

VLF-HF RECEIVER

10 kHz to 30 MHz

EK 085

consisting of:

Volume I

1. MAINFRAME KR 085P1
2. CONTROL UNIT GB 085P1
3. DIGITALLY TUNED FILTER FK 852P2
4. MOTOR - TUNED FILTER FK 852P4
5. TRACKING PROCESSOR GS 085P1
6. LOW - PASS FILTER FK 852P5
7. HF/IF UNIT GX 085P1

Volume II

1. POWER SUPPLY / EMC FILTER IN 085P1
2. DEMODULATOR GM 085P1
3. SYNTHESIZER GF 852P1
4. TEST RELAY GX 085P3
5. ALTERNATIVE CONFIGURATION OF BASIC UNIT

MAINFRAME
KR 085P1

Repair Manual
Part 6: Repair

NOTES

MAINFRAME
KR 085P1Repair Manual
Part 6: Repair- 6.5 -

6.5 Final Inspection

After replacement of components of individual connectors on the mother board perform a visual examination. In particular check the secure seating of the screws.

CAUTION

Following soldering work on the multi-point connectors take care of a proper and clean solder connection. Under no circumstances must the soldering contacts of the connectors be bridged due to excessive solder.

6.6 External Interfaces

All external interfaces of the Mainframe KR 085P1 shown in a special arrangement. This arrangement is contained in the circuit diagram 651.7114.01S in the appendix to this manual.

This arrangement contains all information about contact assignment and type of signals for all plugs and sockets.

MAINFRAME
KR 085P1

Repair Manual
Part 6: Repair

- 6.4 -

6.4 Replacement of Assemblies
 and Components

The Mainframe KR 085P1 contains no assemblies.

The following instructions for replacement of the mother board and its components assume that the mainframe is not outfitted.

However, if the mainframe still contains modules remove these according to the instructions provided in the user manual of the VLF-HF Receiver EK 085.

the cassettes and place them onto the sides of the mainframe.

- 5. Undo the seven screws that fix the mother board in its position. Remove the mother board from the cassette.
- 6. Installation of the mother board is in the reverse order of the removal described above.

6.4.1 Replacement of the Mother
 Board

Remove the mother board from the mainframe as follows:

- 1. Turn the mainframe upside down, undo the four screws and lift off the lower cover.

Note:

If you have a desktop model remove the outer panelling beforehand.

- 2. Revert the mainframe, undo six screws of the upper cover and lift off the cover.
- 3. Ensure that no modules are left in the mainframe.
- 4. Loosen four screws marked red on each side of the mainframe. Lift

6.4.2 Replacement of Components

Before replacing any components remove the mother board from the mainframe according to 6.4.1.

C A U T I O N

- o Ensure that the power supply to the mainframe is disconnected during soldering work.
- o In order to ensure the proper functioning of the mother board, we recommend to replace the complete mother board if a connector has become defect.

The multipoint connectors on the mother board are replaced by following usual workshop procedures. No special instructions are necessary for this.

MAINFRAME KR 085P1

Repair Manual
Part 6: Repair

- 6.3 -

6.3 Troubleshooting Instructions

6.3.1 General

The following troubleshooting instructions cover troubleshooting as well as the elimination of faults in the Mainframe KR 085P1. They consist of visual examination and of a continuity and short circuit test.

Perform the tests in the sequence given below.

6.3.2 Visual Examination

1. Visually inspect the exterior of the mainframe for damage.
2. Check if the outer screws of the mainframe are securely seated.
3. Remove the mother board from the mainframe acc. to 6.4.
4. Inspect the soldering and the component side of the mother board for breaks of the printed tracks, burns or other damage. If required replace the mother board.
5. Inspect the multipoint connectors for bent, corroded and broken pins. If required replace a multipoint connector according to 6.4.2.
6. Re-install the mother board into the mainframe.

6.3.3 Continuity and Short Circuit Test

1. Undo all screws of the upper and lower cover. Lift off both covers.
2. Test each conductor for continuity from the multipoint connector contact to the counter contact according to circuit diagram 651.7514.01S. Use a digital multimeter set to the lowest ohms range.
3. If during this test a break is being detected that is definitely due to a faulty connector contact, the connector may be replaced according to 6.4.2, if required.
4. Test each conductor for short circuit with each of its neighbour conductor not directly connected, according to circuit diagram 651.7514.01S. Use a digital multimeter set to the highest ohms range.
5. If during the tests according to step 2 or 4 above a defective mother board is detected replace it completely according to 6.4.1.
6. Install both the upper and the lower cover.

MAINFRAME
K R 0 8 5 P 1Repair Manual
Part 6: Repair

- 6.2 -

6.2 Special Tools and Test Equipment

The test equipment given in the following list will be required for performing the repairs described in this part of the manual.

be used, of course, provided that their technical data are at least as good.

Equivalent items of test equipment can

There is no requirement for special tools.

6.2.1 Test Equipment List

Item	Test equipment, required data	Recommended R&S test equipment	Ordering code
1	Digital multimeter, 3.5 digits, 0 to 1 Mohm	UDL 33	388.8011

**MAINFRAME
KR 085P1****Repair Manual
Part 6: Repair****- 6.1 -****6. Repair**

See circuit diagrams, parts lists and component layout in the appendix to this repair manual (list on page 0.2).

6.1 Preliminary Remarks**6.1.1 General**

The repair of the Mainframe KR 085P1 consists of troubleshooting and fault elimination, of replacing the mother board and of replacing components fitted to the mother board.

All the information required for repairing the Mainframe KR 085P1 down to component level is given in this part.

The repair of the models (variants) 02 and 03 is generally identical.

Generally observe:

Disassemble the Mainframe KR 085P1 only to the extent necessary for repair of the particular damage.

Any component that is definitely proved to be defective - through use of the troubleshooting instructions - should only be replaced by a component that meets the specifications given in the parts lists in the appendix to this repair manual.

If the mother board itself is faulty, e.g. printed circuit breaks, burns etc., generally replace the mother board by a new one.

All components and assemblies are subjected to strict quality assurance before they are allowed to be fitted. Furthermore they have been aged artificially.

For the purpose of ensuring maximum reliability we recommend that only original spare parts are used, for replacing defective components.

When ordering a spare part, please state the following:

Type, ordering code and serial number of equipment, stock number of the parts list and designation plus stock number of the component concerned.

All of these details are to be found in the circuit diagrams, parts lists and component layout that accompany the manual.

6.1.2 Important User Information

The following contains details which are essential when referring to Part 6 "Repair". This is in order to prevent misunderstandings at a later stage.

- o Abbreviations in the text, such as X8.1b are to be understood as follows:

Connector 8 - Pin 1b

MAINFRAME
KR 085P1

Repair Manual
Part 5: Description of Function

- 5.2 -

NOTES

MAINFRAME
KR 085P1

Repair Manual
Part 5: Description of Function

- 5.1 -

5. Description of Function

See circuit diagrams 651.6018.01S, 651.7114.01S and 651.7514.01S

The Mainframe KR 085P1 contains only the mother board as electrically functional element.

On the component side of the mother board there are different multipoint connectors.

If the mainframe is fitted with modules the multipoint connectors of the modules fit into the multipoint connectors of the mother board.

In operation of the VLF-HF Receiver EK 085 the electrical signals from the modules are fed to the mother board via the multipoint connectors.

Via the printed circuit tracks the signals are then distributed between the individual modules. Subsequently they are fed back to a module through its multipoint connector.

HF signals are not distributed via the mother board. Instead they are distributed directly between the individual modules by means of separate HF coaxial cables, that have to be plugged by hand.

Fixed to the inner side of the upper cover there is a cabling diagram indicating the routing of the HF connections.

MAINFRAME
KR 085P1

Repair Manual
Part 0: List of Contents

---(Continuation) List of Contents

LIST OF FIGURES

Fig.	Title	Page
6.1	Cabling Diagram for HF Cables	6.7
6.2	Mainframe KR 085P1	6.9
6.3	System Diagram of EK 085	6.11

Appendix *****

Circuit Diagram EK 085	651.6018.01S
Circuit Diagram, Mainframe KR 085P1	651.7114.01S
Electrical Parts List, Mainframe KR 085P1 ...	651.7114.01SA
Circuit Diagram, Mother board	651.7514.01S
Electrical Parts List, Mother board	651.7514.01SA
Component Layout, Mother board	651.7514, page 2 + 3

MAINFRAME
KR 085 P 1

Repair Manual
Part 0: List of Contents

- 0.1 -

LIST OF CONTENTS

	Page
1. Characteristics(see User Manual EK 085).....	1.1
2. Preparation for Use and Operation(see User Manual EK 085).....	2.1
3. Maintenance(see User Manual EK 085).....	3.1
4. Troubleshooting(see User Manual EK 085).....	4.1
5. Description of Function	5.1
6. Repair	6.1
6.1 Preliminary Remarks	6.1
6.1.1 General	6.1
6.1.2 Important User Information	6.1
6.2 Special Tools and Test Equipment	6.2
6.2.1 Test Equipment List	6.2
6.3 Troubleshooting Instructions	6.3
6.3.1 General	6.3
6.3.2 Visual Inspection	6.3
6.3.3 Continuity and Short Circuit Test	6.3
6.4 Replacement of Assemblies and Components	6.4
6.4.1 Replacement of the Mother Board	6.4
6.4.2 Replacement of Components	6.4
6.5 Final Inspection	6.5
6.6 External Interfaces	6.5

(Continuation)---



ROHDE & SCHWARZ

Repair Manual
MAINFRAME
KR 085P1
615.7114

MAINFRAME
KR 085P1

Repair Manual
Part 6: Repair

- 6.7/6.8 -

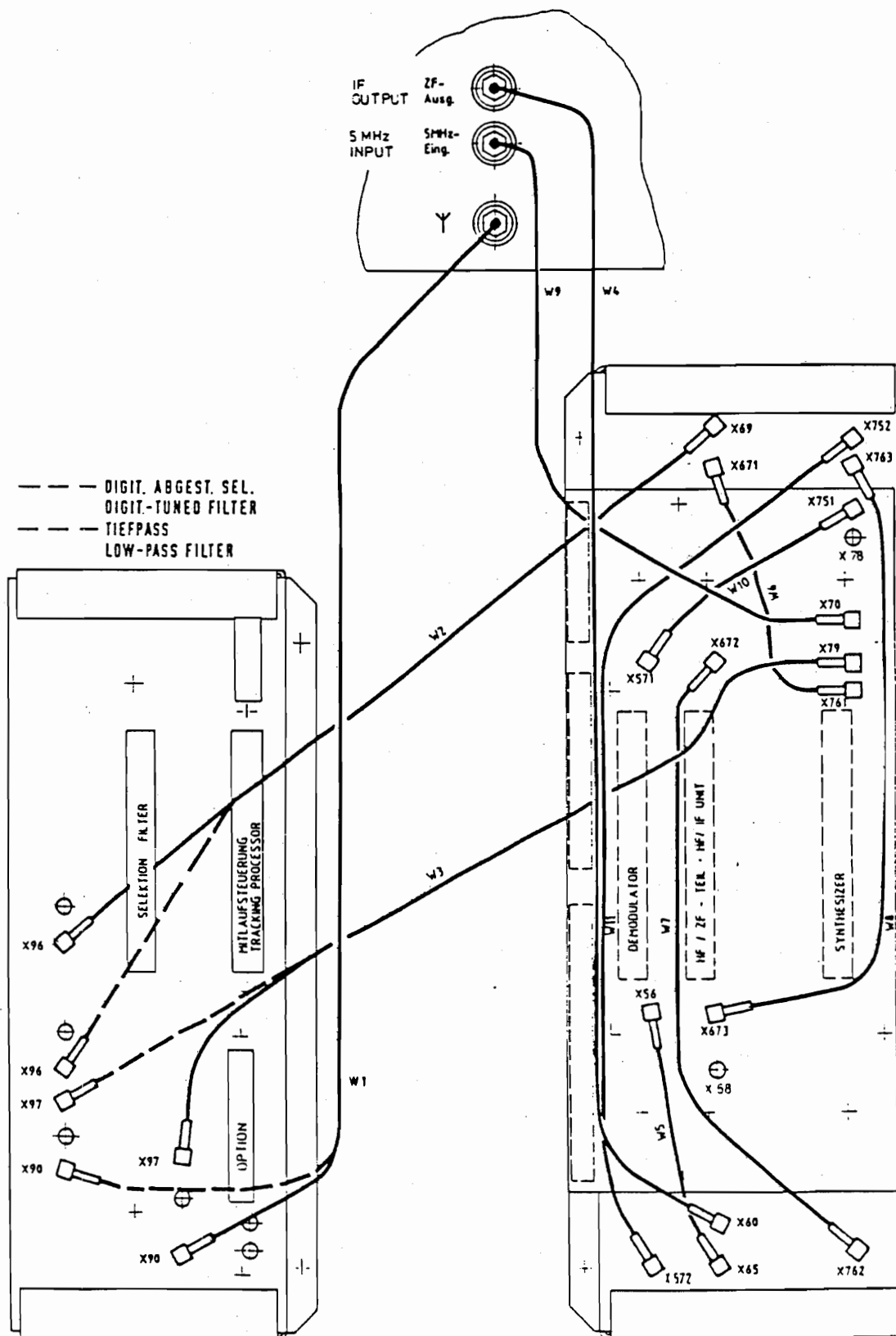


Fig. 6.1 Cabling Diagram for HF Cables

MAINFRAME
KR 085P1

Repair Manual
Part 6: Repair

- 6.9/6.10 -

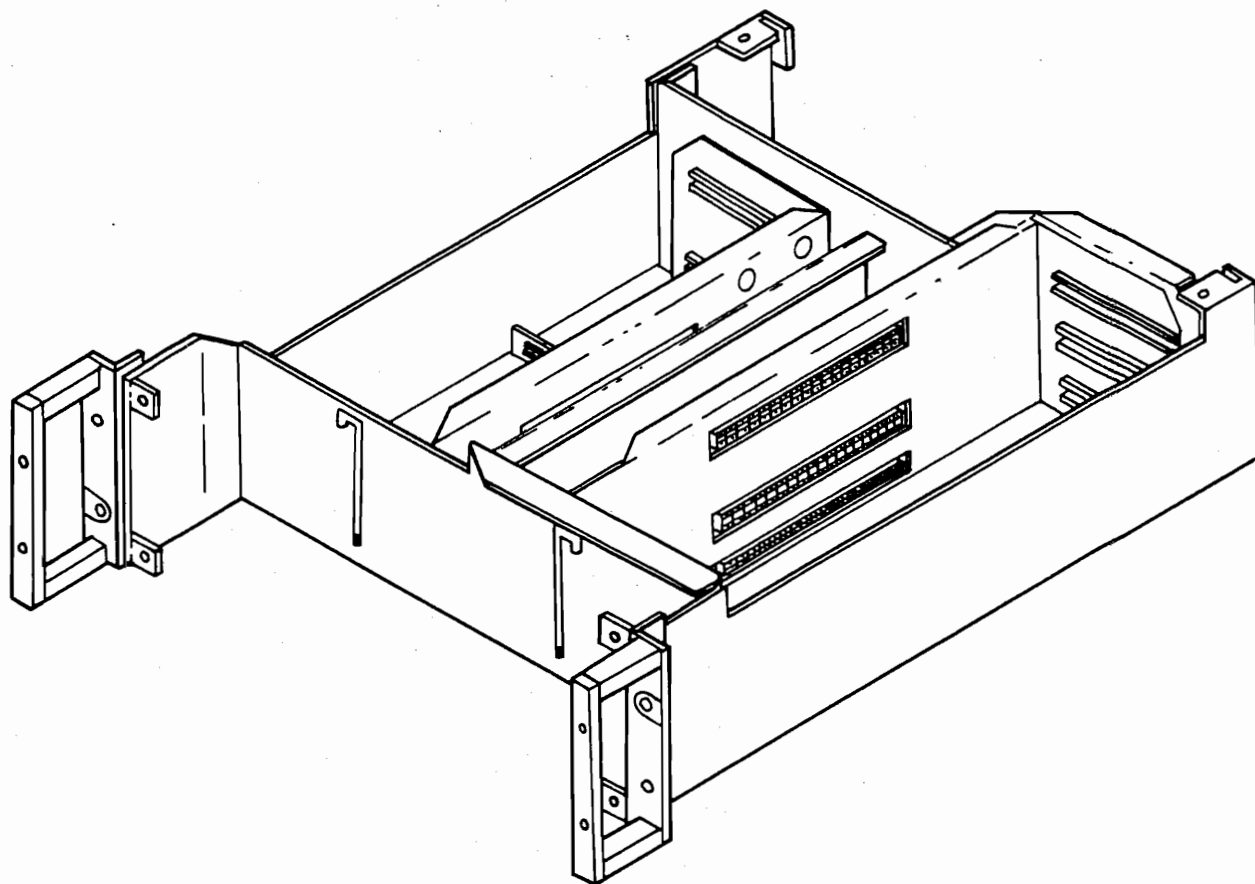


Fig. 6.2 Mainframe KR 085P1

MAINFRAME
KR 085 P1

Repair Manual
Part 6: Repair

- 6.11/6.12 -

EK 085 VLF-HF RECEIVER

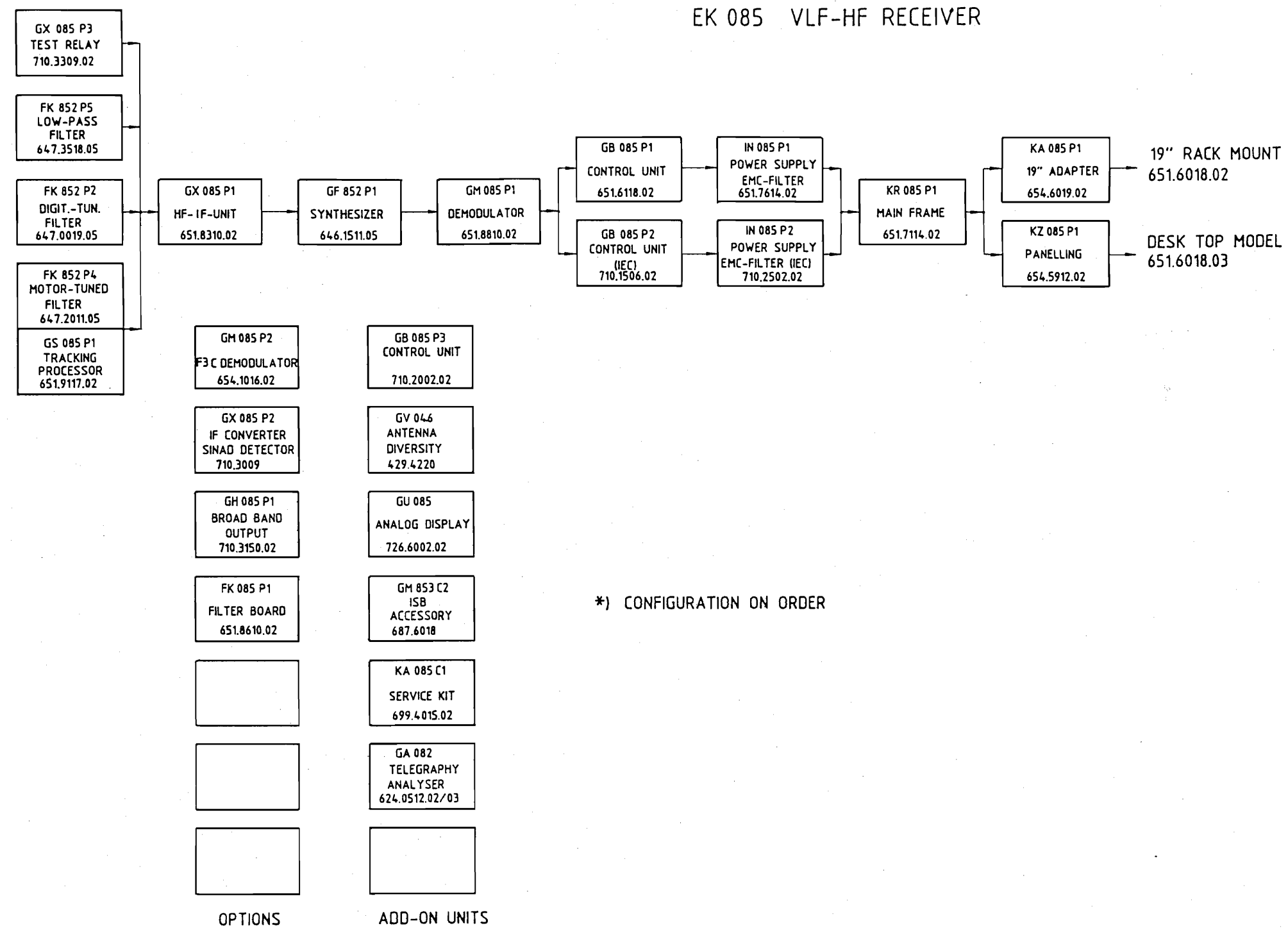


Fig. 6.3 System Diagram of EK 085



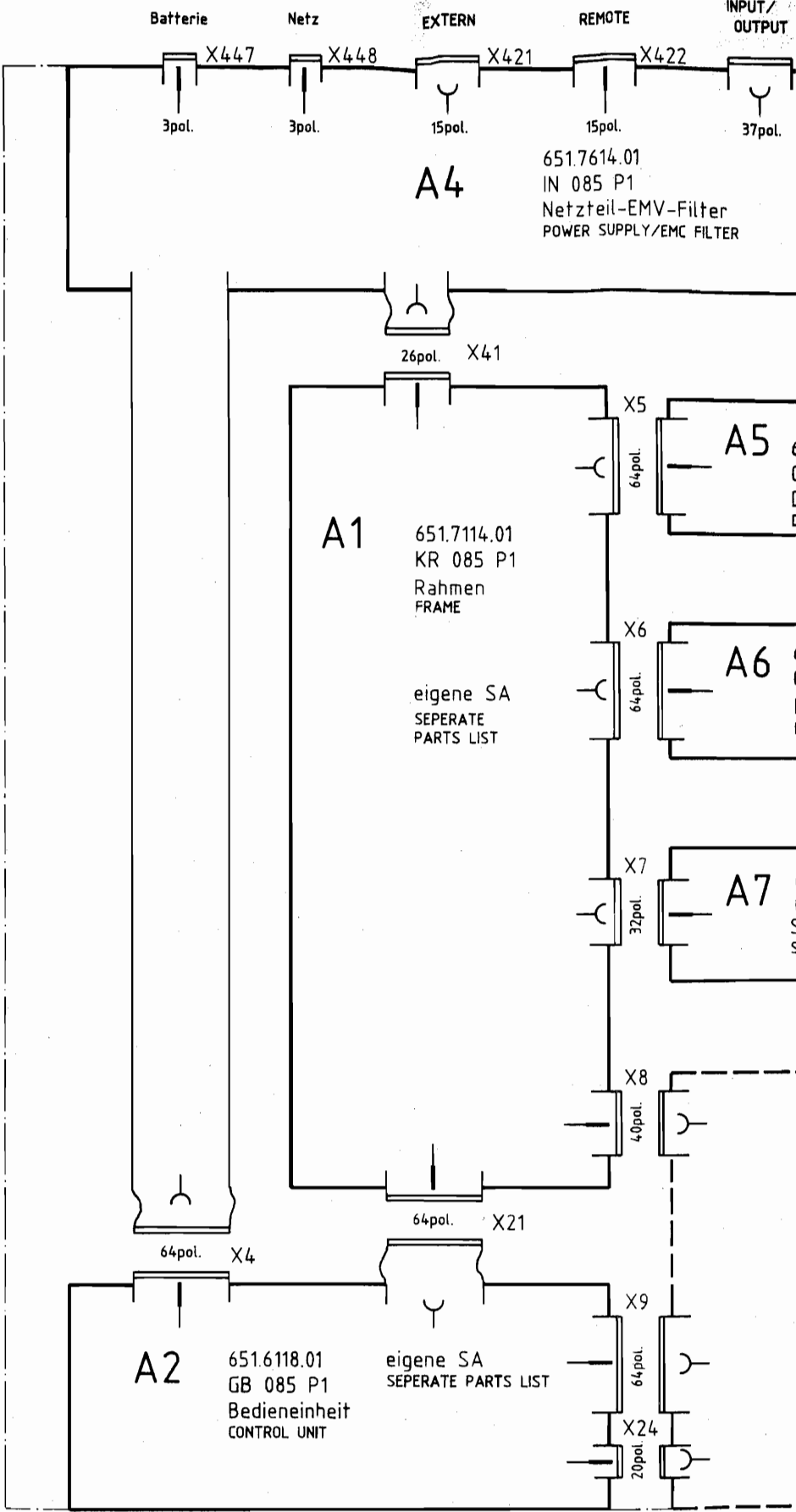
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MÜNCHEN

Schaltteillisten
Stromläufe
Bestückungspläne
Parts lists
Circuit diagrams
Components plans

Steckerbelegung Extern

X421	EXTERN	X422	REMOTE	X423	INPUT/OUTPUT	X424	TTY
1	EXT.1	1	Adressiert	1	⎓	1	Masse
2	EXT.2	2	TXD TA	2	⎓	2	FAX
3	EXT.3	3	RTS CA	3	⎓	3	FSK-Ausgang
4	EXT.4	4	RXD RA	4		4	FAX
5	EXT.5	5	DSR IA	5	Softy-a	5	
6	EXT.6	6	RXC SA	6	Softy-b	6	Masse
7	EXT.7	7	CTS BA	7	Softy-c	7	
8	EXT.8	8	⎓	8	Sperre	8	-Linienstrom
9	EXT.9	9	TXD TB	9	AGC-REF-A	9	+Linienstrom
10	EXT.0	10	RTS CB	10	OPT 2		
11	⎓	11	RXD SB	11	ΔF		
12	⎓	12	DSR IB	12			
13	NC	13	RXC SB	13	OPT 1		
14	NC	14	CTS BB	14			
15	+5V	15	DTR	15			
				16	FSK-Ausgang		
				17	Netz Schalter		
				18			
				19			
				20	⎓		
				21	⎓		
				22	⎓		
				23			
				24			
				25	FAX		
				26	OPT 3		
				27	DIV		
				28	AGC-ZF		
				29			
				30	BITE FSK		
				31			
				32			
				33	Softy-anal.		
				34	Netz-Schalter		
				35			
				36	+5V		
				37			

X447	BATTERIE	X448	NETZ
1	+24V	○	100, 120
2	-24V	○	220, 240V
3	Ausgang	○	⎓



X424	TTY
1	Masse
2	FAX
3	FSK-Ausgang
4	FAX
5	
6	Masse
7	
8	-Linienstrom
9	+Linienstrom



Benennung EK085 VLF-HF Empfänger
VLF RECEIVER

Zeichn.-Nr. 651.6018.01 S

Blatt-Nr.	1
v. 3	Bl

Steckerbelegung Intern

X4	a	b	X5	a	b	X6	a	b	X7	a	X8	a	b	X9	a	b
1	EXT 1	EXT 2	1	BFO-E	NF-E	1	MGC-S	F1	1	CM-SYN	1	AGC		1		
2	EXT 4	EXT 8	2			2	AGC-REF-A	F2	2		2	BFO-E	FRQ Netzteil	2		
3	TXD TA	RTS CB	3	BFO-S		3	AGC-REF-E	F3	3		3	Mithören	Sperre	3		
4	RXD RA	DSR IA	4	BFO A	BFO A	4	AGC-ZF	F4	4	ST2	4		+5V	4		
5		RXC SA	5	BITE-NF	ST9	5	ST9	ST9	5	ST9	5	ST9	ST10	5		
6			6	NF-Leitung		6	DIV	FS	6		6	DAT 7	ST6	6	ST3	
7	RES	RES	7	BFO-Lampe		7	HF-Inst.		7		7	DAT 6	BITE EXT	7	ST4	
8	RES		8			8	HF Rück-Inst.		8		8	DAT 5	CM-EXT	8	CS	
9	CTS BA	TXD TB	9	ST10	ST10	9		Sperre	9	ST1	9	DAT 4		9	ST9	
10	RTS CA	RXD SB	10		DAT 0	10	DAT 0	DAT 0	10	DAT 0	10	DAT 3	DAT 0	10	DAT 0	
11	DSR IB	RXC SB	11		DAT 1	11	DAT 1	DAT 1	11	DAT 1	11	DAT 2	DAT 1	11	DAT 1	
12	CTS BB	DTR	12		DAT 2	12	DAT 2	DAT 2	12	DAT 2	12	ST1		12	DAT 2	
13	BAT.	U-BAT.	13	CM-BFO	DAT 3	13	DAT 3	DAT 3	13	DAT 3	13	+24V	-24V	13	DAT 3	
14	RAM-CLEAR	NF	14		DAT 4	14	DAT 4	DAT 4	14	DAT 4	14	-15V	+15V	14	DAT 4	
15	NF-S	NF-Inst.	15	BITE-FSK	DAT 5	15	DAT 5	DAT 5	15	DAT 5	15	FS	SID	15	DAT 5	
16	FSK-Rück-Inst.	FSK	16	FSK-Ausgang	DAT 6	16	DAT 6	DAT 6	16	DAT 6	16	ST7		16	DAT 6	
17	+16V	+16V	17	ΔF	DAT 7	17	DAT 7	DAT 7	17	DAT 7	17	ST8	CM-TH	17	DAT 7	
18	+16V	Adressiert	18	Softy-anal.	ST6	18	ST6	ST6	18		18	OPT 1	OPT 2	18		
19	+16V	11 1.1 Kurz	19	Softy-a	ST8	19		ST7	19		19	OPT 3	AGC-ZF	19		
20	Netz Schalter	Netz Schalter	20	Softy-b		20	CM-Empf.		20		20	AGC-REF-A	MGC-S	20		
21	FRQ Netzteil	<400 kHz	21	Softy-c		21	AGC-Selektion		21					21	AGC-Selektion	
22	Netz Lampe	RESET Netzteil	22	FAX	Mithören	22		AGC	22					22		
23	-16V	11 1.1 Kurz	23	-15V	-15V	23	-15V	-15V	23	-15V				23	-16V	
24			24	+5V	+5V	24	+5V	+5V	24	+5V				24	+5V	
25	+5V	+5V	25	+5V	+5V	25	+5V	+5V	25	+5V				25	+5V	
26	+5V	+5V	26	BB (+7,2V)	BB (+7,2V)	26	BB (+7,2V)	BB (+7,2V)	26	BB (+7,2V)				26	+5V	
27	+5V	+5V	27	BB (+7,2V)	BB (+7,2V)	27	BB (+7,2V)	BB (+7,2V)	27	BB (+7,2V)				27	+5V	
28		-5V	28	+15V	+15V	28	+15V		28	+15V				28	+16V	
29			29	+15V	+15V	29	+15V	+15V	29	+15V				29	+16V	
30			30			30			30					30	Filter	
31			31			31			31					31		
32			32			32			32					32		



ROHDE & SCHWARZ

A	—	1.86	BM					6KBH	Tag	Name	Benennung
								Bearb.	9.85	BM	EK085
								Gepr.			
And Zust	Anderungs- Mittelung	Datum	Name	And Zust	Anderungs- Mittelung	Datum	Name	Norm			

Steckerbelegung Intern

X6	a	b	X7	a	X8	a	b	X9	a	b	X21	a	b	X24	a	b
1	MGC-S	F1	1	CM-SYN	1	AGC		1			1			1	F1	F2
2	AGC-REF-A	F2	2		2	BFO-E	FRQ Netzteil	2			2			2	F4	F8
3	AGC-REF-E	F3	3		3	Mithören	Sperre	3			3			3	A1	A2
4	AGC-ZF	F4	4	ST2	4		+5V	4			4			4	A4	VAL
5	ST9	ST9	5	ST9	5	ST9	ST10	5			5			5	ST9	DAT 0
6	DIV	FS	6		6	DAT 7	ST6	6	ST3		6			6	DAT 1	RESET Netzteil
7	HF-Inst.		7		7	DAT 6	BITE EXT	7	ST4		7			7	+5V	+5V
8	HF Rück-Inst.		8		8	DAT 5	CM-EXT	8	CS		8	BITE-EXT	CM-EXT	8	⊥	⊥
9		Sperre	9	ST1	9	DAT 4		9	ST9		9	ΔF	BITE-FSK	9	⊥	-16V
10	DAT 0	DAT 0	10	DAT 0	10	DAT 3	DAT 0	10	DAT 0		10	CM-Empf.	ST10	10	+16V	+16V
11	DAT 1	DAT 1	11	DAT 1	11	DAT 2	DAT 1	11	DAT 1		11	CM-BFO	HF-Rück-Inst.			
12	DAT 2	DAT 2	12	DAT 2	12	ST1	⊥	12	DAT 2		12	BFO-Lampe	HF-Inst.			
13	DAT 3	DAT 3	13	DAT 3	13	+24V	-24V	13	DAT 3		13					
14	DAT 4	DAT 4	14	DAT 4	14	-15V	+15V	14	DAT 4		14					
15	DAT 5	DAT 5	15	DAT 5	15	FS	SID	15	DAT 5		15					
16	DAT 6	DAT 6	16	DAT 6	16	ST7		16	DAT 6		16		SID			
17	DAT 7	DAT 7	17	DAT 7	17	ST8	CM-TH	17	DAT 7		17	BITE-NF	BFO-E			
18	ST6	ST6	18		18	OPT 1	OPT 2	18			18	AGC-REF-E	BFO-S			
19		ST7	19		19	OPT 3	AGC-ZF	19			19	AGC-REF-A	BFO A			
20	CM-Empf.		20		20	AGC-REF-A	MGC-S	20			20	BFO-E	NF-E			
21	AGC-Selektion		21					21	AGC-Selektion		21	MGC-S	F1			
22		AGC	22					22			22	F2	F3			
23	-15V	-15V	23	-15V				23	-16V		23	F4	FS			
24	+5V	+5V	24	+5V				24	+5V		24	ST6	ST7			
25	+5V	+5V	25	+5V				25	+5V		25	ST8	CM-SYN			
26	BB (+7,2V)	BB (+7,2V)	26	BB (+7,2V)				26	+5V		26	CM-TH	ST2			
27	BB (+7,2V)	BB (+7,2V)	27	BB (+7,2V)				27	+5V		27	ST9	ST1			
28	+15V		28	+15V				28	+16V		28	AGC-Selektion	⊥			
29	+15V	+15V	29	+15V				29	+16V		29	DAT 0	DAT 1			
30	⊥	⊥	30	⊥				30	Filter		30	DAT 2	DAT 3			
31	⊥	⊥	31	⊥				31	⊥		31	DAT 4	DAT 5			
32	⊥	⊥	32	⊥				32	⊥		32	DAT 6	DAT 7			

