ROHDE & SCHWARZ
MÜNCHEN

Manual

MILLIVOLTMETER URV4

292.5012.02
292.5012.03

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Table of Contents

1. Data Sheet

Characteristics

Specifications

Equipment Supplied

Recommended Extras

2. Preparation for Use and Operating Instructions 6

2.1 Legend to Front- and Rear-panel Views 6

2.2 Preparation for Use 8

2.2.1 Setting up the URV 4 8

2.2.2 Connection to the Local AC Supply 8

2.2.3 Connection to an External Battery or Power Supply 8

2.2.4 Replacement of Fuses 8

2.2.5 Connection of Accessory Units 8

2.3 Operating Instructions 9

2.3.1 General Remarks on RF Voltage Measurements 9

2.3.1.1 Input Impedance of Probe 10

2.3.1.2 Waveform Weighting 11

2.3.2 Range Selection 12

2.3.3 Selection of Type of Readout 13

2.3.4 Zeroing 13

2.4 Remote Control 14

2.4.1 General 14

2.4.2 LOCAL - REMOTE Switchover 15

2.4.3 Setting the Device Address 15

2.4.4 Switching Over to TALK ONLY Operation 15

2.4.5 Setting the Delimiter 15

2.4.6 Programming 16

2.4.6.1 Button-controlled Functions 16

2.4.6.2 Functions that cannot be set Manually 16

2.4.6.3 State of the Programmed Functions at Switch-on 18

2.4.6.4 Group of Addressed and Universal Commands 18

2.4.7 Data Output 18

2.4.8 Program Examples for the Process Controller PPC 20

2.4.8.1 Programming of Device Setting 20

2.4.8.2 Reading Out Test Result 20

2.4.8.3 Programming Addressed and Universal Commands 21
2.4.8.4 Device Status Transfer 21

3. Maintenance 27

3.1 Measuring Instruments and Auxiliary Equipment Required 27
3.2 Performance Check 28
3.2.1 Absolute-value Calibration 28
3.2.2 Calibration of the Analog Indication 29
3.2.3 Autoranging 29
3.2.4 Measurement of the Frequency Response of the Probe 30
3.2.5 Measurement of the Frequency Response of the Insertion Units .. 31
3.2.6 DC Output 32
3.2.7 Remote Control 33
3.3 Electrical Maintenance 34
3.3.1 Replacement of the Diodes in the Probe 34
3.3.2 Replacement of the Diodes in the 10-V and 100-V Insertion Units 34

4. Circuit Description 36

4.1 IEC Interface (Option URV 4-Z1) 39

5. Repair Instructions 40

5.1 Measuring Instruments and Auxiliary Equipment Required 41
5.2 Trouble Shooting 41
5.2.1 Power Supply 42
5.2.2 Digital Board 42
5.2.3 Display Board 44
5.2.4 Analog Board 44
5.2.5 IEC-bus Board 46
5.3 Adjustment Procedures 47
5.3.1 Operating Voltage 47
5.3.2 Reference Voltage 47
5.3.3 Adder 47
5.3.4 A/D Converter 47
5.3.5 Logarithmizer 47
5.3.6 Analog Indication 48
5.3.7 Reference Generator 48
5.3.8 Absolute-value Calibration 49

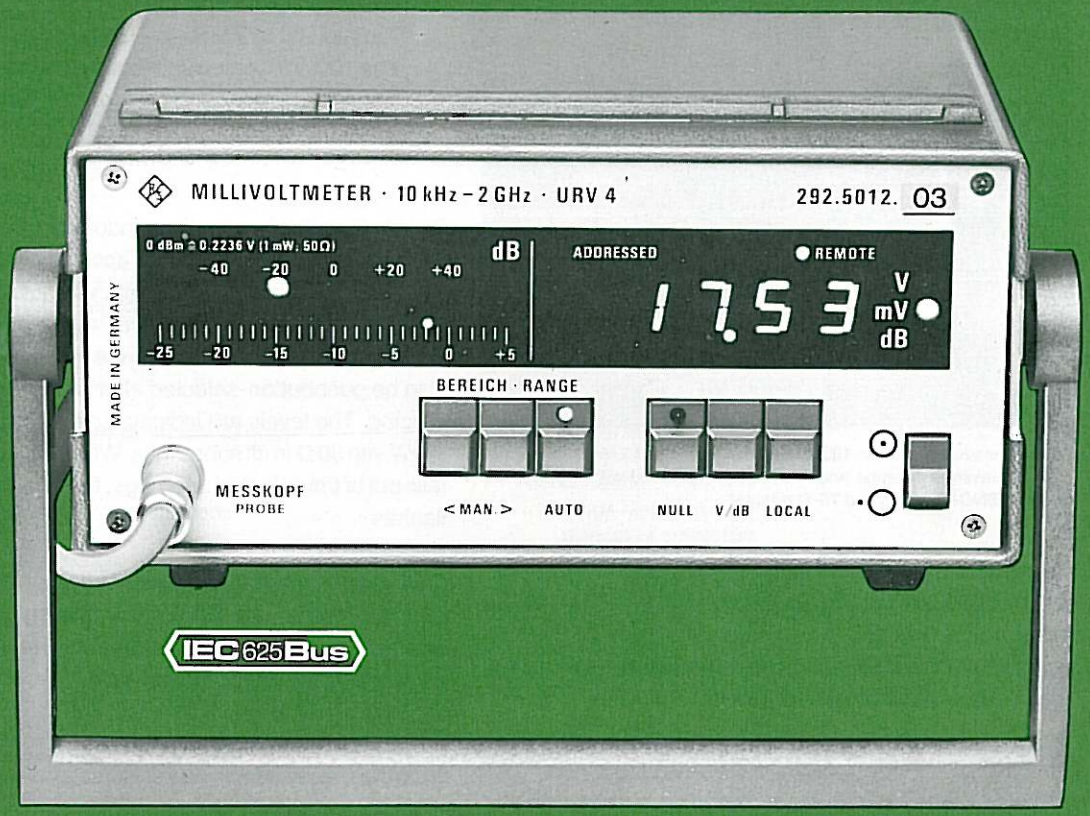
Fig. 1 Front panel
Fig. 2 Rear panel
Fig. 3 Accessory kit
Fig. 4 Insertion units
Fig. 5 Input resistance R_{po} for f < 3 MHz as a typical function of the test voltage (sine wave)
Fig. 6 Typical frequency function of the input resistance R_p relative to the input resistance R_{po} at low frequencies
Fig. 7 RF probe; location of diodes
Fig. 8 Insertion units; location of diodes
Fig. 9 Top view of interior
Fig. 10 Bottom view of interior
Fig. 11 Rear view of URV 4 without cabinet, PC boards swung out, power supply removed
Fig. 12 IEC-bus Board

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URV 4

MILLIVOLT-METER

10 kHz to 2 GHz
700 µV to 1000 V/−50 to +73 dBm

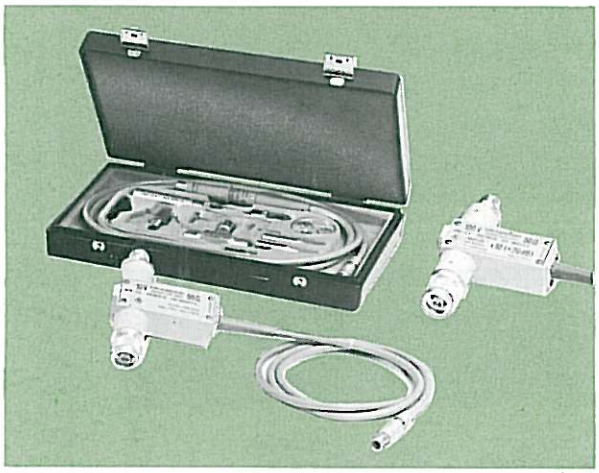


- Model 02 for manual measurements
  Model 03 for manual and remote-controlled measurements via IEC bus
- Digital readout of voltage or level
- Rapid analog indication of level with 0.5-dB resolution for trimming or coarse measurements (tendency indication)
- High sensitivity
  Resolution 1 µV for voltage and 0.01 dB for level measurements
- High accuracy – error limits ±2%
- RF voltage measurements in coaxial systems with the aid of insertion units with standard characteristic impedances
- Compact RF probe with dividers
- Plug-in measuring heads fully compatible with URV family
- Operation from AC supply or battery

Data sheet
292 501
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Characteristics

The URV 4 is a highly sensitive and accurate millivoltmeter for measuring RF voltages in the range from 10 kHz to 2 GHz (up to 3 GHz if only used as indicator). A comprehensive range of accessories (photo below) and battery operation capability make for the extraordinary versatility of the meter, e.g. it can also be used in mobile operation. Low capacitive and resistive loading minimize measuring errors introduced by detuning of resonant circuits, damping and unwanted phase shifts in feedback networks, etc.



URV 4 measuring heads: 100-V insertion unit and 10-V insertion unit; case containing RF probe and accessories (supplied with the URV 4), dividers, BNC-adapters and 75-Ω adapter

Compatibility Model 02 of the URV 4 comes without and model 03 with an IEC-bus interface, all other features are identical. The IEC-bus-compatible model 03 can also be remote controlled, which makes it ideal for use in automatic test assemblies and systems.

Measuring heads The measuring heads are freely interchangeable within the URV family without derating the error limits, since the accuracy is exclusively determined by the matching of the characteristics of the diodes used in the measuring and reference detectors of the measuring heads. The RF probe is supplied with the URV 4. The other accessories are recommended extras.

RF probe alone:
700 µV to 10 V, 100 kHz to 1 GHz (up to 2 GHz if only used as indicator)

RF probe + 20-dB divider:
7 mV to 100 V, 2 to 500 MHz

RF probe + 40-dB divider:
70 mV to 1000 V, 1 to 500 MHz
Owing to their design as capacitive voltage dividers, the 20-dB and 40-dB dividers at the same time reduce the input capacitance and increase the input resistance.

RF probe + BNC adapter
(with or without divider):
RF voltage measurement in coaxial systems up to 350 V (probe + 40-dB divider + BNC adapter): limit dictated by the voltage rating of the BNC connecting cables.

RF probe + 75-Ω adapter:
700 µV to 10 V, 100 kHz to 500 MHz
RF voltage measurement in coaxial 75-Ω systems up to 2 W; adaptable connectors (see page 6).

RF insertion units:
RF voltage measurement with low reflection coefficient in coaxial systems; various connector systems (see page 6).
10-V insertion unit (50 or 75Ω):
700 µV to 10 V
10 kHz to 2 GHz (up to 3 GHz if only used as indicator) with 50 Ω
10 kHz to 1.6 GHz with 75 Ω
100-V insertion unit (50 Ω):
7 mV to 100 V, 1 MHz to 2 GHz
The 100-V insertion unit together with a termination is suitable for measuring the output voltage of power stages up to 200 W.

The **digital display** gives a readout of the voltage or the level. Its high resolution and accuracy (4000 steps for measuring voltage; 10 000 steps without autoranging) is optimally matched to the overall accuracy of the measuring head and the meter. The measurement ranges can also be pushbutton-selected after switching off the autoranging. The levels are indicated directly in dB relative to 1 mW into 50 Ω in all subranges. When the unknown signal falls out of the selected subrange, the display of the URV 4 flashes.

To facilitate trimming (tendency indication) and for coarse measurements, an additional **analog indication** is provided on the URV 4 in the form of a row of LEDs. The coverage is 30 dB in steps of 1 dB. Since two LEDs light inbetween steps, level differences of 0.5 dB are discernible. The reference value for the analog scale can be taken from the five additional range indications.

The URV 4 features **automatic zeroing** for voltage measurements in the most sensitive measurement range. It sets the electrical zero upon depression of a pushbutton, doing away with the tedious and error-prone zero setting by means of a zero adjustment potentiometer. Zero correction is not required in the higher measuring ranges.

A level-proportional DC voltage (100 mV/dB) is available at the **recorder output** provided on the rear panel of the URV 4. Thus with the aid of automatic ranging, continuous recording is possible over a dynamic range of 83 dB.

Remote control (model 03 only). In addition to all operating elements, the following functions of the model 03 of the URV 4 can be remote controlled:

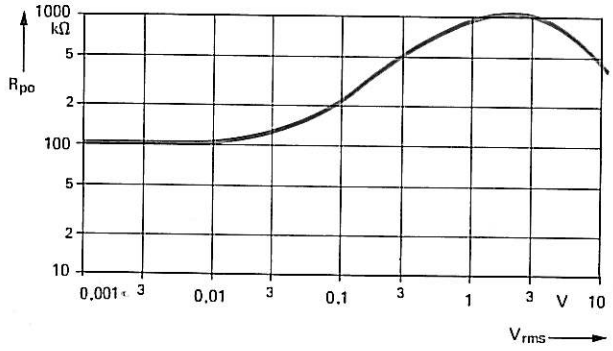
- In **external trigger operation,** the measurement is only started after a talk command has been received.
- In **fast operation,** i.e. **operation with increased conversion rate,** up to 30 measurements per second can be made depending on the measurement range selected and the level step size (reduced resolution, 3½-digit readout).

- **Unconditional data output** (immediate output of instantaneous value) or **conditional data output** (output after two identical values are measured successively) is possible.
- The **device status** may be added to the data output.
- Completion of automatic zeroing may be signalled by a **service request.**

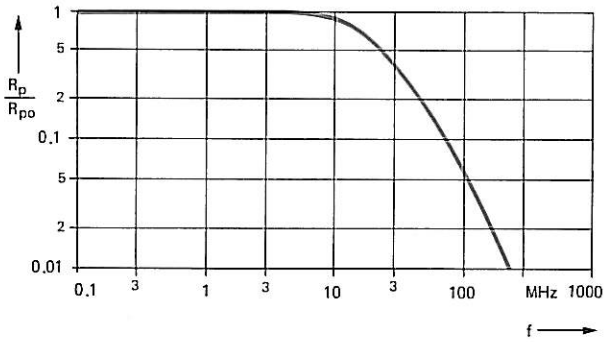
The complete address range is selectable by means of a switch. If necessary, the URV 4 may be adjusted for data output only (talk only).

Input impedance of RF probe

The input impedance of the RF probe is given by the input capacitance C_{in} and the parallel input resistance R_p, which is dependent on the test voltage and above 3 MHz also on the frequency. See diagrams below.



Input resistance R_{po} for f < 3 MHz as a typical function of the test voltage (sinewave)



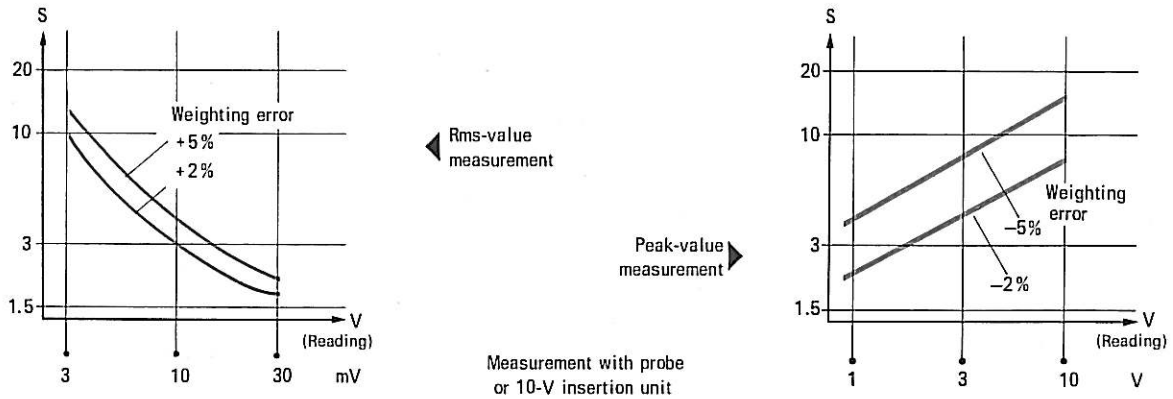
Typical frequency function of the input resistance R_p relative to the input resistance R_{po} at low frequencies

Waveform weighting

Rms-value measurement. The URV 4 measures and reads the rms value in the three most sensitive measurement ranges. The curves below show the maximum permissible crest factor vs. test voltage for weighting errors of +2% and +5%.

Peak-value measurement. The URV 4 measures the peak-to-peak value at voltages above 1 V but reads out the value $\frac{V_{pp}}{2\sqrt{2}}$. This corresponds to readout of the rms value for sinusoidal voltages. The curves below show the maximum permissible crest factor vs. test voltage for weighting errors of −2% and −5%.

Maximum permissible crest factor S
for rms-value measurement (left) and peak-value measurement (right)



				Measurement with probe or 10-V insertion unit				
30	100	300	mV	Measurement with probe and 20-dB divider or 100-V insertion unit	10	30	100	V
300	1000	3000	mV	Measurement with probe and 40-dB divider	100	300	1000	V

In the transition region between rms-value and peak value measurement the reading is defined only for sinusoidal voltages.

Specifications

Test input

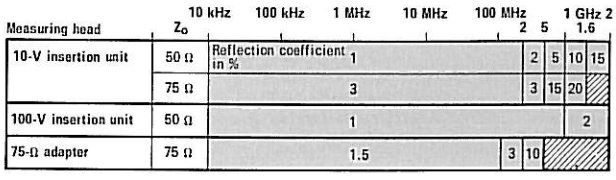
Parameters measured	voltage (V, mV)/level (dBm)
Frequency range	10 kHz to 2 GHz (choice of measuring heads)
Voltage range	700 µV to 1000 V (with dividers)
Level range	−50 to +73 dBm
Level reference	0 dBm corresponding to 1 mW into 50 Ω (0.2236 V)
Range usable for indication only	300 to 700 µV/−57 to −50 dBm
Connection of measuring head	three-pole female connector

Measuring heads

High-impedance	RF probe without divider	RF probe with 20-dB divider	RF probe with 40-dB divider
Voltage range	0.7 mV to 10 V	7 mV to 100 V	70 mV to 1000 V
Correction of indication[1])	—	Indication x 10	Indication x 100
Level range (1 mW into Z = 50 Ω corresponding to 0 dBm)	−50 to +33 dBm	−30 to +53 dBm	−10 to +73 dBm
Correction of indication[1])	—	Indication +20 dB	Indication +40 dB
Input impedance $C_{in} \parallel R_p$ (f = 10 MHz)	2.5 pF ‖ > 80 kΩ	1.0 pF ‖ > 1 MΩ	0.5 pF ‖ > 10 MΩ
Frequency range	100 kHz to 1 GHz[2])	2 to 500 MHz	1 to 500 MHz
Voltage rating (f < 100 MHz)			
V_{rms} (sinewave)	15 V	150 V	1050 V
V_p	22 V	220 V	1500 V
V_{DC}	400 V	1000 V	1000 V

Match-terminated	10-V insertion unit	100-V insertion unit	RF probe with 75-Ω adapter
Voltage range	0.7 mV to 10 V	7 mV to 100 V	0.7 mV to 10 V
Correction of indication[1])	—	Indication x 10	—
Level range (1 mW into Z = 50 Ω corresponding to 0 dBm)	−50 to +33 dBm	−30 to +53 dBm	−50 to +33 dBm
Correction of indication[1])	—	Indication +20 dB	Indication −1.76 dB[4])
Reflection coefficient (f = 100 MHz)	Z = 50 Ω: 1% Z = 75 Ω: 3%	Z = 50 Ω: 1% —	— Z = 75 Ω: 1.5%
Frequency range			
Z = 50 Ω	10 kHz to 2 GHz[3])	1 MHz to 2 GHz	—
Z = 75 Ω	10 kHz to 1.6 GHz	—	100 kHz to 500 MHz
Voltage rating			
V_{rms} (sinewave)	15 V	150 V	12 V
V_p	22 V	220 V	17 V
V_{DC}	50 V	1000 V	12 V

Reflection coefficients



[1]) To be made by user.
[2]) Up to 2 GHz if only used as indicator.
[3]) Up to 3 GHz if only used as indicator.
[4]) For correction of level indication, referred to 75 Ω.

MILLIVOLTMETER URV 4

General data

Nominal temperature range	+5 to +40 °C
Operating temperature range (without measuring heads)	−20 to +60 °C
Shelf temperature range (without measuring heads)	−25 to +75 °C
Operating temperature range of measuring heads	0 to +45 °C
Shelf temperature range of measuring heads	−15 to +60 °C
Power supply	AC supply operation or operation from external battery
AC supply operation	115/220 V ±10%, 47 to 440 Hz (4 VA for model 02, 6 VA for model 03)
Battery operation	external battery 11 to 28 V, 300 mA for model 02, 450 mA for model 03 – at 12 V
Overall dimensions (W x H x D) and weight	240 mm x 109 mm x 217 mm, 2.6 kg for model 02, 2.9 kg for model 03
Engravings	German + English

Order designation ▶ Millivoltmeter URV 4

URV 4 without IEC-bus interface model 02	292.5012.02
URV 4 with IEC-bus interface model 03	292.5012.03

Accessories supplied

RF Probe URV-Z7	292.5312.02 comprising earth cable 241.0620.00 with clip 241.0620.00 earth sleeve 241.0688.00 earth strip 243.9053.00 hook tip 241.0707.00 solder tip 241.0759.00 case 219.5900.02
Connector for battery	292.5406.00
Power cable	025.2365.00
Manual	

Recommended extras

Accessories URV-Z6	292.5364.02 comprising 20-dB divider 241.1510.00 40-dB divider 241.1710.00 BNC adapter URV-Z 241.1110.02 for RF probe (including reducing sleeve for dividers)		
75-Ω Adapter URV-Z3	243.9118.70 comprising adapters from UNI-9 female connector to 2.5/6 connector 243.9260.00 to 1.6/5.6 connector 243.9276.00 to BNC connector 243.9282.00		
RF insertion units	50 Ω N connectors[1])	50 Ω Dezifix B[1])	75 Ω Dezifix B[1])
10-V Insertion Unit URV-Z2	288.8010.55	288.8010.54	288.8010.74
100-V Insertion Unit URV-Z4	283.7716.55	—	—
19″ Rack Adapter ZZA-1 (holds one or two sets)	078.8016.00		

[1]) For other connectors, please enquire.

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679/760 (Bi)

2. Preparation for Use and Operating Instructions

The values given in this section are not guaranteed; only the specifications given in the data sheet are binding.

2.1 Legend to Front- and Rear-panel Views

See Figs. 1 and 2

Ref. No.	Labelling	Function
1	-25 -20 -15 -10 -5 0 +5	Logarithmic analog indication within subrange.
2	-40 -20 0 +20 +40 dB	Indication of subrange. At the same time, reference value for analog indication 1.
3	ADDRESSED	Illuminated text. Lights when the URV 4 is addressed. (Only model 292.5012.03)
4		4 1/2-digit readout of voltage or level.
5	REMOTE	Illuminated text. Lights when the pushbuttons on the front panel for local control of the URV 4 are disabled. (Only model 292.5012.03).
6	V; mV; dB	Indication of physical units.
7	⊙ ·○	ON/OFF switch.
8	LOCAL	Pushbutton for switching from remote-control operation over to manual operation. (Only model 292.5012.03).
9	V/dB	Pushbutton for selection of digital readout for voltage or level measurement. Upon switching on the set digital readout for voltage measurement is automatically selected (light dot at V or mV).
10	NULL	Pushbutton for automatic zeroing.
11	AUTO	Pushbutton for switching auto-ranging on and off. Upon switching on the set auto-ranging is switched on at the same time. The LED provided in the pushbutton lights.

Ref. No.	Labelling	Function
12	MAN >	Pushbutton for selecting the next higher subrange when auto-ranging is switched off.
13	< MAN	Pushbutton for selecting the next lower subrange when auto-ranging is switched off.
14	MESSKOPF PROBE	Input for connection of probe or insertion unit.
15	$\frac{\text{T 0,1 B}}{\text{T 0,2 B}}$ SI 1	Voltage selector
16	ADDRESS	Switches for setting device address and for switching the URV 4 over to TALK ONLY operation.
17	DATA I/O	IEC-bus connector (24-pole, Amphenol)
18	AUSG. OUTP. 100 mV/dB ⏚ 0 dB ≙ 0 V R_i = 1 kΩ	Logarithmic DC output. The socket on the left serves at the same time as earthing socket.
19	BATT. 12 V + -	Connector for external battery.
20	47 - 420 Hz	AC supply receptacle.

2.2 Preparation for Use

2.2.1 Setting up the URV 4

In general, the URV 4 is set up in a horizontal position. It is, however, also possible to adjust it into a tilted position after swinging out the carrying handle. The carrying handle is unlocked by pressing the two joints (arrow in Fig. 1).

2.2.2 Connection to the Local AC Supply

Prior to connecting the set to the local AC supply, check that the voltage selector 15 (Fig. 2) is set to the correct voltage. The set can be operated from 220 V or 115 V AC supply voltage. A deviation of ±10% from the nominal AC supply voltage does not derate the data sheet specifications. The set is factory-adjusted for an AC supply voltage of 220 V. To adapt the set to 115 V, push switch 15 upwards and replace the 0.1-A fuse according to section 2.2.4 by a 0.2-A fuse (T 0.2 B).

2.2.3 Connection to an External Battery or Power Supply

The battery input 19 (Fig. 2) permits an external DC voltage to be applied from a 12-V battery or connection of a power supply using the mating connector supplied with the set. The nominal voltage is 12 V. It is, however, also possible to operate the set from 11 V to 28 V. The current drain is approximately 300 mA at 12 V, decreasing with increasing operating voltage. Observe correct polarity when connecting to the DC voltage source. The set does not operate if the polarity is incorrect.

2.2.4 Replacement of Fuses

The set is fused separately for AC supply and battery operation. After loosening the screws on the side and removing the upper cover of the set, the two fuse holders in the power supply become accessible. Replacement fuses must comply with DIN 41571, viz. Si1 T0.1 B for AC supply operation and Si2 T 1 B for battery operation.

2.2.5 Connection of Accessory Units

For measuring, a measuring head (probe or insertion unit) is required which is connected to the 3-pole socket 14 (Fig. 1). The measuring heads are fitted with a 3-pole plug mating with the socket 14. The plug can be inserted into the socket only if the marker line on the plug points towards the top.

It is possible to fit the plug to the socket and turn it applying a slight pressure until it is felt that it has locked. After the plug has locked in place, it is safeguarded against being pulled out by accident. To pull out the plug, it must be held at the sleeve which is provided with grooves. Pulling at this sleeve unlocks the plug.

The DC output voltage is available at the two sockets 18 (Fig. 2). It is proportional to the level, hence it corresponds to the logarithm of the voltage measured. The zero of the output voltage is referred to 0 dBm (1 mW; 50 Ω), i.e. at an input test voltage of 0.2236 V, the output voltage is 0 V. At higher input levels, a positive and at lower ones a negative output voltage is obtained. The output voltage is 100 mV/dB. Accordingly, an output voltage of +1 V is obtained, for example, at an input level of +10 dBm. The output is short-circuit-proof and exhibits an output impedance of 1 kΩ. Range switchover on the set is automatically corrected. Thus the output voltage is within the range from -5,0 V to +3.3 V corresponding to the measurement range limits from -50 dB to +33 dB.

2.3 Operating Instructions

2.3.1 General Remarks on RF Voltage Measurements

It is possible to connect a probe or an insertion unit to socket 14 (Fig. 1). Measurements can only be made with the aid of a measuring head. The probe permits direct measurement on the circuit in the frequency range up to approximately 200 MHz. The earth connection to the probe should be short (e.g. earth socket with solder strip). The screw-on earth cable can only be used for measurements up to about 50 MHz since the measuring error would increase unduly at higher frequencies on account of the length of the cable.

The voltage range with probe is 700 µV to 10 V. The maximum permissible AC voltage at the probe is V_{rms} = 15 V. A higher voltage leads to the destruction of the detector diodes. The 20-dB and 40-dB dividers recommended as extras extend the voltage range of the probe to 100 V and 1000 V, respectively.

In measurements with probe and 40-dB divider, the maximum measurable voltage of V_{rms} = 1000 V must not be applied at frequencies above 100 MHz since this would lead to the destruction of the divider on account of the dielectric losses of the divider capacitance. Between 100 MHz and 500 MHz,

the permissible voltage decreases inversely with the frequency from 1000 V to 210 V.

With the aid of the BNC adapter, the probe can also be used for measurements on coaxial systems (frequency range 100 kHz to 1 GHz). Use of the reducing sleeve supplied with the set permits the probe to be inserted into the adapter with the divider plugged on to it.

In measurements with the 40-dB divider (frequency range 1 to 500 MHz), the maximum measurable voltage is only limited by the permissible voltage (V_p = 500 V) and the power-handling capacity of the BNC connecting cables. Table 1 lists the power-handling capacity of the BNC cables and the voltage calculated from it as functions of the frequency.

Table 1

f/MHz	1	10	100	200	500
P_{max} /W	1300	410	130	82	42
V_{rms} /V	255	143	81	64	45

Low-reflection insertion units are available for high-accuracy measurements in coaxial systems. The 10-V Insertion Unit URV-Z2 comes with the characteristic impedances 50 and 75 Ω and the 100-V Insertion Unit URV-Z4 with 50 Ω. The 50-Ω insertion units can be fitted with an N plug and an N socket or with Dezifix B connectors. The 75-Ω insertion unit can only be fitted with Dezifix B connectors.

2.3.1.1 Input Impedance of Probe

Up to frequencies of approximately 20 MHz, the input impedance of the probe is equivalent to a capacitance of 2.5 pF shunted by an ohmic resistance whose value at room temperature is between 100 kΩ and 1 MΩ depending on the test voltage (Fig. 5; guaranteed value up to 10 MHz > 80 kΩ at room temperature). At higher frequencies, the resistive component of the input impedance decreases as the square of the frequency due to the input capacitance losses (Fig. 6).

The input capacitance is reduced to 1 pF through the 20-dB divider and to 0.5 pF through the 40-dB divider. The resistive component of the input impedance increases to several MΩ with the 20-dB divider and to above 10 MΩ with the 40-dB divider in the frequency range up to 20 MHz. At higher frequencies, the resistive component likewise decreases as the square of the frequency.

2.3.1.2 Waveform Weighting

The URV 4 reads out the rms value of sinusoidal voltages of any magnitude as long as they are within the measurement range of the set. In the case of other waveforms, however, the weighting is dependent on the magnitude of the voltage to be measured since the diode detector has a square-law response only at low voltages up to about 30 mV and consequently measures the true rms value only up to this value independent of the waveform of the test voltage. This range can be expanded to 3 V by means of the dividers supplied, i.e. the true rms value of an AC voltage can be measured over the range from 700 µV to 3 V. Table 2 lists the maximum permissible crest factor as a function of the magnitude of the test voltage at which the error of the measured rms value relative to the true rms value does not exceed 2 or 5%, respectively.

Table 2

	Measurement with probe and 10-V insertion unit			Measurement with probe, 20-dB divider and 100-V insertion unit			Measurement with probe and 40-dB divider		
Voltage	3 mV	10 mV	30 mV	30 mV	100 mV	300 mV	300 mV	1 V	3 V
Max. crest factor for weighting error of +2%	10	3	1.7	10	3	1.7	10	3	1.7
Max. crest factor for weighting error of +5%	13	4	2	13	4	2	13	4	2

With test voltages above 1 V (above 10 V using 20-dB divider or 100-V insertion unit or above 100 V using 40-dB divider), the diode detector acts as peak-value rectifier. As there is a full-wave rectifier built into the measuring heads, the peak-peak value is measured but the value $V_{pp}/2\sqrt{2}$ is read out. This corresponds to the readout of the rms value in the case of sinusoidal voltages.

Table 3 lists the maximum permissible crest factor for a weighting error of the peak-value rectifier of 2 and 5%, respectively, as a function of the magnitude of the test voltage.

Table 3

	Measurement with probe and 10-V insertion unit			Measurement with probe, 20-dB divider and 100-V insertion unit			Measurement with probe and 40-dB divider		
Voltage	1 V	3 V	10 V	10 V	30 V	100 V	100 V	300 V	1000 V
Max. crest factor for weighting error of -2%	2,2	4	8	2,2	4	8	2,2	4	8
Max. crest factor for weighting error -5%	3,8	8	15	3,8	8	15	3,8	8	15

2.3.2 Range Selection

After switching on, the URV 4 is automatically set to the mode AUTO with the correct range being fully automatically selected at maximum speed as a function of the test voltage. This operating mode normally remains switched on during all measurements. For special cases, such as series measurements where levels are always measured in the same range, autoranging can be switched off by pressing the pushbutton 11 (Fig. 1). The light in the pushbutton 11 goes off indicating that autoranging has been disabled. The subrange last selected is preserved. By pressing the pushbutton 12, the next higher subrange can be selected. If the highest subrange has already been selected (+40 dB), the pushbutton 12 is ineffective. By pressing the pushbutton 13, the next lower subrange can be selected. If the most sensitive subrange has already been selected (-40 dB), the pushbutton 13 is ineffective. To switch autoranging back on, press the pushbutton 11 again. The LED in the pushbutton 11 lights indicating that the mode AUTO has been selected. In this mode, the pushbuttons 12 and 13 are ineffective.

At a voltage readout of about 4000 autoranging switches to the next higher subrange and at a voltage readout of about 300 to the next lower subrange. These values correspond to the values +5 and -15 on the analog scale 1. If autoranging is switched off, the digital readout of the voltage measurement may go up to 10 000, the analog readout remains, however, at +5. If the limit of the dynamic range of the analog section is reached, the digital readout starts blinking to indicate that the measurement is incorrect. The digital readout also blinks when the values obtained are so small that the error limits are no longer guaranteed.

With autoranging, the digital readout blinks only at values exceeding the highest subrange or falling below the lowest subrange (-40 dB) since the subranges are always selected automatically according to the applied voltage to be measured. With manual range selection, the digital readout blinks at values exceeding or falling below the selected subrange.
For level measurements, autoranging should generally be switched on to avoid false measurements.

2.3.3 Selection of Type of Readout

The digital readout 4 (Fig. 1) is in V or mV for voltages and in dBm relative to 1 mW into 50 Ω for levels. The type of readout can be selected by means of the pushbutton 9. The type of readout changes each time the button is pressed. If, for example, the voltage is read out and the pushbutton 9 is pressed, the readout is switched over to level. If then the pushbutton 9 is pressed a second time, the voltage is read out again.

After the set has been switched on, the voltage is always read out.

The type of readout selected can be seen from the indication of the physical unit 6. If the voltage is read out, a dot lights up beside "V" or "mV" depending on the measurement range. If the level is read out, the dot beside "dB" lights.

2.3.4 Zeroing

Electrical zero need only be adjusted for voltage measurements in the most sensitive measurement range. This is necessary with all RF millivoltmeters using diode probes because the detected output voltage of the diode probes may be less than 1 µV.

An unwanted voltage at the input of the amplifier is added to the detected voltage causing an erroneous reading. Since the detected voltage of a diode detector is proportional to the square of the test voltage up to about 30 mV, the influence of this unwanted voltage is dependent on the magnitude of the test voltage. According to the square-law function, the voltage readout is given by

$$V_{readout} = \sqrt{V^2_{test} + V^2_{unwanted}}$$

where V_{test} is the AC voltage to be measured and $V_{unwanted}$ the indication obtained on the meter without test voltage due to inexact zeroing. Thus, an unwanted voltage of, say, 100 µV causes an error of about 0.5% at a test

voltage of 1 mV. Hence, zeroing is only required when voltages are to be measured in the most sensitive range.

NOTE: Only a positive deviation from zero is indicated. In the case of a negative deviation - regardless of its magnitude - the indication remains on "0" even though it also causes a measuring error.

For automatic zeroing of the set connect a measuring head to socket 14. No voltage must be present at the measuring head (preferably insert probe into BNC adapter to prevent stray pickup. Press pushbutton 10 and wait until automatic zeroing has been completed.

During this process, the digital readout 4 goes off and the LED in the pushbutton 10 lights. The zeroing process can be watched on the analog scale 1. Upon completion, the LED in the pushbutton 5 goes off and the digital readout lights again.

If during zeroing a voltage of greater than 0.5 mV is inadvertently applied to the measuring head, zeroing is not possible. The set will automatically return to the original zero and the LED in the pushbutton 10 blinks indicating that the zero adjustment has not been properly carried out. Repeat the zero adjustment after the test voltage has been removed.

The zeroing pushbutton 10 is only operative in the most sensitive subrange. In all other ranges, the pushbutton is electronically inhibited so that it does not respond if it is pressed, preventing inadvertent initiation of the zeroing process which would cut out all measurements while it lasts.

2.4 Remote Control

Sections 2.4 to 2.4.8.4 apply only to model 292.5012.03 of the URV 4 with built-in Option URV4-Z1 (IEC bus).

2.4.1 General

The URV 4 is fitted with a remote control connector according to IEC 625-1 (IEEE 488). It is the 24-pole female connector 17 (Fig. 1) on the rear panel of the instrument. The contact wiring can be seen from Table 12.

The interface functions provided in compliance with IEC 625-1 are SH1, AH1, T5, L4, SR1, RL1, PP0, DC1, DT0, C0 (Table 11). The characters used all belong to the common ASCII code (Table 13). Operation of the URV 4 within an IEC-bus system does not require full understanding of the functioning of

the interface. It is enough to know the program commands and the data output formats, which are explained in the following.

