

**UNIT DESCRIPTION**  
**CONTROL UNIT**  
**FOR NSM-PHONOGRAPGHS**

**ES IV-CD TECHNOLOGY**

to  
Technical Information, Assy

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

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Aktiengesellschaft  
Saarlandstraße 240  
6530 Bingen am Rhein

**4**

Page 401-408/411

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## INDEX

- 1      FUNCTION
- 1.1    Control unit
- 1.2    Processor
- 1.3    Reset
- 1.4    Low voltage recognition and power off
- 1.5    I/O (Input/output)
- 1.6    Output enable
- 1.7    Service plug

Spare parts list

Schematics CONTROL UNIT CD

## 1 FUNCTION

### 1.1 CONTROL UNIT

The heart of the control and credit unit is a microprocessor from the proven Rockwell 6500 family.

All unit functions such as keyboard, display, remote control, carriage (light generator / organ), coin mechanism, title indication etc. are controlled by this unit.

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

Connection of the DATA PRINT is provided at Plug 11.

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

### 1.2 Processor

The processor consists primarily of the microprocessor IC 1, the EPROM IC 2, the battery RAM IC 3 and the I/O component IC 4. Address coding occurs via IC 12.

The tact generator consists of a quartz oscillator with Q 1 (4 MHz) and the frequency divider (1:4) IC 14.

### 1.3 Reset

The Zener diode ZD 2 with transistors T 1 and T 2 serves to activate the reset when U (+5 V) is less than 4,6 V.

Transistor T 2 with its antenna connection serves to recognize static discharges and interferences.

When T 2/C is LOW, reset is activated via IC 16, Pin 10, Pin 11. If T 2/C is HIGH, reset remains stored for approx. 200 msec. over the subsequent monoflop 1/2 IC 13 with timing components R 14, C 19 vis IC 16, Pin 9.

### 1.4 Low Voltage Recognition and Power Off

Resistors R 15, R 16, R 18 from a voltage divider for low voltage recognition.

R 17 and D 6 generate a hysteresis when the voltage rises again. The positive edges (10 msec. at 50 Hz, 8.3 msec. at 60 Hz) coming from T 3/C retrigger the monoflop 1/2 IC 13 with timing components R 20, C 20 (approx. 20 msec.) and IC 13, Pin 4 at LOW.

This signal is monitored by the processor via IC 4, Pin 6.

When IC 4, Pin 6 is HIGH, the program is prematurely deactivated.

## 1.5 I/O (Input/Output)

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

**Output:** IC 5 and IC 6 are output ports.

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

**Input:** IC 8 and IC 9 are input ports.

The resistors, in sequence to the input pins, protect the CMOS components.

Serial interfaces are available:

At ST 3 for control of the light generator

At ST 4 for display and keyboard

At ST 8 for control of CD changer

At ST 10 for control of Title Indication.

## 1.6 Output - Enable

A clock signal is sent by IC 4, Pin 5. Capacitor IC 26 is charged keeps IC 15, Pin 8 at LOW.

If the clock signal does not occur, IC 15, Pin 14 is LOW and OE of IC 5 and IC 6 is inactive (outputs in tree state).

OE also become inactive via D 1 when reset (IC 16, Pin 11) becomes LOW.

## 1.7 Service Plug

Plug ST 11 serves to connect with the DATA PRINT.