X41	a	b
1	OPT 3	DIV
2	AGC-REF-A	AGC-ZF
3	NF-Leitung	OPT 2
4	Sperre	BITE-FSK
5	FSK-Ausgang	ΔF
6	Softy-anal.	Softy-a
7	Softy-b	Softy-c
8	OPT 1	FAX
9	+5V	-15V
10	FRQ Netzteil	BB (+7,2V)
11	+15V	+15V
12	⊥	⊥
13	+24V	-24V

ISB Zusatz

ZF Umsetzung SINAD

Tiefpaß
LOW-PAS-FILTER

Digit. Abgest. Selektion
DIGIT. TUNED FILTER

* Mitlaufsteuerung
TRACKING PROCESSOR
Mot. Abgest. Selektion
MOTOR TUNED FILTER

	X	X	X					
	X	X	X					
				X	X			
				X	X			
	*			X	X			

Mot. Abgest. Selektion
MOTOR TUNED FILTER

Mitlaufsteuerung
TRACKING PROCESSOR

Digit. Abgest. Selektion
DIGIT. TUNED FILTER

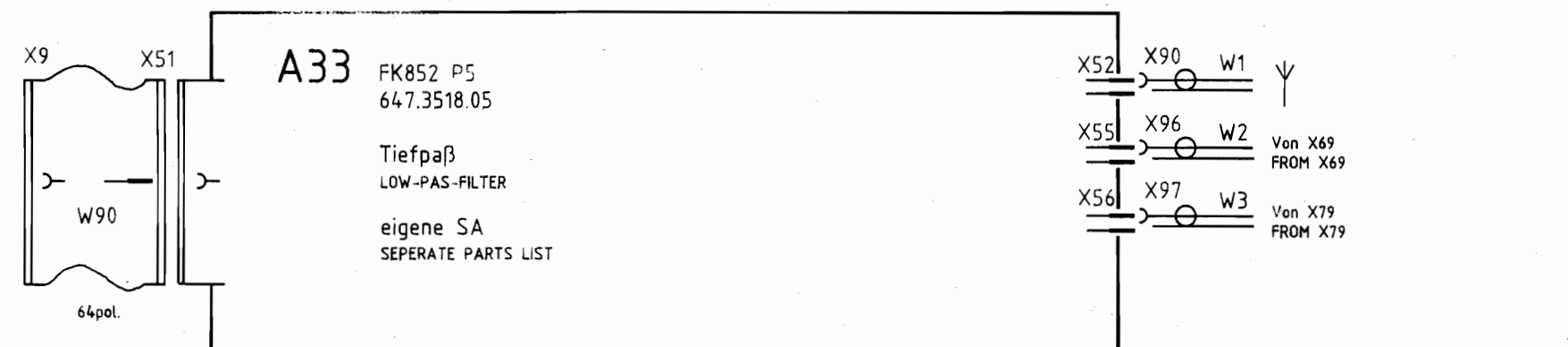
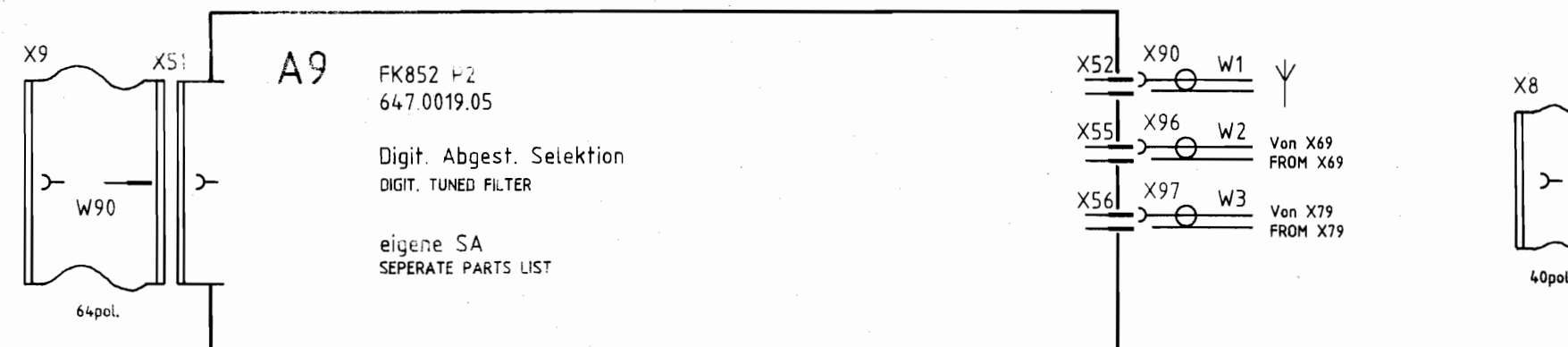
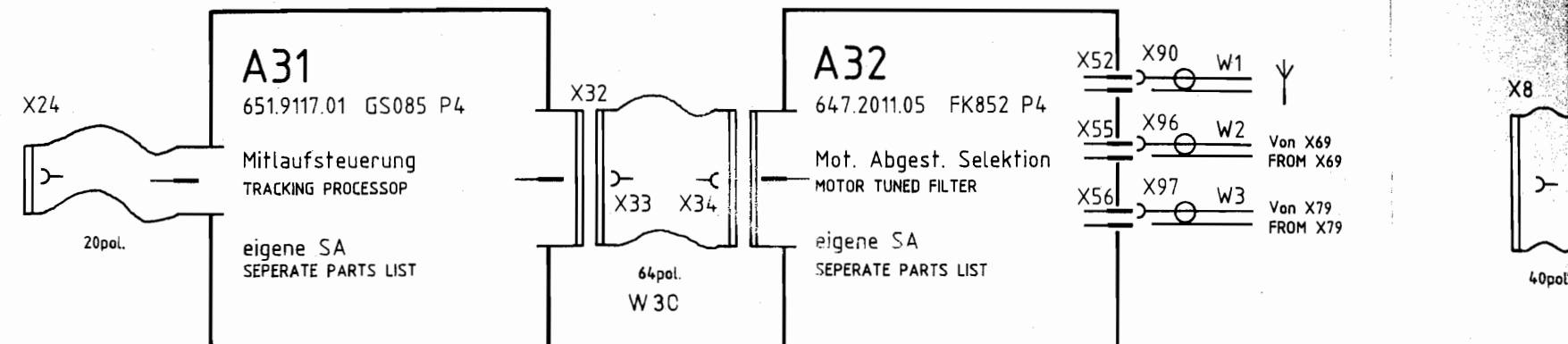
Tiefpaß
LOW-PAS-FILTER

ZF Umsetzung SINAD

ISB Zusatz

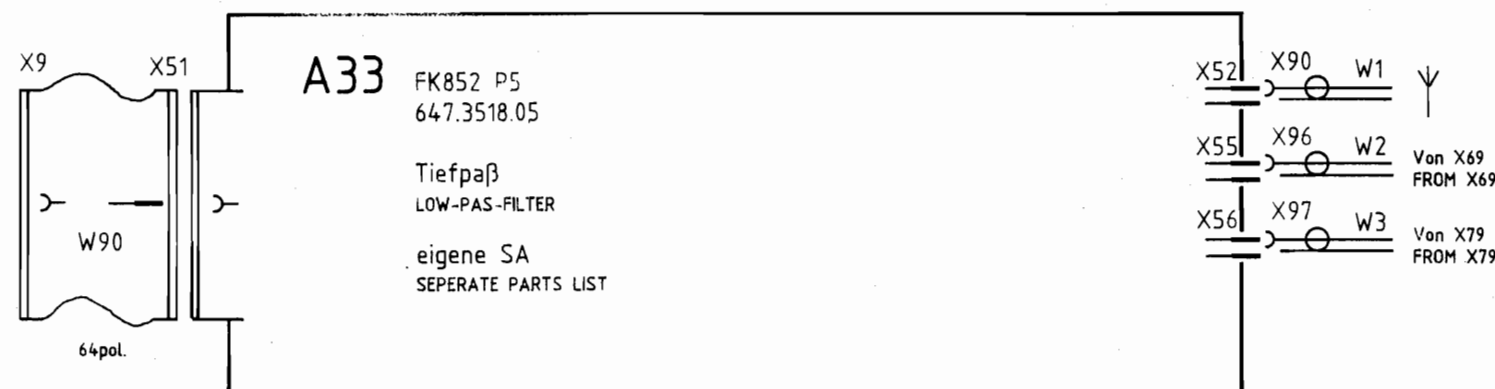
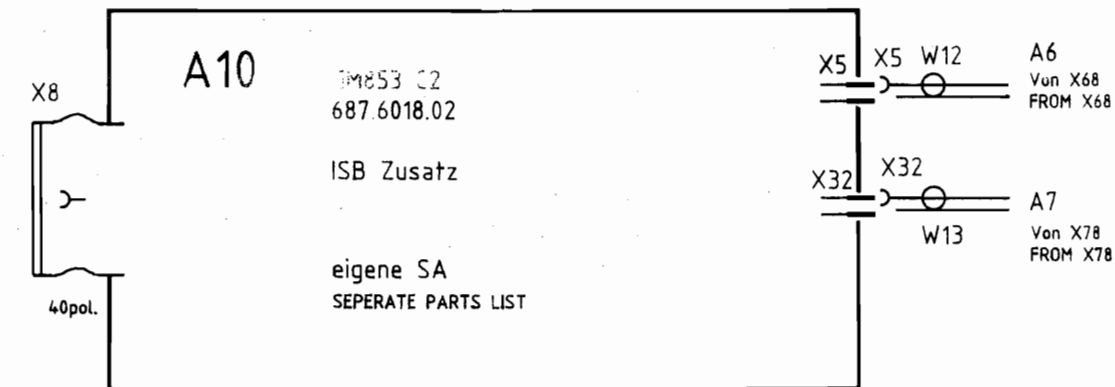
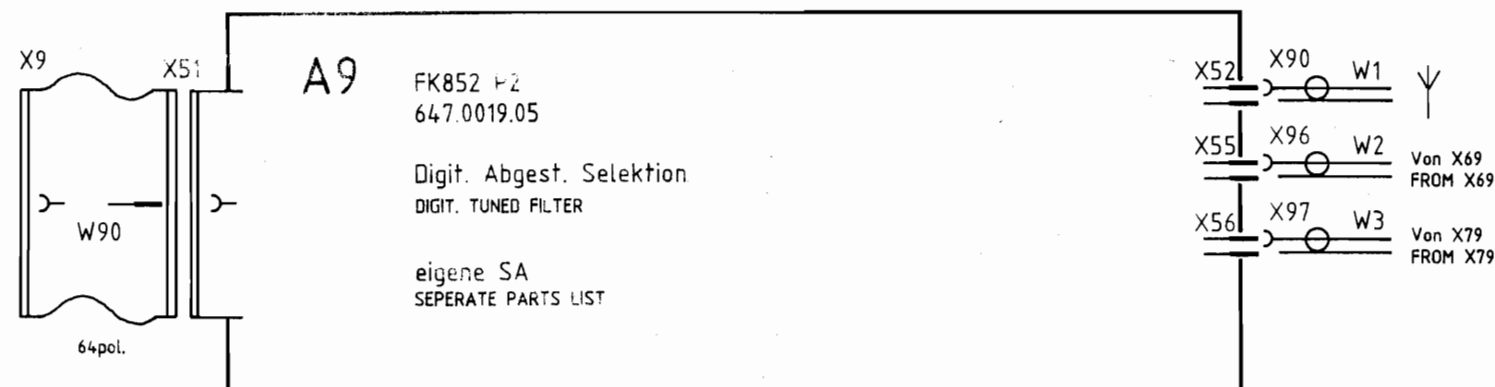
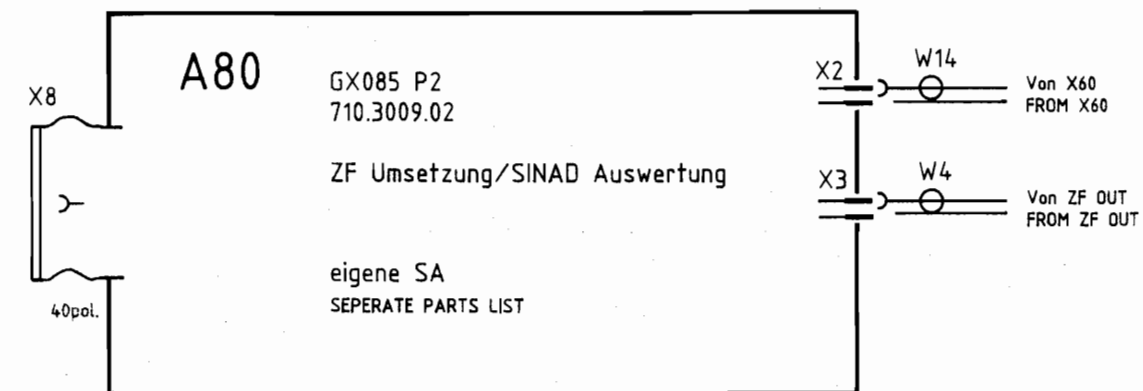
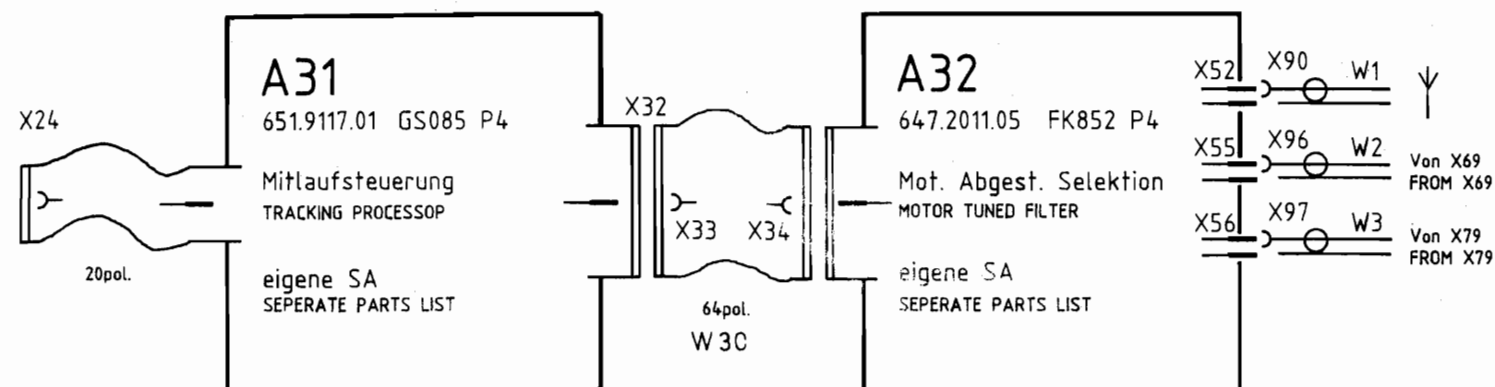
* nur gemeinsam Funktionsfähig
ONLY FUNCTIONAL IF BOTH ARE USED

X mögliche Kombinationen zur gewählten Option (1 weitere Option möglich)
POSSIBLE COMBINATIONS WITH SELECTED OPTION (ONE OTHER OPTION POSSIBLE)



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A	—	1.86	BM					6KBH	Tag	Name	Benennung
								Bearb.	11.85	BM	EK085
								Gepr.			
And. Zust.	Änderungs-Mitteilung	Datum	Name	And. Zust.	Änderungs-Mitteilung	Datum	Name	Norm			



X5	a	b
1	BFO-E	NF-E
2		
3	BFO-S	
4	BFO A	BFO A
5	BITE-NF	ST9
6	NF-Leitung	
7	BFO-LAMPE	
8		
9	ST10	ST10
10		DAT 0
11		DAT 1
12		DAT 2
13	CM-BFO	DAT 3
14		DAT 4
15	BITE-FSK	DAT 5
16	FSK-Ausgang	DAT 6
17	Δ F	DAT 7
18	Softy-anal.	ST6
19	Softy-a	ST8
20	Softy-b	
21	Softy-c	Mithören
22	FAX	-15V
23	-15V	+5V
24	+5V	+5V
25	+5V	+5V
26	BB (+7,2V)	BB (+7,2V)
27	BB (+7,2V)	BB (+7,2V)
28	+15V	+15V
29	+15V	+15V
30	⊥	⊥
31	⊥	⊥
32	⊥	⊥

X6	a	b
1	MGC-S	F1
2	AGC-REF-A	F2
3	AGC-REF-E	F3
4	AGC-ZF	F4
5	ST9	ST9
6	DIV	FS
7	HF-Inst.	
8	HF Rück-Inst.	
9		Sperre
10	DAT 0	DAT 0
11	DAT 1	DAT 1
12	DAT 2	DAT 2
13	DAT 3	DAT 3
14	DAT 4	DAT 4
15	DAT 5	DAT 5
16	DAT 6	DAT 6
17	DAT 7	DAT 7
18	ST6	ST6
19		ST7
20	CM-Empf.	
21	AGC-Selektion	AGC
22		-15V
23	-15V	+5V
24	+5V	+5V
25	+5V	+5V
26	BB (+7,2V)	BB (+7,2V)
27	BB (+7,2V)	BB (+7,2V)
28	+15V	+15V
29	+15V	+15V
30	⊥	⊥
31	⊥	⊥
32	⊥	⊥

X21	a	b
1		
2		
3		
4		
5		
6		
7		
8	BITE-EXT	CM-EXT
9	Δ F	BITE-FSK
10	CM-Empf.	ST10
11	CM-BFO	HF Rück-Inst.
12	BFO-LAMPE	HF -Inst.
13		
14		
15		
16		SID
17	BITE-NF	BFO-E
18	AGC-REF-E	BFO-S
19	AGC-REF-A	BFO A
20	BFO-E	NF-E
21	MGC-S	F1
22	F2	F3
23	F4	FS
24	ST6	ST7
25	ST8	CM-SYN
26	CM-TH	ST2
27	ST9	ST1
28	AGC-SELEKTION	⊥
29	DAT 0	DAT 1
30	DAT 2	DAT 3
31	DAT 4	DAT 5
32	DAT 6	DAT 7

X8	a	b
1	AGC	FRQ. Netzteil
2	BFO-E	Sperre
3	Mithören	+5V
4		ST10
5	ST9	ST6
6	DAT 7	BITE EXT
7	DAT 6	CM-EXT
8	DAT 5	
9	DAT 4	
10	DAT 3	DAT 0
11	DAT 2	DAT 1
12	ST1	⊥
13	+24V	-24V
14	-15V	+15V
15	FS	SID
16	ST7	
17	ST8	CM-TH
18	OPT 1	OPT 2
19	OPT 3	AGC-ZF
20	AGC-REF-A	MGC-S

X41	a	b
1	OPT 3	DIV
2	AGC-REF-A	AGC-ZF
3	NF-Leitung	OPT 2
4	Sperre	BITE-FSK
5	FSK-Ausgang	Δ F
6	Softy-anal.	Softy-a
7	Softy-b	Softy-c
8	OPT 1	FAX
9	+5V	-15V
10	FRQ. Netzteil	BB (+7,2V)
11	+15V	+15V
12	⊥	⊥
13	+24V	-24V

X7	a
1	CM-SYN
2	
3	
4	ST2
5	ST9
6	
7	
8	
9	ST1
10	DAT 0
11	DAT 1
12	DAT 2
13	DAT 3
14	DAT 4
15	DAT 5
16	DAT 6
17	DAT 7
18	
19	
20	
21	
22	
23	-15V
24	+5V
25	+5V
26	BB (+7,2V)
27	BB (+7,2V)
28	+15V
29	+15V
30	⊥
31	⊥
32	⊥



ROEDER & SCHNEIDER

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Datum
DateSchaltteilliste für
Parts list forSachnummer
Stock No.Blatt
Page

03

1085

KR085P1 RAHMEN
KR085P1 MAIN FRAME

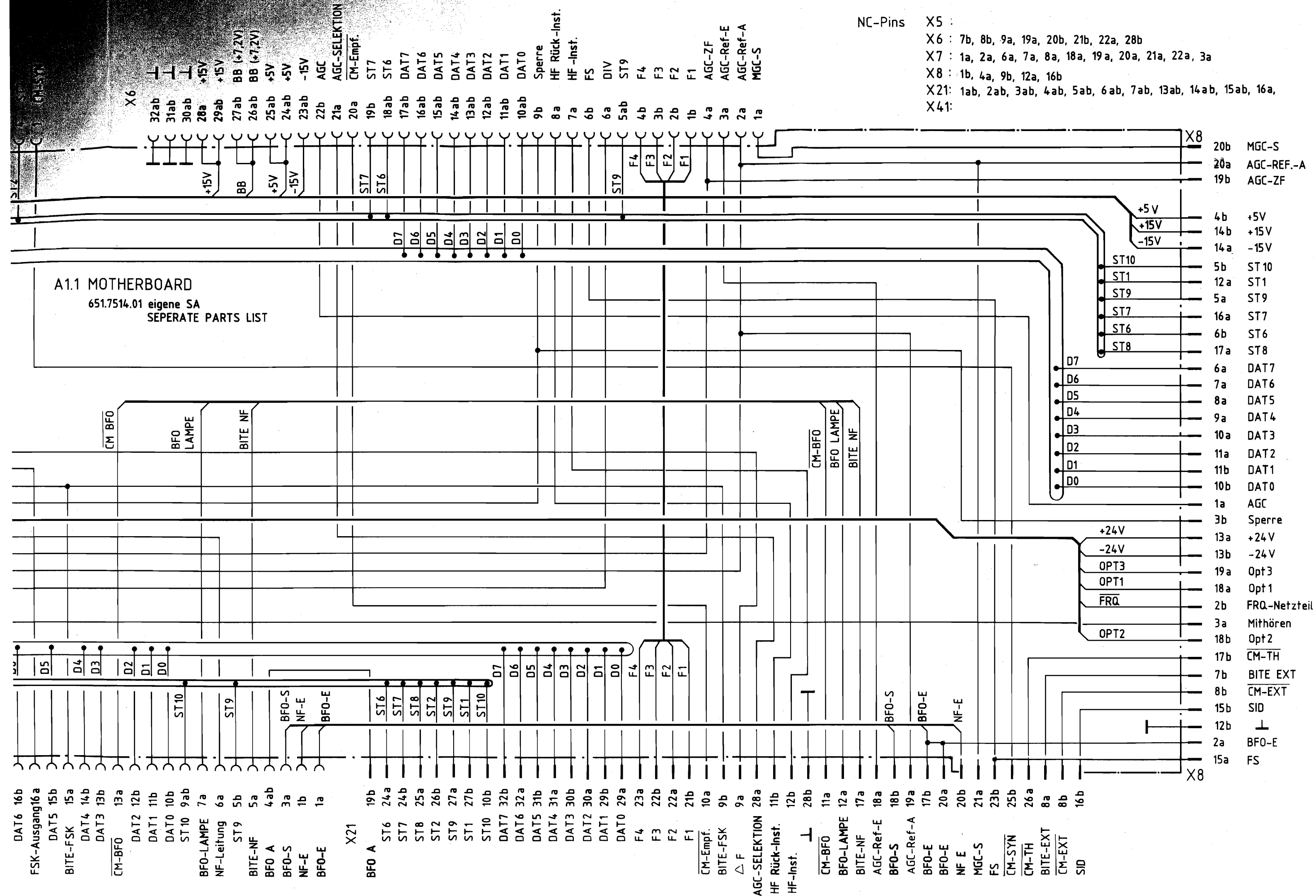
651.7114.01 SA

1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG		
A1.1	ED MOTHERBOARD	651.7514.02	
W2	DX HF-KABEL	651.6747	
W3	DX HF-KABEL	651.6753	
W5	DX HF-KABEL	651.6760	
W6	DX HF-KABEL	651.6776	
W7	DX HF-KABEL	651.6782	
W8	DX HF-KABEL	651.6799	
W10	DX HF-KABEL	651.6801	
W11	DX HF-KABEL	651.6953	
			- ENDE -
		651.7114.01 SA	BL 1

A1.1 MOTHERBOARD

651.7514.01 eigene SA
SEPERATE PARTS LIST



NC-Pins

X5 :

X6 : 7b, 8b, 9a, 19a, 20b, 21b, 22a, 28b

X7 : 1a, 2a, 6a, 7a, 8a, 18a, 19a, 20a, 21a, 22a, 3a

X8 : 1b, 4a, 9b, 12a, 16b

X21: 1ab, 2ab, 3ab, 4ab, 5ab, 6ab, 7ab, 13ab, 14ab, 15ab, 16a,

X41:

20b MGC-S
20a AGC-REF.-A
19b AGC-ZF
4b +5V
14b +15V
14a -15V
5b ST 10
12a ST 1
5a ST 9
16a ST 7
6b ST 6
17a ST 8
6a DAT 7
7a DAT 6
8a DAT 5
9a DAT 4
10a DAT 3
11a DAT 2
11b DAT 1
10b DAT 0
1a AGC
3b Sperre
13a +24V
13b -24V
19a Opt3
18a Opt1
2b FRQ-Netzteil
3a Mithören
18b Opt2
17b CM-TH
7b BITE EXT
8b CM-EXT
15b SID
12b $\perp$
2a BFO-E
15a FS



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Date
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Parts list for
ED MOTHERBOARDSachnummer
Stock No.

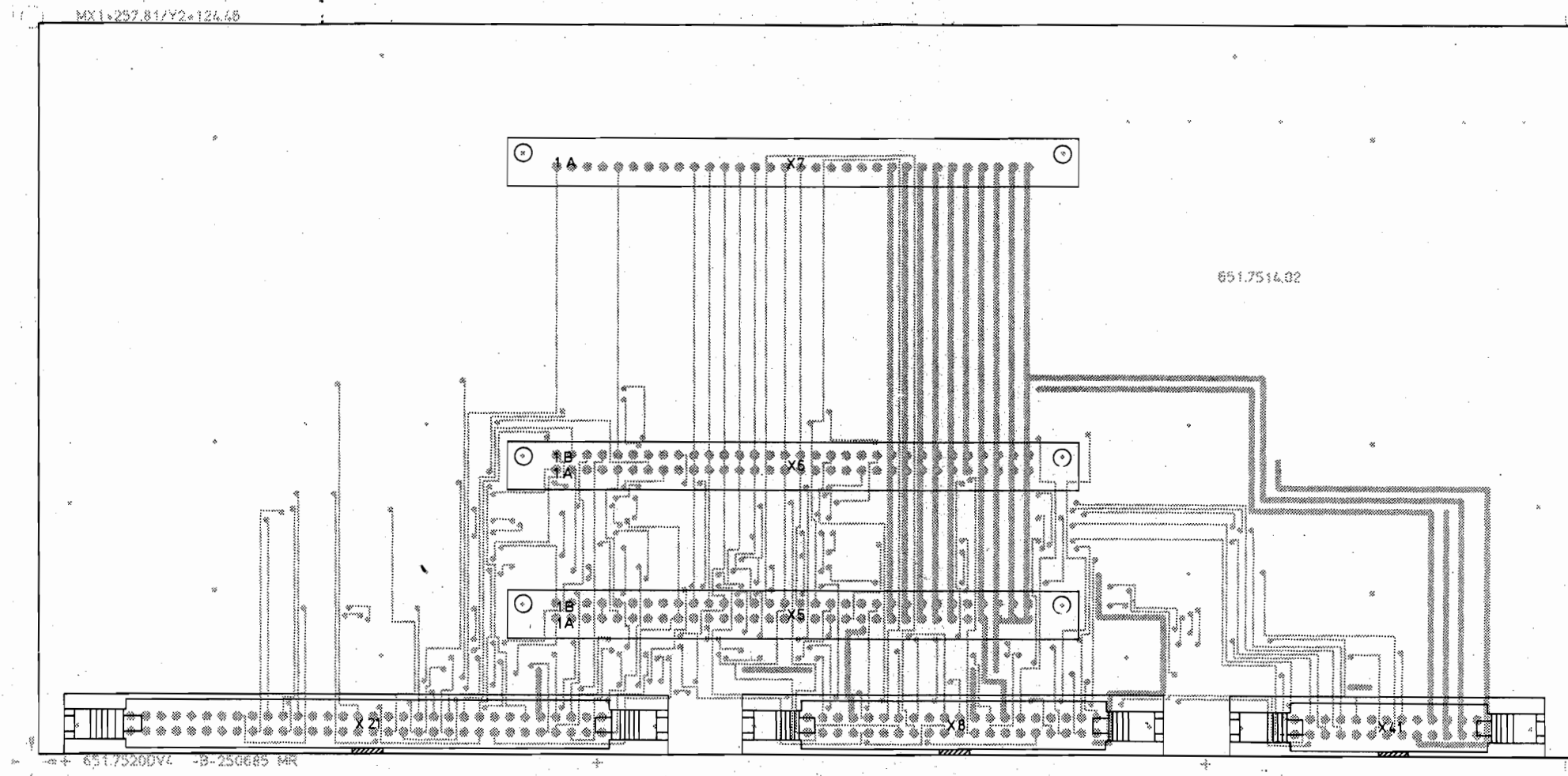
651.7514.01 SA

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Page

1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
-	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
X5	FP IND.BUCHSENLEISTE 64P. FEMALE MULTIPOINT CONNECT PANDUIT 100-064-433/999	FP 278.1913	
X6	FP IND.BUCHSENLEISTE 64P. FEMALE MULTIPOINT CONNECT PANDUIT 100-064-433/999	FP 278.1913	
X7	FP BUCHSENLEISTE 32POL FEMALE MULTIPOINT CONNECT PANDUIT 100-232-433/999	FP 514.4120	
X8	FP STECKERL.40P.M.VERRIEG CONNECTOR PANDUIT 050-040-133BC	FP 624.1419	
X21	FP STECKERLEISTE GER.64P. CONNECTOR 64POL. BERG 76762-264/MIT 2X U2X	FP 645.6784	
X41	FP STECKERLEISTE 26P. CONNECTOR 26POL. PANDUIT 050-026-133BC	FP 620.0147	
			- ENDE -
			651.7514.01 SA BL 1-

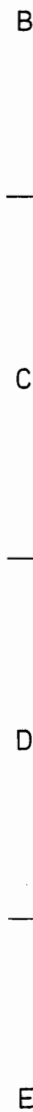
Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Variantenerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST

				Maße ohne Toleranzangabe	Maßstab 1 : 1			
					Halbzeug, Werkstoff			
				6KBE	Tag	Name	Benennung Motherboard	Z
				Bearb.	07.85	MR		
				Gepr.				
				Norm				

A
—
B
—
C
—
D
—
E
—
F



A vertical scale with labels A, B, C, D, E, and F from top to bottom, with horizontal tick marks.

Д

5. Description of Function

5.1 Processor

(See Circuit Diagram 651.6518.01S, pages 1 to 6)

The central unit of the processor is the 80C85 processor D1. The CPU contains a clock oscillator that produces the system clock of 3.072 MHz with the 6.144-MHz control crystal B1 and issues it on pin 37.

The turn-on reset, which resets the CPU to a defined initial status, is produced from the power supply via the two pulse-shaping Schmitt triggers D30-A and D30-B. Of the RST interrupt inputs of CPU D1, the RST 7.5 input is used for the CM (continuous monitoring) interrupt, the RST 6.5 input for the key interrupt and the RST 5.5 input for the USART interrupt. Interrupt input INTR, pin 10 of CPU D1, is driven by the interrupt controller D2-A. This controller manages all interrupts that appear in the processor and applies them to CPU D1 according to the priorities defined in the program.

The 8-bit latch D4-A selects the least-significant eight address bits from the multiplexed address/data bus and adds them to the 16-bit address bus with the most-significant eight address bits, which are output directly by the CPU. Latch D4-A is controlled by the ALE signal from CPU D1.

The operating program of the processor is held in EPROMs D5-A and D6-A. The two EPROMs occupy the addresses 0000H to BFFFH. Thus EPROM D5-A is selected by address line A15 and EPROM D6-A by gating of address lines A14 and A15 by gates D39-C and D36-A.

