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CE

CD-JUKEBOX

CDM 12

FULL
SERVICE
CAT. "OMT"

OPERATING INSTRUCTIONS

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Warning

Although the beam emitted by the laser diodes is nearly invisible, it may cause severe damages to the human eye.

Use an infrared indicator to check the laser beam.



Caution

The CD mechanism and many ICs are extremely susceptible to electrostatic discharges. The photo diodes and the laser diode are more sensitive to discharges than MOS ICs. Careless handling may immediately destroy components or can drastically reduce life expectancy of these components so that it will lead to failure after several weeks or even months of use.

Before you touch the Player, discharge your hands and tools by touching a grounded metal part of the jukebox, such as the amplifier or the mechanic chassis. Make sure that you are connected via a wrist wrap with resistance to the same potential as the chassis of the jukebox. Keep parts and tools at the same potential.

If you remove the player in case of repair or for transport, short the harness with a short circuit plug.

When repairing, observe to the valid safety rules.

Do not change the original condition of the jukebox.

Use original spare parts only.



Subject to alterations.


I. First Installation

1.1. Unlocking

The key is stored in the coin return cup in the RH cabinet wall. The key WUA 1 or WUA 2 (New York) unlocks the cabinet by turning the key clockwise. The lock is spring loaded, press slightly against the door, this allows to turn the key easily. The two other keys with 5 digit number codes unlock the cash box at the bottom of the RH cabinet wall.

1.2. Removal of shipping guards

1. The mechanism platform is fixed to cabinet support with one bolt in front LH side and one bolt back RH side (Fig.1, Pos. 1). Remove both completely using a 13 mm spanner. Possibly you can use the tool being fixed to the lid of the gear box (Fig.1, Pos. 2).
2. Remove plastic string at the pivot point of the pressure arm (Fig.1, Pos. 3).
3. Remove plastic holder securing CD player chassis (Fig.1, Pos. 4).
4. Remove foam (Fig.1, Pos. 5), foam foil (Fig.1, Pos. 6) securing laser head in CD player and instruction plate (Fig.1, Pos. 7).
5. Remove foam between magnetic pressure disc and black plastic cover (Fig.1, Pos. 8)
6. Remove elastic band from the motor page systems (One More Time and New York, NY only).

 **IMPORTANT:** Save the removed shipping bolts and CD-chassis shipping guards. You may need them should you decide to move your machine to another location. The jukebox should never be moved, (a significant distance), without the shipping bolts and CD player secured with foam between pressure arm and player. Discs should also be removed from the carrier for transport.

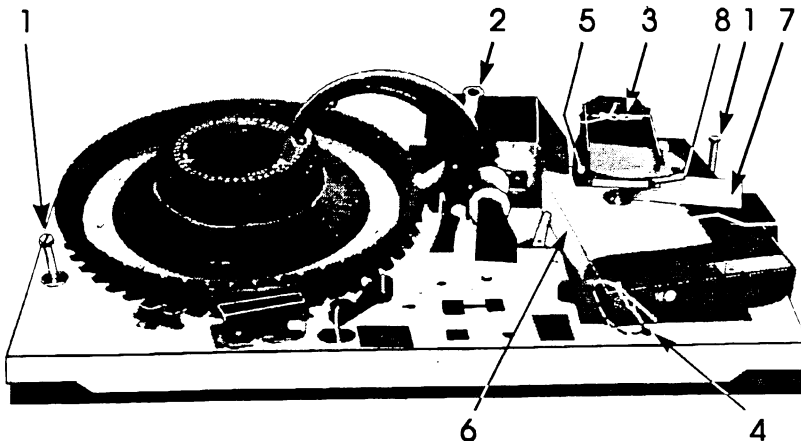


Fig. 1

1.3. Verification of mains voltage

Machines for USA are set to 117 V. Jukeboxes "UNI-Pack" are shipped in 230 V setting. This is marked on the machine label on the rear wall. Other machines with indication 100 - 240 V on the label have a transparent cover on the mains transformer so that the terminals 1 - 3 - 5 - 7 - 9 are indicating mains voltage setting.

The following combinations are possible:

240 V = 1 and 3
 230 V = 1 and 5
 220 V = 9 and 3
 210 V = 9 and 5
 117 V = 1 and 7
 100 V = 9 and 7

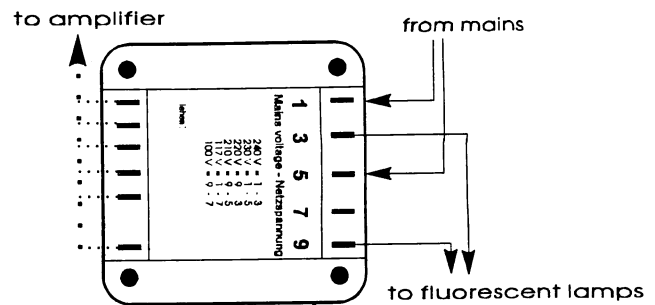


Fig. 2

The power consumption in standby is 146 Watts. With max. volume it is 205 Watts.



IMPORTANT: Some parts of the electrical circuitry are connected to the power line (power transformer, fluorescent tube, ballast and associated wiring).
 Never attempt any intervention to these parts unless qualified.

Always remove mains plug before opening plastic cover.

II. Set-up to play



IMPORTANT! Make sure that wall socket is earthen properly.

2.1. Mains connection.

The CD-jukebox operates on normal household power outlet. Set mains switch at rear wall of cabinet to on position (Fig. 6). If the selection and credit memory is empty the basket turns once and the left two digits show alternatingly a "0". After a short time the display counts up to the carrier size in the two RH digits (50 or 00 for 100 discs). After this the basket stops in position "01". The digital display shows "0 0 0 0", then "0 0 0 1" when a basket with 100 CDs is used, "0 1 0 1" for a 50 CD carrier.

2.2. Compact disc handling precautions

Dust, fingerprints or other dirt on the disc surface can cause skipping, jumping or sticking problems. Dust can be removed with a lintfree soft cloth. If necessary, remove heavy dirt or fingerprints with a moistened soft cloth, using a diluted neutral detergent. Never use record cleaning sprays or anti static sprays! Furthermore, do not use other types of cleaners containing benzene, thinner or other solvents. These liquids will cause damage to the surface of discs.

NEVER TOUCH THE SURFACE OF THE DISC !

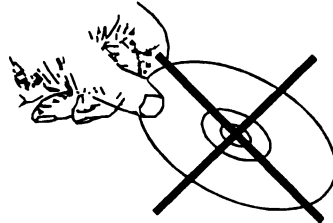


Fig. 3

2.3. Loading compact discs

Insert up to 50 or 100 CDs, depending on the compartments in the carrier. Start with 01. The "Label" must show always to the left, towards the next lowest number. To achieve the optimum position for loading, press in steps the lever "rotate carrier" ("Korb drehen"). (Fig. 4). If less than 50 (100) discs are used, the number of discs used has to be programmed in the service program service level 1, button 5 (ref. to chap. 2.8, page 8).

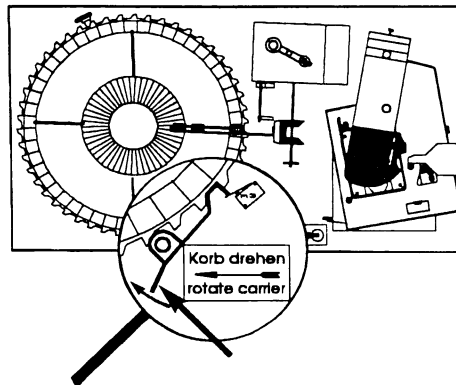


Abb. 4

It is recommended to insert the Compact Disc and then the title page into the appropriate numerical slot position of the motor page system. The pages can be turned manually by hand without any damage of the motor drive. In some models the transparent dust cover of the record carrier has to be lifted up at the front, it will rest in this position.



IMPORTANT: For carriers with 100 CDs the position "00" is the 100th CD.

To play single CDs (Ø 80 mm, diam. 3 1/8 ") specified adapter rings are available under part no. 0032943.

2.4. First test of the jukebox

1. At the rear wall inside of the jukebox cabinet the so-called Selection & Credit Computer is situated. Some units are equipped with a metal cover which has to be removed before starting this test.
2. Set a jumper from 0 to F (free play) in the row GP (Fig. 5, Pos. 1). Jumpers are found in the accessory bag of the service manual. If a jumper is already set in this row memorise its position.
3. Press button LT on the S&CC unit (Fig. 5, Pos. 2).

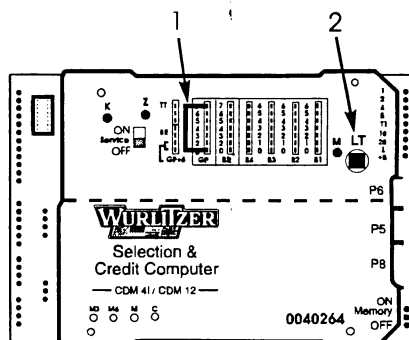


Fig. 5

4. Make a selection with four digits: First enter the number of the CD with two digits, then the track with two digits. After this the digital display will show the selected CD and track (track numbers higher than 25 will not be accepted).
5. The CD carrier rotates and stops at the selected position, then the gripper arm takes the CD onto the turn table. The track can be heard after the CD starts to turn.

- The volume can be controlled with one of the two volume control knobs at the rear side of the jukebox (Fig. 6).
Or: If a infrared remote control is installed by the factory, the volume can be controlled via the hand transmitter, stored in the money bag of the cash box.

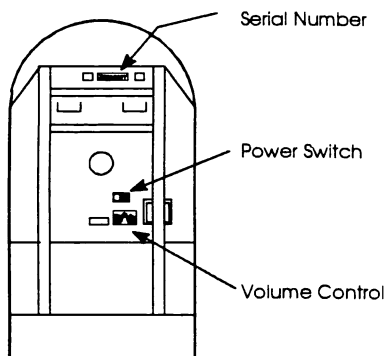


Fig.6

- Press button 'Cancel' between the two volume control knobs or at the remote control.
- The played track will be interrupted and the CD is rejected to the carrier.
- Relocate the jumper in row GP from 0 to F to the origin position. Press button LT on the S&CC unit.
- If less than 50 res. 100 CDs have been loaded in the carrier, the max. number of CDs has to be reprogrammed. Factory setting is 50 res. 100 CDs (Reprogramming ref. to chapt. 2.8, page 8)
- The jukebox is now ready for operation. Coin insertion according the coin denomination label is now possible when a coin validator is installed. For 'Unipack' versions the following steps are necessary:

2.5. Price setting



NOTICE: It is not necessary to program prices on the 'Hideaway' model.

In the „Unipack“ version no play prices are pre-set. Usually the prices are presetted by the factory according the denomination label. If other combinations are required, refer to the examples shown in figure 7a. To set the play prices do the following steps:

- Switch on the jukebox.
- Coin output plugs (Fig. 7, Pos. 1) should be set as shown in Fig. 9 or on an separate attached instruction by connecting to the pin row (Fig. 7, Pos. 2) on the S&CC unit. Pay attention to wiring colours.

3. Set the attached jumpers in B1 to B4, GP, BS (Fig. 7, Pos. 3) according to Fig. 8.
4. Press "LT" button (Fig. 7, Pos. 4) to accept the new bonus setting.

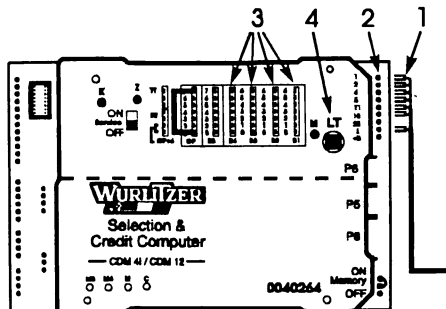


Fig. 7

2.6. Examples for price settings

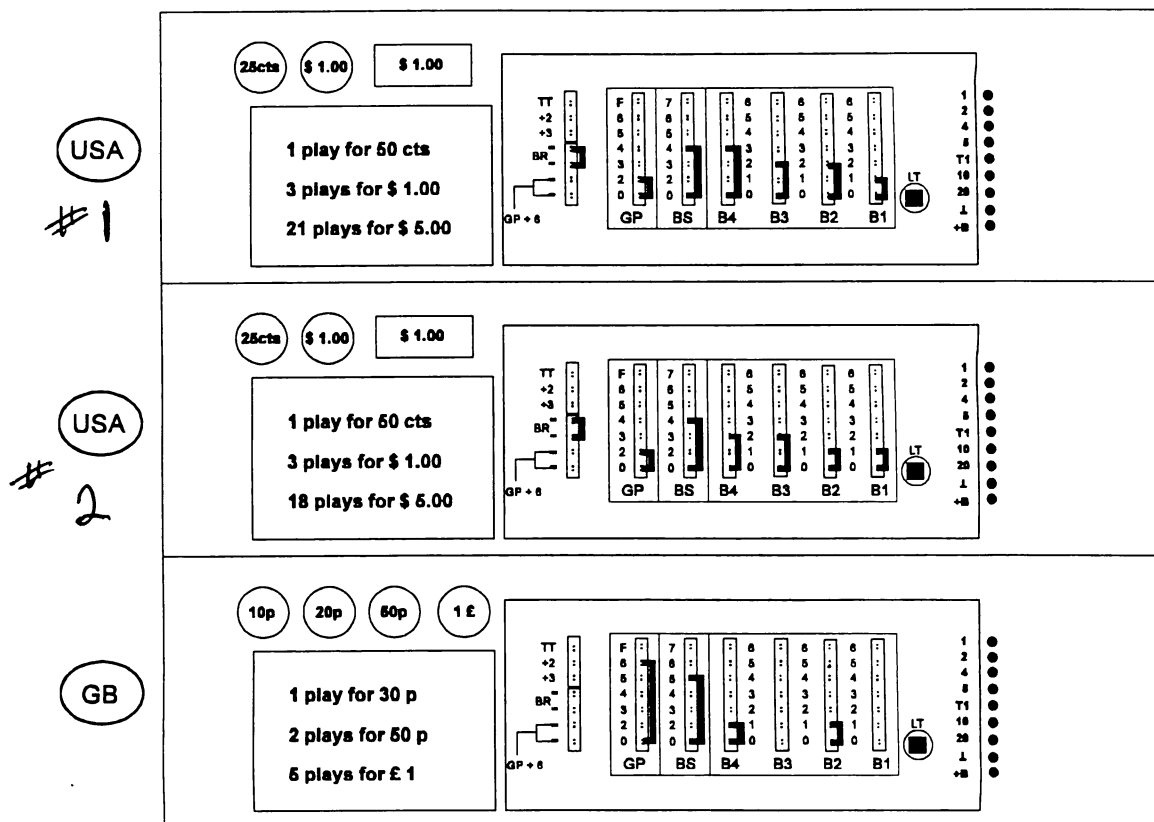


Fig. 8

2.7. Colour codes of coin inputs

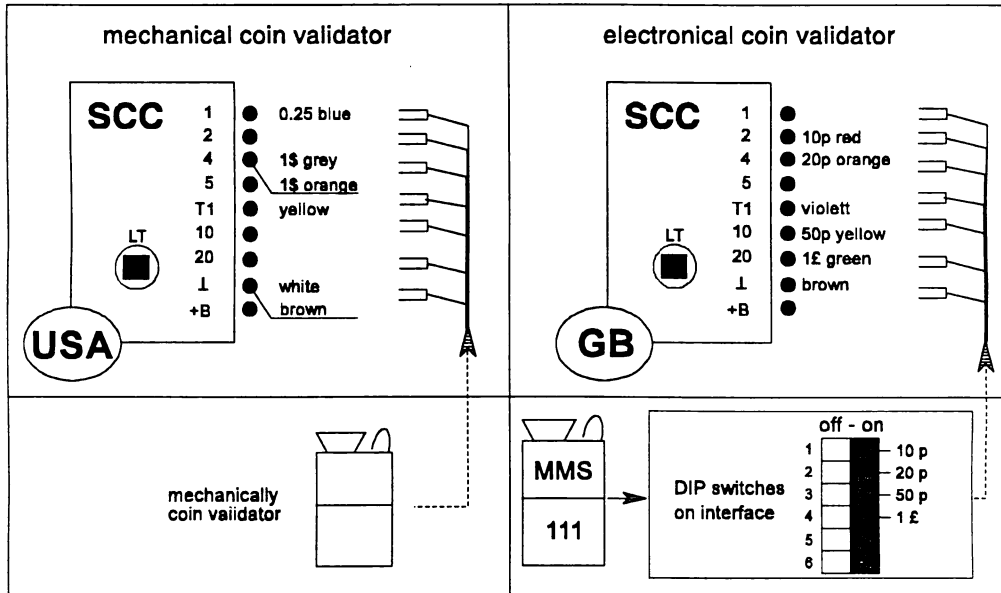


Fig. 9

2.8. Programming number of discs in carrier

It is necessary to reprogram the number of CDs in carrier if a number less than 50 or 100 discs are inserted.

1. Set the 'SERVICE' switch to position ON.

2. Press 'LT' button.

3. Press button 5: digital display shows: or

The 2 LH digits show the number of discs used (default value = 50 or 00, for carriers with 50 or 100 discs).

In the 2 RH digits the display shows the interval between the play stimulator tracks in minutes (default value = 00 = play stimulator switched off).

4. To reprogram: Hold button 5 and press button R; the display goes off; now enter a 4 digit number. First two digits for the number of inserted CDs, then the two other digits for the play stimulator repeat time.

In play stimulator mode the jukebox plays random tracks after the end of the last play of a selected CD. The repeat time is programmable between 1 and 98 minutes.

The programming of the play stimulator is described in chapter 5.5, starting page 15.

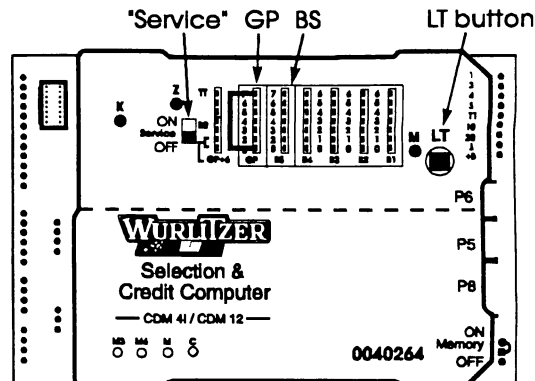


Fig. 10

2.9. Free play programming

Set a jumper from 0 to F (free play) in the row GP on the S&CC unit and press button LT.

Now one track is selectable without coin insertion.

In between two to six plays are selectable by setting an additionally jumper in the row 'BS' (Bonus-Stufe, Bonus Step) from 0 to 2 or from 0 to 6.

Up to 47 titles are pre-selectable by setting a jumper in this row 'BS' from 0 to 7 (ref. to Fig. 10).

2.10. Test credit

For repair and test purposes it is possible to give test credits. These credits will not be stored in the internal cash counter. At each pressing of the test credit button one credit will be given and also displayed in the digital display.

If an electronically coin validator is installed the test credit button is situated on the coin validator interface board. In jukeboxes with mechanical coin validator the test credit button is mounted over the return lever inside.

The test credit input is marked on the S&CC unit as T1.

Not used test credits can be erased by pressing the button 'LT' on the S&CC unit.

III. Amplifier

3.1. Volume control

The volume control of the amplifier, accessible from the rear of the jukebox, is a separate unit and is connected to the amplifier via a DIN 45322 plug. This unit (Fig. 11) can be screwed off and may be used as a remote control.

Its 5-line ribbon cable may be extended as required with any kind of wire. The voltage of the control wires is 5V DC. The control has two volume knobs. One for the left hand channel (L) and one for the right hand channel (R).

In mode 'stereo' (switch S in position stereo) only the left knob is effective. In position '2 Kanal' (two channel) of the slide switch both channels are controllable separately.

An internal automatic volume controller (Fig. 12, Pos. 5) decreases the volume level CDs recorded too loudly to a defined output level, so that an equal volume level is reached. The ALC pot is pre-set from the factory. In left position of the adjustment pot the ALC does not operate.

The separate 'Cancel' button (C) allows to reject a playing track.

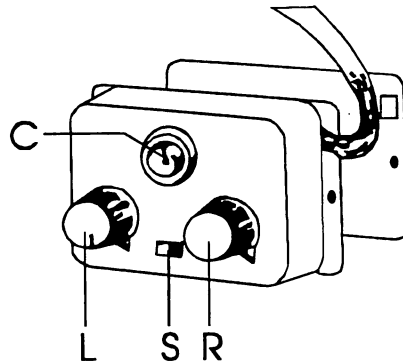


Fig. 11

3.2. Treble and bass controls

The Treble and the Bass Controls (Fig. 12, Pos. 1 and 2) at the top RH-side of the amplifier may be set to any position to suit local acoustic requirements. The Mono-Stereo Switch (Fig. 12, Pos. 3) may also be set to either position, however, it must be set to 'Stereo' if a stereophonic reproduction is desired.

3.3. Slide switch "Stereo/2-Kanal"

In common operating mode the slide switch "Stereo/2-Kanal" (Fig. 12, Pos. 4) is in position "Stereo".

In position "2-Kanal" the cabinet speakers of the jukebox are switched to the left amplifier channel. Both sockets for the external speakers are switched to the right amplifier channel.(Fig. 13).

If the slide switch of the volume control unit is switched to "2-Kanal" a separate control of both cabinet speakers and external speakers (e.g. in another room) is possible (left knob for inside, right one for outside). The slide switch "Mono-Stereo" (Fig. 12, Pos. 3) has to be set to mode "Mono".

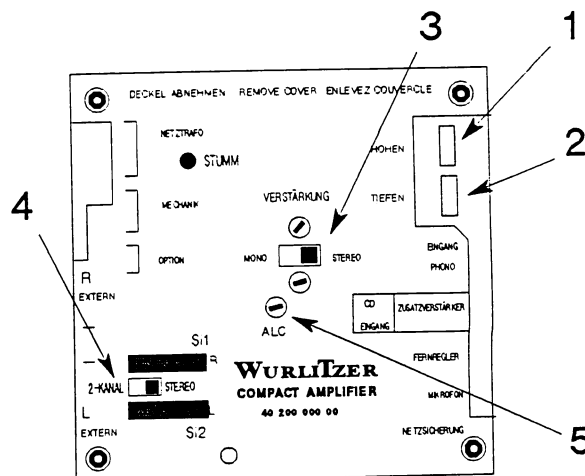


Fig. 12

3.4. Maximum amplifier load and external speakers

The amplifier may not be loaded with more than 4 Ω per channel (less Ohms means more load!). If the amplifier is operating in 2-Channel mode, the speakers are all loaded to the left hand channel.

The impedance of all external speakers per channel in "Stereo" mode should not be less than 8 Ω, because the cabinet speakers represent a load of already 8 Ω per channel.

If the amplifier is operating in 2-Channel mode, the speakers are all loaded to the left hand channel. The right channel (now switched to the sockets "R-Extern" and "L-Extern") now may be loaded with a minimum of 4Ω.

The output to a 4 Ω load is 70 Watts sinus power at 1 % distortion, to 12 Ω it is about 24 Watts, to 24 Ω it is about 12 Watts. That means, that e.g., a 12Ω speaker connected to the external channel at Dual Channel operation must be a type of at least 24 Watts, otherwise the speaker is in danger of destruction at higher volumes. Speaker groups, so-called hi-fi boxes, may have, at certain frequencies, impedances much lower than their rating.

