

Service Manual

Sach-Nr./Part No.
72010-741.40

Zusätzlich erforderliche Unterlagen für den Komplettservice:

Additionally required Service Manuals for the Complete Service:

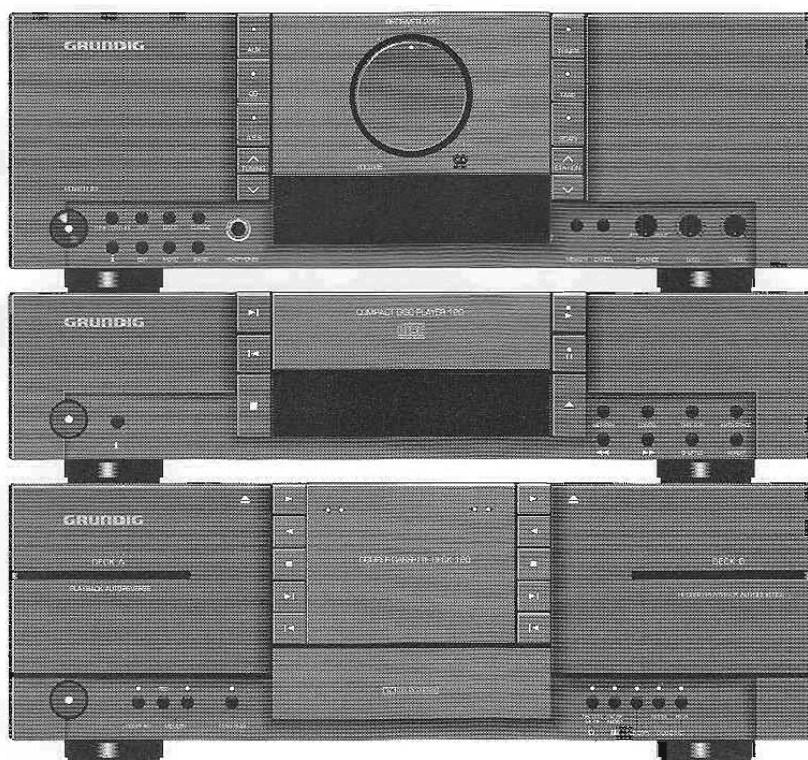
Service Manual

Sicherheit
Safety

Sach-Nr./Part No.
72010-800.00



HiFi-System R 120
HiFi-System R 220



GRUNDIG

R 120 (9.79101-8151 / G.LE 1451)
R 220 (9.79102-8151 / G.LE 1551)
CD 120 (9.79801-8151 / G.LE 1651)
CCF 120 (9.79702-8151 / G.DE 0351)
R 220-RC (75954-010.50)
Box MBX 220 (77601-017.51)

GRUNDIG-FRANCE
SERVICE DOCUMENTATION TECHNIQUE
ARCHIVES

Es gelten die Vorschriften und Sicherheitshinweise gemäß dem Service Manual "Sicherheit", Sach-Nummer 72010-800.00, sowie zusätzlich die eventuell abweichenden, landesspezifischen Vorschriften!



The regulations and safety instructions shall be valid as provided by the "Safety" Service Manual, part number 72010-800.00, as well as the respective national deviations.

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Inhaltsverzeichnis

Seite

Allgemeiner Teil	1-2 ... 1-31
Meßgeräte / Meßmittel	1-2
Technische Daten	1-3
Servicehinweise	1-3
Bedienungsanleitung	1-4
Ausbauhinweise	1-21
Bandlaufprüfung	1-31

Einstellungen	2-1 ... 2-5
----------------------------	--------------------

Schaltpläne und Platinenabbildungen

3-1 ... 3-40

Verdrahtungspläne	3-1
Schaltpläne	
R 120 / R 220 Netzteil, NF-Teil	3-9
R 120 / R 220 Bedienplatte	3-14
R 120 / R 220 Rundfunkplatte	3-18
CD 120	3-25
CCF 120	3-30
Platinenabbildungen	
R 120 / R 220 NF-Platte	3-12
R 120 / R 220 Bedienplatte	3-16
R 120 / R 220 Rundfunkplatte	3-22
CD 120	3-23
CCF 120	3-33
IC Block Diagramme	3-36
Display CD 120	3-40

Explosionszeichnungen und Ersatzteillisten

4-1 ... 4-18

R 120	4-1
R 220	4-4
CD 120	4-8
CCF 120	4-12
Laufwerk (A) CRF 4111	4-15
Laufwerk (B) CRF 4134	4-17

Allgemeiner Teil

Meßgeräte / Meßmittel

Wobbler, Meßsender, Stereocoder, Oszilloskop, Digitalvoltmeter, Regeltrenntrafa, NF-Generator, Frequenzzähler, Tonhöhen schwankungsmesser, DC-Voltmeter, NF-Voltmeter, Klirranalysator, Testcassette 448 A Sach-Nr. 35079-023.00, Drehmomentcassette 456 Sach-Nr. 35079-014.00, Bandlaufcassette MC-112C Sach-Nr. 72008-247.00, Kopflehre 401 Sach-Nr. 72008-401.00.

Diese Meßmittel können Sie über die Serviceorganisation beziehen. Wir weisen jedoch darauf hin, daß es sich hierbei z.T. um Meßmittel handelt, die am Markt bereits eingeführt sind.

Beachten Sie bitte das GRUNDIG Meßtechnik-Programm, das Sie unter folgender Adresse erhalten:

GRUNDIG Electronics GmbH
Würzburger Str. 150
D-90766 Fürth/Bay
Tel. 0911/7330-0
Telefax 0911/7330-479

GB

Table of Contents

Page

General Section	1-2 ... 1-31
Test Equipment / Jigs	1-2
Technical Data	1-3
Service Hints	1-3
Operating Instructions	1-12
Disassembly Instructions	1-21
Tape Run Test	1-31

Adjustment Procedures	2-6 ... 2-10
------------------------------------	---------------------

Circuit Diagrams and Layout of the PCBs

3-1 ... 3-40

Wiring Diagrams	3-1
Circuit Diagrams	
R 120 / R 220 Power Section, AF Section	3-9
R 120 / R 220 Control PCB	3-14
R 120 / R 220 Tuner PCB	3-18
CD 120	3-25
CCF 120	3-30
Layout of the PCBs	
R 120 / R 220 AF PCB	3-12
R 120 / R 220 Control PCB	3-16
R 120 / R 220 Tuner PCB	3-22
CD 120	3-23
CCF 120	3-33
IC Block Diagrams	3-36
Display CD 120	3-40

Exploded Views and Spare Parts Lists

4-1 ... 4-18

R 120	4-1
R 220	4-4
CD 120	4-8
CCF 120	4-12
Drive Mechanism (A) CRF 4111	4-15
Drive Mechanism (B) CRF 4134	4-17

General Section

Test Equipment / Aids

Sweep generator, test generator, stereo coder, oscilloscope, digital voltmeter, variable isolating transformer, AF generator, frequency counter, flutter meter, DC voltmeter, AF voltmeter, distortion analyzer, testcassette 448 A part no. 35079-023.00, cassette torque meter 456 part no. 35079-014.00, tape transport test cassette MC-112C part no. 72008-247.00, head gauge 401 part no. 72008-401.00.

You can order this test equipment from the Service organization. We refer to you that part of this equipment is already obtainable on the market.

Please note the Grundig Catalog "Test and Measuring Equipment" obtainable from:

GRUNDIG Electronics GmbH
Würzburger Str. 150
D-90766 Fürth/Bay.
Tel. 0911/7330-0
Telefax 0911/7330-479

Technische Daten

RECEIVER R120 / R 220

Verstärker

Musikleistung (4 Ohm)	R 120 2 x 45 W, R 220 2 x 95 W
Sinusleistung DIN 45500	
(4 Ohm/0,7% Klirrfaktor, $f = 1$ kHz)	R 120 2 x 30 W, R 220 2 x 50 W
Sinusleistung DIN 45500	
(8 Ohm/0,7% Klirrfaktor, $f = 1$ kHz)	R 120 2 x 20 W, R 220 2 x 40 W
Eingangsempfindlichkeit/Impedanz	180 mV/47 kOhm
Lautsprecherimpedanz	4 - 16 Ohm
Klirrfaktor (Sinusleistung -1dB, 8 Ohm, 1 kHz)	< 0,015%
Geräuschspannungsabstand	> 94 dB
Leistungsbandbreite	> 5 Hz ... < 100000 Hz
Übertragungsbereich linear	> 10 Hz ... < 100000 Hz
Dämpfungsfaktor (8 Ohm, 1 kHz)	> 60
Netzspannung, Netzfrequenz	230 V ~ 50 - 60 Hz
max. Leistungsaufnahme	R 120 160 W, R 220 280 W

Rundfunkteil

FM-Empfangsbereich	87,5 ... 108,0 MHz
Abstimmungsschritt bei Suchlauf	50 kHz
Abstimmungsschritt bei Handabstimmung	25 kHz
Empfindlichkeit (S+N) / N=26 dB, mono	1,1 µV
(S+N) / N=46 dB, stereo	35 µV
Dynamische Trennschärfe (mono, stereo, ± 300 kHz)	≥ 60 dB
Geräuschspannungsabstand (IEC Kurve A eff.) mono	≥ 74 dB
stereo	≥ 70 dB
Frequenzbereich	10 ... 15000 Hz
AM-Empfangsbereiche	
MW: 528 ... 1605 kHz	(manual tuning)
531 ... 1602 kHz	(automatic tuning)
LW: 153 ... 281 kHz	

CD-SPIELER CD 120

Linearität Frequenzgang (20 - 20000 Hz)	< $\pm 0,5$ dB
Signal-/Rauschspannungsabst. (RMS, DIN A, 22 kHz LPF)	> 92 dB

CASSETTENECK CCF 120

Frequenzbereich (Wiedergabe, IEC)	40 Hz ... 16 kHz
Geräuschspannungsabstand	
ohne/mit Dolby B NR IEC wtd., CR	56 dB, 64 dB
Gleichlaufschwankung (IEC wtd.)	> 0,13 %

Dolby Rauschunterdrückung ist hergestellt unter Lizenz von Dolby Laboratories Licensing Corporation.

DOLBY und das Doppel-D-Symbol $\square$ sind Warenzeichen der Dolby Laboratories Licensing Corporation.

NR = Noise Reduction (Rauschunterdrückung).

Servicehinweise

CD 120

Bei Ausbau der CD-Einheit müssen die Anschlußkontakte der Flexprintleitung mit einer Büroklammer kurzgeschlossen werden, um eine Zerstörung der Laserdiode durch statische Aufladung zu vermeiden.

CCF 120

Überprüfen Sie vor Beginn der Service-Arbeiten, ob die Magnetköpfe, die Tonwellen und die Gummiandruckrollen frei von Bandabrieb sind. Zum Reinigen dieser Teile verwenden Sie ein mit Spiritus oder Reinigungsbenzin getränktes Wattebäuschchen; dadurch verbessert sich der Aufnahme- und Wiedergabepegel, sowie der Bandlauf.

Nach dem Ersatz von Magnetköpfen oder sonstiger Bauteile müssen die technischen Daten des Gerätes anhand der im Service Manual vorgegebenen Meßwerte überprüft bzw. eingestellt werden.

Technical Data

RECEIVER R120 / R 220

Amplifier

Music output (4 Ohm)	R 120 2 x 45 W, R 220 2 x 95 W
Harmonic output DIN 45500	
(4 Ohm/0.7% distortion factor, $f = 1$ kHz)	R 120 2 x 30 W, R 220 2 x 50 W
Harmonic output DIN 45500	
(8 Ohm/0.7% distortion factor, $f = 1$ kHz)	R 120 2 x 20 W, R 220 2 x 40 W
Input sensitivity/impedance	180 mV/47 kOhm
Speaker impedance	4 - 16 Ohm
Distortion factor (harmonic output -1dB, 8 Ohm, 1 kHz)	< 0.015%
Noise potential ratio	> 94 dB
Output band width	> 5 Hz ... < 100000 Hz
Transmission range	> 10 Hz ... < 100000 Hz
Attenuation factor (8 Ohm, 1 kHz)	> 60
Supply voltage, mains frequency	230 V ~ 50 - 60 Hz
Power consumption (max)	R 120 160 W, R 220 280 W

Tuner section

FM-reception range	87.5 ... 108.0 MHz
Steps by auto tuning	50 kHz
Steps by manual tuning	25 kHz
Sensitivity (S+N) / N=26 dB, mono	1.1 µV
(S+N) / N=46 dB, stereo	35 µV
Dynamic separation (mono, stereo, ± 300 kHz)	≥ 60 dB
Signal-to-noise ratio (IEC curve A eff.) mono	≥ 74 dB
stereo	≥ 70 dB
Frequency range	10 ... 15000 Hz
AM-reception range	

MW: 528 ... 1605 kHz	(manual tuning)
531 ... 1602 kHz	(automatic tuning)
LW: 153 ... 281 kHz	

CD-PLAYER CD 120

Linear frequency response (20 - 20000 Hz)	< $\pm 0,5$ dB
Signal-noise ratio (RMS, DIN A, 22 kHz LPF)	> 92 dB

CASSETTE DECK CCF 120

Frequency range (Playback, IEC)	40 Hz ... 16 kHz
Noise potential ratio	
without/with Dolby B NR IEC wtd., CR	56 dB, 64 dB
Synchronous deviation (IEC wtd.)	> 0.13 %

Dolby noise reduction under license from Dolby Laboratories Licensing Corporation.

„DOLBY“, the double D Symbol $\square$ are trademarks of Dolby Laboratories Licensing Corporation.

NR = Noise Reduction.

Service Hints

CD 120

When removing the CD unit a paper clip must be attached at the flexprint connections to avoid damage to the laser diode by electrostatic charges.

CCF 120

Before commencing service work, ensure that the magnetic heads, the capstans and the pinch rollers are free from particles produced by tape abrasion. The recording and playback levels and the tape run can be improved by cleaning these parts with a cotton-wool tip soaked in spirit or cleaning benzine.

If the heads or other components have been replaced, the technical data of the recorder must be checked or adjusted according to the values specified in the Service Manual.

8. Wissenswertes

Technische Daten

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inner

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D-Spieler

neutralität Frequenzgang (20 - 20 000 Hz) $\leq \pm 0,5$ dB
 uml. - Rauschspannungsabstand (RMS, DIN A, 22 kHz LPF) > 92 dB

assetten-deck

Frequenz-Bereich (Playback, EC) 40 Hz ... 16 kHz
 Eräräuschnpennungsbstand 50 dB 64 dB
 Inne mit Dolby B NR EC wld. CR)

ieses Garä
chulien.

dem 'Bundesamt für Zulassungen in der Telekommunikation' (ZT) wurde angezeigt, daß das Gerät in Verkehr gebracht wurde. Dem wurde auch die Berechtigung eingeräumt, die Serie auf der Grundlage der Radiomontage zu identifizieren.

es:Gerät entspricht der Sicherheitsbestimmung VDE 0860 und somit der internationalen Sicherheitsvorschrift IEC 65.

technische und politische Änderungen vorbehalten.

Direct Operation Technique D.O.T.

über das "intelligente" Datensystem Ihres Geräts können einzelne Komponenten dieser Geräte-Serie miteinander "kommunizieren". Diese Kommunikation zwischen den einzelnen Geräten Ihres Systems wird automatisch aktiviert, sobald eine Verbindung über ein Anschlußkabel hergestellt wurde.

Die D.O.T. Funktion ermöglicht eine automatische Entlangswahl des Receivers.

Schützschaltungen

er Receiver ist mit umfangreichen elektronischen Schutzschaltungen ausgestattet, welche die angeschlossenen Lautsprecher vor Überlastung und vor Beschädigungen schützen. Bei Überlast wird die Leistung blitzschnell begrenzt.

berhitzt das Gerät, ernennt das Programm einen Thermostat, der die im VOLUME-Drehknopf beginnt schnell zu hinken, der Lautstärkepegel wird reduziert.

Wartung und Pflege

des Systems

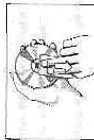
Im Rahmen des Gefährdungs- und der Boxen genügt ein leicht gereinigtes Fensterblei, verwenden Sie keine Reinigungsmittel, die Alkohol, Spiritus, Ammoniak oder Scheuermittel enthalten.

des CD-Spielers

Einigen Sie das CD-Fach mit einem sauberen Tuch

der CD's

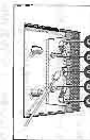
iemals auf die bedruckte CD-Seite schreiben (Label-Seite).
die Aufkleber auf der CD anbringen.



e glänzende Oberfläche der CD
überhalten. Benutzen Sie zum
Reinigen ein fusselfreies Tuch und
ziehen Sie immer in einer geraden
Linie von der CD-Mitte nach außen.
Verwenden Sie zum Reinigen einer CD
niemals weder Reinigungsmittel für
optische Scheibenplatten noch Löslö-

des Cassetendecks

mit immer eine gute Aufnahme- und Wiedergabequalität gewährleistet. Sollen nach jeweils 15 Betriebsstunden die Köpfe A, die Tonwollen und die Andruckrollen C gereinigt werden.



verwenden Sie dazu eine spezielle
Reinigungsassette oder ein leicht mit Alkohol getränktes
Tuch. Der Mechanismus darf nicht geschmiert werden!

Contents

Take Your System at a Glance

Receiver **Connections on the back of the unit**
Display
CD player
Cassette Deck

2 Your Petrol's Control at a Glance

Changing batteries

How to use the remote control

3 Setting up and Connecting

- Setting up
- Power supply connection
- Connecting the speakers
- Antenna connection
- Headphones connection
- Connecting programme sources

4 Operation

Switching on and off
Stand by mode
Selecting programme sources
Sound control
Equalizer function

5 Tuner

- Selecting the wave band
- FM reception MONO/STEREO
- Automatic station search
- Automatic tuning
- Manual tuning
- Station memory
- Storing stations
- Calling up a stored station
- Deleting a memory location
- Last station memory
- RDS Radio Data System (only R220)
- Radiobert (only R220)
- Assigning station names
- Changing a name
- Switching displays

Contents

6 CD Player

General information	1-18
Power supply	1-18
Inserting a CD	1-18
CD playback	1-18
Skip function (next/previous track)	1-18
Fast search	1-18
Repeat function	1-18
Shuffle function	1-18
Programming	1-18
Programming in STOP mode	1-18
Programming in PLAY mode	1-18
Changing the programme	1-18
Programme playback	1-18
Deleting a programme	1-18
Recording from a CD to a cassette (CD-COPY)	1-19
TAPE EDIT function	1-19
AUTO SPARE function	1-19
Warning	1-19

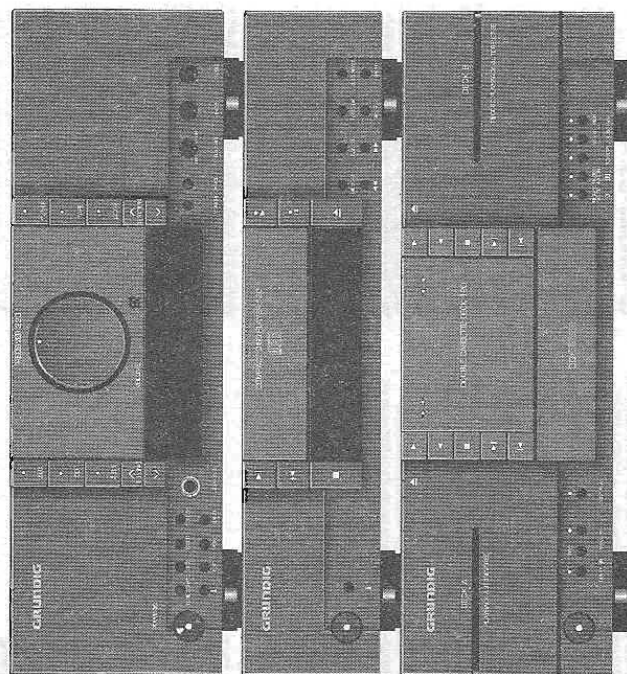
7 Cassette Deck

Power supply	1-19
Inserting a cassette	1-19
Tape type	1-19
Noise reduction system (DOLBY NR)	1-19
Protecting cassettes against unintentional erasure	1-19
Playback	1-19
Fast winding	1-19
CONT. PLAY function	1-19
Music search function	1-19
Recording	1-20
Reverse mode recording	1-20
Recording pause with RECORD MUTE	1-20
Copying cassettes (DUBBING)	1-20
Copying from a CD to cassette (CD-COPY)	1-20
RCC MEMORY function	1-20
Storing tape positions	1-20

8 Important information

Technical data	1-20
D.O.T. Direct Operation Technique	1-20
Protection circuits	1-20
Maintenance and care	1-20

1. Your System at a Glance



2. Your Remote Control at a Glance



Changing the batteries

If the range of your infrared remote control seems to decrease, or if certain individual functions can no longer be carried out, you should replace the batteries. The remote control uses two 1.5 volt LR03 size AAA-size batteries. To change the batteries, open the compartment on the back of the remote control. Ensure that the batteries are inserted properly (note the markings in the compartment). And in the interest of the environment, remember that batteries must always be disposed of properly.

General controls

- 0 - This button is used to switch the unit to STAND BY.
- 1 - This button is used to toggle the display modes of the active source.
- 2 - This button is used for muting the speakers.

TUNER control buttons

TUNER - This button is used for selecting the tuner (radio).
< STATION > - These buttons are used for selecting stations.

CD control buttons

- CD - This button is used for selecting the CD player.
- 01 - This button is used to switch the CD player to PAUSE.
- 02 - This button is used to switch the CD player to STOP.
- 03 - This button is used to start playback of the CD player.
- 04 - These buttons are used to select next or previous tracks on a CD.

TAPE control buttons

- TAPE - This button is used for selecting the cassette deck.
- < > - These buttons are used to start playback in forward or reverse direction.
- 05 - This button is used to switch the cassette deck to STOP.
- 06 - This button is used to switch the cassette deck to PAUSE.
- << >> - These buttons are used for fast winding of the tape in forward or reverse direction.

DECK A - This button is used if you wish to control deck A of the cassette deck. Keep this button pressed while using the other TAPE control buttons.

Other controls

- AUX** - This button is used for selecting the AUX input.
- EQUALIZER** - This button is used to toggle between the different preprogrammed equalizer settings: JAZZ, DISCO, CLASSIC, TONE CONTROL.
- VOLUME +/-** - These buttons are used for controlling the volume of the receiver.

How to use the remote control

First select the source you wish to control (e.g. by pressing TAPE). Then select the desired function.

3. Setting up and Connecting

Sitting up

If you want to set up your system on a shelf, in a cabinet or any other type of enclosure, always ensure that sufficient ventilation is available.

Place the power supply cable as far as possible from the sound signal lines in order to avoid disturbing signal interference.

Important:

Always switch off the system, as well as any other connected auxiliary units, before connecting or removing the connection cables.

When making connections, always note the identification markings on the cables and sockets, as well as on the back of the unit, in order to avoid improper connections. Improper connections can considerably impair sound quality.

Power supply connection

Only connect the unit to a 230V ~, 50/60 Hz a.c. power source.

Always ensure that the voltage indicated on the unit's rating plate agrees with your local power supply. If this is not the case, consult your dealer or customer service center. The rating plate is found on the back of the unit.

Additional information for units sold in Great Britain

Units sold in GB are suitable for operation from a 240V AC, 50 Hz mains supply.

In case this appliance is supplied with a Safety Standard Approved mains lead fitted with a non-removable 13 Amp mains plug which, if unsuitable for your socket, should be cut out and an approved plug fitted by a qualified electrician. Do not attempt to cut the lead or to fit an unsuitable plug. An accidental insertion of the replacement plug into a 13 Amp socket is likely to cause an electrical hazard.

The approved plug must be destroyed to avoid a possible shock hazard. It should be inserted into a 13 Amp socket elsewhere.

It is a necessary precaution to ensure the appliance is disconnected from the mains before any maintenance work is carried out. The fuse cover must be replaced after any maintenance work. The fuse cover must not be refitted if the fuse power is lost or damaged the lead. If a non-removable plug or a removable 13 Amp (BS 1363) plug is used, it must be fitted with a 5 Amp ASTA or BS approved BS 1362 fuse. If an 8 Amp fuse is used, it must be protected by a 5 Amp fuse either in the lead or at the distribution board.

Important:

The wires in the mains lead are coloured in accordance with the following code:

BLUE - LIVE
 BROWN - LIVE
 WHITE - NEUTRAL

As the colours of the wires in the mains lead of your appliance may not correspond with the coloured markings identifying the terminals in your plug, connect the BLUE coloured wire to the plug terminal marked with the letter 'N' or coloured black.

Connect the BROWN coloured wire to the plug terminal marked with the letter 'L' or coloured red.

Do not connect the WHITE coloured wire to the plug terminal marked with the letter 'E' or coloured green or green and yellow.

Replacement mains lead can be obtained from your dealer.

Connecting the speakers

In order to take full advantage of your unit's superior playback quality and overall performance, only quality speakers with corresponding load ratings should be used. Speakers should thus have an impedance of 4 to 16Ω. Maximum receiver output is achieved with 4Ω speakers.

In addition, always make sure that speaker wires are properly and securely connected to avoid producing individual wires. These can cause errors.

To insert the cable, press the provided tab all the way down. Insert the cable into the socket and push it in. Then pull the tab up again. Finally pull on the cable to ensure that the connection is secure.

Important: proper speaker connection is also important for quality sound. As seen from the below, the right speaker should be connected to the right terminal (right channel) and the left speaker to the left terminal (left channel).

Antenna connection

Only a good antenna system (broadcast cable connection to your own antenna system, or a common house antenna system) can guarantee optimum reception quality, especially for FM stereo broadcasts.

For FM reception, your unit is equipped with a DIN FM 75 Ohm connector. Connect your house antenna system to this socket.

The supplied cast antenna is furnished merely as an additional aid to improve reception. It is not intended to be used under optimum conditions. Provide sufficient reception quality. You should not, however, change the length of the cast antenna.

For connecting an AM frame or television antenna, use the AMU COOP ANTENNA terminals socket. For AM and LW reception, use the 50 Ohm frame antenna. This frame antenna is provided with a base so that it can be attached at the most favorable location. If the antenna is attached to the most favorable location, reception performance is decreased.

The elevated antenna as well as earth + can also be connected to these sockets in place of the frame antenna.

Headphones connection

You can connect standard stereo headphones with a 6.3mm headphone jack. Volume is adjusted with the rotary volume control.

The receiver's speaker outputs are automatically switched off when the headphone jack is inserted, and are automatically switched on again when it is removed.

5. Tuner

Automatic tuning

Stations can also be found automatically by pressing **TUNING** $\sim$ or $\sim$. The frequency display begins to run; then release the button. **AUTO** appears in the display, and disappears at the conclusion of the automatic tuning function.



The search stops as soon as a station with sufficient reception quality is found. If you tune precisely to a station, a triangle in the display lights up.



Every time you begin a search, the unit automatically switches to **STEREO**. A bar graph in the display indicates the field strength. The more illuminated dashes you see, the stronger the reception. The frequency of the received station is indicated in kHz (MW/LW) or MHz (FM).

If the search stops, the **AUTO COMPARE** function first verifies whether the station which has been found is stored in the station memory. If this is the case, the memory location of the station is displayed to the left, as well as the name of the station, if you have assigned it one.

Stations which are received with a weak field strength may be skipped. These can be tuned to manually.

If desired, you can also interrupt the search by pressing **TUNING** $\sim$ or $\sim$.

Manual tuning

Keep **TUNING** $\sim$ or $\sim$ pressed until you approach the required frequency.

If you now briefly press **TUNING** $\sim$ or $\sim$ the frequency is changed by one step each time until the right frequency has been reached. Just as with automatic tuning, the illuminated triangle and the number of illuminated dashes indicate the reception quality.

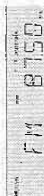


The **AUTO COMPARE** function also verifies whether the found frequency is already stored.

Selecting the wave band

Select the desired wave band (FM, MW or LW) by pressing **BAND**. Pressing this button switches to the next wave band in the following order: FM - MW - LW - FM.

The display shows the selected band.



FM reception MONO/STEREO

Normally, your unit is in stereo standby, which means that as soon as a stereo signal of sufficient strength is received, **STEREO** appears in the display. If the signal is not stereo, **MONO** appears and background noise is suppressed.



If noise-free stereo reception is not possible, you can switch your unit to **MONO** reception. In this case, press **MONO**; **MONO** will disappear from the display and **MONO** will appear. This means that the **MIXING** function is always switched off for **MONO**, meaning in turn that you are now able to receive even very weak broadcast signals.



Automatic station search

To initiate automatic station search, press **ASS**. The LED indicator to the bottom left lights up. The unit will now search all stations on the selected wave band. However, the stations found will not yet be stored in the memory.

After the whole band has been scanned, the unit tunes to the first station it finds. If you wish to store this station in the memory, press **MEMORY** $\sim$ or $\sim$. Now you can start storing the stations in the memory. With **STATION** $\sim$ you can select the station you wish to store at memory location number 1. Press **MEMORY** to store the station. Now, select the station you wish to store at memory location number 2. Press **MEMORY** to store the station, and so on.

This method allows you to store your favorite stations at the first memory locations.

To save the Automatic Station Search mode, press **ASS**. You can also leave the **ASS** mode by pressing any other button on the receiver (except above mentioned **STATION** $\sim$ and **MEMORY** buttons).

4. Operation

Switching on and off

When you want to switch your system on, press **POWER ON** on the receiver. The yellow LED in the middle of the button indicates that the unit is on.

The receiver is muted for approximately 3 seconds when it is turned on in order to suppress disturbing initial signal noise.

The CD player and cassette deck of the series which are connected to the receiver by the supplied flat cable are also provided with power when the receiver is turned on.

Stand By mode

When you switch the receiver off with **POWER OFF**, the CD player and cassette deck, which are connected to the receiver, are disconnected from the power supply.

You can switch the receiver to **STAND BY** with the 2 button on the remote control. Active **STAND BY** mode is indicated by the yellow LED in the middle of the power button.

When you want to switch your system on again, simply press one of the four selection buttons on the unit or on the remote control.

Important:

In use, to reduce unnecessary consumption of electricity, do not use the **STAND BY** mode for longer periods of time.

Selecting programme sources

To select a programme source, press either the corresponding button on the unit or the corresponding button on the remote control. The yellow LED of the respective button on the receiver comes on.

Sound control

The volume can be adjusted with the rotary **VOLUME** controller. The volume can also be controlled via the remote control with the **VOLUME** buttons. Press the **VOLUME** controller buttons for the respective adjustment position.

The stereo balance between the left and the right channels can be adjusted with the **BALANCE** control.

The bass tones can be adjusted with the **BASS** control and the high tones with the **TREBLE** control.

Equalizer function

This receiver is supplied with 9 pre-programmed equalizer settings: **FLAT**, **POP**, **ROCK**, **DISCO** or **CLASSIC**. The first controls bass and treble to simulate the selected sound. The next controls bass and treble will then be deactivated without changing the respective settings. Pressing **TONE CONTROL** switches off the equalizer settings and the tone controls are activated again. When tone control is switched on the indicator above the **TONE CONTROL** button lights up.

Each time one of the above mentioned buttons is pressed, the display will show the respective setting for 2 seconds: **FLAT**, **POP**, **ROCK**, **DISCO**, **CLASSIC**, **FLAT**.

3. Connecting

Connecting programme sources

The supplied flat cable is used to connect the cassette deck and the CD player of this series to your receiver.

Before connecting any programme sources, make sure that all units are switched off.

FROM CASSETTE socket

This socket is used to connect the cassette deck of this series to your receiver.

Connect the cassette deck to this socket by inserting the plug of the flat cable until it clicks firmly in place.

This special connection also supplies power to the cassette deck and allows you to operate the cassette deck by remote control through the sensor of the receiver.

If you wish to disconnect the cassette deck, press the stops left and right together and pull out the plug.

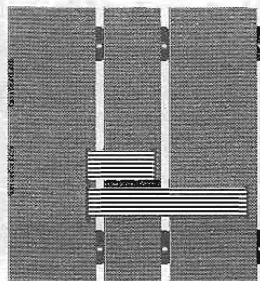
FROM CD PLAYER socket

This socket is used to connect the CD player of this series to your receiver.

Connect the CD player to this socket by inserting the plug of the flat cable until it clicks firmly in place.

This special connection also supplies power to the CD player and allows you to operate the CD player by remote control through the sensor of the receiver.

If you wish to disconnect the CD player, press the stops left and right together and pull out the plug.



Other signal sources

Other signal sources, such as a DCC recorder, DSR tuner, TV, video recorder, etc., can be connected to the AUX in circuit sockets. In addition, make the correct connection of the stereo channels:

- R: right (red)
- L: left (white)

5. Tuner

Station memory

50 memory locations are available for storing stations. Tune to the station you want to store with the station search function or manually.

Press **MEMORY**. The station is stored at the next available memory location.



The tuner software first checks the station memory for available memory locations. If all the locations are occupied, 'FM 104.20' appears on the display for approx. 1.5 seconds.

Assigning a station frequency to two different memory locations is not possible. The selected station is stored at the lowest available memory location, meaning that you need not enter a number for memory locations.

Every time the settings **STEREO** or **MONO** are changed, they are automatically stored (in FM).

Storing stations

If you want to store a selected station, press **MEMORY**. The first station which is stored is assigned to memory location 1, the second station to memory location 2, and so on. If you want to store a real station to another memory location, press **MEMORY**. The station is always assigned to the first available memory location. Pressing the button again assigns a station to the next available memory location. If you keep the button depressed, the memory locations are scanned one after the other, deleting the previously assigned memory location.

Example:

You want to move your favorite station from memory location '5' to memory location '1'. Press **CANCEL** once. This deletes, or clears, memory location '1'. Now select position '5', your favourite station, and then press **MEMORY**. Your station is now stored on memory location '1'.

Calling up a stored station

When you want to call up a stored station, press **STATION** ~~~. The stations are called up in ascending or descending order.

Stations can also be selected via the remote control. Press one of the **TUNER <STATION>** buttons.

The display shows the selected memory location number in the upper left, and the unit switches to this memory location.

It is not possible to select a memory location which has not yet been assigned to a station.

Example: memory location 6 is not assigned to a station. If you are started at memory location number 5 and press once **STATION** > the unit will jump to memory location 7 (provided this location has been assigned to a station).

Deleting a memory location

If you want to delete a memory location to which a station is assigned, first call up its number.

Press **STATION** ~~~ until you reach the station you want to delete, or via the remote control with **STATION**.

Press **CANCEL**. The memory location is deleted, and the memory location after it takes its place. If you want to delete all the memory locations, for example after you move to another location, hold **CANCEL** down for 5 seconds. 'ERASE?' appears briefly on the display.

If you release the button, the 'ERASE' function is not carried out. However, if you keep the button depressed for an additional 5 seconds until the display shows '07.5 MHz', the station memory is deleted.

If you press one of the **STATION** ~~~ buttons, 'FREE' is shown on the display.

LAST STATION MEMORY

LAST STATION MEMORY means that the unit 'remembers' the last station that was tuned to. This function ensures that the station which was selected before the receiver was switched off or to stand by is automatically tuned to again when your unit is switched back on.

5. Tuner

RDS Radio Data System (only R220)

Your unit is capable of receiving and evaluating RDS information which is broadcast along with the normal broadcast signal. The channel name is displayed along with the station name. The memory, overwriting names previously stored in the unit's memory, overwriting names previously stored in the unit's memory.

Your receiver is an RDS receiver. What is RDS?

RDS (Radio Data System) stands for a new generation of radio that provides the listener with more content and better reception in the form of a digital signal. It also opens up completely new information options for the future.

RDS-equipped receivers identify the tuned station (it transmits 'RDS signals') and indicate the name of the program in the 8-place display (e.g. BAYERN 3, SDR 3).

The name of the program is taken from the PS code information. For future use, other codes have been planned that enable, for example, transmission of an alarm notification or lines of text.

If you are tuned to an RDS station, the name of the station will be indicated after a short time. The frequency is then evaluated and the receiver determines if it is from RDS station.

RADIOTEXT (only R220)

Some RDS stations broadcast RADIOTEXT, which is additional information on the station and programme being broadcast. RADIOTEXT information appears as 'tuning text' in the display. Because RADIOTEXT is transmitted character-by-character by the radio station, it may take some time until the entire text has been completely received.

RADIOTEXT is called up by continuously pressing the **DISPLAY MODE** button until the running text of the RADIOTEXT signal can be seen.

If a station does not broadcast RADIOTEXT, NO TEXT appears for approx. 1.5 seconds in the display, which is then followed by the station's name.



Assigning station names

Stations which do not transmit the RDS code can be assigned any name of your choice.

If you attempt to assign a name to a station which transmits the RDS code, RDS-DATA appears in the display, indicating that a name cannot be assigned. (R220 only)

Press **EDIT** with **TUNING** ~~~. You can move the cursor in the (usual) direction. You can enter up to eight characters. With **STATION** ~~~ you can move forward and backward through the alphabet, the numbers 0-9 and to the space key.



When you are ready to include an input and exit the input mode to store a name, press **EDIT** in **MEMORY**.

Changing a name

If you want to correct a mistaken entry, press **EDIT** and slide the insert marker to the position that you want to change. The symbol already selected blinks. Select a new symbol. If you want to insert a blank space, select the blank space from the set of symbols.

When you are ready to exit the input mode and exit the input mode to store a name, press **EDIT** in **MEMORY**.

Switching displays

Pressing **1** briefly switches the display between frequency, station names (RDS or one you have assigned) and RADIOTEXT (only R220). If you want to see the frequency, signal strength, type of tuning (mono, stereo, etc.), press **1** when the station name is displayed. Pressing **1** again when the frequency is displayed to the left of the name.