CMOS RAMs D9-A, D10-A and D11-A are used to store operating data. RAM D9-A is not battery-buffered, i.e. the stored data are lost upon power-down.

RAM D11-A is always battery-buffered and with RAM D10-A it is possible, with links X40 to X42, to change to battery buffering. The battery buffering means that data are preserved upon power-down. To prevent any uncontrolled write operations as the battery voltage drops, the RAMs are deactivated by gate D40, which is also battery-buffered, and gates D31 and D32. RAMs D9-A to D11-A are selected by address decoder D12-A.

The display elements and the keypad on the display board are driven by the key and display controller D13. Lines A0 to A3 and B0 to B3 (connector X23 A/B 27 to 30) form an 8-bit data bus for the 7-segment displays on the display board. Lines SL0 to SL3 (connector X23 A/B 31 and 32) form the associated 4-bit address bus. Latches D14-A and D15-A drive the LEDs on the display board by selecting the data intended for the LEDs from the display data bus.

From address lines SL0 to SL3 the cascaded 1-out-of-4 decoders D16-A and D16-B generate the driving signals SLC0 to SLC7 (connector X22 A 1 to 8) for the keypad matrix. The keypad matrix is interrogated on lines RL0 to RL7 (connector X22 B 1 to 8).

When the operating voltage of +5 V is not present, the voltage supply of the integrated timer circuit D17-A comes from the lithium battery G1 in the power supply/EMC filter, meaning that the time continues to run if the battery voltage fails or the unit is switched off. The control, setting and reading of the time of the timer circuit D17-A is performed by CPU D1.

(Continuation)---

CONTROL UNIT

GB 085P1

Repair Manual

Part 5: Description of Function

- 5.2 -

---(Continuation) Processor

Data are transmitted to other subassemblies via the internal data bus, which is output on port PB of the I/O port D19. The associated internal address bus is output on port PC, the 1-out-of-16 decoder D18-A generating 13 strobe signals for the assignment of the data on the internal data bus. Data are transferred to the follow-up controller via port PA. Latch D22-A, activated by the strobe 11 signal, accepts the data on the internal data bus that are intended for controlling external units.

By way of ports PA and PB of the I/O port D20, configured as inputs, switches S1 and S2 are interrogated for setting the device address and switches S3 and S4 for setting the serial interface and its baud rate. The filter complement of the RF/IF unit is read in on port PC in coded form.

On I/O port D21 ports PB and PC are configured as inputs and PA as an output. Various control signals for other subassemblies are output on port PA. The CM and BITE signals of the various subassemblies are read in on port PB. This is triggered by comparator D23-A, which initiates the CM interrupt if the status of the CM lines changes. The logic operation of gates D31-C, D32-B, D43-A/D and D38-A to D, when the rotary switches on the front panel are operated, generates the switch interrupt, which causes CPU D1 to read in the new switch setting via port PC of the I/O port D21.

The serial interface with USART D24 can operate in different modes. Selection is made with switch S3 of the processor. Assigned to USART D24 are the circuits D25-A and D26-A, which serve as a line driver and line receiver. The transmission timing for

the interface either comes from the timer integrated in I/O port D21 or can be fed in externally. Switching between the two is performed by gates D36-B to D and D31-B. The interface level (0 V/+5 V or ± 5 V) is set with jumper X38. In normal operation the interface corresponds to standards X.21, V.24 or BUS; by changing line driver D25-A with jumper X33 it can be switched to a special mode, however, where there are four independent drivers.

5.2 Display Board

(See Circuit Diagram 651.6318.01S, pages 1 to 7)

The bandwidth, the BFO, the frequency and the time are indicated by the 7-segment displays H50, H51 and H53 to H67. Display H53 shows the sign of the BFO. The 7-segment displays are driven by the BCD-to-7-segment decoders/drivers D20 to D36. Activated by the select signals generated by the 1-out-of-16 decoder D40 from the 4-bit address bus, the BCD-to-7-segment decoders/drivers D20 to D36 accept the data on the 8-bit data bus for driving the displays. 4 bits are required for driving a 7-segment display, meaning that the data for two displays are on the data bus simultaneously. The decoders/drivers assigned to the two displays are activated by a common select line. The LEDs and the sign display are driven by the 8-bit latches D10 to D13.

All display elements have a common cathode terminal whose potential can be set with potentiometer R281 via amplifier N10 and transistor V50 for varying the brightness of the displays.

(Continuation)---

---(Continuation) Display Board

The display of the frequency offset is produced by LED bars H1, H3 and LED H2. These displays are driven by the LED line drivers D1 and D2. The analog voltage that is required for conversion is normalized by the voltage divider R41 and R40 and fed to LED line drivers D1 and D2 on pin 15.

The reference voltage is produced by transistor V51 in conjunction with diodes V10 and V11. This reference voltage is divided by voltage dividers R30 and R35 so that a minimal and maximal threshold value are produced, which are fed to LED line drivers D1 and D2 on pins 12 and 13. The thresholds can be set with potentiometer R31 and the sensitivity of LED line drivers D1 and D2 with potentiometer R37.

The brightness of the LED bars H1, H3 and LED H2 is controlled by amplifier N5, which receives its input information from the common cathode terminal of the remaining display elements.

On the display board there is also AF amplifier N1, which boosts the AF signal to the level required for operation of the loudspeaker. Potentiometer R50 and R51 for setting the manual gain control and the analog BFO plus switches S1 to S3 are also located on the display board.

5.3 Pulse-generator Board

(See Circuit Diagram 651.6282.01S)

On the pulse-generator board there are switches B1 and B2, which use the Hall effect and serve for quasicontinuous frequency tuning. When the tuning knob is operated, switches B1 and B2 produce two pulse trains offset from one another in time. From this offset gates D1 and D2 detect the direction in which the knob is turned. Depending on the direction a pulse train is output on pin 3 (negative turn) or on pin 4 (positive turn) to the keypad and from there via connectors X22.a10 and .b10 to the processor.

5.4 Keypad Board

(See Circuit Diagram 651.6218.01S)

Because of the arrangement of the keys in a matrix, the key and display controller in the processor can evaluate which key has been operated. Through individual activation of signals SLC0 to SLC7 (connector X22.a1 to .a8) and simultaneous interrogation of the return lines RL0 to RL6 (connector X22.b1 to .b7) the location of the activated key in the matrix is produced.

LEDs H1 to H16 assigned to the keys are likewise driven by the key and display controller in the processor.

CONTROL UNIT
GB 085P1

Repair Manual
Part 5: Description of Function

NOTES



ROHDE & SCHWARZ

Repair Manual

CONTROL UNIT

GB 085P1

651.6118

C O N T R O L U N I T
G B 0 8 5 P 1

Repair Manual

Part 0: List of Contents

- 0.1 -

L I S T O F C O N T E N T S

	Page
1. Characteristics (see User Manual) .	1.1
2. Preparation for Use and Operation (see User Manual) .	2.1
3. Maintenance (see User Manual) .	3.1
4. Troubleshooting (see User Manual) .	4.1
5. Description of Function	5.1
5.1 Processor	5.1
5.2 Display Board	5.2
5.3 Pulse-generator Board	5.3
5.4 Keypad Board	5.3
6. Repair	6.1
6.1 Preliminary Remarks	6.1
6.1.1 Troubleshooting Instructions	6.1
6.1.2 Restoring the Nominal Characteristics	6.1
6.1.3 Alignment	6.1
6.1.4 Spare Parts	6.1
6.1.5 Important User Information	6.2
6.2 Test Equipment and Special Tools	6.3
6.2.1 Test Equipment List	6.3
6.3 Troubleshooting	6.4
6.3.1 Troubleshooting: Processor	6.4
6.3.2 Troubleshooting: Display Board	6.6
6.3.3 Troubleshooting: Pulse-generator Board	6.9

(Continuation)---

---(Continuation) List of Contents

	Page
6.4 Measurements and Functional Tests	6.10
6.4.1 Compiled Measured Values	6.10
6.4.2 Test of 7-segment Displays	6.11
6.4.3 Test of LED Displays	6.11
6.4.4 Test of LED Bar	6.12
6.4.5 Test of AF Amplifier	6.12
6.4.6 Test of Pulse Generation	6.12
6.4.7 Test of Hall Switches	6.12
6.5 Setting and Alignment	6.13
6.5.1 Setting of Dimming	6.13
6.5.2 Alignment of LED Bar	6.13
6.6 Replacement of Assemblies	6.14
6.6.1 Removal of Control Unit	6.14
6.6.2 Removal of Processor	6.14
6.6.3 Removal of Display Board	6.14
6.6.4 Removal of Keypad Board with Pulse-generator Board	6.14
6.6.5 Reassembly of Control Unit	6.15
6.7 Final Test	6.15
6.8 External Interfaces	6.15

LIST OF FIGURES

Figure	Title	Page
5.1	Control Unit GB 085P1, Block Diagram	5.5
6.1	Test Adapter for Display Board	6.17
6.2	Removal of Control Unit GB 085P1	6.19
6.3	Removal of Subassemblies	6.21

Appendix *****

Circuit Diagram of Control Unit	651.6118.01S
Parts List of Control Unit	651.6118.01SA
..Circuit Diagram of Keypad Board	651.6218.01S
..Parts List of Keypad Board	651.6218.01SA
..Component Layout of Keypad Board	651.6218.01, p. 2
..Circuit Diagram of Pulse-generator Board	651.6282.01S
..Parts List of Pulse-generator Board	651.6282.01SA
..Component Layout of Pulse-generator Board	651.6282.01, p. 2
..Circuit Diagram of Display Board	651.6318.01S, pages 1 to 7
..Parts List of Display Board	651.6318.01SA
..Component Layout of Display Board	651.6318.01, p. 2
..Circuit Diagram of Processor	651.6518.01S, pages 1 to 6
..Parts List of Processor	651.6518.01SA
..Component Layout of Processor	651.6518.01, p. 2

CONTROL UNIT
GB 085P1

Repair Manual
Part 0: List of Contents

- 0.4 -

NOTES

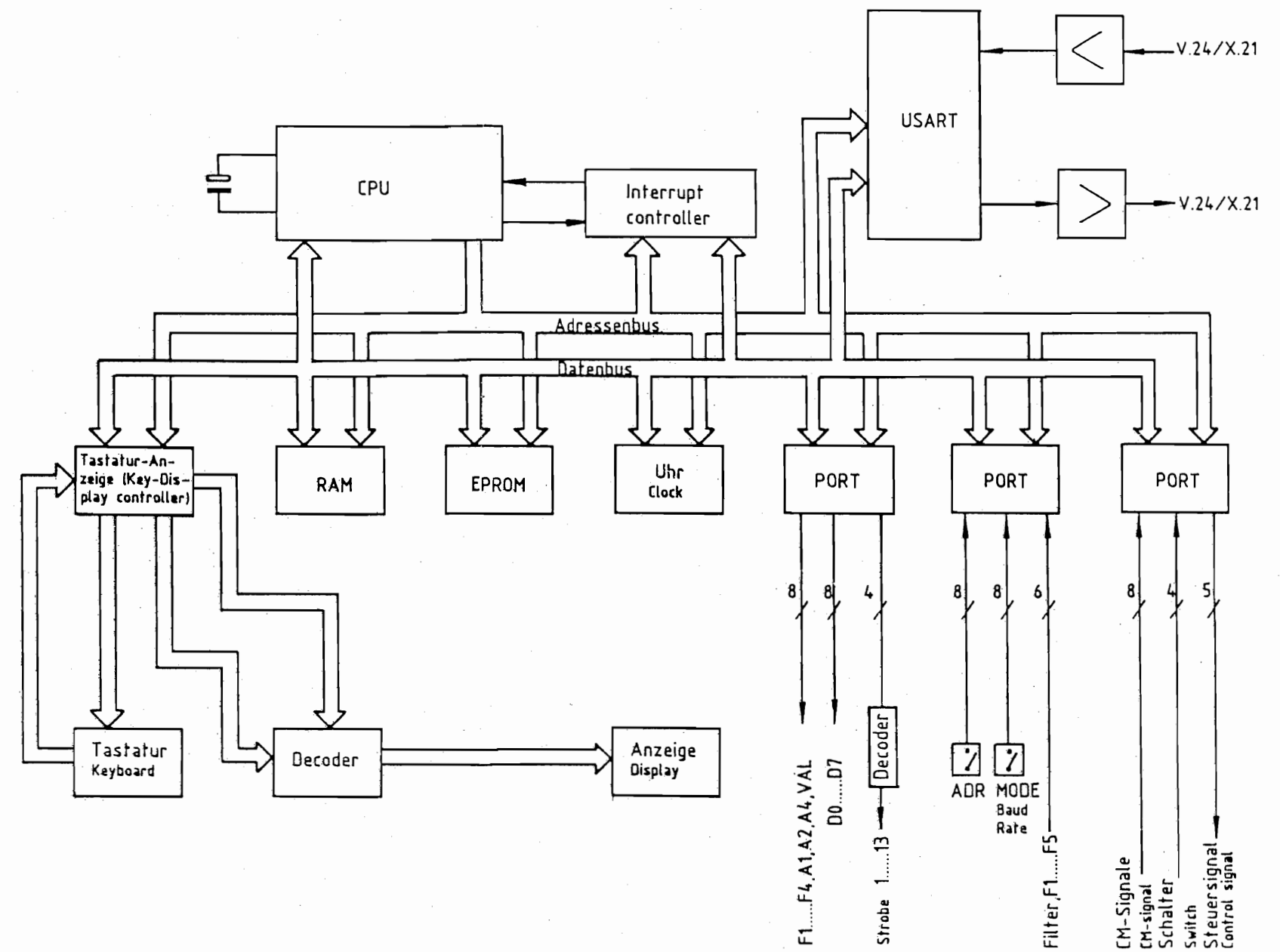


Fig. 5.1 Control Unit GB 085P1, Block Diagram

6. Repair

See circuit diagrams, parts lists and component layouts in the appendix to this manual (list on page 0.3).

6.1 Preliminary Remarks

Repair of the Control Unit GB 085P1 consists of troubleshooting and fault elimination, of measurements, alignments and functional checks, of replacing subassemblies and components as well as of a final test.

All the information required for repairing the control unit down to component level is given in this section.

6.1.1 Troubleshooting Instructions

Use the systematic instructions that follow in 6.3 to localize any fault(s) by checking the nominal values at the testpoints.

6.1.2 Restoring the Nominal Characteristics

Any component that is definitely proved to be defective - through use of the troubleshooting flowcharts or by performing the measurements, alignments and functional checks - should only be replaced by a component that meets the specifications given in the parts lists in the appendix to this repair manual.

Only in this way can the technical data be guaranteed that are given in section 1 of the user manual.

Once any components have been replaced, it is absolutely essential that the final test of the control unit be performed, as detailed in 6.7.

6.1.3 Alignment

After manufacture and before going to the test bay, the control unit is artificially aged according to XVN 016.

This ensures high stability of its values once they have been set. If non-aged components should be used in the course of repair, one must expect a certain drift in individual test values.

For this reason an occasional check of the values in 6.4 is recommended.

Note:

Not all of the resistors labelled in the circuit diagram as "trimming value" are necessary for alignment. They will have been replaced in the meantime by fixed resistors.

6.1.4 Spare Parts

All components and subassemblies are subjected to strict quality control before they are incorporated in the control unit.

For components from outside suppliers, e.g. resistors, capacitors, diodes, transistors and integrated through to highly integrated circuits, R&S has set down its own delivery specifications for the purpose of ensuring maximum reliability.

For this reason we recommended that only original spare parts be used as replacements for defective components.

(Continuation)---

---(Continuation) Spare Parts

When ordering a spare part please state the following:

type, ordering code and serial number of equipment, ident. number of parts list and designation plus stock number of component concerned.

All of these details are to be found in the circuit diagrams, parts lists and component layouts attached to this manual.

6.1.5 Important User Information

Following are some important points to be noted when carrying out repairs. This is done to prevent any misunderstandings.

- o All measurements are made referred to ground, unless stated otherwise.
- o The abbreviations that appear in the text, e.g. X23.A1 and D10.5, are to be interpreted as follows:

X23.A1: connector 23, pin A1

D10.5: integrated circuit 10, pin 5

- o The circuit diagrams in which the mentioned components may be found are stated in the following troubleshooting flowcharts.
- o For all alignment work and measurements the control unit has to be supplied with the operating voltages given in the circuit diagrams.
- o **Disconnect the operating voltage before undertaking any soldering jobs on the unit or an assembly of it.**

- o Among the components incorporated in the control unit there are MOS, MOS-FET and CMOS devices. Devices of this kind are extremely sensitive to high extraneous voltages. Static discharge can produce very high voltage spikes, which are capable of destroying these devices. Electrostatic charge is only felt with voltages of more than 3000 V. Sparks are only produced upwards of 5000 V. Values of less than 10 % of this can destroy semiconductors, however, or degrade their parameters, e.g. bipolar transistors (400 V), ECL and Schottky (300 V), VMOS and CMOS (150 V). A person sitting at a workbench produces about 500 V of static.

For such reasons, when work is being carried out in the vicinity of these devices, i.e. unless a special CMOS workstation is available, the following minimal requirements should be observed:

- o conductive bench and floor coverings
- o chair or stool with conductive coverings
- o grounded, metallic work-surface and conductive wrist-straps with a resistance of $> 200 \text{ kohms} < 1 \text{ Mohm}$ plus an insulated lead and plug
- o soldering iron with safety grounding
- o all conductive surfaces, wrist-straps and work-surfaces must be interconnected by insulated leads
- o supply voltages must be disconnected before any soldering is performed

CAUTION CMOS !!!

CONTROL UNIT

GB 085P1

Repair Manual
Part 6: Repair

- 6.3 -

6.2 Test Equipment and Special Tools

The test equipment and special tools specified in the following list will be required for performing the repairs described in this part of the manual.

Equivalent items of test equipment can be used, provided that their technical data are at least as good as those stated.

6.2.1 Test Equipment List

Test equipment, required technical data	Recommended R&S unit	Ordering code
Digital multimeter	UDL 33	388.8011.02
Logic analysis system with 24 analyzer channels, 20 MHz with 16-channel generator, 20 MHz and 8-channel general-purpose data driver	LAS LAS-B6 LAS-Z7	344.4010.02 345.8510.02 345.9616.02
Frequency counter 10 MHz sensitivity 10 mV		
Triple power supply +16 V, +5 V, -5 V	NGT 20	117.7133.02
Power supply	NGA 15	192.0010.03
AF generator 1 kHz, 50 mV	SPN	336.3019.02
Oscilloscope DC - 10 MHz	BOP	374.0020.02
Resistor 4 ohms/2 W		
4 switches, single-pole		
Service kit	KA 085C1	699.4015.02

CONTROL UNIT

GB 085P1

Repair Manual
Part 6: Repair

- 6.4 -

6.3 Troubleshooting

Troubleshooting covers the following subassemblies:

- o processor
- o display board
- o pulse-generator board

Premises for troubleshooting:

- o The processor, display board or pulse-generator board has been pinpointed as defective.
- o The operating voltages are present.

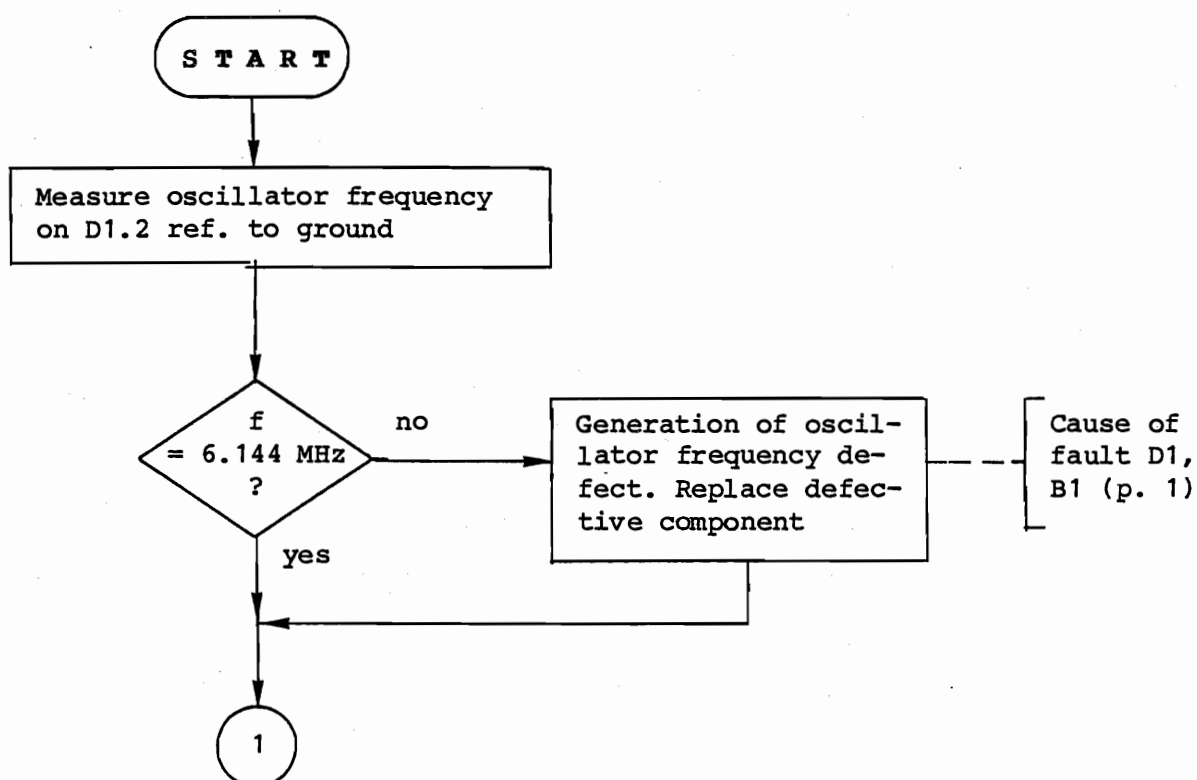
6.3.1 Troubleshooting: Processor

(See Circuit Diagram 651.6518.01S, pages 1 to 6)

The troubleshooting described here explains the possible causes of faulty operation produced by a defective processor.

Requirement:

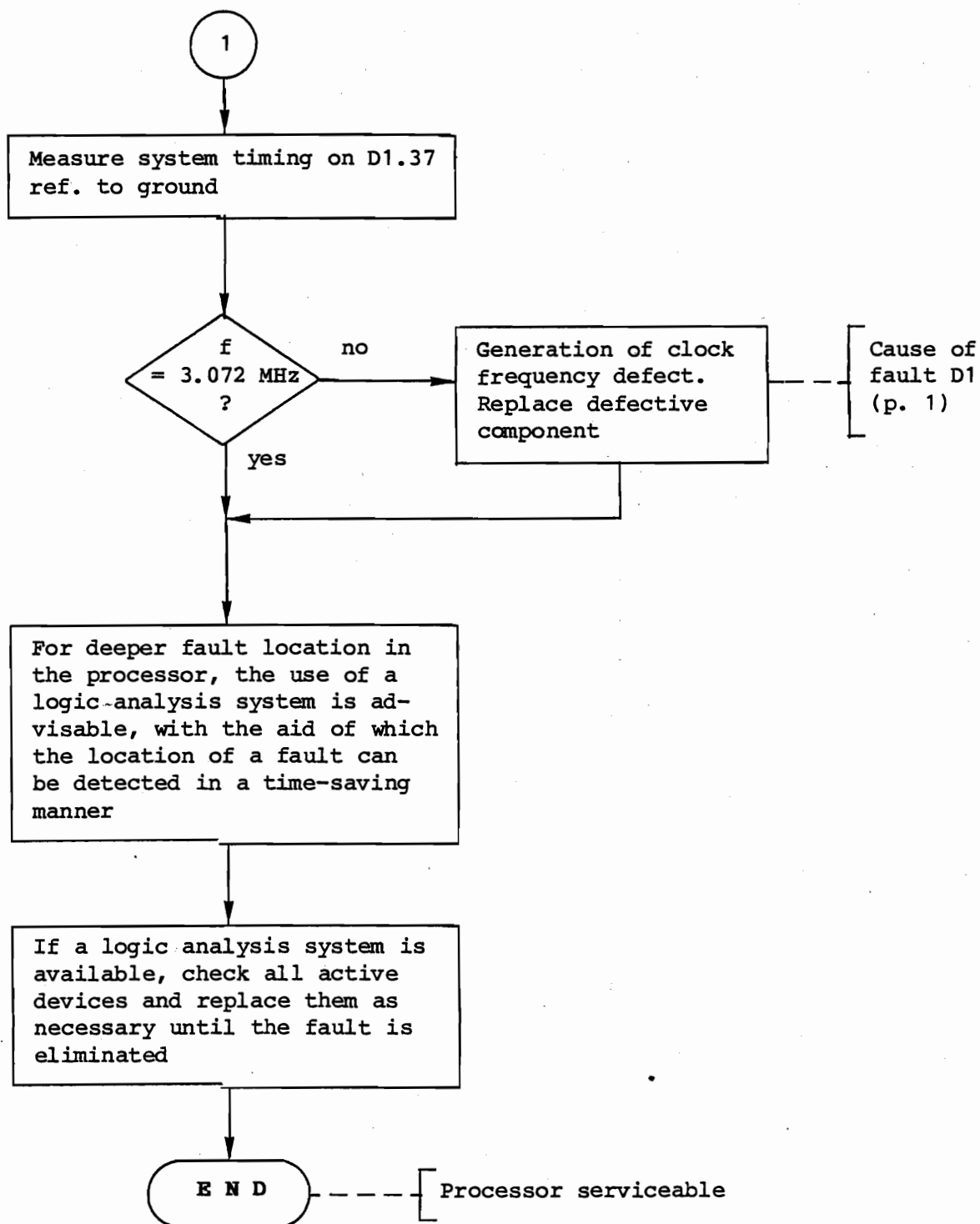
- o For the following troubleshooting the processor must be adapted in the control unit.



CONTROL UNIT
GB 085 P 1

Repair Manual
Part 6: Repair

- 6.5 -



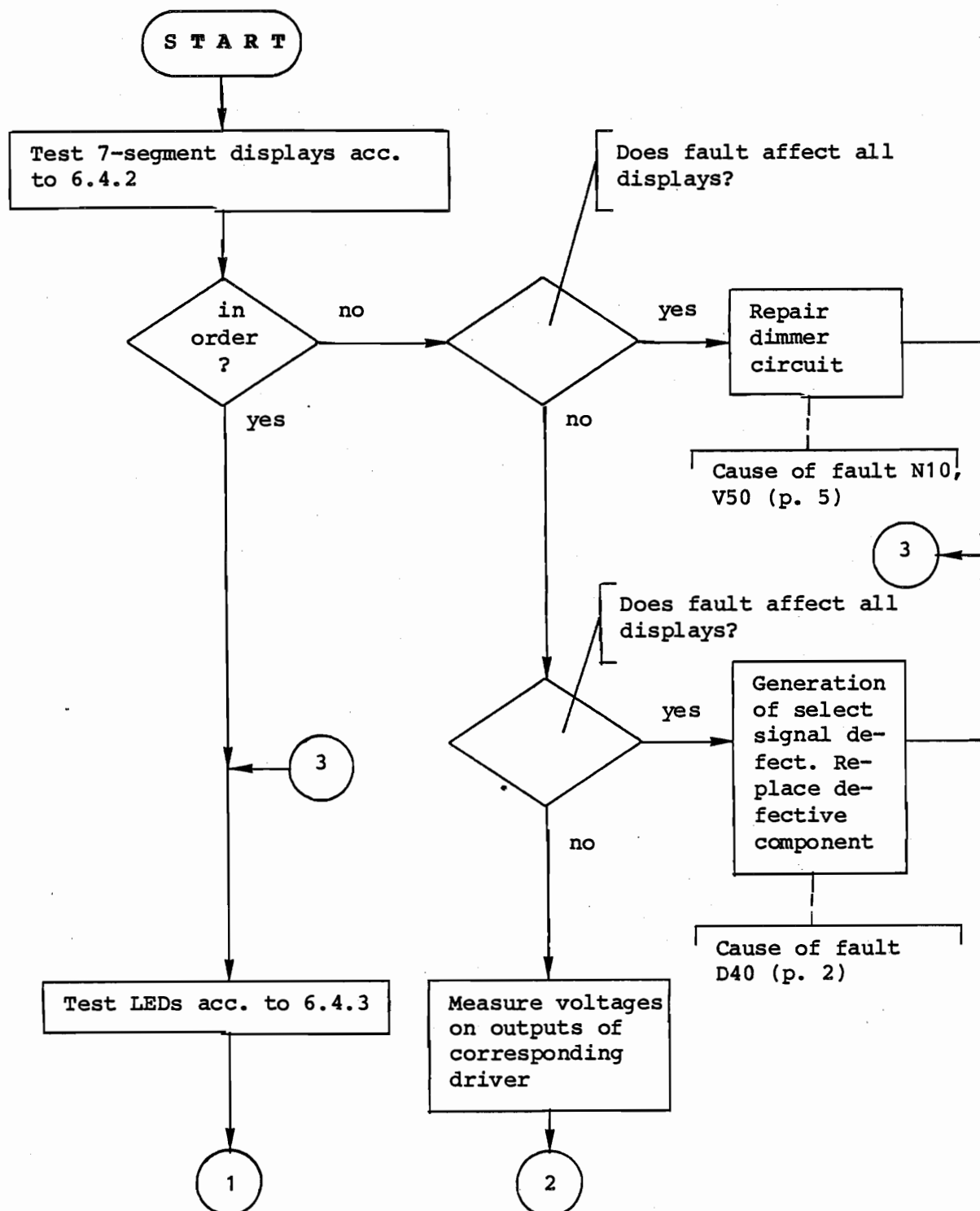
6.3.2 Troubleshooting: Display Board

(See Circuit Diagram 651.6318.01S, pages 1 to 7)

The troubleshooting described here clarifies the possible causes of a defective display.

Requirement:

- o For the following troubleshooting the display board must not be adapted in the control unit.

