



ROHDE & SCHWARZ

Instruments
Division

Service Manual

SIGNAL GENERATOR

SMHU

0.1 to 4320 MHz

835.8011.52/.56/.58

VOLUME 1

The service manual consists of 3 volumes

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¹⁾ only with model 56 and 58

²⁾ only with model 58

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4 Service Manual for Complete Instrument

4.1 Function Description

(See function diagram 835.8011 FS)

The Signal Generator SMHU uses indirect synthesis to generate the output signal. All oscillators are synchronized in the unmodulated state to the (internal or external) reference frequency by means of phase locked loops so that the output signal has the same stability.

This type of synthesis generates frequencies from 1000 to 2160 MHz. Lower frequencies are generated by dividing or mixing with a synchronous fixed frequency.

Frequencies above 2.16 GHz are generated by means of a frequency doubler.

The output level is held constant by a fast control circuit which also generates the amplitude modulation. The control voltage is stored for the pulse modulation so that there are no limitations on the pulse width.

A frequency-modulated LC oscillator is used for frequency modulation instead of a crystal oscillator. The centre frequency of the LC oscillator is also synchronized to the reference frequency by means of a control circuit. This circuit also makes a drift-free FM DC mode possible.

4.1.1 RF Synthesis

The three oscillators which generate the frequency band of 1000 to 2160 MHz (module A 11, RF oscillators) are synchronized with the 25th to 54th harmonics of a reference signal of approx. 40 MHz which can be adjusted such that the changeover from the first harmonic used (the 25th) to the second used (the 26th) is continuous.

This reference signal is generated at 320 to 333 MHz, divided by 8 and used to generate the harmonics.

The reference frequency is synthesized in two stages in order to achieve high spectral purity.

The fine resolution is generated in a synthesis circuit with a fractional division factor with 8 places after the decimal point (module A 7, FRN synthesis). An 8:1 frequency division increases their spectral purity but limits the range of variation such that a further synthesis stage is required whose step size corresponds to the divided variation range (module A 8, step synthesis/FM stage). An initial summing loop (module A 10, summing loops) combines these signals and generates a frequency band of approx. 20 to 33 MHz. In a second summing loop (module A 10, summing loops), a fixed frequency of 300 MHz is added (from module A 9, fixed frequencies) which is generated in the unmodulated state by crystal oscillators. With FM, a frequency-modulated 40-MHz signal is also included (from module A 8, step synthesis/FM stage).

In order to retain the complete output frequency band, the RF oscillators are followed by an RF divider chain (in module A 13, output unit) which can set divider factors from 2 to 64 in steps of 2. Frequencies up to approx. 15 MHz can then be generated. A filter bank (module A 12) is provided because of the square-wave output signal of the dividers and contains lowpass filters at intervals of half an octave.

The filter bank applies the signal to the doubler (A163) which contains a level control element and three bandpass filters for suppressing harmonics and subharmonics.

The frequencies below 15 MHz are generated by mixing with a fixed frequency of 130 MHz from a crystal oscillator (on module A 9, fixed frequencies). There is a special function for switching over to a fixed frequency of 520 MHz. Thus frequencies up to 125 MHz can be generated by mixing. An FM deviation four times as large is thus possible in this band as a result of the smaller divider factor for generation of the RF frequency for the mixer.

4.1.2 Level Control and Amplitude Modulation

The level control and amplitude modulation functions are linked, the AM represents the AC voltage component of the target voltage for the amplitude control loop.

The level control element is an attenuator with PIN diodes which is driven by a PI controller (module A 13, output unit). The respective control voltage can be measured and stored digitally in order to obtain an exact output level with pulse modulation as well.

The output level is measured with a resistive directional coupler at the output of the 4.4 GHz RF Amplifier (A162). This ensures that level and output impedance are correct.

4.1.3 Frequency Modulation

The centre frequency of the modulated 40-MHz oscillator on module A 8 (step synthesis/FM stage) is stabilized by a slow control circuit so that the modulation contents are not influenced with FM AC. In the case of FM DC, the modulation contents are connected to the integrator of the control with the opposite phase to the measured value of the discriminator so that a correction signal is only generated if there is a deviation from the target value. The control loop remains closed and enables drift-free FM DC.

4.1.4 Internal Modulation Sources

The module A 6, AF synthesis, contains two generators, an AF synthesizer from 1 Hz to 100 kHz with a resolution of 1 Hz and a fixed-frequency generator which is switchable from 409.6 to 1024 Hz. Both generators can be used for both modulation modes and as an output signal at the AF connector. Thus e.g. simultaneous AM and FM with different modulation frequencies or internal two-tone modulation are possible.

4.1.5 Controller

The module A 5 (controller) controls all routines in the SMHU. The microprocessor calculates the settings for the modules from the data input from the keyboard/display (A 3) or from the IEC 625/IEEE 488 interface. It then passes them on via an internal serial data bus. All functions except the AC power switch can be remote-controlled. The device status can be polled using the talker function.

