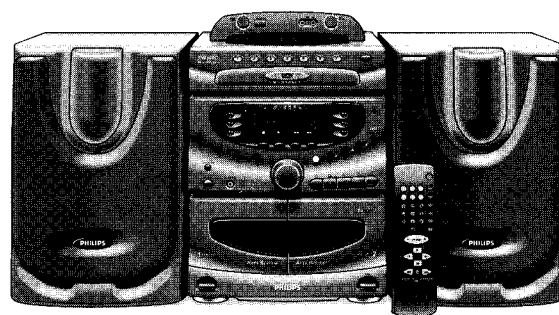


Service Service Service



Service Manual

COMPACT
disc
DIGITAL AUDIO

TABLE OF CONTENTS

Location of printed circuit boards.....	1-2
Technical specification	2-1
Measurement setup	2-2
RC5-code	2-3
Instruction for use (excerpt)	2-4
Warnings & Safety	2-12

Service hints	3-1
Dismantling instructions	3-2
Service test program	3-3

Block diagram	4-1
---------------------	-----

Wiring diagram	5-1
----------------------	-----

Control board	6
---------------------	---

Tuner board

Tuner ECO4VA	7A
Tuner ECO5	7B
Tuner 94	7C

Karaoke board	8
---------------------	---

Combi board	9
-------------------	---

CDC7 module	10
-------------------	----

Power board	11
-------------------	----

Exploded view tape deck	12
-------------------------------	----

Exploded view of set	12
----------------------------	----

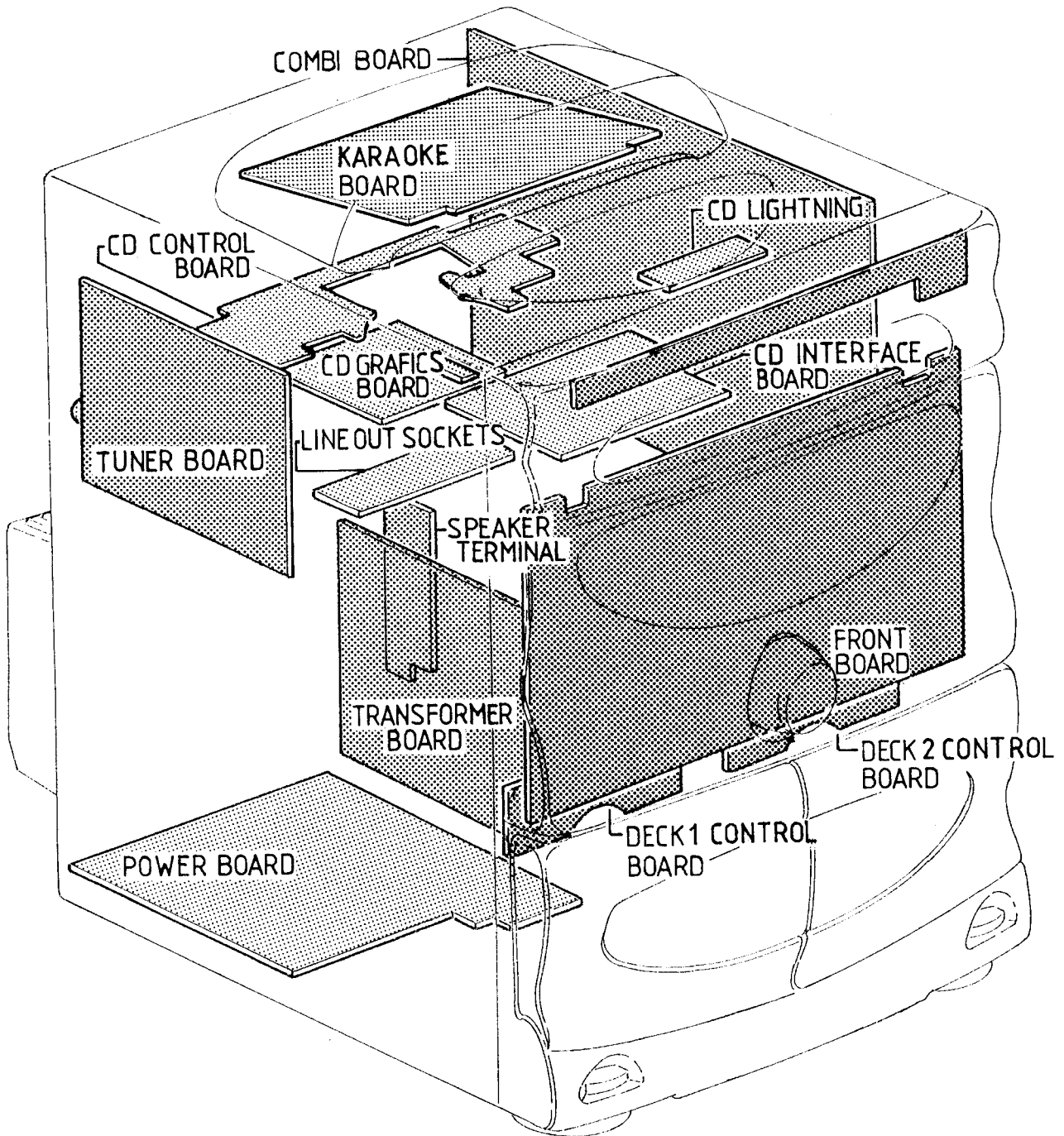
Mechanical partslist of set	12
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**CLASS 1
LASER PRODUCT**



PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



CD GRAPHICS BOARD not on all versions
 KARAOKE BOARD not on all versions

TECHNICAL SPECIFICATION

General:

Mains voltage	: 230V / 50Hz for /22 : 120V / 60Hz for /37 : 110-127V / 220-240V switchable for /21
Power consumption	: ≤150W at maximum output power : ≤3W in power off mode

Amplifier:

Output power	: 2 x 40W at 6Ω	D=10%
Music power	: 2 x 70W at 6Ω	
Headphone	: 3,5mm stereo jack	2,5V EMF
Power stage protection	: Shortcircuit, AC, DC, Temperature	
Frequency response	: 63 Hz - 20kHz (-3dB) Limit	
Input sensitivity		
AUX/LINE	: 500mV	
Microphone	: 2,5mV	

Equalizer:

60Hz	: ± 6dB
1kHz	: ± 6dB
12kHz	: ±6 dB

Tuner:

FM

Tuning range	: 87,5 - 108MHz
Grid	: 50kHz
Aerial input	: 75Ω Coax : 300Ω Click fit for /37
IF	: 10,7MHz ± 25kHz
Sensitivity Mono 26dB S/N	: ≤ 1,7μV
Sensitivity Stereo 46dB S/N	: ≤ 45μV
Sensitivity Search tuning	: ≤ 7μV
Distortion at RF=1mV, Δf=75kHz	: ≤ 7% (2% typ.)
Channel separation	: ≥ 26dB (30dB typ.)
Image rejection ratio	: ≥ 30dB (70dB typ.)
3 dB limiting point	: ≤ 2μV (1,5μV typ.)

MW

Tuning range	: 522 - 1611kHz : 530 - 1710kHz for /37
Grid	: 9kHz : 10kHz for /37
Aerial input	: Ferrite antenna
IF	: 450kHz ± 1kHz
Sensitivity	: ≤ 2mV/m
Distortion at RF=100mV, m=80%	: ≤ 5% (3% typ.)
Image rejection ratio	: ≥ 27dB (30dB typ.)

LW (not for /37)

Tuning range	: 153 - 279kHz
Grid	: 3kHz
Aerial input	: Ferrite antenna
IF	: 450kHz ± 1kHz
Sensitivity	: ≤ 5 mV/m
Distortion at RF=100mV, m=80%	: ≤ 5% (3% typ.)
Image rejection ratio	: ≥ 40dB (43dB typ.)

CD unit:

Have to be measured direct on internal connector 1300

Frequency response	: 20 - 20.000Hz ±2dB
Output level	: 2V ±3dB
Signal/noise ratio	: 90dB
Distortion	: < 1% at 1kHz
Channel difference	: < 2dB at 1kHz
Channel crosstalk	: 50dB max.
De emphasis	: 0 or 15/50 μs

Laser

Output power	: ≤ 500μW
Wave length	: 780nm ± 20nm

Recorder part:

Tape speed	: 4,76cm/s ±2%
Wow & Flutter	: ≤ 0,4%
Winding speed	: ≤ 130s for C60 cassette
Erase / Bias system	: AC 80kHz ± 5kHz
RIF-shift	: service solution on request
Distortion at 200 nWb/m	: ≤ 3%
Channel difference at PB	: ≤ 3dB
Channel difference overall	: ≤ 3dB
Channel separation	: ≥ 18dB at 1kHz
Track separation	: ≥ 55dB at 1kHz
ALC attack time	: ≤ 15ms
ALC recovery time	: ≥ 50s

Frequency response	: 60Hz - 14kHz within 8dB
Signal to Hiss ratio ¹⁾	: typ 52dB with Fe : typ 54dB with CrO ₂
Signal to Noise ratio ²⁾	: typ 47dB with Fe : typ 47dB with CrO ₂
Erase attenuation ³⁾	: ≥ 62dB

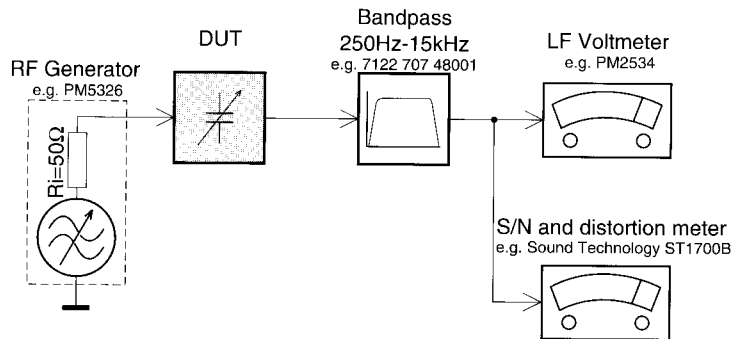
¹⁾ at 250 nW/m A-weighted

²⁾ at 250 nW/m FF-weighted

³⁾ use a 1kHz passfilter to minimize the wide band noise component.

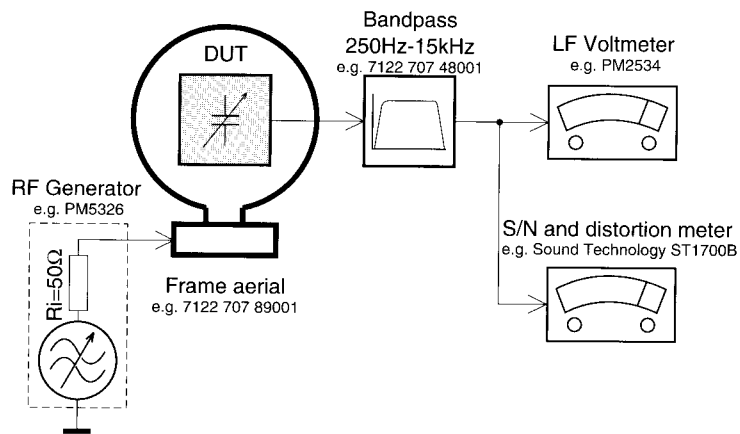
MEASUREMENT SETUP

Tuner FM



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

Tuner AM (MW,LW)



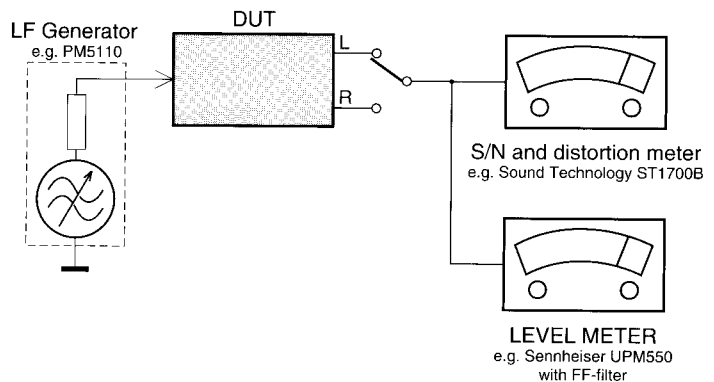
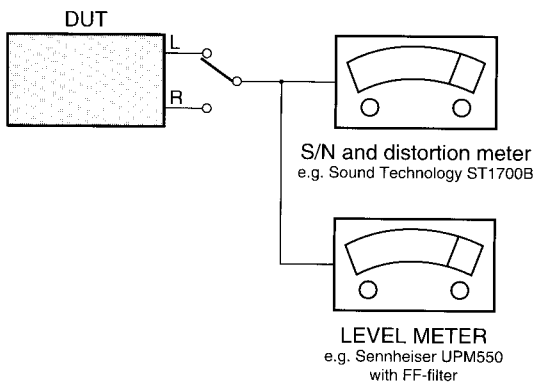
To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday's cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

CD

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

RECORDER

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



RC5 SYSTEM/COMMAND CODES

Remote control key	System Code	Command Code
Standby	17, 18, 20	12
Stand by pressed longer than 1sec	00, 04, 05	12
Tuner	17	63
Tuning up	17	30
Tuning down	17	31
Preset up	17	32
Preset down	17	33
Preset 10 key	17	00-09
CD	20	63
CD Play	20	53
CD Stop	20	54
CD Pause	20	48
Preset 10 key	20	00-09
CD Next	20	32
CD Previous	20	33
CD Search forward	20	52
CD Search backward	20	50
CD Disc	20	30
Tape1	18	44
Tape2	18	46
Side	18	47
Tape Play	18	53
Tape Stop	18	54
Tape Wind	18	52
Tape Rewind	18	50
Tape Pause	18	48
Incredible Sound	16	64
DBB	16	70
DSC	16	79
Volume up	16	16
Volume down	16	17
Vocal Fader ¹⁾	16	67
Key control up ¹⁾	16	68
Key control down ¹⁾	16	69
Multi media	04	63

¹⁾ For sets with KARAOKE only

INDEX

INDEX	4
Supplied accessories	4
Demonstration mode	4
Environmental information	4
CONTROLS	5
INSTALLATION	6/7
Before you start ...	6
Connections	7
Speaker connections	7
REMOTE CONTROL	7
BASIC FUNCTIONS	8
Switching the system on and off/standby	8
Adjusting the display illumination	8
System display and buttons	8
Karaoke – microphone mixing	8
SOUND CONTROLS	9
TUNER	10/11
Tuning to radio stations	10
Programming radio stations (preset stations)	11
Selecting a preset station	11
RECORD TAPE	12
Switchable tuning grid	12
Programming a radio station name	12
CD CHANGER	12/13
Inserting the CDs	12
Playing a CD	13
Selecting another track	13
Searching for a passage during CD play	13
Selecting another source during CD play	13
RECORD TAPE	14
REPEAT – repeating a track, a CD or all CDs	14
SHUFFLE – playing in random order	14
Programming track numbers	14
TAPE DECKS	14/16
Inserting a tape	14
Playing a tape	15
Fast winding	15
Play mode	15
Dolby B Noise Reduction System	15
General information on recording	15
Recording from a CD/EDIT	15
Dubbing tapes	15
RECORD TAPE	16
CLOCK/TIMER	16/17
General	16
Setting the clock	16
Setting the timer for a radio recording	16
Setting the timer for playback	16
At the preset start time ...	16
Reactivating/deactivating the timer	16
MAINTENANCE	18
TECHNICAL DATA	18
TROUBLESHOOTING	19

English

INDEX

Thank you for selecting this Philips system	5
This state-of-the-art mini stereo system offers you the latest technology, high quality sound and an extreme user-friendly operation thanks to its large display which contains advanced interactive user interface	5
Supplied accessories	5
2 loudspeaker boxes, type LS8 650	5
2 loudspeaker cables	5
Remote control	5
Two batteries (AAA cell(s) for the remote control	5
AC mains lead	5
AM/MW frame aerial	5
FM wire antenna	5
Demo mode	5
The system has a demo mode, showing various features offered by the system.	5
1 To switch on the demonstration mode, press DEMO	5
→ The display demonstration starts with the message: "WELCOME TO THE AUDIO WORLD"	5
2 To leave the demonstration mode, press DEMO or POWER ON/STANDBY.	5
Environmental information	5
All unnecessary packaging material has been omitted. We have done our utmost to make the packaging easily separable into three mono-materials:	5
- cardboard (box)	5
- expandable polystyrene (buffer)	5
- polyethylene (bags, protective foam sheet)	5
Note: Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packing materials, exhausted batteries and old equipment.	5
INDEX	4
Supplied accessories	4
Demonstration mode	4
Environmental information	4
CONTROLS	5
INSTALLATION	6/7
Before you start ...	6
Connections	7
Speaker connections	7
REMOTE CONTROL	7
BASIC FUNCTIONS	8
Switching the system on and off/standby	8
Adjusting the display illumination	8
System display and buttons	8
Karaoke – microphone mixing	8
SOUND CONTROLS	9
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Play mode	15
Dolby B Noise Reduction System	15
General information on recording	15
Recording from a CD/EDIT	15
Dubbing tapes	15
RECORD TAPE	16
CLOCK/TIMER	16/17
General	16
Setting the clock	16
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TECHNICAL DATA	18
TROUBLESHOOTING	19

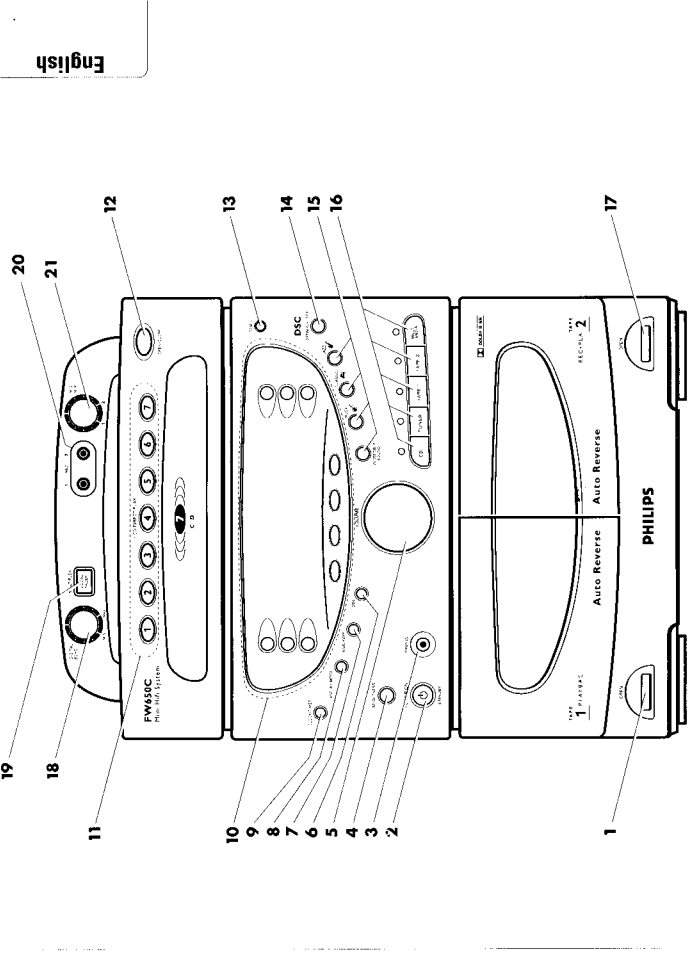
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Supplied accessories	4
Demonstration mode	4
Environmental information	4
CONTROLS	5
INSTALLATION	6/7
Before you start ...	6
Connections	7
Speaker connections	7
REMOTE CONTROL	7
BASIC FUNCTIONS	8
Switching the system on and off/standby	8
Adjusting the display illumination	8
System display and buttons	8
Karaoke – microphone mixing	8
SOUND CONTROLS	9
TUNER	10/11
Tuning to radio stations	10
Programming radio stations (preset stations)	11
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TECHNICAL DATA	18
TROUBLESHOOTING	19

English

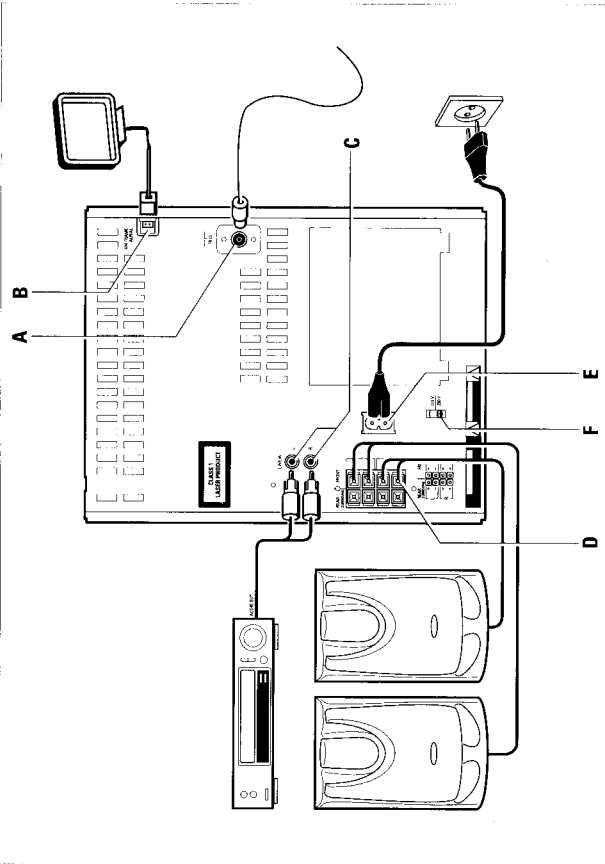
INDEX



English

CONTROLS

INSTRUCTION FOR USE



Before you start ...

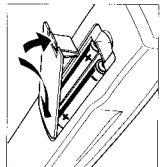
- After unpacking the system, remove all protective material.
- **Before connecting the system to the mains**, check if the mains voltage as shown on the type plate corresponds to your local mains voltage. If it does not, consult your dealer or service organisation.

If your set is equipped with a voltage selector, set this selector to the local mains voltage.

- **The typeplate is located at the rear of the system.**
- Place the system on a hard surface.
- Do not cover the vents and make sure that you leave sufficient room around the unit for ventilation.

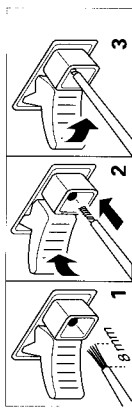
Remote control:

- Open the battery compartment and insert the batteries supplied (type R03, UM-4 or AAA) as indicated.
- Remove the batteries if exhausted or if they will not be used again for a long period.



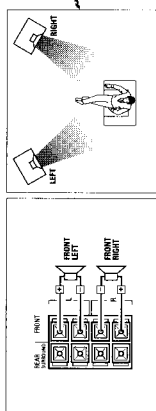
Speaker connections

You can connect the 2 supplied USB 650 speakers or you can create a 4-speaker system for surround sound using two extra speakers having an impedance of at least 8 ohms, e.g. special surround-sound speakers, type Philips SBC 95010.



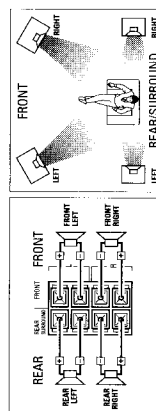
2-speaker system

- Connect the black or non-marked wires to the black terminals and the red or marked wires to the red terminals.



4-speaker system

- **Front speakers SBC 650:** Connect the black or non-marked wires to the black FRONT terminals and the red or marked wires to the red FRONT terminals.
- **Surround speakers, e.g. SBC 95010:** Connect the black or non-marked wires to the black REAR terminals and the red or marked wires to the red REAR terminals.



Positioning of the speakers

- You will find the best speaker position by experimenting. Placing the speakers on the floor will increase the bass response. Placing the speakers behind curtains, furniture etc. will reduce treble response and the stereo effect. You will obtain the ideal position when the two front speakers and the listening position build an equilateral triangle and the speakers are at ear height.

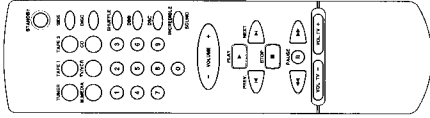
Remote control functions

- Always first select the desired sound source and then press the required function key (for example CD + PLAY ▶ or TAPE + PLAY ▶).

Notes:

- The remote control remains tuned to the selected sound source until another sound source button on the remote control is pressed.
- The corresponding LED indicator above the sound source buttons on the system flashes when its source is operated by the remote control.

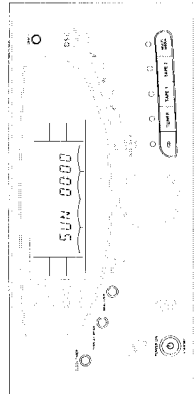
- You can only control TV/VCR if this unit uses the RC-5 remote control system.
- Pressing TV/VCR will first switch on the TV set and after 1 sec. the whole audio set.
- If TV/VCR is selected, the STANDBY button will first switch the TV set to standby and after 1 sec. the whole set.
- Pressing TV/VCR for more than 1 sec will select the external source that is connected via the LINE IN sockets.



- STANDBY** to switch the system to the standby mode
- TUNER - TAPE 1 - TAPE 2 - M-MEDIA - TV/VCR - CD** sound source selection buttons
- SIDE** **TAPE 1 or 2:** to select the front or back side of the tape (FRONT/BACK)
- DISC** **CD:** to select a CD (1-7) - not applicable to all versions
- SHUFFLE** **CD:** to switch on/off the shuffle feature
- DBB** to increase the bass level
- DSC** to select the desired sound setting: ROCK-CLASSIC-JAZZ-OPTIMAL-USER 1-USER 2-ROCK-...
- INCREDIBLE SOUND** to switch on/off this sound feature (numbers consisting of two figures must be keyed in within 2 seconds)
- Digits 0-9** **CD:** to key in a track number
- TUNER** to key in a preset number
- TV** to key in a TV station
- VOLUME - +** to adjust the volume level of the audio system
- PLAY ▶** **CD, TAPE 1 or 2, VCR:** to start playback
- ◀ PREV/NEXT ▶** **TUNER:** to select a radio preset station
- CD:** to select the beginning of the current/previous or a subsequent track
- TV** to select a TV preset station
- STOP ■** **CD, TAPE 1 or 2, VCR:** to stop playback
- ◀ ▶** **TUNER:** to tune to a radio station
- CD:** to search a particular passage
- PAUSE II** **TAPE 1 or 2, VCR:** to wind the tape
- CD, TAPE 1 or 2, VCR:** to interrupt playback
- VOL TV - +** **TV:** to adjust the volume

English

Switching on and off/standby



- **To switch on the unit**, press POWER ON/STANDBY on the unit or any sound source button on the unit or on the remote control.
 - The display illumination comes up with full intensity. The selected sound source is indicated on the display and the be-longing LED indicator above the sound source button lights up.
- **To switch off the unit**, press POWER ON/STANDBY on the unit or on the remote control.
 - The system is in standby mode. The display illumination is half dimmed and the display shows the day and time.
- **To switch off the power supply**, remove the mains plug from the wall socket.

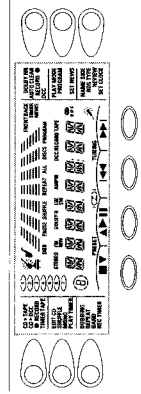
Notes:

 - You can also switch on the set by pressing DISPLAY MODE, ANALYZER, CLOCK/TIMER or DEMO.
 - The clock memory will be maintained for only ten minutes after the power supply is switched off.

Adjusting the display illumination

- You can change the intensity of the display illumination by pressing BRIGHTNESS.
 - When the system is switched on, the illumination switches from FULL INTENSITY-HALF INTENSITY-DIMMED-FULL ...
 - In standby mode, the illumination switches from HALF INTENSITY-DIMMED-HALF ... When the display is dimmed, the power consumption is reduced to about 1 Watt.
- Note: When switching on the system, the display always comes on with full intensity.

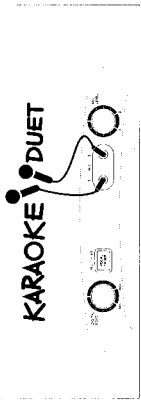
System display and buttons



When you select a sound source or the clock/timer mode, the functions available for the chosen source or the clock/timer mode light up in the display. Using the 10 buttons around the display field, you can select the desired function. These functions are explained in the appropriate chapters in detail.

KARAOKE – microphone mixing

Using a microphone you can mix your voice with any sound source:



- 1 To prevent acoustic feedback e.g. a loud howling sound, set the control MIC LEVEL to the minimum before you plug in the microphone.
 - 2 Connect either 1 or 2 suitable microphones to the MIC sockets.
 - 3 Select the desired sound source CD, TUNER, TAPE 1, TAPE 2 or MULTIMEDIA and start its playback.
- You can mix a digital echo with the signal of the microphones. Use the control DIGITAL ECHO to adjust the echo level for the desired effect.
 - Adjust the mixing ratio with the MIC LEVEL control.

- You can fade out the vocal on a CD or a tape in 4 different ways: Press VOCAL FADER several times until the desired option is displayed.

- **VOCAL FADER**: reduces/fades out the vocal of the original song.
- **AUTO VOCAL FADER**: reduces/fades out the vocal of the original song only for the time you use the microphone. The vocal is faded in again as soon as you stop singing. When (AUTO) VOCAL FADER is activated, this symbol (flashes) lights up in the display.

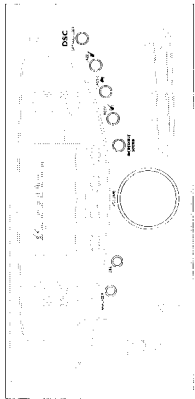
- **MULTIPLY** (for special KARAOKE CDs only): suppresses the right channel (= vocal) of the KARAOKE CD. The music is audible on both channels.

- **AUTO MULTIPLEX** (for special KARAOKE CDs only): suppresses the right channel (= vocal) only for the time you use the microphone. The music is audible on both channels. The vocal is faded in again as soon as you stop singing. When (AUTO) MULTIPLEX is activated, this symbol (flashes) lights up in the display.

- **OFF**: The VOCAL FADER feature is switched off.

Notes:

- It is also possible to record the mixed signal. However, mixing is not possible in DUBBING mode (copying one tape to another).
- If you don't want to record via the microphone, unplug the microphone to avoid accidental mixing with the recording source.
- Due to the recording technique of some CDs it is unfortunately possible that the feature (AUTO) VOCAL FADER does not work.
- We do not recommend to use MULTIPLEX or AUTO MULTIPLEX with a conventional AUDIO CD. The music information would not be transmitted completely and you would only receive mono sound.



ANALYZER – Spectrum Analyzer

The graph bars in the centre of the display show the sound levels. The spectrum analyzer shows continuously the frequency distribution of the current sound.

- By pressing the ANALYZER button, the spectrum analyzer bars are either hidden or shown.
 - The display shows either ANALYZER OFF or ANALYZER ON

Note: When switching on the system, the spectrum analyzer is always switched on.

DBB – Dynamic Bass Boost

- The bass response can be enhanced in 3 steps: every time you press the DBB button, the bass is enhanced even stronger or the DBB feature is switched off.
 - The display shows the selected DBB level: DBB 1–DBB 2–DBB 3–DBB OFF–DBB 1–...

ROCK / CLASSIC / JAZZ

- Press ROCK, CLASSIC or JAZZ (or DSC on the remote control) to enhance the type of music you are listening to.
 - In the display the corresponding icon lights up. A realistic atmosphere for the selected style of music is created.

- **INCREDIBLE SOUND**
 - Additionally to all other sound settings, you can activate the incredible sound feature by pressing INCREDIBLE SOUND.
 - This creates a phenomenal surround sound effect even if the speakers are positioned close to the system. The sound becomes "incredibly" spatial.

The button lights up when the incredible sound feature is switched on.

Switchable "OPTIMAL-USER" sound presets

- By repeatedly pressing OPTIMAL-USER, the display shows the different equalizer settings: OPTIMAL-USER 1–USER 2–OPTIMAL-...

OPTIMAL: This equalizer setting is specially tuned to the acoustics of the supplied LSB 650 speakers.

USER 1 / USER 2: Here you have the possibility to set your individual sound or to listen to your own equalizer setting.

USER 1 / USER 2

Setting the equalizer

- 1 Press OPTIMAL-USER several times until the display shows USER 1 or USER 2.
 - The display function buttons light up and flash for 7 sec.

- 2 Use the display buttons ▼ ▲ and ◀ ▶ to adjust -bass (left two bars), -middle tones (middle three bars) and -treble (right two bars).
 - The graph bars change according to your settings.
 - If no button is pressed for 90 seconds, the sound setting mode is left automatically and the last changes are stored in the memory.

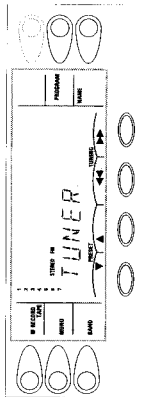
- 3 You can also leave the sound setting mode by pressing OPTIMAL-USER again.

- The new sound setting is stored.

Note: From the moment the buttons ▼ ▲ and ◀ ▶ light up, you have got 7 sec to start adjusting the sound. If non of these buttons are pressed within 7 sec, the sound setting mode is left again.

Tuning to radio stations

- Press TUNER on the unit or on the remote control.
→ First TUNER appears on the display and after a few seconds it will show the current frequency or the station name if available. The available display button functions light up.



- Select the desired waveband by repeatedly pressing BAND.
- Hold down TUNING ◀ or ▶ (◀◀ or ▶▶ on the remote control) until you approach the required frequency.
→ As long as the button is pressed, the digits on the display change according to the frequency.
→ As soon as you release the button, SEARCH appears on the display and the tuner searches the next station of sufficient strength. If the frequency has already been stored, the preset number is also displayed.

- Press MONO to switch over to mono reception if there is interference noise caused by poor FM stereo reception.
→ Briefly MONO is displayed and the icon STEREO disappears.
→ When you switch back to stereo reception, the display will briefly show STEREO.
- Repeat this procedure until you find the desired station.

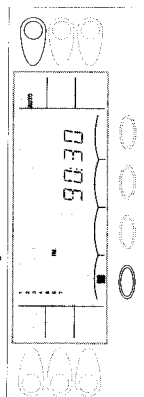
Note: If you briefly press TUNING ◀ or ▶ (◀◀ or ▶▶ on the remote control), the frequency changes step by step.

Programming radio stations (preset stations)

Automatic programming

30 radio stations can be stored automatically in the memory. This function will clear the old preset numbers. If less than 30 radio stations are found, the remaining preset numbers will not be changed.

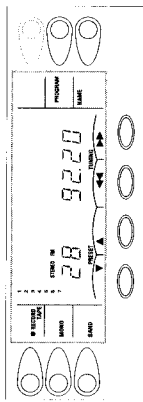
- Press TUNER on the unit or on the remote control.
- Press PROGRAM to enter the programming mode.
→ The available display button functions light up and AUTO starts flashing.
- Select the waveband by repeatedly pressing BAND.
- Press AUTO to start the automatic programming.
→ The available display button functions light up and AUTO starts flashing.



- The tuner automatically tunes to stations in the selected waveband. If less than 30 stations of sufficient strength are found, the tuner will stop.
- The last newly stored preset number is automatically tuned in.
- To stop the automatic programming, press AUTO or ■.

Note: If you want to maintain some old presets, for example preset 1-9, select preset 10 before starting automatic programming; now only the presets 10 up to 30 will be programmed.

Selecting a preset station



- Press PRESET ▲ or ▼ until the desired preset number appears on the display (on the remote control use the buttons ◀ or ▶ or 0-9).

RECORD TAPE ●

- As soon as you press RECORD TAPE ●, the current sound will be recorded on TAPE 2, provided a tape suitable for recording is loaded.
- To stop recording, press ■ (or STOP ■ on the remote control).

Switchable tuning grid (not on all versions)

In North and South America the frequency step between adjacent channels in the AM band is 10 kHz. In the rest of the world this step is 9 kHz. Usually the frequency step has been preset in the factory for your area.

In some versions the frequency step can be changed:

- Keep the sound source button TUNER pressed for more than 5 sec.
→ The display shows either GRID 10 or GRID 9.

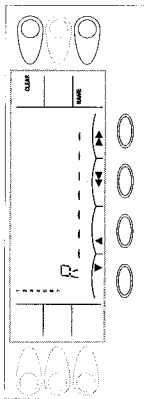
Programming a radio station name

You can assign a name of 8 characters to the preset stations.

- First select the preset station by pressing PRESET ▲ or ▼ (on the remote control use the buttons ◀ or ▶ or 0-9).

- Press NAME to enter the name programming mode.

→ The available display button functions light up and NAME starts flashing. A cursor flashes at the leftmost position.



→ If a name is already assigned to the chosen preset station, this name will then be displayed.

- Move the cursor to the left or right by pressing ◀ or ▶ (◀◀ or ▶▶ on the remote control).

- Select the desired character (A-Z, 0-9) by pressing ▲ or ▼ (on the remote control use the buttons ◀ or ▶).

- If your station name is correct, press NAME to store the name in the memory.

- You can erase a station name by pressing CLEAR.

- The display normally shows the radio station name if available. By repeatedly pressing DISPLAY MODE you can change the type of display information.

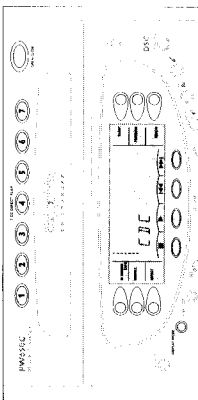
→ The display shows in turn: STATION NAME—FREQUENCY—STATION NAME...

Note: If the name programming mode is selected for more than 90 seconds without pressing ▲ or ▼ or ◀ or ▶, the last name will be recalled and the name programming mode will be left without storing any changes.

CD CHANGER

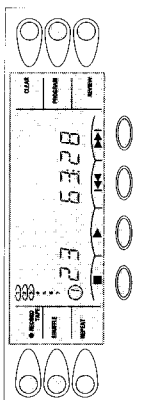
Inserting the CDs

- 1 Press CD on the unit or on the remote control.
 - Briefly CDC appears on the display.
- If there is no CD in the CD tray, the display will show NO DISC.
- The available display button functions light up.



- 2 Press OPEN/CLOSE on the unit to open the CD tray.
 - The display shows OPEN.
- 3 Insert a CD, printed side up.

- 4 Close the tray by pressing OPEN/CLOSE.
 - The display shows HEADING and thereafter the total number of tracks and the total playing time. An oval around the tray number (1-7) indicates when a tray is loaded.



- 5 To load another CD, press the desired digit button 1 - 7 (or DISC on the remote control).
 - The CD tray opens automatically when there is no CD inserted.
- Note: The tray will also close if you press any digit button 1 - 7 or SHUFFLE or gently push against the CD tray.*

Playing a CD

- 1 Press ► (or PLAY ► on the remote control) to start playback of the entire CD.
 - Playback starts with the first track of the selected CD. The display shows the current track number and its elapsed playing time. The playing CD is indicated by a rotating red circle.
 - When all the tracks of all CDs have been played, the CD player stops and the total number of tracks and total playing time of the last played CD are shown on the display.

- 2 To stop CD play, press ■ (STOP ■ on the remote control)

- If you want to select the CD to start playback with, press the desired digit button 1 - 7 (or DISC on the remote control).
 - Playback starts automatically, if the selected tray is loaded.

- You can interrupt CD play by pressing ■ PAUSE ■ on the remote control. Continue CD play by pressing ► (PLAY ► on the remote control).

- During play, the display normally shows the elapsed playing time of the track currently played. You can change the type of the time information, by repeatedly pressing DISPLAY MODE on the unit:
 - The display shows in turn: REMAINING TIME OF CURRENT TRACK - REMAINING TIME OF CD - ELAPSED TIME OF CURRENT TRACK - ...

Notes:

- You can also start CD play by selecting a track with the buttons 0-9 on the remote control.
- CD play also stops if you press OPEN/CLOSE or select another sound source
- The system will switch off automatically, if no button is pressed for more than 15 minutes after CD play has finished.

Selecting another track

- Briefly press ◀ or ▶ once/several times to skip to the beginning of the current/previous or subsequent track (on the remote control) use the buttons ◀ or ▶ or 0-9).
- The display shows the selected track number.
- During play, CD play continues automatically with the selected track.
- In the stop position, press ► to start CD play.

Searching for a passage during CD play

- 1 Hold down ◀ or ▶ (or ◀ or ▶ on the remote control) to find a particular passage in the forward or backward direction.
 - The volume is automatically reduced to a low level.

- 2 Release the button when you have reached the desired passage.
 - Note: In the shuffle mode and when playing a program, searching is only possible within the playing track.*

Selecting another source during CD play

- You can select another sound source during CD play, if you select the CD source again, the CD player will return to the original mode: PLAY, SHUFFLE, REPEAT or PROGRAM.
 - CD play will resume at the position where it was interrupted.

Note: CD play cannot be resumed if the unit has been switched to standby in the meantime.

RECORD TAPE ●

- 1 As soon as you press RECORD TAPE ●, the current CD-sound will be recorded on TAPE 2, provided a tape suitable for recording is loaded.
- 2 To stop recording and CD play, press ■ (or STOP ■ on the remote control). If you only want to stop recording, press TAPE 2 first, and then press ■

CD CHANGER

SHUFFLE – playing in random order

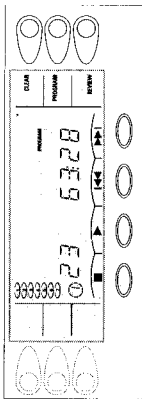
- 1 Press SHUFFLE on the unit (or on the remote control) several times until the desired option is displayed:
 - SHUFFLE**: All tracks of the current CD are played in random order.
 - SHUFFLE ALL DISCS**: All tracks of all loaded CDs are played in random order.
- The selected shuffle mode is automatically executed
- 2 To return to normal CD play, press SHUFFLE on the unit (or on the remote control).

Note: You can combine some of the REPEAT and SHUFFLE features at the same time and for example repeatedly play the entire CD or program in random order (SHUFFLE REPEAT ALL).

Programming track numbers

You may select a number of tracks and store these in the memory in the desired sequence. You may store any track more than once. At most, 40 tracks can be stored in the memory. The display will show the message FULL, if you exceed the maximum of 40 tracks.

- 1 Press PROGRAM to enter the CD programming mode.
 - The available display button functions light up and PROGRAM starts flashing.



- 2 Select the desired CD by pressing the appropriate digit button 1 - 7 (or DISC on the remote control).

- 3 Select the desired track by pressing with ◀ or ▶ (or ◀ or ▶ or 0-9 on the remote control).

- 4 As soon as the desired track is displayed, press PROGRAM to store the track.
 - The display shows the total number of stored tracks, followed by the just stored track number. "PROG" behind the track number indicates, this track number is stored.

- 5 Select and store in this way all desired tracks.

- 6 Quit the CD programming mode by pressing ■ (or STOP ■ on the remote control) or immediately start playback of the program by pressing ► or SHUFFLE (or PLAY ► or SHUFFLE on the remote control).

Reviewing your settings

- You can review your settings by pressing REVIEW.
 - The display shows in sequence all stored track numbers and the corresponding CD.
- During CD play only the tracks that still have to be played are shown on the display.

Note: If you press REVIEW when no program is available, the message NO PROGRAM will appear on the display.

Clearing the entire program (in the stop position)

- Press CLEAR to clear the program.
 - On the display PROGRAM/CLEARED briefly lights up and the flag PROGRAM disappears.

Note: The program will also be cleared if you interrupt the power supply.

Clearing a track from a program

- 1 Press PROGRAM to enter the CD programming mode.
- 2 Select the track to be cleared by pressing ◀ or ▶ (or ◀ or ▶ on the remote control).

- 3 As soon as the number you wish to clear is displayed, press CLEAR.
 - The cleared track number and CLEAR appear briefly.

Notes: - You will clear all tracks of one specific CD by opening the CD tray when this CD is loaded
- You can also clear one particular track number during the program review. The currently displayed track number will be cleared when you press CLEAR.

Inserting a tape

- 1 Press OPEN to open the cassette compartment.

- 2 Insert the tape with the open side down.
 - The display shows **002**.
 - The deck detects the presence of a tape in the cassette compartment and automatically selects the tape type (NORMAL or CrO₂).

English

Fast winding

During playback

- 1 Hold down **◀** or **▶** (or **◀** or **▶** on the remote control) to find a particular passage in the forward or backward direction.
 - The volume is automatically reduced to a low level.
- 2 Release the button when you have reached the desired passage.



In the stop position

- 1 Briefly press **◀** or **▶** (or **◀** or **▶** on the remote control).
- 2 Stop winding by pressing **■** (or **STOP** on the remote control).

Play mode

- You can select the playback mode by pressing PLAY MODE several times until the desired indicator lights up:

- ▶** to play (record) one side. At the end of the first side the recorder stops.
- ◀** to play (record) both sides once. At the end of the first side, the tape direction is reversed and the recorder stops at the end of the second side.
- ⏮** for non-stop playback. The deck reverses the tape direction (up to ten times) whenever reaching the end of the tape side. To stop, press **■**.
- ⏭** for non-stop playback on both decks: The deck reverses the tape direction (up to ten times on each deck) when reaching the end of the tape side. Playback of both tape sides rotates between deck 1 and deck 2. To stop, press **■**.

Note: For a recording only the play modes **▶** and **◀** are available.

Dolby B Noise Reduction System

The Dolby B NR System is manufactured under license from Dolby Laboratories Licensing Corporation. The word Dolby and the DD symbol are trademarks of Dolby Laboratories Licensing Corporation.

- Switch the Dolby B NR on and off with the DOLBY NR button.

Notes:

- A tape recorded with the Dolby B NR system should also be played in the Dolby B NR mode. If you forget to operate the DOLBY NR button, the treble may be reproduced too strongly or too faintly.
- Dolby B NR button has no influence during dubbing (copying from TAPE 1 to TAPE 2). An original tape recorded with Dolby B NR automatically produces a copy with Dolby B NR.

Inserting a tape

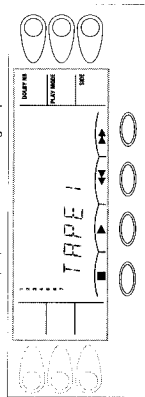
- 1 Press OPEN to open the cassette compartment.

- 2 Insert the tape with the open side down.
 - The display shows **002**.
 - The deck detects the presence of a tape in the cassette compartment and automatically selects the tape type (NORMAL or CrO₂).

English

Playing a tape

- 1 Press TAPE 1 or TAPE 2 on the unit or on the remote control.
 - Briefly TAPE 1 or TAPE 2 appears on the display.
 - The available display button functions light up:

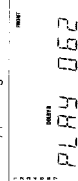


- 2 Insert a recorded tape with the open side down.

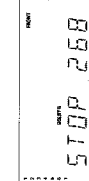
- 3 Select the tape side by pressing SIDE on the unit (or on the remote control) several times until the desired indicator lights up.
 - FRONT: the visible side will be played.
 - BACK: the invisible backside will be played.
 - The tape counter is set to **000**.

- 4 If desired, switch on the Dolby NR system by pressing DOLBY NR.

- 5 Press **▶** (or **PLAY** on the remote control) to start playback.
 - The display shows the tape counter.



- 6 Press **■** (or **STOP** on the remote control) if you want to stop playback before the end of the tape.



Notes:

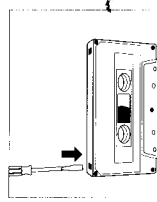
- You can set the tape counter to **000** by pressing SIDE twice.
- If no button is pressed for more than 15 minutes after playback has finished, the system automatically switches off.

General information on recording

- Recording is permissible insofar as copyright or other rights of third parties are not infringed.
- At the very beginning and end of the tape, no recording will take place during the 7 seconds when the leader tape passes the recorder heads.
- When a recording is active, most functions are disabled. RECORDING ACTIVE will appear on the display when a wrong button is pressed.
- In general, the recording level is set automatically. The recording is not affected by the controls VOLUME, DBB, INCREDIBLE SOUND, ROCK, CLASSIC, JAZZ and OPTIMAL USER.

Protecting tapes against accidental erasure

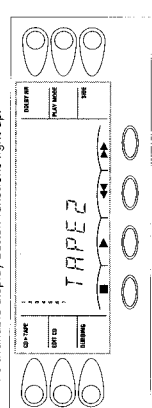
- Keep the tape side to be safeguarded in front of you and break out the left tab. Now, recording on this side is no longer possible.
 - If a protected tape is loaded, the display will show TAPE PROTECTED.



- To render this safeguard ineffective, cover the aperture with a piece of adhesive tape.

Recording from a CD

- 1 Insert a CD and, if desired, program track numbers.
- 2 Press TAPE 2 on the unit or on the remote control.
 - The available display button functions light up.



- 3 Insert a blank tape into TAPE 2.

- 4 Select the tape side by pressing SIDE: FRONT or BACK.

- 5 Select the play mode by pressing PLAY MODE until the desired indicator lights up: **▶**, **◀**, or **⏮**.

- 6 If desired, switch on the Dolby NR system by pressing DOLBY NR.

- 7 If you want to make a "EDIT CD recording", follow from here the instructions for EDIT CD.

- 8 Start the recording by pressing CD ▶ TAPE.

- The display shows COPY.

- With a delay of 7 sec. (leader tape of the tape), playing of the CD or program starts.

- At the very beginning and end of the tape, no recording will take place during the 7 seconds when the leader tape passes the recorder heads.

- When a recording is active, most functions are disabled. RECORDING ACTIVE will appear on the display when a wrong button is pressed.

- Press **■** (or **STOP** on the remote control) to stop the recording at an earlier stage.

EDIT CD – automatic CD track selection by specifying the tape length

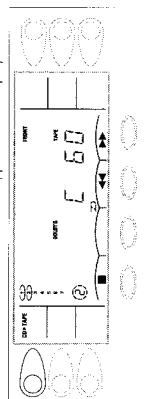
To prevent that at the end of the tape the recording is interrupted somewhere within a track, you can use the EDIT CD feature.

However, it can only be used for CDs with a maximum of 30 tracks. The unit automatically selects the total number of tracks that will fit onto each tape side.

The original order of tracks will not be changed.

- 1 Press EDIT CD.

- SELECT TAPE LENGTH and C 60 appear on the display.



- 2 Press **◀** or **▶** until the desired tape length appears on the display (on the remote control use the buttons **◀** or **▶**).
 - The display shows in turn: C60–C90–C100–C120–C30–C45–C60–...

- 3 Start the recording by pressing CD ▶ TAPE.

- With a delay of 7 sec. (leader tape of the tape), playing of the CD or program starts automatically.
- Recording will stop when it's finished according to the chosen play mode or when the CD player reaches the end of the CD or the program.

- Press **■** (or **STOP** on the remote control) to stop the recording at an earlier stage.

- You can change the type of the CD time information: by repeatedly pressing DISPLAY MODE on the unit.

- The display shows in turn: REMAINING TIME OF CURRENT TRACK--REMAINING TIME OF CURRENT TAPE SIDE--ELAPSED TIME OF CURRENT TRACK--...

Dubbing tapes (copying from TAPE 1 to TAPE 2)

- 1 Insert a recorded tape into deck 1 and a blank tape into deck 2.
- 2 Press TAPE 1 and prepare the deck for the recording:
 - Select the tape side by pressing **SIDE: FRONT** or **BACK**.
 - Select the play mode by pressing **PLAY MODE** until the desired indicator lights up: **FM** or **CD**.
- 3 Press TAPE 2 and select the tape side by pressing **SIDE: FRONT** or **BACK**.
- 4 Press **DUBBING** and thereafter select the dubbing speed by pressing **◀▶** or **▶▶**:
 - The display shows **NORMAL** (normal speed) or **FAST** (high speed).
 - During high-speed dubbing, the sound is reduced to a low volume.
- 5 Start recording by pressing **DUBBING**.
 - Both decks start running and either **NORM 000** (normal speed dubbing) or **FAST 000** (fast speed dubbing) appears.
 - Recording will stop when one or both sides of the tape are full (depending on the chosen play mode).
- Press **■** (or **STOP ■** on the remote control) to stop the recording at an earlier stage.

Notes:

- **PRESS STOP FIRST** will light up if you press **SIDE**: you cannot reverse the playback direction during dubbing.
- During dubbing you can listen to any other sound source.

RECORD TAPE ●

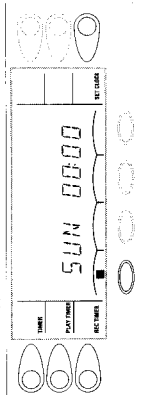
- 1 As soon as you press **RECORD TAPE ●**, the current sound (CD, TUNER, TAPE 1 or MULTIMEDIA) will be recorded on TAPE 2.
- 2 To stop recording, press **■**.

Erase an old tape by recording a silence:

- Select CD without starting CD play and press **RECORD TAPE ●**.

General

- The display shows the weekday and the time. The clock display will flash and has to be set:
- when you first plug the unit into the mains, or
 - if the power supply was interrupted for longer than 10 minutes.
- Press **CLOCK/TIMER** to enter the clock/timer mode.
 - The clock/timer display with its available display button functions appears:



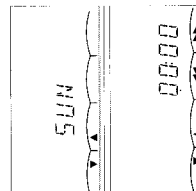
- To leave the timer display, press **■** **CLOCK/TIMER**, **POWER ON/STANDBY** or any sound source selection button.

Notes:

- The clock and the timer cannot be set with the remote control.
- If no button is pressed for more than 90 seconds, the clock setting mode is left automatically without storing the last changes.

Setting the clock

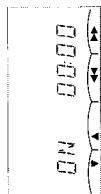
- 1 Press **CLOCK/TIMER** to enter the clock/timer mode.
 - The clock/timer display as shown above appears.
- 2 Press **SET CLOCK** to enter the clock setting mode.
 - The function indicator **SET CLOCK** starts flashing.



- 3 Select the day by pressing **▲** or **▼** until the correct day is indicated.
- 4 Confirm the day by pressing **SET CLOCK**.
 - The hour and the minute digits appear.
- 5 Adjust the hours by using **▲** and the minutes by using **◀▶**:
 - When pressing the buttons briefly, the digits will change step-by-step. By pressing longer, the running speed will increase after a few seconds.
- 6 Press **SET CLOCK** to store the setting and to leave the clock setting mode.
 - The clock starts running.

Setting the timer for a radio recording

- 1 Insert a tape into TAPE 2.
- 2 Press **CLOCK/TIMER** to enter the clock/timer mode.
 - The clock/timer display appears.
- 3 Press **REC TIMER** to enter the timer setting mode.
 - The function indicator **REC TIMER** starts flashing and a radio preset appears.
- 4 Press **▲** or **▼** until the desired preset station is indicated.
- 5 Confirm the preset station by pressing **REC TIMER**.
 - The message **ON** and the time appear.
- 6 Adjust the hours and the minutes by using **▲** and **◀▶**.
- 7 Confirm the start time by pressing **REC TIMER**.
 - The message **OFF** and the time appear.
 - The **recording stop time** must be entered.
- 8 Adjust the hours and the minutes by using **▲** and **◀▶**.
- 9 Press **REC TIMER** to confirm the settings and to leave the timer setting mode.
 - The timer is activated and **TIMER** lights up on the display.



Setting the timer for playback

- 1 Press **CLOCK/TIMER** to enter the clock/timer mode.
 - The clock/timer display appears.
- 2 Press **PLAY TIMER** to enter the timer setting mode.
 - The function indicator **PLAY TIMER** starts flashing and the last selected timer sound source appears.
- 3 Press **▲** or **▼** until the desired sound source is indicated.
- 4 Confirm your selection by pressing **PLAY TIMER**.
 - If you have selected **TUNER**, press **▲** or **▼** to select the desired preset station.
 - If you have selected **CD**, insert a CD and press **▲** or **▼** to select the desired CD.
 - If you have selected **TAPE**, insert a tape into the cassette compartment.
- 5 Confirm your selection by pressing **PLAY TIMER**.
 - The message **ON** and the time appear.
 - The **start time** must be entered.
- 6 Adjust the hours and the minutes by using **▲** and **◀▶**.
- 7 Press **PLAY TIMER** to confirm the settings and to leave the timer setting mode.
 - The timer is activated and **TIMER** lights up on the display.

At the preset start time ...

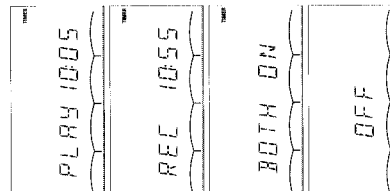
- The power is turned on or, if another sound source is selected, the set switches to the preset source.
- The preset source comes on automatically.
- 15 minutes after playback of the CD or the tape has finished, the system switches to standby.
- If the timer is activated with the **TUNER** mode, the sound remains on until you switch off the system.

Notes:

- If the set was activated from standby mode and no button is pressed for more than 40 minutes, the power is turned off again.
- If there is the same start time for **REC TIMER** and **PLAY TIMER**, the **REC TIMER** will be activated.
- If you are recording at the time the timer is activated, the timer function will be cancelled.

Reactivating/deactivating the timer

- 1 Press **CLOCK/TIMER** to enter the clock/timer mode.
 - The clock/timer display appears.
- 2 To switch off or to reactivate a timer function, press **TIMER** several times until the required indication appears:



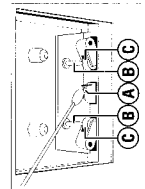
- **PLAY** (playback) and the programmed start time for activating the **PLAY TIMER**.
- **REC** (recording) and the programmed start time for activating the **REC TIMER**.
- **BOTH ON** - both **PLAY TIMER** and **REC TIMER** are activated.
- **OFF** for switching the timer off.

MAINTENANCE

General maintenance

- Do not expose the set, CDs or tapes to humidity or rain, sand or to excessive heat caused by heating equipment or direct sunlight.
- The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated!
- You can clean the set with a soft, slightly dampened chamois leather. Do not use any cleaning agents as they may have a corrosive effect.

TAPE decks



To ensure a good recording and playback quality, clean the head (A), the capstans (B) and the rubber pressure rollers (C) after approx. 50 hours of operation.

- Use a cotton bud slightly moistened with alcohol or a special head cleaning fluid.

Note: Cleaning of the heads (A) can also be done by playing a cleaning tape through once.

CD player and CD handling

- The lens may cloud over when the set is suddenly moved from cold to warm surroundings. Playing a CD is then not possible. Leave the set in a warm environment until the moisture evaporates.
- To take the CD out of its box easily, press the centre spindle while lifting the CD.
- Always pick up the CD by the edge and put it back in its box after use.
- To clean the CD, wipe in a straight line from the centre towards the edge using a soft, lint-free cloth. A cleaning agent may damage the CD!
- Never write on a CD or attach any sticker to it.

TECHNICAL DATA

Technical data (subject to modification)

AMPLIFIER
Output power: 2x 45 W RMS/6 Ω THD 10%
Power bandwidth: 40 - 20000 Hz
Frequency response: 40 - 20000 Hz
Signal-to-noise ratio: ≥ 67 dB(A) (IEC)
Impedance Loudspeakers: ≥ 6 Ω
Impedance headphones: 32 Ω - 1000 Ω (3 Vennik - 150 Ω)

TUNER
FM wave range: 87.5 - 108 MHz
MW wave range: 531 - 1602 kHz
Sensitivity at 75 Ω mono, 26 dB signal-to-noise ratio: 2.8 µV
stereo, 46 dB, signal-to-noise ratio: 61.4 µV
Selectivity: ≥ 26 dB
Total harmonic distortion: ≤ 5%
Frequency response: 63 - 12500 Hz (± 3 dB)
Signal-to-noise ratio: ≥ 50 dB(A)

CD PLAYER
Frequency range: 20 - 20000 Hz
Signal-to-noise ratio: 90 dB(A)
Channel separation: 60 dB(A)
Total harmonic distortion: ≥ 75 dB
Conversion: Continuous Calibration
4x oversampling

TAPE DECKS
Frequency response: - C-02 tape (type II): 60 - 14000 Hz (8 dB)
- Normal tape (type I): 60 - 14000 Hz (8 dB)
Signal-to-noise ratio (without Dolby NR):
- C-02 tape (type II): 47 dB
- Normal tape (type I): 47 dB
Signal-to-noise ratio (with Dolby NR):
- C-02 tape (type II): 55 dB
- Normal tape (type I): 55 dB
Wow and flutter: ≤ 0.4% DIN

SPEAKERS
System: 3-way double bass reflex
Impedance: 6 Ohms
Bass speaker: 5 1/4 inch woofer
Mid/treble speaker: 2 1/2 inch tweeter
Upper treble: piezo tweeter
Dimensions (wxdh): 210 x 310 x 251 mm

General
Dimensions (wxdh): 240 x 310 x 310 mm
Weight (with/without speakers): approx. 14/7 kg

TROUBLESHOOTING

WARNING:

- If a fault occurs, first check the points listed below before taking the set for repair.
- If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

English

PROBLEM	POSSIBLE CAUSE	REMEDY
No power	Mains lead is not securely connected.	Connect the mains lead properly.
No or poor sound	VOLUME is not turned up. Speakers are wrongly or not connected. Unsuited speakers are used. Badly matching equalizer setting for the given type of music. Headphones are connected.	Turn up the VOLUME. Check the speaker connections. Use recommended speakers, impedance 6 Ohms. Choose a matching equalizer setting for the given type of music. Disconnect the headphones.
Reversed left and right sound	Speakers are wrongly connected.	Connect the speaker cables correctly.
System does not react to operation of any button	Electrostatic discharge.	Disconnect the set from power supply and reconnect it after a few seconds.
Poor radio reception	FM antenna is not connected. Interference caused by the vicinity of electrical equipment like TVs, video recorders, computers, etc.	Connect the FM antenna. Keep the set away from electrical equipment.
The CD skips tracks	CD is damaged or dirty.	Replace or clean the CD.
Poor tape sound quality	Dust and dirt on the heads, capstan or pressure roller.	Clean the heads, capstan and pressure roller, see maintenance.
Remote control does not work	The distance to the system is too large. Wrong sound source is selected. Batteries are incorrectly inserted. Batteries are exhausted.	Reduce the distance. Select the sound source before pressing the functional button. Insert the batteries correctly. Replace the batteries.
DISPLAY INDICATION	POSSIBLE CAUSE	REMEDY
NO DISC or CANNOT READ	CD is badly scratched or dirty. No CD inserted. CD inserted upside down.	Replace or clean the CD, see maintenance. Insert a CD. Insert a CD with label upwards.
WRONG TRACK	Laser lens is steamed up. The selected track number does not exist on this CD or is not included in this program	Wait until the lens has acclimatized. Select a correct track number
NO TAPE	No tape inserted.	Insert a tape.
TAPE PROTECTED	Tape is protected against recording.	Replace the tape or undo the protection.
RECORDING ACTIVE	A recording is active.	Stop the recording or wait until it is finished.
EDIT NOT POSSIBLE	The EDIT CD feature can only be used for CDs with a maximum of 30 tracks	Use another CD with less than 30 tracks or create a program with less than 30 tracks

Warnings & Safety

(GB) WARNING

All ICs and many other semiconductors 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 at this potential.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le braceleterti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ESD



(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD). Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren. Sorgen Sie dafür, daß sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind. Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem 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.

(I) AVVERTIMENTO

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

La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa del apparecchio tramite un braccialetto a resistenza.

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

SAFETY



(GB)

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

Safety components are marked by the symbol

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden.

Sicherheitsbauteile sind durch das Symbol markiert.

(I)

Le norme di sicurezza estigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambiaggio identici a quelli specificati. Componenti di sicurezza sono marcati con

(F)

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

(NL)

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

De Veiligheidsonderdelen zijn aangeduid met het symbool

(S) Varning !

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

(DK) Advarsel !

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

(FIN) Varoituis !

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

(F)

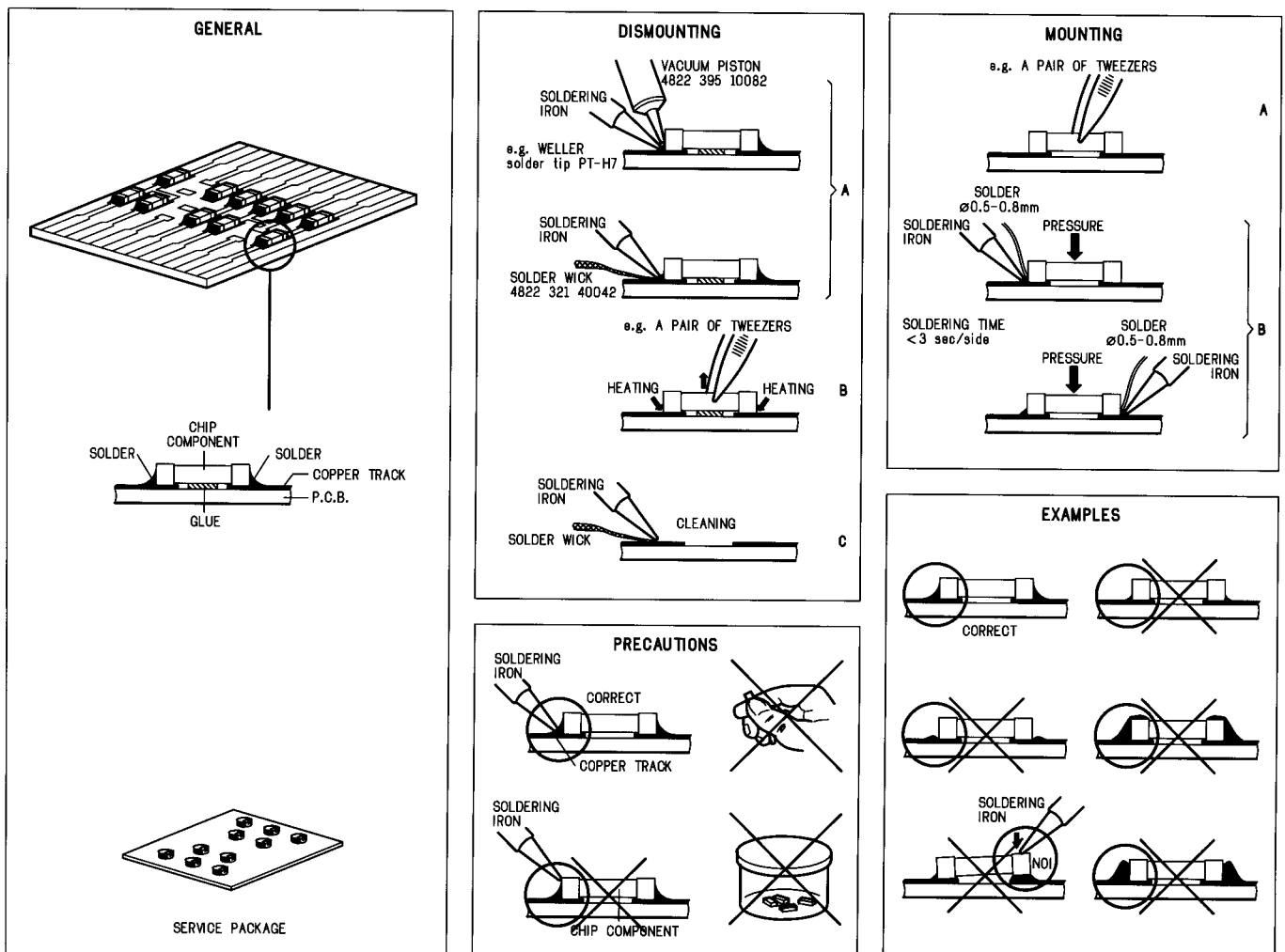
"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

SERVICE HINTS

Service Tools

TORX screwdriver set SBC 163	4822 295 50145
Audio signal disc SBC 429	4822 397 30184
Test disc 5 (disc without errors) + Test disc 5A (disc with dropout errors, black spots and fingerprints) SBC 426/426A	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30dB level without "pause")	4822 397 30155
Universal test cassette Fe SBC 420	4822 397 30071
Universal test cassette CrO2 SBC 419	4822 397 30069

Handling Chip Components



DISMANTLING INSTRUCTIONS

Dismantling of Cassette flap

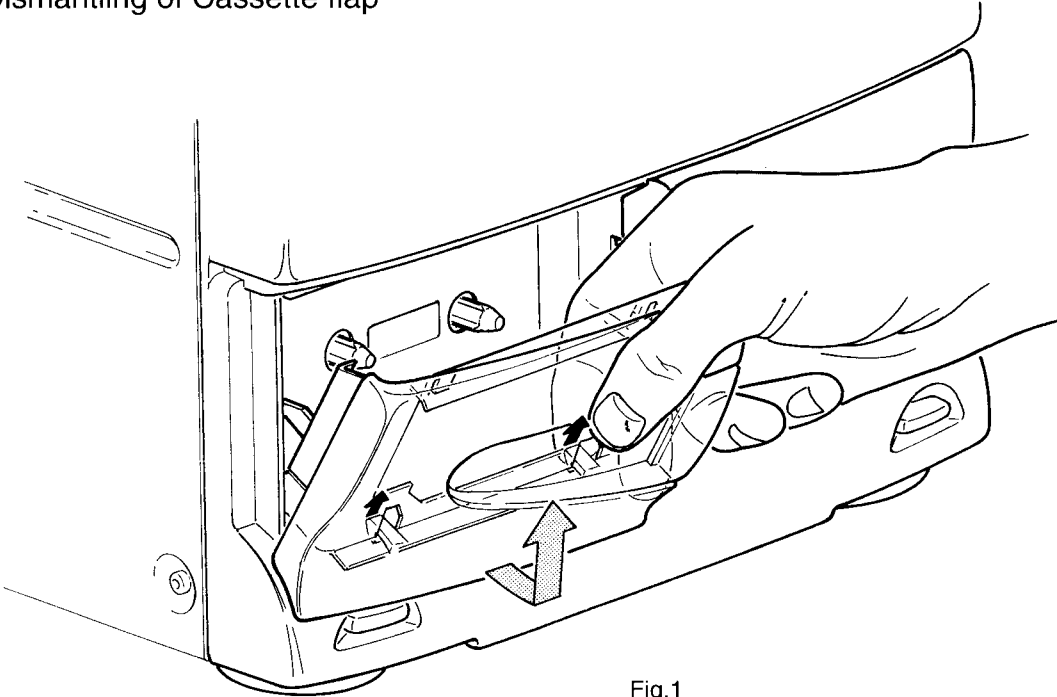


Fig.1

Dismantling the Karaoke Top (not on all Versions)

- 1) Release the two snaps on back side
- 2) Lift the back side of the cover first

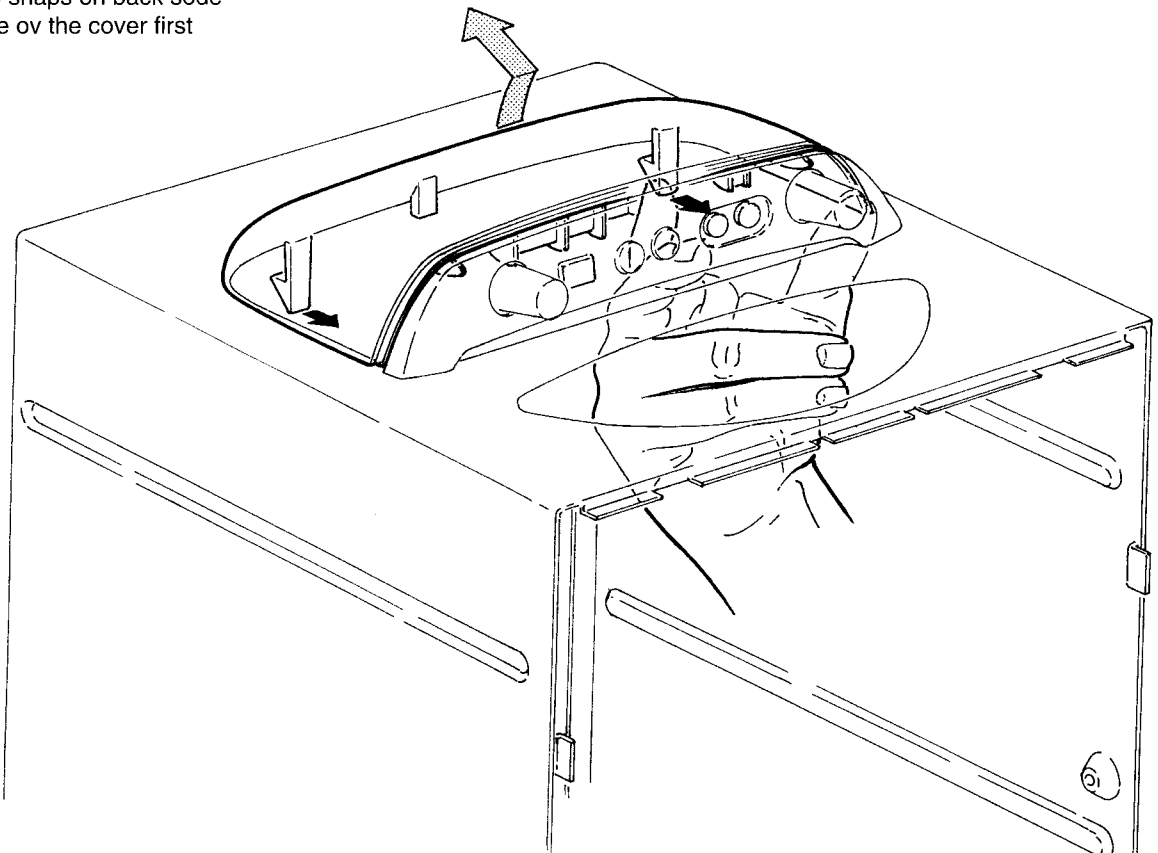
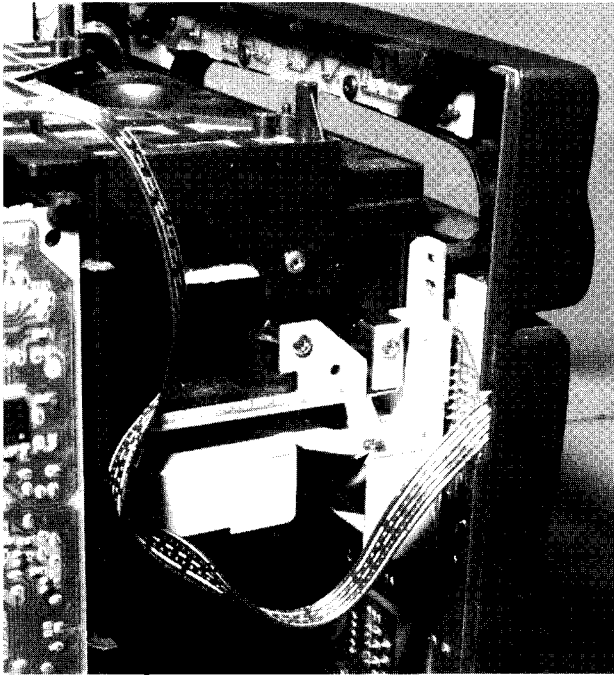


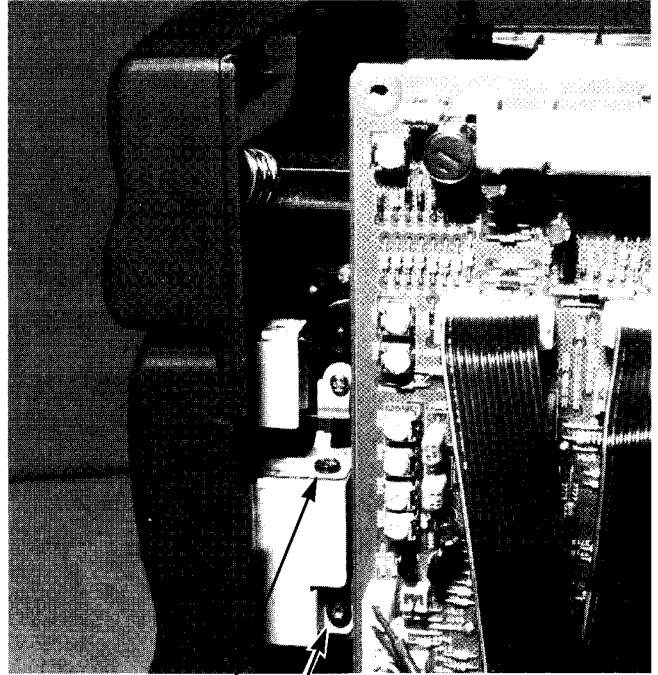
Fig.2

Dismantling of Front

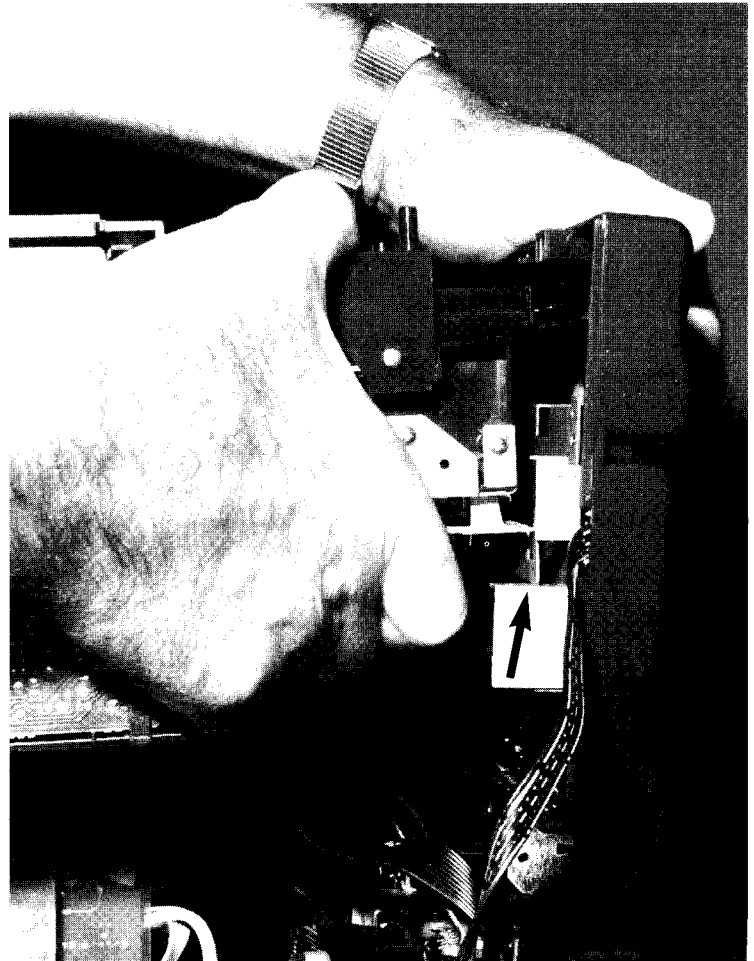
- 1) Remove top cover.
- 2) Loosen 3x screw on bottom.