2.4.2 LOCAL - REMOTE Switchover

Switchover to remote control is automatically accomplished in the URV 4 by addressing it from the controller. The illuminated text ADDRESSED 3 (Fig. 1) and REMOTE 5 on the digital display indicate the status of the device. Push-button 8 permits the URV 4 to be switched over to local operation any time. Thus it is also possible to make manual measurements in between.

If the controller issues the command LOCAL LOCK OUT (Table 13, ASCII code; interface message LLO), the pushbutton LOCAL is also inhibited. It can only be cleared by the command DEVICE CLEAR (interface message SDC or DCL). The pushbutton-controlled function LOCAL is also programmable (interface message GTL).

2.4.3 Setting the Device Address

Listener and talker address are both set with the switch 16 (Fig. 1) on the rear panel of the URV 4 according to Table 10. The URV 4 is supplied with the listener address "&" and the talker address "F" set at the factory (corresponding to device address 6 when using the PPC).

2.4.4 Switching Over to TALK ONLY Operation

In addition to setting the device address, switch 16 (Fig. 1) on the rear panel of the URV 4 permits switchover to TALK ONLY operation. In this case, device addressing and calculator control are not necessary. The meter operates stand-alone and continually sends data via the IEC bus to other devices (listeners). The instrument is manually set.

2.4.5 Setting the Delimiter

The shorting socket BU11 on the IEC-bus interface board 333.7071 permits setting the delimiter to be output by the URV 4 upon termination of the data transfer. If the socket is inserted, the delimiter is CR (CARRIAGE RETURN) and if it is withdrawn, it is CR and LF (LINEFEED). The URV 4 is supplied with the delimiter CR set at the factory.

2.4.6 Programming

Each program command consists of the combination of a letter and a figure which describes the device function in mnemonic form (Table 9).

2.4.6.1 Button-controlled Functions

Table 4

Button	Program character	Function
< MAN > 13 and 12	R4 R3 R2 R1 RØ	Measurement range +40 dB Measurement range +20 dB Measurement range 0 dB Measurement range -20 dB Measurement range -40 dB
AUTO 11	A1 AØ	Automatic ranging on Automatic ranging off
NULL 10	N1	Automatic zeroing on Upon termination of automatic zeroing, automac resetting to NØ.
V/dB 9	V1 VØ	Voltage measurement Level measurement
LOCAL 8	GTL LLO (Table 13)	LOCAL button in on-position LOCAL button disabled (observe section 2.4.2).

2.4.6.2 Functions that cannot be set Manually

In addition to the button-controlled functions, other functions that are not manually settable can be programmed for remote operation, such as fast operation, zeroing with service request (SRQ), device status output, external triggering and conditional data output (Table 9 "Alphabetical list of all program characters").

Fast operation

In this mode of operation, the A/D converter operates at a ten times faster conversion rate. The data output and readout is, however, no longer 4 1/2 digits but only 3 1/2 digits. The digital display 4 (Fig. 1) always reads out a zero as the last figure.

The program characters are FØ for normal conversion rate (approximately 3 measurements/s) and 4 1/2-digit readout and F1 for fast operation.

Automatic zeroing with service request (SRQ)

The service request (SRQ) permits the controller in this mode of operation to address the URV 4 again immediately upon termination of automatic zeroing. A waiting loop for the maximum possible adjustment time or any other delay is, therefore, not required.

The status byte b7 signals the service request (SRQ) in a serial poll. The program character J1 causes the URV 4 to issue the service request upon termination of automatic zeroing and JØ permits the initial state to be programmed again.

After the POLL Statement of the controller in answer to the SERVICE REQUEST an UNLISTEN Statement is to be provided in the program((WBYTE 38,36: mit TEK 4051).

Device status output

To identify the device settings, eight corresponding program characters are added in clear text to the measured data output.

These program characters are given below in the order of their output:

R ... for selected range
A ... autoranging - on/off
V ... voltage-level measurement (V/dB)
F ... normal/fast conversion rate
T ... internal/external triggering
X ... data output - unconditional/after check
J ... service request after automatic zeroing - yes/no
N ... automatic zeroing - just activated/terminated or not programmed.

The program character PØ is used for data output without device status; with device status, P1 is used.

Internal/external triggering

Measurements by the URV 4 can be triggered internally or externally. The program character TØ is used for internal triggering. External triggering is programmed with T1. The URV 4 used in automatic test assemblies or systems will be programmed for external triggering, i.e. it will wait in HOLD operation until it receives the TALK command, then immediately begin with the measurement and transfer the data. In TALK ONLY operation, the URV 4 is programmed for internal triggering, i.e. the free-running URV 4 executes measurement after measurement and outputs the measured data.

Data output

The built-in microprocessor permits the choice between unconditional data output and data output after checking for the same result being obtained twice. This check is always made in fast operation independent of the programmed conversion time, i.e. the last digit is ignored in the comparison. If the same result is obtained twice, a further measurement is made with the programmed conversion time. The result of this measurement is then output. The program character XØ is used for unconditional data output and the character X1 for data output after checking for the same result being obtained twice.

2.4.6.3 State of the Programmed Functions at Switch-on

After switching on the URV 4, all operational buttons are cleared for manual operation, i.e. for LOCAL operation. Automatic ranging is switched on and the selected measurement range corresponds to the input voltage applied. The URV 4 operates in the mode "voltage measurement".

The data is output after checking for the same result being obtained twice and without device status. The data readout and output is 4 1/2 digits. Hence, the URV 4 operates with the normal conversion time and is internally triggered.

2.4.6.4 Group of Addressed and Universal Commands

According to the standard, all characters of the group of the primary commands (see Table 13, ASCII code) are programmable. Some of the commands used, such as GO TO LOCAL (GTL), LOCAL LOCKOUT (LLO) and DEVICE CLEAR (SDC, DCL) are explained in the sections 2.4.2 and 2.4.6.1.

2.4.7 Data Output

The format of the data output in mode of operation "voltage measurement" (program character V1) can be seen from the following example:

SPSPVSP 1.2345E±00CR,

where we have

- two spaces (SP)
- the unit of the measured data (V)
- one space (SP)
- one figure of the mantissa

the decimal point
four figures of the mantissa
the exponent symbol (E)
the exponent sign (+) or (-)
two figures of the exponent
the delimiter (CR)

SP and CR are the ASCII characters for space and carriage return (Table 13).

An example of the format of data output in the mode of operation "level measurement" (program character V0) is given below:

SPSPDB±012.34CR

where we have
two spaces (SP)
the unit of the measured data (DB)
the sign of measured data (+) or (-)
three figures of the measured data
the decimal point
two figures of the measured data
the delimiter.

If the measurement range is exceeded, as indicated by flashing of the digital display 4 (Fig. 1), the first two spaces (SP) of the data output are replaced by the characters OL (OVERLOAD). For example:

OLVSP1.2345E±00CR
OLDB±012.34CR.

If device status output is programmed (program character P1), the format of data output is as given by the following example:

SPSPVSP1.2345E±00;R3A0V1F0T0X1J0N0CR

where we have
two spaces (SP)
the unit of the measured data (V)
one space (SP)
one figure of the mantissa
the decimal point
four figures of the mantissa
the exponent symbol (E)
the exponent sign (+) or (-)

two figures of the exponent

a semicolon for separating measured data from device status

one program character (R3) for the measurement range
one program character (AØ) for the selected range
one program character (V1) for the mode of operation
one program character (FØ) for the conversion mode
one program character (TØ) for the state of triggering
one program character (X1) for the data output
one program character (JØ) for the service request (SRQ)
one program character (NØ) for automatic zeroing
and the delimiter (CR).

2.4.8 Program Examples for the Desk-top Calculator PPC

2.4.8.1 Programming of Device Setting

Task: Setting the URV 4 to mode of operation "level measurement" and measurement range +20 dB.

Solution: a) The URV 4 is supplied with the listener address "&" set at the factory. This corresponds to device address 6 when using the PPC (Table 10).

b) Table 9 lists the program characters for the various device functions. Accordingly, the program character AØ is used for switching off autoranging, R3 for measurement range +20 dB and VØ for mode of operation "level measurement".

c) Hence, the programming command reads: IECOUT6, "AØR3VØ"

2.4.8.2 Reading Out Test Result

Task: Reading out the test result without changing the setting of the URV 4.

Solution: a) The URV 4 is supplied with the talker address "F" set at the factory. This corresponds to device address 6 when using the PPC.

b) The test result can be entered in an ASCII string (e.g. A$) for further processing.

c) Hence, the programming commands read: IECTERM 13
IECIN 6, A$

2.4.8.3 Programming Addressed and Universal Commands

Task: Programming of command GO TO LOCAL (Table 13 ASCII code).

Solution: a) The URV 4 is supplied with the listener address "&" set at the factory. This corresponds to device address 6 when using the PPC.

b) Hence, the programming commands read:

```
IECLAD6
IECGTL
IECUNL
```

2.4.8.4 Device Status Transfer

Task: Entering device status in an ASCII string (e.g. C$), storing it and outputting it at a later time for device setting.

Solution: a) The URV 4 is programmed such that the measured data are output with the device status (program character P1).

b) Enter measured data and device status in an ASCII string (e.g. A$).

c) The device status is separated by program control and entered in C$.

d) Program example:

```
100 IECTERM 13
110 IECTIME 50
120 IECOUT 6, "P1"
130 IECIN 6, A$
140 K = 1
150 B$ = MID$(A$, K, 1)
160 IFB$ = ";" THEN 200
170 K = K + 1
180 GOTO 150
200 K = K + 1
210 C$ = MID$(A$, K, 18)
```

The program for device setting later on is as follows:

```
IECOUT 6, C$
```

3. Maintenance

The values given in this section are not guaranteed, only the specifications given in the data sheet are binding.

3.1 Measuring Instruments and Auxiliary Equipment Required

Ref. No.	o Type of instrument required, performance ratings • Recommended R&S instrument	Type designation	Order number	See section
1	o Digital voltmeter 0 to 1000 V			3.2.6
2	o Signal generator(s) 10 kHz to 1.6 GHz			3.2.1 3.2.3 3.2.4 3.2.5
	• Power Signal Generator 25 to 1000 MHz	SMLU	200.1009.02	
	• UHF Power Signal Generator 0.275 to 2.75 GHz	SLRD	100.4194.02	
3	o Power meter 10 kHz to 1.6 GHz with 50-Ω probe			3.2.4 3.2.5
	• Microwave Power Meter with 50-Ω Probe	NRS	100.2433.92 100.2440.50	
4	o Attenuator 50 Ω 0 to 1.6 GHz			3.2.1 3.2.2 3.2.3 3.2.4 3.2.5
	• Programmable Attenuator 50 Ω, 0 to 139.9 dB	DPVP	214.8017.52	
5	o Termination 50 Ω 0 to 1.6 GHz			3.2.1 3.2.2 3.2.3 3.2.4 3.2.5
	• Termination	RMC	100.2940.50	
6	• Process Controller	PPC	343.3510...	3.2.7

3.2 Performance Check

The underlined reference numbers used in the following for control knobs and terminals are conform to those used in the operating instructions (section 2.1) and in Figs. 1 and 2.

After a warm-up period of 10 minutes, the set reaches the performance specifications guaranteed at AC supply voltages deviating not more than ±10% from the nominal voltage. In battery operation, the performance specifications are met in the operating voltage range from 11 to 28 V.

Prior to performance checking adjust the electrical zero according to section 2.3.4. The measuring instruments required for performance checking are listed under 3.1.

3.2.1 Absolute-value Calibration

Note: Since the test signal is processed in the measuring head, the absolute-value calibration is to a slight degree also dependent on the measuring head used. If the indication deviates appreciably, the trouble source may be in the set itself or in the measuring head. At any rate, a correctly operating measuring head must be used for checking the absolute-value calibration.

Adjustment of the set

a) Make the adjustments at a temperature between 20 and 25°C.

b) Select AUTO mode and voltage measurement. When the set is switched on, AUTO mode and voltage measurement are automatically selected.

c) Connect the cable of the probe to socket 9 and plug the probe into the insertion adapter, which is to be terminated with 50 Ω at one end.

d) Apply AC voltage, accurately adjustable from 1 mV to 10 V (error < 0.1%), f = 10 MHz, to other end of insertion adapter. Distortion should be < 0.3%.

Performance check

Measure the voltage and - after pressing pushbutton 4 - the level at each of the test voltages listed in the following table. The test results read out on the digital display must be within the specified limits.

Table 5

AC voltage to be applied	Voltage measurement	Level measurement
	Permissible deviation of the digital indication on 1 from the value of the voltage applied	Level and permissible tolerance of the digital indication on 1
1.000 mV	±7%	-46.99 ±0.86 dB
10.00 mV	±4.3%	-26.99 ±0.46 dB
100.0 mV	±2.3%	-6.99 ±0.29 dB
1.000 V		-13.01 ±0.29 dB
10.00 V		+33.01 ±0.29 dB

3.2.2 Calibration of the Analog Indication

Adjustment of the set

a) Make the adjustments at a temperature between 20 and 25°C.

b) Select AUTO mode.

c) Connect the probe as described in section 3.2.1 c).

d) Apply defined adjustable (error < 1%) AC voltage of f = 10 MHz to the insertion adapter.

Performance check

The dot beside "0" must light on scale 1 and on scale 2 at a voltage of 223.6 mV.

3.2.3 Autoranging

Adjustment of the set

a) Make the adjustment at a temperature between 20 and 25°C.

b) Select AUTO mode and voltage measurement. When the set is switched on, AUTO mode and voltage measurement are automatically selected.

c) Connect the probe as described in section 3.2.1 c).

d) Apply AC voltage (f = 10 MHz) adjustable from 1 mV to 10 V to insertion adapter.

Performance check

Slowly increase input voltage from 1 mV watching the digital readout on 4 and the indication of the subranges on 2. When the digital readout on 4 reaches the value 3960, the next higher subrange should automatically be selected. The deviation from the nominal value of the switching points may be 50 steps. At an input voltage of 4 V, the set is in the highest subrange corresponding to +40 dB. Now slowly decrease the input voltage again until the subranges are switched over by autoranging. At 300 the next lower subrange should always be selected. Likewise, the deviation from the nominal value may be 50 steps.

3.2.4 Measurement of the Frequency Response of the Probe

Note: Particular care should be applied when measuring the frequency response on account of the bandwidth and sensitivity of the URV 4. Above all, short, matched connections are very important.

Since the frequency response of the URV 4 measuring heads is exclusively determined by the built-in measuring diodes and the mechanical design of the measuring head, the frequency response need only be checked if the measuring head has been repaired.

Adjustment of the set

a) Make the adjustments at a temperature between 20 and 25°C.

b) Select AUTO mode and voltage measurement.

c) Connect the probe as described in section 3.2.1 c) with the only difference that the insertion adapter is to be terminated with the 50-Ω probe of a power meter.

d) Calibrate the power meter with DC voltage.

e) Apply an AC voltage to the insertion adapter with frequency variable from 100 kHz to 100 MHz and distortion factor < 0.3% (use low-pass filter, if necessary).

Performance check

Adjust the amplitude of the AC voltage so that it gives the same deflection on the power meter as a DC voltage of 1.000 V. Check the digital readout on 4 of the URV 4. It should be within the limits specified in the Table 6.

Table 6

Frequency/MHz	Max. permissible deviation from the indication 1.000 V
0.1	±3.3%
1	±2.3%
100	±2.3%
200	±4.3%
500	±8.3%
1000	±19.3%

3.2.5 Measurement of the Frequency Response of the Insertion Units

Adjustment of the set

a) Ambient temperature same as in section 3.2.4.

b) Modes of operation same as in section 3.2.4.

c) Connect the cable of the insertion unit to be checked to socket 14 (Fig. 1) and terminate insertion unit at one end with 50-Ω probe of a power meter.

d) Calibrate power meter with DC voltage.

e) Feed AC voltage to other end of the insertion unit with frequency variable from 10 kHz to 2000 MHz and distortion factor < 0.3% (use low-pass filter, if necessary).

Performance check

Carry out performance check according to section 3.2.4. The digital readout on 4 should be within the limits specified in Table 7.

Table 7

Frequency	Maximum permissible deviation from the indication	
	1 V 10-V insertion unit	100 mV 100-V insertion unit
10 kHz	±2.3%	-
1 MHz	±2.3%	±2.3%
10 MHz	±2.3%	±2.3%
100 MHz	±2.3%	±2.3%
200 MHz	±3.3%	±3.3%
500 MHz	±6.3%	±6.3%
1000 MHz	±8.3%	±8.3%
1600 MHz	±16.3%	±16.3%
2000 MHz	±16.3%+)	±16.3%

+) Only with 50-Ω version

3.2.6 DC Output

Adjustment of the set

a) Make the adjustments at a temperature between 20 and 25°C.

b) Select AUTO mode and level measurement.

c) Connect probe and insertion adapter as described in section 3.2.1 c).

d) Feed AC voltage into other end of insertion adapter with f = 10 MHz.

e) Connect digital voltmeter to the output sockets 18 (Fig. 2).

Performance check

Readout on 4	Output voltage at 18
00.00 dB	0 V ±10 mV
+10.00 dB	+1 V ±10 mV

3.2.7 Remote Control

(applies only to model 292.5012.03 of URV 4)

All pushbutton-controlled functions and functions that cannot be set manually should be checked by means of a desktop calculator, such as PPC. The program commands required for this purpose are listed in Table 8. The correct data output can be checked at the same time (section 2.4.7).

The state of the URV 4 at switch-on is to be checked against Table 8. To this end, it is best to program the device only with the program character P1 after switching it on. The device status output furnishes all device settings.

Table 3

Function-oriented program character	Device function	State at switch-on
A1	Pushbutton AUTO 6	Autoranging switched on
F0	Conversion time	Normal conversion time; 4 1/2-digit display
J0	SRQ after automatic zeroing	No service request after automatic zeroing
N0	Pushbutton NULL 5	Automatic zeroing switched off
P0	Device status output	No output
R...	Pushbuttons < MAN > 7 and 8	Measurement range according to input voltage applied
T0	Triggering	Internal, device free-running
V1	Pushbutton V/dB 4	Mode of operation "V"
X1	Data output	After checking for the same result being obtained twice

The pushbutton LOCAL 8 should permit the URV 4 to be switched over to manual operation at all times (except if LOCAL LOCKOUT is programmed). Renewed application of the listener address automatically resets the device to REMOTE operation.

Check the performance of the indications ADDRESSED 3 and REMOTE 5. The ADDRESSED indication lights as long as the device is addressed as listener or as talker. REMOTE indication lights only if the device has been addressed

as listener. It is preserved until the LOCAL pushbutton is pressed or the command GO TO LOCAL (GTL) is programmed.

To check the performance of the switch ADDRESS 16, it suffices to take a number of setting examples from Table 10 and address the URV 4 accordingly by means of a desktop calculator. Then set again device address 6.

The TALK ONLY function is also controlled by means of switch 16. In this case, the URV 4 functions purely as a talker and continually outputs data. The device is set manually. No controller is required in this mode of operation.

3.3 Electrical Maintenance

Under normal operating conditions, the set does not require regular electrical servicing.

3.3.1 Replacement of the Diodes in the Probe

See Fig. 7

If the measuring diodes in the probe have been destroyed by an excessive input voltage, all four diodes must be replaced. A selected quad can be obtained from Rohde & Schwarz under the order number 243.9001. To replace the diodes, proceed as follows:

a) Push back the cable bushing.

b) Loosen Phillips-type screw.

c) Withdraw the probe sleeve in the direction of the cable.

d) Replace the quad GL1I - GL1IV (GL1I and GL1II red), GL1III + GL1IV gray) shown in Fig. 7 with the aid of a pair of tweezers.

!! No soldering, diodes are plugged in !!

If any soldering must be done in the measuring head, first remove the diodes from their sockets to protect them from inadmissibly high temperatures.

3.3.2 Replacement of the Diodes in the 10-V and 100-V Insertion Units

See Fig. 8

If the measuring diodes have been destroyed by an excessive input voltage, all four diodes have to be replaced. A selected quad can be obtained from Rohde & Schwarz under the order number 288.8304. To replace the diodes, proceed as follows:

a) Unscrew the cover with the engravings. All four diodes are now accessible.

b) Pull out the diodes GL1III (gray) and GL1IV (gray) towards the top. The diode leads are plugged into miniature sockets. They are not soldered in place.

c) Likewise, the diodes GL1I (yellow) and GL1II (yellow) are plugged into miniature sockets. First pull the lead facing the coaxial section out of the miniature socket toward the top. Then pull the diode towards the front which at the same time pulls the other lead out of the miniature socket located in the chamber partition wall.

d) For insertion of the new diodes, see Fig. 8.

4. Circuit Description

(See circuit diagrams 292.5929 S, 292.5558 S, 292.5470 S, 292.4751 S and 292.5012 S)

The operating principle of the URV 4 is based on the comparison of the output voltages of two detector circuits.

Besides a detector for measuring the RF voltage, a reference detector of similar design is provided in the probe or insertion unit, to which a reference AC voltage produced in the set is applied. The difference of the two detected voltages is taken to the chopper-stabilized DC voltage amplifier consisting of the chopper transistors T1 and T2 (292.5612 S), the amplifier T3 and B12, the synchronous detector B1, the transistor T4 and B13. Generator B10 supplies the switching voltage for the chopper amplifier and the synchronous detector. The boosted voltage passes via T5 and T8 to the attenuator R74 - R81. The transistors T5 and T8 act as a rectifier passing positive voltages and inhibiting negative voltages, thus keeping the control loop stable.

After attenuation according to the selected subrange, the output voltage is applied to the feedback circuit by means of FET switch B17. B2 transforms the attenuated DC output voltage into an amplitude-proportional 5-kHz squarewave AC voltage. The trigger voltage for B2 is derived from generator B3. The transformer TR2, capacitor C7 and the resistors R9 - R11 form a damped resonant circuit with a resonant frequency of 5 kHz, which transforms the 5-kHz squarewave voltage into a sinewave voltage. After amplification in the driver amplifier B1, the sinewave voltage is applied via transformer TR1 to the reference detector in the measuring head (probe or insertion unit). The gain of the driver amplifier can be varied with R8 to obtain full-scale reading on the meter.

On account of the high loop gain of the control circuit, the amplitude of the reference voltage is adjusted such that the difference of the detected voltages is zero except for a small offset. Since the diodes in the measuring and reference detectors are selected for matched characteristics, the rms values of the measured and the reference voltage having the same waveform are identical.

Through the feedback circuit, a proportional function between the DC output voltage and the rms value of a sinusoidal test voltage is established. As a result, the meter reading is proportional to the rms value of a sinusoidal test voltage. The measurement accuracy is exclusively determined by the matching of the characteristics of the four diodes used in the measuring head.

The measurement ranges are adjusted by means of the feedback attenuator R74 - R81 and the FET switch B17. The DC voltage passes via the FET switch B16 to the buffer amplifier B18 from where it is taken to the digital board for further processing.

The subrange control is accomplished via lines arriving from the digital board.

Automatic zeroing

The flip-flop consisting of two gates of B6 (292.5929 S) is activated after pressing pushbutton 5. It remains in this state until the zeroing process has been terminated. During automatic zeroing, the feedback circuit is cut off via the FET switch B17 and the chopper-stabilized amplifier is fed back via the FET switch B16 and the resistors R25 and R20. The counter module B4 and the resistors R28 - R38 form a digital/analog converter, the output voltage of which is used for zeroing. The generator B10 supplies the control voltage for the counter via the divider B9 and the gate circuit B8 and B6. The two comparators B14 and B15 monitor the zeroing process. Shortly before reaching zero, the count speed for B4 is reduced and with it the zeroing speed in order to enhance zeroing accuracy. After zero has been set, B14 cuts off the gate circuit B8 and inhibits the count pulses to B4. The flip-flop B6 is reset and the zeroing process is terminated. The state of the counter B4 and consequently the zero setting are preserved until another zeroing process is started. When the set is switched off and then on again, the counter B4 is reset and an auxiliary voltage is applied via R22. Thus the preset value which has been adjusted with R27 is obtained again.

Autoranging

The DC output voltage from the analog board is applied to the two range comparators B2 and B3 on the digital board (292.5558 S). If the range is exceeded or not reached, generator B12 is activated, which controls the up and down counter B10 via B19 and B18 and the FET switch B8. In the MAN mode, the FET switch B8 is cut off, disabling automatic ranging. The count of B10 is decoded in B11 and passed on to the range switch. In the MAN mode, the count pulses for B10 are derived from the pushbuttons 7 and 8.

Logarithmizer

The logarithmizer is a conventional circuit formed by amplifiers B1, B4 and the dual transistor T1 (292.5558 S). The output voltage of this logarithmizer

is supplied to the analog indication 10. The adder B5 adds an additional voltage according to the subrange selected via the FET switches B6 and B7 to compensate for the switchover of the subranges on the analog board. The regulator module B9 supplies the necessary reference voltage.

Analog/digital converter

The analog-digital converter consists of the two LSI modules B14 and B15 (292.5558 S). The necessary clock pulse for the A/D converter is supplied by the generator B13.

FET switch B7II connects either the output voltage of the analog board or the logarithmic voltage to the A/D converter via resistive dividers. Accordingly, either the voltage in V or mV or the level in dB is indicated.

Indication

The indicated value is obtained from the bit-parallel and digit-serial output of the A/D converter. The BCD 7-segment decoder B6 and the digit drivers B8 and B9 are provided on the display board. They drive the 7-segment indicators B12 - B16. The decimal point is driven by the transistors T3 - T5 and the LEDs for the subrange indication by the driver B7.

The analog indication is controlled by the two circuits B10 and B11. They drive the indicator diodes GL13 - GL43.

Bouncing of the control buttons S2 - S6 is eliminated by the flip-flops B1 and B2. The two flip-flops of B3 are the selector switches for autoranging and for voltage or level measurement. Both flip-flops are preset when switching on the set by means of the trigger pulse which is produced by B5.

Power supply

The operating voltage for AC supply operation is derived via TR1 and GL1 while the battery voltage for battery operation is directly connected in parallel with the rectifier GL1 via the diode GL2, which provides protection against confusing the poles. The on/off switch of the set is provided at the low-voltage end after rectification and is, therefore, also effective in battery operation. The different operating voltages for the set are produced with the aid of the switch control B1 by means of the driver transistors T1 and T2 as well as the transformer TR2. After rectification, the pre-stabilized voltage thus obtained is regulated in the regulator B2 and the transistors T3 and T4 to obtain the stable operating voltages of +15 V and -15 V. The output of the driver amplifier B3 is available at the DC output.

4.1 IEC Interface (Option URV 4-Z1)

See circuit diagram 333.7071 S

The IEC-bus board provides the URV 4 with an interface according to IEC 625-1 (IEEE 488).

The functions line driver, input buffer and line termination by resistor networks are performed by the modules B1 to B4. The interface functions proper, such as handshake, addressing, etc. are implemented by the special module B6 and the device-dependent interface functions by microprocessor B11. In addition to the microprocessor, the I/O modules B12 and B13 are provided to handle the diversified control and data transfer tasks.

The clock generator consisting of Q1, B10 and B24 supplies a 6-MHz clock to the microprocessor and a 1.5-MHz clock to the special module B6.

Moreover, the 1.5-MHz clock is used to enter the settings of the address switch (device address, TALK ONLY mode), the LOCAL pushbutton function (RETURN TO LOCAL) and the SERVICE REQUEST (SRQ) via the shift register B7 and B8 into B6. Upon switching on the URV 4, B9 in conjunction with C1-R3 produces a pulse which resets the microprocessor B11 and the special module B6.

By withdrawing the shorting socket BU6 (Fig. 12), a test program is initiated which permits a quick software and hardware check of the IEC-bus board (section 5.2.5). The shortcircuit socket BU11 (Fig. 12) permits the delimiter which terminates the data transfer to be changed (section 2.4.5).

When using the Tektronix desktop calculator TEK 4051 as controller, $\overline{\text{REN}}$ must be set to H level. To do so, relocate the shorting socket BU13 (Fig. 12) closer to the front panel.

The optical couplers B15 to B21 provide safe isolation between the URV 4 and the IEC bus. Also for reasons of safe isolation, the operating voltage (+5 V) for the IEC-bus board is derived directly from the supply voltage by means of a switching power supply consisting of B22-T1-T2.

Isolation is achieved by means of TR2 provided on the power supply board of the URV 4.

5. Repair Instructions

The values given in this section are not guaranteed, only the specifications given in the data sheet are binding.

The component parts used in the URV 4 are carefully selected and the set itself is subjected to a rigid examination prior to delivery. Failures are, therefore, not very likely to occur. In the case of a failure, however, refer to the following to locate the trouble source:

a) Circuit description - section 4

b) Circuit diagrams with voltage and resistance specifications

c) Section 5.2 in which the checking of the various functional groups is described.

All component parts are readily accessible. Loosen the Phillips screws on either side of the set to remove the upper and the lower cover. The PC boards can be swung out after pressing on the locks A (Figs. 9 and 10). Thus, it is possible to gain access to the printed side of the boards. The set can also be operated with the PC boards swung out. All connections between the PC boards are of the plug-in type, i.e. the individual PC boards can be completely removed from the set after removing two retaining screws. Likewise, the PC board carrying the indicating elements and the operating pushbuttons can be readily removed from the set. To do so, swing out the PC board above it and shift the two locks approximately 1 cm away from the front panel. Then press the slotted plastic supports together by means of a pair of flat-jaw pliers and at the same time push the PC board back. When it has come off all supports, it can be removed from the top.

The power supply forms a separate unit. It can be removed after loosening four Phillips screws.

On the analog board and on the digital board is a 16-pole test socket to which all important test points are taken. This simplifies electrical diagnosis. The test socket on the analog board is designated Bu1 and that on the digital board Bu9.

Use only replacement parts of the same type and equal quality. For the necessary ordering information. refer to the respective parts lists.

5.1 Measuring Instruments and Auxiliary Equipment Required

Ref. No.	o Type of instrument required, performance ratings • Recommended R&S instrument	Type designation	Order number	See section
1	o Digital voltmeter 0 to 1000 V			5.2.1 5.2.2 5.2.3 5.2.4 5.3.1 5.3.2 5.3.3 5.3.4 5.3.5 5.3.7
2	o Signal generator(s) 10 kHz to 1.6 GHz • Power Signal Generator 25 to 1000 MHz • UHF Power Signal Generator 0.275 to 2.75 GHz	 SMLU SLRD	 200.1009.02 100.4194.02	5.3.4 5.3.5 5.3.6 5.3.7 5.3.8
3	o Multimeter			5.2.1
4	o Frequency counter			5.2.2 5.2.4 5.3.7
5	o Oscilloscope			5.3.7
6	• Process Controller	PPC	343.3510...	3.2.7
7	Hewlett-Packard Signature Analyzer	5004 A		5.2.5

5.2 Trouble Shooting

This section covers all measurements, performance data and settings required for performance checking of the individual subassemblies and ensuing trouble shooting and repair, if necessary.

The position of the adjusting elements can be seen from Figs 9 and 10.

The specifications for the various performance checks are generally based on the assumption that the subassembly concerned and all subassemblies functionally linked with it are properly operating.

Unless stated otherwise, the current and voltage specifications apply to the nominal operating voltage (220 V or 110 V or 12 V (DC supply)). All voltages are measured at high impedance to the reference potential of 0 V.

Following a repair on the URV 4 make performance check according to section 3.2 to make sure that the meter is functioning properly.

5.2.1 Power Supply

See circuit diagram 292.4751 S and component location plan 292.4751

Power transformer

The secondary voltage of the power transformer at open-circuit and nominal voltage is V_{rms} = 20 V ±5%.

Voltage converter

The operating frequency of the voltage converter is approximately 20 kHz. The control voltage for the switching regulator B1 is derived via an auxiliary winding and G13. The output voltage of the regulator and, consequently, the operating voltage of +5 V is adjusted by means of R12. The load at the operating voltage of +5 V should be approximately 200 mA.

The operating voltages +15 V and -15 V are stabilized by the regulator B2 and the transistors T3 and T4. The nominal load is approximately 50 mA.

5.2.2 Digital Board

See circuit diagram 292.5558 S and component location plan 292.5558

A/D converter

The clock generator for the A/D converter is accessible at test socket 9 contact 2. The clock signal has an amplitude of +5 V and a frequency of approximately 200 kHz in the ranges -20 dB to +40 dB and approximately 60 kHz in the range -40 dB. The input voltage of the A/D converter for an indication of 1000 is approximately 100 mV. The input voltage can be measured at socket 9 contact 1.

Logarithmizer

The logarithmizer consists of the amplifiers B1 and B4 and the dual transistor T1. At an input voltage of 70.7 mV, the output voltage at B4 must be 0 V. The gain of the logarithmizer is 100 mV/dB. Hence, at an input voltage of 2.236 V, the voltage at the output of B4 must be +3 V.

Adder

To the output voltage of the logarithmizer, a voltage is added according to the subrange selected. The addition voltage can be measured at socket 8 contact 4.

Range	Voltage at Bu9.4
+40 dB	0 V
+20 dB	0.9523 V
0 dB	1.9047 V
-20 dB	2.8571 V
-40 dB	3.8095 V

The logarithmic output voltage of the adder is available at socket 9 contact 9. Since the output voltage is further offset by 1 V through R51, the relations obtained in the +40-dB range are as follows: At an input voltage of 22.36 mV, the voltage at Bu9.9 should be 0 V and at an input voltage of 2.236 V, it should be -4 V.

Range comparators

The output voltages of the range comparators B2 and B3 can be measured at socket 9 contact 5 (low comparator) and at socket 9 contact 8 (high comparator). If the input voltage falls below 300 mV, the low comparator must respond and if the input voltage exceeds 3.95 V, the high comparator must respond. As long as one of the two comparators is active, generator B12 must deliver a clock of about 20 Hz to socket 9 contact 3.

Range counter

The count pulses for the range counter are available at socket 9 contact 15. They are - depending on the selected mode - either derived from the range comparators by means of the clock generator or from the range buttons in manual operation. The signal for range counter B10, which determines upwards or downwards counting, is available at socket 9 contact 16. Further upwards

counting is prevented by the gate circuit B20 after the highest range of +40 dB has been reached.

5.2.3 Display Board

See circuit diagram 292.5470 S and components location plan 292.5470

Analog indication

The two modules B10 and B11 control the 31 LEDs GL13 - GL43 of the analog indication. The input voltage range of the analog indication is 0 to +4 V. At an input voltage of +3 V, the indication must be 0 dB, i.e. the diode GL38 must light.

Pushbutton functions

The modules B1 and B2 eliminate pushbutton bouncing. These flip-flops can be inhibited through a common line.

Trigger pulse

When the set is switched on the gate of B5 supplies a high pulse of about 200 ms duration. This pulse sets the URV 4 to a defined initial state.

5.2.4 Analog Board

See circuit diagram 292.5612 S and components location plan 292.5612

Chopper generator

A symmetrical squarewave AC voltage of about 22 Hz is available at the outputs of generator B10.

Reference generator

Generator B3 supplies a symmetrical squarewave AC voltage with a frequency of 5 kHz and an amplitude of +15 V for the reference generator. The DC input voltage of the reference generator is available at the test socket Bu1 contact 13 and the AC output voltage of 5 kHz is available at socket 1 contact 5. At a DC input voltage of 1 V at Bu1.13, the AC output voltage of the reference generator at Bu1.5 must be about 300 mV (NOTE: output impedance at the test socket Bu1.5 = 10 kΩ).

Feedback attenuator

The feedback attenuator for range switching is provided between the amplifier output, which is accessible at Bul.11, and the reference generator, whose input is connected to Bul.13. In the ranges +40 dB and +20 dB no division takes place. In the range 0 dB, the division factor is 10, in the range -20 dB 100 and in the range -40 dB 1000.

Comparators for automatic zeroing

The comparators B14 and B15 control automatic zeroing. The input voltage for the two comparators is available at Bul.14. The outputs of the comparators are connected to Bul.2 and Bul.16. If the voltage at Bul.14 is higher than 1.7 V, the two outputs of the comparators must be at 0. If the voltage at Bul.14 is slowly reduced, the comparator B15 and consequently the voltage at Bul.16 must first change over to "high" at a voltage of about 1.35 V. If the voltage at Bul.14 is further reduced, B14 and consequently the voltages at Bul.2 must also change over to "high" at a voltage of about 0.4 V.

Automatic zeroing

Upon switching on the URV 4, automatic zeroing is reset and the zero adjusted to the preset value. The voltage at Bul.12 must now be +15 V. When automatic zeroing is activated, the flip-flop B5 is reset and instead of the current through R22, the zeroing current is supplied by the counter B4 and the resistors R28 - R38. During the zeroing process, the count frequency of the zeroing counter can be checked at Bul.3. It must at first be approximately 11 Hz and, after the first comparator stage has been reached, i.e. after the voltage at Bul.16 has changed over to +14 V, drop to 3 Hz until the zeroing process has been terminated. During the zeroing process, the voltage at Bul.15 drops to 0 V. After the zeroing process has been terminated, the voltage at Bul.15 is again +15 V.

Display blanking

The diode network GL6 - GL10 prevents overdriving of the chopper-stabilized amplifier. Upon exceeding the overdriving capacity, T6 supplies a blinking clock to the display to indicate overdriving.