4.1.6 Self-monitoring and Diagnostics

All control loops trigger an alarm if the control voltages are out of range. The module A 5 (controller) contains an analog/digital converter with which 70 internal test points can be interrogated, thus enabling the fault to be limited to one particular module even before opening the instrument. The Service Kit SMGU-Z2 (cf. section 4.2) includes a computer program making intensive use of these internal measurement capabilities.

4.1.7 Extensions for Model 56/58

Model 56 contains the additional module fast hop bus (A191), which allows to address up to 4800 fast mode settings via an external interface (X192).

Model 58 includes two additional modules, a broadband modulator (A14) and a converter (A15).

The broadband modulator contains a PLL-controlled oscillator 2.24 GHz that can be broadband-modulated with a high deviation and furthermore an I/Q modulator. Various coders can be supplied as options which process the digital input data to form modulation signals for the I/Q modulator (e.g. for Gaussian minimum shiftkeying, GMSK).

This modulated signal is converted with an appropriate synthesis frequency to the output frequency range of 1 to 2000 MHz using a converter. In this frequency range broadband-FM, broadband-AM, I/Q modulation and digital types of modulations depending on the used coder are thus feasible.

4.2 Mechanical Design

The front panel, rear panel with power supply and a motherboard are fitted in a die-cast frame. The motherboard establishes the signal connections between the various modules which are inserted into it from above and held by guide rails. A locking assembly accessible from below prevents the modules from sliding out in transit. The RF connections are also located at the bottom. The RF amplifier (A162), the doubler (A163) and the precision attenuator (A18) are accommodated in a space at the side.

The Service Kit SMGU-Z2 contains all parts required to access the modules for servicing. It includes further a diskette with the diagnostic program SMSERVIC.BAS in R&S-Basic which

- * makes intensive use of the diagnostic test points for module tests
- * allows to perform many adjustments without any extra test equipment
- * is able to display frequency response curves of important functions.

4.2.1 List of Modules

A 2	Motherboard
A 3	Keyboard/display
A 4	Power supply
A 5	Controller
A 6	AF generator
A 7	FRN synthesis
A 8	Step synthesis/FM
A 9	Fixed frequencies
A 10	Summing loops
A 11	RF oscillators
A 12	Filter bank
A 13	Output section
A 14	Broadband modulator ¹⁾
A 15	Converter ¹⁾
A 18	Precision attenuator
A 162	RF amplifier 4.4 GHz
A 163	Doubler
A 191	Fast hop bus ²⁾

¹⁾ only with model 58

²⁾ only with models 56 and 58

4.3 Testing and Adjustment

4.3.1 Summary of Adjustment Points and Calibration Routines for the Complete Instrument

All these adjustments, with the exception of the calibration routine for RF level and adjustment of the internal reference frequency, can be performed with the diagnostic program contained in the Service Kit SMGU-Z2 without any extra test equipment.

Adjustment	On module	S. Section
Pulse amplitude	RF oscillators (A11)	4.4.1
AM 100 %	Output section (A13)	4.4.2
500-MHz detector linearity	RF amplifier (A162)	4.4.3
4-MHz detector linearity	Output section (A13)	4.4.4
Level below 5 MHz	Output section (A13)	4.4.5
Calibration routine for RF level		4.4.6
Internal reference frequency	Fixed frequencies (A9)	4.4.7
FM deviation	Step synthesis/FM (A8)	4.4.8
Calibration routine for presetting of summing loop 1		4.4.9
Calibration routine for special function 7		4.4.10
Calibration routine for the level before the doubler		4.4.11
Calibration routine for I/Q modulator (only with model 58)		4.4.11

4.3.1.1 List of Feasible Adjustments

The adjustments are listed in the sequence offered by the diagnostic program with the corresponding sections in the service manual:

Module	Part No.	Section	Adjustment element
RF oscillator	819.8262	5.2.2.2 5.2.2.4	R106 R164
FRN synthesis	819.3860	5.2.1	C70/C71
Step synthesis	819.4944	5.2.2.1	C211, C212
Summing loop 1		5.2.1	C31
Summing loop 2	819.7166	5.2.6	C285
RF oscillators	819.8262	5.2.1.1	C1, R202, C21, R203, C51, R203
Output section	820.0461	5.2.1.1	R404
Complete instrument SMHU	819.0010	4.4.3	R72, R85
RF amplifier 2 GHz	843.3450	5.2.1	R30
RF amplifier 4 GHz	836.0766	5.2.1	R72, R85
Output section	820.0461	5.2.2.1 5.2.2.3	R314 R362
AF generator	819.4944	5.2.6.3 5.2.6.5 5.2.2	R260 R125 R19
FM stage	819.4944	5.2.2.5 5.2.2.6 5.2.2.3 5.2.2.6 .2.2.6	R39 R170 R30 R169 R171
Summing loops	819.7166	5.2.3	Special function 67
Complete instrument SMHU	835.8011	4.4.9	Special function 67
Doubler	835.8763	5.2	Special function 66

Module	Part No.	Section	Adjustment element
Complete instrument SMHU	835.8011	4.4.11	Special function 66
Complete instrument SMHU	835.8011	4.4.10	Special function 68
Complete instrument SMHU	835.8011	4.4.12	Special function 320 ¹⁾

¹⁾ only with model 58

4.3.2 Adjustments and Calibration Routines following Module Repair or Replacement

The calibration routine for the special function 7 (4.4.10) should be used each time a repair is made (instrument warmed-up), especially after work on the controller and on the modules from A11 onwards (RF oscillators). The adjustments in line with the following table must be performed before.

