TECHNICAL INFORMATION

FOR

NSM-
CD 2100

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TECHNICAL INFORMATION, COMPL. PART-NUMBER 175 403

0
(TITLE PAGE)
Part No. 219 219

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

1 IN GENERAL

The opportunities offered by modern technology are fully used in this hi-fi CD system CD system "NSM CD 2100" for complete functional ability and simple operation.

VERY IMPORTANT!
The CD mechanism is very sensitive to electrostatic discharge. Careless handling during servicing may destroy components or reduce life expantancy drastically.
Before you touch the player discharge your hands and tools!

Service should only be performed by competent personnel in an authorized shop. A useful service and diagnostic system is available for service and control purposes.

The information and illustrations contained in these technical documents are up to data at the time of publication.

SUBJECT TO TECHNICAL MODIFICATION WITHOUT OBLIGATION TO MODIFY EQUIPMENT ALREADY DELIVERED!

TECHNICAL INSTRUCTIONS

FOR

N S M -
C D 2 1 0 0

1

Part No. 219 220

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

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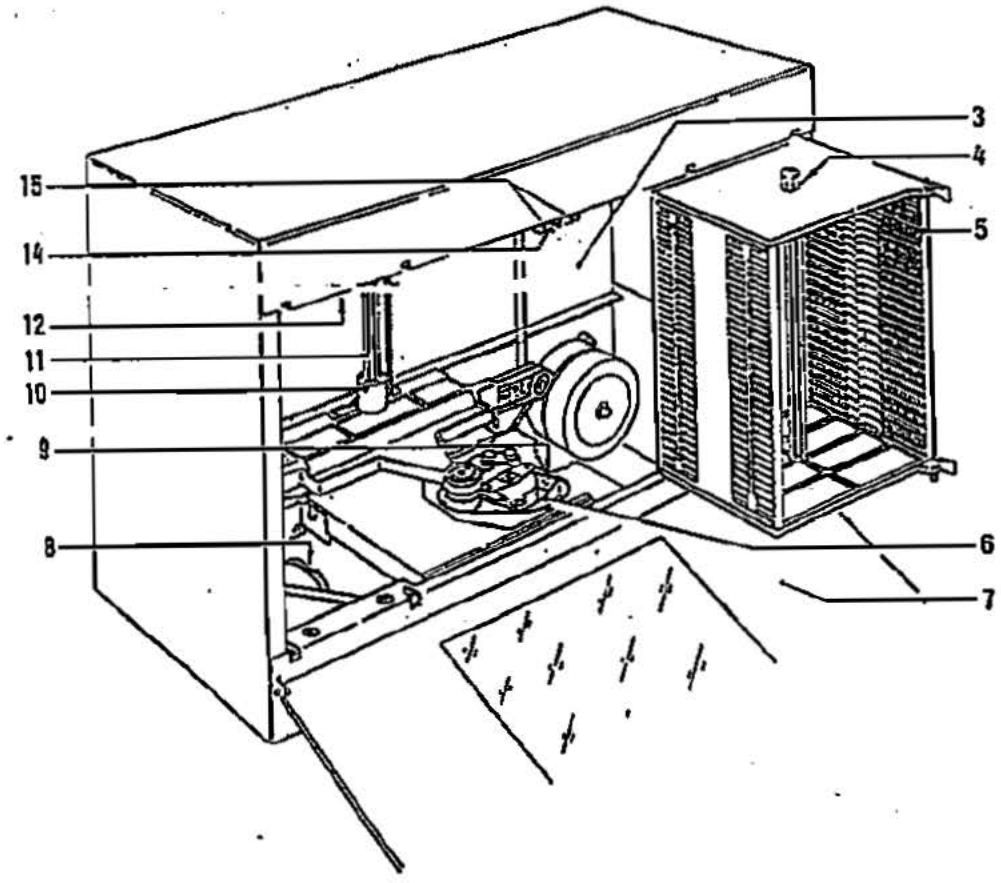


CD-Changer

1 PLEASE READ INSTRUCTIONS

1.1 Transport Damages

If external damage due to transport is noticed, this should at once be recorded on the delivery slip and endorsed by the person making the delivery.

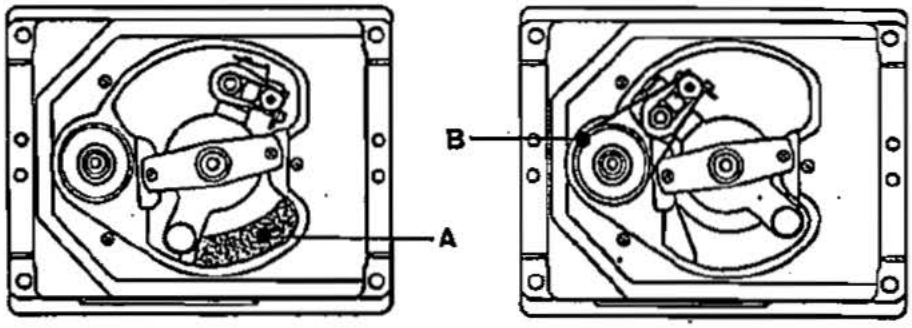
THE MANUFACTURER IS NOT LIABLE FOR DAMAGES DURING TRANSPORT!

1.2 Transport Devices

Before operating the phonograph all devices for safety and protection during transport have to be removed.
Prior to any further transit the safety and protection devices have to be replaced. See also the respective illustrations.

- Open front glass (7) and, if necessary, remove completely.
- Remove safety profile (plastic pipe cut open) from carriage axle (11), take carriage close to axle (10) and pull up.

- Remove molded cover from player.
- Remove protective material of radial motor; remove foam rubber (A) and, if necessary, rubber ring (B). If used again, do not insert foam on the side with the cable!



CD-Player

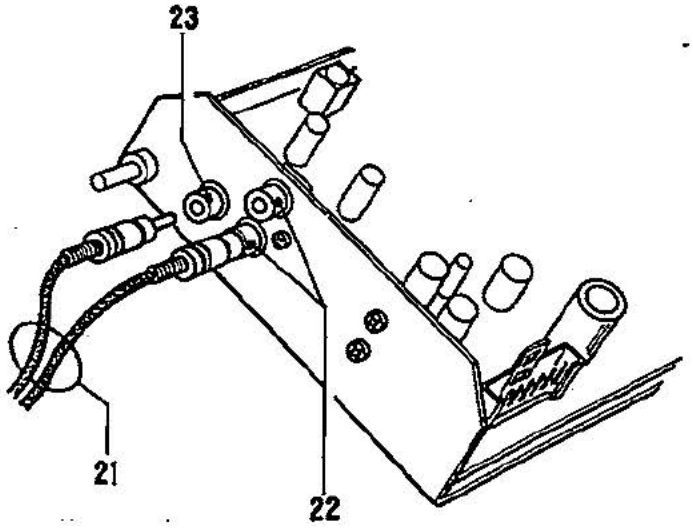
1.3 Installation

1.3.1 Set-up and Connection

- Insert 25-pole plug of control cable into control unit of changer. Tighten two screws.
- Plug socket of ground wire to flat plug on cabinet.
- Plug phono plugs of audio line into CD input of amplifier.
- Turn on amplifier.

1.3.2 Connecting Digital Output

- Remove magazine as described in Pkt. 1.5.
- Remove fastening screw (14).
- Push carrier plate (14) towards the back and push down.
- Replug one of the two audio lines (21) from one of the analog sockets (22) into digital output socket (23).
- Pull up carrier plate (14) until it locks in.
- Insert magazine.



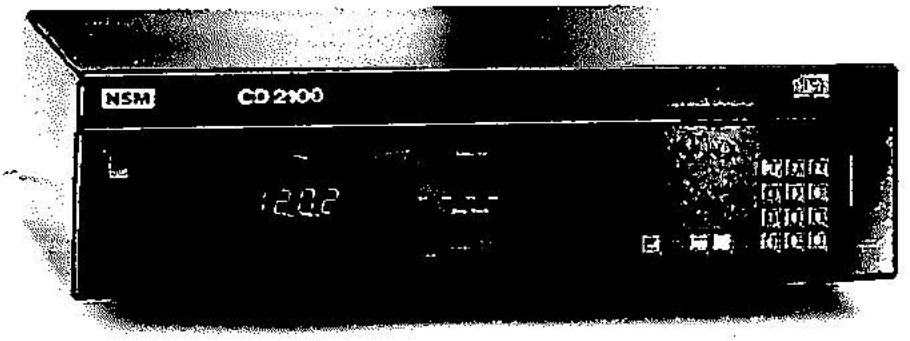
Carrier Plate with Audio Sockets

1.4 Power Connection

This device is set for voltage shown on sticker.

CHECK VOLTAGE BEFORE PLUGGING IN POWER PLUG!

Turn on machine with power switch on upper left front. The lights in CD changer will light up and "--- ---" appears on displays.



Control Unit

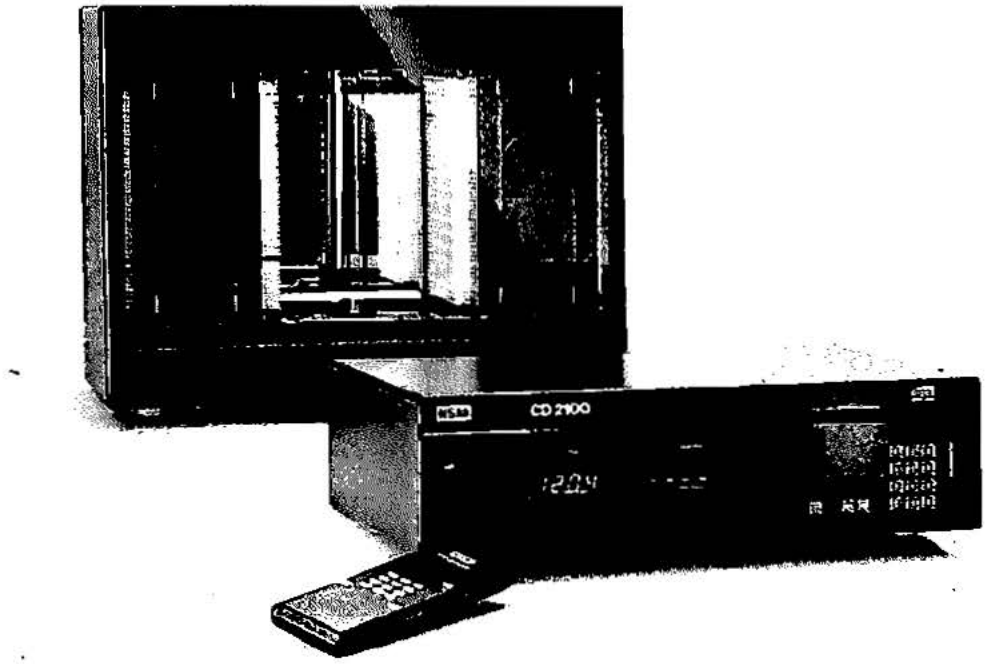
1.5 Loading CD's

- Push control knobs (15) towards center and swing open magazines left and right (5), pull out holders and load CD's Please note sequence of magazine numbers and numbers in CD register.
  To make sure that the carriage is not hindered, the CD holders must be pushed in until they lock.
- Swing in magazines until they lock.
- Put front glass back in and close it.

Note:
To take out the magazines push the button (15) to the outside; take out magazines one after the other!
The CD's can be protected against falling out, when transporting loaded magazines, by putting the plastic pipes (4) through the magazines and all loaded CD's.

1.6 Batteries in Remote Control

Open battery compartment on back side of remote control and insert 4 triple AAA batteries as per the symbols shown.



HIFI-CD-System NSM CD 2100,

CD-Changer 2100	Sach-Nr. 175 320
Glass	Sach-Nr. 175 319
Magazin, right	Sach-Nr. 173 502
Magazin, left	Sach-Nr. 173 503
Control unit CD 2100	Sach-Nr. 175 284
Remote control	Sach-Nr. 206 816

Funk - Entstörfilter
RADIO INTERFERENCE SUPPRESSION

Netzschalter
MAIN SWITCH

100V - 127V T 1,2 A
200V - 250V T 1,25 A

Alle geerdeten Teile
ALL GROUNDED PARTS

Transformator CD
TRANSFORMER CD

Transformator Sicherung
TRANSFORMER FUSE
0,25 A

Nicht benutzt !
NOT USED !

Netz - Transformator
MAINS TRANSFORMER

Bei Netzspannung : 100V; 117V; 200V; 250V;
ist Transformator CD
über Netz - Transformator angeschlossen.

WITH MAIN-POWER SET TO 100V, 117V, 200V, 260V,
THE TRANSFORMER CD IS CONNECTED
VIA MAINS TRANSFORMER.

Anschlußschema
CONNECTING SCHEME

Transformator CD
TRANSFORMER CD

Netz - Transformator
MAINS TRANSFORMER

* Brücke
BRIDGE

parallel geschaltet
CONNECTED IN PARALLEL

IR - Empfänger
IR - RECIVER

rot markiert
red marked

Farbspiegel
COLOR CODE

ws	weiß	white
bl	blau	blue
br	braun	brown
ge	gelb	yellow
gn	grün	green
gr	grau	grey
or	orange	orange
rs	rosa	pink
rt	rot	red
sw	schwarz	black
vi	violett	violet

D SUB - Stecker
D SUB - PLUG
25 polig
25 PRONGS

ST 200

ST 205

Tastatur
KEY BOARD

ST 204

CENTRALE - CD

ST 208

ST 10

ST 4

CD - WECHSLER
CD - CHANGER

WECHSLER - CHANGER - ADAPTER

ST 6

NF

L schwarz BLACK

R rot RED

CD Ausgang
CD OUTPUT

Stereo - Anlage
STEREO SYSTEM

Leitungstreiber 1
LINE DRIVER 1

74 HCT 125

ST 202

ST 201

ST 302

Anzeige
DISPLAY

ST 301

ST 6

ST 1

ST 2

ST 3

CONTROL UNIT - CD

SERVICE - Auswertung
EVALUATION OF SERVICE PROGRAMS

ST 11

ST 5

ST 4

RS-232 Schnittstelle
INTERFACE

Gezeichneter Anschluß 220V~
ADJUSTED FOR CONNECTION 220V~

Für alle anderen Spannungen Netztransformator umstellen.
FOR OTHER VOLTAGES RESOLDER POWER TRANSFORMER.

Gezeichnete Schalterstellung : Betriebsbereit.
CONTACT POSITION : READY FOR SERVICE.

Alle Sicherungen träge.
ALL FUSES SLO BLO.

Sicherungen nur durch solche mit gleichen Werten ersetzen.
REPLACE FUSES ONLY BY THOSE OF THE SAME VALUE.

Farbangaben ohne Gewähr.
COLOR INDICATION WITHOUT WARRANTY.

ÄNDERUNGEN IM SINNE DES TECHN. FORTSCHRITTES VORBEHALTEN
JEDOCH KEINE NACHRÜSTPFLICHT !