6. CD player

General information

To remove a CD from its case, hold it on its outside edge by the index finger and thumb. Do not touch the surface of a CD with your fingers.

Always store a CD in its case when it is not being used. Place a CD in its case with the label facing up and press down lightly.

Do not leave CDs for any length of time in direct sunlight or other places where high temperatures may occur, such as in the vicinity of heating appliances. Do not expose the CD to humidity or rain.

Power supply

The special 10-pin cable connection to the receiver also supplies power to the CD player. As soon as the receiver is switched on, the POWER indicator on the CD player will light up to indicate that the unit is also switched on.

If you have not inserted a CD, "DISC" appears briefly in the display, and then "—".



After the unit has been switched on, it is always in the STOP mode.

Inserting a CD

Open the CD compartment by pressing Δ . Insert the CD so that the printed side of the disc is facing up. Place CD singles (if any) in the depression in the compartment.

Press Δ again.

The compartment can also be closed by hand. After the compartment has closed, the unit reads the contents of the CD. Information on the number of tracks, playing length, etc. are recorded here. This information is shown in the display.



CD playback

Press $\triangleright$ on the unit (or on the remote control) to start the playback. The display shows the number of the track being played as well as the elapsed playing time (radio playing time).



The display can also show you additional information. Press $\mathbf{I}$ and the display shows you the CD's remaining playing time, "REMAIN".



If you press the button once more, the display shows the total playing time and the total number of tracks.



A negative time display shows the pause between the tracks.



If you press $\triangleright$ again, the running track will be repeated (REPEAT function).

If you want to stop playback without changing the unit settings, press $\mathbf{II}$. A yellow indicator in the button comes on.

While playback is interrupted, you can press $\triangleleft$ to skip to another track, or press $\triangleright$ or $\triangleleft$ to search for a certain passage.

If you want to continue with playback, press $\mathbf{II}$ or $\triangleright$ once more.

To stop playback, press $\mathbf{I}$ (STOP).

Skip function (TRACK NEXT/PREVIOUS)

By pressing $\triangleleft$ you can skip to the beginning of the next track in the track sequence (NEXT), and by pressing $\triangleleft$ to skip to another track, or press $\triangleright$ or $\triangleleft$ to search for a certain passage.

If you want to continue with playback, press $\mathbf{II}$ or $\triangleright$ once more.

Fast search (SEARCH)

By pressing $\triangleleft$ or $\triangleright$ you activate the fast search (SEARCH) in the corresponding direction. During the fast search procedure you can listen to the tracks, even with the volume turned down. After approx. 5 seconds the unit's mute function is activated.

REPEAT function

The repeat function allows you to repeat the entire CD (or your programme). By pressing REPEAT, you activate this repeat function. By pressing the button again you deactivate the repeat function. The display shows you the function you have chosen.



SHUFFLE function

By pressing SHUFFLE you activate the shuffle function which mixes up the order of the CD tracks or the tracks you have selected for your programme. A random number generator selects the order of the tracks to be played and continues to function as during normal playback. The random number generator also controls the skip function (button). The display shows the function you have selected.



The function is deactivated by pressing $\square$ or SHUFFLE. In this case the remaining tracks are played in their normal order.

The SHUFFLE function can also be used together with the REPEAT function.

6. CD Player

Programming

You can programme your own track sequence for each CD.

The order of the programmed tracks determines the order in which they are played. Each track can be stored as often as you like. The time display shows you the total playing time of the programme.

There are two methods of programming the desired track sequence. You can enter a programme in the STOP mode or in the PLAY mode.

You can store a sequence of up to 30 tracks.

Programming in STOP mode

Insert a CD and close the compartment. The CD player reads the contents of the CD. The display shows the total playing time and the number of tracks.

Press MEMORY. You have now selected the PROGRAM mode. At the left, the display shows the number of the track you have selected. The track number is shown in the right display. The right display shows the track order. Here you can select which tracks you have stored in the sequence.



Select the first track you want to programme with $\triangleleft$ and $\triangleright$. The track number flashes in the track grid.

By pressing MEMORY, the track is stored in your programme. The track number at the right stops flashing. Then, it is now marked with a dash.



Choose the next track you wish to include in your programme. Use MEMORY to save it. The playing time display is updated and the track number is marked with a dash.

You can leave the programme mode by pressing the $\square$, $\mathbf{II}$ or $\triangleright$ button.

Programming in PLAY mode

You can also enter a programme while a CD is playing.

Press MEMORY. The number of the current track flashes. If you wish to add this track to your programme, press MEMORY again. The track number stops blinking and is now marked with a dash.



If you wish to add a track to your programme other than the one currently being played, press $\triangleleft$ or $\triangleright$ button. Save your selection by pressing MEMORY.

You can leave the programme mode by pressing the $\square$ button.

Changing the programme

It is possible to change the programme you have created; you can add additional tracks or delete tracks from your programme.

If you wish to add an additional track, select it by pressing $\triangleleft$ or $\triangleright$ on the keypad of your remote control. The corresponding track number blinks. Use MEMORY to add the track to your programme.

If you wish to delete a track you can do so by selecting the track and then pressing CANCEL. The playing time display is automatically updated.

Programme playback

To play the programme you have created, press $\triangleright$ (PLAY). All functions of the playback mode continue to function.

Deleting a programme

To delete the entire programme, press CANCEL while in the STOP mode. Opening the compartment (Δ) or shutting off the unit also deletes the programme.

6. CD Player

Recording from a CD to a cassette (CD-COPY)

Your cassette deck is capable of transmitting control commands to the CD-player, enabling you in turn to carry out the CD-COPY function (automatic recording from a CD to a cassette) by pressing just one button.

In addition, you can also optically record individual CD tracks or programmes on both sides of the cassette so that no tracks are cut off in the middle, or so that there is not an excessive amount of blank tape on one side of the cassette.

First there must be a cassette in the cassette compartment and a CD in the CD player.

Press the cassette tape by winding to the desired tape position. Select the desired track on the CD player and, if necessary, the corresponding playing time (04:00:00/00:10:00/00:12:00) with the TAPE EDIT function.

Now press **CD COPY** on the cassette deck. The indicator above the button lights up. The cassette deck starts first in order to take up approx. 6 seconds of tape leader. During this time, the red REC indicator flashes. The CD player then starts automatically.

During the recording procedure you can only use the **□ (STOP)** or **△ (OPEN/CLOSE)** buttons. All other functions are deactivated.

If the CD player is the first unit to stop playback, it automatically sends a corresponding command to the cassette deck and recording is stopped.

If the respective side of the tape reaches the end first, the CD player switches to PAUSE. If you selected reverse mode, your unit switches to the other side of the cassette and continues recording. The cassette deck takes up the leader, and then the CD starts playback at the beginning of the track last played.

For digital recordings (such as DAT, DCC, etc.), you must start the CD player from the PAUSE mode to ensure optimum synchronization. The CD-COPY function is the same as that for analog recording.

Warning

This label is attached to the back of your unit.

**CLASS 1
LASER PRODUCT**

CLASS 1 LASER PRODUCT means that the laser's construction makes it inherently safe so that the legally prescribed maximum permissible radiation values can never be exceeded.

CAUTION:

Using any equipment or device other than those described and specified in these operating instructions, or tampering with the unit in any way, can result in dangerous exposure to radiation.

7. Cassette Deck

Power supply

The special flat cable connection to the receiver also supplies power to the cassette deck. As soon as the receiver is switched on, the **POWER IO** indicator on the cassette deck will light up to indicate that the unit is also switched on.

After switching on, your unit is always in the STOP mode, and automatically selects **DOLBY B NR**.

Inserting a cassette

Open in STOP mode the cassette compartment of DECK A or DECK B by pressing **△** on the compartment cover.

Slide the cassette with the open side forward into the guides of the cover.

Close the compartment by hand.

Tape type

You can use the type type of your choice.

Your unit automatically recognizes and adapts to ferrous oxide (Fe₂O₃) and Chromium dioxide (CrO₂) cassettes.

Noise reduction system (DOLBY NR)

Always play cassette tapes in accordance with the way they were recorded, i.e., with or without **DOLBY NR**. Only in this way is playback quality guaranteed.

The advantage of a recording made with **DOLBY NR** compared to one made without **DOLBY NR** is the reduced tape noise (see "Technical Data").

For this reason, always select **DOLBY NR** for new recorded cassettes. If you buy a music cassette with only the **II** symbol, this indicates that this recording is with **DOLBY B NR**.

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. **DOLBY** and the double-D symbol **DD** are trademarks of Dolby Laboratories Licensing Corporation.

Switch on the noise reduction system with **DOLBY NR**. Press again to switch the system off.

Protecting cassettes against unintentional erasure

Every time you record onto a tape, its contents is erased and replaced by the new recording.

In order to avoid unintentional erasure of a recording, carefully remove its safety tabs with, for example a screw driver.

Original recordings are already provided against unintentional erasure.

If you wish to record on a previously-recorded cassette, place a small strip of tape over the corresponding holes.



Playback

Both cassette decks A and B can play cassettes in the normal forward direction and in reverse direction. This means that you need not remove the cassette to listen to its other side.

Playback (>) can only be started if a cassette tape is in the compartment.

Select the cassette deck by pressing **TAPE** on the receiver or on the remote control.

Switch on the noise reduction system with **DOLBY NR** if a cassette was recorded with **DOLBY NR**.

To start playback, press < or > according to the desired playback direction. An LED next to the cassette compartment cover indicates the playback direction.

If you want to briefly interrupt playback, press **PAUSE**.

Press > to resume playback.

When the end of the tape is reached it either stops automatically, or switches to the other side of the tape if **CONT. PLAY** is selected (see below).

If you want to stop the tape before it reaches the end, simply press **□ (STOP)**.

Fast winding during normal operation

These functions are only possible when in the STOP mode.

Fast reverse: press the << button

Fast forward: press the >> button

The red LED next to the cassette compartment cover is pressed lights up.

To stop press **□ (STOP)**.

CONT. PLAY function

This function is used to switch your unit to continuous playback.

Press **CONT. PLAY**. The cassette deck plays the first side of the cassette in the deck you have selected and then the second side. If you have inserted a cassette in the other cassette deck, this cassette will play at the conclusion of the second side of the cassette in the first deck; at the conclusion of the second side of the second cassette, playback resumes with the first cassette, and so on.

If only one cassette is in a drive, this cassette will continuously play.

MUSIC SEARCH function

If you are playing a cassette and press fast forward >>, the cassette deck winds to the beginning of the next track (NEXT function). If you press << the cassette deck winds to the beginning of the current track (PREVIOUS function).

If you press >> twice, the cassette winds to the second track in the forward direction; if you press the button three times, the cassette winds to the third track (now 15 tracks).

Pressing << once, winds the tape to the beginning of the track currently being played, and pressing <<< again winds it to the beginning of the previous track.

The only requirement for this function is a 4-second pause between each of the tracks (see RECORD NOTE).

Note: On classical music tapes, the search function may recognize extremely quiet passages as pauses.

7. Cassette Deck

Recording

Your unit is equipped with the function (Automatic Level Control) for automatic sound level control.

On the receiver, select the signal source from which you want to record.

Insert a cassette in Deck B.

Press **DOLBY NR** if you wish to record with Dolby.

Press **RECORD/MUTE**. The unit switches to recording/pause.

The yellow indicator above the **PAUSE** button lights up and the red indicator above the **RECORD/MUTE** button lights up.

The tape direction indicator beside the cassette compartment shows. Select the side of the cassette you want to play or onto which you want to record (press > or < to select the tape direction).

Press > again to start the recording. The tape direction indicator and the red **RECORD/MUTE** indicator light up.

To stop the recording, press **STOP** on deck B.

The unit automatically stops recording when the end of the tape is reached.

Reverse mode recording (DECK B)

If you press **CONT. PLAY** button after you press **RECORD/MUTE**, you can record in reverse mode on the second side of the tape. The direction indicator changes the side of the cassette after the first side has been recorded; this is followed by recording on the second side.

Recording pause with RECORD MUTE

In order to find a track with the **MUSIC SEARCH** function, there must be a 4-second recording pause between the individual tracks. Therefore, briefly press **RECORD MUTE** once at the end of a track. The red indicator (**RECORD**) flashes for 4 seconds. The unit generates a 4-second recording pause and waits for you to resume recording (**RECORD PAUSE**).

Resume recording by pressing >.

If you keep **RECORD MUTE** pressed longer, the recording pauses will last as long as you keep the button pressed. When you release the button, the unit waits in recording/pause. The flashing red indicator indicates the length of the pause.

Technical data

Receiver

Amplifier unit	R120	R220
Music output (4 Ohm)	2 x 45 W	2 x 55 W
Harmonic output DIN 45500	2 x 30 W	2 x 50 W
(4 Ohm/0.7% distortion factor, f = 1 kHz)		
Harmonic output DIN 45500	2 x 30 W	2 x 50 W
(8 Ohm/0.7% distortion factor, f = 1 kHz)		
Input sensitivity/impedance	160 mV, 10 kOhm	160 mV, 10 kOhm
Signal-to-noise ratio	94 dB	94 dB
Distortion factor (harmonic output -1 dB, 4 Ohm, 1 kHz/0.01%)	< 0.005	< 0.005
Noise potential ratio	< 94 dB	< 94 dB
Output band width	> 5 Hz ... < 100,000 Hz	> 5 Hz ... < 100,000 Hz
Transmission range	> 10 Hz ... < 100,000 Hz	> 10 Hz ... < 100,000 Hz
Supply voltage, mains frequency	230 V, 50/60 Hz	230 V, 50/60 Hz
Attenuation factor	> 60	> 60
Power consumption (max)	160 W	160 W

Tuner part

FM range	87.5 ... 108.0 MHz	87.5 ... 108.0 MHz
Reception range	50 kHz for auto tuning, 25 kHz for manual tuning	50 kHz for auto tuning, 25 kHz for manual tuning
Sensitivity (S/N) / N=26 dB mono	1.1 µV	1.1 µV
(S/N) / N=46 dB stereo	35 µV	35 µV
Dynamic separation (mono, stereo, ± 300 kHz)	> 60 dB	> 60 dB
Signal-to-noise ratio (EC curve A off)	Min 60 dB	Min 60 dB
Frequency range	531 ... 15,000 Hz	531 ... 15,000 Hz
Reception range	MW: 520 ... 1605 kHz (manual tuning) SW1 ... 1502 kHz (automatic tuning) LW: 153 ... 203 kHz	MW: 520 ... 1605 kHz (manual tuning) SW1 ... 1502 kHz (automatic tuning) LW: 153 ... 203 kHz

CD Player

Linear frequency response (20 - 20,000 Hz)	< ± 0.5 dB
Signal-to-noise ratio (RMS, DIN A, 22 kHz LPF)	> 82 dB

Cassette Deck

Frequency range (Playback, IEC)	20 Hz ... 16 kHz
Noise potential ratio	< 94 dB
(with/without Dolby B NR IEC std., CR)	55 dB, 64 dB
Synchronous deviation (IEC std.)	< 0.13 %

The unit meets the EEC regulations concerning interference

emissions.
The unit complies with the safety regulations according to VDE 0880 / BS 415 and thus with the international safety regulation according to IEC 65.

Subject to technical alterations and alterations in styling. E and D.E.

8. Important Information

Direct Operation Technique D.O.T.

The intelligent data system in your unit makes it possible for individual components of your system to communicate with each other. This communication between the units in your system is automatically generated when the left cable connection is made.

The D.O.T. function allows automatic input selection by the receiver. As soon as you press the > (PLAY) button on the CD player or cassette, the receiver automatically selects the correct input source.

Protection circuits

Your receiver is provided with series of electrical protection devices which reliably safeguard the receiver against damage. Overvoltage is thus almost instantly protected.

If your unit overheats, a thermal error is recognized. In this case, the LED in the VOLUME control supply blinks, and the volume level is automatically reduced.

Maintenance and care

... of the system

To clean the unit's housing and the speakers, simply wipe with lightly moistened cloths.
Never use cleaning agents which contain alcohol, methylated spirits, ammonia or abrasives.

... of the CD player

Clean the CD compartment with a clean cloth.

... of the CD's

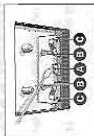
Never write on the printed (label) side of a CD.
Never attach adhesive labels of any kind to a CD.

You should always keep the CD surfaces clean. Wipe the top shiny surface with a lint-free cloth in a spiral line from the center to the edge. Do not use any cleaning agents. Never use cleaning agents intended for conventional LP's, including solvents or abrasives, to clean a CD.



... of the Cassette Deck

To ensure consistent recording and playback quality, you should clean the cassette tape and the cassette deck. Use a cassette cleaner or every 10 hours of operation. The cassette cleaner should be used on a clean, new cassette tape or a cassette worn maintained with alcohol. Do not wipe any other mechanisms with alcohol.



Ausbauhinweise R 120 / R 220

1. Öffnen des Gehäuses

- Gerät vom Netz trennen.
- 4 Schrauben (A) (Torx T 10) und 4 Schrauben (B) herausdrehen (Fig. 1).
- Gehäuseoberteil hinten anheben und abnehmen.



Fig. 1

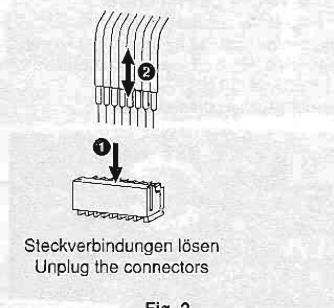


Fig. 2

2. Frontblende abnehmen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Steckverbindungen (Fig. 2) von der Bedienplatte zur Hauptplatte und zur Tunerplatte lösen.
- Steckverbindung TC 550 (Fig. 8) von der Lautstärkereglerplatte abziehen.
- Netzschalter in Stellung "Aus" schalten.
- Laschen (1) links und rechts der Frontblende sowie 3 Haltezapfen (2) am Gehäuseboden ausrasten (Fig. 3).
- Frontblende vorsichtig nach vorne (3) abziehen (Fig. 3).

Auf Netzschalter achten, Bruchgefahr!

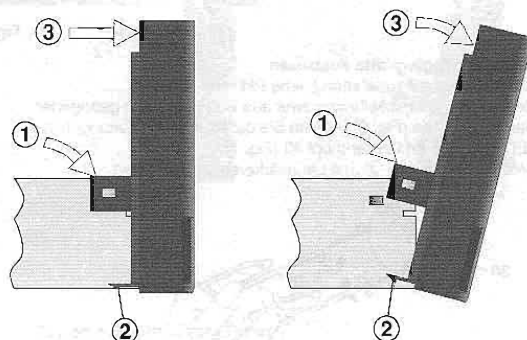


Fig. 3

2. Removing the Front Panel

- Remove the top of the cabinet (see para 1).
- Unplug the connectors (Fig. 2) from the control board to the main board and to the tuner board.
- Unplug the connector TC 550 (Fig. 8) from the volume control board.
- Set the power switch to "Off".
- Disengage the two lugs (1) on the left and right of the front panel and three holding hooks (2) on the bottom of the cabinet (Fig. 3).
- Pull the front panel carefully towards the front (3) (Fig. 3).

Take care of the mains switch. Risk of fracture!

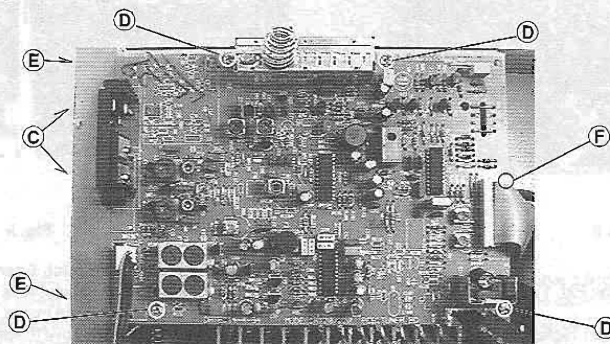


Fig. 4

3. Tunerplatte ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Steckverbindungen von der Tunerplatte lösen (Fig. 2).
- 2 Schrauben (C) und 4 Schrauben (D) herausdrehen (Fig. 4).

3. Removing the Tuner Board

- Remove the top of the cabinet (see para 1).
- Unplug the connectors from the tuner board (Fig. 2).
- Undo 2 screws (C) and 4 screws (D) (Fig. 4).

4. Hauptplatte ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Steckverbindungen von der Tunerplatte lösen (Fig. 2).
- 2 Schrauben (C), 2 Schrauben (E) und Schraube (F) herausdrehen (Fig. 4).
- Tunerplatte mit Montageblech abnehmen.
- 5 Schrauben (G), 5 Schrauben (H) und 2 Schrauben (I) herausdrehen (Fig. 5).
- Bei Bedarf Steckverbindungen lösen.

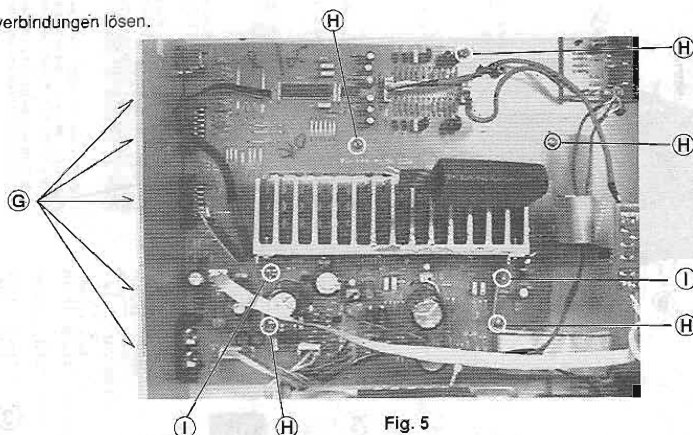


Fig. 5

4. Removing the Main Board

- Remove the top of the cabinet (see para 1).
- Unplug the connectors from the tuner board (Fig. 2).
- Undo 2 screws (C), 2 screws (E) and screw (F) (Fig. 4).
- Remove the tuner board with mounting metal plate.
- Undo 5 screws (G), 5 screws (H) and 2 screws (I) (Fig. 5).
- Disconnect the plugs if necessary.

5. Lautstärkereglerplatte ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Reglerknopf 30 mit Hilfe von zwei aus Büroklammern gebogenen Haken abziehen (Fig. 6). Achten Sie dabei auf die Zuleitungen zur LED-Platte 26 im Reglerknopf 30 (Fig. 7).
- Befestigungsmutter (J) des Lautstärkereglers entfernen.

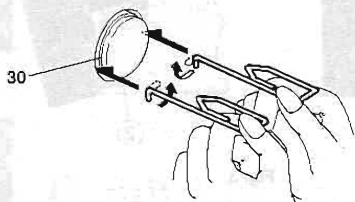


Fig. 6

5. Removing the Volume Control Board

- Remove the top of the cabinet (see para 1).
- Remove the control knob 30 by means of two hooks made out of metallic paper clips (Fig. 6). Take care of the leads to the LED board 26 in the control knob 30 (Fig. 7).
- Remove the nut (J) of the potentiometer.

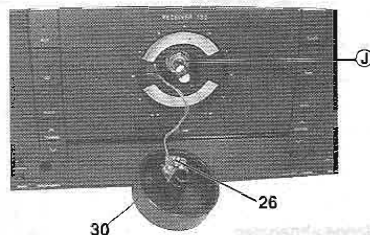


Fig. 7

6. Bedienplatte ausbauen

- Gehäusefront abnehmen (siehe Pkt. 2).
- Lautstärkereglerplatte ausbauen (siehe Pkt. 5).
- 10 Schrauben (K) (Fig. 8) herausdrehen.

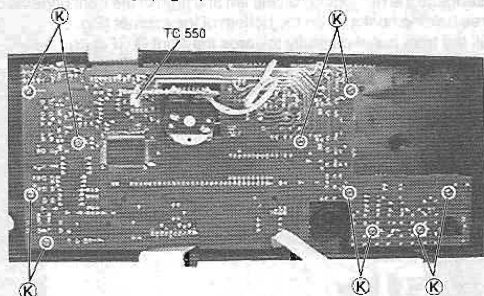


Fig. 8

6. Removing the Control Board

- Remove the front panel (see para 2).
- Remove the volume control board (see para 5).
- Undo 10 screws (K) (Fig. 8).

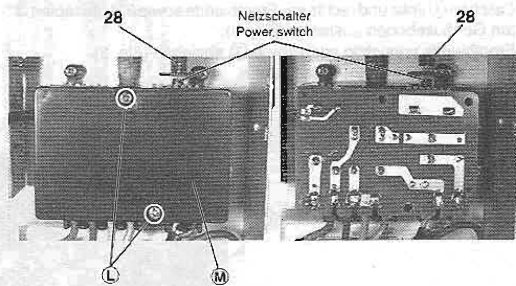


Fig. 9

7. Netzschalterplatte ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Gerät vom Netz trennen.
- 2 Schrauben (L) herausdrehen und Sicherheitsabdeckung (M) abnehmen (Fig. 9).
- Netzschalter in Stellung "Aus" bringen.
- Netzschalterplatte hinten anheben und abnehmen, dabei vorsichtig die Netztaсте 28 abziehen.

Achten Sie nach Reparaturarbeiten auf die ordnungsgemäße Anbringung der Sicherheitsabdeckung der Netzschalterplatte!

7. Removing the Mains Switch Board

- Remove the top of the cabinet (see para 1).
- Disconnect the unit from the mains.
- Undo 2 screws (L) and remove the protective cover (M) (Fig. 9).
- Set the mains switch to "Off".
- Raise the mains switch board on the rear side and remove it. In doing so, pull off the mains button 28 carefully.

On completion of the repairs, ensure that the protective cover is correctly fitted to the mains switch board!

Ausbauhinweise CD 120

1. Öffnen des Gehäuses

- 4 Schrauben (A) (Torx T 10) und 4 Schrauben (B) herausdrehen (Fig. 1).
- Gehäuseoberteil nach oben abnehmen.

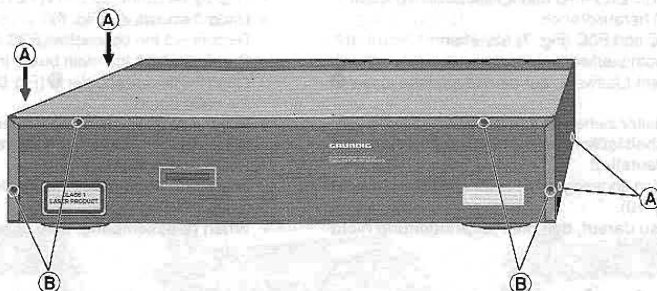


Fig. 1

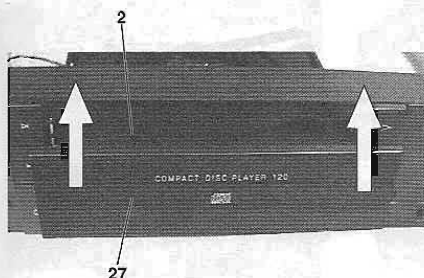


Fig. 2

2. Frontblende abnehmen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Schublade 2 nach vorne schieben.
- Schubladenabdeckung 27 nach oben ausrasten und abnehmen (Fig. 2).
- Steckverbindungen von der Bedienplatte zur Hauptplatte lösen (Fig. 4).
- Laschen 1 links und rechts der Frontblende sowie 3 Haltezapfen 2 am Gehäuseboden ausrasten (Fig. 3).
- Frontblende 30 vorsichtig nach vorne 3 abziehen (Fig. 3).

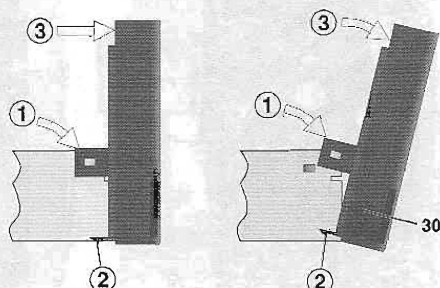
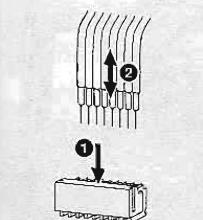


Fig. 3

2. Removing the Front Panel

- Remove the top of the cabinet (see para 1).
- Move the tray 2 towards the front.
- Disengage the cover 27 of the tray by pulling it upwards and take it out (Fig. 2).
- Unplug the connectors from the control board to the main board (Fig. 4).
- Disengage the two lugs 1 on the left and right of the front panel and three holding hooks 2 on the bottom of the cabinet (Fig. 3).
- Pull the front panel 30 carefully towards the front 3 (Fig. 3).



Steckverbindungen lösen
Unplug the connectors

Fig. 4

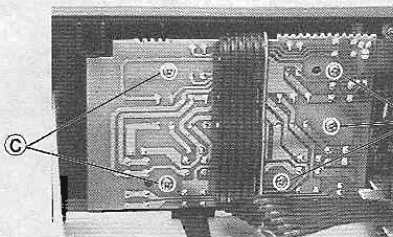


Fig. 5

3. Tastenplatte (rechts) ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- 5 Schrauben (C) (Fig. 5) herausdrehen.
- Tastenplatte nach hinten abnehmen.

4. Tastenplatte (links) ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- 4 Schrauben (D) (Fig. 6) herausdrehen.
- Tastenplatte nach hinten abnehmen.

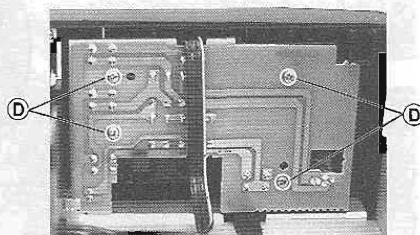


Fig. 6

3. Removing the Keyboard (right)

- Remove the top of the cabinet (see para 1).
- Undo 5 screws (C) (Fig. 5).
- Remove the keyboard towards the rear.

4. Removing the Keyboard (left)

- Remove the top of the cabinet (see para 1).
- Undo 4 screws (D) (Fig. 6).
- Remove the keyboard towards the rear.

5. CD-Einheit ausbauen

- Gehäusefront abnehmen (siehe Pkt. 2).
- Schublade 2 nach vorne schieben.
- 3 Schrauben (E) herausdrehen (Fig. 7).
- 4 Plattenhalter (F) austrasten.
- CD-Einheit mit der Hauptplatte herausnehmen.
- Steckverbindungen P1T, P2T, P11C und Massezuleitung lösen.
- 3 Schrauben (G) (Fig. 8) herausdrehen.
- Steckverbindungen P2C und P3C (Fig. 7) abziehen.
- Hauptplatte vorsichtig vom Laufwerk abheben.
- Flexprinthalter, unter dem Laufwerk, auf der Hauptplatte lösen ① (Fig. 9).
- Flexprint aus Flexprinthalter ziehen ② (Fig. 9).
- **Achtung. Die Lasereinheit ist sehr empfindlich gegen statische Aufladungen. (MOS-Bauteile)!**
Schließen Sie deshalb den abgezogenen Flexprintstecker mit einer Büroklammer kurz. (Fig. 10).
- **Achten Sie beim Einbau darauf, daß die Flexprintleitung nicht geknickt wird.**

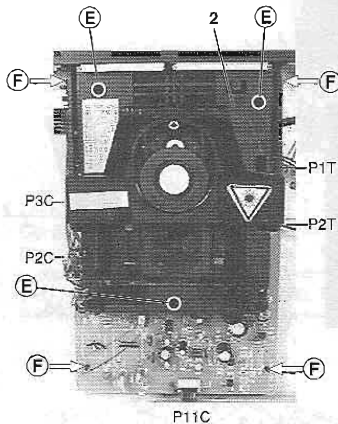


Fig. 7

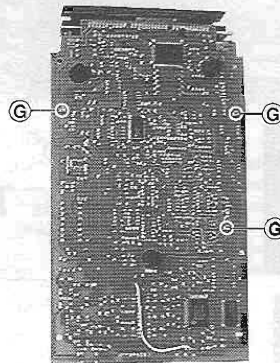


Fig. 8

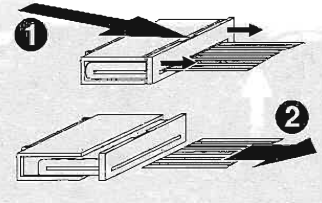


Fig. 9

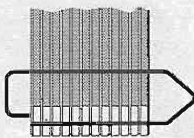


Fig. 10

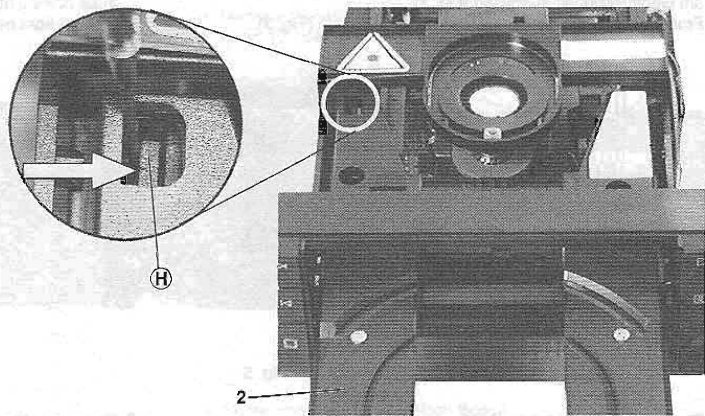


Fig. 11

6. CD-Schublade ausbauen

- Schublade 2 bis zum Anschlag nach vorne schieben (Fig. 11).
- Mit einem kleinen Schraubendreher die Rastung ⑧ (Fig. 11) nach rechts drücken und dadurch austrasten.
- Die CD-Schublade kann jetzt ganz herausgezogen werden.

5. Removing the CD Unit

- Remove the front panel (see para 2).
- Move the tray 2 towards the front.
- Undo 3 screws (E) (Fig. 7).
- Disengage the 4 spacers (F).
- Take out the CD unit with the main board.
- Unplug the connectors P1T, P2T, P11C and the ground connection.
- Undo 3 screws (G) (Fig. 8).
- Disconnect the connectors P2C and P3C (Fig. 7).
- Carefully lift off the main board from the drive mechanism.
- Open the flexprint holder ① (Fig. 9) beneath the drive mechanism on the main board.
- Pull the flexprint out of the holder ② (Fig. 9).
- **Warning. The Laser unit is very sensitive to static charges (MOS components)!**
Therefore, short-circuit the unplugged flexprint connector with a paper clip (Fig. 10).
- **When re-assembling, take care not to kink the flexprint.**

6. Removing the CD Tray

- Move the tray 2 to the front stop (Fig. 11).
- Using a small screw driver, push the catch ⑧ to the right to disengage it (Fig. 11).
- The CD tray can now be removed completely.

7. CD-Laufwerk ausbauen

- CD-Schublade ausbauen (siehe Pkt. 6).
- Schlitten 3 nach hinten in Pfeilrichtung A (Fig. 12) hochschieben und in Pfeilrichtung B (Fig. 13) aushängen.
- Schlitten 3 mit CD-Laufwerk 20 abnehmen (Fig. 14).
- Beim Wiedereinsetzen auf richtigen Sitz in den Führungen ① achten (Fig. 12).

Achtung! Verstellen Sie den Regler für die Laserstromeinstellung nicht. Der Laserstrom wurde werkseitig eingestellt.

7. Removing the CD Drive Mechanism

- Remove the CD tray (see para 6).
- Push the slide 3 to the back and then up into the direction marked A (Fig. 12) and release it in the direction marked B (Fig. 13).
- Remove the slide 3 together with the CD drive mechanism 20 (Fig. 14).
- When re-assembling take care that the slides fits correctly in the rails ① (Fig. 12).

Attention! Do not turn the variable resistor for laser power adjustment. The laser current is pre-set at the factory.

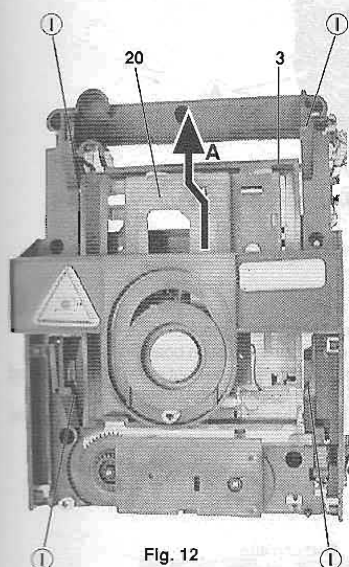


Fig. 12

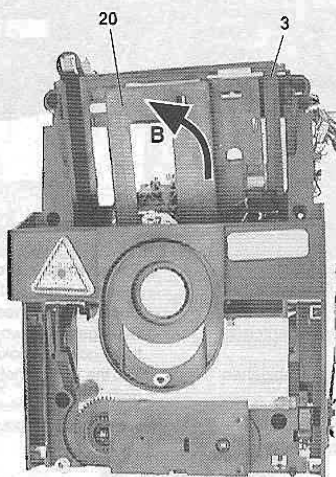


Fig. 13

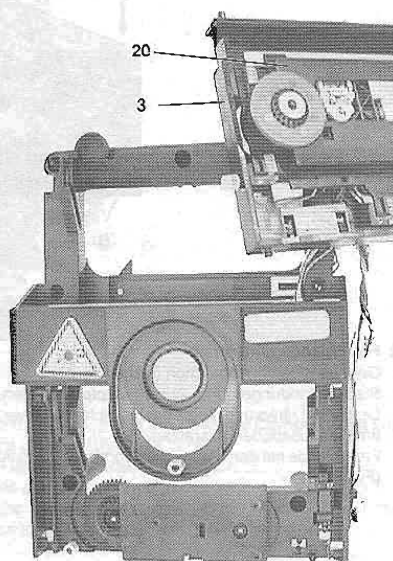


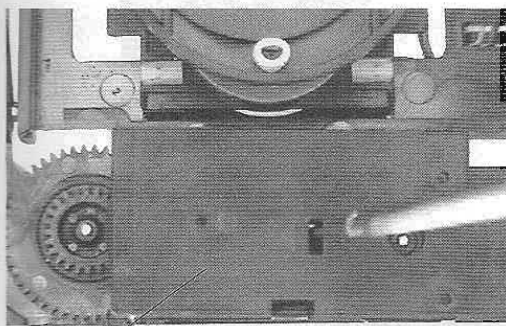
Fig. 14

8. Antriebsriemen ausbauen

- CD-Einheit ausbauen (siehe Pkt. 5).
- CD-Schublade ausbauen (siehe Pkt. 6).
- Mit einem kleinen Schraubendreher die Abdeckung 4 abheben (Fig. 15).
- Riemen 18 (Fig. 16) abnehmen.

