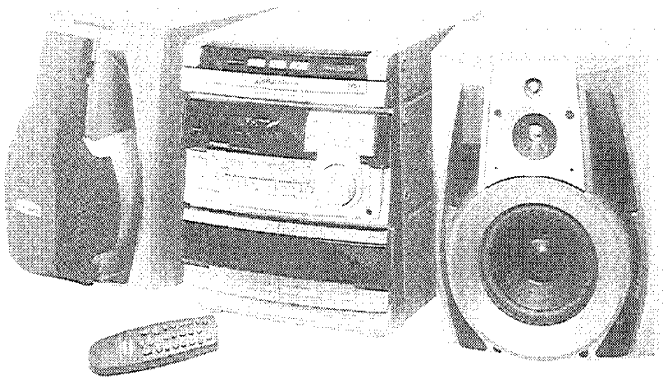
Mini System

FW530C/21/21M/22/37

Service
Service
Service

Manual #1857
FW530C3701



ServiceManual

COMPACT disc DIGITAL AUDIO

TABLE OF CONTENTS

CLASS 1
LASER PRODUCT

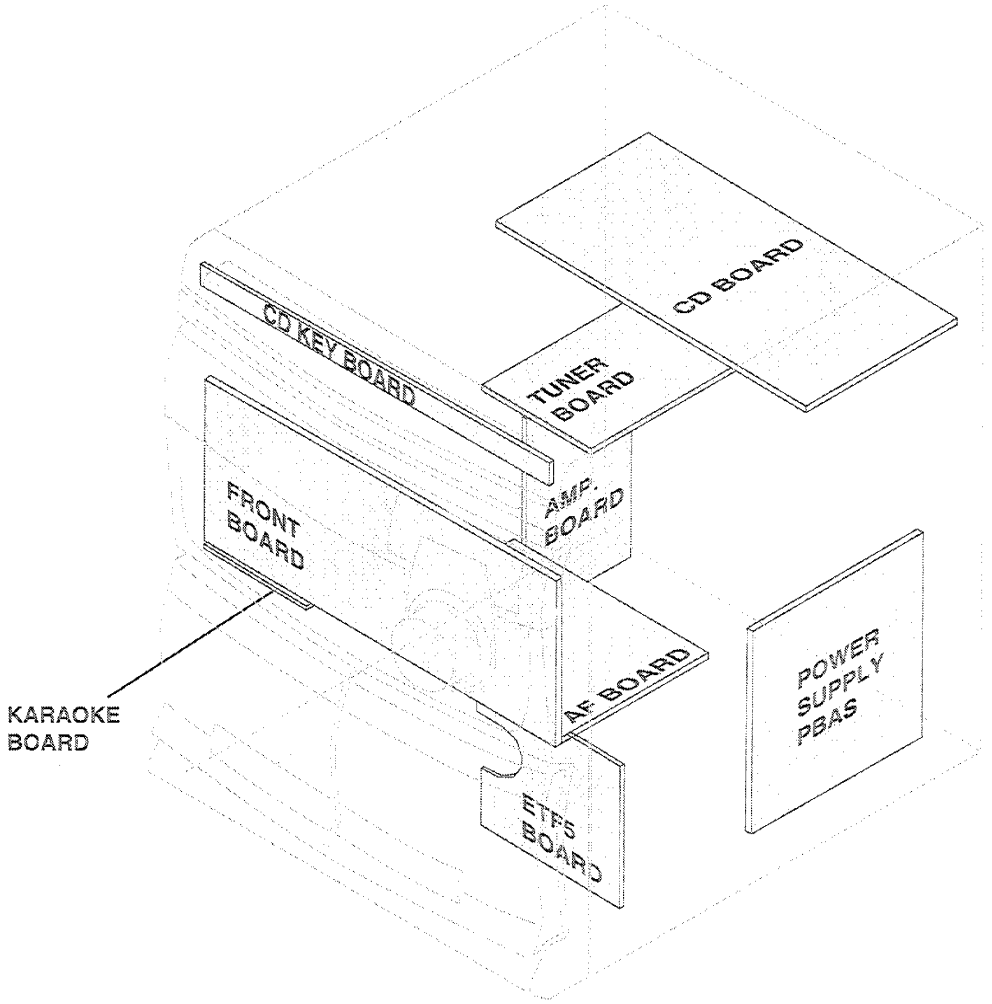
Published by KC 9803 Service Audio Printed in The Netherlands Subject to modification

GB 4822 725 25789

PCS 96 926

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Features & Board in used: / Versions:	/21 /21M	/22	/25	/26	/30	/33	/34	/37
Aux Input	x	x						x
Line Output	x	x						x
Subwoofer Output	x	x						x
Surround Output								
Digital Output								
Dolby B								
RDS		x						
CD Text								
Karaoke Feature	x							
Tuner board - ECO5 Sys	x							x
Tuner board - Tuner 95		x						
Tape pc board - ND/DD/FR	x	x						x
Tape pc board - DB/DD/FR								
Power 4 Module (2 Channel)	x	x						x

SPECIFICATIONS

GENERAL:

Mains voltage : 100V for /26
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 clock mode FTD on
< 75W at 1/8 rated power out
Clock accuracy : < 4 seconds per day
Dimension centre unit : 265 x 310 x 380mm

TUNER:

FM

Tuning range : 87.5-108MHz
65.81-74MHz for /34
Grid : 50kHz (& 30kHz for /34)
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75ohm coaxial
300ohm click fit for /37
Sensitivity at 26dB S/N : < 7µV
Selectivity at 600kHz bandwidth : > 50dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3% [< 2%]
-3dB Limiting point : < 7µV
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 ± 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 ± 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 (6 ohm, 1kHz, 10% THD) : 2 x 50W ± 1dB

Frequency response within -3dB : 60Hz-16kHz
Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB Off [1]
Digital Sound Control : Classic,Rock,Techno,Optimal,Jazz [1]
Incredible Surround : IS ON , IS Off [1]

Headphone output at 32 ohm : 16.5mW
Input sensitivity
Aux/Line-in : 350mV ± 2dB at 600 ohm
Mic : 2.5mV ± 2dB at 600 ohm
Output sensitivity
Line-out : 500mV ± 2dB at 22 kohm
Sub-woofer (max. vol.) : 1.5V ± 2dB at 22 kohm

CASSETTE RECORDER:

Number of track : 2 x 2 stereo
Tape speed : 4.76 cm/sec ± 2%
1.6 x 4.76 cm/sec
Wow and flutter : < 0.4% DIN
Fast-wind/Rewind time C60 : 130 sec
Bias system : 75kHz ± 10kHz
Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz
Signal to noise ratio (IEC I) : > 44dB
Signal to noise ratio (IEC II) : > 47dB

COMPACT DISC:

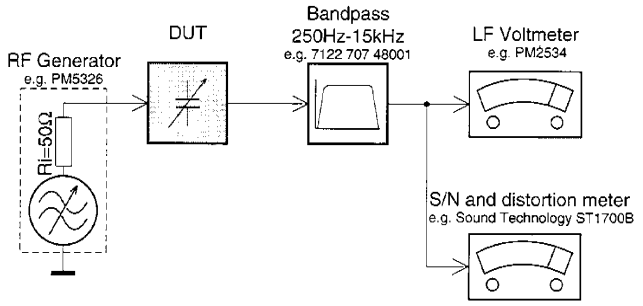
Measurement done at output conn. of the CDC module.
Frequency response within ± 1.5dB : 20Hz - 20kHz
Output level (in Vrms) : 550mV ± 2dB unloaded
Signal/Noise ratio (A-weighted) : > 80dBA
Distortion at 1kHz : < 0.5%
Channel difference at 1kHz : < 1dB
Channel crosstalk at 1kHz : > 45dB
De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

[....] Values indicated are for "Tuner 95 Board" only

[1] Frequency response in each setting is software controlled.

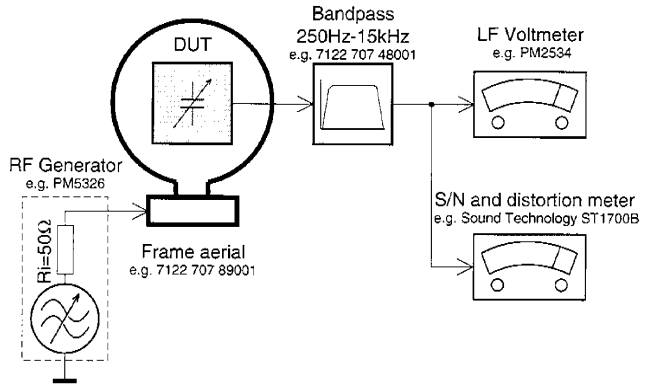
MEASUREMENT SETUP

Tuner FM



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

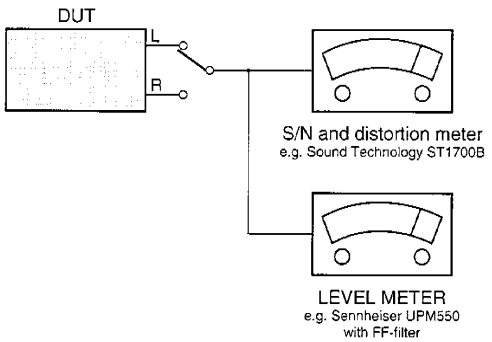
Tuner AM (MW,LW)



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

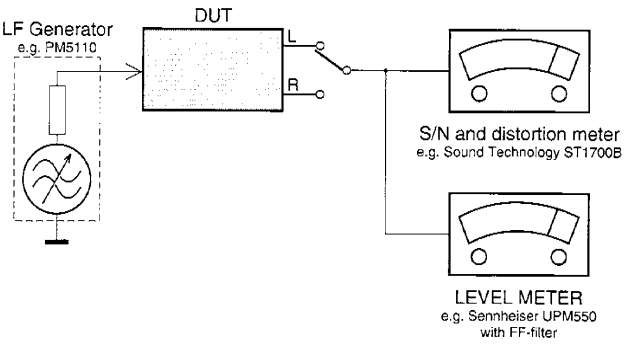
CD

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



Recorder

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



SERVICE AIDS

Service Tools:

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

Cassette:

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

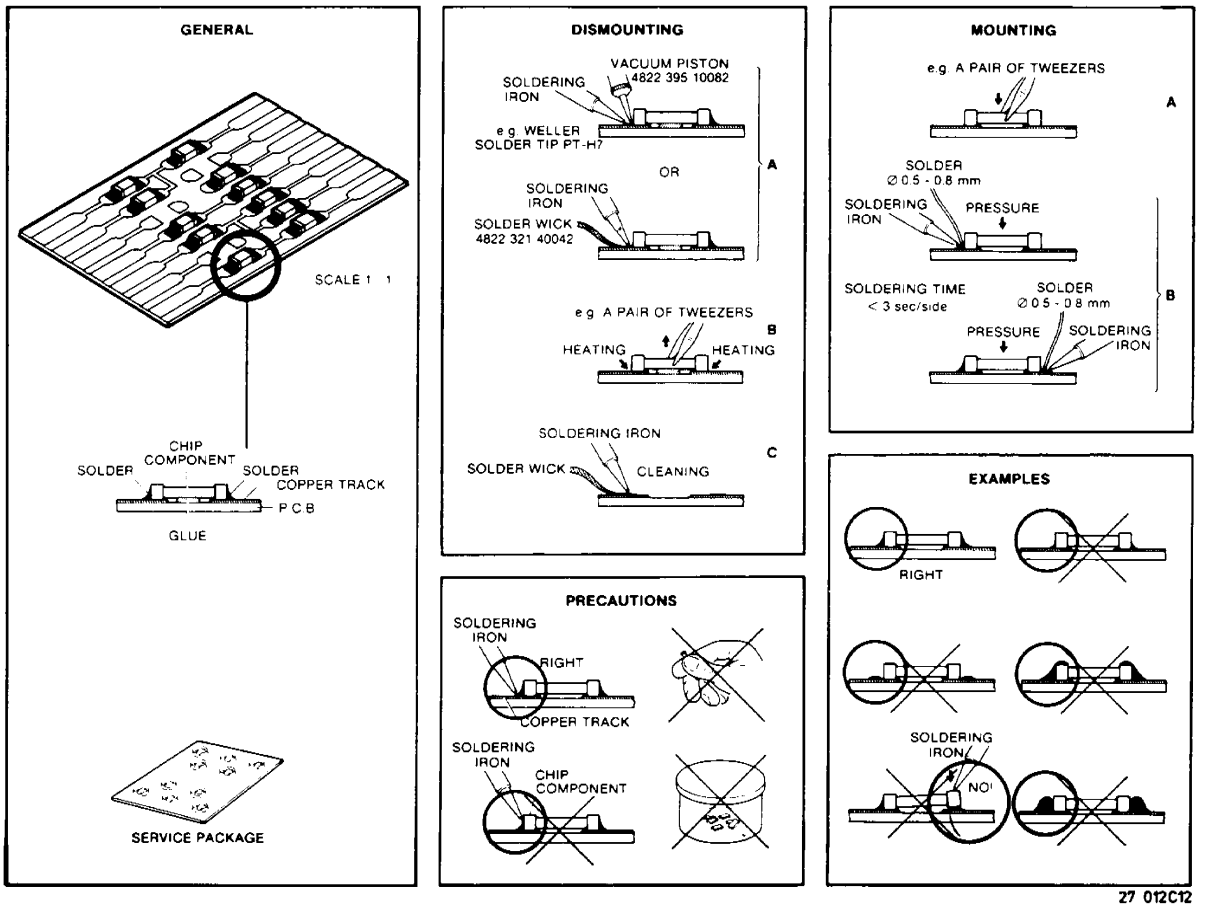
Compact Disc:

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

ESD Equipment:

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

HANDLING CHIP COMPONENTS



27 012C12

ESD

(GB) WARNING

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

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

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

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

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

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

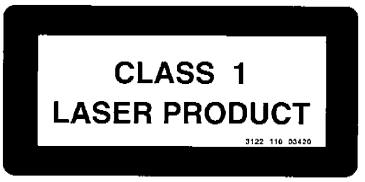
(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

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

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

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

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



(GB) Warning !

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

(S) Varning !

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

(SF) Varoitus !

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

(DK) Advarse !

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

GENERAL INFORMATION

General Information

- ***The typeplate (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.***

Environmental Information

All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials: cardboard (box), polystyrene foam (buffer) and polythene (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.

Accessories (Supplied)

- Remote control
- Batteries (2 x AAA size) for remote control
- AM loop antenna
- FM antenna wire
- AC power cord

Accessories (Recommended)

- Philips FB 201 active subwoofer.
- Philips FB 202W wireless active subwoofer.

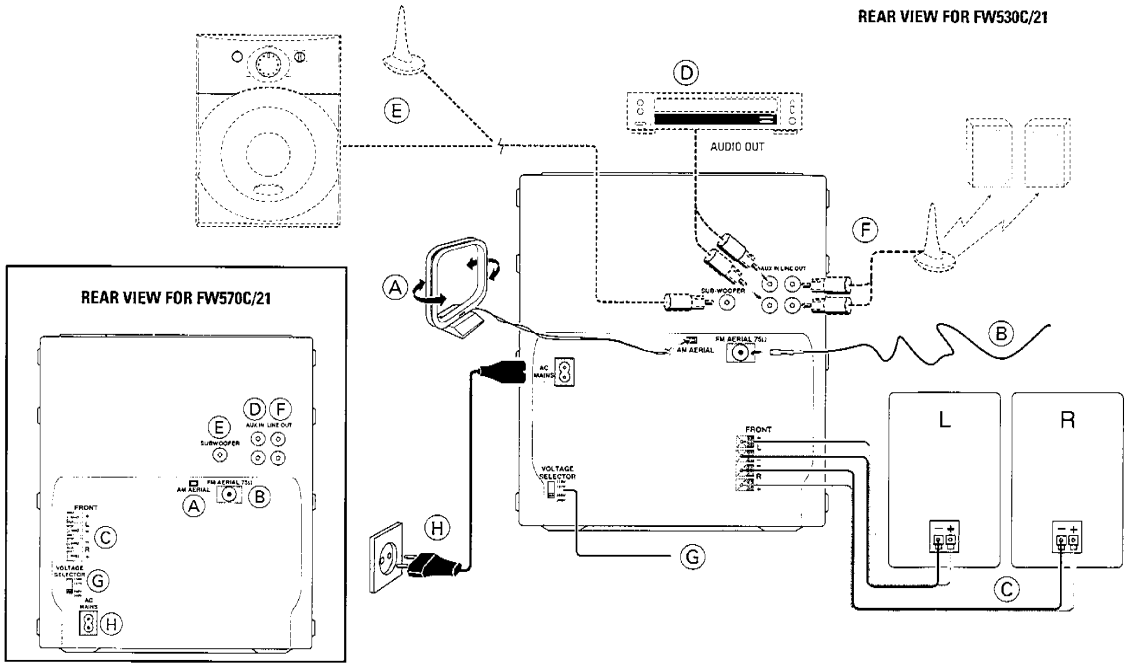
SAFETY INFORMATION

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 type plate is located at the rear of your system.
- When the system is switched on, do not move it around.
- 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.
- 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.**

PREPARATION

Rear Connections



PREPARATION

English

Ⓐ AM Antenna Connection

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

Ⓑ FM Wire Antenna Connection

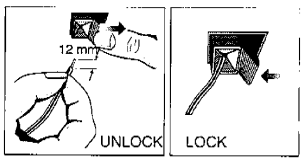
Connect the supplied FM wire antenna to the FM 75 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

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

Ⓒ Speaker Connections

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



Ⓓ Connecting other equipment to your system

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

Ⓔ Subwoofer Out Connection

You can connect either an optional active subwoofer (recommended model FB 201) or an optional wireless active subwoofer (recommended model FB 202W) to the SUBWOOFER OUT terminal. The wireless system uses a radio frequency transmitter. The subwoofer reproduces just the low bass effect (e.g. explosions, the rumble of spaceships, etc.). Be sure to follow the instructions supplied with the subwoofer.

Ⓕ Line Out *(wireless ready)*

You may install additional 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 that 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.*

Ⓖ Adjusting the Operating Voltage

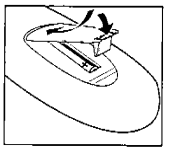
(not available for version /30)

Before connecting the AC power cord to a wall outlet, make sure that the voltage selector at the rear of the system is set to the local power line voltage. If not, reset the selector before connecting to the wall outlet.

Ⓗ AC Power Supply

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

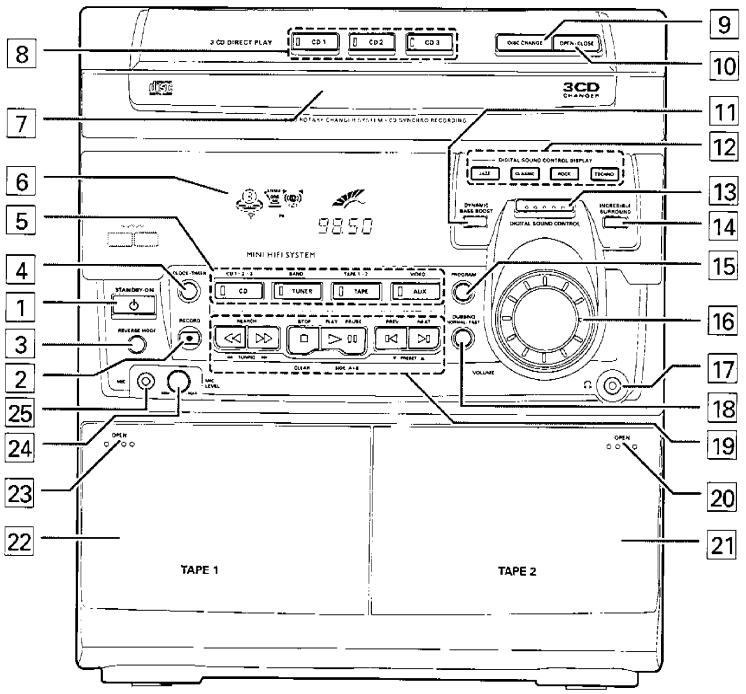
Inserting batteries into the Remote Control

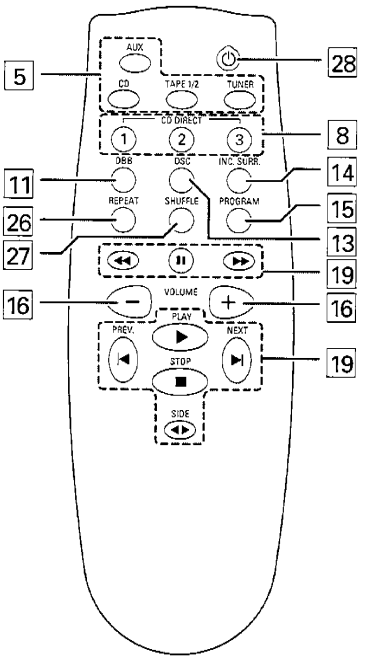


- Insert the batteries (Type R03 or AAA) into the remote control as shown in the battery compartment.
- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R03 or AAA batteries.

CONTROLS

English





CONTROLS

English

Controls on the system and remote control

1 **STANDBY•ON**
- to switch the system on or to standby mode.
- to store radio stations automatically by pressing and holding for 2 seconds *(only in Standby or Demonstration mode)*.

2 **RECORD**
- to start recording on tape deck 2 only.

3 **REVERSE MODE**
- to select the different playback mode on tape deck 2 only.

4 **CLOCK•TIMER**
- to view clock, set clock or timer.

5 **SOURCE SELECTION**
- to select the following:

CD (CD 1•2•3) ..... to select CD mode. When in CD stop mode; to select respective disc tray.
TUNER (BAND) ..... to select Tuner mode. When in Tuner mode; to select the waveband: FM or MW.
TAPE (TAPE 1•2) ..... to select Tape mode. When in tape stop mode; to select either tape deck 1 or tape deck 2.
AUX (VIDEO) ..... to select external source (e.g. DVD, TV, Laser Disc or VCR sound).

6 **DISPLAY**
- to view the current setting of the system.

7 **CD CAROUSEL TRAY**

8 **3 CD DIRECT PLAY**
- to select a CD tray for playback.

9 **DISC CHANGE**
- to change CD(s).

10 **OPEN•CLOSE**
- to open or close the CD carousel tray.

11 **DYNAMIC BASS BOOST (DBB)**
- to select bass boost level (Beat, Punch, Blast).

12 **DIGITAL SOUND CONTROL DISPLAY PANEL**
- to view the selected DSC setting.

13 **DIGITAL SOUND CONTROL (DSC)**
- to select the desired sound effect : OPTIMAL, JAZZ, CLASSIC, ROCK or TECHNO.

14 **INCREDIBLE SURROUND**
- to switch on or off the surround sound effect.

15 **PROGRAM**
- to program CD tracks in CD mode or preset radio stations in tuner mode.

16 **VOLUME**
- to adjust the volume level.

17 **HEADPHONES** ⍾
- to connect headphones jack.

18 **DUBBING**
- to dub a tape in normal or high speed.

19 **MODE SELECTION**

◀◀ 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 on tape deck 2 only.

STOP ■ (CLEAR)
for CD ..... to stop CD playback or clear a program.
for TUNER ... to stop programming.
for TAPE ..... to stop playback or recording.

PLAY ▶ / PAUSE ❚❚ (SIDE A•B)
for CD ..... to start or interrupt playback.
for TAPE ..... to start playback; When playing in tape 2 mode, to change side.

PREV ⏮ / NEXT ⏭ (▼ PRESET ▲)
for CD ..... to skip to the beginning of the current or previous/next track.
for TUNER ... to select a preset radio station in memory.

20 **OPEN**
- to open tape deck 2.

21 **TAPE DECK 2**

22 **TAPE DECK 1**

23 **OPEN**
- to open tape deck 1.

24 **MIC LEVEL** *(not available for version /30)*
- to adjust the mixing level for karaoke or microphone recording.

25 **MIC** *(not available for version /30)*
- to connect microphones jack.

26 **REPEAT**
- to repeat a CD track.

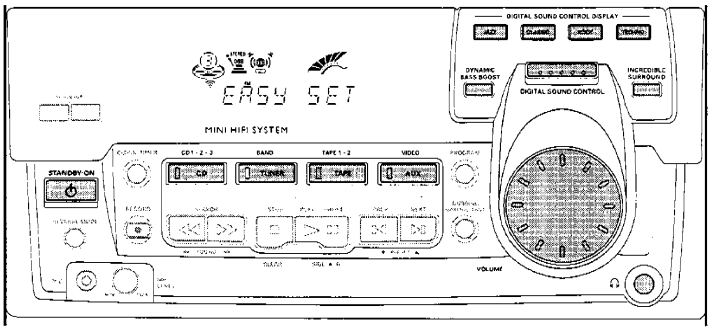
27 **SHUFFLE**
- to play all the available discs and their tracks in random order.

28 ⏻
- 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 buttons on the remote control (e.g. CD, TUNER, TAPE 1/2 or AUX).*
- *Then select the desired function (PLAY, NEXT, etc.).*

OPERATING THE SYSTEM

English



Important:
Before you begin operating the system, complete the preparation procedures.

Demonstration mode

The system has a demonstration mode that shows the various features offered by the system. ***Whenever the system is switched on from the wall socket, the demonstration mode will start automatically.***

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

To cancel demonstration mode
- Press and hold **STOP ■** *(on the system only)* for ***3 seconds*** to stop the demonstration.
  → The demonstration mode will be switched off permanently.

Easy Set *(only in Standby or Demonstration mode)*

EASY SET allows you to store all available radio stations in a particular band (FM•MW) automatically (see Easy Set under Tuner).

Switching the system ON

- Press **STANDBY•ON** *(on the system only)*, **CD**, **TUNER**, **TAPE** or **AUX**.

You can also switch on the system by pressing any one of the 3 CD DIRECT PLAY buttons.

Switching the system to standby mode

- Press **STANDBY•ON** again.

Selecting the Source

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

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

English

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.

INCREDIBLE SURROUND
Normal stereo sound is determined by the distance between the front speakers. When Incredible Surround is switched on, it magnifies the virtual distance between the front speakers for an incredibly wide, enveloping, stereo effect.

- Press **INCREDIBLE SURROUND** to switch on.
  → The INCREDIBLE SURROUND button lights up.
  → "IS" will be displayed.

To switch off Incredible Surround
- Press **INCREDIBLE SURROUND** again.
  → The INCREDIBLE SURROUND button light is switched off.
  → "IS OFF" will be displayed.

DIGITAL SOUND CONTROL (DSC)
The DSC feature enables you to enjoy special sound effects that have preset equalizer settings, providing the best music reproduction.

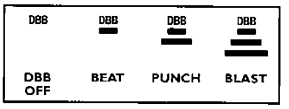
- Press **DIGITAL SOUND CONTROL (DSC)** to select **OPTIMAL**, **JAZZ**, **CLASSIC**, **ROCK** or **TECHNO**.
  → The Digital Sound Control display panel will light up respectively. At OPTIMAL setting, the DSC display panel does not light up.
  → "OPTIMAL, JAZZ, CLASSIC, ROCK or TECHNO" will be displayed.

Automatic DSC-DBB selection
The best setting for the DBB is automatically generated for the respective DSC selection. You can also manually select the DBB setting that best suits your listening environment.

DSC Selection	DBB Selection
Optimal	Punch
Jazz	Punch
Classic	Beat
Rock	Blast
Techno	Blast

DYNAMIC BASS BOOST (DBB)
The DBB mode enhances the bass response.

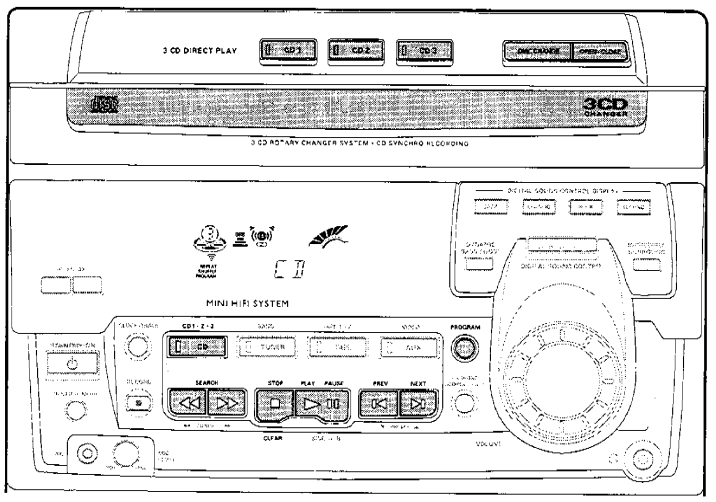
- Press **DBB** briefly to select the various level of bass boost.
  → The DBB button lights up.
  → "BEAT, PUNCH or BLAST" will be displayed.



To switch off DBB
- Press **DBB** briefly until the DBB button light is switched off.
  → "DBB OFF" will be displayed.

Note:
- *Some CDs or tapes might be recorded in high modulation. It may cause distortion at high volume. If this occurs, switch off Incredible Surround (if available), DBB level or reduce the volume.*

English



Warning!
1) This system is designed for conventional CDs. Do not use any accessories like disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.
2) Do not load more than one disc into each tray.
3) When the CD changer is loaded with CD(s), do not turn over or shake the system. This may jam the changer.

You can load up to three discs in the CD changer for continuous playback without interruption.

Loading the CD Changer

1 Press **CD** to select CD mode.
2 Press **OPEN•CLOSE**.
  → The CD compartment slides out.
3 Load a CD with the printed side up in the right tray.
- You can load another disc in the left tray.
- To load the third disc, press **DISC CHANGE**.
  → The CD changer carousel will rotate until the empty tray is at the right hand side and is ready for loading.
  → Playback will always start with the disc in the outer right disc tray.

4 Press **OPEN•CLOSE** to close the CD compartment.
  → The total number of tracks and playing time of the last selected disc appear on the display.

3 CD Direct Play

- You can play a CD directly by pressing the corresponding **3 CD DIRECT PLAY (1 - 3)** button. The CD player will stop at the end of playback of the selected disc.
  → When the button is lighted, it indicates that there is a disc loaded in the disc tray.

Playing a CD

1 Press **PLAY** ▶ to start playback.
  → The disc tray, track number and elapsed playing time of the current track appear on the display.
  → The LED on the respective 3 CD Direct Play button will be flashing.
- To interrupt playback, press **PAUSE** ❚❚ .
  → The playing time flashes.
- To resume playback, press **PLAY** ▶ again.

2 To stop playback, press **STOP** ■ .

Note:
– *All the available discs will be played once, then stop. When the CD has stopped playing, the system will switch to the standby mode after 15 minutes if no button is pressed.*

Disc Change

You can change the outer 2 discs while the third inner disc is at the stop or playback mode.

1 Press **DISC CHANGE**.
  → The CD compartment slides out.
2 Replace the discs in the left and right disc trays.
- If you press **DISC CHANGE** again during playback, the CD will stop playing.
  → The CD carousel tray will rotate until the inner tray is at the right hand side and is ready for changing.

3 Press **OPEN•CLOSE** to close the CD compartment.

Selecting a desired track

Selecting a desired track at the stop mode

1 Press **PREV** ⏮ or **NEXT** ⏭ until the desired track appears on the display.
2 Press **PLAY** ▶ to start playback.
  → The selected track number and elapsed playing time appear on the display.

Selecting a desired track during playback

1 Press **PREV** ⏮ or **NEXT** ⏭ until the desired track appears on the display.
  → The selected track number and elapsed playing time appear on the display.
- If you press **PREV** ⏮ once it will skip to the beginning of the current track and play the track again.

Searching for a particular passage during playback

- Press and hold ◀◀ or ▶▶ until the desired passage is located.
  → The volume will be reduced.
- Playback returns to normal when ◀◀ or ▶▶ is released.

Programming Tracks

Programming tracks of a loaded CD is possible in the stop mode. The display will indicate the total tracks stored in the program. Up to 40 tracks can be stored in the memory in any order. When 40 tracks are stored and you attempt to store another track, the display will show *"PROGRAM FULL"*.

1 Load the desired discs in the disc trays.
2 Press **PROGRAM** to start programming.
  → The PROGRAM flag starts flashing
3 Press the **CD (CD 1•2•3)** to select the desired disc.
4 Press **PREV** ⏮ or **NEXT** ⏭ to select the desired track.
5 Press **PROGRAM** to store the track.
- Repeat steps ***3*** to ***5*** to store other discs and tracks.

6 Press **STOP** ■ once to end programming mode.
  → The total number of tracks programmed and total playing time appear on the display.

Notes:
– *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "--:--" appears in the display instead of the total playing time.*

– *During programming, If no button is pressed within 20 seconds, the system will exit program mode automatically.*

Playing the program

1 Press **PLAY** ▶ to start program playback.
  → *"PLAY PROGRAM"* will be displayed.
  → The track number and elapsed playing time of the current track will appear on the display.
2 Press **STOP** ■ to stop program playback.

Note:
– *If you press any of the 3 CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM flag will also temporarily disappear from the display and then reappear, when the playback for the selected disc ends.*

Reviewing the program

Reviewing of the program is only possible in the stop mode.

- Press **PREV** ⏮ or **NEXT** ⏭ repeatedly to review the programmed tracks.
- Press **STOP** ■ to exit review mode.

Erasing the program *(in the stop mode)*

- Press **CLEAR** on the system.
  → *"PROGRAM CLEARED"* will be displayed.

Note:
– *The program will be erased when the system is disconnected from the power supply. If the CD carousel is opened, the tracks belonging to the outer two trays will be erased and the display will show "CLEARED".*

Shuffle *(only on remote control)*

It will play all the available discs and their tracks in random order. Shuffle may also be used when tracks are programmed.

To shuffle all the discs and tracks

1 Press **SHUFFLE**.
  → *"SHUFFLE"* will be displayed.
  → The SHUFFLE flag, the disc and the track selected at random appear on the display.
- The discs and the tracks will now be played in random order until you press **STOP** ■ .

2 Press **SHUFFLE** again to resume normal playback.
  → The SHUFFLE flag disappears from the display.

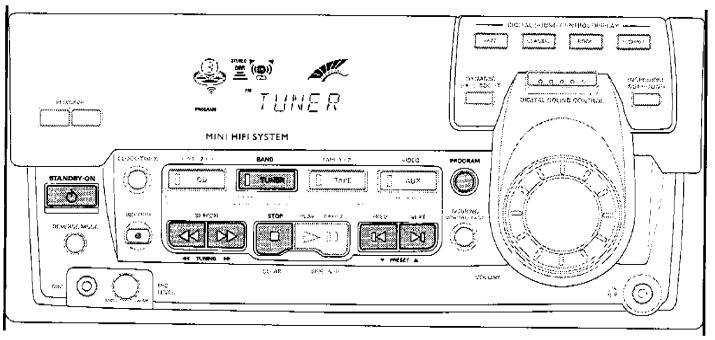
Note:
– *All the available discs will be played once, then stop.*

Repeat *(only on remote control)*

It will play the current track repeatedly.

1 Press **REPEAT** during playback.
  → *"REPEAT TRACK"* will be displayed.
  → The REPEAT flag and the track selected appear on the display.
- The track will now be played repeatedly until you press **STOP** ■ .

2 Press **REPEAT** again to resume normal playback.
  → The REPEAT flag disappears from the display.



Easy Set *(only in Standby or Demonstration mode)*

EASY SET allows you to store all available radio stations in a particular band (FM•MW) automatically.

- Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds.
  → "EASY SET" will be displayed and followed by "TUNER".
  → Easy set will start with the last active band.
  → All available radio stations with sufficient signal strength will be stored until 40 presets are filled.

Notes :
- *When EASY SET is used, all previously stored stations will be erased.*
- *The last preset station will appear on the display when Easy Set is completed.*

Tuning to Radio Stations

1 Press **TUNER** to select TUNER mode.
  → "TUNER" will be displayed.
  → The preset station number, frequency and waveband appear on the display.
2 Press **TUNER (BAND)** again to select the desired waveband : FM or MW.
3 Press **TUNING** ◀◀ 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 radio station is reached.
- To tune to a weak station, briefly press **TUNING** ◀◀ or ▶▶ until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Radio Stations

English

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**.
2 Press **TUNER (BAND)** again to select the desired waveband : FM or MW.
3 Press **PROGRAM** for more than one second.
  → PROGRAM flag starts flashing and 'AUTO' will be displayed.
  → Every available radio station 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.

- Repeat the above procedure to store other preset stations for the other waveband. Remember to select the next available preset number before proceeding. If not, some of the preset radio stations may be erased.

Notes:
- *You can cancel the automatic programming by pressing PROGRAM or STOP ■ .*
- *If you want to reserve a section of preset numbers, for example preset numbers 1 to 9, select preset 10 before starting automatic programming; now only the preset numbers 10 to 40 will be programmed.*

English

Manual programming

1 Press **TUNER**.
2 Press **TUNER (BAND)** to select the desired waveband : FM or MW.
3 Press **PROGRAM** for less than one second.
  → PROGRAM flag, the frequency and preset station number start flashing.
  → The next available preset number will be displayed for selection.
4 Press **TUNING** ◀◀ or ▶▶ to tune to the desired frequency.
- When all 40 presets are stored, no preset number is shown.
  → The message "PROGRAM FULL" will be displayed.
- If you wish to store the radio station to another preset number, press **PRESET** ▼ or ▲ to select the desired preset number.
5 Press **PROGRAM** again.
  → PROGRAM flag will stop flashing, and the radio station will be stored.

- Repeat the above procedure to store other preset radio stations.

Notes:
- *You can cancel the manual programming by pressing STOP ■ .*
- *During programming , If no button is pressed within 20 seconds, the system will exit program mode automatically.*

Tuning to Preset Radio Stations

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

Changing the MW tuning grid

(not available for version /30)

The frequency step can be changed if necessary. In North and South America, the frequency step between adjacent channels in the MW band is 10 kHz. In other parts of the world, it is 9 kHz. The frequency step presetted in the factory is 9 kHz.

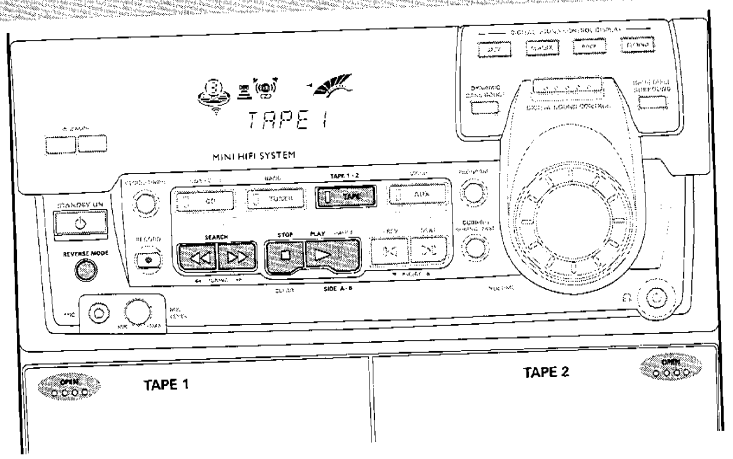
For MW band
To change from 9 kHz to 10 kHz or vice versa

Changing of tuning grid will erase all previously stored preset stations.

1 Disconnect the system from the AC power supply *(pull out the AC power cord).*
2 Press **TUNER** and **TUNING** ▶▶ depressed while reconnecting the system to the AC power supply.
  → Display will show "TUNER" and follow by "GRID 9" or "GRID 10".

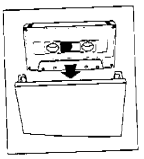
Notes:
- *GRID 9 indicates that the tuning grid is in step of 9 kHz in MW band. GRID 10 indicates that the tuning grid is in step of 10 kHz in MW band.*
- *FM tuning grid will also be changed from 50 kHz to 100 kHz or vice versa. All preset radio stations will also be erased.*

English



Loading a tape

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



Tape Playback

1 Press **TAPE** to select TAPE mode.
→ "TAPE 1" or "TAPE 2" will be displayed.
- Press **TAPE** again to select either tape deck 1 or tape deck 2.

2 Load the tape into the desired tape deck.

3 Press **PLAY** ▶ to start playback.

3a *(For Tape Deck 2 only)*
Press **SIDE A•B** to switch playback between sides A and B.
→ The ◀ or ▶ (back or front) flag appears on the display, depending on the side selected.

3b *(For Tape Deck 2 only)*
Press **REVERSE MODE** to select the different type of playback mode *(see auto reverse playback)*.

4 Press **STOP** ■ to end playback.

Notes:
- *To change side before playback begins, use the SIDE button on the remote control.*
- *When the tape has stopped playing, the system will switch to the standby mode automatically after 15 minutes if no button is pressed.*

Auto Reverse Playback *(only on tape deck 2)*

- Press **REVERSE MODE** to select the different playback modes.

⇀ ..... recording or playback on one side of the tape. The tape stops at the end of one side.

⇄ ..... recording or playback on both sides of the tape. The tape then stops.

⇆ ..... continuous playback on both sides of the tape up to a maximum of 20 times per side unless you press **STOP** ■.

English

Rewind/Fast Forward *(only on tape deck 2)*

At the stop mode

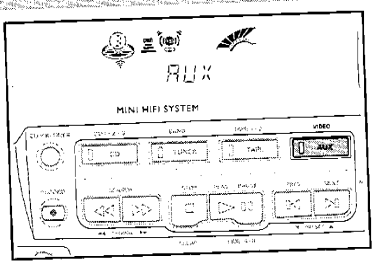
1 You can rewind or fast forward the tape by pressing ◀◀ or ▶▶ respectively.
→ "⋘ or ⋙" will be displayed depending on which button is pressed.
→ The tape will stop automatically at the end of the rewinding or fast forwarding.

2 Press **STOP** ■ to stop rewind or fast forward.

During playback

- Press and hold ◀◀ or ▶▶ respectively until the desired passage is located.
→ 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 possible to select another source (e.g. CD, TUNER or AUX).*
- *Check and tighten slack tape with a pencil before use. 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 loudspeaker boxes).*

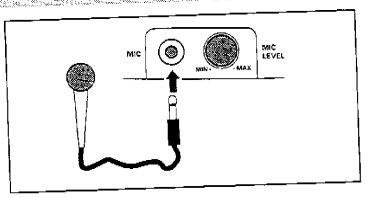


Selecting External Equipment

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

- Press **AUX** to select the external mode.
→ "AUX" will be displayed.

Note:
- *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*



Karaoke *(not available for version /30)*

Microphone mixing

1 Set the **MIC LEVEL** control to the minimum level to prevent acoustic feedback (e.g. a loud howling sound) before you connect the microphone.

2 Connect a microphone to the **MIC** socket.

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

4 Play the selected source.

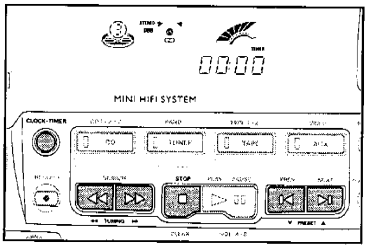
5 Adjust the volume level with **VOLUME** control.

6 Adjust the **MIC LEVEL** control to the mixing level that you want.

7 Start singing or talking through the microphone.

Note:
- *It is advisable to switch off Incredible Surround during karaoke.*

CLOCK TIMER



View Clock

You can view the clock (if it is set) at standby or any source mode. It will be displayed for about 7 seconds.

- Press **CLOCK•TIMER** briefly.
  → "*10:25*" (the current time) will be displayed.
  → "- - : - -" will be displayed if the clock is not set.

Clock setting

The clock is set in 24-hour mode, e.g. *00:00* or *23:59*. Before setting the clock, you must be at the View Clock mode.

1 Press **CLOCK•TIMER** to select clock mode.
  → "*00:00*" or the current time starts flashing.
  → "◀◀, ▶▶, |◀, ▶|" light up.
2 Set the hour with ◀◀ or ▶▶.
3 Set the minute with |◀ or ▶|.
4 Press **CLOCK•TIMER** again to store the setting.
  → The clock starts running.
- To exit without storing the setting, press **STOP** ■.

Notes:
- *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*
- *When power interruption occurs, the clock setting is erased.*

Timer Setting

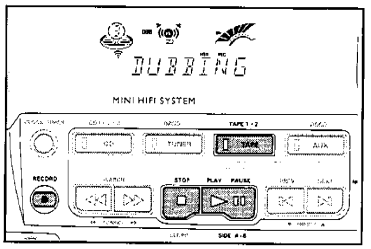
- The system can switch on to CD, TUNER or TAPE 1 mode automatically at a preset time. It can serve as an alarm to wake you up. After half an hour from the preset time, the system will return to the standby mode if no button is pressed.
- Before setting the timer, make sure the clock is set correctly.
- The timer has to be reset or start again for each subsequent preset time.
- **The volume of the timer will be at the last setting before the system is switched to standby mode.**

1 Press and hold **CLOCK•TIMER** for more than 2 seconds to select timer mode.
  → "*ON 00:00*" or the last set timer starts flashing. The TIMER flag will be displayed.
  → The last selected source is lighted while other available sources are flashing.
  → "◀◀, ▶▶, |◀, ▶|" light up.
2 Press **CD**, **TUNER** or **TAPE** to select the desired source.
3 Press ◀◀ or ▶▶ to set the hour for the timer to start.
4 Press |◀ or ▶| to set the minute for the timer to start.
5 Press **CLOCK•TIMER** again to store the start time and the selected source.
  → The TIMER is now set.
  → The TIMER flag remains on the display.
- At the preset time, the TIMER will be activated.
  → The selected source will be played.
  → The TIMER flag disappears from the display.

Notes:
- *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*
- *If the source selected is TUNER, the last tuned frequency will be switched on.*
- *If the source selected is CD, playback will begin with the first track of the last selected disc. If the CD trays are empty, the TUNER will be selected instead.*
- *If the source selected is TAPE 1, and if the preset time is reached during high speed dubbing, the TUNER will be selected instead.*

To start the TIMER again *(for the same time)*
1 Press **CLOCK•TIMER** for more than 2 seconds.
2 Press **CLOCK•TIMER** again to store the start time and the selected source.

RECORDING



Notes:
- *If you do not intend to record via the microphone, unplug the microphone to avoid accidental mixing with other recording sources.*
- *For recording, use only tape of IEC type 1 (normal tape) or IEC type II (Chrome).*
- *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 Incredible Surround.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side that 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 CrO_2 tape detection hole when covering the tab opening.*

Recording from other sources *(only on tape deck 2)*

1 Press **TAPE** to select tape deck 2.
2 Load a blank tape into tape deck 2 with the open side downward.
3 Press **SIDE** on remote control to select the recording side.
  → The ◀ or ▶ (back or front) flag will be displayed, depending on the side selected.
4 Press **REVERSE MODE** to select the playback mode (⇄ or ⇉).
5 Press **CD**, **TUNER** or **AUX**.
- Start playback of the selected source.
6 Press **RECORD** to start recording.
  → The REC flag starts flashing.
7 Press **STOP** ■ 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)*

1 Press **TAPE** to select tape deck 2.
2 Load the prerecorded tape into tape deck 1 and a blank tape into tape deck 2.
  → Make sure that the tape in tape deck 1 has its full spool to the left.
3 Press **SIDE** on remote control to select the recording side.
4 Press **DUBBING** ***once*** for normal speed dubbing or ***twice*** *(within 2 seconds)* for high speed dubbing.
  → "*NORMAL*" (normal speed) or "*FAST*" (high speed) will be displayed and then followed by "*DUBBING*".
  → The HSD flag appears on the display for high speed dubbing.
- Dubbing will start immediately.
  → The REC flag starts flashing.
5 Press **STOP** ■ to stop dubbing.

Notes:
- *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 switch to other source while dubbing.*

RECORDING

CD Synchro Start Recording

1 Load a blank tape into tape deck 2 and a disc into the disc tray.
2 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, the tracks are recorded according to the selected disc.
3 Press **RECORD** to start recording.
→ The REC flag starts flashing.
• CD will start playback automatically.
4 Press **STOP** ■ to stop recording.

Recording the mixed sound/One Touch Recording

• During microphone mixing, you can record the mixed sound on a tape in tape deck 2 except dubbing mode *(not available for version /30)*
• For One Touch Recording, as soon as you press RECORD, the current source will be recorded on tape deck 2.

1 Load a blank tape in tape deck 2.
2 Press **RECORD** to start recording.
→ The REC flag starts flashing.
3 Press **STOP** ■ to stop recording.

Note:
– *When you press RECORD at TAPE mode, "SELECT OTHER SOURCE" will be displayed. One Touch Recording is not possible at TAPE mode.*

MAINTENANCE

Maintenance

English

Cleaning the Cabinet
• Use a soft cloth slightly moistened with a mild detergent solution. Do not use a solution containing alcohol, spirits, ammonia or abrasives.

Cleaning Discs
• When a disc becomes dirty, clean it with a cleaning cloth. Wipe the disc from the center out.
• Do not use solvents such as benzine, thinner, commercially available cleaners, or antistatic spray intended for analog records.

Cleaning the CD lens
• After prolonged usage, dirt or dust may accumulate at the CD lens. To ensure good playback quality, clean the CD lens with Philips CD Lens Cleaner or any commercially available. Follow the instructions supplied with the Lens Cleaner.

Cleaning the Tape Heads and the Tape Paths
• To ensure good recording and playback quality, clean the heads, capstan(s) and pressure roller(s) after every 50 hours of tape operation.
• Use a cotton swab slightly moistened with cleaning fluid or alcohol.
• You can also clean the heads by playing a cleaning tape through once.

Demagnetizing the heads
• Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty.

• If a fault occurs, check the points listed below before taking the system for repair.
• Should any problems persist after you have made these checks, consult your nearest dealer or service center.

CD Player Operation

"NO DISC" is displayed.
• The disc is inserted upside down.
→ *Place CD with printed side up.*
• Moisture condensation at the lens.
→ *Wait until lens has adjusted to normal room temperature.*
• There is no disc in the CD tray.
→ *Insert a CD.*
• The CD is dirty, badly scratched or warped.
→ *Clean or replace the CD.*
• The CD lens is dirty or dusty.
→ *See section under Maintenance.*

Radio Reception

Poor radio reception
• The signal strength is too weak.
→ *Adjust the antenna.*
• The TV or VCR is too close to the stereo system.
→ *Separate the stereo system from the TV or VCR.*
→ *Connect an external antenna for better reception.*

Cannot tune to station.
• Wrong tuning grid.
→ *Switch to the correct tuning grid.*

Tape Deck Operation

"RECORDING ACTIVE" is displayed.
• A recording is in progress.
→ *Stop the recording or wait until it is finished.*

"TAPE DUBBING ONLY" is displayed.
• Tape dubbing is only possible in tape mode.
→ *Switch source to tape mode.*

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.*
• Magnetic build-up in the record/playback head.
→ *Use demagnetizing tape.*

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 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 that the stripped speaker wire is clamped.*

Reversed left and right sound.
• Speakers are incorrectly connected.
→ *Check the speaker connections and location.*

Lack of bass sound or apparently imprecise physical location of musical instruments.
• Speakers are incorrectly connected.
→ *Check the speaker connection for proper phasing, red/black wires to red/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 (PLAY, PREV/NEXT, 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 not working.
• Timer is not switched on.
→ *Press CLOCK•TIMER on the system to switch on the timer.*
• Dubbing/recording is in progress.
→ *Stop dubbing/recording.*

System display features automatically and buttons flashing continuously.
• Demonstration mode is switched on.
→ *Press and hold STOP ■ for 3 seconds to switch off the demonstration mode.*

ADDITIONAL FEATURES - OTHER VERSION

Receiving RDS radio station

RDS (Radio Data System) is a broadcasting service that allows FM stations to send additional information along with the regular FM radio signal. This additional information can contain:

- **STATION NAME:** The station name is displayed.
- **FREQUENCY:** The frequency of the station is displayed.
- **PROGRAM TYPE:** The following program types exist and can be received by your tuner: News, Affairs, Info, Sport, Educate, Drama, Culture, Science, Varied, Pop M, Rock M, M.O.R. (middle of the road music), Light M, Classics, Other M, No type.
- **RADIO TEXT (RT):** text messages appear in the display.

When you have tuned to a RDS station, the RDS logo (RDS) and the station name will appear on the display:

- The display normally shows the radio station name if available.
  By repeatedly pressing **RDS** button you can change the type of display information:
  → The display shows in turn:
  STATION NAME → FREQUENCY → PROGRAM TYPE → RADIO TEXT → STATION NAME ...

Note:
– *When you press the RDS button and the display shows "NO RDS", it indicates that either the tuned station is not transmitting RDS signal or it is a non RDS station.*

RDS Time
Some RDS station may be transmitting a real clock time at an interval of every minute.

Setting the time with RDS clock
1 Press **CLOCK•TIMER**.
→ "- - : - -" or current time appears on the display.
2 Press **CLOCK•TIMER** once more to enter clock setting mode.
→ "00:00" or current time starts flashing.
3 Press **RDS**.
→ The message "SEARCH RDS TIME" will be displayed.
→ If the station does not transmit RDS clock, "NO RDS TIME" will be displayed.
→ When the RDS clock is read, "RDS TIME" will be displayed. The current clock time is displayed for 2 seconds and will be stored automatically.

News *(only available in Radio Station with RDS)*

You can activate NEWS function in Standby or any source mode except Tuner mode. Once the News PTY (program type) is detected in a RDS station, it will switch to TUNER mode automatically.

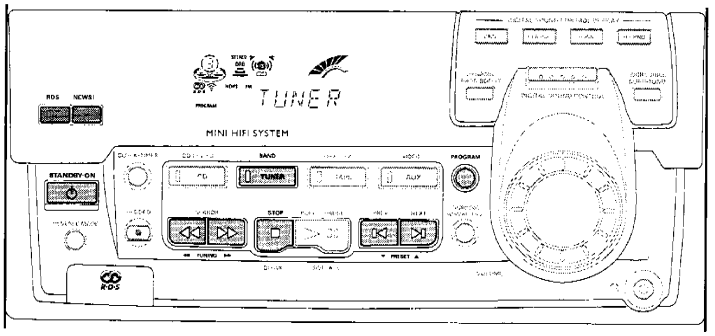
To start NEWS function
1 Press **NEWS**.
- The NEWS flag and "NEWS ON" will be displayed.
- It will search for the first available RDS station in the presets and wait for the News PTY (program type) to be available. During News PTY search :
  → If **NEWS** activate from Standby or Demo mode, the display will show "WAITING FOR NEWS".
  → If **NEWS** is activated from CD, Tape or Aux mode, the current source activity will be remain uninterrupted.
  → If no RDS station is found after the search, the News function will be switched off. The display will show "NO RDS NEWS" and NEWS flag will disappear from the display.
- When News transmission is detected, the system will switch to Tuner mode.
  → The NEWS flag starts flashing.
- After News has ended, the last selected source mode will be resumed.
  → The NEWS flag will disappear from the display.

To cancel NEWS function
- Press **NEWS** again.
  → The NEWS flag disappears and "NEWS OFF" will be displayed.
  → The last selected source mode will be resumed.

Notes:
– *During NEWS bulletin, you can press any available source button to cancel NEWS function and execute the relevant source mode.*
– *The NEWS works only once for each activation.*
– *If NEWS is activated from Standby or Demostration mode, it switches to Tuner mode and the sound will be muted until News is available.*

English

ADDITIONAL FEATURES - OTHER VERSION



Easy Set *(only in Standby or Demonstration mode)*

EASY SET allows you to store all available radio stations and RDS stations in a particular band (FM•MW•LW) automatically.

1 Press and hold **STANDBY•ON** *(on the system only)* for 2 seconds.
→ "EASY SET" will be displayed and followed by "TUNER".
→ Easy set will start with the last active band.
→ All available radio stations with sufficient signal strength will be stored or until 40 presets are filled.
2 The system will search once again for the first available RDS station and to set the RDS time automatically.
- When searching RDS station;
  → "SEARCH RDS STATION" will be displayed. If no RDS station is available, the program will exit automatically.
  → After a station is found, "EASY SET" will be displayed and followed by "TIME".
- When searching RDS time;
  → "SEARCH RDS TIME" will be displayed.
  → When RDS time is read, "RDS TIME" will be displayed. The current time is displayed for 2 seconds and will be stored automatically.

Notes :
– *When EASY SET is used, all previously stored stations will be erased.*
– *The last preset station or the first available RDS will appear on the display when Easy Set is completed.*
– *If RDS station does not transmit RDS time within 90 seconds, the program will exit automatically and the display will show "NO RDS TIME".*

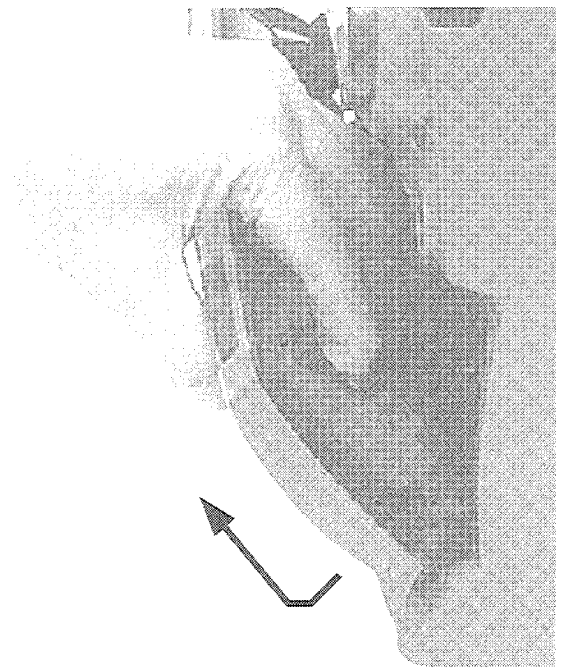
English

Tuning to Radio Stations

1 Press **TUNER** to select TUNER mode.
→ "TUNER" will be displayed.
→ The preset station number, frequency and waveband appear on the display.
2 Press **TUNER (BAND)** again to select the desired waveband : FM, MW or LW.
3 Press **TUNING** ◀◀ 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 radio station is reached.
- To tune to a weak station, briefly press **TUNING** ◀◀ or ▶▶ until the display shows the desired frequency and/or when the best reception has been obtained.

DISMANTLING INSTRUCTIONS

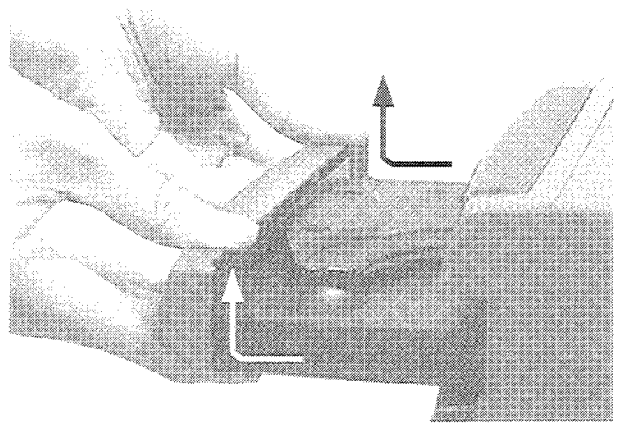
Dismantling of the Cassette Cover



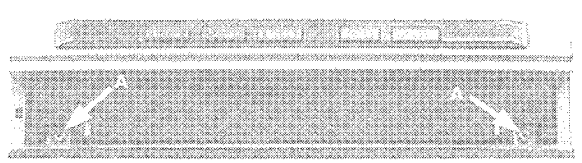
Cassette door

Dismantling of the CDC Module and Front Panel

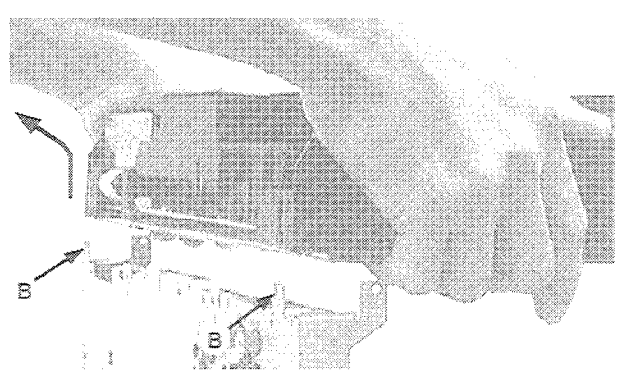
1) Loosen the 19 screws to remove the Cabinet Rear (pos 289).
   - 5 screws each on the left & right side of the Cabinet
   - 9 screws at the rear of the Cabinet
2) Slide out the tray and remove the Cover Tray CDC (pos 205) as indicated.
3) Loosen the 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
4) Remove 1 screw at the bottom to separate the Front Panel Assembly from the Bottom Plate (pos 286).



Remove Cover Tray CDC



Front CDC

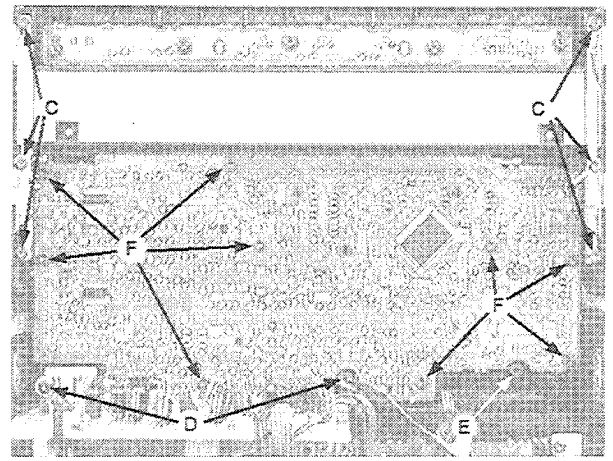


Remove CDC Module

3-1

Dismantling of the Front Board

1) Remove 6 screws C as indicated to take out the CDC Left Bracket (pos 267) and CDC Right Bracket (pos 268).
2) Remove 2 screws D as indicated to loosen the AF Board (pos 1101).
3) Remove 1 screw E as indicated to loosen the Karaoke Board (only for set with Karaoke board).
4) Remove 9 screws F as indicated to loosen the Front Board (pos 1102).

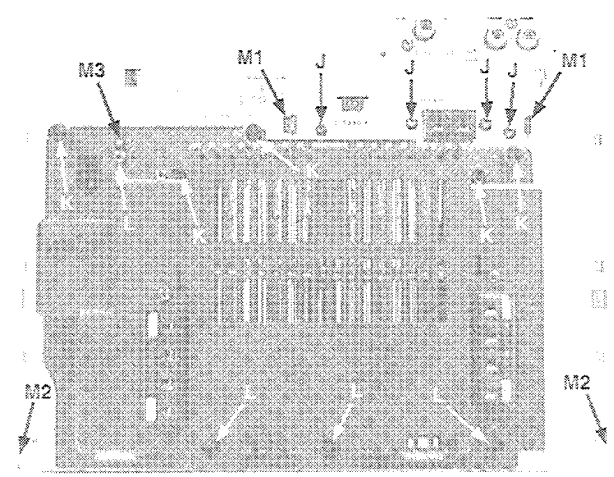


Dismantling of the ETF Module

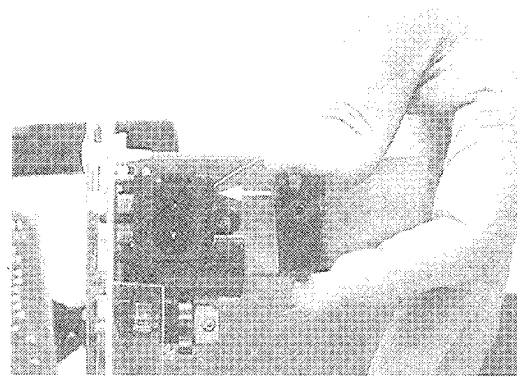
1) Remove 8 screws (4 x screws G and 4 x screws H) as indicated to loosen the ETF Module (pos 1105).

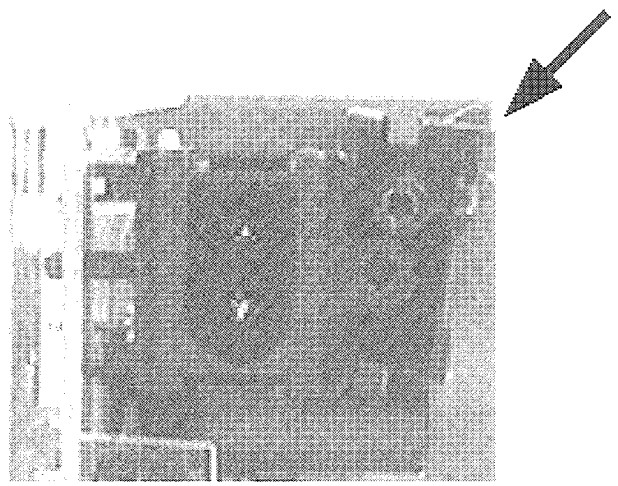
Dismantling of Rear Portion

1) Remove 4 screws J and uncatch M1 to loosen the Tuner Board (pos 1100).
2) Remove 5 screws K and uncatch M2 to take out the Rear Plate (pos 284).
3) Remove 4 screws L and uncatch M3 to free the rucksack (Power Module).



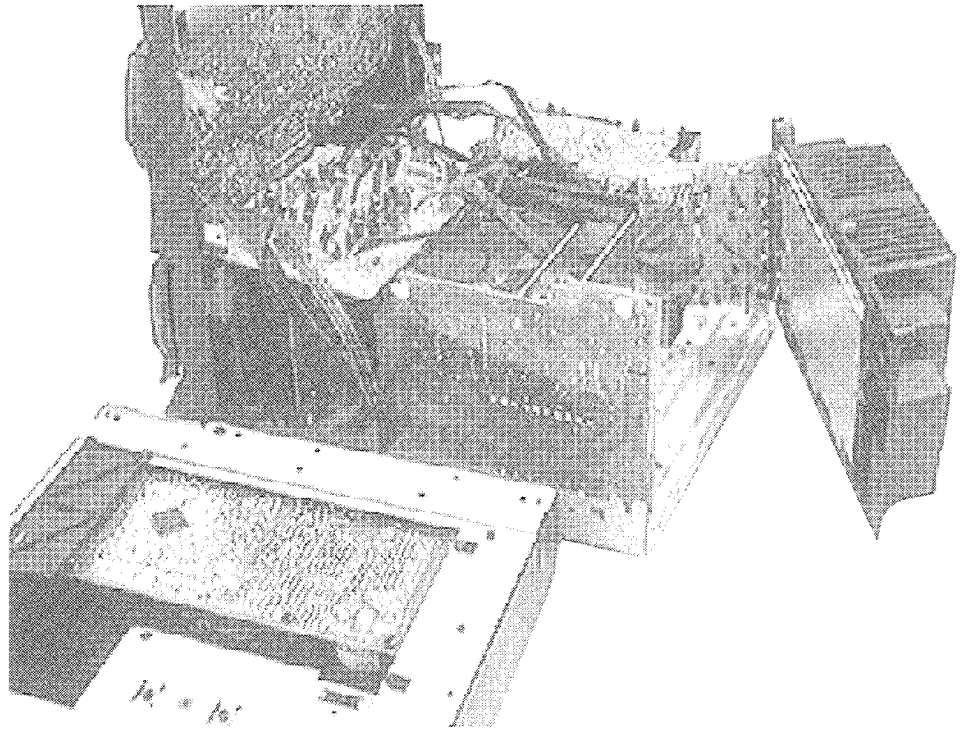
Hints for Power Module & Rear Panel assembly





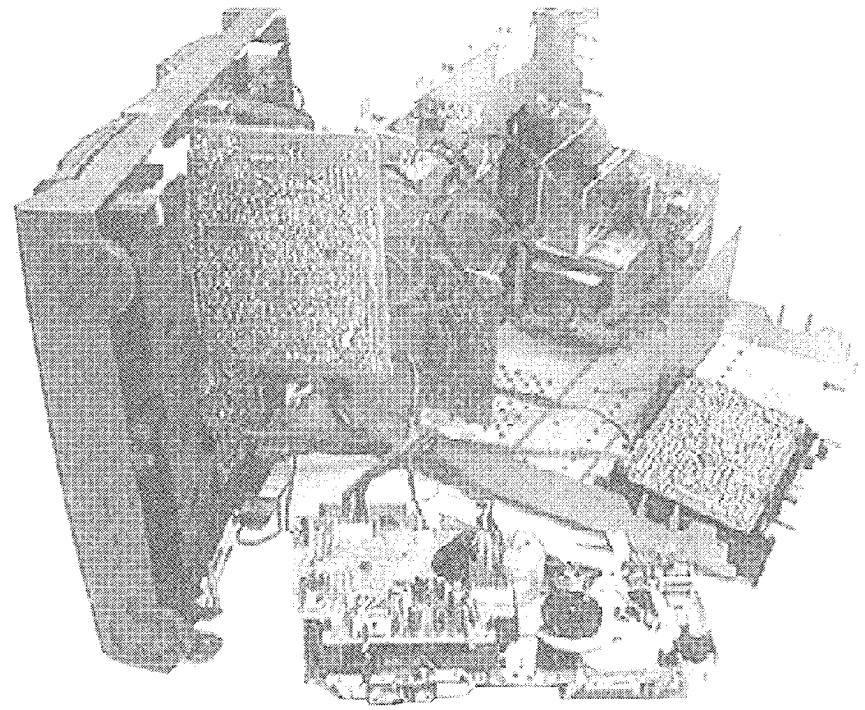
1) During re-assembly of the Rucksack (Power module), care should be taken to alignment all Loudspeaker sockets into the openings. Do not force bend the leads of the sockets.
2) Place the bracket, as indicated, behind the mains socket and catch it into the Rucksack.
3) Assemble the Rear Plate onto the Bottom plate, care should be taken not to damage any wires or pc board copper pattern.

