5% 63V	
2134	5322 122 32654	22nF 10% 63V	for USA
2135	4822 124 40746	0,22μF 20% 63V	
2136	4822 126 13188	15nF 5% 63V	
2136	5322 122 32654	22nF 10% 63V	for USA
2137	4822 124 40746	0,22μF 20% 63V	
2138	4822 124 41576	2,2μF 20% 50V	
2139	4822 126 14236	50V 15pF 5%	
2140	4822 121 51252	470nF 5% 63V	
2141	4822 126 10002	100nF 20% 25V	
2142	4822 126 10002	100nF 20% 25V	
2143	4822 126 13473	220nF +80/-20% 50V	
2144	4822 124 40242	1μF 20% 63V	
2145	4822 122 33575	220pF 5% 50V	
2146	4822 122 33575	220pF 5% 50V	
2147	4822 122 33575	220pF 5% 50V	
2148	4822 126 11585	22nF+80/- 20% 25V	
2149	5322 122 32654	22nF 10% 63V	
2150	4822 122 31947	100nF 20% 63V	
2152	5322 116 80853	560pF 5% 63V	for East. Europe
2152	4822 126 12105	33nF 5% 63V	
2153	4822 122 32139	12pF 2% 63V	for East. Europe
2153	4822 122 32504	15pF 2% 63V	
2155	4822 125 60101	Trimmer 3-11pF 100V	

2158	5322 122 32448	10pF 5% 50V	for LW version
2159	5322 122 32659	33pF 5% 50V	
2160	5322 122 32654	22nF 10% 63V	
2161	4822 126 10002	100nF 20% 25V	
2163	4822 126 10002	100nF 20% 25V	
2164	4822 126 13482	470nF +80/- 20% 16V	
2165	4822 126 10002	100nF 20% 25V	
2166	5322 122 34123	1nF 10% 50V	
2167	4822 122 32139	12pF 2% 63V	
2168	4822 126 13695	82pF 1% 63V	

RESISTORS

3101	4822 051 20562	5k6 5% 0,1W	for East. Europe
3101	4822 051 20333	33k 5% 0,1W	
3102	4822 051 20104	100k 5% 0,1W	
3103	4822 117 10965	18k 1% 0,1W	
3104	4822 117 11448	180R 1% 0,1W	
3105	4822 116 83872	220R 5% 0,5W	
3108	4822 117 11449	2k2 1% 0,1W	for LW version
3109	4822 051 20472	4k7 5% 0,1W	for LW version
3110	4822 116 52195	47R 5% 0,5W	
3120	4822 051 20008	0R Jumper 0805	
3123	4822 051 20472	4k7 5% 0,1W	for LW version
3125	4822 117 10833	10k 1% 0,1W	for LW version
3128	4822 117 11449	2k2 1% 0,1W	for LW version
3132	4822 116 52195	47R 5% 0,5W	
3134	4822 051 20223	22k 5% 0,1W	
3137	4822 051 20223	22k 5% 0,1W	for LW version
3140	4822 051 20008	0R Jumper 0805	
		5120=CDA10.7MG40K	
3140	4822 117 10353	150R 1% 0,1W	
		5120=CDA10.7MG61KA	
3141	4822 051 20563	56k 5% 0,1W	
3142	4822 100 11163	Trimmer 100k 30% 0,1W	
3143	4822 051 20223	22k 5% 0,1W	for RDS version
3144	4822 051 10102	1k 2% 0,25W	for RDS version
3145	4822 117 11449	2k2 1% 0,1W	
3146	4822 051 20229	22R 5% 0,1W	
3152	4822 116 83883	470R 5% 0,5W	
3153	4822 051 20471	470R 5% 0,1W	
3154	4822 116 83868	150R 5% 0,5W	
3155	4822 051 20471	470R 5% 0,1W	
3156	4822 051 20104	100k 5% 0,1W	for /21/30/33 only
3157	4822 116 52234	100k 5% 0,5W	for East. Europe
3158	4822 116 83883	470R 5% 0,5W	
3159	4822 116 83883	470R 5% 0,5W	
3160	4822 116 83883	470R 5% 0,5W	
3161	4822 116 83883	470R 5% 0,5W	
3167	4822 117 11503	220R 1% 0,1W	
3169	4822 051 20154	150k 5% 0,1W	
3170	4822 116 52234	100k 5% 0,5W	
3171	4822 116 52219	330R 5% 0,5W	

ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version	7102	4822 130 60093	2SA838B	
3180	4822 051 20223	22k 5% 0,1W	for LW version	7103	4822 130 42513	BC858C	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only	7104	5322 130 44779	BC338-40	for LW version
4102	4822 051 20008	0R Jumper 0805	for 2-Band only	7105	5322 130 44779	BC338-40	for LW version
4103	4822 051 20008	0R Jumper 0805		7109	5322 130 41983	BC858B	for LW version
4104	4822 051 20008	0R Jumper 0805		7111	5322 130 42136	BC848C	
4105	4822 051 20008	0R Jumper 0805		7122	5322 130 42136	BC848C	for LW version
4106	4822 051 20008	0R Jumper 0805		7124	5322 130 42136	BC848C	for LW version
4108	4822 051 20008	0R Jumper 0805					
4111	4822 051 20008	0R Jumper 0805		Note: Only the parts mentioned in this list are normal service spare parts.			
4120	4822 051 20008	0R Jumper 0805					
4150	4822 051 10008	0R Jumper 1206					
4151	4822 051 20008	0R Jumper 0805					
4152	4822 051 10008	0R Jumper 1206					
4153	4822 051 10008	0R Jumper 1206					
4154	4822 051 10008	0R Jumper 1206					
4155	4822 051 10008	0R Jumper 1206					
4156	4822 051 20008	0R Jumper 0805					
4157	4822 051 10008	0R Jumper 1206					
4158	4822 051 10008	0R Jumper 1206					
4159	4822 051 10008	0R Jumper 1206					
4162	4822 051 10008	0R Jumper 1206					

COILS & FILTERS

5102	4822 157 71634	MW RF Coil	
5103	4822 157 71635	LW RF Coil	for LW version
5109	4822 242 70665	Ceram Filter 10,7MHz	
5110	4822 242 70665	Ceram Filter 10,7MHz	
5111	4822 158 60511	AM-IF Filter 450kHz	
5112	4822 157 70302	AM-IF Filter 450kHz	
5114	4822 157 70302	AM-IF Filter 450kHz	
5119	4822 157 11443	Discriminator 10,7MHz	
5120	4822 242 82065	Cer. Disc. 10,7MG40K	
5120	4822 242 10251	Cer. Disc. 10,7MG61KA-TF21	
5121	4822 242 10261	Quartz 75kHz	
5122	4822 157 60517	Osc. Coil LW	for LW version
5123	4822 157 60517	Osc. Coil MW	
5130	4822 156 30947	RF-Coil 1.5T	
5131	4822 156 30947	RF-Coil 1.5T	

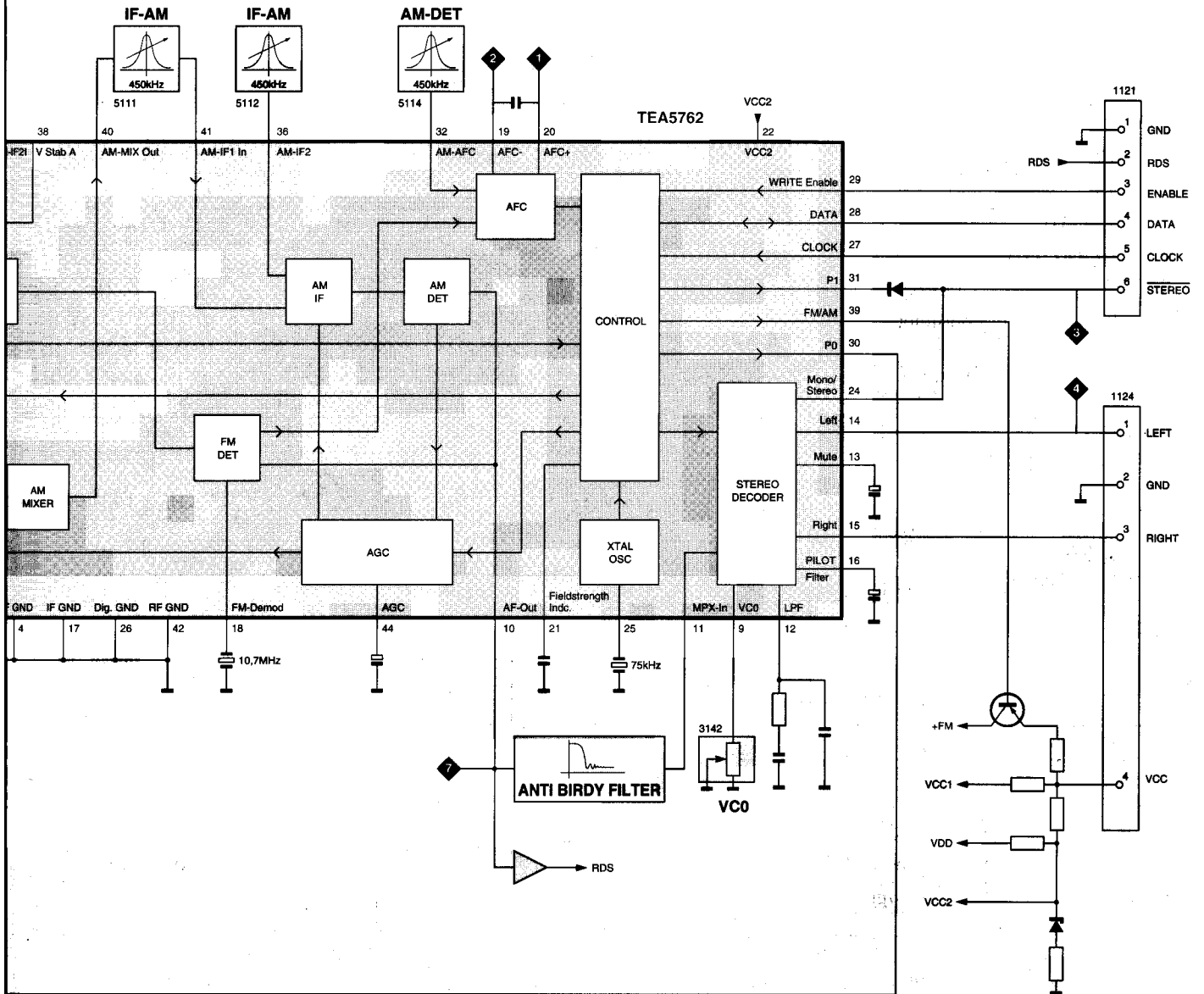
DIODES

6103	4822 130 30621	1N4148	
6104	4822 130 30621	1N4148	
6105	4822 130 83075	HN1V02H-B	
6106	4822 130 30621	1N4148	
6107	4822 130 34488	BZX79-B11	
6120	4822 130 30621	1N4148	not for /21/30/33
6130	4822 130 82833	1SV228	
6131	4822 130 82833	1SV228	

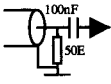
TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90924	TEA5757H/V1	
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TUNER 95 bis Adjustment Table (FM, MW, LW with Frame antenna)

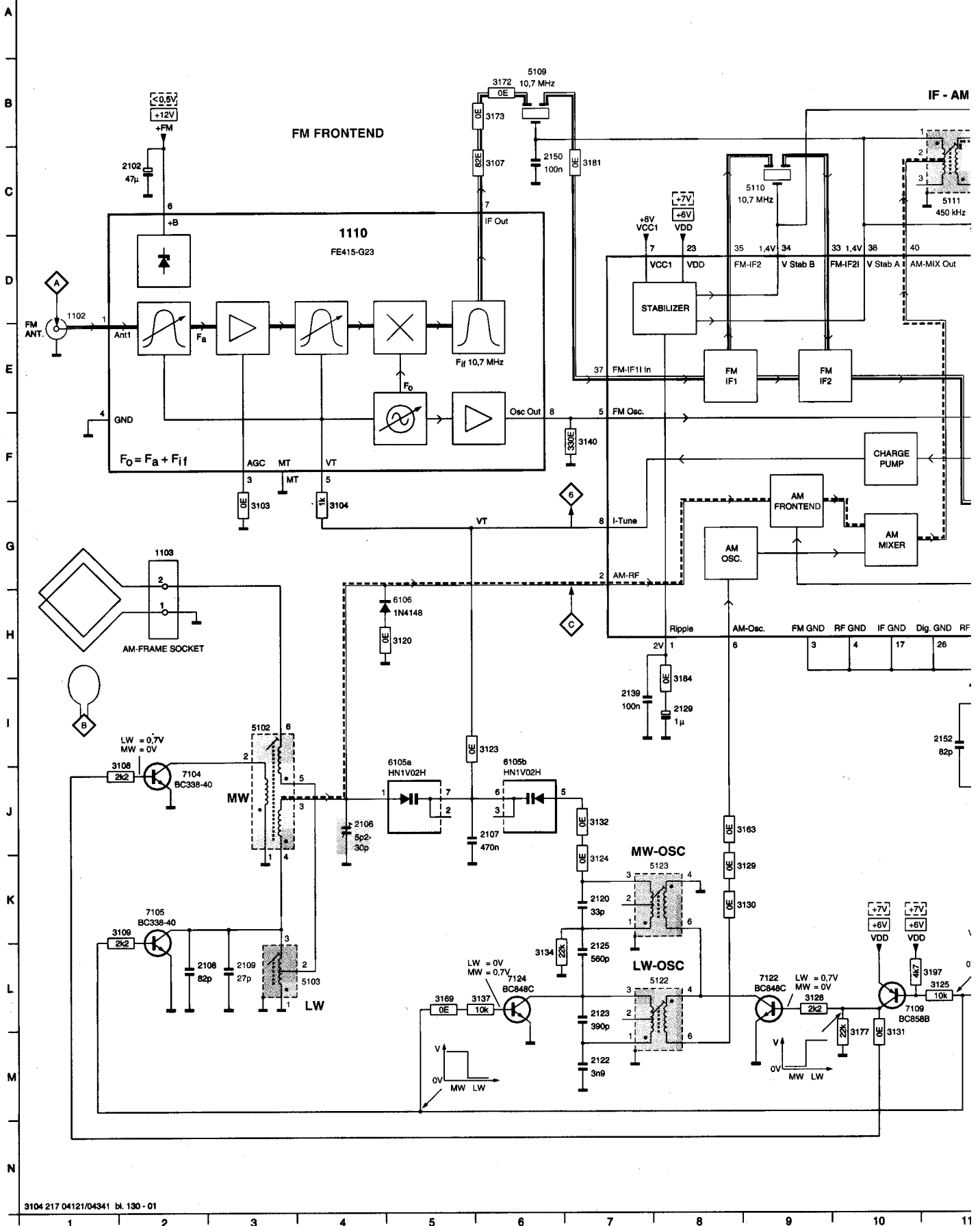
Waverange	Input frequency	Input	Set tuned to	Adjust	Output	Scope / Voltmeter
VARICAP ALIGNMENT						
FM (50)			108 MHz	check	6	7 ... 9V
87.5 - 108 MHz			87.5 MHz	check		1.3 ... 2V
MW (9)			1602 kHz	5123		8.3V ± 0.2V
531 - 1602 kHz			531 kHz	check		1V ± 0.4V
LW (3)			279 kHz	5122		8.3V ± 0.2V
153 - 279 kHz			153 kHz	check		1V ± 0.4V
FM - DETECTION						
FM	98 MHz 1mV continuous wave short pin 21 (IC7101) to ground	A	98 MHz	5107	1 2	0mV ± 3mV
FM - VCO						
FM	98 MHz 1 mV continuous wave	A	98 MHz	3142	3	152kHz ± 1 kHz
DISTORTION						
FM	98 MHz 1 mV 90 % L + 9 % pilot mod = 1kHz	A	98MHz	mixcoil inside Tuner 1110	4	Distortion minimum
AM - IF						
MW	450kHz Δf = 10kHz Low as possible Swept signal	 C	MW	5111	7	symmetrical and max. height
	5112					
	450kHz continuous wave			5114	1 2	0mV ± 2mV
AM - RF						
MW	558kHz Mod = 1kHz 30 % AM 1494 kHz	B *	558kHz	5102	7	MAX
			1494kHz	2106		
LW	198kHz mod = 1kHz 30 % AM		198kHz	5103		MAX

* Signal send via a frame antenna
(..) = tuning grid in kHz

adtable for 3104 217 04121/04341

1102	D1	1124	F21	2107	J6	2122	M7	2128	I13	2132	I17	2136	H19	2140	C14	2144	K20	2150	C6	2160	I15	3104	G4	3120	H5	3128	L9	3132	J7	31-
1103	G2	1126	E20	2108	L2	2123	L7	2129	I8	2133	G18	2137	G19	2141	H15	2145	E19	2151	H12	2161	I15	3107	C6	3123	I6	3129	K8	3134	L6	31-
1110	D4	2102	C2	2109	L3	2125	L7	2130	J20	2134	G19	2138	H18	2142	K19	2147	E19	2152	I11	2162	H20	3108	J1	3124	K7	3130	K8	3137	L5	31-
1121	C21	2106	J4	2120	K7	2127	H16	2131	I17	2135	F19	2139	I7	2143	K20	2148	E19	2158	L18	3103	G3	3109	K1	3125	L11	3131	M10	3140	F7	31-

TUNER 95 bis





ELECTRICAL PARTS LIST - TUNER 95 BOARD**MISCELLANEOUS**

1102	4822 267 10283	Socket Coaxial IEC 75R
1103	4822 265 31184	JST Connector 2 pin
1110	4822 210 10739	Frontend Assembly FE415-G23

CAPACITORS

2102	4822 124 40433	47μF 20% 25V
2106	4822 125 60102	Trimmer 5,2-30pF 100V
2107	4822 121 51252	470nF 5% 63V
2108	4822 126 13695	82pF 1% 63V
2109	4822 126 13691	27pF 1% 63V
2120	5322 122 32659	33pF 5% 50V
2122	5322 126 10465	3,9nF 10% 50V
2123	4822 121 10766	390pF 1% 630V
2125	4822 121 10578	560pF 1% 630V
2127	4822 122 32927	220nF +80/-20% 50V
2128	4822 124 41579	10μF 20% 50V
2129	4822 124 40242	1μF 20% 63V
2130	4822 126 11585	22nF +80/-20% 25V
2131	4822 122 33325	470nF 16V
2132	4822 122 33325	470nF 16V
2133	4822 124 40242	1μF 20% 63V
2134	4822 126 13188	15nF 5% 63V
2135	4822 122 32927	220nF +80/-20% 50V
2136	4822 126 13188	15nF 5% 63V
2137	4822 122 32927	220nF +80/-20% 50V
2138	4822 124 41576	2,2μF 20% 50V
2139	4822 126 10002	100nF 20% 25V
2140	4822 121 51252	470nF 5% 63V
2141	4822 122 31947	100nF 20% 63V
2142	4822 122 31947	100nF 20% 63V
2143	4822 122 32927	220nF +80/-20% 50V
2144	4822 124 40242	1μF 20% 63V
2145	4822 122 33575	220pF 5% 50V
2147	4822 122 33575	220pF 5% 50V
2148	4822 122 33809	22nF 20% 50V
2150	4822 122 31947	100nF 20% 63V
2151	4822 126 14236	15pF 5% 50V
2152	4822 126 13695	82pF 1% 63V
2158	4822 122 31947	100nF 20% 63V
2160	4822 122 32139	12pF 2% 63V
2161	5322 122 34123	1nF 10% 50V
2162	4822 124 81151	22μF 50V

RESISTORS

3103	4822 051 20008	0R Jumper 0805
3104	4822 051 10102	1k 2% 0,25W
3107	4822 051 20829	82R 5% 0,1W
3108	4822 117 11449	2k2 1% 0,1W
3109	4822 117 11449	2k2 1% 0,1W
3120	4822 051 20008	0R Jumper 0805
3123	4822 051 10008	0R Jumper 1206
3124	4822 051 10008	0R Jumper 1206

3125	4822 116 83864	10k 5% 0,5W
3128	4822 116 52256	2k2 5% 0,5W
3129	4822 051 20008	0R Jumper 0805
3130	4822 051 10008	0R Jumper 1206
3131	4822 051 10008	0R Jumper 1206
3132	4822 051 20008	0R Jumper 0805
3134	4822 051 20223	22k 5% 0,1W
3137	4822 117 10833	10k 1% 0,1W
3138	4822 051 20008	0R Jumper 0805
3139	4822 051 10008	0R Jumper 1206
3140	4822 051 20331	330R 5% 0,1W
3141	4822 117 11148	56k 1% 0,1W
3142	4822 100 11163	Trimmer 100k 30% 0,1W
3143	4822 051 20223	22k 5% 0,1W
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
3147	4822 051 10008	0R Jumper 1206
3150	4822 051 20472	4k7 5% 0,1W
3151	4822 051 20683	68k 5% 0,1W
3152	4822 051 20471	470R 5% 0,1W
3153	4822 051 20471	470R 5% 0,1W
3154	4822 116 83872	220R 5% 0,5W
3155	4822 116 52219	330R 5% 0,5W
3158	4822 116 83883	470R 5% 0,5W
3159	4822 116 83883	470R 5% 0,5W
3160	4822 116 83883	470R 5% 0,5W
3161	4822 116 83883	470R 5% 0,5W
3162	4822 117 13579	220k 1% 0,1W
3163	4822 051 10008	0R Jumper 1206
3164	4822 052 10478	Δ 4R7 5% 0,33W
3165	4822 051 10008	0R Jumper 1206
3167	4822 116 83872	220R 5% 0,5W
3169	4822 051 20008	0R Jumper 0805
3171	4822 051 20008	0R Jumper 0805
3172	4822 051 10008	0R Jumper 1206
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3178	4822 051 10008	0R Jumper 1206
3181	4822 051 10008	0R Jumper 1206
3183	4822 051 10008	0R Jumper 1206
3184	4822 051 10008	0R Jumper 1206
3185	4822 051 10008	0R Jumper 1206
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R Jumper 1206
3192	4822 051 20008	0R Jumper 0805
3197	4822 051 20472	4k7 5% 0,1W

COILS & FILTERS

5102	4822 157 71634	MW Aerial
5103	4822 157 71635	LW Aerial

ELECTRICAL PARTS LIST - TUNER 95 BOARD

5107	4822 157 11443	FM Discriminator 10,7MHz
5109	4822 157 71639	Ceram Filter 10,7MHz
5110	4822 242 70665	Ceram Filter 10,7MHz
5111	4822 158 60511	AM-IF Filter 450kHz
5112	4822 157 70302	AM-IF Filter 450kHz
5114	4822 157 70302	AM_IF Filter 450kHz
5115	4822 157 71636	Anti-Birdy Filter
5121	4822 242 10261	X'tal Resonator 75kHz
5122	4822 157 60517	RF Coil AM
5123	4822 157 60517	RF Coil AM

DIODES

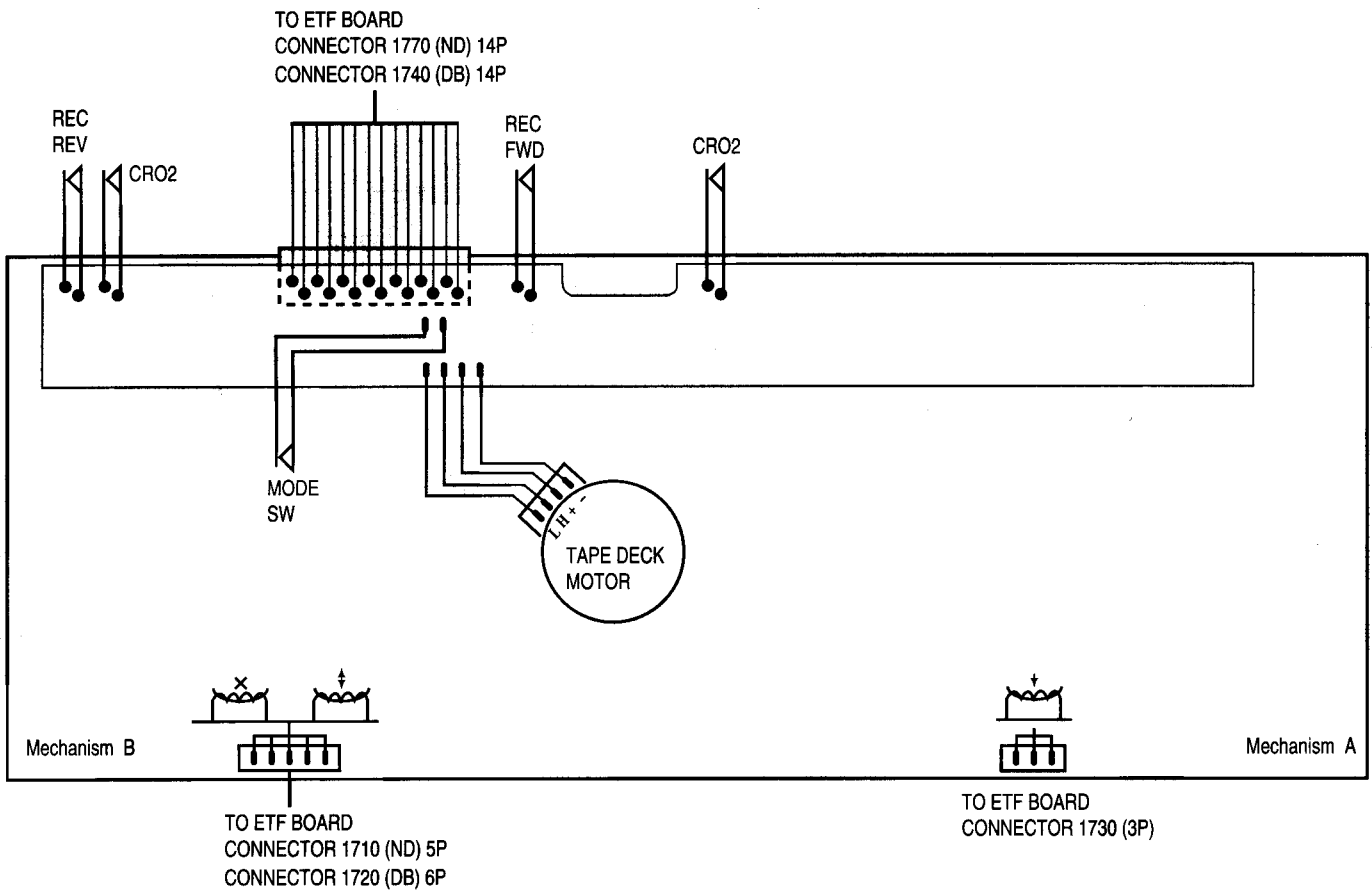
6105	4822 130 83075	HN1V02H-B
6106	4822 130 30621	1N4148
6107	4822 130 34488	BZX79-C11
6120	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1
7103	4822 130 42513	BC858C
7104	5322 130 44779	BC338-40
7105	5322 130 44779	BC338-40
7109	5322 130 41983	BC858B
7110	5322 130 41983	BC858B
7122	5322 130 42136	BC848C
7124	5322 130 42136	BC848C

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

Tapedeck wiring (Double deck)



OPTIONS / VARIANTS TABLE

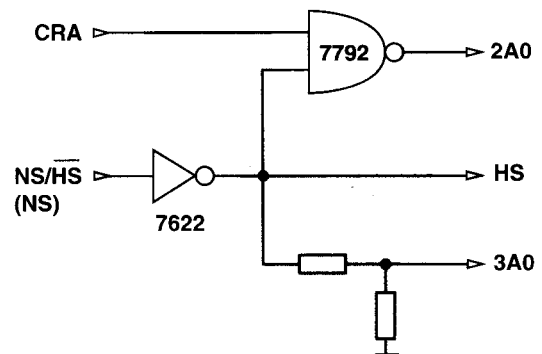
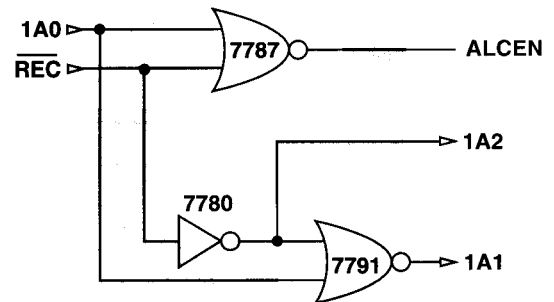
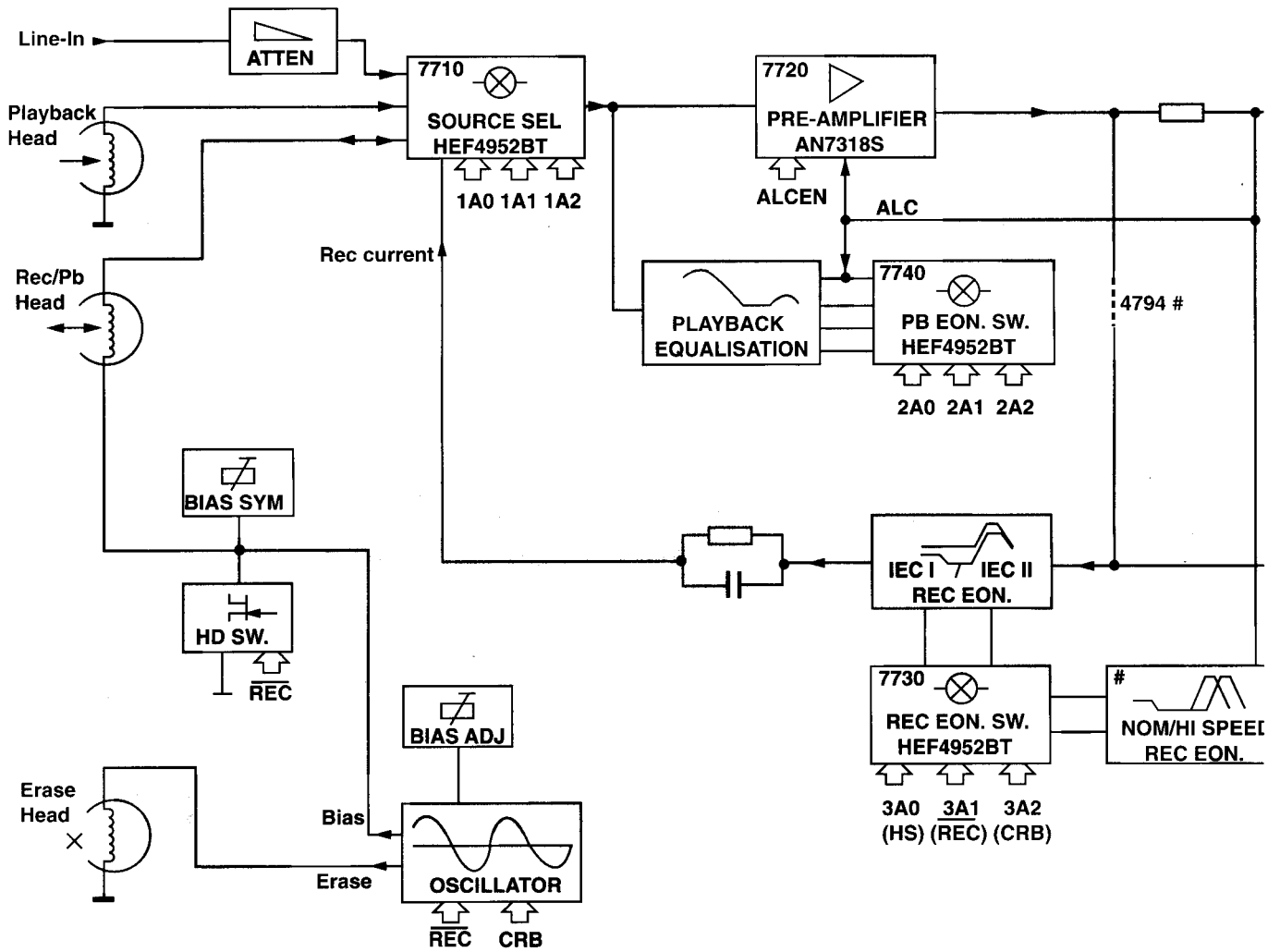
MODULE	ETF7		
VARIANT	1	2	3
FEATURES	DB/DD/FR	ND/DD/FR	ND/DD/FF
Deck configuration	double	double	double
Deck type (Tokyo Pigeon)	CWE	CWE	CWE
Autoreverse	yes (B)	yes (B)	no
Auto Replay	no	no	yes (A+B)
Motor configuration	single	single	single
Auto tape type selection	yes	yes	yes
Dolby type B Noise Reduction	yes	no	no
19 kHz pilot suppression	yes	no	no
Normal / High speed dubbing	yes	yes	no
Cue/Review & Fwd/Rewind	yes	yes	yes

DB = Dolby B NR
 DD = Double Deck
 FF = Non-Autoreverse
 FR = Autoreverse Deck B
 ND = Non-Dolby
 SD = Single Deck

Variations table for Analog Circuit

	Autoreverse	Non-autoreverse
	ND/DD/FR	ND/DD/FF
2701 , 2702	150pF	270pF
2703 , 2704	100pF	220pF
2717 , 2718	10nF	15nF
2727 , 2728	470pF	1nF
3616	10k	1k
3618	6k8	-
3620	10k trimmer	-
3622	-	10k trimmer
3672	4k7	-
3676	47k	-
3688	680R	-
3723 , 3724	15k	18k
3727 , 3728	5k6	6k8
3729 , 3730	3k3	4k7
3743 , 3744	1k5	2k2
3745 , 3746	3k3	5k6
3754 , 3755	1M	47R
3769	12k	8k2
3772	6k8	5k6
3774	15k	8k2
6614	1N4148	-
7616	BC857B	-
7622	BC847B	-