8. Removing the Drive Belt

- Remove the CD unit (see para 5).
- Remove the CD tray (see para 6).
- Lift the cover 4 with a small screw driver (Fig. 15).
- Remove the belt 18 (Fig. 16).



4

Fig. 15

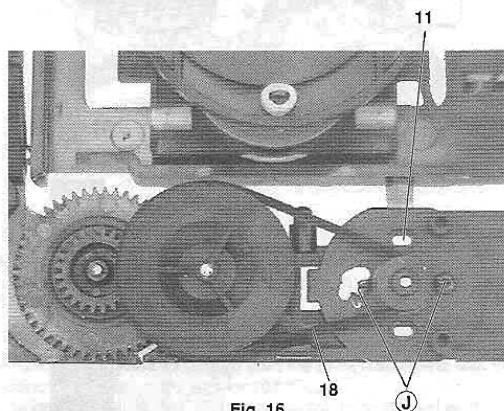


Fig. 16

9. Schubladen-Motor ausbauen

- Antriebsriemen ausbauen (siehe Pkt. 8).
- 2 Schrauben ① herausdrehen (Fig. 16).
- Motor 11 nach unten herausnehmen.

9. Removing the Tray Motor

- Remove the drive belt (see para 8).
- Undo 2 screws ① (Fig. 16).
- Take out the motor 11 towards the bottom.

Ausbaulinweise CCF 120

1. Öffnen des Gehäuses

- 4 Schrauben (A) (Torx T 10) und 4 Schrauben (B) herausdrehen (Fig. 1).
- Gehäuseoberteil hinten anheben und abnehmen.



Fig. 1

2. Frontblende abnehmen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Steckverbindungen (Fig. 2) zur Hauptplatte lösen.
- Laschen ① links und rechts der Frontblende sowie 3 Haltezapfen ② am Gehäuseboden ausrasten (Fig. 3).
- Frontblende mit den Laufwerken vorsichtig nach vorne ③ abziehen (Fig. 3).

2. Removing the Front Panel

- Remove the top of the cabinet (see para 1).
- Unplug the connectors (Fig. 2) to the main board.
- Disengage the two lugs ① on the left and right of the front panel and three holding hooks ② on the bottom of the cabinet (Fig. 3).
- Pull the front panel with the drive mechanisms carefully towards the front ③ (Fig. 3).

Steckverbindungen lösen
Unplug the connectors

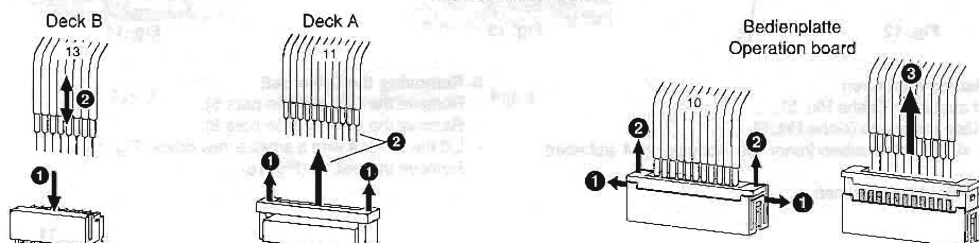


Fig. 2

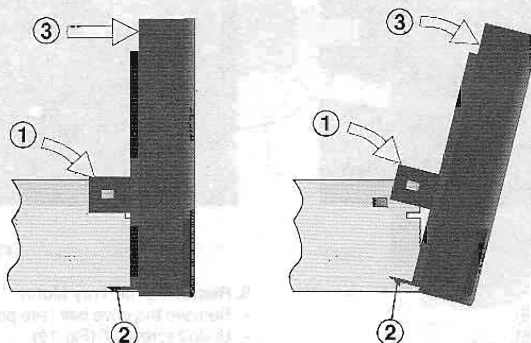


Fig. 3

3. Laufwerke ausbauen (A oder B)

- Gehäusefront abnehmen (siehe Pkt. 2).
 - 4 Schrauben © je Laufwerk herauserschrauben (Fig. 4).
 - Laufwerke nach hinten herausnehmen.
- Achten Sie dabei auf die Zahnstangen 22 und die Cassettenfachklappen-Federn 18 und 19 (Fig. 5).

3. Removing the Drive Mechanism (A or B)

- Remove the front panel (see para 2).
 - Undo 4 screws © on either drive mechanism (Fig. 4).
 - Take the drive mechanism out towards the rear.
- Take care of the toothed racks 22 and the springs 18 and 19 of the cassette compartment lid (Fig. 5).

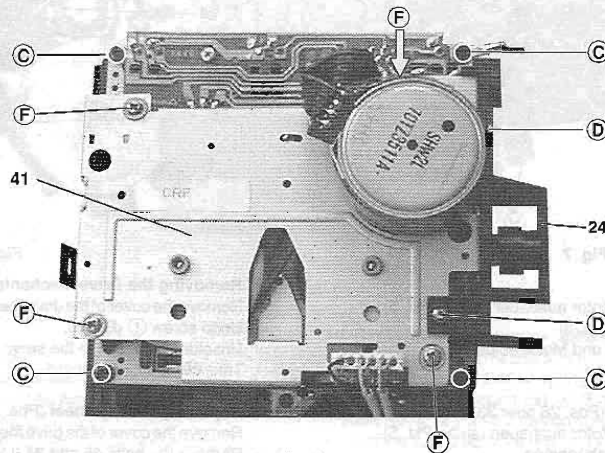


Fig. 4

4. Cassettenfach-Deckelbremsen (23, 24) ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
 - 2 Schrauben © je Bremse herausdrehen (Fig. 4 und 5).
 - Deckelbremsen komplett nach hinten herausnehmen.
- Achten Sie auf die Zahnstangen 22 und die Cassettenfachklappen-federn 18, 19 (Fig. 5).

4. Removing the Brake (23, 24) of the Cassette Compartment Lid

- Remove the top of the cabinet (see para 1).
 - Undo 2 screws © of either brake (Figs. 4 and 5).
 - Take the brakes out towards the rear.
- Take care of the toothed racks 22 and the springs 18, 19 of the cassette compartment lid (Fig. 5).

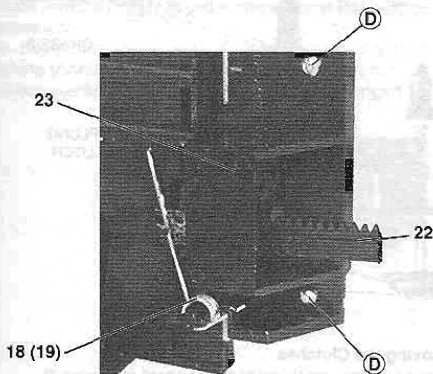


Fig. 5

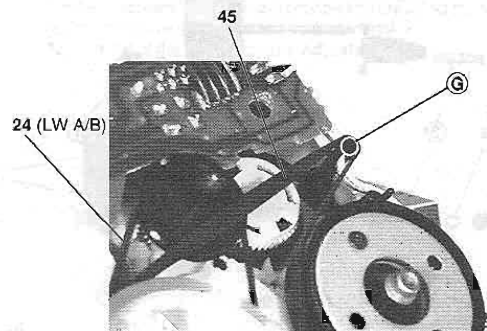


Fig. 6

5. Laufwerkmotor ausbauen

- Laufwerk ausbauen (siehe Pkt. 3).
- 4 Schrauben © herausdrehen (Fig. 4).
- Nehmen Sie den Antriebsriemen 45 von der Motorriemenscheibe und legen Sie ihn über den hochstehenden Bolzen © (Fig. 6).
- Laufwerkabdeckung 41 (Fig. 4) mit Motor abnehmen, achten Sie dabei auf die Scheibe 102 (Fig. 8).
- 2 Schrauben © herausdrehen (Fig. 7), Motor herausnehmen und ablöten.

5. Removing the Motor of the Drive Mechanism

- Dismantle the drive mechanism (see para 3).
- Undo 4 screws © (Fig. 4).
- Take off the drive belt 45 from the motor pulley and put it around the upright bolt © (Fig. 6).
- Remove the cover 41 (Fig. 4) from the drive mechanism with the motor, take care of the washer 102 (Fig. 8).
- Undo 2 screws © (Fig. 7), take the motor out and unsolder it.

6. Antriebsriemen auswechseln

- Die Vorarbeiten zum Auswechseln des Antriebsriemens 45 und des Riemens 24 (LW A/B) sind wie beim Ausbauen des Laufwerkmotors (siehe Pkt. 5).
 - Riemen auswechseln.
- Achtung!** Riemen, Andruckrolle und Bandkontaktstellen müssen frei von Öl und Fett sein.

6. Changing the Drive Belt

- The preparations for changing the drive belt 45 and the belt 24 (LW A/B) are the same as for replacing the motor of the drive mechanism (see para 5).
 - Replace the belt(s).
- Warning!** Belts, pressure roller and parts coming into contact with the tape must be free of oil and grease.

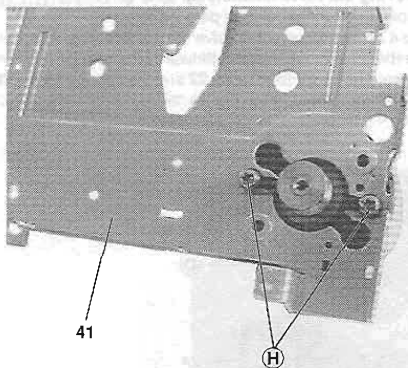


Fig. 7

7. Laufwerkplatte ausbauen

- Laufwerkabdeckung 41 mit Motor ausbauen (siehe Pkt. 5).
- Schraube ① herausdrehen (Fig. 8).
- Leitungen zum Servomagnet und Motor ablöten.
- Leiterplatte abnehmen.

8. Schwungrad auswechseln (Pos. 26 oder 33)

- Laufwerkabdeckung 41 mit Motor ausbauen (siehe Pkt. 5).
- Riemen 45 und 24 (LW A/B) abnehmen.
- Ziehen Sie das Schwungrad nach hinten heraus.
- Achten Sie beim Aus- und Einbau des Schwungrades auf die beiden Lager ①, die beiden Scheiben ② und die Feder ③ (Fig. 9).
- Nach dem Einbau des Schwungrades muß die Capstanwelle mit Spiritus oder Reinigungsbenzin gereinigt werden.

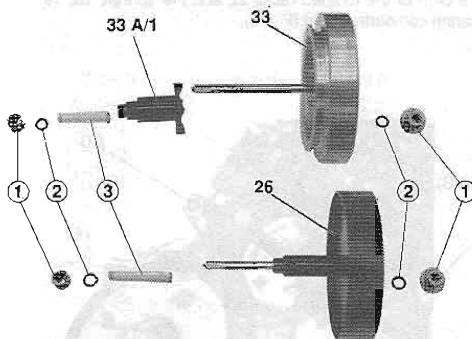


Fig. 9

9. Kupplungen ausbauen

- Laufwerkplatte ausbauen (siehe Pkt. 7).
- Schwungräder ausbauen (siehe Pkt. 8).
- Scheibe 102 und Riemenscheibe 23 abziehen (Fig. 9).
- Wickeldorn 9 aushebeln und abziehen (Fig. 10 und 11).
- Bei Bedarf das Zahnrad 21 abziehen (Fig. 12).
- Nehmen Sie die Kupplungen nach hinten heraus.

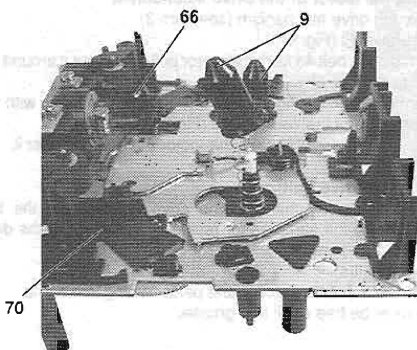


Fig. 11

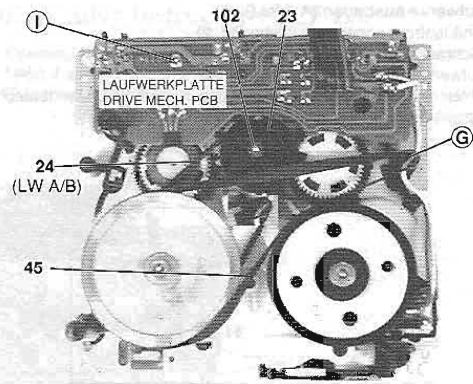


Fig. 8

7. Removing the Drive Mechanism Circuit Board

- Remove the cover of the drive mechanism 41 with motor (see para 5).
- Undo screw ① (Fig. 8).
- Unsolder the leads to the servo release magnet and the motor.
- Take out the circuit board.

8. Replacing the Flywheel (Pos. 26 or 33)

- Remove the cover of the drive mechanism 41 with motor (see para 5).
- Remove the belts 45 and 24 (LW A/B).
- Withdraw the flywheel towards the rear.
- When removing and refitting the flywheel take care of the two bearings ①, the two washers ② and the spring ③ (Fig. 9).
- After having fitted the new flywheel the capstan must be cleaned with spirit or cleaning benzine.

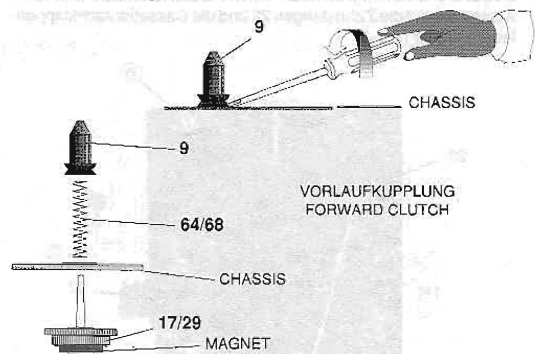


Fig. 10

9. Removing the Clutches

- Remove the drive mechanism circuit board (see para 7).
- Remove the flywheels (see para 8).
- Pull off the washer 102 and the pulley 23 (Fig. 9).
- Lift off and remove the spindle 9 (Figs. 10 and 11).
- If necessary pull off the gearwheel 21 (Fig. 12).
- Remove the clutches towards the rear.

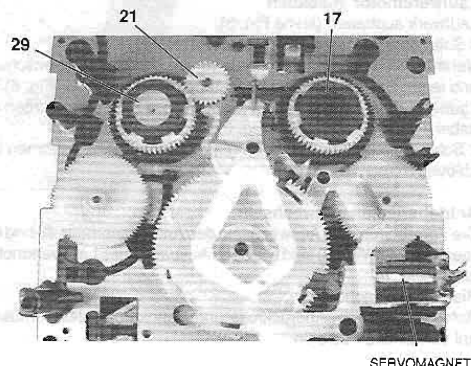


Fig. 12

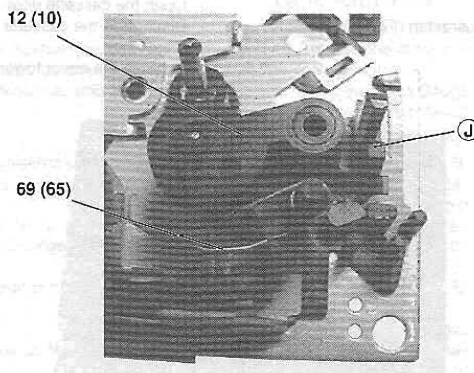


Fig. 13

10. Andruckrollen auswechseln

- Laufwerk ausbauen (siehe Pkt. 3).
- Untere Drehfeder 66 bzw. 70 aushängen (Fig. 11).
- Rastnase J (Fig. 13) austrasten und die Andruckrolle 10 bzw. 12 mit der Drehfeder 65 bzw. 69 abziehen.
- Beim Einbau ist die Feder 66 bzw. 70 (Fig. 11) wieder einzuhängen.

11. Tonkopf auswechseln

- Laufwerk ausbauen (siehe Pkt. 3).
- Kopfleitungen von der Kopfanschlußplatte ablöten (Anschlüsse notieren).
- Kopfleitungen aus den Kabelhaltern aushängen.
- 2 Schrauben K herausdrehen und den Tonkopf herausnehmen (Fig. 14).

- Neuen Tonkopf einsetzen und in umgekehrter Reihenfolge zusammenbauen.

Die Kopfschrauben ① und ② dienen der Kopfspalten senkrechtstellung (Azimut) und dürfen nicht festgedreht werden. Kopfspalten senkrechtstellung siehe unter **Einstellungen**.

10. Replacing the Pressure Rollers

- Remove the drive mechanism (see para 3).
- Unhook the lower torsion spring 66 or 70 (Fig. 11).
- Disengage the locking lug J (Fig. 13) and pull out the pressure roller 10 or 12 with the torsion spring 65 or 69.
- Refit the spring 66 or 70 (Fig. 11) when mounting the new pressure roller.

11. Replacing the Sound Head

- Remove the drive mechanism (see para 3).
- Unsolder the head leads from the head connecting board (note down the connections).
- Detach the head leads from the cable holders.
- Undo 2 screws K and remove the sound head (Fig. 14).
- Fit the new sound head and re-assemble in reverse order. The head screws ① and ② are provided for adjusting the head gap (azimuth) and must not be tightened completely. Adjustment of the head gap, see **Adjustments**.

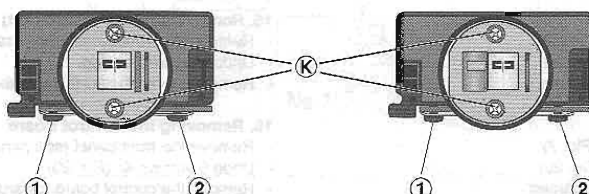


Fig. 14

12. Cassettentüren ausbauen

- Gehäuseoberteil abnehmen (siehe Pkt. 1).
- Drehfeder 18 bzw. 19 aushängen (Fig. 15).
- Cassettentürrahmen links und rechts L (Fig. 16) aushängen und die Tür vorsichtig nach vorne herausnehmen.
- Achten Sie dabei auf die Zahnstange 22.

12. Removing the Cassette Compartment Lids

- Remove the top of the cabinet (see para 1).
- Unhook the torsion spring 18 and 19 respectively (Fig. 15).
- Detach the guides on the left and right of the cassette compartment lid L (Fig. 16) and take it out carefully towards the front.
- Take care of the toothed rack 22.

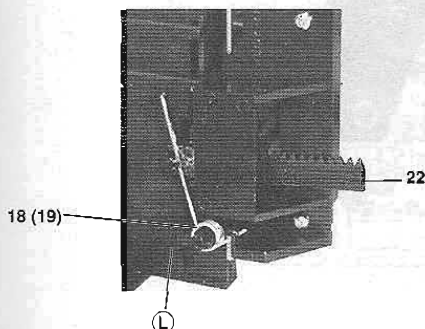


Fig. 15

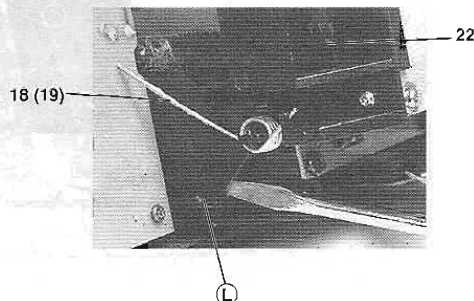


Fig. 16

13. Cassettenfachabdeckung abnehmen

- Cassettentür öffnen.
- Cassettenfachabdeckung nach oben ausrasten (Fig. 17).
- Deckel nach vorne abnehmen.

13. Removing the Cassette Compartment Cover

- Open the cassette door.
- Disengage the cassette compartment cover by pulling it upwards (Fig. 17).
- Remove the cover towards the front.

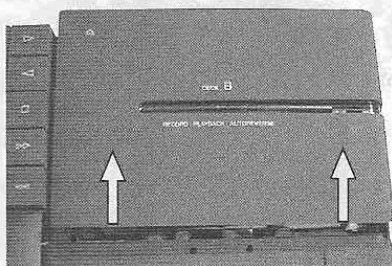


Fig. 17

14. Tastenplatte (rechts) ausbauen

- Gehäusefront abnehmen (siehe Pkt. 2).
- Laufwerk B ausbauen (siehe Pkt. 3).
- 2 Schrauben (M) herausdrehen (Fig. 18).
- Tastenplatte nach hinten herausnehmen.

14. Removing the Keyboard (right)

- Remove the front panel (see para 2).
- Remove the drive mechanism B (see para 3).
- Undo 2 screws (M) (Fig. 18).
- Remove the keyboard towards the rear.

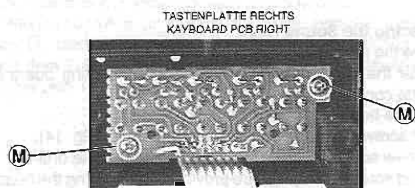


Fig. 18



Fig. 19

15. Tastenplatte (links) ausbauen

- Gehäusefront abnehmen (siehe Pkt. 2).
- 2 Schrauben (N) herausdrehen (Fig. 19).
- Tastenplatte nach hinten herausnehmen.

15. Removing the Keyboard (left)

- Remove the front panel (see para 2).
- Undo 2 screws (N) (Fig. 19).
- Remove the keyboard towards the rear.

16. Bedienplatte ausbauen

- Gehäusefront abnehmen (siehe Pkt. 2).
- 6 Schrauben (O) herausdrehen (Fig. 20).
- Bedienplatte nach hinten herausnehmen.

16. Removing the Control Board

- Remove the front panel (see para 2).
- Undo 6 screws (O) (Fig. 20).
- Remove the control board towards the rear.

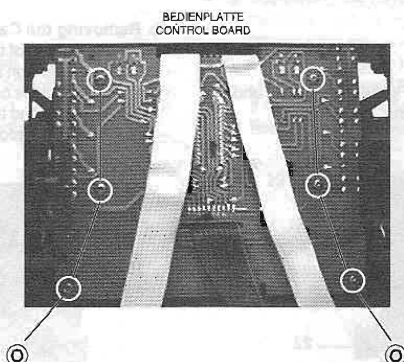


Fig. 20

Bandlaufprüfung

- Laufwerke ausbauen, siehe Pkt. 3 der Ausbauhinweise.
- Kopflehre 401 (Sach-Nr. 72008-401.00) auflegen. Achten Sie dabei auf die Bandselectoren (Cassettefühler) und eine korrekte Auflage der Kopflehre.

Laufwerk A oder B

- Schieben Sie den Kopfschlitten mechanisch in die Gerätefunktion "Start", d.h. den Kopfschlitten in die Richtung der Kopflehre schieben.
- Führen Sie den Fühlhebel B der Kopflehre 401 zu den Bandführungen ④ und ⑤, bzw. zur Bandführungsgabel ③ des Tonkopfes.
- Der Fühlhebel B muß sich leicht zwischen den Bandführungen bewegen lassen.
- Kopflehre abnehmen.
- Danach ist mit einer Bandlaufcassette (z. B. Bandlaufcassette MC-112 C, Sach-Nr. 72008-247.00) der Bandlauf in beiden Laufrichtungen zu kontrollieren.
- Bei der Prüfung mit der Bandlaufcassette muß das Laufwerk angeschlossen und das Gerät elektrisch betriebsbereit sein.
- Bandlaufcassette MC-112 C einlegen.
- Durch Umspulen der Bandlaufcassette ist ein geräteeigener Bandwickel zu erzeugen.
- Gerätefunktion: Start.
- Beim Durchlauf der Bandlaufcassette darf das Band nicht an den oberen oder unteren Kanten der Bandführungen umknicken.
- Die Kopfeinstellschrauben ① und ② (Fig. 2) dienen zur Kopfspaltsenkrechtstellung (Azimut), siehe Einstellungen.

Tape Run Test

- Remove the drive mechanisms, see para 3 of the Disassembly Instructions.
- Place the Head Gauge 401 (part no. 72008-401.00). Take care of tape selectors (cassette sensing levers) and that the head gauge is correctly positioned.

Drive mechanism A or B

- Move the head base by hand to the position it takes in "Start" mode by sliding it towards the head gauge.
 - Move the sensing lever B of the head gauge 401 to the guides ④ and ⑤ and to the tape guide fork ③ of the soundhead respectively.
 - The sensing lever B must move smoothly between the tape guides.
 - Remove the head gauge.
 - With a tape test cassette (eg. the tape test cassette MC-112 C, part no. 72008-247.00) check the tape transport in both directions.
- For carrying out the test with the test cassette the drive mechanism must be connected and the cassette recorder must be electrically operable.
- Insert the tape test cassette MC-112 C.
 - Wind the tape to produce a specific tape roll of this machine.
 - Select the Start function.
 - During this test the tape must not bend on the upper or lower edge of the tape guides.
 - The head adjustment screws ① and ② (Fig. 2) are used for setting the head gap angle (azimuth); see Adjustments.

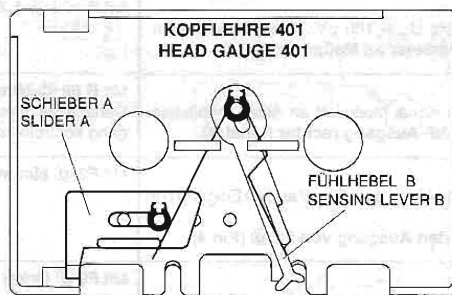


Fig. 1

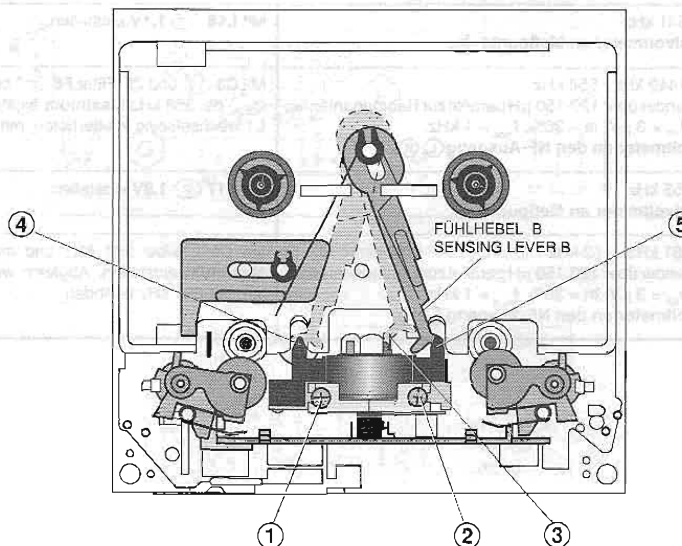


Fig. 2



Alignment

1. Tuner R 120 / R 220

Test Equipment:

Sweep generator, Test generator, Stereo coder, AF generator, Oscilloscope, Digital voltmeter, AF voltmeter, Distortion meter

Note:

The frontend is a completely preadjusted module. Only the IF filter must be adjusted to the IF amplifier (1). The values of the tuning voltages are:

87.5 MHz = typ. 1.6 V min 1.3 V

108 MHz = typ. 8.0 V max 9 V

Adjustment	Preparations	Adjustment Procedure
1. IF Filter	FM, 98 MHz. Sweep generator 98 MHz to aerial socket. Level approx. 100 μ V / 75 Ω . Oscilloscope to testpoint (B).	Adjust F1 (A) to maximum and symmetry.
2. Demodulator	FM, 98 MHz. Test generator 98 MHz to aerial socket. Level approx. 100 μ V / 75 Ω , $\Delta f = \pm 40$ kHz. Distortion meter to AF output (L)(R).	Adjust F7 (I) to K_{min} (typ. 0.12%, max. 0.2%).
3. Field strength indication	FM, 98 MHz. Test generator 98 MHz, $V_{RF} = 300 \mu$ V / 75 Ω to aerial socket. Digital voltmeter to testpoint (F).	Adjust R 119 (F) to 1.5 V + 0.05V.
4. Station search	FM, 98 MHz. Test generator 98 MHz, $V_{RF} = 100 \mu$ V / 75 Ω to aerial socket. Digital voltmeter to testpoint (G).	Adjust R 123 (S) to 1.2 V + 0.05V.
5. Stereo Crosstalk	FM Stereo coder, left channel modulated, to aerial socket. AF voltmeter to AF output, right channel (R).	Adjust R 69 (C) to minimum. Control the left AF output with modulated right channel.
6. Adjacent channel filter	FM AF generator 114 kHz, approx. 100 mV to the input of F2 (D) (Pin 2). AF voltmeter to the output of F2 (D) (Pin 4).	Adjust F2 (D) to minimum.
7. 38 kHz Filter	FM Test generator to aerial socket; FM, $f_{mod} = 38$ kHz. AF voltmeter to AF output (L)(R).	Adjust F9 (J) (left channel) and F11 (K) (right channel) to minimum.
8. 19 kHz Filter	Test generator to aerial socket; FM, $f_{mod} = 19$ kHz. AF voltmeter to AF output (L)(R).	Adjust F9 (G) (left channel) and F11 (H) (right channel) to minimum.
9. MW Oscillator	MW, 531 kHz Digital voltmeter to testpoint (E).	Adjust L18 (V) to 1.1V.
10. MW RF Circuits	MW, 1449 kHz / 558 kHz Test generator via 120-150 μ H parallel to frame aerial; AM, $V_{RF} = 3 \mu$ V, $m = 30\%$, $f_{mod} = 1$ kHz. AF voltmeter to AF output (L)(R).	Adjust C3 (IV) and IF filter F6 (VI) at 1449 kHz and L1 (II) at 558 kHz to maximum. Repeat the adjustment reciprocally C3 and L1, end with 1449 kHz.
11. LW Oscillator	LW, 153 kHz Digital voltmeter to testpoint (E).	Adjust L17 (V) to 1.8V.
12. LW RF Circuits	LW, 261 kHz / 162 kHz Test generator via 120-150 μ H parallel to frame aerial; AM, $V_{RF} = 3 \mu$ V, $m = 30\%$, $f_{mod} = 1$ kHz. AF voltmeter to AF output (L)(R).	Adjust C4 (IT) at 261 kHz and L2 (I) at 162 kHz to maximum. Repeat the adjustment reciprocally, end with 261 kHz.

Alignment Scheme

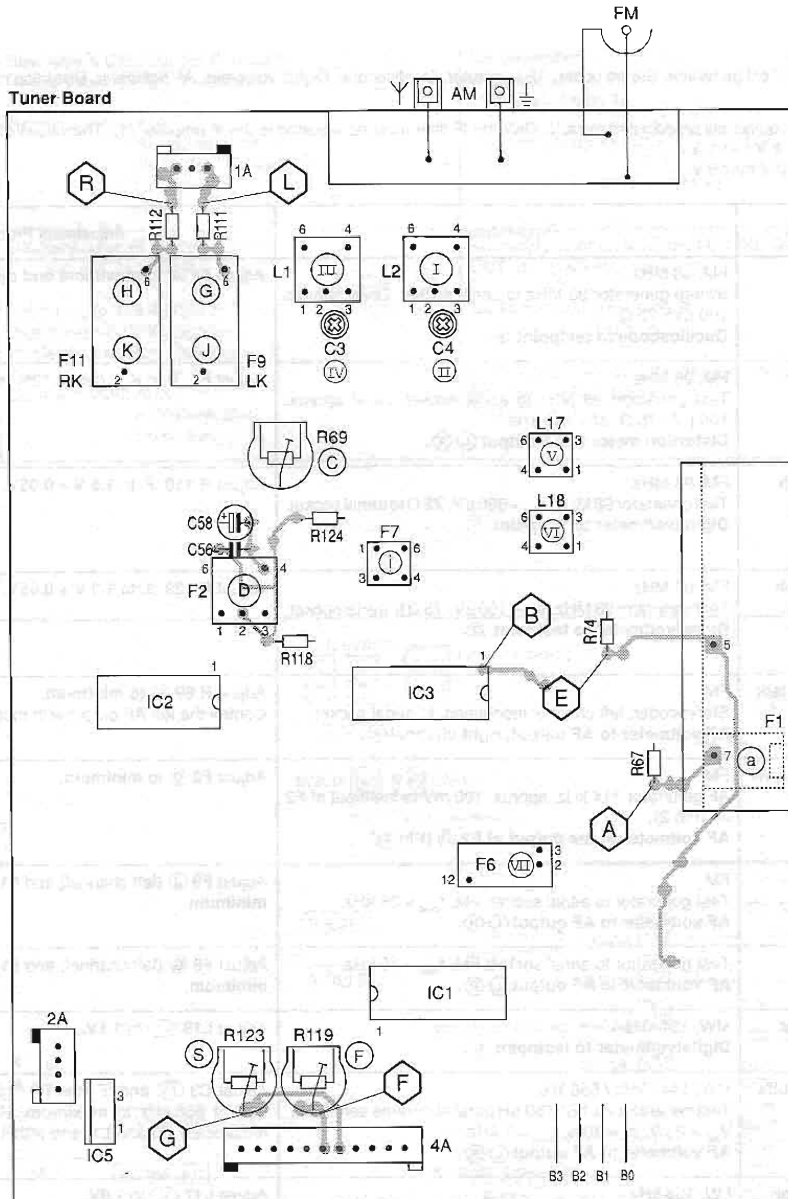


Table for IF-Programming

0 = Bridge opened

1 = Bridge closed

ZF (MHz) IF (MHz)	B3	B2	B1	B0	ZF/IF Filter Colour
10,6500	0	1	0	0	schwarz/black
10,6750	0	1	1	0	blau/blue
10,7000	1	0	0	0	rot/red
10,7250	1	0	1	0	orange
10,7500	1	1	0	0	weiß/white

When replacing one of the ceramic resonators, take care that the colour codes of all resonators are the same.

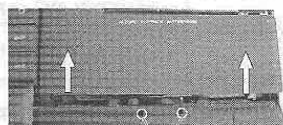
2. Cassette Deck CCF 120

Measuring Instruments/equipment:

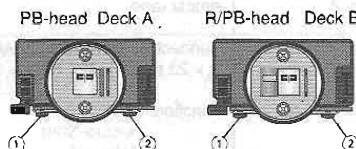
Frequency counter, oscilloscope, AF voltmeter, DC voltmeter, AF generator, distortion analyzer, wow and flutter meter, Cr test cassette 448 A (part no. 35079-023.00), torque test cassette 456 (part no. 35079-014.00).

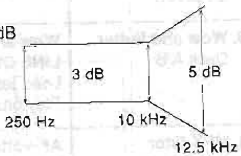
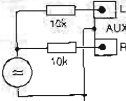
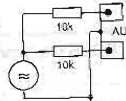
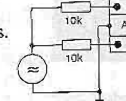
Layout of adjustment controls see page 2-10.

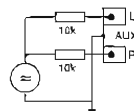
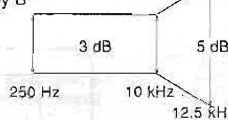
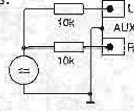
Adjustment	Preparations	Adjustment Procedure
1. Tape speed Deck A/B	Frequency counter to test point L. LINE OUT or to R. LINE OUT. Insert test cassette 448 A in Deck A or Deck B, play back 3150 Hz. 1. High Speed adjustment: - Playback on Deck A or Deck B. - Short-circuit base + emitter of transistor T216 (OPT 2). 2. Normal Speed adjustment: - Playback on Deck A or Deck B.	1. High Speed adjustment: With adjustment control SVR107 (Deck A) or SVR106 (Deck B) set the frequency to 6300 Hz $\pm$ 1% . 2. Normal Speed adjustment: With adjustment control SVR108 (Deck A) or SVR105 (Deck B) set the frequency to 3150 Hz $\pm$ 1%.
2. Take-up torque on Start Deck A/B	Load the torque test cassette 456 einlegen (Deck A/B). Function: Start	On START, the torque should be 25 to 70 x 10 ⁻⁴ Nm $\approx$ 40 g-cm.
3. Wow and flutter Deck A/B	Wow and flutter meter to test point L. LINE OUT or to R. LINE OUT. Load test cassette 448 A (Deck A/B). Play back 3150 Hz.	Deviation < 0.13% (IEC wtd). Playback measuring time $\geq$ 30 seconds.
4. MPX-filter (19 kHz stereo pilot tone) Deck B	AF-voltmeter to test point L. DOLBY (left channel) or R. DOLBY (right channel). Connect AF-generator to AUX sockets. V_{in} = 50 mV, f = 400 Hz or 19 kHz. Insert a recordable cassette, Cr (IEC II), in Deck B. Function: AUX Record-Pause Dolby off	At 400 Hz, the reference voltage measured at the test point L. DOLBY or R. DOLBY is 0 dB (ref). At 19 kHz, set the voltage level at test point L. DOLBY and test point R. DOLBY to minimum ($\leq$ -30 dB) using F124 (left channel) and F224 (right channel) respectively.
5. Erase frequency Deck B	Frequency counter to test point L1 (R413). Insert a recordable cassette, Cr (IEC II), in Deck B. Function: Record-Pause	The oscillator frequency should be 85 kHz $\pm$ 1 kHz . Adjust with L401.
6. Erase current Deck B	AF-voltmeter to test point L1 (In parallel with R413). Insert a recordable cassette. Function: Record-Pause	Erase current: Cr.: 95 mA $\pm$ 10% measured at R413 = 95 mV $\pm$ 10%. Fe.: 78 mA $\pm$ 10% measured at R413 = 78 mV $\pm$ 10%.
7. Record blocking circuits (bias filter)	Oscilloscope (5 μ s/div) to test point L. DOLBY (left channel) or R. DOLBY (right channel). Insert a blank cassette in Deck A. Insert a recordable cassette, Cr (IEC II), in Deck B. Function: High Dubbing-Standby	Adjust for minimum RF with L101 at test point L. DOLBY (left channel) and L201 at test point R. Dolby (right channel).
8. Head gap angle (Azimuth) Deck A/B	AF-voltmeter to test point L. LINE OUT or to R. LINE OUT. Insert test cassette 448 A in Deck A or Deck B, play back 10 kHz. The adjustment holes for the head adjustment screws are accessible by removing the cassette compartment lids (with open cassette compartment push the cover upwards).	Deck A+B Tape direction: "Normal" With the head adjustment screw ① set the left or right channel to maximum level. Then connect the left channel in parallel with the right channel. By minimum re-adjustment of the head adjustment screw ① set the output level to maximum. Turn around the test cassette. Tape direction: "Reverse" Adjustment with head adjustment screw ② is the same as in the "Normal" tape direction.