5.2.5 IEC-bus Board

See circuit diagram 333.7071 S

The close interaction between the microcomputer and the special module B6 would seem to make trouble shooting extremely complicated without knowledge of the complex system and the program sequence. The built-in test program and use of a signature analyzer permit, however, quick error location.

Several initial checks must be made:

Clock generator

A 5-V squarewave voltage should be present at the following points:

B11/2	=	6 MHz
B11/3	=	6 MHz
B 6/31	=	1.5 MHz
B 7/10	=	1.5 MHz
B 8/10	=	1.5 MHz

The information read in with the aid of the shift registers B7 and B8 should be available at B6/9.

After switching on the URV 4, a certain time delay (approximately 0.25 s) must be allowed for before pin 12 of B6 goes low and pin 4 of B11 goes high.

Signature analysis

Connect the signature analyzer to the IEC-bus board of the URV 4 as follows:

start to B11/38
stop to B11/38
clock to B11/3
ground to B11/20

Triggering:

start with falling edge (⌐¬)
stop with rising edge (¬⌐)
clock with rising edge (¬⌐)

Withdraw the shorting socket BU6 which switches the device over to the test program. The program is started upon switching the URV 4 on again.

The signatures entered in the circuit diagram are compared with the signatures measured at the check points. Deviations signify errors which are thus immediately located.

5.3 Adjustment Procedures

See Figs. 9 and 10

5.3.1 Operating Voltage

a) Measure operating voltage at ST6.1 to ST6.2

b) Set operating voltage to +5 V ±10 mV by means of R12.

c) Measure operating voltage at ST6.7 to ST6.6 (⊥).

d) Set to +15 V ±10 mV by means of R21.

5.3.2 Reference Voltage

a) Measure voltage at test socket BU9.11 (digital board).

b) Set to +10 V ±2 mV by means of R59.

5.3.3 Adder

a) Select range -40 dB.

b) Measure voltage at BU9.6.

c) Set to +3.8095 V ±1 mV by means of R58.

5.3.4 A/D Converter

a) Set the URV 4 to voltage measurement mode.

b) Select the +20-dB range.

c) Measure the voltage at BU9.13 to BU9.10.

d) Apply an input voltage of about 2.5 V and about 10 MHz via a measuring head to the URV 4.

e) Vary R34 until the URV 4 reads the same value ±1 digit as measured under c).

5.3.5 Logarithmizer

a) Select the +20-dB range.

b) Measure voltage at BU9.9.

c) Measure the voltage at BU9.13 to BU9.10.

d) Apply variable input voltage to the URV 4.

e) With a voltage of +70.704 mV at BU9.13 adjust voltage at BU9.9 to +1 V ±1 mV by means of R43.

f) With a voltage of +2.236 V at BU9.13 adjust voltage at BU9.9 to -2 V ±1 mV by means of R39.

g) With a voltage of +7.07 mV at BU9.13 adjust voltage at BU9.9 to +3 V ±1 mV by means of R62.

Repeat steps e) to g).

h) Select range 0 dB and voltage measurement mode.

i) Set input voltage so as to obtain an indication of 223.6 mV on the URV 4.

k) Switch over to level measurement mode.

l) Adjust R43 for indication 0 dB (only slight adjustment required).

5.3.6 Analog Indication

a) Select range 0 dB and level measurement mode.

b) Apply input voltage via measuring head so as to obtain a digital readout of 0 dB.

c) Adjust analog indication to 0 dB by means of R71.

5.3.7 Reference Generator

a) Select +20-dB range and voltage measurement mode.

b) Apply voltage with f = 1 MHz and V_{rms} = 1 V to measuring head.

c) Adjust R18 (analog board) for minimum digital readout on the URV 4. Make minimum adjustment as exact as possible.

d) Remove test voltage and turn R27 fully clockwise.

e) Adjust R85 for zero indication.

f) Measure voltage at BU1.14 by means of oscilloscope.

g) Adjust for minimum AC voltage component (approximately 22 Hz) by means of R42.

h) Turn R27 slowly counterclockwise until the output voltage at BU1.11 rises. Then back off clockwise until the output voltage is just zero.

(NOTE: To make this adjustment, automatic zeroing must not have been used after switching on the set.)

5.3.8 Absolute-value Calibration

a) Select +20-dB range and voltage measurement mode.

b) Apply voltage with a frequency of 1 MHz, an amplitude of V_{rms} = 1 V ±1 mV and a distortion factor of < 0.3% to measuring head.

c) Adjust R8 for an indication of 1.000 V on the URV 4.

d) Remove input voltage and select -40-dB range.

e) Recheck electrical zero according to 5.3.7 h).

f) Apply AC voltage with a frequency of 1 MHz and an amplitude of 1 mV to probe.

g) Adjust R16 for an indication of 1.000 mV on the URV 4.

Table 9

Alphabetical list of all program characters

Definition	Program character	State after switching on *)
Button AUTO 11 off, ranging MAN	AØ	
Button AUTO 11 on, ranging AUTO	A1	*
Fast conversion off (4 1/2-digit readout)	FØ	*
Fast conversion on (3 1/2-digit readout)	F1	
Automatic zeroing without service request (SRQ)	JØ	*
Automatic zeroing with service request (SRQ)	J1	
Automatic zeroing off	NØ	*
Automatic zeroing on	N1	
Device status - output NO	PØ	*
Device status - output YES	P1	
Measurement range - 40 dB	RØ	
Measurement range - 20 dB	R1	
Measurement range 0 dB	R2	
Measurement range + 20 dB	R3	
Measurement range + 40 dB	R4	
Triggering INTERNAL	TØ	*
Triggering EXTERNAL	T1	
Mode of operation dB	VØ	
Mode of operation V	V1	*
Data output, unconditional	XØ	
Data output after checking for the same result being obtained twice	X1	*

*) The command. "device clear" restores the state after switching on.

Table 10

List of addresses

Switch setting of S1					Listener address (ASCII)	Talker address (ASCII)	Device address when using the TEK 4051
S1.1	S1.2	S1.3	S1.4	S1.5			
0	0	0	0	0	SP	@	0
1	0	0	0	0	!	A	1
0	1	0	0	0	"	B	2
1	1	0	0	0	#	C	3
0	0	1	0	0	$	D	4
1	0	1	0	0	%	E	5
0	1	1	0	0	&	F	6
1	1	1	0	0	'	G	7
0	0	0	1	0	(	H	8
1	0	0	1	0	)	I	9
0	1	0	1	0	*	J	10
1	1	0	1	0	+	K	11
0	0	1	1	0	,	L	12
1	0	1	1	0	-	M	13
0	1	1	1	0	.	N	14
1	1	1	1	0	/	O	15
0	0	0	0	1	0	P	16
1	0	0	0	1	1	Q	17
0	1	0	0	1	2	R	18
1	1	0	0	1	3	S	19
0	0	1	0	1	4	T	20
1	0	1	0	1	5	U	21
0	1	1	0	1	6	V	22
1	1	1	0	1	7	W	23
0	0	0	1	1	8	X	24
1	0	0	1	1	9	Y	25
0	1	0	1	1	:	Z	26
1	1	0	1	1	;	[	27
0	0	1	1	1	<	\	28
1	0	1	1	1	=	]	29
0	1	1	1	1	>	^	30
1	1	1	1	1	------ Not permissible -----		

Table 11 - Interface functions according to DIN IEC 66.22 (IEEE 488)

Abbreviation	Interface function
SH1	Source handshake, complete capability
AH1	Acceptor handshake, complete capability
T 5	Talker, reply-to-serial-poll, Talk Only mode
L4	Listener
SR1	Service request, complete capability
RL1	Remote/local, complete capability
PPØ	Parallel poll, no capability
DC1	Device clear, complete capability
DTØ	Device trigger, no capability
CØ	Controller, no capability

Table 12

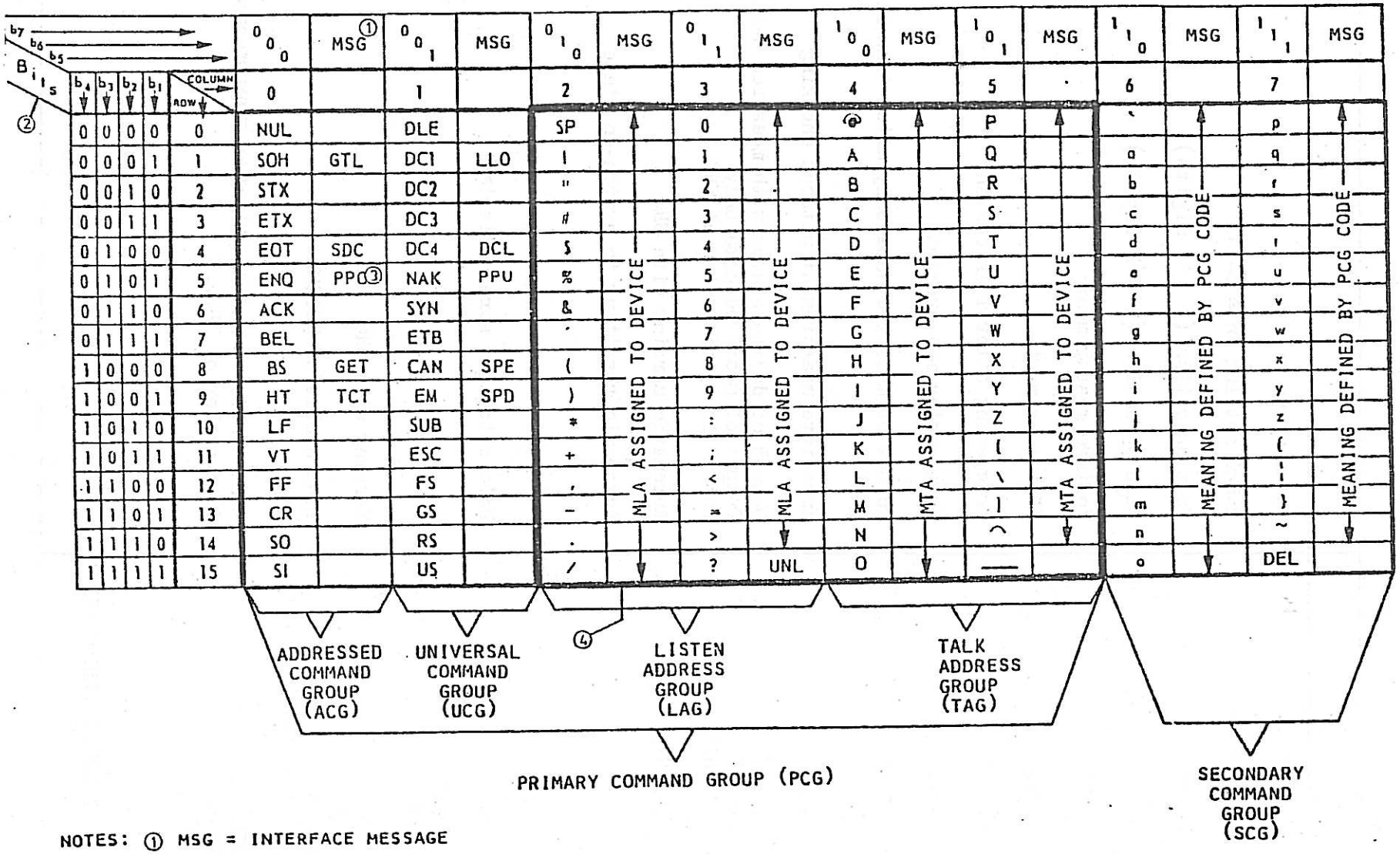
Contact allocation of programming connector

Contact	Line
1	DIO 1
2	DIO 2
3	DIO 3
4	DIO 4
5	EOI
6	DAV
7	NRFD
8	NDAC
9	IFC
10	SRQ
11	ATN
12	Shield
13	DIO 5
14	DIO 6
15	DIO 7
16	DIO 8
17	REN
18	⊥ (6)
19	⊥ (7)
20	⊥ (8)
21	⊥ (9)
22	⊥ (10)
23	⊥ (11)
24	⊥

Table 13

ISO 7-Bit-Code (ASCII-Code)

(SENT AND RECEIVED WITH ATN=1)



b_7 b_6 b_5 →	0 0 0	MSG ①	0 0 1	MSG	0 1 0	MSG	0 1 1	MSG	1 0 0	MSG	1 0 1	MSG	1 1 0	MSG	1 1 1	MSG
$B_{i\,1\,5}$ ② b_4 b_3 b_2 b_1 COLUMN → / ROW ↓	0		1		2		3		4		5		6		7	
0 0 0 0	0	NUL		DLE		SP		0		@		P		`		p
0 0 0 1	1	SOH	GTL	DC1	LLO	!		1		A		Q		a		q
0 0 1 0	2	STX		DC2		"		2		B		R		b		r
0 0 1 1	3	ETX		DC3		#		3		C		S		c		s
0 1 0 0	4	EOT	SDC	DC4	DCL	$		4		D		T		d		t
0 1 0 1	5	ENQ	PPC ③	NAK	PPU	%		5		E		U		e		u
0 1 1 0	6	ACK		SYN		&		6		F		V		f		v
0 1 1 1	7	BEL		ETB		'		7		G		W		g		w
1 0 0 0	8	BS	GET	CAN	SPE	(		8		H		X		h		x
1 0 0 1	9	HT	TCT	EM	SPD	)		9		I		Y		i		y
1 0 1 0	10	LF		SUB		*		:		J		Z		j		z
1 0 1 1	11	VT		ESC		+		;		K		[		k		{
1 1 0 0	12	FF		FS		,		<		L		\		l		|
1 1 0 1	13	CR		GS		-		=		M		]		m		}
1 1 1 0	14	SO		RS		.		>		N		^		n		~
1 1 1 1	15	SI		US		/		?	UNL	O		_		o		DEL

MLA ASSIGNED TO DEVICE

MLA ASSIGNED TO DEVICE

MTA ASSIGNED TO DEVICE

MTA ASSIGNED TO DEVICE

MEANING DEFINED BY PCG CODE

MEANING DEFINED BY PCG CODE

ADDRESSED COMMAND GROUP (ACG)

UNIVERSAL COMMAND GROUP (UCG)

④

LISTEN ADDRESS GROUP (LAG)

TALK ADDRESS GROUP (TAG)

PRIMARY COMMAND GROUP (PCG)

SECONDARY COMMAND GROUP (SCG)

NOTES: ① MSG = INTERFACE MESSAGE

② b_1 = DIO1...b_7 = DIO7

③ REQUIRES SECONDARY COMMAND

④ DENSE SUBSET (COLUMN 2 THROUGH 5)

Table 14 URV 4 Control Commands

The URV 4 is supplied from the factory with the address setting 6 (binary 00110).

Command	Explanation
IECOUT 6,"A1"	Autoranging on
IECOUT 6,"AØRn"	Range setting (n = Ø-4)
IECOUT 6,"F1"	Fast operation (3 1/2 digits)
IECOUT 6,"FØ"	Slow operation (4 1/2 digits)
IECOUT 6,"V1"	Voltage measurement
IECOUT 6,"VØ"	dB measurement
IECOUT 6,"T1"	Triggering after Talk command
IECOUT 6,"TØ"	Freerunning measurement
IECOUT 6,"X1"	Output of measured data only after transient period
IECOUT 6,"XØ"	Immediate measurement without checking
IECOUT 6,"P1" IECOUT 6,"PØ" IECOUT 6,"JØN1"	Output of device status with measured data Output of measured data only Automatic zeroing without SRQ
IECOUT 6,"J1N1"	Automatic zeroing with SRQ
IECLAD 6	Automatic resetting to switch-on state
IECSDC IECUNL	
IECTERM 13 IECTIME 50 IECIN 6,A$ PRINT A$	Data entry and screen display
IECTERM 13 IECTIME 5Ø IECSRQ GOTO... IECOUT 6,"XØJ1N1" Z=0 IF Z=2 THEN... V%=0: GOTO... IECSPL 6,V% Z=2 IECRETSRQ	Zeroing with SRQ Line number of IECSPL Line number of PRINT "ZEROING TERMINATED" Line number of IF...
PRINT "ZEROING TERMINATED" STOP	

ROHDE&SCHWARZ
MÜNCHEN

Bilder
Figures

R 29500 Bl. 1

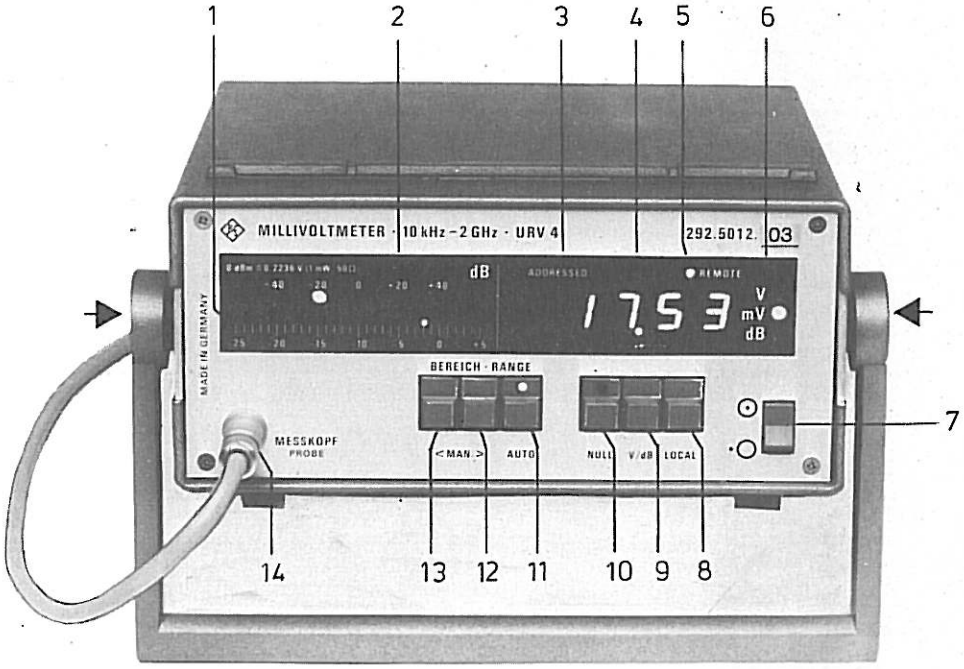


Bild 1 Frontansicht
Fig. 1 Front view

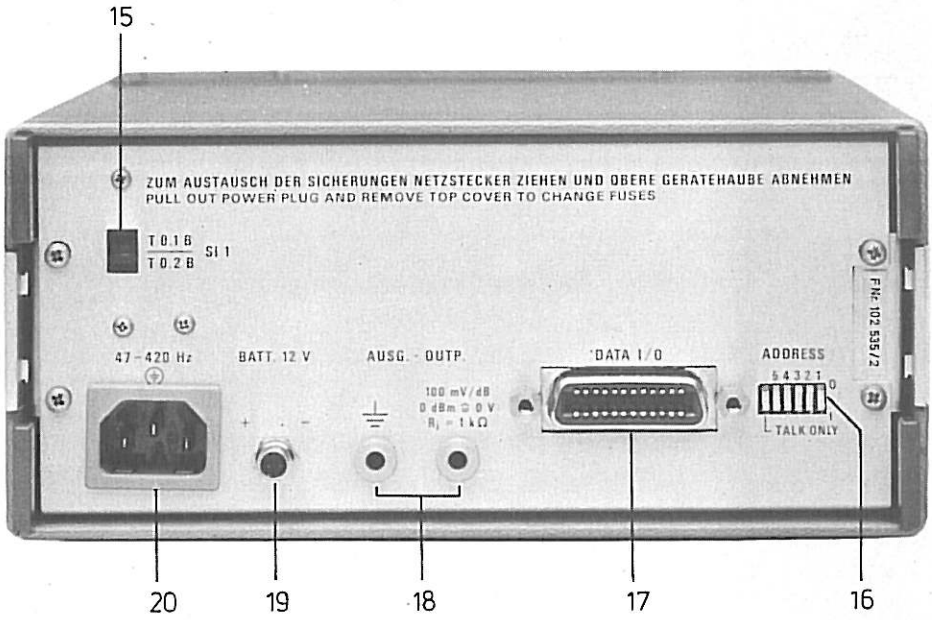


Bild 2 Rückansicht
Fig. 2 Rear view

Die mit URV-Z3 oder URV-Z6 bezeichneten Teile sind empfohlene Ergänzungen, die nur auf besondere Bestellung geliefert werden.

URV-Z3 and URV-Z6 are recommended extras which are supplied on special request only

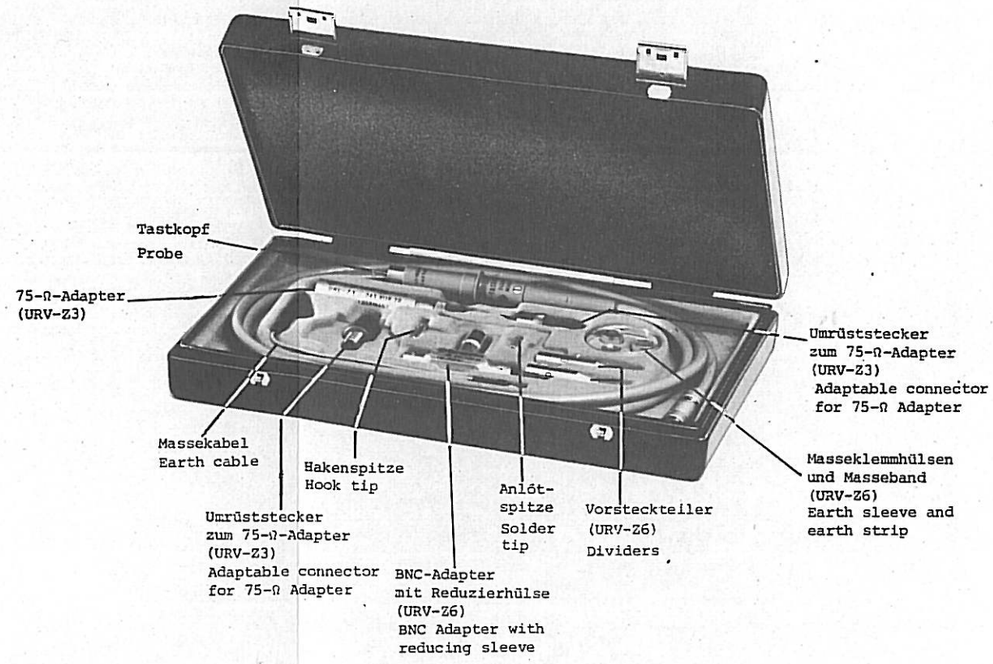


Bild 3 Zubehöretui
Fig. 3 Accessory kit

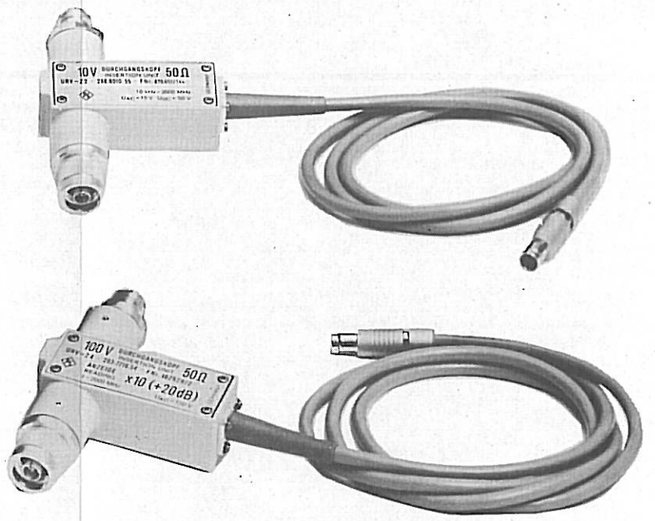


Bild 4 Durchgangsköpfe
Fig. 4 Insertion units

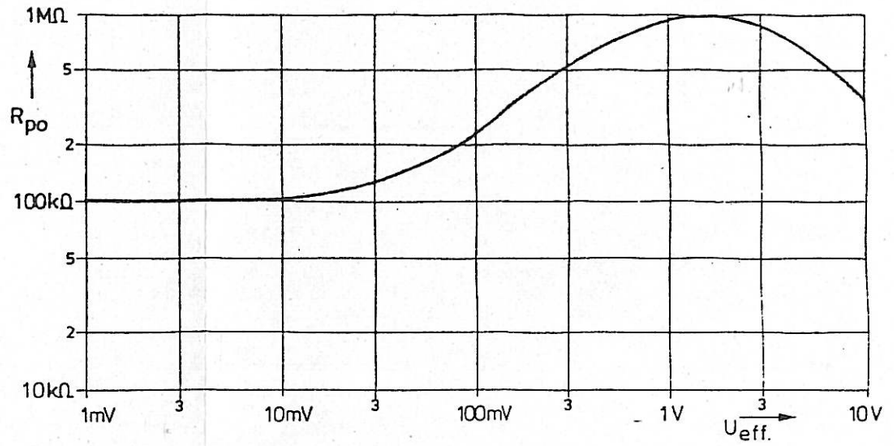


Bild 5 Eingangswiderstand R_{po} für f ‹ 3 MHz, typische Abhängigkeit von der Meßspannung (Sinus)

Fig. 5 Input resistance R_{po} for f ‹ 3 MHz as a typical function of the test voltage (sinewave)

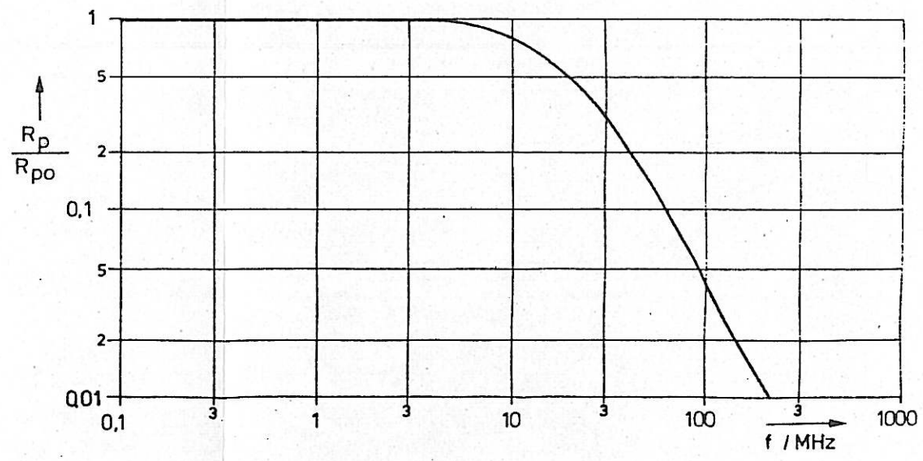


Bild 6 Typische Frequenzabhängigkeit des Eingangswiderstandes R_p bezogen auf den Eingangswiderstand R_{po} für tiefe Frequenzen

Fig. 6 Typical frequency function of the input resistance R_p relative to the input resistance R_{po} at low frequencies

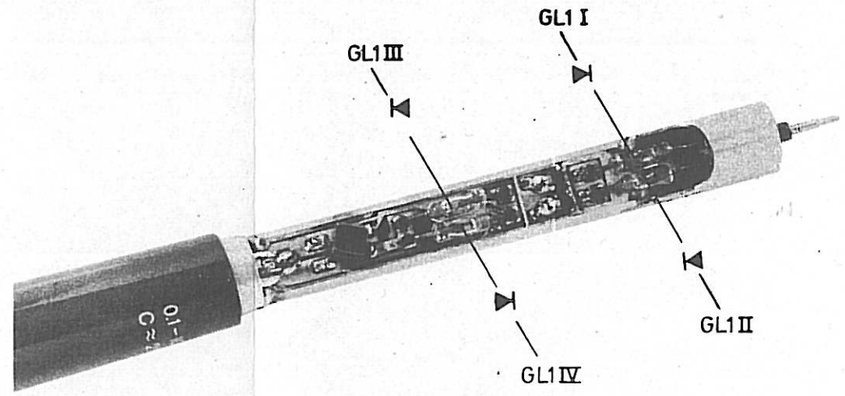
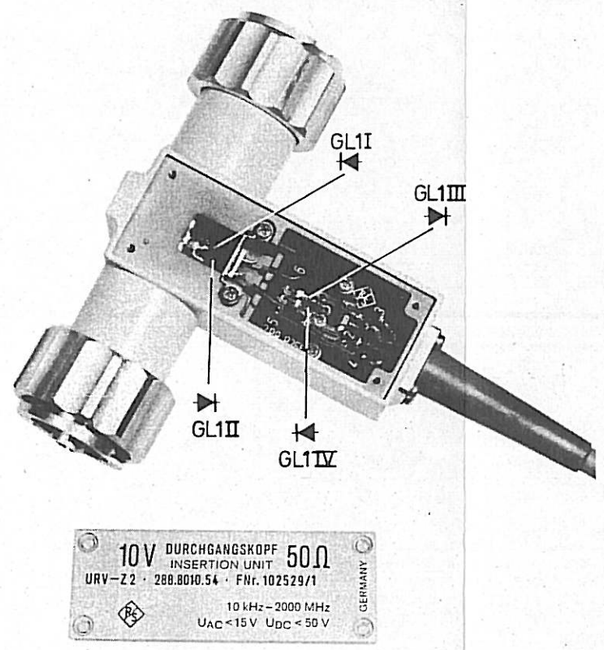


Bild 7 HF-Tastkopf; Lage der Dioden

Fig. 7 RF probe; location of diodes.



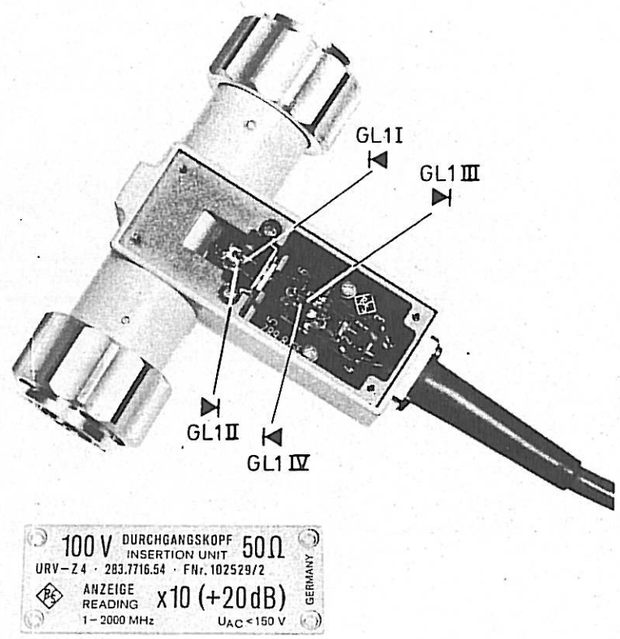


Bild 8 Durchgangsköpfe; Lage der Dioden

Fig. 8 Insertion units; location of diodes

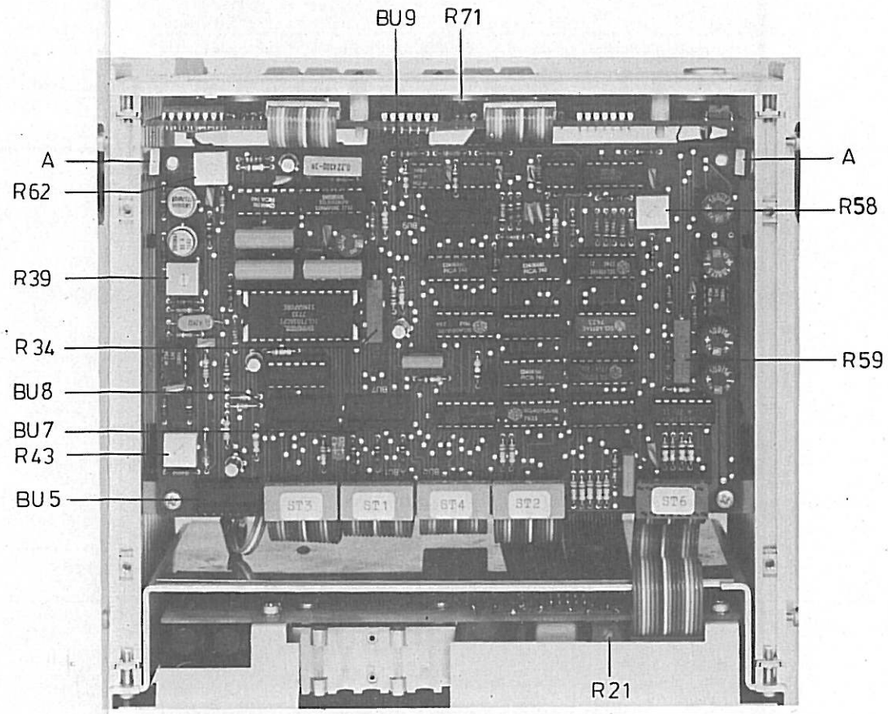


Bild 9 Innenansicht von oben
Fig. 9 Top view of interior

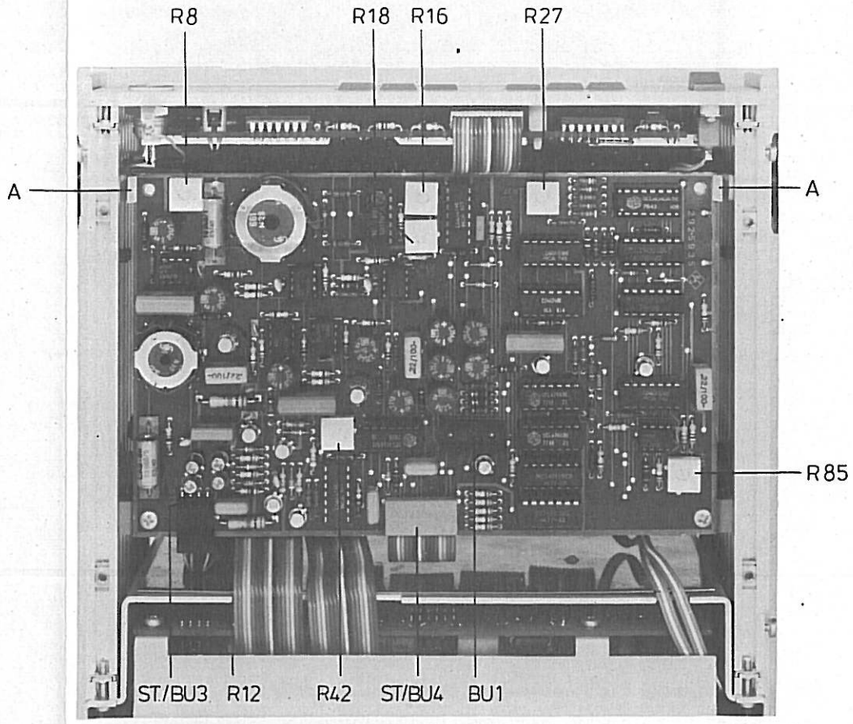


Bild 10 Innenansicht von unten
Fig. 10 Bottom view of interior

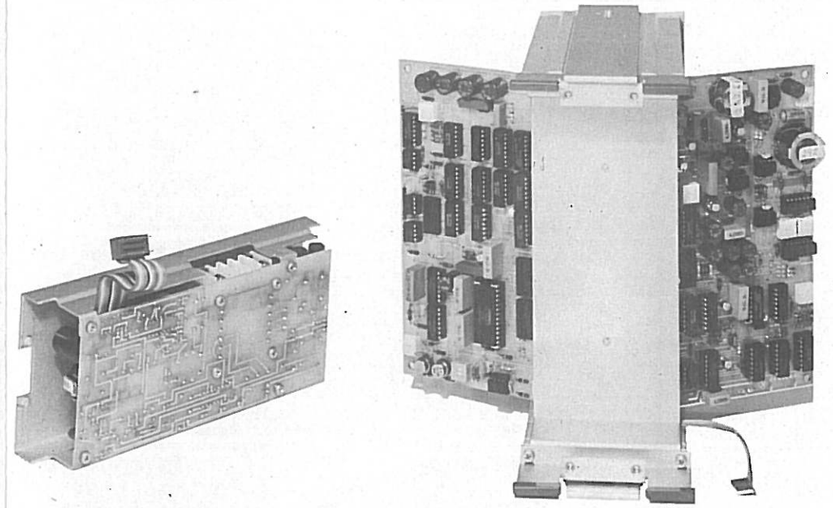


Bild 11 URV4 von rückwärts ohne Gehäuse, Leiterplatten ausgeschwenkt, Netzteil herausgenommen
Fig. 11 Rear view of URV4 without cabinet, PC boards swung out, power supply removed