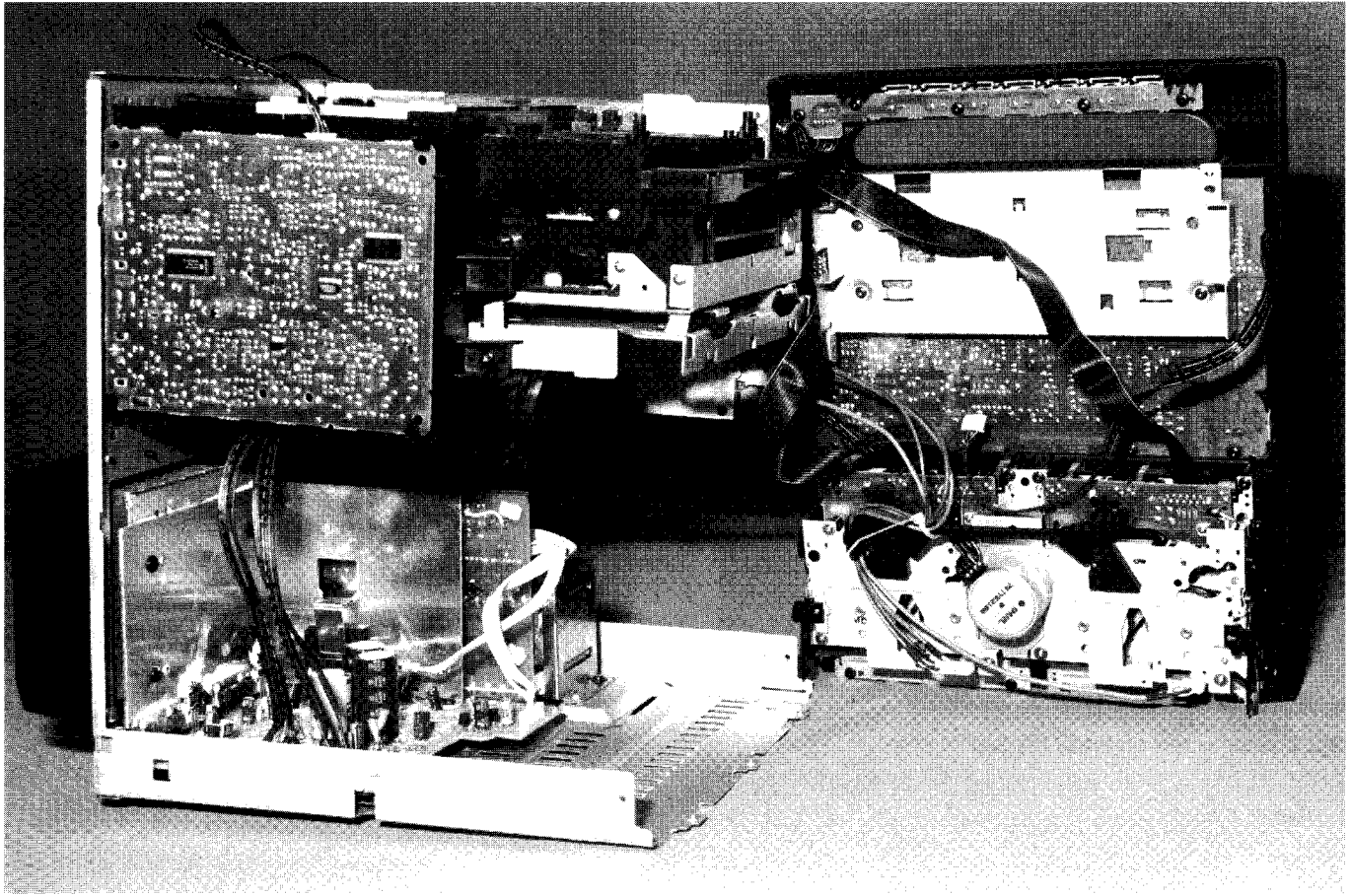
- 3) Loosen screw on metal bracket



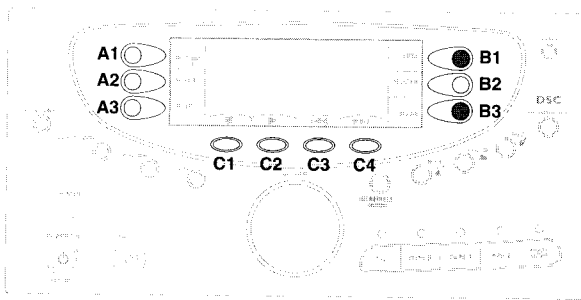
- 3) Loosen 2x screw on metal bracket
- 4) Lift the CD Module to release the metal bracket as shown in picture below.



- 5) Turn the front sideways as shown below.



SERVICE TEST PROGRAM



To start service test program hold B1 & B3 depressed while plugging in the mains cord

Display shows set version and number of ROM version "Sx yy zz" 1) (Main menu)

- 1) S stands for Service Testprogram
 S1 stands for sets with CD
 S2 stands for sets with CD Changer and RDS
 S3 stands for sets with CD Changer without RD
 yy stands for software version number of μ P on (counted from 99 downwards)
 zz stands for software version number of μ P on (counted from 99 downwards)

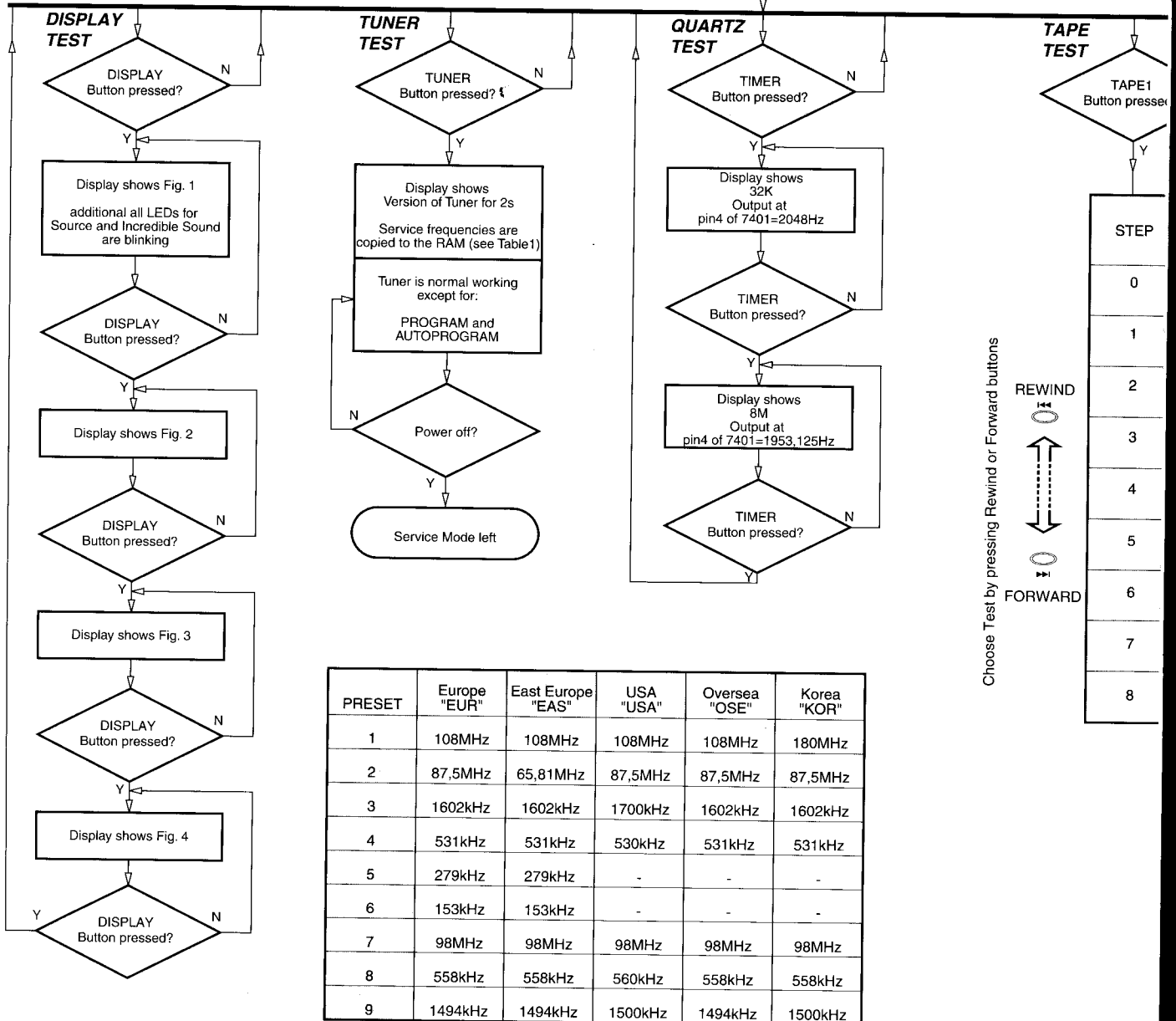


Table 1

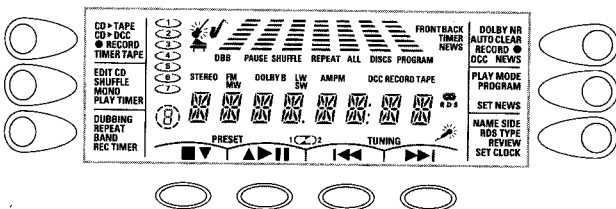


Fig.1

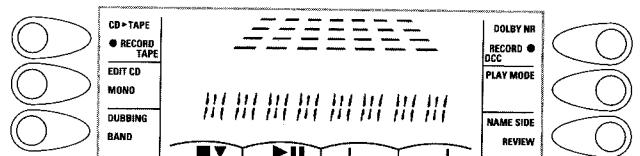
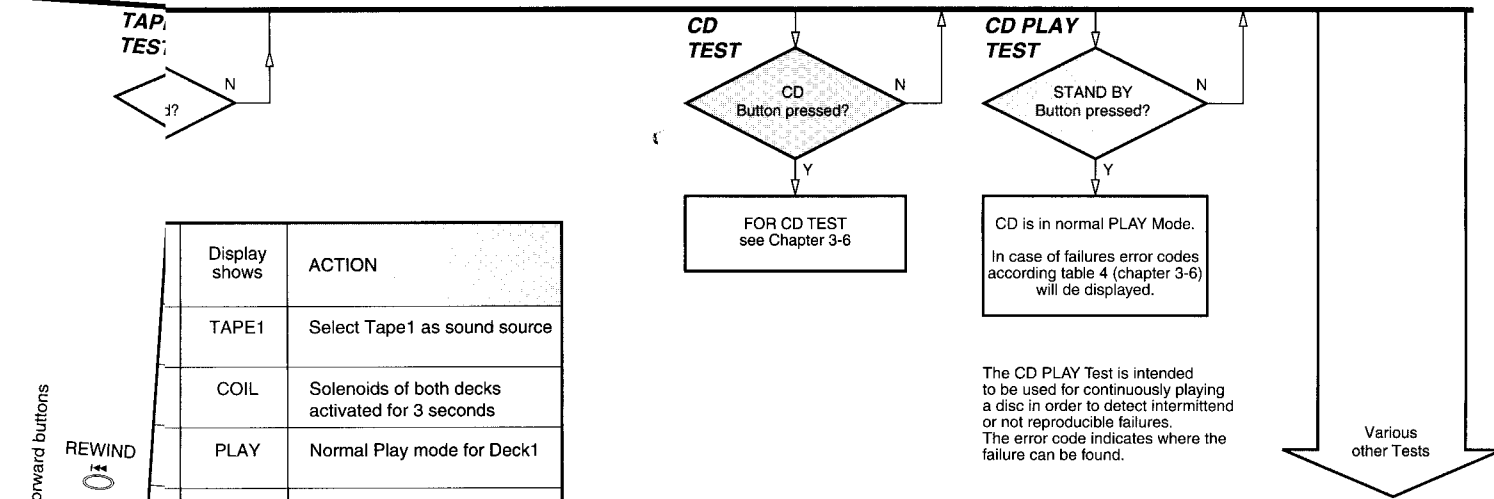


Fig.2

S stands for Service Testprog
S1 stands for sets with CD
S2 stands for sets with CD Ch
S3 stands for sets with CD ChS
yy stands for software version i Front Board
(counted from 99 downwards)
zz stands for software version r Combi Board
(counted from 99 downwards)



Choose Test by pressing Rewind or Forward buttons

Display shows	ACTION
TAPE1	Select Tape1 as sound source
COIL	Solenoids of both decks activated for 3 seconds
PLAY	Normal Play mode for Deck1
FAST	Fast Play mode for Deck1 (High speed)
PLAY	Normal Play mode for Deck2
FAST	Fast Play mode for Deck2 (High speed)
REC	Record mode for Deck2
FAST	High speed dubbing
	Leave Tape Test

TEST	Activated with	ACTION
EEPROM TEST	CLASSIC	A testpattern will be sent to the EEPROM. Size of the eeprom (1K or 4K) is displayed if the pattern is read back correctly. Otherwise ERR will be displayed.
EEPROM CLEAR	JAZZ	Load default data. Display shows NEW for 1 second. Caution! All presets from the customer are lost!
KEY TEST	OPTIMAL USER	Key numbers according table 5 are shown on the display. (see Chapter 3-6)
TEMPERATURE TEST	ROCK	Temperature of the mains transformer is displayed for 2 seconds. At 115° Celsius the μ P reduces the output power $\rightarrow$ DBB off, volume down. Values lower than 66° C are meaningless!
LEAVE SERVICE TESTPROGRAM	disconnect mains	

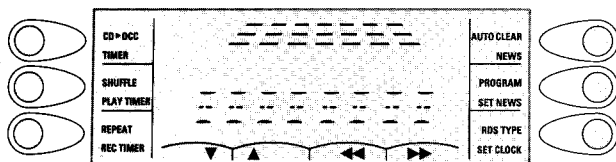
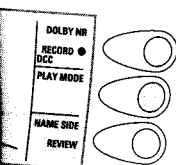


Fig.3

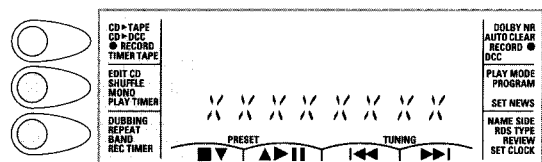


Fig.4

Error number	Error description	Error type
1002	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 playing the CD.	F
1007	Subcode Error. No subcode could have been read, even not after retrying 10 times to restart the PLL and jumping 10 tracks. When this happens the servo is stopped and restarted (as if the user would have pressed stop and then play immediately) to recover.	W
1008	Out of lead-in during reading TOC Triggered when during reading the TOC the lead-in (track no. 0) is left. This can be caused by a misaligned inner-switch or by a disc with a mispositioned lead-in.	W
1010	Radial error Triggered when the radial servo is not on track for a certain time during playing the CD.	F
1011	Sledge error Generated when the inner-switch did not open within a certain time when the pick up is moved from the inner position outside.	W
1012	Fatal sledge error Generated when the inner-switch did not close within a certain time when the pick up is moved inside. Inner-switch or sledge motor problems.	F
1013	Turntable motor error. Generated when the CD did not reach 75% of speed during startup within a certain time. Discmotor problem.	F
1020	PLL lock error. When the PLL did not lock after 10 retries then this warning message is generated and the servo is stopped and restarted (as if the user would have pressed stop and then play immediately) to recover.	W
1070	Carriage did not reach the play position within a certain time.	F
1071	Carriage did not reach the stocker within a certain time.	F
1072	Carriage did not pass the play position within a certain time.	F
1076	Desired disc position of the stocker could not be reached within a certain time.	W
1077	Generated when the cam is moved and either SW1 or SW2 did not open within a certain time.	F
1078	Generated when the cam is moved and either SW1 or SW2 did not close (reach the new position) within a certain time.	F
1079	Tray open position not reached within a certain time.	W
1080	Miscounting of the stocker position occurred	T

Table 3

Key activated	Display shows	Key activated	Display shows	Key activated	Display shows
Disc 1	1	B2	14	Jazz	27
Disc 2	2	B3	15	Optimal User	leave Test
Disc 3	3	C1	16	Brightness	29
Disc 4	4	C2	17	Power / Stand by	30
Disc 5	5	C3	18	CD	31
Disc 6	6	C4	19	TUNER	32
Disc 7	7	Timer/Clock	20	TAPE 1	33
CD open/close	8	Display	21	TAPE 2	34
Demo	9	Analyzer	22	MULTI MEDIA	35
A1	10	DBB	23	Vocal Cancel	36
A2	11	Pop / Incredible Stereo	24	Key Control down	37
A3	12	Rock	25	Key control up	38
B1	13	Classic	26	any RC5 Key	RC

Table 4

To start service test program hold
B1 & B3 depressed while
plugging in the mains cord

Display shows set version
and number of ROM
version "Sx yy zz" 1)
(Main menu)

1) S stands for Service Testprogram
S1 stands for sets with CD
S2 stands for sets with CD Changer and RDS
S3 stands for sets with CD Changer without RDS

yy stands for software version number of μ P on Front Board
(counted from 99 downwards)

zz stands for software version number of μ P on Combi Board
(counted from 99 downwards)

CD
Button pressed?

N

Y

Motor Test

Display shows
CD TEST

Disc Motor

REPEAT (A3)
Button pressed?

N

Y

Disc Motor turns CCW
Display shows
STOP

SHUFFLE (A2)
Button pressed?

Y

Disc Motor turns CW
Display shows
PLAY

N

Y

PLAY (C2)
Button pressed?

Y

Slide Motor

NEXT (C4)
Button pressed?

N

Y

Slide moves outside
Display shows
SLD 0

PREV (C3)
Button pressed?

Y

Slide moves inside
Display shows
SLD 1

Focus Servo Test

Display shows
FOC x

FOC 0 = Focus not found
FOC 1 = Focus found

FOCUS found?

N

Y

Display shows
FOC 0

Display shows
FOC 1

N

Y

PLAY (C2)
Button pressed?

Y

STOP (C1)
Button pressed?

N

Y

STOP (C1)
Button pressed?

N

Y

Disc Servo Test

Display shows
DISC xxx

DISC SLW = too slow
DISC FST = too fast
DISC OK = speed correct

N

Y

PLAY (C2)
Button pressed?

Y

STOP (C1)
Button pressed?

N

Y

Radial Servo Test

Display shows
RDL

N

Y

PLAY (C2)
Button pressed?

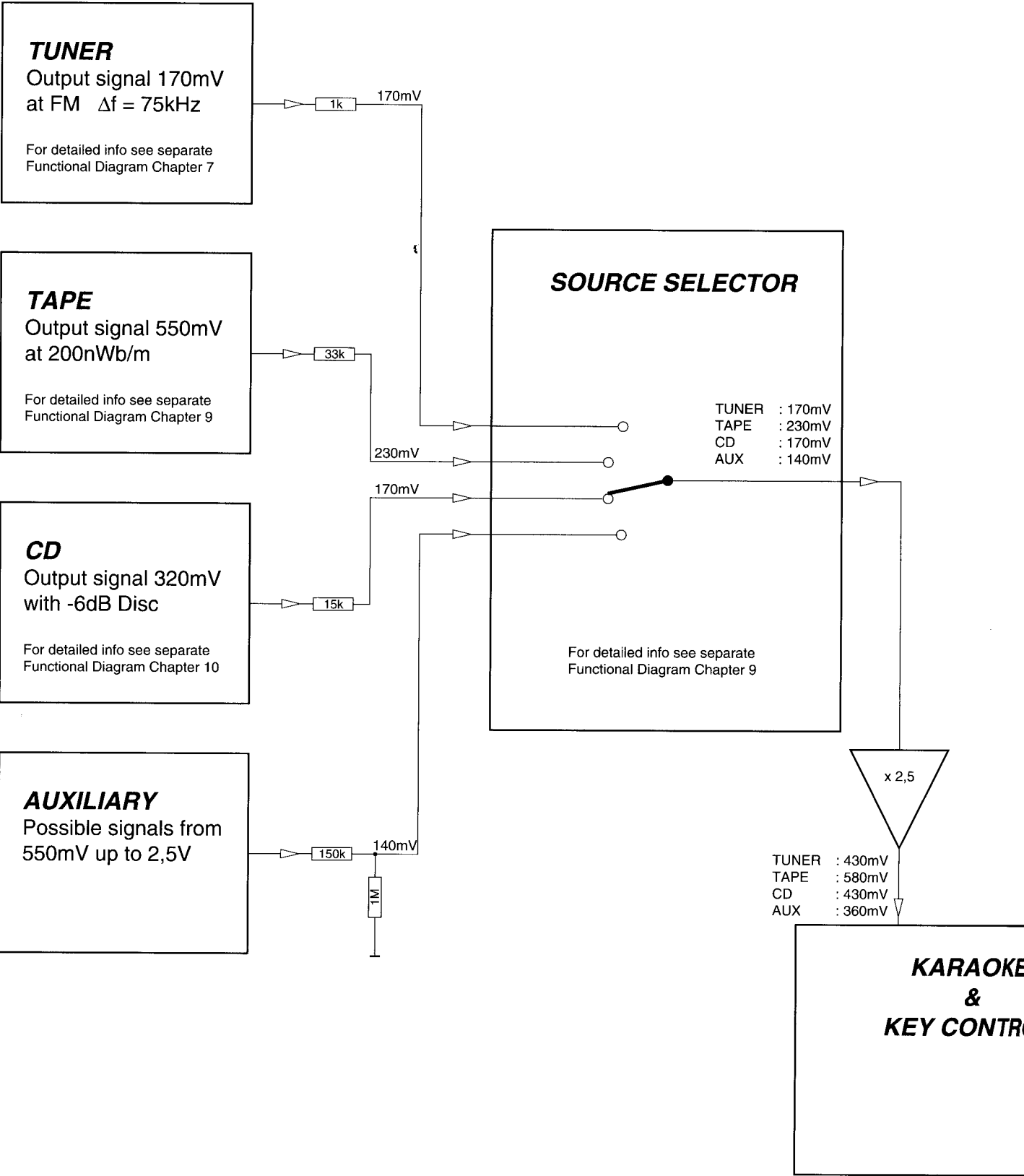
Y

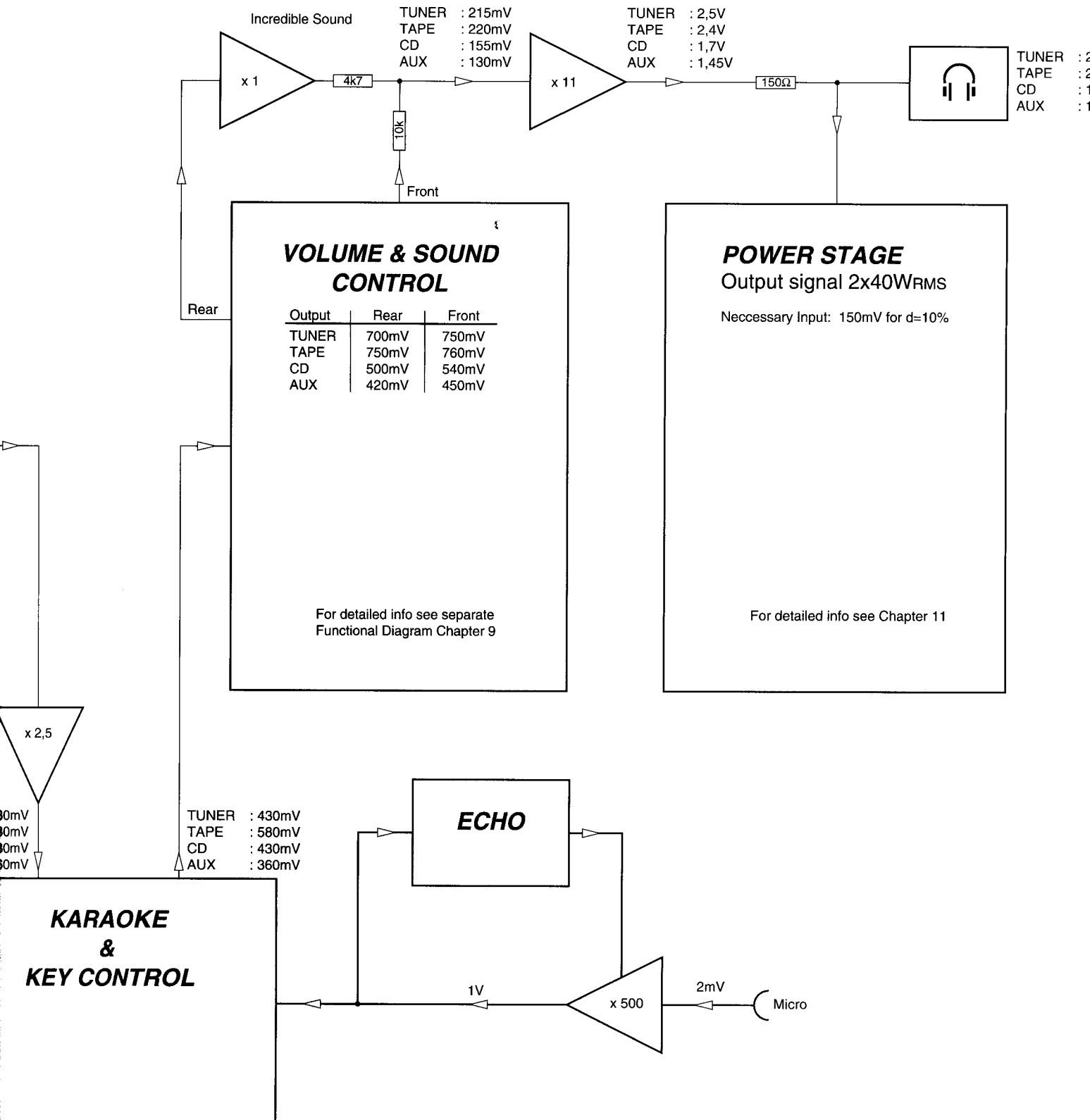
STOP (C1)
Button pressed?

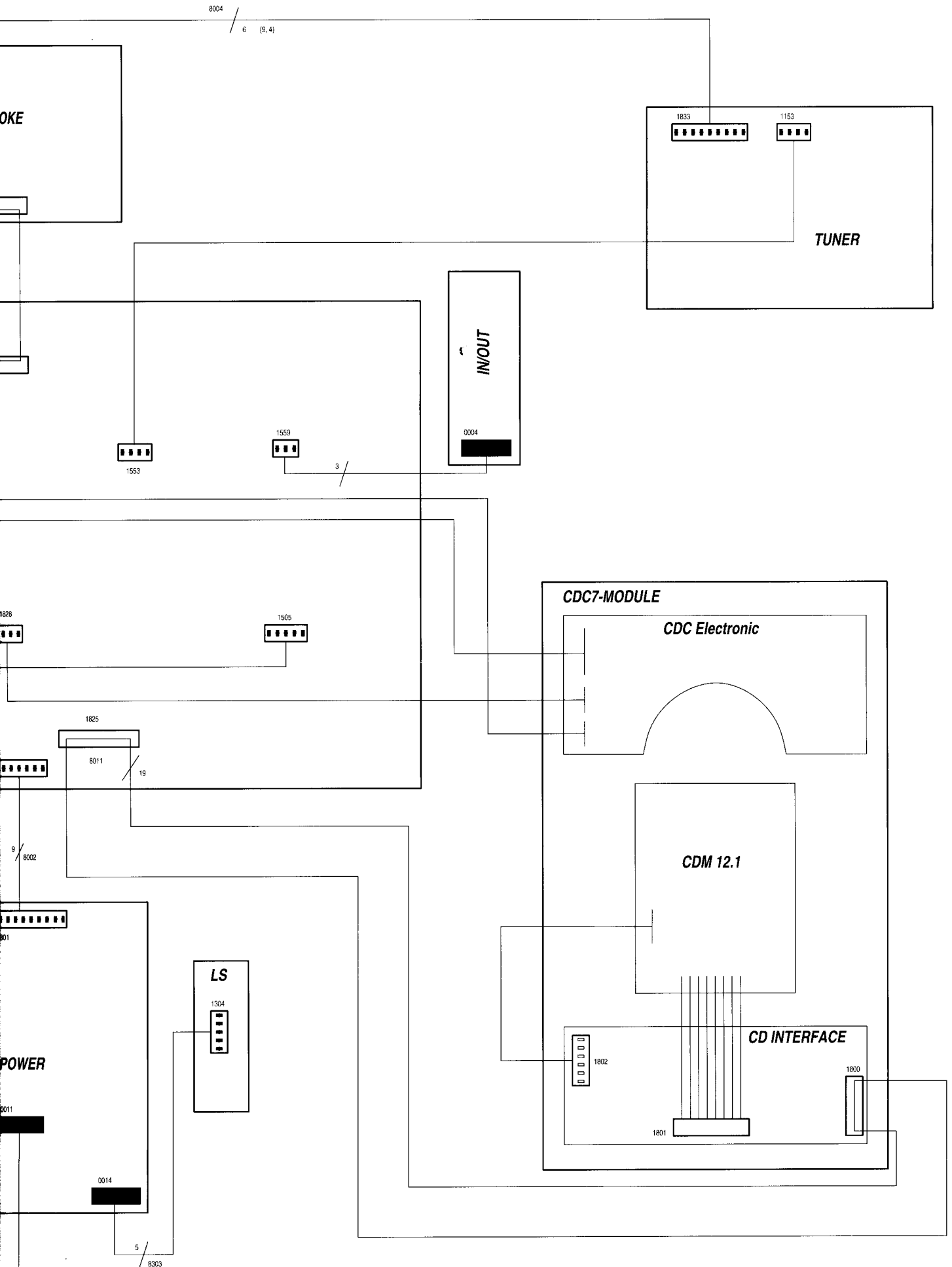
N

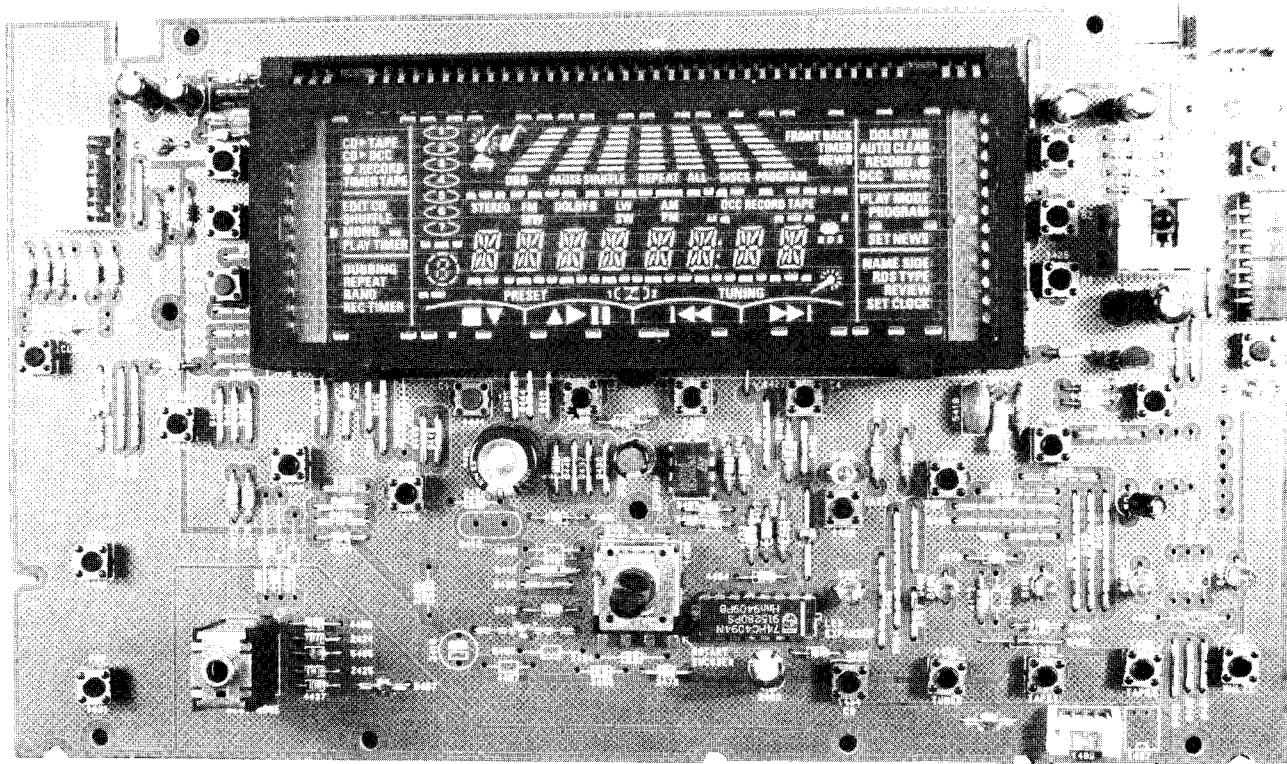
Y

BLOCK DIAGRAM SET







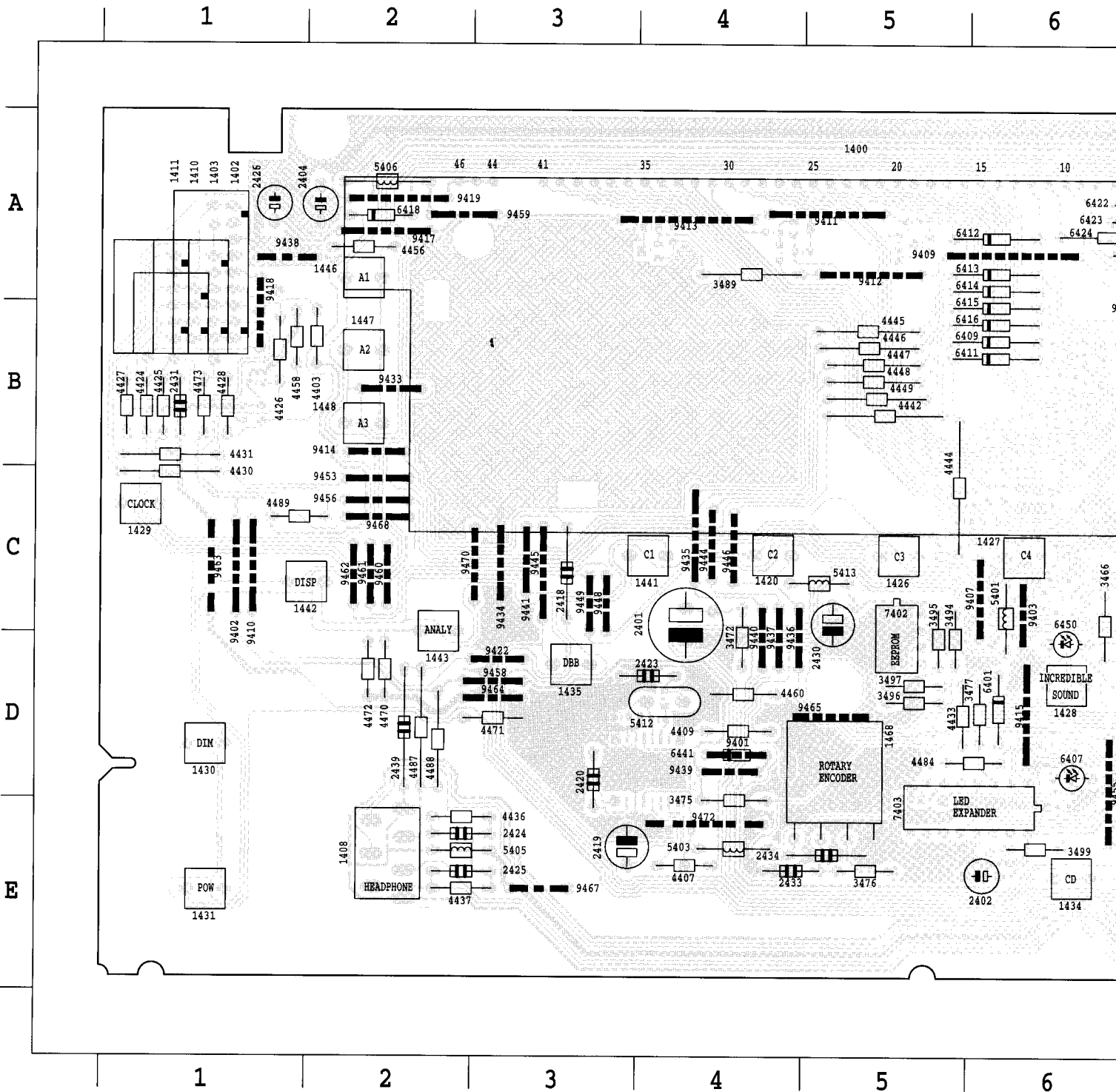


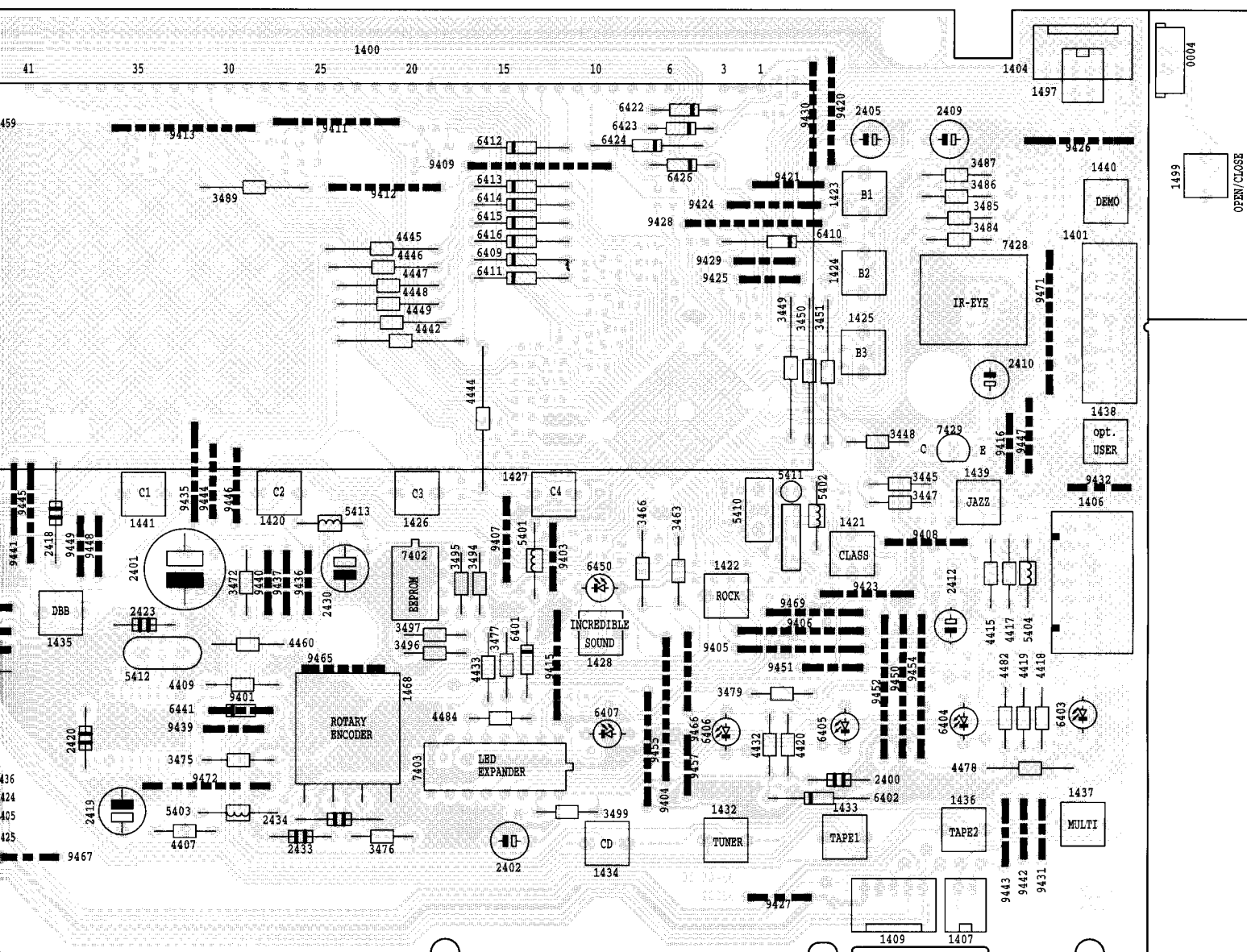
CONTROL BOARD

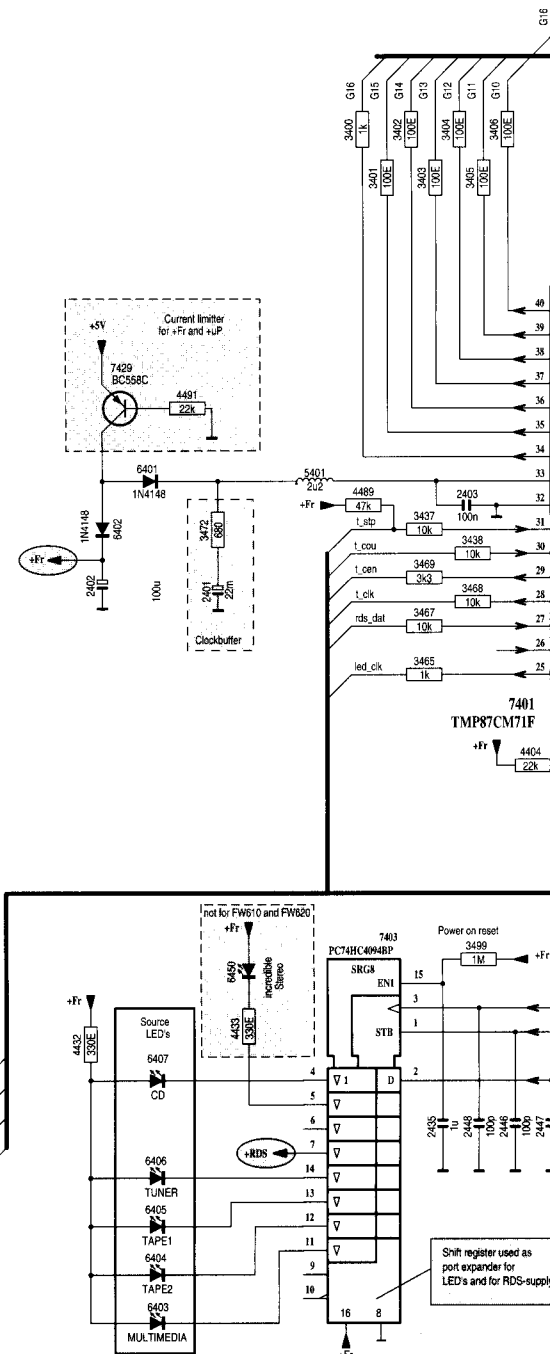
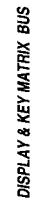
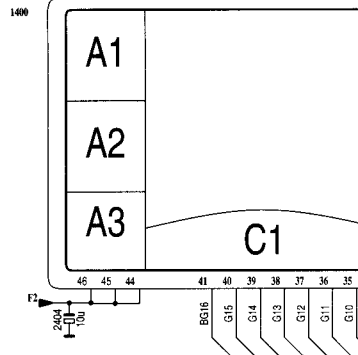
TABLE OF CONTENTS

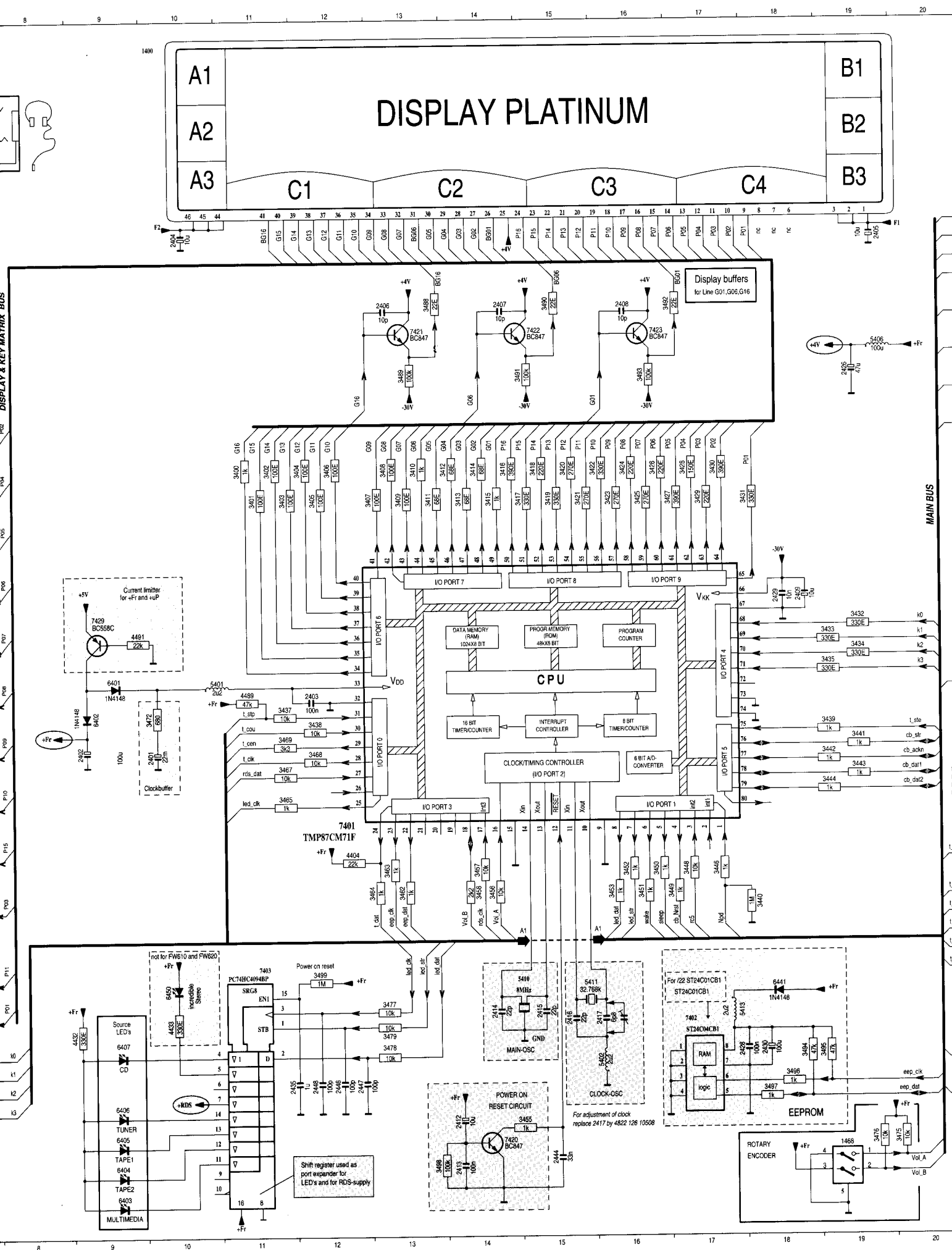
Component layout componentside view	6-1
Circuit diagram	6-2
Component layout copperside view	6-3
CDC-keys	6-4
Partslist	6-4

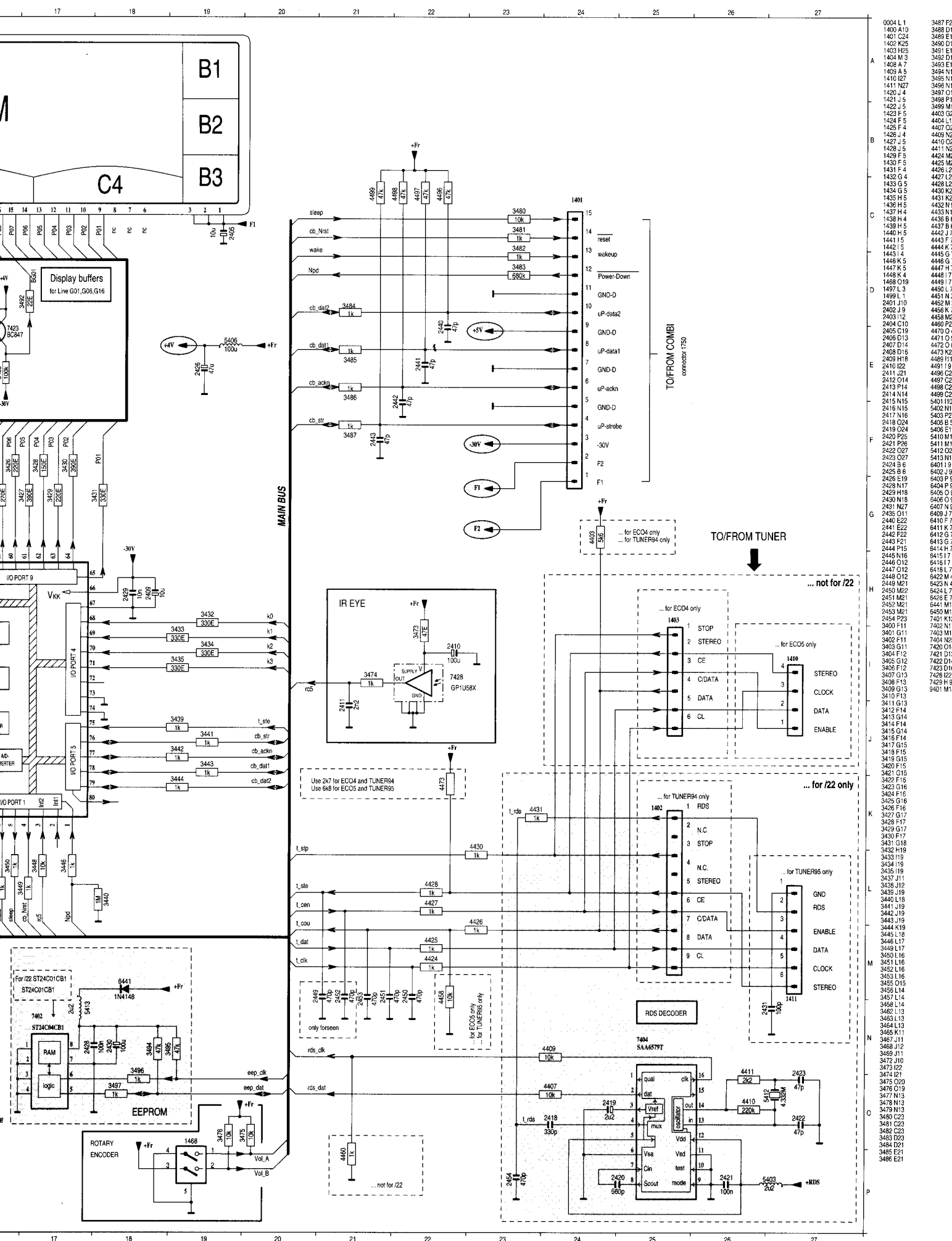
COMPONENT LAYOUT COMPONENTSIDE VIEW







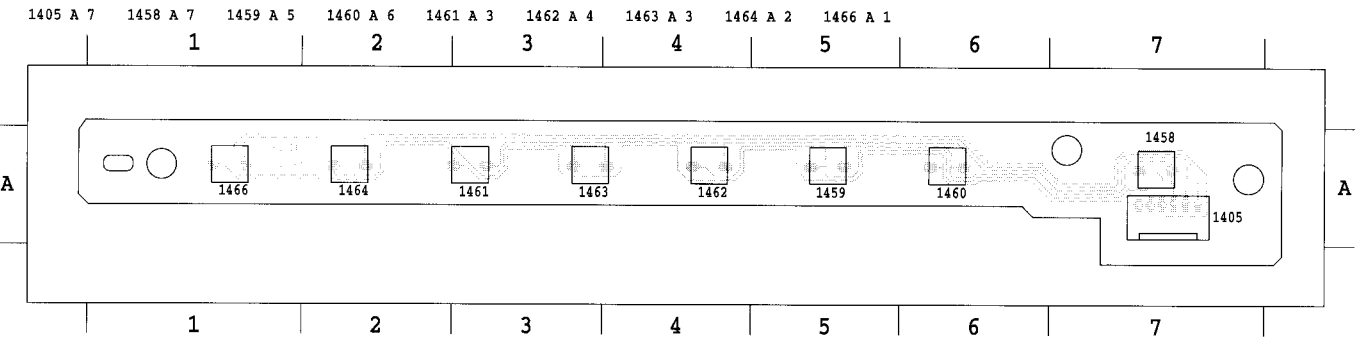
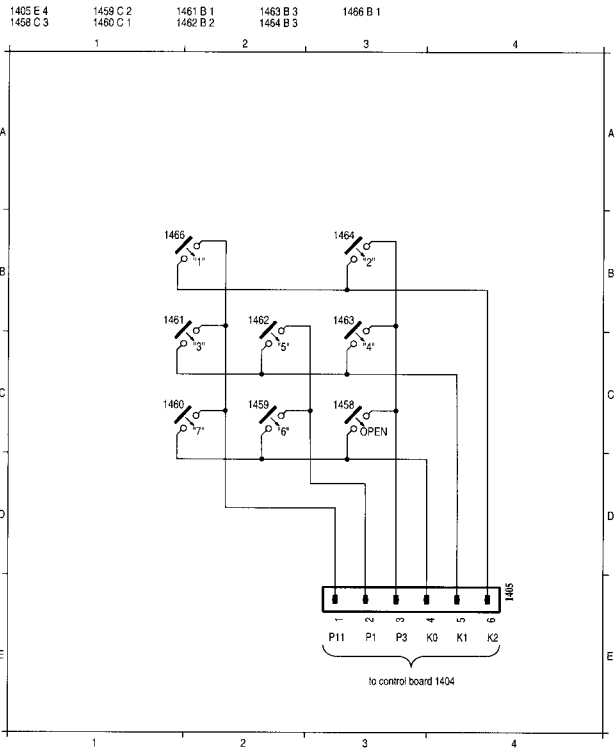






	2403 C 6
	2406 A 4
	2407 A 4
	2408 A 5
	2411 B 8
	2413 D 7
	2414 C 7
	2415 C 7
	2416 C 7
	2417 C 7
A	2421 E 4
	2422 D 3
	2428 C 5
	2429 B 7
	2435 E 6
	2436 C 9
	2437 D 9
	2438 D 9
	2440 B 8
	2441 A 8
B	2442 A 8
	2443 A 8
	2444 C 7
	2446 D 6
	2447 D 6
	2448 D 5
	2449 B 1
	2450 C 1
	2451 B 1
	2452 B 1
	2453 B 1
C	2454 B 1
	3400 C 6
	3401 C 6
	3402 C 5
	3403 C 6
	3404 C 5
	3405 C 5
	3406 C 6
	3407 C 6
	3408 C 6
D	3409 B 6
	3410 B 6
	3411 B 6
	3412 B 6
	3413 B 6
	3414 B 6
	3415 B 6
	3416 B 6
	3417 B 6
	3418 B 6
	3419 B 6
	3420 B 6
E	3421 B 6
	3422 B 6
	3423 B 6
	3424 B 6
	3425 B 6
	3426 B 6
	3427 B 6
	3428 B 6
	3429 B 7
	3430 A 6
	3431 A 7

CDC-KEYS



ELECTRICAL PARTSLIST CDC-KEYS

MISCELLANEOUS

1458	4822 276 13114	TACT SWITCH
1459	4822 276 13114	TACT SWITCH
1460	4822 276 13114	TACT SWITCH
1461	4822 276 13114	TACT SWITCH
1462	4822 276 13114	TACT SWITCH
1463	4822 276 13114	TACT SWITCH
1464	4822 276 13114	TACT SWITCH
1466	4822 276 13114	TACT SWITCH

ELECTRICAL

MISCELLANEOUS

1400	4
1408	4
1420	4
1421	4
1422	4
1423	4
1424	4
1425	4
1426	4
1427	4
1428	4
1429	4
1430	4
1431	4
1432	4
1433	4
1434	4
1435	4
1436	4
1437	4
1438	4
1439	4
1440	4
1441	4
1442	4

1443	4
1446	4
1447	4
1448	4
1468	4

DIODES

6401	4
6402	4
6403	4
6404	4
6405	4
6406	4
6407	4
6409	4
6410	4
6411	4

6412	4
6413	4
6414	4
6415	4
6416	4

6418	4
6422	4
6423	4
6424	4
6426	4

6441	4
6450	4

TRANSISTORS

7420	5
7421	5
7422	5
7423	5
7429	5

ELECTRICAL PARTSLIST CONTROL BOARD**MISCELLANEOUS**

1400	4822 130 91488	DISPLAY
1408	4822 267 31919	PHONE SOCKET
1420	4822 276 13114	TACT SWITCH
1421	4822 276 13114	TACT SWITCH
1422	4822 276 13114	TACT SWITCH
1423	4822 276 13114	TACT SWITCH
1424	4822 276 13114	TACT SWITCH
1425	4822 276 13114	TACT SWITCH
1426	4822 276 13114	TACT SWITCH
1427	4822 276 13114	TACT SWITCH
1428	4822 276 13114	TACT SWITCH
1429	4822 276 13114	TACT SWITCH
1430	4822 276 13114	TACT SWITCH
1431	4822 276 13114	TACT SWITCH
1432	4822 276 13114	TACT SWITCH
1433	4822 276 13114	TACT SWITCH
1434	4822 276 13114	TACT SWITCH
1435	4822 276 13114	TACT SWITCH
1436	4822 276 13114	TACT SWITCH
1437	4822 276 13114	TACT SWITCH
1438	4822 276 13114	TACT SWITCH
1439	4822 276 13114	TACT SWITCH
1440	4822 276 13114	TACT SWITCH
1441	4822 276 13114	TACT SWITCH
1442	4822 276 13114	TACT SWITCH
1443	4822 276 13114	TACT SWITCH
1446	4822 276 13114	TACT SWITCH
1447	4822 276 13114	TACT SWITCH
1448	4822 276 13114	TACT SWITCH
1468	4822 101 21261	ROTARY ENCODER

DIODES

6401	4822 130 30621	1N4148
6402	4822 130 30621	1N4148
6403	4822 130 82978	LED LTL-16KPE
6404	4822 130 82978	LED LTL-16KPE
6405	4822 130 82978	LED LTL-16KPE
6406	4822 130 82978	LED LTL-16KPE
6407	4822 130 82978	LED LTL-16KPE
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148
6411	4822 130 30621	1N4148
6412	4822 130 30621	1N4148
6413	4822 130 30621	1N4148
6414	4822 130 30621	1N4148
6415	4822 130 30621	1N4148
6416	4822 130 30621	1N4148
6418	4822 130 30621	1N4148
6422	4822 130 30621	1N4148
6423	4822 130 30621	1N4148
6424	4822 130 30621	1N4148
6426	4822 130 30621	1N4148
6441	4822 130 30621	1N4148
6450	4822 130 83363	LED LTL-16KGE

TRANSISTORS

7420	5322 130 42755	BC847C
7421	5322 130 42755	BC847C
7422	5322 130 42755	BC847C
7423	5322 130 42755	BC847C
7429	5322 130 60068	BC558C

INTEGRATED CIRCUITS

7401	4822 209 91019	TMP87CP71F-65SV83031 not for /22
7401	4822 209 90998	TMP87CS71F-65RV83041 only for /22
7402	4822 209 32709	ST24C04CB1 not for /22
7402	4822 209 31508	ST24C01CB1 only for /22
7403	5322 209 11532	PC74HC4094P
7404	4822 209 31981	SAA6579T/V1
7428	4822 214 52009	GP1U58XP

COILS

5401	4822 157 62552	2,2μH
5402	4822 157 62552	2,2μH
5403	4822 157 62552	2,2μH
5405	4822 157 62552	2,2μH
5406	4822 157 52333	100μH 10%
5410	5322 242 73697	CER.RES. 8MHz
5411	4822 242 70938	XTAL 32,768kHz
5412	4822 242 72195	XTAL 4,332MHz
5413	4822 157 62552	2,2μH

RESISTORS

3449	4822 050 11002	1k	5%	0,2W
3450	4822 050 11002	1k	5%	0,2W
3451	4822 050 11002	1k	5%	0,2W
3463	4822 050 11002	1k	5%	0,2W
3472	4822 116 52228	680R	5%	0,5W
3475	4822 116 83864	10k	5%	0,5W
3476	4822 116 83864	10k	5%	0,5W
3477	4822 116 83864	10k	5%	0,5W
3479	4822 116 83864	10k	5%	0,5W
3484	4822 050 11002	1k	5%	0,2W
3485	4822 050 11002	1k	5%	0,2W
3486	4822 050 11002	1k	5%	0,2W
3487	4822 050 11002	1k	5%	0,2W
3489	4822 116 52234	100k	5%	0,5W
3494	4822 116 52284	47k	5%	0,5W
3495	4822 116 52284	47k	5%	0,5W
3496	4822 050 11002	1k	5%	0,2W
3497	4822 050 11002	1k	5%	0,2W
3499	4822 116 52235	1M	5%	0,5W
4403	4822 116 52289	5k6	5%	0,16W
4407	4822 116 83864	10k	5%	0,5W
4409	4822 116 83864	10k	5%	0,5W
4424	4822 050 11002	1k	5%	0,2W
4425	4822 050 11002	1k	5%	0,2W
4426	4822 050 11002	1k	5%	0,2W
4427	4822 050 11002	1k	5%	0,2W
4428	4822 050 11002	1k	5%	0,2W
4430	4822 050 11002	1k	5%	0,2W
4431	4822 050 11002	1k	5%	0,2W
4432	4822 116 52219	330R	5%	0,5W
4433	4822 116 52219	330R	5%	0,5W
4436	4822 116 83864	10k	5%	0,5W
4437	4822 116 83864	10k	5%	0,5W
4442	4822 116 52219	330R	5%	0,5W
4444	4822 116 52219	330R	5%	0,5W
4445	4822 116 52219	330R	5%	0,5W
4446	4822 116 52219	330R	5%	0,5W
4447	4822 116 52219	330R	5%	0,5W
4448	4822 116 52219	330R	5%	0,5W
4449	4822 116 52219	330R	5%	0,5W
4456	4822 116 52219	330R	5%	0,5W

ELECTRICAL PARTSLIST CONTROL BOARD**RESISTORS**

4458	4822 116 83864	10k	5%	0,5W	
4460	4822 050 11002	1k	5%	0,2W	
4470	4822 116 52285	470k	5%	0,16W	
4471	4822 116 52285	470k	5%	0,16W	
4472	4822 116 52285	470k	5%	0,16W	
4473	4822 116 52263	2k7	5%	0,5W	for ECO4,Tuner94
4473	4822 116 52296	6k8	5%	0,5W	for ECO5,Tuner95
4489	4822 116 52284	47k	5%	0,5W	

CHIP RESISTORS

3400	4822 051 10102	1k	2%	0,25W	
3401	4822 051 20101	100R	5%	0,1W	
3402	4822 051 20101	100R	5%	0,1W	
3403	4822 051 20101	100R	5%	0,1W	
3404	4822 051 20101	100R	5%	0,1W	
3405	4822 051 20101	100R	5%	0,1W	
3406	4822 051 20101	100R	5%	0,1W	
3407	4822 051 20101	100R	5%	0,1W	
3408	4822 051 20101	100R	5%	0,1W	
3409	4822 051 20101	100R	5%	0,1W	
3410	4822 051 10102	1k	2%	0,25W	
3411	4822 051 20689	68R	5%	0,1W	
3412	4822 051 20689	68R	5%	0,1W	
3413	4822 051 20689	68R	5%	0,1W	
3414	4822 051 20689	68R	5%	0,1W	
3415	4822 051 10102	1k	2%	0,25W	
3416	4822 051 20391	390R	5%	0,1W	
3417	4822 051 20331	330R	5%	0,1W	
3418	4822 051 20221	220R	5%	0,1W	
3419	4822 051 20331	330R	5%	0,1W	
3420	4822 051 20271	270R	5%	0,1W	
3421	4822 051 20271	270R	5%	0,1W	
3422	4822 051 20331	330R	5%	0,1W	
3423	4822 051 20271	270R	5%	0,1W	
3424	4822 051 20221	220R	5%	0,1W	
3425	4822 051 20271	270R	5%	0,1W	
3426	4822 051 20221	220R	5%	0,1W	
3427	4822 051 20391	390R	5%	0,1W	
3428	4822 051 20151	150R	5%	0,1W	
3429	4822 051 20221	220R	5%	0,1W	
3430	4822 051 20391	390R	5%	0,1W	
3431	4822 051 20331	330R	5%	0,1W	
3432	4822 051 20331	330R	5%	0,1W	
3433	4822 051 20331	330R	5%	0,1W	
3434	4822 051 20331	330R	5%	0,1W	
3435	4822 051 20331	330R	5%	0,1W	
3437	4822 051 20103	10k	5%	0,1W	
3438	4822 051 20103	10k	5%	0,1W	
3439	4822 051 10102	1k	2%	0,25W	
3440	4822 051 20105	1M	5%	0,1W	
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	
3446	4822 051 10102	1k	2%	0,25W	
3452	4822 051 10102	1k	2%	0,25W	
3453	4822 051 10102	1k	2%	0,25W	
3455	4822 051 10102	1k	2%	0,25W	
3456	4822 051 20103	10k	5%	0,1W	
3457	4822 051 20103	10k	5%	0,1W	
3458	4822 051 20222	2k2	5%	0,1W	

CHIP RESISTORS

3462	4822 051 10102	1k	2%	0,25W	
3464	4822 051 10102	1k	2%	0,25W	
3465	4822 051 10102	1k	2%	0,25W	
3467	4822 051 20103	10k	5%	0,1W	
3468	4822 051 20103	10k	5%	0,1W	
3469	4822 051 20332	3k3	5%	0,1W	
3473	4822 051 20479	47R	5%	0,1W	
3474	4822 051 10102	1k	2%	0,25W	
3478	4822 051 20103	10k	5%	0,1W	
3480	4822 051 20103	10k	5%	0,1W	
3481	4822 051 10102	1k	2%	0,25W	
3482	4822 051 10102	1k	2%	0,25W	
3483	4822 051 20684	680k	5%	0,1W	
3488	4822 051 20229	22R	5%	0,1W	
3490	4822 051 20229	22R	5%	0,1W	
3491	4822 051 20104	100k	5%	0,1W	
3492	4822 051 20229	22R	5%	0,1W	
3493	4822 051 20104	100k	5%	0,1W	
3498	4822 051 20104	100k	5%	0,1W	
4404	4822 051 20223	22k	5%	0,1W	
4410	4822 051 20224	220k	5%	0,1W	
4411	4822 051 20222	2k2	5%	0,1W	
4443	4822 051 20331	330R	5%	0,1W	
4450	4822 051 20331	330R	5%	0,1W	
4451	4822 051 20331	330R	5%	0,1W	
4452	4822 051 20331	330R	5%	0,1W	
4461	4822 051 10008	CHIP JUMPER 1206			
4462	4822 051 10008	CHIP JUMPER 1206			
4463	4822 051 10008	CHIP JUMPER 1206			
4467	4822 051 10008	CHIP JUMPER 1206			
4491	4822 051 20223	22k	5%	0,1W	
4496	4822 051 20473	47k	5%	0,1W	
4497	4822 051 20473	47k	5%	0,1W	
4498	4822 051 20473	47k	5%	0,1W	
4499	4822 051 20473	47k	5%	0,1W	

CAPACITORS

2401	4822 124 80818	22mF	20%	5,5V	
2402	4822 124 41584	100µF	20%	10V	
2404	4822 124 41579	10µF	20%	50V	
2405	4822 124 41579	10µF	20%	50V	
2409	4822 124 41579	10µF	20%	50V	
2410	4822 124 41584	100µF	20%	10V	
2412	4822 124 22403	10µF	20%	16V	
2418	4822 126 12787	330pF	10%	50V	
2419	4822 124 41576	2,2µF	20%	50V	
2420	4822 122 10459	560pF	10%	50V	
2423	4822 122 33848	47pF	5%	50V	
2424	4822 121 51387	10nF	20%	16V	
2425	4822 121 51387	10nF	20%	16V	
2426	4822 124 40433	47µF	20%	25V	
2430	4822 124 42234	100µF	20%	6,3V	
2431	4822 122 33195	100pF	10%	50V	

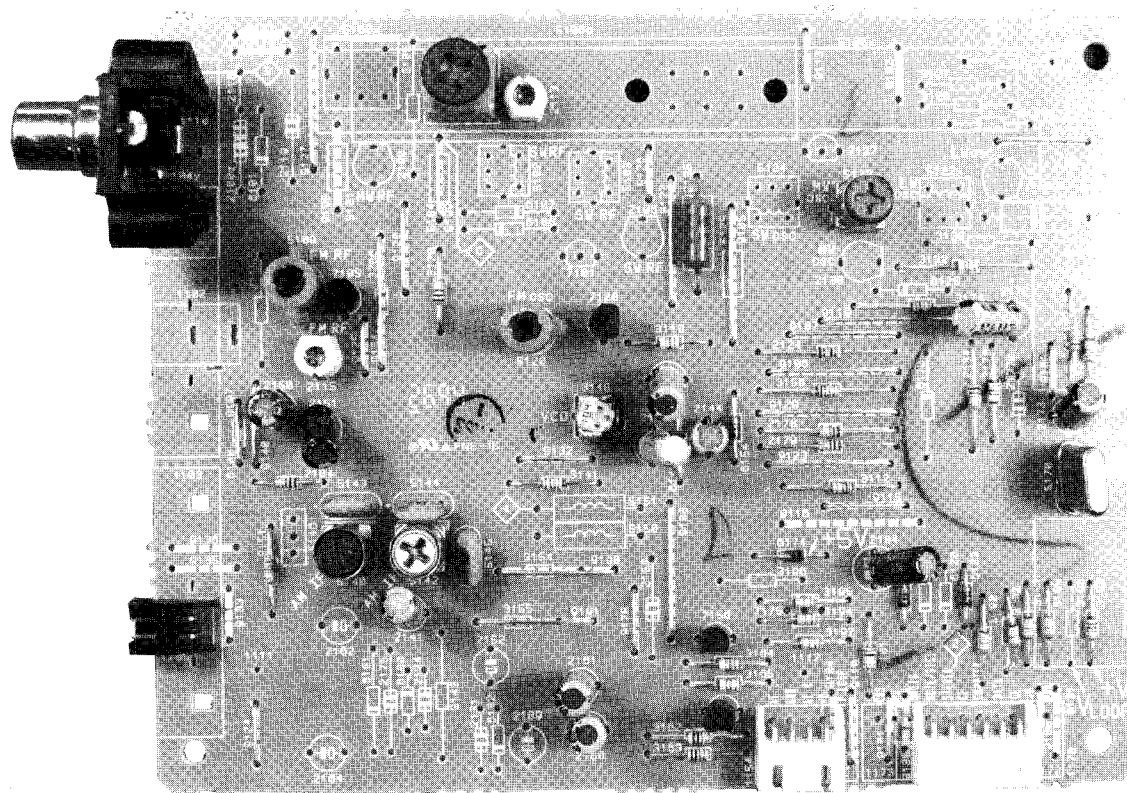
CHIP CAPACITORS

2403	4822 122 33496	100nF	10%	63V	
2406	5322 122 32448	10pF	5%	50V	
2407	5322 122 32448	10pF	5%	50V	
2408	5322 122 32448	10pF	5%	50V	
2411	4822 122 33175	2,2nF	20%	50V	
2413	4822 122 33496	100nF	10%	63V	

ELECTRICAL PARTSLIST CONTROL BOARD

CHIP CAPACITORS

2414	5322 122 32658	22pF	5%	50V
2415	5322 122 32658	22pF	5%	50V
2416	5322 122 32658	22pF	5%	50V
2417	5322 122 32269	6,8pF	5%	50V
2421	4822 122 33496	100nF	10%	63V
2422	5322 122 32452	47pF	5%	50V
2428	4822 122 33496	100nF	10%	63V
2429	4822 122 33177	10nF	20%	50V
2435	4822 126 11692	1μF	20%	16V
2440	5322 122 32452	47pF	5%	50V
2441	5322 122 32452	47pF	5%	50V
2442	5322 122 32452	47pF	5%	50V
2443	5322 122 32452	47pF	5%	50V
2444	4822 122 33342	33nF	10%	63V
2446	5322 122 32531	100pF	5%	50V
2447	5322 122 32531	100pF	5%	50V
2448	5322 122 32531	100pF	5%	50V
2449	5322 122 34099	470pF	10%	63V
2450	5322 122 34099	470pF	10%	63V
2451	5322 122 34099	470pF	10%	63V
2452	5322 122 34099	470pF	10%	63V
2453	5322 122 34099	470pF	10%	63V
2454	5322 122 34099	470pF	10%	63V

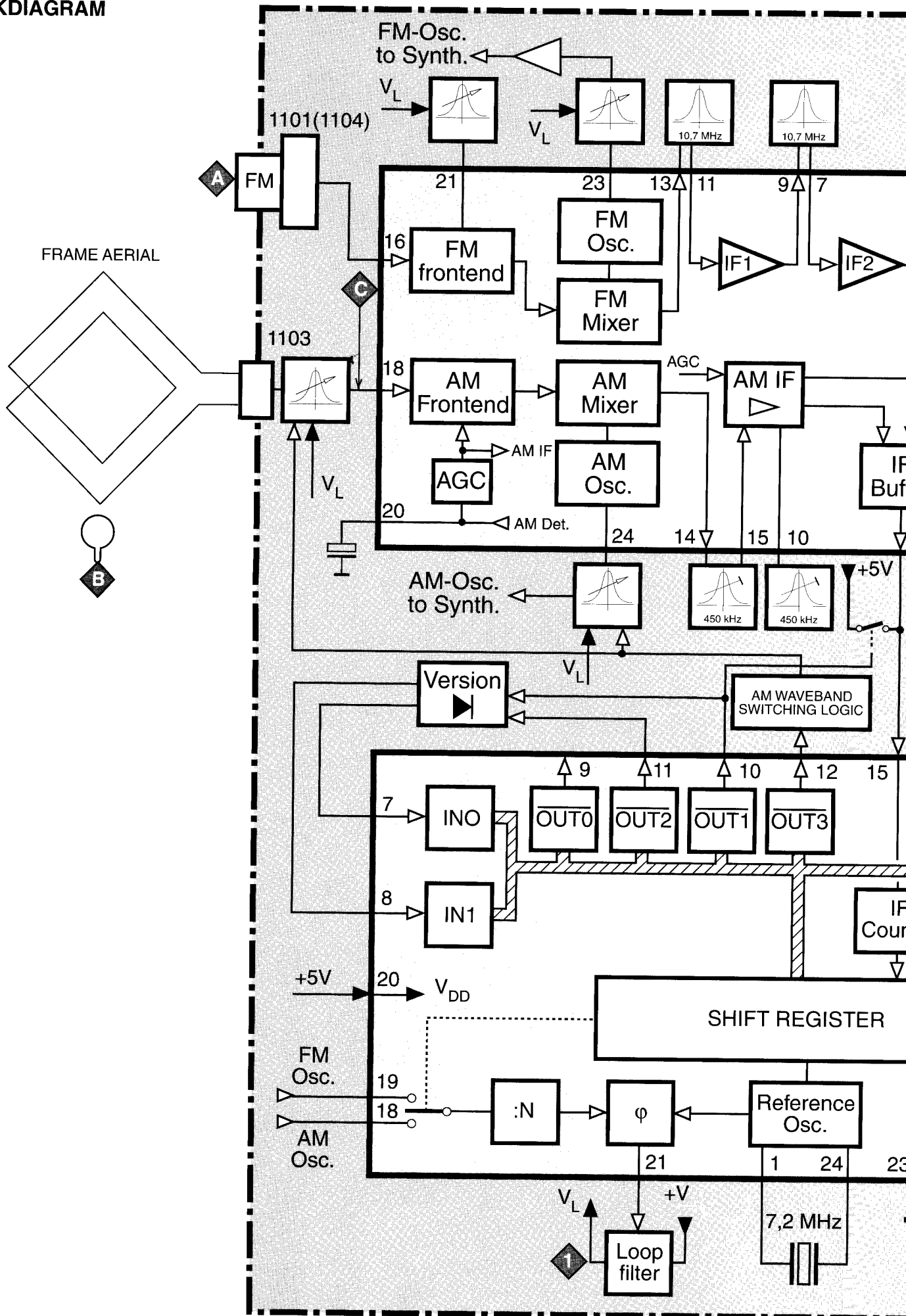


TUNER BOARD ECO4VA

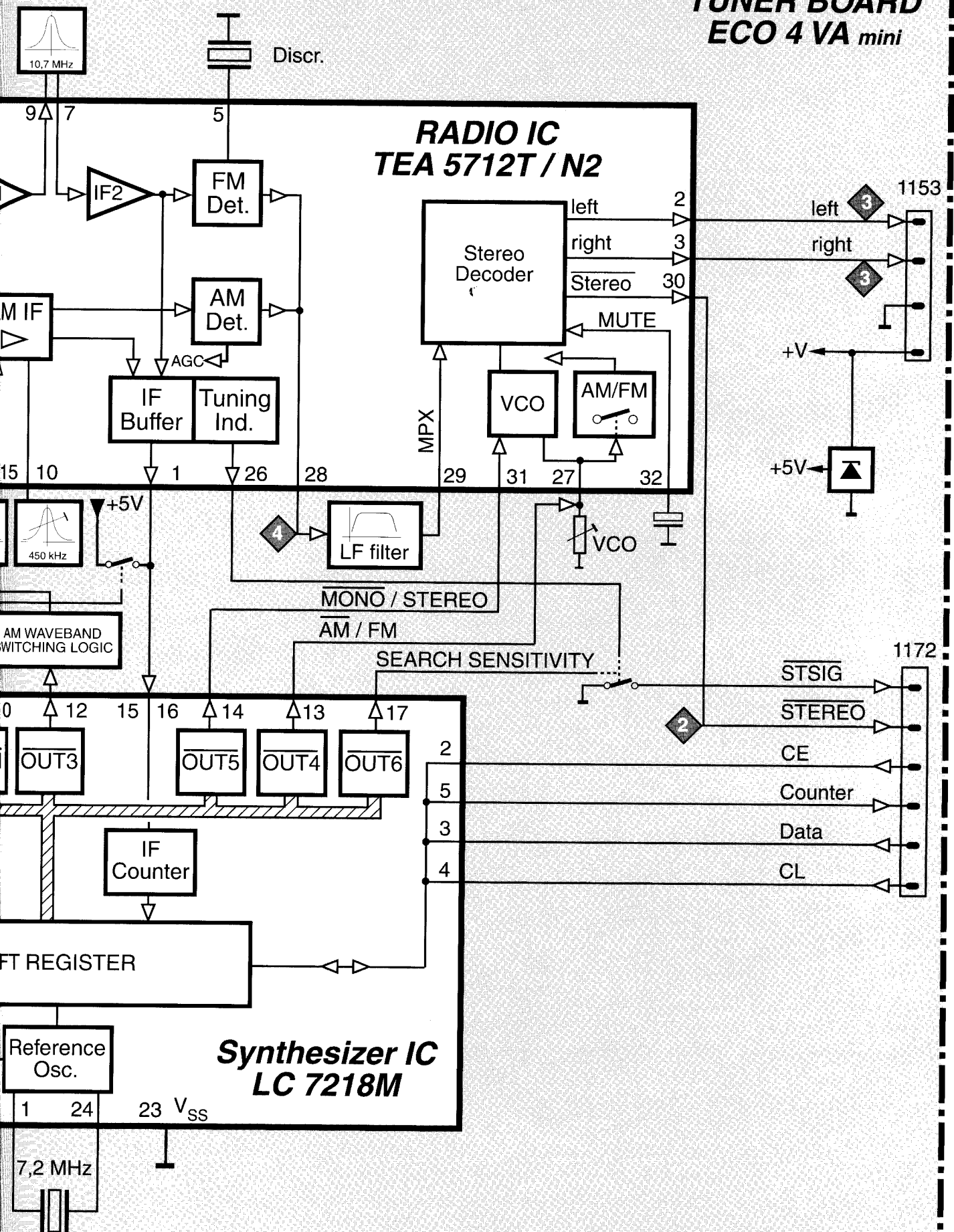
TABLE OF CONTENTS

Blockdiagram	7A-1
Adjustmant table	7A-2
Component layout	7A-2
Circuit diagram	7A-3
Partslist	7A-4

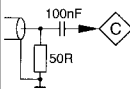
BLOCKDIAGRAM



TUNER BOARD ECO 4 VA mini



TUNER ADJUSTMENT TABLE (ECO4VA FM/MW- and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM			108MHz	5120	1	8V ±0.2V
87.5 - 108MHz			87.5MHz	check		4.1V ±0.5V
FM East Europe			108MHz	5120		8V ±0.2V
65.81 - 108MHz			65.81MHz	check		0.8V ±0.4V
MW			1710kHz	5123		9V ±0.1V
2-band version			530kHz	check		1V ±0.4V
530 - 1710kHz						
LW			279kHz	5122		8V ±0.2V
			153kHz	check		1V ±0.4V
MW			1611kHz	5123		8V ±0.1V
3-band version		522kHz	check	1V ±0.4V		
522 - 1611kHz						
FM RF						
FM	108MHz	A mod=1kHz Δf=22.5kHz	108MHz	2115	3	MAX
87.5 - 108MHz	87.5MHz		87.5MHz	5109		
FM East Europe	108MHz		108MHz	2115		
65.81 - 108MHz	65.81MHz		65.81MHz	5109		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3148	2	152kHz ±1kHz
AM IF						
MW	540kHz Δf=10kHz as low as possible		540kHz	5142 5140	4	symmetrical and max. height
AM RF ¹⁾						
LW	198kHz	B mod=1kHz 30% AM	198kHz	5108	4	MAX
MW	1494kHz		1494kHz	2113		MAX
3-band version	549kHz		549kHz	5107		
522 - 1611kHz						
MW	1500kHz		1500kHz	2113		
2-band version						
530 - 1710kHz	550kHz		550kHz	5107		

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

ECO4VA mini. aj 290595

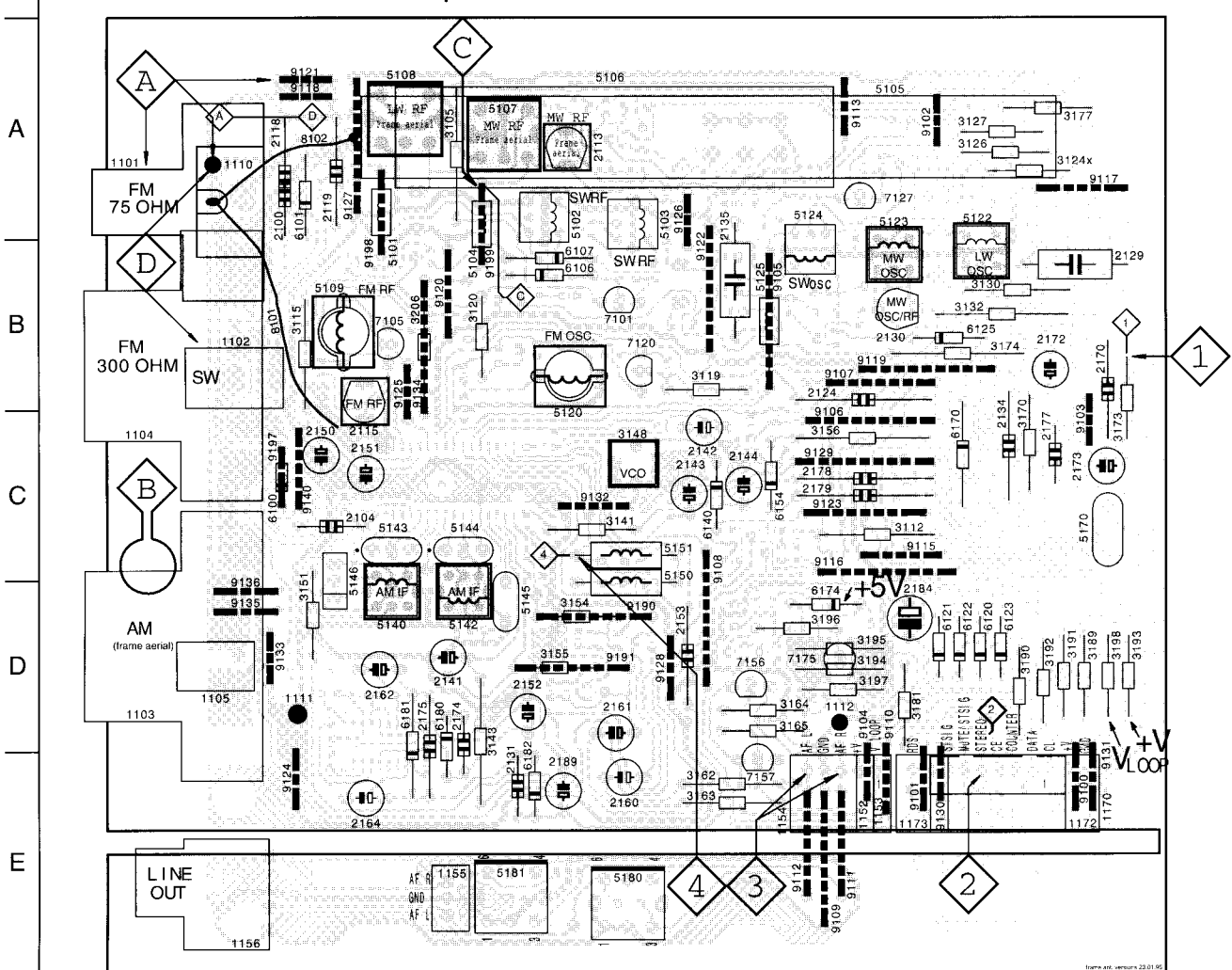
¹⁾ For AM RF adjustments the original frame antenna 4822 158 60622 has to be used !

