2 LAYOUT OF UNITS

CONTROL
LOUDSPEAKER

WALLBOX
CONNECTION

KEY SWITCH

CONTROL UNIT CD

HOLDER FOR CD-
TITLE INDICATION II

CD-CENTRAL UNIT

CABINET SWITCH

OUTPUT STAGE

COIN MECHANISM

OUTPUT
TRANSFORMER

CD-CHANGER

CASH BOX

DISPLAY

KEYBOARD

2.1 DISPLAY and KEYBOARD

SELECTION
NOW PLAYING

8888

background

TOP TEN HITS
AT THIS LOCATION
RANK — TUNE NUMBER

88 8888

credits   your selection

top ten hits
of this
location

error
press,C'

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

Display 1   Display 2   Display 3
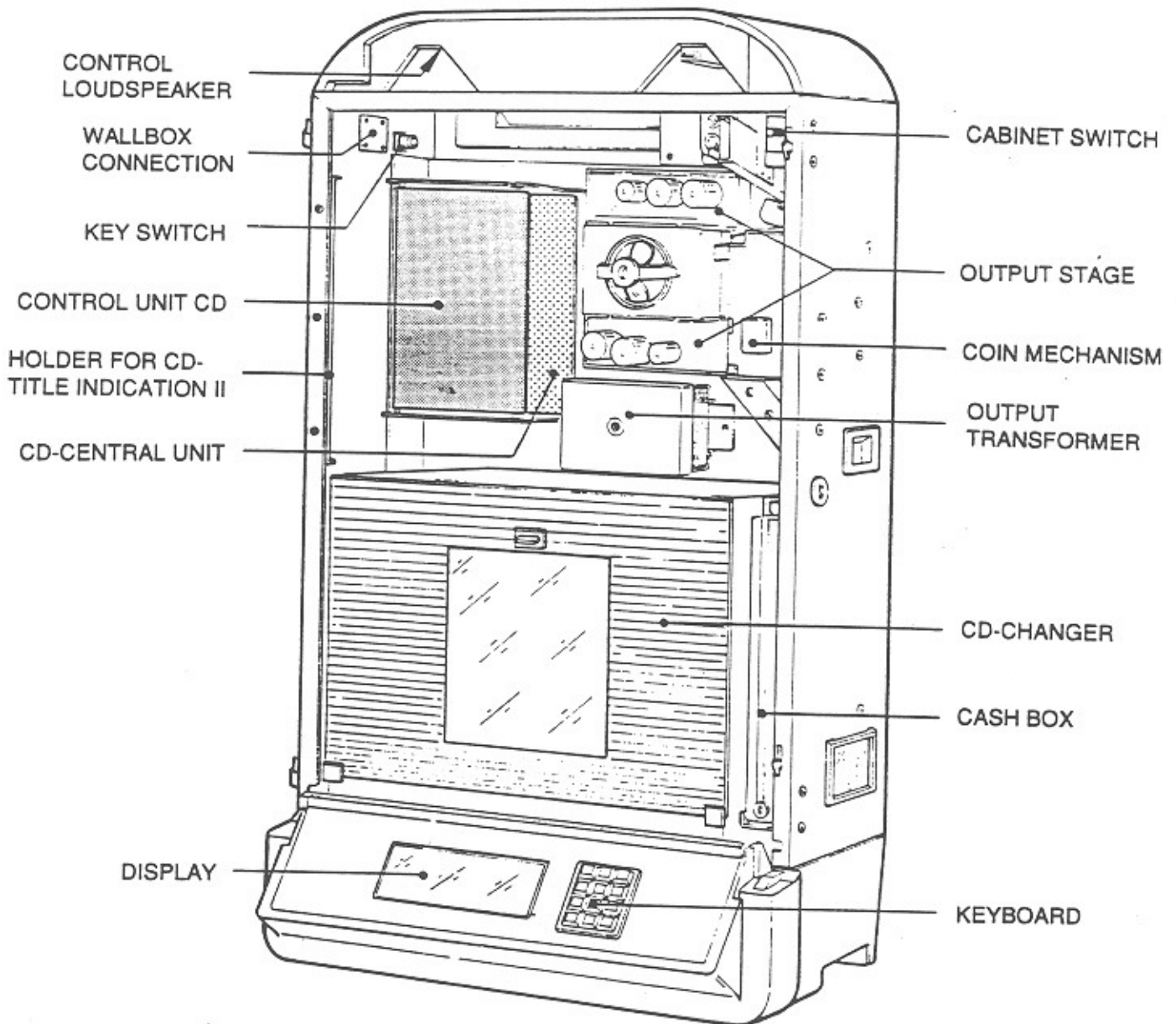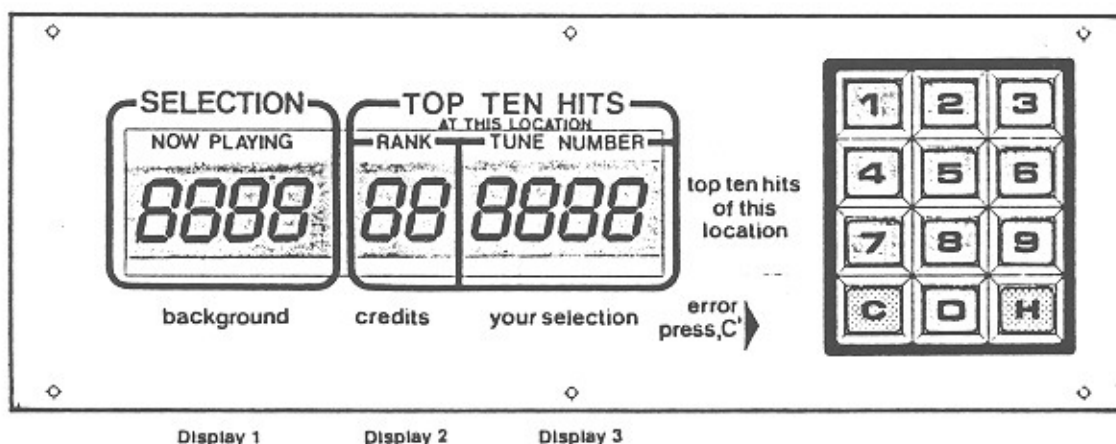
3 SPECIFICATIONS

3.1 Electrical Data

Main voltage: 100–260 V (variable), 50/60 Hz

Power consumption
at stand by   170 W
at play   450 W

3.2 Musik Power

2 x 200 watts music power at 2 ohms

3.3 Fuses

Replace fuses only with those of same value!

3.4 Lighting

Fluorescent lamps = 4 W
Fluorescent lamps = 8 W
Fluorescent lamps = 13 W

Lamps   = 12 V / 2 W

3.5 Credit / Cash Input

Maximum credit display is 99.
Price list adjustable individually or as per table.
Free credit adjustment / permanent credit key–operated switch for free credits and background, elect.–mech.
cash counter (optional).

3.6 Keyboard

10 number keys   0–9
 1 correction key   "C"
 1 hit–step key   "H"

3.7 Displays

Display 1 with 4 seven–segment LED's
Display 2 with 2 seven–segment LED's
Display 3 with 4 seven–segment LED's
1 lamp display "10 top hits"
1 lamp display "background"
1 lamp display "credit"
1 lamp display "your selection"
1 lamp display "error, press key "C"

ACCESSORIES

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, Assy

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

15

INDEX

1 MICROPHONE with Paging Switch

Connection via microphone socket to the central unit.
Microphone announcements are possible in any phonograph mode.

The microphone amplifier with electronic switch–over is integrated into the central unit.
The volume for the background music and microphone can be adjusted separately in the central unit.

Connection cable with plug and microphone socket–length 10 m or 25 m (Part–No. see Spare Parts List in "Technical Instructions").

2 REMOTE CONTROL WALL BOXES

FIRE STORM   w. Title indication II
CARAVELLE II   w. Title indication II

For connection to NSM phonographs in CD technology. Connection Adapter belongs to the equipment. (Part–No. see Spare Parts List in "Technical Instructions"). Detailed installation instructions are included in the adapter kit.

3 REMOTE CONTROLS

3.1 Infrared Remote Control

Wireles remote control consisting of transmitter, receiver and parts for installations. See wiring diagram for connections.
(Part–No. see Spare Parts List in "Technical Instructions").

3.2 Remote Control with Cable

The connection points are illustrated in the wiring diagram and described in unit description "REMOTE CON-TROL".
(Part–No. see Spare Parts List in "Technical Instructions").

4 OUTPUT TRANSFORMER with cable

Significantly expanded adaptation capabilities and low line losses with 70 V output. (See Unit description "OUTPUT TRANSFORMER").
(Part–No. see Spare Parts List in "Technical Instructions").

5 CASH COUNTER

NSM phonographs can be subsequently modified with an electro–mechanical cash counter (12 V = pulse counter).
(Part–No. see Spare Part List in "Technical Instructions").

6 DATAPRINT

The printer is intended for connection to NSM phonographs ES IV–CD Technology. A detailed description is included with the printer. Putting in the paper roll and color ribbon are described in detail in the "TECHNICAL INSTRUCTIONS" for the DATAPRINT.

6.1 Data Transfer and Memorizing

- Turn on service program by opening cabinet and pull out cabinet switch manually, Display 1 "P010".
- Put in printer connector into "Service Socket" of the Control Unit.
- Enter "C", Display 1 "P".
- Enter "30" and "H", Display "P030".
- Enter Code "0" and "H".

Counters + Errors, as well as popularity are transferred.

Note: Display 3 "E0" appears if an error occurs during data transfer.

Attention: After the data transfer has finished succesfully the memory contents of the phonograph are cleared with closing the cabinet lid!

6.2 Transfer to Printer

- Switch on service program by opening cabinet; if needed, pull the cabinet switch manually, Display 1 "P010".
- Plug printer connector into socket of Control Unit.
- Enter "C", Display 1 "P".
- Enter "31" and "H", Display 1 "P031".
- Enter code for the desired print–out and press "H".
  "0" and "H" = complete information
  "1" and "H" = all cash counters
  "2" and "H" = all counters
  "3" and "H" = settings
  "4" and "H" = popularity
  "5" and "H" = hit parade of this location
  "6" and "H" = last 20 error messages

Note: When a popularity counter has reached value 200, all popularity counters are divided by half of the amount. After dividing the popularity printed out is relative; the number of divisions appears in the printout: "RELATIVE 000" to "xxx".
If the printer does not start, "E0" appears in Display 3.

Examples of print–outs

1. Print–out in text mode P030

Open the cabinet lid (door) of the phonograph with ES–V technology and pull the cabinet switch.
Connect the DATA PRINT to the evaluation socket (ST2 on p.c.b. control unit ES–V).
Enter P030: Key 0 – to start the print–out of all available data.

```
04.02.93 / 13.58   V23.1
* NSM *
BOX ES V           V.0003
BOX-ANALYSE:
BOX-NR                0000
TIME                 14:02
DATE              04.02.93

COUNTERS:
CASH                     0
PLAYS                    0          Counters
TITLE-SELECTIONS         0
ALBUM-SELECTIONS         0
OVERPLAYS                0
FREE PLAYS               0
BACKGROUND PLAYS         0
AUTO PLAYS               0
ADVERTISE PLAYS          0
HAPPY HOUR CREDITS       0

POPULARITY:
CD:
001 092,085,072,100,
006 086,096,072,080,084           Popularity
011 066,084,066,092,085
016 076,001,008,100,072
021 005,124,   ,002,
026    ,072,100,060,111
031 061,031,061,031,007
036 004,   ,016,038,087
041 050,127,002,018,120
046 066,016,075,097,016
051 025,016,072,084,070
056 002,108,082,036,052
061 093,030,084,016,096
066 001,109,084,066,016
071 090,090,007,042,016
076 090,090,007,062,084
081 066,084,066,016,068
086 004,106,082,016,088
091 006,091,016,090,090
096 050,066,069,106,084

HITLIST:
RANK CD TRACK PLAYS
 1 0401 240!  2 7603 218          Hitparade with
 3 3204 216!  4 0416 201          number of plays
 5 7601 194!  6 2301 193
 7 7201 186!  8 1401 180
 9 5201 170! 10 0401 169
11 0401 145! 12 7408 144
13 1101 141! 14 3201 133
15 9601 122! 16 0401 122
17 9201 120! 18 6501 100
19 5601  76! 20 0301  72
21 4901  51! 22 0010  32
23 0401  15! 24 3201  14
25 0301  10! 26 0801   5
27 4101   3! 28 6905   1
29 6908   1! 30 0101   0

ERRORS:
NO. CODE TIME   DATE
NO ERRORS!                        Errors

53940 BYTES FREI
```

After finishing the print–out and closing the cabinet lid (door) all counters are deleted!

2. Print–out in graphic mode P031

Prepare the appliance as described.

The command P031 offers several options:

P031:
- 0– All available data
- 1– Cashbox only
- 2– Counters and cashbox
- 3– General settings
- 4– Popularity
- 5– Hitparade
- 6– Errors

Abbreviations:

BGM= Background music

Wochentage: MTWTFSS

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

0 = inactive day

```
BOX ES V            V.0003
BOX-ANALYSE:
BOX-NR..............0000
TIME................14:04
DATE............04.02.93

COUNTERS:
CASH....................0
PLAYS...................0
TITLE-SELECTIONS........0
ALBUM-SELECTIONS........0
OVERPLAYS...............0
FREE PLAYS..............0
BACKGROUND PLAYS........0
AUTO PLAYS..............0
ADVERTISE PLAYS.........0
HAPPY HOUR CREDITS......0

BOX-STATUS:
BOX-CODE................0
CDS / TRACKS........0024
STAND-BY LIGHTING...1105
ACTIVE LIGHTING.....1000
MAX.TIME/TRACK..........0
ORDER OF PLAY...........0
TRACKS IN A ROW.........0
TITLE DISP. PERIOD......0
CLR CREDIT..............2
CLR SELECTIONS..........2
MAX.VOLUME.............31
MAX.BGM-VOLUME........16

PRICE SETTINGS:
P6X  PRICE   !P7X   VALUE
 1   1 0100 !  1    100
 2   1 0100 !  2    500
 3   3 0200 !  3    200
 4   3 0200 !  4     0
 5   3 0200 !  5     0

ALBUM SETTING...........1
BILL BONUS..............0
MONEY CONVERSION........0

FREE CREDIT SETTINGS:
START TIME.........00:00
STOP TIME..........00:00
ACTIVE ON DAYS...0000000
FREE CREDITS........200

BGM SETTINGS:
START TIME.........00:00
STOP TIME..........00:00
ACTIVE ON DAYS...0000000
LOCK FOR BGM............0

AUTO PLAY SETTINGS:
START TIME.........00:00
STOP TIME..........00:00
ACTIVE ON DAYS...0000000
AUTO PLAY PERIOD........0

ADVERTISEMENT SETTINGS:
START TIME.........00:00
STOP TIME..........00:00
ACTIVE ON DAYS...0000000
ADVERTISEMENT PERIOD...0

LOCK OUT SETTINGS:
START TIME.........00:00
STOP TIME..........00:00
ACTIVE ON DAYS...0000000
ACTIVATE LOCK...........0

HAPPY HOUR SETTINGS:
START TIME.........00:00
STOP TIME..........00:00
ACTIVE ON DAYS...0000000
HAPPY HOUR BONUS........0
```
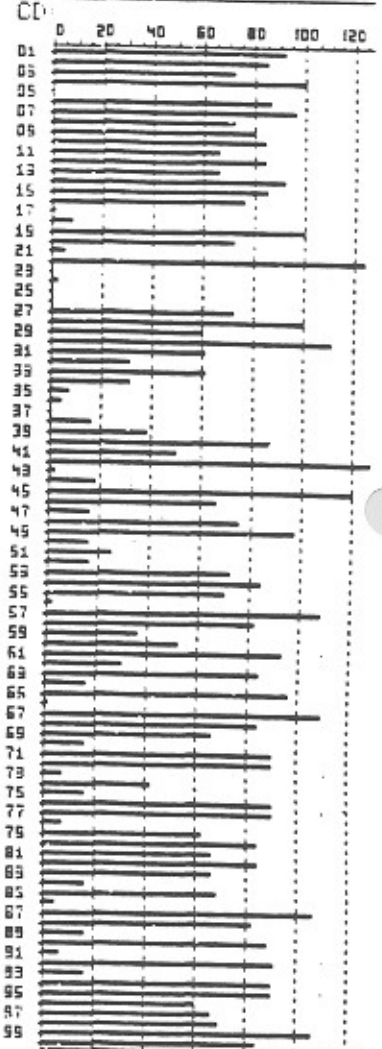

POPULARITY chart (CD numbers 01–99, bar graph scaled 0 20 40 60 80 100 120)

```
HITLIST:
RANK CD TRACK PLAYS
 1 0401  240 !  2 7603 218
 3 3204  216 !  4 0416 201
 5 7601  194 !  6 2301 193
 7 7201  186 !  8 1401 180
 9 5201  170 ! 10 0401 169
11 0401  145 ! 12 7408 144
13 1101  141 ! 14 3201 133
15 9601  122 ! 16 0401 122
17 9201  120 ! 18 6501 100
19 5501   76 ! 20 0301  72
21 4901   51 ! 22 0010  32
23 0401   15 ! 24 3201  14
25 0301   10 ! 26 0801   5
27 4101    3 ! 28 6905   1
29 6908    1 ! 30 0101   0

ERRORS:
NO. CODE TIME    DATE
NO ERRORS!

--END--
```

BACTA* – Juke Box Data Output Standard (UK only)

This standard will provide a common hardware interface for all manufacturers equipment with data output in a identical format.
With the optional available BACTA interface one is able to output statistical data of the NSM phonograph to a hand held unit or remote device (Part number of this option: 176 719).

*) BACTA is the Trade Association for the Coin Operated Amusement Machine Industry

DATA TRANSFER TO A HAND HELD UNIT

Therefore a 4–pole jack socket and a 25 way 'D' type socket are used to connect this hand held unit to the NSM phonograph (also see figure on next page).
Several commands entered by the user via the hand held unit offer the possibilities to

> read out of statistical data of the phonograph,
> delete statistical data of the phonograph,
> program a serial number to the phonograph.

A simple ASCII protocol is defined to ensure that data output from the phonograph to the hand held unit or remote device may be checked on receipt and a repeat transmission requested if required.
The phonograph must respond to a command from the hand held unit within a timeout period of 3 seconds by continuously monitoring the data line and waiting for the transmit command from the hand held unit.
The commands:

"D1" the phonograph transmit the available statistical data to the hand held.

"C" the phonograph (if in service mode) respond with "ACK" and after closing the cabinet lid (door) the statistical data were deleted.

"S...." the phonograph accept the 8 byte serial number following "S" as the new serial number. This serial number is transmitted with each data transfer.

PRINT–OUT TO ANY PRINTER

With command **P032** entered by the key pad of the phonograph one is able to make a print–out of the statistical data of the phonograph to a serial printer (also see figure on next page).

To make a print–out of the statistical data:

> open the cabinet door of the phonograph, set it to service mode and
>
> connect the BACTA compatible printer to the serial interface "BACTA" located left hand at the rear side of the phonograph or at the right inner side of a wall box (see figure below, the 25 way 'D' type socket).
>
> Call the command P032 and confirm with key "H".

The data transfer and the print–out too are started immediately. To interrupt the transfer just push the cabinet switch.
After the print–out of the statistical data is finished, the statistical data of the phonograph are not deleted automatically. You have to delete the data of the phonograph with the command P033! See manual.
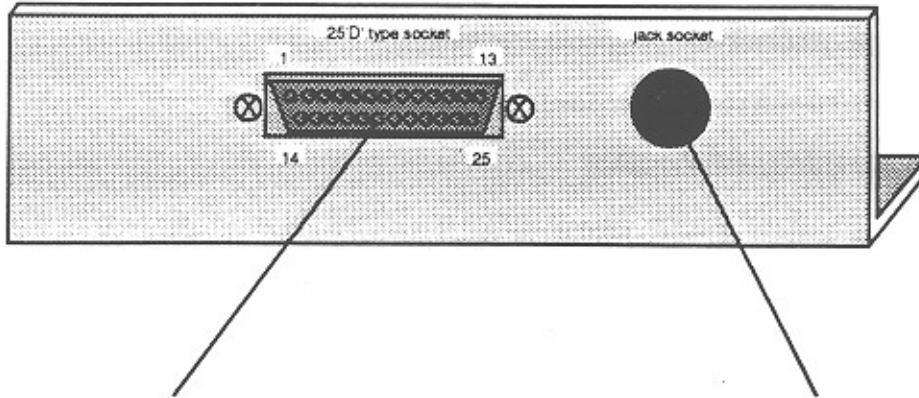
25'D' type socket   jack socket

Pin	Signal	Connection
1	protective ground	
2	received data RxD	WHITE
3	transmitted data TxD	BLUE
7	signal ground GND	GREEN
11	−12V	
25	+12V	

Transmission parameters:

1200 Baud for printer (selected with P032)
9600 Baud for hand held
asynchronous, half duplex
1 start bit, 8 data bits, no parity, 1 stop bit

For detailed information about the BACTA standard refer
to:

BACTA

122 Clapham Common North Side
London SW4 9SP
Telephone: 071–2284107
Telex: 916040
Fax: 071–2230257

UNIT DESCRIPTION

CD CHANGER

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

INDEX

1 PICKUP FUNCTION

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

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 counter step of a light barrier).
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 73" on display 3.
Together with the light barrier OPEND the end position of the lift is verified. Should a mistake appear here (signal too late or to early) the display shows "Er 74".

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 and 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 71" for pull holder or "Er 72" for return holder.

2 PICKUP DRIVER

2.1 Lift Control

With output port of IC1 the microprocessor of the control unit controls the switch transistors T 1–4 via drivers T 5, T 6 and T 8, T 9. These drive the unipolar coil of the stepping motor (ST4, Pin 1–6).
The coil is supplied with a constant current. The current control is done with the current sensor resistors R 44 and R 54 via transistors T 7 and T 10.
The necessary current which depends on the running phase of the stepping motor is switched via R 39, R 40 and R 49, R 50 and IC 1 by the microprocessor.
Using signal OPSTP (ST 5, Pin 2) 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 of IC 3.

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 4 via the output port of IC 2.
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.

3 CD PLAYER

The disc–player "CDM 4" contains the components laser diode, play motor, radial motor, and focus unit.
It reads the data from the CD. (The density is xxx bits per inch?).

4 PCB DECODER BOARD

The components servoprocessor, decoder, digital filter, DA converter and NF output driver are combined on the decoder board. The digital information read from the CD are transformed into the corresponding audio signal for the amplifiers.

5 MAGAZINES

2 equal magazines that are equipped with 50 CD holders each are in the CD changer. With CD holders it is to play 5–inch CD's.
The magazine can be fold out by pushing the corresponding release button to the center of the changer. The magazine can be taken out by pushing the corresponding button to the outside of the changer.
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. For the transportation of a equipped magazine just pull the red transportation fixture of the lift axle through the center holes of all CDs 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 and the informations about the command P 157 in the chapter "Programming of the phonograph" regarding the following text.

After exchanging units their functions must be checked and, if needed, certain adjustments must be made. To exchange the playing unit the CD changer can remain in the phonograph. But to remove or install the lift the changer has to be removed from the machine; tests and adjustments are only possible at a bench tester or at the machine with appropriate 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 (2); a displaced axle changes the position of the upper distance sleeve so that the lift drives against it and blocks!

With help of the command P 157 (in the service and programming mode) "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.

The distance between two magazine slots is 8 motor steps (or 1 step. of the light barrier).

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 are supported by height–adjustable studs in fold–in and locked position. Changing the height setting can be necessary when the lift is exchanged; setting see Pt. 6.4 "Lift".

6.3 PLAYING UNIT

To exchange the playing unit with CD player
- remove both magazines
- pull lift up on gear belt
- remove 4 screws M4
- carefully (!) pick up playing unit, watch balance washers under cabinet
- open plug connections
- installation of playing unit in opposite sequence
- function test:
  - choose CD, check if CD is securely clamped in play position.
  - further tests see Pt. 6.4 "Lift".

6.4 LIFT

To exchange the lift as well as to check and adjust the optical coupling devices (light barrier) 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 lower distance disc(s) (13) and rubber gasket of main axle (14) from cabinet floor upwards.
- Push main axle down until lower rubber gasket can be removed.
- 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:
  - After entering the service mode call the command P 157. On display 2 the corresponding number of the test "F8" is displayed. Now the different functions can be tested according to the scheme shown below.
    The control is done via the keys of the operating panel.

Movement of the lift:

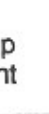| 1	2 Lift up	3 Lift up, single steps
4 Grip left	5 Return holder	6 Grip right
7	8 Lift down	9 Lift down, single steps
C	0 Return holder, restore lift	H

CD positioned on the player:

1 CD player start/stop	2 >FF< fast forward then two times like 1	3 Play next track
4 Return CD grip last CD	5 CD player start/stop like 1	6 Return CD grip next CD
7	8 >FR< fast rewind	9 Play last track
C	0 Stop player return CD	H

The state of the light barriers are displayed on the displays 1 and 3.
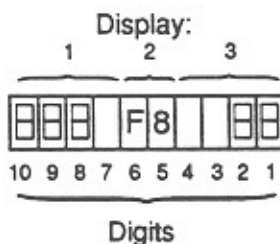
Display:

```
1   2   3
8 8 8 | F 8 | 8 8
10 9 8 7 6 5 4 3 2 1
     Digits
```

Digit 1:   Counter Wheel (OPSTP)
Digit 2:   Final Position (OPEND)
Digit 8:   Grip right (OPGRR)
Digit 9:   Middle Opto OPPUL/OPPUR
Digit 10:   Grip left (OPGRL)

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

On Display 2 (Digit 5+6) code F8 will be displayed during the test. The test is stopped by pressing "C".

- The basic setting occurs in parked position at magazine slot 25/75. Drive pick–up to this position with keys "2" or "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 without 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 be in parked position 25/75 in the center of the light barrier OPSTP (09) (status display of OPSTP in display = "1"). If necessary, loosen screw on hexagon bolt and set PCB with light barrier to center of mask.
- To check light barrier OPEND, lift must be driven down to bottom. Drive lift upwards manually or by pressing Key "3" 4 times one half opto step; the mask must release OPEND when OPSTP (09) opens the light mask, displayed by "0" on digit 1.
- Leave the service mode by pressing the housing switch.
- Select CD in normal play mode. In the parked position of the playing position the lift must have a gap to the lower end position.
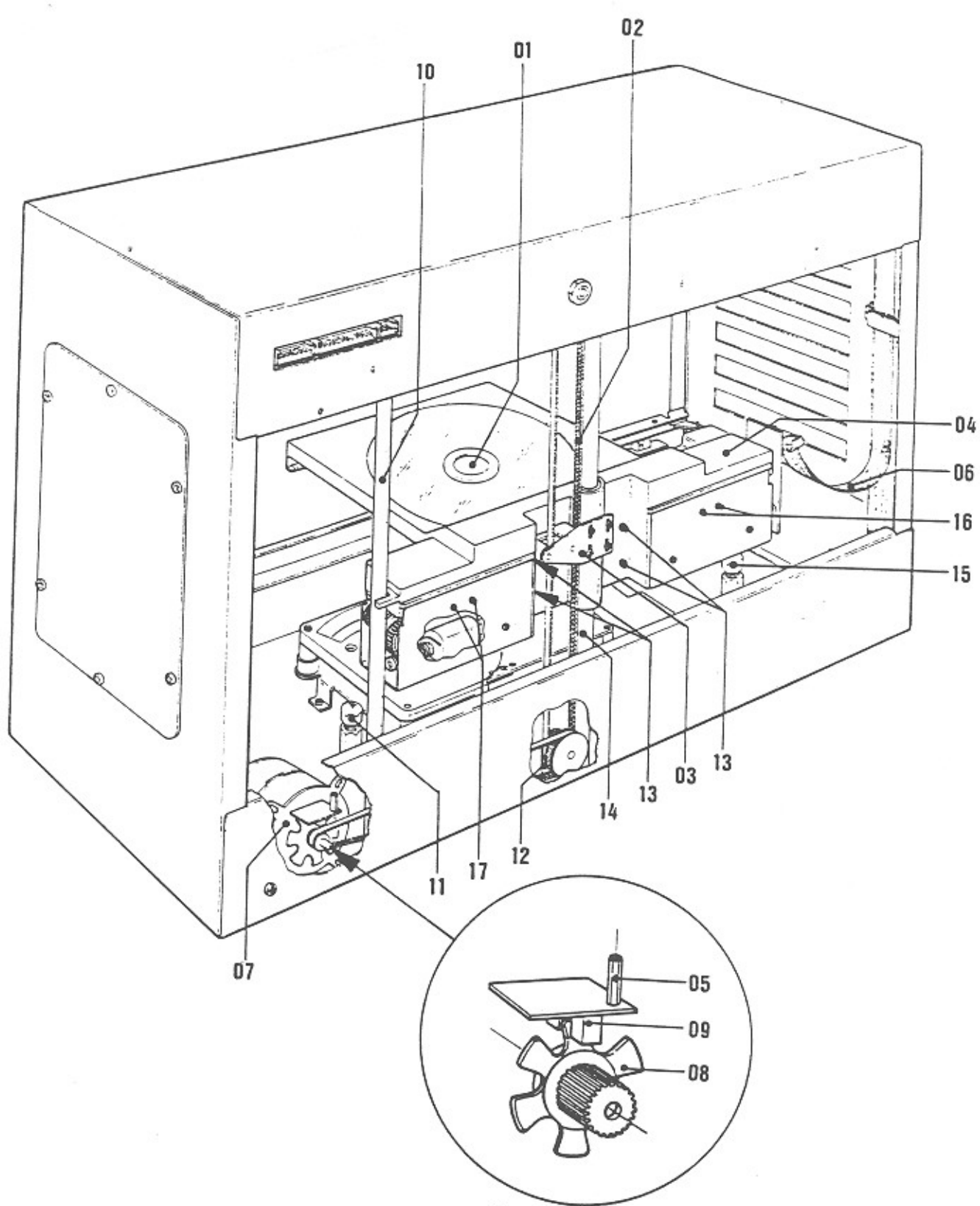- The distance between a cassette and the clamping dish should be at least 1 mm during a gripping procedure. So that the clamping dish can be magnetically attracted, the decorative cover must be in place.
- The CD must run without touch and grinding sounds when in a suspended position.
  To test the function get cassette with CD from magazine by pressing the corresponding keys and place it on CD player in play position.
  Turn on CD player with key "1". After the test is done, turn off CD player by pressing key "0" or any of the other function test keys. The clamping dish must clamp down the CD exactly in center.
- Check function of fork light masks OPGRR, OPGRL, OPPUM as per test "F8". The respective light mask must cover the light barrier in its entire breadth (when status display "1" is shown) and may not touch it physically.

CD CHANGER, COMPL.