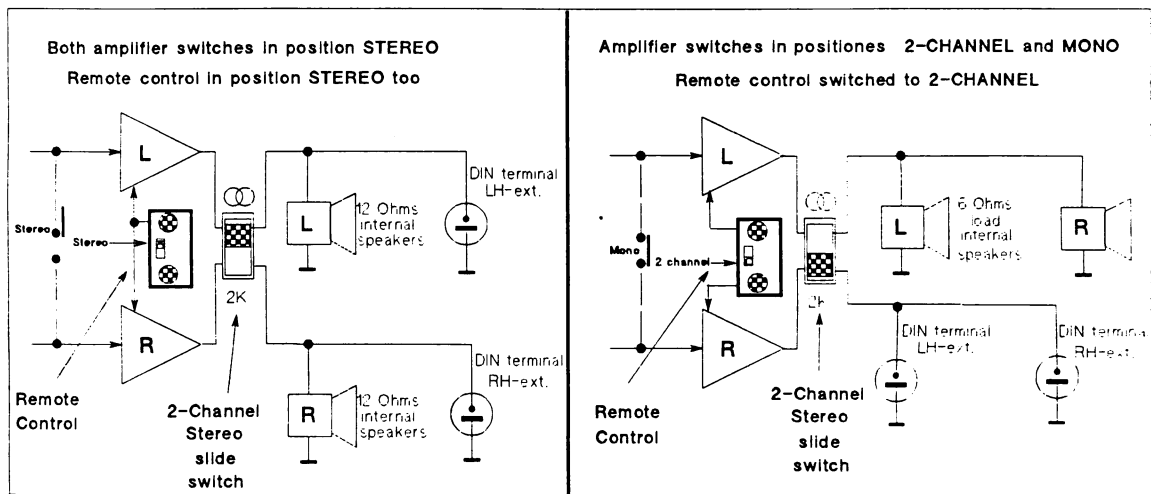


Fig. 13

3.5. Connection of external speakers

Additional speakers may be connected via two speaker DIN plugs to the amplifier.

Caution: In "Stereo" mode do not connect a single speaker with less than 8 Ω to the amplifier! Or: Connect two speakers of 4 Ω in series representing a total impedance of 8 Ω.

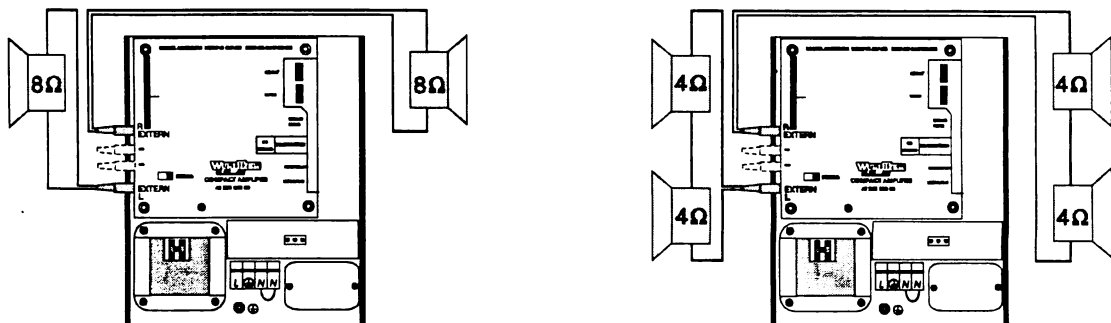
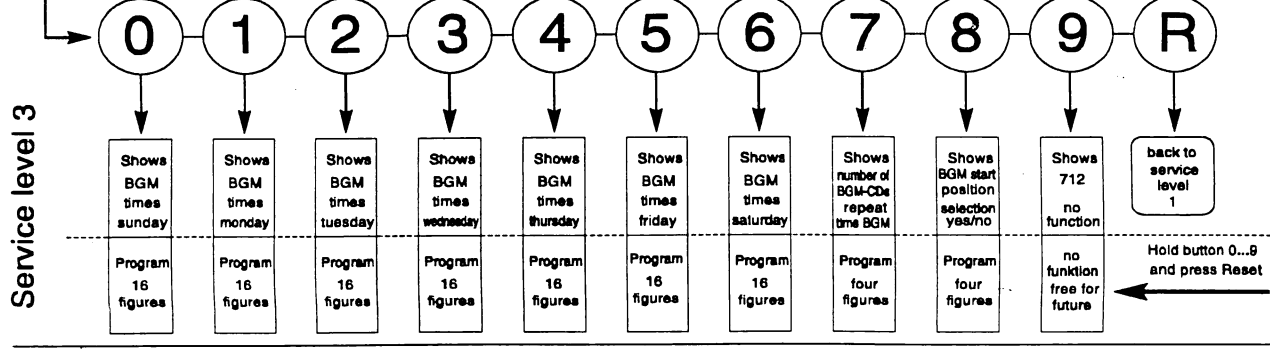
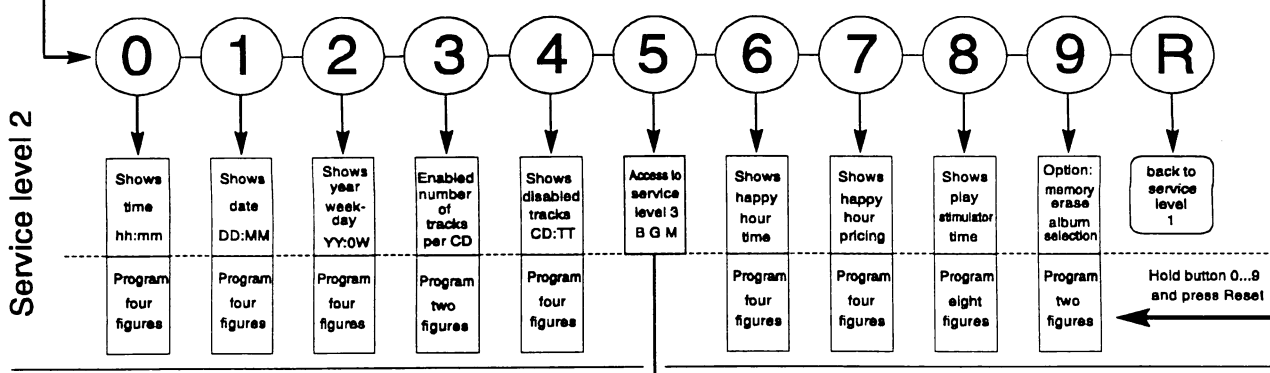
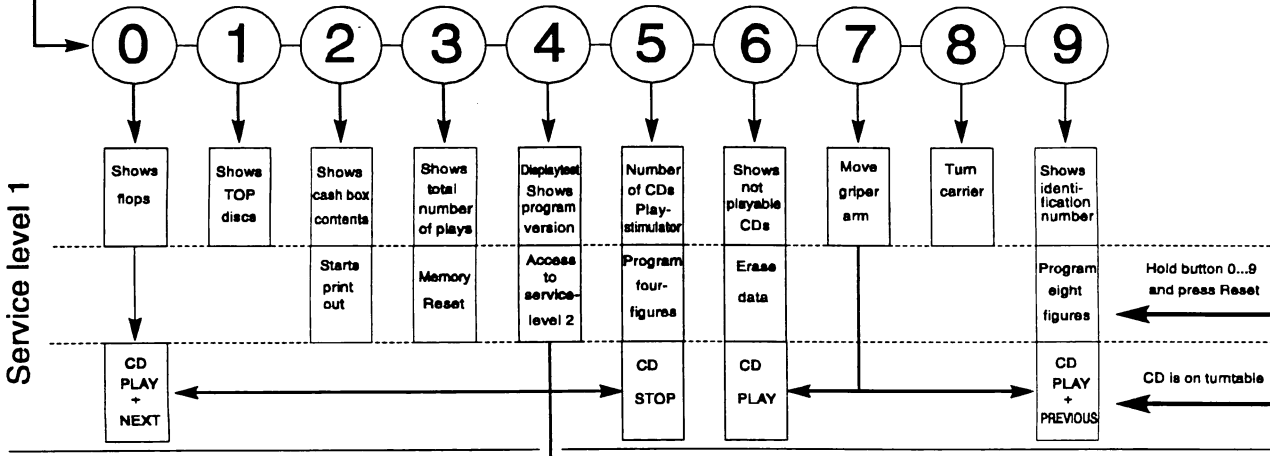


Fig. 14

IV. Programming short view

JUKEBOX O. K.

Serviceswitch to ON
Press LT button



V. Jukebox programming

Additional features like Playstimulator, BGM time and Happy Hour time are programmable. These features are programmable in the service mode of the S&CC unit. To keep the data stored when power is off the plug "Memory" (Fig. 21) must be set to "ON" position on the S&CC unit, otherwise all programmed data in service levels are reset when power is interrupted.

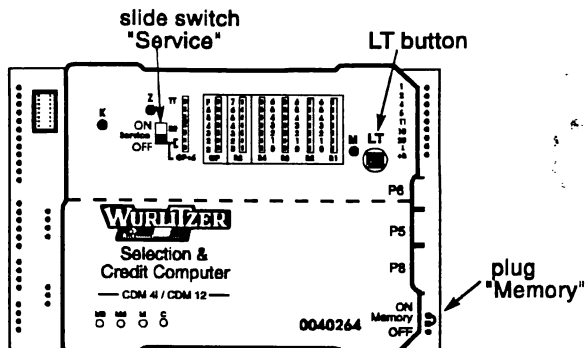
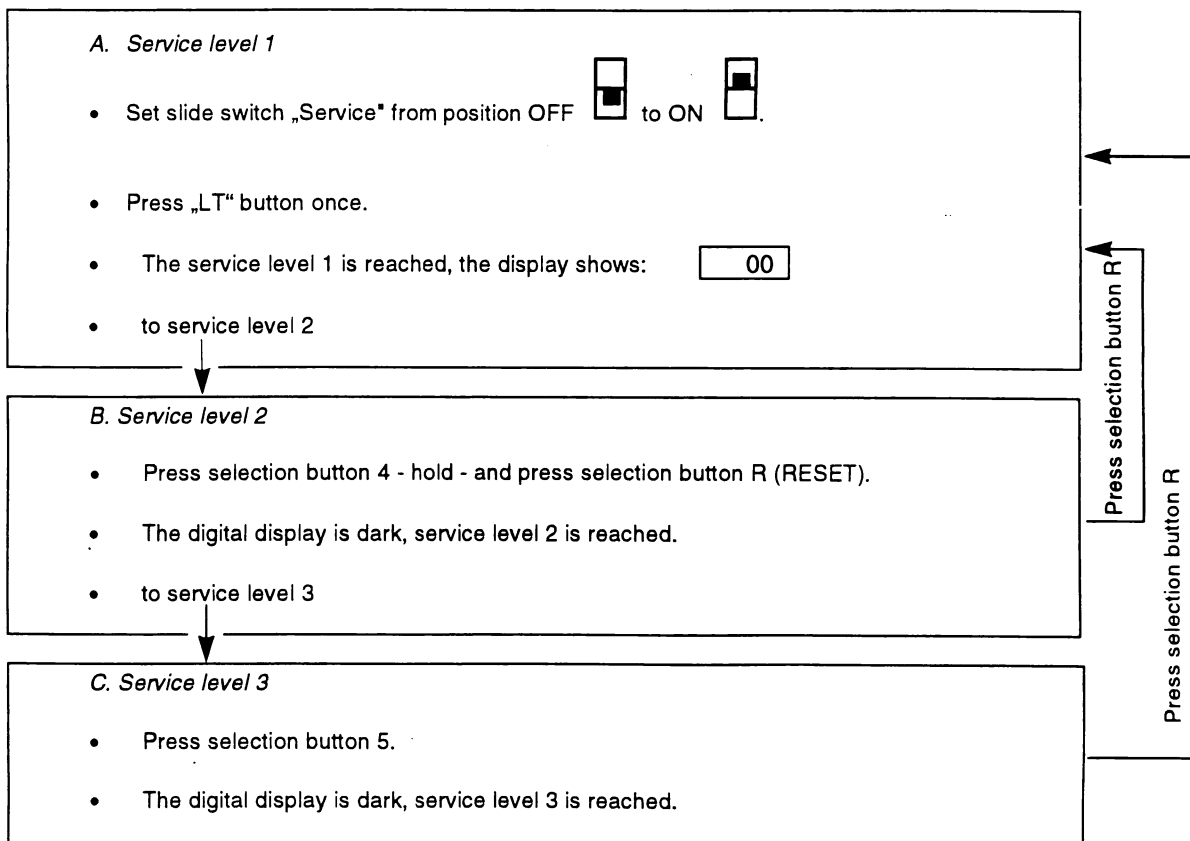


Fig. 16



5.1. Calling service programs

Three service levels are present to program the jukebox. To reach these levels proceed as follows:



IMPORTANT: If selection button R (RESET) is pressed first in any service level, the computer always jumps to service level 1!

D. Exit from all service programs

- Switch slide switch 'Service' from position ON  to OFF .
- Press "LT" button..

The jukebox is ready to operate, the digital display shows for 3 sec.:
Then the display shows the hit of the house, the most played track. e.g.:

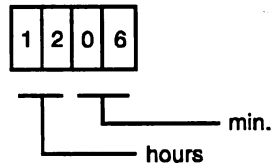
0	0	0	0
0	1	0	7

5.2. Clock setting

level 2	button 0
---------	----------

Clock, date, year and weekday setting is necessary when Playstimulator or back ground music (BGM) is used or for statistic print-outs.

1. Enter the service mode by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Press selection button 4 - hold - and press selection button R (digital display is dark, level 2 is reached).
4. Press selection button 0. The present time is displayed. e.g.:



5. To reprogram press selection button 0 - hold - and press selection button R. The digital display goes dark.
Enter the new time by means of the keyboard with 4 digits in 24 hour format (military time).
6. To check the new time: Only press selection button 0 again.

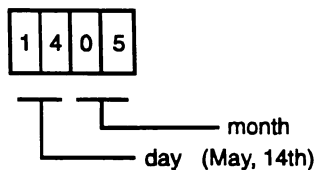


CAUTION! Do not press selection button R after reprogramming, otherwise you will get back to service level 1!

5.3. Set date

level 2	button 1
---------	----------

1. Press selection button 1.
The actual date will be displayed. e.g.:



2. To reprogram press selection button 1 - hold - and press selection button R. The digital display goes dark.
Enter the new date by means of the keyboard with four digits.
3. To check the new date: Only press selection button 1 again.



CAUTION! Do not press selection button R after reprogramming, otherwise you will get back to service level 1!

5.4. Set year and weekday

level 2	button 2
---------	----------

1. Press selection button 2.
The actual year and weekday will be displayed, e.g.:



2. To reprogram press selection button 2 - hold - and press selection button R. The digital display goes dark.
Enter the new year by means of the keyboard with two digits, then enter a 0 followed by the number of the weekday shown in the table below.

0 = Sunday	4 = Thursday
1 = Monday	5 = Friday
2 = Tuesday	6 = Saturday
3 = Wednesday	

3. To check the new setting of year and weekday: Only press selection button 2 again.
4. Press button R to get back to service level 1 to continue for the next steps of programming.

5.5. Playstimulator (random play without coin insertion)

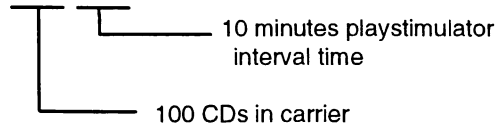
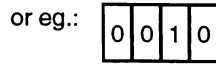
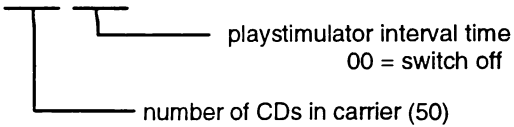
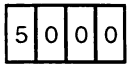
If the Playstimulator is programmed, a track of all CDs in carrier will be played randomly except those CDs which are declared as BGM CDs. BGM play is programmable from 1 min. to 98 min. This time is also the repeat time between two random plays. The volume is the same as in normal operation. If a selection is made the Playstimulator will be interrupted immediately and remains when all established credits from coin insertion are selected (selection memory must be empty, comp. chapt. 5.6, page 17).

Programming of the Playstimulator repeat time:

level 1	button 5
---------	----------

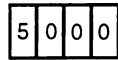
1. Enter the service mode by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Make sure that time, date and year is properly set. Reprogram if necessary (ref. to chapt. 5.2, 5.3, 5.4 starting page 14).

4. Press button 5 the display shows e.g.:

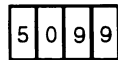


5. Make a note of the number of CDs in carrier shown in the left two digits (comp. chapt. 2.8, page 8).
6. To reprogram press selection button 5 - hold - and press selection button R. The digital display goes dark. Enter the noted number of CDs in carrier and the Playstimulator interval time with four figures.

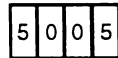
By entering of e.g.:



Playstimulator OFF



Playstimulator ON - CONTINUOUS PLAY



Playstimulator ON - INTERVAL TIME 5 min.

(50 CDs in carrier)

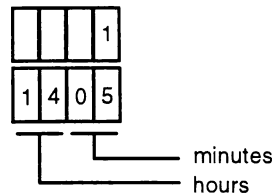
7. Go to service level 2 (press selection button 4 - hold - and press selection button R) to program the Playstimulator start and stop time.

Programming of Playstimulator start and stop time

level 2	button 8
---------	----------

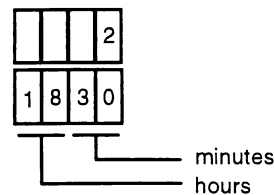
8. Press selection button 8:

At first the display shows flashingly:
(1 - means start time)
then the start time is displayed with
4 digits e.g.:
(2.05 p.m.)



9. Press selection button 8 again.

At first the display shows flashingly:
(2 - means stop time)
then the time is displayed with
4 digits e.g.:
(6.30 p.m.)



10. To reprogram press selection button 8 - hold - and press selection button R. The digital display goes dark. Enter the start and stop time with eight digits.

Example: The Playstimulator should operate from 09.00 to 17.00.

Enter: 0 - 9 - 0 - 0 - 1 - 7 - 0 - 0 Then the digital display goes dark.

The computer is still running in service level two.



IMPORTANT: The Playstimulator can not be programmed over 24.00 o'clock (midnight)!

11. To check the new times: Repeat step 8 and 9.
12. To leave the service program set the slide switch 'SERVICE' to OFF and press button LT on the S&CC unit.

IF THE PLAYSTIMULATOR DOES NOT WORK:



Check if:

- clock is set correctly
- start and stop time is programmed
- repeat time is set correctly
- BGM play mode is disabled.

5.6. Back Ground Music (BGM)

If BGM is programmed and activated a random track from the CDs declared for BGM will be played. The time between the last selected played track and the first BGM track is programmable between 1 and 98 minutes.

This time is also the repeat time between two BGM tracks.

The volume by BGM reproduction is reduced compared to the common volume. It is adjustable with the two pots (RH channel / LH channel) at the BGM adapter board (Fig. 22, Pos. 1). BGM mode is active when the LED on the BGM board lights (Fig. 22, Pos. 2). Once the BGM mode is activated, then it is not possible to operate the Playstimulator.

If a selection is made by means of coin insertion the track being played will be interrupted immediately. As long as no selection is made for paid credits no BGM CDs will be played. Two intervals can be programmed for each weekday.

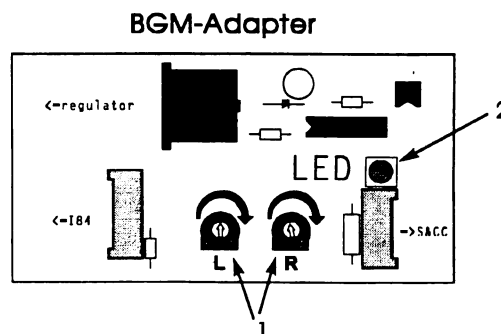


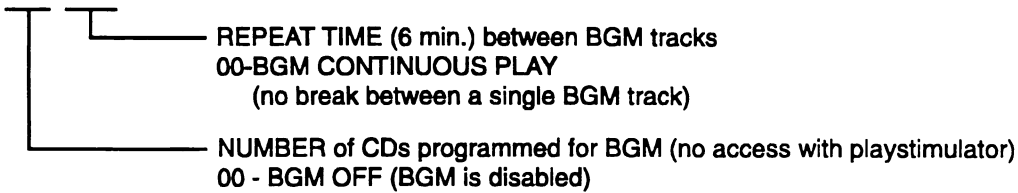
Fig. 17

Programming of Back Ground Music:

level 3 | button 7

1. Enter the service mode by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Press selection button 4 - hold - and press selection button R (digital display is dark, level 2 is reached).
4. Make sure that time, date and year is correctly set (selection buttons 0, 1 and 2). Reprogram if necessary (comp. chapt. 5.2, 5.3, 5.4, starting page 14).
5. Press selection button 5 (level 3 is reached). The digital display goes dark. At this level all options for BGM can be checked and programmed.
6. Press button 7. The number of CDs used for BGM are displayed in the left two digits in the right two digits the repeat time between two BGM plays is displayed, e.g.:

2 0 0 6



7. To reprogram press selection button 7 - hold - and press selection button R. The digital display goes dark. Enter number of CDs and break time with 4 digits.



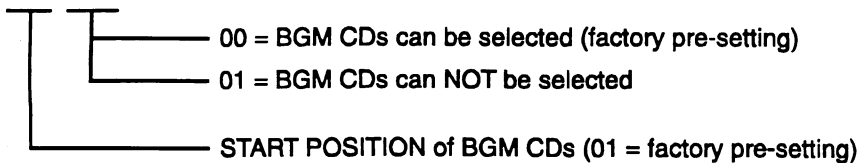
IMPORTANT: Do not press selection button R after reprogramming otherwise you will get back to service level 1!

Programming of BGM start position and selection option:

level 3 | button 8

8. Press button 8. The start position of CDs programmed for BGM is displayed in the left two digits. The right two digits indicate whether BGM CDs can be selected over coin insertion or not.

0 1 0 0



NOTE: If a wall box is connected the BGM selection option must be set to 0 0.

After entering this data the S&CC unit calculates the BGM end position itself.
For loading of BGM discs the end position can be calculated as follows:

$$\text{end position} = \text{start position} + \text{number of BGM-CDs} - 1.$$

9. To reprogram press selection button 8 - hold - and press selection button R. The digital display goes dark. Enter start position and the selection option with 4 digits.



IMPORTANT: Do not press selection button R after reprogramming, otherwise you will get back to service level 1!