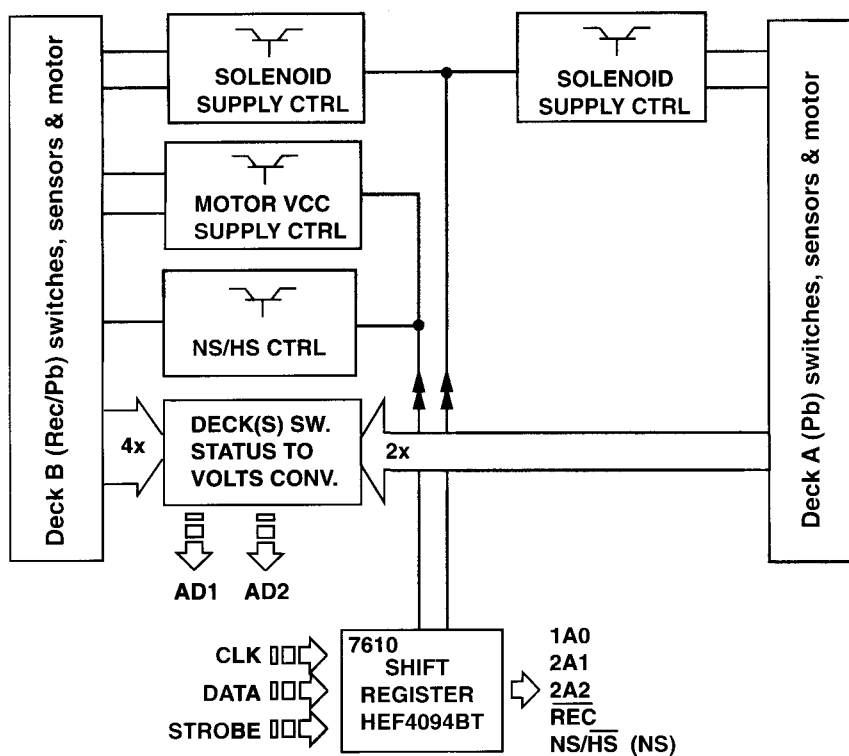
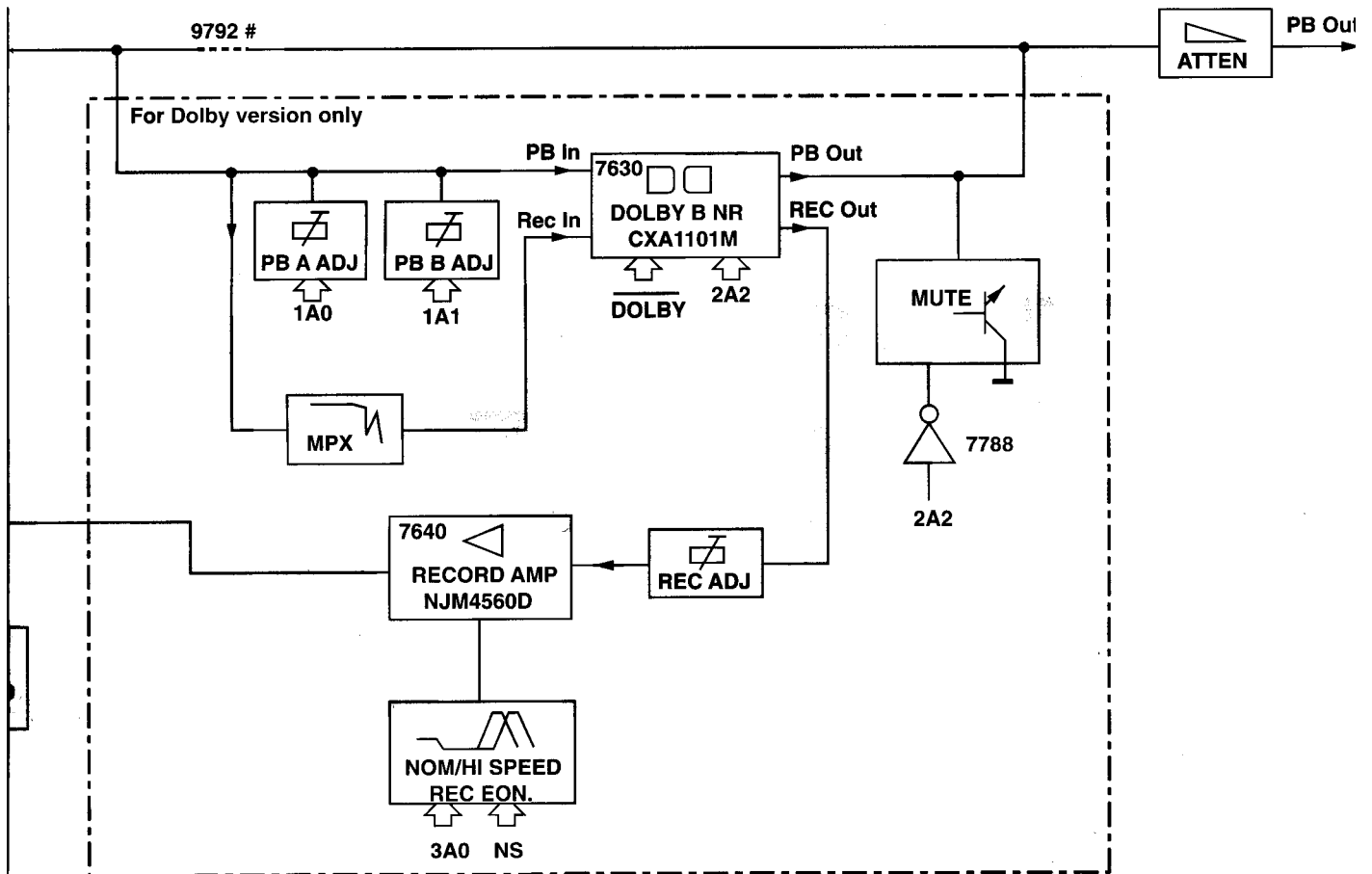
BLOCK DIAGRAM



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

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers



Brief introduction

General

1. Playback Mode
Signal from the playback head Deck A or Deck B is selected and fed through by the Mode Selector IC7710 (HEF4952BT). The signal is amplified by amplifier IC7720 (AN7323S) before feeding to the IC7740 (HEF4952BT) and out to the AF Board via connector 1701.
2. Recording Mode
Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then amplified by the amplifier IC7720 (AN7323S). The amplified output signal will pass through IC7730 (HEF4952BT) for record equalization and back to IC7710 (HEF4952BT) before registered into the Rec/PB Head of Deck B.
3. Dubbing Mode
In Dubbing mode, signal from the playback head Deck A is selected and fed through by the Mode Selector IC7710 (HEF4952BT) which is then equalised for playback mode by the amplifier IC7720 (AN7323S) so that a flat response is obtained after the pre-amp. The equalised signal will then follow the same path as in the Recording mode.
4. Mode Selector
The Mode Selector IC7710 (HEF4952BT) caters for 4 inputs signal, namely Playback Signal from Deck A, Playback Signal from Deck B, Recording Signal and Dubbing Signal.
5. Amplifier PB/REC
Amplifier IC7720 (AN7323S) is for the purpose of amplifying the Playback and Recording signal from the Mode Selector.
6. Automatic Level Control (ALC)
ALC circuit consists of resistors (3760, 3765, 3766, 3767), capacitors (2762, 2763) and control by transistor 7787 (BC847B). ALC limits the amplifier output to a constant value when input signal becomes too large, thus limiting recording current to below saturation level, to prevent recording distortion.
7. Muting Circuit (For Non-Dolby version only)
Switch S4 of the IC7740 (HEF4952BT) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.
8. IC7740 (HEF4952BT)
The function of the IC7740 (HEF4952BT) is to change time constant between 120us Ferro (IEC I) and 70us Chrome (IEC II) during playback mode. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II). This IC will switch to Flat Gain during the Recording mode.
9. IC7730 (HEF4952BT)
The function of the IC7730 (HEF4952BT) is to change gain and time constant according to tape type and recording speed to boost recording current at higher frequency during recording to compensate for head loss. It will automatically determined whether the tape type is 120us Ferro (IEC I) or 70us Chrome (IEC II).
10. Bias Level
Bias Level making use of the Variable resistor (3773) for adjusting the optimal level of the bias current for Ferro or Chrome.
11. Bias Symm (For Dolby B NR version only)
Bias Symm making use of the Variable resistor (3785) to adjust the bias current for the left and the right channel to be equal.
12. PB Switch
Playback Switch which consists of the FETs 7785 (For Dolby B NR version only) & 7786 (J111) is for the purpose of providing a virtual ground for the Rec/PB Head (Deck B) during Playback mode. During the Playback mode, the FETs are turn on and shorted pin 2 and 4 of connector 1720 to the ground. During Recording mode, the FETs are turn off to allow the oscillator signal to be superposition onto the Recording signal for recording.

13. Motor Speed (For FR versions only)

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

14. IC7610 (HEF4094BT)

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

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

15. IC7630 (CXA1551M)

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

16. 19kHz Filter

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

17. Level Adjust

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

18. Amplifier IC7640 (NJM4560M)

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

19. Muting Circuit

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

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

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

CONNECTORS ASSIGNMENTS:**CONNECTOR 1701****INTERCONNECTION TO AF BOARD**

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

CONNECTOR 1703**INTERCONNECTION TO AF BOARD**

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

CONNECTOR 1706**INTERCONNECTION TO FRONT BOARD**

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

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

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

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

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

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

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

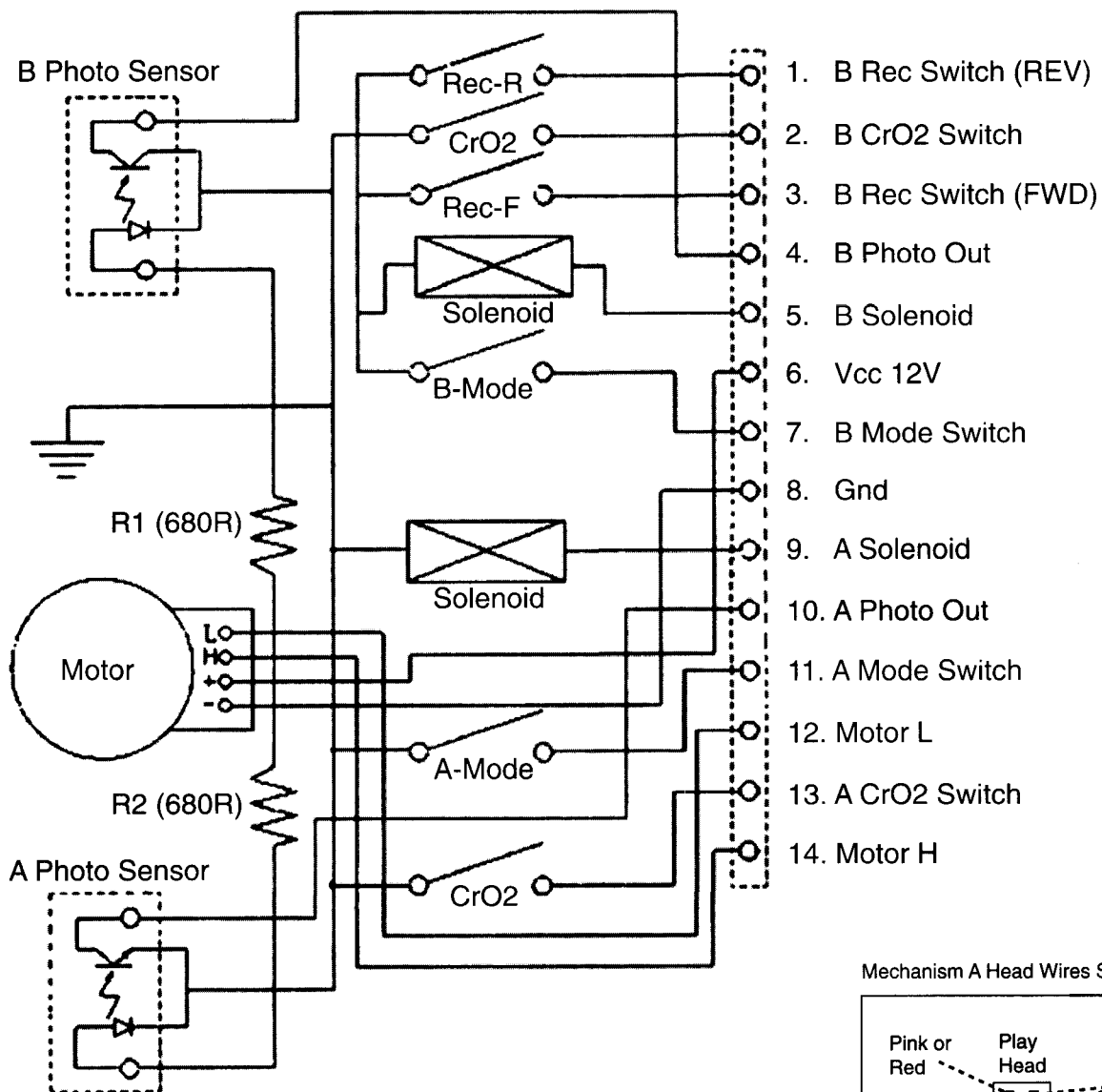
CONNECTOR 1740DECK A & B CONTROL INTERFACE (For Dolby B NR version only)

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

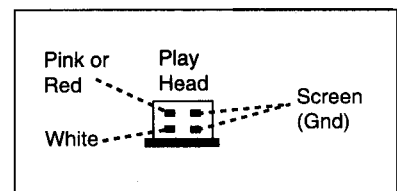
CONNECTOR 1770DECK A & B CONTROL INTERFACE (For Non-Dolby version only)

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

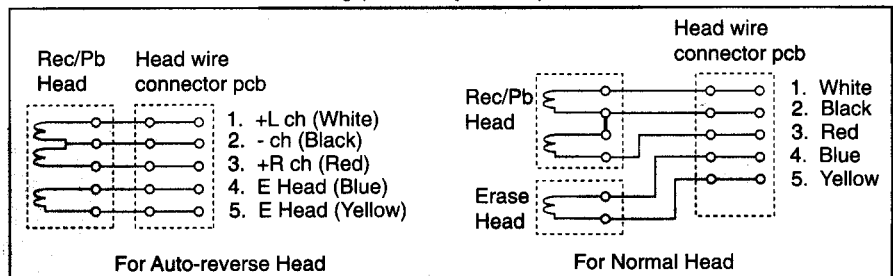
TAPE MECHANISM ELECTRONICS



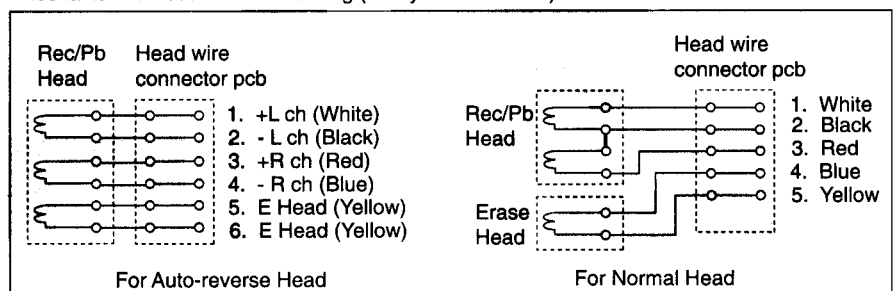
Mechanism A Head Wires Soldering



Mechanism B Head Wires Soldering (Non-Dolby version)



Mechanism B Head Wires Soldering (Dolby B NR version)



TAPE ADJUSTMENT & CHECK TABLE

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

SBC419A : 4822 397 30069

SBC420 : 4822 397 30071

For Auto-reverse version only

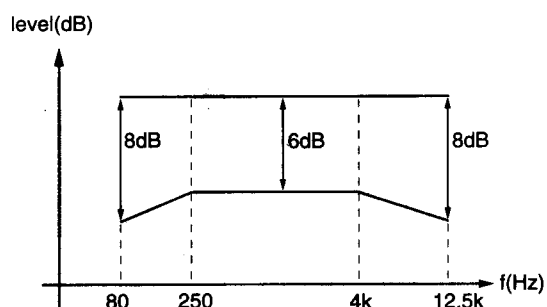
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-measure

figure. 1

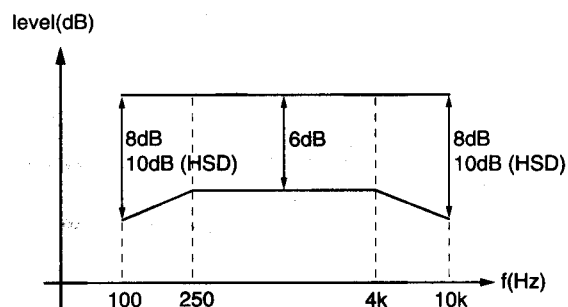
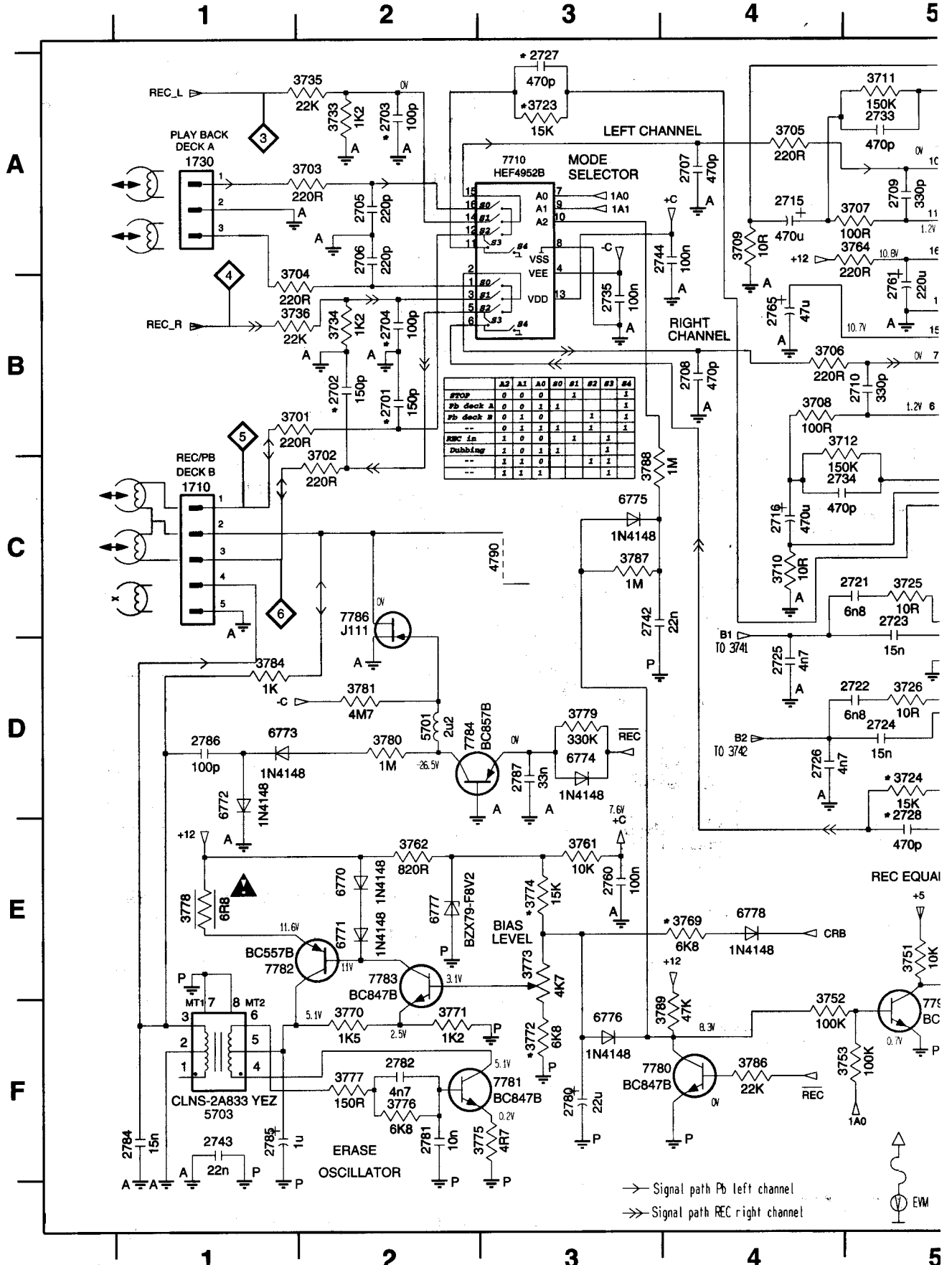


figure. 2

ANALOG CIRCUIT

1701 F9	2705 A2	2712 B6	2719 C5	2726 D4	2735 B3	2745 F5	2765 B4	2785 F1	3705 A4	3712 B4	3719 C6	3726 D5
1710 C1	2706 A2	2713 A6	2720 D5	2727 A3	2737 A6	2746 F8	2769 F7	2786 D1	3706 B4	3713 A7	3720 E6	3727 A7
1730 A1	2707 A4	2714 B6	2721 C5	2728 E5	2738 B6	2747 E8	2770 F8	2787 D3	3707 A5	3714 B7	3721 C6	3728 B7
2701 B2	2708 B4	2715 A4	2722 D5	2729 A8	2741 D6	2760 E3	2780 F3	3701 B1	3708 B4	3715 A6	3722 D6	3729 A7
2702 B2	2709 A5	2716 C4	2723 C5	2730 B8	2742 C3	2761 B5	2781 F2	3702 C2	3709 A4	3716 B6	3723 A3	3730 B7
2703 A2	2710 B5	2717 C6	2724 D5	2733 A5	2743 F1	2762 B6	2782 F2	3703 A2	3710 C4	3717 C6	3724 D5	3731 A7
2704 B2	2711 A6	2718 D6	2725 D4	2734 C4	2744 A4	2763 B6	2784 F1	3704 B1	3711 A5	3718 E6	3725 C5	3732 B7



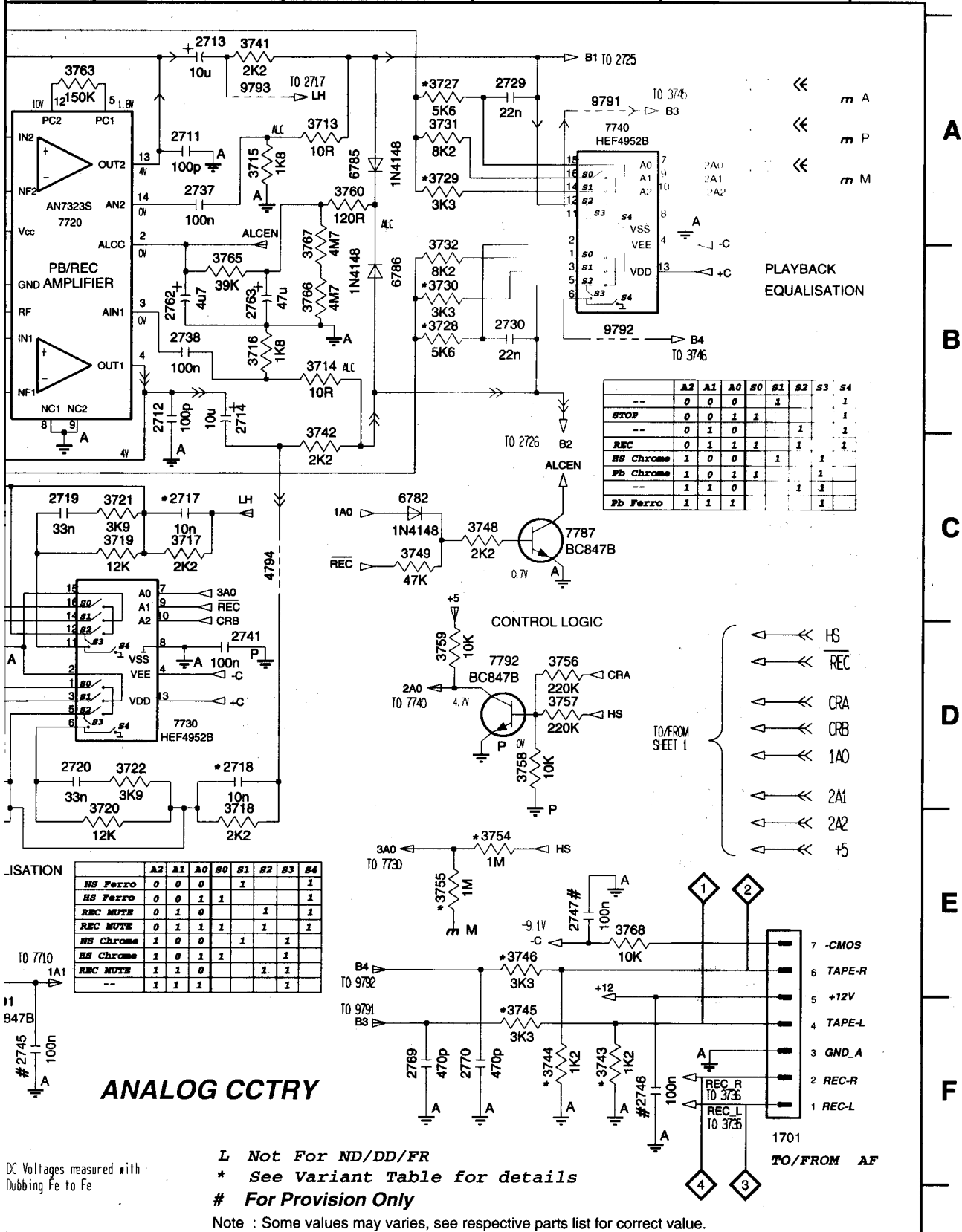
3733 A2	3744 F8	3753 F5	3760 A7	3767 A7	3774 E3	3781 D2	4794 C6	6774 D3	6786 B7	7782 E1	9791 A8
3734 B2	3745 F8	3754 E8	3761 E3	3768 E8	3775 F3	3784 D1	5701 D2	6775 C3	7710 A3	7783 E2	9792 B8
3735 A2	3746 E8	3755 E7	3762 E2	3769 E4	3776 F2	3786 F4	5703 F1	6776 F3	7720 A5	7784 D2	9793 A6
3736 B1	3748 C8	3756 D8	3763 A5	3770 F2	3777 F2	3787 C3	6770 E2	6777 E2	7730 D6	7786 C2	
3741 A6	3749 C7	3757 D8	3764 A5	3771 F2	3778 E1	3788 C3	6771 E2	6778 E4	7740 A8	7787 C8	
3742 C7	3751 E5	3758 D8	3765 B6	3772 F3	3779 D3	3789 F4	6772 D1	6782 C7	7780 F4	7791 F5	
3743 F8	3752 F4	3759 D7	3766 B7	3773 E3	3780 D2	4790 C3	6773 D1	6785 A7	7781 F3	7792 D8	

6

7

8

9



6

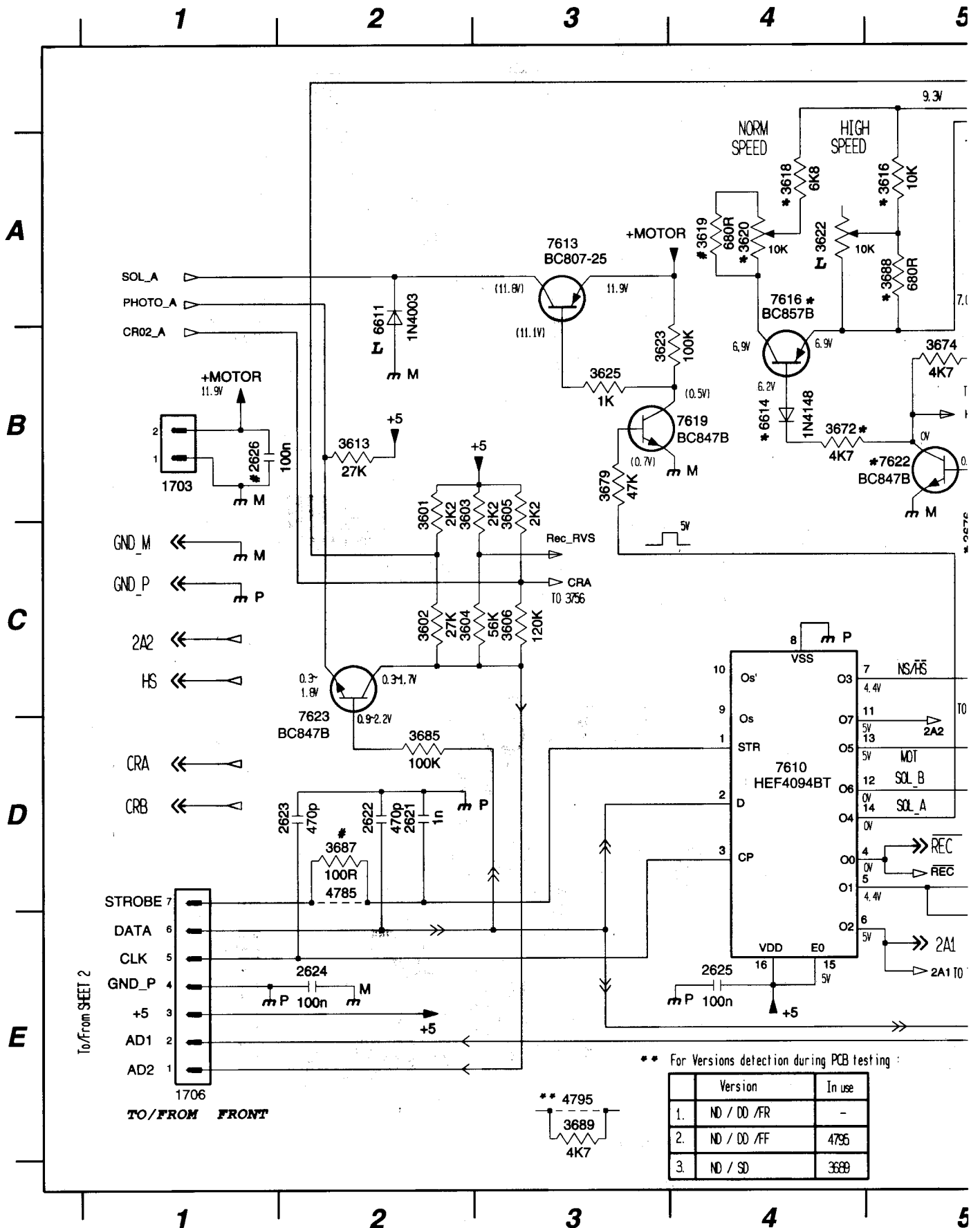
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8