Service pos A

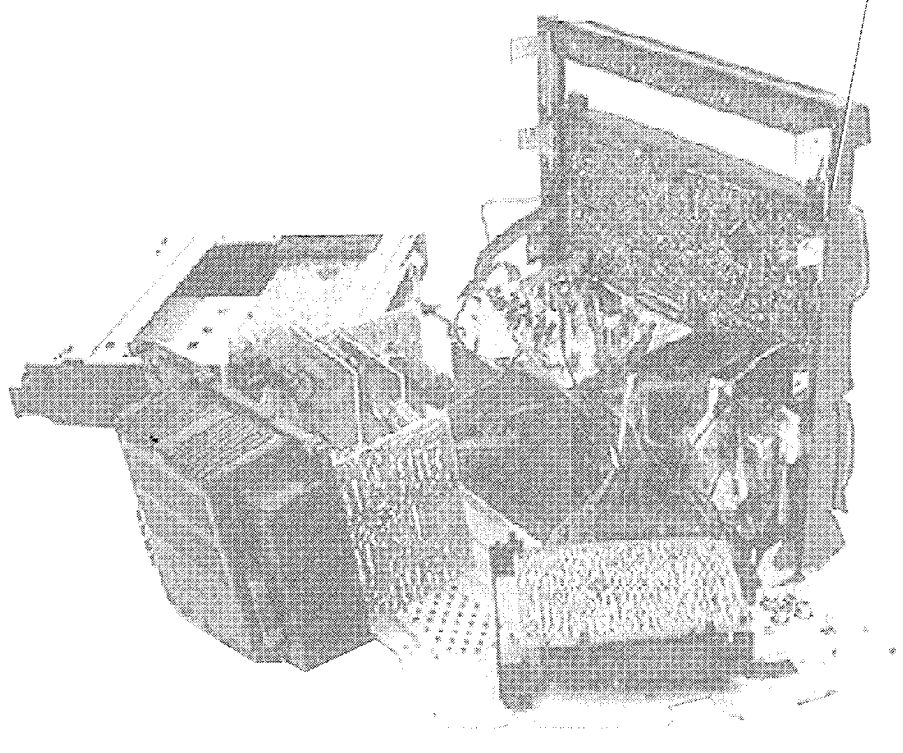


3-2

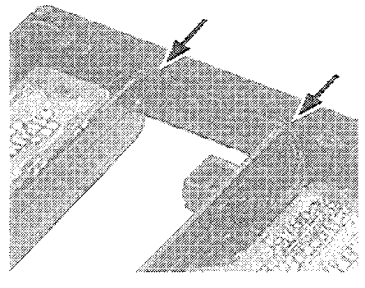
Service pos B



Service pos C

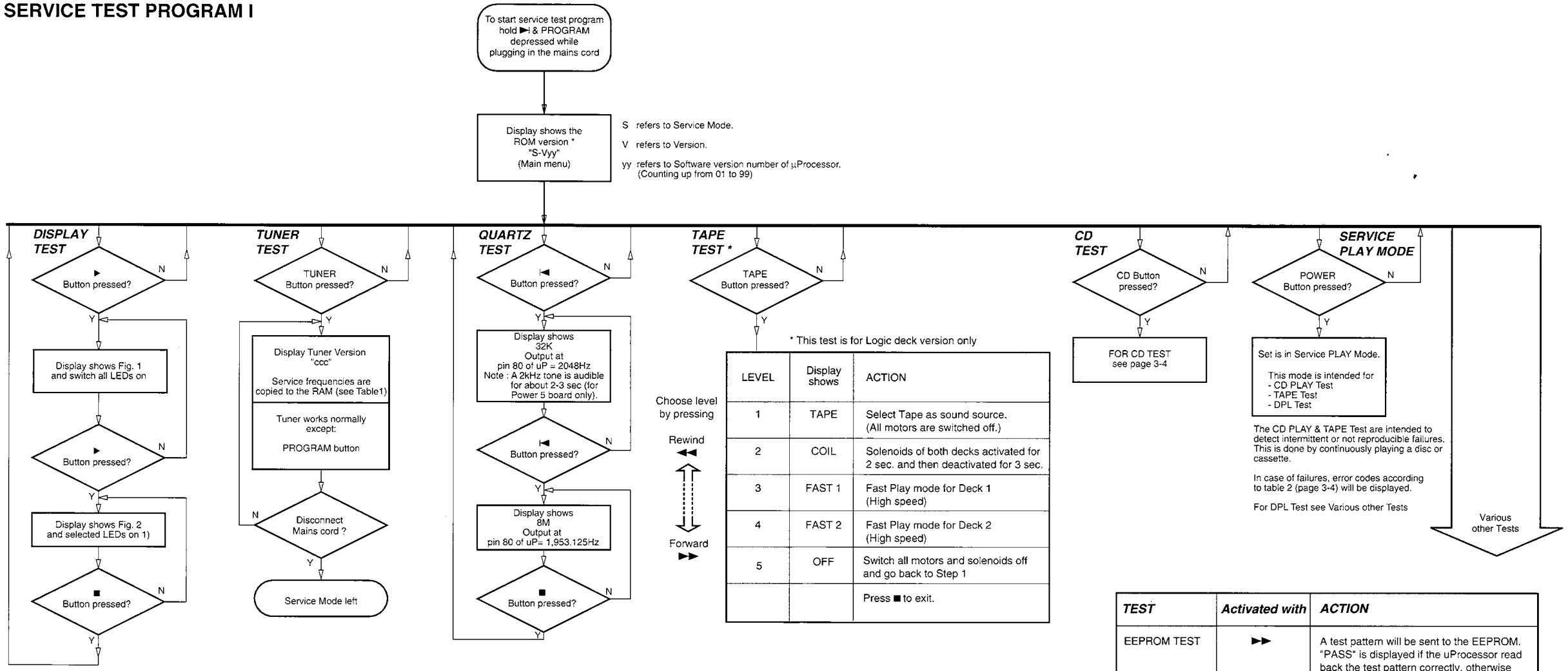


Note: During re-assembly Front board, care should be taken to dress the thin bunch of wires properly in the slots provided so that it will not be damaged by the CDC bracket (pos 267).



3-3

SERVICE TEST PROGRAM I



LEVEL	Display shows	ACTION
1	TAPE	Select Tape as sound source. (All motors are switched off.)
2	COIL	Solenoids of both decks activated for 2 sec. and then deactivated for 3 sec.
3	FAST 1	Fast Play mode for Deck 1 (High speed)
4	FAST 2	Fast Play mode for Deck 2 (High speed)
5	OFF	Switch all motors and solenoids off and go back to Step 1
		Press ■ to exit.

PRESET	Europe "EUR"	East Eur. 3-band "EAS"	East Eur. 2-band "EAS"	USA "USA"	Oversea "OSE"	Korea "KOR"	Japan "JAP"
1	87.5MHz	65.81MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz	76MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz	108MHz	CH3 107.75MHz
3	531kHz	74MHz	74MHz	530kHz	531/530kHz	531kHz	90MHz
4	1602kHz	87.5MHz	87.5MHz	1700kHz	1602/1700kHz	1602kHz	CH1 95.75MHz
5	558kHz	531kHz	531kHz	560kHz	558/560kHz	558kHz	CH2 101.75MHz
6	1494kHz	1602kHz	1602kHz	1500kHz	1494/1500kHz	1494kHz	531kHz
7	153kHz	558kHz	558kHz	98MHz	87.5MHz	87.5MHz	1602kHz
8	279kHz	1494kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz	558kHz
9	198kHz	153kHz	98MHz	87.5MHz	87.5MHz	87.5MHz	1494kHz
10	98MHz	279kHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz	80MHz
11	87.5MHz	198kHz	65.81MHz	87.5MHz	98MHz	98MHz	76MHz

Table 1

East Europe TUNER IF offset correction

1) Input a reference frequency 87.5MHz from the generator.

2) Proceed to the Tuner Test Mode

3) Hold TUNER button down for > 3 seconds

4) The set will self-calibrate automatically and display "OFS-xx" when calibration is successful, otherwise it will display "00E".

xx : offset value between -3 to +3

Note: This has to be done whenever the Eeprom, Microprocessor or the components in the oscillator circuitry are replaced.

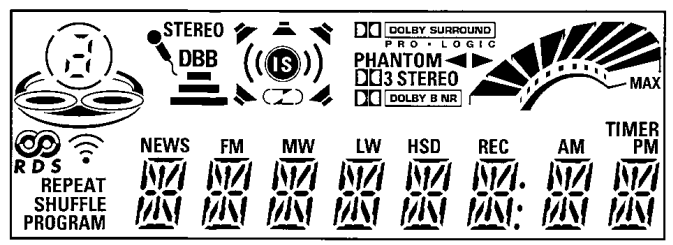
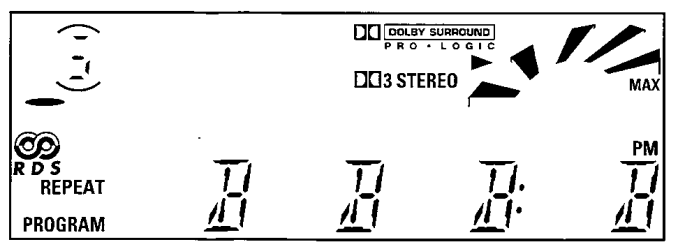


Figure 1



1) CDC1, CDC3, Tuner, Aux, Incredible Surround, Jazz, Rock, Center Phantom, ◀◀, ▶, I◀.

Figure 2

TEST	*Activated with*	*ACTION*
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "ERR" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. ***Caution!*** ***All presets from the customer will be lost!!***
KEY TEST	▶I ■ to Exit	Key numbers according table 3 are shown on the display. (see Chapter 3-4)
FAST CLOCK TEST	CLOCK/TIMER	The clock is switched to fast mode. "FAST" is displayed for 1 sec. Press CLOCK/TIMER again to reset the clock to normal. "NORMAL" displayed for 1 sec.
VOLUME TEST	Volume Knob	Display shows volume value for 2 seconds. Volume increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
DPL TEST (only possible in Service Play mode)	DPL	The set enters into Pro-logic install mode. The noise-source switches between Left, Center, Right and Rear speakers. Pro-logic settings cannot be install in this test.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

Error code	Type	Error Description
E1000	W	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	W	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	W	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed. Inner-switch or sledge motor problem.
E1003	W	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	W	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	W	Subcode Error (no subcode within time) Triggered when a new subcode was missing for a certain time during play.
E1007	W	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	W	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	F	Focus Search Error The focus point has not been found within a certain time.
E1070	W	The carousel switch is not open within time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	W	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	W	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.
E2020	F	Head Movement Error Deck 1 Generated if the head does not reach the desired position within a certain time.
E2021	F	Head Movement Error Deck 2 Generated if the head does not reach the desired position within a certain time.

F = Fatal error & the set stop play function W = Warning

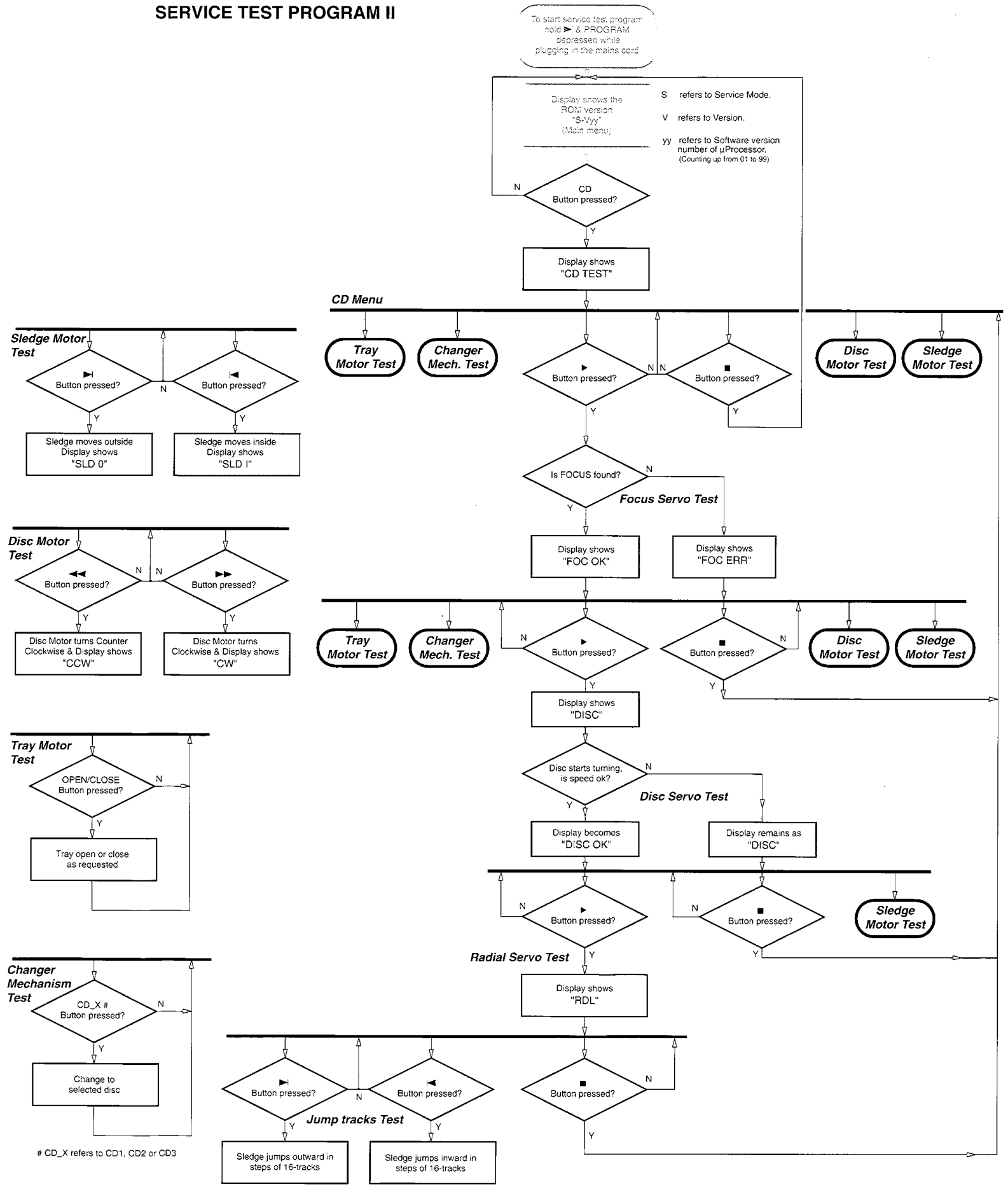
Table 2

Keys activated	Display shows	Keys activated	Display shows	Keys activated	Display shows
No Key pressed	--	PROLOGIC*	10	MODE*	21
Any Remote control key	RC	PHANTOM*	11	RECORD*	22
CD1*	1	3 STEREO*	12	◄◄	23
CD2*	2	INCREDIBLE SURROUND*	13	►►	24
CD3*	3	STANDBY-ON	14	■	Exit
DISC CHANGE	4	CLOCK / TIMER	15	►II	26
OPEN / CLOSE	5	CD	16	I◄	27
RDS*	6	TUNER	17	►I	28
NEWS*	7	TAPE	18	HSD	29
DSC	8	AUX	19		
DBB	9	PROGRAM	20		

* Not for all type/version

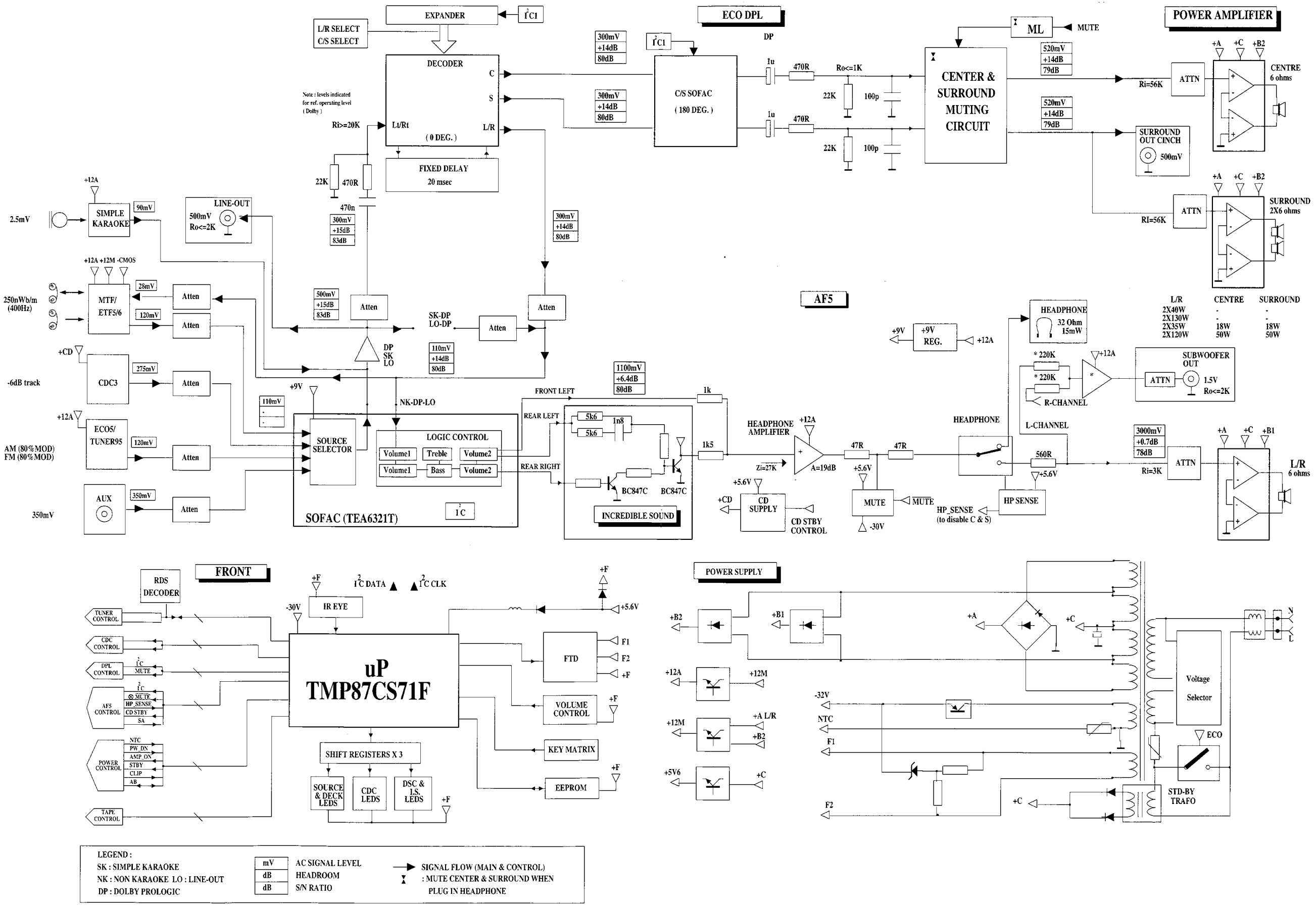
Table 3

SERVICE TEST PROGRAM II



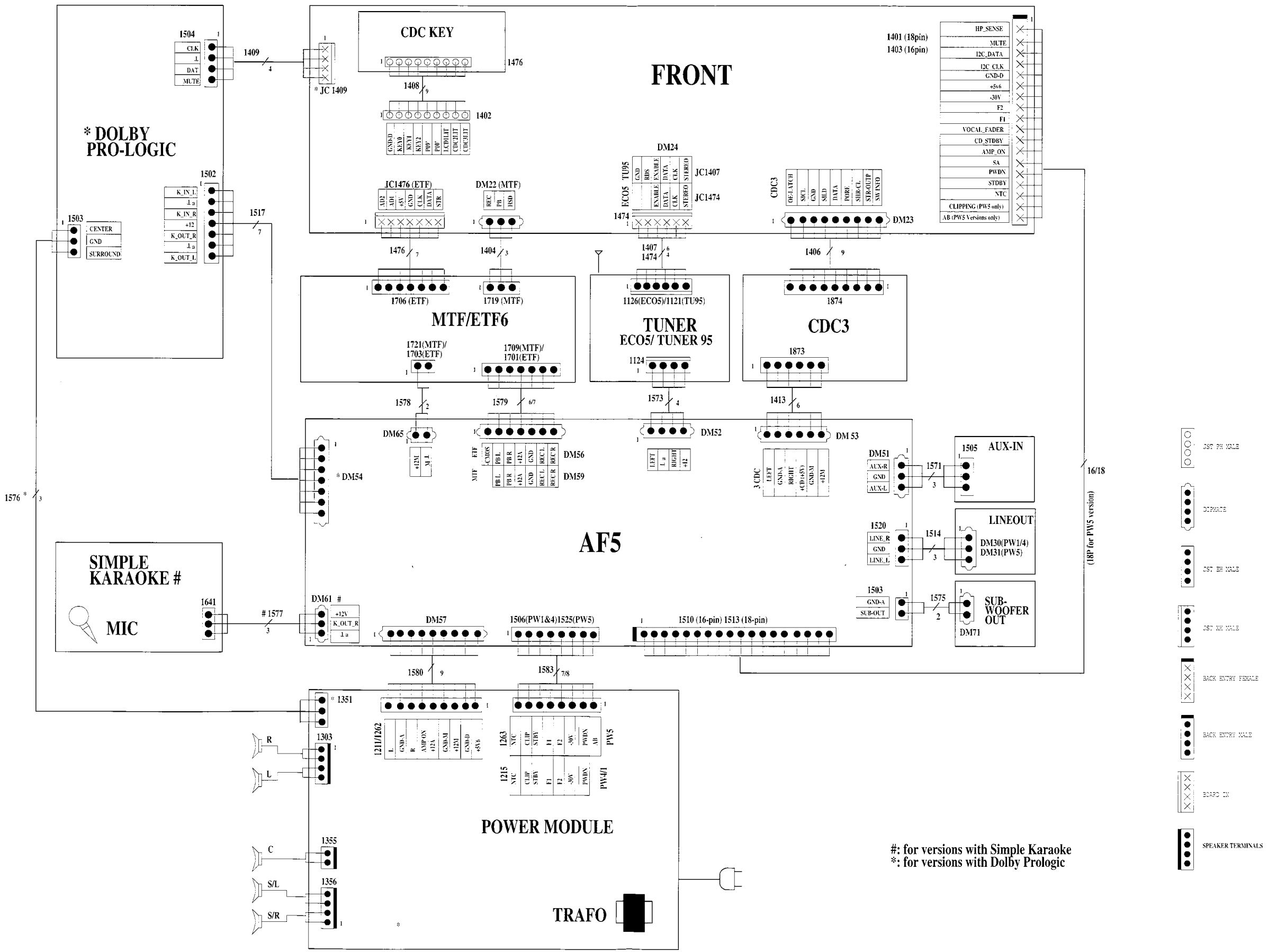
4-1

SET BLOCK DIAGRAM



5-1

SET WIRING DIAGRAM



FRONT BOARD

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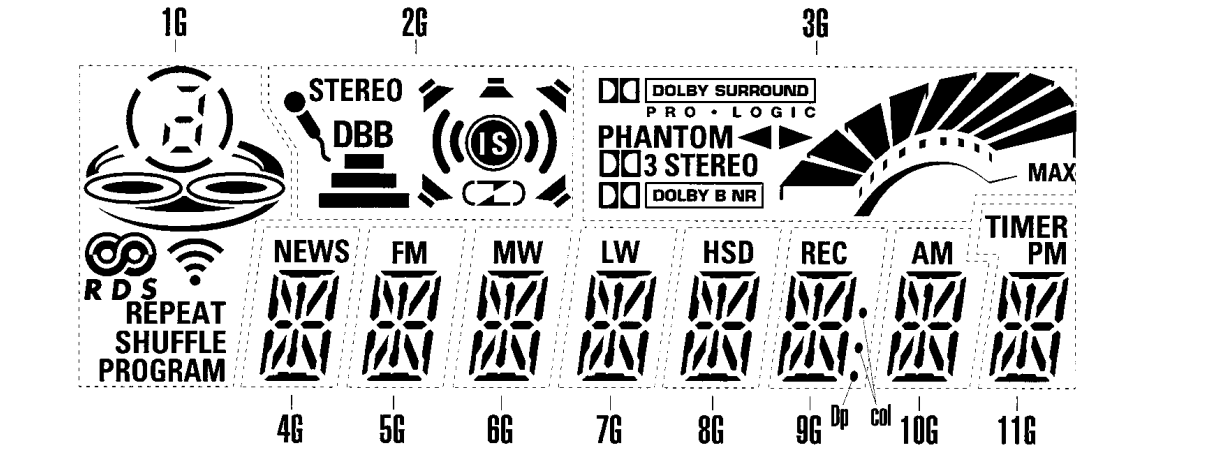
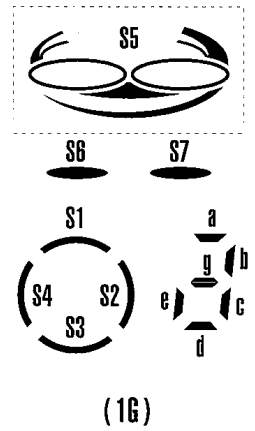
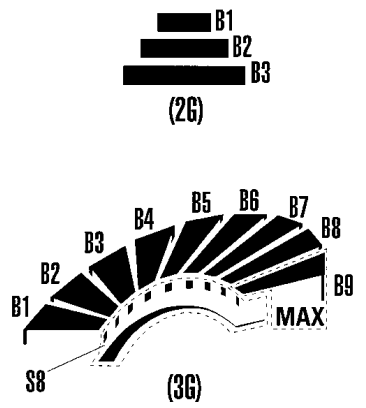
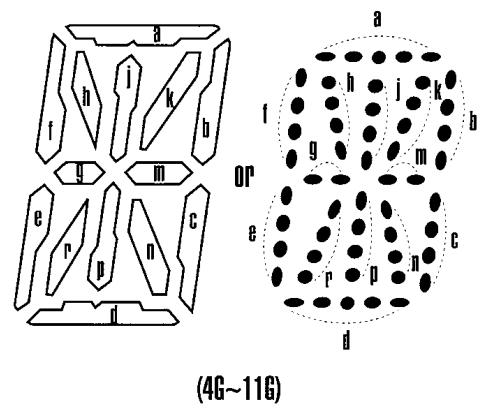
LCD DISPLAY PIN CONNECTIONS









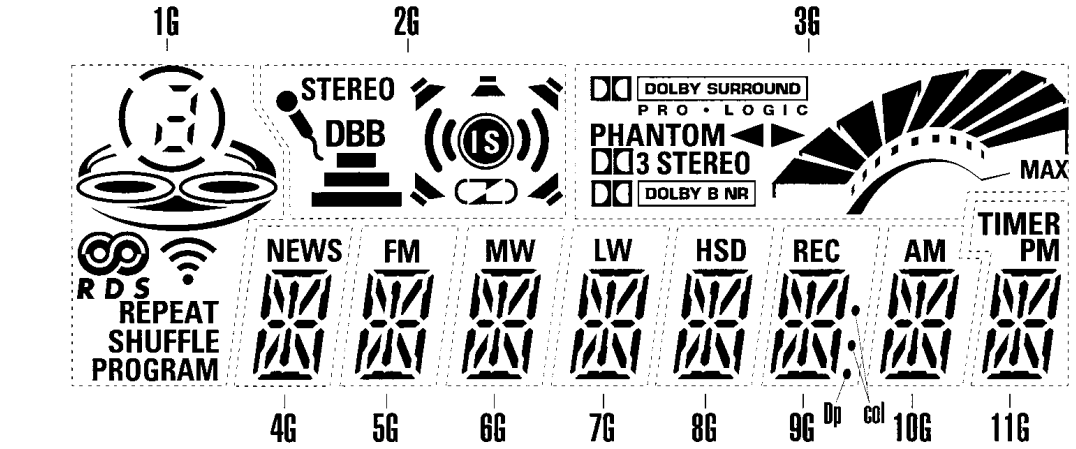
	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1	S1	STEREO	DOLBY SURROUND PRO • LOGIC	a	a	a	a	a	a	a	a
P2	S2	DBB	PHANTOM	h	h	h	h	h	h	h	h
P3	S3	B1	3 STEREO	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	B2	DOLBY B NR	k	k	k	k	k	k	k	k
P5	a , g , d	B3	B1	b	b	b	b	b	b	b	b
P6	b		B2	f	f	f	f	f	f	f	f
P7	c		B3	m	m	m	m	m	m	m	m
P8	e		B4	g	g	g	g	g	g	g	g
P9	REPEAT		B5	c	c	c	c	c	c	c	c
P10	SHUFFLE		B6	e	e	e	e	e	e	e	e
P11	PROGRAM		B7	r	r	r	r	r	r	r	r
P12	S5		B8	n	n	n	n	n	n	n	n
P13	S6		B9	d	d	d	d	d	d	d	d
P14	S7		S8	NEWS	FM	MW	LW	HSD	REC	AM	TIMER
P15	RDS		▶	-	-	-	-	-	col	-	PM
P16			◀	-	-	-	-	-	Dp	-	-

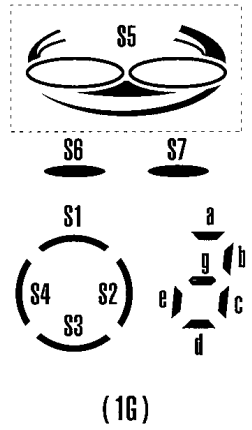
Variations table for

	FW5 /3 FW5 /3
22	x
1401	-
1403	x
1407	-
1409	-
1455/1456	-
1457	-
1458	-
1462/1463	-
1474	x
1476	-
2411/2412	-
2415	-
2420	-
2421/2422	-
2423	-
2424	-
2425	-
2438	-
3521/3522	-
3525	-
3533	-
3534	-
3535	-
3536	10
3537/3538	-
3539	10
3544	-
3545/3546	-
3561/3562	1F
3591	-
3603	6k
3604	8k
3605	-
4415	x
4421	x
4610	-
4611	-
4612	-
4613	-
4614	-
4615	-
5415	-
5417	-
6003	-
6007	1N4
6010	-
6012	-
6031	-
6034/6037	-
6040	-
6054	-
7405	-
7415	-

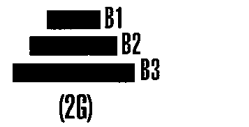
x = Item in use.

LCD DISPLAY PIN CONNECTIONS

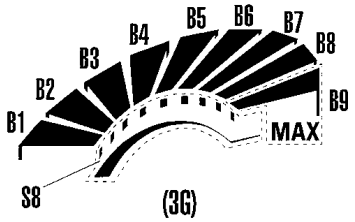




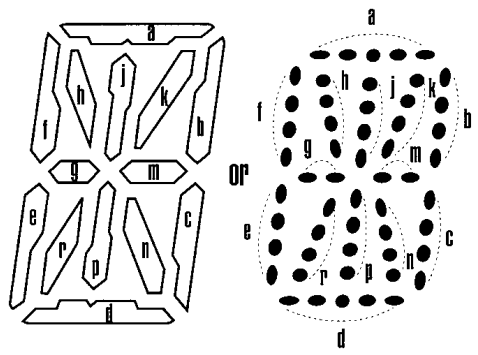
(1G)



(2G)



(3G)



(4G~11G)

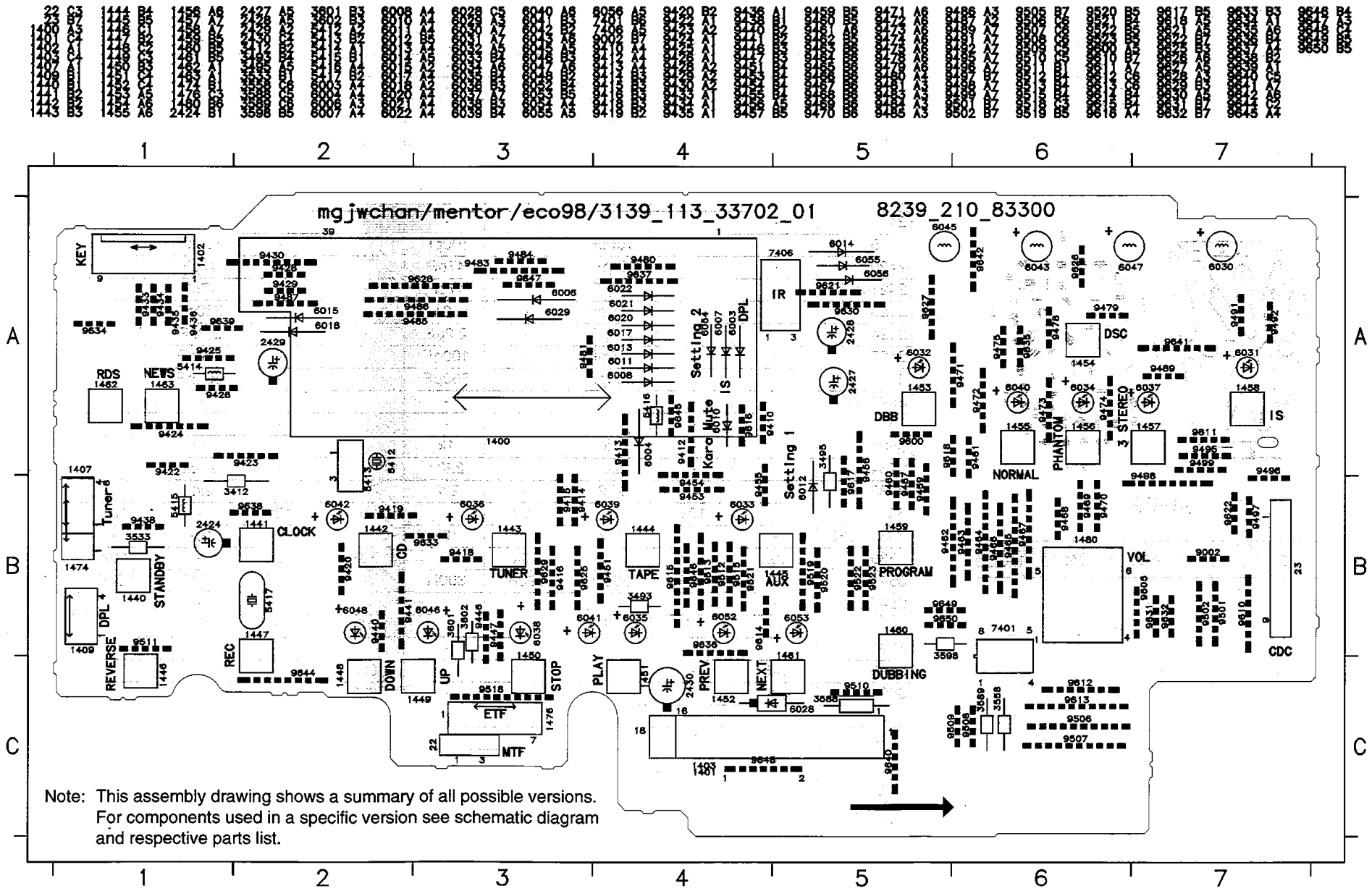
	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1	S1	STEREO	DOLBY SURROUND PRO • LOGIC	a	a	a	a	a	a	a	a
P2	S2	DBB	PHANTOM	h	h	h	h	h	h	h	h
P3	S3	B1	3 STEREO	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p
P4	S4	B2	DOLBY B NR	k	k	k	k	k	k	k	k
P5	a , g , d	B3	B1	b	b	b	b	b	b	b	b
P6	b		B2	f	f	f	f	f	f	f	f
P7	c		B3	m	m	m	m	m	m	m	m
P8	e		B4	g	g	g	g	g	g	g	g
P9	REPEAT		B5	c	c	c	c	c	c	c	c
P10	SHUFFLE		B6	e	e	e	e	e	e	e	e
P11	PROGRAM		B7	r	r	r	r	r	r	r	r
P12	S5		B8	n	n	n	n	n	n	n	n
P13	S6		B9	d	d	d	d	d	d	d	d
P14	S7		S8	NEWS	FM	MW	LW	HSD	REC	AM	TIMER
P15	RDS			-	-	-	-	-	col	-	PM
P16				-	-	-	-	-	Dp	-	-

Variations table for Front board

	FW520C /37 FW510C /37	FW530C /30/37	FW530C /22 FW535C /34	FW530C /21/21M FW535C /21/21M	FW550C /22	FW560C /37	FW570C			FW575C /21/21M /33
							/21/21M	/22	/37	
22	x	-	-	-	-	x	-	-	-	-
1401	-	-	-	-	-	-	-	-	-	-
1403	x	x	x	x	x	x	x	x	x	x
1407	-	-	x	-	x	-	-	x	-	-
1409	-	-	-	-	-	-	-	-	-	-
1455/1456	-	-	-	-	-	-	-	-	-	-
1457	-	-	-	-	-	-	-	-	-	-
1458	-	x	x	x	x	-	x	x	x	x
1462/1463	-	-	x	-	x	-	-	x	-	-
1474	x	x	-	x	-	x	x	-	x	x
1476	-	x	x	x	x	-	x	x	x	x
2411/2412	-	-	-	-	-	-	-	-	-	-
2415	-	-	100pF	-	100pF	-	-	100pF	-	-
2420	-	-	47pF	-	47pF	-	-	47pF	-	-
2421/2422	-	-	47pF	-	47pF	-	-	47pF	-	-
2423	-	-	560pF	-	560pF	-	-	560pF	-	-
2424	-	-	2,2µF	-	2,2µF	-	-	2,2µF	-	-
2425	-	-	100nF	-	100nF	-	-	100nF	-	-
2438	-	-	560pF	-	560pF	-	-	560pF	-	-
3521/3522	-	-	-	-	-	-	-	-	-	-
3525	-	-	-	-	-	-	-	-	-	-
3533	-	-	1k	-	1k	-	-	1k	-	-
3534	-	-	220k	-	220k	-	-	220k	-	-
3535	-	-	2k2	-	2k2	-	-	2k2	-	-
3536	10k	10k	-	10k	-	10k	10k	-	10k	10k
3537/3538	-	-	10k	-	10k	-	-	10k	-	-
3539	10k	10k	-	10k	-	10k	10k	-	10k	10k
3544	-	390R	390R	390R	390R	-	390R	390R	390R	390R
3545/3546	-	-	-	-	-	-	-	-	-	-
3561/3562	1R	1R	1R	1R	1R	1R	1R	1R	1R	1R
3591	-	-	-	-	-	-	-	-	-	-
3603	6k8	-	-	-	-	6k8	-	-	-	-
3604	8k2	-	-	-	-	8k2	-	-	-	-
3605	-	-	-	-	-	-	-	-	-	-
4415	x	x	-	x	x	x	-	x	x	x
4421	x	-	-	-	-	x	-	-	-	-
4610	-	-	-	x	-	-	x	-	-	-
4611	-	-	x	x	-	x	-	-	-	x
4612	-	x	x	x	-	-	x	-	x	x
4613	-	-	-	x	x	-	x	x	x	-
4614	-	x	x	x	-	x	x	-	x	-
4615	-	-	-	-	x	x	x	x	x	-
5415	-	-	2µ2	-	2µ2	-	-	2µ2	-	-
5417	-	-	x	-	x	-	-	x	-	-
6003	-	-	-	-	-	-	-	-	-	-
6007	1N4148	-	-	-	-	1N4148	-	-	-	-
6010	-	-	-	1N4148	-	-	1N4148	-	-	1N4148
6012	-	-	-	-	1N4148	-	1N4148	1N4148	1N4148	-
6031	-	x	x	x	x	-	x	x	x	x
6034/6037	-	-	-	-	-	-	-	-	-	-
6040	-	-	-	-	-	-	-	-	-	-
6054	-	-	-	-	1N4148	1N4148	-	1N4148	-	-
7405	-	-	x	-	x	-	-	x	-	-
7415	-	-	-	-	-	-	-	-	-	-

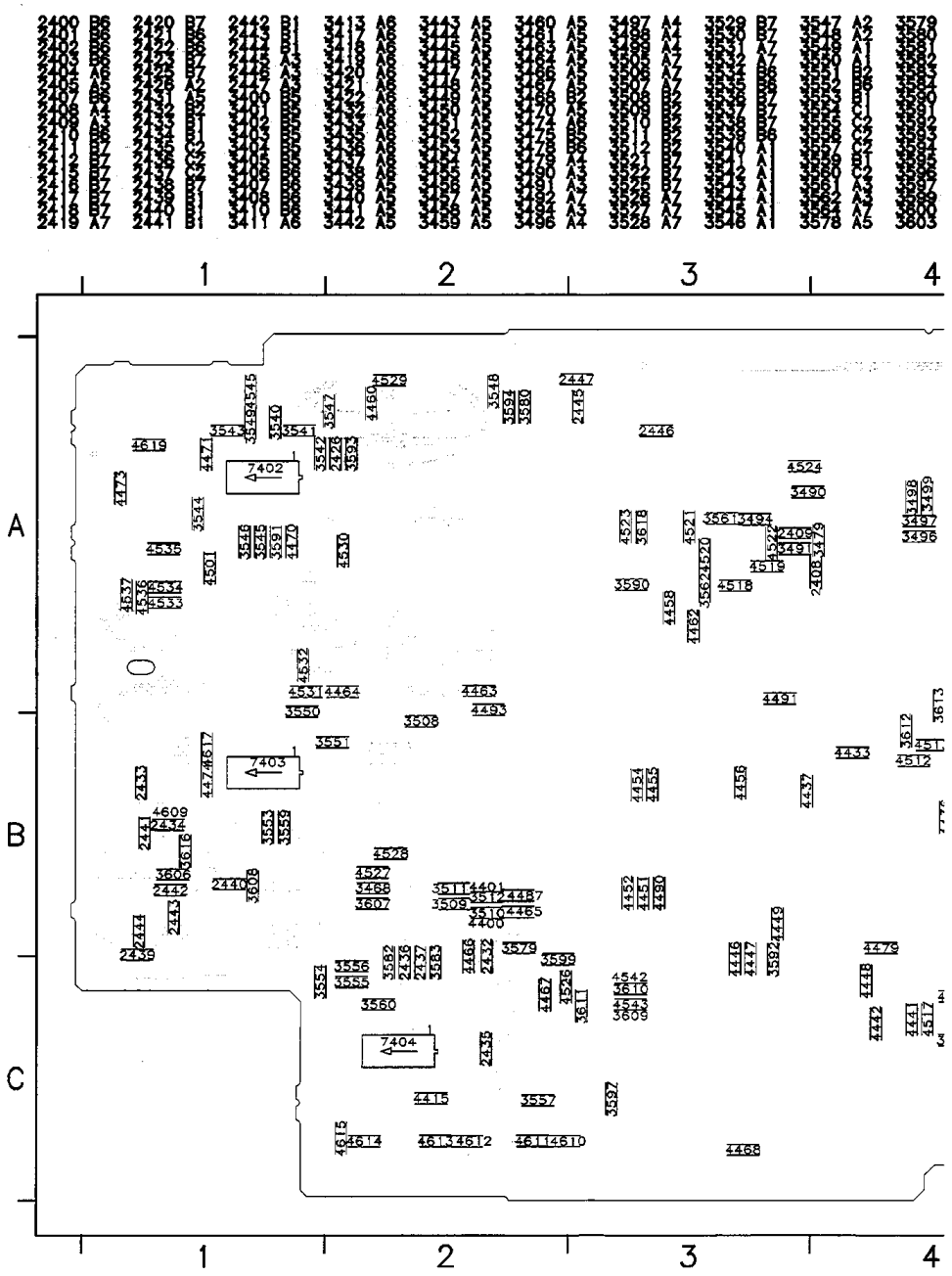
x = Item in use.

FRONT DISPLAY BOARD - COMPONENT VIEW



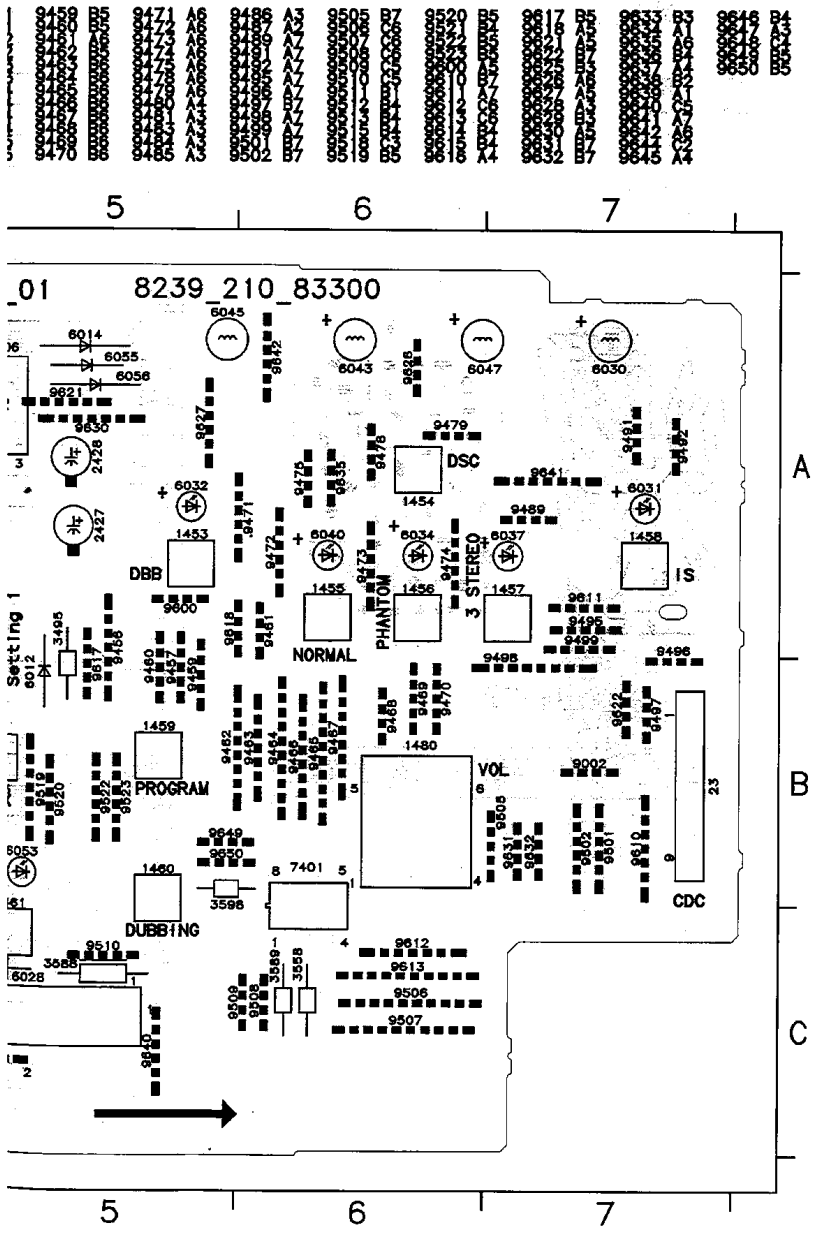
Note: This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

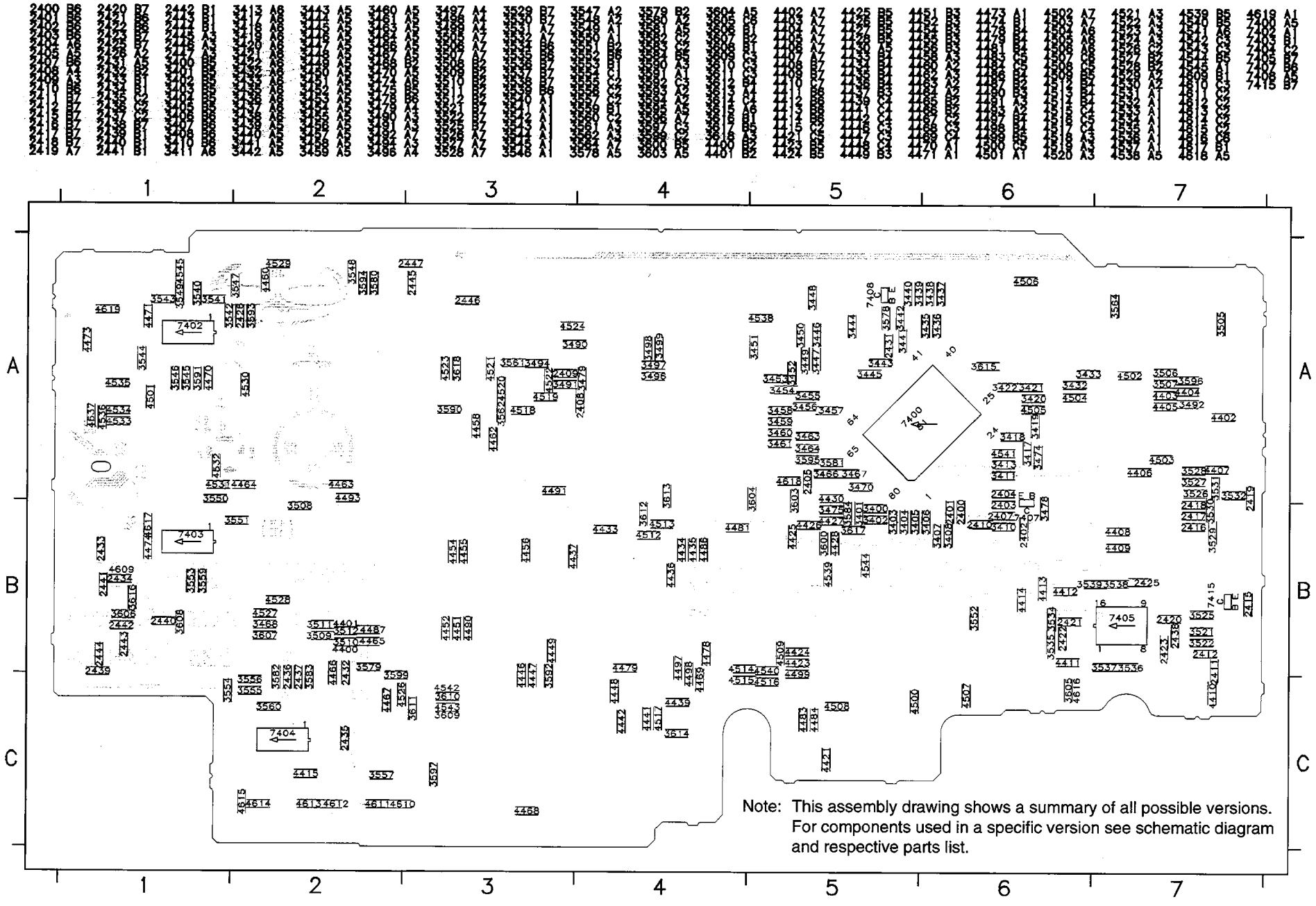
FRONT DISPLAY BOARD - COPPER SIDE VIEW



6-2

FRONT DISPLAY BOARD - COPPER SIDE VIEW





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

6-3

CIRCUIT DIAGRAM - FRONT DISPLAY PART

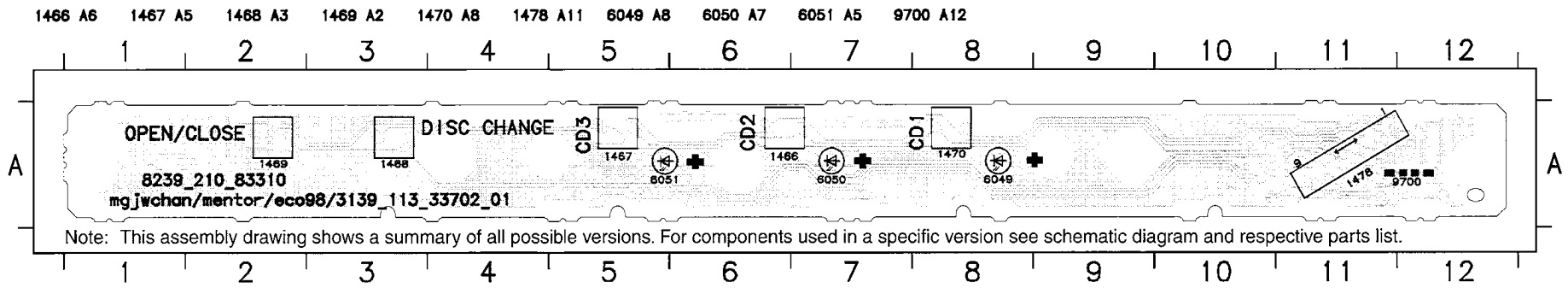
Note: Some values may varies, see variant table for correct value.
Provision on layout.
* For MTF only.

22 A3	3453 C7	4421 B3
23 A1	3454 C7	4542 C2
1400 A5	3455 C7	4543 C2
1401 C1	3456 C8	4609 A1
1402 B13	3457 C8	4610 I13
1403 C1	3458 C8	4611 I13
1407 G1	3459 C8	4612 I13
1409 E1	3460 C8	4613 I13
1440 C10	3461 C8	4614 J13
1441 C11	3463 D9	4615 J13
1442 D11	3464 D9	4616 F2
1443 D10	3466 D9	5412 F7
1444 D11	3467 E9	5413 F6
1445 D11	3468 F5	5414 F13
1446 C10	3470 E9	5415 H5
1447 C11	3474 F5	5416 H13
1448 C11	3475 F9	5417 H1
1449 C11	3478 G9	6003 E10
1450 C10	3479 F4	6004 C12
1451 D11	3490 F4	6006 C12
1452 D11	3491 F4	6007 E10
1453 E11	3492 C11	6008 C12
1454 E11	3493 C11	6010 E10
1455 E11	3494 D11	6011 D12
1456 E10	3495 D11	6012 D10
1457 E10	3496 D11	6013 D12
1458 E11	3497 E11	6014 D4
1459 D10	3498 E11	6015 D8
1460 D10	3499 E11	6017 D12
1461 D11	3505 C13	6018 D4
1462 C11	3506 G11	6020 E12
1463 C11	3507 G11	6021 E12
1474 F1	3508 G9	6022 E12
1476 A3	3509 A5	6028 F13
1480 C3	3510 B5	6029 C12
2400 F7	3511 B3	6030 H7
2401 F7	3512 B3	6031 J7
2402 F6	3521 E2	6032 I9
2403 G6	3522 F2	6033 I9
2404 G6	3525 F2	6034 I7
2405 D9	3526 G3	6035 J12
2407 G9	3527 G3	6036 I9
2408 G3	3528 G3	6037 J7
2409 G4	3529 G2	6038 E3
2410 G7	3530 G2	6039 I9
2411 E3	3531 G2	6040 I7
2412 F3	3532 H2	6041 I12
2415 G1	3533 H1	6042 J9
2416 H2	3534 H1	6043 I8
2417 H2	3535 H2	6045 H7
2418 H3	3536 I5	6046 I12
2419 H3	3537 I4	6047 I7
2420 H1	3538 I4	6048 I12
2421 H1	3539 J5	6052 I12
2422 H2	3540 H5	6053 I12
2423 I1	3541 H5	6054 D10
2424 J1	3542 H5	6055 D4
2425 J4	3543 I7	6056 D4
2426 H6	3544 J7	7400 F4
2427 E13	3545 I7	7401 A4
2428 F13	3546 J7	7402 J6
2429 G13	3547 I7	7403 J9
2430 G13	3548 I7	7404 J11
2431 B8	3549 I7	7405 J4
2432 A4	3550 I9	7406 G4
2433 A1	3551 I9	7407 F9
2434 A1	3552 E3	7408 B9
2435 H6	3553 J9	7415 F2
2436 C2	3554 H7	9002 A1
2437 C3	3555 I11	
2438 H1	3556 I11	
2439 B1	3557 J11	
2440 A1	3558 I11	
2441 A2	3559 I9	
2442 B2	3560 I11	
2443 B2	3561 E13	
2444 B2	3562 E13	
2445 C3	3564 C13	
2446 D3	3578 B9	
2447 D3	3579 A4	
3400 F8	3580 C3	
3401 G8	3581 D9	
3402 F8	3582 C2	
3403 F8	3583 C3	
3404 F8	3584 G8	
3405 F8	3588 H13	
3406 F8	3589 I11	
3407 F7	3590 I9	
3408 F7	3591 I7	
3410 G6	3592 I11	
3411 G6	3593 D4	
3412 F6	3594 C4	
3413 F6	3595 D9	
3417 F5	3596 G10	
3418 F5	3597 D2	
3419 F5	3598 D2	
3420 F4	3599 B2	
3421 E4	3600 E1	
3422 E4	3601 A2	
3432 D3	3602 A2	
3433 D4	3603 F8	
3435 C4	3604 F9	
3436 D4	3605 F2	
3437 C5	3606 A2	
3438 C5	3607 A2	
3439 C5	3608 B2	
3440 C5	3609 C2	
3441 C5	3610 C2	
3442 C6	3611 C1	
3443 C6	3612 E1	
3444 C6	3613 E1	
3445 C6	3614 E1	
3446 C6	3615 E4	
3447 C6	3616 A2	
3448 C6	3617 E9	
3449 C7	3618 E2	
3450 C7	4400 B5	
3451 C7	4401 B3	
3452 C7	4415 H6	

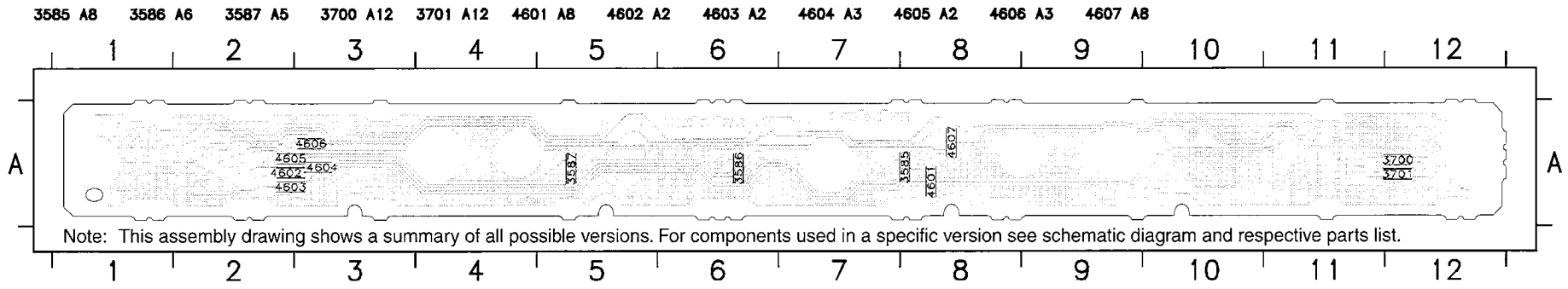
6-4

KEY-CDC PART

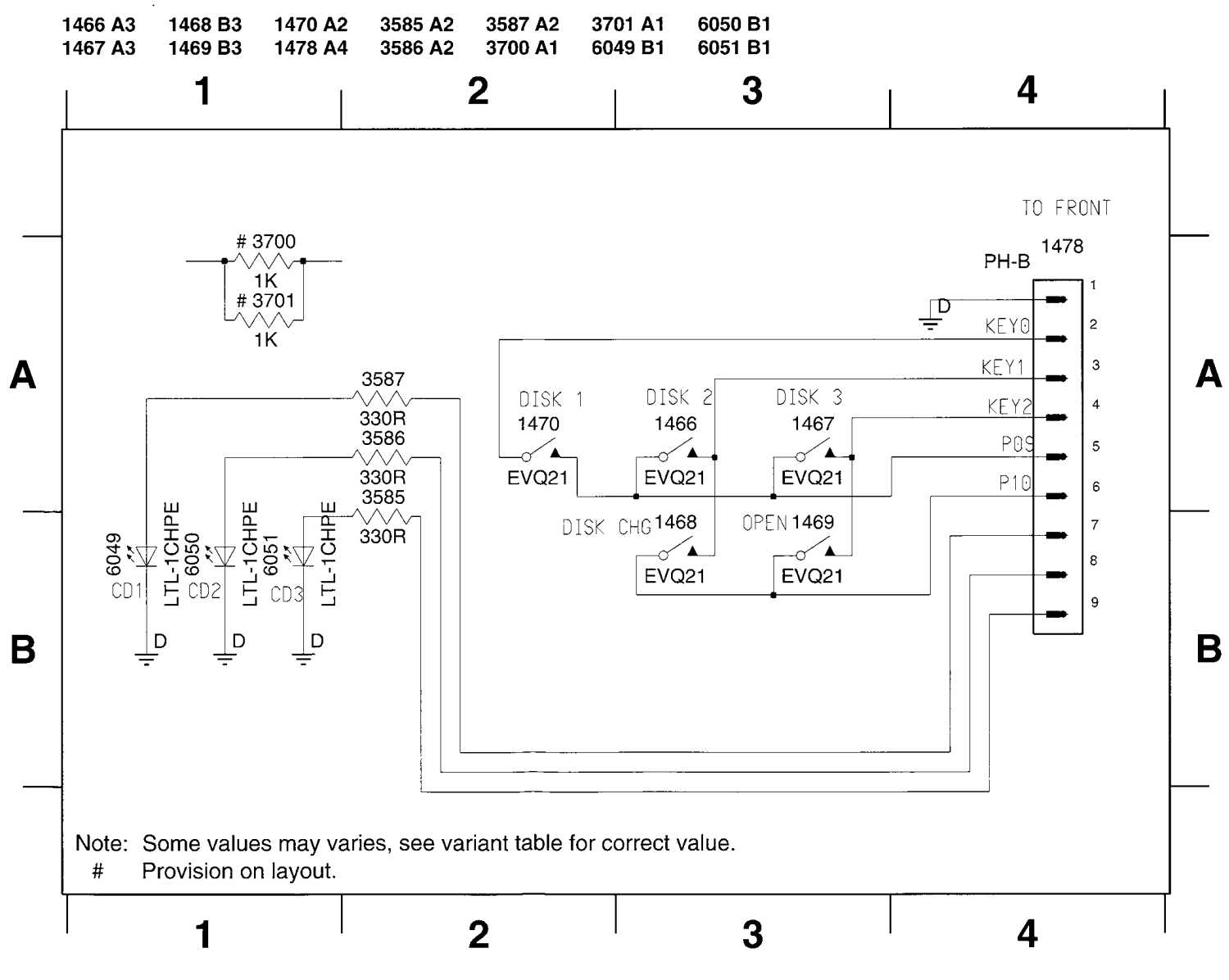
KEY-CDC BOARD - COMPONENT VIEW



KEY-CDC BOARD - COPPER SIDE VIEW



CIRCUIT DIAGRAM - KEY-CDC PART



6-5

ELECTRICAL PARTS LIST - FRONT BOARD

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1400	4822 135 00165	FTD Display for /37
1400	4822 135 00177	FTD Display (Dot Matrix)
1403	4822 267 51238	Connector 16 Pin
1440	4822 276 13114	Tact Switch
1441	4822 276 13114	Tact Switch
1442	4822 276 13114	Tact Switch
1443	4822 276 13114	Tact Switch
1444	4822 276 13114	Tact Switch
1445	4822 276 13114	Tact Switch
1446	4822 276 13114	Tact Switch
1447	4822 276 13114	Tact Switch
1448	4822 276 13114	Tact Switch
1449	4822 276 13114	Tact Switch
1450	4822 276 13114	Tact Switch
1451	4822 276 13114	Tact Switch
1452	4822 276 13114	Tact Switch
1453	4822 276 13114	Tact Switch
1454	4822 276 13114	Tact Switch
1458	4822 276 13114	Tact Switch
1459	4822 276 13114	Tact Switch
1460	4822 276 13114	Tact Switch
1461	4822 276 13114	Tact Switch
1462	4822 276 13114	Tact Switch
1463	4822 276 13114	Tact Switch
1466	4822 276 13114	Tact Switch
1467	4822 276 13114	Tact Switch
1468	4822 276 13114	Tact Switch
1469	4822 276 13114	Tact Switch
1470	4822 276 13114	Tact Switch
1480	4822 101 21261	Rot Encoder 24P

CAPACITORS

2400	4822 122 32504	15pF 2% 50V
2401	4822 122 32504	15pF 2% 50V
2402	4822 126 10002	100nF 20% 25V
2403	5322 122 32659	33pF 5% 50V
2404	5322 122 32659	33pF 5% 50V
2405	4822 126 13473	220nF +80/-20% 50V
2407	4822 122 33177	10nF 20% 50V
2408	4822 126 13751	47nF 10% 63V
2409	4822 122 33175	2,2nF 20% 50V
2410	4822 126 10002	100nF 20% 25V
2415	5322 122 32531	100pF 5% 50V
2416	4822 126 13692	47pF 1% 63V
2417	4822 126 13692	47pF 1% 63V
2418	4822 126 13692	47pF 1% 63V
2419	4822 126 13692	47pF 1% 63V
2420	4822 126 13692	47pF 1% 63V
2421	4822 126 13692	47pF 1% 63V
2422	4822 126 13692	47pF 1% 63V
2423	4822 122 33173	560pF 10% 50V
2424	4822 124 41576	2,2µF 20% 50V
2425	4822 126 13296	100nF 10% 16V
2426	5322 122 32531	100pF 5% 50V
2427	4822 124 40242	1µF 20% 63V
2428	4822 124 40242	1µF 20% 63V
2429	4822 124 80483	47µF 20% 6,3V
2430	4822 124 42446	100µF 20% 10V
2431	5322 122 32531	100pF 5% 50V
2432	4822 126 10002	100nF 20% 25V
2433	4822 126 13296	100nF 10% 16V
2434	4822 126 13296	100nF 10% 16V
2435	4822 126 13296	100nF 10% 16V
2436	4822 122 33177	10nF 20% 50V
2437	4822 122 33177	10nF 20% 50V
2438	4822 122 33173	560pF 10% 50V
2439	5322 122 32531	100pF 5% 50V
2440	4822 126 13692	47pF 1% 63V
2441	4822 126 13692	47pF 1% 63V
2442	4822 126 13692	47pF 1% 63V
2443	4822 126 13692	47pF 1% 63V
2444	5322 122 32531	100pF 5% 50V