10a. Programming of BGM time:

level 3	button 0-6
---------	------------

Each weekday can be programmed differently, 2 intervals per each day can be set.
The following steps are the same for the buttons 1 to 6 in service level 3 according to the table for weekdays :

- | | |
|---------------|--------------|
| 0 = Sunday | 4 = Thursday |
| 1 = Monday | 5 = Friday |
| 2 = Thursday | 6 = Saturday |
| 3 = Wednesday | |

- 10b. Press selection button 0, the display shows flashingly the start time on Sunday:



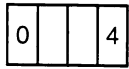
- 10c. Press selection button 0 again, the display shows flashingly:



- 10d. Press selection button 0 again, the display shows flashingly the start time on Sunday:

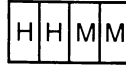


10e. Press selection button 0 again, the display shows flashingly:



End time 2

then approx. 1 sec later stop time:



10f. To program press selection button 0 (or button 1 - 6 depending on the weekday to be programmed) - hold it - and press selection button R. The digital display goes dark. Enter the two time zones in 4 blocks to 4 digits (totally 16 digits).

Example:

Background music
should be active:
Enter:

from 10.20	to 12.40	from 15.30	to 22.10
1 0 2 0	1 2 4 0	1 5 3 0	2 2 1 0
interval 1		interval 2	

Repeat this procedure until all weekdays are programmed.
If only one time zone is to be programmed, enter the first zone with eight digits and the second zone with 0000 0000 (totally 16 digits).

Example:

Background music
should be on:
Enter:

from 10.20	to 22.10	no effect	no effect
1 0 2 0	2 2 1 0	0 0 0 0	0 0 0 0
interval 1		interval 2	

It is also possible to use the second zone only.

10g. After the end of programming procedure press selection button R and leave service program by setting the slide switch 'SERVICE' on the S&CC to OFF and pressing button LT.

5.7. Happy hour pricing (additional bonus plays)

level 2	button 6
---------	----------

During the 'Happy hour' time additional bonus plays can be given. Happy hour time and bonus plays have to be programmed before.

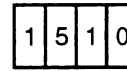
1. Enter the service mode by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Press selection button 4 - hold - and press selection button R (digital display is dark, level 2 is reached).
4. Make sure that time is set correctly (selection button 0). Reprogram if necessary.(chapt. 5.2, page 14).
5. To display the 'Happy hour' start time:

press selection button 6

The digital display shows at first flashingly (1 = start time):



then the start time will be displayed with four digits e.g.:

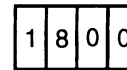


minutes
hours

6. To display the stop time press selection button 6 again. The digital display shows at first flashingly (2 = stop time):



then the stop time will be displayed with four digits e.g.:



minutes
hours

7. To reprogram press selection button 6 - hold - and press selection button R. The digital display goes dark. Enter the 'Happy hour' start and stop time with 8 digits. After complete entry the digital display is dark. Example:

Happy hour
should be on:
Enter:

from 9.05	to 11.00
0 9 0 5	1 1 0 0
happy hour time zone	



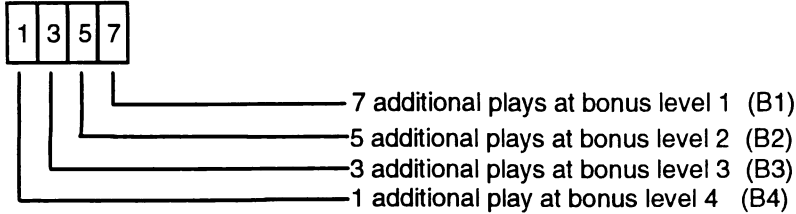
IMPORTANT: Do not press selection button R after reprogramming, otherwise you will get back to service level 1!

8. To verify the entered data: Repeat steps 5 and 6 .

9. To display 'Happy hour' pricing:

level 2 | button 7

Press selection button 7, display shows additional bonus plays available during Happy Hour, e.g.:



10. To reprogram press selection button 7 - hold - and press selection button R. The digital display goes dark. Enter the new happy hour pricing with 4 digits.



IMPORTANT: Do not press selection button R after reprogramming otherwise you will get back to service level 1!

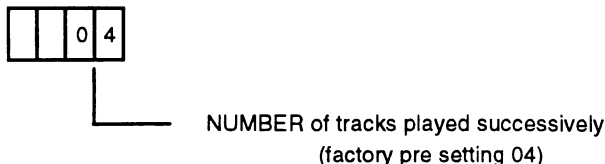
11. To check the new setting, press selection button 7 again.
12. To leave the service program set the slide switch 'SERVICE' to OFF and press button LT on the S&CC unit.

5.8. Programming of maximum number of tracks

level 2 | button 3

Programming of maximum number of tracks played successively on the same disc if other discs have been selected. Default value 4 tracks.

1. Enter the service program by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Press selection button 4 - hold - and press selection button R (digital display is dark, level 2 is reached).
4. Press selection button 3, display shows:

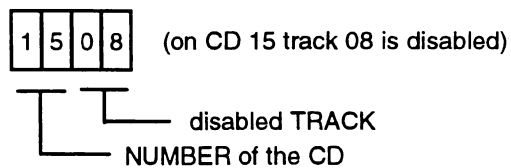


5. To reprogram press selection button 3 - hold - and press selection button R. The digital display goes dark. Enter the number of tracks to be played successively, possible entries are 01 - 25. Setting of 01 causes playing of all tracks in selection order. (Note: This feature cannot be set to 0 0 !)
6. To check: Press selection button 3 again.
7. To leave the service program set the slide switch 'SERVICE' to OFF and press button LT on the S&CC unit.

5.9. Selective disabling of tracks (max. 25)

level 2	button 4
---------	----------

1. Enter the service program by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Press selection button 4 - hold - and press selection button R (digital display is dark, level 2 is reached).
4. Press selection button 4, display shows:



5. Each operation of selection button 4 indicates the next disabled track, maximum 25 tracks. After having reached the last disabled track, the first one is indicated again.
6. *To program:*
 - a. Press selection button 4 - hold - and press selection button R. The digital display goes dark.
 - b. Enter at first the number of the CD to disable followed by the track (totally four digits).
 - c. To disable the next CD/track, press selection button 4 as often as display shows 0 0 0 0 .
 - d. Press selection button 4 again - hold - and press selection button R. The digital display goes dark. Then enter CD and track to disable.
 - e. Continue programming for the next track with step c.
7. To enable a disabled track: When a track is indicated, press button 4 - hold - and press selection button R and enter first the number of the CD followed by 0 0.
8. To enable all disabled tracks enter 0 0 0 0 (4 times 0).
9. To leave the service program set the slide switch 'SERVICE' to OFF and press button LT on the S&CC unit.

level 2	button 9
---------	----------

5.10. Album selection and memory reset by power off

Album selection is possible by entering the disc number followed by 0 0 (track 0 0). All tracks on the CD are played, starting with the first track. An album is only selectable by coin insertion, if credits of the 4th bonus level have been obtained or in free play modus (link in row GP from 0 to F on the S&CC unit) of the jukebox.

Memory reset by power off allows to cancel remaining credits and selections by power off of the jukebox. This option prevents that the jukebox starts to play preselected tracks from the day before. (The jukebox was switched off in the night, not playing all the selected tracks.)

1. Enter the service program by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Press selection button 4 - hold - and press selection button R (digital display is dark, level 2 is reached).
4. Press selection button 9, digital display shows for example:



By setting a '1' or a '0' in the correspond digit the options can be enabled or disabled.

If album play is opted (right digit = 1), selecting a whole CD is possible.

'Memory Reset' is opted if the second digit from right side = 1.

5. To reprogram press selection button 9 - hold - and press selection button R. The digital display goes dark. Enter the new selected options with 2 digits.
6. To check: Press selection button 9 again.
7. To leave the service program set the slide switch 'SERVICE' to OFF and press button LT on the S&CC unit.

level 1	button 9
---------	----------

5.11. Location or Identification number

An location or identification number of 8 figures can be programmed as a customer or individual machine number.

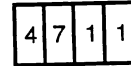
1. Enter the service program by setting the service switch to ON position.
2. Press LT button at the S&CC unit.
3. Make sure that the gripper arm is in carrier position.
4. To program press selection button 9 - hold - down and press selection button R. Enter the identification number with 8 digits.

5. To check: Press selection button 9:

The digital display shows at first
flashingly :



Then the four highest digits will be displayed with 4 digits e.g.:

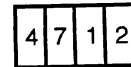


6. Press selection button 9 again.

The digital display shows at first
flashingly :



Then the four lower digits will be displayed with 4 digits, e.g.:



In this case the location number is 47114712.

7. To leave the service program set the slide switch 'SERVICE' to OFF and press button LT on the S&CC unit.

VI. Data retrieval

The data retrieval memory keeps only data if the memory plug is always in the position ON (on the RH side of the S&CC unit).

1. Set service switch (located on the selection & credit computer inside the machine) to ON.
2. Press LT button also on the S&CC unit. Display counter shows 0 0.

6.1. Retrieval of least popular discs (flops)

level 1	button 0
---------	----------

1. Press selection button 0 once.
At first, the first two digits on the display show the least played CD. The last two digits are simply a code confirming the least played status.
The display counter flashed alternately the disc number and then the number of plays. If the counter shows 0 0 0 0, this means the disc had not been played. Press selection button 0 to continue the process for the second least played disc, and so on.

For example:

alternatingly:

0	6	L	L
---	---	---	---

and:

0	0	0	2
---	---	---	---

CD No 06 < > was played twice

2. To cancel the procedure press selection button R.

6.2. Top discs

level 1	button 1
---------	----------

1. Press selection button 1 once.
The display counter flashes alternately the number of the most played CD and then the number of plays. If more than 60 plays have occurred, only the number 60 will appear as the computer is set to display the maximum number of plays to be 60. The most played CDs will still appear in the descending order as selection button 1 is pressed but the number of plays in excess of 60 cannot be reported. Press selection button 1 to continue the process for the second most played CD, and so on.

For example:

alternatingly:


0	3		
---	---	--	--

and:

0	0	5	2
---	---	---	---

CD No 03 < > was played 52 times

The most frequently played track will also be displayed as HIT OF THE HOUSE in common operation.

 **NOTE:** During programs 0 or 1 the display can remain dark for some time or only one digit is on. During this time the calculations take place.

2. To cancel the procedure press selection button R.

6.3. Cash box contents

level 1 | button 2

1. Press selection button 2 once.
Digital display shows the cash box contents in basic units; basic units being the value of the lowest coin value.
2. To cancel the procedure press selection button R.

6.4. Total number of plays

level 1 | button 3

1. Press selection button 3 once.
Display shows the total number of plays since last reset (maximum 9999)
2. To cancel the procedure press selection button R.

6.5. CLEAR ALL counters (reset to 0 0 0 0)

level 1 | button 3 + Reset

1. Press selection button 3 - hold - and press selection button R (reset).
The counters of...
 - least popular disc
 - most popular disc
 - cash box and
 - total plays
 are cleared and reset to 0 0 0 0.
2. To leave the service program first set service switch to OFF and then press LT button.

The sequence of top discs is for the time being 01, 02, 03, 04 etc.

After exit from the service program the disc carrier starts to rotate to initialise the S&CC unit. The digital display shows in its left two digits alternately a '0'. When the '0' position of the carrier is detected the enumeration of disc compartments will be indicated in the right two digits.

If the CD carrier should be changed later e.g. from 50 to 100 CD's or in reverse direction this procedure has to be done once. Only so the SCC can allocate the needed memory size. If this has not be done e.g. at a change from a 50 to a 100 CD carrier the number of CD's (service level 1 button 5) can not be programmed over 50!

6.6. Memory of not playable CDs

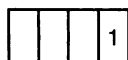
level 1 | button 6

Careful handling of the CDs does not completely exclude that CDs may be damaged in different ways. Possibly the player would interrupt this CD at each selection. The S&CC provides a watch dog function which finds and memorises this difficult playable discs.

Up to six not playable CDs can be memorised. Once a CD is registered every new try will be counted. So it is possible to find out bad discs and change these for new ones.

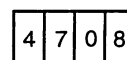
1. Make sure that gripper arm is in carrier position.
2. Press selection button 6, the display shows e.g.:

flashing:



first not playable CD

and then:



NUMBER of times the CD
CD NUMBER was not
playable

3. Press selection button 6 to display the next not playable CD, etc. After displaying the 6th not playable CD and pressing selection button six the display starts with the first one again.
4. To CLEAR this memory press selection button 6 - hold - and press selection button R.
5. To leave the service program, first set service switch to OFF and then press LT button.

level 1	button 2 + Reset
---------	------------------

6.7. Statistic print-outs

For data retrieval a printer can be connected to a receptacle located in a wire loom underneath the S&CC unit.

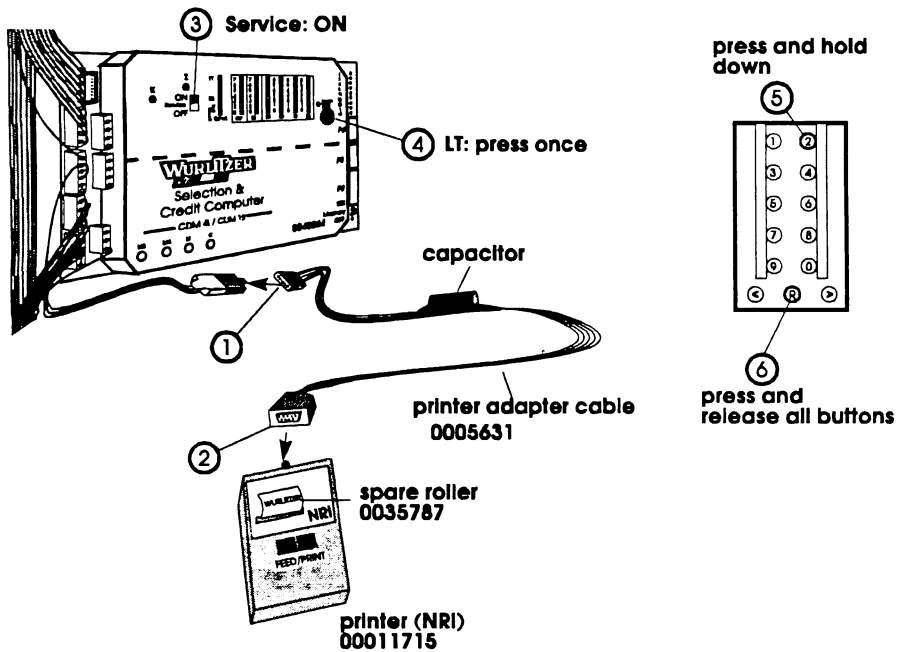


Fig. 18

! **IMPORTANT:** Older printer adapter cables without a capacitor must not be used !

1. Connect printer adapter cable (Part No. 0005631) with receptacle underneath the S&CC unit.
2. Connect printer (Part No. 0011715) with the printer adapter cable.
3. Set service switch (located on the selection & credit computer inside the machine) to ON.
4. Press LT button (also located on the selection & credit computer) The digital display shows '00'.
5. Press selection button 2 - hold - and press button R, the print-out starts.

The following information will be reported:

=====
WURLITZER
COMPACT-DISC
JUKE-BOX
S+C-COMPUTER
=====

PREV.DATE: 11.05.95 10:50	Date and time of the previous print out
ACTUAL DATE: 12.05.95 09:14	Date and time of current print out
PRINT: 0004	No. of print out
IDENT: 00000000	Identification number (service level 1, selection button 9)

--SETTINGS--

CDBOX: 03.09	Program version number
BOX TYPE: 100	Carrier type (50 / 100)
BONUS-1 : +1	
BONUS-2 : +2	Jumper setting
BONUS-3 : +2	on the S&CC unit
BONUS-4 : +3	
BONUS-STEP:4	
CREDITSTEP:2	
TOP-TUNES:+1	
BONUS- HOLD	
DISCS : 36	Programmed number of CDs in carrier (service level 1, selection button 5).
MINUTES : 01	Programmed repeat time for playstimulator.

-STATISTICS-

CASH : 0401	Total income in basic units since last reset.
PLAYS: 0132	Total plays since last Reset.
TOTAL: 000401	Total income, not resettable.
CHECK: 2272	Safety number.

-TOP-DISCS--

===== CD :01 = 0017 CD :12 = 0008 CD :30 = 0007 CD :10 = 0006 CD :20 = 0005 CD :00 = 0000 : CD :50 = 0000 : CD :99 = 0000	Shows all discs in carrier (max.100); and the number of plays. Top disc is shown at first, least popular disc or non played discs are shown at last.
---	---

To leave the service program, first set service switch to OFF and then press LT button.

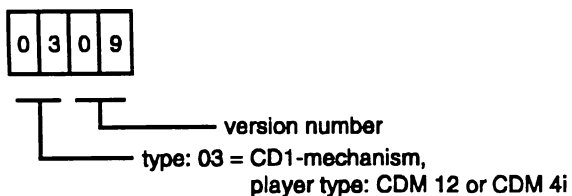
VII. Function tests

Following checks can be done in service level 1, therefore set service switch (located on the selection & credit computer inside the machine) to ON and press LT button also on the S&CC unit. Display counter shows 0 0.

7.1. Digital display test / EPROM-Version

level 1 | button 4

1. Press selection button 4 once.
All segments count 0 to 9 are displayed, then the program version number (EPROM No). For example 03.09 or higher.



2. To cancel the procedure press selection button R.

7.2. Disc carrier control check

level 1 | button 8

1. Press selection button 8. Relay M 3 on the S&CC unit pulls in and disc basket turns provided the gripper arm is in carrier position. Carrier turns as long as selection button 8 is hold down.

7.3. Gripper arm motor check

level 1 | button 7

1. Press selection button 7. Relay M operates and a disc under the grimmer arm position will be transferred to the CD player. If selection button 7 is pressed during play, the disc is returned after one second into the carrier.



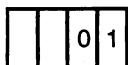
IMPORTANT: The gripper arm moves only if the gear switch ("Gripper Motor") is in position ON.

7.4. CD Player check (START)

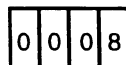
level 1 | button 6

1. Press selection button 7 to place a CD onto turntable.
2. Press selection button 6, the CD will start to play beginning with the first track.

Display shows at first:



than the current play time in sec. (e.g. 8 sec)



If no track is pre-selected with selection button 0 or 9 (ref. to chapt. 7.5, 7.6 on page 31) the complete CD will be played at starting track 1.

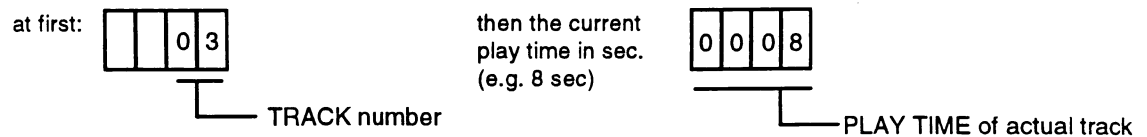
7.5. Jump to NEXT track

level 1 | button 0

1. Press selection button 7 to place a CD on the turntable.
2. Press selection button 0 (several times).

The CD starts and the track number according to the number of key actuation will be played.
Only this track will be played.

The digital display shows e.g.:



If selection button 0 is pressed again once the next track will be played or if selection button 6 is pressed the remaining tracks of the CD will be played.

7.6. Jump to PREVIOUS track

level 1 | button 9

1. Press selection button 7 to place a CD on the turntable.
2. Press selection button 0 (several times).
3. Press selection button 9, the player jumps to the previous track with each actuation, reaching track 1, this track will continuously be played.

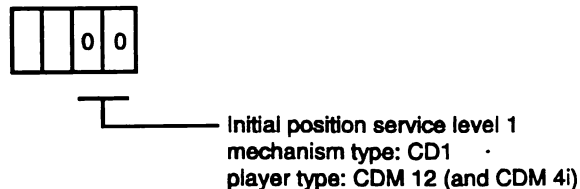
If button 6 is pressed in between after this the remaining tracks of the CD will be played.

If track 1 is reached this track continuously will be played.

7.6. STOP playing

level 1 | button 5

1. Press button 5.
CD play will be interrupted, the display shows:



To terminate all the tests to return to normal operation:
Set slide switch 'SERVICE' on the S&CC unit to OFF.
Press 'LT' button also on the S&CC unit.

VIII. Description of S&CC price setting

Statement: At the right hand side of the S&CC unit are located the so-called coin inputs designated by the numbers 1,2,...10,20. These inputs are used to set a monetary value to the "basic unit" the computer uses to figure credits. If no bonus jumpers are inserted and input 1 is shorted to ground by a coin validator the S&CC gives one credit. This corresponds to a basic unit and will be called as one input pulse in the following description. In most applications one input pulse agrees to the lowest coin value. The terminals 2 to 20 give corresponding to their number 2 to 20 input pulses per coin insertion.

If no jumpers are inserted each input pulse switches the S&CC unit to the next bonus step B1 - B4. This is first of all without result because no jumpers are set in the columns B1 to B4.

If there are jumpers set in B1 to B4 additional credits will be given corresponding to the reached bonus step and the jumper setting in this step.

Example: B1 is set from 0 to 3: By reaching the first bonus step (after one input pulse) one basic credit is given + 3 credits from the bonus step B1 = 4 credits will be displayed

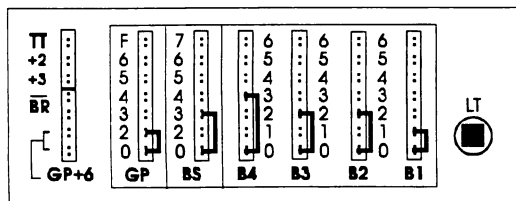
If the same jumper is set in B2 and the next input pulse reaches the S&CC unit, it will switch to the next bonus step B2 and the credits given before the basic credit from the input pulse and the three credits from B2 will be added $4 + 1 + 3 = 8$ credits. This is repeated until B4 is reached.

If the jumper BR is set the S&CC unit it will stay in step B4 until the next selection is made. At each input pulse the basic credit of this pulse and the bonus credits from step B4 will be given. If BR is not set the S&CC will jump back to step B1 when B4 is overflowed.

A jumper in BS causes the computer not stepping at each input pulse to a new bonus step but moreover when two or up to seven input pulses have reached it. For example, if a jumper in BS is set from 0 to 4 the bonus step B1 will first be reached after 4 input pulses. B2 will be reached after the next 4 pulses.

A jumper in GP means that the computer will not give a basic credit at each input pulse, but will only give a basic credit after the programmed number of credits in GP.

