Service
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FW-C50/37
1941

ServiceManual

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GENERAL SAFETY NOTES

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various **CAUTIONS** and **NOTICES** which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these **CAUTIONS** and **NOTICES ARE NOT EXHAUSTIVE**. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ⚠ or **"S"** by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ⚠ on the schematics or exploded views. Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

- Broken Line _____ _ ____ _ _____ _ _____

SAFETY CHECKS

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to Your customer. Be sure to check all of the following:

FIRE AND SHOCK HAZARD
IMPLOSION
X-RADIATION
LEAKAGE CURRENT COLD CHECK
LEAKAGE CURRENT HOT CHECK

PICTURE TUBE REPLACEMENT
PARTS REPLACEMENT

FIRE AND SHOCK HAZARD

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.

2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.

3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.

4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.

5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.

6. Critical components having special safety characteristics are identified with an **'S'** by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol  on the schematic diagrams and /or exploded views.

7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.

8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.

9. After reassembly of the unit, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc., to be sure the unit may be safely operated without danger of electrical shock.

*** Broken line** _____ _ _____ _ _____ _ _____

IMPLOSION

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.

2. Use only replacement tubes specified by the manufacturer.

X-RADIATION

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.

2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.

3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.

4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value - no higher - for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV reading be recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.

5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis longer than necessary to locate the cause of the excessive HV.

6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.

7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.

8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

LEAKAGE CURRENT COLD CHECK

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.

2. Turn on the power switch.

3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the

jumper from the ac line cord.

LEAKAGE CURRENT HOT CHECK

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.

2. Connect a **1.5k, 1OW resistor** paralleled by a **0.15uF. capacitor** between each exposed metallic cabinet part and a **good earth ground** such as a water pipe, as shown below.

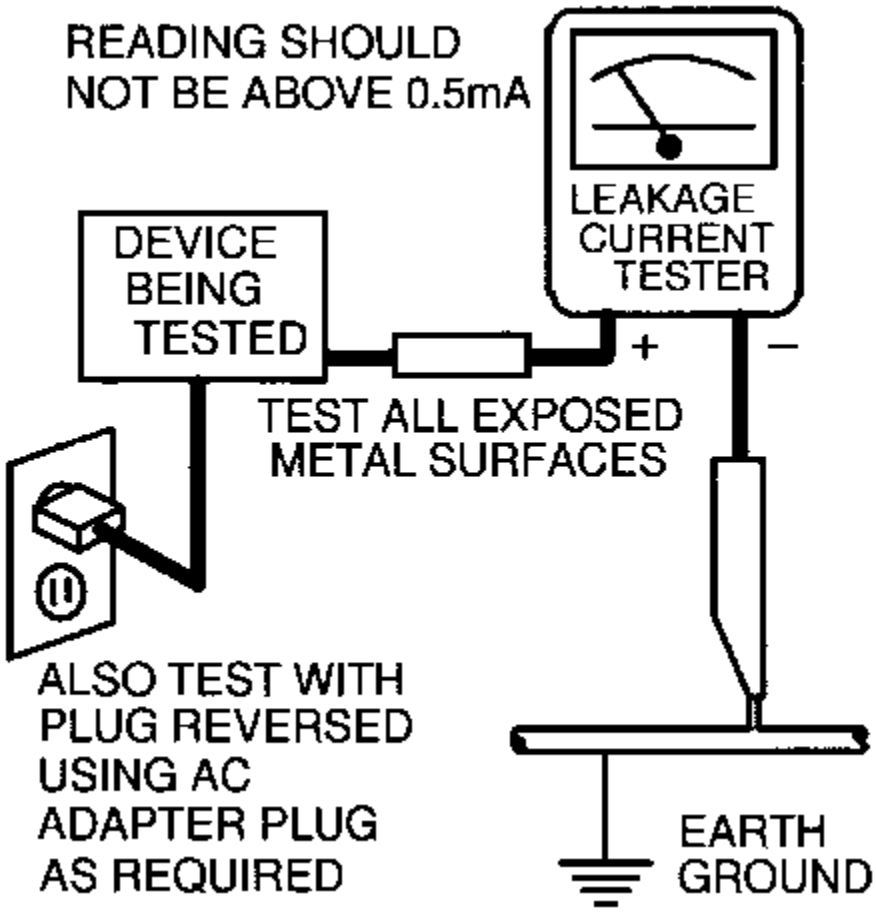
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.

4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5milliamp. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.

5. **Repeat the above procedure with the ac plug reversed.** (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

OR

With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. **(Do not use an isolation transformer during this test.)** Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1410, (50.7). **With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinet, screw heads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat the test. See graphic below.**



PICTURE TUBE REPLACEMENT

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved type.

PARTS REPLACEMENT

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards

TV SAFETY NOTES

SAFETY CHECKS

WARNING

Before removing the CRT anode cap, turn the unit **OFF** and short the **HIGH VOLTAGE** to the **CRT DAG** ground.

SERVICE NOTE: The **CRT DAG** is not at chassis ground.

TV-VCR COMBI SAFETY NOTES

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected for recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

SAFETY PRECAUTIONS FOR TV CIRCUITS

1. Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

   a. Be sure that no built-in protective devices are defective or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.

   b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.

   c. Do a LEAKAGE CURRENT CHECK

   ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER

OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.

d. **X-Radiation and High Voltage Limits** - Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original. Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place. High voltage must be measured each time servicing is performed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called "horizontal disable" or "hold down.") Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on instrument labels and in the **Product Safety & X-Radiation** Warning note on the service data chassis schematic. High voltage is maintained within specified limits by close tolerance safety-related components/adjustments in the high-voltage circuit. If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.

2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.

3. **Design Alteration Warning** - Do not alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions will void the manufacturer's warranty and may make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4**. Picture Tube Implosion Protection Warning** - The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do not remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do not try to remove such "permanently attached" yokes from the picture tube.

5. **Hot Chassis Warning**

a. Some TV receiver chassis are electrically connected directly to one conductor of the ac power cord and may be serviced safely without an isolation transformer only if the ac power plug is inserted so that the chassis is connected to the ground side of the ac power source. To confirm that the ac power plug is inserted correctly, with an ac voltmeter, measure between the chassis and a known earth ground. If a voltage reading in excess of 1.OV is obtained, remove and reinsert the ac power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground.

b. Some TV receiver chassis normally have 85Vac (RMS) between chassis and earth ground regardless of the ac plug polarity. This chassis can be safety-serviced only with an isolation transformer inserted in the power line between the receiver and the ac power source, for both personnel and test equipment protection. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is not isolated from the ac power line. The two ground systems are electrically separated by insulation material that must not be defeated or altered.

6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: **a.** near sharp edges, **b.** near thermally hot parts - be sure that leads and components do not touch thermally hot parts, **c.** the ac supply, **d.** high voltage, and **e.** antenna wiring. Always inspect in all areas for pinched, out of place, or frayed wiring. Check ac power cord for damage.

7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

PRECAUTIONS DURING SERVICE

A. Parts identified by the ⚠ symbol are critical for safety. Replace only with part number specified.

B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.

C. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

D. Use specified insulating materials for hazardous live parts. Note especially:
1) Insulation Tape
2) PVC tubing
3) Spacers
4) Insulators for transistors

E. When replacing ac primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.

F. Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

G. Check that replaced wires do not contact sharp edged or pointed parts.

H. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

I. Also check areas surrounding repaired locations.

J. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

K**. Crimp type wire connector**
When replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, in order to prevent shock hazards, perform carefully and precisely the following steps.

Replacement procedure

1) Remove the old connector by cutting the wires at a point close to the connector. **Important:** Do not re-use a connector (discard it).
2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.
3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.
4) Use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

L. When connecting or disconnecting the VCR connectors, first, disconnect the ac plug from the ac supply socket.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

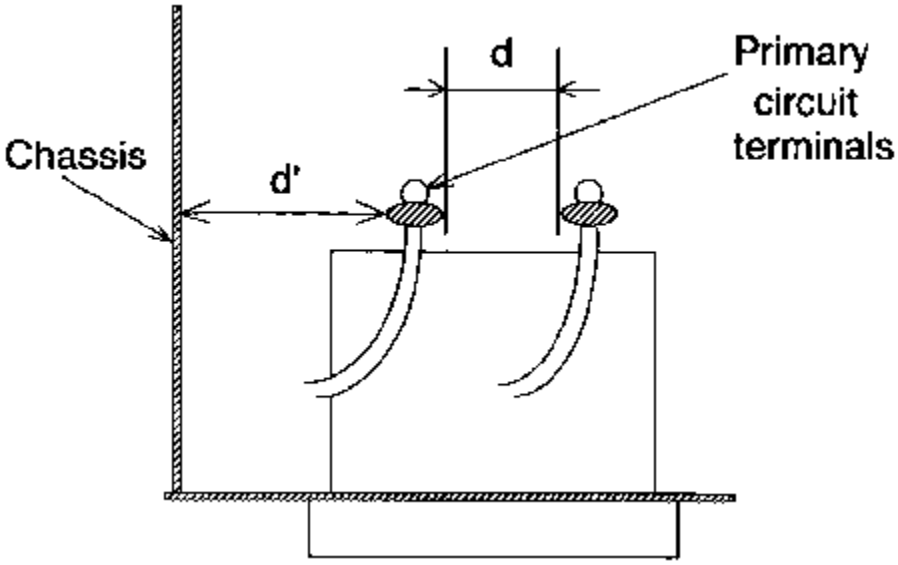
1. **Clearance Distance**

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See graphic bllow)

Table 1 : Ratings for selected area

AC Line Voltage	Region	Clearance Distance (d) (d')
110 to 130 V	USA or CANADA	> 3.2 mm (0.126 inches)

Note: This table is unofficial and for reference only. Be sure to confirm the precise values.



2. LEAKAGE CURRENT CHECKS

VCR SAFETY NOTES

FIRE & SHOCK HAZARD (VCR)

1. Be sure that all components are positioned in such a way to avoid possibility of shorts to adjacent components. This is especially important on those chassis which are transported to and from the repair shop.

2. Always replace all protective devices such as insulators and barriers after working on a set.

3. Check for damaged insulation on wires including the ac cord.

4. Check across-the-line components for damage and replace if necessary.

5. After re-assembly of the unit, always perform an ac leakage test on the exposed metallic parts of the cabinet such as the knobs, antenna terminals, etc. to be sure the set is safe to operate without danger of electrical shock. **Do not use a line isolation transformer during this test.** Use an ac voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm 10 wan resistor, paralleled by 0.15 MFD ac type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the ac voltage across the combination 1500 ohm resistor and 0.15 MFD capacitor. Reverse the ac plug on the set and repeat ac voltage measurements again for each exposed metallic part. Voltage measured must not exceed O.6 volts R.M.S. This corresponds to 0.4 milliamp ac. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.

GENERAL

Power Supply-This receiver is designed for operation on 120 Volts, 6OHz alternating current (ac) only. Never connect to a supply having a different frequency or voltage.

IMPORTANT NOTICE

This device employs many circuits, components, and mechanical parts designed for protection against fire, shock and RF interference. For continued safety any servicing should be performed by qualified personnel and exact replacement parts should be used. Under no circumstances should the original design be altered.

PRODUCT SAFETY GUIDELINES FOR ALL PRODUCTS

CAUTION: Do not modify any circuit. Service work should be performed only after you are thoroughly familiar with all of the following safety checks. Risk of potential hazards and injury to the user increases if safety checks are not adhered to.
USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

PREVENTION OF ELECTROSTATIC DISCHARGE (ESD)

Some semiconductor solid state devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices, Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate an electrical charge sufficient to damage ES devices.

5. Do not use freon·propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION : Be sure no power is applied to the chassis or circuit and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your feet from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device.)

NOTE to CATV system Installer:
This reminder is provided to call the CATV system installer's attention to article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

GENERAL INFORMATION

General Information

- ***The typeplate (which contains the serial number) is located at the rear of the system.***
- ***Recording is permissible if copyright or other rights of third parties are not infringed.***
- ***This device complies with the Federal Communications Commission (FCC) rules, part 15 and with 21 CFR 1040.10. Operation is subject to the following two conditions:***
  - ***This device may not cause harmful interference, and***
  - ***This device must accept any interference received, including interference that may cause undesired operation.***

Environmental Information

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

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

Accessories *(Supplied)*

- Remote control
- Batteries (two AA size) for remote control
- AM loop antenna
- FM wire antenna
- AC power cord
- SS-115 surround speakers *(for model FW-C70 only)*
- SS-107 surround speakers *(for model FW-C50 only)*

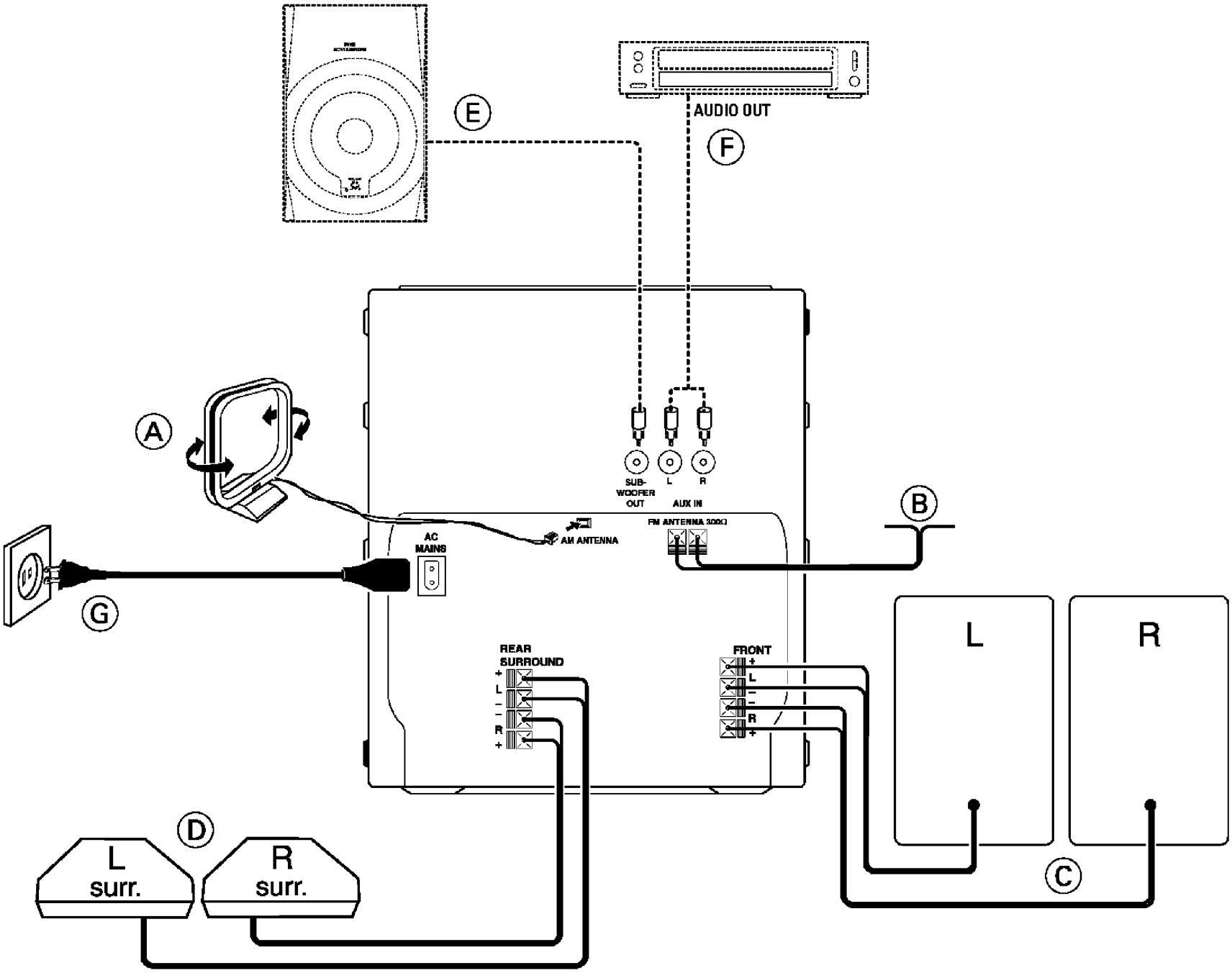
SAFETY INFORMATION

Safety Information

- Before operating the system, check that the operating voltage indicated on the typeplate (or the voltage indication beside the voltage selector) of your system is identical with the voltage of your local power supply. If not, please consult your dealer. The typeplate is located at the rear of your system.
- When the system is switched on, do not move it around.
- Place the system on a solid base (e.g. a cabinet).
- Place the system in a location with adequate ventilation to prevent internal heat build-up in your system. Allow at least 10cm (4 inches) clearance from the rear and the top of the unit and 5cm (2 inches) from the each side.
- The system incorporates a built-in safety feature that prevents overheating.
- Do not expose the system to excessive moisture, rain, sand or heat sources.
- Under no circumstances should you repair the system yourself, as this will invalidate the warranty!
- If the system is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lens of the CD unit inside the system. Should this occur, the CD player will not operate normally. Leave the power on for about one hour with no disc in the system until normal playback is possible.
- Electrostatic discharge may cause unexpected problems. See whether these problems disappear if you unplug the AC power cord and plug it in again after a few seconds.
- **To disconnect the system from the power supply completely, remove the AC power plug from the wall socket.**

CLASS 1
LASER PRODUCT

Rear Connections



PREPARATION

Ⓐ AM Loop Antenna Connection

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

Ⓑ FM Wire Antenna Connection

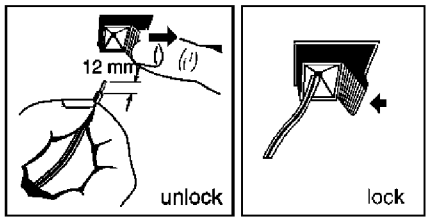
Connect the supplied FM wire antenna to the FM ANTENNA 300 Ω terminal. Adjust the position of the FM antenna for the best reception.

Outdoor Antenna

For better FM stereo reception, connect an outdoor FM antenna to the FM ANTENNA 300 Ω terminal using a 300 Ω dipole wire.

Ⓒ Speakers Connection

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



Ⓓ Rear Surround Speakers' Connection

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

Ⓔ Subwoofer Out Connection

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

Ⓕ Connecting other equipment to your system

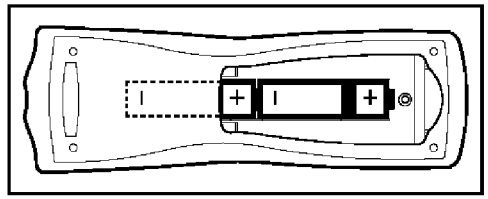
You can connect the audio left and right OUT terminals of a TV, VCR, Laser Disc, player DVD player or CD Recorder to the AUX IN terminals at the rear of the system.

Ⓖ AC Power Supply

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

Inserting batteries into the Remote Control

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

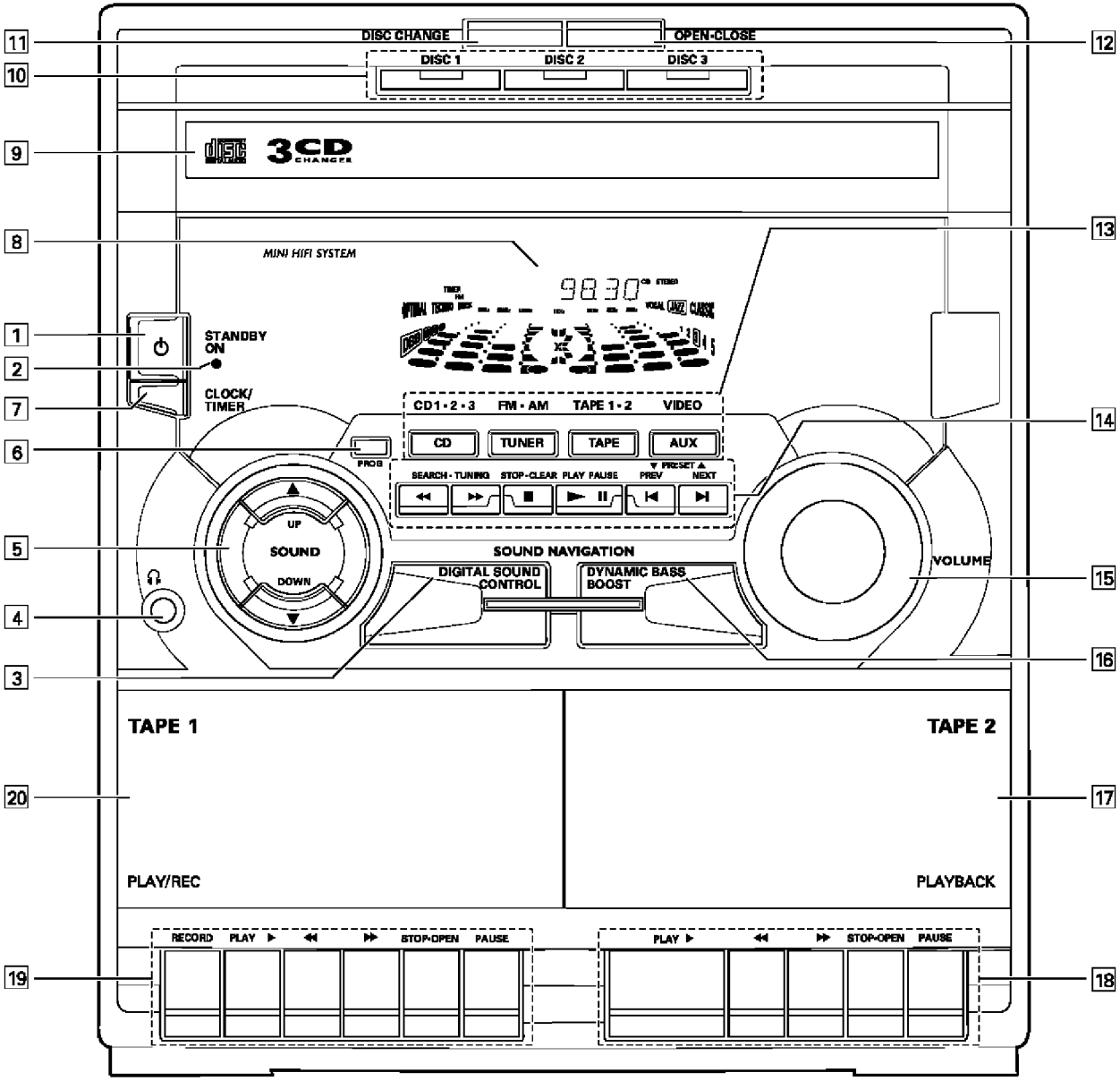


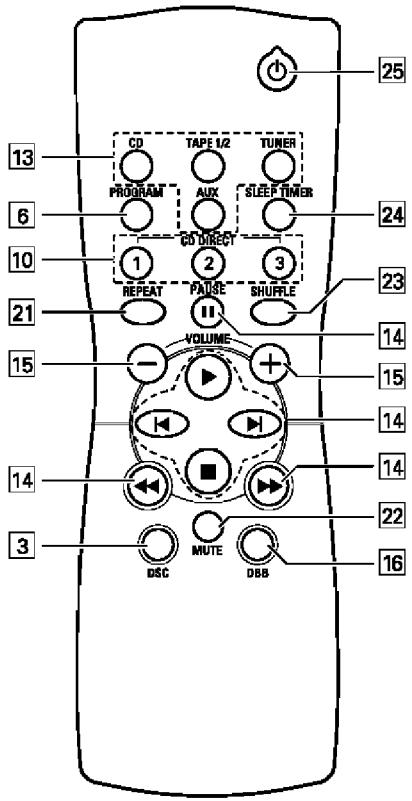
- To avoid damage from possible battery leakage, remove dead batteries or batteries that will not be used for a long time. For replacement, use type R06 or AA batteries.

Notes for remote control:

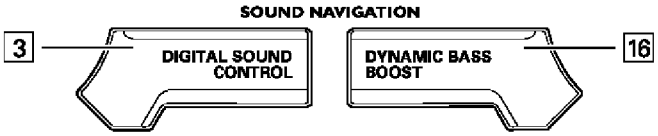
- ***First select the source you wish to control by pressing one of the source select keys on the remote control (e.g. CD or TUNER).***
- ***Then select the desired function (▶, ⏮, ⏭, etc.).***

CONTROLS





C-50 SOUND NAVIGATION DISPLAY



CONTROLS

Controls on the system and remote control

1 **STANDBY ON**
– to switch the system on or to standby mode.
– to use for EASY SET.

2 **LOW POWER STANDBY LED**
– lights up during low power standby *(for model FW-C70 only)*.

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

4 🎧
– to connect headphones.

5 **SOUND ▲ or ▼**
– to select the desired equalizer display.
– to select the desired DSC setting. You must select the DSC feature first.

6 **PROG (PROGRAM)**
for CD ..... to program CD tracks.
for TUNER ... to program preset radio stations.
for CLOCK .. to select 12 or 24 hour in clock setting mode.

7 **CLOCK/TIMER**
– to view the clock, set the clock or set the timer.

8 **DISPLAY SCREEN**
– to view the current setting of the system.

9 **CD CAROUSEL TRAY**

10 **DISC 1 / DISC 2 / DISC 3 (CD DIRECT PLAY)**
– to select a CD tray for playback.

11 **DISC CHANGE**
– to change CD(s).

12 **OPEN•CLOSE**
– to open or close the CD carousel tray.

13 **SOURCE** – to select the following:
CD / (CD 1•2•3)
– to select CD mode. When CD playback is stopped, press to select disc tray 1, 2 or 3.
TUNER / (FM•AM)
– to select Tuner mode. When in tuner mode, press to select the waveband: FM or AM.
TAPE / (TAPE 1• 2)
– to select Tape mode.
AUX / (VIDEO)
– to select sound from an external source (e.g. TV, VCR, Laser Disc player, DVD player or CD Recorder).

14 **MODE SELECTION**
SEARCH ◀◀ ▶▶ (TUNING ◀◀ ▶▶)
for CD ..... to search backward/ forward.
for TUNER .... to tune to a lower or higher radio frequency.
for CLOCK .. to set the hour.
STOP•CLEAR ■
for CD ..... to stop CD playback or to clear a program.
for TUNER ... to stop programming.
for DEMO .... *(on the system only)* to start or stop demonstration mode.
PLAY ▶ / PAUSE ❚❚
for CD ..... to start or interrupt playback.
PREV ⏮ / NEXT ⏭ (PRESET ▼▲)
for CD ..... to skip to the beginning of the current, previous, or next track.
for TUNER ... to select a preset radio station in memory.
for CLOCK .. to set the minute.

15 **VOLUME**
– to increase or decrease the volume.

16 **DYNAMIC BASS BOOST (DBB)**
– to select a bass boost level or to switch off bass boost.

17 **TAPE DECK 2**

18 **TAPE DECK 2 OPERATION**
PLAY ▶ ..... to start playback.
◀◀ ..... to rewind the tape.
▶▶ ..... to fast forward the tape.
STOP•OPEN... to stop playback or to open the tape door.
PAUSE ..... to interrupt playback.

19 **TAPE DECK 1 OPERATION**
RECORD ... to start recording.
PLAY ▶ ..... to start playback.
◀◀ ..... to rewind the tape.
▶▶ ..... to fast forward the tape.
STOP•OPEN... to stop playback/ recording or to open the tape door.
PAUSE ..... to interrupt playback or recording.

20 **TAPE DECK 1**

21 **REPEAT**
– to repeat a CD track, a disc, or all available discs.

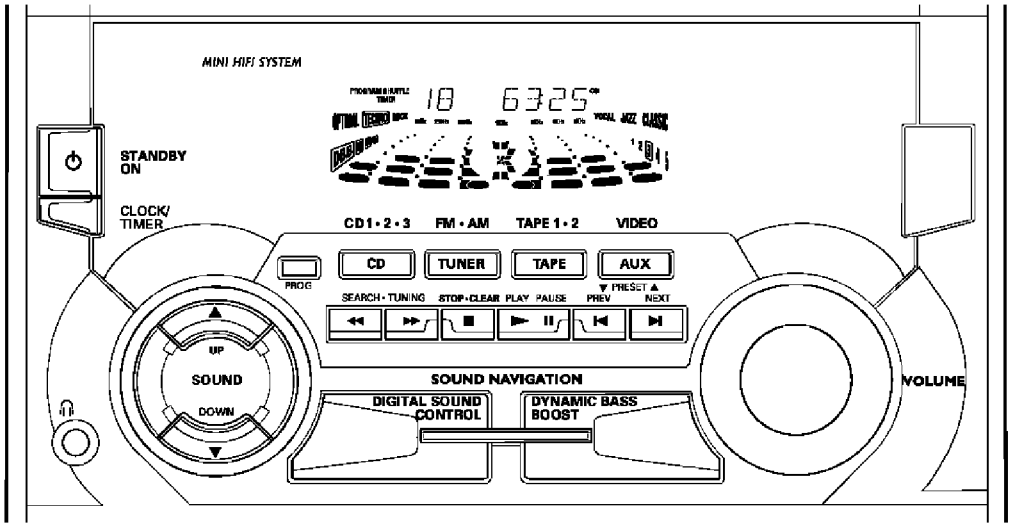
22 **MUTE**
– to switch off the sound temporarily.

23 **SHUFFLE**
– to play all the available discs and their tracks in random order.

24 **SLEEP TIMER**
– to switch the system to standby mode at a selected time.

25 ⏻
– to switch the system to standby mode.

OPERATING THE SYSTEM



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

Demonstration mode

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

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

To stop the demonstration mode
- Press and hold ■ *(on the system only)* for ***five seconds*** when the system is in demonstration mode.
  → The demonstration will stop.
  → "DEMO OFF" is displayed.
  → The system will switch to standby mode.
  → *(for FW-C70 only)*
  About five seconds later, the system will go into an energy saving mode (< 2 watts). The low power STANDBY ON LED will be lit.

Note:
- *Even though the AC power cord is removed from and reconnected to the wall socket, the demonstration will remain off until it is switched on again.*

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

Easy Set

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

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

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

Switching the system ON

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

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

Switching the system to standby mode

- Press **STANDBY ON** or ⏻ on the remote control.
  → The system will switch to standby mode.
  → *(for FW-C70 only)*
  About five seconds later, the system will go into an energy saving mode if the demonstration mode has been disabled.

Selecting the Source

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

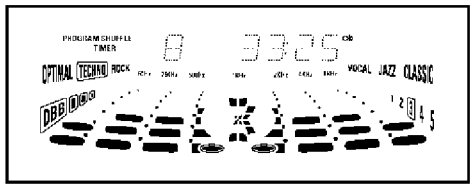
Note:
- *For an external source, make sure you have connected the audio left and right OUT terminals of the external equipment (TV, VCR, Laser Disc player, DVD player or CD Recorder) to the AUX IN terminals.*

Selecting the Equalizer Display

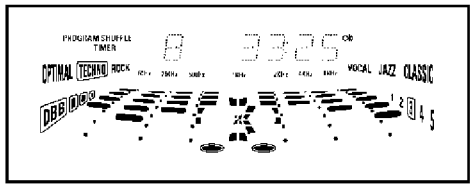
You can select the desired equalizer display for the system. You must not press the DSC button on the system before using the SOUND ▲ or ▼ controls.

- Press the **SOUND** ▲ or ▼ to select the desired Equalizer Display, NORMAL, TOP DOWN, or NITE MODE.
  → The selected display will be shown.

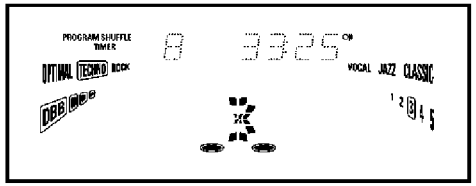
NORMAL Display



TOP DOWN Display



NITE MODE Display



Note:

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

Sound Control

VOLUME ADJUSTMENT

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

For Personal Listening

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

DIGITAL SOUND CONTROL (DSC)

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

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

With the SOUND ▲ or ▼ controls, you can change the level of any DSC setting except CLASSIC.

- First select the DSC feature, then press the **SOUND** ▲ or ▼ until the desired digital sound setting level is reached.
  → The digital sound setting level will increase or decrease between level 1 and 5.

Note:

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

DYNAMIC BASS BOOST (DBB)

There are three DBB settings to enhance the bass response.

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

To switch off DBB

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

Note:

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

Automatic DSC-DBB selection

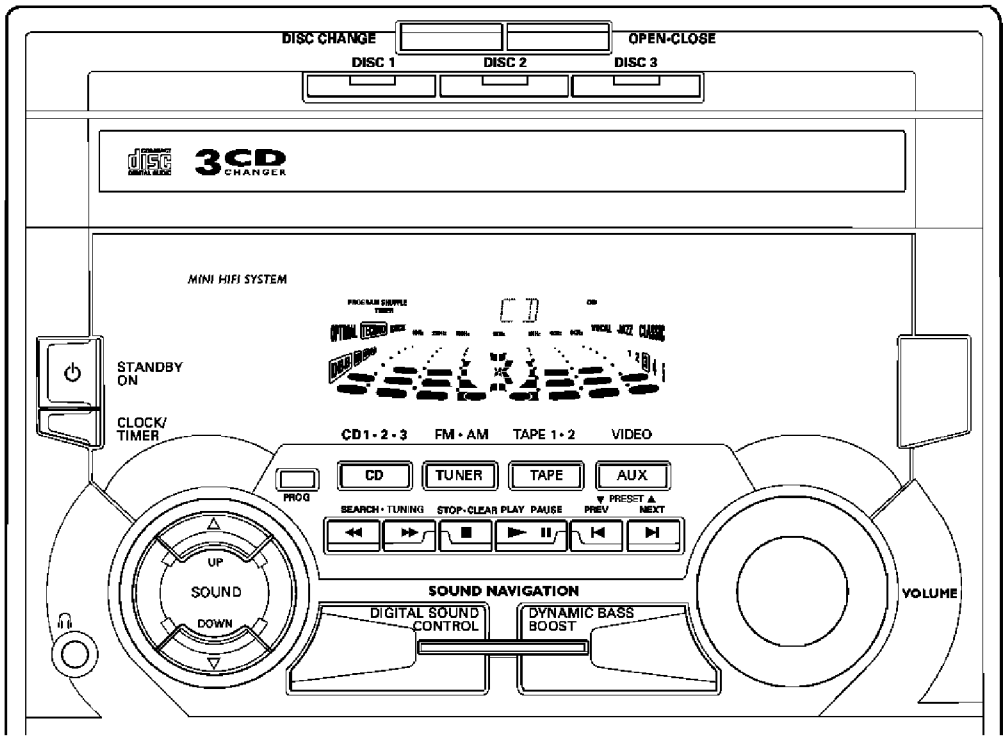
The best DBB setting is generated automatically for each DSC selection. You can manually select the DBB setting that best suits your listening environment.

MUTE *(on remote control only)*

This feature allows you to temporarily switch off the sound without switching off the system when you require a moment of silence.

- Press **MUTE** on the remote control to switch off the sound.
  → "MUTE" will be displayed.
- Press **MUTE** again on the remote control or increase the **VOLUME** level to switch on the sound.

CD



Warning!

1) This system is designed for conventional CDs. Do not use any accessories such as disc stabilizer rings or CD treatment sheets, etc., which may damage the CD mechanism.

2) Do not load more than one disc into each tray.

3) When the CD changer is loaded with CDs, do not turn over or shake the system. This may jam the changer.

You may load three discs in the CD changer for continuous playback without interruption.

Discs for playback

This system can play all digital audio CD, finalized digital audio CD-Recordable and finalized digital audio CD-Rewritable format discs.

COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO Recordable

COMPACT disc DIGITAL AUDIO ReWritable

Loading the CD Changer

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

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

Note:

– *To ensure good system performance, wait until the CD changer completely reads the disc(s) before proceeding.*

CD Direct Play

- You can play a CD directly by pressing the **DISC 1**, **DISC 2** or **DISC 3** button. The CD player will stop at the end of playback of the selected disc.
→ A lit button indicates that a disc is loaded in the disc tray.

Playing a CD

1 Press ▶ to start playback.
→ The disc tray, track number and elapsed playing time of the current track appear on the display.
- To interrupt playback, press ❚❚.
→ The playing time flashes.
- To resume playback, press ▶ again.

2 To stop playback, press ■.

Note:

– *All the available discs will play once, then stop.*

Disc Change

You can change the outer two discs while the third inner disc is stopped or is playing.

1 Press **DISC CHANGE**.
→ The CD carousel tray slides out.
2 Replace the discs in the left and right disc trays.

- If you wish to change the inner disc during playback, press **DISC CHANGE** again.
  → "DISC CHANGE" will be displayed.
  → The CD will stop playing.
  → The CD carousel tray will close to retrieve the inner CD and then open again with the inner CD accessible.

3 Press **OPEN•CLOSE** to close the CD carousel tray.

Selecting a desired track

Selecting a desired track when playback is stopped

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

Selecting a desired track during playback

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

Note:
– *Pressing ⏮ during shuffling can only skip to the beginning of the current track.*

Searching for a particular passage during playback

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

Programming Tracks

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

1 Load the desired discs in the disc trays.
2 Press **PROG** to start programming.
→ The **PROGRAM** starts flashing.
→ It will cancel any previously selected repeat mode.
3 Press the **CD** (CD 1•2•3) or **DISC 1/2/3** button to select the disc.
4 Press ⏮ or ⏭ to select the desired track.
5 Press **PROG** to store the track.
- Repeat steps ***3*** to ***5*** to store other discs and tracks.

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

Notes:
– *If the total playing time is more than "99:59" or if one of the programmed tracks has a number greater than 30, then "- - : - -" appears on the display instead of the total playing time.*
– *If the system is reading the disc, programming is not possible, "READING" will be displayed and followed by "DISC X" "X" is the current read disc number.*
– *During programming, if no button is pressed within 20 seconds, the system will exit program mode automatically.*

Reviewing the program

Reviewing of the program is possible only when playback is stopped.

- Press ⏮ or ⏭ repeatedly to review the programmed tracks.
- Press ■ to exit review mode.

Playing the program

1 Press ▶ to start program playback.
→ "PLAY PROGRAM" appears on the display.
→ The track number and elapsed playing time of the current track will appear on the display.

- If you press **REPEAT** during program playback, the current track or all programmed tracks will be played repeatedly.
  → "TRACK" or "PROGRAM" will be displayed.
  → The **REPEAT** and **PROGRAM** appear on the display.

2 Press ■ to stop program playback.

Notes:
– *If you press any of the CD DIRECT PLAY buttons, the system will play the selected disc or track and the stored program will be ignored temporarily. The PROGRAM display also will disappear temporarily from the display. It will reappear when playback of the selected disc ends.*
– *REPEAT DISC mode will be cancelled when program playback begins.*

Erasing the program *(when playback is stopped)*

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

Note:
– *The program will be erased when the system is disconnected from the power supply or when the CD carousel tray is opened.*

Shuffle *(only on remote control)*

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

To shuffle all the discs and tracks

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

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

Note:
– *REPEAT DISC mode will be cancelled when shuffle is selected.*

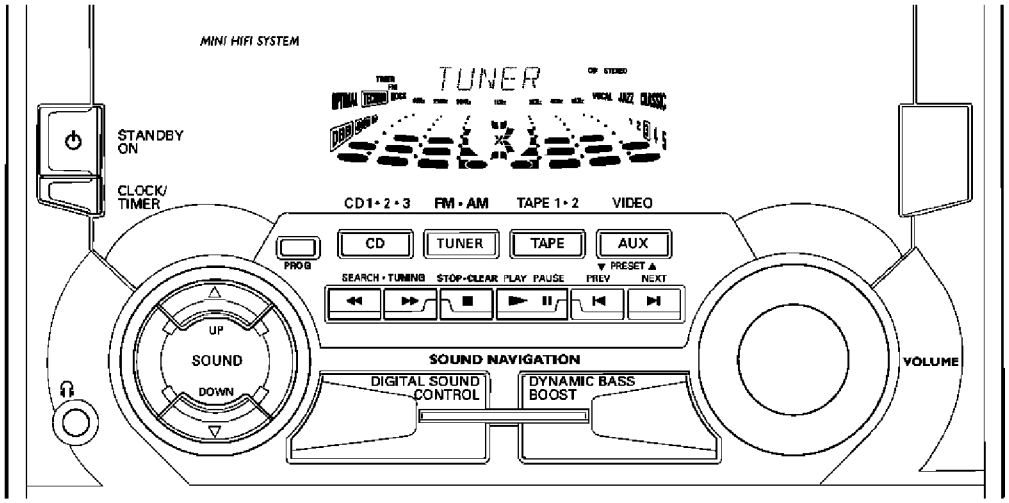
Repeat *(only on remote control)*

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

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

2 Press **REPEAT** until the "OFF" mode is displayed to resume normal playback.
→ The **REPEAT** disappears from the display.

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



Note:
– *For 'EASY SET' feature, please refer to page 12.*

Tuning to radio stations

1 Press **TUNER** (FM•AM) to select TUNER mode.
→ "TUNER" will be displayed.
A few seconds later, the current radio frequency will be displayed.

2 Press **TUNER** (FM•AM) again to select the desired waveband : FM or AM.

3 Press ◀◀ or ▶▶ for more than one second, then release.
→ The display will show "SEARCH" until a radio station with sufficient signal strength is found.
- Repeat this procedure until the desired radio station is reached.
- To tune to a weak radio station, briefly press ◀◀ or ▶▶ repeatedly until the display shows the desired frequency and/or when the best reception has been obtained.

Storing Preset Stations

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

Automatic programming

1 Press **TUNER** (FM•AM).
2 Press **PROG** for more than one second.
→ The **PROGRAM** starts flashing and "AUTO" will be displayed.
→ The system will search for every available radio station in the FM waveband first, then search the AM waveband.
→ All available radio stations will be stored automatically. The frequency and preset number will be displayed briefly.
→ The system will stop searching when all the available radio stations are stored or when the memory for 40 preset radio stations is used.
→ The system will remain tuned to the last stored preset radio station.

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

Manual programming

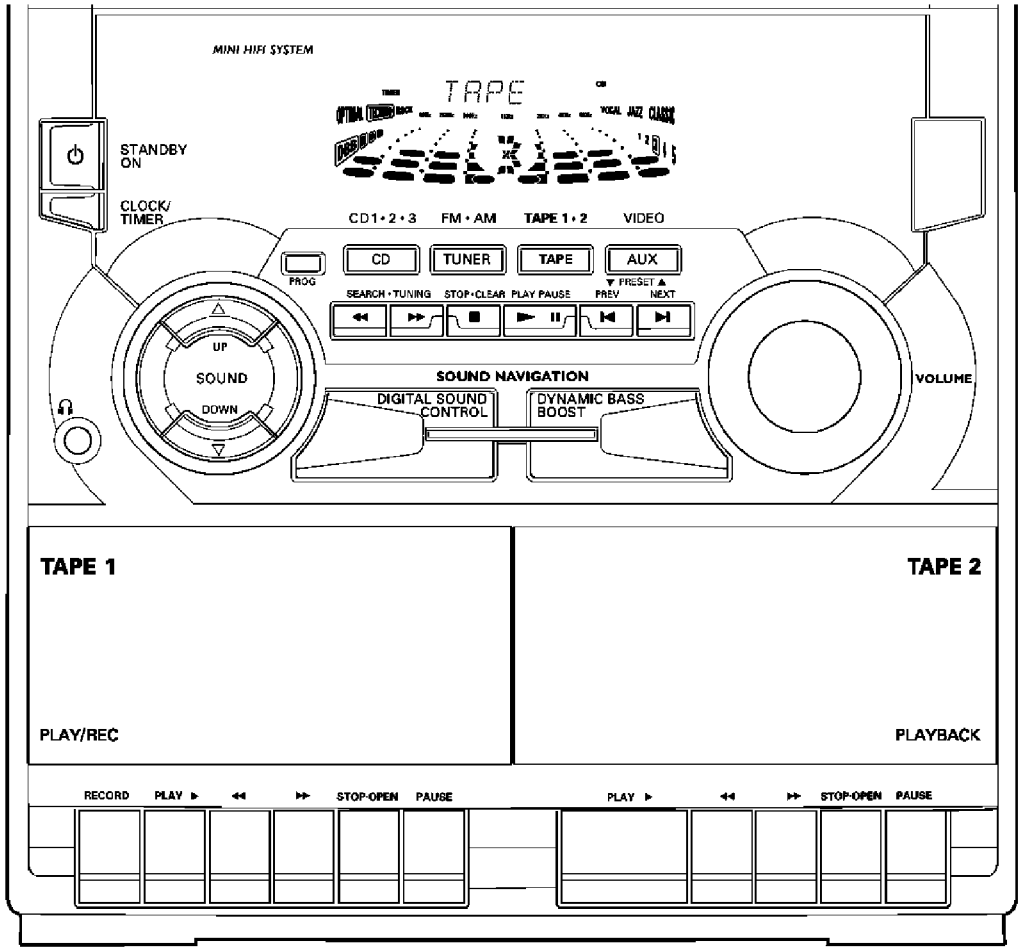
1 Press **TUNER** (FM•AM).
2 Press **TUNER** (FM•AM) again to select the desired waveband : FM or AM.
3 Press **PROG** for less than one second.
→ The **PROGRAM** starts flashing.
→ The next available preset number will be displayed for selection.
4 Press ◀◀ or ▶▶ to tune to the desired frequency.
• If you wish to store the radio station to another preset number, press ▼ or ▲ to select the desired preset number.
5 Press **PROG** again.
→ The **PROGRAM** disappears and the radio station will be stored.
• Repeat ***steps 3 – 5*** to store other preset radio stations.

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

Tuning to Preset Radio Stations

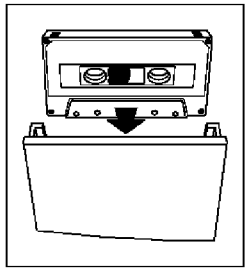
• Press ▼ or ▲ to select the desired preset number.
→ The preset number, radio frequency, and waveband appear on the display.

TAPE



Loading a tape

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



4 Close the tape deck door.

Tape Playback

1 Press **TAPE** to select TAPE mode.
→ "TAPE" will be displayed.
2 Load the tape into the selected tape deck.
3 Press **PLAY ▶** to start playback.
- To interrupt playback, press **PAUSE**.
- To resume playback, press **PAUSE** again.

4 Press **STOP•OPEN** to end playback.

Rewind/Fast Forward

When playback is stopped

1 You can rewind or fast forward a tape by pressing ◀◀ or ▶▶, respectively.
→ The tape will stop automatically at the end of rewinding or fast forwarding.
2 Press **STOP•OPEN** to stop rewinding or fast forwarding.

Continuous Playback From Tape Deck 2 to Tape Deck 1

1 Press **TAPE** to select TAPE mode.
2 Load the tapes in tape deck 1 and 2.
3 Press **PLAY ▶** on tape deck 2.
4 Press **PAUSE** on tape deck 1.
5 Press **PLAY ▶** on tape deck 1.
→ Playback will begin with tape deck 2 and will continue with tape deck 1 when playback on tape deck 2 ends.
6 Press **STOP•OPEN** if you want to stop playback before the end of the tape in tape deck 1 or tape deck 2.

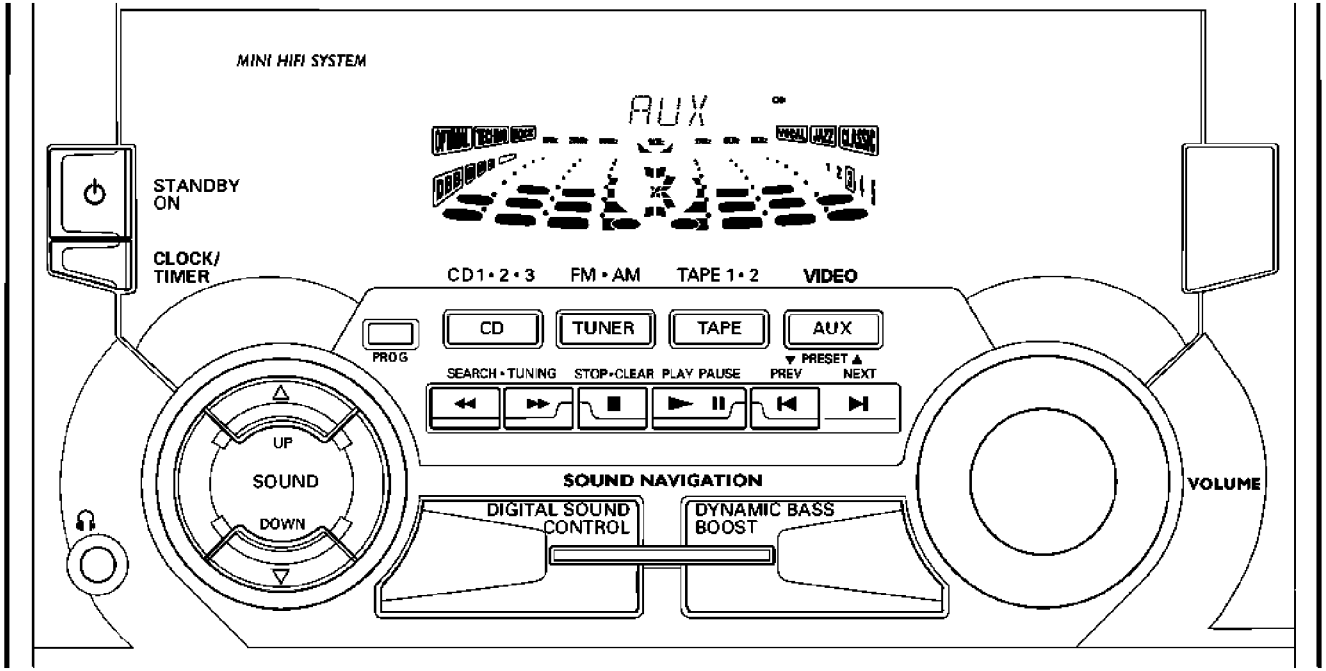
Notes:

– *During rewinding or fast forwarding of a tape, it is also possible to listen to another source (e.g. CD, TUNER or AUX).*

TAPE

– *Before playing a tape, check and tighten slack tape with a pencil. Slack tape may get jammed or may burst in the mechanism.*
– *C-120 tape is extremely thin and is easily deformed or damaged. It is not recommended for use in this system.*
– *Store the tapes at room temperature and do not put them too close to a magnetic field (for example, a transformer, TV or speaker).*

AUX



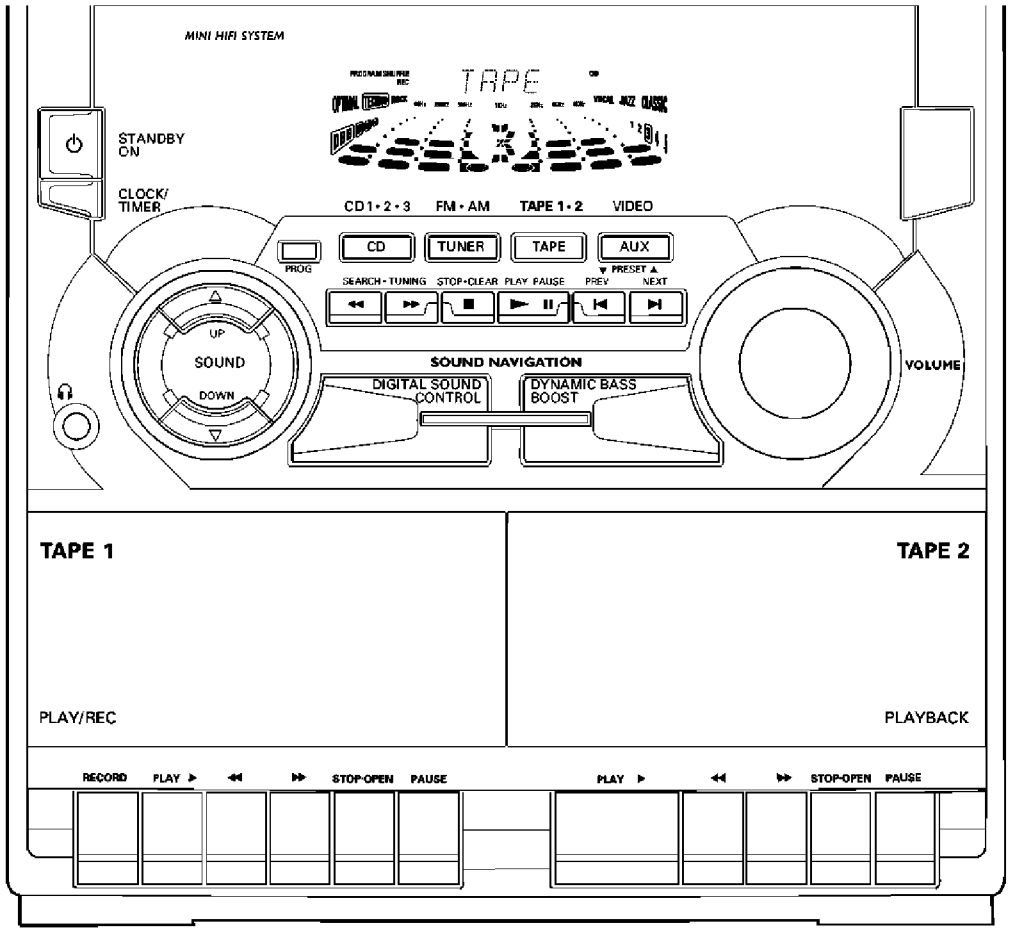
Selecting External Equipment

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

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

Notes:
– *You are advised not to listen to and record from the same source simultaneously.*
– *All the sound control features (e.g. DSC, DBB, etc.) are available for selection.*

RECORDING



Notes:

- *For recording, use only tape of IEC type I (normal tape).*
- *The tape is secured at both ends with leader tape. At the beginning and end of tape, nothing will be recorded for six to seven seconds.*
- *The recording level is set automatically, regardless of the position of Volume, DBB or DSC.*
- *To prevent accidental recording, break out the tab on the left shoulder of the tape side you want to protect.*

One Touch Recording

- For One Touch Recording, as soon as you press RECORD, the current source (CD, TUNER or AUX) will be recorded on tape deck 1.

1 Load a blank tape in tape deck 1.
2 Press **RECORD** on tape deck 1 to start recording.
→ The **REC** starts flashing.
3 Press **PAUSE** to interrupt recording.
4 Press **STOP•OPEN** on tape deck 1 to stop recording.

CD Synchro Start Recording

During CD synchro start recording,

- Do not fast forward/rewind your tape in tape deck 2.
- Do not listen to another source.

1 Load a blank tape into tape deck 1 and a disc into the disc tray.
2 Press **CD**.
- You can program the tracks in the order you want them to be recorded (see Programming Tracks). If you do not, the tracks are recorded according to the order on the selected disc.

3 Press **RECORD** on tape deck 1 to start recording.
→ The **REC** starts flashing.
4 Press **STOP•OPEN** on tape deck 1 to stop recording, then press ■ to stop CD playback.

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

1 Load the prerecorded tape into tape deck 2 and a blank tape into tape deck 1.
- Make sure both tapes have their full spool to the left.

2 Press **PAUSE** on tape deck 1.
3 Press **RECORD** on tape deck 1.
4 Press **PLAY ▶** on tape deck 2.
→ The **REC** starts flashing.

- Recording will start automatically.

5 Press **STOP•OPEN** on tape deck 1 and tape deck 2 to stop dubbing.

Notes:

– *At the end of side A, flip the tapes to side B and repeat the procedure.*
– *Dubbing of tapes is only possible from tape deck 2 to tape deck 1.*
– *To ensure good dubbing, use tapes of the same length.*

Recording from other sources *(only on tape deck 1)*

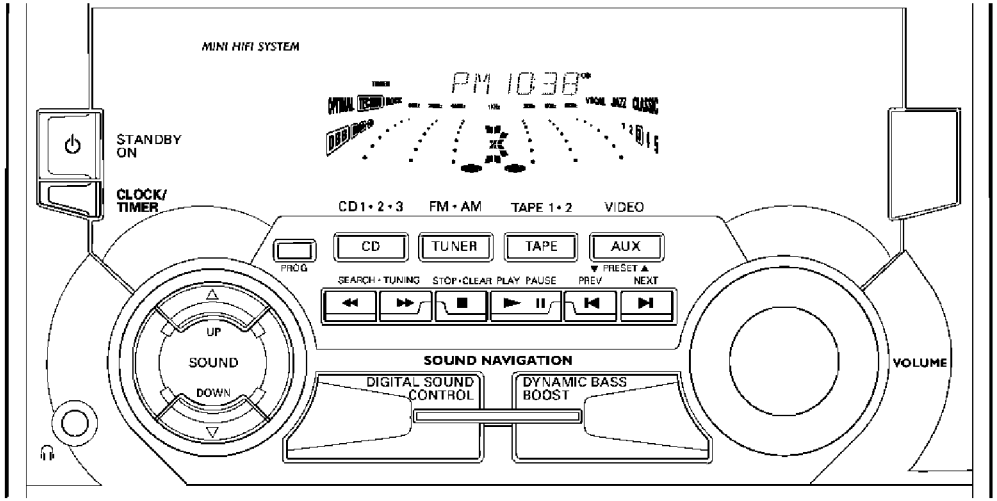
1 Load a blank tape into tape deck 1.
2 Press **CD**, **TUNER** or **AUX**.

- Start playback of the selected source.

3 Press **RECORD** on tape deck 1 to start recording.
→ The **REC** starts flashing.
4 Press **PAUSE** to interrupt recording.
5 Press **STOP•OPEN** on tape deck 1 to stop recording.

Note:

– *During recording, it is not possible to listen to another sound source.*



View Clock

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

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

Note:

– *When the system goes into low power standby mode, the clock setting will not be displayed (for model FW-C70 only).*

Clock Setting

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

1 Press **CLOCK/TIMER** to select clock mode.
2 Press **PROG** to select 12- and 24-hour mode.
→ If 12-hour mode is selected, "AM 12:00" starts flashing.
→ If 24-hour mode is selected, "00:00" starts flashing.
3 Set the hour with ◀◀ or ▶▶.
4 Set the minute with ⏮ or ⏭.
5 Press **CLOCK/TIMER** again to store the setting.
→ The clock starts.

- To exit without storing the setting, press ■.

Notes:

– *During clock setting, if no button is pressed within 90 seconds, the system will exit clock setting mode automatically.*

– *When a power interruption occurs, the clock setting is erased.*

Timer Setting

- The system can switch on to CD or TUNER mode automatically at a preset time. It can serve as an alarm to wake you up.
- Before setting the timer, make sure the clock is set correctly.
- The timer will always be switched on once it is set.
- **The volume of the timer will increase from the minimum level to the most recently selected volume level.**

1 Press and hold **CLOCK/TIMER** for more than ***two seconds*** to select timer mode.
→ "AM 12:00" or "00:00" or the last timer setting starts flashing depending on whether you have selected 12- or 24-hour mode..
→ The **TIMER** starts flashing.
→ The selected source is lit while other available sources are flashing.

2 Press **CD** or **TUNER** to select the desired source.
- Before selecting CD, make sure a CD is loaded in the CD carousel tray.

3 Press ◀◀ or ▶▶ to set the hour for the timer to start.

4 Press ⏮ or ⏭ to set the minute for the timer to start.

5 Press **CLOCK/TIMER** to store the start time.
→ The timer is now set.
→ The **TIMER** remains on the display.
- At the preset time, the timer will be activated.
→ The selected source will be played.