RESISTORS

3400	4822 051 20105	1M 5% 0,1W
3401	4822 051 20684	680k 5% 0,1W
3402	4822 051 10102	1k 2% 0,25W
3403	4822 117 10834	47k 1% 0,1W
3404	4822 051 10102	1k 2% 0,25W
3405	4822 051 10102	1k 2% 0,25W
3406	4822 051 10102	1k 2% 0,25W
3407	4822 051 10102	1k 2% 0,25W
3408	4822 051 10102	1k 2% 0,25W
3410	4822 051 10102	1k 2% 0,25W
3411	4822 117 11449	2k2 1% 0,1W
3412	4822 116 52256	2k2 5% 0,5W
3413	4822 117 11449	2k2 1% 0,1W
3417	4822 051 10102	1k 2% 0,25W
3418	4822 051 10102	1k 2% 0,25W
3419	4822 051 10102	1k 2% 0,25W
3420	4822 051 10102	1k 2% 0,25W
3421	4822 051 10102	1k 2% 0,25W
3422	4822 051 10102	1k 2% 0,25W
3432	4822 117 10833	10k 1% 0,1W
3433	4822 117 10833	10k 1% 0,1W
3435	4822 051 10102	1k 2% 0,25W
3436	4822 051 10102	1k 2% 0,25W
3437	4822 051 10102	1k 2% 0,25W
3438	4822 051 10102	1k 2% 0,25W
3439	4822 051 10102	1k 2% 0,25W
3440	4822 051 10102	1k 2% 0,25W
3441	4822 051 10102	1k 2% 0,25W
3442	4822 051 10102	1k 2% 0,25W
3443	4822 051 10102	1k 2% 0,25W
3444	4822 051 10102	1k 2% 0,25W
3445	4822 051 10102	1k 2% 0,25W
3446	4822 051 10102	1k 2% 0,25W
3447	4822 051 10102	1k 2% 0,25W
3448	4822 051 10102	1k 2% 0,25W
3449	4822 051 10102	1k 2% 0,25W
3450	4822 051 10102	1k 2% 0,25W
3451	4822 051 10102	1k 2% 0,25W
3452	4822 051 10102	1k 2% 0,25W
3453	4822 051 10102	1k 2% 0,25W
3454	4822 051 10102	1k 2% 0,25W
3455	4822 051 10102	1k 2% 0,25W
3456	4822 051 10102	1k 2% 0,25W
3457	4822 051 10102	1k 2% 0,25W
3458	4822 051 10102	1k 2% 0,25W
3459	4822 051 10102	1k 2% 0,25W
3460	4822 051 10102	1k 2% 0,25W
3461	4822 051 10102	1k 2% 0,25W
3463	4822 117 10833	10k 1% 0,1W
3464	4822 117 10833	10k 1% 0,1W
3466	4822 117 10833	10k 1% 0,1W
3467	4822 117 10833	10k 1% 0,1W
3468	4822 051 10102	1k 2% 0,25W
3470	4822 117 10833	10k 1% 0,1W
3474	4822 051 10102	1k 2% 0,25W
3475	4822 051 10102	1k 2% 0,25W
3478	4822 051 20104	100k 5% 0,1W
3479	4822 117 10833	10k 1% 0,1W
3490	4822 051 10102	1k 2% 0,25W
3491	4822 051 20101	100R 5% 0,1W
3492	4822 051 20331	330R 5% 0,1W
3493	4822 116 52219	330R 5% 0,5W
3494	4822 051 20331	330R 5% 0,1W
3495	4822 116 52219	330R 5% 0,5W
3496	4822 051 20331	330R 5% 0,1W
3497	4822 051 20331	330R 5% 0,1W
3498	4822 051 20331	330R 5% 0,1W
3499	4822 051 20331	330R 5% 0,1W
3505	4822 051 20331	330R 5% 0,1W
3506	4822 051 20474	470k 5% 0,1W
3507	4822 051 20474	470k 5% 0,1W
3508	4822 051 20474	470k 5% 0,1W
3509	4822 117 10833	10k 1% 0,1W
3510	4822 051 10102	1k 2% 0,25W
3511	4822 117 10833	10k 1% 0,1W
3512	4822 051 10102	1k 2% 0,25W
3526	4822 117 10833	10k 1% 0,1W
3527	4822 117 10833	10k 1% 0,1W
3528	4822 117 10833	10k 1% 0,1W
3529	4822 051 10102	1k 2% 0,25W
3530	4822 051 10102	1k 2% 0,25W
3531	4822 051 10102	1k 2% 0,25W
3532	4822 051 10102	1k 2% 0,25W
3533	4822 050 11002	1k 1% 0,4W
3534	4822 051 20224	220k 5% 0,1W
3535	4822 117 11449	2k2 1% 0,1W
3536	4822 117 10833	10k 1% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 051 20331	330R 5% 0,1W
3541	4822 051 20331	330R 5% 0,1W
3542	4822 051 20331	330R 5% 0,1W
3543	4822 051 20391	390R 5% 0,1W
3544	4822 117 11503	220R 1% 0.1W
3547	4822 051 20391	390R 5% 0,1W
3548	4822 051 20391	390R 5% 0,1W
3549	4822 051 20391	390R 5% 0,1W
3550	4822 051 20391	390R 5% 0,1W
3551	4822 051 20391	390R 5% 0,1W
3552	4822 117 11503	220R 1% 0.1W
3553	4822 051 20391	390R 5% 0,1W
3554	4822 117 10833	10k 1% 0,1W
3555	4822 117 11503	220R 1% 0.1W
3556	4822 117 11503	220R 1% 0.1W
3557	4822 117 11503	220R 1% 0.1W
3558	4822 116 83872	220R 5% 0,5W
3559	4822 051 20391	390R 5% 0,1W
3560	4822 117 11503	220R 1% 0.1W
3561	4822 051 20108	1R 5% 0,1W
3562	4822 051 20108	1R 5% 0,1W
3564	4822 051 20331	330R 5% 0,1W
3578	4822 051 20104	100k 5% 0,1W
3579	4822 051 20479	47R 5% 0,1W
3580	4822 117 10833	10k 1% 0,1W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 117 10833	10k 1% 0,1W
3583	4822 117 10833	10k 1% 0,1W
3584	4822 051 20105	1M 5% 0,1W
3585	4822 051 20331	330R 5% 0,1W
3586	4822 051 20331	330R 5% 0,1W
3587	4822 051 20331	330R 5% 0,1W
3588	4822 052 10478	⚠ 4R7 5% 0,33W
3589	4822 116 83872	220R 5% 0,5W
3590	4822 117 11503	220R 1% 0.1W
3592	4822 051 10102	1k 2% 0,25W
3593	4822 117 10833	10k 1% 0,1W
3594	4822 117 10833	10k 1% 0,1W
3595	4822 117 10833	10k 1% 0,1W
3596	4822 051 20474	470k 5% 0,1W
3597	4822 117 10833	10k 1% 0,1W
3598	4822 116 83864	10k 5% 0,5W
3599	4822 117 10834	47k 1% 0,1W
3600	4822 051 20154	150k 5% 0,1W

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ELECTRICAL PARTS LIST - FRONT BOARD

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3601	4822 050 11002	1k 1% 0,4W
3602	4822 050 11002	1k 1% 0,4W
3606	4822 051 20471	470R 5% 0,1W
3607	4822 051 20471	470R 5% 0,1W
3608	4822 051 20471	470R 5% 0,1W
3609	4822 051 10102	1k 2% 0,25W
3610	4822 051 10102	1k 2% 0,25W
3611	4822 051 20472	4k7 5% 0,1W
3612	4822 051 10102	1k 2% 0,25W
3613	4822 051 10102	1k 2% 0,25W
3614	4822 051 10102	1k 2% 0,25W
3615	4822 051 10102	1k 2% 0,25W
3616	4822 051 20471	470R 5% 0,1W
3617	4822 051 10102	1k 2% 0,25W
3618	4822 117 10833	10k 1% 0,1W
4402	4822 051 20008	0R Jumper 0805
4403	4822 051 20008	0R Jumper 0805
4404	4822 051 20008	0R Jumper 0805
4405	4822 051 20008	0R Jumper 0805
4406	4822 051 20008	0R Jumper 0805
4407	4822 051 20008	0R Jumper 0805
4408	4822 051 20008	0R Jumper 0805
4409	4822 051 20008	0R Jumper 0805
4410	4822 051 20008	0R Jumper 0805
4411	4822 051 20008	0R Jumper 0805
4412	4822 051 20008	0R Jumper 0805
4413	4822 051 20008	0R Jumper 0805
4414	4822 051 20008	0R Jumper 0805
4415	4822 051 20008	0R Jumper 0805
4423	4822 051 20008	0R Jumper 0805
4424	4822 051 20008	0R Jumper 0805
4425	4822 051 20008	0R Jumper 0805
4426	4822 051 20008	0R Jumper 0805
4427	4822 051 20008	0R Jumper 0805
4428	4822 051 20008	0R Jumper 0805
4430	4822 051 20008	0R Jumper 0805
4433	4822 051 20008	0R Jumper 0805
4434	4822 051 20008	0R Jumper 0805
4435	4822 051 20008	0R Jumper 0805
4436	4822 051 20008	0R Jumper 0805
4437	4822 051 20008	0R Jumper 0805
4439	4822 051 20008	0R Jumper 0805
4441	4822 051 20008	0R Jumper 0805
4442	4822 051 20008	0R Jumper 0805
4446	4822 051 20008	0R Jumper 0805
4447	4822 051 20008	0R Jumper 0805
4448	4822 051 20008	0R Jumper 0805
4449	4822 051 20008	0R Jumper 0805
4451	4822 051 20008	0R Jumper 0805
4452	4822 051 20008	0R Jumper 0805
4454	4822 051 20008	0R Jumper 0805
4455	4822 051 20008	0R Jumper 0805
4456	4822 051 20008	0R Jumper 0805
4458	4822 051 20008	0R Jumper 0805
4460	4822 051 20008	0R Jumper 0805
4462	4822 051 20008	0R Jumper 0805
4463	4822 051 20008	0R Jumper 0805
4464	4822 051 20008	0R Jumper 0805
4465	4822 051 20008	0R Jumper 0805
4466	4822 051 20008	0R Jumper 0805
4467	4822 051 20008	0R Jumper 0805
4468	4822 051 20008	0R Jumper 0805
4469	4822 051 20008	0R Jumper 0805
4470	4822 051 20008	0R Jumper 0805
4471	4822 051 20008	0R Jumper 0805
4473	4822 051 20008	0R Jumper 0805
4474	4822 051 20008	0R Jumper 0805
4478	4822 051 20008	0R Jumper 0805
4479	4822 051 20008	0R Jumper 0805
4481	4822 051 20008	0R Jumper 0805
4483	4822 051 20008	0R Jumper 0805
4484	4822 051 20008	0R Jumper 0805
4486	4822 051 20008	0R Jumper 0805
4487	4822 051 20008	0R Jumper 0805
4490	4822 051 20008	0R Jumper 0805
4491	4822 051 20008	0R Jumper 0805
4493	4822 051 20008	0R Jumper 0805
4497	4822 051 20008	0R Jumper 0805
4498	4822 051 20008	0R Jumper 0805
4499	4822 051 20008	0R Jumper 0805
4500	4822 051 20008	0R Jumper 0805
4501	4822 051 20008	0R Jumper 0805
4502	4822 051 20008	0R Jumper 0805
4503	4822 051 20008	0R Jumper 0805
4504	4822 051 20008	0R Jumper 0805
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4506	4822 051 20008	0R Jumper 0805
4507	4822 051 20008	0R Jumper 0805
4508	4822 051 20008	0R Jumper 0805
4509	4822 051 20008	0R Jumper 0805
4512	4822 051 20008	0R Jumper 0805
4513	4822 051 20008	0R Jumper 0805
4514	4822 051 20008	0R Jumper 0805
4515	4822 051 20008	0R Jumper 0805
4516	4822 051 20008	0R Jumper 0805
4517	4822 051 20008	0R Jumper 0805
4518	4822 051 20008	0R Jumper 0805
4519	4822 051 20008	0R Jumper 0805
4520	4822 051 20008	0R Jumper 0805
4521	4822 051 20008	0R Jumper 0805
4522	4822 051 20008	0R Jumper 0805
4523	4822 051 20008	0R Jumper 0805
4524	4822 051 20008	0R Jumper 0805
4526	4822 051 20008	0R Jumper 0805
4527	4822 051 20008	0R Jumper 0805
4528	4822 051 20008	0R Jumper 0805
4529	4822 051 20008	0R Jumper 0805
4530	4822 051 20008	0R Jumper 0805
4531	4822 051 20008	0R Jumper 0805
4532	4822 051 20008	0R Jumper 0805
4533	4822 051 20008	0R Jumper 0805
4534	4822 051 20008	0R Jumper 0805
4535	4822 051 20008	0R Jumper 0805
4536	4822 051 20008	0R Jumper 0805
4537	4822 051 20008	0R Jumper 0805
4538	4822 051 20008	0R Jumper 0805
4539	4822 051 20008	0R Jumper 0805
4540	4822 051 20008	0R Jumper 0805
4541	4822 051 20008	0R Jumper 0805
4542	4822 051 20008	0R Jumper 0805
4543	4822 051 20008	0R Jumper 0805
4544	4822 051 20008	0R Jumper 0805
4545	4822 051 20008	0R Jumper 0805
4601	4822 051 20008	0R Jumper 0805
4602	4822 051 20008	0R Jumper 0805
4603	4822 051 20008	0R Jumper 0805
4604	4822 051 20008	0R Jumper 0805
4605	4822 051 20008	0R Jumper 0805
4606	4822 051 20008	0R Jumper 0805
4607	4822 051 20008	0R Jumper 0805
4611	4822 051 20008	0R Jumper 0805
4612	4822 051 20008	0R Jumper 0805
4614	4822 051 20008	0R Jumper 0805
4617	4822 051 20008	0R Jumper 0805
4618	4822 051 20008	0R Jumper 0805
4619	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5412	4822 242 70938	X'tal Resonator 32,768kHZ
5413	4822 242 72066	Ceramic Resonator
5414	4822 157 11477	Fixed Inductor 2µ2 5%
5415	4822 157 11477	Fixed Inductor 2µ2 5%
5416	4822 157 11477	Fixed Inductor 2µ2 5%
5417	4822 242 72195	QUARZ 4,332 MHZ

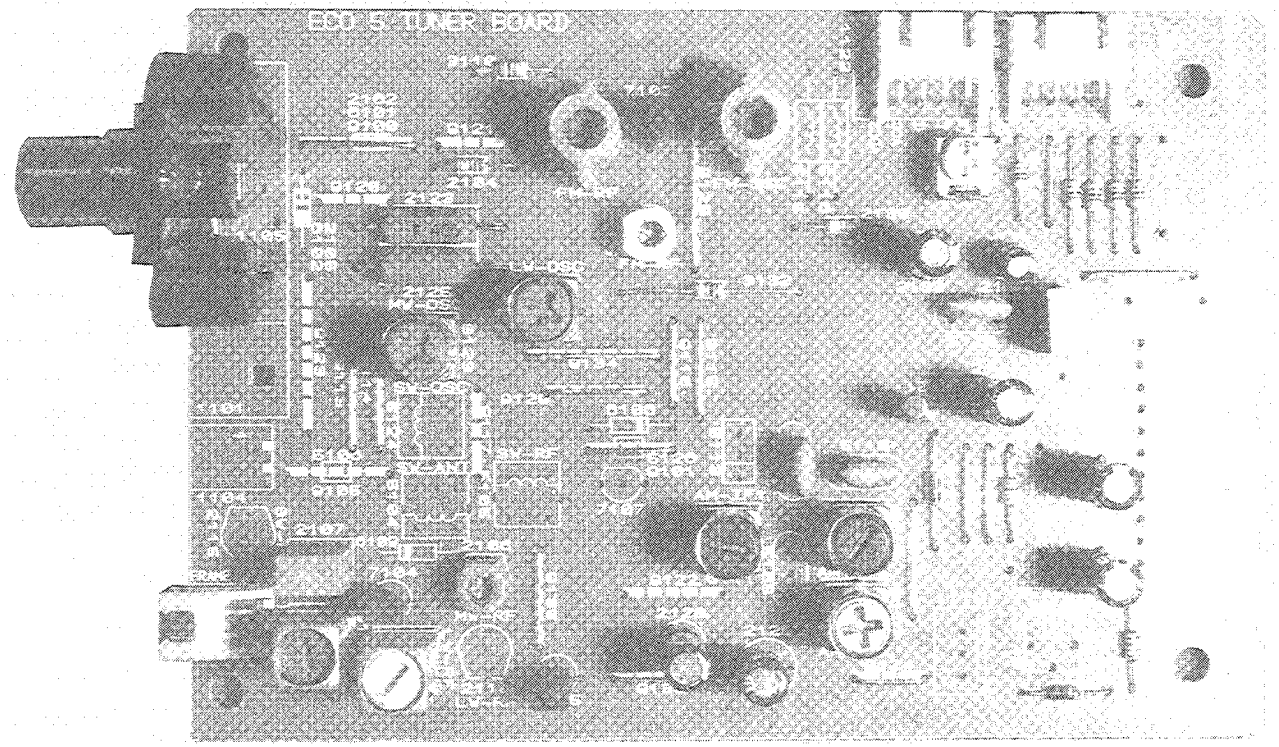
DIODES

6004	4822 130 30621	1N4148
6006	4822 130 30621	1N4148
6008	4822 130 30621	1N4148
6010	4822 130 30621	1N4148
6011	4822 130 30621	1N4148
6013	4822 130 30621	1N4148
6014	4822 130 30621	1N4148
6015	4822 130 30621	1N4148
6017	4822 130 30621	1N4148
6018	4822 130 30621	1N4148
6020	4822 130 30621	1N4148
6021	4822 130 30621	1N4148
6022	4822 130 30621	1N4148
6028	4822 130 31878 ⚠	1N4003G
6029	4822 130 30621	1N4148
6030	4822 130 11137	LTL-307C-001
6031	4822 130 10791	LTL-1CHGE
6032	4822 130 10791	LTL-1CHGE
6033	4822 130 10792	LTL-1CHPE
6035	4822 130 10791	LTL-1CHGE
6036	4822 130 10792	LTL-1CHPE
6038	4822 130 10791	LTL-1CHGE
6039	4822 130 10792	LTL-1CHPE
6041	4822 130 10791	LTL-1CHGE
6042	4822 130 10792	LTL-1CHPE
6043	4822 130 11137	LTL-307C-001
6045	4822 130 11137	LTL-307C-001
6046	4822 130 10791	LTL-1CHGE
6047	4822 130 11137	LTL-307C-001
6048	4822 130 10791	LTL-1CHGE
6049	4822 130 10792	LTL-1CHPE
6050	4822 130 10792	LTL-1CHPE
6051	4822 130 10792	LTL-1CHPE
6052	4822 130 10791	LTL-1CHGE
6053	4822 130 10791	LTL-1CHGE
6055	4822 130 30621	1N4148
6056	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7400	4822 209 16158	TMP87CS71F - '530S51611' for /37
7400	4822 209 16223	TMP87CS71F - '530S51661'
7401	4822 209 31508	ST24C01B1
7402	4822 209 15449	74HC4094D
7403	4822 209 15449	74HC4094D
7404	4822 209 15449	74HC4094D
7405	4822 209 31981	SAA6579T
7406	4822 130 10165	GP1U28XP
7407	4822 130 60511	BC847B
7408	4822 130 60511	BC847B

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



TUNER BOARD ECO5

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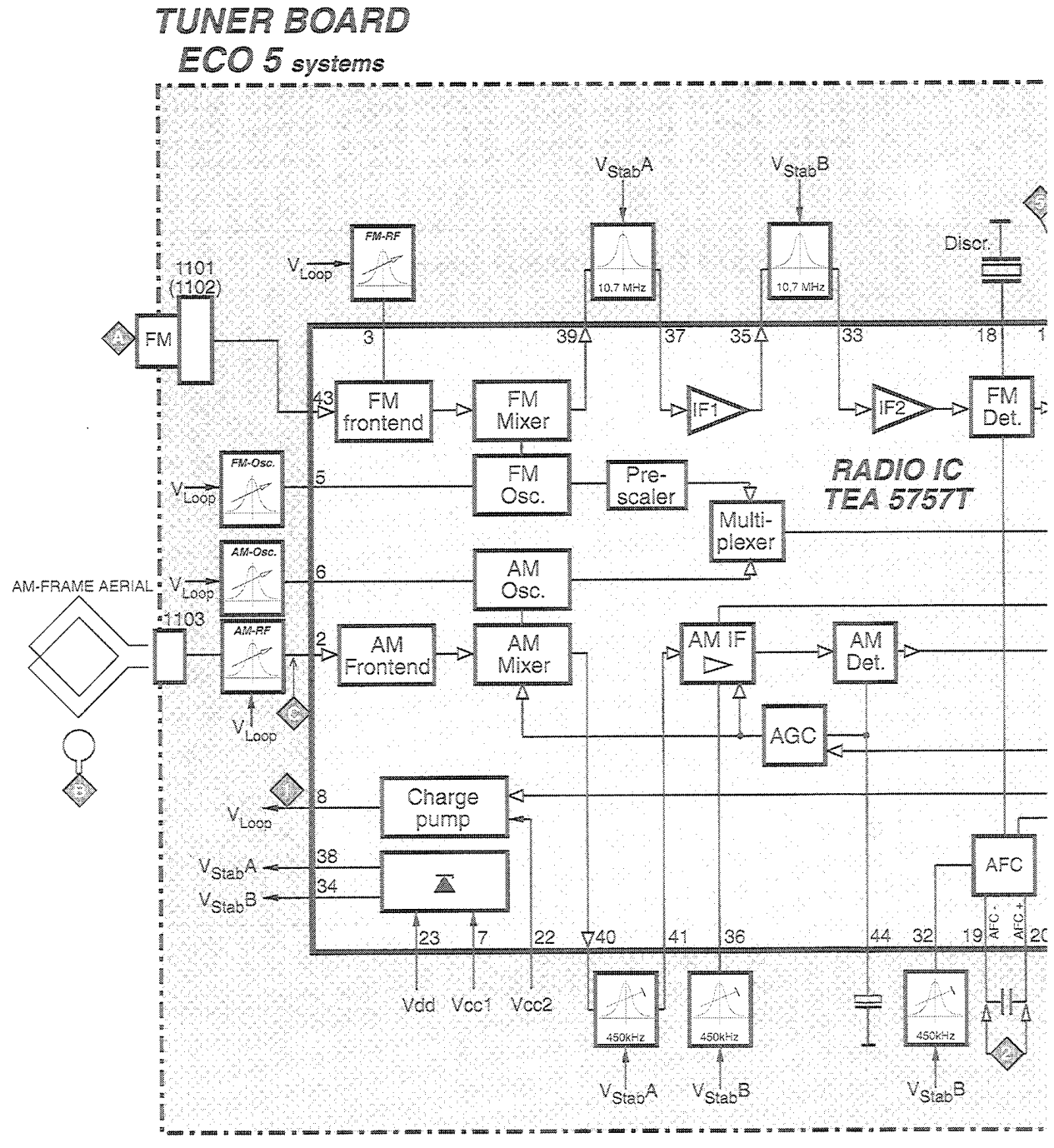
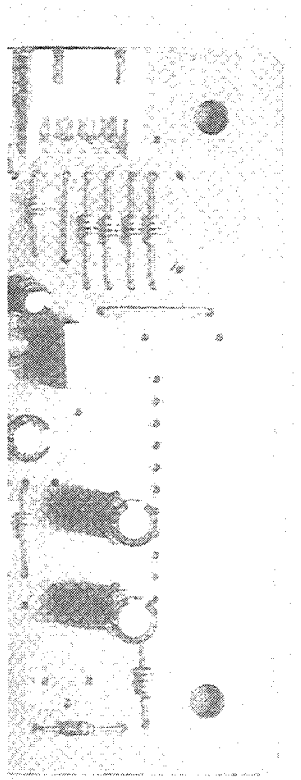
BLOCKDIAGRAM



7B-1

BLOCKDIAGRAM



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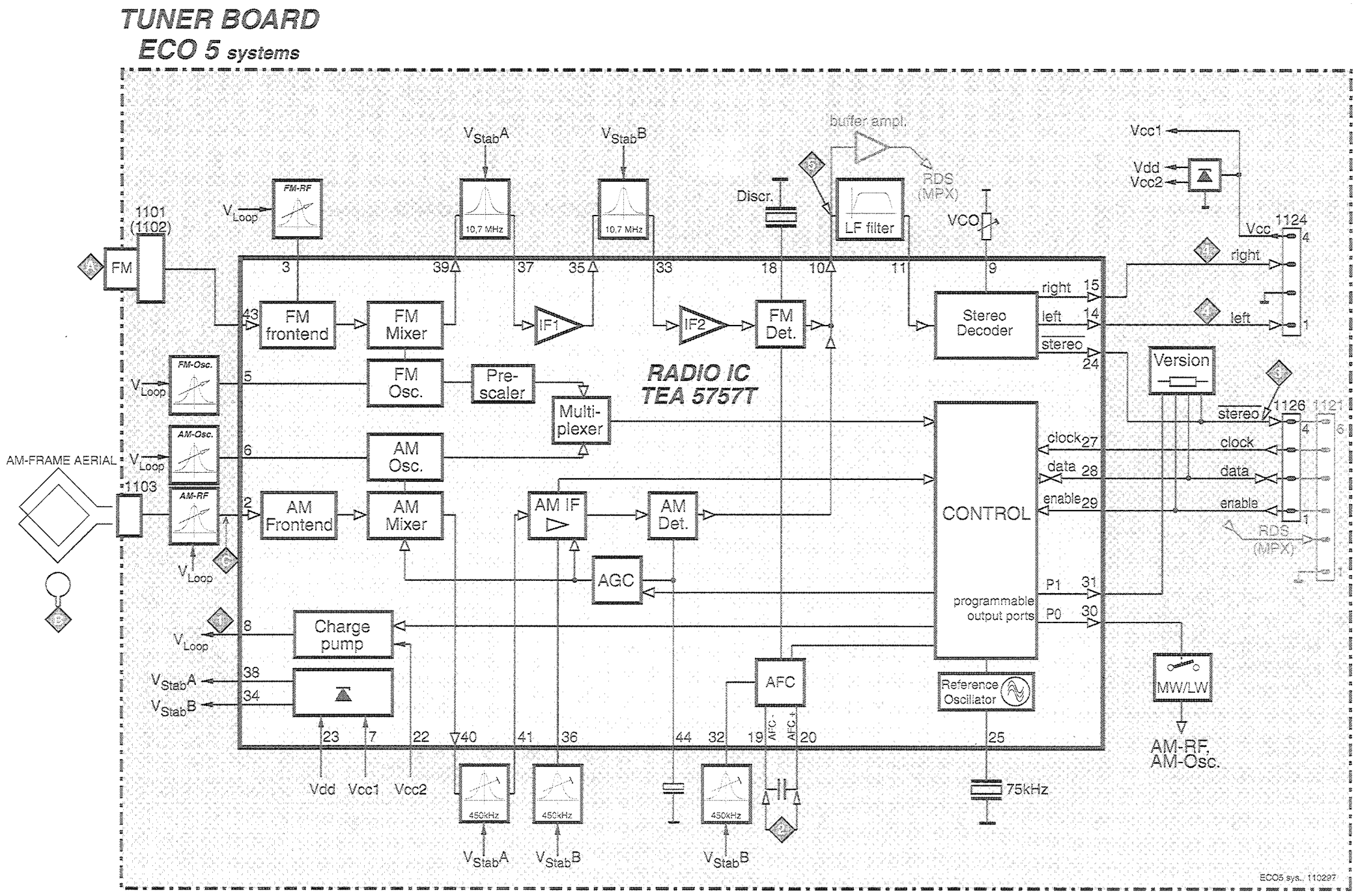

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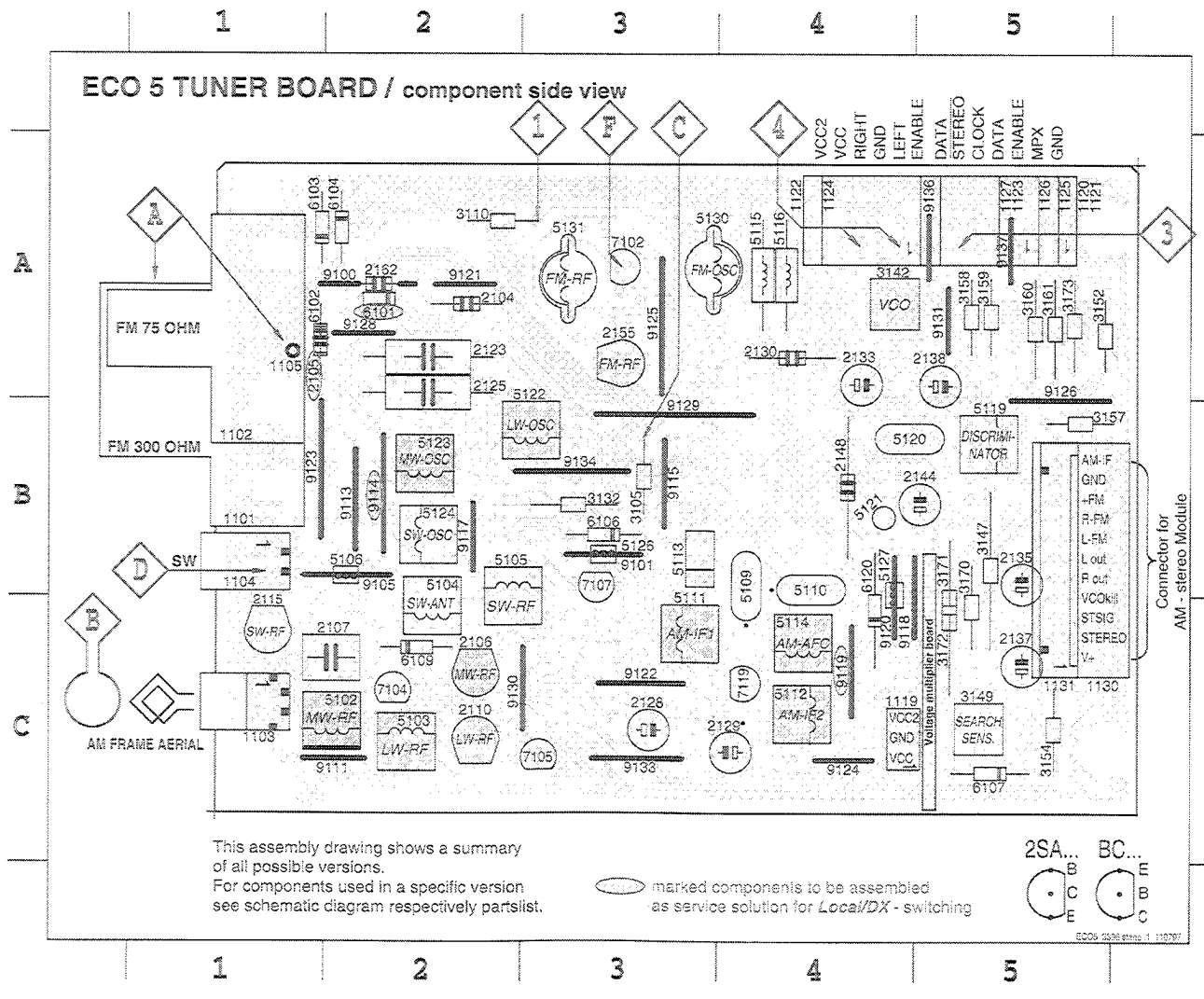
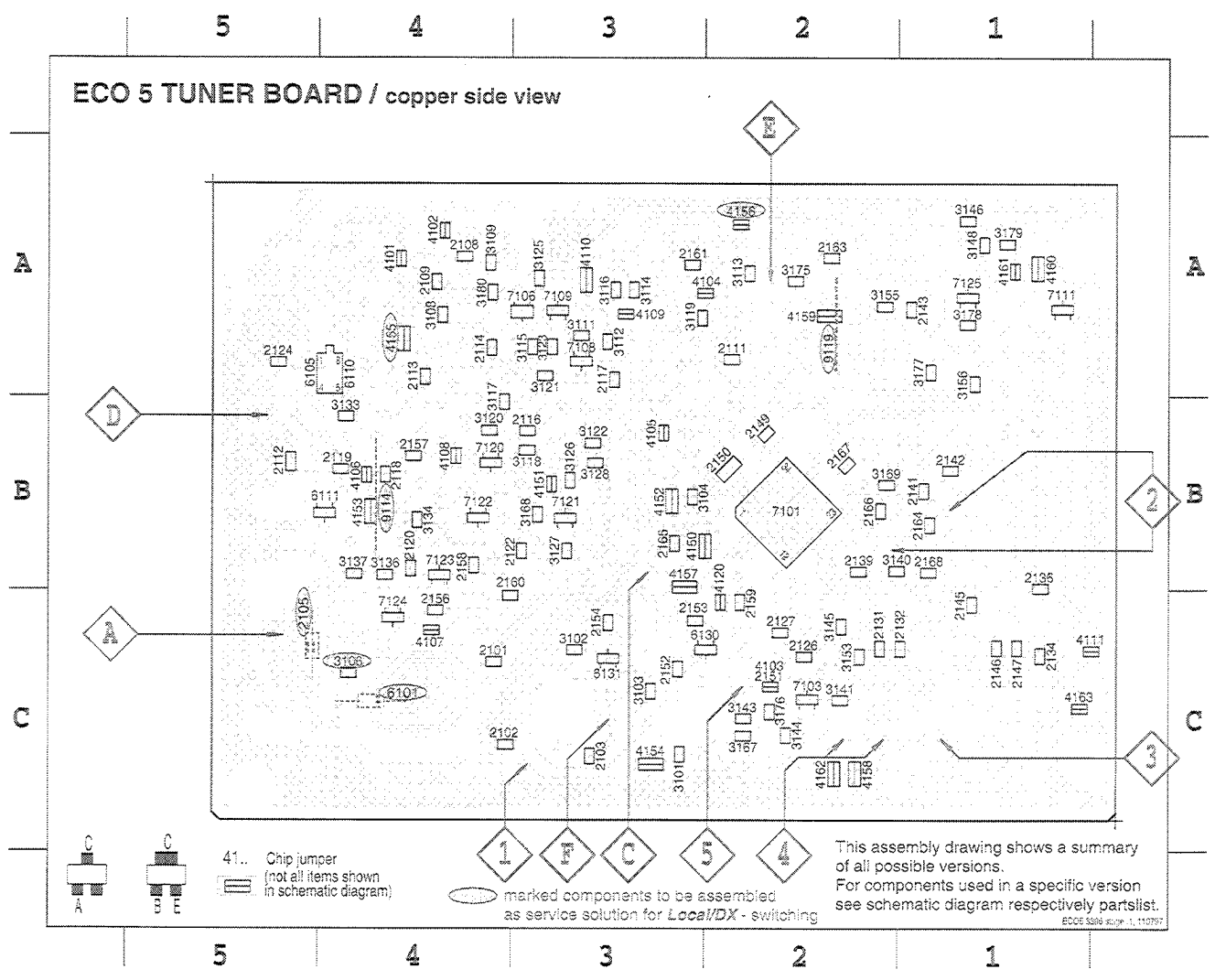
1101 A1	2106 C2	2137 C5	3149 C5	3173 A5	5114 C4	5130 A3	7104 C2	9117 B2	9129 B3		
1102 A1	2107 C2	2138 A5	3152 A5	5102 C2	5115 A4	5131 A3	7105 C3	9118 B4	9130 C3		
1103 C1	2110 C2	2144 B5	3154 C5	5103 C2	5116 A4	5101 A2	7107 B3	9119 C4	9131 A5		
1104 B1	2115 C1	2148 B4	3157 B5	5104 C2	5119 B5	6102 A1	7119 C4	9120 B4	9133 C3		
1105 A1	2123 A2	2155 A3	3158 A5	5105 B2	5120 B4	6103 A1	9100 A2	9121 A2	9134 B3		
1119 C5	2125 A2	2162 A2	3159 A5	5106 B2	5121 B4	6104 A2	9101 B3	9122 C3	9136 A5		
1120 A5	2128 C3	3105 B3	3160 A5	5109 B4	5122 B3	6106 B3	9105 B2	9123 B1	9137 A5		
1130 B5	2129 C4	3110 A2	3161 A5	5110 B4	5123 B2	6107 C5	9111 C2	9124 C4			
1131 B5	2130 A4	3132 B3	3170 C5	5111 C3	5124 B2	6109 C2	9113 B2	9125 A3			
2104 A2	2133 A4	3142 A4	3171 C5	5112 C4	5126 B3	6120 C4	9114 B2	9126 B5			
2105 A1	2135 B5	3147 B5	3172 C5	5113 B3	5127 B4	7102 A3	9115 B3	9128 A2			

2101 C4	2118 B4	2139 B2	2153 C3	2166 B2	3112 A3	3123 A3	3143 C2	3175 A2	4106 B4	4154 C3	6110 A4	7121 B3		
2102 C4	2119 B4	2141 B1	2154 C3	2167 B2	3113 A2	3125 A3	3144 C2	3176 C2	4107 C4	4155 A4	6111 B4	7122 B4		
2103 C3	2120 B4	2142 B1	2156 C4	2168 B1	3114 A3	3126 B3	3145 C2	3177 A1	4108 B4	4156 A2	6130 C2	7123 B4		
2108 A4	2122 B3	2143 A1	2157 B4	3101 C3	3115 A3	3127 B3	3146 A1	3178 A1	4109 A3	4157 B3	6131 C3	7124 C4		
2109 A4	2124 A5	2145 C1	2158 B4	3102 C3	3116 A3	3128 B3	3148 A1	3179 A1	4110 A3	4158 C2	7101 B2	7125 A1		
2111 A2	2126 C2	2146 C1	2159 C2	3103 C3	3117 B4	3133 B4	3153 C2	3180 A4	4111 C1	4159 A2	7103 C2			
2112 B5	2127 C2	2147 C1	2160 C4	3104 B3	3118 B3	3134 B4	3155 A2	4101 A4	4120 C2	4160 A1	7106 A3			
2113 A4	2131 C2	2149 B2	2161 A3	3106 C4	3119 A3	3136 B4	3156 A1	4102 A4	4150 B2	4161 A1	7108 A3			
2114 A4	2132 C1	2150 B2	2163 A2	3108 A4	3120 B4	3137 B4	3167 C2	4103 C2	4151 B3	4162 C1	7109 A3			
2116 B3	2134 C1	2151 C2	2164 B1	3109 A4	3121 A3	3140 B2	3168 B3	4104 A2	4152 B3	4163 C1	7111 A1			
2117 A3	2136 B1	2152 C3	2165 B3	3111 A3	3122 B3	3141 C2	3169 B2	4105 B3	4153 B4	6105 A4	7120 B4			





TUNER ADJUSTMEN

Waverange	Inpu
VARICAP ALIGNMENT	
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	
MW FM/AM-version, 10kHz grid 530 - 1700kHz	
FM/MW-version, 9kHz grid 531 - 1602kHz	
LW 153 - 279kHz	
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz	
FM IF	
FM	10.7 cont
FM RF	
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	
VCO	
FM	98 cont
AM IF	
MW	con IC 71 with gro
AM AFC **MW**	
AM RF [3]	
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	
LW	
MW FM/AM-version, 10kHz grid 530 - 1700kHz	

Use service test program. By selectin

[1] If sensitivity of frequency counter is (input signal: stereo left 90% + 9%,

[3] For AM RF adjustments the original

Repeat

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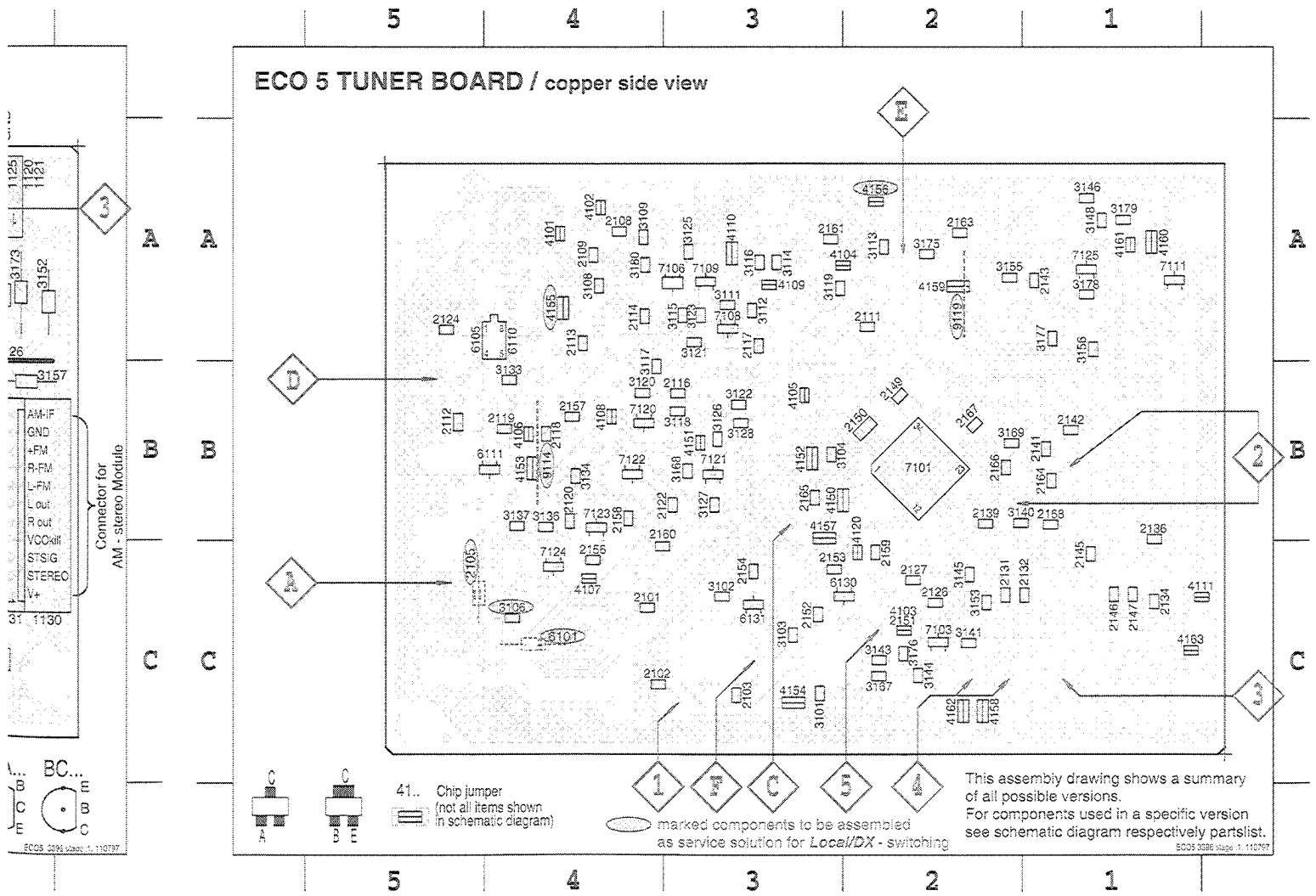
29 B3 2101 C4 2118 B4 2139 B2 2153 C3 2166 B2 3112 A3 3123 A3 3143 C2 3175 A2 4106 B4 4154 C3 6110 A4 7121 B3
30 C3 2102 C4 2119 B4 2141 B1 2154 C3 2167 B2 3113 A2 3125 A3 3144 C2 3176 C2 4107 C4 4155 A4 6111 B4 7122 B4
31 A5 2103 C3 2120 B4 2142 B1 2156 C4 2168 B1 3114 A3 3126 B3 3145 C2 3177 A1 4108 B4 4156 A2 6130 C2 7123 B4
33 C3 2108 A4 2122 B3 2143 A1 2157 B4 3101 C3 3115 A3 3127 B3 3146 A1 3178 A1 4109 A3 4157 B3 6131 C3 7124 C4
34 B3 2109 A4 2124 A5 2145 C1 2158 B4 3102 C3 3116 A3 3128 B3 3148 A1 3179 A1 4110 A3 4158 C2 7101 B2 7125 A1
36 A5 2111 A2 2126 C2 2146 C1 2159 C2 3103 C3 3117 B4 3133 B4 3153 C2 3180 A4 4111 C1 4159 A2 7103 C2
37 A5 2112 B5 2127 C2 2147 C1 2160 C4 3104 B3 3118 B3 3134 B4 3155 A2 4101 A4 4120 C2 4160 A1 7106 A3
2113 A4 2131 C2 2149 B2 2161 A3 3106 C4 3119 A3 3136 B4 3156 A1 4102 A4 4150 B2 4161 A1 7108 A3
2114 A4 2132 C1 2150 B2 2163 A2 3108 A4 3120 B4 3137 B4 3167 C2 4103 C2 4151 B3 4162 C1 7109 A3
2116 B3 2134 C1 2151 C2 2164 B1 3109 A4 3121 A3 3140 B2 3168 B3 4104 A2 4152 B3 4163 C1 7111 A1
2117 A3 2136 B1 2152 C3 2165 B3 3111 A3 3122 B3 3141 C2 3169 B2 4105 B3 4153 B4 6105 A4 7120 B4



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		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check	1	1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	F	IC 7101 21 shortcircuit to block AFC 2141	5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	C Δf=±15kHz V_{RF} = 3mV	IC 7101 36 100nF 220R	5111	4	max. f_o symmetric
			IC 7101 40 100nF 220R see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 10mV		5114	2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	4	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

ECO5, discr. cod. 990797

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

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TUNER BOARD ECO5 / Systems

VERSION PROGRAMMING COMPONENTS					
	6120	3156	3157	3170	remark
/00 FM/MW/LW	x	-	-	-	7111 not mounted
/00 FM/MW/LW/SW-Eu	-	-	-	-	
/01 FM/MW-Stereo	-	-	x	-	SW
/01 FM/MW	-	x	-	x	
/01 FM/MW/SW-Ov	-	x	-	-	
/06 FM-Japan/MW-stereo	-	-	-	x	
/13 FM/MW-Stereo	-	-	x	-	SW
/14 FM-O/RT/MW/LW	x	-	x	x	
/14 FM-O/RT/MW	x	-	x	-	
/17 FM/AM-Stereo	-	-	x	-	SW
/17 FM/AM	x	-	-	x	
/.. FM/MW/2xSW	-	-	x	x	
/15 FM/MW/SW-Eu	-	x	x	x	

x = component mounted
SW = Software initialisation

r....for RDS version only
s...for East European version (/14/34) only
t....for Japanese version (/06/26) only
u...for 2-band (FM/AM) version only
v...for SW-version 3.9-12.1MHz only
w...for LW only
x....not for all versions
y....for USA version (/17/37) only
z....for AM-STEREO (/06/13/26/33) versions only

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	
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 20224	220k 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	

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ELECTRICAL PARTS LIST - ECO5 TUNER BOARD

3176	4822 051 10102	1k 2% 0,25W	for RDS version
4101	4822 051 20008	0R Jumper 0805	for 2-Band only
4102	4822 051 20008	0R Jumper 0805	for 2-Band only
4103	4822 051 20008	0R Jumper 0805	
4104	4822 051 20008	0R Jumper 0805	
4105	4822 051 20008	0R Jumper 0805	
4106	4822 051 20008	0R Jumper 0805	
4108	4822 051 20008	0R Jumper 0805	
4111	4822 051 20008	0R Jumper 0805	
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	

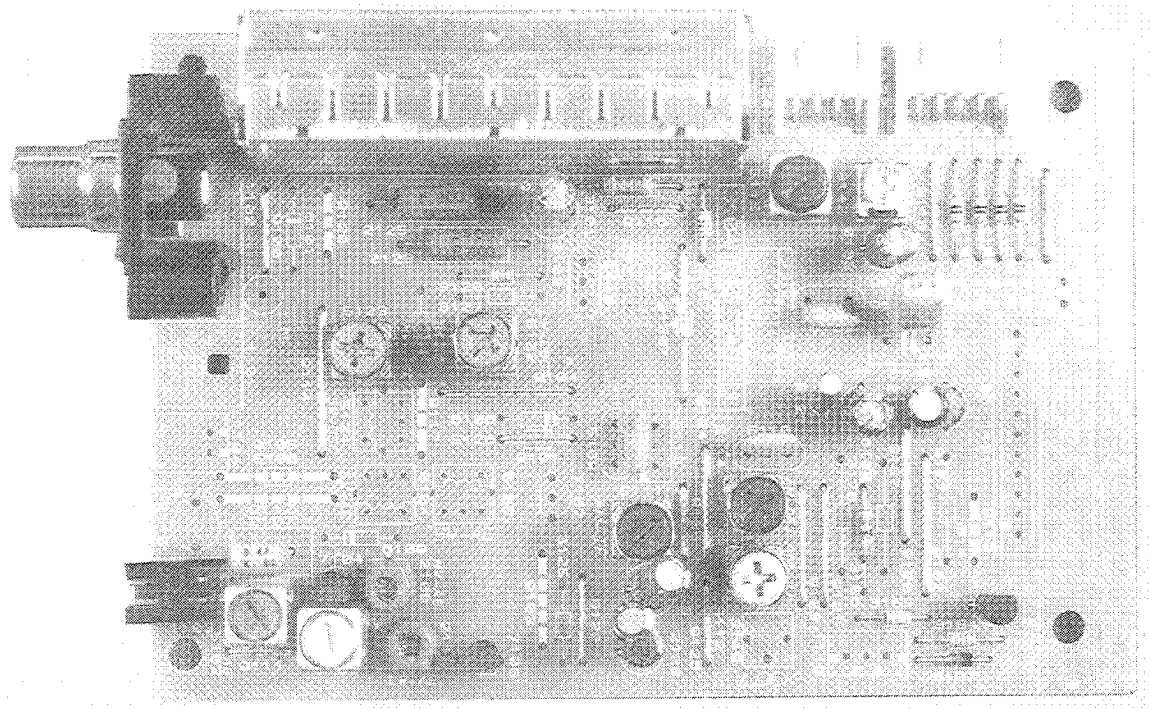
DIODES

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	
7102	4822 130 60093	2SA838B	
7103	4822 130 42513	BC858C	for RDS version
7104	5322 130 44779	BC338-40	for LW version
7105	5322 130 44779	BC338-40	for LW version
7109	5322 130 41983	BC858B	for LW version
7111	5322 130 42136	BC848C	
7122	5322 130 42136	BC848C	for LW version
7124	5322 130 42136	BC848C	for LW version

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



TUNER 95 BOARD

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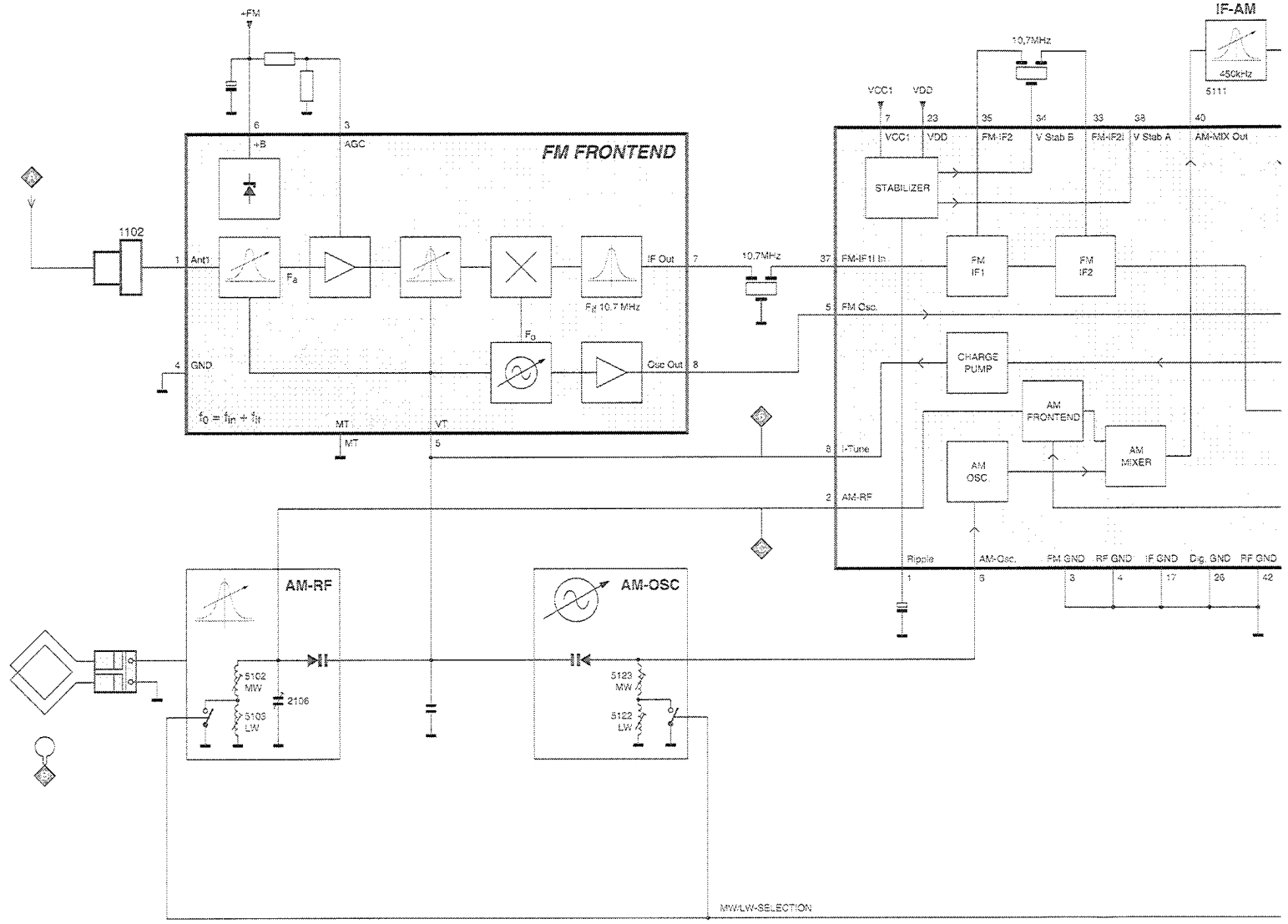
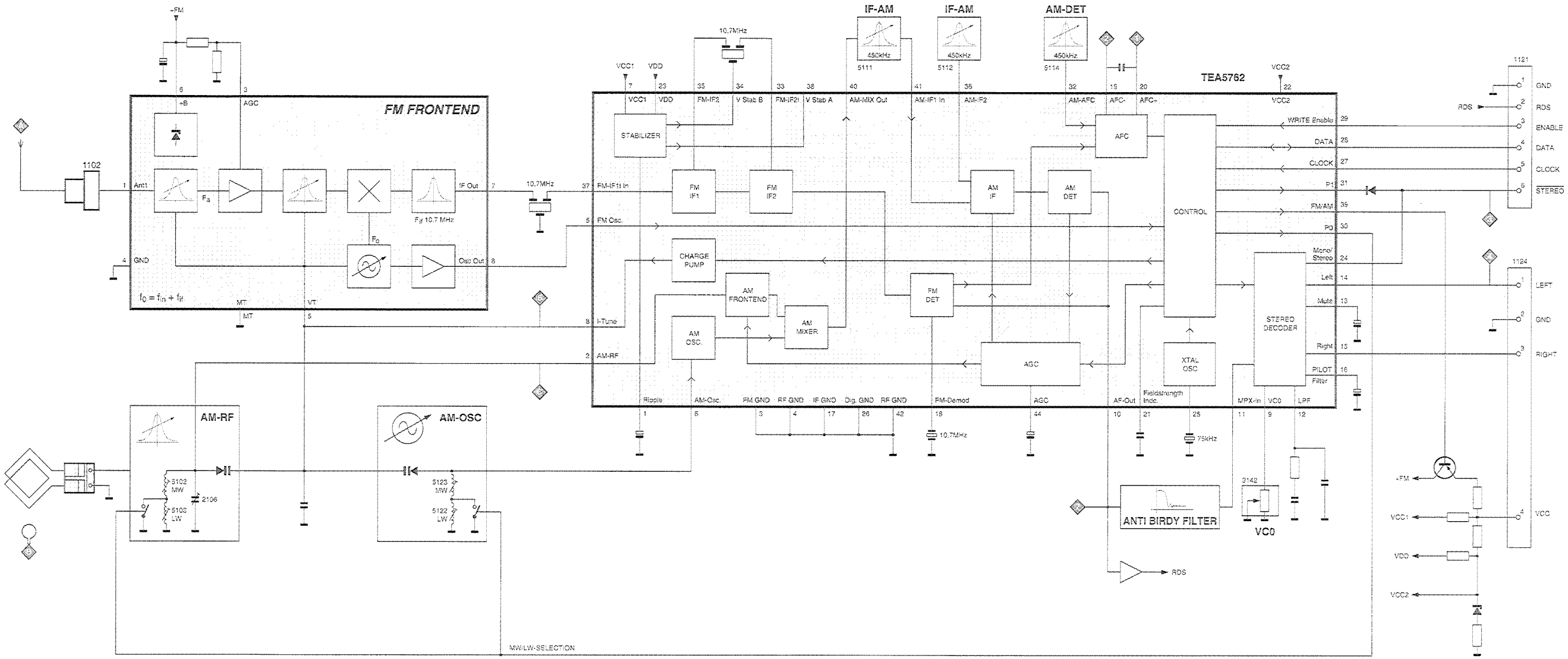


7D-1

BLOCKDIAGRAM



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		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	◇6	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	150nF 50E ◇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

adjtable for 3104 217 04121/04341

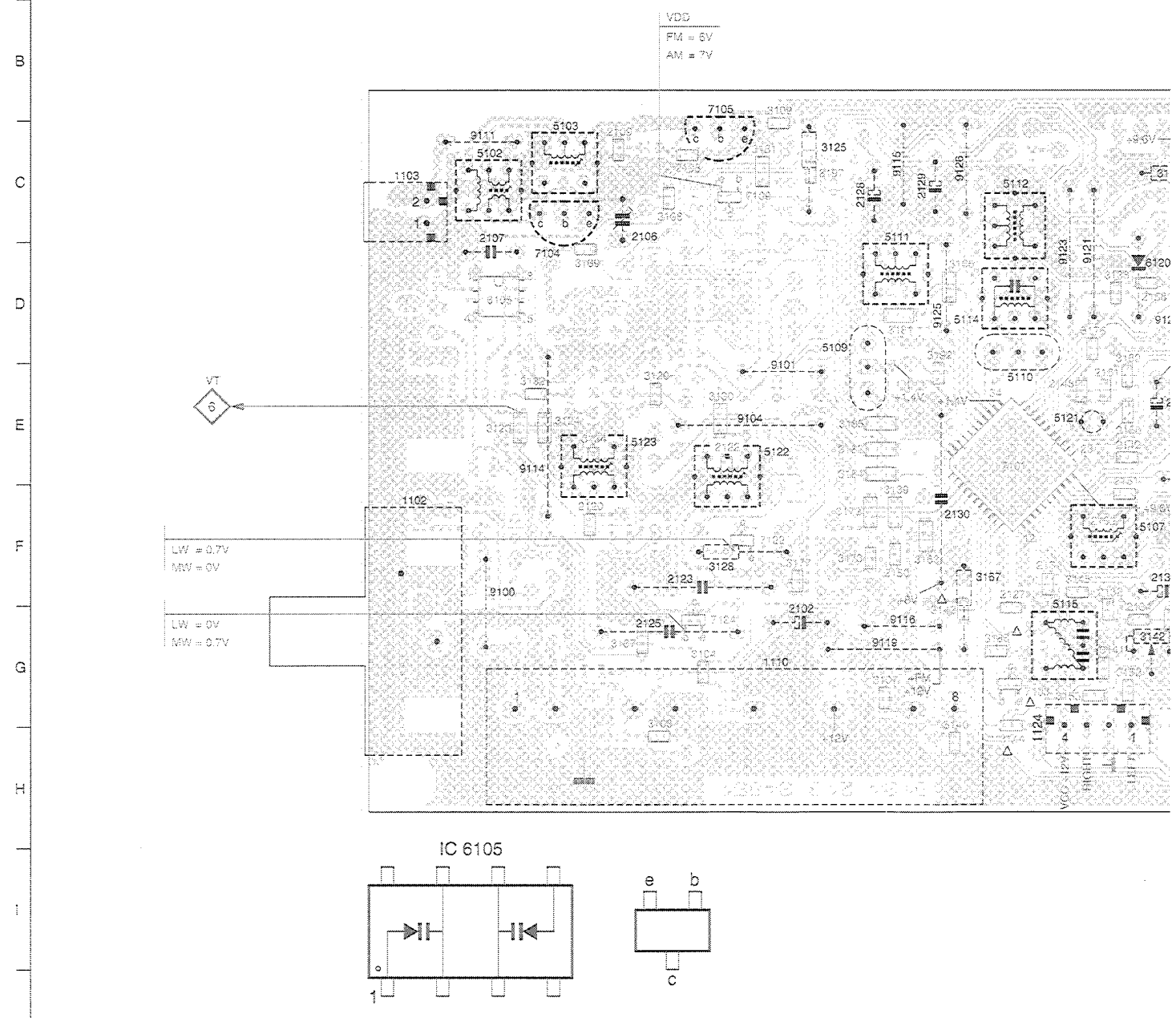
* Signal send via a frame antenna
(..) = tuning grid in kHz

↕ repeat

1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C5	5121			
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F10	5122			
1110	G7	2109	C5	2130	F8	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D7	5123			
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E6	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E9	6105			
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E6	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C6	6107			
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C6	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C9	6120			
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8	7101			
2105	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G9	7103			

1 2 3 4 5 6 7 8 9

TUNER 95 bis Combi: Copper side view



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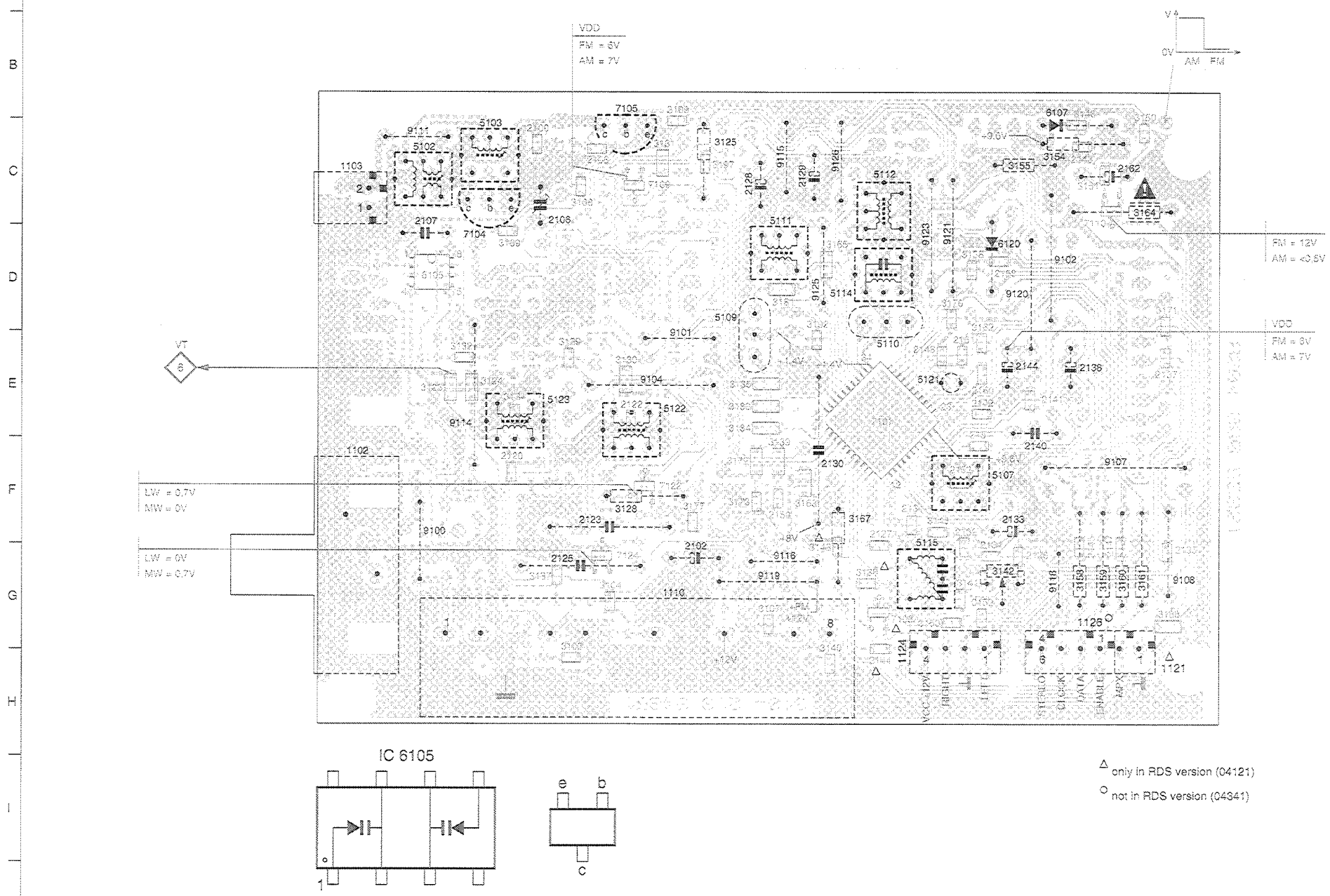
1102	F4	2107	C4	2128	C7	2136	G10	2145	G11	2161	E9	3124	E5	3137	G5	3145	F9	3158	G11	3167	F8	3183	E7	5103	C5	5121	E9	7104	D5	9102	D10	9118	G10
1103	C3	2108	C6	2129	C8	2137	E11	2147	G11	2162	C11	3125	C7	3138	D9	3146	B10	3159	G11	3169	D5	3184	E7	5107	F10	5122	E7	7105	B6	9104	E6	9119	G7
1110	G7	2109	C5	2130	F6	2138	E10	2148	E9	3103	H6	3128	F6	3139	F8	3150	C11	3160	G11	3171	D11	3185	E7	5109	D7	5123	E5	7109	C6	9107	F11	9120	D10
1121	H11	2120	F5	2131	F9	2140	F10	2150	F8	3104	G6	3129	E8	3140	H8	3151	C10	3161	G11	3172	F7	3186	G8	5110	E9	6105	D4	7110	D11	9108	G11	9121	D8
1124	H9	2122	E6	2132	F9	2141	E10	2151	F9	3107	G7	3130	E8	3141	G9	3152	G9	3162	D9	3173	F7	3188	G11	5111	C8	6107	B10	7122	F7	9111	C4	9123	D9
1126	G10	2123	F6	2133	F10	2142	E9	2152	F9	3108	C8	3131	C6	3142	G10	3153	G9	3163	F8	3176	D9	3192	D8	5112	C9	6120	D10	7124	G6	9114	E5	9125	D8
2102	G7	2125	G5	2134	G10	2143	C10	2158	D10	3109	B7	3132	E5	3143	G8	3154	C10	3164	C11	3177	F7	3197	C7	5114	D8	7101	E9	9100	F4	9115	C8	9126	C8
2106	C5	2127	F9	2135	G11	2144	E10	2160	E9	3123	E4	3134	E5	3144	H8	3155	C10	3165	D8	3181	D8	5102	C4	5115	G9	7103	G9	9101	E7	9116	G8		

TUNER 95 bis Combi: Copper side view



TUNER 95 bis
3104 217 04121/04341 bl. 110 - 01

LEU0149
9751

/ Voltmeter
... 9V
3 ... 2V
V ± 0.2V
± 0.4V
V ± 0.2V
± 0.4V
V ± 3mV
Hz ± 1 kHz
stortion
inimum
etrical and
x. height
V ± 2mV
MAX
MAX

217 04121/04341

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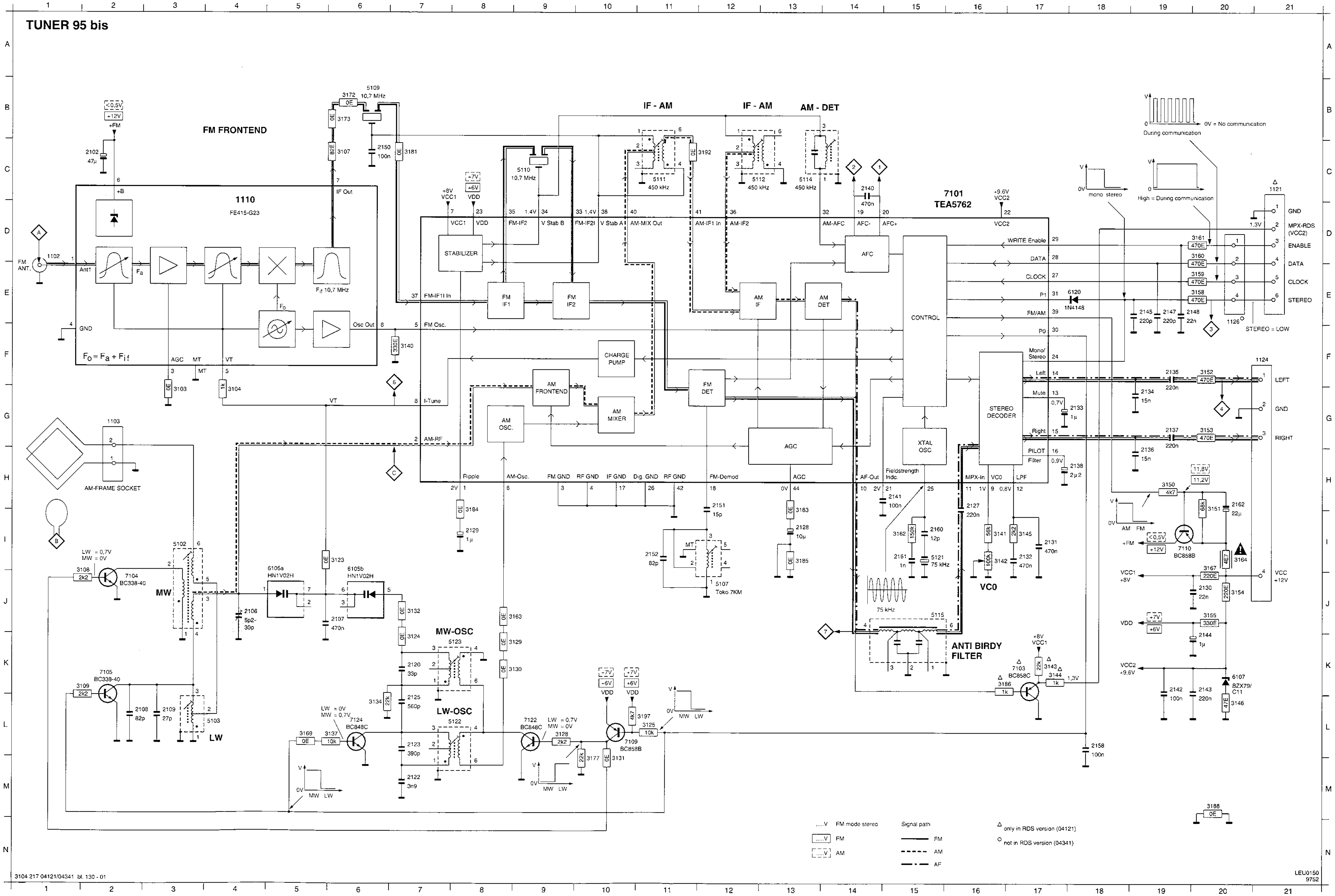
1102	D1	1124	F21	2107	J6	2122	M7	2128	I13	2132	I17	2136	H19	2141	H15	2145	E19	2151	H12
1103	G2	1126	E20	2108	L2	2123	L7	2129	I8	2133	G18	2137	G19	2142	K19	2147	E19	2152	I11
1110	D4	2102	C2	2109	L3	2125	L7	2130	J20	2134	G19	2138	H18	2143	K20	2148	E19	2158	L18
1121	C21	2106	J4	2120	K7	2127	H16	2131	I17	2135	F19	2140	C14	2144	K20	2150	C6	2160	I15

2161	I15	3107	C6	3124	K7	3130	K8	3137	L5	3143	K17	3150	H19	3154	J20	3160	D19	3164	I20
2162	H20	3108	J1	3125	L11	3131	M10	3140	F7	3144	K17	3151	I20	3155	J20	3161	D19	3167	I20
3103	G3	3109	K1	3128	L9	3132	J7	3141	I16	3145	I17	3152	F20	3158	E19	3162	I15	3169	L5
3104	G4	3123	I6	3129	K8	3134	L6	3142	I16	3146	L20	3153	G20	3159	E19	3163	J8	3172	B6

3173	B6	3184	I8	3192	C12	5107	J12	5112	C12	5122	L7	6107	K20	7104	J2	7122	L9
3177	M10	3185	I13	3197	L11	5109	B6	5114	C13	5123	K7	6120	E17	7105	K2	7124	L6
3181	C7	3186	K16	5102	I3	5110	C9	5115	J15	6105a	I5	7101	C15	7109	L10		
3183	I13	3188	M20	5103	L4	5111	C11	5121	I15	6105b	I6	7103	K17	7110	I19		

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% 63V
2125	4822 121 10578	560P 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
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	50V 15pF 5%
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
3123	4822 051 10008	0R 5% 0,25W
3124	4822 051 10008	0R 5% 0,25W
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 5% 0,25W
3131	4822 051 10008	0R 5% 0,25W
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 5% 0,25W
3140	4822 051 20331	330R 5% 0,1W
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
3144	4822 051 10102	1k 2% 0,25W
3145	4822 117 11449	2k2 1% 0,1W
3146	4822 051 20479	47R 5% 0,1W
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 051 20224	220k 5% 0,1W
3163	4822 051 10008	0R 5% 0,25W
3164	4822 052 10478 ⚠	4R7 5% 0,33W
3165	4822 051 10008	0R 5% 0,25W
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 5% 0,25W
3173	4822 051 20008	0R Jumper 0805
3176	4822 051 20008	0R Jumper 0805
3177	4822 051 20223	22k 5% 0,1W
3181	4822 051 10008	0R 5% 0,25W
3183	4822 051 10008	0R 5% 0,25W
3184	4822 051 10008	0R 5% 0,25W
3185	4822 051 10008	0R 5% 0,25W
3186	4822 051 10102	1k 2% 0,25W
3188	4822 051 10008	0R 5% 0,25W
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
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
6107	4822 130 34488	BZX79-B11
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.