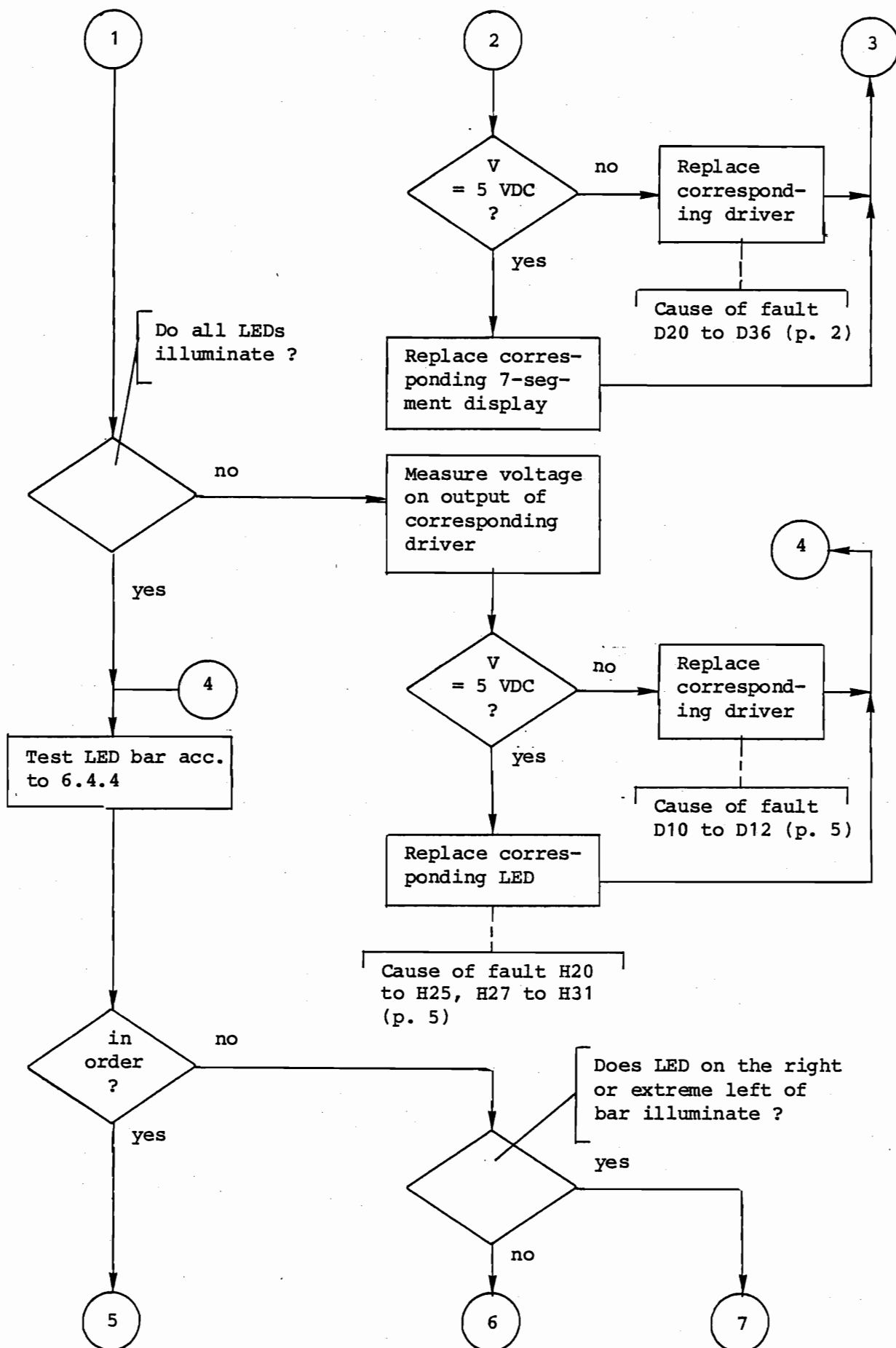


CONTROL UNIT

GB 085P1

Repair Manual
Part 6: Repair

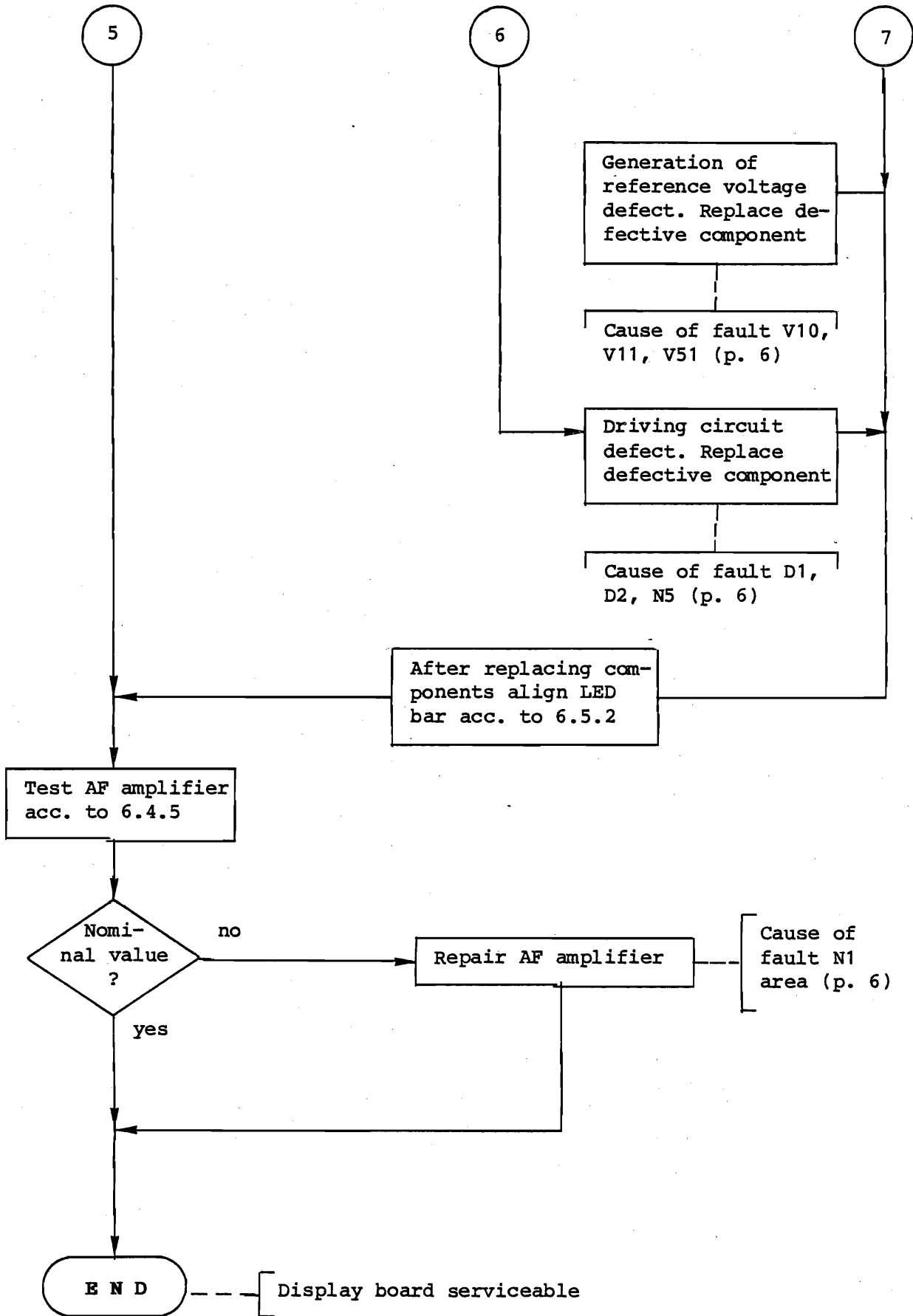
- 6.7 -



CONTROL UNIT
GB 085P1

Repair Manual
Part 6: Repair

- 6.8 -



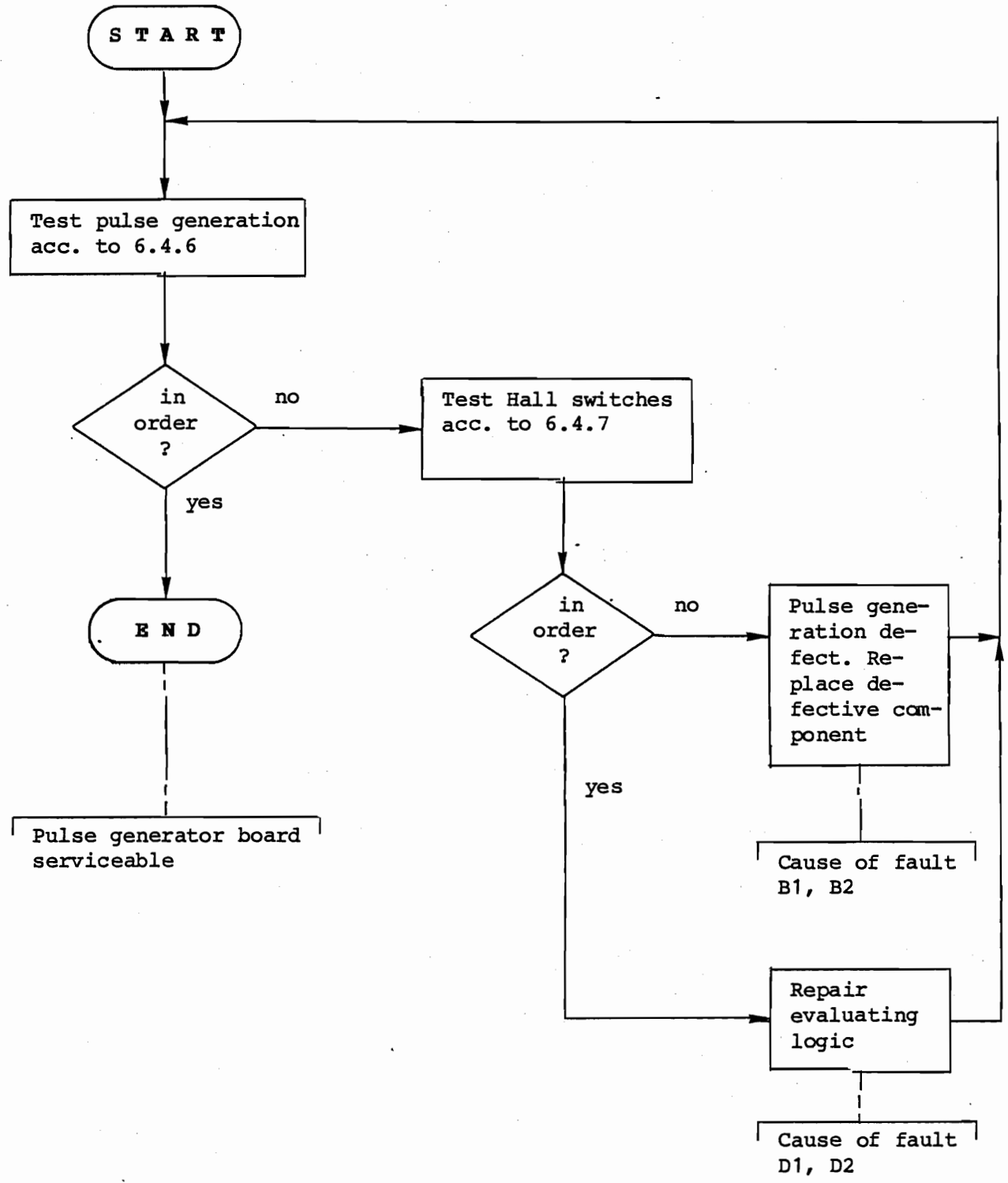
CONTROL UNIT
GB 085P1

Repair Manual
Part 6: Repair

6.3.3 Troubleshooting: Pulse-generator Board

(See Circuit Diagram 651.6382.01S)

The troubleshooting described here clarifies the possible causes of faulty quasicontinuous frequency units.



6.4 Measurements and Functional Tests

The following measurements and functional checks are the detailed procedures to the brief instructions given in the troubleshooting flowcharts. Consequently one will usually undertake these measurements and functional checks by branching out of the troubleshooting flowchart at a particular point. When the measurement, etc. has been performed, return to the troubleshooting flowchart at the same point where it was left.

If a fault has been clearly identified beforehand however, one can of course commence with one of these measurements, etc. directly.

6.4.1 Compiled Measured Values

Current consumption:

Dimmer		
	left-hand stop	right-hand stop
+5 V	0.9 mA	2.9 mA
-5 V	0.9 mA	36.5 mA
+16 V	72.8 mA	117.4 mA

System clock: 3.072 MHz

CONTROL UNIT

GB 085P1

Repair Manual
Part 6: Repair

- 6.11 -

6.4.2 Test of 7-segment Displays

Adapt the display board on the test adapter (Fig. 6.1) and apply the operating voltages +16 V, +5 V and -5 V. Turn the switches SL0 to SL3 on the test adapter one after the other to the following settings:

Switches				All segments illuminate of
SL3	SL2	SL1	SL0	
0	0	0	0	frequency display (decades 10 Hz/100 Hz)
0	0	0	1	frequency display (decades 1 kHz/10 kHz)
0	0	1	0	frequency display (decades 100 kHz/1 MHz)
0	0	1	1	frequency display (decade 10 MHz)
0	1	0	0	channel display
0	1	0	1	timer (seconds)
0	1	1	0	timer (hours)
0	1	1	1	BFO (1 kHz/100 Hz)
1	0	0	0	bandwidth display
1	0	0	1	sign display and decimal points

0 $\hat{=}$ switch made, 1 $\hat{=}$ switch open

Check whether all segments of the 7-segment displays, the sign display and the decimal points illuminate.

6.4.3 Test of LED Displays

Adapt the display board on the test adapter (Fig. 6.1) and apply the operating voltages +16 V, +5 V and -5 V. Turn the switches SL0 to SL3 on the test adapter one after the other to the following settings:

Switches				LEDs illuminate to display
SL3	SL2	SL1	SL0	
1	0	1	0	START, SEC, CHAN ADR, +FSK, -FSK, REM
1	1	0	1	STOP, SWEEP, CH/CH, SCAN

0 $\hat{=}$ switch made, 1 $\hat{=}$ switch open

Check whether all stated LEDs illuminate.

6.4.4 Test of LED Bar

(See Circuit Diagram 651.6318.01S, pages 1 and 6)

Do not adapt the display board for the following testing.

Apply operating voltages:

+16 V on X23.A1	] --- (p. 1)
+5 V on X23.A2	
-5 V on X23.A4	
Ground on X23.A3	

Feed in a voltage of 6.85 VDC on connector X23.A6 (p. 6).

Check whether centre LED of LED bar illuminates.

6.4.5 Test of AF Amplifier

(See Circuit Diagram 651.6318.01S, pages 1 and 7)

Do not adapt the display board for the following testing.

Terminate connector X2.A1 and X2.A2 (p. 7) with 4 ohms.

Apply operating voltages:

+16 V on X23.A1	] --- (p. 1)
+5 V on X23.A2	
-5 V on X23.A4	
Ground on X23.A3	

Turn the volume potentiometer fully clockwise (maximum volume).

On connector X23.B15 (p. 7) feed in an AF signal of $V_{rms} = 50$ mV and 1 kHz referred to connector X23.A14 (p. 7).

Measure the output voltage on connector X2.A2/A1 (p. 7).

Nominal value: V_{rms} approx. 2.5 V

6.4.6 Test of Pulse Generation

(See Circuit Diagram 651.6282.01S)

Do not adapt the pulse-generator board for the following testing.

Apply the operating voltage:

+5 V on pin 1
Ground on pin 2

Turn the tuning knob clockwise and measure the signals on pin 3 (negative direction) and pin 4 (positive direction) with the oscilloscope.

Nominal values: pin 3 High
pin 4 pulse train

Turn the tuning knob counter-clockwise and measure the signals on pin 3 (negative direction) and pin 4 (positive direction) with the oscilloscope.

Nominal values: pin 3 pulse train
pin 4 High

6.4.7 Test of Hall Switches

(See Circuit Diagram 651.6282.01S)

Do not adapt the pulse-generator board for the following testing.

Apply the operating voltage:

+5 V on pin 1
Ground on pin 2

Turn the tuning knob and measure the signals on D1.6 and D1.13 with the oscilloscope.

Nominal values: pulse train

CONTROL UNIT

GB 085P1

Repair Manual
Part 6: Repair

- 6.13 -

6.5 Setting and Alignment

6.5.1 Setting of Dimming

(See Circuit Diagram 651.6318.01S, pages 1, 5 and 6)

Turn potentiometer R281 (p. 5) fully counter-clockwise.

With potentiometer R282 (p. 5) set a voltage of 2.8 ± 0.02 V on the emitter of transistor V50 (p. 5). The reference ground is the anode of the diode V2 (p. 1).

With potentiometer R21 (p. 6) set a voltage of 2.85 ± 0.005 V on pin 6 of the control amplifier N5 (p. 6). The reference ground is the anode of the diode V2 (p. 1).

On connector X23.A6 (p. 6) feed in a voltage of 6.85 ± 0.02 V.

With potentiometer R41 (p. 6) set a voltage of 3.425 ± 0.02 V on pin 11 of the LED line driver D1 (p. 5).

The centre LED of the bar display must illuminate.

On connector X23.A6 (p. 6) feed in a voltage of 3.85 ± 0.02 V.

The first LED of the bar display must illuminate.

6.5.2 Alignment of LED Bar

(See Circuit Diagram 651.6318.01S, pages 1 and 6)

With potentiometer R31 (p. 5) set a reference voltage of 5.09 ± 0.01 V on pin 13 of the LED line driver D1 (p. 5). The reference ground is the anode of the diode V2 (p. 1).

Check the other reference voltages:

$$V_{D1.12} = 2.7 \pm 0.03 \text{ V}$$

$$V_{D2.13} = 3.12 \pm 0.03 \text{ V}$$

$$V_{D2.12} = 0.72 \pm 0.03 \text{ V}$$

On connector X23.A6 (p. 6) feed in a voltage of 9.85 ± 0.02 V.

The last LED of the bar display must illuminate.

Withdraw jumper X5 (p. 6) and connect an ammeter.

On connector X23.A6 (p. 6) feed in a voltage of 6.85 ± 0.02 V.

With potentiometer R37 (p. 6) set a current of 19.5 ± 0.2 mA.

Replace jumper X5 (p. 6).

6.6 Replacement of Assemblies

CAUTION

Before removing the control unit from the housing of the receiver, detach the power and battery cables.

Note:

With the desktop unit the panelling has to be removed before the control unit can be removed/replaced. Proceed as follows:

1. Undo six screws (1, Fig. 6.2) and remove top cover (2) of housing.
2. Undo four screws (22) and remove base cover (13) of housing.

6.6.1 Removal of Control Unit

CAUTION

If the ribbon cables are detached from the control unit, the channel memory will automatically be erased.

1. Undo four screws (16, Fig. 6.2) and pull out control unit (23) towards front.
2. Detach ribbon cable from connector X4 and X24 or X9 on control unit and from connector X21 on mother-board.

6.6.2 Removal of Processor

Preparation:

- Loosen grub screws (13, 15, 17, 22, Fig. 6.3) and withdraw knobs (14, 16, 18, 21).

- Undo two screws (19) and remove bracket (20).

- Undo six screws (23) and remove front panel (24).

1. Undo eight screws (2) and remove rear panel (3).
2. Detach ribbon cables (5, 6) from connectors X22 and X23.
3. Undo eleven screws (1) and remove processor (4).

6.6.3 Removal of Display Board

Preparation:

Before removing the display board, first remove the processor acc. to 6.6.2.

1. Undo eight spacer bolts (29, Fig. 6.3) and three screws (28).
2. Withdraw connector X1 (27) and X2 (8) from display board.
3. Remove display board (7).

6.6.4 Removal of Keypad Board with Pulse-generator Board

Preparation:

Before removing the keypad board with the pulse-generator board, first remove the processor acc. to 6.6.2 and the display board acc. to 6.6.3.

CONTROL UNIT

GB 085P1

Repair Manual
Part 6: Repair

- 6.15 -

---(Continuation) Removal of Keypad Board with Pulse-generator Board

- 1) Undo two screws (26, Fig. 6.3).
- 2) Undo eight screws with nuts (12) and three screws with spacer bolts (25).
- 3) Remove keypad board (10) with pulse-generator board (9).

It is then to be subjected to a functional test to ensure that it works correctly in conjunction with the receiver.

If this functional test is positive, repair may be regarded as completed. Otherwise troubleshooting acc. to 6.3 must be repeated. The procedure should be repeated as often as is necessary to detect and eliminate all faults.

6.6.5 Reassembly of Control Unit

The Control Unit GB 085P1 is reassembled in the reverse order to the procedures detailed above.

6.7 Final Test

When the Control Unit GB 085P1 has been repaired, it must be incorporated in the receiver for a final test.

6.8 External Interfaces

All interfaces of the Control Unit GB 085P1 are shown in Circuit Diagram 651.6118.01S. This configuration contains all information concerning the pin assignments and the nature of the signals on the connectors and sockets.

CONTROL UNIT
GB 085P1

Repair Manual
Part 6: Repair

- 6.16 -

NOTES

CONTROL UNIT
GB 085P1Repair Manual
Part 6: Repair

- 6.17/6.18 -

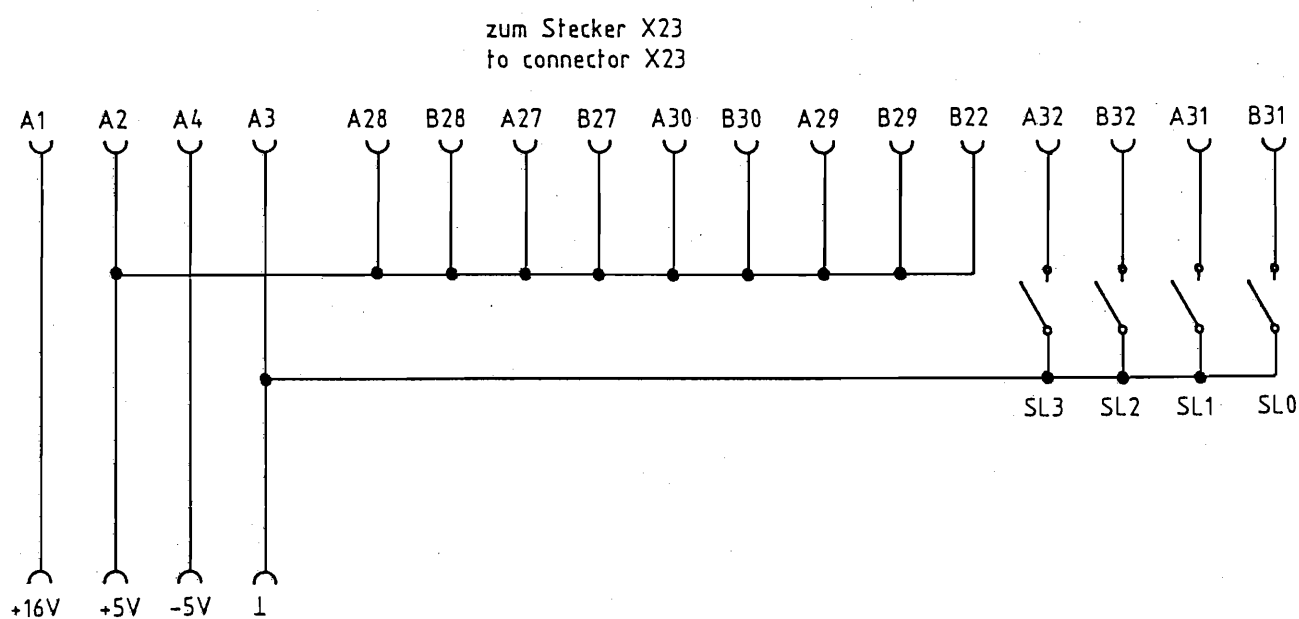


Fig. 6.1 Test Adapter for Display Board

CONTROL UNIT
GB 085P1Repair Manual
Part 6: Repair

- 6.19/6.20 -

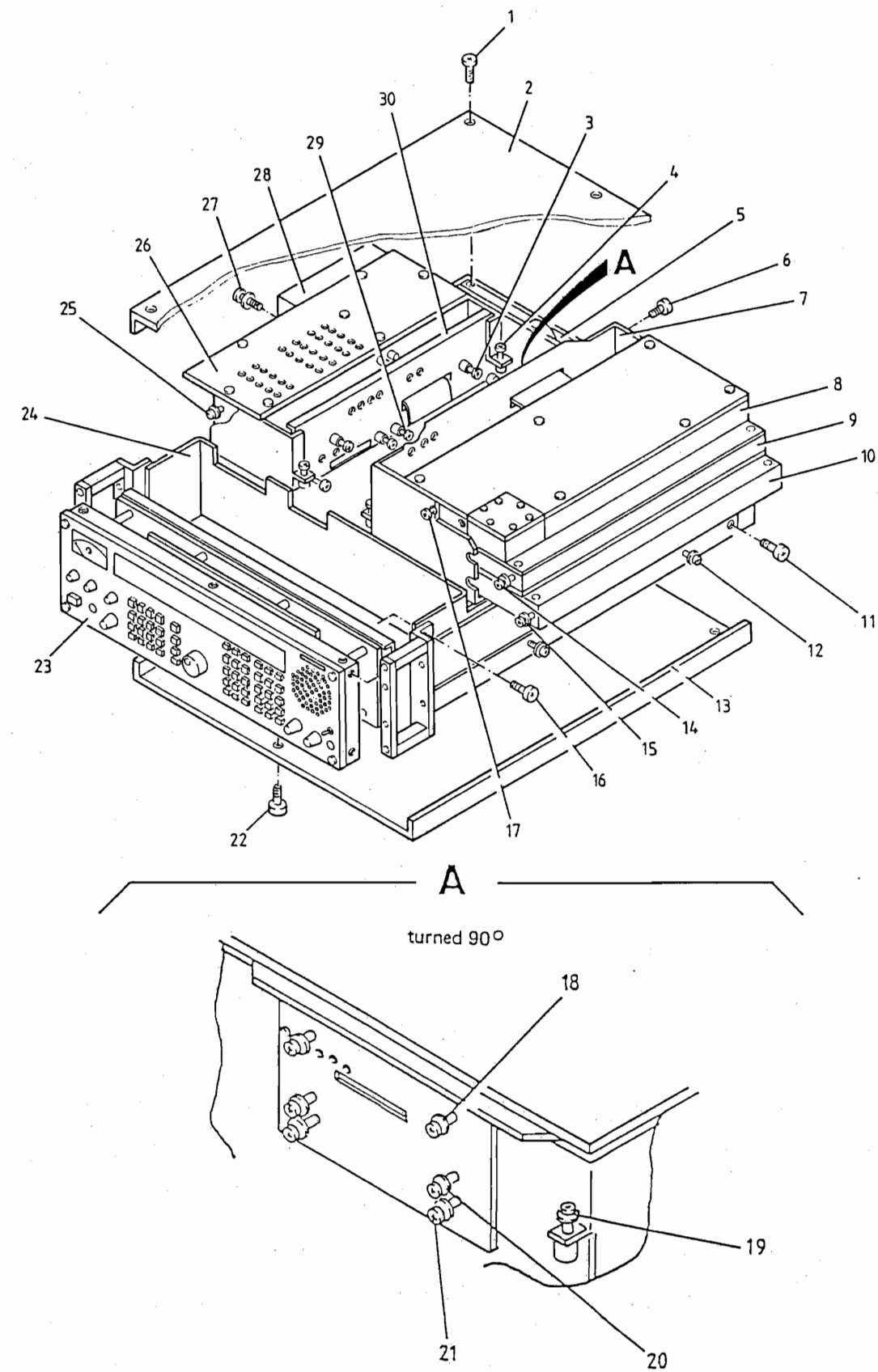


Fig. 6.2 Removal of Control Unit

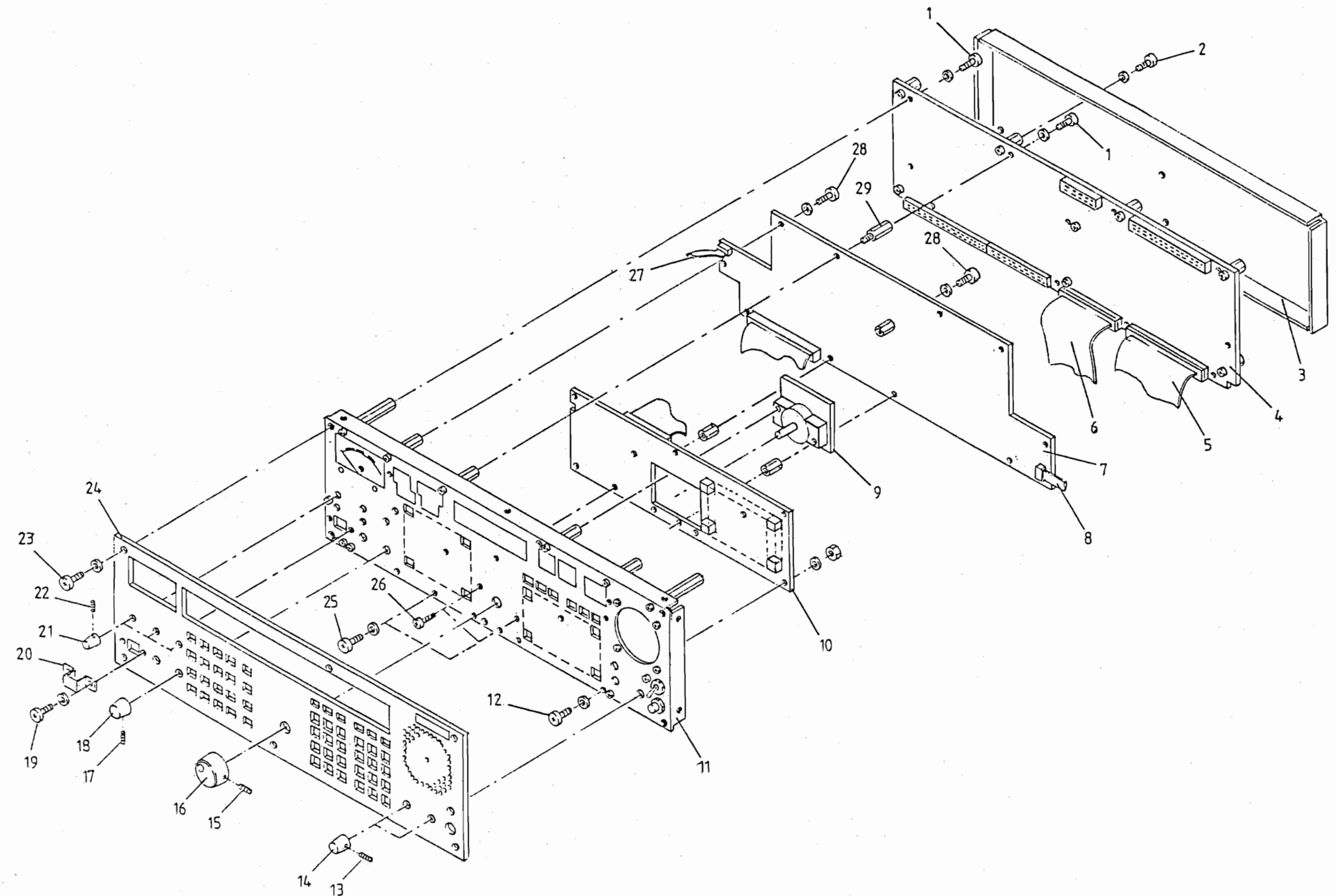


Fig. 6.3 Removal of Subassemblies



ROHDE & SCHWARZ
MÜNCHEN

Schaltteillisten
Stromläufe
Bestückungspläne
Parts lists
Circuit diagrams
Components plans

X4	a	b
1	EXT 1	EXT 2
2	EXT 4	EXT 8
3	TXD TA	RTS CB
4	RXD RA	DSR IA
5		RXC SA
6		
7	(RES)	(RES)
8	(RES)	(RES)
9	CTS BA	TXD TB
10	RTS CA	RXD SB
11	DSR IB	RXC SB
12	CTS BB	DTR
13	BAT	U-Bat.
14	RAM-CLEAR	NF $\overline{\text{—}}$
15	NF-S	NF-Inst.
16	FSK-Rück-Inst.	FSK-Inst.
17	+16V	+16V
18	+16V	Adressiert
19	+16V	11 1,1 Kurz
20	Netz Schalter	Netz Schalter
21	FRQ-Netzteil	<400KHz
22	Netz Lampe	Reset Netzteil
23	-16V	
24		
25	+5V	+5V
26	+5V	+5V
27	+5V	+5V
28		-5V
29	$\overline{\text{—}}$	$\overline{\text{—}}$
30	$\overline{\text{—}}$	$\overline{\text{—}}$
31	$\overline{\text{—}}$	$\overline{\text{—}}$
32	$\overline{\text{—}}$	$\overline{\text{—}}$

X9	a	b
1		
2		
3		
4		
5		
6	ST3	
7	ST4	
8	$\overline{\text{CS}}$	
9	ST9	
10	DAT 0	
11	DAT 1	
12	DAT 2	
13	DAT 3	
14	DAT 4	
15	DAT 5	
16	DAT 6	
17	DAT 7	
18		
19		
20		
21	AGC-Selektion	
22		
23	-16V	
24	+5V	
25	+5V	
26	+5V	
27	+5V	
28	+16V	
29	+16V	
30	Filter	
31	$\overline{\text{—}}$	
32	$\overline{\text{—}}$	

X21	a	b
1		
2		
3		
4		
5		
6	(ST12)	(ST113)
7		(ST5)
8	BITE EXT	$\overline{\text{CM}}$ EXT
9	Δ F	BITE FSK
10	$\overline{\text{CM}}$ Empf.	ST10
11	$\overline{\text{CM}}$ BFO	HF-Rück-Inst.
12	BFO-Lampe	HF-Inst.
13		
14		
15		
16		SID
17	BITE NF	BFO E
18	AGC-REF. E	BFO S
19	AGC-REF. A	BFO A
20	BFO E	NF E
21	MGC-S	F1
22	F2	F3
23	F4	FS
24	ST6	ST7
25	ST8	$\overline{\text{CM}}$ SYN
26	$\overline{\text{CM}}$ TH	ST2
27	ST9	ST1
28	AGC-Selektion	$\overline{\text{—}}$
29	DAT 0	DAT 1
30	DAT 2	DAT 3
31	DAT 4	DAT 5
32	DAT 6	DAT 7

X22	a	b
1	SCL 0	RL 0
2	SCL 1	RL 1
3	SCL 2	RL 2
4	SCL 3	RL 3
5	SCL 4	RL 4
6	SCL 5	RL 5
7	SCL 6	RL 6
8	SCL 7	RL 7
9	+5V	SHIFT
10	-Kurbel	+Kurbel
11	Masse Kurbel	CONTR
12	1kHz	100Hz
13	10Hz	FSK3
14	OPT	USB
15	FSK2	FAX
16	LSB	FSK1
17	CW	MGC
18	AM	FAST
19	STOP	AGC
20	Masse geregelt	Masse geregelt

X24	a	b
1	F1	F2
2	F4	F8
3	A1	A2
4	A4	VAL
5	ST9	DAT 0
6	DAT 1	Reset Netzteil
7	+5V	+5V
8	$\overline{\text{—}}$	$\overline{\text{—}}$
9	$\overline{\text{—}}$	-16V
10	+16V	+16V

X23	a	b
1	+16V	+16V
2	+5V	+5V
3	$\overline{\text{—}}$	$\overline{\text{—}}$
4	-5V	-5V
5	NF-Inst.	FSK-Inst.
6	Δ F	HF-Inst.
7	BFO Lampe	Netz Lampe
8	BFO S	BFO A
9	AGC-REF. A	BFO E
10	MAN	REM
11	$\overline{\text{CH}}$	MEM
12	REM/LOC	REM/LOC/UHR
13	AGC-REF. E	MGC-S
14	NF $\overline{\text{—}}$	NF-S
15	Netz Schalter	NF-E
16	Netz Schalter	
17	FSK Rück-Inst.	
18	HF-Rück-Inst.	
19		12 1,1 Kurz
20	S12	S11
21	Masse geregelt	Masse geregelt
22		$\overline{\text{BD}}$
23		
24		
25		
26		
27	A2	A3
28	A0	A1
29	B2	B3
30	B0	B1
31	SL1	SL0
32	SL3	SL2