Notes:

– *During timer setting, if no button is pressed within 90 seconds, the system will exit timer setting mode automatically.*

– *If the source selected is TUNER, the last tuned frequency will be switched on.*

– *If the source selected is CD, playback will begin with the first track of the selected disc or program. If the CD trays are empty, TUNER will be selected instead.*

– *The timer will not activate if a recording is in progress.*

To switch off the TIMER

1 Press and hold **CLOCK/TIMER** for more than ***two seconds***.

2 Press ■ on the system to cancel the timer.
→ The timer is now switched off.
→ The display will show "OFF" and the **TIMER** disappears.

To start the TIMER again *(for the same preset time and source)*

1 Press and hold **CLOCK/TIMER** for more than ***two seconds***.

2 Press **CLOCK/TIMER** again to store the start time.
→ The timer is now on.
→ The **TIMER** appears on the display.

Sleep Timer *(only on remote control)*

This feature allows you to select a length of time after which the system will switch to the standby mode automatically.

1 Press **SLEEP TIMER** on the remote control repeatedly to select a period of time.
→ The selections are as follows (time in minutes):
60 → 45 → 30 → 15 → OFF → 60 ...
→ "SLEEP XX" or "OFF" will be displayed. "XX" is the time in minutes.

2 When you reach the desired length of time, stop pressing the **SLEEP TIMER** button.
→ After this amount of time passes, the system will switch to the standby mode.

To switch off the Sleep Timer
- Press **SLEEP TIMER** repeatedly until "OFF" is displayed, or press the **STANDBY ON** button.

SPECIFICATIONS

Specifications

AMPLIFIER

Output power
- FW-C70 ..... 2 x 70 W FTC(1)
  - Surround Channel ..... 2 x 7 W FTC, 6 Ω
- FW-C50 ..... 2 x 50 W FTC(1)
  - Surround Channel ..... 2 x 7 W FTC, 6 Ω

Signal-to-noise ratio ..... ≥ 75 dBA (IEC)
Frequency response ..... 40 – 20000 Hz, ± 3 dB
Input sensitivity
- AUX In ..... 500 mV

Output
- Speakers ..... ≥ 6 Ω
- Surround Speakers ..... ≥ 6 Ω
- Headphones ..... 32 Ω – 1000 Ω
- Subwoofer Out ..... 1.5 V ±2dB, > 22000 Ω

(1) (6 Ω, 60 Hz – 12.5 kHz, 10% THD)

CD PLAYER

Number of programmable tracks 40
Frequency response ..... 40 – 20000 Hz
Signal-to-noise ratio ..... ≥ 76 dBA
Channel separation ..... ≥ 79 dB (1 kHz)
Total harmonic distortion ..... < 0.02% (1 kHz)

TUNER

FM wave range ..... 87.5 – 108 MHz
AM wave range ..... 530 – 1700 kHz
Number of presets 40
Antenna
- FM ..... 300 Ω dipole wire
- AM ..... Loop antenna

TAPE DECK

Frequency response
- Normal tape (type I) ..... 80 – 12500 Hz (8 dB)

Signal-to-noise ratio
- Normal tape (type I) ..... ≥ 47 dBA

Wow and flutter ..... ≤ 0.4% DIN

SPEAKERS *(FW-C70)*

System ..... 3-way; double port bass reflex
Impedance ..... 6 Ω
Woofer ..... 1 x 6.5"
Tweeter ..... 1 x 2.5"
Polydome Tweeter ..... 2 x 1"
Dimensions (w x h x d) ..... 9.45x 12.20 x 7.84 (inch)
..... 240 x 310 x 199 (mm)
Weight ..... 6.6 pounds each
..... 3 kg each

SPEAKERS *(FW-C50)*

System ..... 2-way; double port bass reflex
Impedance ..... 6 Ω
Woofer ..... 1 x 5.25"
Tweeter ..... 1 x 2.5"
Dimensions (w x h x d) ..... 9.45x 12.20 x 7.84 (inch)
..... 240 x 310 x 199 (mm)
Weight ..... 6.6 pounds each
..... 3 kg each

SS115 SURROUND SPEAKERS *(FW-C70)*

System ..... closed satellite
Impedance ..... 6 Ω
Speaker Driver ..... 1 x 3" full range
Dimensions (w x h x d) ..... 8.82 x 3.86 x 8.82 (inch)
..... 224 x 98 x 224 (mm)
Weight ..... 1.87 pounds each
..... 0.85 kg each

SS107 SURROUND SPEAKERS *(FW-C50)*

System ..... closed satellite
Impedance ..... 6 Ω
Speaker Driver ..... 1 x 3" full range
Dimensions (w x h x d) ..... 8.82 x 3.86 x 8.82 (inch)
..... 224 x 98 x 224 (mm)
Weight ..... 1.87 pounds each
..... 0.85 kg each

GENERAL INFORMATION

Material/finish ..... Polystyrene/Metal
AC Power ..... 120 V / 60 Hz
Power Consumption
- Active
  - FW-C70 ..... 140 W
  - FW-C50 ..... 75 W
- Standby
  - FW-C70 ..... < 20 W
  - FW-C50 ..... < 15 W
- Standby (energy saving mode)
  - FW-C70 ..... < 2 W

Dimensions (w x h x d) .. 10.43 x 12.20 x 14.29 (inch)
..... 265 x 310 x 363 (mm)
Weight (without speakers) ..... 15.84 pounds
..... 7.2 kg

Subject to modification

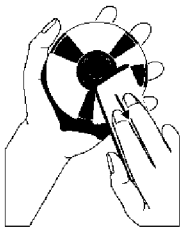
MAINTENANCE

Maintenance

Cleaning the Cabinet

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

Cleaning Discs



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

Cleaning the CD lens

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

Cleaning the Heads and the Tape Paths

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

Demagnetizing the heads

- Use a demagnetizing tape available at your dealer.

TROUBLESHOOTING

Warning! Under no circumstances should you try to repair the set yourself as this will invalidate the guarantee. Do not open the set as there is a risk of electric shock.

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

CD Player Operation

"NO DISC" is displayed.

- The disc is inserted upside down.
→ *Place CD with printed side up.*
- Moisture condensation at the lens.
→ *Wait until lens has adjusted to normal room temperature.*
- There is no disc in the CD tray.
→ *Insert a CD.*
- The CD is dirty, badly scratched or warped.
→ *Clean or replace the CD.*
- The CD lens is dirty or dusty.
→ *See section under Maintenance (page 24).*

"DISC NOT FINALIZED" is displayed.

- The CD-RW or CD-R disc is not properly recorded for use with a standard CD player.
→ *Read the instruction booklet of your CD-Rewritable or CD-Recorder on how to finalize a recording.*
- The CD is badly scratched or dirty.
→ *Replace or clean CD.*

Radio Reception

Poor radio reception.

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

TROUBLESHOOTING

Tape Deck Operation

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

- Dirty tape heads, capstans or pressure rollers.

→ *See section on tape deck maintenance (page 24).*

- Magnetic build-up in the record/ playback head.

→ *Use demagnetizing tape.*

General

System does not react when any button is pressed.

- Electrostatic discharge.

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

No or poor sound.

- Volume is not turned up.

→ *Adjust VOLUME.*

- The headphones are connected.

→ *Disconnect the headphones.*

- Speakers are not connected or are connected wrongly.

→ *Check that the speakers are connected correctly.*

→ *Make sure the stripped speaker wire is clamped.*

Reversed left and right sound.

- Speakers are connected wrongly.

→ *Check the speaker connections and location.*

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

- Speakers are connected wrongly.

→ *Check the speaker connection for proper phasing, colored/black wires to colored/black terminals.*

Remote control has no effect on the system.

- Wrong source is selected.

→ *Select the source (CD, TUNER, etc.) before pressing the function button, (▶, ⏮, ⏭, etc.).*

- The distance to the system is too large.

→ *Reduce the distance.*

- Batteries are inserted incorrectly.

→ *Insert the batteries with their polarities (+/– signs) as indicated.*

- Batteries are exhausted.

→ *Replace the batteries.*

Timer is not working.

- Clock is not set.

→ *Set the clock.*

- Timer is not switched on.

→ *Press CLOCK/TIMER to switch on the timer.*

- Recording is in progress.

→ *Stop recording.*

Clock setting is erased.

- There was a power failure.

→ *Reset the clock.*

System displays features automatically; buttons flash continuously.

- Demonstration mode is switched on.

→ *Press and hold ■ (on the system) for five seconds to switch off the demonstration.*

All lighted buttons are not lit.

- Equalizer Display is in NITE mode.

→ *Press SOUND ▲ or ▼ to select other Equalizer Display.*

DISASSEMBLY INSTRUCTIONS

Dismantling of the Cassette Cover

Display Cassette Cover Removal
Display Cassette Cover

Dismantling of the CDC Module and Front Panel

Display Main Unit Exploded View to observe pos item numbers.

1) Loosen 18 screws to remove the Cabinet Rear (pos 259) of the set :-
   - 5 screws each on the left side & right side of the Cabinet Rear.
   - 8 screws at the rear of the Cabinet Rear.
2) Slide out the CDC Tray as shown in the following graphic below with the help of a flat head screw driver.
   Display CDC Tray Sliding Out
3) Remove the Cover Tray CDC (pos 107) as indicated.
   Display Cover Tray Removal
4) Loosen 2 screws A and 2 screws B to remove the CDC Module (pos 1104) as indicated.
   Display A screw removals within Front View CDC
   Display B screw removals shown within CDC Module View
5) Remove 1 screw (pos 305) at the bottom to separate the Front Panel Assembly from the Plate Bottom (pos 231).

Dismantling the Front Board

Display Main Unit Exploded View to observe pos item numbers.

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

Dismantling of the MTF Module

Display Main Unit Exploded View to observe pos item numbers.

1) Remove 6 screws G as indicated to loosen the MTF Module(pos 1105).
   Display G screw removal within this view.

Dismantling of Rear Portion

Display Main Unit Exploded View to observe pos item numbers.

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

Repair Hint - Volume Knob Removal

Display Main Unit Exploded View to observe pos item numbers.

- The Volume Rotary Knob (pos 140) can be removed by inserting a strong string into the slot and pulling it out in the direction indicated below.

  Display Volume Kob Removal

Repair Hint - Power Module Re-Assembly

- During re-assembly of the Power Module, place the Bracket Mains Socket (pos 232) behind the Mains Socket and catch it onto the Rucksack (pos 1103-201) of the Power Module.

  Display Positioning of Mains Socket

  Display Location of Mains Socket

Repair Hint - Temporary Board Removals

- During repair it is possible to disconnect the Tuner Board and CDC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

Service Positions

Display Service Position "A"

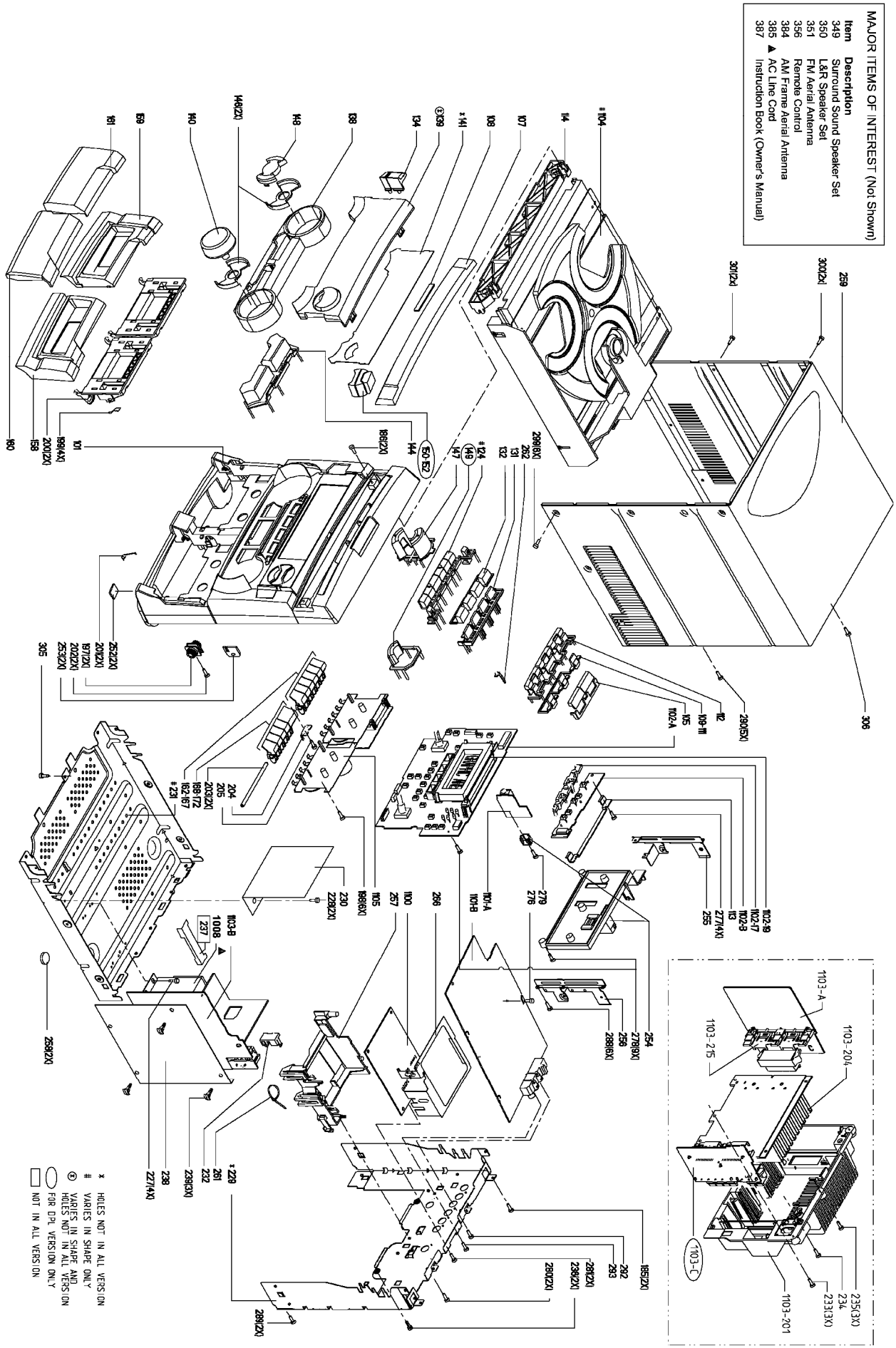
Display Service Position "B"

Note: Use an insulation sheet to prevent the AF Board from being damaged or short-circuited to any metal parts.

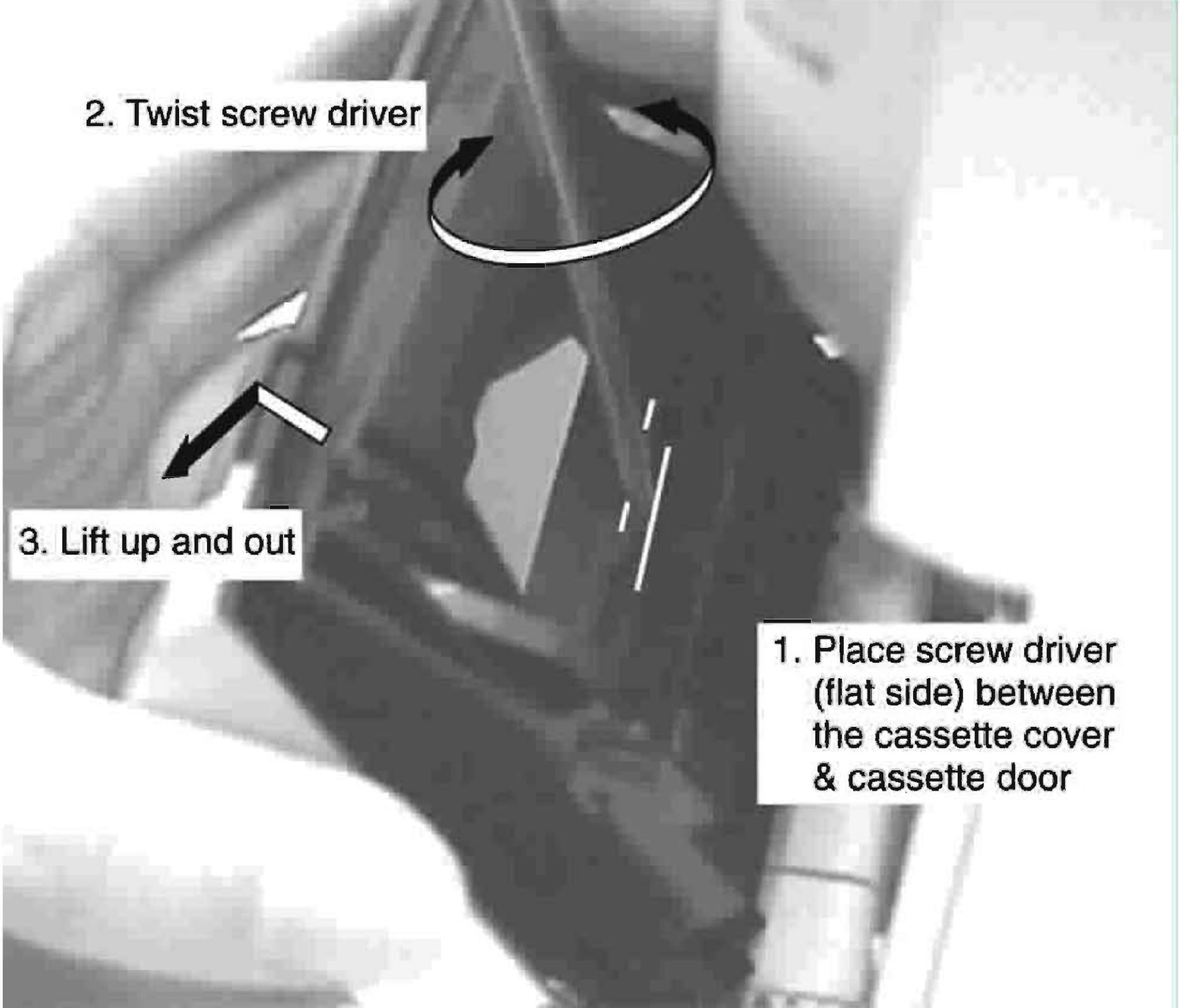
Display Service Position "C"

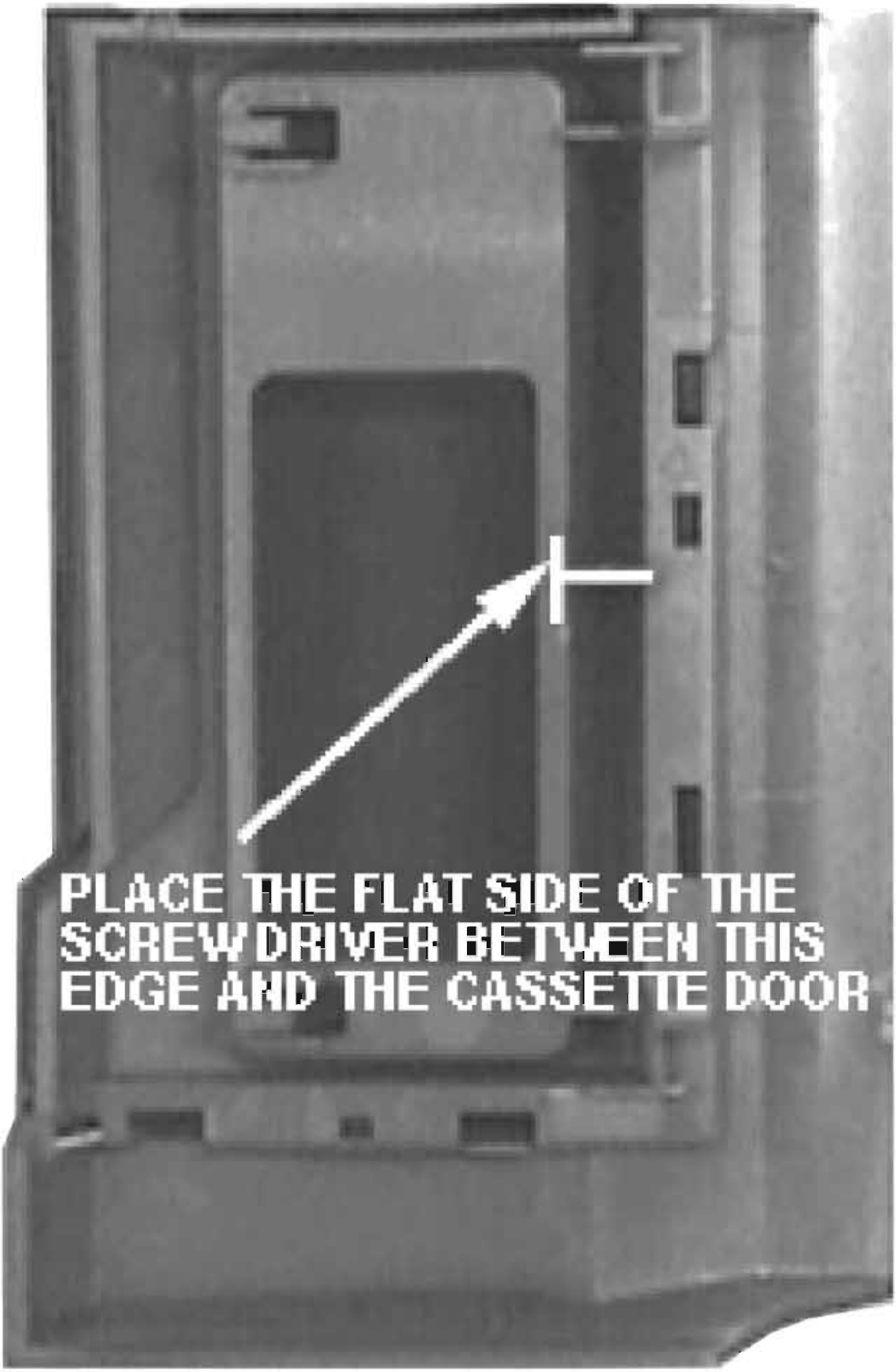
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occure.

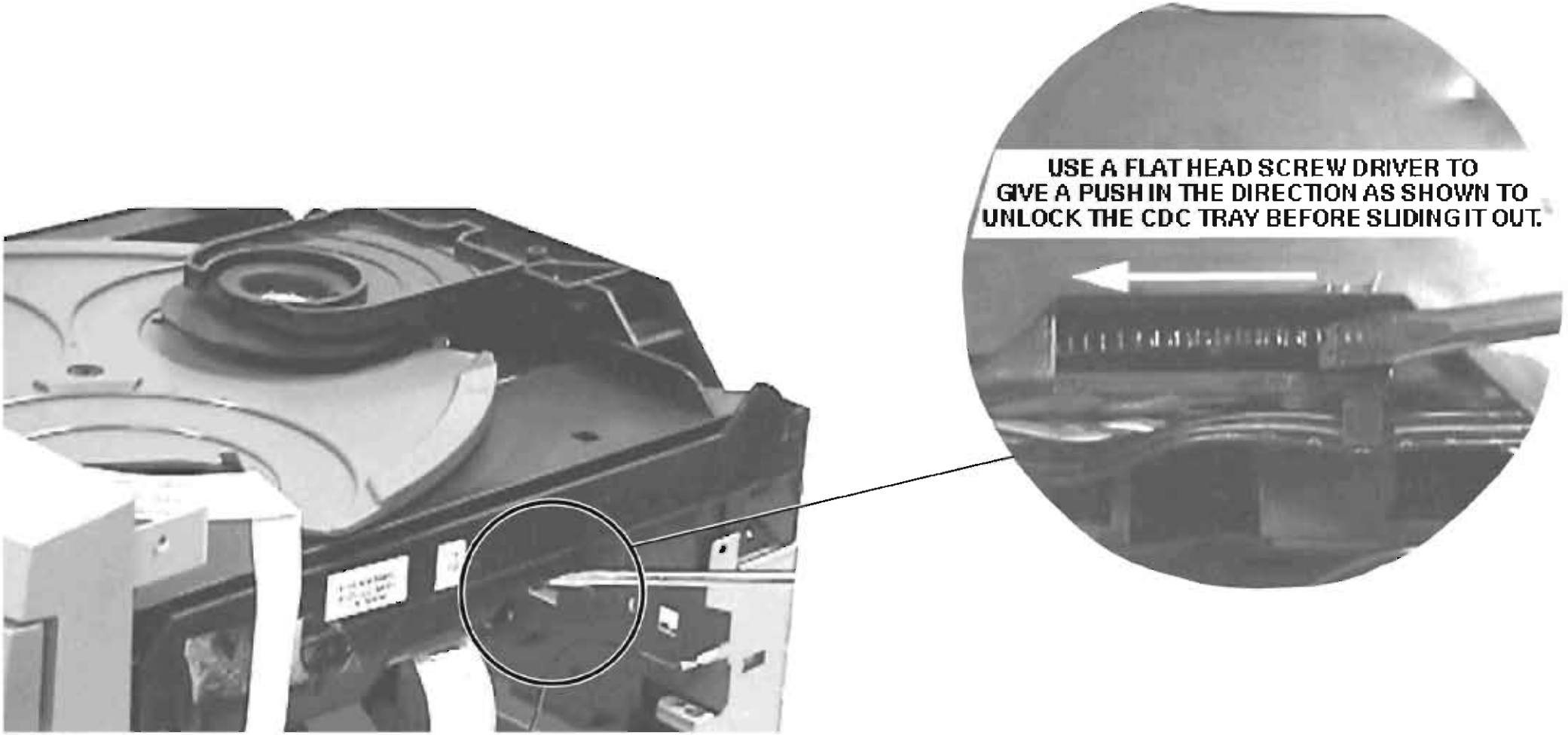
Display Main Unit Exploded View to observe pos item numbers.

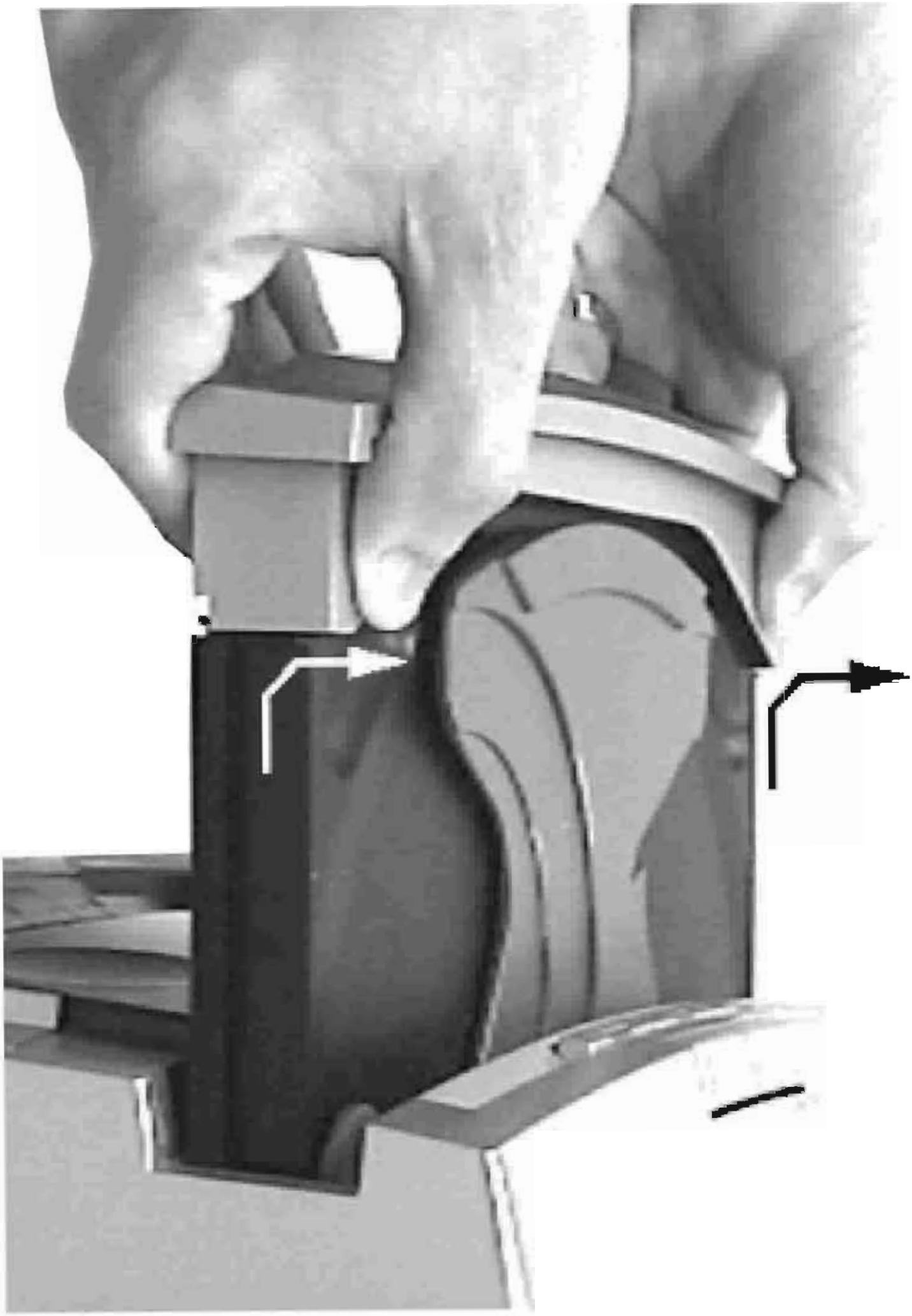


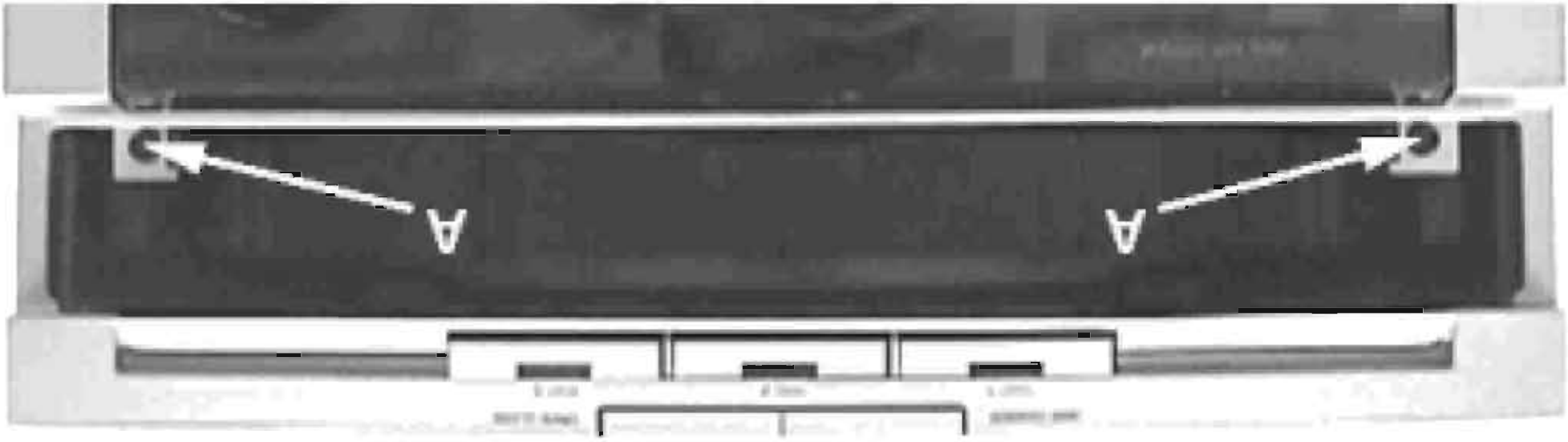
FW-C50/37


2. Twist screw driver
3. Lift up and out
1. Place screw driver (flat side) between the cassette cover & cassette door


PLACE THE FLAT SIDE OF THE
SCREWDRIVER BETWEEN THIS
EDGE AND THE CASSETTE DOOR

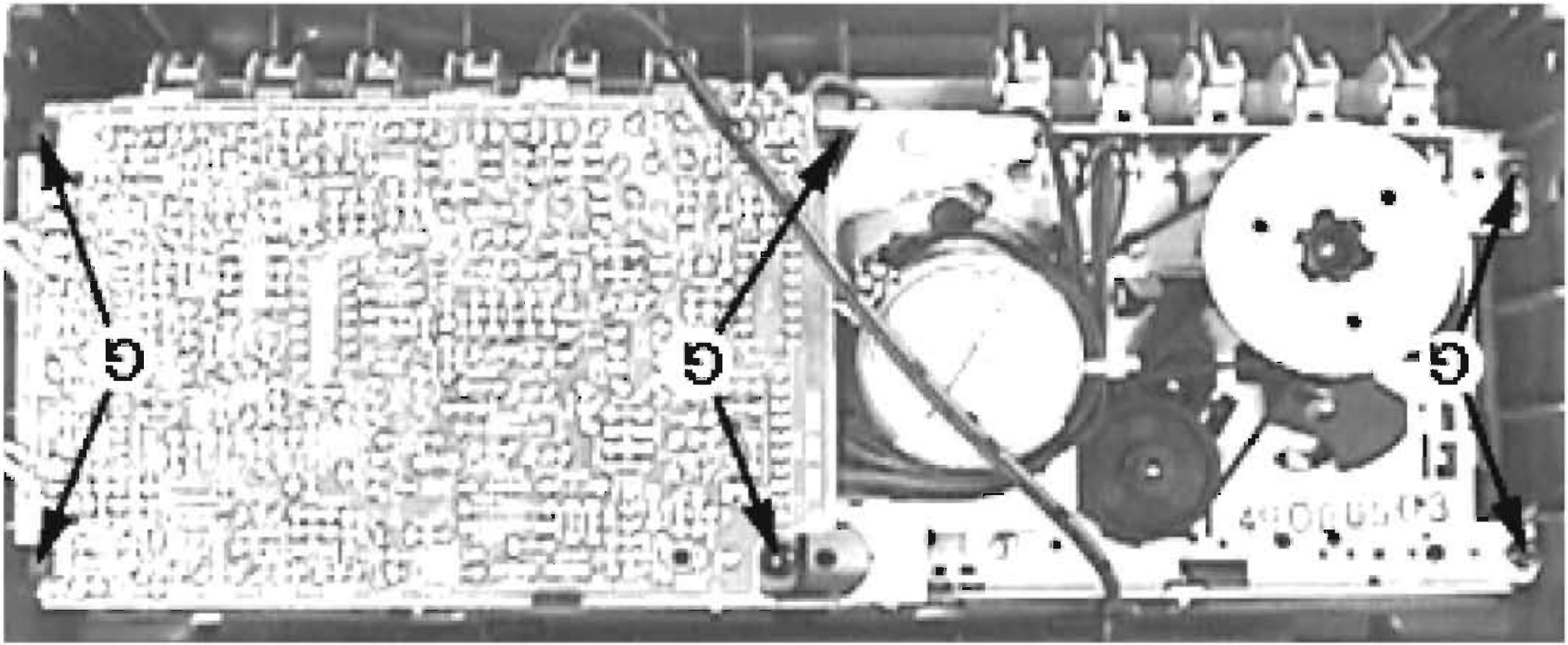

USE A FLAT HEAD SCREW DRIVER TO
GIVE A PUSH IN THE DIRECTION AS SHOWN TO
UNLOCK THE CDC TRAY BEFORE SLIDING IT OUT.

