SIEMENS

Programming Unit PU 631

Contents

Manual

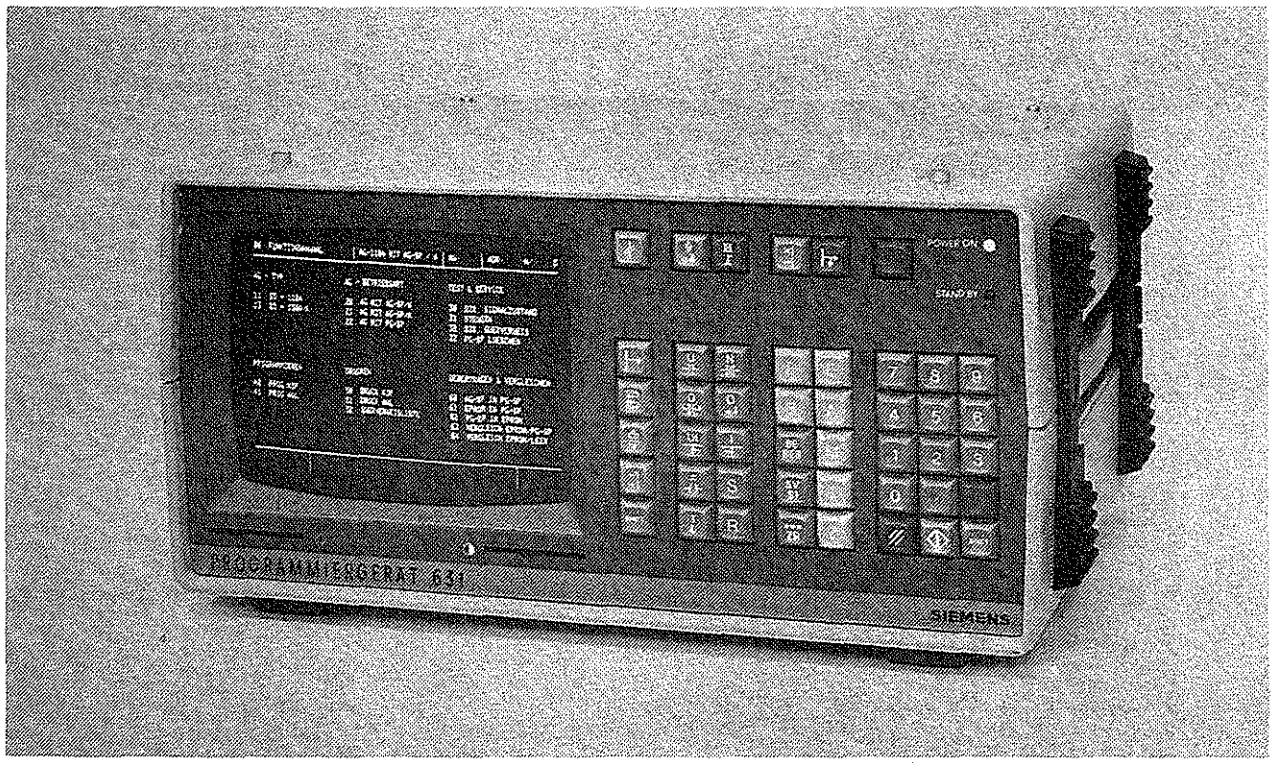
Order No. 6ES5998-0BE21
Release 1

Siemens Aktiengesellschaft

SIEMENS

PU 631 Programming Unit

Operating Instructions Order No. C79000-B8576-C240-2



Contents

PU 631

1 Technical Description

1.1 Application

The 631 VDU programming unit is designed for programming, commissioning and fault diagnosis of SIMATIC S5 systems. It allows the production and testing of a maximum of 4.2^{10} STEP 5 statements for the S5-010,S5-110A and S5-130A/K programmable controllers with parallel interfaces.
The programming can be executed either as a STATEMENT LIST (SL) and LADDER DIAGRAM (LD).

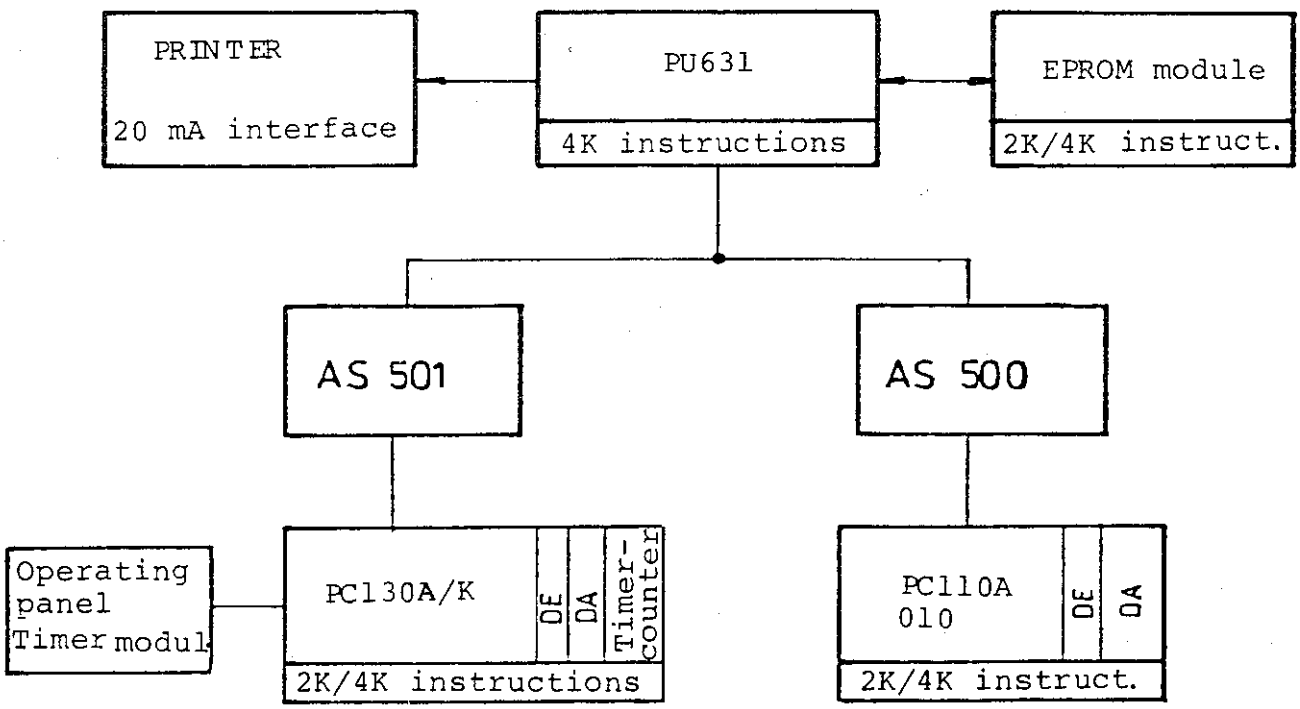


Fig. 1 Configuration of an S5 system using the PU 631

A full scope of test functions make this a computer supported unit for commissioning.

- Program input into the internal RAM memory is realised, either via the keyboard, or an EPROM memory module, or by transferring the memory contents from the programmable controller.

- The VDU and an external printer can be used for outputting the program , either as a STATEMENT LIST (SL) or LADDER DIAGRAM (LD). The program in the PU memory can either be completely printed-out or in sections.

- The program test can be directly realised in the process, by controlling the functional sequence via the memory contents of the PU 631 (ON LINE: PC operates with PU memory). Program corrections can be simultaneously executed using the programming unit.

- The generated program is then, when required, transferred into an EPROM memory which is then used in the programmable controller as control program (OFF LINE: PC runs with PC memory).

- An incorporated battery ensures that the program in the PU memory is retained for a back-up time of a maximum of 30 minutes after switch off, or supply failure.

1.2 Construction

The metalized plastic housing of the PU 631 consists of two half-shells, with laterally located handles, and a front mounted plastic panel with the visual display unit , the intensity and contrast controls and the keyboard. The visual display unit and keyboard can be covered with a protective cover, in order to prevent damage.
A pocket for storing the AS500 or AS501 programming unit interface module is integrated into this cover. The line plug with fuse and the switch for supply on/off are located on the rear panel. The connections to the programmable controller, printer and EPROM module are located on the upper panel, under a cover plate.

The back-up battery is located on the underside of the unit, under a sliding cover, from where it can be easily replaced. The 5 printed circuit boards are inserted vertically into the bus printed circuit board, attached to the lower half shell. This modular type construction is characterized by low cabling requirements. A case is used for transport, in which all connecting leads, and the UV-erase unit can be accommodated.

1.3 Principle of Operation

1.3.1 Introduction

The block circuit diagram of the PU 631 is illustrated in fig. 2. The principle operation of the unit will be described with the aid of this diagram.

The complete programming unit control system is located on several, plug-in, printed circuit boards, and can thus be easily replaced. The SAB 8085 microprocessor is the core of the control system. The microprocessor, in conjunction with the associated highly integrated chips, undertakes the control of all the programming unit functions. A static RAM is available as operating memory; of which 8.2^{10} bytes can be backed-up. The complete unit software is deposited in EPROMS. It is possible to use other EPROM types in the program memory. Thus, a possible expansion of the operating software is ensured.