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ELECTRICAL PARTS LIST - TUNER 95 BOARD

KARAOKE BOARD

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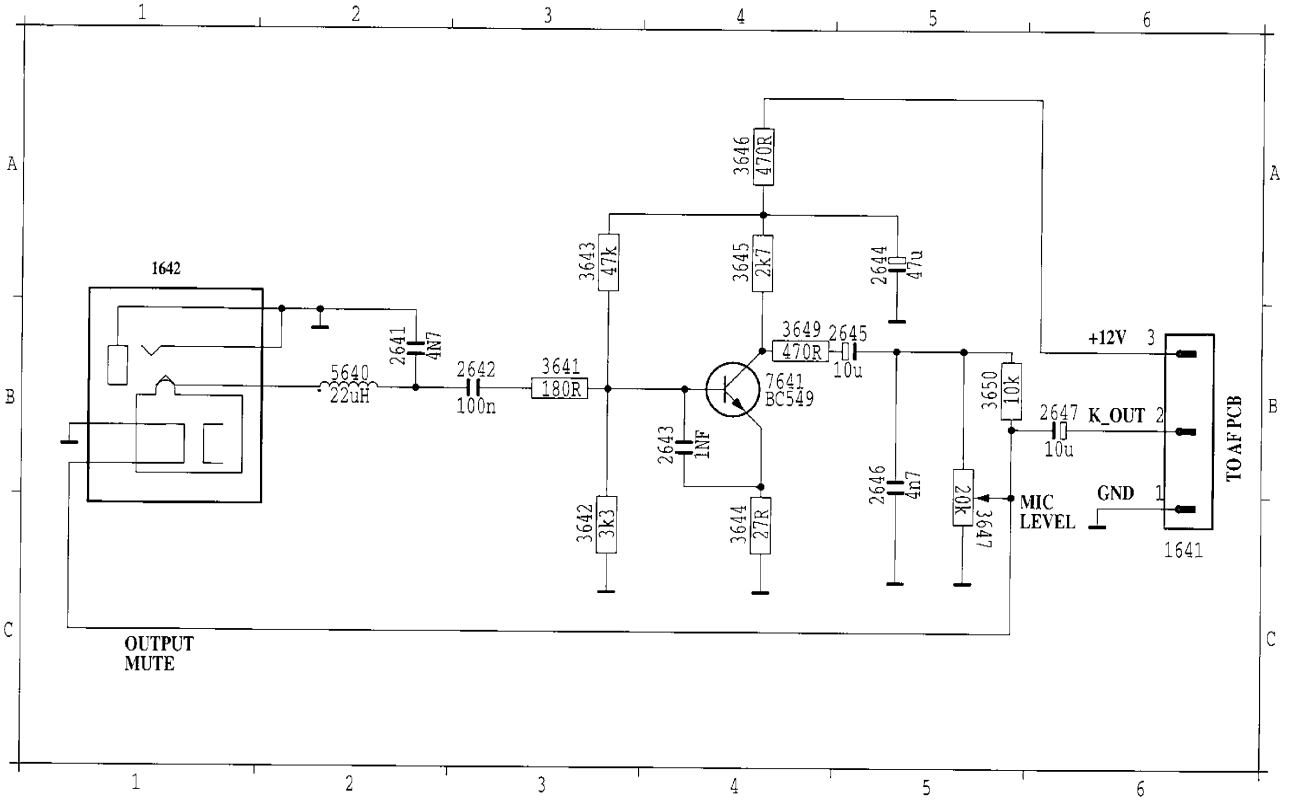
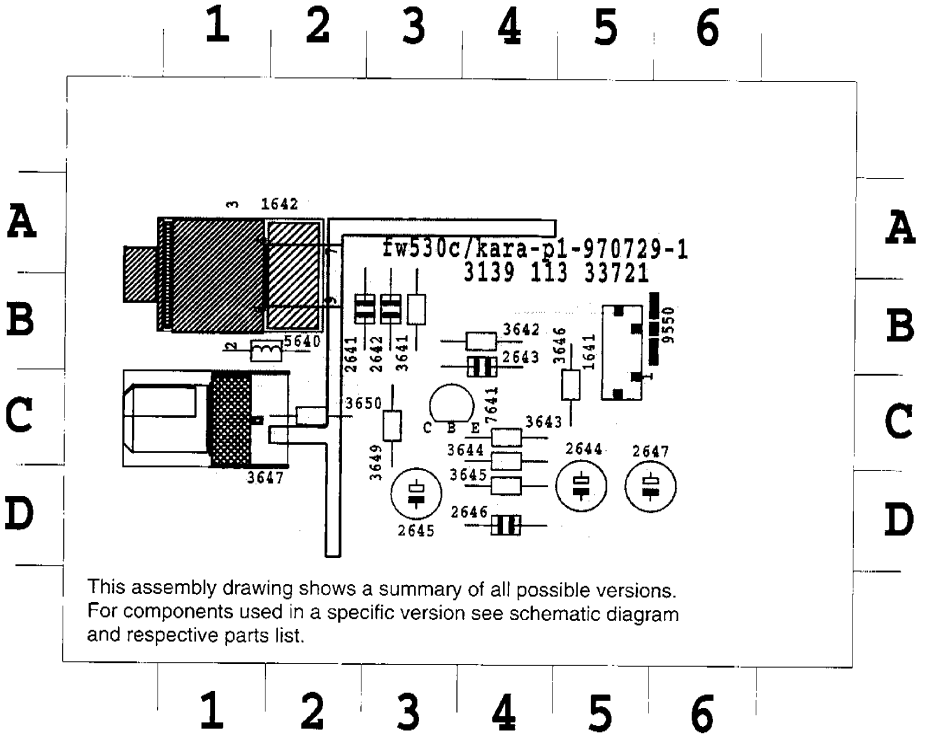
KARAOKE CIRCUIT & LAYOUT

1641 B 6	2642 B 3	2645 B 5	3641 B 3	3644 C 4	3647 C 5	5640 B 2
1642 A 1	2643 B 4	2646 B 5	3642 C 3	3645 A 4	3649 B 4	7641 B 4
2641 B 2	2644 A 5	2647 B 6	3643 A 3	3646 A 4	3650 B 5	



1641 B 5	2643 B 4	2647 D 6	3644 D 4	3649 C 2
1642 B 1	2644 D 5	3641 B 3	3645 D 4	5640 B 1
2641 B 2	2645 D 3	3642 B 3	3646 C 4	7641 C 3
2642 B 3	2646 D 4	3643 C 4	3647 C 1	9550 B 6



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

ELECTRICAL PARTS LIST - KARAOKE BOARD

MISCELLANEOUS

1642	4822 267 40898	Mic. Socket

CAPACITORS

2641	4822 126 11714	4,7nF 20%
2642	4822 126 12882	100nF +80/-20% 50V
2643	4822 122 33197	1nF 10% 50V
2644	4822 124 41751	47µF 20% 50V
2645	4822 124 41579	10µF 20% 50V
2646	4822 126 11714	4,7nF 20%
2647	4822 124 41579	10µF 20% 50V

RESISTORS

3641	4822 116 52213	180R 5% 0,5W
3642	4822 116 52269	3k3 5% 0,5W
3643	4822 116 83884	47k 5% 0,5W
3644	4822 116 52188	27R 5% 0,5W
3645	4822 116 52263	2k7 5% 0,5W
3646	4822 116 83883	470R 5% 0,5W
3647	4822 101 21204	20KA
3649	4822 116 83883	470R 5% 0,5W

COIL

5640	4822 157 52983	22µH 10%

TRANSISTOR

7641	4822 130 41096	BC550C

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

ETF5 TAPE MODULE

(Non-Dolby Version)

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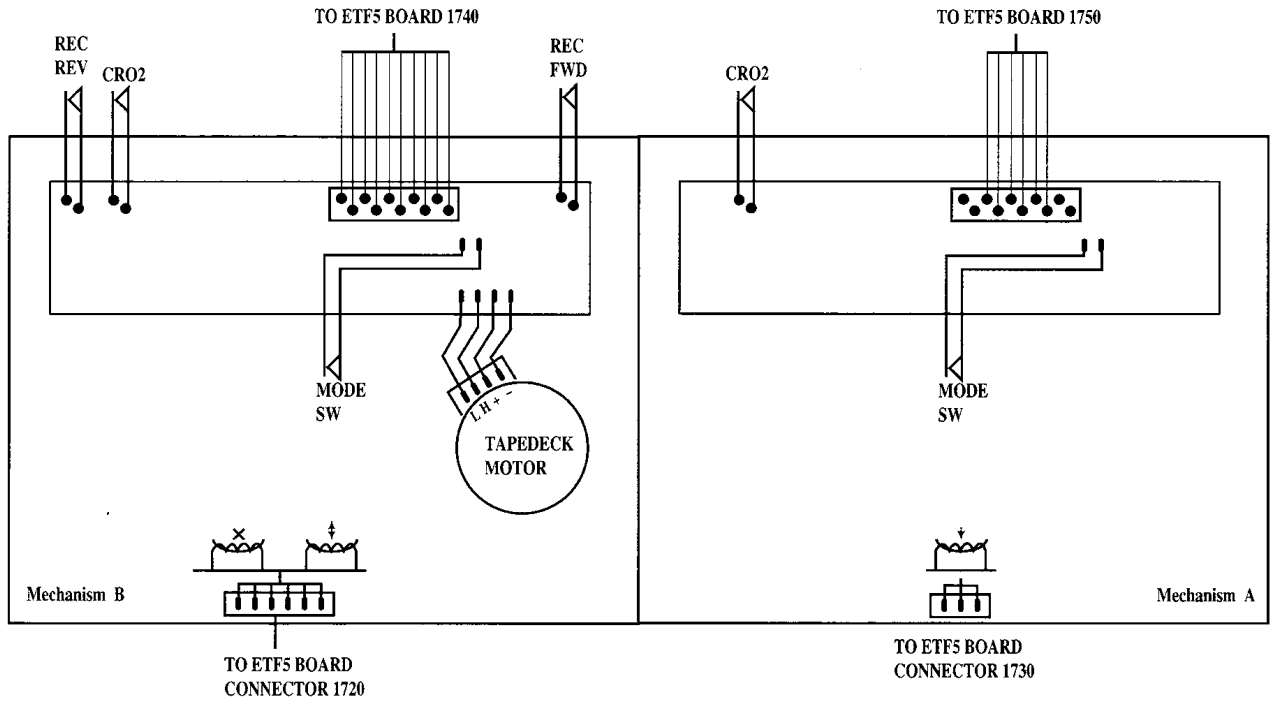
Tapedeck wiring (Double deck)



OPTIONS / VARIANTS TABLE

MODULE	ETF5				ETF6	
VARIANT	**1**	**2**	**3**	**4**	**5**	**6**
NAME	**DB/DD/FR**	**ND/DD/FR**	**ND/SD**	**ND/DD/FF**	**ND/DD/FR**	**ND/DD/FF**
Deck configuration	double	double	single	double	double	double
Autoreverse	yes (B)	yes (B)	yes	no	yes (B)	no
Auto-replay	no	no	no	yes (B)	no	yes (B)
Motor configuration	single	single	single	single	single	single
Auto tape type selection	yes	yes	yes	yes	yes	yes
Dolby B type Noise Reduction	yes	no	no	no	no	no
19 kHz pilot suppression	yes	no	no	no	no	no
High speed dubbing	yes	yes	no	yes	yes	yes

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

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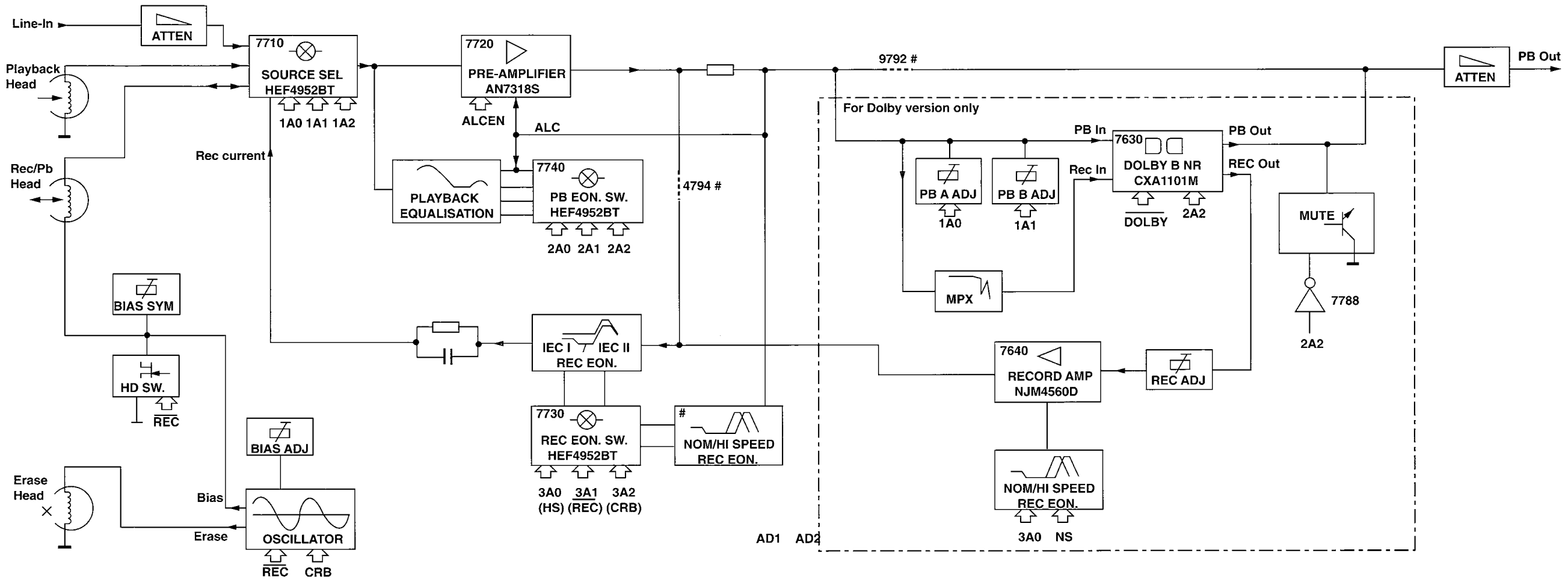
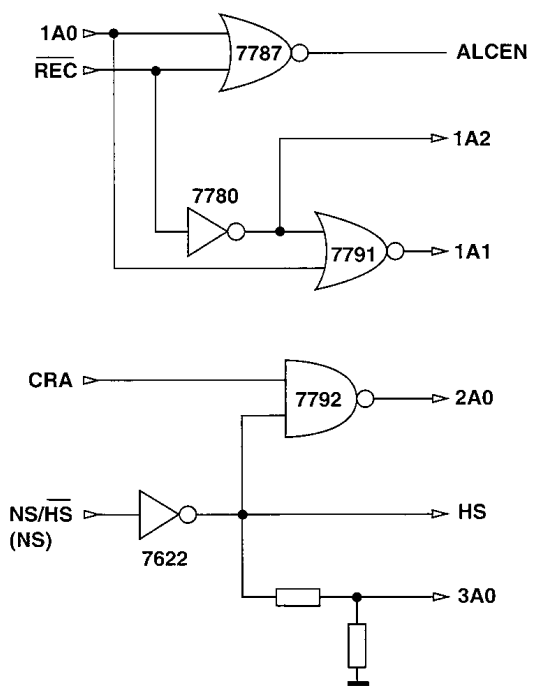
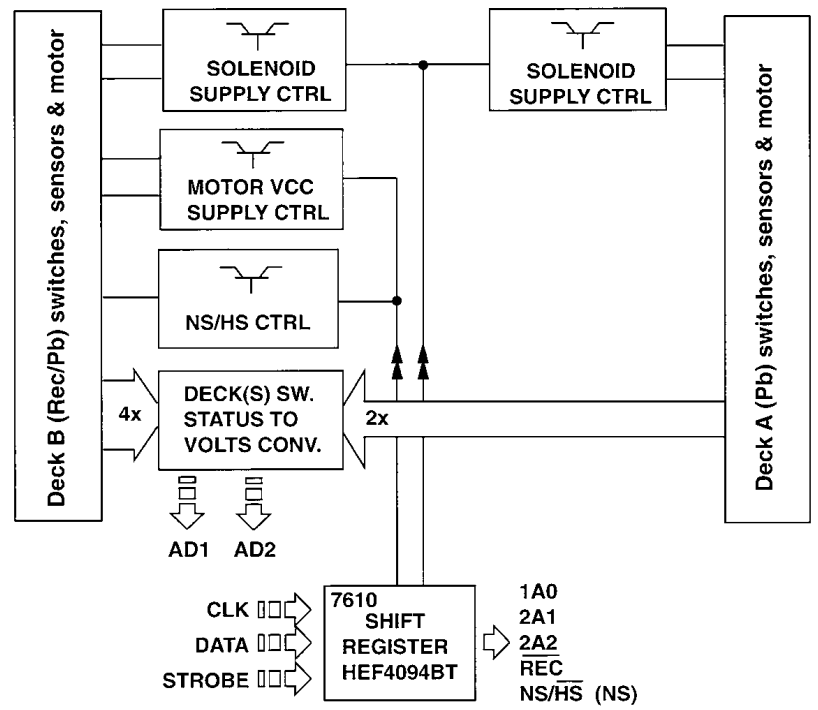
BLOCK DIAGRAM







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

MicroProcessor Control / Communication lines

Direct / Indirect Control lines from Shift Registers

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 (HEF4952B). The signal is amplified by amplifier IC7720 (AN7318S) before feeding to the IC7740 (HEF4952B) and then output to the AF Board through pins 5 and 6 of the connector 1701.

2. Recording Mode
   Recording Signal is selected and fed through by the Mode Selector IC7710 (HEF4952B) which is then amplified by the amplifier IC7720 (AN7318S). The amplified output signal will pass through IC7730 (HEF4952B) and then back to IC7710 (HEF4952B) 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 (HEF4952B) which is then equalised for playback mode by the amplifier IC7720 (AN7318S) 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 (HEF4952B) 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 (AN7318S) 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 (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 only)
   Switch S4 of the IC7740 (HEF4952B) is for the purpose of muting the output during Recording mode. During Recording mode, S4 is closed and shorted to the ground.

8. IC7740 (HEF4952B)
   The function of the IC7740 (HEF4952B) 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 (HEF4952B)
   The function of the IC7730 (HEF4952B) 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 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 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.

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13. Motor Speed
    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 (HEF4952B) via 1A0, 2A1 and 2A2. IC7610(HEF4094BT) also issues logic to On/Off SOL_A, SOL_B and MOT. Recording speed is also controlled by IC7610(HEF4094BT) via NS/HS.

Dolby Circuit (For sets with Dolby B NR only)

15. IC7630 (CXA1101M)
    IC7630 (CXA1101M) in the Dolby circuit is a Dolby Noise Reduction Type B IC for the Playback and Recording signal. Noise Reduction ON/OFF are controlled by $\overline{\text{DOLBY}}$, which is from CLK, direct from uP. After clocking in DATA, CLK is set to HIGH/ LOW for NR OFF/ON.

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

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

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

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

NOTATIONS & ABBREVIATIONS USED IN THIS DOCUMENT

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

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CONNECTORS ASSIGNMENTS:

CONNECTOR 1701 — INTERCONNECTION TO AF5 BOARD

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

CONNECTOR 1703 — INTERCONNECTION TO AF5 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	+5	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 ETF6 only)***

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

CONNECTOR 1720 — DECK B HEADS CONNECTON ***(For ETF5 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 R+	Pb Head right channel positive
2	GND A	Pb Head return ground shield
3	A PB HD L+	Pb Head left channel positive

CONNECTOR 1740 — DECK B CONTROL INTERFACE ***(For ETF5 Double Deck only)***

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

CONNECTOR 1750 — DECK A CONTROL INTERFAC ***(For ETF5 Double Deck only)***

1	CrO2	Chrome tape detection switch	[open=Cr: close=Fe]
2	PHOTO A	Photo sensor output (tape movement indication)	
3	SOL A	Solenoid supply	
4	Vcc	Deck/Motor supply	
5	MODE	Mode switch (head engagement)	[open=off: close=engaged]
6	GND M	Deck/Motor ground	

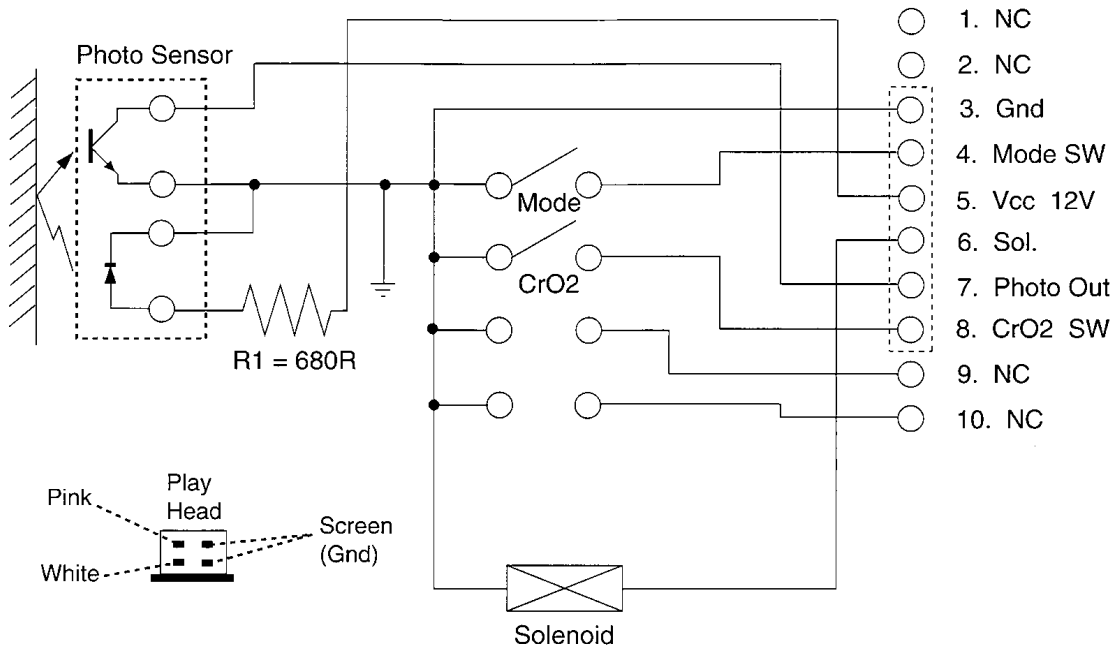
CONNECTOR 1760 — DECK B CONTROL INTERFACE ***(For ETF5 Single Deck only)***

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

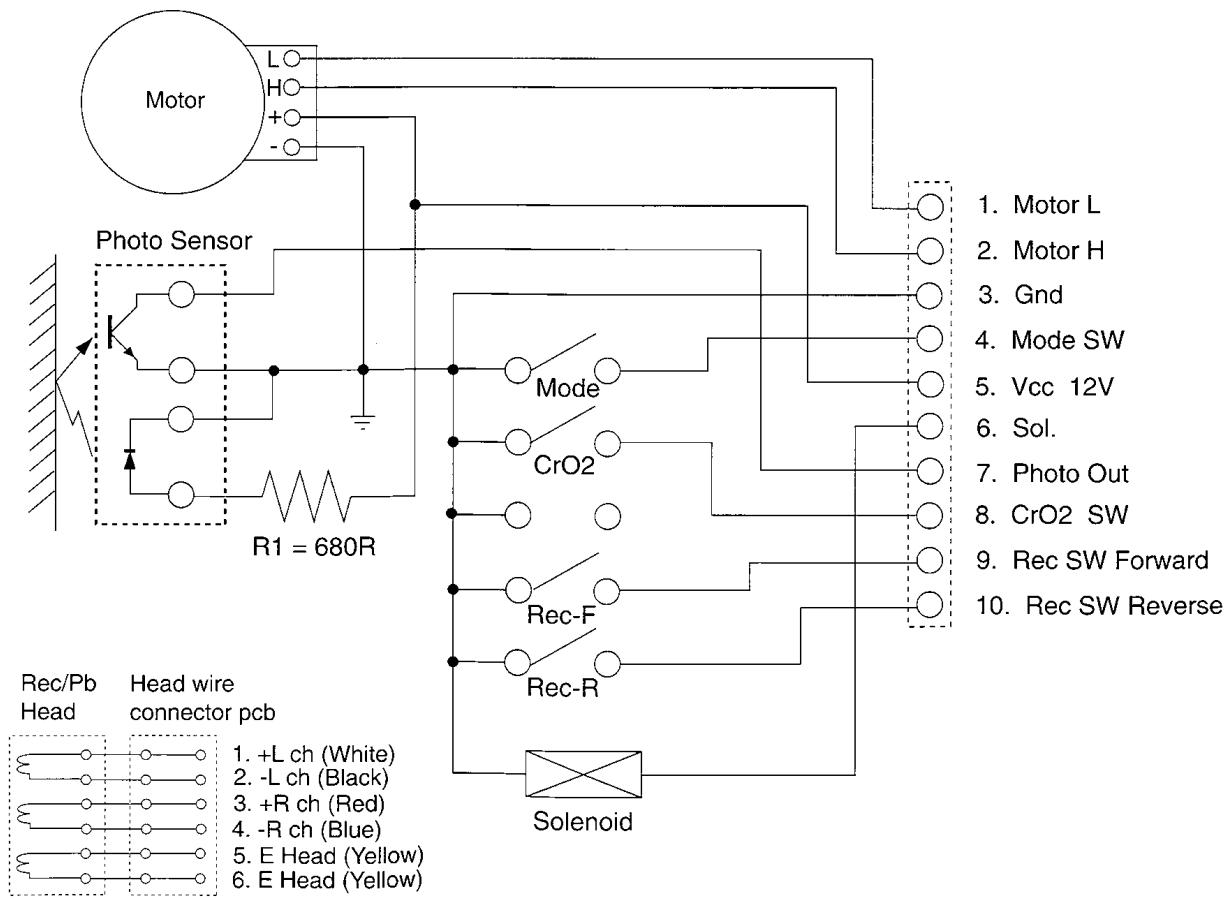
CONNECTOR 1770 — DECK B CONTROL INTERFACE ***(For ETF6 only)***

1	REC REW	Record tab protection status switch (reverse)	[open=on: close=off]
2	REC FWD	Record tab protection status switch (forward)	[open=on: close=off]
3	CrO2 B	Chrome tape detection switch deck B	[open=Cr: close=Fe]
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	L	L pin for motor	
10	H	H pin for motor	
11	CrO2 A	Chrome tape detection switch deck A	[open=Cr: close=Fe]
12	SOL A	Solenoid supply for deck A	
13	PHOTO A	Photo sensor output (tape movement indication)	

TAPE MECHANISM A ELECTRONICS



TAPE MECHANISM B ELECTRONICS



General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	1 or 2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	7 or 8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	1 or 2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only

\# For Auto-reverse version only

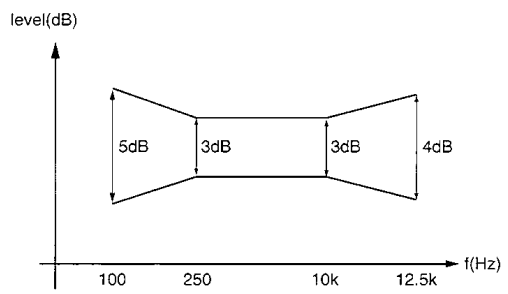


fig. 1

Recording

PRE-ADJUST	
DECK B	
CHECK OVER	
Inject 3mV sign 100Hz, 250Hz, 10kHz, 12.5kH: via 3 or	
Inject 1kHz 8.8 via 3 or	
Remark: If hig If dist	
ADJUST DOL	
Inject 400Hz 8. via 3 or	
Remark: If mea	

* For Dolby ve

NC
NC
Gnd
Mode SW
Vcc 12V
Sol.
Photo Out
CrO2 SW
NC
NC

1. Motor L
2. Motor H
3. Gnd
4. Mode SW
5. Vcc 12V
6. Sol.
7. Photo Out
8. CrO2 SW
9. Rec SW Forward
10. Rec SW Reverse

General

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	◇1 or ◇2 LEFT RIGHT	frequency counter	3622 *	5040Hz ± 0.5%
NORMAL SPEED		PLAY B			3620	3150Hz ± 0.5%
		PLAY A			check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 (4822 397 30071) 3150Hz	PLAY	◇1 or ◇2 LEFT RIGHT	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR *
ADJUST AZIMUTH						
DECK A & B	SBC420 (4822 397 30071) 10kHz	PLAY FWD	◇1 or ◇2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
ADJUST DOLBY PLAYBACK LEVEL *						
DECK A	TCC-130 (4822 397 30269) 200nWb/m	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	3641(L), 3642(R)	548mV ±0.5dB
DECK B		PLAY FWD			3635(L), 3636(R)	
		PLAY REV #			Check	548mV ±1dB
CHECK PLAYBACK FREQUENCY RESPONSE						
PB. FREQ. RESP.	SBC420 (4822 397 30071)	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	Check	limits see fig.1

* For Dolby version only
\# For Auto-reverse version only

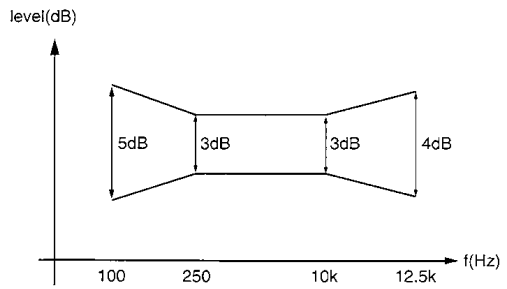


fig. 1

Recording

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
DECK B	CrO 2	RECORD	◇5 or ◇6 LEFT RIGHT	mV-meter	3773	995mV
					3785 *	left = right
	FERRO				check only	750mV ± 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via ◇3 or ◇4	CrO 2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check only	limits see fig.2
Inject 1kHz 8.85mV via ◇3 or ◇4	CrO 2	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						
ADJUST DOLBY RECORD LEVEL *						
Inject 400Hz 8.85mV via ◇3 or ◇4	CrO 2	RECORD	◇9 or ◇10 LEFT RIGHT	mV-meter	3655 & 3556	420mV
	RECORDED CASSETTE	PLAY	◇7 or ◇8 LEFT RIGHT	mV-meter	check	170mV ± 1dB
Remark: If measured value is out, re-adjust record level up or down slightly to attain play level.						

* For Dolby version only

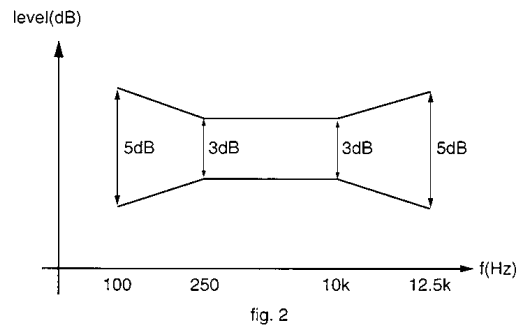
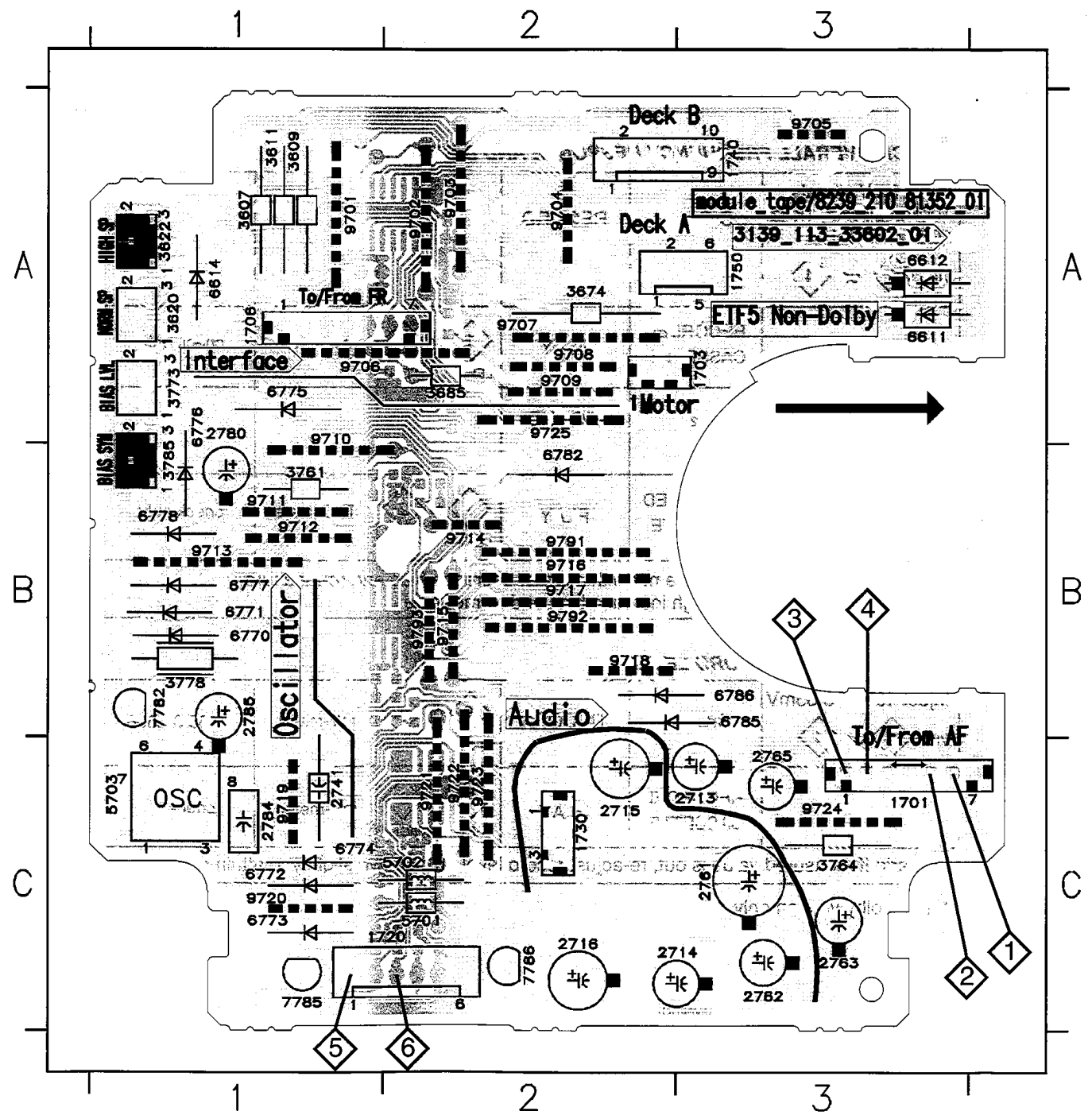


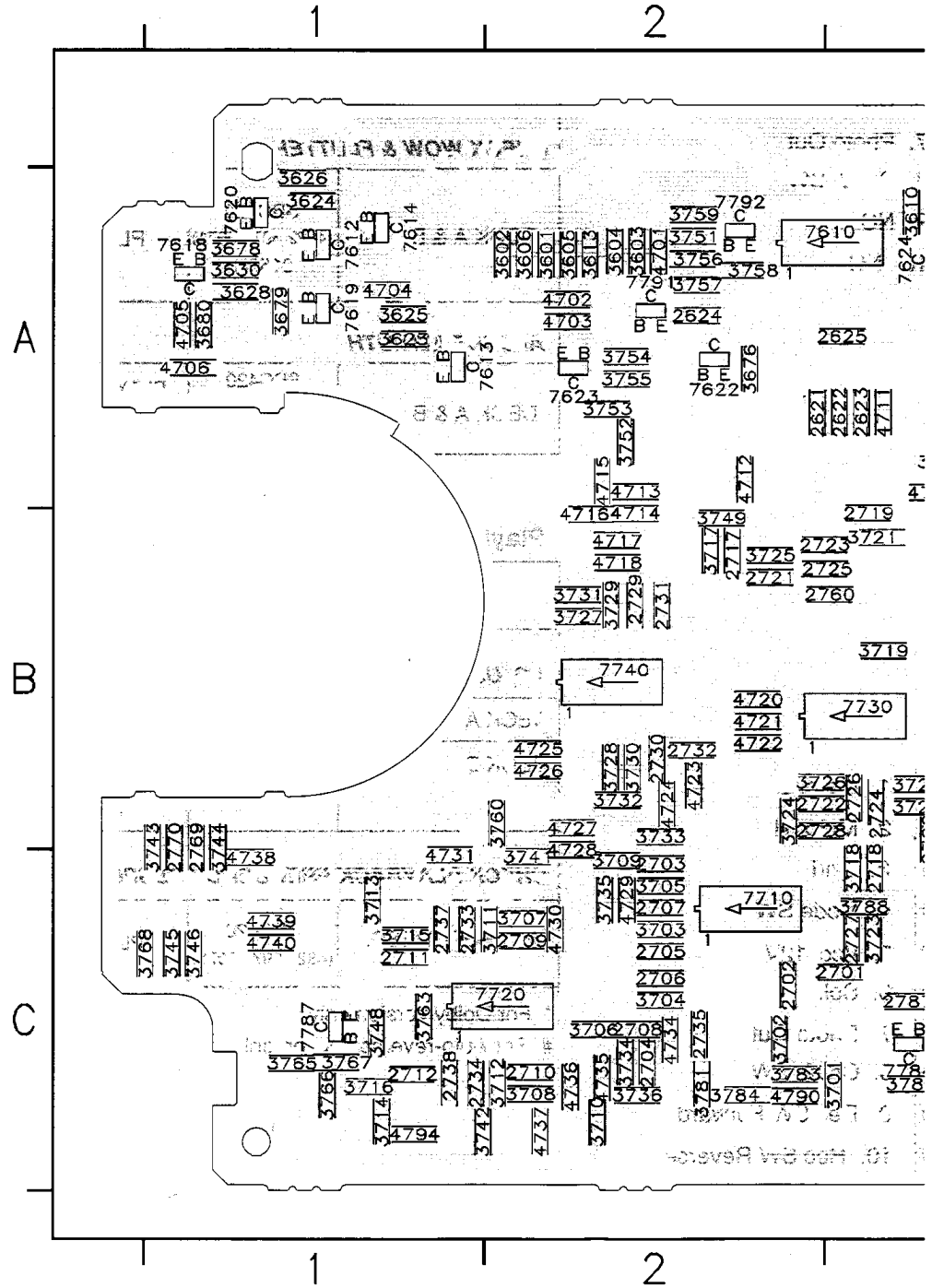
fig. 2

COMPONENT LAYOUT



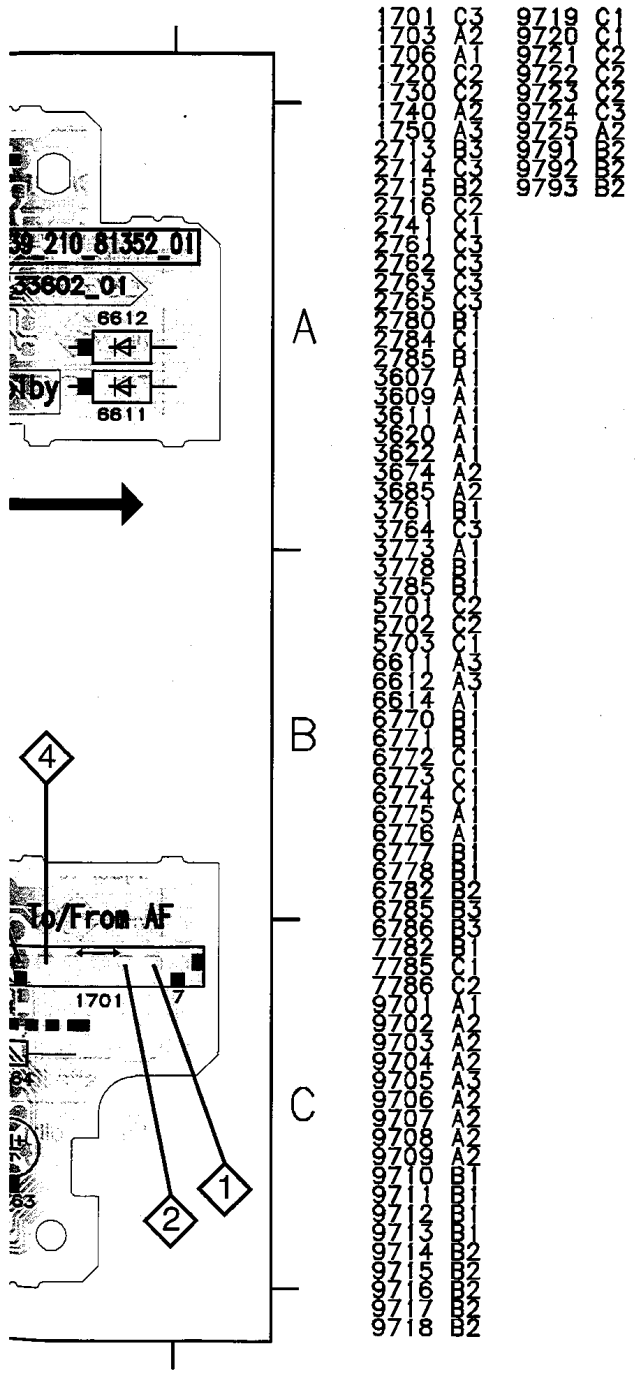
1701	C3	9719	C1
1703	A2	9720	C1
1706	A1	9721	C2
1720	C2	9722	C2
1730	C2	9723	C2
1740	A2	9724	C2
1750	A2	9725	C2
2713	B3	9791	B2
2714	C3	9792	B2
2715	B2	9793	B2
2716	C2		
2741	C1		
2761	C3		
2762	C3		
2763	C3		
2765	C3		
2780	B1		
2784	B1		
2785	B1		
3607	A1		
3609	A1		
3611	A1		
3620	A1		
3622	A1		
3674	A2		
3685	A2		
3761	B1		
3764	C3		
3773	A1		
3778	B1		
3785	B1		
5701	C2		
5702	C2		
5703	C1		
6611	A3		
6612	A3		
6614	A1		
6770	B1		
6771	B1		
6772	C1		
6773	C1		
6774	C1		
6775	A1		
6776	A1		
6777	B1		
6778	B1		
6782	B2		
6785	B3		
6786	B3		
7782	B1		
7785	C1		
7786	C2		
9701	A2		
9702	A2		
9703	A2		
9704	A2		
9705	A2		
9706	A2		
9707	A2		
9708	A2		
9709	A2		
9710	B1		
9711	B1		
9712	B1		
9713	B1		
9714	B2		
9715	B2		
9716	B2		
9717	B2		
9718	B2		

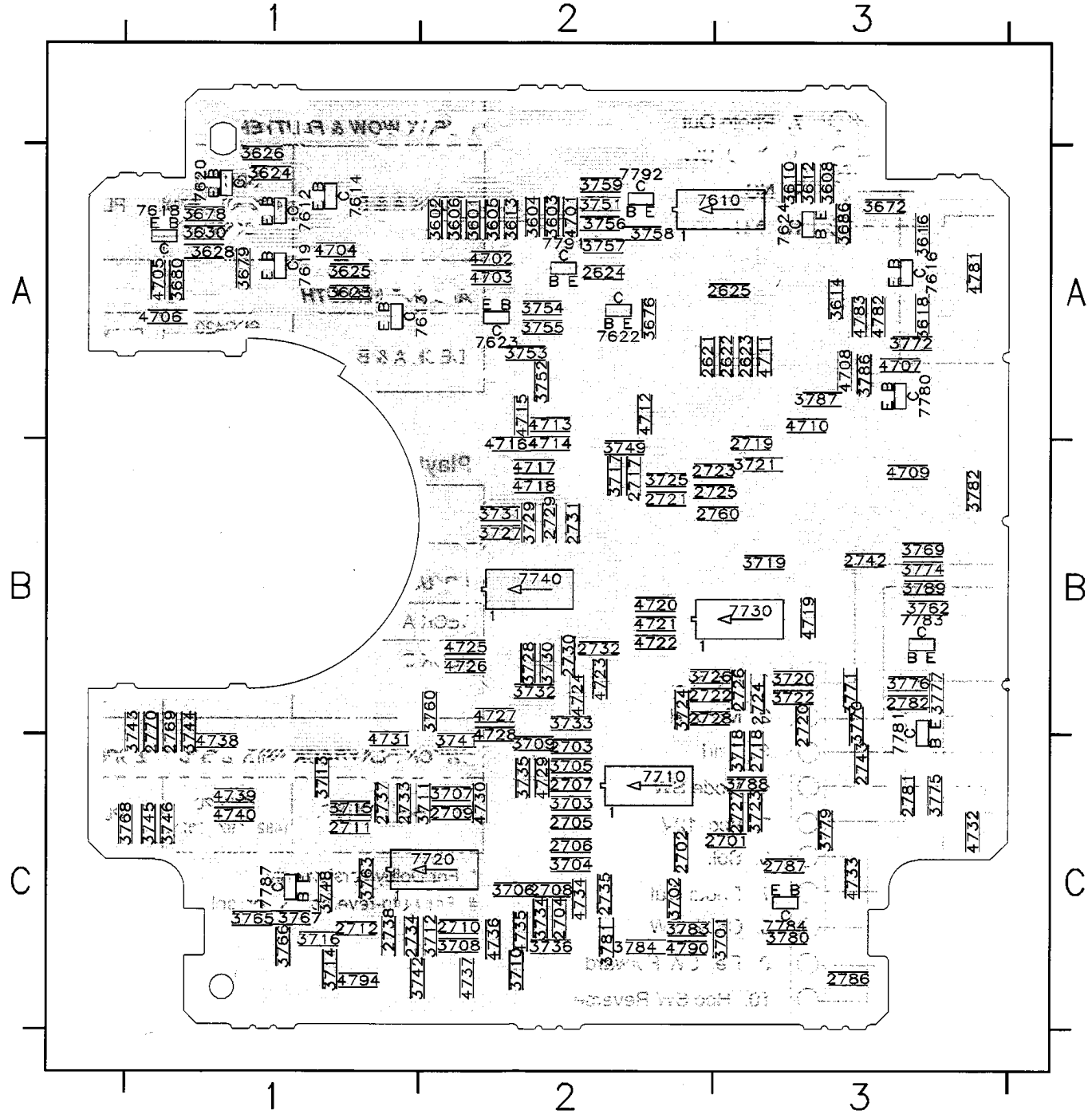
CHIP LAYOUT



9-6

CHIP LAYOUT



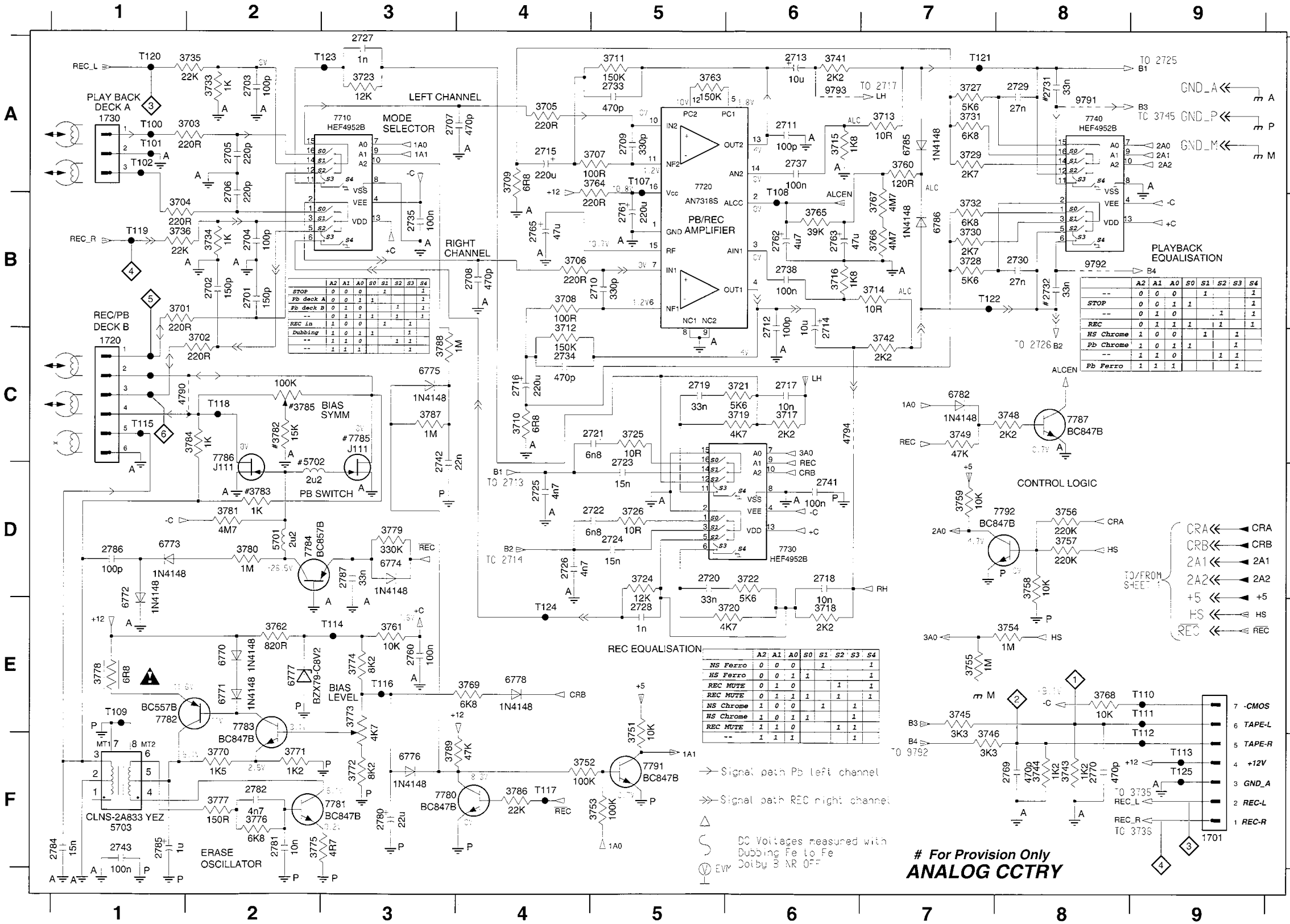


1701 C3
1703 A2
1706 A1
1720 C2
1730 C2
1740 A2
1750 A3
2713 B3
2714 C3
2715 B2
2716 C2
2741 C1
2761 C3
2762 C3
2763 C3
2765 C3
2780 B1
2784 C1
2785 B1
3607 A1
3609 A1
3611 A1
3620 A1
3622 A1
3674 A2
3685 A2
3761 B1
3764 C3
3773 A1
3778 B1
3785 B1
5701 C2
5702 C2
5703 C1
6611 A3
6612 A3
6614 A1
6770 B1
6771 B1
6772 C1
6773 C1
6774 C1
6775 A1
6776 A1
6777 B1
6778 B1
6782 B2
6785 B3
6786 B3
7782 B1
7785 C1
7786 C2
9701 A1
9702 A2
9703 A2
9704 A2
9705 A3
9706 A2
9707 A2
9708 A2
9709 A2
9710 B1
9711 B1
9712 B1
9713 B1
9714 B2
9715 B2
9716 B2
9717 B2
9718 B2
9719 C1
9720 C1
9721 C2
9722 C2
9723 C2
9724 C3
9725 A2
9791 B2
9792 B2
9793 B2

2621 A2
2622 A3
2623 A3
2624 A2
2625 A3
2701 C3
2702 C2
2703 C2
2704 C2
2705 C2
2706 C2
2707 C2
2708 C2
2709 C2
2710 C2
2711 C1
2712 C1
2716 B2
2717 B2
2718 C3
2719 B3
2720 B3
2721 B2
2722 B2
2723 B2
2724 B3
2725 B3
2726 B3
2727 C3
2728 B2
2729 B2
2730 B2
2731 B2
2732 B2
2733 C1
2734 C1
2735 C2
2736 C1
2737 C1
2738 C1
2742 B3
2760 B3
2769 B1
2770 B1
2781 C3
2782 B3
2786 C3
2787 C3
3501 A2
3602 A2
3603 A2
3604 A2
3605 A2
3606 A2
3608 A3
3610 A3
3612 A3
3613 A2
3614 A3
3616 A3
3618 A3
3623 A1
3624 A1
3625 A1
3626 A1
3628 A1
3630 A1
3672 A3
3676 A2
3678 A1
3679 A1
3680 A1
3686 A3
3701 C3
3702 C2
3703 C2
3704 C2
3705 C2
3706 C2
3707 C2
3708 C2
3709 C2
3710 C2
3711 C2
3712 C2
3713 C1
3714 C1
3715 C1
3716 B2
3717 B2
3718 C3
3719 B3
3720 B3
3721 B3
3722 B3
3723 C3
3724 B2
3725 B2
3726 B2
3727 B2
3728 B2
3729 B2
3730 B2
3731 B2
3732 B2
3733 C2
3734 C2
3735 C2
3736 C2
3741 C2
3742 C1
3743 B1
3744 B1
3745 C1
3746 C1
3749 B2
3751 A2
3752 A2
3753 A2
3754 A2
3755 A2
3756 A2
3757 A2
3758 A2
3759 A2
3760 B2
3762 B3
3763 C1
3765 C1
3766 C1
3767 C1
3768 C1
3769 B3
3771 C3
3772 A3
3774 B3
3775 C3
3776 B3
3777 B3
3779 C3
3780 C2
3781 C2
3782 B3
3783 C2
3784 C2
3786 A3
3787 A3
3788 C3
3789 B3
4701 A2
4702 A2
4703 A2
4704 A1
4705 A1
4706 A1
4707 A3
4708 A3
4709 B3
4710 A3
4711 A3
4712 A2
4713 A2
4714 B2
4715 A2
4716 B2
4717 B2
4718 B2
4719 B3
4720 B2
4721 B2
4722 B2
4723 B2
4724 B2
4725 B2
4726 B2
4727 B2
4728 C2
4729 C2
4730 C2
4731 C1
4732 C3
4733 C3
4734 C2
4735 C2
4736 C2
4737 C2
4738 C1
4739 C1
4740 C1
4781 A3
4782 A3
4783 A3
4790 C2
4794 C1
7610 A3
7612 A1
7613 A2
7614 A1
7616 A3
7618 A1
7619 A1
7620 A1
7622 A2
7624 A3
7710 C2
7720 C2
7730 B2
7740 B2
7780 A3
7781 B3
7783 B3
7784 C3
7787 C1
7791 A2
7792 A2

9-7

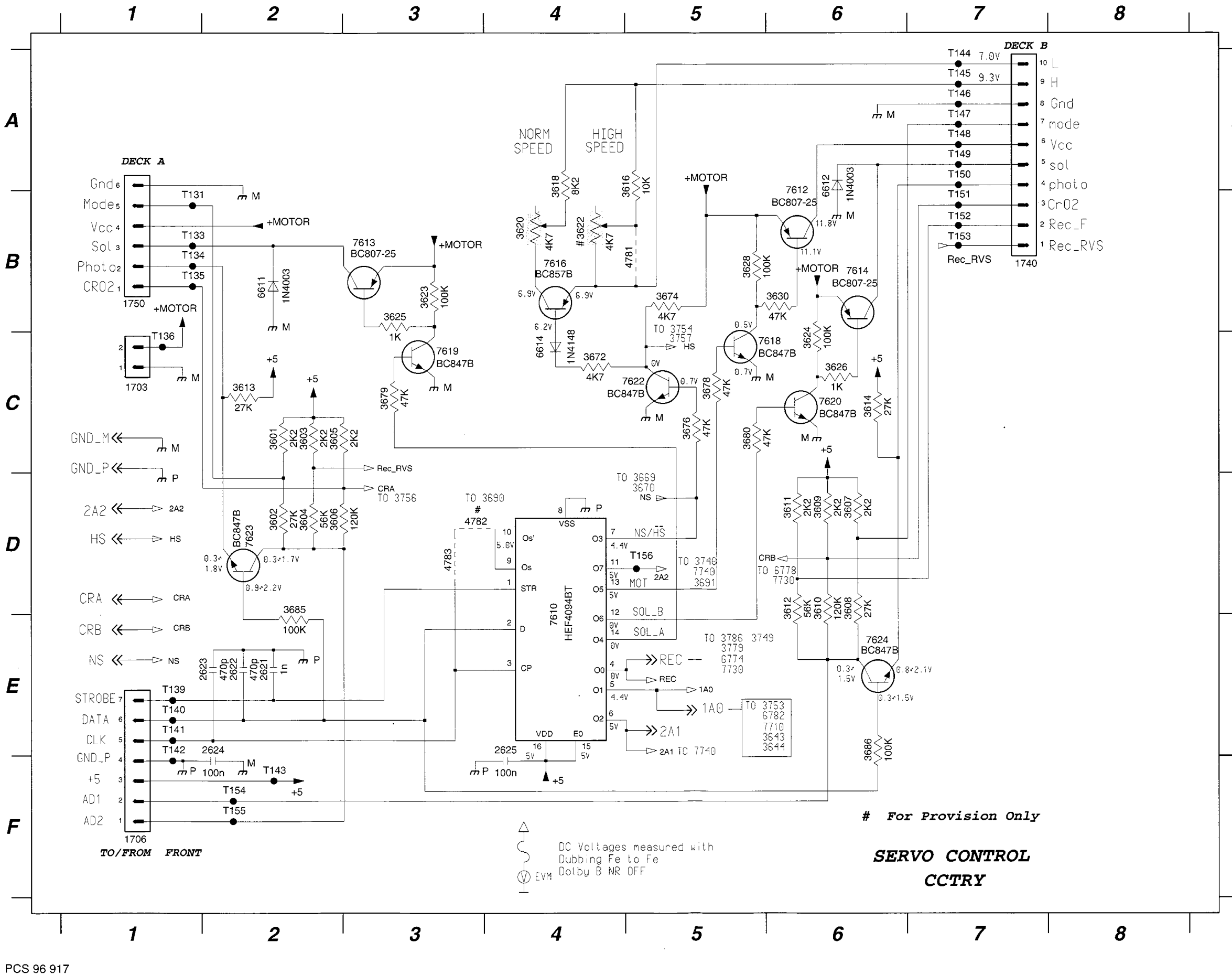
ANALOG CIRCUIT



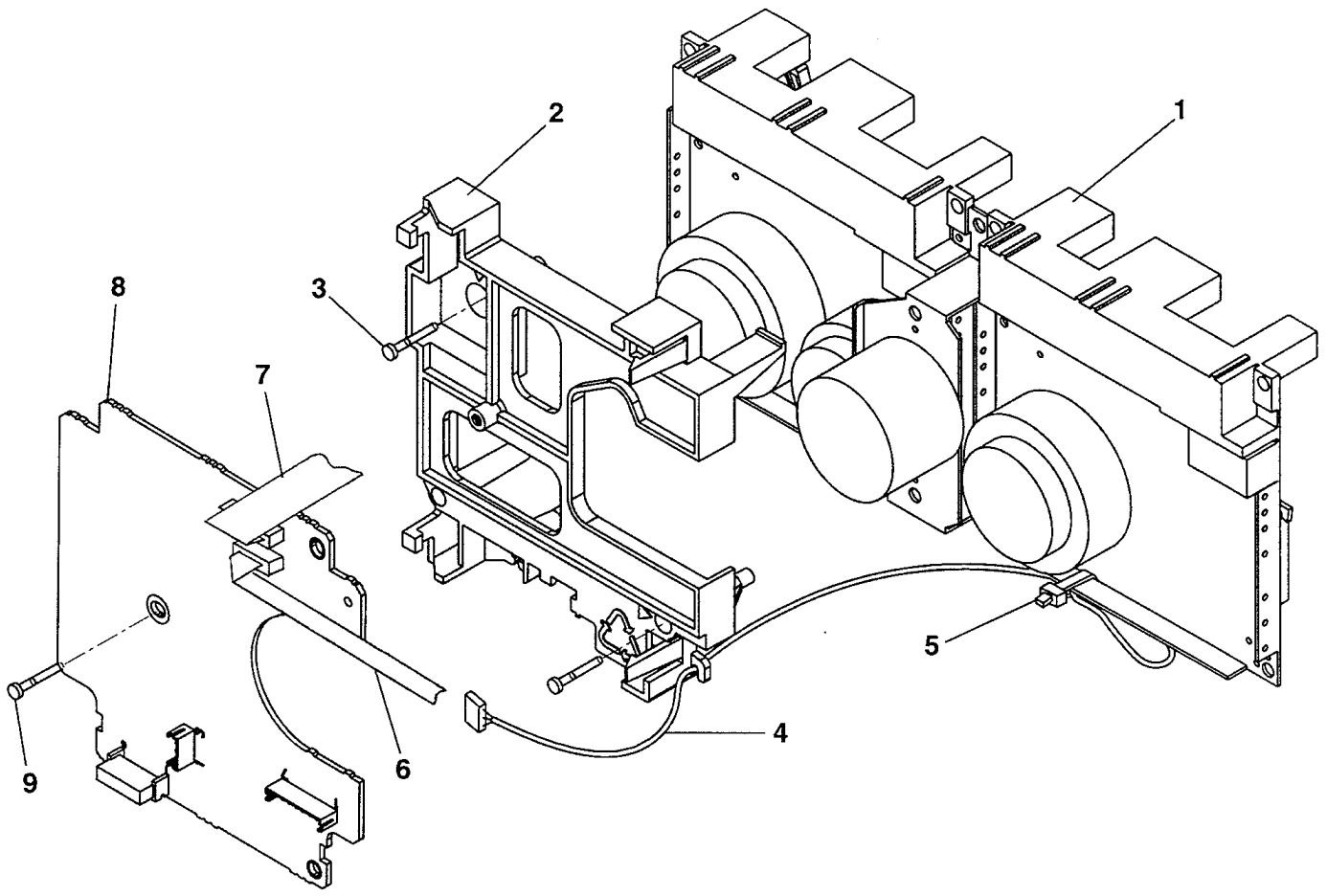
1701 F9	3721 C6	6782 C7
1720 C1	3722 D6	6785 A7
1730 A1	3723 A3	6786 B7
2701 B2	3724 D5	7710 A3
2702 B2	3725 C5	7720 A5
2703 A2	3726 D5	7730 D6
2704 B2	3727 A7	7740 A8
2705 A2	3728 B7	7780 F4
2706 A2	3729 A7	7781 F3
2707 A3	3730 B7	7782 E1
2708 B4	3731 A7	7783 E2
2709 A5	3732 B7	7784 D2
2710 B5	3733 A2	7785 C3
2711 A6	3734 B2	7786 C2
2712 B6	3735 A2	7787 C8
2713 A6	3736 B1	7791 F5
2714 C6	3741 A6	7792 D8
2715 A4	3742 C7	9791 A8
2716 C4	3743 F8	9792 B8
2717 C6	3744 F8	9793 A6
2718 D6	3745 E7	T100 A1
2719 C5	3746 F7	T101 A1
2720 D5	3748 C8	T102 A1
2721 C5	3749 C7	T103 C1
2722 D5	3751 E5	T105 C1
2723 D5	3752 F4	T106 C1
2724 D5	3753 F5	T107 A5
2725 D4	3754 E8	T108 B6
2726 D4	3755 E7	T109 E1
2727 A3	3756 D8	T110 E9
2728 E5	3757 D8	T111 E9
2729 A8	3758 D8	T112 F9
2730 B8	3759 D7	T113 F9
2731 A8	3760 A7	T114 E3
2732 B8	3761 E3	T115 C1
2733 A5	3762 E2	T116 E3
2734 C4	3763 A5	T117 F4
2735 B3	3764 A5	T118 C2
2737 A6	3765 B6	T119 B1
2738 B6	3766 B7	T120 A1
2741 D6	3767 B7	T121 A7
2742 C3	3768 E8	T122 B7
2743 F1	3769 E4	T123 A3
2760 E3	3770 F2	T124 E4
2761 B5	3771 F2	T125 F9
2762 B6	3772 F3	
2763 B6	3773 E3	
2765 B4	3774 E3	
2769 F8	3775 F2	
2770 F8	3776 F2	
2780 F3	3777 F2	
2781 F2	3778 E1	
2782 F2	3779 D3	
2784 F1	3780 D2	
2785 F1	3781 D2	
2786 D1	3782 C2	
2787 D3	3783 D2	
3701 B1	3784 C2	
3702 C2	3785 C2	
3703 A2	3786 F4	
3704 B1	3787 C3	
3705 A4	3788 C3	
3706 B4	3789 F3	
3707 A5	4790 C1	
3708 B4	4794 C6	
3709 A4	5701 D2	
3710 C4	5702 D2	
3711 A5	5703 F1	
3712 C4	6770 E2	
3713 A7	6771 E2	
3714 B7	6772 E1	
3715 A6	6773 D1	
3716 B6	6774 D3	
3717 C6	6775 C3	
3718 E6	6776 F3	
3719 C6	6777 E2	
3720 E6	6778 E4	

9-8

SERVO CONTROL CIRCUIT



1703 C1	T151 B7
1706 F1	T152 B7
1740 B7	T153 B7
1750 B1	T154 F2
2621 E2	T155 F2
2622 E2	T156 D5
2623 E2	
2624 E2	
2625 E4	
3601 C2	
3602 D2	
3603 C2	
3604 D2	
3605 C2	
3606 D2	
3607 D6	
3608 D6	
3609 D6	
3610 D6	
3611 D6	
3612 D6	
3613 C2	
3614 C6	
3616 A5	
3618 A4	
3620 B4	
3622 B4	
3623 B3	
3624 C6	
3625 B3	
3626 C6	
3628 B5	
3630 B6	
3672 C4	
3674 B5	
3676 C5	
3678 C5	
3679 C3	
3680 C5	
3685 D2	
3686 E6	
4781 B5	
4782 D3	
4783 D3	
6611 B2	
6612 A6	
6614 C4	
7610 D4	
7612 B6	
7613 B3	
7614 B6	
7616 B4	
7618 C5	
7619 C3	
7620 C6	
7622 C5	
7623 D2	
7624 E6	
T131 B1	
T133 B1	
T134 B1	
T135 B1	
T136 C1	
T139 E1	
T140 E1	
T141 E1	
T142 E1	
T143 F2	
T144 A7	
T145 A7	
T146 A7	
T147 A7	
T148 A7	
T149 A7	
T150 A7	



ETF5 TAPE MODULE EXPLODED VIEW

1	4822 691 10671	Tape Mechanism CWB44FR502
3	-	Screw M2 x 16
6	4822 320 12243	Flex Cable 6 pin 18 cm
7	4822 320 12242	Flex Cable 10 pin 7,5 cm
9	-	Screw D3 x 10

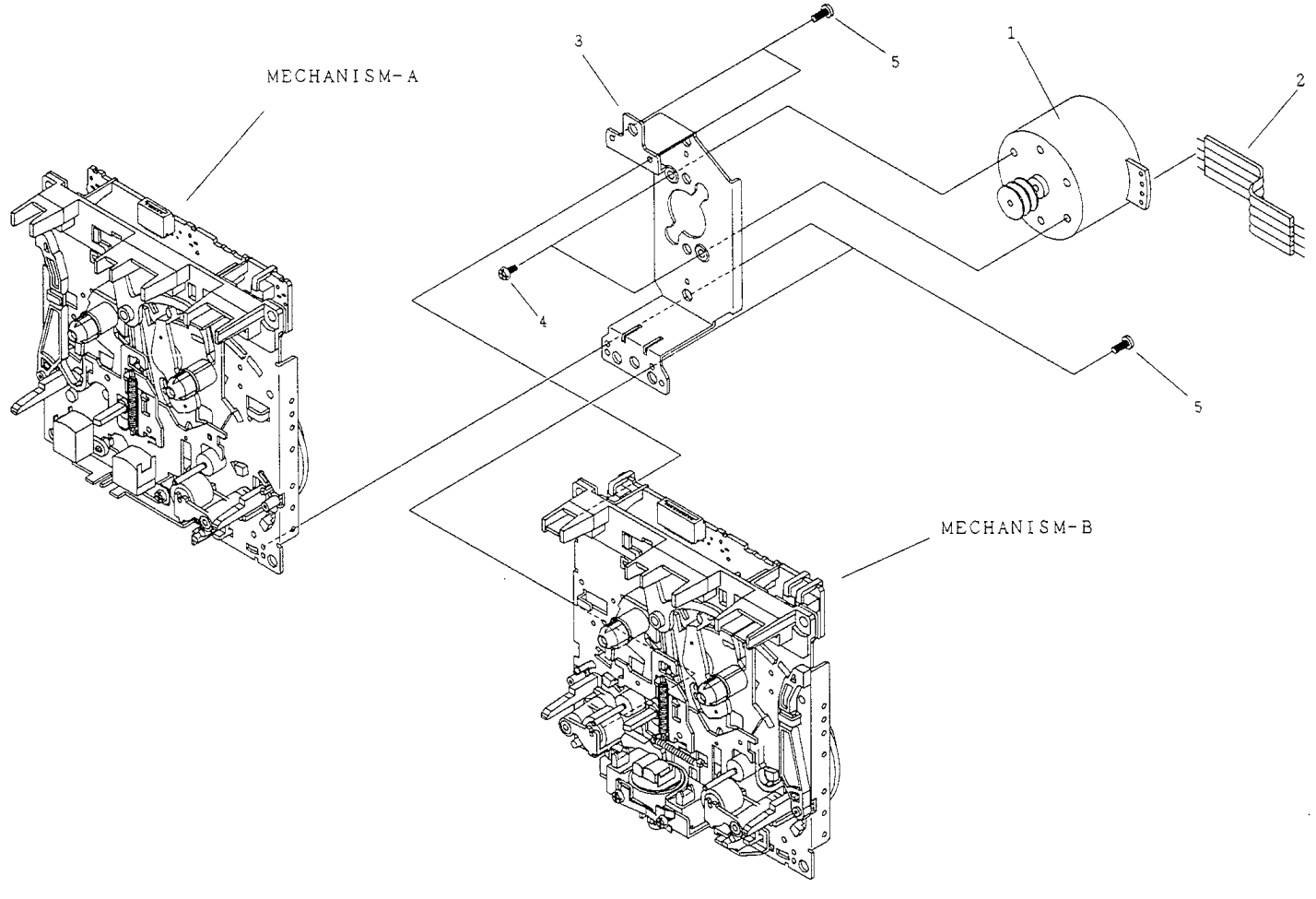
Note: Only the parts mentioned in this list are normal service spare parts.