Replacement of module	Adjustment/calibration	S. Section
A 5 Controller	All the calibration routines	4.4.6 4.4.9 4.4.11 4.4.12
A 6 AF generator	AM 100 % Calibration routine for RF level	4.4.2 4.4.6
A 9 Fixed frequencies	Internal reference frequency	4.4.7
A 10 Summing loops	Pulse amplitude Calibration routine for A10	4.4.1 4.4.9
A 11 RF oscillators	Pulse amplitude Calibration routine for the level before the doubler	4.4.1
A 12 Filter bank	Calibration routine for the level before the doubler	4.4.11
A 13 Output section	AM 100 % 4-MHz detector linearity Level below 5 MHz Calibration routine for RF level Calibration routine for the level before the doubler	4.4.2 4.4.4 4.4.5 4.4.6
A 14 Broadband modulator ¹⁾ A 15 Converter ¹⁾	Calibration routine for the I/Q modulator	4.4.11
A 162 RF amplifier	500-MHz detector linearity Calibration routine for RF level	4.4.3 4.4.6
A 163 Doubler	Calibration routine for the level before the doubler	4.4.11

¹⁾ only with model 58

4.4 Adjustment Points and Calibration Routines

Caution!

Always switch the instrument off before removing or inserting modules. Replacing modules with the power switched on may lead to destruction of the data transfer modules.

4.4.1 Pulse Amplitude

- Make module A11 (RF oscillators) accessible using service adapter.
- Using special function 155 (diagnostics), measure the pulse amplitude at a frequency setting of 1020 MHz.
- Adjust for maximum voltage using potentiometer R106. It should be more than 3 V.

4.4.2 AM 100 %

This adjustment need only be carried out if the high modulation depths are inaccurate when AM is selected or if the dynamic range is insufficient when AM-square, 100 % is used.

- Make module A 13 (output unit) accessible using service adapter.
- Open cover on component side (opposite to front panel).
- Connect oscilloscope to test point P43.
- Set AM 100 % and AF 1 kHz on the SMHU.
- Use R403 to adjust the DC component such that the minimum of the sinewave signal touches the zero line. To achieve a high accuracy, use the complete screen or even better only display lower half of signal.

4.4.3 500-MHz Detector Linearity

The adjustment is made at the RF amplifier (A162). The tuning elements are accessible after removing the carrying handle.

First adjust AM distortion using potentiometer R72 (AM linear):

- Connect a power meter and a modulation analyzer with distortion meter to the RF output of the SMHU via a 6-dB power divider.
- Select an RF of 500 MHz and set a level of 1 dBm on the SMHU power meter.
- Switch on AM INT with 80% modulation depth at 1 kHz AF.
- Switch on special function 1 (uninterrupted level adjustment).
- Note the level on the power meter as the reference value.
- Adjust the AM distortion to a minimum (< 2%).
- Reduce the level on the SMHU by 10 or 20 dB. Check the reduction on the power meter and correct in the case of deviations > 1 dB, using R85 (U-DET linear). After both reductions repeat the distortion adjustment. Now set the linearity of the electronic level adjustment using potentiometer R85 (U-DET linear):
- Connect power meter to RF output connector.
- Set 500 MHz, 13 dBm, unmodulated on the SMGU and adjust the electronic level setting to 0 dB using special function 76. Measure the output level and note it as the reference value.
- Adjust the electronic level setting for -25 dB using special function 77 and measure the level again.
- Adjust the level to 25 ± 0.1 dB below the reference using R85. Repeat the adjustment until a difference in level of 25 ± 0.2 dB is achieved.

4.4.4 4-MHz Detector Linearity

- Make module A 13 (output unit) accessible using service adapter.
- Connect power meter to RF output connector.
- Set 4 MHz, 13 dBm, unmodulated on the SMHU and adjust the electronic level setting to 0 dB using special function 76. Measure the output level and note it as the reference value.
- Adjust the electronic level setting to -25 dB using special function 77 and measure the level again. If necessary, adjust the level to 25 ± 0.1 dB below the reference value using R314.

Repeat the adjustment until a difference in level of 25 ± 0.2 dB is achieved.

4.4.5 Level at Frequencies below 5 MHz

- Expose module A 13 (output unit) using service adapter.
- Connect power meter to RF output connector.
- Set 5.1 MHz, 0 dBm, unmodulated on the SMHU and switch off the level correction using special function 55.
- Measure the output level and note it.
- Reduce the frequency to 4.9 MHz and set the same level again ± 0.1 dB using potentiometer R362.
- **Caution: following this adjustment, always carry out the RF level calibration routine as in 4.4.6.**

4.4.6 Calibration Routine for RF Level

This calibration routine generates a correction table in the EEPROM of the controller by means of which the inaccuracies of the electronic level setting can be kept to a minimum by specifying a corresponding setpoint. The controller specifies the test points at which the setpoint is set using an accurate power meter.