6

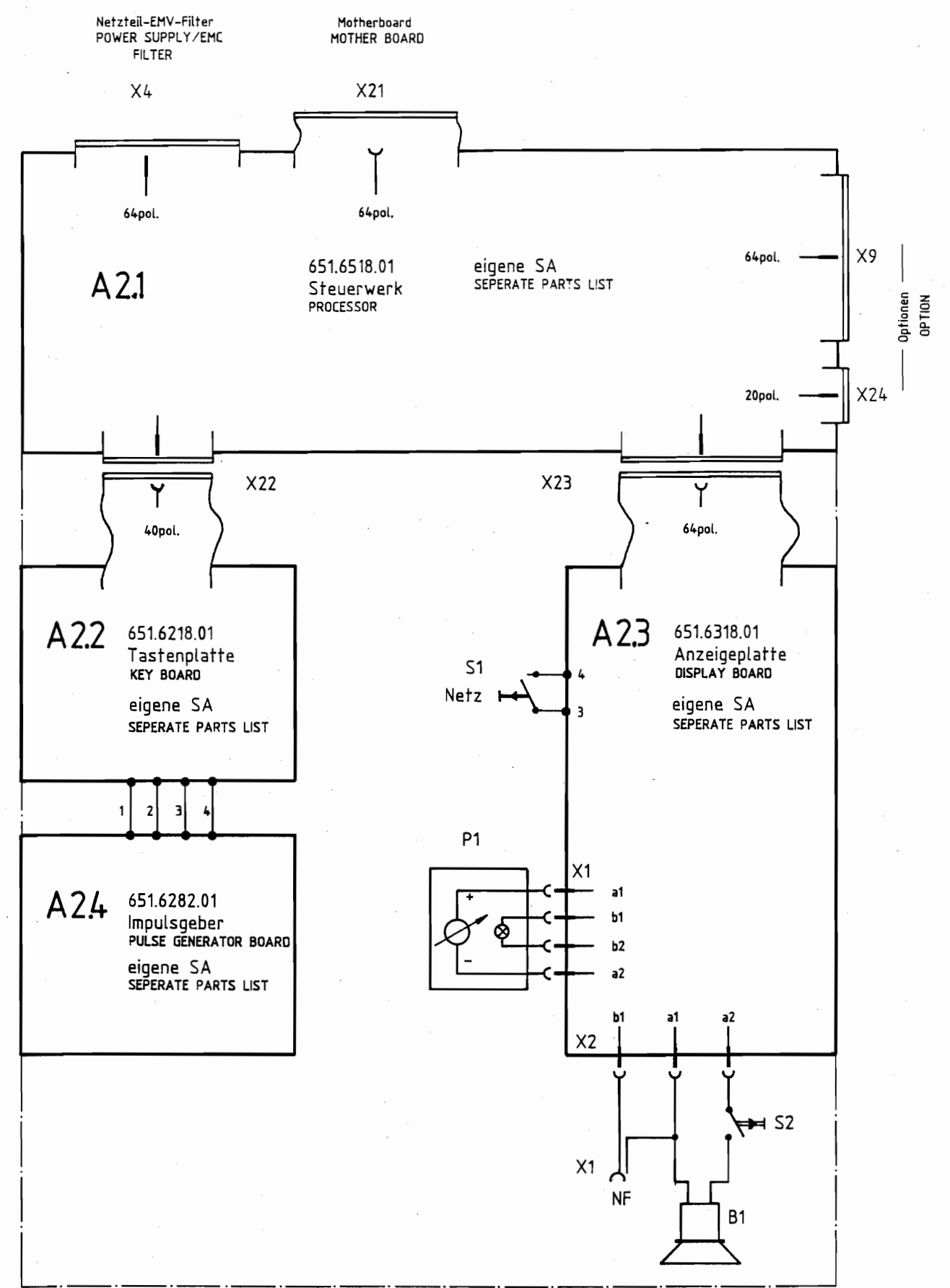
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A2.2

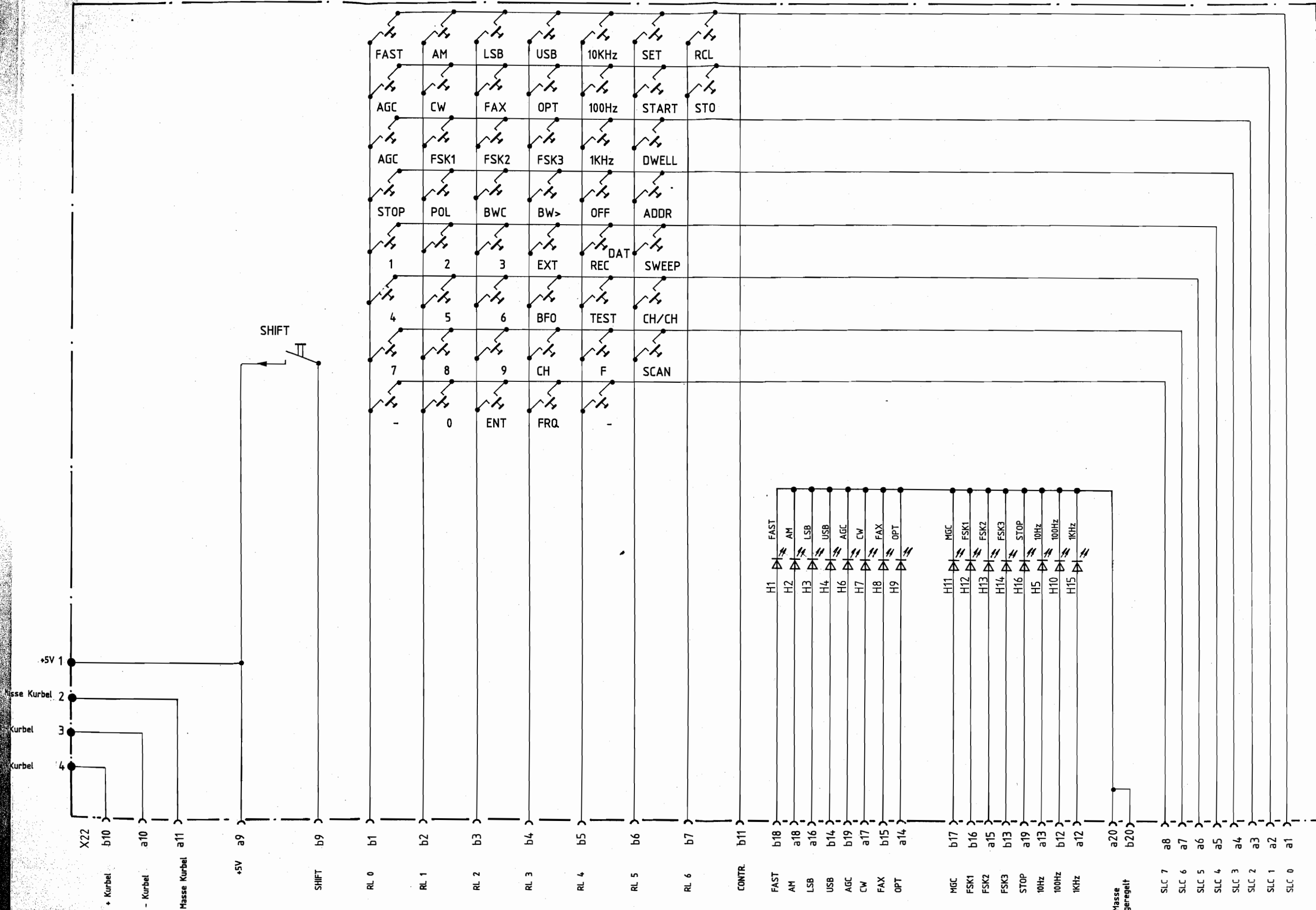
1

A2.4

X21	a	b	X22	a	b	X23	a	b
1			1	SCL 0	RL 0	1	+16V	+16V
2			2	SCL 1	RL 1	2	+5V	+5V
3			3	SCL 2	RL 2	3	—	—
4			4	SCL 3	RL 3	4	-5V	-5V
5			5	SCL 4	RL 4	5	NF -Inst.	FSK -Inst.
6	(ST12)	(ST113)	6	SCL 5	RL 5	6	Δ F	HF -Inst.
7		(ST5)	7	SCL 6	RL 6	7	BFO Lampe	Netz Lampe
8	BITE EXT	CM EXT	8	SCL 7	RL 7	8	BFO S	BFO A
9	Δ F	BITE FSK	9	+5V	SHIFT	9	AGC-REF. A	BFO E
10	CM Empf.	ST10	10	-Kurbel	+Kurbel	10	MAN	REM
11	CM BFO	HF-Rück -Inst.	11	Masse Kurbel	CONTR	11	CH	MEM
12	BFO-Lampe	HF -Inst.	12	1kHz	100Hz	12	REM/LOC	REM/LOC/UHR
13			13	10Hz	FSK3	13	AGC-REF. E	MGC-S
14			14	OPT	USB	14	NF —	NF-S
15			15	FSK2	FAX	15	Netz Schalter	NF-E
16		SID	16	LSB	FSK1	16	Netz Schalter	
17	BITE NF	BFO E	17	CW	MGC	17	FSK Rück -Inst.	
18	AGC-REF. E	BFO S	18	AM	FAST	18	HF-Rück -Inst.	
19	AGC-REF. A	BFO A	19	STOP	AGC	19		12 1,1 Kurz
20	BFO E	NF E	20	Masse geregelt	Masse geregelt	20	S12	S11
21	MGC-S	F1	X24			21	Masse geregelt	Masse geregelt
22	F2	F3				22		BD
23	F4	FS	1	F1	F2	23		
24	ST6	ST7	2	F4	F8	24		
25	ST8	CM SYN	3	A1	A2	25		
26	CM TH	ST2	4	A4	VAL	26		
27	ST9	ST1	5	ST9	DAT 0	27	A2	A3
28	AGC-Selektion	—	6	DAT 1	Reset Netzteil	28	A0	A1
29	DAT 0	DAT 1	7	+5V	+5V	29	B2	B3
30	DAT 2	DAT 3	8	—	—	30	B0	B1
31	DAT 4	DAT 5	9	—	-16V	31	SL1	SL0
32	DAT 6	DAT 7	10	+16V	+16V	32	SL3	SL2



 ROHDE & SCHWARZ		ÄZ Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt Page
05 1085		05 1085	GB085P1 BEDIENEINHEIT GB085P1 CONTROL UNIT	651.6118.01 SA	1
Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL				
A2.1	EE STEUERWERK HIERZ.STROML. 651.6518.01S SEE CIRC.DIAG.651.6518.01S		651.6518.02		
A2.2	ED TASTENPLATTE KEY BOARD HIERZ.STROML. 651.6218.01S SEE CIRC.DIAG.651.6218.01S		651.6218.02		
A2.3	ED ANZEIGEPLATTE HIERZ.STROML. 651.6318.01S SEE CIRC.DIAG.651.6318.01S		651.6318.02		
A2.4	ED IMPULSGEBERPLATTE PULSE GENERATOR BOARD HIERZ.STROML. 651.6282.01S SEE CIRC.DIAG.651.6282.01S		651.6282.02		
B2	EL LAUTSPRECHER 1W4,5 OHM LOUDSPEAKER 1W ITT 49 131 10220		651.6647		
.P1	JK 1MA 30X57 BEL. INSTRUMENT BERTRAM NR&S-ZCHNG.6517014		651.7014		
S1	SB DRUCKSCH.2XU KNOPF GR PUSHBUTTON ITT NK-BL. SB1927		SB 651.7037		
S2	SK KIPPSCH.1POL.UM MIN.AU TOGGLE SWITCH KNITTER MST106DG		SK 082.1693		
X1	FT KLINKENBU.2POL. (JK34) FEMALE CONNECTOR, 2-POLE DAMAR&HAG 6044.100		FT 019.0493		
- ENDE -					
651.6118.01 SA BL 1-					





ROIDE & SCHWARTZ

AZ

Datum
DateSchaltteilliste für
Parts list forSachnummer
Stock No.Blatt
Page

01 0785

ED TASTENPLATTE
KEY BOARD

651.6218.01 SA

1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
-	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
H1	AF HLMP1301 LED RT RD3 LED HEWLETT-P. HLMP1301	AF 257.4736	
BIS/TO H16			
X22	FP BUCHSENLEISTE 40-POL.U CONNECTOR PANDUIT 050A-040-435A	FP 624.1425	651.6247 - ENDE -
651.6218.01 SA BL 1-			

A

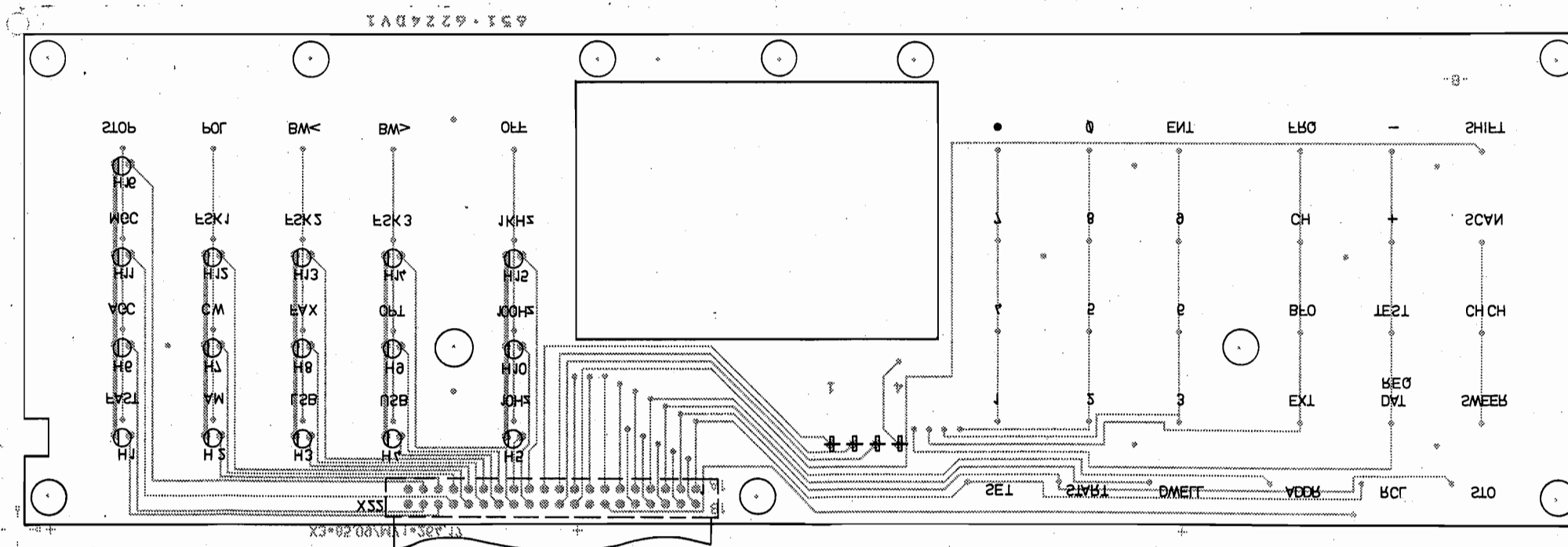
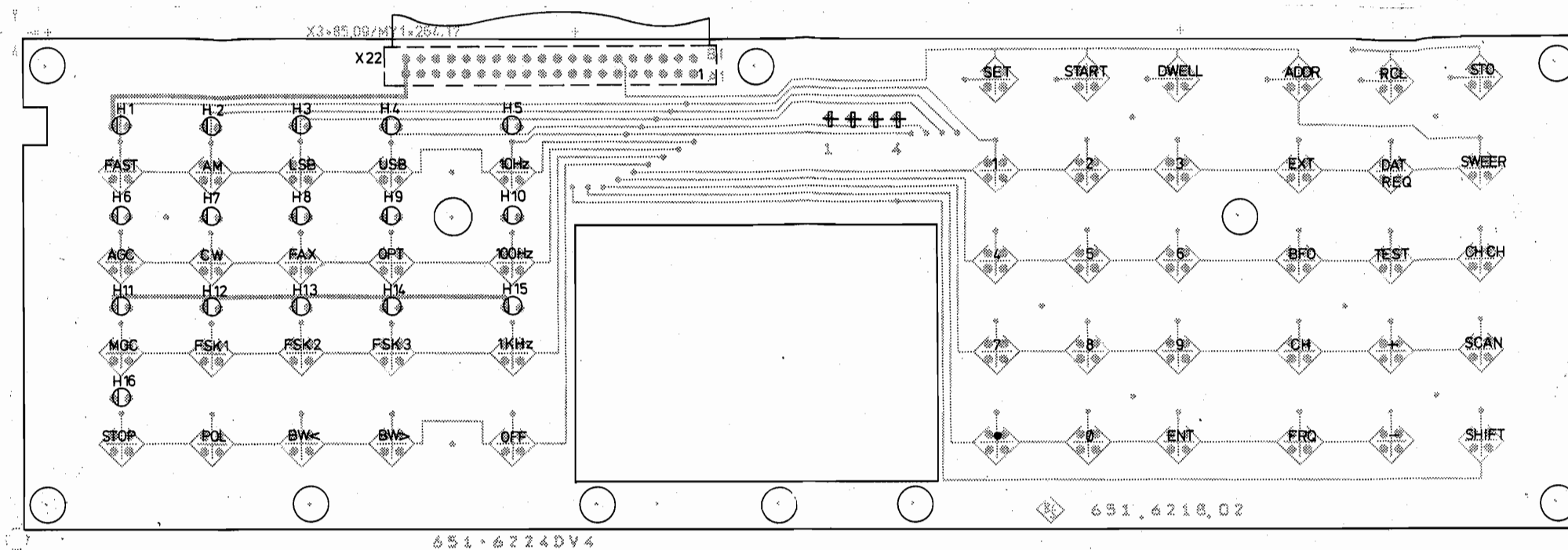
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C.

D

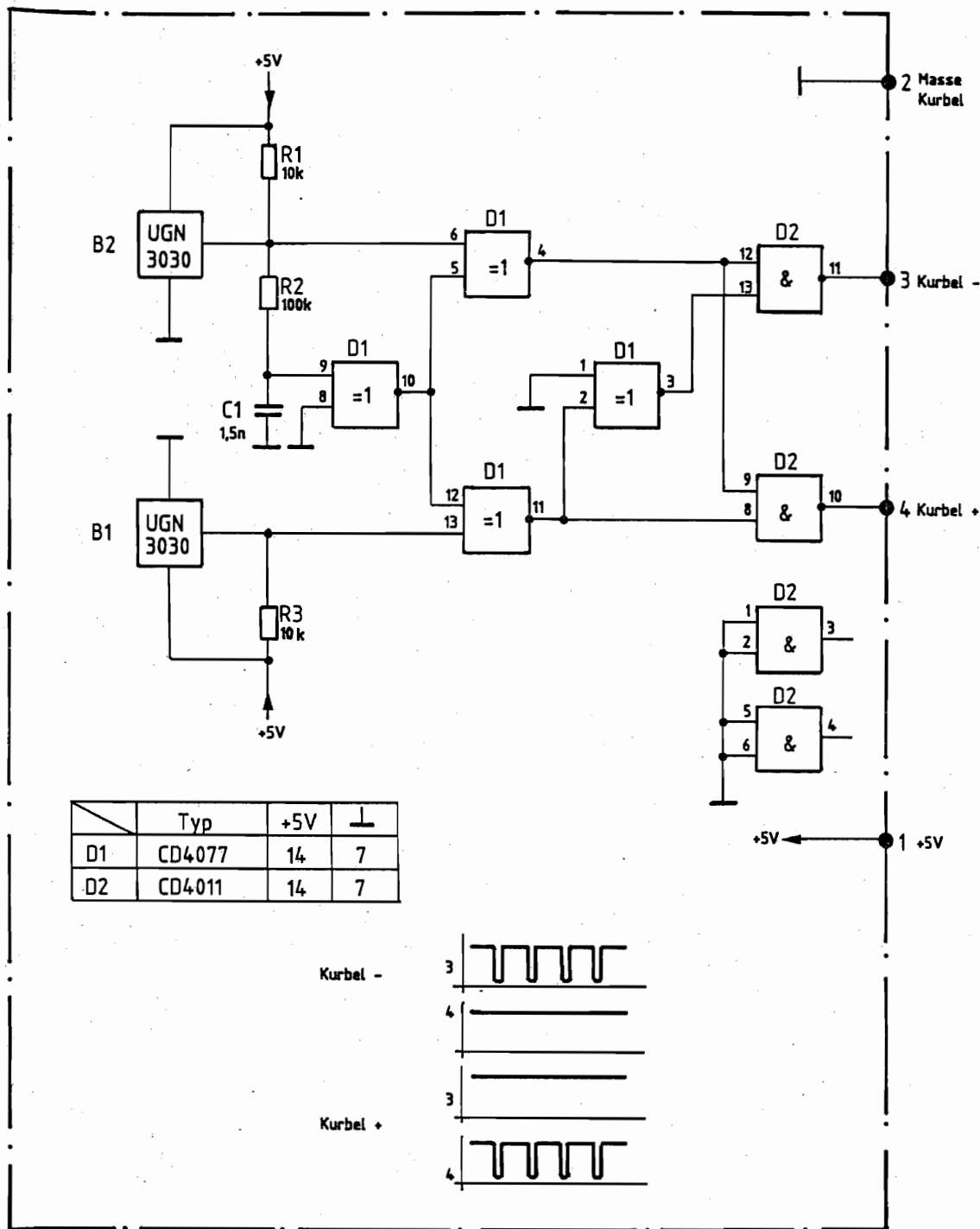
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7

B	—	07.85	MR	Maße ohne Toleranzangabe		Maßstab 1 : 1				
						Halbzeug, Werkstoff				
				6KBE	Tag	Name	Benennung Tastenplatte KEY BOARD			Z
				Bearb.	07.85	MR				
				Gepr.						
				Norm						
						Zeichn.-Nr. 651.6218.01			Blatt-Nr. 2	
Änd. Zust.	Änderungs- Mitteilung	Tag	Name	 ROHDE & SCHWARZ					v	Bl.
				zu Gerät	GB 085 P1	reg. i. V.	651.6118 V	erste Z.	651.6118.01	



	Typ	+5V	⊥
D1	CD4077	14	7
D2	CD4011	14	7

A		9.85	TA	6KBH	Tag	Name	Benennung Impulsgeberplatte PULS GENERATOR BOARD		
				Bearb	8.85	BM			
				Gepr					
				Norm					
				 ROHDE & SCHWARZ			Zeichn.-Nr		Blatt-Nr
							651.6282.01 S		1
And Zust	Anderungs- Mitteilung	Tag	Name	zu Gerät GB085 P1			reg. V 651.6118 V		erste Z 651.6118.01
									v 1 Bl

**ROHDE & SCHWARZ**

ÄZ

Datum
DateSchaltteilliste für
Parts list forSachnummer
Stock No.Blatt
Page

01

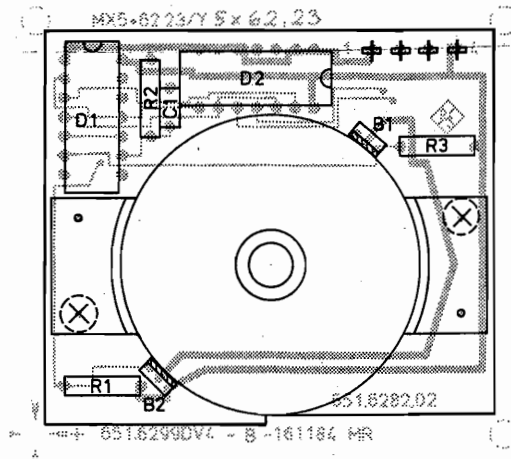
0785

**ED IMPULSGEBERPLATTE
PULSE GENERATOR BOARD****651.6282.01 SA****1**

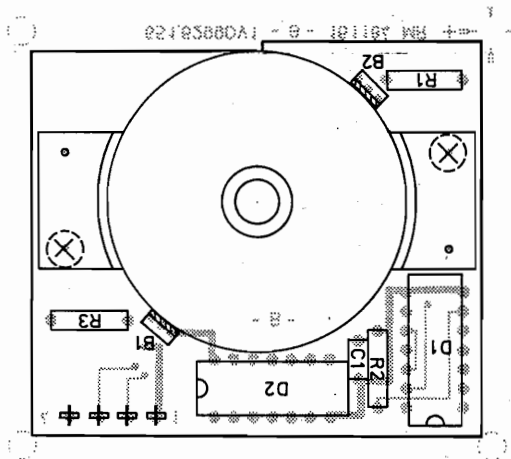
Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
B1	BS UGS3030U HALL-EFF.SW. HALL-EFFECT-SWITCH SPRAGUE UGS-3030U	650.9342	
B2	BS UGS3030U HALL-EFF.SW. HALL-EFFECT-SWITCH SPRAGUE UGS-3030U	650.9342	
C1	CC 1,5NF+-10%200V7K1200VI CAPACITOR UNION CARB M39014/02-1362	CC 084.5373	
D1	BL CD4077BF 4X2IN.EXNOR EXNOR GATE RCA CD4077BF	BL 559.4636	
D2	BL CD4011BF 4X2IN.NANDG NAND GATE RCA CD4011BF	BL 517.7572	
R1	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R2	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R3	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	

- ENDE -**651.6282.01 SA BL 1-**

Ansicht und Leitungsführung Bauteilseite View of tracks on component side



Ansicht und Leitungsführung Lötseite View of tracks on solder side



ACHTUNG EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling

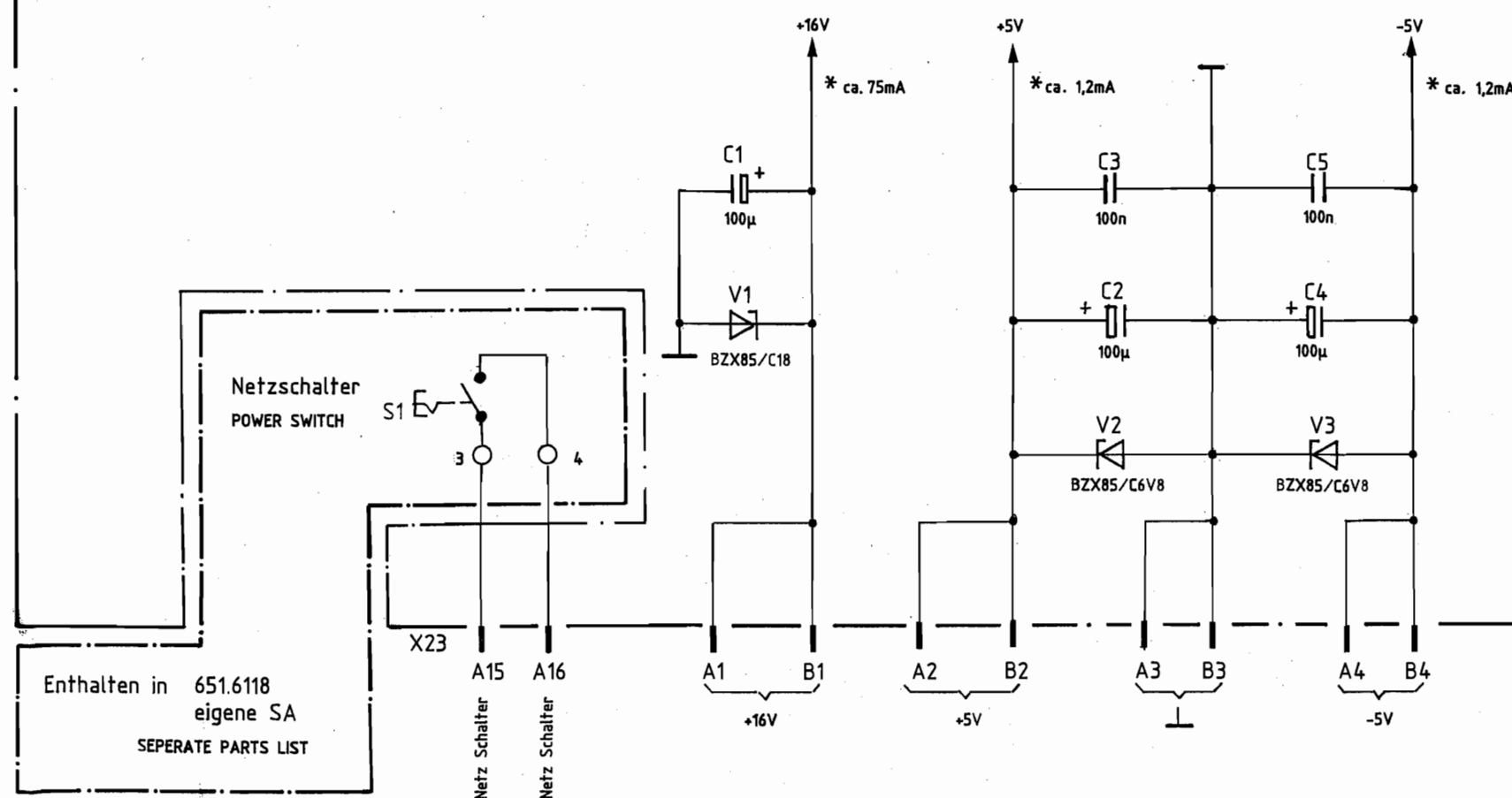
VARIANTENERKLÄRUNG / VERSION VAR 02 - GRUNDAUSFÜHRUNG / BASIC MODEL

C	35168	04.86	BM	Maße ohne Toleranzangabe	Maßstab 1 : 1	
					Halbzeug, Werkstoff	
				6KBH	Tag	Name
				Bearb.	04.86	BM
				Gepr.		
				Norm		
					Benennung	
					IMPULSGEBERPLATTE	Z
					PULSE GENERATOR BOARD	
					Zeichn.-Nr.	
					651.6282.01	
						Blatt-Nr. 2
						v. Bl.
Änd. Zust.	Änderungs- Mitteilung	Tag	Name	zu Gerät GB 085 P1	reg. i. V. 651.6118 V	erste Z. 651.6118.01