801

804

803 802 814

827

826

807

816

806

817

818

805

831

830

809 808 810

815 813

810

821

820

831

830

814

812

819

811

825 824 823 822
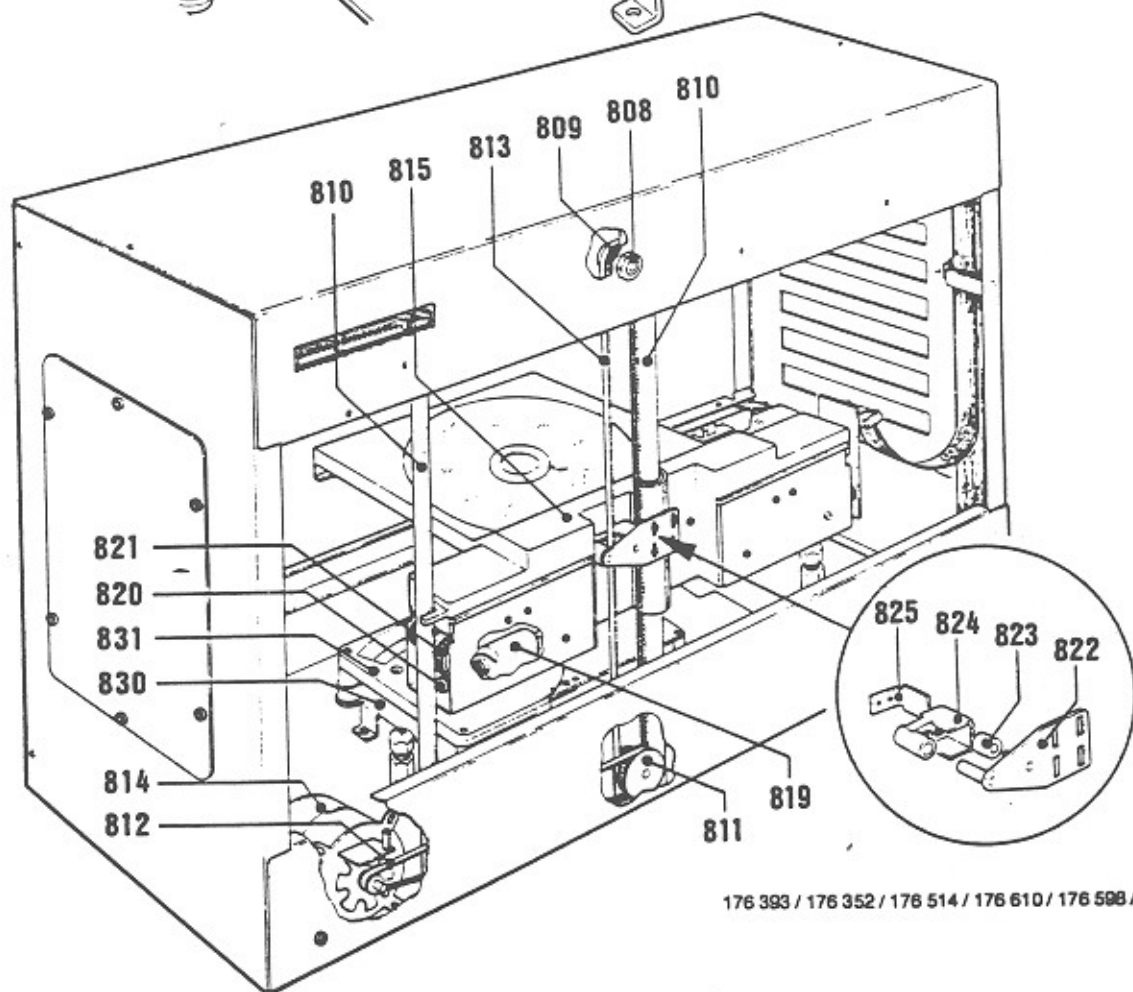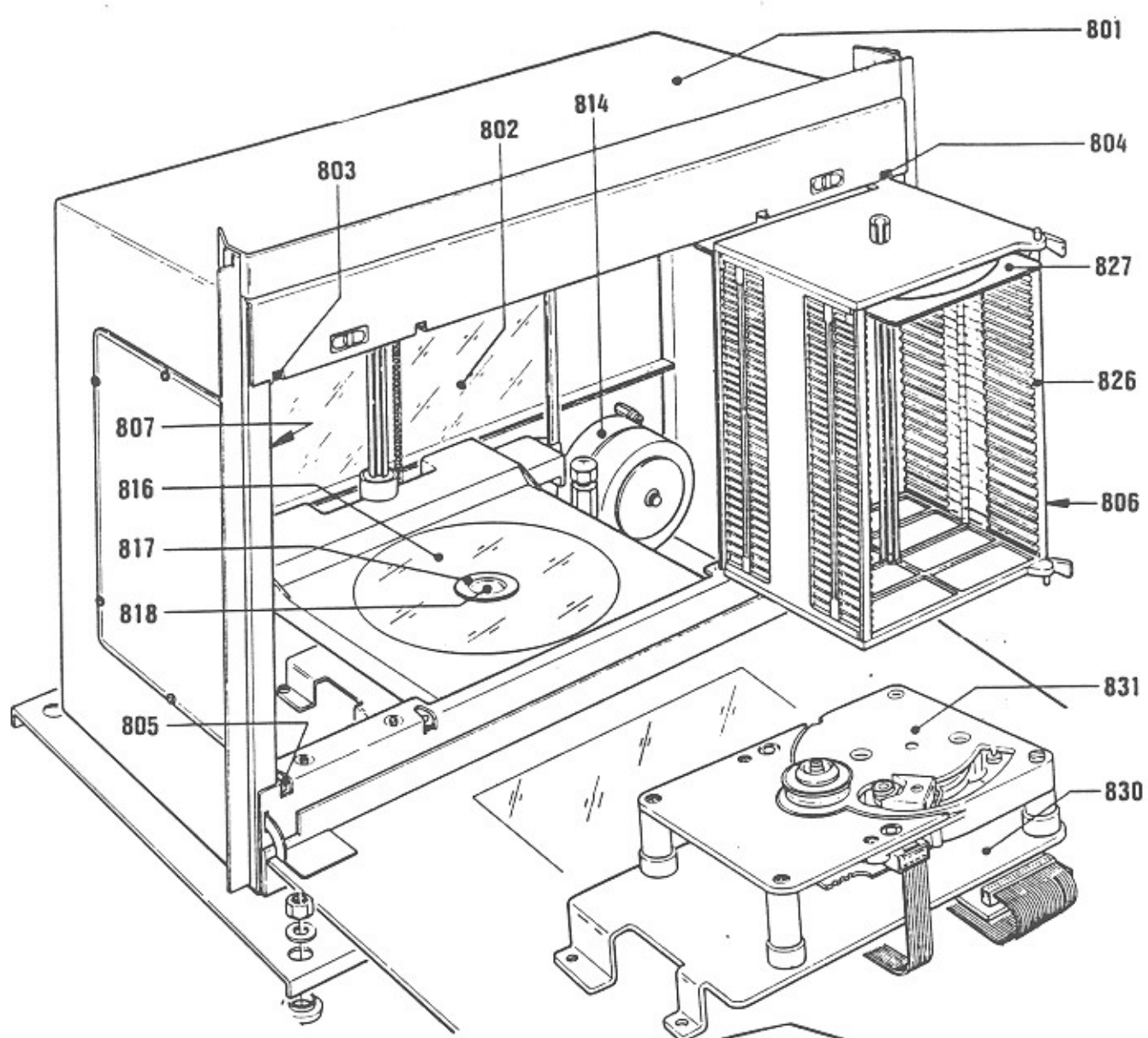
SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION	DATA	QTY
see Page 100/... 800		**CD–CHANGER 100 –CDM 4–**	STANDARD	1
801	176 320	CABINET, welded without SIDE PARTS, slotted		1
	175 733	CABINET, welded with SIDE PARTS, slotted		1
802	175 730	REAR WALL		1
803	175 913	CLOSING LEDGE, UPPER, LEFT, welded		1
804	175 914	CLOSING LEDGE, UPPER, RIGHT, welded		1
805	174 294	CLOSING LEDGE, LOWER, LEFT		1
806	174 295	CLOSING LEDGE, LOWER, RIGHT		1
807	206 655	CONNECTION AXLE		2
808	173 538	SCREW SLEEVE, ASSY		2
	173 526	BOARD WASHER		2
809	173 522	STEP WHEEL, MOUNTED		1
	173 521	WASHER 48		1
810	176 134	AXLE		2
811	173 530	BELT WHEEL, MOUNTED		1
812	206 644	BELT	Typ MXL 195	1
813	206 643	BELT	Typ MXL 298	1
814	176 299	STEPPER MOTOR, ASSY		1
815	175 735	LIFT, ASSY		1
	175 783	LIFT, welded		1
816	176 375	PROTECTIVE SCREEN, ASSY		1
817	175 777	CD–GUIDE		1
818	175 789	COVER		1
819	176 938	MOTOR, ASSY		2
820	175 762	GEAR, MOUNTED		2
821	206 902	BELT	Typ 30 S 2 M 426	2
822	176 298	HOLDING PLATE, riveted		1
823	206 975	DAMPING		1
824	176 293	LEVER		1
825	176 317	BRACKET		1
	173 491	MAGAZINE, LEFT, MOUNTED	(without Cassette)	1
826	173 499	MAGAZINE, RIGHT, MOUNTED	(without Cassette)	1
827	176 395	CASSETTE CD 120	only 10 piece	–
830	175 887	CHASSIS		1
831	176 725	SERVICE KIT –PLAYER CDM–4		1
	205 846	CLAMP		8
	210 486	CARDBOARD for MAGAZINE		1
	212 542	TRANSPORT DEVICES for CASSETTE and LIFT		2
	176 010	CB–CARRIAGE, ASSY	see Page 813	1
	176 249	CB–STEPPER, ASSY	see Page 813	1
	177 231	CB–DECODER BOARD, MOUNTED	OSDA CDM4 – NSM	1
	176 384	CB–DRIVER		1
	175 964	TRAILING CABLE		1
	206 943	CABLE HARNESS 1 CDM 4		1
	206 942	CABLE HARNESS 2 CDM 4		1

NSM
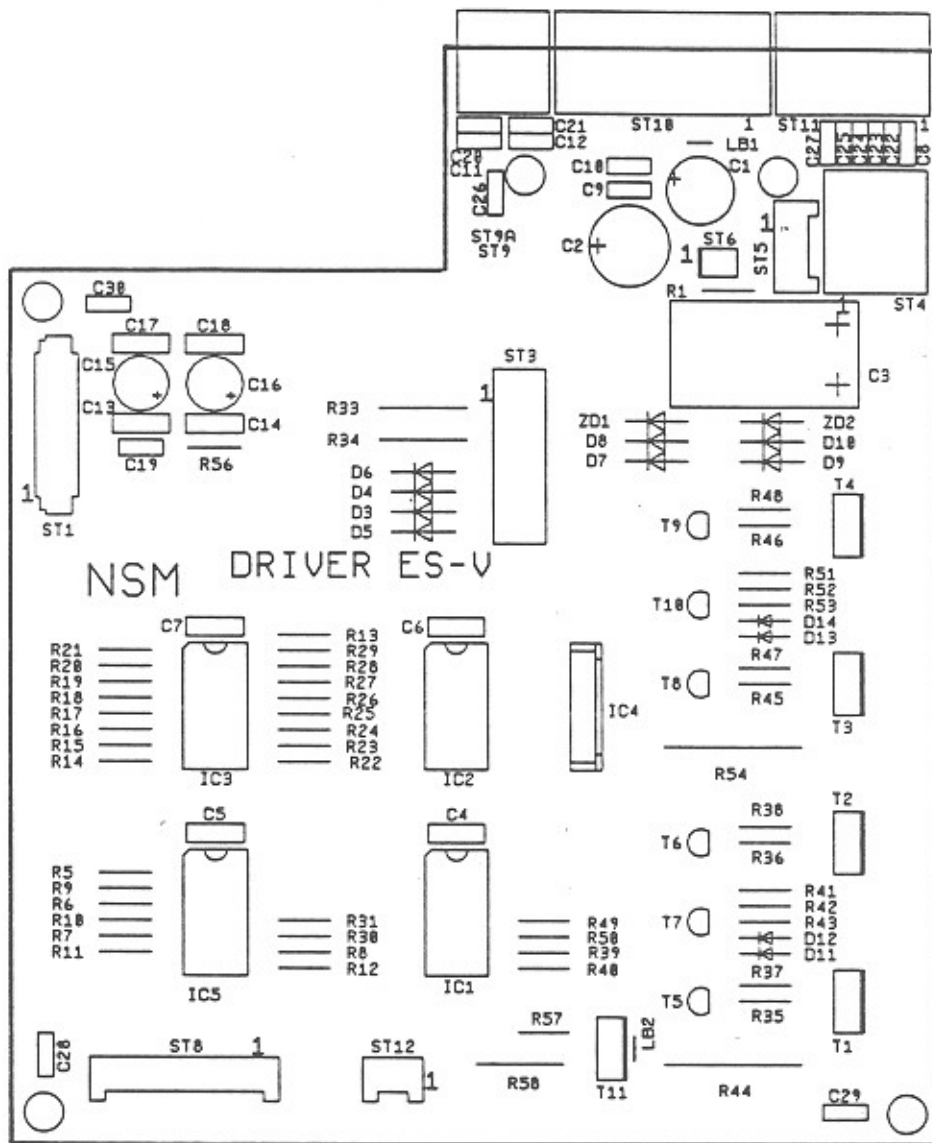
DRIVER ES-V

SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION	DATA		QTY
	176 384	CB–DRIVER ES V, ASSY			1
	175 976	COOLING PLATE			1
ST 3	225 912	PIN PLUG AMP	14 prongs		1
ST 1	225 959	FLAT CABLE PLUG	15 prongs		1
ST 12	225 650	PIN PANEL	2 prongs		1
ST 5	225 651	PIN PANEL	4 prongs		1
ST 9	225 661	PIN PANEL	4 prongs	90°	1
ST 4	225 662	PIN PANEL	6 prongs	90°	1
ST 11	225 663	PIN PANEL	8 prongs	90°	1
ST 10	225 665	PIN PANEL	12 prongs	90°	1
IC 3	221 763	IC–CMOS	HEF 4021 B		1
IC 1, 2	221 771	IC–CMOS	HEF 4094 B		2
IC 4	231 303	IC–LINEAR	L 298		1
D 15–17	221 115	SI–DIODE	1 N 4004		4
D 11–14	221 114	SI–DIODE	1 N 4148		4
D 3–10	221 822	SI–DIODE	BA 157		8
ZD 1, 2	231 326	ZENER–DIODE	ZY 24		2
T 5–10	221 757	SI–TRANSISTOR	BC 547 B		6
T 1–4, 11	231 150	SI–TRANSISTOR	TIP 130		5
C 8	220 342	CER.–CAPACITOR	100 pF		1
C 9–12	220 274	CER.–CAPACITOR	330 pF		4
C 20, 21	220 263	CER.–CAPACITOR	1 nF		2
C 4–7, 13,					>
14, 17, 18	220 481	CER.–CAPACITOR	0,1 µF		8
C 19, 26–30	220 231	CER.–CAPACITOR	2,2 nF		6
C 1	220 162	LYTIC	10 µF	63 V	1
C 15, 16	220 493	LYTIC	47 µF	25 V	2
C 2	220 391	LYTIC	220 µF	25 V	1
R 13	221 600	RESISTOR	100 Ohm	1/4 W	1
R 1	221 632	RESISTOR	160 Ohm	1/4 W	1
R 37, 38,					>
47, 48	221 624	RESISTOR	220 Ohm	1/4 W	4
R 42, 43,					>
52, 53	221 029	RESISTOR	1 KOhm	1/4 W	4
R 9–12, 30	221 033	RESISTOR	3,3 KOhm	1/4 W	5
R 41, 51	221 607	RESISTOR	6,8 KOhm	1/4 W	2
R 35, 36,					>
39, 45, 46,					>
49, 56	221 035	RESISTOR	10 KOhm	1/4 W	7
R 14–21	221 603	RESISTOR	12 KOhm	1/4 W	8
R 22–29	221 036	RESISTOR	15 KOhm	1/4 W	8
R 5–7,					>
31, 55	221 604	RESISTOR	22 KOhm	1/4 W	5
R 40, 50	221 618	RESISTOR	24 KOhm	1/4 W	2
R 8	221 048	RESISTOR	100 KOhm	1/4 W	1
R 56	221 685	¬RESISTOR	3,9 Ohm	1/2 W	1
R 33	221 152	RESISTOR	330 Ohm	1/2 W	1
R 44, 54	221 692	WIRE WOUND RESISTOR	1 Ohm	1 W	2

SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA		QTY
	176 249	**CB-STEPPER, ASSY**			1
	231 322	OPTO-COUPLER	LTH-301		1
	225 611	SOCKET	4 prongs	sw	1
	176 557	**CABLE HARNESS - LIFT**			1
	176 004	CB-LIFT ADAPTR, ASSY			1
	176 433	OPTO, LEFT MOUNTING			1
	231 322	OPTO-COUPLER	LTH 301		2
	220 334	MKT-CAPACITOR	0,1 µF / 63 V		1
	176 434	OPTO, RIGHT MOUNTING			1
	231 322	OPTO-COUPLER	LTH 301		2
	220 334	MKT-CAPACITOR	0,1 µF / 63 V		1
	176 556	CB-ENDCONTROL			1
	231 322	OPTO-COUPLER	LTH 301		1
	176 385	CABLE HARNESS: DRIVER - DECODER			1

814

CENTRALE CENTRALE CONTROL UNIT
ST 7 ST 6 ST 12

ST 9
ST 9A ST 10 ST 11

ST 4

ST 15

1920 ST 1

1901 S T13

DECODER BOARD DRIVER

1903 ST 12

Beleuchtung
ILLUMINATION
12 V
2 W

Schleppleitung
TRAILING CABLE

MOTOR
links / left
MOTOR
rechts / right

M M
MO GRL MO GRR

K2
LTH 301
OP GRL

K2
LTH 301
OP GRR

K1
LTH 301
OP PUL

MOTOR
CONTROL

MOTOR
CONTROL

K1
LTH 301
OP PUR

LIFT-
ADAPTER

END-
CONTROL

K1
LTH 301
OP END

— LIFT —

CD-PLAYER
CDM-4

ST 1

STEPPER CONTROL
OP STP

Schrittmotor
STEPPER MOTOR
M
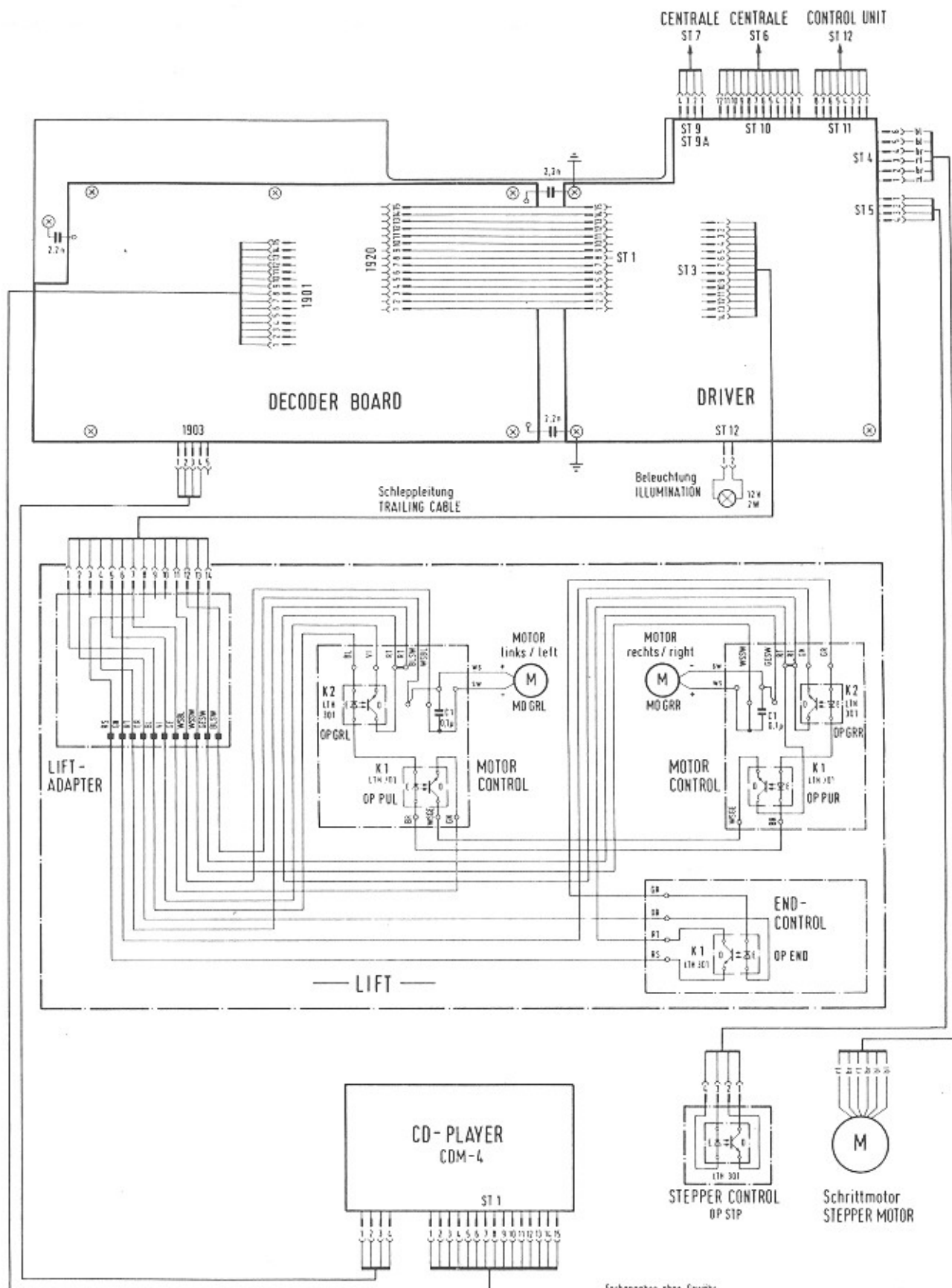
OP END   OPTO END POSITION

OP PUL   OPTO PICKUP CONTROL LINKS
          OPTO PICKUP CONTROL LEFT

OP PUR   OPTO PICKUP CONTROL RECHTS
          OPTO PICKUP CONTROL RIGHT

OP GRL   OPTO GREIFER LINKS
          OPTO GRASP LEFT

OP GRR   OPTO GREIFER RECHTS
          OPTO GRASP RIGHT

OP STP   OPTO STEPPER CONTROL

MO GRL   MOTOR GREIFER LINKS
          MOTOR GRASP LEFT

MO GRR   MOTOR GREIFER RECHTS
          MOTOR GRASP RIGHT

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

Draufsicht
TOP VIEW
LTH 301
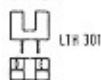
Farbangaben ohne Gewähr
COLOR INDICATION WITHOUT WARRANTY

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

NSM MUSIKAUTOMATEN PHONOGRAPHS ES V-CD TECHNOLOGY

ELEKTROPLAN   CD-WECHSLER
OPERATING SCHEME CD-CHANGER

821

ST 10

CENTRALE ES V
ST 6

GND	1
+5V	2
+15V	3
+13V	4
+28V	5
GND P	6
GND P	7
+10 V	8
-10 V	9
+15 V	10
-15 V	11
GND A	12

→ V1
→ V3
→ V2
→ V4

C3 470p
C2 220p 25V
C1 10µ

LB 1

C 17
C 18
C 14
C 13
4x 0,1µ

C 16
C 15
2x 47µ / 25V

V1
C4 0,1µ
C5 0,1µ
C6 0,1µ
C7 0,1µ

ST 9 / ST 9A

CENTRALE ES V
ST 7

	1
LK	2
RK	3
	4

ST 1

DECODER BOARD
ST 1920

AUDIO L	1
AUDIO GND	2
AUDIO R	3
	4
RESET	5
+15 V VA	6
GND S	7
-15 V VA	8
+5 V	9
-10V VM	10
GND A	11
+10V VM	12
GND A	13
BUS 1 TxD	14
BUS 2 RxD	15

C19 2,2 n
R 56 10 K

C26 2,2n
C27 2,2n
C28 2,2n
C29 2,2n
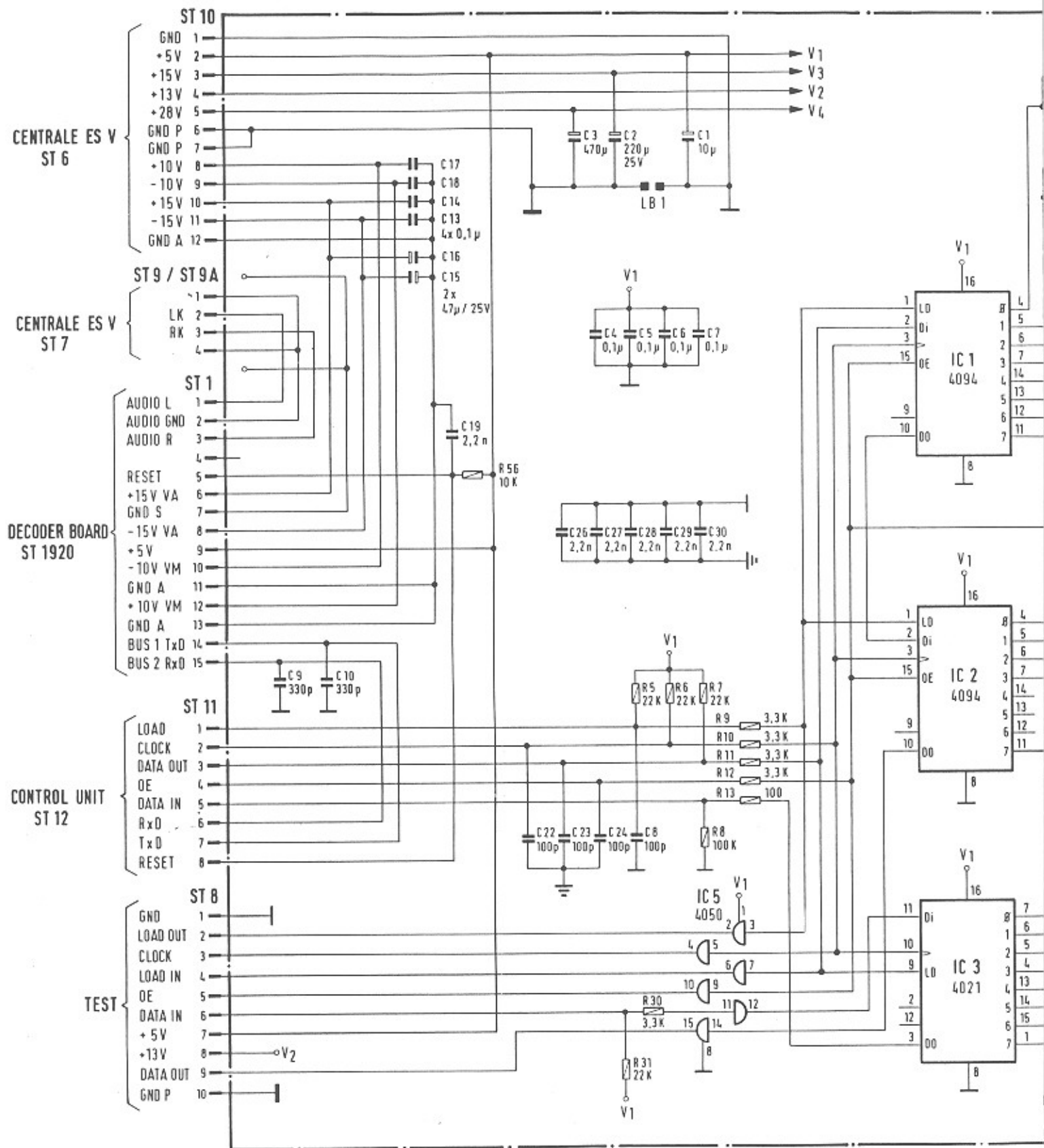C30 2,2n

V1
IC 1 4094
16
1 LO 8
2 Di 1
15 OE 7
9 14
10 DO 13
12
11
8

V1
IC 2 4094
16
1 LO 8
2 Di 1
3 6
15 OE 3
9 14
10 DO 4
12
7
8

ST 11

CONTROL UNIT
ST 12

LOAD	1
CLOCK	2
DATA OUT	3
OE	4
DATA IN	5
RxD	6
TxD	7
RESET	8

C 9 330p
C 10 330p

V1
R5 22K
R6 22K
R7 22K
R 9 3,3 K
R 10 3,3 K
R 11 3,3 K
R 12 3,3 K
R 13 100

C 22 100p
C 23 100p
C 24 100p
C 8 100p
R 8 100 K

ST 8

TEST

GND	1
LOAD OUT	2
CLOCK	3
LOAD IN	4
OE	5
DATA IN	6
+5 V	7
+13 V	8
DATA OUT	9
GND P	10

V2

IC 5 4050
V1
1 3 2
4 5 6 7
10 9
11 12
R 30 3,3 K
15 14 8
R 31 22K
V1

V1
IC 3 4021
16
11 Di 7
10 6
9 LO 5
4
13
2 3
12 14
3 DO 15
6
1
8

Droufsicht
TOP VIEW

¼ W
½ W
1W
ZENER DIODE

von unten
BOTTOM VIEW
C B E

V1
T5 BC 547
R35 10K
R37 220
T1 TIP 130
D11 1N4148
V1
T6 BC 547
R36 10K
R38 220
D12 1N4148
T2 TIP 130
V1
R41 6,8 K
R43 1K
T7 BC 547
R42 1K
R39 10K
R40 24K
R44 1

V1
T8 BC 547
R45 10K
R47 220
T3 TIP 130
D13 1N4148
V1
T9 BC 547
R46 10K
R48 220
D14 1N4148
T4 TIP 130
V1
R51 6,8 K
R53 1K
T10 BC 547
R52 1K
R49 10K
R50 24K
R54 1

V4
ZD1 ZY24
ZD2 ZY24
4x BA157
D7 D8 D9 D10
ST 4
1
2
3
4
5
6
V4
STEPPER MOTOR

ST 5
V3
1
2
3
4
V1
R1 150
STEPPER CONTROL OP STP

V3
IC 4 L298
9 U1
4
5 I1   U2 01 2
7 I2
6 EA   02 3
10 I3
12 I4   03 13
11 EB   04 14
SA GND SB
1   8   15

V1 V3

4x BA 157
D3 D4 D5 D6

ST 6
1
2
V3
Schalter – Sichtscheibe
SWITCH – FRONT GLASS

R58 3,9
ST 12
1
2
V2
Beleuchtung
ILLUMINATION

R57 3,3K
T11 TIP 130
LB2

ST 3
14
13   MOGRR
12
11   MOGRL
10
9
8 OP END
7 OP PUM
6 OP GRR
5 OP GRL
4
V3
3
R33 330
2
1
LIFT – ADAPTER

R22 15K
R23 15K
R24 15K
R25 15K
R26 15K
R27 15K
R28 15K
R29 15K

R14 12K R15 12K R16 12K R17 12K R18 12K R19 12K R20 12K R21 12K

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

E
C   TIP 130
B

sehen
W
547

UNIT DESCRIPTION

CENTRAL UNIT

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

6

INDEX

1 FUNCTION

The power supply, fan controls, stereo amplifier with inputs for microphone, CD and tape are all integrated on one circuit board "CENTRAL UNIT".
The output stages and the fan are connected to the central unit via ST 4, ST 8, ST 9. 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 1) and the center tap of the transformer.
The supply voltage for the voltage regulators VR1 (V3 = +15 V) and VR2 (+VA = +15 V) is supplied with 22 V by a bridge rectifier (D2–D5) from the transformer.
The supply voltage for the voltage regulators VR 3 (V1 = +5 V), VR 4 (+VM = + 10 V) are supplied with 2 x 11,5 V by a two–way rectifier (D6 / D8) and the center tap of the transformer. Appropriate the supply voltage for VR 5 (–VM = –10 V) is supplied by D7 / D9 and the supply voltage for VR 6 (–VA = –15 V) is supplied by a voltage doubler D13, D14, D15 and C20 from the same cods of the transformer.

Fusing is accomplished with
Si 1, Si 2 = 6,3 A   for the voltage V Amp.
Si 3, Si 4 = 3,15 A for voltages V1, V2, +VM, –VM, –VA
Si 5   = 2,5 A   for voltages V3, V4, +VA

The LED's indicate at the same intensity the following supply voltages:
LED 1 = +28 V (V4)
LED 2 = +14 V (V2)
LED 3 = –14 V
LED 4 = –22 V
LED 5 = +60 V (V Amp.).

The TRIAC TC 1 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 build up with a siemens audio processor TDA 4390 with 3 quadruple OpAmps 54 diodes, 23 transistors and 6 voltage regulators.
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 signals
–   MIC is connected via the microphon amplifier IC 4 B and the background mixer IC 4 A to Pin 3 (right channel) and Pin 26 (left channel)
–   TB is connected via the pre–amplifiers IC 3 C respectively IC 3 D to Pin 2 (right channel) and Pin 27 (left channel)
–   CD (symmetrical inputs) is connected via the pre–amplifiers IC 3 A respectively IC 3 B to Pin 1 (right channel) and Pin 28 (left channel)
of the input selection circuit of the audio processor.

When the microphone switch is actuated (Pin 5 of socket MIC to GND) the MIC is switched precedencely. That means TB or CD are interrupted.

Beginning at a level higher then 3 mV of the signal, the TB input is automatically active, if there is no CD played or no microphone switched 1 on. The control circuit is build with IC 4 C and IC 4 D.

On output BU 4 / BU 5 (Out R / Out L) a signal is served to steer towards an additional amplifier.

Via an AVC–stage (automatic volume control), the switch for MONO, STEREO and S–STEREO the audio signal reaches the sound control network and the volume stage of the I^2 C–bus controlled audio processor. The output signals of this processor (Pin 13 / Pin 16) are connected to the inputs of the driver stage T 4 and T 6.

The parallel complementary power Darlington transistors T 151 through T 154 in the output stage allow a minimum loudspeaker impedance of 2 ohms.

Quiescent current compensation and thermic stabilization is accomplished with T 150, the quiescent current setting with TR 250. The amplifier is equipped with two protective circuits against overload mismatching and thermic overload.

T 155 acts as a threshold switch for the electronic fuse. When the emitter current of the output transistors exceeds a certain value, T 8 or T 9 is switched through by T 155 and reduces the volume via the control unit. The actuation of the electronic fuse is controlled by the control unit.

When its fuse is tripped a number of times within a certain period, the volume is reduced automatically by one step each time until the electronic fuse is no longer activated.

The terminating impedance at the loudspeaker output should not be less than 2 ohms. In the case of mismatching (less than 2 ohms), or short–circuit in the loudspeaker cable, the limiting circuit is actuated. The result is distorted sound reproduction or reduction of the volume. After elimination of the mismatch the amplifier is ready for operation and the volume can be readjusted.

The thermal switch on the heat sink switches off the power supply to the output stage when the heat sink temperature reaches approx. 90° C (cooling malfunctioning). LED 150 is dark. The switch–on point (following cooling down) is approx. 60° C (switch–on hysteresis).

1.4 Adjustment of volume and sound characteristics

Volume adjustment for normal play mode is done by use of the command P053 of the service programm. It is done separately for the right and the left channel:

keys "1" / "3" give more volume (left/right)
keys "7" / "9" give less volume (left/right)
keys "4" / "6" give a medium value (left/right) of the volume
keys "2" / "8" are controlling both channels (more/less).