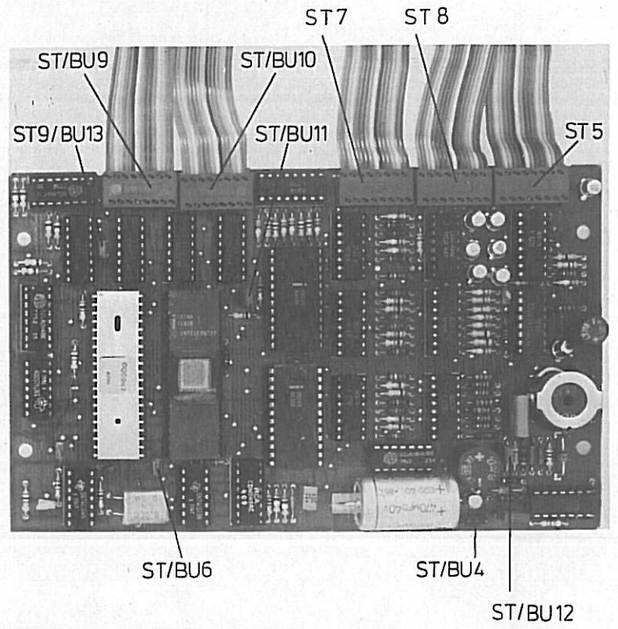


Bild 12 IEC-Bus Leiterplatte
Fig. 12 IEC-Bus board

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MÜNCHEN

Schaltteillisten
Stromläufe
Bestückungspläne

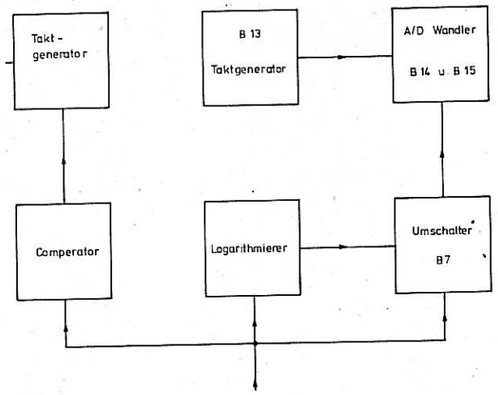
Parts lists
Circuit diagrams
Components plans

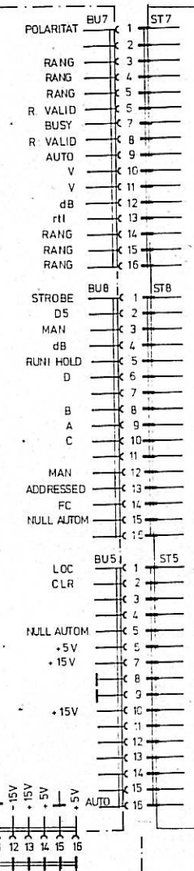
R 29500 BI 2

			Sachnummer	Blatt Nr.
	15 0380	URV4 MILLIVOLTMETER Z	292.5012.01 SA	1

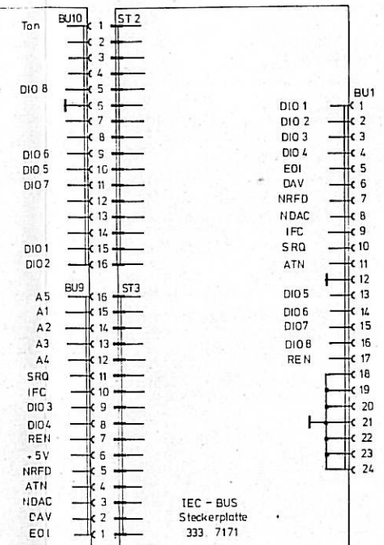
Kennzeichen	Benennung Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 292.5012 S		292.5012.01
BU2	FT TELEFONB.GEERDET GRAU T	FT 018.3147	292.4168
BU3	FT TELEFONBU.ISOLIERTGRAUT	FT 018.3001	292.4168
BU4	BUCHSENLEISTE Z	292.4200	292.4197
BU6	BUCHSENLEISTE Z	292.5858	292.5841
S1	SK SPANNUNGSUMSCH.115/220	292.5387	292.4168
ST1	FN GERAETESTECKER 3POLIG	FN 092.3930	292.4168
ST2	FO EINBAUSTECKER 2POL. BINDER 09-0073-00-02	292.5393	292.4168
Y2	DIGITALPLATTE Y 2 Z HIERZU STROML.292.5558 S	292.5558	292.5012.01
Y3	ANALOGPLATTE Y 3 Z HIERZU STROML.292.5929 S	292.5929	292.5012.01
Y4	NETZTEILPLATTE Y 4 Z HIERZU STROML. 292.4751 S	292.4751	292.4168
Y6	URV4-Z1 IEC-BUS NACHR. Z HIERZU 333.7013 S	333.7013.02	292.5012.01
			- ENDE -

latte 292.5558 S
board

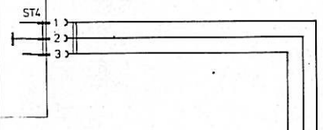


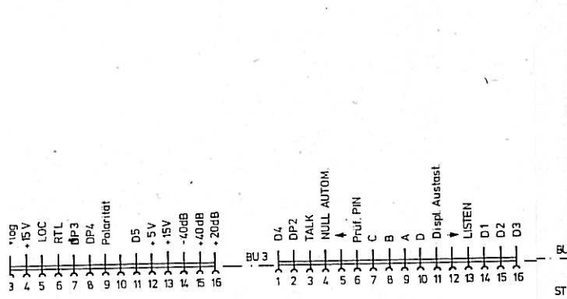


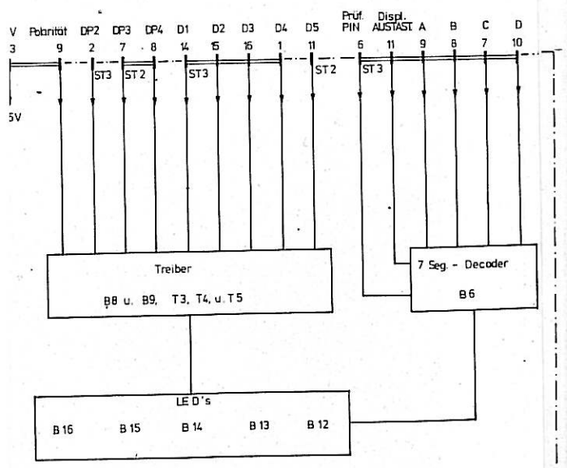
IEC - BUS
333 7071



IEC - BUS
Steckerplatte
333 7171

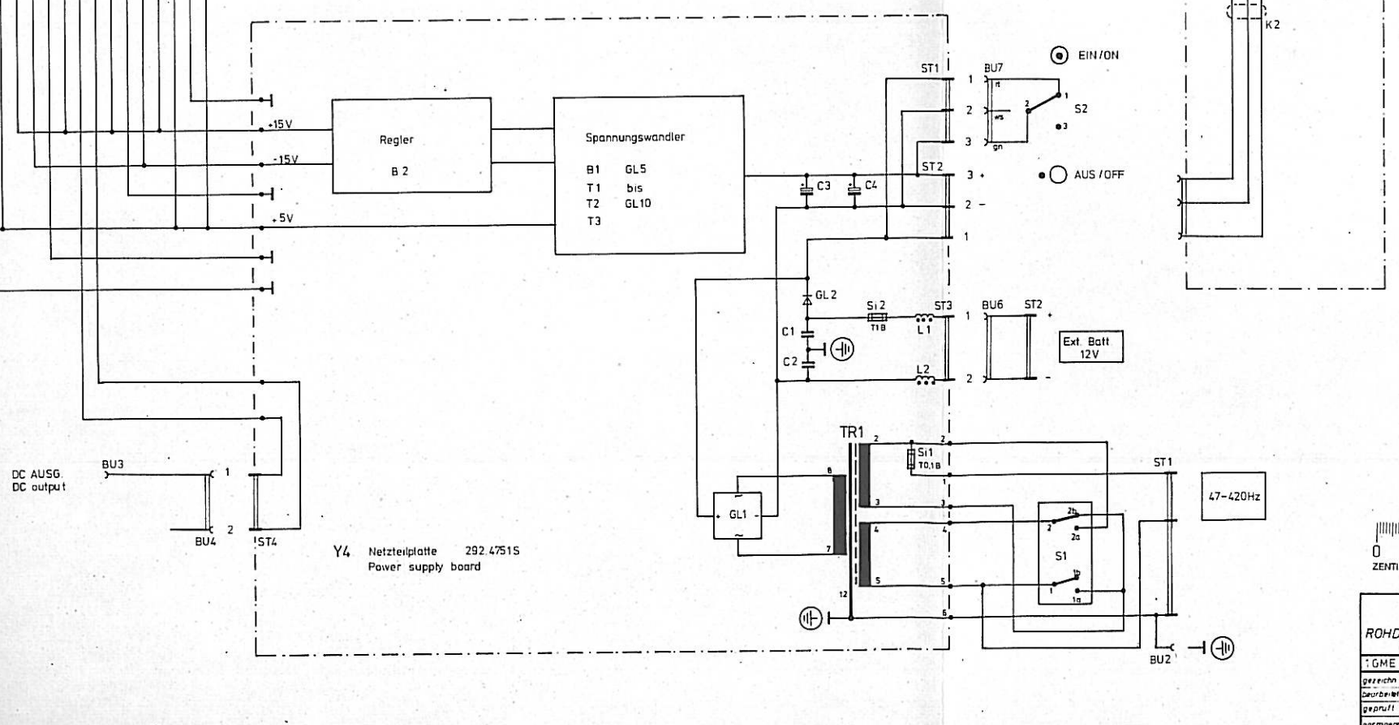






Y1 Anzeigeplatte 292.5470 S
Display board

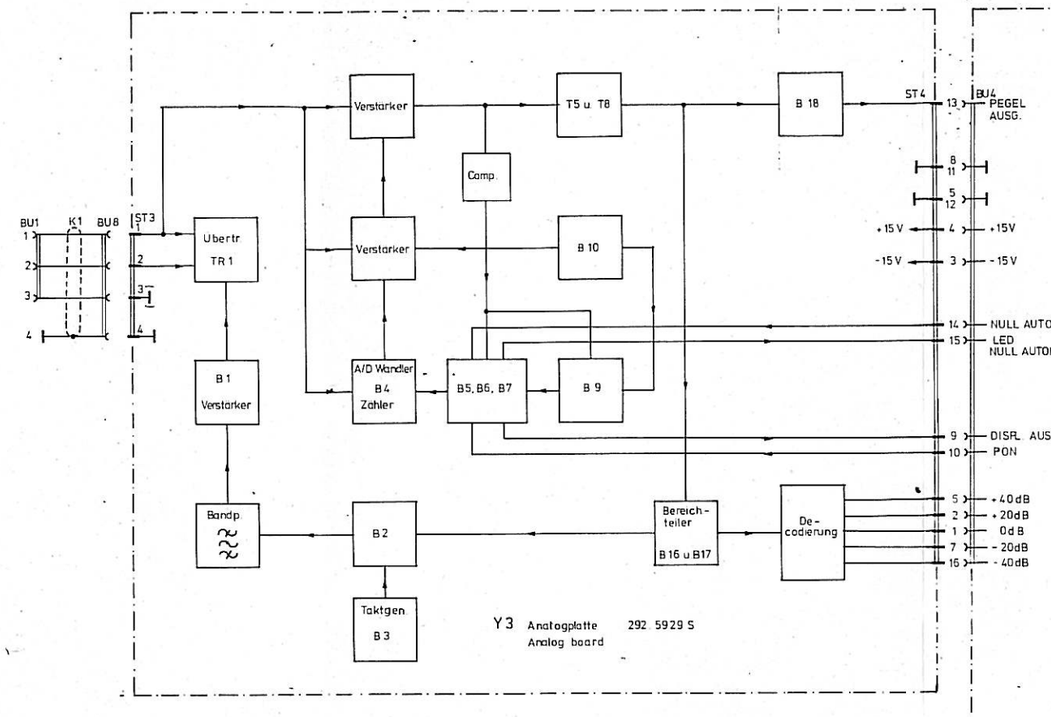
Y6 IEC - BUS Nachr. UVN4 - Z1

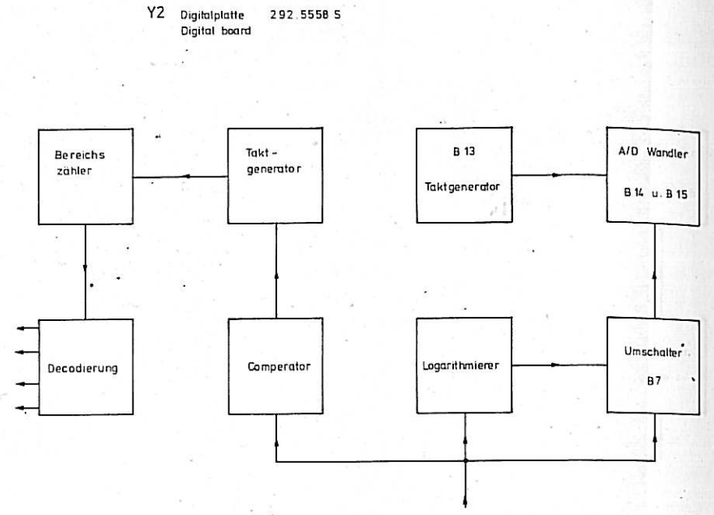


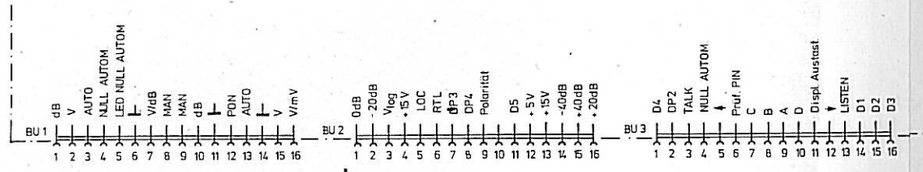
Y4 Netzteilplatte 292.4751S
Power supply board

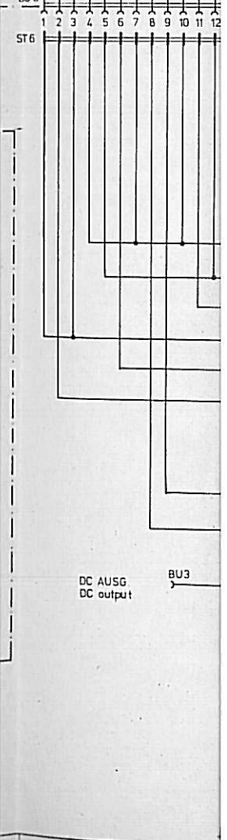
0 1 2 3
ZENTIMETER

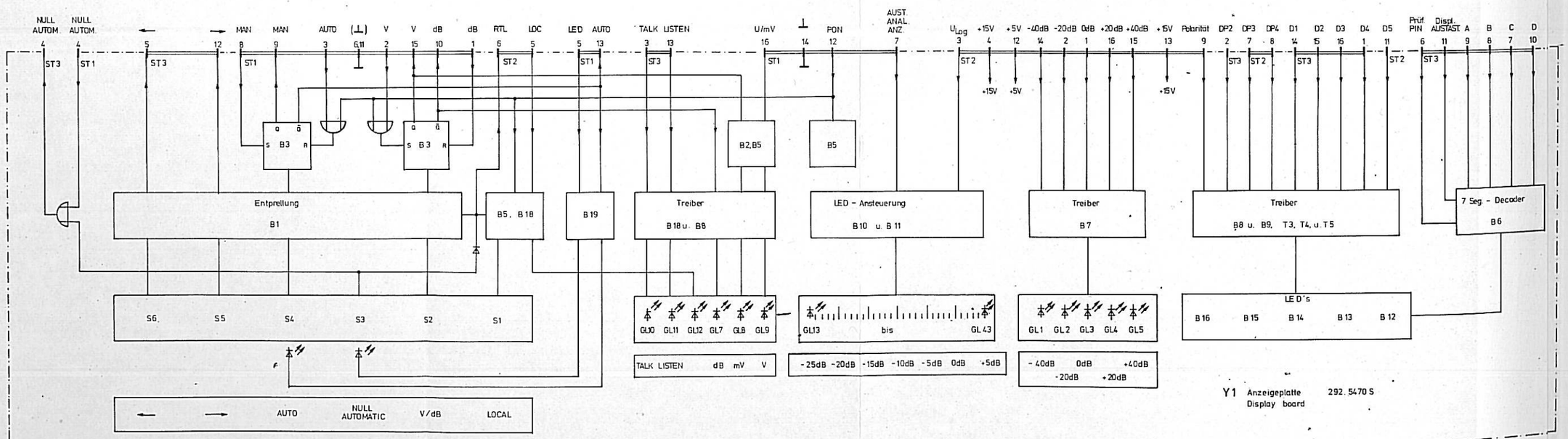
ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff			Unbetonierte Maße	Zeichn. Nr	292.5012 S.	
						Maßstab		292.5012 V	
	GME	Datum	Name	Änd.-Index	Änd.-Mitteilg.-Nr	Datum	Name	Ersatz f. Zeichn.	
gezeichn.		1.79	Ci					Millivoltmeter URV4	Z
bearbeitet									
geprüft									
normgep.									


BU1
K1
BU8
ST3
Übertr.
TR1
Verstärker
Verstärker
Verstärker
Comp.
T5 u. T8
B 18
B 10
B 1
Verstärker
A/D Wandler
B4
Zähler
B5, B6, B7
B 9
Bandp.
B2
Taktgen.
B3
Bereich-
teiler
B16 u. B17
De-
codierung
ST4
BU4
PEGEL
AUSG.
+15 V
-15 V
NULL AUTOM.
LED
NULL AUTOM.
DISPL. AUST.
PON
+40dB
+20dB
0dB
-20dB
-40dB
Y3 Analogplatte 292.5929 S
Analog board


Y2 Digitalplatte 292.5558 S
Digital board
Bereichs
zähler
Takt-
generator
B 13
Taktgenerator
A/D Wandler
B 14 u. B 15
Decodierung
Comperator
Logarithmierer
Umschalter
B7


BU1
dB
V
AUTO
NULL AUTOM
LED NULL AUTOM
V/dB
MAN
MAN
dB
PON
AUTO
V
V/mV
BU2
0dB
-20dB
VLog
+15V
LOC
RTL
DP3
DP4
Polarität
DS
+5V
+15V
-40dB
+40dB
+20dB
BU3
D4
DP2
TALK
NULL AUTOM
Prüf. PIN
C
B
A
D
Displ. Austast
LISTEN
D1
D2
D3


BU6
ST6
+5V
+15V
+15V
-15V
-15V
+15V
DC-Ausg.
PEG-Eing.
-15V
-15V
DC AUSG
DC output
BU3


NULL AUTOM.
NULL AUTOM.
MAN
MAN
AUTO
V
V
dB
dB
RTL
LOC
LED
AUTO
TALK
LISTEN
U/mV
PON
AUST. ANAL. ANZ.
ULog
+15V
+5V
-40dB
-20dB
0dB
+20dB
+40dB
+5V
Polarität
DP2
DP3
DP4
D1
D2
D3
D4
D5
Prüf. PIN
Displ. AUSTAST
A
B
C
D
ST3
ST1
ST2
B3
B2,B5
B5
Entprellung
B1
B5, B18
B19
Treiber
B18 u. B8
LED - Ansteuerung
B10 u. B11
Treiber
B7
Treiber
B8 u. B9, T3, T4, u. T5
7 Seg. - Decoder
B6
S6
S5
S4
S3
S2
S1
GL10
GL11
GL12
GL7
GL8
GL9
GL13
bis
GL43
GL1
GL2
GL3
GL4
GL5
LED's
B16
B15
B14
B13
B12
TALK LISTEN
dB
mV
V
-25dB -20dB -15dB -10dB -5dB 0dB +5dB
-40dB
0dB
+40dB
-20dB
+20dB
AUTO
NULL AUTOMATIC
V/dB
LOCAL
Y1 Anzeigeplatte 292.5470 S
Display board

ROHDE & SCHWARZ MÜNCHEN	Äz	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	13	0479	ANZEIGE Y 1	Z	292.5470	SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
B1	BL CD4044BF 4/RS-LATCH	BL 086.8163	292.5470
B2	BL CD4011BE 4/2INP.NANDG.	BL 252.7337	292.5470
B3	BL CD4027BE 2/JK-FLIPFLOP	BL 086.7144	292.5470
	RCA ICCD4027BE		
B4	BL MC14071BAL 4/2INP.ORG.	BL 418.0158	292.5470
	MOTOROLA MC14071BAL		
B5	BL CD4081BF 4/2INP.ANDG.	BL 531.0259	292.5470
	RCA CD4081BF		
B6	BL MC14511BCP BCD-DECODER	BL 086.7280	292.5470
	RCA IC-C-MOSCD4511BE		
B7	BJ SN75492AN LED-TREIBER	BJ 257.4720	292.5470
	TEXAS IC-SN75492N		
B8	BJ SN75492AN LED-TREIBER	BJ 257.4720	292.5470
	TEXAS IC-SN75492N		
B9	BJ SN75492AN LED-TREIBER	BJ 257.4720	292.5470
	TEXAS IC-SN75492N		
B10	BS UAA170 LED-ANSTEUERUNG	BS 291.4241	292.5470
	SIEMENS UAA 170		
B11	BS UAA170 LED-ANSTEUERUNG	BS 291.4241	292.5470
	SIEMENS UAA 170		
B12	BP 5082-7653. 7SEGM.ANZ.RT	BP 418.0087	292.5470
	HEWLETT 5082-7653		
B13	BP 5082-7653 7SEGM.ANZ.RT	BP 418.0087	292.5470
	HEWLETT 5082-7653		
B14	BP 5082-7653 7SEGM.ANZ.RT	BP 418.0087	292.5470
	HEWLETT 5082-7653		
B15	BP 5082-7653 7SEGM.ANZ.RT	BP 418.0087	292.5470
	HEWLETT 5082-7653		
B16	BP 5082-7656 +-ANZ.F.7653	BP 292.5493	292.5470
	HEWLETT HP 5082-7656		
B17	BL CD40107BE 2/2INP.BUFF.	BL 303.1169	292.5470
	RCA CD40107BE		
C1	CE 2,2UF+-20%20V 4X 8TA	CE 006.3176	292.5470
	ITT TA-ELK04320225122		
C4	CE 10 UF+-20%20V 6X 3X 8	CE 450.7254	292.5470
	TEKELEC MT3R 10MF20V20%		
GL1	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL2	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL3	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL4	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL5	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL7	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL8	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL9	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		
GL11	AF 5082-4684 HI-EFF.LED	AF 257.4736	292.5470
	HEWLETT LED5082-4684		

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	Äz	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	13	0479	ANZEIGE Y 1	Z	292.5470	SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
GL12	AF 5082-4684 HI-EFF.LED HEWLETT LED5082-4684	AF 257.4736	292.5470
GL13	AF TIL268 LED-ZEILE 8XROT TEXAS TIL 268	AF 291.4287	292.5470
BIS GL43	AF TIL268 LED-ZEILE 8XROT TEXAS TIL 268	AF 291.4287	292.5470
GL44	AD 1N4448 SI 75V 150MIA VALVO DIODE1N4448	AD 012.0700	292.5470
GL45	AD 1N4448 SI 75V 150MIA VALVO DIODE1N4448	AD 012.0700	292.5470
GL46	AD 1N4448 SI 75V 150MIA VALVO DIODE1N4448	AD 012.0700	292.5470
GL47	ENTHALTEN IN S4	999.9861	292.5470
GL48	ENTHALTEN IN S3	999.9861	292.5470
GL49	AD 1N4448 SI 75V 150MIA VALVO DIODE1N4448	AD 012.0700	292.5470
GL50	AD 1N4448 SI 75V 150MIA VALVO DIODE1N4448	AD 012.0700	292.5470
R1	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	292.5470
BIS R6	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	292.5470
R7	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	292.5470
R8	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	292.5470
R9	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	292.5470
R10	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	292.5470
R11	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	292.5470
R12	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	292.5470
R13	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	292.5470
BIS R19	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	292.5470
R20	RF 0,25W 82 OHM +-5% DRALORIC LCA0207/+-5%82	RF 069.8200	292.5470
R21	RF 0,25W 82 OHM +-5% DRALORIC LCA0207/+-5%82	RF 069.8200	292.5470
R22	RF 0,25W 82 OHM +-5% DRALORIC LCA0207/+-5%82	RF 069.8200	292.5470
R23	RF 0,25W100 OHM +-5% DRALORIC LCA0207/+-5%100	RF 069.1012	292.5470
R24	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	292.5470
R25	RF 0,25W220 OHM +-5% DRALORIC LCA0207/+-5%220	RF 069.2219	292.5470
R27	RF 0,25W220 OHM +-5%	RF 069.2219	292.5470

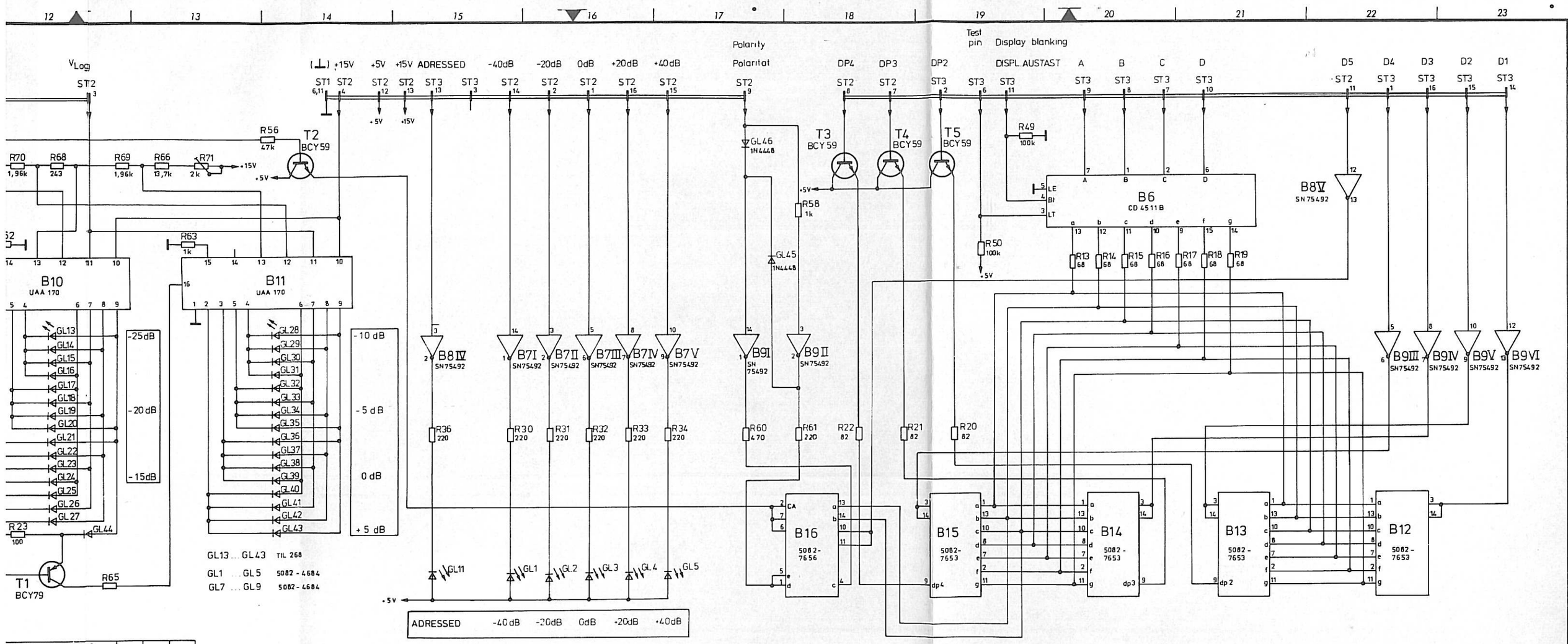
ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	13	0479	ANZEIGE Y 1	Z	292.5470	SA	3

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	DRALORIC LCA0207/+-5%220		
BIS			
R34	RF 0,25W220 OHM +-5%	RF 069.2219	292.5470
	DRALORIC LCA0207/+-5%220		
R36	RF 0,25W220 OHM +-5%	RF 069.2219	292.5470
	DRALORIC LCA0207/+-5%220		
R37	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R38	RF 0,25W 2,2MOHM+-5%	RF 069.1941	292.5470
	DRALORIC LCA0207/+-5%2,2M		
R40	RF 0,25W1,8KOHM +-5%	RF 069.1829	292.5470
	DRALORIC LCA0207/+-5%1,8K		
R41	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R42	RF 0,25W 2,2MOHM+-5%	RF 069.1941	292.5470
	DRALORIC LCA0207/+-5%2,2M		
R43	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
BIS			
R46	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R47	RF 0,25W 2,2MOHM+-5%	RF 069.1941	292.5470
	DRALORIC LCA0207/+-5%2,2M		
R48	RF 0,25W 2,2MOHM+-5%	RF 069.1941	292.5470
	DRALORIC LCA0207/+-5%2,2M		
R49	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R50	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
BIS			
R52	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R53	RF 0,25W 22KOHM +-5%	RF 069.2231	292.5470
	DRALORIC LCA0207/+-5%22K		
R54	RF 0,25W 22KOHM +-5%	RF 069.2231	292.5470
	DRALORIC LCA0207/+-5%22K		
R55	RF 0,25W 22KOHM +-5%	RF 069.2231	292.5470
	DRALORIC LCA0207/+-5%22K		
R56	RF 0,25W 47KOHM +-5%	RF 069.4734	292.5470
	DRALORIC LCA0207/+-5%47K		
R58	RF 0,25W 1KOHM +-5%	RF 069.1029	292.5470
	DRALORIC LCA0207/+-5%1,0K		
R59	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R60	RF 0,25W470 OHM +-5%	RF 069.4711	292.5470
	DRALORIC LCA0207/+-5%470		
R61	RF 0,25W220 OHM +-5%	RF 069.2219	292.5470
	DRALORIC LCA0207/+-5%220		
R62	RF 0,25W 1KOHM +-5%	RF 069.1029	292.5470
	DRALORIC LCA0207/+-5%1,0K		
R63	RF 0,25W 1KOHM +-5%	RF 069.1029	292.5470
	DRALORIC LCA0207/+-5%1,0K		
R64	RF 0,25W 56KOHM +-5%	RF 069.5630	292.5470
	DRALORIC LCA0207/+-5%56K		
R65	RF 0,25W 39KOHM +-5%	RF 069.3938	292.5470
	DRALORIC LCA0207/+-5%39K		
R66	RL 0,25W13,7KOHM+-1%TK50	RL 082.6608	292.5470

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	13	0479	ANZEIGE Y 1 Z	292.5470 SA	4

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	DRALORIC SMA0207/13,7K-F-D		
R67	RL 0,25W 523 OHM+-1%TK50	RL 083.0432	292.5470
	DRALORIC SMA0207/5230HM-F-D		
R68	RL 0,25W 243 OHM+-1%TK50	RL 083.0126	292.5470
	DRALORIC SMA0207/2430HM-F-D		
R69	RL 0,25W 1,96KOHM+-1%TK50	RL 083.0810	292.5470
	DRALORIC SMA0207/1,96K-F-D		
R70	RL 0,25W 1,96KOHM+-1%TK50	RL 083.0810	292.5470
	DRALORIC SMA0207/1.96K-F-D		
R71	RS 0,75W 2KOHM+-10%CERMET	RS 037.7373	292.5470
	BOURNS 3006P-1-202		
R73	RF 0,25W100KOHM +-5%	RF 069.1041	292.5470
	DRALORIC LCA0207/+-5%100K		
R76	RF 0,25W 1 MOHM +-5%	RF 069.1058	292.5470
	DRALORIC LCA0207/+-5%1,0M		
S1	SB TASTER GRAU OHNE LED	SB 292.5506	292.5470
	SCHADOW DIGITAST SR KNOPF GR		
S2	SB TASTER GRAU OHNE LED	SB 292.5506	292.5470
	SCHADOW DIGITAST SR KNOPF GR		
S3	SB TASTER GRAU M.LED ROT	SB 278.4193	292.5470
S4	SB TASTER GRAU M.LED ROT	SB 278.4193	292.5470
S5	SB TASTER GRAU OHNE LED	SB 292.5506	292.5470
	SCHADOW DIGITAST SR KNOPF GR		
S6	SB TASTER GRAU OHNE LED	SB 292.5506	292.5470
	SCHADOW DIGITAST SR KNOPF GR		
ST1	STECKEREINHEIT ST 1 Z	292.5441	292.5470
ST2	STECKEREINHEIT ST 2 Z	292.5458	292.5470
ST3	STECKEREINHEIT ST 3 Z	292.5464	292.5470
T1	AK BCY79IX PNP 45V200MIA	AK 010.3777	292.5470
	SIEMENS SI-TRANSISTORBCY79IX		
T2	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5470
	SIEMENS TRANSIST.BCY59IX		
T3	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5470
	SIEMENS TRANSIST.BCY59IX		
T4	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5470
	SIEMENS TRANSIST.BCY59IX		
T5	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5470
	SIEMENS TRANSIST.BCY59IX		
			- ENDE -



STROMVERSORGUNG Power supply	0V	+15V	+5V
B1, B3,	8	16	
B2, B4, B5	7	14	
B6	8		16
B7, B8, B9	4		11
B17	4	8	

0 1 2 3
ZENTIMETER

Stromlauf zu: Anzeige Display URV 4

Z

Zeichn. Nr. 292.5470 S

292.5012V | 292.5029

ROHDE & SCHWARZ · MÜNCHEN

	Name	Datum	Änd.-Mitt.-Nr.	Änd.-zust.
gezeichnet	Hg	19.4.78	24822	A
Geschnitt	NL	04.7.78	25911	B
geprüft				
genehmigt				

	Name	Datum
	He	03.79
	He	2.80

1GME

LOC ST2 · RTL ST2 · NULL AUTOM ST3 · NULL AUTOM ST1 · Null Autom. LED ST3 · ST1 · MAN ST3 · MAN ST1 · AUTO ST1 · AUTO ST1 · V ST1 · V ST1 · dB ST1 · dB ST1 · PON ST1 · V/mV ST1 · Aust. Anal. Anz ST1 · (⊥) ST1 · V_L

LOCAL · S1 · B2I CD4011B · R37 100k · +15V

B5I CD4081 · B2IV CD4011B · R40 1,6k · GL12 · REMOTE

R38 2,2M · +15V

R42 2,2M · B4II CD4071B

R41 100k · B17 CD40107 · R24 220 · R25 220 · LED im Taster S3 · GL48 · GL47 · LED im Taster S4 · +5V

R46 100k · B3I CD 4027A · +15V

R47 2,2M · B4I CD4071B · R12 100k · R43 100k · R44 100k

R48 2,2M · B4III CD4071B

B3II CD 4027A · R11 100k · R45 100k · +15V

R76 1M · B5II CD4081 · R73 100k · C1 2,2u · R59 100k · GL49 1N4448

R52 100k · R51 100k · R67 523 · R70 1,96k · R68 243 · B5III CD4081 · B2II CD4011B · R64 56k · R62 1k · B2III CD4011B · B10 UAA 170

R54 22k · R53 22k · B8I SN75492 · B8II · R27 220 · R28 220 · B5IV CD4081 · R55 22k · B8III SN75492 · R29 220 · GL7 · GL9 · GL8 · +5V

GL50 1N4448

B1I CD4044 · B1II CD4044 · B1III CD4044 · B1IV CD4044

R7 10k · C4 10µ · R8 100k · S3

S6 · S5 · S4 · S2

R1 1M · R2 1M · R3 1M · R4 1M · R5 1M · R6 1M · R9 1M · R10 1M

dB · V · mV

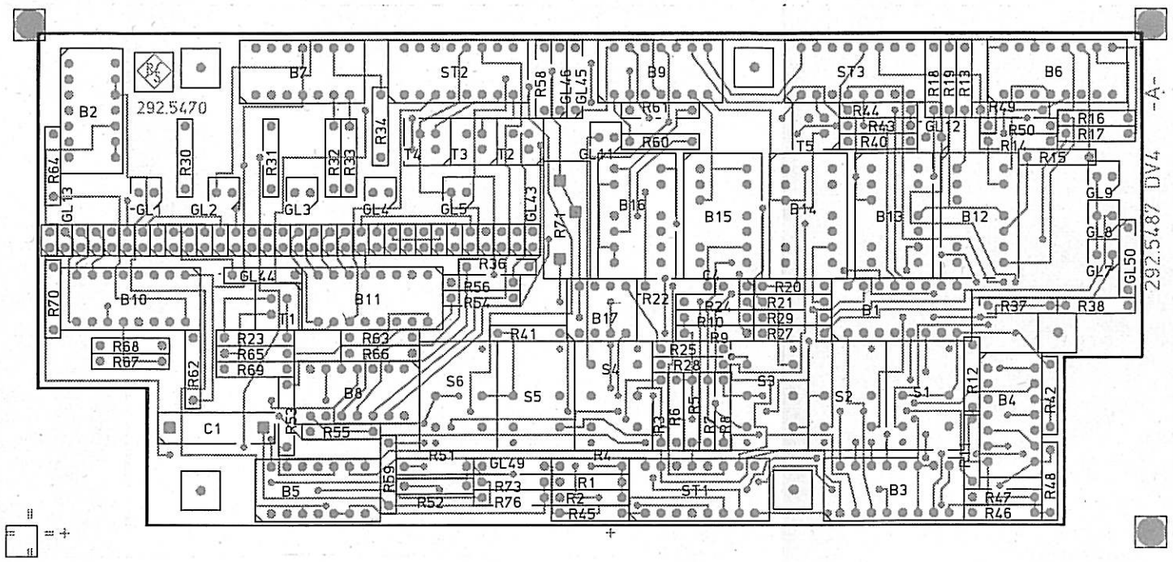
← AUTO · → NULL-AUTOMATIC Auto null · V/dB