- Connect power meter to RF output connector.
- Select calibration routine on SMHU using special function 51.
- Vary the level at each test point using the spinwheel until the power meter also displays the value shown on the left in the level display as accurately as possible. The correction value is then shown in the right half of the level display. The value is stored by pressing an ENTER/UNITS key; the next test point set. The bottom STEP key can be used to repeat the last test point is selected. The top STEP key can be used to skip a test point if a correction is unnecessary.

87 calibration points are gone through. The routine is automatically left after the last calibration point, or at any time using SHIFT PRESET.

4.4.7 Internal Reference Frequency

- Switch on internal reference on SMHU (RF INT/ON).
- Connect calibrated frequency counter to REF connector at rear of instrument.
- After a warm-up time of half an hour, set the nominal frequency using the trimmer INT. REF. 10 MHz on module A 9 (fixed frequencies). The adjustment can be carried out with the module fitted.

4.4.8 Calibration Routine for Presetting of Summing Loop 1

The VCO in the first summing loop is synchronized using a presetting. This is read from a table in the EEPROM of the controller (A5) where it can also be restored using a calibration routine. This is carried out by calling special function 67. The routine must be called following a repair or module replacement A9 (summing loops) and A5 (controller) or if the error message 67 appears when the STATUS key (with flashing LED) is pressed.

4.4.9 Calibration Routine for Special Function 7

In the case of level settings without control (special function 5, pulse modulation), special function 7 selects the control voltages from a table in the EEPROM of the controller. These values can be regenerated using special function 68 without additional instruments. This calibration routine should always be called following repairs on the controller (A5) and on all modules from A11 upwards (RF oscillators).

4.4.10 Calibration Routine for Level before the Doubler

Since the doubler comprises a level control element, the control element in the output section is set via a separate D/A converter such that the PIN modulator of the doubler is driven at a constant input level. For this purpose, a table is provided in the controller EEPROM. It can be overwritten with the calibration routine which uses the internal diagnostics facility, by calling up special routine 66. During the call, SPECIAL 66 appears in the left display, then the previous display is restored.

4.4.11 Calibration Routine for the I/Q Modulator (only Model 58)

With the built-in attenuator voltage sources and diagnostic means the I/Q modulator can be calibrated using a firmware routine. The calibration data are stored in an EEPROM in the controller. Without this calibration the specifications are not adhered to (see also in the operating manual, section 2.3.23). No valid values in the EEPROM (eg after a controller change) cause the status LED to flash and the error code 69 to be indicated upon a status query.

The calibration routine is called by entering special function 320. If hardware errors prevent the routine from being performed, error 71 is output.

4.5 Troubleshooting

4.5.1 Self-monitoring

An alarm is triggered on the controller - indicated by a flashing status LED - if the control voltage in a loop is out of range. One or more error codes are then displayed by pressing the status key. The error codes have the following meanings:

Error number	Meaning
40	40-MHz crystal oscillator (A9) asynchronous
41	130-MHz crystal oscillator (A9) asynchronous
42	FRN synthesis (A7) asynchronous
43	Step synthesis (A8) asynchronous
44	1st summing loop (A10) asynchronous
45	FM oscillator (A8) asynchronous
46	2nd summing loop (A10) asynchronous
47	RF oscillators (A11) asynchronous
48	Level control (A13) faulty
49	Coder clock frequency out of tolerance (only B2/B3/B4)
50	2.24-GHz loop out of sync (only SMHU58)
61	Data error in EPROM
62	Error in RAM
63	Error in a stored instrument setting
64	Error in a memory for special function 45
65	Error in the EEPROM level correction table
67	Error in the EEPROM table for presetting of A10
66	Error in the EEPROM table for level before the doubler
68	Error in the EEPROM table for special function 7
69	Error in I/Q modulator calibration values (only SMHU58)
70	Triggering of overvoltage protection
71	Calibration routine cannot be executed
72	Fault in ADC used for diagnostics
73	Fault in fast hop bus interface (only SMHU56/58)
74	Illegal fast hop bus address (only SMHU56/58)

Error messages 61 to 68 and 72 indicate faults in the controller (A5) if they cannot be eliminated by restoring or by calling the associated calibration routine. If a calibration routine cannot be executed because of a hardware error (error 71), the error must be looked for in the associated modules.

4.5.2 Built-in Diagnostics

In order to localize the errors more precisely, the following test points can be selected using special functions 101 to 199. The voltages listed are approximate values for a fault-free instrument. They are output in the right-hand display and can be read by a controller via the IEC 625/IEEE 488 interface. An extensive computer program facilitating troubleshooting and adjustment is included in the Service Kit SMGU-Z2 (see also section 4.3.1).