Treble and Bass are controlled with P054 for both channels:

keys "1" / "7" more/less of bass   key "4" medium value of bass
keys "3" / "9" more/less of treble   key "6" medium value of treble.

The necessary adjustment depend on the given environmental conditions.

With the potentiometer POT 2 the volume of microphone signal is controlled and with potentiometer POT 1 the volume of sound while the microphone is active.
The adjustment of POT 2 depends on the distance between the phonograph and the microphone (feedback!)

The switch S1 is for selecting:
MONO: e.g. for separated music in different rooms.
STEREO: normal position
S–STEREO: base wide function

1.5 MIC socket, Microphone Connection

A dynamic microphone with an impedance of 200 ohms – 600 ohms with switch for relay control can be used.
NSM option accessories:
Microphone   Order No. 224 223
Connection cable   Order No. 171 880   (length: 10 m)

1.6 Tape Recorder Connection

The TB socket (cinch) allows to record the music from the phonograph on a tape recorder as well as to play music from a tape recorder by the phonograph.

The AF signal (analog signal) for recording on a tape recorder is on BU 4 and BU 5 and can be connected directly with a stereo cable.
For playback of a tape via the phonograph BU 2 and BU 3 are used.

1.7 Connection of an additional Amplifier

An additional amplifier can be connected to BU 4 and BU 5.
The input sensitivity of the external amplifier should be 1 V at a minimum input impedance of
10 KOhms.

2 Adjustment Instructions for Trimmer of Central Unit and Output Stage

TR 150 for quiescent current adjustment of the output stage: The quiescent current must be set to
40 mA +5 mA when volume level is 0.
After replacement of the output transistor T 151 through T 154 a correction may be required. Therefore the
fuse Si 150 or the thermal switch is to be replaced by an ampere–meter.

3 Repair Aid

Amplifier integrated in central unit ES V

Malfunction: No sound, no output power:
It is assumed that LED 1 to LED 5 light with the same intensity and that the power supply is therefore O.K.,
the CD is on the CD player being played, and normal volume was set in program step P053 to "31".

3.1 Output Stage

LED 150 on the output stage circuit board is dark. Malfunction probably located in the output stage; check Si
150 and replace if required. If the fuse blows again, the output transistors are defective.
Remove output stage unit, pull out cover plates on the bottom. Check for short–circuit on transistors T 151/T
152 T 153/T 154 with ohmmeter. Since the transistors are connected in parallel, it is only possible to test
them in pairs.
For individual testing one transistor must be unsoldered from the defective pair. After replacement of the de-
fective transistors the quiescent current must be readjusted with TR 150 according to the adjustment instruc-
tions.

3.2 Tracing Sound Signal

Trace the sound signal arriving at CD plug according to the table below.
The point where the signal is missing is probably the cause of the malfunction.

NF Signal Point	Cause of Malfunction When Signal Missing
IC 1, PIN 1 or PIN 28	IC 3
IC 1, PIN 5 or PIN 24	IC 1
IC 1, PIN 6 or PIN 23	IC 2 (AVC)
IC 1, PIN 13 or PIN 16	IC 1
T 5 / T 7 (collector)	T 4, T 6, T 5, T 7

If the signal is there up to T 5, T 7, but no output signal arrives at the output stage, plug connectors ST 8 / ST 9 as well as the output stage have to be checked.
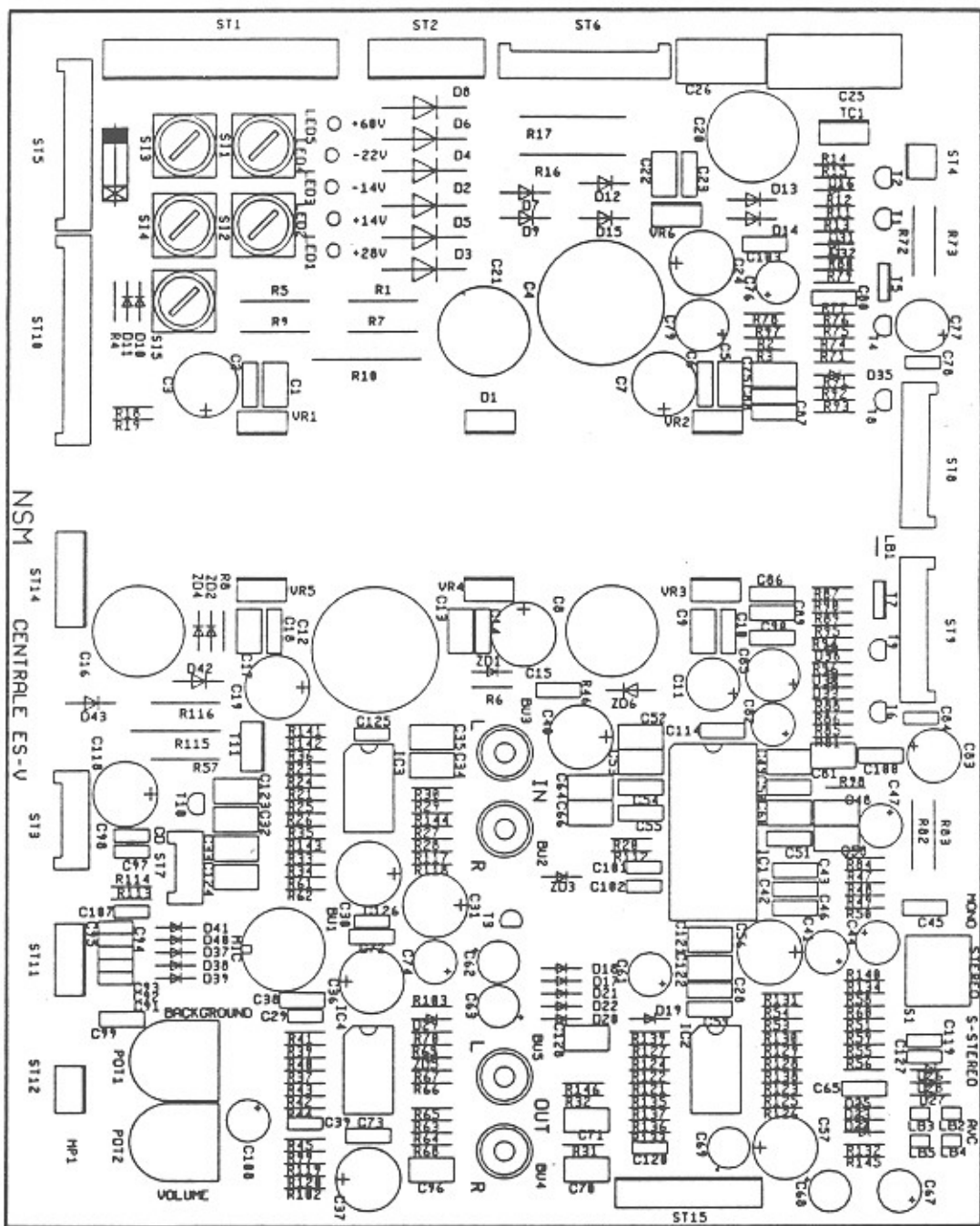
NSM CENTRALE ES-V

SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION		DATA		QTY
	176 326	**CENTRALE ES V, ASSY**		**50 Hz**		1
Si 5	225 538	FUSE		T 2,5 A		1
Si 3, 4	225 029	FUSE		T 3,15 A		2
Si 1, 2	225 374	FUSE		T 6,3 A		2
	225 747	CAP				5
	176 327	**CENTRALE ES V, ASSY**		**60 Hz**		1
Si 5	225 222	FUSE		2,5 A		1
Si 3, 4	225 225	FUSE		3,2 A		2
Si 1, 2	225 218	FUSE		6,25 A		2
	225 748	CAP				5
	150 687	COOLING PLATE				2
	225 746	FUSE HOLDER				5
	173 698	PROFILE, ASSY				1
	171 629	HOLDER				2
BU 1	225 244	SOCKET		S 5 prongs		1
BU 2–5	225 986	RCA–SOCKET		BTOR 1 L		4
S 1	222 550	SLIDE SWITCH		25149 NLDH 6		1
ST 2	225 804	PIN PLUG	RM 3,96	6 prongs		1
ST 1	225 807	PIN PLUG	RM 3,96	12 prongs		1
ST 4	225 439	PIN PLUG	RM 2,5	3 prongs		1
ST 12	225 418	PIN PLUG	RM 2,5	4 prongs		1
ST 11	225 443	PIN PLUG	RM 2,5	6 prongs		1
ST 14	225 444	PIN PLUG	RM 2,5	8 prongs		1
ST 7	225 651	PIN PANEL	RM 2,5	4 prongs		1
ST 3	225 711	PIN PANEL	RM 2,5	6 prongs		1
ST 8, 9	225 654	PIN PANEL	RM 2,5	10 prongs		2
ST 15	225 655	PIN PANEL	RM 2,5	12 prongs		1
ST 5, 6	225 714	PIN PANEL	RM 2,5	12 prongs		2
ST 10	225 656	PIN PANEL	RM 2,5	15 prongs		1
VR 3, 4	221 572	IC–VOLTAGE		+ 5 V	1 A	2
VR 5	221 537	IC–VOLTAGE		– 5 V	1 A	1
VR 1, 2	221 476	IC–VOLTAGE		+15 V	1,5 A	2
VR 6	231 498	IC–VOLTAGE		–15 V	1,5 A	1
	222 447	IC–SOCKET		28 prongs		1
IC 1	231 540	IC–LINEAR		TDA 4390		1
IC 2–4	231 355	IC–LINEAR		TL 074		3
TC 1	231 028	TRIAC		TIC 206 D		1

SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION	DATA	QTY
D 10, 11,				>
16–29,				>
31–41	221 114	SI–DIODE	1 N 4148	27
D 7, 9, 13,				>
14, 15, 42,				>
43	221 115	SI–DIODE	1 N 4004	8
D 2–6, 8	221 463	SI–DIODE	BY 251	6
D 1	231 202	SI–DUO–DIODE	BYV 32/100	1
ZD 1–3, 5	231 079	ZENER–DIODE	ZPD 4,7	4
ZD 4	231 509	ZENER–DIODE	ZPD 10	1
ZD 6	221 406	ZENER–DIODE	ZY 12	1
LED 1–5	231 475	LUMINESZENZ–DIODE	LTL–4223–021	5
T 11	231 150	SI–TRANSISTOR	TIP 130	1
T 5, 7	221 488	SI–TRANSISTOR	BD 139–10	2
T 1, 3,				>
8–10	221 757	SI–TRANSISTOR	BC 547 B	5
T 2, 4, 6	221 459	SI–TRANSISTOR	BC 556 B	3
C 29, 39,				>
125, 126	220 266	CER.–CAPACITOR	27 pF	4
C 73	220 181	CER.–CAPACITOR	47 pF	1
C 80, 86	220 185	CER.–CAPACITOR	270 pF	2
C 2, 6, 10,				>
14, 18, 23,				>
38, 41, 42,				>
44, 45, 50,				>
51, 54, 55,				>
59, 65, 67				>
–90, 99,				>
114	220 481	CER.–CAPACITOR	0,1 µF	23
C 1, 5, 9,				>
13, 17, 22,				>
28, 32–35,				>
48, 49, 52,				>
53, 58, 60,				>
64, 66, 70,				>
71, 75, 81,				>
96, 121–				>
124	220 332	MKT–CAPACITOR	0,33 µF	28
C 107	220 335	MKT–CAPACITOR	22 nF	1
C 120	220 426	MKT–CAPACITOR	47 nF	1
C 26	220 336	MKT–CAPACITOR	2,2 µF	1
C 25	220 460	MKT–CAPACITOR	3,3 µF	1
C 101, 102	220 400	KT–CAPACITOR	1500 pF	2
C 72, 78,				>
84, 91–95,				>
119	220 435	KT–CAPACITOR	4700 pF	9

SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION	DATA		QTY
C 61, 67	220 249	LYTIC	1 µF	63 V	2
C 47, 76,					>
82	220 162	LYTIC	10 µF	63 V	3
C 74, 77,					>
83	220 158	LYTIC	47 µF	40 V	3
C 118	220 247	LYTIC	47 µF	63 V	1
C 11	220 160	LYTIC	100 µF	10 V	1
C 3, 7, 15,					>
19, 24, 30,					>
31, 36, 37,					>
40, 56, 57	220 250	LYTIC	100 µF	25 V	12
C 79, 85	220 390	LYTIC	100 µF	40 V	2
R 80, 90	221 095	RESISTOR	6,8 Ohm	1/4 W	2
R 2, 21, 37,					>
51, 71, 81	221 611	RESISTOR	10 Ohm	1/4 W	6
R 87, 88	221 096	RESISTOR	56 Ohm	1/4 W	2
R 64, 93,					>
96	221 600	RESISTOR	100 Ohm	1/4 W	3
R 44	221 099	RESISTOR	470 Ohm	1/4 W	1
R 112	221 100	RESISTOR	680 Ohm	1/4 W	1
R 3, 4, 6,					>
8, 43, 65,					>
91, 94	221 029	RESISTOR	1 KOhm	1/4 W	8
R 15, 79,					>
89	221 030	RESISTOR	1,5 KOhm	1/4 W	3
R 31, 32	221 031	RESISTOR	2,2 KOhm	1/4 W	2
R 77, 78	221 033	RESISTOR	3,3 KOhm	1/4 W	2
R 27, 29,					>
54, 56,					>
117–122	221 034	RESISTOR	4,7 KOhm	1/4 W	10
R 134, 140	221 607	RESISTOR	6,8 KOhm	1/4 W	2
R 48, 50	221 172	RESISTOR	8,2 KOhm	1/4 W	2
R 11, 13, 14,					>
18–20, 67,					>
114, 125,					>
127	221 035	RESISTOR	10 KOhm	1/4 W	10
R 133, 139	221 603	RESISTOR	12 KOhm	1/4 W	2
R 131, 137	221 036	RESISTOR	15 KOhm	1/4 W	2
R 132, 138	221 501	RESISTOR	18 KOhm	1/4 W	2
R 12, 39,					>
70, 113	221 604	RESISTOR	22 KOhm	1/4 W	4
R 68	221 037	RESISTOR	33 KOhm	1/4 W	1
R 145, 146	221 623	RESISTOR	39 KOhm	1/4 W	2
R 23–26, 28,					>
30, 41, 2,					>
45, 58, 69,					>
92, 95, 99,					>
120, 130,					>
135, 36,					>
141–144	221 038	RESISTOR	47 KOhm	1/4 W	22

SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION	DATA		QTY
R 74, 84, 97, 98	221 039	RESISTOR	56 KOhm	1/4 W	> 4
R 47, 49, 53, 55	221 629	RESISTOR	68 KOhm	1/4 W	> 4
R 123, 124	221 044	RESISTOR	82 KOhm	1/4 W	2
R 40, 66, 75, 85, 126, 128	221 048	RESISTOR	100 KOhm	1/4 W	> > 6
R 86, 76	221 045	RESISTOR	150 KOhm	1/4 W	2
R 103	221 047	RESISTOR	330 KOhm	1/4 W	1
R 33–36, 59–63	221 049	RESISTOR	470 KOhm	1/4 W	> 9
R 102	221 982	RESISTOR	3,3 MOhm	1/4 W	1
R 57	221 161	RESISTOR	47 Ohm	1/2 W	1
R 72, 82	221 230	RESISTOR	470 Ohm	1/2 W	2
R 5, 7	221 183	RESISTOR	1 KOhm	1/2 W	2
R 73, 83	221 210	RESISTOR	1,5 KOhm	1/2 W	2
R 1, 9	221 184	RESISTOR	2,2 KOhm	1/2 W	2
R 116	221 397	RESISTOR	4,7 KOhm	1/2 W	1
R 115	221 276	WIRE WOUND RESISTOR	470 Ohm	1 W	1
R 10	231 232	WIRE WOUND RESISTOR	6,8 KOhm	1 W	1
R 16, 17	231 176	WIRE WOUND RESISTOR	0,22 Ohm	4 W	2
Pot 1, 2	231 553	TRIMMER RESISTOR	500 KOhm	0,15 W	2
	231 235	SHAFT	red		2

Ventilator ST4

R15 820   D16 1N4148   T2 BC556   R13 10K   T1 BC547   R11 10K   VENT

R14 10K   R12 22K

TIC206 TC1

2u2 C26   3u3 C25

gekuehlt

VR1 7815   C1 u33

R16 0R22 4W   +28V

4x BY251   D2   D4

2.9A   S15

D3   D5

R1 2K2 1/2W   LED1

VR2 7815   C4 4700u 40V   C5 u33

D12 1N4004   VR3 7805   R3 1K

C8 2200u 25V   C9 u33   R2 10R

Add. Illumin. ST2

11.5V~ 1
GND 2
11.5V~ 3
0V~ 4
22V~ 5
28V= 6
SL6X

1N4148   R4 1K

R17 0R22 4W   +14V

VR4 7805   R6 1K

D10   D11

D6   D8 BY251

R5 1K 1/2W   LED2   LED

C12 4700u 25V   C13 u33   ZD1 ZPD4.7

LB1   GND-AUDIO

Trafo ST1

11.5V~ 1
0V~ 2
11.5V~ 3
0V~ 4
22V~ 5
6
43V~ 7
8
0V~ 9
10
43V~ 11
12
SL12X

3.15A S14   S13

6.3A T S12

S11

D1 BYV32

R10 6K8 1W   LED5

D7   D9 1N4004

-14V

VR5 7905   R8 1K

R7 1K 1/2W   LED3

C16 1000u 25V   C17 u33   ZD2 ZPD4.7

D13 1N4004   D14 1N4004   -22V

VR6 7915

1000u 25V C20   D15 1N4004   R9 2K2 1/2W   LED4

C21 1000u 40V   C22 u33

VAmp   Power-Amp
+60V

GNDAmp

+VA

D42 1N4004

VAmp   D43 1N4004   470R 1W R115   T11 TIP130   R57 47R 1/2W

R116 4K7 1/2W

C118 47u 63V   ZD4 ZPD10   ZD6 ZY12

V4
+28V

V3
+15V

C3
100u
25V

+VA
+15V

U<

C7
100u
25V

Control-Unit
ST5

1	GND
2	+14V
3	+14V
4	GND
5	+15V
6	+15V
7	-
8	U<
9	GND
10	+5V
11	+5V
12	GND

V1
+5V

C11
100u
10V

V2
+14V

Changer
ST6

1	GND
2	+5V
3	+15V
4	+14V
5	+28V
6	GND
7	GND
8	+10V
9	-10V
10	+15V
11	-15V
12	GND

SW12

+VM
+10V

C15
100u
25V

-VM
-10V

Changer
ST7

CD-L2   1   L
CD-L1   2
CD-R1   3
CD-R2   4   R

C97
C98

(330p)

C19
100u
25V

Bacta
ST3

1	GND
2	+14V
3	-14V
4	TXD1
5	RXD1
6	GND

TXD1
RXD1

-VA
-15V

C24
100u
25V

+12V   VAP

POWER - SUPPLY

Lightorgan
ST14

GND 1
Signal 2
3
+5V 4   OV1
+15V 5   OV3
6
U< 7   U<
GND 8
SL8

AVC

C28 u33   R59
R60 470K
R58 47K

1N4148   C59 u22   R123 10   TL074 IC2C
D17   D19   R125 82K   100K R126
D18   D20   10K   R145 39K   C119 4n7   R129 47K
27p C127

D21   LB3
D22   C61 1u   LB2   R54 4K7   R133 15K   R13 6K8
C62   C63 100u Tan 3V   0R   C60 1u

C31 100u
R118 4K7   R117 4K7   R21 10R   C30 100u   +VA

C32 u33   R23 47K   3   IC3A   1
CD-R1   R24 47K   2   TL074
C123 u33   R141 47K   R142 47K   C125 27p

C33 u33   R25 47K   5   IC3B   7
CD-L1   R26 47K   6   TL074
C124 u33   R143 47K   R144 47K   C126 27p

CD-R2
CD-L2

R53 68K   C58 u33

C48 u33   C49 u33   C50 u1   C51 u1   C47 10u
26   27   26   25   24   23   22   21
IR1   IR2   IR3   IR4   OSR   ICR   GND   BLI

IC1   TDA4390

IL1   IL2   IL3   IL4   OSL   ICL   RES   SCL   SDA
1   2   3   4   5   6   7
C52 u33   C53 u33   C54 u1   C55 u1
R46 LB

Taperecorder
BU2
In R   R31 2K2   C70 u33
C34 u33   R27 4K7   10   IC3C   8
R28 47K   9   TL074
BU3
In L
BU4
Out R   C35 u33   R29 4K7   12   IC3D   14
R30 47K   13   TL074
BU5
Out L

R55 68K   C64 u33   C66 1u   Q1

R32 2K2   C71 u33

470K
R33   R34   R35   R36

100u C57   R51 10R   +VA   R139 15K
R122 4K7   R121 4K7   C56 100u   TL074 IC2A
C65 u22   R124 82K   2   1   C120 4n7   R13 47K
1N4148   D23   D25   R127 10K   100K R128
D24   D26   R146 39K   27p C128

C99 u1
C37 100u   +VA
R120 4K7   R119 4K7   R37 10R   C36 100u
Background
POT1 500K   3   IC4A   1   R41 47K   D27   C67 1u   LB5   R56 4K7
2   TL074   D28   LB4
R39 22K   R40 22K   C29 27p   C68   C69 100u Tan 3V   AVC

BU1   C38 u1   R43 1K   5   IC4B   7   R45 22K
1   TL074
R42 47K   6
MIC   R44 1K   C39 27p   POT2 500K
C108 1u

R61 470K   4n7 C72   10   IC4C   8   R65 1K   D2
R62   R99 1K   9   TL074
C96 u33   R147 1M   1N41
3M3 R102   27p C73   R66 330K

176 392 / 176 351 / 176 513 / 176 609
176 393 / 176 352 / 176 514 / 176 610 / 176 598
176 394 / 176 353 / 176 515

AUD

Left Channel
ST6
1 GND
2 GND
3 GND
4 Vcenter
5 El.Fuse
6 Base1
7 Base2
8 +60V
9 +60V
10 +60V

GNDAmp

VAmp

Right Channel
ST9
1 GND
2 GND
3 GND
4 Vcenter
5 El.Fuse
6 Base1
7 Base2
8 +60V
9 +60V
10 +60V

Volume Control
ST12
1 Reject
2 Vol.+
3 Vol.-
4 GND
SL4

Remote Control
ST11
1 +15V
2 GND
3 RC4
4 RC3
5 RC2
6 RC1
SL6

Control-Unit
ST10
1 -RES-Audio
2 CLK
3 DAT
4 RC1
5 RC2
6 RC3
7 RC4
8 APL
9 APR
10 MIC
11 IN1
12 IN2
13 Ventilator
14 TXD1
15 RXD1

VENT
TXD1
RXD1

Mono
Stereo
Stereo+

IC2D TLØ74
IC2B TLØ74
IC4D TLØ74

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

NSM MUSIKAUTOMATEN PHONOGRAPHS   ES V-CD TECHNOLOGY

Schaltbild
WIRING DIAGRAM   CENTRALE ES V

Dat 29.06.92   Gez Braun   Bearb

Blatt 2 / Page 2

621/2

UNIT DESCRIPTION

ELECTR. COIN– AND BILL ACCEPTOR

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
—176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

10

Page 1001–1007

INDEX

1 MECHANICAL COIN CHUTE

See also the circuit in the wiring diagram in the appendix of the "Technical Information".

The coins that come out of the "good" channels of the coin acceptor run through different optic barriers. The optic barriers are in the coin chute under the coin acceptor.

Two photo transistors, T III and T I as well as T IV and T II are illuminated by one IR diode each (LED I and LED II).
As long as a light barrier is not interrupted by a coin, all photo transistors, T I to T IV, are switched to logically "0". So all output lines.
1 = T IV,
2 = T III,
3 = T I,
4 = T II are at logically "0", i.e. their voltage level is 1,0 V.

If a coin passes through an optic beam, the respective photo transistor is darkened for that time. The output becomes log. "1" via the pull–up resistors in the control unit, i.e. their level is 10 V.
Since T 1 is also darkened, when T III is effected by a coin (T 1 is behind T III, both are illuminated by the same light diode), the output from T I over T V is kept at "0". This occurs via resistors R 72, R 70; they bring transistor T V in a satiated state when T III is open.

The same goes for T IV; it is kept at "0" by T VI when a coin falls through T II. The control for T VI occurs via R 73, R 69.

The addition button is switched in sequence to T IV so that Line 1 becomes log. "1" at service credit.

R 67 limits the current of the luminous diodes LED I and LED II.

The output signals of the four photo transistors are evaluated in the control unit whereby line.
1 = P 074,
2 = P 073,
3 = P 072,
4 = P 071   is assigned to the monetary value setting in the service program and is to be programmed according to the coin value; see also chapter 3 Programming of NSM–phonographs".

2 BILL VALIDATION – DOLLAR BILL ACCEPTOR

See also the circuit in the wiring diagram in the appendix of the "Technical Information".

The bill validator, after the bill has passed through and been accepted, sends as many pulses to the control unit as correspond to the value of the bill.
The output of the bill validator is connected to the control unit via ST 9, Pins 1 and 2. 1 pulse is sent to the control unit with 1 dollar and 5 pulses with 5 dollars.

The input of the bill validator is assigned to program step P075 and is to be programmed accordingly; see also chapter 3 "Programming of NSM–phonographs".

3 MARS ELECTRONIC COIN VALIDATOR

4 or 5 different coins be checked depending on the type. The three sensors in the validator register each separately the width, material composition and pressure of each deposited coin. If a deposited coin passes the sensors, the prepard data are passed on to a register and compared with the contents of a memory (PROM). If validation criteria are identical are identical with a data set of the PROM, an internal "valid" signal is produced. Depending on the coin value it goes as output signal A1 to A5 to the plug of the PCB adapter (depending on type of validator, 15 or 13 poled). From there the signal goes via the 6–pole plug to control unit CD for processing.

3.1 Monetary Value Settings

The information in the "Operating Instructions" and the statistics and service program about monetary value settings refer to coin mechanisms with mechanial coin acceptors.

If a electronic validator has been installed, the monetary value settings in the individual program steps are assigned to corresponding output signals: P071 to signal A1 or A5, P072 to A3, P073 to A4, P074 to A2.

Notive: When inserting a coin during program steps P070–P075, the program step assigned to the coin is automatically displayed in Display 1.

The monetary values are programmed in monetary value units: "0100" $\triangleq$ 1 \$, "0025" $\triangleq$ 25 c, "0050" $\triangleq$ 50 c. Not used channels are programmed with "0000".

3.2 Price Tables

Set the number of credit per monetary value in program steps P061 to P065 as described in the "Statistics" and Service Program, 1.3.2 Price Tables".

3.3 Other Settings/Information

When exchanging the control unit the programming has to be done in the new unit also.

Attention! Then push button "Service credits" is wired parallel to the signal line of channel 4 (signal A2, program step P074). When the cabinet switch is pulled out one service credit is given with each pressing of the push button "service credit". But no cash registration.

For checking the monetary value setting of channel 4 (signal A2) the cabinet switch has to be pushed in.

Notice: Non–used channels can be blocked. For this purpose the bridge of the corresponding channel (A1–A5 on the PCB) has to be disconnected or conductor A5 is not connected.
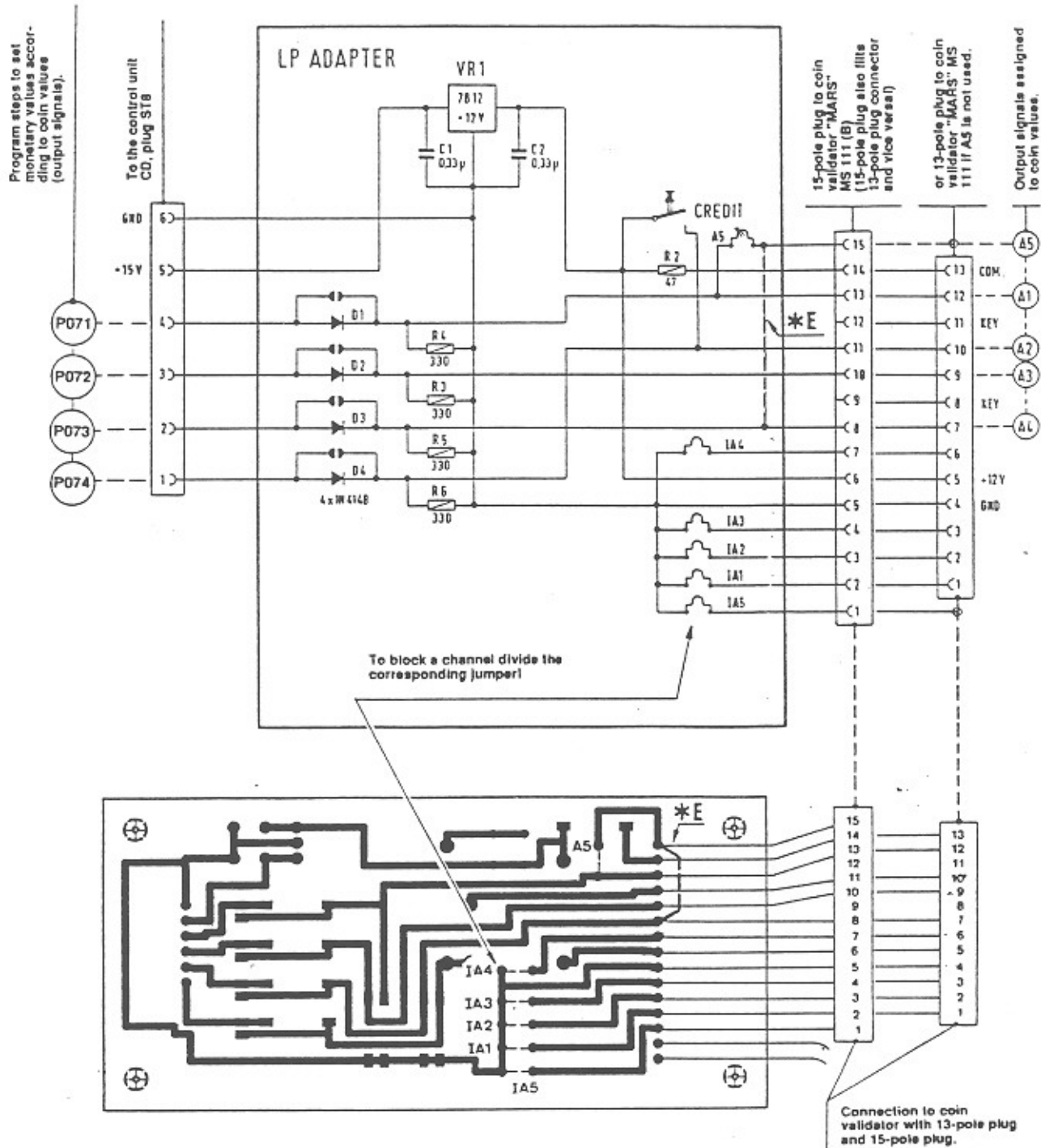
Program steps to set monetary values according to coin values (output signals).

To the control unit CD, plug ST8

15-pole plug to coin validator "MARS" MS 111 (B) (15-pole plug also fits 13-pole plug connector and vice versa)

or 13-pole plug to coin validator "MARS" MS 111 if A5 is not used.

Output signals assigned to coin values.

LP ADAPTER

VR1
7812
-12V

C1 0.33µ   C2 0.33µ

CREDIT
A5
R 2 47

GND 6
-15V 5
PO71 4
PO72 3
PO73 2
PO74 1

D1
D2
D3
D4
4 x IN 414B

R 4 330
R 3 330
R 5 330
R 6 330

*E

C 15
C 14
C 13
C 12
C 11
C 10
C 9
C 8
C 7
C 6
C 5
C 4
C 3
C 2
C 1

IA4
IA3
IA2
IA1
IA5

13 COM   A5
12   A1
11 KEY
10   A2
9   A3
8   KEY
7   A4
6
5   -12V
4   GND
3
2
1

To block a channel divide the corresponding jumper!

*E

15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

13
12
11
10
9
8
7
6
5
4
3
2
1

A5

IA4
IA3
IA2
IA1
IA5

Connection to coin validator with 13-pole plug and 15-pole plug.

FIG.: "layout of CB-adapter"

Monetary Value Settings
Programming of monetary values and values settings according to the individual coins (see 3.1.).