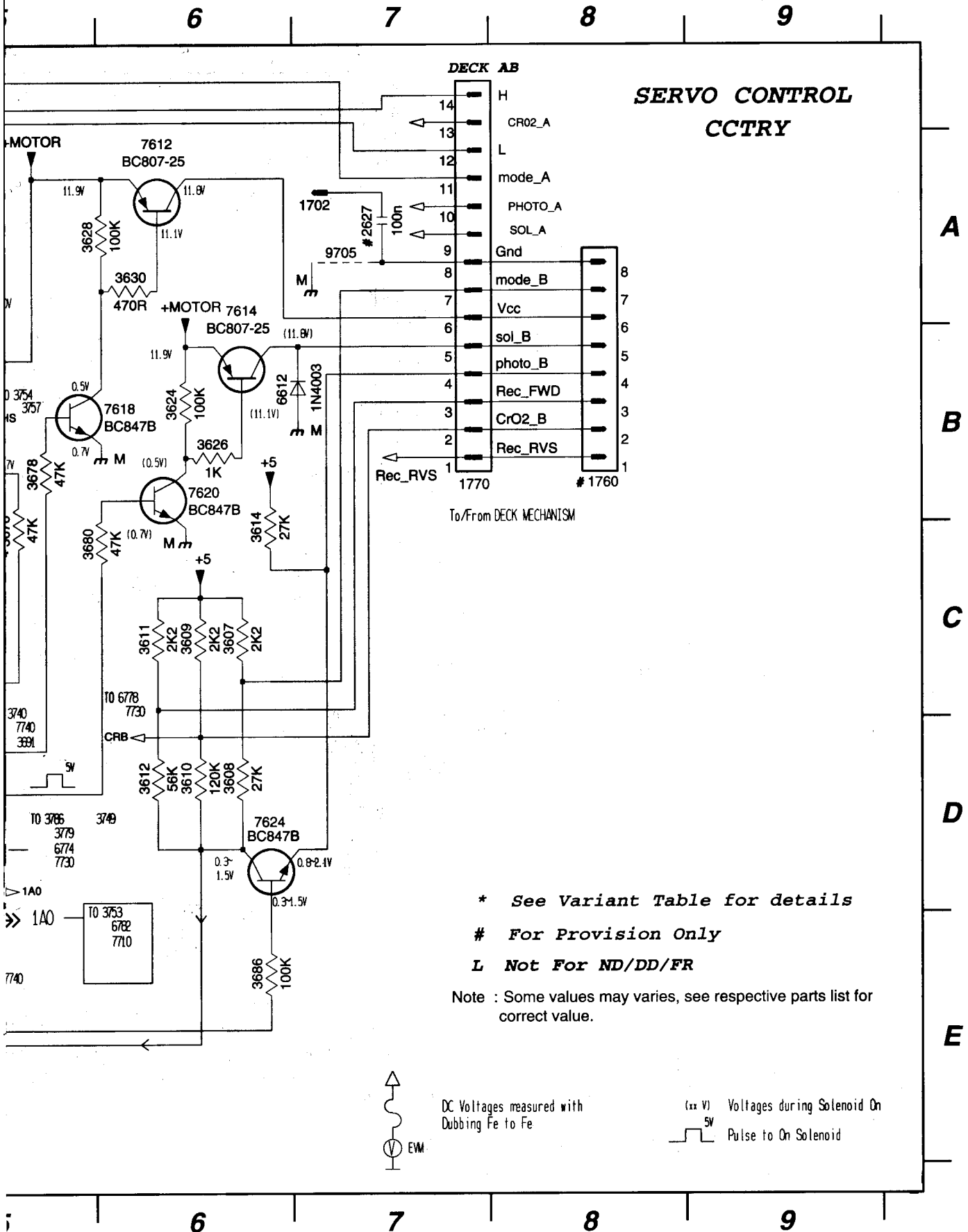
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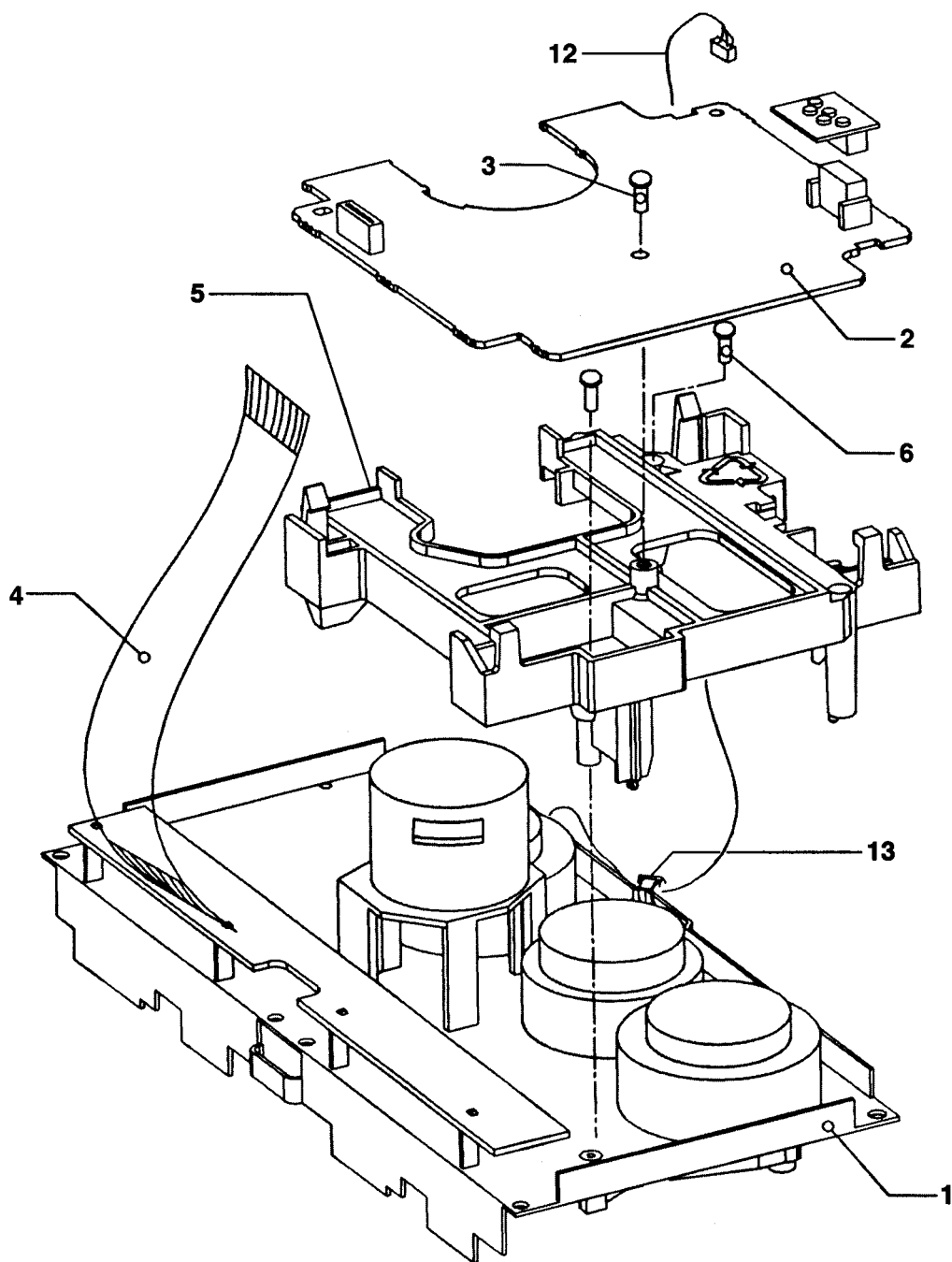
SERVO CONTROL CIRCUIT

1702 A7 1760 B8 2622 D2 2625 E4 3601 B2 3604 C2 3607 C6 3610 D6 3613 B2 3618 A4 3622 A4 3625 B3 363
 1703 B1 1770 B7 2623 D2 2626 B1 3602 C2 3605 B3 3608 D6 3611 C6 3614 C6 3619 A4 3623 B3 3626 B6 367
 1706 E1 2621 D2 2624 E2 2627 A7 3603 B2 3606 C3 3609 C6 3612 D6 3616 A5 3620 A4 3624 B6 3628 A5 367



0 A6	3676 C5	3680 C5	3687 D2	4785 D2	6612 B6	7612 A6	7616 A4	7620 B6	7624 D6
2 B4	3678 B5	3685 D2	3688 A5	4795 E3	6614 B4	7613 A3	7618 B6	7622 B5	9705 A7
4 B5	3679 B3	3686 E6	3689 E3	6611 A2	7610 D4	7614 A6	7619 B4	7623 D2	



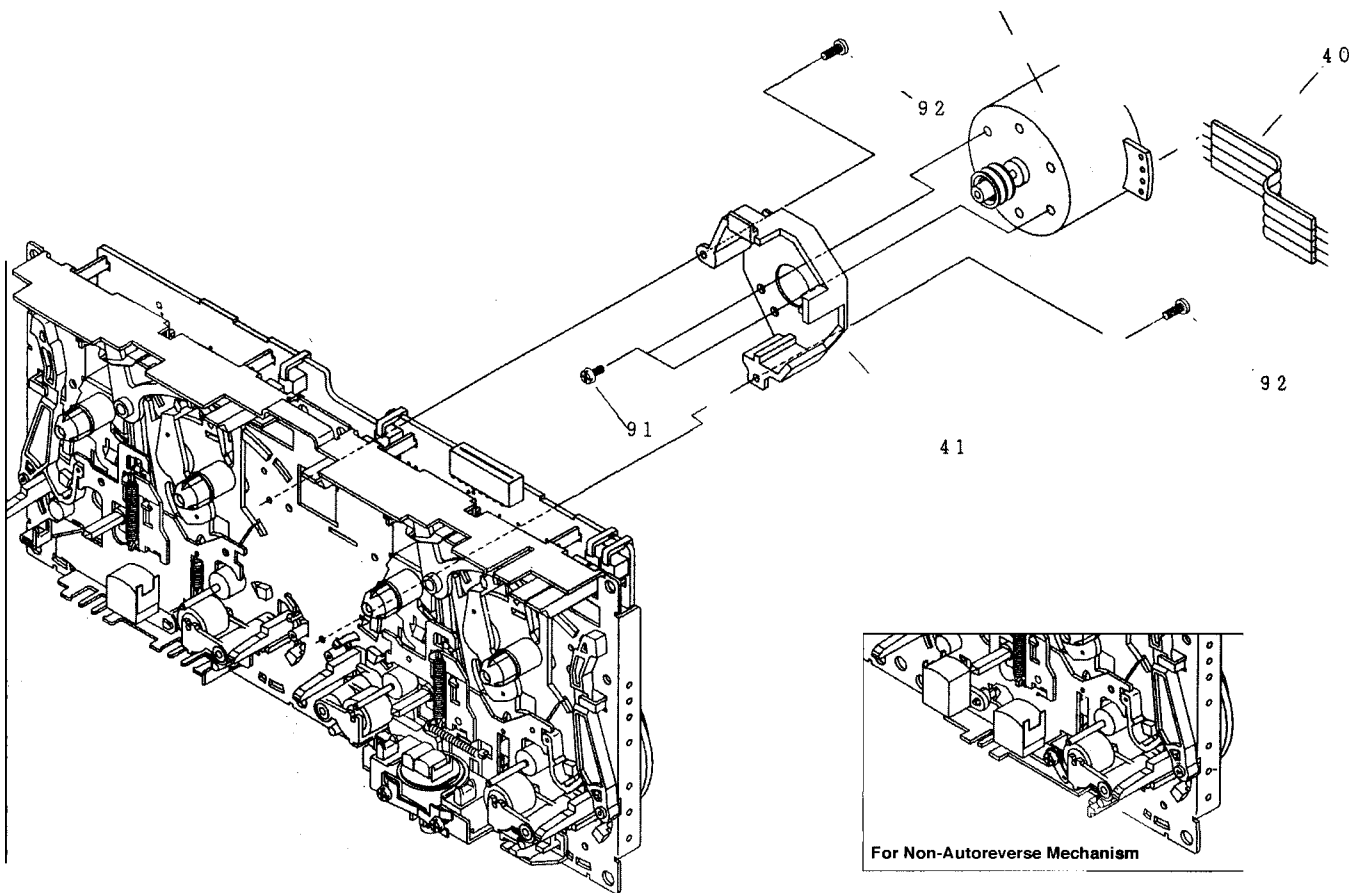


3139 118 77070 (Incl. ...77080) dd wk926

TAPE MODULE EXPLODED VIEW

- | | | |
|---|--------------|---------------------------------|
| 1 | 313911877130 | Autoreverse Mech. CWE44FR01 |
| 1 | 313911877140 | Non-Autoreverse Mech. CWE44FF02 |
| 3 | - | Screw D3 x 10 |
| 6 | - | Screw M2 x 16 |
| 7 | 313911034080 | Flex Cable 14 pin 7,5 cm |

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



TAPE MECHANISM - MOTOR EXPLODED VIEW

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

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

TAPE MECHANISM A - PLAY

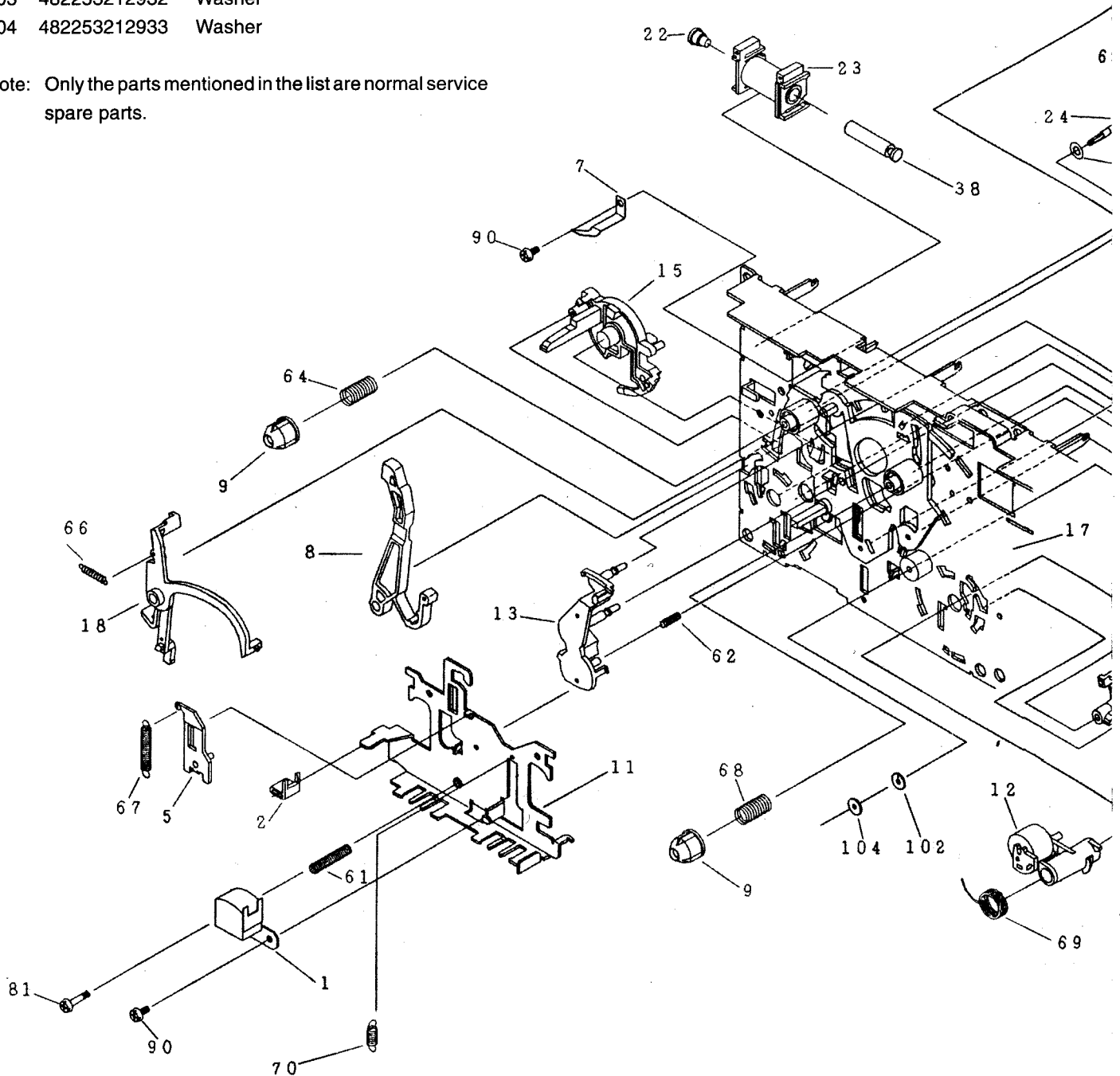
MECHANICAL PARTS - PLAY MECHANISM

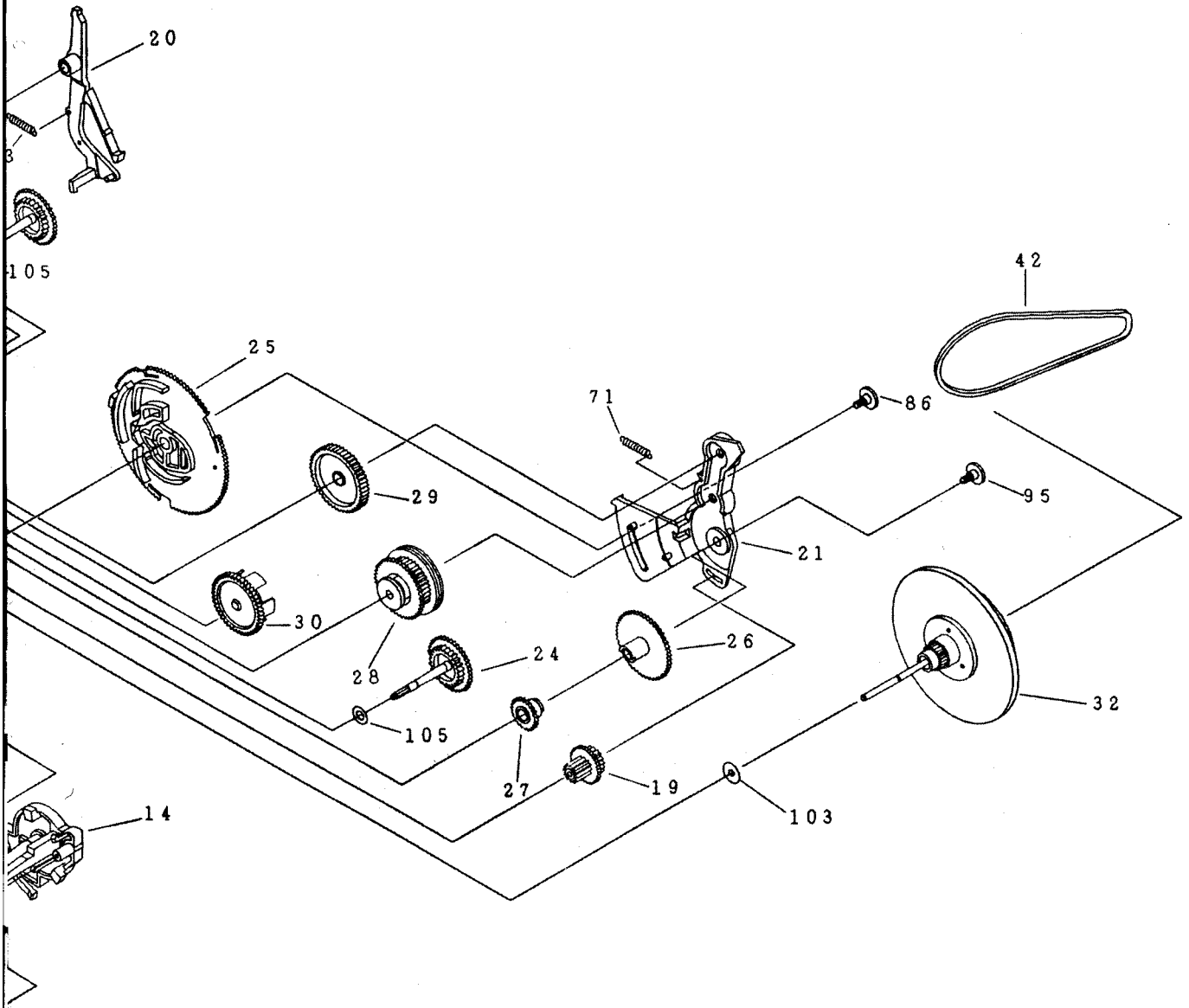
1	996500002313	Play Head (Non-Autoreverse deck)
1	996500002321	Play Head (Autoreverse deck)
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly

32	482252811209	Flywheel Assembly RV
42	996500002315	Belt AF (Autoreverse deck)
42	996500002718	Belt AF (Non-autoreverse deck)
69	482249211761	Spring

102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

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





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

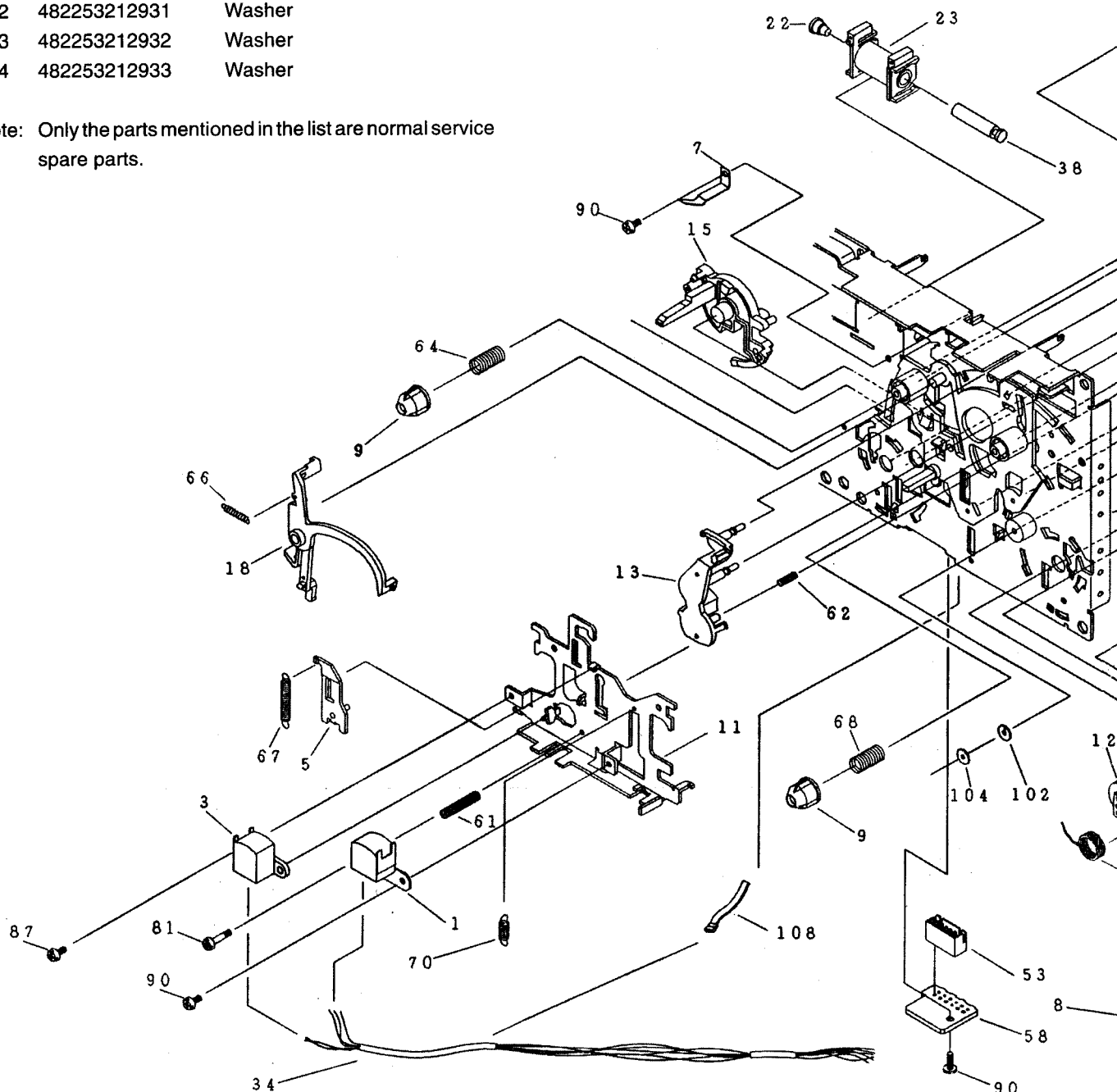
MECHANICAL PARTS - REC/PB MECHANISM

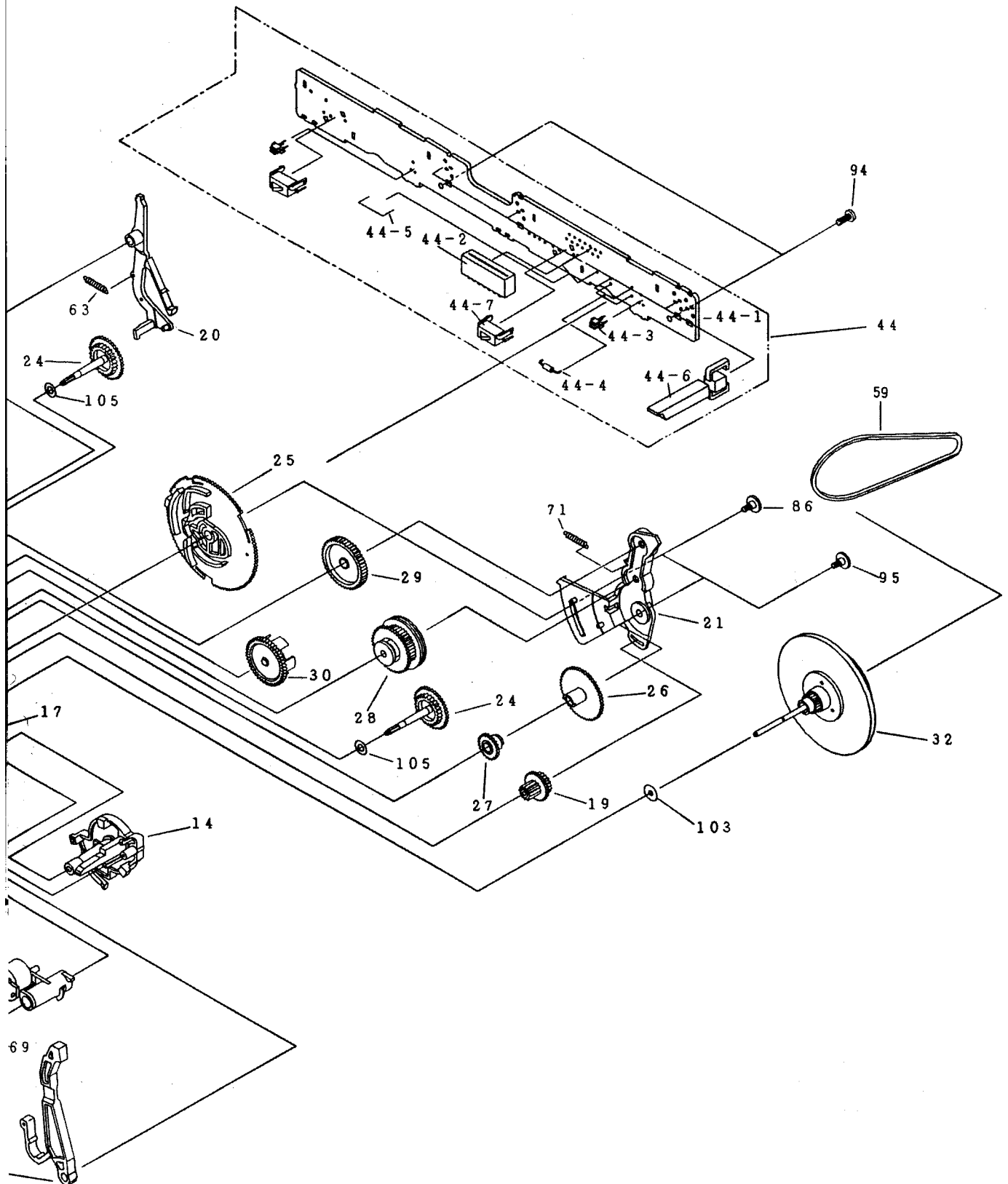
1	996500002313	Play Head
3	996500002600	Head, Erase
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV

44-2	996500002317	Flex Socket 14 Pin
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002319	Mode Switch

59	996500002719	Belt BF (Large)
69	482249211761	Spring
102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer

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





TAPE MECHANISM B - RECORD/PLAYBACK (Autoreverse version)**MECHANICAL PARTS - REC/PB MECHANISM**

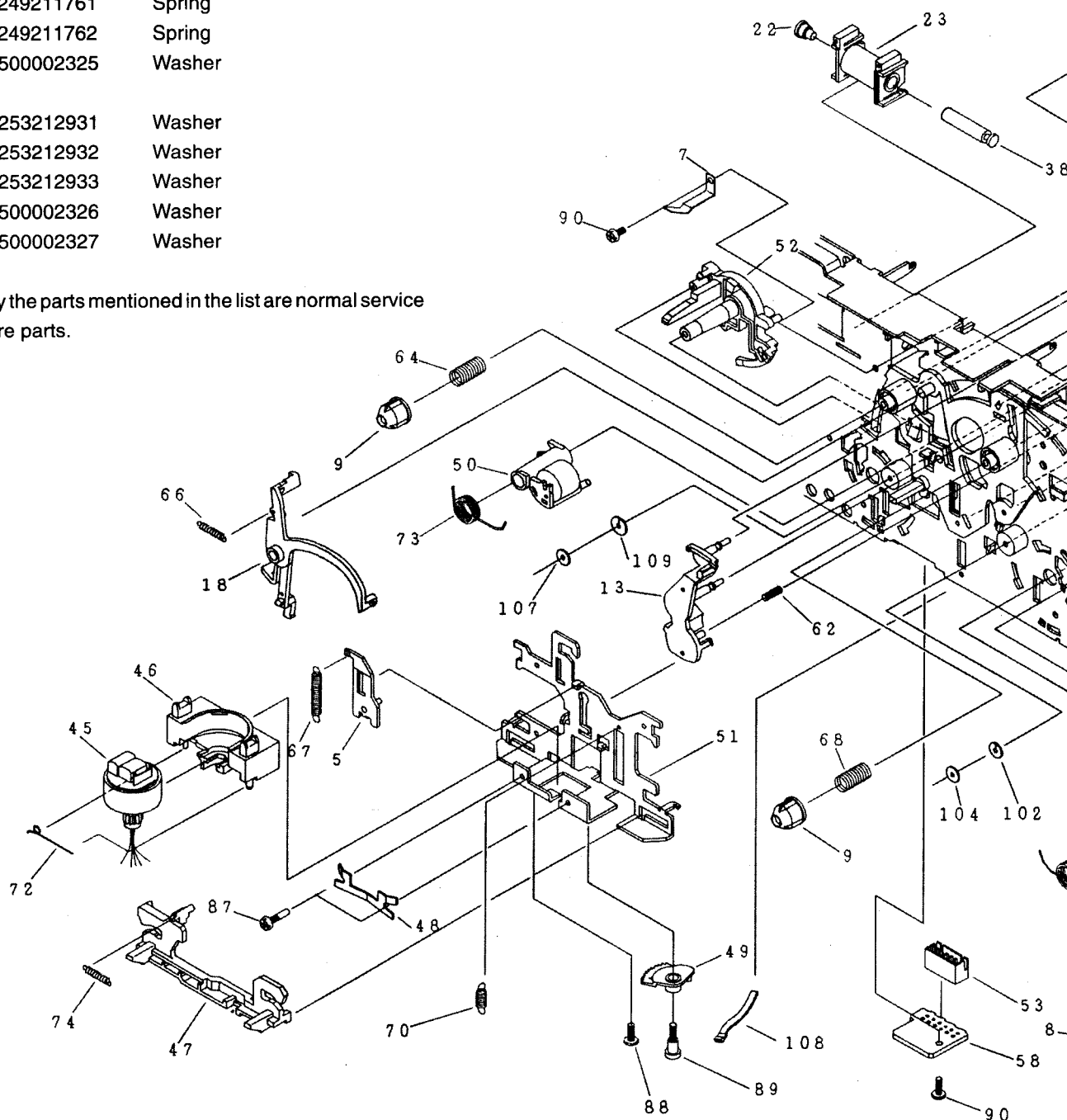
12	482240210972	Pinch Arm Assembly R
23	996500002314	Coil Assembly
32	482252811209	Flywheel Assembly RV
39	996500002322	Belt AF
44-2	996500002317	Flex Socket 14 Pin

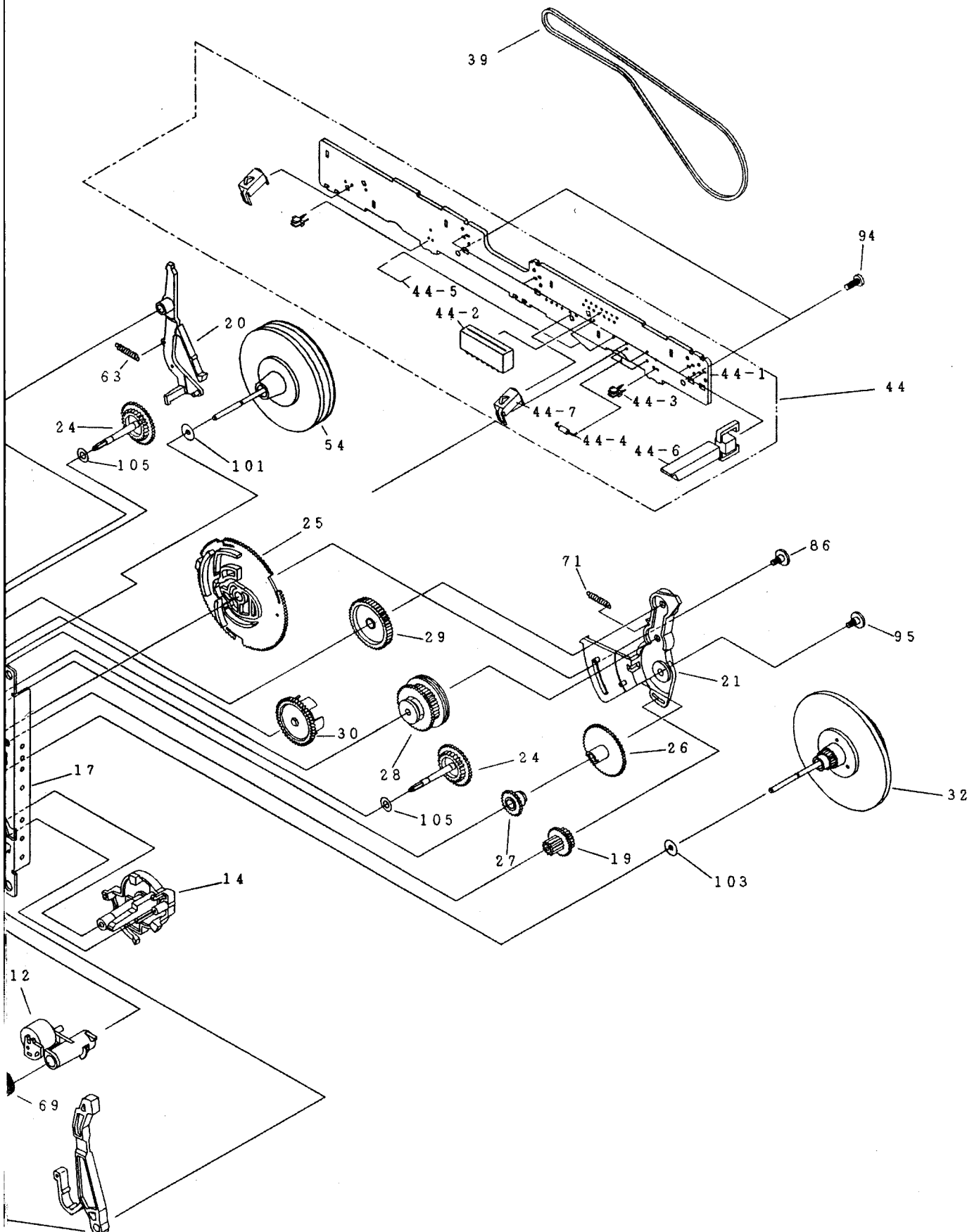
44-3	996500002320	Photo Interrupter
44-4	482205016801	680R 1% 0,4W
44-6	996500002318	Leaf Switch
44-7	996500002319	Mode Switch
45	996500002323	Rec/Pb Head Assembly