SUBJECT TO TECHNICAL MODIFICATION WITHOUT OBLIGATION
TO MODIFY EQUIPMENT ALREADY DELIVERED !

ELEKTROPLAN
OPERATING SCHEME

NSM CD 2100

Dat.	Gez.	Bearb.	Gepr.
12.09.90	Braun		

OPERATING INSTRUCTIONS

FOR

N S M -
C D 2 1 0 0

2

Part No. 219 221

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

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1.3.1 Title Selection

1.3.2 Album Selection

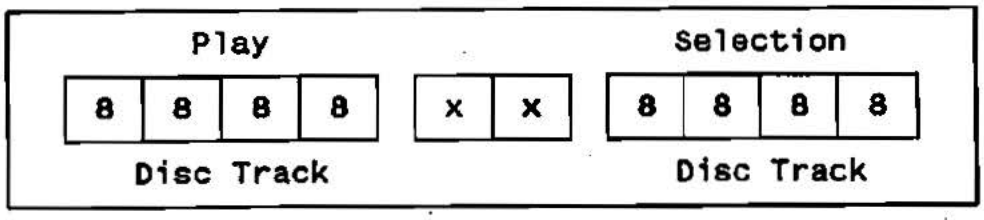
1.3.3 AUTO-Play

1.4 Play Operation

2 SERVICE OPERATION

2.1. Short Introduction

SELECTOR and DISPLAY PANEL



Display panel with displays-digits

1	2	3
4	5	6
7	8	9
C	0	H

CLR AUTO NEXT

Function Keys **12er Keyboard**

1 PLAY SEQUENCE

The following shows the complete operational sequence starting after POWER ON with the selection of a tune until the end of play is shown. While reading the instructions refer to the illustrations of the display and keypad.

1.1 Operations after POWER ON

Immediately after turning on the machine the electronic system checks itself; all memory banks on CONTROL UNIT and all preprogrammed values are checked. The left display shows for approx. 2 sec. the program index.
If an error is found, it is displayed on the right-hand side for about 2 sec. with "Er xx". "Er 31" (invalid memory content) on the left shows with "Pxx" the program step that needs to be reprogrammed. See description in Chapter 2 "SERVICE OPERATION". With other Er displays, also during regular operation, proceed according to the description in "3 SERVICE PROGRAMS", Chapter 2 "ERROR DISPLAYS".

The basic settings on this machine were set as per a standard table before shipping (factory settings).
If the magazines are equipped with less than 100 CD's or if you have special wishes regarding the music, you should first make the necessary settings as per Chapter 2 "SERVICE OPERATION".

1.2 Ready to Play

If all tests are o.k., then "--- ---" appears on display.

1.2.1 Hit Display

The microprocessor determines current popularity chart from among the 30 titles last played. When pushing the "H" key, the 10 most popular titles are shown according to their ranking. They are shown in display on right.
Note: When deleting the popularity counter in service program step P10, the hit parade, too, is deleted. In that case "0" appears until new titles are recognized and are evaluated.

1.3 Selection

One can set in service program step P35 if the selection should be by four digits (album selection by track 00) or by two digits (only album selection).

One can correct a selection by pushing the "C" button until it is stored (about 2 sec. after pressing the last number).

An incorrect selection, i.e. higher than the number of preprogrammed CD's/tracks or invalid album selection, causes "error" to blink. In that case press "C" and repeat selection.

1.3.1 Title Selection

Enter four-digit number of desired title (2 digits each for CD and track); entered digits are shown in display on right.

1.3.2 Album Selection

When entering track 00, all titles on a CD are automatically chosen (i.e. 0100 = all titles if CD 01).

1.3.3 AUTO-Play

When pressing "AUTO", turn on AUTO PLAY function; the automatic play mode is shown by a red glowing dot under the left display. When pressing the "AUTO" button again, this mode will be turned off and the display will be dimmed.
During "AUTO" CD's that are "incidentally" selected from the upper part of the magazine are played. The part from which they are selected can be set in service program step P25.
During AUTO play manually selected titles are played after the currently playing AUTO play title is finished. The red disappears during this time.
After all "selected" titles have been played, the machine goes back to the AUTO play mode until it is turned off with the "AUTO" key.
If the AUTO play mode is turned on while a title is playing, the red dot will appear for a short time to indicate that the function has been activated and disappears until the last manually "selected" title has been played.

1.4 Play Operation

After selection the pick-up of the CD changer moves to the selected CD and pulls it with the tray into the pick-up.
The pick-up brings the CD to the disc player where it is played.
Just before playing the number of the title is shown in the left display "Play". At the end of the title the display disappears and the CD is returned to its magazine slot.

When pressing the "NEXT" key, the currently playing title is interrupted, and if P31 has been programmed accordingly, the title selected next will be played.

When pressing the "CLR" key, the title playing presently is stopped and all selected titles are cancelled. The machine is in "play stand-by" position.

Note:
If an error appears on the CD changer or disc player, the error display "Er 7x" or "Er 6x" appears for about 2 sec. In that case proceed as per the instructions in "3 SERVICE PROGRAMS", Chapter 2 "ERROR DISPLAYS".

2 SERVICE OPERATION, Short Program for Most Important Settings

The control unit of this machine developed for the home market is exactly the same as the one in the "big" NSM phonographs and, therefore, the **service technician** has many valuable and user-friendly aid programms at his disposal.
The detailed description and chart illustrations can be seen in the "SERVICE PROGRAM".

For the user of this system it is sufficient to be informed of the most important settings. Therefore, you can program the system as you wish without burdening yourself with too much technology.

2.1 Short Introduction

This description is an excerpt of the service program.

- After "POWER ON" keep "CLR" key pressed at the same time until "P01" appears in the left display. The machine is in the set mode.
- Continue to other program steps with "H".
- To find another program step push "C", Display "P". After that the **direct selection** of a program step is possible by entering the desired program number and "H".
- **Return to the regular program** by pressing "C".
- The **standard setting** important for home operation can be executed in program step "P20".

Display	Designation	Remarks
P10	Total reset of popularity the HIT-parade and the counters.	Enter number "1" and "H".
P22	Number of maximum choice CD's and tracks.	Enter desired number between "0101" and "0099" as well as "H". CD 00 ≙ 100. Example for 100 CD's/ 24 tracks: 0024".
P24	Time interval for random title.	Enter desired time interval between "0" and "255" minutes, followed by "H". (No random titles are played when "0" is entered).

Display	Designation	Remarks
P25	Number of AUTO play music-CD.	Enter desired number between "0" and "100", followed by "H".AUTO play-area starts counting downwards starting with maximum number of CD's up (P22) to set of AUTO play CD's positions. With setting "0" no AUTO play area.
P30	Maximum playing time for a title.	Enter desired time in minutes between 0 and 99 and then press "H". With "0" no limit of playing time.
P31	Sequence of CD's playing.	Enter Number 0, 1 or 2 and then press "H". 0 = in sequence of selection 1 = in numerically increasing sequence 2 = random sequence
P32	Maximum number of successive plays of same CD (for album selection and AUTO PLAY).	Enter desired number of plays following after one another and press "H". With "0" no limit of playing time.
P35	4-digit selection for regular title selection 2-digit selection for album selection.	0 = 4-digit title selection (album selection for Track 00). 1 = 2-digit album selection.
P46	Block album selection.	0 = no album selection 1 = album selection free

SERVICE PROGRAMS

FOR

NSM-
CD 2100

3

Part No. 219 222

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

In General

The NSM CD 2100 developed for the home market has been equipped with the same CONTROL UNIT as the "big" NSM phonographs so that the same settings, error displays and test programs in this service program are valid.
The description and the complete service program were fully adopted.

Usually, the "short program" described in Pkt. 2 of "Service Operation" is sufficient for the user of the NSM CD 2100.

1 SERVICE PROGRAM

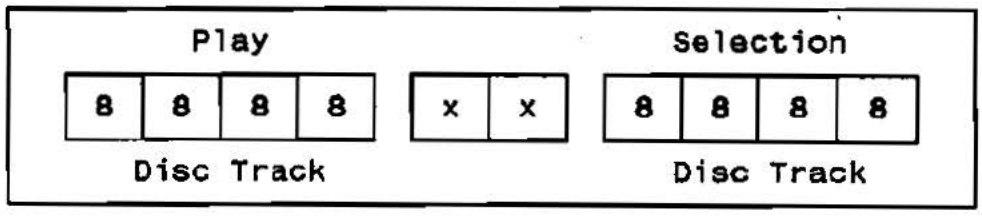
In the service mode the user has available many valuable and easy-to-use aid programs. There are three main sections:

1. Statistical programs which support the reading, evaluating, printing and erasing of all counters (P01 to P12).
2. Programs which permit a standard setting by the manufacturer as well as settings for customers of all machine parameters (P20 to P39).
3. Testing programs which support a quick functional test of units as well as locating an error on location (P60/P61).

Short Instructions

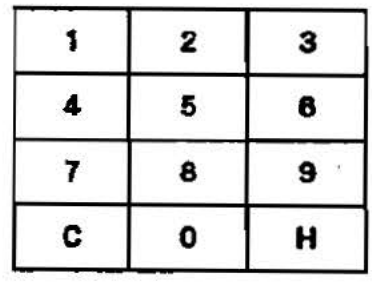
- After POWER ON keep "CLR" pressed at the same time until "P01" appears in left display. The machine is in the set mode.
- Continue to other program steps by pressing "C".
- To find another program step push "C", display "P".
  After that **direct selection** of a program step is possible by entering the desired program number and "H".
- **Return to the regular program** by pressing "C" twice.
- **Information** (read-out of counters) is possible by entering code numbers within certain program steps.
- **Extended functions** within certain program steps by entering a code number and "H".
- **Standard setting** in program step P20 by entering chart number and "H".

SELECTOR and DISPLAY PANEL



Display panel with displays-digits

Function Keys



12er Keyboard

1.1 Statistical program

1.1.1 Popularity–from least played title upward

Display	Designation	Remarks	
P01	Number of least played CD.	Enter number "0" (is switched on automatically).	
	Number of next least played CD, etc. upwards to the most played CD.	Advance with "1".	
	Rank of CD displayed.	Enter the number "2". The next display corresponds to the rank of this record Example display "5" corresponds to the fifth least played record.	
	Total of this CD played (max. 255).	Enter number "3"	If a pop. counter is gerater than 200 at "power off", all counters are divided by 2 (normalized). An "r" appears on display 2 until the counters are reset (the pop. display is relative).
	Information on a cartain CD.	Enter the number "4", the desired CD number and "H". The desired information on this CD can be called up as described previously with the keys "1" through "3".	

1.1.2 Popularity, from best title upwards

P02	Number of most played CD.	Enter number "0" (is switched on automatically).	
	Number of next most played CD etc. down to the least played CD.	Advance with "1".	
	Rank of CD displayed.	Enter the number "2". The next display corresponds to the rank of this record. Example display "5" corresponds to the fifth least played record.	
	Total of this CD played (max. 255).	Enter number "3"	If a pop. counter is greater than 200 at "power off", all counters are divided by 2. An "r" appears on display 2 until the counters are reset. Get actual popularity, multiply all by 2.
	Information on a certain CD.	Enter the number "4", the desired CD number and "H". The desired information on this CD can be called up as described previously with the keys "1" through "3".	

1.1.3 Counter read-out

P04	Play counter.	Enter number "0". (is switched on automatically).
	Play counter, accumulated	Enter number "1".
P05	Number of selected title.	
P06	Number of album selections.	
P08	Number of auto play titles.	

1.1.4 Counter and credit reset

Display	Designation	Remarks
P10	Total reset of popularity (P01, P02) the HIT-parade, the counters P03 through P08.	Enter number "1" and "H".
	Resetting the popularity (P01, P02) and HIT-parade.	Enter number "2" and "H".
	Resetting the counters (P03 through P08).	Enter number "3" and "H".

1.1.5 Data transfer

P11	Data transfer and memory (storage) with the NSM DATA PRINT.	Plug DATA PRINT into "Service Socket" of control unit. Enter Code "1" and "H". Counters (P03-P08) and popularity will be transferred. Display 3 "E0" appears in case of error during data transfer. Counters (P03-P08) and popularity are cancelled after successful data transfer. Also see description NSM DATA PRINT.
P12	Transfer to NSM-DATA PRINT.	Plug printer into the "service socket" on the control unit. Enter "1" = counters (P03 through P08) or "2" = counters (P03 through P08), settings (P21 through P37, P39)or "3" = counters (P03 through P08), popularity (P01, P02) or "4" = counters, settings, popularity, If overflow has taken place, the popularity is relative, the multiplying of overflows is printed out also. If the printer does not operate, "E0" appears on display 3.

1.2 Specific Settings

1.2.1 Standard Settings

P20	Programming of steps P21 through P39 (for factory settings see table 1).	Press "1" and "H". If values deviating from the table are desired, they can be entered according to the following program steps.

Standard table for specific settings in program step P20.
The following table shows the basic setting (factory setting) of the phonograph.

Tab.-No.	Result in the individual program step:
P21	0000 = unit code (for recording device)
P22	0099 = maximum choice CD/track (100 CD's/99 Tracks)
P24	0 = interval for random play in minutes (0 = out)
P25	100 = Number of CD's for auto play
P30	0 = No limit of playing time for a title
P31	0 = Playing in sequence of selection
P32	1 = Limit on playing titles on the same CD
P33	0 = No limit of playing time
P34	0 = No limit of playing time
P35	0 = 4-digit selection

1.2.2 Code number for NSM DATA PRINT

Display Designation	Remarks
P21 Machine code number for NSM DATA PRINT.	Enter code number between "0" and "9999" as well as "H".

1.2.3 Maximum choice CD's/tracks

P22 Number of maximum choice CD/tracks.	Enter desired number between "0101" and "0099" as well as "H". CD-Nr. 00 ≙ 100.

1.2.4 Random title and Background

P24 Time interval for random title.	Enter desired time interval between "0" and "255" minutes followed by "H". No random titles are played when "0" is entered.
P25 Number of auto play music-CD.	Enter desired number between "0" und "100", followed by "H". Auto play mode starts counting downwards starting with maximum number of CD's up (P22) to set number of auto play positions. With setting "0" no auto play mode operation.

1.2.5 Maximum Playing Time

P30 Maximum playing time for a title.	Enter desired time in minutes between 0 and 99 and then press "H". With "0" no limit of playing time.

1.2.6 Sequence of CD's playing

P31 Sequence of CD's playing.	Enter Number 0, 1 or 2 and then press "H". 0 = in sequence of selection (FIFO) 1 = in numerically increasing sequence 2 = random sequence

1.2.7 Maximum of tunes played on the same CD

P32 Maximum of tunes played on the same CD.	Enter desired maximum number of tunes played and then press "H". With "0" no limit.

1.2.8 Limitation Play Time

P33 Maximum play time (w/o interruption).	Desired time in min., enter between 1 and 255 minutes.
P34 Restricted time.	When setting "0" = no play time limit.