Currency	Monetary Values ≙ Coin Value P071 (A1/A5)	P072 (A3)	P073 (A4)	P074 (A2)	Discon. Jumpers	Coin Validator - Type
Germany	500 ≙ 5,- DM	100 ≙ 1,- DM	0	200 ≙ 2,- DM	IA4/IA5	GDE58 L00K/B1 / GDE55L00C/B1
Switzerland	500 ≙ 5 Fr	100 ≙ 1 Fr	0 (1/2 Fr)	200 ≙ 2 Fr	IA4/IA5	GCH 31 L00C / B1
Italy	500 ≙ 500 L	100 ≙ 100 L	0 (50 L)	200 ≙ 200 L	IA4/IA5	GIT 26 L00C / B1
	500 ≙ 500 L	0 (100 L)	0 (50 L)	200 ≙ 200 L	IA3/IA4	GIT 06 L00C
Belgium	5000 ≙ 50 bfr	500 ≙ 5 bfr (new)	0 (1 bfr)	2000 ≙ 20 bfr	IA3/IA4 (A3/A4)	GBE 19 L00C / B1
	50 ≙ 50 bfr / 1 bfr (new)	5 ≙ 5 bfr (new)	0 (1 bfr (old))	20 ≙ 20 bfr	IA4/IA5	GBE 25 L00C / B1 / GBE 19 L00C / B1
Netherland	25 ≙ 25 c	250 ≙ 2 1/2 hfl	500 ≙ 5 hfl	100 ≙ 1 hfl		GNL 37 L00C / B1
France	1000 ≙ 10 F	200 ≙ 2 F	100 ≙ 1 F	500 ≙ 5 F		GFR 19 L00C
	1000 ≙ 10 F (old/new)	200 ≙ 2 F	100 ≙ 1 F	500 ≙ 5 F		GFR 96 L00C / B1 *F
	1000 ≙ 10 F (new)	200 ≙ 2 F	100 ≙ 1 F	500 ≙ 5 F		GFR B7 L00C 02
Denmark	2000 ≙ 20 dkr	500 ≙ 5 dkr	100 ≙ 1 dkr	1000 ≙ 10 dkr		GDK 1D L00C / GDK 1N L00C
	0	50 ≙ 5 dkr	10 ≙ 1 dkr	100 ≙ 10 dkr		by 3-Canal GDK xx L00C
	100 ≙ 10 dkr	10 ≙ 1 dkr	0 (0,25 dkr)	50 ≙ 5 dkr	IA4	by 4-Canal GDK 02 L00C
	100 ≙ 10 dkr (new)	50 ≙ 5 dkr	10 ≙ 1 dkr	100 ≙ 10 dkr (old)		by 4-Canal GDK 1A L00C
Austria	2000 ≙ 20 S	500 ≙ 5 S	100 ≙ 1 S	1000 ≙ 10 S	A5/IA5	GAU 03 L00C
Spain	200 ≙ 200 Pst	50 ≙ 50 Pst	25 ≙ 25 Pst	100 ≙ 100 Pst		GES 1J L00C
Greece	(0) MP closed	50 ≙ 50 Dr	20 ≙ 20 Dr	0		GGR 1C L00C
Norway	1000 ≙ 10 Kr	100 ≙ 1 Kr	0 (1/2 Kr)	500 ≙ 5 Kr	IA4	GN 008 L00C
Finland	0	500 ≙ 5 MK	100 ≙ 1 MK	0		GSF 1A L00C
Sweden	500 ≙ 5 Kr	100 ≙ 1 Kr	0 (50 ön)	100 ≙ 1 Kr	IA4	GSW 09 L00C
Great Britain	100 ≙ 1 £ / 100 ≙ 1 £	20 ≙ 20p / 20 ≙ 20p	10 ≙ 10p / 10 ≙ 10p (new/old)	50 ≙ 50p / 50 ≙ 50p	IA5	GDB 31 L00C/GGB81 L000C/ B1 / GGBG3 L00C/02 * GB
USA	100 ≙ 1 $	25 ≙ 25 c	0	50 ≙ 50 c	IA4	GUS 20 L00C
	10 ≙ (10c)	50 ≙ (50c)	25 ≙ 25c	100 ≙ (1 $)	IA5	GUS 1B L00C / B1
Canada	10 ≙ 10 c	100 ≙ 1 $	25 ≙ 25 c	0		GCN 1A L00C
Australia	0	100 ≙ 1 $	20 ≙ 20c	200 ≙ 2 $		GAS XX L00C B1/ GAS 1A L00C
	200 ≙ 2 $	0 (50c)	20 ≙ 20c	100 ≙ 1 $	IA3	GAS 28 L00C
Neth.Antilien	0	0	100 ≙ 1 NAF	0	A5/IA5	GNA 1A L00G / B1 / GNA 1A L00C / 02
New Zealand	50 ≙ 50 c	10 ≙ 10 c	5 ≙ 5 c	20 ≙ 20		GNZ 03 L00C
	200 ≙ 2 $	50 ≙ 50 c	20 ≙ 20 c	100 ≙ 1 $	IA4/IA5/A5	GAS 41 L00C / 02 AS./ NZ
Korea	0	100 ≙ 10 NTS	50 ≙ 5 NTS	0		GTW 1A L00C
Mexico	0	0	1000 ≙ 1000 P	0		GME 1A L00C
Hong Kong	500 ≙ 5 $	100 ≙ 1 $	0	200 ≙ 2 $		GHK 1A L00C / B1
Hungaria	200 ≙ 20 F	50 ≙ 5 F	0	100 ≙ 10 F	IA4/IA5	GHU 1B L000C / B1
Thailand	0	0	500 ≙ 5 Baht	0		GTH 1A L00C / 02
South Africa	200 ≙ 2 R (new)	100 ≙ 1 R (old)	50 ≙ 50 C (old/new)	100 ≙ 1 R (new)	A5	GZA 1B L00C / B1 *E
Israel	0500 ≙ 5 Shekel	0050 ≙ 1/2 Shekel	0010 ≙ 0,1 Shekel	0100 ≙ 1 Shekel	IA3/IA4	GIS 13 L00C / 02

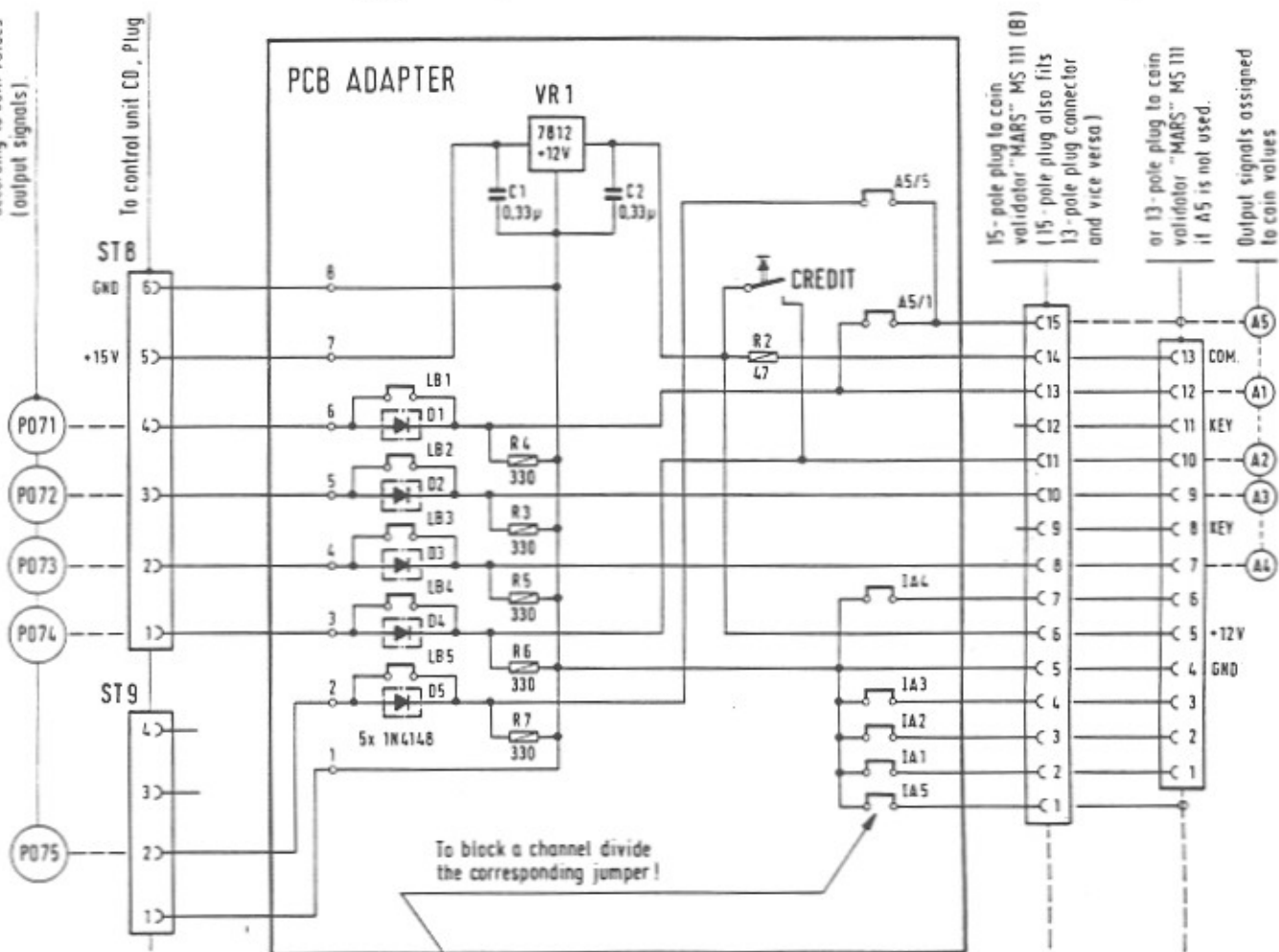≙ Alternative values depending on the type of coin validator

* GB see next page

* E Connection necessary between wire 8 (signal A4) and wire 15 (signal A5) on "CB-adapter" (see also figure "layout of CB-adapter").

* F A5 and IA 5 closed

dotted components are not installed.

PCB ADAPTER

VR 1
7812
+12V

C1 0,33µ   C2 0,33µ

A5/5

CREDIT

A5/1

R2 47

Program steps to set monetary values
according to coin values
(output signals)
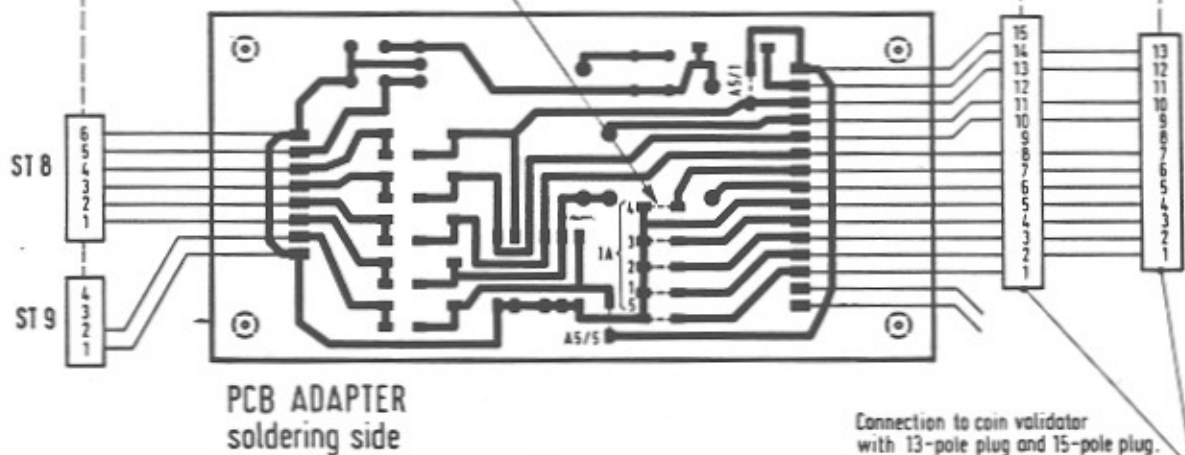
To control unit CO_Plug

15-pole plug to coin
validator "MARS" MS 111 (B)
(15-pole plug also fits
13-pole plug connector
and vice versa)

or 13-pole plug to coin
validator "MARS" MS 111
if A5 is not used.

Output signals assigned
to coin values

ST 8

GND   6   8

+15V   5   7

P071   4   6   LB 1 D1

P072   3   5   LB 2 D2   R4 330

P073   2   4   LB 3 D3   R3 330

P074   1   3   LB 4 D4   R5 330

ST 9   2   LB 5 D5   R6 330

4   5x 1N4148   R7 330

3

P075   2

1

To block a channel divide
the corresponding jumper!

IA4

IA3
IA2
IA1
IA5

C15
C14
C13
C12
C11
C10
C9
C8
C7
C6
C5
C4
C3
C2
C1

C13 COM.
C12
C11 KEY
C10
C9
C8   KEY
C7
C6
C5   +12V
C4   GND
C3
C2
C1

A5
A1
A2
A3

A4

PCB ADAPTER
soldering side

ST 8

ST 9

Connection to coin validator
with 13-pole plug and 15-pole plug.

176 393 / 176 352 / 176 514 / 176 598 / 176 705

07/93

1005

Monetary Value Settings

Programming of monetary values and values settings according to the individual coins (see 3.1.).

CURRENCY	Monetary Values = Coin Value					Discon. Jumper	Coin Validator – Type
	P071 (A1/A5)	P072 (A3)	P073 (A4)	P074 (A2)	P075 (A5)		
Germany	500 = 5 – DM	100 = 1 – DM	0	200 = 2 – DM	0	IA4/IA5	GDE58 L00K/B1 / GDE55L00C/B1
Switzerland	500 = 5 Fr	100 = 1 Fr	0 (1/2 Fr)	200 = 2 Fr	0	IA4/IA5	GCH 31 L00C / B1
Italy	500 = 500 L	100 = 100 L	0 (50 L)	200 = 200 L	0	IA4/IA5	GIT 26 L00C / B1
	500 = 500 L	0 (100 L)	0 (50 L)	200 = 200 L	0	IA3/IA4	GIT 06 L00C
Belgium	5000 = 50 bfr	500 = 5 bfr (new)	0 (1 bfr)	2000 = 20 bfr	0	IA3/IA4 (A3/A4)	GBE 19 L00 C / B1
	50 = 50 bfr 1 bfr (new)	5 = 5 bfr (new)	0 (1 bfr (old))	20 = 20 bfr	0	IA4/IA5	GBE 25 L00C / B1 GBE 19 L00C / B1
Netherland	25 = 25 c	250 = 2 1/2 hfl	500 = 5 hfl	100 = 1 hfl	0		GNL 37 L00C / B1
France	1000 = 10 F	200 = 2 F	100 = 1 F	500 = 5 F	0		GFR 19 L00C
	1000 = 10 F old/new	200 = 2 F	100 = 1 F	500 = 5 F	0		GFR 96 L00C / B1 *F
	1000 = 10 F (new)	200 = 2 F	100 = 1 F	500 = 5 F	0		GFR B7 L00C 02
	1000 = 10 FF	200 = 2 FF	100 = 1 FF	500 = 5 FF	2000 = 20 FF	A5/1	GFR 2W L00C / B1
Denmark	100 = 10 dkr	10 = 1 dkr	0 (0.25 dkr)	50 = 5 dkr	0	IA4	bei 4–Kanal GDK 02 L00C
	100 = 10 dkr (new)	50 = 5 dkr	10 = 1 dkr	100 = 10 dkr (old)	0		bei 4–Kanal GDK 1A L00C
	2000 = 20 KR (new)	500 = 5 Kr (new)	100 = 1 Kr (old/new)	1000 = 10 Kr (new)	0	A5/1	GDK 37 L00C / 02 *E
	2000 = 20 dkr	500 = 5 dkr	200 = 2 dkr	1000 = 10 dkr	100 = 1 dkr	A5/1	GDK 1K L00C 02
Austria	2000 = 20 S	500 = 5 S	100 = 1 S	1000 = 10 S	0	A5/IA5	GAU 03 L00C
Spain	200 = 200 Pst	50 = 50 Pst	25 = 25 Pst	100 = 100 Pst	0		GES 1J L00C
	500 = 500 P	100 = 100 P	25 = 25 P	200 = 200 P	50 = 50 P	A5/1	GESA5 L00B/02
	500 = 500 P	100 = 100 P	25 = 25 P	200 = 200 P	50 = 50 P	A5/1 IA1	GESA5 L00C/02
Greece	(0) MP closed	50 = 50 Dr	20 = 20 Dr	0	0		GGR 1C L00C
Norway	1000 = 10 Kr	100 = 1 Kr	0 (1/2 Kr)	500 = 5 Kr	0	IA4	GN 008 L00C
Finland	0	500 = 5 MK	100 = 1 MK	0	0		GSF 1A L00C
Sweden	500 = 5 Kr	100 = 1 Kr	0 (50 on)	100 = 1 Kr	0	IA4	GSW 09 L00C
Great Britain	100 = 1 £ 100 = 1 £	20 = 20p 20 = 20p	10 = 10p 10 = 10p (new/old)	50 = 50p 50 = 50p	0	IA5 A5/1	GDB 31 L00C/GGB81 L00C/B1 GGBG3 L00C/02 *GB
USA	100 = 1 $	25 = 25 c	0	50 = 50 c	0	IA4	GUS 20 L00C
	10 = (10c)	50 = (50c)	25 = 25c	100 = (1 $)	0	IA5	GUS 1B L00C / B1
Canada	10 = 10 c	100 = 1 $	25 = 25 c	0	0		GCN 1A L00C
Australia	0	100 = 1 $	20 = 20c	200 = 2 $	0		GAS XX L00C B1/ GAS 1A L00C
	200 = 2 $	0 = (50c)	20 = 20c	100 = 1 $	0	IA3	GAS 28 L00C
Neth. Antillen	0	0	100 = 1 NAF	0	0	A5/1 IA5	GNA 1 A L00G / B1 GNS 1 A L00C / 02
New Zealand	50 = 50 c	10 = 10 c	5 = 5 c	20 = 20	0	.	GNZ 03 L00C
	200 = 2 $	50 = 50 c	20 = 20 C	100 = 1 $	0	IA4/IA5 A5/1	GAS 41 L00C / 02 AS / NZ
Korea	0	100 = 10 NTS	50 = 5 NTS	0	0		GTW 1A L00C
Mexico	0	0	1000 = 1000 P	0	0		GME 1A L00C
Hong Kong	500 = 5 $	100 = 1 $	0	200 = 2 $	0		GHK 1A L00C/B1
Hungaria	200 = 20 F	50 = 5 F	0	100 = 10 F	0	IA4/IA5	GHU 1B L00C / B1
Thailand	0	0	500 = 5 Baht	0	0		GTH 1A L00C / 02
South Africa	200 = 2 R (new)	100 = 1 R (old)	50 = 50 C (old/new)	100 = 1 R (new)	0	A5/1	GZA 1B L00C / B1 *E
Israel	500 = 5 Shekel	50 = 1/2 Shekel	10 = 0,1 Shekel	100 = 1 Shekel	0	IA3/IA4	GIS 13 L00C /02
Japan	500 = 500 Jen	0 .	0	100 = 100 Jen	0	A5/1	GJA 1A L00C / 02

*F   A5 and IA 5 closed

*E   Connection necessary between wire 8 (signal A4) and wire 15 (signal (A5) on "CB–adapter" (see also figure "layout of CB–adapter").

*GB   see next page

07/93

* GB: Selection of coin acception

The coin validator is provided with a group of jumpers. These are used to select the coin acception of several coins (old/new).

To select a version:

−   unscrew the Phillips screw "A" (see figure),
−   open the cabinet.
−   Set jumper corresponding to the following table:

Coin acception of	Jumper C	E
10 p new	open	open
10 p old	closed	closed
10 p new + old	open	closed

−   Close the cabinet of the coin validator after selection.

"A"

A B C D E → Jumper
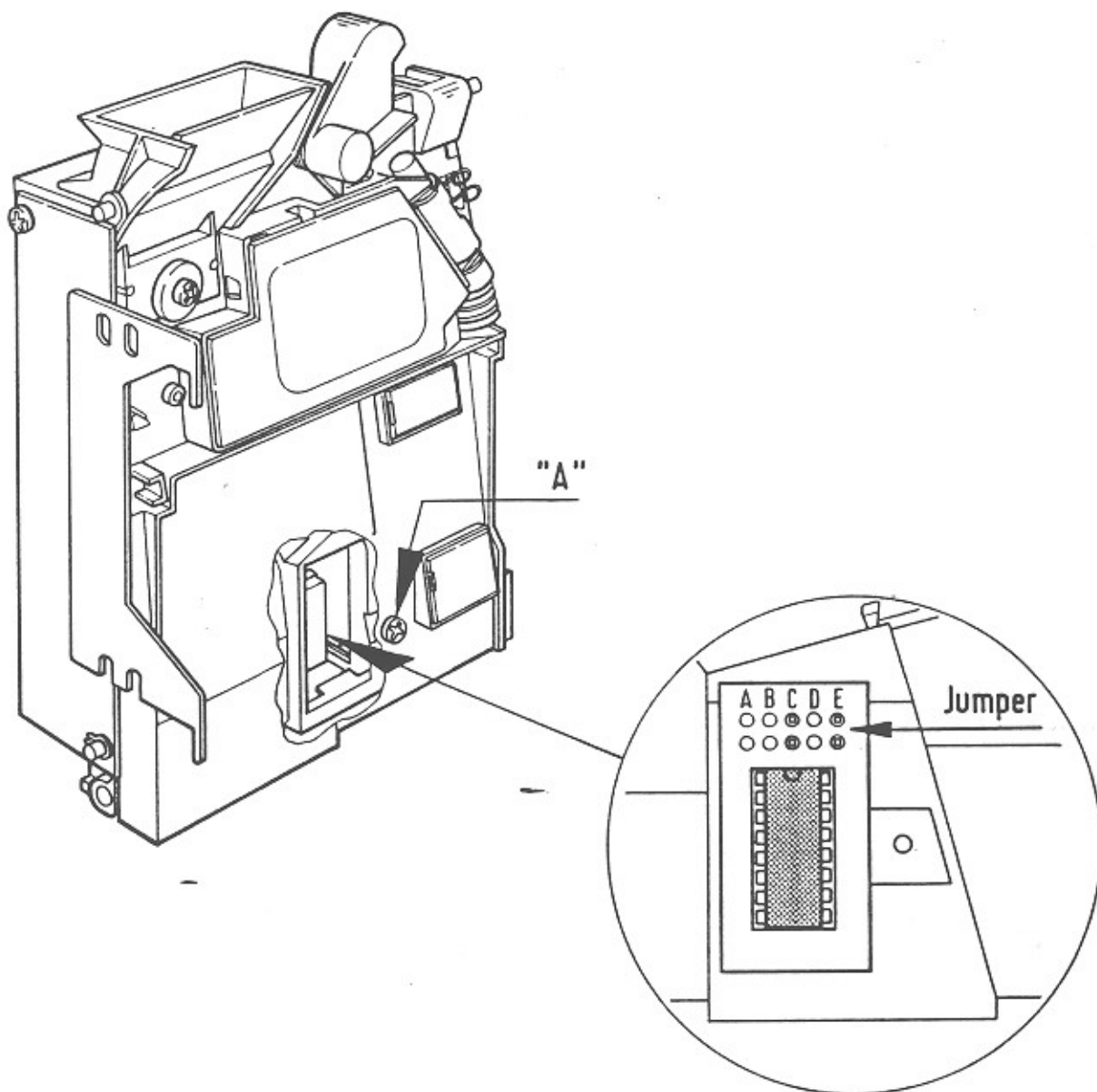
UNIT DESCRIPTION

DISPLAY / KEYBOARD

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

5

INDEX

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
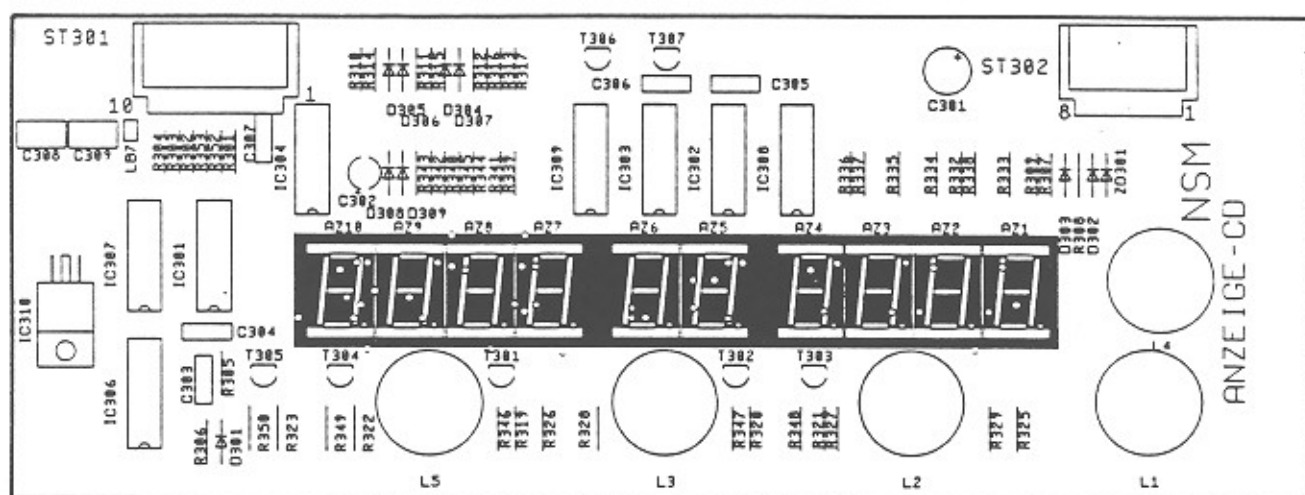
SPARE PARTS LIST

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 1–10	231 416	DISPLAY	TD SL 5150		10
	176 413	TUBUS			1
	171 629	HOLDER			4
IC 310	221 573	IC–VOLTAGE	12 V 1 A		1
IC301–303	221 771	IC–CMOS	HEF 4094 B		3
IC 304	221 763	IC–CMOS	HEF 4021 B		1
IC306–309	221 497	IC–LINEAR	ULN 2003 A		4
D 301–309	221 114	SI–DIODE	1 N 4148		9
T301–305	231 240	SI–TRANSISTOR	BC 636 F		5
T306, 307	221 283	SI–TRANSISTOR	BC 212 B		2
C303–307	220 334	MKT–CAPACITOR	0,1 µF	63 V	5
C308,309	220 332	MKT–CAPACITOR	0,33 µF	63 V	2
C 302	220 249	LYTIC	1 µF	63 V	1
C 301	220 162	LYTIC	10 µF	63 V	1
R 301	221 611	RESISTOR	10 Ohm	1/4 W	1
R306, 332–350	221 627	RESISTOR	1,2 KOhm	1/4 W	20 >
R302–304, 307–309, 314–317, 354	221 033	RESISTOR	3,3 KOhm	1/4 W	> > > 16
R310–313	221 038	RESISTOR	47 KOhm	1/4 W	4
R 305	221 009	RESISTOR	1 MOhm	1/4 W	1
R325–329	231 366	MET.–RESISTOR	10 Ohm	1/4 W	5
L 1–5	225 533	LAMP SOCKET			5
	226 056	LAMPS	12 V 2 W		5
	173 900	DISPLAY, ASSY	12–fach		1

IC 306
ULN 2003

+5V

D 309

C 302
1µ

R 306
1,2 K

C 303
0,1µ

D 308

R 305
1M

D 301

ST 301

CONTROL UNIT
Stecker ST 10
PLUG ST 10

LOAD
CLOCK
DATA IN
DATA OUT

R 304   3,3 K
R 303   3,3 K
R 302   3,3 K

R 301
10

+5V
+14V

C 301
10µ
63V

R 300
22

L6
12V
2W

Tastatur – Beleuchtung
ILLUMINATION KEY BOARD
Nur wenn vorhanden.
ONLY IF AVAILABLE.

IC 304
4021

+5V

C 307
0,1µ

R 310 R 311 R 312 R 313
47K   47K   47K   47K

R 314
3,3 K
R 315
3,3 K
R 316
3,3 K
R 317
3,3 K

T 306

2x
BC 212 B

T 307

+12V

R 308
3,3 K

R 307
3,3 K

D 302

D 307

D 303

D 306

R 309
3,3 K

D305 D304

+14V   9

IC 3
ULN 2

R 350 R 349 R 348
1,2K   1,2K   1,2K

Leiterplatte   Anzeige
CIRCUIT BOARD DISPLAY

ST 302

Leiterplatte   Tastatur
CIRCUIT BOARD KEY BOARD

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

176 392 / 176 351 / 176 513 / 176 609
176 393 / 176 352 / 176 514 / 176 610 / 176 598
176 394 / 176 353 / 176 515
07/93

IC 301
4094

IC 302
4094

IC 303
4094

C 304
0,1 µ

C 305
0,1 µ

C 306
0,1 µ

+5V

IC 307
4003

+14V

IC 306
ULN 2003

+14V

IC 308
ULN 2003

+14V

IC 309
ULN 2003

R347 R346 R325 R326
1,2K 1,2K 10 10

R327 R328 R329
10 10 10

R332 R333 R334 R335 R336 R337 R338
1,2K 1,2K 1,2K 1,2K 1,2K 1,2K 1,2K

R339 R340 R341 R342 R343 R344 R345
1,2K 1,2K 1,2K 1,2K 1,2K 1,2K 1,2K

a b c d e f g

L1 L5

L2 L3 L4

12V 12V
2W 2W

12V 12V 12V
2W 2W 2W

AZ1 AZ2 AZ3 AZ4 AZ5

AZ6 AZ7 AZ8 AZ9 AZ10

+14V

L 1 = error Taste ‚C' drücken / error press ‚C'
L 2 = Ihre Wahl / your selection
L 3 = Kredit / credits
L 4 = 10 top Hits / top ten hits of this location
L 5 = Background spielt / Background

T301 T302 T303 T304 T305

5 x BC 636

IC 310
7812 C

+12V

+12V

C 308
0,33µ
63V

R 352

C 309
0,33µ
63V

+14V

LB 7

R319 R320 R321 R322 R323
3,3K 3,3K 3,3K 3,3K 3,3K

Draufsicht : Display
TOP VIEW : DISPLAY

g f A a b
1 1 1 1 1
10 9 8 7 6

a
f   b
g
e   c
d   • dp

1 2 3 4 5
1 1 1 1 1
e d A c dp

A = gemeinsame Anode
COM. ANODE

⊗ L4

AZ10 AZ9 AZ8 AZ7   AZ6 AZ5   AZ4 AZ3 AZ2 AZ1

⊗ L5   ⊗ L3   ⊗ L2   ⊗ L1
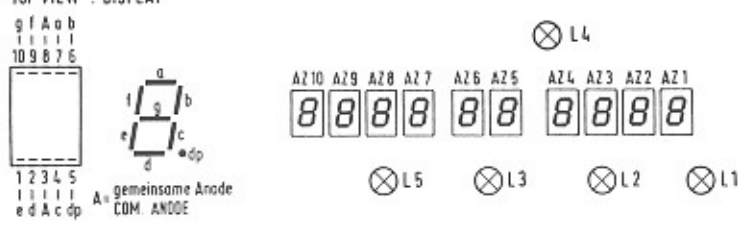
Draufsicht : Spannungsregler IC 310
TOP VIEW : VOLTAGE REGULATOR IC 310
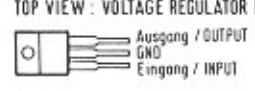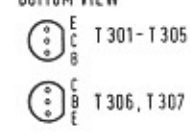
Ausgang / OUTPUT
GND
Eingang / INPUT

von unten gesehen
BOTTOM VIEW

E
C   T 301 - T 305
B

C
B   T 306, T 307
E

gerasterte 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 !

— ZENER - DIODE
— 1N 4148
— ½ W
— ½ W

NSM MUSIKAUTOMATEN ES V-CD TECHNOLOGY
PHONOGRAPHS

Schaltbild   Anzeige / Tastatur
WIRING DIAGRAM   DISPLAY / KEY BOARD

| Dat. 10.04.92 | Gez. Braun | Bearb. Weigel | Gepr. |

511

OPERATING INSTRUCTIONS

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, Assy

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

2

INDEX

SELECTOR and DISPLAY PANEL

Display 1   Display 2   Display 3

1 PLAYING SEQUENCE

The functional sequence, starting with "power on", standby credit, selection and playing of selected title to the rest position is described below.
The technical assembly and the working together of the components can be seen in the "electronic schematics". Compare the descriptions with the illustration of the display / keyboard above.

1.1 Operation after Switching on

Immediately after switch–on the memory components –on the CONTROL UNIT– and all preprogrammed values are checked.
Display 1 shows then for 2 sec. the program index
If an error is found during checking, error display Er xx is then shown for 2 sec.
With Er 31 (unverified memory contents) and Er 40 (price settings incorrect) Display 1 shows the correct program step with Pxxx which needs to be reprogrammed. See programming manual.
With other Er–numbers in display 3, even during operation, proceed according to the instructions in "Trouble Shooting".

1.2 Standby

Hit display:
The microprocessor of the CONTROL UNIT finds out the ten most played titles of the 30 titles just played before (at this phonograph).
On Display 3 the title numbers of the 10 most popular titles, whose rankings (1–10) are shown on Display 2, are changed in intervals of 2 sec. Also the lamp "top ten hits" lights up.
When pushing "H", the hit display can be stopped for 16 sec; every press the key "H" causes an advance to the next hit.
Note: When the popularity counters are erased (program step P033), the hit parade is erased too. In that case "0" appears for ranking until records are played again.

<u>Autoplay mode</u>:

A time interval can be set by programming the command group P 11x for playing of incentive titles.