50	482240210973	Pinch Arm Assembly L
54	996500002324	Flywheel Assembly L
69	482249211761	Spring
73	482249211762	Spring
101	996500002325	Washer

102	482253212931	Washer
103	482253212932	Washer
104	482253212933	Washer
107	996500002326	Washer
109	996500002327	Washer

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





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

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

CAPACITORS

2621	532212231647	1nF 10% 63V
2622	532212234099	470pF 10% 63V
2623	532212234099	470pF 10% 63V
2624	482212614585	100nF 10% 50V
2625	482212614585	100nF 10% 50V
2701	532212233538	150pF 2% 63V Autoreverse
2701	482212233216	270pF 5% 63V Non-autoreverse
2702	532212233538	150pF 2% 63V Autoreverse
2702	482212233216	270pF 5% 63V Non-autoreverse
2703	532212232531	100pF 5% 50V Autoreverse
2703	482212233575	220pF 5% 63V Non-autoreverse
2704	532212232531	100pF 5% 50V Autoreverse
2704	482212233575	220pF 5% 63V Non-autoreverse
2705	482212233575	220pF 5% 63V
2706	482212233575	220pF 5% 63V
2707	532212234099	470pF 10% 63V
2708	532212234099	470pF 10% 63V
2709	532212231863	330pF 5% 63V
2710	532212231863	330pF 5% 63V
2711	532212232531	100pF 5% 50V
2712	532212232531	100pF 5% 50V
2713	482212440248	10µF 20% 63V
2714	482212440248	10µF 20% 63V
2715	482212480195	470µF 20% 10V
2716	482212480195	470µF 20% 10V
2717	482212233177	10nF 20% 50V Autoreverse
2717	482212613188	15nF 5% 63V Non-autoreverse
2718	482212233177	10nF 20% 50V Autoreverse
2718	482212613188	15nF 5% 63V Non-autoreverse
2719	482212612105	33nF 5% 50V
2720	482212612105	33nF 5% 50V
2721	532212231866	6,8nF 10% 63V
2722	532212231866	6,8nF 10% 63V
2723	482212613188	15nF 5% 63V
2724	482212613188	15nF 5% 63V
2725	532212610223	4,7nF 10% 63V
2726	532212610223	4,7nF 10% 63V
2727	532212234099	470pF 10% 63V Autoreverse
2727	532212231647	1nF 10% 63V Non-autoreverse
2728	532212234099	470pF 10% 63V Autoreverse
2728	532212231647	1nF 10% 63V Non-autoreverse
2729	532212232654	22nF 10% 63V
2730	532212232654	22nF 10% 63V
2733	532212234099	470pF 10% 63V
2734	532212234099	470pF 10% 63V
2735	482212614585	100nF 10% 50V
2737	482212614585	100nF 10% 50V

2738	482212614585	100nF 10% 50V
2741	482212611585	22nF +80/-20% 25V
2742	532212232654	22nF 10% 63V
2743	532212232654	22nF 10% 63V
2744	482212614585	100nF 10% 50V
2760	482212614585	100nF 10% 50V
2761	482212480144	220µF 20% 25V
2762	482212440769	4,7µF 20% 100V
2763	482212440433	47µF 20% 25V
2765	482212440433	47µF 20% 25V
2769	532212234099	470pF 10% 63V
2770	532212234099	470pF 10% 63V
2780	482212481151	22µF 20% 50V
2781	482212233177	10nF 20% 50V
2782	532212610223	4,7nF 10% 63V
2784	482212151305	15nF 10% 50V
2785	482212421913	1µF 20% 63V
2786	532212232531	100pF 5% 50V
2787	482212612105	33nF 5% 50V

RESISTORS

3601	482211711449	2k2 1% 0,1W
3602	482205120273	27k 5% 0,1W
3603	482211711449	2k2 1% 0,1W
3604	482211711148	56k 1% 0,1W
3605	482211711449	2k2 1% 0,1W
3606	482205120124	120k 5% 0,1W
3607	482211652256	2k2 5% 0,5W
3608	482205120273	27k 5% 0,1W
3609	482211652256	2k2 5% 0,5W
3610	482205120124	120k 5% 0,1W
3611	482211652256	2k2 5% 0,5W
3612	482211711148	56k 1% 0,1W
3613	482205120273	27k 5% 0,1W
3614	482205120273	27k 5% 0,1W
3616	482211710833	10k 1% 0,1W Autoreverse
3616	482205110102	1k 2% 0,25W Non-autoreverse
3618	482211711507	6k8 1% 0,1W Autoreverse
3620	482210011141	Trimmer 10k 30% 0,1W Autorev.
3622	482210011141	Trimmer 10k 30% 0,1W Non-autorev.
3623	482211710837	100k 1% 0,1W
3624	482211710837	100k 1% 0,1W
3625	482205110102	1k 2% 0,25W
3626	482205110102	1k 2% 0,25W
3628	482211710837	100k 1% 0,1W
3630	482205120471	470R 5% 0,1W
3672	482205120472	4k7 5% 0,1W Autoreverse
3674	482211652283	4k7 5% 0,5W
3676	482211710834	47k 1% 0,1W Autoreverse
3678	482211710834	47k 1% 0,1W
3679	482211710834	47k 1% 0,1W
3680	482211710834	47k 1% 0,1W

ELECTRICAL PARTS LIST - ETF7 NON-DOLBY BOARD

3685	482211652234	100k 5% 0,5W		3745	482205120562	5k6 5% 0,1W	Non-autoreverse
3686	482211710837	100k 1% 0,1W		3746	482205120332	3k3 5% 0,1W	Autoreverse
3688	482211710361	680R 1% 0,1W	Autoreverse	3746	482205120562	5k6 5% 0,1W	Non-autoreverse
3701	482211711503	220R 1% 0,1W		3748	482211711449	2k2 1% 0,1W	
3702	482211711503	220R 1% 0,1W		3749	482211710834	47k 1% 0,1W	
3703	482211711503	220R 1% 0,1W		3751	482211710833	10k 1% 0,1W	
3704	482211711503	220R 1% 0,1W		3752	482211710837	100k 1% 0,1W	
3705	482211711503	220R 1% 0,1W		3753	482211710837	100k 1% 0,1W	
3706	482211711503	220R 1% 0,1W		3754	482205120105	1M 5% 0,1W	Autoreverse
3707	482205120101	100R 5% 0,1W		3754	482205120479	47R 5% 0,1W	Non-autoreverse
3708	482205120101	100R 5% 0,1W		3755	482205120105	1M 5% 0,1W	Autoreverse
3709	482205120109	10R 5% 0,1W		3755	482205120479	47R 5% 0,1W	Non-autoreverse
3710	482205120109	10R 5% 0,1W		3756	482211713579	220k 1% 0,1W	
3711	482205120154	150k 5% 0,1W		3757	482211713579	220k 1% 0,1W	
3712	482205120154	150k 5% 0,1W		3758	482211710833	10k 1% 0,1W	
3713	482205120109	10R 5% 0,1W		3759	482211710833	10k 1% 0,1W	
3714	482205120109	10R 5% 0,1W		3760	482205120121	120R 5% 0,1W	
3715	482205120182	1k8 5% 0,1W		3761	482205021003	10k 1% 0,6W	
3716	482205120182	1k8 5% 0,1W		3762	482211711454	820R 1% 0,1W	
3717	482211711449	2k2 1% 0,1W		3763	482205120154	150k 5% 0,1W	
3718	482211711449	2k2 1% 0,1W		3764	482211683872	220R 5% 0,5W	
3719	482211711383	12k 1% 0,1W		3765	482205120393	39k 5% 0,1W	
3720	482211711383	12k 1% 0,1W		3766	482205120475	4M7 5% 0,1W	
3721	482205120392	3k9 5% 0,1W		3767	482205120475	4M7 5% 0,1W	
3722	482205120392	3k9 5% 0,1W		3768	482211710833	10k 1% 0,1W	
3723	482211683933	15k 1% 0,1W	Autoreverse	3769	482211711383	12k 1% 0,1W	Autoreverse
3723	482211710965	18k 1% 0,1W	Non-autoreverse	3769	482205120822	8k2 5% 0,1W	Non-autoreverse
3724	482211683933	15k 1% 0,1W	Autoreverse	3770	482211711139	1k5 1% 0,1W	
3724	482211710965	18k 1% 0,1W	Non-autoreverse	3771	482205120122	1k2 5% 0,1W	
3725	482205120109	10R 5% 0,1W		3772	482211711507	6k8 1% 0,1W	Autoreverse
3726	482205120109	10R 5% 0,1W		3772	482205120562	5k6 5% 0,1W	Non-autoreverse
3727	482205120562	5k6 5% 0,1W	Autoreverse	3773	482210012227	Trimmer 4k7 30% 0,1W	
3727	482211711507	6k8 1% 0,1W	Non-autoreverse	3774	482211683933	15k 1% 0,1W	Autoreverse
3728	482205120562	5k6 5% 0,1W	Autoreverse	3774	482205120822	8k2 5% 0,1W	Non-autoreverse
3728	482211711507	6k8 1% 0,1W	Non-autoreverse	3775	482205120478	4R7 5% 0,1W	
3729	482205120332	3k3 5% 0,1W	Autoreverse	3776	482211711507	6k8 1% 0,1W	
3729	482205120472	4k7 5% 0,1W	Non-autoreverse	3777	482211710353	150R 1% 0,1W	
3730	482205120332	3k3 5% 0,1W	Autoreverse	3778	482205210688	△ 6R8 5% 0,33W	
3730	482205120472	4k7 5% 0,1W	Non-autoreverse	3779	482205120334	330k 5% 0,1W	
3731	482205120822	8k2 5% 0,1W		3780	482205120105	1M 5% 0,1W	
3732	482205120822	8k2 5% 0,1W		3781	482205120475	4M7 5% 0,1W	
3733	482205120122	1k2 5% 0,1W		3784	482205110102	1k 2% 0,25W	
3734	482205120122	1k2 5% 0,1W		3786	482205120223	22k 5% 0,1W	
3735	482205120223	22k 5% 0,1W		3787	482205120105	1M 5% 0,1W	
3736	482205120223	22k 5% 0,1W		3788	482205120105	1M 5% 0,1W	
3741	482211711449	2k2 1% 0,1W		3789	482211710834	47k 1% 0,1W	
3742	482211711449	2k2 1% 0,1W		4701	482205120008	0R Jumper 0805	
3743	482211711139	1k5 1% 0,1W	Autoreverse	4702	482205120008	0R Jumper 0805	
3743	482211711449	2k2 1% 0,1W	Non-autoreverse	4703	482205120008	0R Jumper 0805	
3744	482211711139	1k5 1% 0,1W	Autoreverse	4704	482205120008	0R Jumper 0805	
3744	482211711449	2k2 1% 0,1W	Non-autoreverse	4705	482205120008	0R Jumper 0805	
3745	482205120332	3k3 5% 0,1W	Autoreverse	4706	482205120008	0R Jumper 0805	

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

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

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

TRANSISTORS & INTEGRATED CIRCUITS

7610	532220911306	HEF4094BT	
7612	532213060845	BC807-25	
7613	532213060845	BC807-25	
7614	532213060845	BC807-25	
7616	482213060373	BC857B	Autoreverse
7618	482213060511	BC847B	
7619	482213060511	BC847B	
7620	482213060511	BC847B	
7622	482213060511	BC847B	Autoreverse
7623	482213060511	BC847B	
7624	482213060511	BC847B	
7710	482220932919	HEF4952BT	
7720	932214000668	AN7323S	
7730	482220932919	HEF4952BT	
7740	482220932919	HEF4952BT	
7780	482213060511	BC847B	
7781	482213042804	BC817-25	
7782	482213044568	BC557B	
7783	482213060511	BC847B	
7784	482213060373	BC857B	
7786	482213063494	J111	
7787	482213060511	BC847B	
7791	482213060511	BC847B	
7792	482213060511	BC847B	

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

COILS & FILTERS

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

DIODES

6611	482213031878	1N4003G
6612	482213031878	1N4003G

WARNING

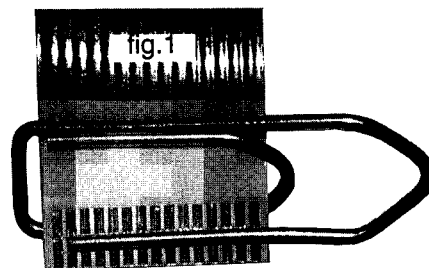
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

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

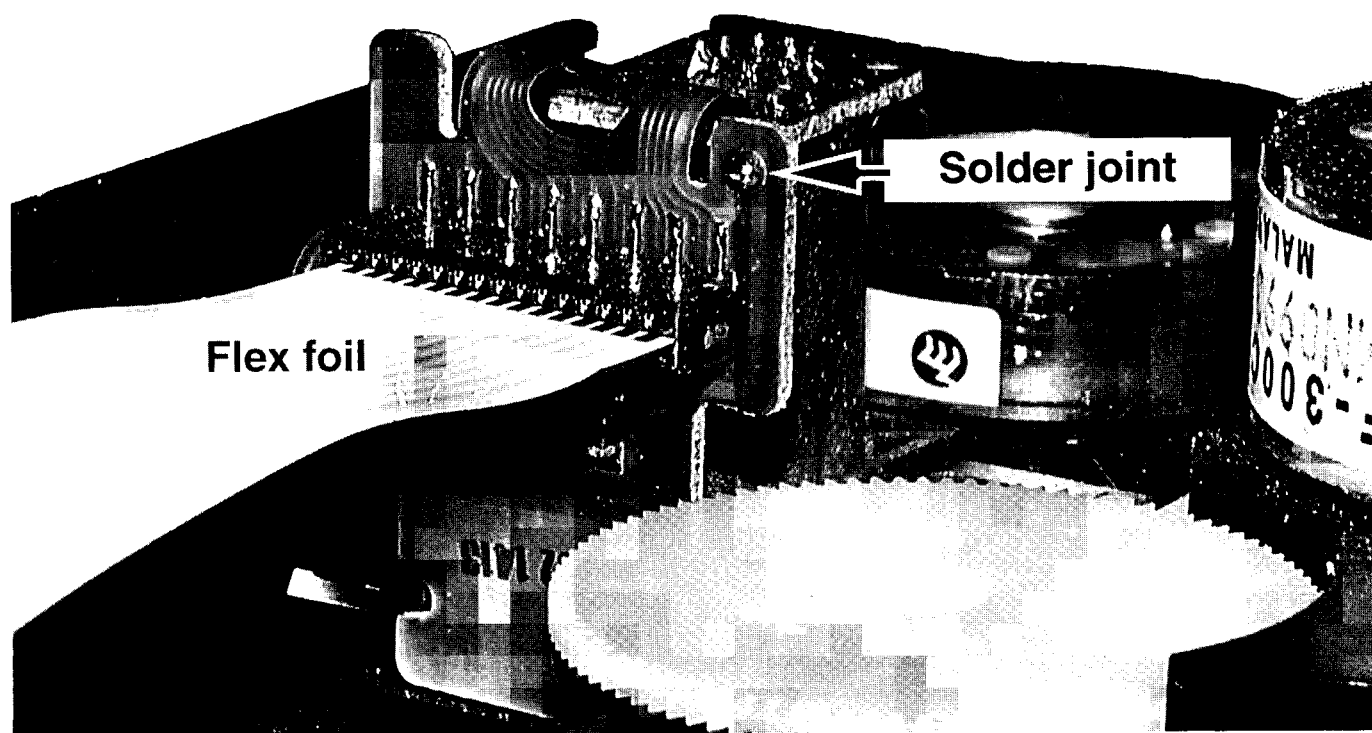
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

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

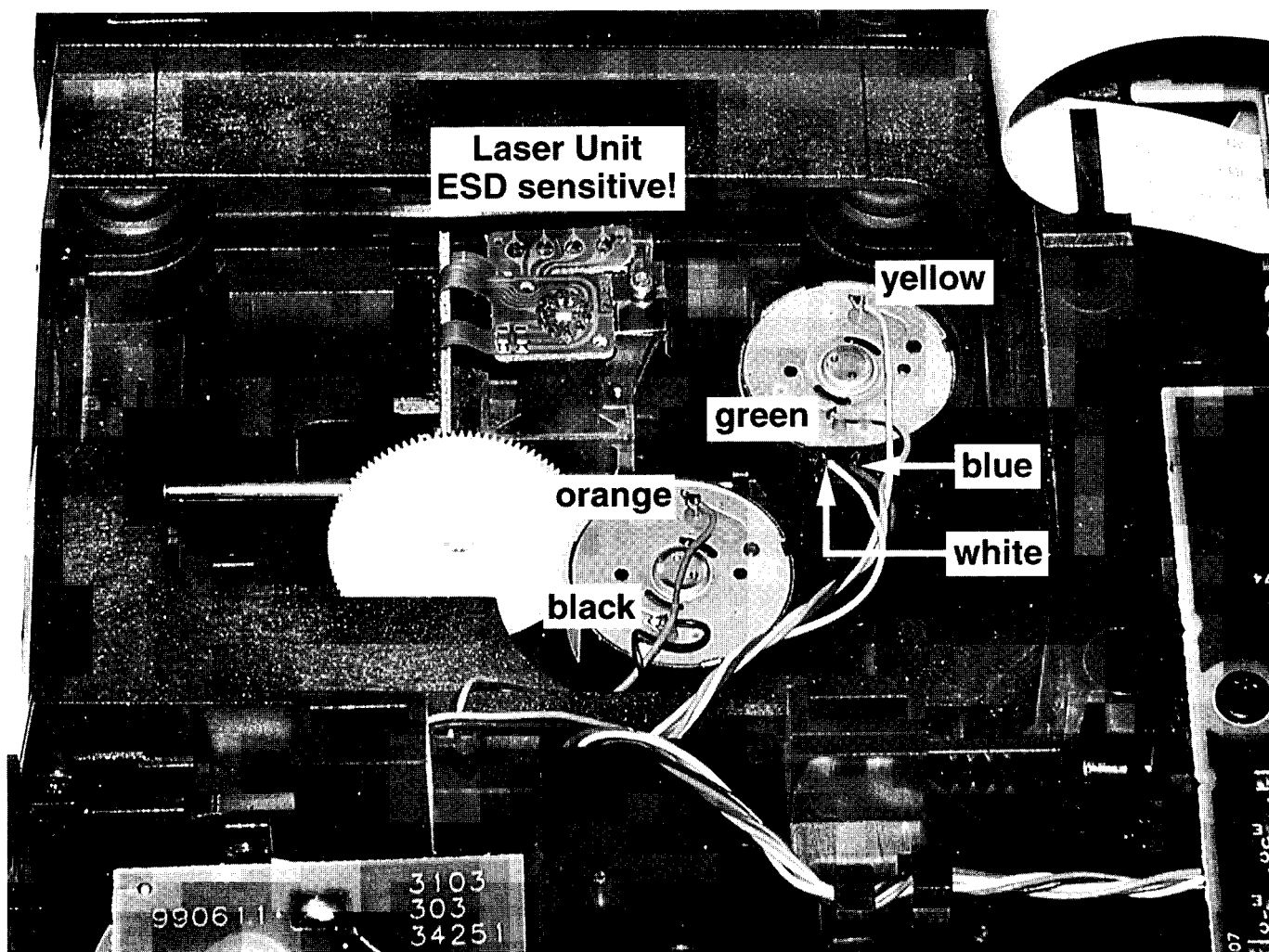
1. Disconnect CD drive flexfoil from old CD drive
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Remove old CD drive
4. Remove short-circuit from flexfoil
5. Connect flexfoil to new CD drive
6. Position new CD drive in its studs
7. Remove short-circuit from Laserunit

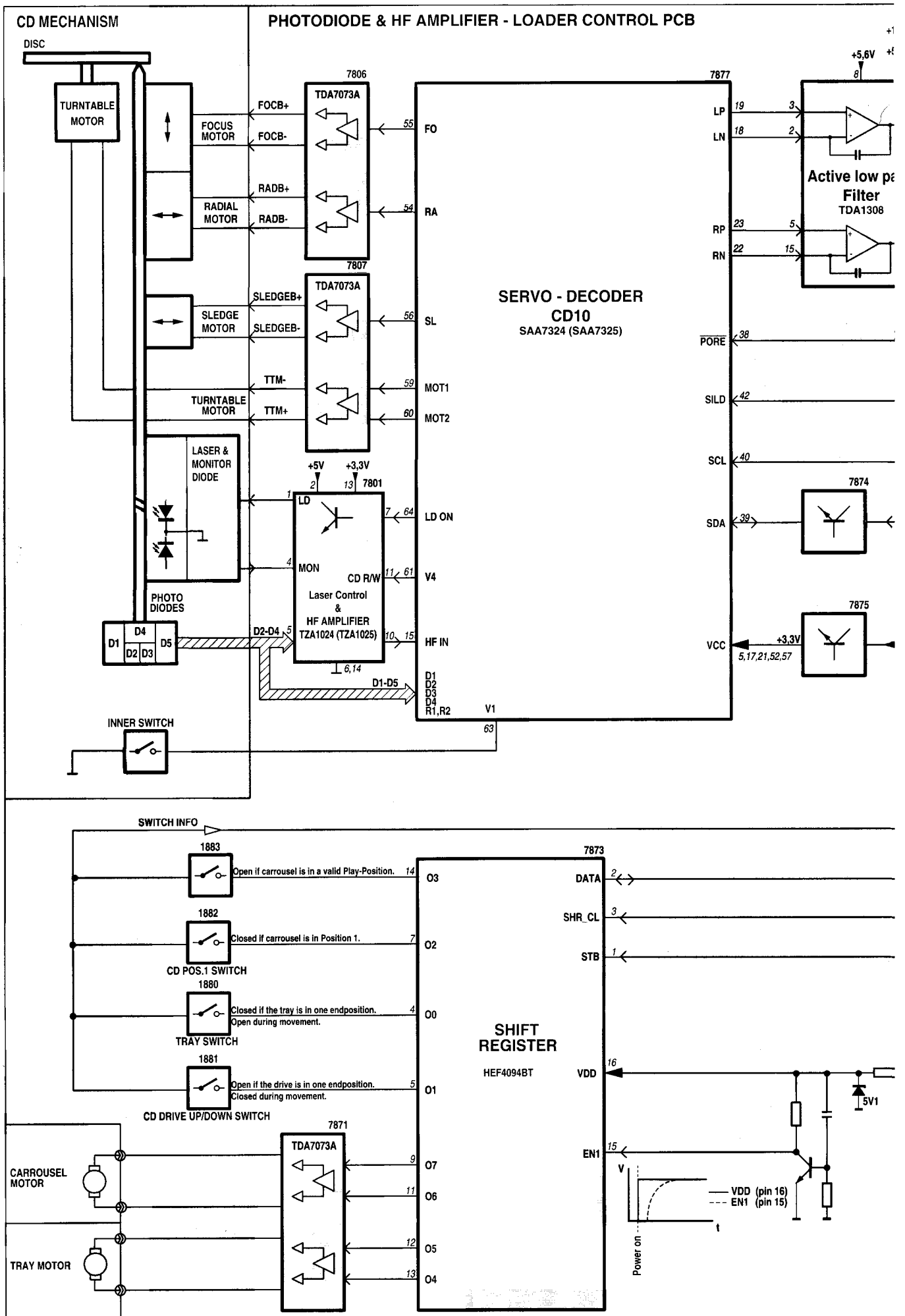


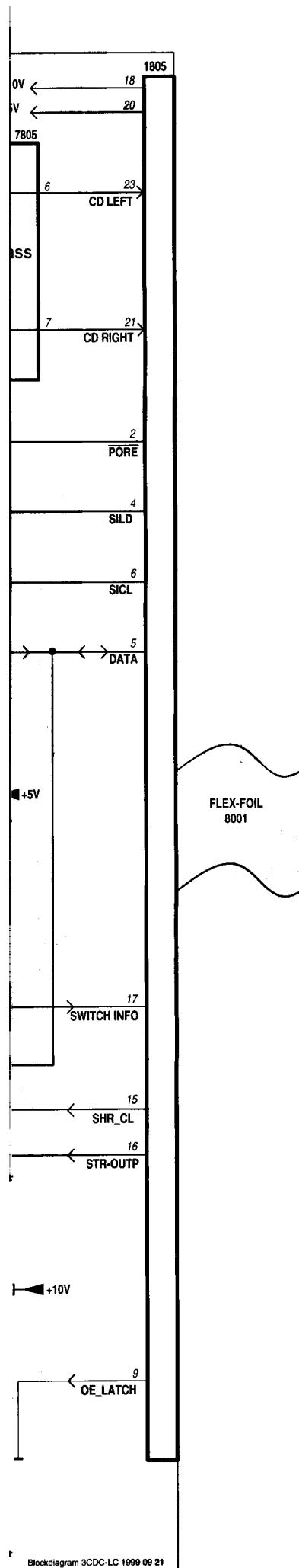
Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.

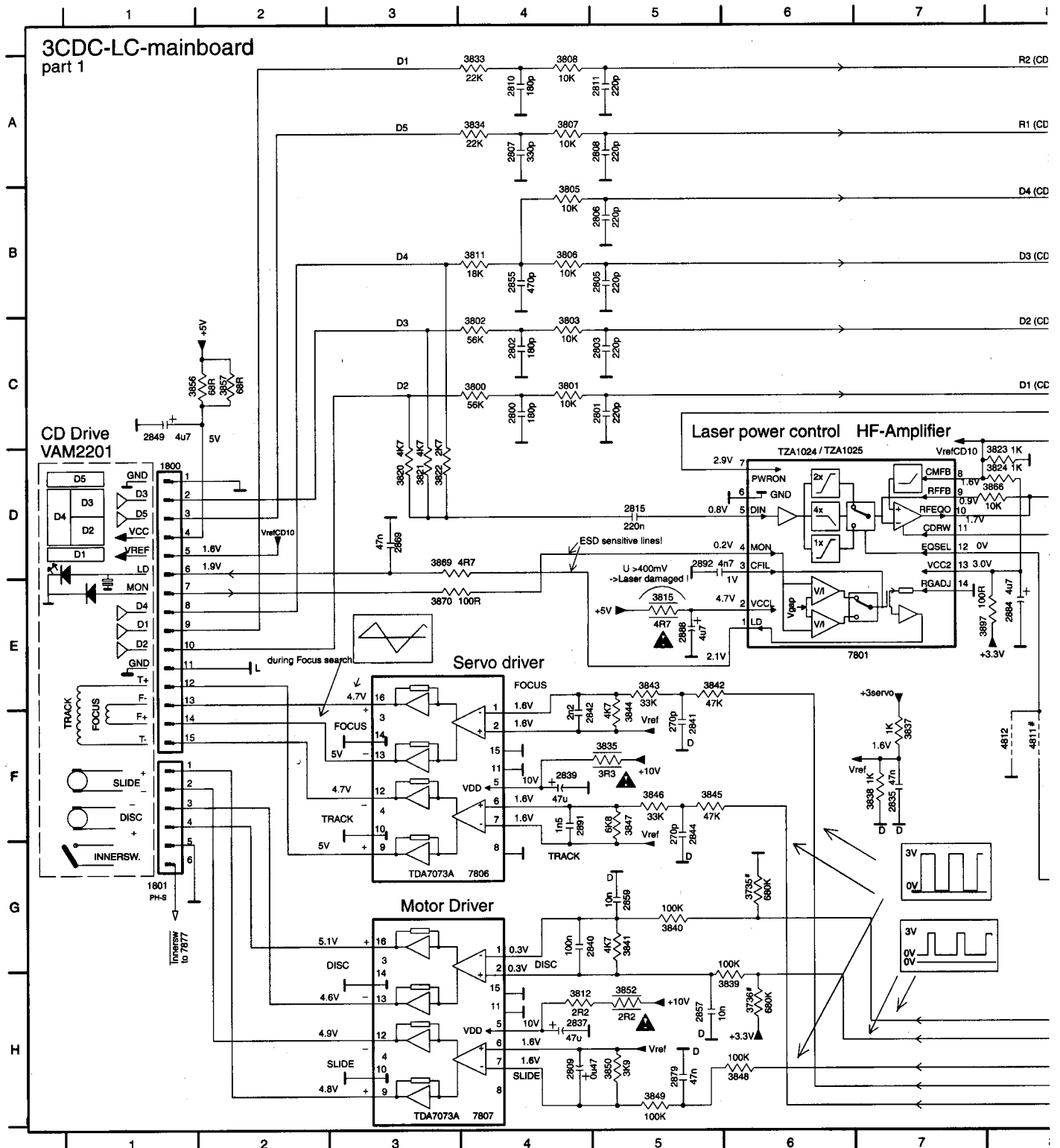


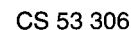
Wiring







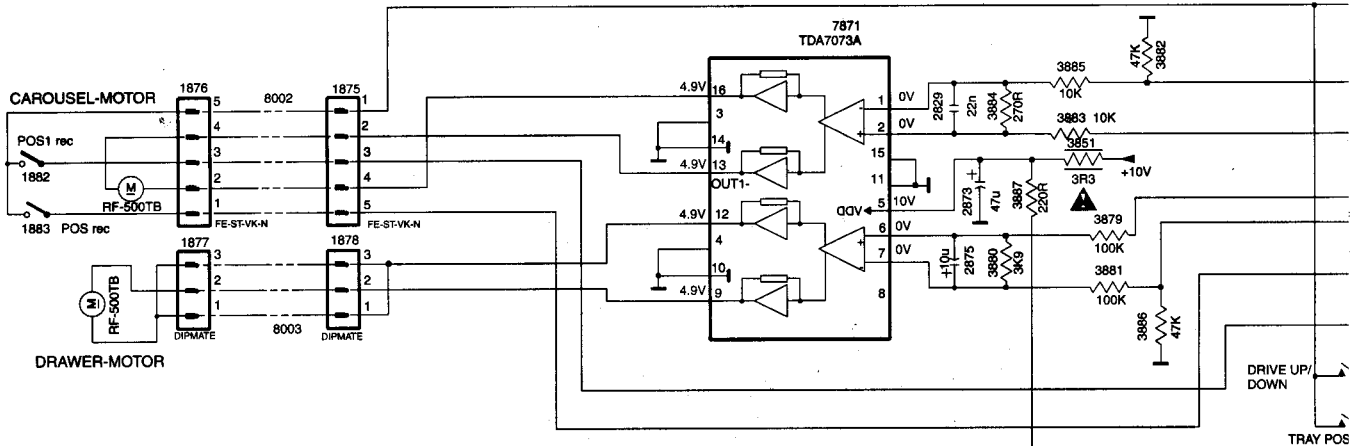
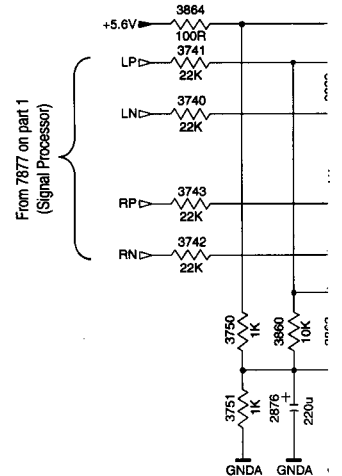
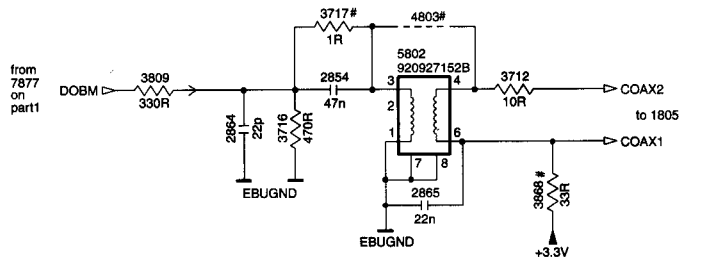