1.2.9 4-digit or 2-digit selection

P35 4-digit selection for normal title selection 2-digit selection for album selection	0 = 4-digit title selection (album selection with Track 00)

1.3 TEST PROGRAMS

The displays in this program step acts as test aids for testing the phonograph.
In the event of a malfunction the defective unit can be determined or a malfunction resultion from incorrect settings can be recognized in a simple manner with the aid of these tests. Certain displays are aids for the adjustment of the playing mechanism.

SWITCH ON TEST PROGRAM:

- After POWER ON press "CLR" at the same time and keep pressed until "P01" appears in the left display. The machine is in the set mode.
- Display 1 shows "P", press letter "C".
- Press number 60 and H, Display 1 shows "P60".

1.3.1 Display Test, Display 1 "P60"

This program tests the lights and displays on the display circuit board. After starting "F1" (first function test) appears on display 2.
The test is run through in steps:
1. All 5 display lights together
2. The digits are switched on one after another individually with "8".
3. The display lamps 1 through 5 individually.
4. Displays together, running through the numbers "0" through "9".

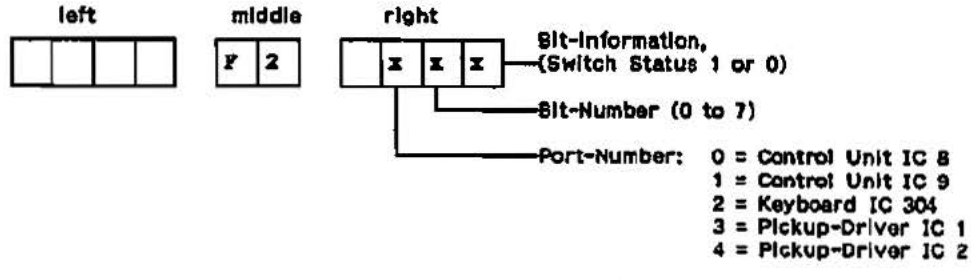
The "F1" is displayed for approx. 2 seconds before the test repeats, itself.

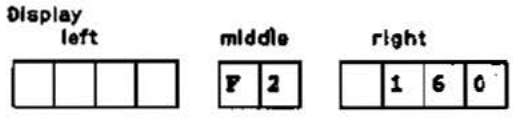
Designation	Remarks
Display test -continuous test-.	Enter "1" and "H". Display 2 "F1".
Stop test sequence.	Enter "H".
Contime test sequence.	Enter "H" again.
Terminate test.	Enter "C" 1, Display 1 "P60".

1.3.2 Input Test, Display 1 "P60"

In the following test the functions of all entries of Input Ports 1-5 can be tested:
Port 1, Port 2: Control unit
Port 3 : Keyboard (Display Board)
Port 4, Port 5: Pickup-Driver
Every input change is shown on the display as follows:

Input Test, Enter "H" again, Enter "2" and "H", Display middle "F2" (second function test).
Display:





Meaning of the displays:

"F2" = Input Test
"1" = Port 1 (IC9)
"6" = Bit 6
"0" = Switch Status 0 (closed)

Instructions: The accuracy of the inputs from the keyboard can be checked due to the entry connections simply by selecting a titel

Terminate test. Enter "C" 1, Display 1 "P60".

1.3.3 Continuous Run 1

The machine is switched to continuous run. Every CD is played continuously for 16 sec. All errors of the CD changer or CD player are registered.

Continuous Run 1

Enter "3" and "H", Display 2 "F3"

Display:

left	middle	right
	F 3	x x x — Number of errors

Terminate test.

Push "CLR"-key, Display 1 "P60", "--- ---" is being displayed, the phonograph returns to normal program.

1.3.4 Continuous Run 2

The machine is switched to continuous run. Every CD is played continuously for 16 sec., starting with the first selection. All errors of the CD changer or CD player are registered.

Continuous Test 2

Enter "4" and "H", Display middle "F3".

Display:

left	middle	right
	F 4	x x x — Number of errors

Terminate test.

Push "CLR"-key, Display 1 "P60", "--- ---" is being displayed, the phonograph returns to normal program.

1.3.5 CD changer Test

All function of the changer can be tested individually.

CD changer test

Enter "5" and "H", Display middle "F5".
The select any title.

Keep in mind the code numbers for the individual changer functions as per the following keyboard illustration:

Input	Function
1	CD-Player, Start/Stop
2	Lift, upwardw
8	Lift, downwards
4	Grip left
6	Grip right
5	Return holder
0	Stop lift at magazine space
3	Motor steps, upwards (per 0,5 mm)
9	Motor steps, downwards (per 0,5 mm)

Dispalys:

				F 5				
x	x	x			x	x	x	x

The time in sec. during which the lift position is held. The lift position is held after every function for 2 sec., by touching "0" for 10 sec.

OPTO stepper control	OPSTP
OPTO end position	OPEND
OPTO grip right	OPGRR
OPTO pickup middle	OPPUM
OPTO grip left	OPGRL

Meaning of displays: OPTO lit up = "0", OPTO darkened = "1".

Terminate test.

Enter "C" 1, Display 1 "P60".

1.3.6 Track selection of CD test records

Display	Designation	Remarks
P61	Track selection of CD test records.	Select the required CD record and track number and press "H". e.g. 0123 - Disc 01, Track 23. The selected title will be stored and played after returning to play mode.

1.3.7 Read-out of errors

P62	Error code of last error (see descr. error displays).	Enter "0". (Is automatically switched on).
	Error code of previous errors (see descr. error displays).	Advance with key "1". Up to max. 10 errors.
	At error code 6x no. of CD at which error occurred.	Enter "2".
	Time since power on or start of test P60/3 or P60/4 when error occurs.	Enter "3". Display in hrs., min.
	Cancellation of stored error code.	Enter "4", "1" and "H".

2 Error Displays

Displays le.	mi.	ri.	Possible Causes	Corrections
	Er	01	EPROM contents (CONTROL UNIT) interrupted.	Change EPROM (IC2).
	Er	10	RAM (CONTROL UNIT) defective.	Change RAM (IC3). After that reprogram all program steps (P20-P56).
	Er	11	RAM contents (CONTROL UNIT) short-term disturbance.	No correction necessary; program is reinitialized. Change RAM IC3 if frequently occurring.
	Er	20	Verification errors in program (CONTROL UNIT).	No correction necessary; program is reinitialized. Change CPU IC1 if frequently occurring.
Pxx	Er	30	Memory contents (CONTROL UNIT) invalid.	No correction necessary; program step Pxx (in Display 1) is automatically reprogrammed.
Pxx	Er	31	Memory contents (CONTROL UNIT) invalid or not programmed.	Service step Pxx shown in Display 1 must be reprogrammed.
	Er	6x	Error at CD player.	See Er 60 - Er 62. Play interrupted after error.
	Er	60	Error before playing CD (track selection). No supply voltage present for decoder of player.	Exchange decoder board, microcomputer T018 on pickup driver (IC8). Check primary fuse in CD transformer.
	Er	61	No CD recognized by player. No CD in CD tray, CD defective. Player defective. Decoder board defective. No supply voltage present for decoder or player.	Check CD and exchange if needed. Laser player (CDM-3). Exchange decoder board. Check primary fuse in CD transformer.
	Er	62	Error after playing CD (stop).	As in Er 60.
	Er	63	Track cannot be played (CD defective) or choosing a track number which is too high (error display appears only during continuous test P60/3 or P60/4; during regular operation track No. 1 is played when choosing a track number which is too high).	Exchange CD, check track selection.
	Er	7x	Malfunction on CD changer.	See Er 70 - Er 76. If error display does not disappear after 2 sec., error cannot be automatically corrected. No CD will be played. until cabinet switch or "power on" is activated.
	Er	70	CD tray after playing CD incorrect in pickup.	Check function of light barries OPPUM, OPGRL, OPGRR.
	Er	71	Error during grip from left-side magazine.	Ckeck alignment from magazine to pickup assy and adjust if necessary. Check function of light barrier OPPUM.
	Er	72	Error during grip from right-side magazine.	As in Er 71.
	Er	73	Error during replacing in left-side magazine. Malfunction of left grip lever.	Check alignment of magazine to pickup assy and adjust if needed. Check function of grip. Check function of light barrier OPGRL.
	Er	74	Error during replacing of right-side magazine. Malfunction of right grip lever.	As in Er 73. Check function of light barrier OPGRR.
	Er	75	Malfunction during lift drive.	Check lift for jamming. Check function and correct adjustment of light barrier OPSTP (drive wheel).
	Er	76	End position of lift not o.k.	Check function and adjustment of light barrier OPEND.

An error on the programmable memory area the corresponding program steps is show on Display 1; Pxx Er 31; the "error" lamp flashes.
After the phonograph is turned on, the malfunction display in Display 3 and the flashing of "error" remains visible for 2 sec. After that the phonograph is operational; without regaring the malfunctioning program step, through.
By using serv.-progr.-step P62, the last 10 error codes can be called; see "service programs" pt. 1.3.7.

UNIT DESCRIPTION

CONTROL UNIT

FOR

N S M -
C D 2 1 0 0

4

Part No. 219 224

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

INDEX

1 FUNCTION

1.1 CONTROL UNIT

1.2 Processor

1.3 Reset

1.4 LOW Voltage Recognition and POWER OFF

1.5 I/O (Input/Output)

1.6 Output-Enable

1 FUNCTION

1.1 CONTROL UNIT

The heart of the control and credit unit is a microprocessor from the proven Rockwell 6500 family.
All unit functions such as keyboard, display, remote control, carriage (light generator / organ), coin mechanism, title indication etc. are controlled by this unit.

Different types of malfunctions are recognized and reported as such on the display. All statistical data such as phonograph status, price adjustments and bookkeeping data are stored in the CONTROL UNIT. These as well as credits remaining are stored when the power is switched off.

A number of service programs allow the read-out of statistical data, individual as well as test programs.

1.2 Processor

The processor consists primarily of the microprocessor IC 1, the EPROM IC 2, the battery RAM IC 3 and the I/O component IC 4. Address coding occurs via IC 12.
The tact generator consists of a quartz oscillator with Q1 (4 MHz) and the frequency divider (1:4) IC 14.

1.3 Reset

The Zener diode ZD2 with transistors T1 and T2 serves to activate the reset when U (+5 V) is less than 4,6 V.
Transistor T2 with its antenna connection serves to recognize static discharges and interferences.
When T2/C is LOW, reset is activated via IC 16, Pin 10, Pin 11. If T2/C is HIGH, reset remains stored for approx. 200 msec. over the subsequent monoflop 1/2 IC 13 with timing components R 14, C 19 vis IC 16, Pin 9.

1.4 Low Voltage Recognition and Power OFF

Resistors R 15, R 16, R 18 form a voltage divider for low voltage recognition.
R 17 and D 6 generate a hysteresis when the voltage rises again. The positive edges (10 msec. at 50 Hz, 8,3 msec. at 60 Hz) coming from T3/C retrigger the monoflop 1/2 IC 13 with timing components R 20, C 20 (approx. 20 msec.) and IC 13, Pin 4 at LOW.
This signal is monitored by the processor via IC 4, Pin 6.
When IC 4, Pin 6 is HIGH, the program is prematurely deactivated.

1.5 I/O (Input/Output)

All I/O operations are controlled via a serial bi-directional interface (IC 4, Pin 18 = CLOCK; IC 4, Pin 19 = DATA). IC 18 selects the different input channels; IC 11 decodes the load impluses for the output channels.

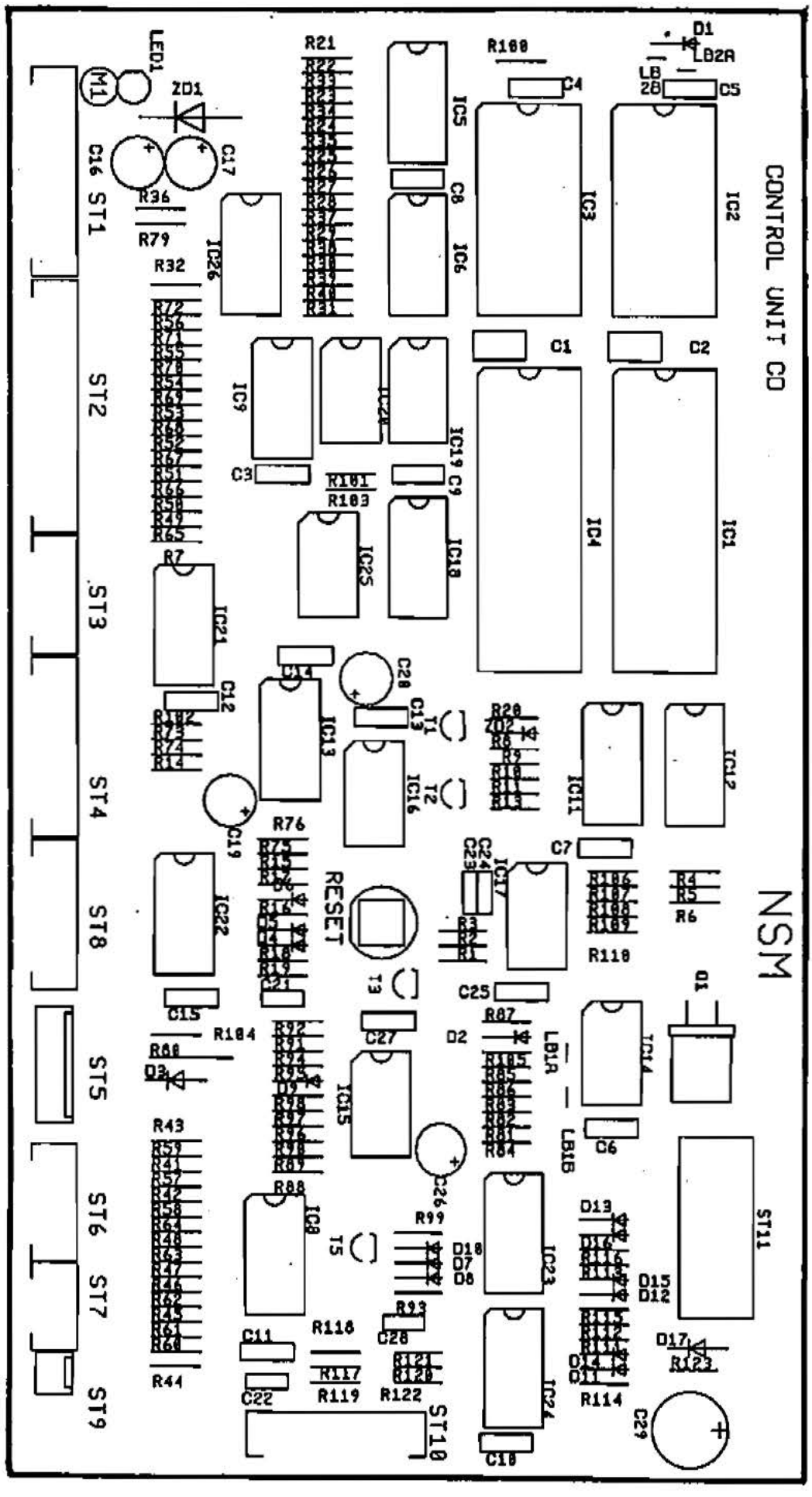
Output: IC 5 and IC 6 are output ports.
Resistors R 22-40 together make two D/A converters.