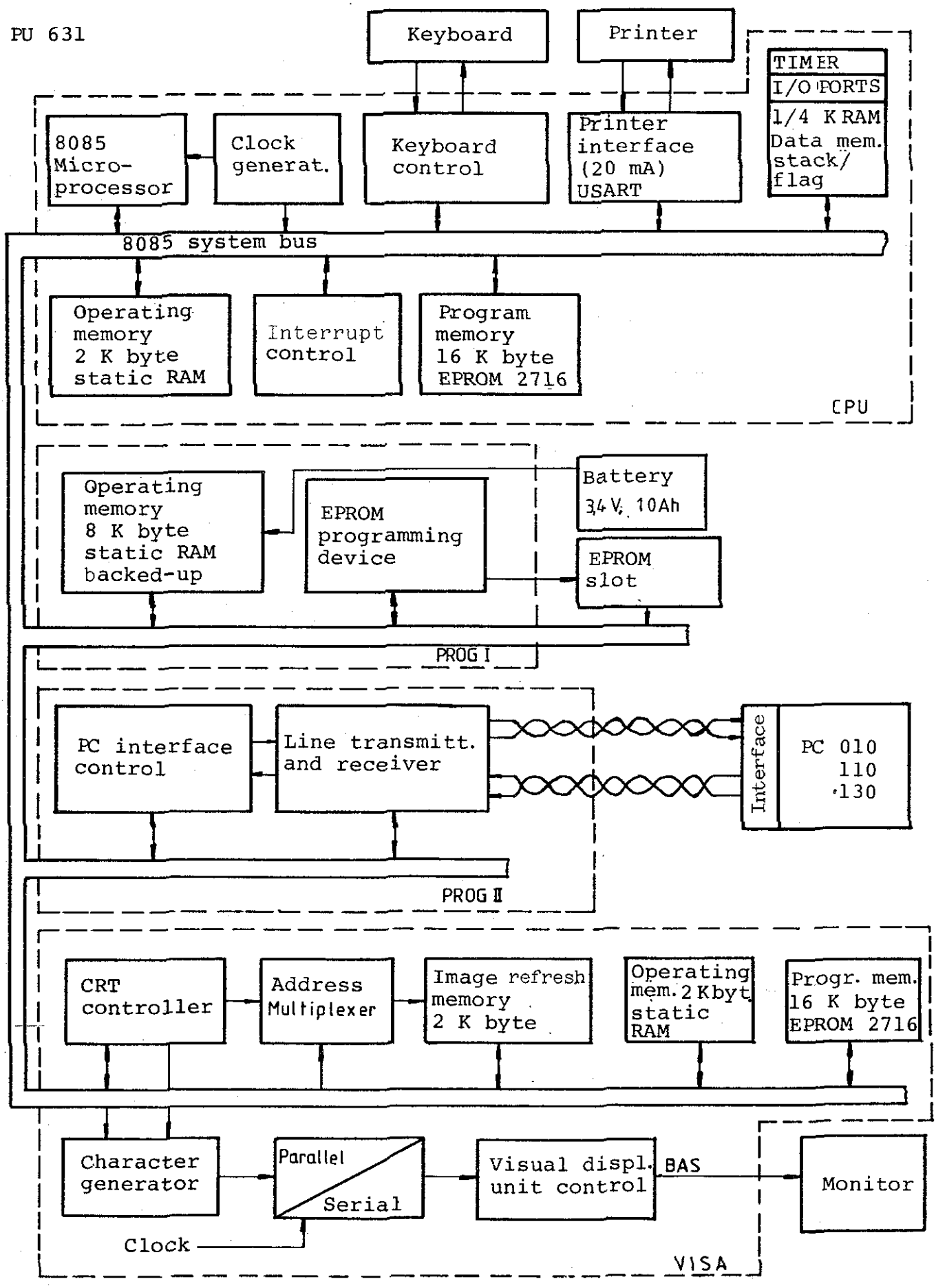


Fig. 2 PU 631 block circuit diagram

1.3.2 Description of the individual printed circuit boards

CPU

All operating functions of the programming unit are executed on this printed circuit board. The system start is undertaken by the 8085 microprocessor after switch-on. The instructions for 8085 are deposited in the program memory from address 0000_{16}. Further, the keyboard and interrupt control system is realised on the printed circuit board. The microprocessor can control the system, and scan for certain conditions and react to these conditions, via the I/O ports. A 20 mA interface (TTY, line current, passive, full duplex) is available for connecting printers. The transfer rates of 110 to 9,600 bit/s can be selected using jumpers in the plug (refer to section 1.3.5).

PROG I

The PROG I printed circuit board accommodates the operating memory which can be backed-up in which the complete user program for the programmable controller is deposited (maximum 4.2^{10} STEP 5 statements) An EPROM programming device, located on the PROG I allows the program to be deposited on an EPROM module. EPROM modules up to 8.2^{10} byte (4 x 2716) memory capacity can be used.

PROG II

The PROG II printed circuit board controls and monitors the parallel interface, including the corresponding special signals to the programmable controllers. In this case, the address counter for the PU memory is also synchronized to the programmable controllers.

VISA

The visual display unit is controlled via the MC 6845 CRT controller. Data is transferred line for line via a visual display unit control system to the monitor via the image refresh memory.

1.3.3 Printer Interface

The plug connection to the printer is established on the upper panel of the PU 631. Printers with a 20 mA line current interface (current source in the printer) can be connected-up. The transmission rate (Baud rate) can be selected by inserting corresponding jumpers in the plug housing of the printer cable on the programming unit side.

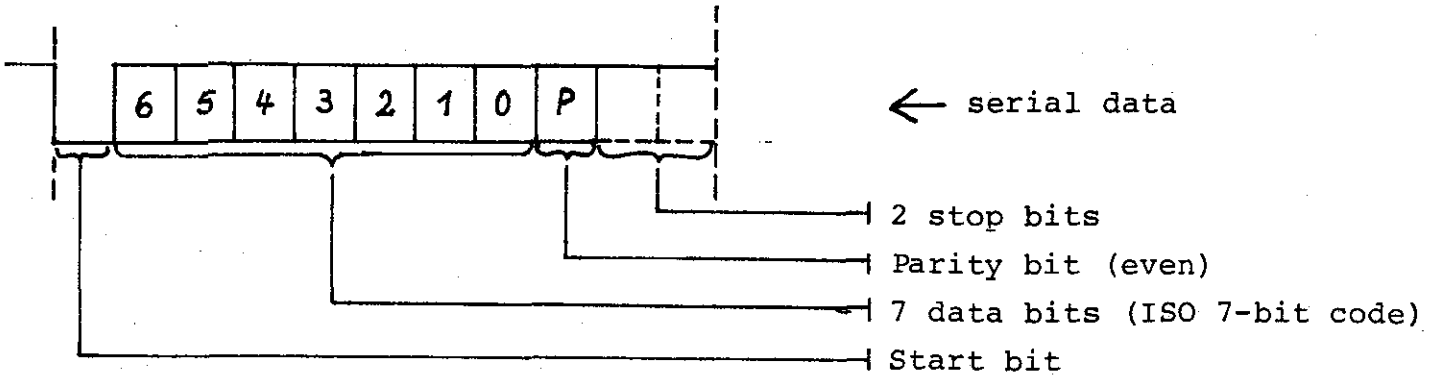
Selecting the Baud Rate

Jumper	Baud Rate in bit/s
17 - 2	110
3,4 - 2	300
4 - 2	600
3 - 2	1200
4,17- 2	2400
3,17- 2	4800
3,4,17-2	9600

Plug S3	CPU↔PRINTER
1	14
2 O V	15 +5 V
3 K 10	16
4 K 9	17 K 18
5	18
6 +RxD	19
7	20
8 -RxD	21
9	22
10 +TxD	23
11	24
12 -TxD	25
13	

The PU 631 transmits the signals CR, and LF as control characters for the printer. The print-out has 80 characters per line and 60 lines (11" format) or 66 lines (12" format) per sheet. The printer paper must be positioned at the page start after the programming unit has been switched-on or after a cold restart in order that the page control system functions correctly (fold = 1 line above the print position). During printing, the sheets are changed in a fixed raster for 11 inches or 12 inches paper format. The networks are printed without gaps on each page. If not enough space is available for the complete network on one page, then a page change is executed.

Message Format



Key for connecting cable between the printer and programmable controller

Length	Order No.
2,50 m	6ES5 7**-OBC50
5,00 m	-OBF00
10,00 m	-OCB00

Printer specification

1. PT 80 (SIEMENS designation 3914 or 3917)

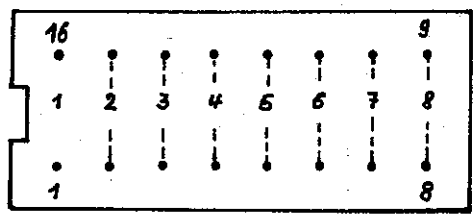
- technical data: 60 characters/s
- control character handling: CR, LF
- waiting time: Refer to waiting time calculation below
- plug-in lead: 6ES5 736-0..0

Waiting time calculation:

≥ 600 bit/s: W1 = 75ms + 5ms x number of the previously printed characters

< 600 bit/s: W2 4 x W1

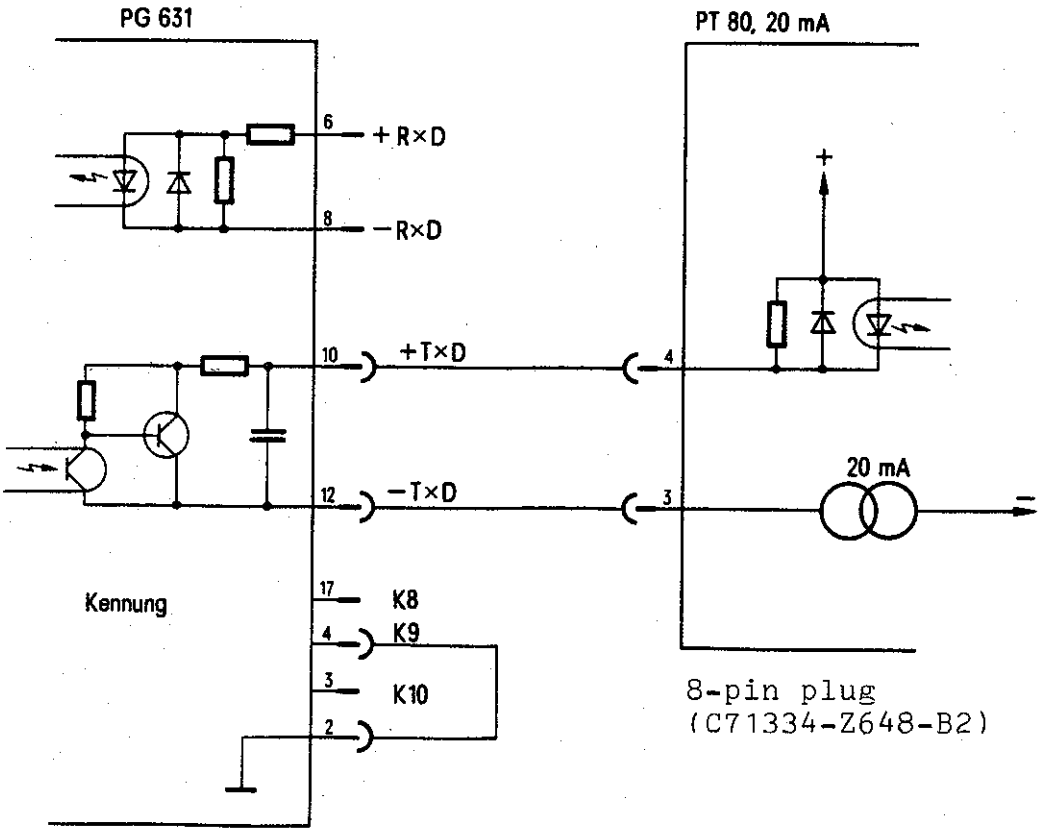
- Jumper disposition:



positions of the jumpers on the jumper socket

a) Basic electronics (= large module in the bottom panel after raising printing unit)

(only for KSR : X13 -- 1, 6, 7)
RO : X14 -- 1, 6, 7
X15 -- 5, 7, 8
X16 -- no jumpers
additionally : W4, W11, W12