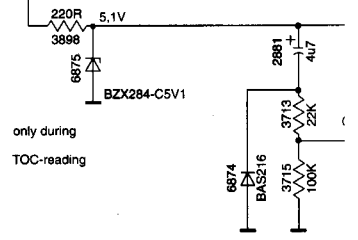
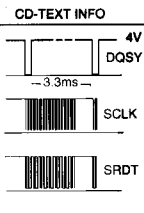
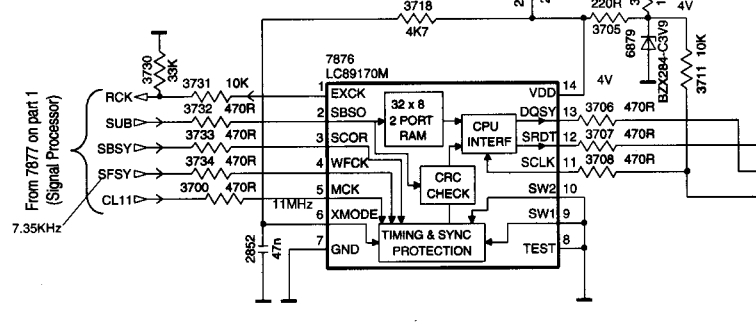
1805 D15	2830 B10	2858 A10	2865 C4	2877 F11	3705 G4	3713 F8	3730 G2	3741 A7	3751 C7	3762 B12	3855 B11	3868 C4	3877 F12	3883 D6	389C
1875 D2	2831 B9	2860 A10	2867 A9	2878 F11	3706 G4	3714 F8	3731 G2	3742 B7	3770 A11	3809 B2	3858 A11	3871 F12	3878 E12	3884 D6	3891
1878 D2	2832 A8	2861 B10	2872 G10	2881 F8	3707 G4	3715 G8	3732 G2	3743 A7	3771 A12	3814 C12	3859 B11	3872 B13	3879 D7	3885 C6	389C
1880 E8	2852 H2	2862 B9	2873 D6	2882 B10	3708 G4	3716 B3	3733 G2	3744 A9	3772 A12	3831 F4	3860 B8	3874 B13	3880 E6	3886 E7	389E
1881 E8	2853 F4	2863 B8	2875 E6	2893 F12	3711 G5	3717 B3	3734 G2	3746 B10	3780 B11	3851 D6	3861 B8	3875 C12	3881 E7	3887 D6	389E
2829 D6	2854 B3	2864 B3	2876 C8	3700 H2	3712 B4	3718 G3	3740 A7	3750 B7	3781 B12	3854 A11	3864 A7	3876 C11	3882 C7	3888 F12	480C

3CDC-LC-mainboard part 2

digital out circuitry (not for all versions)

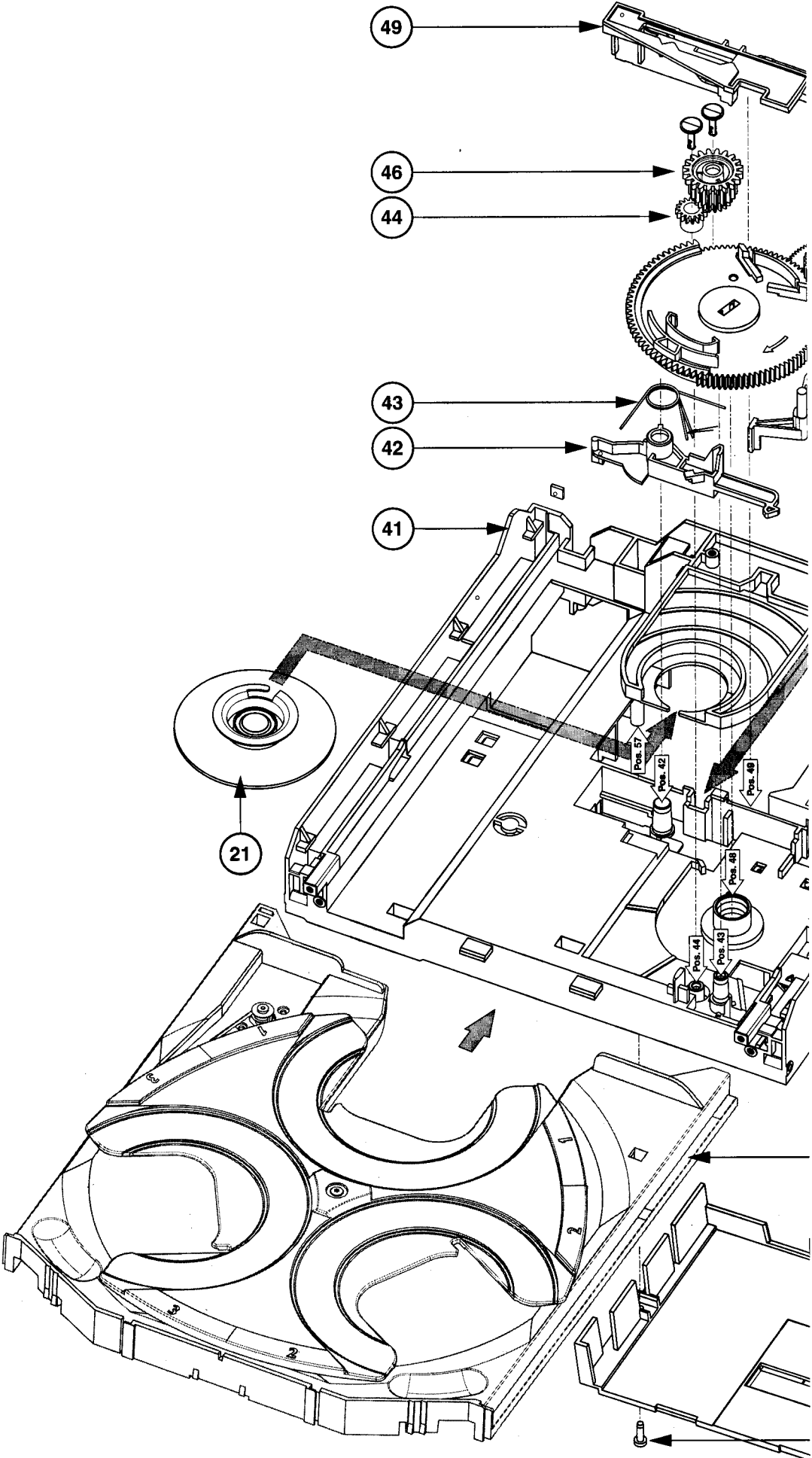


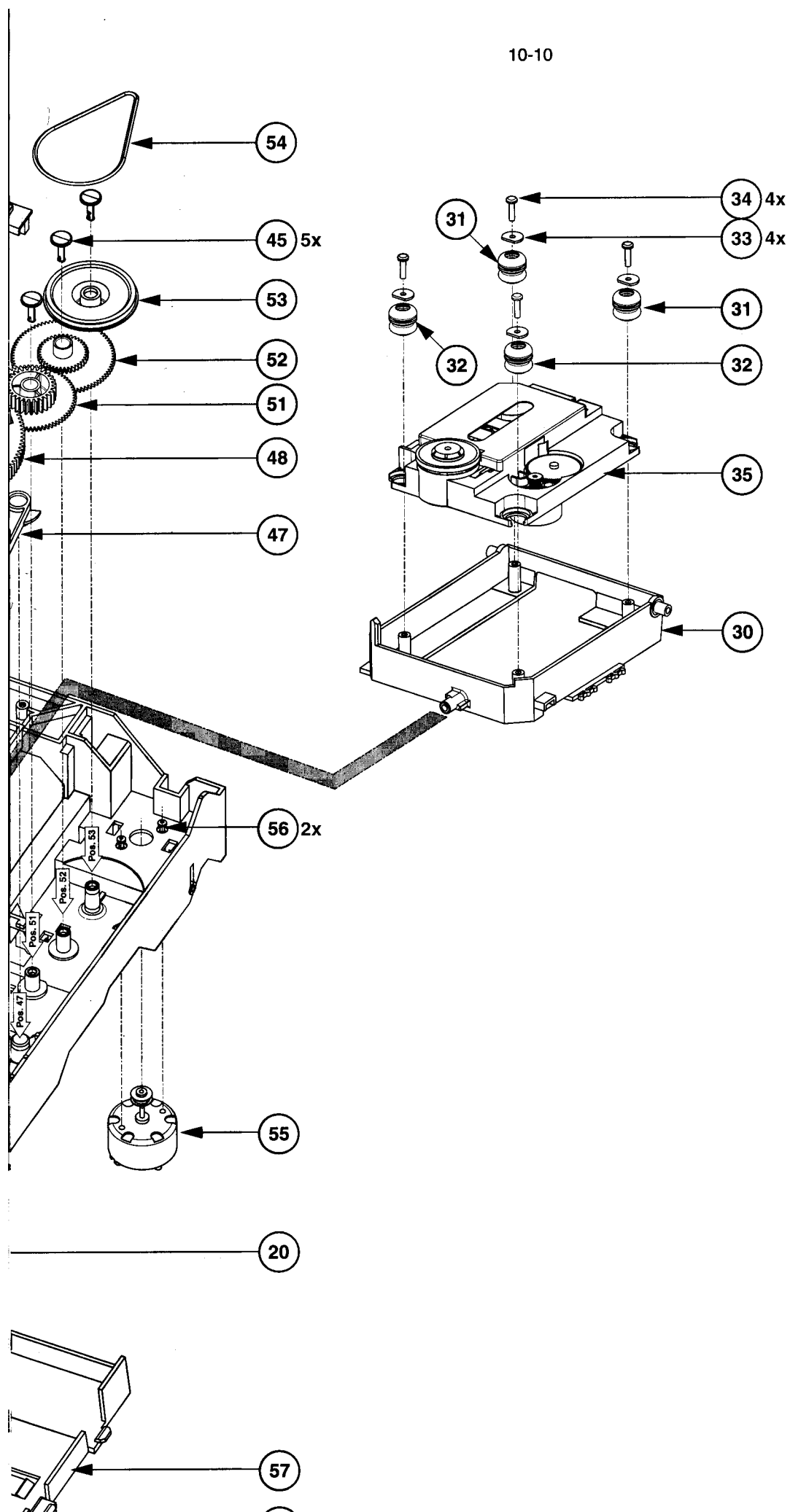
CD-Text circuitry (not for all versions)



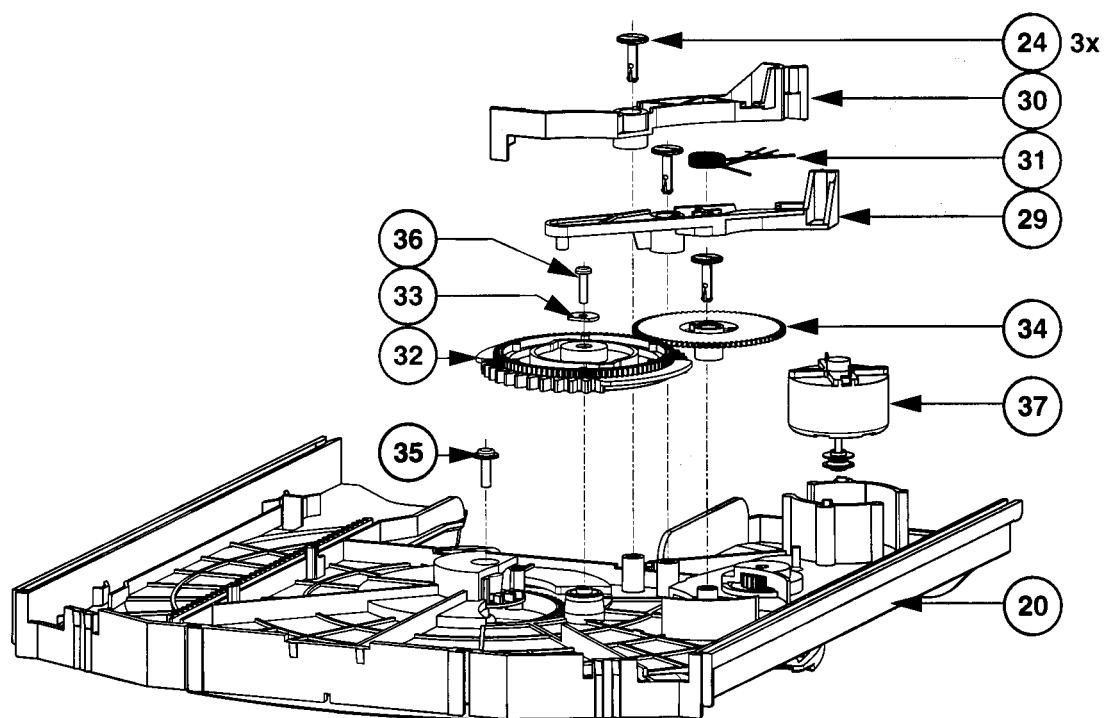


EXPLODED VIEW (3CDC-LC MODULE)

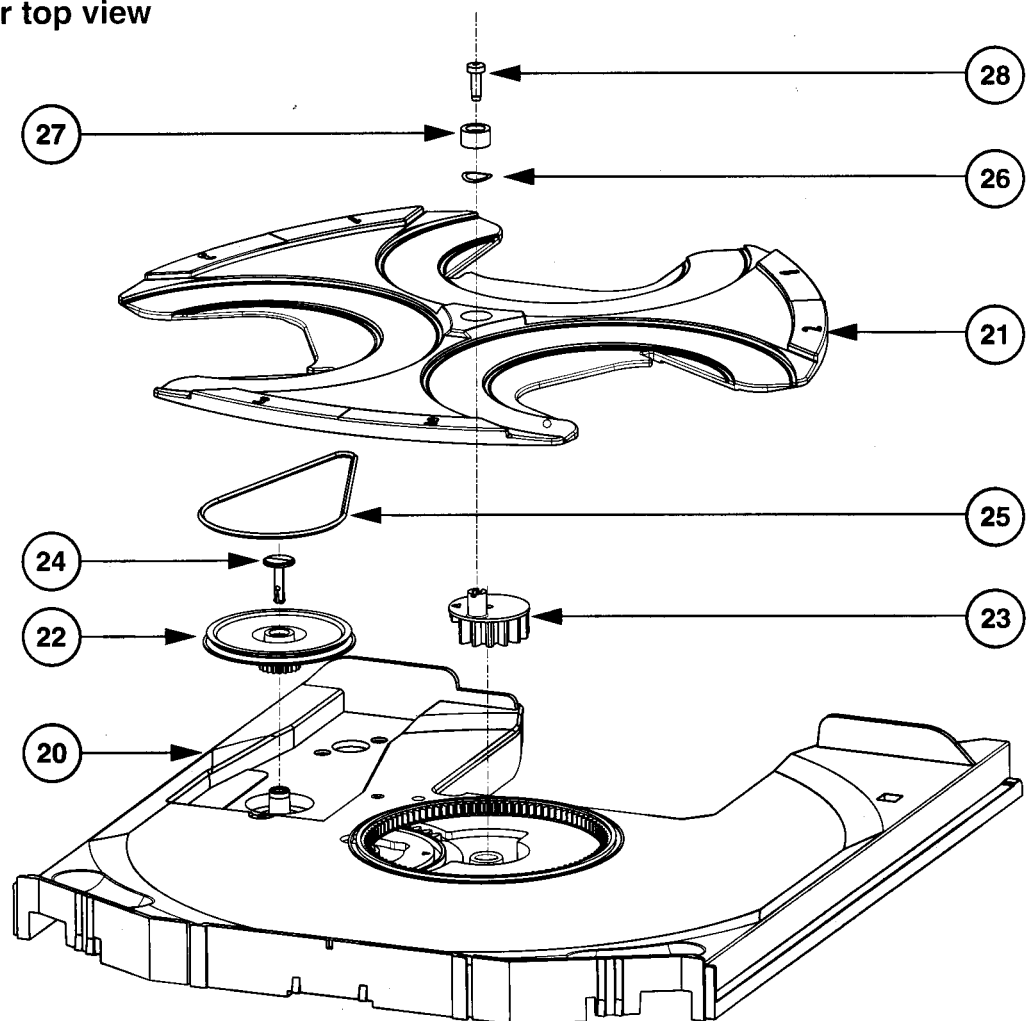




Drawer bottom view



Drawer top view



MECHANICAL PARTS LIST - 3CDC-LC DRAWER ASSEMBLY (Page 10-11)

0020	310330466500	DRAWER	0029	310330466550	BRACKET-DISC
0021	310330466490	CARROUSELL	0030	310330466520	TUMBLER
0022	310330406860	PULLEY-DRAWER	0031	310330106470	SPRING-DISC
0023	310330406850	ECCENTRIC	0032	310330406920	CONTROL-DISC
0024	310330406980	NAIL	0033	310330406970	WASHER
0025	310330466850	DRIVING-BELT-CARROUSEL	0034	310330406870	GEAR-1
0027	482253212365	BUSH DRAWER	0037	482236110753	MOTOR ASSY
0027	310330407100	BUSH DRAWER / BWC Version			

MECHANICAL PARTS LIST - 3CDC-LC MODULE (Page 10-10)

0021	314011758650	CLAMPER ASSY-VAM	0047	310330466530	BRACKET-LOAD
0030	310330466560	SUPPORT	0048	310330406910	CAM
0031	482252910431	DAMPER - RUBBER (25DEG)	0049	310330466510	GUIDING
0032	482252910431	DAMPER - RUBBER (25DEG)	0051	310330406900	GEAR-4
0033	310330406970	WASHER	0052	310330406870	GEAR-1
0035	482269110772	VAM2201/01	0053	310330406960	PULLEY-FRAME
0041	310330466480	FRAME	0054	310330466910	DRIVING-BELT-DRAWER
0042	310330466540	BRACKET-GUIDING	0055	482236110753	MOTOR ASSY
0043	310330106460	SPRING-GUIDING	0056	482250212548	SCREW M2,6X2,9
0044	310330406890	GEAR-3	0057	310330468890	COVER-VAM
0045	310330406980	NAIL	0059	482246612146	RUBBER
0046	310330406880	GEAR-2			

ELECTRICAL PARTS LIST - 3CDC-LC MODULE**MISCELLANEOUS**

1800	482226510925	Flex Foil Connector 15P	2808	482212233575	220pF 5% 63V
1805	482226510979	Flex Foil Connector 15P	2809	532212441948	470nF 20% 50V
1805	482226511545	Flex Foil Connector 19P	2810	482212610326	180pF 5% 63V
1805	482226511182	Flex Foil Connector 23P	2811	482212233575	220pF 5% 63V
1810	482224210849	RES XTL 8MHz4672	2815	482212614076	220nF +80/-20% 25V
1810	482224273557	RES CER 8MHz467	2816	482212613344	1,5nF 5% 63V
1875	482226710958	Flex Foil Connector 5P	2818	482212613344	1,5nF 5% 63V
1876	242202508332	Flex Foil Connector 5P	2822	222286115222	2,2nF 5% 50V
1880	482227613503	Switch	2823	482212613692	47pF 1% 63V
1881	482227613503	Switch	2824	482212613751	47nF 10% 63V
1882	482227613503	Switch	2825	482212233177	10nF 20% 50V
1883	482227613503	Switch	2826	482212412362	47μF 20% 4V
8002	310330891990	Flex Foil 5P 200mm	2828	482212412362	47μF 20% 4V
8005	310330891980	Flex Foil 15P 170mm	2829	532212232654	22nF 10% 63V
			2830	482212613751	47nF 10% 63V
			2831	532212232531	100pF 5% 50V
			2832	532212232531	100pF 5% 50V
			2833	532212232659	33pF 5% 50V
			2834	532212232659	33pF 5% 50V
			2835	482212613751	47nF 10% 63V
			2837	482212440433	47μF 20% 25V
			2838	482212440248	10μF 20% 63V
			2839	482212440433	47μF 20% 25V

CAPACITORS

2800	482212610326	180pF 5% 63V	2831	532212232531	100pF 5% 50V
2801	482212233575	220pF 5% 63V	2832	532212232531	100pF 5% 50V
2802	482212610326	180pF 5% 63V	2833	532212232659	33pF 5% 50V
2803	482212233575	220pF 5% 63V	2834	532212232659	33pF 5% 50V
2805	482212233575	220pF 5% 63V	2835	482212613751	47nF 10% 63V
2806	482212233575	220pF 5% 63V	2837	482212440433	47μF 20% 25V
2807	532212231863	330pF 5% 63V	2838	482212440248	10μF 20% 63V
			2839	482212440433	47μF 20% 25V

ELECTRICAL PARTS LIST - 3CDC-LC MODULE**CAPACITORS**

2840	482212614585	100nF 10% 50V	3718	482205120472	4k7 5% 0,1W
2841	482212233216	270pF 5% 50V	3727	482205120472	4k7 5% 0,1W
2842	482212233127	2,2nF 10% 63V	3728	482205120472	4k7 5% 0,1W
2844	482212233216	270pF 5% 50V	3730	482205120333	33k 5% 0,1W
2849	482212440769	4,7μF 20% 100V	3731	482211710833	10k 1% 0,1W
2850	532212231647	1nF 10% 63V	3732	482205120471	470R 5% 0,1W
2851	482212442383	220μF 20% 4V	3733	482205120471	470R 5% 0,1W
2852	482212613751	47nF 10% 63V	3734	482205120471	470R 5% 0,1W
2853	532212232654	22nF 10% 63V	3740	482205120223	22k 5% 0,1W
2854	482212613751	47nF 10% 63V	3741	482205120223	22k 5% 0,1W
2855	532212234099	470pF 10% 63V	3742	482205120223	22k 5% 0,1W
2856	482212613691	27pF 1% 63V	3743	482205120223	22k 5% 0,1W
2857	482212233177	10nF 20% 50V	3744	482211710833	10k 1% 0,1W
2858	482212412245	220μF 20%	3746	482211710833	10k 1% 0,1W
2859	482212233177	10nF 20% 50V	3750	482205110102	1k 2% 0,25W
2860	482212411947	10μF 20% 16V	3751	482205110102	1k 2% 0,25W
2861	482212411947	10μF 20% 16V	3800	482211711148	56k 1% 0,1W
2862	482212233575	220pF 5% 63V	3801	482211710833	10k 1% 0,1W
2863	482212233575	220pF 5% 63V	3802	482211711148	56k 1% 0,1W
2864	532212232658	22pF 5% 50V	3803	482211710833	10k 1% 0,1W
2865	532212232654	22nF 10% 63V	3804	482211710833	10k 1% 0,1W
2867	482212233575	220pF 5% 63V	3805	482211710833	10k 1% 0,1W
2869	482212613751	47nF 10% 63V	3806	482211710833	10k 1% 0,1W
2872	482212613751	47nF 10% 63V	3807	482211710833	10k 1% 0,1W
2873	482212480231	47μF 20% 16V	3808	482211710833	10k 1% 0,1W
2875	482212411947	10μF 20% 16V	3809	482211713577	330R 1% 1,25W
2876	482212412245	220μF 20%	3811	482211710965	18k 1% 0,1W
2877	482212613692	47pF 1% 63V	3812	482205310228	2R2 5% 1W
2878	482212233575	220pF 5% 63V	3814	482205120339	33R 5% 0,1W
2879	482212613751	47nF 10% 63V	3815	482205210478	Δ 4R7 5% 0,33W
2881	482212440769	4,7μF 20% 100V	3819	482205120471	470R 5% 0,1W
2882	482212233575	220pF 5% 63V	3820	482205120472	4k7 5% 0,1W
2884	482212440769	4,7μF 20% 100V	3821	482205120472	4k7 5% 0,1W
2885	482212440769	4,7μF 20% 100V	3822	482211712955	2k7 1% 0,1W
2887	482212614585	100nF 10% 50V	3823	482205110102	1k 2% 0,25W
2888	482212440769	4,7μF 20% 100V	3824	482205110102	1k 2% 0,25W
2891	532212231865	1,5nF 10% 63V	3825	482205110102	1k 2% 0,25W
2892	532212610223	4,7nF 10% 63V	3826	482205120223	22k 5% 0,1W
2893	482212233575	220pF 5% 63V	3827	482205120333	33k 5% 0,1W

RESISTORS

3700	482205120471	470R 5% 0,1W	3828	482205120223	22k 5% 0,1W
3705	482211711503	220R 1% 0,1W	3831	482205120101	100R 5% 0,1W
3706	482205120471	470R 5% 0,1W	3832	482211710833	10k 1% 0,1W
3707	482205120471	470R 5% 0,1W	3833	482205120223	22k 5% 0,1W
3708	482205120471	470R 5% 0,1W	3834	482205120223	22k 5% 0,1W
3709	482205120108	1R 5% 0,1W	3835	482205210338	Δ 3R3 5% 0,33W
3711	482211710833	10k 1% 0,1W	3837	482205110102	1k 2% 0,25W
3712	482205120109	10R 5% 0,1W	3838	482205110102	1k 2% 0,25W
3713	482205120223	22k 5% 0,1W	3839	482211710837	100k 1% 0,1W
3714	482211710833	10k 1% 0,1W	3840	482211710837	100k 1% 0,1W
3715	482211710837	100k 1% 0,1W	3841	482205120472	4k7 5% 0,1W
3716	482205120471	470R 5% 0,1W	3842	482211710834	47k 1% 0,1W
			3843	482205120333	33k 5% 0,1W
			3844	482205120472	4k7 5% 0,1W

ELECTRICAL PARTS LIST - 3CDC-LC MODULE**RESISTORS**

3845	482211710834	47k 1% 0,1W
3846	482205120333	33k 5% 0,1W
3847	482211711507	6k8 1% 0,1W
3848	482211710837	100k 1% 0,1W
3849	482211710837	100k 1% 0,1W
3850	482205120392	3k9 5% 0,1W
3851	482205210338	△ 3R3 5% 0,33W
3852	482205210228	△ 2R2 5% 0,33W
3853	482205120471	470R 5% 0,1W
3854	482205120101	100R 5% 0,1W
3855	482205120101	100R 5% 0,1W
3856	482211712521	68R 1% 0,1W
3857	482211712521	68R 1% 0,1W
3858	482205120223	22k 5% 0,1W
3859	482205120223	22k 5% 0,1W
3860	482211710833	10k 1% 0,1W
3861	482211710833	10k 1% 0,1W
3862	482205120121	120R 5% 0,1W
3863	482205120101	100R 5% 0,1W
3863	482205120339	33R 5% 0,1W
3864	482205120101	100R 5% 0,1W
3866	482211710833	10k 1% 0,1W
3867	482205120121	120R 5% 0,1W
3869	482205120478	4R7 5% 0,1W
3870	482205120101	100R 5% 0,1W
3871	482211710833	10k 1% 0,1W
3873	482205120471	470R 5% 0,1W
3875	482211710833	10k 1% 0,1W
3876	482211710837	100k 1% 0,1W
3877	482211710833	10k 1% 0,1W
3878	482211710833	10k 1% 0,1W
3879	482211710837	100k 1% 0,1W
3880	482205120392	3k9 5% 0,1W
3881	482211710837	100k 1% 0,1W
3882	482211710834	47k 1% 0,1W
3883	482211710833	10k 1% 0,1W
3884	482211711504	270R 1% 0,1W
3885	482211710833	10k 1% 0,1W
3886	482211710834	47k 1% 0,1W
3887	482211711503	220R 1% 0,1W
3888	482211710833	10k 1% 0,1W
3889	482205120471	470R 5% 0,1W
3890	482205110102	1k 2% 0,25W
3891	482205110102	1k 2% 0,25W
3892	482205120471	470R 5% 0,1W
3893	482205120471	470R 5% 0,1W
3894	482205120101	100R 5% 0,1W
3895	482205120159	15R 5% 0,1W
3897	482205120101	100R 5% 0,1W
3898	482211711503	220R 1% 0,1W
3899	482205120101	100R 5% 0,1W
4800	482205120008	0R Jumper 0805
4801	482205120008	0R Jumper 0805

4802	482205120008	0R Jumper 0805
4804	482205120008	0R Jumper 0805
4805	482205120008	0R Jumper 0805
4806	482205120008	0R Jumper 0805
4807	482205120008	0R Jumper 0805
4808	482205120008	0R Jumper 0805
4810	482205120008	0R Jumper 0805
4812	482205120008	0R Jumper 0805
4817	482205120008	0R Jumper 0805
4818	482205120008	0R Jumper 0805
4819	482205120008	0R Jumper 0805
4820	482205120008	0R Jumper 0805
4821	482205120008	0R Jumper 0805
4822	482205120008	0R Jumper 0805
4823	482205120008	0R Jumper 0805
4824	482205120008	0R Jumper 0805
4825	482205120008	0R Jumper 0805
4826	482205120008	0R Jumper 0805
4827	482205120008	0R Jumper 0805
4828	482205120008	0R Jumper 0805
4830	482205120008	0R Jumper 0805
4831	482205120008	0R Jumper 0805
4832	482205120008	0R Jumper 0805
4833	482205120008	0R Jumper 0805
4834	482205120008	0R Jumper 0805
4835	482205120008	0R Jumper 0805
4836	482205120008	0R Jumper 0805
4837	482205120008	0R Jumper 0805
4838	482205120008	0R Jumper 0805
4839	482205120008	0R Jumper 0805
4840	482205120008	0R Jumper 0805
4841	482205120008	0R Jumper 0805
4842	482205120008	0R Jumper 0805
4843	482205120008	0R Jumper 0805
4844	482205120008	0R Jumper 0805
4845	482205120008	0R Jumper 0805
4846	482205120008	0R Jumper 0805
4847	482205120008	0R Jumper 0805
4848	482205120008	0R Jumper 0805
4849	482205120008	0R Jumper 0805
4876	482205120008	0R Jumper 0805

COILS & FILTERS

5802	482215631058	100μH
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DIODES

6871	482213083757	BAS216
6872	482213083757	BAS216
6873	482213083757	BAS216
6874	482213083757	BAS216
6875	482213011383	BZX284-C5V1
6877	482213011366	BZX284-C3V9
6878	482213083757	BAS216

ELECTRICAL PARTS LIST - 3CDC-LC MODULE

DIODES

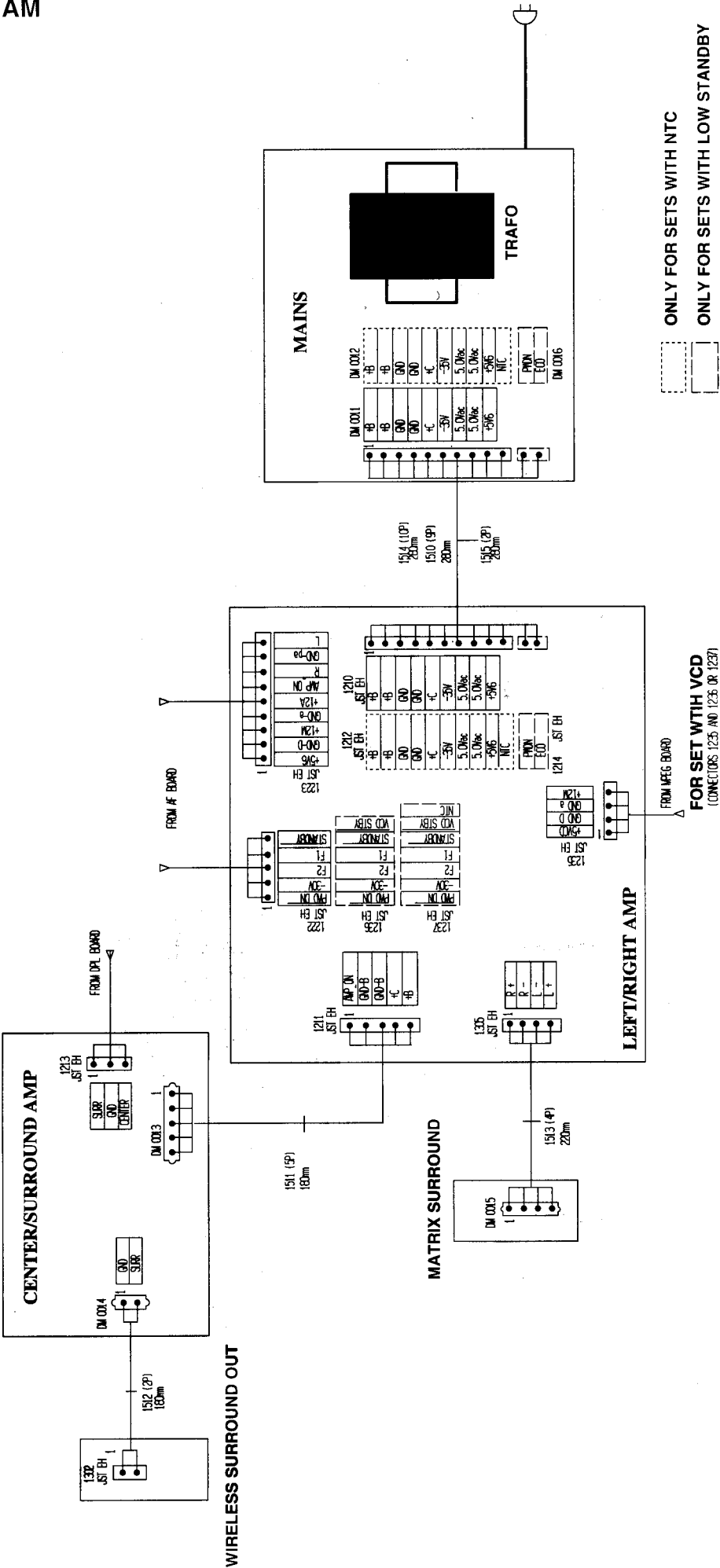
6879	482213011366	BZX284-C3V9
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TRANSISTORS & INTEGRATED CIRCUITS

7801	935262236118	IC SM TZA1025T/V2
7805	482220933165	TDA1308T/N1
7806	482220932852	TDA7073A/N2
7807	482220932852	TDA7073A/N2
7812	482213060511	BC847B
7871	482220932852	TDA7073A/N2
7873	532220911306	HEF4094BT
7874	482213060511	BC847B
7875	482213060511	BC847B
7876	482220916143	LC89170M
7877	482220917324	SAA7325H

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

WIRING DIAGRAM



CONNECTORS ASSIGNMENTS

CONNECTOR 1210/1212*

1	+B	High voltage supply rail for all class-G power amplifiers.
2	+B	High voltage supply rail for all class-G power amplifiers.
3	GND	System ground reference.
4	GND	System ground reference.
5	+C	Low voltage supply rail for all class-G power amplifiers.
6	-35V	Secondary AC voltage for -30V regulator and PWDN control signal.
7	~5.0V	AC supply for FTD filament.
8	~5.0V	AC supply for FTD filament.
9	+5V6	Supply voltage for μ P.
10*	NTC	Control signal to μ P for NTC fuzzy logic protection.

