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1.2.5 Random title and Background

Display	Designation	Remarks	x
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).	x
P25	Number of background music CD.	Enter desired number between "0" and "100", followed by "H". Background starts counting downwards starting with maximum number of CD's up (P22) to set number of background positions. With setting "0" no background operation.	

1.2.6 Light Console / Light Organ (Only for models with light organ / luminous effects)

		A B C D		
P26 P27	Luminous effects for "stand by mode". or Luminous affects for "play mode"	0 0 0 1 ↓ ↓ ↓ ↓ 1 3 1 5	Setting "A" corresponds to the switching characteristic: "0"-slow to "1"-fast. Setting "B" corresponds to speed of intervals (0-3). Setting "C-D" corresponds to the various types of light effects "1" through "15". Complete entry with the "H"-button.	x
P26 P27	Continuous light for "stand by mode" or Continuous light for "play mode"	0 0 0 0 ↓ 3	Setting "B" corresponds to the desired brightness ("0" through "3"). Complete entry with "H"-button.	x
P27	Light organ in "play mode".	1 0 0 0 ↓ 3	Setting "B" is for the desired basic brightness ("0" through "3"). Complete entry with the "H"-button.	x

1.2.7 Volumes for Regular and Background Music

P28	Maximum volume.	Enter two digits each for desired maximum volume of normally chosen and background titles as well as "H". e.g.: 31 24 24 — Background 31 — Normal	x

.2.8 Maximum Playing Time

P30	Maximum playing time for a title (from Progr.-Index 004)	Enter desired time in minutes between 0 and 99 and then press "H". With "0" no limit of playing time.	x

1.2.9 Sequence of CD's playing

P31	Sequence of CD's playing (from Progr.-Index 004)	Enter Number 0, 1 or 2 then press "H". 0 = in sequence of selection (FIFO) 1 = in numerically increasing sequence 2 = random sequence	x

1.2.10 Maximum of tunes played on the same CD

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Display	Designation	Remarks	x
P32	Maximum of tunes plaed on the same CD (from Progr.-Index 004)	Enter desired maximum number of tunes played and then press "H". With "0" no limit.	x

1.2.11 Authorization

P38	Authorization.	Enter correct code number and "H". Each of the four digits is confirmed by "P". After closing with "H" "PPPP" is shown and the operator is thereby given authorization. Only the correct code number enables access to protected data. After closing of cabinet or going back to regular program by pressing "C" twice, the programs are protected again.

1.2.12 Code number

P39	Code number.	Changing of code number is only possible when operator has been authorized in program step P38. Enter new code number and "H". Each digit is confirmed after entry with "P". After closing with "H" "PPPP" is shown. Possible entries between "0000" and "9999". If "0000" is programmed, the machine is not protected and access to all programs is possible without authorization. A programmed code number is not show anymore, so please remember your code number!	x

1.3 PRICE SETTINGS

1.3.1 Standard Settings, from Progr.-Index 004

P40	Programming of the program steps P41 through P46 (Standard setting).	Enter corresponding table No. and "H". If values deviating from those in the table desired, they can be changed according to the following program steps (P41 through P46).	x

Standard settings for plays per monetary value in program step P40. The result of the programming of a table ("0" through "20") shows the number of plays per monetary value allocated to the program steps P41 through P45. The monetary values er programmed in monetary value units as they are set in P50 through P55: example table 17, P41: If no bonus is to be given for a high monetary value, it is sufficient to program only the small monetary value, the total of the small values results in the larger value;
example table 17: 1 x 25 c = 1 play + 100 c = 7 plays.
Standard settings for P46 = "0".

Table-No.	Display of Program Number P41 Sp/Gw	P42 Sp/Gw	P43 Sp/Gw	P44 Sp/Gw	P45 Sp/Gw	Remarks/ as set by the factory				
0	00 000	00 000	00 000	00 000	00 000	no coin conversion in this setting.				
1	01 050	01 050	01 050	01 050	01 050	New Zealand	1 play =	50	c	NZ
2	01 020	01 020	01 020	03 050	03 050	Belgium	1 play =	20,-	Bfr	B
							3 plays =	50,-	Bfr	
3	01 005	01 005	03 010	03 010	07 020	If desired, please adjust	1 play =	5,-		
							3 plays =	10,-		
							7 plays =	20,-		
4	02 050	02 050	05 100	05 100	12 200	Austria	2 plays =	5,-	öS	A
							5 plays =	10,-	öS	
							12 plays =	20,-	öS	