Repeat

1101 A 1	1173 E 5	2142 C 4	2175 D 2	3127 A 6	3173 B 6	5101 A 2	5142 D 2	6121 D 5	7156 D 4	9110 E 5	9126 A 4	9198 A 2
1102 B 1	2100 A 1	2143 C 4	2177 C 6	3130 B 6	3174 B 5	5102 A 3	5143 C 2	6122 D 5	7157 E 4	9111 E 5	9127 A 2	9199 A 3
1103 D 1	2104 C 2	2144 C 4	2178 C 5	3132 B 6	3177 A 6	5103 A 3	5144 C 2	6123 D 6	7175 D 5	9112 E 4	9128 D 4	
1104 B 1	2106 B 4	2150 C 2	2179 C 5	3141 C 3	3181 D 5	5104 A 3	5145 D 3	6125 B 5	8101 B 1	9113 A 5	9129 C 5	
1105 D 1	2113 A 3	2151 C 2	2184 D 5	3143 D 3	3189 D 6	5105 A 4	5146 D 2	6140 C 4	8102 A 1	9115 C 5	9130 E 5	
1110 A 1	2115 B 2	2152 D 3	2189 E 3	3148 C 3	3190 D 6	5106 A 4	5150 D 3	6154 C 4	9100 E 6	9116 C 5	9131 E 6	
1111 D 2	2118 A 1	2153 D 4	2190 A 2	3151 D 2	3191 D 6	5107 A 3	5151 C 3	6170 C 5	9101 E 5	9117 A 6	9132 C 3	
1112 D 5	2119 A 2	2160 E 3	2191 A 6	3154 D 3	3192 D 6	5108 A 2	5170 C 6	6174 D 5	9102 A 5	9118 A 2	9133 D 1	
1152 E 5	2124 B 5	2161 D 3	3105 A 2	3155 D 3	3193 D 6	5109 B 2	5180 E 3	6180 D 2	9103 C 6	9119 B 5	9134 B 2	
1153 E 5	2129 B 6	2162 D 2	3112 C 5	3156 C 5	3194 D 5	5120 B 3	5181 E 3	6181 D 2	9104 E 5	9120 B 2	9135 D 1	
1154 E 4	2130 B 5	2164 E 2	3115 B 2	3162 E 4	3195 D 5	5122 B 6	6100 C 1	6182 E 3	9105 B 4	9121 A 2	9136 D 1	
1155 E 2	2131 E 3	2170 B 6	3119 B 4	3163 E 4	3196 D 4	5123 B 5	6101 A 2	7101 B 3	9106 C 5	9122 B 4	9140 C 2	
1156 E 1	2134 C 6	2172 B 6	3120 B 3	3164 D 4	3197 D 5	5124 B 5	6106 B 3	7105 B 2	9107 B 5	9123 C 5	9190 D 3	
1170 E 6	2135 B 4	2173 C 6	3124 A 6	3165 D 4	3198 D 6	5125 B 4	6107 B 3	7120 B 4	9108 D 4	9124 E 1	9191 D 3	
1172 E 6	2141 D 2	2174 D 2	3126 A 6	3170 C 6	3206 B 2	5140 D 2	6120 D 6	7127 A 5	9109 E 5	9125 B 2	9197 C 1	

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

ECO4 VA TUNER BOARD / component side view



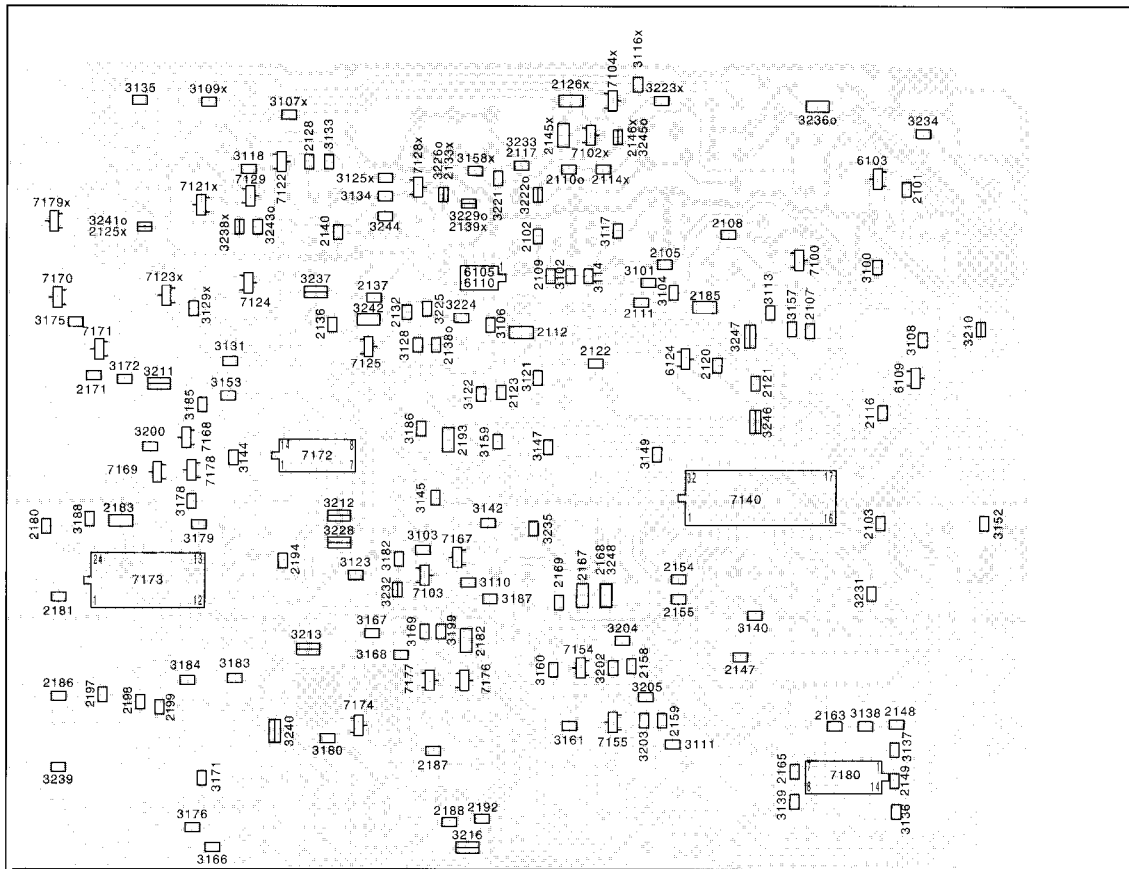
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.

BC...
2SA...
JC...
2SC...

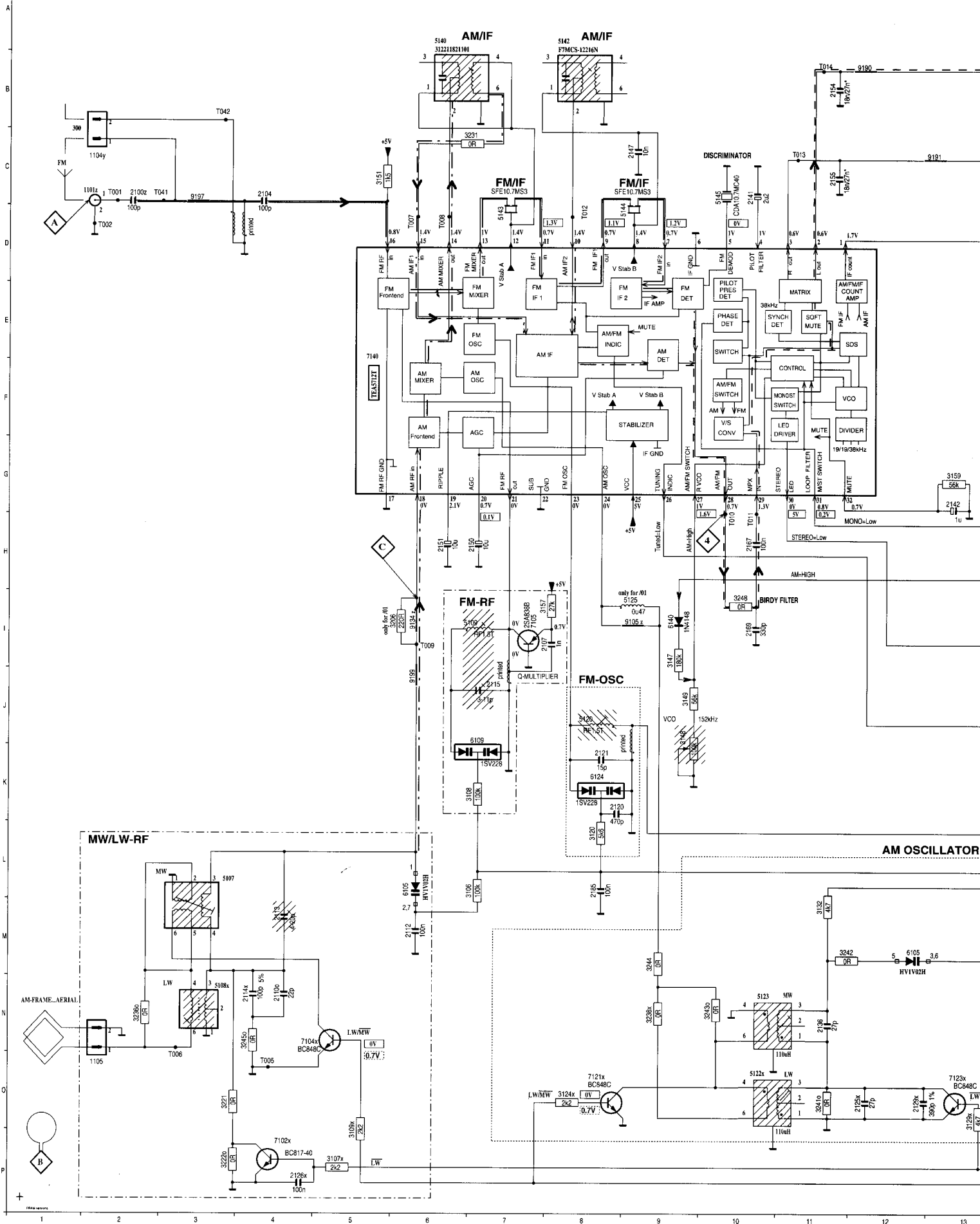
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2102 A 4	2123 B 4	2149 D 2	2185 B 3	3106 B 4	3128 B 4	3149 C 3	3176 E 6	3204 D 3	3228 C 5	3244 A 5	7122 A 5	7173 C 6
2103 C 2	2125x A 6	2154 C 3	2186 D 6	3107x A 5	3129x B 6	3152 C 1	3178 C 6	3205 D 3	3229o A 4	3245o A 3	7123x B 6	7174 D 5
2105 B 3	2126x A 3	2155 C 3	2187 D 4	3108 B 2	3131 B 5	3153 B 5	3179 C 6	3210 B 1	3231 C 2	3246 B 2	7124 B 5	7176 D 4
2107 B 2	2128 A 5	2158 D 3	2188 E 4	3109x A 5	3133 A 5	3157 B 2	3180 D 5	3211 B 6	3232 C 4	3247 B 3	7125 B 5	7177 D 4
2108 A 3	2132 B 4	2159 D 3	2192 E 4	3110 C 4	3134 A 5	3158x A 4	3182 C 4	3212 C 5	3233 A 4	3248 C 3	7128x A 4	7178 C 6
2109 B 4	2133x A 4	2163 D 2	2193 C 4	3111 D 3	3135 A 6	3159 C 4	3183 D 5	3213 D 5	3234 A 2	6103 A 2	7129 A 5	7179x A 6
2110o A 4	2136 B 5	2165 E 2	2194 C 5	3113 B 2	3136 E 2	3160 D 4	3184 D 6	3214 E 3	3235 C 4	6105 B 4	7140 C 2	7180 D 2
2111 B 3	2137 B 5	2167 C 3	2197 D 6	3114 B 3	3137 D 2	3161 D 3	3185 B 6	3215 E 3	3236o A 2	6109 B 2	7154 D 3	
2112 B 4	2138o B 4	2168 C 3	2198 D 6	3116x A 3	3138 D 2	3166 E 5	3186 C 4	3216 E 4	3237 B 5	6110 B 4	7155 D 3	
2114x A 3	2139x A 4	2169 C 4	2199 D 6	3117 A 3	3139 D 2	3167 D 5	3187 C 4	3221 A 4	3238x A 5	6124 B 3	7167 C 4	
2116 B 2	2140 A 5	2171 B 6	3100 B 2	3118 A 5	3140 D 2	3168 D 4	3188 C 6	3222o A 4	3239 D 6	7100 B 2	7168 C 6	
2117 A 4	2145x A 4	2180 C 6	3101 B 3	3121 B 4	3142 C 4	3169 D 4	3199 D 4	3223x A 3	3240 D 5	7102x A 3	7169 C 6	
2120 B 3	2146x A 3	2181 C 6	3102 B 3	3122 B 4	3144 C 5	3171 D 6	3200 C 6	3224 B 4	3241o A 6	7103 C 4	7170 B 6	
2121 B 2	2147 D 3	2182 D 4	3103 C 4	3123 C 5	3145 C 4	3172 B 6	3202 D 3	3225 B 4	3242 B 5	7104x A 3	7171 B 6	

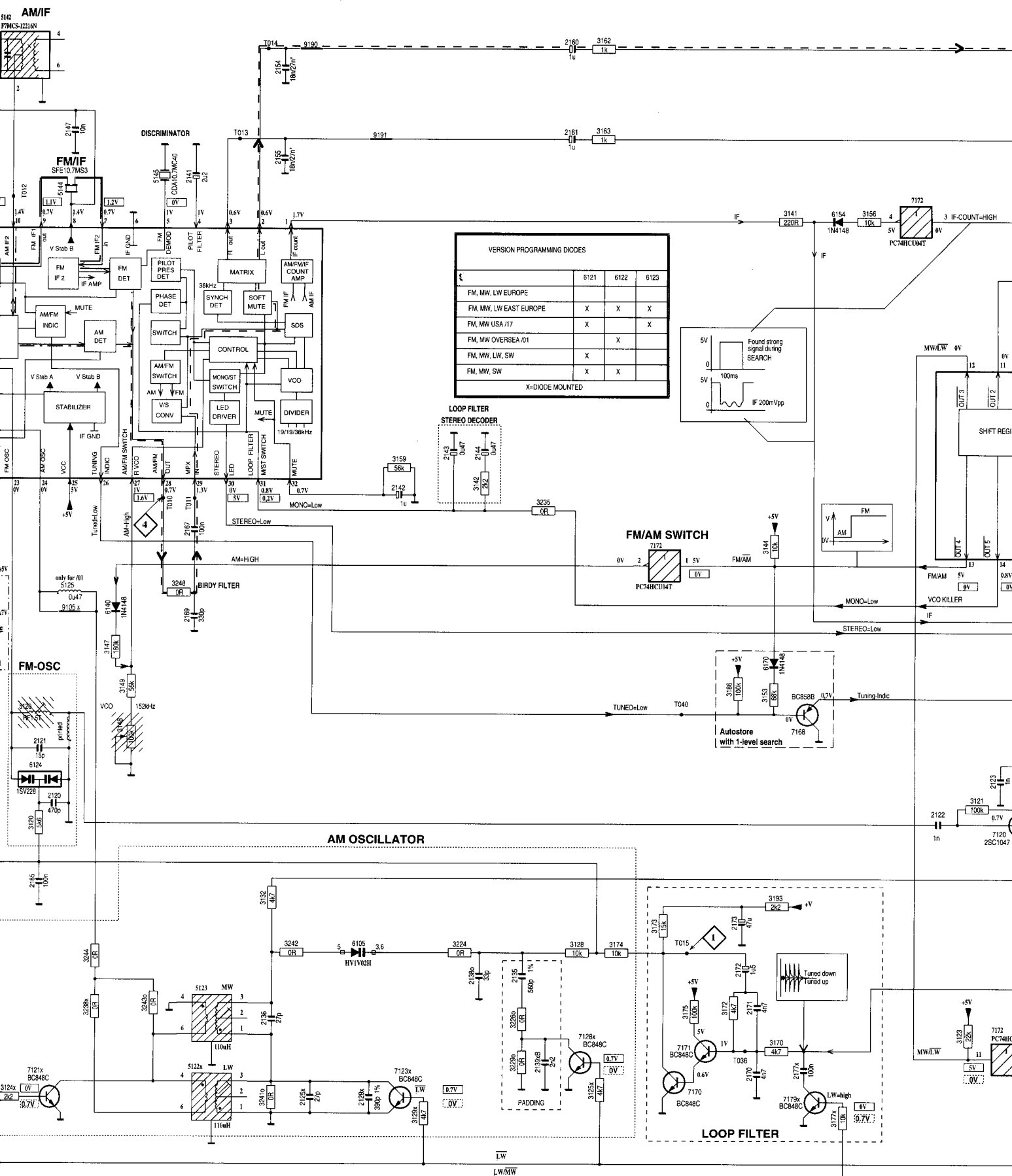
o for AM-version only
x for LW-version only
y for USA version only
z not for all versions

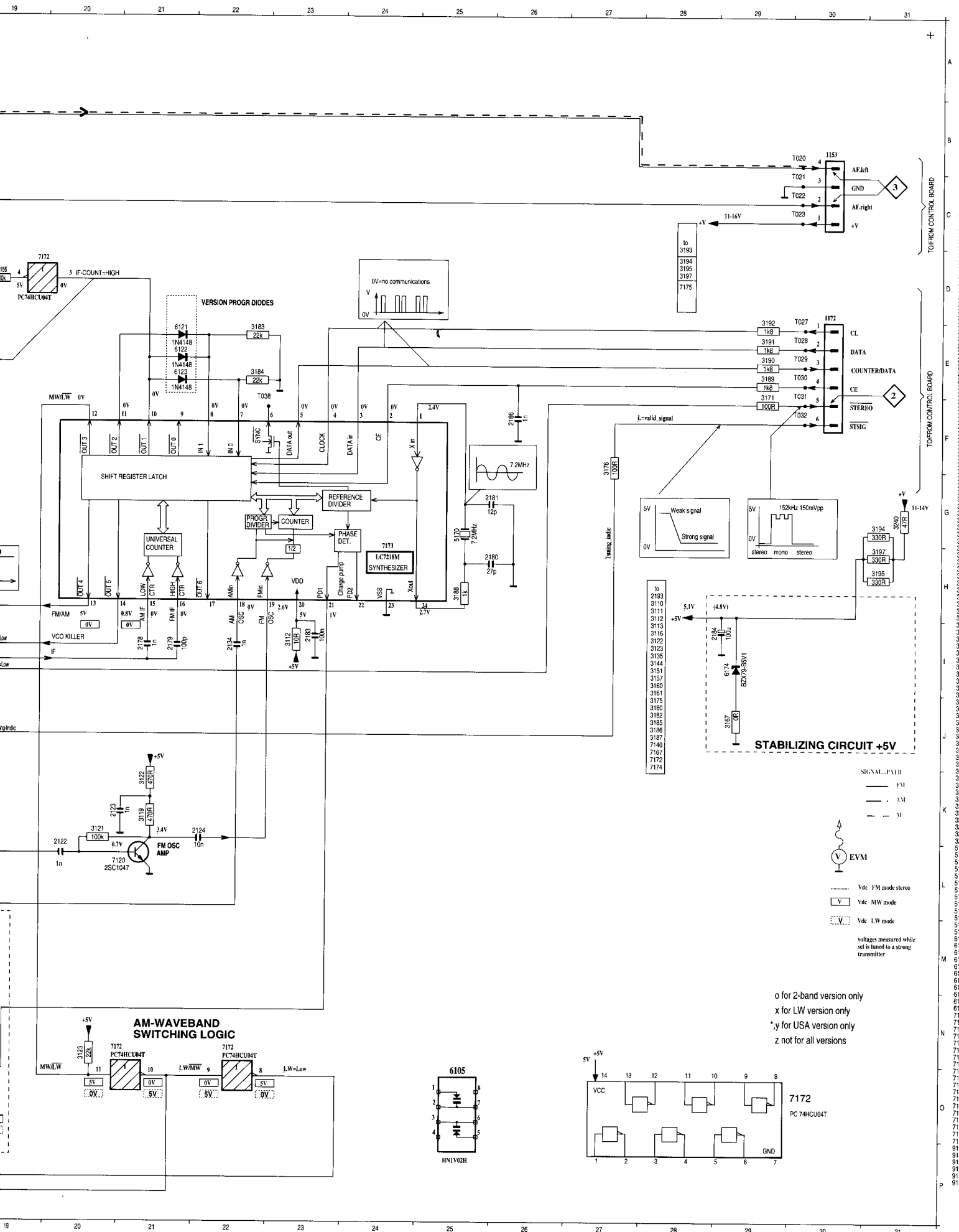
ECO4 VA TUNER BOARD / copper side view



TUNER UNIT ECO4-VA (MINI)







ELECTRICAL PARTSLIST TUNER ECO4VA BOARD**MISCELLANEOUS**

1101	4822 267 10283	SOCKET COAX IEC 75R
1105	4822 265 31184	JST CONNECTOR 2 POLE

DIODES

6105	4822 130 83075	HN1V02H
6109	4822 130 82833	1SV228
6122	4822 130 30621	1N4148
6124	4822 130 82833	1SV228
6140	4822 130 30621	1N4148

6154	4822 130 30621	1N4148
6170	4822 130 30621	1N4148
6174	4822 130 34233	BZX79-B5V1

TRANSISTORS

7105	4822 130 60093	2SA838B
7120	4822 130 60163	2SC1047
7168	5322 130 41983	BC858B(CHIP)
7170	5322 130 42136	BC848C(CHIP)
7171	5322 130 42136	BC848C(CHIP)

INTEGRATED CIRCUITS

7140	4822 209 32701	TEA5712T/N2 (RF IC)
7172	5322 209 11517	PC74HCU04T
7173	4822 209 31998	LC7218M SYNTHESIZER

COILS

5107	4822 157 63835	ANT. COIL MW 2-BAND
5109	4822 156 30947	RF COIL 1,5 TURNS
5120	4822 156 30947	RF COIL 1,5 TURNS
5123	4822 157 60517	110µH 8%
5125	4822 157 61898	0,47µH
5140	4822 158 60511	AM-IF FILTER 450kHz
5142	4822 157 70302	AM-IF FILTER 450kHz
5143	4822 242 70665	CER. FILTER 10,7MHZ
5144	4822 242 70665	CER. FILTER 10,7MHZ
5145	4822 242 81362	CER. DISCRIMINATOR
5170	4822 242 72976	CER. RESONATOR 7,2MHZ

RESISTORS

3112	4822 116 52176	10R	5%	0,5W
3119	4822 116 52224	470R	5%	0,5W
3120	4822 116 52289	5k6	5%	0,16W
3132	4822 116 52283	4k7	5%	0,5W
3141	4822 116 52215	220R	5%	0,16W

3148	4822 100 11163	TRIMPOT.100k lin.		
3151	4822 116 52243	1k5	5%	0,16W
3156	4822 116 83864	10k	5%	0,5W
3162	4822 050 11002	1k	5%	0,2W
3163	4822 050 11002	1k	5%	0,2W

3170	4822 116 52283	4k7	5%	0,5W
3173	4822 116 52244	15k	5%	0,5W
3174	4822 116 83864	10k	5%	0,5W
3189	4822 116 52249	1k8	5%	0,16W
3190	4822 116 52249	1k8	5%	0,16W

3191	4822 116 52249	1k8	5%	0,16W
3192	4822 116 52249	1k8	5%	0,16W
3193	4822 116 52256	2k2	5%	0,16W
3194	4822 116 52219	330R	5%	0,5W
3195	4822 116 52219	330R	5%	0,5W

RESISTORS

3197	4822 116 52219	330R	5%	0,5W
3206	4822 116 52215	220R	5%	0,16W

CHIP RESISTORS

3106	4822 051 20104	100k	5%	0,1W
3108	4822 051 20104	100k	5%	0,1W
3121	4822 051 20104	100k	5%	0,1W
3122	4822 051 20471	470R	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W

3128	4822 117 10833	10k	1%	0,1W
3142	4822 051 20222	2k2	5%	0,1W
3144	4822 117 10833	10k	1%	0,1W
3147	4822 051 20184	180k	5%	0,1W
3149	4822 051 20563	56k	5%	0,1W

3153	4822 051 20683	68k	5%	0,1W
3157	4822 051 20273	27k	5%	0,1W
3159	4822 051 20563	56k	5%	0,1W
3167	4822 051 20008	CHIP JUMPER 0805		
3171	4822 051 20101	100R	5%	0,1W

3172	4822 051 20472	4k7	5%	0,1W
3175	4822 051 20104	100k	5%	0,1W
3176	4822 051 20101	100R	5%	0,1W
3183	4822 051 20223	22k	5%	0,1W
3184	4822 051 20223	22k	5%	0,1W

3186	4822 051 20104	100k	5%	0,1W
3188	4822 051 10102	1k	2%	0,25W
3210	4822 051 20008	CHIP JUMPER 0805		
3211	4822 051 10008	CHIP JUMPER1206		
3212	4822 051 10008	CHIP JUMPER1206		

3213	4822 051 10008	CHIP JUMPER1206
3221	4822 051 20008	CHIP JUMPER 0805
3222	4822 051 20008	CHIP JUMPER 0805
3224	4822 051 20008	CHIP JUMPER 0805
3226	4822 051 20008	CHIP JUMPER 0805

3228	4822 051 10008	CHIP JUMPER1206
3229	4822 051 20008	CHIP JUMPER 0805
3231	4822 051 20008	CHIP JUMPER 0805
3235	4822 051 20008	CHIP JUMPER 0805
3236	4822 051 10008	CHIP JUMPER1206

3237	4822 051 10008	CHIP JUMPER1206
3240	4822 051 10479	47R
3241	4822 051 20008	CHIP JUMPER 0805
3242	4822 051 10008	CHIP JUMPER1206
3243	4822 051 20008	CHIP JUMPER 0805

3244	4822 051 20008	CHIP JUMPER 0805
3246	4822 051 10008	CHIP JUMPER1206
3247	4822 051 10008	CHIP JUMPER1206
3248	4822 051 10008	CHIP JUMPER1206

CAPACITORS

2100	4822 122 33195	100pF	10%	50V
2104	4822 122 33195	100pF	10%	50V
2113	4822 125 50355	4,2-20pF VARIABLE		
2115	4822 125 60101	10pF VARIABLE		
2124	4822 121 51387	10nF	20%	16V

2134	4822 122 33197	1nF	10%	50V
2135	4822 121 70245	560pF	1%	160V
2141	4822 124 40244	2,2µF	20%	63V
2142	4822 124 40242	1µF	20%	63V
2143	4822 124 40239	0,47µF	20%	63V

ELECTRICAL PARTSLIST TUNER ECO4VA BOARD**CAPACITORS**

2144	4822 124 40239	0,47µF	20%	63V
2150	4822 124 40248	10µF	20%	63V
2151	4822 124 40248	10µF	20%	63V
2160	4822 124 40242	1µF	20%	63V
2161	4822 124 40242	1µF	20%	63V

2170	4822 126 11714	4,7nF	20%	
2172	4822 124 41631	1,5µF	20%	50V
2173	4822 124 40433	47µF	20%	25V
2178	4822 122 33197	1nF	10%	50V
2179	4822 122 33195	100pF	10%	50V

2184	4822 124 41584	100µF	20%	10V
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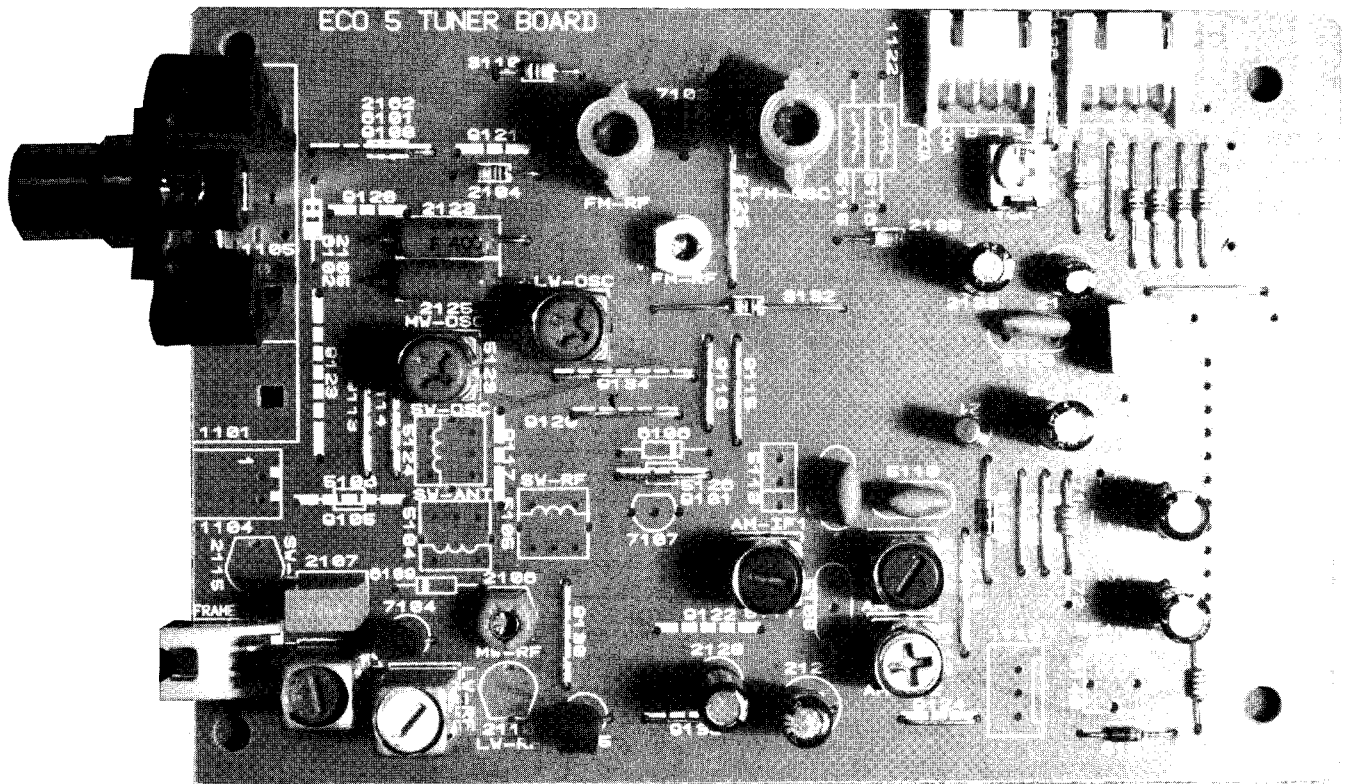
CHIP CAPACITORS

2107	5322 122 34123	1nF	10%	50V
2112	4822 122 33496	100nF	10%	63V
2120	5322 122 32268	470pF	10%	50V
2121	5322 122 32481	15pF	5%	50V
2122	5322 122 34123	1nF	10%	50V

2123	5322 122 34123	1nF	10%	50V
2136	5322 122 31946	27pF	5%	50V
2138	5322 122 32659	33pF	5%	50V
2147	4822 122 33177	10nF	20%	50V
2154	4822 122 33893	18nF	10%	63V

2155	4822 122 33893	18nF	10%	63V
2167	4822 122 33496	100nF	10%	63V
2169	5322 122 31863	330pF	5%	50V
2171	5322 126 10223	4,7nF	10%	63V
2180	5322 122 31946	27pF	5%	50V

2181	4822 122 32139	12pF	5%	63V
2183	4822 122 33496	100nF	10%	63V
2185	4822 122 33496	100nF	10%	63V
2186	5322 122 34123	1nF	10%	50V



TUNER BOARD ECO5

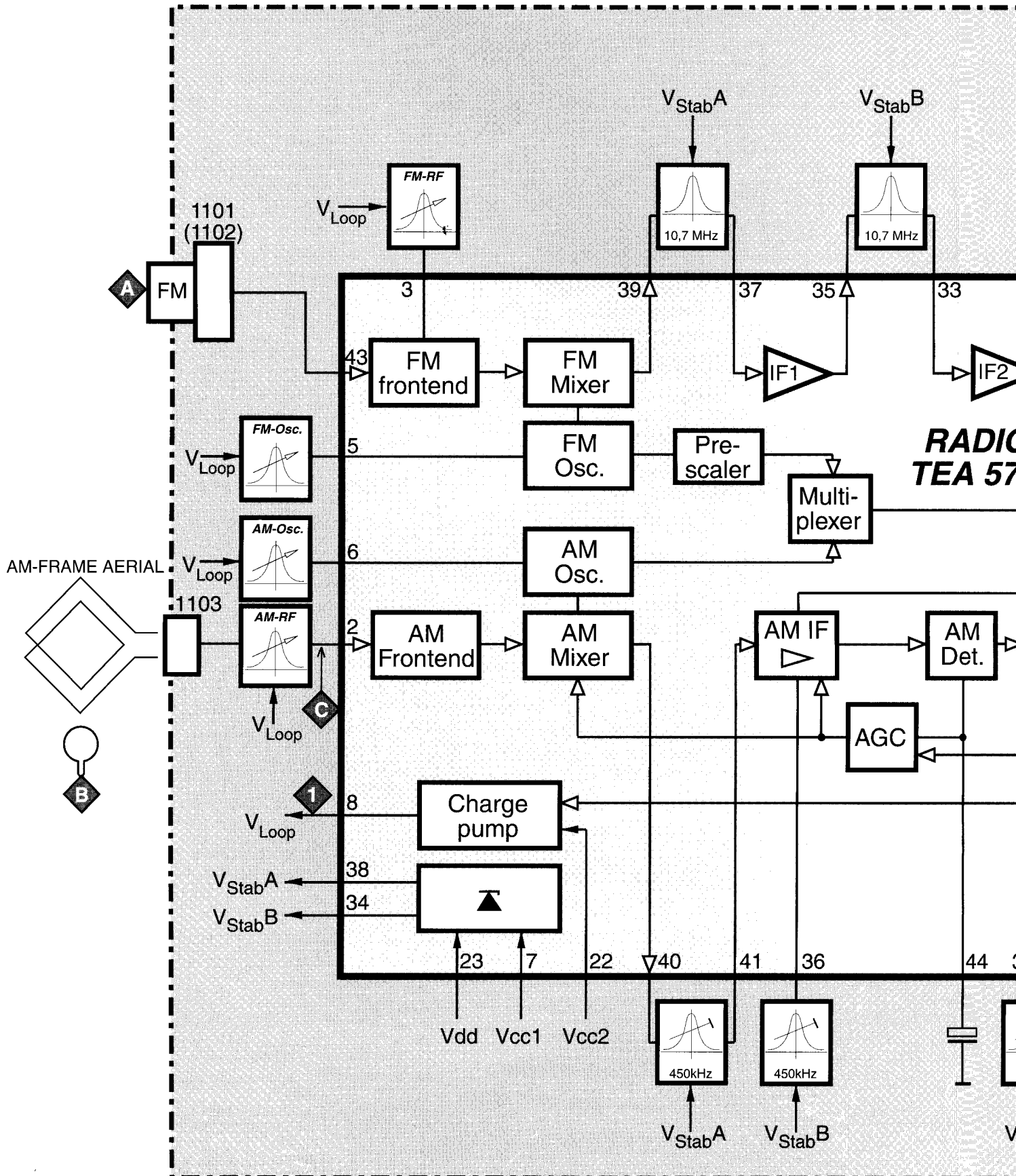
TABLE OF CONTENTS

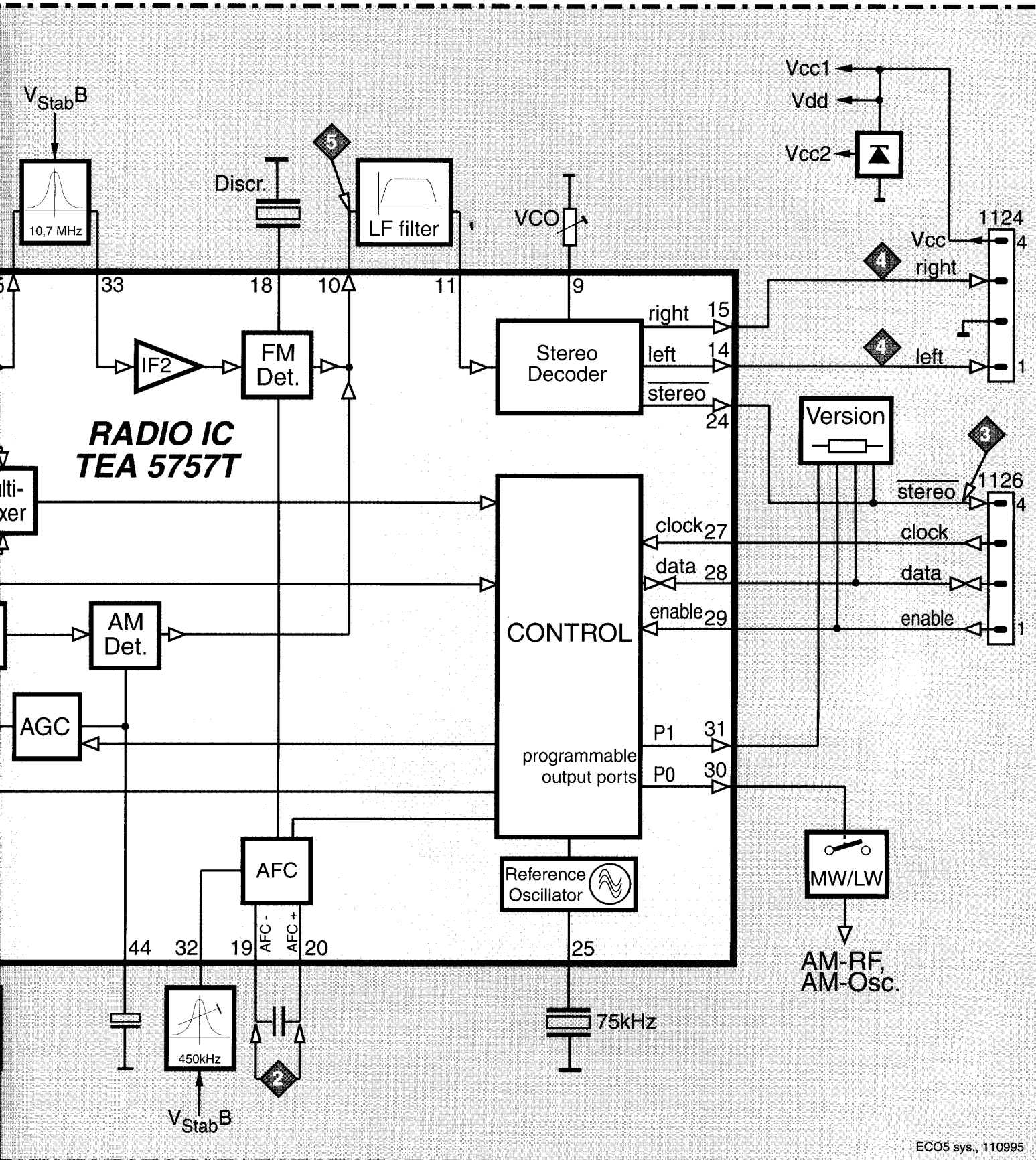
Blockdiagram	7B-1
Adjustmant table	7B-2
Component layout	7B-2
Circuit diagram	7B-3
Partslist	7B-4

BLOCKDIAGRAM

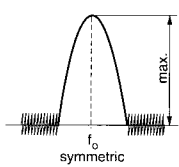
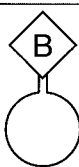
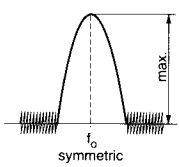
TUNER BOARD

ECO 5 systems





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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM			108MHz	5130	1	8V ±0.2V
87.5 - 108MHz			87.5MHz	check		4.3V ±0.5V
MW			1700kHz	5123		8V ±0.2V
FM/AM-version, 10kHz grid 530 - 1700kHz			530kHz	check		1.1V ±0.4V
LW			279kHz	5122		8V ±0.2V
153 - 279kHz			153kHz	check		1.1V ±0.4V
MW			1602kHz	5123		8V ±0.2V
FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz			531kHz	check		1.1V ±0.4V
FM RF						
FM	108MHz	A mod=1kHz Δf=±22.5kHz	108MHz	2155	4	MAX
87.5 - 108MHz	87.5MHz		87.5MHz	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
AM IF						
MW	450kHz	C Δf=±15kHz V _{RF} = 3mV	IC 7101 36 220R 100nF	5111	4	
	connect pin 26 of IC 7101 (AM Osc.) with short wire to ground (pin 4)		IC 7101 40 220R 100nF see remark 2)	5112		
AM AFC		C continuous wave V _{RF} = 10mV		5114	2	0 ± 2 mV DC
MW						
AM RF ³⁾						
MW ⁴⁾	1494kHz	B 	1494kHz	2106	4	
FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW	1500kHz		1500kHz	2106		
FM/AM-version, 10kHz grid 530 - 1700kHz	560kHz	Δf = ±30kHz V _{RF} as low as possible	560kHz	5102		

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

ECO5, 020995

1101 A1	2106 C2	2137 C5	3147 B5	3172 C5	5112 C4	5130 A3	7104 C2	9118 B4	9130 C3
1102 A1	2107 C2	2138 A5	3149 C5	3173 A5	5113 B3	5131 A3	7105 C3	9119 C4	9131 A5
1103 C1	2110 C2	2140 B5	3152 A5	5102 C2	5114 C4	6101 A2	7107 B3	9120 B4	9133 C3
1104 B1	2115 C1	2144 B5	3154 C5	5103 C2	5115 A4	6102 A1	9100 A2	9121 A2	9134 B3
1105 A1	2123 A2	2148 B4	3157 B5	5104 C2	5116 A4	6103 A1	9101 B3	9122 C3	9136 A5
1119 C5	2125 A2	2155 A3	3158 A5	5105 B2	5120 B4	6104 A2	9105 B2	9123 B1	9137 A5
1120 A5	2128 C3	2162 A2	3159 A5	5106 B2	5121 B4	6106 B3	9111 C2	9124 C4	
1130 B5	2129 C4	3105 B3	3160 A5	5108 C4	5122 B3	6107 C5	9113 B2	9125 A3	
1131 B5	2130 A4	3110 A2	3161 A5	5109 B4	5123 B2	6109 C2	9114 B2	9126 B5	
2104 A2	2133 A4	3132 B3	3170 C5	5110 B4	5124 B2	6120 C4	9115 B3	9128 A2	
2105 A1	2135 B5	3142 A4	3171 C5	5111 C3	5126 B3	7102 A3	9117 B2	9129 B3	

1

2

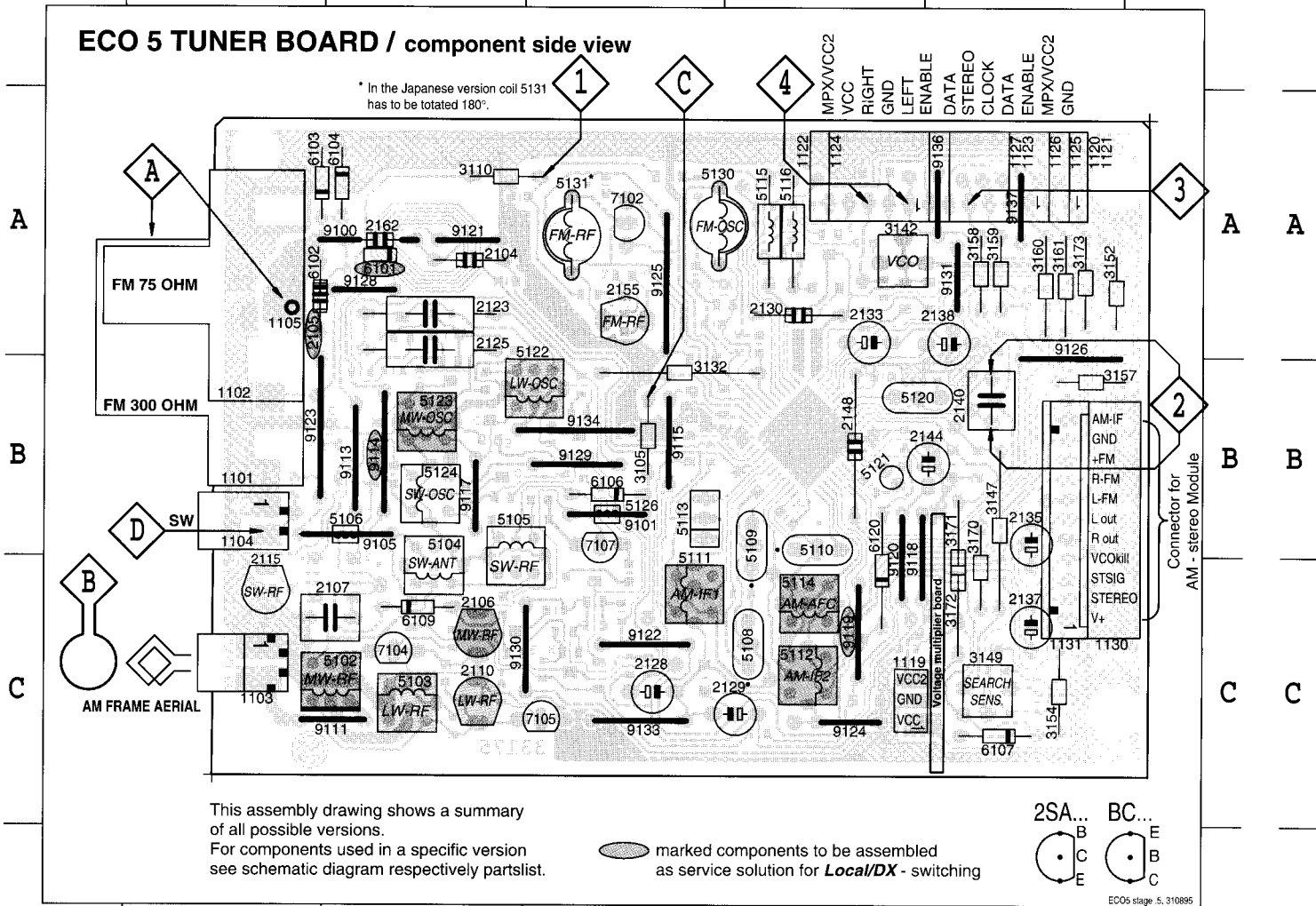
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4

5

ECO 5 TUNER BOARD / component side view

* In the Japanese version coil 5131 has to be totaled 180°.



1

2

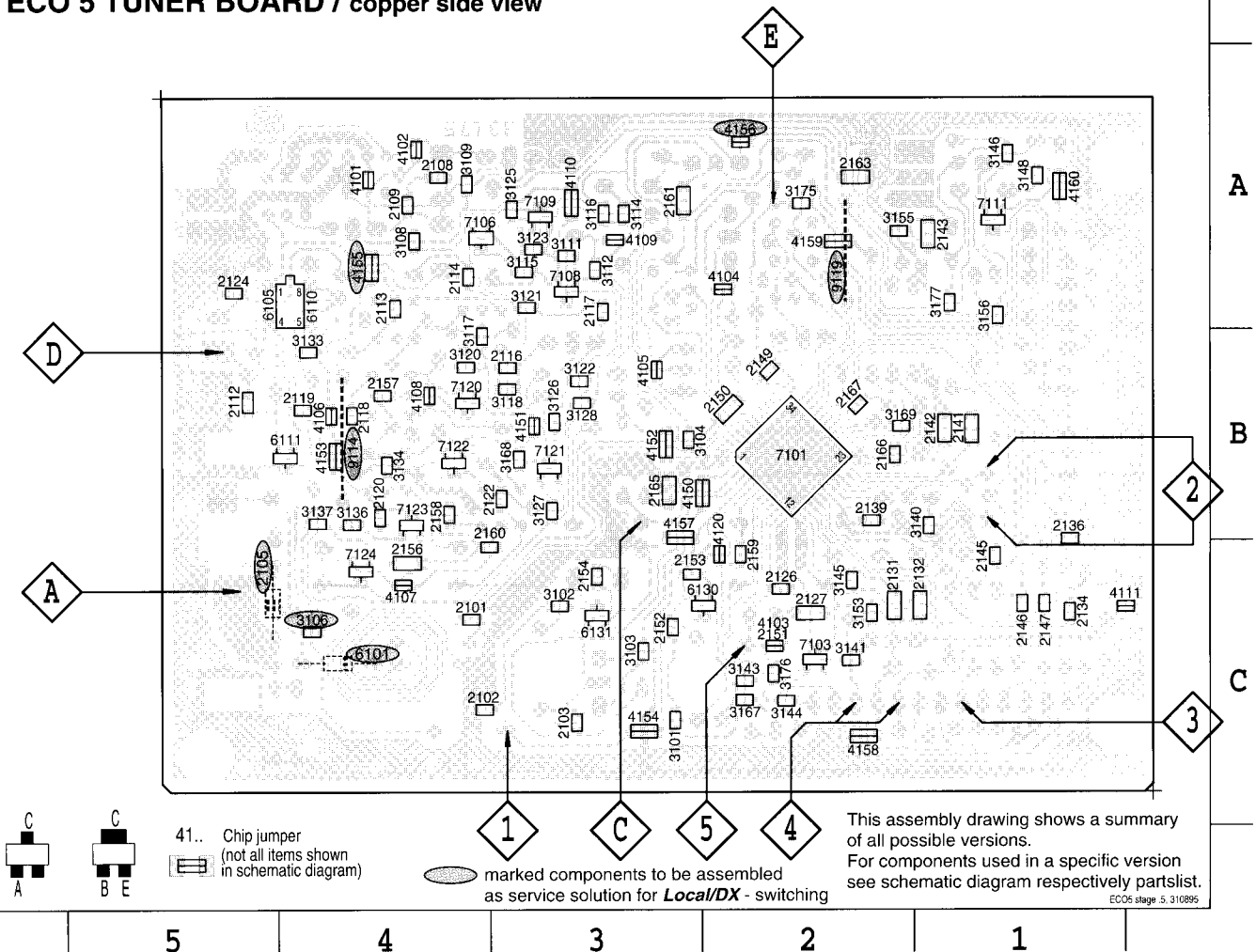
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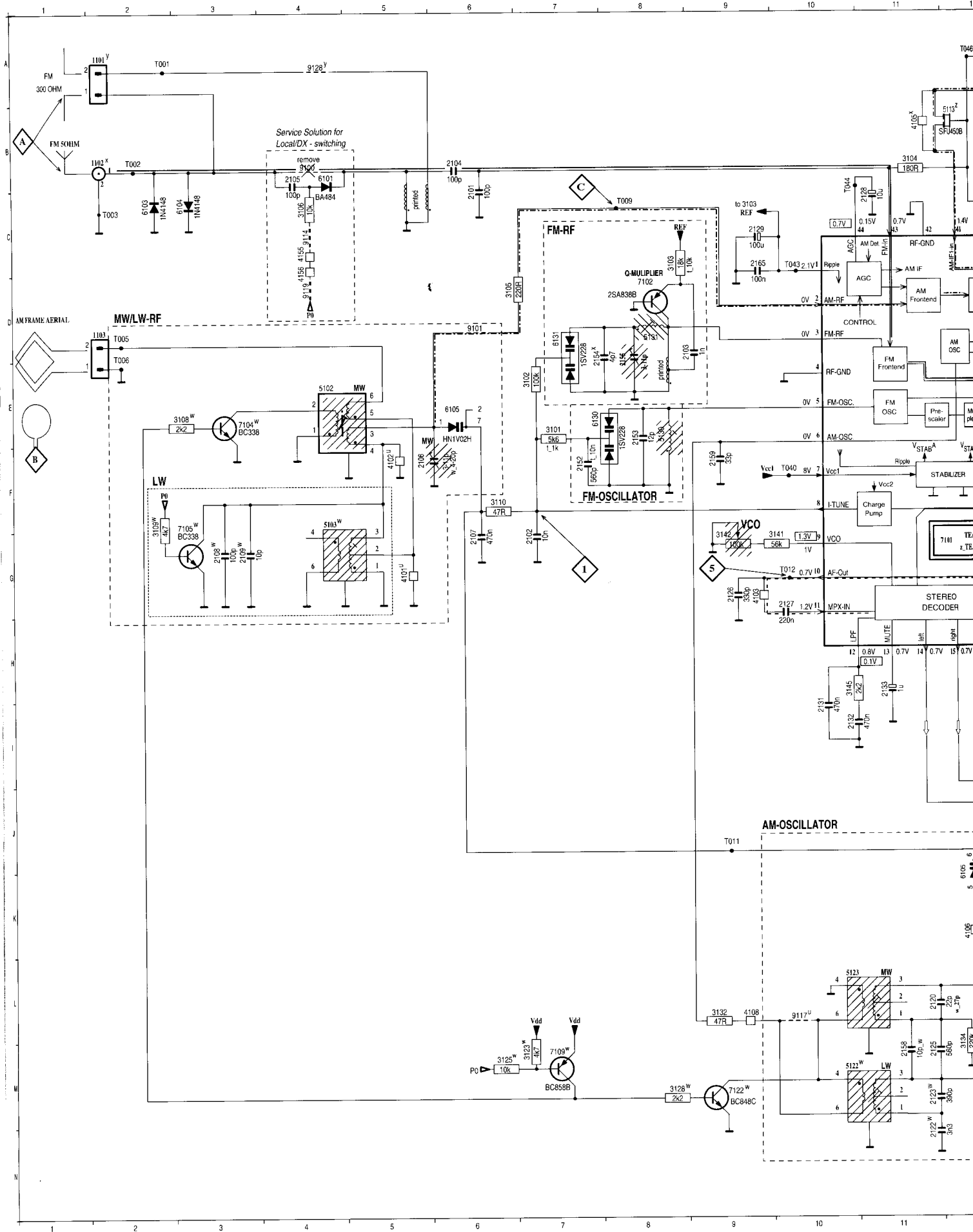
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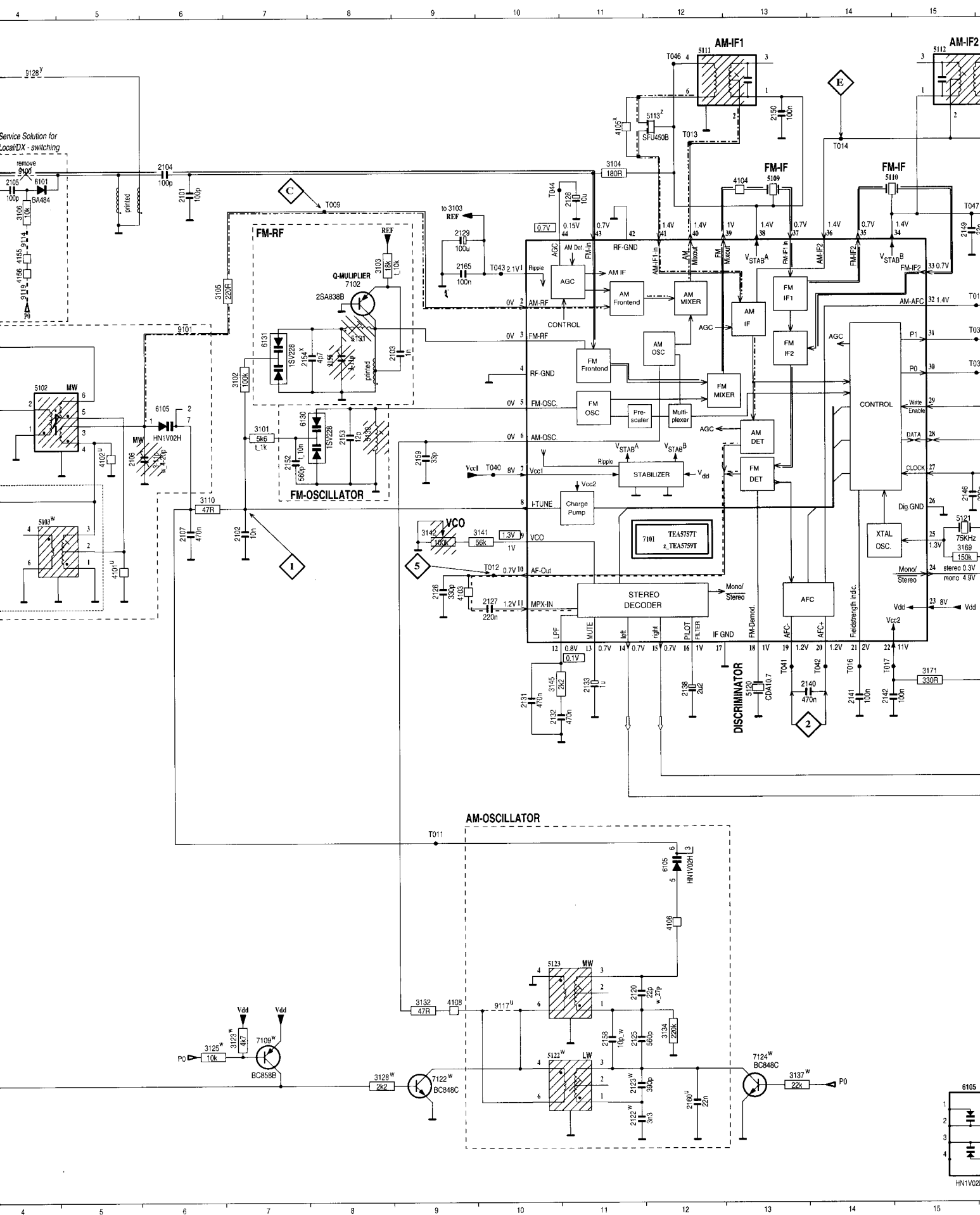
2101 C4	2119 B4	2141 B1	2154 C3	3101 C3	3116 A3	3133 B4	3153 C2	4103 C2	4151 B3	6110 A4	7121 B3
2102 C4	2120 B4	2142 B1	2156 C4	3102 C3	3117 B4	3134 B4	3155 A2	4104 A2	4152 B3	6111 B4	7122 B4
2103 C3	2122 B3	2143 A1	2157 B4	3103 C3	3118 B3	3136 B4	3156 A1	4105 B3	4153 B4	6130 C2	7123 B4
2108 A4	2124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

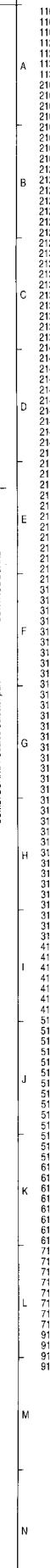
ECO 5 TUNER BOARD / copper side view



TUNER BOARD ECO5 / Systems







ELECTRICAL PARTSLIST TUNER ECO5 BOARD**ELECTRICAL****MISCELLANEOUS**

1101 4822 267 31505 SOCKET 2P CLICKFIT

DIODES

6103 4822 130 30621 1N4148
 6104 4822 130 30621 1N4148
 6105 4822 130 83075 HN1V02H
 6107 4822 130 34488 BZX79-C11
 6120 4822 130 30621 1N4148

6130 4822 130 82833 1SV228
 6131 4822 130 82833 1SV228

TRANSISTORS

7102 4822 130 60093 2SA838B
 7111 5322 130 42136 BC848C(CHIP)

INTEGRATED CIRCUITS

7101 4822 209 90924 TEA5757H/V1,RADIO IC

COILS

5102 4822 157 71634 RF-COIL MW
 5109 4822 242 70665 CER. FILTER 10,7MHZ
 5110 4822 242 70665 CER. FILTER 10,7MHZ
 5111 4822 158 60511 AM-IF FILTER 450kHz
 5112 4822 157 70302 AM-IF FILTER 450kHz

5114 4822 157 71637 AM-AFC FILTER 450KHZ
 5120 4822 242 82065 CER. DISCRIMINATOR
 5121 4822 242 81021 QUARTZ 75kHz
 5123 4822 157 60517 110μH 8%
 5130 4822 156 30947 RF COIL 1,5 TURNS

5131 4822 156 30947 RF COIL 1,5 TURNS

RESISTORS

3105 4822 116 52215 220R 5% 0,16W
 3110 4822 116 52195 47R 5% 0,5W
 3132 4822 116 52195 47R 5% 0,5W
 3142 4822 100 11163 TRIMPOT.100k lin.
 3152 4822 116 52224 470R 5% 0,5W

3154 4822 116 52211 150R 5% 0,5W
 3158 4822 116 52224 470R 5% 0,5W
 3159 4822 116 52224 470R 5% 0,5W
 3160 4822 116 52224 470R 5% 0,5W
 3161 4822 116 52224 470R 5% 0,5W

3170 4822 116 52234 100k 5% 0,5W
 3171 4822 116 52219 330R 5% 0,5W

CHIP RESISTORS

3101 4822 051 20562 5k6 5% 0,1W
 3102 4822 051 20104 100k 5% 0,1W
 3103 4822 051 20183 18k 5% 0,1W
 3104 4822 051 20181 180R 5% 0,1W
 3134 4822 051 20224 220k 5% 0,1W

3140 4822 051 20008 CHIP JUMPER 0805
 3141 4822 051 20563 56k 5% 0,1W
 3145 4822 051 20222 2k2 5% 0,1W
 3146 4822 051 20229 22R 5% 0,1W
 3153 4822 051 20471 470R 5% 0,1W

3155 4822 051 20471 470R 5% 0,1W
 3167 4822 051 20221 220R 5% 0,1W

CHIP RESISTORS

3169 4822 051 20154 150k 5% 0,1W
 4101 4822 051 20008 CHIP JUMPER 0805
 4102 4822 051 20008 CHIP JUMPER 0805
 4103 4822 051 20008 CHIP JUMPER 0805
 4104 4822 051 20008 CHIP JUMPER 0805

4105 4822 051 20008 CHIP JUMPER 0805
 4106 4822 051 20008 CHIP JUMPER 0805
 4108 4822 051 20008 CHIP JUMPER 0805
 4111 4822 051 20008 CHIP JUMPER 0805
 4120 4822 051 20008 CHIP JUMPER 0805

4150 4822 051 10008 CHIP JUMPER1206
 4152 4822 051 10008 CHIP JUMPER1206
 4153 4822 051 10008 CHIP JUMPER1206
 4154 4822 051 10008 CHIP JUMPER1206
 4157 4822 051 10008 CHIP JUMPER1206

4158 4822 051 10008 CHIP JUMPER1206
 4159 4822 051 10008 CHIP JUMPER1206

CAPACITORS

2104 4822 122 33195 100pF 10% 50V
 2106 4822 125 60101 10pF VARIABLE
 2107 4822 121 51252 470nF 5% 63V
 2125 4822 121 51381 560pF 1% 400V
 2128 4822 124 41579 10μF 20% 50V

2129 4822 124 41584 100μF 20% 10V
 2130 4822 126 11585 22nF+80/-20% 50V
 2133 4822 124 40242 1μF 20% 63V
 2135 4822 124 40746 0,22μF 20% 63V
 2137 4822 124 40746 0,22μF 20% 63V

2138 4822 124 41576 2,2μF 20% 50V
 2140 4822 121 51252 470nF 5% 63V
 2144 4822 124 40242 1μF 20% 63V
 2148 4822 126 11585 22nF+80/-20% 50V
 2155 4822 125 60101 10pF VARIABLE

CHIP CAPACITORS

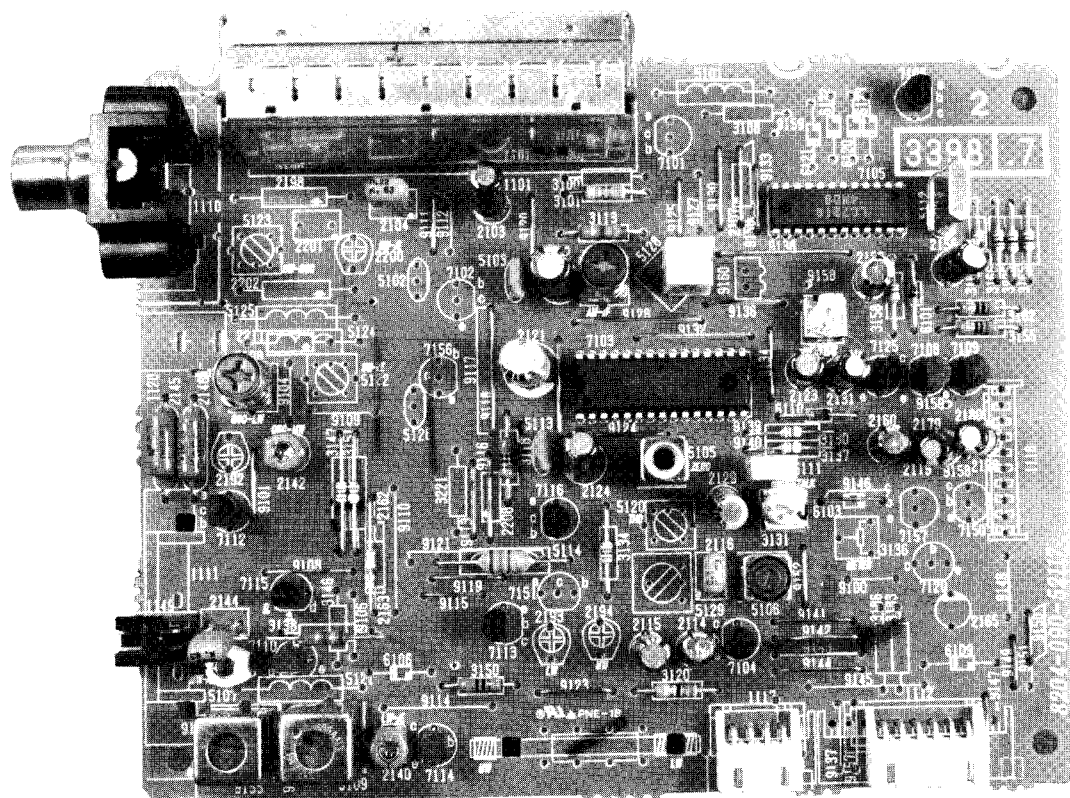
2101 5322 122 32531 100pF 5% 50V
 2102 4822 122 33177 10nF 20% 50V
 2103 5322 122 34123 1nF 10% 50V
 2120 5322 122 32658 22pF 5% 50V
 2126 5322 122 31863 330pF 5% 50V

2127 4822 122 32927 220nF 10% 63V
 2131 4822 122 33325 470nF 20% 50V
 2132 4822 122 33325 470nF 20% 50V
 2134 5322 122 32654 22nF 10% 63V
 2136 5322 122 32654 22nF 10% 63V

2141 4822 122 31947 100nF 20% 50V
 2142 4822 122 31947 100nF 20% 50V
 2143 4822 122 32927 220nF 10% 63V
 2145 4822 122 33575 220pF 5% 50V
 2146 4822 122 33575 220pF 5% 50V

2147 4822 122 33575 220pF 5% 50V
 2149 5322 122 32654 22nF 10% 63V
 2150 4822 122 31947 100nF 20% 50V
 2152 5322 116 80853 560pF 5% 63V
 2153 4822 122 32139 12pF 5% 63V

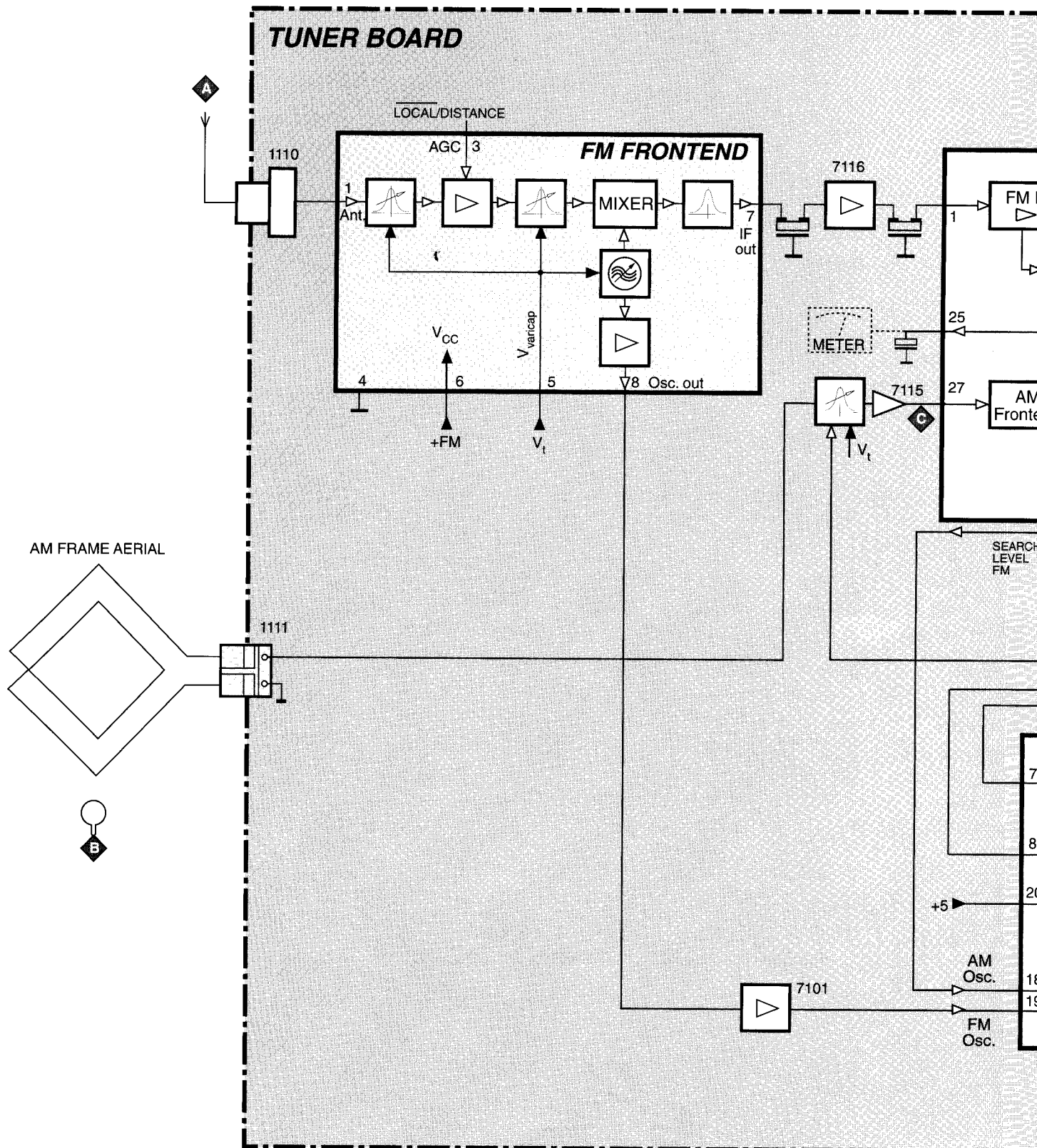
2159 5322 122 32659 33pF 5% 50V
 2160 5322 122 32654 22nF 10% 63V
 2165 4822 122 31947 100nF 20% 50V
 2166 5322 122 34123 1nF 10% 50V