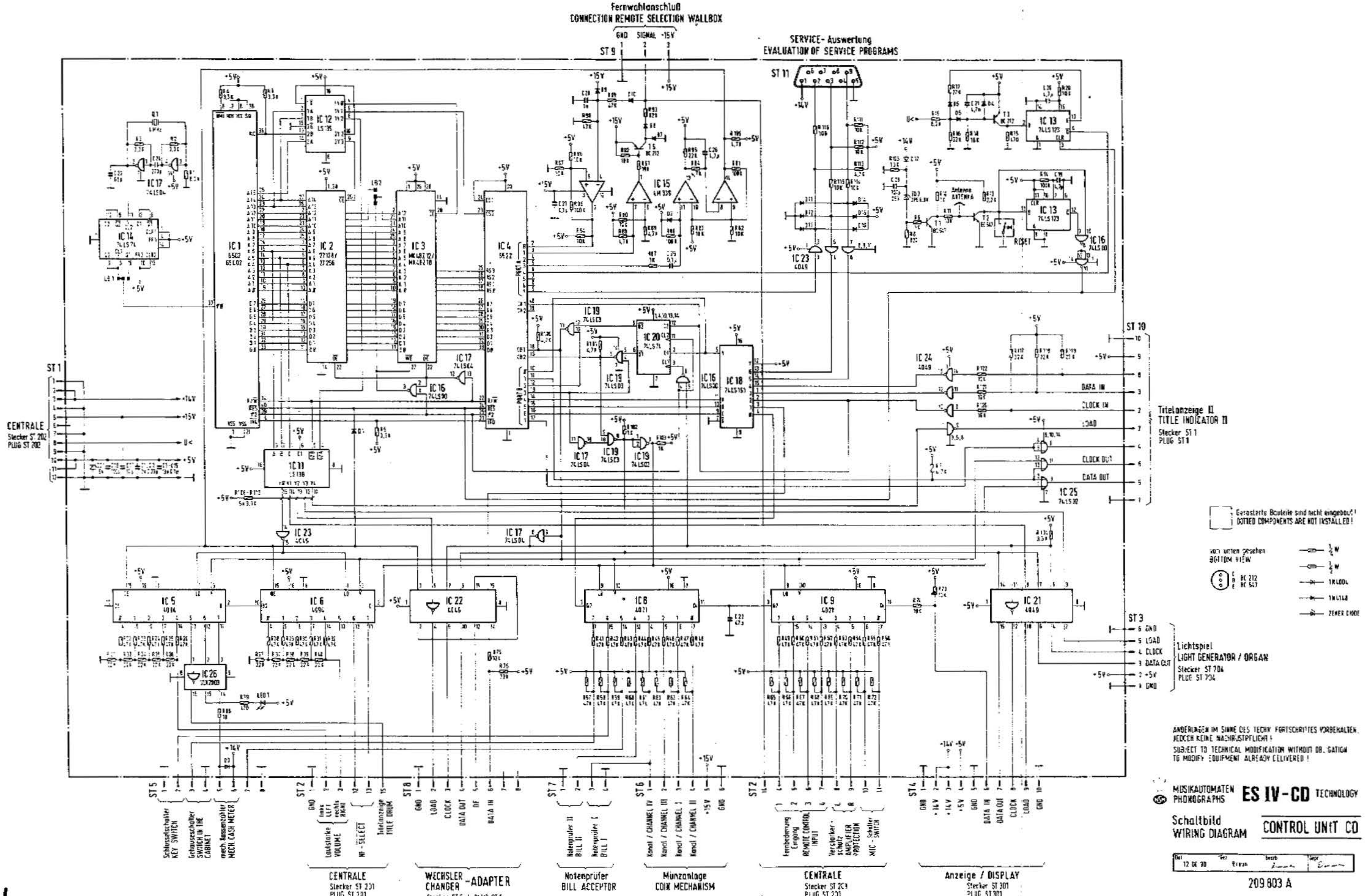
Input: IC 8 and IC 9 are input ports.
The resistors, in sequence to the input pins, protect the CMOS components.

Serial interfaces are available:
At ST 4 for display and keyboard
At ST 8 for control of CD changer.

1.6 Output-Enable

A clock signal is sent by IC 4, Pin 5. Capacitor IC 26 is charged and keeps IC 15, Pin 8 at LOW.
If the clock signal does not occur, IC 15, Pin 14 is LOW and OE of IC 5 and IC 6 is inactive (outputs in tree state).
OE also become inactive via D1 when reset (IC 16, Pin 11) becomes LOW.


CONTROL UNIT CD
NSM
RESET
ST1
ST2
ST3
ST4
ST8
ST5
ST6
ST7
ST9
ST10
ST11
IC1
IC2
IC3
IC4
IC5
IC6
IC8
IC9
IC11
IC12
IC13
IC14
IC15
IC16
IC17
IC18
IC19
IC21
IC22
IC23
IC24
IC25
IC26
D1
LB2A
LB2B
C1
C2
C3
C4
C5
C6
C7
C8
C9
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C22
C23
C24
C25
C26
C27
C28
C29
LED1
ZD1
M1
R21
R32
R36
R44
R79
R101
R103
R107
R110
R114
R116
R117
R119
R122
R123
R184
T1
T2
T3
T5



ÄNDERUNGEN IM SINNE DES TECHN. FORTSCHRITTES VORBEHALTEN. JEDOCH KEINE NACHRÜSTPFLICHT!
SUBJECT TO TECHNICAL MODIFICATION WITHOUT OBLIGATION TO MODIFY EQUIPMENT ALREADY DELIVERED!

MUSIKAUTOMATEN PHONOGRAPHS **ES IV-CD** TECHNOLOGY

Schaltbild
WIRING DIAGRAM

CONTROL UNIT CD

209 803 A

4

UNIT DESCRIPTION

DISPLAY/KEYBOARD

FOR

N S M -
C D 2 1 0 0

5

Part No. 219 242

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

1 FUNCTION

1.1 Display

The shift registers IC 301 through IC 303 are the output ports for the display control.
The display is operated in the multiplex mode.
The segment information is prepared for one digit with IC 302 and IC 303 via drivers IC 308 and IC 309.
The transistors T 303 through T 305 are controlled by IC 307 via IC 301 and switch on the appropriate multiplex level for 4 milliseconds.

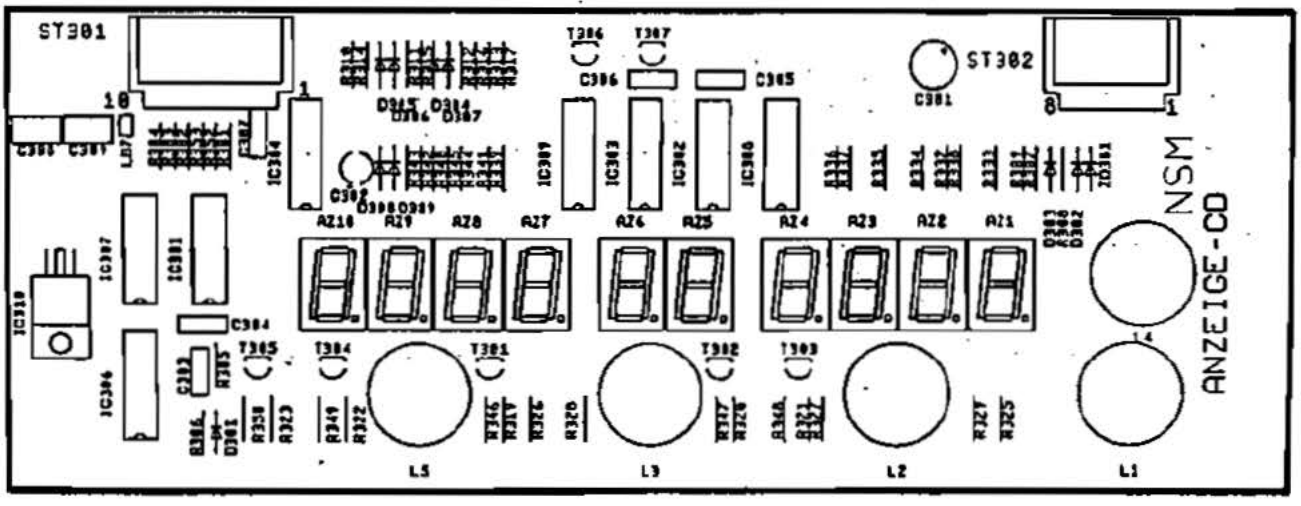
Resistors R 332 to R 345 determine the segment current.

Lamps L1 to L5 are controlled statically via IC 307, Pin 12 and 14 and IC 306, Pin 19, 11, 12.
Resistors R 325 to R 329 limit the transient current.

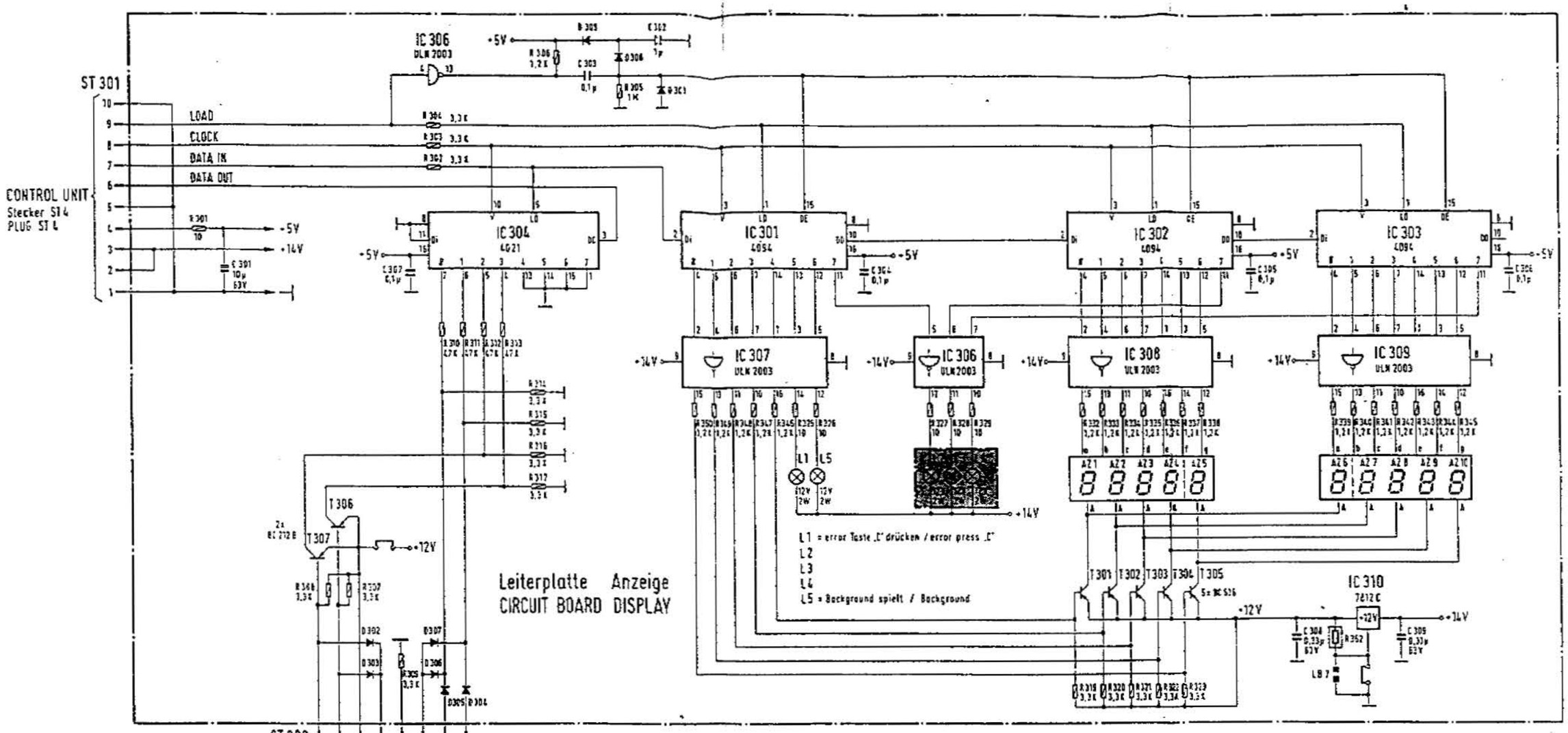
The load signal for the output shift registers is monitored by circuit IC 306, Pin 4 and 13, R 306, C 303, D 301.
During the duration of the load signal the display is dark.
C 303 is discharged via D 301 and IC 306, Pin 13.
OE of IC 301 to IC 303 becomes LOW and thereby inactive.
If no load signal occurs, OE becomes inactive via R 305.
Capacitor C 302 avoids lighting up of the digits after switching on.

1.2 Keyboard

IC 301 is an input port for the keyboard which is connected to plug ST 302.
The circuit with diodes D 302 - D 307 and transistors T 306, T 307 codes the keyboard matrix to a 4-bit signal combination.



CB Keyboard



Draufsicht: Display
TOP VIEW: DISPLAY

gemeinsame Anode
COM. ANODE

Draufsicht: Spannungsregler IC 310
TOP VIEW: VOLTAGE REGULATOR IC 310

Ausgang / OUTPUT
GND
Eingang / INPUT

von unten gesehen
BOTTOM VIEW

T 301 - T 305

T 306, T 307

gerasterte Bauteile sind nicht eingebaut !
DOTTED COMPONENTS ARE NOT INSTALLED !