SF-No.	Test point	V _{min}	V _{max}	Unit
A 5 Controller				
101	Voltmeter	-40	+40	V
102	RAM battery	2	4	V
103	X voltage for sweep	0	10	V

A 6 AF synthesis				
109	Oscillator level	1.5	2.5	V
110	5-V reference	4.9	5.1	V
111	5-V supply	4.5	5.3	V
112	15-V supply	14.0	15.5	V
113	-15-V supply	-15.5	-14.0	V
114	AF output	-2	2	V
115	AMOD output	-6	6	V
116	FMOD output	-1.45	1.45	V

A 7 FRN synthesis				
117	PI controller output	-8	+8	V
118	VCO control voltage	2.0	18.0	V
119	Presetting voltage <i>3.2</i>	-4.2	-3.5	V
120	Oscillator level	0.4	0.8	V
121	Output level 3 to 3.6 MHz	0.2	0.5	V
122	40-MHz input	0.7	1.5	V
123	IF level	1.1	2.7	V
124	Supply	23	25	V

A 10 Summing loops				
141	SUM 1 presetting	1.6	21.6	V
142	SUM 1 tuning voltage	1.6	21.6	V
143	SUM 1 oscillator signal	0.3	1	V
144	SUM 2 tuning voltage	1.6	21.6	V
145	SUM 2 oscillator signal	0.05	0.3	V
146	SUM 2 sync signal	-0.5	1.5	V
147	SUM 2 IF signal	0.5	1.5	V
148	Pulse blanking divider signal	0.4	1.2	V

A 8 Step/FM				
125	Alarm (low-active) <i>3/4 mV</i>	3.5	5.3	V
126	Step tuning voltage	1	18	V
127	FM tuning voltage	2	13	V
128	Step synthesizer level	0.3	1.1	V
129	FM output level	0.2	0.6	V
130				V
131				V
132				V

A 11 RF oscillators				
149	Oscillator control voltage	1	22	V
150	RF level before sampler	0	0.11	V
151	RF amplifier supply	7.0	7.6	V
152	PLL alarm (high active)	-0.1	1.2	V
153	Sampler reference level	0.8	2.5	V
154	Sampler offset (adj.)	0.8	2.5	V
155	Sampler pulse level	3	10	V
156	Output level	20	220	mV

A 9 Fixed frequencies				
133	OCXO thermostat	5.5	6.5	V
134	40-MHz tuning voltage	1.2	19	V
135	135-MHz tuning voltage	1.2	19	V
136	130/520-MHz signal	0/0.2	0.7	V
137	300-MHz signal	0.3	0.8	V
138	40-MHz signal to FRN	0.3	1.2	V
139	40-MHz signal to FM	0.3	1.2	V
140	40-MHz signal to OPT	0.3	1.2	V

A 12 Filter bank				
157	-15-V supply	-15.5	-13.5	V
158	Output amplifier (N320)	13	15	V
159	Input amplifier (V4)	13	15	V
160	Mixer amplifier (V400)	13	15	V
161	5-V supply	4.5	5.3	V
162	Output level X123	0	250	mV
163	+15-V supply	14.0	15.5	V
164	Output level X122	0	250	mV

A 13 Output section				
165	Alarm signal (low-act.)	3.5	5.3	V
166	Modulator control voltage	-15	3	V
167	Detector >5 MHz	0	6	V
168	Output level X121	0/10	120	mV
169	Output level X131	0/10	600	mV
170	AM control value	-5	-0.4	V
171	Detector <5 MHz	0	6	V
172	Input voltage, pin modulator	-15	3	V

A 164 RF amplifier/doubler driver				
181	2/4-GHz identification (1 V = 4 GHz)	-0.1	1.2	V
182	10 V internal	9.8	10.2	V
183	Modulator control voltage	-0.7	10	V
184	Level before the doubler	1.0	5.0	V
185	Level after the doubler	0.5	2.0	V
186	Level of coh. carrier	-0.1	0.5	V
187	Converter output level	-0.1	5	V
188				V

A 14 Broadband modulation				
173	Model identification / option	-0,1	5.5	V
174	PLL GMSK coder clock	13/-1.5	-12	V
175	2.24-GHz oscillator level	0/50	250	mV
176	LO level, Q channel	0/50	400	mV
177	LO level, I channel	0/50	400	mV
178	Level X142 (I/Q)	0	100	mV
179	Level X141 (coh. carrier)	0/30	150	mV
180	PLL 2.24-GHz oscillator	13.2/+6	-6	V
189	I channel amplitude	0	22	V
190	Q channel amplitude	0	22	V
191	I channel offset comp. + carrier leak	6	10	V
192	Q channel offset comp.	0	10	V
193	Q channel phase	2.7	13.5	V
194	I channel phase	2.7	13.5	V
195	D/A BB-FM	0	3.3	V
196	Carr. leak. comp.	0	10	V

4.6 Checking Modules with the Built-in Diagnostics Facility

4.6.1 Troubleshooting at Module Level

Before setting the SMHU, the instrument should be set to a defined status without using special functions by pressing SHIFT PRESET. Diagnostics test points not referred to below should be within the limits specified in 4.5.2 independent of the settings. More information on troubleshooting at the modules can be found in Section 5 of the relevant module description.