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5.	02 010	02 010	05 020	05 020	[illegible]	[illegible]	2 plays = 1,- DM 6 plays = 2,- DM 12 plays = 5,- DM		D
6	01 050	01 050	01 050	03 100	03 100	USA	1 play = 2x 25 c 3 plays = 4x 25 c		USA
7	02 010	02 010	02 010	12 050	12 050	Norway	2 plays = 1,- Kr 12 plays = 5,- Kr		N
8	01 010	01 010	03 020	03 020	03 020	Venezuela	1 play = 1,- Bol 3 plays = 2,- Bol (7 plays = 5,- Bol)		YV
9	01 010	01 010	03 020	03 020	10 060	Ireland	1 play = 10 p 3 plays = 20 p 10 plays = 50 p		IR
10	03 010	03 010	07 020	07 020	18 050	Switzerland	3 plays = 1,- sfr 7 plays = 2,- sfr 18 plays = 5,- sfr		CH
11	01 030	01 030	02 050	02 050	05 100	United Kingdom Denmark	1 play = 30 p 2 plays = 50 p 5 plays = 1 £		GB DK
12	01 020	01 020	01 020	03 050	03 050	Yugoslavia (Din) Finland (mK)	1 play = 2x 1,- 3 plays = 5,-		YU SF
13	01 020	01 020	03 050	03 050	07 100	Union of South Africa France	1 play = 20 c 3 plays = 50 c 7 plays = 1,- R		SAU F
14	01 040	01 040	02 060	03 080	04 100	Australia	1 play = 2x 20 c 2 plays = 3x 20 c 3 plays = 4x 20 c 4 plays = 1 Dollar		AUS
15	01 025	01 025	01 025	01 025	01 025	Canada Dutch Antilles	1 play = 25 c 4 plays = 1 NAF		CAN NA
16	01 025	01 025	01 025	05 100	05 100	Spain (pts)	1 play = 0,25 5 plays = 1,-		E
17	01 050	01 050	03 100	03 100	18 500	USA	1 play = 50 c 3 plays = 1 $ 18 plays = 5 $		USA
18	01 100	01 100	03 250	03 250	07 500	Netherlands	1 play = 4x 25 c 3 plays = 2,5 hfl 7 plays = 5 hfl		NL
19	01 100	01 100	03 200	03 200	05 300	Japan	1 play = 100 Yen 3 plays = 2x 100 Yen 5 plays = 3x 100 Yen		J
20	01 040	01 040	01 040	03 100	03 100	Italy	1 play = 2x 200 L 3 plays = 2x 500 L		I

1.3.2 Price List (Number of Selections/Monetary Value)

Display	Designation	Remarks	x
P41	Number of selections per coin (smallest value).	Enter desired number of plays coin (smallest value) and "H". Entry sequence: 2 digits for number of plays. 3 digits for corresponding coin e.g. 01 020 correspond to one play for 20 pence. Largest programmable number of plays up to 63, price list from 005 to 995.	x
P42 P43 P44 P45	Operating display are analogous to program step P41	Note: All five program steps must be programmed with the price classes in the sequence or their priority. For less than 5 price classes program more than once or set to "00 000".	x x x x
P46	Number of required credits for one album.	Enter desired number and "H". At "0" no album selection allowed.	x

1.4 MONETARY SETTINGS

1.4.1 Standard Settings

P50 Programming of the program steps P51 through P55 (Standard setting).

Enter corresponding table and "H". If values other than those in the table are desired, they can be changed according to the following program steps (P51 through P55). ×

The monetary value settings in the individual program steps are associated with the corresponding coin channel: P51 for channel 1; P52 for channel 2, etc. to P55 for channel 5. This table shows the coin values for the corresponding channel in the currency of the columns P51 through P55.
Standard setting of P56 = "0".

Table-No.	Display of Program Number P51 (Channel 1)	P52 (Channel 2)	P53 (Channel 3)	P54 (Channel 4)	P55 (Channel 5)	Remarks/ as set by the factory
0	000	000	000	000	000	no coin conversion in this setting
1	010 1,- DM 1 Bol 1,- sfr	050 5,- DM 5 Bol 5,- sfr	020 2,- DM 2 Bol 2,- sfr	000 -,- -,- -,-	000 -,- -,- -,-	Germany (D) Venezuela (YV) Switzerland (CH)
2	050 5 S	200 20 S	100 10 S	000 -,-	000 -,-	Austria (A)
3	020 200 L	010 100 L	050 500 L	000 -,-	000 -,-	Italy (I)
4	000 -,- -,- -,-	050 5 mK 6 Kr 5 Din	010 1 mK 1 Kr 1 Din	000 -,- -,- -,-	000 -,- -,- -,-	Finland (SF) Norway (N) Yugoslavia (YU)
5	025 25 C	250 2,5 hfl	100 1 hfl	000 -,-	000 -,-	Netherland (NL)
6	000 -,-	100 1,- NAF	025 0,25 NAF	000 -,-	000 -,-	Netherland Antillen (NA)
7	000 -,-	020 20 Bfr	005 5 Bfr	000 -,-	000 -,-	Belgium (B)
8	010 1 Fr 1 dkr	050 5 Fr 5 dkr	100 10 Fr 10 dkr	000 -,- -,-	000 -,- -,-	France (F) Denmark (DK)
9	020 20 p	050 50 p	010 10 p	000 -,-	000 -,-	United Kingdom/ Ireland (GB) (IR)
10	010 10 c	050 50 c	025 25 c	000 -,-	100 1 Dollar	USA (USA)
11	000 -,-	025 25 c	000 -,-	000 -,-	100 1 Dollar	Canada (CAN)
12	020 20 c	100 1 R	050 50 c	000 -,-	000 -,-	Union of South Africa (SAU)
13	100 1 Dollar 100 Yen	050 50 c 50 Yen	020 20 c 20 Yen	000 -,- -,-	000 -,- -,-	Australia (AUS) Japan (J)
14	000 -,-	025 25 pts	100 100 pts	000 -,-	000 -,-	Spain (E)