9-9

TAPE MECHANISM A & B EXPLODED VIEW

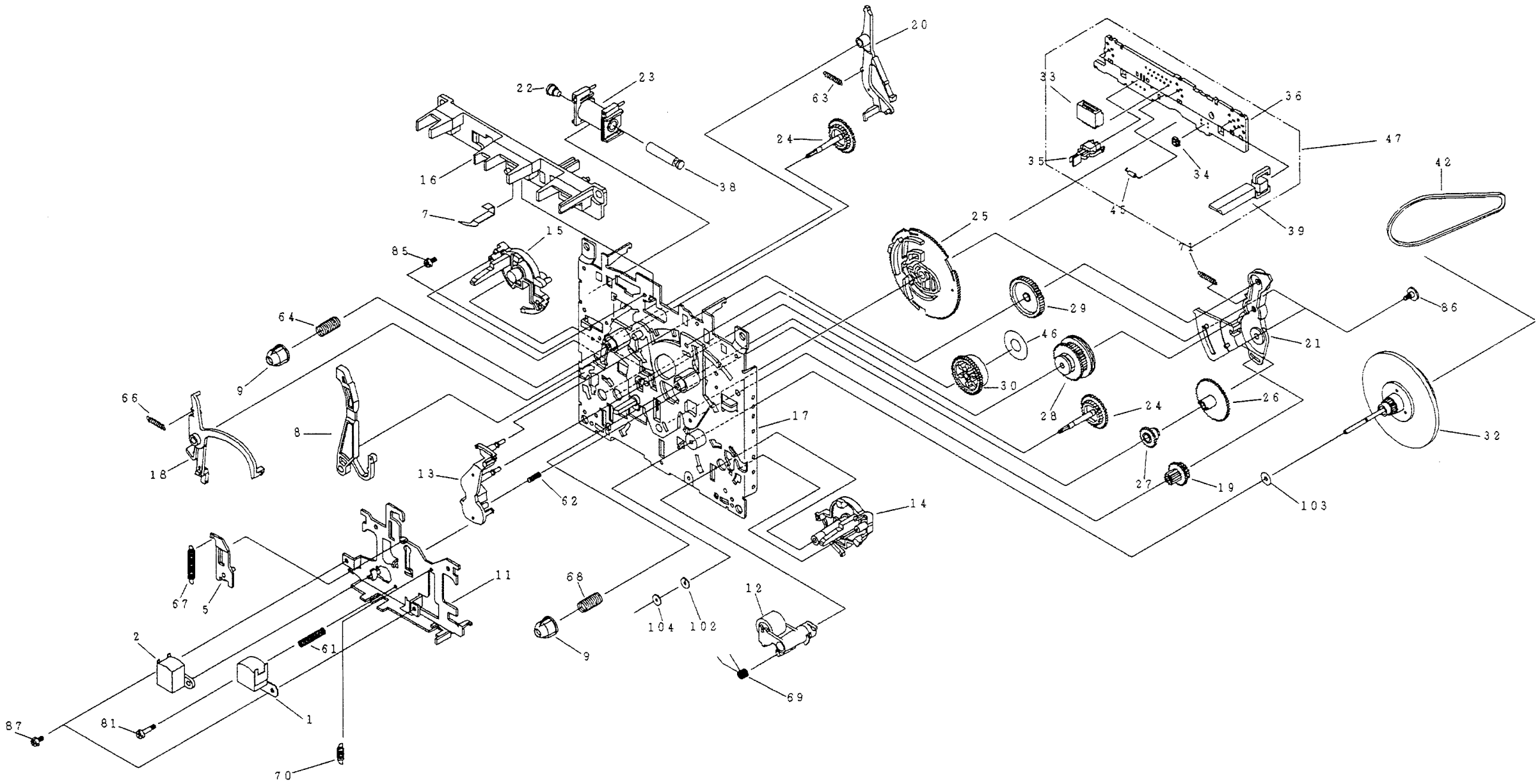
1	4822 361 10841	Motor Assembly
4	-	Screw M2,6 x 4
5	-	Screw M2 x 3

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



9-10

TAPE MECHANISM A - PLAY



MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10397	MS15RAA2N1	45	4822 050 16801	680R 1% 0,4w
2	4822 249 30146	Dummy Head	69	4822 492 11542	Spring
12	4822 528 10974	Assembly Arm Pinch R	102	4822 532 12931	Washer
23	4822 281 11069	Solenoid	103	4822 532 12932	Washer
32	4822 528 11209	Assembly Flywheel RV	104	4822 532 12933	Washer
33	4822 265 11207	Connector Socket 6 pin			
34	4822 130 10205	Photo Sensor			
35	4822 276 13946	Mode Switch			
39	4822 278 90613	Leaf Switch			
42	4822 358 10168	Belt AF 40mm			

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

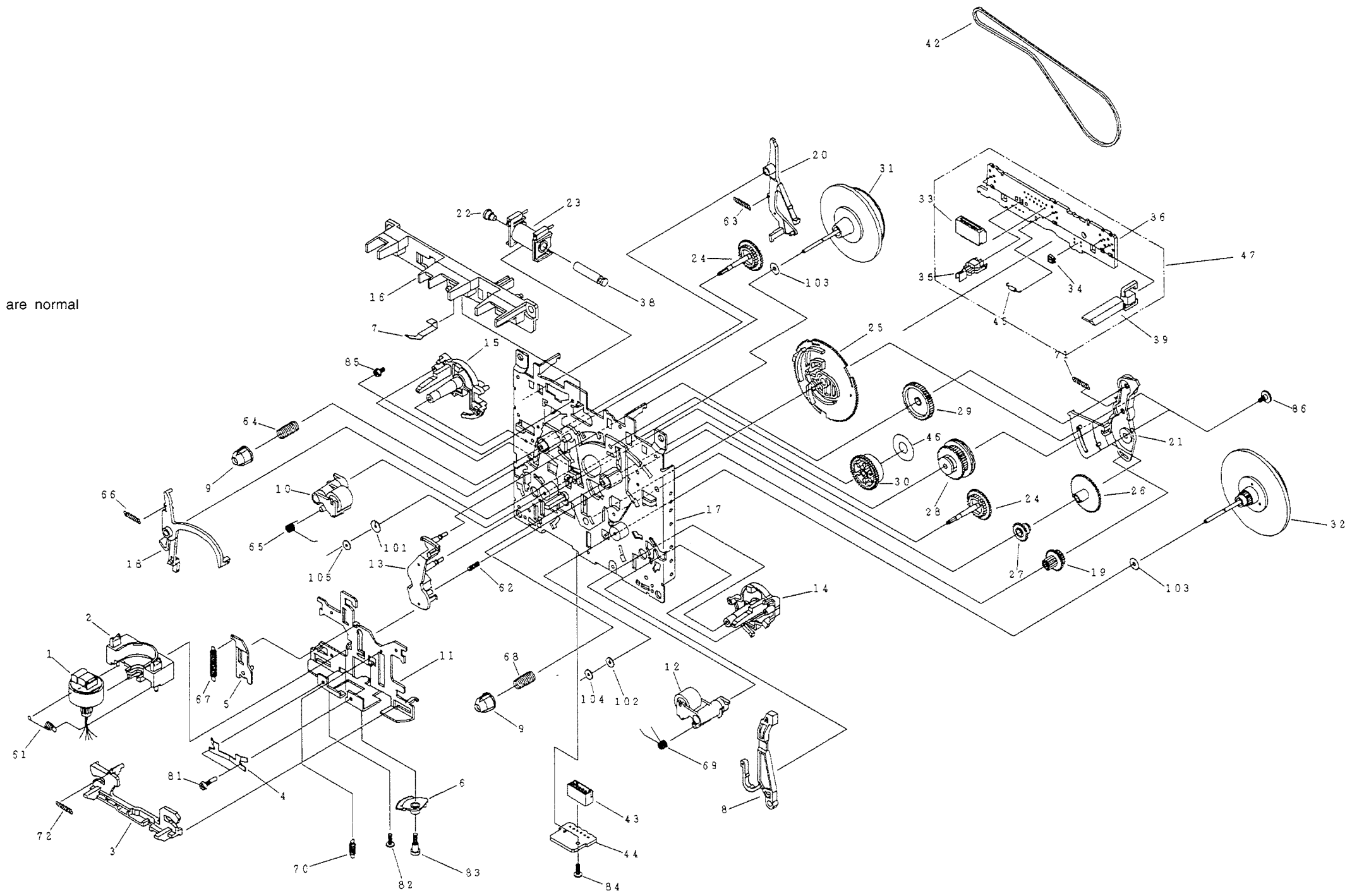
9-11

TAPE MECHANISM B - RECORD/PLAYBACK

MECHANICAL PARTS - PLAY MECHANISM

1	4822 249 10526	Record/Playback Head
10	4822 528 10975	Assembly Arm Pinch L
12	4822 528 10974	Assembly Arm Pinch R
23	4822 281 11069	Solenoid
31	4822 528 11211	Assembly Flywheel LV
32	4822 528 11209	Assembly Flywheel RV
33	4822 265 11208	Connector Socket 10 pin
34	4822 130 10205	Photo Sensor
35	4822 276 13946	Mode Switch
39	4822 278 90613	Leaf Switch
42	4822 358 10169	Belt
45	4822 050 16801	680R 1% 0,4w
65	4822 492 11546	Spring
69	4822 492 11542	Spring
101	4822 532 12934	Washer
102	4822 532 12931	Washer
103	4822 532 12932	Washer
104	4822 532 12933	Washer
105	4822 532 12935	Washer

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



9-12

ELECTRICAL PARTS LIST - ETF5 NON-DOLBY BOARD

ELECTRICAL PARTS LIST - ETF5 NON-DOLBY BOARD

MISCELLANEOUS

1740	4822 267 10729	Flex connector 10 pin
1750	4822 267 10731	Flex connector 6 pin

CAPACITORS

2621	5322 122 34123	1nF 10% 50V
2622	5322 122 34099	470pF 10% 63V
2623	5322 122 34099	470pF 10% 63V
2624	4822 126 13296	100nF 10% 16V
2625	4822 126 13296	100nF 10% 16V
2701	5322 122 33538	150pF 2% 63V
2702	5322 122 33538	150pF 2% 63V
2703	5322 122 32531	100pF 5% 50V
2704	5322 122 32531	100pF 5% 50V
2705	4822 122 33575	220pF 5% 50V
2706	4822 122 33575	220pF 5% 50V
2707	5322 122 34099	470pF 10% 63V
2708	5322 122 34099	470pF 10% 63V
2709	5322 122 31863	330pF 5% 50V
2710	5322 122 31863	330pF 5% 50V
2711	5322 122 32531	100pF 5% 50V
2712	5322 122 32531	100pF 5% 50V
2713	4822 124 41579	10µF 20% 50V
2714	4822 124 41579	10µF 20% 50V
2715	4822 124 40196	220µF 20% 16V
2716	4822 124 40196	220µF 20% 16V
2717	4822 122 33177	10nF 20% 50V
2718	4822 122 33177	10nF 20% 50V
2719	4822 126 12105	33nF 5% 63V
2720	4822 126 12105	33nF 5% 63V
2721	5322 122 31866	6,8nF 10% 63V
2722	5322 122 31866	6,8nF 10% 63V
2723	4822 126 13188	15nF 5% 63V
2724	4822 126 13188	15nF 5% 63V
2725	5322 126 10223	4,7nF 10% 63V
2726	5322 126 10223	4,7nF 10% 63V
2727	5322 122 34123	1nF 10% 50V
2728	5322 122 34123	1nF 10% 50V
2729	4822 122 32541	27nF 10% 63V
2730	4822 122 32541	27nF 10% 63V
2733	5322 122 34099	470pF 10% 63V
2734	5322 122 34099	470pF 10% 63V
2735	4822 126 13296	100nF 10% 16V
2737	4822 126 13296	100nF 10% 16V
2738	4822 126 13296	100nF 10% 16V
2741	4822 126 11585	22nF+80/- 20% 25V
2742	5322 122 32654	22nF 10% 63V
2743	5322 122 32654	22nF 10% 63V
2760	4822 126 13296	100nF 10% 16V
2761	4822 124 22263	220µF 20% 25V
2762	4822 124 40246	4,7µF 20% 63V
2763	4822 124 40433	47µF 20% 25V
2765	4822 124 40433	47µF 20% 25V
2769	5322 122 34099	470pF 10% 63V
2770	5322 122 34099	470pF 10% 63V
2780	4822 124 81151	22µF 50V
2781	4822 122 33177	10nF 20% 50V
2782	5322 126 10223	4,7nF 10% 63V
2784	4822 121 51305	15nF 10% 50V
2785	4822 124 40242	1µF 20% 63V
2786	5322 122 32531	100pF 5% 50V
2787	4822 126 12105	33nF 5% 63V

RESISTORS

3601	4822 117 11449	2k2 1% 0,1W
3602	4822 051 20273	27k 5% 0,1W
3603	4822 117 11449	2k2 1% 0,1W
3604	4822 051 20563	56k 5% 0,1W
3605	4822 117 11449	2k2 1% 0,1W
3606	4822 051 20124	120k 5% 0,1W
3607	4822 116 52256	2k2 5% 0,5W
3608	4822 051 20273	27k 5% 0,1W
3609	4822 116 52256	2k2 5% 0,5W
3610	4822 051 20124	120k 5% 0,1W
3611	4822 116 52256	2k2 5% 0,5W
3612	4822 051 20563	56k 5% 0,1W
3613	4822 051 20273	27k 5% 0,1W
3614	4822 051 20273	27k 5% 0,1W
3616	4822 117 10833	10k 1% 0,1W
3618	4822 051 20822	8k2 5% 0,1W
3620	5322 100 11542	Trimmer 4k7 30% 0,1W
3623	4822 051 20104	100k 5% 0,1W
3624	4822 051 20104	100k 5% 0,1W
3625	4822 051 10102	1k 2% 0,25W
3626	4822 051 10102	1k 2% 0,25W
3628	4822 051 20104	100k 5% 0,1W
3630	4822 051 20471	470R 5% 0,1W
3672	4822 051 20472	4k7 5% 0,1W
3674	4822 116 52283	4k7 5% 0,5W
3676	4822 117 10834	47k 1% 0,1W
3678	4822 117 10834	47k 1% 0,1W
3679	4822 117 10834	47k 1% 0,1W
3680	4822 117 10834	47k 1% 0,1W
3685	4822 116 52234	100k 5% 0,5W
3686	4822 051 20104	100k 5% 0,1W
3701	4822 117 11503	220R 1% 0.1W
3702	4822 117 11503	220R 1% 0.1W
3703	4822 117 11503	220R 1% 0.1W
3704	4822 117 11503	220R 1% 0.1W
3705	4822 117 11503	220R 1% 0.1W
3706	4822 117 11503	220R 1% 0.1W
3707	4822 051 20101	100R 5% 0,1W
3708	4822 051 20101	100R 5% 0,1W
3709	4822 051 20688	6R80 5% 0,1W
3710	4822 051 20688	6R80 5% 0,1W
3711	4822 051 20154	150k 5% 0,1W
3712	4822 051 20154	150k 5% 0,1W
3713	4822 051 20109	10R 5% 0,1W
3714	4822 051 20109	10R 5% 0,1W
3715	4822 051 20182	1k8 5% 0,1W
3716	4822 051 20182	1k8 5% 0,1W
3717	4822 117 11449	2k2 1% 0,1W
3718	4822 117 11449	2k2 1% 0,1W
3719	4822 051 20472	4k7 5% 0,1W
3720	4822 051 20472	4k7 5% 0,1W
3721	4822 051 20562	5k6 5% 0,1W
3722	4822 051 20562	5k6 5% 0,1W
3723	4822 117 11383	12k 1% 0,1W
3724	4822 117 11383	12k 1% 0,1W
3725	4822 051 20109	10R 5% 0,1W
3726	4822 051 20109	10R 5% 0,1W
3727	4822 051 20562	5k6 5% 0,1W
3728	4822 051 20562	5k6 5% 0,1W
3729	4822 117 12955	2k7 1% 0,1W
3730	4822 117 12955	2k7 1% 0,1W
3731	4822 117 11507	6k8 1% 0,1W
3732	4822 117 11507	6k8 1% 0,1W
3733	4822 051 10102	1k 2% 0,25W
3734	4822 051 10102	1k 2% 0,25W
3735	4822 051 20223	22k 5% 0,1W
3736	4822 051 20223	22k 5% 0,1W
3741	4822 117 11449	2k2 1% 0,1W
3742	4822 117 11449	2k2 1% 0,1W
3743	4822 051 20122	1k2 5% 0,1W
3744	4822 051 20122	1k2 5% 0,1W
3745	4822 051 20332	3k3 5% 0,1W
3746	4822 051 20332	3k3 5% 0,1W
3748	4822 117 11449	2k2 1% 0,1W
3749	4822 117 10834	47k 1% 0,1W
3751	4822 117 10833	10k 1% 0,1W
3752	4822 051 20104	100k 5% 0,1W
3753	4822 051 20104	100k 5% 0,1W
3754	4822 051 20105	1M 5% 0,1W
3755	4822 051 20105	1M 5% 0,1W
3756	4822 051 20224	220k 5% 0,1W
3757	4822 051 20224	220k 5% 0,1W
3758	4822 117 10833	10k 1% 0,1W
3759	4822 117 10833	10k 1% 0,1W
3760	4822 051 20121	120R 5% 0,1W
3761	4822 116 83864	10k 5% 0,5W
3762	4822 117 11454	820R 1% 0,1W
3763	4822 051 20154	150k 5% 0,1W
3764	4822 116 83872	220R 5% 0,5W
3765	4822 051 20393	39k 5% 0,1W
3766	4822 051 20475	4M7 5% 0,1W
3767	4822 051 20475	4M7 5% 0,1W
3768	4822 117 10833	10k 1% 0,1W
3769	4822 117 11507	6k8 1% 0,1W
3770	4822 117 11139	1k5 1% 0,1W
3771	4822 051 20122	1k2 5% 0,1W
3772	4822 051 20822	8k2 5% 0,1W
3773	5322 100 11542	Trimmer 4k7 30% 0,1W
3774	4822 051 20822	8k2 5% 0,1W
3775	4822 051 20478	4R7 5% 0,1W
3776	4822 117 11507	6k8 1% 0,1W
3777	4822 117 10353	150R 1% 0,1W
3778	4822 052 10688 ⚠	6R8 5% 0,33W
3779	4822 051 20334	330k 5% 0,1W
3780	4822 051 20105	1M 5% 0,1W
3781	4822 051 20475	4M7 5% 0,1W
3784	4822 051 10102	1k 2% 0,25W
3786	4822 051 20223	22k 5% 0,1W
3787	4822 051 20105	1M 5% 0,1W
3788	4822 051 20105	1M 5% 0,1W
3789	4822 117 10834	47k 1% 0,1W
4701	4822 051 20008	0R Jumper 0805
4702	4822 051 20008	0R Jumper 0805
4703	4822 051 20008	0R Jumper 0805
4704	4822 051 20008	0R Jumper 0805
4705	4822 051 20008	0R Jumper 0805
4706	4822 051 20008	0R Jumper 0805
4707	4822 051 20008	0R Jumper 0805
4708	4822 051 20008	0R Jumper 0805
4709	4822 051 20008	0R Jumper 0805
4710	4822 051 20008	0R Jumper 0805
4711	4822 051 20008	0R Jumper 0805
4712	4822 051 20008	0R Jumper 0805
4713	4822 051 20008	0R Jumper 0805
4714	4822 051 20008	0R Jumper 0805
4715	4822 051 20008	0R Jumper 0805
4716	4822 051 20008	0R Jumper 0805
4717	4822 051 20008	0R Jumper 0805
4718	4822 051 20008	0R Jumper 0805
4719	4822 051 20008	0R Jumper 0805
4720	4822 051 20008	0R Jumper 0805
4721	4822 051 20008	0R Jumper 0805
4722	4822 051 20008	0R Jumper 0805
4723	4822 051 20008	0R Jumper 0805
4724	4822 051 20008	0R Jumper 0805
4725	4822 051 20008	0R Jumper 0805
4726	4822 051 20008	0R Jumper 0805
4727	4822 051 20008	0R Jumper 0805
4728	4822 051 20008	0R Jumper 0805
4729	4822 051 20008	0R Jumper 0805
4730	4822 051 20008	0R Jumper 0805
4731	4822 051 20008	0R Jumper 0805
4732	4822 051 20008	0R Jumper 0805
4733	4822 051 20008	0R Jumper 0805
4734	4822 051 20008	0R Jumper 0805

ELECTRICAL PARTS LIST - ETF5 NON-DOLBY BOARD

RESISTORS

4735	4822 051 20008	0R Jumper 0805
4736	4822 051 20008	0R Jumper 0805
4737	4822 051 20008	0R Jumper 0805
4738	4822 051 20008	0R Jumper 0805
4739	4822 051 20008	0R Jumper 0805
4740	4822 051 20008	0R Jumper 0805
4781	4822 051 20008	0R Jumper 0805
4790	4822 051 20008	0R Jumper 0805
4794	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5701	4822 156 21721	Fixed Inductor 2µ2 10%
5703	4822 156 20946	Osc Coil 100kHz

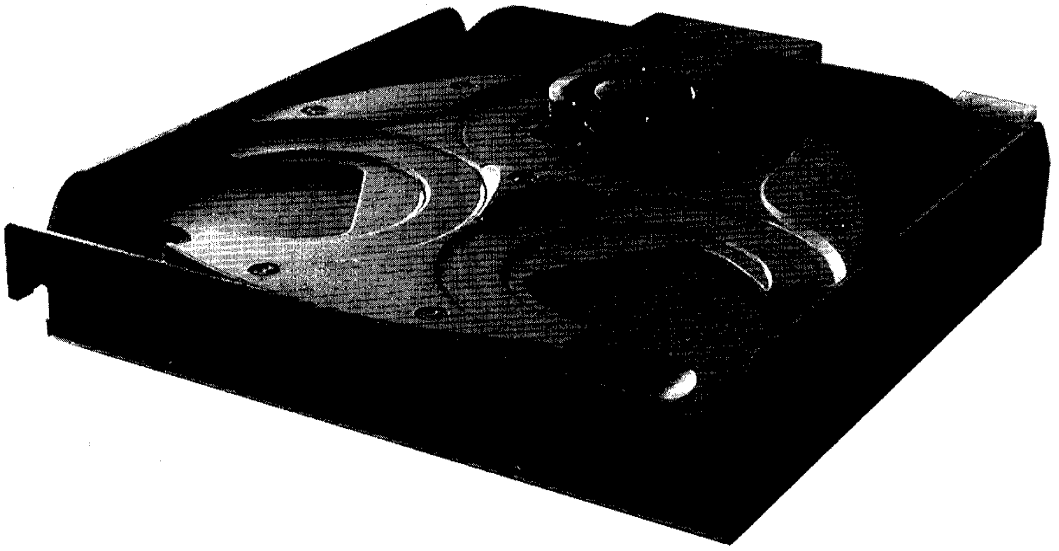
DIODES

6611	4822 130 31878	1N4003G
6612	4822 130 31878	1N4003G
6614	4822 130 30621	1N4148
6770	4822 130 30621	1N4148
6771	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
6773	4822 130 30621	1N4148
6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-B8V2
6778	4822 130 30621	1N4148
6782	4822 130 30621	1N4148
6785	4822 130 30621	1N4148
6786	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7610	5322 209 11306	HEF4094BT
7612	5322 130 60845	BC807-25
7613	5322 130 60845	BC807-25
7614	5322 130 60845	BC807-25
7616	5322 130 60508	BC857B
7618	4822 130 60511	BC847B
7619	4822 130 60511	BC847B
7620	4822 130 60511	BC847B
7622	4822 130 60511	BC847B
7623	4822 130 60511	BC847B
7624	4822 130 60511	BC847B
7710	4822 209 32919	HEF4952BT
7720	4822 209 32918	AN7318S
7730	4822 209 32919	HEF4952BT
7740	4822 209 32919	HEF4952BT
7780	4822 130 60511	BC847B
7781	4822 130 60511	BC847B
7782	4822 130 44568	BC557B
7783	4822 130 60511	BC847B
7784	5322 130 60508	BC857B
7786	4822 130 63494	J111
7787	4822 130 60511	BC847B
7791	4822 130 60511	BC847B
7792	4822 130 60511	BC847B

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



3CDC Module

(3 Disc Carrousel Changer)

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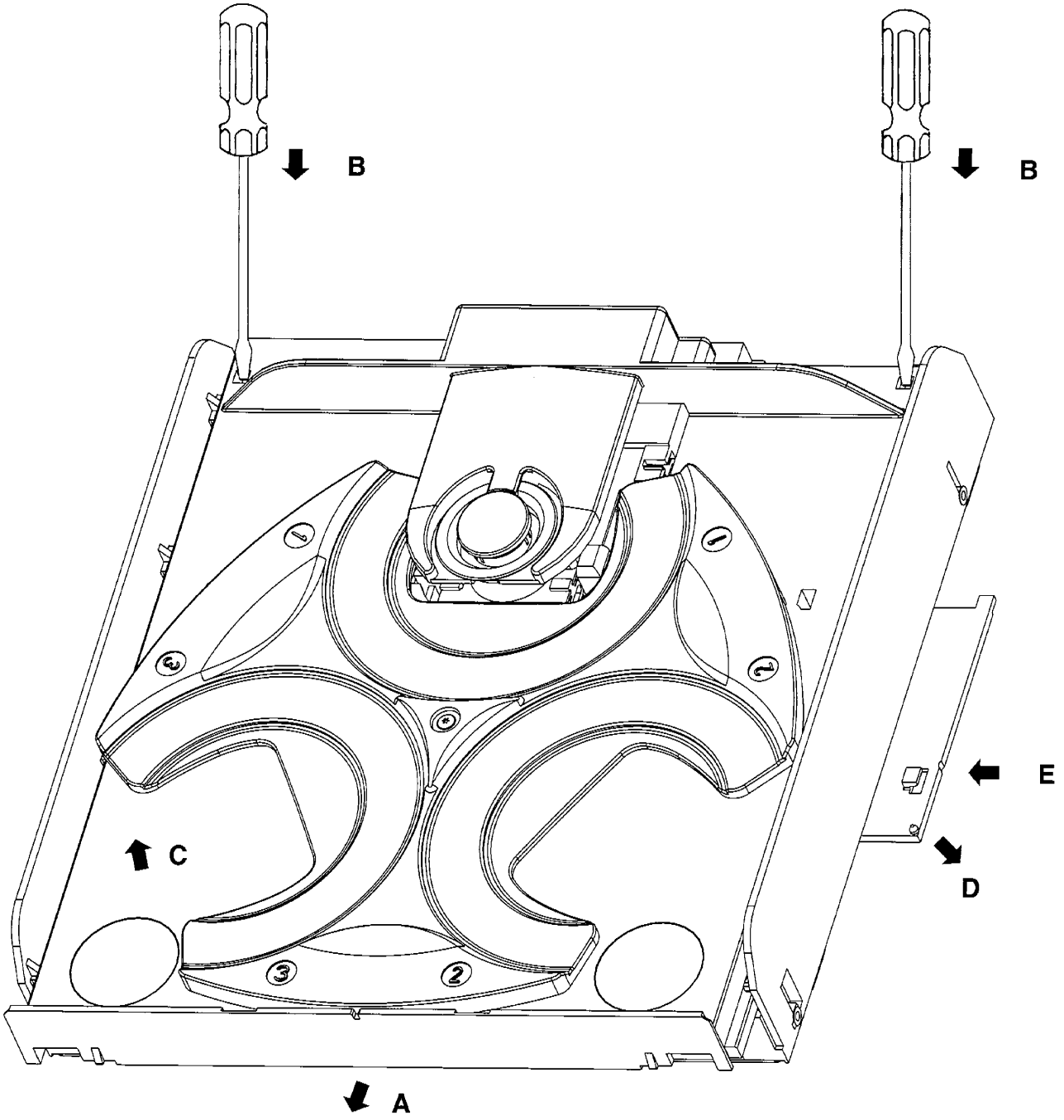
Demounting Hints



Demounting of Drawer

→ **A** Pull drawer outwards
→ **B** Unlock drawer with screwdriver
→ **C** Lift drawer to demount from chassis

Demounting of Flex Plate

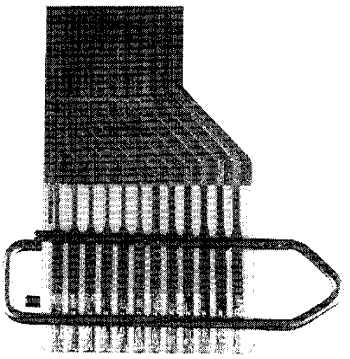
→ **D** Lift plate to unlock pin from bottom plate
→ **E** Move plate inwards to demount from bottom plate

Servicing Hints

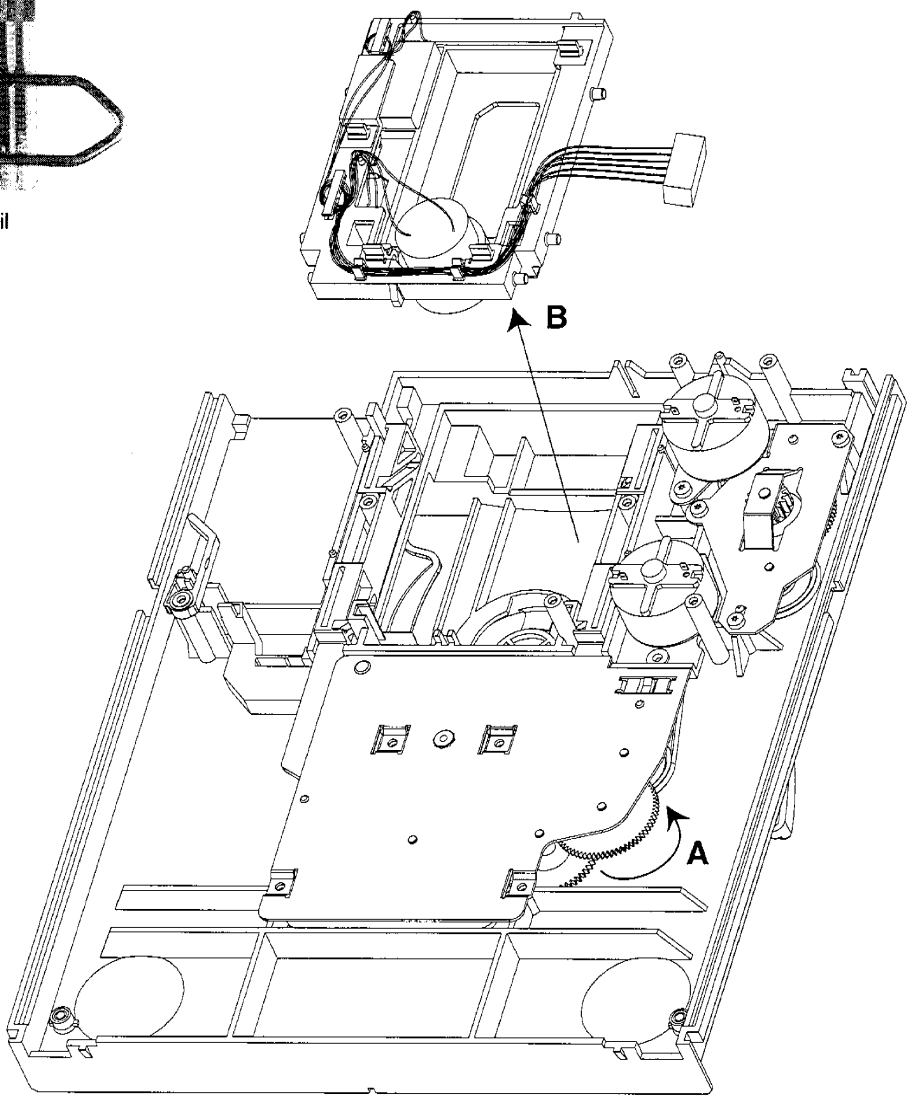
Replacement of CD Drive

See also exploded view of changer mechanism.

1. Demount flex plate (pos 140).
2. Demount printed circuit board: remove 6 screws and desolder lips of tray motor and carrousel motor.
3. Disconnect flexfoil and JST connector of CD drive from Printed circuit board. Shortcircuit the flexfoil with a paperclip to protect the laser against ESD.
4. Remove 2 screws (pos 107,108) and demount CD drive lockings (pos 105,106).
5. Turn gearwheel (pos 42) of disc change mechanism by finger to move CD drive support in upper position as shown in picture below Ⓐ.
6. Demount CD drive support (pos 95) Ⓑ.
7. Replace CD drive (pos 100). The wire tree of JST connector has to be desoldered and resoldered on the new CD drive again.



CD drive flex foil

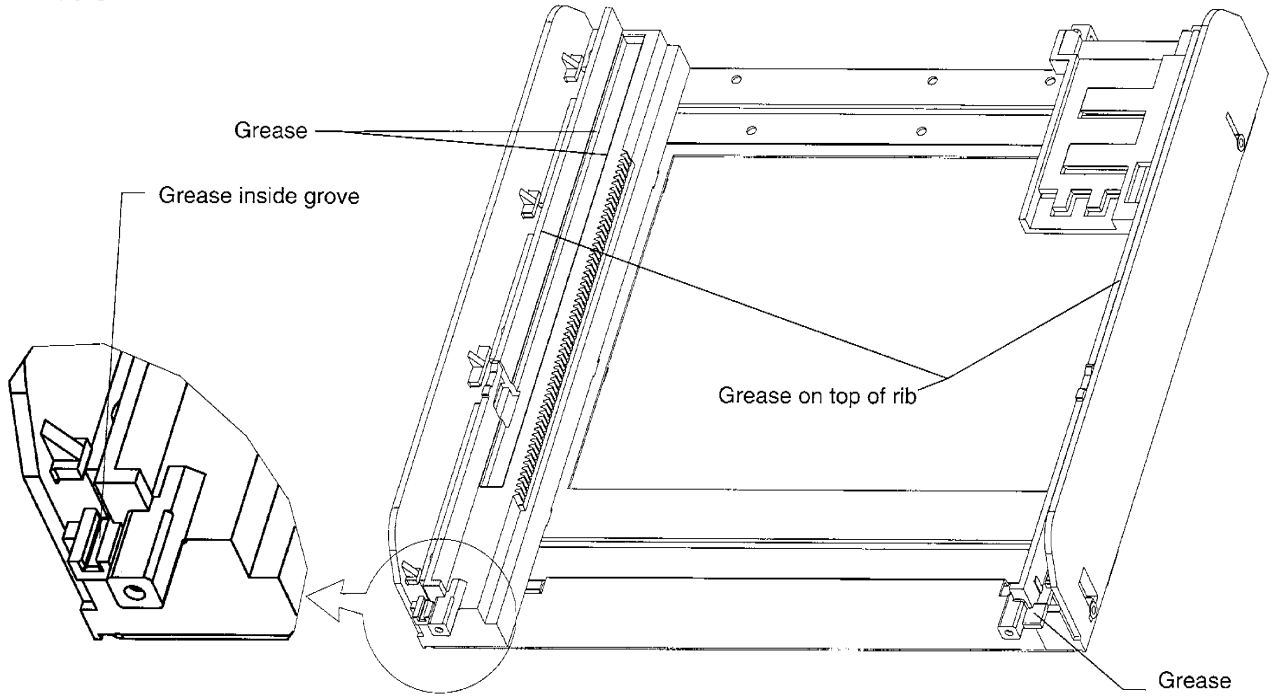


Mounting of Carrousel

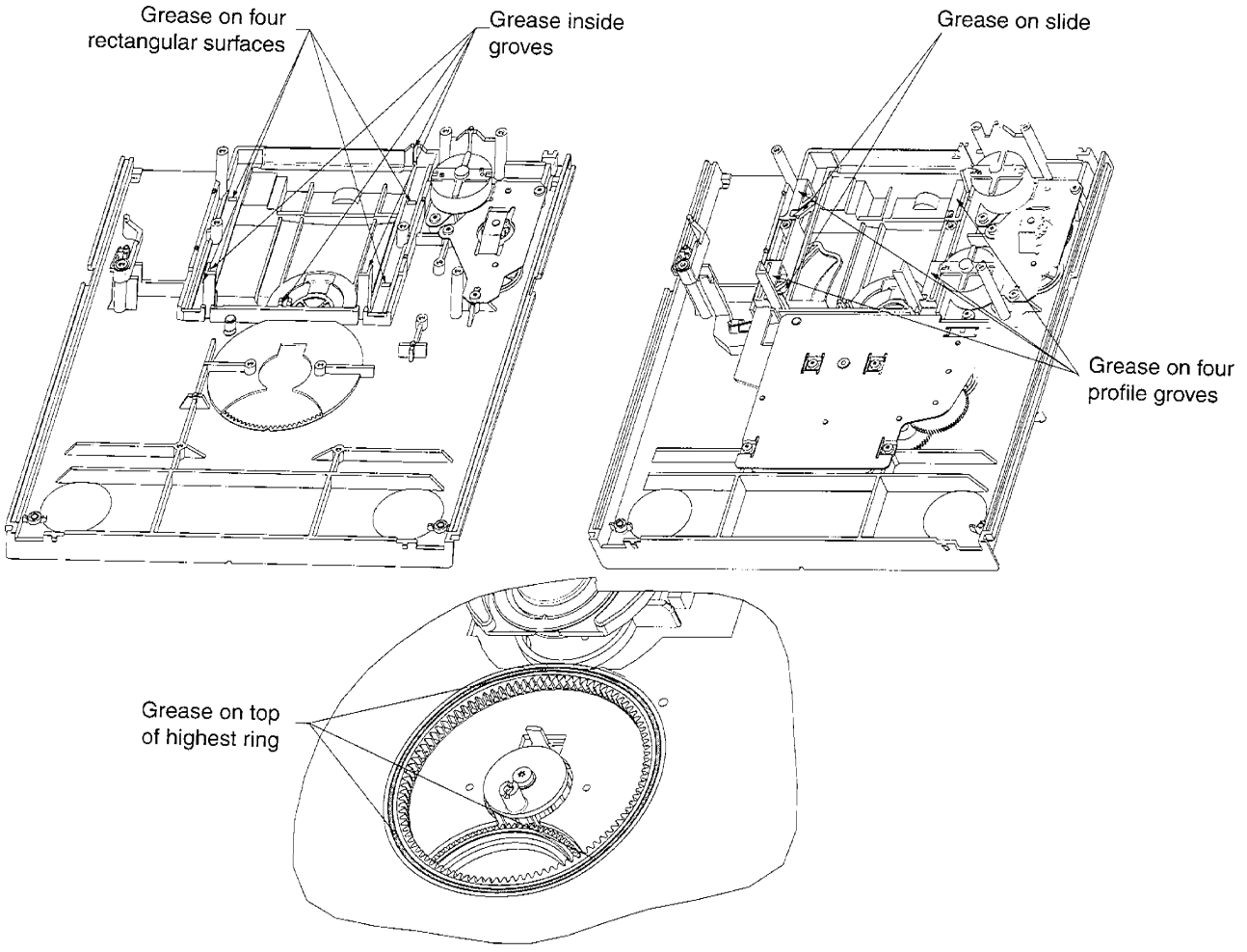
1. Turn gearwheel (pos 42) of disc change mechanism by finger until CD drive is in play position.
2. Mount carrousel (pos 115) so that disc is positioned right on turntable. Carrousel position number doesn´t matter.

Lubrication Instructions

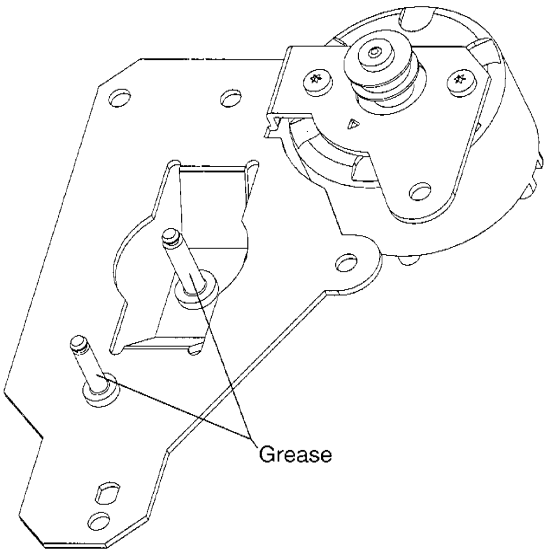
CHASSIS



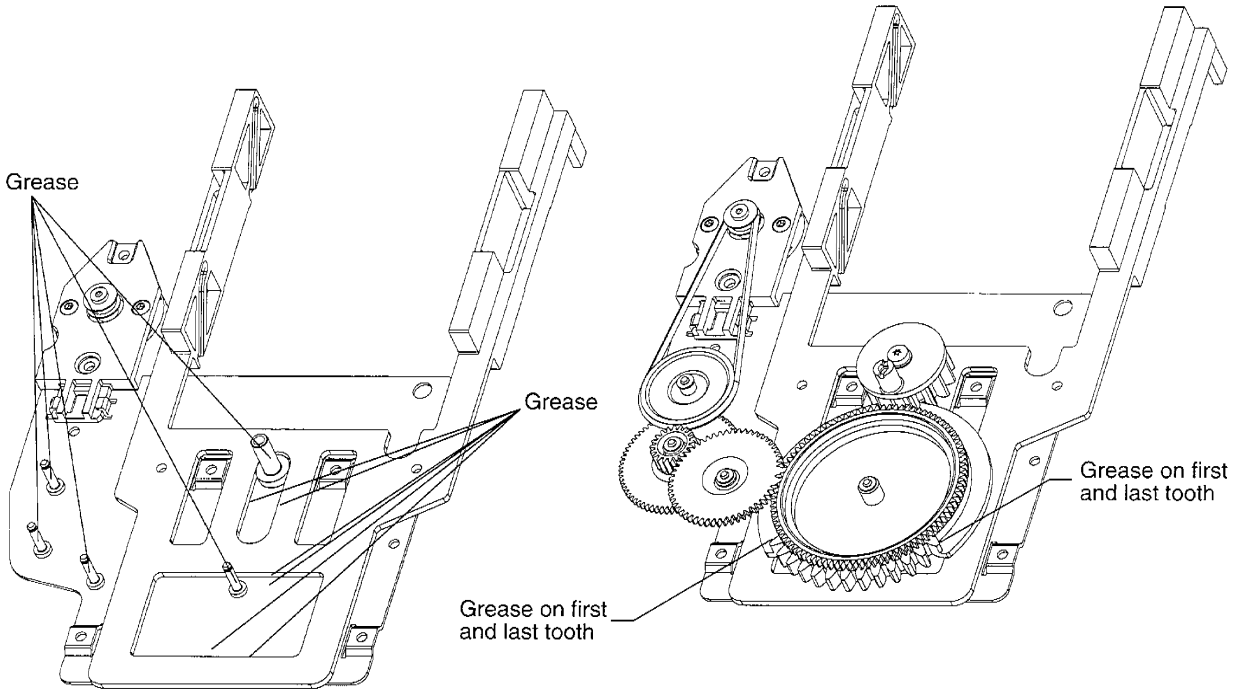
DRAWER



DRAWER MECHANISM



DISC CHANGE MECHANISM



Use only grease **Polylub GLY 801** service codenumber 4822 390 10136

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 CDM mechanism:
1. Disconnect old CD drive flexfoil from printed board
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil (fig.1)
3. Short-circuit printed board with **brass-sheet (4822 321 11197)** plugged into the flexfoil connector (fig.2)
4. Remove old CD drive mechanism
5. Position new CD mechanism in its studs
6. Remove short-circuit from printed board connector
7. Remove short-circuit from flexfoil of new CD drive
8. Connect new flexfoil to print connector (fig.3)

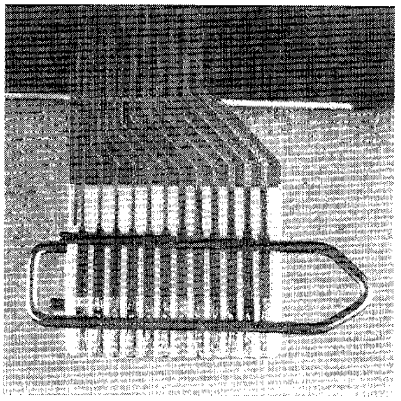


fig.1

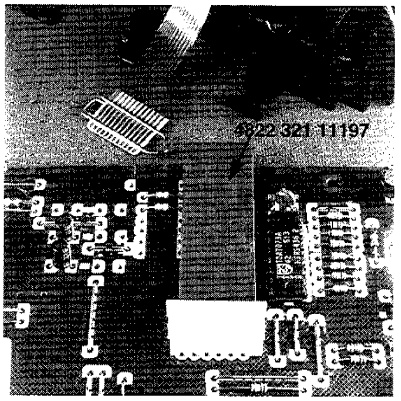


fig.2

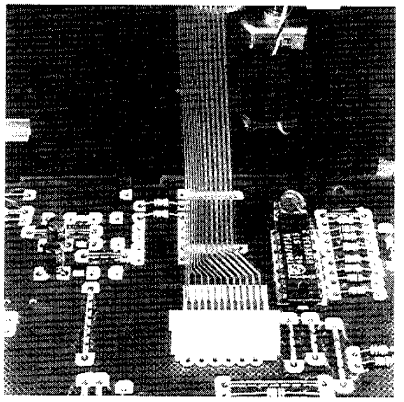
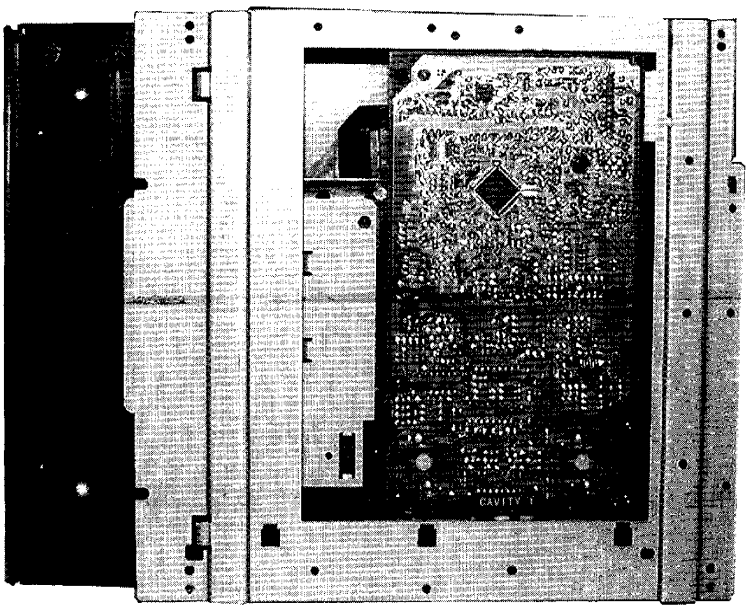


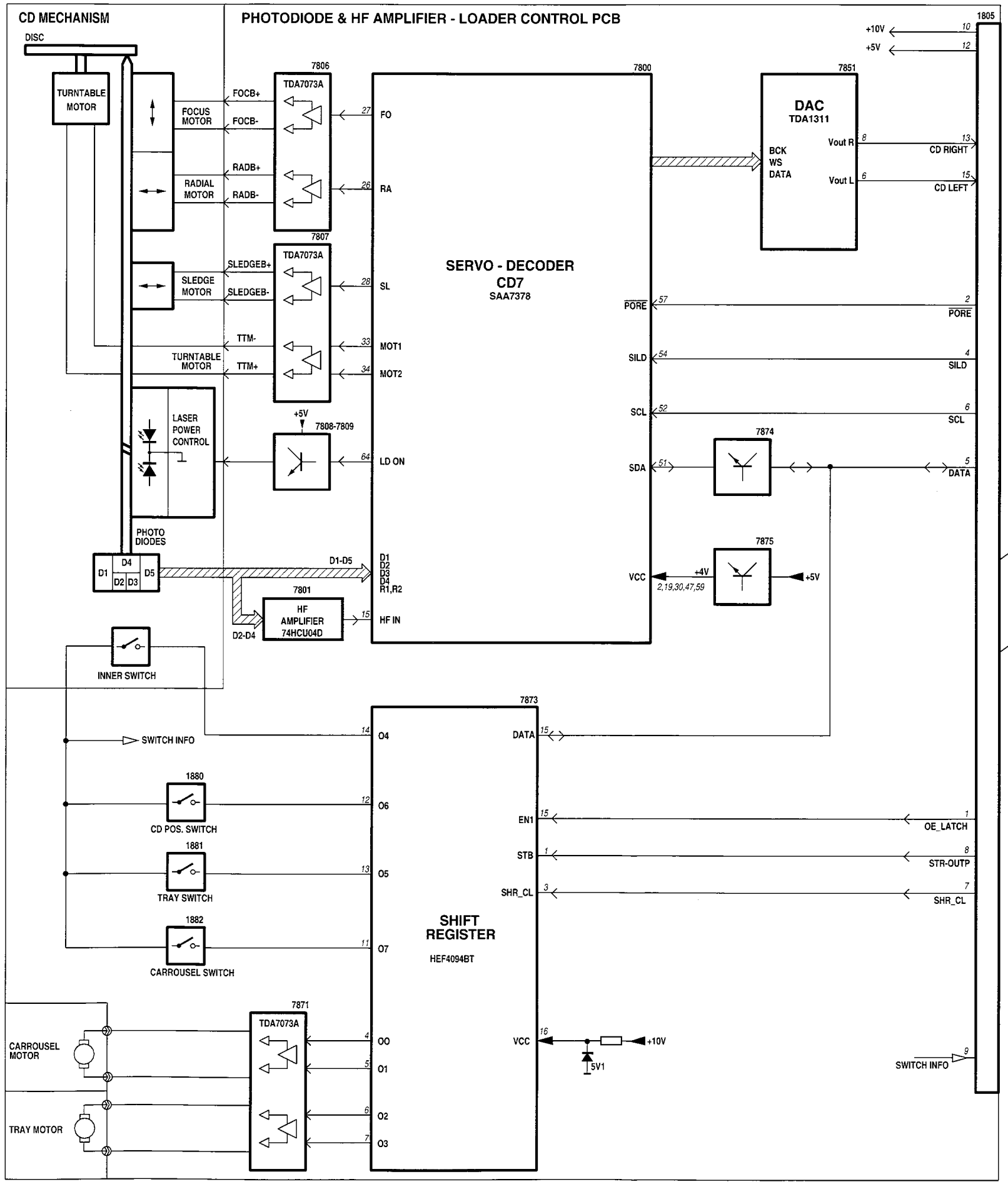
fig.3

Service Position



10-7

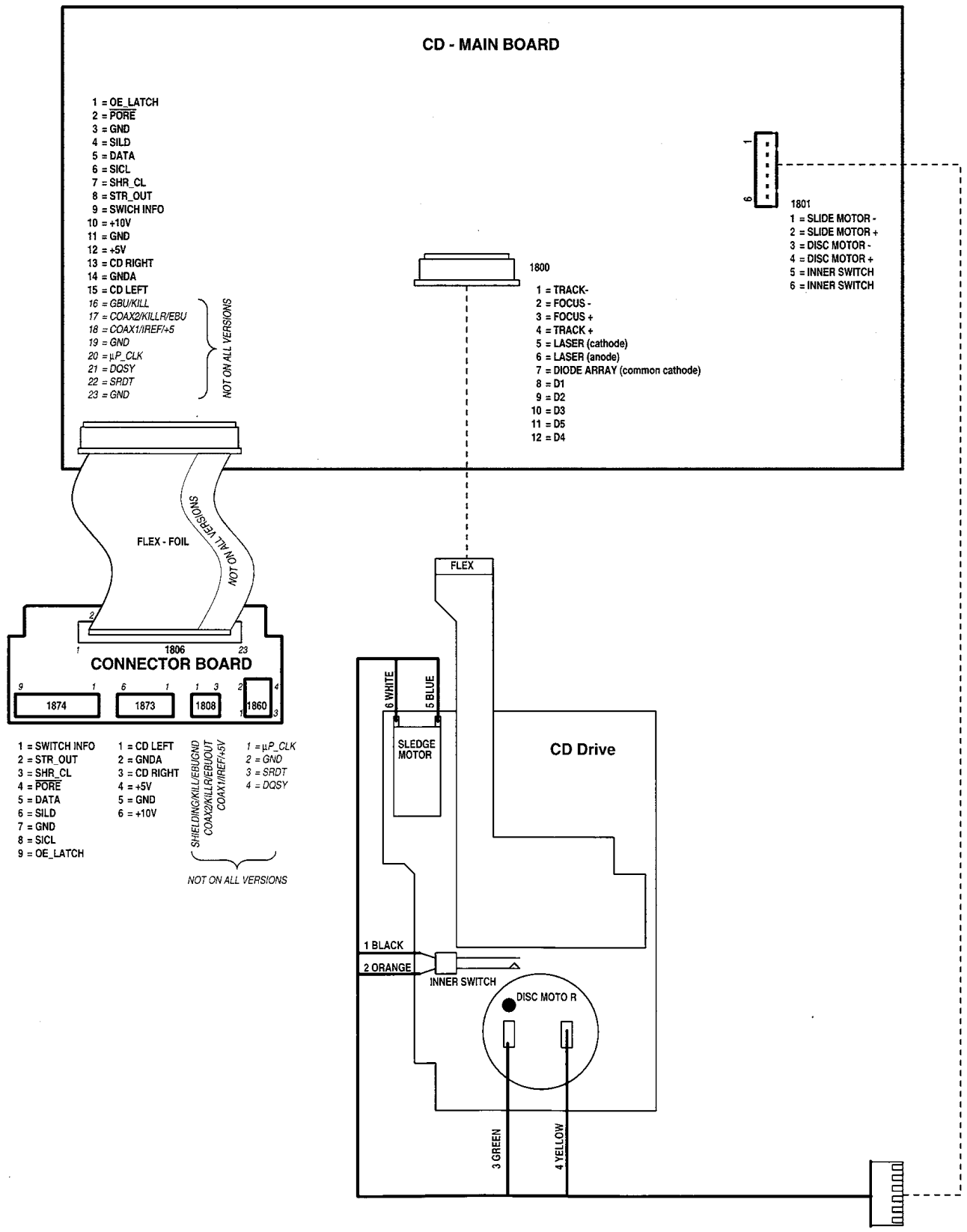
Blockdiagram



NOT ON ALL VERSIONS

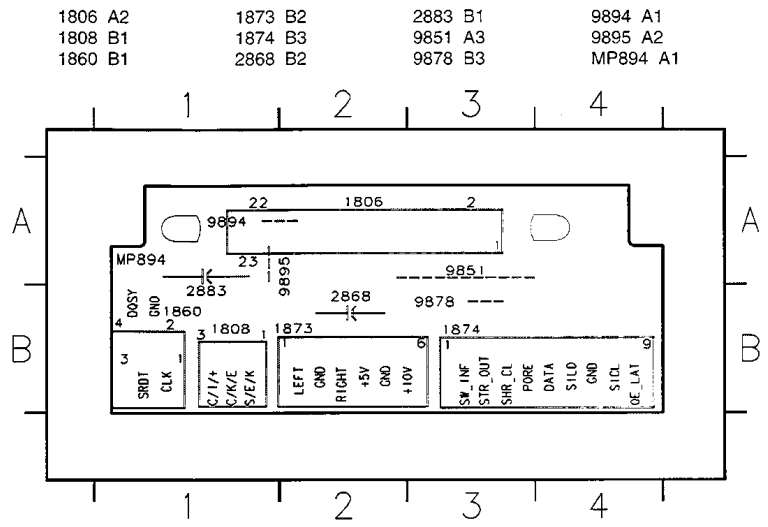
For sets without this board flexfoil 8002 is connected directly.