# SPARE PARTS LIST

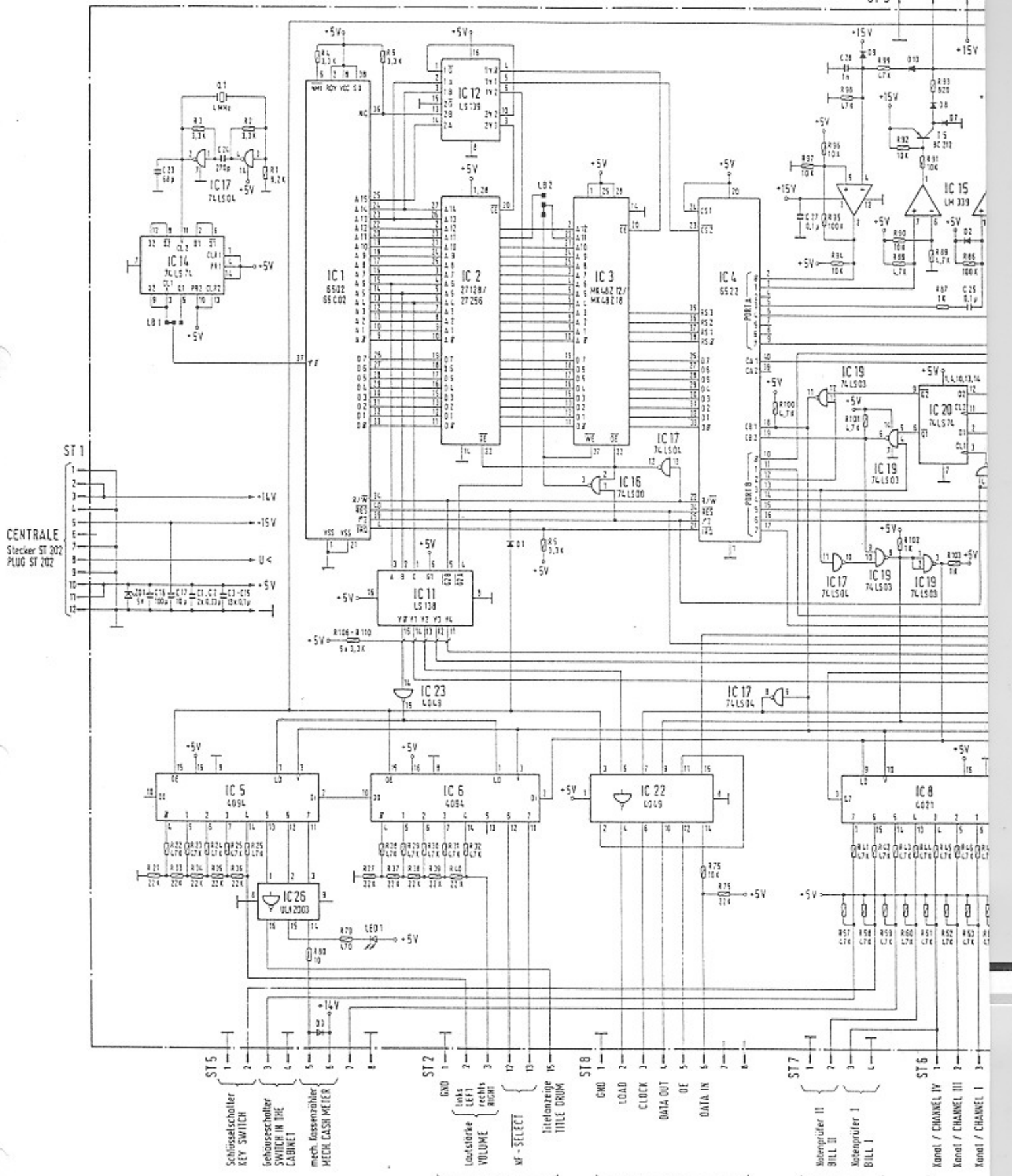
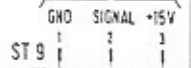
POS.	PART-No.	DESCRIPTION	DATA	QTY
	174 873	<u>CB-CONTROL UNIT CD, ASSY</u>		1
ST 07	225 651	PIN PANEL	4 prongs	1
ST 03, 06	225 652	PIN PANEL	6 prongs	2
ST 08	225 653	PIN PANEL	8 prongs	1
ST 04	225 654	PIN PANEL	10 prongs	1
ST 01	225 655	PIN PANEL	12 prongs	1
ST 02	225 656	PIN PANEL	15 prongs	1
ST 09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

# SPARE PARTS LIST

POS.	PART-No.	DESCRIPTION	DATA		QTY
C 22	220 181	CER.-CAPACITOR	47 pF		1
C 23	220 242	CER.-CAPACITOR	68 pF		1
C 24	220 185	CER.-CAPACITOR	270 pF		1
C 18, 28	220 263	CER.-CAPACITOR	1000 pF		2
C 21	220 341	CER.-CAPACITOR	4700 pF		1
C 1-15, 25, 27	220 334	MKT-CAPACITOR	0,1 μF	63 V	17
C 19, 20, 26	220 159	LYTIC	4,7 μF	63 V	3
C 17	220 162	LYTIC	10 μF	63 V	1
C 16	220 160	LYTIC	100 μF	10 V	1
R 8, 9, 116	221 600	RESISTOR	100 Ω	± W	3
R 12, 19, 79	221 099	RESISTOR	470 Ω	± W	3
R 93	221 622	RESISTOR	820 Ω	± W	1
R 10, 87	221 029	RESISTOR	1 KΩ	± W	1
R 13	221 031	RESISTOR	2,2 KΩ	± W	1
R 2-6, 102-104, 106-110	221 033	RESISTOR	3,3 KΩ	± W	13
R 84, 88, 89, 94, 110, 101, 105, 113	221 034	RESISTOR	4,7 KΩ	± W	8
R 1, 15	221 172	RESISTOR	8,2 KΩ	± W	2
R 11, 18, 20, 47, 74, 76, 82, 83, 90-92, 95, 111, 112, 114, 115	221 035	RESISTOR	10 KΩ	± W	16
R 16, 21, 27, 33-40, 73, 75, 85	221 604	RESISTOR	22 KΩ	± W	14
R 17	221 601	RESISTOR	27 KΩ	± W	1
R 22-26, 28-32, 41-72, 98, 99	221 038	RESISTOR	47 KΩ	± W	44
R 14, 81, 86, 95	221 048	RESISTOR	100 KΩ	± W	4
R 80	221 273	RESISTOR	10 Ω	± W	1