Example: GP: 0 -> 4 = 4 input pulses give one credit. This system is needed to enable the machine to deal with as smaller coins as a nickel and to be able to interface with foreign coin systems. The table below gives an example for the following jumper setting:



BR = Bonus Reset

BS = Bonus-Step

GP = Basic Price

Fig. 19

pulse	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
credits GP	-	1	-	1	-	1	-	1	-	1	-
bonus step			B1			B2			B3		
credits BS			1			2			2		
sum	-	1	2	3	3	6	6	7	9	10	10

pulse	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
credits GP	1	-	1	-	1	-	1	-	1	-	1
bonus step	B4			B1			B2			B3	
credits BS	3			1			2			2	
sum	14	14	15	16	17	17	20	20	21	23	24

IX. Integrated test program of the CDM12 player

9.1. Access to the player functions without S&CC unit

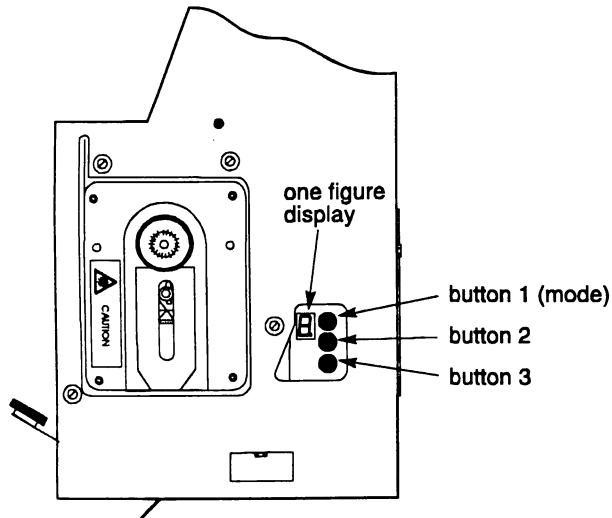


Fig. 20

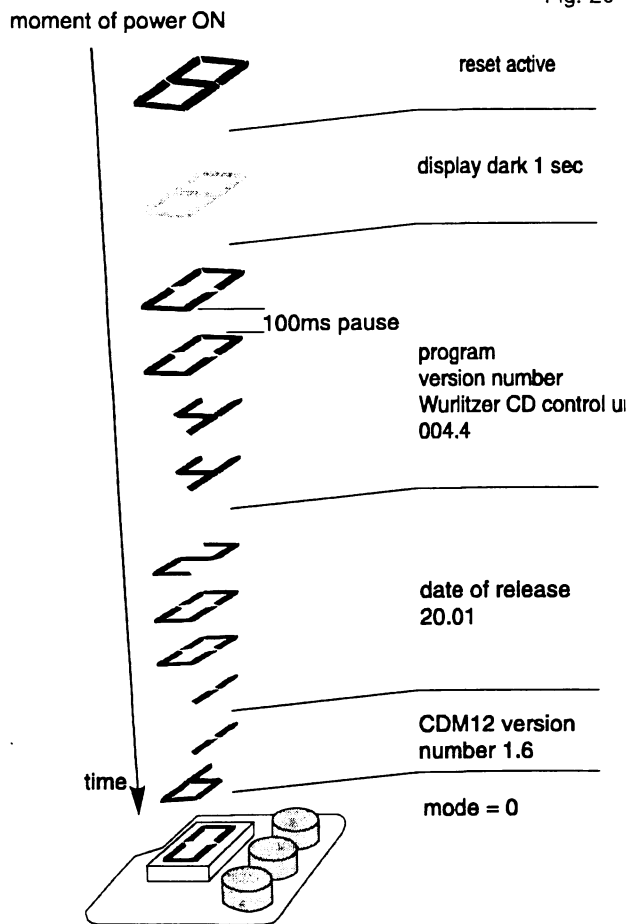


Fig. 21

For a test the complete player unit CDM12 can be operated without S&CC unit.

The power supply from the installed amplifier, the sub-transformer and an amplifier with CD input for the audio signal is required.

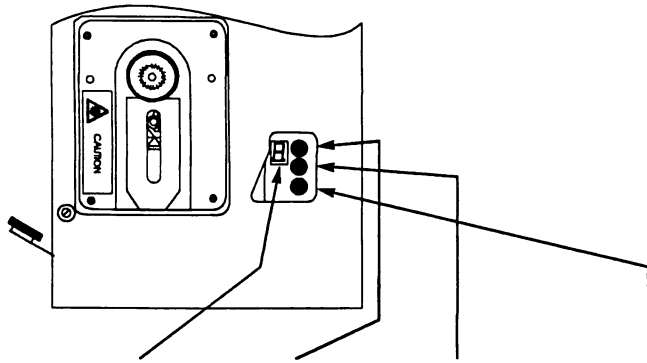
A one digit digital display indicates the current operation mode and three command buttons are located on the player chassis.

The one digit display is able to display more information.

To display two or more digits the information starts with a dark phase of approx. 1 sec. followed by the digits shown one after another with dark phase of 100 msec. between each digit. The most significant digit will be displayed at first.

After power on and after an general reset command (display shows „8“), the program version number of the Wurlitzer CD control unit will be displayed with four digits followed by the version number of the CDM12 servo processor with two digits.

If the player is in stand by and the three buttons on the player are pressed at the same time the above mentioned sequence will be displayed but without showing „8“ for „reset active“.



TEST FUNCTIONS CDM 12

(Example: If mode display = 3 and button 2 will be pressed, then pause is switched on.)

mode display	button 1 (mode)	button 2	button 3	buttons 2 + 3 together
0	mode 1	start	stop	repeat CD
1	mode 2	next track	previous track	repeat track
2	mode 3	search forward	search backward	single, double speed.
3	mode 4	pause ON	pause OFF	
4	mode 5	volume +	volume -	mute
5	mode 0	track -1	track +1	play selected track (read TOC if necessary)

Fig. 22

CDM 12 error code table:

Error code	Meaning
0	No error
2	Focus error or no disc
7	Subcode error, no valid subcode
8	TOC error
10	Radial error
12	Fatal sledge error
13	Turntable motor error
31	Search time out
32	Search binary error
33	Search index error
34	Search time error
40	Illegal command
41	Illegal value
42	Illegal time value
43	Communication error
44	Reserved
45	HF detector error
48	Emergency stop

Fig. 23

If „repeat CD“ had been selected with the buttons 2 + 3 in mode 0 the display will be „99“. At each beginning of a new track it will be displayed with two digits.

If „repeat track“ had been selected with the buttons 2 + 3 in mode 1 the actual played track will be displayed.

By pressing of two buttons at the same time additional values will be displayed:

Buttons 1+2: The last occurred error code will be displayed (ref. to error code table).

This error code will be reset after this retrieval or after a CDM12 reset (e.g. the next power on).

Buttons 1+3: The actual playing track will be displayed.

Buttons 1+2+3: a) No CD is playing: Program version and date of release.
b) CD is playing: Max. / min. track number will be displayed.

Remark:

If commands will be sent to the CDM12 player, the display will flash. During this time no commands given by the buttons will be accepted.

While the table of contents (TOC) is read an 8 flashes in the display. In this way, the necessary time to read the TOC can be prolonged. So bad CDs can be recognised and taken out.

9.2. Special test function of the CDM12 player

Service program of CDM12 (mode 9)

With this service program different functions of the CDM12 player can be tested.

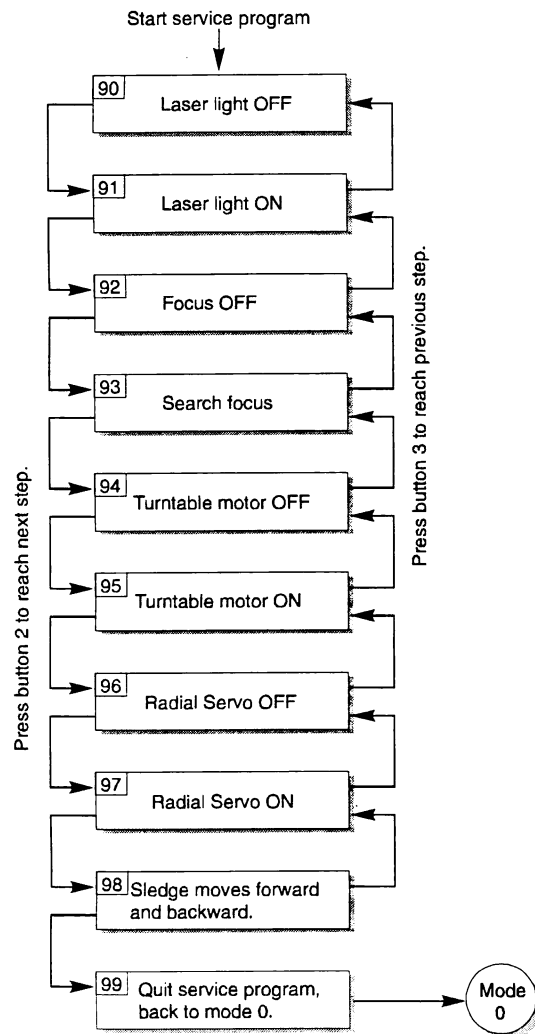


Fig. 24

Results:

- Test 91: You can check the laserlight with an infrared indicator.
- Test 93: With out a CD: laser lense moves up and down. If you put a CD on the turntable while the test runs the lens stops moving when if founds the focus point.

How to call:

Switch main power OFF. Press button 1 - hold down - and switch main power on. (Remark: „Power ON - OFF“ can also be done by disconnecting the wire bk/gy from pin 6 of the sub transformer.)

Function:

The Wurlitzer CD control unit steps into mode 9 and runs the tests 90 up to 99. Mode 9 will be displayed continuously. While changing the test step it will be displayed with two digits.

Remarks:

Starting test step 94 a CD has to be placed on turntable.

The button 1... has no function during this test.

The button 2... switches to the next test step.

The button 3... switches to the previous test step.

Quit:

Press button 2 while test 98 is running. Control unit steps over test 99 to mode 0 automatically.

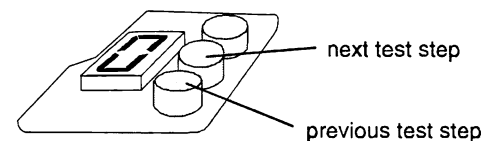


Fig. 25

Test 95: The turntable motor must spin.

Test 98: The sledge moves itsself from inside to outside and back again. If this test is successful the speed of the disc must change to lower speed at the outside of the disc.

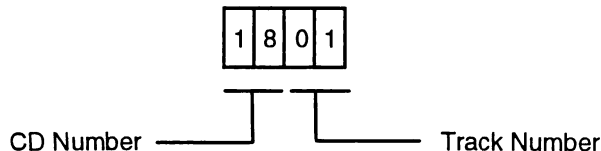
X. Functional description

10.1. Abbreviations

- CD sub transformer:** Insulating transformer with primary 30V AC / secondary 9V AC and 14V AC for laser control board.
- CDM12 SC Control Board:** (Compact Disc Mechanic 12 Serial Controller)
The CDM12 SC is controlled by the S&CC and commands the operating sequence of the CD player. All commands are verified and carried out by the on-board micro processor. CDM12 SC also supplies the voltages for laser control board.
- Laser control board:** Control board and interface for CD player. This assembly is controlled by a serial data connection, the easy-line bus. Supply voltages are also provided by this bus.

10.2. Functional description mechanism

- Power supply**
Power is supplied from the amplifier over plug "mechanism" to the mechanism chassis. The disc carrier latch magnet M3 is connected to -30V DC. The gripper motor MM is operates with +30V DC and the disc carrier motor KM with 30V AC.
- S&CC supply**
Looped over the mechanism chassis the S&CC unit is supplied by the amplifier with 30V AC and 12V DC over plug red. 12V DC are protected over fuse Si5 and the 30V AC are protected over fuse Si6 on the amplifier board.
- CDM12 SC supply**
The CDM12 SC board, the laser control board and connected CD player are supplied by the CD sub transformer. The sub transformer is supplied with 30V AC. A thermostatic switch inside the transformer protects this circuit. Secondary supply is 9V AC (for the digital part of the CDM12 SC) and 14V AC for the supply of the laser control board. All voltages are rectified and stabilised on the CDM12 SC. The power supply for the RS232 level adapter (MAX232) is isolated from the other circuitry. It belongs to machine ground. The CPU and the laser control board are connected to the audio ground. The player is connected with a serial data link from the S&CC plug ST5 to the CDM12 SC board running the "DW - Protokoll - CD" and from there via opto-couplers over the DSA bus (cable blue).
- Digital display**
The digital display consists of four 7-segments digits multiplexed from the S&CC. The 2 LH digits show the CD and the 2 RH digits the title, e.g. CD No 18, Track 01 => 1801.



5. Number of plays and cash counter

The S&CC unit acknowledges coin insertion by indicating the number of selectable plays and a series of relay pulses (relay C). The plays are established depending on the setting of the bonus jumpers in the rows B1 to B4 on the S&CC unit. A mechanical counter connected to plug green pin 3 (connects to ground) and +30V registers the coins inserted in basic units. The mechanical counter is optional.
6. Selection and disc carrier

After a valid selection the S&CC operates the M3 relays, connecting plug blue pin 4 to ground. M3 disc carrier latch magnet pulls in and starts carrier motor KM over microswitch m3. The disc carrier turns to the selected position.
7. Start/Counting process

The disc carrier is provided with tooth slots at each disc compartment. By means of a light gate in front of the carrier the exact slot position is controlled. The tooth slots of each compartment are registered by the S&CC and visible by the flashing Z-LED when the carrier rotates. Just before passing the 01 position the K-LED will flash indicating disc 1. Slot 01 is found by passing of a special bracket mounted underneath the carrier base plate. The teeth (Z-LED) are counted after the K-pulse has been send.
8. Disc transfer

If the desired disc has reached the gripper arm position, M3 is de-energised and the disc carrier stops. To transfer the disc the S&CC starts the gripper motor MM over plug blue pin 2 from relay M. At the same time a "Reset" command is transferred to the CD control unit which resets the CDM12 SC control board and the laser control board. The gripper arm now transfers the disc to the player. The relay M is active for 1,5 sec. During this time the gear motor has turned and K6 (slide contact on the gear box contact disc) switches the motor into self holding position. After the disc is placed onto the turntable and held by the magnetic clamp arm, K1 opens, ground is disconnected from gear motor MM and it stops. K6 is closed.
9. Mute off

The amplifier is now activated from the open K1 contact by the mute or cancel line grey over plug mechanism. D1 prevents continuous mute from the S&CC.
10. Play

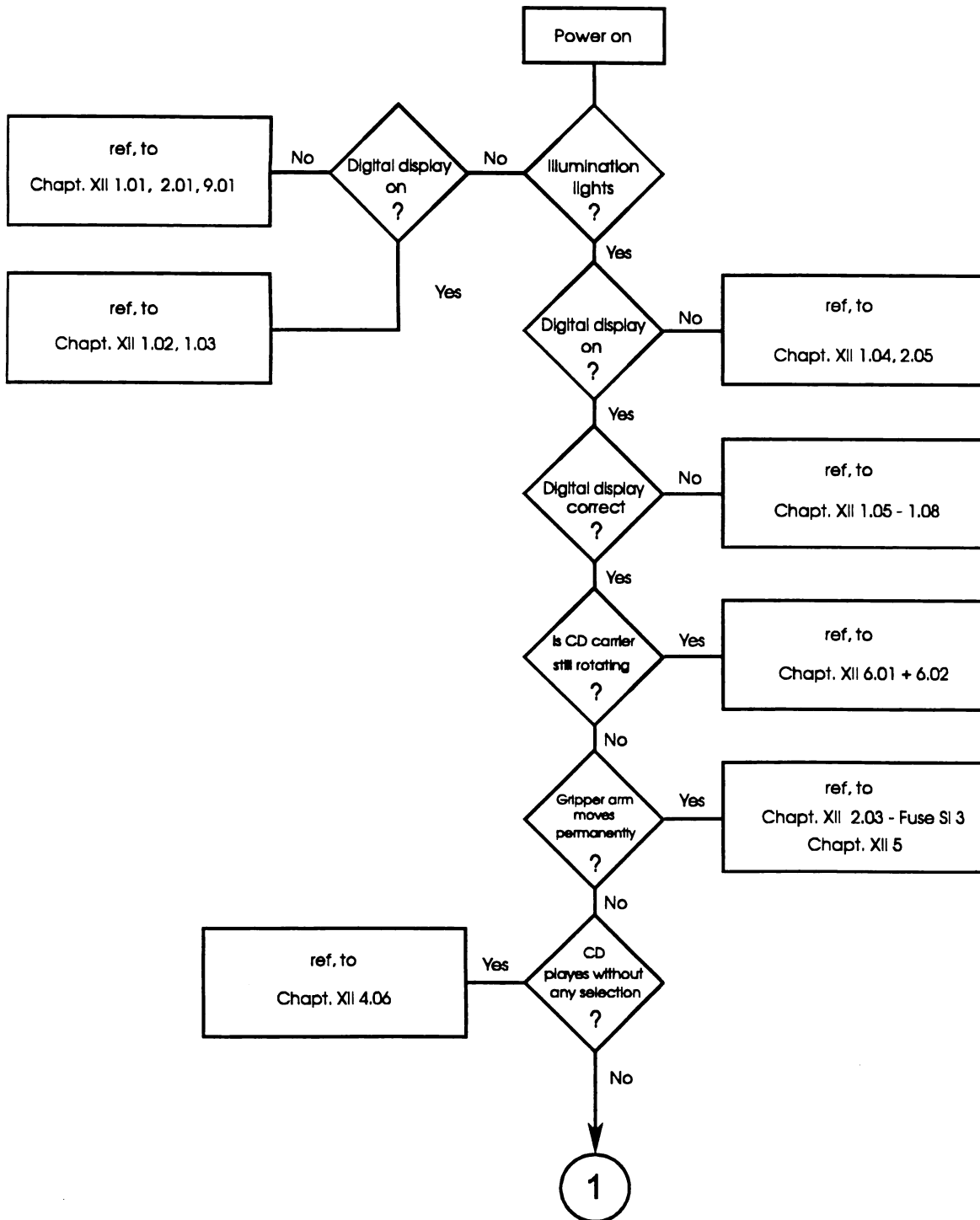
During the 6 sec. lasting CD transfer operation the S&CC sends the selection information to the CDM12 SC which is carried out by the laser control board. The CD starts after approx. 2 sec. The audio frequency signal is connected with RCA jacks to the amplifier CD-input.
At the end of each track the CD control is switched to pause mode. This is transferred over the communication line to the S&CC which recognises this condition which then causes a stop-title-command. The CD stops.
11. Cancel

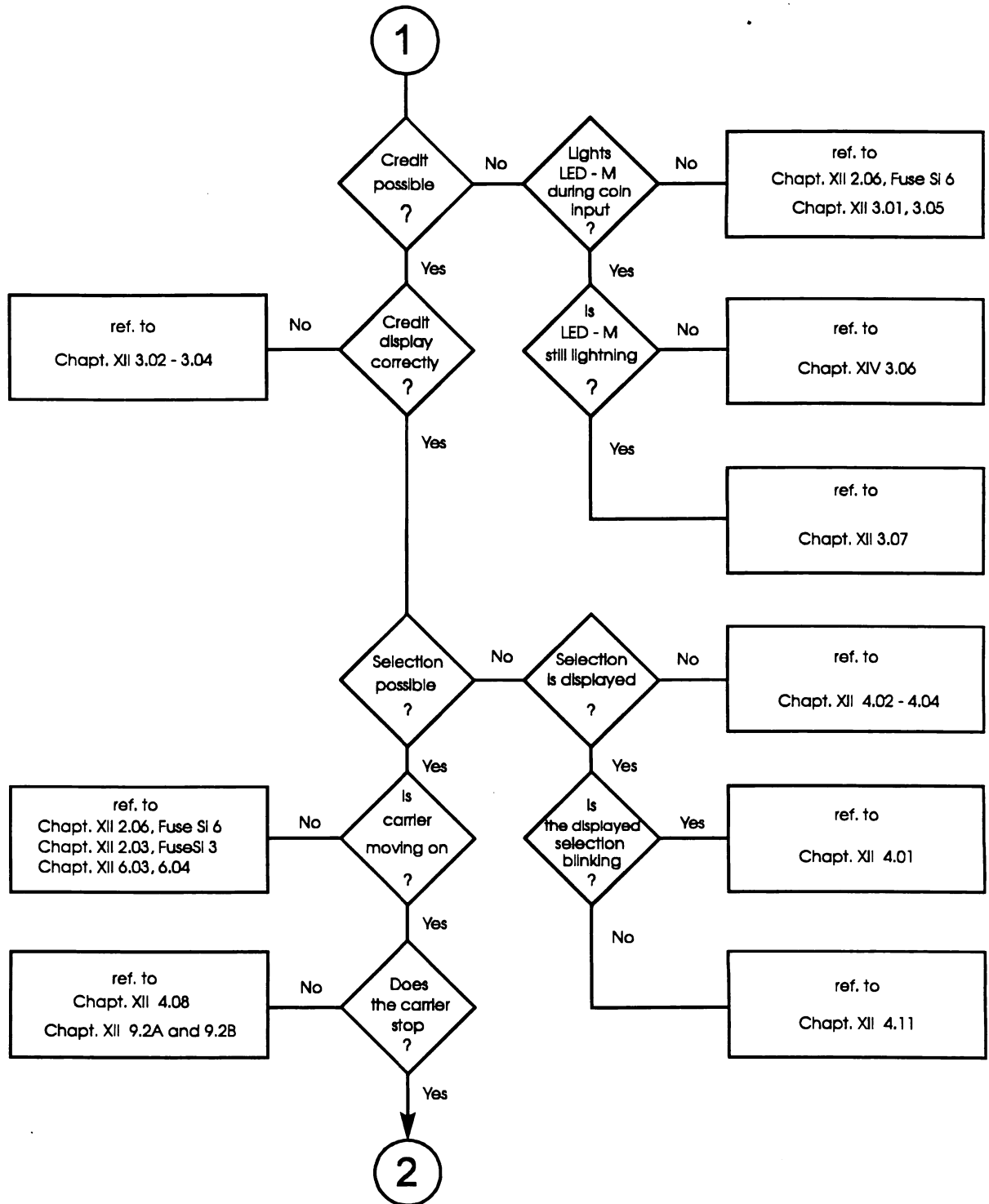
3 sec. after start of a play a track can be interrupted with the cancel button.
The S&CC recognises this over plug green/pin 1. Diode 2 in the mechanism chassis prevents restart of the gripper motor by pulling the input to ground. Otherwise the gripper mechanism would pull the CD from the still spinning player. The control immediately sends a stop command through the "DW-Protokoll-CD" to the CDM12 SC for stopping the CD. A serial acknowledgement informs the S&CC.
12. Disc return