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NSM CD 2100

Schaltbild
WIRING DIAGRAM

Anzeige / Tastatur
DISPLAY / KEY BOARD

12.09.90

219 246

UNIT DESCRIPTION

CENTRAL UNIT

FOR

N S M -
C D 2 1 0 0

6

Part No. 219 243

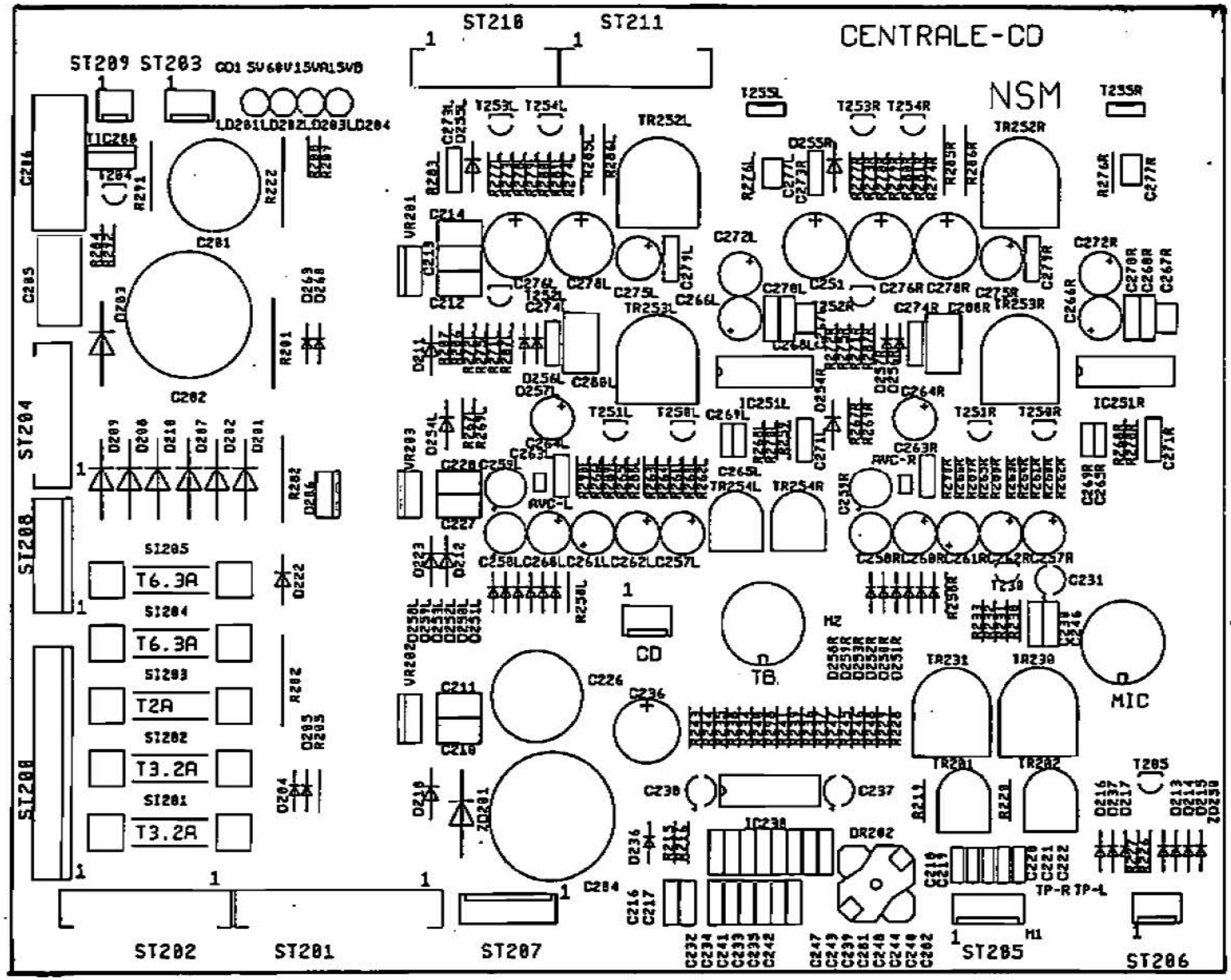
NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

1 FUNCTION

1.1 Power Supply

The power transformer supplies from separate secondary coils 22 volt, 2x11,5 volt and 2x43 volt.
With 2x11,5 volt a two-way rectification (D201/202) and center connection at the transformer the power supply VR 201, +5 volt is provided.
The low voltage detection occurs at D 204 and D 205. Fuse protection is provided by SI 201 and SI 202. Fuses for the output stage are SI 204 and 205.
The unregulated voltage +14 volt for display and key illumination is taken from condenser C 201. The control voltage +15 volt a for pick-up driver and control unit are delivered by the 22 volt transformer coil via bridge stabilizer D 207 to D 210 to VR 203. The fuse protection is provided by SI 203.

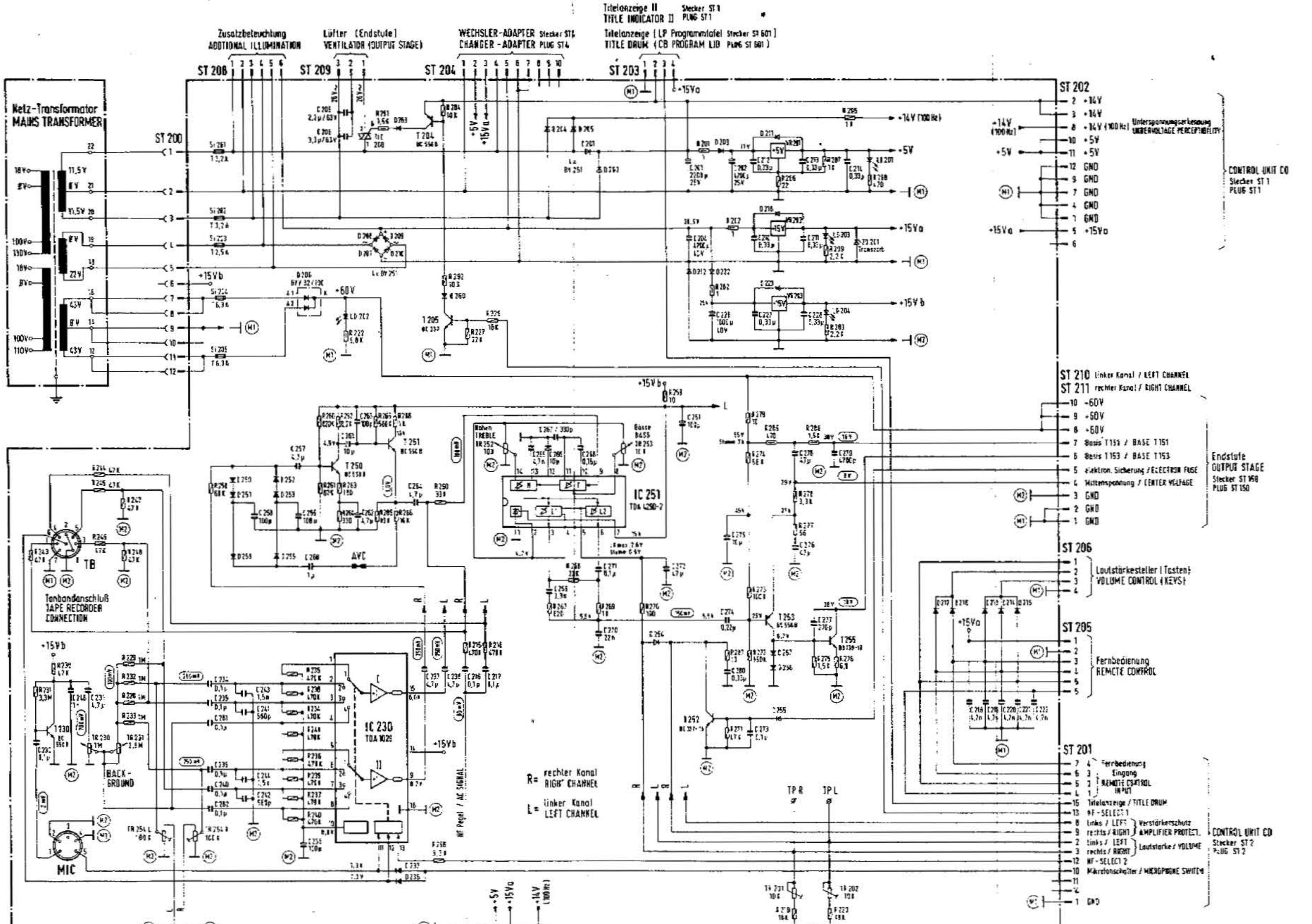
The LED's show with equal intensity the following supply voltages:
LED 201 = + 5 V
LED 202 = +60 V
LED 203 = +15 V a
LED 204 = +15 V b



603

CB CENTRAL

219 243



Netz-Transformator
MAINS TRANSFORMER
ST 200
Zusatzbeleuchtung
ADDITIONAL ILLUMINATION
ST 208
Lüfter (Endstufe)
VENTILATOR (OUTPUT STAGE)
ST 209
WECHSLER-ADAPTER Stecker ST4
CHANGER-ADAPTER PLUG ST4
ST 204
Titelanzeige II Stecker ST1
TITLE INDICATOR II PLUG ST1
Titelanzeige (LP Programmtafel Stecker ST 601)
TITLE DRUM (CB PROGRAM LID PLUG ST 601)
ST 203
ST 202
+14V
+14V (100 Hz) Unterspannungserkennung
UNDERVOLTAGE PERCEPTIBILITY
+5V
GND
+15Va
CONTROL UNIT CD
Stecker ST 1
PLUG ST 1
+15Vb
+60V
ST 210 linker Kanal / LEFT CHANNEL
ST 211 rechter Kanal / RIGHT CHANNEL
+60V
Basis T151 / BASE T151
Basis T153 / BASE T153
elektron. Sicherung / ELECTRON FUSE
Mittenspannung / CENTER VOLTAGE
Endstufe
OUTPUT STAGE
Stecker ST 150
PLUG ST 150
IC 251
TDA 4290-2
Höhen
TREBLE
Bässe
BASS
AVC
ST 206
Lautstärkesteller (Tasten)
VOLUME CONTROL (KEYS)
ST 205
Fernbedienung
REMOTE CONTROL
TB
Tonbandanschluß
TAPE RECORDER CONNECTION
BACK-GROUND
MIC
IC 230
TDA 1029
R= rechter Kanal
RIGHT CHANNEL
L= linker Kanal
LEFT CHANNEL
NF Pegel / AC SIGNAL
TP R
TP L
ST 201
Fernbedienung Eingang
REMOTE CONTROL INPUT
Titelanzeige / TITLE DRUM
NF-SELECT 1
links / LEFT
rechts / RIGHT
Verstärkerschutz
AMPLIFIER PROTECT.
Lautstärke / VOLUME
NF-SELECT 2
Mikrofonschalter / MICROPHONE SWITCH
GND
CONTROL UNIT CD
Stecker ST 2
PLUG ST 2
CD
WECHSLER-ADAPTER
CHANGER-ADAPTER
Stecker ST 2
PLUG ST 2
ST 207
Lichtspiel
LIGHT GENERATOR/ORGAN
Stecker ST 701
PLUG ST 701
von unten gesehen
BOTTOM VIEW
Draufsicht
TOP VIEW
NF-Pegel bei 1 kHz, Lautstärkesteller auf max.
Höhen und Bässe max., mit AVC gemessen mit elektronischem Voltmeter.
Gleichspannung gemessen mit Voltmeter. Ri = 10 MΩ
AC SIGNAL VOLTAGES AT 1000 cps, VOLUME CONTROL TO MAX. TREBLES AND BASSES MAX., WITH AVC MEASURED WITH ELECTRONIC VOLTMETER
DC VOLTAGES MEASURED WITH VOLTMETER Ri = 10 MEG OHMS
Trimmer-Widerstand
TRIMMER RESISTOR
Leuchtdiode
LIGHT EMITTING DIODE
TRIAC
Spannungsregler
VOLTAGE REGULATOR

Sicherungen nur durch solche mit gleichen Werten ersetzen.
REPLACE FUSES ONLY BY THOSE OF THE SAME VALUE.

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MUSIKAUTOMATEN
PHONOGRAPHS

ES IV-CD TECHNOLOGY

Schaltbild
WIRING DIAGRAM

CENTRALE-CD

Dat. 12.06.90	Gez. Braun	Bearb.	Gepr.

209 806 A

UNIT DESCRIPTION

CD-CHANGER

FOR

N S M -
C D 2 1 0 0

8

Part No. 219 245

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

INDEX

1 PICKUP-FUNCTION
1.1 Transport
1.2 Pull holder
1.3 Return holder

2 PICKUP-DRIVER
2.1 Lift control
2.2 Grip control
2.3 CD-Player control

3 PLAYER
3.1 Disc Player CDM 3
3.2 Servo panel

4 LP DECODER BOARD

5 MAGAZINE

6 CD-CHANGER 100, test, set, adjust
6.1 General information
6.2 Magazine
6.3 Playing unit
6.4 Lift

SPARE PARTS LISTS

1 PICK UP-FUNCTION

The pickup serves to transport the CD's between the magazines and the player.

ATTENTION! When the CD changer has the switch at the window (upper right), the transport does **not** function if the window is open.
If the window is opened while the CD is playing, the title will be played to the end, but the CD will only be transported back after the window is closed.

1.1 Transport

The lift is moved via a stepping motor controlled by the microprocessor of the control unit. The distance between 2 CD slots is 8 motor steps (1 opto counter step).
During the run the light barrier OPTSP, which is directly connected to the drivewheel, checks the motor's position every 4 steps. Stepping errors are immediately recognized and displayed with Er 75.
Together with the light barrier OPEND the end position of the lift is verified. Should a mistake appear here (signal too late or early) the display shows Er 76.

1.2 Pull Holder

With both grip levers, brought into lock position by CD motors MOGRL for left and MOGRR for right, the CD holders with their CD's are pulled out of the magazine. The light barrier OPPUM reports the correct position of the CD holder in the pickup unit.
If there is no report 2 sec. after switching on the motor, the display will show Er 71 for the left magazine or Er 72 for the right magazine.

1.3 Return Holder

To return a CD holder to its magazine, either motor MOGRL for the left magazine or MOGRR for the right magazine is switched on in the opposite direction.
Light barriers OPGRL or OPGRR report the end position of the grips.
If the report does not appear within 2 sec. after switching on the motor, the display shows Er 73 for the left magazine or Er 74 for the right magazine.

2 PICK UP-DRIVER

2.1 Lift Control

With output port IC 3 the microprocessor of the control unit controls switch transistors T2-T5 via drivers T6-T9. These drive the unipolar coil of the stepping motor (ST 4, Pin 1-6). Using signal OPSTP (ST 4, Pin 7) the microprocessor controls the position of the motors.
Together with signal OPEND (ST 3, Pin 8) the end position of the lift is reported via input port IC 1.

2.2 Grip Control

Both of the grip motors (MOGRL for the left magazine and MOGRR for the right magazine) are driven from the double motor bridge IC 6 via output port IC 3.
While pulling a CD from the magazine the signal OPPUM (ST 3, Pin 7) reports the end position of the CD holder in the pickup to the microprocessor of the control unit.
While returning the CD it recognizes the end position of the grips via signals OPGRL (ST 3, Pin 5) for left and OPGRR (ST 3, Pin 6 for right.

2.3 Control of the CD Player

Microcomputer IC 8 (TD18) is used to convert the incoming serial data in I2C-Bus format from the decoder panel into parallel signals that can be processed.
The microprocessor of the control unit communicates with it via ports IC 4 and IC 2.

3 PLAYER

3.1 Disc-Player CDM-3

The CDM3 contains the components laser diode, play motor, radial motor, and focus unit.
It reads the data from the CD.

3.2 Servo Panel

The servo panel contains the components to control the CDM3.
They consist primarily of the photodiode signal processor, the radial error processor, the drivers for the laser diode, the focus unit, the radial motor and the playing motor.