Conditions for an incentive title to be played:
- Phonograph in standby mode
- No credit available
- Microphone switch not being used
- No muting

1.3 Credits (not for HIDE–AWAY)

See unit description "Coin and Bill Validation".

After insertion of a coin the hit display is interrupted, lamp "10 top hits" goes off and lamps "credit" and "your selection" light up. Display 2 shows the number of credits.
For every selection credit is deducted.
If not enough credits are available for the selection, the lamp "credit" flashes.
If no more coins are inserted within 16 sec. or no selector key is pressed, the mode changes to "hit display".
Free–credit switch (add. key), below the mechanical coin acceptor or on the adapter PCB with electronic coin validators, is only possible when the cabinet lid is open and the cabinet interlock switch is in service position (press add. button once = 1 credit). These credits are not registered statistically.
Attention! The machine is furnished with an interlock switch which must be manually set in service position (pull out). The switch resets automatically when closing the lid.
<u>Note:</u> Credits remain stored during "power off/on" (P049 = 0).
If the computer detects no activity on the phonograph within a time, the stored credit is cancelled (P049 = time).

1.4 Title display

By pushing the keys respectively title holders are moved into the corresponding direction. Upon each key operation two new CD–covers including titlestrips are shown. In case of a limitation of selectable CDs by programming P042 only the corresponding title holders are shown.
<u>Note:</u> A problem with the title display will initiate error code "Er 9x". Following instructions in "Trouble Shooting".

1.5 Selection

<u>Title Selection:</u> The four–digit number of the desired title has to be entered (2 digits each for CD–No. and title). "Credit" and "your selection" light up. The selection can be corrected by pressing "C" up to 2 sec. after pressing the 4th digit.

<u>Album Selection:</u> When entering Track 00, all titles of a CD are automatically played (i.e. 0300 = all titles of CD 03).

With open cabinet switch (interlock lever pulled out) no credit is deducted when selecting. If the entry is incorrect, e.g. higher than the programmed number of CD titles which can be selected or an unallowed selection of albums, "error" flashes. In that case, press "C" and repeat the selection.

One credit is deducted for each selection of a title. With album selections credits are deducted as per the programming in program step P066. When programming "0", album selection is blocked. If there is not enough credit available, "credit" lamp flashes.

16 sec. after selection "hit display" is switched on automatically again.

Note: If a background or incentive title is playing during selection, the volume is fading and the selected tune is being played.

1.6 Play Mode

After selection of a title the CD which is to be played corresponding to the entries in the selection storage is transported to the player and then played.

Just before start the number of the title is shown on Display 1 ("selection now playing"). After the disc is played, the display is erased and the CD is transported back to its magazine space.

Note: If a error occurs with the CD changer or the player, "Er 7x" or "Er 6x" appears for 2 sec. In that case proceed according to the description in "Trouble Shooting".

Limiting playing time for a title (track)
By programming P045 the time that a title is to be played maximum can be set in minutes.
After expiration of this time the volume for that title is fading and then muted.
When setting "0" (default), there is no limit in playing time.

Sequence of tunes playing
By programming P046 one can set in which sequence the selected titles are played.

Settings:
        0 = in sequence of selection (FIFO)
        1 = in numerically increasing sequence
        2 = random sequence

Limit of Playing Titles on the same CD
One can set by programming P047 how many titles can be played consecutively on the same CD.
With 0 (default) there is no limit.

Attention!
When playing a test compact disc, the description that comes with the test disc is to be exactly adhered to. By any means, it is to be avoided to give sine signals with peak signal "0dB" at full volume level to the loudspeakers for more than 1 sec.

But also other unfiltered noises and high–frequency signals (which are only used for measuring purposes) can damage the amplifier and loudspeakers at full volume.

When checking channel separation, it is to take in consideration if the box is not switch to "Mono–mode" (see page 110).

1.7. Advertising

With the commands of group 12x it is possible to define timeslices for playing special CD's containing advertising information (ad).
While the ad–mode is active a title is played every x minutes (x ist the time defined in P124) after closing the currently played title. The CD's containing ad can be selected for "not to be played by normal customers" (P126).

1.8 LOCK–OUT TITLES

If one titles of a CD is bad it can be locked out for a defined time at every day by programming the steps in group P13x.

A lock out title can be defined by
– bad quality of reproduction
– bad track within the title
– shocking information.

1.9 Happy–Hour Credits

For additional animation of the audiance, a so called Happy–Hour can be programmed to be active at several days.
While active an additional bonus credit is given if the customer has payed a number of credits (defined as calculation number in P144). I.e. After 5 payed credits one Happy–Hour credit is given if the calculation number is programmed as 5. The programming of Happy–Hour is done with the P14x group of commands. See also descriptions in chapter 3.

1.10 SERVICE and MAITENANCE

With the commands of groups 15x and 16x you can

– read out errors of the phonograph with CD and date of appearence,
– test the CD changer,
– test the CD played,
– test the lamps and keys,
– install new CDs
– remove bad or not actual CDs.
Refer to "Programming of the phonograph" and "Trouble shooting"

2 ADJUSTMENTS WITH REMOTE CONTROL

The phonograph can optionally be equipped with cable–type remote control or infra–red remote control. All functions and the operation of both models are identical. Therefore, this description is valid for both of them.

The button–control box attached to the rear of the cabinet allows common control of both channels "+" or "–" and "REJECT".

Information about the functions of different controls is presented in the unit description "Remote Control".

2.1 Volume Controls

We differentiate between two volumes:
1.)   The normal volume of selected titles and random play titles
2.)   The background volume of background titles

For selected titles and random titles or with microphone and tape mode the corresponding volume is adjustable; background volume only with background mode:
Key "I" for the left channel; Key "II" for the right channel; "+" = louder, "–" = quieter. When pushing center key (I+II), the channels are regulated together. If they were differently set, they are first "balanced" and regulated together.
When no selection is taking place, the volume for the channels are shown in Display 3 during the adjustment in steps of "1" to "31".
At "muting" function "OFF" appears in Display 1; no more titles will be played until MUTING is cancelled.
The volume set at the end is stored during "power off".
The maximum possible volume for normal and background mode can be limited By programming P051 and P052 in steps of "1" to "31".

Note: To protect the amplifiers a check is made whether an overload occurs due to mismatching.
Upon recognition of an error the volume of the corresponding channel is reduced step by step automatically by the computer until a non–critical point is reached.

2.2 Muting

The volume of both channels can be set to "0" by pressing the MUTING key; "OFF" appears on Display 1. Re–pressing of the MUTING key or one of the VOLUME "+" keys causes the system to switch back to the previously set volume for both channels.

Note: With display "OFF" no more records are played until MUTING is switched off.

2.3 Free Credits

With an "open" key switch free credits programmed in program step P094 can be called up. The following free credits are possible depending upon the settings in step P094:
1.)   Number of set free credits can be called up individually step by step.
2.)   Unlimited free credits can be called up individually step by step.
3.)   Permanent credit when pressing key "FREE CREDIT" for the first time (credit display "99").
       When key "FREE CREDIT" is pressed again, permanent credit is blocked.
4.)   Permanent credit automatically within the time window.

2.4 Background Music

With an "open" key switch the background mode can be switched on with the BACKGROUND key. "Background playing" lights up.
When pressing this key again, the background mode is switched off. In the background mode "random" records are played as defined in P105. The time when background musik is played is to set in P10x.
The records are played at a "specific" background volume which can be changed as desired during playing.
A "normal record", selected while background music is playing, interrupts the background disc and the selected tune is played at "normal volume".

2.5 Key Switch

A key switch at the side wall serves as protection against unauthorized calling up of free credits and switching on the background mode. When the key switch is "locked", settings from the remote control are disregarded. Key switch "open" permits programmed free credits to be called up and the background mode to be switched on.
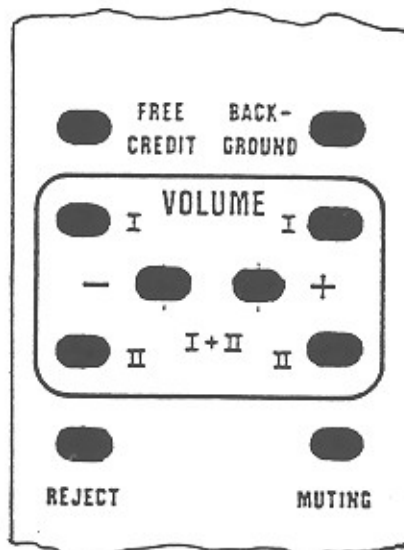
REMOTE CONTROL

3 PROGRAMMING PRICE– AND MONETARY VALUE SETTINGS

This description is a summary of a section of the service program.
A detailed description and the corresponding tables are contained in chapter "Price Settings" and "Monetary Value Settings" in the programming manual.

Practical example for setting the "price settings" and the "monetary value settings":

    1 play = 50 p
    2 plays = 50 p
    5 plays = 1 $ (1 £)

Programming of price settings:

Programming Information	Operation	Displays 1	2	3
Switch–over from play mode to service mode	pull out plunger	P010	xx	xxxx
	Press key(s)		Play	price
Entering command mode	"C"	P		
Direct selection of a command, Display of previous setting in P061.	"61", "H".	P061	xx	xxxx
New setting in P061 "1 play/50 p".	"01", "0050", "H".	P061	01	0050
Advance to next command, Display of previous setting in P062.	"H"	P062	xx	xxxx
New setting in P062 "1 plays/50p".	"01", "0050", "H".	P062	01	0050
Advance to next command, Display of previous setting in P063:	"H"	P063	xx	xxxx
New setting in P063 "5 plays/1 $.	"05", "0100", "H".	P063	05	0100
Advance to next command, Display of previous setting in P064:	"H"	P064	xx	xxxx
For only 3 classes setting "00 0000".	"00", "0000", "H".	P064	00	0000
Advance to next command, Display of previous setting in P065:	"H"	P065	xx	xxxx
For only 3 price classes setting "00 0000".	"00", "0000", "H".	P065	00	0000

Caution! Press "C" key in the event of incorrect programming or when display flashes.

Press "C" key twice or close hood to **return to standard program (play mode).**

Example of Programming the monetary value settings:

Depending on the type of coin validator the individual coin channels must be programmed for the associated monetary values in the corresponding program steps. Unused channels must be programmed with the monetary value "0"!

See also chapter 3: "Programming of monetary value settings" and chapter 10: "Electr. coin– and bill acceptor".

Checking the monetary value settings: Select one program step between P071 and P075. After inserting a certain coin the channel associated with the coin is displayed, e.g. 50 pence in channel 2: Display P072 0050.

Changing the monetary settings: As an example, the 20 pence slot (channel 1) is not to be used: First enter program step P071 as described above. In the coin acceptor or on the adapter PCB of electronic coin validators the respective channel has to be blocked also so that these coins drop into the coin return.

Standard settings: The programming of standard settings is done with the command P070 and entering the number of the desired table values (see table "Monetary value settings" in the chapter "Programming of the phonograph"). The correct programming of all channels is done automatically after entering the number and pressing the key "H".

Programming information	Press keys	Displays 1	2	3
Direct selection of a command, Display of previous setting in P071.	See text.	P071		xxxx
New setting; no coin conversion	"000", "H".	P071		0000

If the standard setting according to the table is to be used thereafter, call up program step P070 (as described previously).

Ready for standard setting P071 through P075	See text.	P070		
Program standard table 1.	"1", "H".	P070		1

Press "C" key twice or close cabinet hood and **return to standard program (play mode).**

4 CD CHANGE / CASH COLLECTION

■ Open machine and activate cabinet switch (pull out plunger) to enter into service mode. Display 3 automatically shows the least played CD.

■ By pressing "1" successively, the next best CD is shown each time.

■ Unlock magazine, swing out; pull out the corresponding CD holders to change CD's. After changing push back CD holders until they lock in.

■ The title information of the new inserted CD must be recognized to the juke box by calling the command P161. You also may call–up P160 if you have finished the service.

■ Change corresponding title cards, unlock flip–chart unit and flap down. Get desired program tables in position with the button on the PCB of the right–hand side of the unit.

■ Read counters: P013 = Cash total
                        P016 = Counter for plays
                        P017 = Number of selected titles
                        P018 = Number of selected albums
                        P019 = Number of overplay titles
                        P020 = Number of payed credits
                        P021 = Number of free credits provided
                        P022 = Number of background titles played
                        P023 = Number of autoplay titles
                        P024 = Number of advertisement titles
                        P025 = Number of Happy–Hour credits

■ Erase counters: P033, and selected code number.

■ After service is finished call–up P160.
The read–in of all CD title information is done also while the cabinet is closed. If the read–in was completed the programm automatically returns to the normal play mode.

For more information see chapter 3 "Programming the phonograph.

UNIT DESCRIPTION

OUTPUT STAGE

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/ OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

Output Stage

The output stage is designed without induction coils or transformer and is therefore ironless. At full volume the music power is 200 W per channel when connected to a 2–ohm loudspeaker impedance.

Functions such as power supply, signal path and settings as well as repair aids are described in detail in the unit description "CENTRAL UNIT".

SPARE PARTS LIST
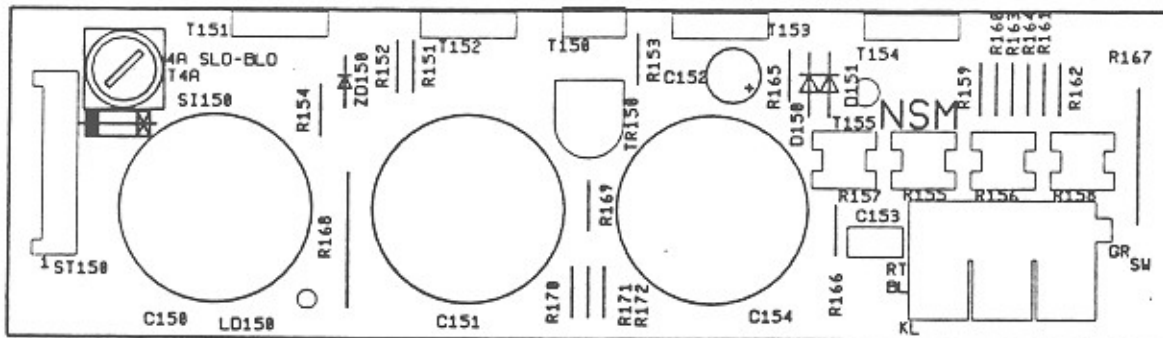
SPARE PARTS LIST

POS.	PART–No.	DESCRIPTION	DATA		QTY
	171 701	**OUTPUT STAGE, ASSY**	**50 Hz**		1
Si 150	225 036	FUSE	T 4 A träge		1
	225 747	CAP			1
	171 696	CHASSIS			1
	171 881	VENTILATOR, ASSY			1
	171 699	AIR VANE			1
	222 485	TEMPERATURE CONTROLLER			1
	171 704	CLAMP, STAMPED			2
	171 758	HOLDER			2
	250 177	COOLING PLATE			2
	171 759	COVER			2
		CB–OUTPUT STAGE			
	225 422	TERMINAL BAR	3 prongs		1
ST 150	225 654	PIN PANEL	10 prongs	SW	1
	225 746	FUSE HOLDER			2
D150,151	221 115	SI–DIODE	1 N 4004		2
ZD 150	221 650	SI–ZENER–DIODE	ZPD 33		1
LD 150	221 466	LUMINESZENZ–DIODE	CQY 65		1
T 150	221 883	SI–TRANSISTOR	NPN BD 239 B		1
T 155	221 459	SI–TRANSISTOR	PNP BD 256		1
T151,152	221 886	DARLINGTON–TRANSISTOR	NPN BDW 83 C		2
T153,154	221 902	DARLINGTON–TRANSISTOR	PDP BDW 84 C		2
C 153	220 333	MET.–CAPACITOR	0,22 µF	63 V	1
C 152	220 162	LYTIC	10 µF	63 V	1
C 154	220 396	LYTIC	4700 µF	50 V	1
C150,151	220 436	LYTIC	4700 µF	63 V	2
R 166	221 094	RESISTOR	2,7 Ohm	1/4 W	1
R152,153	221 096	RESISTOR	56 Ohm	1/4 W	2
R 170	231 154	RESISTOR	750 Ohm	1/4 W	1
R159–162	221 029	RESISTOR	1 KOhm	1/4 W	4
R163,164	221 034	RESISTOR	4,7 KOhm	1/4 W	2
R 154	221 625	RESISTOR	5,6 KOhm	1/4 W	1
R 165	221 604	RESISTOR	22 KOhm	1/4 W	1
R168,171	231 232	RESISTOR	6,8 KOhm	1/2 W	2
R151,172	221 627	RESISTOR	1,2 KOhm	1/4 W	1
R 167	221 276	WIRE WOUND RESISTOR	470 Ohm	1 W	1
R155–158	221 275	WIRE WOUND RESISTOR	0,22 Ohm	7 W	4

Thermoschalter
TEMPERATURE SWITCH

90°

R 168 6.8 K
C 151 4700µ 63V
C 150 4700µ 63V

Imax = 3,3A
IR = 40mA

60V

ZD 150 33V

R 154 5,6F
LD 150

(CD/10V) 15V
30V R 152 56

T 151 BDW 83 C
T 152 BDW 83 C

R 159 1K
R 160 1K

ST 150

R 151 1,2 K
T 150 BC 239 B

10
9 Si 150 1,4 A
8
7
6
5
4
3
2 GND
1

R 172 1,2K
R 171 6,8K
R 170 750

(CD/10V) 15V
28V

R 155 0,22
R 157 0,22
R 163 4,7K
ZD 150 1N4004

T 155 BC 256

29V

R 164 4,7K

(CD/8V) 14V
C 154 4700µ 50V

CENTRALE
linker Kanal Stecker ST 8
LEFT CHANNEL PLUG ST 8
rechter Kanal Stecker ST 9
RIGHT CHANNEL PLUG ST 9

R 156 0,22
R 158 0,22

R 161 1K
R 162 1K

151 1N4004

R 165 22 K
R 166 2,7
R 167 470
GND

C 152 10µ 63V
C 153 0,22µ

R 153 56
T 153 BDW 84 C
T 154 BDW 84 C

704

¼ W
½ W
1W
5W

ZD ZENER-DIODE

LD Leuchtdiode
LIGHT EMITTING DIODE
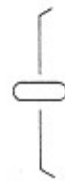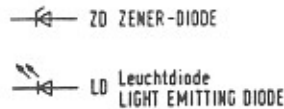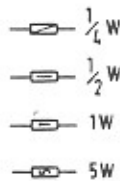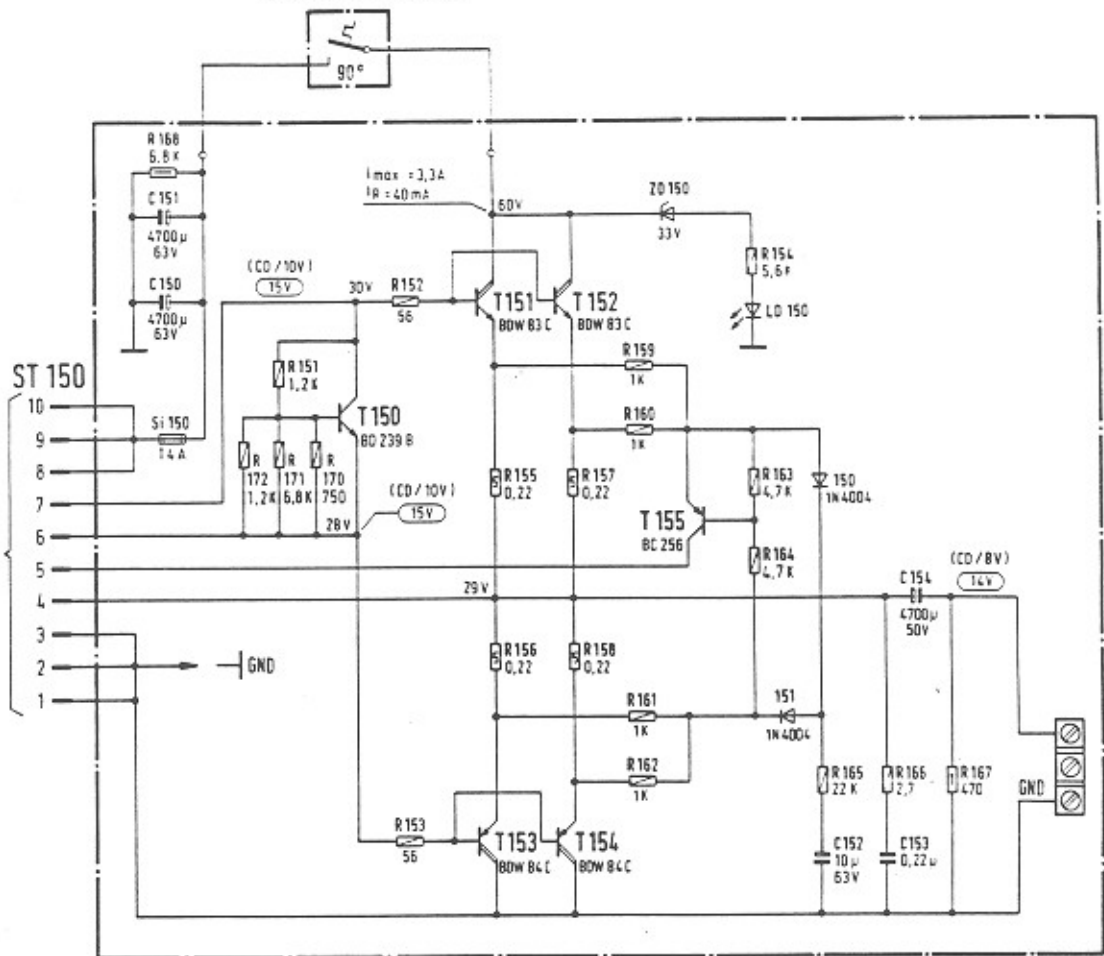
NF-Pegel bei 1 KHz, Lautstärkesteller auf max.
Höhen und Bässe max., ohne (CD/mit) AVC gemessen mit elektron. Voltmeter.
Gleichspannung gemessen mit Voltmeter Ri = 10 MΩ

AC SIGNAL VOLTAGES AT 1000 cps, VOLUME CONTROL TO MAX. TREBLES AND
BASSES MAX., WITHOUT (CD/WITH) AVC MEASURED WITH ELECTRONIC VOLTMETER
DC VOLTAGES MEASURED WITH VOLTMETER Ri = 10 MEG OHMS.

Alle Sicherungen träge !
ALL FUSES SLO BLO !

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

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

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

Draufsicht
TOP VIEW
E C B T 150

E C B T 151 - T 154

von unten gesehen
BOTTOM VIEW
C B E T 155

NSM MUSIKAUTOMATEN PHONOGRAPHS ES V-CD TECHNOLOGY

Schaltbild Endstufe
WIRING DIAGRAM OUTPUT STAGE

Dat.	Gez.	Bearb.	Gepr.
29.06.93	Braun		

176 393 / 176 352 / 176 514 / 176 610 / 176 598 / 176 705

07/93

UNIT DESCRIPTION

OUTPUT TRANSFORMER

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/ OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

13

Page 1301–1304

OUTPUT TRANSFORMER with cable harness

The output transformer is connected directly to the terminals of the output amplifier. It has input impedance of 4 ohms and transforms the input voltage down so that smaller output voltages are available at Connection Terminals 1 through 5 permitting speakers with lower impedances to be connected.
A number of loudspeakers can be connected together (in parallel) up to a total maximum power of 130 W music power per channel; depending on how much power is taken directly from the amplifier.
The table below shows the power required for a loudspeaker with the corresponding impedance at Connection Terminals 0–1 through 0–5. Also observe the output transformer diagram and connection schematics.
Further information is given in the "TECHNICAL INSTRUCTIONS" under "Loudspeaker Connection".

Endstufe ES.V
OUTPUT STAGE ES V

Externe Lautsprecher links
EXTERNAL SPEAKER LEFT

Externe Lautsprecher rechts
EXTERNAL SPEAKER RIGHT

Ausgangsübertrager
OUTPUT TRANSFORMER
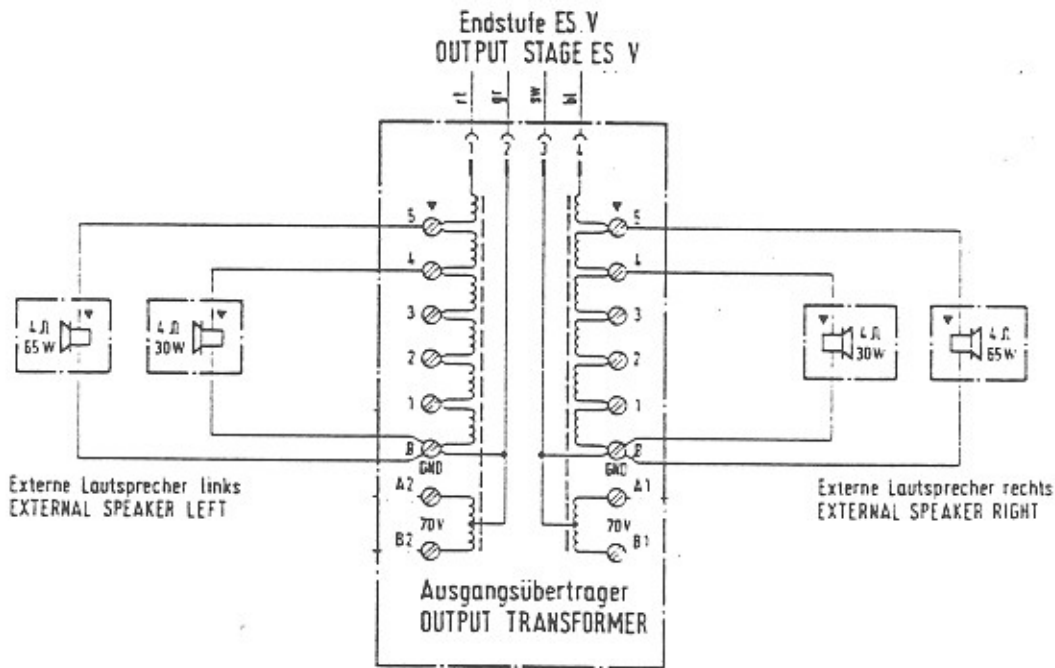
Anschlußschema für Ausgangsübertrager
CONNECTION DIAGRAM FOR OUTPUT TRANSFORMER
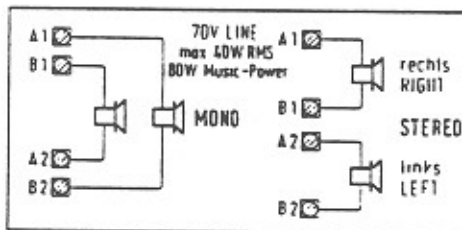
Klemme TERMINAL POSITION	Lautsprecher SPEAKER				
	2 Ω	2.5 Ω	4 Ω	8 Ω	16 Ω
0 - 5	130 W	100 W	65 W	35 W	18 W
0 - 4	60 W	48 W	30 W	16 W	8 W
0 - 3	30 W	24 W	15 W	8 W	4 W
0 - 2	15 W	12 W	7.5 W	4 W	2 W
0 - 1	3.7 W	3 W	1.8 W	1 W	0.5 W

Maximum Power Output Connections

The maximum power output of the amplifier is 2x200 W music power at
2 ohms.
The following is an example of how to connect external loudspeakers to the "CD GALAXY": The phonograph
itself consumes (when directly connected at 5.5 ohm impedance) 2x70 watts.
Therefore, 2x130 W is still available for external loudspeakers.
For example, two 4–ohm loudspeakers each can be connected to Terminals
0–5 (see diagram) or four loudspeakers (with 4 ohms each) can be connected to Terminals 0–4.

Example for connection of wallboxes or Hide–Away's
If loudspeakers with 4 ohm are connected directly to a wallbox or Hide–Away, the consumption is 100 watts;
therefore there is only 100 watts left for the loudspeaker connected to the transformer.

Connection for Lower Phonograph Output Power

When full power is not required from the phonograph, it can be connected to the corresponding terminals of
the transformer and external loudspeakers can then be connected directly to the output amplifier for higher
output.

70 V – High Voltage Output

Additionally, the transformer also has a 70 V high–voltage output (A1–B1/A2–B2) for each channel.
These features are provided for operation of a widespread external loudspeaker system whereby the higher
voltage keep the line losses low. Only loudspeakers with input transformers (socalled high–impedance loud-
speakers of 50 ohms upwards) can be connected to this terminal. these outputs also provide a maximum of
80 W music power each, e.g. two 50 W loudspeakers (200 ohms) can be connected to each channel.

| | A1–B1 A2–B2 | |
Lautsprecher–Impedanz Loudspeaker–Impedance	Music–Ausgangsleistung Output power (music)	Sinus–Ausgangsleistung RMS Output power
125 Ohm	80 W	40 W
250 Ohm	40 W	20 W
275 Ohm	35 W	18 W
400 Ohm	25 W	13 W
500 Ohm	20 W	10 W

The total wattage of all remote loudspeakers connected to one channel of the output transformer
(whether low impedance, high impedance or combined) may not exceed max.
130 W.

HV – MONO Mode

Since the high-voltage coils are connected with their center, a loudspeaker connected to A1–B2 or B1–A2 radiates sound from both (stereo) channels; for this mono mode no special NF–coupling of the channels is necessary, coupling is provided by the transformer.

left channels — A 2 / A 1

right channels — A 2 / A 1

MONO
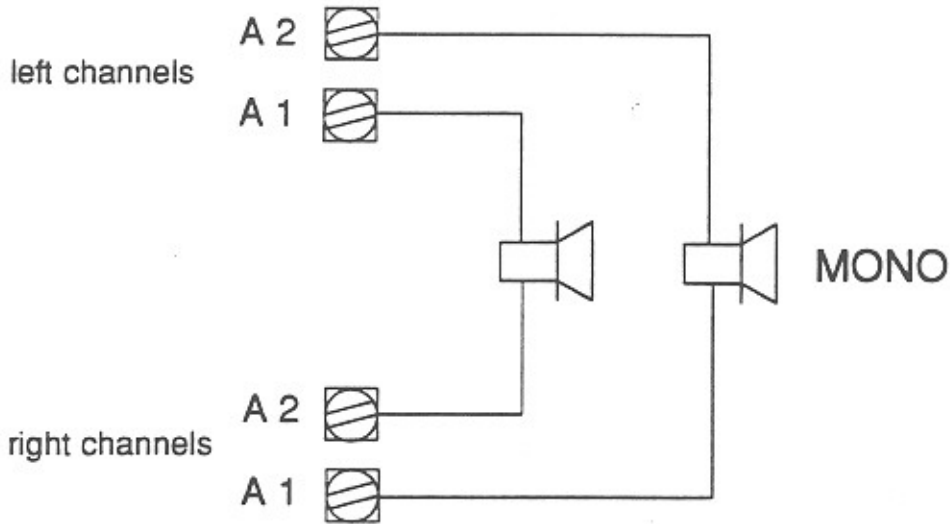
HV – STEREO Mode

If the loudspeakers are connected to A1–B1 or A2–B2, stereo mode is possible, but without NF–coupling of the channels.

left channels — A 2 / A 1

right channels — A 2 / A 1

STEREO
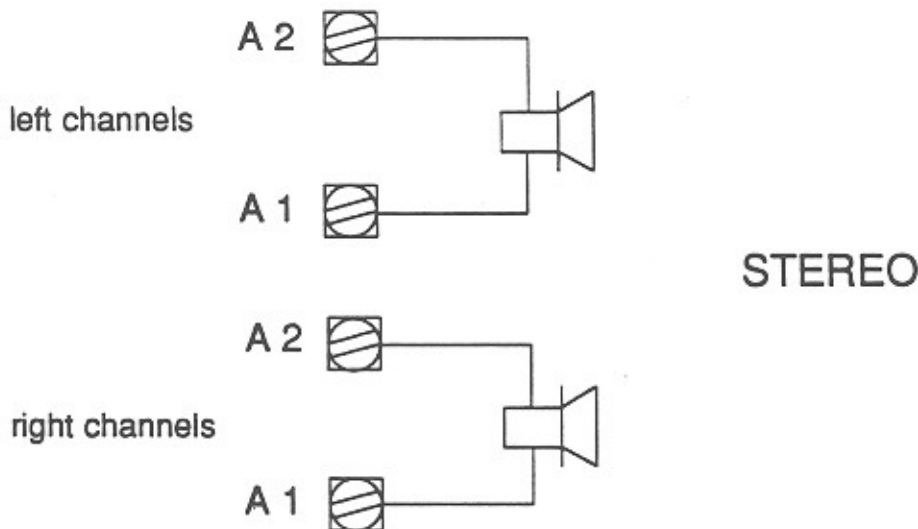
PROGRAMMING OF

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, Assy

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

3

Table of contents

Overview of tables used

PROGRAMMING OF PHONOGRAPHS

Main Menu

In order to program NSM phonographs in a simple yet extensive fashion, a service program has been installed with which the different settings can be altered via the keyboard of the phonograph.
In order to get to operating mode "programming", the following steps must be taken:

> Opening of cabinet lid (door) and
> pulling out service switch (cabinet interlock switch).