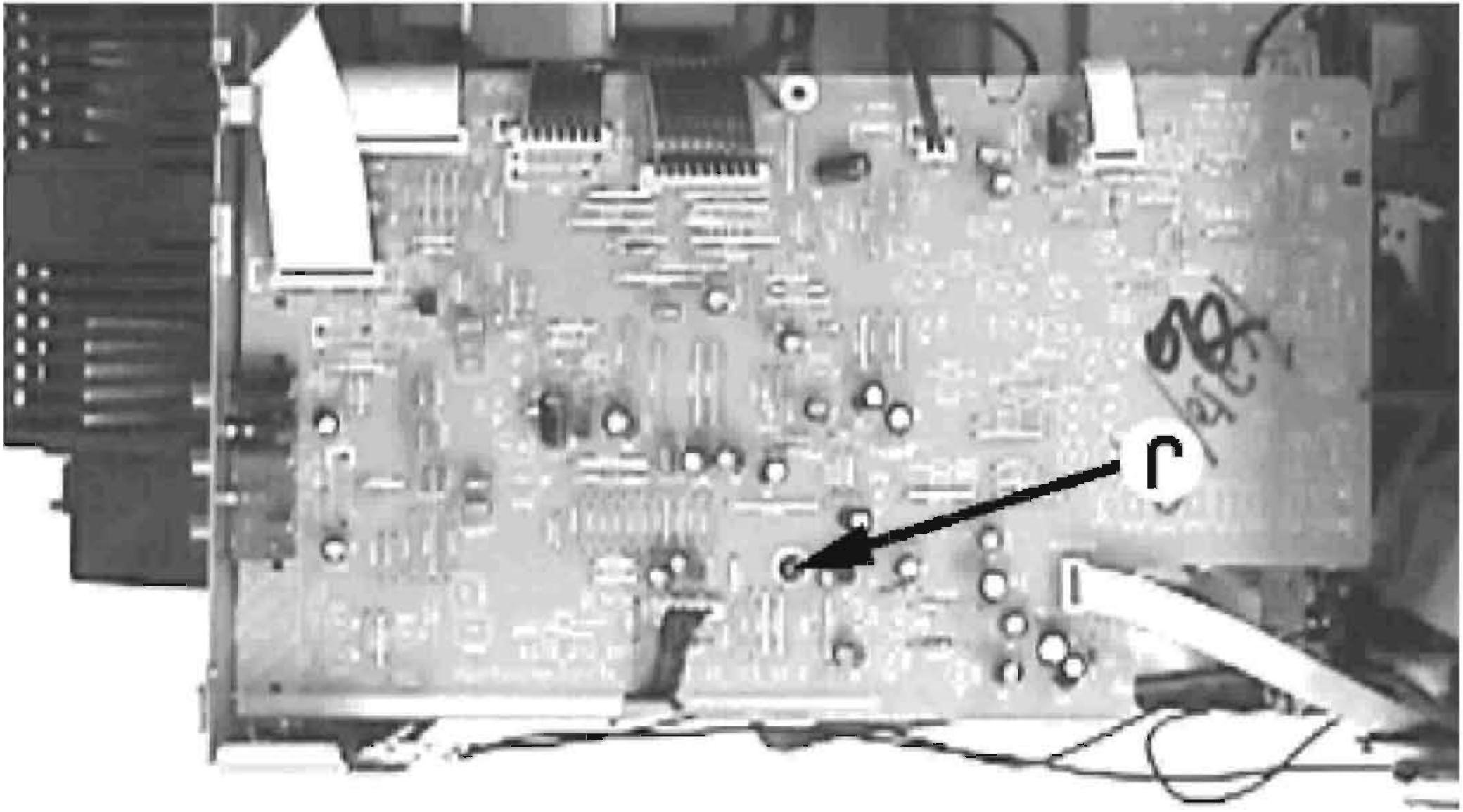


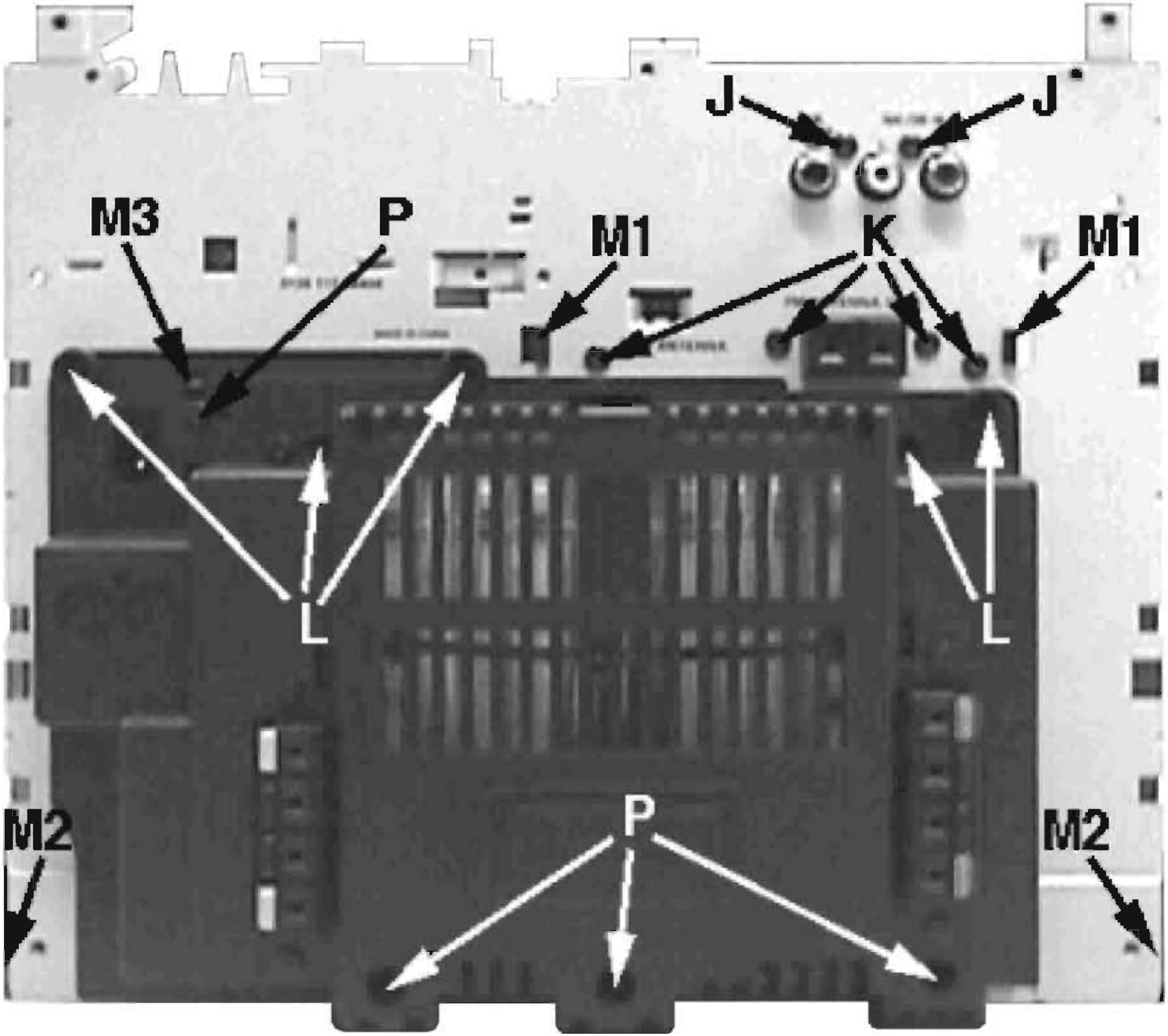

A
A

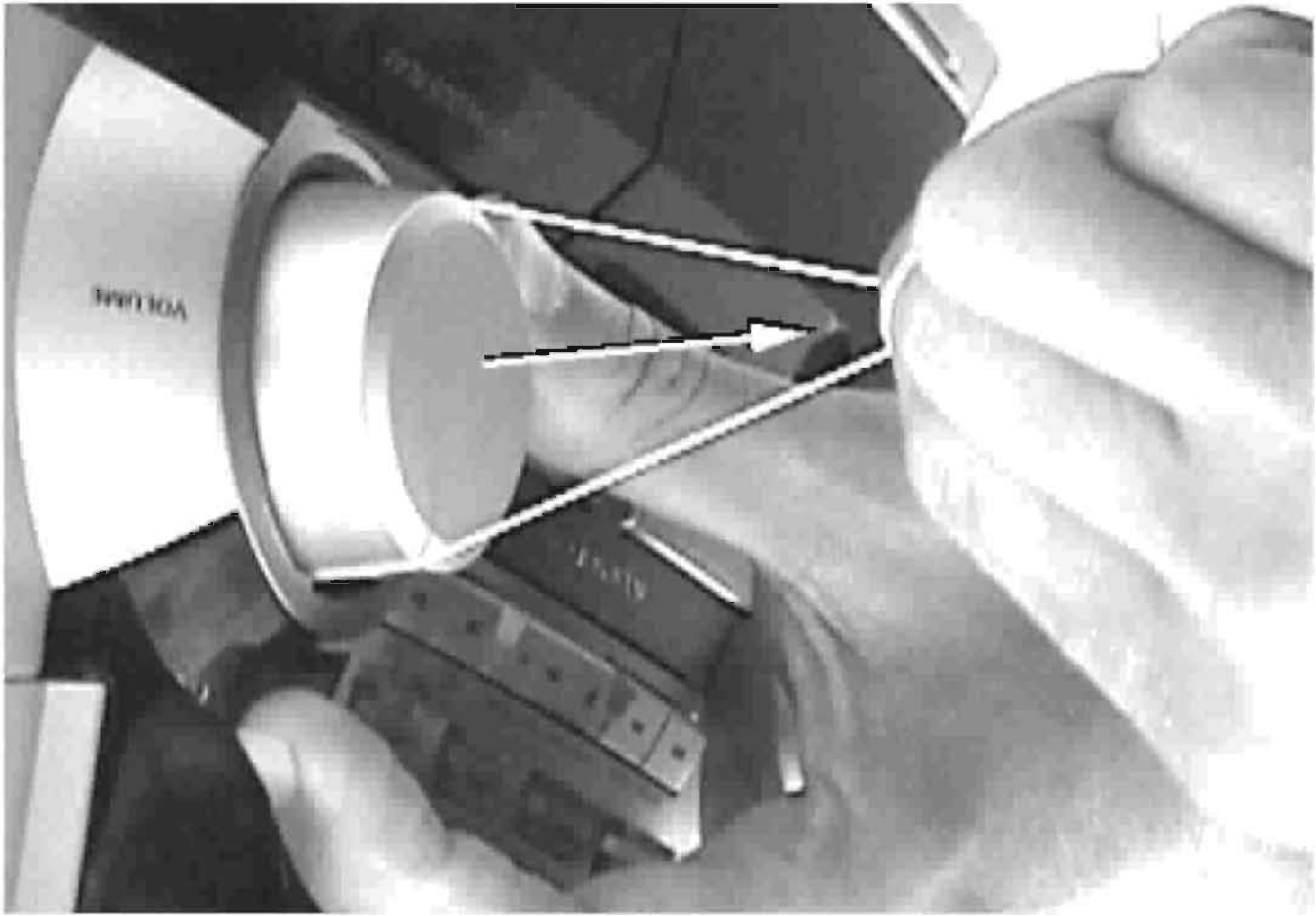
B
B

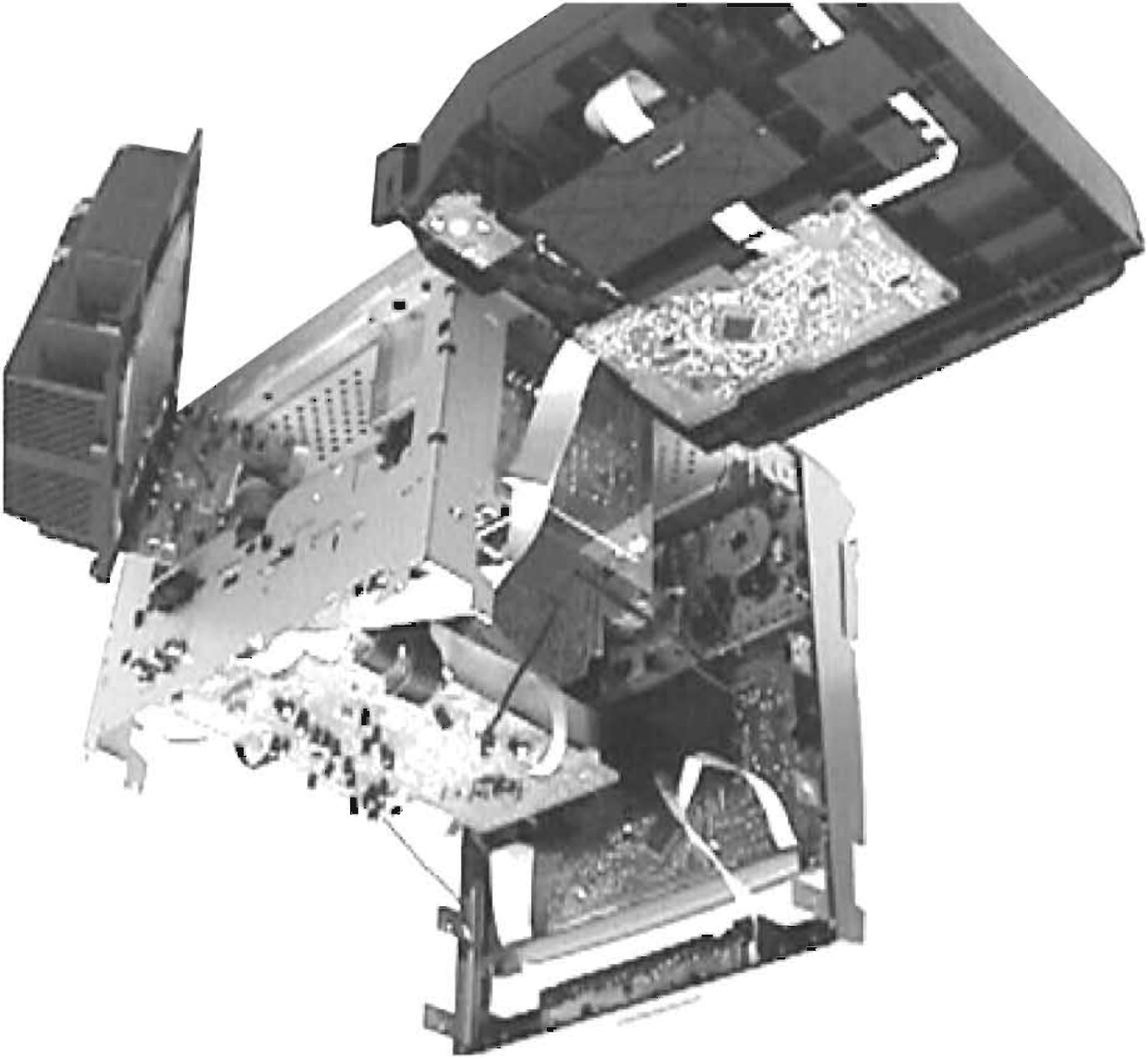
F
E
C
F

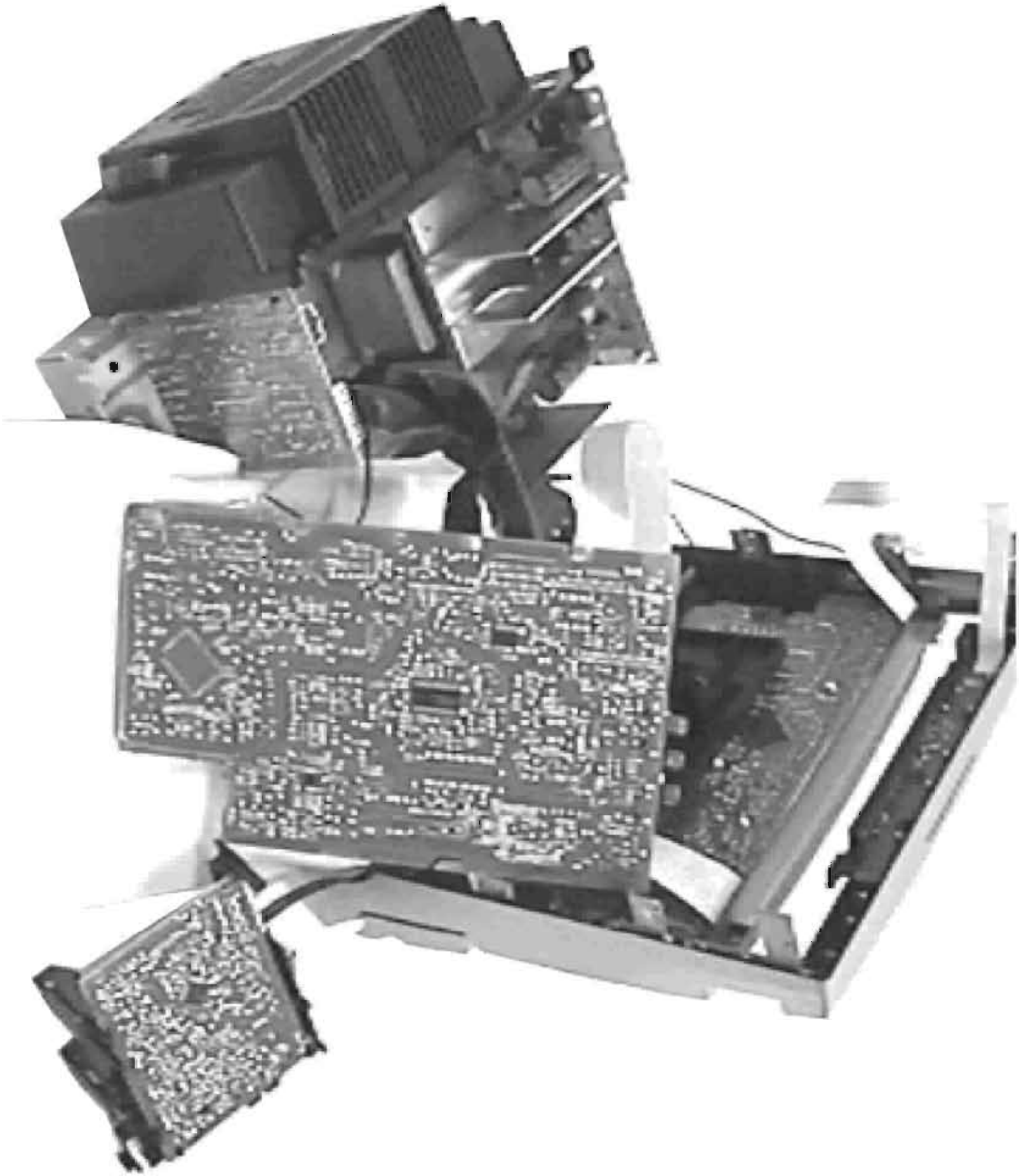

5
5
5

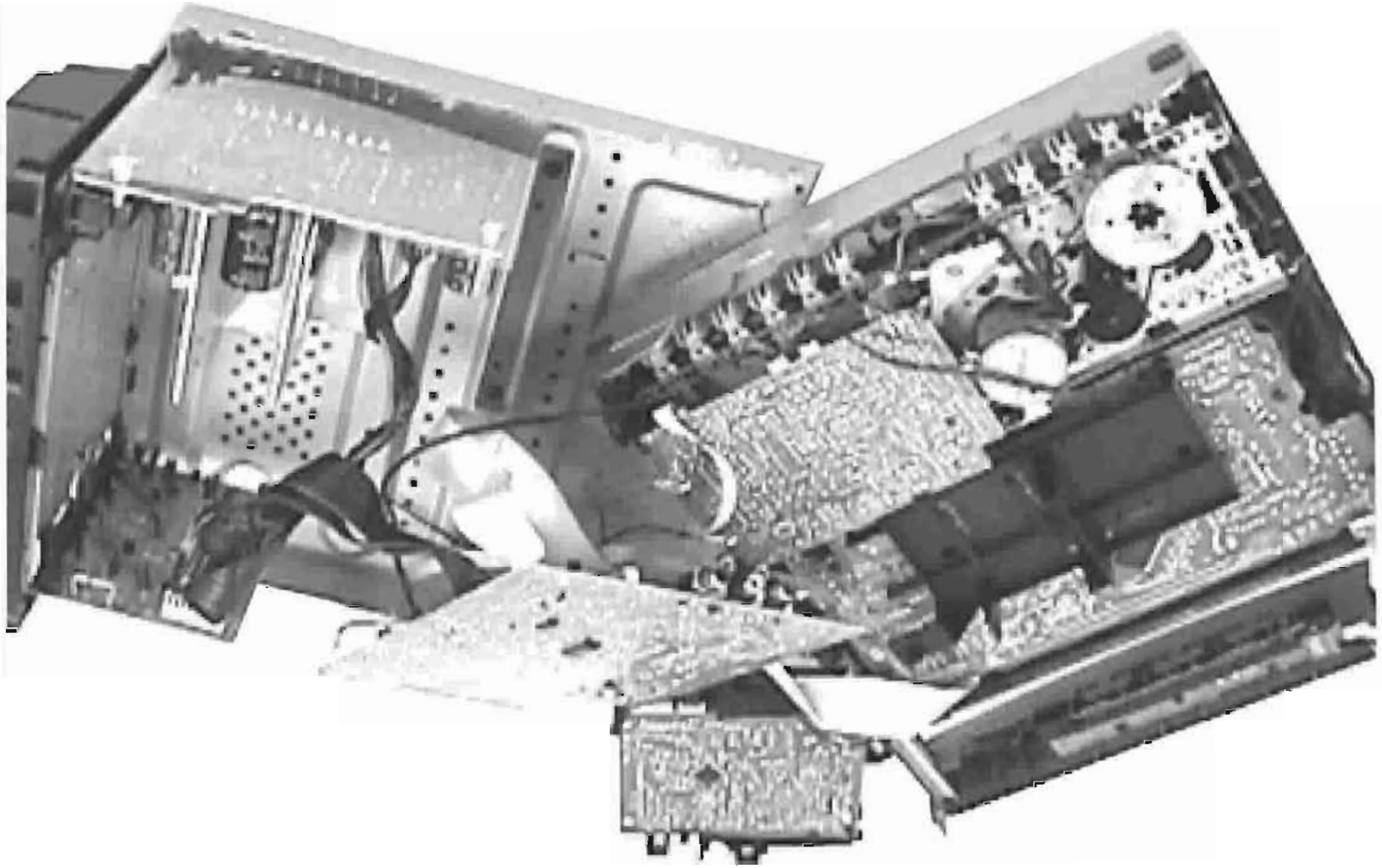

J

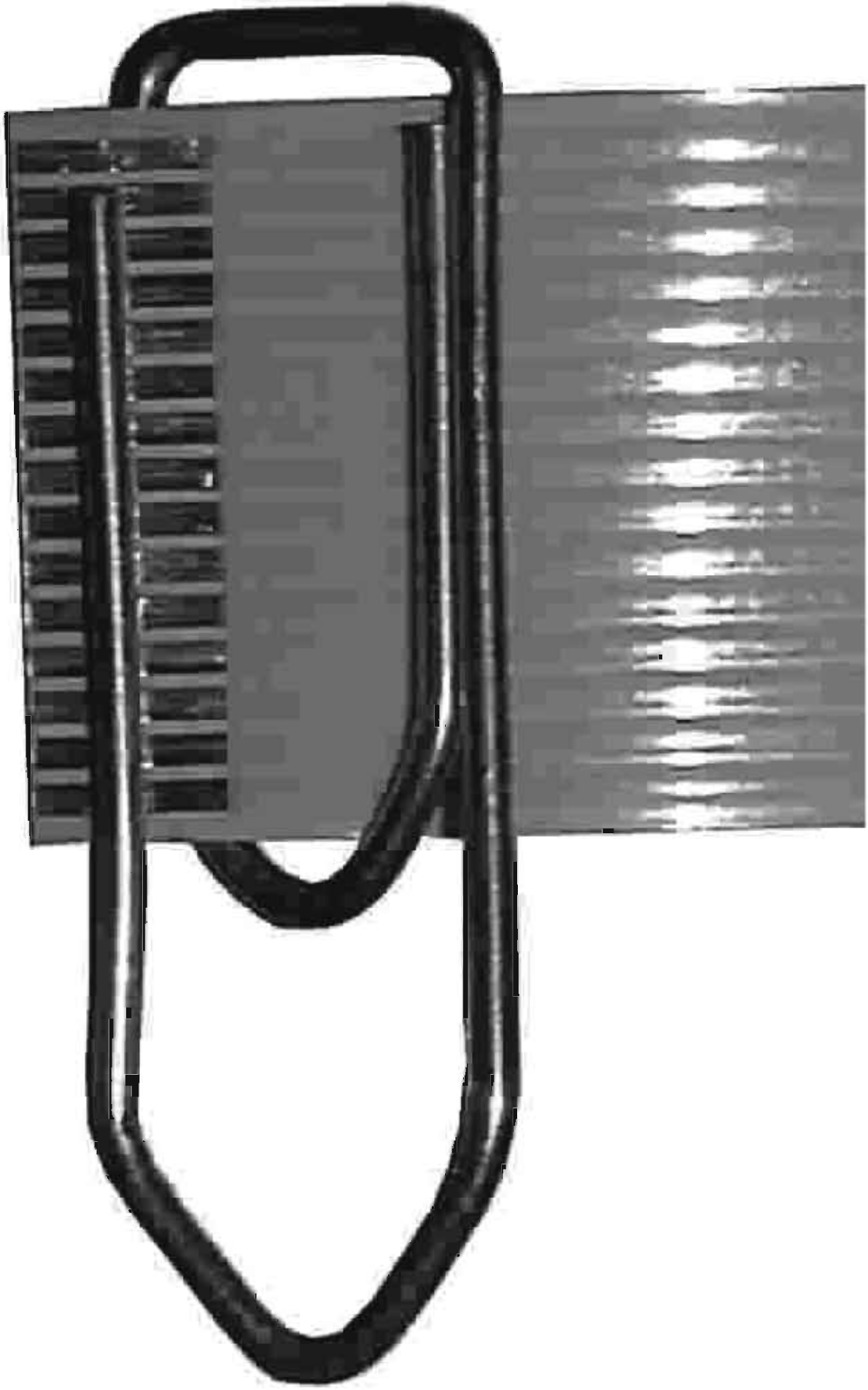

J
J
M3
P
M1
K
M1
L
L
M2
P
M2

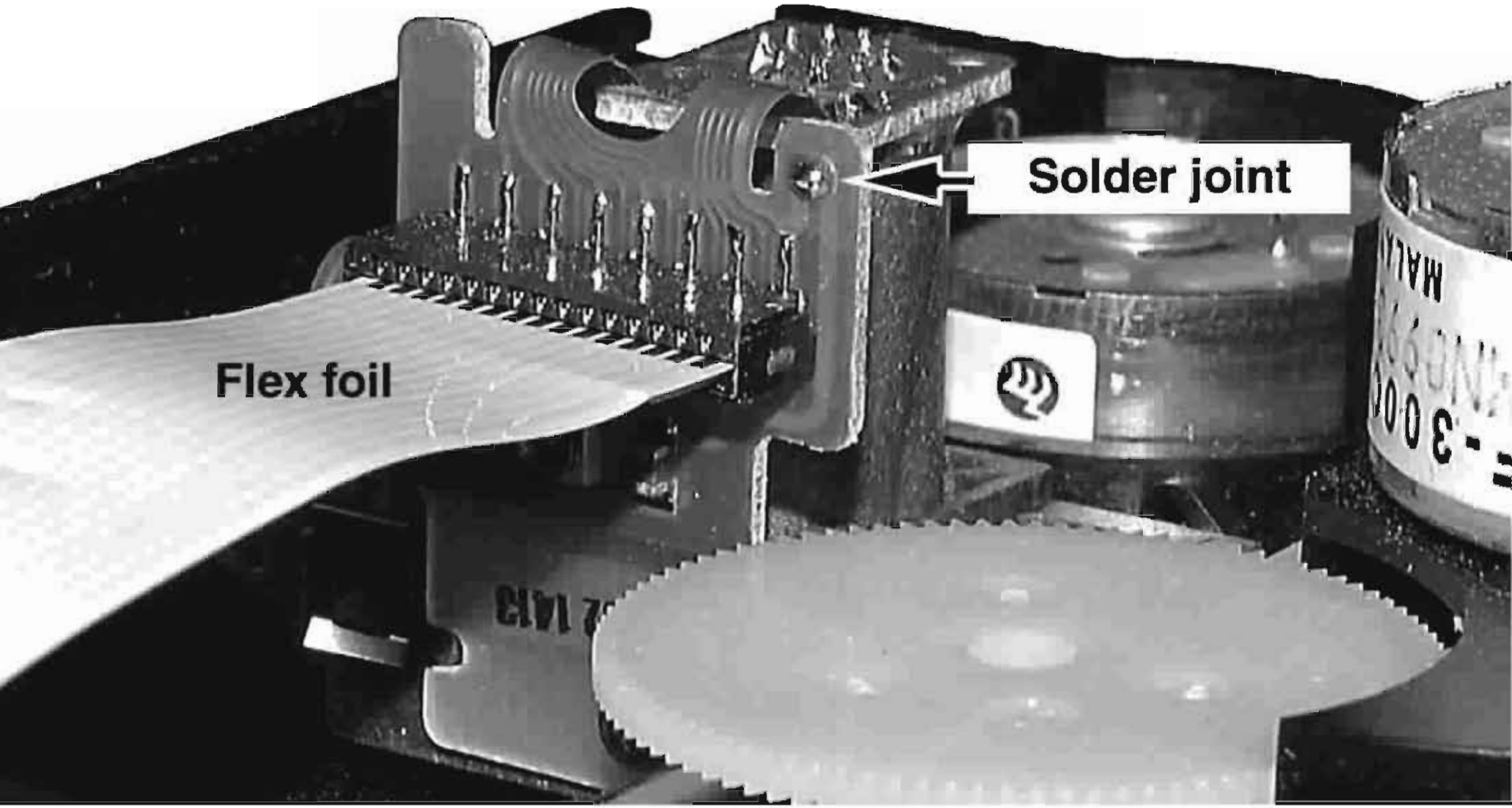


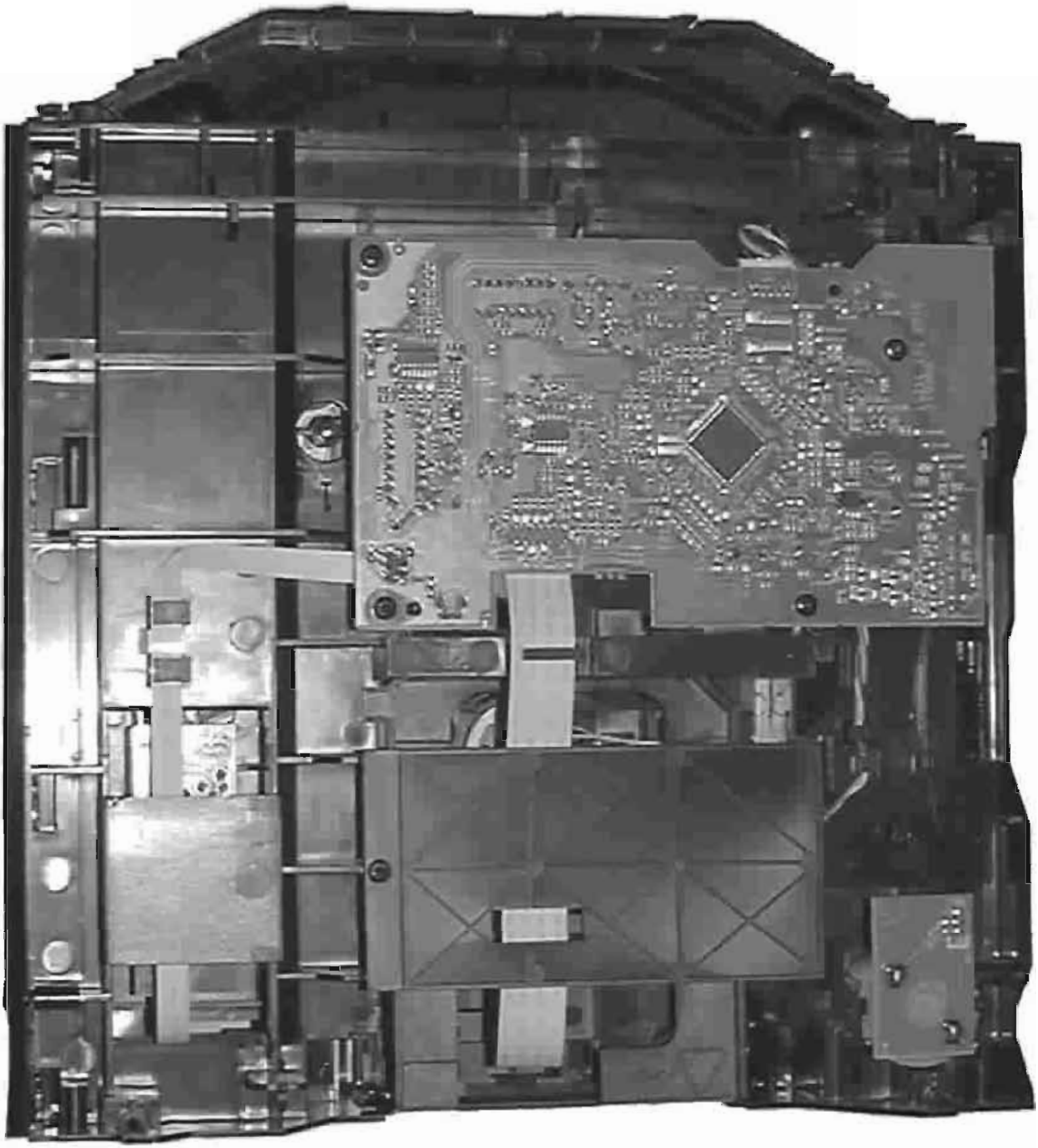


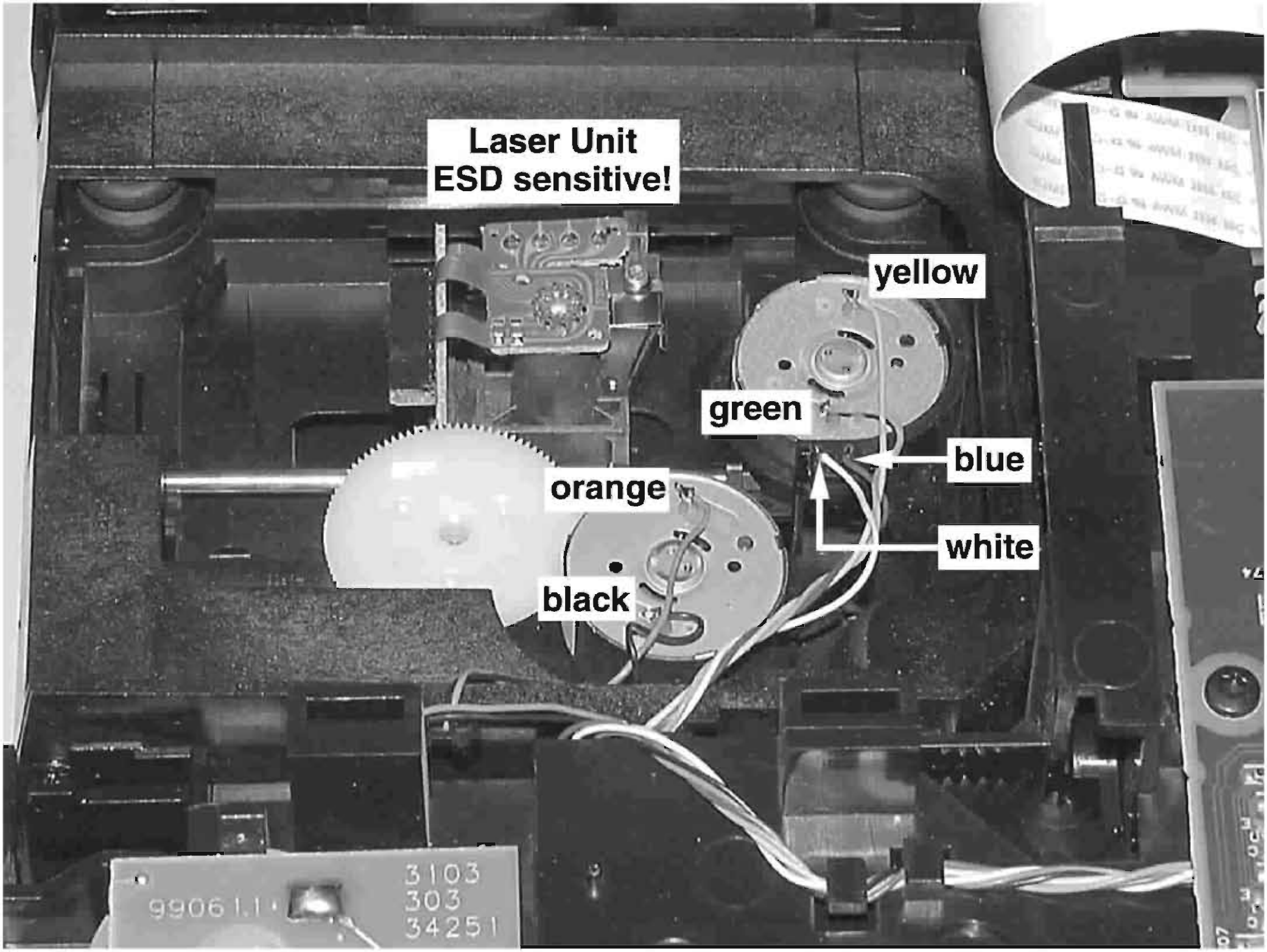


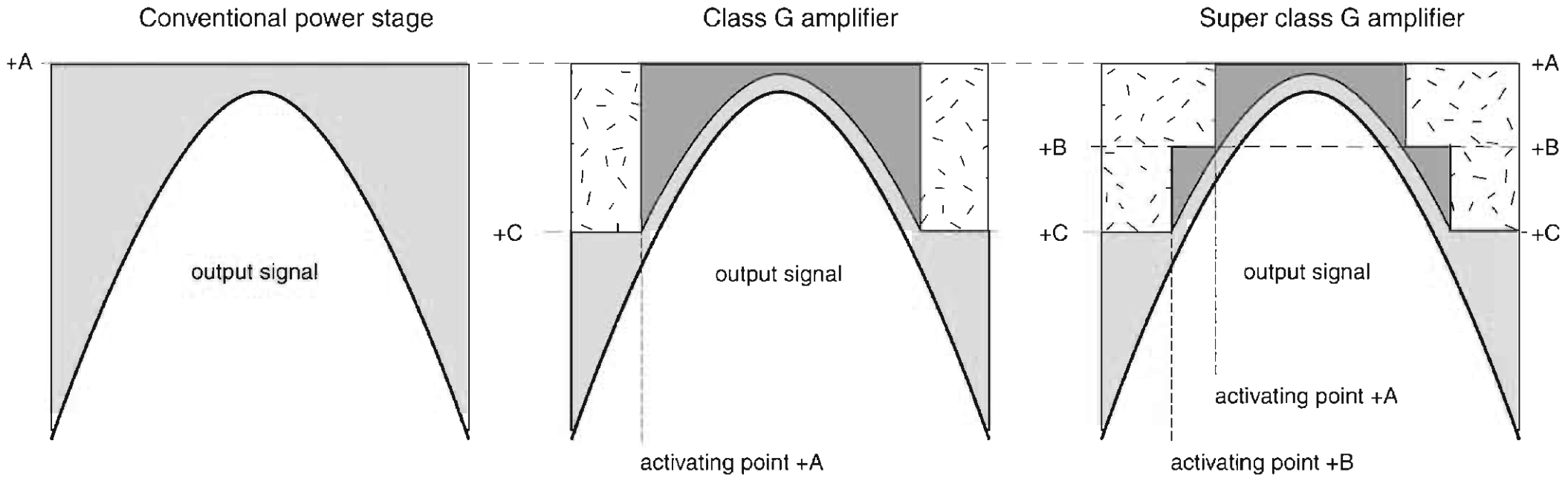


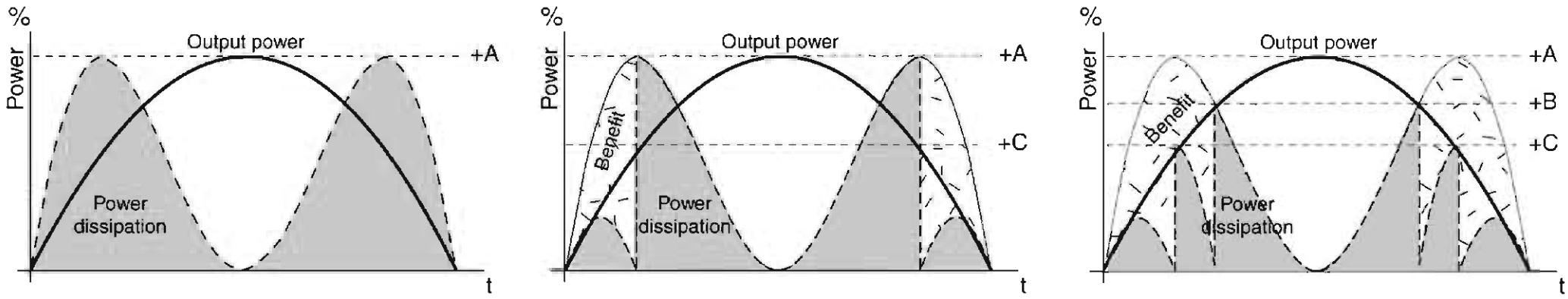



Solder joint
Flex foil

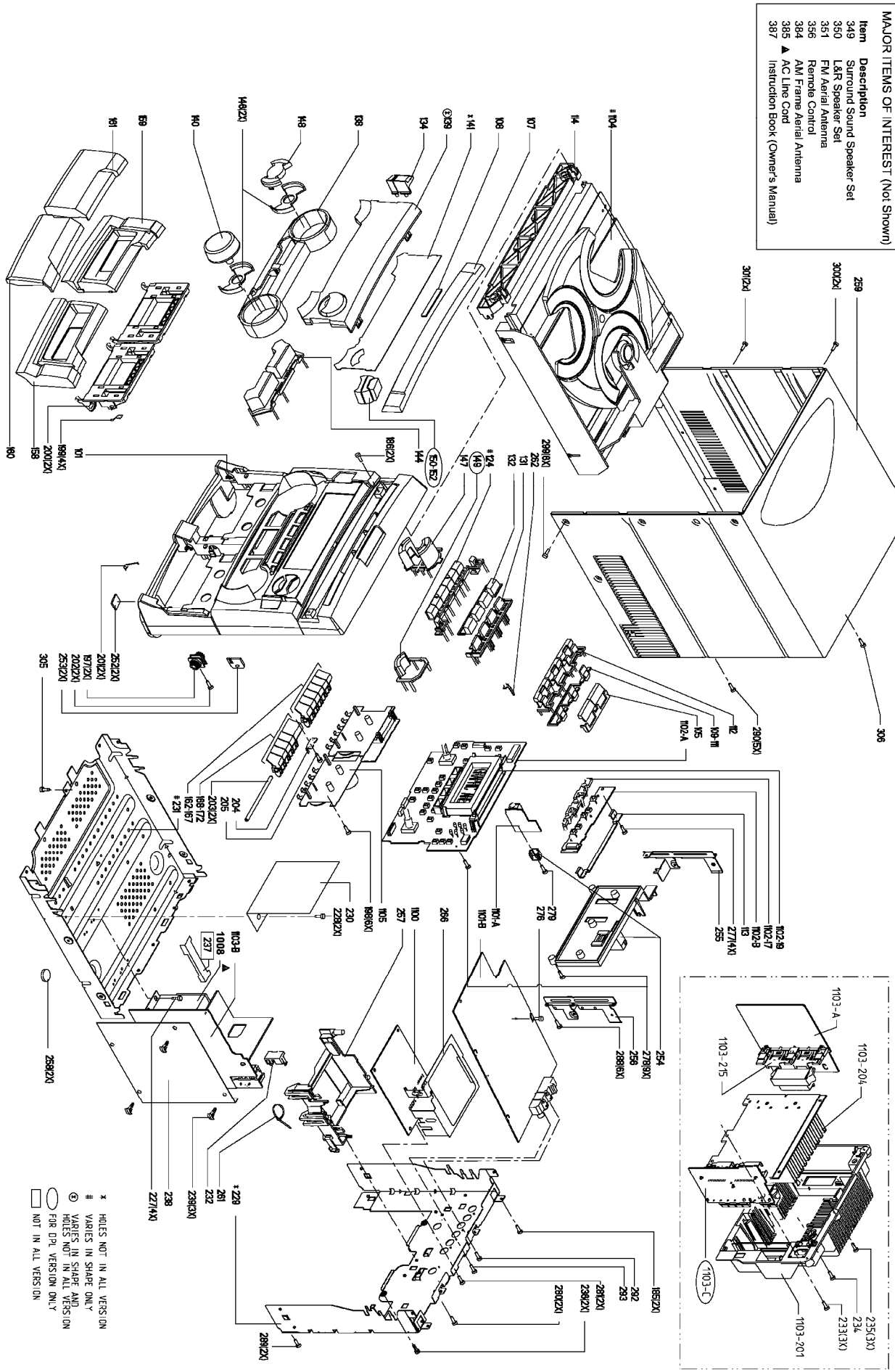



Laser Unit
ESD sensitive!
yellow
green
blue
orange
white
black
3103
303
34251

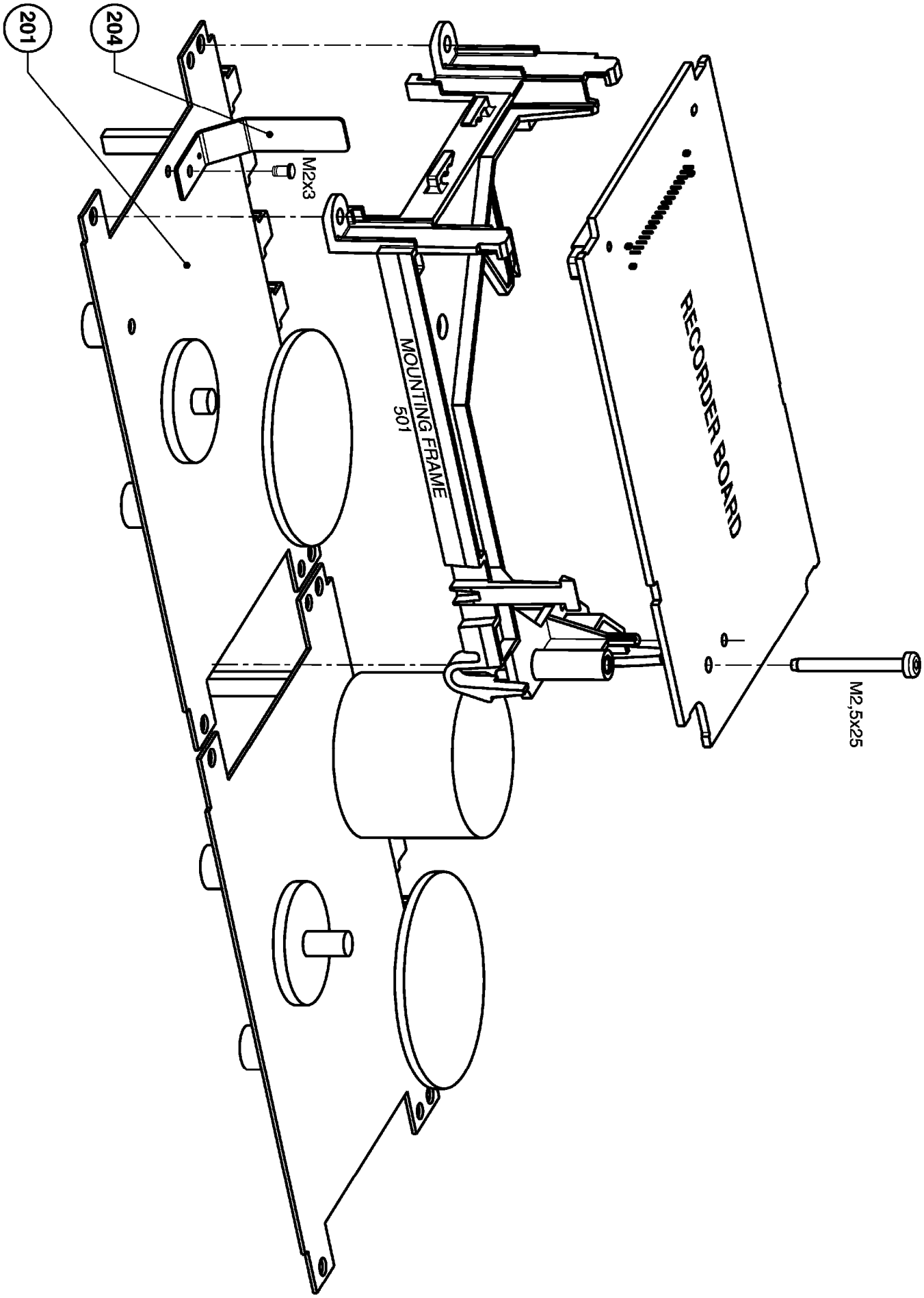

Conventional power stage
Class G amplifier
Super class G amplifier
+A
+B
+C
output signal
activating point +A
activating point +B
Voltage drop on power stage IC
Voltage drop on switching transistor(s)
Benefit - voltage drop on switching transistor(s) reduces total power dissipation


%
Power
Output power
+A
+B
+C
Power dissipation
Benefit
t

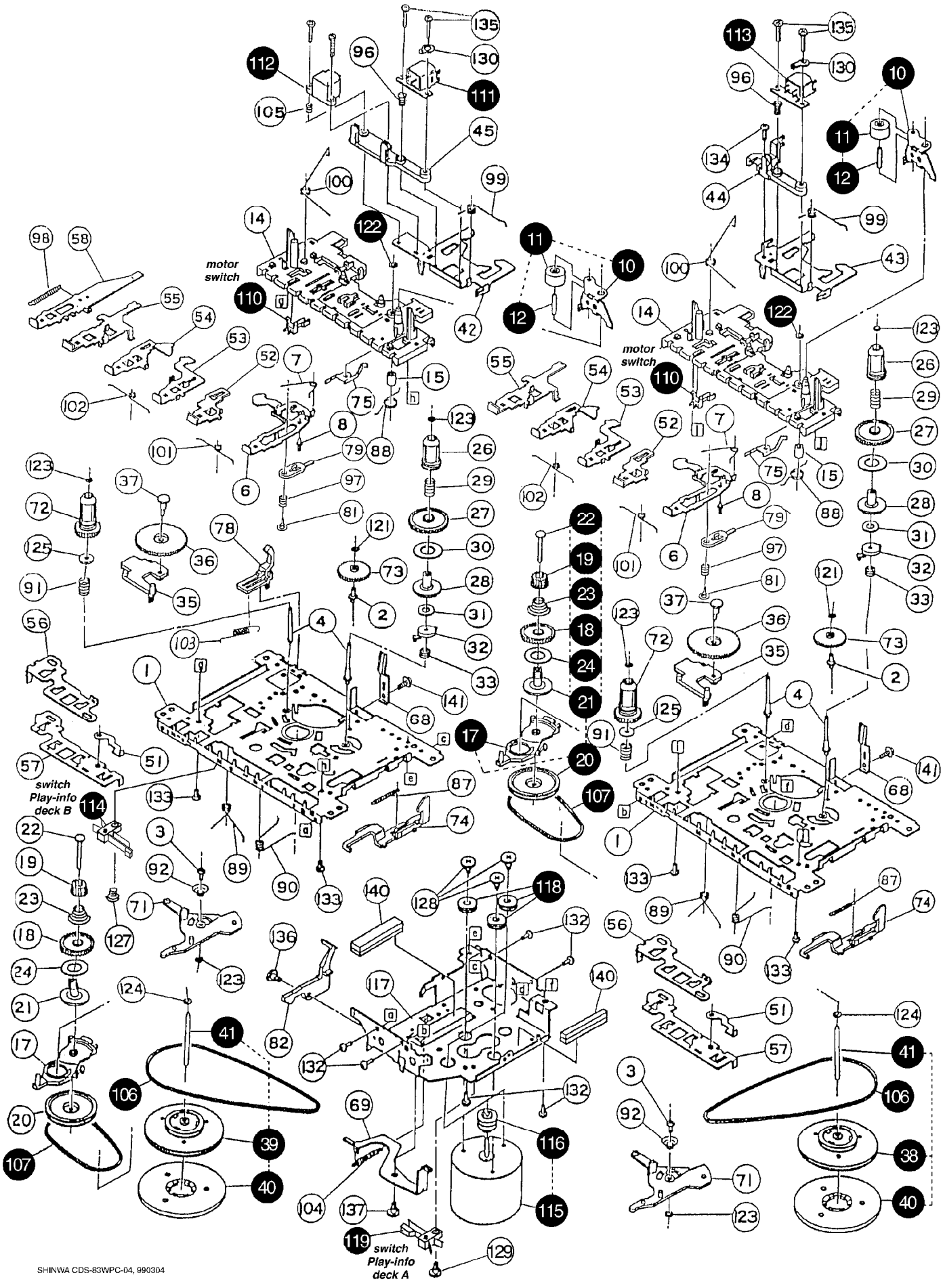
MAIN CABINET EXPLODED VIEW



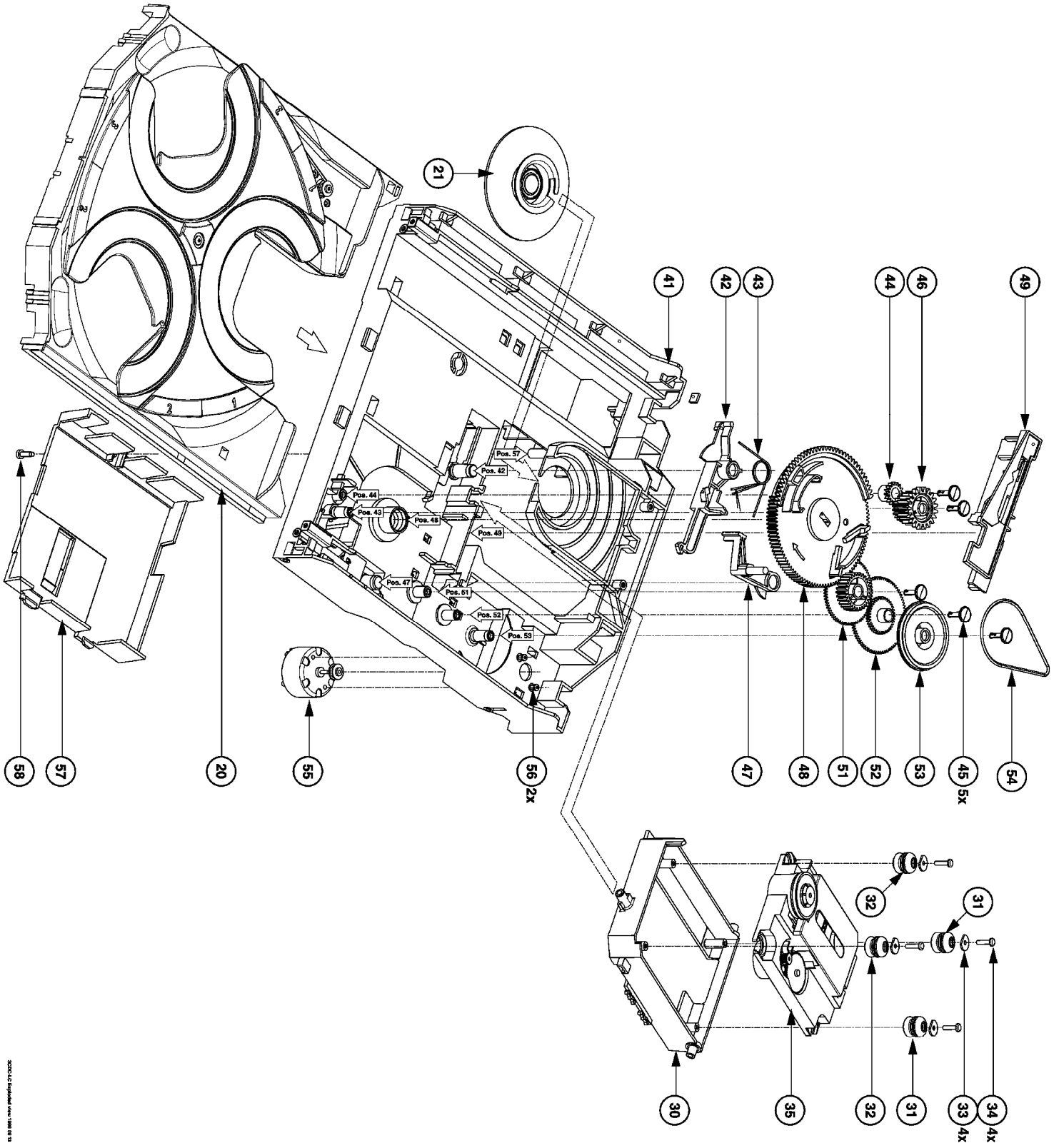
RECORDER BOARD MOUNTING DETAIL



TAPE MECHANISM EXPLODED VIEW

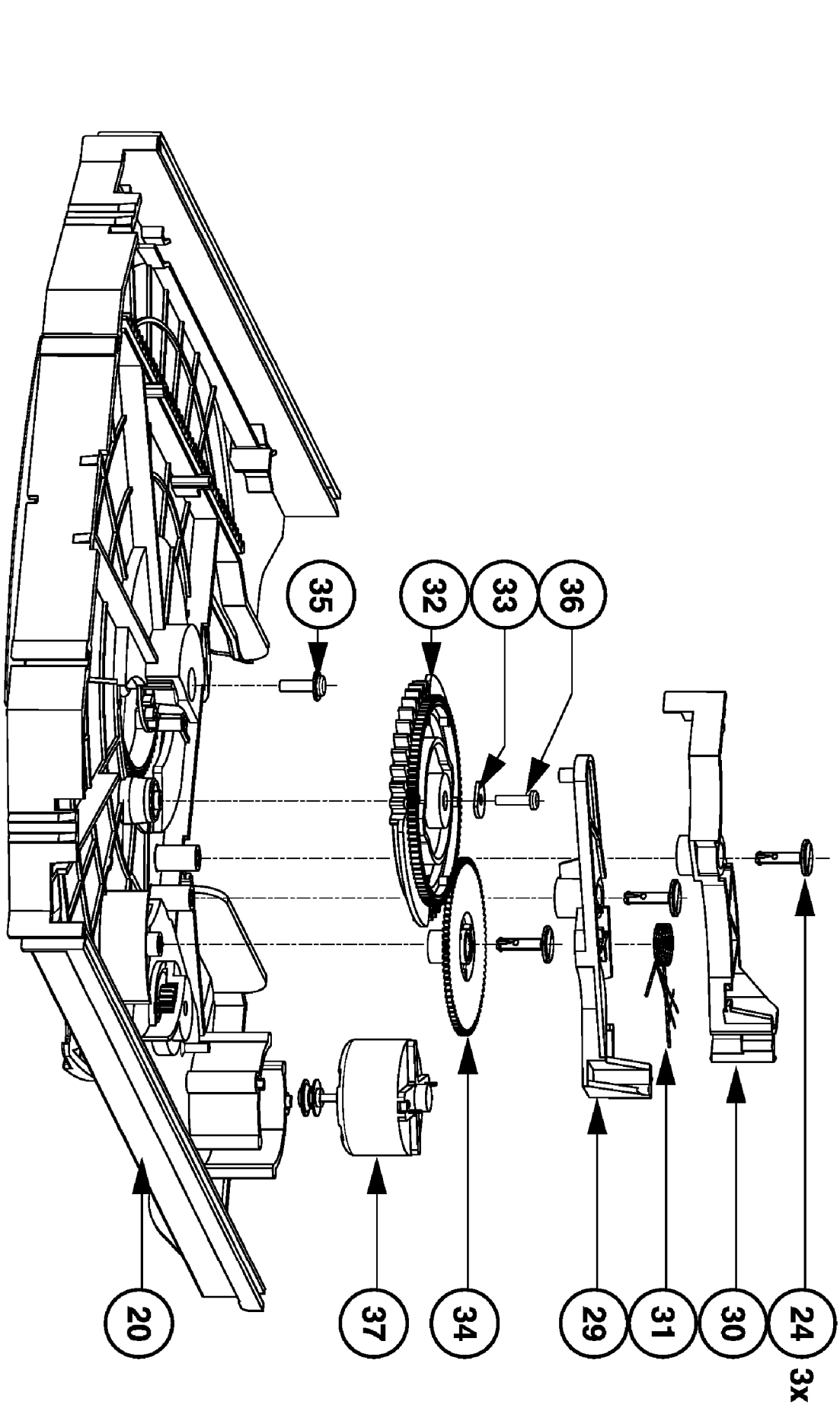


3CDC - LT MODULE ASM. EXPLODED VIEW

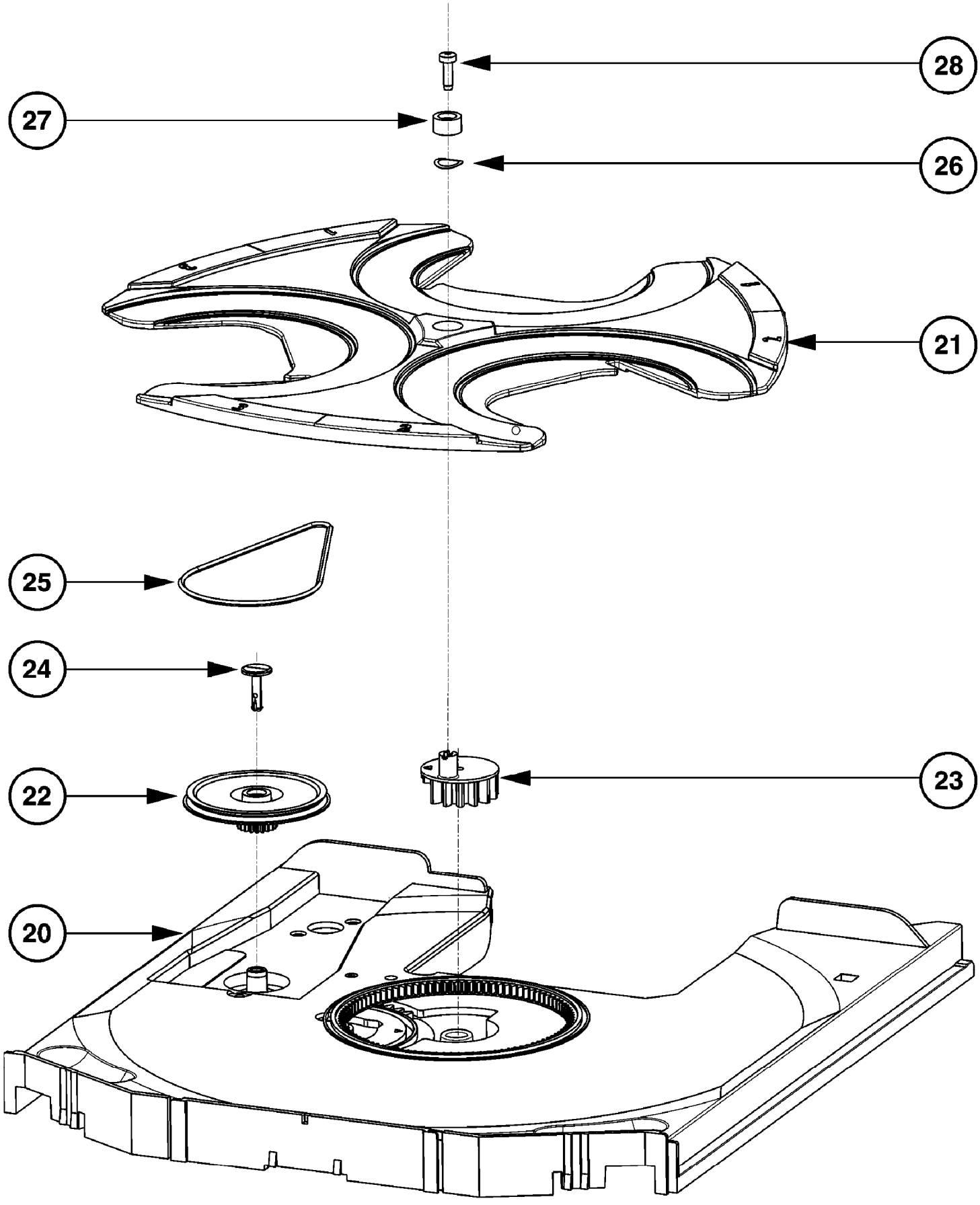


3CDC-LC Exploded view 1998 05 13

CD DRAWER BOTTOM VIEW



CD DRAWER TOP VIEW



General Information

Manual 1941 – FW-C50/37

Display FW-C50/37 Product View

Safety & Warning Notices

Display Warning & Safety Notice

Version Variations:

Type / Versions:	FW-C50
Features & Board in used:	**/37**
Aux In	**X**
Line Out	
Surround Out	
Subwoofer Out	**X**
Digital Out	
Matrix Surround	**X**
CD Text	
Dolby B	
RDS	
News	
Dolby Prologic (DPL)	
Incredible Surround	
Karaoke Features	
Voltage Selector	
Low Power Standby (Clock Display Off)	
Tuner board - ECO5 Sys	**X**
Tuner board - Tuner 95	
Surround Loudspeakers	**X**

Specifications

GENERAL:

Mains voltage : 100V for /26
110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22/34
230V for /25

230-240V for /30

Mains frequency	: 50/60Hz
Power consumption	: < 15W at Standby 75W at 1/8 rated power out
Clock accuracy	: < 4 seconds per day
Dimension centre unit	: 265 x 310 x 390mm

TUNER:

FM

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

MW

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

LW

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

AMPLIFIER:

Output power (6ohm, 60Hz-12.5kHz, 10% THD)

L & R	: 2 x 45W
Surround	: 2 x 7W

Frequency response within -3dB : 40Hz-20kHz

Dynamic Bass Boost : BEAT, PUNCH, BLAST, DBB OFF 1)

Digital Sound Control :

Optimal, Classic, Techno, Jazz, Rock, Vocal 1)

Headphone output at 32 ohm : 15mW ± 2dB

Input sensitivity

Aux in	: 1V ± 2dB at 1 kohm

Output sensitivity

Subwoofer out (max. vol.)	: 1.5V ± 2dB at 22 kohm

CASSETTE RECORDER:

Number of track	: 2 x 2 stereo
Tape speed	: 4.76 cm/sec ± 2%
Wow and flutter	: < 0.4% (DIN)
Fast-wind/Rewind time C60	: 130 sec
Bias system	: 75kHz ± 10kHz

Rec/Pb frequency response within 8dB : 80Hz - 12.5kHz

Signal to noise ratio (unweighted): > 44dB

COMPACT DISC:

Measurement done at output conn. of the CDC module.

Frequency response within ± 1.5dB	: 20Hz - 20kHz
Output level (in Vrms)	: 550mV ± 1dB unloaded
Signal/Noise ratio (A-weighted)	: > 80dBA
Distortion at 1kHz	: < 0.5%
Channel difference at 1kHz	: < ±1dB
Channel crosstalk at 1kHz	: > 60dB

De-emphasis : 0 or 15/50 mS (Switched by subcode on the disc)

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

1) Frequency response in each setting is software controlled.

Service Aids

Service Tools:

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

Cassette:

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

Compact Disc:

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

ESD Equipment:

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

Handling SMD "Chip Type" Components

Display Chip Component Removal & Replacement

Measurement Setups

Display Tuner FM Measurement Setup
Display Tuner AM Measurement Setup
Display CD Measurement Setup
Display Recorder Measurement Setup

Panel Location Guide

Display Panel Location Guide

ESD

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 wristband with resistance. Keep components and tools at this potential.

SAFETY

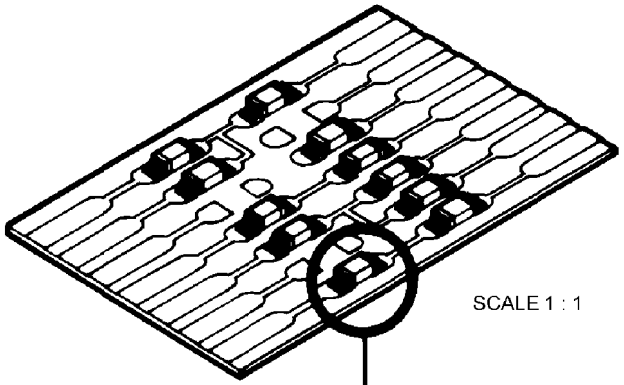
Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

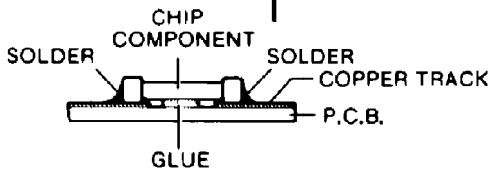
Safety components are marked by the symbol ⚠

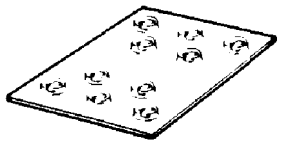
DANGER: Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

HANDLING CHIP COMPONENTS

GENERAL

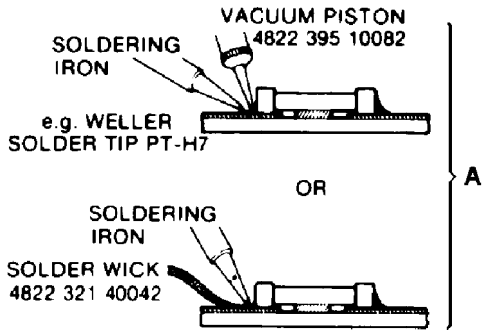


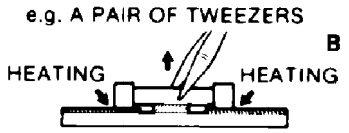


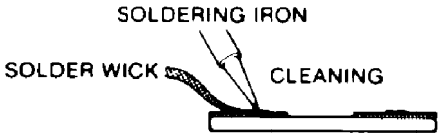


SERVICE PACKAGE

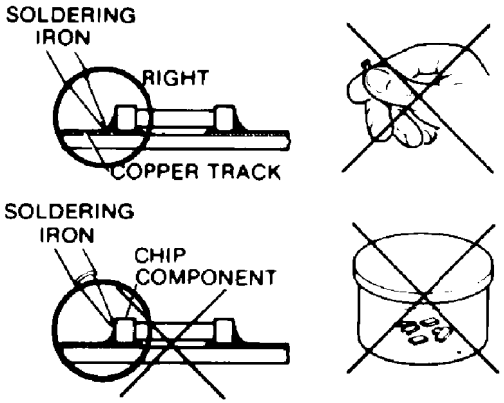
DISMOUNTING



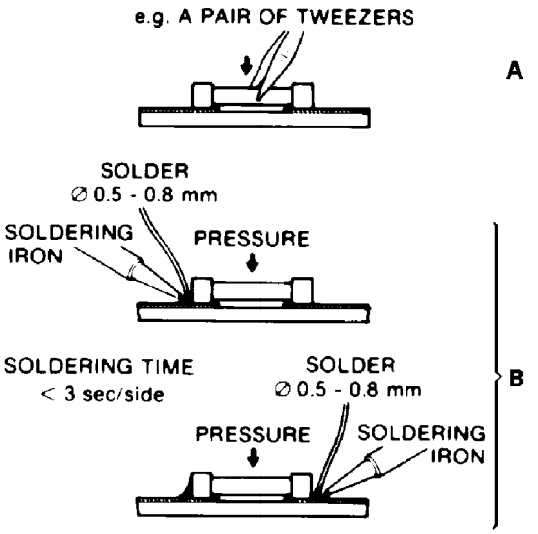




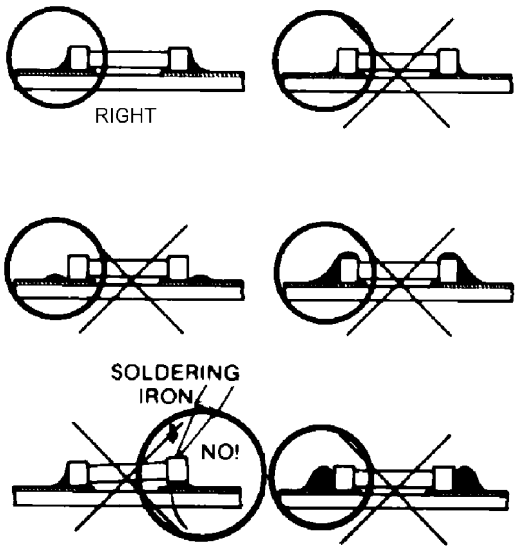
PRECAUTIONS



MOUNTING

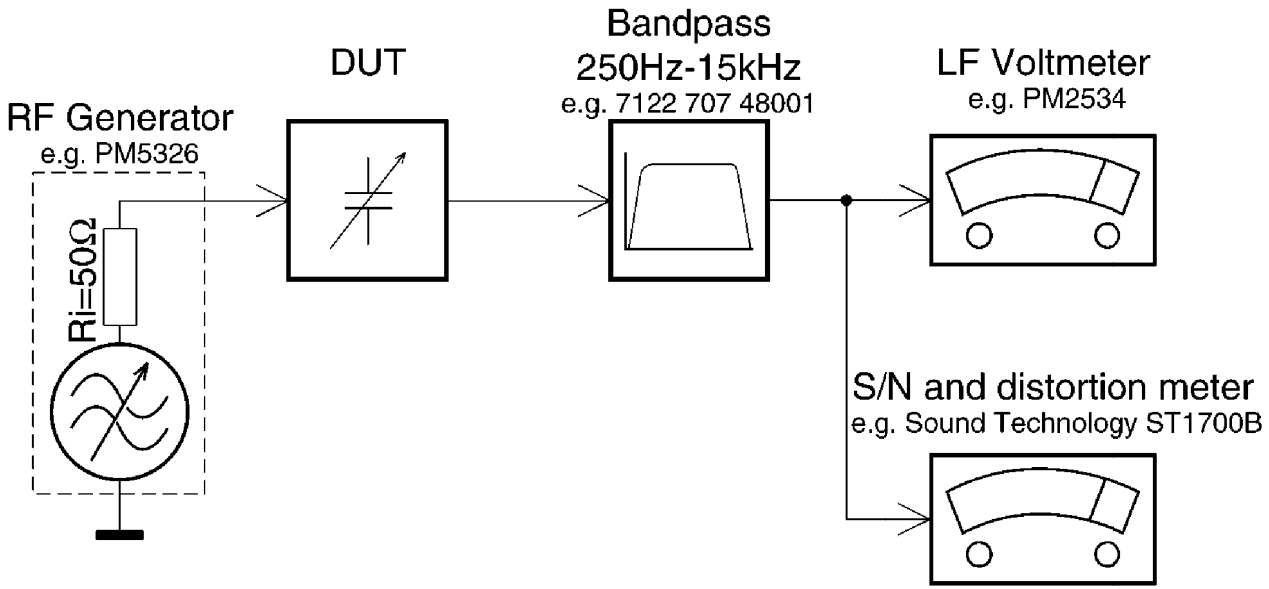


EXAMPLES



MEASUREMENT SETUP

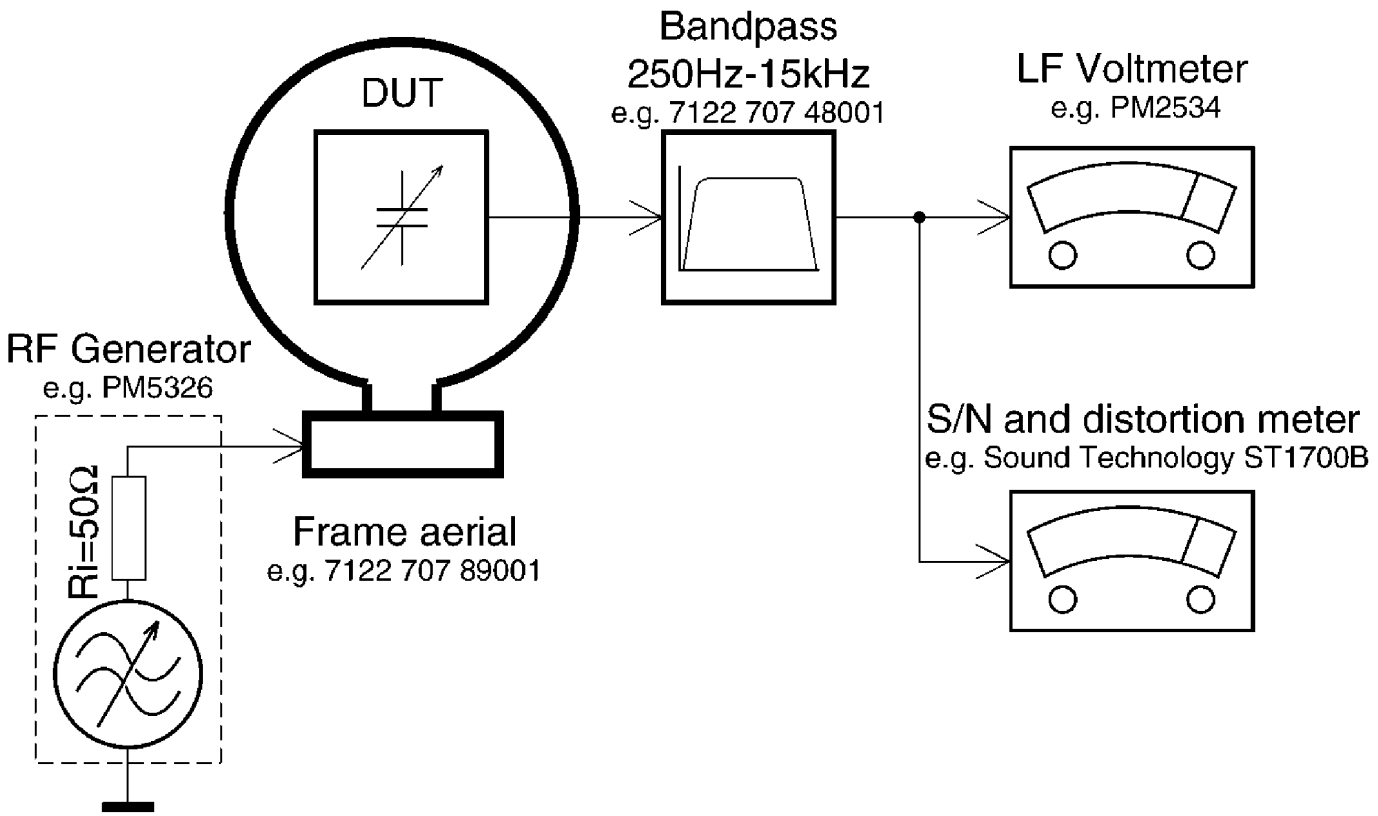
Tuner FM



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

MEASUREMENT SETUP

Tuner AM (MW,LW)

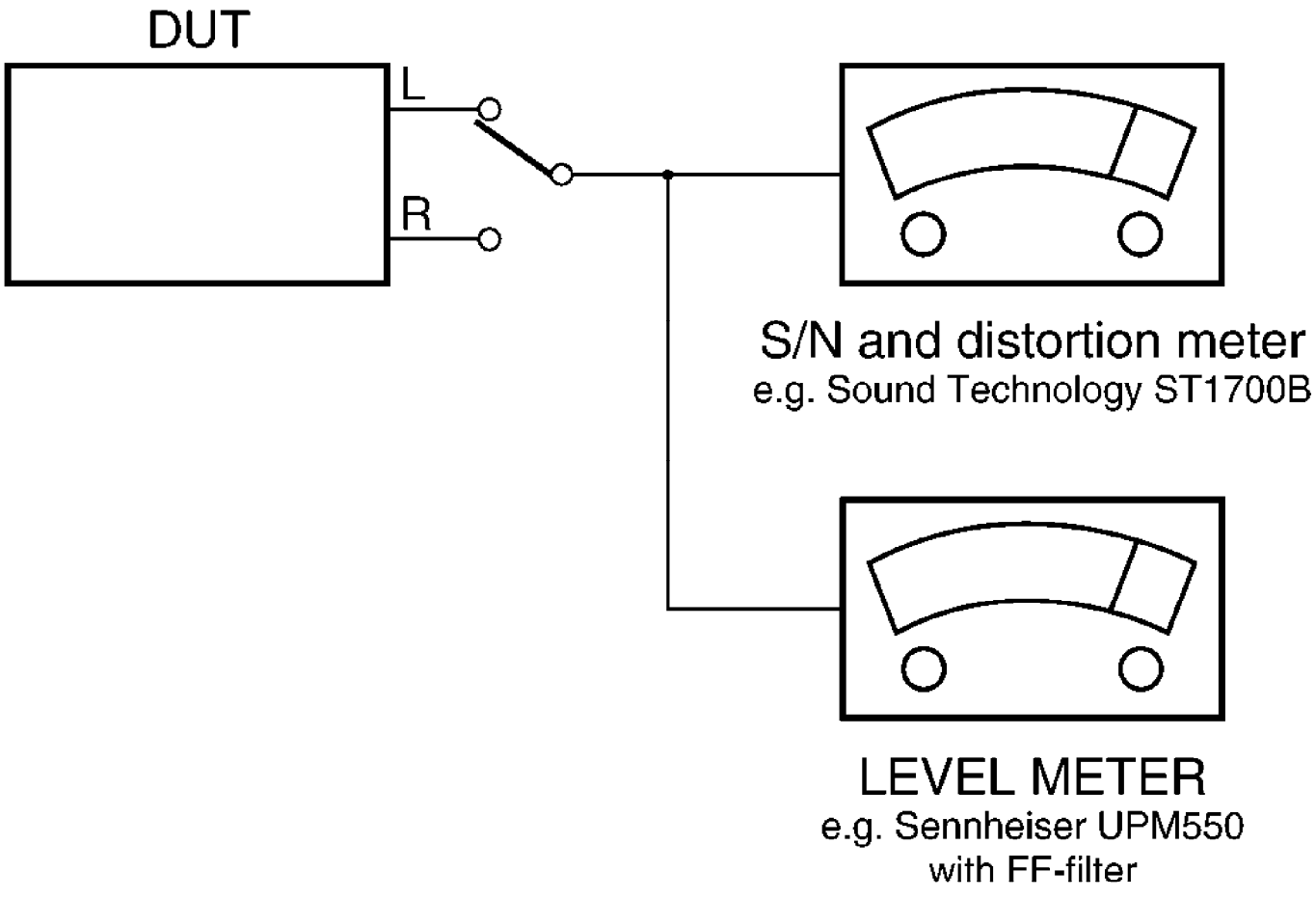


To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday´s cage.
Use a bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).