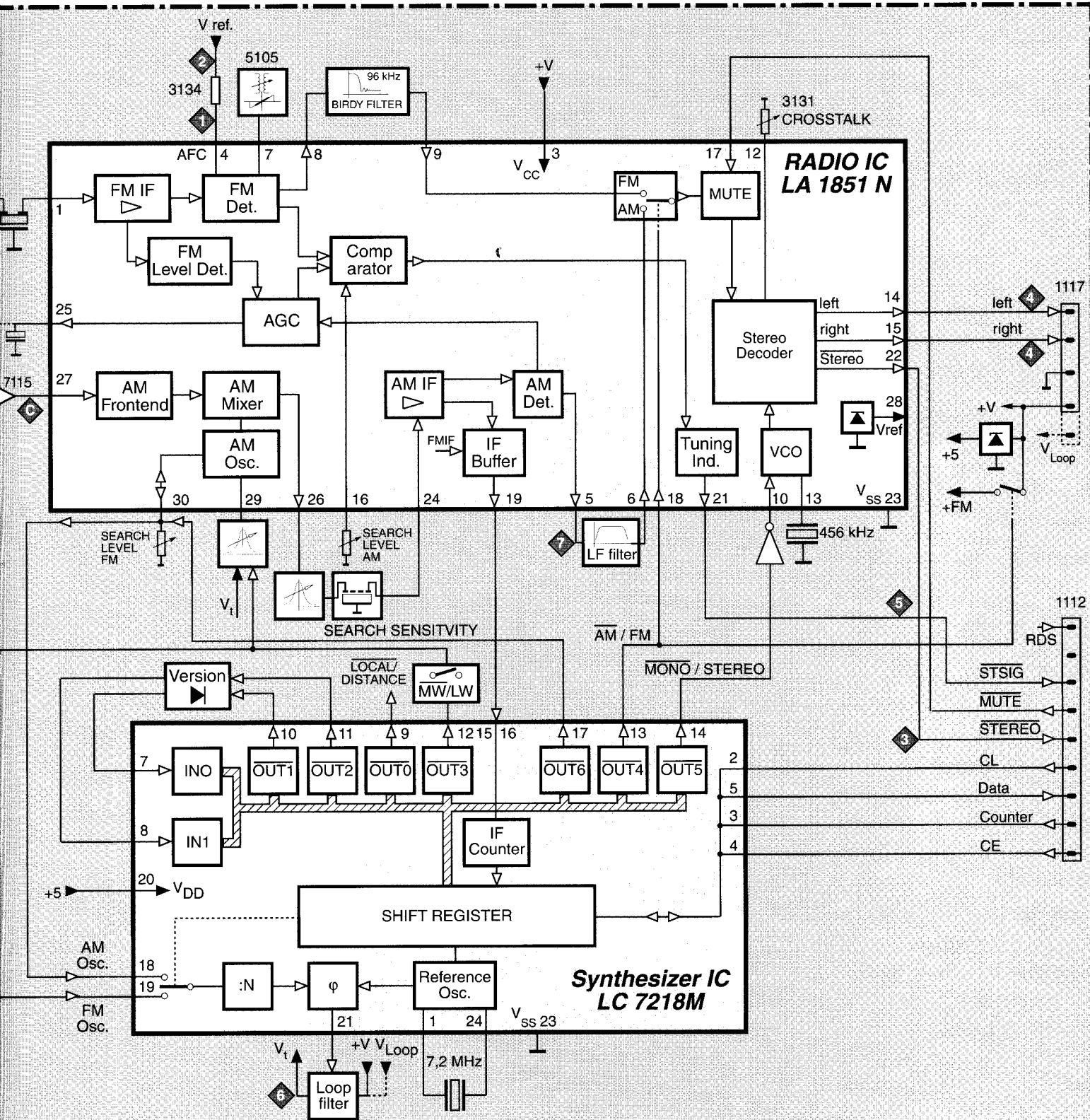


TUNER 94 BOARD

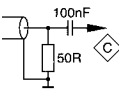
TABLE OF CONTENTS

Blockdiagram	7C-1
Adjustmant table	7C-2
Component layout	7C-2
Circuit diagram	7C-3
Partslist	7C-4





ADJUSTMENT TABLE

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	6	7...9V
			87.5MHz	check		1.3...2V
LW 153 - 279kHz (3kHz grid)			279kHz	5108		8.5V ±0.1V
			153kHz	check		0.7...1.5V
MW 522 - 1611kHz (9kHz grid)			1611kHz	2142		8V ±0.1V
			522kHz	check		0.7...1.7V
FM IF						
FM	98MHz 1mV mod=1kHz Δf=75kHz	A	98MHz	5105	1 2	0V ±20mV
STEREO CROSSTALK						
FM	98MHz 1mV 90% L + 9% pilot	A	98MHz	check	3	low < 1V
				3131	4	right channel min.
SEARCH SENSITIVITY						
FM	98MHz 12μV mod=1kHz Δf=75kHz	A		3125	5	switches just from high to low
AM IF						
MW	1494kHz Δf=10kHz as low as possible			5104	7	symmetrical and max. height
AM RF						
LW	155kHz mod=1kHz, 30% AM 270kHz	B	155kHz	5109	7	MAX
			270kHz	2140		
MW	558kHz mod=1kHz, 30% AM 1494kHz		558kHz	5107		MAX
			1494kHz	2141		

* Signal supplied via frame antenna

↑
Repeat0004
1101
1110
1112
1112
1117
1149
2103
2104
2114

A

B

C

D

E

F

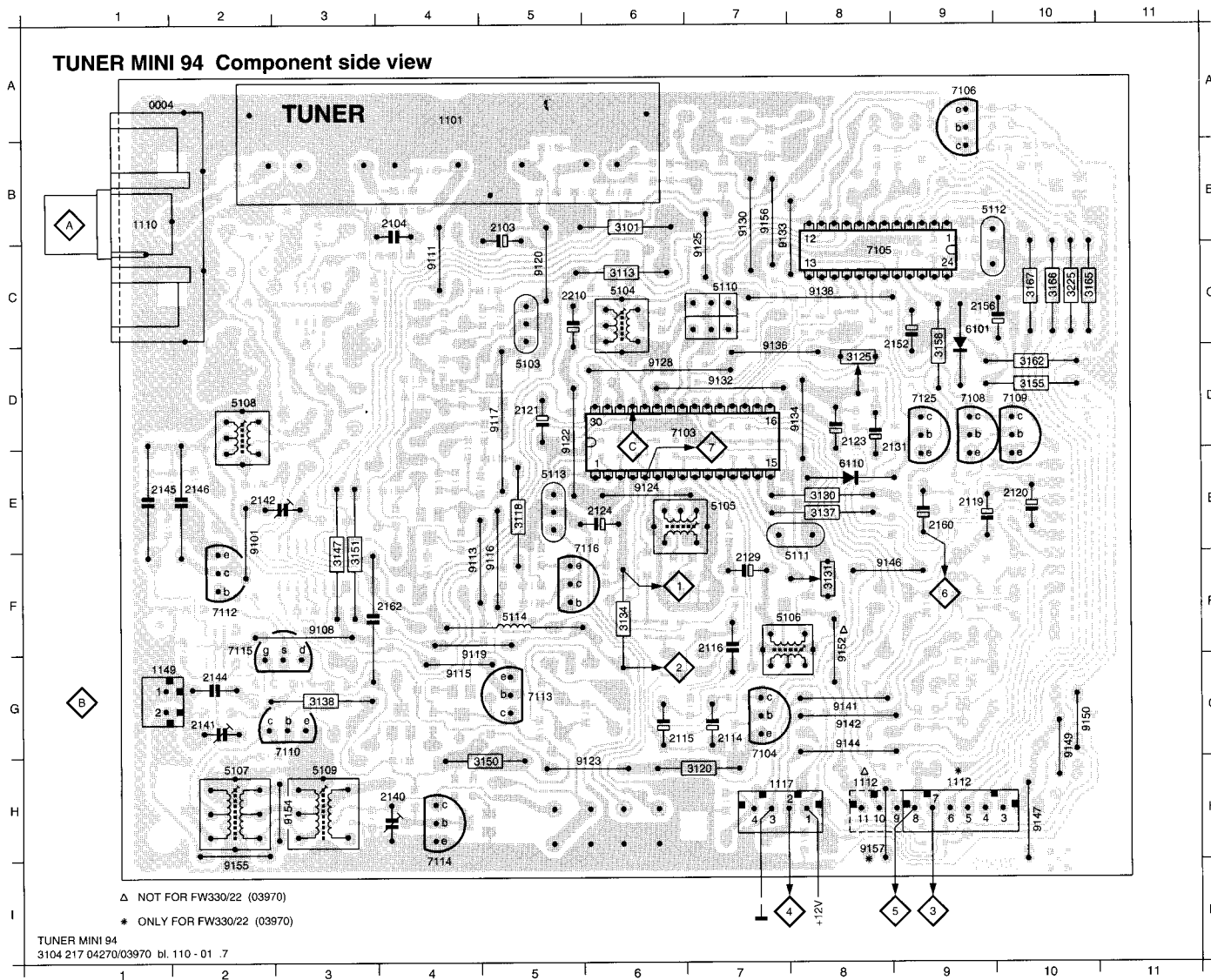
G

H

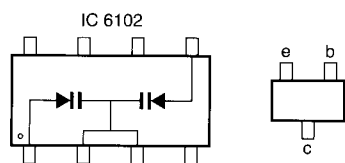
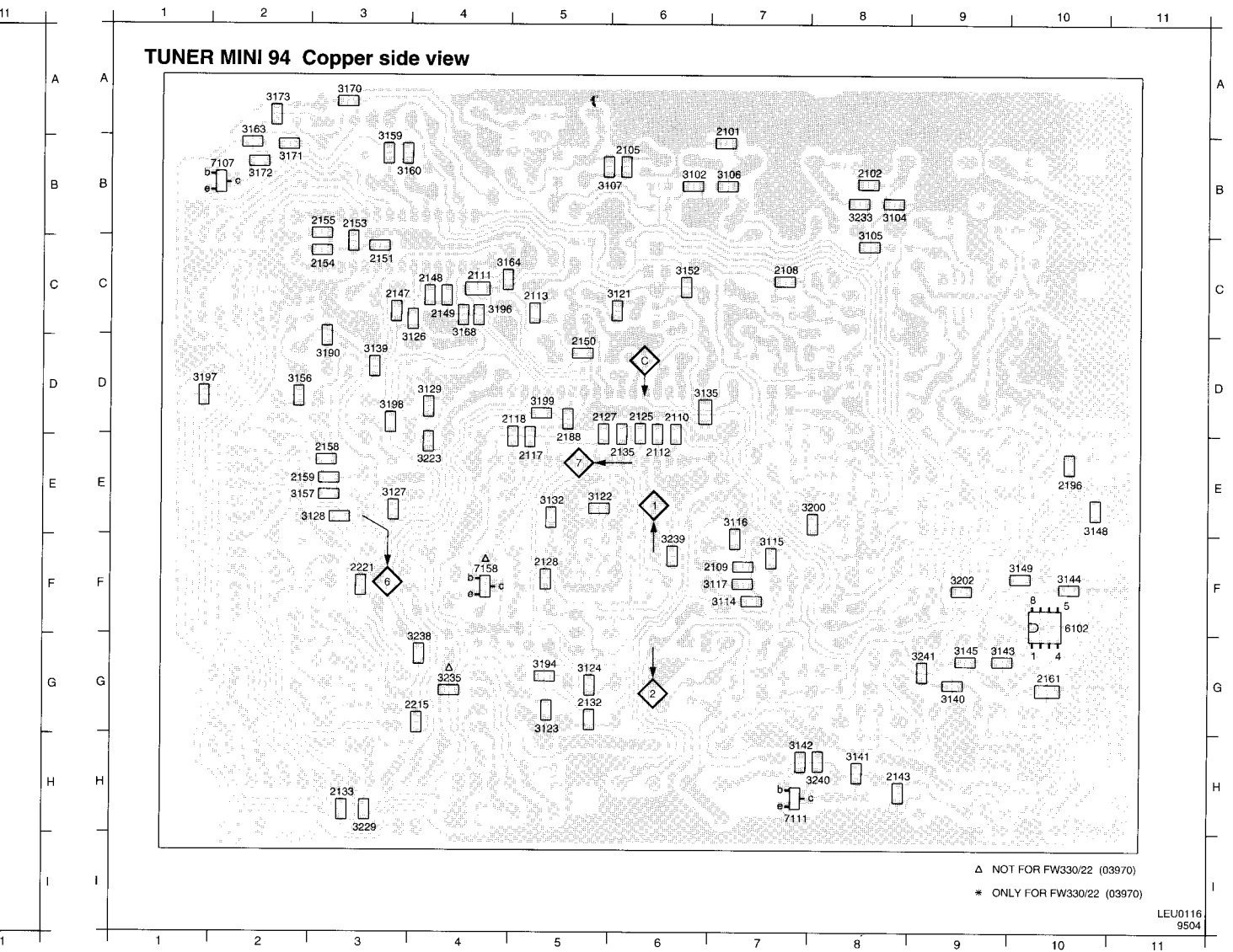
I

TUNE
3104

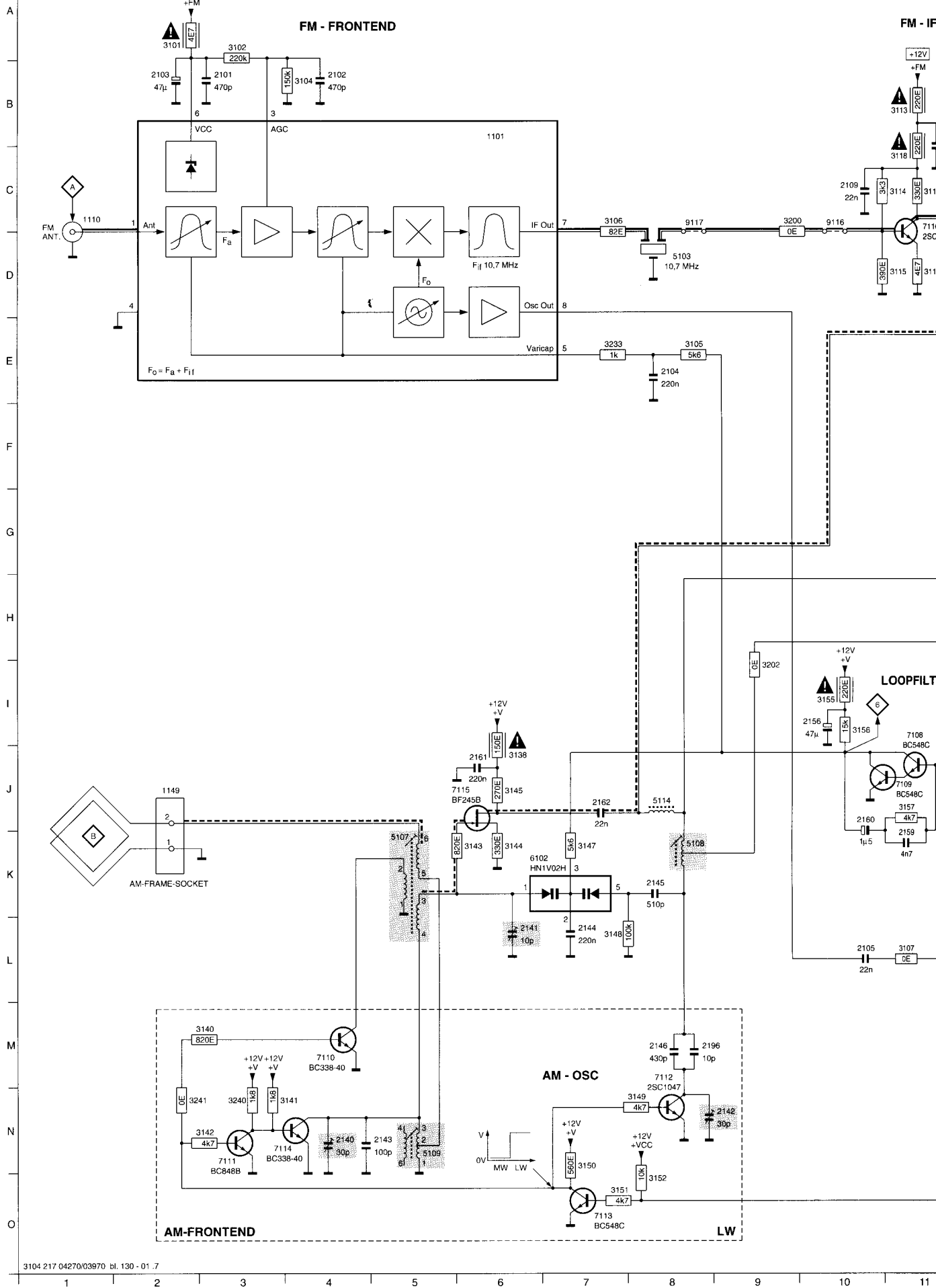
0004	A1	2115	G6	2141	G2	3101	B6	3147	F3	5103	D5	5113	E5	7110	G3	9113	F4	9128	D6	2101
1101	A4	2116	F7	2142	E2	3113	C6	3150	H4	5104	C6	5114	F5	7112	F2	9115	G4	9130	B7	2102
1110	B1	2119	E9	2144	G2	3118	E5	3151	F3	5105	E7	6101	C9	7113	G5	9116	F5	9132	D7	2105
1112	H8	2120	E10	2145	E1	3120	H7	3155	D10	5106	F7	6110	E8	7114	I4	9117	D5	9133	C7	2108
1112	H9	2121	D5	2146	E2	3125	D8	3158	D9	5107	H2	7103	D6	7115	F2	9119	G4	9134	D8	2109
1117	H7	2123	D8	2152	D8	3130	E8	3162	D10	5108	D2	7104	H7	7116	F5	9120	C5	9136	D7	2110
1149	G1	2124	E6	2156	C9	3131	F8	3165	C10	5109	H3	7105	C8	7125	D9	9122	E5	9138	C8	2111
2103	B5	2129	F7	2160	E9	3134	F6	3166	C10	5110	C7	7106	A9	9101	F2	9123	H5	9141	G8	2112
2104	B4	2131	E8	2162	F3	3137	E8	3167	C10	5111	F7	7108	D9	9108	F3	9124	E6	9142	G8	2113
2114	G7	2140	H4	2210	C5	3138	G3	3225	C10	5112	B9	7109	D10	9111	C4	9125	C7	9144	G8	2117

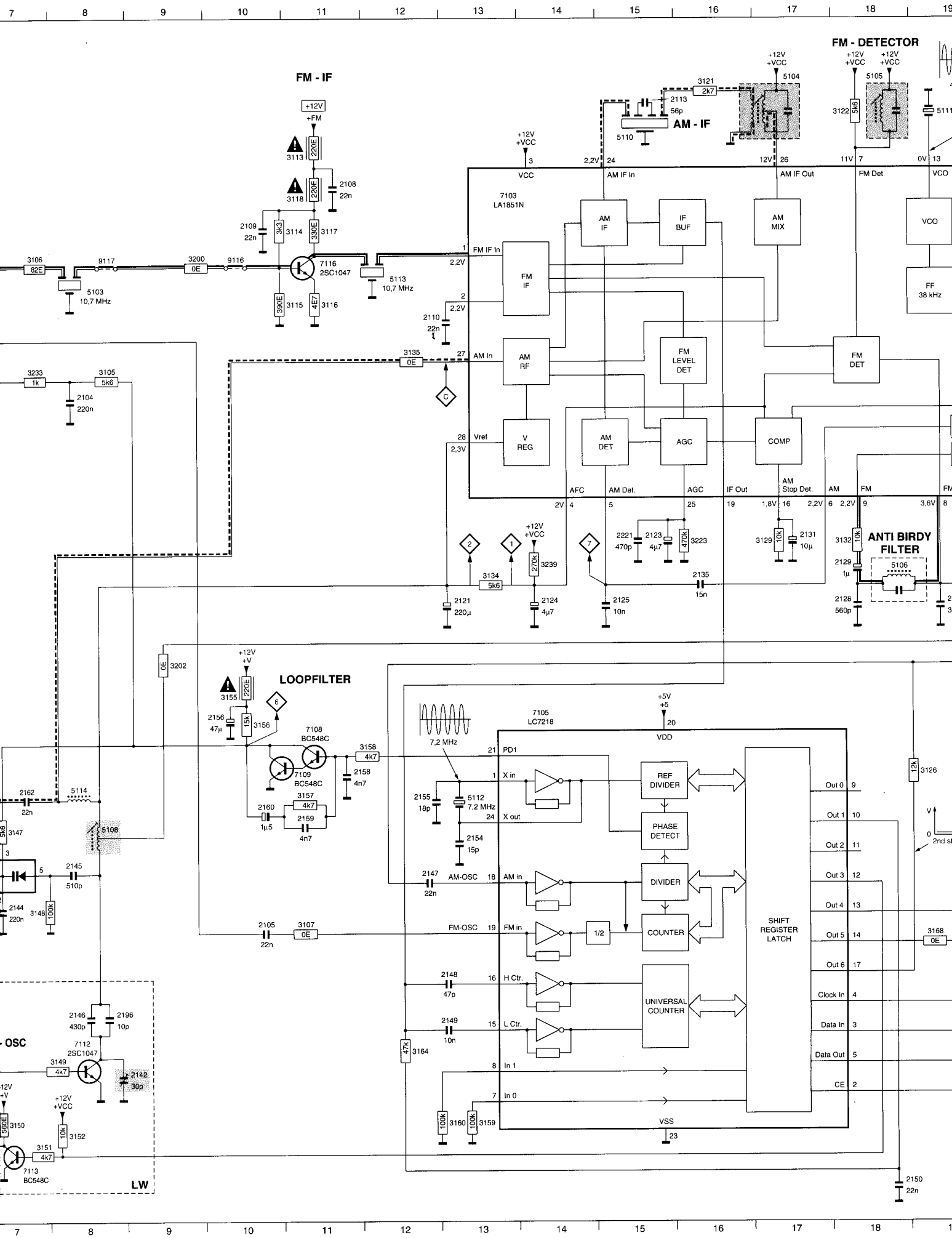


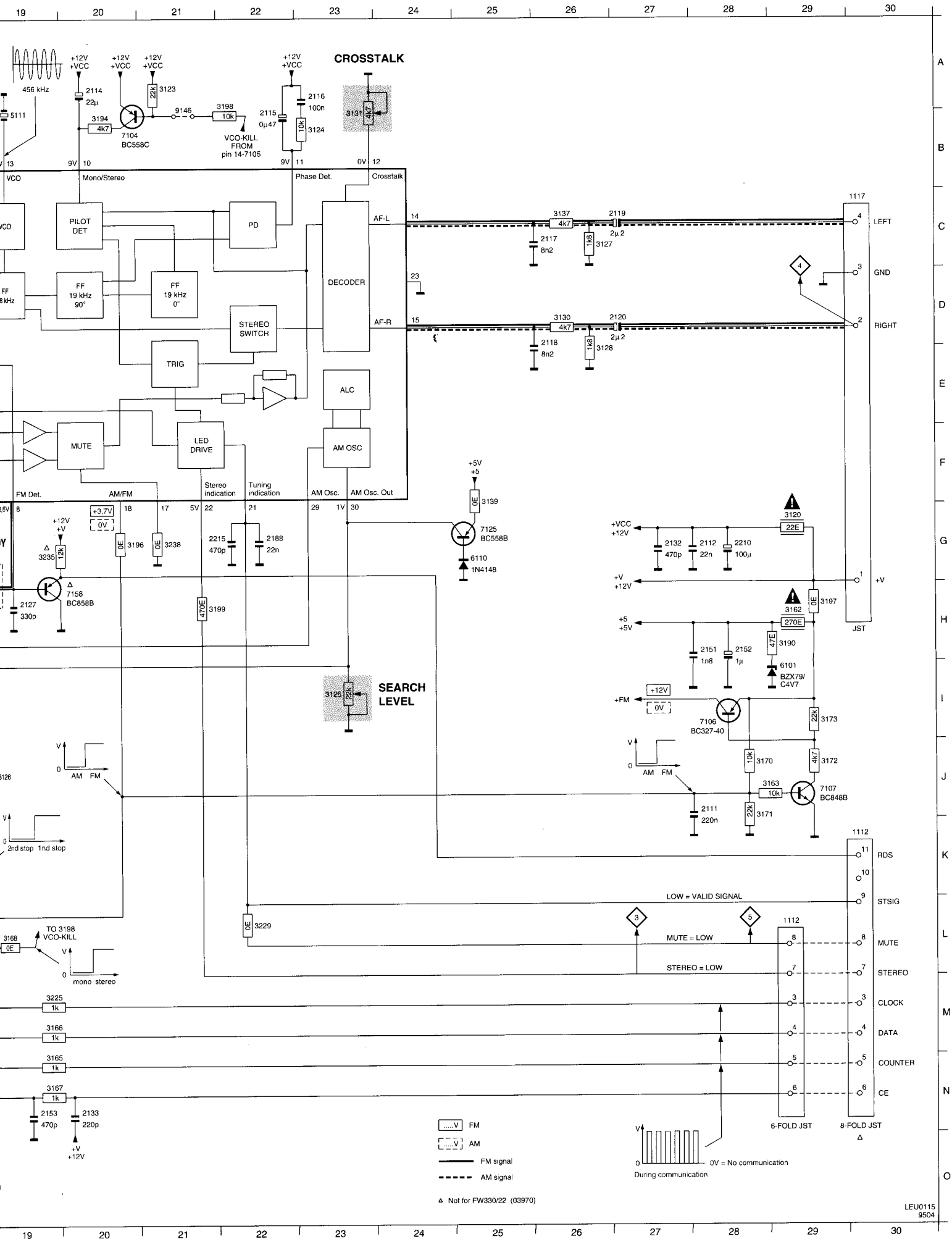
8	D6	2101	A7	2118	D4	2149	C4	2196	E10	3116	E7	3132	E5	3149	F10	3171	B2	3202	F9	7107	B1
0	B7	2102	B8	2125	D6	2150	D5	2215	G3	3117	F6	3135	D6	3152	C6	3172	B2	3223	E4	7111	H7
2	D7	2105	B6	2127	D5	2151	C3	2221	F3	3121	C5	3139	D3	3156	D2	3173	A2	3229	H3	7158	F4
3	C7	2108	C7	2128	F5	2153	B3	3102	B6	3122	E5	3140	G9	3157	E2	3190	D3	3233	B8		
4	D8	2109	F6	2132	G5	2154	C2	3104	B8	3123	H5	3141	H8	3159	B3	3194	G5	3235	G4		
6	D7	2110	D6	2133	H3	2155	B2	3105	C8	3124	G5	3142	H7	3160	B3	3196	C4	3238	G3		
8	C8	2111	C4	2135	E5	2158	E3	3106	B7	3126	D3	3143	G9	3163	A2	3197	D1	3239	F6		
1	G8	2112	E6	2143	H8	2159	E2	3107	B5	3127	E3	3144	F10	3164	C4	3198	D3	3240	H7		
2	G8	2113	C5	2147	C3	2161	G10	3114	F7	3128	E2	3145	G9	3168	D4	3199	D5	3241	G9		
4	G8	2117	E5	2148	C4	2188	E5	3115	F7	3129	D4	3148	E10	3170	A3	3200	E7	6102	F10		



TUNER MINI 94







ELECTRICAL PARTSLIST TUNER 94 BOARD**MISCELLANEOUS**

1101	4822 210 10492	FRONTEND ASSY /02/08
1110	4822 267 10283	SOCKET COAX IEC 75R

DIODES

6101	4822 130 34174	BZX79-B4V7
6102	4822 130 83075	HN1V02H
6110	4822 130 30621	1N4148

TRANSISTORS

7104	5322 130 60068	BC558C
7106	4822 130 41327	BC327-40
7107	5322 130 41982	BC848 (CHIP)
7108	4822 130 44196	BC548C
7109	4822 130 44196	BC548C
7110	5322 130 44779	BC338-40
7111	5322 130 41982	BC848 (CHIP)
7112	4822 130 60163	2SC1047
7113	4822 130 44196	BC548C
7114	5322 130 44779	BC338-40
7115	4822 130 41024	BF245B
7116	4822 130 60163	2SC1047
7125	4822 130 44197	BC558B
7158	5322 130 41983	BC858B(CHIP)

INTEGRATED CIRCUITS

7103	4822 209 31001	LA1851N
7105	4822 209 30178	LC7218

COILS

5103	4822 242 81249	CER. FILTER 10,7MHz
5104	4822 157 63029	AM IF COIL
5105	4822 157 63904	Q-DETECION COIL
5106	4822 157 71661	ANTI-BIRDY FILTER
5107	4822 157 71094	ANT. COIL MW, 3-BAND
5108	4822 157 63912	OSC.COIL AM 3-BAND
5109	4822 157 71093	ANT. COIL LW
5110	4822 242 71878	CERAM.FILTER 450kHz
5111	4822 242 81248	CERAM. RES. 19kHz
5112	4822 242 72976	CER.RESONATOR 7,2MHz
5113	4822 242 81249	CER. FILTER 10,7MHz
5114	4822 157 51503	560pH

RESISTORS

3101	4822 052 10478	4R7	5%	NFR
3113	4822 053 10221	220R	5%	1W
3118	4822 050 22201	220R	2%	0,25W
3120	4822 052 10229	22R	5%	0,33W
3125	4822 100 11213	22k	30%	POT.
3130	4822 116 52283	4k7	5%	0,5W
3131	4822 100 11319	4k7		trimpot.
3134	4822 116 52289	5k6	5%	0,16W
3137	4822 116 52283	4k7	5%	0,5W
3138	4822 116 83922	150R	5%	1W
3147	4822 116 52289	5k6	5%	0,16W
3150	4822 050 25601	560R	1%	0,6W
3151	4822 116 52283	4k7	5%	0,5W
3155	4822 050 22201	220R	2%	0,25W
3158	4822 116 52283	4k7	5%	0,5W

RESISTORS

3162	4822 050 22701	270R	1%	0,6W
3165	4822 050 11002	1k	5%	0,2W
3166	4822 050 11002	1k	5%	0,2W
3167	4822 050 11002	1k	5%	0,2W
3225	4822 050 11002	1k	5%	0,2W

CHIP RESISTORS

3102	4822 051 20224	220k	5%	0,1W
3104	4822 051 20154	150k	5%	0,1W
3105	4822 051 20562	5k6	5%	0,1W
3106	4822 051 20829	82R	5%	0,1W
3107	4822 051 20008	CHIP JUMPER 0805		
3114	4822 051 20332	3k3	5%	0,1W
3115	4822 051 20391	390R	5%	0,1W
3116	4822 051 20478	4R7	5%	0,1W
3117	4822 051 20331	330R	5%	0,1W
3121	4822 051 20272	2k7	5%	0,1W
3122	4822 051 20562	5k6	5%	0,1W
3123	4822 051 20223	22k	5%	0,1W
3124	4822 117 10833	10k	1%	0,1W
3126	4822 051 20123	12k	2%	0,1W
3127	4822 051 20182	1k8	5%	0,1W
3128	4822 051 20182	1k8	5%	0,1W
3129	4822 117 10833	10k	1%	0,1W
3132	4822 117 10833	10k	1%	0,1W
3133	4822 051 20008	CHIP JUMPER 0805		
3135	4822 051 10008	CHIP JUMPER 1206		
3139	4822 051 20008	CHIP JUMPER 0805		
3140	4822 051 20821	820R	5%	0,1W
3141	4822 051 20182	1k8	5%	0,1W
3142	4822 051 20472	4k7	5%	0,1W
3143	4822 051 20821	820R	5%	0,1W
3144	4822 051 20331	330R	5%	0,1W
3145	4822 051 20271	270R	5%	0,1W
3148	4822 051 20104	100k	5%	0,1W
3149	4822 051 20472	4k7	5%	0,1W
3152	4822 117 10833	10k	1%	0,1W
3156	4822 051 20153	15k	5%	0,1W
3157	4822 051 20472	4k7	5%	0,1W
3159	4822 051 20104	100k	5%	0,1W
3160	4822 051 20104	100k	5%	0,1W
3163	4822 117 10833	10k	1%	0,1W
3164	4822 051 10473	47k	2%	0,25W
3164	4822 051 20473	47k	5%	0,1W
3168	4822 051 20008	CHIP JUMPER 0805		
3170	4822 117 10833	10k	1%	0,1W
3171	4822 051 20223	22k	5%	0,1W
3172	4822 051 20472	4k7	5%	0,1W
3173	4822 051 20223	22k	5%	0,1W
3190	4822 051 20479	47R	5%	0,1W
3194	4822 051 20472	4k7	5%	0,1W
3196	4822 051 20008	CHIP JUMPER 0805		
3197	4822 051 20008	CHIP JUMPER 0805		
3198	4822 117 10833	10k	1%	0,1W
3199	4822 051 20471	470R	5%	0,1W
3200	4822 051 20008	CHIP JUMPER 0805		
3202	4822 051 20008	CHIP JUMPER 0805		
3223	4822 051 20474	470k	5%	0,1W
3229	4822 051 20008	CHIP JUMPER 0805		
3233	4822 051 10102	1k	2%	0,25W
3235	4822 051 20123	12k	2%	0,1W

ELECTRICAL PARTSLIST TUNER 94 BOARD**CHIP RESISTORS**

3236	4822 051 20008	CHIP JUMPER 0805
3238	4822 051 20008	CHIP JUMPER 0805
3239	4822 051 20274	270k 5% 0,1W
3240	4822 051 20182	1k8 5% 0,1W
3241	4822 051 20008	CHIP JUMPER 0805

CAPACITORS

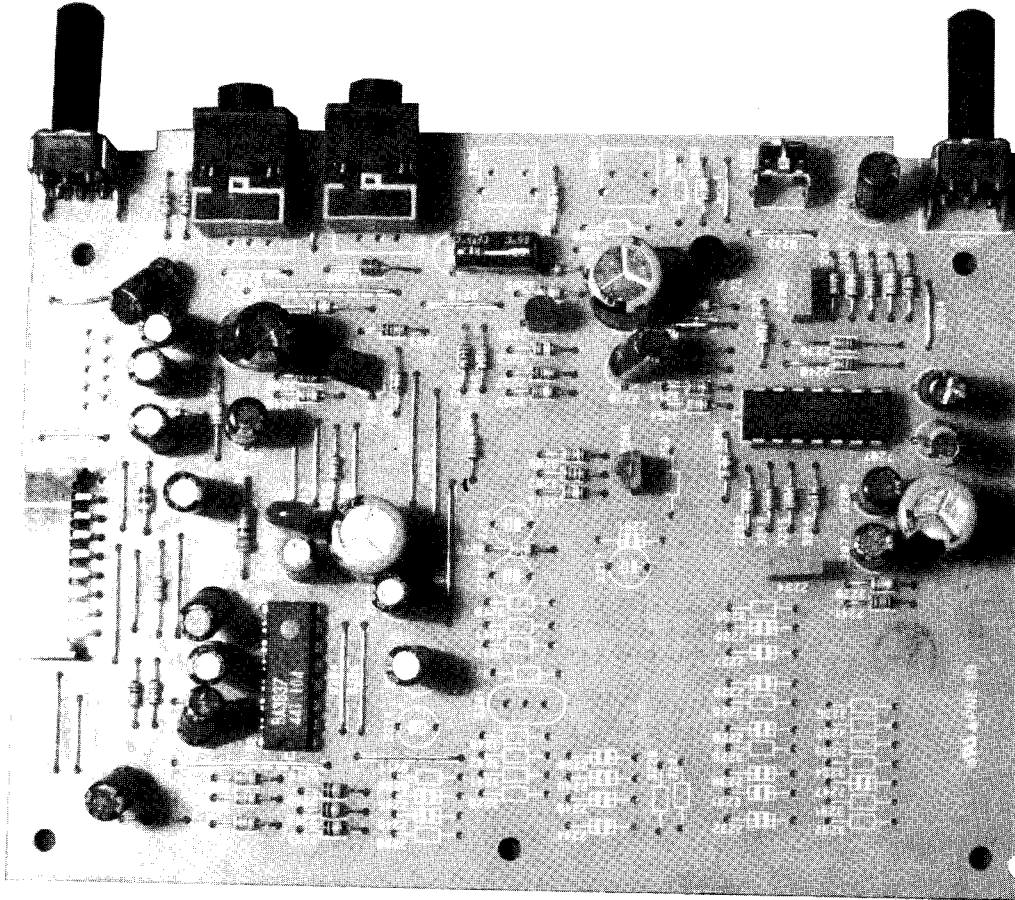
2103	4822 124 40433	47μF	20%	25V
2104	4822 121 42408	220nF	5%	63V
2114	5322 124 41431	22μF	20%	25V
2115	4822 124 40239	0,47μF	20%	63V
2116	5322 121 42386	100nF	5%	63V
2119	4822 124 40244	2,2μF	20%	63V
2120	4822 124 40244	2,2μF	20%	63V
2121	4822 124 40196	220μF	20%	16V
2123	4822 124 40246	4,7μF	20%	63V
2124	4822 124 40246	4,7μF	20%	63V
2129	4822 124 40242	1μF	20%	63V
2131	4822 124 40248	10μF	20%	63V
2140	4822 125 60102	30pF	VARIABLE	
2141	4822 125 60101	10pF	VARIABLE	
2142	4822 125 60102	30pF	VARIABLE	
2144	4822 121 42408	220nF	5%	63V
2145	4822 121 51263	510pF	1%	400V
2146	4822 121 70082	430pF	1%	400V
2152	4822 124 40242	1μF	20%	63V
2156	4822 124 40433	47μF	20%	25V
2160	4822 124 41631	1,5μF	20%	50V
2162	4822 126 11585	22nF+80/-20%		50V
2210	4822 124 41643	100μF	20%	16V

CHIP CAPACITORS

2101	5322 122 34099	470pF	10%	63V
2102	5322 122 32268	470pF	10%	50V
2105	5322 122 32654	22nF	10%	63V
2108	5322 122 32654	22nF	10%	63V
2109	5322 122 32654	22nF	10%	63V
2110	5322 122 32654	22nF	10%	63V
2111	4822 122 32927	220nF	10%	63V
2112	5322 122 32654	22nF	10%	63V
2113	5322 122 32661	56pF	5%	50V
2117	4822 122 33336	8,2nF	10%	50V
2118	4822 122 33336	8,2nF	10%	50V
2125	4822 122 33177	10nF	20%	50V
2126	4822 122 31782	15nF	10%	50V
2127	5322 122 31863	330pF	5%	50V
2128	5322 116 80853	560pF	5%	63V
2132	5322 122 32268	470pF	10%	50V
2133	5322 126 10794	220pF	10%	
2135	4822 122 33128	15nF	10%	63V
2143	5322 122 32531	100pF	5%	50V
2147	5322 122 32654	22nF	10%	63V
2148	5322 122 32452	47pF	5%	50V
2149	4822 122 33177	10nF	20%	50V
2150	5322 122 32654	22nF	10%	63V
2151	5322 122 34099	470pF	10%	63V
2151	4822 122 33219	1,8nF	10%	50V
2153	5322 122 34099	470pF	10%	63V
2154	5322 122 32481	15pF	5%	50V
2155	5322 122 32965	18pF	5%	50V
2158	5322 126 10223	4,7nF	10%	63V
2159	5322 126 10223	4,7nF	10%	63V

CHIP CAPACITORS

2161	4822 122 32927	220nF	10%	63V
2188	5322 122 32654	22nF	10%	63V
2196	5322 122 32448	10pF	5%	50V
2215	5322 122 32268	470pF	10%	50V
2216	5322 122 32268	470pF	10%	50V
2221	5322 122 32268	470pF	10%	50V

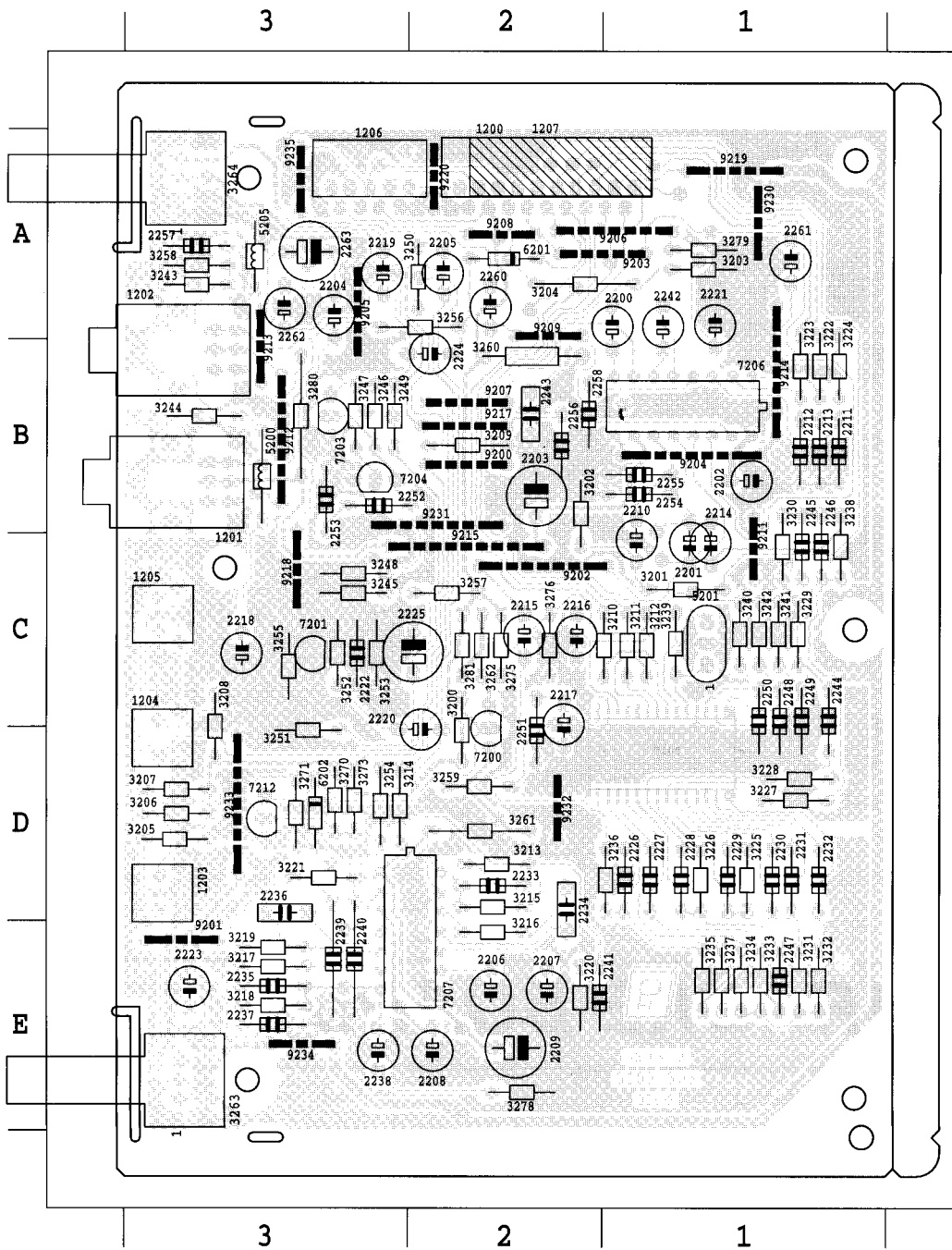


KARAOKE BOARD

TABLE OF CONTENTS

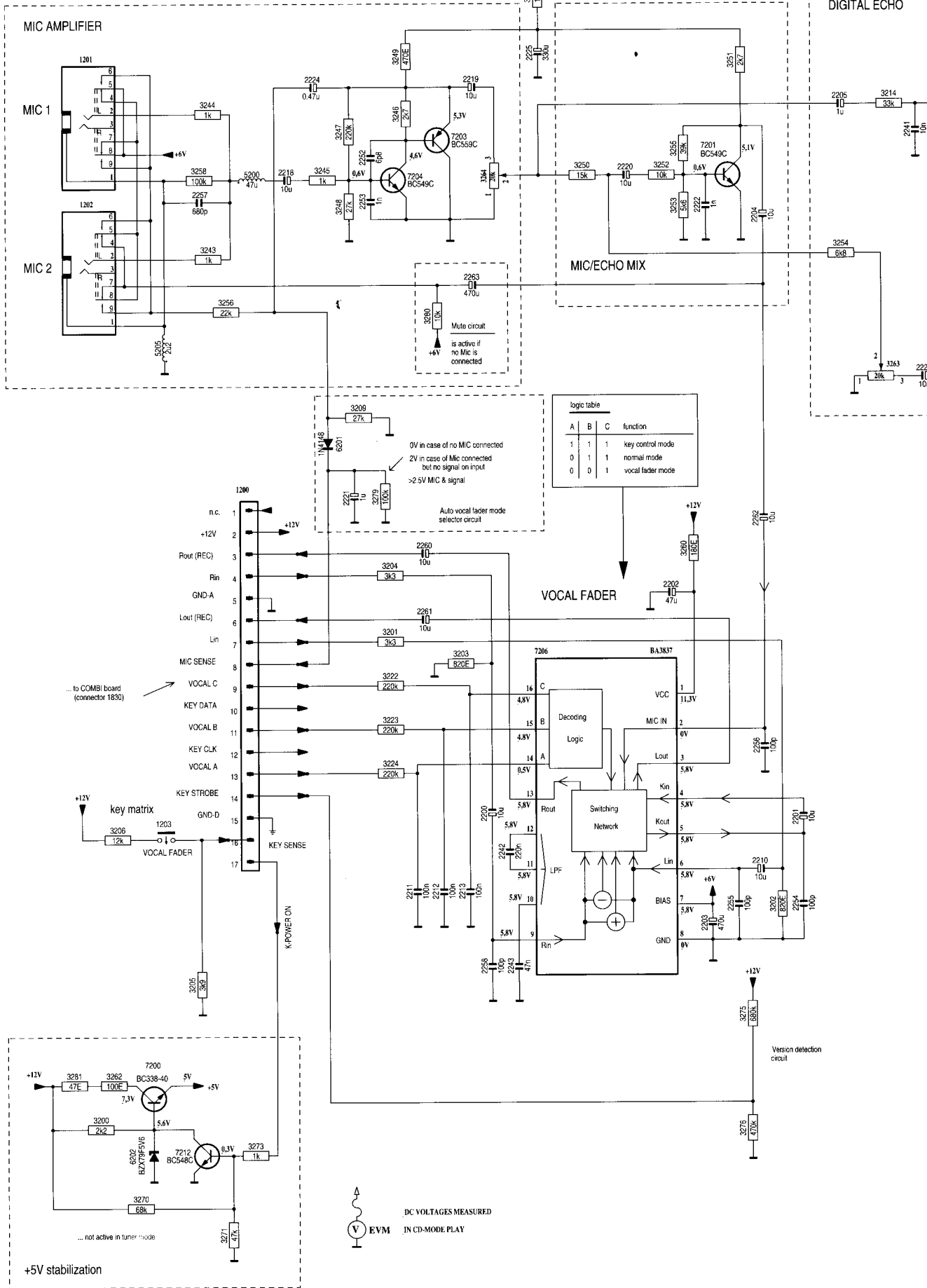
Component layout	8-2
Circuit diagram	8-3
Partslist	8-4

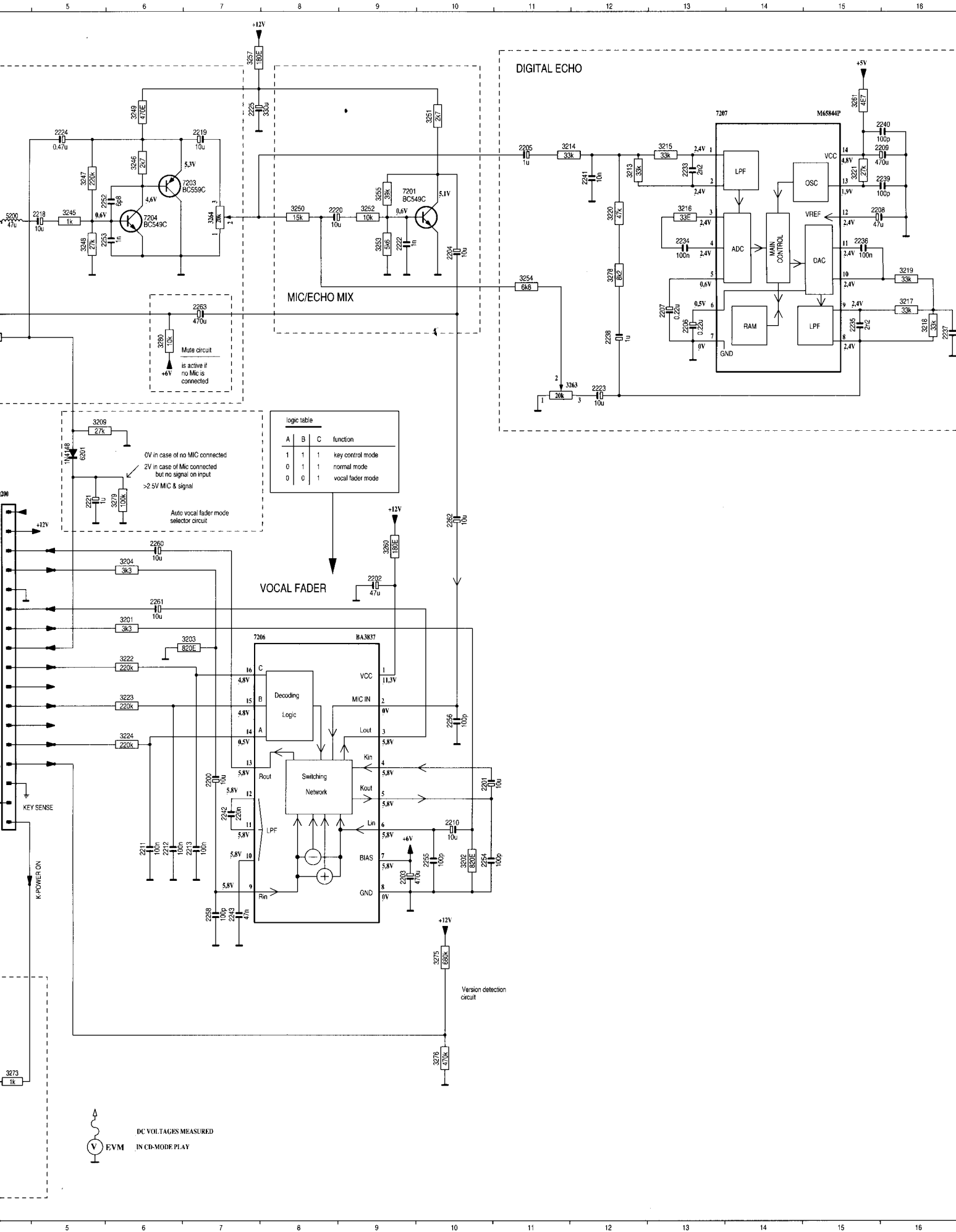
COMPONENT LAYOUT COPPERSIDE VIEW



3254 D 3	2258 B 2	1204 D 3
3255 C 3	2260 A 2	1205 C 3
3256 A 2	2261 A 1	1206 A 3
3257 C 2	2262 A 3	1207 A 2
3258 A 3	2263 A 3	2200 A 1
3259 D 2	3200 D 2	2201 C 1
3260 B 2	3201 C 1	2202 B 1
3261 D 2	3202 B 2	2203 B 2
3262 C 2	3203 A 1	2204 A 3
3263 E 3	3204 A 2	2205 A 2
3264 A 3	3205 D 3	2206 E 2
3270 D 3	3206 D 3	2207 E 2
3271 D 3	3207 D 3	2208 E 2
3273 D 3	3208 D 3	2209 E 2
3275 C 2	3209 B 2	2210 C 1
3276 C 2	3210 C 1	2211 B 1
3278 E 2	3211 C 1	2212 B 1
3279 A 1	3212 C 1	2213 B 1
3280 B 3	3213 D 2	2214 C 1
3281 C 2	3214 D 3	2215 C 2
5200 B 3	3215 D 2	2216 C 2
5201 C 1	3216 E 2	2217 C 2
5205 A 3	3217 E 3	2218 C 3
6201 A 2	3218 E 3	2219 A 3
6202 D 3	3219 E 3	2220 D 2
7200 D 2	3220 E 2	2221 A 1
7201 C 3	3221 D 3	2222 C 3
7203 B 3	3222 B 1	2223 E 3
7204 B 3	3223 B 1	2224 B 2
	3224 B 1	2225 C 2
7206 B 1	3225 D 1	2226 D 1
7207 E 2	3226 D 1	2227 D 1
7212 D 3	3227 D 1	2228 D 1
9200 E 2	3228 D 1	2229 D 1
9201 E 3	3229 C 1	2230 D 1
9202 C 2	3230 C 1	2231 D 1
9203 A 1	3231 E 1	2232 D 1
9204 B 1	3232 E 1	2233 D 2
9205 A 3	3233 E 1	2234 D 2
9206 A 1	3234 E 1	2235 E 3
9207 B 2	3235 E 1	2236 D 3
9208 A 2	3236 D 1	2237 E 3
9209 A 2	3237 E 1	2238 E 3
9211 C 1	3238 C 1	2239 E 3
9212 B 3	3239 C 1	2240 E 3
9213 B 3	3240 C 1	2241 E 2
9214 B 1	3241 C 1	2242 A 1
9215 C 2	3242 C 1	2243 B 2
9217 B 2	3243 A 3	2244 C 1
9218 C 3	3244 B 3	2245 C 1
9219 A 1	3245 C 3	2246 C 1
9220 A 2	3246 B 3	2247 E 1
9230 A 1	3247 B 3	2248 C 1
9231 B 2	3248 C 3	2249 C 1
9232 D 2	3249 B 3	2250 C 1
9233 D 3	3250 A 2	2251 D 2
9234 E 3	3251 D 3	2252 B 3
9235 A 3	3252 C 3	2253 B 3
T313 A 1	3253 C 3	2254 B 1
2255 B 1	1201 B 3	
2256 B 2	1202 B 3	
2257 A 3	1203 D 3	

KARAOKE BOARD





ELECTRICAL PARTSLIST KARAOKE BOARD**MISCELLANEOUS**

1201	4822 267 31792	MICROPHONE SOCKET
1202	4822 267 31792	MICROPHONE SOCKET
1203	4822 276 13614	TACT SWITCH

DIODES

6201	4822 130 30621	1N4148
6202	4822 130 34173	BZX79-B5V6

TRANSISTORS

7200	5322 130 44779	BC338-40
7201	4822 130 44246	BC549C
7203	5322 130 42625	BC559C
7204	4822 130 44246	BC549C
7212	4822 130 44196	BC548C

INTEGRATED CIRCUITS

7206	4822 209 90408	BA3837
7207	4822 209 90407	M65844P

COILS

5200	4822 157 53906	47μH 10%
5205	4822 157 62552	2,2μH

RESISTORS

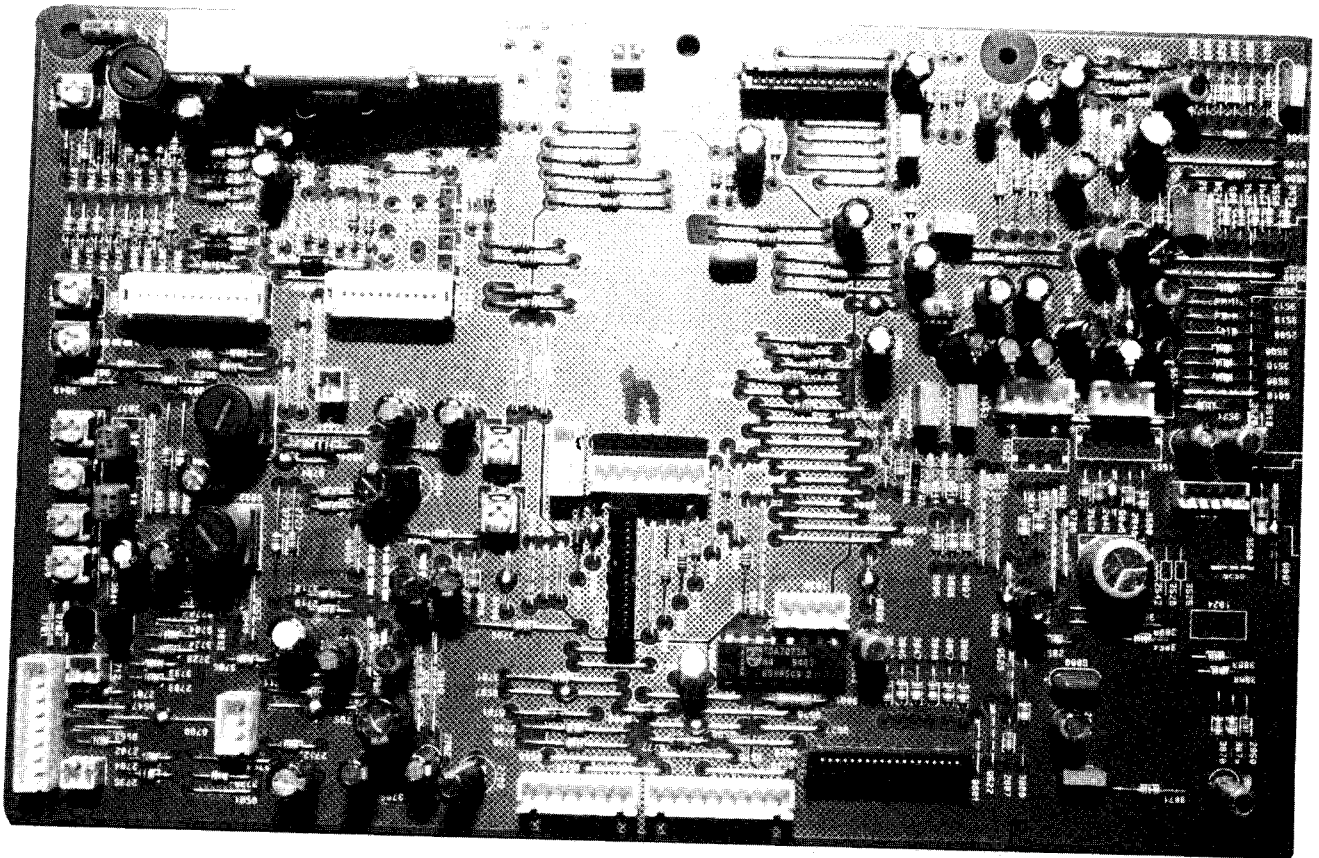
3200	4822 116 52256	2k2	5%	0,16W
3201	4822 116 52269	3k3	5%	0,5W
3202	4822 116 52231	820R	5%	0,5W
3203	4822 116 52231	820R	5%	0,5W
3204	4822 116 52269	3k3	5%	0,5W
3205	4822 116 52276	3k9	5%	0,5W
3206	4822 116 52238	12k	5%	0,5W
3209	4822 116 52264	27k	5%	0,5W
3213	4822 116 52271	33k	5%	0,16W
3214	4822 116 52271	33k	5%	0,16W
3215	4822 116 52271	33k	5%	0,16W
3216	4822 116 52191	33R	5%	0,5W
3217	4822 116 52271	33k	5%	0,16W
3218	4822 116 52271	33k	5%	0,16W
3219	4822 116 52271	33k	5%	0,16W
3220	4822 116 52284	47k	5%	0,5W
3221	4822 116 52264	27k	5%	0,5W
3222	4822 116 83874	220k	5%	0,5W
3223	4822 116 83874	220k	5%	0,5W
3224	4822 116 83874	220k	5%	0,5W
3243	4822 050 11002	1k	5%	0,2W
3244	4822 050 11002	1k	5%	0,2W
3245	4822 050 11002	1k	5%	0,2W
3246	4822 116 52263	2k7	5%	0,5W
3247	4822 116 83874	220k	5%	0,5W
3248	4822 116 52264	27k	5%	0,5W
3249	4822 116 52224	470R	5%	0,5W
3250	4822 116 52244	15k	5%	0,5W
3251	4822 116 52263	2k7	5%	0,5W
3252	4822 116 83864	10k	5%	0,5W
3253	4822 116 52289	5k6	5%	0,16W
3254	4822 116 52296	6k8	5%	0,5W
3255	4822 116 83882	39k	5%	0,5W
3256	4822 116 52257	22k	5%	0,5W
3257	4822 116 52213	180R	5%	0,5W
3258	4822 116 52234	100k	5%	0,5W
3260	4822 116 52213	180R	5%	0,5W

RESISTORS

3261	4822 050 24708	4R7	1%	0,6W
3262	4822 116 52175	100R	5%	0,5W
3263	4822 100 12268	20k		POTMETER
3264	4822 100 12268	20k		POTMETER
3270	4822 116 52297	68k	5%	0,5W
3271	4822 116 52284	47k	5%	0,5W
3273	4822 050 11002	1k	5%	0,2W
3275	4822 116 52298	680k	5%	0,5W
3275	4822 116 52298	680k	5%	0,5W
3276	4822 116 52285	470k	5%	0,5W
3278	4822 116 52303	8k2	5%	0,5W
3279	4822 116 52234	100k	5%	0,5W
3280	4822 116 83864	10k	5%	0,5W
3281	4822 116 52195	47R	5%	0,5W

CAPACITORS

2200	4822 124 41579	10μF	20%	50V
2201	4822 124 41579	10μF	20%	50V
2201	4822 124 41579	10μF	20%	50V
2202	4822 124 40433	47μF	20%	25V
2203	4822 124 41997	470μF	20%	10V
2204	4822 124 41579	10μF	20%	50V
2205	4822 124 40242	1μF	20%	63V
2206	4822 124 40746	0,22μF	20%	63V
2207	4822 124 40746	0,22μF	20%	63V
2208	4822 124 40433	47μF	20%	25V
2209	4822 124 41997	470μF	20%	10V
2210	4822 124 41579	10μF	20%	50V
2211	4822 126 12882	100nF	20%	50V
2212	4822 126 12882	100nF	20%	50V
2213	4822 126 12882	100nF	20%	50V
2218	4822 124 41579	10μF	20%	50V
2219	4822 124 41579	10μF	20%	50V
2220	4822 124 41579	10μF	20%	50V
2221	4822 124 40242	1μF	20%	63V
2222	4822 122 33197	1nF	10%	50V
2223	4822 124 41579	10μF	20%	50V
2224	4822 124 41407	0,47μF	20%	63V
2225	4822 124 40849	330μF	20%	16V
2233	4822 126 12339	2,2nF	10%	16V
2234	5322 121 42386	100nF	5%	63V
2235	4822 126 12339	2,2nF	10%	16V
2236	5322 121 42386	100nF	5%	63V
2237	4822 121 51387	10nF	20%	16V
2238	4822 124 40242	1μF	20%	63V
2239	4822 122 33195	100pF	10%	50V
2240	4822 122 33195	100pF	10%	50V
2241	4822 121 51387	10nF	20%	16V
2242	4822 124 40746	0,22μF	20%	63V
2243	4822 121 43526	47nF	5%	100V
2252	4822 126 12572	6,8pF	5%	50V
2253	4822 122 33197	1nF	10%	50V
2254	4822 122 33195	100pF	10%	50V
2255	4822 122 33195	100pF	10%	50V
2256	4822 122 33195	100pF	10%	50V
2257	4822 122 33169	680pF	10%	50V
2258	4822 122 33195	100pF	10%	50V
2260	4822 124 41579	10μF	20%	50V
2261	4822 124 41579	10μF	20%	50V
2262	4822 124 41579	10μF	20%	50V
2263	4822 124 41997	470μF	20%	10V

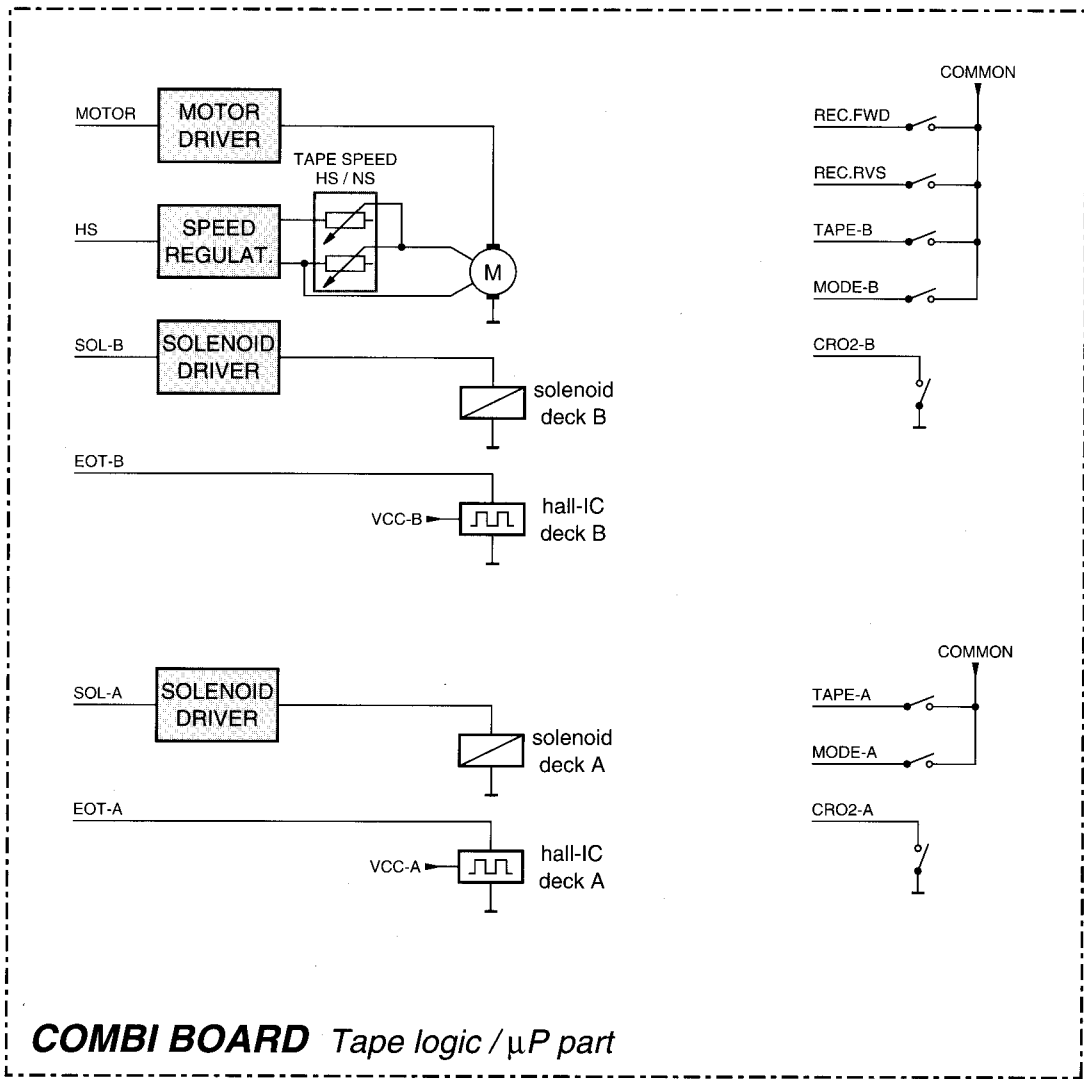
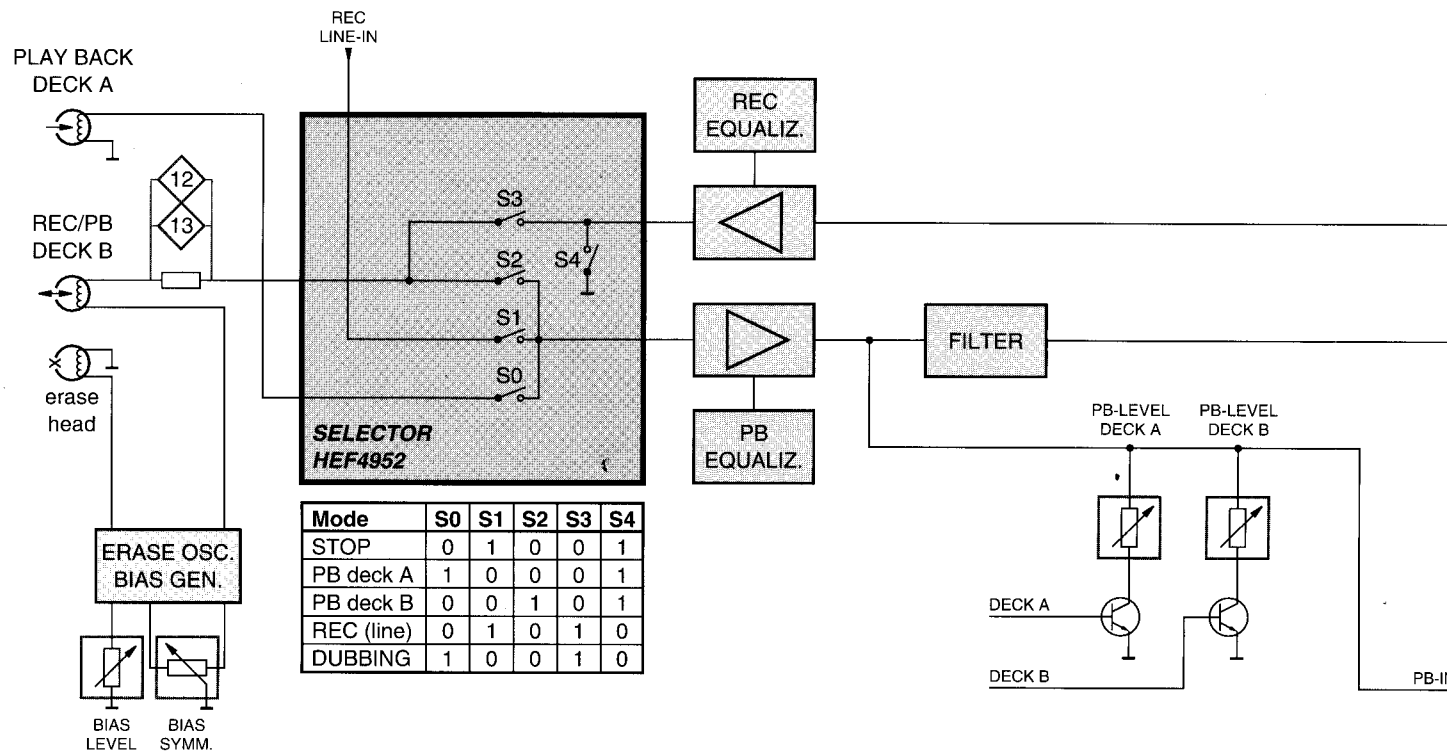


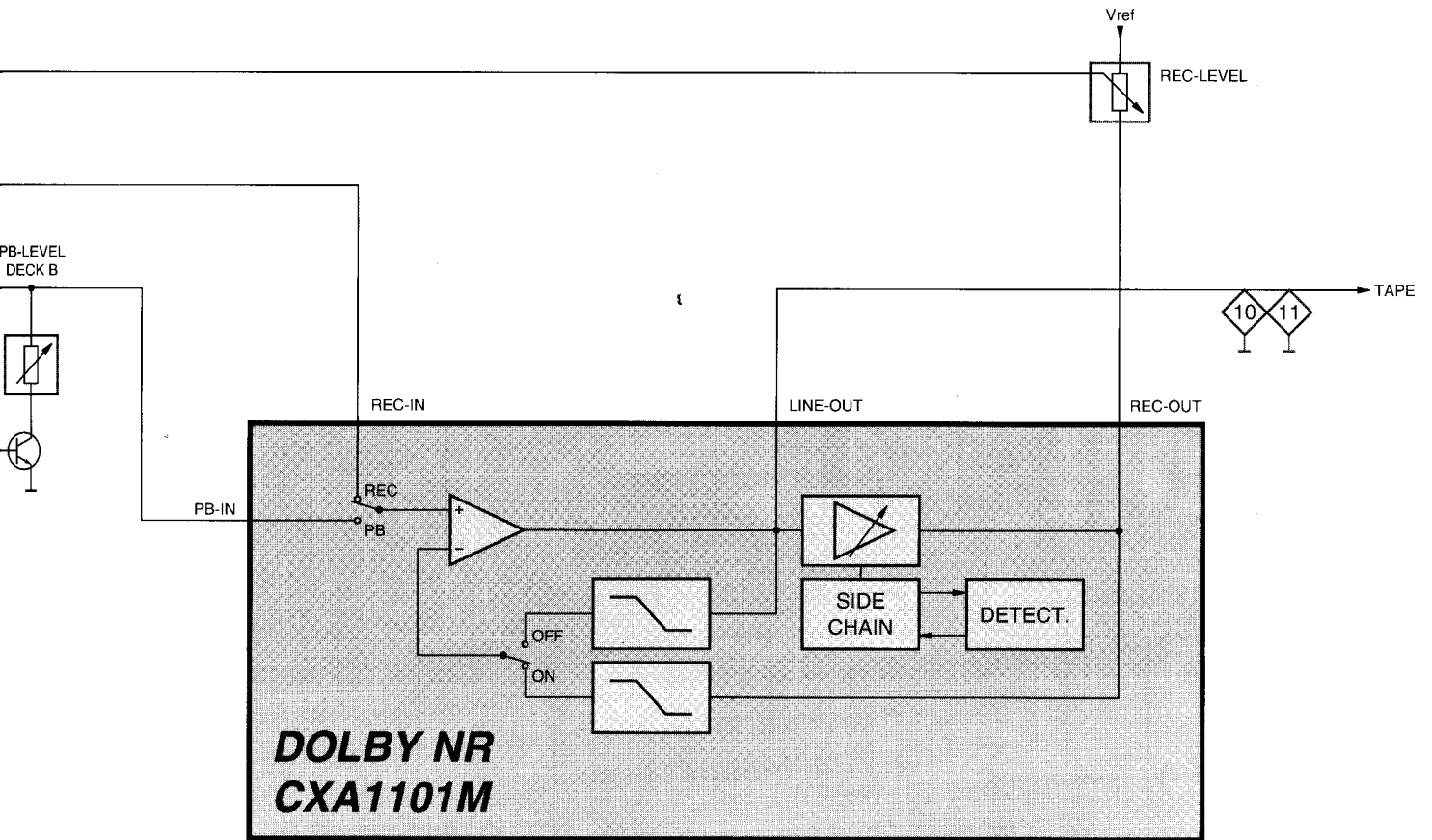
COMBI BOARD

TABLE OF CONTENTS

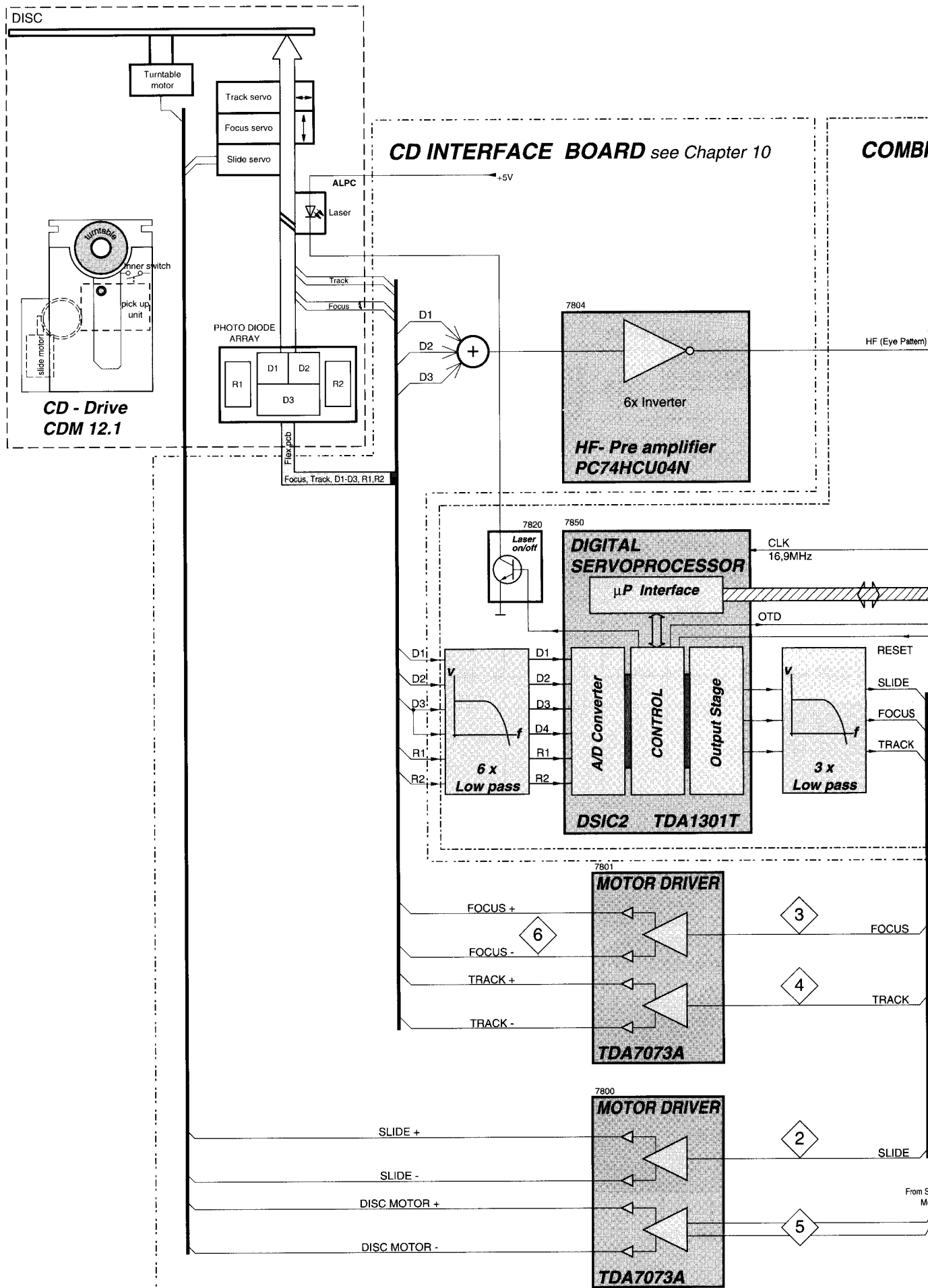
Functional Diagram tape part	9-2
Functional Diagram CD	9-3
Functional Diagram AF-part	9-4
Adjustment Table Tape	9-5
Circuit Diagram Tape logic/ μ P-part	9-6
Component Layout Combi Board	9-7
Circuit Diagram Tape signal part	9-9
Circuit Diagram Tape CD-part	9-10
Component Layout combi board	9-11
Circuit Diagram Combi AF-part	9-13
Partslist	9-14