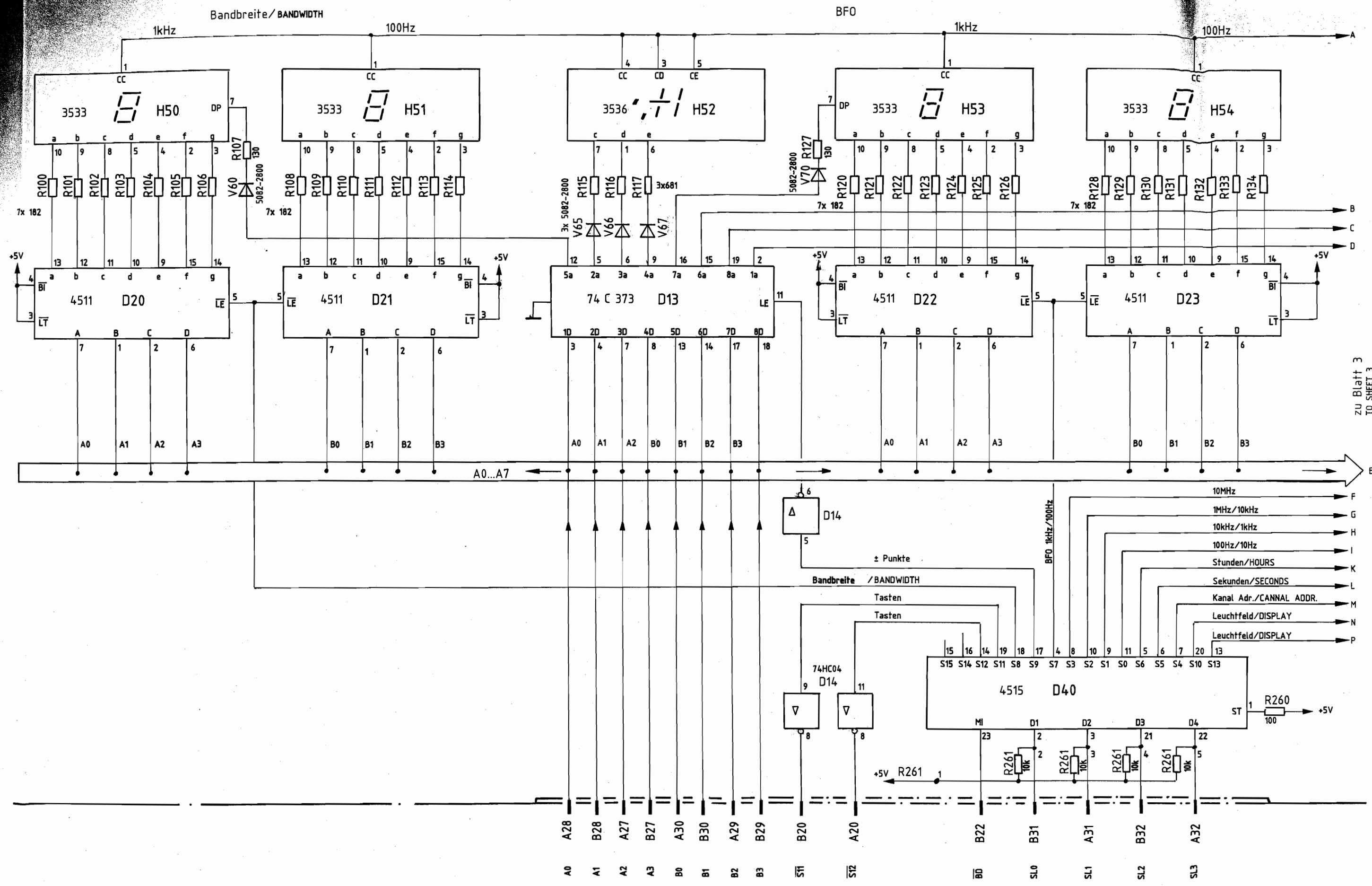
ISO-Projektion
Methode E



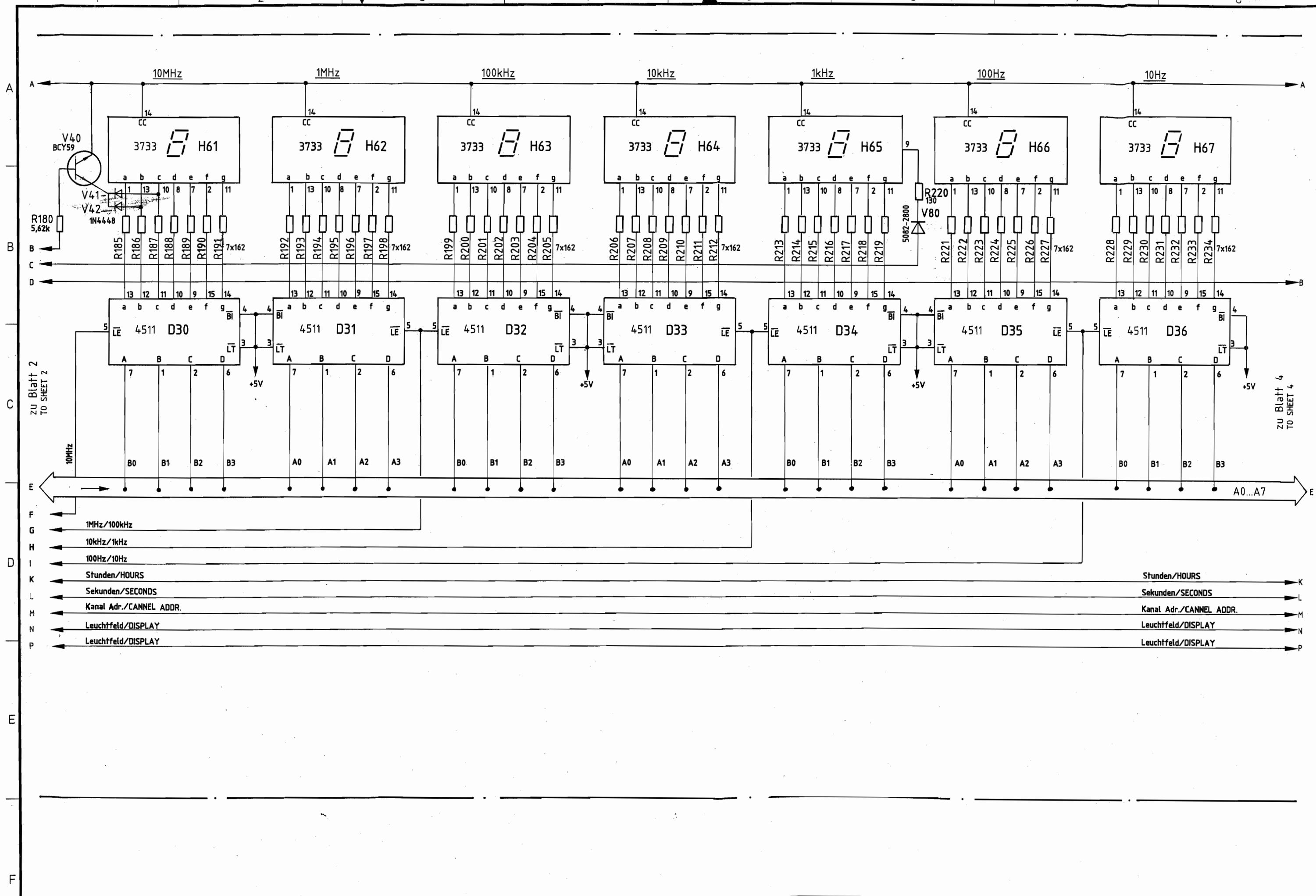
IC - Spannungs-Versorgung PIN Nr.									
IC - SUPPLY VOLTAGE									
IC	+16V	+5V	⊥	-5V	IC	+16V	+5V	⊥	-5V
D1	10		1		D32		16	8	
D2	10		1		D33		16	8	
D10		20	10		D34		16	8	
D11		20	10		D35		16	8	
D12		20	10		D36		16	8	
D13		20	10		D40		24	12	
D14		14	7		N1			10	
D20		16	8		N5	1		4	
					N10	7	1		4
D21		16	8						
D22		16	8						
D23		16	8						
D24		16	8						
D25		16	8						
D26		16	8						
D27		16	8						
D28		16	8						
D29		16	8						
D30		16	8						
D31		16	8						

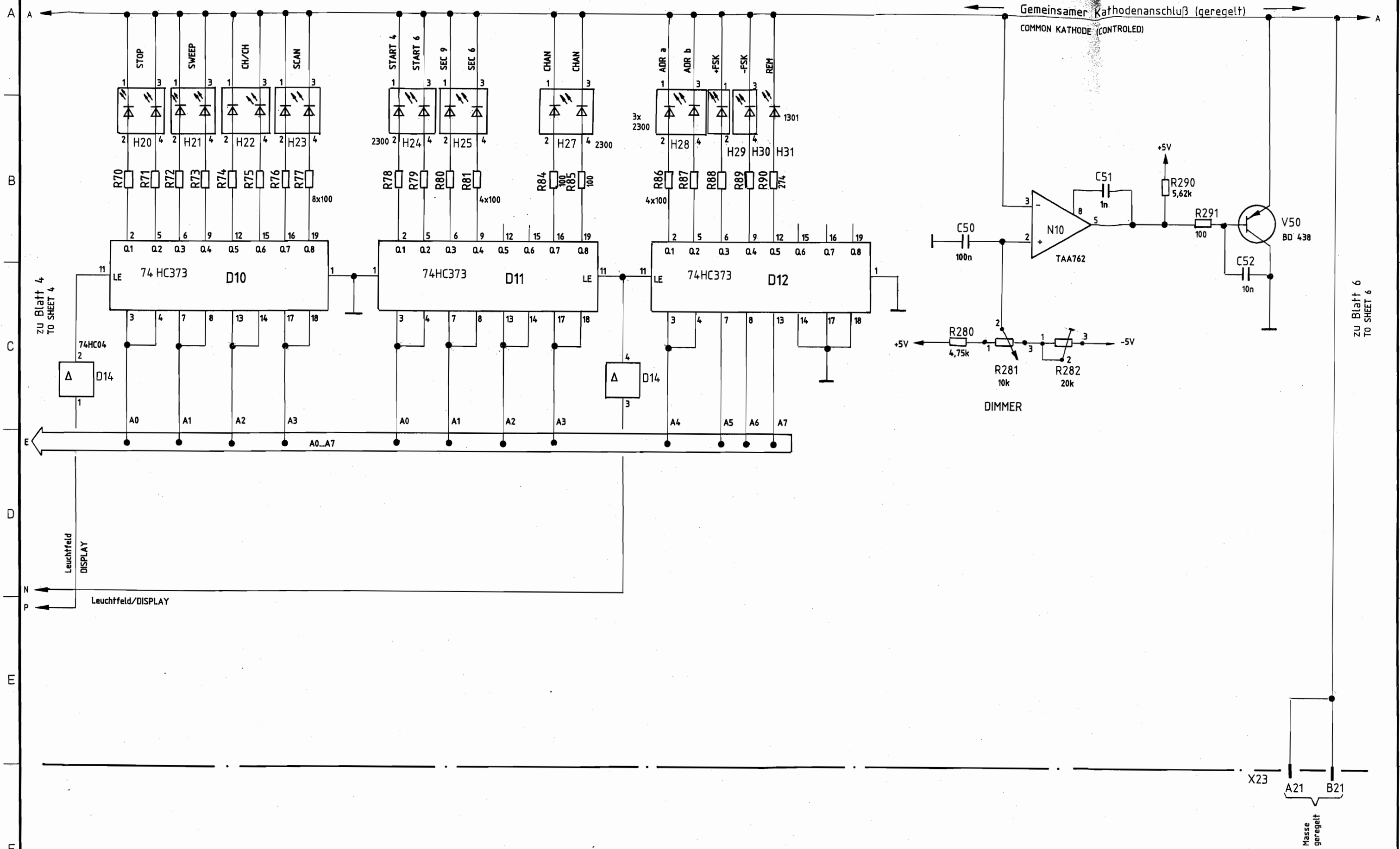


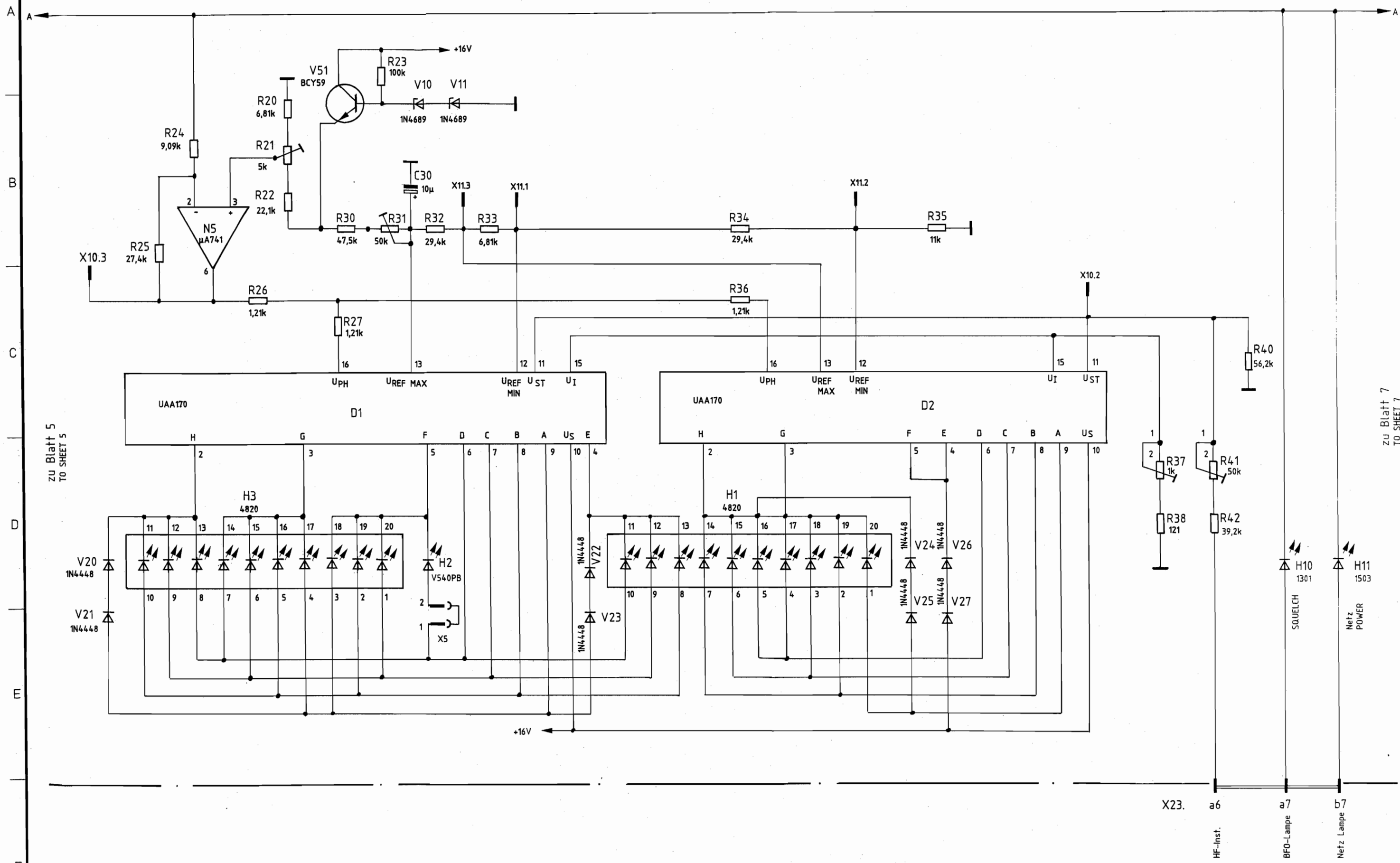
* Strommessung:
alle Lampen dunkel
Dimmpoti (R280) auf linken Anschlag



zu Blatt 3
TO SHEET 3





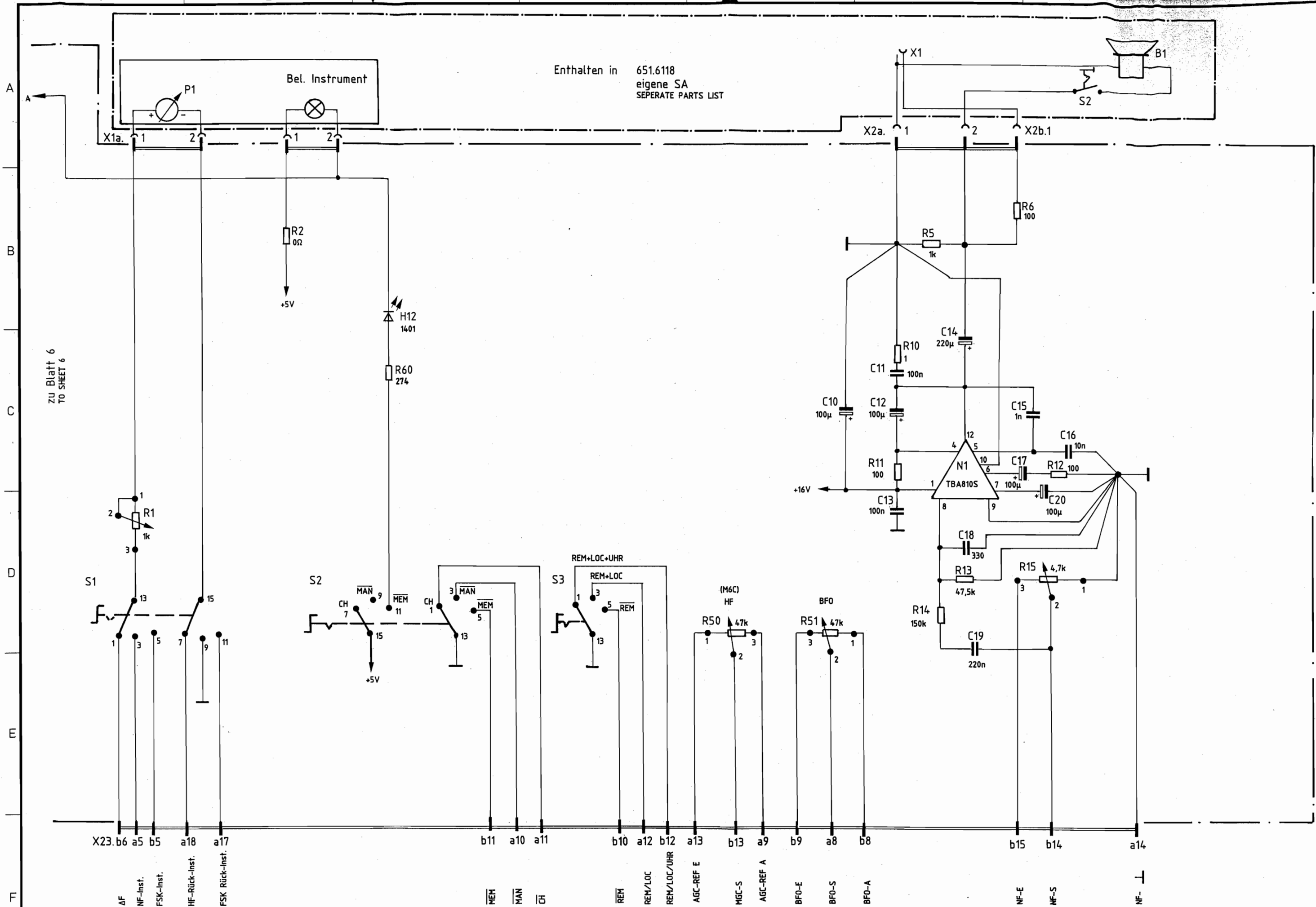


zu Blatt 5
TO SHEET 5

zu Blatt 7
TO SHEET 7



A	-	9.85	BM						6KBH	Tag	Name	Benennung	Zeichn.-Nr	651.6318.01 S	Blatt-Nr 6
And. Zust.	Anderungs-Mitteilung	Datum	Name	And. Zust.	Anderungs-Mitteilung	Datum	Name	Norm				zu Gerät: GB 085 P1	reg. i. V. 651.6118 V	erste Z 651.6118.01	7





ROHDE & SCHWARZ

ÄZ

Datum
DateSchaltteilliste für
Parts list for
ED ANZEIGEPLATTESachnummer
Stock No.Blatt
Page

05 0885

651.6318.01 SA

1

Kennzeichen
Component No.Benennung/Beschreibung
DesignationSachnummer
Stock No.enthalten in
contained in

.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
C1	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C2	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C3	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C4	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C5	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C10	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C11	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C12	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C13	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C14	CE 220UF-10+50% 16V 13X17 ELECTROLYTIC CAPACITOR SIEMENS B41316-A4227-2	CE 022.7566	
C15	CC 1NF+-10%63V K20C0 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C16	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C17	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C18	CC 330PF+-10%3X4R2000 CAPACITOR VALVO 2222 63051 331	CC 087.6970	
C19	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR UNION CARB M39014/02-1395	CC 084.5515	
C20	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C30	CE 10UF -10+50% 63V 9X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK10/63	CE 022.7650	

651.6318.01 SA BL 1+


ROHDE & SCHWARZ

ÄZ

 Datum
Date

 Schalteilliste für
Parts list for

ED ANZEIGEPLATTE

 Sachnummer
Stock No.

 Blatt
Page

05

0885

651.6318.01 SA

2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C50	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
C51	UNION CARB M39014/01-1433 CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 022.0784	
C52	VALVO 2222 63051 102 CC 10NF-20+50%7X8R6000 CAPACITOR	CC 087.7525	
	VALVO 2222 63051 64051103		
D1	BS UAA170 LED-ANSTEUERUNG IC LED BIASING	BS 291.4241	
D2	SIEMENS UAA170 BS UAA170 LED-ANSTEUERUNG IC LED BIASING	BS 291.4241	
D10	SIEMENS UAA170 BL MM74C373N 8B.D-LATCH D-LATCH	BL 335.8823	
	NSC MM74C373N		
BIS/TO			
D13			
D14	BL MM74HC04N 6XINVERTER HEX-INVERTER	BL 571.3365	
	NSC MM74HC04N		
D20	BL MC14511BCP BCD/7S.DRIV 7-SEGMENT DRIVER	BL 086.7280	
	RCA CD4511BE		
BIS/TO			
D36			
D40	BL CD4515BD 10F16 DECOD DECODER	BL 517.7620	
	RCA CD4515BD		
H1	AF HDSP4820 LEDZEIL10XRT LED-ARRAY	AF 617.3578	
	HEWLETT HDSP-4820		
H2	AF V540PB LED RT DREIE LED	AF 597.7780	
	AEG-TELEF. V540PB		
H3	AF HDSP4820 LEDZEIL10XRT LED-ARRAY	AF 617.3578	
	HEWLETT HDSP-4820		
H10	AF HLMP1301 LED RT RD3 LED	AF 257.4736	
	HEWLETT-P. HLMP1301		
H11	AF HLMP1503 LED GN RD3 LED	AF 252.5570	
	HEWLETT-P. HLMP1503		
H12	AF HLMP1401 LED GE RD3 LED	AF 235.4604	
	HEWLETT-P. HLMP-1401		
H20	AF HLMP2300 LEDBALK.2XRT LED-ARRAY	AF 300.9423	
	HEWLETT-P. HLMP2300		
BIS/TO			
651.6318.01 SA BL 2+			



ROHDE & SCHWARZ

ÄZ

Datum
DateSchaltteilliste für
Parts list for

ED ANZEIGEPLATTE

Sachnummer
Stock No.Blatt
Page

05

0885

651.6318.01 SA

3

Kennzeichen
Component No.Benennung/Beschreibung
DesignationSachnummer
Stock No.enthalten in
contained in

H25

H27

AF HLMP2300 LEDBALK.2XRT
LED-ARRAY
HEWLETT-P. HLMP2300

AF 300.9423

BIS/TO

H30

H31

AF HLMP1301 LED RT RD3
LED

AF 257.4736

H50

HEWLETT-P. HLMP1301
BP HDSP3533 1X 7SEGM RTR
LED-DISPLAY

BP 566.1239

H51

HEWLETT-P. HDSP3533 HKL:E,F
BP HDSP3533 1X 7SEGM RTR
LED-DISPLAY

BP 566.1239

H52

HEWLETT-P. HDSP3533 HKL:E,F
BP HDSP3536 1X +-ANZ RT
LED-DISPLAY

BP 566.1222

H53

HEWLETT-P. HDSP3536 HKL:E,F
BP HDSP3533 1X 7SEGM RTR
LED-DISPLAY
HEWLETT-P. HDSP3533 HKL:E,F

BP 566.1239

BIS/TO

H58

H59

BP HDSP3733 1X 7SEGM RTR
LED-DISPLAY
HEWLETT-P. HDSP3733 HKL:E,F

BP 566.1245

BIS/TO

H67

N1

BO TBA810AS LF POW.AMPL
POWER AMPLIFIER
AEG-TELEF TBA810AS

645.8312

N5

BO UA741MJG OPAMP
OPERATIONAL AMPLIFIER
TEXAS UA741MJG

BO 275.0822

N10

BO TAA762 OC. OPAMP
OPERATIONAL AMPLIFIER
SIEMENS TAA762

BO 455.2880

R1

RS 0,5W1KOHM+-10%10X10X5
CERMET POTENTIOMETER
BOURNS 3386X-1-102

RS 247.5917

R2

RL 0-WIDERSTAND DIN 0204
0-OHM RESISTOR

RL 069.0000

R5

DRALORIC OMA 0204
RL 0,35W 1KOHM+-1%TK50
RESISTOR

RL 082.2160

R6

DRALORIC SMA0207/1K-F-C
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR

RL 082.6543

R10

DRALORIC SMA0207/100/HM-F-D
RL 0,35W 1,0 OHM+-1%TK50
METALFILMRESISTOR

RL 099.7860

R11

RESISTA MK2 1,00 OHM 1% TK50
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR
DRALORIC SMA0207/100/HM-F-D

RL 082.6543

651.6318.01 SA BL 3+



RHODE & SCHWARZ

ÄZ

Datum
DateSchaltteilliste für
Parts list for
ED ANZEIGEPLATTESachnummer
Stock No.Blatt
Page

05 0885

651.6318.01 SA

4

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R12	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R13	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800	
R14	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C	RL 083.2129	
R15	RS 0,25W4,7K 10%POSEX L32 DEPOS.-CARBON POTENTIOMET DRALORIC 61HDS4,7K10%POSEXL32	RS 092.5091	
R20	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	
R21	RS 0,5W5KOHM+-10%10X10X5 CERMET POTENTIOMETER BOURNS 3386X-1-502	RS 247.7978	
R22	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R23	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R24	RL 0,35W 9,09KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/9,09K-F-C	RL 082.2177	
R25	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R26	RL 0,35W 1,21KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,21K-F-D	RL 083.0655	
R27	RL 0,35W 1,21KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,21K-F-D	RL 083.0655	
R30	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800	
R31	RS 0,5W50KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386-1-503	RS 087.7677	
R32	RL 0,35W 29,4KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/29,4K-F-C	RL 083.1622	
R33	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	
R34	RL 0,35W 29,4KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/29,4K-F-C	RL 083.1622	
R35	RL 0,35W 11,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/11K-F-D	RL 083.1322	
R36	RL 0,35W 1,21KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,21K-F-D	RL 083.0655	

651.6318.01 SA BL 4+


ROHDE & SCHWARZ
ÄZ
Datum
Date
Schaltteilliste für
Parts list for
ED ANZEIGEPLATTE
Sachnummer
Stock No.
Blatt
Page

05 0885

651.6318.01 SA

5

Kennzeichen
Component No.
Benennung/Beschreibung
Designation
Sachnummer
Stock No.
enthalten in
contained in

R37

RS 0,5W1KOHM+-10%10X10X5
CERMET POTENTIOMETER

RS 247.5917

R38

BOURNS 3386X-1-102
RL 0,35W 121 OHM+-1%TK50
RESISTOR

RL 082.9859

R40

DRALORIC SMA0207/1210HM-F-D
RL 0,35W 56,2KOHM+-1%TK50
RESISTOR

RL 082.2231

R41

DRALORIC SMA0207/56,2K-F-C
RS 0,5W50KOHM+-10%10X10X5
CERMET POTENTIOMETER T

RS 087.7677

R42

BOURNS 3386-1-503
RL 0,35W 39,2KOHM+-1%TK50
RESISTOR

RL 083.1745

R50

DRALORIC SMA/207/39,2K-F-C
RS 0,5W 47K 10%LIN L32
DEPOS.-CARBON POTENTIOMET

RS 087.8780

R51

DRALORIC 61CDS 47KOHM10%LIN.
RS 0,5W 47K 10%LIN L32
DEPOS.-CARBON POTENTIOMET

RS 087.8780

R60

DRALORIC 61CDS 47KOHM10%LIN.
RL 0,35W 274 OHM+-1%TK50
RESISTOR

RL 083.0178

R70

DRALORIC SMA0207/274OHM-F-D
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR

RL 082.6543

BIS/TO

R81

R84

DRALORIC SMA0207/100/HM-F-D
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR

RL 082.6543

BIS/TO

R89

R90

DRALORIC SMA0207/274OHM-F-D
RL 0,35W 274 OHM+-1%TK50
RESISTOR

RL 083.0178

R100

DRALORIC SMA0207/182OHM-F-D
RL 0,35W 182 OHM+-1%TK50
RESISTOR

RL 083.0010

BIS/TO

R106

R107

DRALORIC SMA0207/130OHM-F-D
RL 0,35W 130 OHM+-1%TK50
RESISTOR

RL 082.9888

R108

DRALORIC SMA0207/182OHM-F-D
RL 0,35W 182 OHM+-1%TK50
RESISTOR

RL 083.0010

BIS/TO

R114

R115

DRALORIC SMA0207/68,1OHM-F-D
RL 0,35W 68,1 OHM+-1%TK50
RESISTOR

RL 082.9636

R116

DRALORIC SMA0207/68,1OHM-F-D
RL 0,35W 68,1 OHM+-1%TK50
RESISTOR

RL 082.9636

651.6318.01 SA BL 5+



ROHDE & SCHWARZ

ÄZ

Datum
Date

05

0885

Schaltteilliste für
Parts list for
ED ANZEIGEPLATTESachnummer
Stock No.

651.6318.01 SA

Blatt
Page

6

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R117	RL 0,35W 68,1 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/68,10HM-F-D	RL 082.9636	
R120	RL 0,35W 182 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1820HM-F-D	RL 083.0010	
BIS/TO R126 R127	RL 0,35W 130 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1300HM-F-D	RL 082.9888	
R128	RL 0,35W 182 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1820HM-F-D	RL 083.0010	
BIS/TO R148 R149	RL 0,35W 130 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1300HM-F-D	RL 082.9888	
R150	RL 0,35W 182 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1820HM-F-D	RL 083.0010	
BIS/TO R163 R164	RL 0,35W 162 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1620HM-F-D	RL 082.9971	
BIS/TO R177 R180	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R185	RL 0,35W 162 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1620HM-F-D	RL 082.9971	
BIS/TO R219 R220	RL 0,35W 130 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1300HM-F-D	RL 082.9888	
R221	RL 0,35W 162 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/1620HM-F-D	RL 082.9971	
BIS/TO R234 R250	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK ECURNS 4310R-101-103	RN 343.4523	
R260	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R261	RN 5X 10KOHM+-2%SIL 6 H5 RESISTOR NETWORK BOURNS 4306R-101-103	RN 099.2675	
R28C	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
		651.6318.01 SA	BL 6+



ROHDE & SCHWARZ

ÄZ

Datum
DateSchaltteilliste für
Parts list for
ED ANZEIGEPLATTESachnummer
Stock No.Blatt
Page

05 0885

651.6318.01 SA

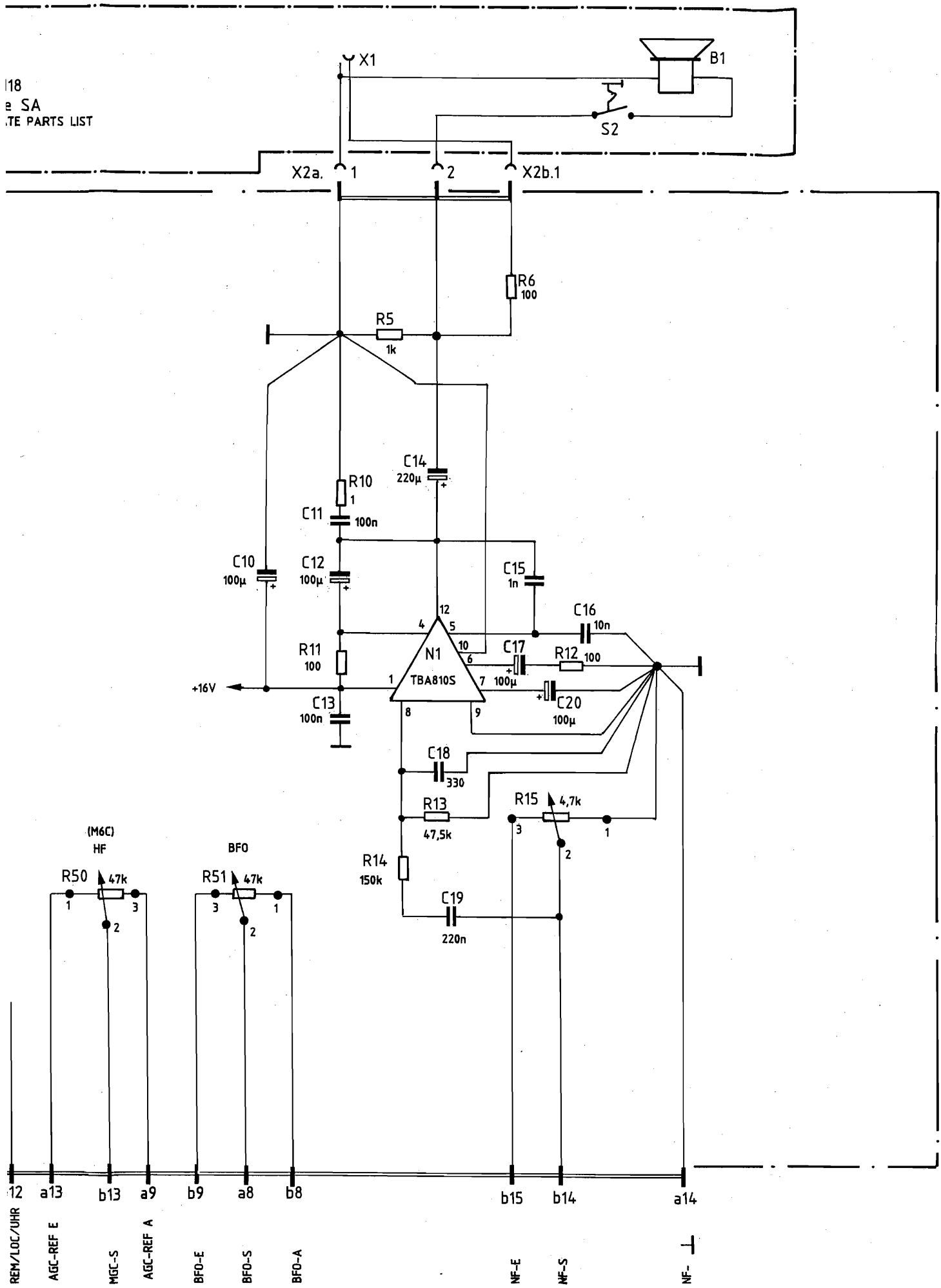
7

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R281	RS 0,5W 10K 10XLIN L32 DEPOS.-CARBON POTENTIOMET DRALORIC 61CDS 10KOHM10XLIN.	RS 087.8767	
R282	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386X-1-203	RS 087.7660	
R290	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR	RL 082.2190	
R291	DRALORIC SMA0207/5,62K-F-C RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
S1	MB DREHSCHALTER	651.6624	
S2	MB DREHSCHALTER	651.6624	
S3	MB DREHSCHALTER	651.6630	
V1	AE BZX85/C18 1,3W Z-DI ZENER DIODE THOMSON BZX85/C18	AE 092.8310	
V2	AE BZX85/C6V8 1,3W Z-DI ZENER DIODE THOMSON BZX85/C6V8	AE 092.8255	
V3	AE BZX85/C6V8 1,3W Z-DI ZENER DIODE THOMSON BZX85/C6V8	AE 092.8255	
V10	AE 1N4689 5V1 0,3W Z-DI ZENER DIODE SIEMENS 1N4689	AE 303.9418	
V11	AE 1N4689 5V1 0,3W Z-DI ZENER DIODE SIEMENS 1N4689	AE 303.9418	
V20	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
BIS/TO			
V27			
V40	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V41	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V42	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V50	AL BD438 PNP 45V 4AC TRANSISTOR VALVO BD438	AL 010.0403	
V51	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V60	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	