Electronic Coin Acceptor

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Table-No.	Display of Program Number P51 (Channel 1)	P52 (Channel 2)	P53 (Channel 3)	P54 (Channel 4)	P55 (Channel 5)	Remarks/ as set by the factory	
15	100 10 Fr 1 £	020 2 Fr 20 p	010 1 Fr 10 p	050 5 Fr 50 p	000 -,- -,-	France United Kingdom	F GB
16	050 5,- DM	010 1,- DM	000 -,-	020 2,- DM	000 -,-	Germany	D
17	050 5.- sfr 500 L 50 c	010 1,- sfr (100 L)	005 1/2 sfr (50 L) 5 c	020 2,- sfr 200 L 20 c	000 .- -,- -,-	Switzerland Italy New Sealand	CH I NZ
18	100 10 dkr (neu)	050 5 dkr	010 1 dkr	100 10 dkr (alt)	000 -,-	bei 4-Channel (1 A) Denmark	DK
19	200 20 S	050 5 S	010 1 S	100 10 S	000 -,-	Austria	A
20	025 25 c	250 2 1/2 hfl	500 5 hfl	100 1 hfl	000 -,-	Netherland	NL

1.4.2 Monetary Values (Allocated to coin channels 1 through 5)

Display	Designation		Remarks	x
P51	Coin value channel 1.	Monetary Setting for electr. Coin Acceptor see chapter 10,	Enter desired coin value for channel 1 and "H". Example: "010" corresponds to 10p, "020" to 20p and "100" corresponds to 1 £. Note: when a coin is inserted in the program steps P50 through P55 the channel assigned to this coin is automatically displayed on display 1; P51 for channel 2 etc. to P55 for channel 5. Not used channels are set to "0"!	x
P52	Operation and display are analogous to program step P51.		The programmed monetary units for P51 through P55 must correspond to the unit programmed by the cash counter P03), e.g. 050 units for 50p, 020 units for 20p and 100 units for 1 £.	x
P53				x
P54				x
P55				x
P56	Bonus credits for bills.		Enter desired number and "H". When a dollar bill is inserted (Channel 5/P55), the programmed value is added to the credit.	x

1.5 TEST PROGRAMS

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The displays in this program step acts as test aids for testing the [illegible]
In the event of a malfunction the defective unit can be determined or a malfunction resulting 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: Open cabinet lid pull out interlock cabinet switch
Display 1 shows "P01", press letter "C".
Display 1 shows "P".
Press number 60 and "H", Display 1 shows "P60".

1.5.1 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.

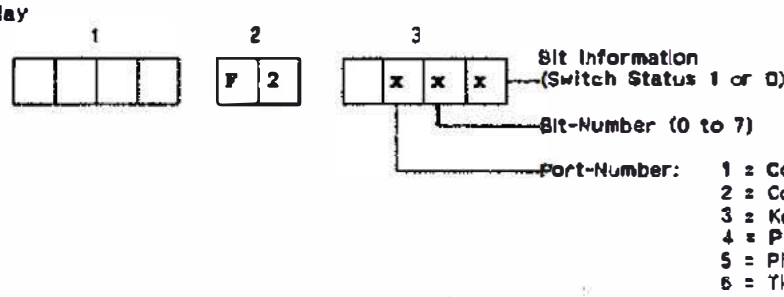
Designation	Remarks
Display test -continuous test-.	Enter "1" and "H". Display 2 "F1".
Stop test sequence.	Enter "H". The light "10 top hits" comes on.
Continne test sequence.	Enter "H" again. The light "10 top hits" goes off.
Terminate test.	Enter "C" once, display 1 "P60" or actuate cabinet switch, the unit returns to the regular program.

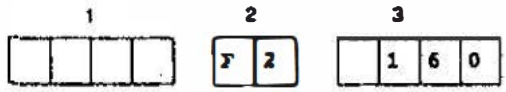
1.5.2 Input Test, Display 1 "P60"

In the following test the functions of all entries of Input Ports 1-6 can be tested:
Port 1, Port 2 : Control Unit
Port 3 : Keyboard (Display Board)
Port 4, Port 5 : Pickup Driver
Port 6 : Title Indication
Every input change is shown on the display as follows:

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

Display





Meaning of the displays:
"F2" = Input Test
"1" = Port 1 (IC9)
"6" = Bit 6 (Key Switch)
"0" = Switch Status 0 (closed)

Instruction: The accuracy of the inputs from the keyboard can be checked due to the entry connections simply by selecting a title!

Terminate test. — Enter "C" 1, display "P60" or actuate cabinet switch, the phonograph returns to the normal program.

1.5.3 Continuous Run I

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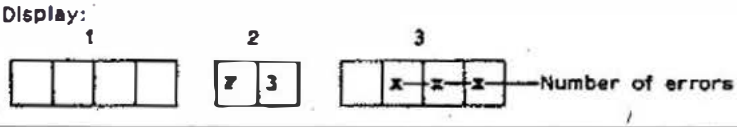
The machine is switched to continuous run. Now every CD is played continuously for 16 sec. beginning with the first selection. All errors of the CD changer or CD player are registered.

Continuous Run 1 — Enter "3" and "H", Display 2 "F3". After that select the CD with which to begin.

Display:



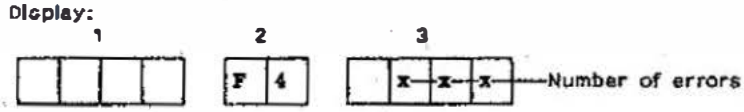
Terminate test. Actuate housing switch.

1.5.4 Continuous Run 2

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

Continuous Test 2 — Enter "4" and "H", Display 2 "F4". The select any title.

Display:



Terminate test. Actuate housing switch.