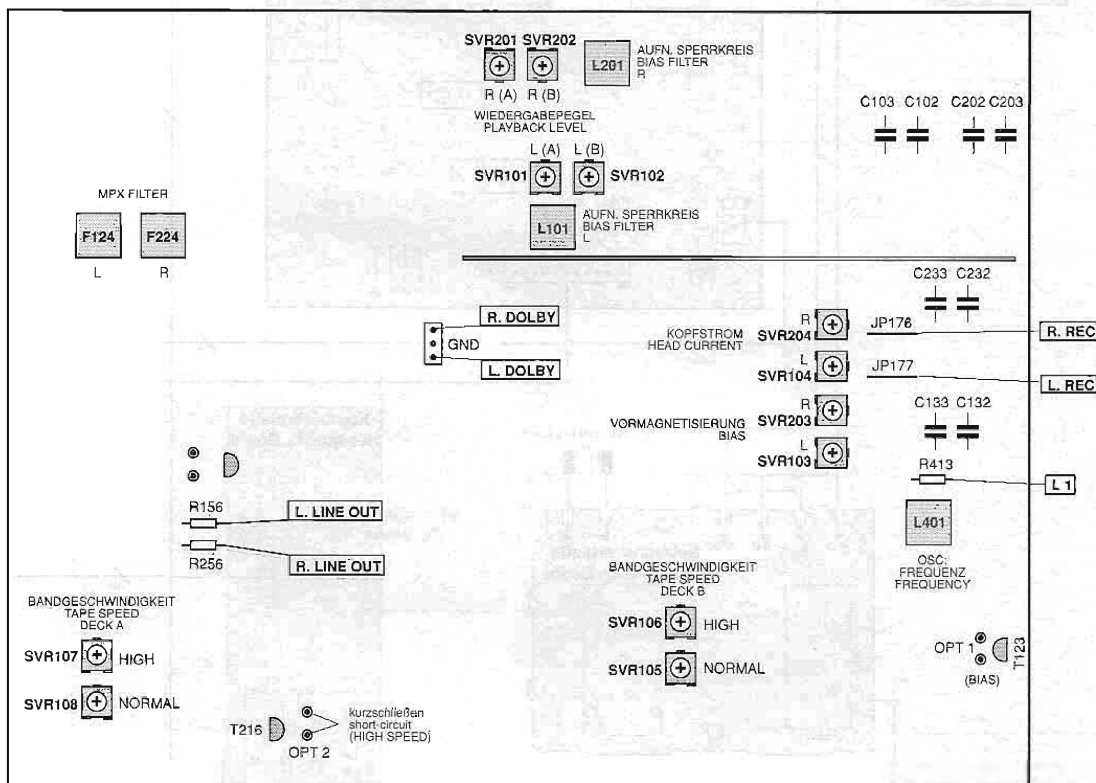
Adjustment holes in the cass. compartment



Adjustment	Preparations	Adjustment Procedure
9. Playback level Reference tape scanning (Dolby level) Deck A/B	AF-voltmeter to test point L. DOLBY (left channel) or R. DOLBY (right channel). Insert test cassette 448 A. Play back 315 Hz (250 nWb/m). Dolby off	With SVR101 (left), SVR201 (right) for Deck A and with SVR102 (left), SVR202 (right) for Deck B, set a playback level of $308 \text{ mV} \pm 0.5 \text{ dB}$. (test points R./L. LINE OUT $\approx 950 \text{ mV}$). When using a test cassette with 200 nWb/m set the playback level to $245 \text{ mV} \pm 0.5 \text{ dB}$ (test points R./L. LINE OUT = 750 mV).
10. Frequency response on Playback Deck A/B	AF-voltmeter to test point L. DOLBY (left channel) or R. DOLBY (right channel). Insert test cassette 448 A in Deck B or Deck A. Play back the 250 Hz / 12.5 kHz frequency recording on the tape. Dolby off.	Deck B: If the levels $V_o f_1$ (250 Hz) and $V_o f_2$ (12.5 kHz) measured at L. DOLBY and R. DOLBY differ by more than $\pm 1.5 \text{ dB}$ disconnect the capacitors C 132, C 133 (left channel) or C 232, C 233 (right channel). Deck A: If the levels $V_o f_1$ (250 Hz) and $V_o f_2$ (12.5 kHz) measured at L. DOLBY and R. DOLBY differ by more than $\pm 1.5 \text{ dB}$ disconnect the capacitors C 102, C 103 (left channel) or C 202, C 203 (right channel). $\frac{V_o (12.5 \text{ kHz})}{V_o (250 \text{ Hz})} = +1 \pm 0.5 \text{ dB}$ Frequency response tolerance range: 
11. Head current (coarse) Deck B	AF-voltmeter to test point L. REC (left channel) or R. REC (right channel). Connect AF-generator to AUX sockets. $V_i = 50 \text{ mV}$, $f = 1 \text{ kHz}$.  Switch the bias off by short-circuiting the base and emitter of transistor T123 (OPT 1). Insert a recordable cassette, Cr (IEC II). Function: AUX Record-Start Dolby off	With SVR104 (left channel) and with SVR204 (right channel) set to test points L. REC and R. REC 6.0 mV. When recording on Fe IEC I-cassettes the voltage must be 4.5 mV.
12. Head current (fine) Deck B	AF-voltmeter to test point L. DOLBY (left channel) or R. DOLBY (right channel). Insert a recordable cassette, Cr (IEC II). Connect AF-generator to AUX sockets. $V_i = 50 \text{ mV}$, $f = 400 \text{ Hz}$.  Function: AUX Record-Start Dolby off — Playback-Start	$V_o = 23 \text{ mV}$ at the test points L. DOLBY and R. DOLBY during recording. On playing back the recording made on the cassette recorder, a voltage level of $23 \text{ mV} \pm 0.5 \text{ dB}$ must be present at the test points L. DOLBY and R. DOLBY. If the level differs from the value above re-adjust the head current control SVR104 (left channel) or SVR204 (right channel) during recording. When recording on Fe IEC I-cassettes the voltage must be $23 \text{ mV} \pm 1 \text{ dB}$.
13. Bias voltage (coarse) Deck B	AF-voltmeter with a 1:1000 capacitive voltage divider to test point L. REC (left channel) or R. REC (right channel). Insert a recordable cassette Fe or Cr. Function: Record-Start	With Cr-cassettes, set the voltage level to 14.5 mV at test point L. REC or R. REC. with SVR103 (left channel) and SVR203 (right channel). With Fe-cassettes the voltage must be 12 mV .
14. Frequency adjustment during recording Deck B	AF-voltmeter to test point L. DOLBY (left channel) or R. DOLBY (right channel). Insert test cassette 448 A, side B (blank part) Cr (IEC II) or similar tape. Connect AF-generator to AUX sockets. $V_i = 23 \text{ mV}$, $f_1 = 400 \text{ Hz}$, $f_2 = 12.5 \text{ Hz}$.  Function: AUX Record-Start Dolby off — Playback-Start	When playing back the recording the levels at the test points L. DOLBY and R. DOLBY must not differ by more than 0.5 dB. If $V_o f_2$ to $V_o f_1$ is higher than 0.5 dB correct the bias. Re-adjust with SVR103 (left channel) or SVR203 (right channel). $\frac{V_o f_2 (12.5 \text{ kHz})}{V_o f_1 (400 \text{ Hz})} = 0 \text{ dB} \pm 0.5 \text{ dB}$

Adjustment	Preparations	Adjustment Procedure
15. Frequency response on playback/recording Deck B	Connect AF-generator to AUX sockets. $V_i = 50 \text{ mV}$, $f = 250 \text{ Hz} - 12.5 \text{ kHz}$. Insert a recordable cassette, Fe (IEC I) or Cr (IEC II). Function: AUX Record-Start Dolby off / Dolby B 	AF-voltmeter to test point L. LINE OUT or R. LINE OUT (47kΩ termination). Function: Playback-Start Dolby off / Dolby B Frequency response tolerance range: 
16. Distortion factor Deck B	Connect AF-generator to AUX sockets. $V_i = 500 \text{ mV}$, $f = 333 \text{ Hz}$. Insert test cassette 448 A, side B (blank part) Cr (IEC II) or similar tape. Function: AUX Record-Start Dolby off 	Distortion analyzer to test point L. LINE OUT or R. LINE OUT (47kΩ termination). Function: Playback-Start Dolby off Distortion factor measured on playing back the recording made: Fe IEC I $K_3 \leq 1.5 \%$ CrO₂ IEC II $K_3 \leq 2.0 \%$

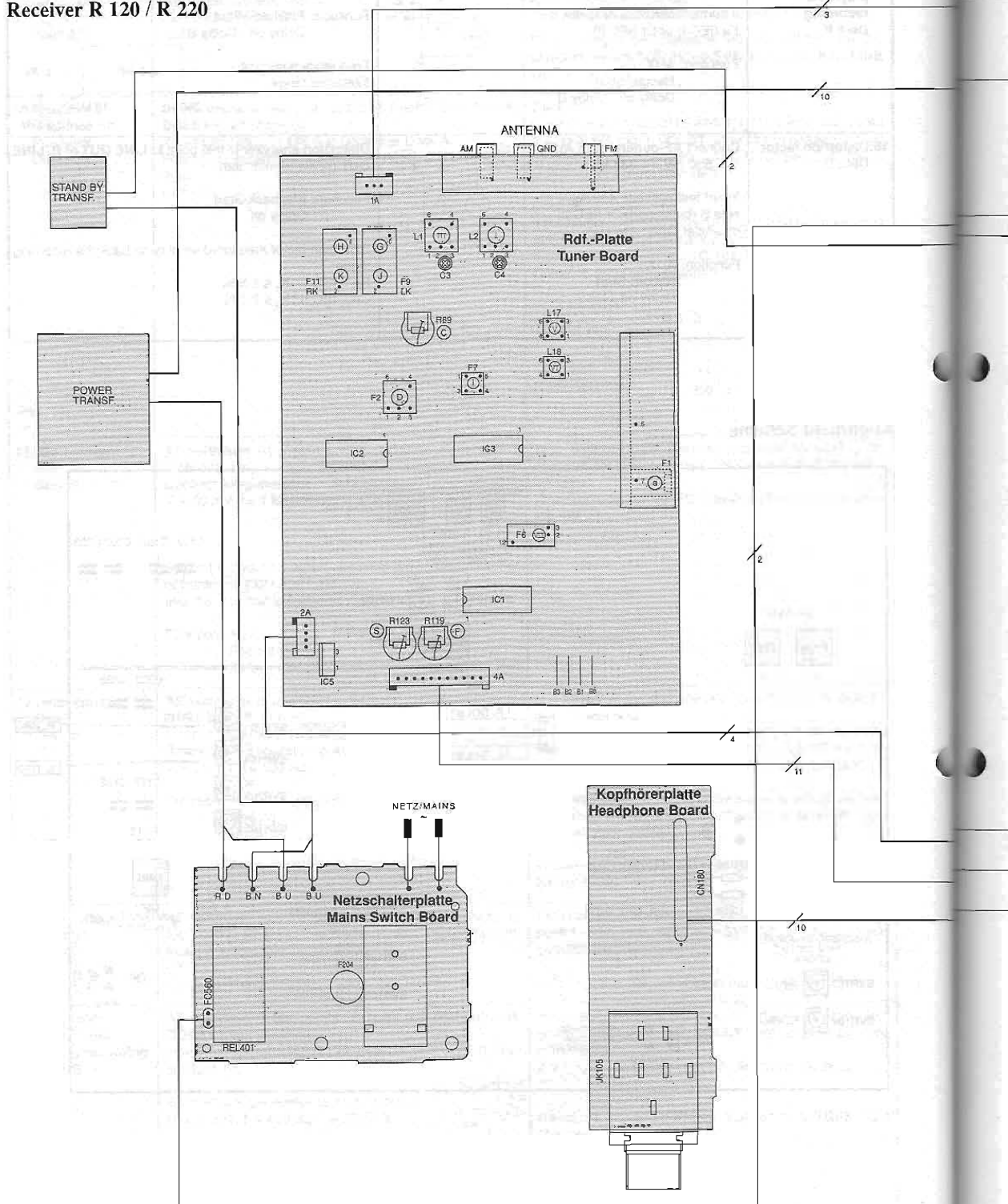
Alignment Scheme

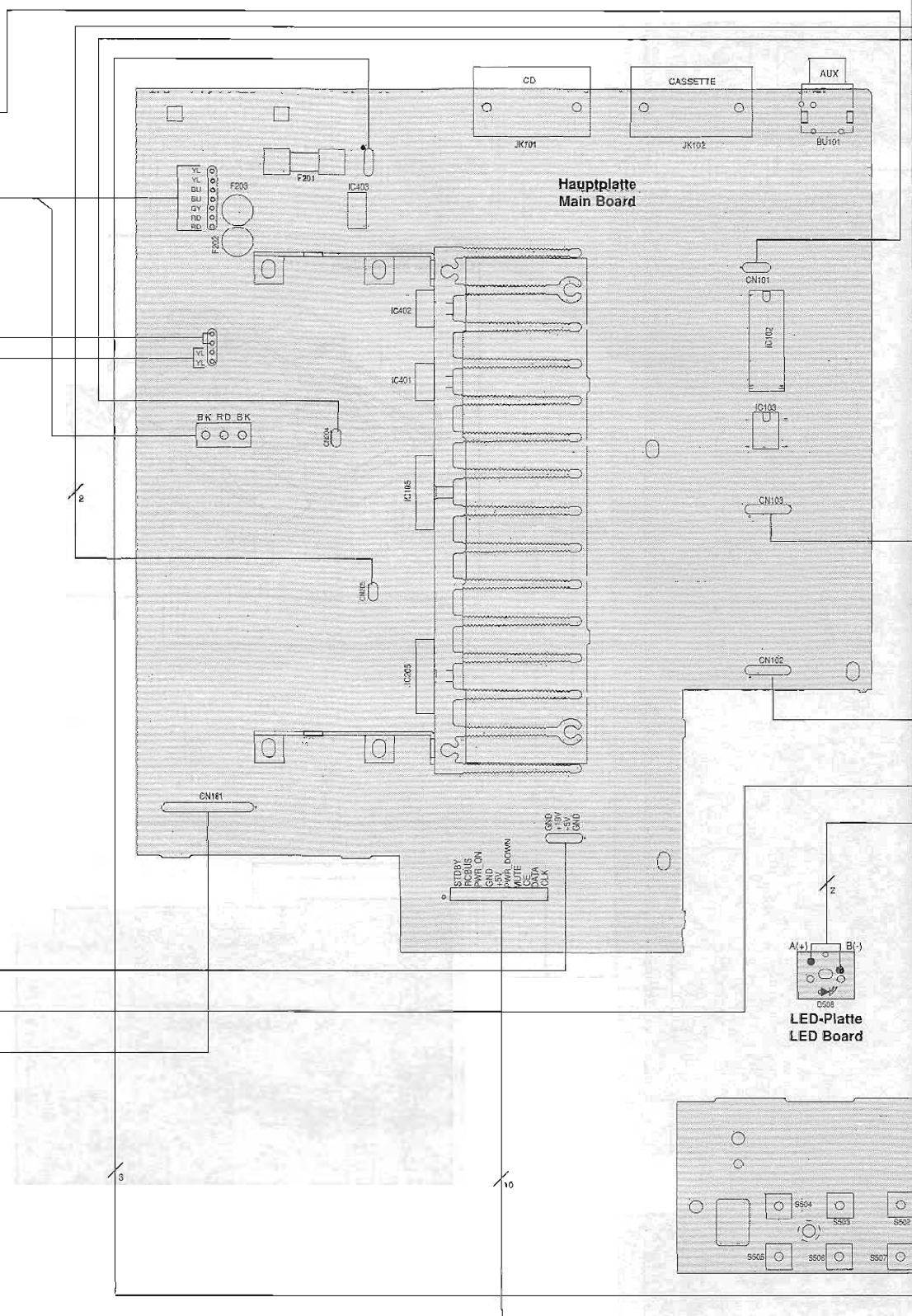


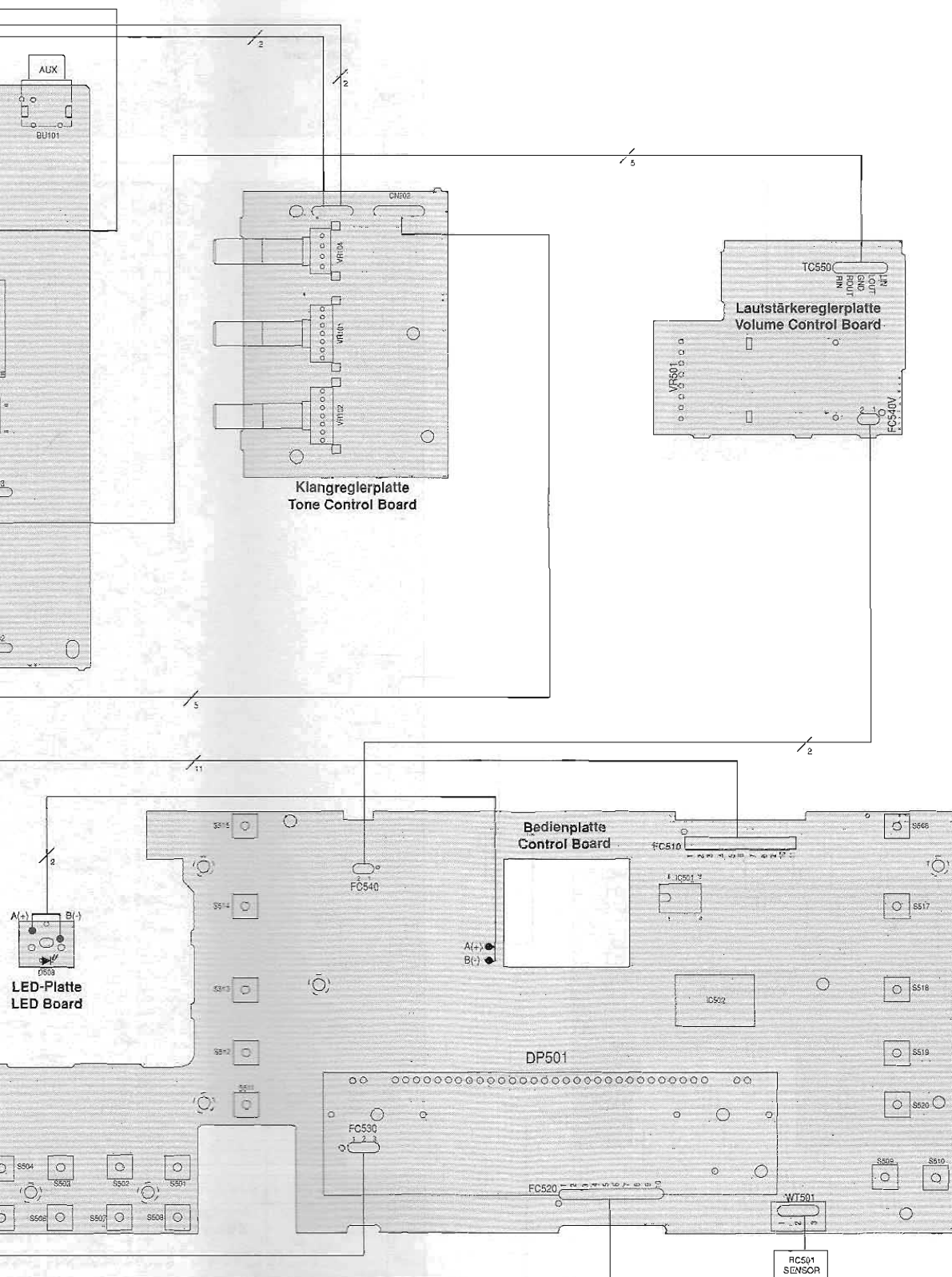
Schaltpläne und Platinenabbildungen Circuit Diagrams and Layout of PCBs

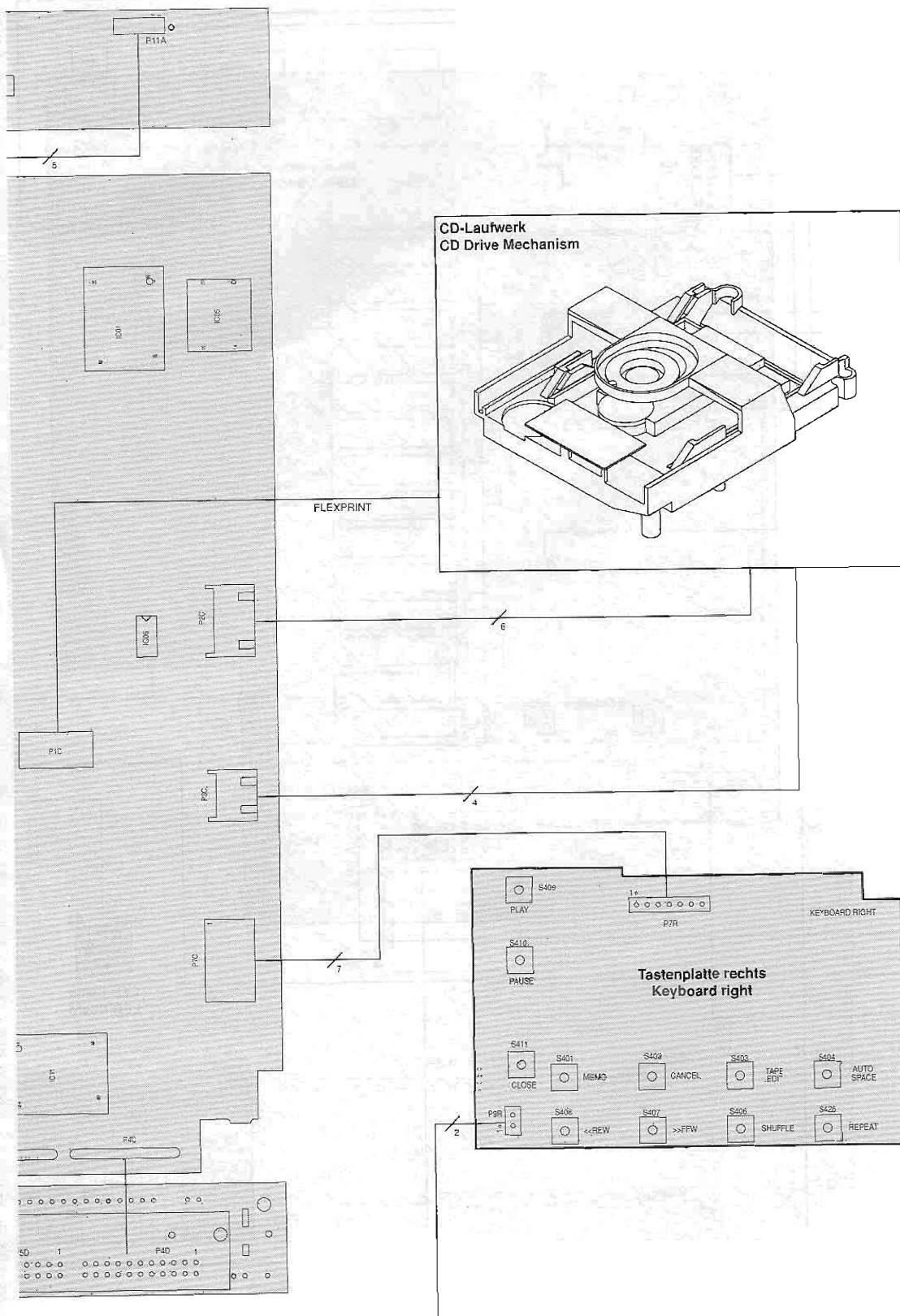
Verdrahtungsplan / Wiring Diagram

Receiver R 120 / R 220



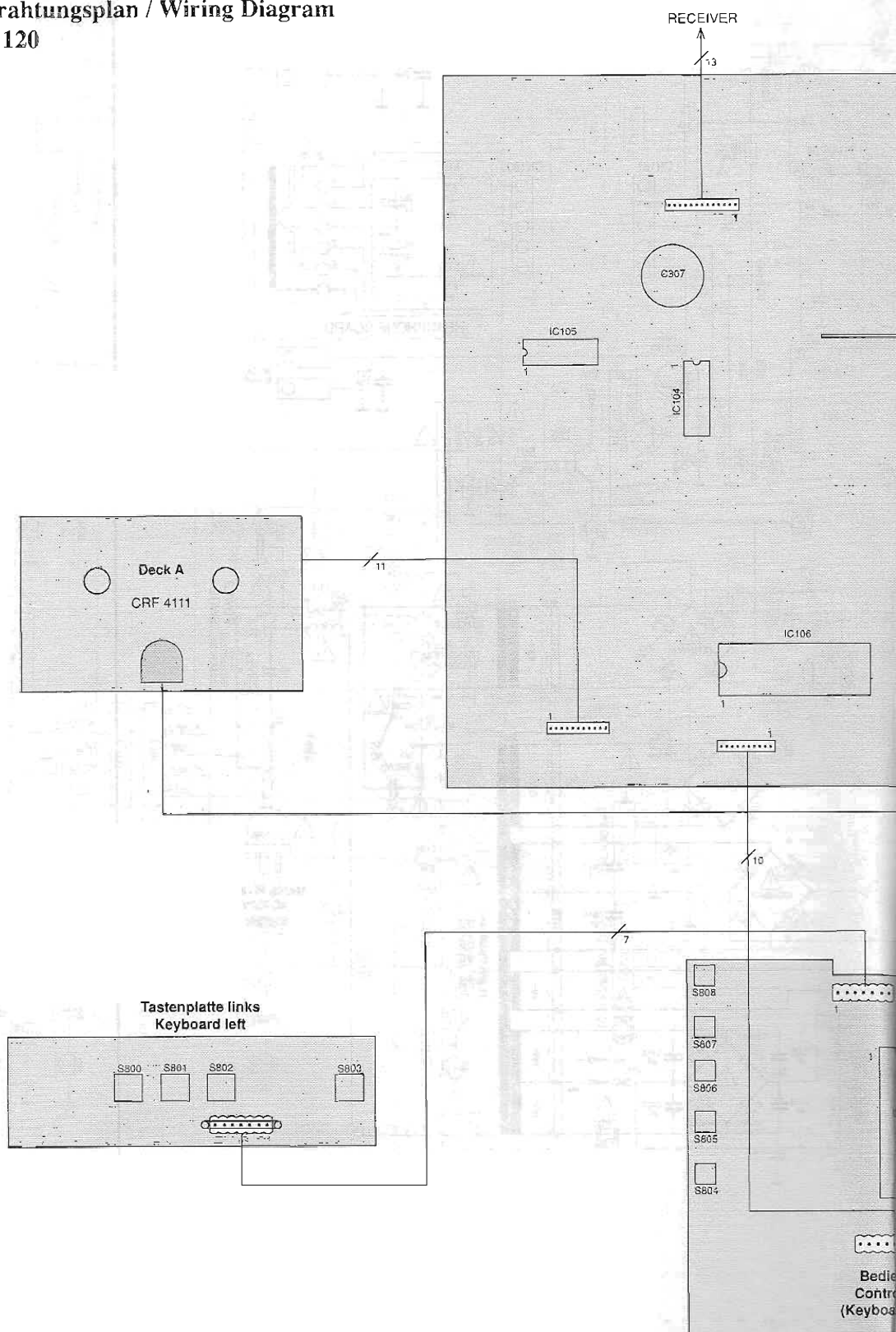


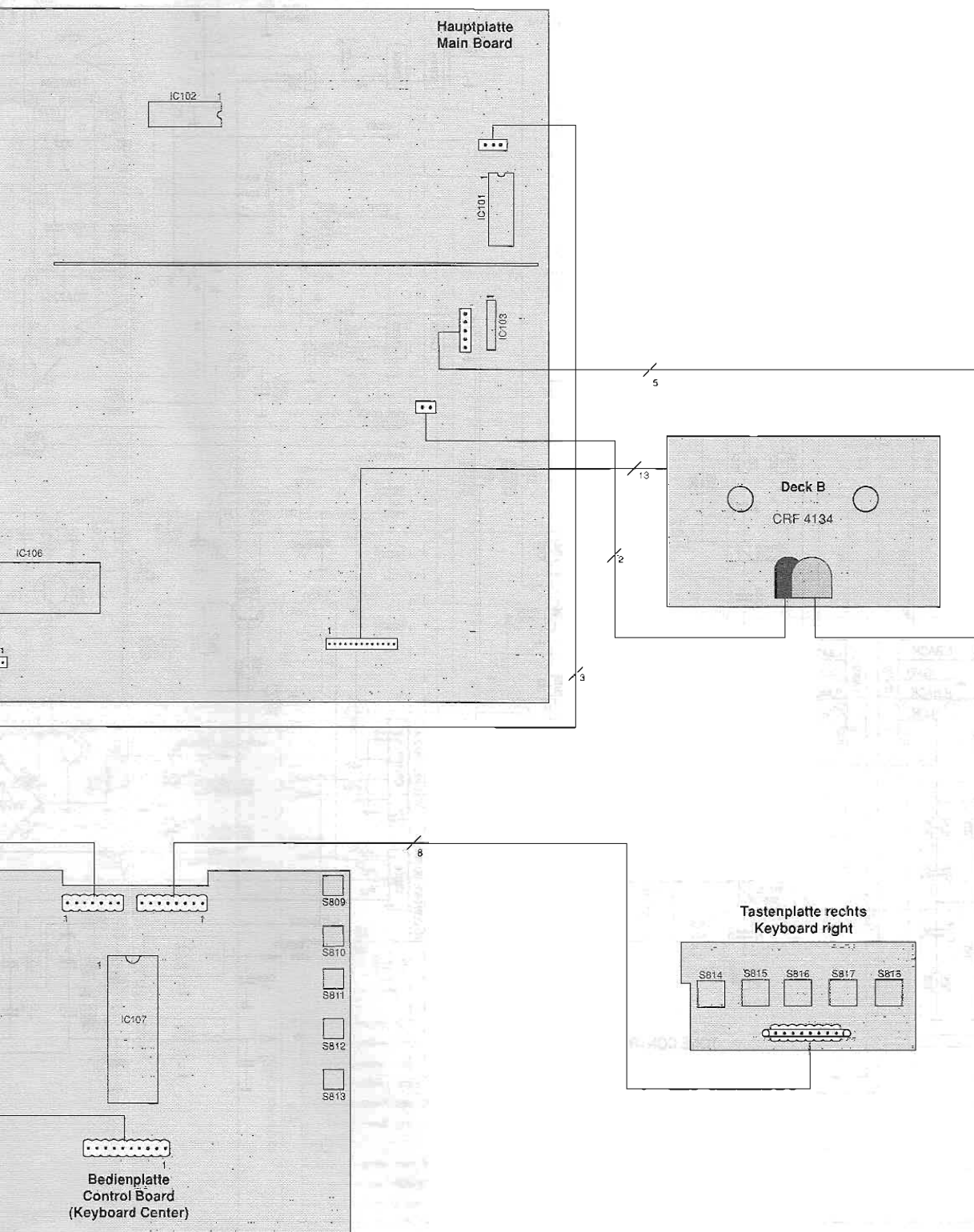




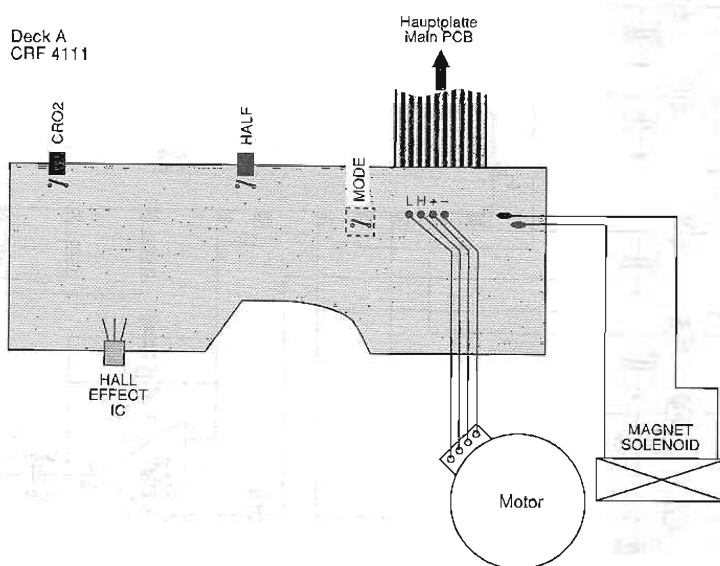
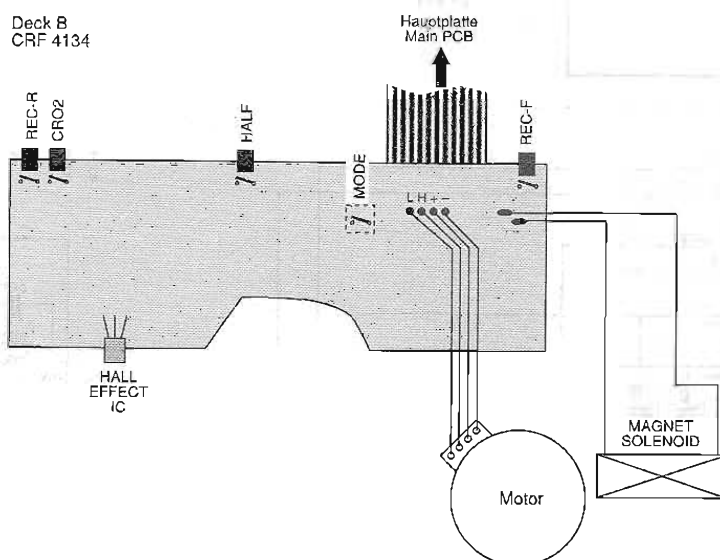
Verdrahtungsplan / Wiring Diagram