Wiring diagram

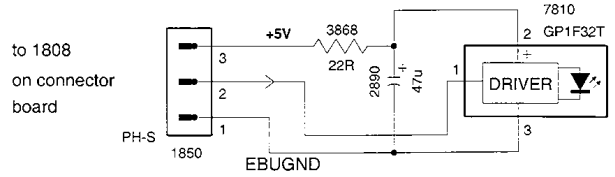


Remarks

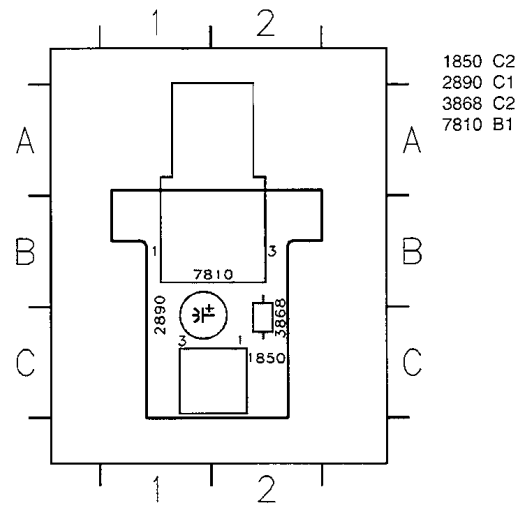
Connector Board Copperside view



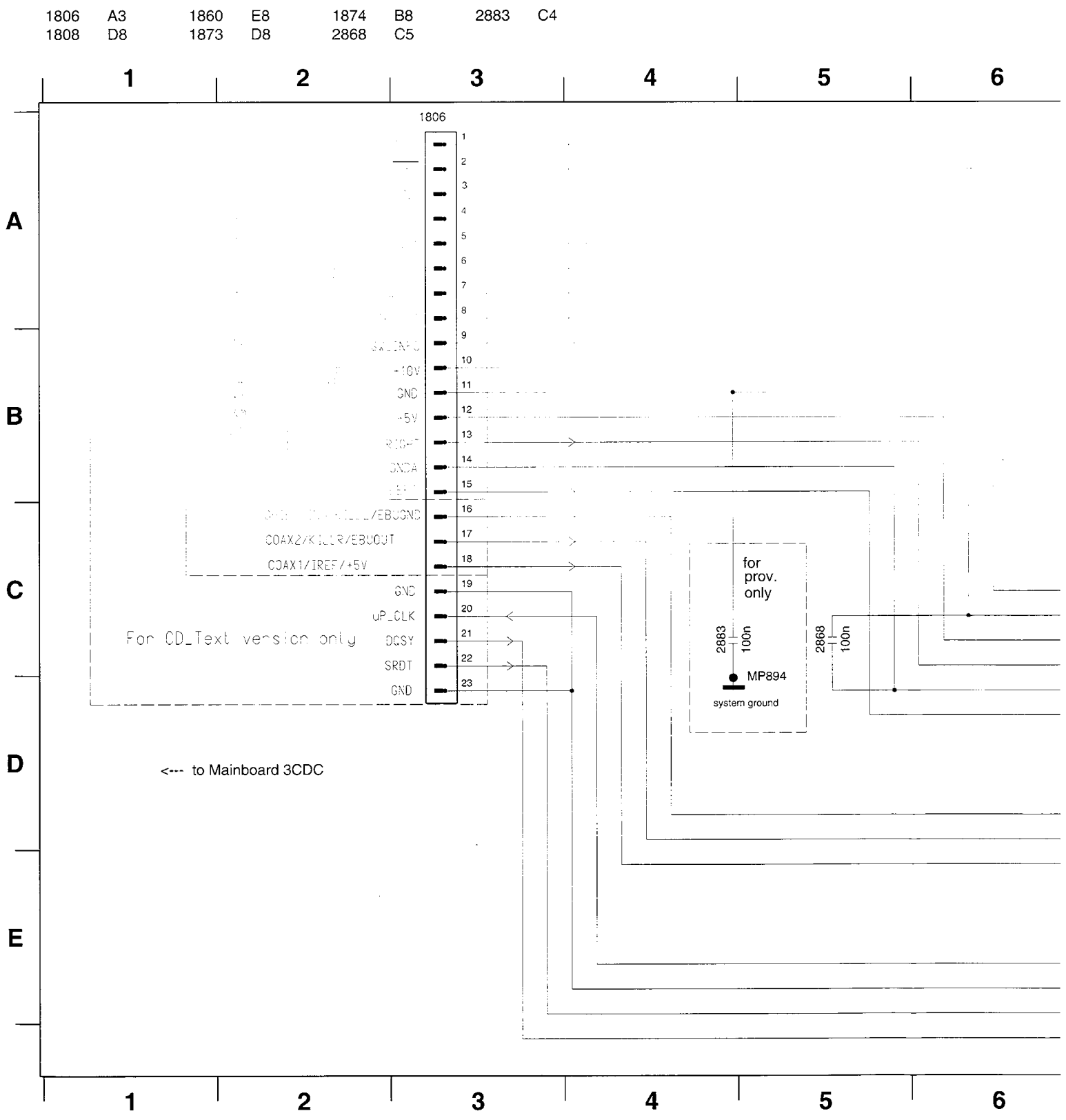
Circuit Diagram Optical out



Component Layout Optical out



Circuit diagram Connector Board



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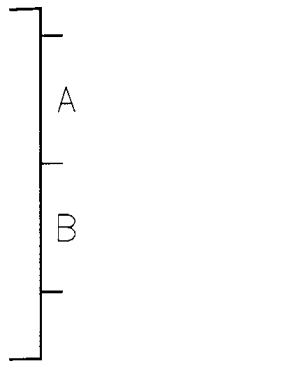
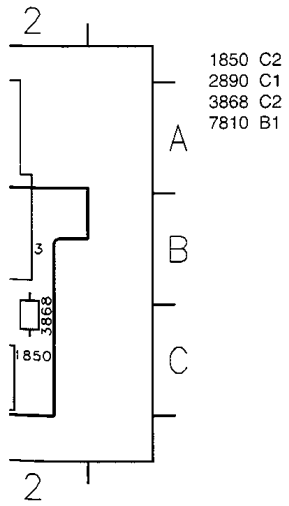
Circuit diagram Connector Board

1806 A3
1808 D8
1860 E8
1873 D8
1874 B8
2868 C5
2883 C4



ptical out

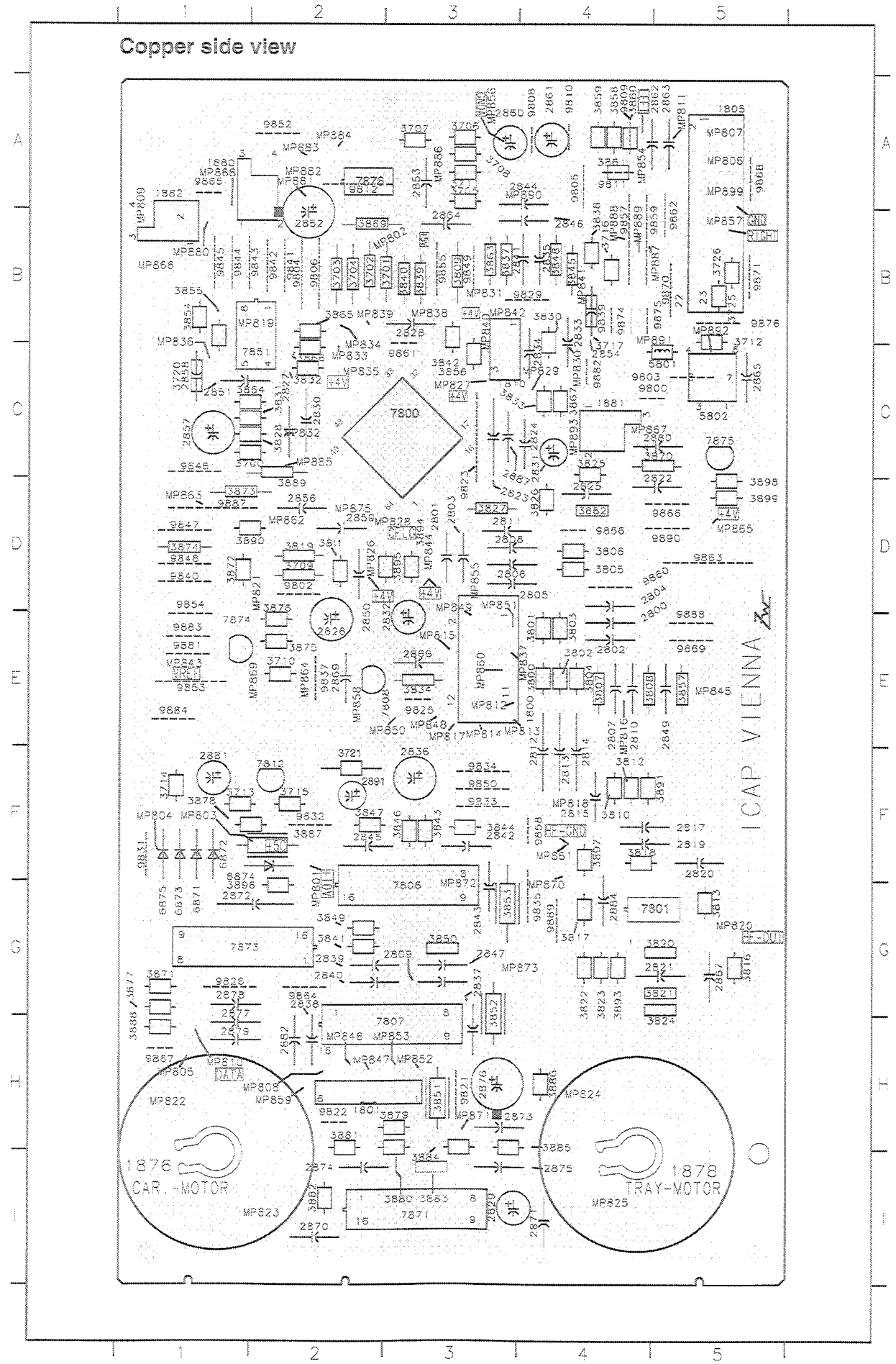


1850 C2
2890 C1
3868 C2
7810 B1

1806
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
GND
uP_CLK
DQSY
SRDT
GND
For CD_Text version only
<--- to Mainboard 3CDC
for prov. only
2883 100n
2868 100n
MP894
system ground
1874
SXXB-EH-A
CE_LATCH
SCL
GND
SDA
DATA
PORE
SHR_CL
STR_OUT
SW_INFO
to frontboard of set
1873
SXXB-EH-A
+10V
GND
+5V
RIGHT
GNDA
LEFT
to A/F board of set
1808
PH-S
SHIELDING/KILLL/EBUGND
COAX2/KILLR/EBUOUT
COAX1/IREF/+5V
1860
FFC
uP_CLK
GND
SRDT
DQSY
to frontboard

NOT ON ALL VERSIONS

Copper side view



1800	E3	2869	E2	3841	G2	7874	E1
1801	H2	2870	I2	3842	B3	7875	C5
1805	B5	2871	I4	3843	F3	9800	C4
1810	C3	2872	G2	3844	F3	9802	D2
1876	I1	2873	H3	3845	B4	9803	C5
1878	I4	2874	I2	3846	F3	9804	B2
1880	B2	2875	I3	3847	F2	9805	A4
1881	C4	2876	H3	3848	B4	9806	B2
1882	B1	2877	G1	3849	G2	9808	A4
2800	D4	2878	G1	3850	G3	9809	A4
2801	D3	2879	H1	3851	H3	9810	A4
2802	E4	2880	C5	3852	G3	9811	A4
2803	D3	2881	F1	3853	G3	9812	A2
2804	D4	2882	H2	3854	B1	9821	H3
2805	D3	2884	G4	3855	B1	9822	H2
2806	D3	2887	C3	3856	C3	9823	C3
2807	E4	3700	C1	3857	E5	9825	E3
2808	D3	3701	B3	3858	A4	9826	G1
2809	G3	3702	B2	3859	A4	9829	B4
2810	E4	3703	B2	3860	A4	9831	F1
2811	D3	3704	B2	3861	A4	9832	F2
2812	F4	3705	A3	3862	D4	9833	F3
2813	F4	3706	A3	3863	B3	9834	F3
2814	F4	3707	A3	3864	C1	9835	G4
2815	F4	3708	A3	3865	B2	9837	E2
2817	F4	3709	D2	3866	C2	9839	B4
2819	F4	3710	E2	3867	C4	9840	D1
2820	F5	3711	A3	3869	B2	9841	B2
2821	G5	3712	B5	3870	C5	9842	B2
2822	D5	3713	F1	3871	G1	9843	B2
2823	C3	3714	F1	3872	D1	9844	B1
2824	C4	3715	F2	3873	D1	9845	B1
2825	D4	3716	B4	3874	D1	9846	C1
2826	D2	3717	B4	3875	E2	9847	D1
2827	C2	3720	C1	3876	E2	9848	D1
2828	B3	3725	B5	3877	G1	9849	B3
2829	I3	3726	B5	3878	F2	9850	F3
2830	C2	3800	E4	3879	H3	9852	A2
2831	C4	3801	E4	3880	H3	9853	E1
2832	E3	3802	E4	3881	H2	9854	D1
2833	B4	3803	E4	3882	I2	9855	B3
2834	C3	3804	E4	3883	I3	9856	D4
2835	B4	3805	D4	3884	H3	9857	B4
2836	F3	3806	D4	3885	H3	9858	F4
2837	H3	3807	E4	3886	H4	9859	B4
2838	H2	3808	E4	3887	F2	9860	D4
2839	G2	3809	B3	3888	H1	9861	B3
2840	G2	3810	F4	3889	C2	9862	B5
2841	B3	3811	D2	3890	D1	9863	D5
2842	F3	3812	F4	3891	F4	9864	G2
2843	G3	3813	G5	3893	G4	9865	A1
2844	B4	3816	G5	3894	D3	9866	D5
2845	F2	3817	G4	3895	D3	9867	H1
2846	B4	3818	F4	3896	G2	9868	A5
2847	G3	3819	D2	3897	F4	9869	E5
2849	E5	3820	G5	3898	D5	9870	B5
2850	D2	3821	G5	3899	D5	9871	B5
2851	C1	3822	G4	5801	B5	9874	B4
2852	A2	3823	G4	5802	C5	9875	B4
2853	A3	3824	G5	6871	F1	9876	B5
2854	B4	3825	C4	6872	F1	9881	E1
2856	D2	3826	D4	6873	F1	9882	C4
2857	C1	3827	D3	6874	F2	9883	E1
2858	C1	3828	C1	6875	F1	9884	E1
2859	D2	3830	B4	7800	C2	9887	D1
2860	A3	3831	C1	7801	G4	9888	E5
2861	A4	3832	C2	7806	G3	9889	G4
2862	A4	3833	C4	7807	H3	9890	D5
2863	A5	3834	E3	7808	E2		
2864	B3	3837	B3	7812	F2		
2865	C5	3838	B4	7851	B2		
2866	E3	3839	B3	7871	I3		
2867	G5	3840	B3	7873	G1		

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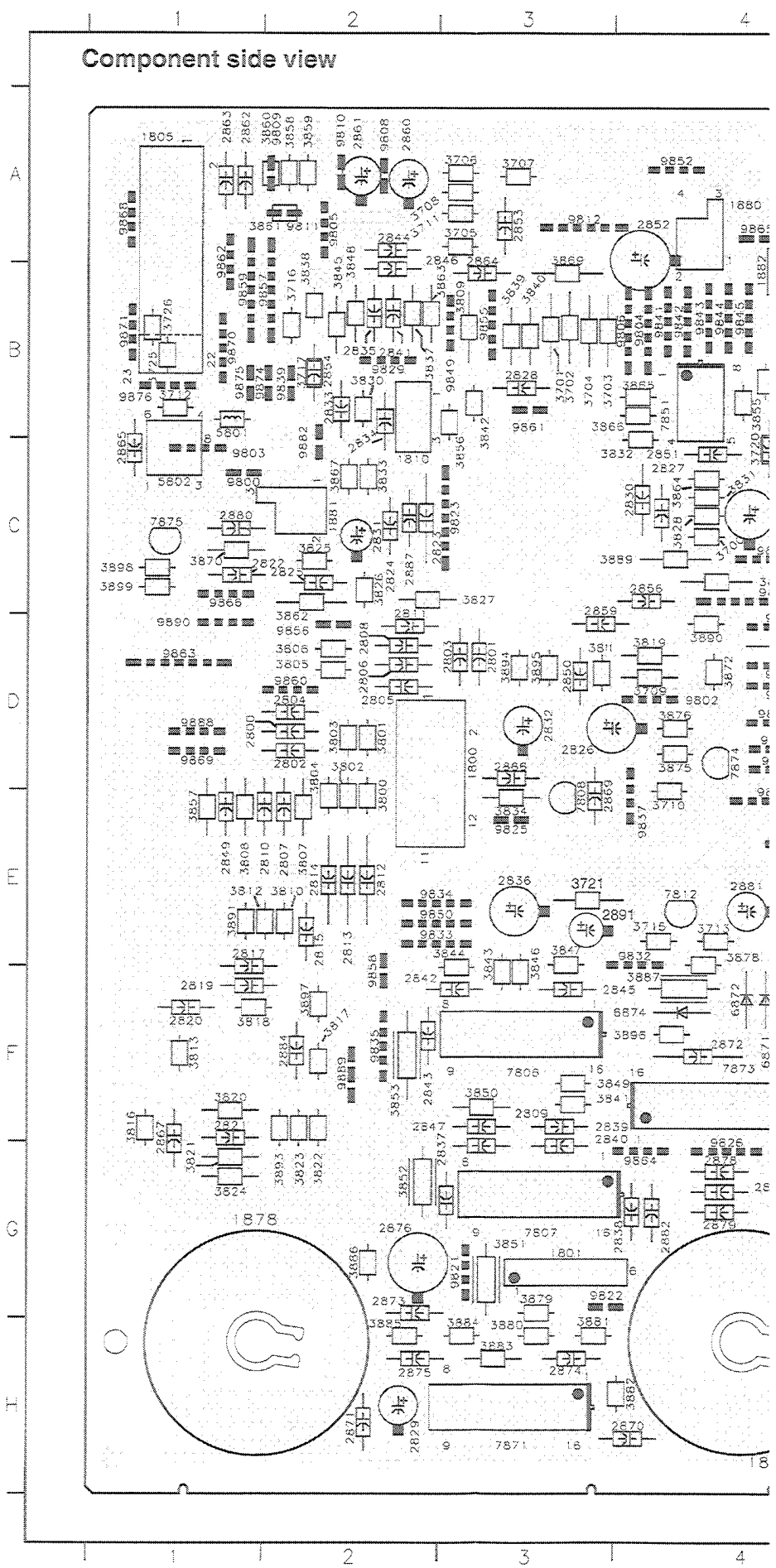
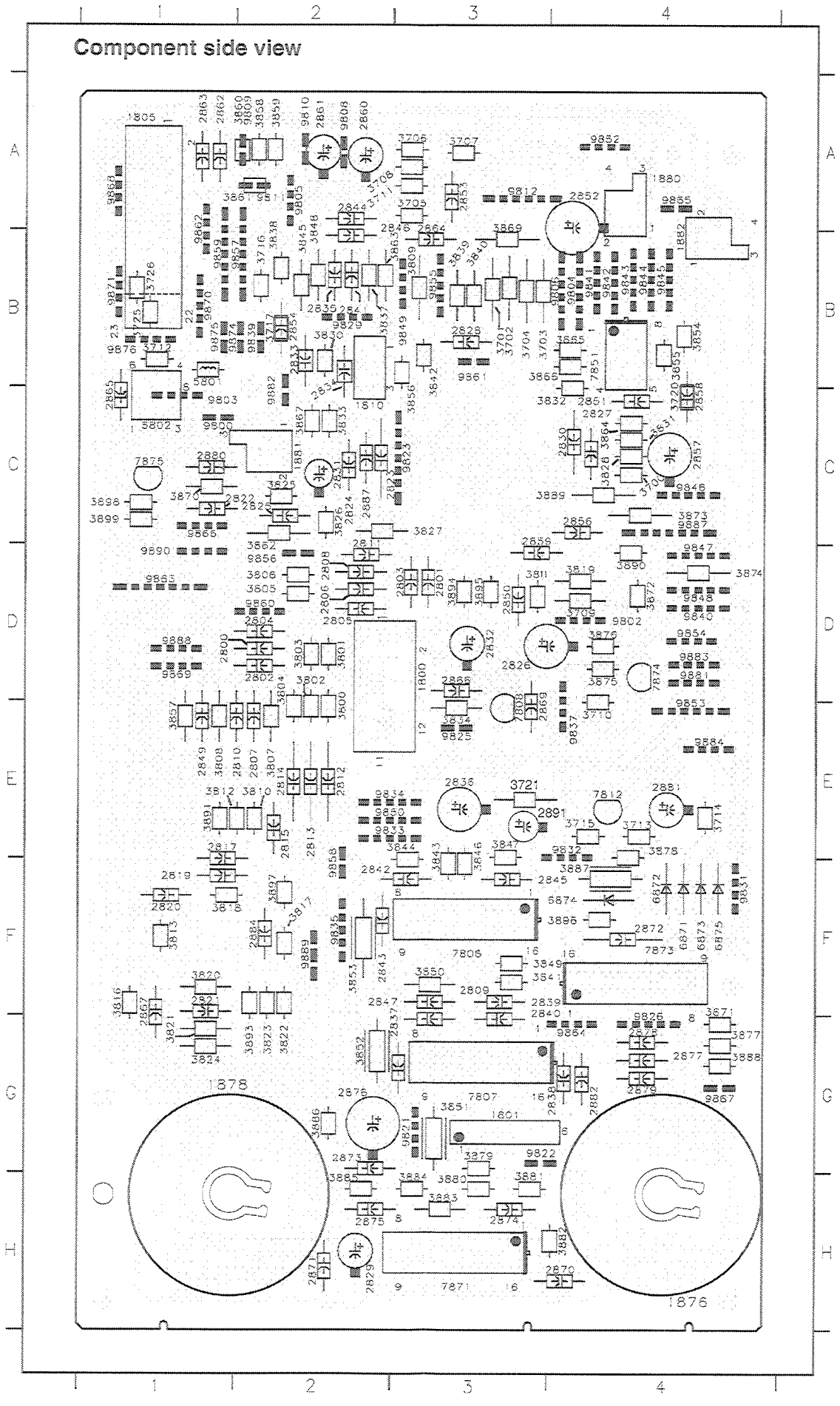
Component side view



Component side view



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1801 H2	2870 I2	3842 B3	7875 C5
1805 B5	2871 I4	3843 F3	9800 C4
1810 C3	2872 G2	3844 F3	9802 D2
1876 I1	2873 H3	3845 B4	9803 C5
1878 I4	2874 I2	3846 F3	9804 B2
1880 B2	2875 I3	3847 F2	9805 A4
1881 C4	2876 H3	3848 B4	9806 B2
1882 B1	2877 G1	3849 G2	9808 A4
2800 D4	2878 G1	3850 G3	9809 A4
2801 D3	2879 H1	3851 H3	9810 A4
2802 E4	2880 C5	3852 G3	9811 A4
2803 D3	2881 F1	3853 G3	9812 A2
2804 D4	2882 H2	3854 B1	9821 H3
2805 D3	2884 G4	3855 B1	9822 H2
2806 D3	2887 C3	3856 C3	9823 C3
2807 E4	3700 C1	3857 E5	9825 E3
2808 D3	3701 B3	3858 A4	9826 G1
2809 G3	3702 B2	3859 A4	9829 B4
2810 E4	3703 B2	3860 A4	9831 F1
2811 D3	3704 B2	3861 A4	9832 F2
2812 F4	3705 A3	3862 D4	9833 F3
2813 F4	3706 A3	3863 B3	9834 F3
2814 F4	3707 A3	3864 C1	9835 G4
2815 F4	3708 A3	3865 B2	9837 E2
2817 F4	3709 D2	3866 C2	9839 B4
2819 F4	3710 E2	3867 C4	9840 D1
2820 F5	3711 A3	3869 B2	9841 B2
2821 G5	3712 B5	3870 C5	9842 B2
2822 D5	3713 F1	3871 G1	9843 B2
2823 C3	3714 F1	3872 D1	9844 B1
2824 C4	3715 F2	3873 D1	9845 B1
2825 D4	3716 B4	3874 D1	9846 C1
2826 D2	3717 B4	3875 E2	9847 D1
2827 C2	3720 C1	3876 E2	9848 D1
2828 B3	3725 B5	3877 G1	9849 B3
2829 I3	3726 B5	3878 F2	9850 F3
2830 C2	3800 E4	3879 H3	9852 A2
2831 C4	3801 E4	3880 H3	9853 E1
2832 E3	3802 E4	3881 H2	9854 D1
2833 B4	3803 E4	3882 I2	9855 B3
2834 C3	3804 E4	3883 I3	9856 D4
2835 B4	3805 D4	3884 H3	9857 B4
2836 F3	3806 D4	3885 H3	9858 F4
2837 H3	3807 E4	3886 H4	9859 B4
2838 H2	3808 E4	3887 F2	9860 D4
2839 G2	3809 B3	3888 H1	9861 B3
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2841 B3	3811 D2	3890 D1	9863 D5
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2843 G3	3813 G5	3893 G4	9865 A1
2844 B4	3816 G5	3894 D3	9866 D5
2845 F2	3817 G4	3895 D3	9867 H1
2846 B4	3818 F4	3896 G2	9868 A5
2847 G3	3819 D2	3897 F4	9869 E5
2849 E5	3820 G5	3898 D5	9870 B5
2850 D2	3821 G5	3899 D5	9871 B5
2851 C1	3822 G4	5801 B5	9874 B4
2852 A2	3823 G4	5802 C5	9875 B4
2853 A3	3824 G5	6871 F1	9876 B5
2854 B4	3825 C4	6872 F1	9881 E1
2856 D2	3826 D4	6873 F1	9882 C4
2857 C1	3827 D3	6874 F2	9883 E1
2858 C1	3828 C1	6875 F1	9884 E1
2859 D2	3830 B4	7800 C2	9887 D1
2860 A3	3831 C1	7801 G4	9888 E5
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2862 A4	3833 C4	7807 H3	9890 D5
2863 A5	3834 E3	7808 E2	
2864 B3	3837 B3	7812 F2	
2865 C5	3838 B4	7851 B2	
2866 E3	3839 B3	7871 I3	
2867 G5	3840 B3	7873 G1	

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1800 D3	2869 E3	3841 F3	9800 C1
1801 G3	2870 H4	3842 B3	9802 D4
1805 A1	2871 H2	3843 F3	9803 C1
1810 B2	2872 F4	3844 F3	9804 B4
1876 H4	2873 G2	3845 B2	9805 A2
1878 H1	2874 H3	3846 F3	9806 B4
1880 B4	2875 H2	3847 E3	9808 A2
1881 C2	2876 G3	3848 B2	9809 A2
1882 B4	2877 G4	3849 F3	9810 A2
2800 D2	2878 G4	3850 F3	9811 A2
2801 D3	2879 G4	3851 G3	9812 A3
2802 D2	2880 C1	3852 G2	9821 G3
2803 D3	2881 E4	3853 F2	9822 G3
2804 D2	2882 G4	3854 B4	9823 C3
2805 D2	2884 F2	3855 B4	9825 E3
2806 D2	2887 C2	3856 B3	9826 G4
2807 E2	3700 C4	3857 E1	9829 B2
2808 D2	3701 B3	3858 A2	9831 F4
2809 F3	3702 B3	3859 A2	9832 E4
2810 E2	3703 B3	3860 A2	9833 E2
2811 D2	3704 B3	3861 A2	9834 E2
2812 E2	3705 A3	3862 C2	9835 F2
2813 E2	3706 A3	3863 B2	9837 E4
2814 E2	3707 A3	3864 C4	9839 B2
2815 E2	3708 A3	3865 B4	9840 D4
2817 F1	3709 D4	3866 B4	9841 B4
2819 F1	3710 E4	3867 C2	9842 B4
2820 F1	3711 A3	3869 B3	9843 B4
2821 G1	3712 B1	3870 C1	9844 B4
2822 C1	3713 E4	3871 G4	9845 B4
2823 C2	3714 E4	3872 D4	9846 C4
2824 C2	3715 E4	3873 C4	9847 D4
2825 C2	3716 B2	3874 D4	9848 D4
2826 D3	3717 B2	3875 D4	9849 B3
2827 C4	3720 C4	3876 D4	9850 E2
2828 B3	3725 B1	3877 G4	9852 A4
2829 H2	3726 B1	3878 E4	9853 E4
2830 C4	3800 E2	3879 G3	9854 D4
2831 C2	3801 D2	3880 H3	9855 B3
2832 D3	3802 E2	3881 H3	9856 D2
2833 B2	3803 D2	3882 H4	9857 B2
2834 B2	3804 E2	3883 H3	9858 F2
2835 B2	3805 D2	3884 H3	9859 B1
2836 E3	3806 D2	3885 H2	9860 D2
2837 G2	3807 E2	3886 G2	9861 B3
2838 G4	3808 E1	3887 F4	9862 A1
2839 F3	3809 B3	3888 G4	9863 D1
2840 F3	3810 E2	3889 C4	9864 G4
2841 B2	3811 D3	3890 D4	9865 A4
2842 F3	3812 E2	3891 E1	9866 C1
2843 F2	3813 F1	3893 F2	9867 G4
2844 B2	3816 F1	3894 D3	9868 A1
2845 F3	3817 F2	3895 D3	9869 D1
2846 B2	3818 F1	3896 F4	9870 B1
2847 F3	3819 D4	3897 F2	9871 B1
2849 E1	3820 F1	3898 C1	9874 B2
2850 D3	3821 G1	3899 C1	9875 B1
2851 C4	3822 F2	5801 B1	9876 B1
2852 A4	3823 F2	5802 C1	9881 D4
2853 A3	3824 G1	6871 F4	9882 C2
2854 B2	3825 C2	6872 F4	9883 D4
2856 C4	3826 C2	6873 F4	9884 E4
2857 C4	3827 C2	6874 F4	9887 C4
2858 C4	3828 C4	6875 F4	9888 D1
2859 C3	3830 B2	7806 F3	9889 F2
2860 A2	3831 C4	7807 G3	9890 D1
2861 A2	3832 C4	7808 E3	
2862 A1	3833 C2	7812 E4	
2863 A1	3834 E3	7851 B4	
2864 B3	3837 B2	7871 H3	
2865 C1	3838 B2	7873 F4	
2866 E3	3839 B3	7874 D4	
2867 F1	3840 B3	7875 C1	

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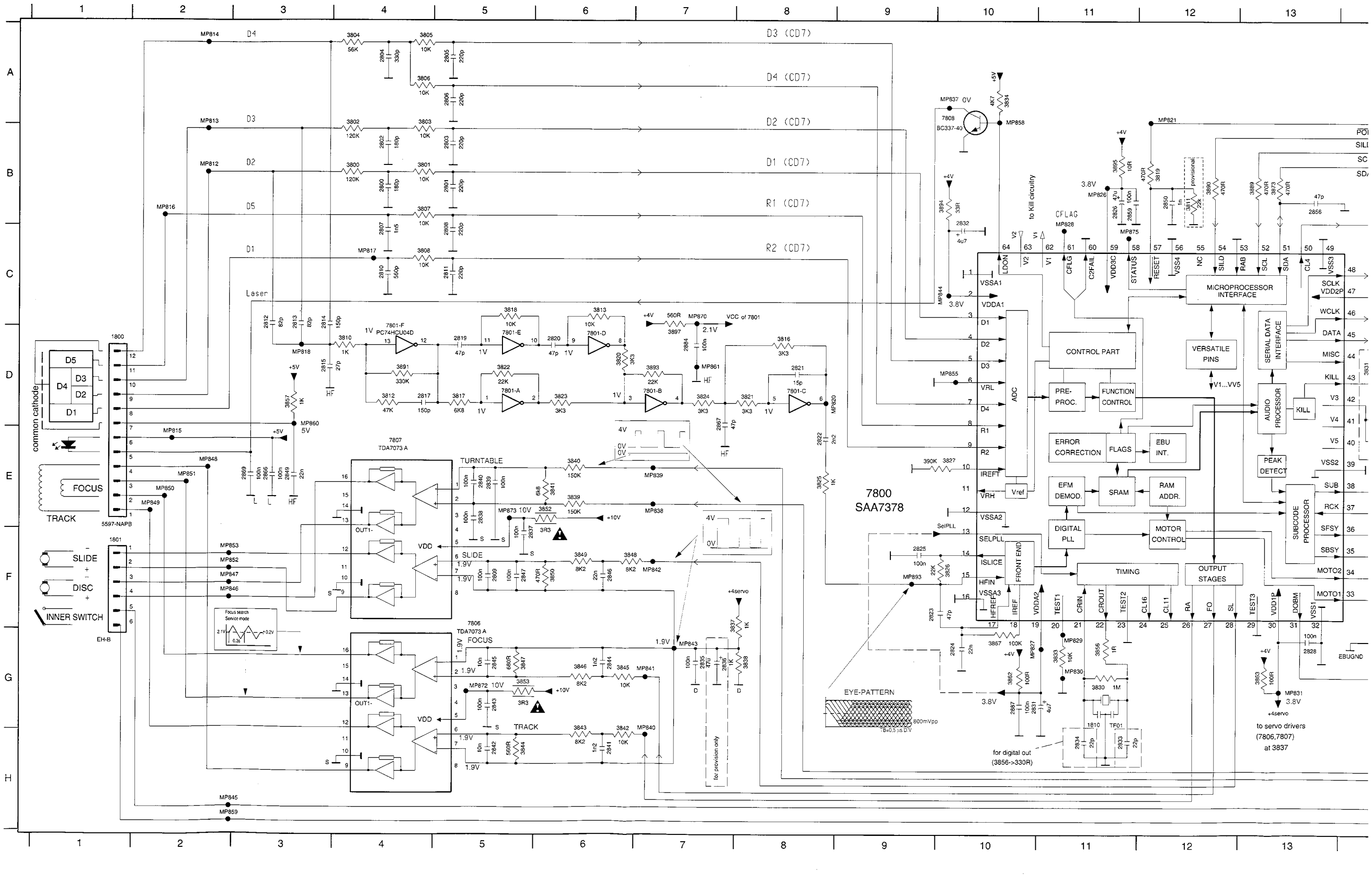
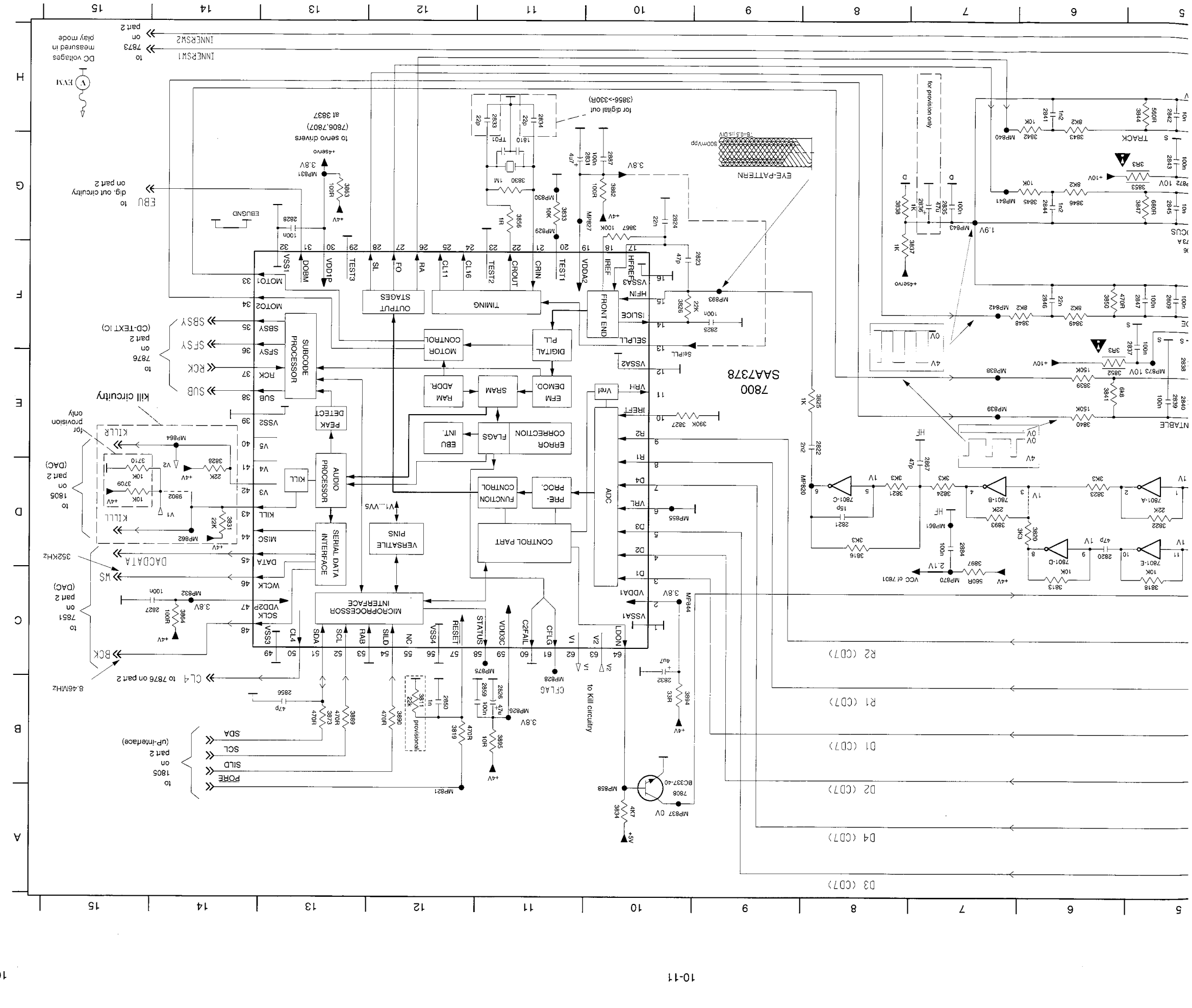
Circuit Diagram Main Board part1





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1801 F1	3813 C6	MP827 G10
1810 G11	3816 D8	MP828 B11
2800 B4	3817 D5	MP829 G11
2801 B5	3818 C5	MP830 G11
2802 B4	3819 B12	MP831 G13
2803 B5	3820 D6	MP832 C14
2804 A4	3821 D8	MP837 B10
2805 A5	3822 D5	MP838 E6
2806 A5	3823 D6	MP839 E6
2807 C4	3824 D7	MP840 G7
2808 C5	3825 E8	MP841 G7
2809 F5	3826 F10	MP842 F7
2810 C4	3827 E10	MP843 G7
2811 C5	3828 D14	MP844 C10
2812 C3	3830 G11	MP845 H3
2813 C3	3831 D14	MP846 F2
2814 C3	3833 G11	MP847 F2
2815 D3	3834 B10	MP848 E2
2817 D4	3837 F8	MP849 E2
2819 D5	3838 G8	MP850 E2
2820 D6	3839 E6	MP851 E2
2821 D8	3840 E6	MP852 F2
2822 E8	3841 E6	MP853 F2
2823 F9	3842 G6	MP855 D10
2824 G9	3843 G6	MP858 B10
2825 F9	3844 H5	MP859 H3
2826 B11	3845 G6	MP860 D3
2827 C14	3846 G6	MP861 D7
2828 G13	3847 G5	MP862 D14
2831 G10	3848 F6	MP864 E14
2832 B10	3849 F6	MP870 C7
2833 H11	3850 F6	MP872 G5
2834 H11	3852 E6	MP873 E5
2835 G7	3853 G5	MP875 C11
2836 G7	3856 G11	MP893 F9
2837 F5	3857 D3	
2838 E5	3862 G10	
2839 E5	3863 G13	
2840 E5	3864 C14	
2841 H6	3867 G10	
2842 H5	3873 B13	
2843 G5	3889 B13	
2844 G6	3890 B12	
2845 G5	3891 D4	
2846 F6	3893 D7	
2847 F5	3894 B10	
2849 E3	3895 B11	
2850 B12	3897 D7	
2856 B13	7800 E9	
2859 B11	7801-A D5	
2866 E3	7801-B D7	
2867 D7	7801-C D8	
2869 E3	7801-D D6	
2884 D7	7801-E D5	
2887 G10	7801-F D4	
3709 D15	7806 G5	
3710 D15	7807 E4	
3800 B4	7808 B10	
3801 B4	9802 D14	
3802 A4	MP812 B2	
3803 A4	MP813 A2	
3804 A4	MP814 A2	
3805 A4	MP815 E2	
3806 A4	MP816 B2	
3807 B4	MP817 C4	
3808 C4	MP818 D3	
3810 D4	MP820 D8	
3811 B12	MP821 B12	

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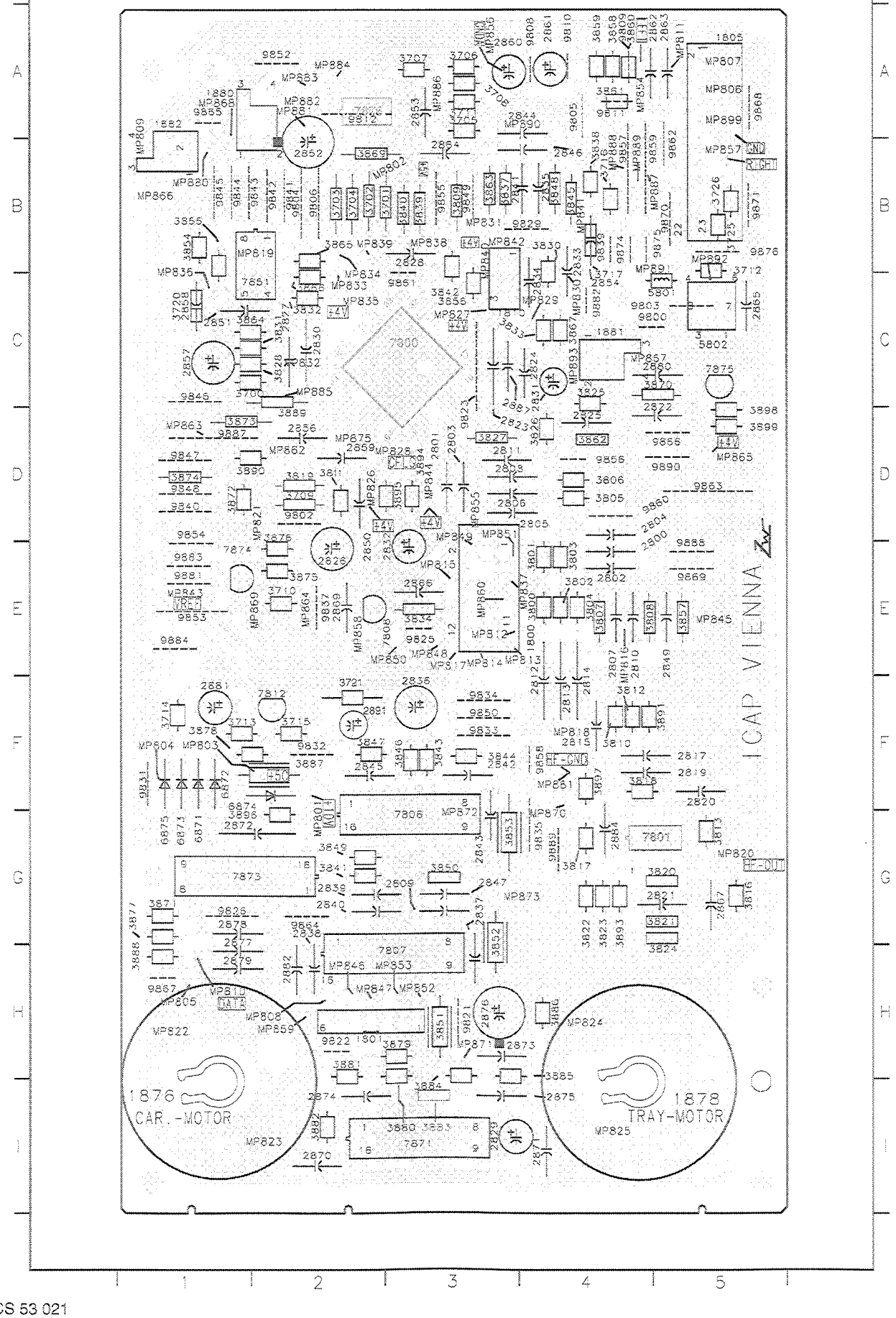
Copper side view



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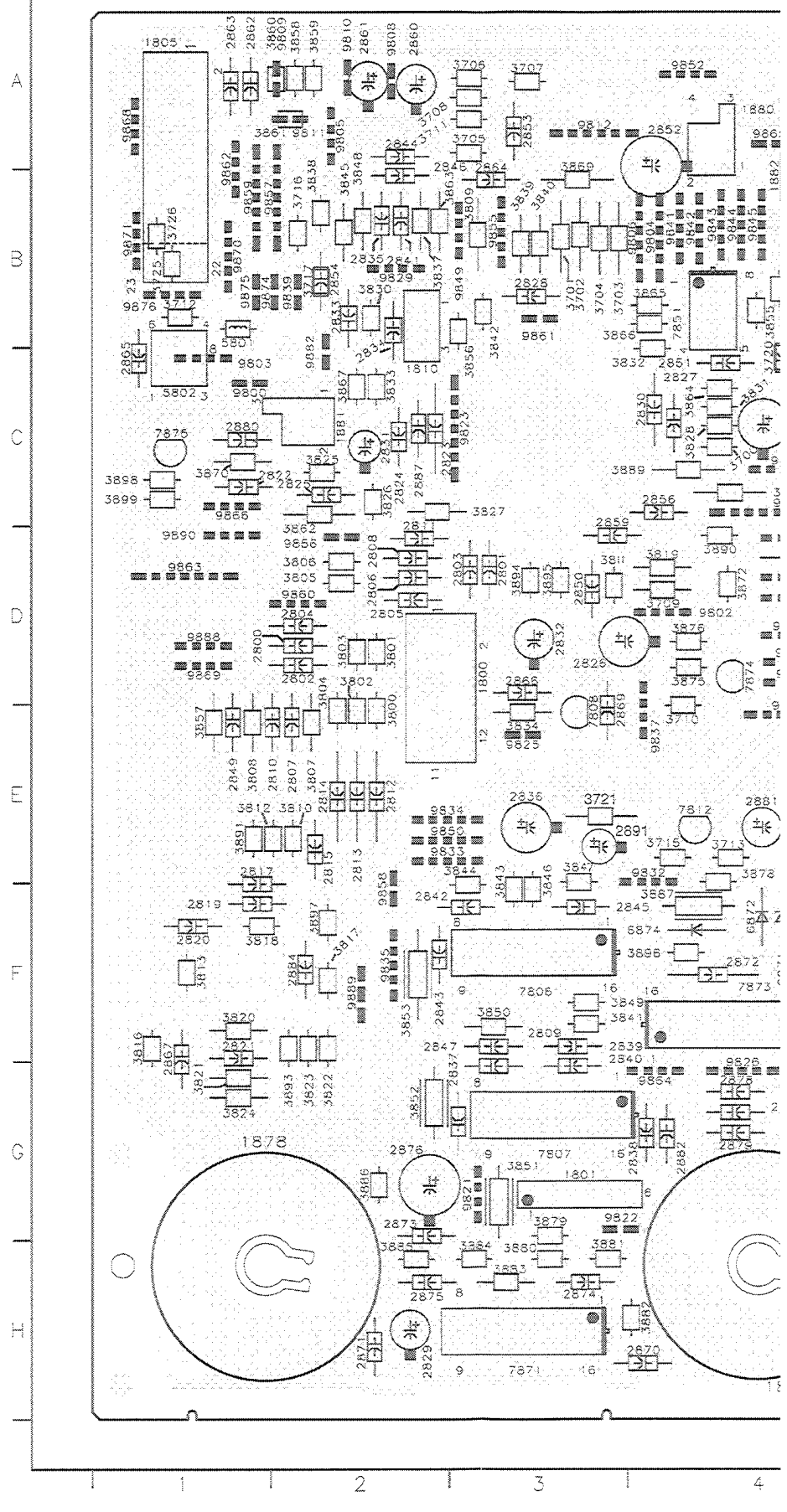
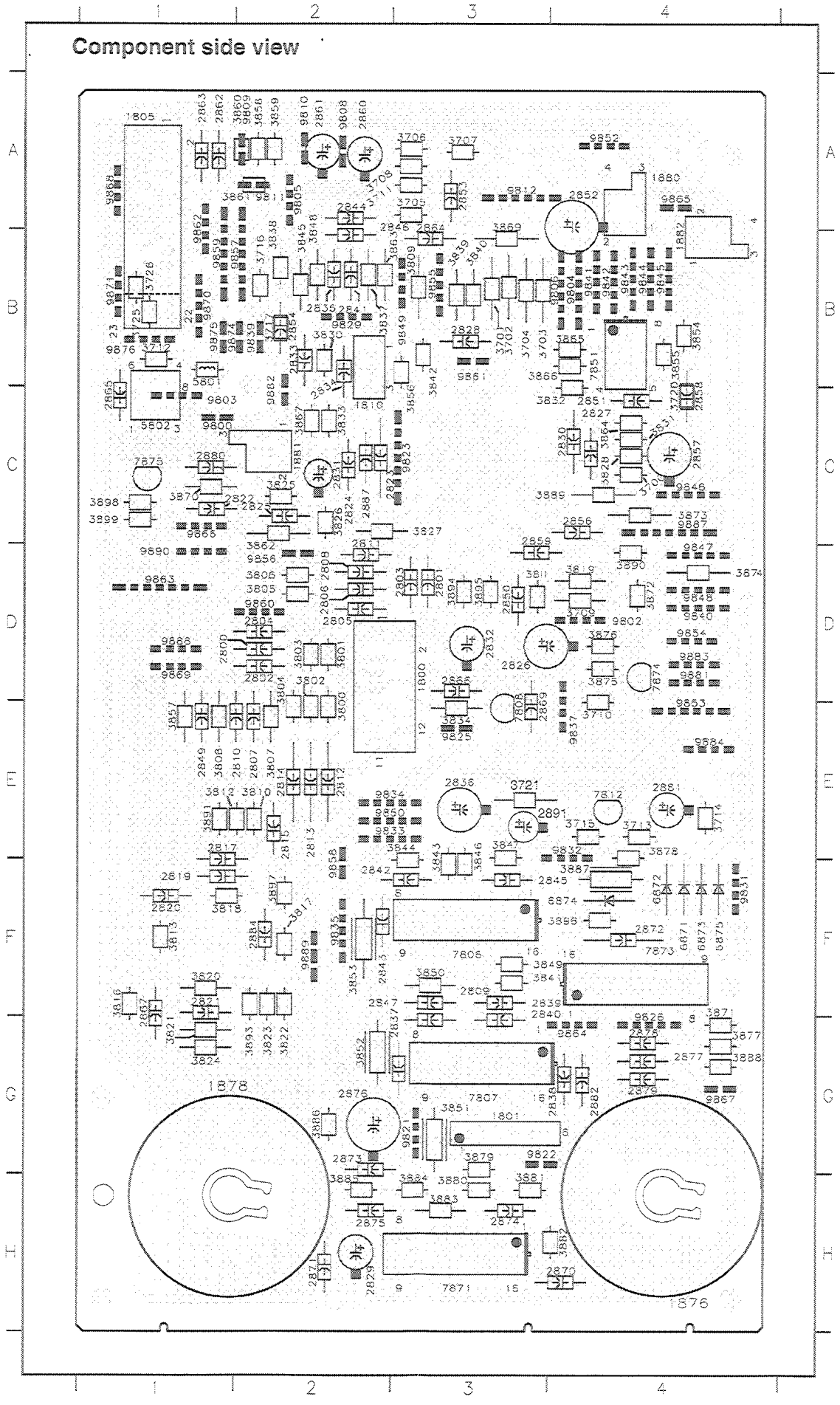
1810 C3	2872 G2	3844 F3	9802 D2
1876 I1	2873 H3	3845 B4	9803 C5
1878 I4	2874 I2	3846 F3	9804 B2
1880 B2	2875 I3	3847 F2	9805 A4
1881 C4	2876 H3	3848 B4	9806 B2
1882 B1	2877 G1	3849 G2	9808 A4
2800 D4	2878 G1	3850 G3	9809 A4
2801 D3	2879 H1	3851 H3	9810 A4
2802 E4	2880 C5	3852 G3	9811 A4
2803 D3	2881 F1	3853 G3	9812 A2
2804 D4	2882 H2	3854 B1	9821 H3
2805 D3	2884 G4	3855 B1	9822 H2
2806 D3	2887 C3	3856 C3	9823 C3
2807 E4	3700 C1	3857 E5	9825 E3
2808 D3	3701 B3	3858 A4	9826 G1
2809 G3	3702 B2	3859 A4	9829 B4
2810 E4	3703 B2	3860 A4	9831 F1
2811 D3	3704 B2	3861 A4	9832 F2
2812 F4	3705 A3	3862 D4	9833 F3
2813 F4	3706 A3	3863 B3	9834 F3
2814 F4	3707 A3	3864 C1	9835 G4
2815 F4	3708 A3	3865 B2	9837 E2
2817 F4	3709 D2	3866 C2	9839 B4
2819 F4	3710 E2	3867 C4	9840 D1
2820 F5	3711 A3	3869 B2	9841 B2
2821 G5	3712 B5	3870 C5	9842 B2
2822 D5	3713 F1	3871 G1	9843 B2
2823 C3	3714 F1	3872 D1	9844 B1
2824 C4	3715 F2	3873 D1	9845 B1
2825 D4	3716 B4	3874 D1	9846 C1
2826 D2	3717 B4	3875 E2	9847 D1
2827 C2	3720 C1	3876 E2	9848 D1
2828 B3	3725 B5	3877 G1	9849 B3
2829 I3	3726 B5	3878 F2	9850 F3
2830 C2	3800 E4	3879 H3	9852 A2
2831 C4	3801 E4	3880 H3	9853 E1
2832 E3	3802 E4	3881 H2	9854 D1
2833 B4	3803 E4	3882 I2	9855 B3
2834 C3	3804 E4	3883 I3	9856 D4
2835 B4	3805 D4	3884 H3	9857 B4
2836 F3	3806 D4	3885 H3	9858 F4
2837 H3	3807 E4	3886 H4	9859 B4
2838 H2	3808 E4	3887 F2	9860 D4
2839 G2	3809 B3	3888 H1	9861 B3
2840 G2	3810 F4	3889 C2	9862 B5
2841 B3	3811 D2	3890 D1	9863 D5
2842 F3	3812 F4	3891 F4	9864 G2
2843 G3	3813 G5	3893 G4	9865 A1
2844 B4	3816 G5	3894 D3	9866 D5
2845 F2	3817 G4	3895 D3	9867 H1
2846 B4	3818 F4	3896 G2	9868 A5
2847 G3	3819 D2	3897 F4	9869 E5
2849 E5	3820 G5	3898 D5	9870 B5
2850 D2	3821 G5	3899 D5	9871 B5
2851 C1	3822 G4	5801 B5	9874 B4
2852 A2	3823 G4	5802 C5	9875 B4
2853 A3	3824 G5	6871 F1	9876 B5
2854 B4	3825 C4	6872 F1	9881 E1
2856 D2	3826 D4	6873 F1	9882 C4
2857 C1	3827 D3	6874 F2	9883 E1
2858 C1	3828 C1	6875 F1	9884 E1
2859 D2	3830 B4	7800 C2	9867 D1
2860 A3	3831 C1	7801 G4	9888 E5
2861 A4	3832 C2	7806 G3	9889 G4
2862 A4	3833 C4	7807 H3	9890 D5
2863 A5	3834 E3	7808 E2	
2864 B3	3837 B3	7812 F2	
2865 C5	3838 B4	7851 B2	
2866 E3	3839 B3	7871 I3	
2867 G5	3840 B3	7873 G1	

Component side view



10-12

Component side view



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1801 H2	2870 I2	3842 B3	7875 C5
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1810 C3	2872 G2	3844 F3	9802 D2
1876 I1	2873 H3	3845 B4	9803 C5
1878 I4	2874 I2	3846 F3	9804 B2
1880 B2	2875 I3	3847 F2	9805 A4
1881 C4	2876 H3	3848 B4	9806 B2
1882 B1	2877 G1	3849 G2	9808 A4
2800 D4	2878 G1	3850 G3	9809 A4
2801 D3	2879 H1	3851 H3	9810 A4
2802 E4	2880 C5	3852 G3	9811 A4
2803 D3	2881 F1	3853 G3	9812 A2
2804 D4	2882 H2	3854 B1	9821 H3
2805 D3	2884 G4	3855 B1	9822 H2
2806 D3	2887 C3	3856 C3	9823 C3
2807 E4	3700 C1	3857 E5	9825 E3
2808 D3	3701 B3	3858 A4	9826 G1
2809 G3	3702 B2	3859 A4	9829 B4
2810 E4	3703 B2	3860 A4	9831 F1
2811 D3	3704 B2	3861 A4	9832 F2
2812 F4	3705 A3	3862 D4	9833 F3
2813 F4	3706 A3	3863 B3	9834 F3
2814 F4	3707 A3	3864 C1	9835 G4
2815 F4	3708 A3	3865 B2	9837 E2
2817 F4	3709 D2	3866 C2	9839 B4
2819 F4	3710 E2	3867 C4	9840 D1
2820 F5	3711 A3	3869 B2	9841 B2
2821 G5	3712 B5	3870 C5	9842 B2
2822 D5	3713 F1	3871 G1	9843 B2
2823 C3	3714 F1	3872 D1	9844 B1
2824 C4	3715 F2	3873 D1	9845 B1
2825 D4	3716 B4	3874 D1	9846 C1
2826 D2	3717 B4	3875 E2	9847 D1
2827 C2	3720 C1	3876 E2	9848 D1
2828 B3	3725 B5	3877 G1	9849 B3
2829 I3	3726 B5	3878 F2	9850 F3
2830 C2	3800 E4	3879 H3	9852 A2
2831 C4	3801 E4	3880 H3	9853 E1
2832 E3	3802 E4	3881 H2	9854 D1
2833 B4	3803 E4	3882 I2	9855 B3
2834 C3	3804 E4	3883 I3	9856 D4
2835 B4	3805 D4	3884 H3	9857 B4
2836 F3	3806 D4	3885 H3	9858 F4
2837 H3	3807 E4	3886 H4	9859 B4
2838 H2	3808 E4	3887 F2	9860 D4
2839 G2	3809 B3	3888 H1	9861 B3
2840 G2	3810 F4	3889 C2	9862 B5
2841 B3	3811 D2	3890 D1	9863 D5
2842 F3	3812 F4	3891 F4	9864 G2
2843 G3	3813 G5	3893 G4	9865 A1
2844 B4	3816 G5	3894 D3	9866 D5
2845 F2	3817 G4	3895 D3	9867 H1
2846 B4	3818 F4	3896 G2	9868 A5
2847 G3	3819 D2	3897 F4	9869 E5
2849 E5	3820 G5	3898 D5	9870 B5
2850 D2	3821 G5	3899 D5	9871 B5
2851 C1	3822 G4	5801 B5	9874 B4
2852 A2	3823 G4	5802 C5	9875 B4
2853 A3	3824 G5	6871 F1	9876 B5
2854 B4	3825 C4	6872 F1	9881 E1
2856 D2	3826 D4	6873 F1	9882 C4
2857 C1	3827 D3	6874 F2	9883 E1
2858 C1	3828 C1	6875 F1	9884 E1
2859 D2	3830 B4	7800 C2	9887 D1
2860 A3	3831 C1	7801 G4	9888 E5
2861 A4	3832 C2	7806 G3	9889 G4
2862 A4	3833 C4	7807 H3	9890 D5
2863 A5	3834 E3	7808 E2	
2864 B3	3837 B3	7812 F2	
2865 C5	3838 B4	7851 B2	
2866 E3	3839 B3	7871 I3	
2867 G5	3840 B3	7873 G1	

1800 D3	2869 E3	3841 F3	9800 C1
1801 G3	2870 H4	3842 B3	9802 D4
1805 A1	2871 H2	3843 F3	9803 C1
1810 B2	2872 F4	3844 F3	9804 B4
1876 H4	2873 G2	3845 B2	9805 A2
1878 H1	2874 H3	3846 F3	9806 B4
1880 B4	2875 H2	3847 E3	9808 A2
1881 C2	2876 G3	3848 B2	9809 A2
1882 B4	2877 G4	3849 F3	9810 A2
2800 D2	2878 G4	3850 F3	9811 A2
2801 D3	2879 G4	3851 G3	9812 A3
2802 D2	2880 C1	3852 G2	9821 G3
2803 D3	2881 E4	3853 F2	9822 G3
2804 D2	2882 G4	3854 B4	9823 C3
2805 D2	2884 F2	3855 B4	9825 E3
2806 D2	2887 C2	3856 B3	9826 G4
2807 E2	3700 C4	3857 E1	9829 B2
2808 D2	3701 B3	3858 A2	9831 F4
2809 F3	3702 B3	3859 A2	9832 E4
2810 E2	3703 B3	3860 A2	9833 E2
2811 D2	3704 B3	3861 A2	9834 E2
2812 E2	3705 A3	3862 C2	9835 F2
2813 E2	3706 A3	3863 B2	9837 E4
2814 E2	3707 A3	3864 C4	9839 B2
2815 E2	3708 A3	3865 B4	9840 D4
2817 F1	3709 D4	3866 B4	9841 B4
2819 F1	3710 E4	3867 C2	9842 B4
2820 F1	3711 A3	3869 B3	9843 B4
2821 G1	3712 B1	3870 C1	9844 B4
2822 C1	3713 E4	3871 G4	9845 B4
2823 C2	3714 E4	3872 D4	9846 C4
2824 C2	3715 E4	3873 C4	9847 D4
2825 C2	3716 B2	3874 D4	9848 D4
2826 D3	3717 B2	3875 D4	9849 B3
2827 C4	3720 C4	3876 D4	9850 E2
2828 B3	3725 B1	3877 G4	9852 A4
2829 H2	3726 B1	3878 E4	9853 E4
2830 C4	3800 E2	3879 G3	9854 D4
2831 C2	3801 D2	3880 H3	9855 B3
2832 D3	3802 E2	3881 H3	9856 D2
2833 B2	3803 D2	3882 H4	9857 B2
2834 B2	3804 E2	3883 H3	9858 F2
2835 B2	3805 D2	3884 H3	9859 B1
2836 E3	3806 D2	3885 H2	9860 D2
2837 G2	3807 E2	3886 G2	9861 B3
2838 G4	3808 E1	3887 F4	9862 A1
2839 F3	3809 B3	3888 G4	9863 D1
2840 F3	3810 E2	3889 C4	9864 G4
2841 B2	3811 D3	3890 D4	9865 A4
2842 F3	3812 E2	3891 E1	9866 C1
2843 F2	3813 F1	3893 F2	9867 G4
2844 B2	3816 F1	3894 D3	9868 A1
2845 F3	3817 F2	3895 D3	9869 D1
2846 B2	3818 F1	3896 F4	9870 B1
2847 F3	3819 D4	3897 F2	9871 B1
2849 E1	3820 F1	3898 C1	9874 B2
2850 D3	3821 G1	3899 C1	9875 B1
2851 C4	3822 F2	5801 B1	9876 B1
2852 A4	3823 F2	5802 C1	9881 D4
2853 A3	3824 G1	6871 F4	9882 C2
2854 B2	3825 C2	6872 F4	9883 D4
2856 C4	3826 C2	6873 F4	9884 E4
2857 C4	3827 C2	6874 F4	9887 C4
2858 C4	3828 C4	6875 F4	9888 D1
2859 C3	3830 B2	7806 F3	9889 F2
2860 A2	3831 C4	7807 G3	9890 D1
2861 A2	3832 C4	7808 E3	
2862 A1	3833 C2	7812 E4	
2863 A1	3834 E3	7851 B4	
2864 B3	3837 B2	7871 H3	
2865 C1	3838 B2	7873 F4	
2866 E3	3839 B3	7874 D4	
2867 F1	3840 B3	7875 C1	

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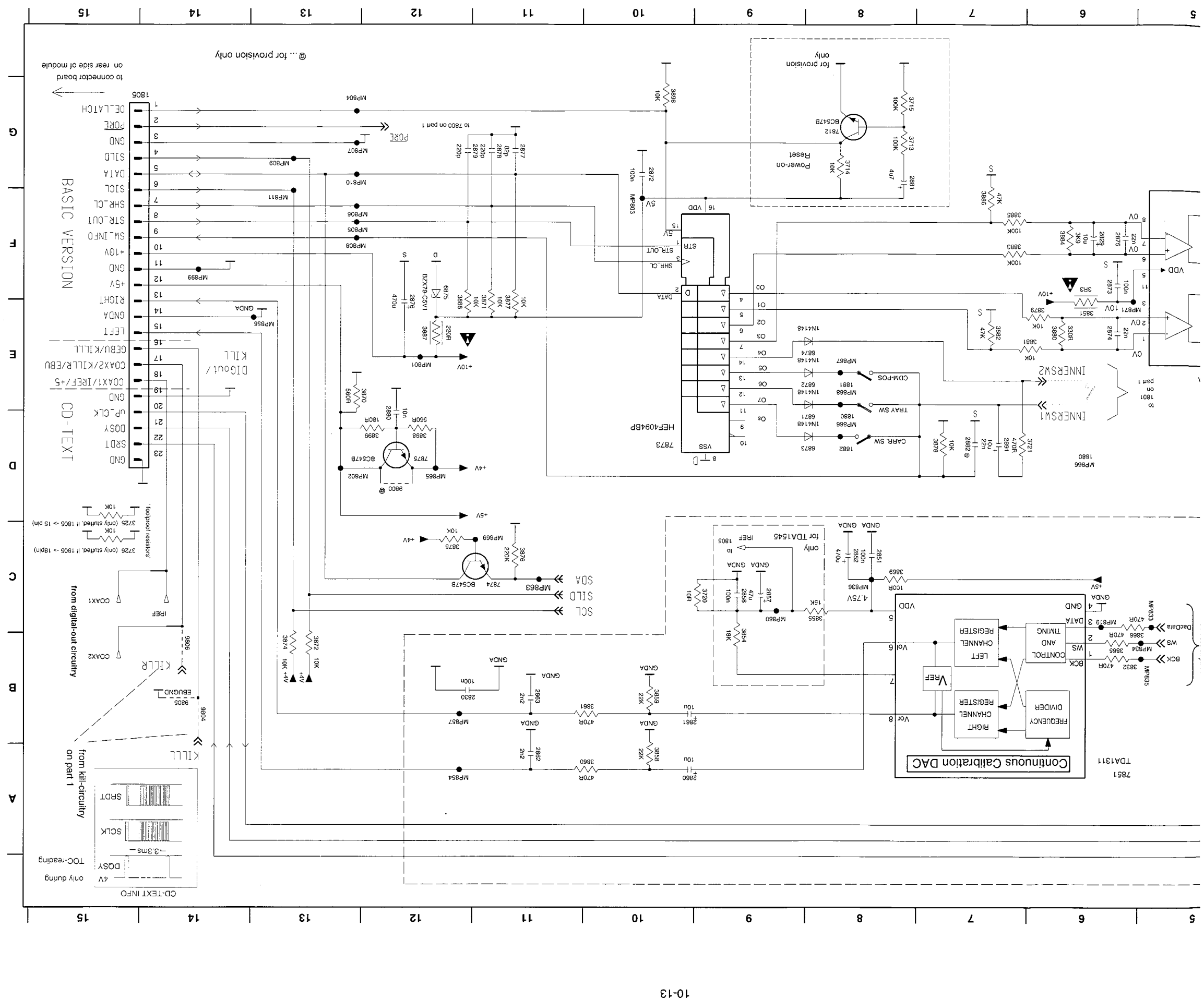
Circuit Diagram Main Board part2

CD-Text circuitry

digital out circuitry

ITEM	OPT_OUT	COAX_OUT
5802	NO	YES
5801	YES	NO
9803	YES	NO
3809	YES	YES
3717	YES	NO
3716	NO	YES
3712	NO	YES
2865	NO	YES
2864	YES	YES
2854	NO	YES

@... for provision only



1805 G14	3876 C11	MP871 E6
1876 E3	3877 E11	MP880 C9
1878 F3	3878 D7	MP881 A2
1880 D8	3879 E6	MP882 A2
1881 E8	3880 E6	MP883 B2
1882 D8	3881 E6	MP884 B2
2829 F6	3882 E7	MP885 B2
2830 B12	3883 F7	MP886 A4
2851 C8	3884 F6	MP887 B4
2852 C8	3885 F7	MP888 B4
2853 B2	3886 F7	MP889 B4
2854 C2	3887 E12	MP890 C2
2857 C9	3888 E12	MP891 D4
2858 C9	3896 G10	MP892 D4
2860 A10	3898 D12	MP899 F14
2861 B10	3899 D12	
2862 A11	5801 C4	
2863 B11	5802 C3	
2864 D2	6871 D8	
2865 D3	6872 E8	
2870 E4	6873 D8	
2871 F4	6874 E8	
2872 G10	6875 F12	
2873 F6	7812 G8	
2874 E6	7851 A6	
2875 F6	7871 E5	
2876 E12	7873 D10	
2877 G11	7874 C11	
2878 G11	7875 D12	
2879 G11	7876 A2	
2880 D12	9800 D12	
2881 G8	9803 C3	
2882 D7	9804 B14	
3700 B2	9805 B14	
3701 B2	9806 B14	
3702 B2	9808 A10	
3703 A2	9809 A10	
3704 A2	9810 B10	
3705 A2	9811 B10	
3706 A4	9812 A2	
3707 B4	MP801 E12	
3708 B4	MP802 D13	
3711 A4	MP803 F10	
3712 C3	MP804 G13	
3713 G8	MP805 F13	
3714 G8	MP806 F13	
3715 G8	MP807 G13	
3716 D2	MP808 F13	
3717 C2	MP809 G13	
3720 C9	MP810 G13	
3725 D15	MP811 F13	
3726 C15	MP819 C6	
3809 C2	MP822 E4	
3832 B6	MP823 E4	
3851 E6	MP824 F4	
3854 B9	MP825 F4	
3855 C8	MP833 C5	
3858 A10	MP834 B5	
3859 B10	MP835 B5	
3860 A10	MP836 C8	
3861 B10	MP854 A12	
3865 B6	MP856 E13	
3866 C6	MP857 B12	
3869 C8	MP863 C11	
3870 E12	MP865 D12	
3871 E11	MP866 D8	
3872 B13	MP867 E8	
3874 B13	MP868 E8	
3875 C12	MP869 C11	