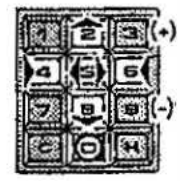
1.5.5 CD changer Test

All functions of the changer can be tested individually.

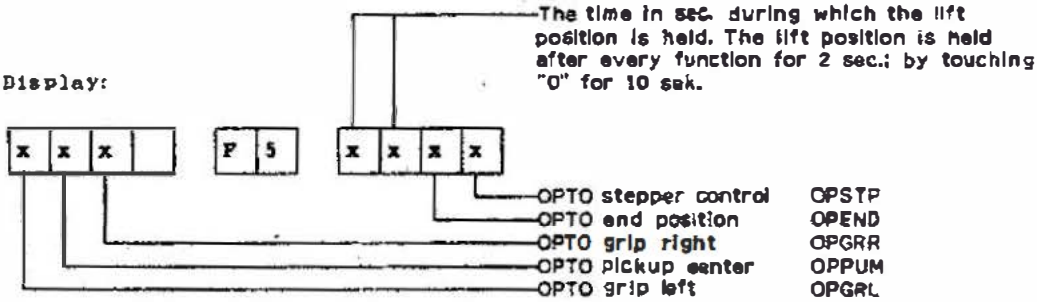
CD changer test — Enter "5" and "H", Display 2 "F5".

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, upwards
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)



Display:



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

Terminate test. Actuate housing switch.

*) from Progr.-Index 004

1.5.6 Track selection of CD test records

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P61	Track selection of CD test records (more than 15 tracks per record).	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.

1.5.7 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 8x no. of CD at which error occurred. At error code 9x no. of cover 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".

UNIT DESCRIPTION

CONTROL UNIT
FOR NSM-PHONOGRAPGHS

ES IV-CD TECHNOLOGY

to
Technical Information, Assy

174 903	SILVER CITY
174 831	SILVER SKY
174 486	FASCINATION
175 274	SOUNDMASTER
175 040	FIREBIRD/COUNTRY
176 046	THE PERFORMER "GRAND"

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

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
1.7 Service plug

Spare parts list

Schematics CONTROL UNIT CD

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.
Connection of the DATA PRINT is provided at Plug 11.

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 Q 1 (4 MHz) and the frequency divider (1:4) IC 14.

1.3 Reset

The Zener diode ZD 2 with transistors T 1 and T 2 serves to activate the reset when U (+5 V) is less than 4,6 V.
Transistor T 2 with its antenna connection serves to recognize static discharges and interferences.

When T 2/C is LOW, reset is activated via IC 16, Pin 10, Pin 11. If T 2/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 from 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 T 3/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 impulses for the output channels.

Output: IC 5 and IC 6 are output ports.
Resistors R 22-40 together make two D/A converters. The DC signals obtained thereby control the volume and are conducted to the amplifiers via plugs ST 2, Pin 2, Pin 3.

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

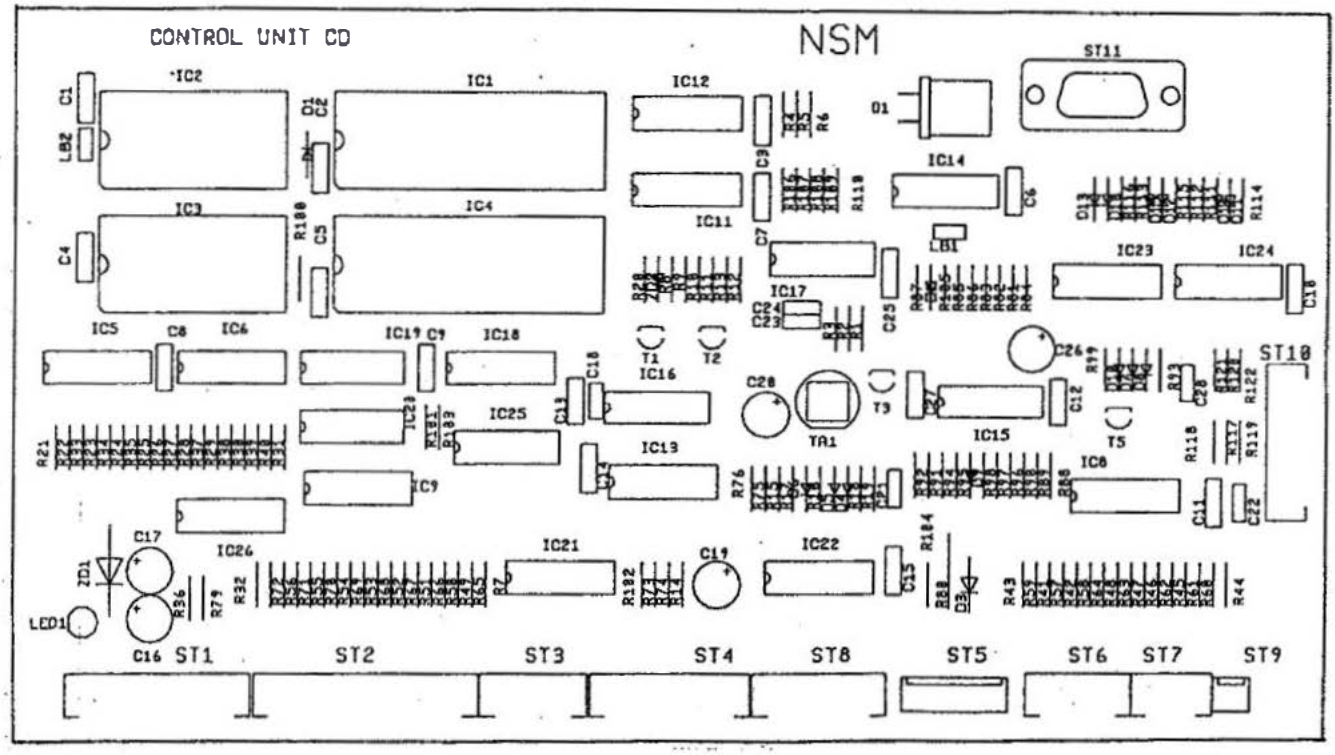
Serial interfaces are available:
At ST 3 for control of the light generator
At ST 4 for display and keyboard
At ST 8 for control of CD changer
At ST 10 for control of Title Indication.