R23 100 · T1 BCY79

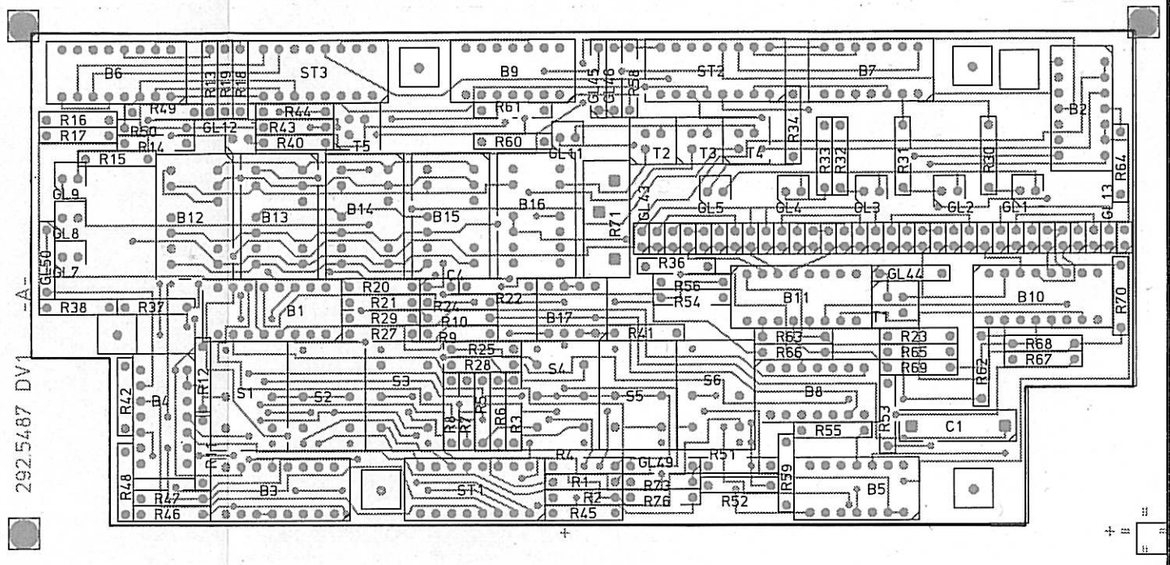
B4IV CD4071B

STROMVERSORG Power supply
B1, B3,
B2, B4, B5
B6
B7, B8, B9
B17

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Versorg.-Nr.						VG-Sachnr.	
A	24822	03.79	He	Maße ohne Toleranzangabe		Maßstab 1 : 1	
						Halbzeug, Werkstoff	
				1GM	Tag	Name	Benennung: Anzeige — Z
				Bearb.	19.6.78	Nk	
				Gepr.			
				Norm			
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	ROHDE & SCHWARZ MÜNCHEN		Zeichn.-Nr. 292.5470	Blatt-Nr. 2 v. Bl.
				zu Gerät URV 4		reg. i. V. 292.5012 V	erste Z. 292.5029

Für diese Zeichnung behalten wir uns alle Rechte vor.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	14	C780	DIGITALPLATTE Y 2	Z	292.5558	SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
B1	BO LM308AH PRAEZ.OP-AMP. NSC IC-LM308AH	BO 257.4788	292.5558
B2	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5558
B3	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5558
B4	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5558
B5	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5558
B6	BL C4066BE 4/ANALOGSWITCH	BL 290.3906	292.5558
B7	BL C4066BE 4/ANALOGSWITCH	BL 290.3906	292.5558
B8	BL C4066BE 4/ANALOGSWITCH	BL 290.3906	292.5558
B9	BO MA723C -0+70 SPGSREGL NSC ICLM723CN	BO 009.0190	292.5558
B10	BL CD4029BE UP/DOWN-COUNT RCA ICCD4029AE	BL 086.7167	292.5558
B11	BL SCL4028BE BCD/DEC.DEC. RCA ICCD4028AE	BL 086.7150	292.5558
B12	BL CD4047AE MULTIVIBRATOR RCA ICC-MOSCD4047AE	BL 086.7221	292.5558
B13	BL CD4047AE MULTIVIBRATOR RCA ICC-MOSCD4047AE	BL 086.7221	292.5558
B14	BJ ICL8052ACPD A/D-WANDL. INTERSIL ICL 8052 ACPD	BJ 292.5587	292.5558
B15	BJ ICL7103ACPI A/D-WANDL. INTERSIL ICL 7103 ACPI	BJ 292.5593	292.5558
B16	BL MC14071BAL 4/2INP.ORG. MOTOROLA MC14071BAL	BL 418.0158	292.5558
B17	BL MC14075BAL 3/3INP.ORG. MOTOROLA MC14075BAL	BL 418.0164	292.5558
B18	BL CD4001BE 4/2INP.NORG. RCA ICCD4001AE	BL 086.6960	292.5558
B19	BL CD4081BF 4/2INP.ANDG. RCA CD4081BF	BL 531.0259	292.5558
B20	BL CD4011UBE 4/2INP.NANDG RCA IC-C-MOSCD4011AE	BL 200.8384	292.5558
B21	BL MC14071BAL 4/2INP.ORG. MOTOROLA MC14071BAL	BL 418.0158	292.5558
B22	BL CD4001BE 4/2INP.NORG. RCA ICCD4001AE	BL 086.6960	292.5558
B23	BO LM308AH PRAEZ.OP-AMP. NSC IC-LM308AH	BO 257.4788	292.5558
BU1 BIS BU9	FR JC-FASSUNG 16 POLIG EURO-DIP BU160Z	FR 249.6091	292.5558
C1	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	292.5558
C2	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	292.5558
C3	CK 220NF+-20%100V MKP ROEDERST MKP 1840-422/01	292.5606	292.5558
C4	CK 1,0UF+-10% 63V QUADER	CK 024.6973	292.5558

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	14	0780	DIGITALPLATTE Y 2 Z	292.5558 SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	ROEDERST MKT1822-510/06/10%		
C5	CC 330PF+-2%6X9N750	CC 087.6964	292.5558
	DRALORIC EDPU6X9/330/2%N750		
C6	CE 10UF -10+100%40V 9X13B	CE 247.6588	292.5558
	ROEDERST ELKOEKU10/40		
C7	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C8	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C9	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C10	CE 100UF-10+100%25V 13X13	CE 208.4007	292.5558
	ROEDERST ELKOEK100/25		
C11	CE 100UF-10+100%25V 13X13	CE 208.4007	292.5558
	ROEDERST ELKOEK100/25		
C12	CE 100UF-10+100%16V 11X13	CE 022.7550	292.5558
	SIEMENS B41316-A4107-Z		
C13	CE 100UF-10+100%16V 11X13	CE 022.7550	292.5558
	SIEMENS B41316-A4107-Z		
C14	CC 33PF+-2%4X5N150	CC 087.6658	292.5558
	DRALORIC EDPU4X5/33/2%N150		
C15	CC 100NF+-10%50V5K1200VIE	CC 084.5350	292.5558
	AEROVOX CKR05BX104KL		
C16	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C17	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C18	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C19	CK 100NF+-20%100V QUADER	CK 006.5033	292.5558
	ROEDERST MKT1822-410/0		
C20	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C21	CC 100PF+-2%6X7N150	CC 087.6712	292.5558
	DRALORIC EDPU6X7/100/2%N150		
C22	CC 33PF+-2%4X5N150	CC 087.6658	292.5558
	DRALORIC EDPU4X5/33/2%N150		
C23	CC 33PF+-2%4X5N150	CC 087.6658	292.5558
	DRALORIC EDPU4X5/33/2%N150		
C24	CC 33PF+-2%4X5N150	CC 087.6658	292.5558
	DRALORIC EDPU4X5/33/2%N150		
C25	CK 100NF+-20%100V QUADER	CK 006.5033	292.5558
	ROEDERST MKT1822-410/0		
C26	CE 4,7UF+-20%35V 7X 5X11	CE 022.8204	292.5558
	ERO-TANTAL TA-ELKOETR3-4,7/35		
C27	CC 1NF+-10%63V K2000	CC 022.0784	292.5558
	DRALORIC EDPU4X5/63V1000/10%		
GL1	AD AAZ15GE75V140MIA	AD 012.0381	292.5558
	VALVO DIODEAAZ15		
GL2	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5558
	VALVO DIODE1N4448		
GL3	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5558
	VALVO DIODE1N4448		
R1	RF 0,25W 22KOHM +-5%	RF 069.2231	292.5558
	DRALORIC LCA0207/+-5%22K		

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	14	0780	DIGITALPLATTE Y 2 Z	292.5558 SA	3

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
BIS			
R5	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	292.5558
R6	RF 0,25W 47KOHM +-5% DRALORIC LCA0207/+-5%47K	RF 069.4734	292.5558
R7	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	292.5558
R8	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	292.5558
R9	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	292.5558
R10	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	292.5558
BIS			
R13	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	292.5558
R14	RL 0,25W 1,74KOHM+-1%TK50 DRALORIC SMA0207/1,74K-F-D	RL 083.0784	292.5558
R15	RF 0,25W 27KOHM +-5% DRALORIC LCA0207/+-5%27K	RF 069.2731	292.5558
R16	RF 0,25W2,2KOHM +-5% DRALORIC LCA0207/+-5%2,2K	RF 069.2225	292.5558
R17	RF 0,25W 2KOHM +-5% DRALORIC LCA0207/+-5%2,0K	RF 069.2025	292.5558
R18	RL 0,25W 6,81KOHM+-1%TK50 DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	292.5558
R19	RF 0,25W 33 OHM +-5% DRALORIC LCA0207/+-5%33	RF 069.3309	292.5558
R20	RL 0,25W 100 OHM+-1%TK50 DRALORIC SMA0207/100/HM-F-D	RL 082.6543	292.5558
R21	RF 0,25W330KOHM +-5% DRALORIC LCA0207/+-5%330K	RF 069.3344	292.5558
R22	RF 0,25W 39KOHM +-5% DRALORIC LCA0207/+-5%39K	RF 069.3938	292.5558
R23	RL 0,25W10,0KOHM+-0,1%T25 DRALORIC SMA0207/10K-B-E	RL 084.3064	292.5558
R24	RL 0,25W90,9KOHM+-0,1%T25	RL 084.4902	292.5558
R25	RL 0,25W10,0KOHM+-0,1%T25 DRALORIC SMA0207/10K-B-E	RL 084.3064	292.5558
R26	RL 0,25W90,9KOHM+-0,1%T25	RL 084.4902	292.5558
R27	RL 0,25W 301 OHM+-1%TK50 DRALORIC SMA0207/3010HM-F-D	RL 083.0210	292.5558
R28	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	292.5558
R29	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	292.5558
R30	RL 0,25W 3,65KOHM+-1%TK50 DRALORIC SMA0207/3,65K-F-C	RL 082.2260	292.5558
R31	RL 0,25W 6,04KOHM+-1%TK50 DRALORIC SMA 0207/6,040HM-F-C	RL 082.6089	292.5558
R32	RL 0,25W 37,4KOHM+-1%TK50 DRALORIC SMA/207/37,4K-F-C	RL 083.1722	292.5558
R33	RL 0,25W 1,21KOHM+-1%TK50 DRALORIC SMA0207/1,21K-F-D	RL 083.0655	292.5558
R34	RS 0,75W5000HM+-10%CERMET BOURNS 3006P-1-501	RS 037.7350	292.5558
R35	RF 0,25W100KOHM +-5%	RF 069.1041	292.5558

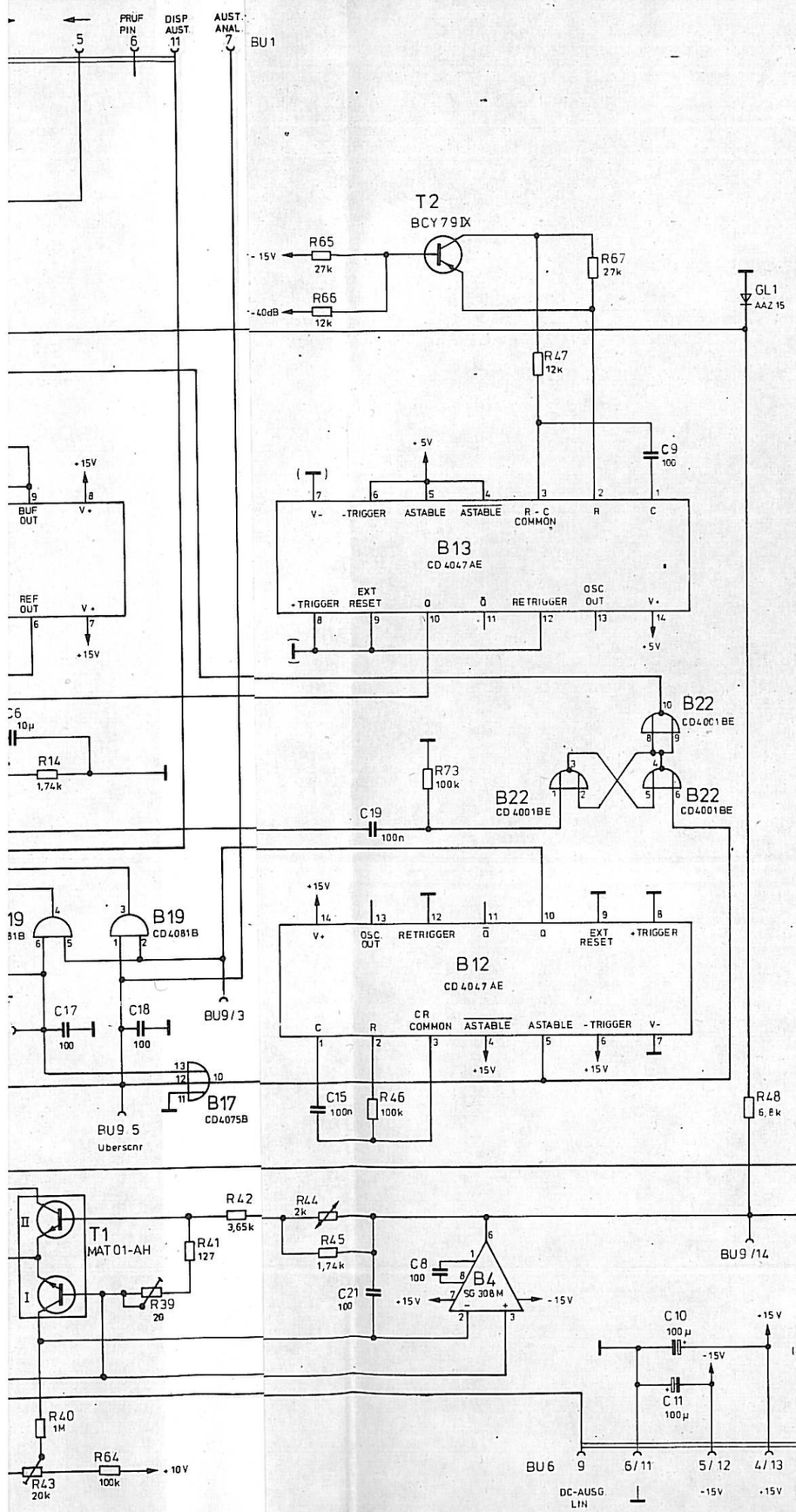
Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	DRALORIC LCA0207/+-5%10CK		
R36	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5558
	DRALORIC LCA0207/+-5%10K		
BIS			
R38	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5558
	DRALORIC LCA0207/+-5%10K		
R39	RS 0,5W20 OHM+-20%10X10X5	RS 087.7548	292.5558
	BOURNS 3386F-1-200		
R40	RL 0,25W 1MOHM+-1%TK50	RL 082.7862	292.5558
	DRALORIC SMA0207/1M-F-D		
R41	RL 0,25W 127 OHM+-1%TK50	RL 082.9871	292.5558
	DRALORIC SMA0207/1270HM-F-D		
R42	RL 0,25W 3,65KOHM+-1%TK50	RL 082.2260	292.5558
	DRALORIC SMA0207/3,65K-F-C		
R43	RS 0,5W20KOHM+-20%10X10X5	RS 087.7577	292.5558
	BOURNS 3386F-1-203		
R44	AW HEISSL 2KOHM+-10% 0,8W	AW 008.0100	292.5558
	SIEMENS HEISSLK11102K		
R45	RL 0,25W 1,74KOHM+-1%TK50	RL 083.0784	292.5558
	DRALORIC SMA0207/1,74K-F-D		
R46	RF 0,25W100KOHM +-5%	RF 069.1041	292.5558
	DRALORIC LCA0207/+-5%100K		
R47	RF 0,25W 12KOHM +-5%	RF 069.1235	292.5558
	DRALORIC LCA0207/+-5%12K		
R48	RF 0,25W6,8KOHM +-5%	RF 069.6820	292.5558
	DRALORIC LCA0207/+-5%6,8K		
R49	RL 0,25W22,1KOHM+-0,1%T25	RL 084.3729	292.5558
R50	RL 0,25W22,1KOHM+-0,1%T25	RL 084.3729	292.5558
R51	RL 0,25W 221 KOHM+-1%TK50	RL 083.2270	292.5558
	DRALORIC SMA0207/221K-F-C		
R52	RL 0,25W 45,3KOHM+-1%TK50	RL 082.2225	292.5558
	DRALORIC SMA0207/45,3K-F-C		
R53	RL 0,25W7,50KOHM+-0,1%T25	RL 084.2822	292.5558
	DRALORIC SMA/207/7,50K-B-E		
BIS			
R56	RL 0,25W7,50KOHM+-0,1%T25	RL 084.2822	292.5558
	DRALORIC SMA/207/7,50K-B-E		
R57	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5558
	DRALORIC LCA0207/+-5%10K		
R58	RS 0,5W5KOHM+-20%10X10X5	RS 247.7890	292.5558
	BOURNS 3386F-1-502		
R59	RS 0,75W 1KOHM+-10%CERMET	RS 037.7367	292.5558
	BOURNS 3006P-1-102		
R60	RL 0,25W 2,21KOHM+-1%TK50	RL 082.2477	292.5558
	DRALORIC SMA 0207/2,21K-F-C		
R61	RL 0,25W 1MOHM+-1%TK50	RL 082.7862	292.5558
	DRALORIC SMA0207/1M-F-D		
R62	RS 0,5W1MOHM+-20%10X10X5	RS 087.7602	292.5558
	BOURNS 3386F-1-105		
R63	RL 0,25W 12,1KOHM+-1%TK50	RL 083.1351	292.5558
	DRALORIC SMA0207/12,1K-F-D		
R64	RL 0,25W 100KOHM+-1%TK50	RL 082.1764	292.5558
	DRALORIC SMA0207/100K-F-C		
R65	RF 0,25W 27KOHM +-5%	RF 069.2731	292.5558
	DRALORIC LCA0207/+-5%27K		
R66	RF 0,25W 12KOHM +-5%	RF 069.1235	292.5558
	DRALORIC LCA0207/+-5%12K		

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	14	0780	DIGITALPLATTE Y 2	Z	292.5558	SA	5

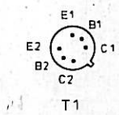
Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R67	RF 0,25W 27KOHM +-5% DRALORIC LCA0207/+-5%27K	RF 069.2731	292.5558
R68	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	292.5558
R69	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	292.5558
R70	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	292.5558
R71	RF 0,25W220KOHM +-5% DRALORIC LCA0207/+-5%220K	RF 069.2248	292.5558
R72	RF 0,25W220KOHM +-5% DRALORIC LCA0207/+-5%220K	RF 069.2248	292.5558
R73	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	292.5558
R74	RF 0,25W220KOHM +-5% DRALORIC LCA0207/+-5%220K	RF 069.2248	292.5558
R75	RL 0,25W22,1KOHM+-0,1%T25	RL 084.3729	292.5558
R76	RL 0,25W22,1KOHM+-0,1%T25	RL 084.3729	292.5558
R77	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	292.5558
R78	RF 0,25W220KOHM +-5% DRALORIC LCA0207/+-5%220K	RF 069.2248	292.5558
R79	RF 0,25W 27 OHM +-5% DRALORIC LCA0207/+-5%27	RF 069.2702	292.5558
T1	AK MAT-01AH DUAL NPN 45V PMI TRANSISTORMAT-01-AH	AK 257.4842	292.5558
T2	AK BCY79IX PNP 45V200MIA SIEMENS SI-TRANSISTORBCY79IX	AK 010.3777	292.5558
T3	AK BCY59IX NPN 45V 200MA SIEMENS TRANSIST.BCY59IX	AK 010.5163	292.5558
T4	AK BCY59IX NPN 45V 200MA SIEMENS TRANSIST.BCY59IX	AK 010.5163	292.5558
T5	AK BCY59IX NPN 45V 200MA SIEMENS TRANSIST.BCY59IX.	AK 010.5163	292.5558
			- ENDE -

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Stromversorgung	⊥	+15V
B16, B17, B18, B19, B20, B21, B22	7	14

BU1, BU2, BU3	an	ANZEIGEPLATTE
BU4	an	ANALOGPLATTE
BU6	an	NETZTEILPLATTE
BU5, BU7, BU8	an	IEC-BUS
BU9		PRÜFBUCHSE



ROHDE & SCHWARZ MÜNCHEN			Halbzeug, Werkstoff			Untolerierte Maße	Zeichn. Nr. 292.5558 S
						Maßstab	292.5012 V / 292.5012
1GME	Datum	Name	Änd.-zust.	Änd.-Mitteilg Nr	Datum	Name	
gezeichn.	25.9.78	Hg	A	25911	2.80	He	Digitalplatte URV4 Z
bearbeit.	09.78	He					

BU8: dB 12, V 11, V 10, AUTO 9, RANGE VALID 6, MAN 12, NULL AUTOM 15, MAN 3, dB 4, D5 2

BU3: D 6, C 10, B 8, A 9, FC 14, STROBE 1, ADRESSED 13, RUNI HOLD 5

BU1: DP2 2, NULL AUTOM 4, D1 14, D2 15, D3 16, D4 1, D 10, C 7, B 8, A 9, ADRESSED 13, 3, 12, 5, PRÜF PIN 6, DISP AUST. 11, AUST. ANAL. 7

T4 BCY59C — R70 22k

T3 BCY59C — R69 4,7k — R68 22k

T5 BCY59C — R6 47k — R13 10k → +5V

B15 ICL 7103 ACP I

28	27	26	25	24	23	22	21	20	19	18	17	16	15
BUSY	D1 LSB	D2	D3	D4	B8	B4	B2	B1 LSB	D5 MSB	STROBE	A-Z IN	A-Z OUT	DIG GND

1	2	3	4	5	6	7	8	9	10	11	12	13	14
V+ +5V	POLARITY	RUNI HOLD	COMP IN	V- -15V	REF	REF CAP1	REF CAP2	ANALOG INPUT	ANAL GND	CLOCK IN	UNDER RANGE	OVER RANGE	

C1 1µ — C2 1µ

GL2 1N4448 — GL3 1N4448 — C4 1µ — -15V — R21 330k — R22 39k

B14 ICL 8052 ACPD

14	13	12	11	10	9	8
INT OUT	+BUF IN	+INT IN	-INT IN	-BUF IN	BUF OUT	V+ +15V

R79 27 — C3 0,22 µ — R35 100k

1	2	3	4	5	6	7
V- -15V	COMP OUT	REF CAP	REF BYPASS	GND	REF OUT	V+ +15V

C5 330

C6 10µ — R33 1,21k — R34 500 — R14 1,74k

BU9/2

R65 27k → -15V — R66 12k → -40dB

B21 CD4071B

B7/II CD 4066 AE

5	CONT	IN	4 dB
3	OUT		
13	CONT	IN	1 V
2	OUT		

R23 10k — R24 90,9k — R25 10k — R26 90,9k

BU9/1 — BU9/13 — BU9/10

B3 SG308M — R27 301 — R28 100k — R30 3,65k — C22 33

B2 SG 308M — R29 100k — R31 6,04k — C23 33

B19 CD4081B — R36 10k — C17 100 — C18 100 — BU9/3

BU9/8 Unterschr — R37 10k — B17 CD4075B — BU9 5 Überschr

B1 LM308AH — R32 37,4k — R20 100 — R61 1M — C7 100 — C27 In — R62 1M

T1 MAT01-AH — R38 10k — R41 127 — R42 3,65k — R39 20 — R44 2k — R45 1,74k

R40 1M — R63 12,1k — R43 20k — R64 100k → +10V

BU4: 10 PON, 15 LED NULL AUTOM, 6 +40dB, 2 +20dB, 1 0dB, 7 -20dB, 16 -40dB, 9 DISPL AUST, 4 +15V, 3 -15V, 14 NULL AUTOM, 5/12 UNTER-SCHR, 11, 8, 13 PEG EING.

5 NULL AUTOM — 7/10 +15V — 8/9

BU2 -40dB -20dB 0dB +20dB +40dB DP4 DP3 LOC +15V +15V D5 +5V rfl POLARITAT V_{LOG} BU7 RANGE BUSY POLARITAT rfl RANGE VALID RANGE dB V V AUTO

R1 22k R2 22k R3 22k R4 22k R5 22k R7 22k R8 22k

(+15V) +15V (+5V)

+40dB +20dB 0dB -20dB -40dB

B16 CD4071B B16 CD4071B B16 CD4071B B17 CD4075B

B11 CD4028AE

B10 CD4029AE

CARRY OUT CARRY IN UP DOWN CLOCK BINARY DECADE PRESET ENABLE JAM INPUT

C20 100

R71 220k R72 220k R74 220k R78 220k

+15V

B18 CD4001AE B20 CD4011B B21 CD4071B B21 CD4071B B22 CD4001BE

B19 CD4081B R9 22k DP2

B19 CD4081B

B16 CD4071B DP3

B20 CD4011B B20 CD4011B

B18 CD4001AE

BU9/16

B18 CD4001AE

B17 CD4075B

R57 10k

BU9/15

B21 CD4071B

BU9/4

BU9/7

B8 CD4066AE

CONT IN OUT A B C D

+15V

R12 10k

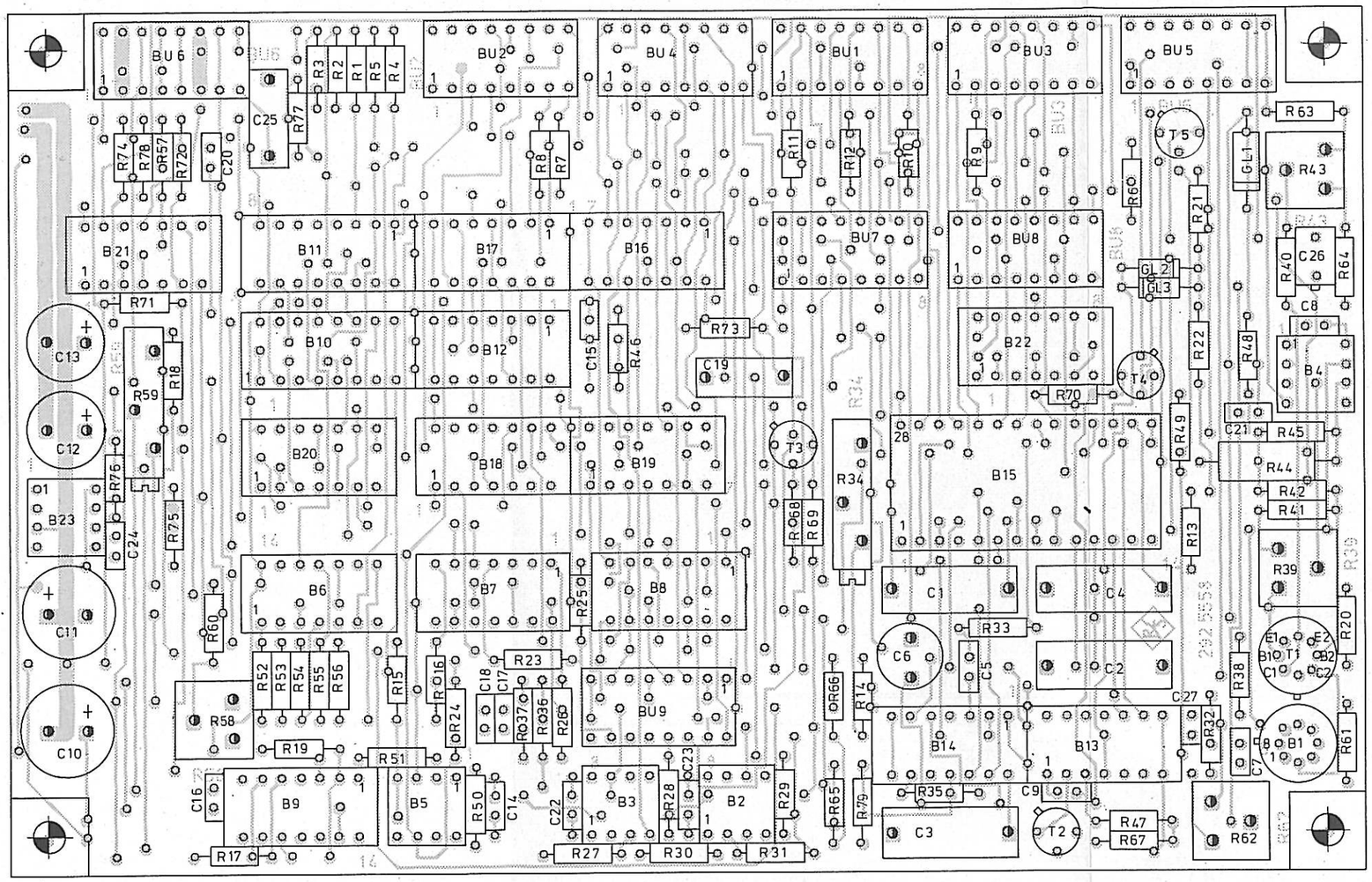
R10 10k R11 10k

C26 4,7µ

+5V

BU1 dB V V/mV MAN AUTO PON dB V MAN NULL AUTOM. LED NULL AUTOM. AUTO BU5 AUTO LOC CLR +5V NULL AUTOM

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



ZENTIMETER
0 1 2 3

And	Änderungs Mitteilung	Tag	Name
A	24822	02.79	He
B	25911	2.80	He

Maße ohne Toleranzangabe

Maßstab 2 : 1

Halbzeug, Werkstoff

1GME	Tag	Name
Bearb	9.6.78	Wm.
Gepr		
Norm		

Benennung: Digitalplatte

Z

ROHDE & SCHWARZ MÜNCHEN

Zeichn.-Nr: 292.5558

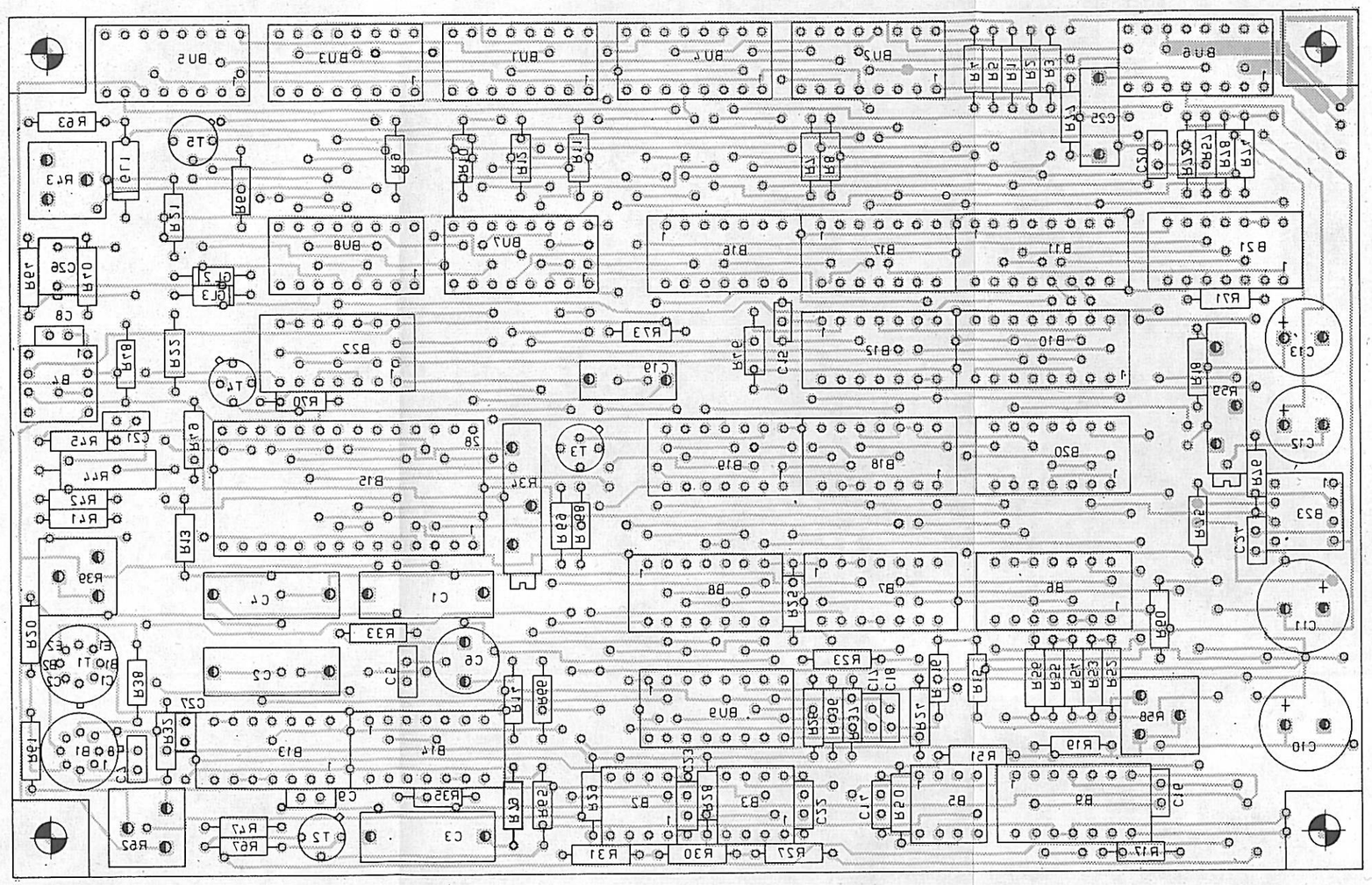
Blatt-Nr: 2

zu Gerät URV 4

reg. v 292.5012V erste Z 292.5012

Für diese Zeichnung behalten wir uns alle Rechte vor

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



ZENTIMETER
0 1 2 3

A	24822	02.79	He	Maße ohne Toleranzangabe		Maßstab 2:1	
B	25911	2.80	He			Halbzeug, Werkstoff	
				IGME	Tag	Name	Benennung: Digitalplatte — Z
				Bearb	9.6.78	Wm.	
				Gepr			
				Norm			
				ROHDE & SCHWARZ MÜNCHEN			Zeichn.-Nr 292.5558 — Blatt-Nr 3
And. Zust.	Änderungs Mitteilung	Tag	Name	zu Gerät URV4		reg.-V 292.5012V	erste Z 292.5012