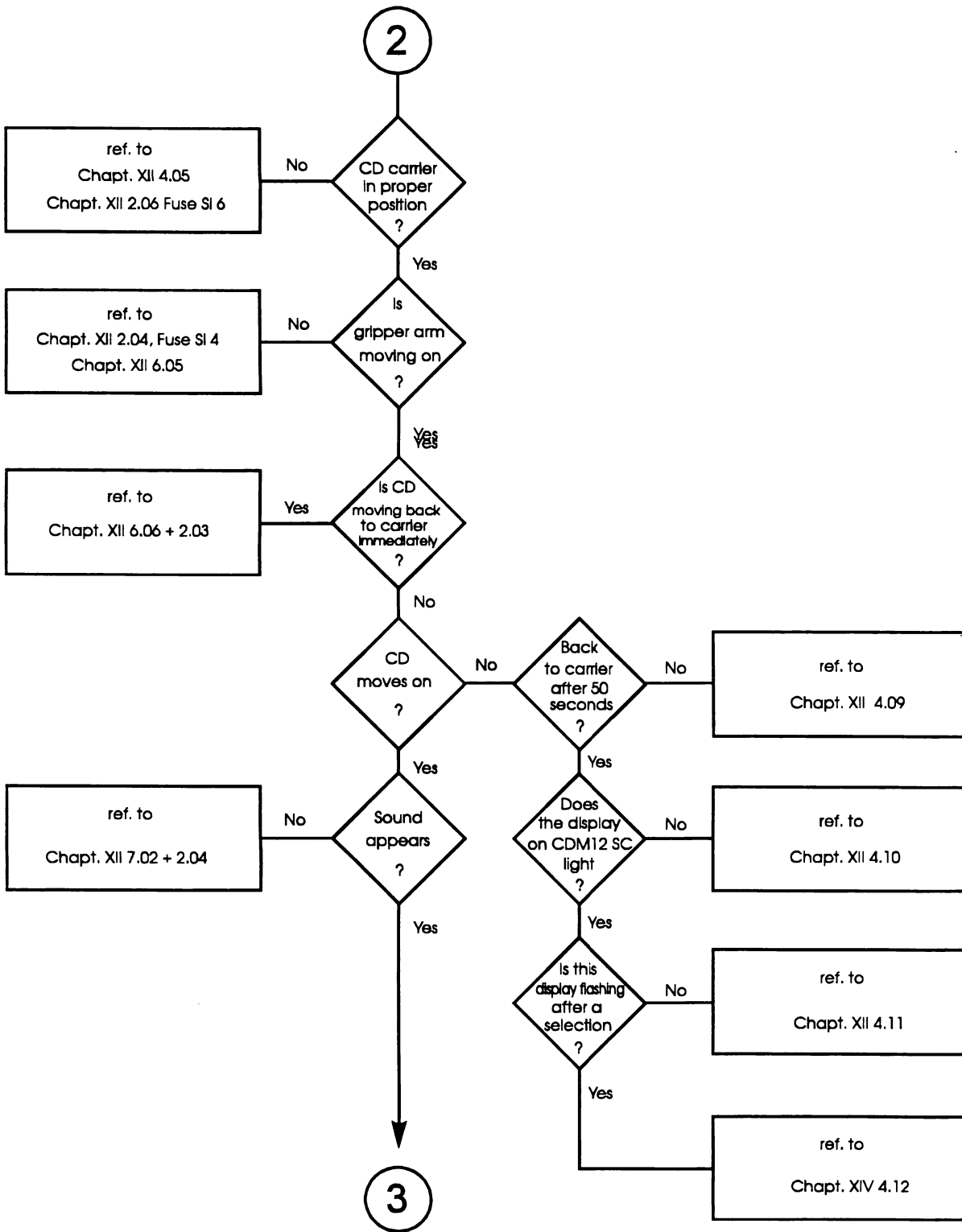
The mechanism MM is being activated from the S&CC for 1,5 sec. The gear box contact disc brings K6 into self-latching (K1 is closed = ground). When K6 reaches the insulated gap the gripper motor MM stops. The gripper arm has returned the disc. K7 and K8 are closed again. The closed K7 reports over the circuit around M3 (-30V DC over wire grey plug blue/pin 4 (relay M3 open) to T22 in the S&CC): "disc in carrier". The closed K8 allows a new disc search.
13. New selection

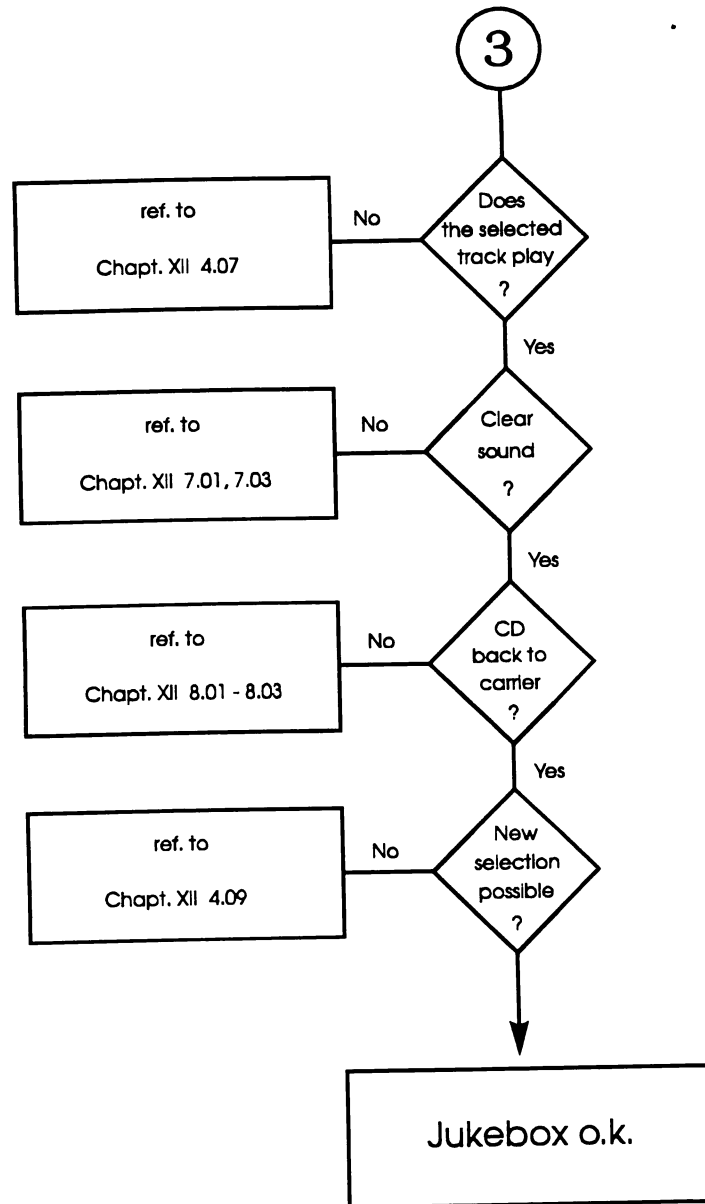
If another selection has been registered in the S&CC the sequence is repeated from the beginning.

XI. Trouble shooting diagram









XII. Trouble shooting chart

12.1. Failures with the illumination, display and power system generally

Symptoms	Cause	Possible faults
01. No light, jukebox not working at all.	No power at wall socket; open primary circuit.	Wall socket defective. Main fuse blown. Fuse Si1 blown (ref. to chapter 12.2). Internal break in line cord or plug. Line switch off or defective.
02. Illumination does not light, but jukebox works.	Defective lamp circuit (ref. to chapter 12.9. / hint 1).	Lamp's circuit plug not in light socket at amplifier. Lamp not properly seated in holder. Defective starter, defective lamp.
03. Bubble tubes do not work, colour tubes do not rotate, lamp 24V does not light.	Defective 24V circuit.	Power supply leading from transformer to distribution interface interrupted. Fuses on interface (1A/M) defective. Caution: Short circuit in harness of heating resistors possible.
04. Digital display remains dark , but jukebox works.	Signal supply leading to display interrupted.	14-pole D.I.L. plug not set or wrong way 'round (right: flat cable is coming from LH side, orange below).
05. Digital display shows non-sense figures, but jukebox works.	Signal lines interchanged.	14-pole D.I.L. plug displaced (not in line with the base). Computer defective, e.g. IC 7.
06. Digital display shows incomplete figures (missing segment). The fault is the same with all four digits.	Signal for one (or some) segments missing.	One pin (or some) of 14-pole plug broken off. One wire (or some) of flat cable broken. Broken connection at display PC-board. Computer defective, e.g. IC 7.
07. Digital display shows incomplete figures (missing segment). The fault, however, occurs with one (or to three) of the four digits only.	Segment signal does not reach this digit.	Cracked connection on display PC-board. Defective display unit (4 identical one-digit units).
08. One of the digits of display completely off .	Multiplex signal missing.	Defective D.I.L. plug or broken wire. (A1, A2, A3, A4). Display or computer defective (T23 - T26).

12.2. Fuses. Which one controls what circuit? Trouble with failures of fuses

Usually the machines are fitted with fuses of DIN 41571 (5x20 mm) slow blow. Slow blow fuses of DIN standard bear the letter T (T = "Träge"), hence T 3,15 is the proper type to be used. All fuses in the amplifier are rated T 3,15 250V.

The open holders of the LT fuses are capable to hold either 5x20 mm fuses of DIN 41571 standard or fuses of 6x30 mm size. Fast and medium blow fuses are unsuitable for the machine.

Only exceptions are countries with 110/117 V supply where a fast blow fuse of 6,3 Amps (F 6,3 of 6x30 mm size) is used for the primary mains fuse.

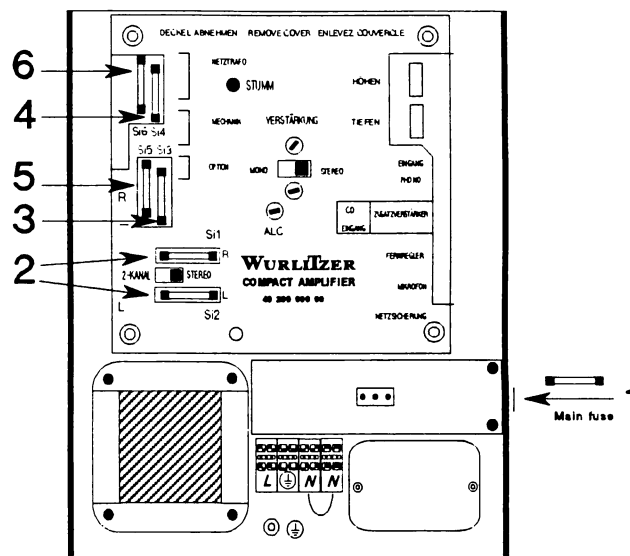


Abb. 26

Fuse	Failure
01. Main fuse T 3, 15 (Fig. 26, 1) At 110/117 V-supply F6,3 A.	No illumination, jukebox completely dead.
02. Fuses Si1 and Si2 : Speaker fuses (Fig. 26, 2)	No sound on LH channel (Si1) or RH channel; the reason for a blown fuse here might be a shorted power transistor.
03. Fuse Si3 : 30 V negative supply (Fig. 26, 3).	Amplifier distorting on both channels, green LED 1 not lit. Gripper arm is still moving. Digital display shows a flashing 8 on the RH digit.
04. Fuse Si4 : 30 V positive supply (Fig. 26, 4).	Amplifier silent though the red LED (mute) is dark. Gear motor not working . After power on disc carrier moves on and stops, relays M3 picks up, after this no further function.
05. Fuse Si5 : 12 V positive supply (Fig. 26, 5).	S&CC unit dead - digital display dark (except red LED M still lightning up on coin insertion).
06. Fuse Si6 : 30V AC supply (Fig. 26, 6).	Disc carrier motor KM not working , power supply for CD control unit (one digit display dark) and CD player interrupted. Break in credit circuit (LED M). After power on carrier latch solenoid picks up, digital display shows 0000 and then no further function.

12.3. Faults with the coin system. The jukebox, however, operates normally with free credit established with the jumper in the column GP at S&CC unit (0-F)

The function of the coin system can be checked by observing the LED-light "M" on the computer, which should light up with every coin accepted. Credits can also be given with the credit button on the interface of the electronic slug rejecter. If a mechanical slug rejecter is installed, then with the credit button next to the slug rejecter.

Symptoms	Cause	Possible faults
01. Coins rejected	Disabled slug rejecter. No power supply (electronic slug rejecter).	Dirt, oil or dust particle in the rejecter; rejecter maladjusted. Reject lever jammed holding the coin acceptor open. Rejecter or entire jukebox not leveled. Interruption in harness from S&CC unit over slug rejecter interface to electronic slug rejecter. (Amplifier Si4 - Option socket pin 1 - Interface). Interface defective.
02. Single coins give wrong credits (or none at all).	Coin actuates the wrong coin switch. Coin pulse does not reach the computer. Electronic slug rejecter defective.	Slug rejecter not properly positioned, leads the coin to an improper switch paddle or by passing it. One line of the coin switches to Computer cable broken, disconnected at either end or wrongly set at computer connector. Electronic slug rejecter: switching transistor at the interface defective. Using MMS 111 rejecter: coins may be blocked by D.I.L. micro switches at the interface. Input of computer defective (IC2 - IC4; diodes: D14-D25; capacitors: C20 - C27).
03. Permanent credit, display shows 1 permanently, credit free selections.	Jumper is set from 0 to F in row GP (Free Play).	
04. Wrong credits, repetitive or all the time, with credits higher or lower than programmed pricing.	Programming mistake.	Jumper BR is not set, then reset to bonus level 1 (B1) if bonus level 4 is overstepped. Unintentional programming in "Happy Hour" programming level (service level 2 buttons 6 and 7). Programming jumper making poor contact (Note: modifications in reposition of jumpers are only efficient by switch off or pressing the LT button).
05. No credit, coins are properly accepted. Free Play, with GP-jumper 0-F still possible.	All coin input lines disabled. Credit inputs inactive (LED M does not light up). Checking of the single inputs (1, 2, 4, 5, T1, 10, 20) with a ground connected test wire.	30V AC does not reach the computer (from amplifier Si6 to CD mechanism to plug red/pin 1 at the S&CC unit). Computer defective (D7, LED M).
06. No credit although coins are registered (LED-M lights up). Even no free play credit with GP jumper set from 0 to F.	Computer out of operation.	No 12V power supplied to the computer (pin 2 and 4 plug red), compare to chapter 2 / 5. Computer defective.
07. No credit, LED - M is lit permanently.	Permanent contact to ground of one or more coin inputs	Ground connection of several coin input leads (check by disconnecting the leads at the S&CC coin inputs). Defective transistors at the electronic coin validator interface (if existing). Partially defective transistors may cause free credit. Function check with ground connections to several coin inputs of the S&CC unit.

12.4. Faults by selection entry (credit system does work).

Symptoms	Cause	Possible faults
01. No selections; selection is displayed flashingly	Selection is not accepted.	No credit available (Caution: after free play jumper setting LT button has to be pressed). The entered selection is bigger than the programmed number of CDs (service level 1, button 5). The selected CD is programmed for BGM only. (service level 3, button 8 programmed to xx01). The selected CD is disabled (service level 2, button 4).
02. No selections; numbers of actuated keys not displayed (only credit is shown)	Open circuits in the keyboard wiring.	Plug yellow displaced or not inserted deep enough. Key RESET permanently closed or shorted to ground (pole 12, brown, plug yellow). Computer defective.
03. No selections. In standby the LH digit of display shows a number, but selection keys are disabled. With insertion of further coins the new credit is displayed properly.	Permanent selection signal from that key of which the number is shown on the display.	Jammed key, permanently closed key contact. Wire of this contact is shorted to ground. Computer defective (C60 - C70, D44-D66 possibility of ground shorting, IC 8, IC 9). Check with digital multimeter: plug yellow pin 2 to 12 approximately 5V DC, function check with test wire to ground.
04. No response from one key.	Open circuit with this key.	Malfunction of key's contact. Insufficient key travel. Broken wire on this key. Plug yellow not seated good enough. Computer defective with an affected input circuit (R65 to 86, D45 to 65, IC 8, IC 9).
05. The CD played is not the one selected. The selection was properly displayed.	Improper counting of disc carrier's position.	Wrong adjustment of light control gates (ref. to chapt. 9 / 2). Illumination light affecting the Z light gate; reflections at the edges of carrier base plate. Record carrier latch delayed by mechanical friction or too wide opening (latching too late). Light control gate retarded (ref. to Chapt. 9 / 2).
06. After power on a track or more are played without a selection.	There are selections left in memory.	Credit and selection resetting after power off in service level 2 button 9 is not used.
07. The CD played is the one selected, however, not the selected track.	Selection does not correspond to the label. Laser control board defective.	The selected track number is higher than the number of tracks on CD. After reaching the highest CD number the laser control board starts to count at track one again.
08. The selected CD is not played, the CD carrier is rotating permanently.	Counting pulse "Z" or sensing pulse "K" missing.	Lamp of light gate dark. Breaks in harness to plug BLACK. S&CC Computer defective (IC 10, C75 - C78, D92, D94 ref. to Chapt. 9 / 2C).
09. Digital display shows the selection correctly, but after this the jukebox does not operate.	The S&CC unit gets the impression that a CD is still playing.	Caused by a defective or maladjusted K7 switch the voltage 30V DC at pin 4 plug GREY is missing. This voltage usually indicates the replacing of CD in carrier after playing. If this circuit is interrupted the status of S&CC unit is the same as CD is playing, so it is not able to start the carrier for a new search. S&CC unit defective (T22: ref. Chap. 12.9. / 8). (Program version 3.09 does not take back a CD after a fault occurs.)

Symptoms	Cause	Possible faults
10. The selected CD is placed onto the turntable, but will not be played. The digit on the CD control does not light. After approx. 50 seconds CD will be returned to carrier.	30V AC supply for CD control and player missing.	Fuse Si6 blown. Interrupts in lines from amplifier (to changer, pin 1) to S&CC unit (line brown, plug RED) or from there to CD controller. Sub transformer switched off by its thermostatic switch. Sub transformer defective. Voltage control ICs on CDM12SC faulty.
11. The selected CD is placed onto the turntable, but will not be played. The digit on the CD shows a „0“. After approx. 50 seconds CD will be returned to carrier.	Communication between S&CC unit (P5) and CD control interrupted.	Data leads between S&CC Computer and CD Controller interrupted (In this case operation is possible in mode 0 button T2; stop with T3).
12. The selected CD is placed onto the turntable, not played, but after about 50 seconds CD will be returned to carrier.	Failure between DW-CD-Control and laser control board or laser control board and player.	Leads not deeply enough inserted between player, laser control board or DW-CD-Control. Player or laser control board defective.

12.5. Repetitive apply of selected or non-selected discs to turntable.

Symptoms	Cause	Possible faults
01. Permanent gripper arm movement (with or without disc) with the disc carrier not making a rotation between a complete cycle. This continues even if plug BLUE is disconnected at the S&CC unit.	Main cam motor (MM) not stopping at the end of the play cycle.	Wiper switch K6 maladjusted.
02. Permanent gripper arm movement. It stops if plug blue is pulled off the SCC unit. The display shows a flashing „8“.	The SCC unit can not detect the position of the gripper arm. Detection via pin4 (gy) plug blue. -30V = CD in carrier; approx. 0V = CD is not in carrier.	SCC unit defect ("jammed" relay 2, transistor T 2 defective). Mikroschwitch K7 or its plastic cam maladjusted. While the gripper arm is in carrier position K7 has to be closed. Carrier latch solenoid M3 defective. T22 inside the SCC unit defective.

12.6. Failures in the system carrier gripper arm

Symptoms	Cause	Possible faults
01. Record carrier permanently rotating, even after plug BLUE is pulled off. If a selection is made the gripper arm randomly takes a disc onto the turntable.	Carrier latch permanently open.	Carrier latch or its solenoid jammed.
02. Record carrier permanently rotating. Sometimes the gripper arm randomly takes a disc onto the turntable, but the CD will not be played. Also by pressing the LT button the gripper arm takes a CD onto the turntable, the CD will not be played, either. After power off for short time a flashing 8 will appear in addition on the display.	Carrier latch solenoid permanently switched on.	Grey line from M3 to pole 4 of plug BLUE shorted to ground. S&CC unit defective (relay 4 sticks, T4 def.).
03. Carrier does not start after a properly completed selection. Carrier latch does not open.	Circuit of the carrier latch solenoid not completed.	DC supply -30V missing (Fuse Si3). Coil of latch solenoid open. Grey line from M3 to pole 4, or green line to pole 1 (relays common), plug BLUE, interrupted. Computer defective; go to service program, key 8, to check relay 4 (M3). Test only successful if -30V DC Voltage across the M3 coil reached pin 4 X4 of the S&CC unit (plug BLUE). Test the machine with a programming jumper from pin 1, green, to pin 4, grey.
04. Disc carrier does not rotate although the carrier latch opens after a selection.	Carrier motor KM disabled.	Micro switch M3 (at carrier latch) maladjusted or defective. Micro switch K8 (at gripper arm) maladjusted or gripper arm not fully in rest position (ref. to chap. 0 / 3). Defective motor KM, broken wiring.
05. Gripper arm does not move to take the disc out of the carrier although the selected disc was properly brought forward. After approx. 1 second relay M drops out. The jukebox does not work and takes no notice of any input.	Main cam motor (MM) does not work.	Motor MM defective. Pre resistor R15 interrupted. DC 30V supply missing (Fuse Si4). Blue wire to motor broken. Shortage in capacitor C5 or in motor itself (then R15 hot). Test: Connecting plug BLUE pin 1 (green) with pin 2 (blue) with jumper wire of S&CC unit. If motor is moving on then S&CC unit defective (relay. 2, T2). Test also with service program level 1 key 7.
06. Disc on turntable returned to carrier before play has started.	Main cam motor not resting when system in play position.	Wiper switch K1 does not open. Cancel button at amplifier jammed in "cancel" position, same with cancel button of the remote control; shorted remote control cable. Retarding resistor R10 at motor MM open (ref. Chapt 9 / 3C).

12.7. Failures with sound reproduction.

Symptoms	Cause	Possible faults
01. Clicks and banging noises during CD playing, jump over of traces.	Reading of CD data disturbed	CD defective (error correction for insignificant defects only). Dirty optic caused by nicotine and/or dust particle. Maladjusted optic assembly. Faults in CD player or laser control board.
02. CD moves on but no sound.	Faults in the system of CD controller - amplifier - speaker.	Audio frequency cable at CD controller or amplifier (chinch socket) not inserted. Audio cable is inserted in the Phono input of amplifier, not in CD input. Fuses Si1 and/or Si2 blown (speaker fuses). Fuse Si4 blown (then motor MM does not work, too). Wire grey (pin 8) amplifier to mechanic shorted to ground (ref. Chapt. 12.9. / 05). Amplifier defective (transistor 2), laser control board defective.
03. Hum in sound reproduction	Ground loop, amplifier or CD controller def.	Gripper arm touches the chassis of the player in play position; other connection between player ground and chassis ground. Ground loop out of the jukebox caused by additional equipment. Amplifier or CD-Controller defective.

12.8. CD not properly returned to carrier.

Symptoms	Cause	Possible faults
01. Gripper arm does not move to bring the disc home.	Main cam motor does not start.	Error at MM-Motor could have developed while a disc was playing (ref. to Chapt. 12.6. / 05).
02. Returned disc not properly unclamped (not freed) in the carrier.	Main cam motor switched off too early.	Wiper switch K6 wrongly adjusted (compare to Chapt. 12.9. / hint 3).
03. Disc missing in compartment is found in other compartment or somewhere about the chassis.	Gripper arm generally moving too fast. (Time for one complete cam rotation is 11 to 13 seconds).	Disadjustment of grimmer arm. Gripper arm sticks to the centring disc (disc holder arm). Wrong adjustment of puck arm height. Cam motor too fast.

12.9. Hints for trouble shooting

Note 1: There are always 220V in plug-in unit for **fluorescent lamps** on amplifier disregarding the actual voltage the jukebox is adjusted to or operating with. Possible operating voltages are 100V, 117V, 210V, 220V, 230V and 240V. Lamp, starter and ballast is a matched group, never use replacements of other wattage.