1.6 Output - Enable

A clock signal is sent by IC 4, Pin 5. Capacitor IC 26 is charged 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 D 1 when reset (IC 16, Pin 11) becomes LOW.

1.7 Service Plug

Plug ST 11 serves to connect with the DATA PRINT.



174 903 / 174 931 / 174 486 / 178 274 / 175 040 / 178 049

SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
	174 873	CB-CONTROL UNIT CD, ASSY		1
ST 07	225 651	PIN PANEL	4 prongs	1
ST 03, 06	225 652	PIN PANEL	6 prongs	2
ST 09	225 653	PIN PANEL	8 prongs	1
ST 04	225 654	PIN PANEL	10 prongs	1
ST 01	225 655	PIN PANEL	12 prongs	1
ST 02	225 656	PIN PANEL	15 prongs	1
ST 08	225 439	PIN PLUG	3 prongs	1
ST 05	225 444	PIN PLUG	8 prongs	1
ST 11	225 828	D-SUBMINIATURE-CONNECTOR	SLEEVE 9 prongs	1
Q 1	221 535	OSCILLATOR QUARTS	4 MHz	1
IC 3	222 446	IC-SOCKET	24 prongs	>
	231 423	IC-MEMORY	MK 48 Z 12-20	1
IC 2	222 447	IC-SOCKET	28 prongs	>
	175 102	IC-MEMORY Program 007	AM 27 256 DC	1
IC 1, 4	222 448	IC-SOCKET	40 prongs	2
IC 1	231 413	IC-MICROCOMPUTER	R 65 C 02 - P 2	1
IC 4	231 415	IC-MICROCOMPUTER	R 65 C 22 - P 2	1
IC 8, 9	221 763	IC-CMOS	HEF 4021 B	2
IC 5, 6	221 771	IC-CMOS	HEF 4094 B	2
IC 21-23	221 541	IC-CMOS	F 4049 BC	3
IC 18	221 665	IC-TTL	SN 74 LS 00	1
IC 19	221 525	IC-TTL	SN 74 LS 03	1
IC 17	221 652	IC-TTL	SN 74 LS 04	1
IC 14, 20	221 705	IC-TTL	SN 74 LS 74 A	2
IC 13	221 792	IC-TTL	SN 74 LS 123	1
IC 12	221 653	IC-TTL	SN 74 LS 139	1
IC 10	221 852	IC-TTL	SN 74 LS 151	1
IC 11	221 796	IC-TTL	SN 74 LS 138	1
IC 15	221 813	IC-LINEAR	LM 339	1
IC 26	221 497	IC-LINEAR	ULN 2003 A	1
D 3	221 115	SI-DIODE	1 N 4004	1
D 1, 2, 4-16	221 114	SI-DIODE	1 N 4148	> 16
ZD 1	221 539	TRANZORB DIODE	IC TE-5	1
ZD 2	221 948	ZENER-DIODE	ZPD 3,9	1
LED 1	221 466	LIGHT EMITTING DIODE	LR 3160-F	1
T 1, 2	221 757	TRANSISTOR	BC 547 B	2
T 3, 5	221 283	TRANSISTOR	BC 212 B	2

SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA		QTY
C 22	220 181	CER.-CAPACITOR	47 pF		1
C 23	220 242	CER.-CAPACITOR	68 pF		1
C 24	220 185	CER.-CAPACITOR	270 pF		1
C 98, 28	220 263	CER.-CAPACITOR	1000 pF		2
C 21	220 341	CER.-CAPACITOR	4700 pF		1
C 1-15,					>
25, 27	220 334	MKT-CAPACITOR	0,1 µF	63 V	17
C 19, 20,					>
26	220 159	LYTIC	4,7 µF	63 V	3
C 17	220 162	LYTIC	10 µF	63 V	1
C 18	220 160	LYTIC	100 µF	10 V	1
R 8, 9,					>
116	221 600	RESISTOR	100 Ω	¼ W	3
R 12, 19,					>
79	221 099	RESISTOR	470 Ω	¼ W	3
R 93	221 622	RESISTOR	820 Ω	¼ W	1
R 10, 87	221 029	RESISTOR	1 KΩ	¼ W	1
R 13	221 031	RESISTOR	2,2 KΩ	¼ W	1
R 2-6,					>
102-104,					>
106-110	221 033	RESISTOR	3,3 KΩ	¼ W	13
R 84, 88,					>
89, 94,					>
112, 201,					>
105, 113	221 034	RESISTOR	4,7 KΩ	¼ W	8
R 1, 15	221 172	RESISTOR	8,2 KΩ	¼ W	2
R 11, 18,					>
20, 42,					>
74, 78,					>
82, 83,					>
90-92,					>
96, 111,					>
112, 114,					>
115	221 035	RESISTOR	10 KΩ	¼ W	16
R 16, 21,					>
27, 33-40					>
73, 75,					>
85	221 604	RESISTOR	22 KΩ	¼ W	14
R 17	221 801	RESISTOR	27 KΩ	¼ W	1
R 22-26,					>
29-32,					>
41-72,					>
98, 99	221 038	RESISTOR	47 KΩ	¼ W	44
R 14, 86,					>
86, 95	221 048	RESISTOR	100 KΩ	¼ W	4
R 80	221 273	RESISTOR	10 Ω	½ W	1