Fernwahlschluß  
CONNECTION REMOTE SELECTION



174 902 / 174 830 / 174 485 / 175 275 / 175 039  
 174 903 / 174 831 / 174 486 / 175 274 / 175 040  
 175 592 / 175 534 / 175 539 / 176 043 / 175 593

**CENTRALE**  
Stecker ST 201  
PLUG ST 201

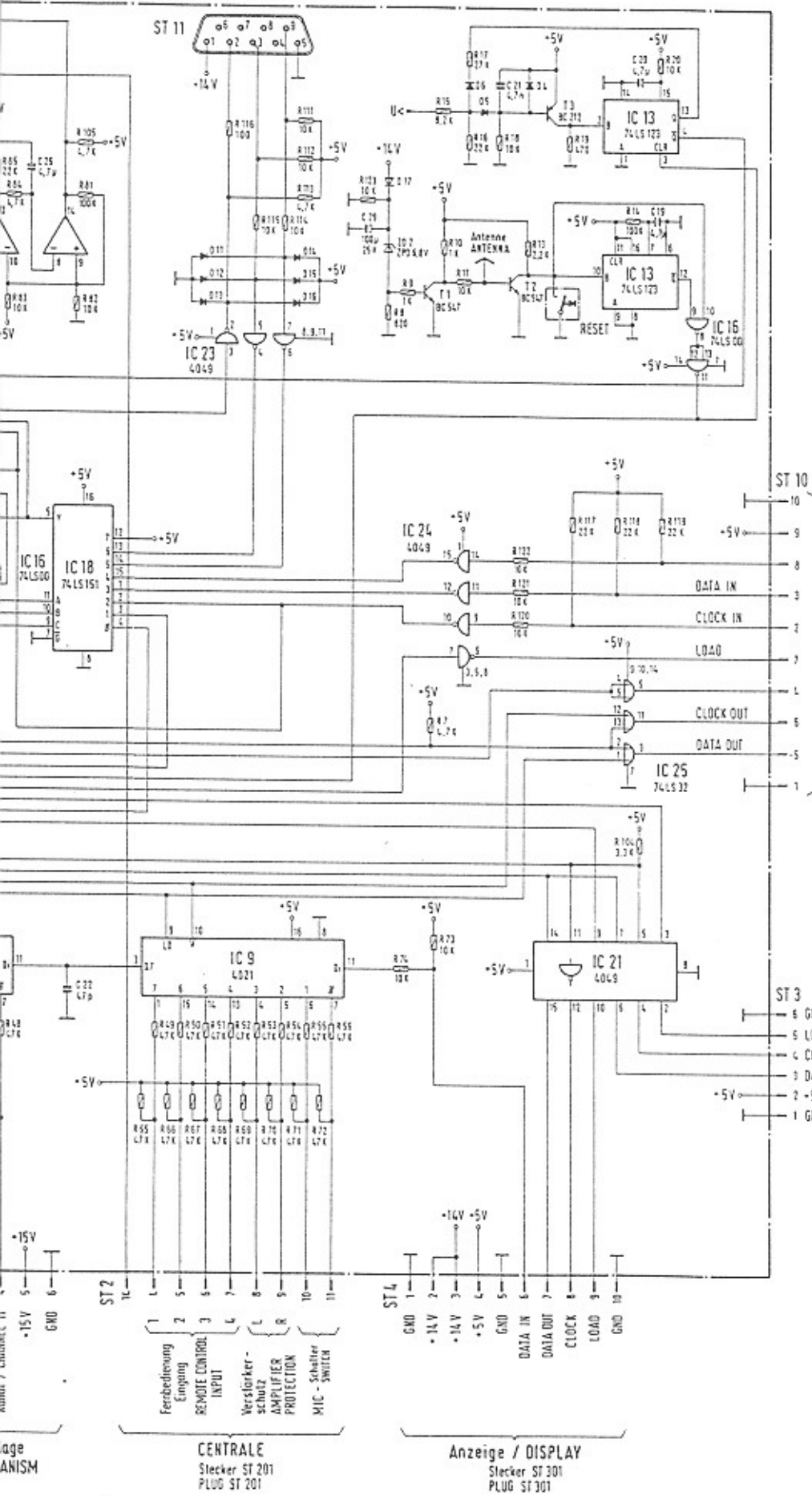
**WECHSLER -ADAPTER**  
Stecker ST 6 / PLUG ST 6

**Notenprüfer**  
BILL ACCEPTOR

**Münza**  
COIN MEC

WALLBOX

SERVICE- Auswertung  
EVALUATION OF SERVICE PROGRAMS



Titelanzeige II  
TITLE INDICATOR II  
Stecker ST 1  
PLUG ST 1

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

- van unten gesehen  
BOTTOM VIEW
- 1x 1K00L
  - 1x 4C118
  - ZENER DIODE

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

MUSIKAUTOMATEN  
PHONOGRAPHS **ES IV-CD** TECHNOLOGY

Schaltbild  
WIRING DIAGRAM **CONTROL UNIT CD**

Dat.	12 28 90	Gez.	Braun	Zeich.	1000	Über.	2000
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