CCF 120





Laufwerk-Verdrahtung Drive Mechanism Wiring



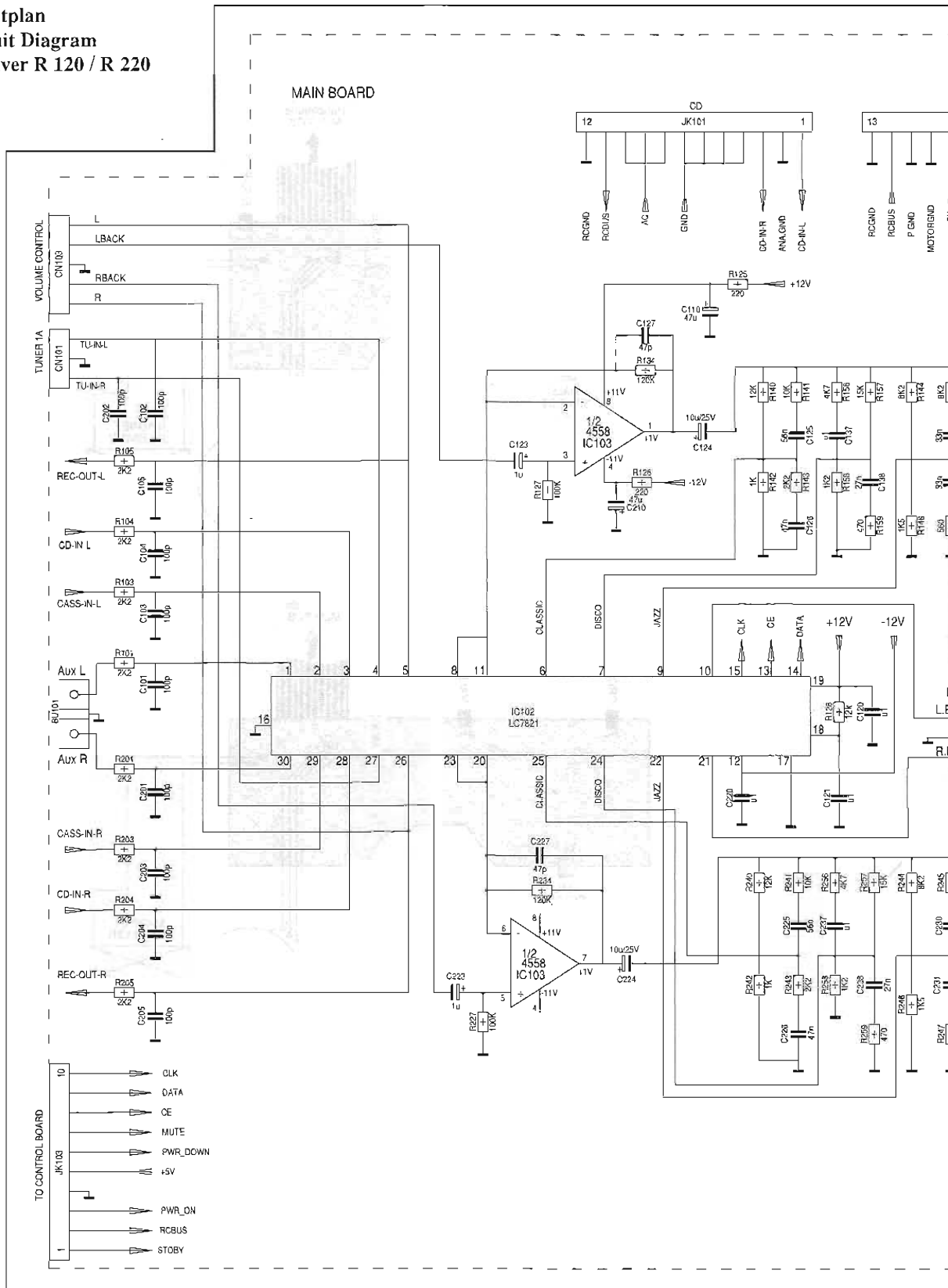
LAUFWERKSCHALTER DRIVE MECH. SWITCHES

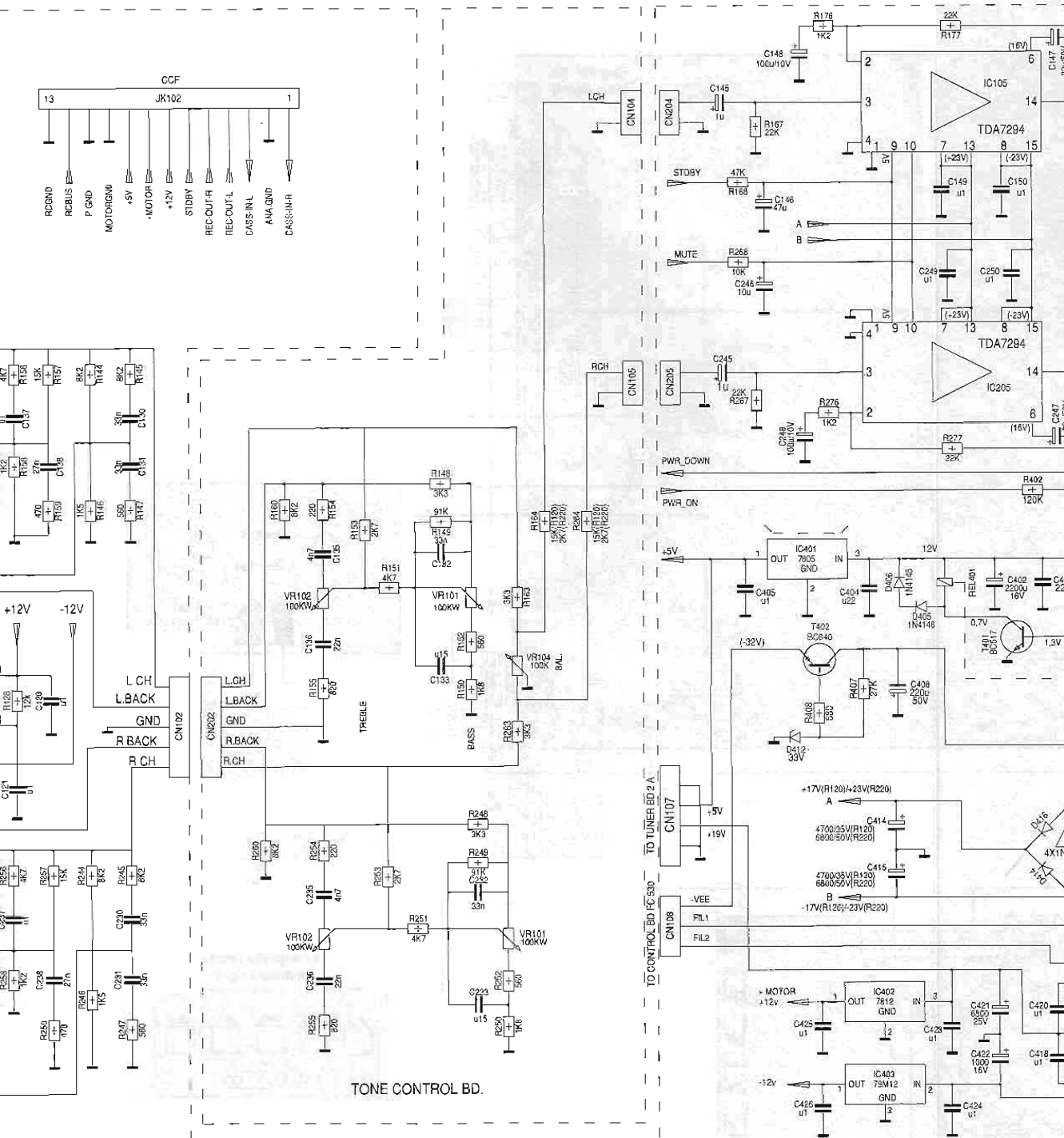
- REC-F = Aufnahmesperre Normallauf
Rec. lock FWD
- REC-R = Aufnahmesperre Reverselauf
Rec. lock REV
- HALF = Cassettenerkennung
Cass. "loaded" ident.
- MODE = Kopfschlittenschalter
Head carrier switch
- CRO2 = Bandsortenerkennung
Tape select

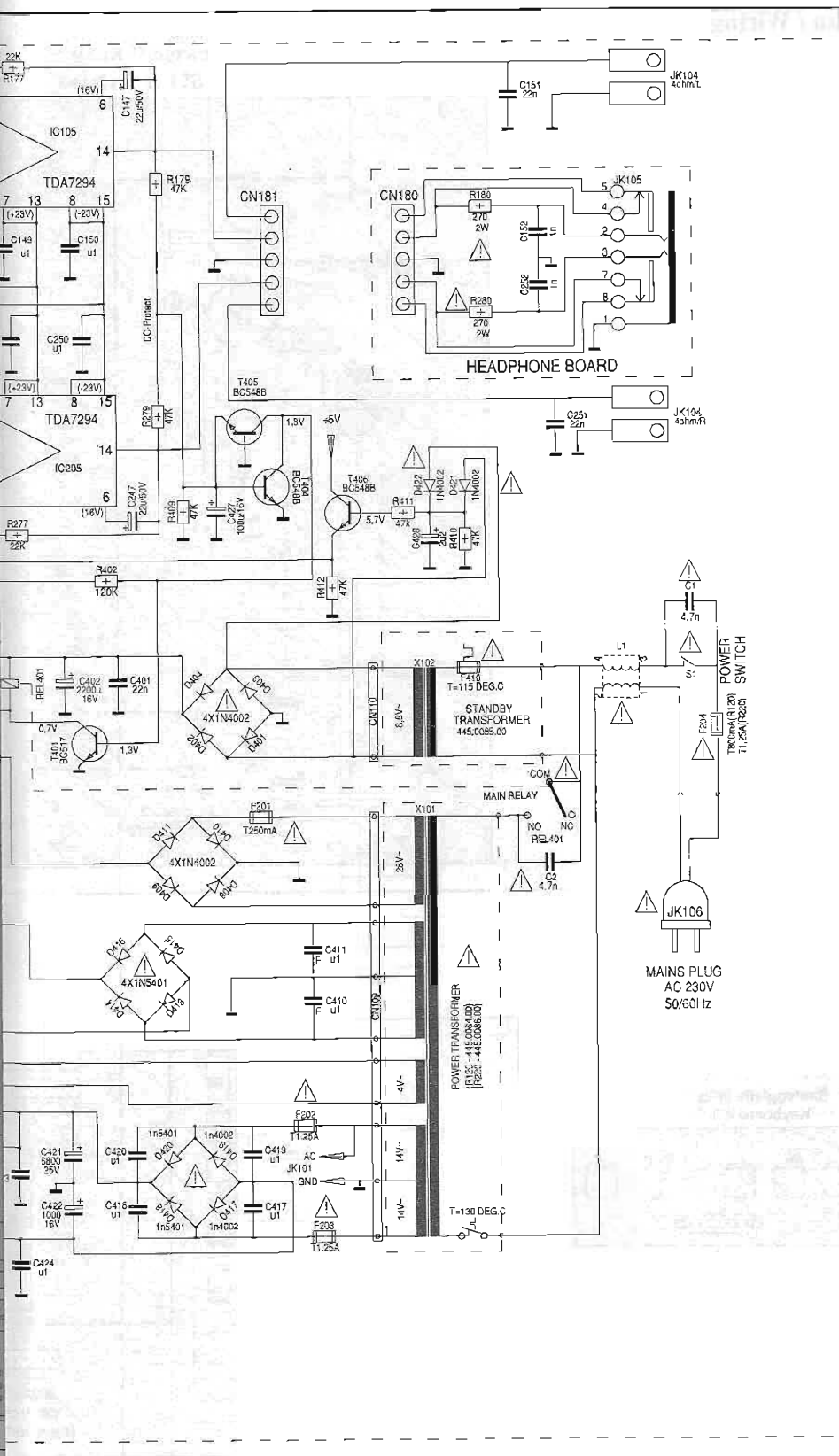
Schaltplan

Circuit Diagram

Receiver R 120 / R 220

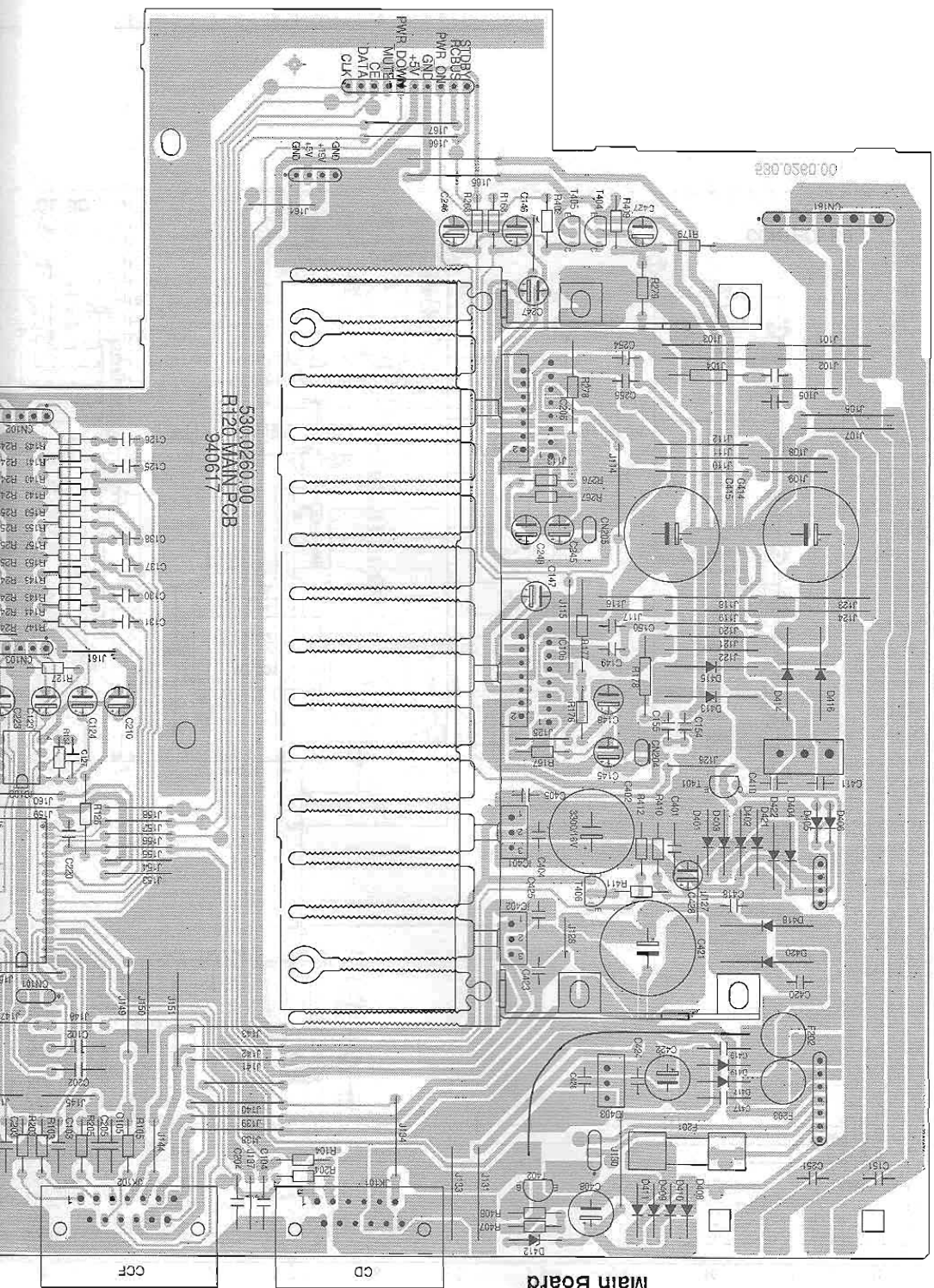


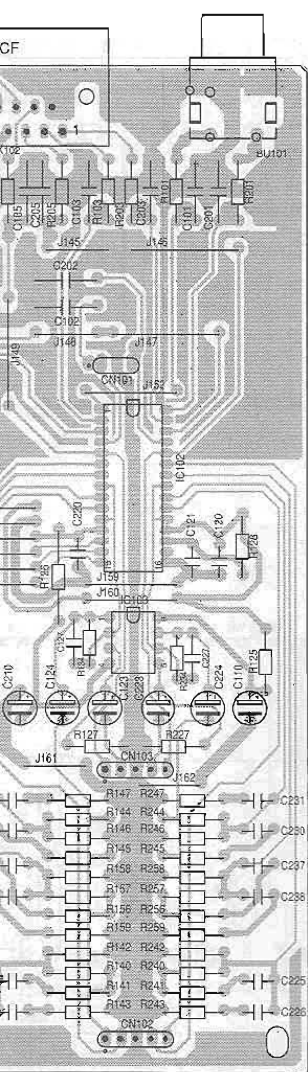




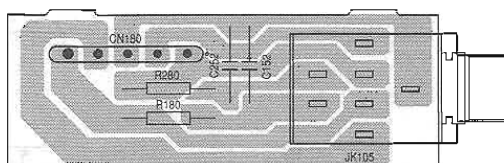
Leiterplatten / PCBs
Receiver R 120 / R 220
Bestückungssseite
Component side

Hauptplatte
Main Board

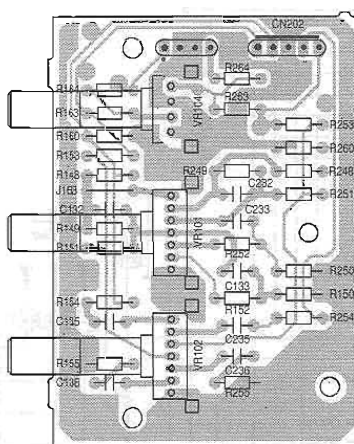




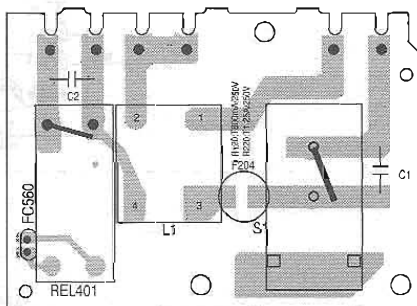
Kopfhörerplatte Headphone Board



Klangreglerplatte Tone Control Board



Netzschalterplatte Mains Switch Board

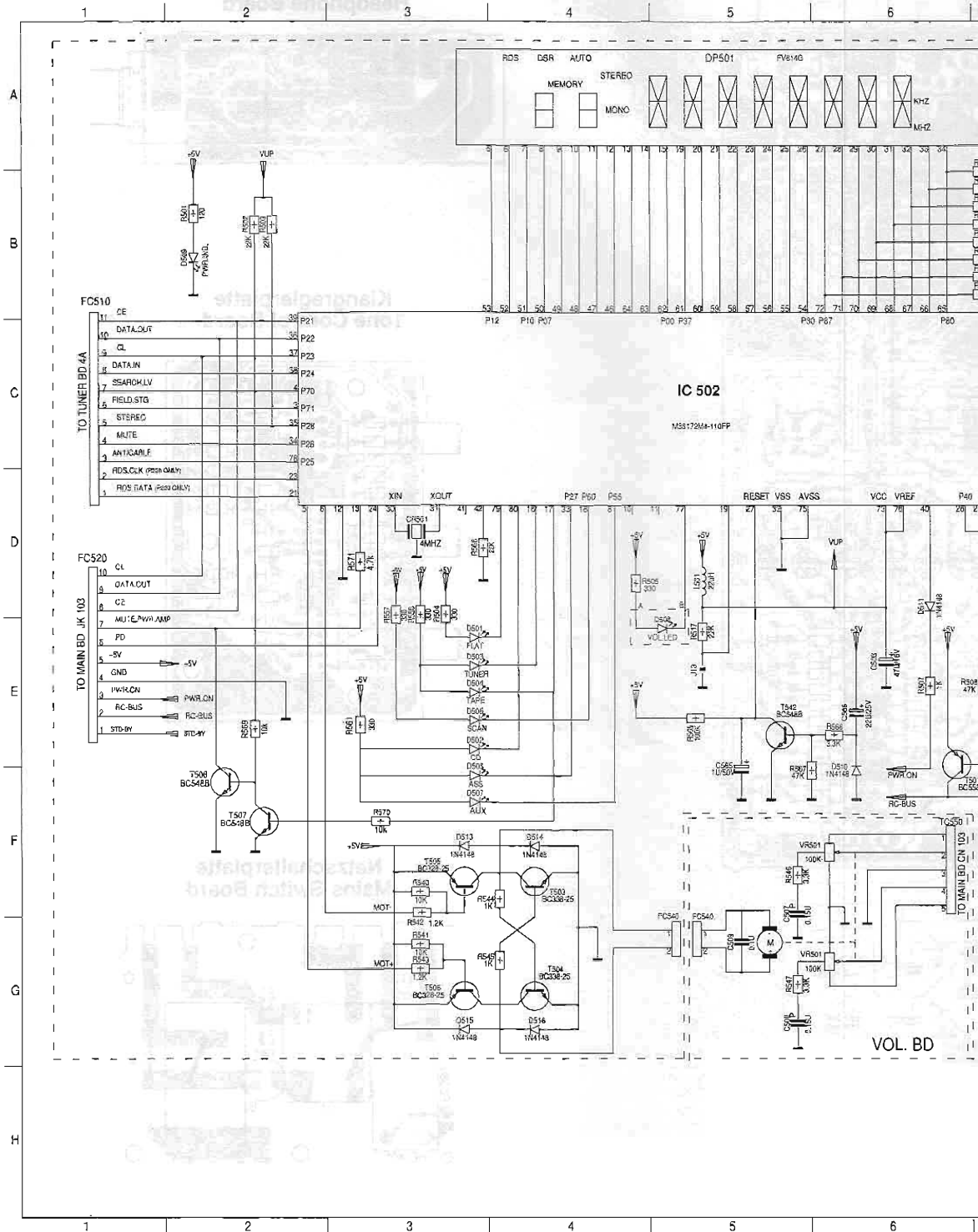


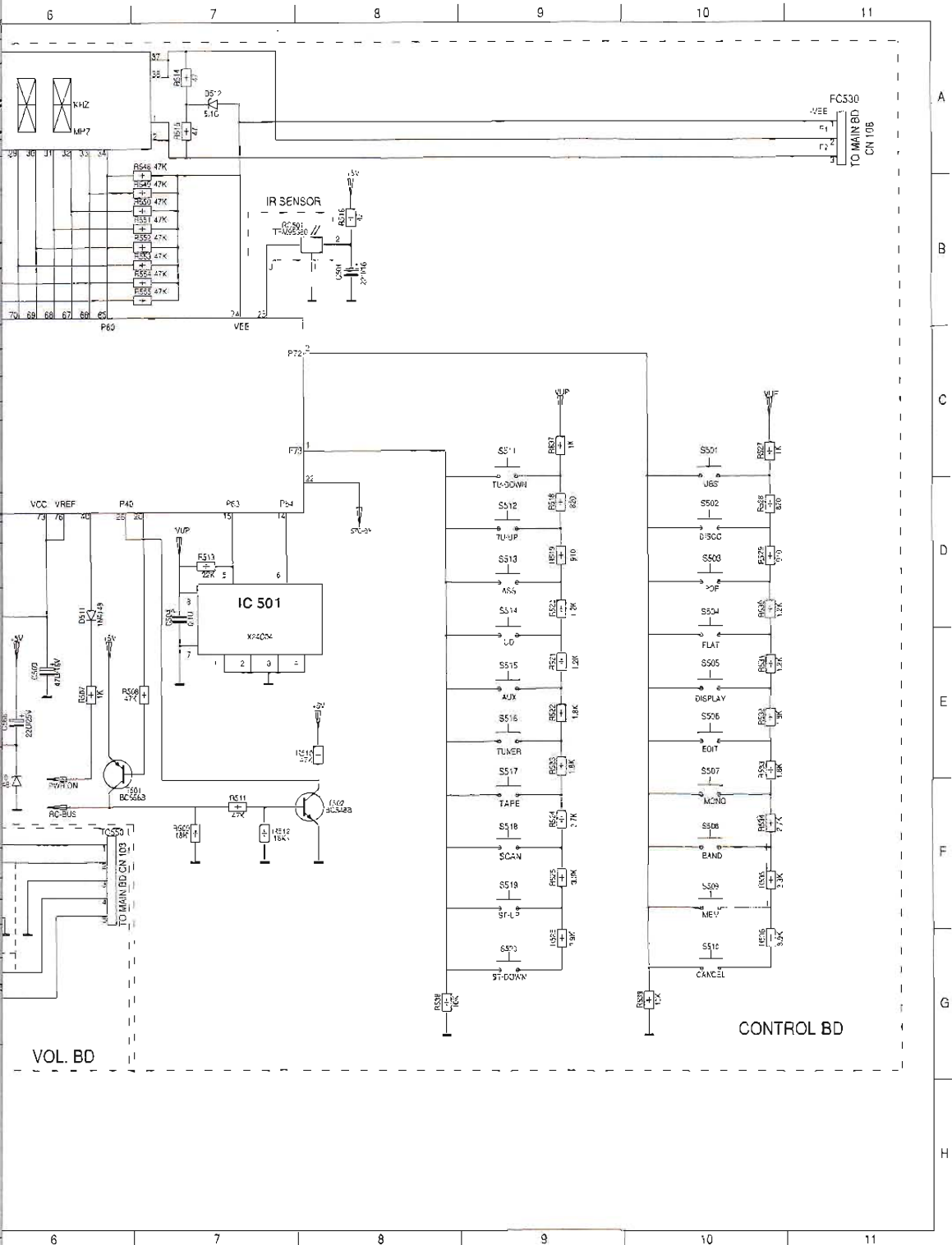
Schaltplan

Circuit Diagram

Receiver R 120 / R 220

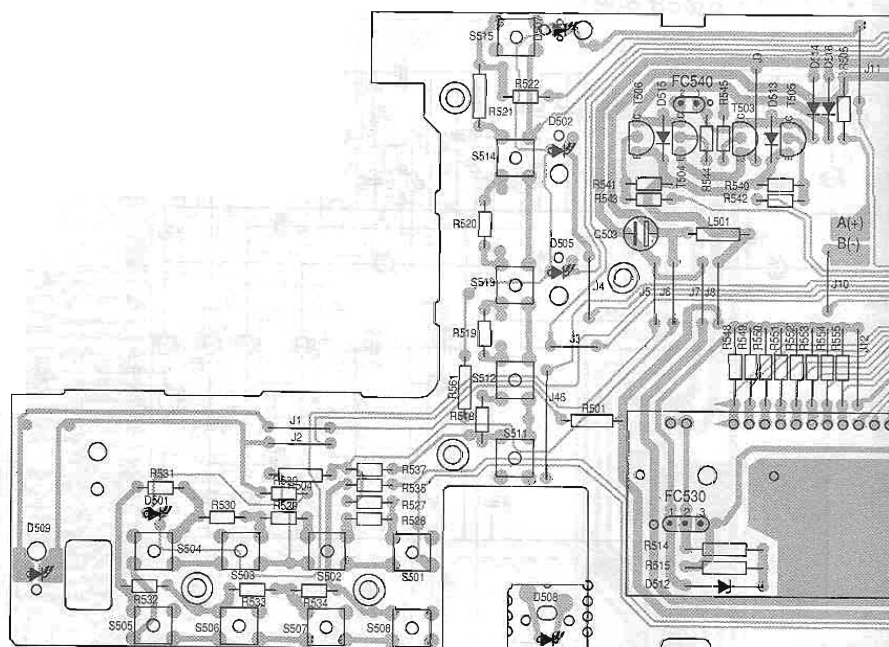
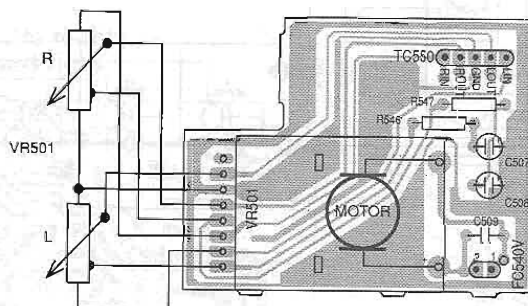
(Bedienplatte / Control Board)



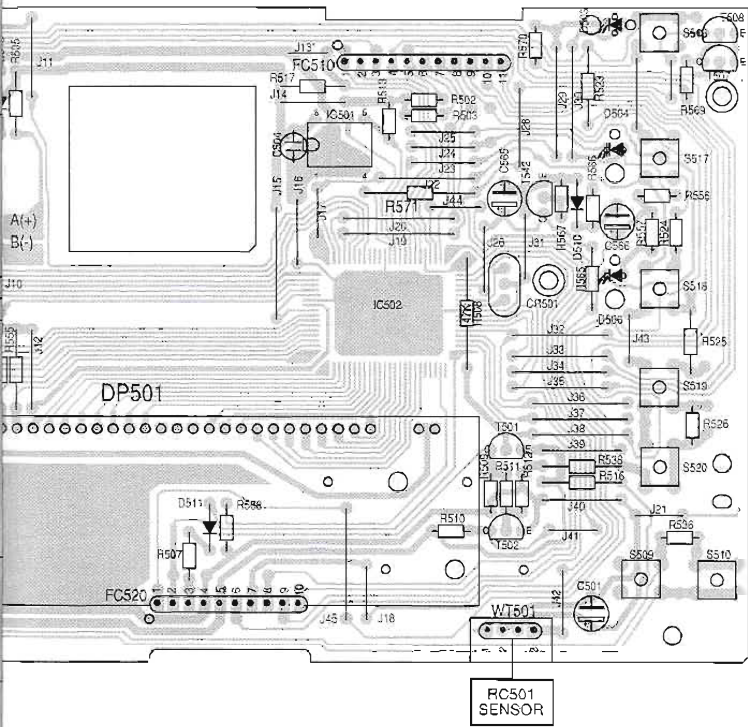


Leiterplatten / PCBs

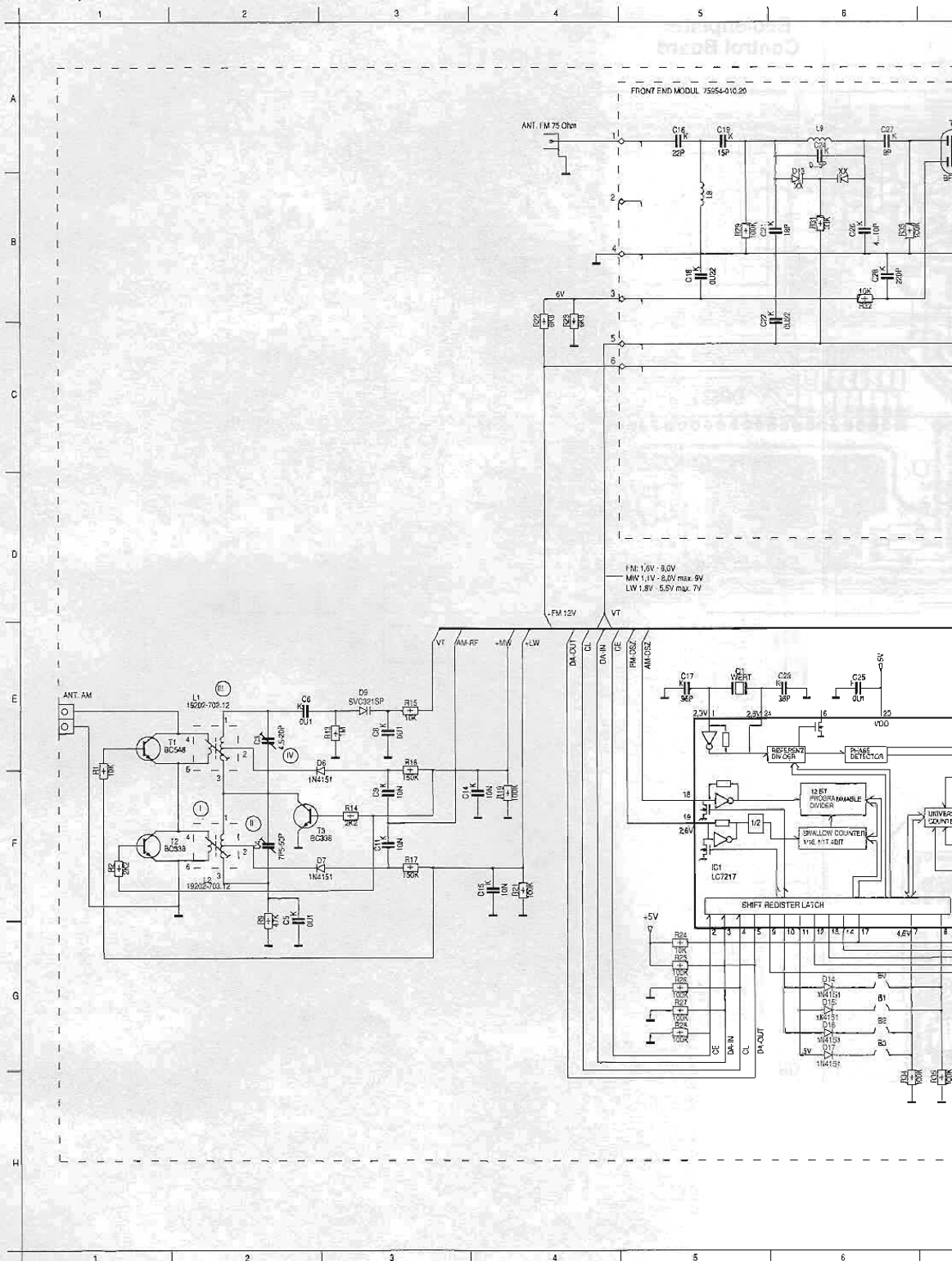
Receiver R 120 / R 220

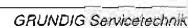
Bestückungsseite
Component sideLED-Platte
LED BoardLautstärkeregerplatte
Volume Control Board

Bedienplatte
Control Board

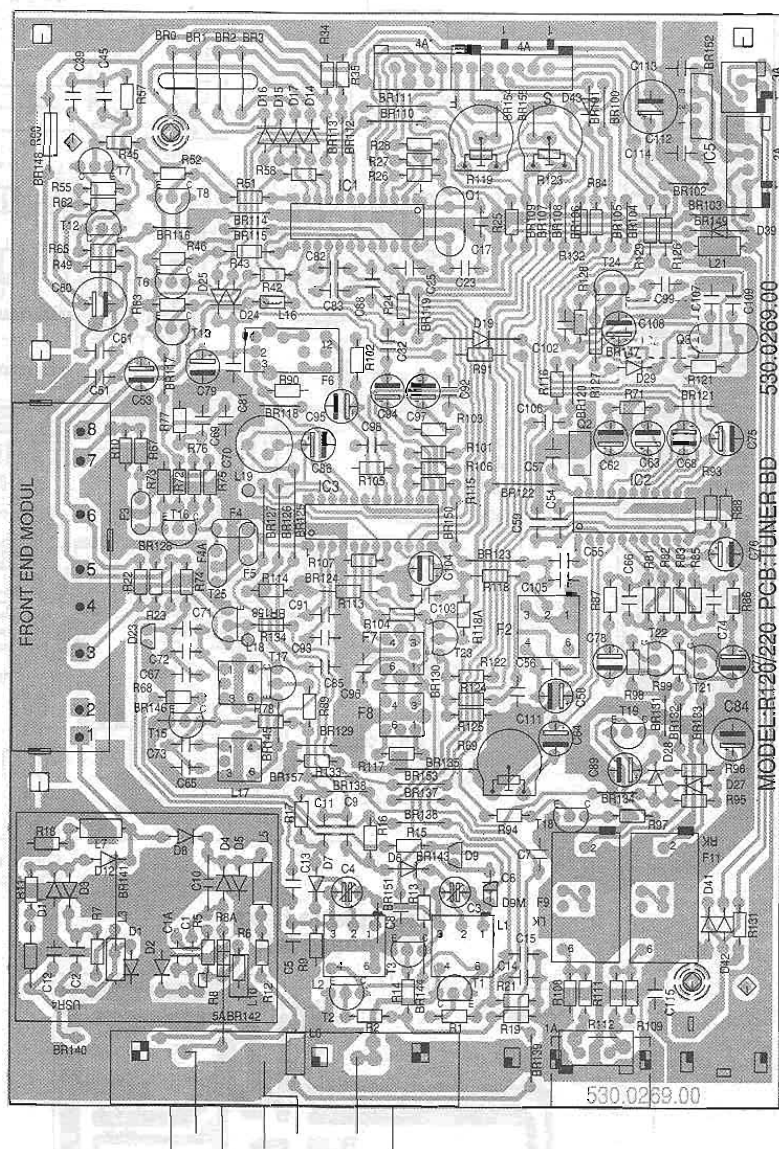


Schaltplan
Circuit Diagram
Receiver R 120 / R 220
(Rdf.-Platte / Tuner Board)







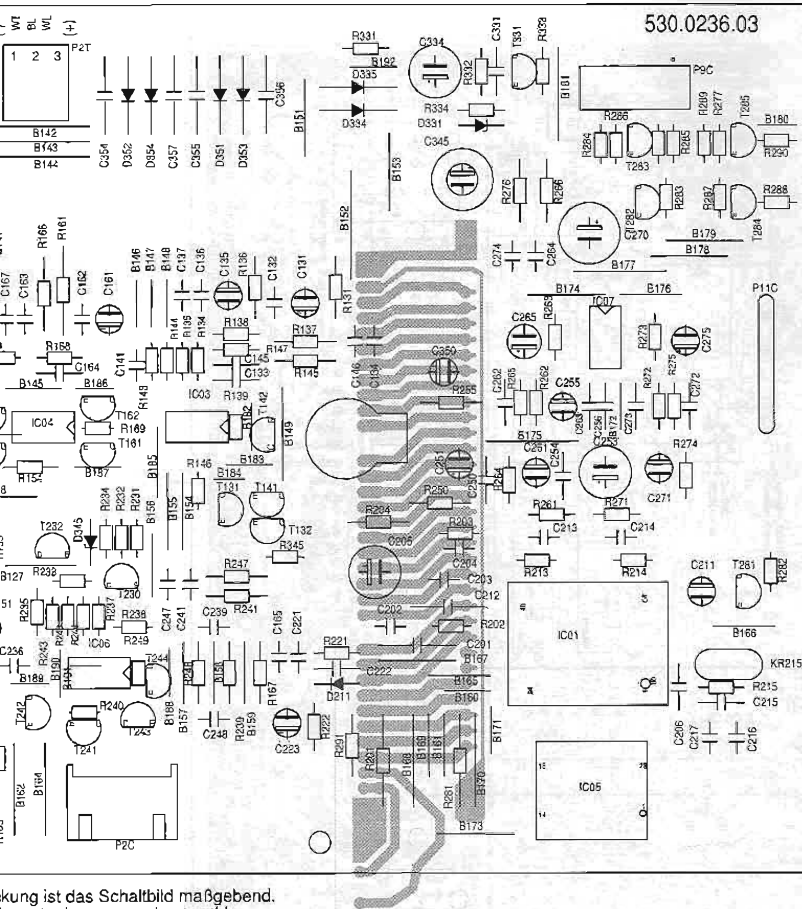
Rdf.-Platte / Tuner PCBBestückungsseite
Component side

Für die tatsächliche Bauteilebestückung ist das Schaltbild maßgebend.
The circuit diagram is relevant for the actual component assembly.