MEASUREMENT SETUP

CD

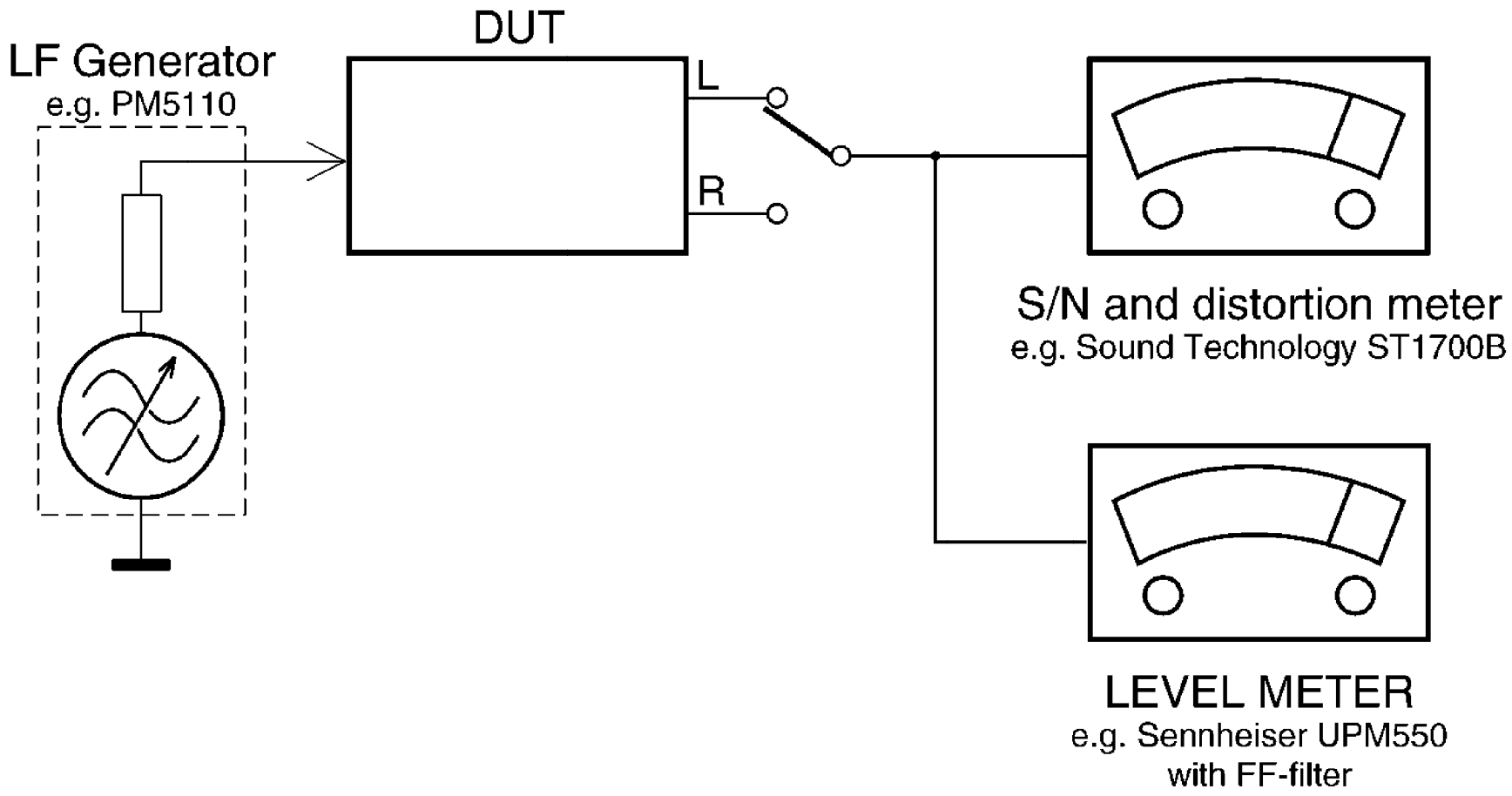
Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



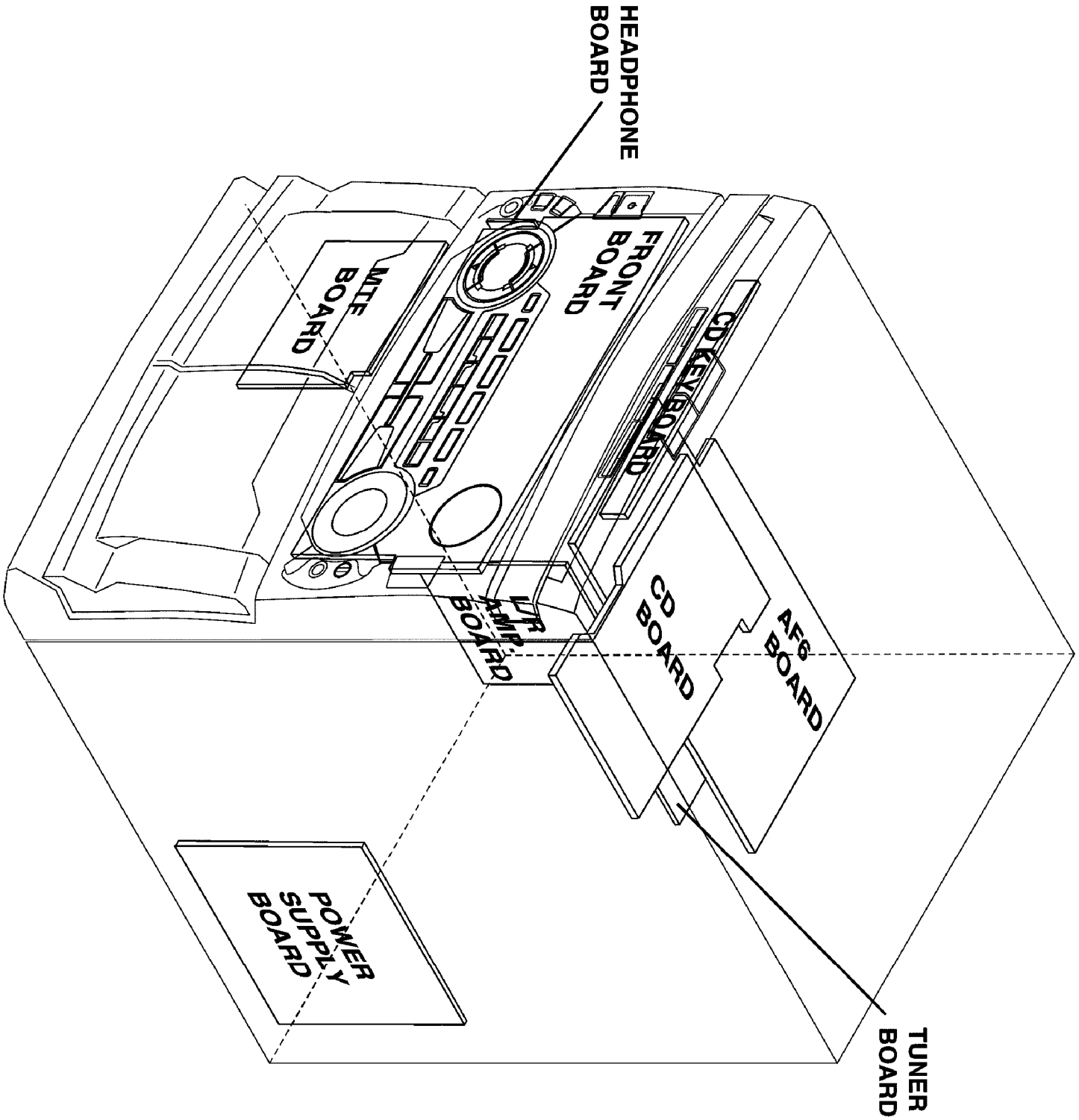
MEASUREMENT SETUP

Recorder

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



Display Panel Location Guide



ADJUSTMENTS

Safety Instructions:

Display Safety & Warning Notices

Service Aids:

Service Tools:	
Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6 - T20	4822 395 50145
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Earth cable (to connect product to mat or box)	4822 320 11308
Complete kit ESD3 (combining all above products)	4822 320 10671
Wristband tester	4822 344 13999

Panel Location Guide

Display Panel/Board Location Guide

Service Test Program

Display Service Test Program

Adjustment Tables:

Display Tuner Adjustment Table - EC05 Tuner

Display Tuner PCB Top View

Display Tuner PCB Bottom View

Display Tape Module Adjustment Table - MTF Module

Display Recorder PCB Bottom View

Servicing the CD Drive

ESD Warning - CD Drive

WARNING: CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE-
• SWITCH OFF POWER SUPPLY
• ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

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

1. Disconnect CD drive flexfoil from old CD drive.
2. Connect paperclip to CD drive flexfoil to short-circuit flexfoil

   Display Flexfoil Short-circuit
3. Remove old CD drive.
4. Remove short-circuit from flexfoil.
5. Connect flexfoil to new CD drive.
6. Position new CD drive in its studs
7. Remove short-circuit (solder joint) from Laser unit (see below).

Attention: The laser diode of a new replacement CD drive is protected against ESD by a solder joint which short-circuits the laser diode to ground.
For proper functionality of the CD drive this solder joint must be removed **after connection** of the drive to the system.

Display Solder Joint detail

CD Board Service Position

Display CD Board Service Position

CD Mechanism Wiring Information

Display CD Mechanism Wiring detail

ESD

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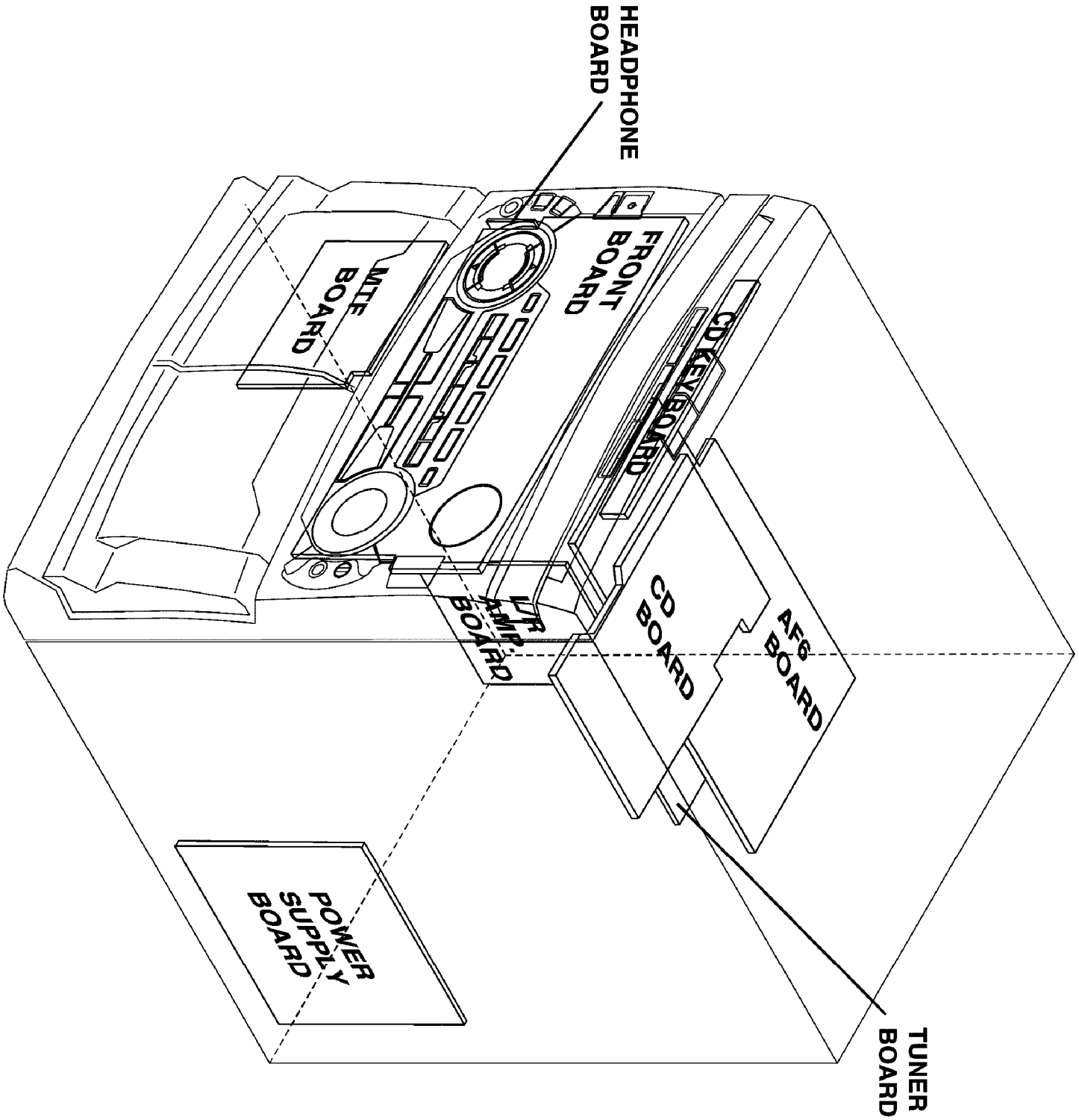
SAFETY

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 ⚠

DANGER: Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

Display Panel/Board Location Guide



SERVICE TEST PROGRAM

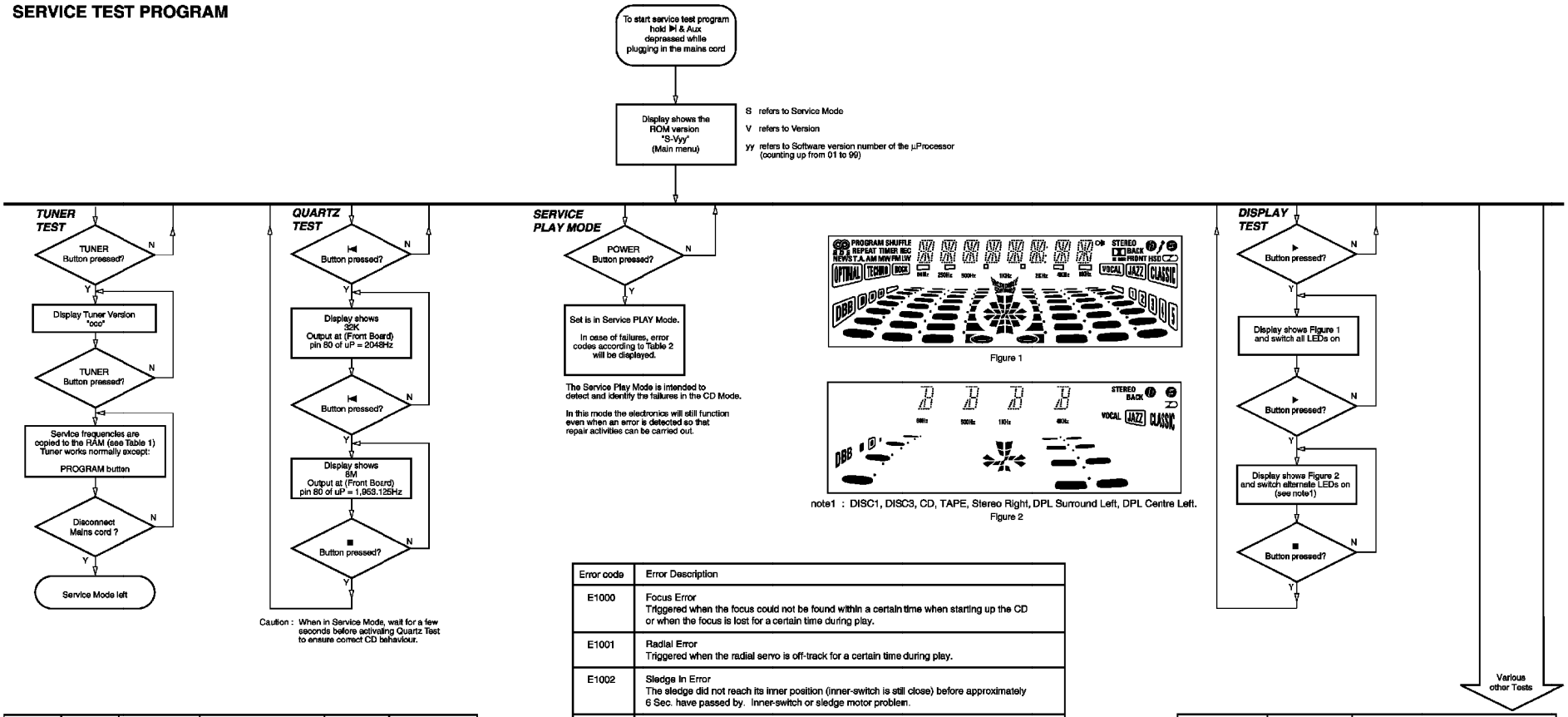


Figure 1

note1 : DISC1, DISC3, CD, TAPE, Stereo Right, DPL Surround Left, DPL Centre Left.

Figure 2

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

Table 1

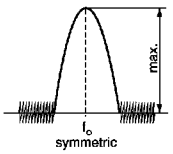
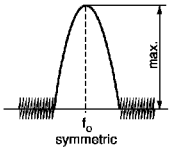
Note: * Depending on the selected grid frequency (9 or 10kHz)
By holding the TUNER and ⏭⏭ buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during startup within a certain time. Discmotor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1070	The carousel switch is not open within certain time. This can happen when either the switch is defective and closed all the time, or when the carousel is blocked when located exactly at a disc position.
E1071	The carousel position switch did not close within a certain time. This can happen when the switch is defective and never closes electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
E1079	The drawer could not enter the inside position is opening again. This can be caused because the drawer is blocked by something and cannot go fully inside, or the drawer switch is defective and does not close.

Table 2

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

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

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	◇1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 50mV continuous wave	◇F	IC 7101 21 — shortcircuit to block AFC — 2141	5119	◇2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	◇A	108MHz	2155	◇4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	◇A	98MHz	3142	◇3	152kHz ±1kHz [1]
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with short wire to ground (pin 4)	◇C Δf=±15kHz V_{RF} = 3mV	IC 7101 36 — 100nF — 220R	5111	◇4	
			IC 7101 40 — 100nF — 220R (see remark 2)	5112		
AM AFC **MW**		◇C continuous wave V_{RF} = 10mV		5114	◇2	0 ± 2 mV DC
AM RF [3]						
MW [4] FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	◇B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	◇4	 Repeat
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		Repeat
	560kHz		560kHz	5102		

ECO5, discr. coil, 090797

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

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

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

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

[4] MW has to be aligned before LW.

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST with	ADJUST to
General						
ADJUST MOTOR SPEED	SBC420 (4822 397 30071) 3150Hz	PLAY deck A or B	◇1 or ◇2 LEFT RIGHT or headphone socket	frequency counter	3758	3150Hz ±1%
CHECK WOW & FLUTTER	SBC420 (4822 397 30071) 3150Hz	PLAY deck A or B	◇1 or ◇2 LEFT RIGHT or headphone socket	W&F-meter	check only	≤0.4 % DIN or ≤0.35 % CCIR
ADJUST AZIMUTH	SBC420 (4822 397 30071) 10kHz	PLAY deck A / PLAY deck B	◇1 ◇2 LEFT RIGHT or headphone socket	mV-meter or oscilloscope	left hand screw	max. output level & left=right
Playback						
CHECK PLAYBACK FREQUENCY RESPONSE	SBC420 (4822 397 30071)	PLAY deck A / PLAY deck B	◇1 or ◇2 LEFT RIGHT	mV-meter	Check	limits see fig.1
Recording						
PRE-ADJUST BIAS	FERRO	RECORD	◇5	mV-meter	5701	$14V_{rms}$ ($40V_{pp}$)
CHECK OVERALL FREQUENCY RESPONSE Input signal: 3mV 100Hz, 250Hz, 1kHz, 10kHz via ◇3 or ◇4	FERRO	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	mV-meter	check only	limits see fig.2
CHECK DISTORTION Input signal: 300mV 1kHz via ◇3 or ◇4	FERRO	RECORD				
	RECORDED CASSETTE	PLAY	◇1 or ◇2 LEFT RIGHT	THD-meter	check only	≤5%
Remark: If high frequencies are not within lower limit, decrease bias and re-measure. If distortion is too high increase bias and re-measure.						

adj. ECO MTF DD AS, 110399

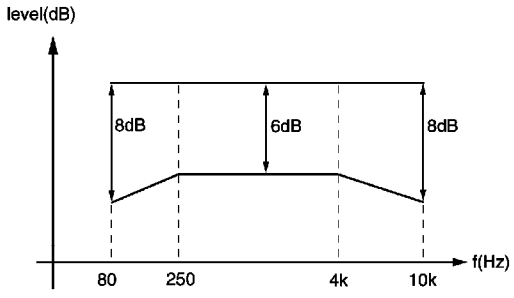


figure. 1

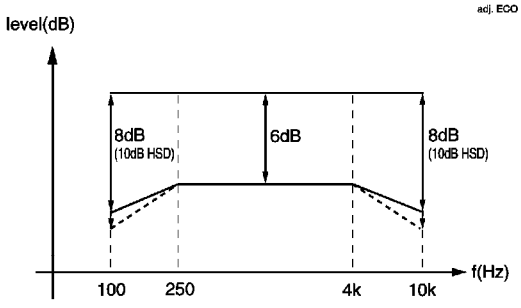
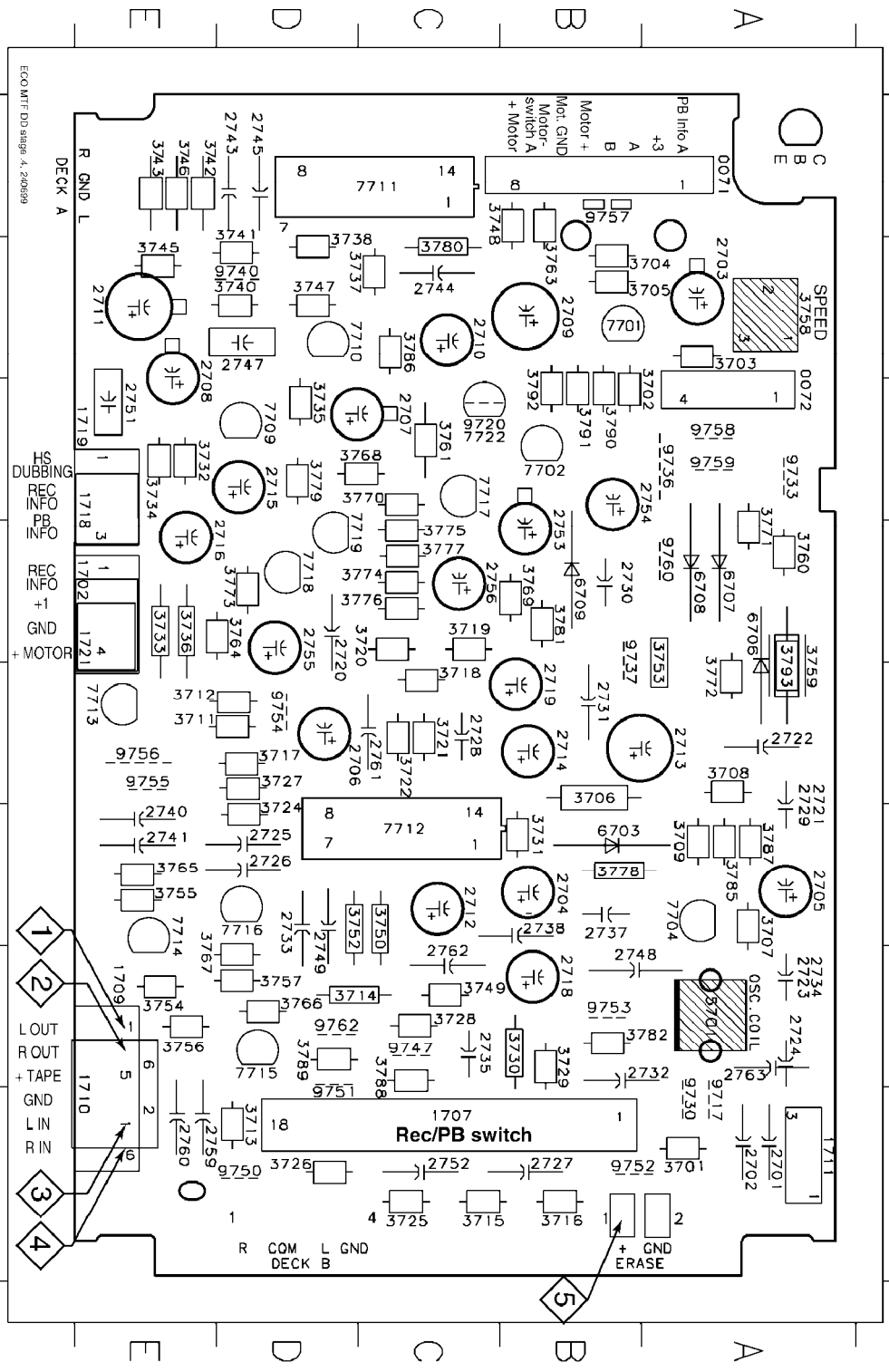


figure. 2

Display Recorder PCB Bottom View



0071 B1 2744 C2 3735 D3 3789 D7
0072 A3 2745 E1 3736 E4 3790 B3
1702 E4 2747 D2 3737 D2 3791 B2
1707 B8 2748 B7 3738 D2 3792 B3
1709 E8 2749 D6 3740 D2 3793 A5
1710 E8 2751 E3 3741 D1 5701 A7
1711 A8 2752 C8 3742 E1 6703 B6
1719 E3 2753 B4 3743 E1 6706 A4
1721 E4 2754 B3 3745 E2 6707 A4
2701 A8 2755 D5 3746 D1 6708 A4
2702 A8 2756 C4 3747 D2 6709 B4
2703 A2 2759 E8 3748 C1 7701 B2
2704 C6 2760 E8 3749 C7 7702 B3
2705 A6 2761 D5 3750 C6 7704 A6
2706 D5 2762 C7 3752 D6 7709 D3
2707 C3 2763 A7 3753 A4 7710 D2
2708 E3 3701 A8 3754 E7 7711 C1
2709 B2 3702 A3 3755 E6 7712 C6
2710 C2 3703 A2 3756 E7 7713 E5
2711 E2 3704 B2 3757 E7 7714 E7
2712 C6 3705 B2 3758 A2 7715 D7
2713 A5 3706 B5 3759 A5 7716 D6
2714 B5 3707 A6 3760 A4 7717 C3
2715 D4 3708 A5 3761 C3 7718 D4
2716 D4 3709 A6 3763 B2 7719 D4
2718 B7 3711 E5 3764 E4 7722 C3
2719 B5 3712 E5 3765 E6 9717 A8
2720 D4 3713 D8 3766 D7 9720 C3
2721 A6 3714 C7 3767 E7 9730 A7
2722 A5 3715 B8 3768 C3 9733 A3
2723 A7 3716 B8 3769 C4 9736 A3
2724 A7 3717 E5 3770 C3 9737 B4
2725 D6 3718 C5 3771 A4 9740 D2
2726 E6 3719 C5 3772 A5 9747 C7
2727 B8 3720 D4 3773 D4 9750 E8
2728 C5 3721 C5 3774 D4 9751 D8
2729 A6 3722 C5 3775 C4 9752 B8
2730 B4 3723 A7 3776 C4 9753 B7
2731 B5 3724 E6 3777 C4 9754 D5
2732 B7 3725 C8 3778 B6 9755 E6
2733 D6 3726 D8 3779 D3 9756 E5
2734 A7 3727 D5 3780 C2 9757 B1
2735 C7 3728 C7 3781 B4 9758 A3
2737 B6 3729 B7 3782 A7 9759 A3
2738 B7 3730 C7 3785 A6 9760 A4
2740 E6 3731 B5 3786 C2 9762 D7
2741 E6 3732 E3 3787 A6
2743 E1 3734 E3 3788 C8

TRAINING INFORMATION

Block Diagrams

Circuit Descriptions:

Power 4-99 Module (2 Ch. Ver.)

Supply-part

General (pos. numbers refer to circuit diagram)

The primary circuitry depends on the version:

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

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

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

Circuit details:

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

- **DC voltages +A, +B1/+B2, +C**
  These voltages supply the Super Class G amplifier, described later in this chapter.
  The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several ”tricky“ details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A

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

Generation of +B1/+B2

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

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

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

Display +B2 Supply Voltage Generation

Generation of +C
Full wave rectifying with 2 diodes of bridge rectifier 6201, using 50% secondary winding of mains transformer (pin 13-15/13-11).

Display +C Supply Voltage Gereration
Display Simplified +C Generation

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

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

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

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

Amplifier part

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

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

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

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

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

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

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

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

-30V-regulator

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

VCD- Supply:

Is a provision for versions with a Video CD Player.

This circuitry consists of a switched supply with a regulator to 5,1V (±0,15V).

- **Switching on/off** is done via the VCD_ON line from the microprocessor (H=on, L=off). If the VCD_ON line is high - transistor 7236 becomes conductive. This causes transistor 7238 to switch through. +5VCD is available. If the VCD_ON is low - transistor 7236 is blocked >> no base current through 7238 >> transistor 7238 is blocked too >> +5VCD is switched off.

- **Regulation** is done via Z- diode 6244 and transistor 7237.
  If the +5VCD exceeds 5,1V the basis of transistor 7237 becomes higher than 0,6V via Z- diode 6244. Consequently transistor 7237 becomes conductive. This causes a reduced base current through 7236. Transistor 7236 becomes less conductive and reduces the base current trough 7238. Transistor 7238 becomes less conductive too and reduces the +5VCD.

Amplifier:

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

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

- Super class G - operation

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

Principle / benefit of Super Class G

Display Super Class G Output Benefits

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

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

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

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

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

- In all four channel versions a pre-amplifier out for SURROUND is available to add a wireless speaker system

(e.g. FB206,FB208).

AF6 Board (Source Select & Audio Control) Brief Introduction

The AF6 Board consists of the following features :

a. SOFAC IC

SOFAC IC TEA6321 (7511) which includes functions such as source selection, loudness control, dynamic bass control, treble control, front/rear volume control and muting function. Sound features such as DBB, DSC and IS are controllable via I^2C Bus from the microprocessor.

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

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

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

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

b. KARAOKE MIC. MIXING

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

NK : Non-Karaoke.

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

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

c. DOLBY PRO LOGIC (DPL) INTERFACE

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

d. LINE OUT

Line out with cinch socket for connection to external amplifier.

e. SUB-WOOFER OUT

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

f. INCREDIBLE SURROUND

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

g. HEADPHONE AMPLIFIER

Headphone Amplifier to drive 32 ohm to 1kohm headphone.

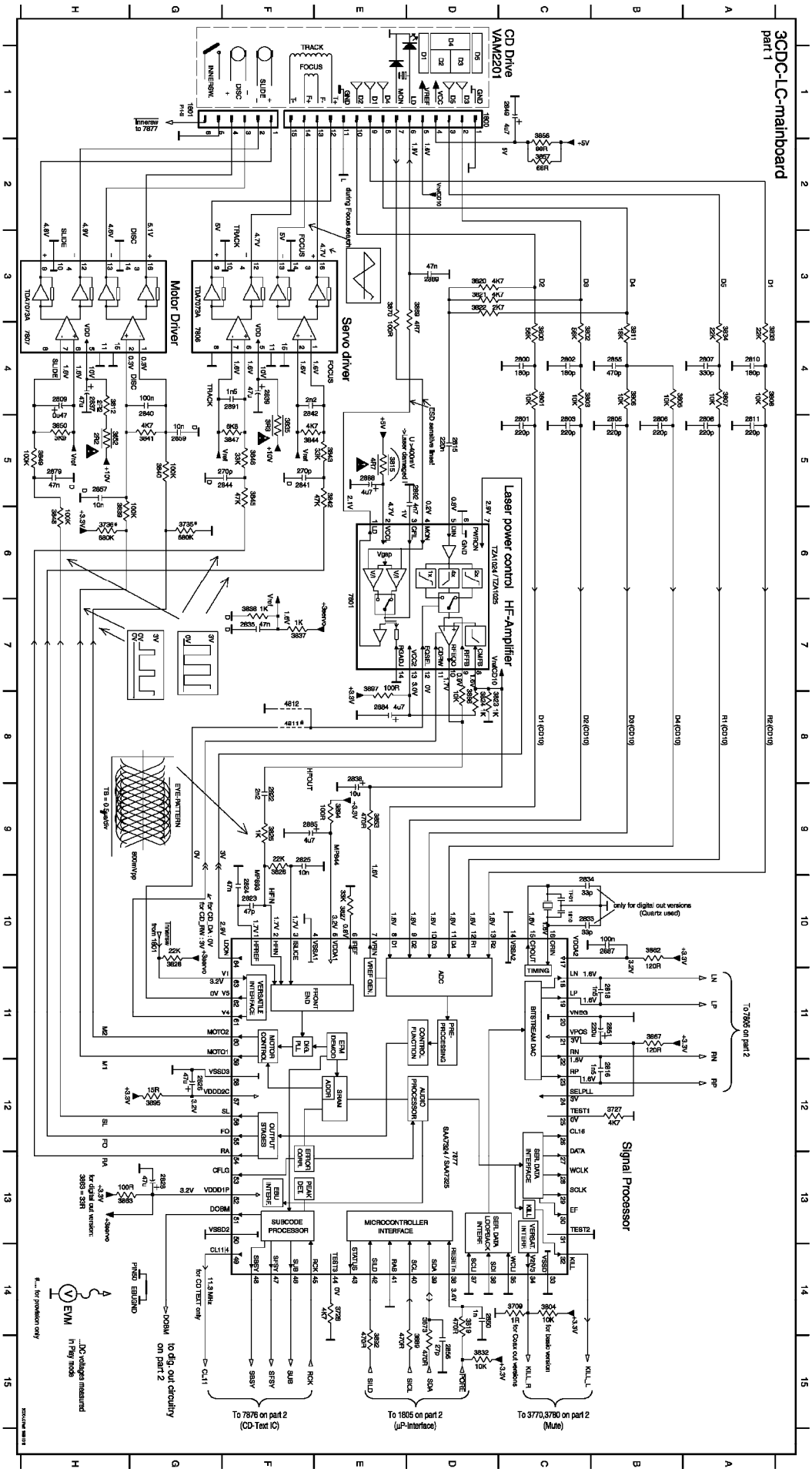
h. CD STANDBY CONTROL

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

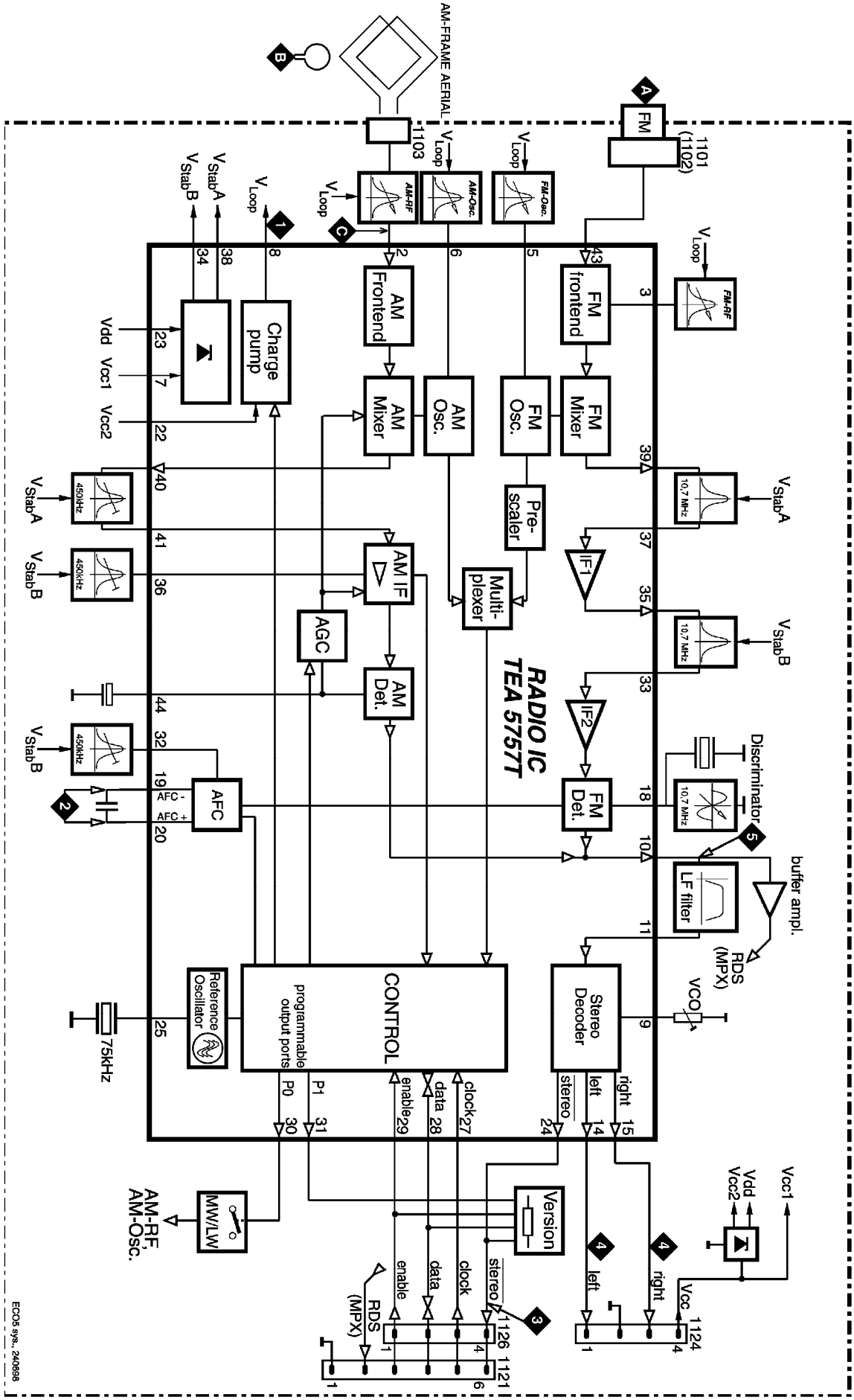
i. ATTENUATION NETWORK

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

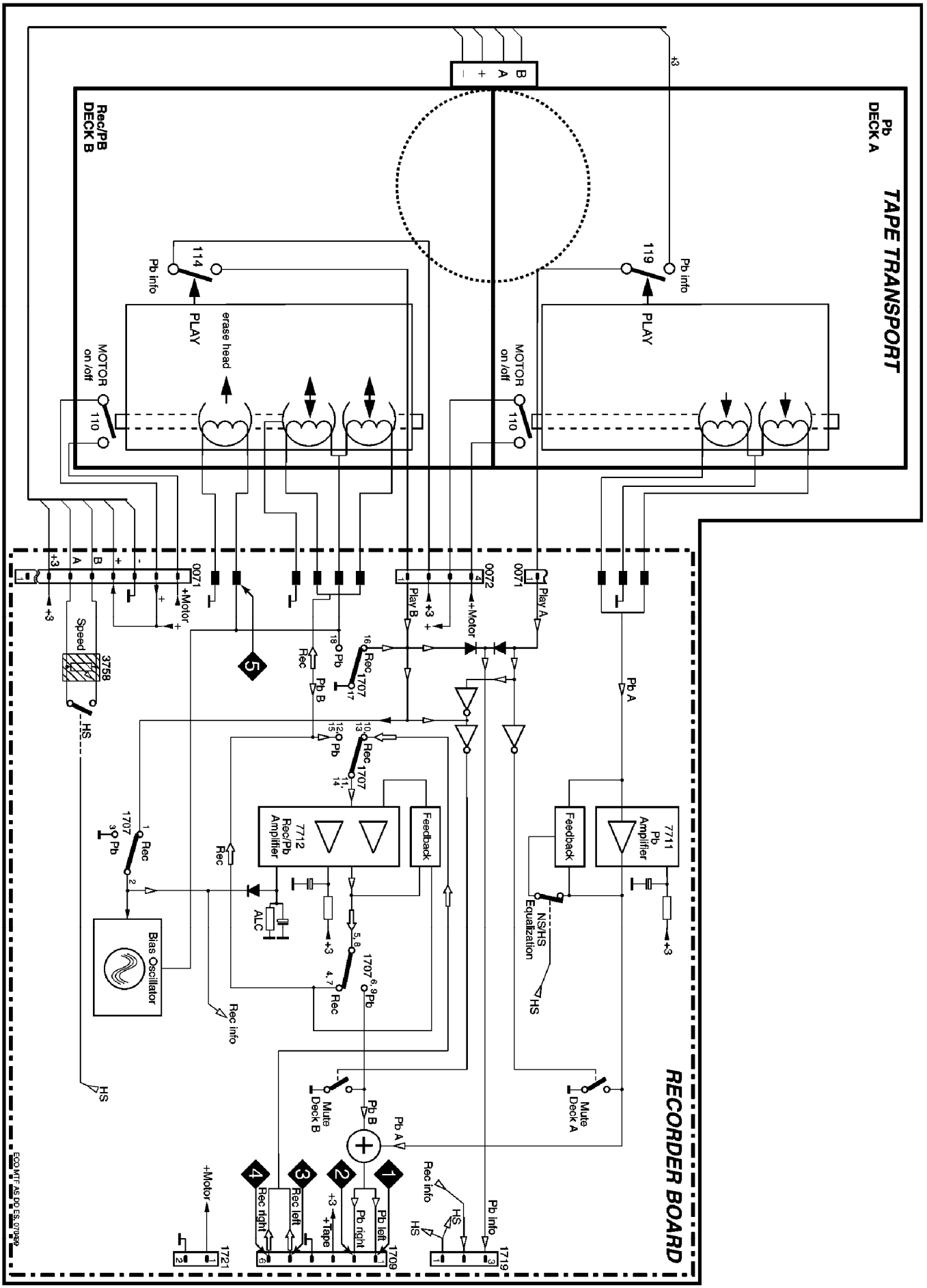
Overall Block Diagram



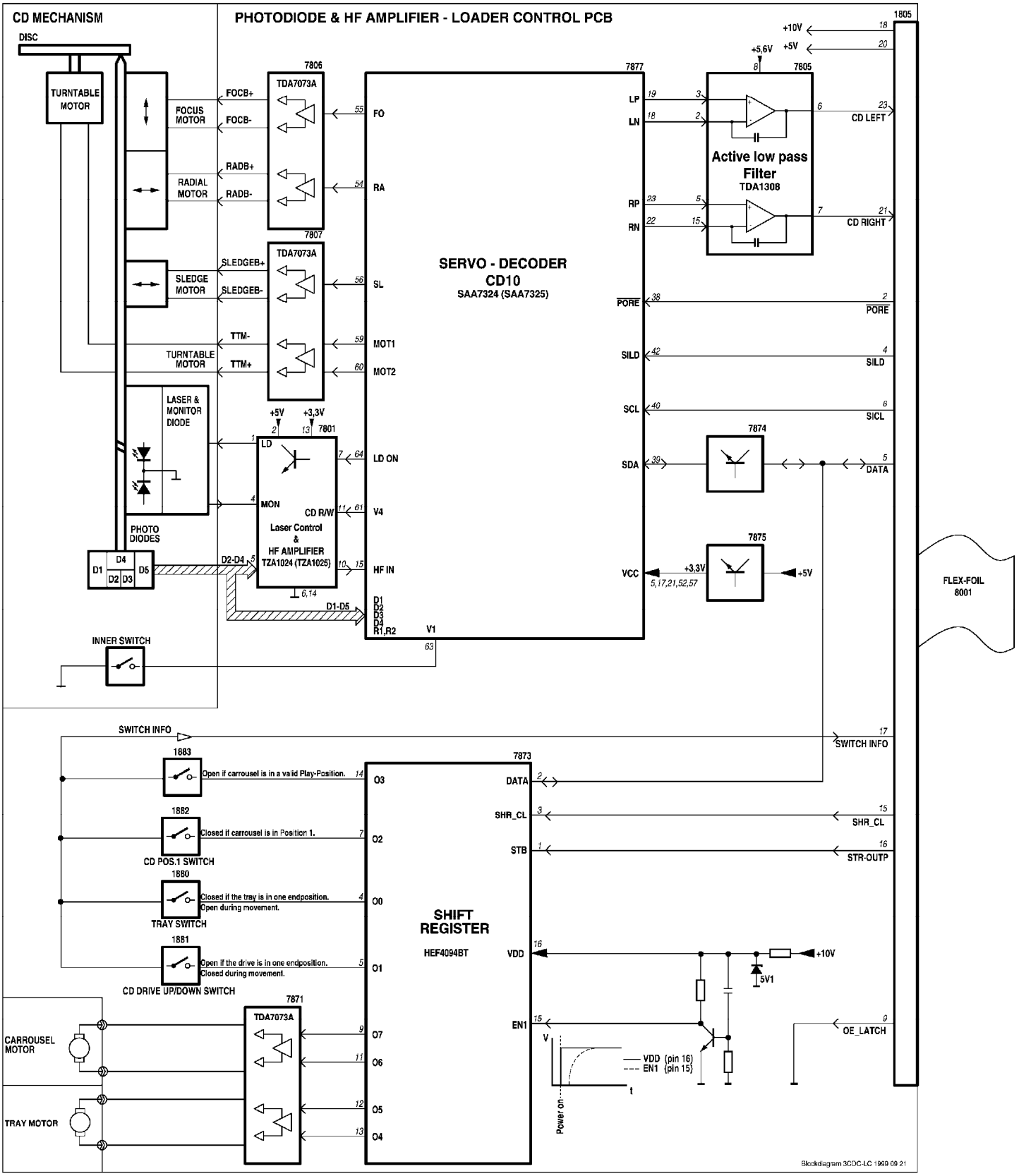
Tuner Block Diagram, EC05 Tuner



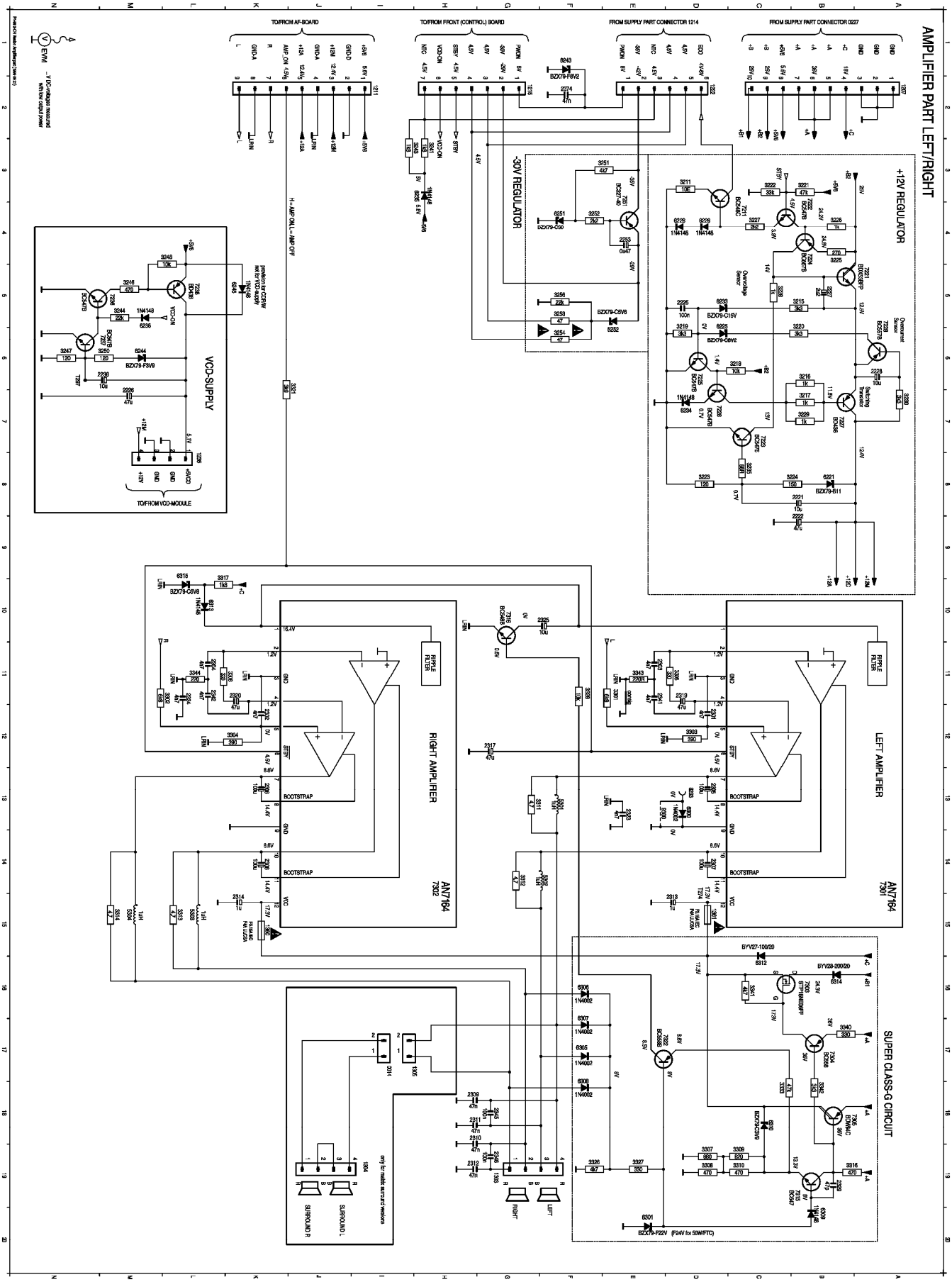
Tape Module Block Diagram, MTF Module



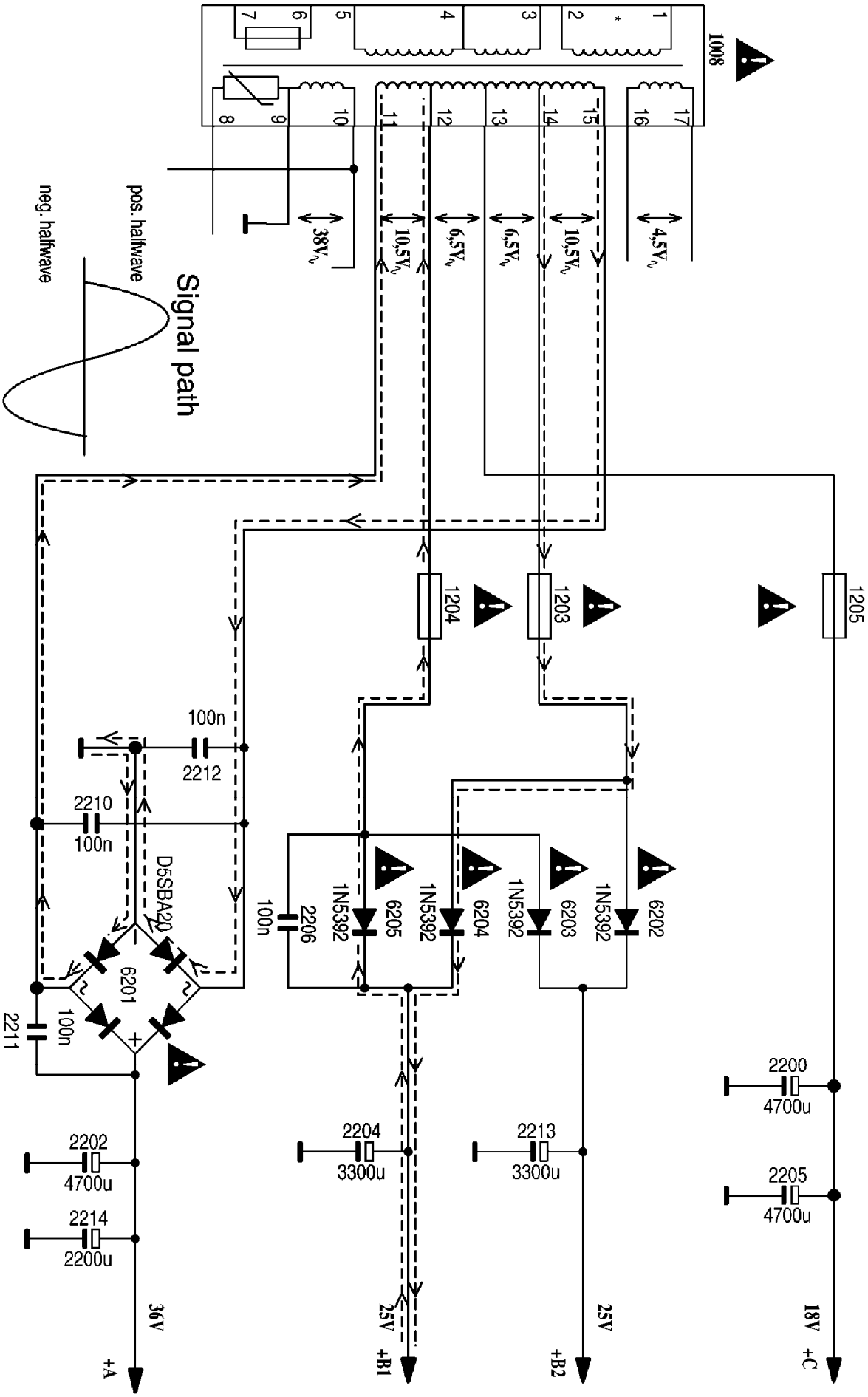
CD Block Diagram, 3CDC - LC Module



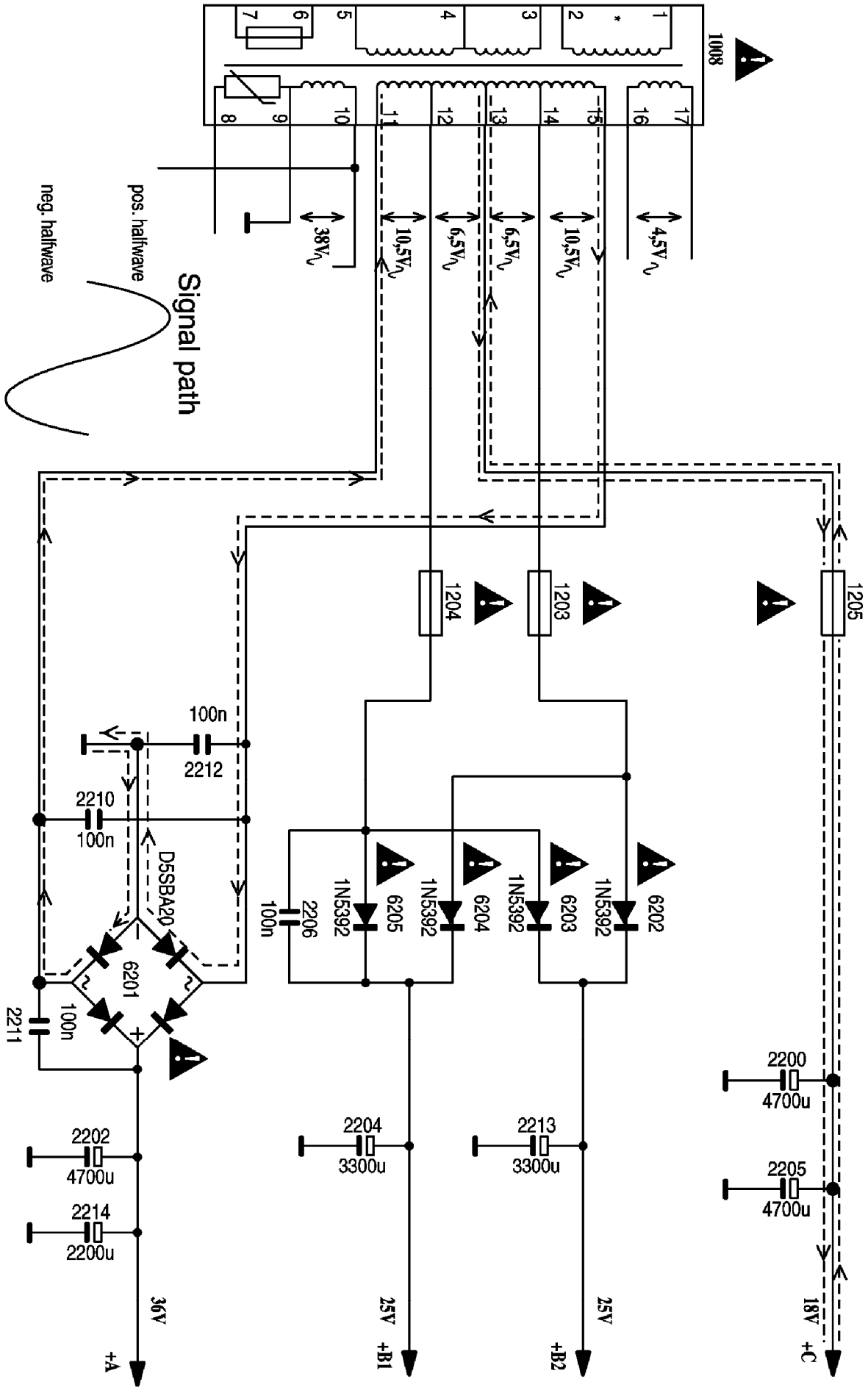
(pos. numbers refer to circuit diagram)