- Note 2A: A selected disc can properly be located as long as the **light gate** controls are working properly. The counting pulses can be checked easily by observing the LED indicator Z which has to light up rhythmically when the carrier is rotating (manually unlock the carrier latch for check). LED Z is dark, whenever the carrier is in rest position but has to light up as soon as a tooth of the carrier's base plate has passed the carrier latch's front edge for about 1-2 mm. For a check lift the carrier off its friction drive wheel a little, unlock the carrier latch with the other hand and advance the carrier slowly by hand.
- Note 2B: The **locating pulse "01"** can be checked with the LED indicator K. For a check bring the disc preceding "00" ("50", if fifty discs in carrier) beneath the grimmer arm. Then advance the carrier slowly (lift off the drive as explained with note 2A): K now has to light up by all means before Z but a very little advance in time is sufficient and K must still be alight when Z lights up. Which LED then goes out first does not matter but K by all means must be out before Z lights up again for the next disc approaching the gripper arm. If K lights up after Z, the S&CC unit cannot find its starting position and the disc to be located will not be found, the carrier then rotates permanently. If K is still alight when Z lights up for 03/04, the S&CC will consider this one as 01 and any disc located will be that one "behind" the one actually selected. The light gate assembly can be shifted for about 1 mm to find a proper timing.
Note, if K and Z signalise four times „01“ without a selection played in between, a memory erase same as if the LT button is actuated. Therefore, rotation checks with the carrier should be terminated with an actuation of LT button to prevent complaints raised by the first person making a selection after the service, that he lost his money because his selection leads to the fourth K-signal in succession!
- Note 2C: The **lamp of light gates** is one of 24 Volts, 3 Watts. The received power supply is 12 Volts, coming from amplifier fuse Si5. The photo transistors can be checked with an Ohm-meter at plug BLACK when disconnected. Read between poles 3 and 5 for the gate K and between poles 2 and 3 for gate Z. Results will be obtained only if poles 2 or 5 are positive to pole 3, hence, interchange the poles for a test. With an open light gate the measured resistance should be below 2 k Ω (Digital-Multimeter about 300 Ω) and with the light broken it should be above 2 M Ω (Digital-Multimeter shows overflow).
- Note 3: **Micro switch K8** is actuated by the large disc clamp of the gripper arm. If this switch is maladjusted or if the main cam gear box stops before this disc clamp is fully retraced, K8 will not be actuated. This disables the changer for the next search run. The same situation, however, can be produced by a main cam and gear box overrunning the proper rest positions and stopping finally at a time when K8 is released again. Symptom 04 of chapter 12.6. refers to the first situation, symptom 02 of chapter 12.8. to the second.

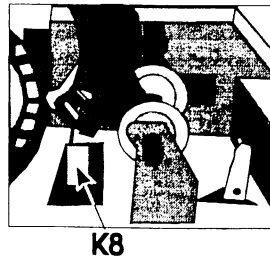


Fig. 27

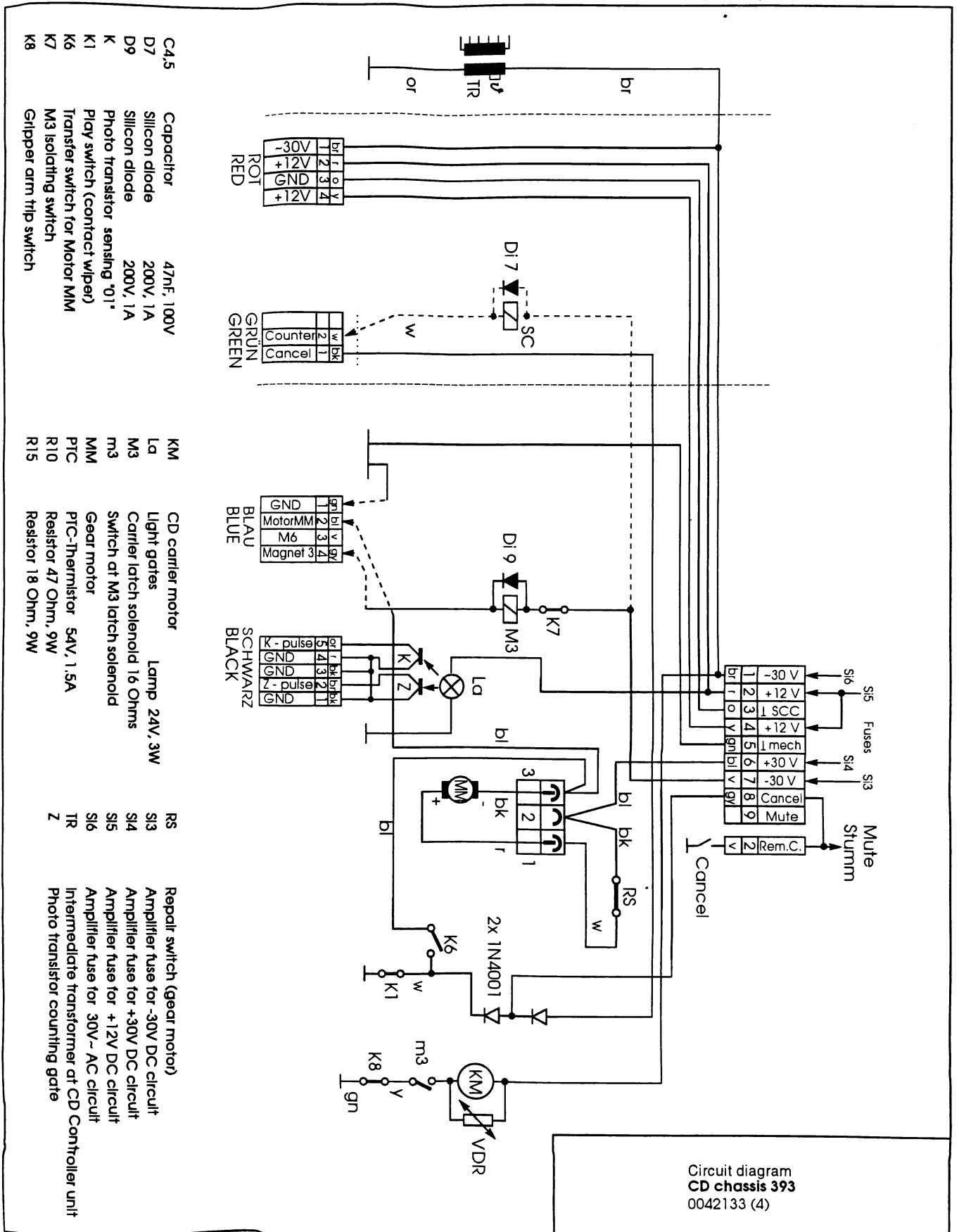
To test, actuate K8 manually and run the changer through some play cycles. The disc clamp has to actuate K8 before it reaches the most retraced position and has come to rest before it has passed this position; compare the adjustment instructions. A bended K6 wiper contact (additional contact with rear edge) can also cause a too early or too late stop of the gear motor.

XII. Trouble shooting chart

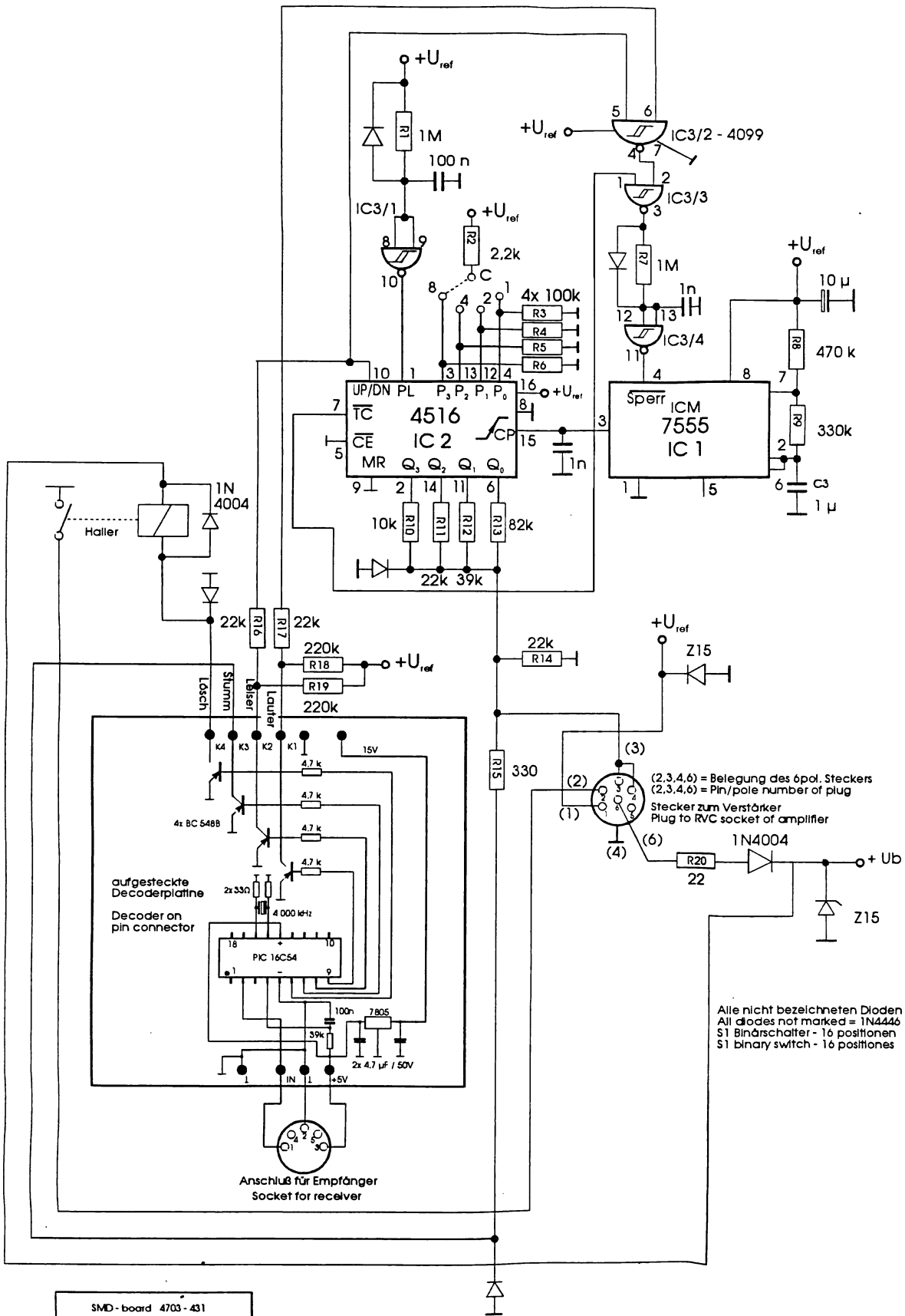
- Note 4: A detail of circuit **timing**: Main cam motor MM is started by relay 2 of the S&CC unit for about 3 seconds. After this the transfer switch **K6** should switch on within these 3 seconds. If K6 is maladjusted or defective, the main cam motor will stop in this moment, that is when the gripper arm is about half way between the disc carrier and the turntable.
- Note 6: The **amplifier muting** at an electronic circuit is controlled by transistor Tr2, and controlled by switch K1 via the grey line, pole 8, amplifier-to-changer cable. The amplifier is mute as long as this line is grounded, hence, the amplifier works outside the jukebox without any need of unmuting.
- Note 6: The gripper arm is linked with the cam & gear shaft by two-way spring clutch. If the gripper arm somehow is locked with the centring disc and the arm is unable to take it off, the gear box still advances and loads the clutch spring. Finally, the spring at a certain tension will free the disc and then the arm flips to catch up. The disc then is thrown about and may land in wrong compartment or anywhere.
 With a main cam and gear unit generally moving too fast, the arm may run the returning record into the neighbouring compartment or even lose it. A complete **gear cycle** normally takes about 12 seconds, never permit times shorter then ten seconds. To check time, disconnect plug blue from the S&CC unit and connect pin 1 (gn) and 2 (bl) of the plug with a bonus wire. The gripper arm now is still moving on. Measure the time the gripper arm needs to come to a certain point the second time.
 If there is a second disc in one compartment and the original disc is selected, there is a 50% chance that the wrong one is played; the service call to be expected in such a case will be likely one of a "wrong selection".
- Note 7: Transistor T22 pulls its collector to L as soon as the negative supply of the changer appears at the switch of relay 4 thus indicating that the disc just being played is now back in the carrier. If this circuit is defective, the computer does not sense this because it gets the impression that the disc is still playing. Hence it will not start a new search run although it has accepted coins and selections properly. Typical for this fault is that after power off the main **cam motor is still moving** on and on the digital display a **flashing "8"** in the RH digit appears. For a start, short the collector of T22 to ground momentarily.
 If transistor T22 is permanently shorted to ground the disc playing can not be cancelled while it is playing. After this last play and also after power off the jukebox does not do anything.

K7
 K8
 M3 Isolating switch
 Gripper arm trip switch
 R10
 R15
 Resistor 47 Ohm, 9W
 Resistor 18 Ohm, 9W
 Z
 Photo transistor counting gate

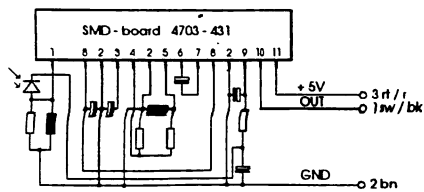
XIII. Circuit diagrams



Circuit diagram
CD chassis 393
0042133 (4)

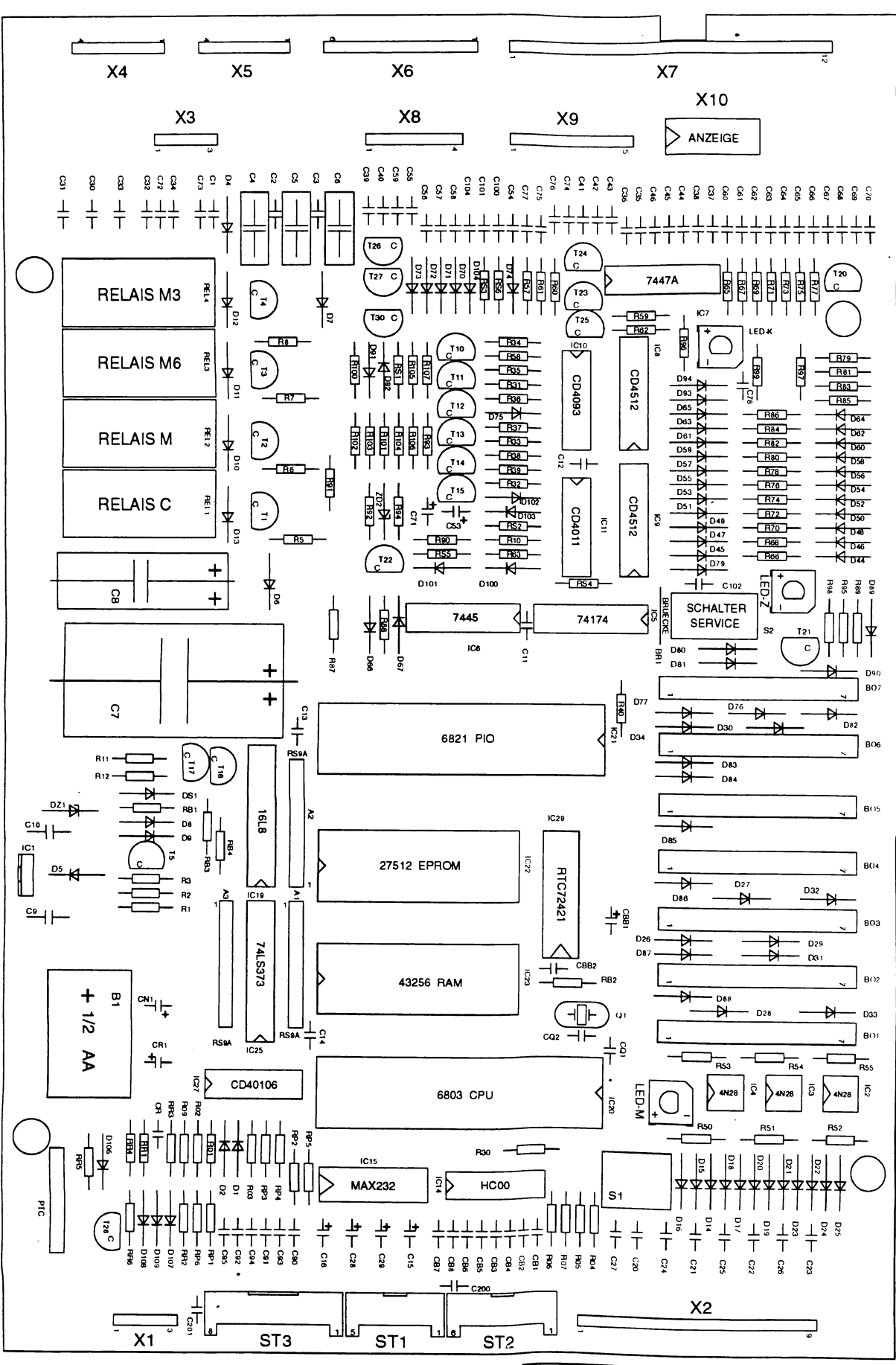


Alle nicht bezeichneten Dioden = 1N4446
 All diodes not marked = 1N4446
 S1 Binärschalter - 16 positionen
 S1 binary switch - 16 positions

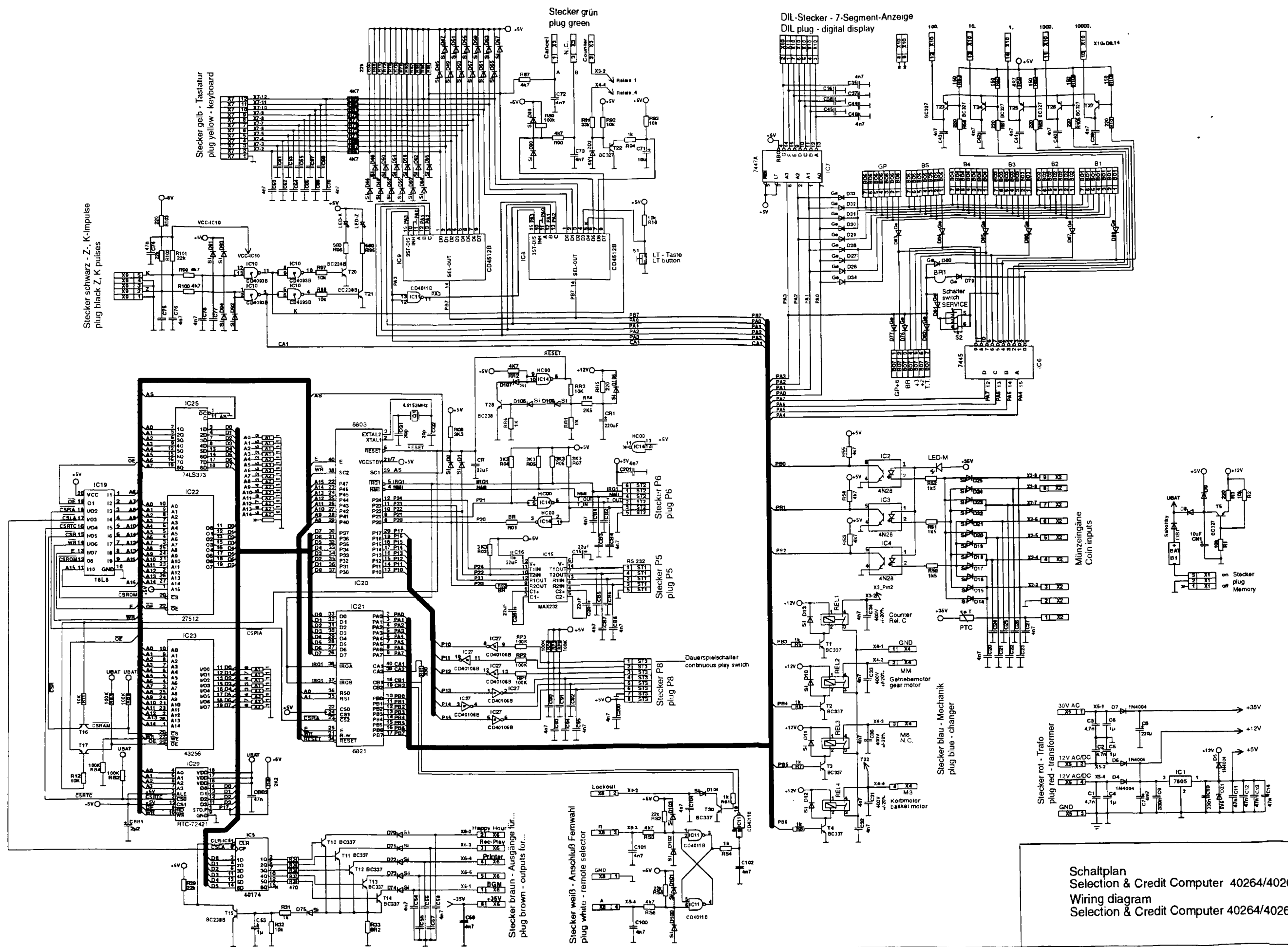


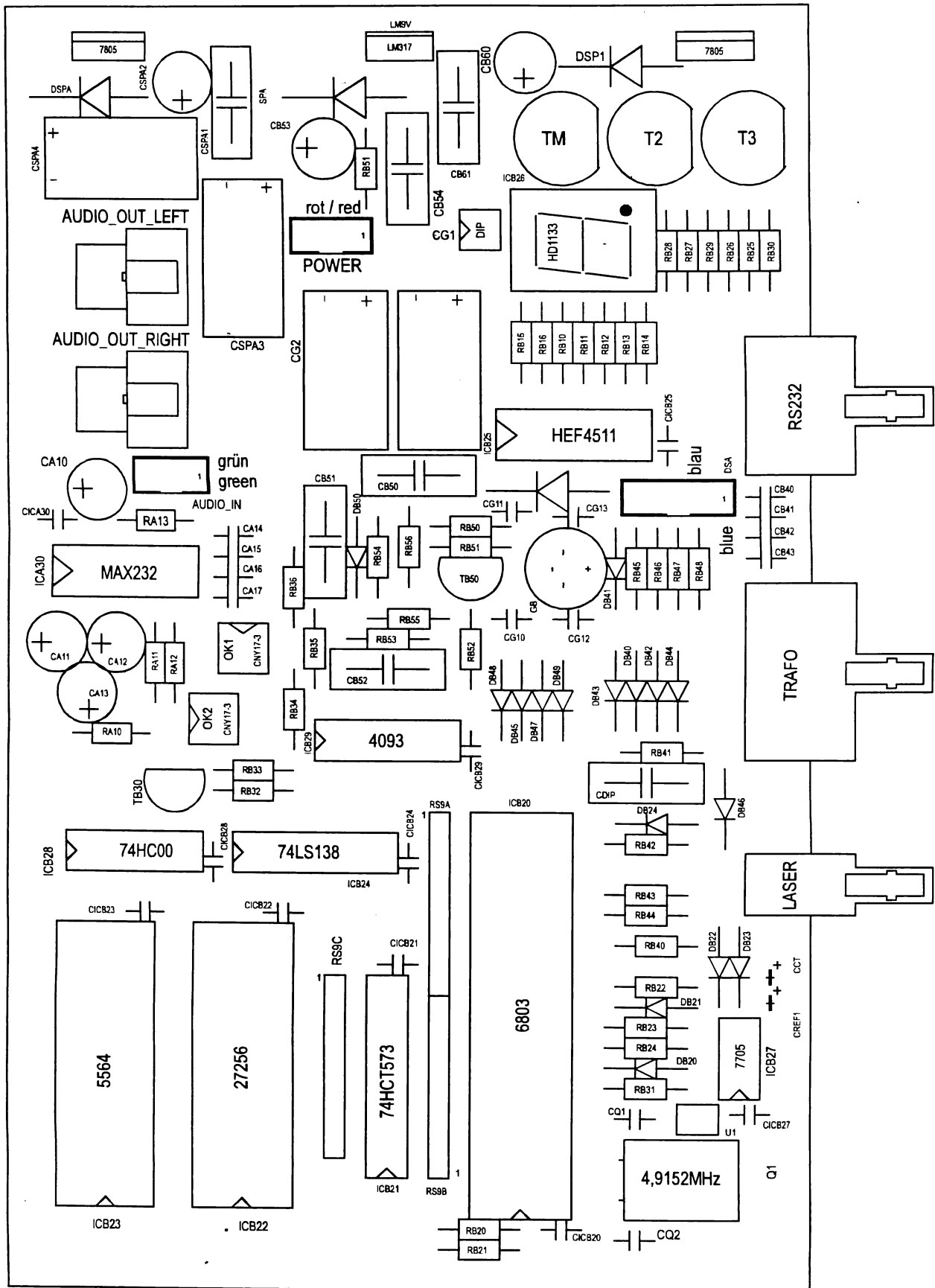
Prinzipschaltbild Empfänger
 Basic circuit diagram receiver