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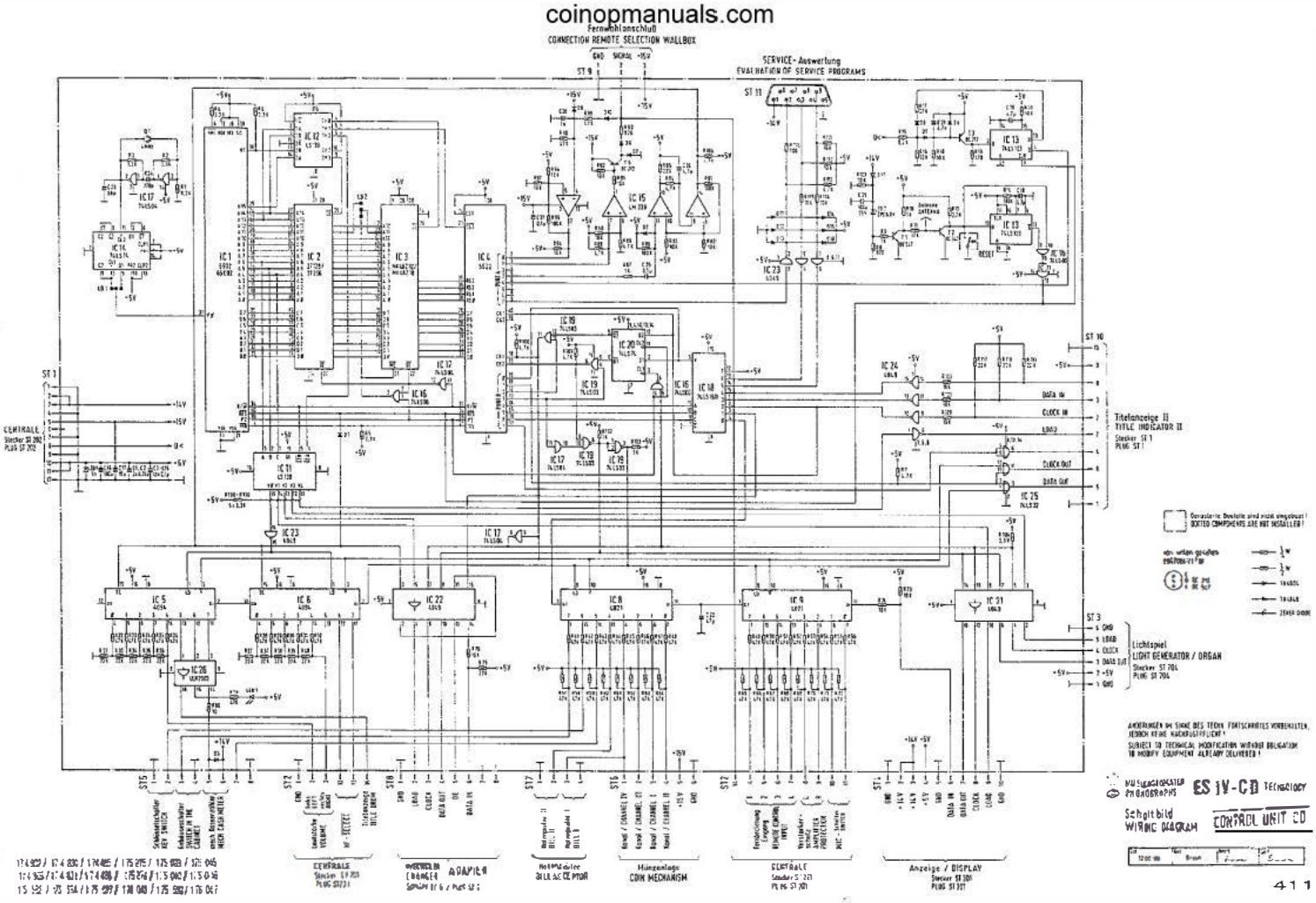


UNIT DESCRIPTION

DISPLAY/KEYBOARD

FOR NSM-PHONOGRAPHS

IV-CD TECHNOLOGY

to
Technical Information, Assy

174 903	SILVER CITY
174 831	SILVER SKY
174 486	FASCINATION
175 274	SOUNDMASTER
175 040	FIREBIRD/COUNTRY
176 046	THE PERFORMER "GRAND"

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

INDEX

1 FUNCTION
1.1 Display
1.2 Keyboard

Spare parts list

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.