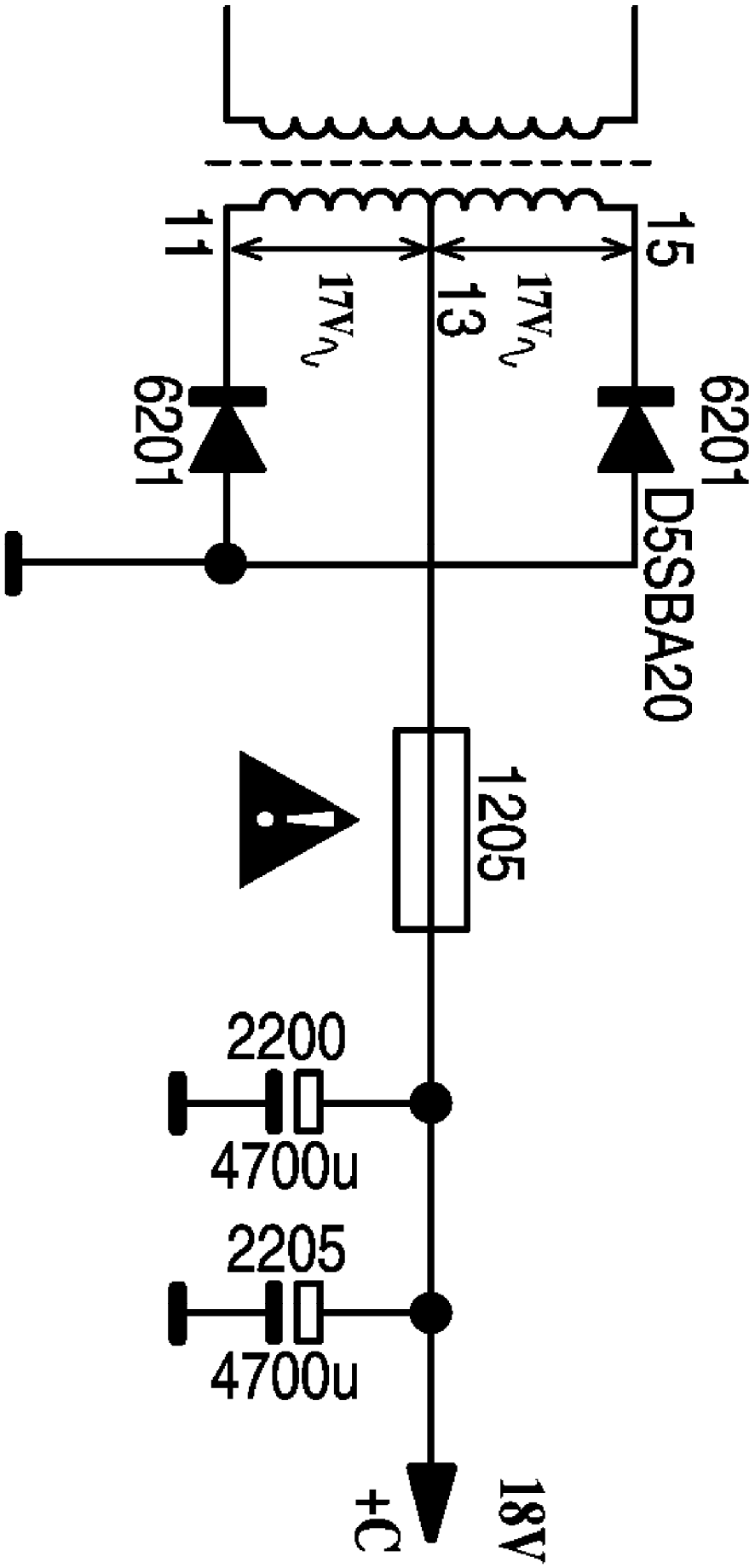
Display +B2 Supply Voltage Generation



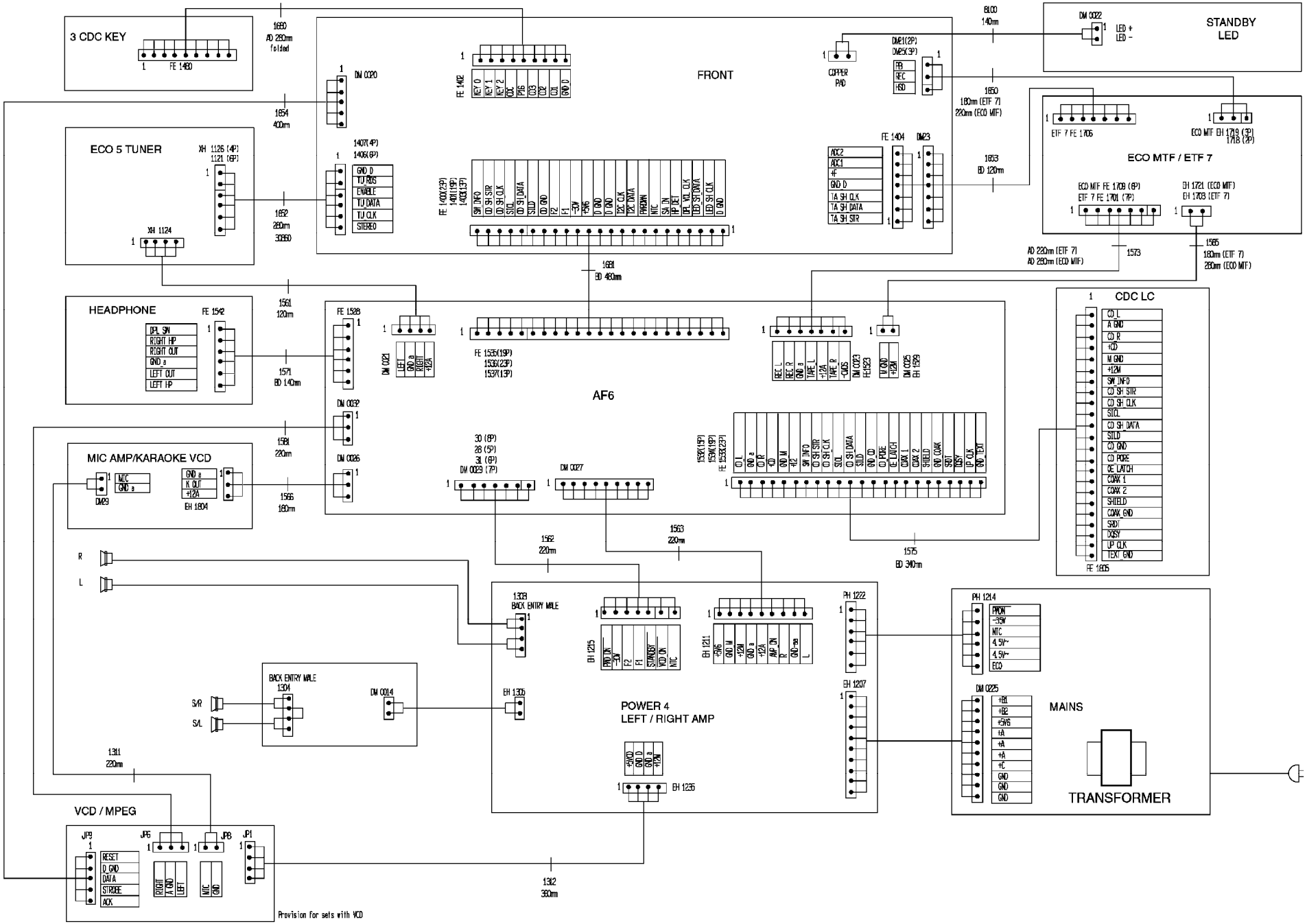
Display +C Supply Voltage Gereration



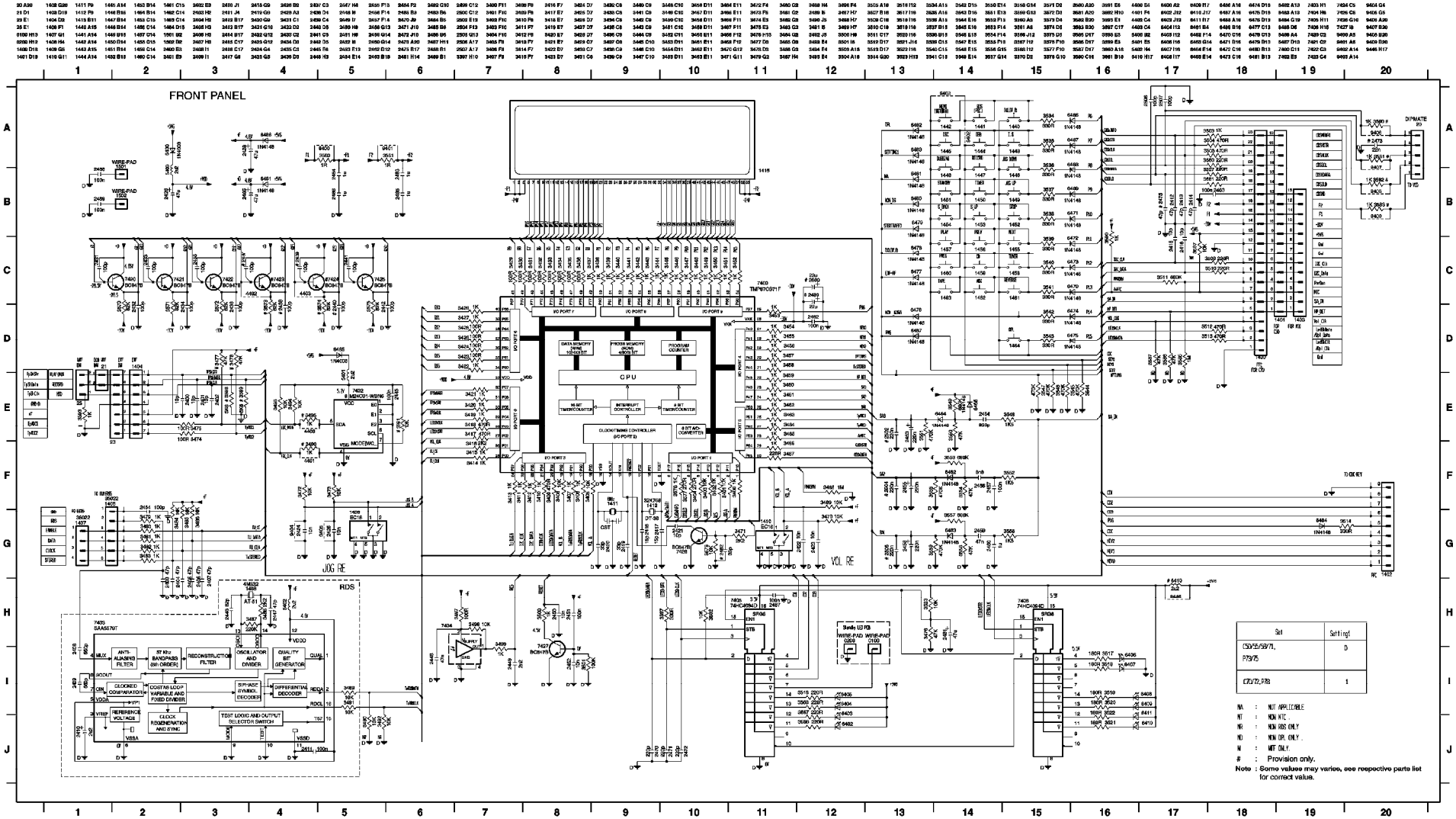
Display Simplified +C Generation

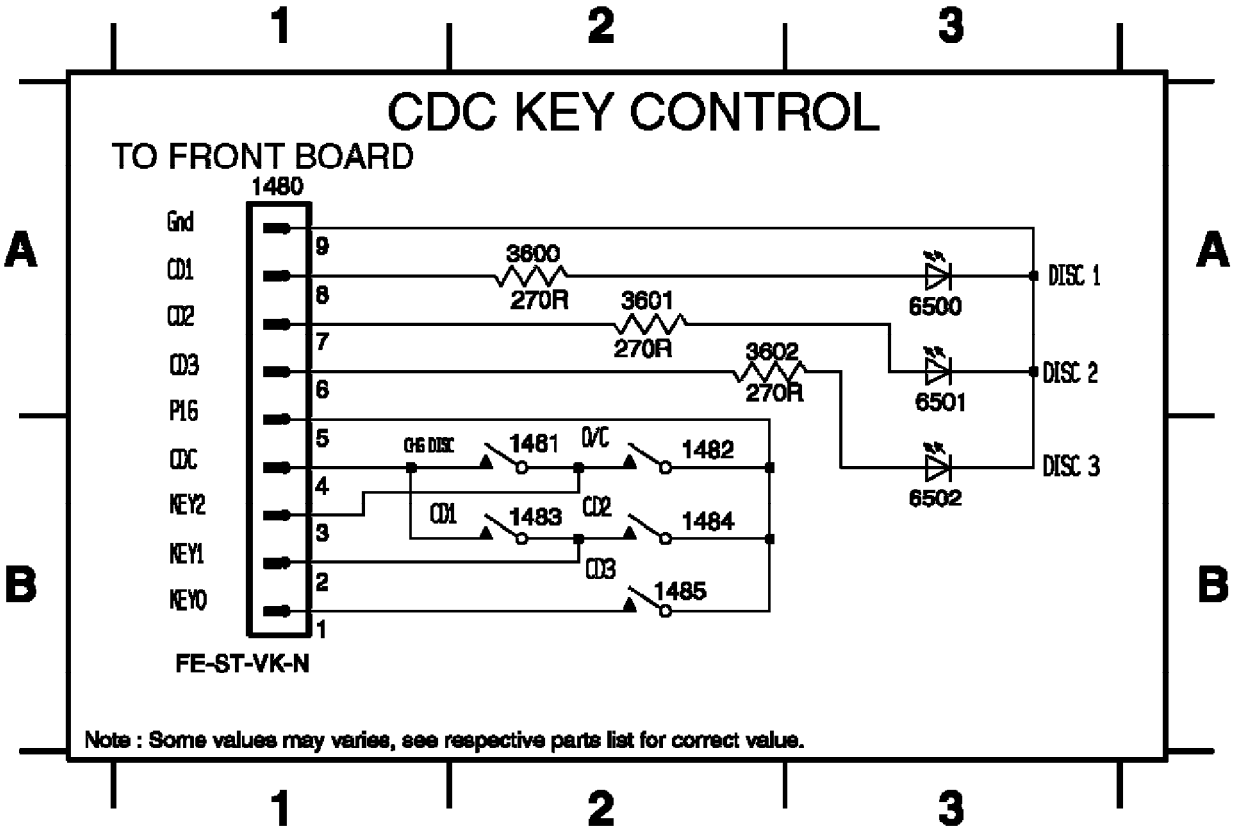


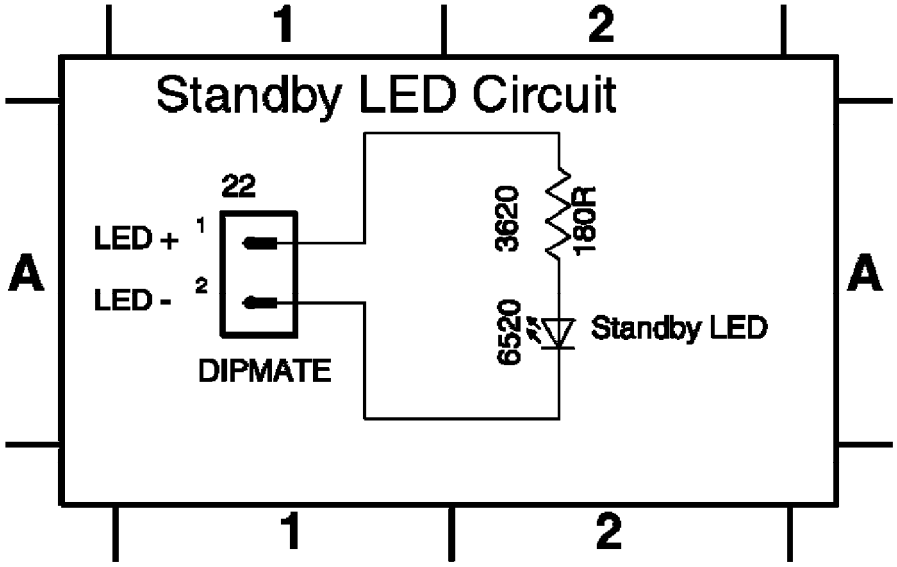
All Models (1941) - OVERALL WIRING DIAGRAM



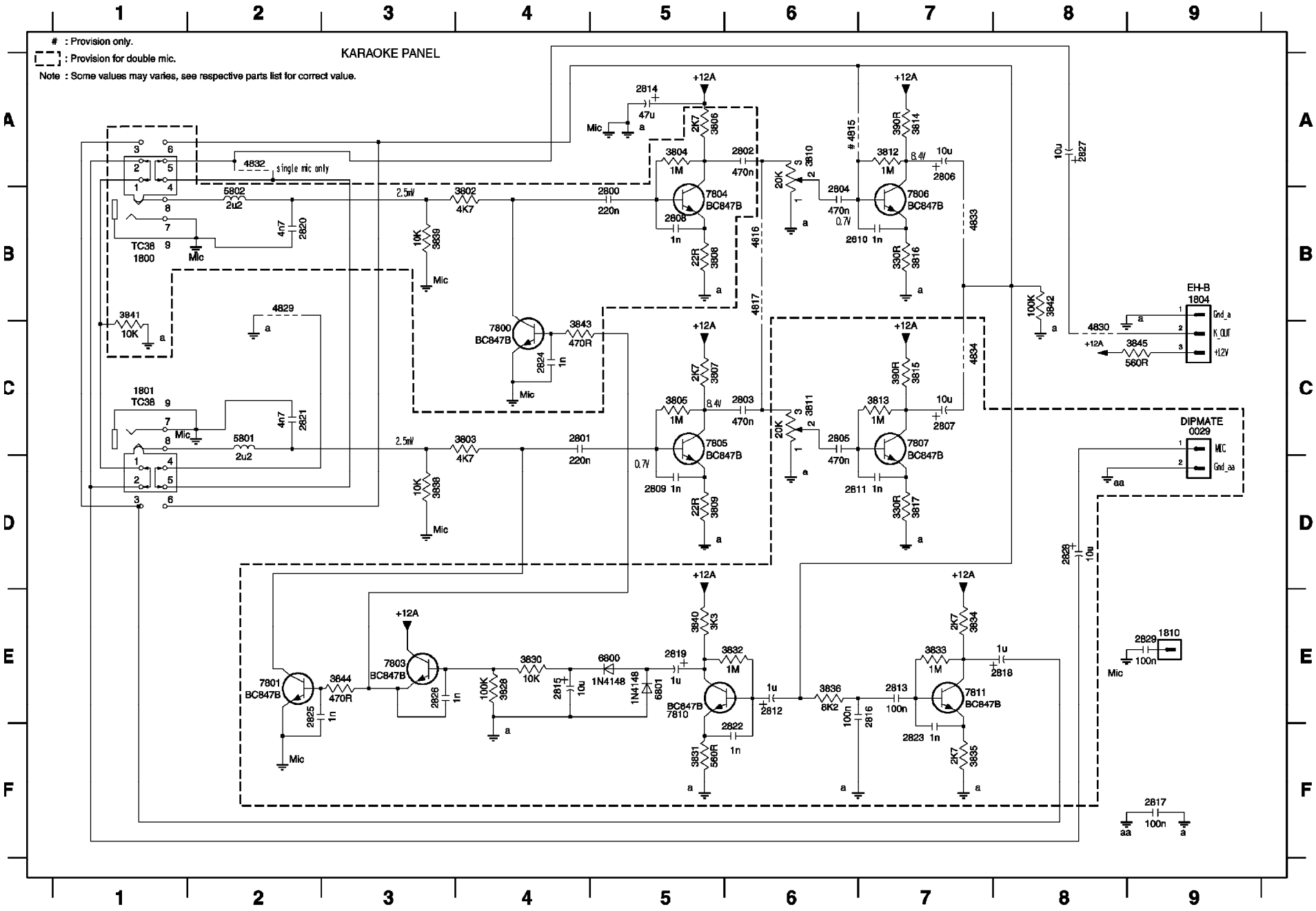
All Models (1941) - FRONT BOARD SCHEMATIC DIAGRAM



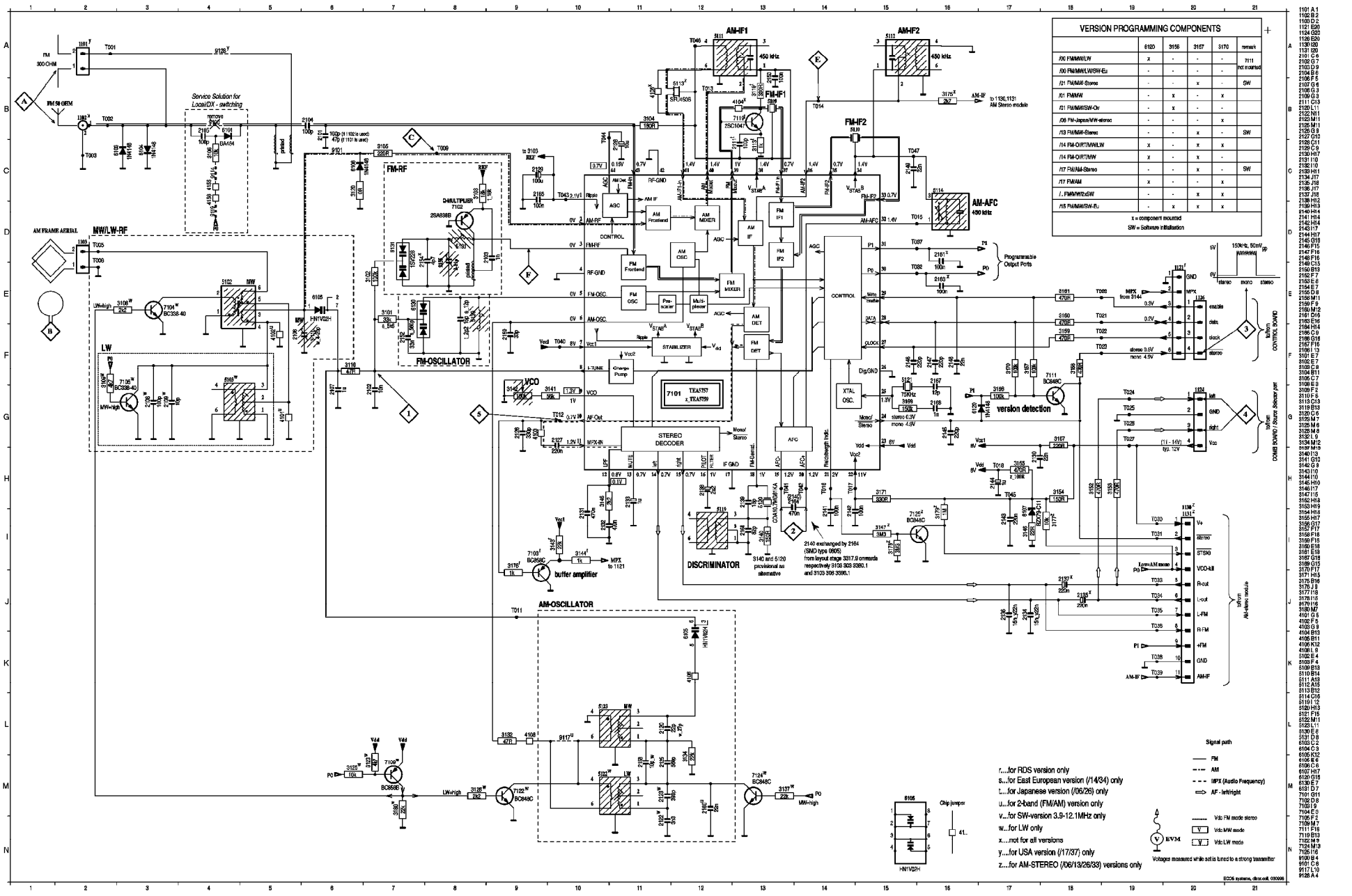

1
2
3
CDC KEY CONTROL
TO FRONT BOARD
1480
Gnd
CD1
CD2
CD3
P16
CDC
KEY2
KEY1
KEY0
9
8
7
6
5
4
3
2
1
FE-ST-VK-N
3600
270R
3601
270R
3602
270R
6500
6501
6502
DISC 1
DISC 2
DISC 3
CD DISC
1481
D/C
1482
CD1
1483
CD2
1484
CD3
1485
A
B
Note : Some values may varies, see respective parts list for correct value.

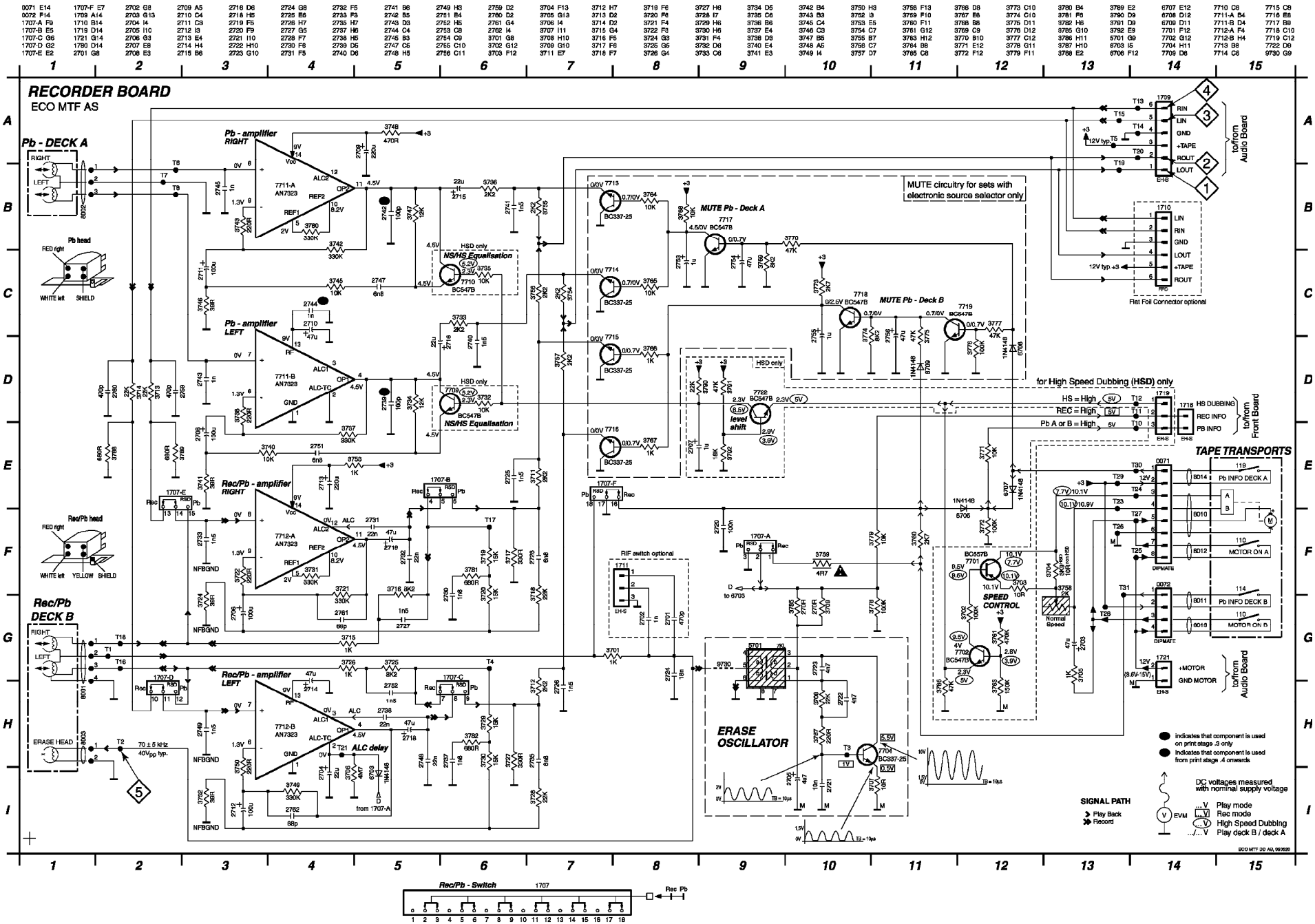

1
2
Standby LED Circuit
22
LED +
LED -
1
2
DIPMATE
3620
180R
6520
Standby LED
A

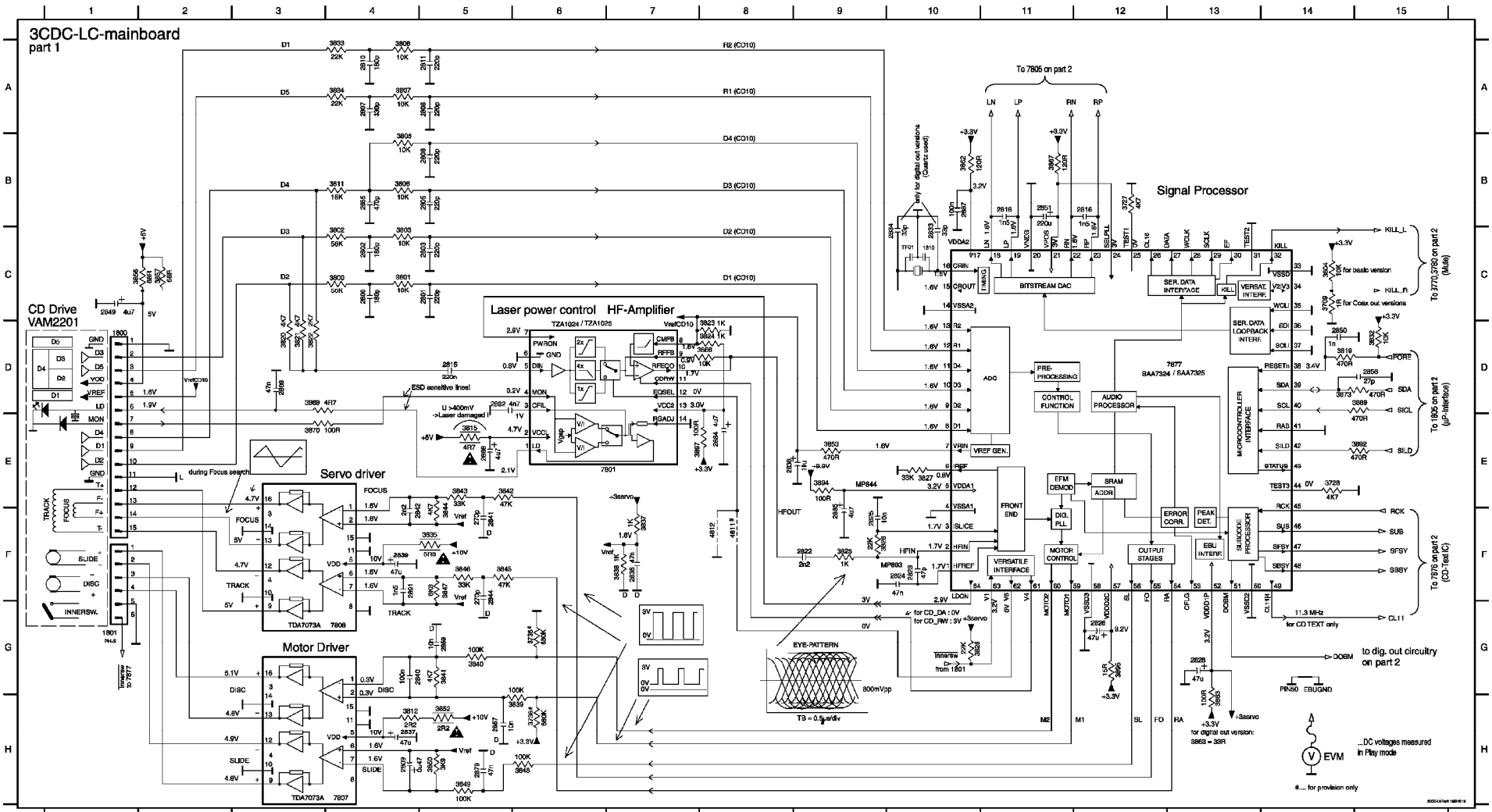
0029 C9	1810 E9	2803 C6	2807 C7	2811 D6	2815 E4	2819 E5	2823 F7	2827 A8	3803 C4	3807 C5	3811 C6	3815 C7	3830 E4	3834 E7	3839 B3	3843 C4	4816 B6	4832 A2	5802 B2	7801 E2	7806 B7	
1800 B1	2800 B5	2804 B6	2808 B5	2812 E6	2816 E7	2820 B2	2824 C4	2828 D8	3804 A5	3808 B5	3812 A7	3816 B7	3831 F5	3835 F7	3840 E5	3844 E3	4817 B6	4833 B7	6800 E5	7803 E3	7807 C7	
1801 C1	2801 C4	2805 C6	2809 D5	2813 E7	2817 F9	2821 C2	2825 E2	2829 E9	3805 C5	3809 D5	3813 C7	3817 D7	3832 E6	3836 E6	3841 B1	3845 C9	4829 B2	4834 C7	6801 E5	7804 B5	7810 E5	
1804 B9	2802 A6	2806 A7	2810 B6	2814 A5	2818 E8	2822 F6	2826 E3	3802 B4	3806 A5	3810 A6	3814 A7	3828 E4	3833 E7	3838 D3	3842 B8	4815 A6	4830 C8	5801 C2	7800 C4	7805 C5	7811 E7	



TUNER BOARD ECO5 / Systems




RECORDER BOARD
ECO MTF AS
Pb - DECK A
Rec/Pb DECK B
Pb - amplifier RIGHT
Pb - amplifier LEFT
Rec/Pb - amplifier RIGHT
Rec/Pb - amplifier LEFT
MUTE Pb - Deck A
MUTE Pb - Deck B
MUTE circuitry for sets with electronic source selector only
NS/HS Equalisation
HSD only
for High Speed Dubbing (HSD) only
level shift
ALC delay
ERASE OSCILLATOR
SPEED CONTROL
TAPE TRANSPORTS
RIF switch optional
Rec/Pb - Switch
Flat Foil Connector optional
to/from Audio Board
to/from Front Board
SIGNAL PATH
Play Back
Record
Play mode
Rec mode
High Speed Dubbing
Play deck B / deck A
ECO MTF 2D A3, 060620



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2858 A10 2860 A10 2861 B10 2862 B9 2863 B8 2864 B3
2865 C4 2867 A9 2872 G10 2873 D6 2875 E8 2876 C8
2877 F11 2878 F11 2881 F8 2882 B10 2893 F12 3700 H2
3705 G4 3706 G4 3707 G4 3708 G4 3711 G5 3712 B4
3713 F8 3714 F8 3715 G8 3716 B3 3717 B3 3718 G3
3730 G2 3731 G2 3732 G2 3733 G2 3734 G2 3740 A7
3741 A7 3742 B7 3743 A7 3744 A9 3746 B10 3750 B7
3751 C7 3770 A11 3771 A12 3775 A12 3780 B11 3781 B12
3782 B12 3809 B2 3814 C12 3831 F4 3851 D6 3854 A11
3855 B11 3858 A11 3859 B11 3860 B8 3861 B8 3864 A7
3868 C4 3871 F12 3874 B13 3875 C12 3876 C11 3881 E7
3882 C7
3877 F12 3878 E12 3879 D7 3880 E8 3886 E7 3887 D6 3888 F12
3883 D6 3884 D6 3885 C6 3888 E7 3889 D12 4803 B4
3890 F11 3891 F11 3893 F11 3895 F6 3899 D12
4813 G14 4527 G14 4849 G13 4526 C13 5802 B4 6871 E8
4813 G14 6872 E8 6873 E8 6874 G7 6875 F8 6878 C13 6877 D12
6878 E8 6879 G4 7805-A A10 7856 B A9 7812 G8 7850 A12
7851 A13 7860 B12 7861 B13 7871 C5 7873 C9 7874 C12
7875 C12 7876 G3 MP721 C8 MP723 C8 MP724 D8
MP725 D8 MP726 D8 MP740 H14 MP741 G14 MP742 G14
MP803 F10 MP804 G14 MP805 E13 MP806 F13 MP807 F14 MP808 E13
MP810 F13 MP811 F13 MP822 E3 MP823 D3 MP824 D4 MP825 D4
MP830 A9 MP832 G9 MP833 F13 MP834 G14 MP835 F14 MP854 A13
MP856 E14 MP857 B13 MP858 F8 MP859 C12 MP860 G3 MP861 D5
MP862 G11 MP863 C11 MP871 D6 MP874 D12 MP886 G5 MP889 G5
MP882 G2 MP886 G3 MP887 H5 MP888 D13 MP889 E14
MP891 B5 MP892 B5 MP897 D12 MP899 E14

3CDC-LC-mainboard
part 2

digital out circuitry (not for all versions)

CD-Text circuitry (not for all versions)

Changer Control logic

BASIC VERSION (15 Pin)

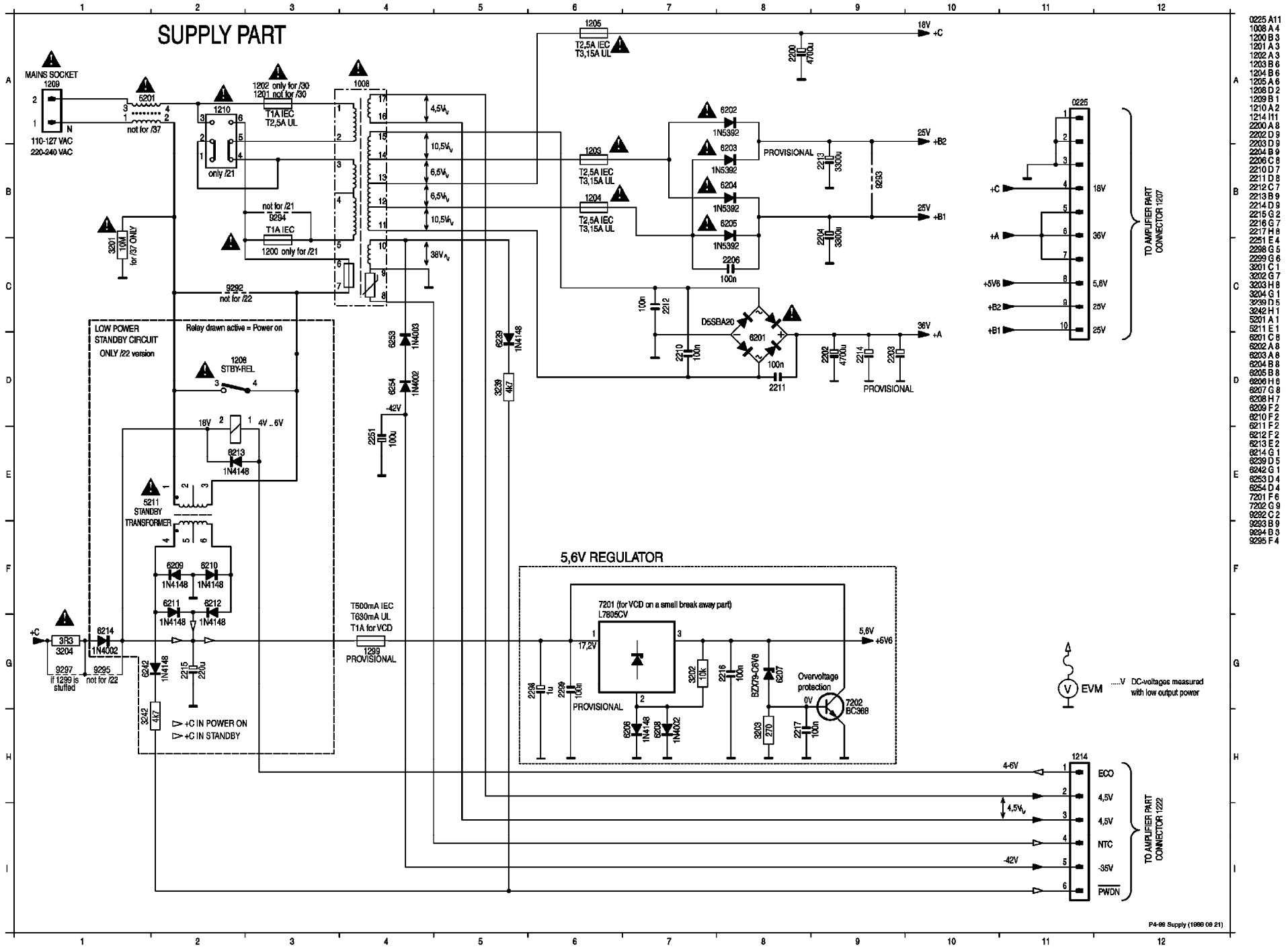
CD-TEXT (23 Pin) DIGout (19 Pin)

to combi-board

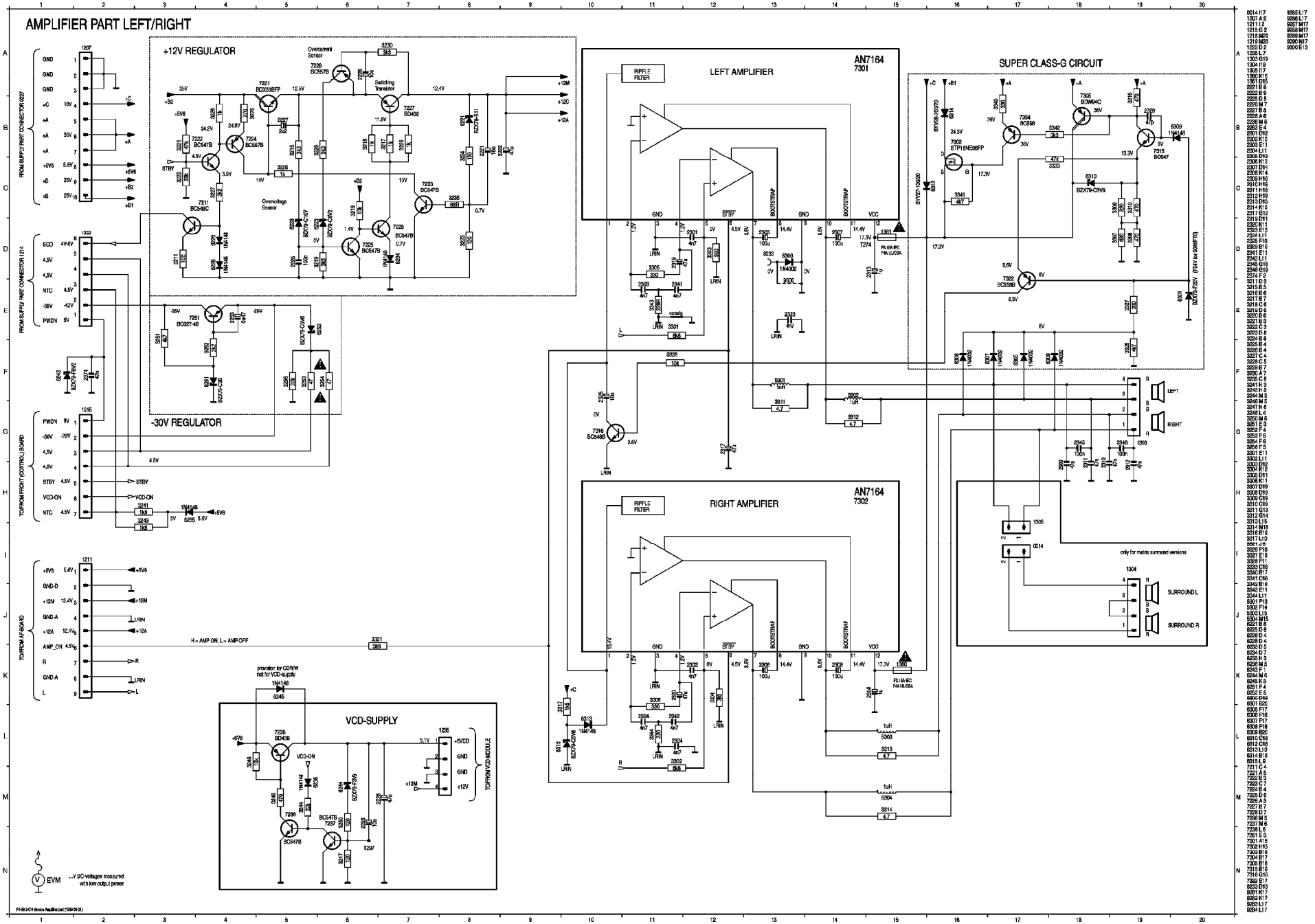
CD-TEXT INFO

Output enable delay circuitry

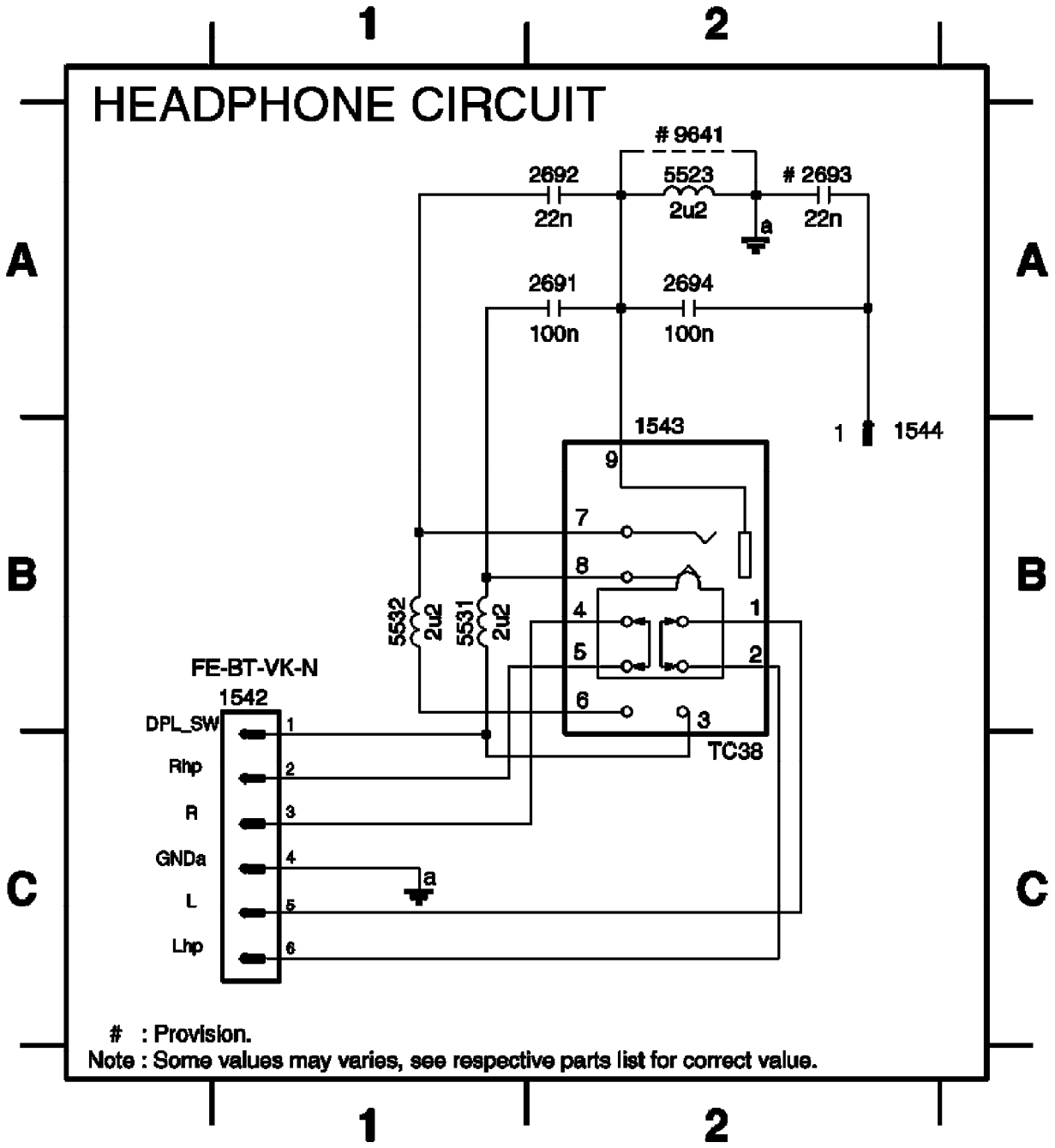
EVM ...DC voltages measured in Play mode



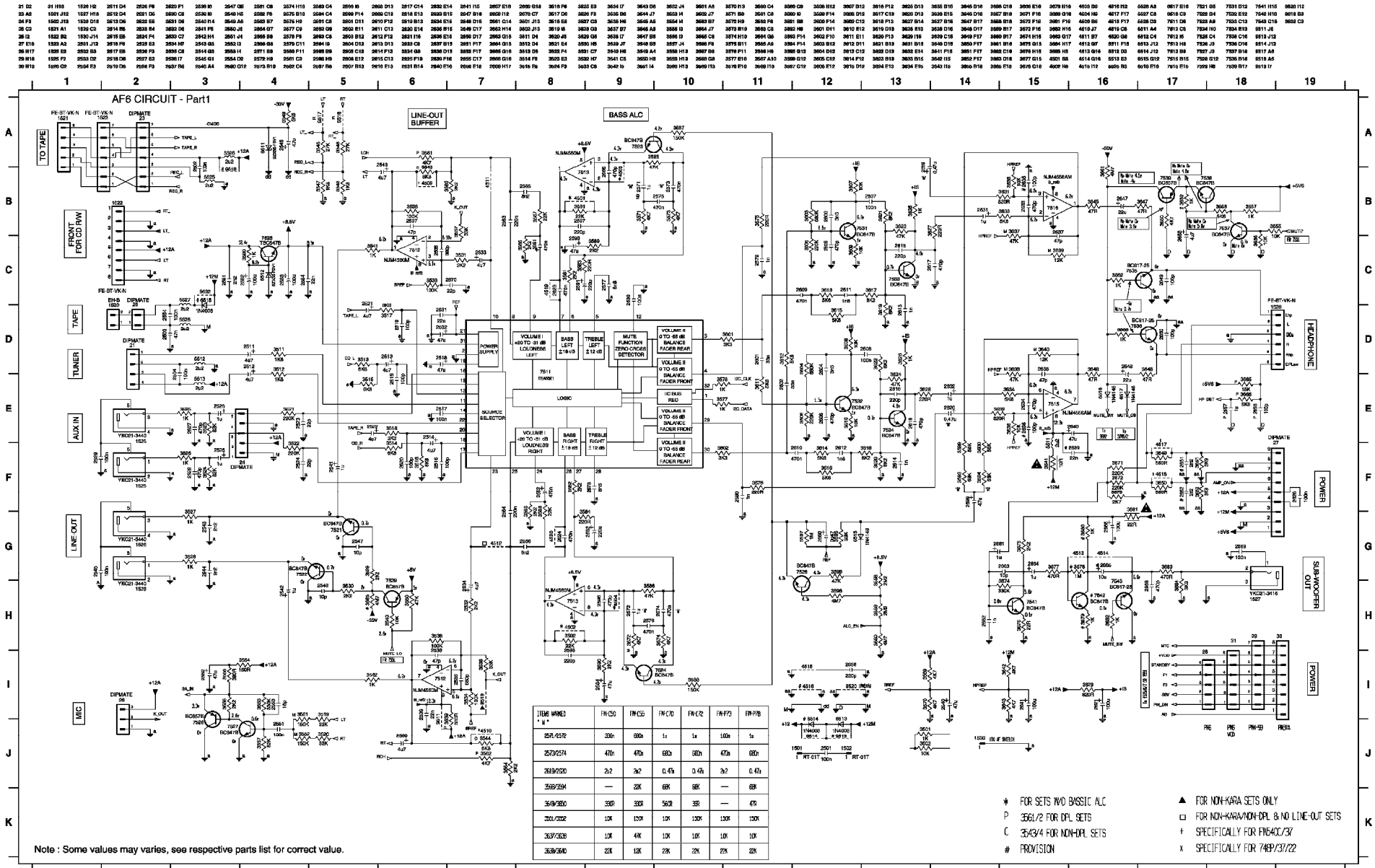
0225 A11
1006 A 4
1200 B 3
1201 A 3
1202 A 3
1203 B 6
1204 B 6
1205 A 6
1208 D 2
1209 B 1
1210 A 2
1214 I11
2200 A 8
2202 D 9
2203 D 9
2204 B 9
2206 C 8
2210 D 7
2211 D 8
2212 C 7
2213 B 9
2214 D 9
2215 G 2
2216 G 7
2217 H 8
2251 E 4
2298 G 5
2299 G 6
3201 C 1
3202 G 7
3203 H 8
3204 G 1
3239 D 5
3242 H 1
5201 A 1
5211 E 1
6201 C 8
6202 A 8
6203 A 8
6204 B 8
6205 B 8
6206 H 6
6207 G 8
6208 H 7
6209 F 2
6210 F 2
6211 F 2
6212 F 2
6213 E 2
6214 G 1
6239 D 5
6242 G 1
6253 D 4
6254 D 4
7201 F 6
7202 G 9
9292 C 2
9293 B 9
9294 B 3
9295 F 4


AMPLIFIER PART LEFT/RIGHT
+12V REGULATOR
-30V REGULATOR
LEFT AMPLIFIER
RIGHT AMPLIFIER
AN7164
7301
AN7164
7302
SUPER CLASS-G CIRCUIT
VCD-SUPPLY
FROM SUPPLY PART CONNECTOR 6027
FROM SUPPLY PART CONNECTOR 1214
TO/FROM FRONT (CONTROL) BOARD
TO/FROM AF-BOARD
TO/FROM VCD-MODULE
LEFT
RIGHT
SURROUND L
SURROUND R
only for matrix surround versions
H = AMP ON, L = AMP OFF
provision for CDR/W not for VCD-supply
STBY
VCD-ON
EVM
...V DC-voltages measured with low output power

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

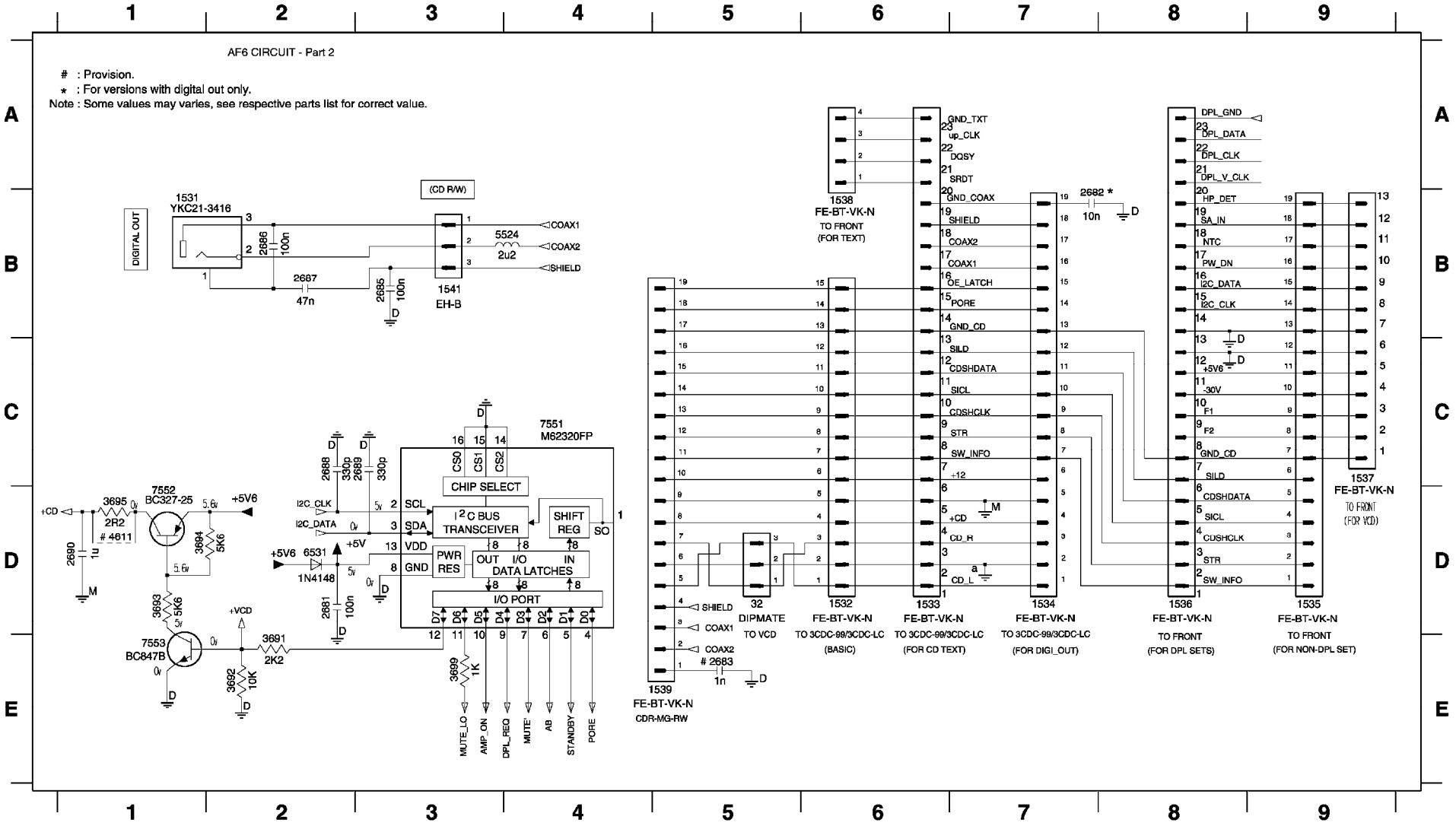


All Models (1941) - AF6 BOARD CIRCUIT DIAGRAM, PART 1

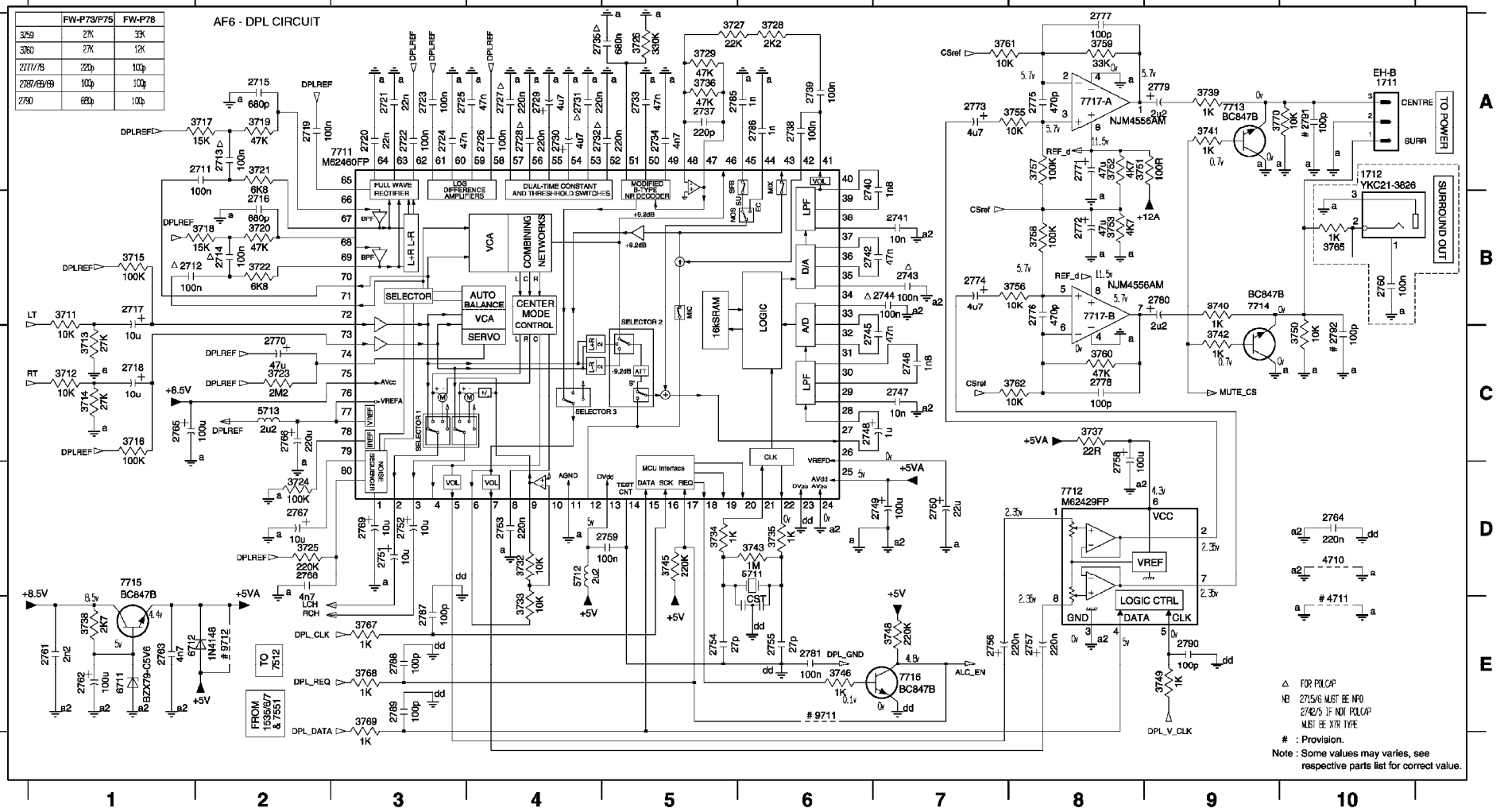


ITEMS MARKED * M *	FW-C50	FW-C55	FW-C70	FW-C72	FW-F73	FW-F75
2571/2572	330n	680n	1u	1u	100n	1u
2573/2574	470n	470n	680n	680n	470n	680n
2619/2620	2u2	2u2	0.47u	0.47u	2u2	0.47u
3569/3594	—	22K	68K	68K	—	68K
3649/3650	330	330	560	33	—	470
3201/3202	10K	120K	10K	120K	120K	120K
3637/3638	10K	44K	10K	10K	10K	10K
3639/3640	22K	12K	22K	22K	22K	22K

32 D5	1532 D6	1534 D7	1536 D8	1538 B6	1541 B3	2682 B7	2685 B3	2687 B2	2689 C3	3691 E2	3693 D1	3695 D1	4611 D1	6531 D2	7552 D1	
1531 B1	1533 D6	1535 D9	1537 C9	1539 E5	2681 D2	2683 E5	2686 B2	2688 C2	2690 D1	3692 E2	3694 D1	3699 E3	5524 B4	7551 C4	7553 E1	