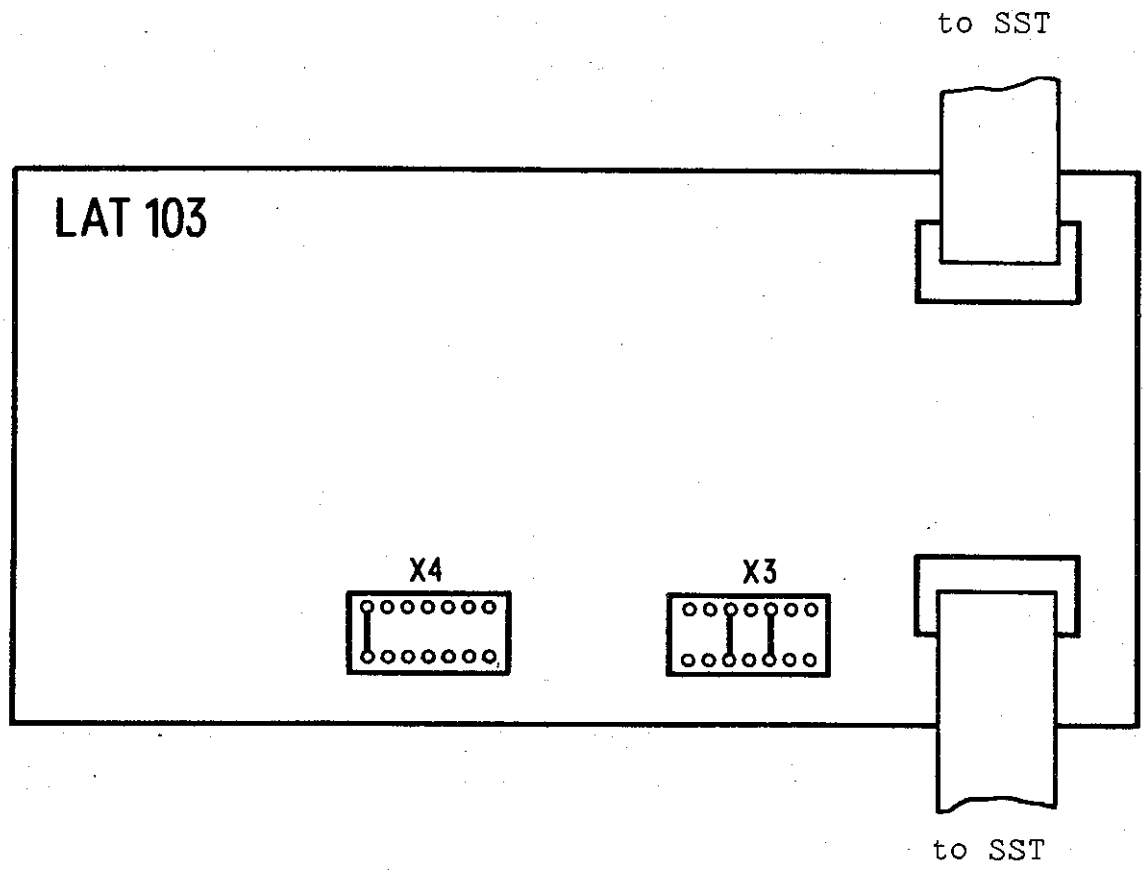
8-pin plug
(C71334-Z648-B2)

Fig. 3

b) Control section STT 103 :X6 -- 1, 2, 5, 7

c) Lead matching section LAT103 :X3 -- 3, 5

X4 -- 1



The PT 80 printers are listed in the PR23 process computer catalogue (1981 edition) section "standard peripheral devices" with the designations 3914 or 3917, and have the subsequent order numbers:

Order No. **)	Short description
L22751-A80-B295	PT 80, RO *) / 80 characters per line/matrix printer/600 bit/s
L22751-A80-B294	PT 80, RO *)/80 characters per line/ink printer/ 600 bit/s
L22751-A80-B292	PT 80, RO *)/132 characters per line/matrix printer/600 bit/s
L22751-A80-B293	PT 80, RO *)/132 characters per line/ink printer 600 bit/s
L22751-A80-C256	PT 8-, KSR *)/80 characters per line/matrix printer/600 bit/s

*) RO = without keyboard; KSR = with keyboard

**) The order nos. are only a reference. The actual state, as well as the ordering location should be taken from the PR 23 process computer catalogue.

2. ST 8000 (metallic paper printer)

- technical data : 80 characters per line
  50 characters per second
- control character handling : CR, LF
- plug-in lead, : not a GWK product

1.3.4 Parallel interface to PC 010, 110 A, 130 A/K

The PU 631 can be connected via this parallel interface with the actual programmable controller using a 6ES5 734-0..0 cable (maximum length: 3 m) for commissioning and test purposes. The connected programmable controller, in this case, uses the buffered PU memory (RAM, 4.2^{10} STEP 5 statements) as program memory. An interface control in the programming unit (address counter, check-point register,...) is synchronized with that of the programmable controller in order to execute the data transfer between the programming unit, and the programmable controller . The so-called differential current transfer system is used for transferring the interface signals. The connection to the programmable controller is established by a 50 pole plug (CANNON) located on the upper side of the programming unit.

Interface to the PC 130 A/K via the AS 501

- transfer of the programme memory PC-EPROM, into the PU-RAM
- operation of the PC with the PU memory (ON LINE operation)
- STATUS and RLO (result of logic operation) display
- Forcing of output, flags, timers and counters

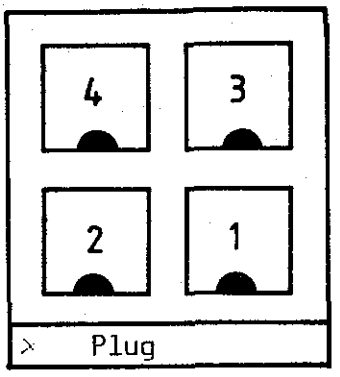
Interface to PC 010/110A via AS 500

- operation of the PC with PU memory (ON LINE opertion)
- STATUS SCAN, and FORCING when the PC is in the STOP condition is not possible.

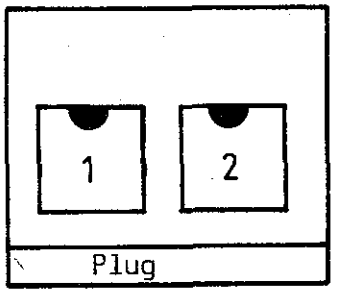
1.3.5 Interface to EPROM module

The EPROM modules are inserted onto the upper side of the programming unit (48 pole socket strip on PROG I). It is possible to use memory modules with different EPROM types (e.g. 2716/2516, 2732/2532..) For this purpose, there are six identifications (refer to plug disposition with which the modules can be differentiated).

Configuration of an EPROM module



Module for PC 130 A/K



Module for PC 010/110A

Allocation of the EPROM types

EPROM location	Memory Capacity	EPROM type	Machine readable code	Comments
1 ... 4	8 × 2^{10}byte	2716(2516)	6ES5 370-0AA41	PC 130A/K
1 ... 2	4 "	"	6ES5 370-0AA31	
1	2 "	"	6ES5 370-0AA21	
1 ... 2	4 "	"	6ES5 910-0AA31	PC 110A
1	2 "	"	6ES5 910-0AA21	
1	1 "	2758	6ES5 910-0AA11	PC 110A
1 ... 2	8 "	2532	6ES5 371-0AA41	PC 130A/K
1	4 "	"	6ES5 371-0AA31	
1 ... 2	8 "	"	6ES5 910-0AA41	PC 110A
1	4 "	"	6ES5 910-0AA31	

1.4 Technical Data

Power supply (SN 26555)

Line voltage	220 V, 110 V/+ 10% -15% selectable
Line frequency range	48 to 63 Hz
Line fuse	1 A/220 V, 2 A/ 110 V
Current consumption	Approx. 0.6 A at 220 V
Degree of protection conforming to DIN 40050	IP 20
Protection class	I
Voltage test conforming to VDE 0160	Line/housing: $U_{=}$ = 2100 V Output/housing: U_{eff} = 500 V
RF suppression conforming to VDE 0871 (0875)	Class B
Cooling	forced ventilation with filter

Ambient conditions (SN 26 556)

Temperature	
operation	+10 to +45° C
storage/transport	-40 to +70° C
Relative air humidity	Letter F, conforming to DIN 40040
operation	Average 75% relative air humidity throughout the year max. 95% for 30 days per year
Barometric air pressure	Letter S, conforming to DIN 40040
operation	up to 3500 m

Mechnical Data

Dimensions WxHxD (without case):	465 mm x 230 mm x 375 mm
Dimensions WxHxD (with case):	585 mm x 260 mm x 430 mm
Weight	approx. 15 kg
Monitor	23 cm screen 80 characters per line 24 lines
Keyboard	46 mechanical keys

Back-up battery (primary element)

Voltage	3.4 V
Capacity	10 Ah
Temperature range	- 40 to + 70° C
Storage life	10 years
Back-up current	Max. 20 mA
Back-up time	Automatic switch off after 30 mins.
Battery type	Lithium battery

Interfaces

Serial interface

Printer connection	20 mA line current, passive
Transfer rate	110,300,600,1200,2400,4800, 9600 bit/s
Cable length to printer	Preferable length: 3m

Parallel interfaces

- connection to PC 110/130	50 pole plug connector
- max. cable length to PC	3 m
- Plug connection to EPROM module	48 pole socket connecter strip

2 Mounting and Operation.

2.1 Setting-up

The PU 631 programming unit is supplied in a transport case (optional), together with the line cable, the PC interface cable and the EPROM erase device (optional).

The programming unit can be used either in the horizontal position or in the vertical position.
The programming unit can be used in an incline position by using the two support brackets located next to the two front feet.