The Service Kit SMGU-Z2 (cf. section 4.2) contains a computer program considerably facilitating troubleshooting. Without any extra test equipment hardly any instrument function can be checked using module-oriented test routines. Adjustments can be carried out easily and diagrams of important control voltages can be displayed.

4.6.1.1 A 3 Keyboard/Display

If the instrument does not react to keyboard entries even though the displays indicate an entry, first check that the instrument is not locked up by the remote control (IEC/IEEE bus) (best of all by removing the cable) or that a key is not stuck. If these are not the causes, refer to the service manual, modules A3 and A5.

4.6.1.2 A 4 Power Supply

The power supply has an independent self-monitoring facility and switches over to standby mode if overloading or internal faults (LED on front panel) occur.

In this case it is advisable to remove all modules apart from the controller and front panel and to switch the instrument on again. If the power supply again switches over to standby, check the power supply, controller and front panel (see Section 5). If the instrument can be switched on successfully, insert the modules again singly (with the instrument switched off) until one particular module causes the instrument to be switched off when it is switched on again. This module must then be examined more closely (see Section 5).

Caution!

Switching the set on and off without removing the fault may cause further damage.

In the case of modules inserted right at the front in the motherboard, test points 111, 112, 113 and 124 can be used to check whether the supply voltages still reach these modules.

4.6.1.3 A 5 Controller

Test point 101 is a voltmeter with autoranging. Voltages up to ± 40 V can be measured. The Service Kit SMHU-Z2 contains a probe for measuring voltages at test points in the modules which are not connected to the diagnostics system. The nominal values for the various modules are listed in the service manuals.

Test point 102 gives the voltage of the battery which supplies the RAM. If the voltage is below 3.3 V, the data may not be stored when the set is switched off.

Test point 103 gives the voltage for the output connector X-AXIS at the rear.

- ▶ Set any sweep with approx. 100 steps on the SMHU. Vary from the start frequency to the stop frequency in MAN mode and observe the displayed voltage. It must be proportional to the sweep steps, i.e. from 0 to 10 V.

4.6.1.4 A 6 AF Generator

Test points 114 to 116 are used for function checks.

- ▶ Set AF to 1 Hz, select squarewave, set AF LEVEL to 2 V, AM INT 100 % and FM INT to maximum deviation, e.g. 800 kHz at RF 600 MHz. The result display must now vary between the values given.

4.6.1.5 A 7 FRN Synthesis

Check the tuning of the oscillator using special function 118:

- ▶ Set RF 1070.0625 MHz on the SMHU, the displayed voltage should be 2.0 ± 1 V.
- ▶ Set RF 1072.0925 MHz on the SMHU, the displayed voltage should now be 18.0 ± 1.5 V.
- ▶ The voltage should have a ramp response when the frequency is varied between these limits.

4.6.1.6 A 8 Step Synthesis/FM

Check the tuning of the step synthesis oscillator using special function 126:

- ▶ First set 1001 MHz on the SMHU and then 1000.2 MHz. The displayed voltage should now be $4.0 + 1/2$ V.
- ▶ Set RF 1019.2 MHz on the SMHU. The displayed voltage should now be 17 ± 1 V.
- ▶ The voltage should increase in 15 steps when varying the frequency from the bottom to the top limit.

4.6.1.7 A 10 Summings

Check the VCO in the first loop using special function 142:

- ▶ Set RF 1000.5 MHz on the SMHU, the displayed voltage should be 2.5 ± 1 V.
- ▶ Set RF 1019.5 MHz on the SMHU, the displayed voltage should now be 17 ± 1 V.
- ▶ Set RF 1020.5 MHz on the SMHU, the displayed voltage should now be 5 ± 1 V.
- ▶ Set RF 1039.5 MHz on the SMHU, the displayed voltage should now be 20 ± 1 V.

Check the presetting:

- ▶ For all the following frequencies, first measure the preset voltage using special function 141 and then the tuning voltage using special function 142. The values should not differ by more than 0.3 V. If the difference is greater, a new calibration can be attempted using special function 67. If this leads to error message 71, the module must be examined more closely (see Section 5).

Test frequencies (in MHz):

1000.250,	1001.367,	1003.320,	1005.273,
1007.227,	1009.180,	1011.133,	1013.086,
1015.039,	1016.992,	1018.945,	1020.117,
1022.070,	1024.023,	1025.977,	1027.930,
1029.883,	1031.836,	1033.789,	1035.742,
1037.695,	1039.648,		

Check the VCO of the second summing loop using special function 144:

- ▶ Set RF 1000.5 MHz on the SMHU, the displayed voltage should be 2.5 ± 1 V.
- ▶ Set RF 1039.5 MHz on the SMHU, the displayed voltage should now be 19.5 ± 1 V.