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	08	0379	ANALOGPLATTE Z	292.5929 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 292.5929 S	999.9810	292.5929
B1	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5929
B2	BL CD4016BE 4/ANALOGSWITC RCA ICCD4016AE	BL 086.7050	292.5929
B3	BL CD4047AE MULTIVIBRATOR RCA ICC-MOSCD4047AE	BL 086.7221	292.5929
B4	BL CD4040BE 12BIT-COUNTER RCA ICCD4040AE	BL 086.7180	292.5929
B5	BL CD4001BE 4/2INP.NORG. RCA ICCD4001AE	BL 086.6960	292.5929
B6	BL CD4001BE 4/2INP.NORG. RCA ICCD4001AE	BL 086.6960	292.5929
B7	BL CD4011UBE 4/2INP.NANDG RCA IC-C-MOSCD4011AE	BL 200.8384	292.5929
B8	BL CD4011UBE 4/2INP.NANDG RCA IC-C-MOSCD4011AE	BL 200.8384	292.5929
B9	BL CD4024BE 7BIT-COUNTER RCA ICCD4024AE	BL 086.7115	292.5929
B10	BL CD4047AE MULTIVIBRATOR RCA ICC-MOSCD4047AE	BL 086.7221	292.5929
B11	BL CD4016BE 4/ANALOGSWITC RCA ICCD4016AE	BL 086.7050	292.5929
B12	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5929
B13	BO LF355N BIFET.OP-AMP. NSC LF 355 N	BO 092.8161	292.5929
B14	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5929
B15	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5929
B16	BL C4066BE 4/ANALOGSWITCH	BL 290.3906	292.5929
B17	BL C4066BE 4/ANALOGSWITCH	BL 290.3906	292.5929
B18	BO LM308N PRAEZ.OP-AMPL. NSC IC-LM308N	BO 247.7510	292.5929
B19	BL CD4011UBE 4/2INP.NANDG RCA IC-C-MOSCD4011AE	BL 200.8384	292.5929
B20	BL CD4081BF 4/2INP.ANDG. RCA CD4081BF	BL 531.0259	292.5929
BU1	FR IC-FASSUNG 16 POLIG SAE CSA3100 16B	FR 249.6091	292.5929
C1	CK 22NF+- 5%63V RD 8X18KS SCHUEMANN CKS22000/5/63/400	CK 024.4258	292.5929
C2	CC 1NF+-10%63V K2000 DRALORIC EDPU4X5/63V1000/10%	CC 022.0784	292.5929
C3	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	292.5929
C4	CC 33PF+-2%4X5NPO DRALORIC EDPU4X5/33/2%/NPO	CC 087.6487	292.5929
C5	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C6	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	Äz	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	08	0379	ANALOGPLATTE	Z	292.5929	SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C7	CK 10NF+-1% 63V RD 7X18KS SCHUEMANN CKS10000/1/63/40	CK 024.4593	292.5929
C8	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C9	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C10	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C11	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C12	CC 1PF+-0,25PF3X4P100 DRALORIC EDPU3X4/1/0,25/P100	CC 087.6170	292.5929
C14	CK 1,0UF+-10% 63V QUADER ROEDERST MKT1822-510/06/10%	CK 024.6973	292.5929
C15	CC 1 NF+- 5%100V NPO VIEL ERIE B133-100-COG-1NF-J	CC 060.0894	292.5929
C16	CK 47NF+-20%100V4X9X11MKT	CK 087.0914	292.5929
C17	CK 47NF+-20%100V4X9X11MKT	CK 087.0914	292.5929
C18	CK 100NF+-20%100V QUADER ROEDERST MKT1822-410/0	CK 006.5033	292.5929
C19	CK 470NF+-20%100VQUADER ROEDERST MKT1822-447/0	CK 006.5079	292.5929
C20	CE 47UF -10+100%16V 9X13 ROEDERST ELKO EK47/16	CE 022.7543	292.5929
C21	CK 220NF+-20%100V QUADER ROEDERST MKT1822-422/0	CK 006.5056	292.5929
C22	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C23	CE 22UF -10+100%16V 9X13B ROEDERST ELKO 22/16	CE 086.4368	292.5929
C24	CC 33PF+-2%4X5NPO DRALORIC EDPU4X5/33/2%/NPO	CC 087.6487	292.5929
C25	CE 22UF -10+100%40V 9X13 SIEMENS B4136-B7226-Z	CE 022.7572	292.5929
C26	CK 220NF+-20%100V QUADER ROEDERST MKT1822-422/0	CK 006.5056	292.5929
C27	CC 2,2PF+-0,25PF3X4NPO DRALORIC EDPU3X4/2,2/0,25NPO	CC 087.6341	292.5929
C28	CC 5,6PF+-0,25PF3X4NPO DRALORIC EDPU3X4/5,6/0,25NPO	CC 087.6393	292.5929
C29	CC 33PF+-2%4X5NPO DRALORIC EDPU4X5/33/2%/NPO	CC 087.6487	292.5929
C30	CC 1NF+-10%63V K2000 DRALORIC EDPU4X5/63V1000/10%	CC 022.0784	292.5929
C31	CC 1NF+-10%63V K2000 DRALORIC EDPU4X5/63V1000/10%	CC 022.0784	292.5929
C32	CK 47NF+-20%100V4X9X11MKT	CK 087.0914	292.5929
C33	CK 220NF+-20%100V QUADER ROEDERST MKT1822-422/0	CK 006.5056	292.5929
C34	CC 33PF+-2%4X5NPO DRALORIC EDPU4X5/33/2%/NPO	CC 087.6487	292.5929
C35	CC 1NF+-10%63V K2000 DRALORIC EDPU4X5/63V1000/10%	CC 022.0784	292.5929
C36	CK 220NF+-20%100V QUADER ROEDERST MKT1822-422/0	CK 006.5056	292.5929
GL1	AE BAV45 PICO-AMP.DIODE	AE 252.5386	292.5929

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	VALVO DIODEBAV45		
GL2	AE BAV45 PICO-AMP.DIODE	AE 252.5386	292.5929
	VALVO DIODEBAV45		
GL3	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL4	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL5	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL6	AE BAV45 PICO-AMP.DIODE	AE 252.5386	292.5929
	VALVO DIODEBAV45		
GL7	AE BZX55/B12 0,5W Z-DI	AE 218.8940	292.5929
	VALVO DIODEBZX79/B12		
GL8	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL9	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL10	AE BAV45 PICO-AMP.DIODE	AE 252.5386	292.5929
	VALVO DIODEBAV45		
GL11	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL12	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
GL13	AD 1N4448 SI 75V 150MIA	AD 012.0700	292.5929
	VALVO DIODE1N4448		
R1	RF 0,25W100 OHM +-5%	RF 069.1012	292.5929
	DRALORIC LCA0207/+-5%100		
R2	RF 0,25W330 OHM +-5%	RF 069.3315	292.5929
	DRALORIC LCA0207/+-5%330		
R3	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCA0207/+-5%10K		
R4	RL 0,25W 12,1KOHM+-1%TK50	RL 083.1351	292.5929
	DRALORIC SMA0207/12,1K-F-D		
R5	RF 0,25W100 OHM +-5%	RF 069.1012	292.5929
	DRALORIC LCA0207/+-5%100		
R6	RF 0,25W100 OHM +-5%	RF 069.1012	292.5929
	DRALORIC LCA0207/+-5%100		
R7	RL 0,25W 51,1KOHM+-1%TK50	RL 083.1822	292.5929
	DRALORIC SMA/207/51,1K-F-C		
R8	RS 0,5W20KOHM+-20%10X10X5	RS 087.7577	292.5929
	BOURNS 3386F-1-203		
R9	RL 0,25W 30,1KOHM+-1%TK50	RL 083.1639	292.5929
	DRALORIC SMA0207/30,1K-F-C		
R10	RL 0,25W 24,3KOHM+-1%TK50	RL 083.1574	292.5929
	DRALORIC SMA/207/24,3K-F-C		
R11	RL 0,25W 30,1KOHM+-1%TK50	RL 083.1639	292.5929
	DRALORIC SMA0207/30,1K-F-C		
R12	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCA0207/+-5%10K		
R13	RF 0,25W8,2KOHM +-5%	RF 069.8223	292.5929
	DRALORIC LCA0207/+-5%8,2K		
R14	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCA0207/+-5%10K		
R15	RF 0,25W8,2KOHM +-5%	RF 069.8223	292.5929
	DRALORIC LCA0207/+-5%8,2K		
R16	RS 0,5W1MOHM+-20%10X10X5	RS 087.7602	292.5929

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	08	0379	ANALOGPLATTE	Z	292.5929	SA	4

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	BOURNS 3386F-1-105		
R17	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCA0207/+-5%100K		
R18	RS 0,5W10KOHM+-20%10X10X5	RS 247.7903	292.5929
	BOURNS 3386F-1-103		
R19	RL 0,25W 41,2KOHM+-1%TK50	RL 082.2319	292.5929
	DRALORIC SMA0207/41,2K-F-C		
R20	RF 0,5 W 10 MOHM +-5%	RF 007.1854	292.5929
	RESISTA SK4/10M5%		
R21	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCA0207/+-5%100K		
R22	RL 0,25W 54,9KOHM+-1%TK50	RL 082.6595	292.5929
	DRALORIC SMA0207/54,9K-F-D		
R23	RL 0,25W 56,2KOHM+-1%TK50	RL 082.2231	292.5929
	DRALORIC SMA0207/56,2K-F-C		
R24	RL 0,125W1,210HM+-1%TK50	RL 086.4551	292.5929
	DALE MF1/10,1,210HM1%		
R25	RF 0,25W 15KOHM +-5%	RF 069.1535	292.5929
	DRALORIC LCA0207/+-5%15K		
R26	RL 0,25W 22,1KOHM+-1%TK50	RL 083.1545	292.5929
	DRALORIC SMA/207/22,1K-F-C		
R27	RS 0,5W20KOHM+-20%10X10X5	RS 087.7577	292.5929
	BOURNS 3386F-1-203		
R28	RF 0,25W 3,9MOHM+-5%	RF 069.3950	292.5929
	DRALORIC LCA0207/+-5%3,9M		
R29	RF 0,25W 3,3MOHM+-5%	RF 069.3350	292.5929
	DRALORIC LCA0207/+-5%3,3M		
R30	RF 0,25W 3,9MOHM+-5%	RF 069.3950	292.5929
	DRALORIC LCA0207/+-5%3,9M		
R31	RF 0,25W1,8MOHM +-5%	RF 069.1858	292.5929
	DRALORIC LCA0207/+-5%1,8M		
R32	RL 0,2KW 909 KOHM+-1%TK50	RL 083.2858	292.5929
	DRALORIC SMA0207/909K-F-C		
R34	RL 0,25W 453 KOHM+-1%TK50	RL 083.2570	292.5929
R35	RL 0,25W 226 KOHM+-1%TK50	RL 083.2287	292.5929
	DRALORIC SMA0207/226K-F-C		
R36	RL 0,25W 113KOHM+-1%TK50	RL 082.2248	292.5929
	DRALORIC SMA0207/113K-F-C		
R37	RL 0,25W 56,2KOHM+-1%TK50	RL 082.2231	292.5929
	DRALORIC SMA0207/56,2K-F-C		
R38	RL 0,25W 54,9KOHM+-1%TK50	RL 082.6595	292.5929
	DRALORIC SMA0207/54,9K-F-D		
R39	RF 0,25W 1KOHM +-5%	RF 069.1029	292.5929
	DRALORIC LCA0207/+-5%1,0K		
R40	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCA0207/+-5%10K		
R41	RF 0,25W220KOHM +-5%	RF 069.2248	292.5929
	DRALORIC LCA0207/+-5%220K		
R42	RS 0,5W100KOHM+-20%10X10X	RS 087.7583	292.5929
R43	RF 0,25W 47KOHM +-5%	RF 069.4734	292.5929
	DRALORIC LCA0207/+-5%47K		
R44	RF 0,25W 47KOHM +-5%	RF 069.4734	292.5929
	DRALORIC LCA0207/+-5%47K		
R45	RF 0,25W 47KOHM +-5%	RF 069.4734	292.5929
	DRALORIC LCA0207/+-5%47K		
R46	RF 0,25W 47KOHM +-5%	RF 069.4734	292.5929
	DRALORIC LCA0207/+-5%47K		

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	08	0379	ANALOGPLATTE Z	292.5929 SA	5

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R47	RF 0,25W 4,7MOHM+-5% DRALORIC LCAD207/+-5%4,7M	RF 069.4757	292.5929
R48	RF 0,25W820 OHM +-5% DRALORIC LCAD207/+-5%820	RF 069.8217	292.5929
R49	RF 0,25W1,5MOHM +-5% DRALORIC LCAD207/+-5%1,5M	RF 069.1558	292.5929
R50	RF 0,25W 1 MOHM +-5% DRALORIC LCAD207/+-5%1,0M	RF 069.1058	292.5929
R51	RF 0,25W 1KOHM +-5% DRALORIC LCAD207/+-5%1,0K	RF 069.1029	292.5929
R52	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
BIS			
R55	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R56	RF 0,25W 10KOHM +-5% DRALORIC LCAD207/+-5%10K	RF 069.1035	292.5929
R57	RF 0,25W 1KOHM +-5% DRALORIC LCAD207/+-5%1,0K	RF 069.1029	292.5929
R58	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R59	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R60	RF 0,5 W 10 MOHM +-5% RESISTA SK6/10M5%	RF 007.1854	292.5929
R61	RF 0,25W100 OHM +-5% DRALORIC LCAD207/+-5%100	RF 069.1012	292.5929
R62	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R63	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R64	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R65	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R66	RL 0,25W 5,11KOHM+-1%TK50 DRALORIC SMAD207/5,11K-F-C	RL 082.2348	292.5929
R67	RF 0,25W 10KOHM +-5% DRALORIC LCAD207/+-5%10K	RF 069.1035	292.5929
R68	RF 0,25W120KOHM +-5% DRALORIC LCAD207/+-5%120K	RF 069.1241	292.5929
R69	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R70	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R71	RF 0,25W100KOHM +-5% DRALORIC LCAD207/+-5%100K	RF 069.1041	292.5929
R72	RL 0,25W 162 OHM+-1%TK50 DRALORIC SMAD207/162OHM-F-D	RL 082.9971	292.5929
R73	RL 0,25W 162 OHM+-1%TK50 DRALORIC SMAD207/162OHM-F-D	RL 082.9971	292.5929
R75	RL 0,25W200 OHM+-0,1%TK25 DRALORIC SMAD207/200OHM-B-E	RL 083.7808	292.5929
R76	RL 0,25W1,62KOHM+-0,1%T25	RL 083.9546	292.5929
R77	RL 0,25W1,62KOHM+-0,1%T25	RL 083.9546	292.5929
R79	RL 0,25W200 OHM+-0,1%TK25 DRALORIC SMAD207/200OHM-B-E	RL 083.7808	292.5929

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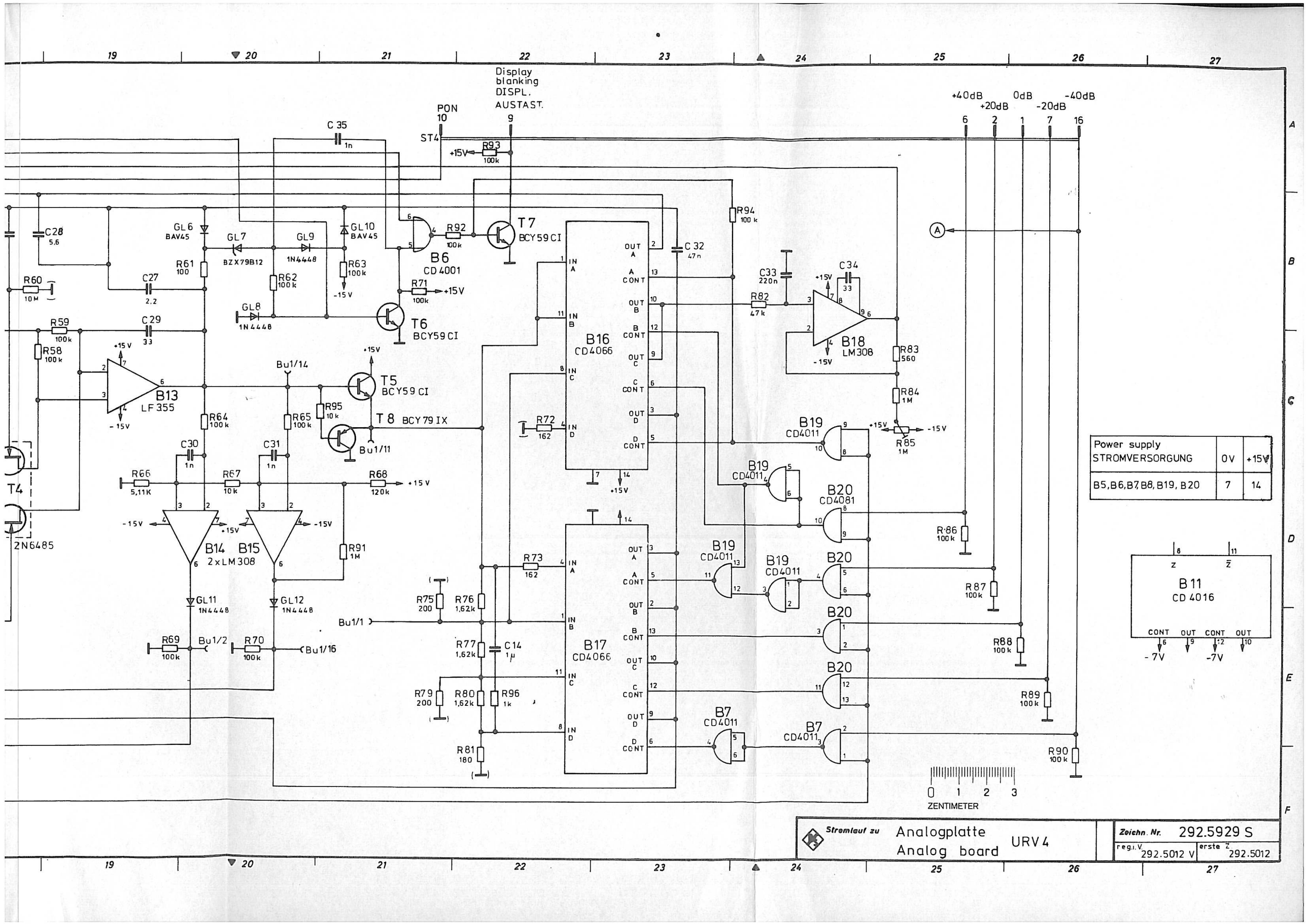
ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	08	0379	ANALOGPLATTE Z	292.5929 SA	6

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R80	RL 0,25W1,62KOHM+-0,1%T25	RL 083.9546	292.5929
R81	RL 0,25W180 OHM+-0,1%TK25	RL 083.7714	292.5929
	DRALORIC SMAD207/1800HM-B-E		
R82	RF 0,25W 47KOHM +-5%	RF 069.4734	292.5929
	DRALORIC LCAD207/+-5%47K		
R83	RF 0,25W560 OHM +-5%	RF 069.5618	292.5929
	DRALORIC LCAD207/+-5%560		
R84	RF 0,25W 1 MOHM +-5%	RF 069.1058	292.5929
	DRALORIC LCAD207/+-5%1,0M		
R85	RS 0,5W1MOHM+-20%10X10X5	RS 087.7602	292.5929
	BOURNS 3386F-1-105		
R86	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R87	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R88	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R89	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R90	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R91	RF 0,25W 1 MOHM +-5%	RF 069.1058	292.5929
	DRALORIC LCAD207/+-5%1,0M		
R92	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R93	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R94	RF 0,25W100KOHM +-5%	RF 069.1041	292.5929
	DRALORIC LCAD207/+-5%100K		
R95	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCAD207/+-5%10K		
R96	RF 0,25W 1KOHM +-5%	RF 069.1029	292.5929
	DRALORIC LCAD207/+-5%1,0K		
R97	RF 0,25W 33KOHM +-5%	RF 069.3338	292.5929
	DRALORIC LCAD207/+-5%33K		
R98	RF 0,25W 1 MOHM +-5%	RF 069.1058	292.5929
	DRALORIC LCAD207/+-5%1,0M		
R99	RF 0,25W 1 MOHM +-5%	RF 069.1058	292.5929
	DRALORIC LCAD207/+-5%1,0M		
R100	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCAD207/+-5%10K		
R101	RF 0,25W 10KOHM +-5%	RF 069.1035	292.5929
	DRALORIC LCAD207/+-5%10K		
R102	RL 0,25W 365 KOHM+-1%TK50	RL 083.2487	292.5929
	DRALORIC SMAD207/365K-F-C		
R103	RL 0,25W 124KOHM+-1%TK50	RL 082.6072	292.5929
	DRALORIC SMAD207/1240HM-F-C		
ST3	FP WINKELSTECKERLEIST.36P	FP 243.3578	292.5929
	BERG 75168-113-36		
ST4	STECKEREINHEIT Z	292.5670	292.5929
T1	AM 2N4117 SELEKTIERT	248.2486	292.5929
	INTERSIL 2N4117 SELEKTIERT		
T2	AM 2N4117 SELEKTIERT	248.2486	292.5929
	INTERSIL 2N4117 SELEKTIERT		
T3	AM 2N6485 N-KANAL DUALFET	AM 292.5712	292.5929

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	08	0379	ANALOGPLATTE Z	292.5929 SA	7

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	INTERSIL 2N6485		
T4	AM 2N6485 N-KANAL DUALFET	AM 292.5712	292.5929
	INTERSIL 2N6485		
T5	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5929
	SIEMENS TRANSIST.BCY59IX		
T6	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5929
	SIEMENS TRANSIST.BCY59IX		
T7	AK BCY59IX NPN 45V 200MA	AK 010.5163	292.5929
	SIEMENS TRANSIST.BCY59IX		
T8	AK BCY79IX PNP 45V200MIA	AK 010.3777	292.5929
	SIEMENS SI-TRANSISTORBCY79IX		
T9	AK BCY79IX PNP 45V200MIA	AK 010.3777	292.5929
	SIEMENS SI-TRANSISTORBCY79IX		
TR1	UEBERTRAEGER 1 Z	292.5641	292.5929
TR2	UEBERTRAEGER 2 Z	292.5658	292.5929
			- ENDE -

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.


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Display blanking DISPL. AUSTAST.
PON
10
9
ST4
+40dB
+20dB
0dB
-20dB
-40dB
6
2
1
7
16
C 35
1n
+15V
R93
100k
C28
5.6
GL6
BAV45
GL7
BZX79B12
GL9
1N4448
GL10
BAV45
R61
100
R62
100 k
R63
100k
-15 V
R60
10 M
C27
2.2
GL8
1N4448
R71
100k
+15V
B6
CD 4001
R92
100k
T7
BCY59 CI
T6
BCY59 CI
R94
100 k
C 32
47n
C33
220n
C34
33
R82
47 k
B18
LM308
R83
560
R84
1M
R85
1M
R59
100k
C29
33
R58
100 k
+15 V
B13
LF 355
- 15V
Bu1/14
T5
BCY59 CI
T 8 BCY 79 IX
R64
100 k
R65
100 k
R95
10 k
Bu1/11
R72
162
B16
CD4066
B19
CD4011
B20
CD4081
C30
1n
C31
1n
R66
5,11K
R67
10 k
R68
120k
+15 V
T4
2N6485
B14 B15
2xLM308
R91
1M
GL11
1N4448
GL12
1N4448
R69
100k
Bu1/2
R70
100k
Bu1/16
R73
162
R75
200
R76
1,62k
Bu1/1
R77
1,62k
C14
1µ
R79
200
R80
1,62k
R96
1k
R81
180
B17
CD4066
B19
CD4011
B20
CD4081
B7
CD4011
R86
100 k
R87
100 k
R88
100 k
R89
100 k
R90
100 k
B 11
CD 4016
CONT
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Power supply
STROMVERSORGUNG
0V
+15V
B5, B6, B7 B8, B19, B20
7
14
0 1 2 3
ZENTIMETER
Stromlauf zu
Analogplatte
Analog board
URV 4
Zeichn. Nr.
292.5929 S
regi. V.
292.5012 V
erste Z.
292.5012

Auto null LED
NULL AUTOM. LED
Level output
Ausg Pegel
Undercut recogniteon
Unterschreitungserkennung

8 5/12 15 13 11

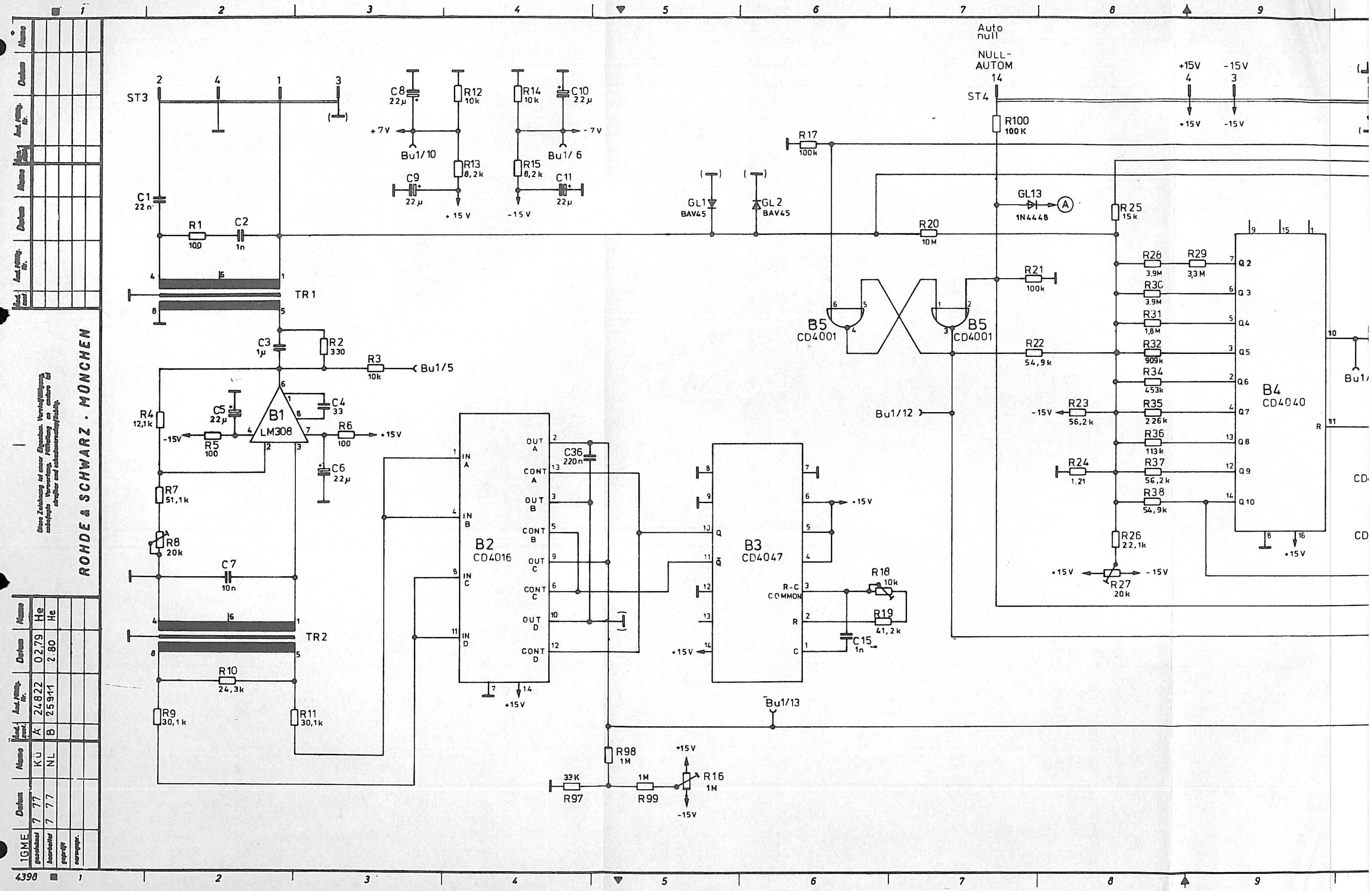
R40 10k
R101 10K
T9 BCY79 1X
-15V
365K R102
124K R103
B7 CD4011
B8 CD4011
B8 CD4011
B8 CD4011
B8 CD4011
R39 1k
B6 CD4001
u1/3
Bu1/4
B5 CD4001
B7 CD4011
B5 CD4001
B6 CD4001
GL3 1N4448
B6 CD4001
Bu1/15

B9 CD4024
Q1 Q2 Q3 Q4 Q5 Q6 Q7
INPUT PULS
2,7
14
+15V

+7V
14 4,5,6
B10 CD4047
OSC OUT
R
R-C COMMON
Q
Q
7,8,9,12
-7V
R41 220k
C16 47n
C17 47n

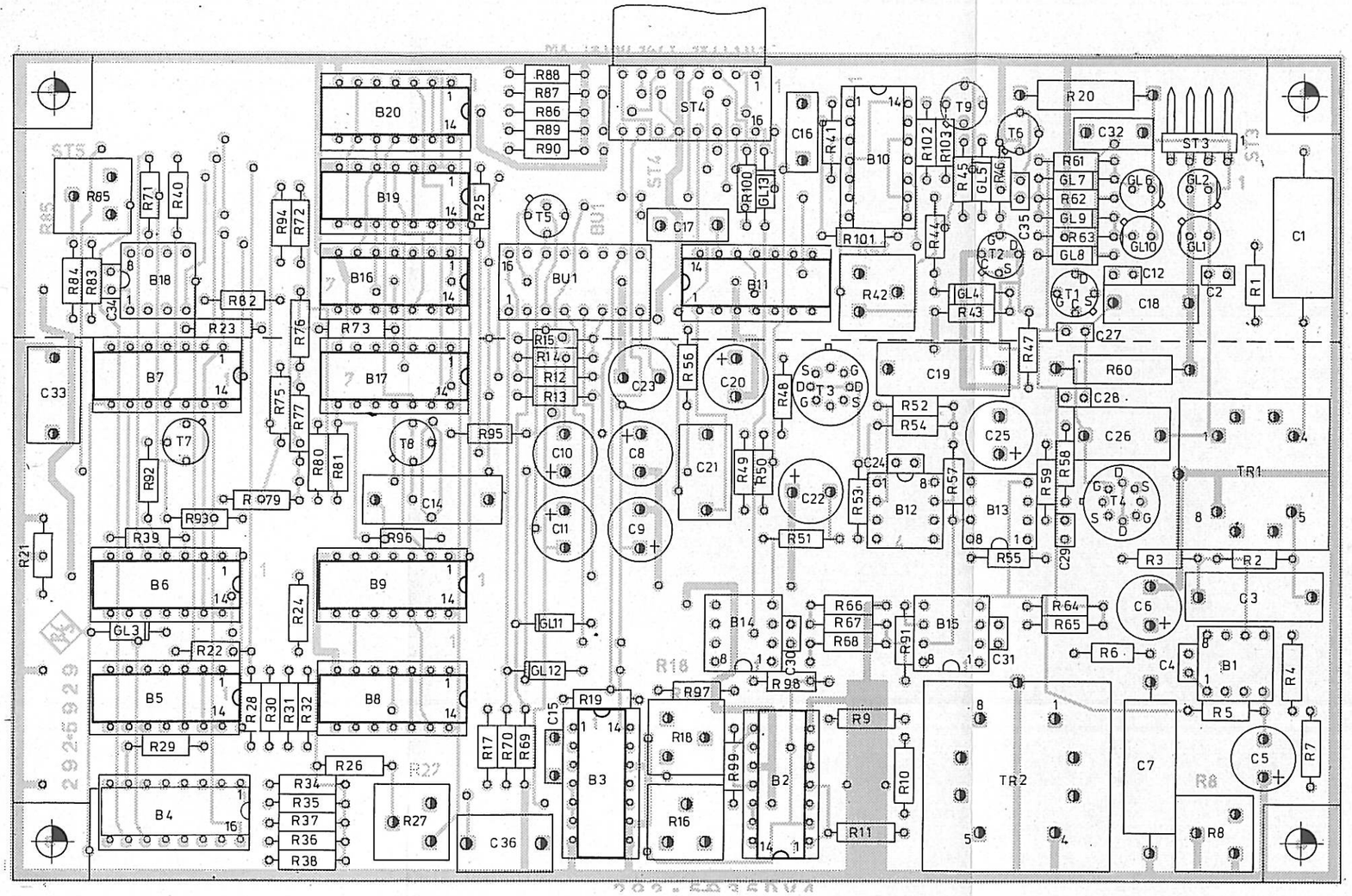
C18 100n
C12 1p
T1 2N4117
T2 2N4117
R43 47k
R44 47k
GL4 1N4448
R46 47k
R42 100k
GL5 1N4448
R45 47k

C19 470n
R47 4,7M
2N6485
T3
R48 820
C20 47µ
R49 1.5M
C21 220n
Bu1/9
B11 CD4016
IN B
IN A
-7 V
+7 V
B CONT
B OUT
A CONT
A OUT
R50 1M
R51 1k
-15 V
C22 22µ
R52 100k
R53 100k
R54 100k
R55 100k
+15 V
R57 1k
C25 22µ
B12 LM308
C24 33
C26 220n
C28 5.6
R60 10M
R59 100k
R58 100k
T4
2N6485
Bu1/7
C23 22µ
R56 10k
Bu1/8



ROHDE & SCHWARZ · MÜNCHEN
1GME
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25911
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2.80
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4398
ST3
ST4
Auto null
NULL-AUTOM
TR1
TR2
B1 LM308
B2 CD4016
B3 CD4047
B4 CD4040
B5 CD4001
C1 22n
R1 100
C2 1n
C3 1µ
R2 330
R3 10k
Bu1/5
R4 12,1k
C5 22µ
C4 33
R5 100
R6 100
C6 22µ
R7 51,1k
R8 20k
C7 10n
R10 24,3k
R9 30,1k
R11 30,1k
C8 22µ
R12 10k
R13 8,2k
C9 22µ
Bu1/10
+7V
R14 10k
C10 22µ
R15 8,2k
C11 22µ
Bu1/6
-7V
+15V
-15V
GL1 BAV45
GL2 BAV45
R17 100k
R20 10M
R100 100K
GL13 1N4448
R21 100k
R22 54,9k
Bu1/12
R23 56,2k
R24 1.21
R25 15k
R26 22,1k
R27 20k
R28 3,9M
R29 3,3M
R30 3,9M
R31 1,8M
R32 909k
R34 453k
R35 226k
R36 113k
R37 56,2k
R38 54,9k
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
C36 220n
OUT A
CONT A
OUT B
CONT B
OUT C
CONT C
OUT D
CONT D
IN A
IN B
IN C
IN D
R-C COMMON
R18 10k
R19 41,2k
C15 1n
Bu1/13
R98 1M
R97 33K
R99 1M
R16 1M

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



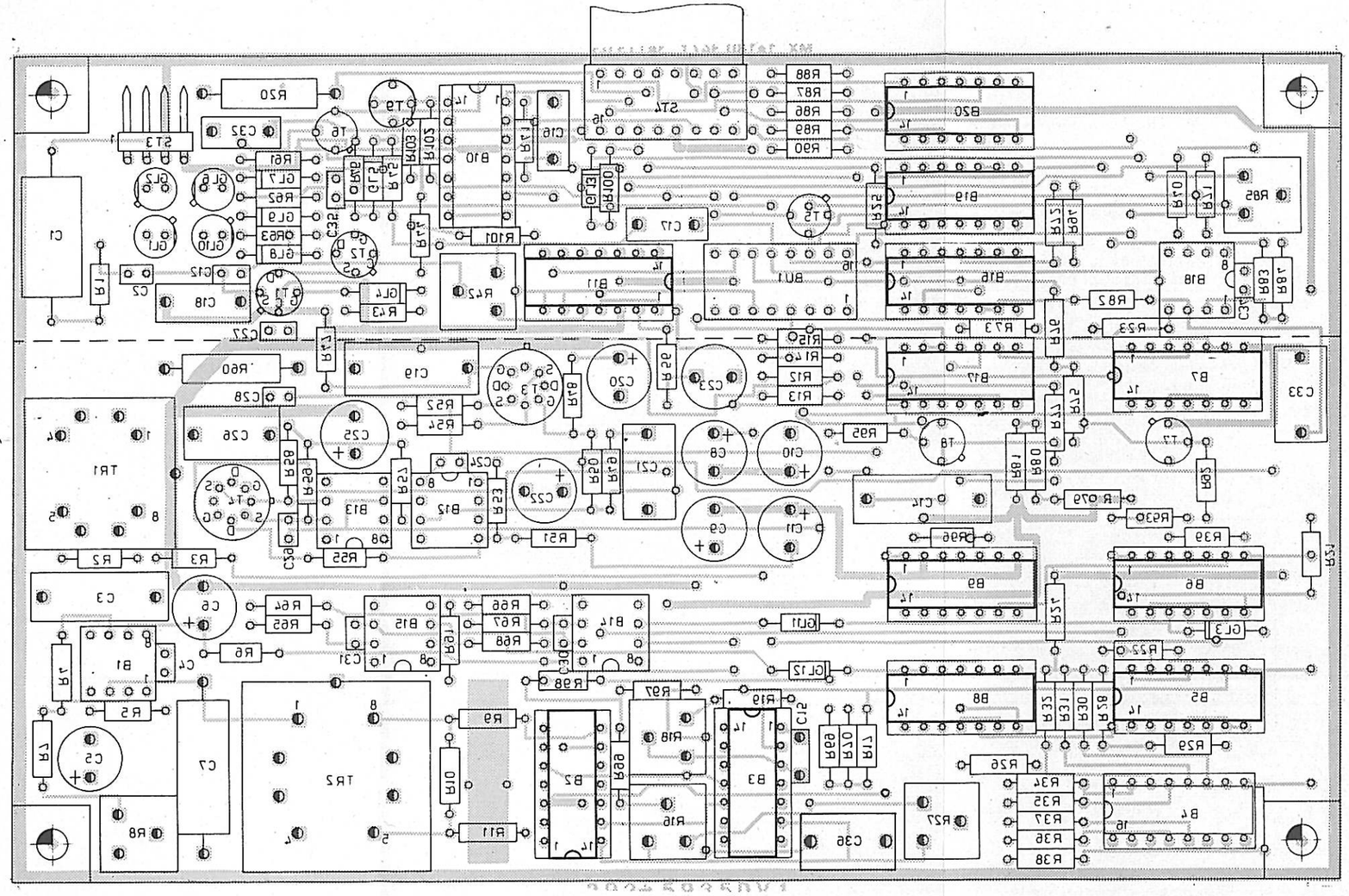
0 1 2 3
ZENTIMETER

A	24822	02.79	He	Maße ohne Toleranzangabe		Maßstab 2 : 1
B	25911	2.80	He			Halbzeug Werkstoff
				1GME	Tag	Name
				Bearb	8.6.78	Wm.
				Gepr		
				Norm		
And Zust	Änderungs Mitteilung	Tag	Name	ROHDE & SCHWARZ MÜNCHEN		Benennung Analogplatte Z
				zu Gerät URV 4		Zeichn -Nr 292.5929 Blatt-Nr 2 Bl
						reg. : V 292.5012 V erste Z 292.5012

Für diese Zeichnung behalten wir uns alle Rechte vor

DE 5952487

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



0 1 2 3
ZENTIMETER

A	24822	02.79	He	Maße ohne Toleranzangabe		Maßstab 2 : 1	
B	25911	2.80	He			Halbzeug, Werkstoff	
				1GME	Tag	Name	Benennung: Analogplatte
				Bearb	8.6.78	Wm.	Z
				Gepr			
				Norm			
Änd Zust	Änderungs Mitteilung	Tag	Name	ROHDE & SCHWARZ MÜNCHEN		Zeichn.-Nr 292.5929	Blatt-Nr 3
				zu Gerät URV4		reg. - V 292,5012 V	erste - 292.5012