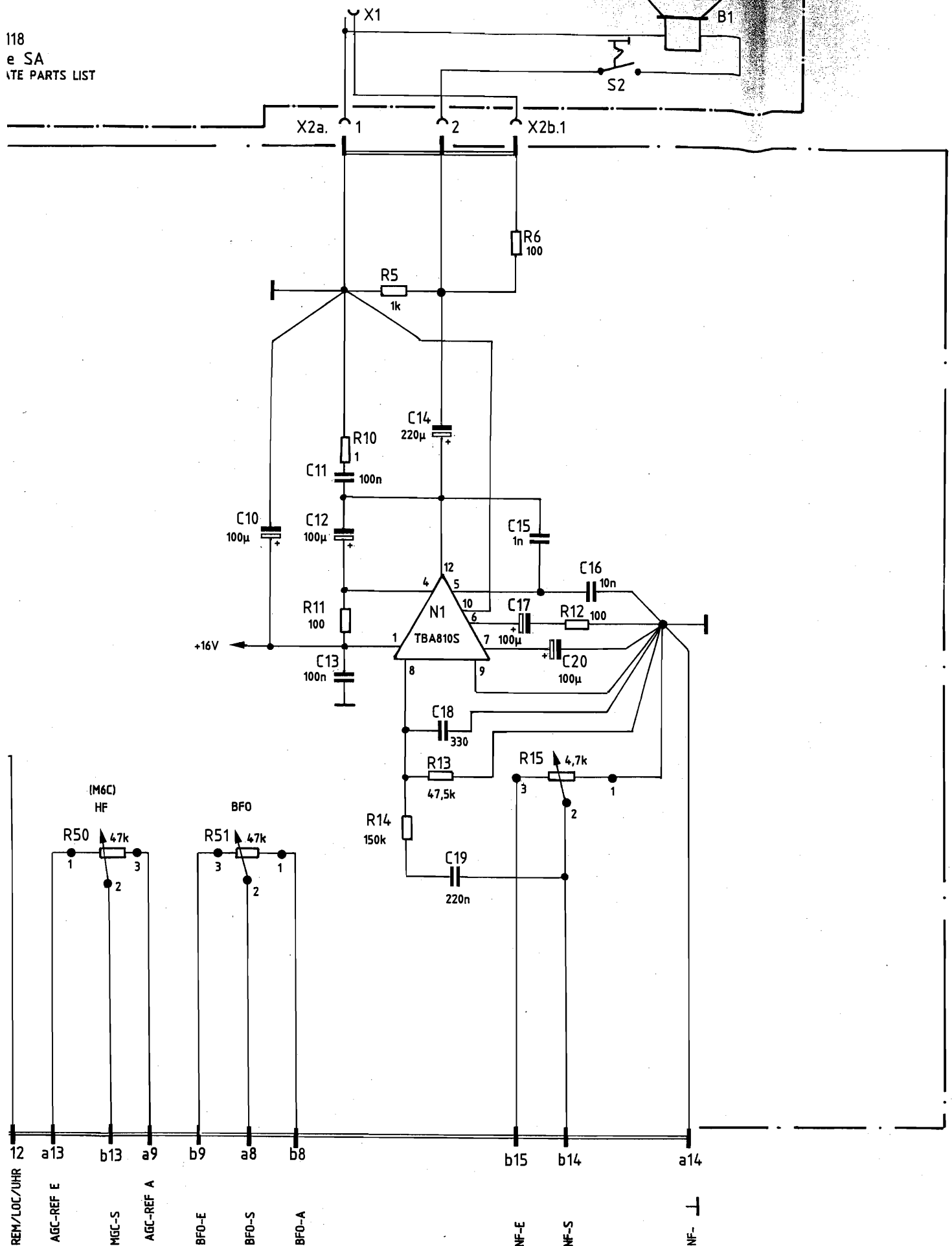
651.6318.01 SA BL 7+

 ROHDE & SCHWARZ		ÄZ Datum Date 05 0885	Schaltteilliste für Parts list for ED ANZEIGEPLATTE	Sachnummer Stock No. 651.6318.01 SA	Blatt Page 8
Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in		
V65	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066			
V66	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066			
V67	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066			
V70	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066			
V75	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066			
V80	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066			
X5	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36 2-POLIG/2 PINS	FP 242.3600			
X10	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36 3-POLIG/3 PINS	FP 242.3600			
X11	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36 3-POLIG/3 PINS	FP 242.3600			
X23	FP BUCHSENLEISTE 64POL. CONNECTOR 64POL. BERG 76787-464	FP 645.6790	651.6347		
X1A	FP STECKERL.IND.36P.R2,54 ANGLE PIN CONNECTOR BERG 75168-116-36 3-POLIG/3 PINS	FP 288.1945			
X1B	FP STECKERL.IND.36P.R2,54 ANGLE PIN CONNECTOR BERG 75168-117-36 3-POLIG/3 PINS	FP 288.1951			
X2A	FP STECKERL.IND.36P.R2,54 ANGLE PIN CONNECTOR BERG 75168-116-36 2-POLIG/2 PINS	FP 288.1945			
X2B	FP STECKERL.IND.36P.R2,54 ANGLE PIN CONNECTOR BERG 75168-117-36 2-POLIG/2 PINS	FP 288.1951			
			- ENDE -		
651.6318.01 SA BL 8-					

118
e SA
TE PARTS LIST



Name	Benennung	Zeichn.-Nr.	Blatt-Nr.
BM	Anzeigeplatte	651.6318.01 S	7
	DISPLAY BOARD		v. 7 Bl.
zu Gerät: GB 085 P1		reg. i. V. 651.6118 V	erste Z. 651. 6118.01

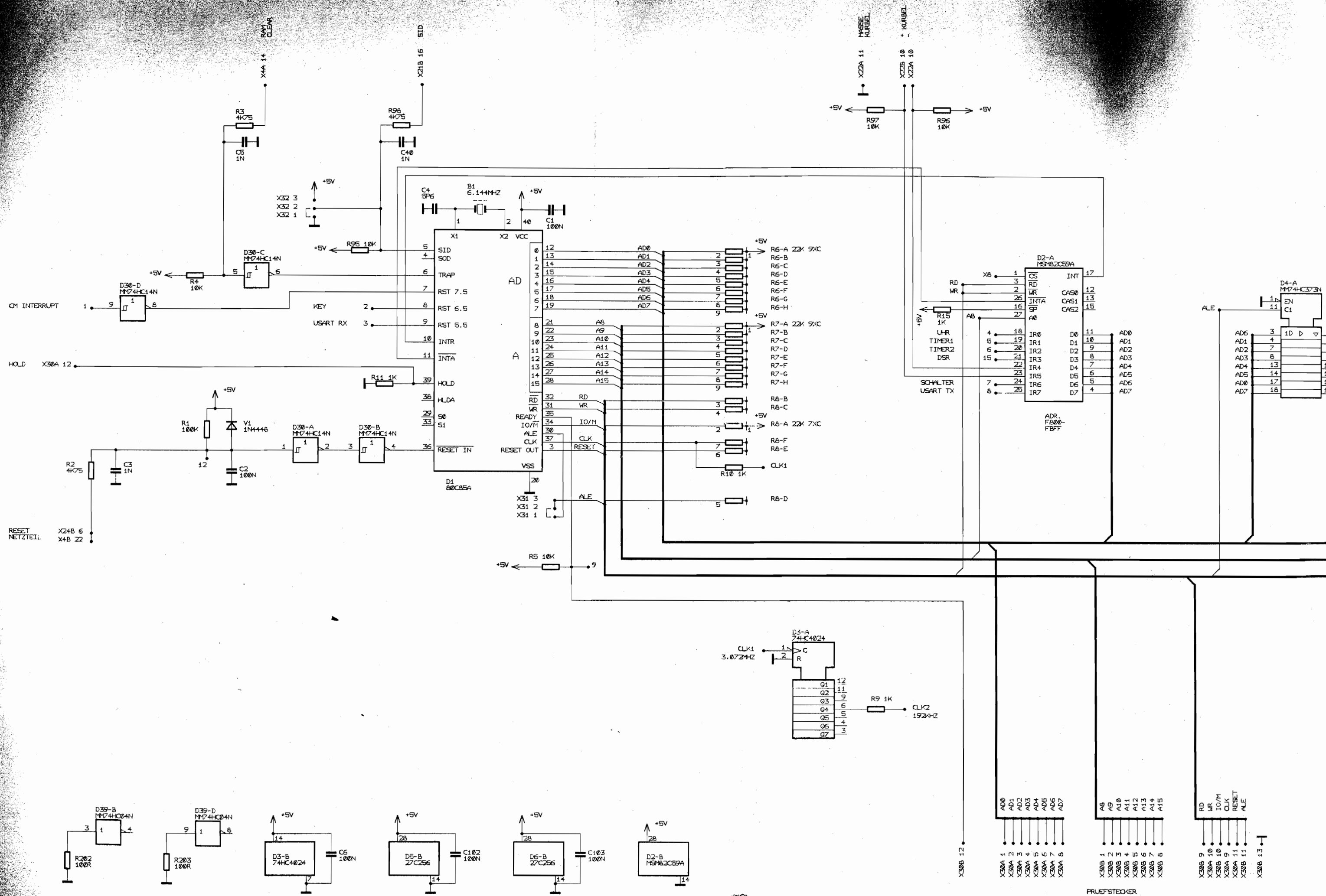


Name	Benennung	Zeichn.-Nr.	Blatt-Nr.
BM	Anzeigeplatte DISPLAY BOARD	651.6318.01 S	7
			v. 7 BI
zu Gerät: GB 085 P1		reg. i. V. 651.6118 V	erste Z. 651.6118.01

(hierzu HVC 250)


ROHDE & SCHWARZ

B		06.85	MAR					6KBC	Tag	Name	Benennung
C	35168	3.86	BM					Bearb.	06.85	MAR	
								Gepr.			
And. Zust.	Anderungs- Mitteilung	Datum	Name	And. Zust.	Anderungs- Mitteilung	Datum	Name	Norm			

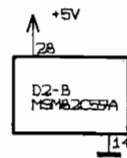
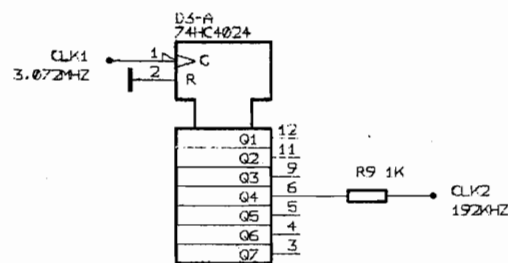
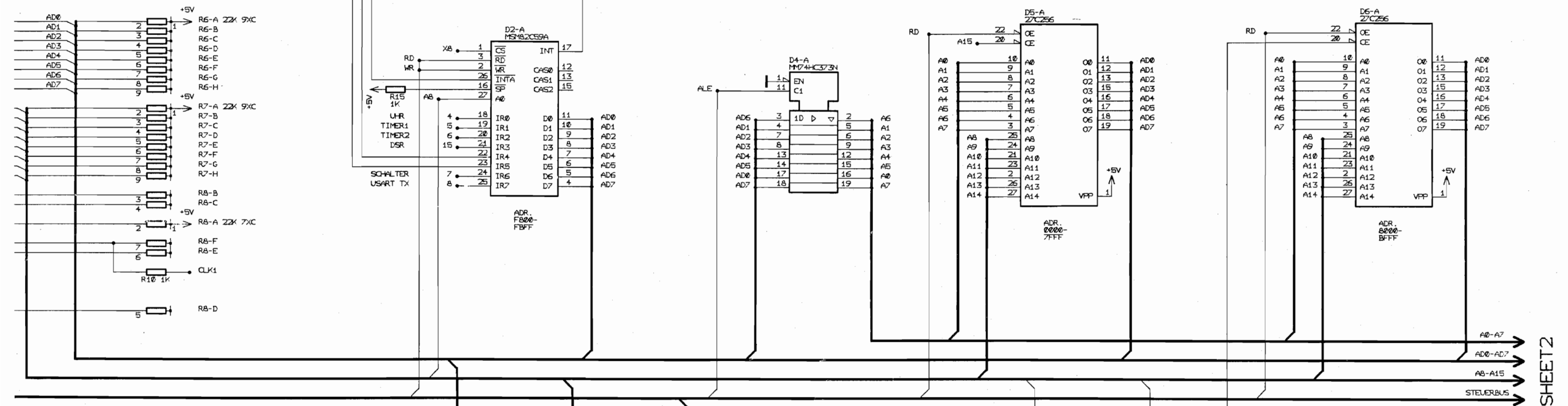




	1-2	2-3
X31	ALE-BETRIEB *	ALE-TEST
X32	SID-0 *	SID-1
X33	SPEZIAL MODE 4UNABH. TREIBER	X. 21, V. 24 BUS *
X37	KANALSPEICHER FREI *	KANALSPEICHER GESPERRT
X38	SCHNITTSTELLENPEGEL 0, +5V	SCHNITTSTELLENPEGEL -5V *
X39	ECHO AUS *	ECHO EIN
X40	RAM D10 VCC AN +5V *	RAM D10 VCC AN BAT
X41	RAM D10 VCC AN +5V *	RAM D10 VCC AN BAT
X42	RAM D10 VCC AN BAT	RAM D10 VCC AN +5V *

X32/SID	X21 B23 F5	X9 A36 FILTER SELEKTION	FUNKTION
1-2/0	0	1 0	VIERKANAL BETRIEB DATEN ZU FILTER DATEN ZU SELEKTION
1-2/0	1	1 0	PARALLEL- INTERFACE DATEN ZU FILTER DATEN ZU SELEKTION UND FILTER
2-3/1	0	1 0	OPTION DATEN ZU FILTER DATEN ZU SELEKTION
2-3/1	1	1 0	NORMAL- BETRIEB DATEN ZU FILTER DATEN ZU SELEKTION

* GRUNDEINSTELLUNG



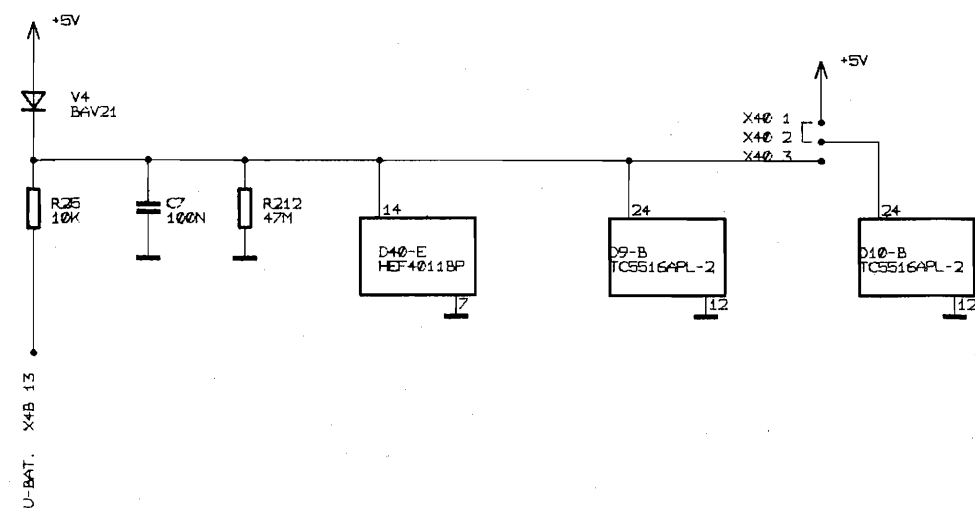
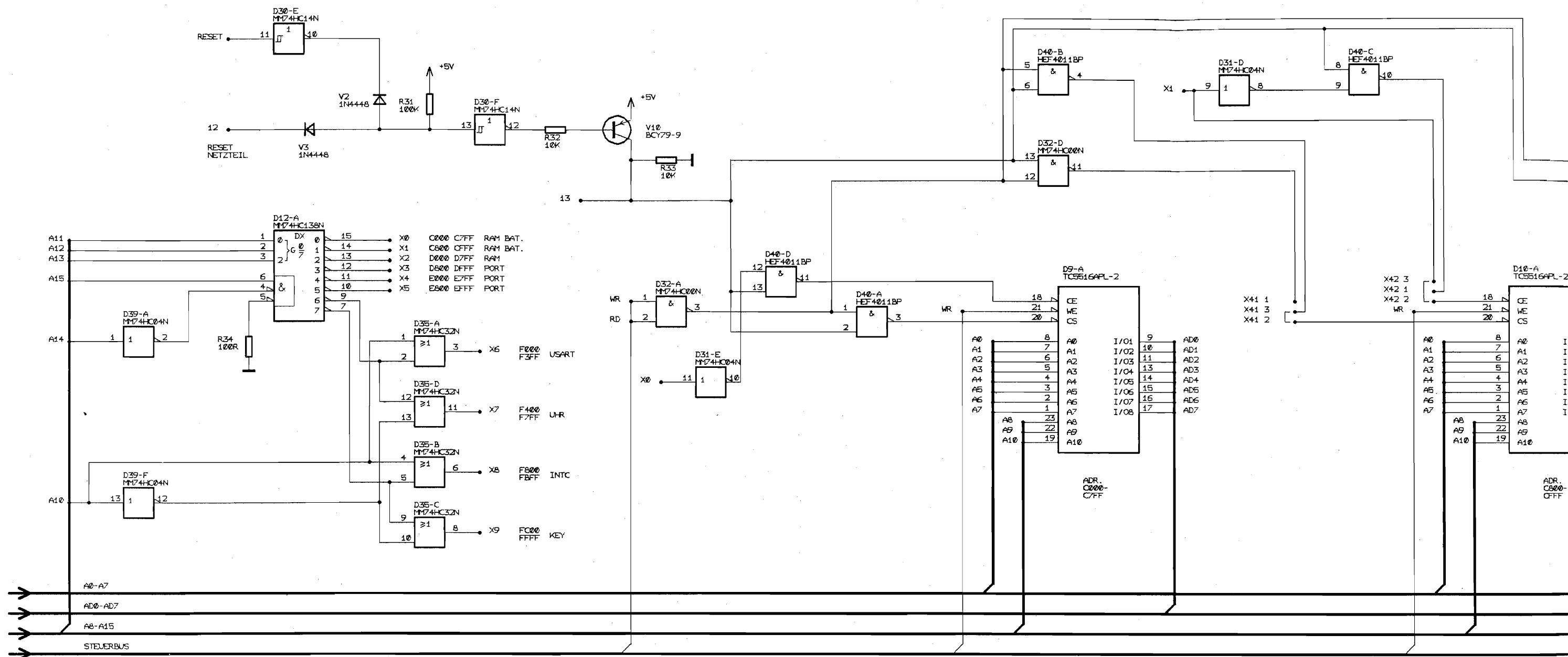
VARIANTENERKLÄRUNG SIEHE SA
EXPLANATION OF MODELS
SEE PARTS LIST

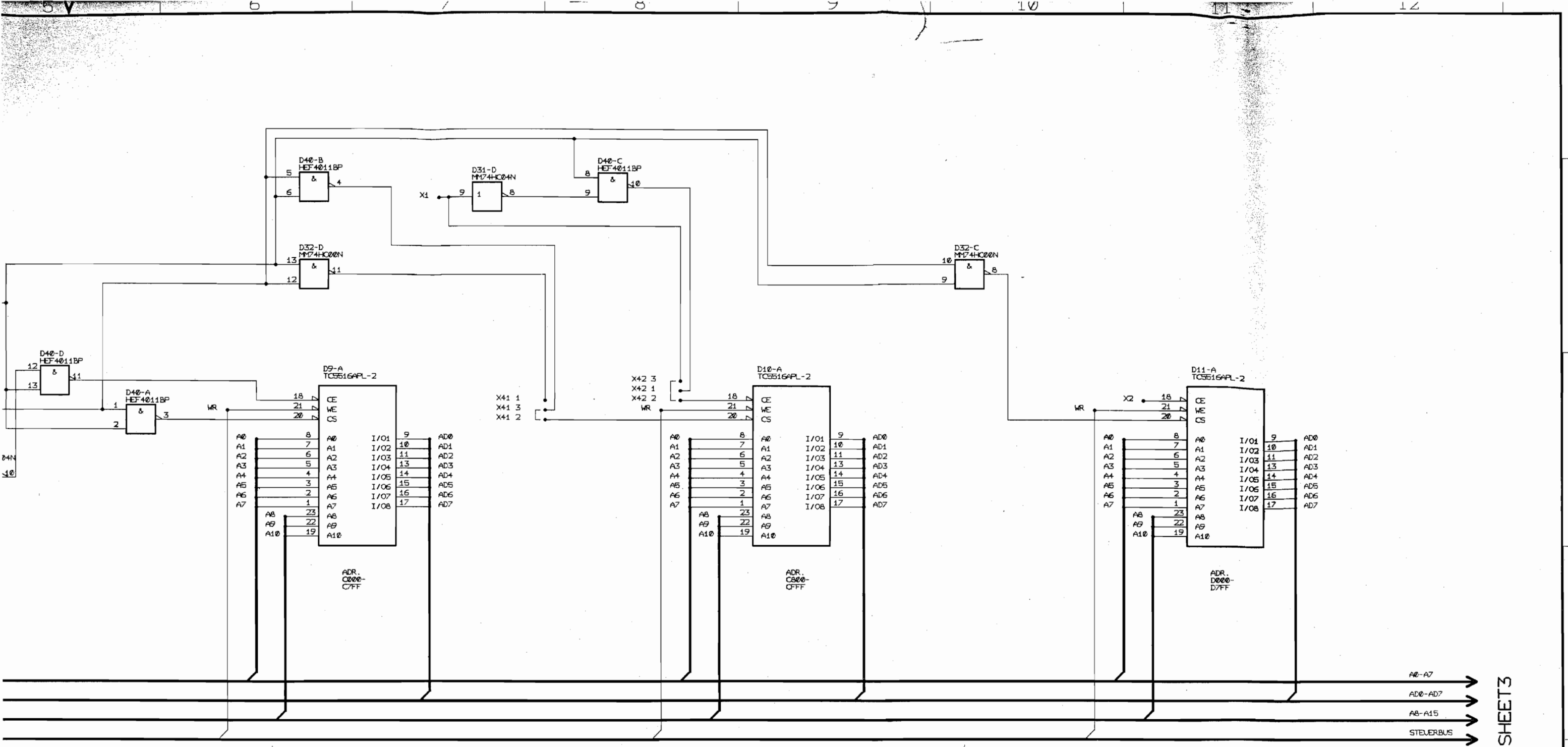


ACHTUNG EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling

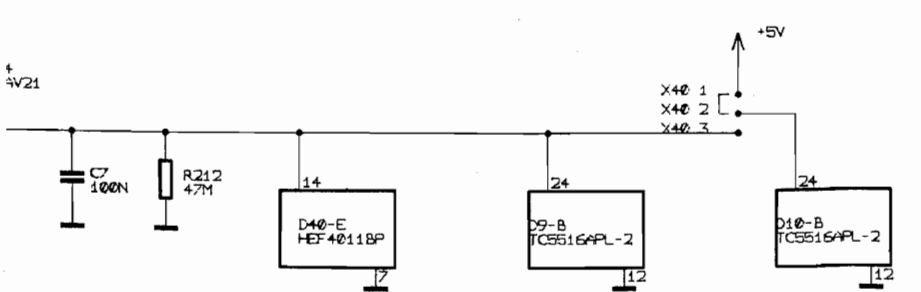
B	MR	GKBC	TAG	NAME	BENENNUNG	Z
		BEARB.	16-07-85	MR	STEUERWERK PROCESSOR	
		GEPR.				
		NORM				
		PLOTT		3CDA	ZEICHN.-NR.	651.651801S
AEND. ZUST.	AENDERUNG	DATUM	NAME	ZU GERÄT	GB085 P1	REG. I.V.
						651.6518 V
						ERSTE Z.

SHEET 2





SHEET 3

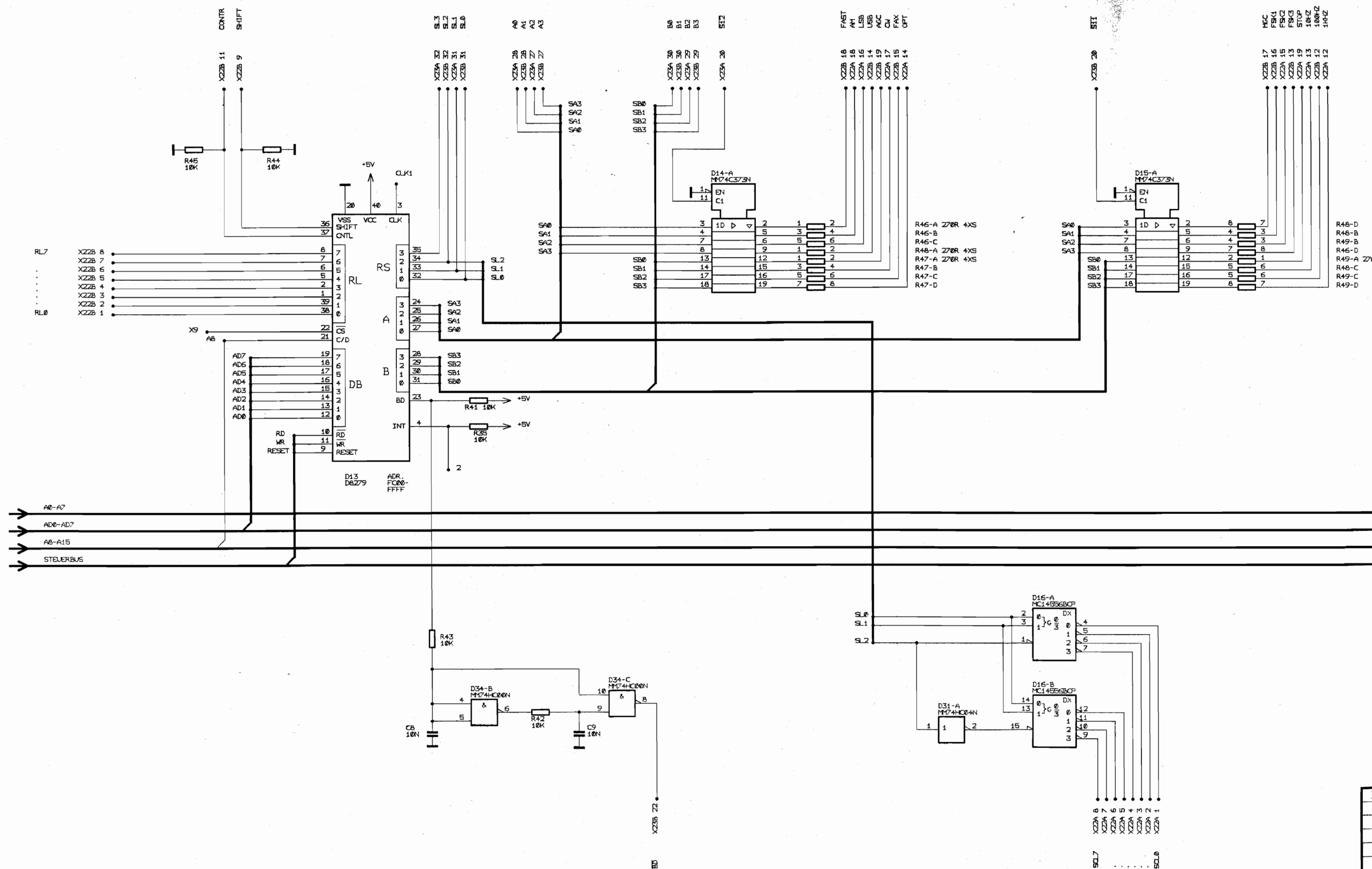


VARIANTENERKLÄRUNG SIEHE SA
EXPLANATION OF MODELS
SEE PARTS LIST

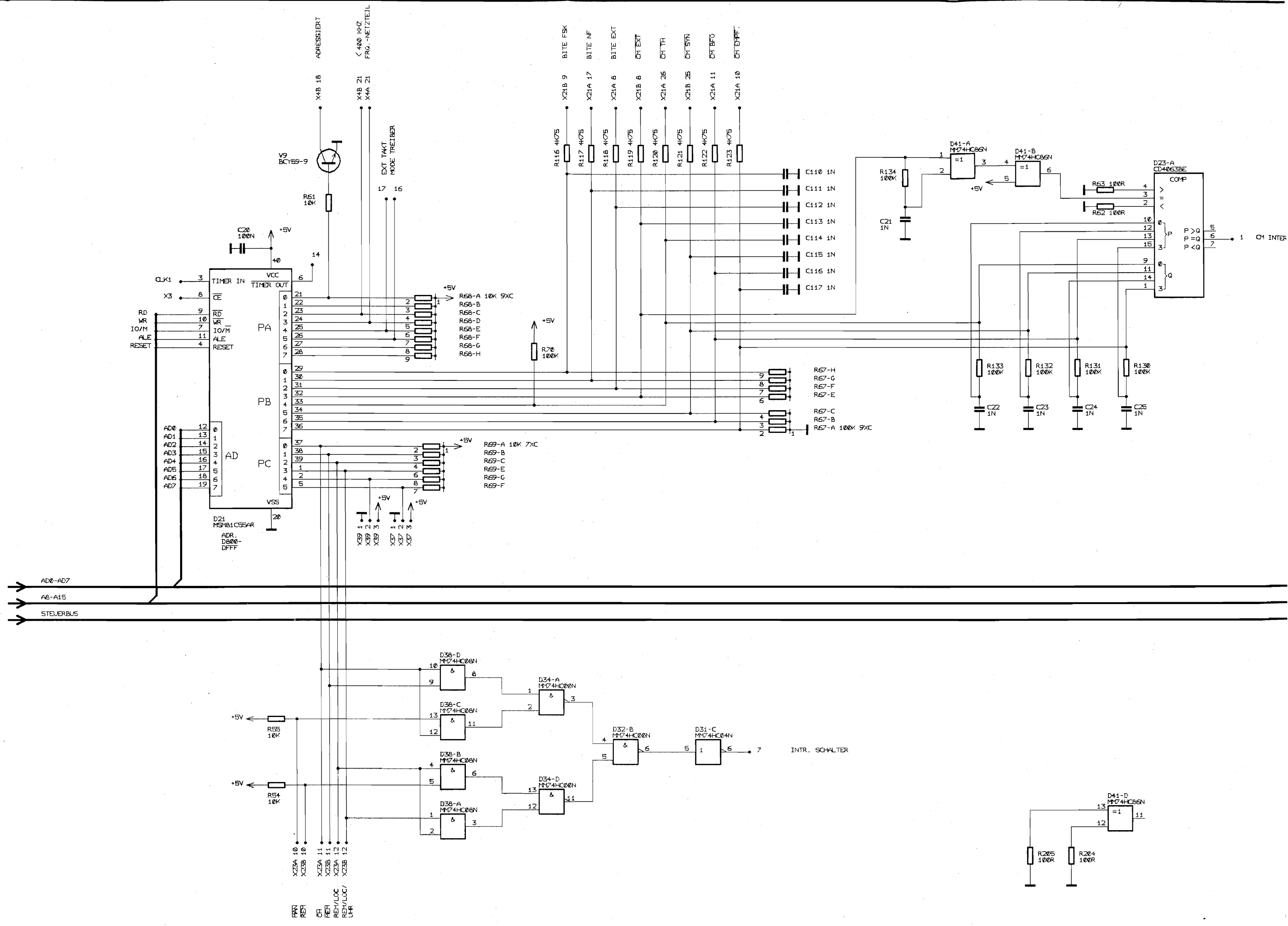


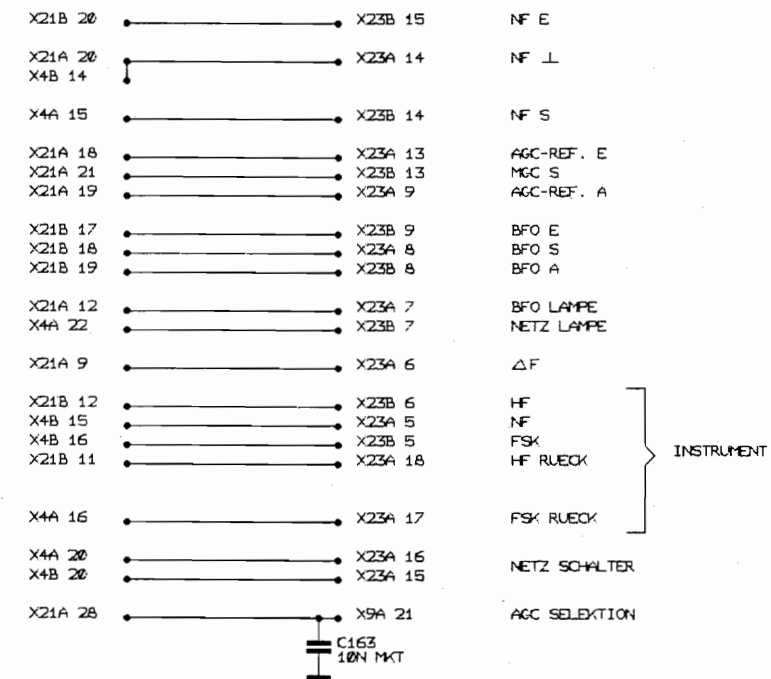
ACHTUNG EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling

B		MR	SKBC	TAG	NAME	BENENNUNG	Z
			BEARB.	15-07-85	MR	STEUERWERK	
			GEPR.			PROCESSOR	
			NORM				
			PLOTT		3CDA		
						ZEICHN.-NR.	BLATT-NR.
						651.6518	2
						01S	6 BL.
AEND. ZUST.	AENDERUNG	DATUM	NAME	ZU GERÄT	GB085 P1	REG. I.V.	ERSTE Z.
						651.6118 V	



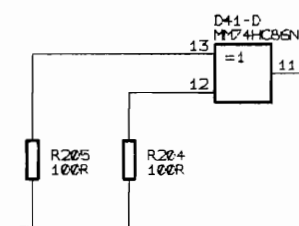






STEUERBUS

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hierzu HVC 250.