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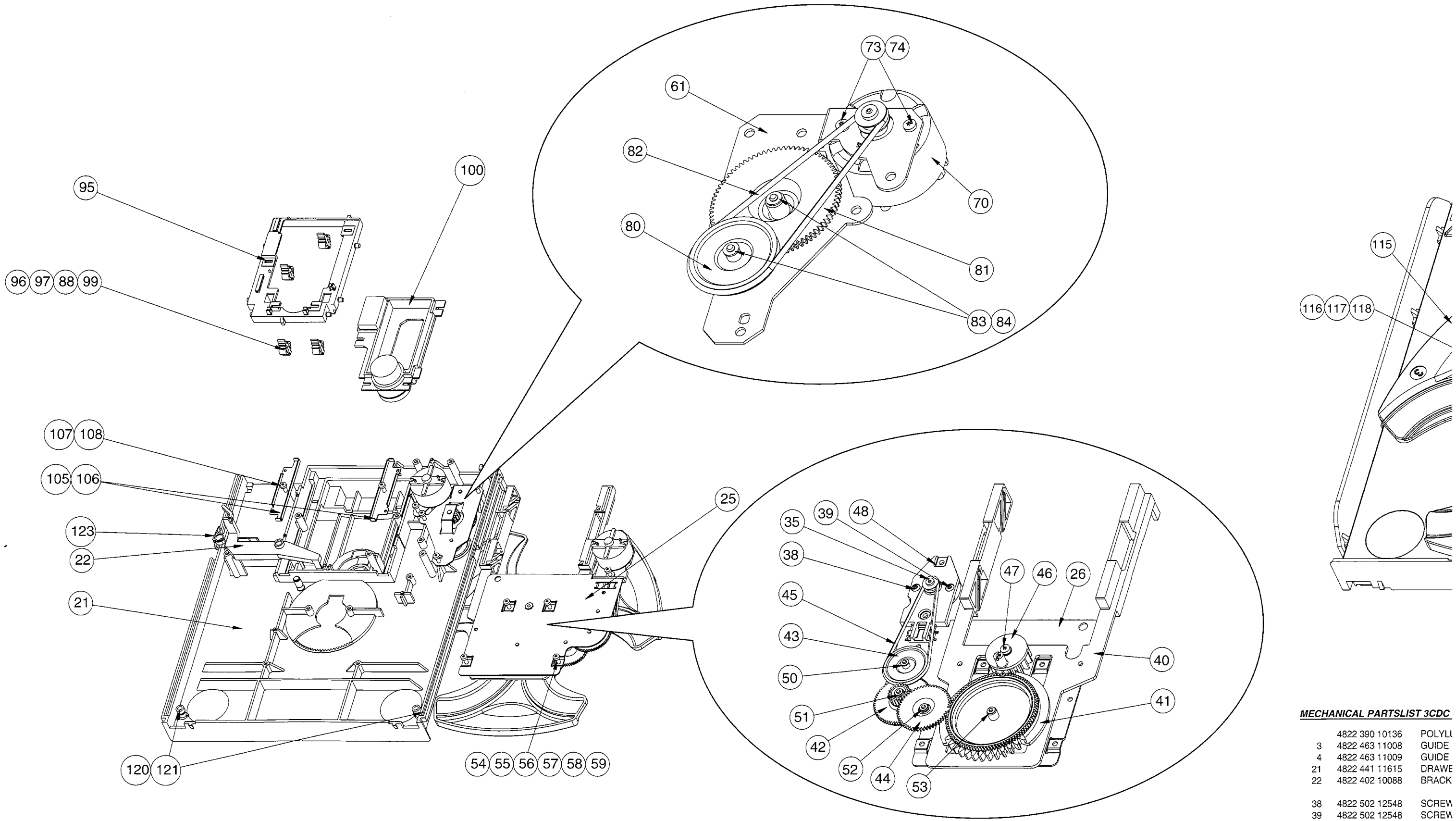
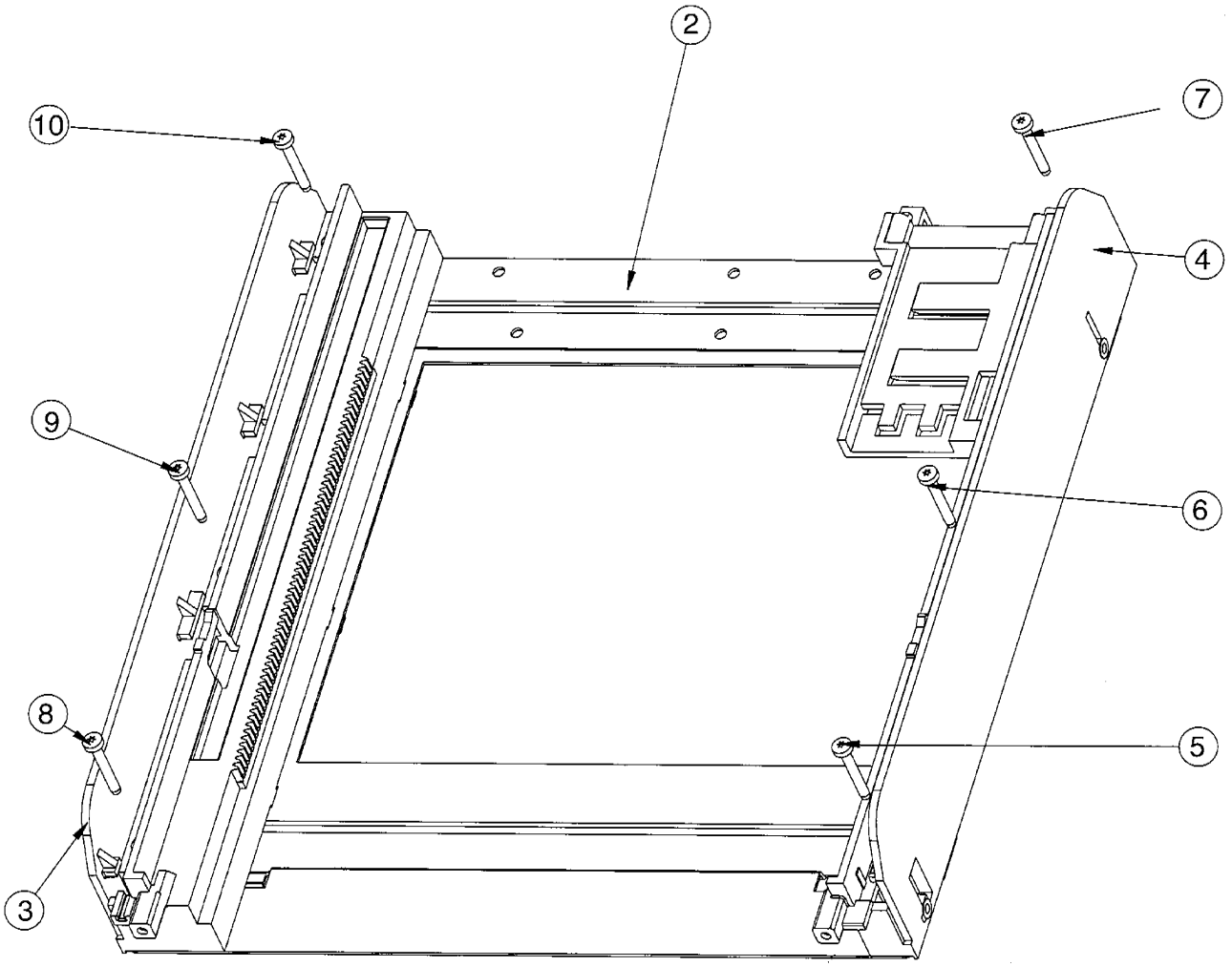
EXPLODED VIEW (3CDC MODULE)



MECHANICAL PARTSLIST 3CDC

	4822 390 10136	POLYLI
3	4822 463 11008	GUIDE
4	4822 463 11009	GUIDE
21	4822 441 11615	DRAWE
22	4822 402 10088	BRACK
38	4822 502 12548	SCREW
39	4822 502 12548	SCREW
40	4822 463 11011	SLIDE
41	4822 522 10509	CONTR
42	4822 522 10492	GEAR V



MECHANICAL PARTSLIST 3CDC MODULE

73	4822 502 12548	SCREW M2,6X3,5
74	4822 502 12548	SCREW M2,6X3,5
80	4822 528 10937	PULLEY
81	4822 522 10494	GEAR DRAWER
82	4822 358 10115	BELT
83	4822 532 12364	WASHER
84	4822 532 12364	WASHER
95	4822 404 10894	SUPPORT
96	4822 325 50215	SUSPENSION
97	4822 325 50215	SUSPENSION
98	4822 325 50215	SUSPENSION
99	4822 325 50215	SUSPENSION
100	4822 691 10615	CD DRIVE VAM1201
115	4822 466 10736	CARROUSEL
117	4822 532 12365	BUSH DRAWER
120	4822 532 51756	GROMMET
121	4822 532 51756	GROMMET
123	4822 402 10085	SWITCH BRACKET
125	4822 401 11708	DISC CLAMP
140	4822 466 10734	PLATE

ELECTRICAL PARTSLIST 3CDC MODULE

MISCELLANEOUS

1800	4822 267 51453	Flex Foil connector 12pin
1805	4822 265 10979	Flex Foil connector 15pin
1805	4822 265 11182	Flex Foil connector 23pin
1805	4822 265 11184	Flex Foil connector 18pin
1806	4822 265 10981	Flex Foil connector 15pin
1806	4822 267 10757	Flex Foil connector 23pin top entry
1806	4822 265 11185	Flex Foil connector 18pin top entry
1860	4822 265 11183	Flex Foil connector 4pin side entry
1880	4822 276 13503	Switch
1881	4822 276 13503	Switch
1882	4822 276 13503	Switch
8002	4822 320 11974	Flex Foil 15pin length= 190mm
8002	4822 320 12229	Flex Foil 18pin length= 190mm
8002	4822 320 12231	Flex Foil 23pin length= 190mm
8002	4822 320 12232	Flex Foil 15pin length= 480mm

CAPACITORS

2800	4822 126 10053	180pF	10%	50V
2801	4822 122 10466	220pF	10%	50V
2802	4822 126 10053	180pF	10%	50V
2803	4822 122 10466	220pF	10%	50V
2804	4822 126 12787	330pF	10%	50V
2805	4822 122 10466	220pF	10%	50V
2806	4822 122 10466	220pF	10%	50V
2807	4822 126 12878	1,5nF	10%	16V
2808	4822 122 10466	220pF	10%	50V
2809	4822 126 12882	100nF	20%	50V
2810	4822 122 10459	560pF	10%	50V
2811	4822 122 10466	220pF	10%	50V
2812	4822 122 10319	82pF	5%	50V
2813	4822 122 10319	82pF	5%	50V
2814	4822 122 33849	150pF	10%	50V
2815	4822 122 33192	27pF	5%	50V
2817	4822 122 33849	150pF	10%	50V
2819	4822 122 33848	47pF	5%	50V
2820	4822 122 33848	47pF	5%	50V
2821	4822 122 10462	15pF	5%	50V
2822	4822 126 12339	2,2nF	10%	16V
2823	4822 122 33848	47pF	5%	50V
2824	4822 126 11585	22nF	20%	50V
2825	4822 126 12882	100nF	20%	50V
2826	4822 124 23624	470µF	20%	16V
2827	4822 126 12882	100nF	20%	50V
2828	4822 126 12882	100nF	20%	50V
2829	4822 124 41579	10µF	20%	50V
2830	4822 126 12882	100nF	20%	50V
2831	4822 124 12032	4,7µF	20%	50V
2832	4822 124 12032	4,7µF	20%	50V
2833	4822 122 33191	22pF	5%	50V
2834	4822 122 33191	22pF	5%	50V
2835	4822 126 12882	100nF	20%	50V
2837	4822 126 12882	100nF	20%	50V
2838	4822 126 12882	100nF	20%	50V
2839	4822 126 12882	100nF	20%	50V
2840	4822 126 12882	100nF	20%	50V
2841	4822 122 10574	1,2nF	10%	16V
2842	4822 121 51387	10nF	20%	16V
2843	4822 126 12882	100nF	20%	50V
2844	4822 122 10574	1,2nF	10%	16V
2845	4822 121 51387	10nF	20%	16V
2846	4822 126 11585	22nF	20%	50V
2847	4822 126 12882	100nF	20%	50V

CAPACITORS

2849	4822 126 11585	22nF	20%	50V
2850	4822 122 33197	1nF	10%	50V
2851	4822 126 12882	100nF	20%	50V
2852	4822 124 80857	470µF	20%	16V
2853	4822 126 12882	100nF	20%	50V
2856	4822 122 33848	47pF	5%	50V
2859	4822 126 12882	100nF	20%	50V
2860	4822 124 41579	10µF	20%	50V
2861	4822 124 41579	10µF	20%	50V
2862	4822 126 12339	2,2nF	10%	16V
2863	4822 126 12339	2,2nF	10%	16V
2864	4822 122 33848	47pF	5%	50V
2866	4822 126 12882	100nF	20%	50V
2867	4822 122 33848	47pF	5%	50V
2868	4822 126 12882	100nF	20%	50V
2869	4822 126 12882	100nF	20%	50V
2870	4822 126 12882	100nF	20%	50V
2871	4822 126 11585	22nF	20%	50V
2872	4822 126 12882	100nF	20%	50V
2873	4822 126 12882	100nF	20%	50V
2874	4822 126 11585	22nF	20%	50V
2875	4822 126 11585	22nF	20%	50V
2876	4822 124 80857	470µF	20%	16V
2877	4822 122 10319	82pF	5%	50V
2878	4822 122 10466	220pF	10%	50V
2879	4822 122 10466	220pF	10%	50V
2880	4822 121 51387	10nF	20%	16V
2884	4822 126 12882	100nF	20%	50V
2887	4822 126 12882	100nF	20%	50V
2890	4822 124 23624	470µF	20%	16V
2891	4822 124 12125	10µF	20%	16V

RESISTORS

3700	4822 116 83883	470Ω	5%	0,16W
3701	4822 116 83883	470Ω	5%	0,16W
3702	4822 116 83883	470Ω	5%	0,16W
3703	4822 116 83883	470Ω	5%	0,16W
3704	4822 116 83883	470Ω	5%	0,16W
3705	4822 116 52195	47Ω	5%	0,5W
3706	4822 116 83883	470Ω	5%	0,16W
3707	4822 116 83883	470Ω	5%	0,16W
3708	4822 116 83883	470Ω	5%	0,16W
3710	4822 116 83864	10kΩ	5%	0,5W
3711	4822 116 83864	10kΩ	5%	0,5W
3717	4822 116 80176	1Ω	5%	0,5W
3720	4822 116 52176	10Ω	5%	0,5W
3721	4822 116 83883	470Ω	5%	0,16W
3725	4822 116 83864	10kΩ	5%	0,5W
3726	4822 116 83864	10kΩ	5%	0,5W
3800	4822 116 52239	120kΩ	5%	0,5W
3801	4822 116 83864	10kΩ	5%	0,5W
3802	4822 116 52239	120kΩ	5%	0,5W
3803	4822 116 83864	10kΩ	5%	0,5W
3804	4822 116 52291	56kΩ	5%	0,5W
3805	4822 116 83864	10kΩ	5%	0,5W
3806	4822 116 83864	10kΩ	5%	0,5W
3807	4822 116 83864	10kΩ	5%	0,5W
3808	4822 116 83864	10kΩ	5%	0,5W
3809	4822 116 52175	100Ω	5%	0,5W
3810	4822 050 11002	1kΩ	5%	0,2W
3812	4822 116 83884	47kΩ	5%	0,16W
3813	4822 116 83864	10kΩ	5%	0,5W
3816	4822 116 52269	3,3kΩ	5%	0,5W

ELECTRICAL PARTSLIST 3CDC MODULE

RESISTORS

3817	4822 116 83961	6,8kΩ	5%	0,16W
3818	4822 116 83864	10kΩ	5%	0,5W
3819	4822 116 83883	470Ω	5%	0,16W
3820	4822 116 52269	3,3kΩ	5%	0,5W
3821	4822 116 52269	3,3kΩ	5%	0,5W
3822	4822 116 52257	22kΩ	5%	0,5W
3823	4822 116 52269	3,3kΩ	5%	0,5W
3824	4822 116 52269	3,3kΩ	5%	0,5W
3825	4822 050 11002	1kΩ	5%	0,2W
3826	4822 116 52257	22kΩ	5%	0,5W
3827	4822 116 52278	390kΩ	5%	0,5W
3828	4822 116 52257	22kΩ	5%	0,5W
3830	4822 116 52235	1MΩ	5%	0,5W
3831	4822 116 52257	22kΩ	5%	0,5W
3832	4822 116 83883	470Ω	5%	0,16W
3833	4822 116 83864	10kΩ	5%	0,5W
3834	4822 116 52283	4,7kΩ	5%	0,5W
3837	4822 050 11002	1kΩ	5%	0,2W
3838	4822 050 11002	1kΩ	5%	0,2W
3839	4822 116 52245	150kΩ	5%	0,16W
3840	4822 116 52245	150kΩ	5%	0,16W
3841	4822 116 83961	6,8kΩ	5%	0,16W
3842	4822 116 83864	10kΩ	5%	0,5W
3843	4822 116 52303	8,2kΩ	5%	0,5W
3844	4822 116 52226	560Ω	5%	0,5W
3844	4822 116 83883	470Ω	5%	0,16W
3845	4822 116 83864	10kΩ	5%	0,5W
3846	4822 116 52303	8,2kΩ	5%	0,5W
3847	4822 116 52228	680Ω	5%	0,5W
3847	4822 116 83883	470Ω	5%	0,16W
3848	4822 116 52303	8,2kΩ	5%	0,5W
3849	4822 116 52303	8,2kΩ	5%	0,5W
3850	4822 116 83883	470Ω	5%	0,16W
3851	4822 052 10338	3,3Ω		NFR25
3852	4822 052 10338	3,3Ω		NFR25
3853	4822 052 10338	3,3Ω		NFR25
3856	4822 116 52219	330Ω	5%	0,5W
3856	4822 116 80176	1Ω	5%	0,5W
3857	4822 050 11002	1kΩ	5%	0,2W
3858	4822 116 52257	22kΩ	5%	0,5W
3859	4822 116 52257	22kΩ	5%	0,5W
3860	4822 116 83883	470Ω	5%	0,16W
3861	4822 116 83883	470Ω	5%	0,16W
3862	4822 116 52175	100Ω	5%	0,5W
3863	4822 116 52175	100Ω	5%	0,5W
3864	4822 116 52175	100Ω	5%	0,5W
3865	4822 116 83883	470Ω	5%	0,16W
3866	4822 116 83883	470Ω	5%	0,16W
3867	4822 116 52234	100kΩ	5%	0,5W
3868	4822 116 52191	33Ω	5%	0,5W
3869	4822 116 52175	100Ω	5%	0,5W
3870	4822 116 52226	560Ω	5%	0,5W
3871	4822 116 83864	10kΩ	5%	0,5W
3872	4822 116 83864	10kΩ	5%	0,5W
3873	4822 116 83883	470Ω	5%	0,16W
3874	4822 116 83864	10kΩ	5%	0,5W
3875	4822 116 83864	10kΩ	5%	0,5W
3876	4822 116 83874	220kΩ	5%	0,5W
3877	4822 116 83864	10kΩ	5%	0,5W
3878	4822 116 83864	10kΩ	5%	0,5W

RESISTORS

3879	4822 116 83864	10kΩ	5%	0,5W
3880	4822 116 52219	330Ω	5%	0,5W
3881	4822 116 83864	10kΩ	5%	0,5W
3882	4822 116 83884	47kΩ	5%	0,16W
3883	4822 116 52234	100kΩ	5%	0,5W
3884	4822 116 52276	3,9kΩ	5%	0,5W
3885	4822 116 52234	100kΩ	5%	0,5W
3886	4822 116 83884	47kΩ	5%	0,16W
3887	4822 052 10221	220Ω	5%	
3888	4822 116 83864	10kΩ	5%	0,5W
3889	4822 116 83883	470Ω	5%	0,16W
3890	4822 116 83883	470Ω	5%	0,16W
3891	4822 116 52272	330kΩ	5%	0,5W
3893	4822 116 52257	22kΩ	5%	0,5W
3894	4822 116 52191	33Ω	5%	0,5W
3895	4822 116 52176	10Ω	5%	0,5W
3896	4822 116 83864	10kΩ	5%	0,5W
3897	4822 116 52226	560Ω	5%	0,5W
3898	4822 116 52226	560Ω	5%	0,5W
3899	4822 116 52213	180Ω	5%	0,5W

COILS

1810	4822 242 10849	CRYSTAL 8MHz
1810	4822 242 73557	CERAMIC RES. 8,46MHz
5801	4822 157 11477	2,2µH

DIODES

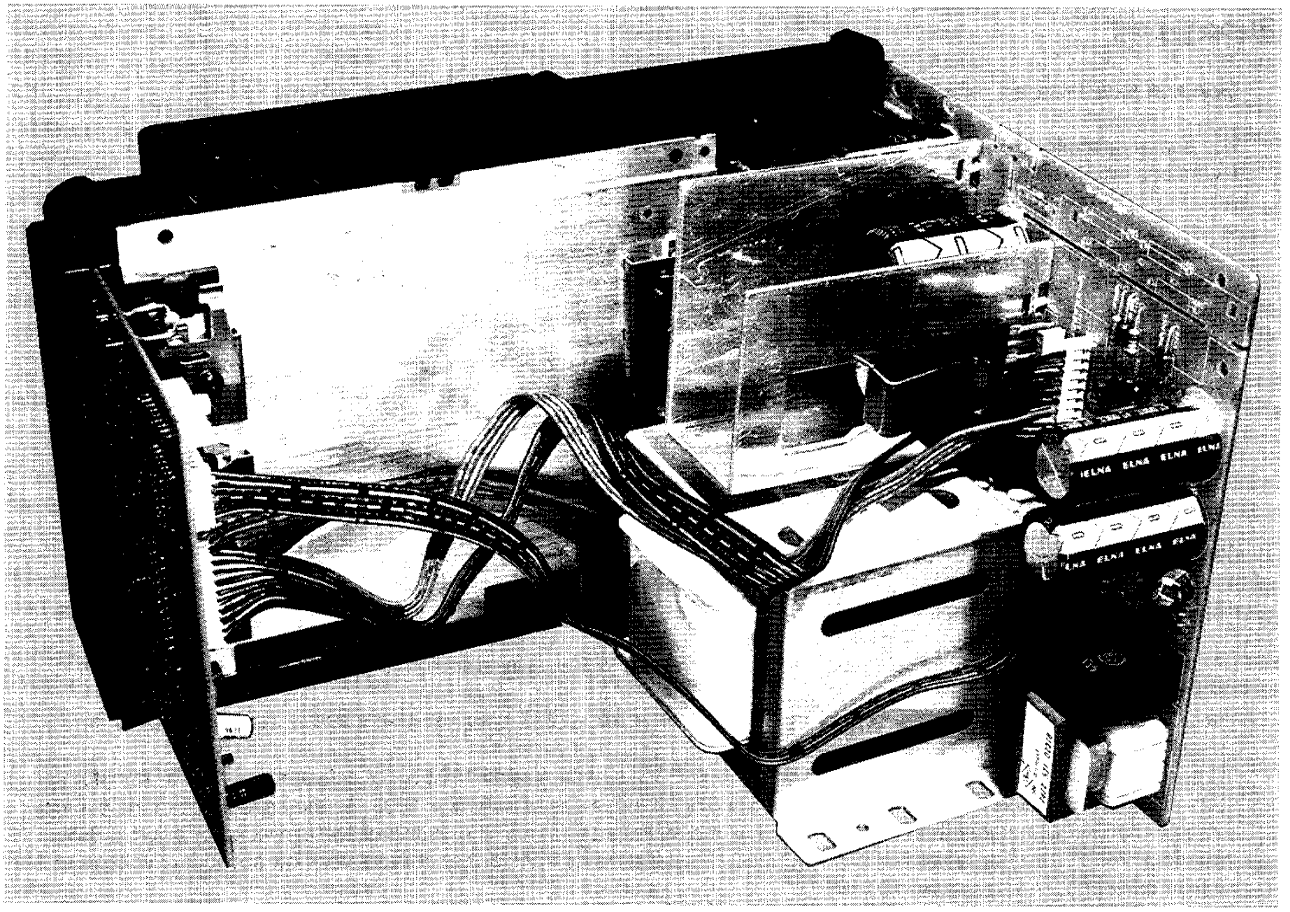
6871	4822 130 30621	1N4148
6872	4822 130 30621	1N4148
6873	4822 130 30621	1N4148
6874	4822 130 30621	1N4148
6875	4822 130 34233	BZX79-B5V1

TRANSISTORS

7808	4822 130 41344	BC337-40
7874	4822 130 40959	BC547B
7875	4822 130 40959	BC547B

INTEGRATED CIRCUITS

7800 ©	4822 209 12752	SAA7378GP (Signal Processor CD7)
7801 ©	5322 209 11517	PC74HCU04T (HF Amplifier)
7806	4822 209 32852	TDA7073A/N2 (Servo Driver)
7807	4822 209 32852	TDA7073A/N2 (Motor Driver)
7810	4822 130 10845	OPTICAL OUT UNIT
7851	4822 209 32421	TDA1311A/N2(DAC)
7871	4822 209 32852	TDA7073A/N2 (Motor Driver)
7873	5322 209 10421	HEF4094BP (Shift Register)
7876	4822 209 16143	LC89170M (CD Text)



POWER 4 Module

(2 Channel Version)

TABLE OF CONTENTS

CIRCUIT DESCRIPTION FOR POWER4-MODULE

Supply-part

General *(pos. numbers refer to circuit diagram chapter 11-7)*

The primary circuitry depends on the version:

- Versions with fixed primary voltage: 100VAC for /26
  120VAC for /37
  220-240VAC for /22/25/30/33/34
  Versions /22/25/26/37 use radial type-fuse 1201, versions /30/33/34 use glass tube fuse 1202.
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- Version with switchable primary voltage: 110-127/220-240VAC for /21
  In version /21 voltage selector 1210 is built-in and each primary winding is protected separately (fuses 1201 and 1200).
  For correct replacement see service printing on printed board respectively version table in circuit diagram or partslist.

- European versions – *"low power standby feature"*
  For detailed description see below.

Circuit details:

- **Low power standby feature**

An additional small standby transformer, connected in series to the mains transformer, reduces power consumption in standby-mode.
In case power is switched on, the control line ECO is low → relay 1208 is activated → standby transformer 5211 is shortened and out of work.
When the set is switched off (standby) the control line ECO is high → relay 1208 is not activated → standby transformer 5211 is now connected in series to the primary winding of the mains transformer 1008. As the impedance of the standby transformer is much higher than the impedance of the mains transformer, the mainsvoltage is divided by approx. 85% (standby transformer) to 15% (mains transformer). Thus the mains transformer delivers very low secondary voltage → power consumption is less than 100mW.
Via standby transformer and rectifiers 6209-6212 the supply voltage +C is substituted. The 5,6V regulator is still working and so the microprocessor is kept running.

- **DC voltages +A, +B1/+B2, +C**

These voltages supply the Super Class G amplifier, described later in this chapter.
The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several "tricky" details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A

Common full wave rectifying with bridge rectifier 6201, using 100% secondary winding of mains transformer (pin 11-15).

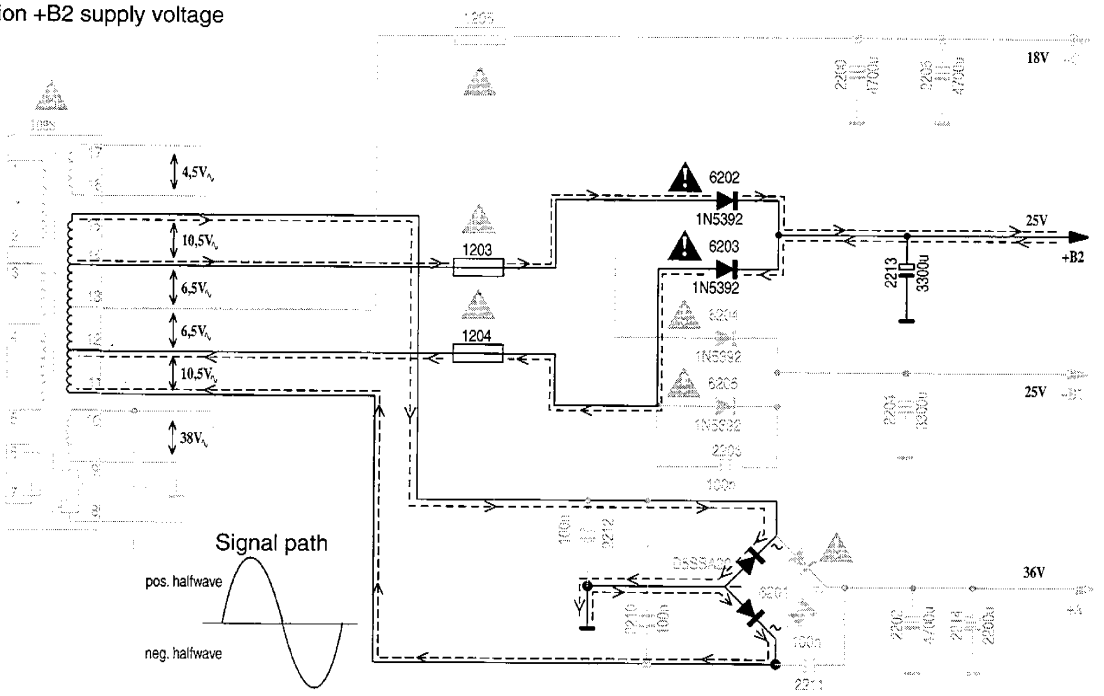
Generation of +B1/+B2

The power supply is designed to cover both, 2-channel and 4-channel application.
While for 2-channel application only one supply voltage +B1 is sufficient, 4-channel application requires an additional supply part +B2 which supplies the Center/Surround-amplifiers and the +12V-regulator (current required by 4 amplifiers would overload a single rectifier).

The supply for 2-channel versions consists of one full wave rectifier:
– 2 diodes of bridge rectifier 6201, with 6204/6205 for generation of +B1
– +B2 is connected in parallel with a bridge wire.

The supply for 4-channel versions consists of two separate full wave rectifiers:
– 2 diodes of bridge rectifier 6201, with 6204/6205 (for +B1) and
– 2 diodes of bridge rectifier 6201, with 6202/6203 (for +B2),
using approx. 70% secondary winding of mains transformer (pin 11-14 respectively pin 12-15).
As example for generation of +B2 see picture 1.

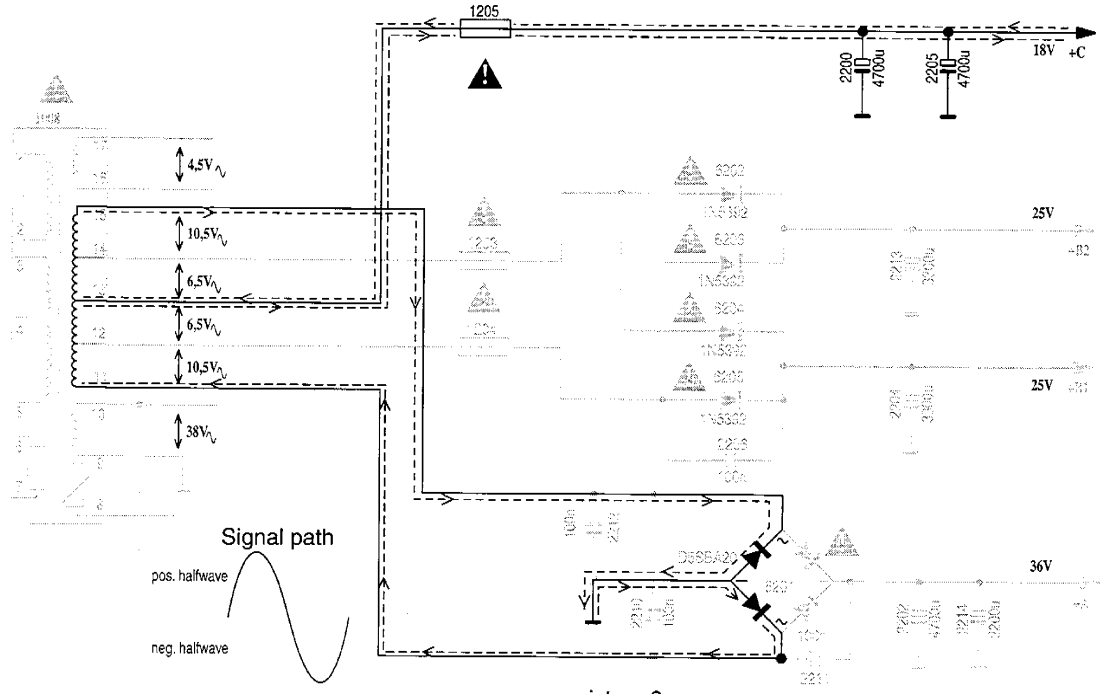
Generation +B2 supply voltage



picture 1

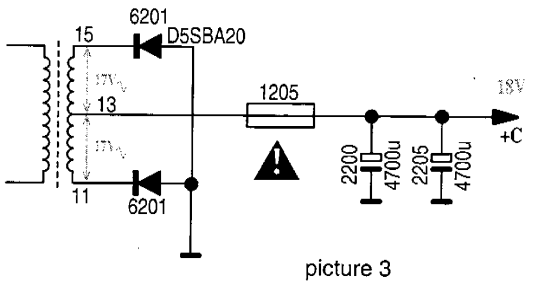
Generation of +C

Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11). See pictures 2 and 3 below.



picture 2

Simplified



picture 3

Circuit details (continoued):

- **Supply voltages for FTD** (**F**luorescent **T**ube **D**isplay)
  The FTD requires two supply voltages, delivered by separate windings of the mains transformer:
  – 4,5VAC for FTD heating (transformer pin 16/17)
  – -30V stabilized by the -30V regulator located on the amplifier part. The supply part delivers -35V unstabilized (transformer pin 9/10), typical value: -35V...-45V.

- **Stabilized +5V6**
  Stabilizer 7201 generates the supply voltage +5V6 for the microprocessor. In fault condition the output voltage can rise up to approx. 17V, which would definitely damage the device. Therefore an overvoltage protection for the +5V6 supply is implemented.
  Whenever the output of stabilizer rises above 7,5V, the base of 7202 reaches 0,7V (7,5V - voltage drop on 6207), the transistor switches through and short circuits the input voltage. This causes the safety resistor 3204 to blow out and interrupt immediately.

- **Temperature monitoring**
  The mains transformer is equipped with a NTC, embedded in the secondary winding (pin 8/9). Via the NTC line the temperature of the mains transformer is continuously monitored by the microprocessor. Further actions depend on the software of the set. Usually the set will be switched to standby mode when the transformer is overheated.

- **Power down (PWDN) monitoring**
  In order to enable proper switch off conditions the mains supply is monitored by the microprocessor via the PWDN line. In case of mains supply interrupts the PWDN line becomes low, while the +5V6 is still stable. This enables the microprocessor to take actions for a save shut-down (e.g. mute, reset of electronics, release of head support of tape deck).

Amplifier part

+12V-regulator *(pos. numbers refer to circuit diagram chapter 11-9)*

Is used to supply all motors (+12M) and all analogue circuits (+12A) in the set. +12C is provisional only.

- **Power on/off:**
  Switching on/off is done via the STBY-line from the microprocessor. H=ON, L=OFF
  If the STBY line is high - transistor 7222 is conductive. Base of 7224 becomes less positive than the emitter. This causes transistor 7224 to switch trough and supply the base of 7221. Consequently 7221 swiches trough too.
  Via 3218 transistor 3228 is conductive as soon as B2 is available. Consequently switching transistor 7227 is also switched through.

  If the STBY line is switched to low level base current for 7222 is blocked. In turn 7224 and 7221 are blocked. → OFF.

- **Regulation:**
  Key components are power-transistor 7221, reference diode 6221 and transistor 7223.
  After power is switched on via the STBY line as described above the +12A increases until 7223 becomes conductive via reference diode 6221 → 7223 reduces base current of 7221 → +12A is stable (typical +12,4V).
  In normal operating mode 7227 is always switched trough as described above.

- **Protections:**
  In case of overcurrent (typical 2,5A) 7227 gets out of saturation → 7226 becomes conductive → 7225 becomes conductive via 6225 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.
  Restarting is only possible with power OFF→ ON.

  In case of overvoltage (more than +15V on emitter of 7221) 7225 is now activated via 6233 → 7228 is blocked (no base current anymore) → 7227 is blocked too → no +12V.

  These protections are implemented for saving the set-electronic in any fault-condition.

-30V-regulator

- Grid supply for the FTD switched by the microprocessor.
  Simple regulation with 6251 as reference. Typical value: -29V. Maximum current: 30mA

Circuit details (continoued):

Fan-circuit:

Is a provision for versions with not enough cooling-capacity (e.g. MICRO-sets).

There are three modes: (off, low and high) which are controlled by: - an NTC located on the cooling-plate and
- info-line TURBOFAN from the amplifier-supply.

OFF: If NTC 3250 has high resistance, 7236 is conductive → 7237 is blocked → fan is not running.

LOW: When the NTC becomes hot the resistance decreases. At approx. 60°C 7236 blocks. 7237 becomes conductive → fan starts running. The fan is supplied is approx. 8V because divider 3244/3245 keeps base of 7237 at typ. 9V.
3246 works as a hysteresis resistor. Just when the temperature decreases to about 50°C the fan will be switched off.

HIGH: When the set is driven with very high output-levels, +B or even +A is switched as supply voltage to the power stages. Via 6244 the level of the TURBOFAN-line becomes high. Base of 7237 increases and in turn the emitter. This results in a higher fan-speed. The voltage on the fan can rise up to +12V - depending on the music.

Amplifier:

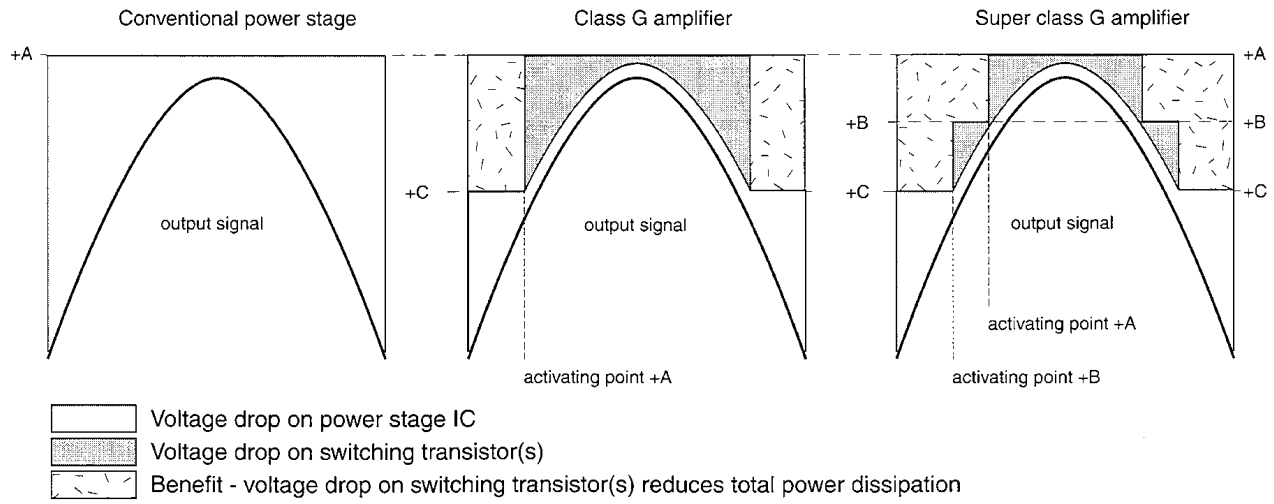
Attention: In the POWER 4 module the power amplifier IC AN7164 is used as a bridge-amplifier.
Any connection from output to ground will destroy the outpout stages!

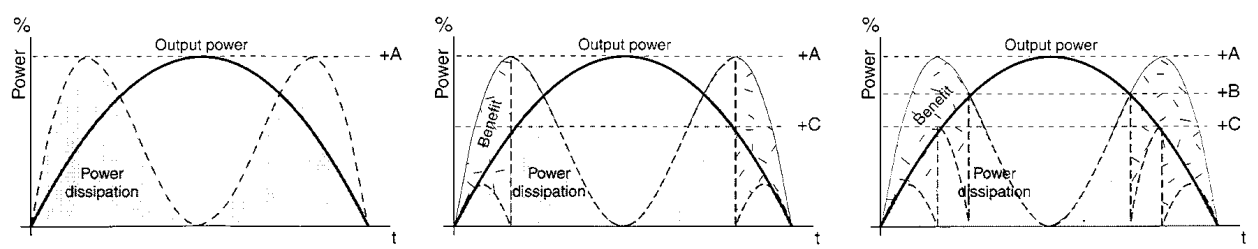
- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the µP.
  High level (approx. 4,5V): power amplifiers switched on
  Low level (approx. 0V): power amplifiers switched off

- Super class G - operation

  The power amplifiers operate as so-called super class G - amplifiers:
  The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
  Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
  ⇒ +C (+18V) for low output power
  ⇒ +B (+25V) for medium output power
  ⇒ +A (+36V for high output power

Principle / benefit of Super Class G





11-5

- advantages: - best efficiency
  - less power drawn from the mains transformer than by conventional operating amplifiers reduces transformer heating.
  - reduced power dissipation at the amplifier ICs results in
    - less junction temperature and better reliability
    - possibility of higher output power with smaller cooling fin
    - smaller size

- Functional description of the super class G - circiuitry used in Power4-module

  The DC-level on the amplifier output pins is normally Vcc/2.
  With low signals +C is supplying the amplifiers via decoupling diode 6312. The DC-level on the output pins is therefore approx. 8,6V and approx. 8V on the base of 7315.
  When the output signal increases, also DC-level on base of 7315 increases via diodes 6305, 6306, 6307 and 6308. At a certain output power 7315 becomes slightly conductive and enables low base current for 7304 which becomes conductive too and pulls gate of FET 7303 up to a more positive level. Thus FET 7303 begins to switch through and connects the higher DC supply +B1 slowly to the power stages.
  This does not end up in a hard switching but in a smooth regulating because Vcc is coupled back to the emitter of 7315 via Zener diode 6310. As soon as Vcc increases also the level on emitter 7315 is increased by a 3,9V lower level than Vcc.
  When the output power is increased further +B1 would not be high enough to enable undistorted output signal. The more the output level increases the more increases the DC-level on base of 7315 which causes the transistor more and more conducting until the summary of the voltage drop on 3340+E/B 7304+3342 becomes approx. 1,4V. Now the necessary VBE for a darlington-type transistor is obtained, 7305 begins to switch through and connects the again higher DC supply +A slowly to the power stages. 7305 regulates +A, same as described before for +B.
  7322 and 7316 switch the ripple capacitor 2355, dependent on the output power.
  With low output power the DC-level on base 7322 is approx. 8V. Via Zener diode 6310 and resistor 3333 the emitter is pulled to Vcc (+C at low levels). 7322 is switched through and in turn 7316. The ripple capacitor 2325 is connected to ground and functions as in normal amplifiers. Hum is suppressed and good S/N-ratio is guaranteed even during silent music passages.
  When the supply voltage has to be switched to a higher level the DC-level of the ripple capacitor has to increase in the same relation, otherwise the reference voltages inside the IC would not fit to the actual Vcc. Because of the different delays this relation cannot be obtained and a continuously connected capacitor to the ripple input would cause distortion. For that reason the ripple capacitor 2325 is disconnected as soon as the output power exceeds a certain value. When the output signal increases, also DC-level on base of 7322 increases via diodes 6305, 6306, 6307 and 6308. 7322 blocks and in turn 7316. The ripple capacitor 2325 is disconnected from ground. The circuitry is designed so that 2325 is disconnected just before 7303 begins to switch +B through (see above).

- For Center/Surround-amplifier the function of the Super Class G circuit is similar. Instead of +B1 there +B2 is connected.

- For the /37-versions with two channel-application the so called MATRIX SURROUND is added. The 2 surround-speakers are added in a way, that in case of STEREO a high signal can be measured (up to 10W per speaker at 6 Ohm). In MONO only a few 100mW are available. Result: The widening of the STEREO base is increased without any additional electronic or amplifier.

- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system (e.g. FB206,FB208).

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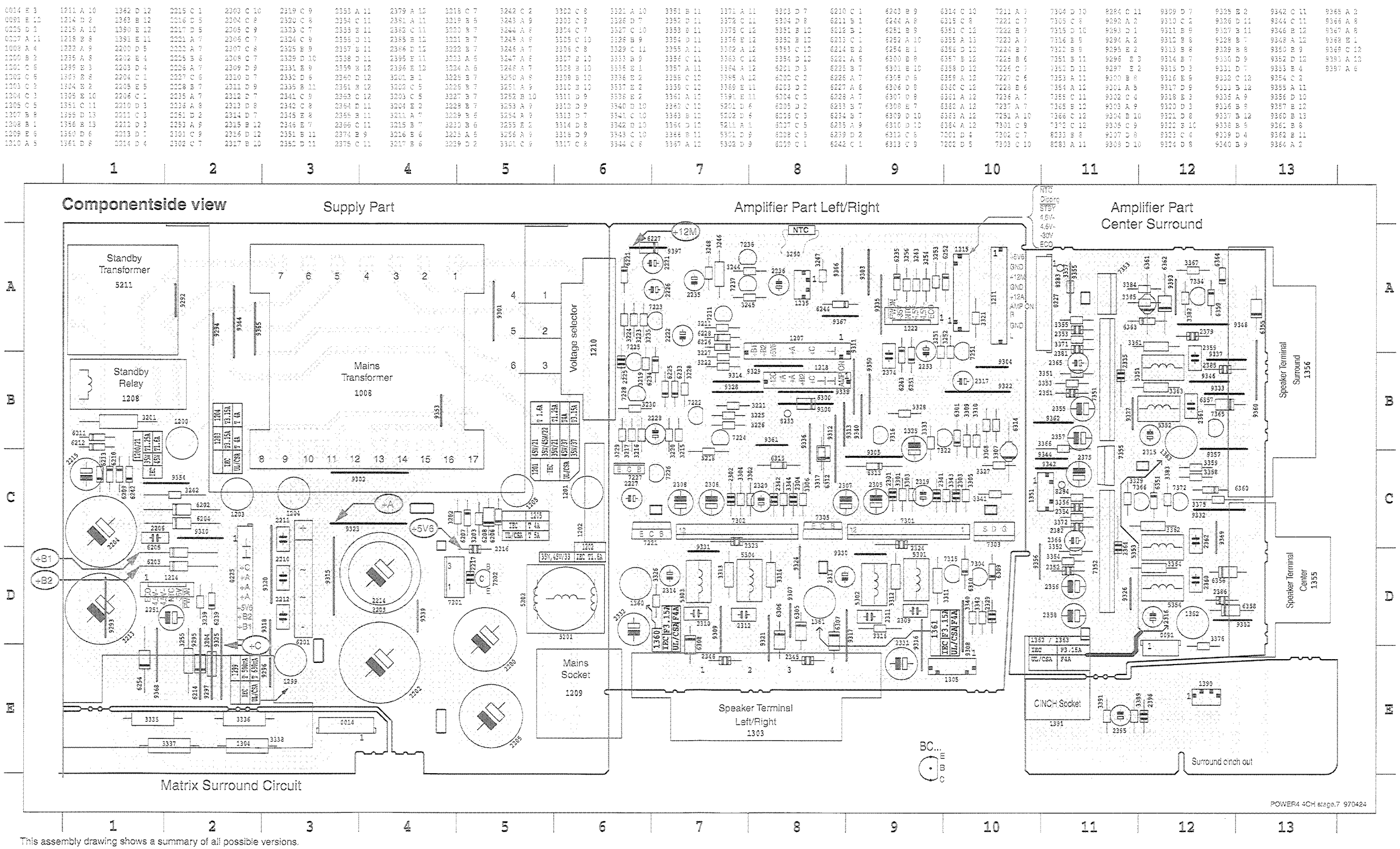
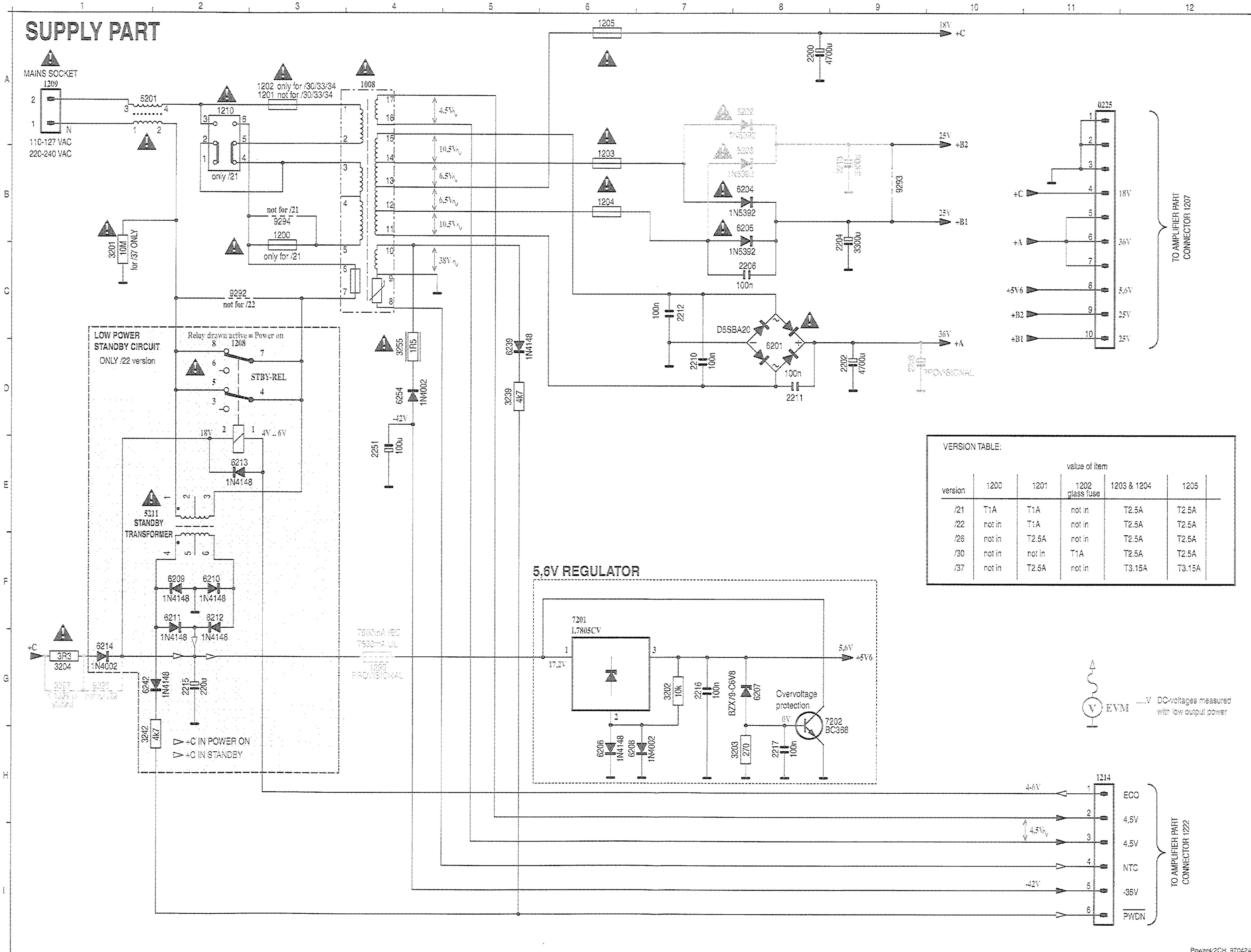


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

SUPPLY PART



VERSION TABLE:

version	1200	1201	1202 glass fuse	1203 & 1204	1205
/21	T1A	T1A	not in	T2.5A	T2.5A
/22	not in	T1A	not in	T2.5A	T2.5A
/26	not in	T2.5A	not in	T2.5A	T2.5A
/30	not in	not in	T1A	T2.5A	T2.5A
/37	not in	T2.5A	not in	T3.15A	T3.15A

value of item

0225 A11
1008 A4
1200 B3
1201 A3
1202 A3
1203 B6
1204 B6
1205 A6
1208 D2
1209 B1
1210 A2
1214 I11
2200 A8
2202 D9
2203 D9
2204 B9
2206 C8
2210 D7
2211 D8
2212 C7
2213 B9
2215 G2
2216 G7
2217 H8
2251 E4
3201 C1
3202 G7
3203 H8
3204 G1
3239 D5
3242 H1
3255 D4
5201 A1
5211 E1
6201 C8
6202 A8
6203 A8
6204 B8
6205 B8
6206 H6
6207 G8
6208 H7
6209 F2
6210 F2
6211 F2
6212 F2
6213 E2
6214 G1
6239 D5
6242 G1
6254 D4
7201 F6
7202 G9
9292 C2
9293 B9
9294 B3
9295 F4

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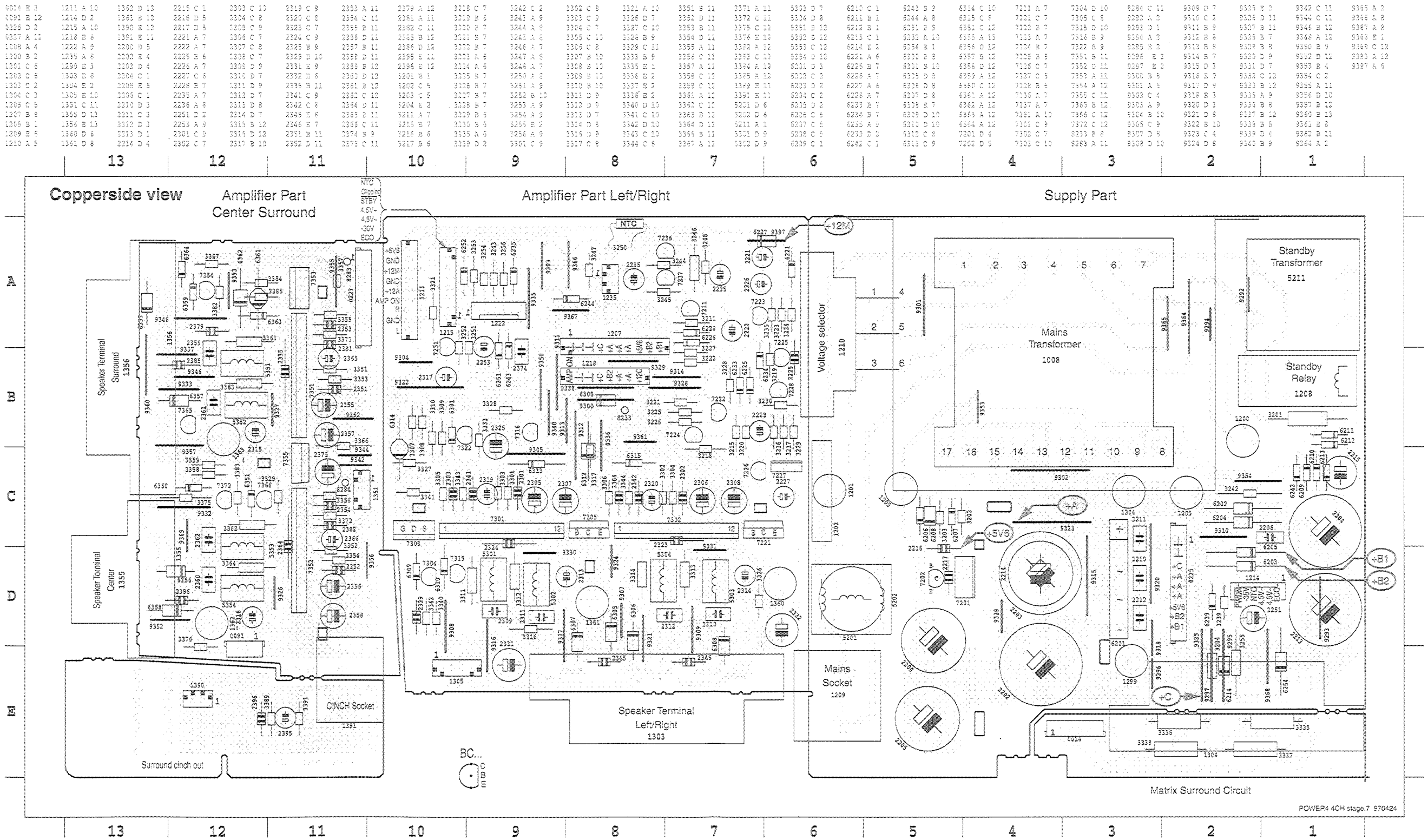

This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

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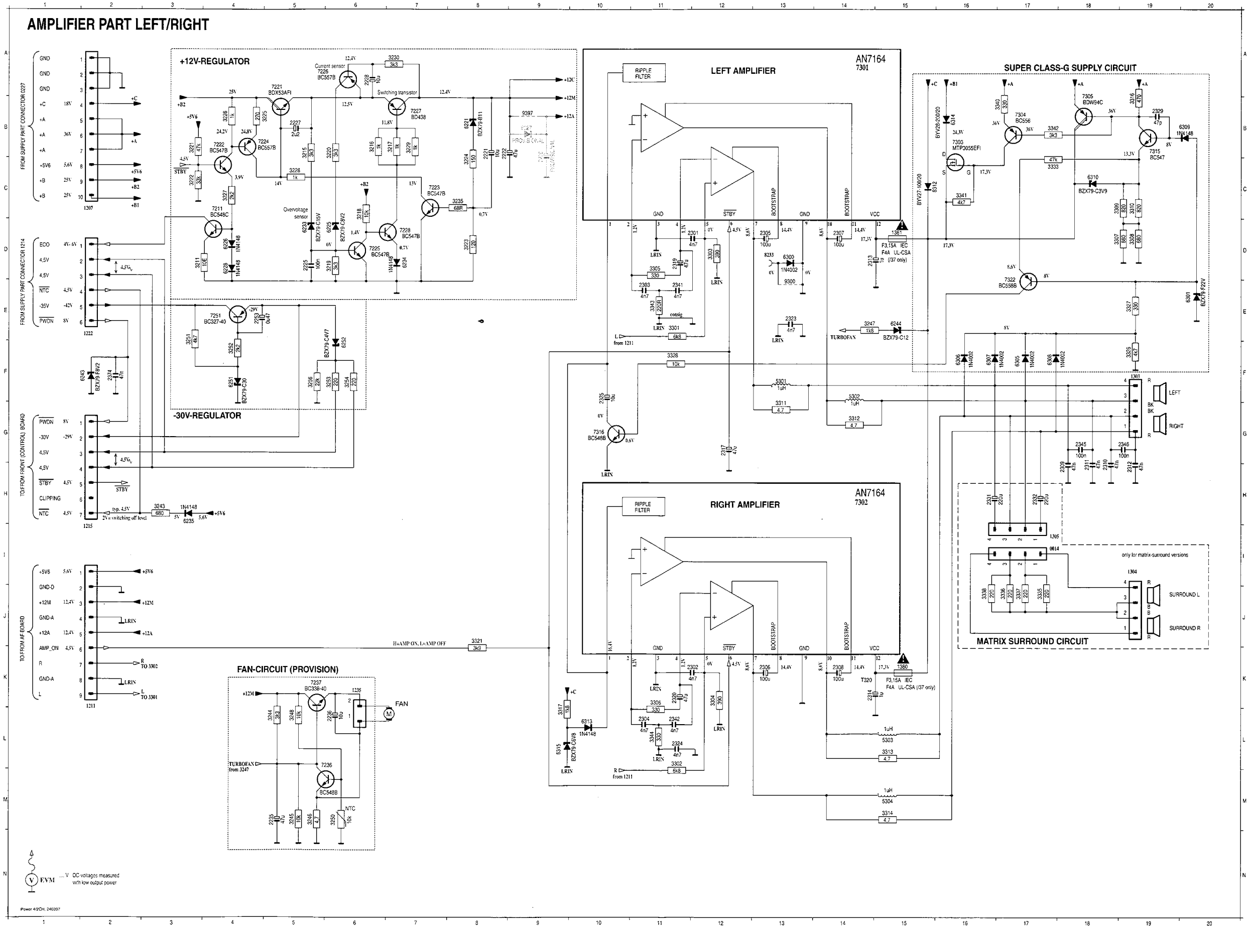
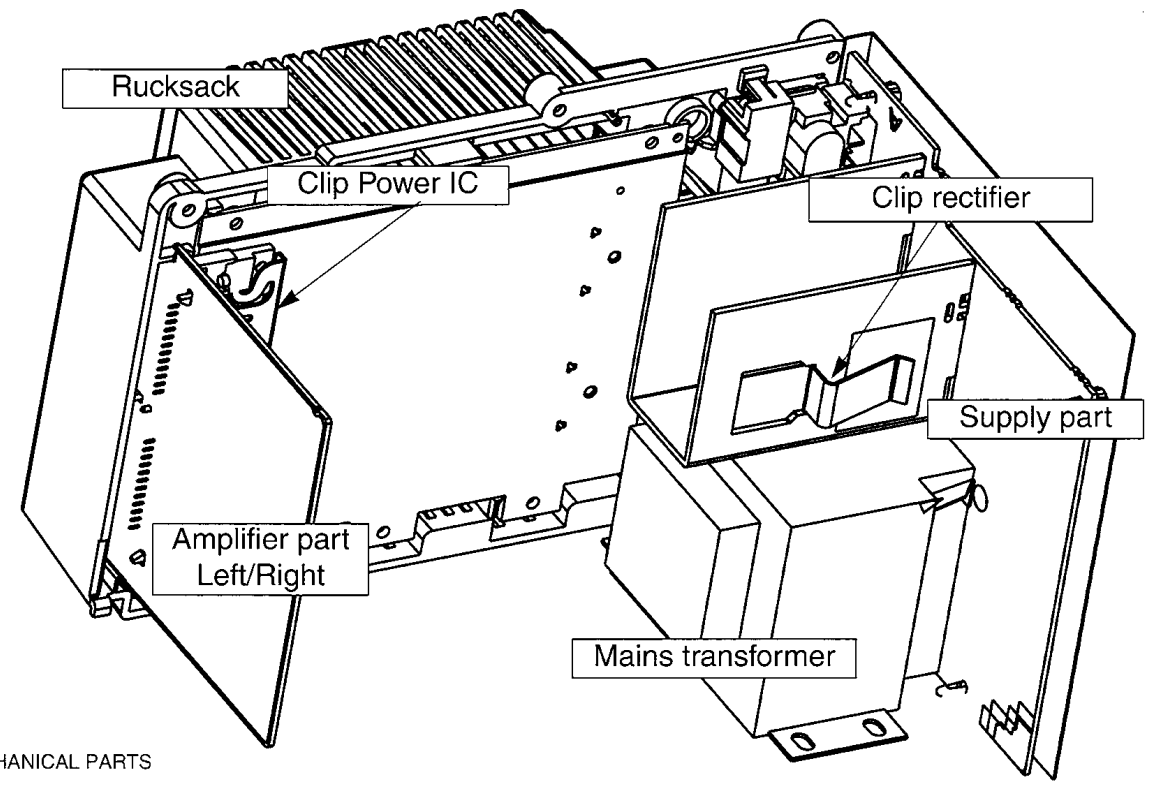
AMPLIFIER PART LEFT/RIGHT



PARTSLIST POWER4 MODULE



MECHANICAL PARTS

4822 492 11068	CLIP RECTIFIER	
4822 492 11395	CLIP POWER-IC	
4822 255 40179	CLIP TO220	
4822 600 10662	RUCKSACK	not for /37
4822 600 10661	RUCKSACK	for /37 only

ELECTRICAL PARTSLIST POWER4 MODULE

MISCELLANEOUS

1200	4822 071 51002	FUSE T1A	
1201	4822 071 51002	FUSE T1A	not for /37
1201	4822 253 50137	FUSE T 2,5A UL	for /37 only
1202	4822 252 11224	FUSE T1A	
1203	4822 071 52502	FUSE T 2,5A	not for /37
1203	4822 252 51121	FUSE T3,15A UL	for /37 only
1204	4822 071 52502	FUSE T 2,5A	not for /37
1204	4822 252 51121	FUSE T3,15A UL	for /37 only
1205	4822 071 52502	FUSE T 2,5A	not for /37
1205	4822 252 51121	FUSE T3,15A UL	for /37 only
1208	4822 280 80777	RELAY	for /22 only
1209	4822 265 31015	MAINS SOCKET	not for /37
1209	4822 265 31016	MAINS SOCKET	for /37 only
1210	4822 272 10269	VOLTAGE SELECTOR	for /21 only
1303	4822 267 31176	SPEAKER TERMINAL	
1360	4822 252 11225	FUSE F3.15A IEC 250V	not for /37
1360	4822 252 11226	FUSE F4A UL/CSA 250V	for /37 only
1361	4822 252 11225	FUSE F3.15A IEC 250V	not for /37
1361	4822 252 11226	FUSE F4A UL/CSA 250V	for /37 only
5211	4822 146 10756	TRANSFORMER STANDBY	for /22 only

CAPACITORS

2200	4822 124 80103	4700µF	20%	25V
2202	4822 124 80415	4700µF	20%	50V
2204	4822 124 42367	3300µF	20%	35V
2206	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V

CAPACITORS

2211	5322 121 42386	100nF	5%	63V
2212	5322 121 42386	100nF	5%	63V
2215	4822 124 22263	220µF	20%	25V
2216	4822 126 12882	100nF	20%	50V
2217	4822 126 12882	100nF	20%	50V
2221	4822 124 41579	10µF	20%	50V
2222	4822 124 40433	47µF	20%	25V
2227	4822 124 41576	2,2µF	20%	50V
2228	4822 124 41579	10µF	20%	50V
2251	4822 124 40255	100µF	20%	50V
2253	4822 124 41407	0,47µF	20%	63V
2301	4822 126 11714	4,7nF	20%	16V
2302	4822 126 11714	4,7nF	20%	16V
2303	4822 126 11714	4,7nF	20%	16V
2304	4822 126 11714	4,7nF	20%	16V
2305	4822 124 81029	100µF	20%	25V
2306	4822 124 81029	100µF	20%	25V
2307	4822 124 81029	100µF	20%	25V
2308	4822 124 81029	100µF	20%	25V
2309	4822 121 43526	47nF	5%	100V
2310	4822 121 43526	47nF	5%	100V
2311	4822 121 43526	47nF	5%	100V
2312	4822 121 43526	47nF	5%	100V
2313	4822 124 40242	1µF	20%	63V
2314	4822 124 40242	1µF	20%	63V

ELECTRICAL PARTSLIST POWER4 MODULE

CAPACITORS

2317	4822 124 40433	47µF	20%	25V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V
2323	4822 126 11714	4,7nF	20%	16V
2324	4822 126 11714	4,7nF	20%	16V
2325	4822 124 41579	10µF	20%	50V
2329	4822 122 33848	47pF	5%	50V
2331	4822 124 41992	220µF		35V
2332	4822 124 41992	220µF		35V
2341	4822 126 11714	4,7nF	20%	16V
2342	4822 126 11714	4,7nF	20%	16V
2345	4822 126 12882	100nF	20%	50V
2346	4822 126 12882	100nF	20%	50V
2374	4822 121 43526	47nF	5%	100V

RESISTORS

3201	4822 053 21106	10MΩ	5%	0,5W
3202	4822 116 83864	10kΩ	5%	0,5W
3203	4822 116 83876	270Ω	5%	0.16W
3204	4822 052 10338	3,3Ω		NFR25
3211	4822 116 52176	10Ω	5%	0,5W
3215	4822 116 52269	3,3kΩ	5%	0,5W
3216	4822 050 11002	1kΩ	5%	0,2W
3217	4822 050 11002	1kΩ	5%	0,2W
3218	4822 116 83864	10kΩ	5%	0,5W
3219	4822 116 52269	3,3kΩ	5%	0,5W
3220	4822 116 52269	3,3kΩ	5%	0,5W
3221	4822 116 83884	47kΩ	5%	0,16W
3222	4822 116 52271	33kΩ	5%	0,16W
3223	4822 116 52206	120Ω	5%	0,5W
3224	4822 116 83868	150Ω	5%	0,5W
3225	4822 116 83876	270Ω	5%	0,16W
3226	4822 050 11002	1kΩ	5%	0,2W
3227	4822 116 52256	2,2kΩ	5%	0,16W
3228	4822 050 11002	1kΩ	5%	0,2W
3229	4822 050 11002	1kΩ	5%	0,2W
3230	4822 116 52269	3,3kΩ	5%	0,5W
3235	4822 116 52199	68Ω	5%	0,16W
3239	4822 116 52283	4,7kΩ	5%	0,5W
3242	4822 116 52283	4,7kΩ	5%	0,5W
3243	4822 116 52228	680Ω	5%	0,5W
3251	4822 116 52283	4,7kΩ	5%	0,5W
3252	4822 116 52256	2,2kΩ	5%	0,16W
3253	4822 116 83872	220Ω	5%	0,5W
3254	4822 116 83872	220Ω	5%	0,5W
3255	4822 117 12148	1,5Ω	5%	
3256	4822 116 52257	22kΩ	5%	0,5W
3301	4822 116 83961	6,8kΩ	5%	0,16W
3302	4822 116 83961	6,8kΩ	5%	0,16W
3303	4822 116 83881	390Ω	5%	0,5W
3304	4822 116 83881	390Ω	5%	0,5W
3305	4822 116 52219	330Ω	5%	0,5W
3306	4822 116 52219	330Ω	5%	0,5W
3307	4822 116 52228	680Ω	5%	0,5W
3308	4822 116 52228	680Ω	5%	0,5W
3309	4822 116 52231	820Ω	5%	0,5W
3310	4822 116 52231	820Ω	5%	0,5W
3311	4822 050 24708	4,7Ω	1%	0,6W
3312	4822 050 24708	4,7Ω	1%	0,6W
3313	4822 050 24708	4,7Ω	1%	0,6W
3314	4822 050 24708	4,7Ω	1%	0,6W

RESISTORS

3316	4822 116 83883	470Ω	5%	0,16W
3317	4822 116 52249	1,8kΩ	5%	0,16W
3321	4822 116 52276	3,9kΩ	5%	0,5W
3326	4822 116 52283	4,7kΩ	5%	0,5W
3327	4822 116 52219	330Ω	5%	0,5W
3328	4822 116 83864	10kΩ	5%	0,5W
3333	4822 116 83884	47kΩ	5%	0,16W
3335	4822 053 10221	220Ω	5%	1W
3336	4822 053 10221	220Ω	5%	1W
3337	4822 053 10221	220Ω	5%	1W
3338	4822 053 10221	220Ω	5%	1W
3340	4822 116 52219	330Ω	5%	0,5W
3341	4822 116 52283	4,7kΩ	5%	0,5W
3342	4822 116 52269	3,3kΩ	5%	0,5W
3343	4822 116 83872	220Ω	5%	0,5W
3344	4822 116 83872	220Ω	5%	0,5W

COILS

5201	4822 157 71285	400µH
5301	4822 157 62255	COIL 18,5 TURNS
5302	4822 157 62255	COIL 18,5 TURNS
5303	4822 157 62255	COIL 18,5 TURNS
5304	4822 157 62255	COIL 18,5 TURNS

DIODES

6201	4822 130 82078	D5SBA20
6204	5322 130 80686	1N5392
6205	5322 130 80686	1N5392
6206	4822 130 30621	1N4148
6207	4822 130 34278	BZX79-C6V8
6208	4822 130 31878	1N4003G
6209	4822 130 30621	1N4148
6210	4822 130 30621	1N4148
6211	4822 130 30621	1N4148
6212	4822 130 30621	1N4148
6213	4822 130 30621	1N4148
6214	4822 130 31878	1N4003G
6221	4822 130 34488	BZX79-C11
6225	4822 130 34382	BZX79-C8V2
6226	4822 130 30621	1N4148
6228	4822 130 30621	1N4148
6233	4822 130 34281	BZX79-C15
6234	4822 130 30621	1N4148
6235	4822 130 30621	1N4148
6239	4822 130 30621	1N4148
6242	4822 130 30621	1N4148
6243	4822 130 34382	BZX79-C8V2
6251	4822 130 34328	BZX79-C30
6252	4822 130 34174	BZX79-B4V7
6254	4822 130 31878	1N4003G
6300	4822 130 31878	1N4003G
6301	4822 130 34441	BZX79-F22
6305	4822 130 31878	1N4003G
6306	4822 130 31878	1N4003G
6307	4822 130 31878	1N4003G
6308	4822 130 31878	1N4003G
6309	4822 130 30621	1N4148
6310	4822 130 31981	BZX79-C3V9
6312	4822 130 31982	BYV27-100
6313	4822 130 30621	1N4148
6314	4822 130 80791	BYV28-200/20
6315	4822 130 34278	BZX79-C6V8

ELECTRICAL PARTSLIST POWER4 MODULE

TRANSISTORS

7202	5322 130 44647	BC368
7211	4822 130 44196	BC548C
7221	4822 130 10812	BDX53BFI
7222	4822 130 40959	BC547B
7223	4822 130 40959	BC547B
7224	4822 130 41691	BC556B
7225	4822 130 40959	BC547B
7226	4822 130 41691	BC556B
7227	4822 130 40995	BD438
7228	4822 130 40959	BC547B
7251	4822 130 41327	BC327-40
7303	4822 130 63726	MTP3055EFI
7304	4822 130 41691	BC556B

TRANSISTORS

7305	4822 130 10847	BDW94C
7315	4822 130 40959	BC547B
7316	4822 130 40959	BC547B
7322	4822 130 44568	BC557B

INTEGRATED CIRCUITS

7201	4822 209 80817	L7805CV
7301	4822 209 90411	AN7164
7302	4822 209 90411	AN7164

AF5 BOARD

TABLE OF CONTENTS

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BRIEF INTRODUCTION OF THE AF5 BOARD

The AF5 Board consists of the following features :

a. SOFAC IC
SOFAC IC TEA6321 (7553) 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 data 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 100n. In our application , software will switch the input source to MONO input during STANDBY mode and some other occasions where noise from other input sources 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
Karaoke Mic. Mixing can be configured to cater for one of the following :
NK : Non Karaoke.
SK : Simple Karaoke which caters for mic. mixing with additional mic. amplifier board.
FK : Full Karaoke with vocal fader and echo effect with additional karaoke board.

c. DOLBY PRO LOGIC (DPL) INTERFACE
DPL Interface can be configured to cater for DPL and also DPL with one of the karaoke functions.

d. LINE OUT
Line Out with JST XH connector for connection to LINE OUT cinch socket.

e. SUB-WOOFER OUTPUT
Sub-Woofer Output with cinch socket for connection to active sub-woofer speaker.

f. INCREDIBLE SURROUND
Incredible Surround effect using transistor circuit BC847C (7517, 7518, 7519, 7520) to create phase shifting and spatial effect.

g. HEADPHONE AMPLIFIER
Headphone Amplifier using Op-Amp. NJM4556AM (7501).

h. CD STANDBY SWITCH
CD Standby control circuit using transistors BC327-40 (7515) and BC847C (7516) which switches on the supply to CD servo control IC , HF circuit and the laser light pen in CD mode only.

i. HEADPHONE SENSING CIRCUIT
Headphone Sensing circuit to mute centre and surround channels in DPL application.

j. ATTENUATION NETWORK
Attenuation network is provided at the output of the AF5 Board for interfacing with the power board of different output power.