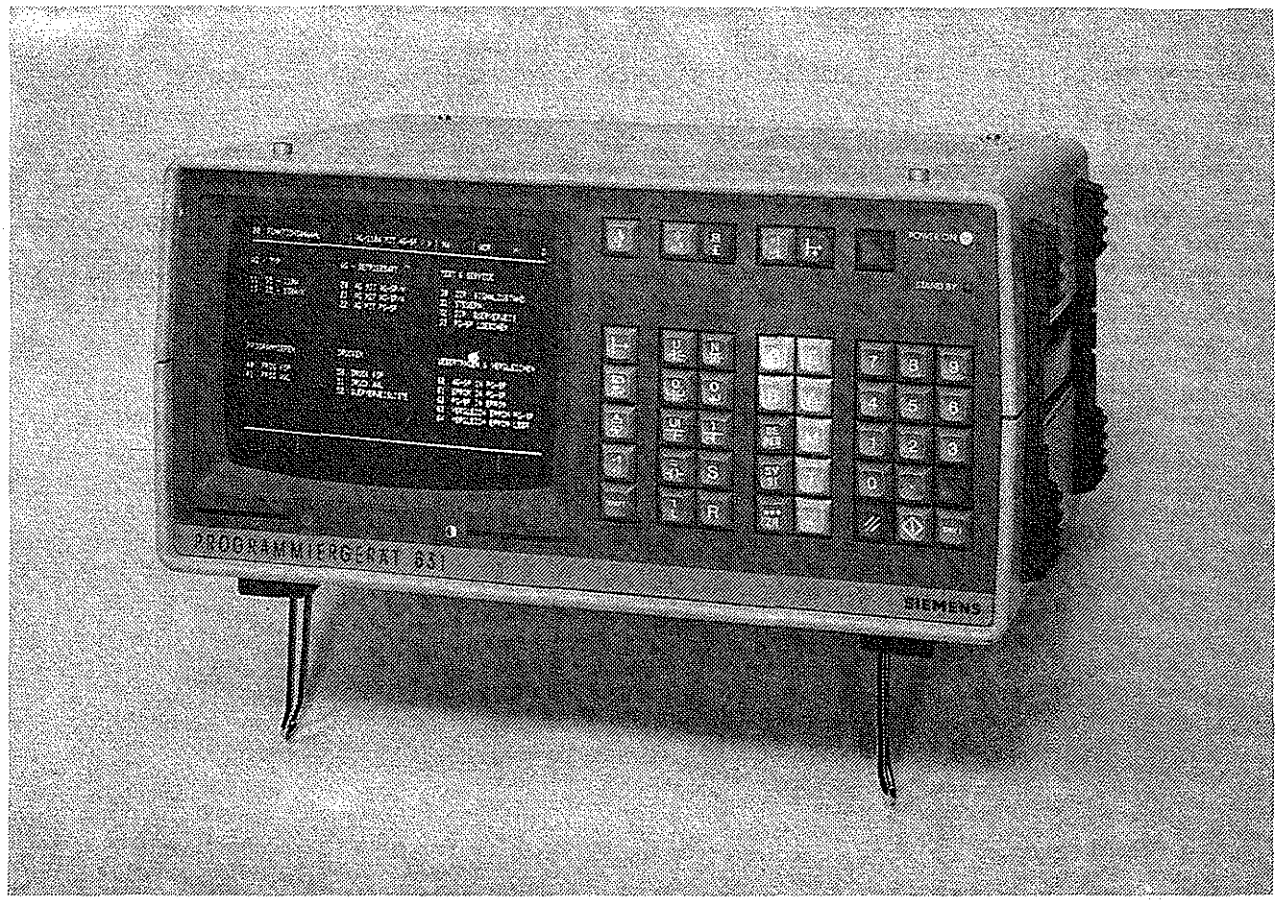


Fig. 4 PU 631 in an inclined position

2.2 Checking and Selecting the Permissible Line Voltage

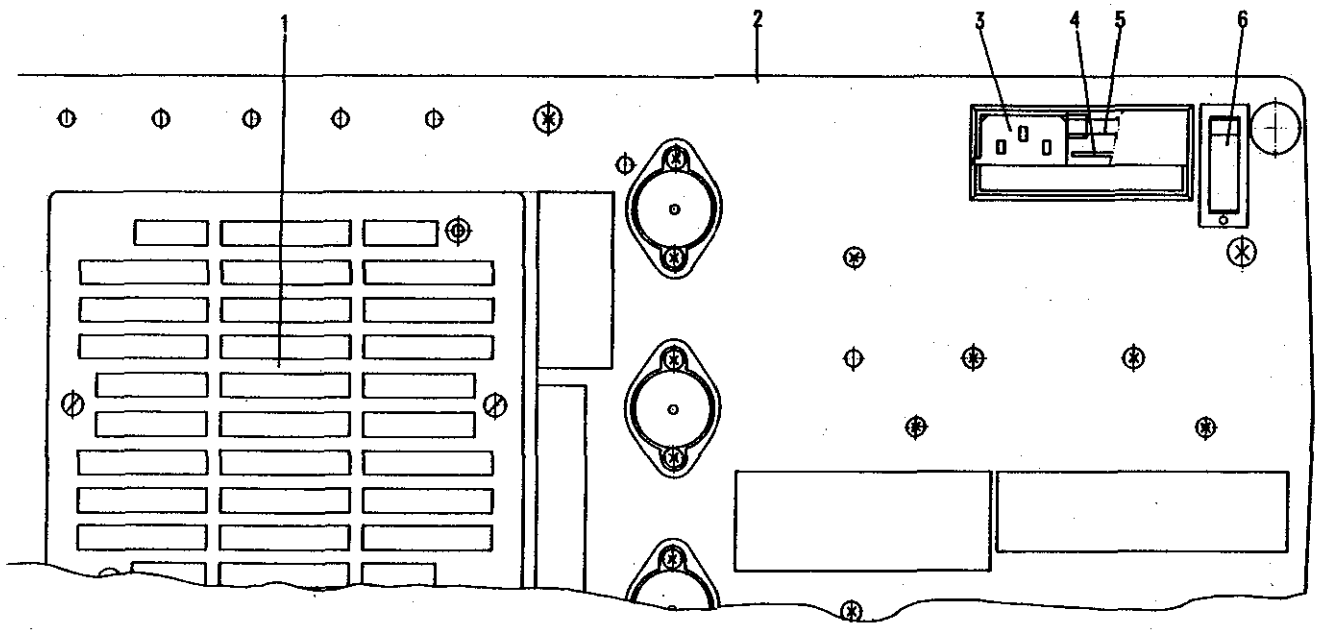


Fig. 5 Rear panel of the PU 631 (1 dustfilter, 2 rear panel of unit, 3 line plug, 4 coding plate, 5 line fuse, 6 line switch)

The programming unit can either be used with a 110 V or 220 V line voltage. When supplied, the unit is adjusted for 220 V line voltage. The following procedure should be followed in order to select the required line voltage:

1. Remove line cable
2. Shift the line fuse towards the left hand side
3. The oltage value which can be read underneath the fuse holder indicates the permissible line voltage.

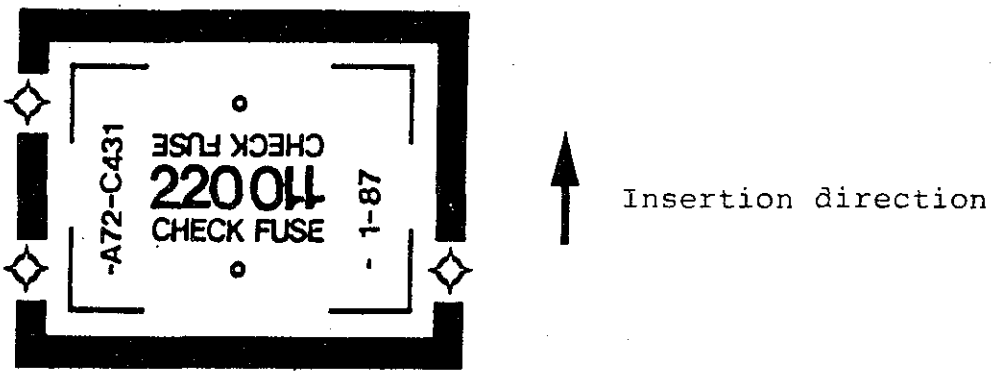
4. In order to select another line voltage, the fibre cover is withdrawn using a pair of pliers, after which the line fuse is removed (shift the ejector towards the left hand side). The selected voltage value is imprinted on the left hand side half of the cover, in the insertion direction.

5. Insert the cover with the required mains voltage in the insert direction.

5. Insert the fuse for the changed line voltage (refer to technical data).

7. Shift the line fuse cover towards the right hand side.

8. Connect the programming unit to the selected line voltage using the line cable.



The selected voltage value is imprinted on the left hand side of the cover in the direction of insertion.
Fig. 6 coding plate

Switch-on

The PU 631 is switched-on using the line switch on the rear side of the unit. The green LED ''Power on'' and the neon lamp in the line switch indicates that the unit is operational.

Warning Do not cover the air ventilation slots

2.3 UV Erase Unit

The EPROM erase unit is operational when it is connected to the 220 V line voltage. The erase unit is located in the transport case (optional) when supplied.

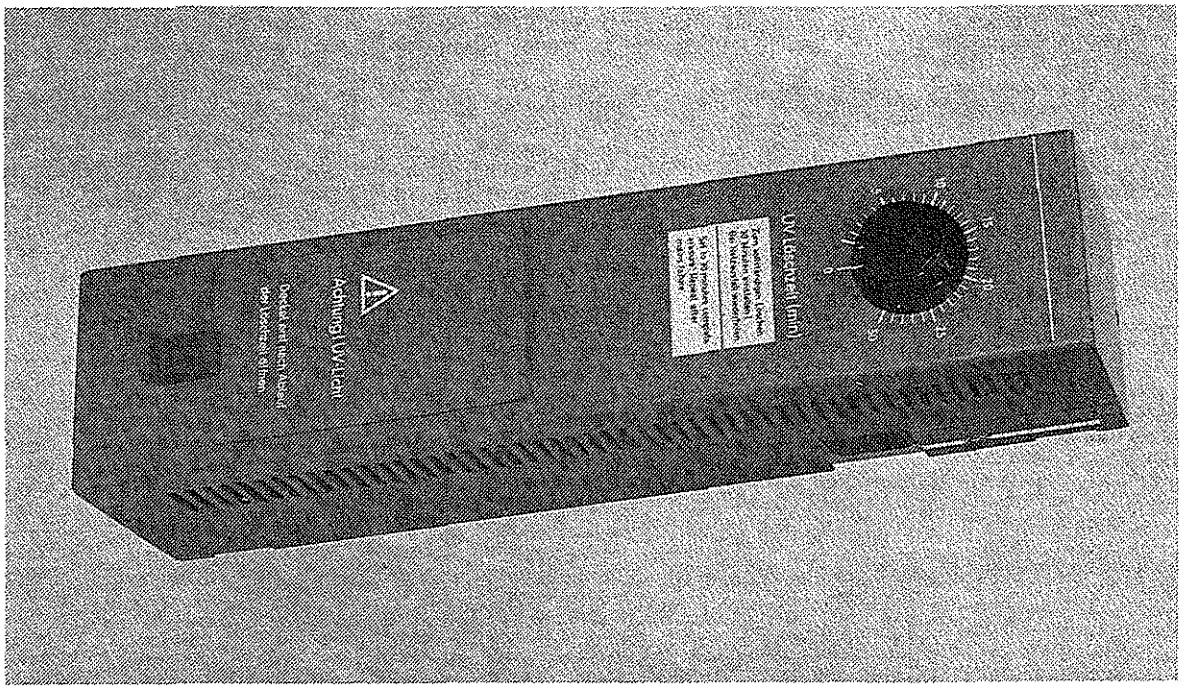


Fig. 7 UV erase unit

1 Timer

The UV lamp in the EPROM erase unit is switched-on, and the switch-o periods selected to 30 minutes, by rotating the timer to its right hand end stop.

2. Slot for EPROM module

The slot is automatically opened far enough so that an EPROM module can be inserted, by shifting back the retaining clip. The EPROM should be positioned so that its quartz glass window is pointing in the direction of the lamp.