FUNCTIONAL DIAGRAM TAPE PART



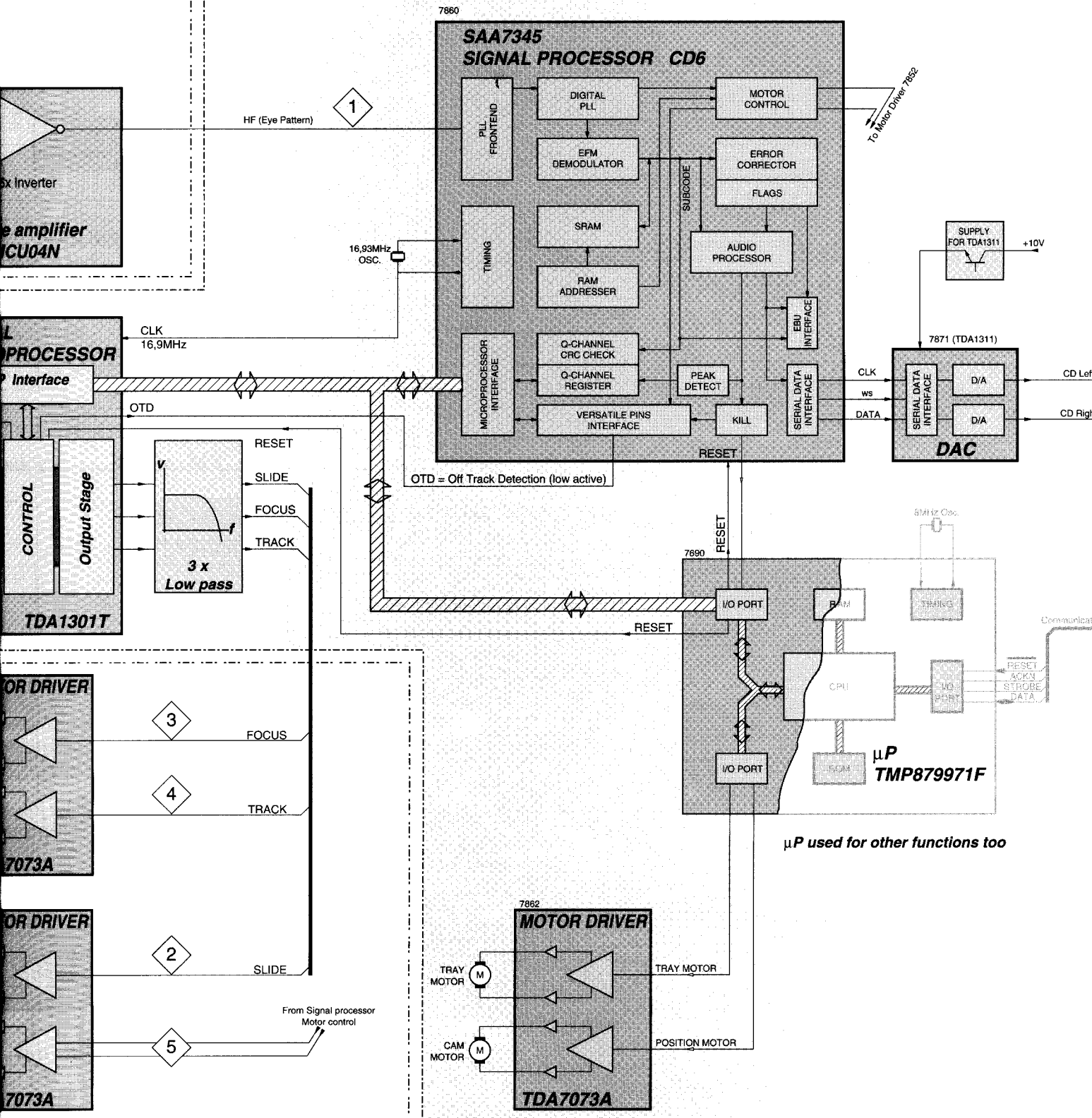


FUNCTIONAL DIAGRAM CD-PART

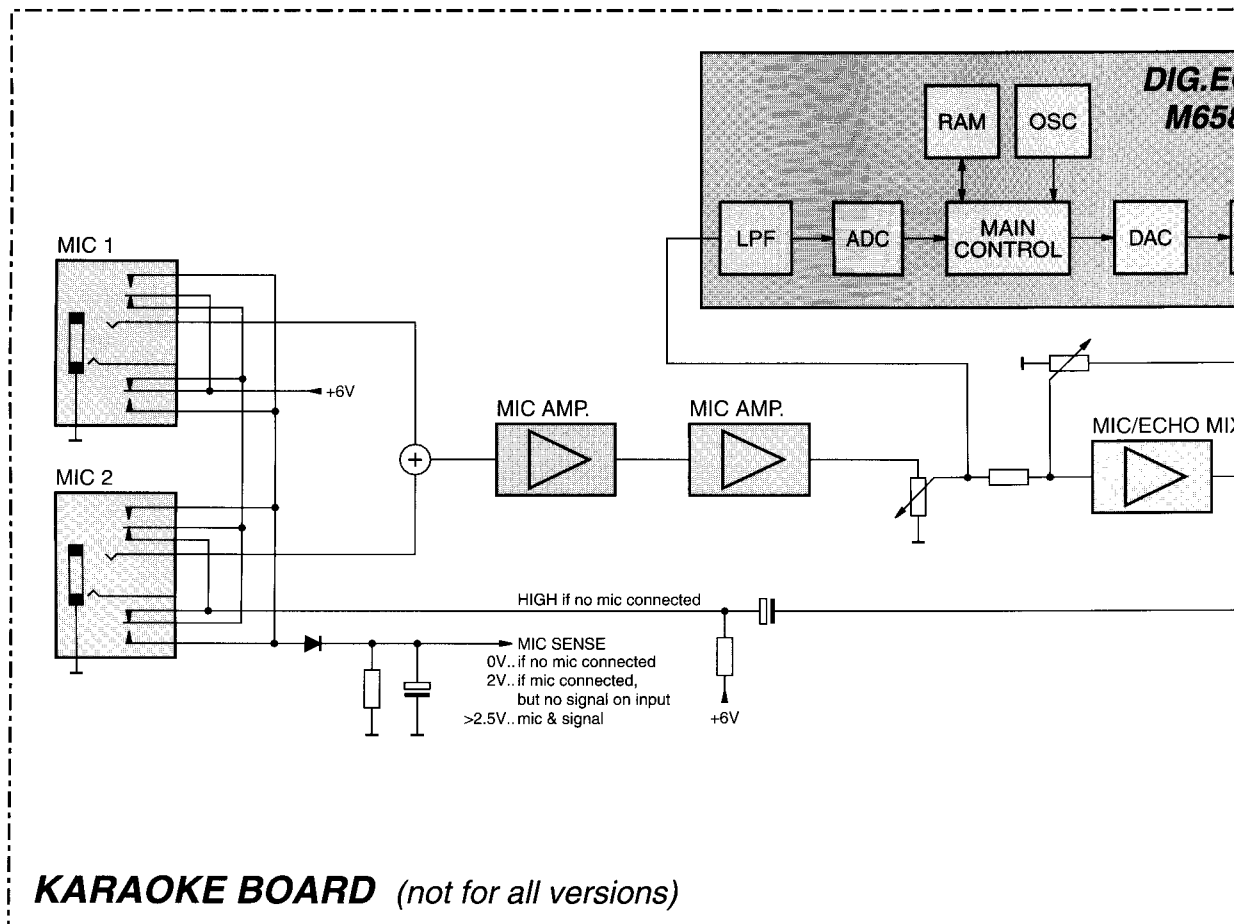
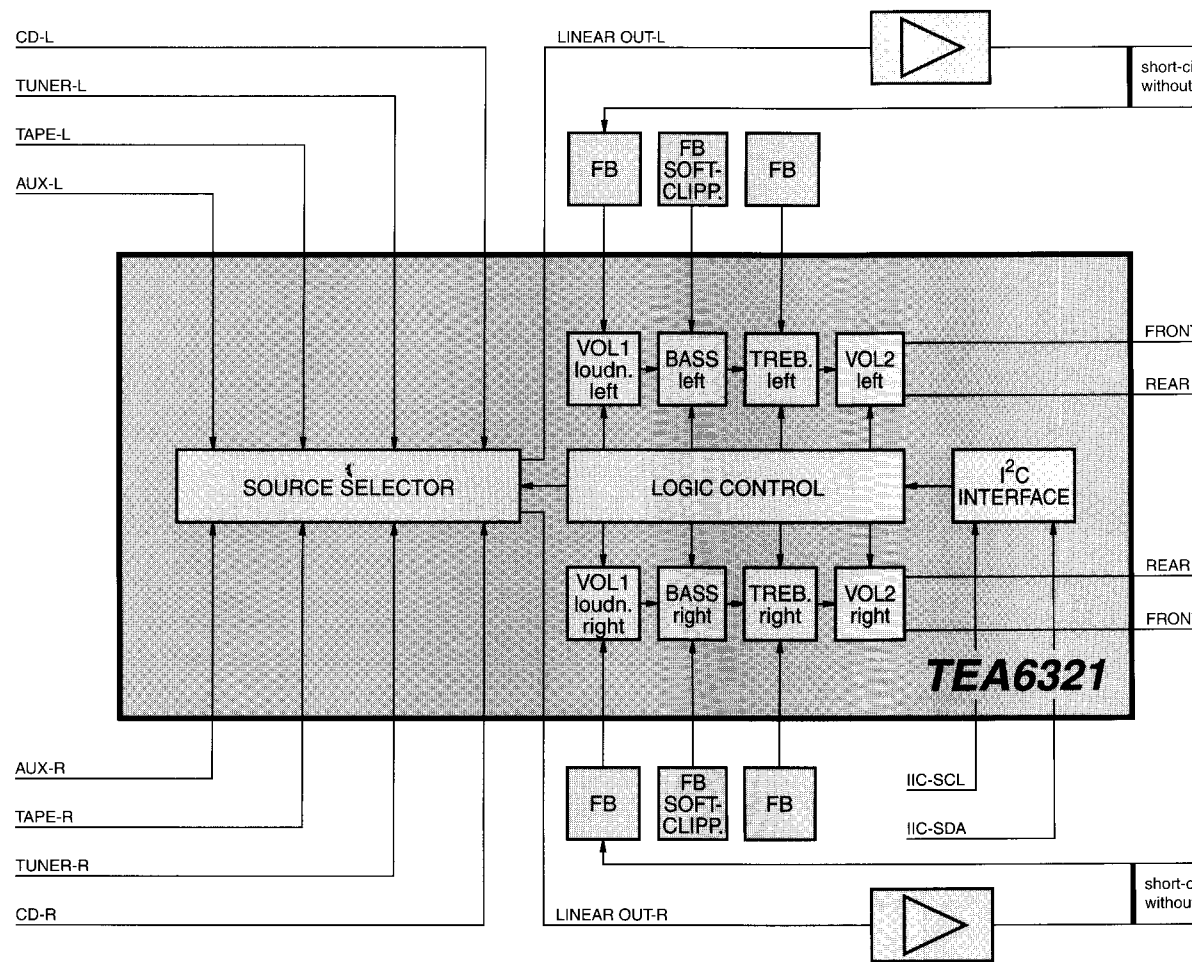


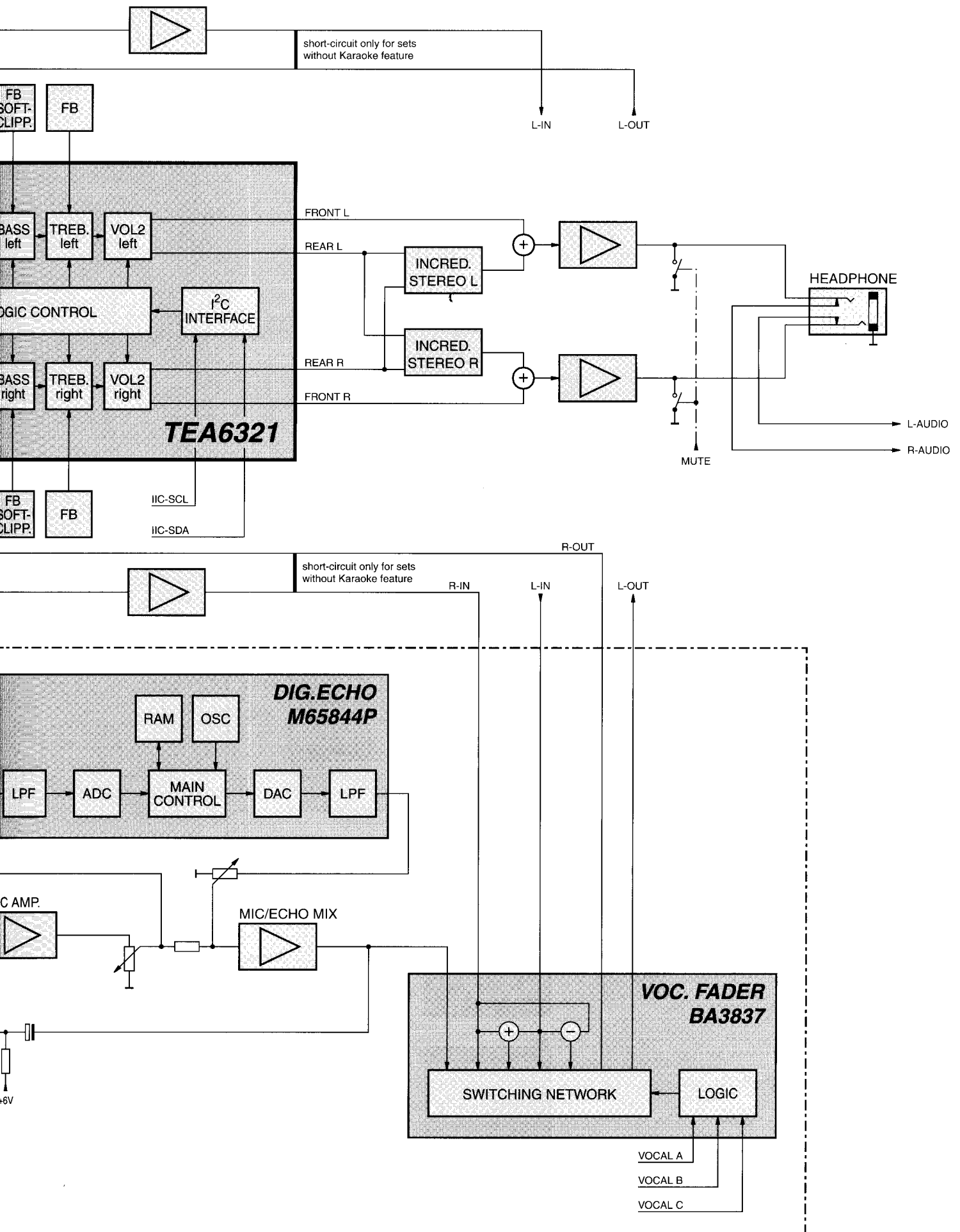
RD see Chapter 10

COMBI BOARD see Chapter 9



FUNCTIONAL DIAGRAM AF-PART





General

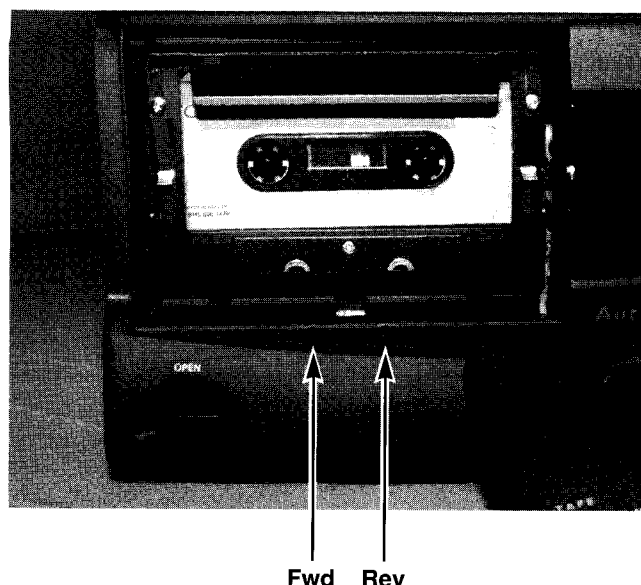
	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with to	
ADJUST MOTOR SPEED						
HIGH SPEED	SBC420 (4822 397 30071) 3150Hz	DUBBING	10 or 11 LEFT RIGHT	frequency counter	3682	5670Hz ±0.5%
NORMAL SPEED		PLAY			3684	3150Hz ±0.5%
CHECK WOW & FLUTTER (DECK1 AND DECK2)						
WOW & FLUTTER	SBC420 (4822 397 30071) 3150Hz	PLAY	10 or 11 LEFT RIGHT	W&F-meter	check only	≤0.35% unwtd.
ADJUST AZIMUTH (DECK1 AND DECK2)						
NORM. DIRECTION	SBC420 (4822 397 30071) 10kHz	PLAY FWD	10 & 11 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
REV. DIRECTION		PLAY REV			right hand screw	

Playback

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST withto	
ADJUST PLAYBACK LEVEL						
DECK1	DOLBY REF. (4822 397 30071) 200nWb/m	PLAY	10 & 11 LEFTRIGHT	mV-meter	3635(L), 3636(R)	535mV ±0.5dB
DECK2					3641(L), 3642(R)	
CHECK PLAYBACK FREQUENCY RESPONSE (DECK1 AND DECK2)						
PB FREQU. RESP.	SBC420 (4822 397 30071)	PLAY	10 & 11 LEFTRIGHT	mV-meter	check only	limits see fig.1

AZIMUTH ALIGNMENT

Remove ornamental part of cassette door.
For alignment use a small cross slot screwdriver.



Fwd Rev

Record

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST withto	
PRE-ADJUST BIAS AND BIAS-SYMMETRY						
CrO ₂	CrO ₂	RECORD	12 & 13 LEFTRIGHT	mV-meter	3773 & 3785	110mV & left=right
FERRO	FERRO	RECORD			check only	71mV ±0.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
37mV at AUX-IN, 100Hz,250Hz,1kHz, 10kHz,12.5kHz	CrO ₂	RECORD				
	RECORDED CASSETTE	PLAY	10 & 11 LEFTRIGHT	mV-meter	check only	limits see fig.2
100mV at AUX-IN, 1kHz	CrO ₂	RECORD				
	RECORDED CASSETTE	PLAY	10 & 11 LEFTRIGHT	THD-meter	check only	≤3%
Remark: If high frequencies are not within limits, decrease bias and remeasure. If distortion is too high increase bias and remeasure.						
ADJUST RECORD LEVEL						
AUX-IN	CrO ₂	RECORD	10 & 11 LEFTRIGHT	mV-meter	LF-generator	330Hz 170mV
	CrO ₂	RECORD	12 & 13 LEFTRIGHT	mV-meter	3655 & 3556	5mV ¹⁾
¹⁾ Remark: Use low pass filter to attenuate the bias component, or short-circuit base of 7783 to ground.						
RECORD LEVEL						
	RECORDED CASSETTE	PLAY	10 & 11 LEFTRIGHT	mV-meter	check only	330Hz 170mV ±0.5dB
Remark: If measured value is out of limit, re-adjust record level and remeasure.						

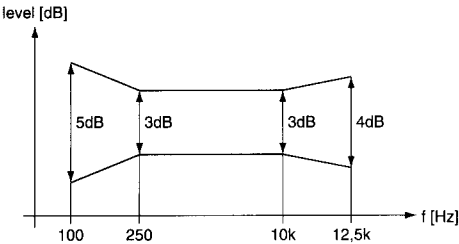


fig.1

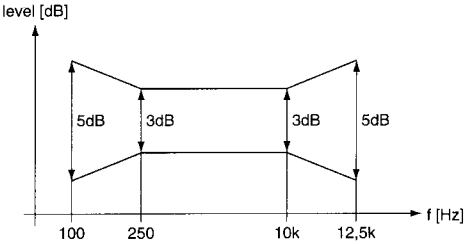


fig.2



2539 E 5	2707 A 8	2838 A 4	3532 D 3	3592 E 2	3665 C 7	3713 A 8	3752 E 7	3851 B 2	4503 A 9	4543 A 5	4597 E 5	4659 D 6	4699 C 5	7502 D 4	7660 E 8	T004 A 4	T031 C 6	T059 A 5	T091 E 6	T129 E 7	T169 A 8
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2559 E 3	2710 A 8	2841 A 3	3537 D 4	3605 E 5	3673 D 9	3719 B 8	3760 E 6	3856 A 3	4511 E 8	4547 B 7	4632 C 6	4662 D 5	4702 A 7	7505 E 2	7690 D 6	T007 A 4	T034 C 5	T063 A 5	T094 E 1	T132 D 8	T172 B 7
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2581 D 2	2721 B 8	2852 A 3	3540 C 4	3608 E 6	3676 D 8	3722 C 8	3764 A 7	3861 A 4	4518 D 8	4550 B 6	4635 C 6	4665 E 6	4705 A 6	7508 C 1	7720 A 8	T010 A 4	T037 C 5	T066 E 3	T097 D 1	T135 E 8	T175 C 8
2582 C 2	2723 B 7	2857 B 3	3545 C 4	3609 E 6	3677 D 8	3723 C 8	3765 A 6	3862 A 4	4519 D 8	4551 C 1	4636 C 6	4666 D 6	4710 B 5	7509 C 1	7730 B 8	T011 A 4	T038 C 6	T067 E 3	T098 D 1	T139 B 6	T176 C 9
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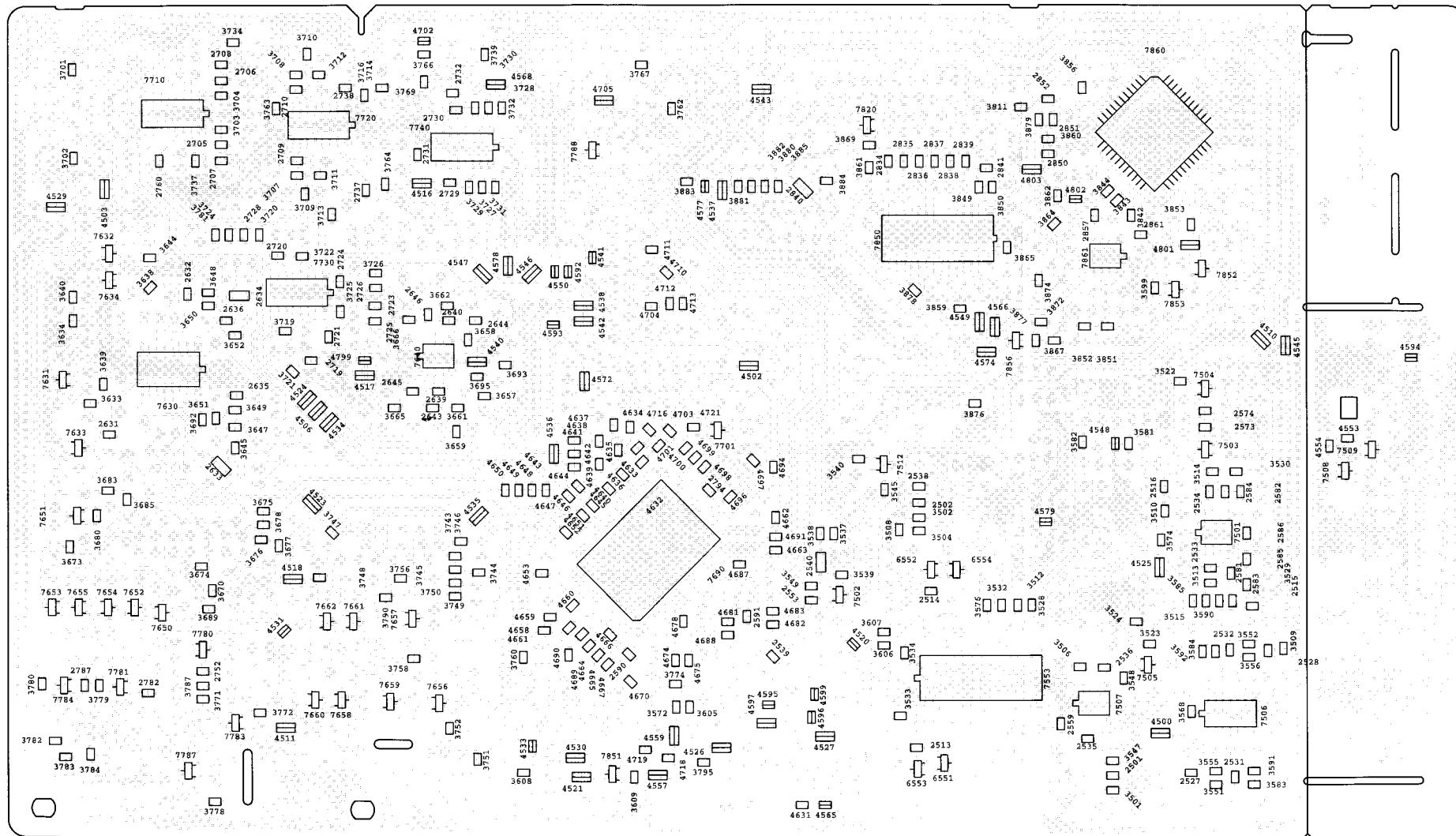
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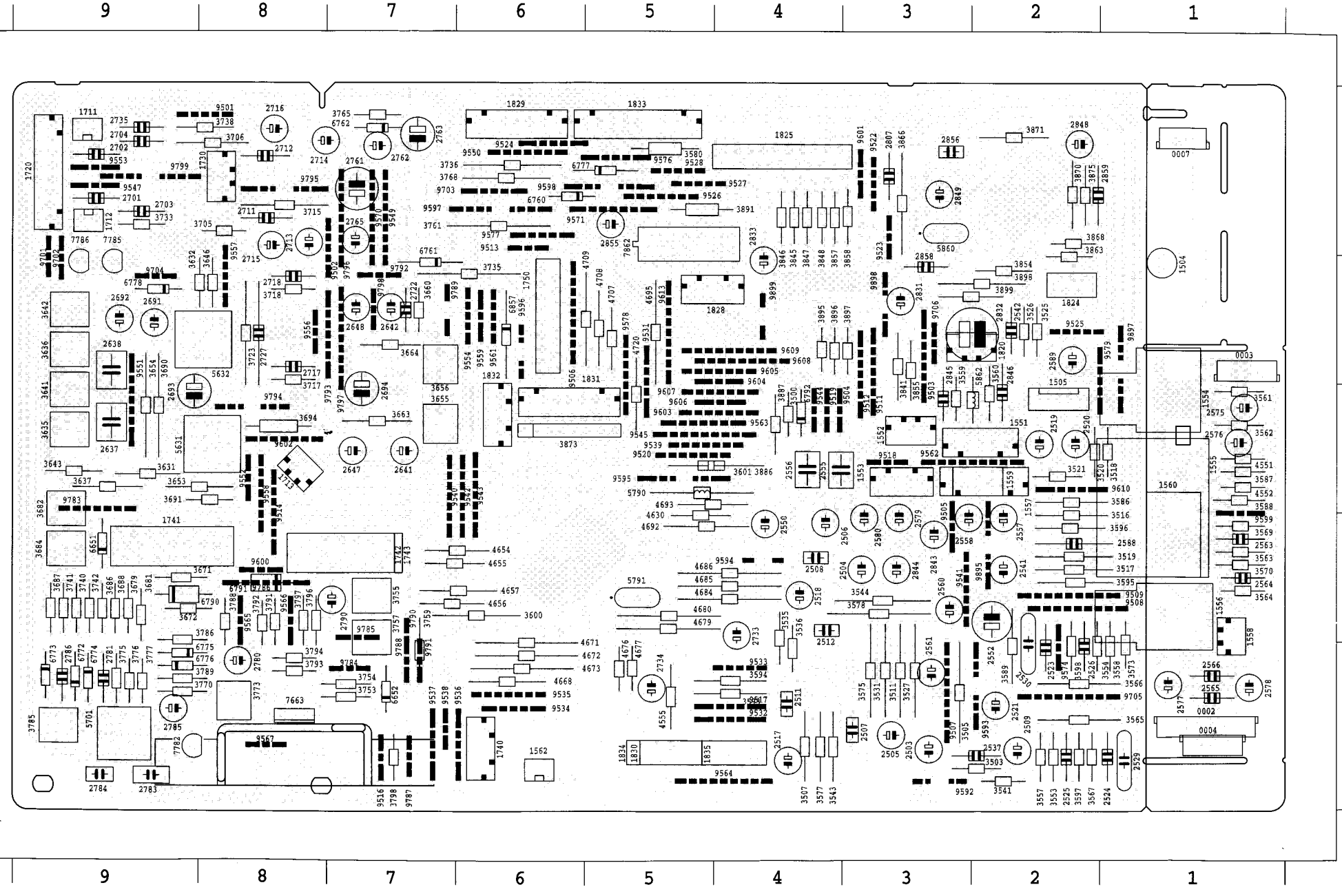
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2

1

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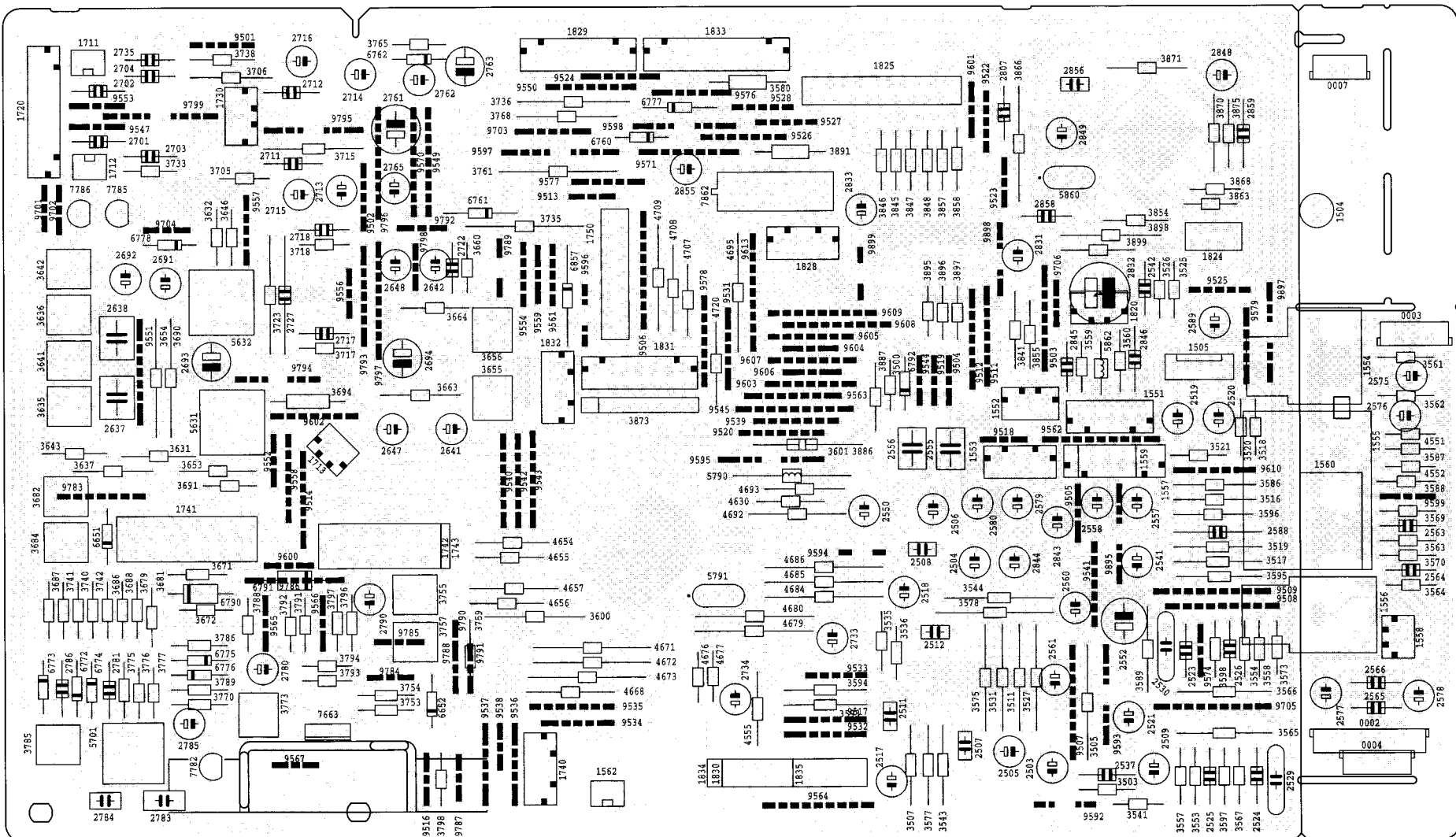
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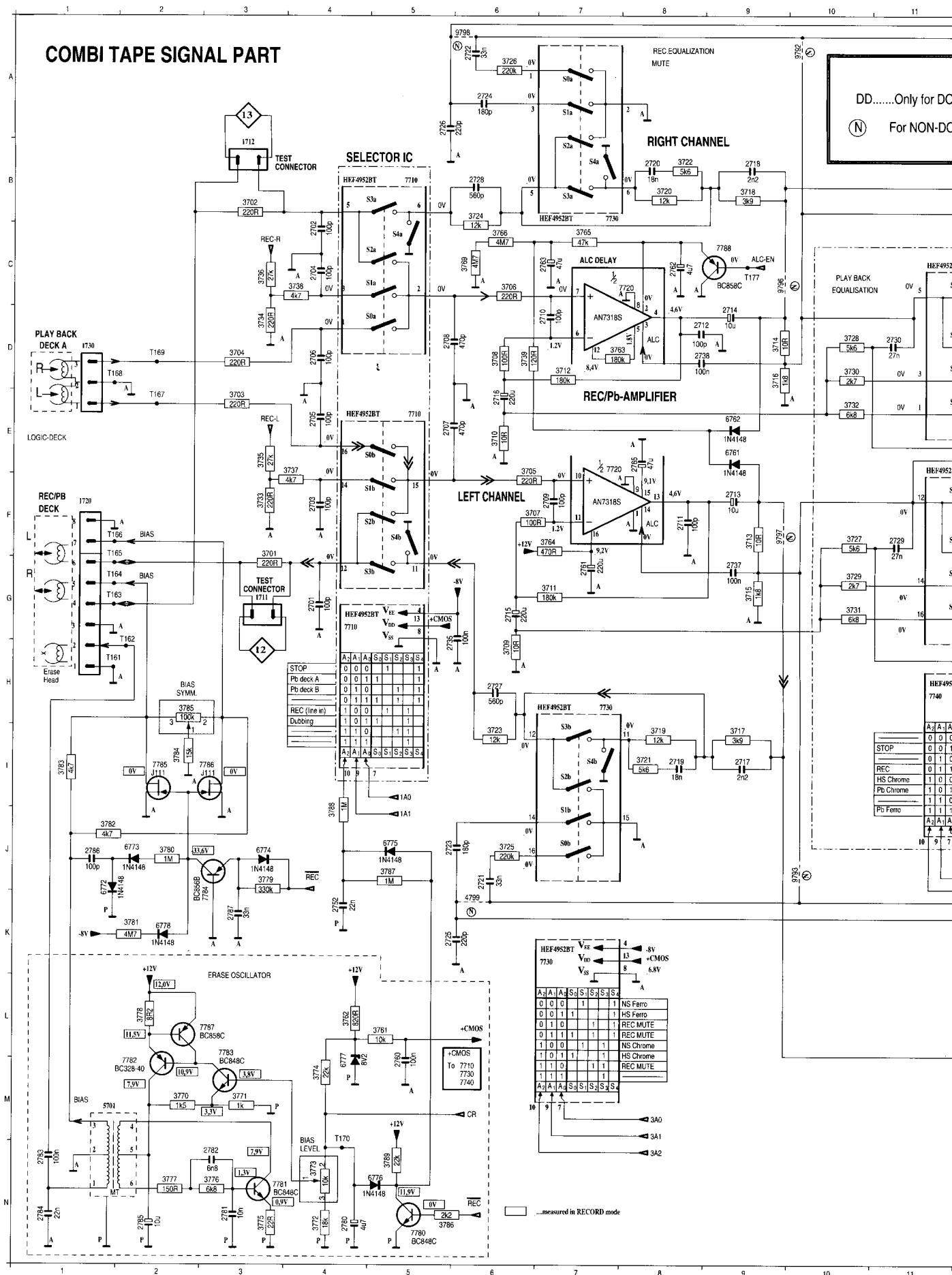
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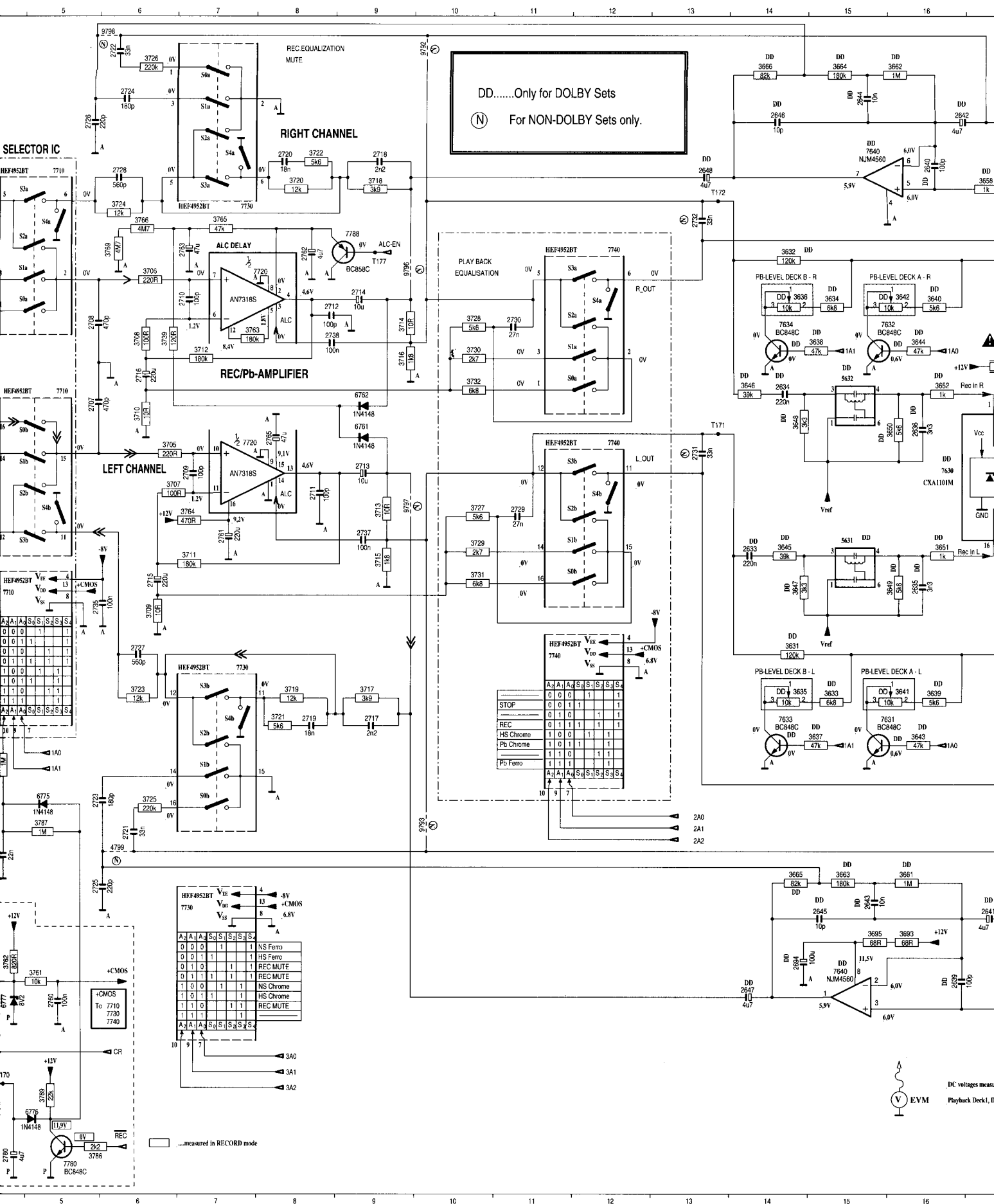
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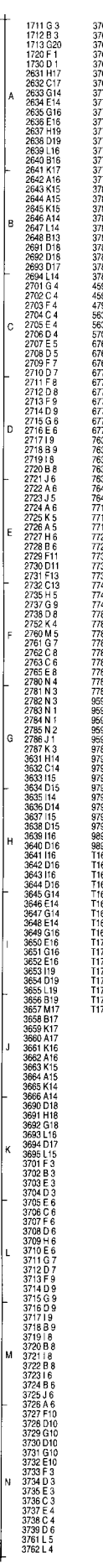
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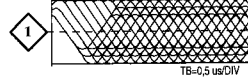


Ⓝ For NON-DOLBY Sets only.



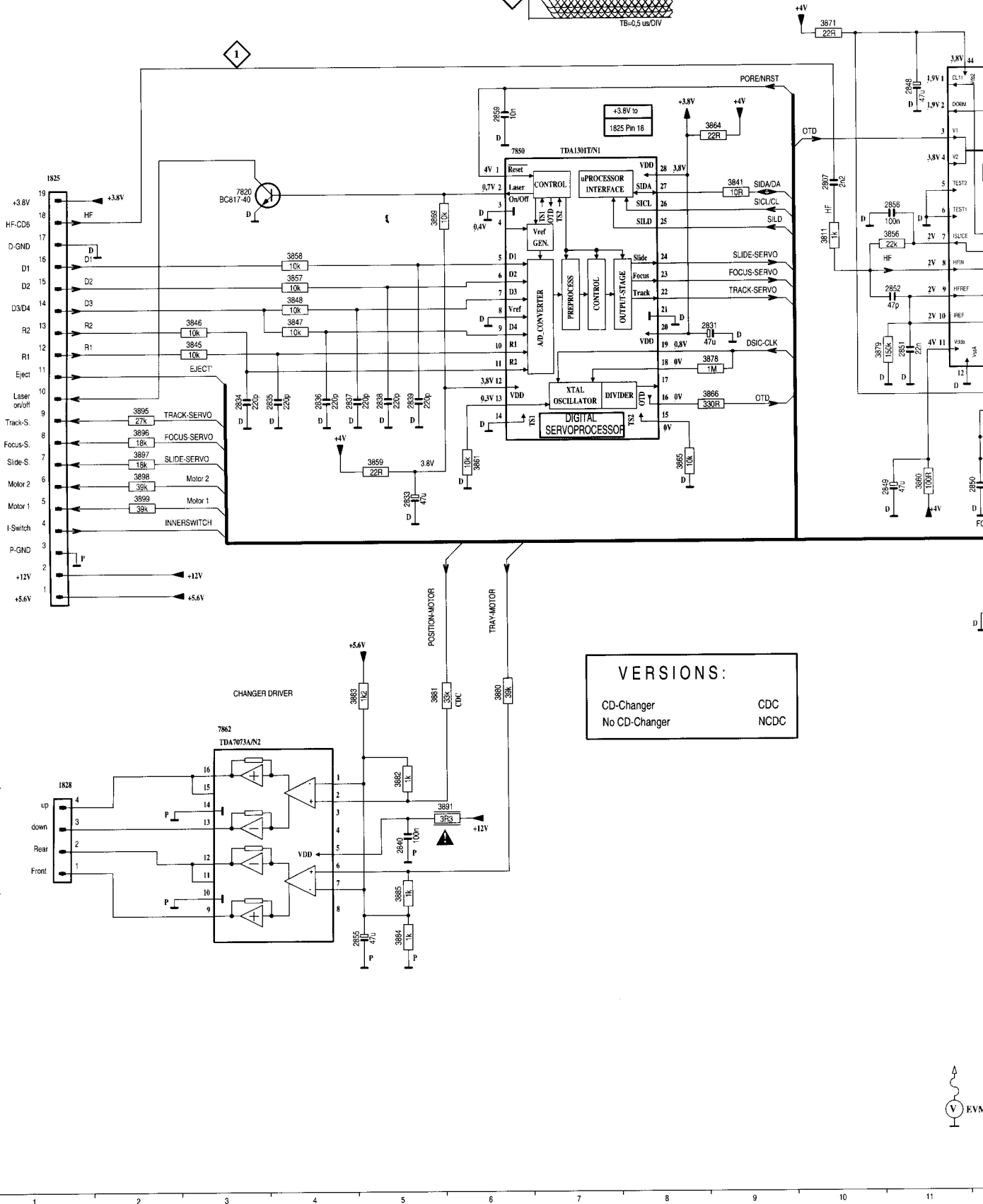
COMBI CD-PART

eye-pattern



TO / FROM CD(C) MODULE

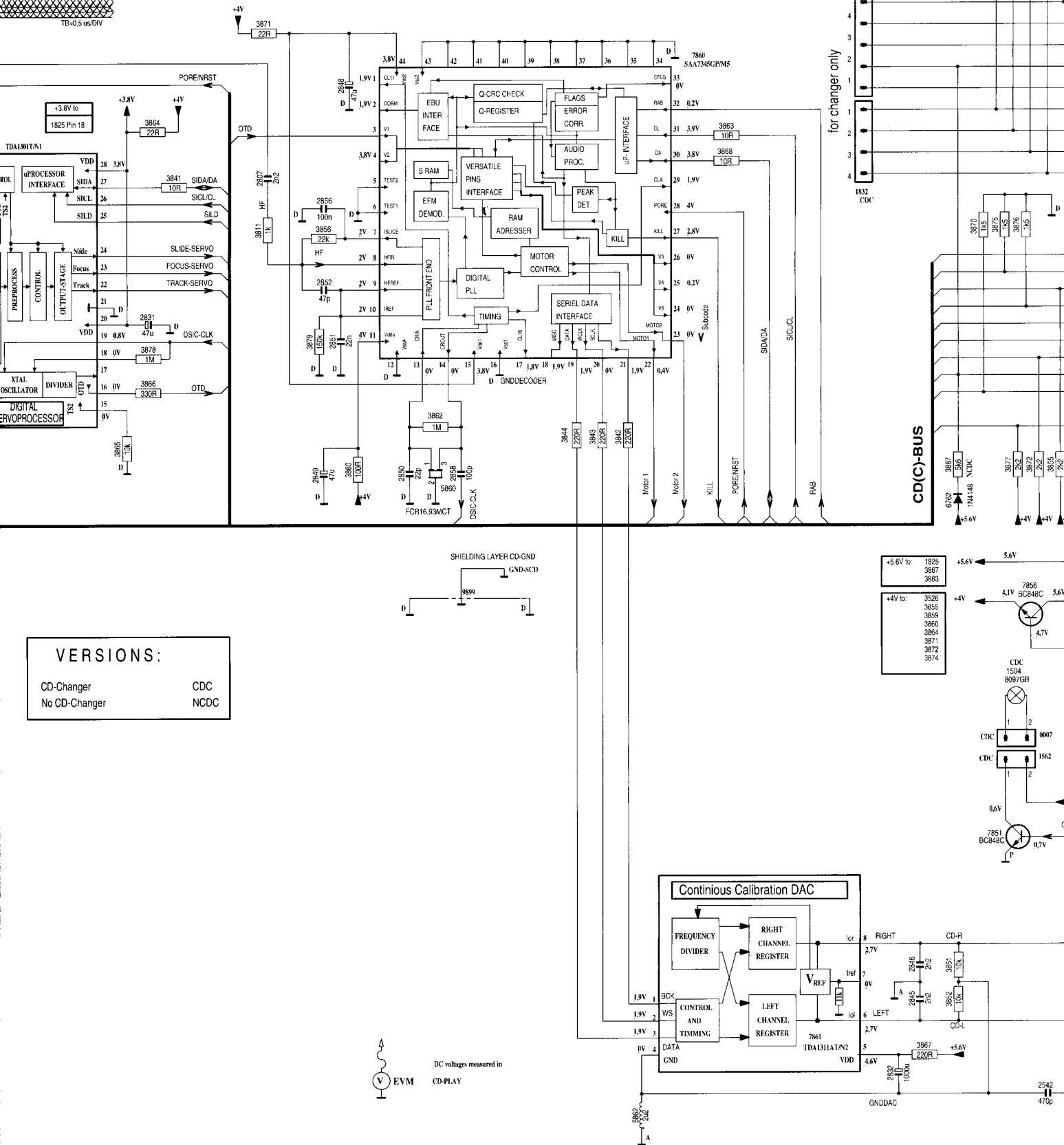
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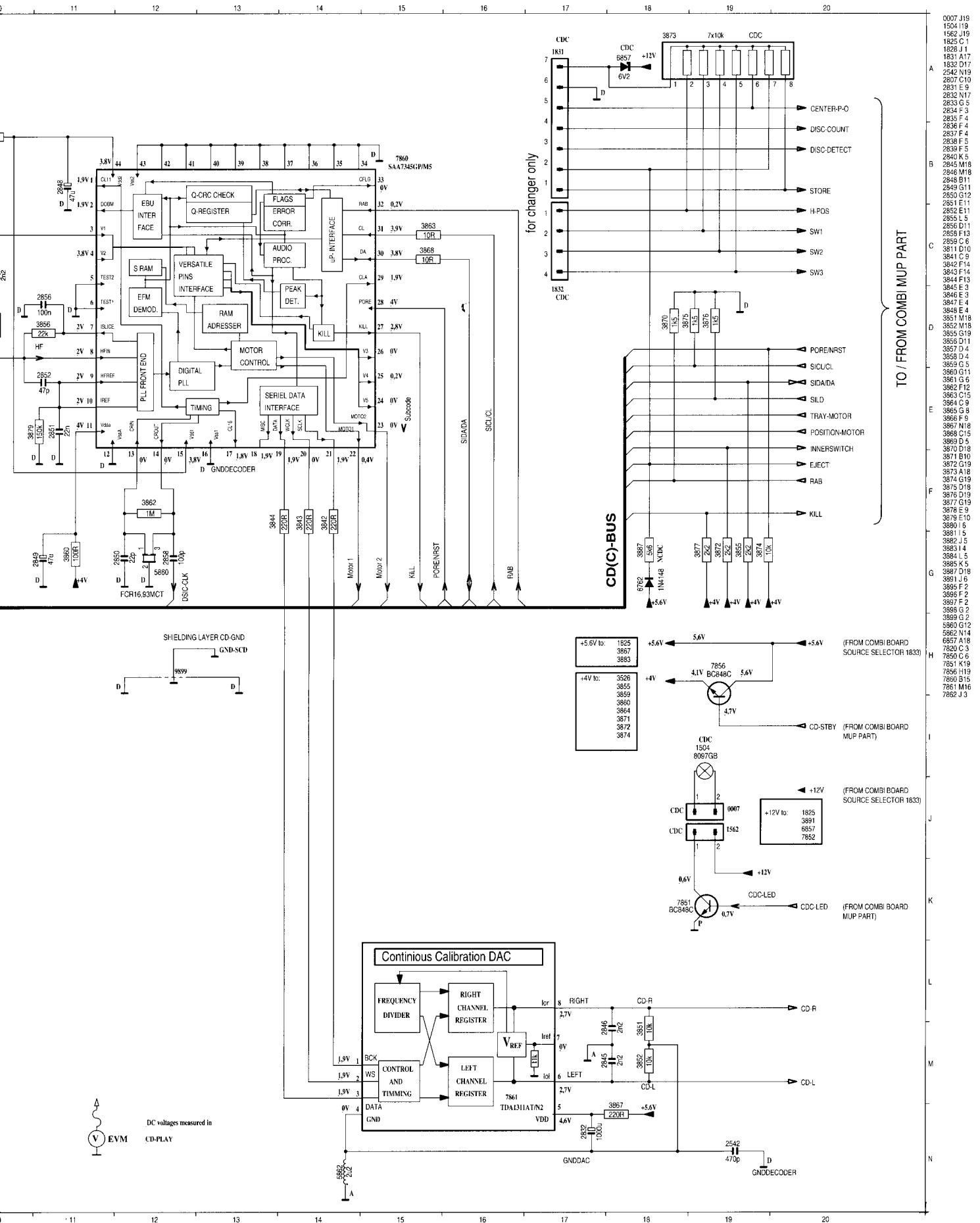


pattern

> 800 mVpp

TB=0.5 us/DIV





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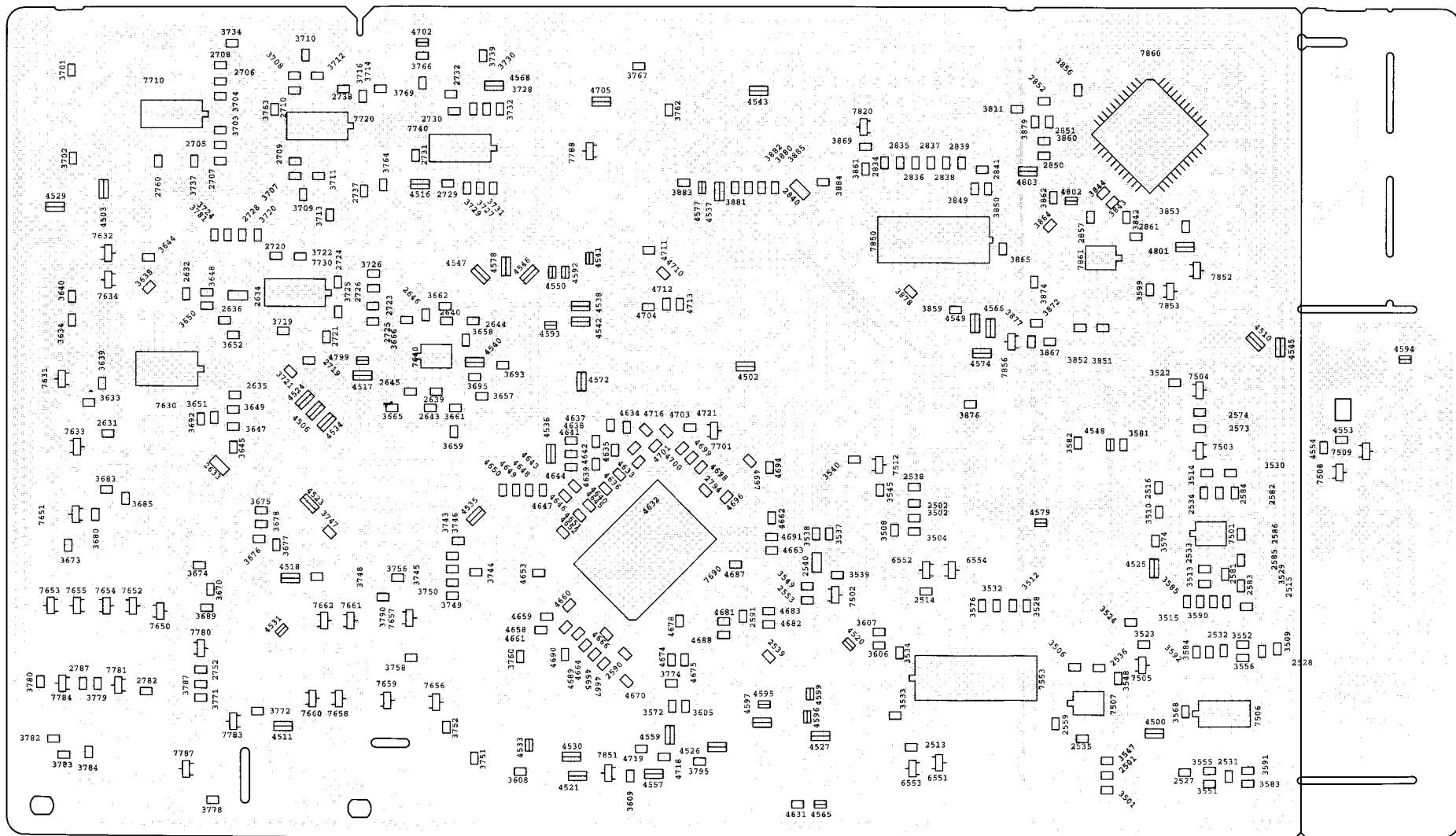
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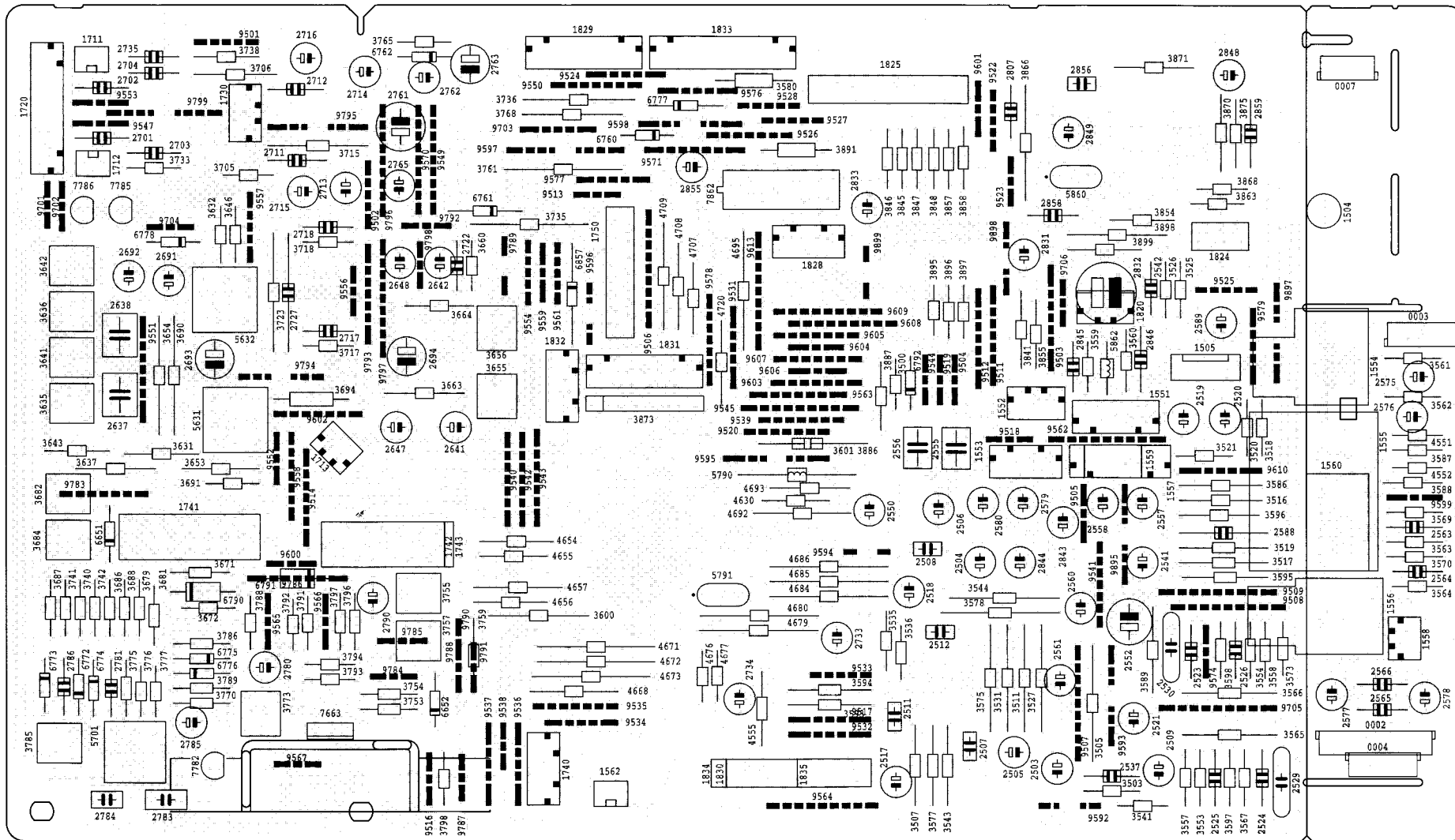
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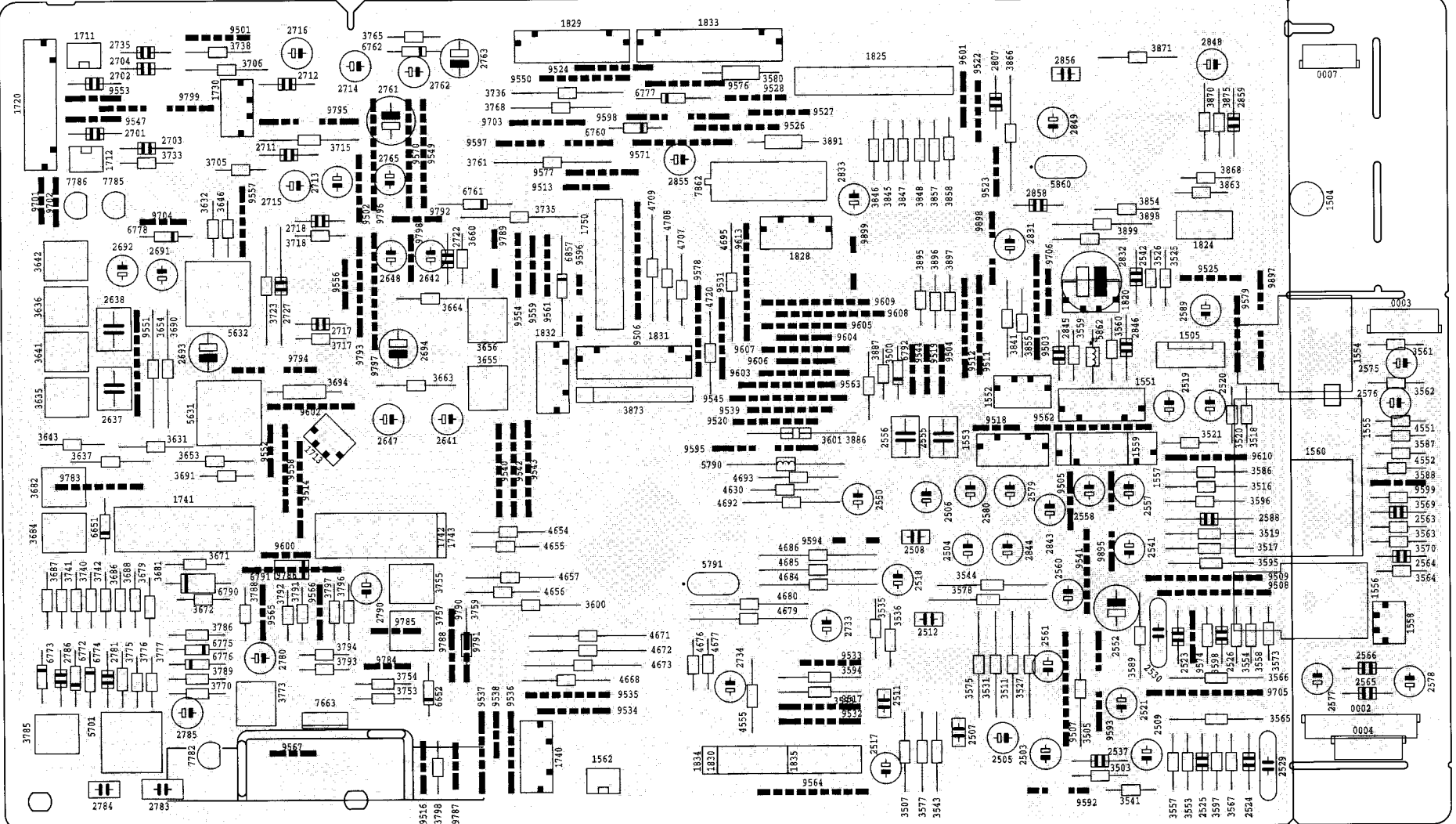
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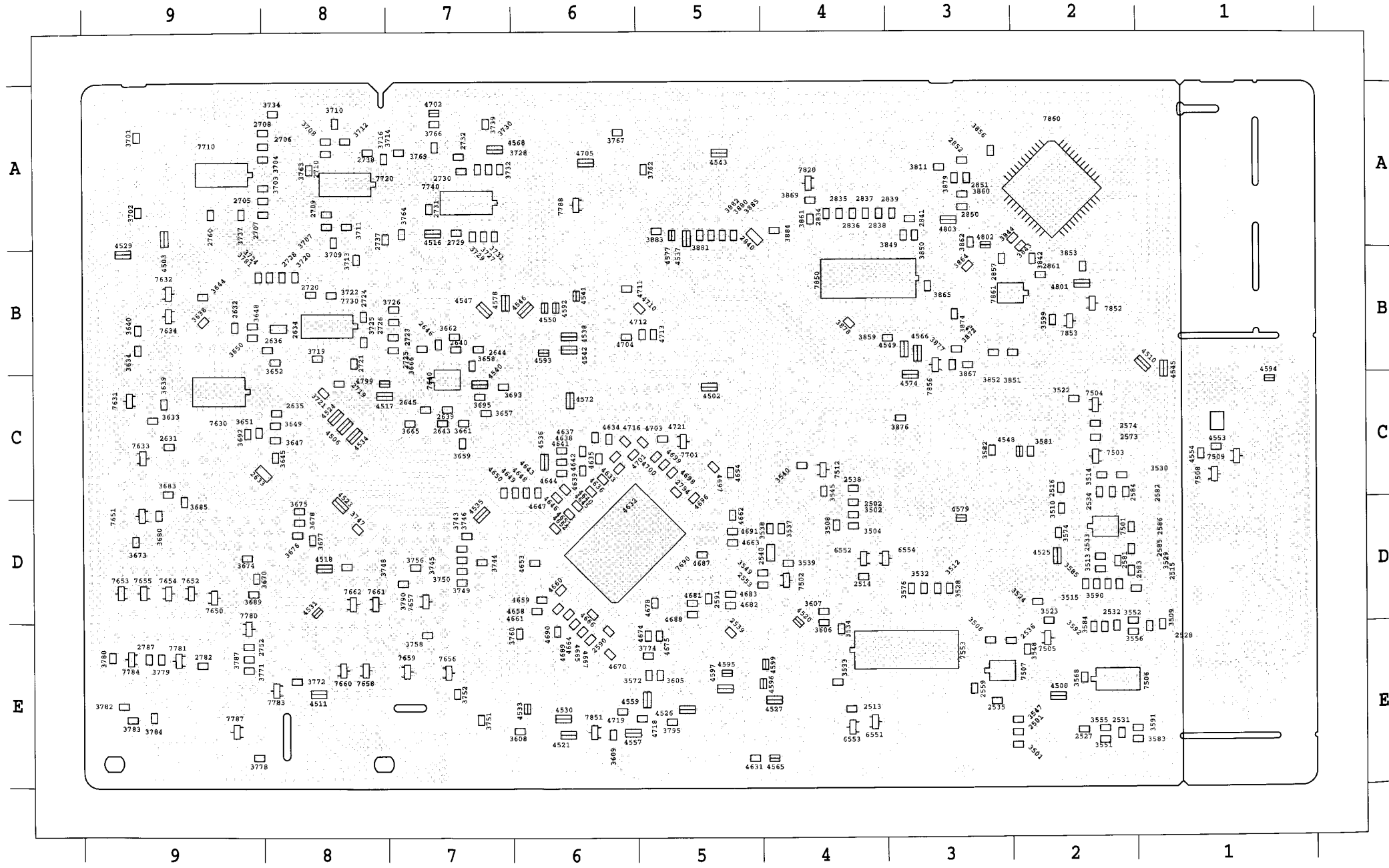
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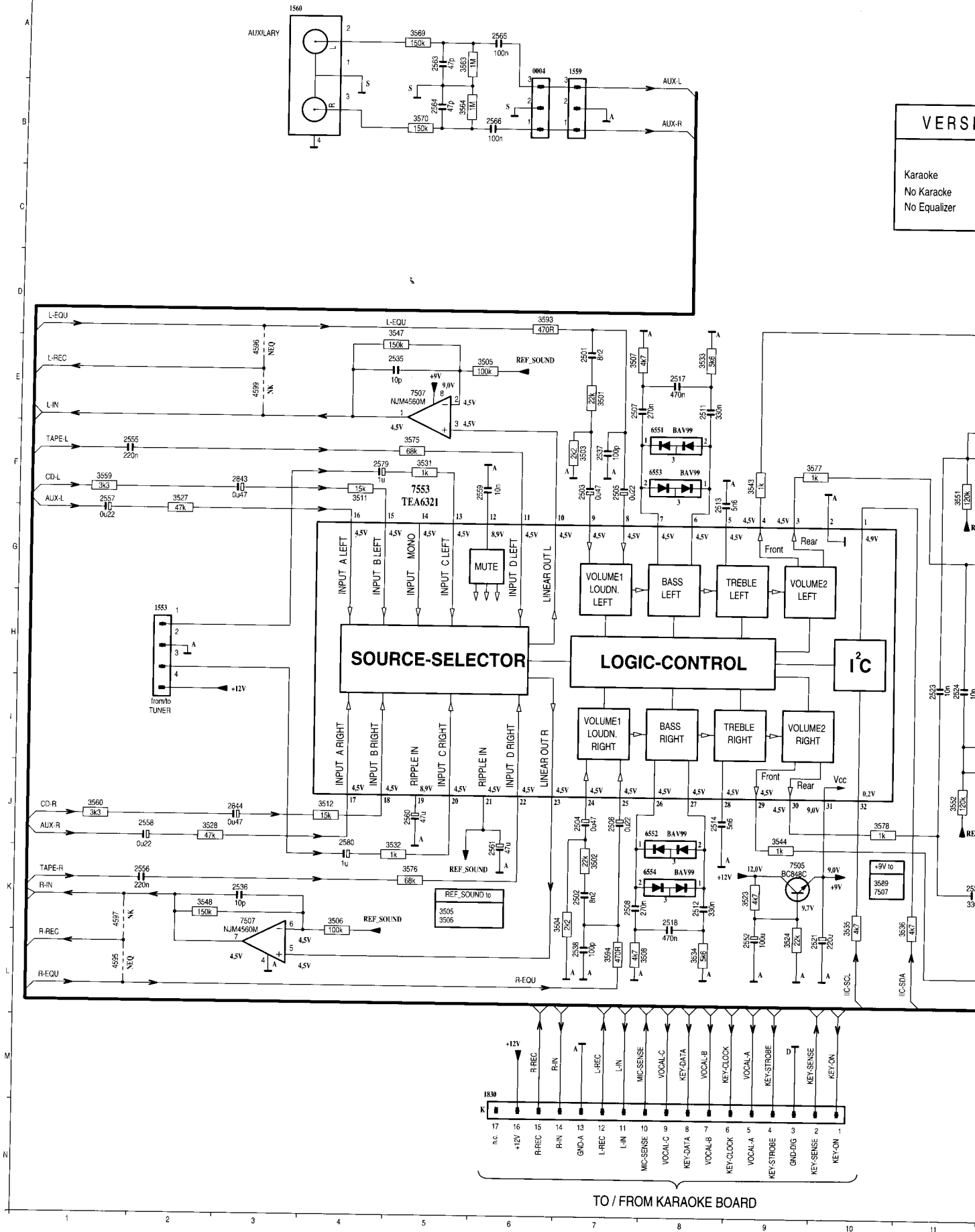
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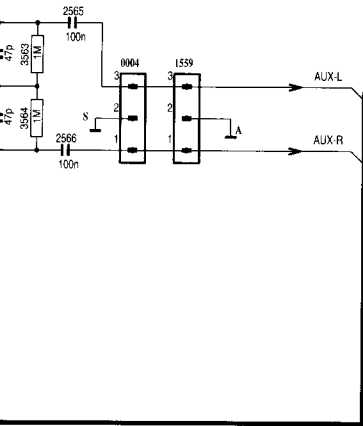


COMBI AF-PART

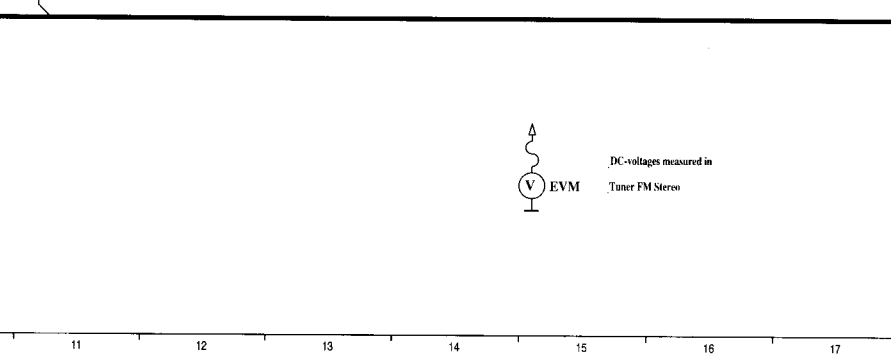
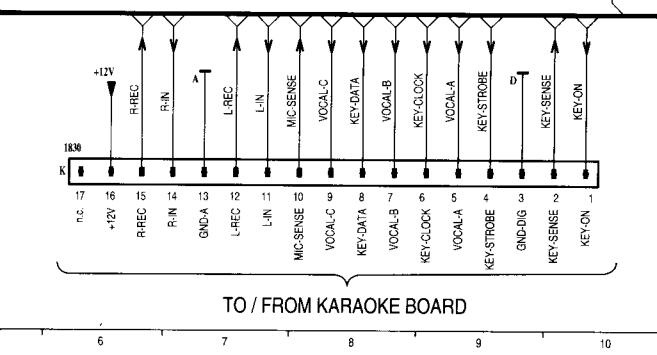
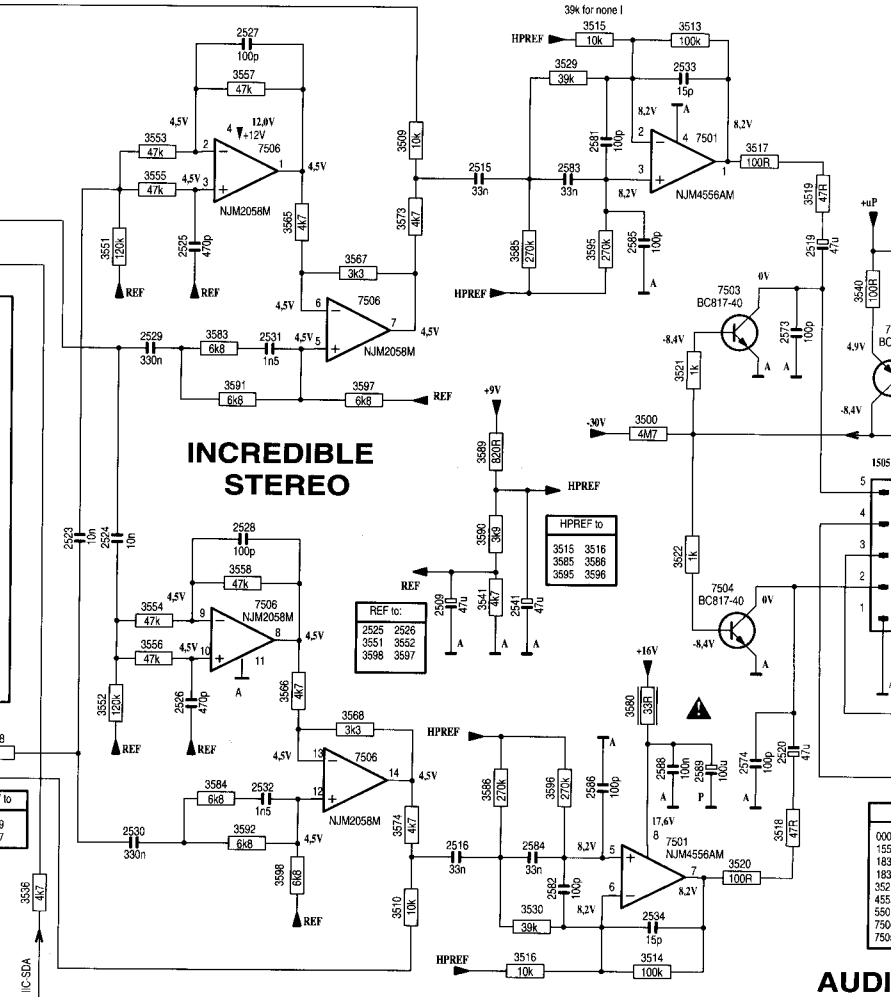
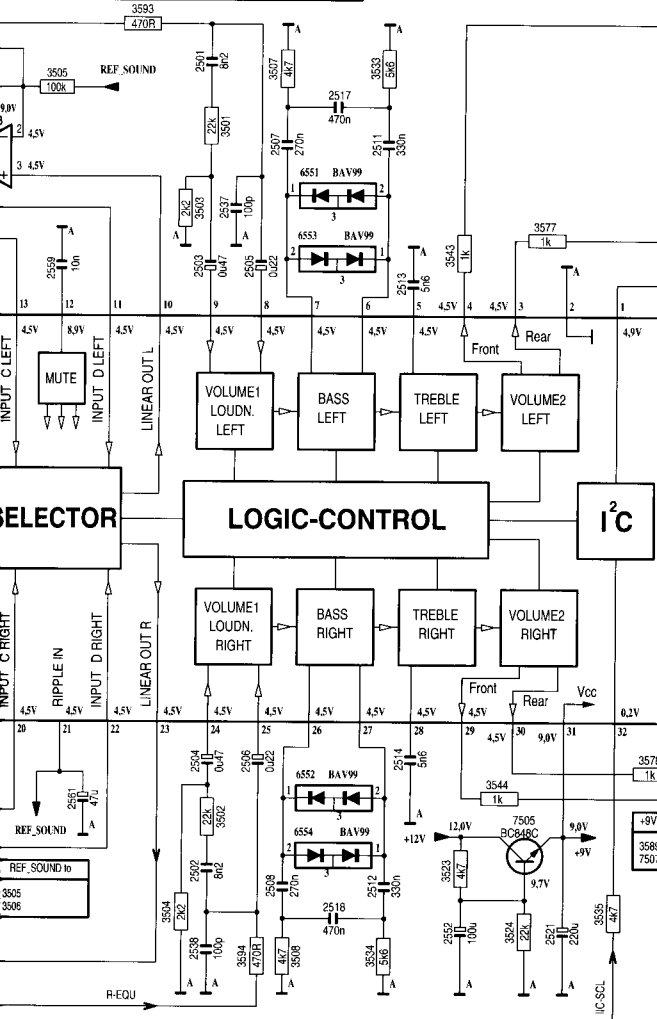
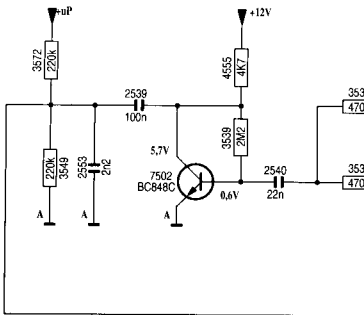
VERS

Karaoke
No Karaoke
No Equalizer





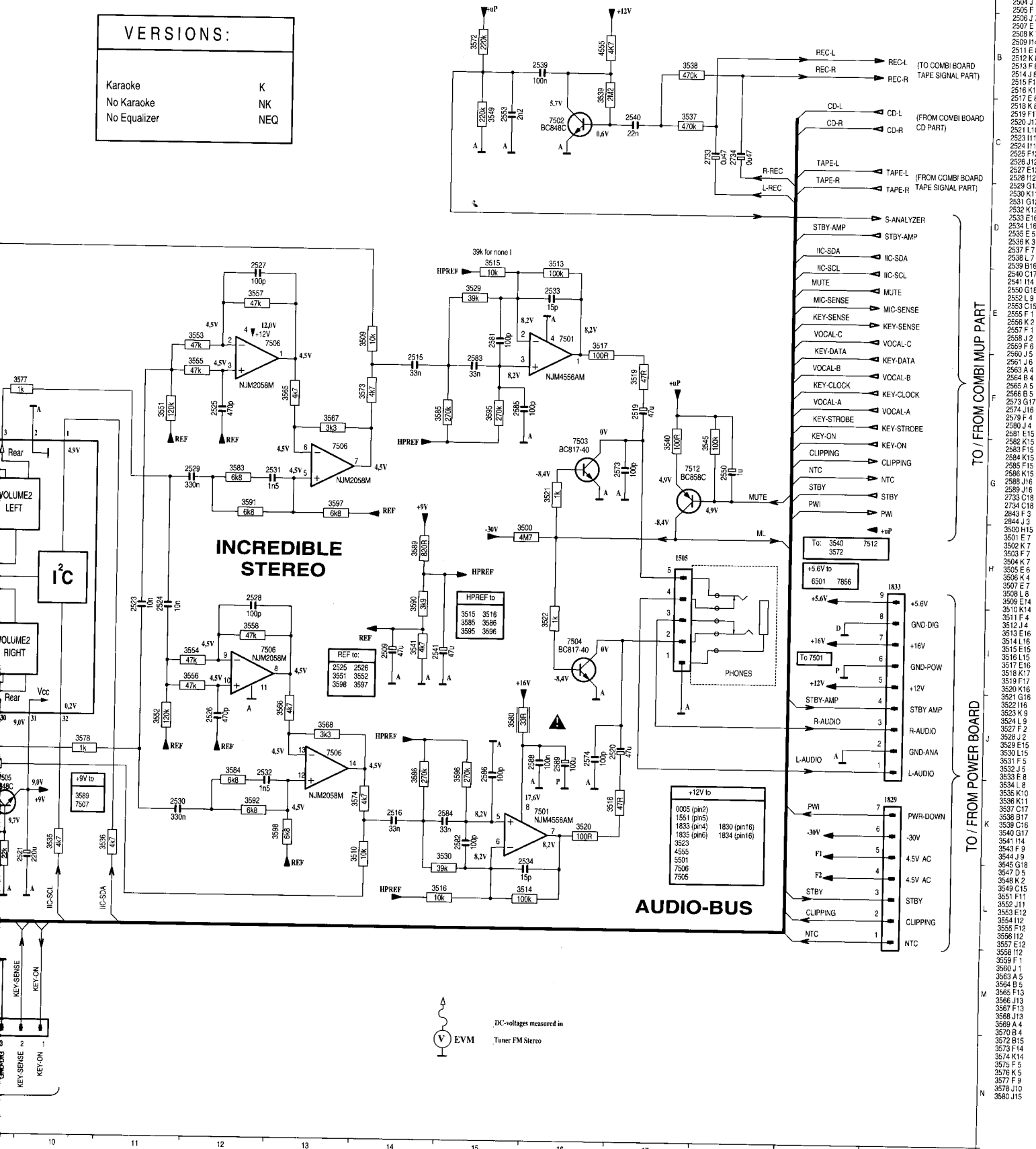
VERSIONS:	
Karaoke	K
No Karaoke	NK
No Equalizer	NEQ