Schaltplan / wiring diagram
 Telecontrol / control unit
 0039074
 Empfänger / receiver
 0039129

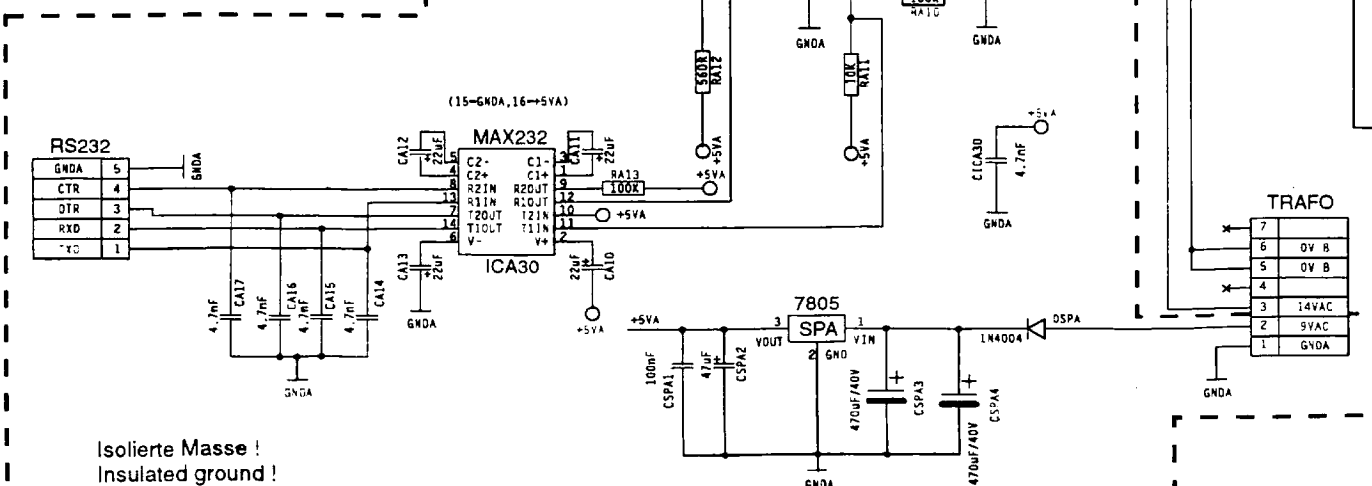
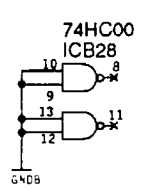
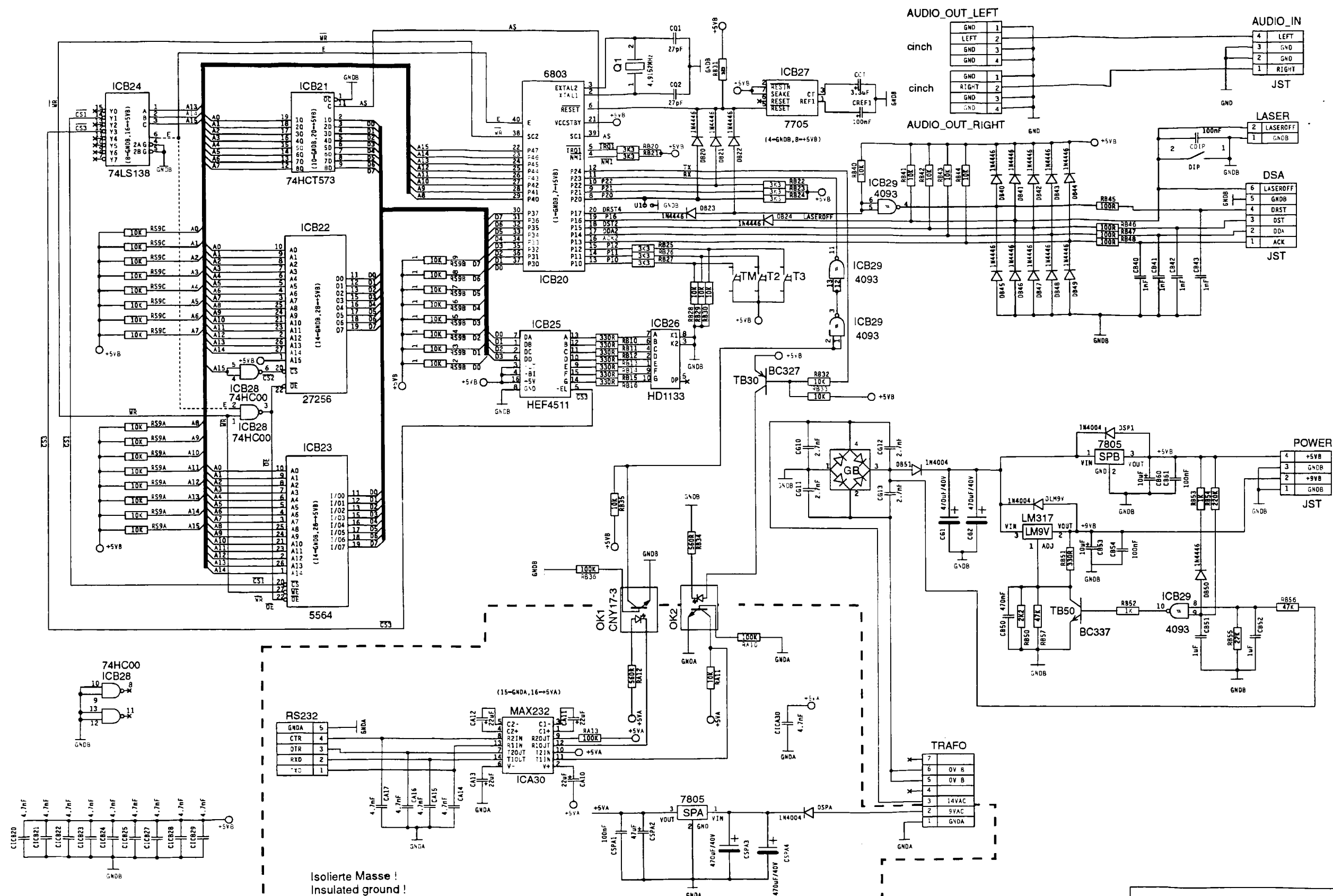


Bestückungsplan
 Board layout
 Selection & Credit Computer





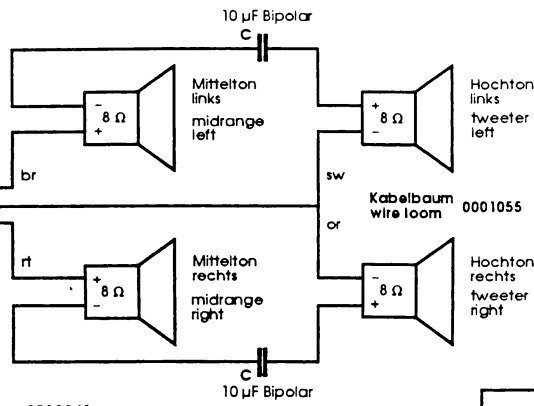
Bestückungsplan
 CDM12 SC-Steuerung
 Board Layout
 CDM12 Serial Controller



Isolierte Masse!
Insulated ground!

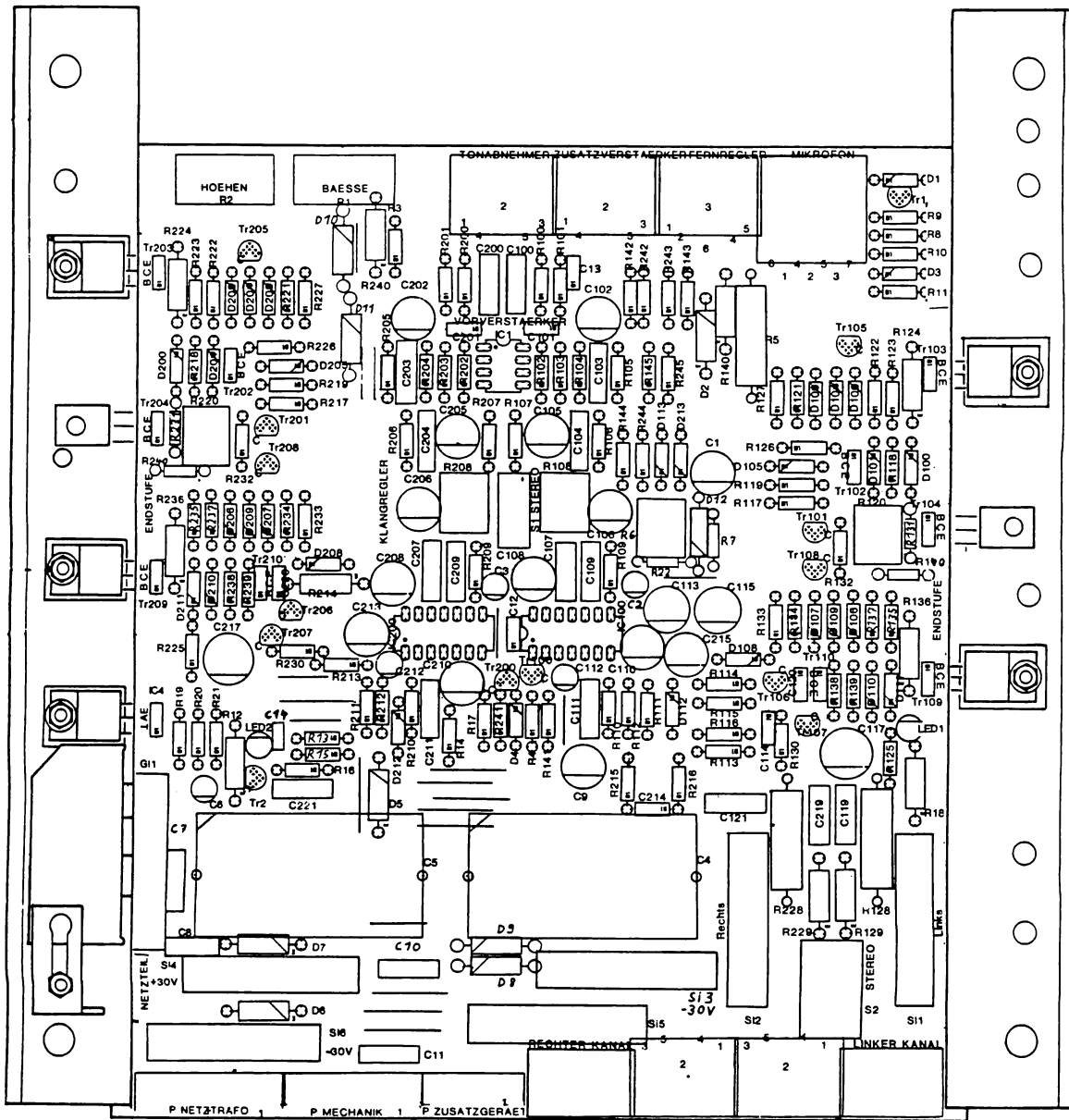
Schaltplan
CDM12 SC-Steuerung
Wiring diagram
CDM12 Serial Controller

Verstärker Ausgang
Amplifier output

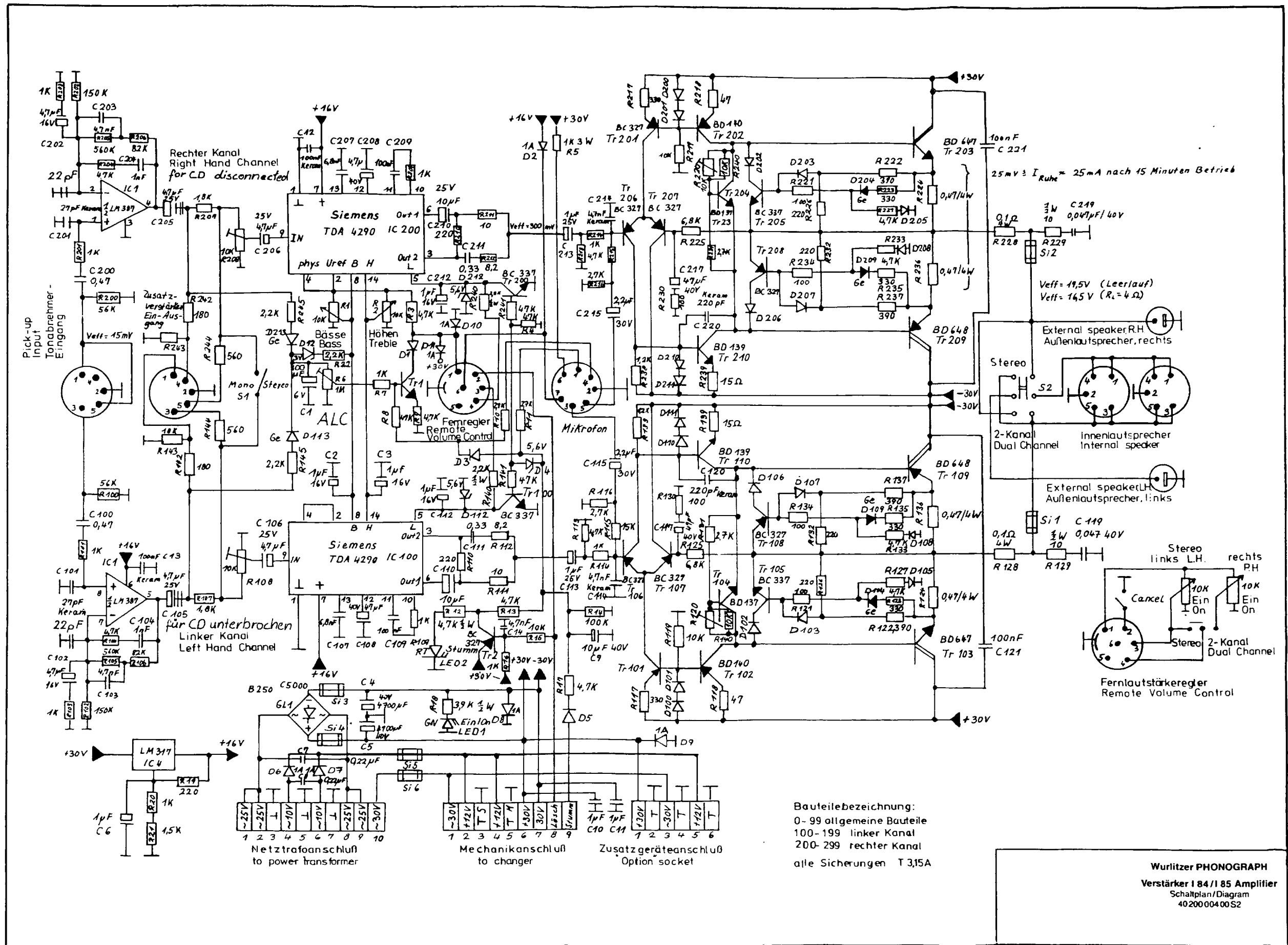


Lautsprecher Hochtön / tweeter : LPH 70/93 FP 0012941
 Lautsprecher Mitteltön / midrange: LPM 100/95 FP 0012942
 Kondensator / capacitor : 10 μF / 23V AC - GLATT / Bipolar 0011103

Verdrahtungsplan
 Lautsprecher OMT - Tür
 wiring diagram
 loudspeaker door OMT



Bestückungsplan Verstärker 184
 Board layout amplifier 184



Rechter Kanal
Right Hand Channel
for CD disconnected

Linker Kanal
Left Hand Channel
für CD unterbrochen

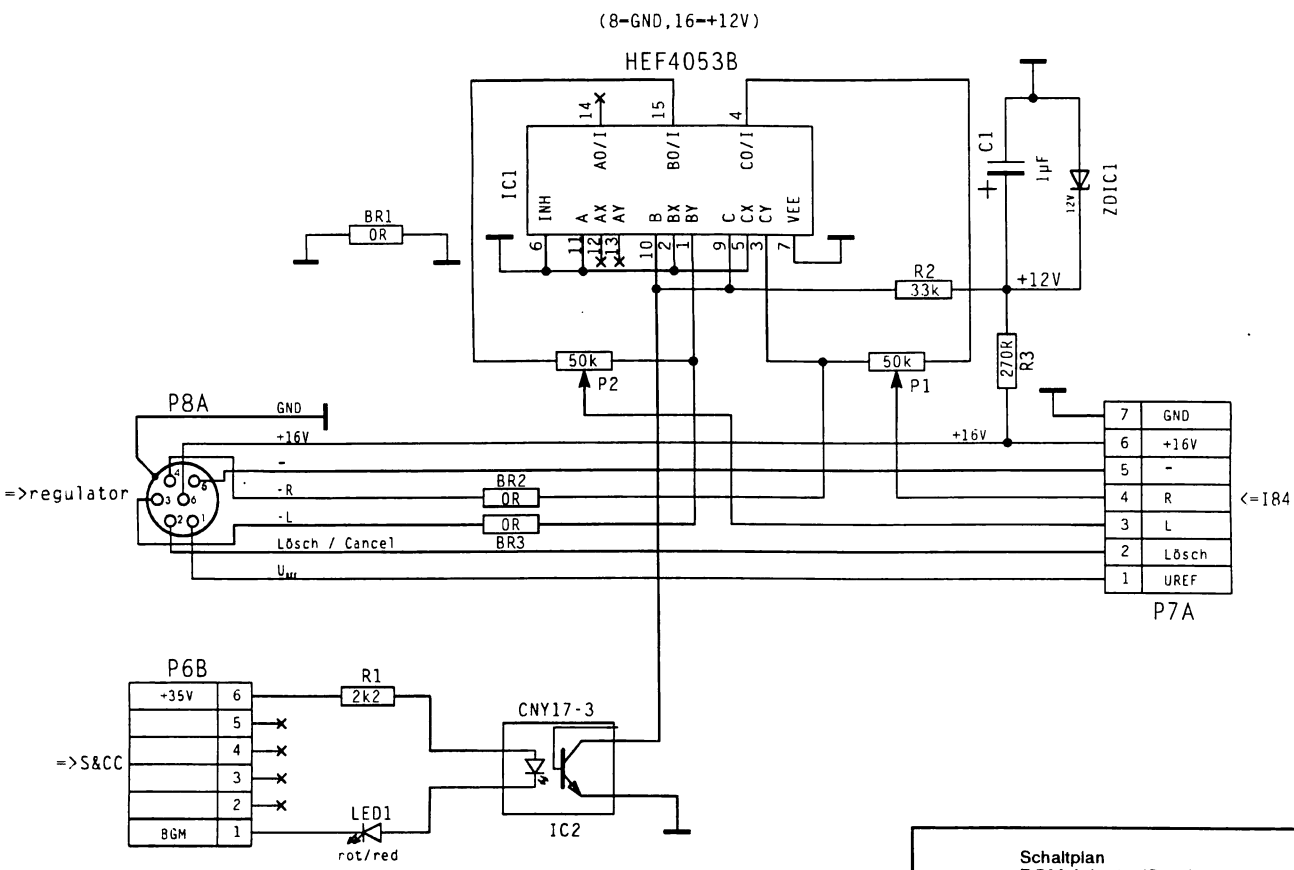
Netztrafoanschluß
to power transformer

Mechanikanschluß
to changer

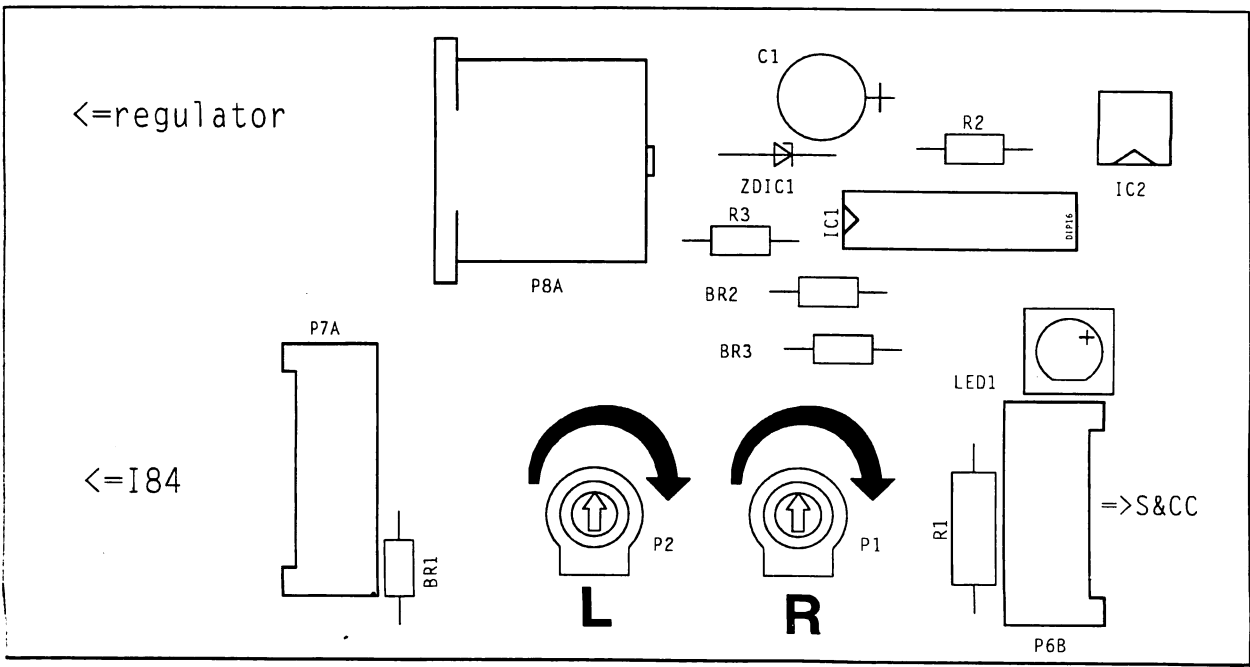
Zusatzgeräteeanschluß
Option socket

Bauteilebezeichnung:
0- 99 allgemeine Bauteile
100- 199 linker Kanal
200- 299 rechter Kanal
alle Sicherungen T 3,15A

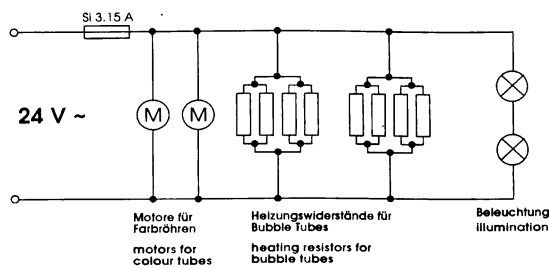
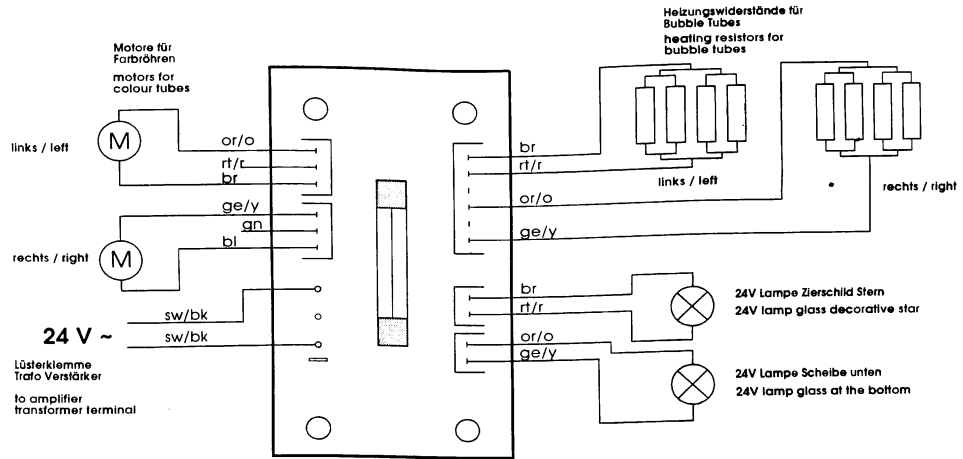
Wurlitzer PHONOGRAPH
Verstärker I 84/1 85 Amplifier
Schaltplan/Diagramm
4020000400S2



Schaltplan
BGM-Adapter/Optok.
Wiring diagram
BGM-Adaptor/optoc.