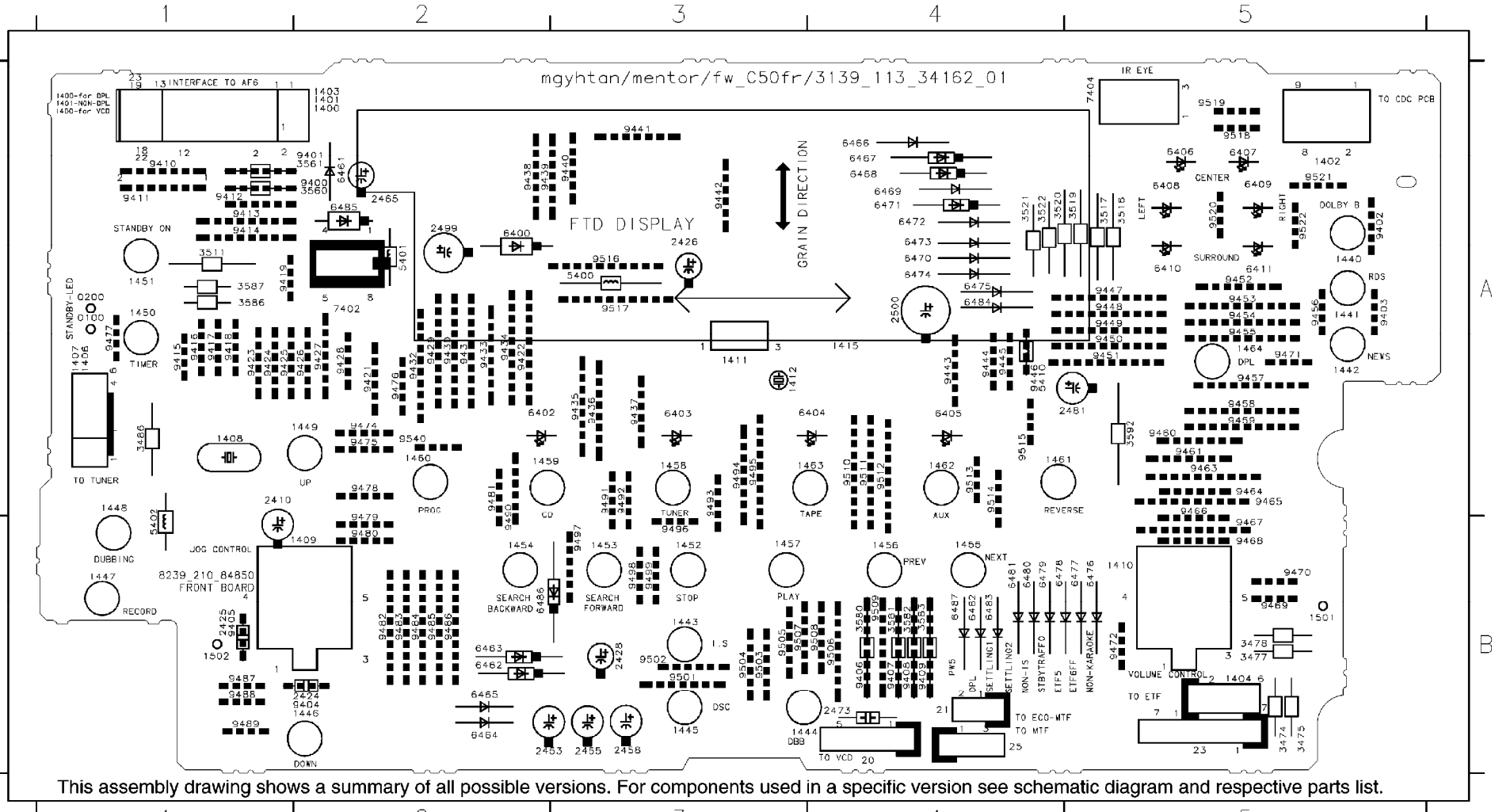


1711 A10	2717 B1	2725 A3	2733 A5	2742 B6	2750 D7	2758 C8	2766 C2	2774 B7	2785 A5	3711 B1	3719 A2	3727 A5	3737 C8	3746 E6	3756 B8	3767 E3	5713 C2	7716 E7
1712 A10	2718 C1	2726 A4	2734 A5	2743 B7	2751 D3	2759 D5	2767 D2	2775 A8	2786 A6	3712 C1	3720 B2	3728 A6	3738 E1	3748 E7	3757 A8	3768 E3	6711 E1	7717-A A8
2711 A2	2719 A2	2727 A4	2735 A4	2744 B7	2752 D3	2760 B10	2768 D2	2776 B8	2787 E3	3713 C1	3721 A2	3729 A5	3739 A9	3749 E9	3758 B8	3769 E3	6712 E1	7717-B B8
2712 B1	2720 A3	2728 A4	2737 A5	2745 C6	2753 D4	2761 E1	2769 D3	2777 A8	2788 E3	3714 C1	3722 B2	3732 D4	3740 B9	3750 C10	3759 A8	3770 A9	7711 A3	9711 E6
2713 A2	2721 A3	2729 A4	2738 A6	2746 C7	2754 E5	2762 E1	2770 C2	2778 C8	2789 E3	3715 B1	3723 C2	3733 E4	3741 A9	3751 A8	3760 C8	4710 D10	7712 D8	9712 E2
2714 B2	2722 A3	2730 A4	2739 A6	2747 C7	2755 E6	2763 E1	2771 A8	2779 A9	2790 E9	3716 C1	3724 D2	3734 D5	3742 C9	3752 A8	3761 A7	4711 E10	7713 A9	
2715 A2	2723 A3	2731 A4	2740 A6	2748 C6	2756 E7	2764 D10	2772 B8	2780 B9	2791 A10	3717 A2	3725 D2	3735 D6	3743 D6	3753 B8	3762 C8	5711 D6	7714 B9	
2716 B2	2724 A3	2732 A4	2741 B7	2749 D7	2757 E8	2765 C1	2773 A7	2781 E6	2792 C10	3718 B2	3726 A5	3736 A5	3745 D5	3755 A8	3765 B10	5712 D4	7715 D1	



All Models (1941) - FRONT BOARD CBA (TOP VIEW)

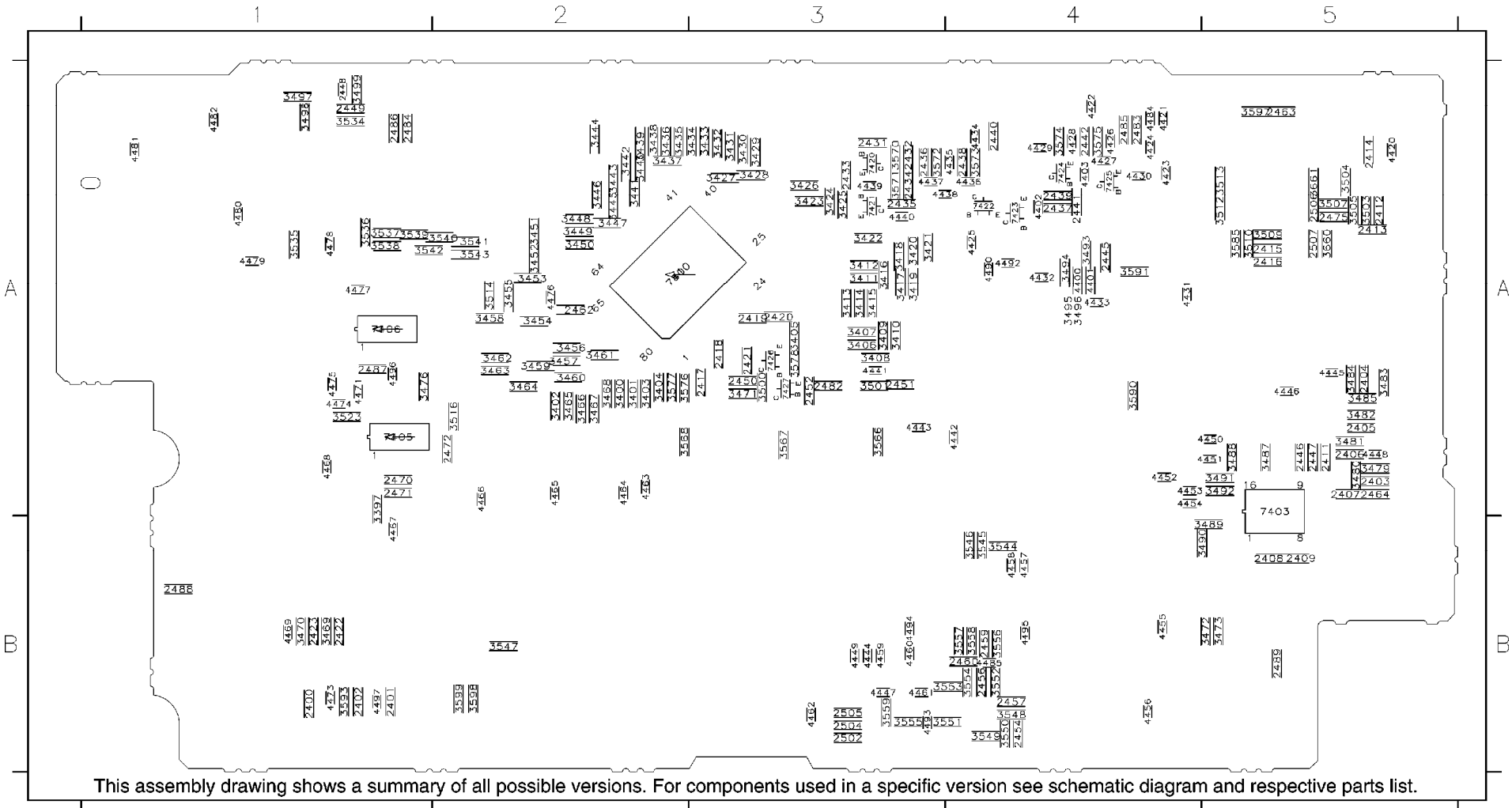
20 B4	1408 A1	1447 B1	1460 A2	2455 B3	3517 A5	3587 A1	6408 A5	6470 A4	6483 B4	9406 B4	9419 A1	9433 A2	9446 A4	9459 A5	9474 A2	9487 B1	9501 B3	9514 A4			
21 B4	1409 B2	1448 A1	1461 A4	2458 B3	3518 A5	3592 A5	6409 A5	6471 A4	6484 A4	9407 B4	9421 A2	9434 A2	9447 A5	9460 A5	9475 A2	9488 B1	9502 B3	9515 A3			
23 B5	1410 B5	1449 A2	1462 A4	2465 A2	3519 A5	5400 A3	6410 A5	6472 A4	6485 A2	9408 B4	9422 A2	9435 A3	9448 A5	9461 A5	9476 A2	9489 B1	9503 B3	9516 A3			
25 B4	1411 A3	1450 A1	1463 A4	2473 B4	3520 A4	5401 A2	6411 A5	6473 A4	6486 B2	9409 B4	9423 A1	9436 A3	9449 A5	9463 A5	9477 A1	9490 B2	9504 B3	9517 A3			
0100 A1	1412 A3	1451 A1	1464 A5	2481 A5	3521 A4	5402 B1	6461 A2	6474 A4	6487 B4	9410 A1	9424 A1	9437 A3	9450 A5	9464 A5	9478 A2	9491 A3	9505 B3	9518 A5			
0200 A1	1415 A4	1452 B3	1501 B5	2499 A2	3522 A4	5410 A4	6462 B2	6475 A4	7402 A2	9411 A1	9425 A1	9438 A2	9451 A5	9465 A5	9479 B2	9492 A3	9506 B4	9519 A5			
1400 A2	1440 A5	1453 B3	1502 B1	2500 A4	3560 A2	6400 A2	6463 B2	6476 B5	7404 A5	9412 A1	9426 A2	9439 A2	9452 A5	9466 A5	9480 B2	9493 A3	9507 B3	9520 A5			
1401 A2	1441 A5	1454 B2	2410 A1	3474 B5	3561 A2	6402 A2	6464 B2	6477 B5	9400 A2	9413 A1	9427 A2	9440 A3	9453 A5	9467 B5	9481 A2	9494 A3	9508 B4	9521 A5			
1402 A5	1442 A5	1455 B4	2424 B2	3475 B5	3580 B4	6403 A3	6465 B2	6478 B4	9401 A2	9414 A1	9428 A2	9441 A3	9454 A5	9468 B5	9482 B2	9495 A3	9509 B4	9522 A5			
1403 A2	1443 B3	1456 B4	2425 B1	3477 B5	3581 B4	6404 A4	6466 A4	6479 B4	9402 A5	9415 A1	9429 A2	9442 A3	9455 A5	9469 B5	9483 B2	9496 B3	9510 A4	9540 A2			
1404 B5	1444 B3	1457 B3	2426 A3	3478 B5	3582 B4	6405 A4	6467 A4	6480 B4	9403 A5	9416 A1	9430 A2	9443 A4	9456 A5	9470 B5	9484 B2	9497 B3	9511 A4				
1406 A1	1445 B3	1458 A3	2428 B3	3486 A1	3583 B4	6406 A5	6468 A4	6481 B4	9404 B2	9417 A1	9431 A2	9444 A4	9457 A5	9471 A5	9485 B2	9498 B3	9512 A4				
1407 A1	1446 B2	1459 A2	2453 B2	3511 A1	3586 A1	6407 A5	6469 A4	6482 B4	9405 B1	9418 A1	9432 A2	9445 A4	9458 A5	9472 B5	9486 B2	9499 B3	9513 A4				



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

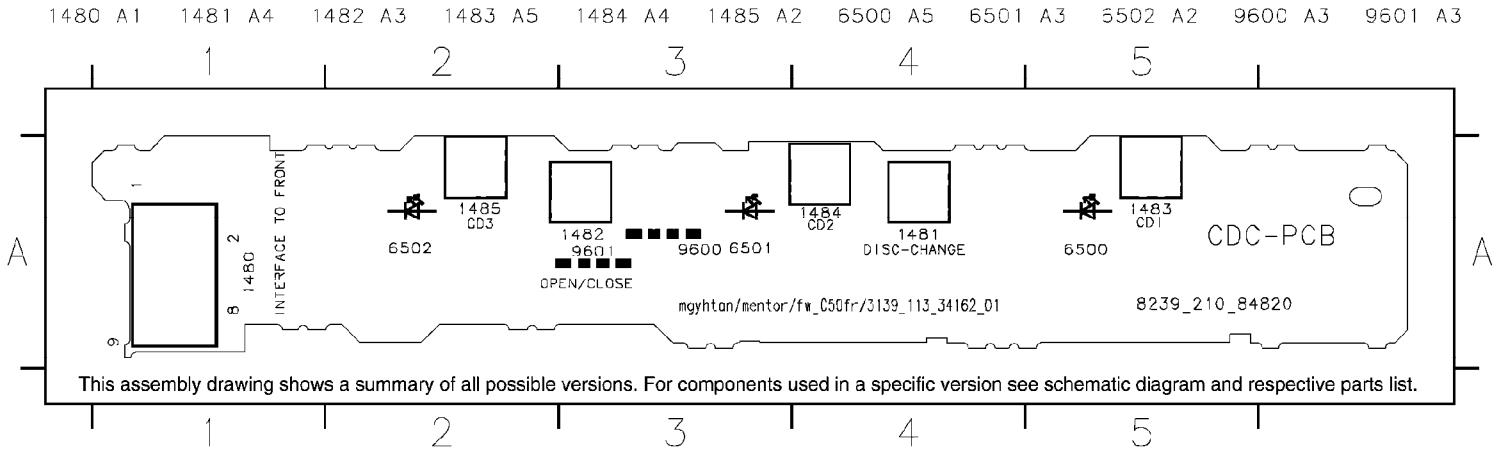
All Models (1941) - FRONT BOARD CBA (BOTTOM VIEW)

2400 B1	2418 A3	2442 A4	2470 A1	3397 A1	3416 A3	3433 A3	3450 A2	3467 A2	3489 B5	3509 A5	3544 B4	3567 A3	3599 B2	4430 A4	4447 B3	4464 A2	4484 A4	7424 A4			
2401 B1	2419 A3	2445 A4	2471 A1	3400 A2	3417 A3	3434 A3	3451 A2	3468 A2	3490 B5	3510 A5	3545 B4	3568 A2	3660 A5	4431 A4	4448 A5	4465 A2	4485 B4	7425 A4			
2402 B1	2420 A3	2446 A5	2472 A2	3401 A2	3418 A3	3435 A2	3452 A2	3469 B1	3491 A5	3512 A5	3546 B4	3570 A3	3661 A5	4432 A4	4449 B3	4466 A2	4490 A4	7426 A3			
2403 A5	2421 A3	2447 A5	2475 A5	3402 A2	3419 A3	3436 A2	3453 A2	3470 B1	3492 A5	3513 A5	3547 B2	3571 A3	4400 A4	4433 A4	4450 A5	4467 B1	4492 A4	7427 A3			
2404 A5	2422 B1	2448 A1	2482 A3	3403 A2	3420 A3	3437 A2	3454 A2	3471 A3	3493 A4	3514 A2	3548 B4	3572 A3	4401 A4	4434 A4	4451 A5	4468 A1	4493 B3				
2405 A5	2423 B1	2449 A1	2483 A4	3404 A2	3421 A3	3438 A2	3455 A2	3472 B5	3494 A4	3516 A2	3549 B4	3573 A4	4402 A4	4435 A4	4452 A4	4469 B1	4494 B3				
2406 A5	2431 A3	2450 A3	2484 A1	3405 A3	3422 A3	3439 A2	3456 A2	3473 B5	3495 A4	3523 A1	3550 B4	3574 A4	4403 A4	4436 A4	4453 A4	4471 A1	4495 B4				
2407 A5	2432 A3	2451 A3	2485 A4	3406 A3	3423 A3	3440 A2	3457 A2	3476 A1	3496 A4	3534 A1	3551 B4	3575 A4	4420 A5	4437 A3	4454 A4	4473 B1	4496 A1				
2408 B5	2433 A3	2452 A3	2486 A1	3407 A3	3424 A3	3441 A2	3458 A2	3479 A5	3497 A1	3535 A1	3552 B4	3576 A2	4421 A4	4438 A4	4455 B4	4474 A1	4497 B1				
2409 B5	2434 A3	2454 B4	2487 A1	3408 A3	3425 A3	3442 A2	3459 A2	3480 A5	3498 A1	3536 A1	3553 B4	3577 A2	4422 A4	4439 A3	4456 B4	4475 A1	7400 A2				
2411 A5	2435 A3	2456 B4	2488 B1	3409 A3	3426 A3	3443 A2	3460 A2	3481 A5	3499 A1	3537 A1	3554 B4	3578 A3	4423 A4	4440 A3	4457 B4	4476 A2	7403 A5				
2412 A5	2436 A3	2457 B4	2489 B5	3410 A3	3427 A3	3444 A2	3461 A2	3482 A5	3500 A3	3538 A1	3555 B3	3585 A5	4424 A4	4441 A3	4458 B4	4477 A1	7405 A1				
2413 A5	2437 A4	2459 B4	2502 B3	3411 A3	3428 A3	3445 A2	3462 A2	3483 A5	3501 A3	3539 A1	3556 B4	3590 A4	4425 A4	4442 A4	4459 B3	4478 A1	7406 A1				
2414 A5	2438 A4	2460 B4	2504 B3	3412 A3	3429 A3	3446 A2	3463 A2	3484 A5	3503 A5	3540 A2	3557 B4	3591 A4	4426 A4	4443 A3	4460 B3	4479 A1	7420 A3				
2415 A5	2439 A4	2462 A2	2505 B3	3413 A3	3430 A3	3447 A2	3464 A2	3485 A5	3504 A5	3541 A2	3558 B4	3593 B1	4427 A4	4444 B3	4461 B3	4480 A1	7421 A3				
2416 A5	2440 A4	2463 A5	2506 A5	3414 A3	3431 A3	3448 A2	3465 A2	3487 A5	3505 A5	3542 A1	3559 B3	3597 A5	4428 A4	4445 A5	4462 B3	4481 A1	7422 A4				
2417 A3	2441 A4	2464 A5	2507 A5	3415 A3	3432 A3	3449 A2	3466 A2	3488 A5	3507 A5	3543 A2	3566 A3	3598 B2	4429 A4	4446 A5	4463 A2	4482 A1	7423 A4				

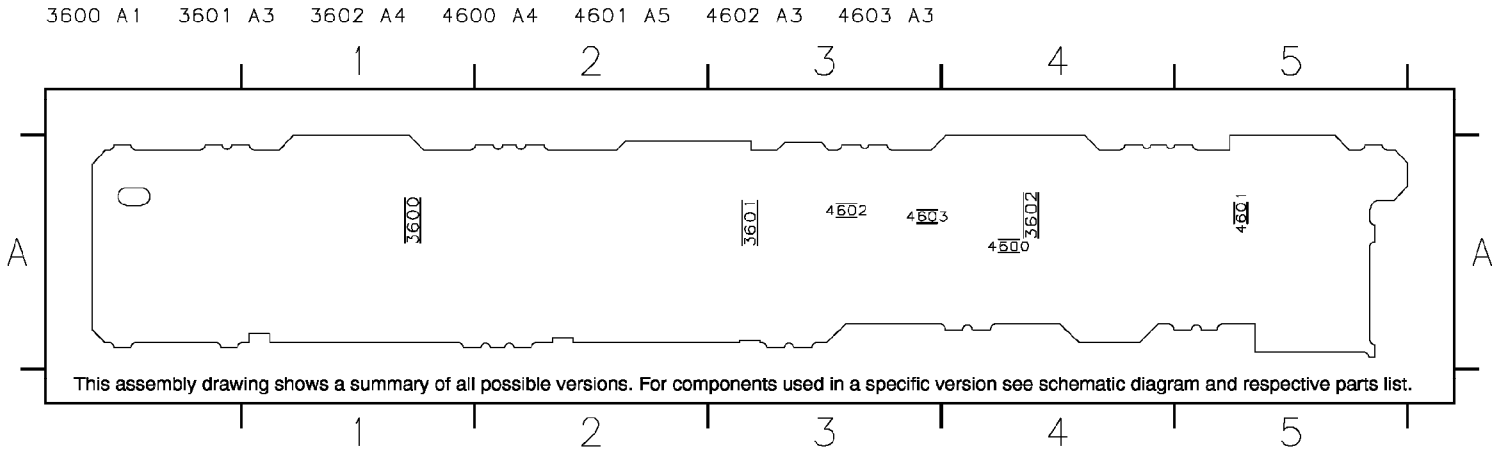


This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

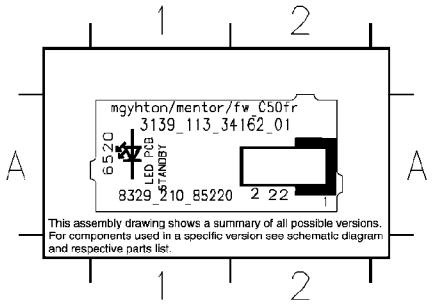
CDC KEYBOARD (TOP VIEW)



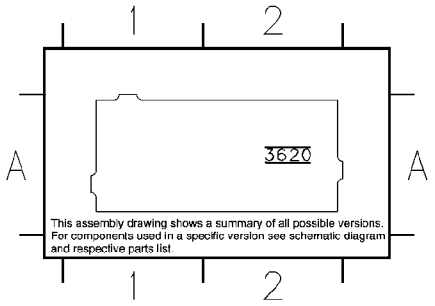
CD KEYBOARD (BOTTOM VIEW)

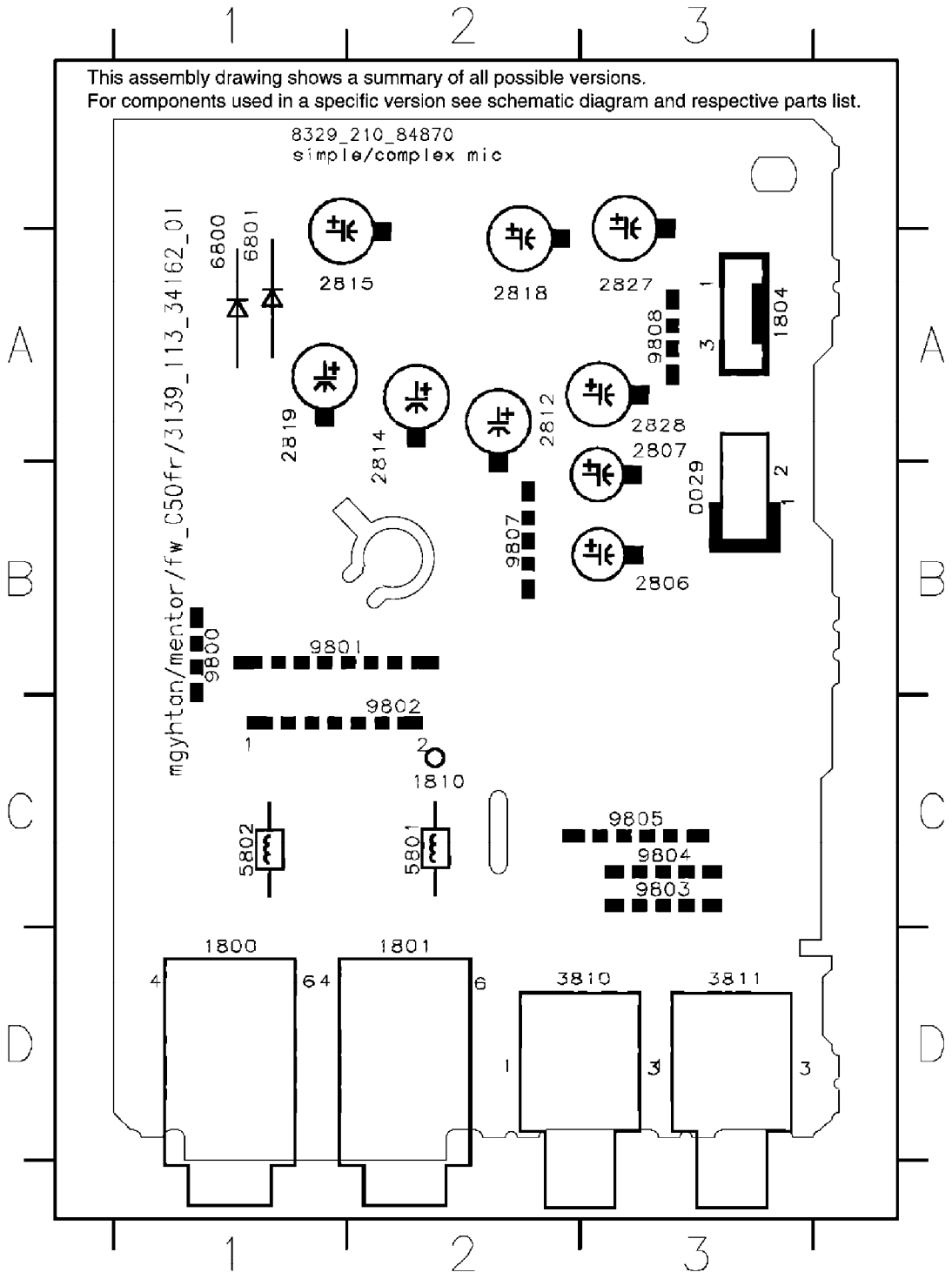


STANDBY LED (TOP VIEW)



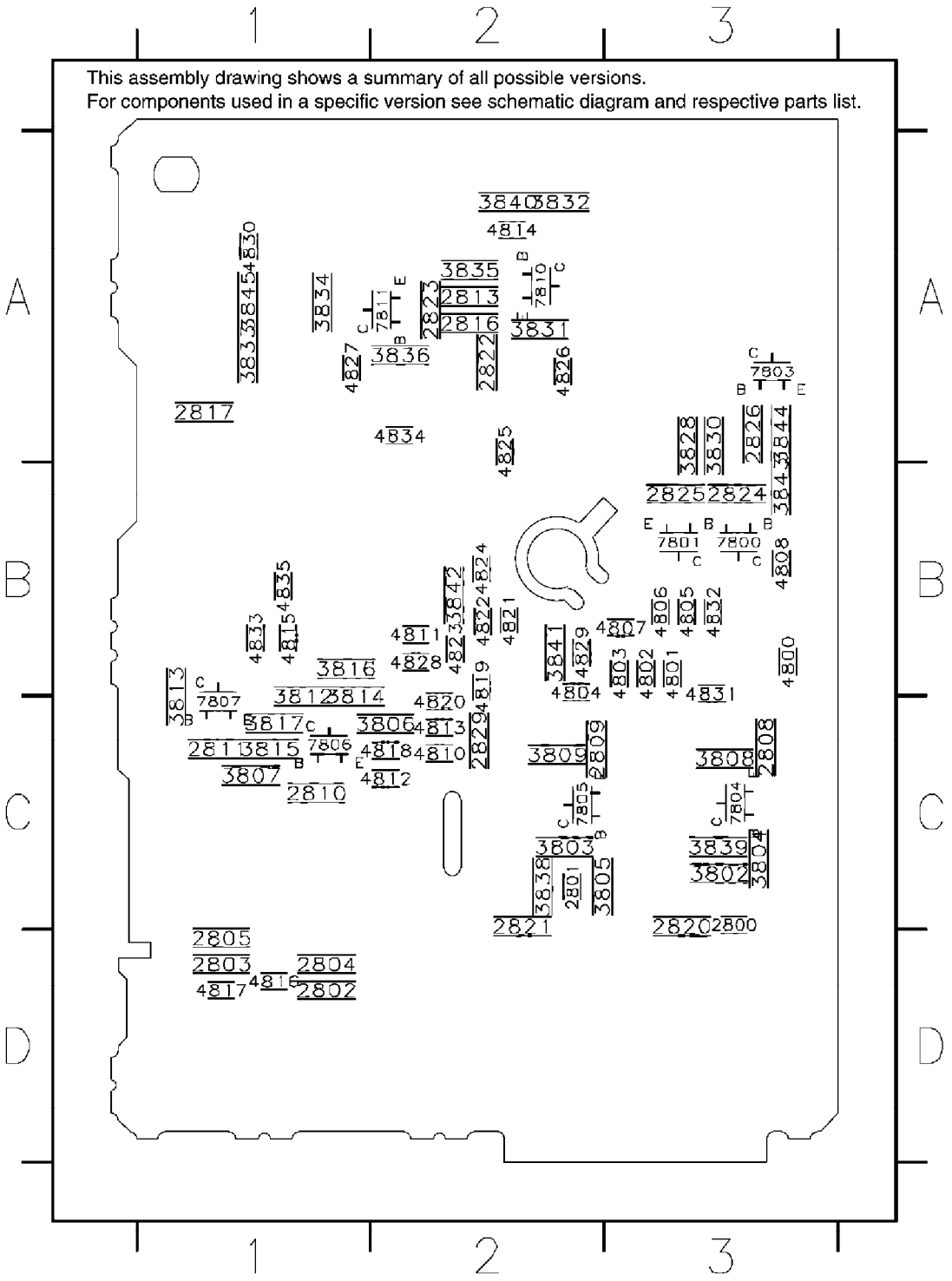
STANDBY LED (BOTTOM VIEW)





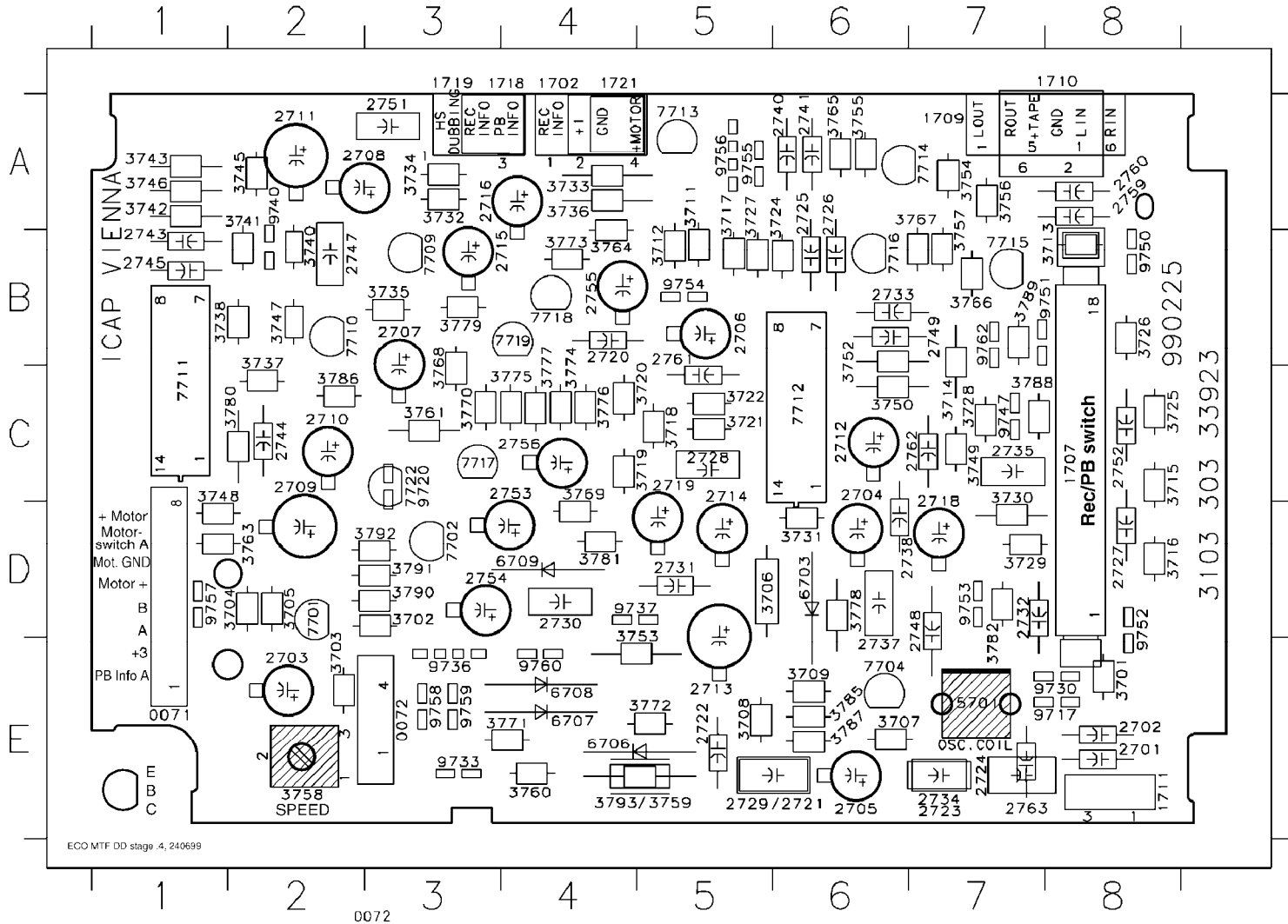
0029 B3
1800 D1
1801 D2
1804 A3
1810 C2
2806 B3
2807 A3
2812 A2
2814 A2
2815 A1
2818 A2
2819 A1
2827 A3
2828 A3
3810 D3
3811 D3
5801 C2
5802 C1
6800 A1
6801 A1
9800 B1
9801 B1
9802 C2
9803 C3
9804 C3
9805 C3
9807 B2
9808 A3

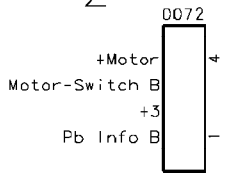
All Models (1941) - KARAOKE BOARD CBA (BOTTOM VIEW)



2800	C3	3843	B3
2801	C2	3844	A3
2802	D1	3845	A1
2803	D1	4800	B3
2804	D1	4801	B3
2805	D1	4802	B3
2808	C3	4803	B3
2809	C2	4804	B2
2810	C1	4805	B3
2811	C1	4806	B3
2813	A2	4807	B3
2816	A2	4808	B3
2817	A1	4810	C2
2820	C3	4811	B2
2821	C2	4812	C2
2822	A2	4813	C2
2823	A2	4814	A2
2824	B3	4815	B1
2825	B3	4816	D1
2826	A3	4817	D1
2829	C2	4818	C2
3802	C3	4819	B2
3803	C2	4820	C2
3804	C3	4821	B2
3805	C2	4822	B2
3806	C2	4823	B2
3807	C1	4824	B2
3808	C3	4825	A2
3809	C2	4826	A2
3812	C1	4827	A1
3813	C1	4828	B2
3814	C1	4829	B2
3815	C1	4830	A1
3816	B1	4831	B3
3817	C1	4832	B3
3828	A3	4833	B1
3830	A3	4834	A2
3831	A2	4835	B1
3832	A2	7800	B3
3833	A1	7801	B3
3834	A1	7803	A3
3835	A2	7804	C3
3836	A2	7805	C2
3838	C2	7806	C1
3839	C3	7807	C1
3840	A2	7810	A2
3841	B2	7811	A2
3842	B2		

RECORDER BOARD / componentside view

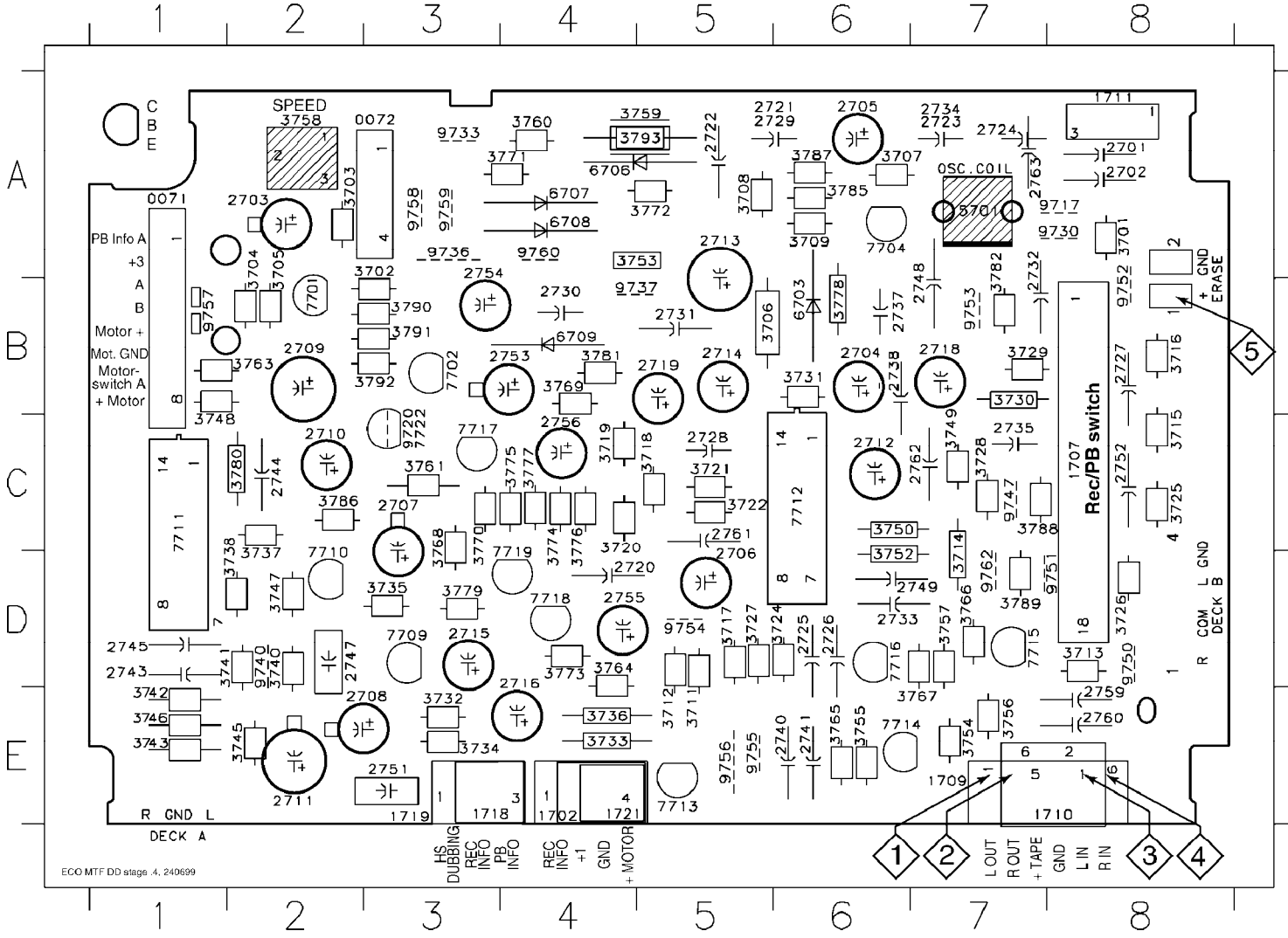




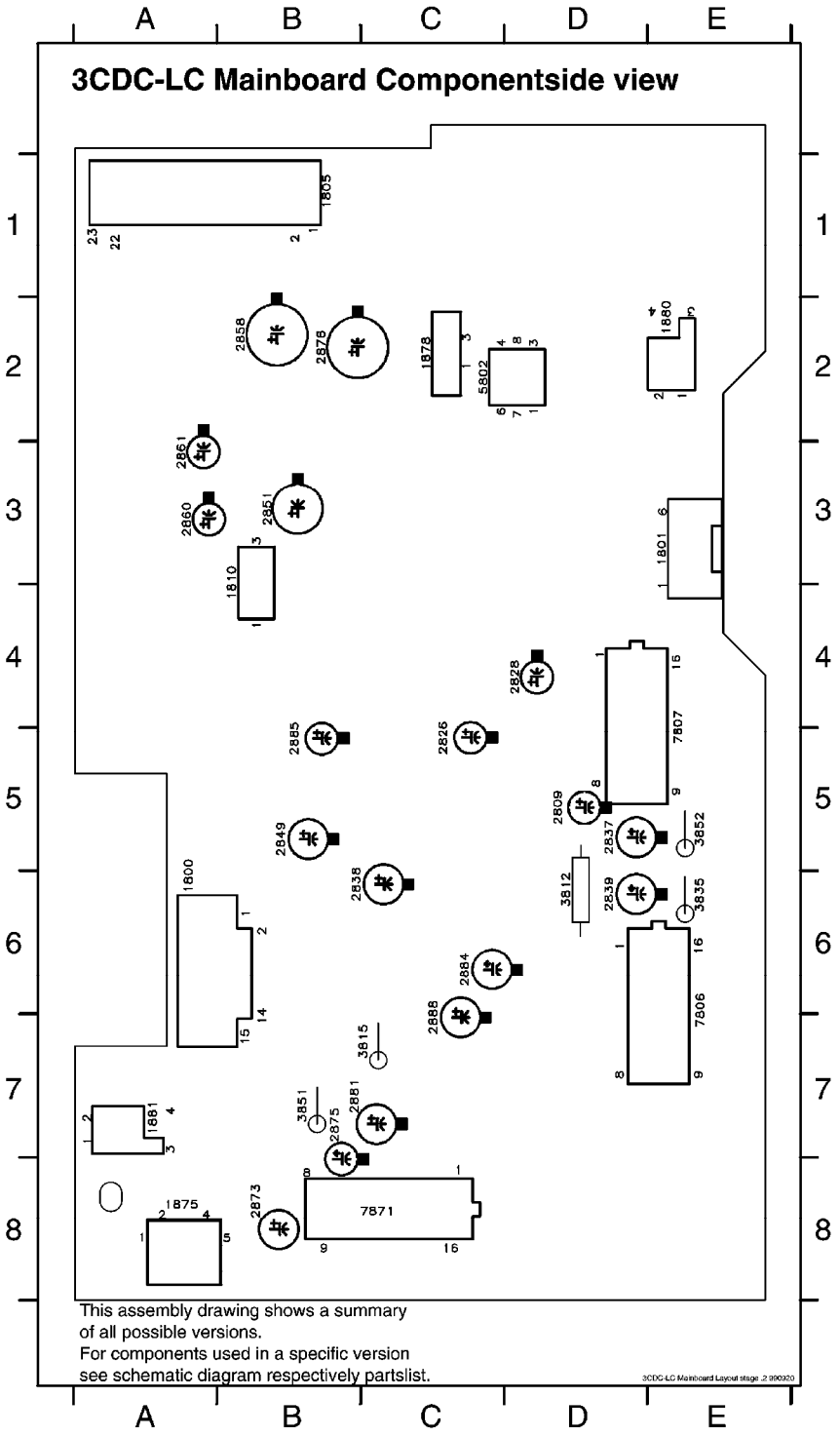
These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

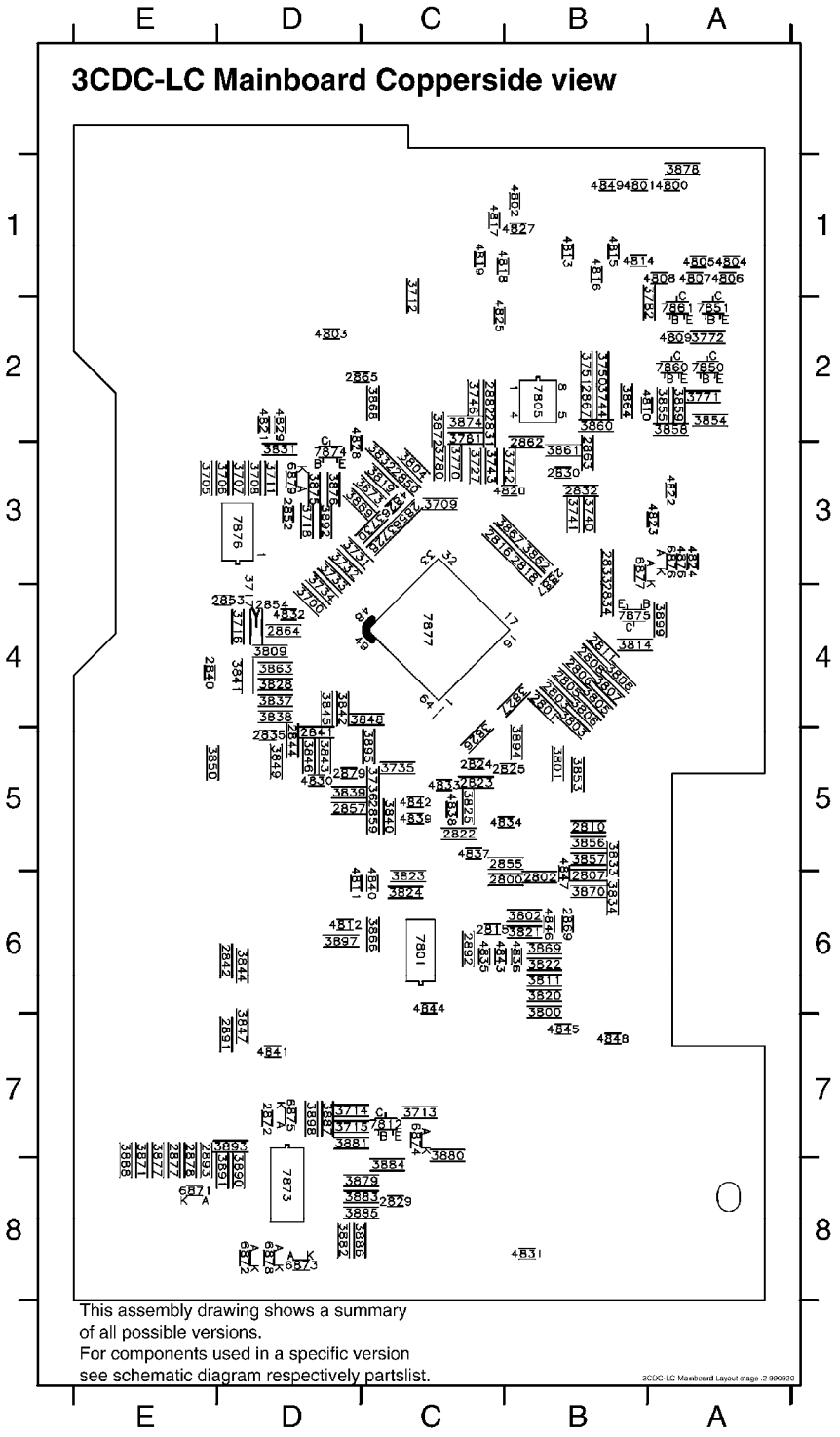
0071	E1	2744	C2	3735	B3	3789	B7
0072	E3	2745	A1	3736	A4	3790	D3
1702	A5	2747	B2	3737	B2	3791	D3
1707	B8	2748	D7	3738	B2	3792	D3
1709	A7	2749	B7	3740	B2	3793	E4
1710	A7	2751	A3	3741	A2	5701	E7
1711	E8	2752	C8	3742	B1	6703	D6
1719	A3	2753	D4	3743	B1	6706	E4
1721	A4	2754	D4	3745	A2	6707	E4
2701	E8	2755	B4	3746	A1	6708	E4
2702	E8	2756	C4	3747	B2	6709	D4
2703	E2	2759	A8	3748	C1	7701	D2
2704	C6	2760	A8	3749	C7	7702	D3
2705	E6	2761	B5	3750	C6	7704	E6
2706	B5	2762	C7	3752	B6	7709	B3
2707	B3	2763	E7	3753	D5	7710	B2
2708	A3	3701	E8	3754	A7	7711	C1
2709	D2	3702	D3	3755	A6	7712	B6
2710	C2	3703	E2	3756	A7	7713	A5
2711	A2	3704	D2	3757	B7	7714	A7
2712	C6	3705	D2	3758	E2	7715	B7
2713	E5	3706	D6	3759	E5	7716	B6
2714	D5	3707	E6	3760	E4	7717	C3
2715	B4	3708	E5	3761	C3	7718	B4
2716	A3	3709	E6	3763	D2	7719	B4
2718	D7	3711	A5	3764	B4	7722	C3
2719	D5	3712	B5	3765	A6	9717	E8
2720	B4	3713	B8	3766	B7	9720	C3
2721	E6	3714	C7	3767	A7	9730	E7
2722	E5	3715	C8	3768	C3	9733	E3
2723	E7	3716	D8	3769	C4	9736	E3
2724	E7	3717	B5	3770	C3	9737	D4
2725	A6	3718	C5	3771	E4	9740	B2
2726	A6	3719	C5	3772	E5	9747	C7
2727	D8	3720	C5	3773	B4	9750	B8
2728	C5	3721	C5	3774	C4	9751	B8
2729	E5	3722	C5	3775	C4	9752	D8
2730	D4	3724	A5	3776	C4	9753	D7
2731	D5	3725	C8	3777	C4	9754	B5
2732	D7	3726	B8	3778	D6	9755	A5
2733	B6	3727	A5	3779	B3	9756	A5
2734	E7	3728	C7	3780	C1	9757	D1
2735	C7	3729	D7	3781	D4	9758	E3
2737	E6	3730	C7	3782	E7	9759	E3
2738	D7	3731	D6	3785	E6	9760	E4
2740	A5	3732	A3	3786	C2	9762	B7
2741	A6	3733	A4	3787	E6		
2743	A1	3734	A3	3788	C7		

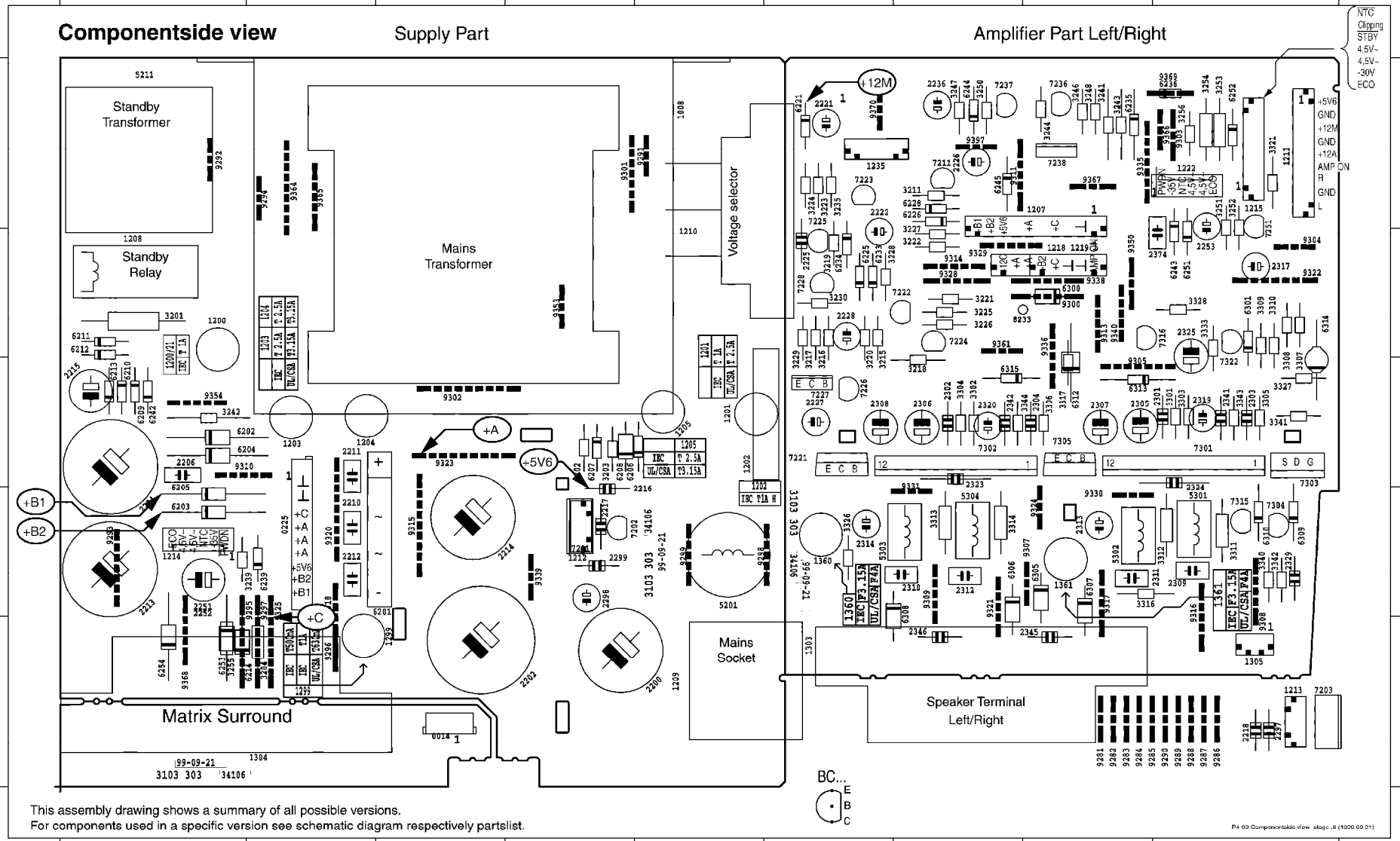
RECORDER BOARD / copperside view

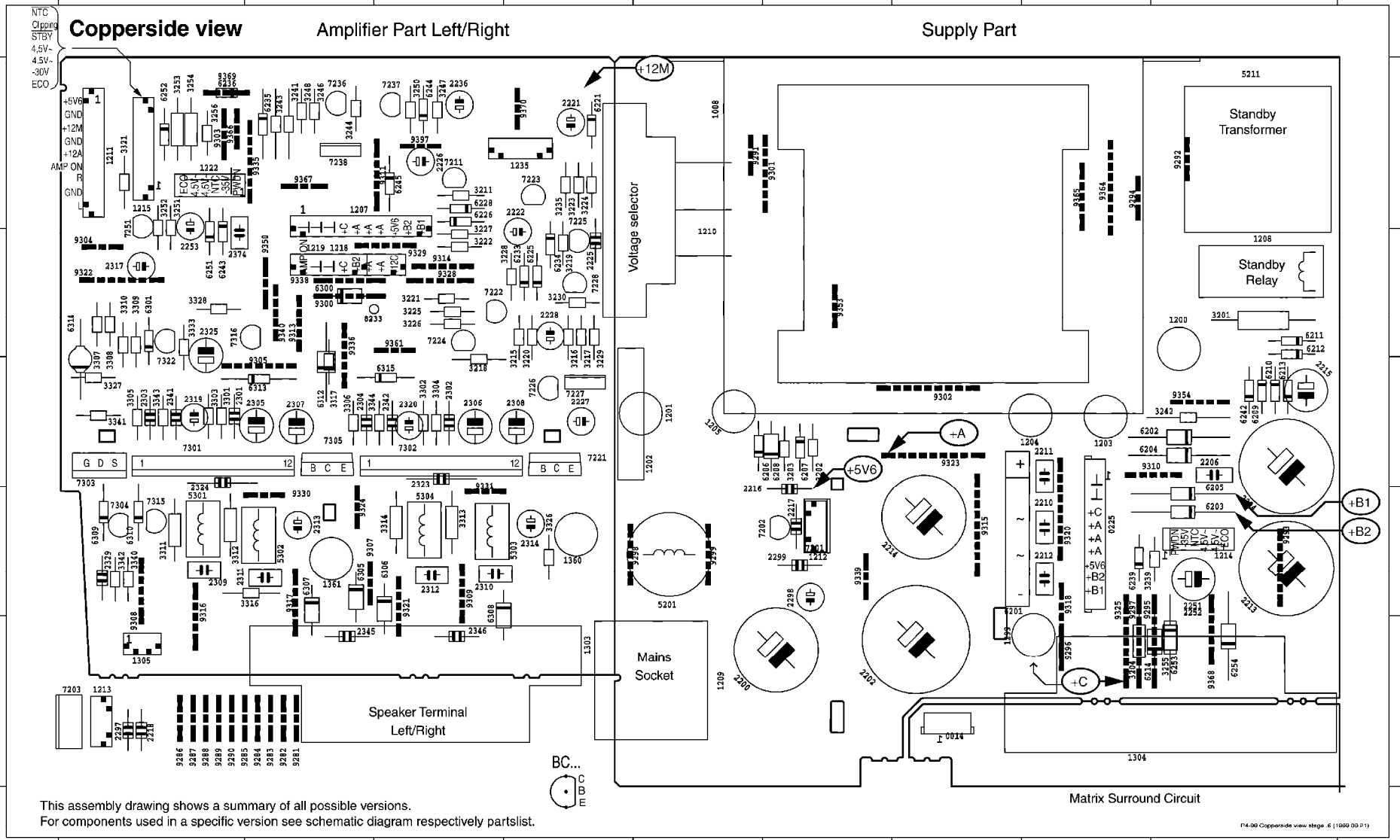


0071	B1	2744	C2	3735	D3	3789	D7
0072	A3	2745	E1	3736	E4	3790	B3
1702	E4	2747	D2	3737	D2	3791	B2
1707	B8	2748	B7	3738	D2	3792	B3
1709	E8	2749	D6	3740	D2	3793	A5
1710	E8	2751	E3	3741	D1	5701	A7
1711	A8	2752	C8	3742	E1	6703	B6
1719	E3	2753	B4	3743	E1	6706	A4
1721	E4	2754	B3	3745	E2	6707	A4
2701	A8	2755	D5	3746	D1	6708	A4
2702	A8	2756	C4	3747	D2	6709	B4
2703	A2	2759	E8	3748	C1	7701	B2
2704	C6	2760	E8	3749	C7	7702	B3
2705	A6	2761	D5	3750	C6	7704	A6
2706	D5	2762	C7	3752	D6	7709	D3
2707	C3	2763	A7	3753	A4	7710	D2
2708	E3	3701	A8	3754	E7	7711	C1
2709	B2	3702	A3	3755	E6	7712	C6
2710	C2	3703	A2	3756	E7	7713	E5
2711	E2	3704	B2	3757	E7	7714	E7
2712	C6	3705	B2	3758	A2	7715	D7
2713	A5	3706	B5	3759	A5	7716	D6
2714	B5	3707	A6	3760	A4	7717	C3
2715	D4	3708	A5	3761	C3	7718	D4
2716	D4	3709	A6	3763	B2	7719	D4
2718	B7	3711	E5	3764	E4	7722	C3
2719	B5	3712	E5	3765	E6	9717	A8
2720	D4	3713	D8	3766	D7	9720	C3
2721	A6	3714	C7	3767	E7	9730	A7
2722	A5	3715	B8	3768	C3	9733	A3
2723	A7	3716	B8	3769	C4	9736	A3
2724	A7	3717	E5	3770	C3	9737	B4
2725	D6	3718	C5	3771	A4	9740	D2
2726	E6	3719	C5	3772	A5	9747	C7
2727	B8	3720	D4	3773	D4	9750	E8
2728	C5	3721	C5	3774	D4	9751	D8
2729	A6	3722	C5	3775	C4	9752	B8
2730	B4	3724	E6	3776	C4	9753	B7
2731	B5	3725	C8	3777	C4	9754	D5
2732	B7	3726	D8	3778	B6	9755	E6
2733	D6	3727	D5	3779	D3	9756	E5
2734	A7	3728	C7	3780	C2	9757	B1
2735	C7	3729	B7	3781	B4	9758	A3
2737	B6	3730	C7	3782	A7	9759	A3
2738	B7	3731	B5	3785	A6	9760	A4
2740	E6	3732	E3	3786	C2	9762	D7
2741	E6	3733	E4	3787	A6		
2743	E1	3734	E3	3788	C8		


A
B
C
D
E
1
2
3
4
5
6
7
8
3CDC-LC Mainboard Componentside view
1805
2858
2878
1878
5802
1880
2861
2860
2851
1810
1801
2828
2885
2826
7807
2809
2837
3852
2849
2838
3812
2839
3835
1800
2884
2888
7806
3815
3851
2875
2881
1881
2873
7871
1875
This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.
3CDC-LC Mainboard Layout stage 2 990920


E
D
C
B
A
1
2
3
4
5
6
7
8
3CDC-LC Mainboard Copperside view
This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.
3CDC-LC Mainboard Layout stage .2 990920



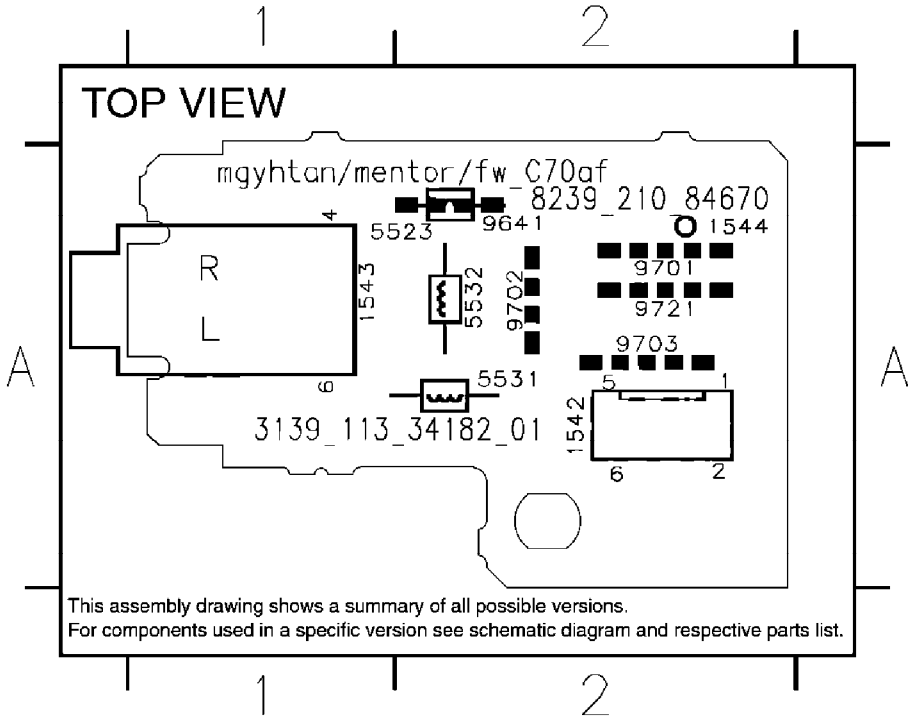


1542 A2
1543 A1
1544 A2

5523 A2
5531 A2
5532 A2

9641 A2
9701 A2
9702 A2

9703 A2
9721 A2

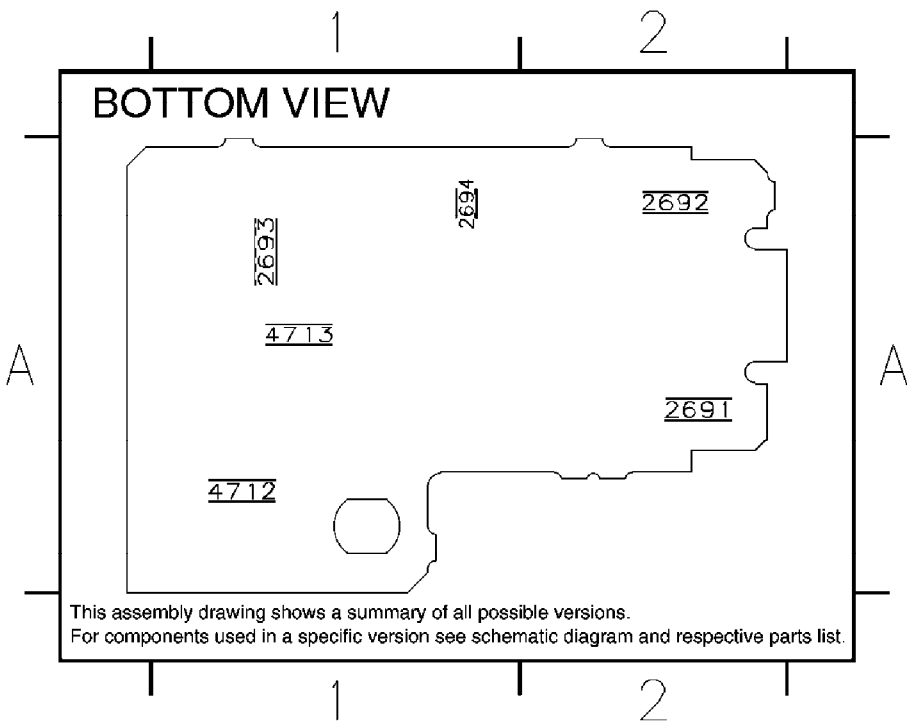


This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram and respective parts list.