DC-voltages measured in
Tuner FM Stereo

VERSIONS:

Karaoke	K
No Karaoke	NK
No Equalizer	NEQ



ELECTRICAL PARTSLIST COMBI BOARD**ELECTRICAL PARTSLIST****MISCELLANEOUS**

	4822 492 71734	SPRING CLIP TO126
1504	4822 134 41176	LAMP
1560	4822 265 20553	CHINCH SOCKET

DIODES

6551	5322 130 34337	BAV99
6552	5322 130 34337	BAV99
6553	5322 130 34337	BAV99
6554	5322 130 34337	BAV99
6651	4822 130 30621	1N4148
6760	4822 130 34382	BZX79-C8V2
6761	4822 130 30621	1N4148
6762	4822 130 30621	1N4148
6772	4822 130 30621	1N4148
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6774	4822 130 30621	1N4148
6775	4822 130 30621	1N4148
6776	4822 130 30621	1N4148
6777	4822 130 34382	BZX79-C8V2
6778	4822 130 30621	1N4148

6790	5322 130 30684	1N4002
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6792	4822 130 30621	1N4148
6857	4822 130 34167	BZX79-C6V2

TRANSISTORS

7502	5322 130 42136	BC848C
7503	4822 130 42615	BC817-40
7504	4822 130 42615	BC817-40
7505	5322 130 42136	BC848C
7512	4822 130 42513	BC858C

7631	5322 130 42136	BC848C
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7663	4822 130 40982	BD437
7701	5322 130 42136	BC848C
7780	5322 130 42136	BC848C

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7783	5322 130 42136	BC848C
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7856	5322 130 42136	BC848C
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7506	4822 209 91046	NJM2058M
7507	4822 209 83357	NJM4560M
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7630	4822 209 90406	CXA1101M
7640	4822 209 83357	NJM4560M
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7720	4822 209 32918	AN7318S

7730	4822 209 32919	HEF4952BT	3600
7740	4822 209 32919	HEF4952BT	3601
7850	4822 209 31064	TDA1301T/N1	3631
7860	4822 209 90618	SAA7345GP/S5	3632
7861	4822 209 32196	TDA1311AT/N2	3635

7862	4822 209 32852	TDA7073A/N2	3636
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COILS

5631	4822 156 21725	MPX FILTER	3643
5632	4822 156 21725	MPX FILTER	3643
5701	4822 156 20946	OSC.COIL 100kHz	3646
5790	4822 156 21721	2,2µH	3653
5791	5322 242 73697	CER.RES. 8MHz	3654
5860	4822 242 81865	CER.RES. 16,93MHz	3655
5862	4822 156 21721	2,2µH	3656

RESISTORS

3500	4822 111 30893	4M7	5%	0,2W	3660
3503	4822 116 52256	2k2	5%	0,16W	3663
3505	4822 116 52234	100k	5%	0,5W	3664
3507	4822 116 52283	4k7	5%	0,5W	3671
3511	4822 116 52244	15k	5%	0,5W	3672
3516	4822 116 83864	10k	5%	0,5W	3679
3517	4822 116 52175	100R	5%	0,5W	3681
3518	4822 116 52195	47R	5%	0,5W	3682
3519	4822 116 52195	47R	5%	0,5W	3684
3520	4822 116 52175	100R	5%	0,5W	3686
3521	4822 050 11002	1k	5%	0,2W	3687
3527	4822 116 52284	47k	5%	0,5W	3688
3531	4822 050 11002	1k	5%	0,2W	3690
3535	4822 116 52283	4k7	5%	0,5W	3691
3536	4822 116 52283	4k7	5%	0,5W	3694
3541	4822 116 52283	4k7	5%	0,5W	3705
3543	4822 050 11002	1k	5%	0,2W	3706
3544	4822 050 11002	1k	5%	0,2W	3715
3553	4822 116 52284	47k	5%	0,5W	3717
3554	4822 116 52284	47k	5%	0,5W	3718
3557	4822 116 52284	47k	5%	0,5W	3723
3558	4822 116 52284	47k	5%	0,5W	3733
3559	4822 116 52269	3k3	5%	0,5W	3735
3560	4822 116 52269	3k3	5%	0,5W	3736
3563	4822 116 52235	1M	5%	0,5W	3738
3564	4822 116 52235	1M	5%	0,5W	3740
3565	4822 116 52283	4k7	5%	0,5W	3741
3566	4822 116 52283	4k7	5%	0,5W	3742
3567	4822 116 52269	3k3	5%	0,5W	3759
3569	4822 116 52245	150k	5%	0,16W	3761
3570	4822 116 52245	150k	5%	0,16W	3765
3573	4822 116 52283	4k7	5%	0,5W	3768
3575	4822 116 52297	68k	5%	0,5W	3770
3577	4822 050 11002	1k	5%	0,2W	3773

ELECTRICAL PARTSLIST COMBI BOARD**RESISTORS**

3578	4822 050 11002	1k	5%	0,2W
3580	4822 052 10339	33R	5%	NFR
3586	4822 116 83878	270k	5%	0,5W
3589	4822 116 52231	820R	5%	0,5W
3593	4822 116 52224	470R	5%	0,5W
3594	4822 116 52224	470R	5%	0,5W
3595	4822 116 83878	270k	5%	0,5W
3596	4822 116 83878	270k	5%	0,5W
3597	4822 116 52296	6k8	5%	0,5W
3598	4822 116 52296	6k8	5%	0,5W
3600	4822 116 52284	47k	5%	0,5W
3601	4822 116 52235	1M	5%	0,5W
3631	4822 116 52239	120k	5%	0,5W
3632	4822 116 52239	120k	5%	0,5W
3635	4822 100 20166	10k		TRIMPOT.
3636	4822 100 20166	10k		TRIMPOT.
3637	4822 116 52284	47k	5%	0,5W
3641	4822 100 20166	10k		TRIMPOT.
3642	4822 100 20166	10k		TRIMPOT.
3643	4822 116 52284	47k	5%	0,5W
3646	4822 116 83882	39k	5%	0,5W
3653	4822 050 11002	1k	5%	0,2W
3654	4822 050 11002	1k	5%	0,2W
3655	4822 100 20166	10k		TRIMPOT.
3656	4822 100 20166	10k		TRIMPOT.
3660	4822 116 52271	33k	5%	0,16W
3663	4822 116 52252	180k	5%	0,5W
3664	4822 116 52252	180k	5%	0,5W
3671	4822 050 11002	1k	5%	0,2W
3672	4822 116 52234	100k	5%	0,5W
3679	4822 116 52284	47k	5%	0,5W
3681	4822 116 52283	4k7	5%	0,5W
3682	4822 100 20166	10k		TRIMPOT.
3684	4822 100 20166	10k		TRIMPOT.
3686	4822 116 52284	47k	5%	0,5W
3687	4822 050 11002	1k	5%	0,2W
3688	4822 116 52234	100k	5%	0,5W
3690	4822 116 83864	10k	5%	0,5W
3691	4822 116 83864	10k	5%	0,5W
3694	4822 052 10109	10R	5%	0,33W
3705	4822 116 52215	220R	5%	0,16W
3706	4822 116 52215	220R	5%	0,16W
3715	4822 116 52249	1k8	5%	0,16W
3717	4822 116 52276	3k9	5%	0,5W
3718	4822 116 52276	3k9	5%	0,5W
3723	4822 116 52238	12k	5%	0,5W
3733	4822 116 52215	220R	5%	0,16W
3735	4822 116 52264	27k	5%	0,5W
3736	4822 116 52264	27k	5%	0,5W
3738	4822 116 52283	4k7	5%	0,5W
3740	4822 116 52284	47k	5%	0,5W
3741	4822 050 11002	1k	5%	0,2W
3742	4822 116 52234	100k	5%	0,5W
3759	4822 050 11002	1k	5%	0,2W
3761	4822 116 83864	10k	5%	0,5W
3765	4822 116 52284	47k	5%	0,5W
3768	4822 116 52285	470k	5%	0,16W
3770	4822 116 52243	1k5	5%	0,16W
3773	4822 100 20166	10k		TRIMPOT.
3775	4822 116 52186	22R	5%	0,5W
3776	4822 116 52296	6k8	5%	0,5W

RESISTORS

3777	4822 116 52211	150R	5%	0,5W
3785	4822 100 11163	100k lin.		TRIMPOT.
3886	4822 116 52256	2k2	5%	0,16W
3788	4822 116 52235	1M	5%	0,5W
3789	4822 116 52257	22k	5%	0,5W
3796	4822 050 11002	1k	5%	0,2W
3797	4822 116 52234	100k	5%	0,5W
3798	4822 116 52175	100R	5%	0,5W
3841	4822 116 52176	10R	5%	0,5W
3845	4822 116 83864	10k	5%	0,5W
3846	4822 116 83864	10k	5%	0,5W
3847	4822 116 83864	10k	5%	0,5W
3848	4822 116 83864	10k	5%	0,5W
3855	4822 116 52256	2k2	5%	0,16W
3857	4822 116 83864	10k	5%	0,5W
3858	4822 116 83864	10k	5%	0,5W
3863	4822 116 52176	10R	5%	0,5W
3866	4822 116 52219	330R	5%	0,5W
3868	4822 116 52176	10R	5%	0,5W
3870	4822 116 52243	1k5	5%	0,16W
3871	4822 116 52186	22R	5%	0,5W
3873	4822 116 90835	10k x 7 Res.		Network
3875	4822 116 52243	1k5	5%	0,16W
3887	4822 116 52289	5k6	5%	0,16W
3886	4822 116 52284	47k	5%	0,5W
3891	4822 052 10338	3R3		NFR25
3895	4822 116 52264	27k	5%	0,5W
3896	4822 116 52251	18k	5%	0,5W
3897	4822 116 52251	18k	5%	0,5W
3898	4822 116 83882	39k	5%	0,5W
3899	4822 116 83882	39k	5%	0,5W
4555	4822 116 52283	4k7	5%	0,5W
4630	4822 050 11002	1k	5%	0,2W
4654	4822 050 11002	1k	5%	0,2W
4655	4822 050 11002	1k	5%	0,2W
4656	4822 050 11002	1k	5%	0,2W
4657	4822 050 11002	1k	5%	0,2W
4668	4822 050 11002	1k	5%	0,2W
4671	4822 050 11002	1k	5%	0,2W
4672	4822 050 11002	1k	5%	0,2W
4673	4822 050 11002	1k	5%	0,2W
4676	4822 050 11002	1k	5%	0,2W
4677	4822 050 11002	1k	5%	0,2W
4679	4822 050 11002	1k	5%	0,2W
4680	4822 050 11002	1k	5%	0,2W
4684	4822 116 52256	2k2	5%	0,16W
4685	4822 116 52256	2k2	5%	0,16W
4686	4822 050 11002	1k	5%	0,2W
4692	4822 050 11002	1k	5%	0,2W
4693	4822 116 52234	100k	5%	0,5W
4695	4822 050 11002	1k	5%	0,2W
4707	4822 050 11002	1k	5%	0,2W
4708	4822 050 11002	1k	5%	0,2W
4709	4822 050 11002	1k	5%	0,2W
4720	4822 116 52278	390k	5%	0,5W
CHIP RESISTORS				
3501	4822 051 20223	22k	5%	0,1W
3502	4822 051 20223	22k	5%	0,1W
3504	4822 051 20222	2k2	5%	0,1W
3506	4822 051 20104	100k	5%	0,1W
3508	4822 051 20472	4k7	5%	0,1W

ELECTRICAL PARTSLIST COMBI BOARD**CHIP RESISTORS**

3509	4822 051 20103	10k	5%	0,1W
3510	4822 051 20103	10k	5%	0,1W
3512	4822 051 20153	15k	5%	0,1W
3513	4822 051 20104	100k	5%	0,1W
3514	4822 051 20104	100k	5%	0,1W
3515	4822 051 20103	10k	5%	0,1W
3522	4822 051 10102	1k	2%	0,25W
3523	4822 051 20472	4k7	5%	0,1W
3524	4822 051 20223	22k	5%	0,1W
3528	4822 051 20473	47k	5%	0,1W
3529	4822 051 20393	39k	5%	0,1W
3530	4822 051 20393	39k	5%	0,1W
3532	4822 051 10102	1k	2%	0,25W
3533	4822 051 20562	5k6	5%	0,1W
3534	4822 051 20562	5k6	5%	0,1W
3537	4822 051 20474	470k	5%	0,1W
3538	4822 051 20474	470k	5%	0,1W
3539	4822 051 20225	2M2	5%	0,1W
3540	4822 051 20101	100R	5%	0,1W
3545	4822 051 20104	100k	5%	0,1W
3547	4822 051 20154	150k	5%	0,1W
3548	4822 051 20154	150k	5%	0,1W
3549	4822 051 20224	220k	5%	0,1W
3551	4822 051 20124	120k	5%	0,1W
3552	4822 051 20124	120k	5%	0,1W
3555	4822 051 20473	47k	5%	0,1W
3556	4822 051 20473	47k	5%	0,1W
3568	4822 051 20332	3k3	5%	0,1W
3572	4822 051 20224	220k	5%	0,1W
3574	4822 051 20472	4k7	5%	0,1W
3576	4822 051 20683	68k	5%	0,1W
3583	4822 051 20682	6k8	5%	0,1W
3584	4822 051 20682	6k8	5%	0,1W
3585	4822 051 20274	270k	5%	0,1W
3590	4822 051 20392	3k9	5%	0,1W
3591	4822 051 20682	6k8	5%	0,1W
3592	4822 051 20682	6k8	5%	0,1W
3605	4822 051 20103	10k	5%	0,1W
3606	4822 051 20473	47k	5%	0,1W
3607	4822 051 20473	47k	5%	0,1W
3609	4822 051 20103	10k	5%	0,1W
3633	4822 051 20682	6k8	5%	0,1W
3634	4822 051 20682	6k8	5%	0,1W
3638	4822 051 20473	47k	5%	0,1W
3639	4822 051 20562	5k6	5%	0,1W
3640	4822 051 20562	5k6	5%	0,1W
3644	4822 051 20473	47k	5%	0,1W
3645	4822 051 20393	39k	5%	0,1W
3647	4822 051 20332	3k3	5%	0,1W
3648	4822 051 20332	3k3	5%	0,1W
3649	4822 051 20562	5k6	5%	0,1W
3650	4822 051 20562	5k6	5%	0,1W
3651	4822 051 10102	1k	2%	0,25W
3652	4822 051 10102	1k	2%	0,25W
3657	4822 051 10102	1k	2%	0,25W
3658	4822 051 10102	1k	2%	0,25W
3659	4822 051 20333	33k	5%	0,1W
3661	4822 051 20105	1M	5%	0,1W
3662	4822 051 20105	1M	5%	0,1W
3665	4822 117 11149	82k	1%	0,1W

CHIP RESISTORS

3666	4822 117 11149	82k	1%	0,1W
3673	4822 051 10102	1k	2%	0,25W
3674	4822 051 10102	1k	2%	0,25W
3675	4822 051 10102	1k	2%	0,25W
3676	4822 051 10102	1k	2%	0,25W
3677	4822 051 20473	47k	5%	0,1W
3678	4822 051 10102	1k	2%	0,25W
3680	4822 051 20472	4k7	5%	0,1W
3683	4822 051 20562	5k6	5%	0,1W
3685	4822 051 20472	4k7	5%	0,1W
3689	4822 051 20104	100k	5%	0,1W
3692	4822 117 11746	43k	1%	0,1W
3693	4822 051 20689	68R	5%	0,1W
3695	4822 051 20689	68R	5%	0,1W
3701	4822 051 20221	220R	5%	0,1W
3702	4822 051 20221	220R	5%	0,1W
3703	4822 051 20221	220R	5%	0,1W
3704	4822 051 20221	220R	5%	0,1W
3707	4822 051 20101	100R	5%	0,1W
3708	4822 051 20101	100R	5%	0,1W
3709	4822 051 20109	10R	5%	0,1W
3710	4822 051 20109	10R	5%	0,1W
3711	4822 051 20184	180k	5%	0,1W
3712	4822 051 20184	180k	5%	0,1W
3713	4822 051 20109	10R	5%	0,1W
3714	4822 051 20109	10R	5%	0,1W
3716	4822 051 20182	1k8	5%	0,1W
3719	4822 051 20123	12k	2%	0,1W
3720	4822 051 20123	12k	2%	0,1W
3721	4822 051 20562	5k6	5%	0,1W
3722	4822 051 20562	5k6	5%	0,1W
3724	4822 051 20123	12k	2%	0,1W
3725	4822 051 20224	220k	5%	0,1W
3726	4822 051 20224	220k	5%	0,1W
3727	4822 051 20562	5k6	5%	0,1W
3728	4822 051 20562	5k6	5%	0,1W
3729	4822 051 20272	2k7	5%	0,1W
3730	4822 051 20272	2k7	5%	0,1W
3731	4822 051 20682	6k8	5%	0,1W
3732	4822 051 20682	6k8	5%	0,1W
3734	4822 051 20221	220R	5%	0,1W
3737	4822 051 20472	4k7	5%	0,1W
3739	4822 051 20121	120R	5%	0,1W
3744	4822 051 20153	15k	5%	0,1W
3745	4822 051 10102	1k	2%	0,25W
3746	4822 051 10102	1k	2%	0,25W
3747	4822 051 20104	100k	5%	0,1W
3749	4822 051 10102	1k	2%	0,25W
3760	4822 051 20104	100k	5%	0,1W
3762	4822 051 20821	820R	5%	0,1W
3763	4822 051 20184	180k	5%	0,1W
3764	4822 051 20471	470R	5%	0,1W
3766	4822 051 20475	4M7	5%	0,1W
3767	4822 051 20223	22k	5%	0,1W
3769	4822 051 20475	4M7	5%	0,1W
3771	4822 051 10102	1k	2%	0,25W
3772	4822 051 20183	18k	5%	0,1W
3774	4822 051 20223	22k	5%	0,1W
3779	4822 051 20334	330k	5%	0,1W
3780	4822 051 20105	1M	5%	0,1W

ELECTRICAL PARTSLIST COMBI BOARD**CHIP RESISTORS**

3781	4822 051 20475	4M7	5%	0,1W
3782	4822 051 20472	4k7	5%	0,1W
3783	4822 051 20472	4k7	5%	0,1W
3784	4822 051 20153	15k	5%	0,1W
3787	4822 051 20105	1M	5%	0,1W
3795	4822 051 20103	10k	5%	0,1W
3811	4822 051 10102	1k	2%	0,25W
3842	4822 051 20221	220R	5%	0,1W
3843	4822 051 20221	220R	5%	0,1W
3844	4822 051 20221	220R	5%	0,1W
3851	4822 051 20103	10k	5%	0,1W
3852	4822 051 20103	10k	5%	0,1W
3856	4822 051 20223	22k	5%	0,1W
3859	4822 051 20229	22R	5%	0,1W
3860	4822 051 20101	100R	5%	0,1W
3861	4822 051 20103	10k	5%	0,1W
3862	4822 051 20105	1M	5%	0,1W
3864	4822 051 20229	22R	5%	0,1W
3865	4822 051 20103	10k	5%	0,1W
3867	4822 051 20221	220R	5%	0,1W
3869	4822 051 20103	10k	5%	0,1W
3872	4822 051 20222	2k2	5%	0,1W
3874	4822 051 20103	10k	5%	0,1W
3876	4822 117 11139	1k5	5%	0,1W
3877	4822 051 20222	2k2	5%	0,1W
3878	4822 051 20105	1M	5%	0,1W
3879	4822 051 20154	150k	5%	0,1W
3880	4822 051 20393	39k	5%	0,1W
3881	4822 051 20333	33k	5%	0,1W
3882	4822 051 10102	1k	2%	0,25W
3883	4822 051 20122	1,2k	5%	0,1W
3884	4822 051 10102	1k	2%	0,25W
3885	4822 051 10102	1k	2%	0,25W
4500	4822 051 10008	CHIP JUMPER1206		
4502	4822 051 10008	CHIP JUMPER1206		
4503	4822 051 10008	CHIP JUMPER1206		
4506	4822 051 10008	CHIP JUMPER1206		
4510	4822 051 10008	CHIP JUMPER1206		
4511	4822 051 10008	CHIP JUMPER1206		
4516	4822 051 10008	CHIP JUMPER1206		
4517	4822 051 10008	CHIP JUMPER1206		
4518	4822 051 10008	CHIP JUMPER1206		
4520	4822 051 20008	CHIP JUMPER 0805		
4521	4822 051 10008	CHIP JUMPER1206		
4523	4822 051 10008	CHIP JUMPER1206		
4524	4822 051 10008	CHIP JUMPER1206		
4525	4822 051 10008	CHIP JUMPER1206		
4526	4822 051 10008	CHIP JUMPER1206		
4527	4822 051 10008	CHIP JUMPER1206		
4529	4822 051 10008	CHIP JUMPER1206		
4530	4822 051 10008	CHIP JUMPER1206		
4531	4822 051 20008	CHIP JUMPER 0805		
4533	4822 051 20008	CHIP JUMPER 0805		
4534	4822 051 10008	CHIP JUMPER1206		
4535	4822 051 10008	CHIP JUMPER1206		
4536	4822 051 10008	CHIP JUMPER1206		
4537	4822 051 10008	CHIP JUMPER1206		
4538	4822 051 10008	CHIP JUMPER1206		
4540	4822 051 10008	CHIP JUMPER1206		
4541	4822 051 20008	CHIP JUMPER 0805		

CHIP RESISTORS

4542	4822 051 10008	CHIP JUMPER1206		
4543	4822 051 10008	CHIP JUMPER1206		
4545	4822 051 10008	CHIP JUMPER1206		
4546	4822 051 10008	CHIP JUMPER1206		
4547	4822 051 10008	CHIP JUMPER1206		
4548	4822 051 20008	CHIP JUMPER 0805		
4549	4822 051 10008	CHIP JUMPER1206		
4550	4822 051 20008	CHIP JUMPER 0805		
4557	4822 051 10008	CHIP JUMPER1206		
4559	4822 051 10008	CHIP JUMPER1206		
4565	4822 051 20008	CHIP JUMPER 0805		
4566	4822 051 10008	CHIP JUMPER1206		
4568	4822 051 10008	CHIP JUMPER1206		
4572	4822 051 10008	CHIP JUMPER1206		
4574	4822 051 10008	CHIP JUMPER1206		
4577	4822 051 20008	CHIP JUMPER 0805		
4578	4822 051 10008	CHIP JUMPER1206		
4579	4822 051 20008	CHIP JUMPER 0805		
4595	4822 051 20008	CHIP JUMPER 0805		
4596	4822 051 20008	CHIP JUMPER 0805		
4597	4822 051 10008	CHIP JUMPER1206		
4599	4822 051 20008	CHIP JUMPER 0805		
4631	4822 051 20103	10k	5%	0,1W
4632	4822 051 10102	1k	2%	0,25W
4633	4822 051 10102	1k	2%	0,25W
4634	4822 051 10102	1k	2%	0,25W
4635	4822 051 10102	1k	2%	0,25W
4636	4822 051 10102	1k	2%	0,25W
4637	4822 051 10102	1k	2%	0,25W
4638	4822 051 10102	1k	2%	0,25W
4639	4822 051 10102	1k	2%	0,25W
4640	4822 051 10102	1k	2%	0,25W
4641	4822 051 10102	1k	2%	0,25W
4642	4822 051 10102	1k	2%	0,25W
4643	4822 051 10102	1k	2%	0,25W
4644	4822 051 10102	1k	2%	0,25W
4645	4822 051 10102	1k	2%	0,25W
4646	4822 051 10102	1k	2%	0,25W
4647	4822 051 10102	1k	2%	0,25W
4648	4822 051 10102	1k	2%	0,25W
4649	4822 051 10102	1k	2%	0,25W
4650	4822 051 10102	1k	2%	0,25W
4651	4822 051 10102	1k	2%	0,25W
4652	4822 051 10102	1k	2%	0,25W
4653	4822 051 20473	47k	5%	0,1W
4658	4822 051 10102	1k	2%	0,25W
4659	4822 051 20221	220R	5%	0,1W
4660	4822 051 10102	1k	2%	0,25W
4661	4822 051 10102	1k	2%	0,25W
4662	4822 051 20472	4k7	5%	0,1W
4663	4822 051 20472	4k7	5%	0,1W
4664	4822 051 20222	2k2	5%	0,1W
4665	4822 051 20103	10k	5%	0,1W
4666	4822 051 20222	2k2	5%	0,1W
4667	4822 051 20472	4k7	5%	0,1W
4670	4822 051 20103	10k	5%	0,1W
4674	4822 051 10102	1k	2%	0,25W
4675	4822 051 20273	27k	5%	0,1W
4678	4822 051 10102	1k	2%	0,25W
4681	4822 051 20472	4k7	5%	0,1W

ELECTRICAL PARTSLIST COMBI BOARD**ELECTRICAL PARTSLIST COMBI BOARD****CHIP RESISTORS**

4681	4822 051 20472	4k7	5%	0,1W
4682	4822 051 10102	1k	2%	0,25W
4683	4822 051 20103	10k	5%	0,1W
4687	4822 051 20472	4k7	5%	0,1W
4688	4822 051 20223	22k	5%	0,1W
4689	4822 051 10102	1k	2%	0,25W
4690	4822 051 20471	470R	5%	0,1W
4691	4822 051 20472	4k7	5%	0,1W
4694	4822 051 10102	1k	2%	0,25W
4696	4822 051 20221	220R	5%	0,1W
4697	4822 051 10102	1k	2%	0,25W
4698	4822 051 20221	220R	5%	0,1W
4699	4822 051 20221	220R	5%	0,1W
4700	4822 051 20221	220R	5%	0,1W
4701	4822 051 10102	1k	2%	0,25W
4702	4822 051 20008	CHIP JUMPER 0805		
4703	4822 051 10102	1k	2%	0,25W
4704	4822 051 10102	1k	2%	0,25W
4705	4822 051 10008	CHIP JUMPER 1206		
4710	4822 051 10102	1k	2%	0,25W
4711	4822 051 10102	1k	2%	0,25W
4712	4822 051 10102	1k	2%	0,25W
4713	4822 051 10102	1k	2%	0,25W
4716	4822 051 10102	1k	2%	0,25W
4718	4822 051 20103	10k	5%	0,1W
4719	4822 051 20103	10k	5%	0,1W
4721	4822 051 20104	100k	5%	0,1W
4801	4822 051 10008	CHIP JUMPER 1206		
4802	4822 051 20008	CHIP JUMPER 0805		
4803	4822 051 10008	CHIP JUMPER 1206		

CAPACITORS

2503	4822 124 41407	0,47µF	20%	63V
2504	4822 124 41407	0,47µF	20%	63V
2505	4822 124 40746	0,22µF	20%	63V
2506	4822 124 40746	0,22µF	20%	63V
2507	4822 121 41738	270nF	5%	63V
2508	4822 121 41738	270nF	5%	63V
2509	4822 124 40433	47µF	20%	25V
2511	5322 121 42661	330nF	5%	63V
2512	5322 121 42661	330nF	5%	63V
2517	4822 121 51252	470nF	5%	63V
2518	4822 121 51252	470nF	5%	63V
2519	4822 124 40433	47µF	20%	25V
2520	4822 124 40433	47µF	20%	25V
2521	4822 124 40196	220µF	20%	16V
2523	4822 121 51387	10nF	20%	16V
2524	4822 121 51387	10nF	20%	16V
2525	4822 122 33519	470pF	10%	50V
2526	4822 122 33519	470pF	10%	50V
2529	5322 121 42661	330nF	5%	63V
2530	5322 121 42661	330nF	5%	63V
2537	4822 122 33195	100pF	10%	50V
2541	4822 124 40433	47µF	20%	25V
2542	4822 122 33519	470pF	10%	50V
2550	4822 124 40242	1µF	20%	63V
2552	4822 124 41525	100µF	20%	25V
2555	4822 121 42408	220nF	5%	63V
2556	4822 121 42408	220nF	5%	63V
2557	4822 124 40746	0,22µF	20%	63V
2558	4822 124 40746	0,22µF	20%	63V
2560	4822 124 40433	47µF	20%	25V

CAPACITORS

2561	4822 124 40433	47µF	20%	25V
2563	4822 122 33848	47pF	5%	50V
2564	4822 122 33848	47pF	5%	50V
2565	4822 126 12882	100nF	20%	50V
2566	4822 126 12882	100nF	20%	50V
2579	4822 124 40242	1µF	20%	63V
2580	4822 124 40242	1µF	20%	63V
2588	4822 126 12882	100nF	20%	50V
2589	4822 124 41525	100µF	20%	25V
2637	5322 121 42498	680nF	5%	63V
2638	5322 121 42498	680nF	5%	63V
2641	4822 124 40246	4,7µF	20%	63V
2642	4822 124 40246	4,7µF	20%	63V
2647	4822 124 40246	4,7µF	20%	63V
2648	4822 124 40246	4,7µF	20%	63V
2691	4822 124 40246	4,7µF	20%	63V
2692	4822 124 41584	100µF	20%	10V
2693	4822 124 41525	100µF	20%	25V
2694	4822 124 41525	100µF	20%	25V
2701	4822 122 33195	100pF	10%	50V
2702	4822 122 33195	100pF	10%	50V
2703	4822 122 33195	100pF	10%	50V
2704	4822 122 33195	100pF	10%	50V
2711	4822 122 33195	100pF	10%	50V
2712	4822 122 33195	100pF	10%	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 126 12339	2,2nF	10%	16V
2718	4822 126 12339	2,2nF	10%	16V
2722	4822 126 13174	33nF	20%	16V
2727	4822 122 10459	560pF	10%	50V
2733	4822 124 41407	0,47µF	20%	63V
2734	4822 124 41407	0,47µF	20%	63V
2735	4822 126 12882	100nF	20%	50V
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
2780	4822 124 40246	4,7µF	20%	63V
2781	4822 121 51387	10nF	20%	16V
2783	5322 121 42386	100nF	5%	63V
2784	4822 121 41934	22nF	10%	100V
2785	4822 124 41579	10µF	20%	50V
2786	4822 122 33195	100pF	10%	50V
2807	4822 126 12339	2,2nF	10%	16V
2831	4822 124 40433	47µF	20%	25V
2832	4822 124 40184	1000µF	20%	10V
2833	4822 124 40433	47µF	20%	25V
2843	4822 124 41407	0,47µF	20%	63V
2844	4822 124 41407	0,47µF	20%	63V
2845	4822 126 12339	2,2nF	10%	16V
2846	4822 126 12339	2,2nF	10%	16V
2848	4822 124 40433	47µF	20%	25V
2849	4822 124 40433	47µF	20%	25V
2855	4822 124 40433	47µF	20%	25V
2856	5322 121 42386	100nF	5%	63V
2858	4822 122 33195	100pF	10%	50V
2859	4822 121 51387	10nF	20%	16V

CHIP CAPACITORS

2501	4822 124 40433	47µF	20%	25V
2502	4822 122 33848	47pF	5%	50V
2513	4822 122 33848	47pF	5%	50V
2514	4822 126 12882	100nF	20%	50V
2515	4822 126 12882	100nF	20%	50V
2516	4822 124 40242	1µF	20%	63V
2527	4822 124 40242	1µF	20%	63V
2528	4822 126 12882	100nF	20%	50V
2531	4822 124 41525	100µF	20%	25V
2532	5322 121 42498	680nF	5%	63V
2533	5322 121 42498	680nF	5%	63V
2534	4822 124 40246	4,7µF	20%	63V
2535	4822 124 40246	4,7µF	20%	63V
2536	4822 124 40246	4,7µF	20%	63V
2538	4822 124 40246	4,7µF	20%	63V
2539	4822 124 40246	4,7µF	20%	63V
2540	4822 124 41584	100µF	20%	10V
2553	4822 124 41525	100µF	20%	25V
2559	4822 124 41525	100µF	20%	25V
2573	4822 122 33195	100pF	10%	50V
2574	4822 122 33195	100pF	10%	50V
2581	4822 122 33195	100pF	10%	50V
2582	4822 122 33195	100pF	10%	50V
2583	4822 122 33195	100pF	10%	50V
2584	4822 122 33195	100pF	10%	50V
2585	4822 124 41579	10µF	20%	50V
2586	4822 124 41579	10µF	20%	50V
2590	4822 124 40196	220µF	20%	16V
2591	4822 124 40196	220µF	20%	16V
2631	4822 126 12339	2,2nF	10%	16V
2632	4822 126 12339	2,2nF	10%	16V
2633	4822 126 13174	33nF	20%	16V
2634	4822 122 10459	560pF	10%	50V
2635	4822 124 41407	0,47µF	20%	63V
2636	4822 124 41407	0,47µF	20%	63V
2639	4822 126 12882	100nF	20%	50V
2640	4822 124 22263	220µF	20%	25V
2643	4822 124 40246	4,7µF	20%	63V
2644	4822 124 40433	47µF	20%	25V
2645	4822 124 40433	47µF	20%	25V
2646	4822 124 40246	4,7µF	20%	63V
2705	4822 121 51387	10nF	20%	16V
2706	5322 121 42386	100nF	5%	63V
2707	4822 121 41934	22nF	10%	100V
2708	4822 124 41579	10µF	20%	50V
2709	4822 122 33195	100pF	10%	50V
2710	4822 126 12339	2,2nF	10%	16V
2719	4822 124 40433	47µF	20%	25V
2720	4822 124 40184	1000µF	20%	10V
2721	4822 124 40433	47µF	20%	25V
2723	4822 124 41407	0,47µF	20%	63V
2724	4822 124 41407	0,47µF	20%	63V
2725	4822 126 12339	2,2nF	10%	16V
2726	4822 126 12339	2,2nF	10%	16V
2728	4822 124 40433	47µF	20%	25V
2729	4822 124 40433	47µF	20%	25V
2730	4822 124 40433	47µF	20%	25V
2737	5322 121 42386	100nF	5%	63V
2738	4822 122 33195	100pF	10%	50V
2752	4822 121 51387	10nF	20%	16V
2760	4822 124 40433	47µF	20%	25V

ELECTRICAL PARTSLIST COMBI BOARD

CHIP CAPACITORS

2501	4822 122 33336	8,2nF	10%	50V
2502	4822 122 33336	8,2nF	10%	50V
2513	4822 122 32646	5,6nF	10%	50V
2514	4822 122 32646	5,6nF	10%	50V
2515	4822 122 33342	33nF	10%	63V

2516	4822 122 33342	33nF	10%	63V
2527	5322 122 32531	100pF	5%	50V
2528	5322 122 32531	100pF	5%	50V
2531	5322 122 31865	1,5nF	10%	63V
2532	5322 122 31865	1,5nF	10%	63V

2533	5322 122 32481	15pF	5%	50V
2534	5322 122 32481	15pF	5%	50V
2535	5322 122 32448	10pF	5%	50V
2536	5322 122 32448	10pF	5%	50V
2538	5322 122 32531	100pF	5%	50V

2539	4822 126 10002	100nF	20%	50V
2540	4822 122 31797	22nF	10%	63V
2553	4822 122 33175	2,2nF	20%	50V
2559	4822 122 33177	10nF	20%	50V
2573	5322 122 32531	100pF	5%	50V

2574	5322 122 32531	100pF	5%	50V
2581	5322 122 32531	100pF	5%	50V
2582	5322 122 32531	100pF	5%	50V
2583	4822 122 33342	33nF	10%	63V
2584	4822 122 33342	33nF	10%	63V

2585	5322 122 32531	100pF	5%	50V
2586	5322 122 32531	100pF	5%	50V
2590	4822 122 33177	10nF	20%	50V
2591	4822 122 33177	10nF	20%	50V
2631	4822 122 32541	27nF	10%	63V

2632	4822 122 32541	27nF	10%	63V
2633	4822 126 13057	220nF	10%	25V
2634	4822 126 13057	220nF	10%	25V
2635	4822 122 33891	3,3nF	10%	63V
2636	4822 122 33891	3,3nF	10%	63V

2639	5322 122 32531	100pF	5%	50V
2640	5322 122 32531	100pF	5%	50V
2643	4822 122 33177	10nF	20%	50V
2644	4822 122 33177	10nF	20%	50V
2645	5322 122 32448	10pF	5%	50V

2646	5322 122 32448	10pF	5%	50V
2705	5322 122 32531	100pF	5%	50V
2706	5322 122 32531	100pF	5%	50V
2707	5322 122 34099	470pF	10%	63V
2708	5322 122 34099	470pF	10%	63V

2709	5322 122 32531	100pF	5%	50V
2710	5322 122 32531	100pF	5%	50V
2719	4822 122 33893	18nF	10%	63V
2720	4822 122 33893	18nF	10%	63V
2721	4822 122 33342	33nF	10%	63V

2723	4822 126 10326	180pF	5%	
2724	4822 126 10326	180pF	5%	
2725	4822 122 33575	220pF	5%	50V
2726	4822 122 33575	220pF	5%	50V
2728	4822 122 33173	560pF	10%	63V

2729	4822 122 32541	27nF	10%	63V
2730	4822 122 32541	27nF	10%	63V
2737	4822 126 10002	100nF	20%	50V
2738	4822 126 10002	100nF	20%	50V
2752	5322 122 32654	22nF	10%	63V

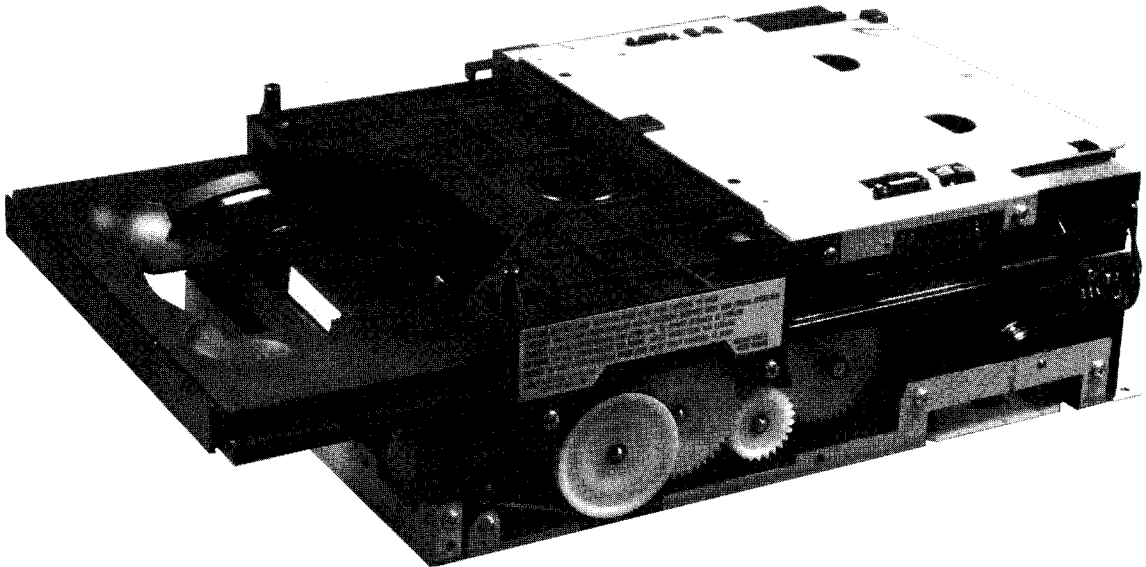
2760	4822 126 10002	100nF	20%	50V
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CHIP CAPACITORS

2782	5322 122 31866	6,8nF	10%	63V
2787	4822 122 33342	33nF	10%	63V
2794	4822 126 10002	100nF	20%	50V
2834	5322 126 10794	220pF	10%	
2835	5322 126 10794	220pF	10%	

2836	5322 126 10794	220pF	10%	
2837	5322 126 10794	220pF	10%	
2838	5322 126 10794	220pF	10%	
2839	5322 126 10794	220pF	10%	
2840	4822 122 33496	100nF	10%	63V

2850	5322 122 32658	22pF	5%	50V
2851	5322 122 32654	22nF	10%	63V
2852	5322 122 32452	47pF	5%	50V



CD CHANGER UNIT CDC7

TABLE OF CONTENTS

Description	10-2
Mechanical overview	10-4
Dismantling hints	10-6
Disassembly drawings	10-7
Functional Diagram	10-8
CDC7 Mechanism electronic	10-9
CD IF Board	
Circuit Diagram	10
Component Layout	11
Exploded view	12
Partslist	13

Overview of the CDC-7 mechanism

The CDC-7 mechanism is a tray-loader system with an elevator called "stocker" in its back that can hold up to 7 discs. The CD-pickup unit (CDM12.1 mechanism) is in the middle of the CDC-7 mechanism.

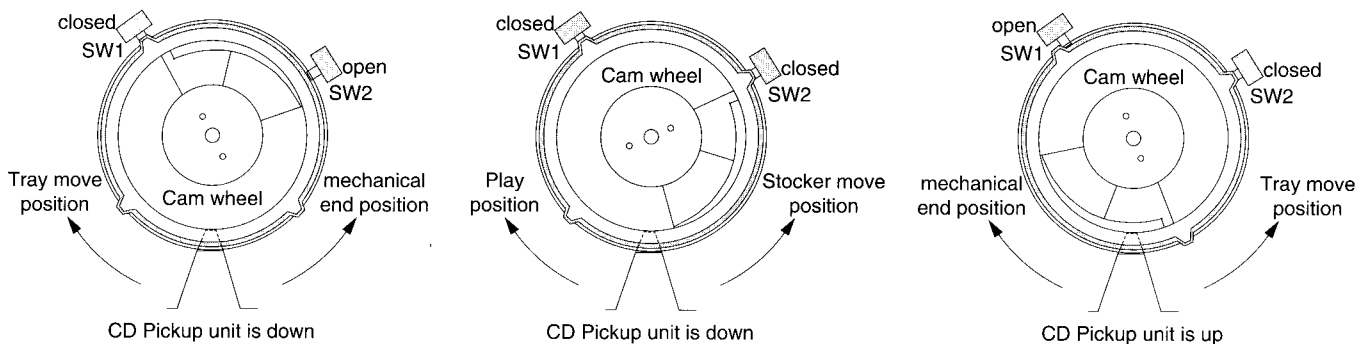
The tray motor is responsible for movement of tray and stocker. Which part it moves depends on a clutch, controlled by a cam wheel in the middle of the CDC-7 mechanism. The Cam wheel lifts or lowers also the Disc lock pin and the CD pickup unit. The cam wheel is driven by the cam motor and has 3 positions, called 'PLAY', 'TRAY MOVE' and 'STOCKER MOVE'

Cam position	Tray motor	CD pickup unit	Disc lock pin	SW1	SW2	SW3
Stocker move	Drives the stocker up or down	down	up	close	open	open
Tray move	Drives the tray in or out	down	down	close	close	close
Play	-	up	down	open	close	close

Stocker move position

Tray move position

Play position



The complete operation (including feedback sensing) of the CDC-7 mechanism is controlled by 2 motors, 2 photo sensors and several switches. A quick reference of the switches and sensors' functions are given in the table below:

Name	Activated by	Detects
Eject switch	Outer tray	- Tray open - User's intention (push tray to close)
Store switch	Shuttle	Carriage is fully in the stocker
Play position over switch	Shuttle	Approximate position for disc play. It actually reverses the tray motion for the disc detect photo reflector to locate the play position.
Disc detect photo reflector	Carriage	Detects a disc
SW1, SW2	Cam wheel	- Cam in 'STOCKER MOVE' or in 'TRAY MOVE' position. - CD pickup unit in up or down position.
SW3 (Disc lock)	Disc lock pin	Actual position of the disc lock pin
Home switch	Moving bracket (pos. 23)	Upmost stocker position (Disc 1)
Disc count photo interruptor	Moving bracket (pos. 23)	Counts the current carriage (or disc)

Operations

The tray consists of an outer tray which is the same for all discs and an inner carriage for each individual disc. The carriage which actually holds the disc is moved by a tooth-bar called 'SHUTTLE'. Each carriage has a slot in which the shuttle engages when the stocker chooses that particular disc position. The shuttle pulls the carriage out of the stocker. When it reaches the outer tray, both the outer tray and carriage opens. All the movements are done by the combination of the tray motor, belt and gears. A mechanical locking between the carriage and outer tray prevents accidental separation by the customer. When the tray is closed the shuttle pushes the carriage back in the stocker (if requested). At the right back of the stocker are springs that will hold each carriage in position within the stocker.

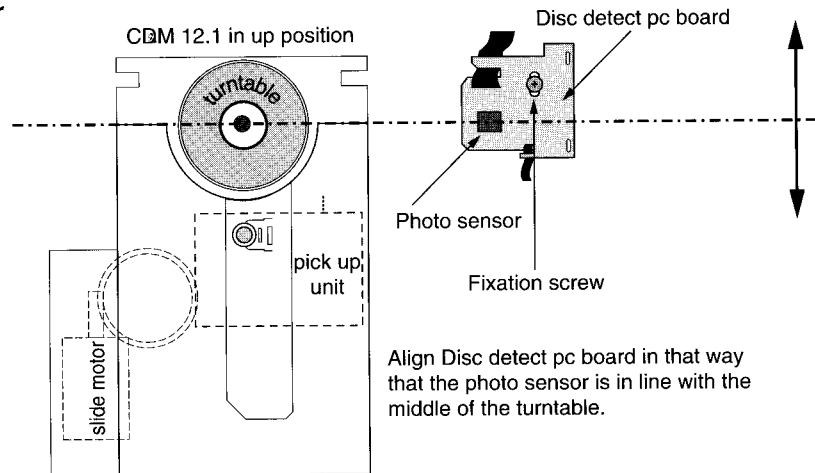
When the carriage is in the stocker, this position is signalled by a switch at the right back called STORE SWITCH. It is pressed by the shuttle when the carriage is completely in the stocker.

The open position of the tray is given by an EJECT SWITCH. This eject switch at left front is actuated when the tray has fully opened. This switch also indicates the customer's intention to close the tray when he pushes the tray inside.

To find the PLAY POSITION (center position) of the carriage (disc) there is a photo reflector called DISC DETECT on the right middle of the CDC-7 mechanism. This photo reflector is responsible for disc detection. It shines through a very small rectangular hole (1 x 5 mm) in the carriage. Because the photo reflector is used to find the play position it is clear that the *play position cannot be reached without a disc* on the carriage. The hole in the carriage and the position of the photo reflector are pre-aligned in the factory such that accurate play position is achieved at the first photo reflector signal.

Note: The photo reflector must be aligned to the same horizontal centre line as the CDM12.1 turntable spindle. This will ensure the disc to sit accurately during play and prevents any rubbing of the disc against the carriage.

Alignment of photo sensor



There is an extra switch, called PLAY-POSITION-OVER SWITCH that is triggered by the small latch lever on the outer tray. The carriage moves till the play-position-over switch is triggered and then reverses slowly till the photo-reflector senses that the play position is reached.

The cam motor turns the cam wheel in the center of the CDC-7 mechanism. This cam controls a clutch which selects between tray or stocker movement. It also lifts or lowers the disc-lock pin and the CD-pickup unit. The 3 positions of the cam is given by two switches named SW1 and SW2. At the cam's mechanically blocked end positions both switches are open.

The position of the stocker is monitored by a disc count photo interrupter and a home switch. The disc count interrupter gives a low signal when a disc position is reached and a high signal when the stocker is between two valid positions (or carriages). The home switch gives the location of the uppermost stocker position (disc number 1). The home switch is located on the right of the cam switch SW2. The disc count photo interrupter is immediately next to the right side of the home switch (it is very small!!).

Note: If the stocker is between two valid positions, tray movement will be mechanically blocked.

The CDC-7 mechanism has 2 safety features - its ability to detect 2 discs loaded into one carriage and to detect an 8cm CD-Single that is placed off-center on a carriage, obstructing the center hole of the carriage.

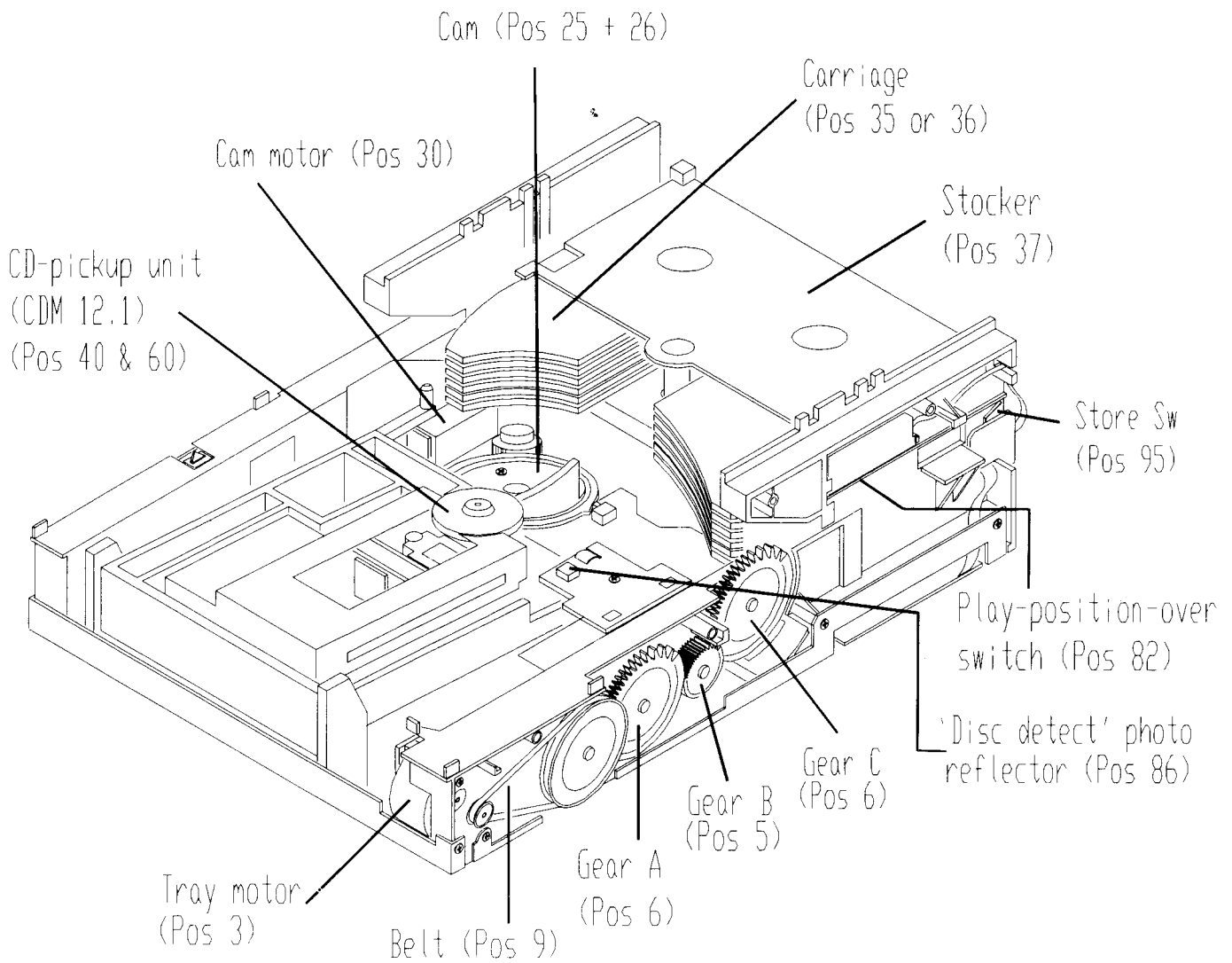
Note: Only disc 1 has a special carriage that can hold either a 12cm or a 8cm disc, all other carriages are designed to carry 12cm discs only!

If two discs are loaded into a single carriage the upper disc cannot go into the stocker because it will be stopped by a pip on left side of the outer tray. The disc-detect photo reflector will also sense the extra disc outside the stocker. When this happens, the same tray with the rejected discs is opened and a message is given on the display.

For further information see Circuit Description CDC7 Changer (4822 725 24764)!

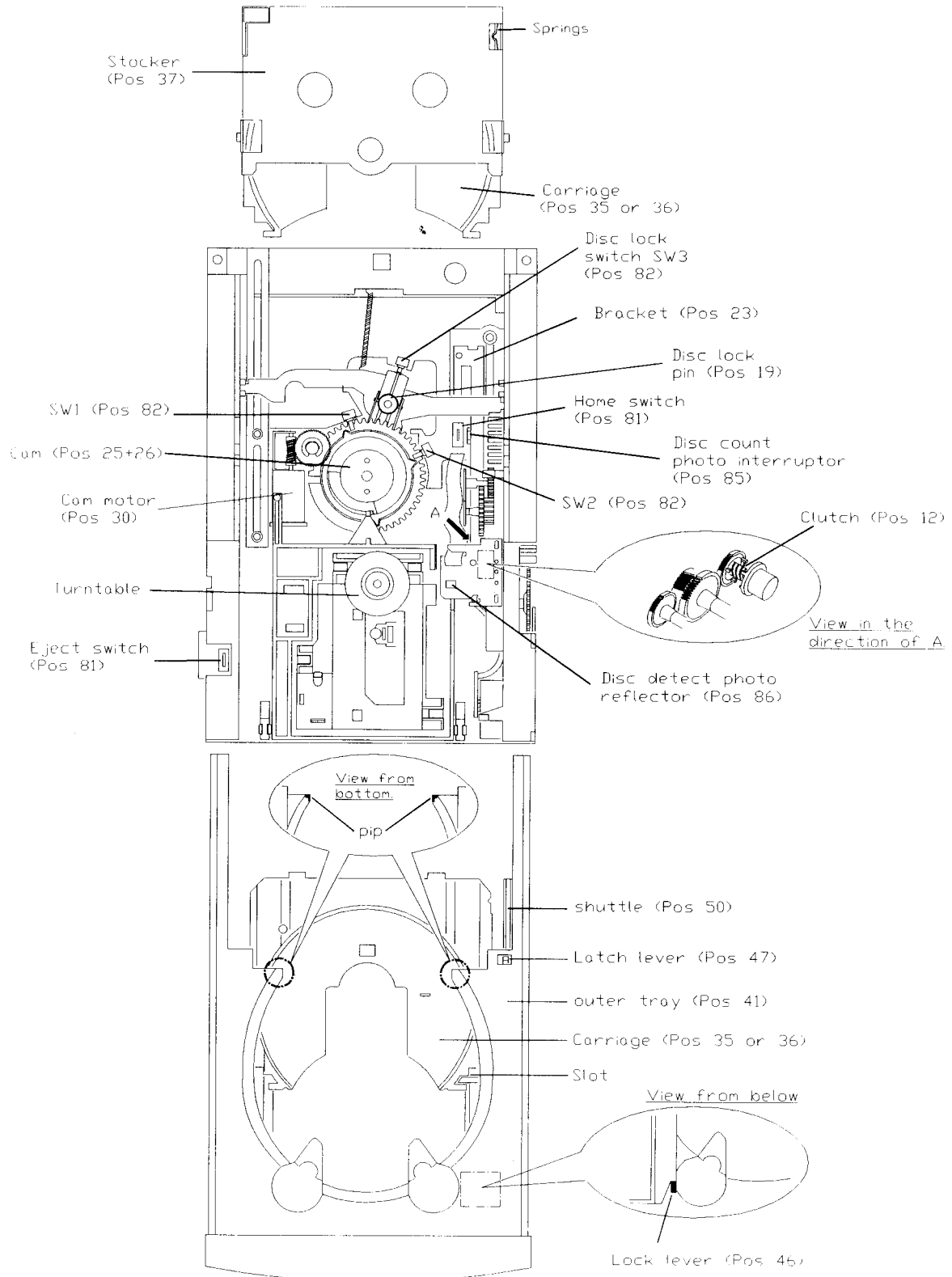
Mechanical overview of CDC7 Module

Identification of parts



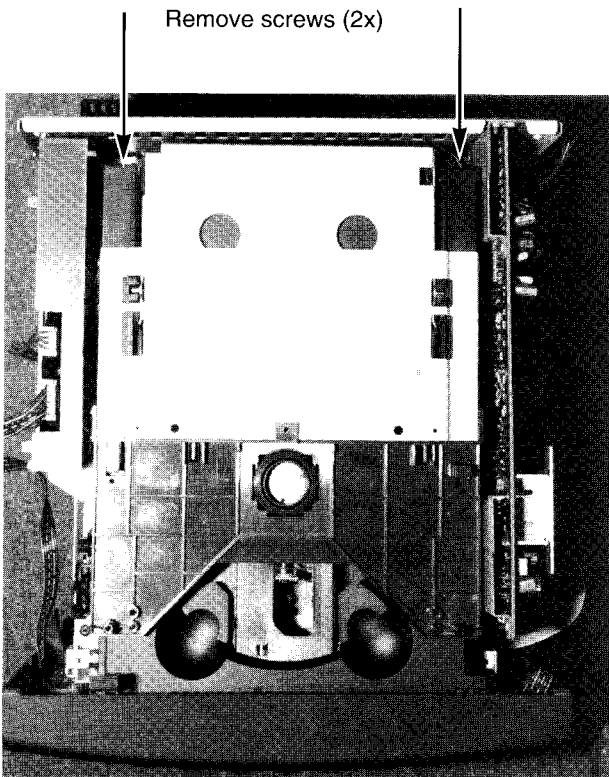
Mechanical overview of CDC7 Module

Identification of parts

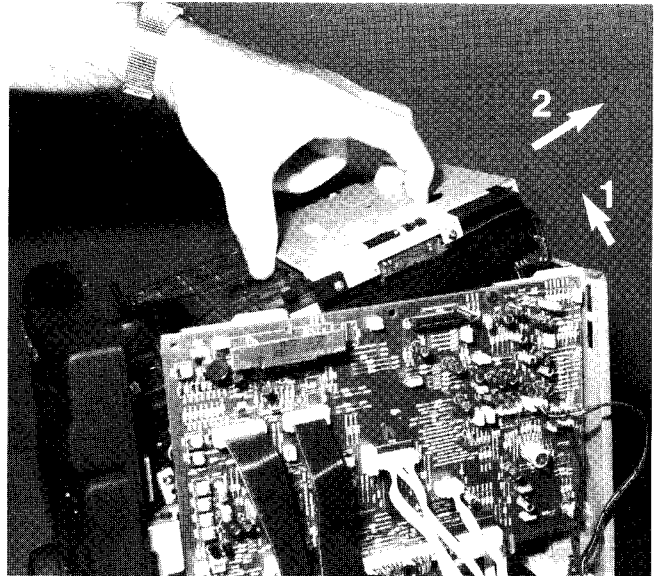


Dismantling hints

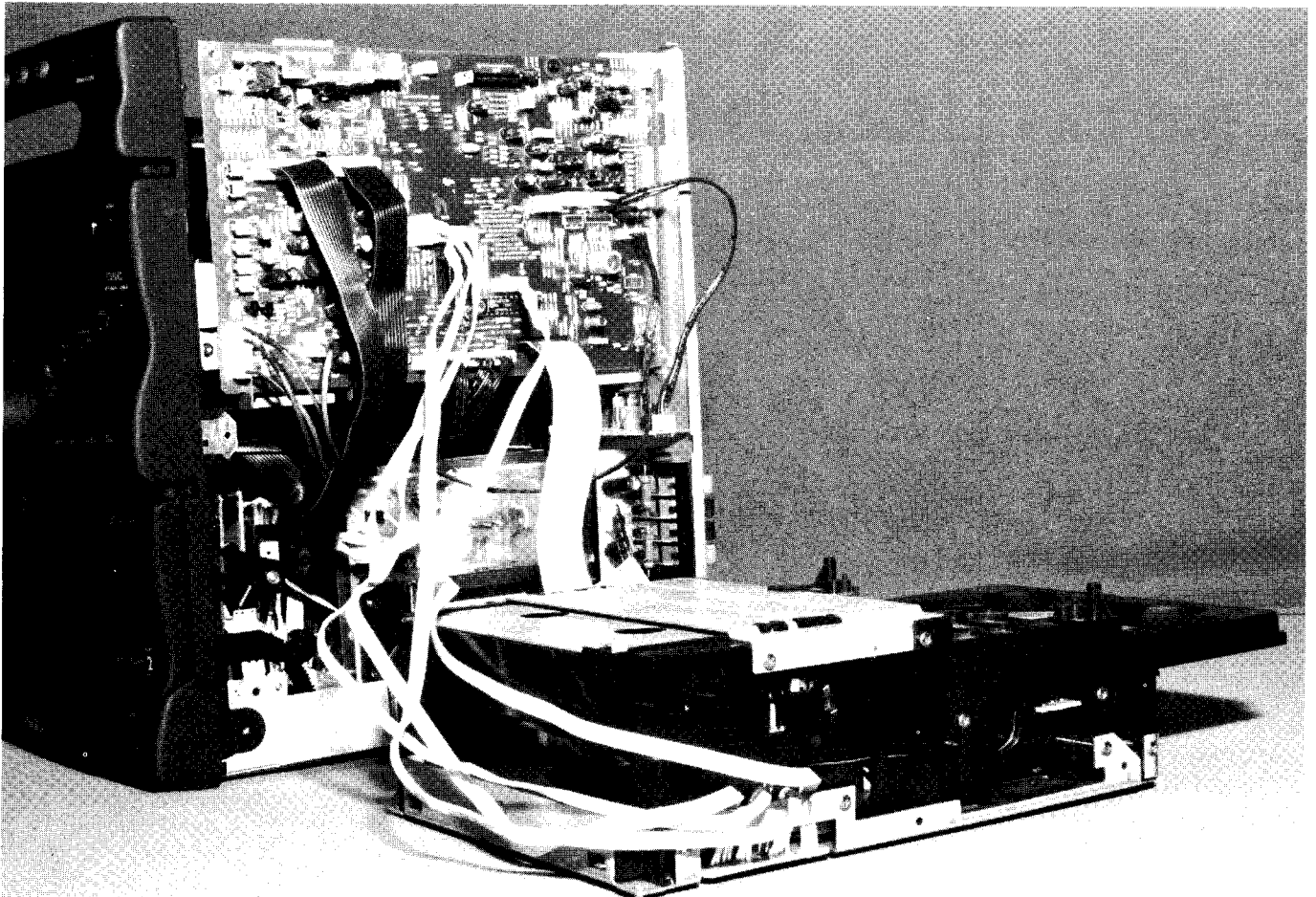
Remove screws (2x)

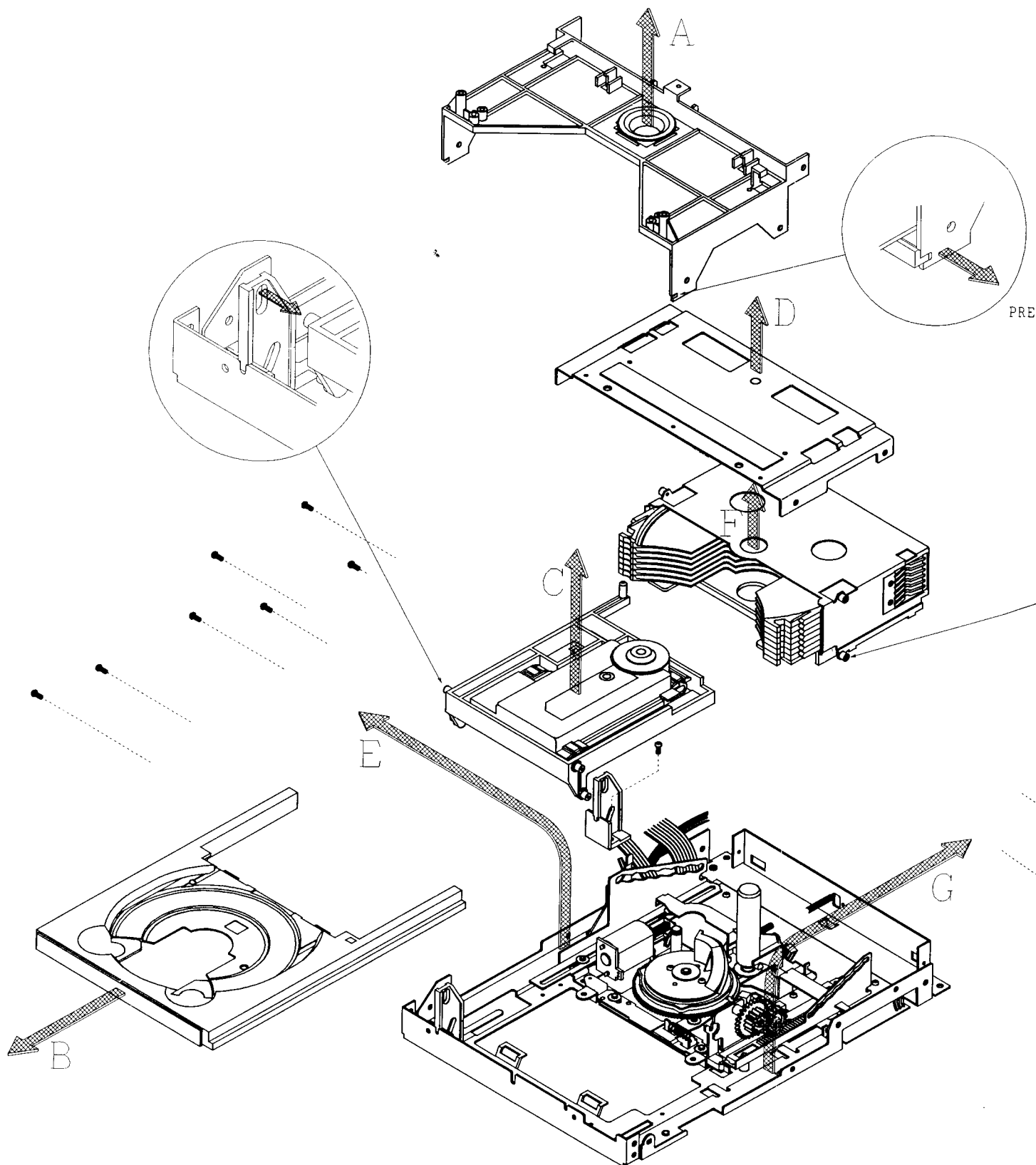


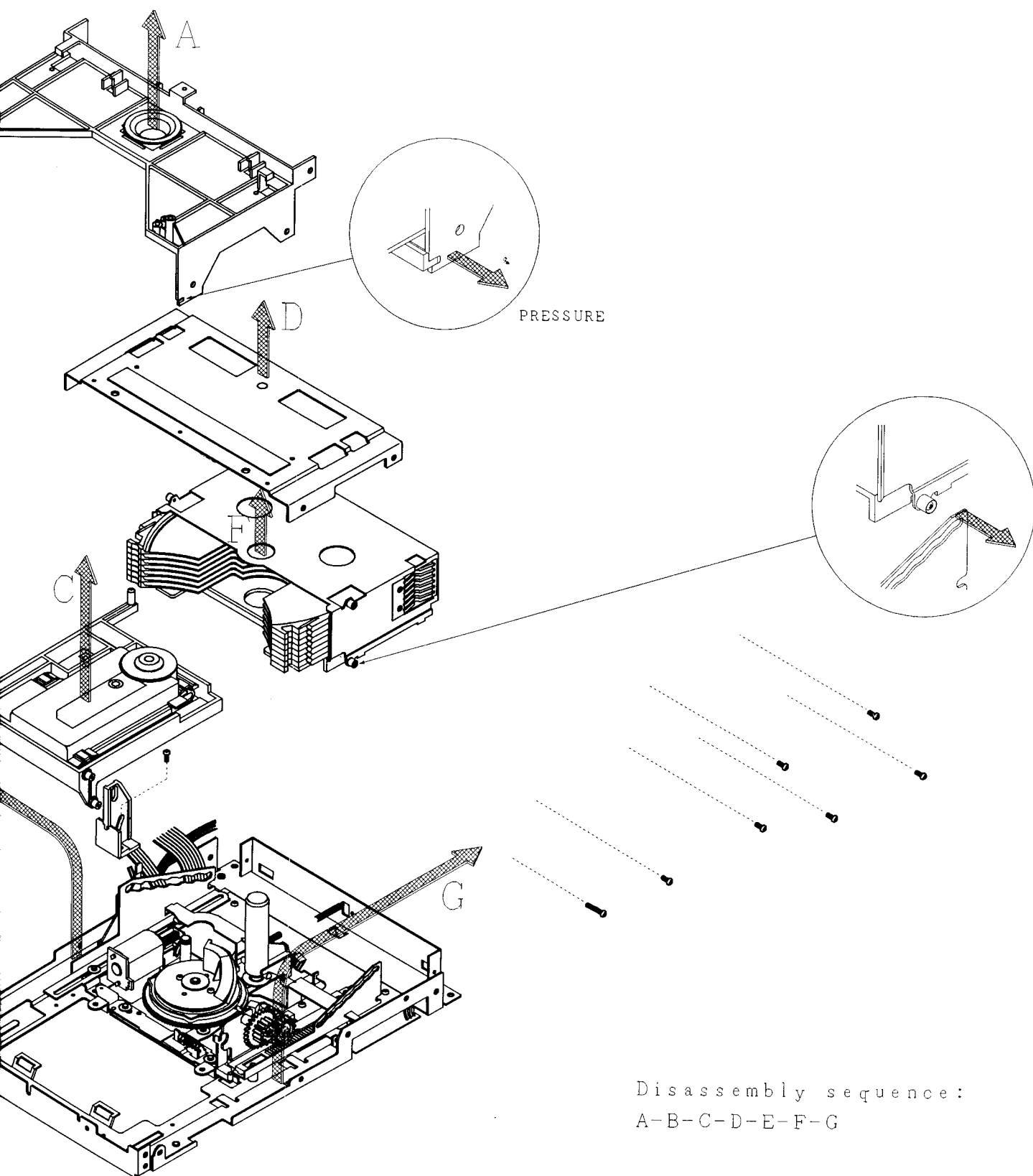
Lift the module on the back side as shown below



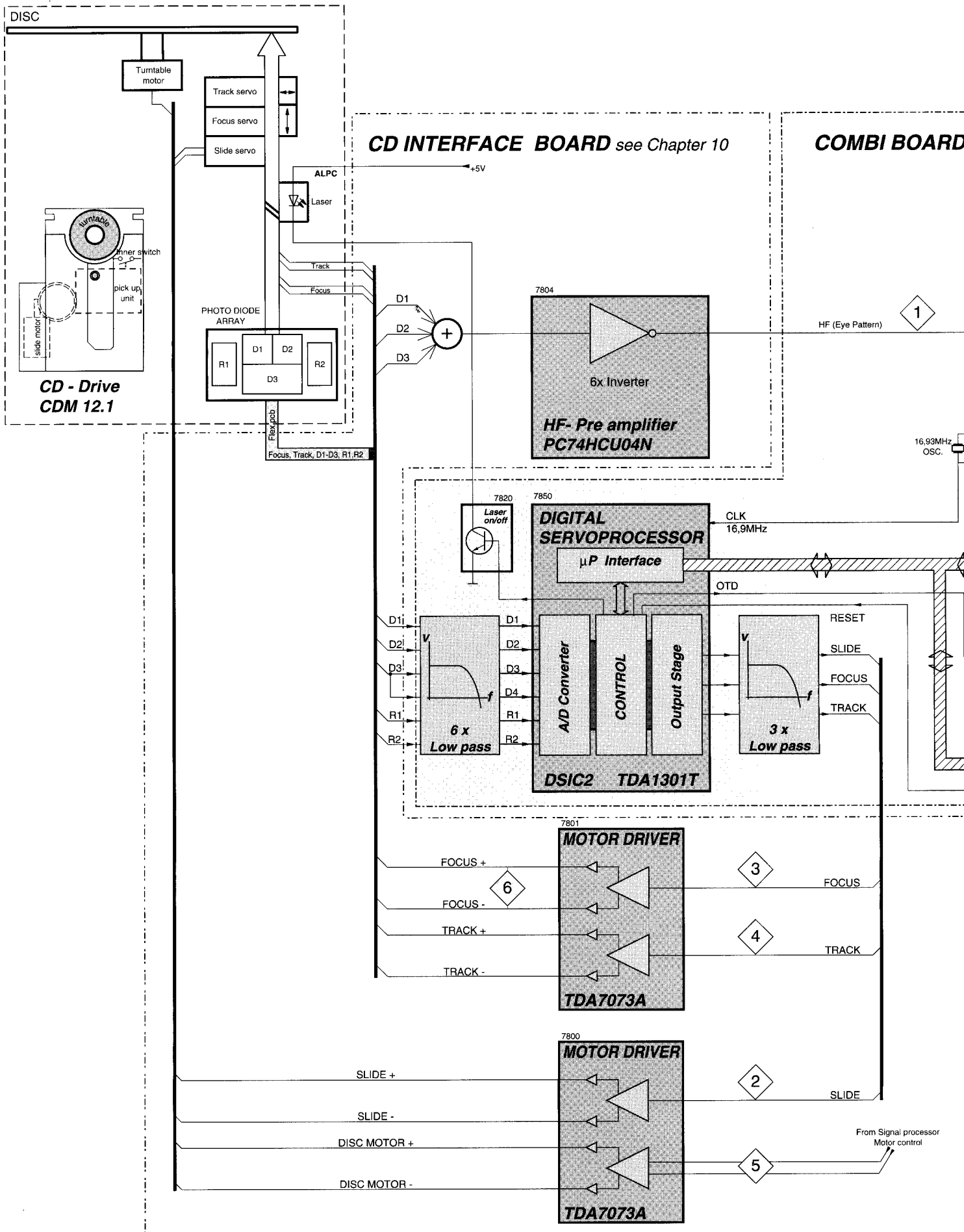
Repair position

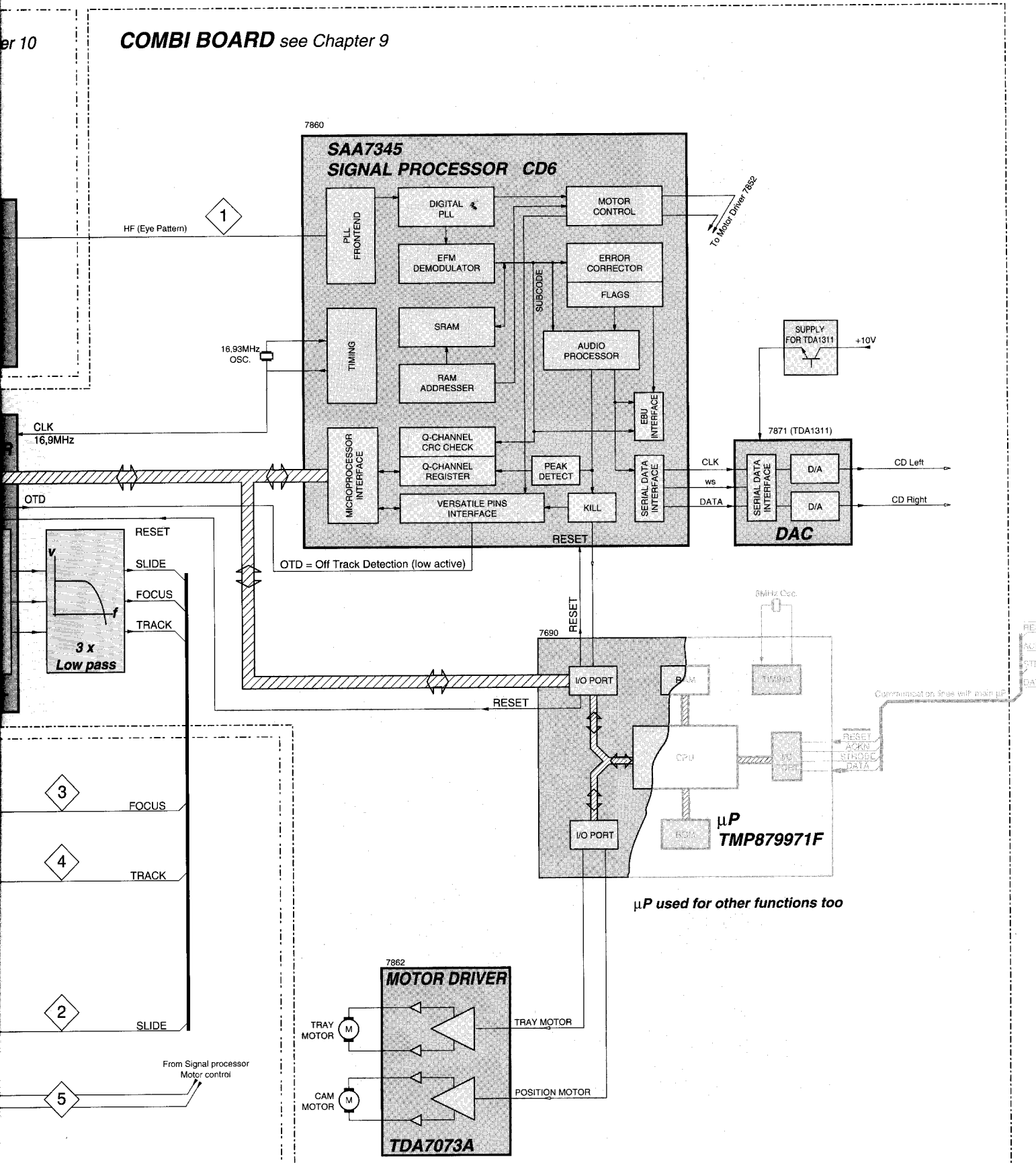


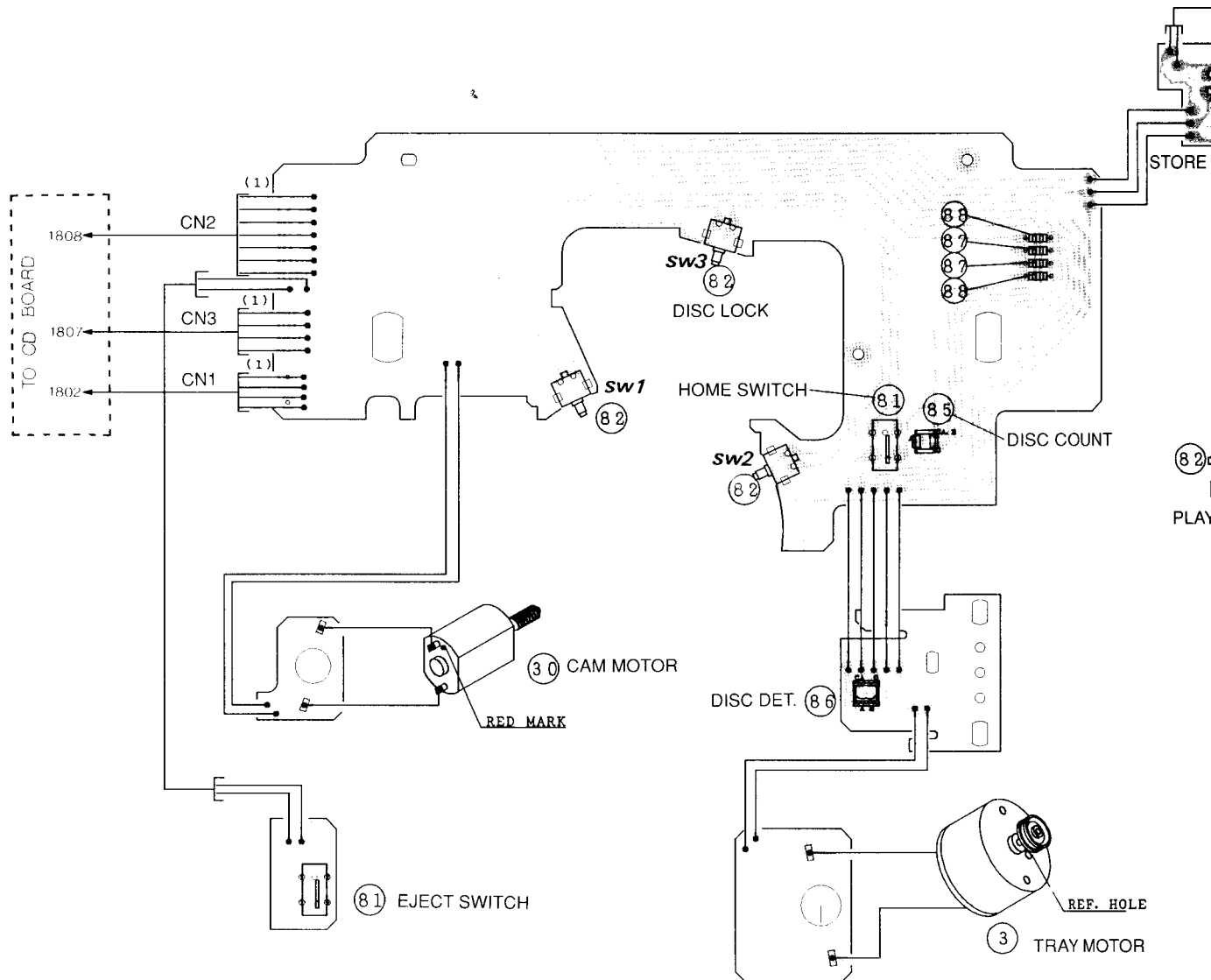
CDC7 Disassembly drawing



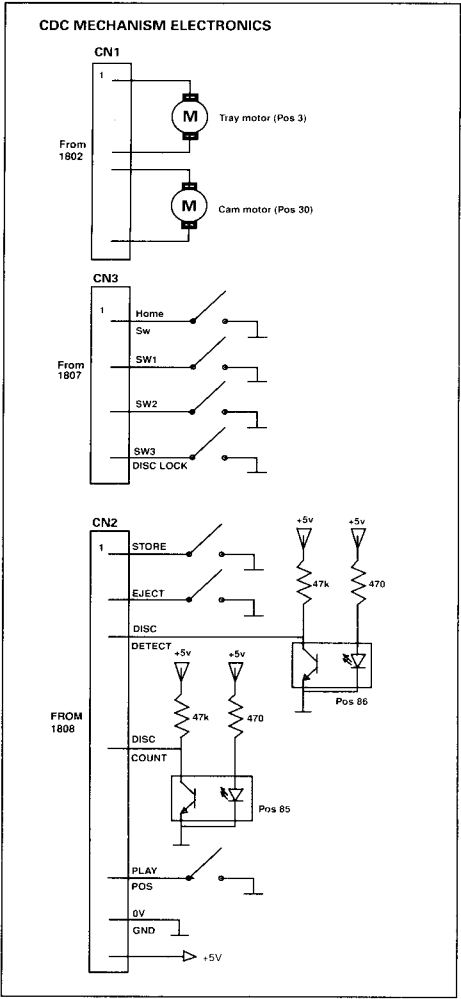
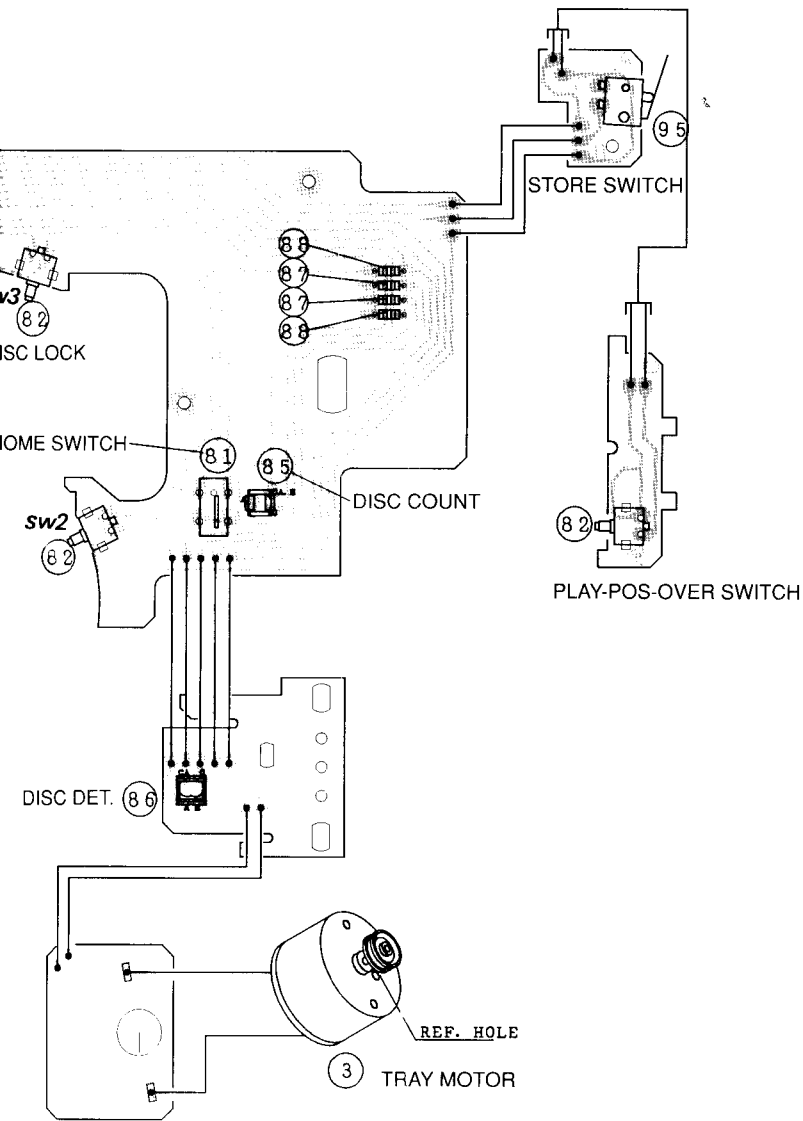
FUNCTIONAL DIAGRAM *CDC7 Module*



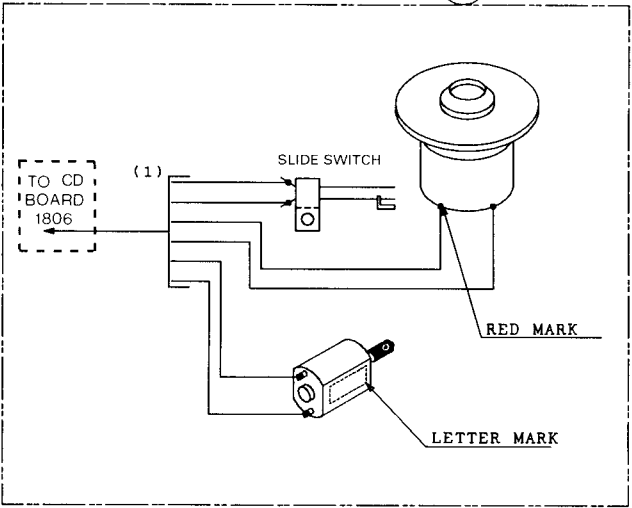
COMBI BOARD see Chapter 9

CDC7 MECHANISM ELECTRONIC

NOTE: NUMBERS IN CIRCLES REFERS TO POSITION
NUMBERS IN THE CDC EXPLODED VIEW.