The MOS safety recommendations should be adhered to (refer to DIN IEC 47 (CO) 701) when handling EPROM cards.
The 30 minute erase time should be adhered to as otherwise individual memory locations can be regenerated after shorter erase times.

3 Maintenance

3.1 Testing and preventive maintenance

The numbers in brackets refer to the components indicated in the drawing of the complete unit, the rear panel of the PU 631, and the diagrams. The assembly is realised in the opposite sequence.

3.1.1 Opening the PU 631

a) Preparations
- locate the PU on a level working surface
- remove all cable connection

b) Remove the upper half shell (1)
- remove 2 screws from each of the support handles (4)
- remove 2 screws (5) on the rear panel
- remove the upper half shell

3.1.2 Replacing the dust filter
- remove 2 screws (7) on the filter frame in the unit rear panel
- replace filter (6)

3.1.3 Battery replacement (refer to fig. 8)

After indication no. 3 (refer to indication table): back-up battery defect, the battery (3) must be replaced. The battery voltage should be checked(refer to section 3.1.4) if an erroneous back-up has been identified.

- place the programming unit on its rear panel, so that the underside is accessible
- remove the back-up battery out of its retainer, located behind the cover plate (8) and insert a new battery, ensuring that the polarity is correct.

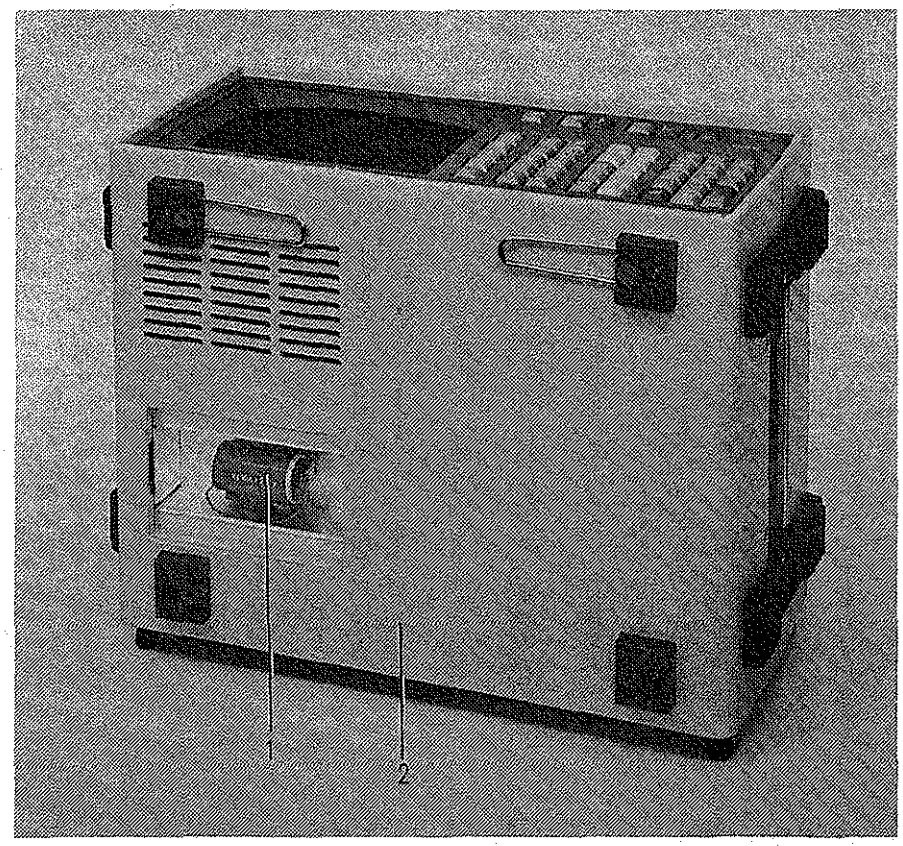


Fig. 8 PU 631 in the vertical operating position (1 back-up battery, 2 lower half shell)

3.1.4 Checking the power supply (fig. 9)

Do not remove the printed circuit board in order to check the power supply.

- remove the upper half shell of the programming unit, according to section 3.1.1 a,b
- connect the programming unit to the line supply, and switch-on
- check the line voltage according to the circuit diagram for power supply 1
- check the secondary voltage

Connections for the power supply p.c.b.		Comments
X 1 - X 4	7.5 V	unsmoothed a.c. voltage
X 1 - X 7	7.5 V	" " "
X 4 - X 7	15.0 V	" " "
X 8 - X 9	31.0 V	" " "
X10 - X11	7.8 V	" " "
X11 - X12	7.8 V	" " "
X10 - X12	15.5 V	" " "
X15 - X16	18.5 V	" " "
X17 - X18	+3.4 V	Battery voltage
X19 - X20	+24 V	d.c. voltage
X21 - X22	+5 V	d.c. voltage

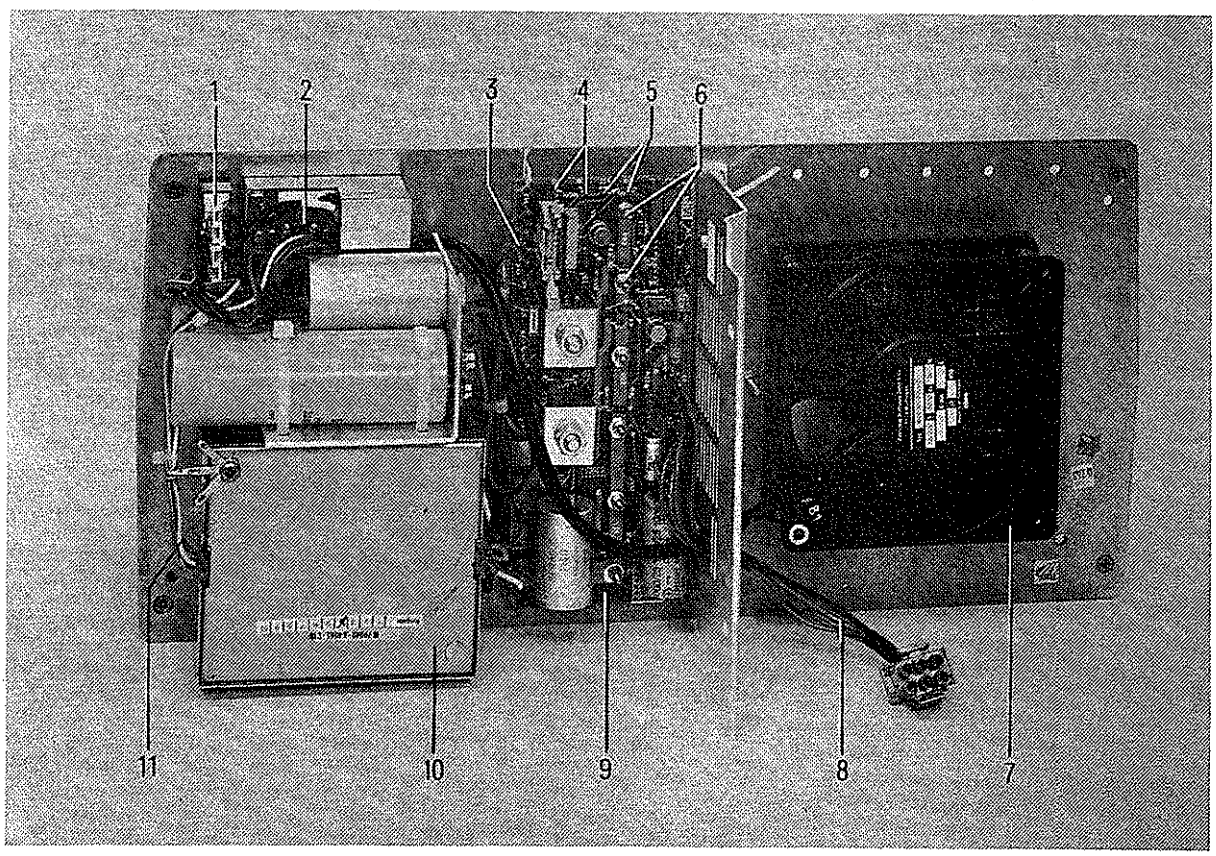


Fig. 9 PU 631 - complete rear panel (1 ON/OFF switch, 2 line filter, 3 secondary voltages, 4 power supply monitor, 5 power supply battery, 6 power transistor screw retainers, 7 fan, 8 power supply for the bus p.c.b., 9 power supply printed circuit board, 10 transformer, 11 primary voltages.

3.2 Repair

3.2.1 UV erase unit

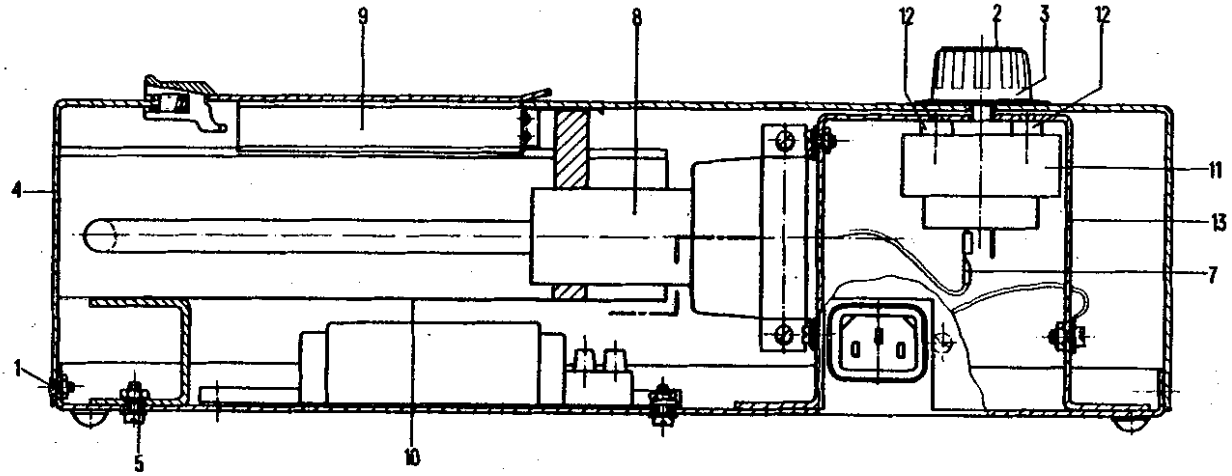
The lamp intensity is reduced to approx. 50% after 3000 operating hours.

a) Opening the erase unit
- isolate the unit from the line supply
- remove the cap 2 from the knob
- screw off knob (3) and remove
- remove the phillips screws (1) on the front side and rear panel
- remove the cover (4) upwards

b) Replacing the timer
- remove the slip-on connectors for the power supply (7) from the pins 1-1 of the timer
- remove the screws (12) on the bracket (13)
- remove the timer (11)

c) Replacing the UV lamp
- remove the retaining screw (5) for the reflector
- withdraw the reflector (10) with the rubber gasket (6) over the UV lamp
- remove the UV lamp (8)

The assembly is realised in the opposite sequence. In order that damage does not occur, it should be ensured, that the cover is first inserted over the reflector.