* Only for NTC.

CONNECTOR 1214

1	PWDN	Control signal to μ P to detect mains failure at low standby mode.
2	ECO	Control line to switch mains transformer on and off.

CONNECTOR 1211

1	AMP_ON	Control signal from μ P to turn on/off the power amplifiers.
2	GND	Ground reference for large signal of power amplifiers.
3	GND	Ground reference for large signal of power amplifiers.
4	+C	Low voltage supply rail for all class-G power amplifiers.
5	+B	High voltage supply rail for all class-G power amplifiers.

CONNECTOR 1305

1	+SR	Return path for Surround Right speaker.
2	-SR	Connection to +terminal of the Surround Right speaker.
3	-SL	Connection to +terminal of the Surround Left speaker.
4	+SL	Return path for Surround Left speaker.

CONNECTOR 1223

1	+5V6	Supply voltage for μ P.
2	D	Ground for μ P i.e. digital ground.
3	+12M	Supply voltage for tape and CD motors.
4	a	Ground for +12A.
5	+12A	Supply for analog electronics including headphone amplifier.
6	AMP_ON	Control signal from μ P to turn on/off the power amplifier.
7	R	Right channel input for power amplifier.
8	pa	Audio input reference ground.
9	L	Left channel input for power amplifier.

CONNECTOR 1222/1236*

/1237^

1	PWDN	Control signal to μ P to detect mains failure.
2	-30V	Negative supply to FTD grid.
3	~F2	AC voltage to FTD filament.
4	~F1	AC voltage to FTD filament.
5	STBY	Control signal from μ P to switch supply voltages to standby mode
6*	VCD_STBY	Control signal from μ P to switch VCD supply to standby mode.
7^	NTC	Control signal to μ P for NTC fuzzy logic protection.

* Only for VCD version.

^ Only for VCD version and with NTC.

Note : The STBY line must not be controlled by tri-state output.

CONNECTOR 0014

- 1 GND
- 2 S

INTERCONNECTION TO DPL SURROUND CINCH OUT PART (Only for 4 channel version)

Audio input reference for DPL C/S Amp. and surround cinch out.
 Surround output signal for DPL C/S Amp. and surround cinch out.

CONNECTOR 1213

- 1 S
- 2 GND
- 3 C

INTERCONNECTION TO DPL BOARD (Only for 4 channel version)

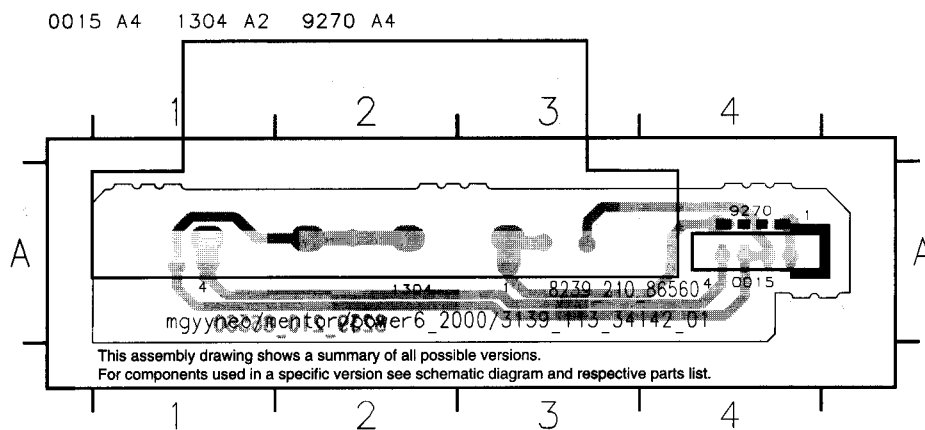
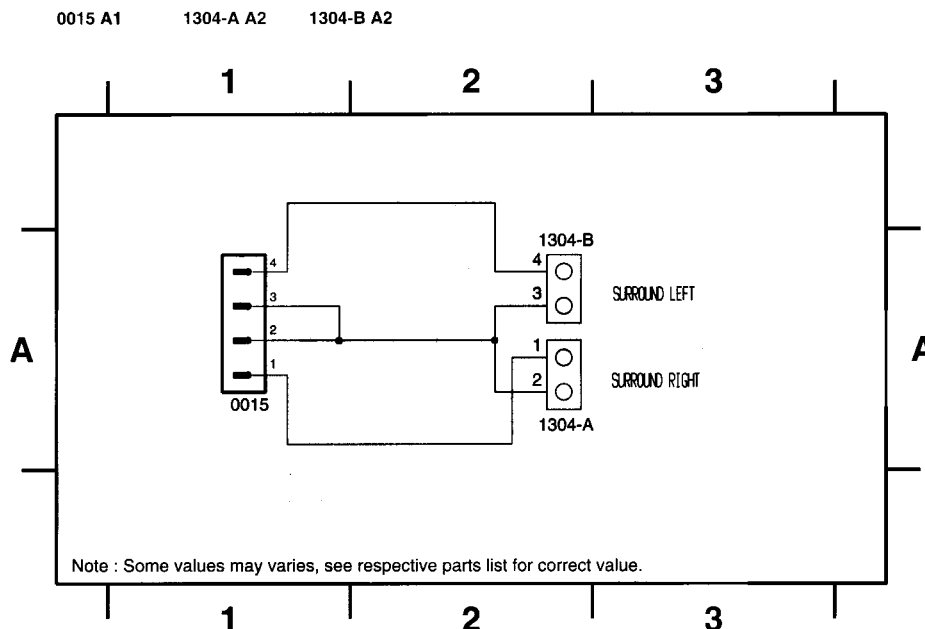
Surround input for power amplifier.
 Audio input reference ground for center & surround channel.
 Center input for power amplifier.

CONNECTOR 1235

- 1 +5VCD
- 2 D
- 3 a
- 4 +12M

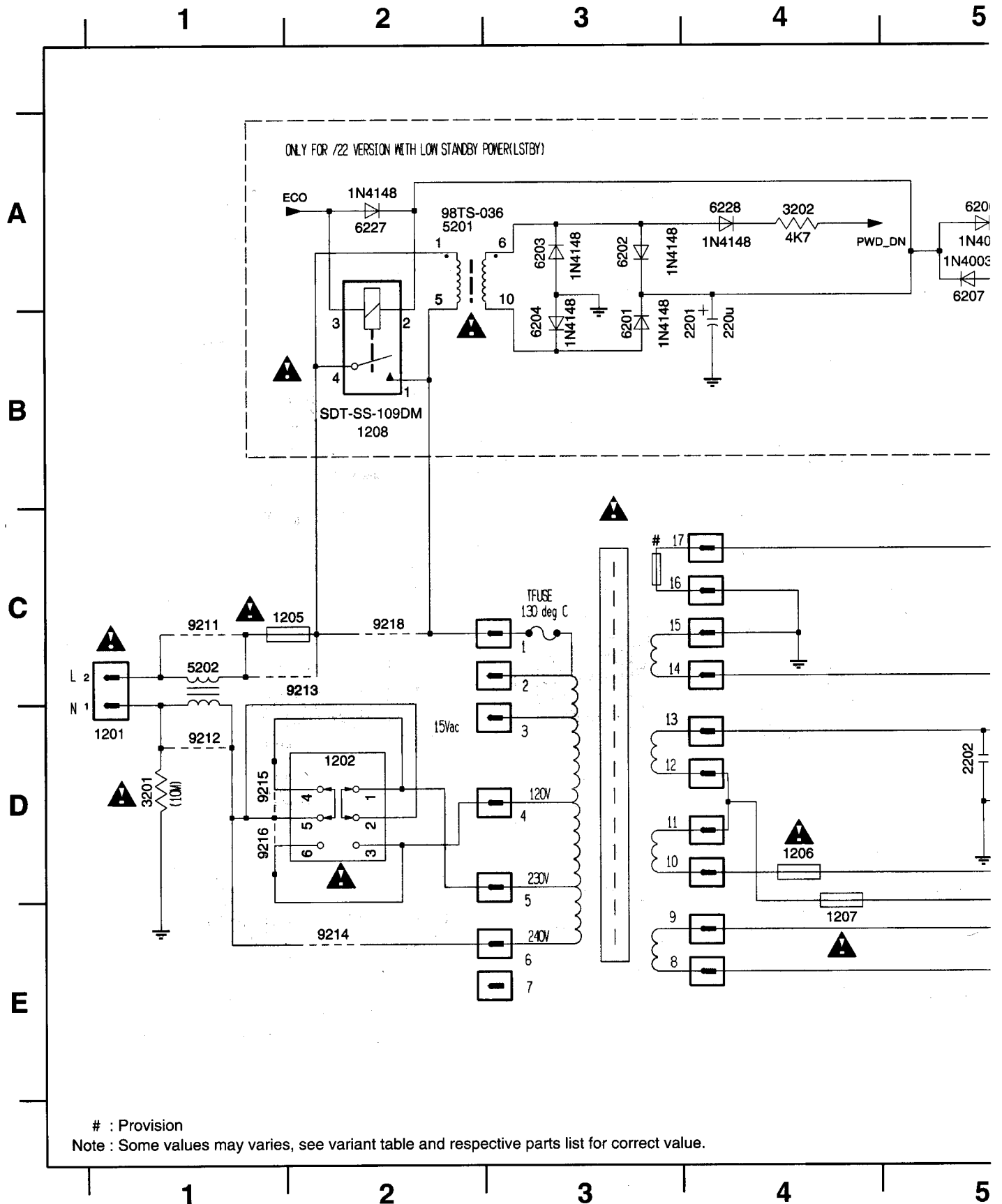
INTERCONNECTION TO MPEG BOARD (Only for VCD version)

Unswitched supply voltage for VCD μ P.
 Ground for VCD μ P, digital circuit and motor.
 Ground for motor.
 Supply for analog electronics including headphone amplifier.

MATRIX SURROUND PART - COMPONENT VIEW**MATRIX SURROUND PART - CIRCUIT DIAGRAM**

SUPPLY PART - CIRCUIT DIAGRAM

0011 C9	0016 E9	1202 D2	1206 D4	1208 B2	2202 D5	2204 D6	2206 D7	2250 B7	3201 D1	3203 C8	3301 B6	5202
0012 C9	1201 D1	1205 C2	1207 E4	2201 B4	2203 D5	2205 D7	2230 B6	2330 B6	3202 A4	3300 B6	5201 A2	6201



6
7
8
9

VERSION TABLE

VERSION	9211	9212	9213	9214	9215	9216	9218	5202	3201	1202	1205	1206	1207
/ 3/	φ	φ	φ	-	-	φ	φ	-	φ	-	-	T6.3, U.L.	T6.3, U.L.
/ 21	-	-	-	-	-	-	φ	φ	-	φ	T500mA IEC	T5A, IEC	T5A, IEC
/ 22	-	-	φ	-	φ	-	φ	φ	-	-	-	T5A, IEC	T5A, IEC
/ 22 WITH LSTBY	-	-	φ	-	φ	-	-	φ	-	-	-	T5A, IEC	T5A, IEC

1 +B
 2 +B
 3 GND
 4 GND
 5 +C
 6 -35V
 7 5.0Vac
 8 5.0Vac
 9 +5V6
 10 NTC

1 PWD_DN
 2 ECO

0016

6
7
8
9

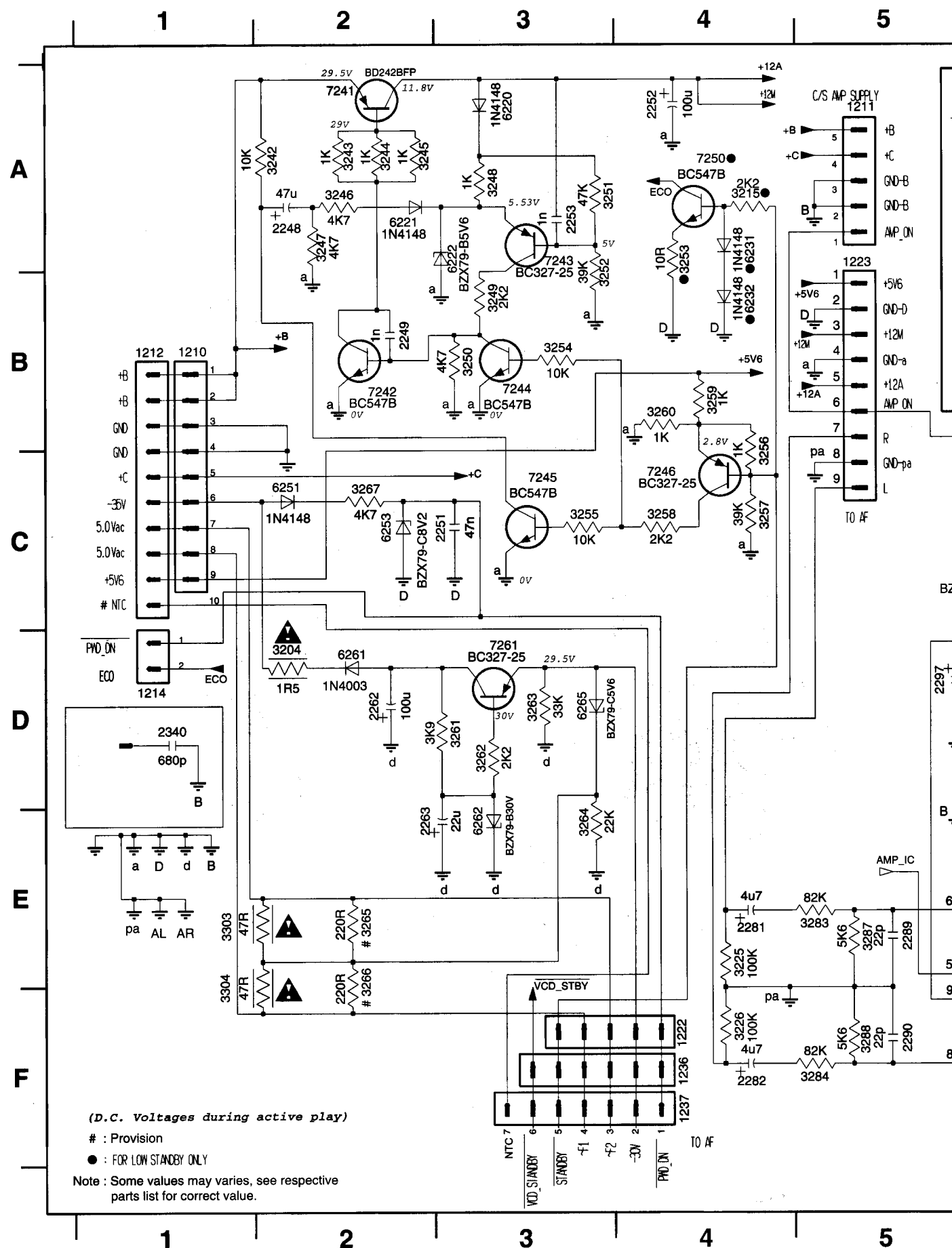
A

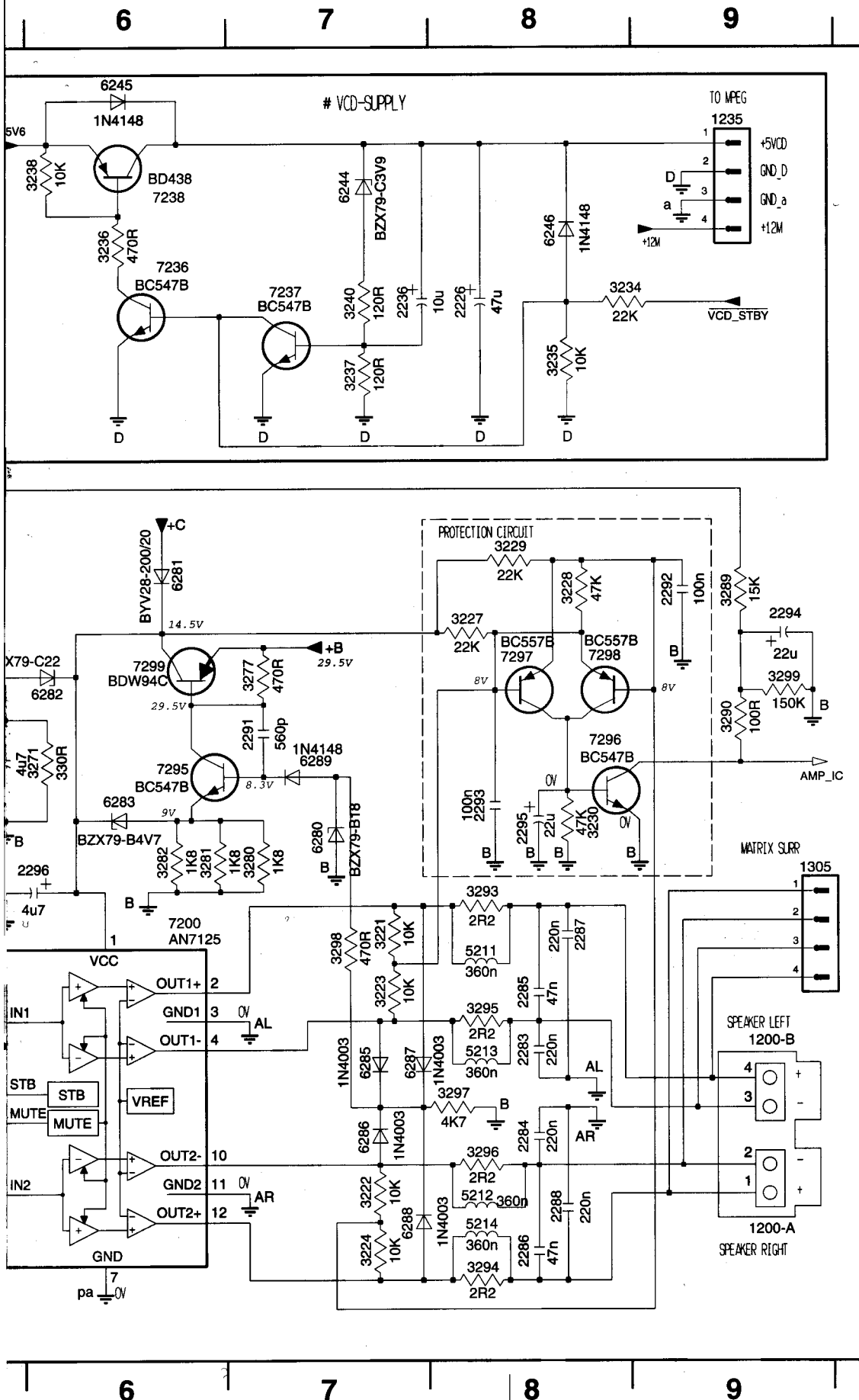
B

C

D

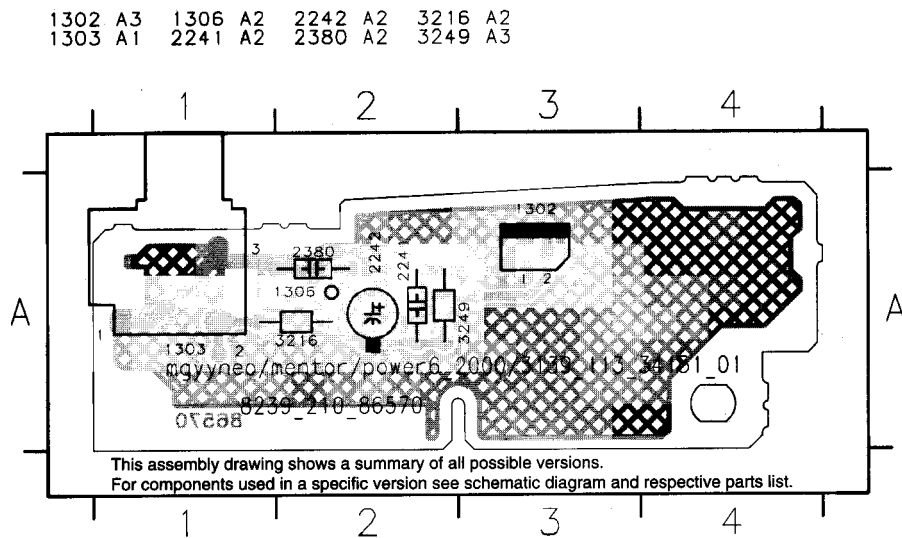
E



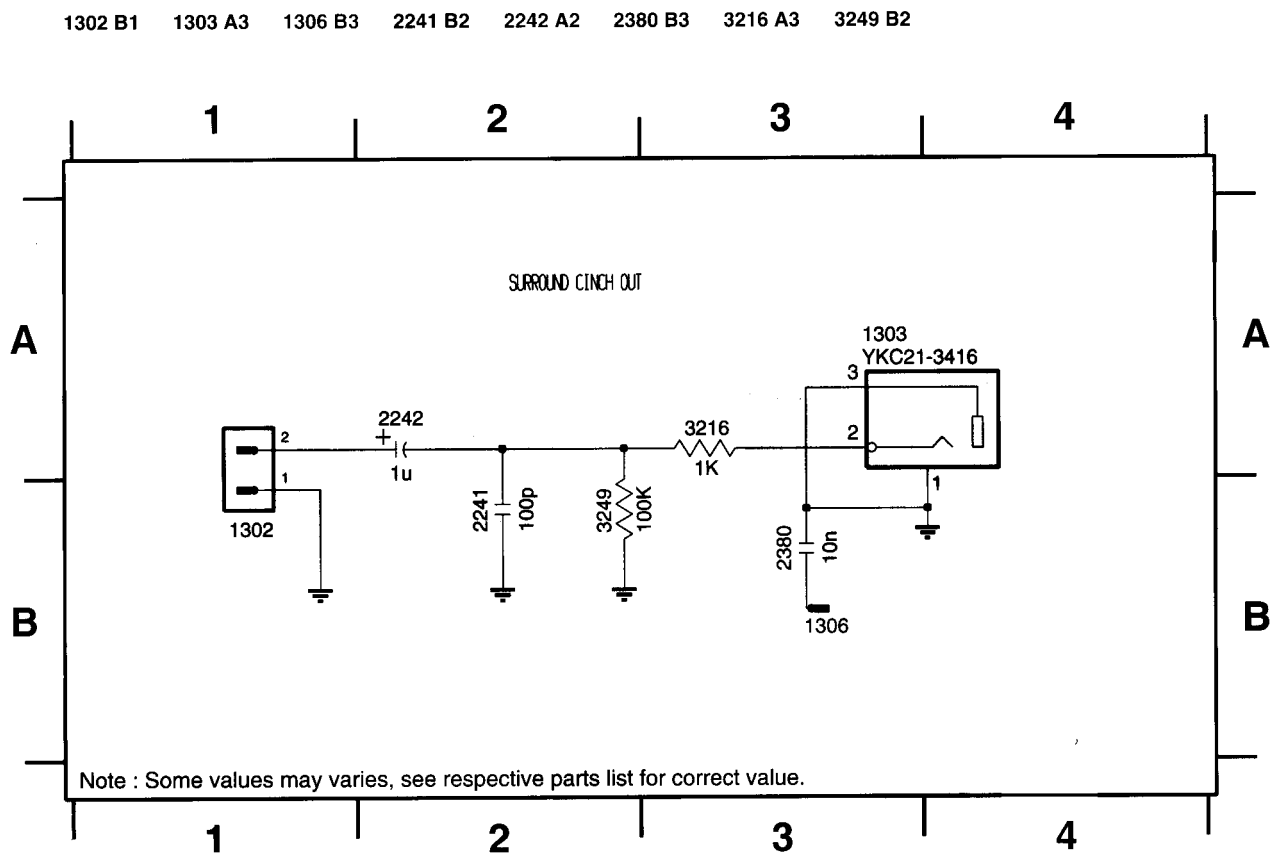


1200-A F9	3260 B4
1200-B E9	3261 D3
1210 B1	3262 D3
1211 A5	3263 D3
1212 B1	3264 E3
1214 D1	3265 E2
1222 F4	3266 F2
1223 A5	3267 C2
1235 A9	3271 D6
1236 F4	3277 C7
1237 F4	3280 D7
1305 D9	3281 D6
2226 B8	3282 D6
2236 B7	3283 E5
2248 A2	3284 F5
2249 B2	3287 E5
2251 C3	3288 F5
2252 A4	3289 C9
2253 A3	3290 D9
2262 D2	3293 D8
2263 E2	3294 F8
2281 E4	3295 E8
2282 F4	3296 F8
2283 E8	3297 E8
2284 F8	3298 E7
2285 E8	3299 C9
2286 F8	3303 E1
2287 E8	3304 F1
2288 F8	5211 E8
2289 E5	5212 F8
2290 F5	5213 E8
2291 D7	5214 F8
2292 C9	6220 A3
2293 D8	6221 A2
2294 C9	6222 A3
2295 D8	6231 A4
2296 D6	6232 B4
2297 D5	6244 A7
2340 D1	6245 A6
3204 D2	6246 A8
3215 A4	6251 C2
3221 E7	6253 C2
3222 F7	6261 D2
3223 E7	6262 E3
3224 F7	6265 D3
3225 E4	6280 D7
3226 F4	6281 C6
3227 C8	6282 C6
3228 C8	6283 D6
3229 C8	6285 E7
3230 D8	6286 F7
3234 A8	6287 E7
3235 B8	6288 F7
3236 A6	6289 D7
3237 B7	7200 E6
3238 A6	7236 A6
3240 B7	7237 A7
3242 A2	7238 A6
3243 A2	7241 A2
3244 A2	7242 B2
3245 A2	7243 A3
3246 A2	7244 B3
3247 A2	7245 C3
3248 A3	7246 C4
3249 B3	7250 A4
3250 B3	7261 D3
3251 A3	7295 D6
3252 B3	7296 D8
3253 A4	7297 C8
3254 B3	7298 C8
3255 C3	7299 C6
3256 C4	
3257 C4	
3258 C4	
3259 B4	

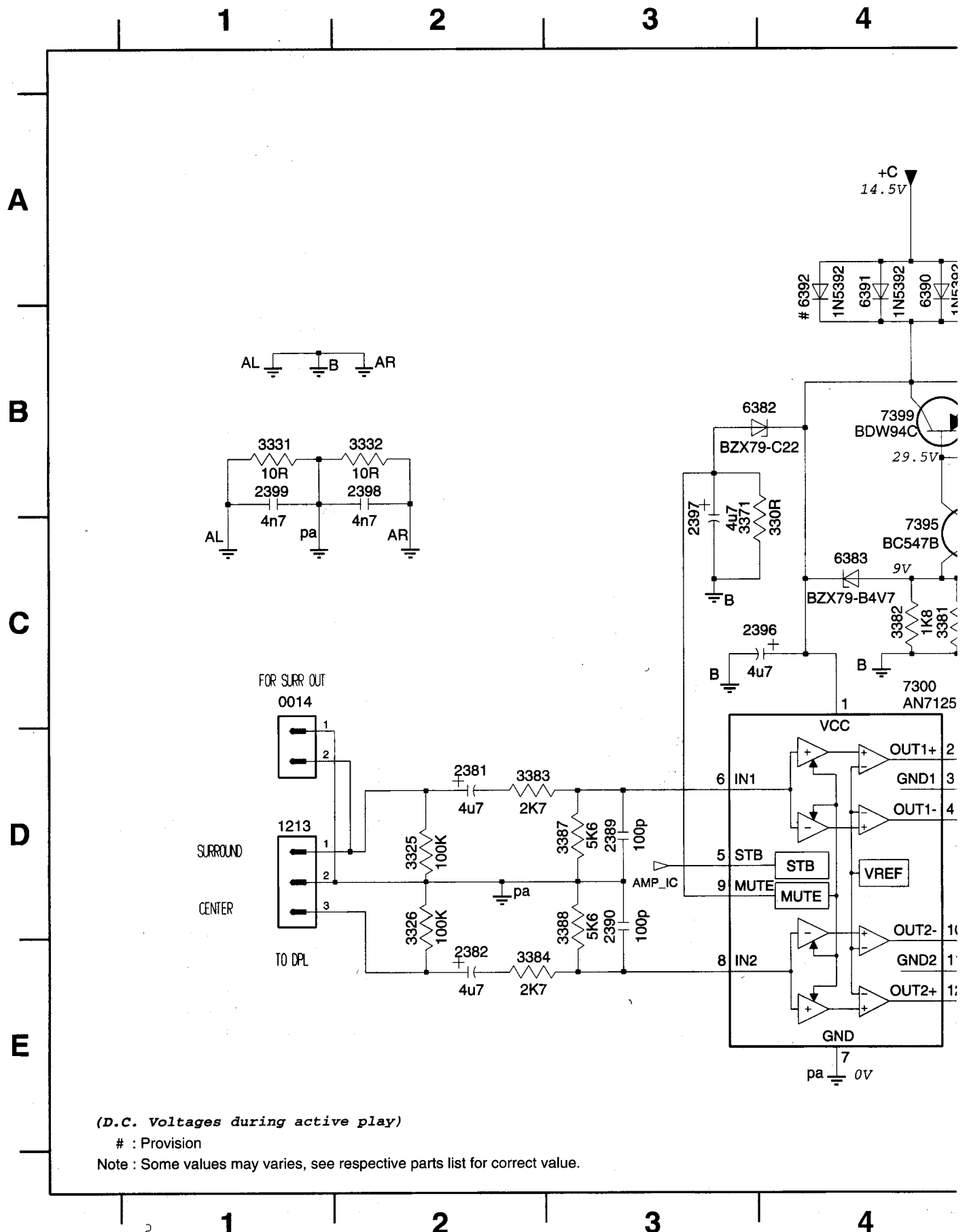
SURROUND CINCH-OUT PART- COMPONENT VIEW

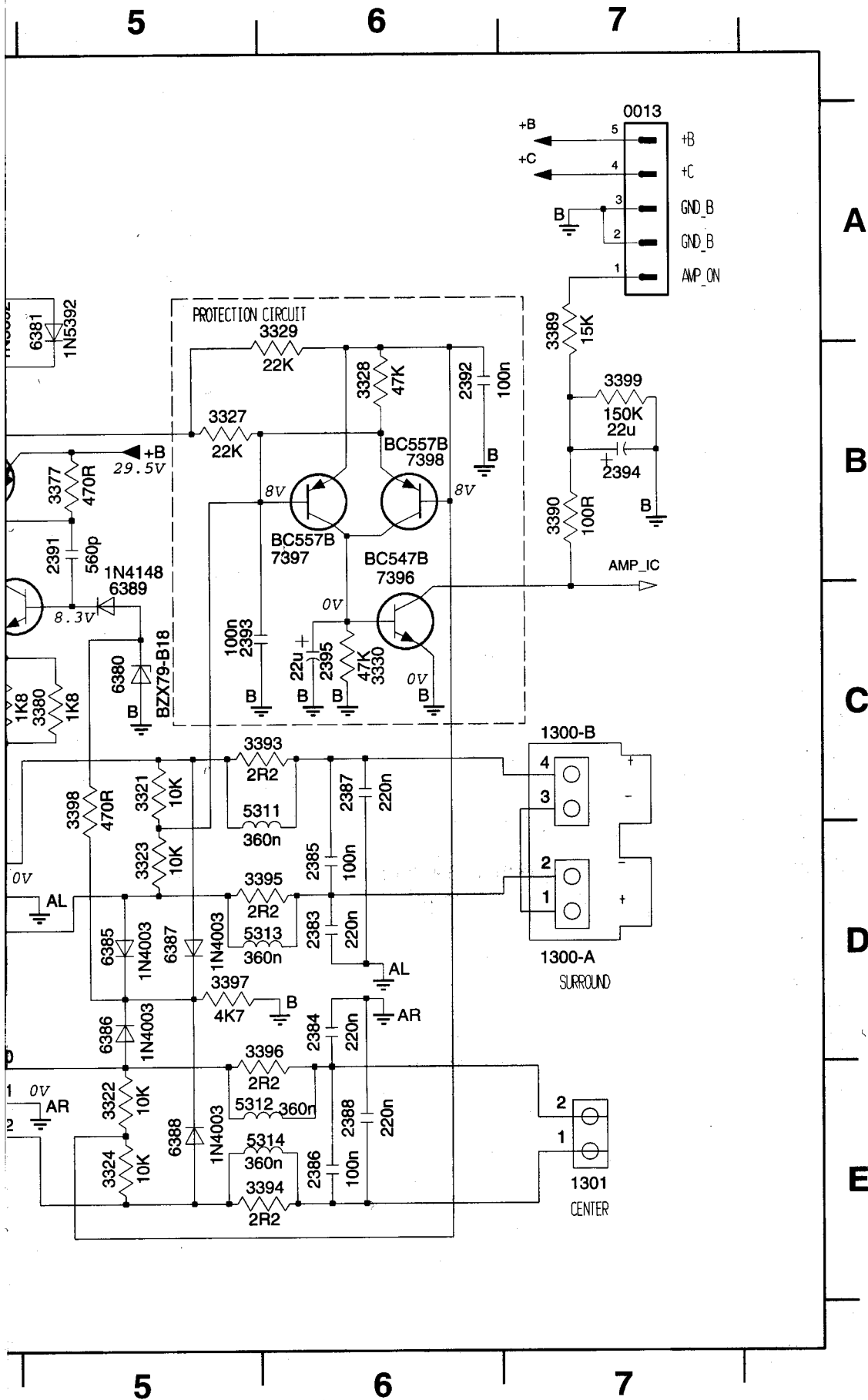


SURROUND CINCH-OUT PART - CIRCUIT DIAGRAM

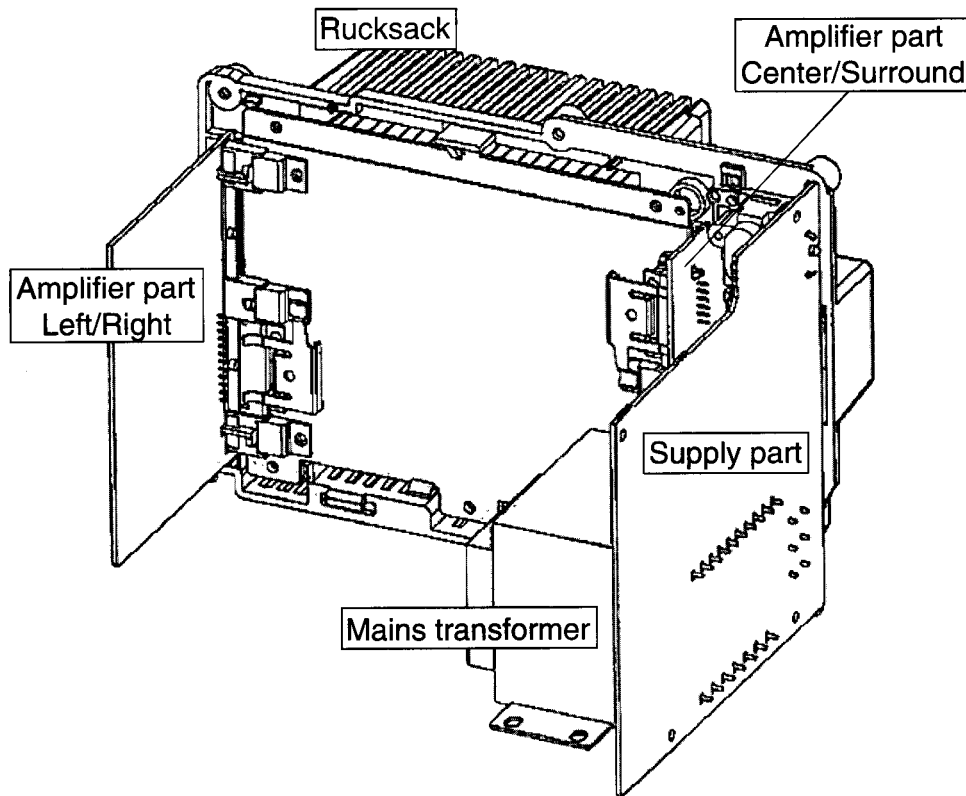


AMPLIFIER PART CENTER/SURROUND - CIRCUIT DIAGRAM





0013 A7	5314 E6
0014 C1	6380 C5
1213 D1	6381 A5
1300-A D7	6382 B4
1300-B C7	6383 C4
1301 E7	6385 D5
2381 D2	6386 D5
2382 E2	6387 D5
2383 D6	6388 E5
2384 D6	6389 C5
2385 D6	6390 A4
2386 E6	6391 A4
2387 C6	6392 A4
2388 E6	7300 C4
2389 D3	7395 C4
2390 D3	7396 C6
2391 B5	7397 B6
2392 B6	7398 B6
2393 C5	7399 B4
2394 B7	
2395 C6	
2396 C4	
2397 C3	
2398 B2	
2399 B1	
3321 C5	
3322 E5	
3323 D5	
3324 E5	
3325 D2	
3326 D2	
3327 B5	
3328 B6	
3329 A6	
3330 C6	
3331 B1	
3332 B2	
3371 C3	
3377 B5	
3380 C5	
3381 C4	
3382 C4	
3383 D2	
3384 E2	
3387 D3	
3388 D3	
3389 A7	
3390 B7	
3393 C6	
3394 E6	
3395 D6	
3396 D6	
3397 D5	
3398 C5	
3399 B7	
5311 C6	
5312 E6	
5313 D6	