4.6.1.8 A 11 RF Oscillators

Check the VCOs using the special function 149:

- ▶ Set RF 1000.5 MHz on the SMHU, the displayed voltage should be 1.5 ± 1 V.
- ▶ Set RF 1399.5 MHz on the SMHU, the displayed voltage should now be 21.5 ± 1 V.
- ▶ Set RF 1400.5 MHz on the SMHU, the displayed voltage should now be 1.5 ± 1 V.
- ▶ Set RF 1799.5 MHz on the SMHU, the displayed voltage should now be 21.5 ± 1 V.
- ▶ Set RF 1800.5 MHz on the SMHU, the displayed voltage should now be 1.5 ± 1 V.
- ▶ Set RF 2160 MHz on the SMHU, the displayed voltage should now be 20.5 ± 1 V.

4.6.1.9 A 12 Filter Bank

- ▶ To obtain an exact display for test points 162 and 164, disconnect cable W 162 from connector X162 on A13 (output section). The PLL is then interrupted and the maximum level can be measured at these test points.

A voltage >50 mV should be measured at test point 162 at RF 500 MHz and at test point 164 at RF 4 MHz.

4.6.1.10 A 13 Output Section

- ▶ Set RF 500 MHz, unmodulated, on the SMHU... At a level of 13 dBm, enter special functions 1 (interruption-free level setting) and 55 (switch off level correction).

The following voltages (± 0.05 V) must be found at test point 170:

Level	Voltage at test point 170
13 dBm	3,00 V
8 dBm	1,69 V
3 dBm	0,95 V
-2 dBm	0,53 V
-7 dBm	0,30 V

The same voltages must be found at test point 167, repeat the measurement there with RF 4 MHz.

- ▶ Set 13 dBm, unmodulated, on the SMHU and vary the RF over the complete range.

The voltage must remain within the defined limits at test point 166.

- ▶ To obtain a valid display for test points 168 and 169, disconnect cable W 162 from connector X162 on A13 (output section). The PLL is then interrupted and the maximum level can be measured at these test points.

A voltage >50 mV should be measured at test point 168 with RF 500 MHz and at test point 169 with RF 4 MHz.

4.6.1.11 A 163 Doubler

To check the doubler

- ▶ set frequencies from 2160 MHz to 4320 MHz, 0 dBm, unmodulated on the SMHU.

Voltages at test points 184 and 185 must be within the limits specified in 4.5.2.

The voltage at test point 183 is typically 1 to 3 V. If considerable deviations are noticed in one of the frequency ranges 2160 to 2720, 2720 to 3440, 3440 to 4320 Mz, it can be assumed that the bandpass filter for this range is defective.

4.6.1.12 A 14 Broadband Modulator (only Model 58)

To check the modulation oscillator

- ▶ switch on BB-FM with a deviation of 0 Hz after preset, select the diagnostic special function 175, nominal value 50 to 250 mV
- ▶ select the diagnostic special function 180, the displayed voltage must be between +6 and -6 V. It must jump to about 13 V upon switch-off and the settling process must be visible when switching the instrument on again.

The following table applies to testing the I and Q channels (with unchanged settings):

Special function	Nominal value	
176	50 to 400	mV
177	50 to 400	mV
179	30 to 100	mV
189	5 to 10	V
190	0 to 22	V
191	8.4 to 10	V
192	0 to 10	V
193	7 to 9	V
194	2.7 to 13.5	V
196	9.5 to 10.5	V

To test the deviation setting

- ▶ select special function 195, nominal value -10 to + 10 mV
- ▶ set deviation to 25 MHz, nominal value is now 1.5 ± 0.05 V
- ▶ set deviation to 50 MHz, nominal value is now 3.0 ± 0.1 V.

To test the output level

- ▶ set RF to 1950 MHz, level to 19 dBm, select special function 178, nominal value 30 to 100 mV.

4.6.1.13 A15 Converter (only Model 58)

To test the output level

- ▶ set RF to 10 MHz, level to 13 dBm, BB-FM to 0 kHz after preset
- ▶ select special function 187, nominal value 2.5 to 4.1 V
- ▶ select special function 186, nominal value 30 to 250 mV

4.6.2 Troubleshooting According to Type of Fault

For each type of fault, proceed in the given order, tracing the subassembly that may be causing the fault along the signal path. Troubleshooting may be done in the opposite direction.

4.6.2.1 Frequency Errors

A 9	Fixed frequencies
A 7	FRN synthesis
A 8	Step synthesis/FM
A 10	Summing loops
A 11	RF oscillators
A 13	Output section
A 14	Broadband modulator (only model 58)
A 15	Converter (only model 58)

The nominal frequency for each synthesis stage can be displayed using special functions 78 to 85 (see 4.6.2.7).

4.6.2.2 Level Errors

A 11	RF oscillators
A 13	Output section
A 12	Filter bank
A 163	Doubler
A 162	RF amplifier 4.4 GHz
A 18	Precision attenuator
A 14	Broadband modulator (only model 58)
A 15	Converter (only model 58)

4.6.2.3 AM Errors

A 6	AF generator
A 13	Output section
A 163	Doubler

4.6.2.4 FM/ Φ M Errors

A 6	AF generator
A 8	Step synthesis/FM
A 9	Fixed frequencies
A 11	RF oscillators

4.6.2.5 Harmonics Level Too High

A 12	Filter bank
A 13	Output unit (RF < 15 MHz)
A 163	Doubler
A 162	RF amplifier 4.4 GHz

4.6.2.6 Poor Spectral Purity (SSB Noise, residual FM)

See 4.6.2.1 if this error occurs when there is no modulation, or see 4.6.2.4 with FM/ Φ M.