4 LP DECODER BOARD

The components servoprocessor, decoder, digital filter, DA converter and NF output driver are combined on the decoder board. It also contains the circuit to process the complete power supply for decoder board CDM3 and servopanel.

The analog/digital outputs are also located on the decoder board. When using the digital output, one of the two audio cables which has been plugged into the analog output at the factory, has to be replugged into the digital output socket. An exact description with illustration can be found in "1 Technical Instructions", Pkt. 1.3.2.

5 MAGAZINES

2 equal magazines that are equipped with 50 CD holders each are in the CD changer. With different CD holders it is possible to play 5- or 3-inch CD's.
The magazine can be swung out and totally taken out.
Equipping with or changing CD's can be done simply by taking out the respective CD holders, inserting the new CD into the holder and pushing it back till it locks in the magazine.

6 CD-CHANGER 100,
test, set, adjust

6.1 General Information

Please note the illustration of the CD changer on the last page regarding the following text.
After exchanging units their functions must be checked and, if needed, certain adjustments must be made.
Checks and adjustments are only possible at a test bench or at the machine with the necessary extensions!
Take care that the changer is set down on supports so that the board disc (12) or the main axle (14) which protrude from the cabinet floor are not pushed inside. Otherwise the board disc will jam the gear belt (2); a displaced axle changes the position of the upper distance sleeve so that the lift drives against it and blocks!

In service program step P60, Pkt. 1.3.5 "Test CD Changer" the grips can be moved left or right with Keys "4"/"5" or "6"/"5" and the lift can be moved up or down with key "2"/"8". With Key 1 the CD player can be started and stopped.

For fine adjustments of the lift position the lift can be moved with Key "3" (+) or "9" (-) one motor step at a time (equals about 0,5 mm height difference) either up or down; this option is available for ES-IV CD phonographs as of Program Index 004. The distance between two magazine slots is 8 motor steps (or 1 opto step).
In the displays the present status of the respective opto mask and the time in seconds during which the lift position is held are shown.

6.2 Magazine

The magazines in swung-in and locked position are supported by height-adjustable studs. Changing the height settings can be necessary when the lift is exchanged; setting see Pkt. 4 "Lift".

6.3 Playing unit

To exchange the playing unit with CD player
- remove both magazines
- pull lift up on belts
- swing support clamps on chassis of playing unit out
- carefully (!) pick up playing unit, watch balance washers under cabinet
- open plug connections
- installation of playing unit in opposite sequence
- function test:
  - remove decorative cover (01) and check if axle of suspension plate is in the center of the upper lift bore.
  - choose CD, check if CD is securely clamped in play position.
  - further tests see Pkt. 4 "Lift".

6.4 Lift

To exchange the lift as well as to check and adjust the opto coupler of the CD changer, completely remove the CD changer, disconnect cables, remove rear wall.

- From the rear side of the machine pull lift (04) up by the gear belt (02), interrupt connection between lift and gear belt by unscrewing the gear belt lock (03).
- Pull out plug of connecting cable (06).
- Remove board disc (12) after removal of washer.
- Pull distance sleeve (13) at bottom of main axle (14) from cabinet floor upwards; remove securing clamp of main axle from inside of cabinet.
- Remove securing clamp of guiding axle (10) from inside of cabinet.
- Pull guiding axle down through floor of cabinet.
- Push main axle down until upper distance sleeve can be removed.
  If main is pulled out all the way, do not mistake upper and lower distance sleeves; they are of different lenght!
- Remove lift; mount exchange lift in opposite sequence.
- Function test, basic setting; CD changer must be completely connected to operate either with extensions to phonographs or a bench tester:
  - turn on test program P60/5, "test CD changer" F5. All functions of the changer can be checked, see excerpt of service program below:

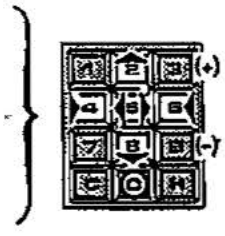
All function of the changer can be tested individually.

CD changer test

Enter "5" and "H", Display middle "F5".
The select any title.

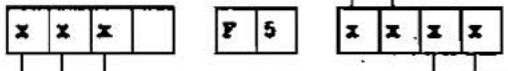
Keep in mind the code numbers for the individual changer functions as per the following keyboard illustration:

Input	Function
1	CD-Player, Start/Stop
2	Lift, upwardw
8	Lift, downwards
4	Grip left
6	Grip right
5	Return holder
0	Stop lift at magazine space
3	Motor steps, upwards (per 0,5 mm)
9	Motor steps, downwards (per 0,5 mm)



The time in sec. during which the lift position is held. The lift position is held after every function for 2 sec., by touching "0" for 10 sec.

Dispalys:

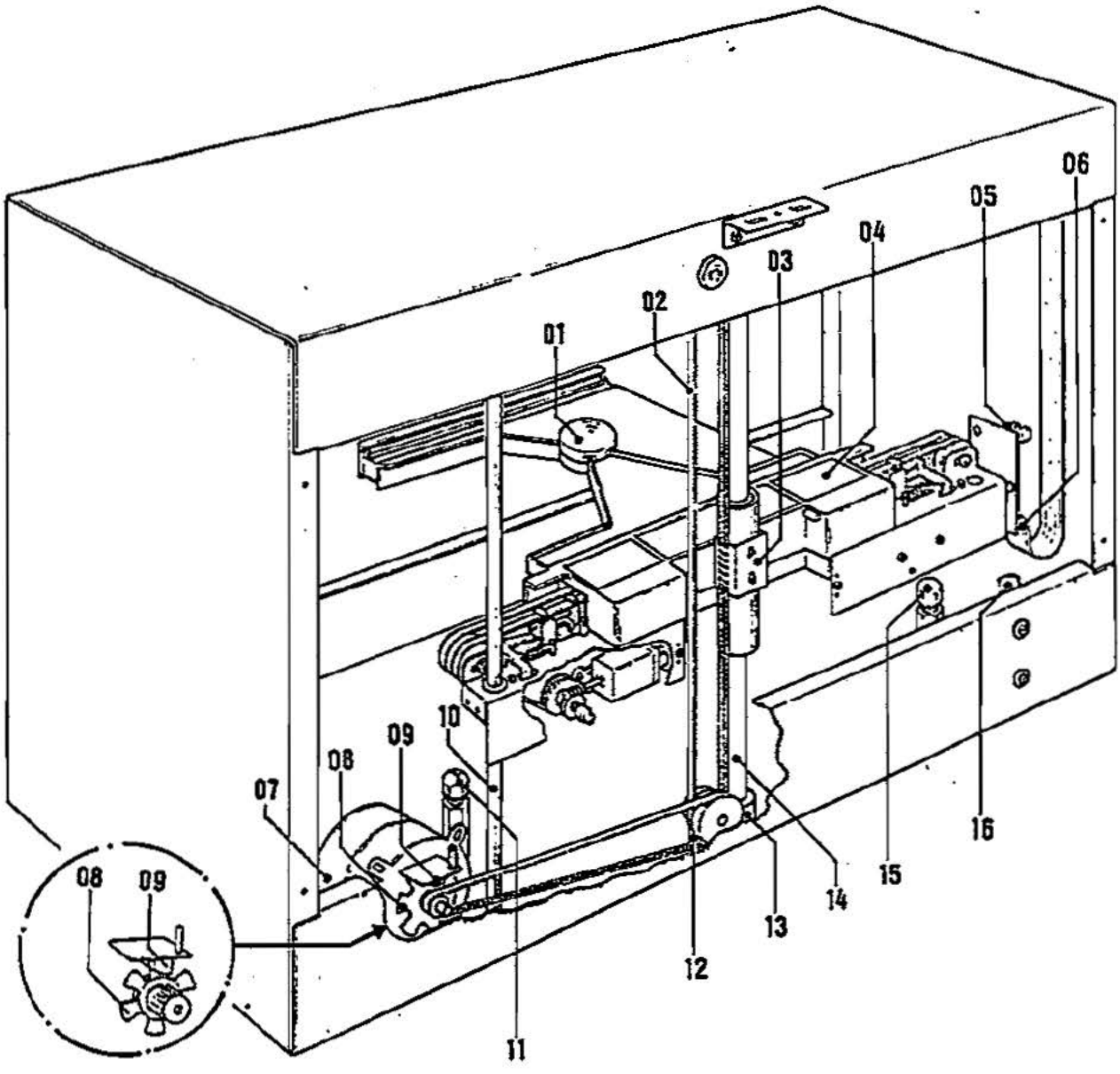


OPTO stepper control	OPSTP
OPTO end position	OPEND
OPTO grip right	OPGRR
OPTO pickup middle	OPPUM
OPTO grip left	OPGRL

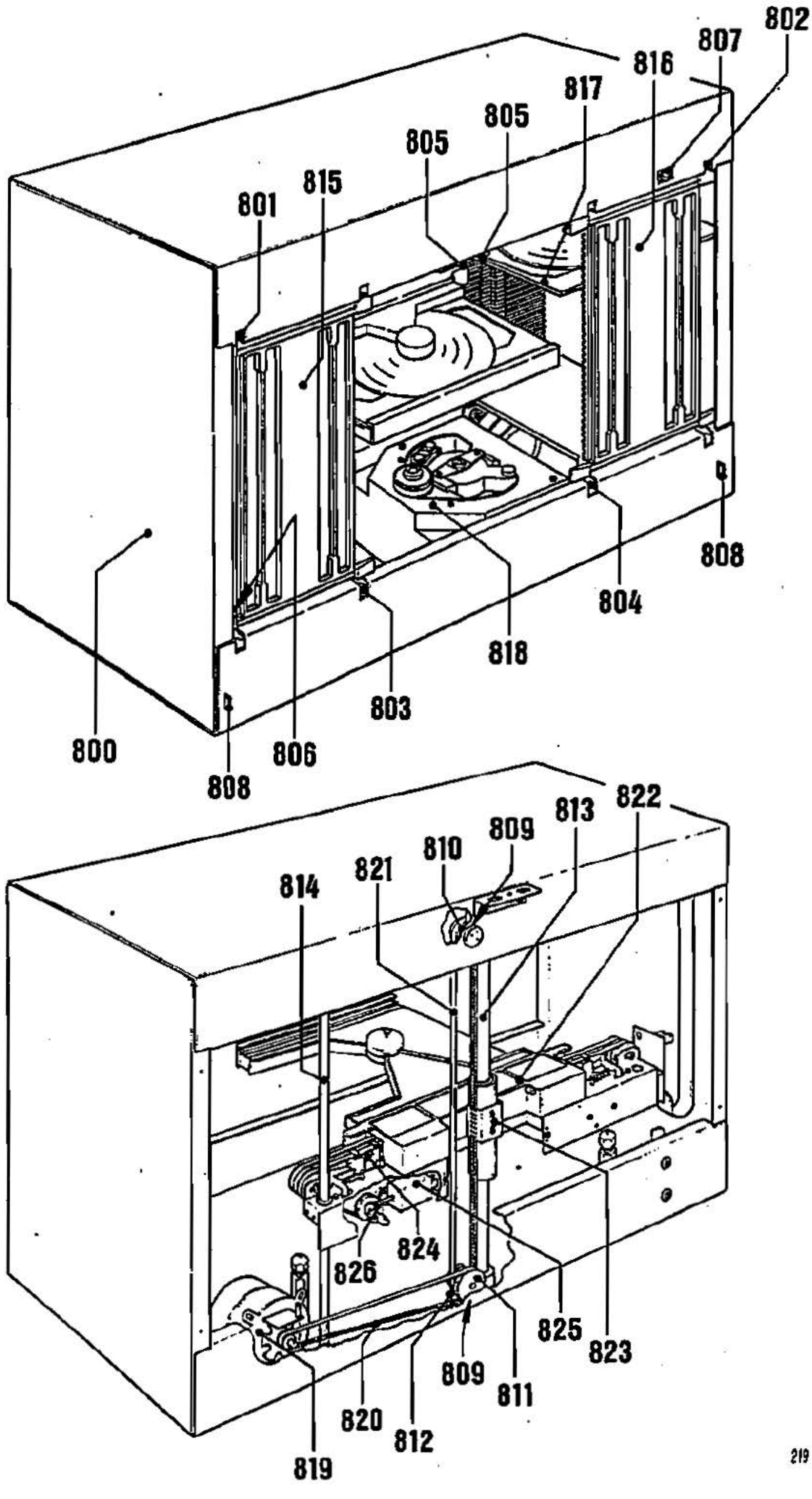
Meaning of displays: OPTO lit up = "0", OPTO darkened = "1".

Terminate test. Enter "C" 1, Display 1 "P60".

- The basic setting occurs in parked position at Magazine Slot 25/75. Drive pick-up to this position with Keys "2" and "8".
  The lift is held after each function in this position for 2 sec.; with Key "0" for 10 sec.
- Drive cassette in and out with Keys "4"/"5" or "6"/"5".
  Check function for smooth movement.
  The respective grip lever must fall into the cassette w/o hindrance!
- To adjust lift height loosen belt lock and move up or down; then tighten screws!
- Move lift down one motor step (about 0,5 mm height difference) with Key "9" (-); same test for smooth movement.
- Drive to normal park position with key "0" and with Key "3" (+); switch lift one motor step above normal position. Same check for smooth movement.
- Set magazine height: If magazine slots do not align with lift, then adjust lift only to one magazine at first. After that the other magazine is adjusted with support screw (11/15) to the correct height.
- The light barrier (08) on the step motor must in parked position 25/75 be in the center of the opto scanner OPSTP (09) (status display of OPSTP in display = "1"). If necessary, loosen screw on hexagon bolt and set PCB with opto coupler to center of mask.
- To adjust opto coupler OPEND (05) lift must be driven down to bottom. Drive lift upwards with Key "3" (press 4 times) or manually with one half opto step; the mask (16) must release OPEND (05) when OPSTP (09) opens the light mask, displayed by "0". Adjustment done by shifting of light mask angle (16) of OPEND, displayed by transition of "0" to "1" or "1" to "0".
- Select CD in normal program. In the parked position of the playing position the lift must have a gap to the lower end position.
- The distance between a cassette and the clamping dish should be at least 1 mm during a gripping procedure. So that the clamping dish can be magnetically attracted, the decorative cover must be in place.
- The CD must run w/o touch and grinding sounds when in a suspended position.
  To test the function get cassette with CD from magazine by pressing correct keys and place it on CD player in play position.
  Turn on CD player with Key "1". After test with Key "1" or any of the other function test keys turn off CD player.
  The clamping dish must clamp down on CD exactly in center.
- Check function of fork light masks OPGRR, OPGRL, OPPUM as per test "F5". The respective mask must cover the light barrier in its entire breadth when Status Display "1" is shown and may not touch the housing physically.