2691 A2
2692 A2

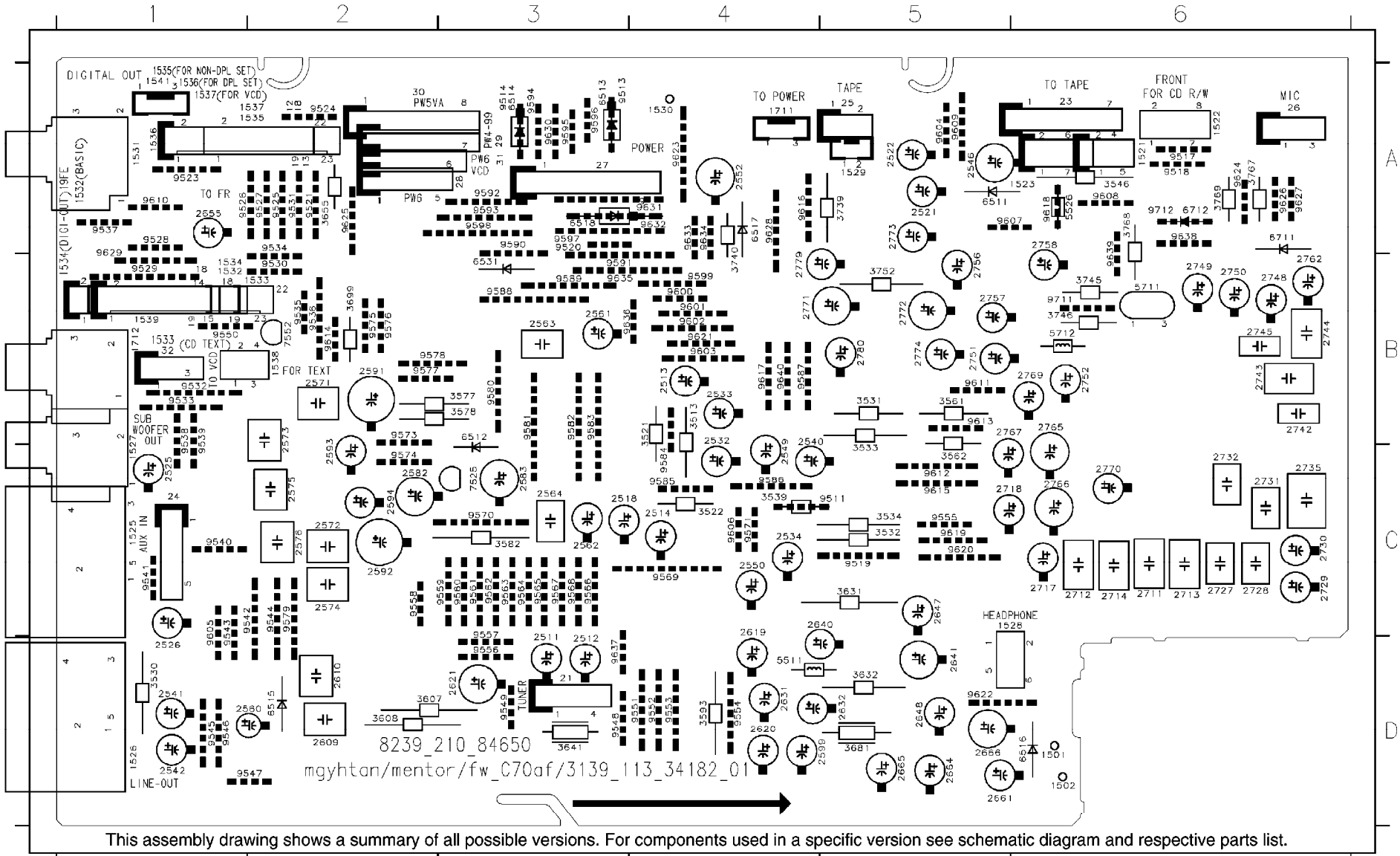
2693 A1
2694 A1

4712 A1
4713 A1



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

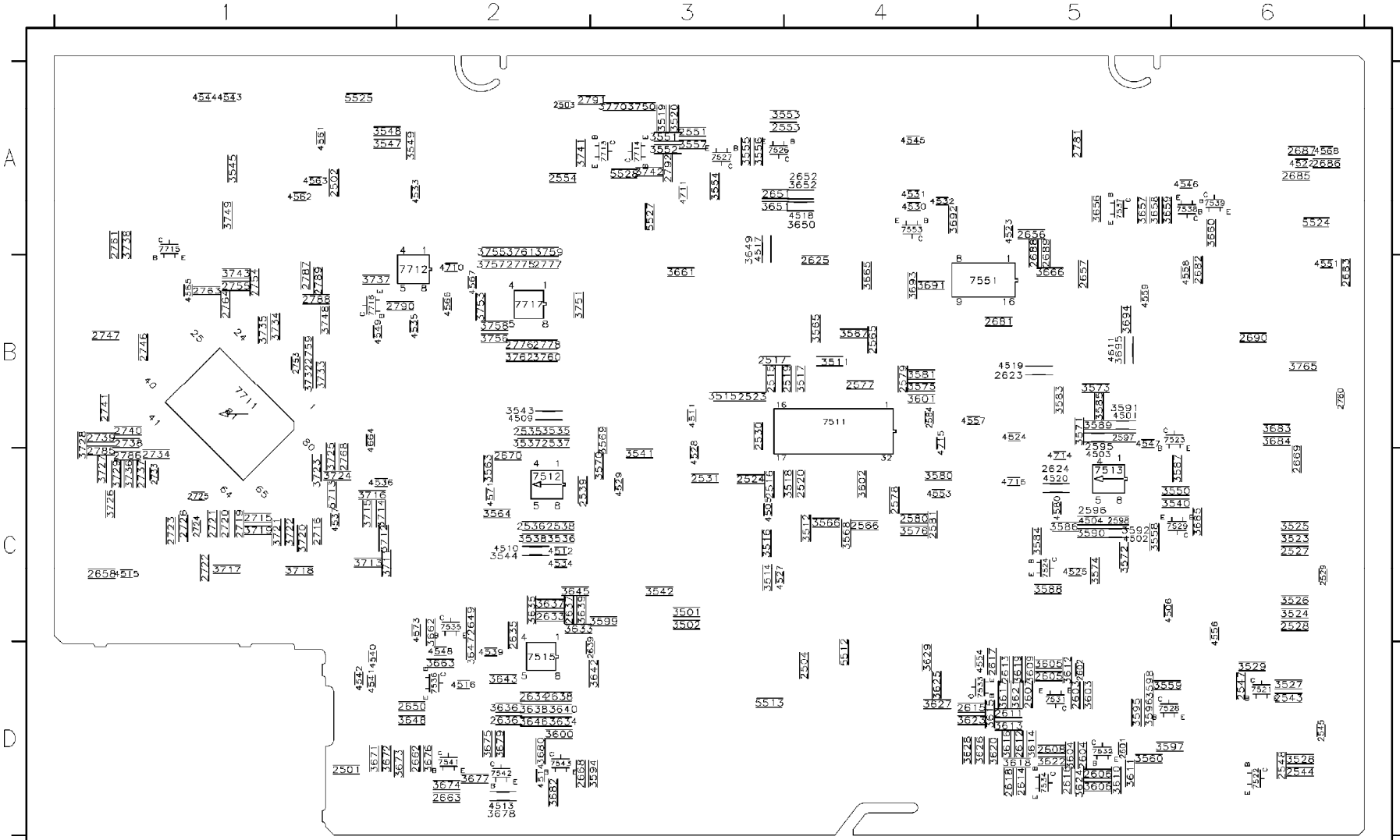
21 D3 1522 A6 1537 A2 2526 D1 2563 B3 2599 D5 2664 D5 2732 C6 2762 B6 3522 C4 3607 D2 3768 A6 6531 B3 9524 A2 9538 B1 9552 D4 9566 C3 9581 B3 9595 A3 9609 A5 9623 A4 9637 D3
23 A6 1523 A6 1538 B2 2532 B4 2564 C3 2609 D2 2665 D5 2735 C6 2765 B6 3530 D1 3608 D2 3769 A6 6711 A6 9525 A2 9539 B1 9553 D4 9567 C3 9582 B3 9596 A3 9610 A1 9624 A6 9638 A6
24 C1 1525 C1 1539 B1 2533 B4 2571 B2 2610 D2 2666 D5 2742 B6 2766 C6 3531 B5 3631 C5 5511 D4 6712 A6 9526 A1 9540 C1 9554 D4 9568 C3 9583 B3 9597 A3 9611 B5 9625 A2 9639 B6
25 A5 1526 D1 1541 A1 2534 C4 2572 C2 2619 C4 2711 C6 2743 B6 2767 B5 3532 C5 3632 D5 5526 A6 7525 C3 9527 A2 9541 C1 9555 C5 9569 C4 9584 C4 9598 A3 9612 C5 9626 A6 9640 B4
26 A6 1527 C1 1711 A4 2540 B4 2573 B2 2620 D4 2712 C6 2744 B6 2769 B6 3533 C5 3641 D3 5711 B6 7552 B2 9528 A1 9542 C1 9556 D3 9570 C3 9585 C4 9599 B4 9613 B5 9627 A6 9711 B6
27 A3 1528 C5 1712 B1 2541 D1 2574 C2 2621 D3 2713 C6 2745 B6 2770 C6 3534 C5 3655 A2 5712 B6 9511 C5 9529 B1 9543 C1 9557 C3 9571 C4 9586 C4 9600 B4 9614 B2 9628 A4 9712 A6
28 A3 1529 A5 2511 D3 2542 D1 2575 C2 2631 D4 2714 C6 2748 B6 2771 B4 3539 C4 3681 D5 6511 A5 9513 A3 9530 B2 9544 C2 9558 C2 9573 B2 9587 B4 9601 B4 9615 C5 9629 A1
29 A3 1530 A4 2512 D3 2546 A5 2576 C2 2632 D5 2717 C6 2749 B6 2772 B5 3546 A6 3699 B2 6512 B3 9514 A3 9531 A2 9545 D1 9559 C3 9574 C2 9588 B3 9602 B4 9616 A4 9630 A3
30 A2 1531 A1 2513 B4 2549 C4 2582 C2 2640 C5 2718 C5 2750 B6 2773 A5 3561 B5 3739 A5 6513 A3 9517 A6 9532 B1 9546 D1 9560 C3 9575 B2 9589 B3 9603 B4 9617 B4 9631 A4
31 A3 1532 B1 2514 C4 2550 C4 2583 C3 2641 D5 2727 C6 2751 B5 2774 B5 3562 C5 3740 B4 6514 A3 9518 A6 9533 B1 9547 D2 9561 C3 9576 B2 9590 A3 9604 A5 9618 A6 9632 A4
32 B1 1533 B2 2518 C3 2552 A4 2591 B2 2647 C5 2728 C6 2752 B6 2779 B4 3577 B3 3745 B6 6515 D2 9519 C5 9534 A2 9548 D3 9562 C3 9577 B2 9591 B3 9605 C1 9619 C5 9633 A4
1501 D6 1534 B1 2521 A5 2560 D2 2592 C2 2648 D5 2729 C6 2756 B5 2780 B5 3578 B3 3746 B6 6516 D6 9520 A3 9535 B2 9549 D3 9563 C3 9578 B2 9592 A3 9606 C4 9620 C5 9634 A4
1502 D6 1535 A2 2522 A5 2561 B3 2593 C2 2655 A1 2730 C6 2757 B5 3513 B4 3582 C3 3752 B5 6517 A4 9521 A2 9536 B2 9550 B1 9564 C3 9579 C2 9593 A3 9607 A5 9621 B4 9635 B3
1521 A6 1536 A1 2525 C1 2562 C3 2594 C2 2661 D5 2731 C6 2758 A6 3521 B4 3593 D4 3767 A6 6518 A3 9523 A1 9537 A1 9551 D4 9565 C3 9580 B3 9594 A3 9608 A6 9622 D5 9636 B3



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

All Models (1941) - AF6 BOARD CBA (BOTTOM SIDE)

2501 D1 2538 C2 2596 C5 2623 B5 2668 D2 2724 C1 2764 B1 3514 C3 3541 C3 3563 C2 3586 C5 3606 D5 3627 D4 3651 A3 3678 D2 3718 C1 3741 A2 4502 C5 4524 B5 4545 A4 4571 C2 7513 C5 7541 D2
2502 A1 2539 C2 2597 B5 2624 C5 2669 C6 2725 C1 2768 C1 3515 B3 3542 C3 3564 C2 3587 C6 3609 D5 3628 D4 3652 A4 3679 D2 3719 C1 3742 A3 4503 C5 4525 C5 4546 A6 4573 C2 7515 D2 7542 D2
2503 A2 2543 D6 2598 C5 2625 B4 2670 C2 2726 C1 2775 B2 3516 C3 3543 B2 3565 B4 3588 C5 3610 D5 3629 D4 3656 A5 3680 D2 3720 C1 3743 B1 4504 C5 4527 C3 4547 B5 4580 C5 7521 D6 7543 D2
2504 D4 2544 D6 2601 D5 2633 C2 2681 B5 2733 C1 2776 B2 3517 B4 3544 C2 3566 C4 3589 B5 3611 D5 3633 C2 3657 A5 3682 D2 3721 C1 3748 B1 4505 C3 4528 C3 4548 D2 4611 B5 7522 D6 7551 B5
2515 B3 2545 D6 2602 D5 2634 D2 2682 B6 2734 C1 2777 B2 3518 C4 3545 A1 3567 B4 3590 C5 3612 D5 3634 D2 3658 A5 3683 B6 3722 C1 3749 A1 4506 C5 4529 C3 4549 B1 4664 B1 7523 B6 7553 A4
2516 C3 2547 D6 2603 D5 2635 C2 2683 B6 2737 C1 2778 B2 3519 A3 3547 A1 3568 C4 3591 B5 3613 D5 3635 C2 3659 A5 3684 B6 3723 C1 3750 A3 4509 B2 4530 A4 4551 B6 4710 B2 7524 C5 7711 B1
2517 B3 2548 D6 2604 D5 2636 D2 2685 A6 2738 B1 2781 A5 3520 A3 3548 A1 3569 B3 3592 C5 3614 D5 3636 D2 3660 A6 3685 C6 3724 C1 3751 B2 4510 C2 4531 A4 4553 C4 4711 A3 7526 A3 7712 B2
2519 B4 2551 A3 2605 D5 2637 C2 2686 A6 2739 B1 2785 C1 3523 C6 3549 A2 3570 C3 3594 D3 3615 D5 3637 C2 3661 B3 3691 B4 3725 C1 3753 B2 4511 B3 4532 A4 4554 D5 4714 C5 7527 A3 7713 A3
2520 C4 2553 A4 2606 D5 2638 D2 2687 A6 2740 B1 2786 C1 3524 C6 3550 C6 3571 B5 3595 D5 3616 D5 3638 D2 3662 C2 3692 A4 3726 C1 3755 A2 4512 C2 4533 A2 4556 C6 4715 B4 7528 D5 7714 A3
2523 B3 2554 A2 2607 D5 2639 D2 2688 A5 2741 B1 2787 B1 3525 C6 3551 A3 3572 C5 3596 D5 3617 D5 3639 C2 3663 D2 3693 B4 3727 C1 3756 B2 4513 D2 4534 C2 4557 B4 4716 C5 7529 C6 7715 A1
2524 C3 2565 B4 2608 D5 2649 C2 2689 A5 2746 B1 2788 B1 3526 C6 3552 A3 3573 B5 3597 D5 3618 D5 3640 D2 3665 B4 3694 B5 3728 B1 3757 B2 4514 D2 4535 B2 4558 B6 5512 D4 7531 D5 7716 B1
2527 C6 2566 C4 2611 D5 2650 D2 2690 B6 2747 B1 2789 B1 3527 D6 3553 A4 3574 C5 3598 D5 3619 D5 3642 D3 3666 B5 3695 B5 3729 C1 3758 B2 4515 C1 4536 C1 4559 B5 5513 D3 7532 D5 7717 B2
2528 C6 2577 B4 2612 D5 2651 A3 2715 C1 2753 B1 2790 B2 3528 D6 3554 A3 3575 B4 3599 C3 3620 D5 3643 D2 3671 D1 3711 C1 3732 B1 3759 A2 4516 D2 4537 C1 4561 A1 5524 A6 7533 D5
2529 C6 2578 C4 2613 D5 2652 A4 2716 C1 2754 B1 2791 A3 3529 D6 3555 A3 3576 C4 3600 D2 3621 D5 3645 C2 3672 D1 3712 C1 3733 B1 3760 B2 4517 A3 4539 D2 4562 A1 5525 A1 7534 D5
2530 B3 2579 B4 2614 D5 2656 A5 2719 C1 2755 B1 2792 A3 3535 B2 3556 A3 3580 C4 3601 B4 3622 D5 3646 D2 3673 D2 3713 C1 3734 B1 3761 A2 4518 A4 4540 D1 4563 A1 5527 A3 7535 C2
2531 C3 2580 C4 2615 D4 2657 B5 2720 C1 2759 B1 3501 C3 3536 C2 3557 A3 3581 B4 3602 C4 3623 D4 3647 D2 3674 D2 3714 C1 3735 B1 3762 B2 4519 B5 4541 D1 4565 B1 5528 A3 7536 D2
2535 B2 2581 C4 2616 D5 2658 C1 2721 C1 2760 B6 3502 C3 3537 B2 3558 C5 3583 B5 3603 D5 3624 D5 3648 D2 3675 D2 3715 C1 3736 C1 3765 B6 4520 C5 4542 D1 4566 B2 5713 C1 7537 A5
2536 C2 2584 B4 2617 D5 2662 D2 2722 C1 2761 A1 3511 B4 3538 C2 3559 D5 3584 C5 3604 D5 3625 D4 3649 A3 3676 D2 3716 C1 3737 B1 3770 A3 4522 A6 4543 A1 4567 B2 7511 B4 7538 A6
2537 B2 2595 B5 2618 D5 2663 D2 2723 C1 2763 B1 3512 C4 3540 C6 3560 D5 3585 B5 3605 D5 3626 D5 3650 A4 3677 D2 3717 C1 3738 A1 4501 B5 4523 A5 4544 A1 4568 A6 7512 C2 7539 A6



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

FWC50C37 - Manual no. 1941

FRONT BOARD PARTS LIST

	FRONT BOARD PARTS LIST	
	MISCELLANEOUS	
1401	Flex Connector 19Pin	4822 265 11545
1402	Flex Connector 9Pin.	4822 265 11531
1410	Rotary Encoder 24Pin	4822 273 10365
1411	Ceramic Resonator.	4822 242 72066
1412	RES XTL 32kHz768	2422 543 01069
1415	FTD Display.	3139 110 52230
1444	Tact Switch.	4822 276 13775
1445	Tact Switch.	4822 276 13775
1446	Tact Switch.	4822 276 13775
1449	Tact Switch.	4822 276 13775
1450	Tact Switch.	4822 276 13775
1451	Tact Switch.	4822 276 13775
1452	Tact Switch.	4822 276 13775
1453	Tact Switch.	4822 276 13775
1454	Tact Switch.	4822 276 13775
1455	Tact Switch.	4822 276 13775
1456	Tact Switch.	4822 276 13775
1457	Tact Switch.	4822 276 13775
1458	Tact Switch.	4822 276 13775
1459	Tact Switch.	4822 276 13775
1460	Tact Switch.	4822 276 13775
1462	Tact Switch.	4822 276 13775
1463	Tact Switch.	4822 276 13775
1480	Flex Connector 9Pin.	4822 265 11531
1481	Tact Switch.	4822 276 13775
1482	Tact Switch.	4822 276 13775
1483	Tact Switch.	4822 276 13775
1484	Tact Switch.	4822 276 13775
1485	Tact Switch.	4822 276 13775
	CAPACITORS	
2400	10pF., 5%, 63V	5322 122 32448
2401	10pF., 5%, 63V	5322 122 32448
2404	47pF., 1%, 63V	4822 126 13692
2405	47pF., 1%, 63V	4822 126 13692
2406	47pF., 1%, 63V	4822 126 13692
2407	47pF., 1%, 63V	4822 126 13692
2412	47pF., 1%, 63V	4822 126 13692
2413	47pF., 1%, 63V	4822 126 13692
2414	47pF., 1%, 63V	4822 126 13692
2415	10pF., 5%, 63V	5322 122 32448
2416	10pF., 5%, 63V	5322 122 32448
2417	15pF., 2%, 63V	4822 126 13486
2418	15pF., 2%, 63V	4822 126 13486
2419	33pF., 5%, 50V	5322 122 32659
2420	33pF., 5%, 50V	5322 122 32659
2421	10pF., 5%, 63V	5322 122 32448
2422	10nF., 20%, 50V.	4822 122 33177
2423	10nF., 20%, 50V.	4822 122 33177
2426	47uF., 20%, 6.3V	4822 124 80483
2428	47uF., 20%, 6.3V	4822 124 80483
2431	100pF., 5%, 50V.	5322 122 32531
2432	100pF., 5%, 50V.	5322 122 32531
2433	100pF., 5%, 50V.	5322 122 32531
2434	100pF., 5%, 50V.	5322 122 32531
2435	100pF., 5%, 50V.	5322 122 32531
2436	100pF., 5%, 50V.	5322 122 32531
2441	100pF., 5%, 50V.	5322 122 32531
2442	100pF., 5%, 50V.	5322 122 32531
2445	100nF., 10%, 50V	4822 126 14585
2448	47nF., 10%, 63V.	4822 126 13751
2449	2.2nF., 10%, 63V	4822 122 33127
2450	10nF., 10%, 63V.	5322 122 34098
2451	100nF., 10%, 50V	4822 126 14585
2452	10nF., 10%, 63V.	5322 122 34098
2453	0.22uF., 20%, 63V.	4822 124 40746
2454	820pF., 5%, 50V.	5322 126 10184
2455	0.22uF., 20%, 63V.	4822 124 40746
2456	6.8nF., 10%, 63V	5322 122 31866
2457	100nF., 10%, 50V	4822 126 14585
2458	0.22uF., 20%, 63V.	4822 124 40746
2459	47nF., 10%, 63V.	4822 126 13751
2460	1uF., +80/-20%, 16V.	4822 126 14043
2462	100nF., +80/-20%, 50V.	4822 126 13838
2463	100nF., 10%, 50V	4822 126 14585
2465	47uF., 20%, 6.3V	4822 124 80483
2470	220pF., 5%, 63V.	4822 122 33575
2471	220pF., 5%, 63V.	4822 122 33575
2472	220pF., 5%, 63V.	4822 122 33575
2481	47uF., 20%, 6.3V	4822 124 80483
2483	1uF., +80/-20%, 16V.	4822 126 14043
2484	1uF., +80/-20%, 16V.	4822 126 14043
2485	1uF., +80/-20%, 16V.	4822 126 14043
2486	1uF., +80/-20%, 16V.	4822 126 14043
2487	100nF., 10%, 50V	4822 126 14585
2488	47nF., 10%, 63V.	4822 126 13751
2489	47nF., 10%, 63V.	4822 126 13751
	RESISTORS	
3397	330 ohm, 1%, 1.25W	4822 117 13577
3400	1k, 2%, 0.25W.	4822 051 10102
3401	10k, 1%, 0.1W.	4822 117 10833
3402	1k, 2%, 0.25W.	4822 051 10102
3403	10k, 1%, 0.1W.	4822 117 10833
3404	470 ohm, 5%, 0.1W.	4822 051 20471
3405	10k, 1%, 0.1W.	4822 117 10833
3406	1k, 2%, 0.25W.	4822 051 10102
3407	1k, 2%, 0.25W.	4822 051 10102
3408	10k, 1%, 0.1W.	4822 117 10833
3409	470 ohm, 5%, 0.1W.	4822 051 20471
3410	1k, 2%, 0.25W.	4822 051 10102
3411	1k, 2%, 0.25W.	4822 051 10102
3412	1k, 2%, 0.25W.	4822 051 10102
3413	1k, 2%, 0.25W.	4822 051 10102
3414	1k, 2%, 0.25W.	4822 051 10102
3415	1k, 2%, 0.25W.	4822 051 10102
3416	2.2k, 1%, 0.1W	4822 117 11449
3417	470 ohm, 5%, 0.1W.	4822 051 20471
3418	470 ohm, 5%, 0.1W.	4822 051 20471
3419	1k, 2%, 0.25W.	4822 051 10102
3420	1k, 2%, 0.25W.	4822 051 10102
3421	1k, 2%, 0.25W.	4822 051 10102
3422	1k, 2%, 0.25W.	4822 051 10102
3423	100 ohm, 5%, 0.1W.	4822 051 20101
3424	100 ohm, 5%, 0.1W.	4822 051 20101
3425	100 ohm, 5%, 0.1W.	4822 051 20101
3426	100 ohm, 5%, 0.1W.	4822 051 20101
3427	1k, 2%, 0.25W.	4822 051 10102
3428	1k, 2%, 0.25W.	4822 051 10102
3429	100 ohm, 5%, 0.1W.	4822 051 20101
3430	100 ohm, 5%, 0.1W.	4822 051 20101
3431	100 ohm, 5%, 0.1W.	4822 051 20101
3432	100 ohm, 5%, 0.1W.	4822 051 20101
3433	100 ohm, 5%, 0.1W.	4822 051 20101
3434	100 ohm, 5%, 0.1W.	4822 051 20101
3435	100 ohm, 5%, 0.1W.	4822 051 20101
3436	100 ohm, 5%, 0.1W.	4822 051 20101
3437	1k, 2%, 0.25W.	4822 051 10102
3438	1k, 2%, 0.25W.	4822 051 10102
3439	1k, 2%, 0.25W.	4822 051 10102
3440	1k, 2%, 0.25W.	4822 051 10102
3441	1k, 2%, 0.25W.	4822 051 10102
3442	1k, 2%, 0.25W.	4822 051 10102
3443	1k, 2%, 0.25W.	4822 051 10102
3444	1k, 2%, 0.25W.	4822 051 10102
3445	1k, 2%, 0.25W.	4822 051 10102
3446	1k, 2%, 0.25W.	4822 051 10102
3447	1k, 2%, 0.25W.	4822 051 10102
3448	1k, 2%, 0.25W.	4822 051 10102
3449	1k, 2%, 0.25W.	4822 051 10102
3450	1k, 2%, 0.25W.	4822 051 10102
3451	1k, 2%, 0.25W.	4822 051 10102
3452	1k, 2%, 0.25W.	4822 051 10102
3453	1k, 2%, 0.25W.	4822 051 10102
3454	1k, 2%, 0.25W.	4822 051 10102
3455	1k, 2%, 0.25W.	4822 051 10102
3456	1k, 2%, 0.25W.	4822 051 10102
3457	1k, 2%, 0.25W.	4822 051 10102
3458	1k, 2%, 0.25W.	4822 051 10102
3459	1k, 2%, 0.25W.	4822 051 10102
3460	1k, 2%, 0.25W.	4822 051 10102
3461	1k, 2%, 0.25W.	4822 051 10102
3462	1k, 2%, 0.25W.	4822 051 10102
3463	1k, 2%, 0.25W.	4822 051 10102
3464	1k, 2%, 0.25W.	4822 051 10102
3465	1k, 2%, 0.25W.	4822 051 10102
3466	1k, 2%, 0.25W.	4822 051 10102
3467	220 ohm, 1%, 0.1W.	4822 117 11503
3468	1Meg, 5%, 0.1W	4822 051 20105
3469	10k, 1%, 0.1W.	4822 117 10833
3470	10k, 1%, 0.1W.	4822 117 10833
3471	2.2k, 1%, 0.1W	4822 117 11449
3476	47k, 1%, 0.1W.	4822 117 10834
3480	1k, 2%, 0.25W.	4822 051 10102
3481	1k, 2%, 0.25W.	4822 051 10102
3482	1k, 2%, 0.25W.	4822 051 10102
3483	1k, 2%, 0.25W.	4822 051 10102
3484	10k, 1%, 0.1W.	4822 117 10833
3485	10k, 1%, 0.1W.	4822 117 10833
3486	10k, 1%, 0,6W.	4822 050 21003
3490	10k, 1%, 0.1W.	4822 117 10833
3492	10k, 1%, 0.1W.	4822 117 10833
3493	10k, 1%, 0.1W.	4822 117 10833
3494	10k, 1%, 0.1W.	4822 117 10833
3497	100 ohm, 5%, 0.1W.	4822 051 20101
3498	10k, 1%, 0.1W.	4822 117 10833
3499	1k, 2%, 0.25W.	4822 051 10102
3500	1k, 2%, 0.25W.	4822 051 10102
3501	100k, 1%, 0.1W	4822 117 10837
3503	1k, 2%, 0.25W.	4822 051 10102
3504	470 ohm, 5%, 0.1W.	4822 051 20471
3505	470 ohm, 5%, 0.1W.	4822 051 20471
3507	220 ohm, 1%, 0.1W.	4822 117 11503

S = Safety Part Be sure to use exact replacement part.

FWC50C37 (continued)

3509	220 ohm, 1%, 0.1W.	4822 117 11503
3510	220 ohm, 1%, 0.1W.	4822 117 11503
3511	680k, 5% 0,5W.	4822 116 52298
3514	330 ohm, 1%, 1.25W	4822 117 13577
3516	220 ohm, 1%, 0.1W.	4822 117 11503
3523	10k, 1%, 0.1W.	4822 117 10833
3535	330 ohm, 1%, 1.25W	4822 117 13577
3536	330 ohm, 1%, 1.25W	4822 117 13577
3537	330 ohm, 1%, 1.25W	4822 117 13577
3538	330 ohm, 1%, 1.25W	4822 117 13577
3539	330 ohm, 1%, 1.25W	4822 117 13577
3540	330 ohm, 1%, 1.25W	4822 117 13577
3541	330 ohm, 1%, 1.25W	4822 117 13577
3542	330 ohm, 1%, 1.25W	4822 117 13577
3543	330 ohm, 1%, 1.25W	4822 117 13577
3544	470k, 5%, 0.1W	4822 051 20474
3545	470k, 5%, 0.1W	4822 051 20474
3546	470k, 5%, 0.1W	4822 051 20474
3547	470k, 5%, 0.1W	4822 051 20474
3548	1.5k, 1%, 0.1W	4822 117 11139
3549	680k, 5%, 0.1W	4822 051 20684
3550	47k, 1%, 0.1W.	4822 117 10834
3551	470k, 5%, 0.1W	4822 051 20474
3552	1.5k, 1%, 0.1W	4822 117 11139
3553	680k, 5%, 0.1W	4822 051 20684
3554	47k, 1%, 0.1W.	4822 117 10834
3555	470k, 5%, 0.1W	4822 051 20474
3556	1.5k, 1%, 0.1W	4822 117 11139
3557	680k, 5%, 0.1W	4822 051 20684
3558	47k, 1%, 0.1W.	4822 117 10834
3559	470k, 5%, 0.1W	4822 051 20474
3560	1 ohm, 5%, 0.5W.	4822 116 80176
3561	1 ohm, 5%, 0.5W.	4822 116 80176
3566	220 ohm, 1%, 0.1W.	4822 117 11503
3567	220 ohm, 1%, 0.1W.	4822 117 11503
3568	220 ohm, 1%, 0.1W.	4822 117 11503
3570	82k, 1%, 0.1W.	4822 117 11149
3571	82k, 1%, 0.1W.	4822 117 11149
3572	82k, 1%, 0.1W.	4822 117 11149
3575	82k, 1%, 0.1W.	4822 117 11149
3576	1k, 2%, 0.25W.	4822 051 10102
3577	470 ohm, 5%, 0.1W.	4822 051 20471
3578	10k, 1%, 0.1W.	4822 117 10833
3585	1Meg, 5%, 0.1W	4822 051 20105
3586	47k, 5%, 0.5W.	4822 116 83884
3587	47k, 5%, 0.5W.	4822 116 83884
3593	1k, 2%, 0.25W.	4822 051 10102
3600	270 ohm, 1%, 0.1W.	4822 117 11504
3601	270 ohm, 1%, 0.1W.	4822 117 11504
3602	270 ohm, 1%, 0.1W.	4822 117 11504
4400	0 ohm, Jumper 0805	4822 051 20008
4401	0 ohm, Jumper 0805	4822 051 20008
4402	0 ohm, Jumper 0805	4822 051 20008
4403	0 ohm, Jumper 0805	4822 051 20008
4420	0 ohm, Jumper 0805	4822 051 20008
4421	0 ohm, Jumper 0805	4822 051 20008
4422	0 ohm, Jumper 0805	4822 051 20008
4423	0 ohm, Jumper 0805	4822 051 20008
4424	0 ohm, Jumper 0805	4822 051 20008
4425	0 ohm, Jumper 0805	4822 051 20008
4426	0 ohm, Jumper 0805	4822 051 20008
4427	0 ohm, Jumper 0805	4822 051 20008
4428	0 ohm, Jumper 0805	4822 051 20008
4429	0 ohm, Jumper 0805	4822 051 20008
4430	0 ohm, Jumper 0805	4822 051 20008
4431	0 ohm, Jumper 0805	4822 051 20008
4432	0 ohm, Jumper 0805	4822 051 20008
4433	0 ohm, Jumper 0805	4822 051 20008
4434	0 ohm, Jumper 0805	4822 051 20008
4435	0 ohm, Jumper 0805	4822 051 20008
4436	0 ohm, Jumper 0805	4822 051 20008
4437	0 ohm, Jumper 0805	4822 051 20008
4438	0 ohm, Jumper 0805	4822 051 20008
4439	0 ohm, Jumper 0805	4822 051 20008
4440	0 ohm, Jumper 0805	4822 051 20008
4441	0 ohm, Jumper 0805	4822 051 20008
4442	0 ohm, Jumper 0805	4822 051 20008
4443	0 ohm, Jumper 0805	4822 051 20008
4445	0 ohm, Jumper 0805	4822 051 20008
4446	0 ohm, Jumper 0805	4822 051 20008
4447	0 ohm, Jumper 0805	4822 051 20008
4448	0 ohm, Jumper 0805	4822 051 20008
4449	0 ohm, Jumper 0805	4822 051 20008
4450	0 ohm, Jumper 0805	4822 051 20008
4451	0 ohm, Jumper 0805	4822 051 20008
4452	0 ohm, Jumper 0805	4822 051 20008
4453	0 ohm, Jumper 0805	4822 051 20008
4454	0 ohm, Jumper 0805	4822 051 20008
4455	0 ohm, Jumper 0805	4822 051 20008
4456	0 ohm, Jumper 0805	4822 051 20008
4457	0 ohm, Jumper 0805	4822 051 20008
4458	0 ohm, Jumper 0805	4822 051 20008
4459	0 ohm, Jumper 0805	4822 051 20008
4460	0 ohm, Jumper 0805	4822 051 20008
4461	0 ohm, Jumper 0805	4822 051 20008
4462	0 ohm, Jumper 0805	4822 051 20008
4463	0 ohm, Jumper 0805	4822 051 20008
4464	0 ohm, Jumper 0805	4822 051 20008
4465	0 ohm, Jumper 0805	4822 051 20008
4466	0 ohm, Jumper 0805	4822 051 20008
4467	0 ohm, Jumper 0805	4822 051 20008
4468	0 ohm, Jumper 0805	4822 051 20008
4469	0 ohm, Jumper 0805	4822 051 20008
4471	0 ohm, Jumper 0805	4822 051 20008
4473	0 ohm, Jumper 0805	4822 051 20008
4474	0 ohm, Jumper 0805	4822 051 20008
4475	0 ohm, Jumper 0805	4822 051 20008
4476	0 ohm, Jumper 0805	4822 051 20008
4477	0 ohm, Jumper 0805	4822 051 20008
4478	0 ohm, Jumper 0805	4822 051 20008
4479	0 ohm, Jumper 0805	4822 051 20008
4480	0 ohm, Jumper 0805	4822 051 20008
4481	0 ohm, Jumper 0805	4822 051 20008
4482	0 ohm, Jumper 0805	4822 051 20008
4484	0 ohm, Jumper 0805	4822 051 20008
4485	0 ohm, Jumper 0805	4822 051 20008
4490	0 ohm, Jumper 0805	4822 051 20008
4492	0 ohm, Jumper 0805	4822 051 20008
4493	0 ohm, Jumper 0805	4822 051 20008
4494	0 ohm, Jumper 0805	4822 051 20008
4495	0 ohm, Jumper 0805	4822 051 20008
4496	0 ohm, Jumper 0805	4822 051 20008
4497	0 ohm, Jumper 0805	4822 051 20008
4600	0 ohm, Jumper 0805	4822 051 20008
4601	0 ohm, Jumper 0805	4822 051 20008
4602	0 ohm, Jumper 0805	4822 051 20008
4603	0 ohm, Jumper 0805	4822 051 20008
	COILS & FILTERS	
5400	Coil, 2.2uH, 5%.	4822 157 62552
5401	Coil, 2.2uH, 5%.	4822 157 62552
	SEMICONDUCTORS	
6400	Diode, 1N4003G	4822 130 31878
6402	Diode, LTL-1CHGE	4822 130 10791
6403	Diode, LTL-1CHGE	4822 130 10791
6404	Diode, LTL-1CHGE	4822 130 10791
6405	Diode, LTL-1CHGE	4822 130 10791
6461	Diode, 1N4148.	4822 130 30621
6462	Diode, 1N4148.	4822 130 30621
6463	Diode, 1N4148.	4822 130 30621
6464	Diode, 1N4148.	4822 130 30621
6465	Diode, 1N4148.	4822 130 30621
6467	Diode, 1N4148.	4822 130 30621
6468	Diode, 1N4148.	4822 130 30621
6469	Diode, 1N4148.	4822 130 30621
6470	Diode, 1N4148.	4822 130 30621
6471	Diode, 1N4148.	4822 130 30621
6472	Diode, 1N4148.	4822 130 30621
6473	Diode, 1N4148.	4822 130 30621
6474	Diode, 1N4148.	4822 130 30621
6475	Diode, 1N4148.	4822 130 30621
6476	Diode, 1N4148.	4822 130 30621
6480	Diode, 1N4148.	4822 130 30621
6484	Diode, 1N4148.	4822 130 30621
6485	Diode, 1N4003G	4822 130 31878
6486	Diode, 1N4148.	4822 130 30621
6500	Diode, LTL-1CHGE	4822 130 10791
6501	Diode, LTL-1CHGE	4822 130 10791
6502	Diode, LTL-1CHGE	4822 130 10791
7400	IC, TMP87CS71F - 'C50S52211'	3139 110 52210
7402	IC, M24C01-WBN6.	9322 143 19682
7404	IC, GP1U28XP	4822 130 10165
7405	IC, 74HC4094D.	4822 209 15449
7420	Transistor, BC847B	4822 130 60511
7421	Transistor, BC847B	4822 130 60511
7422	Transistor, BC847B	4822 130 60511
7425	Transistor, BC847B	4822 130 60511
7426	Transistor, BC847B	4822 130 60511
7427	Transistor, BC847B	4822 130 60511

ECO5 TUNER BOARD PARTS LIST

	ECO5 TUNER BOARD PARTS LIST	
	MISCELLANEOUS	
1101	Antenna Socket 300 ohm	4822 267 31505
1102	Antenna Socket Coax IEC 75 ohm	4822 267 10283
	CAPACITORS	
2101	100pF., 5%, 50V.	5322 122 32531
2101	47pF., 1%, 63V, for USA.	4822 126 13692
2102	10nF., 20%, 50V.	4822 122 33177
2103	1nF., 10%, 50V	5322 122 34123
2104	100pF., 10%, 50V	4822 122 33195
2106	Trimmer, 4-20pF., for LW version	4822 125 50355
2106	Trimmer, 3-11pF., 100V	4822 125 60101
2107	1uF., 10%, 63V	4822 121 51319
2108	100pF., 5%, 50V, for LW version.	5322 122 32531

S = Safety Part Be sure to use exact replacement part.

2109	10pF., 5%, 50V, for LW version . . .	5322 122 32448
2120	27pF., 1%, 63V, for LW version . . .	4822 126 13691
2120	22pF., 5%, 50V	5322 122 32658
2122	3.3nF., 10%, 63V, for LW version . .	4822 122 33891
2125	560pF., 5%, 400V	4822 121 51381
2126	330pF., 5%, 50V.	5322 122 31863
2127	220nF., +80/-20%, 50V.	4822 126 13473
2128	10uF., 20%, 50V.	4822 124 41579
2129	100uF., 20%, 10V	4822 124 41584
2130	22nF., +80/- 20%, 25V.	4822 126 11585
2131	470nF., 16V.	4822 122 33325
2132	470nF., 16V.	4822 122 33325
2131	470nF., +80/- 20%, 16V	4822 126 13482
2132	470nF., +80/- 20%, 16V	4822 126 13482
2133	1uF., 20%, 63V	4822 124 40242
2134	15nF., 5%, 63V	4822 126 13188
2134	22nF., 10%, 63V, for USA	5322 122 32654
2135	0.22uF., 20%, 63V.	4822 124 40746
2136	15nF., 5%, 63V	4822 126 13188
2136	22nF., 10%, 63V, for USA	5322 122 32654
2137	0.2uF., 20%, 63V	4822 124 40746
2138	2.2uF., 20%, 50V	4822 124 41576
2139	15pF., 5%, 50V	4822 126 14236
2140	470nF., 5%, 63V.	4822 121 51252
2141	100nF., 20%, 25V	4822 126 10002
2142	100nF., 20%, 25V	4822 126 10002
2143	220nF., +80/-20%, 50V.	4822 126 13473
2144	1uF., 20%, 63V	4822 124 40242
2145	220pF., 5%, 50V.	4822 122 33575
2146	220pF., 5%, 50V.	4822 122 33575
2147	220pF., 5%, 50V.	4822 122 33575
2148	22nF., +80/- 20%, 25V.	4822 126 11585
2149	22nF., 10%, 63V.	5322 122 32654
2150	100nF., 20%, 63V	4822 122 31947
2152	560pF., 5%, 63V, for East. Europe. .	5322 116 80853
2152	33nF., 5%, 63V	4822 126 12105
2153	12pF., 2%, 63V, for East. Europe . .	4822 122 32139
2153	15pF., 2%, 63V	4822 122 32504
2155	Trimmer, 3-11pF., 100V	4822 125 60101
2158	10pF., 5%, 50V, for LW version . . .	5322 122 32448
2159	33pF., 5%, 50V	5322 122 32659
2160	22nF., 10%, 63V.	5322 122 32654
2161	100nF., 20%, 25V	4822 126 10002
2163	100nF., 20%, 25V	4822 126 10002
2164	470nF., +80/- 20%, 16V	4822 126 13482
2165	100nF., 20%, 25V	4822 126 10002
2166	1nF., 10%, 50V	5322 122 34123
2167	12pF., 2%, 63V	4822 122 32139
2168	82pF., 1%, 63V	4822 126 13695
	RESISTORS	
3101	5.6k, 5%, 0.1W, for East. Europe . .	4822 051 20562
3101	33k, 5%, 0.1W.	4822 051 20333
3102	100k, 5%, 0.1W	4822 051 20104
3103	18k, 1%, 0.1W.	4822 117 10965
3104	180 ohm, 1%, 0.1W.	4822 117 11448
3105	220 ohm, 5%, 0.5W.	4822 116 83872
3108	2.2k, 1%, 0.1W, for LW version . . .	4822 117 11449
3109	4.7k, 5%, 0.1W, for LW version . . .	4822 051 20472
3110	47 ohm, 5%, 0.5W	4822 116 52195
3120	0 ohm, Jumper 0805	4822 051 20008
3123	4.7k, 5%, 0.1W, for LW version . . .	4822 051 20472
3125	10k, 1%, 0.1W, for LW version. . . .	4822 117 10833
3128	2.2k, 1% 0.1W, for LW version. . . .	4822 117 11449
3132	47 ohm, 5%, 0.5W	4822 116 52195
3134	22k, 5%, 0.1W.	4822 051 20223
3137	22k, 5%, 0.1W, for LW version. . . .	4822 051 20223
3140	0 ohm, Jumper 0805, 5120=CDA10.7MG40K	4822 051 20008
3140	150 ohm, 1%, 0.1W, 5120=CDA10.7MG61KA	4822 117 10353
3141	56k, 5%, 0.1W.	4822 051 20563
3142	Trimmer, 100k, 30%, 0.1W	4822 100 11163
3143	22k, 5%, 0.1W, for RDS version . . .	4822 051 20223
3144	1k, 2%, 0.25W, for RDS version . . .	4822 051 10102
3145	2.2k, 1%, 0.1W	4822 117 11449
3146	22 ohm, 5%, 0.1W	4822 051 20229
3152	470 ohm, 5%, 0.5W.	4822 116 83883
3153	470 ohm, 5%, 0.1W.	4822 051 20471
3154	150 ohm, 5%, 0.5W.	4822 116 83868
3155	470 ohm, 5%, 0.1W.	4822 051 20471
3156	100k, 5%, 0.1W, for /21/30/33 only .	4822 051 20104
3157	100k, 5%, 0.5W, for East. Europe . .	4822 116 52234
3158	470 ohm, 5%, 0.5W.	4822 116 83883
3159	470 ohm, 5%, 0.5W.	4822 116 83883
3160	470 ohm, 5%, 0.5W.	4822 116 83883
3161	470 ohm, 5%, 0.5W.	4822 116 83883
3167	220 ohm, 1%, 0.1W.	4822 117 11503
3169	150k, 5%, 0.1W	4822 051 20154
3170	100k, 5%, 0.5W	4822 116 52234
3171	330 ohm, 5%, 0.5W.	4822 116 52219
3176	1k, 2%, 0.25W, for RDS version . . .	4822 051 10102
3180	22k, 5%, 0.1W, for LW version. . . .	4822 051 20223
4101	0 ohm, Jumper 0805, for 2-Band only.	4822 051 20008
4102	0 ohm, Jumper 0805, for 2-Band only.	4822 051 20008
4103	0 ohm, Jumper 0805	4822 051 20008
4104	0 ohm, Jumper 0805	4822 051 20008
4105	0 ohm, Jumper 0805	4822 051 20008
4106	0 ohm, Jumper 0805	4822 051 20008
4108	0 ohm, Jumper 0805	4822 051 20008
4111	0 ohm, Jumper 0805	4822 051 20008
4120	0 ohm, Jumper 0805	4822 051 20008
4150	0 ohm, Jumper 1206	4822 051 10008
4151	0 ohm, Jumper 0805	4822 051 20008
4152	0 ohm, Jumper 1206	4822 051 10008
4153	0 ohm, Jumper 1206	4822 051 10008
4154	0 ohm, Jumper 1206	4822 051 10008
4155	0 ohm, Jumper 1206	4822 051 10008
4156	0 ohm, Jumper 0805	4822 051 20008
4157	0 ohm, Jumper 1206	4822 051 10008
4158	0 ohm, Jumper 1206	4822 051 10008
4159	0 ohm, Jumper 1206	4822 051 10008
4162	0 ohm, Jumper 1206	4822 051 10008
	COILS & FILTERS	
5102	MW RF Coil	4822 157 71634
5103	LW RF Coil, for LW version	4822 157 71635
5109	Ceramic Filter 10.7MHz	4822 242 70665
5110	Ceramic Filter 10.7MHz	4822 242 70665
5111	AM-IF Filter 450kHz.	4822 158 60511
5112	AM-IF Filter 450kHz.	4822 157 70302
5114	AM-IF Filter 450kHz.	4822 157 70302
5119	Discriminator 10.7MHz.	4822 157 11443
5120	Ceramic Disc. 10.7MG40K.	4822 242 82065
5120	Ceramic Disc. 10.7MG61KA-TF21. . . .	4822 242 10251
5121	Quartz 75kHz	4822 242 10261
5122	Osc. Coil LW, for LW version	4822 157 60517
5123	Osc. Coil MW	4822 157 60517
5130	RF-Coil, 1.5T.	4822 156 30947
5131	RF-Coil, 1.5T.	4822 156 30947
	SEMICONDUCTORS	
6103	Diode, 1N4148.	4822 130 30621
6104	Diode, 1N4148.	4822 130 30621
6105	Diode, HN1V02H-B	4822 130 83075
6106	Diode, 1N4148.	4822 130 30621
6107	Diode, BZX79-B11	4822 130 34488
6120	Diode, 1N4148, not for /21/30/33 . .	4822 130 30621
6130	Diode, 1SV228.	4822 130 82833
6131	Diode, 1SV228.	4822 130 82833
7101	IC, TEA5757H/V1.	4822 209 90924
7102	Transistor, 2SA838B.	4822 130 60093
7103	Transistor, BC858C, for RDS version.	4822 130 42513
7104	Transistor, BC338-40, for LW version	5322 130 44779
7105	Transistor, BC338-40, for LW version	5322 130 44779
7109	Transistor, BC858B, for LW version .	5322 130 41983
7111	Transistor, BC848C	5322 130 42136
7122	Transistor, BC848C, for LW version .	5322 130 42136
7124	Transistor, BC848C, for LW version .	5322 130 42136

TAPE TRANSPORT PART LIST

	TAPE TRANSPORT PART LIST	
201	tape transport CDS-83WPC-04.	4822 691 10793
204	SPRING, RECORD	4822 492 11755

TAPE TRANSPORT MECHANICAL PARTS

	TAPE TRANSPORT MECHANICAL PARTS	
10	PINCH ROLLER ASM. (items 10-12). . .	4822 528 11189
11	PINCH ROLLER ASM. (items 10-12). . .	4822 528 11189
12	PINCH ROLLER ASM. (items 10-12). . .	4822 528 11189
17	CLUTCH ASM. (items 17-24).	4822 402 10966
18	CLUTCH ASM. (items 17-24).	4822 402 10966
19	CLUTCH ASM. (items 17-24).	4822 402 10966
20	CLUTCH ASM. (items 17-24).	4822 402 10966
21	CLUTCH ASM. (items 17-24).	4822 402 10966
22	CLUTCH ASM. (items 17-24).	4822 402 10966
23	CLUTCH ASM. (items 17-24).	4822 402 10966
24	CLUTCH ASM. (items 17-24).	4822 402 10966
38	FLYWHEEL ASSY, PB DECK	4822 528 11242
39	FLYWHEEL ASSY, REC/PB DECK	4822 528 11243
40	See Flywheel Asm. Items 38 or 39 . .	0000 000 0----
41	See Flywheel Asm. Items 38 or 39 . .	0000 000 0----
106	MAIN BELT.	4822 358 31225
107	SUB BELT	4822 358 31124
110	LEAF SWITCH, MOTOR ON/OFF.	4822 278 90663
111	REC/PB-HEAD, TC951-B	4822 249 10565
112	ERASE HEAD, LE15B-C1	4822 249 10548
113	REC/PB-HEAD, TC951-B	4822 249 10565
114	LEAF SWITCH, INDICAT. ,PLAY" REC/PB-D ECK.	4822 277 11754
115	MOTOR ASM., EG530YD-2BH + PULLEY (ite ms 115-116).	4822 361 11053
116	MOTOR ASM., EG530YD-2BH + PULLEY (ite ms 115-116).	4822 361 11053
118	MOTOR CUSHION.	4822 466 11787
119	LEAF SWITCH, INDICAT. ,PLAY" PB-DECK	4822 277 11753
122	WASHER, 1.6X3.5X0.4.	4822 532 12937

ECO MTF BOARD PARTS LIST

	ECO MTF BOARD PARTS LIST

FWC50C37 (continued)

	MISCELLANEOUS	
1707	SWITCH SLIDE, REC/PB	4822 277 11504
1710	FFC-SOCKET 6Pin, SIDE ENTRY, (not on all versions).	4822 265 11207
	CAPACITORS	
2703	47uF., 20%, 25V.	4822 124 40433
2704	22uF., 20%, 50V.	4822 124 81151
2705	4.7uF., 20%, 100V.	4822 124 40769
2706	100uF., 20%, 10V	4822 124 41584
2707	1uF., 20%, 63V, HSD only	4822 124 40242
2708	100uF., 20%, 10V	4822 124 41584
2709	220uF., 20%, 16V	4822 124 40196
2710	47uF., 20%, 25V.	4822 124 40433
2711	100uF., 20%, 10V	4822 124 23432
2712	100uF., 20%, 10V	4822 124 41584
2713	220uF., 20%, 16V	4822 124 40196
2714	47uF., 20%, 25V.	4822 124 40433
2715	22uF., 20%, 50V.	4822 124 81151
2716	22uF., 20%, 50V.	4822 124 81151
2718	47uF., 20%, 25V.	4822 124 40433
2719	47uF., 20%, 25V.	4822 124 40433
2720	100nF., 20%, 50V	4822 126 12882
2721	10nF., 5%, 250V.	4822 121 41857
2722	4.7nF., 20%, 16V	4822 126 11714
2723	4.7nF., 10%, 50V	4822 121 10686
2724	18nF., 5%, 63V	4822 121 43179
2725	1.5nF., 10%, 16V	4822 126 12878
2726	1.5nF., 10%, 16V	4822 126 12878
2727	1.5nF., 10%, 16V	4822 126 12878
2728	6.8nF., 10%, 50V	4822 121 10746
2730	1.8nF., 10%, 50V	4822 121 10685
2731	22nF., 20%, 50V.	4822 126 11585
2732	22nF., 20%, 50V.	4822 126 11585
2733	1.5nF., 10%, 16V	4822 126 12878
2735	6.8nF., 10%, 50V	4822 121 10746
2737	1.8nF., 10%, 50V	4822 121 10685
2738	22nF., 20%, 50V.	4822 126 11585
2739	100pF., 10%, 50V, .3 only.	4822 122 33195
2740	1.5nF., 10%, 16V	4822 126 12878
2741	1.5nF., 10%, 16V	4822 126 12878
2742	100pF., 10%, 50V, .3 only.	4822 122 33195
2743	1nF., 10%, 50V	4822 122 33197
2744	1nF., 10%, 50V, .4 onwards	4822 122 33197
2745	1nF., 10%, 50V	4822 122 33197
2747	6.8nF., 10%, 50V	4822 121 10746
2748	22nF., 20%, 50V.	4822 126 11585
2749	1.5nF., 10%, 16V	4822 126 12878
2751	6.8nF., 10%, 50V	4822 121 10746
2752	1.5nF., 10%, 16V	4822 126 12878
2753	1uF., 20%, 63V	4822 124 40242
2754	47uF., 20%, 25V.	4822 124 40433
2755	1uF., 20%, 63V	4822 124 40242
2756	47uF., 20%, 25V.	4822 124 40433
2759	470pF., 10%, 50V	4822 122 33519
2760	470pF., 10%, 50V	4822 122 33519
2761	68pF., 10%, 50V.	4822 126 10329
2762	68pF., 10%, 50V.	4822 126 10329
	RESISTORS	
3701	1k, 5%, 0.2W	4822 050 11002
3702	100k, 5%, 0.5W, HSD only	4822 116 52234
3703	10 ohm, 5%, 0.5W, HSD only	4822 116 52176
3704	10 ohm, 5%, 0.5W, Normal Speed only.	4822 116 52176
3704	3.9k, 5%, 0.5W, HSD only	4822 116 52276
3705	1k, 5%, 0.2W	4822 050 11002
3706	4.7M, 1%, 0.6W	4822 050 24705
3707	10 ohm, 5%, 0.5W	4822 116 52176
3708	22k, 5%, 0.5W.	4822 116 52257
3709	270 ohm, 5%, 0.16W	4822 116 83876
3711	2.2k, 5%, 0.16W.	4822 116 52256
3712	2.2k, 5%, 0.16W.	4822 116 52256
3713	22k, 5%, 0.5W.	4822 116 52257
3714	22k, 5%, 0.5W.	4822 116 52257
3715	1k, 5%, 0.2W	4822 050 11002
3716	8.2k, 5%, 0.5W	4822 116 52303
3717	330 ohm, 5 %, 0.5W	4822 116 52219
3718	22k, 5%, 0.5W.	4822 116 52257
3719	15k, 5%, 0.5W.	4822 116 52244
3720	15k, 5%, 0.5W.	4822 116 52244
3721	330k, 5%, 0.5W	4822 116 52272
3722	220 ohm, 5%, 0.5W.	4822 116 83872
3724	39, 5%, 0.16W.	4822 116 52193
3725	8.2k, 5%, 0.5W	4822 116 52303
3726	1k, 5%, 0.2W	4822 050 11002
3727	330 ohm, 5%, 0.5W.	4822 116 52219
3728	22k, 5%, 0.5W.	4822 116 52257
3729	15k, 5%, 0.5W.	4822 116 52244
3730	15k, 5%, 0.5W.	4822 116 52244
3731	330k, 5%, 0.5W	4822 116 52272
3732	10k, 5%, 0.5W, HSD only.	4822 116 83864
3733	2.2k, 5%, 0.16W.	4822 116 52256
3734	12k, 5%, 0.5W.	4822 116 52238
3735	10k, 5%, 0.5W, HSD only.	4822 116 83864
3736	2.2k, 5%, 0.16W.	4822 116 52256
3737	330k, 5%, 0.5W	4822 116 52272
3738	220 ohm, 5%, 0.5W.	4822 116 83872
3740	10k, 5%, 0.5W.	4822 116 83864
3741	39 ohm, 5%, 0.16W.	4822 116 52193
3742	330k, 5%, 0.5W	4822 116 52272
3743	220 ohm, 5%, 0.5W.	4822 116 83872
3745	10k, 5%, 0.5W.	4822 116 83864
3746	39 ohm, 5%, 0.16W.	4822 116 52193
3747	12k, 5%, 0.5W.	4822 116 52238
3748	470 ohm, 5%, 0.16W	4822 116 83883
3749	330k, 5%, 0.5W	4822 116 52272
3750	220 ohm, 5%, 0.5W.	4822 116 83872
3752	39 ohm, 5%, 0.16W.	4822 116 52193
3753	1k, 5%, 0.2W	4822 050 11002
3754	2.2k, 5%, 0.16W.	4822 116 52256
3755	2.2k, 5%, 0.16W.	4822 116 52256
3756	2.2k, 5%, 0.16W.	4822 116 52256
3757	2.2k, 5%, 0.16W.	4822 116 52256
3758	2k, TRIMPOT. LIN..	4822 100 11368
S 3759	4.7 ohm, 5%, NFR	4822 052 10478
3760	2.7k, 5%, 0.5W	4822 116 52263
3761	470k, 5%, 0.5W, HSD only	4822 116 52285
3763	150k, 5%, 0.16W, HSD only.	4822 116 52245
3764	10k, 5%, 0.5W.	4822 116 83864
3765	10k, 5%, 0.5W.	4822 116 83864
3766	1k, 5%, 0.2W	4822 050 11002
3767	1k, 5%, 0.2W	4822 050 11002
3768	10k, 5%, 0.5W.	4822 116 83864
3769	8.2k, 5%, 0.5W	4822 116 52303
3770	47k, 5%, 0.16W	4822 116 83884
3771	10k, 5%, 0.5W.	4822 116 83864
3772	100k, 5%, 0.5W	4822 116 52234
3773	2.7k, 5%, 0.5W	4822 116 52263
3774	8.2k, 5%, 0.5W	4822 116 52303
3775	47k, 5%, 0.16W	4822 116 83884
3776	100k, 5%, 0.5W	4822 116 52234
3777	47k, 5%, 0.16W	4822 116 83884
3778	100k, 5%, 0.5W	4822 116 52234
3779	10k, 5%, 0.5W.	4822 116 83864
3780	330k, 5%, 0.5W	4822 116 52272
3781	680 ohm, 5%, 0.5W.	4822 116 52228
3782	680 ohm, 5%, 0.5W.	4822 116 52228
3785	270 ohm, 5%, 0.16W	4822 116 83876
3786	47k, 5%, 0.16W, HSD only	4822 116 83884
3787	220 ohm, 5%, 0.5W.	4822 116 83872
3788	680 ohm, 5%, 0.5W.	4822 116 52228
3789	680 ohm, 5%, 0.5W.	4822 116 52228
3790	22k, 5%, 0.5W, HSD only.	4822 116 52257
3791	47k, 5%, 0.16W, HSD only	4822 116 83884
3792	18k, 5%, 0.5W, HSD only.	4822 116 52251
	COILS	
5701	OSC. COIL VAR. 100kHz.	4822 157 10371
	SEMICONDUCTORS	
6703	Diode, 1N4148.	4822 130 30621
6706	Diode, 1N4148.	4822 130 30621
6707	Diode, 1N4148.	4822 130 30621
6708	Diode, 1N4148.	4822 130 30621
6709	Diode, 1N4148.	4822 130 30621
7701	Transistor, BC557B, HSD only	4822 130 44568
7702	Transistor, BC547B, HSD only	4822 130 40959
7704	Transistor, BC337-25	4822 130 40981
7709	Transistor, BC547B, HSD only	4822 130 40959
7710	Transistor, BC547B, HSD only	4822 130 40959
7713	Transistor, BC337-25	4822 130 40981
7714	Transistor, BC337-25	4822 130 40981
7715	Transistor, BC337-25	4822 130 40981
7716	Transistor, BC337-25	4822 130 40981
7717	Transistor, BC547B	4822 130 40959
7718	Transistor, BC547B	4822 130 40959
7719	Transistor, BC547B	4822 130 40959
7722	Transistor, BC547B, HSD only	4822 130 40959
7711	IC, AN7323, REC/PB-AMPLIFIER IC. . .	4822 209 17498
7712	IC, AN7323, REC/PB-AMPLIFIER IC. . .	4822 209 17498

CD DRAWER ASSEMBLY PARTS LIST

	CD DRAWER ASSEMBLY PARTS LIST	
20	DRAWER	3103 304 66500
21	CARROUSELL	3103 304 66490
22	PULLEY-DRAWER.	3103 304 06860
23	ECCENTRIC.	3103 304 06850
24	NAIL	3103 304 06980
25	DRIVING-BELT-CARROUSEL	3103 304 66850
27	BUSH DRAWER.	4822 532 12365
27	BUSH DRAWER / BWC Version.	3103 304 07100
29	BRACKET-DISC	3103 304 66550
30	TUMBLER.	3103 304 66520
31	SPRING-DISC.	3103 301 06470
32	CONTROL-DISC	3103 304 06920
33	WASHER	3103 304 06970
34	GEAR-1	3103 304 06870
37	MOTOR ASSY	4822 361 10753

S = Safety Part Be sure to use exact replacement part.