By changing the display, the phonograph indicates that it is in operating mode "programming". The display shows the following text:
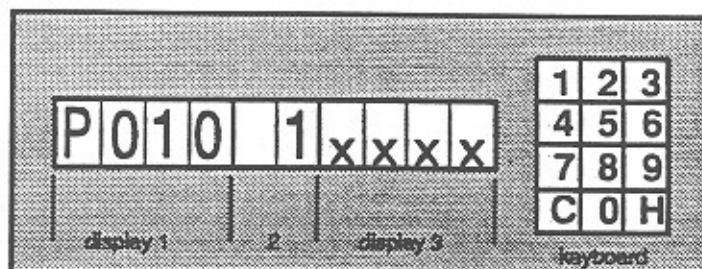
Illustration: "Display after calling up command mode"

The display "popularity" shows the least played CD. When pressing "C", the display is cancelled. To the left the letter "P" appears. Now enter the desired command number. Zeros before the number can be left out. Pressing "H" confirms the entry.
For example:

> Enter: *P 40 H 1 H*   to program the phonhgraph with all default values.

In order to find single commands easier, all possible commands are put together in single groups. Compared to their predecessors, the programming of machines with ES–V technology is much more extensive. The commands of Groups 1 to 6 and 14 have previously existed, but have been revised. The commands in Groups 7 to 13 have been added. By integrating a real time clock, the phonograph has been equipped with some very interesting new commands. Thus, the phonographs have become even more attractive.

In Table 1 "Overview of Commands of the Service Program" the 14 command groups existing now are listed.

Table 1: "Overview of Commands of the Service Program"

Group	Name of Command Group	Command Numbers
1	Authorization	P001...P002
2	Statistics	P010...P026
3	Data Transfer/Cancellation	P030...P033
4	General Settings	P040...P054
5	Price Setting	P060...P066
6	Monetary Value Setting	P070...P076
7	Programming Real Time Clock	P080...P082
8	Programming Free Credits	P090...P094
9	Programming Background Music	P100...P107
10	Programming Auto Play	P110...P117
11	Programming Advertising	P120...P127
12	Lock–out of Different Titles	P130...P135
13	Programming Happy–Hour–Credits	P140...P144
14	Test Programs	P150...P164

The following "Programming table for NSM–phonographs" lists all commands possible with this service program. When entering the respective command number, one can eliminate the leading zeros. A command called up in error can be cancelled by pressing "C".

Table of Programs for NSM Phonographs with ES V-Technology

Program	Description / Values
P001	Authorization! Enter code: "-pppp-"
P002*	Change authorization code "-pppp-"
	Statistics:
P010	0- No. of least played CD / 1- No. of second-least played CD
P011	0- No. of the most played (beat) CD / 1- No. of the second-beat CD / 2- No. of plays / 3- Data about any CD
P012	0- Top-title, Hit #1 / 1- Second-beat title
P013*	0- Cash amount since last evaluation / 1- Accumulated Cashbox amount
P014*	0- Number of coins through Chute 1 (K1) / 1- Number of coins through Chute 2 (K2) / 2- Number of coins through Chute 3 (K3) / 3- No. of coins through K4 or bits NP1 / 4- Number of bits through validator NP2 / 5- Accumulated counter for K1 / 6- Accumulated counter for K2 / 7- Accumulated counter for K3 / 8- Accumulated counter for K4 or NP1 / 9- Accumulated counter for K5 or NP2
P015* 1)	Light show in stand-by, if installed
P016*	Light show in operation, if installed
P017*	0- Counter of selected titles / 1- Accumulated counter
P018*	0- Counter of album selections / 1- Accumulated counter
P019*	0- Counter of overplay titles / 1- Accumulated counter
P020*	0- Cash amount of wall box / 1- Accumulated Cashbox amount
P021*	0- Counter for paid credits / 1- Accumulated counter
P022*	0- Counter for free credits / 1- Accumulated counter
P023*	0- Counter for background titles / 1- Accumulated counter
P024*	0- Counter for autoplay titles / 1- Accumulated counter
P025*	0- Counter for advertising tracks / 1- Accumulated counter
P026	0- Counter for Happy-Hour-credits / 1- Accumulated counter
P027	reserve
P028	reserve
P029	Number of unused credits
P030	Number of selections not yet played
	Datatransfer to DATA PRINT in textmode / 0- cashbox,counters,popularity,errors,...
P031*	Datatransfer to DATA PRINT in graphic mode "-pppp-" / 0- all available data / 1- Cashbox / 2- Counter with cashbox / 3- General settings / 4- Popularity of all CDs / 5- Top 30 hits / 6- Previous 20 error reports
P032*	Option
P033*	Cancellation routines! / 0+H- Cancels all memories! / 1+H- Cancels top 30 hits! / 2+H- Cancels popularity! / 3+H- Cancels counters and cashbox / 4+H- Cancels cashbox! / 5+H- Cancels all selection memories! / 6+H- Cancels all error report memories!
P040*	General settings: / 0+H Default values for 41 to 54, 77, 94 / 1+H Default values for 41 to 54, 77, 94, 104, 107 and 114, 117
P041*	Define machine code number, maximum 4 digits
P042	Selection code for CDTRACK (title) "0024" / max. 100CDs, 99 tracks
P043	Light show in stand-by, if installed "1105"
P044	Light show in operation, if installed "1000"
P045*	Time limit for play in minutes for one title (0=no limit)
P046	Sequence of play for normal selections (0/1/2) "0 (FIFO)"
P047	Maximum number of titles in a sequence from one CD (0= no limit)
P048	Automatic advancing of title display in minutes (0= none)
P049*	Cancels credits after power off/stand-by "2" (x=0-no, 1 to 240=yes) x/10hrs.
P050*	Cancels selection memory after power off (x=0-no, 1 to 240=yes) x/10 hrs. "2"
P051*	Maximum volume in play operation (max. 31) "31"
P052*	Maximum volume for background music (max. 31) "16"
P053	Set volume "0505"
P054	Set treble and bass "0808"
P060*	Price settings: see table "Price settings"
P061*	0+H- Cancels previous price setting / n+H- Selection "n" from table (s.a.) / Arbitrary price setting for chute 1 "xx yyyy" / xx-selections, yyyy-price
P062*	ditto for chute 2
P063*	ditto for chute 3
P064*	ditto for chute 4
P065*	ditto for chute 5
P066*	Bonus listing for album selection "1" / 0- No album selection allowed / 1- No bonus / 2- 1 bonus for 5 Titles / 3- 1 bonus for 4 Titles / 4- 1 bonus for 3 Titles
P070*	Monetary value settings: see table "Monetary value settings"
P071*	0+H- Cancels previous monetary value / n+H- Selection "n" from table (s.a.) / Arbitrary monetary value setting f. chute 1 "zzzz" / zzzz=coin value (0500=$ 5,-)
P072*	ditto for chute 2
P073*	ditto for chute 3
P074*	ditto for chute 4
P075*	ditto for chute 5
P076*	Bonus credits for bill insert "0"
P077*	0- indirect revaluation / 1- direct revaluation "0"
P080*	Program real time clock: "hhmm" / Set time
P081*	Set date "ddmmyy"
P082*	Set week-day (d=1 to 7) "d"
P090*	Program free credits: "2" / 0+H- default, cancels entries + time
P091*	Start time for time window "Free Credit"
P092*	Stop time for time window "Free Credit"
P093*	Active on weekday(s) "x" (x = 1 to 7) "16" / (0=no,1=yes)+H
P094*	Number of free credits: "0505" / 0: No free credits
P100*	Program background music: "0808" / 0+H- default,cancels entries + time
P101*	Start time for time window "Background music" "xx yyyy"
P102*	Stop time for time window "Background music"
P103*	ditto for chute 3
P104*	Lock for background music (BGM): / 0- No BGM / 1= BGM possible in time window / 2= BGM automatically in time window "-1-"
P105*	Entry of 20 titles or albums "1" / Enter: nnnn+H
P106*	Patron Selection / (0=free, 1=locked for guests)
P107*	Sequence of play / (0=FIFO, 1=RANDOM) "0"
P110*	Program auto play: / 0+H- default,cancels entries + time
P111*	Start time for time window "Auto Play"
P112*	Stop time for time window "Auto Play" "zzzz"
P113*	Active on weekday(s) "x" (x = 1 to 7) / (0=no,1=yes)+H
P114*	Time between two titles in minutes / Enter: nn+H (0=no auto play) "3"
P115*	Entry of 20 titles or albums "4" / Enter: nnnn+H
P116*	Patron Selection / (0=free, 1=locked for guests) "5"
P117*	Sequence of play / (0=FIFO, 1=RANDOM) "0"
P120*	Program advertisement play: "0" / 0+H- default,cancels entries + time
P121*	Start time for time window "Advertisement"
P122*	Stop time for time window "Advertisement"
P123*	Active on weekday(s) "x" (x = 1 to 7) "d" / (0=no,1=yes)+H
P124*	Time between two titles in minutes / Enter: nn+H (0=no advert.)
P125*	Entry of 20 titles or albums / Enter: nnnn+H
P126*	Patron Selection / (0=free, 1=locked for guests)
P127*	Sequence of play / (0=FIFO, 1=RANDOM) "0"
P130*	Lock-out certain titles: / 0+H- default,cancels entries + time
P131*	Start time for time window "Free title selection"
P132*	Stop time for time window "Free title selection"
P133*	Active on weekday(s) "x" (x = 1 to 7) / (0=no,1=yes)+H
P134*	Activate lock: 1- Title locked / 0- Title in time window available
P135*	Entry of 20 titles or albums / Enter: nnnn+H
P140*	Program Happy-Hour-credits: / 0+H- default, no Happy-Hour
P141*	Start time for time window "Happy-Hour" "-1-"
P142*	Stop time for time window "Happy-Hour"
P143*	Active on weekday(s) "x" (x = 1 to 7) "1" / (0=no,1=yes)+H
P144*	Calculation number (n=1 to 5) "0" / Enter n+H (0=no Happy-Hour)
	CALLING UP TEST PROGRAMS:
P150	Read out error report memory / 0- Last reported error / 1- Previous error report / 2- CD-Nr. at which the error occured / 3- Time of occurence / 4- Date of occurence
P151	0- Continuous run 1 all CDs played for 16 sec. each "15"
P152	0- Selected CDs played for 16 sec each / Enter: nnnn+H
P153	0- Continuous run 3. All CDs are placed in the lift, but not played / 1- Continuous run 4 6 CDs are continually played for 16 sec. (1,25,50,51,75,00) "-1-" / 2- Continuous run 5, 2x cont run 3, thereafter repeated cont run 4
P155	0- Lamp test (F6). Stop with key "C"
P156	0- Input test (F7). Stop with key "C"
P157	0- manual control of the CD-changer / Enter CD-nr nn"+H / Stop with key "C" / Stop the continuous runs always with the cabinet switch!
	Title memory:
P160	0- Read in all CD titles / i.e with initial equipping of all CDs
P161	Read in the titles of one newly equipped CD Enter CD# nn"+H / Read the title memory
P162	0- Number of titles from first CD / 1- Number of titles from the next CD / 2- Number of titles from the last CD
P163	3- Number of titles from any CD / Enter CD # nn"+H / Cancels title memory of all CDs / 0+H- all entries = 1
P164	Switch signal sources: / (only necessary when servicing) / 0+H- Mute (no signal source) / 1+H- CD-player / 2+H- Tape or cassette player / 3+H- Microfone

1) not yet implemented   "Values" = factory settings   ...ut of authorization code necessary

1. Authorization P001 to P002

Because the jukeboxes can be programmed with so many important data as well as input in cash counter and statistics, it is even more important than before that only authorized personnel may have access. For this reason access to essential data of the phonograph can be protected by using an authorization code.

P001 – Authorization: In order to call up the protected commands, one must start authorization by using the P001 command.

> *Enter: P 001 H P P P P H   or   P 1 H P P P P H*

The authorization code "0000" has been programmed for delivery. The phonograph is not protected and the operator can choose his own code by entering command P002. For security reasons the code number is not shown. In the display each number is shown as "P. When "PPPP" is shown, the secret code number is complete and after pressing "H" and leaving the programming mode, the machine is protected.

P002 – Changing of authorization code: During regular operation changing of the authorization code is only possible after previous authorization. Illegal misuse is thus prevented.

> *Enter: P 001 H P P P P H (for authorization)*

```
┌─────────────────────────────────────┐
│  P001         ▨       PPPP           │
└─────────────────────────────────────┘
```
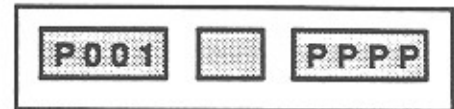
> *Enter: P 002 H p p p p H (when entering new authorization code)*

Caution: As described beforehand, the authorization code is NEVER shown! Therefore, it is important that the code is never lost since there is no opportunity to reprogram the phonograph.

2. Statistics P010 to P029

Within the command group statistics there is information regarding cash and number values as well as statements as to how often CDs are played (popularity, hit parade).

The single comamnds for cash value and counters are divided into two groups. The regular information is under code "0". Cumulated values are under code "1" which have been added up since the jukebox has been operating.

Individual commands:

Popularity: Relating to CD albums, the commands P010 and P011 exist in order to determine the popularity.

P010:
    0: Display of number of **least played CD**
    1: Display of number of the next higher CD (stepping through with "1")
    2: Number of plays
    3: Information to any CD (enter CD number)

After entering the proper code, the display shows the information such as the following:

> *Enter: P 010 H   0   i.e. least played CD No. 45*
>   1

```
┌─────────────────────────────────────┐
│  P010        1           45          │
└─────────────────────────────────────┘
```
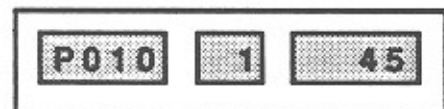
> *Enter: P 010 H   2   i.e. 13269 plays*

```
┌─────────────────────────────────────┐
│  P010        1         3269          │
└─────────────────────────────────────┘
```

> *Enter: P 010 H   3 53 H*
>   *i.e. CD No. 53 in 17th place*

```
┌─────────────────────────────────────┐
│  P010        17          53          │
└─────────────────────────────────────┘
```
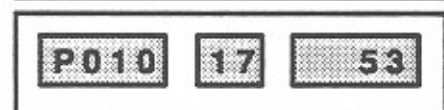
P011:   0: Display of number of **most popular CD**
1: Display of number of next higher CD (advance with "1"
2: Number of plays
3: Information regarding any CD (enter CD number).

After entering the proper code, the display shows the respective data.

Enter: P 011 H 0 *i.e. most popular CD No. 19*		`P011` `1` `19`
1		

Enter: P 011 H   2   *i.e. 731 plays*   `P011`   `  `   `731`

Enter: P 011 H   3 24 H
                     i.e. CD No. 24 in 2nd place   `P011`   `2`   `24`

Hit Parade: One can also call up the top 30 titles.

P012:   0: Display of top title number, Hit No. 1
1: Display 2nd best title (advance with key "1")
2: Number of plays of the actual title

Enter: P 012 H   0   `P012`   `16`   `0103`
               1   *i.e. in 16th place: Title 3 of CD 1*

                                                CD–No.   title

               2   *i.e. this title was played*
                    169 times until now: `P012`   `16`   `169`

Values of several counters: The following commands display the actual cash contents as well as diverse counter readings since the last collection. One receives statistics concerning the entire time of operation by reading the cumulated counters.

Cashbox: The display of the cash amount is done by total numbers, read out in currency amounts. Contrary to the monetary value setting in command group P07x where the coin value multiplied by factor 100 is displayed, i.e. $1.— are entered in P07x as 0100, but are shown as 1 in P013.

Display of the cash contents is indicated by maximum 6 spaces (max. display: $ 99 9,999.–).

P013:   0: Display of cash contents since the last collection
1: cumulated cash contents

Enter: P 013 H   0   `P013`   `3`   `4829`
               1   *i.e. $34,829.–*

Coin counter/bill counter: Besides displaying the cash levels, the counters of the individual money chutes can be called up. This makes possible an additional control of the cash contents. The five integrated counters are distributed as follows:

Chutes 1 to 3: only coins (defined by monetary value setting P071 to P073)
Chute 4: coins as well as bills (can be selected with P074)
Chute 5: only bills (defined by P075)

The total of the individual counters corresponds to the total of the cashbox contents.

P014:
0: Number of coins through Chute 1 (enter P071)
1: Number of coins through Chute 2 (enter P072)
2: Number of coins through Chute 3 (enter P073)
3: Number of coins through Chute 4 and/or bills counted in Bill Validator 1 (enter P074)
4: Number of bills counted in Bill Validator 2 (enter P075)

5: Cumulated counter Chute 1 (enter P071)
6: Cumulated counter Chute 2 (enter P072)
7: Cumulated counter Chute 3 (enter P073)
8: Cumulated counter Chute 4 (enter P074)
9: Cumulated counter Chute 5 (enter P075)

Enter: P 014 H   0
                  1   i.e. 12.543 coins through
                  2   channel 2:
                  ...
                  9

P014	1	2543
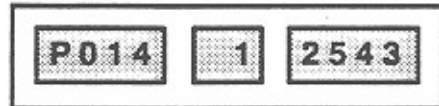
The respective cashbox total is derived by multiplying: number of coins x monetary value of coin.

Additional Counters: With commands P016 to P025 diverse counters can be called up which can be used as actual counters and as cumulative ones as the commands described previously. The statistical data contained therein can be used to settle accounts.

P016:
0: Number of **titles played**
1: Cumulated counter

P017:
0: Number of **titles chosen**
1: Cumulated counter

P018:
0: Number of **albums chosen**
1: Cumulated counter

P019:
0: Number of **overplay titles**
1: Cumulated counter

P020:
0: Number of **credits paid**
1: Cumulated counter

P021:
0: Number of **free credits**
1: Cumulated counter

P022:
0: Number of **background titles**
1: Cumulated counter

P023:
0: Number of **titles in auto play mode**
1: Cumulated counter

P024:
0: Number of **advertising titles**
1: Cumulated counter

P025:
0: Number of **Happy–Hour–credits**
1: Cumulated counter

>>

I.e.: calling up number of titles played; a total of 10273 titles were played on this jukebox.

Enter: *P 016 H*   1   *i.e. 10,273 titles played in total*

```
┌─────────────────────────────────────┐
│  ┌──────┐   ┌────┐   ┌──────┐        │
│  │P 016 │   │  1 │   │0 273 │        │
│  └──────┘   └────┘   └──────┘        │
└─────────────────────────────────────┘
```
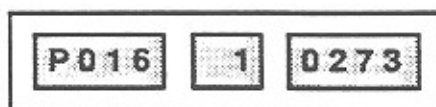
The counters P026 and P027 are not used.

Further interesting data are recorded in counters P028 and P029.

__P028__: Number of credits unused.
                This shows the number of payed credits available for selections of titles or albums.

__P029__: Number of chosen unplayed titles.
                This shows how many entries are remaining in the selection storage.

3. Data Transfer/Cancellation! P030 to P033

In this group of service program commands the stored data in the counters mentioned beforehand are pre-
pared for output to a DATA PRINT or to evaluation devices which process the data. Prerequisite is, for in-
stance, the DATA PRINT is already connected to the evaluation connector (ST2 on the control unit). After
calling up the command and entering the respective code, data transfer follows.
There are two ways of Print–out possible:

> P030 transfers all available data in text mode. The data are stored within the DATA PRINT.
> They can be printed out or edited on a PC i.e. with the software DATA CONTACT.
> The counters of the phonograph are deleted after the print–out is done and the cabinet lid is
> closed.
> P031 transfers all data in graphic mode. The data are printed–out directly after recieving.

See also the print–out examples in chapter 15.

If an error is determined, "E0" is shown in Display 3. In that case, please check the connection to DATA
PRINT.

Display of the Jukebox if a transfer error occurs:

```
┌─────────────────────────────────────┐
│  ┌──────┐   ┌────┐   ┌──────┐        │
│  │P 03x │   │    │   │  E 0 │        │
│  └──────┘   └────┘   └──────┘        │
└─────────────────────────────────────┘
```
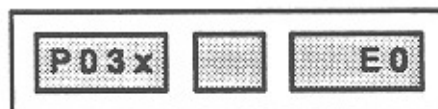
Remember to pull out the interface cord after the print–out is finished.

DATA PRINT Print–out in Text Mode

__P030__: 0: All data of the statistics counters are processed
                   and sent to DATA PRINT. There they are stored and printed out depending on DATA
                   PRINT setting.

The stored data can continue to be processed by a PC, i.e. by DATA CONTACT.

Enter: *P 030 H*   0
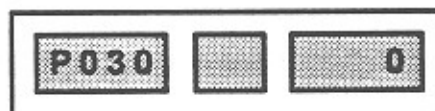
```
┌─────────────────────────────────────┐
│  ┌──────┐   ┌────┐   ┌──────┐        │
│  │P 030 │   │    │   │    0 │        │
│  └──────┘   └────┘   └──────┘        │
└─────────────────────────────────────┘
```

The counters of the phonograph are deleted after the print–out is done and the cabinet lid is closed.

DATA PRINT Print-out in Graphic Mode

Contrary to the output of P030, the entire statistics as well as individual statistical areas can be printed out by P031. But the data are not stored within the DATA PRINT.

P031:
- 0: Print all data
- 1: Cashbox amount
- 2: Counter with cashbox
- 3: General settings
- 4: Popularity of all CDs
- 5: Hit parade of the best 30 titles
- 6: The last 20 errors shown

Enter: P 031 H   0
                 1
                 ...   i.e. 4 print-out popularity:
                 6

P 0 3 1		4
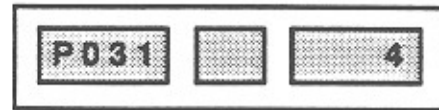
! CANCELLATION

The P30 group contains not only the printing commands but also the cancellation commands of counters P010 to P024. Only the "regular" counters are cancelled. The cumulated counters are excluded from cancellation. The memories for credit and selection of titles as well as the error memory are cancelled. To avoid the cancellation of data by accident or by unauthorized persons, this function can be protected by an authorization code (enter P001).

P033:
- 0+H: Cancellation of all memory contents   **!!CAUTION!!**
- 1+h: Cancels hit parade (P012)
- 2+H: Cancels popularity (P010)
- 3+H: Cancels counters and cashbox contents (P013–P024)
- 4+H: Cancels credit memory
- 5+H: Cancels selection memory
- 6+H: Cancels error memory

To additionally safeguard accidental cancellations, each input has to be confirmed by pressing "H".

Enter: P 033 H   0 H
                 1 H
                 2 H   i.e. cancel popularity:
                 ...
                 6 H

P 0 3 3		2
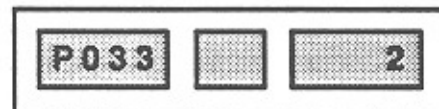
4. General Settings P040 to P054

In order to adjust each phonograph individually to the location requirements, certain general settings can be individually changed. Basis are detailed values which have been set at the factory (Note: "default values").

P040:   0+H: programming of **default values** (P041 to P054, P077, P094)
                     cancellation of values (P091 to P144), set to inactive:

P041:	0	P050	2	P077	0
P042:	0024	P051	31	P094	0
P043	1105	P052	16		
P044	1000	P053	0505		
P045	0	P054	0808		
P046	0				
P047	0				
P048	0				
P049	2				

      1+H: as above, additional programming of default values for:

backgroundmusic autoplaytitles with defined acces to all CDs.

P104:	1	P114	15
P107:	0	P117	1

Enter: P 040 H   *0 H*
                           1 H *i.e. set default values*

```
┌──────────────────────────────────┐
│ ┌────────┐ ┌────────┐ ┌────────┐ │
│ │ P 0 4 0│ │        │ │      0 │ │
│ └────────┘ └────────┘ └────────┘ │
└──────────────────────────────────┘
```

P041:   **I.D. Number**; every phonograph can be programmed with its own I.D. number. Data print-outs can then be easily identified when several machines are evaluated. The I.D. number has at most 4 digits.

Enter: P 041 H   *nnnn H*

```
┌──────────────────────────────────┐
│ ┌────────┐ ┌────────┐ ┌────────┐ │
│ │ P 0 4 1│ │        │ │ 2 6 0 2│ │
│ └────────┘ └────────┘ └────────┘ │
└──────────────────────────────────┘
```

P042:   **Maximum number of selectable CDs and titles**; in partially equipped phonographs, unused magazine slots can be excluded. A maximum of 100 CDs (01–to 00) as well as a maximum of 99 titles can thus be selected. (Default value: 24).

Enter: P 042 H   *0024 H*
                           i.e. release 100 CDs with
                           24 titles each to be selected

```
┌──────────────────────────────────┐
│ ┌────────┐ ┌────────┐ ┌────────┐ │
│ │ P 0 4 2│ │        │ │ 0 0 2 4│ │
│ └────────┘ └────────┘ └────────┘ │
└──────────────────────────────────┘
```

Please remember that with each change regarding the number of CDs, the new parameters will have to be reported to the juke box via program step P160 or P161. Otherwise, there will be problems when playing the CD.

P043: **Light in stand—by;** a light generator can be programmed. hich causes the phonograph to attract the patrons' attention as long as no music has been selected. OPTION!

Enter: P 043 H

P043		1105
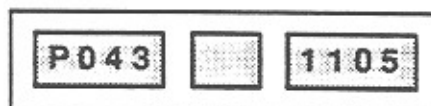
Programming the running light is done by entering a 4 digit number according to the following scheme:

A: Switch over charakteristica	0= hardly		1105:	Running light no.05,
	1= softly	A B C D → 1105		slowly with softly
B: Speed	0= slowly	0 0 0 1		switching light.
	3= fast	▼ ▼ ▼ ▼		
C+D: various running lights	01 to 15	1 3 1 5		

P044: **Light during play;** another light generator can be programmed here to differentiate between the two. OPTION!

Enter: P 044 H

P044		1000
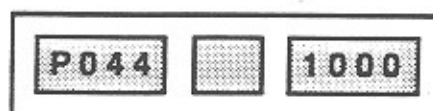
Programming the light show is done by entering a 4 digit number according to the following scheme:

A: Mode of operation	0= steady light		1000:	light organ, relative dark
	1= light organ	A B C D → 1000		
B: Basic brightness/contrast	0= dark	0 0 0 0		
	3= bright	▼ ▼		
C+D: Various light effects	00= lightorgan	1 3		
	01 to 15 s.o.			

P045: **Limit play time of one track** in minutes; in order to suppress too long titles play time can be limited. The title just playing will slowly fade when the time (value "nn" in minutes) is up. When entering 0, there is no limit.

Enter: P 045 H   nn H
3 H: titles will slowly fade after 3 min.

P045		3
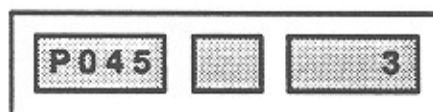
P046: **Sequence of plays at normal selection:** in order to alter the music menu, three variations can be chosen when playing different titles:
0 – play as selected (FIFO)
1 – play in numerically ascending numbers
2 – play randomly (RANDOM).

Enter: P 046 H   n H
2 H   i.e. play randomly

P046		2
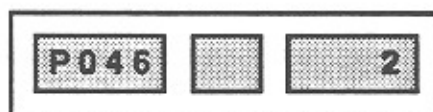
P047:   **Maximum number of titles of one CD** (value "n" as number)in sequence; here it is determined how many titles of one CD are played in sequence. 0 means no limit.

Enter: *P 047 H*   *n H*

               0 H   i. e. no limit

P 0 4 7		0

P048:   **Automatic advancing of title display;** 0 = no automatic advancing. If minutes are entered here (value "nn"), the title display is changed accordingly in stand–by.

Enter: *P 048 H*   *nn H*
                 10 H i.e. advancing of
                        title display every 10 min.

P 0 4 8		1 0

P049:   **Cancel credit** after X/10 hrs. (X x 6 min.) power off or stand–by.
P050:   **Cancel selection memory** after X/10 hrs. (X x 6 min.) power off.

        Value "X" can be between 0 and 240 with commands P049 and P050.
        i.e. X = 1: waiting time = 6 min.
           X = 10: waiting time = 1 hr.
           X = 240: waiting time = 24 hrs.

        "0" does not cancel.

Enter: *P 049 H*   *2 H*
                 i.e. cancel credit after 12 min.
                 power off/stand–by (2/10 hrs.):

P 0 4 9		2

Enter: *P 050 H*   *4 H*
                 i.e. cancel selection memory
                 after 24 min. power off:

P 0 5 0		4

Maximum Volume Levels

Maximum volume levels during play and background mode can be pre–set to a certain limit. The manually adjustable volume level of the phonograph cannot go beyond the set levels.

P051:   **Maximum volume during play;** can be set between 0 (mute) and 31 (loud).

P052:   **Maximum volume during background mode;** can be set between 0 (mute) and 31 (loud).

Enter: *P 051 H*   *31 H*
                 i.e. maximum volume possible

P 0 5 1		3 1

312

Set volume for play mode

With command **P053** the volume of the phonograph is set. This function can be set in two ways:

> In the program mode it can be set via the keypad of the phonograph or the remote control.
> In regular play mode it can only occur via remote control.

In both cases one hears the volume changes immediately.

Key pad layout for volume setting:

1 ▲ left channel louder	2 ▲ both channels louder	3 ▲ right channel louder
4	5	6
7 left channel quieter ▽	8 both channels quieter ▽	9 right channel quieter ▽
C Cancel	0	H Step to the next command.

Enter: P 053 H

Change per pressing keys
i.e.   Key "2" = louder

```
P053      1010
```
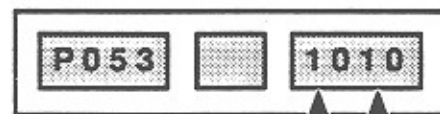
channel value: left, right

Sound setting

With command **P054** the sound setting is performed in a range from 1 to 10. Here treble and bass volume are set for both channels at the same time. The changed setting can also be immediately heard.

Key pad layout for sound setting:

1 ▲ more bass	2 ▲ more bass + treble	3 ▲ more treble
4 mean value	5 mean values	6 mean value
7 less bass ▽	8 less bass + treble ▽	9 less treble ▽
C Cancel	0	H Step to the next command.

Enter: P 054 H

Change per pressing keys
i.e.   Key "8" = less bass and treble

```
P054      0808
```
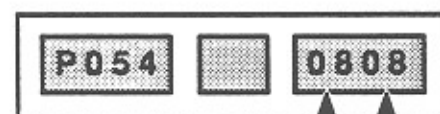
value of bass, treble

5. Price Settings P060 to P066

To make programming of credit values easier and faster, a table for price settings, standard value via code number, has been programmed for command **P060** in which actual price values have been entered. The programming of the five possible price levels can be automized with the table.

Another possibility is the individual programming of the individual price scales with commands **P061** to **P065**. Entry as per form plays/monetary value: nn xxxx (nn = two-digit number of plays, xxxx = 4-digit monetary value).

Table 2:"Price Settings"

Code No.	COUNTRY	P061	P062	P063	P064	P065	Remarks
0	———————	00 0000	00 0000	00 0000	00 0000	00 0000	no coin conversion in this setting
1	Germany	01 0100	01 0100	03 0200	03 0200	03 0200	1 play = 1,–DM
2	Belgium	02 2000	02 2000	02 2000	06 5000	06 5000	
3	Netherland	02 0100	02 0100	02 0100	06 0250	06 0250	2 different settings
4	France	02 0500	02 0500	10 1000	10 1000	10 1000	
5	Switzerland	02 0100	02 0100	05 0200	05 0200	14 0500	
6	Austria	01 0500	01 0500	03 1000	03 1000	07 2000	
7	Italy	01 0400	01 0400	01 0400	03 1000	03 1000	
8	Spain	01 0050	01 0050	02 0100	02 0100	05 0200	
9	Greece	01 2000	01 2000	01 2000	02 5000	02 5000	
10	Jugoslavia	01 0200	01 0200	01 0200	03 0500	03 0500	
11	Denmark	01 0300	01 0300	02 0500	05 1000	12 2000	4 different settings
12	Norway	01 0300	01 0300	02 0500	02 0500	04 1000	
13	Finland/Sweden	01 0300	01 0300	01 0300	02 0500	02 0500	
14	Hungary	01 2000	01 2000	01 2000	01 2000	01 2000	
15	Ireland	01 0010	01 0010	03 0020	03 0020	10 0050	
16	Great Britain	01 0030	01 0030	02 0050	02 0050	05 0100	
17	USA (1) / Canada	01 0050	01 0050	01 0050	03 0100	03 0100	Dollarbill on chan.5 (P065)
18	USA (2)	01 0050	01 0050	03 0100	03 0100	18 0500	
19	Africa	01 0020	01 0020	03 0050	03 0050	07 0100	
20	Australia	01 0100	01 0100	01 0100	03 0200	03 0200	
21	Netherl. Antillen	01 0400	01 0400	01 0400	01 0400	01 0400	
22	New Zealand	01 0050	01 0050	01 0050	01 0050	01 0050	

Programming the price settings by default values

P060: In order to program the phonograph with the default values of the table, the respective code number is entered after command P060 and confirmed with "H". The setting selected (n = code no. of the table) is automatically conferred to the respective price scales.