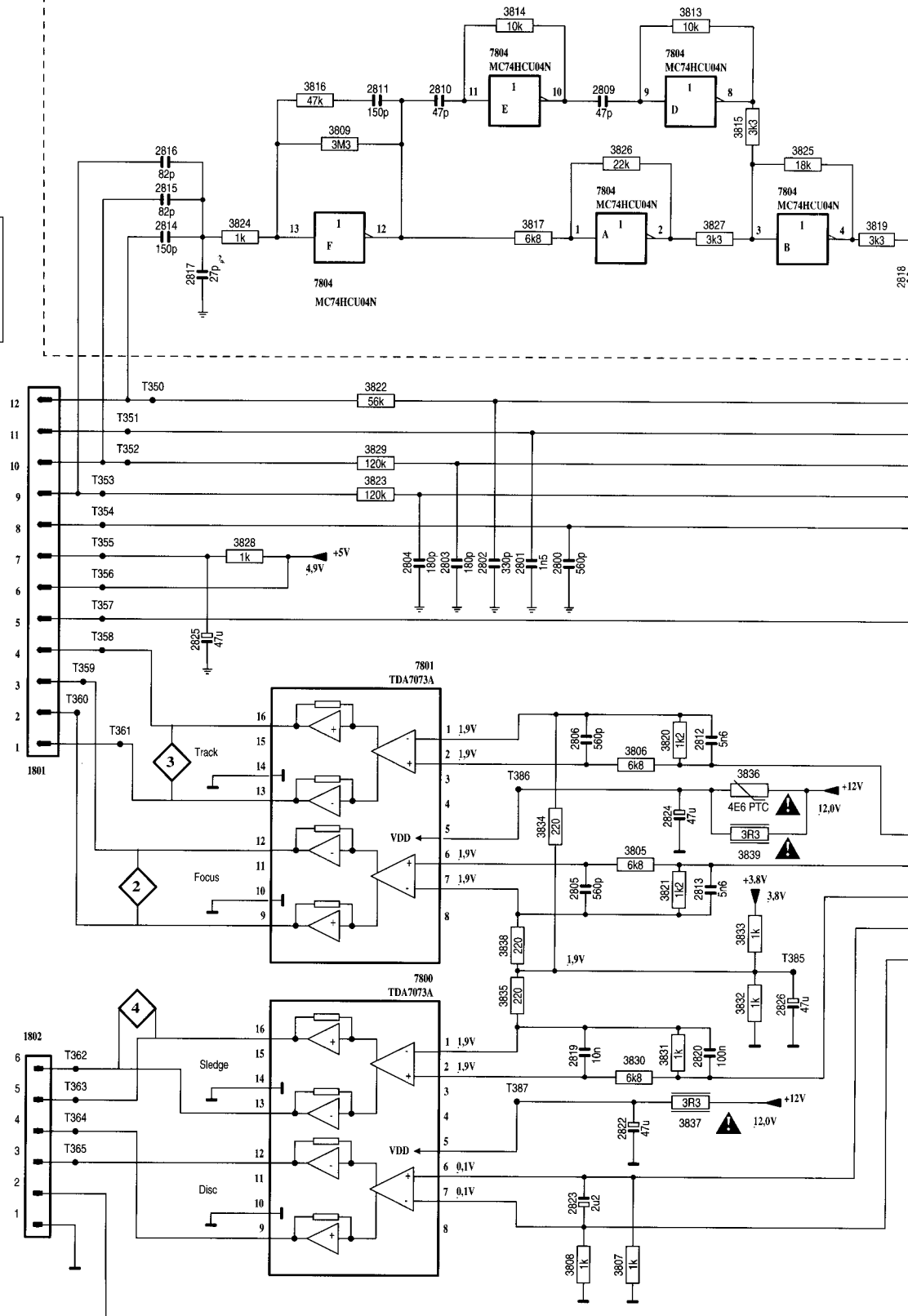
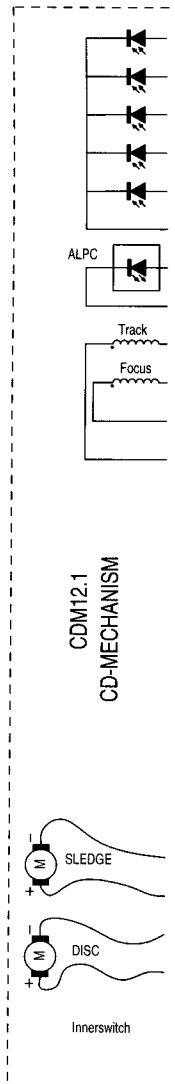
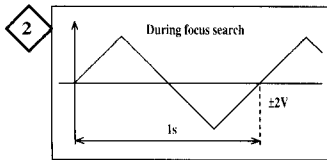


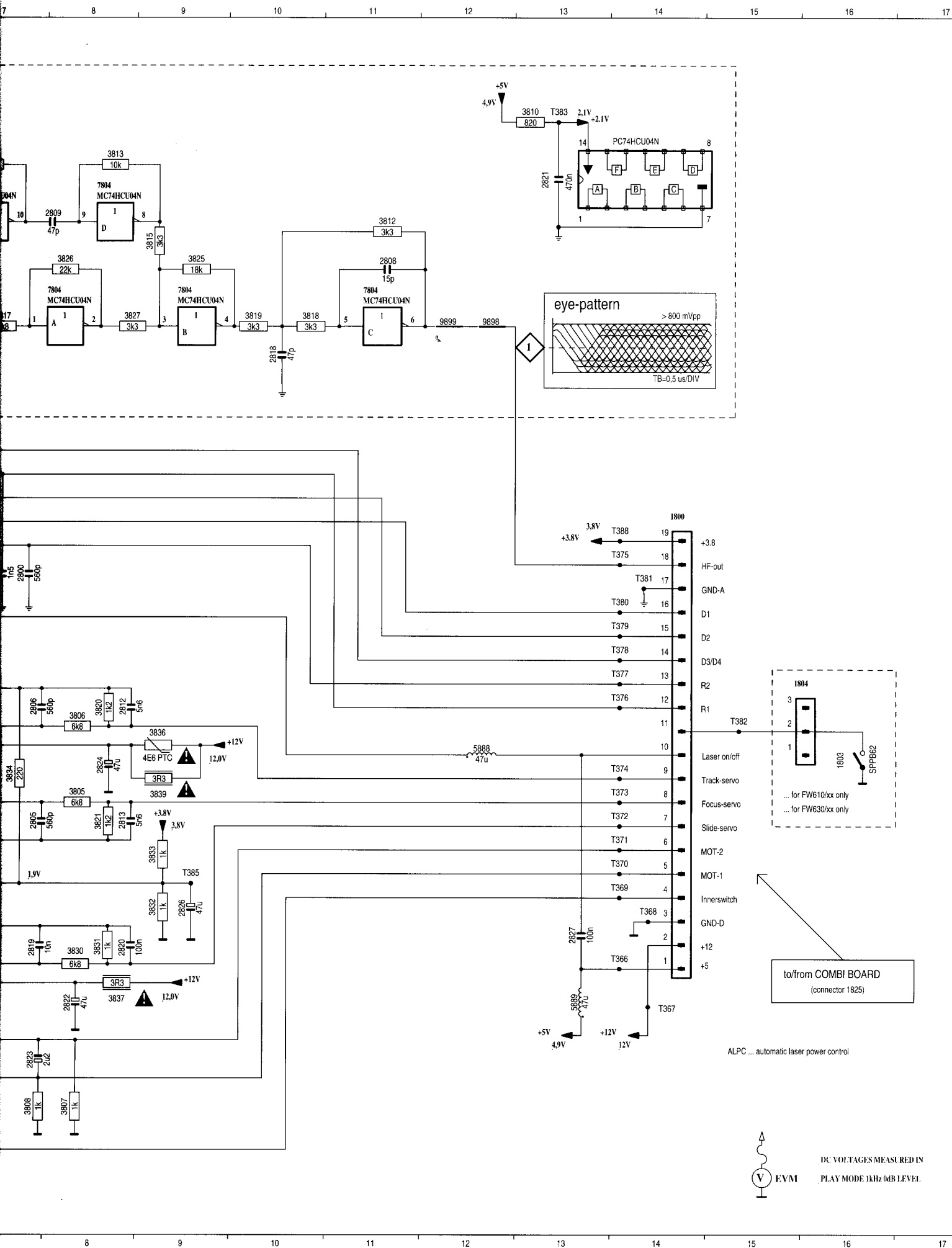
60 CDM 12.1



CD-INTERFACE BOARD

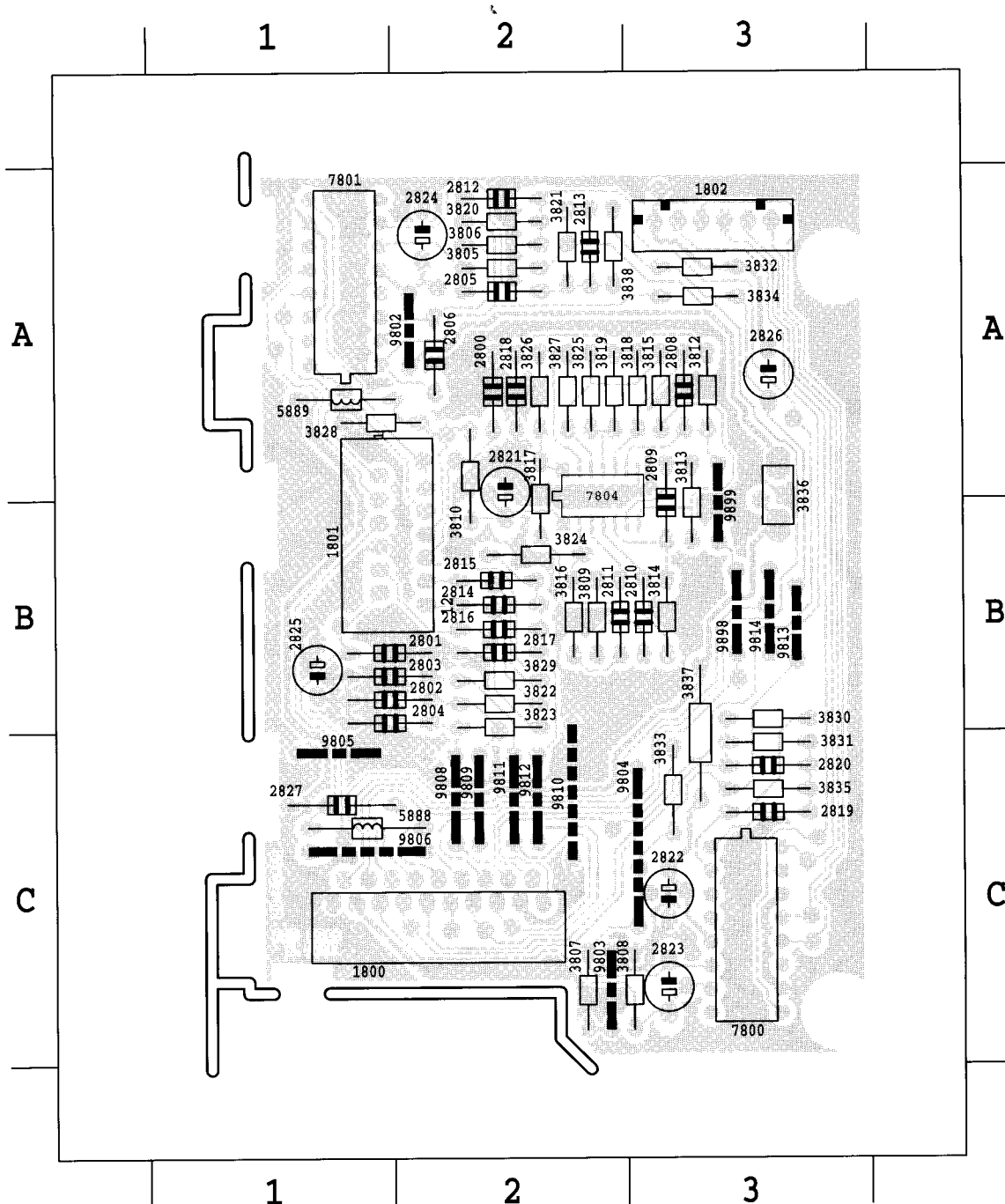
HF-PREAMPLIFIER





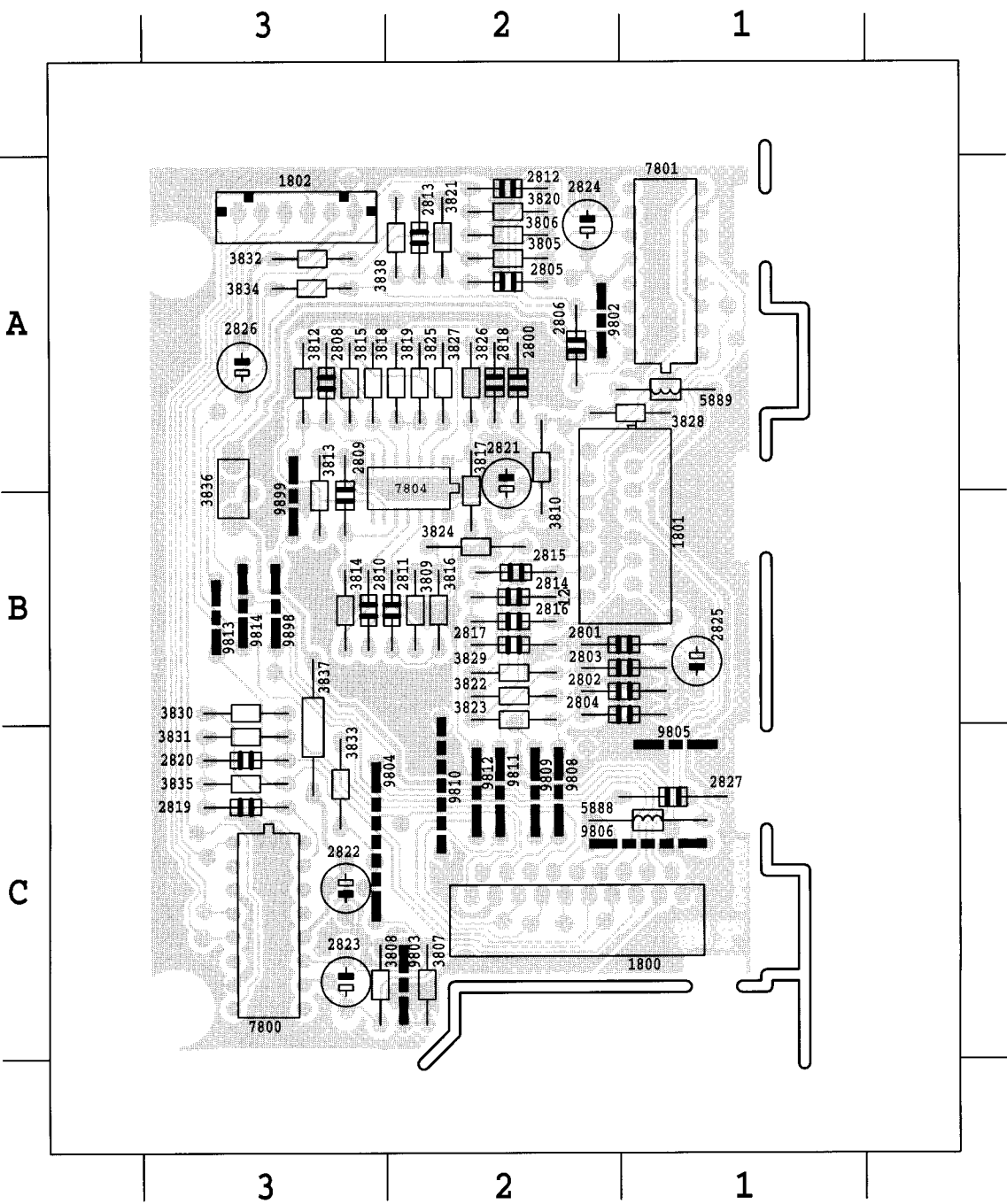
CDC7 IF BOARD Componentside view

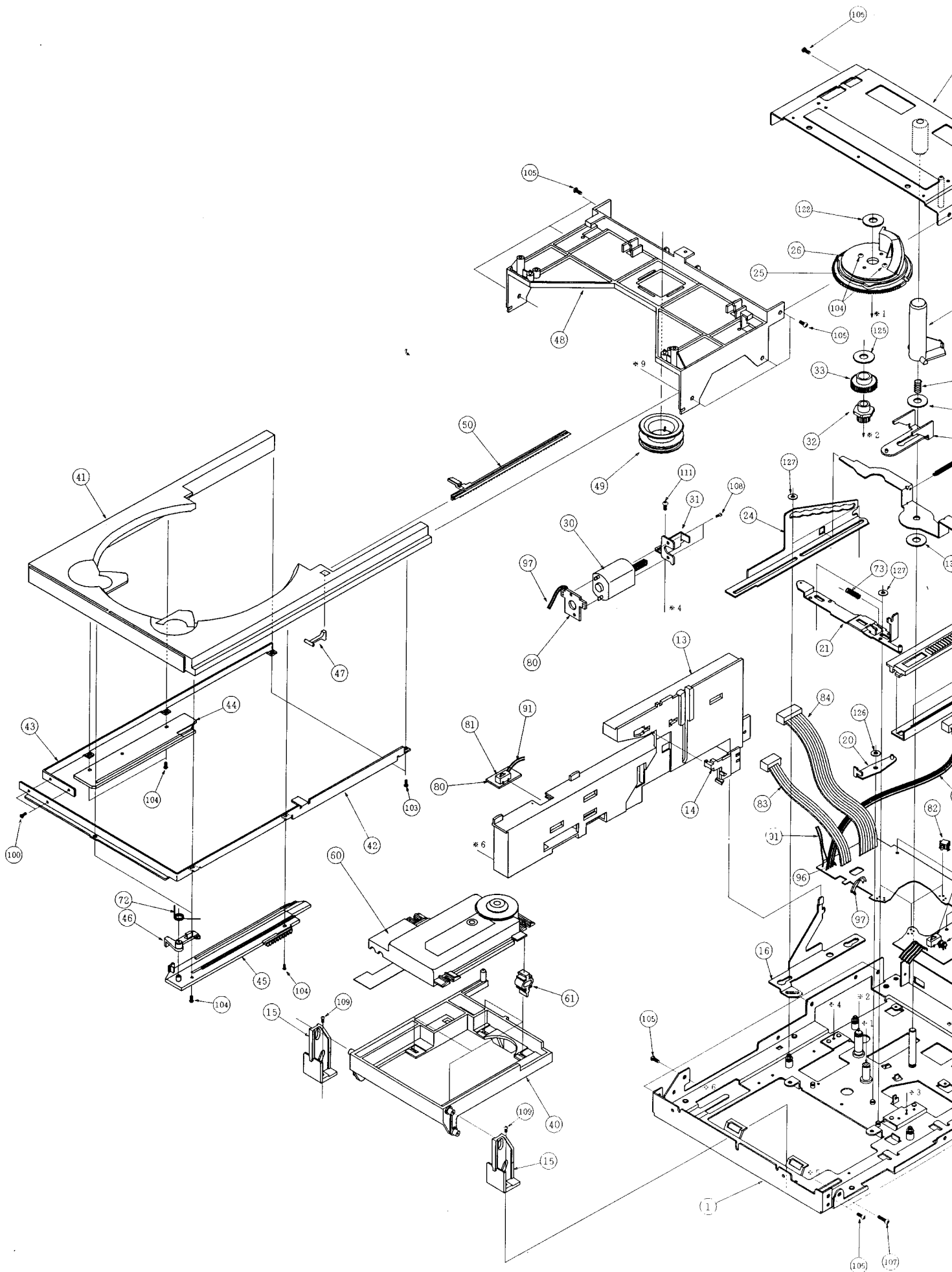
1800 C 2	2810 B 3	2822 C 3	3812 A 3	3824 B 2	3836 A 3	9806 C 1
1801 B 2	2811 B 2	2823 C 3	3813 B 3	3825 A 2	3837 C 3	9808 C 2
1802 A 3	2812 A 2	2824 A 2	3814 B 3	3826 A 2	3838 A 2	9809 C 2
2800 A 2	2813 A 2	2825 B 1	3815 A 3	3827 A 2	5888 C 1	9810 C 2
2801 B 1	2814 B 2	2826 A 3	3816 B 2	3828 A 1	5889 A 1	9811 C 2
2802 B 1	2815 B 2	2827 C 1	3817 B 2	3829 B 2	7800 C 3	9812 C 2
2803 B 1	2816 B 2	3805 A 2	3818 A 3	3830 B 3	7801 A 1	9813 B 3
2804 B 1	2817 B 2	3806 A 2	3819 A 2	3831 C 3	7804 B 2	9814 B 3
2805 A 2	2818 A 2	3807 C 2	3820 A 2	3832 A 3	9802 A 2	9898 B 3
2806 A 2	2819 C 3	3808 C 3	3821 A 2	3833 C 3	9803 C 2	9899 B 3
2808 A 3	2820 C 3	3809 B 2	3822 B 2	3834 A 3	9804 C 3	
2809 B 3	2821 A 2	3810 A 2	3823 B 2	3835 C 3	9805 C 1	

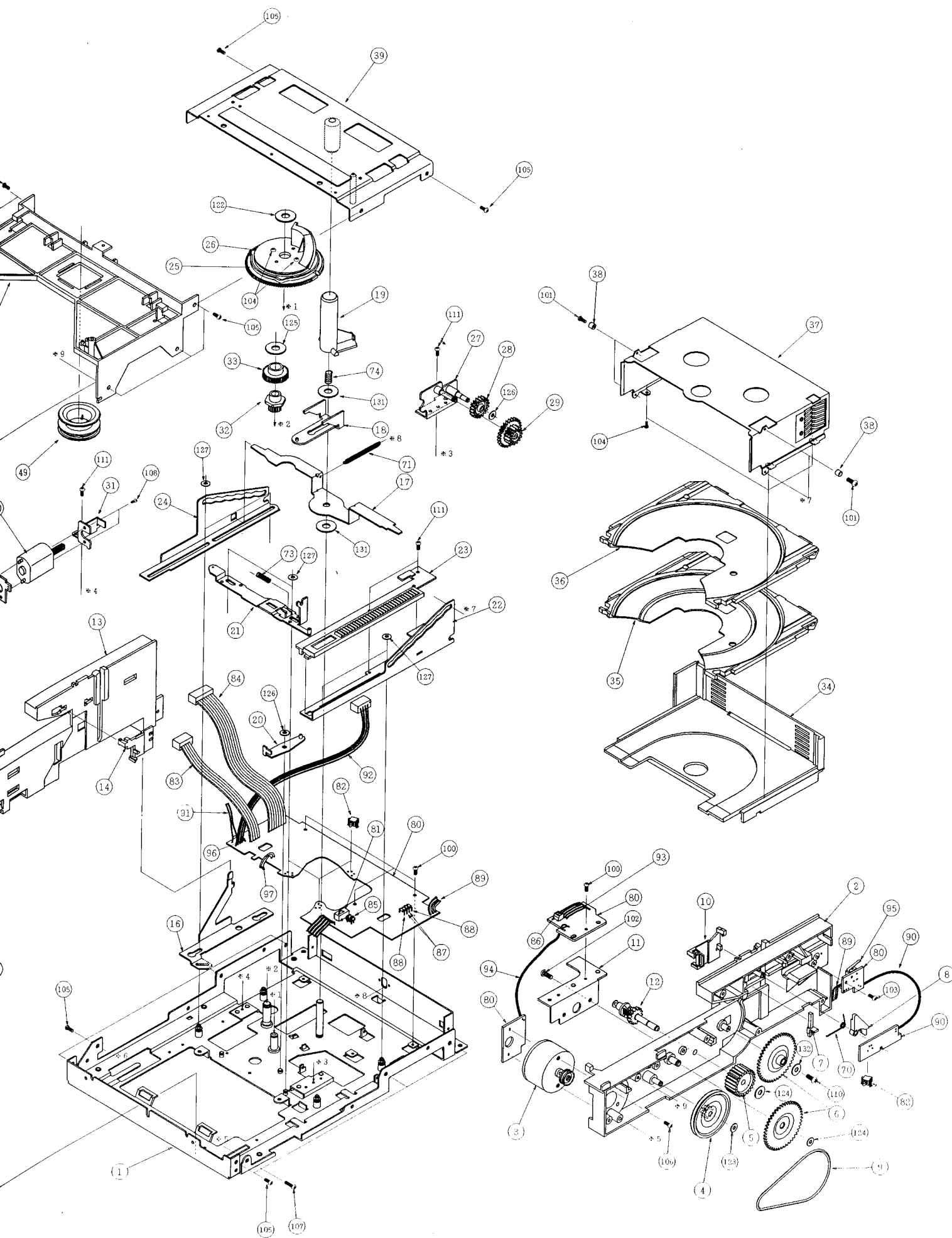


CDC7 IF BOARD Copperside view

1800 C 2	2810 B 3	2822 C 3	3812 A 3	3824 B 2	3836 A 3	9806 C 1
1801 B 2	2811 B 2	2823 C 3	3813 B 3	3825 A 2	3837 C 3	9808 C 2
1802 A 3	2812 A 2	2824 A 2	3814 B 3	3826 A 2	3838 A 2	9809 C 2
2800 A 2	2813 A 2	2825 B 1	3815 A 3	3827 A 2	5888 C 1	9810 C 2
2801 B 1	2814 B 2	2826 A 3	3816 B 2	3828 A 1	5889 A 1	9811 C 2
2802 B 1	2815 B 2	2827 C 1	3817 B 2	3829 B 2	7800 C 3	9812 C 2
2803 B 1	2816 B 2	3805 A 2	3818 A 3	3830 B 3	7801 A 1	9813 B 3
2804 B 1	2817 B 2	3806 A 2	3819 A 2	3831 C 3	7804 B 2	9814 B 3
2805 A 2	2818 A 2	3807 C 2	3820 A 2	3832 A 3	9802 A 2	9898 B 3
2806 A 2	2819 C 3	3808 C 3	3821 A 2	3833 C 3	9803 C 2	9899 B 3
2808 A 3	2820 C 3	3809 B 2	3822 B 2	3834 A 3	9804 C 3	
2809 B 3	2821 A 2	3810 A 2	3823 B 2	3835 C 3	9805 C 1	







MECHANICAL PARTSLIST CDC7 CHANGER MODULE**MECHANICAL PARTS**

4	4822 528 70861	PULLEY GEAR
5	4822 522 33484	CHANGE GEAR
6	4822 522 33483	GEAR
9	4822 358 10148	BELT
10	4822 404 21346	BRACKET RIGHT
12	4822 522 20457	CLUTCH ASSY
14	4822 404 21347	BRACKET LEFT
16	4822 402 50316	CARRIAGE LEVER
17	4822 402 50315	STOCKER ARM
18	4822 402 61542	LOCK PIN CAM ASSY
20	4822 402 61536	ARM CHANGE ASSY
21	4822 402 50314	LEVER CHANGE ASSY
22	4822 402 61537	STOCKER LEVER RIGHT
23	4822 522 33485	STOCKER GEAR
24	4822 402 61538	STOCKER LEVER LEFT
25	4822 522 33479	CAM GEAR
26	4822 522 33478	CAM UPPER PART
28	4822 522 33482	GEAR
29	4822 522 33481	GEAR
32	4822 522 33476	GEAR
33	4822 522 33477	GEAR CAM WHEEL
34	4822 256 92294	STOCKER
35	4822 466 93397	CARRIAGE DISC 1
36	4822 466 93398	CARRIAGE DISC 2-7
38	4822 532 12282	STOCKER SHAFT
41	4822 444 30489	TRAY
45	4822 466 93396	TRAY PLATE RIGHT
46	4822 402 61539	LOCK ARM
47	4822 402 61541	LATCH LEVER
49	4822 532 61255	CLAMPER ASSY
50	4822 535 93488	SHUTTLE
60	4822 691 30278	CDM12
61	4822 325 50215	SUSPENSION
70	4822 492 42713	SPRING TORSION
71	4822 492 33459	SPRING STOCKER ARM
72	4822 492 42714	SPRING SHUTTLE
73	4822 492 33461	SPRING LEVER CHANGE
74	4822 492 52407	SPRING DISC LOCK PIN
122	4822 532 52591	WASHER
123	4822 532 52588	WASHER
124	4822 532 52589	WASHER
125	4822 530 70124	WASHER
126	4822 532 52586	WASHER
127	4822 532 52587	WASHER
131	4822 532 52465	WASHER

MISCELLANEOUS

3	4822 361 21725	TRAY MOTOR
7	4822 277 11473	LEVER SWITCH
30	4822 361 21726	CAM MOTOR
81	4822 271 30845	SWITCH
82	4822 271 30847	SWITCH
85	4822 130 91369	SENSOR
86	4822 130 91368	SENSOR
87	4822 117 11343	CR16 470E PITCH 5MM
88	4822 117 11344	CR16 47k PITCH 5MM
95	4822 271 30846	SWITCH

ELECTRICAL PARTSLIST CDC7 INTERFACE BOARD**MISCELLANEOUS**

1800	4822 267 60412	FLEX PRINT CONNECTOR
1803	4822 276 13503	SWITCH

INTEGRATED CIRCUITS

7800	4822 209 32852	TDA7073A/N2
7801	4822 209 32852	TDA7073A/N2
7804	5322 209 11517	PC74HCU04T

COILS

5888	4822 157 53906	47μH	10%
5889	4822 157 53906	47μH	10%

RESISTORS

3805	4822 116 52296	6k8	5%	0,5W
3806	4822 116 52296	6k8	5%	0,5W
3807	4822 050 11002	1k	5%	0,2W
3808	4822 050 11002	1k	5%	0,2W
3809	4822 111 50499	3M3	5%	0,2W

3810	4822 116 52231	820R	5%	0,5W
3812	4822 116 52269	3k3	5%	0,5W
3813	4822 116 83864	10k	5%	0,5W
3814	4822 116 83864	10k	5%	0,5W
3815	4822 116 52269	3k3	5%	0,5W

3816	4822 116 52284	47k	5%	0,5W
3817	4822 116 52296	6k8	5%	0,5W
3818	4822 116 52269	3k3	5%	0,5W
3819	4822 116 52269	3k3	5%	0,5W
3820	4822 116 52207	1k2	5%	0,5W

3821	4822 116 52207	1k2	5%	0,5W
3822	4822 116 52291	56k	5%	0,5W
3823	4822 116 52239	120k	5%	0,5W
3824	4822 050 11002	1k	5%	0,2W
3825	4822 116 52251	18k	5%	0,5W

3826	4822 116 52257	22k	5%	0,5W
3827	4822 116 52269	3k3	5%	0,5W
3828	4822 050 11002	1k	5%	0,2W
3829	4822 116 52239	120k	5%	0,5W
3830	4822 116 52296	6k8	5%	0,5W

3831	4822 050 11002	1k	5%	0,2W
3832	4822 050 11002	1k	5%	0,2W
3833	4822 050 11002	1k	5%	0,2W
3834	4822 116 52215	220R	5%	0,16W
3835	4822 116 52215	220R	5%	0,16W

3836	4822 116 40227	PTC	4R6	
3837	4822 052 10338	3R3	NFR25	
3838	4822 116 52215	220R	5%	0,16W

CAPACITORS

2800	4822 122 10459	560pF	10%	50V
2801	4822 126 12878	1,5nF	10%	16V
2802	4822 126 12787	330pF	10%	50V
2803	4822 126 10053	180pF	10%	50V
2804	4822 126 10053	180pF	10%	50V

2805	4822 122 10459	560pF	10%	50V
2806	4822 122 10459	560pF	10%	50V
2808	4822 122 10462	15pF	5%	50V
2809	4822 122 33848	47pF	5%	50V

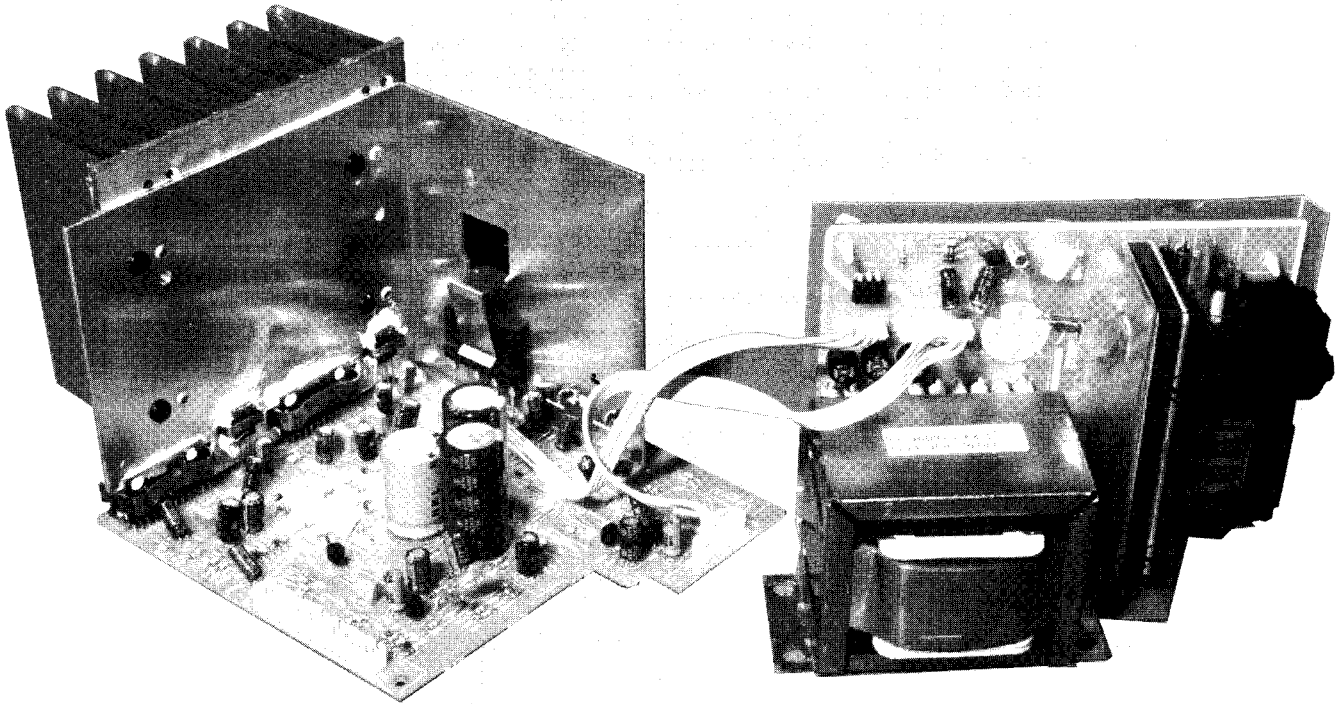
CAPACITORS

2810	4822 122 33848	47pF	5%	50V
2811	4822 122 33849	150pF	10%	50V
2812	4822 126 13098	5,6nF	20%	16V
2813	4822 126 13098	5,6nF	20%	16V
2814	4822 122 33849	150pF	10%	50V

2815	4822 122 10319	82pF	5%	50V
2816	4822 122 10319	82pF	5%	50V
2817	4822 122 33192	27pF	5%	50V
2818	4822 122 33848	47pF	5%	50V
2819	4822 121 51387	10nF	20%	16V

2820	4822 126 12882	100nF	20%	50V
2821	4822 124 41407	0,47μF	20%	63V
2822	4822 124 40433	47μF	20%	25V
2823	4822 124 41407	0,47μF	20%	63V
2824	4822 124 40433	47μF	20%	25V

2825	4822 124 40433	47μF	20%	25V
2826	4822 124 40433	47μF	20%	25V
2827	4822 126 12882	100nF	20%	50V



POWER BOARD

TABLE OF CONTENTS

Circuit description	11-1
Component layout	11-2
Circuit diagram Supply part	11-3
Component layout	11-4
Circuit diagram Power stage	11-5
Partslist	11-6

CIRCUIT DESCRIPTION

The mains transformer 1008 is fed with a preregulated voltage. The preregulation is done by a power MOSFET 7351. To be able to handle AC, the voltage for the FET is rectified by a diode bridge 6351, 6352, 6353 and 6354. The control of the MOSFET is depending of the mode of the set.

In Power on mode the MOSFET is controled by the optocoupler 7353 via resistor 3345. The supply for the optocoupler is created via resistor 3343 and the diode 6344. Stabilisation and filtering is done by the zenerdiode 6345 and the elcap 2343. The optocoupler is activated by the transistor 7369. The emitter of this transistor is connected to the stabilized voltage +5,6V via resistor 3386. The base is connected via zenerdiode 6384 and resistor 3383 to the voltage +16V. This enables the transistor to compare the voltage +16V with the voltage +5,6V. In case of a too low +16V the transistor conducts and makes via the optocoupler also the MOSFET conducting. In case of a too high +16V both semiconductors become nonconducting.

To provide sufficient stability in the whole control loop, some measures are taken. On the primary side a feed back via resistor 3341 and diode 6341 reduces the overall gain. On the secondary side the resistor 3386 works in similar way. The RC network 2379/3379 reduces the AC gain while the DC gain remains unaffected.

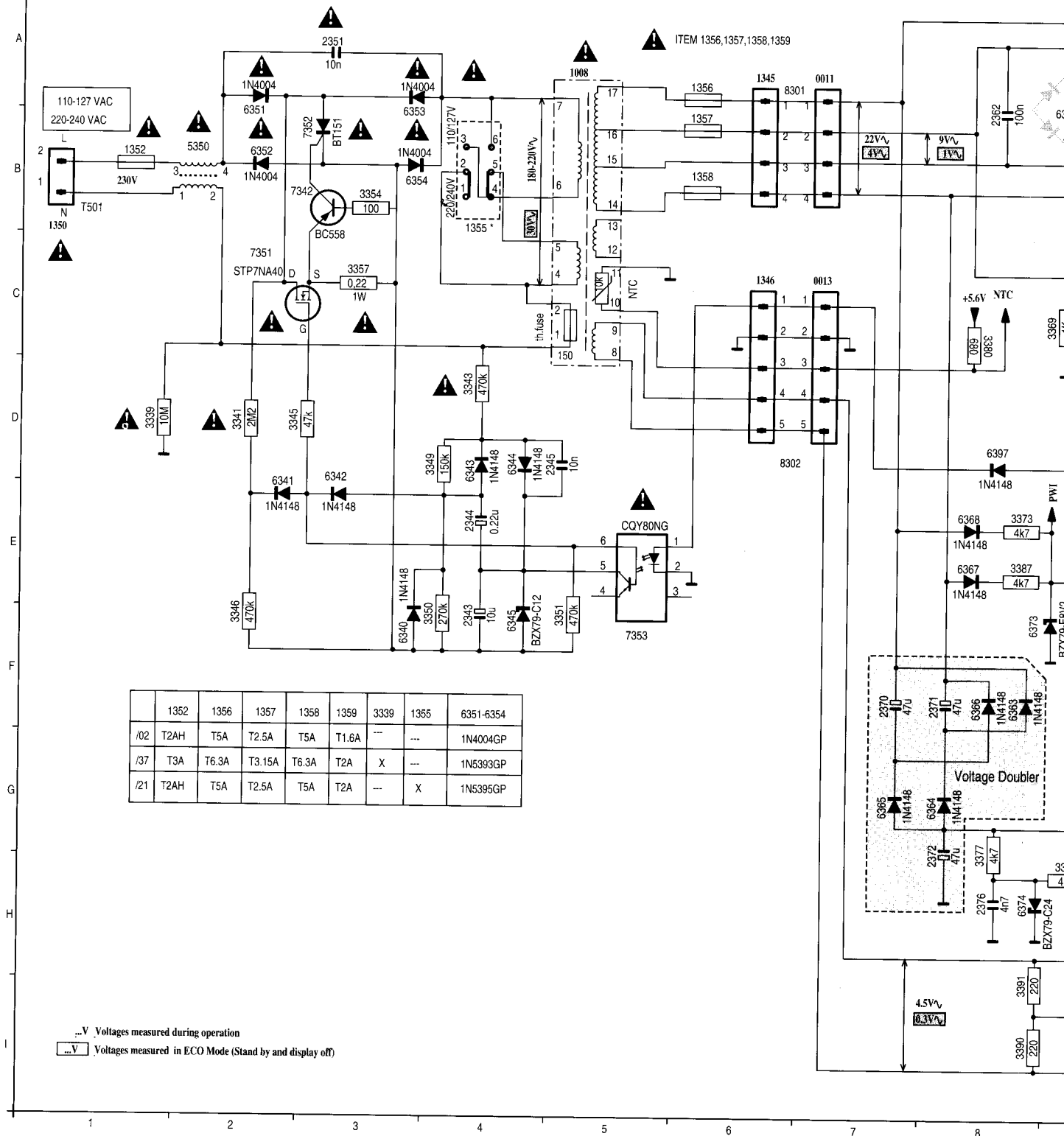
Transients could cause too high current peaks in the FET. To safeguard the FET, the current is sensed by the resistor 3357 and the transistor 7342. In case of overcurrent the thyristor 7352 fires and bypass the FET.

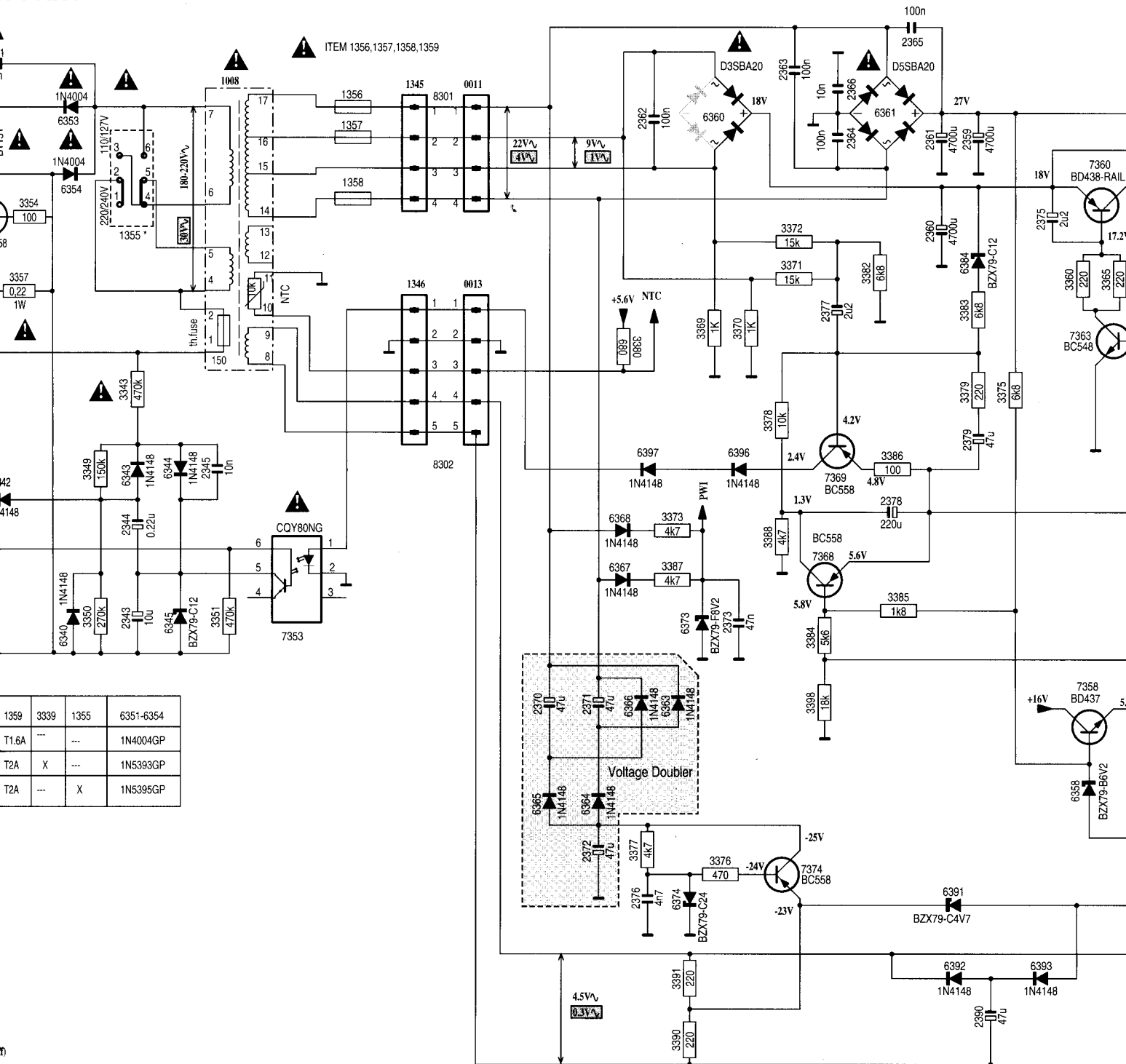
To avoid a too high supply in case of fault condition the thyristor 7376 is used as a crowbar device. The zenerdiode 6386 senses the voltage +24V and fires the thyristor in case of excessive voltage. The fuses will be blown.

In the ECO mode (Stand by and display off) it is only necessary to supply the microprocessor and the infrared eye. This can be done with a drastically reduced voltage on the transformer. To activate that mode, the line STBY is switched by the microprocessor to ground. This makes the transistor 7366 conducting. As a consequence the +12V stabilisation, realized by transistors 7360, 7363 and 7364, is switched off. Additional the transistor 7368 is conducting and switches transistor 7369 off. The control loop via the optocoupler is now cut off. The control is working only with components connected to the primary side of the transformer. Via the diode 6344 still a stabilized voltage of 12V is created. The voltage at the anode of the diode 6344 is during one half cycle about +12V and during the other half cycle below zero depending on the voltage across the transformer.

Integration by resistor 3349 and capacitor 2344 results a triangle voltage, fed via diode 6342 to the gate of the FET. The positive peak happens at the zero crossing of the mains, switching on the FET for a short time. The average DC level is depending on the transformer voltage. Increasing transformer voltage shifts the DC level to negative. This is reducing the conduction time of the FET.

POWER BOARD SUPPLY PART





1359	3339	1355	6351-6354
T1.6A	---	---	1N4004GP
T2A	X	---	1N5393GP
T2A	---	X	1N5395GP

0011 A7
0013 B7
1008 A5
1304 A6
1346 B6
1350 B1
1352 B1
1355 B4
1356 A6
1357 B6
1358 B6
2337 A4
2342 E5
2345 E4
2345 D5
2351 A3
2357 G12
2359 B1
2360 B1
2361 D10
2362 E8
2363 A9
2364 B10
2365 A10
2366 A10
2367 D12
2368 C14
2370 F7
2371 F8
2372 G8
2375 F9
2374 D13
2375 B11
2376 H8
2377 C10
2378 E10
2379 D11
2390 I1
2339 D1
3341 D2
3343 D4
3345 D2
3346 F2
3349 D4
3350 F4
3351 F5
3354 B3
3357 C3
3358 C3
3360 C2
3361 C12
3362 C14
3363 D14
3364 D14
3365 C12
3367 F13
3368 E13
3369 C9
3370 C9
3371 C9
3372 B9
3373 E8
3374 C13
3375 D11
3376 H9
3377 G8
3378 D9
3379 D11
3380 C8
3382 C10
3383 C11
3384 F9
3385 E10
3386 D10
3387 E8
3388 E9
3390 I8
3391 H8
3398 F9
3350 B2
6340 F3
6341 E2
6342 D3
6343 D4
6344 D4
6345 F4
6351 B2
6352 B2
6353 B3
6354 B3
6358 G12
6360 A9
6361 A10
6362 F14
6363 C8
6364 F8
6365 G7
6366 F8
6367 E8

COMPONENT SIDE VIEW

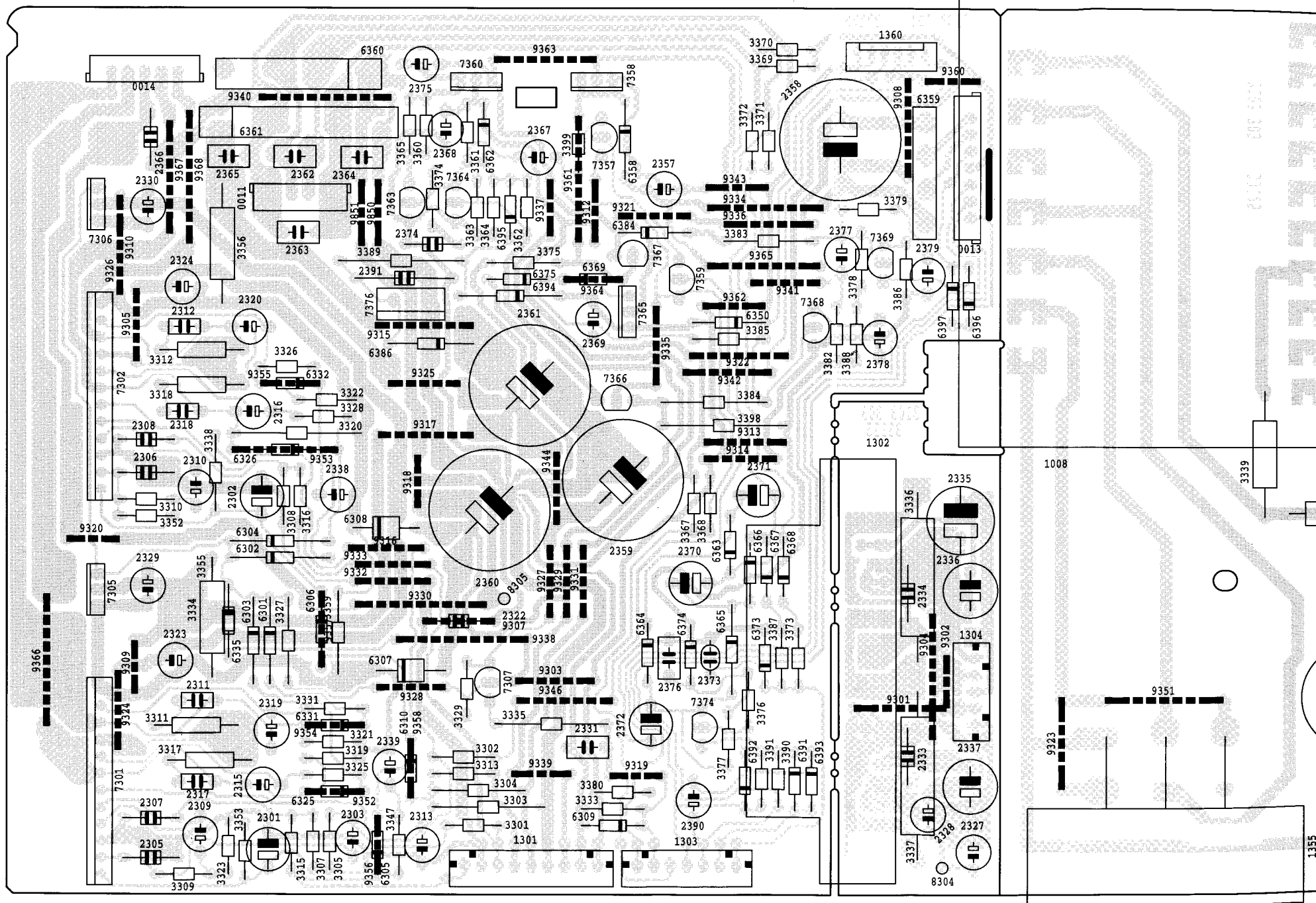
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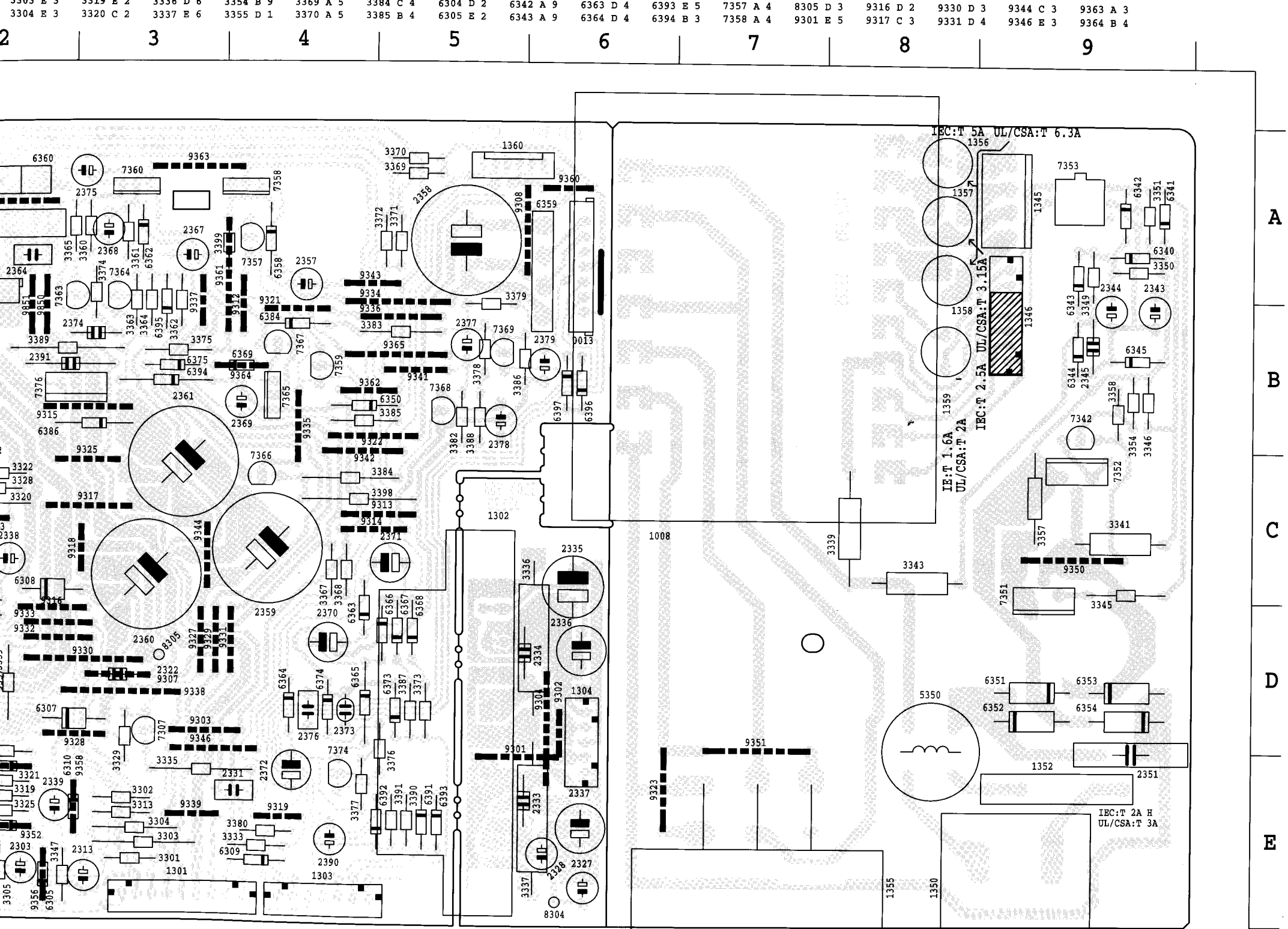
B

C

D

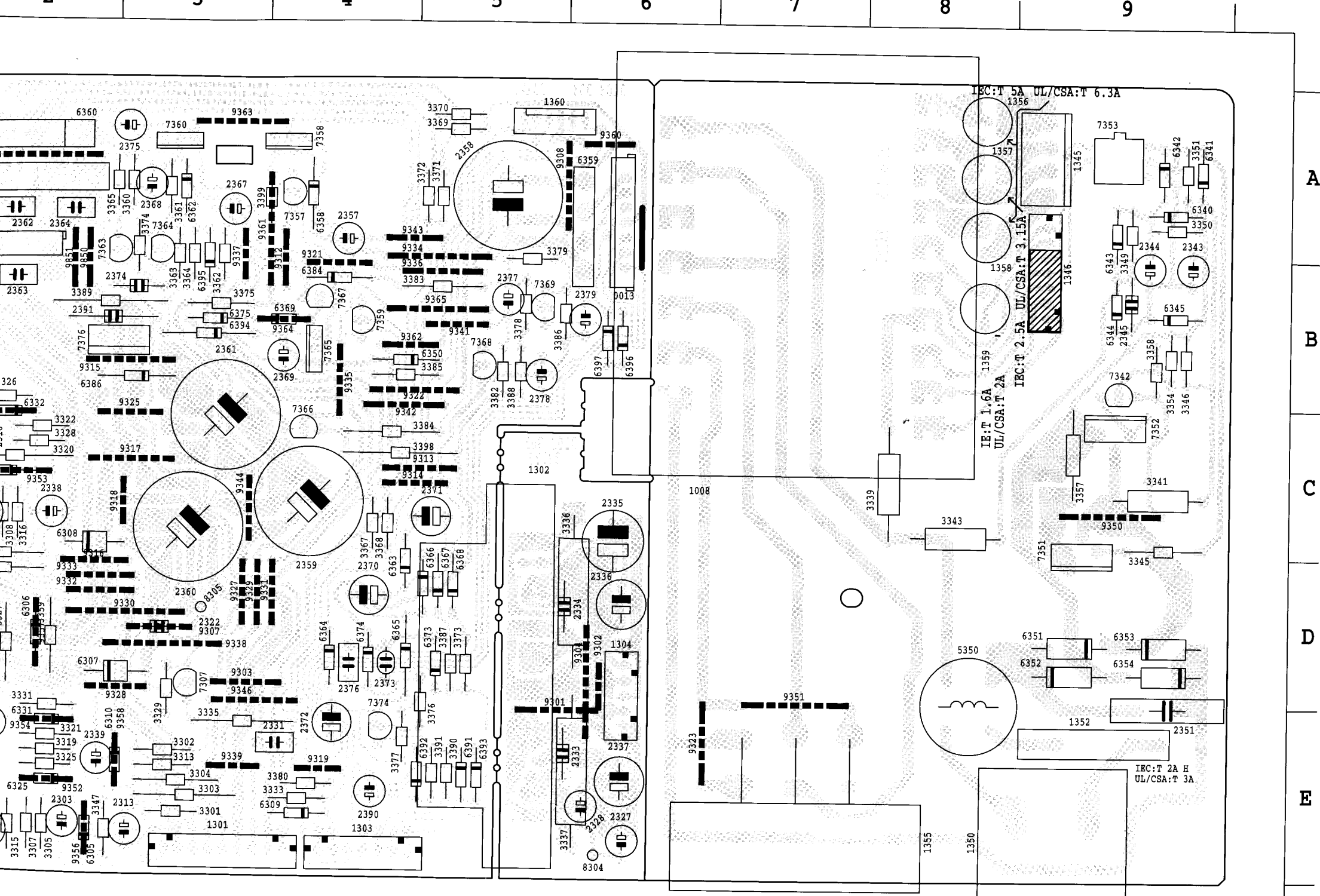
E

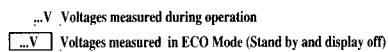


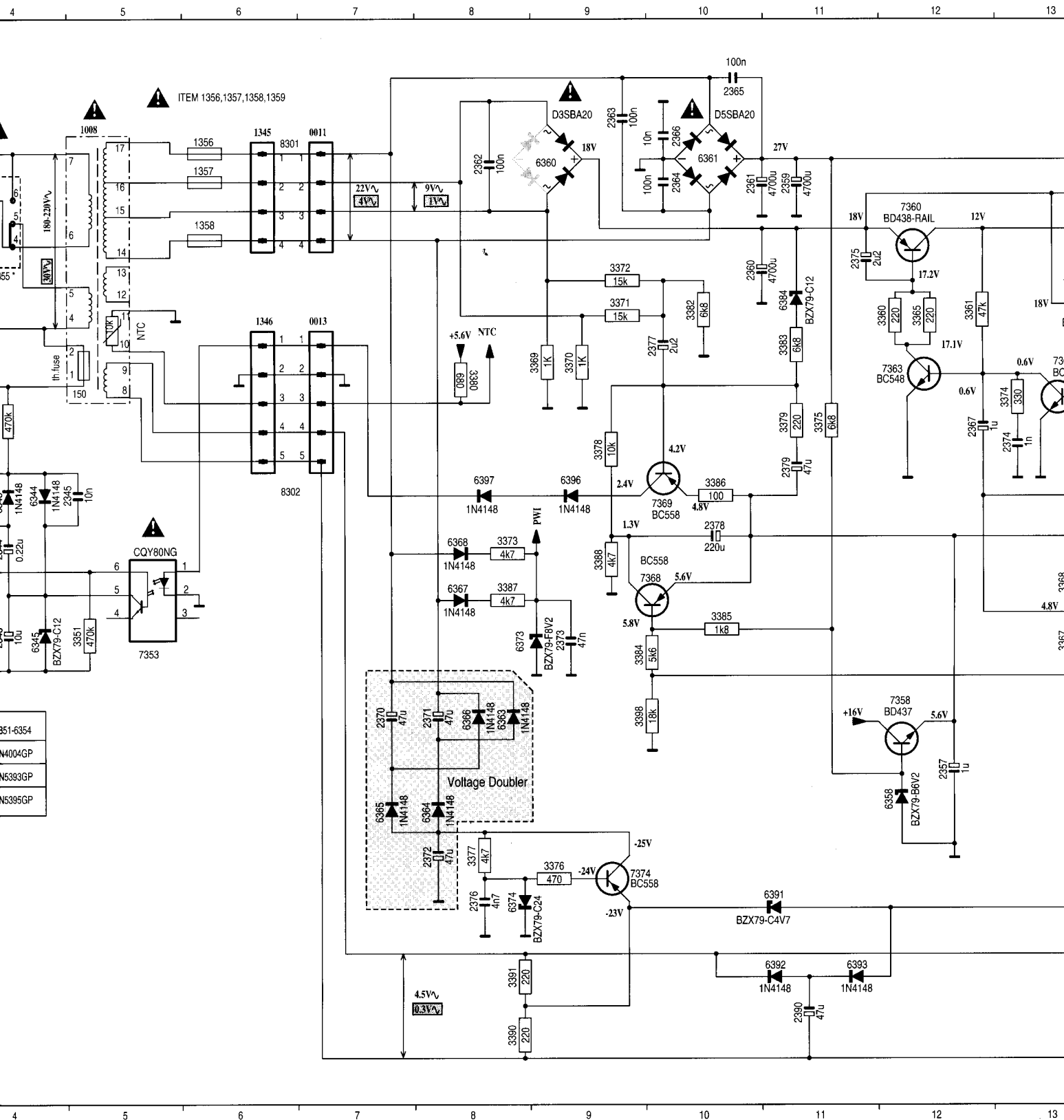


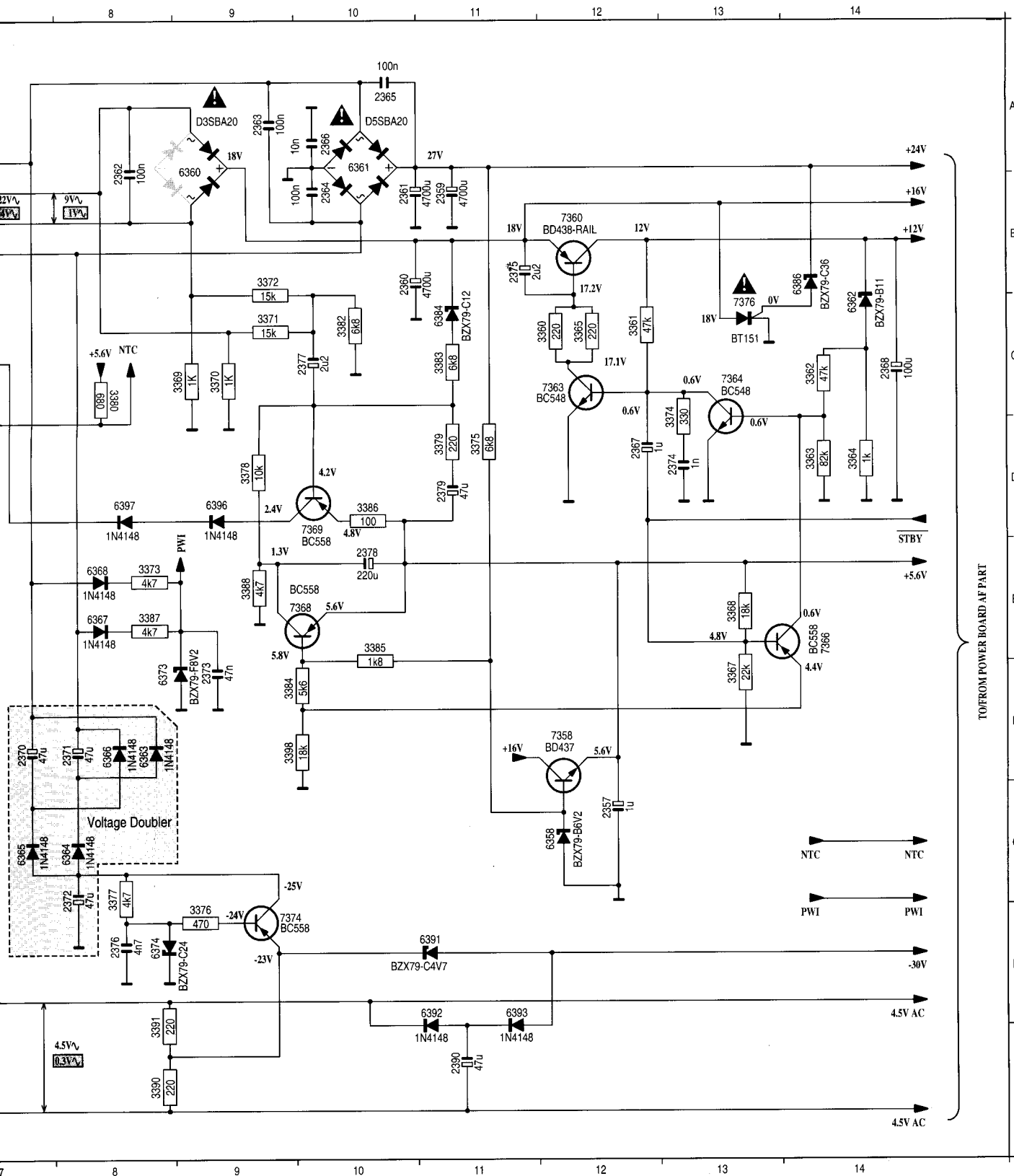
E











TO/FROM POWER BOARD AT PART

0011 A7
1008 A5
1945 A6
1466 B6
1350 B1
1352 B1
1355 B4
1356 A6
1357 B6
1358 B6
2343 F4
2344 E4
2345 D5
2351 A3
2357 G12
2359 B10
2360 B10
2361 B10
2362 A8
2363 A9
2364 B10
2365 A10
2367 D12
2368 D12
2368 D4
2370 F7
2371 F8
2372 G8
2373 F9
2374 D13
2375 B11
2377 C10
2378 E10
2379 D11
2390 D1
2391 D1
2391 D2
2393 D4
2394 D2
2395 F7
2399 D4
3351 F5
3352 C3
3353 C3
3358 C3
3360 C12
3361 C12
3362 C14
3363 D14
3364 D14
3365 C12
3366 C12
3367 F13
3368 C13
3369 C9
3370 C9
3371 C9
3372 B9
3373 E8
3374 C13
3375 D11
3377 G8
3378 D9
3379 D8
3382 C10
3383 C11
3384 F9
3385 E10
3386 D10
3387 E8
3388 E9
3390 E8
3391 H8
3398 F9
5350 B2
6340 F3
6341 E2
6342 D2
6343 D4
6344 D4
6345 F4
6351 B2
6352 B2
6353 B3
6354 B3
6358 G12
6360 A9
6361 A10
6362 C14
6364 G8
6365 F7
6366 F8
6367 E7