3CDC-LC MODULE ASM. PARTS LIST

	3CDC-LC MODULE ASM. PARTS LIST	
21	CLAMPER ASSY-VAM	3140 117 58650
30	SUPPORT.	3103 304 66560
31	DAMPER - RUBBER (25DEG).	4822 529 10431
32	DAMPER - RUBBER (25DEG).	4822 529 10431
33	WASHER	3103 304 06970
35	VAM2201/01	4822 691 10772
41	FRAME.	3103 304 66480
42	BRACKET-GUIDING.	3103 304 66540
43	SPRING-GUIDING	3103 301 06460
44	GEAR-3	3103 304 06890
45	NAIL	3103 304 06980
46	GEAR-2	3103 304 06880
47	BRACKET-LOAD	3103 304 66530
48	CAM.	3103 304 06910
49	GUIDING.	3103 304 66510
51	GEAR-4	3103 304 06900
52	GEAR-1	3103 304 06870
53	PULLEY-FRAME	3103 304 06960
54	DRIVING-BELT-DRAWER.	3103 304 66910
55	MOTOR ASSY	4822 361 10753
56	SCREW M2,6X2,9	4822 502 12548
57	COVER-VAM.	3103 304 68890
59	RUBBER	4822 466 12146

3CDC-LC ELECTRICAL PARTS

	3CDC-LC ELECTRICAL PARTS	
	MISCELLANEOUS	
1800	Flex Foil Connector 15Pin.	4822 265 10925
1805	Flex Foil Connector 15Pin.	4822 265 10979
1805	Flex Foil Connector 19Pin.	4822 265 11545
1805	Flex Foil Connector 23Pin.	4822 265 11182
1810	RES XTL 8MHz4672	4822 242 10849
1810	RES CER 8MHz467.	4822 242 73557
1875	Flex Foil Connector 5Pin	4822 267 10958
1876	Flex Foil Connector 5Pin	2422 025 08332
1880	Switch	4822 276 13503
1881	Switch	4822 276 13503
1882	Switch	4822 276 13503
1883	Switch	4822 276 13503
8002	Flex Foil 5Pin 200mm	3103 308 91990
8005	Flex Foil 15Pin 170mm.	3103 308 91980
	CAPACITORS	
2800	180pF., 5%, 63V.	4822 126 10326
2801	220pF., 5%, 63V.	4822 122 33575
2802	180pF., 5%, 63V.	4822 126 10326
2803	220pF., 5%, 63V.	4822 122 33575
2805	220pF., 5%, 63V.	4822 122 33575
2806	220pF., 5%, 63V.	4822 122 33575
2807	330pF., 5%, 63V.	5322 122 31863
2808	220pF., 5%, 63V.	4822 122 33575
2809	470nF 20% 50V.	5322 124 41948
2810	180pF., 5%, 63V.	4822 126 10326
2811	220pF., 5%, 63V.	4822 122 33575
2815	220nF., +80/-20%, 25V.	4822 126 14076
2816	1.5nF., 5%, 63V.	4822 126 13344
2818	1.5nF., 5%, 63V.	4822 126 13344
2822	2.2nF., 5%, 50V.	2222 861 15222
2823	47pF., 1%, 63V	4822 126 13692
2824	47nF., 10%, 63V.	4822 126 13751
2825	10nF., 20%, 50V.	4822 122 33177
2826	47uF., 20%, 4V	4822 124 12362
2828	47uF., 20%, 4V	4822 124 12362
2829	22nF., 10%, 63V.	5322 122 32654
2830	47nF., 10%, 63V.	4822 126 13751
2831	100pF., 5%, 50V.	5322 122 32531
2832	100pF., 5%, 50V.	5322 122 32531
2833	33pF., 5%, 50V	5322 122 32659
2834	33pF., 5%, 50V	5322 122 32659
2835	47nF., 10%, 63V.	4822 126 13751
2837	47uF., 20%, 25V.	4822 124 40433
2838	10uF., 20%, 63V.	4822 124 40248
2839	47uF., 20%, 25V.	4822 124 40433
2840	100nF., 10%, 50V	4822 126 14585
2841	270pF., 5%, 50V.	4822 122 33216
2842	2.2nF., 10%, 63V	4822 122 33127
2844	270pF., 5%, 50V.	4822 122 33216
2849	4.7uF., 20%, 100V.	4822 124 40769
2850	1nF., 10%, 63V	5322 122 31647
2851	220uF., 20%, 4V.	4822 124 42383
2852	47nF., 10%, 63V.	4822 126 13751
2853	22nF., 10%, 63V.	5322 122 32654
2854	47nF., 10%, 63V.	4822 126 13751
2855	470pF., 10%, 63V	5322 122 34099
2856	27pF., 1%, 63V	4822 126 13691
2857	10nF 20% 50V	4822 122 33177
2858	220uF., 20%.	4822 124 12245
2859	10nF., 20%, 50V.	4822 122 33177
2860	10æF 20% 16V	4822 124 11947
2861	10uF., 20%, 16V.	4822 124 11947
2862	220pF., 5%, 63V.	4822 122 33575
2863	220pF., 5%, 63V.	4822 122 33575
2864	22pF., 5%, 50V	5322 122 32658
2865	22nF., 10%, 63V.	5322 122 32654
2867	220pF., 5%, 63V.	4822 122 33575
2869	47nF., 10%, 63V.	4822 126 13751
2872	47nF., 10%, 63V.	4822 126 13751
2873	47uF., 20%, 16V.	4822 124 80231
2875	10uF., 20%, 16V.	4822 124 11947
2876	220uF., 20%.	4822 124 12245
2877	47pF., 1%, 63V	4822 126 13692
2878	220pF., 5%, 63V.	4822 122 33575
2879	47nF., 10%, 63V.	4822 126 13751
2881	4.7uF., 20%, 100V.	4822 124 40769
2882	220pF., 5%, 63V.	4822 122 33575
2884	4.7uF., 20%, 100V.	4822 124 40769
2885	4.7uF., 20%, 100V.	4822 124 40769
2887	100nF., 10%, 50V	4822 126 14585
2888	4.7uF., 20%, 100V.	4822 124 40769
2891	1.5nF., 10%, 63V	5322 122 31865
2892	4.7nF., 10%, 63V	5322 126 10223
2893	220pF., 5%, 63V.	4822 122 33575
	RESISTORS	
3700	470 ohm, 5%, 0.1W.	4822 051 20471
3705	220 ohm, 1%, 0.1W.	4822 117 11503
3706	470 ohm, 5%, 0.1W.	4822 051 20471
3707	470 ohm, 5%, 0.1W.	4822 051 20471
3708	470 ohm, 5%, 0.1W.	4822 051 20471
3709	1 ohm, 5%, 0.1W.	4822 051 20108
3711	10k, 1%, 0.1W.	4822 117 10833
3712	10 ohm, 5%, 0.1W	4822 051 20109
3713	22k, 5%, 0.1W.	4822 051 20223
3714	10k, 1%, 0.1W.	4822 117 10833
3715	100k, 1%, 0.1W	4822 117 10837
3716	470 ohm, 5%, 0.1W.	4822 051 20471
3718	4k7 5%, 0.1W	4822 051 20472
3727	4k7 5%, 0.1W	4822 051 20472
3728	4k7 5%, 0.1W	4822 051 20472
3730	33k, 5%, 0.1W.	4822 051 20333
3731	10k, 1%, 0.1W.	4822 117 10833
3732	470 ohm, 5%, 0.1W.	4822 051 20471
3733	470 ohm, 5%, 0.1W.	4822 051 20471
3734	470 ohm, 5%, 0.1W.	4822 051 20471
3740	22k, 5%, 0.1W.	4822 051 20223
3741	22k, 5%, 0.1W.	4822 051 20223
3742	22k, 5%, 0.1W.	4822 051 20223
3743	22k, 5%, 0.1W.	4822 051 20223
3744	10k, 1%, 0.1W.	4822 117 10833
3746	10k, 1%, 0.1W.	4822 117 10833
3750	1k, 2%, 0.25W.	4822 051 10102
3751	1k, 2%, 0.25W.	4822 051 10102
3800	56k, 1%, 0.1W.	4822 117 11148
3801	10k, 1%, 0.1W.	4822 117 10833
3802	56k, 1%, 0.1W.	4822 117 11148
3803	10k, 1%, 0.1W.	4822 117 10833
3804	10k, 1%, 0.1W.	4822 117 10833
3805	10k, 1%, 0.1W.	4822 117 10833
3806	10k, 1%, 0.1W.	4822 117 10833
3807	10k, 1%, 0.1W.	4822 117 10833
3808	10k, 1%, 0.1W.	4822 117 10833
3809	330 ohm, 1%, 1.25W	4822 117 13577
3811	18k, 1%, 0.1W.	4822 117 10965
3812	2.2 ohm, 5%, 1W.	4822 053 10228
3814	33 ohm, 5%, 0.1W	4822 051 20339
S 3815	4.7 ohm, 5%, 0.33W	4822 052 10478
3819	470 ohm, 5%, 0.1W.	4822 051 20471
3820	4k7, 5%, 0.1W.	4822 051 20472
3821	4k7, 5%, 0.1W.	4822 051 20472
3822	2k7, 1%, 0.1W.	4822 117 12955
3823	1k, 2% 0.25W	4822 051 10102
3824	1k, 2% 0.25W	4822 051 10102
3825	1k, 2% 0.25W	4822 051 10102
3826	22k, 5%, 0.1W.	4822 051 20223
3827	33k, 5%, 0.1W.	4822 051 20333
3828	22k, 5%, 0.1W.	4822 051 20223
3831	100 ohm, 5%, 0.1W.	4822 051 20101
3832	10k, 1%, 0.1W.	4822 117 10833
3833	22k, 5%, 0.1W.	4822 051 20223
3834	22k, 5%, 0.1W.	4822 051 20223
S 3835	3.3 ohm, 5%, 0.33W	4822 052 10338
3837	1k, 2%, 0.25W.	4822 051 10102
3838	1k, 2%, 0.25W.	4822 051 10102
3839	100k, 1%, 0.1W	4822 117 10837
3840	100k, 1%, 0.1W	4822 117 10837
3841	4k7, 5%, 0.1W.	4822 051 20472
3842	47k, 1%, 0.1W.	4822 117 10834
3843	33k, 5%, 0.1W.	4822 051 20333
3844	4k7, 5%, 0.1W.	4822 051 20472
3845	47k, 1%, 0.1W.	4822 117 10834
3846	33k, 5%, 0.1W.	4822 051 20333
3847	6k8, 1%, 0.1W.	4822 117 11507
3848	100k, 1%, 0.1W	4822 117 10837

S = Safety Part Be sure to use exact replacement part.

FWC50C37 (continued)

3849	100k, 1%, 0.1W	4822 117 10837	
3850	3k9, 5%, 0.1W.	4822 051 20392	
S 3851	3.3 ohm, 5%, 0.33W	4822 052 10338	
S 3852	2.2 ohm, 5%, 0.33W	4822 052 10228	
3853	470 ohm, 5%, 0.1W.	4822 051 20471	
3854	100 ohm, 5%, 0.1W.	4822 051 20101	
3855	100 ohm, 5%, 0.1W.	4822 051 20101	
3856	68 ohm, 1%, 0.1W	4822 117 12521	
3857	68 ohm, 1%, 0.1W	4822 117 12521	
3858	22k, 5%, 0.1W.	4822 051 20223	
3859	22k, 5%, 0.1W.	4822 051 20223	
3860	10k, 1%, 0.1W.	4822 117 10833	
3861	10k, 1%, 0.1W.	4822 117 10833	
3862	120 ohm, 5%, 0.1W.	4822 051 20121	
3863	100 ohm, 5%, 0.1W.	4822 051 20101	
3863	33 ohm, 5%, 0.1W	4822 051 20339	
3864	100 ohm, 5%, 0.1W.	4822 051 20101	
3866	10k, 1%, 0.1W.	4822 117 10833	
3867	120 ohm, 5%, 0.1W.	4822 051 20121	
3869	4.7 ohm, 5%, 0.1W.	4822 051 20478	
3870	100 ohm, 5%, 0.1W.	4822 051 20101	
3871	10k, 1%, 0.1W.	4822 117 10833	
3873	470 ohm, 5%, 0.1W.	4822 051 20471	
3875	10k, 1%, 0.1W.	4822 117 10833	
3876	100k, 1%, 0.1W	4822 117 10837	
3877	10k, 1%, 0.1W.	4822 117 10833	
3878	10k, 1%, 0.1W.	4822 117 10833	
3879	100k, 1%, 0.1W	4822 117 10837	
3880	3k9, 5%, 0.1W.	4822 051 20392	
3881	100k, 1%, 0.1W	4822 117 10837	
3882	47k, 1%, 0.1W.	4822 117 10834	
3883	10k, 1%, 0.1W.	4822 117 10833	
3884	270 ohm, 1%, 0.1W.	4822 117 11504	
3885	10k, 1%, 0.1W.	4822 117 10833	
3886	47k, 1%, 0.1W.	4822 117 10834	
3887	220 ohm, 1%, 0.1W.	4822 117 11503	
3888	10k, 1%, 0.1W.	4822 117 10833	
3889	470 ohm, 5%, 0.1W.	4822 051 20471	
3890	1k, 2%, 0.25W.	4822 051 10102	
3891	1k, 2%, 0.25W.	4822 051 10102	
3892	470 ohm, 5%, 0.1W.	4822 051 20471	
3893	470 ohm, 5%, 0.1W.	4822 051 20471	
3894	100 ohm, 5%, 0.1W.	4822 051 20101	
3895	15 ohm, 5%, 0.1W	4822 051 20159	
3897	100 ohm, 5%, 0.1W.	4822 051 20101	
3898	220 ohm, 1%, 0.1W.	4822 117 11503	
3899	100 ohm, 5%, 0.1W.	4822 051 20101	
4800	0 ohm, Jumper 0805	4822 051 20008	
4801	0 ohm, Jumper 0805	4822 051 20008	
4802	0 ohm, Jumper 0805	4822 051 20008	
4804	0 ohm, Jumper 0805	4822 051 20008	
4805	0 ohm, Jumper 0805	4822 051 20008	
4806	0 ohm, Jumper 0805	4822 051 20008	
4807	0 ohm, Jumper 0805	4822 051 20008	
4808	0 ohm, Jumper 0805	4822 051 20008	
4810	0 ohm, Jumper 0805	4822 051 20008	
4812	0 ohm, Jumper 0805	4822 051 20008	
4817	0 ohm, Jumper 0805	4822 051 20008	
4818	0 ohm, Jumper 0805	4822 051 20008	
4819	0 ohm, Jumper 0805	4822 051 20008	
4820	0 ohm, Jumper 0805	4822 051 20008	
4821	0 ohm, Jumper 0805	4822 051 20008	
4822	0 ohm, Jumper 0805	4822 051 20008	
4823	0 ohm, Jumper 0805	4822 051 20008	
4824	0 ohm, Jumper 0805	4822 051 20008	
4825	0 ohm, Jumper 0805	4822 051 20008	
4826	0 ohm, Jumper 0805	4822 051 20008	
4827	0 ohm, Jumper 0805	4822 051 20008	
4828	0 ohm, Jumper 0805	4822 051 20008	
4830	0 ohm, Jumper 0805	4822 051 20008	
4831	0 ohm, Jumper 0805	4822 051 20008	
4832	0 ohm, Jumper 0805	4822 051 20008	
4833	0 ohm, Jumper 0805	4822 051 20008	
4834	0 ohm, Jumper 0805	4822 051 20008	
4835	0 ohm, Jumper 0805	4822 051 20008	
4836	0 ohm, Jumper 0805	4822 051 20008	
4837	0 ohm, Jumper 0805	4822 051 20008	
4838	0 ohm, Jumper 0805	4822 051 20008	
4839	0 ohm, Jumper 0805	4822 051 20008	
4840	0 ohm, Jumper 0805	4822 051 20008	
4841	0 ohm, Jumper 0805	4822 051 20008	
4842	0 ohm, Jumper 0805	4822 051 20008	
4843	0 ohm, Jumper 0805	4822 051 20008	
4844	0 ohm, Jumper 0805	4822 051 20008	
4845	0 ohm, Jumper 0805	4822 051 20008	
4846	0 ohm, Jumper 0805	4822 051 20008	
4847	0 ohm, Jumper 0805	4822 051 20008	
4848	0 ohm, Jumper 0805	4822 051 20008	
4849	0 ohm, Jumper 0805	4822 051 20008	
4876	0 ohm, Jumper 0805	4822 051 20008	
	COILS & FILTERS		
5802	Coil, 100uH.	4822 156 31058	
	SEMICONDUCTORS		
6871	Diode, BAS216.	4822 130 83757	
6872	Diode, BAS216.	4822 130 83757	
6873	Diode, BAS216.	4822 130 83757	
6874	Diode, BAS216.	4822 130 83757	
6875	Diode, BZX284-C5V1	4822 130 11383	
6877	Diode, BZX284-C3V9	4822 130 11366	
6878	Diode, BAS216.	4822 130 83757	
6879	Diode, BZX284-C3V9	4822 130 11366	
7801	IC, SM TZA1025T/V2	9352 622 36118	
7805	IC, TDA1308T/N1.	4822 209 33165	
7806	IC, TDA7073A/N2.	4822 209 32852	
7807	IC, TDA7073A/N2.	4822 209 32852	
7812	Transistor, BC847B	4822 130 60511	
7871	IC, TDA7073A/N2.	4822 209 32852	
7873	HEF4094BT.	5322 209 11306	
7874	Transistor, BC847B	4822 130 60511	
7875	Transistor, BC847B	4822 130 60511	
7876	LC89170M	4822 209 16143	
7877	SAA7325H	4822 209 17324	

POWER 4 MODULE MECHANICAL PARTS LIST

	POWER 4 MODULE MECHANICAL PARTS LIST	
201	Rucksack	4822 426 10607
201	Rucksack With Matrix Surround.	4822 426 10608
215	Spring Transistor.	4822 492 11735
253	Clamping Spring.	4822 492 11068
255	Spring Clip.	4822 255 40179
	POWER 4 MODULE ELECTRICAL PARTS LIST	
	MISCELLANEOUS	
S 1200	Fuse T1A	4822 071 51002
S 1201	Fuse T1A	4822 071 51002
S 1201	Fuse T2.5A UL.	4822 253 50137
S 1202	Fuse T1A	4822 252 11224
S 1203	Fuse T2.5A	4822 071 52502
S 1203	Fuse T3.15A UL	4822 252 51121
S 1204	Fuse T2.5A	4822 071 52502
S 1204	Fuse T3.15A UL	4822 252 51121
S 1205	Fuse T2.5A	4822 071 52502
S 1205	Fuse T3.15A UL	4822 252 51121
1207	Connector.	4822 267 10557
S 1208	Relay.	2422 132 07402
S 1209	Mains Socket, IEC.	4822 265 31015
S 1209	Mains Socket, UL	4822 265 31016
S 1210	Voltage Selector	4822 272 10269
S 1299	Fuse T1A	4822 071 51002
1303	Speaker Terminal	4822 267 31176
1304	Matrix Surround Terminal	4822 265 10912
S 1360	Fuse F3.15A IEC 250V	4822 252 11225
S 1360	Fuse F4A UL 250V	4822 252 11226
S 1361	Fuse F3.15A IEC 250V	4822 252 11225
S 1361	Fuse F4A UL 250V	4822 252 11226
	CAPACITORS	
2200	4700uF., 20%, 25V.	4822 124 80103
2202	4700uF., 20%, 50V.	4822 124 80415
2204	3300uF., 20%, 35V.	4822 124 42367
2206	100nF., 5%, 63V.	5322 121 42386
2210	100nF., 5%, 63V.	5322 121 42386
2211	100nF., 5%, 63V.	5322 121 42386
2212	100nF., 5%, 63V.	5322 121 42386
2215	220uF., 20%, 25V	4822 124 80144
2216	100nF., +80/-20%, 50V.	4822 126 12882
2217	100nF., +80/-20%, 50V.	4822 126 12882
2221	10uF., 20%, 50V.	4822 124 41579
2222	47uF., 20%, 25V.	4822 124 40433
2225	100nF., +80/-20%, 50V.	4822 126 12882
2226	47uF., 20%, 25V.	4822 124 40433
2227	2.2uF., 20%, 50V	4822 124 41576
2228	10uF., 20%, 50V.	4822 124 41579
2236	10uF., 20%, 50V.	4822 124 41579
2251	100uF., 20%, 63V	4822 124 40255
2253	0.47uF., 20%, 63V.	4822 124 41407
2298	1uF., 20%, 63V	4822 124 40242
2299	100nF., +80/-20%, 50V.	4822 126 12882
2301	4.7nF., 20%.	4822 126 11714
2302	4.7nF., 20%.	4822 126 11714
2303	4.7nF., 20%.	4822 126 11714
2304	4.7nF., 20%.	4822 126 11714
2305	100uF., 20%, 25V	4822 124 81029
2306	100uF., 20%, 25V	4822 124 81029
2307	100uF., 20%, 25V	4822 124 81029
2308	100uF., 20%, 25V	4822 124 81029
2309	47nF., 5%, 250V.	4822 121 43526
2310	47nF., 5%, 250V.	4822 121 43526
2311	47nF., 5%, 250V.	4822 121 43526
2312	47nF., 5%, 250V.	4822 121 43526
2313	1uF., 20%, 63V	4822 124 40242
2314	1uF., 20%, 63V	4822 124 40242
2317	47uF., 20%, 25V.	4822 124 40433
2319	47uF., 20%, 25V.	4822 124 40433
2320	47uF., 20%, 25V.	4822 124 40433
2323	4.7nF., 20%.	4822 126 11714

S = Safety Part Be sure to use exact replacement part.

FWC50C37 (continued)

2324	4.7nF., 20%.	4822 126 11714
2325	10uF., 20%, 50V.	4822 124 41579
2329	47pF., 5%, 50V	4822 122 33848
2341	4.7nF., 20%.	4822 126 11714
2342	4.7nF., 20%.	4822 126 11714
2345	100nF., +80/-20%, 50V.	4822 126 12882
2346	100nF., +80/-20%, 50V.	4822 126 12882
2374	47nF., 5%, 250V.	4822 121 43526
	RESISTORS	
S 3201	10Meg, 5%, 0.5W.	4822 053 21106
3202	10k, 5%, 0.5W.	4822 116 83864
3203	270 ohm, 5%, 0.5W.	4822 116 83876
S 3204	3.3 ohm, 5%, 0.33W	4822 052 10338
3211	10 ohm, 5%, 0.5W	4822 116 52176
3215	3.3k, 5%, 0.5W	4822 116 52269
3216	1k, 1% 0.4W.	4822 050 11002
3217	1k, 1% 0.4W.	4822 050 11002
3218	10k, 5%, 0.5W.	4822 116 83864
3219	3.3k, 5%, 0.5W	4822 116 52269
3220	3.3k, 5%, 0.5W	4822 116 52269
3221	47k, 5%, 0.5W.	4822 116 83884
3222	33k, 5%, 0.5W.	4822 116 52271
3223	120 ohm, 5%, 0.5W.	4822 116 52206
3224	150 ohm, 5%, 0.5W.	4822 116 83868
3225	270 ohm, 5%, 0.5W.	4822 116 83876
3226	1k, 1% 0.4W.	4822 050 11002
3227	2.2k, 5%, 0.5W	4822 116 52256
3228	1k, 1% 0.4W.	4822 050 11002
3229	1k, 1% 0.4W.	4822 050 11002
3230	3.3k, 5%, 0.5W	4822 116 52269
3235	68 ohm, 5%, 0.5W	4822 116 52199
3239	4.7k, 5%, 0.5W	4822 116 52283
3241	1.8k, 5%, 0.5W	4822 116 52249
3242	4.7k, 5%, 0.5W	4822 116 52283
3243	1.8k, 5%, 0.5W	4822 116 52249
3244	22k, 5%, 0.5W.	4822 116 52257
3246	470 ohm, 5%, 0.5W.	4822 116 83883
3247	120 ohm, 5%, 0.5W.	4822 116 52206
3248	10k, 5%, 0.5W.	4822 116 83864
3250	120 ohm, 5%, 0.5W.	4822 116 52206
3251	4.7k, 5%, 0.5W	4822 116 52283
3252	2.2k, 5%, 0.5W	4822 116 52256
S 3253	47 ohm, 5%, 0.33W.	4822 052 10479
S 3254	47 ohm, 5%, 0.33W.	4822 052 10479
3255	1.5 ohm, 5%.	4822 117 12148
3301	6.8k, 5%	4822 116 83961
3302	6.8k, 5%	4822 116 83961
3303	390 ohm, 5%, 0.5W.	4822 116 83881
3304	390 ohm, 5%, 0.5W.	4822 116 83881
3305	330 ohm, 5%, 0.5W.	4822 116 52219
3306	330 ohm, 5%, 0.5W.	4822 116 52219
3307	680 ohm, 5%, 0.5W.	4822 116 52228
3308	680 ohm, 5%, 0.5W.	4822 116 52228
3309	820 ohm, 5%, 0.5W.	4822 116 52231
3310	820 ohm, 5%, 0.5W.	4822 116 52231
3311	4.7 ohm, 1% 0,6W	4822 050 24708
3312	4.7 ohm, 1% 0,6W	4822 050 24708
3313	4.7 ohm, 1% 0,6W	4822 050 24708
3314	4.7 ohm, 1% 0,6W	4822 050 24708
3316	470 ohm, 5%, 0.5W.	4822 116 83883
3317	1.8k, 5%, 0.5W	4822 116 52249
3321	3.9k, 5%, 0.5W	4822 116 52276
3326	4.7k, 5%, 0.5W	4822 116 52283
3327	330 ohm, 5%, 0.5W.	4822 116 52219
3328	10k, 5%, 0.5W.	4822 116 83864
3333	47k, 5%, 0.5W.	4822 116 83884
3340	330 ohm, 5%, 0.5W.	4822 116 52219
3341	4.7k, 5%, 0.5W	4822 116 52283
3342	3.3k, 5%, 0.5W	4822 116 52269
3343	220 ohm, 5%, 0.5W.	4822 116 83872
3344	220 ohm, 5%, 0.5W.	4822 116 83872
	COILS & TRANSFORMERS	
S 5201	Mains Filter 400uH, 3A	4822 157 11832
S 5211	Standby Transformer.	4822 146 10756
S 5211	Standby Transformer.	3103 308 30590
5301	Coil, 18.5 Turns	4822 157 62255
5302	Coil, 18.5 Turns	4822 157 62255
5303	Coil, 18.5 Turns	4822 157 62255
5304	Coil, 18.5 Turns	4822 157 62255
	SEMICONDUCTORS	
S 6201	Diode, D5SBA20	4822 130 82078
S 6204	Diode, 1N5392.	5322 130 80686
S 6205	Diode, 1N5392.	5322 130 80686
6206	Diode, 1N4148.	4822 130 30621
6207	Diode, BZX79-C6V8.	4822 130 34278
6208	Diode, 1N4003G	4822 130 31878
6209	Diode, 1N4148.	4822 130 30621
6210	Diode, 1N4148.	4822 130 30621
6211	Diode, 1N4148.	4822 130 30621
6212	Diode, 1N4148.	4822 130 30621
6213	Diode, 1N4148.	4822 130 30621
6214	Diode, 1N4003G	4822 130 31878
6221	Diode, BZX79-B11	4822 130 34488
6225	Diode, BZX79-C8V2.	4822 130 34382
6226	Diode, 1N4148.	4822 130 30621
6228	Diode, 1N4148.	4822 130 30621
6233	Diode, BZX79-C15	4822 130 34281
6234	Diode, 1N4148.	4822 130 30621
6235	Diode, 1N4148.	4822 130 30621
6236	Diode, 1N4148.	4822 130 30621
6239	Diode, 1N4148.	4822 130 30621
6242	Diode, 1N4148.	4822 130 30621
6243	Diode, BZX79-B8V2.	4822 130 34382
6244	Diode, BZX79-B3V9.	4822 130 31981
6251	Diode, BZX79-C30	4822 130 34328
6252	Diode, BZX79-C5V6.	4822 130 34173
6253	Diode, 1N4003G	4822 130 31878
6254	Diode, 1N4003G	4822 130 31878
6300	Diode, 1N4003G	4822 130 31878
6301	Diode, BZX79-B22	4822 130 34441
6301	Diode, BZX55-F24	9338 872 90673
6305	Diode, 1N4003G	4822 130 31878
6306	Diode, 1N4003G	4822 130 31878
6307	Diode, 1N4003G	4822 130 31878
6308	Diode, 1N4003G	4822 130 31878
6309	Diode, 1N4148.	4822 130 30621
6310	Diode, BZX79-C3V9.	4822 130 31981
6312	Diode, BYV27-100	4822 130 31982
6313	Diode, 1N4148.	4822 130 30621
6314	Diode, BYV28-200/20.	4822 130 80791
6315	Diode, BZX79-C6V8.	4822 130 34278
7201	IC, L7805CV (Regulator).	4822 209 80817
7202	Transistor, BC368.	9332 592 40126
7211	Transistor, BC547C	4822 130 44503
7221	Transistor, BDX53BFP	9322 139 23687
7222	Transistor, BC547B	4822 130 40959
7223	Transistor, BC547B	4822 130 40959
7224	Transistor, BC556B	4822 130 41691
7225	Transistor, BC547B	4822 130 40959
7226	Transistor, BC556B	4822 130 41691
7227	Transistor, BD438.	4822 130 40995
7228	Transistor, BC547B	4822 130 40959
7236	Transistor, BC547B	4822 130 40959
7237	Transistor, BC547B	4822 130 40959
7238	Transistor, BD438.	4822 130 40995
7251	Transistor, BC327-40	4822 130 41327
7301	IC, AN7164, Amplifier.	4822 209 90411
7302	IC, AN7164, Amplifier.	4822 209 90411
7303	Transistor, STP16NE06FP.	4822 130 11336
7304	Transistor, BC556B	4822 130 41691
7305	Transistor, DW94C.	4822 130 10847
7315	Transistor, BC547B	4822 130 40959
7316	Transistor, BC547B	4822 130 40959
7322	Transistor, BC557B	4822 130 44568

AF6 BOARD ELECTRICAL PARTS LIST

	AF6 BOARD ELECTRICAL PARTS LIST	
	MISCELLANEOUS	
1523	Flex Connector 6Pin.	4822 267 41062
1525	Cinch Socket - Aux in.	4822 267 20452
1527	Cinch Socket - Sub-Woofer out.	4822 267 31729
1528	Flex Connector 6Pin.	4822 267 10731
1532	Flex Connector 15Pin	4822 265 10981
1535	Flex Connector 19Pin	4822 265 11553
1542	Flex Connector 6Pin.	4822 267 10731
1543	Headphone Socket	4822 265 11529
	CAPACITORS	
2511	4.7uF., 20%, 100V.	4822 124 40769
2512	4.7uF., 20%, 100V.	4822 124 40769
2513	4.7uF., 20%, 100V.	4822 124 40769
2514	4.7uF., 20%, 100V.	4822 124 40769
2515	100pF, 5%, 50V	5322 122 32531
2516	100pF, 5%, 50V	5322 122 32531
2517	100nF, 10%, 50V.	4822 126 14585
2518	47uF., 20%, 25V.	4822 124 40433
2519	100pF, 5%, 50V	5322 122 32531
2520	100pF, 5%, 50V	5322 122 32531
2521	4.7uF., 20%, 100V.	4822 124 40769
2522	4.7uF., 20%, 100V.	4822 124 40769
2523	22pF, 5%, 50V.	5322 122 32658
2524	22pF, 5%, 50V.	5322 122 32658
2525	1uF., 20%, 63V	4822 124 21913
2526	1uF., 20%, 63V	4822 124 21913
2527	470pF, 10%, 63V.	5322 122 34099
2528	470pF, 10%, 63V.	5322 122 34099
2529	100nF, +80/-20%, 50V	4822 126 13838
2530	100nF, 10%, 50V.	4822 126 14585
2531	22nF, 10%, 63V	5322 122 32654
2532	47uF., 20%, 25V.	4822 124 40433
2539	22nF, 10%, 63V	5322 122 32654
2540	47uF., 20%, 25V.	4822 124 40433
2545	100nF, +80/-20%, 50V	4822 126 13838
2546	47uF., 20%, 50V.	4822 124 41751
2549	4.7uF., 20%, 100V.	4822 124 40769

S = Safety Part Be sure to use exact replacement part.

FWC50C37 (continued)

2550	4.7uF., 20%, 100V.	4822 124 40769
2551	100nF, 10%, 50V.	4822 126 14585
2552	47uF., 20%, 50V.	4822 124 41751
2553	15pF, 2% 63V	4822 126 13486
2554	100nF, +80/-20%, 50V	4822 126 13838
2561	0.47uF., 20%, 63V.	4822 124 41407
2562	0.47uF., 20%, 63V.	4822 124 41407
2563	470nF, 5%, 63V	4822 121 51252
2564	470nF, 5%, 63V	4822 121 51252
2565	8.2nF, 10%, 63V.	4822 126 10525
2566	8.2nF, 10%, 63V.	4822 126 10525
2571	330nF, 5%, 63V	5322 121 42661
2572	330nF, 5%, 63V	5322 121 42661
2573	470nF, 5%, 63V	4822 121 51252
2574	470nF, 5%, 63V	4822 121 51252
2575	470nF, 5%, 63V	4822 121 51252
2576	470nF, 5%, 63V	4822 121 51252
2577	6.8nF, 10%, 63V.	5322 122 31866
2578	6.8nF, 10%, 63V.	5322 122 31866
2579	1nF, 10%, 63V.	5322 122 31647
2580	1nF, 10%, 63V.	5322 122 31647
2581	2.2nF, 10%, 63V.	4822 122 33127
2582	100uF., 20%, 25V	4822 124 40207
2583	100uF., 20%, 25V	4822 124 40207
2584	22nF, 10%, 63V	5322 122 32654
2619	2.2uF., 20%, 50V	4822 124 22652
2620	2.2uF., 20%, 50V	4822 124 22652
2625	22pF, 5%, 50V.	5322 122 32658
2626	22pF, 5%, 50V.	5322 122 32658
2633	470pF, 10%, 63V.	5322 122 34099
2634	470pF, 10%, 63V.	5322 122 34099
2635	100pF, 5%, 50V	5322 122 32531
2636	100pF, 5%, 50V	5322 122 32531
2637	47pF, 1%, 63V.	4822 126 13692
2638	47pF, 1%, 63V.	4822 126 13692
2639	22nF, 10%, 63V	5322 122 32654
2640	47uF., 20%, 25V.	4822 124 40433
2641	100uF., 20%, 25V	4822 124 40207
2647	22uF., 50V	4822 124 81151
2648	22uF., 50V	4822 124 81151
2649	100pF, 5%, 50V	5322 122 32531
2650	100pF, 5%, 50V	5322 122 32531
2655	4.7uF., 20%, 100V.	4822 124 40769
2658	220pF, 5%, 63V	4822 122 33575
2661	1uF., 20%, 63V	4822 124 21913
2662	1nF, 10%, 63V.	5322 122 31647
2663	10pF, 5%, 63V.	5322 122 32448
2664	1uF., 20%, 63V	4822 124 21913
2666	100uF., 20%, 25V	4822 124 40207
2668	470pF, 10%, 63V.	5322 122 34099
2669	100nF, +80/-20%, 50V	4822 126 13838
2681	100nF, 10%, 50V.	4822 126 14585
2685	100nF, +80/-20%, 50V	4822 126 13838
2688	330pF, 5%, 63V	5322 122 31863
2689	330pF, 5%, 63V	5322 122 31863
2690	1uF., +80/-20%, 16V.	4822 126 14043
2691	22nF, 10%, 63V	5322 122 32654
2692	22nF, 10%, 63V	5322 122 32654
2694	100nF, +80/-20%, 50V	4822 126 13838
	RESISTORS	
3501	1k, 2%, 0.25W.	4822 051 10102
3502	10k, 1%, 0.1W.	4822 117 10833
3511	1k8, 5%, 0.1W.	4822 051 20182
3512	1k8, 5%, 0.1W.	4822 051 20182
3513	10k, 1%, 0.6W.	4822 050 21003
3514	10k, 1%, 0.1W.	4822 117 10833
3515	6k8, 1%, 0.1W.	4822 117 11507
3516	6k8, 1%, 0.1W.	4822 117 11507
3517	3k3, 5%, 0.1W.	4822 051 20332
3518	3k3, 5%, 0.1W.	4822 051 20332
3519	33k, 5%, 0.1W.	4822 051 20333
3520	33k, 5%, 0.1W.	4822 051 20333
3521	220k, 5%, 0.5W	4822 116 83874
3522	220k, 5%, 0.5W	4822 116 83874
3523	82k, 1%, 0.1W.	4822 117 11149
3524	82k, 1%, 0.1W.	4822 117 11149
3525	1k, 2%, 0.25W.	4822 051 10102
3526	1k, 2%, 0.25W.	4822 051 10102
3545	4k7, 5%, 0.1W.	4822 051 20472
3546	4k7, 5%, 0.5W.	4822 116 52283
3547	1k8, 5%, 0.1W.	4822 051 20182
3548	1k8, 5%, 0.1W.	4822 051 20182
3549	5k6, 5%, 0.1W.	4822 051 20562
3551	10k, 1%, 0.1W.	4822 117 10833
3552	10k, 1%, 0.1W.	4822 117 10833
3553	330k, 5%, 0.1W	4822 051 20334
3554	150 ohm, 1%, 0.1W.	4822 117 10353
3555	390 ohm, 5%, 0.1W.	4822 051 20391
3556	2k2, 1%, 0.1W.	4822 117 11449
3557	82k, 1%, 0.1W.	4822 117 11149
3565	2k2, 1%, 0.1W.	4822 117 11449
3566	2k2, 1%, 0.1W.	4822 117 11449
3567	22k, 5%, 0.1W.	4822 051 20223
3568	22k, 5%, 0.1W.	4822 051 20223
3569	4k7, 5%, 0.1W.	4822 051 20472
3570	4k7, 5%, 0.1W.	4822 051 20472
3571	4k7, 5%, 0.1W.	4822 051 20472
3572	4k7, 5%, 0.1W.	4822 051 20472
3573	4k7, 5%, 0.1W.	4822 051 20472
3574	4k7, 5%, 0.1W.	4822 051 20472
3575	220 ohm, 1%, 0.1W.	4822 117 11503
3576	220 ohm, 1%, 0.1W.	4822 117 11503
3577	1k, 1%, 0.4W	4822 050 11002
3578	1k, 1%, 0.4W	4822 050 11002
3580	1k, 2%, 0.25W.	4822 051 10102
3581	2k2, 1%, 0.1W.	4822 117 11449
3582	2k2, 5%, 0.5W.	4822 116 52256
3631	820 ohm, 5%, 0.5W.	4822 116 52231
3632	820 ohm, 5%, 0.5W.	4822 116 52231
3635	10k, 1%, 0.1W.	4822 117 10833
3636	10k, 1%, 0.1W.	4822 117 10833
3637	10k, 1%, 0.1W.	4822 117 10833
3638	10k, 1%, 0.1W.	4822 117 10833
3639	22k, 5%, 0.1W.	4822 051 20223
3640	22k, 5%, 0.1W.	4822 051 20223
S 3641	10 ohm, 5%, 0.33W.	4822 052 10109
3642	4k7, 5%, 0.1W.	4822 051 20472
3643	4k7, 5%, 0.1W.	4822 051 20472
3645	47 ohm, 5%, 0.1W	4822 051 20479
3646	47 ohm, 5%, 0.1W	4822 051 20479
3647	47 ohm, 5%, 0.1W	4822 051 20479
3648	47 ohm, 5%, 0.1W	4822 051 20479
3649	330 ohm, 1% 1.25W.	4822 117 13577
3650	330 ohm, 1% 1.25W.	4822 117 13577
3651	3k9, 5%, 0.1W.	4822 051 20392
3652	3k9, 5%, 0.1W.	4822 051 20392
3655	10k, 1%, 0.6W.	4822 050 21003
3656	10k, 1%, 0.1W.	4822 117 10833
3657	1k, 2%, 0.25W.	4822 051 10102
3658	5k6, 5%, 0.1W.	4822 051 20562
3660	4k7, 5%, 0.1W.	4822 051 20472
3661	4M7, 5%, 0.1W.	4822 051 20475
3662	1k, 2%, 0.25W.	4822 051 10102
3663	1k, 2%, 0.25W.	4822 051 10102
3671	220k, 1%, 0.1W	4822 117 13579
3672	220k, 1%, 0.1W	4822 117 13579
3673	2k7, 1%, 0.1W.	4822 117 12955
3674	330k, 5%, 0.1W	4822 051 20334
3675	2k2, 1%, 0.1W.	4822 117 11449
3676	22 ohm, 5%, 0.1W	4822 051 20229
3677	470 ohm, 5%, 0.1W.	4822 051 20471
S 3681	22 ohm, 5%, 0.33W.	4822 052 10229
3682	1k, 2%, 0.25W.	4822 051 10102
3683	470 ohm, 5%, 0.1W.	4822 051 20471
3684	3k9, 5%, 0.1W.	4822 051 20392
3691	2k2, 1%, 0.1W.	4822 117 11449
3692	10k, 1%, 0.1W.	4822 117 10833
3693	5k6, 5%, 0.1W.	4822 051 20562
3694	5k6, 5%, 0.1W.	4822 051 20562
3695	2.2 ohm, 5%, 0.1W.	4822 051 20228
3699	1k, 1%, 0.4W	4822 050 11002
3768	1k, 1%, 0.4W	4822 050 11002
4501	0 ohm, Jumper 0805	4822 051 20008
4502	0 ohm, Jumper 0805	4822 051 20008
4503	0 ohm, Jumper 0805	4822 051 20008
4504	0 ohm, Jumper 0805	4822 051 20008
4505	0 ohm, Jumper 0805	4822 051 20008
4506	0 ohm, Jumper 0805	4822 051 20008
4509	0 ohm, Jumper 0805	4822 051 20008
4510	0 ohm, Jumper 0805	4822 051 20008
4511	0 ohm, Jumper 0805	4822 051 20008
4512	0 ohm, Jumper 0805	4822 051 20008
4513	0 ohm, Jumper 0805	4822 051 20008
4514	0 ohm, Jumper 0805	4822 051 20008
4515	0 ohm, Jumper 0805	4822 051 20008
4519	0 ohm, Jumper 0805	4822 051 20008
4520	0 ohm, Jumper 0805	4822 051 20008
4522	0 ohm, Jumper 0805	4822 051 20008
4523	0 ohm, Jumper 0805	4822 051 20008
4524	0 ohm, Jumper 0805	4822 051 20008
4525	0 ohm, Jumper 0805	4822 051 20008
4527	0 ohm, Jumper 0805	4822 051 20008
4528	0 ohm, Jumper 0805	4822 051 20008
4529	0 ohm, Jumper 0805	4822 051 20008
4530	0 ohm, Jumper 0805	4822 051 20008
4531	0 ohm, Jumper 0805	4822 051 20008
4532	0 ohm, Jumper 0805	4822 051 20008
4533	0 ohm, Jumper 0805	4822 051 20008
4534	0 ohm, Jumper 0805	4822 051 20008
4535	0 ohm, Jumper 0805	4822 051 20008
4536	0 ohm, Jumper 0805	4822 051 20008
4537	0 ohm, Jumper 0805	4822 051 20008
4538	0 ohm, Jumper 0805	4822 051 20008
4539	0 ohm, Jumper 0805	4822 051 20008

S = Safety Part Be sure to use exact replacement part.

FWC50C37 (continued)

4540	0 ohm, Jumper 0805	4822 051 20008
4541	0 ohm, Jumper 0805	4822 051 20008
4542	0 ohm, Jumper 0805	4822 051 20008
4543	0 ohm, Jumper 0805	4822 051 20008
4544	0 ohm, Jumper 0805	4822 051 20008
4545	0 ohm, Jumper 0805	4822 051 20008
4546	0 ohm, Jumper 0805	4822 051 20008
4547	0 ohm, Jumper 0805	4822 051 20008
4548	0 ohm, Jumper 0805	4822 051 20008
4549	0 ohm, Jumper 0805	4822 051 20008
4551	0 ohm, Jumper 0805	4822 051 20008
4553	0 ohm, Jumper 0805	4822 051 20008
4554	0 ohm, Jumper 0805	4822 051 20008
4556	0 ohm, Jumper 0805	4822 051 20008
4557	0 ohm, Jumper 0805	4822 051 20008
4558	0 ohm, Jumper 0805	4822 051 20008
4559	0 ohm, Jumper 0805	4822 051 20008
4561	0 ohm, Jumper 0805	4822 051 20008
4562	0 ohm, Jumper 0805	4822 051 20008
4563	0 ohm, Jumper 0805	4822 051 20008
4565	0 ohm, Jumper 0805	4822 051 20008
4566	0 ohm, Jumper 0805	4822 051 20008
4567	0 ohm, Jumper 0805	4822 051 20008
4571	0 ohm, Jumper 0805	4822 051 20008
4573	0 ohm, Jumper 0805	4822 051 20008
4580	0 ohm, Jumper 0805	4822 051 20008
4712	0 ohm, Jumper 0805	4822 051 20008
4713	0 ohm, Jumper 0805	4822 051 20008
4714	0 ohm, Jumper 0805	4822 051 20008
4715	0 ohm, Jumper 0805	4822 051 20008
4716	0 ohm, Jumper 0805	4822 051 20008
	COILS & FILTERS	
5511	Coil, 2.2uH, 5%.	4822 157 62552
5523	Coil, 2.2uH, 5%.	4822 157 62552
5525	Coil, 2.2uH, 10%	4822 157 10586
5526	Coil, 2.2uH, 5%.	4822 157 62552
5527	Coil, 2.2uH, 10%	4822 157 10586
5528	Coil, 2.2uH, 10%	4822 157 10586
5531	Coil, 2.2uH, 5%.	4822 157 62552
5532	Coil, 2.2uH, 10%	4822 156 21721
	SEMICONDUCTORS	
6511	Diode Regulator, BZX55-F9V1.	9338 871 90673
6512	Diode Regulator, BZX55-F9V1.	9338 871 90673
6513	Diode, 1N4003G	4822 130 31878
6516	Diode, 1N4148.	4822 130 30621
6531	Diode, 1N4148.	4822 130 30621
7511	IC, TEA6321T/V1.	4822 209 33652
7515	IC, NJM4556AM.	4822 209 31378
7525	Transistor, BC547B	4822 130 40959
7526	Transistor, BC856B	4822 130 60373
7527	Transistor, BC847B	4822 130 60511
7535	Transistor, BC817-25	4822 130 42804
7536	Transistor, BC817-25	4822 130 42804
7537	Transistor, BC847B	4822 130 60511
7538	Transistor, BC847B	4822 130 60511
7539	Transistor, BC856B	4822 130 60373
7541	Transistor, BC847B	4822 130 60511
7543	Transistor, BC817-25	4822 130 42804
7551	IC, M62320FP	4822 209 17345
7552	Transistor, BC327-25	4822 130 41246
7553	Transistor, BC847B	4822 130 60511

MAIN UNIT MECHANICAL & ACCESSORIES PARTS

	MAIN UNIT MECHANICAL & ACCESSORIES PARTS	
101	Cabinet Front.	3139 117 89740
105	Button CDC Open/Close.	3139 117 89750
107	Cover Tray CDC	3139 117 89760
108	Badge Philips.	4822 454 13408
112	Button Set CDC	3139 117 89770
113	Bracket Disc Stopper	3139 114 69190
124	Button Set Control	3139 118 11560
131	Frame Lightguide Source Sel.	4822 464 10514
132	Button Set Source.	3139 117 89790
134	Button Standby/Timer	3139 117 89800
138	Cover Orn SNP.	3139 118 11570
139	Window Display	3139 118 10460
140	Knob Volume Rotary	3139 117 89830
144	Button Set SNP	3139 117 89840
147	Button Set Up/Down Jog	3139 117 89850
148	Cover Orn Up/Down Jog.	3139 117 89860
158	Cover Cassette Right	3139 117 89870
159	Cover Cassette Left.	3139 117 89880
160	Lens Cassette Right.	3139 117 89890
161	Lens Cassette Left	3139 117 89900
162	Record Button Set Asm. Left (items 162-167)	8240 009 23500
163	Record Button Set Asm. Left (items 162-167)	8240 009 23500
164	Record Button Set Asm. Left (items 162-167)	8240 009 23500
165	Record Button Set Asm. Left (items 162-167)	8240 009 23500
166	Record Button Set Asm. Left (items 162-167)	8240 009 23500
167	Record Button Set Asm. Left (items 162-167)	8240 009 23500
168	Playback Button Set Asm. Right (items 168-172)	8240 009 23510
169	Playback Button Set Asm. Right (items 168-172)	8240 009 23510
170	Playback Button Set Asm. Right (items 168-172)	8240 009 23510
171	Playback Button Set Asm. Right (items 168-172)	8240 009 23510
172	Playback Button Set Asm. Right (items 168-172)	8240 009 23510
197	Damper Assembly.	4822 529 10322
199	Spring Leaf.	4822 492 70231
200	Door Cassette (Mech)	4822 443 10881
201	Spring Cassette Door	4822 492 42709
232	Bracket Mains Socket	4822 402 10288
239	Spacer 5mm	4822 466 93148
252	Foot Rubber LSQ.	4822 462 40683
254	Plate Front.	4822 466 12197
258	Plate (Foot)	4822 462 40683
259	Cabinet Rear	3139 114 69230
349	Surround Speaker	3139 118 77320
350	L/R Loudspeaker Box.	3139 118 77430
351	FM Aerial.	4822 320 11094
356	Remote Control	3139 228 84230
384	AM Frame Aerial.	4822 303 50082
S 385	Mains Cord	4822 321 11466
387	Instruction For Use.	3139 116 19440
1571	FFC BD 6P 140mm.	4822 320 12702
1573	FFC Foil 06P/280/06P AD.	3139 110 34360
1575	FFC Foil 15P/340/15P BD.	3139 110 34400
1680	FFC AD 9P 280mm Folded	4822 320 12656
1681	FFC BD 19P 480mm	4822 320 12704
S 1008	Mains Transformer.	4822 146 11129

MAIN UNIT SCREW LIST

	MAIN UNIT SCREW LIST	
185	Screw, D3 x 10	0000 000 0----
186	Screw, D3 x 25	0000 000 0----
187	Screw, D3 x 12	0000 000 0----
198	Screw, D3 x 12	0000 000 0----
202	Screw, M3 x 12	0000 000 0----
205	Screw, D3 x 12	0000 000 0----
227	Screw, M3 x 6.	0000 000 0----
228	Screw, M3 x 6.	0000 000 0----
233	Screw, M3 x 10	0000 000 0----
234	Screw, D3 x 12	0000 000 0----
235	Screw, M3 x 10	0000 000 0----
236	Screw, M3 x 10	0000 000 0----
276	Screw, D3 x 12	0000 000 0----
277	Screw, D3 x 12	0000 000 0----
278	Screw, D3 x 12	0000 000 0----
279	Screw, M3 x 12	0000 000 0----
280	Screw, D3 x 12	0000 000 0----
281	Screw, D3 x 12	0000 000 0----
288	Screw, D3 x 10	0000 000 0----
289	Screw, M3 x 10	0000 000 0----
290	Screw, M3 x 10	0000 000 0----
292	Screw, D3 x 12	0000 000 0----
293	Screw, D3 x 12	0000 000 0----
299	Screw, M3 x 10	0000 000 0----
300	Screw, M3 x 10	0000 000 0----
301	Screw, M3 x 10	0000 000 0----
305	Screw, M3 x 6.	0000 000 0----
306	Screw, M3 x 10	0000 000 0----

S = Safety Part Be sure to use exact replacement part.