> Enter: **P 060 H**   n H
> 18 H i e. price setting: USA

P060		18
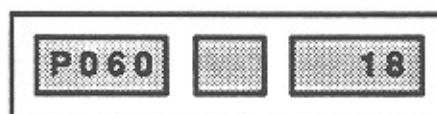
Programming the price settings with individual (personnel) values

P061 to P065: The stakes for the individual price scales can also be separately defined. With commands P061 to P065 the respective stake can be programmed.
You just have to observe the order of entering the values: P061 is programmed with the lowest and P065 is programmed with the highest Price setting.
Unused Steps may be programmed with zero or with the preceeding value (examples see table)

Example of individual price setting: 12 titles for $ 5,– (price scale 3).

Enter: *P 065 H 120500 H*

```
┌──────┐ ┌────┐ ┌──────┐
│ P065 │ │ 12 │ │ 0500 │
└──────┘ └────┘ └──────┘
```

Programming an album bonus

The setting of bonus credits for album selection is done with command P066 in the service program. The following settings are permitted:

P066:   0: no album selection possible
               1: no bonus (default setting),
               2: 1 bonus for every 5th track,
               3: 1 bonus for every 4th track,
               4: 1 bonus for every 3rd track.

Setting is confirmed by pressing "H".

Enter: *P 066 H   0 H*
              1   i.e. no bonus
              ...
              4

```
┌──────┐ ┌────┐ ┌──────┐
│ P066 │ │    │ │    1 │
└──────┘ └────┘ └──────┘
```
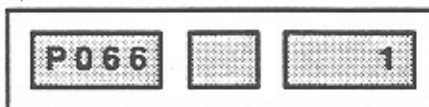
6. Monetary Value Setting P070 to P077

As with the price setting, the identification of the different coins as related to the monetary values processed by the phonograph, can be done automatically when the pre–defined basic values are sufficient.
Table 3 "Monetary Value Setting" shows which setting can be programmed as basic value (see next page).

__P070__: The **standard values** of the table are selected with command P070 "n" + "H" (n = code no. from table).

Enter: *P 070 H*   *n H*
                   10 H i.e. USA

P070		10
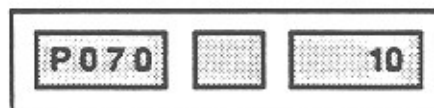
"n" is the code number for the respective setting. To avoid erroneous entries, each entry has to be confirmed by "H". This is very important since entry of Code Number 0 cancels the current monetary value setting and no currency acceptance is possible.

__P071 to P075__: **Individual monetary values**: as with the price setting, with the monetary value setting the coin value of each chute can be individually identified.
This is easily done by inserting one or more coins after command P070 has been called up. According to coin value the program changes to the proper chute command P071 to P075. On display 1 the monetary value of each coin is displayed. This can be changed as needed. Unused chutes have to be programmed with monetary value 0.

Entries occur in the smallest counting unit of each currency that makes sense, i.e.

USA   with $1,–   => 0100,
GERMANY with DM 5,– => 0500 or
AUSTRIA   with öS 20,–=> 2000.

Normally the standard setting is sufficient.

BONUS CREDITS

With command __P076__ another bonus (value n = 0 to 4) is defined. The bonus for paying with bills.

Enter: *P 076 H*   *nn H*
                3 H   i.e. 3 bonus credits

P076		3
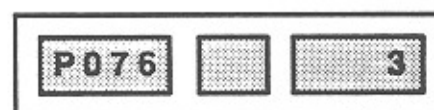
When accepting a bill in Chute 5, this bonus is added to the regular credits.

INDIRECT / DIRECT MONEY TO CREDIT REVALUATION

With this command it is possible to differ between the how and when of the revaluation of inserted coins.

__P077__: "0" + "H" Indirect revaluation: inserted coins are stored. At an appointed coins value the
                         credit is defined from the highest possible price setting, including a possible bonus.
      "1" + "H" Direct revaluation: inserted coins are revaluated directly after insertion.
                         Then no bonus is possible with multiple insertion of coins.

Enter: *P 077 H*   *n H*
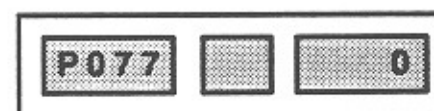   *0 H i.e. indirect revaluation*

P077		0

Table 3:"Monetary Settings"

Table No.	COUNTRY	channel 1(P071)	channel 2(P072)	channel 3(P073)	channel 4(P074)	channel 5(P075)	Remarks. example for 1 chan.
0	———————	0	0	0	0	0	no coin conversion
	mechanical coin acceptor						
1	Germany, Schwitzerland, Venezuela	100	500	200	0	0	100 = 1,–DM 100 = 1 sfr 100 = 1,–Bol
2	Belgium	0	2000	500	0	0	2000 = 20 Bfr
3	Netherlands	25	250	100	0	0	250 = 2,5 hfl
4	Denmark, France	100	500	1000	0	0	100 = 1 dkr
5	Austria	500	2000	1000	0	0	500 = 5 OS
6	Italy	200	100	500	0	0	200 = 200 L
7	Spain	0	25	100	0	0	25 = 25 Pst
8	Finland, Norway, Jugoslavia	0	500	100	0	0	500 = 5 mK 500 = 5 Kr 500 = 5 Din
9	Great Britain, Ireland	20	50	10	0	0	20 = 20 p
10	USA	10	50	25	0	100	10 = 10 c, 100 = 1 $
11	Canada	0	25	0	0	100	25 = 25 c, 100 = 1 $
12	Union of South–Africa	20	100	50	0	0	20 = 20 c, 100 = 1 R
13	Australia	100	50	20	0	0	100 = 1 $
14	Netherl. Antillen	0	100	25	0	0	100 = 1 NAF
	elektronic coin acceptor						
15	Germany, Schwitzerland, Italy	500	100	0	200	0	500 = 5,–DM 500 = 5sfr 500 = 500 L
16	Belgium	5000	500	0	2000	0	100 = 1 Bfr
17	Netherlands	25	250	500	100	0	25 = 25 c, 500 = 5 hfl
18	France	1000	200	100	500	0	1000 = 10 F
19	Denmark, Austria	2000	500	100	1000	0	2000 = 20 dkr 2000 = 20 ÖS
20	Spain	200	50	25	100	0	200 = 200 Pst
21	Greece	0	50	20	0	0	50 = 0,5 Dr
22	Norway	1000	100	0	500	0	1000 = 10 Kr
23	Finland	0	500	100	0	0	200 = 200 L
24	Sweden	500	100	0	100	0	500 = 5 Kr
25	Great Britain	100	20	10	50	0	100 = 1£, 20 = 20 p
26	USA	100	25	0	50	0	100 = 1$
27	Canada	10	100	25	0	0	10 = 10 c, 100 = 1 $
28	Australia	0	100	20	200	0	200 = 2 $
29	Netherl. Antillen	0	0	100	0	0	100 = 1 NAF
30	Neu Zeeland	50	10	5	20	0	50 = 50 c

Chutes entered with 0 on this table are blocked. One must be careful to block also the coin pathways so these coins will not be accepted and are rather expelled through the coin return.

7. Programming Real Time Clock P080 to P082

The most important modification of the ES–V technology is the implementation of a real time clock. Referring to the data supplied by the clock, a number of functions have been developed that are dependent on chronological data for start and stop times. Together with the weekday programming which continues to be available, an "automatic programm" for a whole week can be developed during which all functions operate automatically.

The real time clock runs quartz–precise with a battery backed–up power supply if the phonograph is turned off.

Set time: With command **P080** the time can be set. The newly set minute information starts the counter for seconds automatically at zero.

Keypad layout for command "set time":

1	2	3
▲ hour +1		▲ minute +1
4 12:00	**5** 00:00	**6** 30 minutes
7 hour −1 ▼	**8**	**9** minute −1 ▼
C Cancel	**0**	**H** Step to the next command

Enter: P 080 H

change per pressing keys i.e. 10.45 h

P080		1045

Set date: With command **P081** the date is set. The date is shown on displays 2 and 3.

Keypad layout for command "set date":

1	2	3
▲ day +1	▲ month +1	▲ year +1
4	**5**	**6**
7 day −1 ▼	**8** month −1 ▼	**9** year −1 ▼
C Cancel	**0**	**H** Step to the next command

Enter: P 081 H

change per pressing keys i. e. May 21, 1992:

P081	21	0592

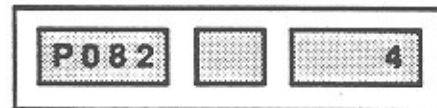**Set day code**: With command **P082** the day code is set for the week–day of the previous set date.

Key pad layout for command "set day code":

	1	2	3
			day code +1
	4	5	6
	7	8	9
			day code –1
	C Cancel	0	H Step to the next command

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

Enter: P 082 H

change per pressing keys
i.e Thursday is 4:

P082		4

After confirming one week–day entry the jukebox switches to the next week–day.

The data supplied by the real time clock are processed by commands P090 to P135 (described as follows) for the so–called time windows. Here the entry of the time window values also occurs via the illustrated key-pad layout.

Furthermore the informations of time and date are used for the print–out of statistical data to the DATA PRINT (P030 and P031).

8. Programming Free Credits P090 to P094

The group of 90th commands allows the operator to give free credits (music selection without coin insert) at certain times of the week.
Amount and type of free credits are set in the program as well as the time periods.

__P090__: In P090 a standard setting cancels automatically the previous setting.
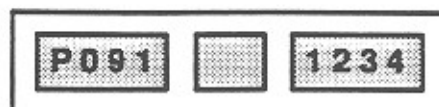The time factor is set to zero, so there are no automatic time periods for free credits.

Enter: *P 090 H   0 H*

```
┌─────────┐  ┌─────────┐  ┌─────────┐
│ P 0 9 0 │  │░░░░░░░░░│  │        0│
└─────────┘  └─────────┘  └─────────┘
```
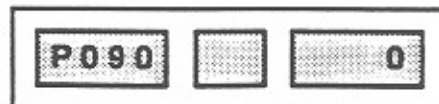
__P091__: To set the starting time for the time window "free credit," the keypad is used (see P080).

Enter: *P 091 H*   *Set per pressing keys*
i.e. starting time 12:34
confirm setting with key "H".

```
┌─────────┐  ┌─────────┐  ┌─────────┐
│ P 0 9 1 │  │░░░░░░░░░│  │ 1 2 3 4 │
└─────────┘  └─────────┘  └─────────┘
```

__P092__: Here the stop time of the a.m. time window is set (see P080).

Enter: *P 092 H*   *Set per pressing keys*
i.e. stopping time 13:45
confirm setting with key "H".

```
┌─────────┐  ┌─────────┐  ┌─────────┐
│ P 0 9 2 │  │░░░░░░░░░│  │ 1 3 4 5 │
└─────────┘  └─────────┘  └─────────┘
```
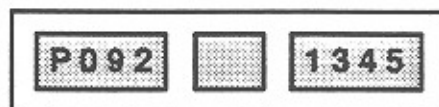
__P093__: Here the weekday is chosen on which the previously determined time window is to become active.

On the middle display the weekdays (according to the illustration of P082) are shown through Numbers 1 to 7. Each weekday can be activated individually. "1" means active on that day. "0" means non–active. The inputs must be confirmed by pressing "H".
To simplify the entries it is defined that the whole week is active with "0" or "1" (for all days).

Enter: *P 093 H   0 or 1 H*
Set per pressing keys
i.e. monday is inactive
confirm setting with key "H".

```
┌─────────┐  ┌─────────┐  ┌─────────┐
│ P 0 9 3 │  │    1    │  │        0│
└─────────┘  └─────────┘  └─────────┘
```

With confirming one week–day entry the software steps to the following week–day.

__P094__: Entering the number of free credits.

Different program types are possible:

0:       No free credits possible (default setting).
<200:   Limited free credit. Amount corresponds to input number. Free credits can be used
         individually. In the display the remaining credits are shown.
=200:   Unlimited free credit while time window is active.
=201:   Switching between no free credits and unlimited free credits while time window is active.
         Switching via remote control.
=202:   Unlimited free credit automatically while time window is active. If non–active switching is done via
         remote control.

Enter: *P 094 H   200 H*
                 i.e. no free credit:

```
┌─────────┐  ┌─────────┐  ┌─────────┐
│ P 0 9 4 │  │░░░░░░░░░│  │        0│
└─────────┘  └─────────┘  └─────────┘
```
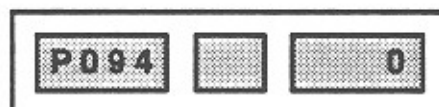
9. Programming Background Music P100 to P107

During those times when few people are present or for social festivities, the phonograph operator can call up the background mode. The played music is heard quietly in the background. This operational mode remains even after a power failure. If money is inserted into the machine and a title selected, the background music is interrupted for the duration of play. The factory setting (P040=1) defines that the background mode can be started and stopped by pressing the key "BACKGROUND" (P104=1, P107=0).

P100: If the command P100 is called up and "0" is entered and confirmed with "H", the default setting is activated because all settings of Group P10x will be set to 0.

   *Enter: P 100 H   0 H*

```
| P100 | [  ] |      0 |
```
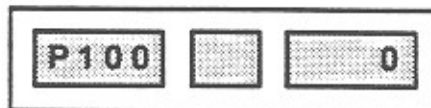
With command **P101** the starting time and with command **P102** the stopping time is set for the time window of background music. Key pad layout see P080.

P103: With command P103 the week-days are set when background music should be played. Key pad layout see P082.

      Enter: P 103 H   0 or 1 H
                              Set per pressing keys
   *i.e. Wednesday inactiv:*
                              confirm settings with key "H"

```
| P103 | 3 |      0 |
```
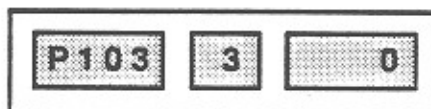
With confirming one week-day entry the software steps to the following week-day.

**P104**: With command P104 the mode of operation is set. Three types are possible.

P104 "0"   no background music.
P104 "1"   allows starting and stopping background music by pressing background key on machine or on remote control.
P104 "2"   automatically plays background music at defined times of the time window.

      Enter: P 104 H   n H
                             2 H   i.e. automatically within the time window

```
| P104 | [  ] |      2 |
```
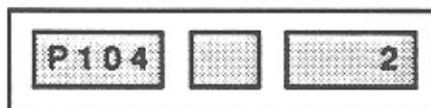
P105: What is played as background music, is also determined by the operator. With command P105, followed by 20 four-digit entries, 20 titles or albums can be determined. Without entry in P105 all CDs (defined by P042 to be selectable) are played.

      Enter: P 105 H   nnnn H
                             i.e. 1. entry: CD #17 title 3 and so on:

```
| P105 | [  ] |   1703 |
```
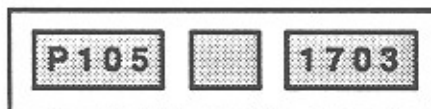
P106: Another new function is the "Patron Selection". With command P106 the operator determines whether the selected titles for background music can also be chosen by other customers.

P106 "0"   titles and albums free for selection,
P106 "1"   titles or albums are locked.

      Enter: P 106 H   n H
                             0 H   i.e. titles are not locked:

```
| P106 | [  ] |      0 |
```
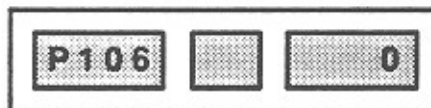
P107: The titles selected in P105 are played in the sequence selected in P107.

*P107 "0"   sequence of play in order of entry (FIFO), factory setting
P107 "1"   random play (RANDOM).

10. Programming Auto Play P110 to P117

The phonograph can be programmed to automatically play a title once in a while to animate the audience during stand–by, the time period when no selections are being made. The factory setting (P040=1) makes it possible that any title is played every 15 minutes (P114=15, P117=1).

P110: The standard setting is "**no auto play**" since with command P110 "0" +"H" all entries in group P11x are set to zero.

    Enter: P 110H   0 H

                      i.e. set default values:

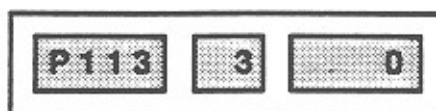   `P110`   `   `   `        0`
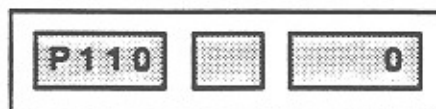
With command **P111** the starting time and with command **P112** the stopping time is set for the time window of auto play. Key pad layout see P080.

P113: With command P113 the week–days are set at which auto play should be active. Key pad layout see P082

    Enter: P 113 H   0 or 1 H

                      Set per pressing keys
                      i.e. Wednesday inactiv:
                      confirm settings with key "H"

                      `P113`   `3`   `        0`

With confirming one week–day entry the software steps to the following week–day.
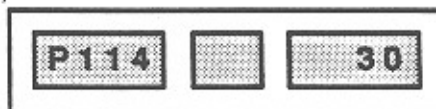
P114: With command P114 the mode of operation is set. Three types are possible.

P114 "0" + "H"   **no** auto play
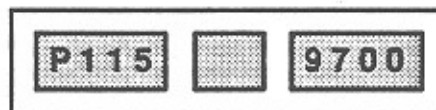P114 "nn" + "H"   time between two titles (nn = max. 99 minutes)

    Enter: P 114 H   nn H
                    30 H i.e. all 30 minutes play an
                            animation title

                      `P114`   `   `   `      30`

P115: With command P115 followed by 20 four–digit entries (value nnnn), 20 titles or albums can be defined. Without entry in P105 all CDs (defined by P042 to be selectable) are played.

    Enter: P 115 H   nnnn H
                      i.e. 1. entry: CD # 97 all titles
                      and so on:

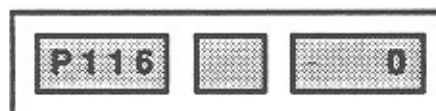   `P115`   `   `   `9700`

P116: also defines a "Patron Selection" (see P106) which defines if a title is locked or not

P116 "0"   titles and albums are free for selection
P116 "1"   titles and albums are locked.

    Enter: P 116 H   n H
                    0 H i.e. titles are not locked:

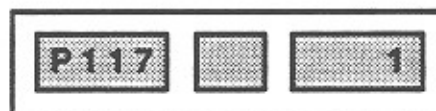   `P116`   `   `   `        0`

P117: defines the sequence of play for the titles or albums chosen under P115.

P117 "0"   Play in sequence of entry (FIFO)
P117 "1"   Play randomly (RANDOM)

    Enter: P 117 H   n H
                    1 H i.e. play randomly:

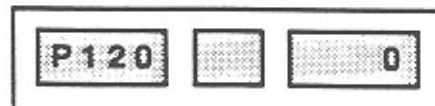   `P117`   `   `   `        1`

11. Programming Advertisements P120 to P127

The broad distribution of CDs has led to advertising for various areas being recorded on CDs. Thus, you have another source of income with phonographs with ES–V technology.
Standard value is again "**no advertising**".

__P120__: With the command P120 "0" +"H" all entries of group P12x are cancelled (set to zero) and no advertising is played.

> *Enter: P 120 H 0 H*
>> *i.e. set default values:*

```
┌────────────────────────────────────┐
│ ┌────────┐  ┌────────┐  ┌────────┐ │
│ │ P120   │  │        │  │      0 │ │
│ └────────┘  └────────┘  └────────┘ │
└────────────────────────────────────┘
```

With command __P121__ the starting time and with __P122__ the stopping time is set for the time window of advertisement play. Key pad layout see P080.
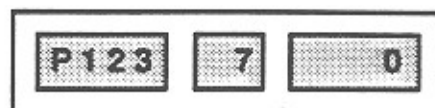
__P123__: With P123 the week–day is set for advertisement play. See P082 for key pad layout.

> *Enter: P 123 H   0 or 1 H*
>> *Set per pressing keys*
>> *i.e. sunday inactiv:*
>> *confirm settings with key "H"*

```
┌────────────────────────────────────┐
│ ┌────────┐  ┌────────┐  ┌────────┐ │
│ │ P123   │  │   7    │  │      0 │ │
│ └────────┘  └────────┘  └────────┘ │
└────────────────────────────────────┘
```

With confirming one week–day entry the software steps to the following week–day.
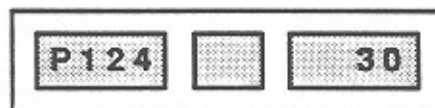
__P124__: With P124 it is set if or if not and which time between advertising spots should be waited .

> P124 "0" + "H" no advertisement play
> P124 "nn" + "H" time between titles (nn = max. 99 minutes).
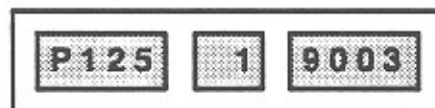
> *Enter: P 124 H   nn H*
>> *30 H i.e. play a title every 30 minutes:*

```
┌────────────────────────────────────┐
│ ┌────────┐  ┌────────┐  ┌────────┐ │
│ │ P124   │  │        │  │     30 │ │
│ └────────┘  └────────┘  └────────┘ │
└────────────────────────────────────┘
```

__P125__: With command P125 followed by 20 four–digit entries (value nnnn), 20 titles or albums can be defined.

> *Enter: P 125 H   nnnn H*
>> *i.e. 1.entry: CD # 90 3.title*
>> *and so on:*

```
┌────────────────────────────────────┐
│ ┌────────┐  ┌────────┐  ┌────────┐ │
│ │ P125   │  │   1    │  │  9003  │ │
│ └────────┘  └────────┘  └────────┘ │
└────────────────────────────────────┘
```

__P126__: defines "patron selection" again. See P106.

> P126 "0" titles and albums are free for selection
> P126 "1" titles and albums are locked.

__P127__: defines the playing sequence for advertising spots selected with P125.

> P127 "0" Play in sequence of entry (FIFO)
> P127 "1" Play randomly (RANDOM)

12. Blocking Certain Titles P130 to P135 (lock–out titles)

At certain times it may be necessary to lock–out one or more titles from being played. Perhaps these titles should not be played by minors or are simply damaged (bad playing quality). Standard is that all titles can be played.

P130: With the command P130 "0" + "H" all entries of group P13x are set to zero and no CDs or titles are locked–out.

Enter: *P 130 H 0 H*

    i.e. set default values

```
┌─────────────────────────────────────────┐
│  ┌─────────┐   ┌───────┐   ┌─────────┐   │
│  │ P 1 3 0 │   │       │   │       0 │   │
│  └─────────┘   └───────┘   └─────────┘   │
└─────────────────────────────────────────┘
```

With command **P131** the starting time and with **P132** the stopping time is set for the time window for lock–out. Key pad layout see P080.

P133: With P133 the week–day is set. See P082 for key pad layout.

Enter: *P 133 H* *0 or 1 H*
        Set per pressing keys
        i.e. saturday activ:
        confirm settings with key "H"

```
┌─────────────────────────────────────────┐
│  ┌─────────┐   ┌───────┐   ┌─────────┐   │
│  │ P 1 3 3 │   │   6   │   │       1 │   │
│  └─────────┘   └───────┘   └─────────┘   │
└─────────────────────────────────────────┘
```

With confirming one week–day entry the software steps to the following week–day.

P134: With P134 "0"+"H" the titles can be selected in the time window; with "1" they are locked–out.

Enter: *P 134 H* *1 H*
        0 H *i.e. all titles are*
            selectable within the
            time window:

```
┌─────────────────────────────────────────┐
│  ┌─────────┐   ┌───────┐   ┌─────────┐   │
│  │ P 1 3 4 │   │       │   │       0 │   │
│  └─────────┘   └───────┘   └─────────┘   │
└─────────────────────────────────────────┘
```

P135 defines a maximum of 20 titles or albums which are supposed to be locked–out. Input occurs with 4 digits for the CD number (nn__) and the title (__nn).

Enter: *P 135 H* *nnnn H*
        i.e. 1.entry: CD #85 all titles
        and so on.

```
┌─────────────────────────────────────────┐
│  ┌─────────┐   ┌───────┐   ┌─────────┐   │
│  │ P 1 3 5 │   │       │ . │  8 5 0 0 │  │
│  └─────────┘   └───────┘   └─────────┘   │
└─────────────────────────────────────────┘
```

NOTE: Take care to change entries in P135 (if necessary delete entry) to a certain CD number if you change this CD. To delete an entry you step through the list of P135 by pressing key "H" as long as you reach the right entry. Now enter "0" and confirm with "H".
Or you delete all entries by setting default values with command P130 and "0" + "H".

13. Happy–Hour–Credits P140 to P144

For additional animation of the audiance this function is implemented.
At defined times of the week additional free credits (Happy–Hour–credits) are given, depending on the number of bought credits.
Standard setting is that no Happy–Hour–credits are given.

P140: With the command P140 "0" + "H" all entries of group P14x are set to zero so that there is no happy–hour.

Enter: *P 140 H 0 H*

i.e. set default values
No Happy–Hour:

```
┌──────────────────────────────────┐
│  P 1 4 0  │        │          0   │
└──────────────────────────────────┘
```
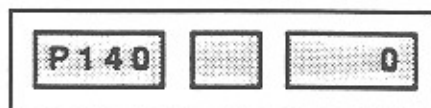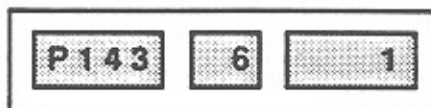
With command **P141** the starting time and with **P142** the stopping time is set for the time window for Happy–Hour–credits. Key pad layout see P080.

P143: With P143 the week–day is set. See P082 for key pad layout.

Enter: *P 143 H   0 or 1 H*

Set per pressing keys
i.e. saturday activ:
confirm settings with key "H"

```
┌──────────────────────────────────┐
│  P 1 4 3  │   6    │          1   │
└──────────────────────────────────┘
```

With confirming one week–day entry the software steps to the following week–day.
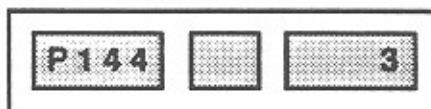
P144: Here a calculation number may be programmed. This number defines how many credits one must have bought to get an additional Happy–Hour–credit.
P144 "0"+"H"   **no** Happy–Hour
P144 "n"+"H"   after "n" bought credits (n=1 to 5) 1 additional Happy–Hour–credit is given.

Enter: *P 144 H   n H*
            3 H   i.e. after 3 bought credits
                  1 additional Happy–Hour–
                  credit is given

```
┌──────────────────────────────────┐
│  P 1 4 4  │        │          3   │
└──────────────────────────────────┘
```

# 14. Calling up Test Programs P150 to P164

To support the operator when equipping the CD changer with new CDs, trouble-shooting or servicing. several aid functions have been incorporated as known from earlier phonographs. Group 15x of the test programs includes functions such as read-out of error memory, various continuous run tests as well as input and display tests. For these purposes, the respective group code (Fx) is shown in the middle display. Group 16x serves to integrate the CDs and their number of titles in the juke box memory.

14.1 Test Programs for Service Operation P150 to P157

P150: Read-out of Error Memory:

        0: last registered error; see Table 4 for "Error Codes" on the next page.
        1: previous error; the phonograph records the last 20 error reports.
        2: CD number during which the error occurred.
        3: Time of error and
        4: Date of occurrence
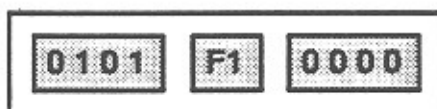
Display:

Pxxx	1	60
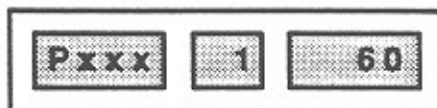
Continous run tests

With commands P151 to P153 various tests in continuous run mode are executed. A continuous run can only be stopped by pressing the cabinet switch.

P151: Plays all CDs for 16 sec. (F1):

    Enter: P 151 H   0

                Start continuous run 1:

0101	F1	0000
CD / Titel		Anzahl der Fehler

P152: Plays selected CDs for 16 sec. (F2):

During CD play another number "nnnn" can be entered (continuous run 2). With each entry "Your Selection" will light up on the display panel.

    Enter: P 152 H   n n n n H
                 (enter a CD-number)

P153: Other Continuous Play Tests (F3 to F5):

    Enter: P n
        0: All CDs are placed on player, but are not played (continuous run 3, F3).
        1: 6 certain CDs (CD No. 1, 25, 50, 51, 75, 00) are placed and played 16 sec. each
           continually (continuous run 4, F4)
        2: Combination of twice continuous run 3 followed by 4 until cabinet switch is turned
           off (continuous run 5, F5).

P155: Display Test (F6):

During the display test all digits of 7-segment-displays and all control lamps are successively turned on and off. Pressing "H" will stop the test and continue it after pressing "H" again. The display test does not check the lamps of a light organ that might be connected.
Pressing "C" stops the test.

    Enter: P 155 H
        0:    Start lamp test
             (Display 2 shows briefly F6)

P155	F6	0

Table 4: "Error Displays"

Displays 1	2	3	Possible Causes	Corrections
	Er	01	EPROM contents (CONTROL–UNIT) disturbed.	Change EPROM (IC2).
	Er	10	RAM (CONTROL–UNIT) defective.	Change RAM (IC 3). After that reprogram all program steps.
	Er	11	RAM contents (CONTROL–UNIT) short–term disturbance.	No correction necessary; program is reinitialized. Change RAM IC 3 if frequently occurring.
	Er	12	RAM battery is empty.	Change RAM (IC 3). After that reprogram all program steps.
	Er	20	Verification errors in program (CONTROL UNIT).	No correction necessary; program is reinitialized. Change CPU IC 1 if frequently occurring.
Pxxx	Er	30	Memory contents (CONTROL UNIT) invalid.	No correction necessary; program step Pxxx (in Display 1) is automatically reprogrammed.
Pxxx	Er	31	Memory contents (CONTROL UNIT) invalid or not programmed.	Program step Pxxx shown in Display 1 must be reprogrammed.
Pxxx	Er	40	Wrong price setting.	Check price setting and reprogram if necessary.
	Er	50	Coin mechanism defective. Too much credit.	Check coin mechanism.
	Er	6x	Error at CD player.	See Er 60 – Er 63.
	Er	60	Connection to the CD–player interrupted. No supply voltage present for decoder board or CD player.	Check connection cables to the decoder board, check fuses.
	Er	61	No CD recognized by CD player. No CD in CD tray, CD defective. Player defective.	Check CD and exchange if needed. Exchange CD player. Exchange decoder board.
	Er	62	Specified track on the CD not found.	Check the CD.
	Er	63	Malfunction while playing a CD.	Check the CD player with equipped CD for easy running.
	Er	7x	Malfunction on CD changer.	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	Malfunction of operating control.	No correction necessary.
	Er	71	Error during grip from magazine.	Equip CD–tray to magazine. Check alignment from magazine to pickup assy and adjust if necessary. Check function of light barrier OPPUM.
	Er	72	Error during replacing CD in magazine. Malfunction of grip lever.	Check alignment of magazine to pickup assy and adjust if needed. Check function of grip. Check function of light barriers OPGRL and OPGRR.
	Er	73	Malfunction during lift drive. Playing of CD not possible.	Check lift for jamming. Check function and correct adjustment of light barrier OPSTP (drive wheel).
	Er	74	End position of lift not o.k.. Playing of CD not possible.	Check function and adjustment of light barrier OPEND.
	Er	80	Short circuit on wallbox signal wire.	Check wallbox connection.
	Er	81	Malfunction of the audio processor (CB CENTRALE).	Change IC 1 = TDA 4390 if frequently occurring.
	Er	90	Title display, three blocking in sequence, not functional anymore.	
	Er	91	Blocking title display while left movement.	Blocking remedy
	Er	92	Blocking title display while right movement.	
	Er	93	Blocking title display, stack left.	see also chapter 9 "Title display" the paragraph 1.4
	Er	94	Blocking title display, stack right.	Jammed or dislocated title holders.

P156: Input Test (F7):
The input test checks all input ports and shows the results in a matrix on Display 3. The test can be stopped by pressing "C".
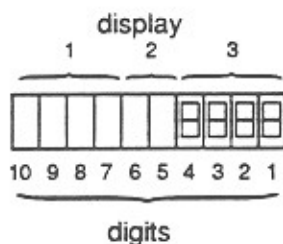
        0: Start input test (Display 2 shows briefly F7)

Enter: P 156 H 0

        i.e. Key switch operated:

| | F7 | 0 1 4 0 |

The 4 digits of displays are used as follows:

digit 1: state of operation   i.e. key switch:

        0 = locked not able to call background musik
        1 = free

digit 2: bit number of input port (see table 5 "Attaching...", s. a. wiring diagram "Control Unit")

digit 3: port number from which input occurs (s.a. table 6:"Port–numbers of input ports").

digit 4: Is not used.

Table 5: "Attaching of bit numbers to input ports"

Bit number	corresponds to wiring diagram "Control Unit"	
0	signal line	A
1		B
2		C
3		D
4		E
5		F
6		G
7		H

Table 6: "Port–numbers of input ports"

Port number	name of input port
0	Control Unit (IC15)
1	Control Unit (IC16)
2	Control Unit (IC17)
3	Kea pad
4	Title display (IC1)
5	Is not used
6	Pickup driver (IC3)

Testing the CD changer

P157: Manual control of CD changer via keypad (F8):
In this test program the CD changer is controlled manually via the keyboard (Keys 1 to 0). The illustrated functions are executed by pressing the corresponding key depending on whether a CD is in the pick–up or not.