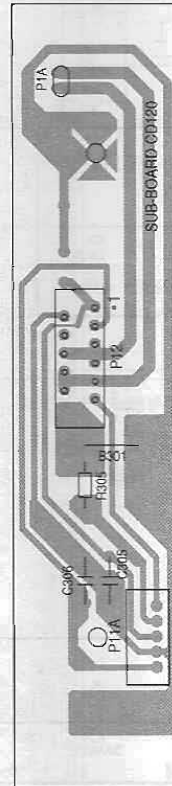
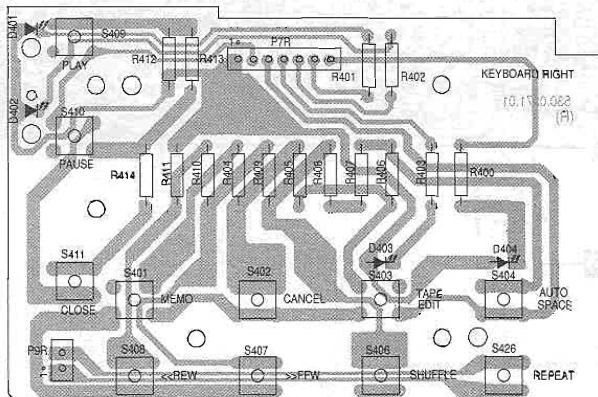
Bestückungsseite
Component side

Hauptp
Main B

Für die tatsächliche Bauteilebestückung ist das Schaltb.
The circuit diagram is relevant for the actual components

**Hauptplatte
Main Board**

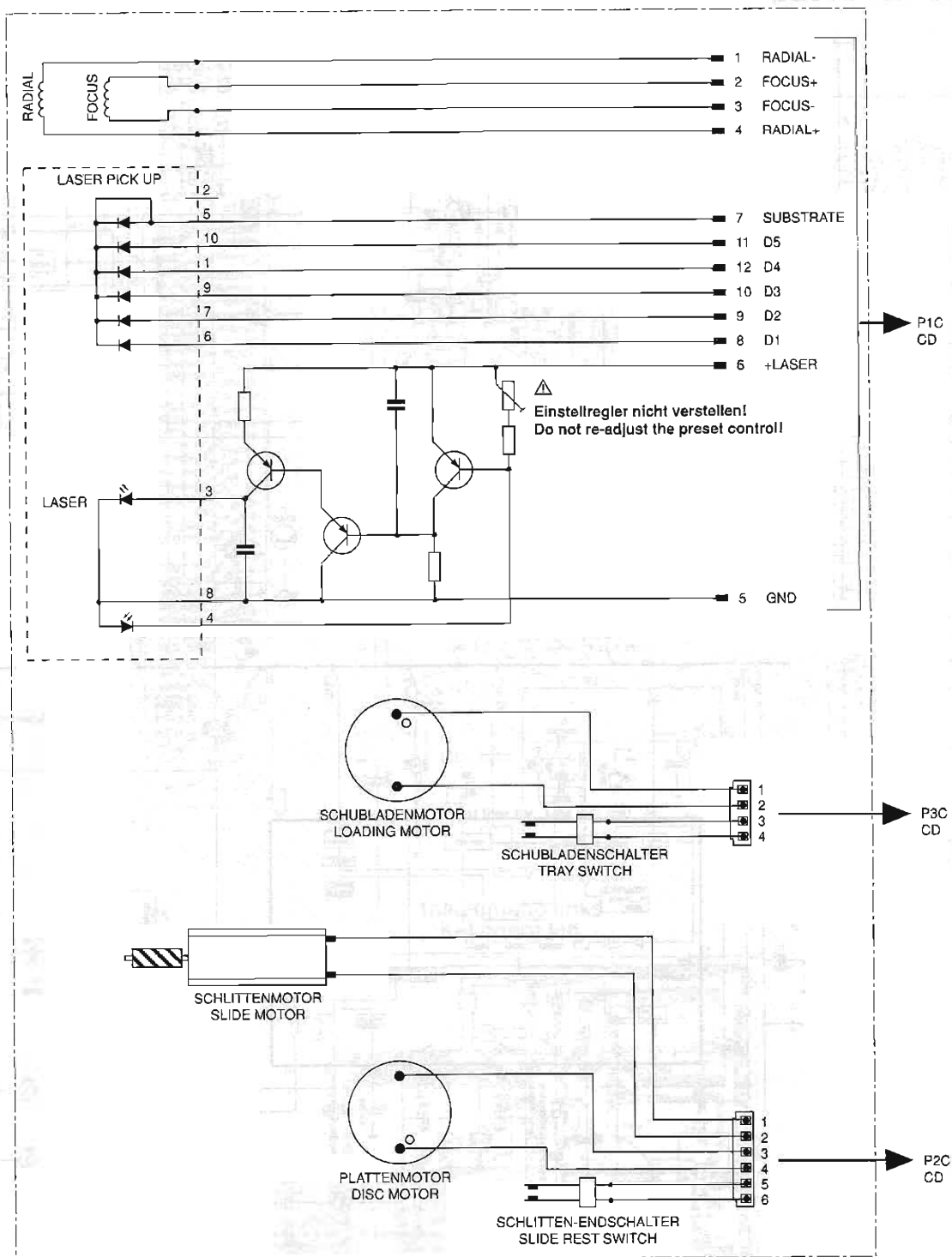
Die Schaltung ist das Schaltbild maßgebend.
The actual component assembly.

**Zusatzplatte
Sub Board****Tastenplatte rechts
Keyboard right**

CD-Laufwerk

CD Drive Mechanism

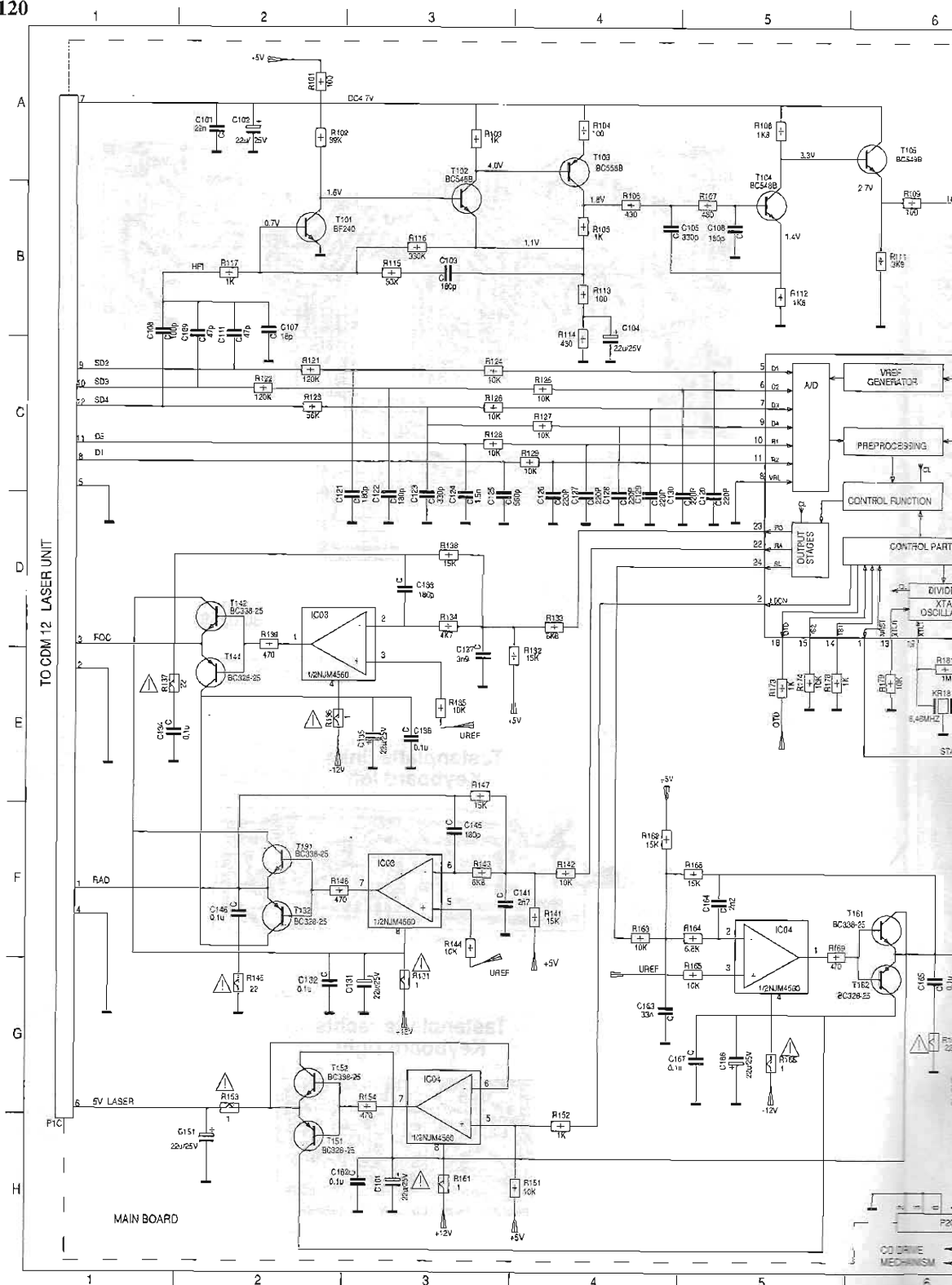
CDM 12

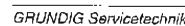


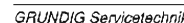
Schaltplan

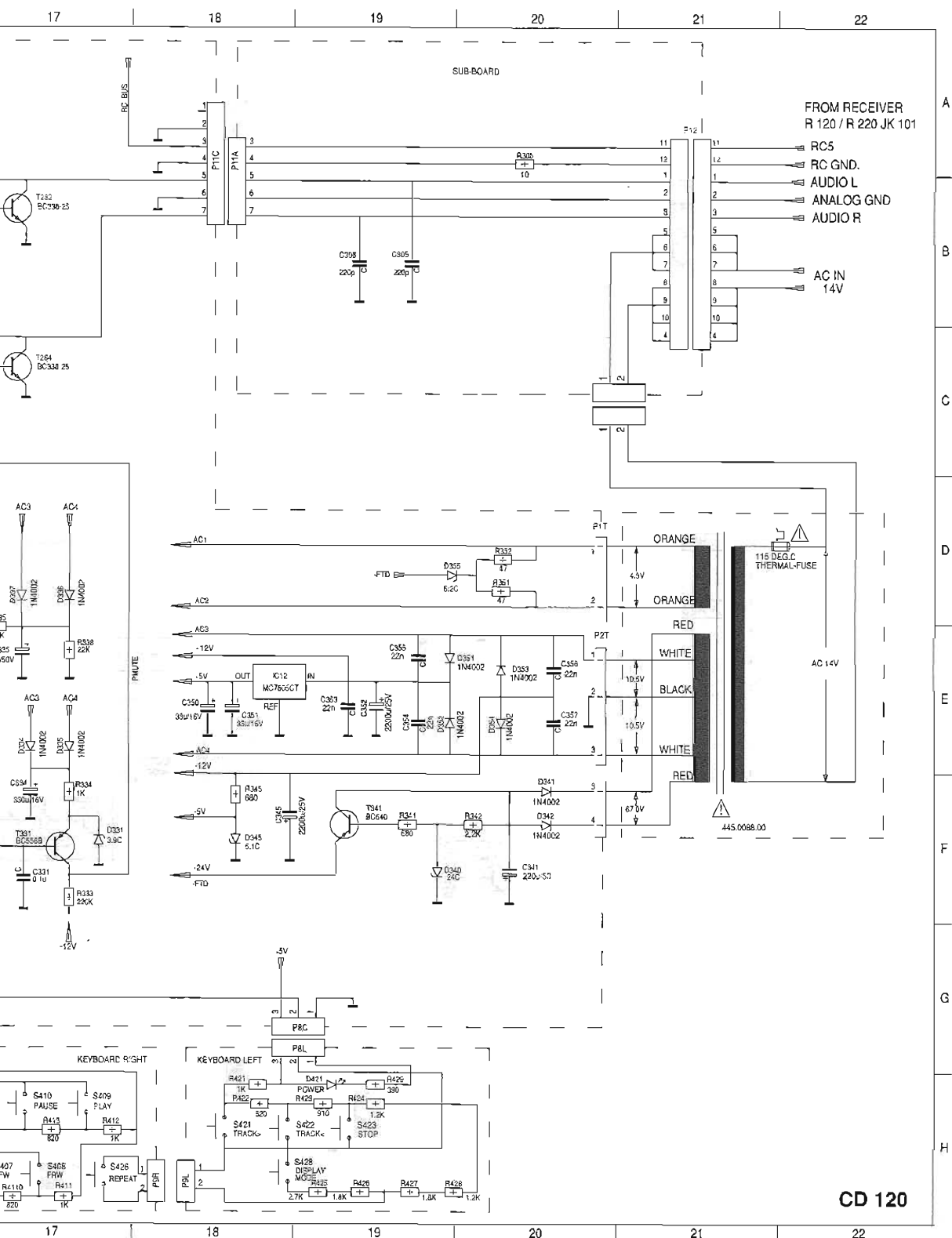
Circuit Diagram

CD 120





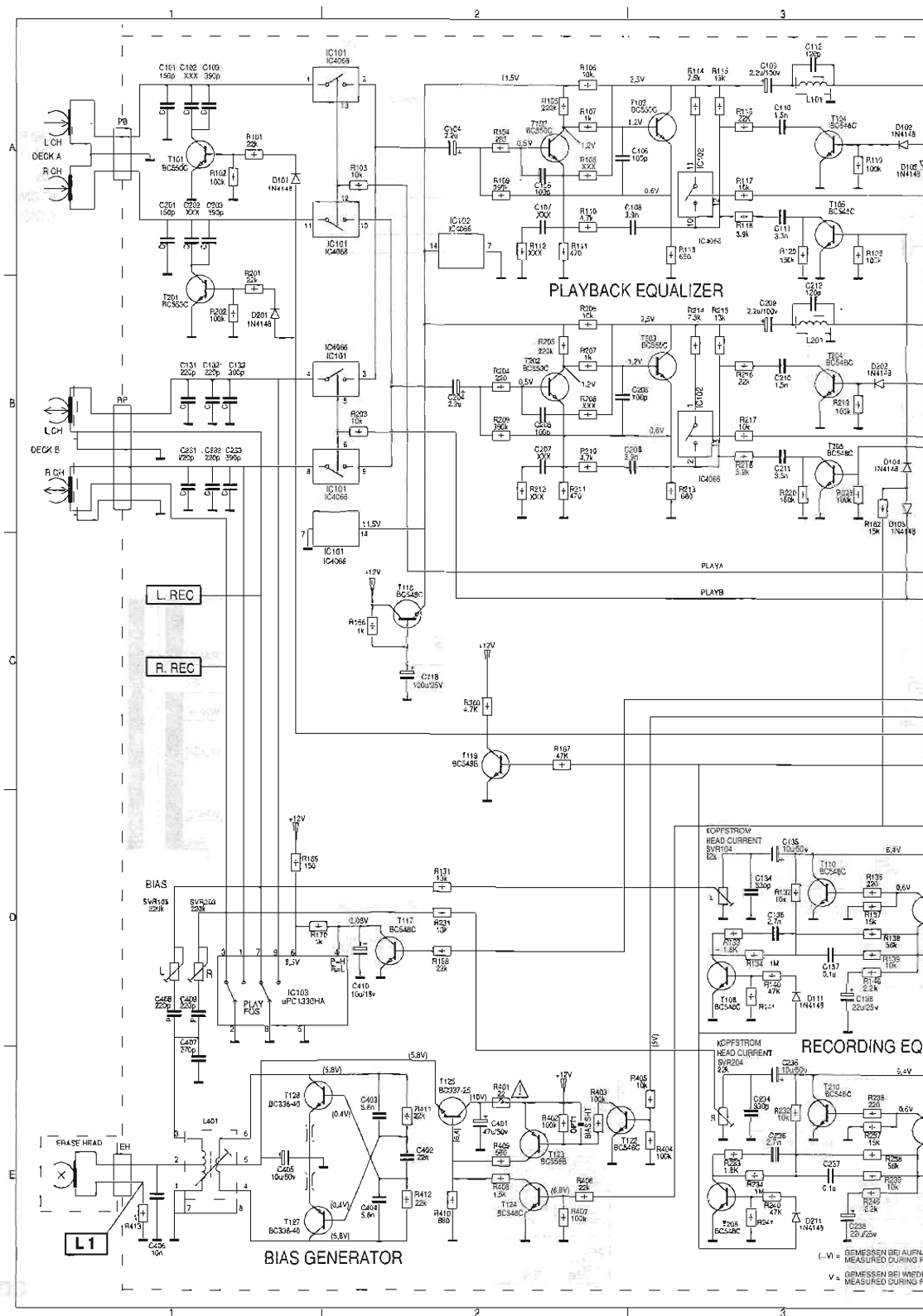




CD 120

Schaltplan / Circuit Diagram

CCF 120

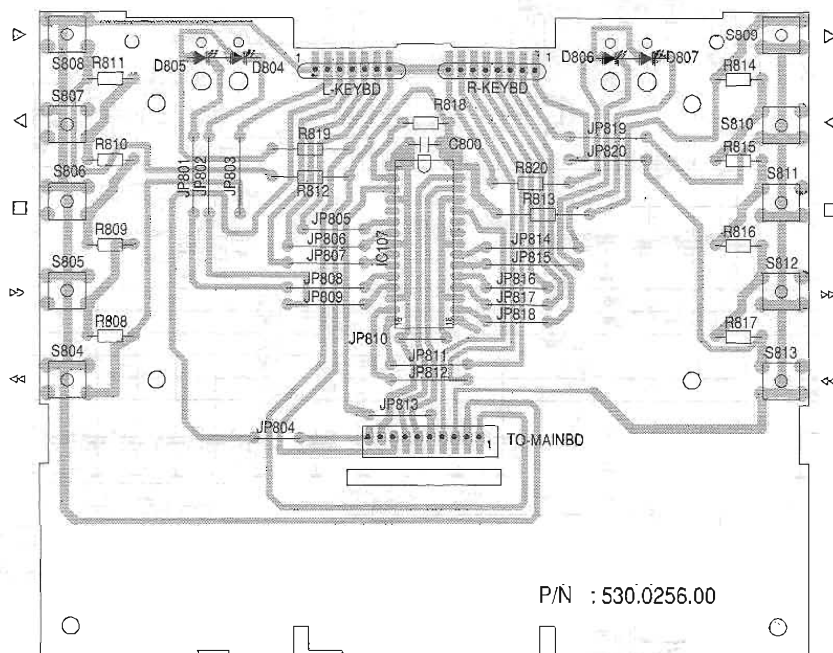
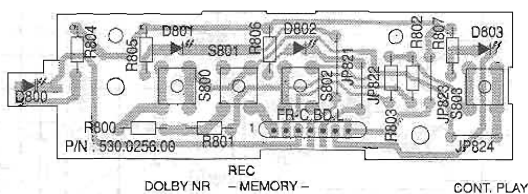
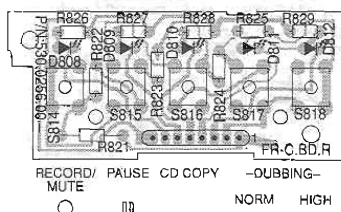




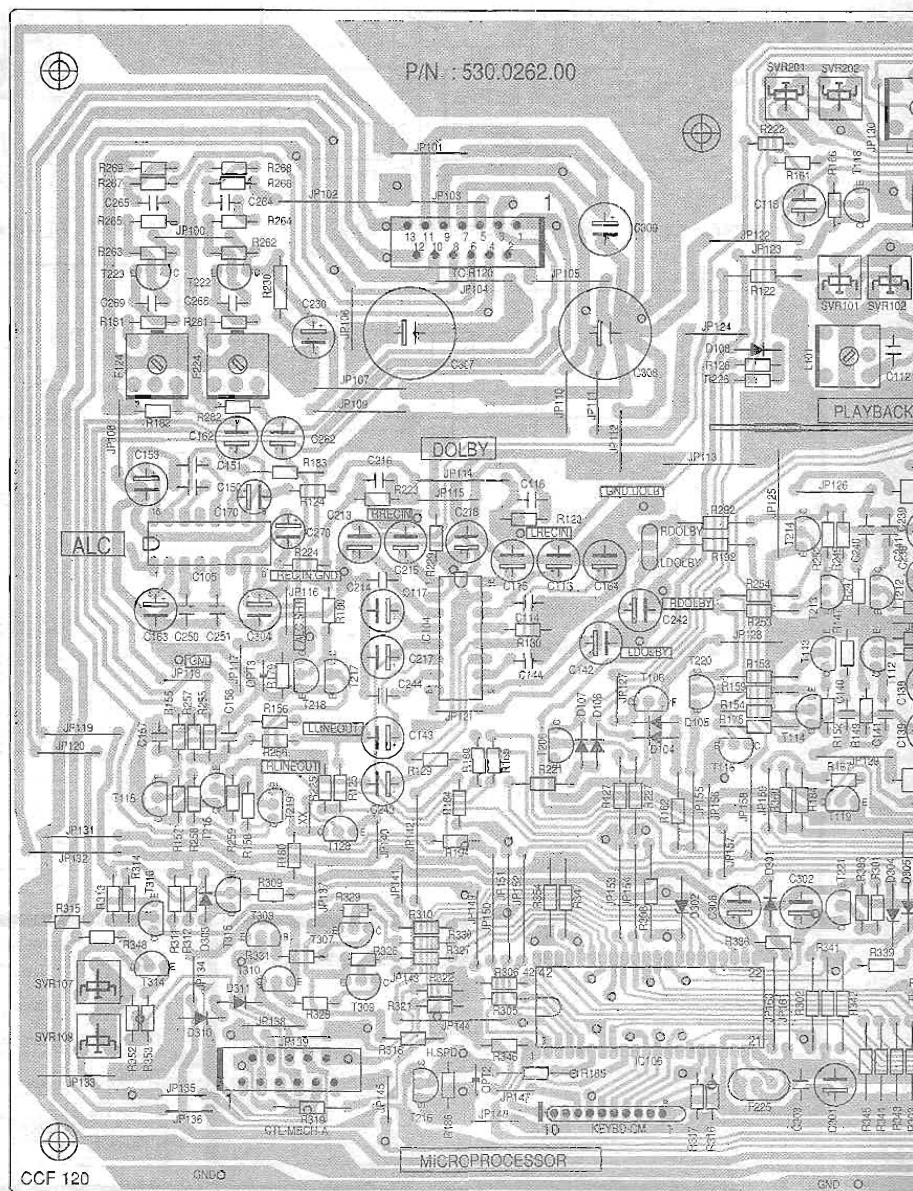


Leiterplatten / PCBs

CCF 120

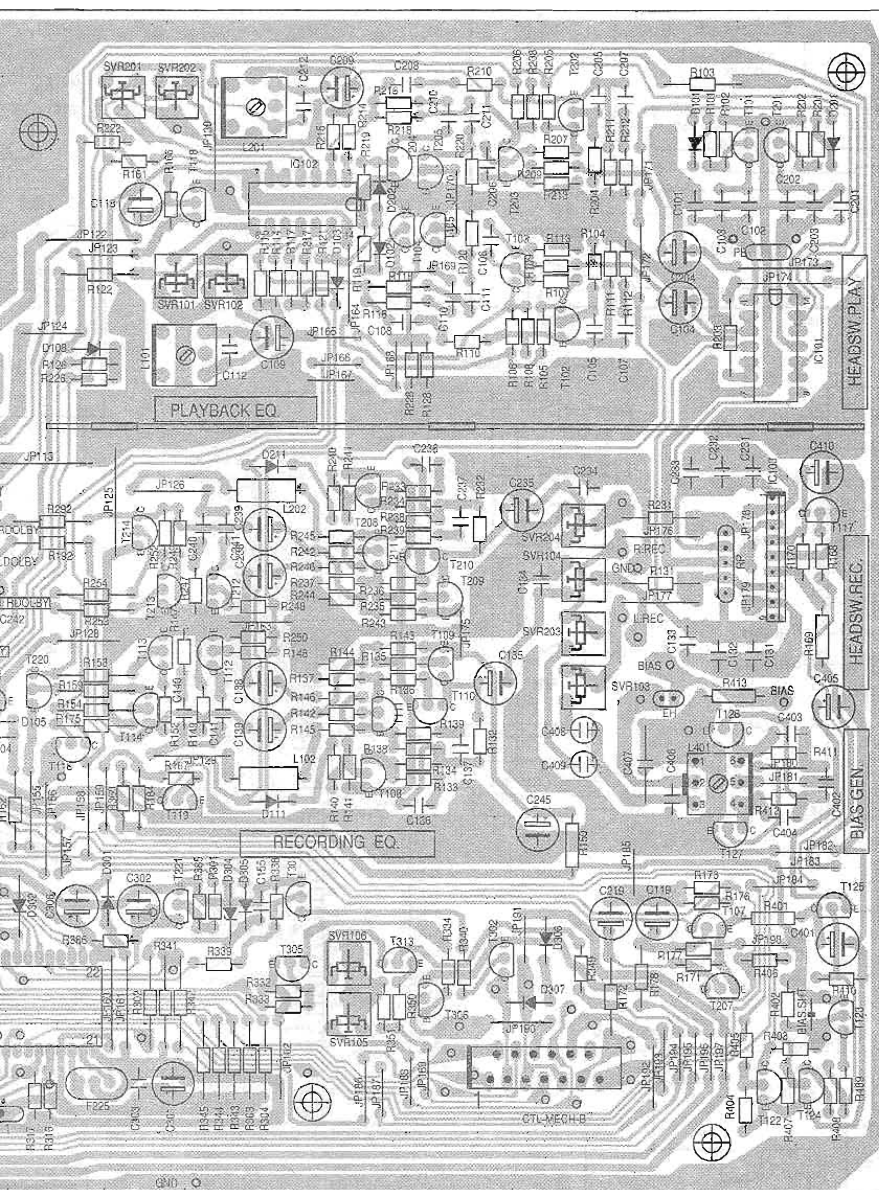
Bestückungsseite
Component sideBedienplatte
Control BoardTastenplatte links
Keyboard leftTastenplatte rechts
Keyboard right

Hauptplatte Main Board



Hauptplatte

Main Board

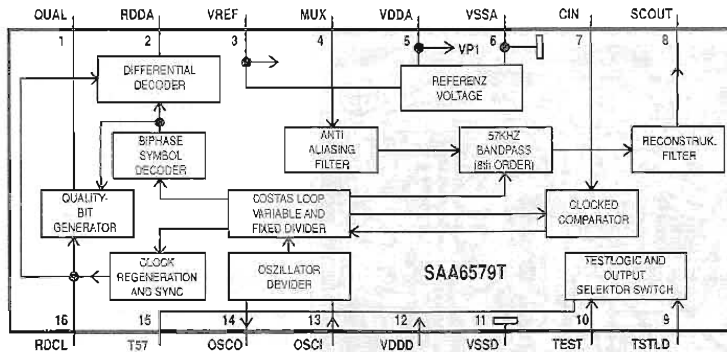


Für die tatsächliche Bauteilebestückung ist das Schaltbild maßgebend.
The circuit diagram is relevant for the actual component assembly.

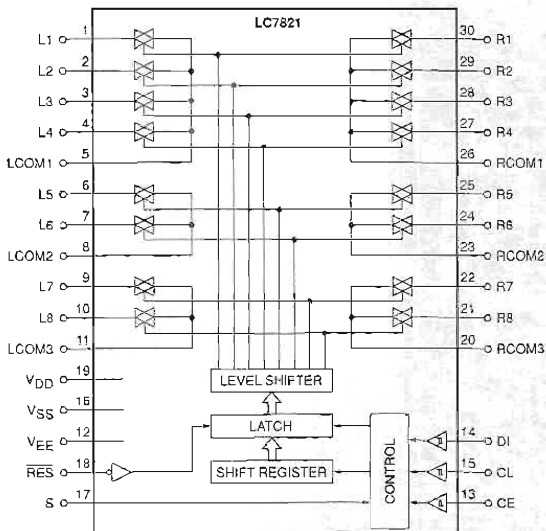
IC-Blockdiagramme

IC Block Diagrams

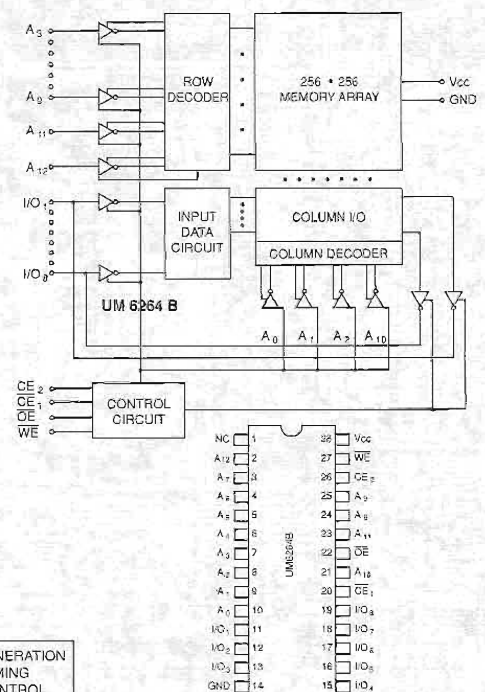
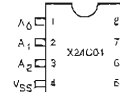
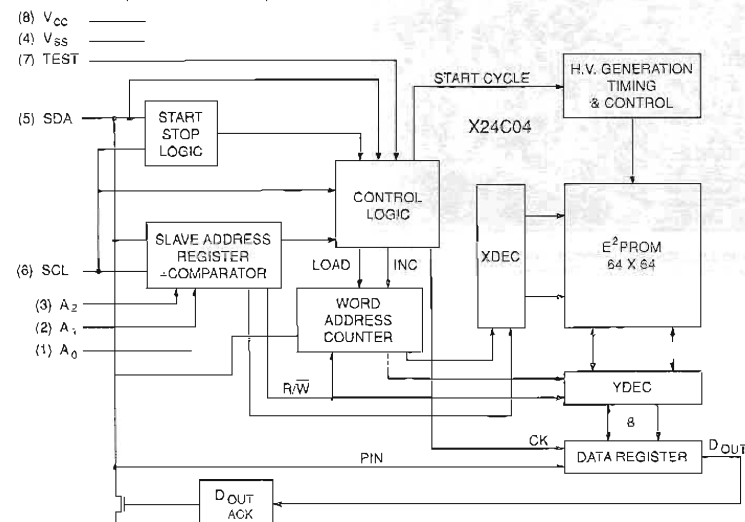
IC SAA 6579 T (RDS DEMODULATOR)



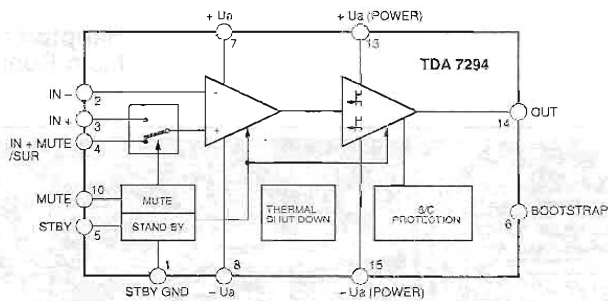
IC LC 7821 (ANALOG FUNCTION SWITCH)



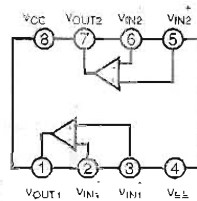
IC UM 6264 B (CMOS SRAM)

IC X 24 C 04 (SERIAL E²PROM)

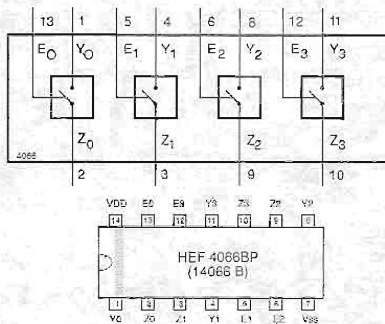
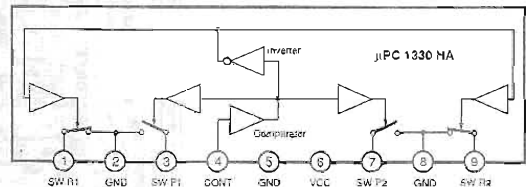
IC TDA 7294 (AUDIO AMPLIFIER)



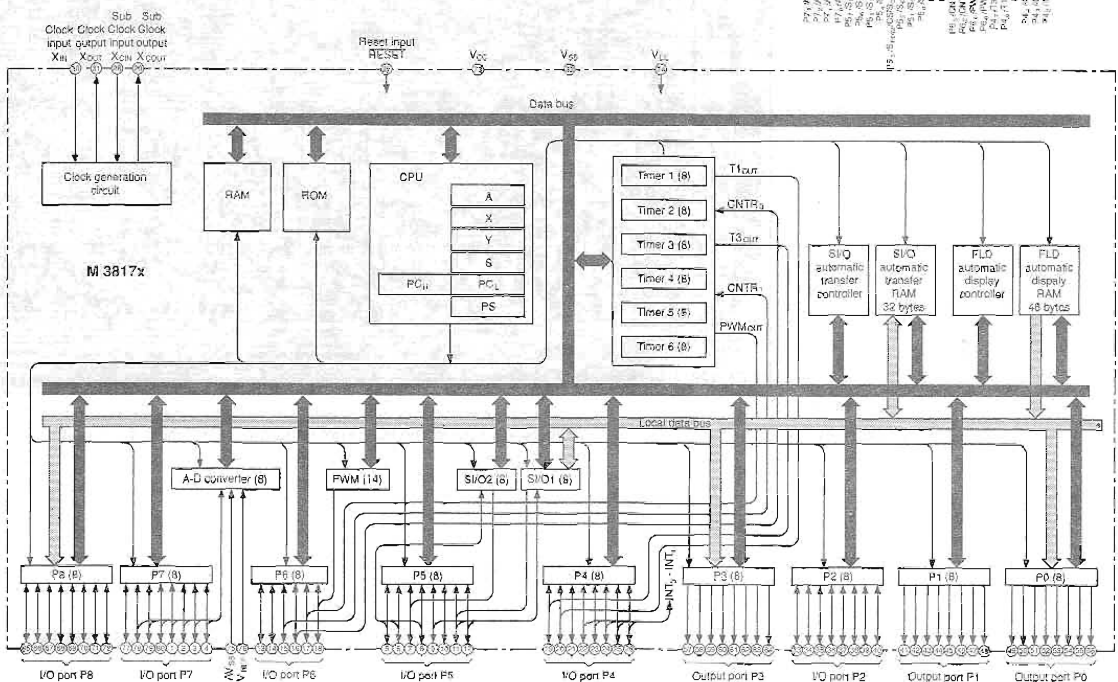
IC LM 633, NJM 4558, NJM 4560 (DUAL OPERATIONAL AMPLIFIER)



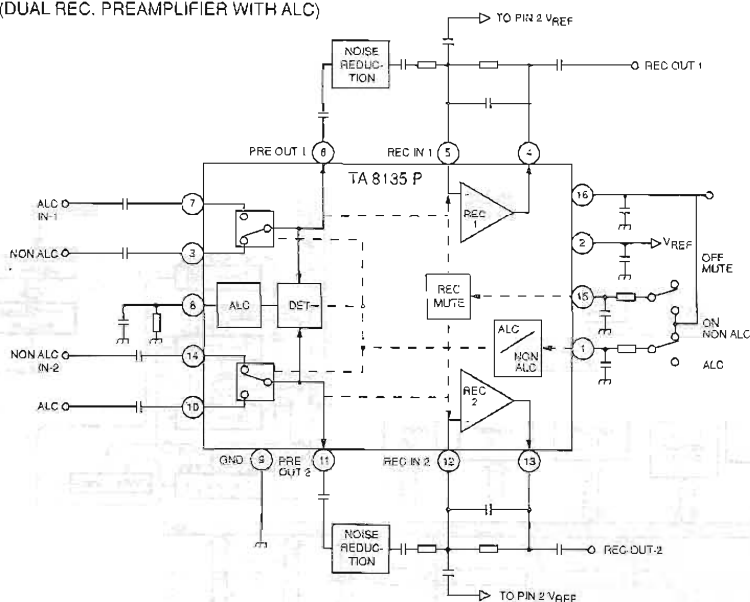
IC 4066 B, 14066 (QUADR. BILATERAL SWITCHES)

IC μ PC 1330 HA (REC/PLAYB. AUDIO HEAD SWITCH)

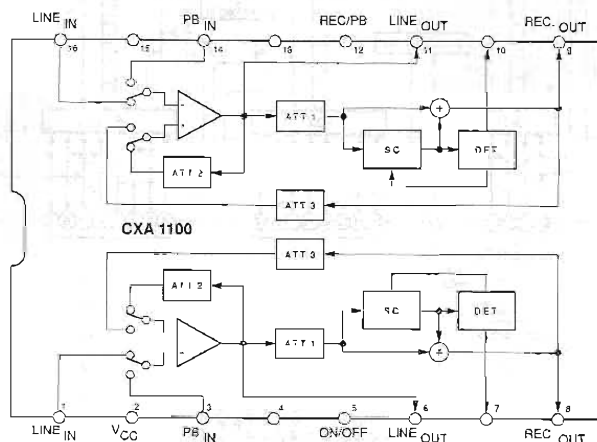
IC M 3817x (8-BIT CMOS MICROCOMPUTER)



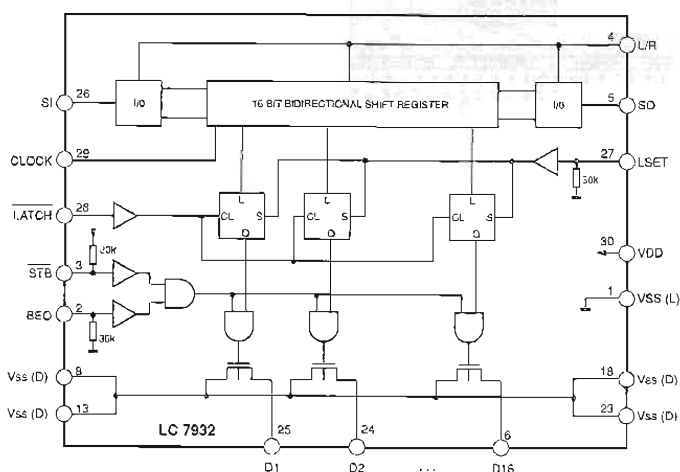
IC TA 8135 P (DUAL REC. PREAMPLIFIER WITH ALC)