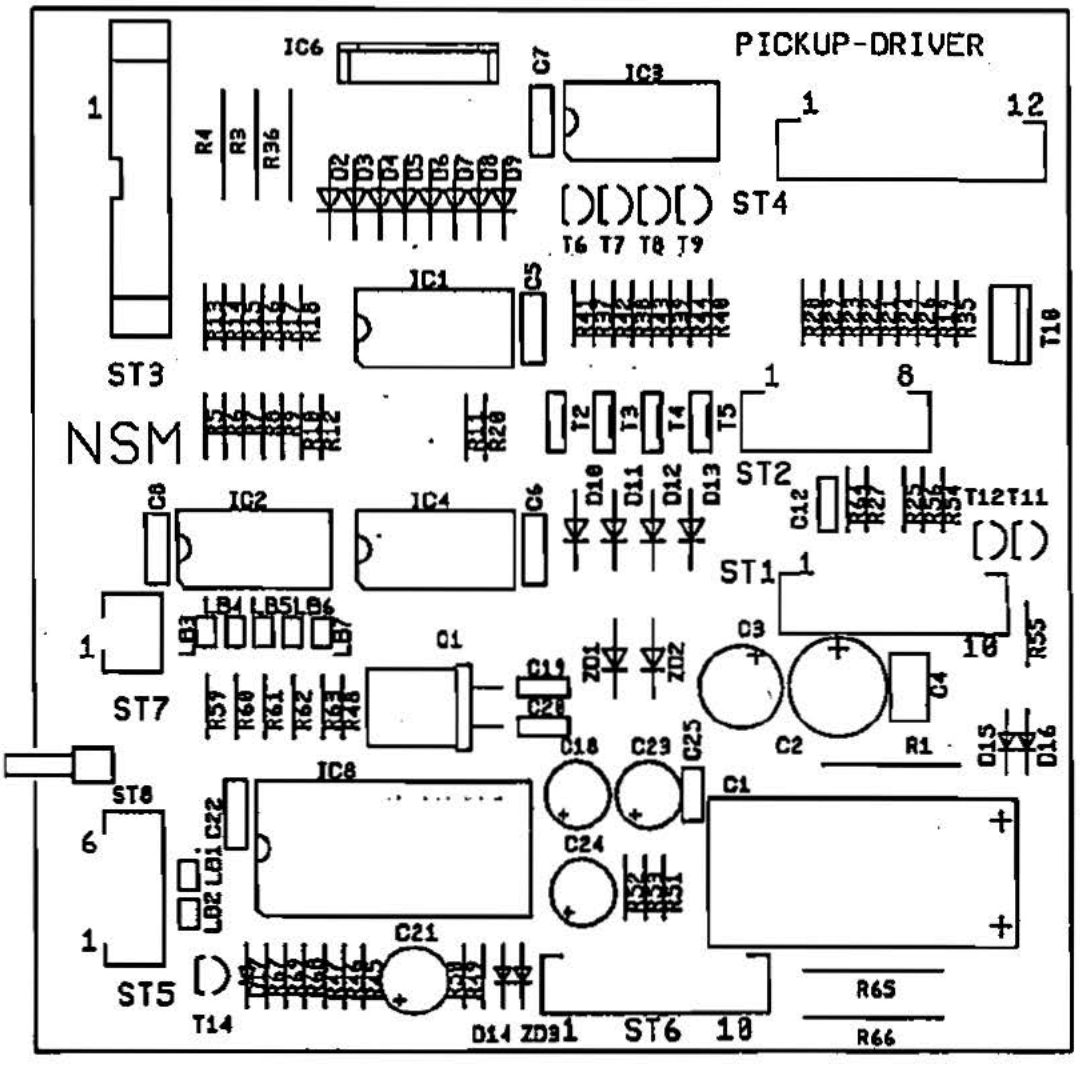


CD-CHANGER compl.


802
807
816
817
805
805
815
801
808
804
818
803
800
806
808
822
813
809
810
821
814
824
826
825
823
809
811
820
812
819

SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
	175 320	**CD-CHANGER 100, STANDARD**	without design parts without magazines	1
800	173 487	CABINET, welded		1
801	174 296	CLOSING LEDGE, left upper		1
802	174 297	CLOSING LEDGE, right upper		1
803	174 294	CLOSING LEDGE, left lower		1
804	174 295	CLOSING LEDGE, right lower		1
805	173 485	CONTROL KNOB		2
806	206 655	CONNECTION AXLE		2
807	222 531	MICRO SWITCH f. CONNEC. BLOCK	E63-10K	1
808	174 293	FLAT SPRING for VIEW GLASS		2
809	173 538	SCREW SLEEVE, ASSY		2
810	173 522	STEP WHEEL, MOUNTED		1
811	173 521	WASHER 48		1
812	173 526	BOARD WASHER		1
813	173 558	AXLE		1
814	173 559	GUIDE AXLE		1
	175 319	VIEW GLASS, MOUNTED		1
	174 265	BRIDGE		1
	173 635	LIGHTING, ASSY		1
815	173 503	MAGAZINE LEFT, MOUNTED (without CASSETTE)		1
816	173 502	MAGAZINE RIGHT, MOUNTED (without CASSETTE)		1
817	174 536	CASSETTE CD 120, only 10 piece		
817	174 537	CASSETTE CD 80, only 10 piece		
	212 425	TRANSPORT GUIDE for CASSETTE		2
818	173 551	PLAY BACK UNIT, ASSY	with CD-Player	1
819	173 518	STEP MOTOR, ASSY		1
820	206 644	BELT	MXL 195 Gears	1
821	206 643	BELT	MXL	1
822	173 607	LIFT, ASSY		1
	206 629	RUBBER RING		1
	209 776	LABEL	NSM 100 CD	1
	174 220	DECOR COVER		1
823	173 614	BELT LOCK		1
824	173 581	LIFT AXLE		1
825	173 606	MOTOR, ASSY		2
826	173 630	GEAR, MOUNTED		2
	173 552	CB-CASSETTCONTROL, ASSY		1
	173 563	CB-STEPPER, ASSY		1
	173 507	CB-DECODER BOARD, ASSY		1
	173 665	CB-PICK UP DRIVER, ASSY		1
	173 510	CB-LIFT ADAPTER, ASSY		1
	173 557	CB-MOTORCONTROL, ASSY		2
	173 508	CB-CHANGER ADAPTER, ASSY		1

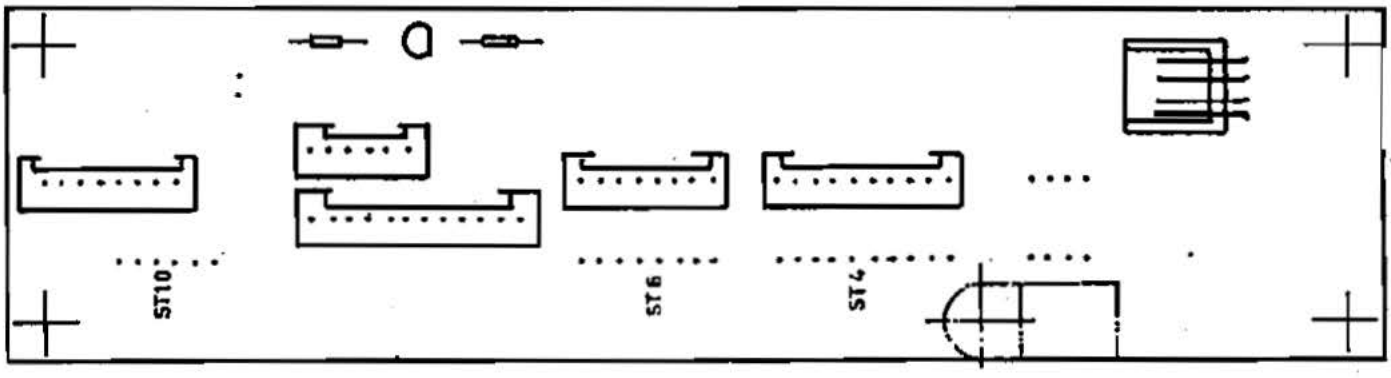

PICKUP-DRIVER
NSM
ST1
ST2
ST3
ST4
ST5
ST6
ST7
ST8
IC1
IC2
IC3
IC4
IC6
IC8
C1
C2
C3
C4
C5
C6
C7
C8
C21
R1
R65
R66
T6 T7 T8 T9
T14
D14 ZD3

SPARE PARTS LIST

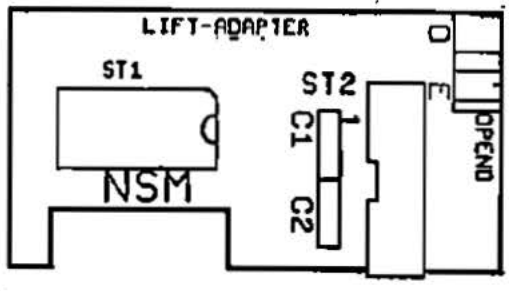
POS.	PART-No.	DESCRIPTION		DATA	QTY
	173 665	**LP-PICK UP DRIVER, ASSY**			**1**
ST 08	225 392	PIN PLUG		2 prongs 90°	1
ST 03	225 912	PIN PLUG		14 prongs	1
ST 07	225 650	PIN PANEL		2 prongs	1
ST 06	225 850	PIN PANEL		5 prongs	1
ST 02	225 653	PIN PANEL		8 prongs	1
ST 01	225 654	PIN PANEL		10 prongs	1
ST 04	225 655	PIN PANEL		12 prongs	1
Q 1	221 535	OSCILLATOR QUARTZ		4 MHz	1
	222 447	IC-SOCKET		28 prongs	1
IC 8	231 409	IC-MICROCOMPUTER	T 018	MAB 8441	1
IC 6	231 303	IC-LINEAR		L 298	1
IC 3,4	221 771	IC-CMOS		HEF 4094 B	2
IC 1,2	221 763	IC-CMOS		HEF 4021 B	2
D14-16,17	221 114	SI-DIODE		1 N 4148	4
D2-13	221 822	SI-DIODE		BA 157	12
D18,19	221 115	SI-DIODE		1 N 4004	2
ZD1,2	231 326	ZENER-DIODE		ZY 24	2
T11,14	221 283	SI-TRANSISTOR		BC 212 B	2
T6-9,12	221 757	SI-TRANSISTOR		BC 547 B	5
T2-5	221 777	SI-TRANSISTOR		BD 679	4
T10	231 150	SI-TRANSISTOR		TIP 130	1
C19,20	220 266	Cer.-CAPACITOR		27 pF	2
C12	220 342	Cer.-CAPACITOR		100 pF	1
C5-8,22	220 334	MKT-CAPACITOR		0,1 µF 63 V	5
C4	220 332	MKT-CAPACITOR		0,33 µF 63 V	1
C21	220 249	LYTIC		1 µF 63 V	1
C18	220 389	LYTIC		47 µF 10 V	1
C3	220 160	LYTIC		100 µF 10 V	1
C2	220 391	LYTIC		220 µF 25 V	1
C1	220 165	LYTIC		470 µF 40 V	1
R64	221 606	RESISTOR		47 Ω ¼ W	1
R25,54	221 600	RESISTOR		100 Ω ¼ W	2
R35	221 632	RESISTOR		160 Ω ¼ W	1
R37-40	221 614	RESISTOR		330 Ω ¼ W	4
R56,57	221 099	RESISTOR		470 Ω ¼ W	2
R45,49	221 029	RESISTOR		1 kΩ ¼ W	2
R27-29	221 033	RESISTOR		3,3 kΩ ¼ W	3
R46,47	221 034	RESISTOR		4,7 kΩ ¼ W	2
R26,41-44,					>
66,69	221 035	RESISTOR		10 kΩ ¼ W	7
R5-12	221 603	RESISTOR		12 kΩ ¼ W	8
R13-20,55	221 036	RESISTOR		15 kΩ ¼ W	9
R21-23,					>
59-63	221 604	RESISTOR		22 kΩ ¼ W	8
R24	221 048	RESISTOR		100 kΩ ¼ W	1
R48	221 009	RESISTOR		1 MΩ ¼ W	1
R3	221 392	RESISTOR		390 Ω ¼ W	1
R1,36,65	221 692	WIRE WOUND RESISTOR		1 Ω 1 W	3
R66	231 418	WIRE WOUND RESISTOR		2,7 Ω 1 W	1

SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
	175 296	**LP-CHANGER ADAPTER, ASSY**		**1**
ST 1	225 661	PIN PANEL	4 prongs 90°	1
ST 9	225 652	PIN PANEL	6 prongs	1
ST 7,11	225 653	PIN PANEL	8 prongs	2
ST 5	225 654	PIN PANEL	10 prongs	1
ST 8	225 655	PIN PANEL	12 prongs	1
R1	221 031	RESISTOR 2,2 kΩ		1
D1	221 114	SI-DIODE		1
LD1	231 475	LUMINESSENZ-DIODE		



	173 510	**LP-LIFT-ADAPTER, ASSY**		**1**
ST 2	225 892	PLUG	14 prongs	1
ST 1	222 445	IC-SOCKET	16 prongs	1
OPEND	231 322	OPTO-COUPLER	LTH-301	1



	173 563	**LP-STEPPER, ASSY**		**1**
	231 322	OPTO-COUPLER	LTH-301	1
	112 464	CABLE HARNESS	4 prongs	1
	173 557	**LP-MOTORCONTROL, ASSY**		**1**
	231 322	OPTO-COUPLER	LTH-301	1

OP END OPTO END POSITION

OP GRL OPTO GREIFER LINKS / OPTO GRASP LEFT

OP GRR OPTO GREIFER RECHTS / OPTO GRASP RIGHT

OP PUM OPTO PICK UP MITTE / OPTO PICK UP CENTER

OP STP OPTO STEPPER CONTROL

MO GRL MOTOR GREIFER LINKS / MOTOR GRASP LEFT

MO GRR MOTOR GREIFER RECHTS / MOTOR GRASP RIGHT

Draufsicht
TOP VIEW

LTH 301

Stereo - Anlage
STEREO SYSTEM

R L

rot red

schwarz black

R L

NF

DECODER BOARD

Beleuchtung
ILLUMINATION

12V 3W

ST 7

ST 5

ST 8

PICK UP - DRIVER

ST 3

CD - PLAYER

WECHSLER - ADAPTER
CHANGER

ST 11

ST 10

Transformator CD
TRANSFORMER CD

Leitungstreiber II
LINE DRIVER II

74 HCT 125

ST 2

ST 7

ST 6

CONTROL UNIT
Stecker ST 6
PLUG ST 6

ST 1

ST 5

ST 4

CENTRALE
Stecker ST 204
PLUG ST 204

ST 4

ST 8

ST 9

ST 12

ST 1

Motor rechts
MOTOR RIGHT

MO GRR

M

MOTOR CONTROL
OP GRR

MOTOR CONTROL
OP GRL

Motor links
MOTOR LEFT

MO GRL

M

OP END

ST 2

ST 1

markiert
marked

LIFT - ADAPTER

CASSET CONTROL
OP PUM

OP STP
STEPPER CONTROL

Schrittmotor
STEPPER MOTOR

NSM CD 2100

ELEKTROPLAN CD-WECHSLER
OPERATING SCHEME CD-CHANGER

Dat	Gez	Bearb	Gen
12.09.90	Braun		

UNIT DESCRIPTION

REMOTE CONTROL

FOR

N S M -
C D 2 1 0 0

11

Part No. 219 223

NSM
Aktiengesellschaft
SaarlandstraBe 240
6530 Bingen am Rhein

1 FUNCTION

1.1 Infra-red Remote Control

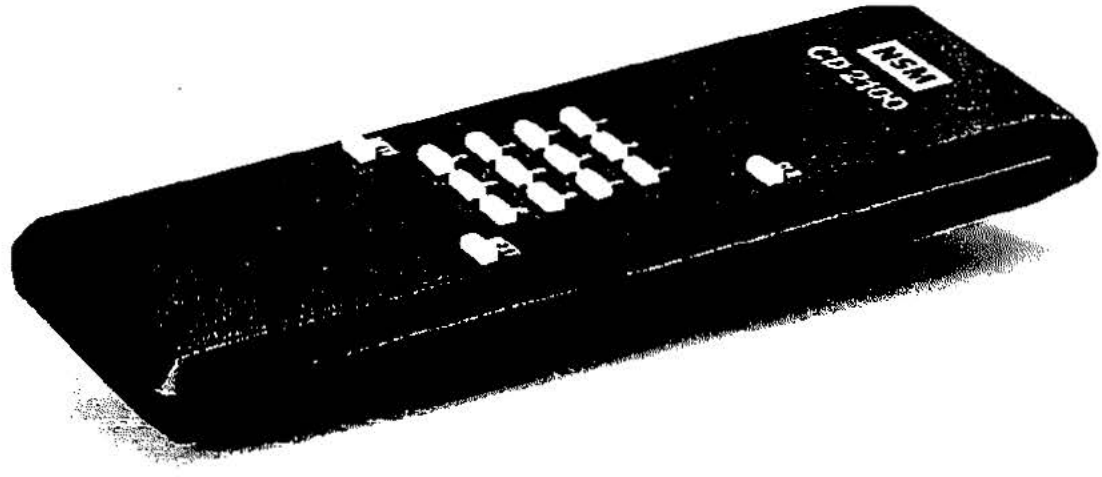
The 12-key keypad as well as the three individual keys of the remote device correspond in their function to the operating keys on the control unit with the exception that the service program cannot be used simultaneously with the remote control.