Variations table for

	FW5 /21/ FW5 /21/ FW5 /21/ FW5 /21/2
3674	8
3675	2
9589	
3661/3662	5
DM61/1577	3
3521/3522	1
4525/4580	
3605/3606	1
4611/4612	
4572	
4573	
DM54/1517	
3645/3636	
3529	
3530	
2603	
2643	
3519/3520	
3597/3598	
4623/4527	
4501/4502	
1513	
1525	
1510	1
1506	7
3501/3502	1(
9507	
4600/4602	
1523	
1531/1530	
1507	
DM30	
DM31	
2586	
2652/2653	2
3563/3564	1
9623/9624	
3523/3524	8
3525/3526	2
2521/2522	4.
DM56	7
DM59	
1579	7
1578	2
3589	5
2585	4
6501	

x = Item in use.

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The AF5 Board consists of the following features :

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Attenuation network is provided at the output of the AF5 Board for interfacing with the power board of different output power.

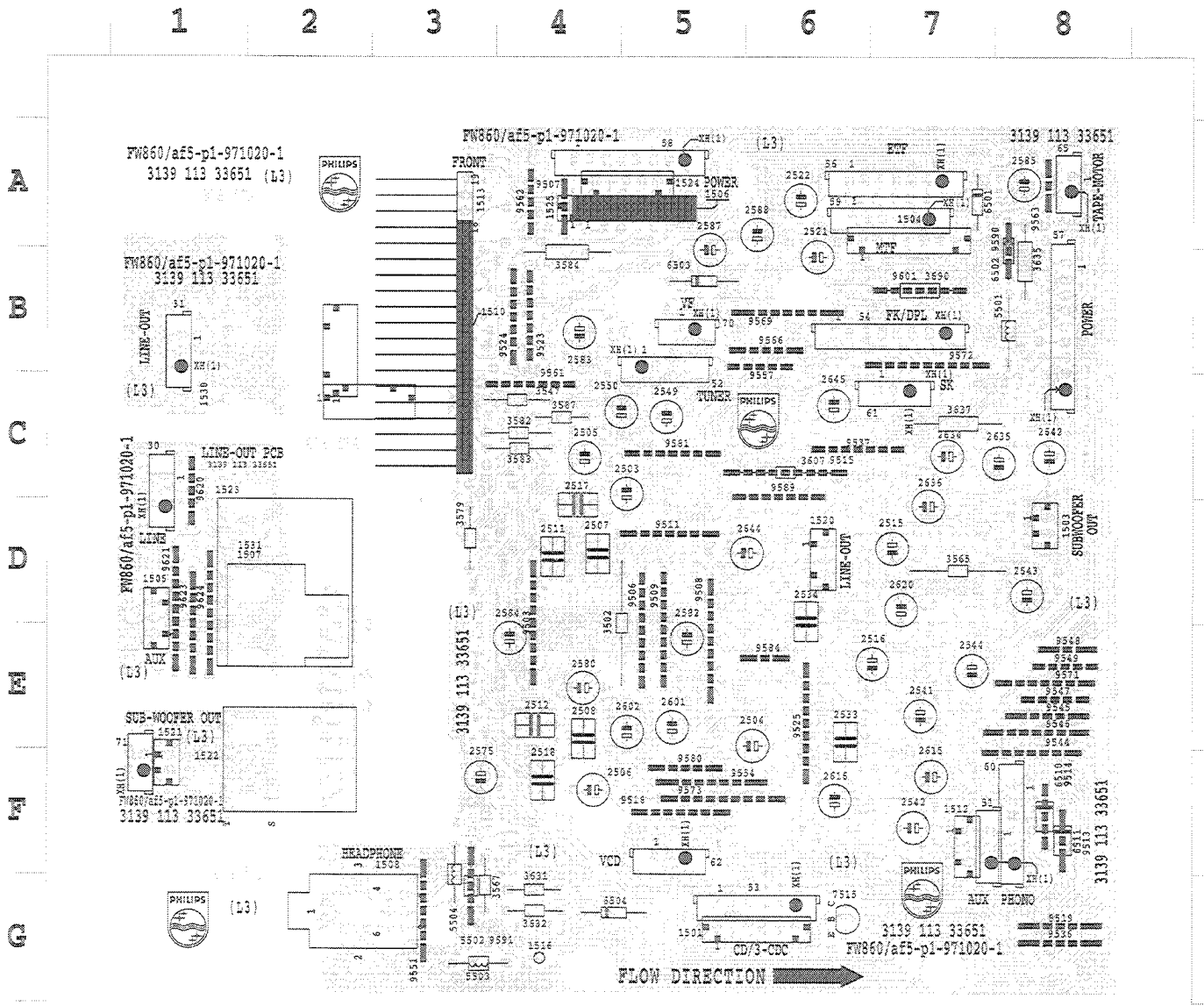
12-1

Variations table for AF5 Board

	FW530C /21/21M FW535C /21/21M FW570C /21/21M FW575C /21/21M/33	FW530C /22/37 FW535C /22/30/34 FW550C /22 FW570C /22	FW755P /30	FW754P /37	FW775P /22/30/37	FW765P /22 FW795W /22	FW765P /21/21M FW795W /21	FW520C /37	FW510C /37	FW560C /37
3674	8k2	8k2	15k	15k	15k	15k	15k	8k2	8k2	8k2
3675	2k2	3k3	6k8	4k7	8k2	3k3	2k2	6k8	4k7	8k2
9589	x	-	-	-	-	-	-	-	-	-
3661/3662	5k6	-	-	-	-	-	-	-	-	-
DM61/1577	3P	-	-	-	-	-	-	-	-	-
3521/3522	15k	-	-	-	-	-	-	-	-	-
4525/4580	x	-	-	-	-	-	-	-	-	-
3605/3606	1k5	-	1k2	1k2	1k2	1k2	1k2	-	-	-
4611/4612	x	-	x	x	x	x	x	-	-	-
4572	x	-	x	x	x	x	x	-	-	-
4573	-	-	x	x	x	x	x	-	-	-
DM54/1517	-	-	7P	7P	7P	7P	7P	-	-	-
3645/3636	-	-	1k8	1k8	1k8	1k8	1k8	-	-	-
3529	-	-	5k6	5k6	5k6	5k6	5k6	-	-	-
3530	-	-	15k	15k	15k	15k	15k	-	-	-
2603	-	-	100pF	100pF	100pF	100pF	100pF	-	-	-
2643	-	-	1µF	1µF	1µF	1µF	1µF	-	-	-
3519/3520	-	-	6k8	6k8	6k8	6k8	6k8	-	-	-
3597/3598	-	-	27k	27k	27k	27k	27k	-	-	-
4623/4527	-	-	x	x	x	x	x	-	-	-
4501/4502	-	x	-	-	-	-	-	x	x	x
1513	-	-	-	-	18P	-	-	-	-	18P
1525	-	-	-	-	8P	-	-	-	-	8P
1510	16P	16P	16P	16P	-	16P	16P	16P	16P	-
1506	7P	7P	7P	7P	-	7P	7P	7P	7P	-
3501/3502	100R	100R	100R	100R	10k	100R	100R	100R	100R	10k
9507	x	x	x	x	-	x	x	x	x	-
4600/4602	-	-	-	-	x	-	-	-	-	x
1523	x	x	x	x	-	x	x	-	-	-
1531/1530	-	-	-	-	x	-	-	-	-	x
1507	-	-	-	-	-	-	-	x	x	-
DM30	x	x	x	x	-	x	x	-	-	-
DM31	-	-	-	-	x	-	-	-	-	x
2586	-	-	-	-	100nF	-	-	100nF	100nF	100nF
2652/2653	22nF	22nF	22nF	22nF	-	22nF	22nF	-	-	-
3563/3564	150k	150k	100k	100k	100k	100k	100k	100k	100k	100k
9623/9624	-	-	-	-	x	-	-	-	-	x
3523/3524	8k2	8k2	47k	47k	8k2	8k2	8k2	47k	47k	47k
3525/3526	2k2	2k2	39k	39k	2k2	2k2	2k2	39k	39k	39k
2521/2522	4.7µF	4.7µF	0.47µF	0.47µF	4.7µF	4.7µF	4.7µF	0.47µF	0.47µF	0.47µF
DM56	7P	7P	-	-	7P	7P	7P	-	-	-
DM59	-	-	6P	6P	-	-	-	6P	6P	6P
1579	7P	7P	6P	6P	7P	7P	7P	6P	6P	6P
1578	2P	2P	2P	2P	2P	2P	2P	2P	2P	2P
3589	5k6	5k6	-	-	5k6	5k6	5k6	-	-	-
2585	47µF	47µF	-	-	47µF	47µF	47µF	-	-	-
6501	x	x	-	-	x	x	x	-	-	-

x = Item in use.

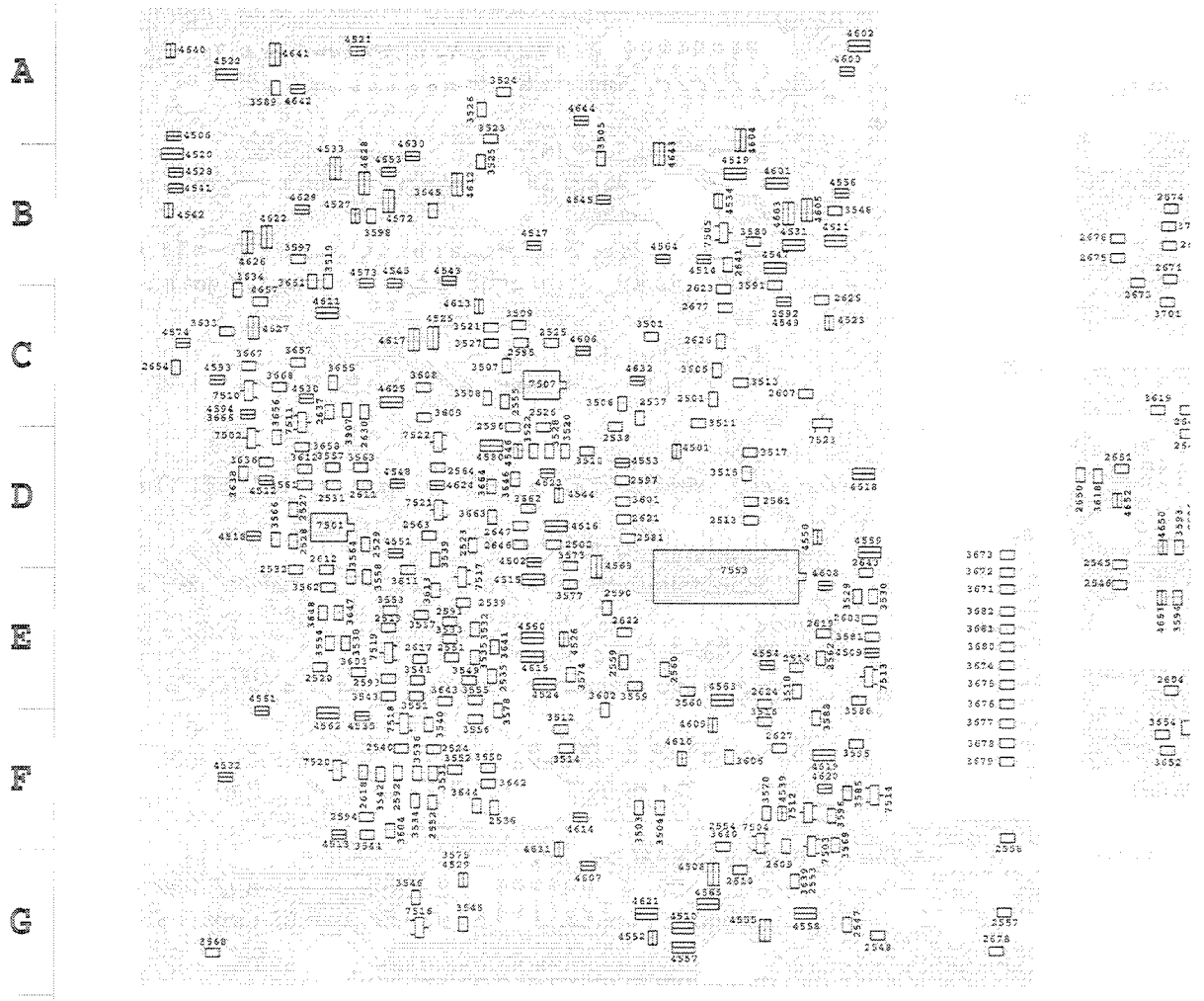
COMPONENT LAYOUT



30	C 1	2580	E 4	9536	G 8
31	B 1	2582	E 5	9537	C 6
51	F 7	2583	B 4	9544	F 8
52	B 5	2584	E 4	9545	E 8
53	G 6	2585	A 8	9546	E 8
54	E 7	2587	B 5	9547	E 8
56	A 7	2588	A 6	9548	E 8
57	B 8	2601	E 5	9549	E 8
58	A 5	2602	E 5	9551	G 3
59	A 7	2615	F 7	9554	F 5
60	F 8	2616	F 6	9557	B 6
61	C 7	2620	D 7	9561	C 4
62	F 5	2634	C 7	9562	A 4
65	A 8	2635	C 8	9563	A 8
70	E 5	2636	D 7	9566	B 6
71	F 1	2642	C 8	9569	B 6
1501	G 6	2644	D 6	9571	E 8
1503	D 8	2645	C 5	9572	B 7
1504	A 7	3502	E 5	9573	F 5
1505	D 1	3547	C 4	9580	F 5
1506	A 5	3565	D 7	9581	C 5
1507	E 2	3567	G 3	9584	E 6
1508	G 2	3579	D 3	9589	C 6
1510	B 3	3582	C 4	9590	B 8
1512	F 7	3583	C 4	9591	G 3
1513	B 3	3584	B 4	9601	B 7
1516	G 4	3587	C 4	9620	C 1
1520	D 6	3607	C 6	9621	D 1
1521	F 1	3631	G 4	9623	E 1
1522	F 2	3632	G 4	9624	D 1
1523	D 2	3635	B 8		
1524	A 5	3637	C 7		
1525	A 5	3690	B 7		
1530	B 2	5501	B 8		
1531	C 2	5502	G 3		
2503	C 5	5503	G 3		
2504	E 6	5504	G 3		
2505	C 4	6501	A 7		
2506	F 4	6502	B 8		
2507	D 4	6503	B 5		
2508	E 4	6504	G 4		
2511	D 4	6510	F 8		
2512	E 4	6511	F 8		
2515	D 7	7515	G 6		
2516	E 7	9503	E 4		
2517	D 4	9506	E 5		
2518	F 4	9507	A 4		
2521	B 5	9508	E 5		
2522	A 6	9509	E 5		
2533	E 6	9511	D 5		
2534	D 6	9513	F 8		
2541	E 7	9514	F 8		
2542	F 7	9515	C 6		
2543	D 8	9518	F 5		
2544	E 7	9519	G 8		
2549	C 5	9523	B 4		
2550	C 5	9524	B 4		
2575	F 3	9525	E 6		

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

CHIP LAYOUT



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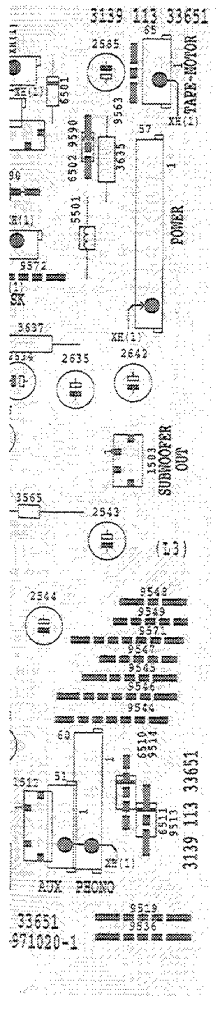
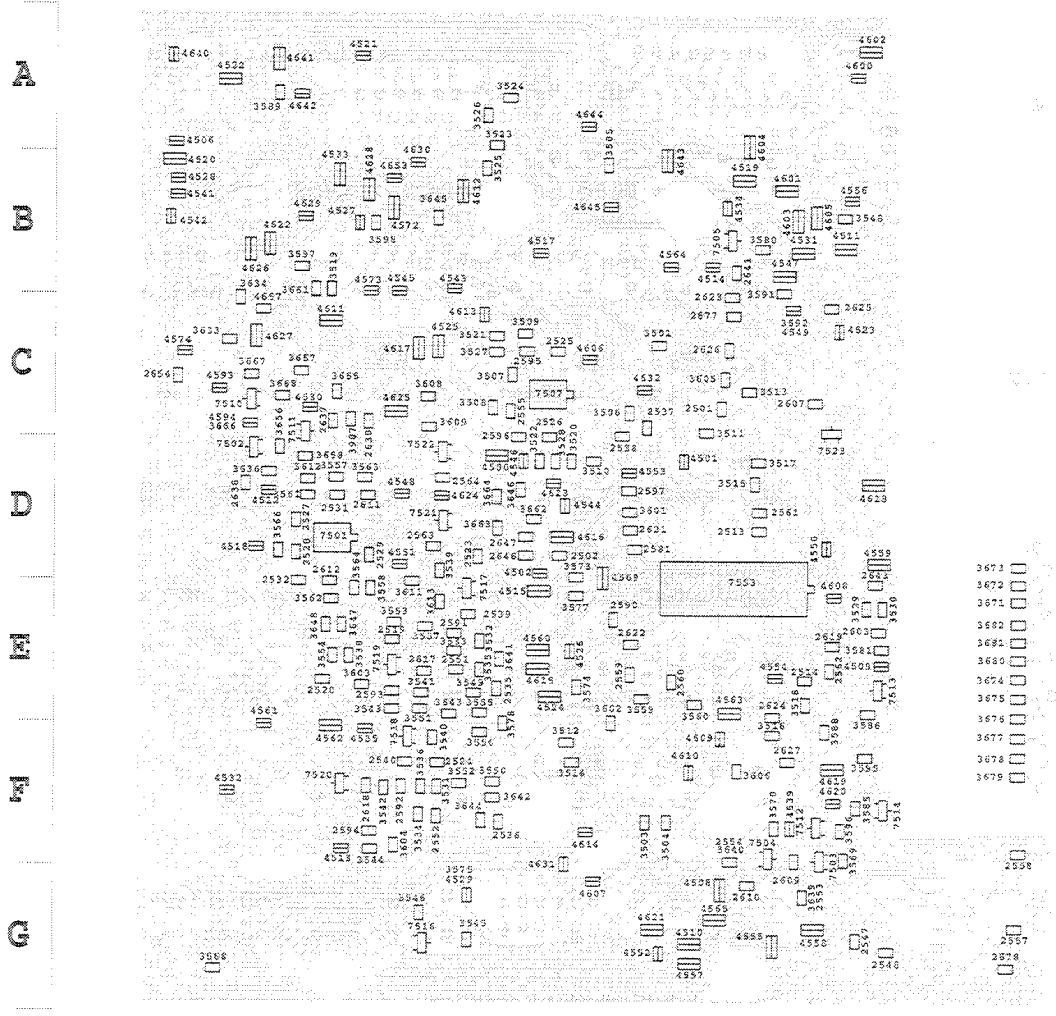
CHIP LAYOUT



30	C 1	2580	E 4	9536	G 8	2501	C 4	2618	F 7	3528	D 6
31	B 1	2582	E 5	9537	C 6	2502	D 6	2619	E 4	3529	E 3
51	F 7	2583	E 4	9544	F 8	2513	D 4	2621	D 5	3530	E 3
52	B 5	2584	E 4	9545	E 8	2514	E 4	2622	E 5	3531	F 6
53	G 6	2585	A 8	9546	E 8	2519	E 7	2623	C 4	3532	E 6
54	B 7	2587	B 5	9547	E 8	2520	E 7	2624	E 4	3533	E 6
56	A 7	2588	A 6	9548	E 8	2523	D 6	2625	C 4	3534	F 7
57	B 8	2601	E 5	9549	E 8	2524	F 6	2626	C 4	3535	E 6
58	A 5	2602	E 5	9551	G 3	2525	C 6	2627	F 4	3536	F 7
59	A 7	2615	F 7	9554	F 5	2526	C 6	2630	C 7	3537	E 6
60	F 8	2616	F 6	9557	B 6	2527	D 7	2632	F 1	3538	E 7
61	C 7	2620	D 7	9561	C 4	2528	D 7	2637	C 7	3539	D 6
62	F 5	2634	C 7	9562	A 4	2529	D 7	2638	D 8	3540	F 6
65	A 8	2635	C 8	9563	A 8	2531	D 7	2641	B 4	3541	E 7
70	B 5	2636	D 7	9566	B 6	2532	E 7	2643	E 3	3542	F 7
71	F 1	2642	C 8	9569	B 6	2535	E 5	2646	D 6	3543	E 7
1501	G 6	2644	D 6	9571	E 8	2536	F 6	2647	D 6	3544	F 7
1503	D 8	2645	C 6	9572	B 7	2537	C 5	2648	D 1	3545	G 6
1504	A 7	3502	E 5	9573	F 5	2538	C 5	2649	C 1	3546	G 7
1505	D 1	3547	C 4	9580	F 5	2539	E 6	2650	D 2	3548	B 4
1506	A 5	3565	D 7	9581	C 5	2540	F 7	2651	D 2	3549	E 6
1507	E 2	3567	G 3	9584	E 6	2545	D 2	2652	D 1	3550	F 6
1508	G 2	3579	D 3	9589	C 6	2546	E 2	2653	D 1	3551	E 7
1510	B 3	3582	C 4	9590	B 8	2547	G 3	2654	C 8	3552	F 6
1512	F 7	3583	C 4	9591	G 3	2548	G 3	2671	B 1	3553	E 7
1513	B 3	3584	E 4	9601	B 7	2551	E 6	2672	B 1	3554	E 7
1516	G 4	3587	C 4	9620	C 1	2552	F 6	2673	B 1	3555	E 5
1520	D 6	3607	C 6	9621	D 1	2553	G 4	2674	B 1	3556	F 5
1521	F 1	3631	G 4	9623	E 1	2554	F 4	2675	B 2	3557	D 7
1522	F 2	3632	G 4	9624	D 1	2555	C 6	2676	B 2	3558	E 7
1523	D 2	3635	B 8			2557	G 2	2677	C 4	3559	E 5
1524	A 5	3637	C 7			2558	F 2	2678	G 2	3560	E 5
1525	A 5	3690	B 7			2559	E 5	3501	C 5	3561	D 7
1530	B 2	5501	B 8			2560	E 5	3503	F 5	3562	E 7
1531	C 2	5502	G 3			2561	D 4	3504	F 5	3563	D 7
2503	C 5	5503	G 3			2562	E 4	3505	B 5	3564	E 7
2504	E 6	5504	G 3			2563	D 6	3506	C 5	3566	D 8
2505	C 4	6501	A 7			2564	D 6	3507	C 6	3568	G 8
2506	F 4	6502	B 8			2573	D 1	3508	C 5	3569	F 4
2507	D 4	6503	B 5			2574	E 1	3509	C 6	3570	F 4
2508	E 4	6504	G 4			2581	D 5	3510	D 5	3571	D 1
2511	D 4	6510	F 8			2586	D 1	3511	C 5	3572	E 1
2512	E 4	6511	F 8			2590	E 5	3512	F 5	3573	D 5
2515	D 7	7515	G 5			2591	E 6	3513	C 4	3574	B 5
2516	E 7	9503	E 4			2592	F 7	3514	F 5	3575	G 6
2517	D 4	9506	E 5			2593	E 7	3515	D 4	3577	E 5
2518	F 4	9507	A 4			2594	F 7	3516	F 4	3578	F 6
2521	B 6	9508	E 5			2595	C 6	3517	D 4	3580	B 4
2522	A 6	9509	E 5			2596	C 6	3518	E 4	3581	E 3
2533	E 6	9511	D 5			2597	D 5	3519	B 7	3585	F 3
2534	D 6	9513	F 8			2603	E 3	3520	D 5	3586	E 3
2541	E 7	9514	F 8			2604	E 1	3521	C 6	3588	F 4
2542	F 7	9515	C 6			2607	C 4	3522	D 6	3589	A 8
2543	D 8	9518	F 5			2609	F 4	3523	A 6	3591	B 4
2544	E 7	9519	G 8			2610	G 4	3524	A 6	3592	C 4
2549	C 5	9523	B 4			2611	D 7	3525	E 6	3593	D 1
2550	C 5	9524	B 4			2612	E 7	3526	A 6	3594	E 1
2575	F 3	9525	E 6			2617	E 7	3527	C 6	3595	F 3

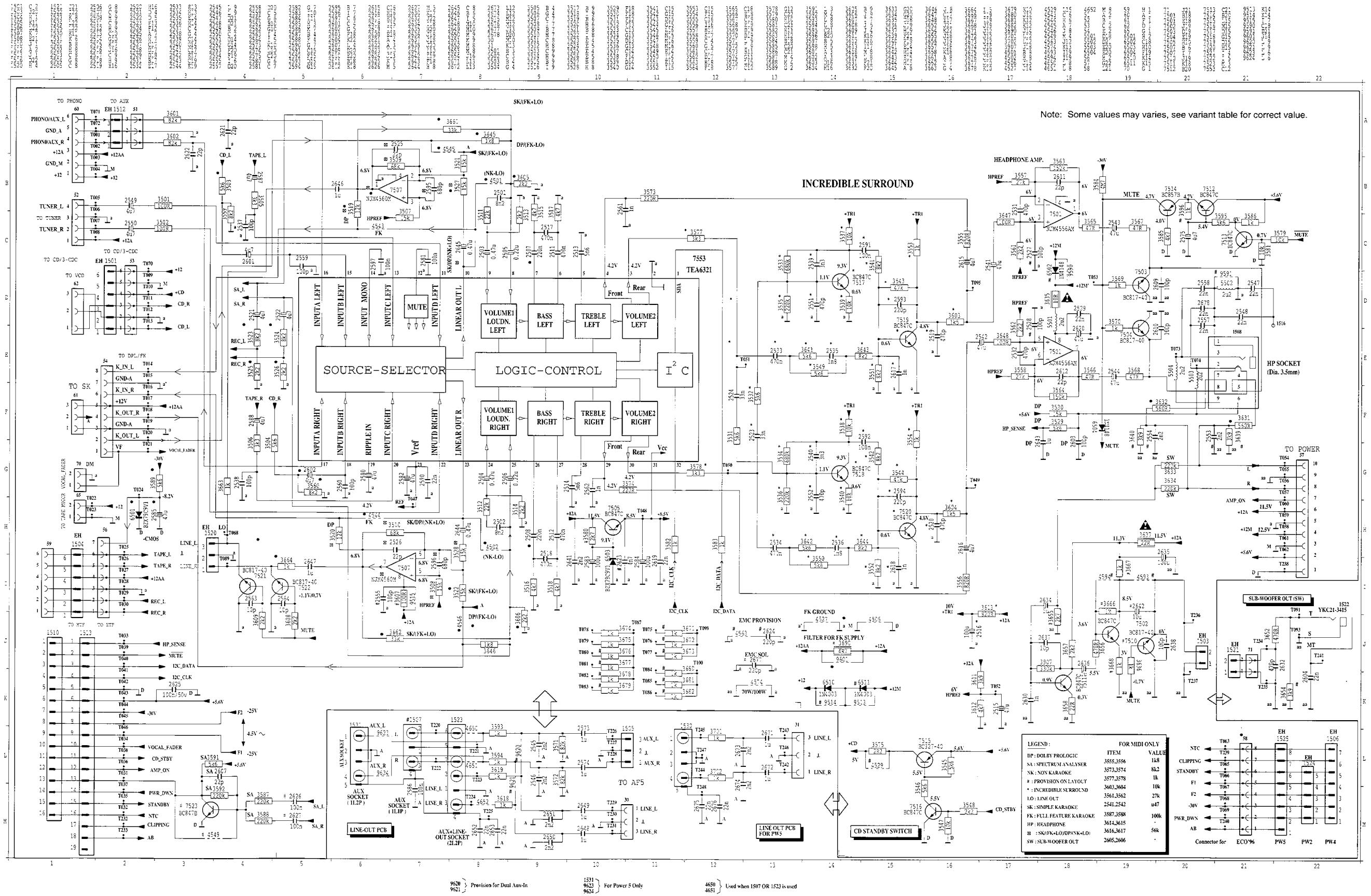


Note: This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

3596	F 4	4502	D 6	4574	C 8	7514	F 3				
3597	B 7	4506	A 8	4580	D 6	7516	G 7				
3598	B 7	4508	G 4	4593	C 8	7517	E 6				
3601	D 5	4509	E 3	4594	C 8	7518	F 7				
3602	E 5	4510	G 5	4600	A 3	7519	E 7				
3603	E 7	4511	B 4	4601	B 4	7520	F 7				
3604	F 7	4512	D 8	4602	A 3	7521	D 6				
3605	C 4	4513	F 7	4603	B 4	7522	D 6				
3606	F 4	4514	B 4	4604	A 4	7523	C 4				
3608	C 6	4515	E 6	4605	B 4	7553	E 4				
3609	C 6	4517	B 6	4606	C 5	45658	D 1				
3611	E 7	4518	D 8	4607	G 5						
3612	D 7	4519	B 4	4608	E 4						
3613	E 6	4520	B 8	4609	F 4						
3618	D 2	4521	A 7	4610	F 5						
3619	C 1	4522	A 8	4611	C 7						
3633	C 3	4523	C 4	4612	B 6						
3634	C 8	4524	E 6	4613	C 6						
3636	D 8	4525	C 6	4614	F 5						
3639	G 4	4526	E 5	4615	E 6						
3640	F 4	4527	B 7	4616	D 6						
3641	E 6	4528	B 8	4617	C 7						
3642	F 6	4529	G 6	4618	D 3						
3643	E 5	4530	C 7	4619	F 4						
3644	F 6	4531	B 4	4620	F 4						
3645	B 5	4532	F 8	4621	G 5						
3646	D 6	4533	B 7	4622	B 8						
3647	E 7	4534	B 4	4623	D 6						
3648	E 7	4535	F 7	4624	D 6						
3652	F 1	4539	F 4	4625	C 7						
3654	F 1	4541	B 8	4626	B 8						
3655	C 7	4542	B 8	4627	C 8						
3656	D 8	4543	B 6	4628	B 7						
3657	C 7	4544	D 6	4629	B 7						
3658	D 7	4545	B 7	4630	B 7						
3661	B 7	4546	D 6	4631	F 6						
3662	D 6	4547	B 4	4632	C 5						
3663	D 6	4548	D 7	4640	A 8						
3664	D 6	4549	C 4	4641	A 8						
3666	C 8	4550	D 4	4642	A 7						
3667	C 8	4551	D 7	4643	B 5						
3668	C 8	4552	G 5	4644	A 5						
3671	E 2	4553	D 5	4645	B 5						
3672	E 2	4554	E 4	4650	D 1						
3673	E 2	4555	G 4	4651	E 1						
3674	E 2	4556	B 4	4652	D 2						
3675	E 2	4557	G 5	4653	B 7						
3676	E 2	4558	G 4	4657	C 8						
3677	F 2	4559	D 3	7501	D 7						
3678	F 2	4560	E 6	7502	D 8						
3679	F 2	4561	F 8	7503	F 4						
3680	E 2	4562	F 7	7504	F 4						
3681	E 2	4563	E 4	7505	E 4						
3682	E 2	4564	B 5	7507	C 6						
3701	C 1	4565	G 4	7510	C 8						
3702	B 1	4569	D 5	7511	C 7						
3907	C 7	4572	B 7	7512	F 4						
4501	D 5	4573	B 7	7513	E 3						

12-3

CIRCUIT DIAGRAM



12-4

ELECTRICAL PARTS LIST - AF5 BOARD

ELECTRICAL PARTS LIST - AF5 BOARD

MISCELLANEOUS

1508	4822 267 40898	Headphone Socket
1510	4822 265 41325	Connector 16 Pin
1522	4822 267 31729	Cinch Socket - Sub-Woofer out
1523	4822 267 31823	Cinch Socket - Aux/Line-out

CAPACITORS

2501	4822 126 10525	8,2nF 10% 63V
2502	4822 126 10525	8,2nF 10% 63V
2503	4822 124 41407	0,47µF 20% 63V
2504	4822 124 41407	0,47µF 20% 63V
2505	4822 124 40746	0,22µF20% 63V
2506	4822 124 40746	0,22µF20% 63V
2507	4822 121 42408	220nF 5% 63V
2508	4822 121 42408	220nF 5% 63V
2511	4822 121 51252	470nF 5% 63V
2512	4822 121 51252	470nF 5% 63V
2513	4822 122 32646	5,6nF 10% 50V
2514	4822 122 32646	5,6nF 10% 50V
2515	4822 124 81029	100µF 20% 25V
2516	4822 124 81029	100µF 20% 25V
2517	4822 121 51252	470nF 5% 63V
2518	4822 121 51252	470nF 5% 63V
2519	5322 122 32268	470pF 10% 50V
2520	5322 122 32268	470pF 10% 50V
2521	4822 124 40246	4,7µF 20% 63V
2522	4822 124 40246	4,7µF 20% 63V
2523	4822 126 12105	33nF 5% 63V
2524	4822 126 12105	33nF 5% 63V
2525	5322 122 32658	22pF 5% 50V
2526	5322 122 32658	22pF 5% 50V
2529	5322 122 32654	22nF 10% 63V
2531	5322 122 32268	470pF 10% 50V
2532	5322 122 32268	470pF 10% 50V
2533	4822 121 51252	470nF 5% 63V
2534	4822 121 51252	470nF 5% 63V
2535	4822 126 10847	1,8nF 10% 63V
2536	4822 126 10847	1,8nF 10% 63V
2537	5322 122 32531	100pF 5% 50V
2538	5322 122 32531	100pF 5% 50V
2539	4822 122 33891	3,3nF 10% 63V
2540	4822 122 33891	3,3nF 10% 63V
2541	4822 124 41751	47µF 20% 50V
2542	4822 124 41751	47µF 20% 50V
2543	4822 124 41751	47µF 20% 50V
2544	4822 124 41751	47µF 20% 50V
2545	5322 122 32268	470pF 10% 50V
2546	5322 122 32268	470pF 10% 50V
2547	5322 122 32654	22nF 10% 63V
2548	4822 126 10002	100nF 20% 25V
2549	4822 124 40246	4,7µF 20% 63V
2550	4822 124 40246	4,7µF 20% 63V
2551	5322 122 32268	470pF 10% 50V
2552	5322 122 32268	470pF 10% 50V
2557	5322 122 32654	22nF 10% 63V
2558	5322 122 32654	22nF 10% 63V
2559	5322 122 32531	100pF 5% 50V
2560	5322 122 32531	100pF 5% 50V
2561	5322 122 34123	1nF 10% 50V
2562	5322 122 34123	1nF 10% 50V
2563	5322 122 32448	10pF 5% 50V
2564	5322 122 32448	10pF 5% 50V
2573	4822 126 13836	1µF 16V
2574	4822 126 13836	1µF 16V
2575	4822 124 40246	4,7µF 20% 63V
2580	4822 124 41751	47µF 20% 50V
2581	4822 126 10002	100nF 20% 25V
2582	4822 124 41751	47µF 20% 50V
2583	4822 124 81029	100µF 20% 25V
2584	4822 124 81029	100µF 20% 25V
2585	4822 124 41751	47µF 20% 50V
2587	4822 124 40246	4,7µF 20% 63V
2588	4822 124 40246	4,7µF 20% 63V
2590	5322 122 32654	22nF 10% 63V
2591	4822 126 10002	100nF 20% 25V
2592	4822 126 10002	100nF 20% 25V
2593	4822 122 33575	220pF 5% 50V
2594	4822 122 33575	220pF 5% 50V
2595	4822 122 32535	680pF 10% 63V
2596	4822 122 32535	680pF 10% 63V
2597	4822 126 10002	100nF 20% 25V
2601	4822 124 40246	4,7µF 20% 63V
2602	4822 124 40246	4,7µF 20% 63V
2604	5322 122 32654	22nF 10% 63V
2609	5322 122 32531	100pF 5% 50V
2610	5322 122 32531	100pF 5% 50V
2611	5322 122 32658	22pF 5% 50V
2612	5322 122 32658	22pF 5% 50V
2615	4822 124 40246	4,7µF 20% 63V
2616	4822 124 40246	4,7µF 20% 63V
2617	5322 122 34123	1nF 10% 50V
2618	5322 122 34123	1nF10% 50V
2619	5322 122 32654	22nF 10% 63V
2620	4822 124 40433	47µF 20% 25V
2621	5322 122 32658	22pF 5% 50V
2622	5322 122 32658	22pF 5% 50V
2623	5322 126 10223	4,7nF 10% 63V
2625	4822 126 10002	100nF 20% 25V
2630	5322 122 34123	1nF 10% 50V
2632	5322 122 32268	470pF 10% 50V
2634	4822 124 40242	1µF 20% 63V
2635	4822 124 81029	100µF 20% 25V
2636	4822 124 40242	1µF 20% 63V
2637	5322 122 32448	10pF 5% 50V
2638	5322 122 32531	100pF 5% 50V
2641	4822 122 33175	2,2nF 20% 50V
2644	4822 124 41407	0,47µF 20% 63V
2645	4822 124 41407	0,47µF 20% 63V
2646	4822 126 13836	1µF 16V
2647	4822 126 13836	1µF 16V
2648	4822 126 13836	1µF 16V
2649	4822 126 13836	1µF 16V
2650	4822 122 33175	2,2nF 20% 50V
2651	4822 122 33175	2,2nF 20% 50V
2652	5322 122 32654	22nF 10% 63V
2653	5322 122 32654	22nF 10% 63V
2654	4822 122 33575	220pF 5% 50V
2678	5322 122 32654	22nF 10% 63V

RESISTORS

3501	4822 051 20101	100R 5% 0,1W
3502	4822 116 52175	100R 5% 0,5W
3503	4822 051 20562	5k6 5% 0,1W
3504	4822 051 20562	5k6 5% 0,1W
3505	4822 051 20332	3k3 5% 0,1W
3506	4822 051 20332	3k3 5% 0,1W
3507	4822 051 20153	15k 5% 0,1W
3508	4822 051 20153	15k 5% 0,1W
3509	4822 051 20683	68k 5% 0,1W
3510	4822 051 20683	68k 5% 0,1W
3511	4822 051 20223	22k 5% 0,1W
3512	4822 051 20223	22k 5% 0,1W
3513	4822 117 11449	2k2 1% 0,1W
3514	4822 117 11449	2k2 1% 0,1W
3515	4822 051 20472	4k7 5% 0,1W
3516	4822 051 20472	4k7 5% 0,1W
3517	4822 051 20472	4k7 5% 0,1W
3518	4822 051 20472	4k7 5% 0,1W
3521	4822 051 20153	15k 5% 0,1W
3522	4822 051 20153	15k 5% 0,1W
3523	4822 051 20822	8k2 5% 0,1W
3524	4822 051 20822	8k2 5% 0,1W
3525	4822 051 20332	3k3 5% 0,1W
3526	4822 051 20332	3k3 5% 0,1W
3527	4822 051 20153	15k 5% 0,1W
3528	4822 051 20153	15k 5% 0,1W
3531	4822 051 20562	5k6 5% 0,1W
3532	4822 051 20562	5k6 5% 0,1W
3533	4822 051 20684	680k 5% 0,1W
3534	4822 051 20684	680k 5% 0,1W
3535	4822 051 20224	220k 5% 0,1W
3536	4822 051 20224	220k 5% 0,1W
3537	4822 117 10833	10k 1% 0,1W
3538	4822 117 10833	10k 1% 0,1W
3539	4822 117 10833	10k 1% 0,1W
3540	4822 117 10833	10k 1% 0,1W
3541	4822 051 20822	8k2 5% 0,1W
3542	4822 051 20822	8k2 5% 0,1W
3543	4822 117 10834	47k 1% 0,1W
3544	4822 117 10834	47k 1% 0,1W
3545	4822 051 20562	5k6 5% 0,1W
3546	4822 051 20562	5k6 5% 0,1W
3547	4822 116 83864	10k 5% 0,5W
3548	4822 117 11449	2k2 1% 0,1W
3549	4822 051 20562	5k6 5% 0,1W
3550	4822 051 20562	5k6 5% 0,1W
3551	4822 051 20822	8k2 5% 0,1W
3552	4822 051 20822	8k2 5% 0,1W
3553	4822 051 10102	1k 2% 0,25W
3554	4822 051 10102	1k 2% 0,25W
3555	4822 117 11454	820R 1% 0,1W
3556	4822 117 11454	820R 1% 0,1W
3557	4822 051 20273	27k 5% 0,1W
3558	4822 051 20273	27k 5% 0,1W
3559	4822 051 20822	8k2 5% 0,1W
3560	4822 051 20822	8k2 5% 0,1W
3561	4822 051 20153	15k 5% 0,1W
3562	4822 051 20153	15k 5% 0,1W
3563	4822 051 20154	150k 5% 0,1W
3564	4822 051 20154	150k 5% 0,1W
3565	4822 116 52195	47R 5% 0,5W
3566	4822 051 20479	47R 5% 0,1W
3567	4822 116 52195	47R 5% 0,5W
3568	4822 051 20479	47R 5% 0,1W
3569	4822 051 10102	1k 2% 0,25W
3570	4822 051 10102	1k 2% 0,25W
3571	4822 117 11149	82k 1% 0,1W
3572	4822 117 11149	82k 1% 0,1W
3573	4822 117 11503	220R 1% 0.1W
3574	4822 117 11503	220R 1% 0.1W
3575	4822 051 20228	2R2 5% 0,1W
3577	4822 051 20332	3k3 5% 0,1W
3577	4822 051 20472	4k7 5% 0,1W /21/21M
3578	4822 051 20332	3k3 5% 0,1W
3578	4822 051 20472	4k7 5% 0,1W /21/21M
3579	4822 116 83864	10k 5% 0,5W
3581	4822 117 10833	10k 1% 0,1W
3582	4822 050 11002	1k 1% 0,4W
3583	4822 050 11002	1k 1% 0,4W
3584	4822 050 24705	4M7 1% 0,6W
3585	4822 051 20472	4k7 5% 0,1W
3586	4822 051 10102	1k 2% 0,25W
3589	4822 051 20562	5k6 5% 0,1W
3593	4822 051 10102	1k 2% 0,25W
3594	4822 051 10102	1k 2% 0,25W

ELECTRICAL PARTS LIST - AF5 BOARD

RESISTORS

3595	4822 051 20562		5k6 5% 0,1W
3601	4822 117 11149		82k 1% 0,1W
3602	4822 117 11149		82k 1% 0,1W
3603	4822 117 11139		1k5 1% 0,1W
3604	4822 117 11139		1k5 1% 0,1W
3605	4822 117 11139		1k5 1% 0,1W
3606	4822 117 11139		1k5 1% 0,1W
3608	4822 117 11449		2k2 1% 0,1W
3609	4822 117 11449		2k2 1% 0,1W
3611	4822 051 20392		3k9 5% 0,1W
3612	4822 051 20472		4k7 5% 0,1W
3613	4822 117 11454		820R 1% 0,1W
3618	4822 051 10102		1k 2% 0,25W
3619	4822 051 10102		1k 2% 0,25W
3631	4822 116 52226		560R 5% 0,5W
3632	4822 116 52226		560R 5% 0,5W
3633	4822 051 20224		220k 5% 0,1W
3634	4822 051 20224		220k 5% 0,1W
3635	4822 052 10109	⚠	10R 5% 0,33W
3636	4822 051 10102		1k 2% 0,25W
3637	4822 052 10229	⚠	22R 5% 0,33W
3641	4822 051 20562		5k6 5% 0,1W
3642	4822 051 20562		5k6 5% 0,1W
3643	4822 051 20822		8k2 5% 0,1W
3644	4822 051 20822		8k2 5% 0,1W
3647	4822 051 20101		100R 5% 0,1W
3648	4822 051 20101		100R 5% 0,1W
3652	4822 051 20471		470R 5% 0,1W
3654	4822 051 20392		3k9 5% 0,1W
3656	4822 051 20471		470R 5% 0,1W
3657	4822 117 11449		2k2 1% 0,1W
3658	4822 051 20229		22R 5% 0,1W
3661	4822 051 20562		5k6 5% 0,1W
3662	4822 051 20562		5k6 5% 0,1W
3663	4822 051 10102		1k 2% 0,25W
3664	4822 051 10102		1k 2% 0,25W
3674	4822 051 20822		8k2 5% 0,1W
3675	4822 051 20332		3k3 5% 0,1W
3675	4822 117 11449		2k2 1% 0,1W /21/21M
3907	4822 051 20334		330k 5% 0,1W
4501	4822 051 20008		0R Jumper 0805
4502	4822 051 20008		0R Jumper 0805
4506	4822 051 20008		0R Jumper 0805
4508	4822 051 10008		0R Jumper 1206
4509	4822 051 20008		0R Jumper 0805
4510	4822 051 10008		0R Jumper 1206
4512	4822 051 20008		0R Jumper 0805
4513	4822 051 20008		0R Jumper 0805
4514	4822 051 20008		0R Jumper 0805
4515	4822 051 10008		0R Jumper 1206
4517	4822 051 20008		0R Jumper 0805
4518	4822 051 20008		0R Jumper 0805
4519	4822 051 10008		0R Jumper 1206
4520	4822 051 10008		0R Jumper 1206
4521	4822 051 20008		0R Jumper 0805
4522	4822 051 10008		0R Jumper 1206
4523	4822 051 20008		0R Jumper 0805
4524	4822 051 10008		0R Jumper 1206
4525	4822 051 10008		0R Jumper 1206
4526	4822 051 20008		0R Jumper 0805
4528	4822 051 20008		0R Jumper 0805
4530	4822 051 20008		0R Jumper 0805
4531	4822 051 10008		0R Jumper 1206
4532	4822 051 20008		0R Jumper 0805
4533	4822 051 10008		0R Jumper 1206
4534	4822 051 20008		0R Jumper 0805
4535	4822 051 20008		0R Jumper 0805
4539	4822 051 20008		0R Jumper 0805
4541	4822 051 20008		0R Jumper 0805
4542	4822 051 20008		0R Jumper 0805
4548	4822 051 20008		0R Jumper 0805
4550	4822 051 20008		0R Jumper 0805
4551	4822 051 20008		0R Jumper 0805
4552	4822 051 20008		0R Jumper 0805
4553	4822 051 20008		0R Jumper 0805
4554	4822 051 20008		0R Jumper 0805
4555	4822 051 10008		0R Jumper 1206
4556	4822 051 20008		0R Jumper 0805
4557	4822 051 10008		0R Jumper 1206
4558	4822 051 10008		0R Jumper 1206
4559	4822 051 10008		0R Jumper 1206
4560	4822 051 10008		0R Jumper 1206
4561	4822 051 20008		0R Jumper 0805
4562	4822 051 10008		0R Jumper 1206
4569	4822 051 10008		0R Jumper 1206
4572	4822 051 10008		0R Jumper 1206
4573	4822 051 20008		0R Jumper 0805
4574	4822 051 20008		0R Jumper 0805
4580	4822 051 10008		0R Jumper 1206
4593	4822 051 20008		0R Jumper 0805
4594	4822 051 20008		0R Jumper 0805
4601	4822 051 10008		0R Jumper 1206
4603	4822 051 10008		0R Jumper 1206
4604	4822 051 10008		0R Jumper 1206
4606	4822 051 20008		0R Jumper 0805
4607	4822 051 20008		0R Jumper 0805
4608	4822 051 20008		0R Jumper 0805
4609	4822 051 20008		0R Jumper 0805
4610	4822 051 20008		0R Jumper 0805
4611	4822 051 10008		0R Jumper 1206
4612	4822 051 10008		0R Jumper 1206
4613	4822 051 20008		0R Jumper 0805
4614	4822 051 20008		0R Jumper 0805
4615	4822 051 10008		0R Jumper 1206

ELECTRICAL PARTS LIST - AF5 BOARD

RESISTORS

4616	4822 051 10008	0R Jumper 1206
4617	4822 051 10008	0R Jumper 1206
4622	4822 051 10008	0R Jumper 1206
4623	4822 051 20008	0R Jumper 0805
4624	4822 051 20008	0R Jumper 0805
4625	4822 051 10008	0R Jumper 1206
4626	4822 051 10008	0R Jumper 1206
4628	4822 051 10008	0R Jumper 1206
4629	4822 051 20008	0R Jumper 0805
4630	4822 051 20008	0R Jumper 0805
4631	4822 051 20008	0R Jumper 0805
4632	4822 051 20008	0R Jumper 0805
4640	4822 051 20008	0R Jumper 0805
4641	4822 051 10008	0R Jumper 1206
4642	4822 051 20008	0R Jumper 0805
4643	4822 051 10008	0R Jumper 1206
4644	4822 051 20008	0R Jumper 0805
4645	4822 051 20008	0R Jumper 0805
4650	4822 051 20008	0R Jumper 0805
4651	4822 051 20008	0R Jumper 0805
4652	4822 051 20008	0R Jumper 0805
4653	4822 051 20008	0R Jumper 0805
4657	4822 051 20008	0R Jumper 0805

COILS & FILTERS

5501	4822 157 11477	Fixed Inductor 2µ2 50%
5502	4822 157 11477	Fixed Inductor 2µ2 50%
5503	4822 157 11477	Fixed Inductor 2µ2 50%
5504	4822 157 11477	Fixed Inductor 2µ2 50%

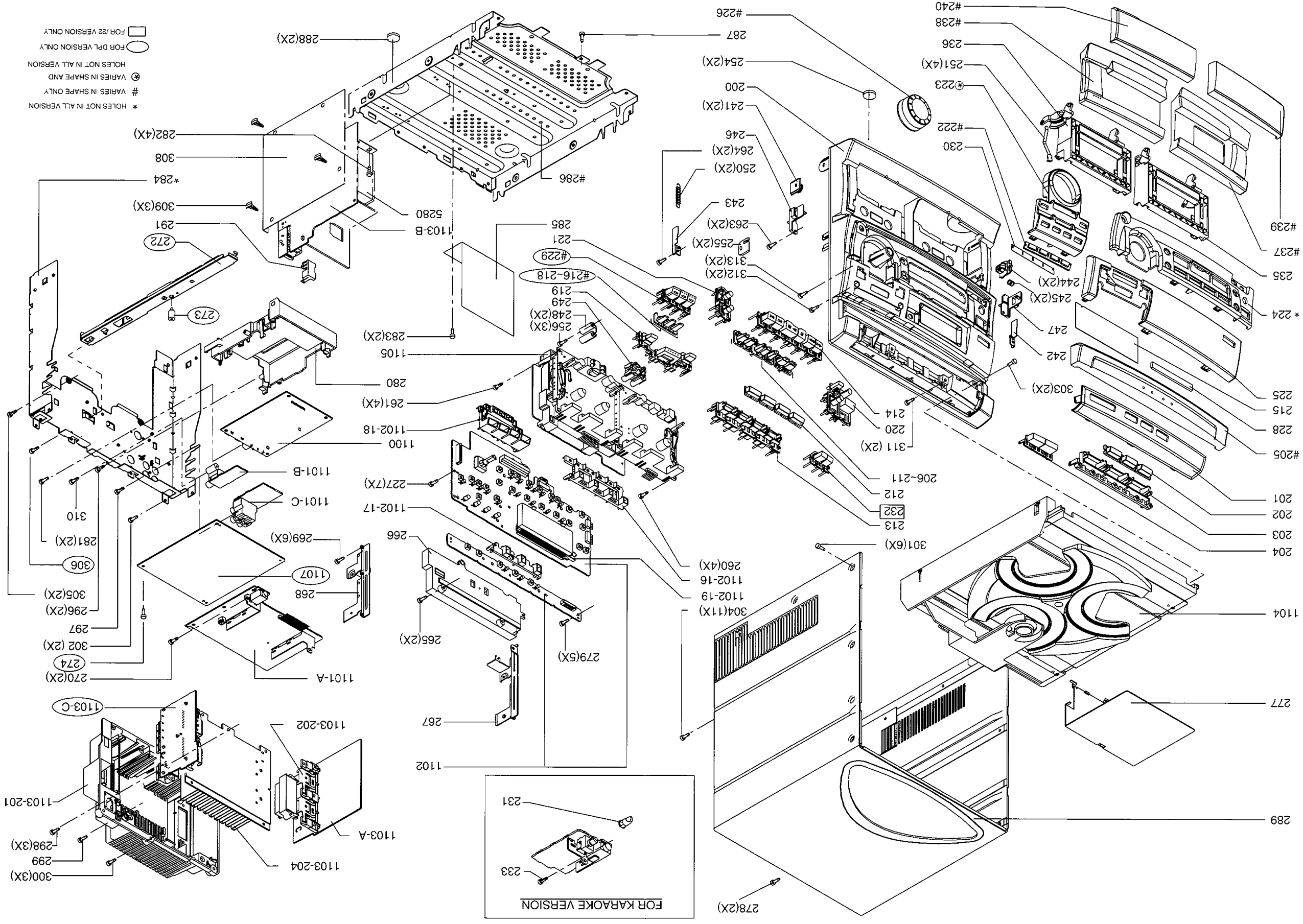
DIODES

6501	4822 130 30862	BZX79-B9V1
6503	4822 130 30862	BZX79-B9V1
6504	4822 130 30621	1N4148
6510	4822 130 31878	1N4003G
6511	4822 130 31878	1N4003G

TRANSISTORS & INTEGRATED CIRCUITS

7501	4822 209 31378	NJM4556MB
7502	4822 130 42804	BC817-25
7503	4822 130 42804	BC817-25
7504	4822 130 42804	BC817-25
7505	5322 130 42755	BC847C
7507	4822 209 83357	NJM4560M
7511	5322 130 42755	BC847C
7512	5322 130 42755	BC847C
7513	5322 130 42755	BC847C
7514	5322 130 60508	BC857B
7515	4822 130 41246	BC327-25
7516	5322 130 42755	BC847C
7517	5322 130 42755	BC847C
7518	5322 130 42755	BC847C
7519	5322 130 42755	BC847C
7520	5322 130 42755	BC847C
7521	5322 130 42755	BC847C
7522	5322 130 42755	BC847C
7553	4822 209 33652	TEA6321T/V1

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


* HOLES NOT IN ALL VERSION
# VARIES IN SHAPE ONLY
⊛ VARIES IN SHAPE AND HOLES NOT IN ALL VERSION
FOR DPL VERSION ONLY
FOR /22 VERSION ONLY
#240
#238
236
251(4X)
⊛223
#222
230
#239
#237
235
244(2X)
245(2X)
* 224
247
242
303(2X)
225
215
228
#205
201
202
203
204
1104
277
289
278(2X)
301(6X)
304(11X)
1102-19
1102-16
260(4X)
279(5X)
265(2X)
267
1102
266
1102-17
227(7X)
1102-18
1100
261(4X)
280
1105
283(2X)
#216~218
#229
219
249
248(2X)
256(3X)
#226
287
254(2X)
200
241(2X)
246
264(2X)
250(2X)
243
263(2X)
255(2X)
313(2X)
312(2X)
221
285
#286
288(2X)
282(4X)
308
*284
309(3X)
291
5280
1103-B
272
273
1101-B
1101-C
310
281(2X)
306
269(6X)
1107
268
305(2X)
296(2X)
297
302 (2X)
274
270(2X)
1101-A
1103-C
1103-202
1103-201
298(3X)
299
300(3X)
1103-204
1103-A
FOR KARAOKE VERSION
231
233
311 (2X)
220
214
206~211
212
232
213

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MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

200	4822 459 04889	Cabinet Front
201	4822 450 10442	Window CDC
202	4822 410 11645	Button Set CDC
203	4822 464 10372	Frame Button Set CDC
204	4822 410 11646	Button Set Open/Close
205	4822 442 01226	Cover Tray CDC /37
205	4822 442 01246	Cover Tray CDC /21/21M/22
212	4822 410 11647	Button Set Source Select
213	4822 464 10373	Frame Button Source Select
214	4822 410 11648	Button Set Control
219	4822 410 11649	Button Set DSC/DBB 1
220	4822 410 11651	Button Set Power
221	4822 410 11652	Button Set PROG/HSD
223	4822 426 10582	Panel Control DSC1
224	4822 454 13264	Orn Display /37
224	4822 454 13278	Orn Display /22
224	4822 450 10469	Orn Display /21/21M
225	4822 450 10443	Window Display /21/21M/37
225	4822 454 13279	Window Display /22
226	4822 410 11653	Knob Volume
228	4822 454 13265	Badge (PH-MAG) Assy /37
228	4822 454 13035	Badge-PHILIPS /21/21M/22
231	4822 410 11595	Knob Karaoke /21/21M
232	4822 410 11698	Button RDS/NEWS /22
235	4822 443 10488	Door Cassette Right
236	4822 443 10487	Door Cassette Left
237	4822 442 01227	Cover Cassette Left
238	4822 442 01228	Cover Cassette Right
239	4822 381 11937	Lens Cassette Left
240	4822 381 11938	Lens Cassette Right
241	4822 529 10322	Damper Assembly
244	4822 402 10621	Push-Catch
245	4822 492 11344	Spring Compression
250	4822 492 11345	Spring Tension
251	4822 492 42787	Spring Cassette
254	4822 462 40683	Plate (Foot)
288	4822 462 40683	Plate (Foot)
289	4822 426 10583	Cabinet Rear
291	4822 402 10288	Bracket Mains Socket
309	4822 466 93148	Spacer 5mm
350	4822 445 10711	LS Pair To Single /37
350	4822 445 10723	LS Pair To Single /21/21M/22
351	4822 320 11094	FM Aerial /37
351	4822 303 50063	FM Aerial /21/21M/22
356	4822 219 10429	Remote Control /37

356	4822 219 10446	Remote Control /21/21M/22
384	4822 303 50082	AM Frame Aerial
385	4822 321 10883 ⚠	Mains Cord /37
385	4822 321 10249 ⚠	Mains Cord /21/21M/22
387	4822 736 15908	Instruction For Use /37
387	4822 736 15935	Instruction For Use /22
387	4822 736 15971	Instruction For Use /21/21M
5280	4822 146 10746 ⚠	Transformer /37
5280	4822 146 10728 ⚠	Transformer /22
5280	4822 146 10755 ⚠	Transformer /21/21M

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

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SCREW LISTS - MAIN UNIT

227	D3 x 12
233	D3 x 12
256	D3 x 30
260	D3 x 12
261	D3 x 30
263	D3 x 12
264	D3 x 12
265	D3 x 12
269	D3 x 12
270	D3 x 10
278	M3 x 10
279	D3 x 12
281	D3 x 12
282	M3 x 6
283	M3 x 6
287	M3 x 10
296	D3 x 12
297	D3 x 12
298	M3 x 10
299	D3 x 12
300	M3 x 10
301	M3 x 10
302	D3 x 10
303	D3 x 10
304	M3 x 10
305	M3 x 10
310	D3 x 12
311	D3 x 10
312	D3 x 10
313	D3 x 10