IC CXA 1100 P (DOLBY B PROCESSOR)

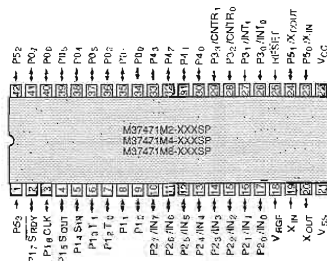
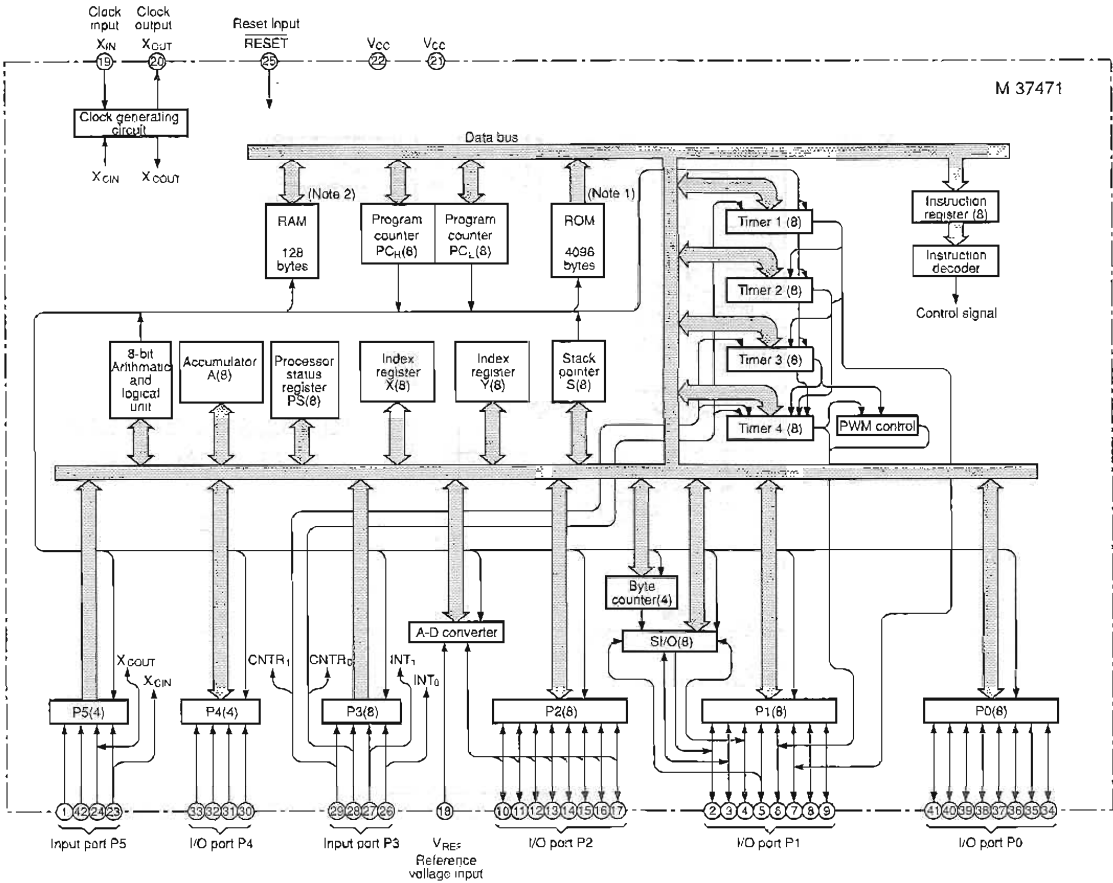


IC LC 7932 (16-BIT LED DRIVER)



Vss (L)	1	31	VDD
BEO	12	28	CLOCK
STB	13	29	LATCH
L/R	14	27	LSET
SD	15	26	SI
D16	16	25	D1
D15	17	24	D2
Vss (D)	18	23	Vss (D)
D14	19	22	D3
D13	20	21	D4
D12	21	20	D5
D11	22	19	D6
Vss (D)	23	18	Vss (D)
D10	24	17	D7
D9	25	16	D8

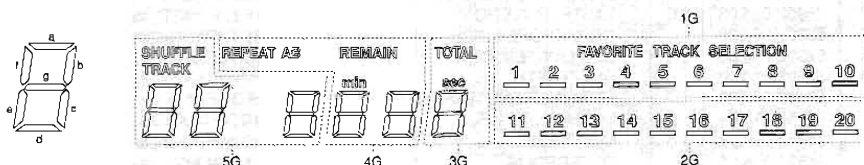
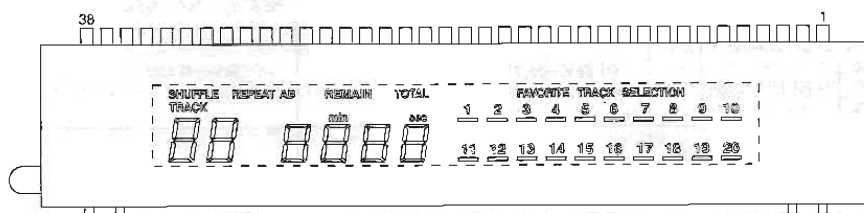
IC M 37471 (8-BIT CMOS MICROCOMPUTER)



Display CD 120

PIN CONNECTION

IN CONNECTION																																			
PIN NO.	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	7	6	5	4	3	2	1	
CONNECTION	F	F	N	N	P	P	P	P	P	P	P	P	P	P	P	P	P	1	2	3	4	5	N	N	F	F	1	2	3	4	5	P	P	1	
	2	2	P	P	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1



ANODE CONNECTION

	5G	4G	3G	2G	1G
P1	4a	REMAIN	TOTAL	11	1
P2	4b	-	-	□ (11)	□ (1)
P3	4f	-	-	12	2
P4	4g	B	-	□ (12)	□ (2)
P5	4c	A	-	13	3
P6	4e	REPEAT	-	□ (13)	□ (3)
P7	4d	min	sec	14	4
P8	6a	3a	1a	□ (14)	□ (4)
P9	6b	3b	1b	15	5
P10	6f	3f	1f	□ (15)	□ (5)
P11	6g	3g	1g	16	6
P12	6c	3c	1c	□ (16)	□ (6)
P13	6e	3e	1e	17	7
P14	6d	3d	1d	□ (17)	□ (7)
P15	5a	2a	-	18	8
P16	5b	2b	-	□ (18)	□ (8)
P17	5f	2f	-	19	9
P18	5g	2g	-	□ (19)	□ (9)
P19	5c	2c	-	20	10
P20	5e	2e	-	□ (20)	□ (10)
P21	5d	2d	-	-	SELECTION
P22	SHUFFLE	-	-	-	FAVORITE
P23	TRACK	co0	-	-	TRACK

GRUNDIGErsatzteilliste
Spare Parts ListHIFI 

D Btx * 32700 #

10 / 94

R 120

SACH-NR. / PART NO.: 9.79101-8151

BESTELL-NR. / ORDER NO.: G.LE 1451 SCHWARZ

POS. NR. POS. NO.	ABB. NR. FIG NO	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG D	DESCRIPTION GB
0015.000	1	75954-010.01	4	FUSS	FOOT
0016.000		75954-010.02	4	FILZ	FELT
0019.000	1	75954-010.03	3	KNOPF, BASS-BALANCE-TREBLE	KNOB
0021.000	1	75954-010.06		FRONTBLLENDE M. TASTENLEIST	FRONT MASK
0022.000	1	75952-055.04		GRUNDIG LOGO	GRUNDIG LOGO
0024.000		75953-028.22	7	LED-LINSE, TASTEN L/R	LED LENS
0025.000	1	75952-055.03	10	TASTE, FUNKTION	KEY, FUNCTION
0026.000		52308-260.00		DREHKNOPF-LINSE	ROTARY KNOB. LENS
0027.000	1	52308-254.00		DISPLAY-FENSTER	LED LENS
0028.000	1	52308-210.00		NETZTASTE	POWER KEY
0029.000		52308-250.00		LED-LINSE / NETZTASTE	LED LENS
0030.000	1	75954-010.04		DREHKNOPF KPL.	ROTARY KNOB
0034.000	 1	75952-030.02		NETZKABEL	POWER CABLE
0035.000		54527-348.01		FILTERFOLIE	FILTER FOIL
0040.000		75954-010.20		TUNER, FRONT END MODUL	TUNER, FRONT END MODUL
		75954-010.46		ANTENNE	ANTENNA (USA): AERIAL (GB)
	1	75954-010.19		ANTENNENBUCHSE	AERIAL SOCKET
		72010-741.75		BEDIENUNGSANLEITUNG	INSTRUCTION MANUAL
		72010-741.40		SERVICE MANUAL	SERVICE MANUAL

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
BU 101	75954-010.34	CINCHBUCHSE	
C 1 Δ	75954-010.45	GER.-KONDENS.4 7NF 400V	
C 2 Δ	75954-010.45	GER.-KONDENS.4.7NF 400V	
C 3	75954-010.14	TRIMMER 4,5/20 PF	
C 4	75954-010.13	TRIMMER 7,5/50 PF	
C 402	75952-030.17	ELKO 3300UF 16V	
C 414	75954-010.26	ELKO 4700UF 35V 20%	
C 415	75954-010.26	ELKO 4700UF 35V 20%	
C 421	75954-010.27	ELKO 6800UF 25V	
C 422	75954-010.28	ELKO 1000UF 25V + -20%	
CR 501	75952-030.19	CER RESONATOR 4,00 MHZ	
D 6	75952-030.43	SI-DIODE 1 N 4148	
D 7	75952-030.43	SI-DIODE 1 N 4148	
D 9	75954-010.18	DIODE SVC 321	
D 14	75952-030.43	SI-DIODE 1 N 4148	
D 15	75952-030.43	SI-DIODE 1 N 4148	
D 16	75952-030.43	SI-DIODE 1 N 4148	
D 17	75952-030.43	SI-DIODE 1 N 4148	
D 19	75952-030.43	SI-DIODE 1 N 4148	
D 23	75954-010.18	DIODE SVC 321	
D 24	75952-030.43	SI-DIODE 1 N 4148	
D 25	75952-030.43	SI-DIODE 1 N 4148	
D 27	75952-030.43	SI-DIODE 1 N 4148	
D 28	75952-030.43	SI-DIODE 1 N 4148	
D 43	75952-030.43	SI-DIODE 1 N 4148	
D 401	75954-010.33	DIODE 1 N 4002 M 03	
D 402	75954-010.33	DIODE 1 N 4002 M 03	
D 403	75954-010.33	DIODE 1 N 4002 M 03	
D 404	75954-010.33	DIODE 1 N 4002 M 03	
D 405	75952-030.43	SI-DIODE 1 N 4148	
D 406	75952-030.43	SI-DIODE 1 N 4148	
D 408	75952-030.44	SI-DIODE IN 4002	
D 409	75952-030.44	SI-DIODE IN 4002	
D 410	75952-030.44	SI-DIODE IN 4002	
D 411	75952-030.44	SI-DIODE IN 4002	
D 412	75954-010.35	Z DIODE HZ 33-2	
D 413	75954-010.32	DIODE 1 N 5401	
D 414	75954-010.32	DIODE 1 N 5401	
D 415	75954-010.32	DIODE 1 N 5401	
D 416	75954-010.32	DIODE 1 N 5401	
D 417	75952-030.44	SI-DIODE IN 4002	
D 418	75954-010.32	DIODE 1 N 5401	
D 419	75952-030.44	SI-DIODE IN 4002	
D 420	75954-010.32	DIODE 1 N 5401	
D 421	75954-010.33	DIODE 1 N 4002 M 03	
D 422	75954-010.33	DIODE 1 N 4002 M 03	
D 501	75952-030.04	LE DIODE	
D 502	75952-030.04	LE DIODE	
D 503	75952-030.04	LE DIODE	
D 504	75952-030.04	LE DIODE	
D 505	75952-030.04	LE DIODE	
D 506	75952-030.04	LE DIODE	
D 507	75952-030.04	LE DIODE	
D 508	75952-030.04	LE DIODE	
D 509	75952-030.04	LE DIODE	
D 510	75952-030.43	SI-DIODE 1 N 4148	
D 511	75952-030.43	SI-DIODE 1 N 4148	
D 512	75952-030.48	Z DIODE 5,1 C D035 0,5W	
D 513	75952-030.43	SI-DIODE 1 N 4148	
D 514	75952-030.43	SI-DIODE 1 N 4148	
D 515	75952-030.43	SI-DIODE 1 N 4148	
D 516	75952-030.43	SI-DIODE 1 N 4148	
DP 501	75954-010.43	DISPLAY	
F 2	19202-705.12	FILTER (NACHBARKANAL)	
F 3	75987-414.62	FILTER	
F 4	75987-414.62	FILTER	
F 6	75954-010.17	FILTER	
F 7	75954-010.73	SPULE 7X7	
F 9	19202-704.12	FILTER LPF V 20	
F 11	19202-704.12	FILTER LPF V 20	
F 201 Δ	75954-010.22	SICHERUNG T 250MA 250V	
F 202 Δ	75981-307.67	SICHERUNG T1.25A	
F 203 Δ	75981-307.67	SICHERUNG T1.25A	
F 204 Δ	75983-660.00	SICHERUNG T1A/250V	
IC 1	8305-262-218	IC LC 7218 SANYO MOS	
IC 2	8305-260-340	IC LA 3401 SANYO MOS	
IC 3	8305-260-166	IC LA 1266 SANYO MOS	
IC 5	8305-204-341	IC LM 340 AT-12 NSC	
IC 102	8305-262-821	IC LC 7821 SANYO MOS	
IC 103	75952-030.45	IC NJM 4560 D JRC	
IC 105	75954-010.31	IC TDA 7294	
IC 205	75954-010.31	IC TDA 7294	
IC 401	75952-030.26	IC MC 7805 CT	
IC 402	8305-204-341	IC LM 340 AT-12 NSC	
IC 403	75954-010.29	IC LM 79 M 12	
IC 501	75954-010.39	IC X 24 C 04 P EPROM	
IC 502	75954-010.38	IC M 38172 M 4-110 FP	
JK 101	75954-010.48	BUCHSE. CD	
JK 102	75954-010.47	BUCHSE. CASSETTE	
JK 104	75954-010.36	LS-TERMINAL	
JK 105	75954-010.37	KOPFHOERERBUCHSE	
L 1	19202-702.12	MW-VORKR.	
L 2	19202-703.12	LW-VORKR.	
L 01	75952-030.62	AC-FILTER	
L 16	75954-010.21	SPULE 0,33UH 10%	
L 17	07202-728.12	SPULE LW-OSZ.	
L 18	07202-727.12	SPULE MW-OSZ.	
L 501	75954-010.44	SPULE 22UH + -10%	
Q 1	75954-010.11	QUARZ 7.2 MHZ	
Q 2	75954-010.16	CER.RESONATOR	
R 69	75954-010.12	ESTR.100 KOHM	
R 119	75954-010.12	ESTR.100 KOHM	
R 123	75954-010.12	ESTR.100 KOHM	
RC 501	75954-010.41	IR EMPFAENGER	
REL401 Δ	75954-010.42	RELAIS	
S 1 Δ	75952-030.12	NETZSCHALTER	
S501- Δ	75952-030.08	TAKTSCHALTER	
S520 Δ	75952-030.08	TAKTSCHALTER	
T 1	75952-030.39	TRANS.BC 548 B	
T 2	75952-030.41	TRANS.BC 338-25	
T 3	75952-030.41	TRANS.BC 338-25	

ÄNDERUNGEN VORBEHALTEN

ALTERATIONS RESERVED

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION
		(D)
		(GB)
T 6	75952-030.38	TRANS.BC 558 B
T 7	8302-638-030	TRANS.2 SK 30 A-TM-Y1
T 8	75952-030.38	TRANS.BC 558 B
T 12	8303-206-548	TRANS.BC 548 C
T 13	75952-030.38	TRANS.BC 558 B
T 15	75952-030.39	TRANS.BC 548 B
T 16	75952-030.75	TRANS.BF 240
T 17	75952-030.39	TRANS.BC 548 B
T 18	75952-030.39	TRANS.BC 548 B
T 19	75952-030.38	TRANS.BC 558 B
T 21	75952-030.39	TRANS.BC 548 B
T 22	75952-030.39	TRANS.BC 548 B
T 401	8302-200-517	TRANS.BC 517 TID/SIE
T 402	75952-030.76	TRANS.PNP BC 640
T 404	75952-030.39	TRANS.BC 548 B
T 405	75952-030.39	TRANS.BC 548 B
T 406	75952-030.39	TRANS.BC 548 B
T 501	75952-030.38	TRANS.BC 558 B
T 502	75952-030.39	TRANS.BC 548 B
T 503	75952-030.41	TRANS.BC 338-25
T 504	75952-030.41	TRANS.BC 338-25
T 505	8302-200-174	TRANS.BC 328-25
T 506	8302-200-174	TRANS.BC 328-25
T 507	75952-030.39	TRANS.BC 548 B
T 508	75952-030.39	TRANS.BC 548 B
T 542	75952-030.39	TRANS.BC 548 B
VR 101	75954-010.24	POTI 100 KOHM / BASS
VR 102	75954-010.24	POTI 100 KOHM / HOEHEN
VR 104	75954-010.23	POTI 100 KOHM / BALANCE
VR 501	75954-010.40	POTI.100 KOHM / LAUTST.
X 101 	75954-010.76	NETZTRAFO
X 102 	75954-010.77	TRAFO STANDBY

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)

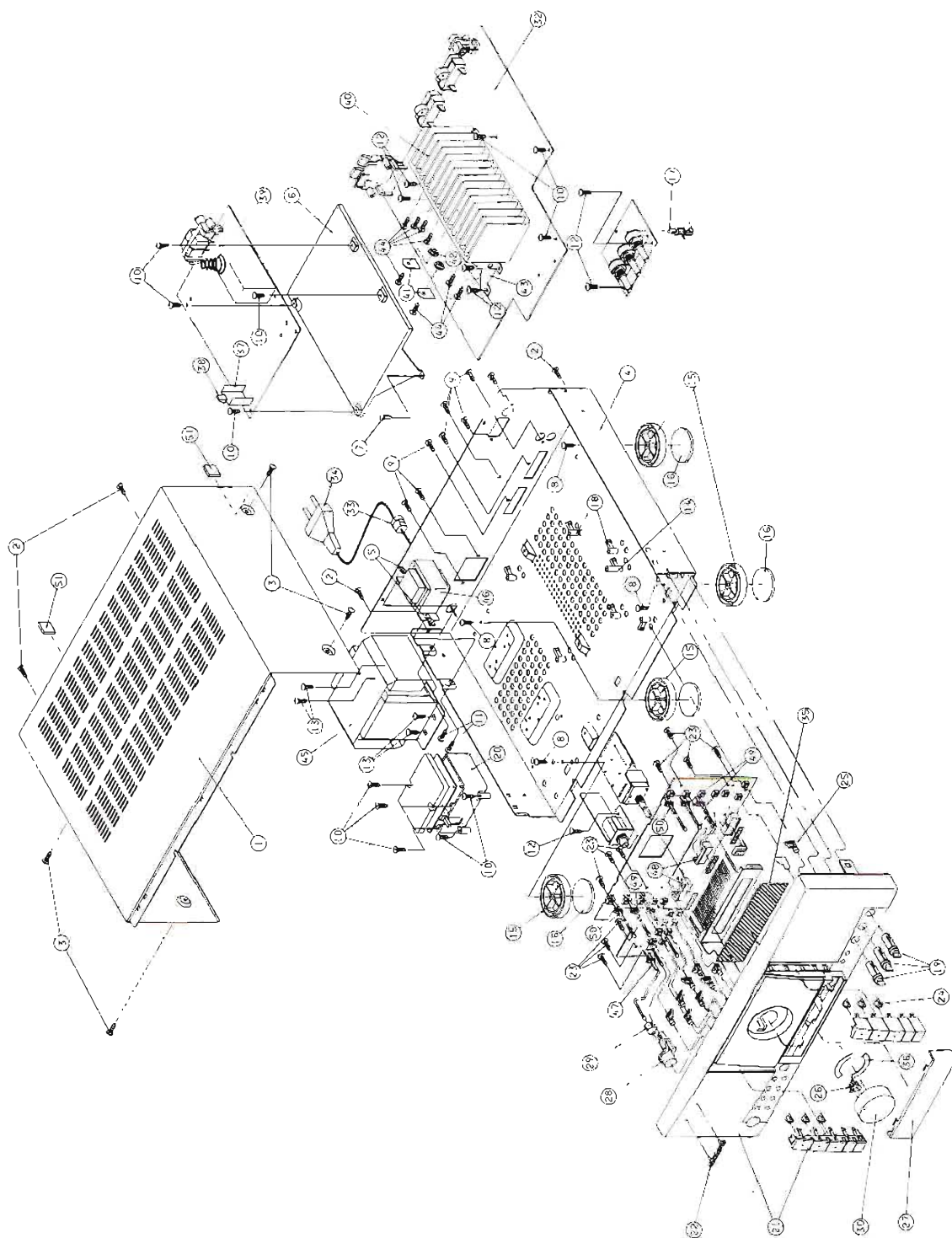
Es gelten die Vorschriften und Sicherheitshinweise gemäß dem Service Manual "Sicherheit", Sach-Nummer 72010-800.00, sowie zusätzlich die eventuell abweichenden, landesspezifischen Vorschriften!



The regulations and safety instructions shall be valid as provided by the "Safety" Service Manual, part number 72010-800.00, as well as the respective national deviations.

Explosionszeichnung Exploded View R 120 / R 220

1



GRUNDIGErsatzteilliste
Spare Parts ListHIFI  Btx * 32700 #

10 / 94

R 220

SACH-NR. / PART NO.: 9.79102-8151

BESTELL-NR. / ORDER NO.: G.LE 1551 SCHWARZ

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG 	DESCRIPTION 
0015.000	1	75954-010.01	4	FUSS	FOOT
0016.000	1	75954-010.02	4	FILZ	FELT
0019.000	1	75954-010.03	3	KNOPF.BASS-BALANCE-TREBLE	KNOB, BASS-BALANCE-TREBLE
0021.000	1	75954-012.01		FRONTBLENDE M.TASTENLEISTE L/R	FRONT MASK
0022.000	1	75952-055.04		GRUNDIG LOGO	GRUNDIG LOGON
0024.000		75953-028.22	7	LED-LINSE, TASTEN L/R	LED LINSE
0025.000	1	75952-055.03	10	TASTE, FUNKTION	KEY, FUNCTION
0026.000		52308-260.00		DREHKNOPF-LINSE	ROTARY KNOB, LENS
0027.000	1	52308-254.00		DISPLAY-FENSTER	LED LENS
0028.000	1	52308-210.00		NETZTASTE	POWER KEY
0029.000		52308-250.00		LED-LINSE FUER NETZTASTE	LED LENS
0030.000	1	75954-010.04		DREHKNOPF KPL.	ROTARY KNOB
0034.000		75952-030.02		NETZKABEL	POWER CABLE
0035.000		55312-256.00		FILTERFOLIE	FILTER FOIL
0040.000		75954-010.20		TUNER, FRONT END MODUL	TUNER, FRONT END MODUL
		75954-010.46		ANTENNE	ANTENNA (USA); AERIAL (GB)
	1	75954-010.19		ANTENNENBUCHSE	AERIAL SOCKET
		72010-741.75		BEDIENUNGSANLEITUNG	INSTRUCTION MANUAL
		72010-741.40		SERVICE MANUAL	SERVICE MANUAL

POS. NR. POS. NO	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
BU 101	75954-010.34	CINCHBUCHSE	
C 1 Δ	75954-010.45	CER.-KONDENS.4.7NF 400V	
C 2 Δ	75954-010.45	CER.-KONDENS.4.7NF 400V	
C 3	75954-010.14	TRIMMER 4,5/20 PF	
C 4	75954-010.13	TRIMMER 7,5/50 PF	
C 402	75952-030.17	ELKO 3300UF 16V	
C 414	75954-012.18	ELKO 6800UF 50V	
C 415	75954-012.18	ELKO 6800UF 50V	
C 421	75954-010.27	ELKO 6800UF 25V	
C 422	75954-010.28	ELKO 1000UF 25V $\pm$ 20%	
CR 501	75952-030.19	CER RESONATOR 4,00 MHZ	
D 6	75952-030.43	SI-DIODE 1 N 4148	
D 7	75952-030.43	SI-DIODE 1 N 4148	
D 9	75954-010.18	DIODE SVC 321	
D 14	75952-030.43	SI-DIODE 1 N 4148	
D 15	75952-030.43	SI-DIODE 1 N 4148	
D 16	75952-030.43	SI-DIODE 1 N 4148	
D 17	75952-030.43	SI-DIODE 1 N 4148	
D 19	75952-030.43	SI-DIODE 1 N 4148	
D 23	75954-010.18	DIODE SVC 321	
D 24	75952-030.43	SI-DIODE 1 N 4148	
D 25	75952-030.43	SI-DIODE 1 N 4148	
D 27	75952-030.43	SI-DIODE 1 N 4148	
D 28	75952-030.43	SI-DIODE 1 N 4148	
D 29	75952-030.43	SI-DIODE 1 N 4148	
D 43	75952-030.43	SI-DIODE 1 N 4148	
D 401	75954-010.33	DIODE 1 N 4002 M 03	
D 402	75954-010.33	DIODE 1 N 4002 M 03	
D 403	75954-010.33	DIODE 1 N 4002 M 03	
D 404	75954-010.33	DIODE 1 N 4002 M 03	
D 405	75952-030.43	SI-DIODE 1 N 4148	
D 406	75952-030.43	SI-DIODE 1 N 4148	
D 408	75952-030.44	SI-DIODE IN 4002	
D 409	75952-030.44	SI-DIODE IN 4002	
D 410	75952-030.44	SI-DIODE IN 4002	
D 411	75952-030.44	SI-DIODE IN 4002	
D 412	75954-010.35	Z DIODE HZ 33-2	
D 413	75954-010.32	DIODE 1 N 5401	
D 414	75954-010.32	DIODE 1 N 5401	
D 415	75954-010.32	DIODE 1 N 5401	
D 416	75954-010.32	DIODE 1 N 5401	
D 417	75952-030.44	SI-DIODE IN 4002	
D 418	75954-010.32	DIODE 1 N 5401	
D 419	75952-030.44	SI-DIODE IN 4002	
D 420	75954-010.32	DIODE 1 N 5401	
D 421	75954-010.33	DIODE 1 N 4002 M 03	
D 422	75954-010.33	DIODE 1 N 4002 M 03	
D 501	75952-030.04	LE DIODE	
D 502	75952-030.04	LE DIODE	
D 503	75952-030.04	LE DIODE	
D 504	75952-030.04	LE DIODE	
D 505	75952-030.04	LE DIODE	
D 506	75952-030.04	LE DIODE	
D 507	75952-030.04	LE DIODE	
D 508	75952-030.04	LE DIODE	
D 509	75952-030.04	LE DIODE	
D 510	75952-030.43	SI-DIODE 1 N 4148	
D 511	75952-030.43	SI-DIODE 1 N 4148	
D 512	75952-030.48	Z DIODE 5,1 C D035 0,5W	
D 513	75952-030.43	SI-DIODE 1 N 4148	
D 514	75952-030.43	SI-DIODE 1 N 4148	
D 515	75952-030.43	SI-DIODE 1 N 4148	
D 516	75952-030.43	SI-DIODE 1 N 4148	
DP 501	75954-010.43	DISPLAY	

POS. NR. POS. NO	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
F 1	19202-704.12	FILTER (PILOT) LPF-V20	
F 2	19202-705.12	FILTER (NACHBARKANAL)	
F 3	75987-414.62	FILTER	
F 4	75987-414.62	FILTER	
F 6	75954-010.17	FILTER	
F 7	75954-010.73	SPULE 7X7	
F 9	19202-704.12	FILTER (PILOT) LPF-V20	
F 11	19202-704.12	FILTER (PILOT) LPF-V2	
F 201 Δ	75954-010.22	SICHERUNG T 250MA 250V	
F 202 Δ	75981-307.67	SICHERUNG T1,25A	
F 203 Δ	75981-307.67	SICHERUNG T1,25A	
F 204 Δ	75954-012.07	SICHERUNG T 1,6 A	
IC 1	8305-262-218	IC LC 7218 SANYO MOS	
IC 2	8305-260-340	IC LA 3401 SANYO MOS	
IC 3	8305-260-166	IC LA 1266 SANYO MOS	
IC 5	8305-204-341	IC LM 340 AT-12 NSC	
IC 04	8305-303-579	IC SAA 6579 T PHI MOS	
IC 102	8305-262-821	IC LC 7821 SANYO MOS	
IC 103	75952-030.45	IC NJM 4560 D JRC	
IC 105	75954-010.31	IC TDA 7294	
IC 205	75954-010.31	IC TDA 7294	
IC 401	75952-030.26	IC MC 7805 CT	
IC 402	8305-204-341	IC LM 340 AT-12 NSC	
IC 403	75954-010.29	IC LM 79 M 12	
IC 501	75954-010.39	IC X 24 C 04 P EPROM	
IC 502	75954-010.38	IC M 38172 M 4-110 FP	
JK 101	75954-010.48	BUCHSE, CD	
JK 102	75954-010.47	BUCHSE, CASSETTE	
JK 104	75954-010.36	LS-TERMINAL	
JK 105	75954-010.37	KOPFHOERERBUCHSE	
L 1	19202-702.12	MW-VORKR.	
L 2	19202-703.12	LW-VORKR.	
L 01	75952-030.62	AC-FILTER	
L 16	75954-010.21	SPULE 0,33UH 10%	
L 17	07202-728.12	SPULE (LW OSZ.)	
L 18	07202-727.12	SPULE (MW-OSZ.)	
L 19	75954-010.74	SPULE 39MH 5%	
L 21	75954-010.44	SPULE 22UH $\pm$ -10%	
L 501	75954-010.44	SPULE 22UH $\pm$ -10%	
Q 1	75954-012.02	QUARZ 7,2 MHZ	
Q 2	75954-010.16	CER. RESONATOR	
Q 3	75954-012.03	QUARZ 4,33 MHZ	
R 69	75954-010.12	ESTR.100 KOHM	
R 119	75954-010.12	ESTR.100 KOHM	
R 123	75954-010.12	ESTR.100 KOHM	
RC 501	75954-010.41	IR EMPFAENGER	
REL401 Δ	75954-010.42	RELAIS	
S 1 Δ	75952-030.12	NETZSCHALTER	
S 501	75952-030.08	TAKTSCHALTER	
S 520	75952-030.08	TAKTSCHALTER	

ANDERUNGEN VORBEHALTEN

ALTERATIONS RESERVED

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	D GB
T 1	75952-030.39	TRANS.BC 548 B	
T 2	75952-030.41	TRANS.BC 338-25	
T 3	75952-030.41	TRANS.BC 338-25	
T 6	75952-030.38	TRANS.BC 558 B	
T 7	8302-638-030	TRANS.2 SK 30 A-TM-Y1	
T 8	75952-030.38	TRANS.BC 558 B	
T 12	8303-206-548	TRANS.BC 548 C	
T 13	75952-030.38	TRANS.BC 558 B	
T 15	75952-030.39	TRANS.BC 548 B	
T 16	75952-030.75	TRANS.BF 240	
T 17	75952-030.39	TRANS.BC 548 B	
T 18	75952-030.39	TRANS.BC 548 B	
T 19	75952-030.38	TRANS.BC 548 B	
T 21	75952-030.39	TRANS.BC 548 B	
T 22	75952-030.39	TRANS.BC 548 B	
T 23	75952-030.39	TRANS.BC 548 B	
T 401	8302-200-517	TRANS.BC 517 TID/SIE	
T 402	75952-030.76	TRANS.PNP BC 640	
T 404	75952-030.39	TRANS.BC 548 B	
T 405	75952-030.39	TRANS.BC 548 B	
T 406	75952-030.39	TRANS.BC 548 B	
T 501	75952-030.38	TRANS.BC 558 B	
T 502	75952-030.39	TRANS.BC 548 B	
T 503	75952-030.41	TRANS.BC 338-25	
T 504	75952-030.41	TRANS.BC 338-25	
T 505	8302-200-174	TRANS.BC 328-25	
T 506	8302-200-174	TRANS.BC 328-25	
T 507	75952-030.39	TRANS.BC 548 B	
T 508	75952-030.39	TRANS.BC 548 B	
T 542	75952-030.39	TRANS.BC 548 B	
VR 101	75954-010.24	POTI 100 KOHM / BASS	
VR 102	75954-010.24	POTI 100 KOHM / HÖHEN	
VR 104	75954-010.23	POTI 100 KOHM / BALANCE	
VR 501	75954-010.40	POTI 100 KOHM / LAUTST.	
X 101 	75954-010.78	NETZ-TRAFO	
X 102 	75954-010.77	TRAFO STANDBY	

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)

Es gelten die Vorschriften und Sicherheitshinweise gemäß dem Service Manual "Sicherheit", Sach-Nummer 72010-800.00, sowie zusätzlich die eventuell abweichenden, landesspezifischen Vorschriften!



(!)

The regulations and safety instructions shall be valid as provided by the "Safety" Service Manual, part number 72010-800.00, as well as the respective national deviations.