PARTS LIST POWER6 2000 MODULE**MECHANICAL PARTS**

0201	482225610547	Rucksack 4CH	0255	482225540179	Spring Clip
0215	482249211735	Spring-Trans			

ELECTRICAL PARTS LIST - SUPPLY & LEFT/RIGHT AMPLIFIER BOARD**MISCELLANEOUS**

1200	482226731176	Speaker Terminal
1201	482226531015	△ Mains Socket
1201	482226531016	△ Mains Socket /37
1206	482207155002	△ Fuse T5A
1206	482225251123	△ Fuse T6,3A /37
1207	482207155002	△ Fuse T5A
1207	482225251123	△ Fuse T6,3A /37

CAPACITORS

2202	532212142386	100nF 5% 63V
2203	532212142386	100nF 5% 63V
2204	532212142386	100nF 5% 63V
2205	482212480415	4700µF 20% 50V
2206	482212412328	6800µF 16V
2248	482212412233	47µF 20% 25V
2249	482212233197	1nF 10% 50V
2250	482212440207	100µF 20% 25V
2251	482212612785	47nF 50V
2252	482212440207	100µF 20% 25V
2253	482212233197	1nF 10% 50V
2262	482212440255	100µF 20% 63V
2263	482212481151	22µF 50V

2281	482212440769	4,7µF 20% 100V
2282	482212440769	4,7µF 20% 100V
2283	482212142408	220nF 5% 63V
2284	482212142408	220nF 5% 63V
2285	482212612785	47nF 50V
2286	482212612785	47nF 50V
2287	482212142408	220nF 5% 63V
2288	482212142408	220nF 5% 63V
2289	482212233191	22pF 5% 50V
2290	482212233191	22pF 5% 50V
2291	482212210459	560pF 10% 50V
2292	482212612882	100nF +80/-20% 50V
2293	482212612882	100nF +80/-20% 50V
2294	482212481151	22µF 50V
2295	482212481151	22µF 50V
2296	482212440769	4,7µF 20% 100V
2297	482212440769	4,7µF 20% 100V
2330	482212480791	470µF 20% 16V
2340	482212614316	680pF 10% 50V

RESISTORS

3201	482205321106	△ 10M 5% 0,5W
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ELECTRICAL PARTS LIST - CENTER/SURROUND AMPLIFIER BOARD**MISCELLANEOUS**

1300	482226510912	Surround Speaker Terminal 4P
1301	482226510464	Center Speaker Terminal 2P

CAPACITORS

2381	482212440769	4,7μF 20% 100V
2382	482212440769	4,7μF 20% 100V
2383	482212142408	220nF 5% 63V
2384	482212142408	220nF 5% 63V
2385	482212612882	100nF +80/-20% 50V
2386	482212612882	100nF +80/-20% 50V
2387	482212142408	220nF 5% 63V
2388	482212142408	220nF 5% 63V
2389	482212233195	100pF 10% 50V
2390	482212233195	100pF 10% 50V
2391	482212210459	560pF 10% 50V
2392	482212612882	100nF +80/-20% 50V
2393	482212612882	100nF +80/-20% 50V
2394	482212481151	22μF 50V
2395	482212481151	22μF 50V
2396	482212440769	4,7μF 20% 100V
2397	482212440769	4,7μF 20% 100V
2398	482212611714	4,7nF 20%
2399	482212611714	4,7nF 20%

RESISTORS

3321	482205021003	10k 1% 0,6W
3322	482205021003	10k 1% 0,6W
3323	482205021003	10k 1% 0,6W
3324	482205021003	10k 1% 0,6W
3325	482211652234	100k 5% 0,5W
3326	482211652234	100k 5% 0,5W
3327	482211652257	22k 5% 0,5W
3328	482211683884	47k 5% 0,5W
3329	482211652257	22k 5% 0,5W
3330	482211683884	47k 5% 0,5W
3331	482211652176	10R 5% 0,5W
3332	482211652176	10R 5% 0,5W
3371	482211652219	330R 5% 0,5W
3377	482211683883	470R 5% 0,5W
3380	482211652249	1k8 5% 0,5W
3381	482211652249	1k8 5% 0,5W
3382	482211652249	1k8 5% 0,5W
3383	482211652263	2k7 5% 0,5W
3384	482211652263	2k7 5% 0,5W
3387	482211652289	5k6 5% 0,5W
3388	482211652289	5k6 5% 0,5W
3389	482211652244	15k 5% 0,5W
3390	482211652175	100R 5% 0,5W
3393	482211681154	2R2 5% 0,5W
3394	482211681154	2R2 5% 0,5W
3395	482211681154	2R2 5% 0,5W
3396	482211681154	2R2 5% 0,5W

3397	482211652283	4k7 5% 0,5W
3398	482211683883	470R 5% 0,5W
3399	482211652245	150k 5% 0,5W

COILS & FILTERS

5311	482215711837	Coil 0,36μH 10%
5312	482215711837	Coil 0,36μH 10%
5313	482215711837	Coil 0,36μH 10%
5314	482215711837	Coil 0,36μH 10%

DIODES

6380	482213031024	BZX79-B18
6381	532213080686	1N5392
6382	482213034441	BZX79-C22
6383	482213034174	BZX79-B4V7
6385	482213031878	1N4003G
6386	482213031878	1N4003G
6387	482213031878	1N4003G
6388	482213031878	1N4003G
6389	482213030621	1N4148
6390	532213080686	1N5392
6391	532213080686	1N5392

TRANSISTORS & INTEGRATED CIRCUITS

7300	482220916224	AN7125
7395	482213040959	BC547B
7396	482213040959	BC547B
7397	482213044568	BC557B
7398	482213044568	BC557B
7399	482213010847	BDW94C

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

BRIEF INTRODUCTION OF THE AF6 BOARD

The AF6 Board consists of the following features :

a. **SOFAC IC**

SOFAC IC TEA6321 (7511) which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I²C Bus from the microprocessor.

The SOFAC IC caters for 4 input sources, namely tuner, tape, CD and AUX.

It also has a MONO input which is tied to ground via a capacitor. In our application, software will switch the input source to previous source MUTE during STANDBY mode and some other occasions where noise from other input source is undesirable.

Note that the input to the SOFAC IC must be ac coupled to prevent 'plop' noise.

Input networks are included to provide appropriate attenuation for various sources.

b. **KARAOKE MIC. MIXING**

The AF6 Board has provisions which can be configured to cater for one of the following:

NK : Non-Karaoke.

SK : Simple Karaoke which caters for single mic. mixing with additional mic. amplifier board.

FK : Full Karaoke which caters for double mic. mixing with additional mic. amplifier board.

c. **DOLBY PRO LOGIC (DPL) INTERFACE**

The AF6 Board has provisions which can be configured to cater for Dolby Pro Logic (DPL).

d. **LINE OUT**

Line out with cinch socket for connection to external amplifier.

e. **SUB-WOOFER OUT**

Sub-woofer out with cinch socket for connection to active sub-woofer speaker.

f. **INCREDIBLE SURROUND**

Incredible surround effect using transistor circuit to create phase shifting and spatial effect.

g. **HEADPHONE AMPLIFIER**

Headphone Amplifier to drive 32 ohm to 1kohm headphone.

h. **CD STANDBY CONTROL**

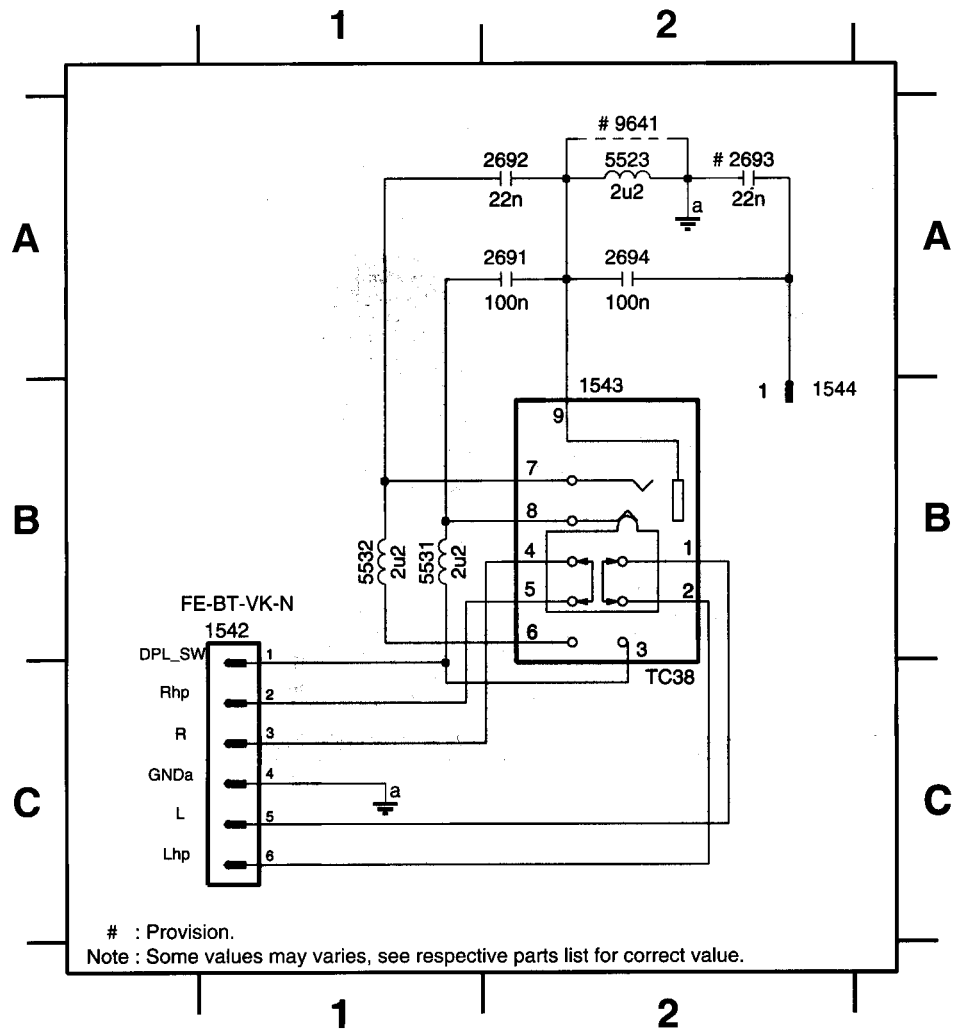
CD Standby Control circuit which switches on the supply to CD servo control IC, HF circuit and the laser light pen in CD mode only.

i. **ATTENUATION NETWORK**

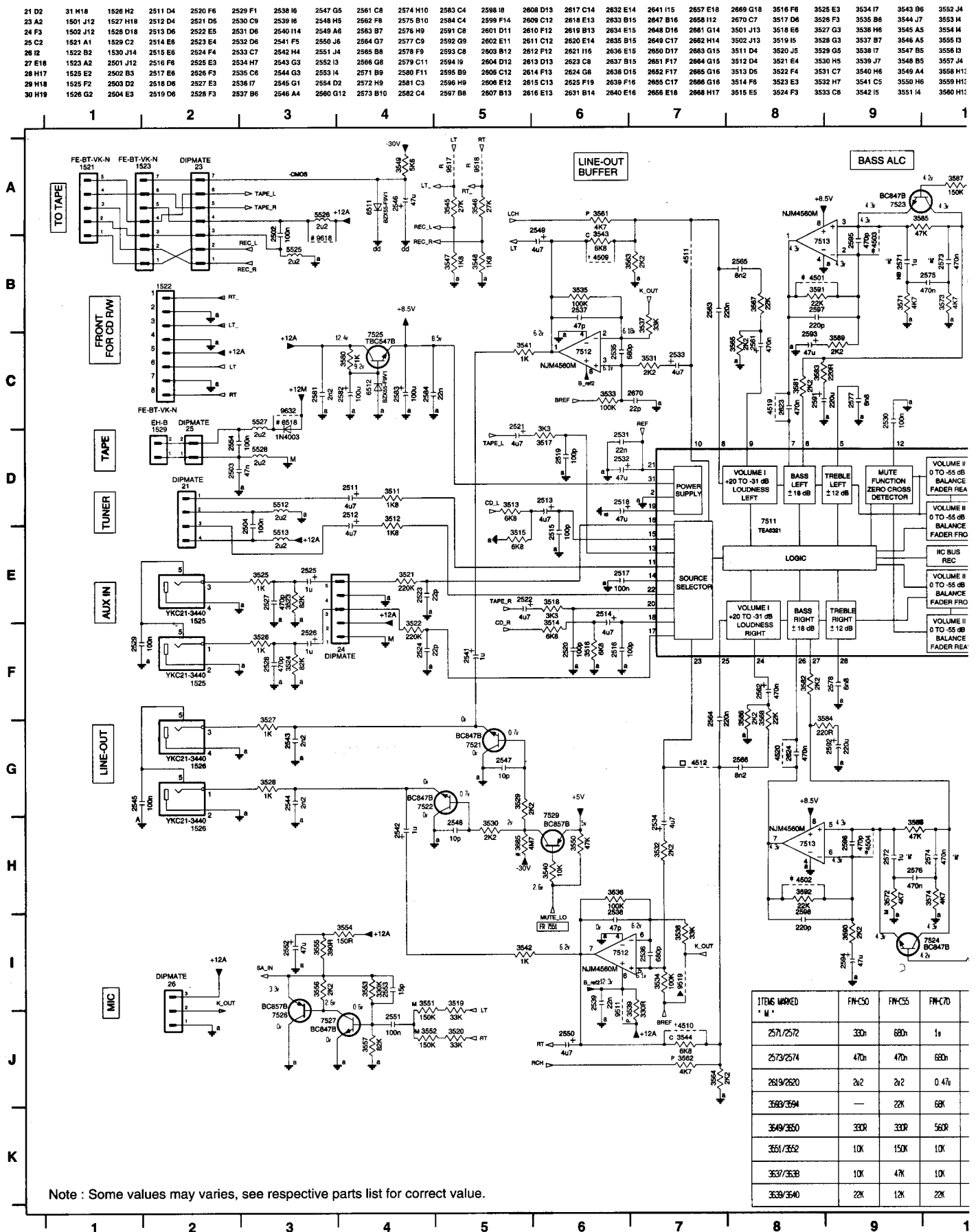
Attenuation network is provided at the output of the AF6 Board for interfacing with power board of different output power.

HEADPHONE BOARD - CIRCUIT DIAGRAM

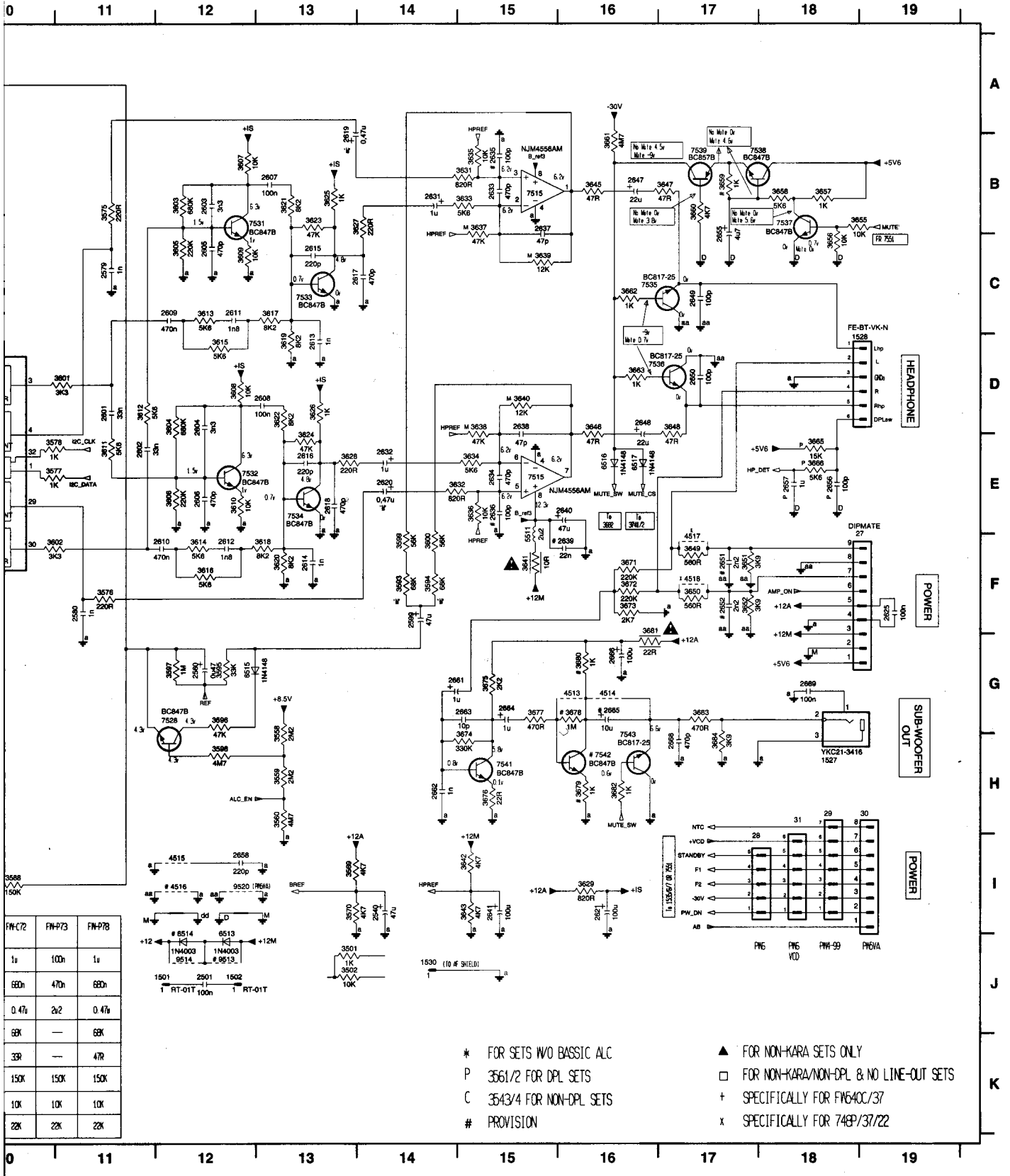
1542 B1 1544 B2 2692 A2 2694 A2 5531 B1 9641 A2
 1543 B2 2691 A2 2693 A2 5523 A2 5532 B1



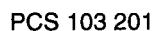
AF6 BOARD - CIRCUIT DIAGRAM (PART 1)



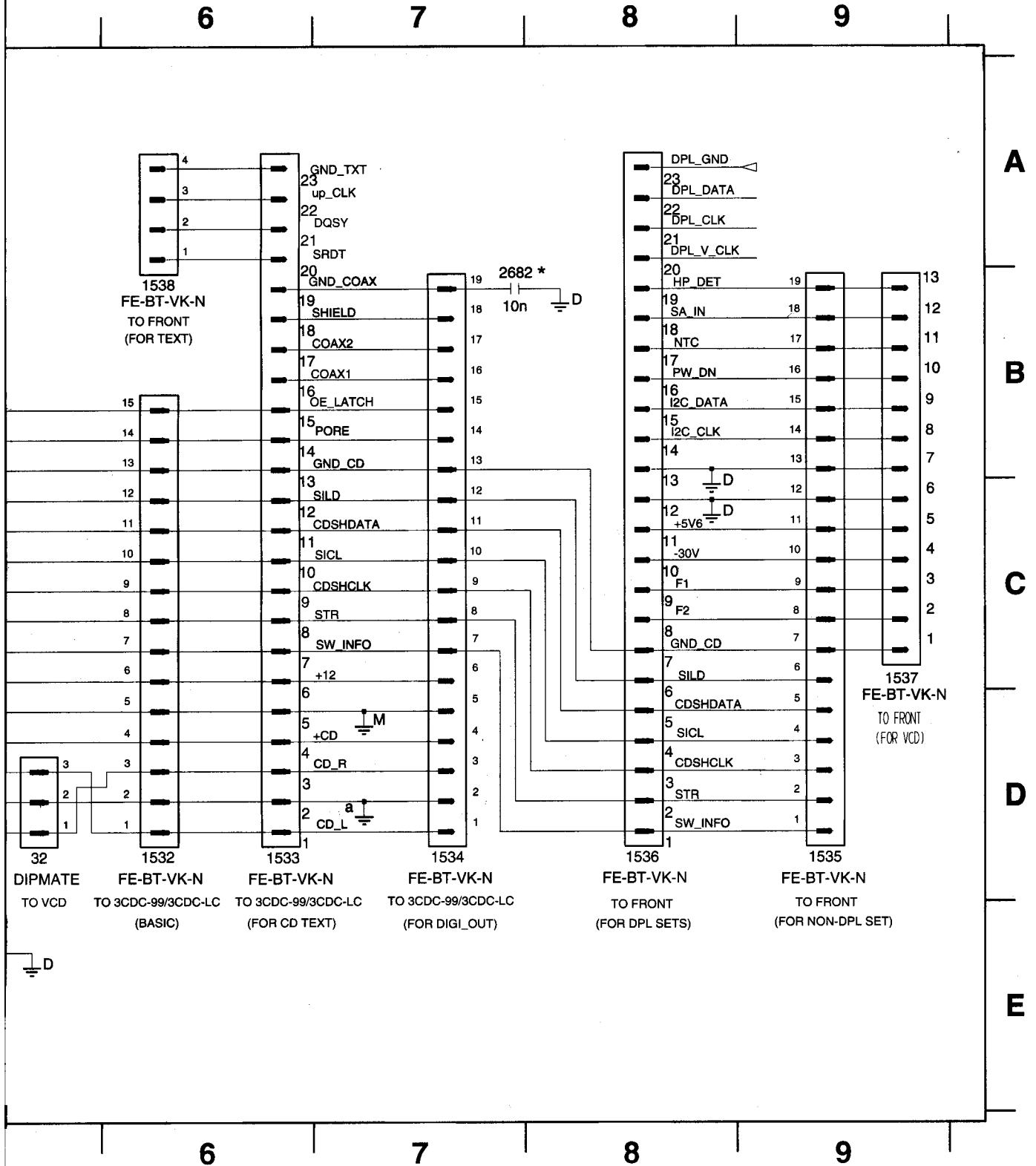
3561 A6 3570 I13 3580 C4 3589 C9 3598 H12 3607 B12 3616 F12 3625 B13 3635 B15 3645 B16 3656 C18 3666 E18 3679 H16 4503 B9 4516 I12 5526 A3 6517 E16 7521 G5 7531 B12 7541 H15 9520 I12
 3562 J7 3571 B9 3581 C8 3590 I9 3599 F14 3608 D12 3617 C13 3626 D13 3636 E15 3646 D16 3657 B18 3671 F15 3680 G16 4504 H9 4517 F17 5527 C3 6518 C3 7522 G4 7532 E12 7542 H16 9618 B3
 3563 B7 3572 H9 3582 F8 3591 B8 3600 F14 3609 C12 3618 F13 3627 B14 3637 B15 3647 B17 3658 B18 3672 F16 3681 F16 4509 B8 4518 F17 5528 D3 7511 D8 7523 A9 7533 C13 7543 G16 9632 C3
 3564 J7 3573 B10 3583 C8 3592 H8 3601 D11 3610 E12 3619 D13 3628 E13 3638 D15 3648 D17 3659 B17 3673 F16 3682 H16 4510 J7 4519 C8 6511 A4 7512 C6 7524 I10 7534 E13 9611 J6
 3565 C8 3574 H10 3584 G8 3593 F14 3602 F10 3611 E11 3620 F13 3629 I16 3639 C15 3649 F17 3660 B17 3674 H15 3683 G17 4511 B7 4520 G8 6512 C4 7512 I6 7525 C4 7535 C16 9613 J12
 3566 F8 3575 B11 3585 A9 3594 F14 3603 B12 3612 D11 3621 B13 3631 B15 3640 D15 3650 F17 3661 B16 3675 G15 3684 H17 4512 G7 5511 F15 6513 J12 7513 H8 7526 J3 7536 D16 9614 J12
 3567 B8 3576 F11 3586 H9 3595 G12 3604 D12 3613 C12 3622 D13 3632 E14 3641 F15 3651 F17 3662 C16 3676 H15 3685 H5 4513 G16 5512 D3 6514 J12 7513 B9 7527 J3 7537 B18 9615 A5
 3568 G8 3577 E10 3587 A10 3596 G12 3605 C12 3614 F12 3623 B13 3633 B15 3642 I15 3652 F17 3663 D16 3677 G15 4501 B8 4514 G16 5513 E3 6515 G12 7515 B15 7528 G12 7538 B18 9618 A5
 3569 I13 3578 E10 3588 I10 3597 G12 3606 E12 3615 D12 3624 E13 3634 E15 3643 I15 3655 B18 3665 E18 3678 B16 4502 H8 4515 I12 5525 B3 6516 E16 7516 E15 7529 H6 7539 B17 9619 I7



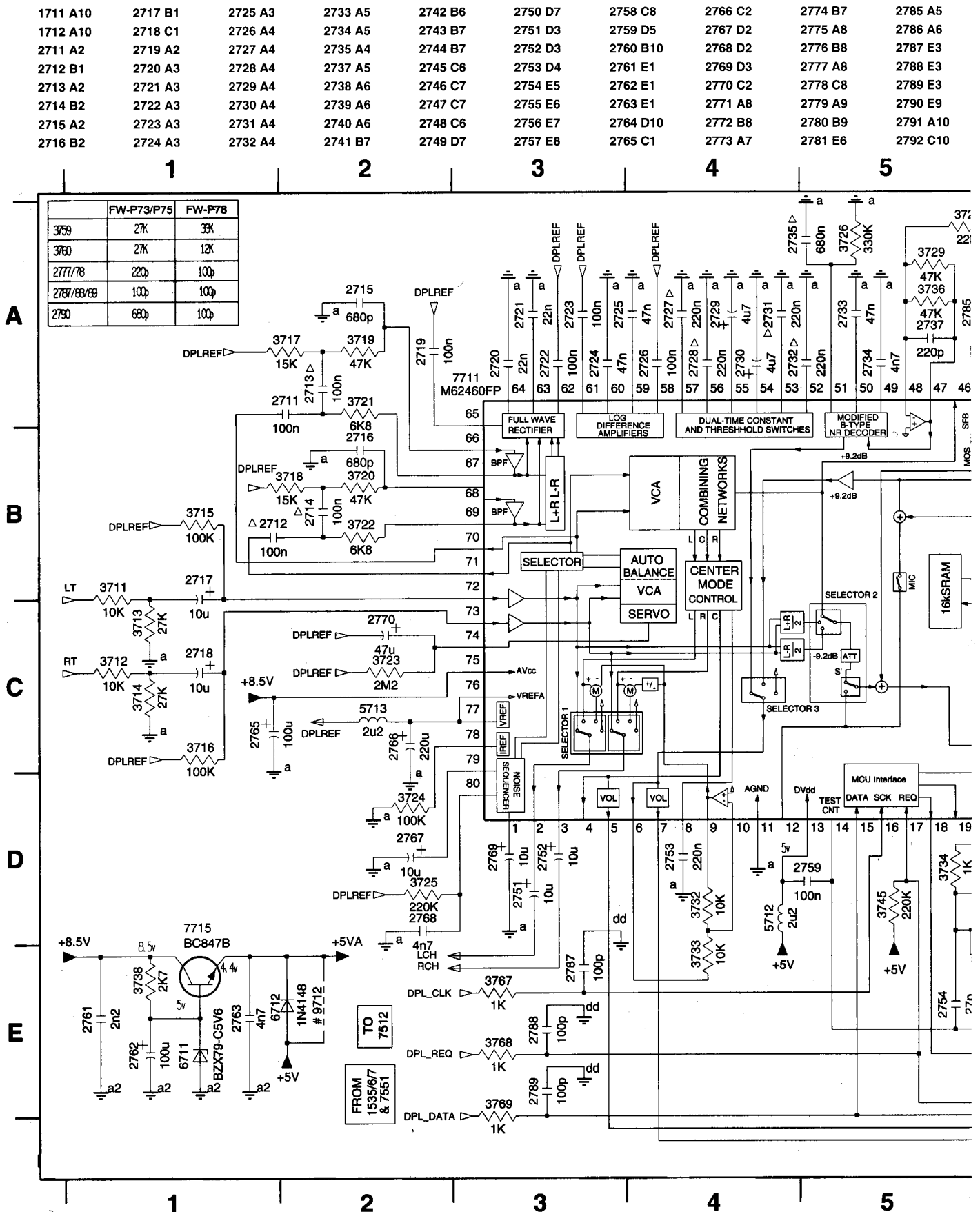
: Provision.
 * : For versions with digital out only.
 Note : Some values may varies, see respective parts list for correct value.