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	16	0780	URV4-Z1 IEC-BUS NACHR. Z	333.7013.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
B1	BJ MC3441AP 4XBUS-TRANSC. MOTOROLA MC3441P	BJ 333.7107	333.7071
B2	BJ MC3441AP 4XBUS-TRANSC. MOTOROLA MC3441P	BJ 333.7107	333.7071
B3	BJ MC3441AP 4XBUS-TRANSC. MOTOROLA MC3441P	BJ 333.7107	333.7071
B4	BJ MC3441AP 4XBUS-TRANSC. MOTOROLA MC3441P	BJ 333.7107	333.7071
B5	BL SN74LS00N 4/2INP.NAND TEXAS IC-SN74LS00N	BL 266.4641	333.7071
B6	BJ HEF4738VP IEC-BUS-INT. VALVO HEF4738VP	BJ 302.7157	333.7071
B7	BL CD4014BE 8BIT-SHIFTREG RCA ICCD4014AE	BL 086.7038	333.7071
B8	BL CD4014BE 8BIT-SHIFTREG RCA ICCD4014AE	BL 086.7038	333.7071
B9	BL CD4049UBE 6/INVERTER RCA IC-C-MOSCD4049BE	BL 086.7244	333.7071
B10	BL SN74LS04N 6/INVERTER TEXAS IC-SN74LS04N	BL 266.2010	333.7071
B11	BC 8748 PROGR. Z	333.7142	333.7071
B12	BC D8243 4X4BIT-I/O-EXP. INTEL D8243	BC 092.8155	333.7071
B13	BC D8243 4X4BIT-I/O-EXP. INTEL D8243	BC 092.8155	333.7071
B14	BL CD4027BE 2/JK-FLIPFLOP RCA ICCD4027BE	BL 086.7144	333.7071
B15	BP IQL74 4FACH OPTOKOPPL. LITRONIX OPTPKOPPLILQ74	BP 216.1803	333.7071
BIS			
B21	BP IQL74 4FACH OPTOKOPPL. LITRONIX OPTPKOPPLILQ74	BP 216.1803	333.7071
B22	BO MA723C -0+70 SPGSREGL NSC ICLM723CN	BO 009.0190	333.7071
B23	BL CD4049UBE 6/INVERTER RCA IC-C-MOSCD4049BE	BL 086.7244	333.7071
B24	BL SN74LS73N 2/JK-FLIPFL. TEXAS IC-SN74LS73N	BL 266.7928	333.7071
B25	BL CD4081BE 4/2INP.ANDG. RCA CD4081BE	BL 299.6872	333.7071
BU1	FM BUCHSENLEISTE 24POL AMPHENOL 57-20240-8	FM 290.8514	333.7171
BU6	FP KURZSCHLUSSBUCHSE VALVO 242202488003	FP 491.7042	333.7071
BU9	FR JC-FASSUNG 16 POLIG EURO-DIP BU160Z	FR 249.6091	333.7071
BU10	FR JC-FASSUNG 16 POLIG EURO-DIP BU160Z	FR 249.6091	333.7071
BU11	FP KURZSCHLUSSBUCHSE VALVO 242202488003	FP 491.7042	333.7071
BU12	FP KURZSCHLUSSBUCHSE VALVO 242202488003	FP 491.7042	333.7071
BU13	FP KURZSCHLUSSBUCHSE VALVO 242202488003	FP 491.7042	333.7071
BU16	FP KURZSCHLUSSBUCHSE VALVO 242202488003	FP 491.7042	333.7071

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	16	0780	URV4-Z1 IEC-BUS NACHR. Z	333.7013.01 SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
C1	CE 2,2UF+-20%35V 7X 5X11	CE 022.8191	333.7071
	ERO-TANTAL TA-ELKOETR2,2/35		
C2	CC 4,7NF+-10%6X9R2000	CC 087.7102	333.7071
	DRALORIC EDPU6X9/4700/10R2000		
C3	CC 33PF+-2%3X4N750	CC 087.6841	333.7071
C4	CC 120PF+-2%5X6N750	CC 087.6912	333.7071
C5	CK 100NF+-20%100V QUADER	CK 006.5033	333.7071
	ROEDERST MKT1822-410/0		
C6	CE 470UF-10+50%40V 16X30	CE 092.6198	333.7071
	ROEDERST EGS 470/40 16X30		
C7	CE 220UF-10+100%16V 13X17	CE 022.7566	333.7071
	SIEMENS B41316-A4227-Z		
C8	CE 47UF -10+100%16V 9X13	CE 022.7543	333.7071
	ROEDERST ELKO EK47/16		
C9	CC 470PF+-10%3X4R2000	CC 087.6993	333.7071
	DRALORIC EDPU3X4/470/10%R2000		
C10	CC 1NF+-10%63V K2000	CC 022.0784	333.7071
	DRALORIC EDPU4X5/63V1000/10%		
GL1	AD 1N4448 SI 75V 150MIA	AD 012.0700	333.7071
	VALVO DIODE1N4448		
GL2	AG A114A GLEICHR.TRR200NS	418.1477	333.7071
	GEN-ELECTR GLEICHRICHTERA114A		
GL3	AE BZX85/C6V2 1,3W Z-DI	AE 092.8249	333.7071
	THOMSON BZX85C6V2		
GL4	AD 1N4448 SI 75V 150MIA	AD 012.0700	333.7071
	VALVO DIODE1N4448		
K2	BANDLEITUNG Z	333.7059	333.7013.01
L1	SPULE Z	333.7159	333.7071
Q1	EQ 6,000 MHZ CL30PF HC43U	302.7186	333.7071
R1	RF 0,25W 1 MOHM +-5%	RF 069.1058	333.7071
	DRALORIC LCA0207/+-5%1,0M		
R2	RF 0,25W100KOHM +-5%	RF 069.1041	333.7071
	DRALORIC LCA0207/+-5%100K		
R3	RF 0,25W100KOHM +-5%	RF 069.1041	333.7071
	DRALORIC LCA0207/+-5%100K		
R4	RF 0,25W 1KOHM +-5%	RF 069.1029	333.7071
	DRALORIC LCA0207/+-5%1,0K		
BIS			
R7	RF 0,25W 1KOHM +-5%	RF 069.1029	333.7071
	DRALORIC LCA0207/+-5%1,0K		
R8	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
R9	RF 0,25W 1KOHM +-5%	RF 069.1029	333.7071
	DRALORIC LCA0207/+-5%1,0K		
BIS			
R12	RF 0,25W 1KOHM +-5%	RF 069.1029	333.7071
	DRALORIC LCA0207/+-5%1,0K		
R13	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071
	DRALORIC LCA0207/+-5%220K		
BIS			
R20	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	DRALORIC LCA0207/+-5%220K		
R21	RF 0,25W 1KOHM +-5%	RF 069.1029	333.7071
	DRALORIC LCA0207/+-5%1,0K		
BIS			
R23	RF 0,25W 1KOHM +-5%	RF 069.1029	333.7071
	DRALORIC LCA0207/+-5%1,0K		
R25	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071
	DRALORIC LCA0207/+-5%220K		
BIS			
R28	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071
	DRALORIC LCA0207/+-5%220K		
R29	RF 0,25W1,2KOHM +-5%	RF 069.1229	333.7071
	DRALORIC LCA0207/+-5%1,2K		
R30	RF 0,25W1,2KOHM +-5%	RF 069.1229	333.7071
	DRALORIC LCA0207/+-5%1,2K		
R31	RF 0,25W1,2KOHM +-5%	RF 069.1229	333.7071
	DRALORIC LCA0207/+-5%1,2K		
R32	RF 0,25W1,2KOHM +-5%	RF 069.1229	333.7071
	DRALORIC LCA0207/+-5%1,2K		
R33	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
R34	RF 0,25W3,3KOHM +-5%	RF 069.3321	333.7071
	DRALORIC LCA0207/+-5%3,3K		
R35	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
R36	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
R37	RF 0,25W1,5KOHM +-5%	RF 069.1529	333.7071
	DRALORIC LCA0207/+-5%1,5K		
R38	RF 0,25W470 OHM +-5%	RF 069.4711	333.7071
	DRALORIC LCA0207/+-5%470		
BIS			
R41	RF 0,25W470 OHM +-5%	RF 069.4711	333.7071
	DRALORIC LCA0207/+-5%470		
R42	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071
	DRALORIC LCA0207/+-5%220K		
BIS			
R45	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071
	DRALORIC LCA0207/+-5%220K		
R46	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
BIS			
R49	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
R51	RF 0,25W220KOHM +-5%	RF 069.2248	333.7071
	DRALORIC LCA0207/+-5%220K		
R52	RF 0,25W1,2KOHM +-5%	RF 069.1229	333.7071
	DRALORIC LCA0207/+-5%1,2K		
R57	RF 0,25W150 OHM +-5%	RF 069.1512	333.7071
	DRALORIC LCA0207/+-5%150		
BIS			
R60	RF 0,25W150 OHM +-5%	RF 069.1512	333.7071
	DRALORIC LCA0207/+-5%150		
R61	RF 0,25W 10KOHM +-5%	RF 069.1035	333.7071
	DRALORIC LCA0207/+-5%10K		
R63	RF 0,25W150 OHM +-5%	RF 069.1512	333.7071
	DRALORIC LCA0207/+-5%150		

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	16	0780	URV4-Z1 IEC-BUS NACHR. Z	333.7013.01 SA	4

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
R64	RF 0,25W 68 OHM +-5% DRALORIC LCA0207/+-5%68	RF 069.6808	333.7071
R65	RL 0,25W 2,21KOHM+-1%TK5C DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	333.7071
R66	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	333.7071
R67	RL 0,25W 5,11KOHM+-1%TK50 DRALORIC SMA0207/5,11K-F-C	RL 082.2348	333.7071
R68	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	333.7071
R69	RF 0,25W 22 OHM +-5% DRALORIC LCA0207/+-5%22	RF 069.2202	333.7071
R70	RF 0,25W 1 MOHM +-5% DRALORIC LCA0207/+-5%1,0M	RF 069.1058	333.7071
R71	RF 0,25W 1 OHM +-5% DRALORIC LCA0207/+-5%1	RF 073.9872	333.7071
R72	RF 0,25W 10 OHM +-5% DRALORIC LCA0207/+-5%10	RF 069.1006	333.7071
R73	RF 0,25W470 OHM +-5% DRALORIC LCA0207/+-5%470	RF 069.4711	333.7071
R74	RF 0,25W 56 OHM +-5% DRALORIC LCA0207/+-5%56	RF 069.5601	333.7071
R75	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	333.7071
BIS R80	RF 0,25W100KOHM +-5% DRALORIC LCA0207/+-5%100K	RF 069.1041	333.7071
R81	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	333.7071
R82	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	333.7071
R83	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	333.7071
BIS R86	RF 0,25W 1KOHM +-5% DRALORIC LCA0207/+-5%1,0K	RF 069.1029	333.7071
R87	RF 0,25W 22KOHM +-5% DRALORIC LCA0207/+-5%22K	RF 069.2231	333.7071
R88	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	333.7071
R89	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	333.7071
R90	RF 0,25W 10KOHM +-5% DRALORIC LCA0207/+-5%10K	RF 069.1035	333.7071
S1	SK CODIERSCH MIT HAUBE AMP 435166-4MIT 435238-3	SK 240.0126	333.7171
ST2	STECKEREINHEIT Z	333.7288	333.7171
ST3	STECKEREINHEIT Z	333.7294	333.7171
ST4	FP INDIREKT.STECKERL.36P. BERG 75160-102-36	FP 242.3600	333.7071
ST5	STECKEREINHEIT Z	333.7113	333.7071
ST6	FP INDIREKT.STECKERL.36P. BERG 75160-102-36	FP 242.3600	333.7071
ST7	STECKEREINHEIT Z	333.7120	333.7071
ST8	STECKEREINHEIT Z	333.7136	333.7071
ST9	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	16	0780	URV4-Z1 IEC-BUS NACHR. Z	333.7013.01 SA	5

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	BERG 75160-102-36		
ST11	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071
	BERG 75160-102-36		
ST12	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071
	BERG 75160-102-36		
ST13	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071
	BERG 75160-102-36		
ST14	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071
	BERG 75160-102-36		
ST15	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071
	BERG 75160-102-36		
ST16	FP INDIREKT.STECKERL.36P.	FP 242.3600	333.7071
	BERG 75160-102-36		
T1	AL 2N4918/BD234 SI PNP40V	AL 010.0303	333.7071
	THOMSON TRANSISTBD234		
T2	AK BCY59IX NPN 45V 200MA	AK 010.5163	333.7071
	SIEMENS TRANSIST.BCY59IX		
BIS			
T9	AK BCY59IX NPN 45V 200MA	AK 010.5163	333.7071
	SIEMENS TRANSIST.BCY59IX		
T10	AK BCY79IX PNP 45V200MIA	AK 010.3777	333.7071
	SIEMENS SI-TRANSISTORBCY79IX		
			- ENDE -

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

* Clock mit fallender Flanke getriggert
clock triggered by falling edge

B 12 D8243 — B 13 D8243 — B 10 SN 74 LS04 — B 11 8048 — B 24 SN 74 LS 73 — B 14 CD 4027 — B 15 IQL 74 — B 16 IQL 74 — B 17 IQL 74 — B 18 IQL 74 — B 19 IQL 74 — B 20 IQL 74 — B 21 IQL 74 — B 22 µA 723 — B 23 CD 4049 — B 25 CD 4081

T1 2N4918 — T2 BCY 59 — T3 BCY 59 — T5 BCY 59 — T6 BCY 59 — T7 BCY 59 — T8 BCY 59 — T9 BCY 59 — T10 BCY 79

ST 7/15 RANGE
ST 7/14 RANGE
ST 7/16 RANGE
ST 7/ 8 R VALID
ST 5/16 AUTOM.
ST 8/15 NULL AUTOM.
ST 7/11 V
ST 8/12 MAN
ST 7/12 dB
ST 5/2 CLR
ST 5/1 LOC
ST 8/ 5 HOLD
ST 8/13 ADDRESSED
ST 8/14 FC
ST 8/9 DATA
ST 8/8 DATA
ST 8/10 DATA
ST 8/6 DATA
ST 7/4 RANGE
ST 7/3 RANGE
ST 7/5 RANGE
ST 7/6 R VALID
ST 5/5 NULL AUTOM.
ST 7/10 VdB
ST 7/1 +/-
ST 7/9 AUTO/MAN
ST 5/6
ST 5/7 u 10
ST 5/8 u. 9
ST 8/1 STROBE
ST 8/2 DS
ST 7/2
ST 7/13 RTL
ST 4 +11V ± 28V

Schlußzeichen — ST 11 — BU 11 — ST 13 Start/Stop — ST 14 — ST 6 — BU 6 — ST/BU 16 — ST 12 — BU 12 — K 2 — GL 2 A114A — GL 3 BZX 85/C6 V2

T1 2N4918 — T2 BCY 59 — T3 BCY 59 — T5 BCY 59 — T6 BCY 59 — T7 BCY 59 — T8 BCY 59 — T9 BCY 59 — T10 BCY 79

T1 E C B — T2 – T10 E B C — B 5, B10, B 22, B 24, B 25 — B 1 – B4, B7, B8, B9, B14 – B 21, B 23 — B 12, B 13 — B6, B 11 — B 24 — B1, B4, B7, B8 B14 — B5, B10 — B 9 — B 23 — B 25 — Draufsicht Top view

ZENTIMETER 0 1 2 3

ROHDE & SCHWARZ MÜNCHEN	Halbzeug, Werkstoff	Unbemaßte Maße	Zeichn. Nr
		Maßstab	333.7013 S
			333.7013V 333.7013
		Projekt	

	Datum	Name	Änd.-Index	Änd.-Mitteilg.-Nr	Datum	Name
1GME						
gezeichn	10.01.79	Gr	A	25914	02.80	He
bearbeitet			B	26341	07.80	Wk
geprüft						
normgep.						

IEC-BUS — Z

* Clock mit fallender Flanke getriggert
clock triggered by falling edge

B 12 D8243 — B 13 D8243 — B 10 SN 74 LS04 — B 11 8048 — B 24 SN 74 LS 73 — B 14 CD 4027 — B 15 IQL 74 — B 16 IQL 74 — B 17 IQL 74 — B 18 IQL 74 — B 19 IQL 74 — B 20 IQL 74 — B 21 IQL 74 — B 22 µA 723 — B 23 CD 4049 — B 25 CD 4081

T1 2N4918 — T2 BCY 59 — T3 BCY 59 — T5 BCY 59 — T6 BCY 59 — T7 BCY 59 — T8 BCY 59 — T9 BCY 59 — T10 BCY 79

ST 7/15 RANGE
ST 7/14 RANGE
ST 7/16 RANGE
ST 7/ 8 R VALID
ST 5/16 AUTOM.
ST 8/15 NULL AUTOM.
ST 7/11 V
ST 8/12 MAN
ST 7/12 dB
ST 5/2 CLR
ST 5/1 LOC
ST 8/ 5 HOLD
ST 8/13 ADDRESSED
ST 8/14 FC
ST 8/9 DATA
ST 8/8 DATA
ST 8/10 DATA
ST 8/6 DATA
ST 7/4 RANGE
ST 7/3 RANGE
ST 7/5 RANGE
ST 7/6 R VALID
ST 5/5 NULL AUTOM.
ST 7/10 VdB
ST 7/1 +/-
ST 7/9 AUTO/MAN
ST 5/6
ST 5/7 u 10
ST 5/8 u. 9
ST 8/1 STROBE
ST 8/2 DS
ST 7/2
ST 7/13 RTL
ST 4 +11V ± 28V

Schlußzeichen — ST 11 — BU 11 — ST 13 Start/Stop — ST 14 — ST 6 — BU 6 — ST/BU 16 — ST 12 — BU 12 — K 2 — GL 2 A114A — GL 3 BZX 85/C6 V2

T1 2N4918 — T2 BCY 59 — T3 BCY 59 — T5 BCY 59 — T6 BCY 59 — T7 BCY 59 — T8 BCY 59 — T9 BCY 59 — T10 BCY 79

T1 E C B — T2 – T10 E B C — B 5, B10, B 22, B 24, B 25 — B 1 – B4, B7, B8, B9, B14 – B 21, B 23 — B 12, B 13 — B6, B 11 — B 24 — B1, B4, B7, B8 B14 — B5, B10 — B 9 — B 23 — B 25 — Draufsicht Top view

ZENTIMETER 0 1 2 3

ROHDE & SCHWARZ MÜNCHEN	Halbzeug, Werkstoff	Unbemaßte Maße	Zeichn. Nr
		Maßstab	333.7013 S
			333.7013V 333.7013
		Projekt	

	Datum	Name	Änd.-Index	Änd.-Mitteilg.-Nr	Datum	Name
1GME						
gezeichn	10.01.79	Gr	A	25914	02.80	He
bearbeitet			B	26341	07.80	Wk
geprüft						
normgep.						

IEC-BUS — Z

BU 1

DIO 8 16 — 5
DIO 7 15 — 11
DIO 6 14 — 9
DIO 5 13 — 10

ST BU 2 10

DIO 2 2 — 16
DIO 1 1 — 15
DIO 4 4 — 8
DIO 3 3 — 9

ST BU 3 9

DAV 6 — 2
NDAC 8 — 3
NRFD 7 — 5
SRQ 10 — 11

EOI 5 — 1
ATN 11 — 4
REN 17 — 7
IFC 9 — 10

12 18 19 20 21 22 23 24 — 6

Gehäuse

ST BU 2 10

ADDRESSED
TALK ONLY
S1

5 4 3 2 1 — 1 16 12 13 14 15

ST BU 3 9

IEC-BUS Steckerplatte 333 7171

B1 B2 B3 B4 MC 3441

B5 SN 74 LS 00

B10 SN 74 LS 04

B9 CD 4049

B6 HEF 4738 V

B7 CD 4014

B8 CD 4014

ST9 BU13

R80 R75 R76 R77 R78 R79 100k

R88 10k

IEC-BUS Platte 333 7071

5A2H UA02 7CP4 F478 F2U4 CP40 6394 1423 4234 PF78

R84 1k
R86 1k

B12 D82433

B13 D8243

P40 P41 P42 P43 P50 P51 P52 P53 P60 P61 P62 P63 P70 P71 P72 P73

RANG RANG RANG R VALID AUFMA NULL-A VdB SRQ HOLD ADDR FC da te rdy nba

DATA DATA DATA DATA RANG RANG RANG R-VALID dv VdB +/- AUTO/M NULL-AU LOC dvd dcd

B 10 SN 74 LS 04

R81 1k
R83 1k
Schlußzeichen ST11 BU 11

ST 13 Start Stop

B 11 8048

RESET VSS EA XTAL 1 XTAL 2 TO PROG VDD VCC

ST 14 GND

R7 1k
ST13 Clock
R82 10k
Test
ST6 BU 6

ST/BU 16

ST15

GL 4 1N4448
GL1 1N4448

R2 100k
R3 100k
C1 2,2µ
C10 1n
R1 1M
C2 4,7n
R4 1k
R5 1k
C3 33
C4 120
Q1 6MHz

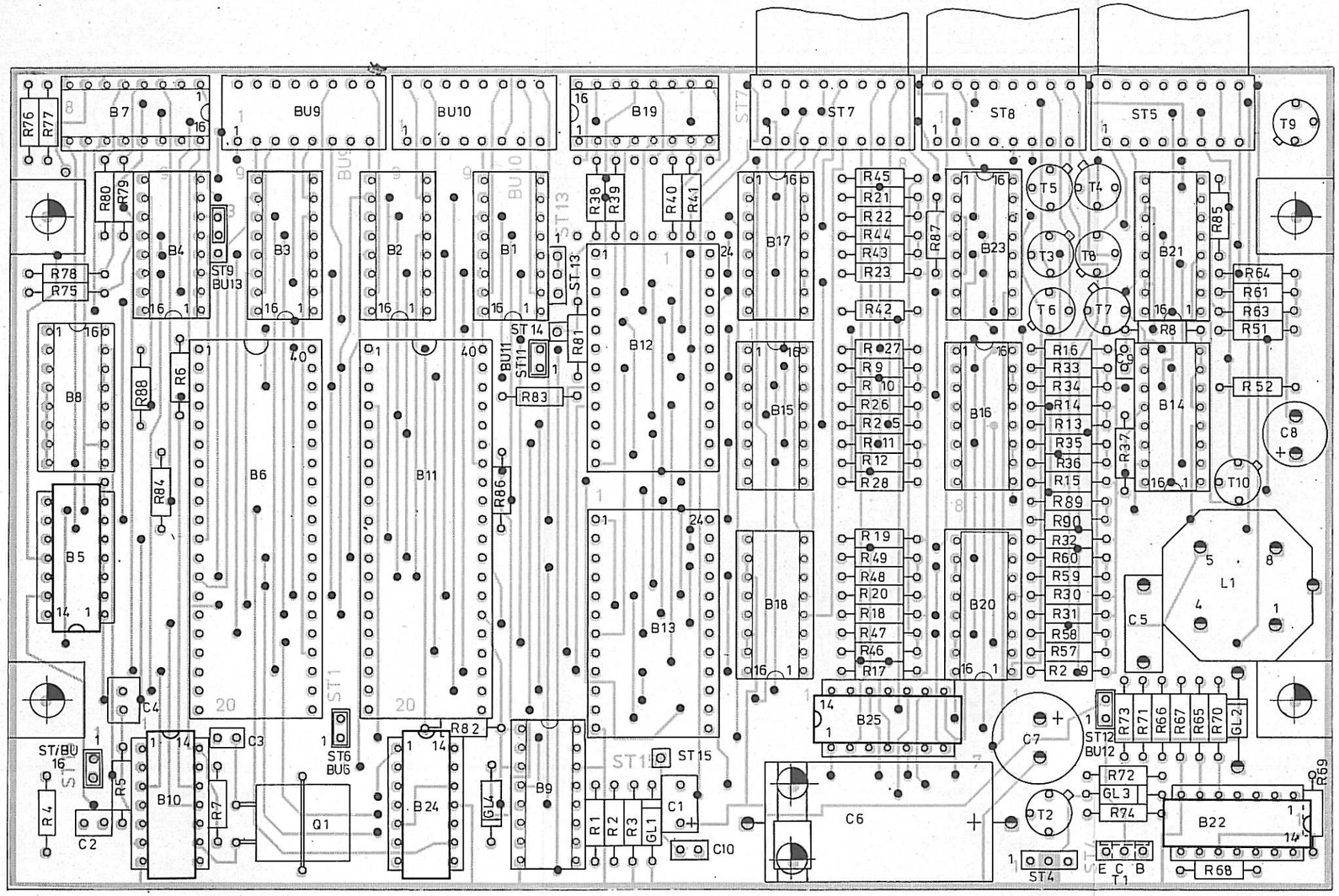
B 24 SN 74 LS 73

T1 E C B

T2 - T10 E B C

B 5, B10, B 22, B 24, B 25 Draufsicht Top view

Draufsich Top view

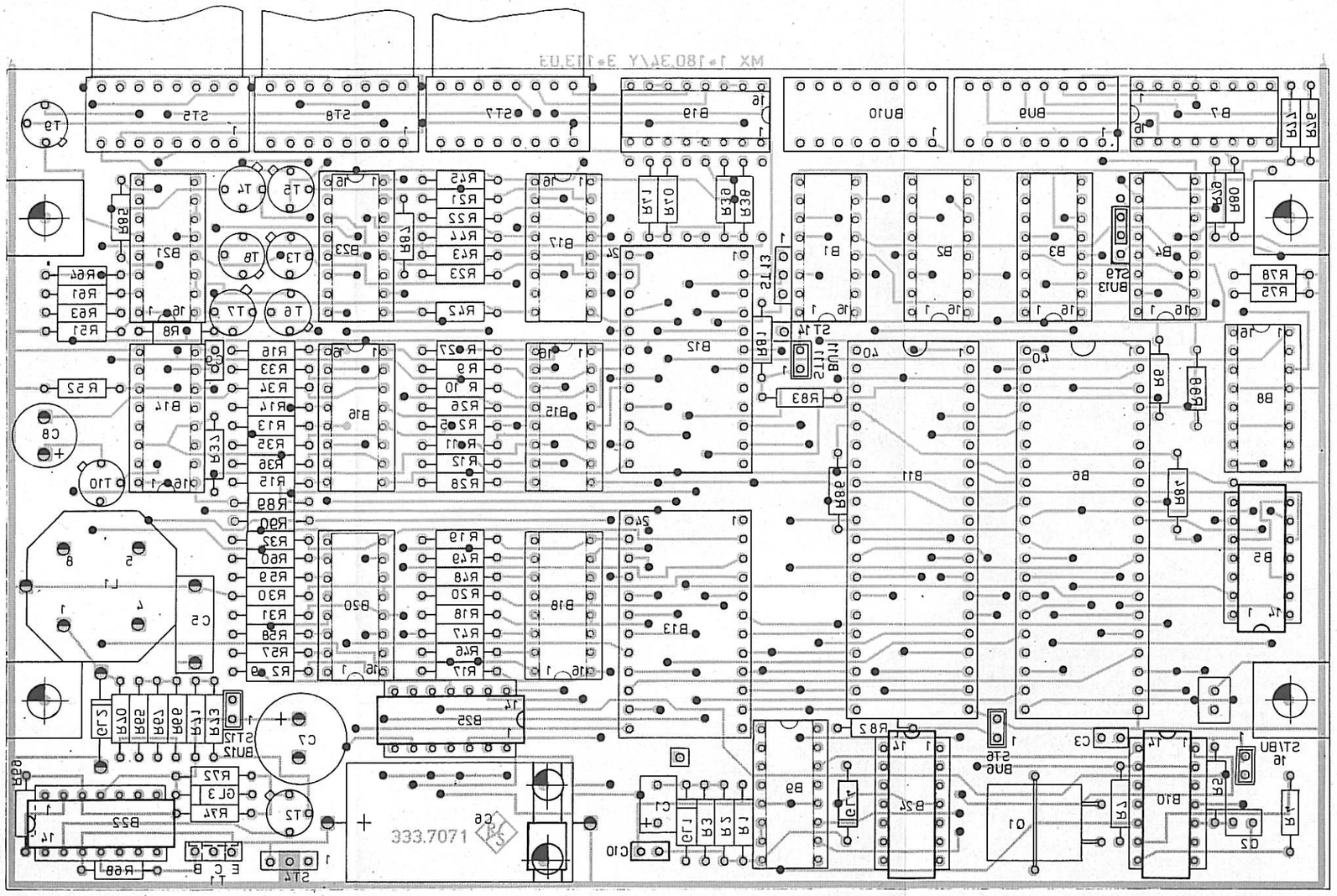


Ansicht und Leitungsführung Bauteilseite
View of tracks on component side

ZENTIMETER
0 1 2 3

A	24821	03.79	He	Maße ohne Toleranzangabe		Maßstab 2 : 1
B	25914	2.80	He			Halbzeug, Werkstoff
C	26341	7.80	Wk	1GME	Tag / Name	Benennung: IEC-BUS Platte / IEC-BUS board — Z
				Bearb.	17.10.78 / Wm.	
				Gepr.		
				Norm		
				ROHDE & SCHWARZ MÜNCHEN		Zeichn. Nr. 333.7071 — Blatt Nr. 2
Änd. Zust.	Änderungs Mitteilung	Tag	Name	Zugehörig		Ers. f. 333.7013 V — Ersetzt d. 333.7013

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



ZENTIMETER
0 1 2 3

And Zust	Änderungs-Mitteilung	Tag	Name
A	24821	03.79	He
B	25914	2.80	He
C	26341	7.80	Wk

Maße ohne Toleranzangabe

Maßstab 2 : 1

Halbzeug, Werkstoff

IGME	Tag	Name
Bearb	17.10.78	Wm
Gepr		
Norm		

Benennung
IEC-BUS Platte
IEC-BUS board

Z

ROHDE & SCHWARZ
MÜNCHEN

Zeichn.-Nr 333.7071

Blatt-Nr 3

zu Gerät

reg. i. V. 333.7013 V

erste Z 333.7013

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	05	0280	NETZTEILPLATTE Y 4 Z	292.4751 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
B1	BO SG3524J SCHALTREGLER SILICON-GE SG 3524 J	BO 292.5758	292.4751
B2	BO SG4501N DUAL-U-REGLER SILICONIX IC-SG4501N	BO 243.3549	292.4751
C1	CK 100NF+-20%100V QUADER ROEDERST MKT1822-410/0	CK 006.5033	292.4751
C2	CK 100NF+-20%100V QUADER ROEDERST MKT1822-410/0	CK 006.5033	292.4751
C3	CE 470UF-10+100%40V 15X30 ROEDERST ELKO EK470/40	CE 087.0572	292.4751
C4	CE 470UF-10+100%40V 15X30 ROEDERST ELKO EK470/40	CE 087.0572	292.4751
C5	CK 4,7NF+-10%160V RD14X3X WESTERMANN FKS-4700PF+10%/160V-	CK 006.5310	292.4751
C6	CK 47NF+-20%100V4X9X11MKT ITT 42515-12747	CK 087.0914	292.4751
C7	CK 100NF+-20%100V QUADER ROEDERST MKT1822-410/0	CK 006.5033	292.4751
C8	CE 470UF-10+100%40V 15X30 ROEDERST ELKO EK470/40	CE 087.0572	292.4751
C9	CE 470UF-10+100%40V 15X30 ROEDERST ELKO EK470/40	CE 087.0572	292.4751
C10	CE 1000UF10+100%16V 15X30 ROEDERST ELKO EK 1000/16	CE 087.0437	292.4751
C11	CC 1NF+-10%63V K2000 DRALORIC EDPU4X5/63V1000/10%	CC 022.0784	292.4751
C12	CE 4,7UF+-20%10V 5X 4X 7 ERO-TANTAL TA-ELKOETR1,4,7/10	CE 022.8056	292.4751
C13	CK 47NF+-20%100V4X9X11MKT ITT 42515-12747	CK 087.0914	292.4751
C14	CE 1,0UF+-20%35V 5X 4X 7 ERO-TANTAL TA-ELKOETR1-1/35	CE 022.8185	292.4751
C15	CE 1,0UF+-20%35V 5X 4X 7 ERO-TANTAL TA-ELKOETR1-1/35	CE 022.8185	292.4751
C16	CK 10NF+-20%400V QUADER VALVO 344/0,010/20/400	CK 006.5227	292.4751
C17	CK 10NF+-20%400V QUADER VALVO 344/0,010/20/400	CK 006.5227	292.4751
GL1	AG B40C3700/2200 SI-BR.GL SIEMENS C2206-B40C3700/2200	AG 092.8532	292.4751
GL2	AG 1N4004 SI 1A 400V ITT DIODE1N4004	AG 013.0291	292.4751
GL3	AD BAV21 SI-DIODE 250V INTERMETAL DIODEBAV21	AD 082.6837	292.4751
GL5	AD BAV21 SI-DIODE 250V INTERMETAL DIODEBAV21	AD 082.6837	292.4751
BIS			
GL8	AD BAV21 SI-DIODE 250V INTERMETAL DIODEBAV21	AD 082.6837	292.4751
GL9	AD FDH300 SI 125V 500MA FAIRCHILD DIODEFD300	AD 012.1442	292.4751
GL10	AD FDH300 SI 125V 500MA FAIRCHILD DIODEFD300	AD 012.1442	292.4751
GL11	AE BZX85/C27 1,3W Z-DI	AE 092.8355	292.4751

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für		Sachnummer		Blatt Nr.
	05	0280	NETZTEILPLATTE Y 4	Z	292.4751	SA	2

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
	THOMSON BZX85C27		
GL12	AE BZX85/C27 1,3W Z-DI	AE 092.8355	292.4751
	THOMSON BZX85C27		
GL13	AE BZX85/C5V6 1,3W Z-DI	AE 092.8232	292.4751
	THOMSON BZX85C5V6		
L1	LD UKW-DR.Z=750 OHM 50MHZ	LD 026.4578	292.4751
	VALVO 431202036641		
L2	LD UKW-DR.Z=750 OHM 50MHZ	LD 026.4578	292.4751
	VALVO 431202036641		
L3	SPULE Z	292.5893	292.4751
R1	RL 0,25W 10,0KOHM+-1%TK50	RL 083.1297	292.4751
	DRALORIC SMA0207/10K-F-D		
R2	RL 0,25W 10,0KOHM+-1%TK50	RL 083.1297	292.4751
	DRALORIC SMA0207/10K-F-D		
R3	RF 0,25W6,8KOHM +-5%	RF 069.6820	292.4751
	DRALORIC LCA0207/+-5%6,8K		
R4	RF 0,25W270 OHM +-5%	RF 069.2719	292.4751
	DRALORIC LCA0207/+-5%270		
R5	RF 0,25W270 OHM +-5%	RF 069.2719	292.4751
	DRALORIC LCA0207/+-5%270		
R6	RF 0,25W 1KOHM +-5%	RF 069.1029	292.4751
	DRALORIC LCA0207/+-5%1,0K		
R7	RF 0,25W 1KOHM +-5%	RF 069.1029	292.4751
	DRALORIC LCA0207/+-5%1,0K		
R8	RL 0,25W 4,75KOHM+-1%TK50	RL 083.1097	292.4751
	DRALORIC SMA0207/4,75K-F-D		
R9	RF 0,25W 1 OHM +-5%	RF 073.9872	292.4751
	DRALORIC LCA0207/+-5%1		
R10	RF 0,25W 1 OHM +-5%	RF 073.9872	292.4751
	DRALORIC LCA0207/+-5%1		
R11	RL 0,25W 4,75KOHM+-1%TK50	RL 083.1097	292.4751
	DRALORIC SMA0207/4,75K-F-D		
R12	RS 0,5W200 OHM+-20%10X10X	RS 247.7949	292.4751
	BOURNS 3386X-1-201		
R13	RL 0,25W 1KOHM+-1%TK50	RL 082.2160	292.4751
	DRALORIC SMA0207/1K-F-C		
R14	RL 0,25W 221 OHM+-1%TK50	RL 083.0084	292.4751
	DRALORIC SMA0207/2210HM-F-D		
R15	RF 0,25W 1 OHM +-5%	RF 073.9872	292.4751
	DRALORIC LCA0207/+-5%1		
R16	RF 0,25W 1 OHM +-5%	RF 073.9872	292.4751
	DRALORIC LCA0207/+-5%1		
R18	RF 0,25W100 OHM +-5%	RF 069.1012	292.4751
	DRALORIC LCA0207/+-5%100		
R19	RF 0,25W100 OHM +-5%	RF 069.1012	292.4751
	DRALORIC LCA0207/+-5%100		
R20	RL 0,25W 22,1KOHM+-1%TK50	RL 083.1545	292.4751
	DRALORIC SMA/207/22,1K-F-C		
R21	RS 0,5W10KOHM+-20%10X10X5	RS 247.7526	292.4751
	BOURNS 3386X1-103		
R22	RL 0,25W 27,4KOHM+-1%TK50	RL 082.2583	292.4751
	DRALORIC SMA 0207/27,4K-F-C		
R23	RF 0,25W100 OHM +-5%	RF 069.1012	292.4751
	DRALORIC LCA0207/+-5%100		

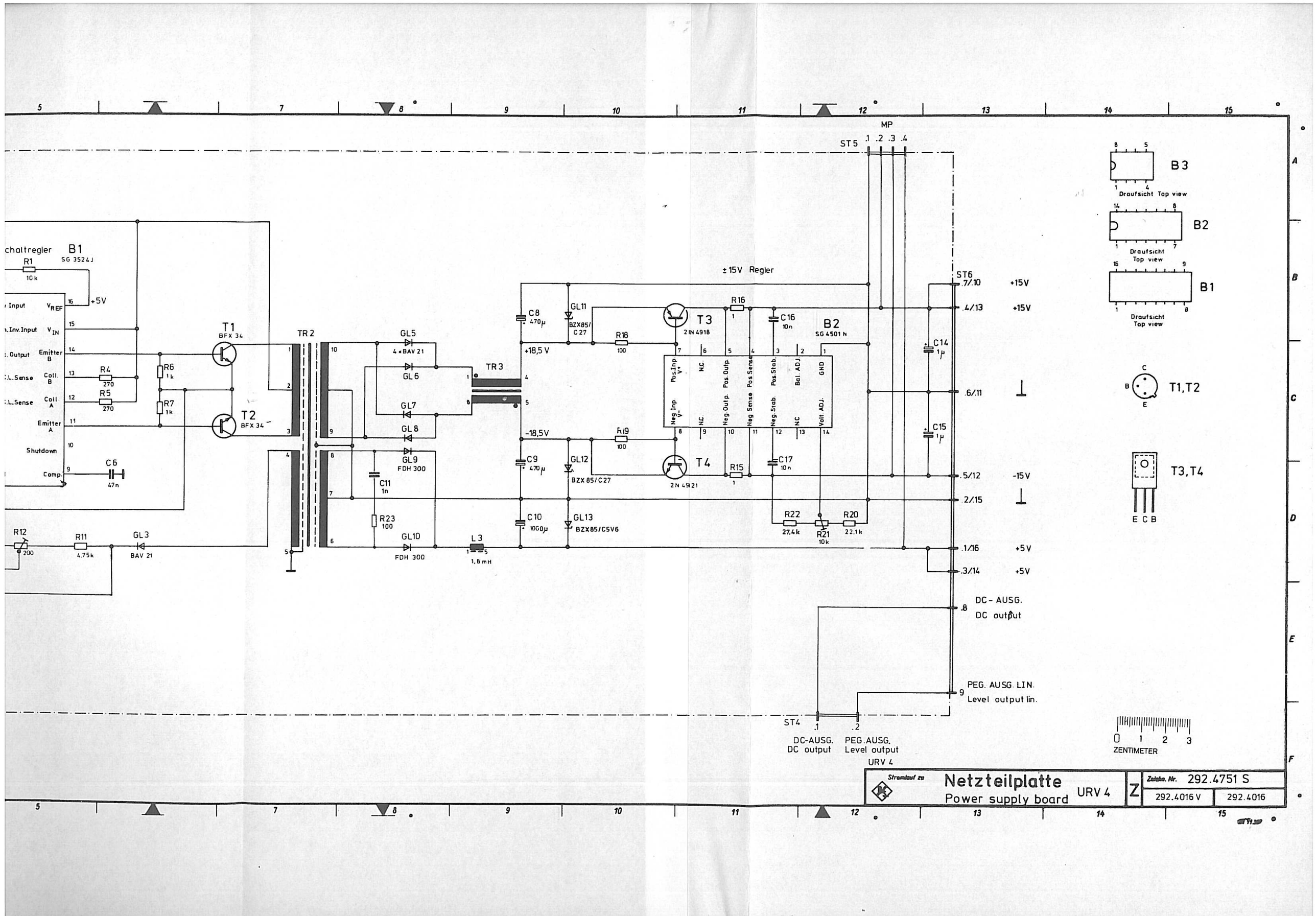
Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	05	0280	NETZTEILPLATTE Y 4 Z	292.4751 SA	3

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
SI1	SS SCHMELZD.TO,1BDIN41571 WICKMANN TO,1BDIN41571TROP.	SS 020.7146	292.4751
SI2	SS SCHMELZS.T 1B DIN41571 WICKMANN T1BDIN41571TROP.	SS 020.7446	292.4751
ST1	FP INDIREKT.STECKERL.36P. BERG NR75160-102	FP 242.3600	292.4751
ST2	FP INDIREKT.STECKERL.36P. BERG NR75160-102	FP 242.3600	292.4751
ST3	FP INDIREKT.STECKERL.36P. BERG NR75160-102	FP 242.3600	292.4751
ST4	FP INDIREKT.STECKERL.36P. BERG NR75160-102	FP 242.3600	292.4751
ST5	FP INDIREKT.STECKERL.36P. BERG NR75160-102	FP 242.3600	292.4751
ST6	STECKEREINHEIT Z	292.5764	292.4751
T1	AK BFX34 SINPN 120V SGS TRANSISTBFX34	AK 010.5486	292.4751
T2	AK BFX34 SINPN 120V SGS TRANSISTBFX34	AK 010.5486	292.4751
T3	AL 2N4918/BD234 SI PNP40V THOMSON TRANSISTBD234	AL 010.0303	292.4751
T4	AL 2N4921 SI NPN 40V 1A MOTOROLA TRANSIST2N4921	AL 010.0784	292.4751
TR1	NETZTRAFO Z	292.5787	292.4751
TR2	UEBERTRAGER Z	292.5829	292.4751
TR3	UEBERTRAGER Z	292.5864	292.4751

- ENDE -

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.