1 Phillips screws
2 Knob cap
3 Knob
4 Cover
5 Reflector retaining screws
6 Rubber gasket
7 Slip-on connectors for the power supply
8 UV lamp
9 Recess for memory module/EPROM
10 Reflector
11 Timer
12 Timer retaining screws
13 Brackets

Fig. 10 Erase Unit

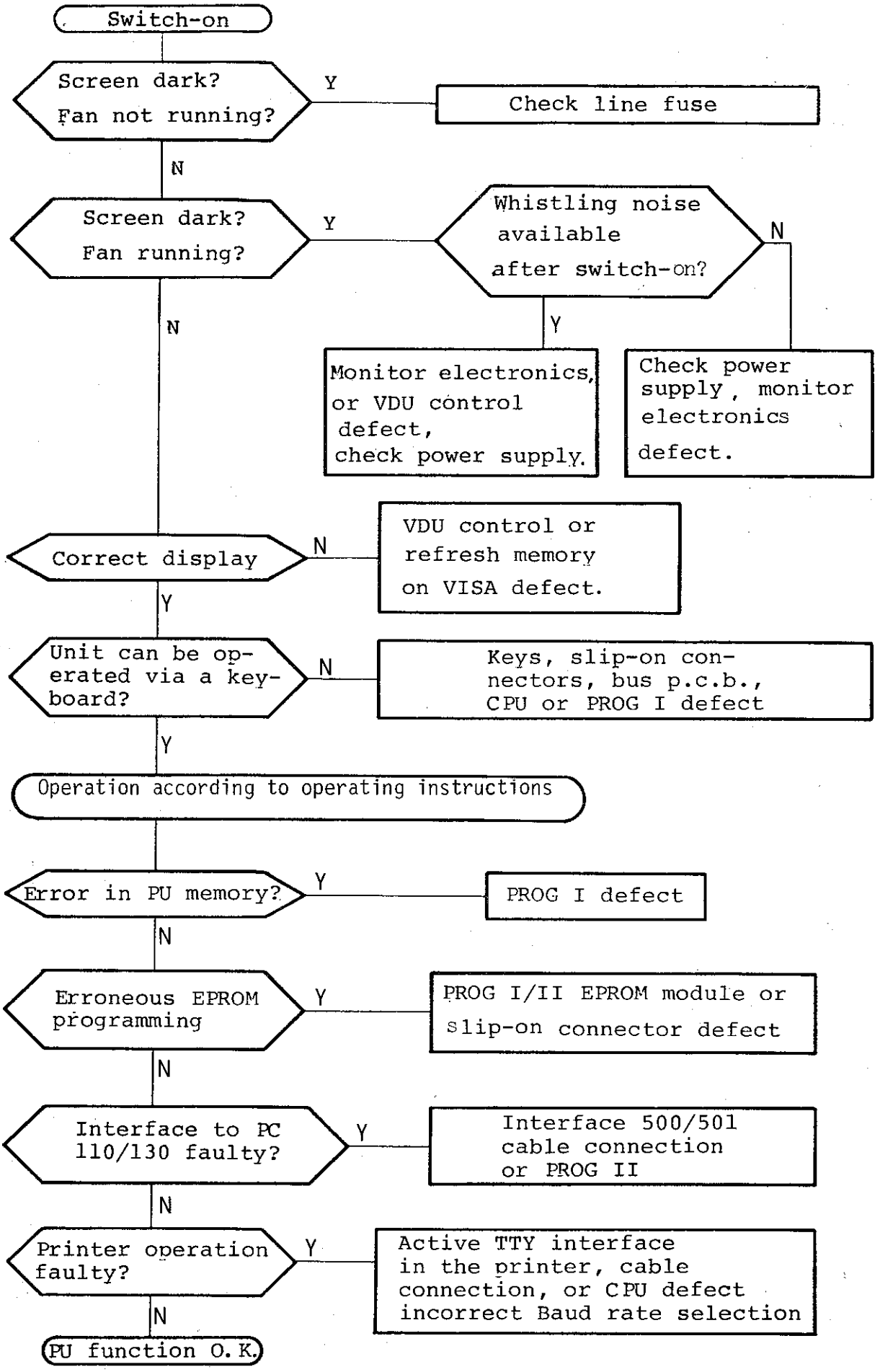
3.2.2 Fault functions, and fault identification

The subsequent fault finding instructions only provide recommendations for fault identification, and for replacing printed circuit boards. An accurate specification of the fault cause is not possible due to the multiplicity of the signal paths.
For defined fault indications on the visual display screen, a search should be executed according to the indication table in the operating instructions (page 38).

- faults which occur during operation should be differentiated between static, dynamic, and thermal faults. The permissible ambient temperature and the dust filter contamination state should always be checked for faults associated with temperature effects.

PU 631

Fault finding instructions



3.2.3 Replacing defective components

a) Line fuse (also refer to section 2.2, fig. 5)

- remove line cable
- shift the perspex cover in front of the line fuse towards the left
- throw ejector lever towards the left
- replace line fuse (refer to technical data)

b) Printer circuit board (refer to ''PU 631 complete unit'' drawing)

- the programming unit should be opened according to section 3.1.1 a,b in order to replace the following printer circuit boards: CPU (9), PROG I (11), PROG II (10), and VISA (12).
- remove the front plate on the rear panel
- withdraw the printed circuit board, together with the front panel from the bus printed circuit board

Points to watch:

VISA p.c.b.: - L553 -	The cable for the BAS signal should be removed, before the printed circuit board is removed from the bus printed circuit board
PROG I p.c.b: - L550 -	The signalribbon cable should be removed from the power supply unit, before the printed circuit board is withdrawn from the bus printed circuit board

c) Bus printed circuit board (13)

- remove upper half shell
- withdraw the printed circuit board from the bus printed circuit board
- remove the 6 pole plug for the power supply
- remove the keyboard, according to section 3.2.3 d)
- remove 5 screws (14) on the lower half shell
- withdraw the bus printed circuit board upwards

d) Keyboard/keys (15)

- remove the upper half shell according to section 3.1.1, a,b
- remove the front panels of the printed circuit boards on the rear panel
- remove the cable connections to the printed circuit boards
- withdraw the printed circuit boards from the bus printed circuit board
- withdraw the keyboard upwards in a tilted fashion, out of the socket connector stip, after removing 7 screws on the front panel
- replace defective key
  . remove key cap
  . solder out key socket

e) Fan (refer to fig. 9)

- remove upper half shell according to section 3.1.1 a, b)
- remove printed circuit boards according to section 3.2.3 b)
- isolate fan from power supply (refer to circuit diagram: power supply 1)
- remove the filter frame on the reverse side of the unit
- remove the 4 screws on the protective mesh
- withdraw fan
- observe the direction of rotation arrow on the fan when installing (air flow direction: from outside into the unit)

f) Monitor module (refer to fig. 11)

- remove upper half shell (section 3.1.1 a,b)
- withdraw printed circuit boards from bus printed circuit board (section 3.2.3 b)
- remove 3 screws on the right hand side of the monitor retainer (16)
- tilt the monitor electronics up after removing 2 screws
- remove the monitor retainer by removing 2 screws (17) on the lower half shell and 1 screw on the left hand side support handle with shock protection
- isolate the monitor electronics from the power supply on the rear panel (X15, X16)
- remove the monitor module from the programming unit

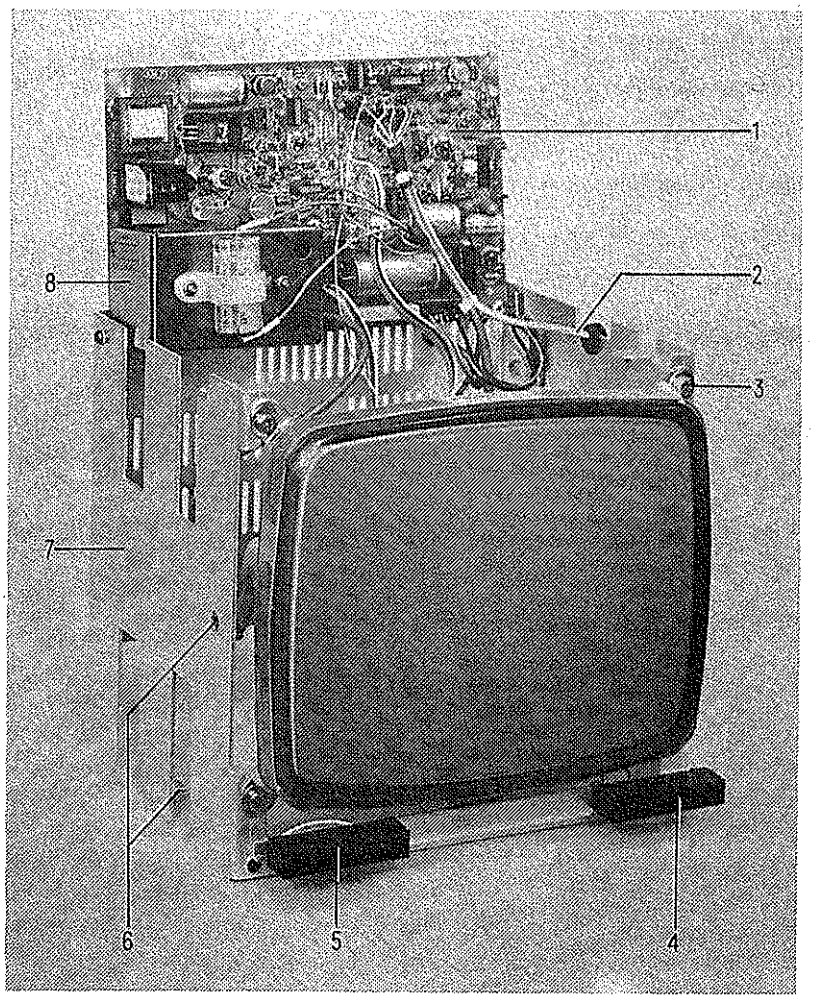


Fig. 11 Monitor module (1 monitor electronics, 2 BAS cable, 3 screen retaining screws, 4 contrast controller, 5 intensity controller, 6 module retaining screws, 7 module retainer, 8 high voltage transformer)

Intensity and Contrast Controls

- remove the leads from the corresponding potentiometers
- assemble according to the 'monitor' diagram
- CRT (observe the use of protective clothing)
- remove plug 1 from the monitor electronics
- remove the earthing discharge cable to the monitor electronics
- remove anode voltage cable (blue) on the underside of the CRT
- remove the plug from the CRT socket
- remove the earthing band from the CRT
- 4 remove the 4 screws from the monitor retainer
- remove the CRT
- remove the deflection unit from the CRT
  (loosen the retaining clamp)
- carefully replace CRT
- recalibrate with the monitor electronics