1.2 Batteries in Remote Control

To change batteries open battery compartment on bottom. Insert four triple AAA batteries as per symbols inside.

1.3 Remote Control Receiver

The receiver is integrated into the control unit. The connection to the control unit occurs via PCB keypad and plug ST 205.
Pin 1 delivers +15 V voltage.
Pin 2 = GND.



HANDSENDER FOR
INFRAROT- REMOTE CONTROL

ACCESSORIES

FOR

N S M -
C D 2 1 0 0

15

Part-No. 219 225

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

1 INTERFACE PCB CD100-RS 232 FOR NSM CD CHANGER

With the newly developed interface PCB CD100-RS 232 NSM phonographs can be controlled and evaluated with almost any computer.

1.1 The following commands are understood and executed:

10-key keypad 0 to 9	- Selection via keypad
B	- Background
C	- Selection as via keypad
D	- Display request
F	- Free credit
H	- Selection as via keypad
M	- Muting
R	- Reject
U	- Vol I -
V	- Vol I +
W	- Vol II -
X	- Vol II +
Y	- Vol I/II -
Z	- Vol I/II +

1.2 Acknowledgements:

```
Wrong commands          ?x (x = incorrectly received command)
D (display read-out)    !VWWWWWYYZZZZ
                        V = lighting status = 010vvvv
                                              ::::+-  L1 error-press C
                                              :::+--  L2 your selection
                                              ::+---  L3 credit
                                              :+----  L4 10 top hits
                                              +-----  L5 background plays
                        W = in ASCII disc/track of playing title
                        Y = in ASCII credits
                        Z = just selected title or chart in ASCII

                        (WWWWWYYZZZZ correspond to display of
                        phonographs).
```

1.3 Transfer Format:

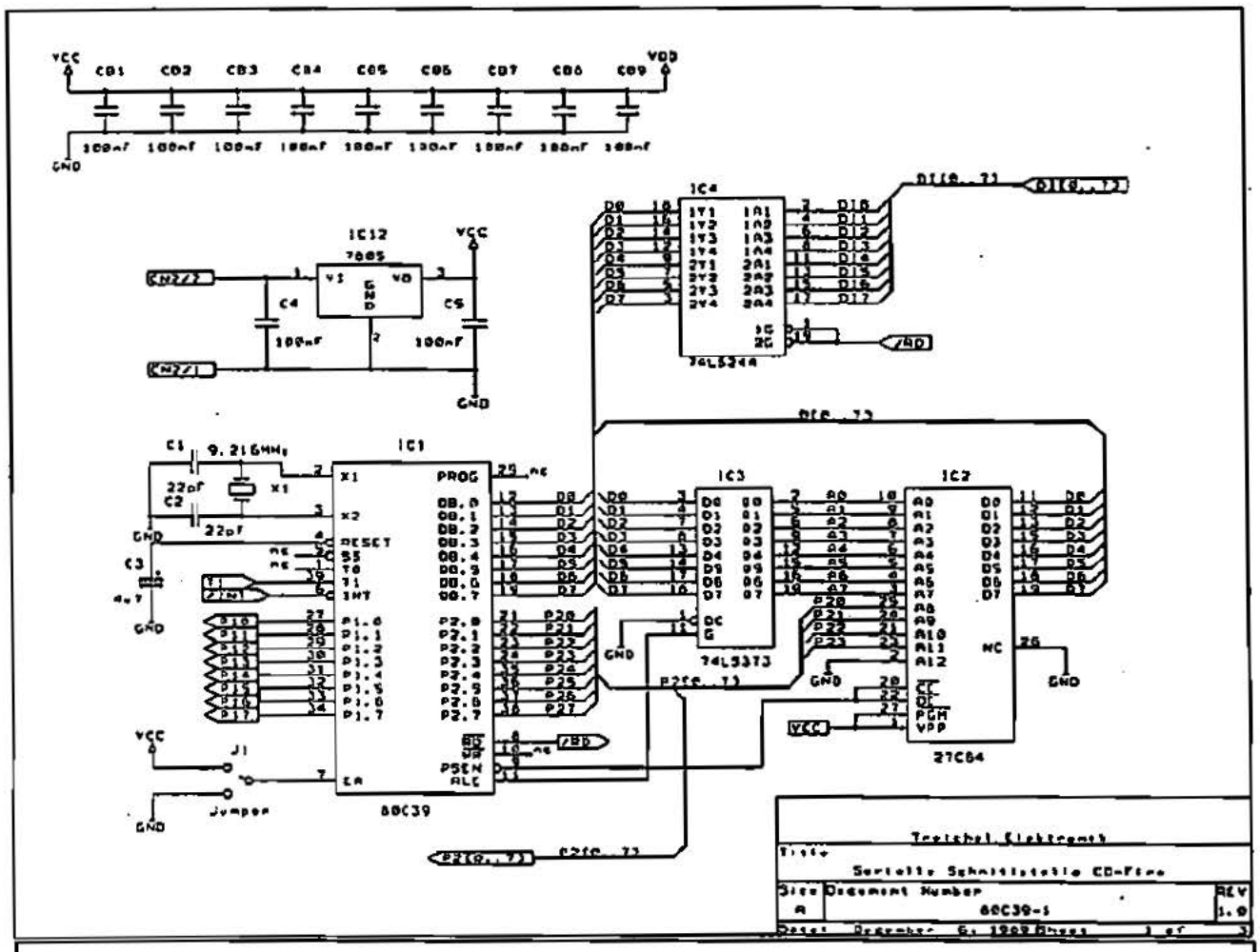
RS 232 with V 24 drivers, 1200 Bd, 1 start bit, 8 data bits, 1 stop bit, no parity handshake via CTS and DTR no XON/XOFF, RTS is not evaluated, DCD is not connected, DSR is always on + 10 volt.

1.4 Connection Plan:

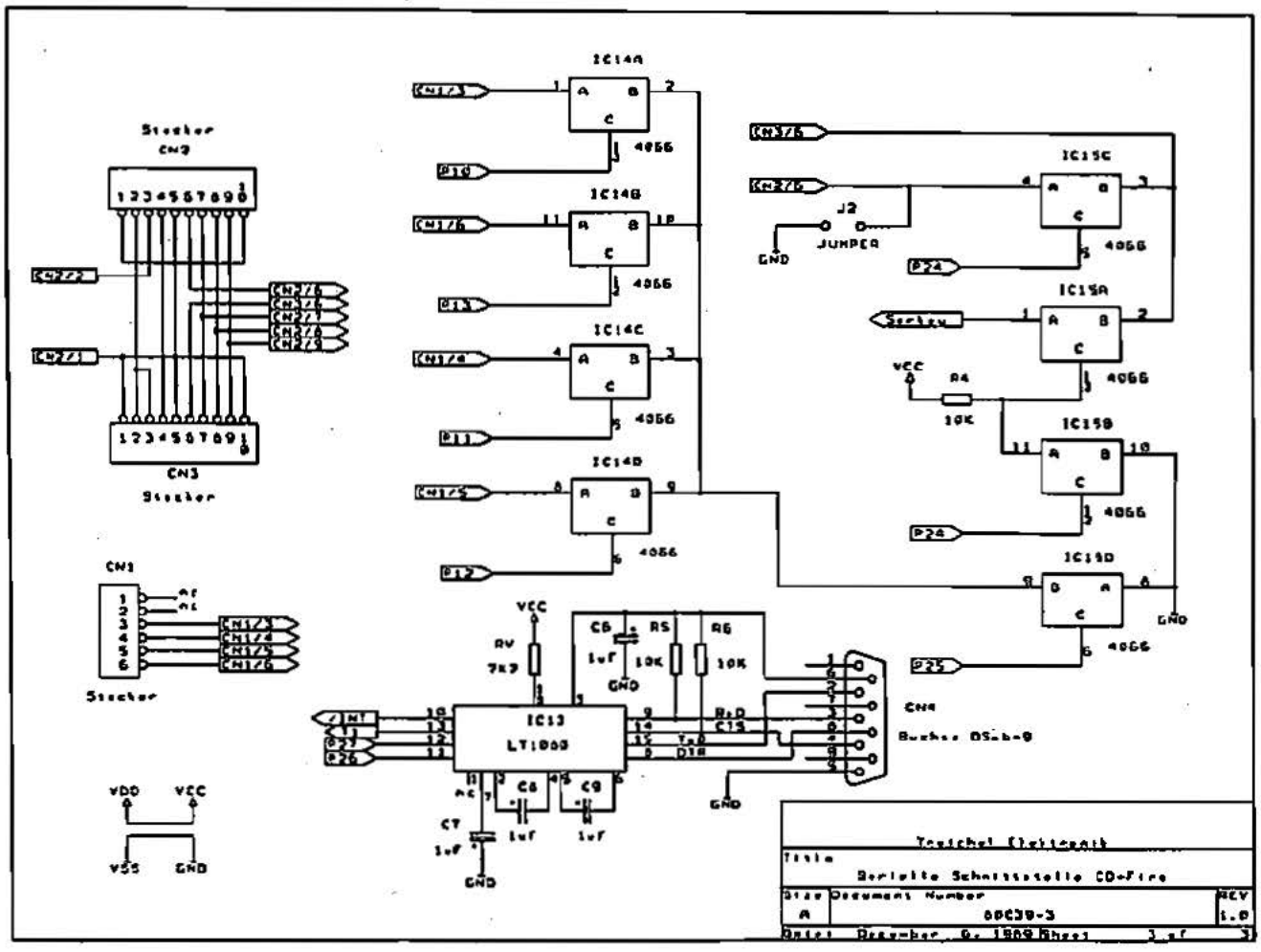
1 free (DCD), 2 TX, 3 RX, 4 DTR, 5 GND, 6 DSR7 free (RTS), 8 CTS, 9 free.
To connect to the 9-pole RS 232 plug of an AT compatible PC, a 1:1 connection with plug/socket (i.e. monitor extension cable, flat wire) is sufficient.

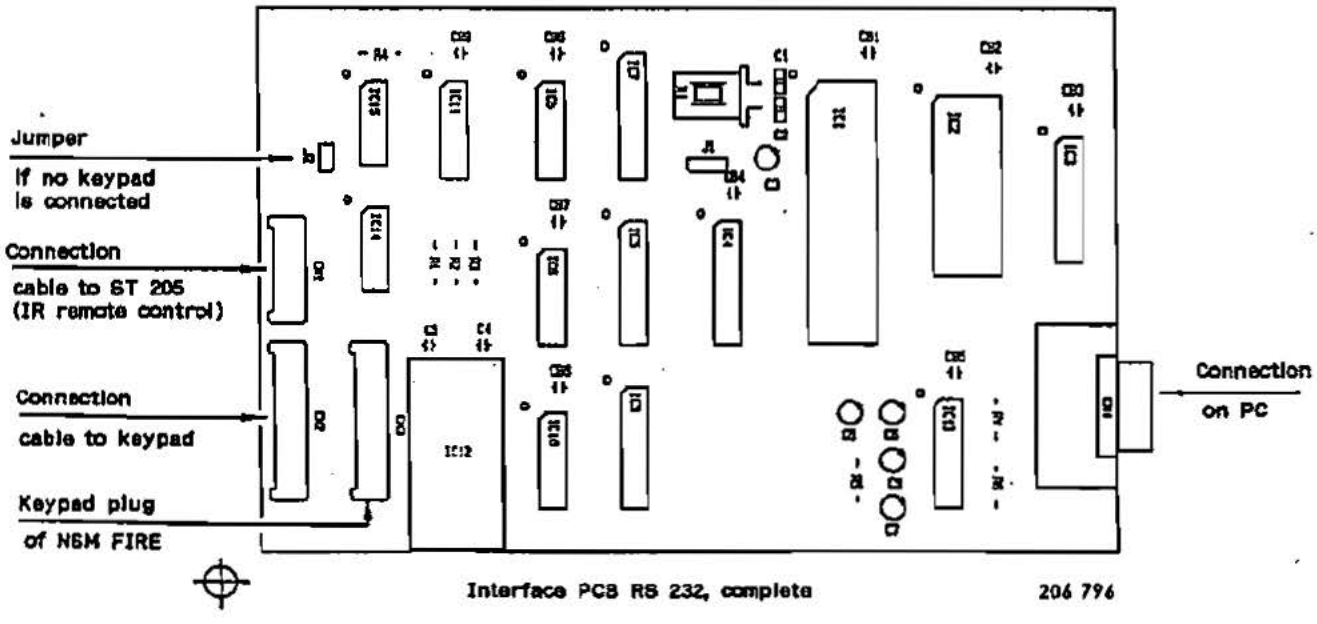
1.5 Power Supply

Supply (via keypad connection on CD box) 8 to 12 volt, 0,25 A.



Schematics of interface PCB





Interface PCB RS 232, complete 206 796