GRUNDIGErsatzteilliste
Spare Parts List

D Btx * 32700 #

10 / 94

CD 120

SACH-NR. / PART NO.: 9.79801-8151
BESTELL-NR. / ORDER NO.: G.LE 1651 SCHWARZ

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
004.000	1	54527-347.01		FILTERFOLIE	FILTER FOIL
021.000	1	75954-010.01	4	FUSS	FOOT
022.000	1	75954-010.02	4	FILZ	FELT
023.000	1	52308-250.00		LENS / POWER	LENS / POWER
025.000	1	75952-055.03	9	TASTE, FUNKTION	KEY, FUNCTION
026.000	1	75954-012.24		ABDECKUNG	COVER
027.000	1	75954-012.12		ABDECKUNG, SCHUBLADE	COVER DRAWER
028.000	1	75952-055.08		FENSTER, DISPLAY	WINDOW, DISPLAY
030.000	1	75954-012.13		FRONTBLLENDE M.TASTENLEISTE L/R	FRONT MASK
031.000	1	75952-055.04		GRUNDIG LOGO	GRUNDIG LOGO
033.000	1	75953-028.22	4	LED-LINSE, TASTEN L/R	LED LENS
		75954-012.11		VERBINDUNGSKABEL 12 P	CONNECTING CABLE
				CD-LAUFWERK	CD - DRIVE
001.000	2	75952-030.50		LAUFWERK KPL. (POS.8)	TAPE DRIVE CPL. (POS.8)
002.000	2	75952-030.51		SCHUBLADE	DRAWER
005.000	2	75952-030.52		ZAHNRAD	GEAR WHEEL
006.000	2	75953-800.49		DAEMPfung	DAMPING
009.000	2	75953-800.49		DAEMPfung	DAMPING
010.000	2	75952-030.05		SCHALTER	SWITCH
011.000	2	75952-030.57		MOTOR KPL.M.PULLY	MOTOR
014.000	2	75952-030.53		ZAHNRAD	GEAR WHEEL
015.000	2	75952-030.54		ZAHNRAD	GEAR WHEEL
018.000	2	75952-030.56		RIEMEN	BELT
020.000	2	75952-030.55		LASEREINHEIT	LASER UNIT
040.000	2	75952-030.95		DAEMPfung	DAMPING
041.000	2	75952-030.95		DAEMPfung	DAMPING
		72010-741.75		BEDIENUNGSANLEITUNG	INSTRUCTION MANUAL
		72010-741.40		SERVICE MANUAL	SERVICE MANUAL

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
D 211	75952-030.43	SI-DIODE 1 N 4148	
D 321	75952-030.43	SI-DIODE 1 N 4148	
D 331	75952-030.46	Z DIODE 3,9 V 500MW	
D 334	75952-030.44	SI-DIODE IN 4002	
D 335	75952-030.44	SI-DIODE IN 4002	
D 336	75952-030.44	SI-DIODE IN 4002	
D 337	75952-030.44	SI-DIODE IN 4002	
D 340	75954-012.17	Z DIODE BXZ 79 C 55 C 24V	
D 341	75952-030.44	SI-DIODE IN 4002	
D 342	75952-030.44	SI-DIODE IN 4002	
D 345	75952-030.48	Z DIODE 5,1 C D035 0,5W	
D 351	75952-030.44	SI-DIODE IN 4002	
D 352	75952-030.44	SI-DIODE IN 4002	
D 353	75952-030.44	SI-DIODE IN 4002	
D 354	75952-030.44	SI-DIODE IN 4002	
D 355	75952-030.47	Z DIODE HZS 6 C 2	
D 401	75952-030.04	LE DIODE (POS.3)	
D 402	75952-030.04	LE DIODE (POS.3)	
D 403	75952-030.13	LE DIODE TLMY 4405 BT 12 (POS.7)	
D 404	75952-030.13	LE DIODE TLMY 4405 BT 12 (POS.7)	
D 421	75952-030.13	LE DIODE TLMY 4405 BT 12 (POS.7)	
DP	75952-030.10	DISPLAY (POS.5)	
IC 01	75952-030.28	IC SAA 7341 GP	
IC 02	75952-030.27	IC TDA 1301 T	
IC 03	75952-030.45	IC NJM 4560 D JRC	
IC 04	75952-030.45	IC NJM 4560 D JRC	
IC 05	75954-012.15	IC SRAM UM 6264 BM 10 L	
IC 06	75952-030.45	IC NJM 4560 D JRC	
IC 07	75952-030.24	IC LM 833 N	
IC 11	75952-030.23	IC M 38172 M4	
IC 12	75952-030.26	IC MC 7805 CT	
KR 181	75952-030.18	CER RESONATOR 8.46MHZ	
KR 215	75952-030.14	QUARZ 16,934 MHZ	
KR 311	75952-030.19	CER RESONATOR 4,00 MHZ	
R 131	75954-012.14	SI.-WIDERST.1,0	
R 136	75954-012.14	SI.-WIDERST.1,0	
R 137	75952-030.89	SI.-WIDERST.22 LCA	
R 145	75952-030.89	SI.-WIDERST.22 LCA	
R 153	75952-030.91	SI.-WIDERST.4,7 1/4W ERD	
R 161	75954-012.14	SI.-WIDERST.1,0	
R 166	75954-012.14	SI.-WIDERST.1,0	
R 167	75952-030.89	SI.-WIDERST.22 LCA	
R 182	75952-030.91	SI.-WIDERST.4,7 1/4W ERD	
R 183	75952-030.91	SI.-WIDERST.4,7 1/4W ERD	
R 204	75952-030.89	SI.-WIDERST.4,7 1/4W ERD	
R 238	75952-030.89	SI.-WIDERST.22 LCA	
R 239	75952-030.89	SI.-WIDERST.22 LCA	
R 241	75954-012.14	SI.-WIDERST.1,0	
R 247	75954-012.14	SI.-WIDERST.1,0	
R 250	75952-030.91	SI.-WIDERST.4,7 1/4W ERD	

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
R 255	75952-030.91	SI.-WIDERST.4,7 1/4W ERD	
R 266	75952-030.89	SI.-WIDERST.22 LCA	
R 276	75952-030.89	SI.-WIDERST.22 LCA	
S 401-	75952-030.07	TAKTSCHALTER (POS. 29)	
S 411	75952-030.07	TAKTSCHALTER (POS. 29)	
S 421-	75952-030.07	TAKTSCHALTER (POS. 29)	
S 428	75952-030.07	TAKTSCHALTER (POS. 29)	
T 101	75952-030.75	TRANS.BF 240	
T 102	75952-030.39	TRANS.BC 548 B	
T 103	75952-030.38	TRANS.BC 558 B	
T 104	75952-030.39	TRANS.BC 548 B	
T 105	75952-030.39	TRANS.BC 548 B	
T 131	75952-030.41	TRANS.BC 338-25	
T 132	8302-200-174	TRANS.BC 328-25	
T 141	8302-200-174	TRANS.BC 328-25	
T 142	75952-030.41	TRANS.BC 338-25	
T 151	8302-200-174	TRANS.BC 328-25	
T 152	75952-030.41	TRANS.BC 338-25	
T 161	75952-030.41	TRANS.BC 338-25	
T 162	8302-200-174	TRANS.BC 328-25	
T 230	75952-030.38	TRANS.BC 558 B	
T 232	75952-030.39	TRANS.BC 548 B	
T 241	75952-030.41	TRANS.BC 338-25	
T 242	8302-200-174	TRANS.BC 328-25	
T 243	75952-030.41	TRANS.BC 338-25	
T 244	8302-200-174	TRANS.BC 328-25	
T 282	75952-030.41	TRANS.BC 338-25	
T 284	75952-030.41	TRANS.BC 338-25	
T 321	75952-030.38	TRANS.BC 558 B	
T 322	75952-030.39	TRANS.BC 548 B	
T 331	75952-030.38	TRANS.BC 558 B	
T 338	75952-030.38	TRANS.BC 558 B	
T 341	75952-030.76	TRANS.PNP BC 640	
X 101	75954-012.08	TRANSFORMER (POS. 11)	

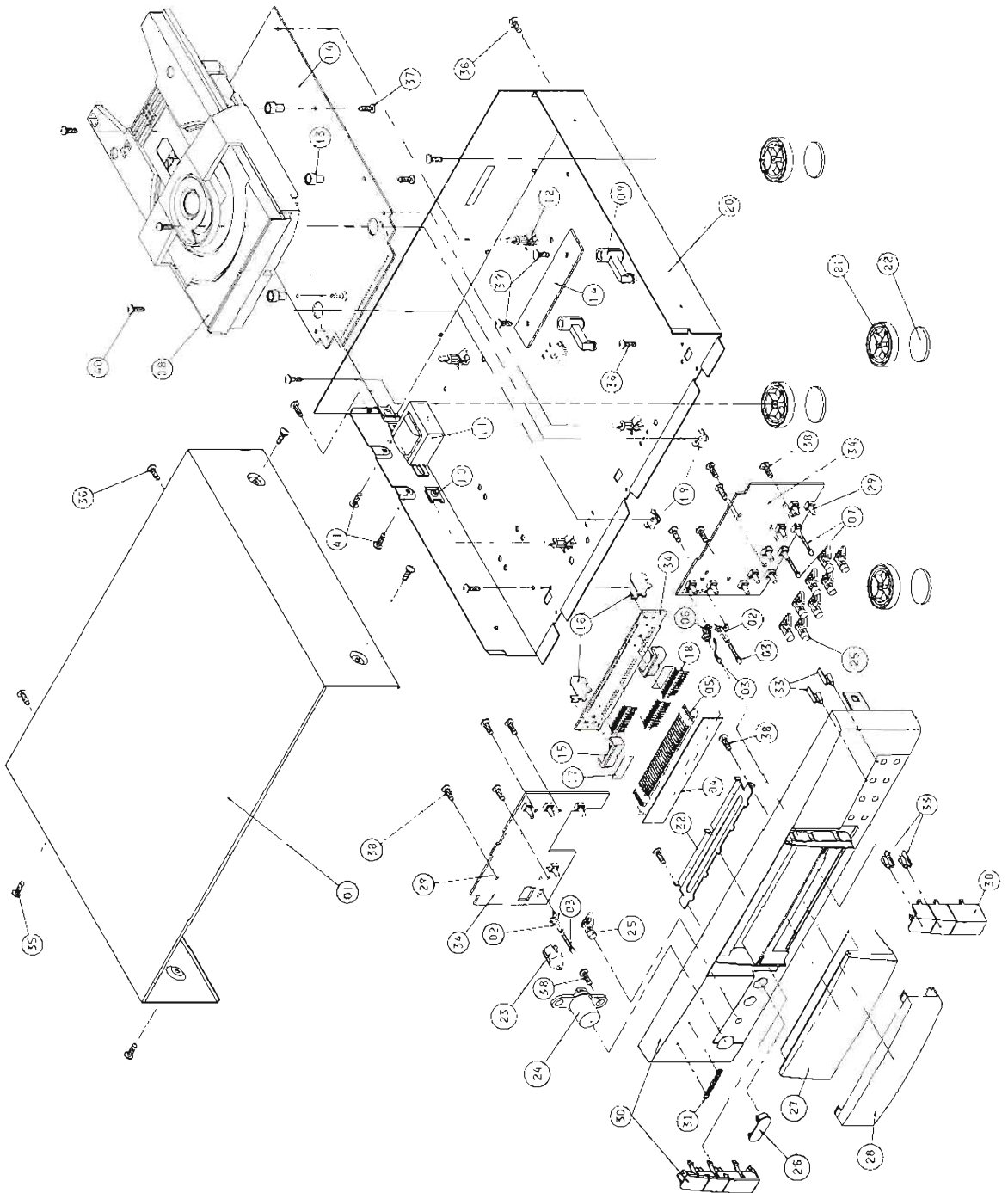
Es gelten die Vorschriften und Sicherheitshinweise gemäß dem Service Manual "Sicherheit", Sach-Nummer 72010-800.00, sowie zusätzlich die eventuell abweichenden, landesspezifischen Vorschriften!



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Explosionszeichnung
Exploded View
CD 120

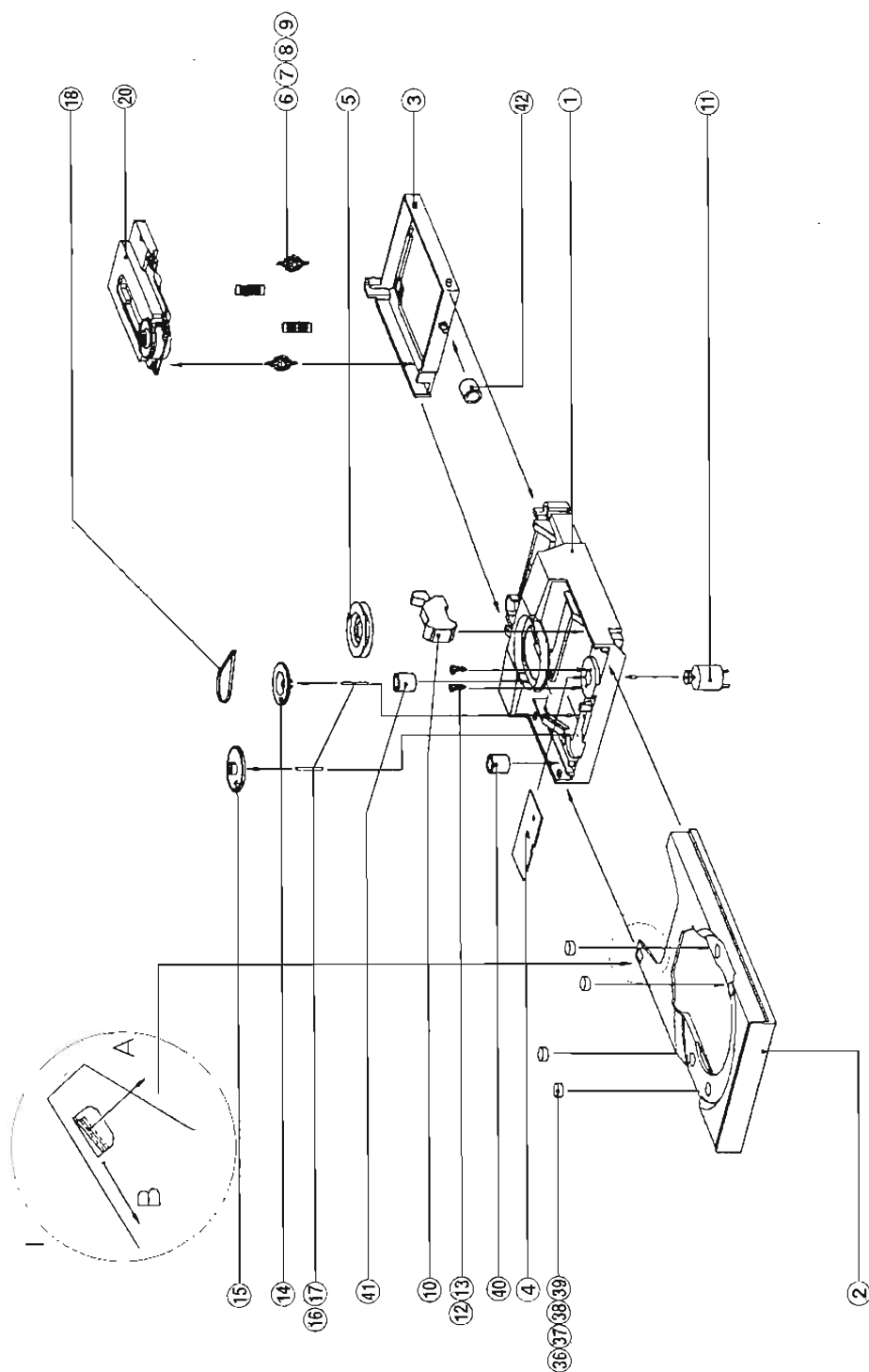
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CD-Einheit

CD Unit

2



GRUNDIGErsatzteilliste
Spare Parts List

D Btx * 32700 #

10 / 94

CCF 120

SACH-NR. / PART NO.: 9.79702-8151
BESTELL-NR. / ORDER NO.: G.DE 0351 SCHWARZ

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG D	DESCRIPTION GB
0003.000	1	75954-010.01	4	FUSS	FOOT
0004.000	1	75954-010.02	4	FILZ	FELT
0006.000	1	75952-055.04		GRUNDIG LOGO	GRUNDIG LOGO
0008.000	1	52301-130.00	2	FEDER 1 (TUER)	SPRING 1 (DOOR)
0009.000	1	52302-130.00	2	DREHFEDER 3 (TUER)	SPRING 3 (DOOR)
0010.000	1	52312-135.00	4	BLATTFEDER	LEAF SPRING
0013.000	1	75953-028.22	12	LED-LINSE, TASTEN L/R	LED LENS
0014.000	1	75952-055.03	9	TASTE, FUNKTION	KEY, FUNCTION
0015.000	1	52308-233.00		CASSETTENABDECKUNG, LINKS	CASSETTE COVER LEFT
0016.000	1	52308-234.00		CASSETTENABDECKUNG, RECHTS	CASSETTE COVER RIGHT
0017.000	1	52308-255.00	2	CASSETTENFENSTER	CASSETTE WINDOW
0018.000		52302-236.00	2	ZAHNRAD	FASTENING BEARING
0019.000	1	52302-237.00	2	ZAHNSTANGE	GEAR BAR
0020.000	1	52302-235.00		DECKELBREMSE 1	FASTENING BEARING 1
0021.000	1	52302-238.00		DECKELBREMSE 2	FASTENING BEARING 2
0023.000	1	59852-004.00	2	DRUCKSCHNAPPER	PRESSURE SNAPPER
0024.000	1	52308-250.00		LED-LINSE	LED LENS
0027.000	1	52308-254.00		DISPLAY-FENSTER	LED LENS
0028.000	1	75954-010.64		FRONTBLENDEN M.TASTENLEISTE L/R	FRONT MASK
0029.000	1	52308-231.00		CASSETTENTUER LINKS	CASSETTE DOOR LEFT
0030.000	1	52308-230.00		CASSETTENTUER RECHTS	CASSETTE DOOR RIGHT
		75954-010.63		VERBINDUNGSKABEL 13 P	CONNECTING CABLE
		75954-010.50		IR-GEBER	IR - REMOTE CONTROL
		59726-011.00	X	LAUFWERK A CRF 4111	TAPE DRIVE A CRF 4111
		72008-614.50	X	LAUFWERK B CRF 4134	TAPE DRIVE B CRF 4134
		72010-741.75		BEDIENUNGSANLEITUNG	INSTRUCTION MANUAL
		72010-741.40		SERVICE MANUAL	SERVICE MANUAL
				X = SIEHE GESONDERTE E-LISTE	X = SEE SEPARATE PARTS LIST

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
C 307	75952-030.17	ELKO 3300UF 16V	
C 308	8410-001-801	ELKO 2200UF 16V 105C	
C 309	75952-030.68	ELKO 1000UF 16V	
D 101	75952-030.43	SI-DIODE 1 N 4148	
D 102	75952-030.43	SI-DIODE 1 N 4148	
D 103	75952-030.43	SI-DIODE 1 N 4148	
D 104	75952-030.43	SI-DIODE 1 N 4148	
D 105	75952-030.43	SI-DIODE 1 N 4148	
D 106	75952-030.43	SI-DIODE 1 N 4148	
D 107	75952-030.43	SI-DIODE 1 N 4148	
D 108	75952-030.43	SI-DIODE 1 N 4148	
D 111	75952-030.43	SI-DIODE 1 N 4148	
D 201	75952-030.43	SI-DIODE 1 N 4148	
D 202	75952-030.43	SI-DIODE 1 N 4148	
D 211	75952-030.43	SI-DIODE 1 N 4148	
D 301	75952-030.43	SI-DIODE 1 N 4148	
D 302	75954-010.81	Z DIODE 5.6V 500MA	
D 303	75952-030.43	SI-DIODE 1 N 4148	
D 304	75952-030.46	Z DIODE 3.9 V 500MW	
D 305	8309-198-042	DIODE BAT 42 THO	
D 306	75952-030.43	SI-DIODE 1 N 4148	
D 307	75952-030.43	SI-DIODE 1 N 4148	
D 310	75952-030.43	SI-DIODE 1 N 4148	
D 311	75952-030.43	SI-DIODE 1 N 4148	
D 800-812	75952-030.04	LE DIODE	
D 808	75954-010.72	LE DIODE ROT	
F 124	75954-010.67	FILTER	
F 224	75954-010.67	FILTER	
F 225	75952-030.19	CER RESONATOR 4,00 MHZ	
IC 101	75954-003.57	IC MC 14066 BCP	
IC 102	75954-003.57	IC MC 14066 BCP	
IC 103	75987-555.41	IC UPC 1330 HA	
IC 104	8305-258-100	IC CXA 1100 P DIP SONY	
IC 105	75986-626.24	IC TA 8135 P	
IC 106	75954-010.69	IC 37471 M 4-433 SP	
IC 107	75954-010.82	IC LC 7932	
L 101	75954-010.68	SPULE	
L 102	75954-010.71	SPULE 10MH +-10%	
L 201	75954-010.68	SPULE	
L 202	75954-010.71	SPULE 10MH +-10%	
L 401	75954-010.66	OSZ.SPULE	
R 150 	75952-030.89	SI.-WIDERST.22 LCA	
R 230 	75952-030.89	SI.-WIDERST.22 LCA	
R 401 	75952-030.89	SI.-WIDERST.22 LCA	
S 800-818	75952-030.08	TAKTSCHALTER	
SVR 101	75954-010.86	ESTR 50KOHM	
SVR 102	75954-010.86	ESTR 50KOHM	
SVR 103	75954-010.88	ESTR.220KOHM	
SVR 104	75954-010.87	ESTR.20KOHM	
SVR 105	75954-010.84	ESTR.4,7KOHM	
SVR 108	75954-010.84	ESTR.4,7KOHM	
SVR 201	75954-010.86	ESTR 50KOHM	
SVR 202	75954-010.86	ESTR.50KOHM	
SVR 203	75954-010.88	ESTR.220KOHM	
SVR 204	75954-010.87	ESTR.20KOHM	

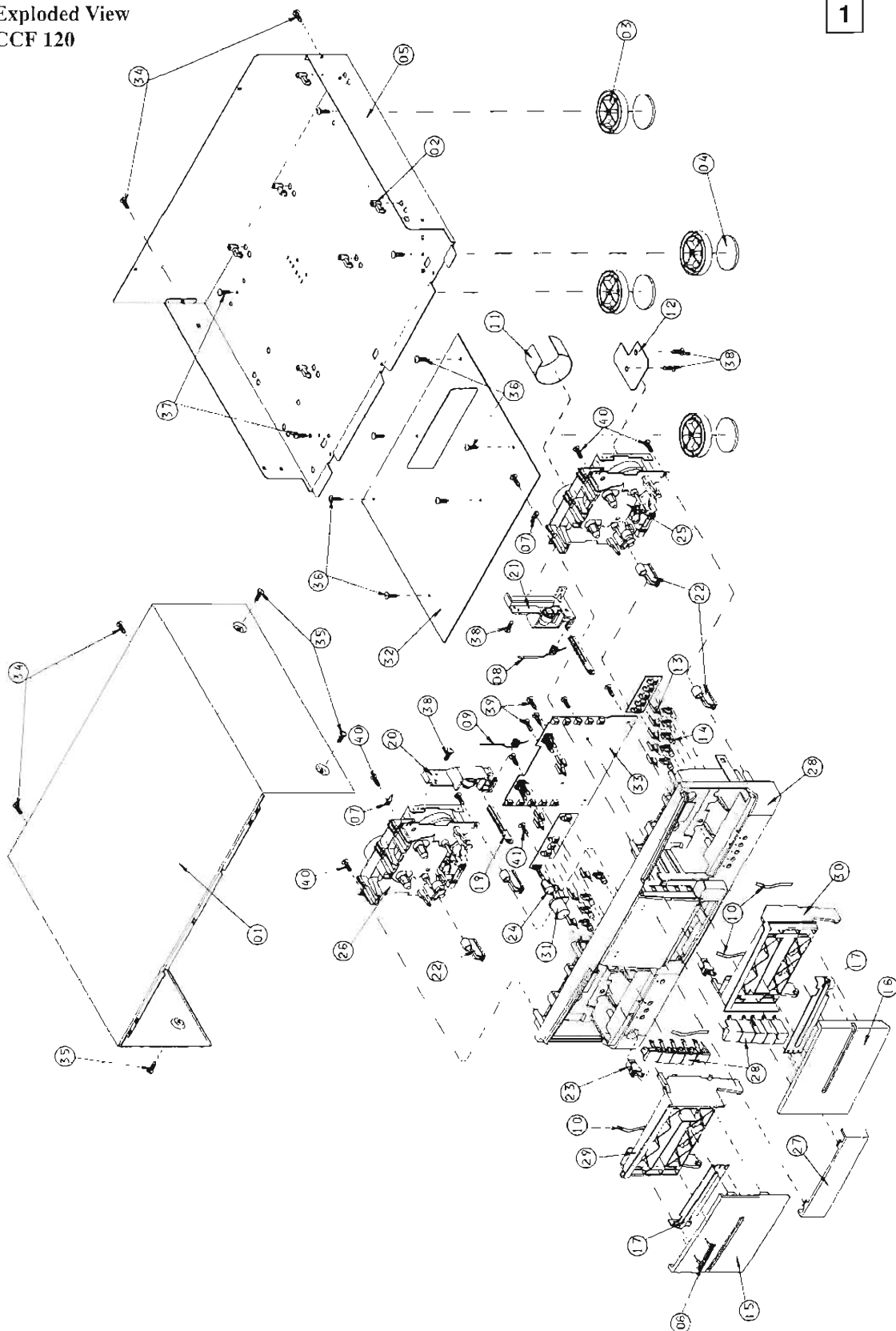
POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG DESCRIPTION	(D) (GB)
T 101	8303-267-550	TRANS.BC 550 C	
T 102	8303-267-550	TRANS.BC 550 C	
T 103	8303-267-550	TRANS.BC 550 C	
T 104	8303-206-548	TRANS.BC 548 C	
T 105	8303-206-548	TRANS.BC 548 C	
T 106	75952-030.39	TRANS.BC 548 B	
T 107	75952-030.38	TRANS.BC 558 B	
T 108	8303-206-548	TRANS.BC 548 C	
T 109	75952-030.38	TRANS.BC 558 B	
T 110	8303-206-548	TRANS.BC 548 C	
T 111	75952-030.38	TRANS.BC 558 B	
T 112	8303-206-548	TRANS.BC 548 C	
T 113	8303-206-548	TRANS.BC 548 C	
T 114	8303-283-338	TRANS.BC 338-40	
T 115	75952-030.41	TRANS.BC 338-25	
T 116	75952-030.38	TRANS.BC 558 B	
T 117	8303-206-548	TRANS.BC 548 C	
T 118	8303-206-548	TRANS.BC 548 C	
T 119	75952-030.39	TRANS.BC 548 B	
T 122	8303-206-548	TRANS.BC 548 C	
T 123	75952-030.38	TRANS.BC 558 B	
T 124	8303-206-548	TRANS.BC 548 C	
T 125	75954-010.79	TRANS.BC 337-225	
T 126	8303-283-338	TRANS.BC 338-40	
T 127	8303-283-338	TRANS.BC 338-40	
T 128	75952-030.39	TRANS.BC 548 B	
T 201	8303-267-550	TRANS.BC 550 C	
T 202	8303-267-550	TRANS.BC 550 C	
T 203	8303-267-550	TRANS.BC 550 C	
T 204	8303-206-548	TRANS.BC 548 C	
T 205	8303-206-548	TRANS.BC 548 C	
T 206	75952-030.39	TRANS.BC 548 B	
T 207	75952-030.38	TRANS.BC 558 B	
T 208	8303-206-548	TRANS.BC 548 C	
T 209	75952-030.38	TRANS.BC 558 B	
T 210	8303-206-548	TRANS.BC 548 C	
T 211	75952-030.38	TRANS.BC 558 B	
T 212	8303-206-548	TRANS.BC 548 C	
T 213	8303-206-548	TRANS.BC 548 C	
T 214	8303-283-338	TRANS.BC 338-40	
T 215	75952-030.41	TRANS.BC 338-25	
T 216	75952-030.39	TRANS.BC 548 B	
T 217	75952-030.39	TRANS.BC 548 B	
T 218	75952-030.39	TRANS.BC 548 B	
T 219	75952-030.38	TRANS.BC 558 B	
T 220	75952-030.38	TRANS.BC 558 B	
T 221	75952-030.39	TRANS.BC 548 B	
T 222	8303-267-550	TRANS.BC 550 C	
T 223	8303-267-550	TRANS.BC 550 C	
T 301	75952-030.39	TRANS.BC 548 B	
T 302	8303-272-327	TRANS.BC 327-25	
T 305	75952-030.39	TRANS.BC 548 B	
T 306	8303-284-636	TRANS.BC 636	
T 307	75952-030.39	TRANS.BC 548 B	
T 308	8303-284-636	TRANS.BC 636	
T 309	75952-030.39	TRANS.BC 548 B	
T 310	8303-272-327	TRANS.BC 327-25	
T 313	75952-030.38	TRANS.BC 558 B	
T 314	75952-030.38	TRANS.BC 558 B	
T 315	75952-030.38	TRANS.BC 558 B	
T 316	75952-030.39	TRANS.BC 548 B	

Explosionszeichnung

Exploded View

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1



GRUNDIGErsatzteilliste
Spare Parts ListAUDIO
CASSETTE 

D Btx * 32700 #

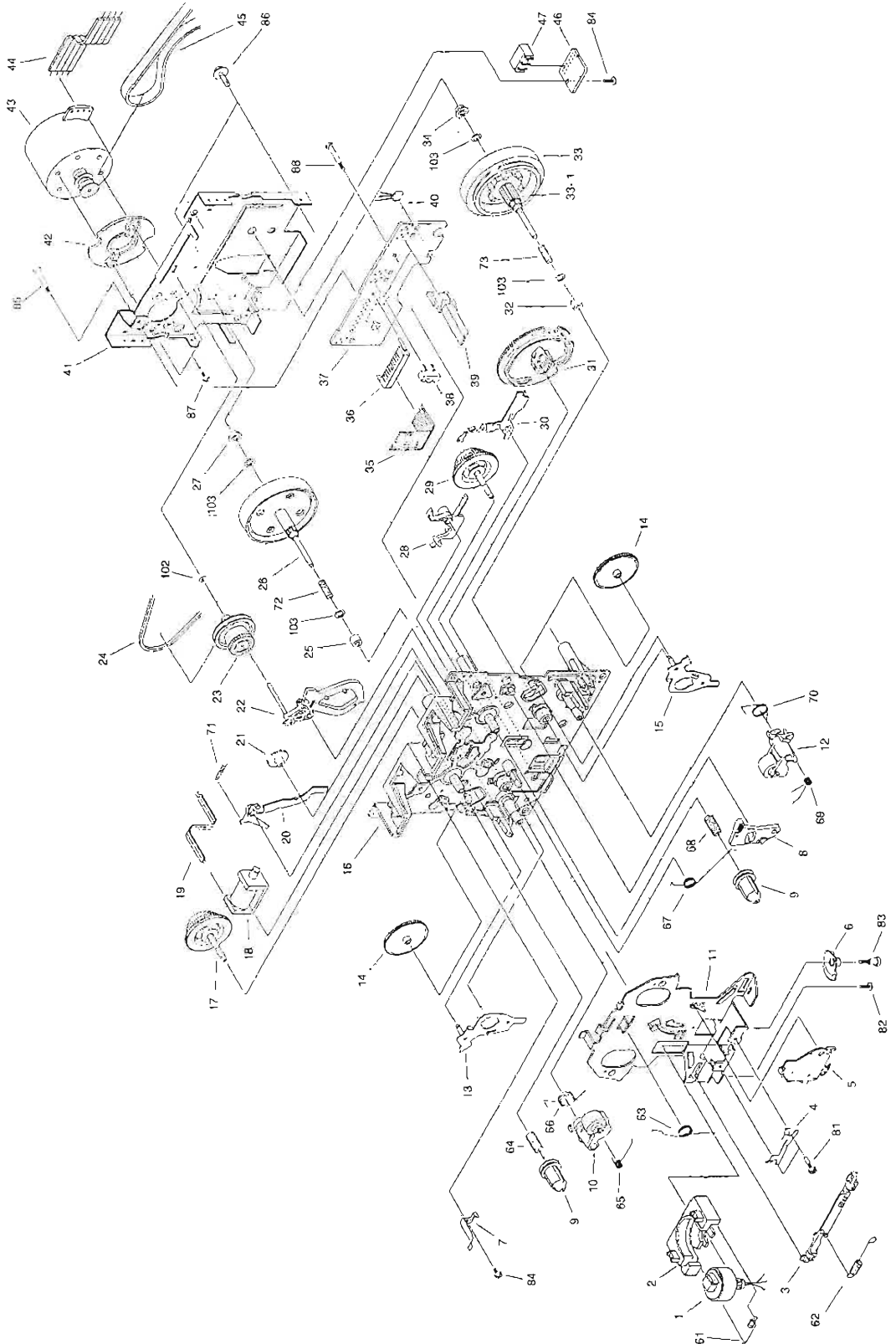
12 / 93

LAUFWERK
CRF 4111

SACH-NR. / PART NO.: 59726-011.00

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
0001.000	1	72008-614.61		WIEDERGABEKOPF	P/HEAD
0002.000	1	72008-614.49		KOPFHALTER	HEAD HOLDER
0003.000	1	72008-614.51		HEBEL	LEVER
0004.000	1	72008-418.47		FEDER	SPRING
0006.000	1	72008-614.52		ZAHRNAD	GEAR WHEEL
0007.000	1	72008-614.01		FEDER	SPRING
0008.000	1	72008-614.28		AUSWURFHABEL	EJECT LEVER
0009.000	1	72008-614.02	2	KUPPLUNGSKAPPE	CAP
0010.000	1	75951-018.96		ANDRUCKROLLE KPL. LINKS	PINCH ROLLER
0012.000	1	75951-018.97		ANDRUCKROLLE KPL. RECHTS	PINCH ROLLER
0014.000	1	72008-614.03	2	ZAHRNAD	GEAR WHEEL
0017.000	1	75951-018.98		RUECKLAUFKUPPLUNG KPL.L.	REWIND CLUTCH
0018.000	1	72008-614.06		BREMSLUEFTMAGNET	BRAKE LIFTING SOLENOID
0021.000	1	72008-614.07		ZAHRNAD	GEAR WHEEL
0022.000	1	72008-614.31		UMSCHALTHEBEL	SWITCH-OVER LEVER
0023.000	1	72008-614.08		PULLY	PULLEY
0024.000	1	75951-018.42		RIEMEN	BELT
0025.000	1	72008-614.47		CAPST.LAGER	CAPSTAN BEARING
0026.000	1	72008-614.62		SCHWUNGRAD, LINKS KPL	FLYWHELL
0027.000	1	72008-418.16		BUCHSE	SOCKET
0028.000	1	72008-614.32		ARM-HEBEL	LEVER
0029.000	1	75951-018.44		VORLAUFKUPPLUNG KPL.R.	FORWARD CLUTCH
0030.000	1	72008-614.44		FUEHLHEBEL	SENSING LEVER
0031.000	1	72008-614.09		ZAHRNAD	GEAR WHEEL
0032.000	1	72008-614.33		LAGER	BEARING
0033.000	1	72008-614.11		SCHWUNGRAD	FLYWHELL
0033.100	1	72008-614.12		ZAHRNAD	GEAR WHEEL
0034.000	1	72008-418.15		BUCHSE	SOCKET
0038.000	1	72008-614.13		SCHALTER, MODE	SWITCH, MODE
0039.000	1	72008-417.46	2	KONTAKTFEDERSCHALTER	CONTACT SPRING SWITCH
0040.000	1	72008-418.38		IC DN 6851 A	IC DN 6851 A
0043.000	1	72008-614.14		MOTOR KPL.	MOTOR
0044.000	1	72008-417.21		KABEL	CABLE
0045.000	1	72008-614.54		ANTRIEBSRIEMEN	DRIVE BELT
0061.000	1	72008-614.37		FEDER	SPRING
0062.000	1	72008-614.38		FEDER	SPRING
0063.000	1	72008-614.18		FEDER	SPRING
0064.000	1	72008-614.19		FEDER	SPRING
0065.000	1	72008-614.39		FEDER	SPRING
0066.000	1	72008-614.41		FEDER	SPRING
0067.000	1	72008-614.22		FEDER	SPRING
0068.000	1	72008-614.21		FEDER	SPRING
0069.000	1	72008-614.23		FEDER	SPRING
0070.000	1	72008-614.24		FEDER	SPRING
0071.000	1	72008-614.42		FEDER	SPRING
0072.000	1	72008-417.78		DRUCKFEDER	PRESSURE SPRING
0073.000	1	72008-614.27		FEDER	SPRING
0081.000	1	72008-417.70		SCHRAUBE	SCREW
0082.000	1	72008-418.27		SCHRAUBE	SCREW
0083.000	1	72008-418.43		SCHRAUBE	SCREW
0084.000	1	72008-417.54	2	SCHRAUBE	SCREW
0087.000	1	72008-614.46	2	SCHRAUBE	SCREW
0102.000	1	72008-614.53		OELFANGSCHEIBE	OIL STOP WASHER
0103.000	1	72008-614.36	4	SCHEIBE	WASHER
		59726-011.00		LAUFWERK KPL.	TAPE DRIVE ASSY

Laufwerk A
Drive Mechanism A
CRF 4111



GRUNDIGErsatzteilliste
List of spare partsAUDIO
CASSETTE 

D Btx * 32700 #

LAUFWERK B CRF 4134

SACH-NR. / PART NO.: 59726-003.00

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG 	DESCRIPTION 
0001.000		72008-614.48		WIEDERGABEKOPF KPL.	P/ HEAD
0002.000		72008-614.49		KOPFHALTER	HEAD HOLDER
0003.000		72008-614.51		HEBEL	LEVER
0004.000		72008-418.47		FEDER	SPRING
0006.000		72008-614.52		ZAHNRAD	GEAR WHEEL
0007.000		72008-614.01		FEDER	SPRING
0008.000		72008-614.28		AUSWURFHEBEL	EJECT LEVER
0009.000		72008-614.02	2	KUPPLUNGSKAPPE	CAP
0010.000		75951-018.96		ANDRUCKROLLE KPL. LINKS	PINCH ROLLER
0012.000		75951-018.97		ANDRUCKROLLE KPL. RECHTS	PINCH ROLLER
0014.000		72008-614.03	2	ZAHNRAD	GEAR WHEEL
0017.000		75951-018.98		RUECKLAUFKUPPLUNG KPL.L.	REWIND CLUTCH
0018.000		72008-614.06		BREMSLUEFTMAGNET	BRAKE LIFTING SOLENOID
0021.000		72008-614.07		ZAHNRAD	GEAR WHEEL
0022.000		72008-614.31		UMSCHALTHEBEL	SWITCH-OVER LEVER
0023.000		72008-614.08		PULLY	PULLEY
0024.000		75951-018.42		RIEMEN	BELT
0025.000		72008-614.47		CAPST.LAGER	CAPSTAN BEARING
0026.000		72008-614.43		SCHWUNGRAD KPL.	FLYWHEEL
0027.000		72008-418.16		BUCHSE	SOCKET
0028.000		72008-614.32		ARM-HEBEL	LEVER
0029.000		75951-018.44		VORLAUFKUPPLUNG KPL.R.	FORWARD CLUTCH
0030.000		72008-614.44		FUEHLHEBEL	SENSING LEVER
0031.000		72008-614.09		ZAHNRAD	GEAR WHEEL
0032.000		72008-614.33		LAGER	BEARING
0033.000		72008-614.11		SCHWUNGRAD	FLYWHEEL
0033.100		72008-614.12		ZAHNRAD	GEAR WHEEL
0034.000		72008-418.15		BUCHSE	SOCKET
0038.000		72008-614.13		SCHALTER, MODE	SWITCH, MODE
0039.000		72008-417.46		KONTAKTFEDERSCHALTER	CONTACT SPRING SWITCH
0040.000		72008-418.38		IC DN 6851 A	IC DN 6851 A
0043.000		72008-614.14		MOTOR KPL	MOTOR
0044.000		72008-417.21		KABEL	CABLE
0045.000		72008-614.54		ANTRIEBSRIEMEN	DRIVE BELT
0061.000		72008-614.37		FEDER	SPRING
0062.000		72008-614.38		FEDER	SPRING
0063.000		72008-614.18		FEDER	SPRING
0064.000		72008-614.19		FEDER	SPRING
0065.000		72008-614.39		FEDER	SPRING
0066.000		72008-614.41		FEDER	SPRING
0067.000		72008-614.22		FEDER	SPRING
0068.000		72008-614.21		FEDER	SPRING
0069.000		72008-614.23		FEDER	SPRING
0070.000		72008-614.24		FEDER	SPRING
0071.000		72008-614.42		FEDER	SPRING
0072.000		72008-417.78		DRUCKFEDER	PRESSURE SPRING
0073.000		72008-614.27		FEDER	SPRING
0081.000		72008-417.70		SCHRAUBE	SCREW
0083.000		72008-418.43		SCHRAUBE	SCREW
0084.000		72008-417.54		SCHRAUBE	SCREW
0087.000		72008-614.46		SCHRAUBE	SCREW
0102.000		72008-614.53		OELFANGSCHEIBE	OIL STOP WASHER
0103.000		72008-614.36		SCHEIBE	WASHER
		59726-003.00		LAUFWERK KPL.	TAPE DRIVE ASSY

Laufwerk B **Drive Mechanism B** **CRF 4134**