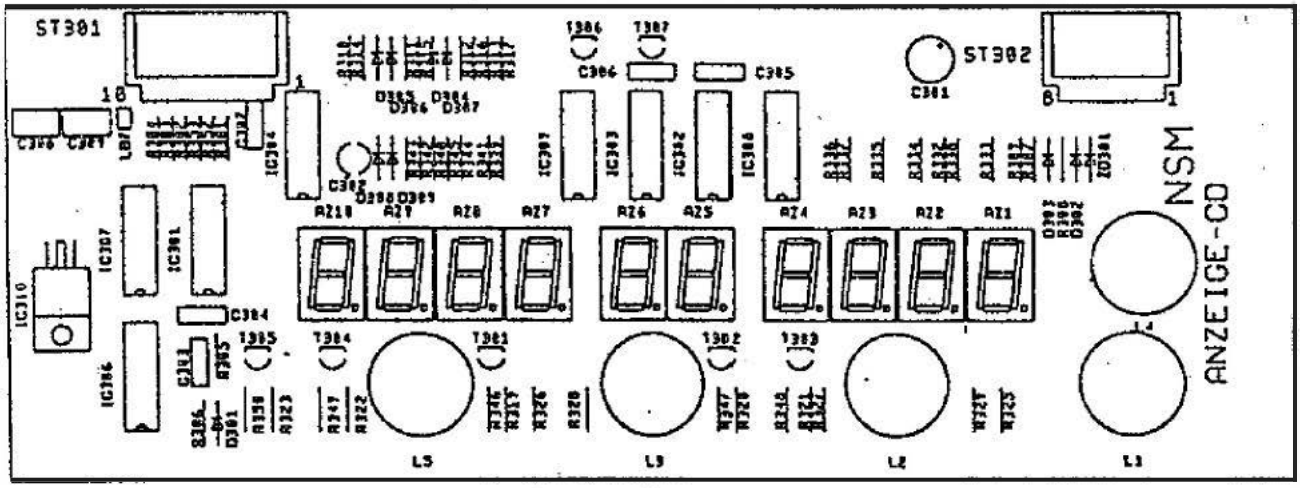
Lamps L 1 to L 5 are controlled statically via IC 307, Pin 12 and 14 and IC 306, Pin 19, 11, 12.
Resistors R 325 to R 329 limit the transient current.

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.

SPARE PARTS LIST



SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA	QTY
	173 664	CB-DISPLAY CD, ASSY		1
ST 302	225 663	PIN PANEL	8 prongs 90°	1
ST 301	225 664	PIN PANEL	10 prongs 90°	1
AZ 1-8	231 416	DISPLAY	TD SL 5150	10
	173 384	TUBUS		1
	171 629	HOLDER		4
IC 310	221 573	IC-VOLTAGE	12 V 1 A	1
ST 301-303	221 771	IC-CMOS	HEF 4094 B	3
IC 304	221 763	IC-CMOS	HEF 4021 B	1
ST 306-309	221 497	IC-LINEAR	ULN 2003 A	4
D 301-307	221 114	SI-DIODE	1 N 4148	7
ZD 301	231 079	ZENER-DIODE	ZPD 4,7	1
T 301-305	231 240	SI-TRANSISTOR	BC 636 F	5
T 306, 307	221 283	SI-TRANSISTOR	BC 212 B	2
T 308-327	220 334	MKT-CAPACITOR	0,1 µF 63 V	5
C 308, 309	220 332	MKT-CAPACITOR	0,33 µF 63 V	2
C 302	220 249	LYTIC	1 µF 63 V	1
C 304	220 162	LYTIC	10 µF 63 V	1
R 301	221 611	RESISTOR	10 Ω ¼ W	1
R 305,				>
332 350	221 627	RESISTOR	1,2 KΩ ¼ W	20
R 302-304,				>
307-309,				>
314-317,				>
319-323,				>
354	221 033	RESISTOR	3,3 KΩ ¼ W	16
R 310-313	221 038	RESISTOR	47 KΩ ¼ W	4
R 305	221 009	RESISTOR	1 MΩ ¼ W	1
R 325-329	231 366	MET.-RESISTOR	10 Ω ¼ W	5