Anti-reflex frame

- loosen monitor and shift slightly backwards
- remove the anti-reflex frame upwards

g) Front panel (2)

- remove monitor module according to section 3.2.3 f)
- remove 3 screws (18) on the lower half shell
- withdraw the front panel together with the keyboard from the bus printed circuit board
- isolate the keyboard from the front panel by removing 7 screws
- remove the connection bracket by loosening 2 screws

h) Printed circuit board - mains power supply unit (19)

- remove upper half shell (section 3.1.1 a,b)
- remove printed circuit board (section 3.2.3 b)
- withdraw 6 pole plug for power supply from bus printed circuit board
- loosen 2 screws on the partition panel
- remove 2 screws (20) from the partition panel of the rear panel
- remove 3 screws (21) which retain the lower half shell to the rear panel
- remove the 4 leads from the printed circuit board (refer to fig. 9)
- withdraw the rear panel upwards, simultaneously pushing the partition panel towards the front
- 6 remove the 6 nuts on the printed circuit board
- remove the solder on the base emitter connections
- remove all soldered leads
- remove the 3 power transistors from the rear panel
- install the new printed circuit board according to the power supply 1 diagram, and adjust, according to the testing instruction

i) Transformer (refer to fig. 9)

- remove unit rear panel (section 3.2.3.h)
- remove the 4 leads to the transformer
- remove 4 screws, which retain the transfomer to the rear panel
- replace transformer and connect up the new transformer according to the power supply 1 diagram

j) ON/OFF (refer to figs. 5 and 9)

- open programming unit according to section 3.1.1 a,b
- remove 4 leads to the ON-OFF switch
- withdraw the ON-OFF switch through the rear panel towards the outside
- install the new switch according to the diagram

k) Re-calibration of monitor electronics/CRT

Required measuring instruments:

Multimeter (0 to 30 V)
Signal generator (BAS $signal_{pp}$ = 1 V into 75 ohm , grid pattern)

Preparation:

- Check 12 V supply voltage for the monitor electronics
- Establish a connection between the signal generator and the VDU control using coaxial cable
- Turn-up the contrast control to approx. 1/3
- Adjust the intensity control, until the image is visible

CRT replacement:

- Retain the deflecting unit axially after the CRT has been replaced, and check using the grid pattern
- If necessary, correct image geometry using grid pattern
- Adjust focus with R42 for optimum image sharpness between the centre and edge
- Generate a ladder diagram on the screen
- Adjust the image position if necessary using the positioning magnet discs on the defl ecting system

Monitor electronics:

- Generate ladder diagram on the screen
- Adjust image width using coil L4
- Adjust image height using R24 (image seize approx. 160mm x 110mm)
- Generate a grid pattern on the screen
- Adjust the horizontal linearity using coil L3
- Adjust vertical linearity with R27
- Adjust focus with R42 for optimum image sharpness between the centre and edge
- Generate a ladder diagram on the screen
- Adjust the image position using the position magnet discs on the deflection system

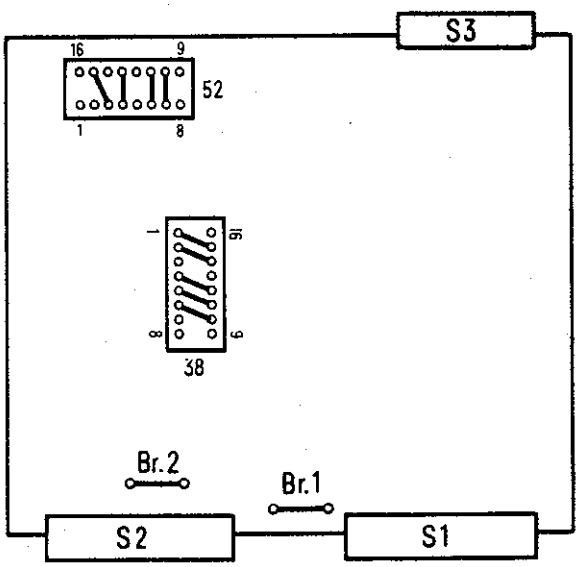
3.2.4 Jumper dispositions

The subsequent jumpers are inserted:

CPU: Jumper 1, Jumper 2

EPROM 2716 I/2516 TI

38/1-15	52/3-15
/2-14	4-13
/4-12	/6-11
/5-11	/7-10
/6-10	

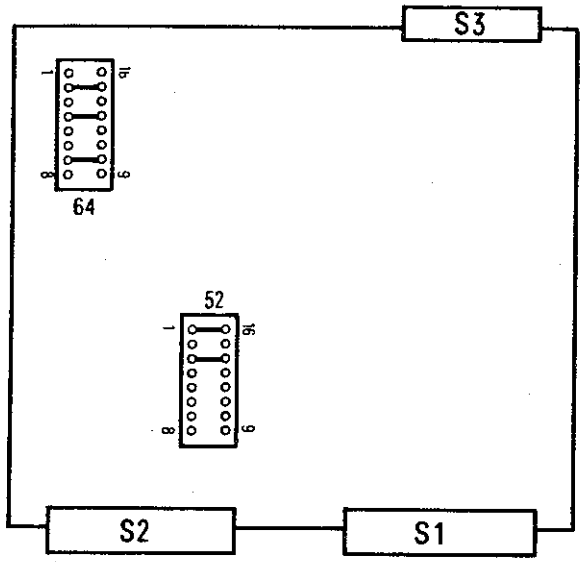


Br. = Jumper

PU 631

PROG I:

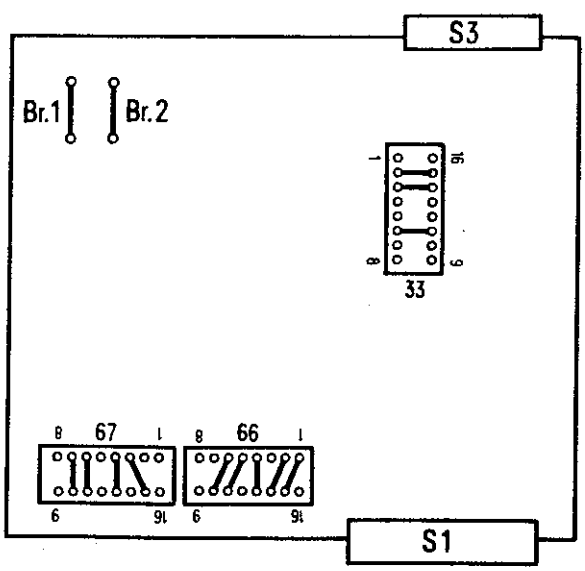
52/1-16 64/2-15
/3-14 /4-13
/7-10



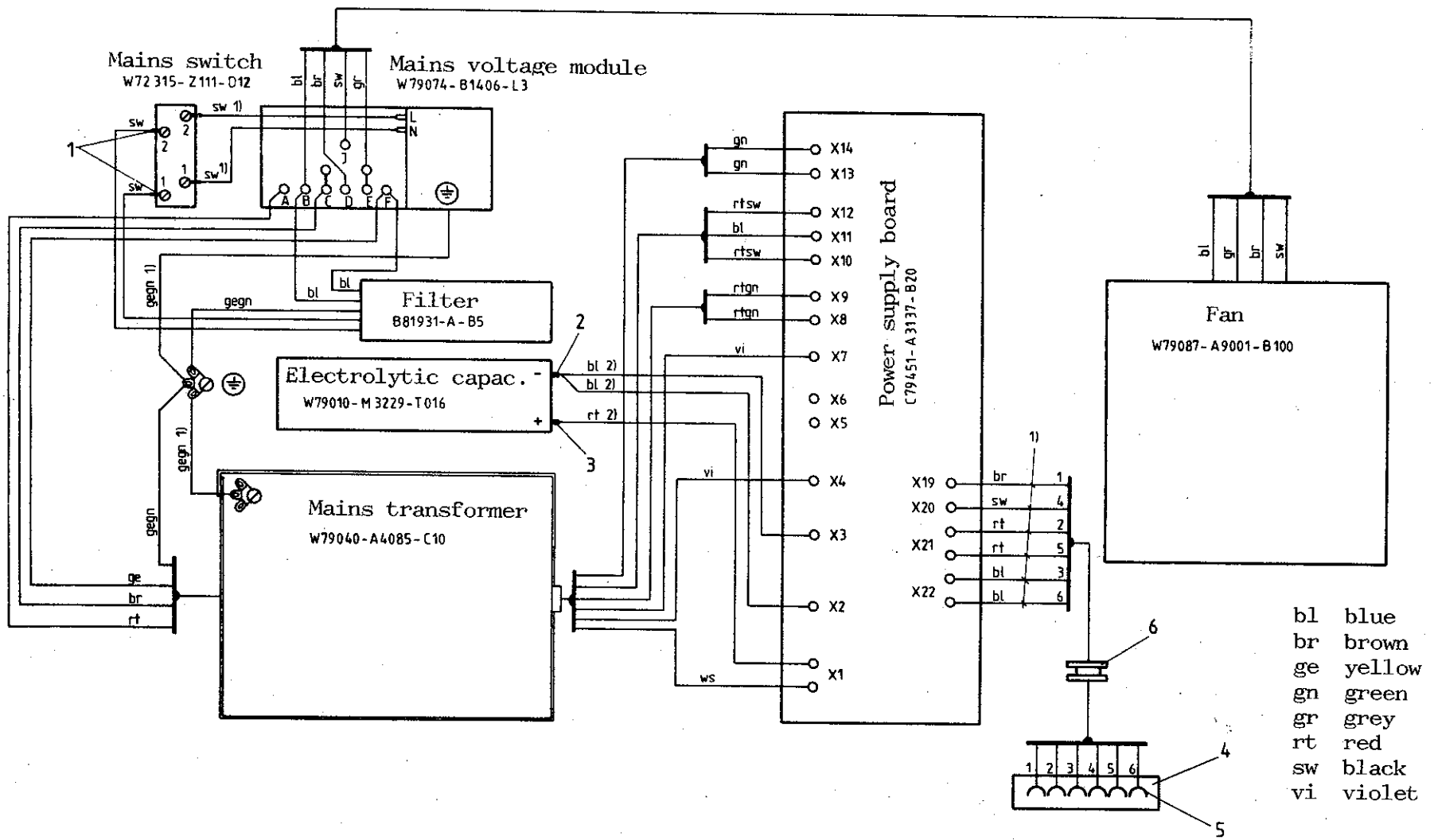
VISA Jumper 1, Jumper 2

EPROM 2716 I/2516/ TI

33/2-15 66/1-15 67/3-15
/3-14 /2-14 /4-13
/6-11 /4-13 /6-11
/5-11 /7-10
/6-10



Br. = Jumper



1) LIY 1×0,75²
2) LIY 1×1,5²

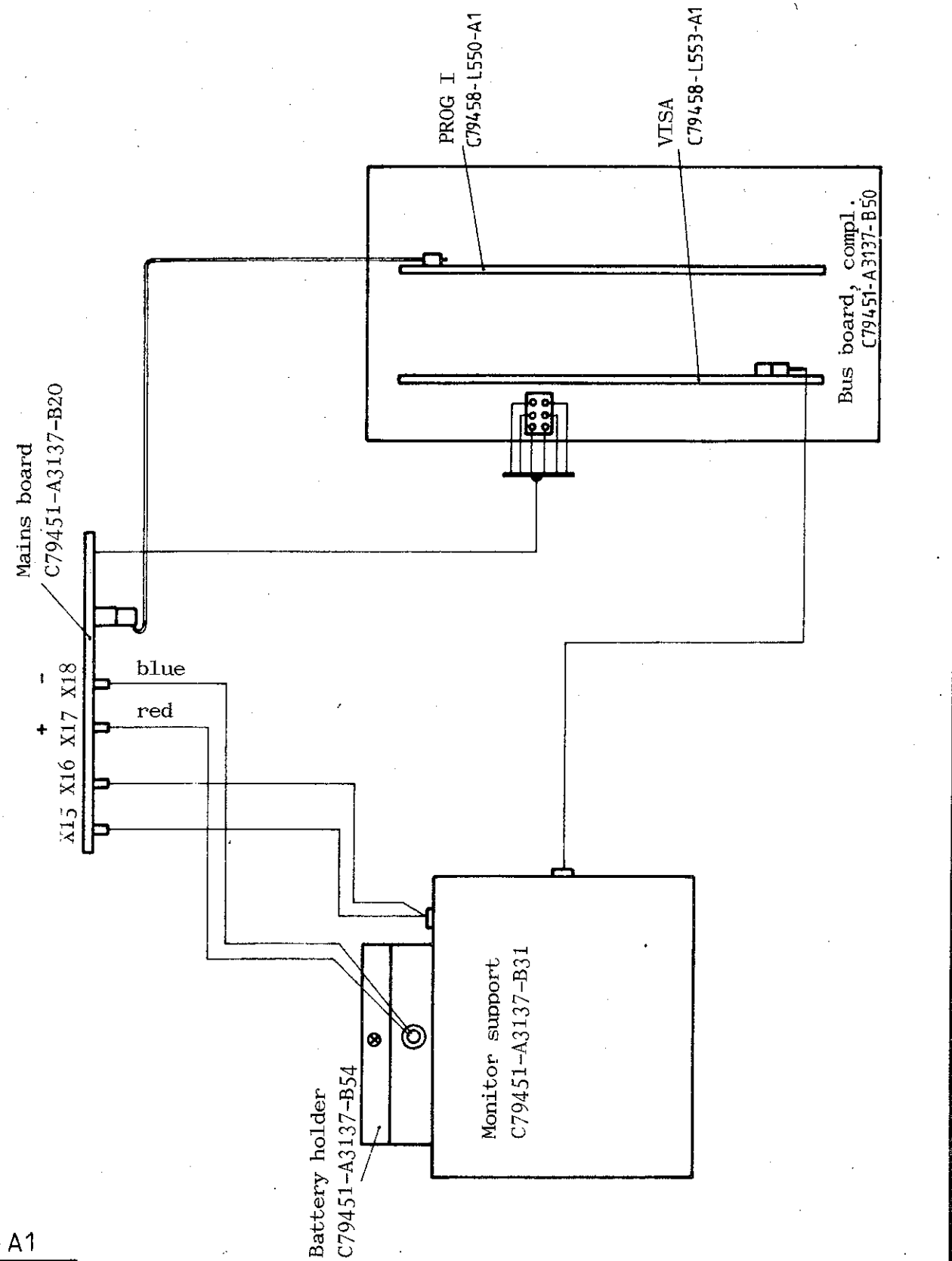
-B11...15
225

				Datum	3.4.81
				Bearb.	Schmitt
				Gepr.	3.4.81
				Norm.	
				GWK TEK2/TSS4	
1	79ANO579	3.4.81		SIEMENS AKTIENGESELLSCHAFT	
Zust.	Mitteilung	Datum	Name		

Connection diagram
Power supply unit 1

C79451-A3137-B11...B15-X-82

Blatt
Bl.



-A1

225

2	79AN1359	30.6.81	
1	79AN0579	1.4.81	
Zust	Mitteilung	Datum	Name

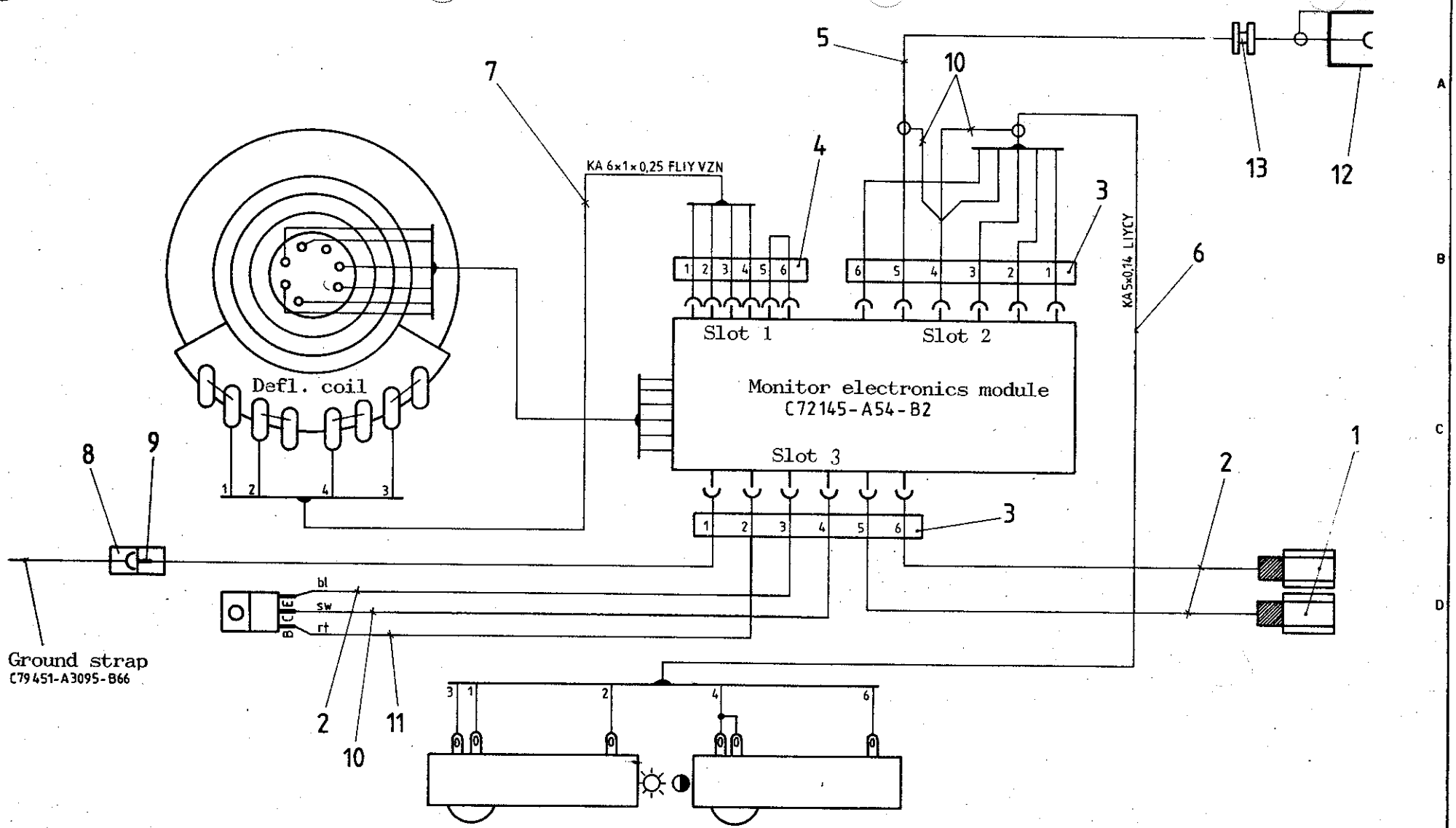
Datum	1.4.81
Bearb	Schmitt
Gepr	
Norm	
GWK TEK2 / TSS4	

Connection diagram
Power supply unit 2

SIEMENS AKTIENGESELLSCHAFT

C79451-A3137-A1-*-82

Blatt 81



-B34 / 225			Maßstab
		Datum 20.3.81 Bearb. Schmitt Gepr. 3.4.81 Norm GWKTEK2/TEP1	Connection diagram Monitor
1 79AN0579 3.4.81		Siemens AG	C79451-A3137-B31-X-82 Blatt
Zust. Mitteilung	Datum Name		

	1	2	3	4				
	Pos.	Designation	Order No.		*)			
A	1	Case	6ES5986-9AA11		N	1		
	2	CPU	C79458-L549-A1		R	1		
	3	PROG II	C79458-L551-A1		R	1		
	4	PROG I	C79458-L550-A1		R	1		
B	5	VISA	C79458-L553-A1		R	1		
	6	KEYBOARD	C79451-Z542-U180		R	1		
	7	Bus p.c.b.	C79451-A3137-B50		R	1		
	8	PU Interface module	6ES5501-5AA11		R	1		
	9	Protective cover	C79451-A3137-B59		N	1		
C	10	Line cable (supply)	W79079-N2001-A3		N	1		
	11	Plug-in lead PC110, 130	6ES5734-0...0		N	1		max. 3 m
	12	Anti-reflex frame	C79451-A3095-B59		N	1		
	13	Litium battery	W79084-U1001-B12		N	1		
	14	Cover plate	C79451-A3137-B18		N	2		
	15	On-off switch	W72315-Z111-D12		N	1		
D	16	Fan	W79087-A9001-B100		N	1		
	17	Fuse link	W79054-L4011-T100		N	1		220 V
	18	Fuse link	W79054-L4011-T200		N	1		110 V
	19	Dust filter	C79451-A3137-C20		N	1		
	20	Monitor retainer	C79451-A3137-B31		R	1		
	21	Monitor CRT	W79045-A2010		N	1		

Lieferort

*) R can be repaired
N cannot be repaired

Zust. | Mitteilung | Datum | Name

Datum 3/82
Bearb. Dennert
Gepr.
Norm

PU 631
Spare parts list

Siemens AG

Blatt 1+2 Bl.

1	2	3	4				
Pos.	Designation	Order No.		*)			
22	Teletype plug in lead	6ES5735-0...0		N	1		
23	PT 80 plug-in lead	6ES5736-0...0		N	1		
24	Line power supply p.c.b.	C79451-A3137-B20		R	1		
25	Complete rear panel	C79451-A3137-B11		R	1		

Lieferort:

*) R can be repaired
N cannot be repaired

Datum 3/82
Bearb. Dennert
Ges.
Name

PU 631
Spare parts list

Siemens AG

Blatt 2-

Zust. Änderung Datum Name