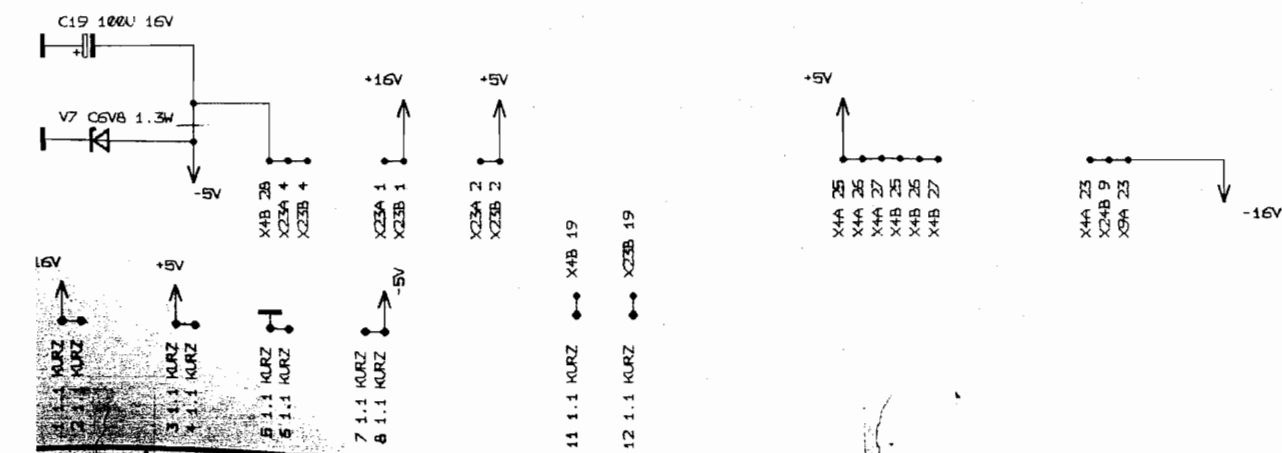


ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling

AEND. ZUST.	AENDEPUNG	DATUM	NAME	ZU GERÄT	REG. I. V.	ERSTE Z.
				GR085 P1	651 6118 V	



AEND.
ZUST.



100



LEITERPLATTE

B			MR	GBBC	TAG	NAME	BENENNUNG		Z
				BEARB.	15-07-85	MR	STEUERWERK		
				GEPR.			PROCESSOR		
				NORM					
				PLOTT		3CDA			
							ZEICHN.-NR.		BLATT-NR.
				ROHDE&SCHWARZ			651.6518.01 S		6
ÄND. 7157	ÄNDERUNG	DATUM	NAME	ZU GERÄT	GB085 P1	REG. I. V.	651 6118 V	ERSTE Z.	V. 6 BL.



ROHDE & SCHWARTZ

 ÄZ Datum
Date
06 1085

 Schalteilliste für
Parts list for
EE STEUERWERK

 Sachnummer
Stock No.

651.6518.01 SA

 Blatt
Page

1

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
A2.5	HS EPROM-PROGRAMMSATZ	651.6676.02	
B1	EQ 6,144 MHZ CL30PF HC43U QUARTZ CRYSTAL UNIT	EQ 091.0221	
B2	EQ 32,768KHZ CL12,5 RD3X8 SE R&S-ZCHNG.354.5210	354.5210	
C1	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C2	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C3	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C4	CC 5,6PF+-0,25PF3X4NPO CAPACITOR VALVO 2222 678 09568	CC 087.6393	
C5	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C7	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C8	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C9	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C10	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C16	CC 22PF+-2%4X5NPO CAPACITOR VALVO 2222 678 10229	CC 087.6464	
C17	CT 10,5PF N 1500 RD5XH6 DISC TRIMMER STETTNER 5STRIK0046/22N	CT 037.9530	
C18	CE 100UF-10+50% 16V 9X13 ELECTROLYTIC CAPACITOR ROEDERST EK 00CB 310 D	CE 006.7165	
C19	CE 100UF-10+50% 16V 9X13 ELECTROLYTIC CAPACITOR ROEDERST EK 00CB 310 D	CE 006.7165	
C20	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C21	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
		651.6518.01 SA	BL 1+


ROHDE & SCHWARZ

ÄZ

 Datum
Date

 Schaltteilliste für
Parts list for
EE STEUERWERK

 Sachnummer
Stock No.

 Blatt
Page

06 1085

651.6518.01 SA

2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
BIS/TO			
C25			
C26	CK 100NF+-5%63V5RM MKT CAPACITOR	CK 099.2930	
	WIMA MKS/2/63/0,1UF/5%		
C27	CC 1,8NF+-10%4X5R2000 CAPACITOR	CC 087.7054	
	VALVO 2222 63051 182		
C28	CC 1,8NF+-10%4X5R2000 CAPACITOR	CC 087.7054	
	VALVO 2222 63051 182		
C29	CC 150PF+-2%5X6N750 CAPACITOR	CC 087.6929	
	VALVO 2222 678 58151		
C30	CC 150PF+-2%5X6N750 CAPACITOR	CC 087.6929	
	VALVO 2222 678 58151		
C31	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 022.0784	
	VALVO 2222 63051 102		
C32	CK 100NF+-5%63V5RM MKT CAPACITOR	CK 099.2930	
	WIMA MKS/2/63/0,1UF/5%		
C40	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 022.0784	
	VALVO 2222 63051 102		
C102	CK 100NF+-5%63V5RM MKT CAPACITOR	CK 099.2930	
	WIMA MKS/2/63/0,1UF/5%		
C103	CK 100NF+-5%63V5RM MKT CAPACITOR	CK 099.2930	
	WIMA MKS/2/63/0,1UF/5%		
C110	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 022.0784	
	VALVO 2222 63051 102		
BIS/TO			
C117			
C119	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 022.0784	
	VALVO 2222 63051 102		
BIS/TO			
C160			
C161	CK 1UF+-10%50V5RM MKT CAPACITOR	CK 099.2998	
	WIMA MKS2/50/1UF/10%		
C162	CK 1UF+-10%50V5RM MKT CAPACITOR	CK 099.2998	
	WIMA MKS2/50/1UF/10%		
C163	CK 10NF+-5%63V5RM MKT CAPACITOR	CK 099.2869	
	WIMA FKS 2/100/0,01UF/5%		
D1	BC MSM80C85A 8B.CPU CMOS CPU OKI MSM80C8 5ARS	BC 633.9019	
651.6518.01 SA BL 2+			



ROHDE & SCHWARTZ

ÄZ

Datum
DateSchaltteilliste für
Parts list for
EE STEUERWERKSachnummer
Stock No.Blatt
Page

06

1085

651.6518.01 SA

3

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
D2	BC MSM82C59A INTERRU.CONTR INTERRUPT CONTROLLER OKI MSM82C59A	BC 006.9597	
D4	BL MM74HC373N 8XD-LATCH OCTAL D-TYPE LATCH TRIST. TEXAS SN74HC373N	BL 645.6726	
D9	BC TC5516APL-2 2KX8B.SRAM SRAM TOSHIBA TC5516APL-2	006.9639	
D10	BC TC5516APL-2 2KX8B.SRAM SRAM TOSHIBA TC5516APL-2	006.9639	
D11	BC TC5516APL-2 2KX8B.SRAM SRAM TOSHIBA TC5516APL-2	006.9639	
D12	BL MM74HC138N 3/8L.DECOD 3-TO-8 LINE DECODER MOTOROLA MC74HC138N	BL 571.3165	
D13	BC D8279 KEYB/DISP.IF KEYBOARD/DISPLAY INTERF. INTEL D8279	BC 092.9180	
D14	BL MM74C373N 8B.D-LATCH D-LATCH NSC MM74C373N	BL 335.8823	
D15	BL MM74C373N 8B.D-LATCH D-LATCH NSC MM74C373N	BL 335.8823	
D16	BL MC14556BCP 2X1:4DEMUX. DECODER/DEMULTIPLEXER SSS SCL4556BE	BL 282.3400	
D17	BC MM58167AN ECHTZEITUHR REALTIME CLOCK NATIONAL MM58167AN	354.5232	
D18	BL CD4514BE 10F16 DEC DECODER RCA CD4514BE	BL 299.6589	
D19	BC MSM81C55RS I/O+TIM+RAM 2K-RAM INPUT/OUTPUT OKI MSM81C55RS	BC 633.9025	
D20	BC MSM81C55RS I/O+TIM+RAM 2K-RAM INPUT/OUTPUT OKI MSM81C55RS	BC 633.9025	
D21	BC MSM81C55RS I/O+TIM+RAM 2K-RAM INPUT/OUTPUT OKI MSM81C55RS	BC 633.9025	
D22	BL MM74C374N 8XD-FLIPFL D-FLIPFLOP NSC MM74C374N	BL 347.4240	
D24	BC MSM82C51A PR.COMM.IF PROGR.COMMUNIC.INTERFACE OKI MSM82C51A	BC 586.9987	
D25	BJ DS1691J 2X LINE DRIV LINE DRIVER NSC DS1691J	BJ 565.1487	
D26	BJ DS26LS32MJ 4XLINE REC LINE RECEIVER AMD AM26LS32DM	BJ 565.1470	

651.6518.01 SA BL 3+


ROHDE & SCHWARZ

ÄZ

 Datum
Date

06

1085

 Schaltteilliste für
Parts list for
EE STEUERWERK

 Sachnummer
Stock No.

651.6518.01 SA

 Blatt
Page

4

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
D27	BL CD4063BE 4BIT COMPAR COMPARATOR RCA CD4063BE	BL 086.9982	
D30	BL MM74HC14N 6XINV.SCHM HEX INV.SCHMITT TRIGGER NSC MM74HC14N	BL 099.9492	
D31	BL MM74HC04N 6XINVERTER HEX-INVERTER NSC MM74HC04N	BL 571.3365	
D32	BL MM74HC00N 4X2IN.NAND QUAD 2-INPUT NAND GATE MOTOROLA MC74HC00N	BL 571.3194	
D34	BL MM74HC00N 4X2IN.NAND QUAD 2-INPUT NAND GATE MOTOROLA MC74HC00N	BL 571.3194	
D36	BL MM74HC00N 4X2IN.NAND QUAD 2-INPUT NAND GATE MOTOROLA MC74HC00N	BL 571.3194	
D37	BL MM74HC02N 4X2IN.NORG QUAD 2-INPUT NOR GATE MOTOROLA MC74HC02N	BL 571.3142	
D38	BL MM74HC08N 4X2IN ANDG QUAD 2INP. AND GATE MOTOROLA MC74HC08N	BL 571.3313	
D39	BL MM74HC04N 6XINVERTER HEX-INVERTER NSC MM74HC04N	BL 571.3365	
D40	BL HEF4011BP 4X2IN.NANDG NAND GATE VALVO HEF4011BP	BL 565.1670	
D41	BL MM74HC86N 4X2IN.EXOR QUAD 2-INP.EXCL.OR GATE NSC MM74HC86N	BL 571.3159	
L1	LD 20UH BEI 1,5A 0,11 OHM CHOKE SIEMENS B82111-A-C34	LD 026.4710	
R1	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R2	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R3	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R4	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R5	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R6	RN 9X22 KOHM+-2% SIL10 H5 RESISTOR NETWORK BOURNS 4310R-101-223	RN 344.6607	

651.6518.01 SA BL 4+


ROHDE & SCHWARZ

 ÄZ Datum
Date
06 1085

 Schalteilliste für
Parts list for
EE STEUERWERK

 Sachnummer
Stock No.

651.6518.01 SA

 Blatt
Page

5

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R7	RN 9X22 KOHM+-2% SIL10 H5 RESISTOR NETWORK BOURNS 4310R-101-223	RN 344.6607	
R8	RN 7X 22KOHM+-2% SIL 8 H5 RESISTOR NETWORK BOURNS 4308R-101-223	RN 540.5720	
R10	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R11	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R15	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R25	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R32	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R33	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R34	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R35	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R41	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
BIS/TO R45 R46	RN 4X270 OHM+-2% SIL 8 H5 RESISTOR NETWORK BOURNS 4308R-102-271	RN 341.9270	
BIS/TO R49 R51	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R52	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R53	RN 7X 10KOHM+-2% SIL 8 H5 RESISTOR NETWORK BOURNS 4308R-101-103	RN 581.2184	
R54	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R55	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	

651.6518.01 SA BL 5+



R. SCHNEIDER

AZ

Datum
DateSchalttailliste für
Parts list for
EE STEUERWERKSachnummer
Stock No.Blatt
Page

06 1085

651.6518.01 SA

6

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R56	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK BOURNS 4310R-101-103	RN 343.4523	
R57	RN 7X 10KOHM+-2XSIL 8 H5 RESISTOR NETWORK BOURNS 4308R-101-103	RN 581.2184	
R58	RN 9X100KOHM+-2XSIL10 H5 RESISTOR NETWORK BOURNS 4310R-101-104	RN 542.5092	
R59	RN 7X100KOHM+-2XSIL 8 H5 RESISTOR NETWORK BOURNS 4308R-101-104	RN 540.5737	
R60	RN 7X100KOHM+-2XSIL 8 H5 RESISTOR NETWORK BOURNS 4308R-101-104	RN 540.5737	
R61	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R62	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R63	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R64	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R65	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R67	RN 9X100KOHM+-2XSIL10 H5 RESISTOR NETWORK BOURNS 4310R-101-104	RN 542.5092	
R68	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK BOURNS 4310R-101-103	RN 343.4523	
R69	RN 7X 10KOHM+-2XSIL 8 H5 RESISTOR NETWORK BOURNS 4308R-101-103	RN 581.2184	
R71	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R72	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R73	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R74	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 082.1764	
R81	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D	RL 083.1351	
BIS/TO			

651.6518.01 SA BL 6+



ROBESCHWARTZ

AZ Datum
Date

06 1085

Schaltteilliste für
Parts list for
EE STEUERWERKSachnummer
Stock No.

651.6518.01 SA

Blatt
Page

7

Kennzeichen
Component No.Benennung/Beschreibung
DesignationSachnummer
Stock No.enthalten in
contained in

R84

R91

RL 0,35W 22,1KOHM+-1%TK50
RESISTOR
DRALORIC SMA/207/22,1K-F-C

RL 083.1545

BIS/TO

R94

R95

RL 0,35W 10,0KOHM+-1%TK50
RESISTOR
DRALORIC SMA0207/10K-F-D

RL 083.1297

R96

RL 0,35W 10,0KOHM+-1%TK50
RESISTOR
DRALORIC SMA0207/10K-F-D

RL 083.1297

R97

RL 0,35W 10,0KOHM+-1%TK50
RESISTOR
DRALORIC SMA0207/10K-F-D

RL 083.1297

R98

RL 0,35W 4,75KOHM+-1%TK50
RESISTOR
DRALORIC SMA0207/4,75K-F-D

RL 083.1097

R100

RL 0,35W 47,5KOHM+-1%TK50
RESISTOR
DRALORIC SMA/207/47,5K-F-C

RL 083.1800

BIS/TO

R104

R110

RL 0,35W 4,75KOHM+-1%TK50
RESISTOR
DRALORIC SMA0207/4,75K-F-D

RL 083.1097

BIS/TO

R123

R130

RL 0,35W 100KOHM+-1%TK50
RESISTOR
DRALORIC SMA0207/100K-F-C

RL 082.1764

BIS/TO

R134

R200

RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR
DRALORIC SMA0207/100/HM-F-D

RL 082.6543

BIS/TO

R211

R212

RG 0,5W 47MOHM+-5% 2,5KV
RESISTOR
VALVO VR37 47MOHM 5%

RG 007.3334

S1

SD CODIERSCHALT.BCD REAL
CODIER-SWITCH
KEL KDS10-111

586.9993

S2

SD CODIERSCHALT.BCD REAL
CODIER-SWITCH
KEL KDS10-111

586.9993

S3

SD CODIERSCHALT.HEXA REAL
CODIER-SWITCH
KEL KDS16-112

587.0002

S4

SD CODIERSCHALT.HEXA REAL
CODIER-SWITCH
KEL KDS16-112

587.0002

V1

AD 1N4448 75V 0,15A UDI
DIODE
VALVO 1N4448

AD 012.0700

651.6518.01 SA BL 7+



R. SCHNEIDER

ÄZ Datum
Data

06 1085

Schaltteilliste für
Parts list for
EE STEUERWERKSachnummer
Stock No.

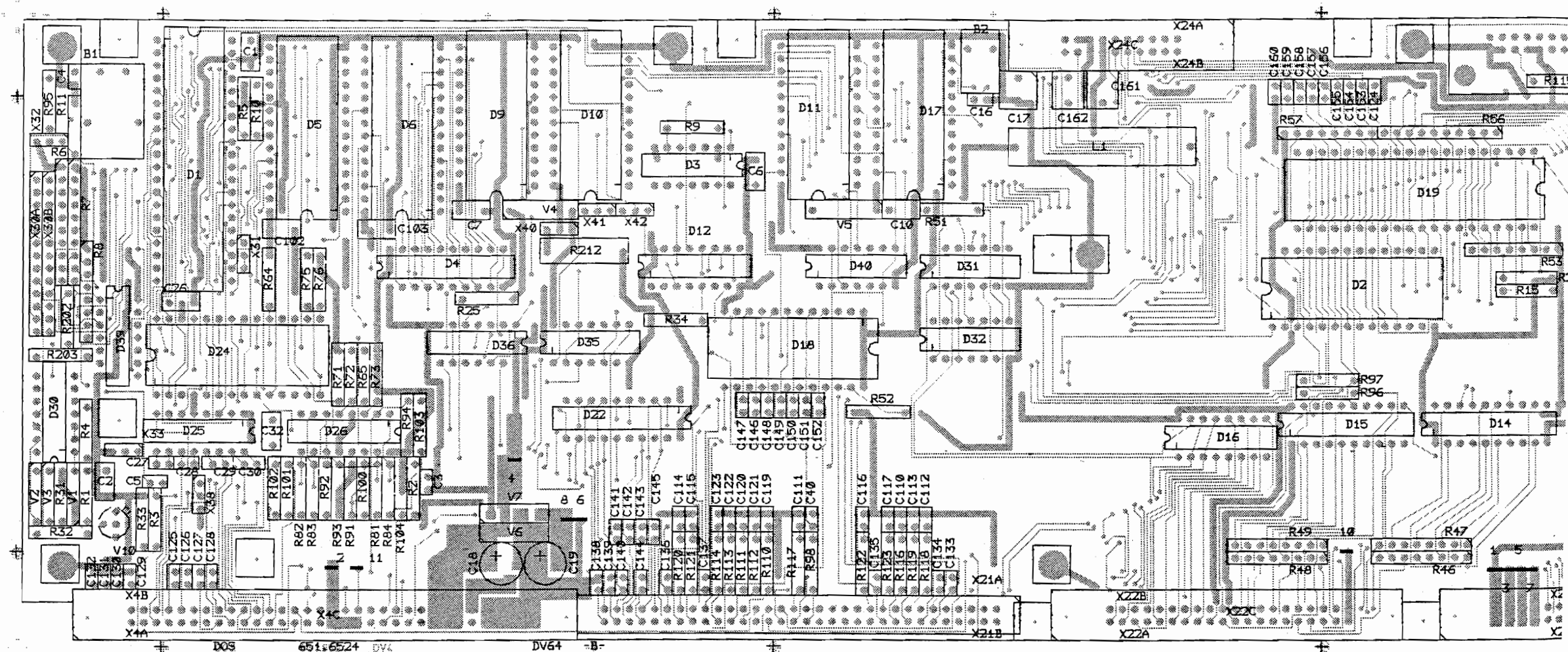
651.6518.01 SA

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Page

8

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V2	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V3	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V4	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21	AD 082.6837	
V5	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21	AD 082.6837	
V6	AE BZX85/C6V8 1,3W Z-DI ZENER DIODE THOMSON BZX85/C6V8	AE 092.8255	
V7	AE BZX85/C6V8 1,3W Z-DI ZENER DIODE THOMSON BZX85/C6V8	AE 092.8255	
V9	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V10	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
X4	FP STECKERLEISTE GER.64P. CONNECTOR 64POL. BERG 76762-264/MIT 2X U2X	FP 645.6784	
X9	FP STECKERLEISTE 64POL. 64-PIN INSERT PANDUIT 100-064-133/999	FP 290.1255	
X21	FP BUCHSENLEISTE 64POL. CONNECTOR 64POL. BERG 76787-464	FP 645.6790	651.6547
X22	FP STECKERL.40P.M.VERRIEG CONNECTOR PANDUIT 050-040-133BC	FP 624.1419	
X23	FP STECKERLEISTE GER.64P. CONNECTOR 64POL. BERG 76762-264/MIT 2X U2X	FP 645.6784	
X24	FP STECKERLEISTE 20P.GER. CONNECTOR 20P. PANDUIT 050-020-133BC	FP 099.9428	
X30	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
BIS/TO X33 X37	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
BIS/TO X42			
			- ENDE -
			651.6518.01 SA BL 8-

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



(hierzu HVC 250)



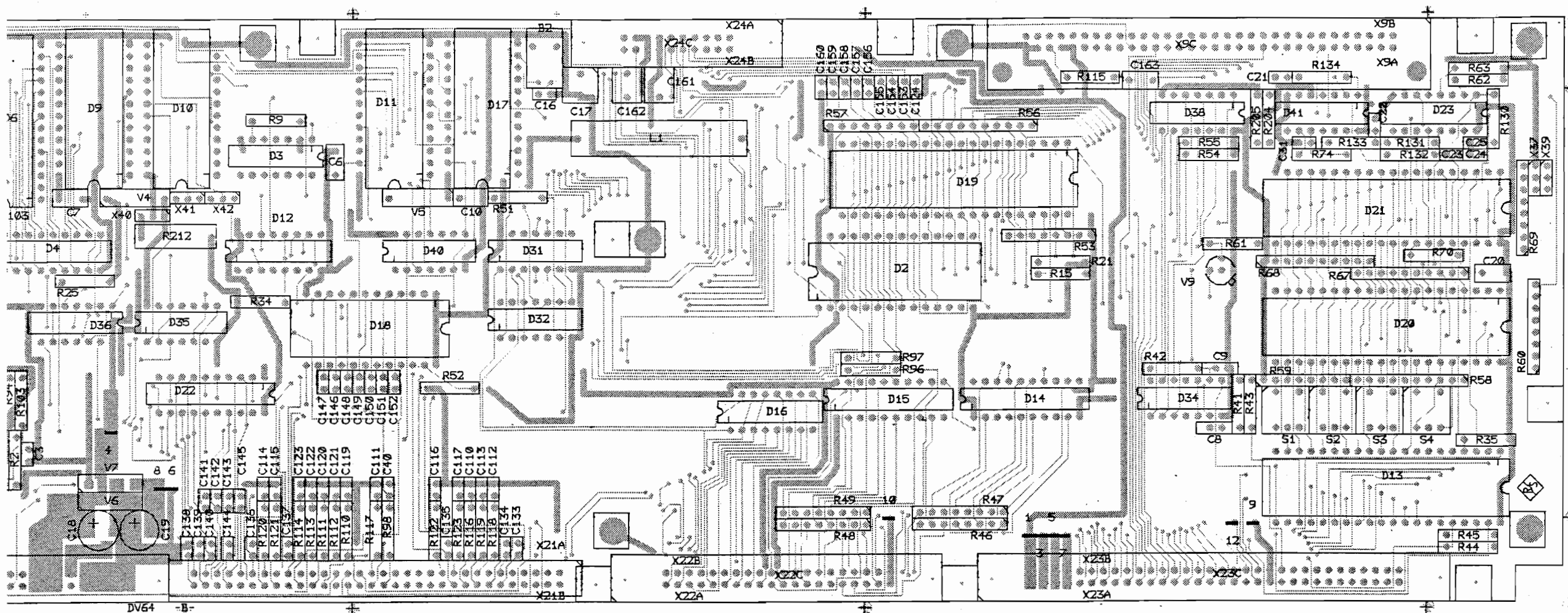
ACHTUNG: EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung.
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling.

Variantenerklärung siehe 3A
EXPLANATION OF MODELS
SEE PARTS LIST

ROHDE & SCHWARZ

B	06.85	MR	6KBC	Tag	Name	Ber
			Bearb.	06.85	MR	
			Gepr.			

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Variantenklärung siehe BA
EXPLANATION OF MODELS
SEE PARTS LIST

ROHDE & SCHWARZ

B	06.85	MR	6KBC	Tag	Name	Benennung	Z	Zeichn.-Nr.	Blatt-Nr.
			Bearb.	06.85	MR	Steuerwerk		651.6518.01	2
			Gepr.						v. j. Bl.
And.	Änderungs-	Datum	Name	Änd.	Änderungs-	Datum	Name	Norm	
zu Gerät: GB 085 P1							reg. i. V. 651.6018 V		
							erste Z. 651.6118		

A

B

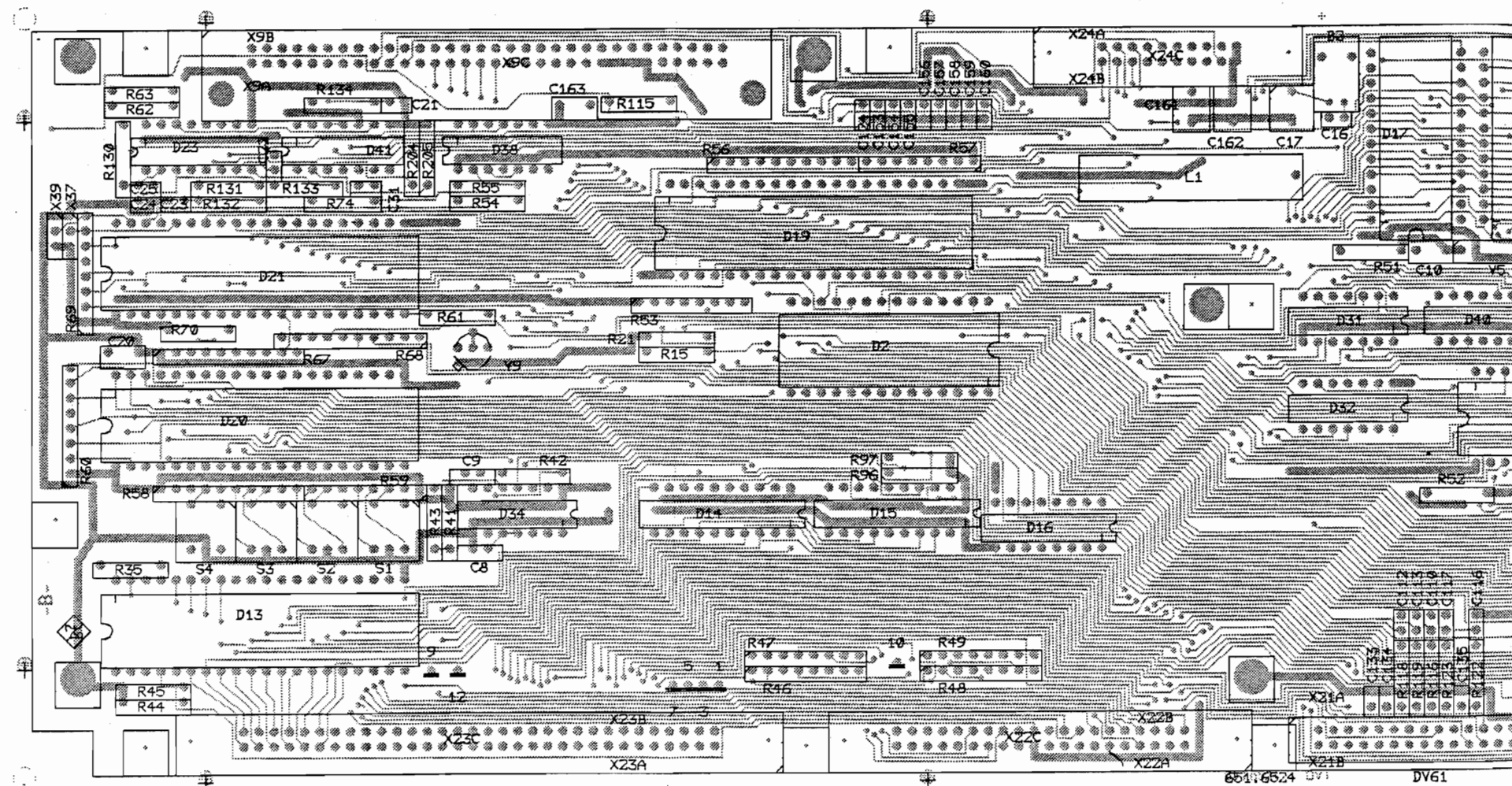
C

D

E

F

Ansicht und Leitungsführung Löt
View of tracks on solder side



Hersteller HVC 250



ACHTUNG: EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung.
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling.

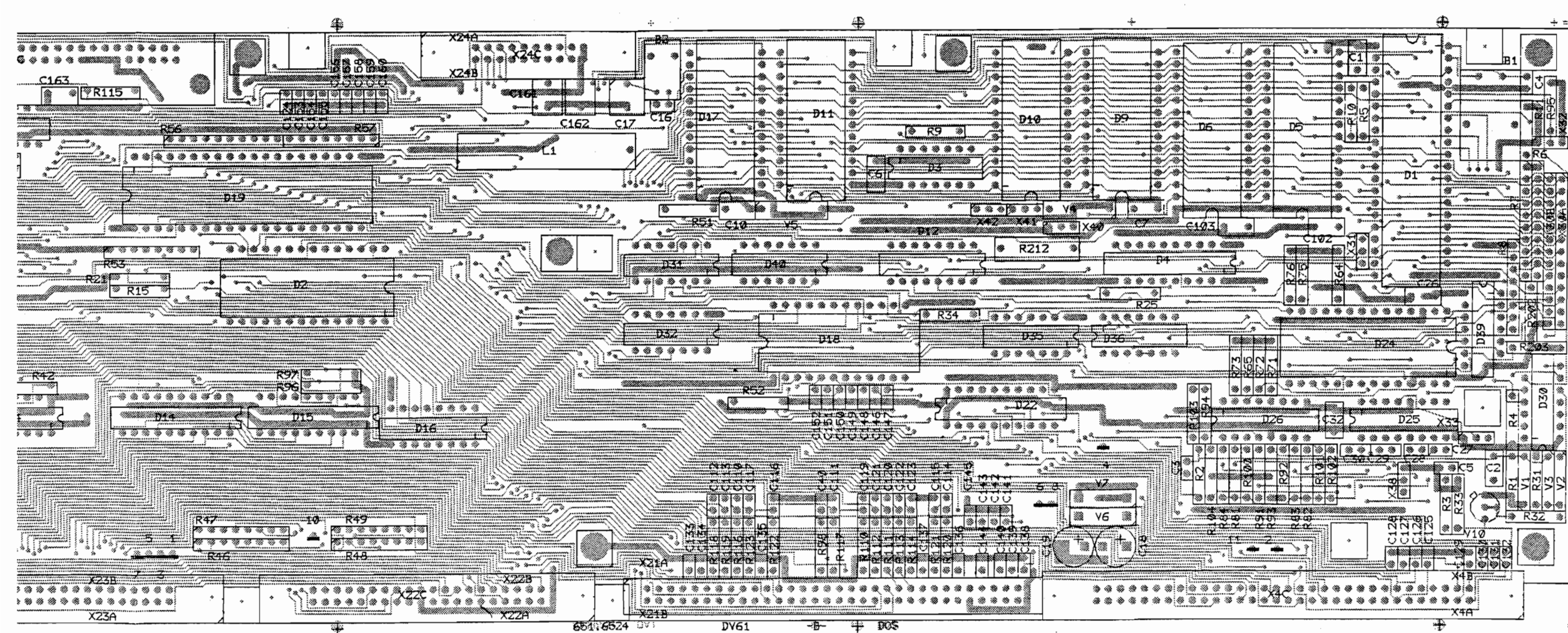
Variantenerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST



ROHDE & SCHWARZ

B		06.85	MR						
Änderung	Änderungs- Witzung	Datum	Name	Änderung	Änderungs- Witzung	Datum	N		

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Variantenerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST

	B		06.85	MR				6KBC	Tag	Name	Benennung	Z	Zeichn.-Nr.	Blatt-Nr.
								Bearb.	06.85	MR	Steuerwerk		651.6518.01	3
								Gepr.						3
								Norm.						3
And.	Änderungs- Mittlung	Datum	Name	And.	Änderungs- Mittlung	Datum	Name	Norm.			zu Gerät GB 085 P1		reg. V 651.6018 V	551.6118