173 900 KEY BOARD, ASSY

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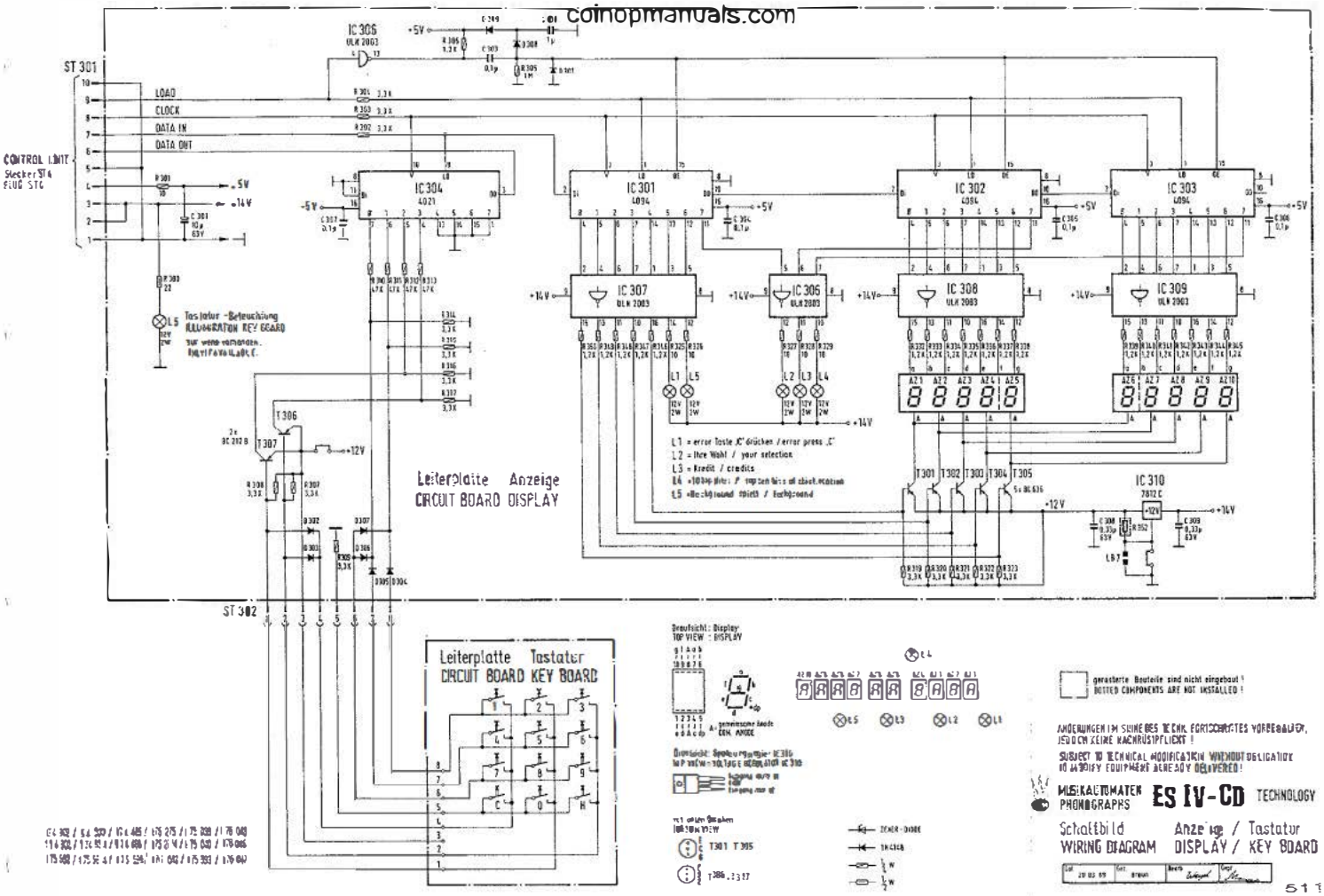

gestrichelte Bauteile sind nicht eingebaut !
DOTTED COMPONENTS ARE NOT INSTALLED !

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 / Anzeige / Tastatur
WIRING DIAGRAM / DISPLAY / KEY BOARD

511

UNIT DESCRIPTION

CENTRAL UNIT

FOR NSM-PHONOGRAPHS

ES IV-CD TECHNOLOGY

to
Technical Information, Assy

174 903	SILVE
174 831	SILVER SKY
174 486	FASCINATION
175 274	SOUNDMASTER
175 040	FIREBIRD/COUNTRY
176 046	THE PERFORMER "GRAND"

NSM
Aktiengesellschaft
Saarlandstraße 240
6530 Bingen am Rhein

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1.2 Amplifier
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1.5 MIC socket, microphone connection
1.6 TB socket
1.6.1 Tape recorder connection
1.6.2 Connection of auxiliary amplifier

2 Adjustment instructions for trimmer of central unit and output stage

3 Repair aid
3.1 Output stage
3.2 Control of Volume and muting
3.3 Tracing sound signal

1 FUNCTION

The power supply, fan controls, stereo amplifier with inputs for microphone, CD and tape are all integrated on one circuit board.
The output stages and the fan are connected to the central unit via ST 209, ST 210, ST 211. The music power per channel is 200 watts when matched to a loudspeaker impedance of 2 ohms.

1.1 Power Supply

The power transformer supplies 22 V, 2 x 11,5 V and 2 x 43 V from three separate secondary coils. The supply voltage for the output stages is supplied with 2 x 43 V by a two-way rectifier (D 206) and the center tap of the transformer.
The supply voltage for the voltage regulator VR 201, +5 V is supplied with 2 x 11,5 V by a two-way rectifier (D 201/202) and the center tap on the transformer. The low voltage recognition is accomplished by D 204 and D 205. Fusing is accomplished with SI 201 and SI 202. Fusing for the output stage is accomplished with SI 204 and SI 205.
The non-controlled voltage +14 V for the display and key illumination is being picked up at capacitor C 201.
The control voltage of +15 Va, for the pickup driver, coin mechanism, control unit, remote control, luminous effects as well as the supply voltage for the preamplifier of +15 Vb, are supplied by the 22 V transformer coil and rectified by D 207 through 210 and VR 203. Fusing is accomplished by SI 203.

The LED's indicate the following supply voltages at the same intensity:
LED 201 = + 5 V
LED 202 = +60 V
LED 203 = +15 V a
LED 204 = +15 V b
The TRIAC TIC 200 controls the output stage fan depending upon the operational state of the amplifier (REJECT); i.e. the fan only runs when the amplifier is not muted.

1.2 Amplifier

The stereo amplifier is equipped with two tone control IC's, one AF switch IC, 50 diodes and 17 transistors.
The output stage is designed without induction coils or transformers and is therefore ironless.
At full volume level the music power is 200 watts per channel.

1.3 Signal path

The input signal MIC goes to microphone amplifier T 230 and background mixer of TA, TR 231 to Pins 4 and 8 of IC 230. The TB input is connected to Pins 3 and 7. The CD input is connected to Pin 2 and Pin 6.
In the play mode the signal goes from Pin 2 to Pin 15 respectively through Pin 6 and Pin 9.