MP
ST5 .1 .2 .3 .4
Schaltregler B1
SG 3524 J
R1 10k
+5V
V REF
Inv. Input
V IN
Output
Emitter B
L. Sense
Coll. B
R4 270
L. Sense
Coll. A
R5 270
Emitter A
Shutdown
Comp.
C6 47n
T1 BFX 34
T2 BFX 34
R6 1k
R7 1k
TR2
TR3
GL5 4 x BAV 21
GL6
GL7
GL8
GL9 FDH 300
C11 1n
R23 100
GL10 FDH 300
L3 1,8 mH
R12 200
R11 4,75k
GL3 BAV 21
± 15V Regler
C8 470µ
GL11 BZX85/C27
+18,5 V
R18 100
T3 2 N 4918
R16
C16 10n
B2 SG 4501 N
Pos. Inp. V+
N.C.
Pos. Outp.
Pos. Sense
Pos. Stab.
Bal. ADJ
GND
Neg. Inp. V-
N.C.
Neg. Outp.
Neg. Sense
Neg. Stab.
N.C.
Volt. ADJ.
-18,5V
R19 100
C9 470µ
GL12 BZX 85/C27
T4 2 N 4921
R15 1
C17 10n
C10 1000µ
GL13 BZX85/C5V6
R22 27,4k
R21 10k
R20 22,1k
ST6
.7/.10 +15V
.4/.13 +15V
C14 1µ
.6/.11
C15 1µ
.5/.12 -15V
.2/.15
.1/.16 +5V
.3/.14 +5V
.8 DC - AUSG. DC output
.9 PEG. AUSG. LIN. Level output lin.
ST4 .1 .2
DC-AUSG. DC output
PEG.AUSG. Level output
B3
Draufsicht Top view
B2
Draufsicht Top view
B1
Draufsicht Top view
T1,T2
E C B
T3,T4
E C B
0 1 2 3
ZENTIMETER
Stromlauf zu
Netzteilplatte
Power supply board
URV 4
Z
Zeichn. Nr. 292.4751 S
292.4016 V
292.4016

Diese Zeichnung ist unser Eigentum. Vervielfältigung, Weitergabe sowie Verwertung, Mitteilung an andere ist ohne unsere ausdrückliche Genehmigung strafbar und schadenersatzpflichtig

ROHDE & SCHWARZ · MÜNCHEN

	Name	Datum	Änd. Mitteilg. Nr.	Änd. zust.	Name	Datum
gezeichnet		11.77		A	Sd.	5.78
bearbeitet			24029	B	Nl.	3.79
geprüft			25913	C		2.80
genehmigt						

1GME

ST1 .1 .2 .3 ST2 .1 .2 .3

TR1

SI1 T 0,1B

GL1 B 40 C 3700/2200

C13 47n

C3 470u

C4 470µ

Schaltregler B1 SG 3524 J

R2 10k +2,5V R1 10k

+2,5V

+5V

1	Inv Input	V_{REF}	16
2	Non.Inv.Input	V_{IN}	15
3	Osc. Output	Emitter B	14
4	(+)C.L.Sense	Coll. B	13
5	(-)C.L.Sense	Coll. A	12
6	R_T	Emitter A	11
7	C_T	Shutdown	10
8	Gnd	Comp.	9

R14 221 R9 1 R10 1

C12 4,7µ

R3 6,8k

C5 4,7n

R8 4,75k

C7 0,1µ

R13 1K R12 200 R11 4,75k GL3 BAV 21

R4 270 R5 270

R6 1k R7 1k

T1 BFX 34 T2 BFX 34

TR2

GL5 4 x BAV 21

GL6 GL7 GL8 GL9 FDH 300

GL10 FDH 300

C11 1n

R23 100

L3 1,8 mH

TR3

C8 470µ GL11 BZX85/C27 R18 100 +18,5V

-18,5V R19 100 C9 470µ GL12 BZX 85/C27 C10 1000µ GL13 BZX85/C5V6

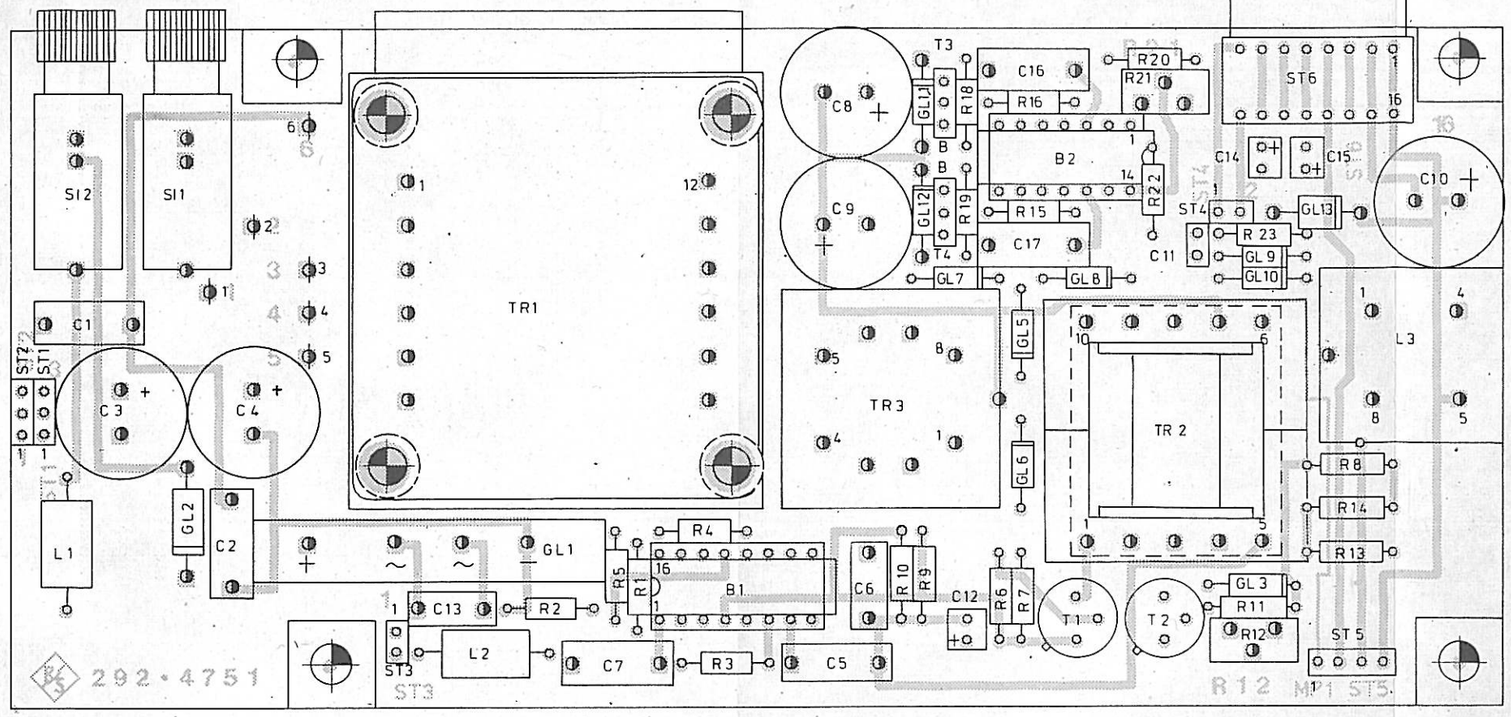
Pos.Inp. V+

Neg.Inp. V-

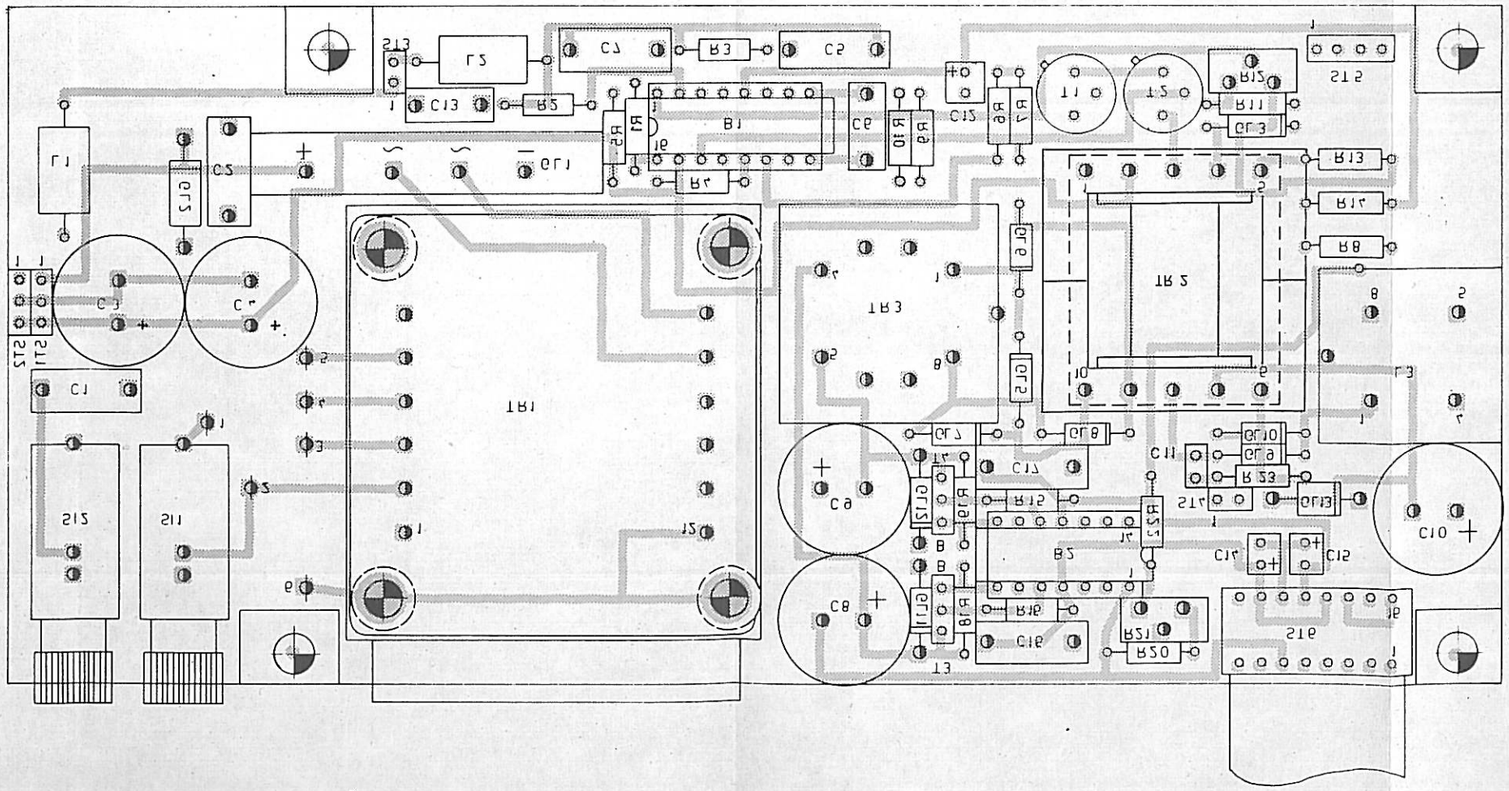
2N 4918

ST3 .2 - L2 C2 0,1µ C1 0,1µ L1 SI2 T1B GL2 1N 4004 .1 +

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



0 1 2 3
ZENTIMETER

A					Maßstab 2:1		
B	25913	03.79	He		Halbzeug Werkstoff		
		2.80	He				
				1GME	Tag	Name	Benennung: Netzteilplatte Z
				Bearb.	12.6.78	Wm.	
				Gepr.			
				Norm			
				ROHDE & SCHWARZ MÜNCHEN			Zeichn.-Nr 292.4751 Blatt-Nr 2
Änd. Ind.	Änderung / Mitteilung	Tag	Name	Ers. f. UVN4			Neg. v. 292.4016 V erste A. 292.4168

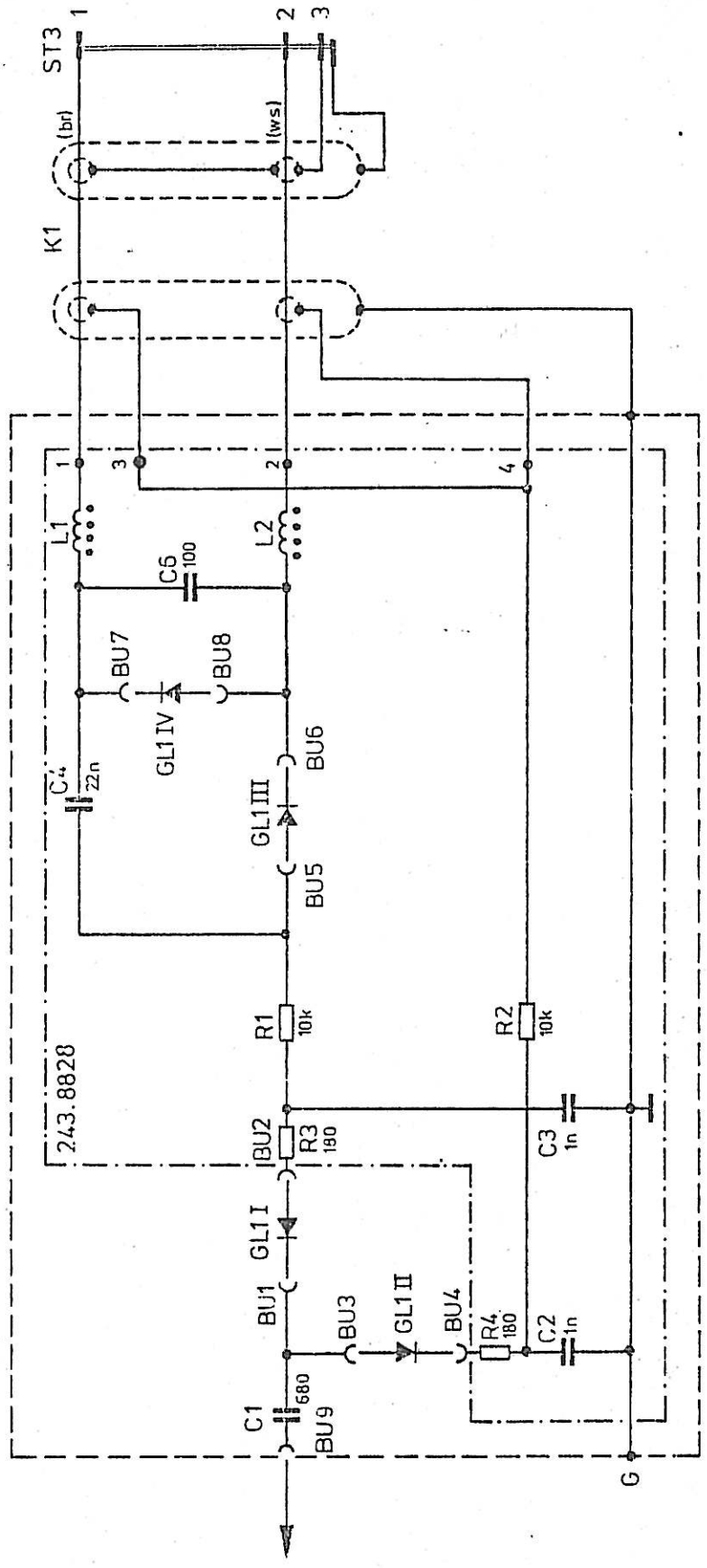
UVN4

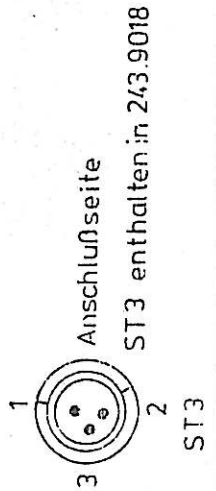
ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	13	0180	HF-TASTKOPF Z. URV Z	243.8811.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 243.8811 S		243.8811.01
BU1	FR IC-FASSUNG 14POL. AUGAT 714-AG1D	FR 155.0926	243.9101
BU2	FR IC-FASSUNG 14POL. AUGAT 714-AG1D	FR 155.0926	243.8828
BU3	FR IC-FASSUNG 14POL. AUGAT 714-AG1D	FR 155.0926	243.9101
BU4	FR IC-FASSUNG 14POL. AUGAT 714-AG1D	FR 155.0926	243.8828
BIS			
BU8	FR IC-FASSUNG 14POL. AUGAT 714-AG1D	FR 155.0926	243.8828
BU9	FR IC-FASSUNG 14POL. AUGAT 714-AG1D	FR 155.0926	243.9101
C1	CC 680PF+50-20%5R4000 DRALORIC SEFK5/680/2050R4000	CC 022.4850	243.9101
C2	CC 1NF+-10%100V3K1200CHIP ERIE 8013-271-W5R-102K	CC 082.3221	243.8828
C3	CC 1NF+-10%100V3K1200CHIP ERIE 8013-271-W5R-102K	CC 082.3221	243.8828
C4	CC 22NF+-10%50VK1200VIELS AEROVOX CKR 05 BX 223 K L	CC 060.2445	243.8828
C6	CC 100PF+-10%100V3NP0 CHI ERIE 8013-271-C0G-101K	CC 082.3109	243.8828
GL1	HF-DIODEN-QUARTET Z	243.9076	243.8828
K1	KABEL Z	243.9018	243.8811.01
L1	DROSSEL Z	243.9024	243.8828
L2	DROSSEL Z	243.9024	243.8828
R1	RL 0,13W 10,0KOHM+-1%TK50 RESISTA MK1 10K0 1% TK50	RL 092.1567	243.8828
R2	RL 0,13W 10,0KOHM+-1%TK50 RESISTA MK1 10K0 1% TK50	RL 092.1567	243.8828
R3	RL 0,13W 182 OHM+-1%TK50 RESISTA MK1 182OHM 1% TK50	RL 092.1350	243.8828
R4	RL 0,13W 182 OHM+-1%TK50 RESISTA MK1 182OHM 1% TK50	RL 092.1350	243.8828

- ENDE -

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Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an Andere ist strafbar und schadenersatzpflichtig

Änd. zust.	Änd.-Mitteil. Nr.	Datum	Name
A	17691	23.1.73	Ka
B	19551	04.75	NL
C	19783	11.75	Pcz
D	24952	9.79	He

Halbzeug, Werkstoff

Maßstab

Untol. Maße

Benennung: HF-Tastkopf z.URV

Zeichnung besteht aus 1 Blatt

Blatt-Nr.

registr. in Verz.: 243.8811 V

erste Z.

Zeichn. Nr.: 243.8811 S

ROHDE & SCHWARZ MÜNCHEN

Stelle	gez. Datum	bearb. Datum	geprüft Datum	Ordn.-Nr (nur für K-Ordner)
1EMU	31.6.72 Schim	8.72 Ka	18.9.72 W	

ISO-Prof Math. E

PE 095 G12A

ROHDE & SCHWARZ MÜNCHEN	Äz	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	09	0480	10V DURCHGANGSKOPF Z	288.8010.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 288.8010 S-		288.8010.01
BU1	FB UMRUESTSTECKER DEZI.B T FUER VAR 54=50 OHM UMR.BU.N FJ 017.5398 FUER VAR 04,55 = 50 OHM UMR.BU.7/16 FK 017.8739 FUER VAR 56 = 50 OHM UMR.DEZ. FD 108.2228 FUER VAR 64 = 60 OHM UMR.BU.6/16 FK 017.8780 FUER VAR 66 = 60 OHM UMR.DEZ. FB 018.234 FUER VAR 74 = 75 OHM	FB 018.2205	288.8010.01
BU2	FB UMRUESTSTECKER DEZI.B T FUER VAR 54 = 50 OHM UMR. DEZ. FB 018.2228 FUER VAR 64 = 60 OHM UMR. DEZ. FP 018.2234 FUER VAR 74 = 75 OHM	FB 018.2205	288.8010.01
C2	CC 2X10NF+-20%50VK1200VIE	288.8233	288.8210
C4	CK 22NF+-5%63V5RM MKT WIMA MKS2/63/0,022UF/5%	099.2881	288.8256
C5	CC 100PF+-10% N5600 TRAP DRALORIC TRE7L0E,100/10%N5600	CC 086.7467	288.8256
GL1	HF-DIODEN-QUARTETT Z	288.8304	288.8010.01
K1	KABEL Z FUER VAR 54,55,56,64,66,74 KABEL 288.8285 FUER VAR 04	288.8291	288.8010.01
L1	DROSSEL Z	243.9024	288.8256
L2	DROSSEL Z	243.9024	288.8256
R1	RL 0,13W 10,0KOHM+-1%TK50 RESISTA MK1 10KO 1% TK50	RL 092.1567	288.8010.01
R2	RL 0,13W 10,0KOHM+-1%TK50 RESISTA MK1 10KO 1% TK50	RL 092.1567	288.8010.01
ST1	FJ UMRUESTST.DEZ.B/SYST.NT FUER VAR 04,55 = 50 OHM UMR. ST.7/16 FK 017.9258 FUER VAR 56 = 50 OHM UMR. ST 6/16 FK 017.9306 FUER VAR 66 = 60 OHM	FJ 017.7532	288.8010.01
ST3	FO KABELST.3POLIG MINIAT. PFISTERER S103A052-6MM FUER VAR 54,55,56,64,66,74 ENTH.IN 243.9018 KABELSTECKER 5P.018.5356 FUER VAR 04 ENTH.IN 288.8285	243.8957	288.8291
			- ENDE -

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ MÜNCHEN	ÄZ	Datum	Schaltteilliste für	Sachnummer	Blatt Nr.
	10	0480	100V DURCHGANGSKOPF Z	283.7716.01 SA	1

Kennzeichen	Benennung / Beschreibung	Sachnummer	enthalten in
A	ZUGEHOERIGER STROMLAUF 283.7716S		283.7716.01
BU1	FB UMRUESTSTECKER DEZI.B T FUER VAR 54 50 OHM UMR.BU.N FJ 017.5398 FUER VAR 55 50 OHM UMR.BU 7/16 FK 017.8739 FUER VAR 56 50 OHM UMR.DEZ.FB 018.2228 FUER VAR 64 60 OHM	FB 018.2205	283.7716.01
BU2	FB UMRUESTSTECKER DEZI.B T FUER VAR 54 50 OHM UMR. DEZ FB 018.2228 FUER VAR 64 60 OHM	FB 018.2205	283.7716.01
C2	CC 2X10NF+-20%50VK1200VIE	288.8233	283.7897
C4	CK 22NF+-5%63V5RM MKT WIMA MKS2/63/0,022UF/5%	099.2881	288.8256
C5	CC 100PF+-10% N5600 TRAP DRALORIC TRE7L0E,100/10%N5600	CC 086.7467	288.8256
GL1	HF-DIODEN-QUARTETT Z	288.8304	283.7716.01
K1	KABEL Z	288.8291	283.7716.01
L1	DROSSEL Z	243.9024	288.8256
L2	DROSSEL Z	243.9024	288.8256
R1	RL 0,13W 10,0KOHM+-1%TK50 RESISTA MK1 10KO 1% TK50	RL 092.1567	283.7716.01
R2	RL 0,13W 10,0KOHM+-1%TK50 RESISTA MK1 10KO 1% TK50	RL 092.1567	283.7716.01
ST1	FJ UMRUESTST.DEZ.B/SYST.NT FUER VAR 55 50 OHM UMR.ST.7/16 FK 017.9258 FUER VAR 56 50 OHM	FJ 017.7532	283.7716.01
ST3	FO KABELST.3POLIG MINIAT. PFISTERER S103A052-6MM FUER VAR 54,55,56,64,66,74 ENTH.IN 243.9018 KABELSTECKER 5P.018.5356 FUER VAR 04 ENTH.IN 288.8285	243.8957	288.8291
			- ENDE -

Diese Unterlage ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

TOME	Datum	Name	Änd.-zust.	Änd.-Mitteilg. Nr.	Datum	Name
gezeichnet	9.4.76	Hg	A	24546	11.78	NL.
bearbeitet						
geprüft						
normgepr.						

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

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Änd.-zust.	Änd.-Mitteilg. Nr.	Datum	Name	Änd.-zust.	Änd.-Mitteilg. Nr.	Datum	Name

Stromlauf zu

100 V Durchgangskopf

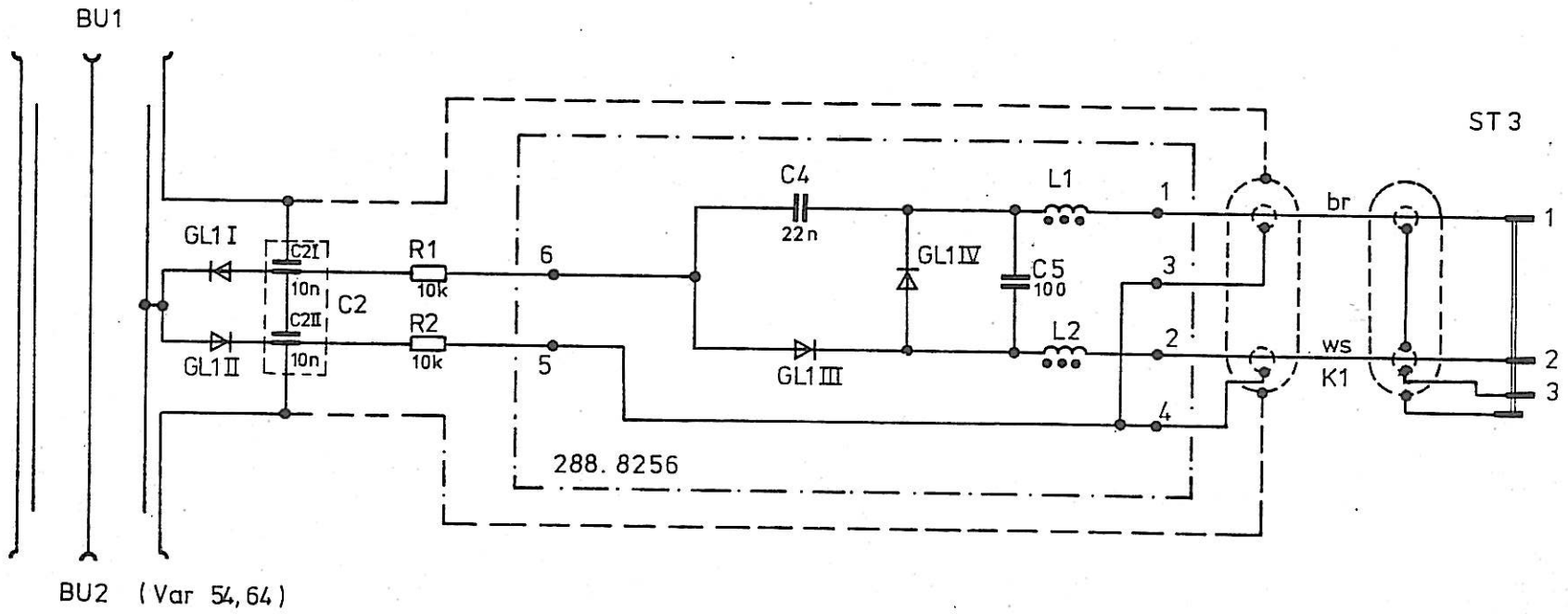
Insertion unit

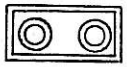
Zeichn. Nr. 283.7716S01

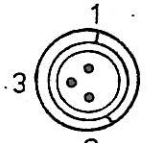
283.7716V

Varianten

Var 54 = 50 Ω Ausf. Dezifix B
Var 55 = 50 Ω Ausf.m. N-Stecker und Bu
Var 64 = 60 Ω Ausf. Dezifix B







Anschlußseite
ST 3 enthalten in 243.9018

1GME	Datum	Name	zust	Nr.	Datum	Name
gezeichnet	25.11.75	Hg	A	20267	06.76	FL
bearbeitet		Ze	B	24638	11.78	NL.
geprüft		Schr	C	26 023	3.80	Wk
normgepr.						

Diese Zeichnung ist unser Eigentum. Vervielfältigung, unbefugte Verwertung, Mitteilung an andere ist strafbar und schadenersatzpflichtig.

ROHDE & SCHWARZ · MÜNCHEN

zust	Nr.	Datum	Name	zust.	Nr.		

Stromlauf zu 10V Durchgangskopf

Insertion unit

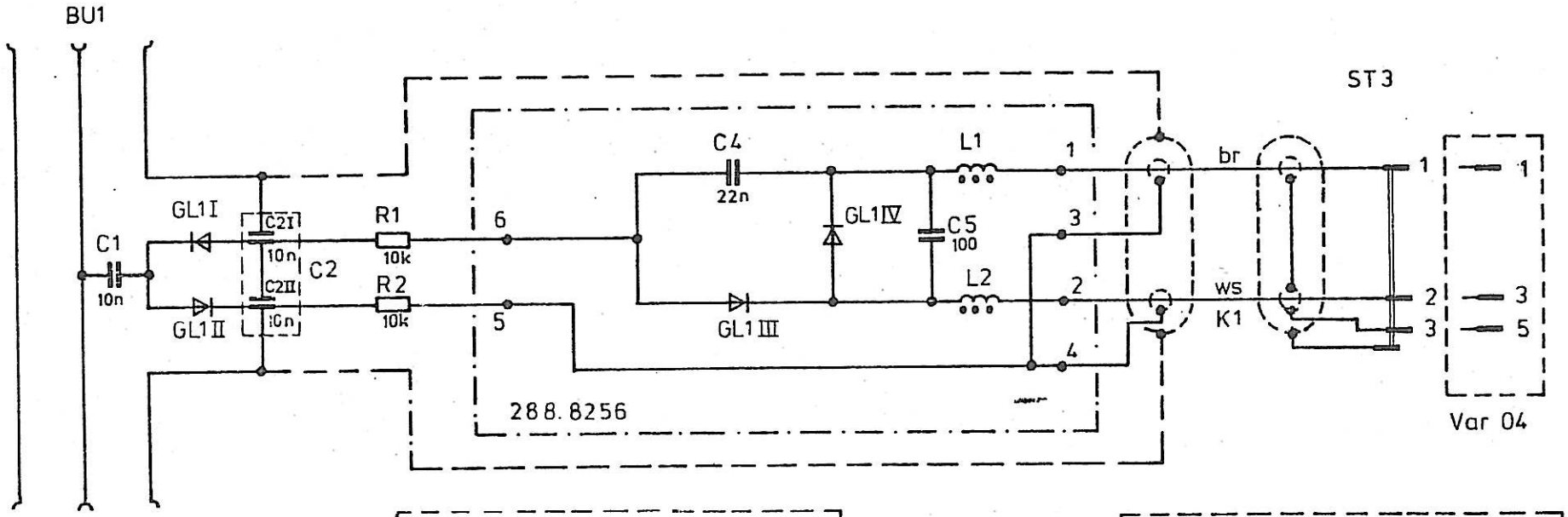
Z

Zeichn. Nr. 288.8010.01

288.8010V

Varianten

Var 54 = 50 Ω Ausf. Dezifix B
Var 55 = 50 Ω Ausf. m. N-Stecker und Bu
Var 56 = 50 Ω Ausf. m. 7/16 Stecker und Bu
Var 64 = 60 Ω Ausf. Dezifix B
Var 66 = 60 Ω Ausf. m. 6/16 Stecker und Bu
Var 74 = 75 Ω Ausf. Dezifix B
Var 04 = 50 Ω Embargoausf. m. N-Stecker u. Bu



BU2 (Var 54,64,74)

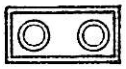
ST1 (Var 55,56,66,04)



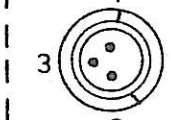
ST3

Anschlußseite ST 3 enthalten in 342.3617

Darstellung Var 04



C2



Darstellung Var 54 bis 74 Anschlußseite

ST3 enthalten in 243.9018

ST3