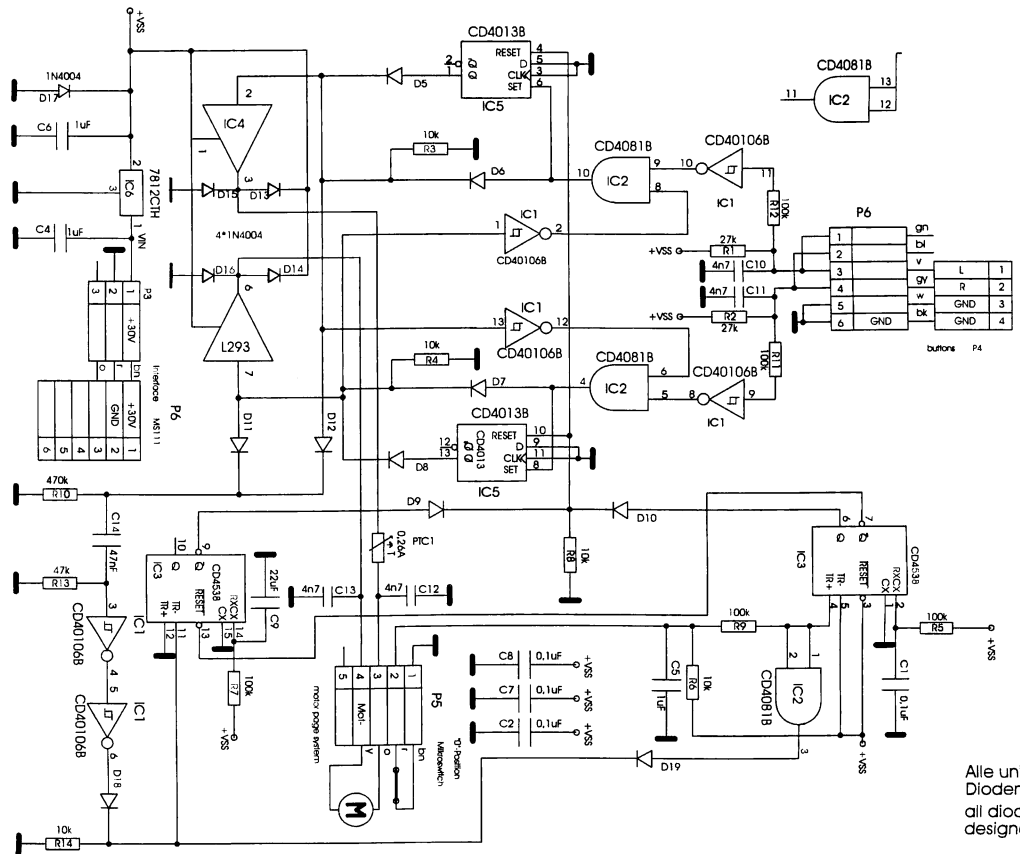


Bestückungsplan
BGM-Adapter/Optok.
Board layout
BGM-Adaptor/optoc.



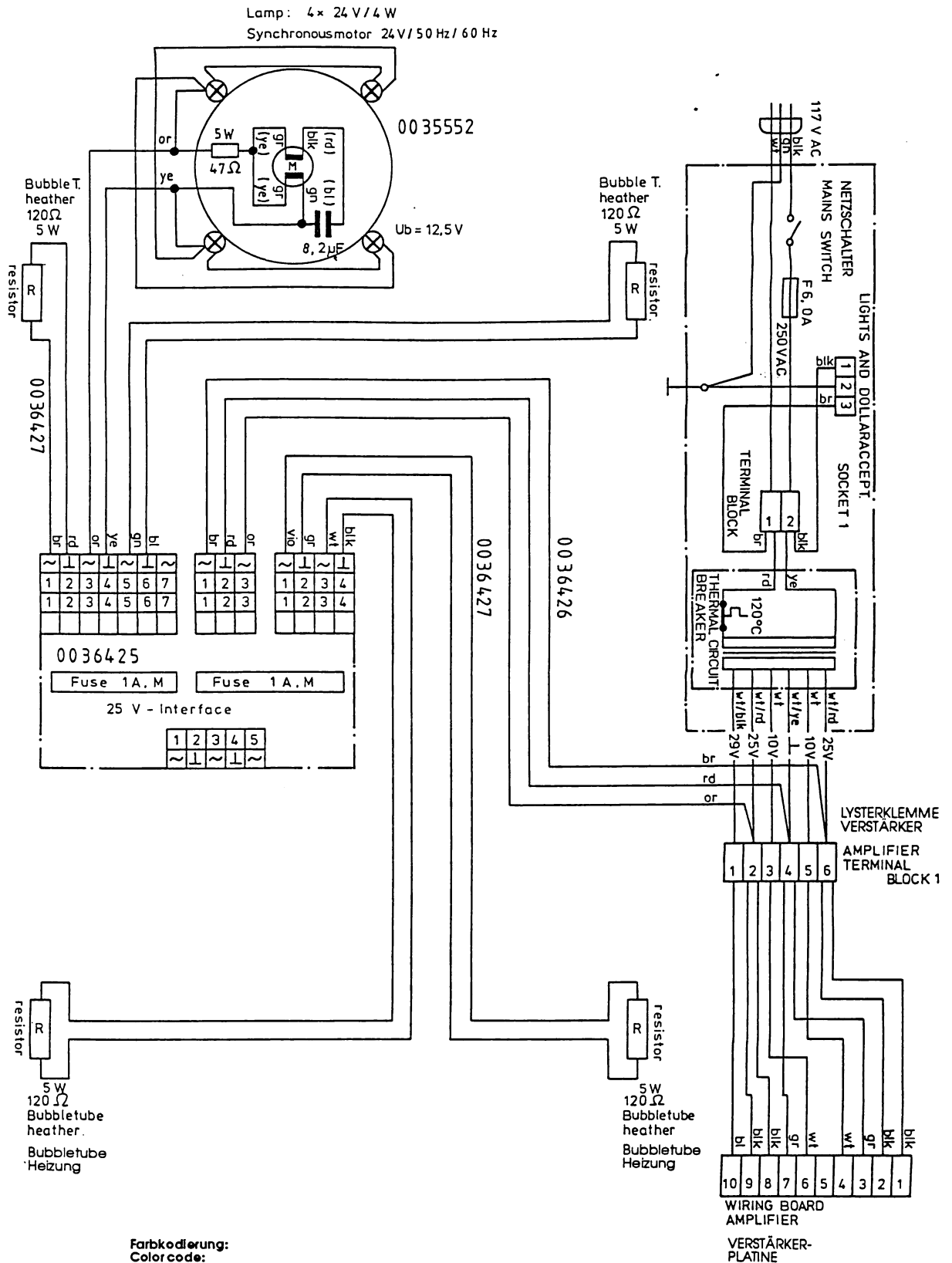
Synchronmotor	motor	24V - 375U 50Hz	0013648
Lampe	lamp	24V 21W	0012943
Heizwiderstand	heating resistor	120 Ω 10% 5W	0013217
Sicherung	fuse	T 3,15 A 250V	0012407

One More Time
Wiring diagram 24V AC distribution interface
Schaltplan 24V- Verteilerinterface



Alle unbezeichneten
Dioden 1N4446
all diodes without
designation: 1N4446

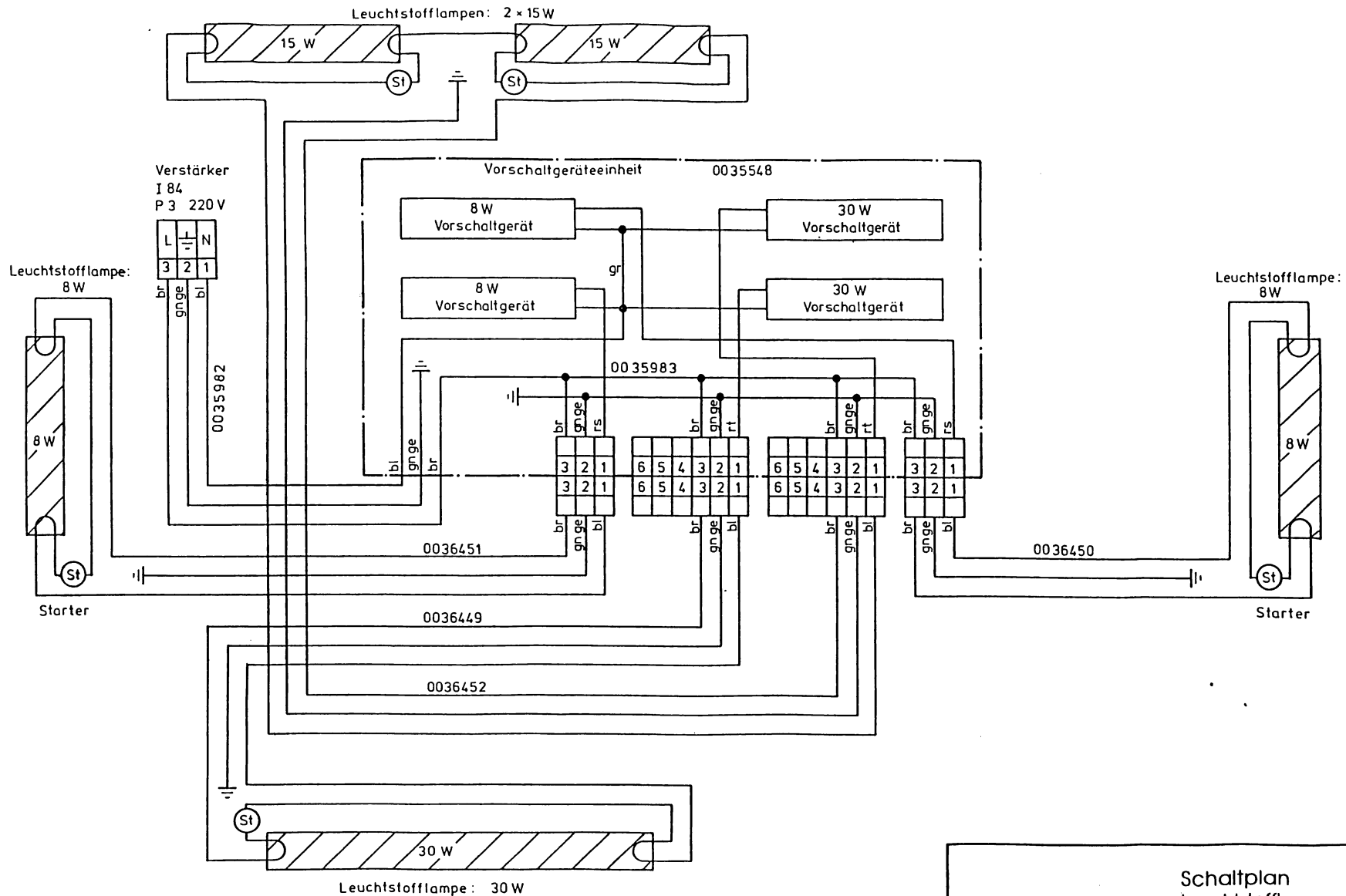
One More Time
Schaltplan Motorbuchansteuerung
Wiring diagram motor page system
0035737



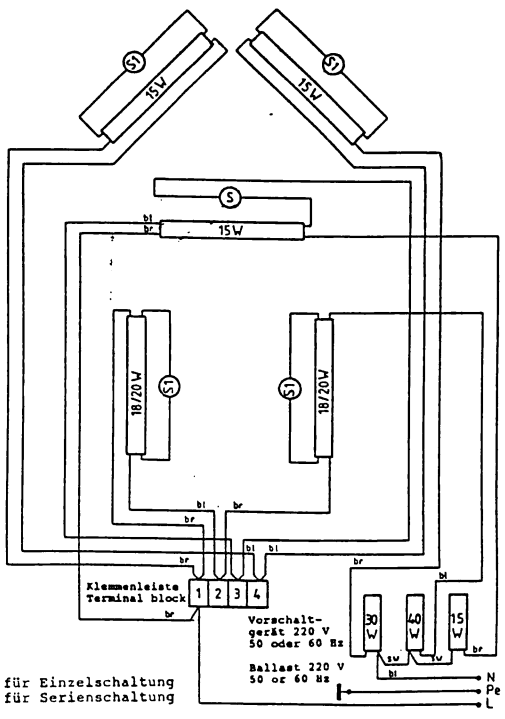
Farbkodierung:
Colorcode:

blk	=	black	=	schwarz
bl	=	blue	=	blau
br	=	brown	=	braun
gn	=	green	=	grün
gr	=	grey	=	grau
or	=	orange	=	orange
rd	=	red	=	rot
vio	=	violet	=	violett
wt	=	white	=	weiß
ye	=	yellow	=	gelb

Schaltplan
Wiring Diagram
Bubble Tubes
New York, NY

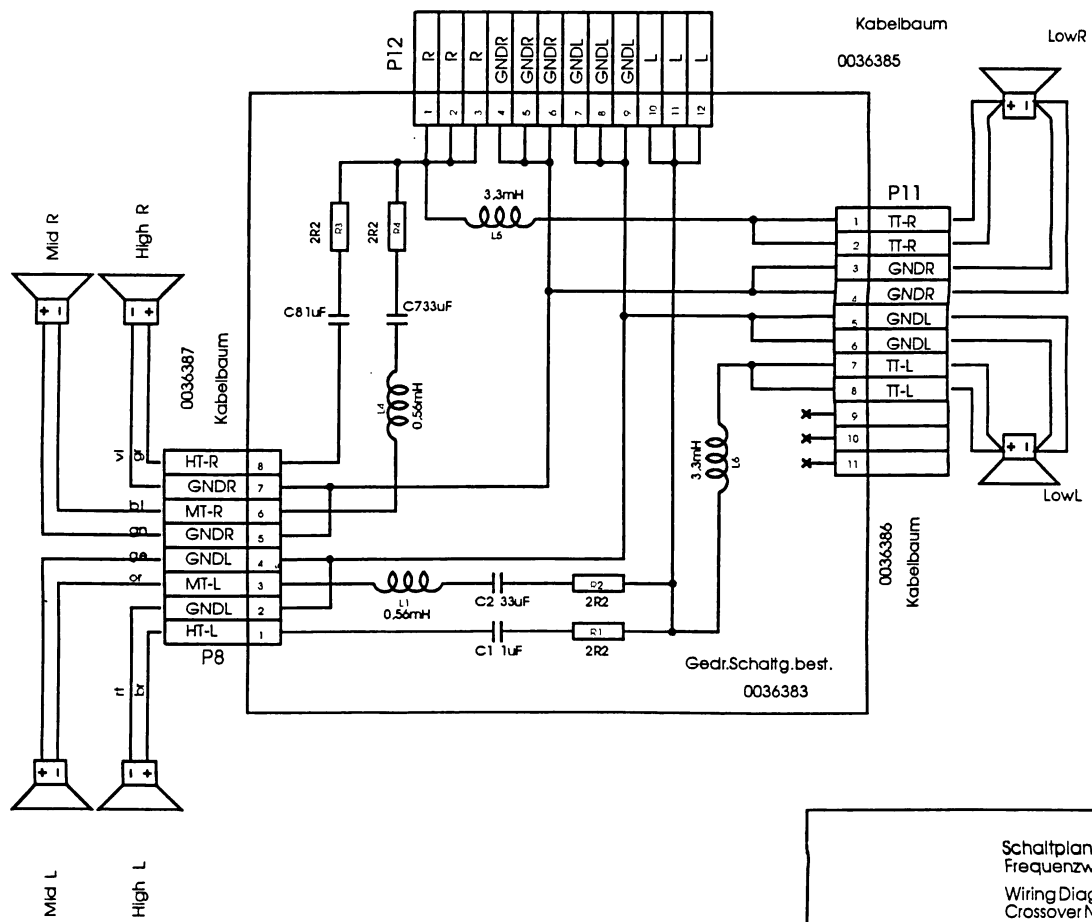


Schaltplan
Leuchtstofflampen NY,NY
Wiring Diagram
Fluorescent Lamps NY,NY
0036909

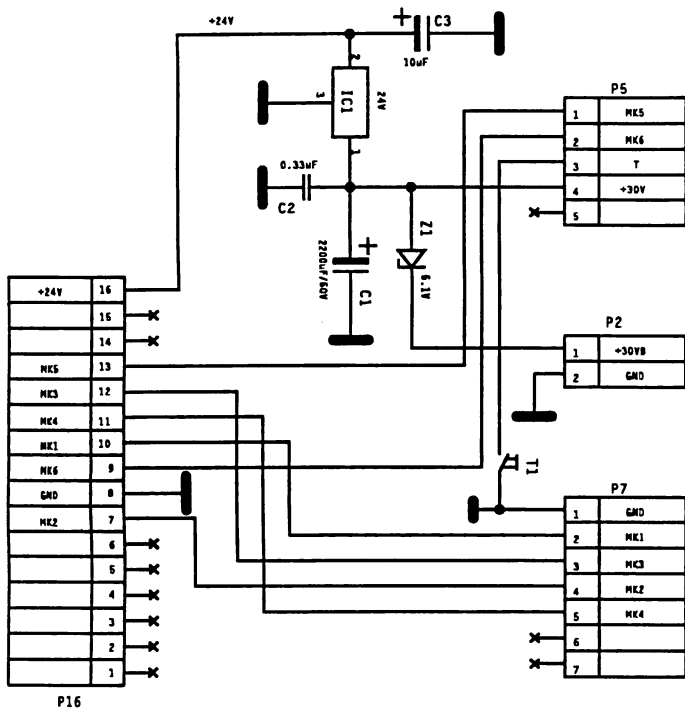


- S = Starter für Einzelschaltung
- S1 = Starter für Serienschaltung
- S = Starter for single lamp
- S1 = Starter for 2 lamps series-connected

Schaltplan
Tür-Beleuchtung OMT
Wiring Diagram
Door-Illumination OMT

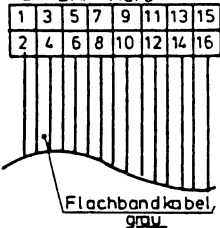


Schaltplan
Frequenzweiche NY, NY
Wiring Diagram
Crossover Network NY, NY



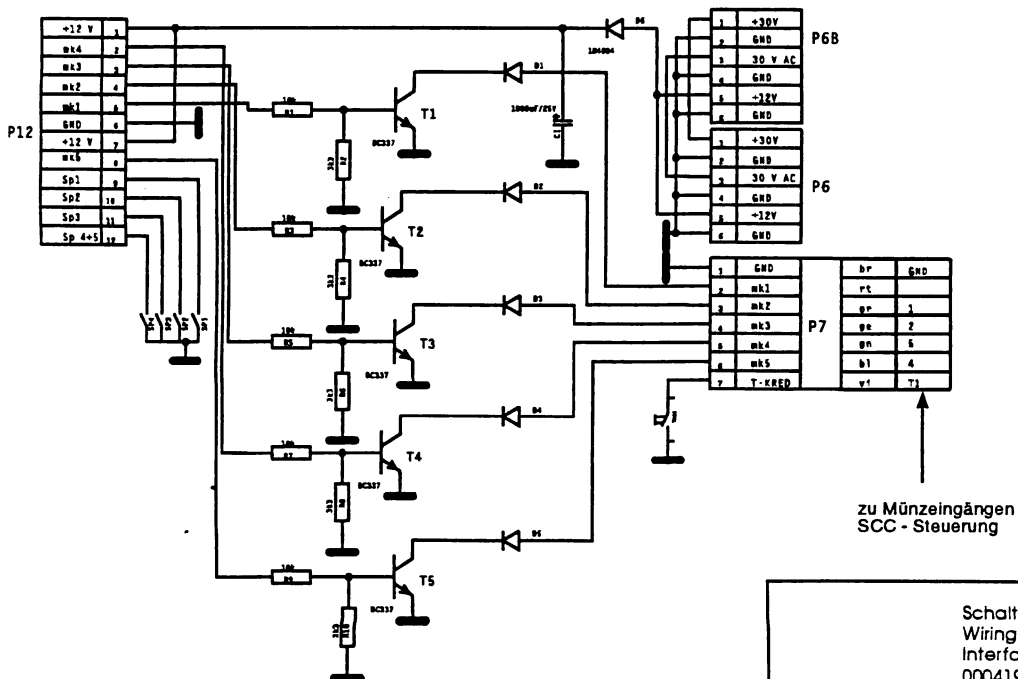
Blick auf MP Buchsenleiste
Steckseite

16 polige graue Buchsenleiste
am EMP-Mars



Farbenkode/
Colour code
br - braun - brown
ge - gelb - yellow
gn - grün - green
or - orange - orange
rt - rot - red
sw - schwarz - black
ws - weiß - white

Schaltplan
Wiring Diagram
Interface EMP Mars 130
0006175



zu Münzeingängen
SCC - Steuerung

Schaltplan
Wiring Diagram
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0004197

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