5 D1 4611 D1 6531 D2 7552 D1
9 E3 5524 B4 7551 C4 7553 E1



DOLBY PROLOGIC (DPL) - CIRCUIT DIAGRAM



3711 B1	3719 A2	3727 A5	3737 C8	3746 E6	3756 B8	3767 E3	5713 C2	7716 E7
3712 C1	3720 B2	3728 A6	3738 E1	3748 E7	3757 A8	3768 E3	6711 E1	7717-A A8
3713 C1	3721 A2	3729 A5	3739 A9	3749 E9	3758 B8	3769 E3	6712 E1	7717-B B8
3714 C1	3722 B2	3732 D4	3740 B9	3750 C10	3759 A8	3770 A9	7711 A3	9711 E6
3715 B1	3723 C2	3733 E4	3741 A9	3751 A8	3760 C8	4710 D10	7712 D8	9712 E2
3716 C1	3724 D2	3734 D5	3742 C9	3752 A8	3761 A7	4711 E10	7713 A9	
3717 A2	3725 D2	3735 D6	3743 D6	3753 B8	3762 C8	5711 D6	7714 B9	
3718 B2	3726 A5	3736 A5	3745 D5	3755 A8	3765 B10	5712 D4	7715 D1	

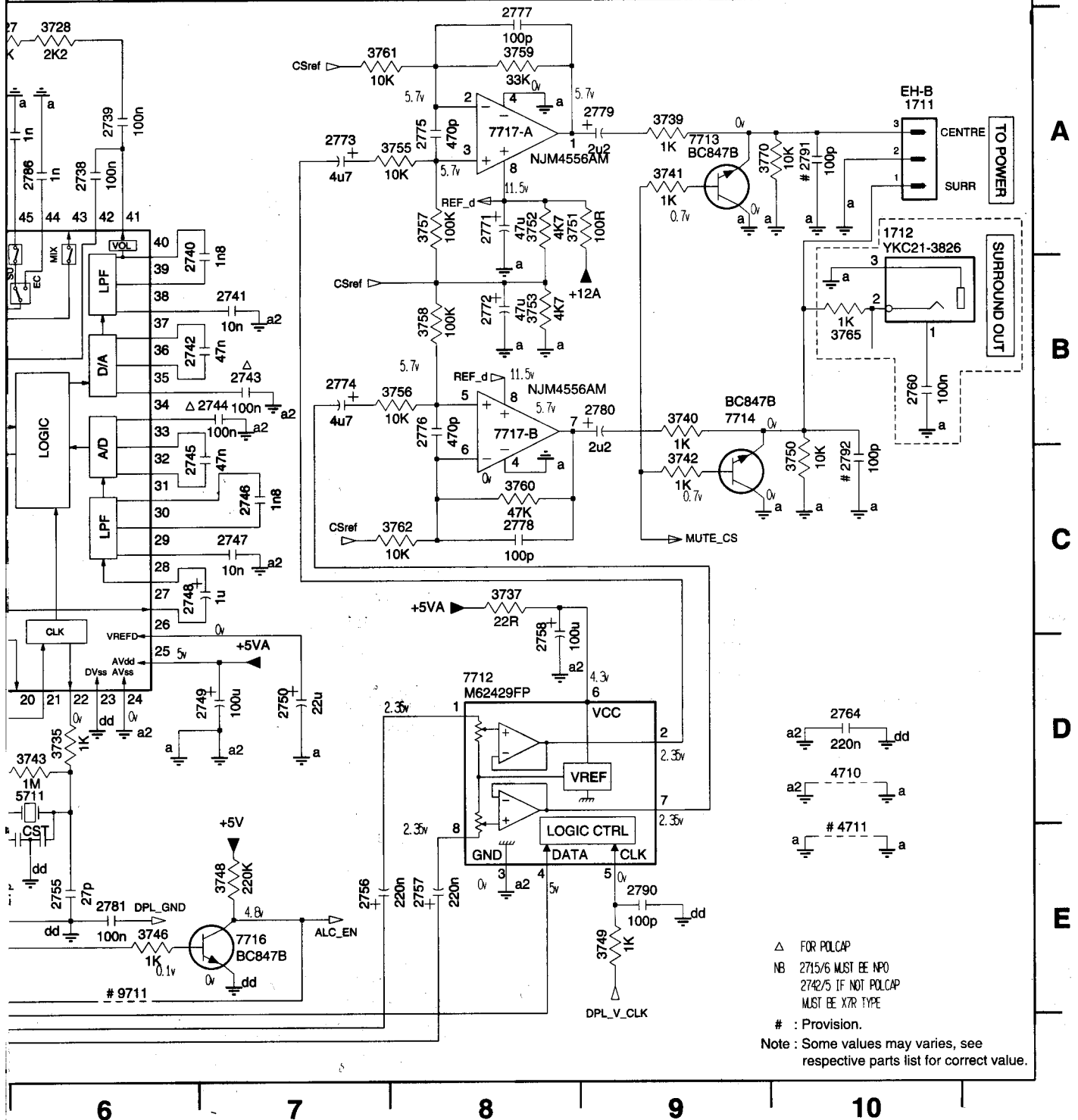
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ELECTRICAL PARTS LIST - AF6 BOARD**MISCELLANEOUS**

1523	482226710953	Flex Connector 7P
1525	482226720452	Cinch Socket - Aux in
1526	482226720452	Cinch Socket - Line-out
1527	482226731729	Cinch Socket - Sub-Woofer out
1528	482226710731	Flex Connector 6P
1531	482226731729	Cinch Socket - Digital out
1534	482226511553	Flex Connector 19P
1536	482226710757	Flex Connector 23P
1542	482226710731	Flex Connector 6P
1543	482226511529	Headphone Socket

CAPACITORS

2501	482212614585	100nF 10% 50V
2502	482212613838	100nF +80/-20% 50V
2504	482212613838	100nF +80/-20% 50V
2511	482212440769	4,7μF 20% 100V
2512	482212440769	4,7μF 20% 100V
2513	482212440769	4,7μF 20% 100V
2514	482212440769	4,7μF 20% 100V
2515	532212232531	100pF 5% 50V
2516	532212232531	100pF 5% 50V
2517	482212614585	100nF 10% 50V
2518	482212440433	47μF 20% 25V
2519	532212232531	100pF 5% 50V
2520	532212232531	100pF 5% 50V
2521	482212440769	4,7μF 20% 100V
2522	482212440769	4,7μF 20% 100V
2523	532212232658	22pF 5% 50V
2524	532212232658	22pF 5% 50V
2525	482212421913	1μF 20% 63V
2526	482212421913	1μF 20% 63V
2527	532212234099	470pF 10% 63V
2528	532212234099	470pF 10% 63V
2529	482212614585	100nF 10% 50V
2530	482212614585	100nF 10% 50V
2531	532212232654	22nF 10% 63V
2532	482212440433	47μF 20% 25V
2533	482212440769	4,7μF 20% 100V
2534	482212440769	4,7μF 20% 100V
2535	482212232535	680pF 10% 63V
2536	482212232535	680pF 10% 63V
2537	482212613692	47pF 1% 63V
2538	482212613692	47pF 1% 63V
2539	532212232654	22nF 10% 63V
2540	482212440433	47μF 20% 25V
2541	482212421913	1μF 20% 63V
2542	482212421913	1μF 20% 63V
2543	482212233127	2,2nF 10% 63V
2544	482212233127	2,2nF 10% 63V
2545	482212613838	100nF +80/-20% 50V
2546	482212441751	47μF 20% 50V
2547	532212232448	10pF 5% 63V

2548	532212232448	10pF 5% 63V
2549	482212440769	4,7μF 20% 100V
2550	482212440769	4,7μF 20% 100V
2551	482212614585	100nF 10% 50V
2552	482212441751	47μF 20% 50V
2553	482212613486	15pF 2% 63V
2554	482212613838	100nF +80/-20% 50V
2560	482212440769	4,7μF 20% 100V
2561	482212441407	0,47μF 20% 63V
2562	482212441407	0,47μF 20% 63V
2563	482212142408	220nF 5% 63V
2564	482212142408	220nF 5% 63V
2565	482212610525	8,2nF 10% 63V
2566	482212610525	8,2nF 10% 63V
2571	532212142386	100nF 5% 63V
2572	532212142386	100nF 5% 63V
2573	482212151252	470nF 5% 63V
2574	482212151252	470nF 5% 63V
2575	482212142408	220nF 5% 63V
2576	482212142408	220nF 5% 63V
2577	532212231866	6,8nF 10% 63V
2578	532212231866	6,8nF 10% 63V
2579	532212231647	1nF 10% 63V
2580	532212231647	1nF 10% 63V
2581	482212233127	2,2nF 10% 63V
2582	482212440207	100μF 20% 25V
2583	482212440207	100μF 20% 25V
2584	482212613838	100nF +80/-20% 50V
2619	482212422652	2,2μF 20% 50V
2620	482212422652	2,2μF 20% 50V
2621	482212440207	100μF 20% 25V
2625	482212613838	100nF +80/-20% 50V
2634	532212234099	470pF 10% 63V
2635	532212232531	100pF 5% 50V
2636	532212232531	100pF 5% 50V
2637	482212613692	47pF 1% 63V
2638	482212613692	47pF 1% 63V
2639	532212232654	22nF 10% 63V
2640	482212440433	47μF 20% 25V
2641	482212440207	100μF 20% 25V
2647	482212481151	22μF 50V
2648	482212481151	22μF 50V
2649	532212232531	100pF 5% 50V
2650	532212232531	100pF 5% 50V
2655	482212440769	4,7μF 20% 100V
2656	532212232531	100pF 5% 50V
2657	482212614043	1μF +80/-20% 16V
2658	482212233575	220pF 5% 63V
2661	482212421913	1μF 20% 63V
2662	532212231647	1nF 10% 63V
2663	532212232448	10pF 5% 63V
2664	482212421913	1μF 20% 63V

ELECTRICAL PARTS LIST - AF6 BOARD

2666	482212440207	100µF 20% 25V	2750	482212481151	22µF 50V
2668	532212234099	470pF 10% 63V	2751	482212440248	10µF 20% 63V
2669	482212614585	100nF 10% 50V	2752	482212440248	10µF 20% 63V
2681	482212614585	100nF 10% 50V	2753	482212614076	220nF +80/-20% 25V
2682	532212234098	10nF 10% 63V	2754	482212613691	27pF 1% 63V
2685	482212613838	100nF +80/-20% 50V	2755	482212613691	27pF 1% 63V
2686	482212613838	100nF +80/-20% 50V	2756	482212440746	0,22µF 20% 63V
2687	482212613751	47nF 10% 63V	2757	482212440746	0,22µF 20% 63V
2688	532212231863	330pF 5% 63V	2758	482212441584	100µF 20% 10V
2689	532212231863	330pF 5% 63V	2759	482212614585	100nF 10% 50V
2690	482212614043	1µF +80-20% 16V	2761	482212233127	2,2nF 10% 63V
2691	482212613838	100nF +80/-20% 50V	2762	482212441584	100µF 20% 10V
2692	532212232654	22nF 10% 63V	2763	532212610223	4,7nF 10% 63V
2694	482212613838	100nF +80/-20% 50V	2764	482212613473	220nF +80/-20% 50V
2711	532212142386	100nF 5% 63V	2765	482212440207	100µF 20% 25V
2712	532212142386	100nF 5% 63V	2766	482212440196	220µF 20% 16V
2713	532212142386	100nF 5% 63V	2767	482212440248	10µF 20% 63V
2714	532212142386	100nF 5% 63V	2768	532212610223	4,7nF 10% 63V
2715	532212610184	820pF 5% 50V	2769	482212440248	10µF 20% 63V
2716	532212610184	820pF 5% 50V	2770	482212440433	47µF 20% 25V
2717	482212440248	10µF 20% 63V	2771	482212441751	47µF 20% 50V
2718	482212440248	10µF 20% 63V	2772	482212441751	47µF 20% 50V
2719	482212614585	100nF 10% 50V	2773	482212440769	4,7µF 20% 100V
2720	532212232654	22nF 10% 63V	2774	482212440769	4,7µF 20% 100V
2721	532212232654	22nF 10% 63V	2775	532212234099	470pF 10% 63V
2722	482212614585	100nF 10% 50V	2776	532212234099	470pF 10% 63V
2723	482212614585	100nF 10% 50V	2777	482212233575	220pF 5% 63V
2724	482212613751	47nF 10% 63V	2778	482212233575	220pF 5% 63V
2725	482212613751	47nF 10% 63V	2779	482212422652	2,2µF 20% 50V
2726	482212614585	100nF 10% 50V	2780	482212422652	2,2µF 20% 50V
2727	482212142408	220nF 5% 63V	2781	482212614585	100nF 10% 50V
2728	482212142408	220nF 5% 63V	2785	532212231647	1nF 10% 63V
2729	482212440769	4,7µF 20% 100V	2786	532212231647	1nF 10% 63V
2730	482212440769	4,7µF 20% 100V	2787	532212232531	100pF 5% 50V
2731	482212142408	220nF 5% 63V	2788	532212232531	100pF 5% 50V
2732	482212142408	220nF 5% 63V	2789	532212232531	100pF 5% 50V
2733	482212613751	47nF 10% 63V	2790	532212610184	820pF 5% 50V
2734	532212610223	4,7nF 10% 63V	RESISTORS		
2735	532212142498	680nF 5% 63V	3501	482205110102	1k 2% 0,25W
2737	482212233575	220pF 5% 63V	3502	482211710833	10k 1% 0,1W
2738	482212614585	100nF 10% 50V	3511	482205120182	1k8 5% 0,1W
2739	482212614585	100nF 10% 50V	3512	482205120182	1k8 5% 0,1W
2740	482212610847	1,8nF 10% 63V	3513	482205021003	10k 1% 0,6W
2741	532212234098	10nF 10% 63V	3514	482211710833	10k 1% 0,1W
2742	482212151399	47nF 10% 50V	3515	482211711507	6k8 1% 0,1W
2743	532212142386	100nF 5% 63V	3516	482211711507	6k8 1% 0,1W
2744	532212142386	100nF 5% 63V	3517	482205120332	3k3 5% 0,1W
2745	482212151399	47nF 10% 50V	3518	482205120332	3k3 5% 0,1W
2746	482212610847	1,8nF 10% 63V	3519	482205120333	33k 5% 0,1W
2747	532212234098	10nF 10% 63V	3520	482205120333	33k 5% 0,1W
2748	482212421913	1µF 20% 63V	3521	482211683874	220k 5% 0,5W
2749	482212441584	100µF 20% 10V			

ELECTRICAL PARTS LIST - AF6 BOARD**RESISTORS**

3522	482211683874	220k 5% 0,5W	3578	482205011002	1k 1% 0,4W
3523	482211711149	82k 1% 0,1W	3580	482205110102	1k 2% 0,25W
3524	482211711149	82k 1% 0,1W	3581	482211711449	2k2 1% 0,1W
3525	482205110102	1k 2% 0,25W	3582	482211652256	2k2 5% 0,5W
3526	482205110102	1k 2% 0,25W	3631	482211652231	820R 5% 0,5W
3527	482205110102	1k 2% 0,25W	3632	482211652231	820R 5% 0,5W
3528	482205110102	1k 2% 0,25W	3635	482211710833	10k 1% 0,1W
3529	482211711449	2k2 1% 0,1W	3636	482211710833	10k 1% 0,1W
3530	482211652256	2k2 5% 0,5W	3637	482211710833	10k 1% 0,1W
3531	482211652256	2k2 5% 0,5W	3638	482211710833	10k 1% 0,1W
3532	482211652256	2k2 5% 0,5W	3639	482205120223	22k 5% 0,1W
3533	482211652234	100k 5% 0,5W	3640	482205120223	22k 5% 0,1W
3534	482211652234	100k 5% 0,5W	3641	482205210109	△ 10R 5% 0,33W
3535	482211710837	100k 1% 0,1W	3642	482205120472	4k7 5% 0,1W
3536	482211710837	100k 1% 0,1W	3643	482205120472	4k7 5% 0,1W
3537	482205120333	33k 5% 0,1W	3645	482205120479	47R 5% 0,1W
3538	482205120333	33k 5% 0,1W	3646	482205120479	47R 5% 0,1W
3540	482211710833	10k 1% 0,1W	3647	482205120479	47R 5% 0,1W
3541	482205110102	1k 2% 0,25W	3648	482205120479	47R 5% 0,1W
3542	482205110102	1k 2% 0,25W	3651	482205120392	3k9 5% 0,1W
3543	482211711507	6k8 1% 0,1W	3652	482205120392	3k9 5% 0,1W
3544	482211711507	6k8 1% 0,1W	3655	482205021003	10k 1% 0,6W
3545	482205120273	27k 5% 0,1W	3656	482211710833	10k 1% 0,1W
3546	482211652264	27k 5% 0,5W	3657	482205110102	1k 2% 0,25W
3547	482205120182	1k8 5% 0,1W	3658	482205120562	5k6 5% 0,1W
3548	482205120182	1k8 5% 0,1W	3660	482205120472	4k7 5% 0,1W
3549	482205120562	5k6 5% 0,1W	3661	482205120475	4M7 5% 0,1W
3550	482211710834	47k 1% 0,1W	3662	482205110102	1k 2% 0,25W
3551	482205120154	150k 5% 0,1W	3663	482205110102	1k 2% 0,25W
3552	482205120154	150k 5% 0,1W	3665	482211683933	15k 1% 0,1W
3553	482205120334	330k 5% 0,1W	3666	482205120562	5k6 5% 0,1W
3554	482211710353	150R 1% 0,1W	3671	482211713579	220k 1% 0,1W
3555	482205120391	390R 5% 0,1W	3672	482211713579	220k 1% 0,1W
3556	482211711449	2k2 1% 0,1W	3673	482211712955	2k7 1% 0,1W
3557	482211711149	82k 1% 0,1W	3674	482205120334	330k 5% 0,1W
3561	482211652283	4k7 5% 0,5W	3675	482211711449	2k2 1% 0,1W
3562	482211652283	4k7 5% 0,5W	3676	482205120229	22R 5% 0,1W
3563	482211711449	2k2 1% 0,1W	3677	482205120471	470R 5% 0,1W
3564	482211711449	2k2 1% 0,1W	3681	482205210229	△ 22R 5% 0,33W
3565	482211711449	2k2 1% 0,1W	3682	482205110102	1k 2% 0,25W
3566	482211711449	2k2 1% 0,1W	3683	482205120471	470R 5% 0,1W
3567	482205120223	22k 5% 0,1W	3684	482205120392	3k9 5% 0,1W
3568	482205120223	22k 5% 0,1W	3691	482211711449	2k2 1% 0,1W
3569	482205120472	4k7 5% 0,1W	3692	482211710833	10k 1% 0,1W
3570	482205120472	4k7 5% 0,1W	3693	482205120562	5k6 5% 0,1W
3571	482205120472	4k7 5% 0,1W	3694	482205120562	5k6 5% 0,1W
3572	482205120472	4k7 5% 0,1W	3695	482205120228	2R2 5% 0,1W
3573	482205120472	4k7 5% 0,1W	3699	482205011002	1k 1% 0,4W
3574	482205120472	4k7 5% 0,1W	3711	482211710833	10k 1% 0,1W
3575	482211711503	220R 1% 0,1W	3712	482211710833	10k 1% 0,1W
3576	482211711503	220R 1% 0,1W	3713	482205120273	27k 5% 0,1W
3577	482205011002	1k 1% 0,4W	3714	482205120273	27k 5% 0,1W

ELECTRICAL PARTS LIST - AF6 BOARD

3715	482211710837	100k 1% 0,1W	4514	482205120008	0R Jumper 0805
3716	482211710837	100k 1% 0,1W	4515	482205120008	0R Jumper 0805
3717	482211683933	15k 1% 0,1W	4516	482205120008	0R Jumper 0805
3718	482211683933	15k 1% 0,1W	4517	482205120008	0R Jumper 0805
3719	482211710834	47k 1% 0,1W	4518	482205120008	0R Jumper 0805
3720	482211710834	47k 1% 0,1W	4519	482205120008	0R Jumper 0805
3721	482211711507	6k8 1% 0,1W	4520	482205120008	0R Jumper 0805
3722	482211711507	6k8 1% 0,1W	4522	482205120008	0R Jumper 0805
3723	482205120225	2M2 5% 0,1W	4523	482205120008	0R Jumper 0805
3724	482211710837	100k 1% 0,1W	4524	482205120008	0R Jumper 0805
3725	482211713579	220k 1% 0,1W	4525	482205120008	0R Jumper 0805
3726	482205120334	330k 5% 0,1W	4527	482205120008	0R Jumper 0805
3727	482205120223	22k 5% 0,1W	4528	482205120008	0R Jumper 0805
3728	482211711449	2k2 1% 0,1W	4529	482205120008	0R Jumper 0805
3729	482211710834	47k 1% 0,1W	4530	482205120008	0R Jumper 0805
3732	482211710833	10k 1% 0,1W	4531	482205120008	0R Jumper 0805
3733	482211710833	10k 1% 0,1W	4532	482205120008	0R Jumper 0805
3734	482205110102	1k 2% 0,25W	4533	482205120008	0R Jumper 0805
3735	482205110102	1k 2% 0,25W	4534	482205120008	0R Jumper 0805
3736	482211710834	47k 1% 0,1W	4535	482205120008	0R Jumper 0805
3737	482205120229	22R 5% 0,1W	4536	482205120008	0R Jumper 0805
3738	482211712955	2k7 1% 0,1W	4537	482205120008	0R Jumper 0805
3739	482205011002	1k 1% 0,4W	4538	482205120008	0R Jumper 0805
3740	482205011002	1k 1% 0,4W	4539	482205120008	0R Jumper 0805
3741	482205110102	1k 2% 0,25W	4540	482205120008	0R Jumper 0805
3742	482205110102	1k 2% 0,25W	4541	482205120008	0R Jumper 0805
3743	482205120105	1M 5% 0,1W	4542	482205120008	0R Jumper 0805
3745	482211683874	220k 5% 0,5W	4543	482205120008	0R Jumper 0805
3749	482205110102	1k 2% 0,25W	4544	482205120008	0R Jumper 0805
3750	482211710833	10k 1% 0,1W	4545	482205120008	0R Jumper 0805
3751	482205120101	100R 5% 0,1W	4546	482205120008	0R Jumper 0805
3752	482211652283	4k7 5% 0,5W	4547	482205120008	0R Jumper 0805
3753	482205120472	4k7 5% 0,1W	4548	482205120008	0R Jumper 0805
3755	482211710833	10k 1% 0,1W	4549	482205120008	0R Jumper 0805
3756	482211710833	10k 1% 0,1W	4551	482205120008	0R Jumper 0805
3757	482211710837	100k 1% 0,1W	4553	482205120008	0R Jumper 0805
3758	482211710837	100k 1% 0,1W	4554	482205120008	0R Jumper 0805
3759	482205120273	27k 5% 0,1W	4556	482205120008	0R Jumper 0805
3760	482205120273	27k 5% 0,1W	4557	482205120008	0R Jumper 0805
3761	482211710833	10k 1% 0,1W	4558	482205120008	0R Jumper 0805
3762	482211710833	10k 1% 0,1W	4559	482205120008	0R Jumper 0805
3767	482205011002	1k 1% 0,4W	4561	482205120008	0R Jumper 0805
3768	482205011002	1k 1% 0,4W	4562	482205120008	0R Jumper 0805
3769	482205011002	1k 1% 0,4W	4563	482205120008	0R Jumper 0805
3770	482211710833	10k 1% 0,1W	4565	482205120008	0R Jumper 0805
4501	482205120008	0R Jumper 0805	4566	482205120008	0R Jumper 0805
4502	482205120008	0R Jumper 0805	4567	482205120008	0R Jumper 0805
4503	482205120008	0R Jumper 0805	4568	482205120008	0R Jumper 0805
4504	482205120008	0R Jumper 0805	4571	482205120008	0R Jumper 0805
4505	482205120008	0R Jumper 0805	4573	482205120008	0R Jumper 0805
4506	482205120008	0R Jumper 0805	4580	482205120008	0R Jumper 0805
4513	482205120008	0R Jumper 0805	4664	482205120008	0R Jumper 0805

ELECTRICAL PARTS LIST - AF6 BOARD

RESISTORS

4710	482205120008	0R Jumper 0805
4712	482205120008	0R Jumper 0805
4713	482205120008	0R Jumper 0805
4714	482205120008	0R Jumper 0805
4715	482205120008	0R Jumper 0805
4716	482205120008	0R Jumper 0805

7553	482213060511	BC847B
7711	482220917347	M62460FP
7712	482220917349	M62429FP
7713	482213060511	BC847B
7714	482213060511	BC847B
7715	482213060511	BC847B
7717	482220931378	NJM4556AM

COILS & FILTERS

5511	482215762552	Coil 2,2μH 5%
5512	482215710586	Coil 2,2μH 10%
5513	482215710586	Coil 2,2μH 10%
5523	482215762552	Coil 2,2μH 5%
5524	482215710586	Coil 2,2μH 10%
5525	482215710586	Coil 2,2μH 10%
5526	482215762552	Coil 2,2μH 5%
5527	482215710586	Coil 2,2μH 10%
5528	482215710586	Coil 2,2μH 10%
5531	482215762552	Coil 2,2μH 5%
5532	482215762552	Coil 2,2μH 5%
5711	482224272527	Ceramic Resonator
5712	482215762552	Coil 2,2μH 5%
5713	482215710586	Coil 2,2μH 10%

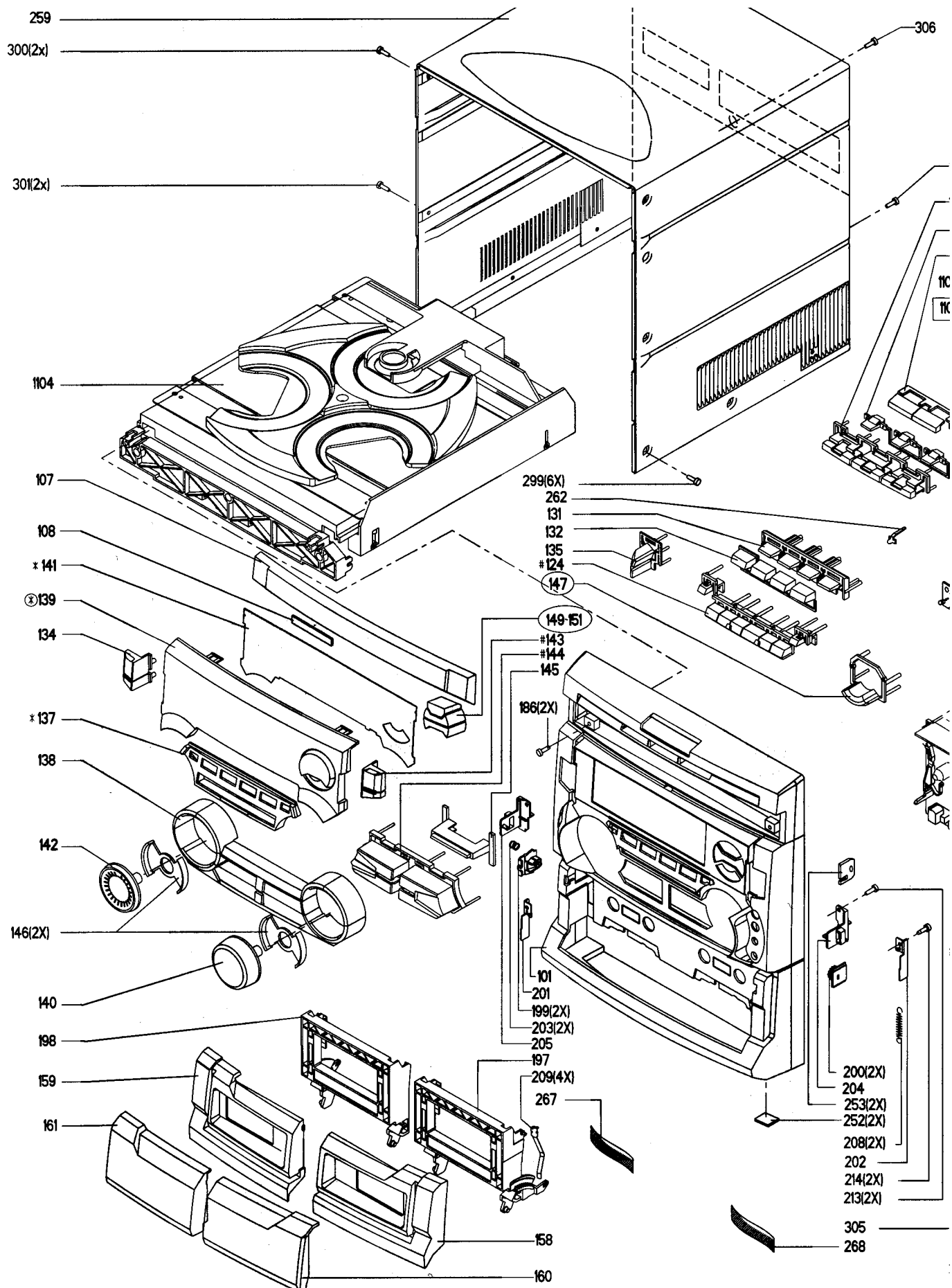
Note: Only the parts mentioned in this list are normal service spare parts.

DIODES

6511	933887190673	BZX55-F9V1
6512	933887190673	BZX55-F9V1
6513	482213031878	1N4003G
6516	482213030621	1N4148
6517	482213030621	1N4148
6531	482213030621	1N4148
6711	482213034173	BZX79-C5V6
6712	482213030621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7511	482220933652	TEA6321T/V1
7512	482220983357	NJM4560M
7515	482220931378	NJM4556AM
7521	482213060511	BC847B
7522	482213060511	BC847B
7525	482213040959	BC547B
7526	482213060373	BC857B
7527	482213060511	BC847B
7529	482213060373	BC857B
7535	482213042804	BC817-25
7536	482213042804	BC817-25
7537	482213060511	BC847B
7538	482213060511	BC847B
7539	482213060373	BC857B
7541	482213060511	BC847B
7543	482213042804	BC817-25
7551	482220917345	M62320FP
7552	482213041246	BC327-25



MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

0101	313911789940	Cabinet Front	0387	313911619560	Instruction For Use /34
0105	313911789750	Button CDC Open/Close	1571	482232012702	FFC Foil 06P/140/06P BD
0107	313911789760	Cover Tray CDC	1573	482232012654	FFC Foil 07P/220/07P AD
0108	482245413408	Badge Philips	1575	313911034390	FFC Foil 19P/340/19P BD
0112	313911789770	Button Set CDC Select	1653	482232012703	FFC Foil 07P/140/07P BD
0113	313911469190	Bracket Disc Stopper	1680	482232012656	FFC AD 09P 280 Folded
0124	313911789970	Button Set Control	1681	482232012707	FFC Foil 23P/480/23P BD
0131	482246410514	Frame Lightguide Source Sel	5280	313911832120	△ Mains Transformer
0132	313911789920	Button Set Source			
0134	313911789800	Button Standby/Timer			
0135	313911810150	Button Set Dub/Rec			
0137	313911810960	Cover Orn Control		996500003226	Tweeter 2,5" 30W 6R
0138	313911810140	Cover Orn SNP		996500003227	Woofer 5,25" 30W 6R
0139	313911811610	Window Display		996500003234	Bi-Polar Capacitor 2,2μF/50V
0140	313911789830	Knob Volume Rotary		996500003235	Cloth Frame Assembly
0142	313911810130	Jog Rotary			
0143	482246693014	Cover RDS/NEWS			
0144	313911812600	Button Set SNP			
0149	313911810050	Button DPL		482224010373	Speaker 3" 3R 10W
0158	313911810880	Cover Cassette Right			
0159	313911810890	Cover Cassette Left			
0160	313911810820	Lens Cassette Right			
0161	313911810830	Lens Cassette Left		996500003229	Speaker 3" 6R 20W
0197	482244310488	Door Cassette Right			
0198	482244310487	Door Cassette Left			
0199	482240210621	Push-Catch			
0200	482252910322	Damper Assembly			
0203	482249211344	Spring Compression			
0204	482240211246	Bracket Right			
0205	482240211245	Bracket Left			
0208	482249211345	Spring Tension			
0209	482249242787	Spring Cassette			
0232	482240210288	Bracket Mains Socket			
0239	482246693148	Spacer 5mm			
0252	482246240683	Foot Rubber (SQ)			
0254	482246612197	Plate Front			
0258	482246240683	Plate (Foot)			
0259	313911469230	Cabinet Rear			
0350	313911877290	L/R Loudspeaker Box			
0351	482230350063	FM Aerial			
0352	313911877410	Center/Surround Box			
0356	313911877610	Remote Control			
0384	482230350082	AM Frame Aerial			
0385	482232110249	△ Mains Cord			
0387	313911619760	Instruction For Use /22			

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN**SURROUND BOX BREAKDOWN****CENTER BOX BREAKDOWN**

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

SCREW LISTS - MAIN UNIT

185 D3 x 10
186 D3 x 25
211 D3 x 12
212 D3 x 12
213 D3 x 12

214 D3 x 12
227 M3 x 6
228 M3 x 6
233 M3 x 10
234 D3 x 12

235 M3 x 10
236 M3 x 10
276 D3 x 12
277 D3 x 12
278 D3 x 12

279 M3 x 12
280 D3 x 12
281 D3 x 12
288 D3 x 10
289 M3 x 10

290 M3 x 10
291 D3 x 12
292 D3 x 12
293 D3 x 12
295 D3 x 12

296 D3 x 12
299 M3 x 10
300 M3 x 10
301 M3 x 10
303 D3 x 12

305 M3 x 6
306 M3 x 10