Lift not set down:

1	2 Lift up	3 Lift up stepwise
4 Get CD from left	5 Replace CD	6 Get CD from right
7	8 Lift down	9 Lift down stepwise
C Cancel	0 Replace CD set lift down	H

Lift is set down or CD is on player:

1 1.Play CD 2.CD in pause	2 >FF< afterwards 2x key "1" fast forward	3 Play next track
4 Replace CD get last one	5 1.Play C, 2.CD in pause	6 Replace CD get next one
7	8 >FR< afterwards 2x key "1" fast reverse	9 Play last track
C Cancel	0 Stop CD replace CD	H

This test serves also to check the opto couplers in the various end positions. The status of each opto coupler is displayed. If "1" is displayed, then the opto coupler is disrupted. A "0" means the opto coupler is not disrupted. The following table shows the different combinations. The digits 1, 2, 8, 9 and 10 are employed for this purpose.

Enter: P 157 H   0

1 0 1 _	F8	_ _ 1 1
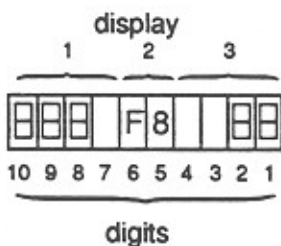
display
1   2   3   _

8 8 8	F 8	8 8
10 9 8 7 6 5 4 3 2 1

digits

Digit 1:   Counter Wheel (OPSTP)
Digit 2:   Final Position (OPEND)
Digit 8:   Grip right (OPGRR))
Digit 9:   Middle Opto (OPPUM)
Digit 10:   Grip left (OPGRL)

On Diplay 2 (Digit 5+6) code F8 will be displayed during the test.
The test is stopped by pressing "C."

14.2 Recording title quantities in title memory

<u>P160</u>: Recording title quantities of all CDs

After calling up this command, the phonograph searches through all CD slots for the number of CDs defined in P042. During the search it reads the number of titles recorded on each CD into the title memory. This command is used by initial equipping, for example, or if several CDs are exchanged.
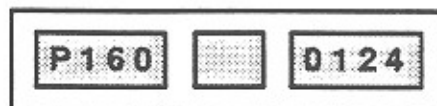The number of titles on each CD is registered in the title memory. Simultaneously, the established values are displayed. The number of titles is also read with each playing a CD

> Enter: P 160 H   0
>
> i.e. result: CD 01 has 24 titles

`P 1 6 0`   `▒▒▒`   `0 1 2 4`

<u>P161</u>: Recording title quantities of one CD

After calling up this command and entering the number of the newly installed CD, its number of titles is registered in the title memory (nn = 01 to number of P042). The number of titles from one CD is also read with every normal play of it. This function serves as single entry cancellation, if a not equipped CD is selected.

> Enter: P 161 H   nn H
>
> 67 H i.e. = CD #67:

`P 1 6 1`   `▒▒▒`   `. 6 7`

<u>P162</u>: Displaying all title memories

After calling up this command and entering the respective code number, the corresponding title data will be displayed.

> 0: Number of titles from CD #01
> 1: Switch to the next CD #
> 2: Return to the previous CD #
> 3: Title number of any CD

`P 1 6 2`   `▒▒▒`   `0 3 2 0`
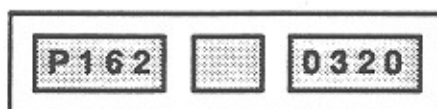
With P162,3 the two–digit CD number must be entered and confirmed with "H".

<u>P163</u>: Erasing entry in title memory

All entries in the title memory are set to 1. So all CD titles are cleared, but the phonograph furthermore may acces any CD tray. The basic function of the phonograph is kept. If new CDs are equipped and the command P160 is confirmed you may be sure that all new titles are stored in the title memory. P163 is to confirm by pressing "H".

> Enter: P 163 H   0 H

`P 1 6 3`   `▒▒▒`   `6 7 0 0`
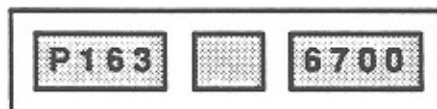
After removing a CD you also have to remove the corresponding CD cover of the display unit.

<u>P164</u>: Switching between signal sources

For test purposes different signal input ports for the 3 intended signal sources can be switched individually. This is done with command P164 by entering different code numbers (value "n" of command):

> 0: No signal source active, mute (amplifier turned off)
> 1: CD changer is signal source
> 2: A cassette player is signal source.
> 3: A microphone is signal source.

This "manual" switching occurs automatically in normal play according to the signal source that is turned on.

> Enter: P 164 H   n H
>
> 2 H   i.e. for cassette player:

`P 1 6 4`   `▒▒▒`   `2`

330

IC2

VCC   CA1 40
V1 20 VCC CA2 39

       VSS PA0 2   PA0
            PA1 3   PA1
            PA2 4   PA2
            PA3 5
            PA4 6   PA4
       CS2 PA5 7   PA5
A9 23 CS1 PA6 8   PA6
    24   PA7 9   PA7

A0 38 RS0
A1 37 RS1
A2 36 RS2
A3 35 RS3

D0 33 D0
D1 32 D1   CB1 18   CB1
D2 31 D2   CB2 19   CB2
D3 30 D3
D4 29 D4   PB0 10   PB0
D5 28 D5   PB1 11   PB1
D6 27 D6   PB2 12   PB2
D7 26 D7   PB3 13   PB3
            PB4 14   PB4
-IRQ 21 IRQ PB5 15 PB5
-RES 34 RES PB6 16 PB6
R/-W 22 R/W PB7 17
X2   25 X2

65C22

-RES   -RES

IC3

          XTLI 3
V1 40 VCC XTLO 4
          CLKOUT 5
          RXC   25
          TXC   15   OV1

          DCD2 8
      VSS DSR2 7
          DTR2 13 DTR2
CS 39 CS RTS2 10
          CTS2 9
A0 35 RS0
A1 36 RS1 TXD2 14 TxD2
A2 37 RS2 RXD2 12 RxD2

D0 24 D0
D1 23 D1
D2 22 D2 OCD1 32 TXD1
D3 21 D3 DSR1 33 RXD1
D4 19 D4
D5 18 D5 DTR1 27
D6 17 D6 RTS1 30
D7 16 D7
          CTS1 31   io.sch
-IRQ 29 IRQ1
      11 IRQ2 TXD1 26
-RES 1   RES   RXD1 28
R/-W 38 R/W

65C52

IO

4K7
R130
R131   4049   IC21A
IC21B 3   2   D5 D6 D7 100R R25   22K R24
X0 12   10K R24
X1 13   10K R23
Y0 2   4   5   D8 D9 D10
Y1 1   6   7
        IC21C
Z0 5
Z1 3   1N4148 V1
INH 6
A   11
B   10   IC26A
C   9   4050
T4053   3   2   100R R20
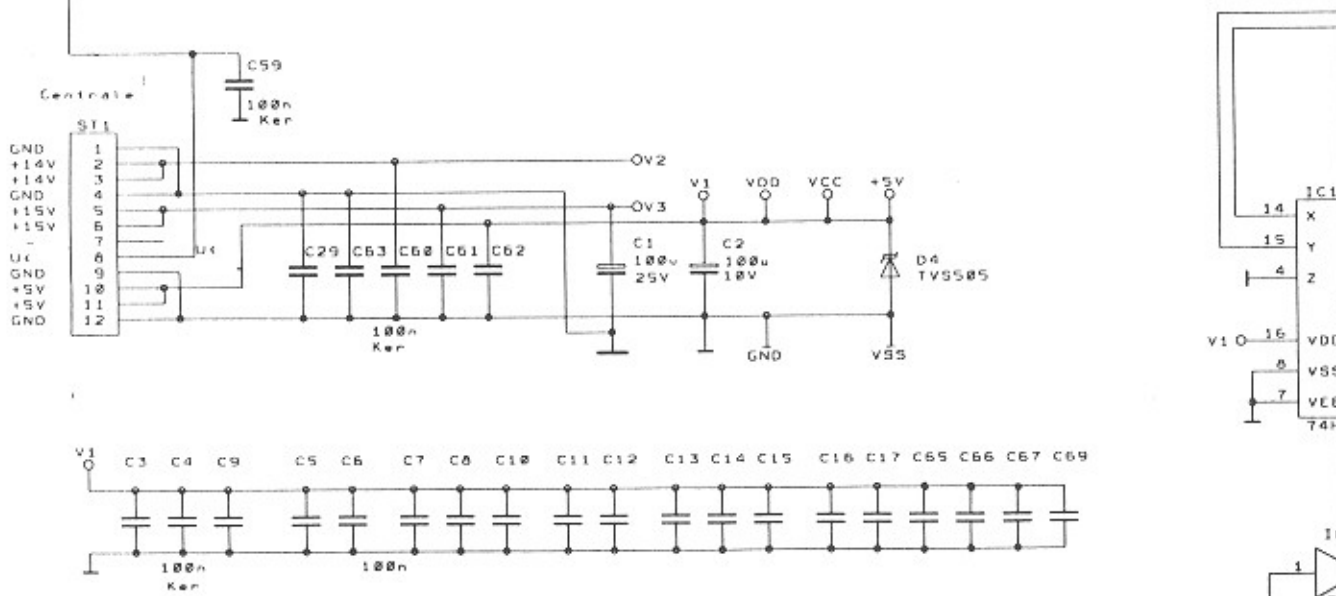   4   5   10K   R19
                 IC26B

R22
R21
Service
ST2
V20 1
     6
     2   TxD
     7
     3   RxD
     4
     9   BSY
     5   GND
DB9
F

2K2
R18

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

NSM MUSIKAUTOMATEN PHONOGRAPHS **ES V-CD** TECHNOLOGY

Schaltbild
WIRING DIAGRAM   CONTROL UNIT

| Dat 29.06.92 | Gez Braun | Bearb | Gpr |

Blatt 1 / Page 1

421/1

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

ST5 Wallbox
1 GND
2 Sig
V3 O— 3 +15V
SL3

C48
(330p) C47 C46
330p

Centrale
ST6
1 -RES-Audio
2 CLK
3 DAT
4 RC1
5 RC2
6 RC3
7 RC4
8 APL
9 APR
10 MIC
11 IN1
12 IN2
13 -MUTE
TXD1 > 14 TXD1
< RXD1 15 RXD1

V1
R128 22K
V1
RA1 22KA8
47K
R60
R62
R64
R66
LB5
LB6
PA4 14 IC21F 15

V1
R129 22K 11 IC21E 12
4049

V1
RA2 22KA8
47K
R76
R78
R80
R82

ST7
1 GND
2 Key-Switch
3 GND
4 Cabinet-Sw1
5 Cabinet-Sw2
6 GND
7 Secur
8 GND
9 +14V
10 Cash-Meter
SL10

R121
T9 R119 4K7 BC517 10R 1/2W V2 O D17 BA157
R120 22K

(2n2)
C53 C52 C51 C50 C49

V1
RA3 22KA8
47K
R92
R94
R96
R98

Coin-Mech
ST8
6 GND
5 +15V
V3 O 4 Chanel II
3 Chanel I
2 Chanel III
1 Chanel IV

(2n2)
C58 C57 C56 C55 C54

Bill-Acceptor
ST9
4 GND
3 Bill 1
2 Bill 2
1 GND

ST4
V1 O
SL8

R122 470R O V1
LD2
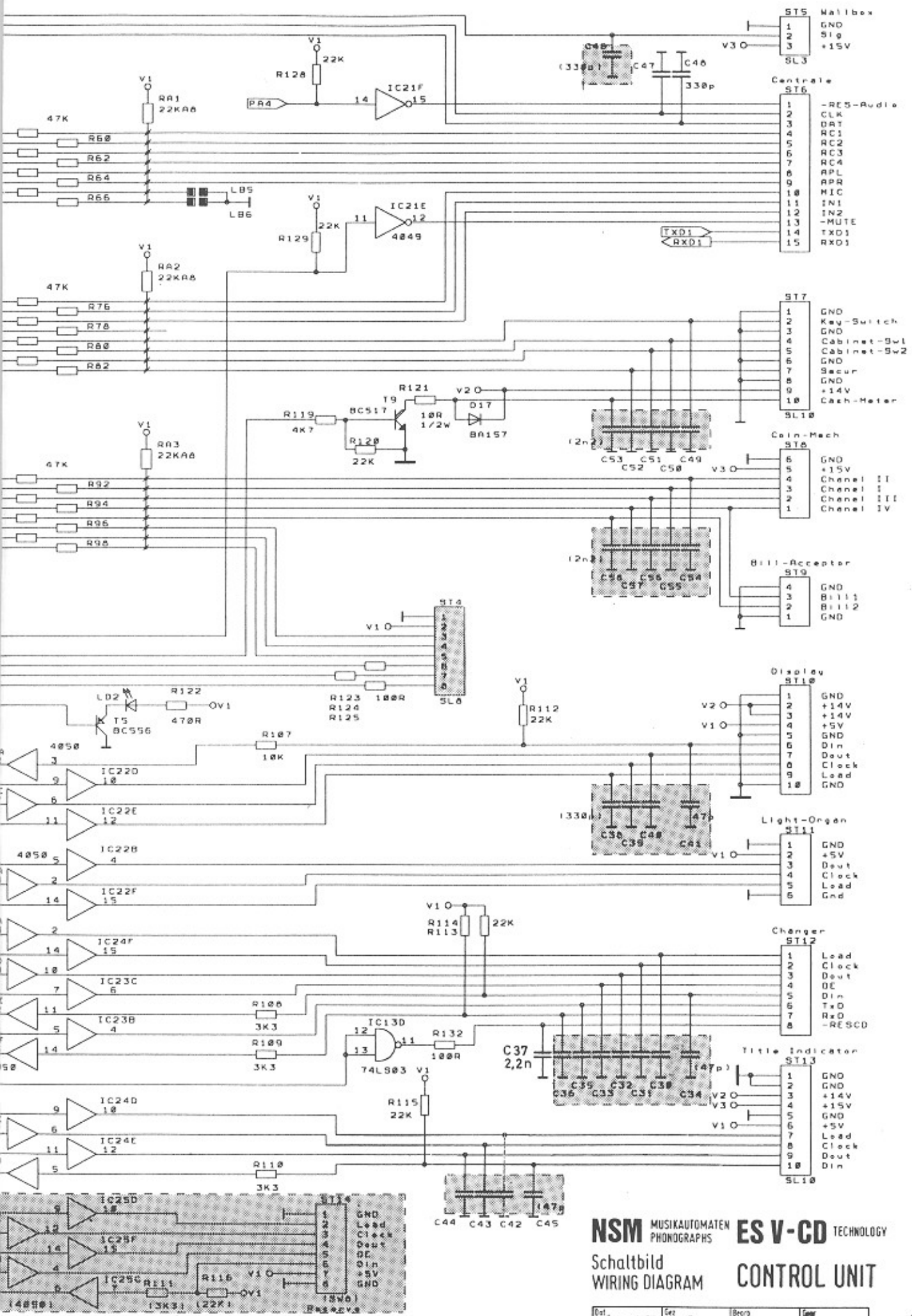T5 BC556
4050 3
IC22D 10
IC22E 12
4050 IC22B 4
IC22F 15

R123 100R
R124
R125

R107 10K

V1
R112 22K

Display
ST10
1 GND
V2 O 2 +14V
3 +14V
V1 O 4 +5V
5 GND
6 Din
7 Dout
8 Clock
9 Load
10 GND

(330p)
C38 C39 C40 C41 (47p)

Light-Organ
ST11
1 GND
2 +5V
V1 O 3 Dout
4 Clock
5 Load
6 Gnd

V1 O
R114 22K
R113

IC24F 15
IC23C 6
R108 3K3
IC23B 4
R109 3K3

IC13D 12 11
74LS03 13
R132 100R

C37 2,2n

Changer
ST12
1 Load
2 Clock
3 Dout
4 OE
5 Din
6 TxD
7 RxD
8 -RESCD

(2n2)
C36 C35 C32 C30 C34 (47p)
C33 C31

V1
R115 22K

IC24D 10
IC24E 12
R110 3K3

Title Indicator
ST13
1 GND
2 GND
V2 O 3 +14V
V3 O 4 +15V
5 GND
6 +5V
V1 O 7 Load
8 Clock
9 Dout
10 Din
SL10

C44 C43 C42 C45 (47p)

IC25D
IC25F
IC25G R111 R116 V1 O
3K3 22K O V1
4050
ST14
1 GND
2 Load
3 Clock
4 Dout
5 OE
6 Din
7 +5V
8 GND
(SW0)

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

NSM MUSIKAUTOMATEN PHONOGRAPHS **ES V-CD** TECHNOLOGY
Schaltbild
WIRING DIAGRAM CONTROL UNIT

Dat. 29.06.92 Gez Braun Bearb

421/2
Blatt 2 / Page 2

UNIT DESCRIPTION

REMOTE CONTROL

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, ASSY

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

INDEX

INFRARED REMOTE CONTROL, ASSY.

with 1,5 m Cable	171 808
with 5,0 m Cable	174 258
sender	206 783
Receiver with Cover	173 178

REMOTE CONTROL with 5 m cable

Part No.	**171 743**

VOLUME CONTROL

Part–No.	**170 212**

Option: This volume control is a remote alternative to the control installed in the device. (For connections see par. 1.4) The cable has to be extended – any 4 pole cable can be used.
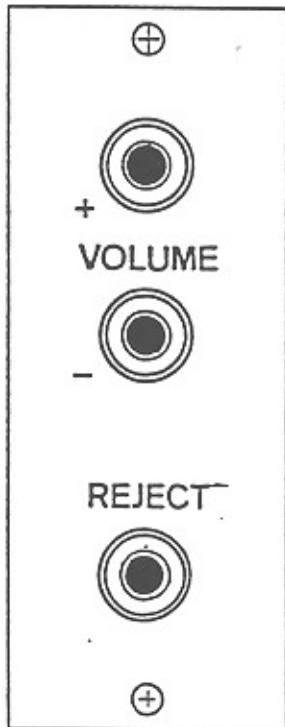
to 1.4

1 FUNCTION

1.1 Infrared remote control (wireless)

The cable of the remote control receiver has to be put into plug ST 11 of the central unit.
Pin 1 supplies the +15 V voltage.
Pin 2 = GND
The commands – as per chart – are fed to the computer inputs via Pins 3 through 6 by switching to ground.
The signals go to the control unit via plug ST 10.

1.2 Wired remote control

For remote controls with cable the plug has to be connected with ST 11 on the central unit (instead of infra-red remote control). The corresponding channels (Pins 3 through 6) – as per chart – are connected to GND Pin 2 via the remote control diode linkage.

TASTE / KEY	AUSGANGS–CODE OUTPUT–CODE	STECKER / PLUG ST 11 / PIN
VOLUME – 1	2 / 4	5 / 3
VOLUME + 1	4	3
VOLUME – II	2 / 3	5 / 4
VOLUME + II	3	4
FREE CREDIT	1 / 3	6 / 4
BACKGROUND	1 / 4	6 / 3
REJECT	2	5
MUTING	1	6
VOLUME + (I+II)	3 / 4	4 / 3
VOLUME – (I+II)	2 / 3 / 4	5 / 4 / 3

1.3 Installation Instructions for Infrared Remote Control

The receiver with standard connection cable is mounted onto the back of the cabinet or the back of the hood when a small distance is involved. The top (receiving side) of the receiver should be mounted a little underneath the upper edge of the rear cabinet. Wallboxes and Hide–Away's have to be mounted close to the machine.
If a greater distance has to be bridged or an absorbing ceiling is influencing correct functioning the receiver has to be mounted in such a way on the wall or the ceiling that direct radiating of the manual sender is possible. A connection cable (5 m), is available for this purpose.
The connection cable of the receiver is put into plug ST 11 of the central unit.

SECURING MANUAL SENDER
To protect the manual sender from theft, mount the bracket with two screws onto the back of the sender (see fig.). This way the sender can be secured with a chain.
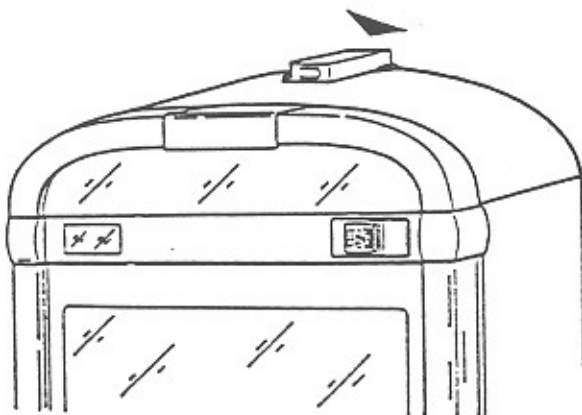
Fig. 1
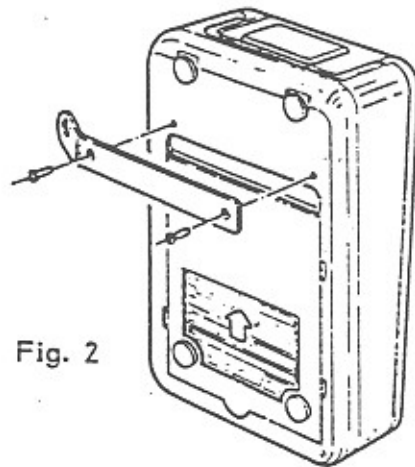
Fig. 2

Manual sender with safety
bracket and screws

1.4 Volume Control (On Rear Cabinet Wall does not apply to wallboxes and Hide–Away's).

The connection cable must be put into plug ST 12 of the central unit. When the volume keys are pressed, the computer inputs are switched to GND via the diode linkage D 37–41.

TASTE / KEY	AUSGANGS–CODE OUTPUT–CODE	STECKER / PLUG ST 10 / PIN
VOLUME + (I+II)	3 / 4	4 / 5
VOLUME –(I+II)	2 / 3 / 4	4 / 5 / 6
REJECT	2	7

TROUBLE SHOOTING

FOR NSM–PHONOGRAPHS

ES V–CD TECHNOLOGY

to
Technical Information, Assy

176 393	THE PERFORMER GRAND II
176 352	THE WIZARD/
	OLD FASHION WIZARD
176 514	THE PERFORMER CLASSIC
176 610	CD HIDE–AWAY II
176 598	FIREBIRD II
176 705	THE PERFORMER WALL

14

INDEX

1 DESCRIPTION OF MALFUNCTION / CAUSE

The follwing table gives a short reference of the posible solution to vepair a phonograph that diol not work.

DESCRIPTION	CAUSE
Phonograph illumination and LED's in central unit/CD supply do not light up.	1. Power cord 2. Main switch 3. Power fuse (switch plate/fuse box)
Phonograph illumination okay, LED's in central unit do no light up.	1. Plug connection ST 1 of central unit 2. Fuses Si 1–5 of central unit 3. Power transformer connection
Fan for output stage does not run while disc is playing.	1. Plug connection ST 4 2. Triac TC 1. 3. Transistor T2 / T1.
LED's in central unit do not light up or are darker Fuses are okay.	1. Voltage regulators VR 1–6 in central unit defective 2. Short circuit in connected units. (Pull plugs one after another and observe LED's).
No tone signal at loudspeaker even though a CD is playing and the switched on.	1. Loudspeaker connection 2. Plug connection of frequency volume is network and output transformer 3. Interruption on signal wire
Volume reduced by electronic protection device.	1. Loudspeaker mismatch (less than 2 ohms impedance) due to remote speakers. 2. Transistor T 9 defective. 3. Output transistor defective. 4. Control unit defective.
Poor bass reproduction.	1. Loudspeaker connections reversed.
Er xx–display.	See "Error Displays".
Luminous effect lights do not light phonographs with light generator).	1. Fuse on PCB light organ (running light) 2. Plug connection to PCB light organ

2 ERROR DISPLAYS / TABLE OF ERROR MESSAGES

After power on the phonograph, respectivly after each closing of the programming mode the microprocessor on the PCB Control Unit checks all memoried values. If there is detected an error on the programmable memory area, the corresponding programm step is entered. The display shows the command number Pxxx and "Er 31" is flashing. Also the lamp "error" flashes.

With entering the service mode and input of the correct value and pressing the key "H" this error is cleared.

After power on the phonograph, the malfunction display "Display 3" an the flashing lamp "error" remains visible for 2 sec. Here after the phonograph is operational without regarding the malfunctioning part.

When entering the programming mode there is a possibility for service and maintenance requests. With the command of group 15x and 16x it is possible to check, or to initialise CD's to, the phonograph. By using P150 the last 20 errors occured while operating are display sequentially including the information about CD-no. and date of occurance.
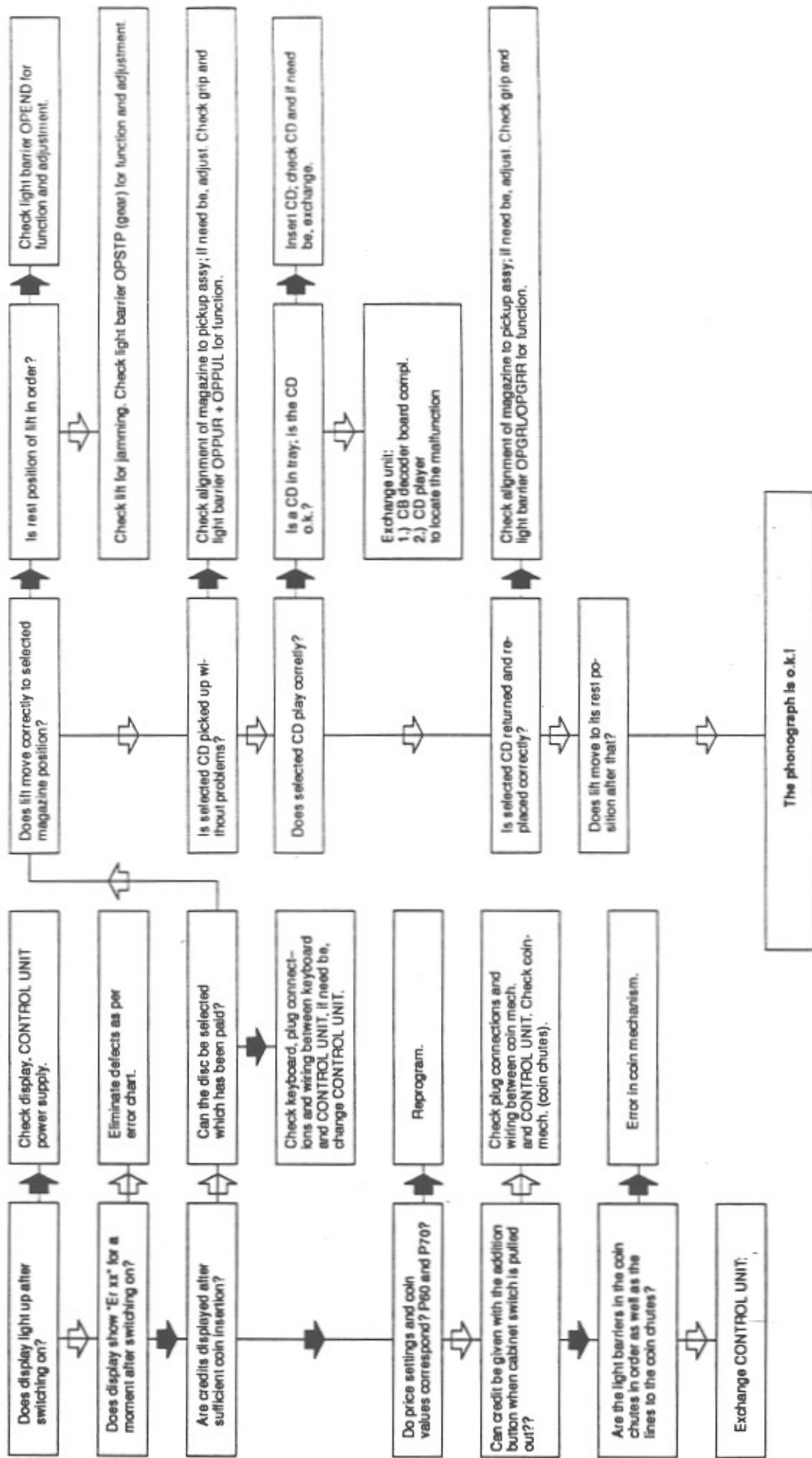
The following table gives an overview of the error messages and the possible corrections.

Table 4: "Error Displays"

Displays 1	2	3	Possible Causes	Corrections
	Er	01	EPROM contents (CONTROL-UNIT) disturbed.	Change EPROM (IC2).
	Er	10	RAM (CONTROL-UNIT) defective.	Change RAM (IC 3). After that reprogram all program steps.
	Er	11	RAM contents (CONTROL-UNIT) short-term disturbance.	No correction necessary; program is reinitialized. Change RAM IC 3 if frequently occurring.
	Er	12	RAM battery is empty.	Change RAM (IC 3). After that reprogram all program steps.
	Er	20	Verification errors in program (CONTROL UNIT).	No correction necessary; program is reinitialized. Change CPU IC 1 if frequently occurring.
Pxxx	Er	30	Memory contents (CONTROL UNIT) invalid.	No correction necessary; program step Pxxx (in Display 1) is automatically reprogrammed.
Pxxx	Er	31	Memory contents (CONTROL UNIT) invalid or not programmed.	Program step Pxxx shown in Display 1 must be reprogrammed.
Pxxx	Er	40	Wrong price setting.	Check price setting and reprogram if necessary.
	Er	50	Coin mechanism defective. Too much credit.	Check coin mechanism.
	Er	6x	Error at CD player.	See Er 60 – Er 63.
	Er	60	Connection to the CD-player interrupted. No supply voltage present for decoder board or CD player.	Check connection cables to the decoder board, check fuses.
	Er	61	No CD recognized by CD player. No CD in CD tray, CD defective. Player defective.	Check CD and exchange if needed. Exchange CD player. Exchange decoder board.
	Er	62	Specified track on the CD not found.	Check the CD.
	Er	63	Malfunction while playing a CD.	Check the CD player with equipped CD for easy running.
	Er	7x	Malfunction on CD changer.	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	Malfunction of operating control.	No correction necessary.
	Er	71	Error during grip from magazine.	Equip CD-tray to magazine. Check alignment from magazine to pickup assy and adjust if necessary. Check function of light barrier OPPUM.
	Er	72	Error during replacing CD in magazine. Malfunction of grip lever.	Check alignment of magazine to pickup assy and adjust if needed. Check function of grip. Check function of light barriers OPGRL and OPGRR.
	Er	73	Malfunction during lift drive. Playing of CD not possible.	Check lift for jamming. Check function and correct adjustment of light barrier OPSTP (drive wheel).
	Er	74	End position of lift not o.k.. Playing of CD not possible.	Check function and adjustment of light barrier OPEND.
	Er	80	Short circuit on wallbox signal wire.	Check wallbox connection.
	Er	81	Malfunction of the audio processor (CB CENTRALE).	Change IC 1 = TDA 4390 if frequently occurring.
	Er	90	Title display, three blocking in sequence, not functional anymore.	
	Er	91	Blocking title display while left movement.	Blocking remedy
	Er	92	Blocking title display while right movement.	
	Er	93	Blocking title display, stack left.	see also chapter 9 "Title display" the paragraph 1.4
	Er	94	Blocking title display, stack right.	Jammed or dislocated title holders.

3 Trouble-Shooting Chart for NSM Phonographs ES V / CD-Technology

Conditions: Line voltage present, line connection and power supply in order.

Column 1 (decision boxes):
- Does display light up after switching on?
- Does display show "Er xx" for a moment after switching on?
- Are credits displayed after sufficient coin insertion?
- Do price settings and coin values correspond? P60 and P70?
- Can credit be given with the addition button when cabinet switch is pulled out??
- Are the light barriers in the coin chutes in order as well as the lines to the coin chutes?
- Exchange CONTROL UNIT;

Column 2 (action boxes):
- Check display, CONTROL UNIT power supply.
- Eliminate defects as per error chart.
- Can the disc be selected which has been paid?
- Check keyboard, plug connections and wiring between keyboard and CONTROL UNIT, if need be, change CONTROL UNIT.
- Reprogram.
- Check plug connections and wiring between coin mech. and CONTROL UNIT. Check coin-mech. (coin chutes).
- Error in coin mechanism.

Column 3 (decision boxes):
- Does lift move correctly to selected magazine position?
- Is selected CD picked up without problems?
- Does selected CD play correctly?
- Is selected CD returned and re-placed correctly?
- Does lift move to its rest position after that?

Column 4 (action boxes):
- Is rest position of lift in order?
- Check lift for jamming. Check light barrier OPSTP (gear) for function and adjustment.
- Check alignment of magazine to pickup assy; if need be, adjust. Check grip and light barrier OPPUR + OPPUL for function.
- Is a CD in tray; is the CD o.k.?
- Exchange unit: 1.) CB decoder board compl. 2.) CD player to locate the malfunction
- Check alignment of magazine to pickup assy; if need be, adjust. Check grip and light barrier OPGRL/OPGRR for function.

Column 5 (end boxes):
- Check light barrier OPEND for function and adjustment.
- Insert CD; check CD and if need be, exchange.
- The phonograph is o.k.!

Legend:
- ⇨ : jes
- ⮕ : no
- Compare also 1.2 "Error Displays".

1406

176 393 / 176 352 / 176 514 / 176 610 / 176 598 / 176 705

07/93