CS

1

2

3

4

5

6

7

COMPONENT SIDE VIEW

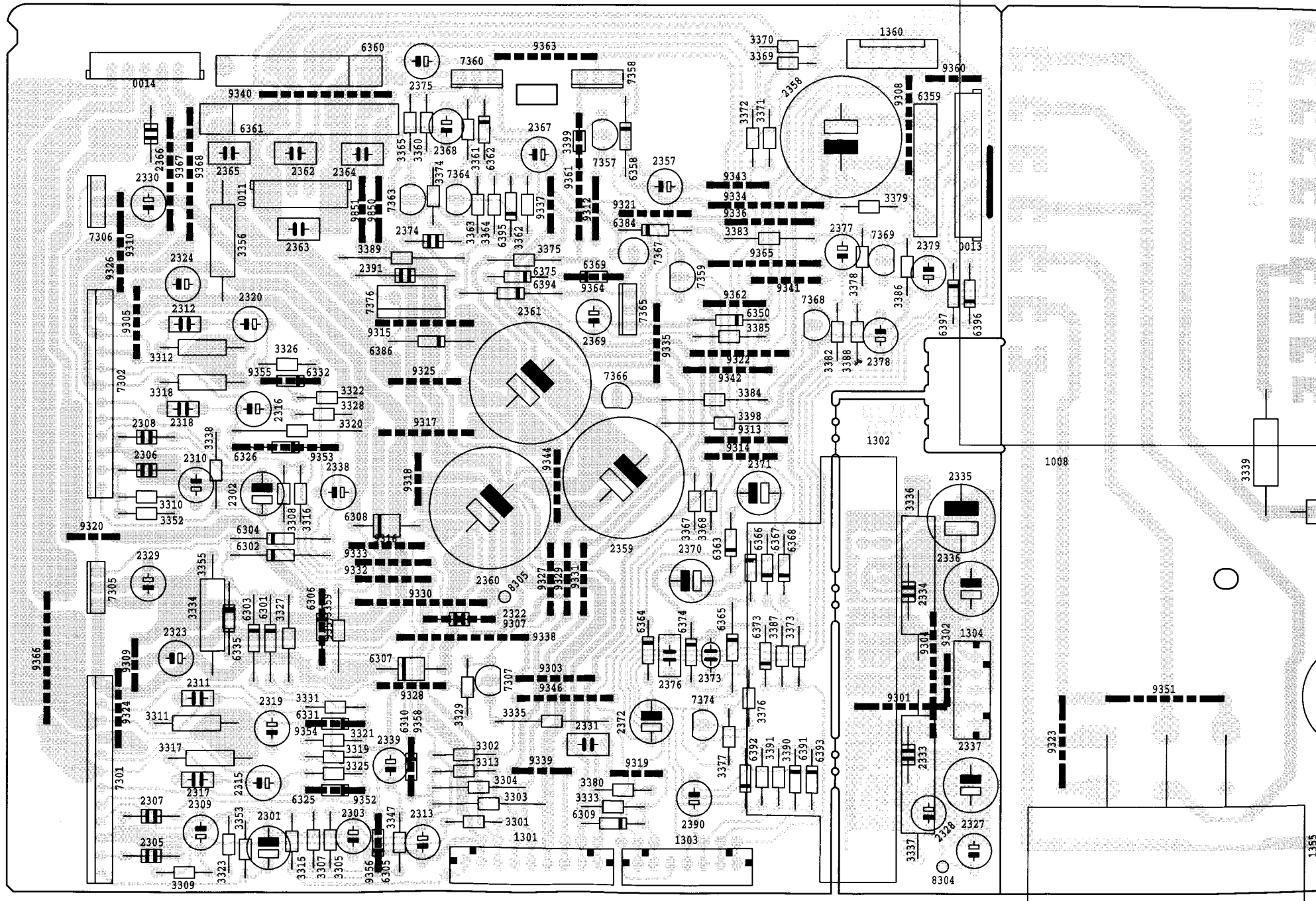
A

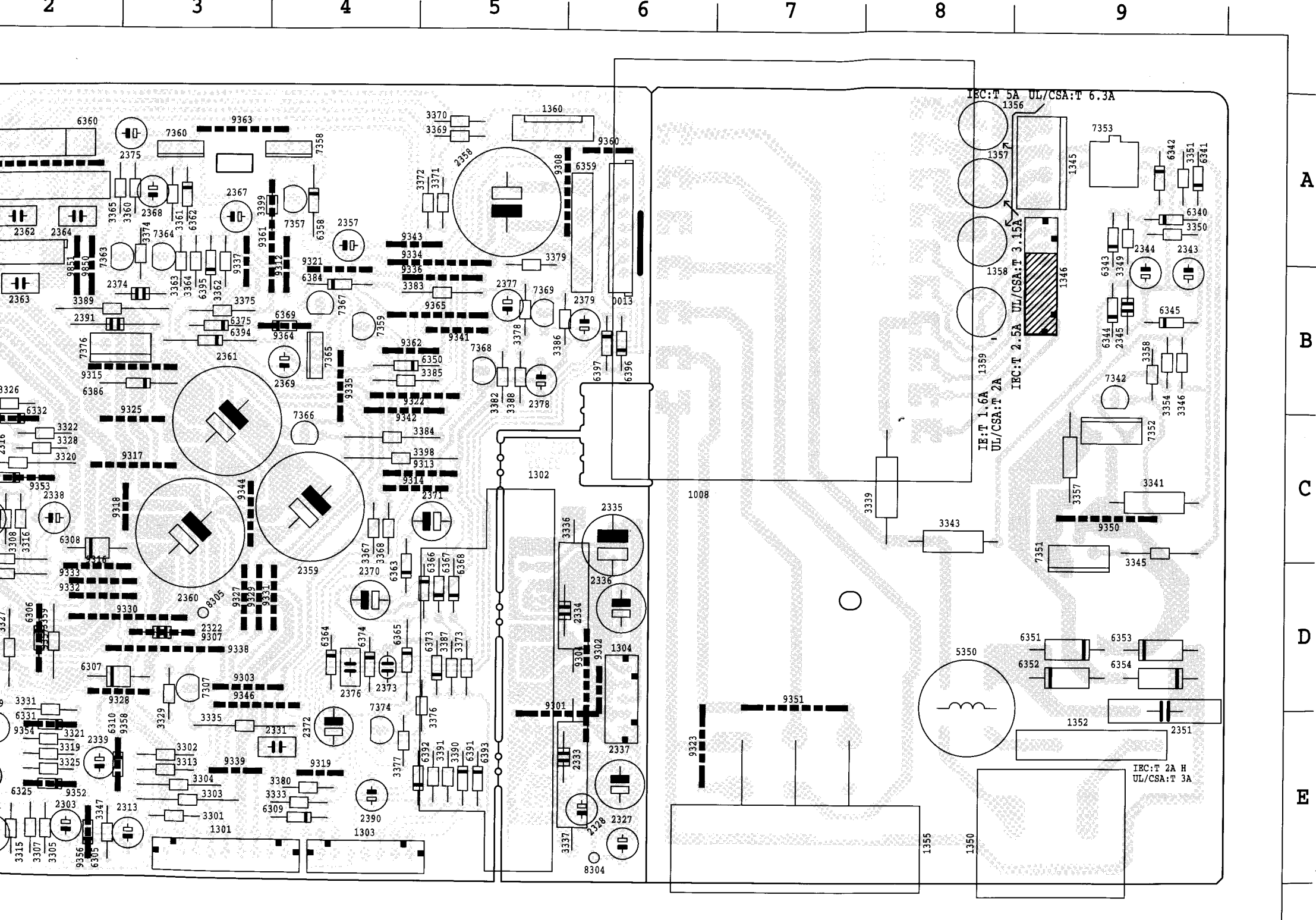
B

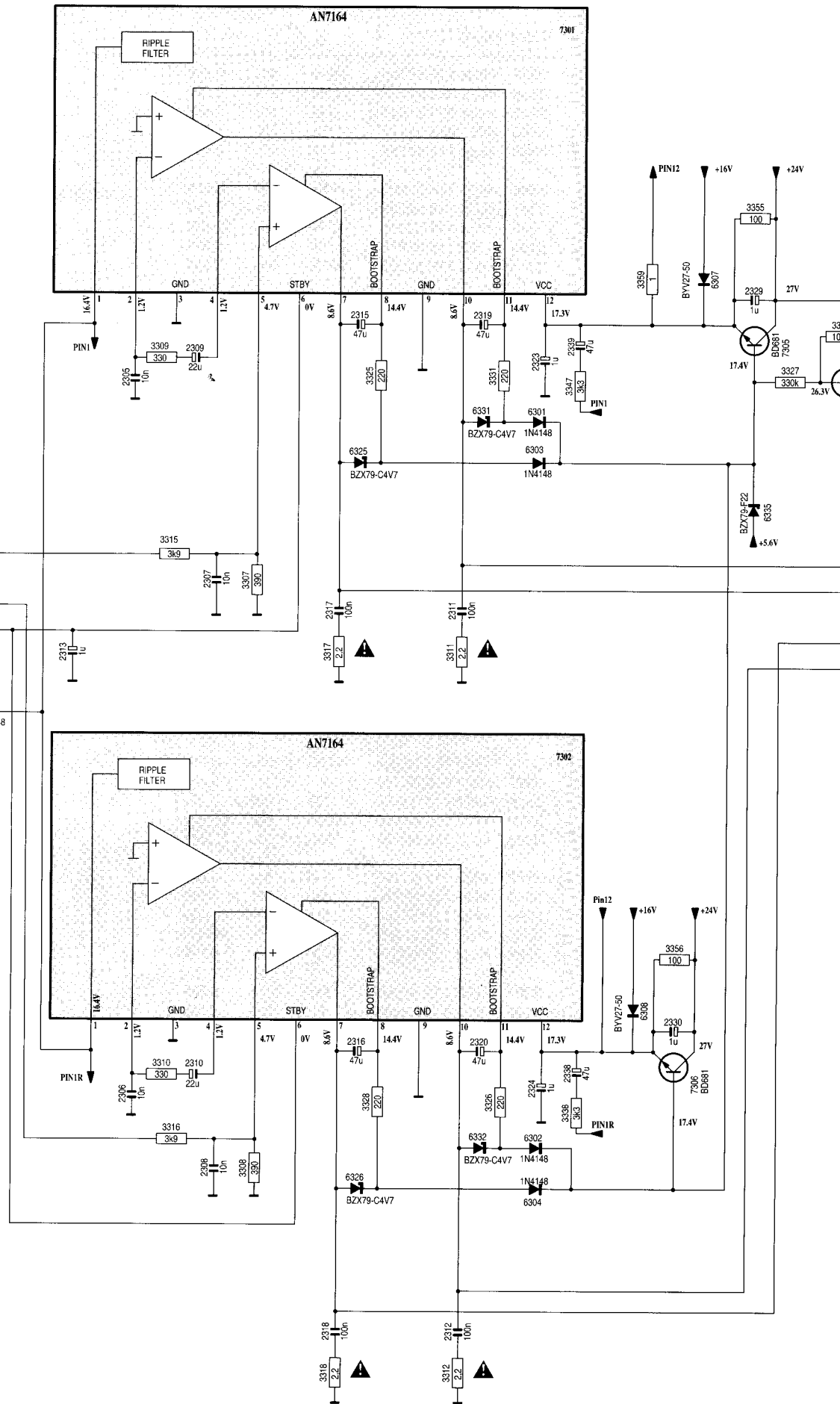
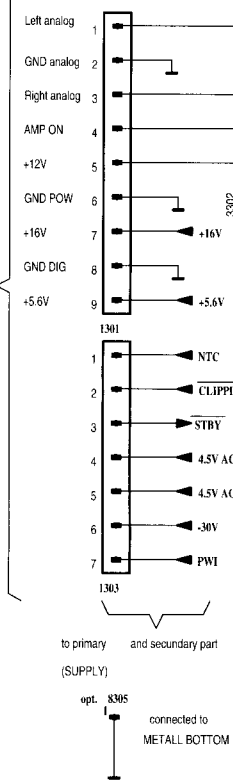
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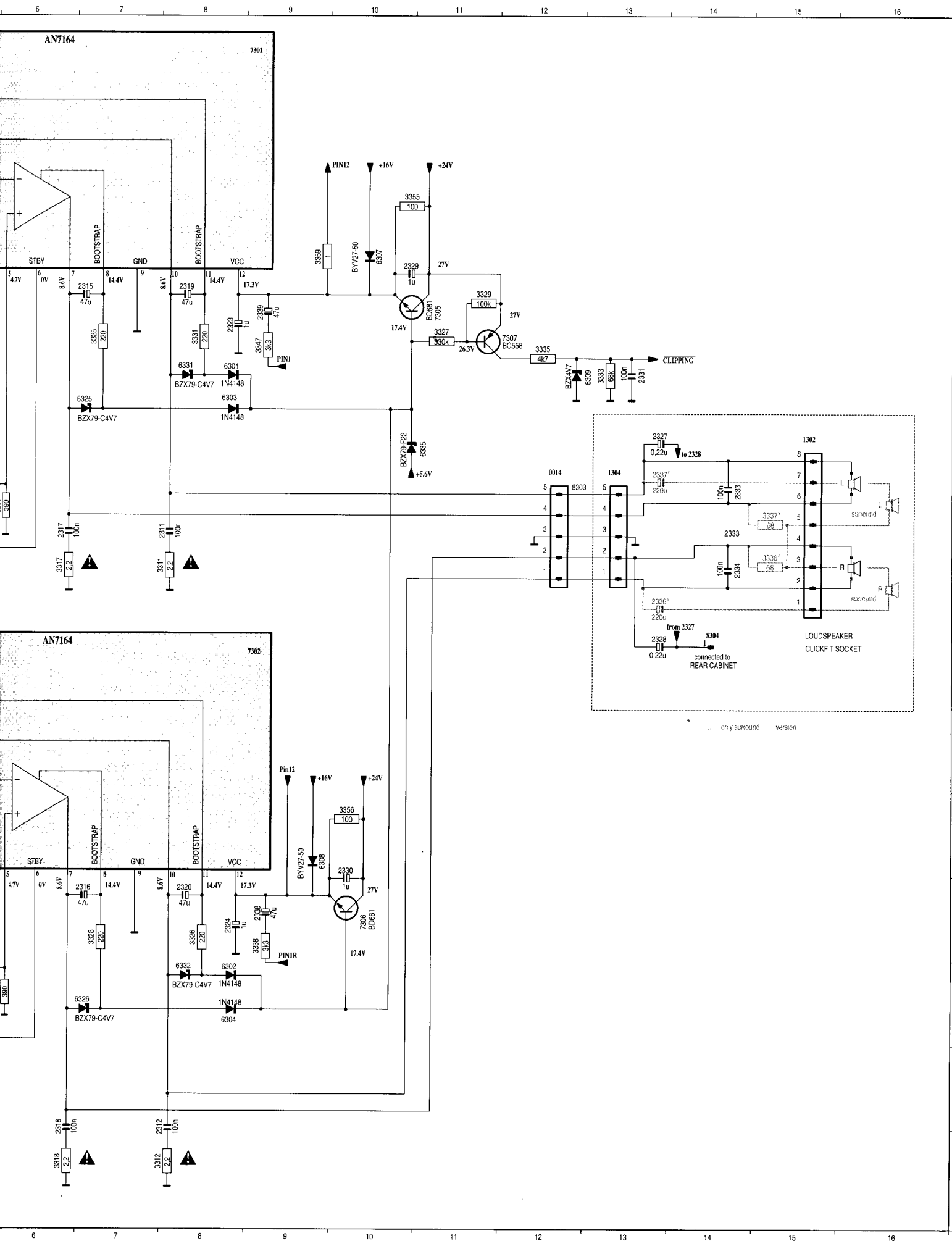
D

E









PARTSLIST POWER BOARD

PARTSLIST

MISCELLANEOUS

	4822 492 71734	SPRING CLIP TO126
	4822 255 40179	SPRING CLIP TO220
	4822 492 71733	SPRING CLIP AN71XX
	4822 492 71704	FIXATION RECTIFIER
1008	4822 146 21827	MAINS TRANSFORMER /21/41

1008	4822 146 21826	MAINS TRANSFORMER /22
1008	4822 146 31506	MAINS TRANSFORMER /37
1302	4822 267 31107	LS-TERMINAL for surround
1302	4822 267 31176	LS-TERMINAL no surround
1350	4822 265 31015	MAINS SOCKET not for /37

1350	4822 265 31016	MAINS SOCKET only for /37
1352	5322 253 30373	FUSE 2A
1352	4822 070 33152	FUSE 3,15A
1355	4822 272 10269	VOLTAGE SELECTOR
1356	4822 071 55002	FUSE T5A

1356	4822 252 51123	FUSE T6,3A
1357	4822 071 52502	FUSE T 2,5A
1357	4822 252 51121	FUSE 3,15A
1358	4822 071 55002	FUSE T5A
1358	4822 252 51123	FUSE T6,3A

DIODES

6301	4822 130 30621	1N4148
6302	4822 130 30621	1N4148
6303	4822 130 30621	1N4148
6304	4822 130 30621	1N4148
6307	4822 130 31982	BYV27-100

6308	4822 130 31982	BYV27-100
6309	4822 130 34174	BZX79-B4V7
6310	4822 130 30621	1N4148
6325	4822 130 34174	BZX79-B4V7
6326	4822 130 34174	BZX79-B4V7

6331	4822 130 34174	BZX79-B4V7
6332	4822 130 34174	BZX79-B4V7
6335	4822 130 34441	BZX79-F22
6340	4822 130 30621	1N4148
6341	4822 130 30621	1N4148

6342	4822 130 30621	1N4148
6343	4822 130 30621	1N4148
6344	4822 130 30621	1N4148
6345	4822 130 34197	BZX79-C12
6351	4822 130 83362	1N4004GP not for /21/37

6351	4822 130 83928	1N5395GP only for /21
6351	4822 130 83929	1N5393GP only for /37
6352	4822 130 83362	1N4004GP not for /21/37
6352	4822 130 83928	1N5395GP only for /21
6352	4822 130 83929	1N5393GP only for /37

6353	4822 130 83362	1N4004GP not for /21/37
6353	4822 130 83928	1N5395GP only for /21
6353	4822 130 83929	1N5393GP only for /37
6354	4822 130 83362	1N4004GP not for /21/37
6354	4822 130 83928	1N5395GP only for /21

6354	4822 130 83929	1N5393GP only for /37
6358	4822 130 34167	BZX79-C6V2
6360	4822 130 82079	D3SBA20
6361	4822 130 82078	D5SBA20
6362	4822 130 34488	BZX79-C11

6363	4822 130 30621	1N4148
6364	4822 130 30621	1N4148
6365	4822 130 30621	1N4148
6366	4822 130 30621	1N4148
6367	4822 130 30621	1N4148

DIODES

6368	4822 130 30621	1N4148
6373	4822 130 34382	BZX79-C8V2
6374	4822 130 34398	BZX79-C24
6384	4822 130 34197	BZX79-C12
6386	4822 130 34368	BZX79-C36

6391	4822 130 34174	BZX79-B4V7
6392	4822 130 30621	1N4148
6393	4822 130 30621	1N4148
6396	4822 130 30621	1N4148
6397	4822 130 30621	1N4148

TRANSISTORS

7305	5322 130 44786	BD681
7306	5322 130 44786	BD681
7307	5322 130 60068	BC558C
7342	5322 130 60068	BC558C
7351	4822 130 63925	STP7NA40

7352	5322 130 24081	BT151-500R
7358	4822 130 40982	BD437
7360	4822 130 40995	BD438
7363	4822 130 44196	BC548C
7364	4822 130 44196	BC548C

7366	5322 130 60068	BC558C
7368	5322 130 60068	BC558C
7369	5322 130 60068	BC558C
7374	5322 130 60068	BC558C
7376	5322 130 24081	BT151-500R

INTEGRATED CIRCUITS

7301	4822 209 90411	AN7164
7302	4822 209 90411	AN7164
7353	4822 130 91451	CQY80NG

COILS

5350	4822 157 71285	MAINS FILTER
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RESISTORS

3302	4822 116 83864	10k	5%	0,5W
3303	4822 116 52206	120R	5%	0,5W
3304	4822 116 52215	220R	5%	0,16W
3307	4822 116 52222	390R	5%	0,16W
3308	4822 116 52222	390R	5%	0,16W

3309	4822 116 52219	330R	5%	0,5W
3310	4822 116 52219	330R	5%	0,5W
3311	4822 052 10228	2R2	5%	0,33W
3312	4822 052 10228	2R2	5%	0,33W
3313	4822 116 52284	47k	5%	0,5W

3315	4822 116 52276	3k9	5%	0,5W
3316	4822 116 52276	3k9	5%	0,5W
3317	4822 052 10228	2R2	5%	0,33W
3318	4822 052 10228	2R2	5%	0,33W
3325	4822 116 52215	220R	5%	0,16W

3326	4822 116 52215	220R	5%	0,16W
3327	4822 116 52272	330k	5%	0,5W
3328	4822 116 52215	220R	5%	0,16W
3329	4822 116 52234	100k	5%	0,5W
3331	4822 116 52215	220R	5%	0,16W

3333	4822 116 52297	68k	5%	0,5W
3334	4822 116 83874	220k	5%	0,5W
3335	4822 116 52283	4k7	5%	0,5W
3336	4822 117 11782	68R	5%	
3337	4822 117 11782	68R	5%	

RESISTOR

3338	4822 116 52297	68k	5%	0,5W
3339	4822 116 83874	220k	5%	0,5W
3341	4822 116 52283	4k7	5%	0,5W
3343	4822 117 11782	68R	5%	
3345	4822 117 11782	68R	5%	

3346	4822 130 34174	BZX79-B4V7
3347	4822 130 30621	1N4148
3349	4822 130 30621	1N4148
3350	4822 130 30621	1N4148
3351	4822 130 30621	1N4148

3354	4822 265 31016	MAINS SOCKET only for /37
3355	5322 253 30373	FUSE 2A
3356	4822 070 33152	FUSE 3,15A
3357	4822 272 10269	VOLTAGE SELECTOR
3359	4822 071 55002	FUSE T5A

3360	4822 252 51123	FUSE T6,3A
3361	4822 071 52502	FUSE T 2,5A
3362	4822 252 51121	FUSE 3,15A
3363	4822 071 55002	FUSE T5A
3364	4822 252 51123	FUSE T6,3A

3365	4822 130 30621	1N4148
3367	4822 130 30621	1N4148
3368	4822 130 30621	1N4148
3369	4822 130 30621	1N4148
3370	4822 130 31982	BYV27-100

3371	4822 130 31982	BYV27-100
3372	4822 130 34174	BZX79-B4V7
3373	4822 130 30621	1N4148
3374	4822 130 34174	BZX79-B4V7
3375	4822 130 34174	BZX79-B4V7

3376	4822 130 34174	BZX79-B4V7
3377	4822 130 34174	BZX79-B4V7
3378	4822 130 34441	BZX79-F22
3379	4822 130 30621	1N4148
3380	4822 130 30621	1N4148

3382	4822 130 30621	1N4148
3383	4822 130 30621	1N4148
3384	4822 130 30621	1N4148
3385	4822 130 30621	1N4148
3386	4822 130 34197	BZX79-C12

3387	4822 130 83362	1N4004GP not for /21/37
3388	4822 130 83928	1N5395GP only for /21
3390	4822 130 83929	1N5393GP only for /37
3391	4822 130 83362	1N4004GP not for /21/37
3398	4822 130 83928	1N5395GP only for /21

2305	4822 130 83929	1N5393GP only for /37
2306	4822 130 83362	1N4004GP not for /21/37
2307	4822 130 83928	1N5395GP only for /21
2308	4822 130 83929	1N5393GP only for /37
2309	4822 130 83362	1N4004GP not for /21/37

2310	4822 130 83929	1N5393GP only for /37
2311	4822 130 34167	BZX79-C6V2
2312	4822 130 82079	D3SBA20
2313	4822 130 82078	D5SBA20
2315	4822 130 34488	BZX79-C11

2316	4822 130 30621	1N4148
2317	4822 130 30621	1N4148
2318	4822 130 30621	1N4148
2319	4822 130 30621	1N4148
2320	4822 130 30621	1N4148

CAPACIT

PARTSLIST POWER BOARD**RESISTORS**

3338	4822 116 52269	3k3	5%	0,5W
3339	4822 053 21106	10M	5%	0,5W
3341	4822 053 21225	2M2	5%	0,5W
3343	4822 053 21474	470k	5%	0,5W
3345	4822 116 52284	47k	5%	0,5W
3346	4822 116 52285	470k	5%	0,5W
3347	4822 116 52269	3k3	5%	0,5W
3349	4822 116 52245	150k	5%	0,16W
3350	4822 116 83878	270k	5%	0,5W
3351	4822 116 52285	470k	5%	0,5W
3354	4822 116 52175	100R	5%	0,5W
3355	4822 053 11101	100R	5%	2W
3356	4822 053 11101	100R	5%	2W
3357	4822 117 11744	0R22	5%	1W
3359	4822 116 80176	1R	5%	0,5W
3360	4822 116 52215	220R	5%	0,16W
3361	4822 116 52284	47k	5%	0,5W
3362	4822 116 52284	47k	5%	0,5W
3363	4822 116 52304	82k	5%	0,5W
3364	4822 050 11002	1k	5%	0,2W
3365	4822 116 52215	220R	5%	0,16W
3367	4822 116 52257	22k	5%	0,5W
3368	4822 116 52251	18k	5%	0,5W
3369	4822 050 11002	1k	5%	0,2W
3370	4822 050 11002	1k	5%	0,2W
3371	4822 116 52244	15k	5%	0,5W
3372	4822 116 52244	15k	5%	0,5W
3373	4822 116 52283	4k7	5%	0,5W
3374	4822 116 52219	330R	5%	0,5W
3375	4822 116 52296	6k8	5%	0,5W
3376	4822 116 52224	470R	5%	0,5W
3377	4822 116 52283	4k7	5%	0,5W
3378	4822 116 83864	10k	5%	0,5W
3379	4822 116 52215	220R	5%	0,16W
3380	4822 116 52228	680R	5%	0,5W
3382	4822 116 52296	6k8	5%	0,5W
3383	4822 116 52296	6k8	5%	0,5W
3384	4822 116 52289	5k6	5%	0,16W
3385	4822 116 52249	1k8	5%	0,16W
3386	4822 116 52175	100R	5%	0,5W
3387	4822 116 52283	4k7	5%	0,5W
3388	4822 116 52283	4k7	5%	0,5W
3390	4822 116 52215	220R	5%	0,16W
3391	4822 116 52215	220R	5%	0,16W
3398	4822 116 52251	18k	5%	0,5W

CAPACITORS

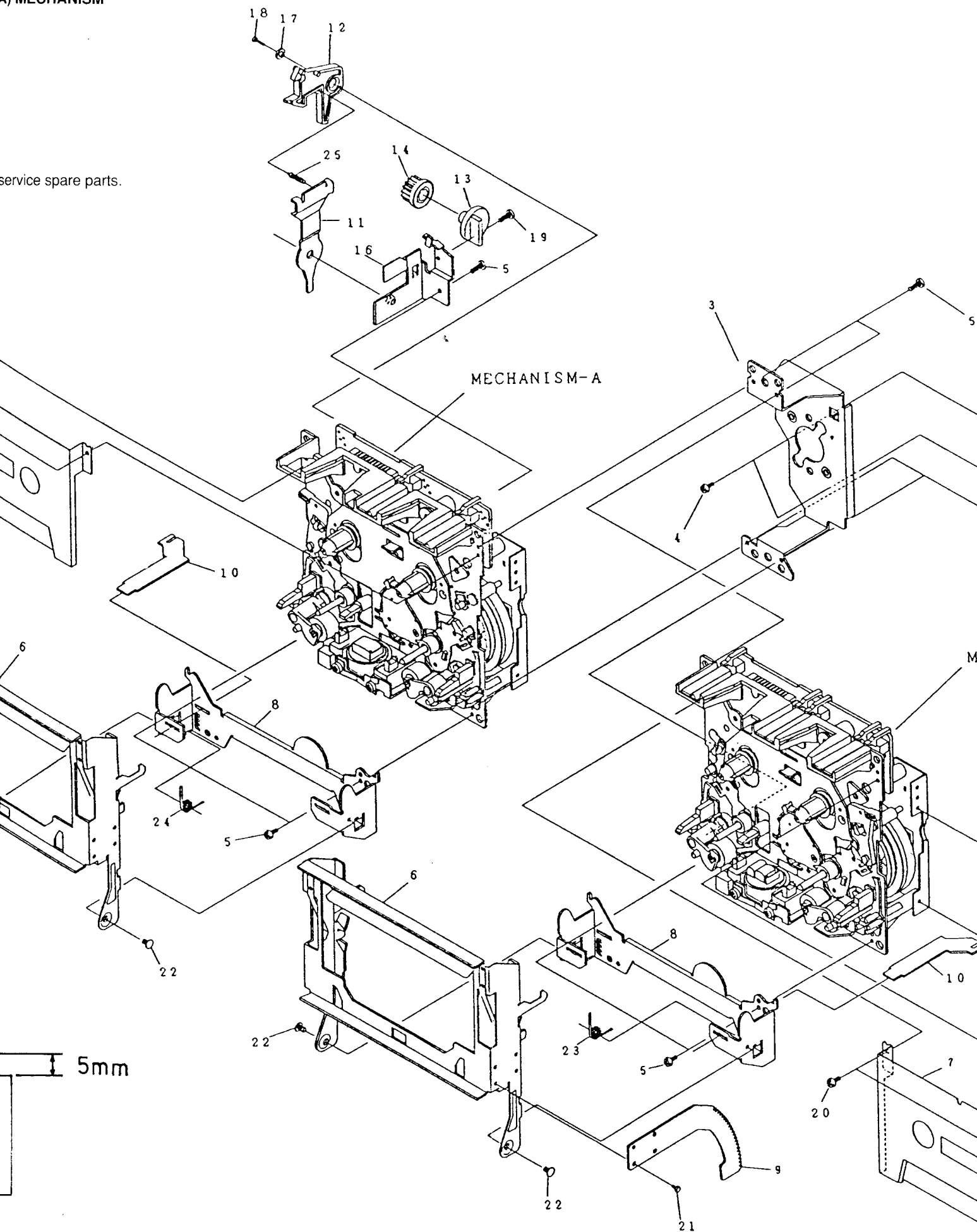
2305	4822 121 51387	10nF	20%	16V
2306	4822 121 51387	10nF	20%	16V
2307	4822 121 51387	10nF	20%	16V
2308	4822 121 51387	10nF	20%	16V
2309	4822 124 41596	22µF	20%	50V
2310	4822 124 41596	22µF	20%	50V
2311	5322 121 42386	100nF	5%	63V
2312	5322 121 42386	100nF	5%	63V
2313	4822 124 40242	1µF	20%	63V
2315	4822 124 40433	47µF	20%	25V
2316	4822 124 40433	47µF	20%	25V
2317	5322 121 42386	100nF	5%	63V
2318	5322 121 42386	100nF	5%	63V
2319	4822 124 40433	47µF	20%	25V
2320	4822 124 40433	47µF	20%	25V

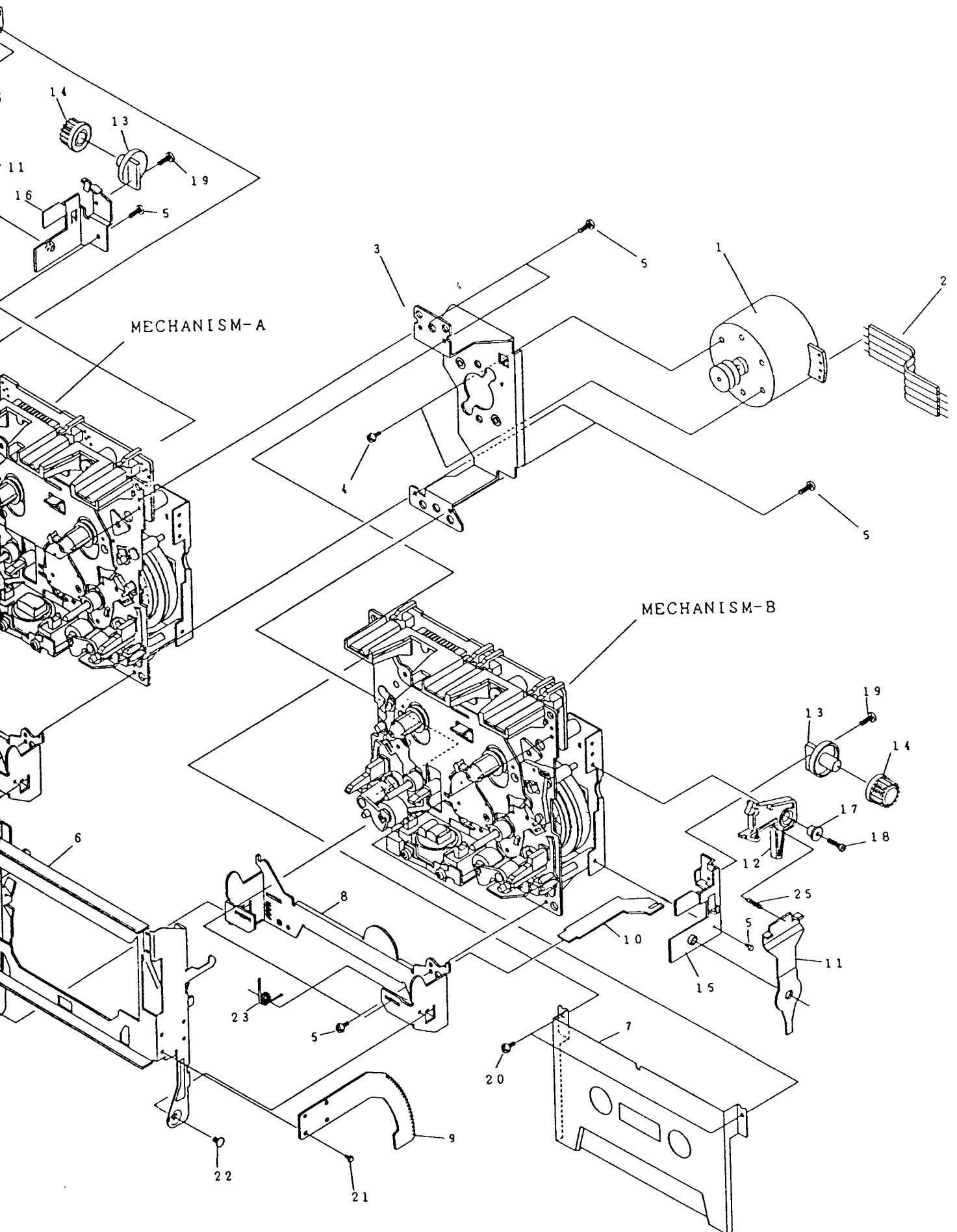
CAPACITORS

2323	4822 124 40242	1µF	20%	63V
2324	4822 124 40242	1µF	20%	63V
2327	4822 124 40746	0,22µF	20%	63V
2328	4822 124 40746	0,22µF	20%	63V
2329	4822 124 40242	1µF	20%	63V
2330	4822 124 40242	1µF	20%	63V
2330	4822 124 40242	1µF	20%	63V
2331	5322 121 42386	100nF	5%	63V
2333	4822 126 12882	100nF	20%	50V
2334	4822 126 12882	100nF	20%	50V
2336	4822 124 41992	220µF		35V
2337	4822 124 41992	220µF		35V
2338	4822 124 40433	47µF	20%	25V
2339	4822 124 40433	47µF	20%	25V
2343	4822 124 41579	10µF	20%	50V
2344	4822 124 40746	0,22µF	20%	63V
2345	4822 121 51387	10nF	20%	16V
2351	4822 126 13637	10nF	10%	1000V
2357	4822 124 40242	1µF	20%	63V
2359	4822 124 80563	4700µF	20%	35V
2360	4822 124 42119	4700µF	20%	25V
2361	4822 124 80563	4700µF	20%	35V
2362	5322 121 42386	100nF	5%	63V
2363	5322 121 42386	100nF	5%	63V
2364	5322 121 42386	100nF	5%	63V
2365	5322 121 42386	100nF	5%	63V
2366	4822 121 51387	10nF	20%	16V
2367	4822 124 40242	1µF	20%	63V
2368	4822 124 41525	100µF	20%	25V
2370	4822 124 80196	47µF	20%	50V
2371	4822 124 80196	47µF	20%	50V
2372	4822 124 80196	47µF	20%	50V
2373	4822 121 43526	47nF	5%	100V
2374	4822 122 33197	1nF	10%	50V
2375	4822 124 41576	2,2µF	20%	50V
2376	4822 121 43856	4,7nF	5%	250V
2377	4822 124 41576	2,2µF	20%	50V
2378	4822 124 40196	220µF	20%	16V
2379	4822 124 40433	47µF	20%	25V
2390	4822 124 40433	47µF	20%	25V

A) MECHANISM

service spare parts.

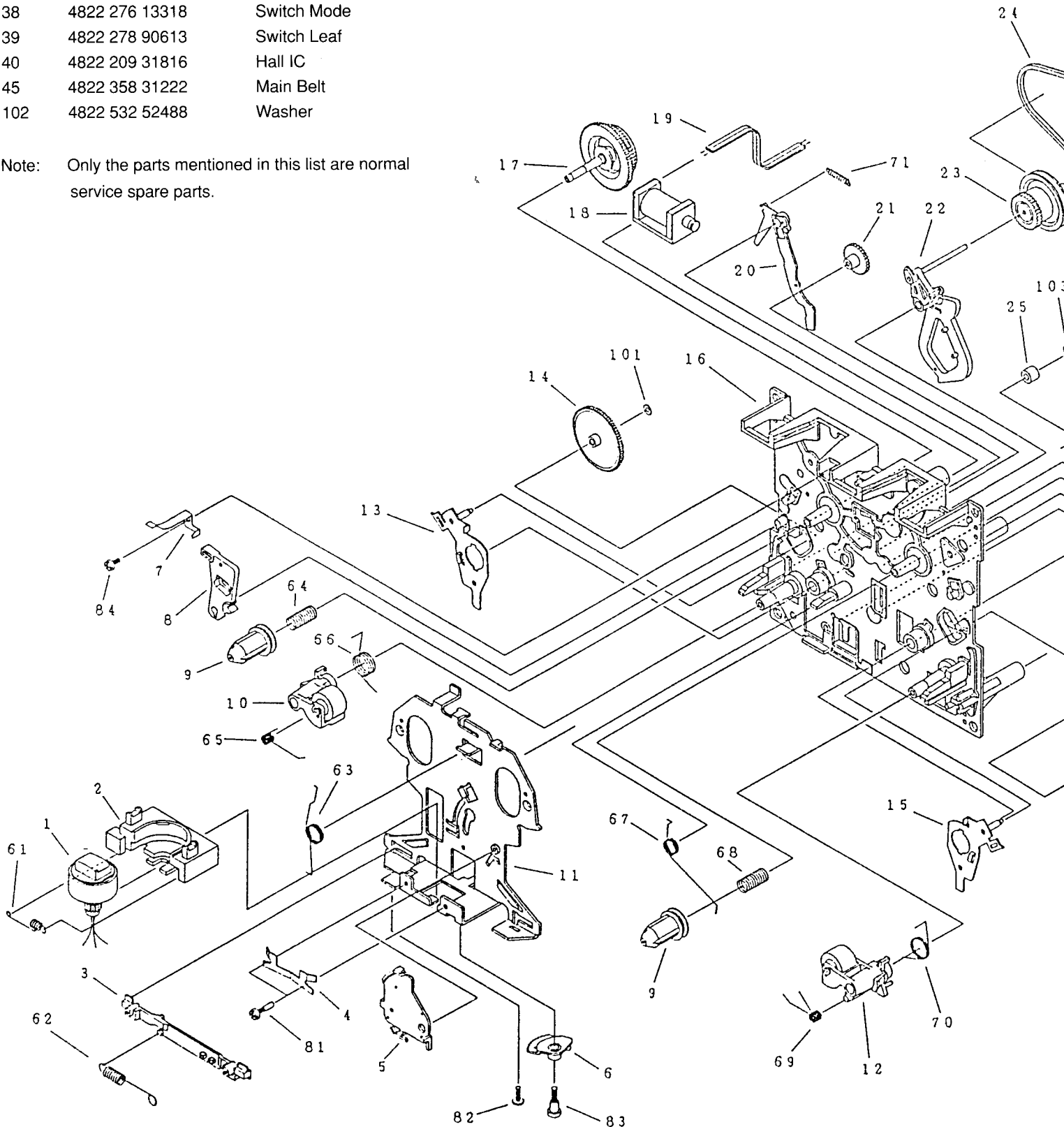


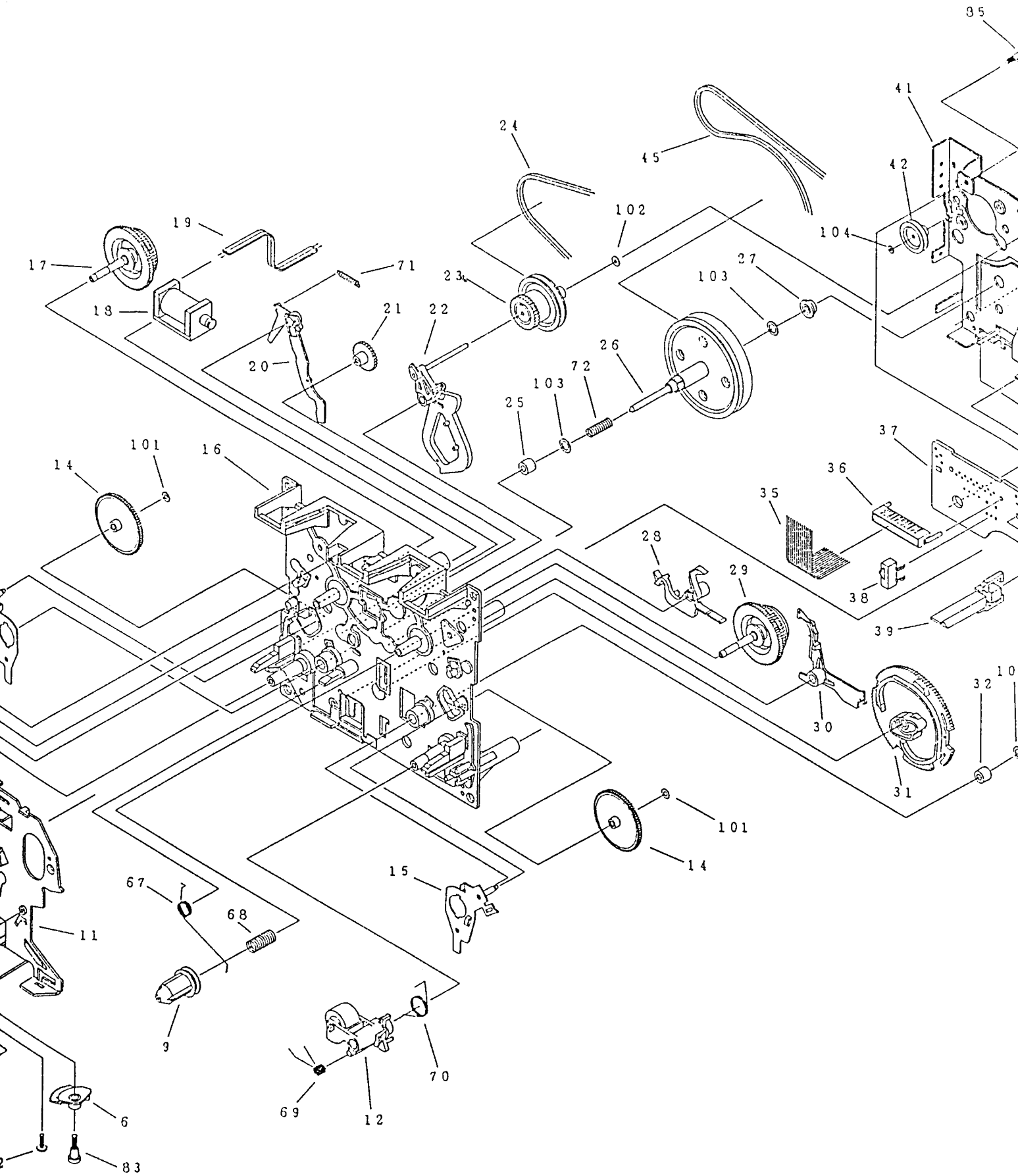


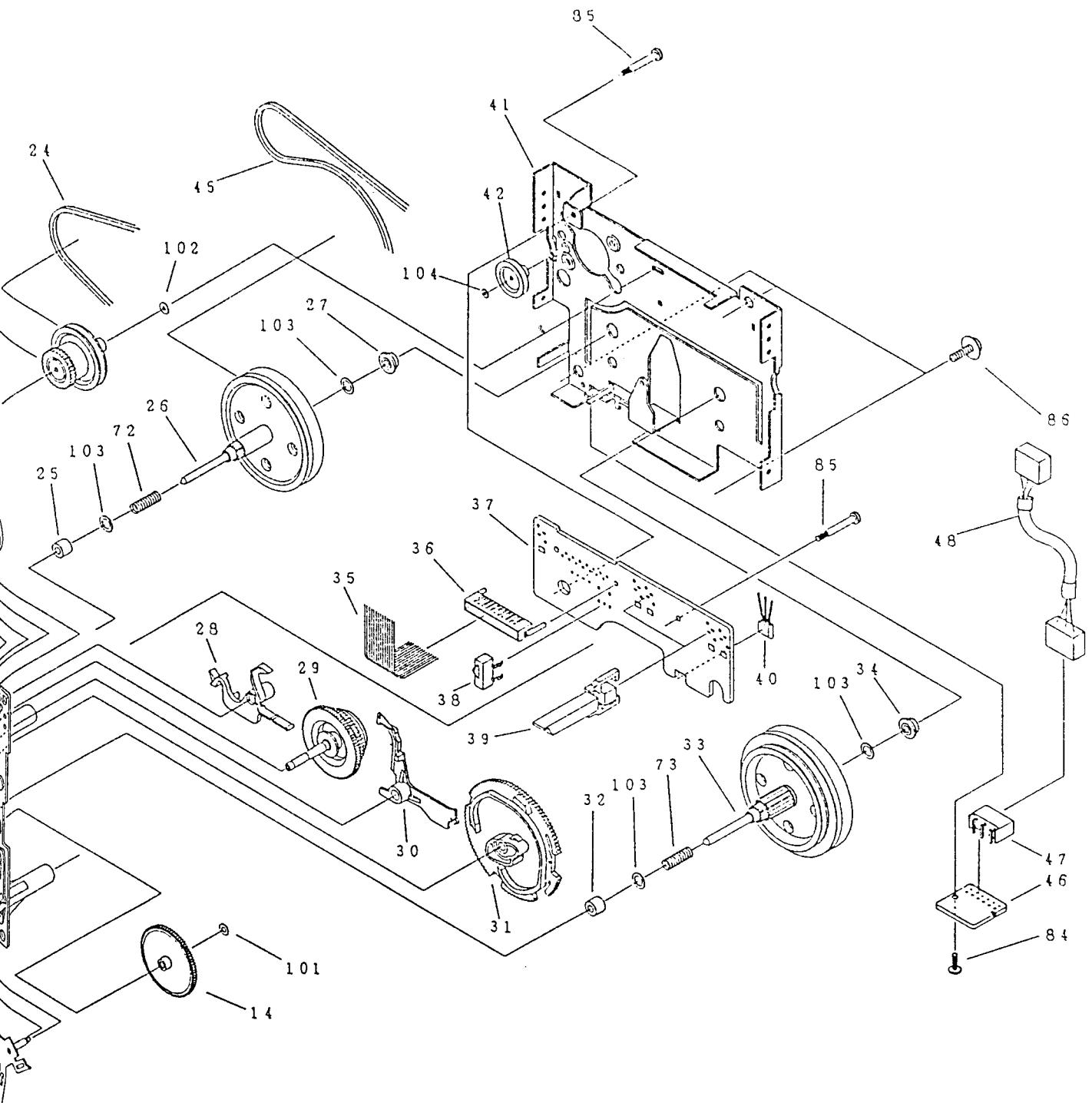
EXPLODED VIEW - PLAY (MECH A) MECHANISM

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

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



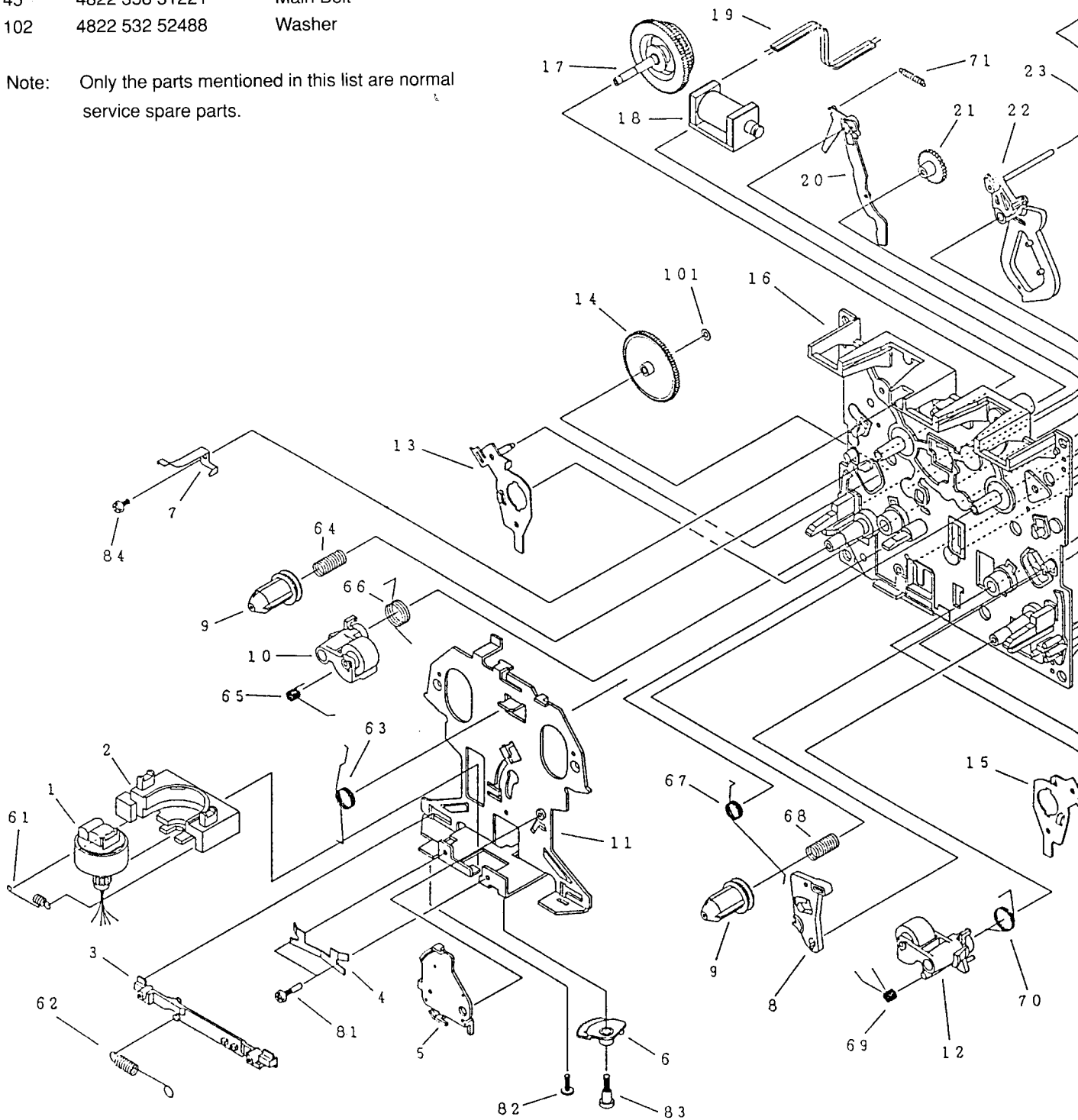


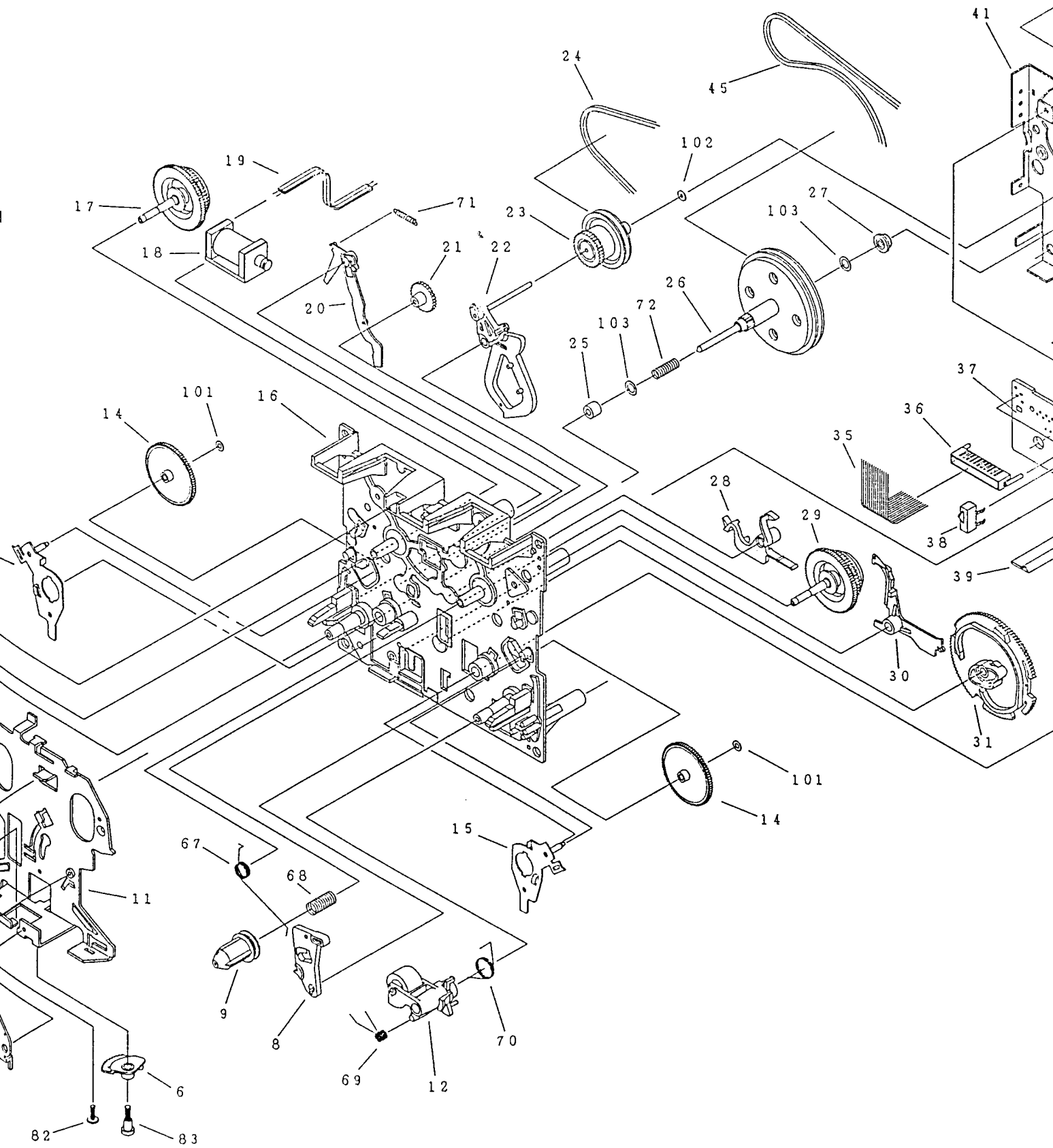


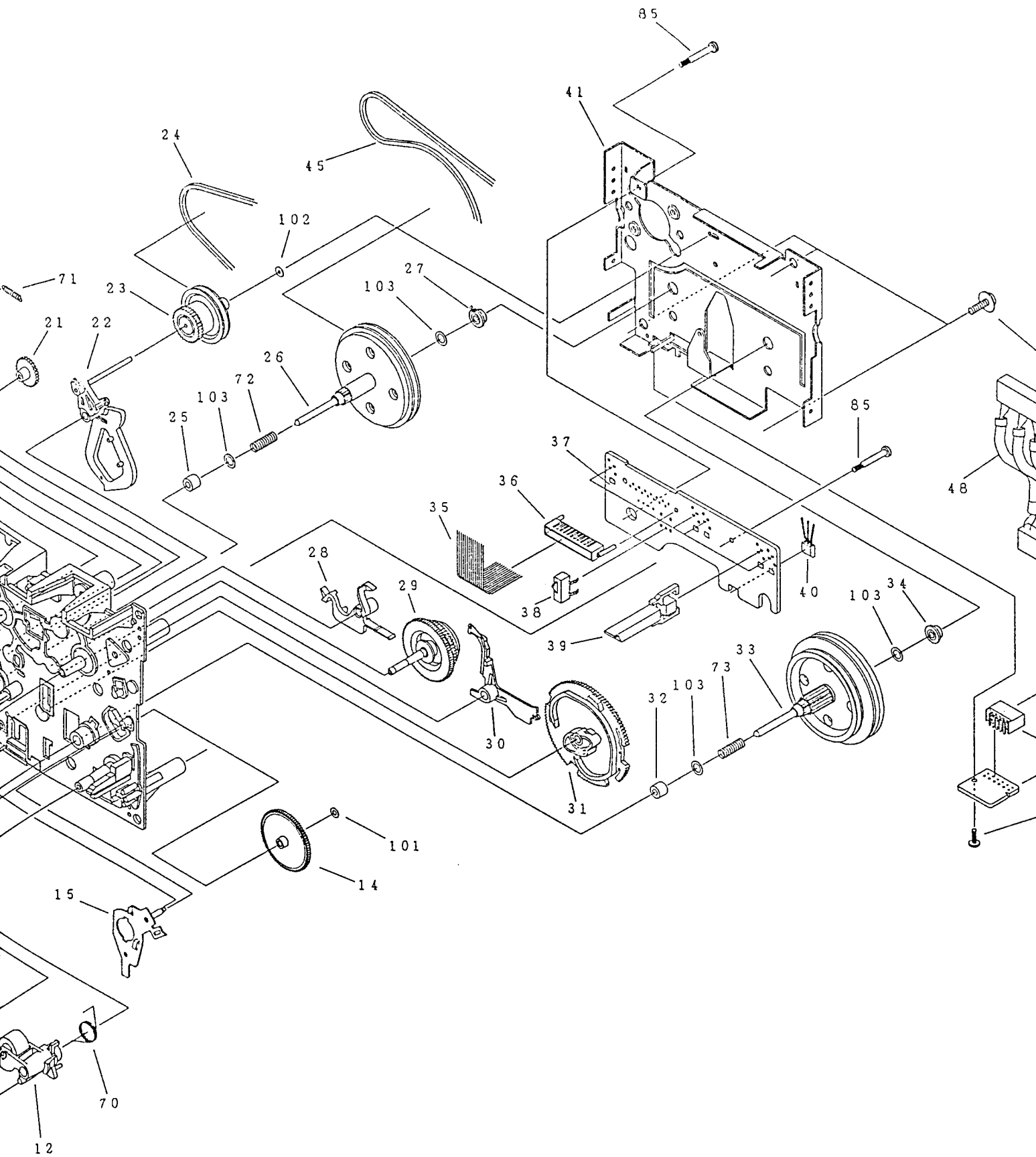
EXPLODED VIEW - REC/PB (MECH B) MECHANISM

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

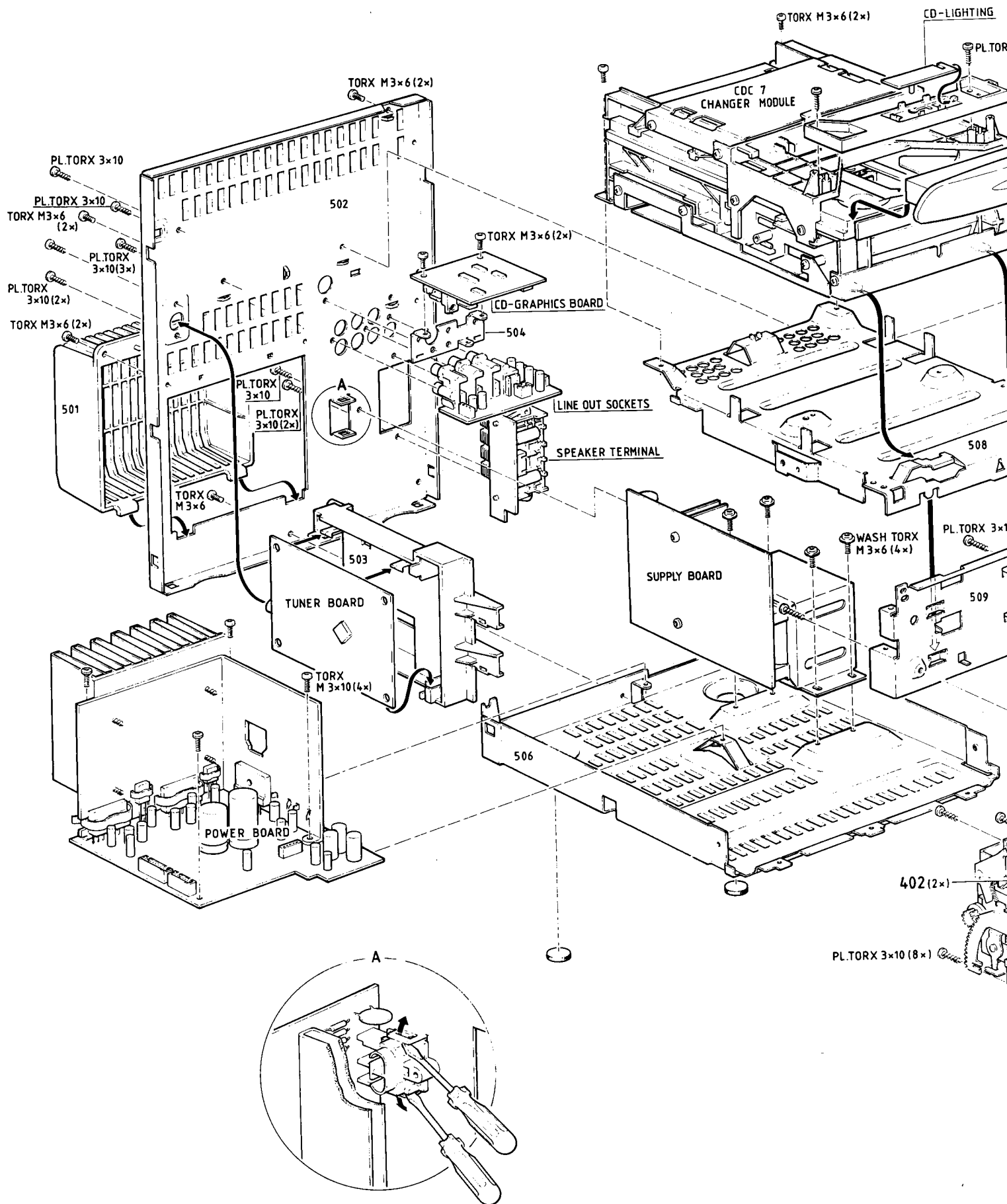
Note: Only the parts mentioned in this list are normal service spare parts.

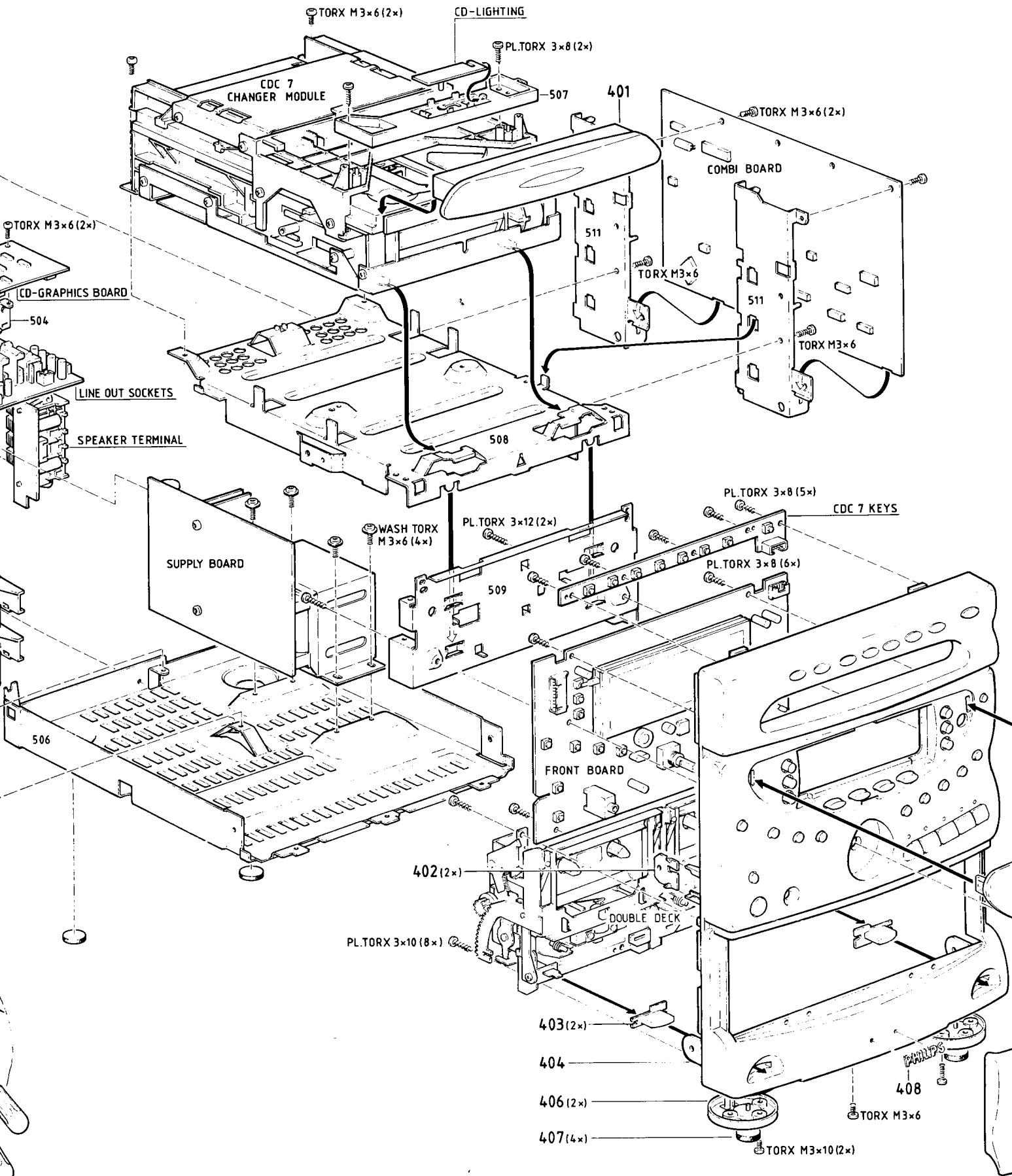


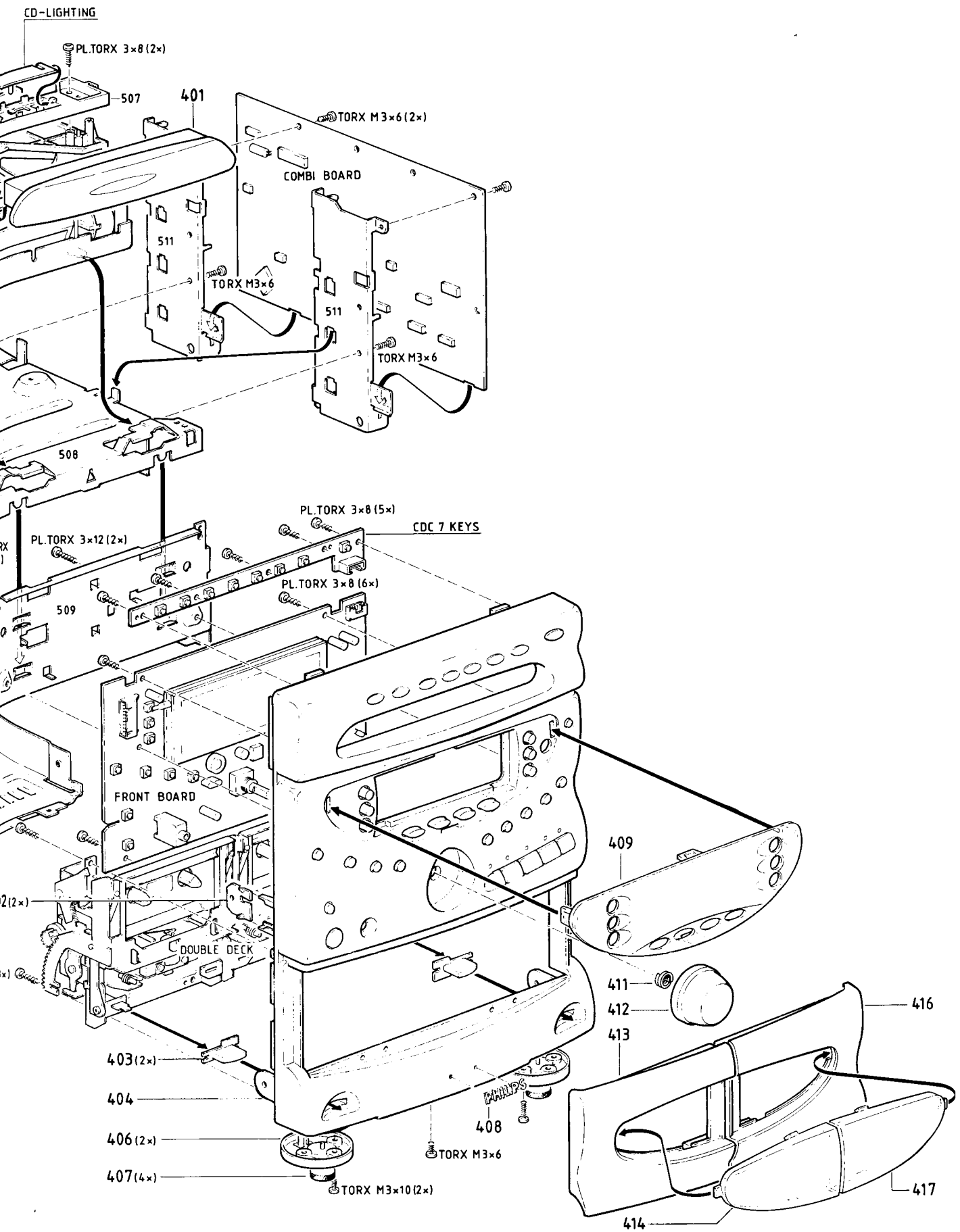




EXPLODED VIEW OF SET I







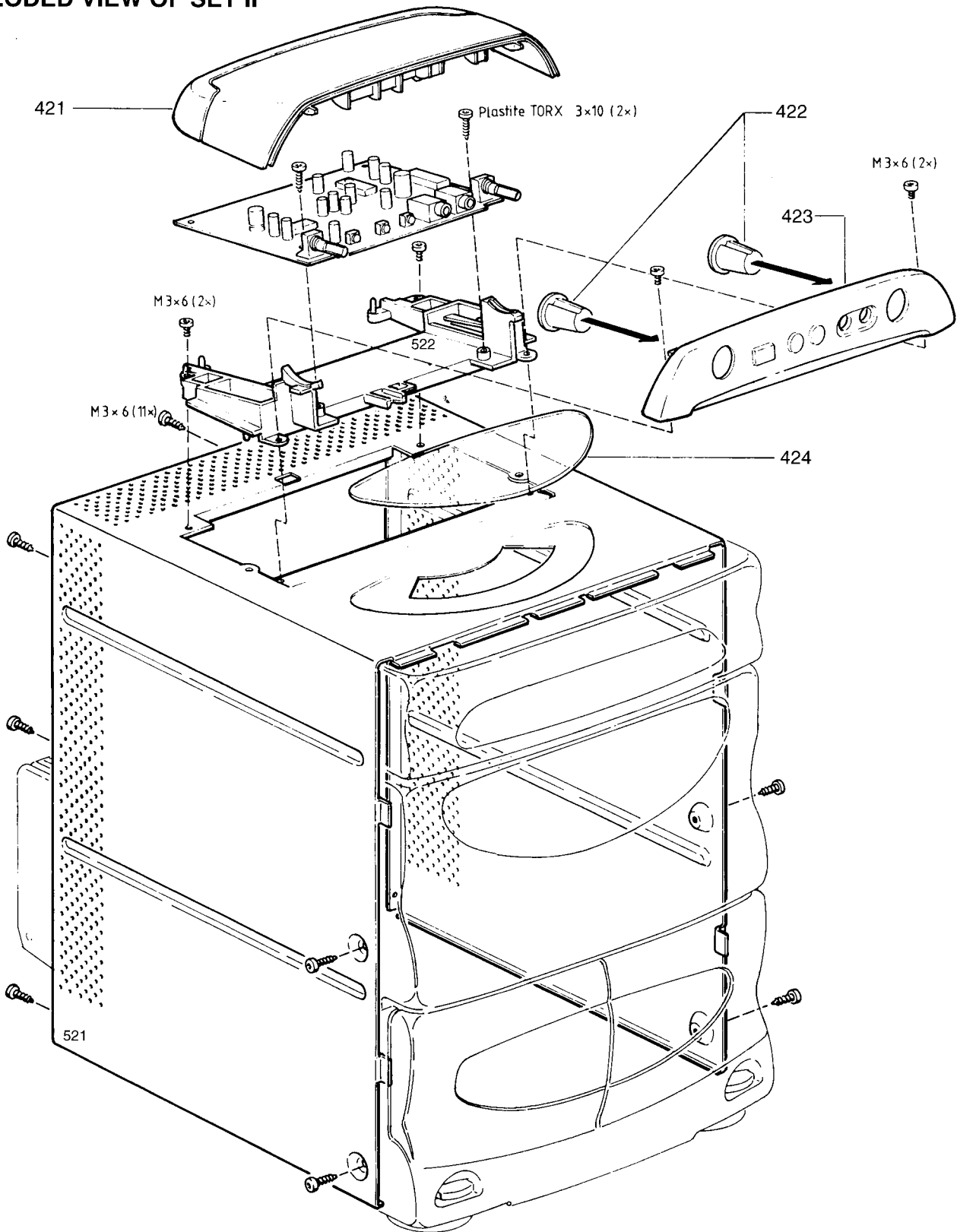
MECHANICAL PARTS

401	4822 444 30512	FRONT CDC7 TRAY
403	4822 410 63807	EJECT BUTTON
404	4822 426 51829	FRONT PRINTED for sets without RDS
404	4822 426 51869	FRONT PRINTED for sets with RDS only
406	4822 462 42211	FOOT ORNAMENTAL PART
407	4822 462 40683	RUBBER FOOT
408	4822 459 11086	WORDMARK PHILIPS
408	4822 459 11087	WORDMARK MAGNAVOX
409	4822 450 62477	WINDOW DISPLAY
411	4822 492 51374	SPRING KNOB CLAMP
412	4822 413 51508	KNOB VOLUME
413	4822 443 64506	CASSETTE DOOR LEFT
414	4822 450 62478	CASSETTE WINDOW LEFT
416	4822 443 64507	CASSETTE DOOR RIGHT
417	4822 450 62479	CASSETTE WINDOW RIGHT
421	4822 444 40836	COVER KARAOKE
422	4822 413 41916	KNOB KARAOKE
	4822 492 51374	SPRING KNOB CLAMP
423	4822 426 51832	FRONT KARAOKE
424	4822 450 62481	WINDOW CDC
501	4822 444 40835	COVER HEATSINK

MISCELLANEOUS

4822 445 10443	LOUDSPEAKER BOX PHILIPS
4822 445 10486	LOUDSPEAKER BOX MAGNAVOX
4822 218 10601	IR REMOTE CONTROL (neutral)
4822 303 50063	FM AERIAL
4822 303 50082	AM FRAME AERIAL
4822 321 10249	MAINS CORD not for /37
4822 321 10883	MAINS CORD for /37 only

EXPLODED VIEW OF SET II



MECHANICAL PARTS

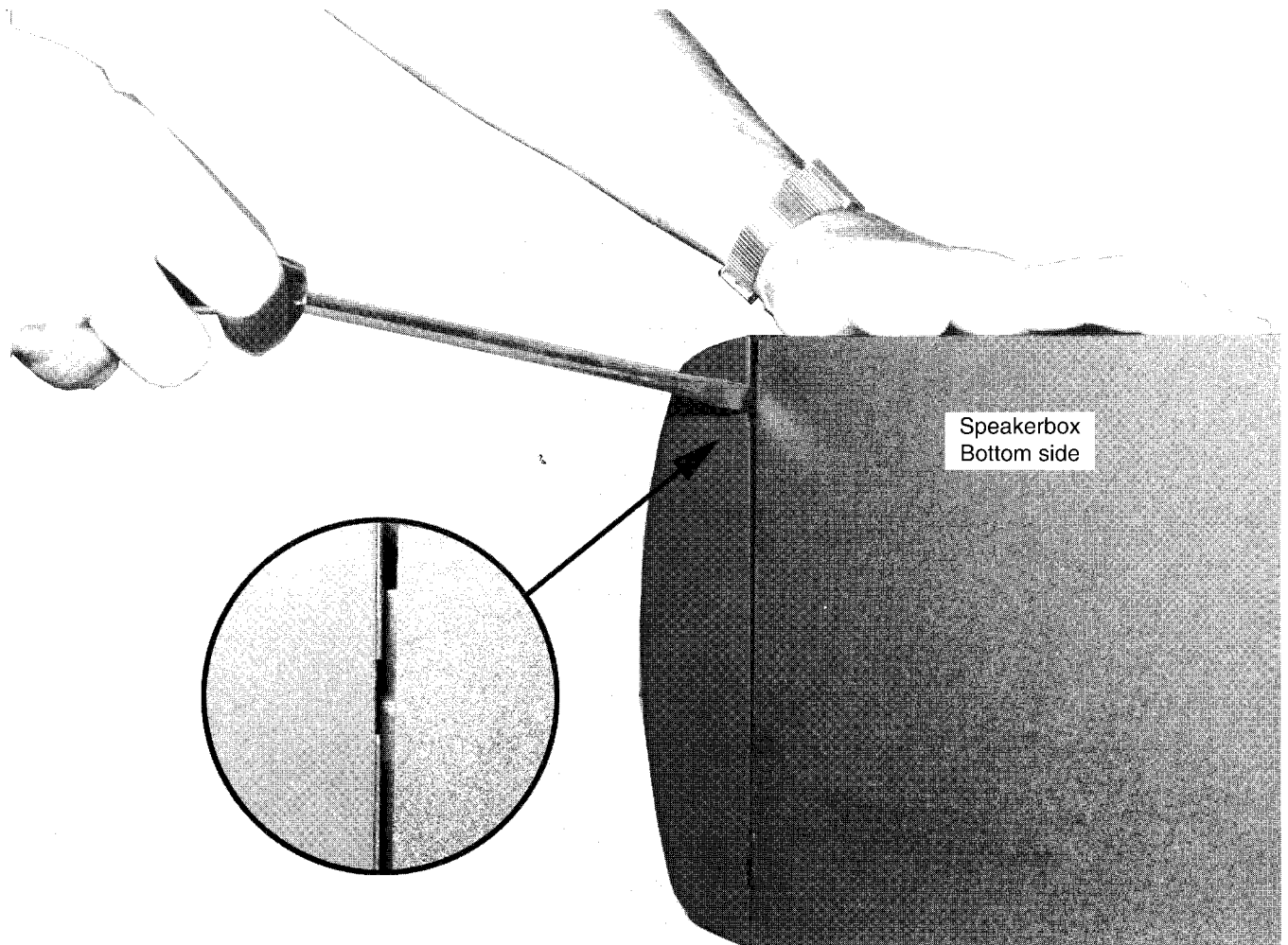
421	4822 444 40836	COVER KARAOKE
422	4822 413 41916	KNOB KARAOKE
	4822 492 51374	SPRING KNOB CLAMP
423	4822 426 51832	FRONT KARAOKE
424	4822 450 62481	WINDOW CDC

MISCELLANEOUS

4822 445 10443	LOUDSPEAKER BOX PHILIPS
4822 445 10486	LOUDSPEAKER BOX MAGNAVOX
4822 218 10601	IR REMOTE CONTROL (neutral)
4822 303 50063	FM AERIAL
4822 303 50082	AM FRAME AERIAL

4822 321 10249	MAINS CORD not for /37
4822 321 10883	MAINS CORD for /37 only

Dismantling of Speakerbox



Spareparts