4.6.2.7 List of Special Functions for Service Purposes

71	Display of firmware version number 2)
72	Display test (including LED test)
73	RAM test
74	EPROM test 1)
75	EEPROM test 1)
76	Set electronic level setting to 0 dB (do not change setting of mechanical precision attenuator in process). Special display in level/memory display 2)
77	Set electronic level setting to -25 dB, otherwise as in 76
78	Displays FRN frequency (A7) 2)
79	Displays step frequency (A8) 2)
80	Displays frequency of summing loop 1 (A10) 2)
81	Displays frequency of summing loop 2 (A10) 2)
82	Displays sampler frequency (A10) 2)
83	Displays harmonics of RFO synchronization (A11) 2)
84	Displays RF divider factor (A13) 2)
85	Displays undivided synthesis frequency 2)

- 1) The display only occurs if the ENTER/UNITS key is held down.
- 2) The display (and module setting) is cancelled as soon as any key is pressed.

4.7 Retrofitting Options SMHU58 B-2/3/4/5

4.7.1 Installation

Check the software status using SF 71; in the case of GMSK, DECT and ADC coder for versions below 3.0, the EPROMs on the controller module must additionally be replaced by the supplied EPROM set. The same applies to the CT coder for versions below 4.0. For versions 3.0 or later (4.0 with CT coder), only the coder has to be installed.

- Loosen the four countersunk screws in the rear parts of the feet and remove the feet. Shift the two instrument panels towards the rear and lift off. Loosen the two screws on the locking rails on the bottom of the instrument and push the rails towards the front panel. If the EPROMs are to be replaced, the controller module must be removed (1st module after the front panel). The cables need not be removed for this purpose. Remove the screws of the screening cover and replace the EPROMs on locations D135 and D140. Remount the screening cover and install the module, paying attention to the position of the ribbon cables.
- Remove the SMB cables on the bottom towards the broadband modulator (last module before the power supply), take out the module and remove the screening cover. Remove the screws from the fastening blocks of the coder. The optional coder is installed in the left chamber above the 4 SMB connectors. Engage the option into the hole in the screening panel using the grub screw, insert the connector, fit in the module and turn the screw into the fastening block opposite to the grub screw. Make sure that the choke L515 on component side of the broadband modulator is not damaged during assembly. It must then be possible to swivel the coder. Make sure that there are no short-circuits to the test points on the broadband modulator. Then fix the coder using the second fastening screw and mount the screening cover of the broadband modulator.

- In order to adjust the coder, insert the module on the service adapter (included in the service kit) to make the adjustment points accessible. Adjustment is not necessary for proper functioning of the coder, however it permits to improve the vector accuracy by max. 1 %.

If the respective coder has already been installed in the broadband modulator and adjusted, readjustment is not necessary. Otherwise, install the module and connect the SMB-type cables in the correct order (labelling motherboard).

Perform the following procedure only if the coder is to be adjusted.

4.7.2 Adjustment

- ▶ Connect the spectrum analyzer to the RF output of the SMHU58

Settings: CF 140 MHz, REF LEV 0 dBm, SPAN 677 kHz (with GMSK coder), SPAN 2.88 MHz (with DECT coder), SPAN 30.4 kHz (with ADC coder), SPAN 240 kHz (with CT coder).

- ▶ Do not perform adjustments with the upper screening cover of the broadband modulator removed. If the cover is not fitted with trimming bores, our central service will replace it by a new cover.
- ▶ Switch on the SMHU58, OP.2/3/4/5 must be displayed.

Perform the calibration routines and the adjustments only after an instrument warm-up period of about 10 minutes. The error messages Err. 68 and Err. 69 may occur.

- ▶ Then record the ALC table using SF 68 and calibrate the I/Q modulator using SF 320, which must not be followed by any error message.

Settings on the SMHU58: PRESET, RF 140 MHz, LEV 0 dBm, DM ON, F 15 with GMSK and DECT coder, F 3 with ADC coder.

The CLOCK and DATA inputs on the rear panel of the instrument remain open.

The spectrum of the RF carrier then consists of

the residual carrier at 140 MHz, the useful signal at 140 MHz + df (df = 67.7 kHz with GMSK coder, df = 288 kHz with DECT coder, df = 3.04 kHz with ADC coder, df = 24 kHz with CT coder) and the unwanted sideband at 140 MHz - df.

- ▶ Then perform the adjustment according to the following table. It is useful to switch between modulation normal/inverted (SF 314/SF 313) and effect the adjustment such that with both settings the same values result.

Adjustment	GMSK coder	DECT coder	ADC coder	CT coder
Residual carrier f_0	R42, R62	R62, R74	R42, R62	R42, R62
Lower sideband $f_0 - df$	R74, C70	R42	R74	R74, C70

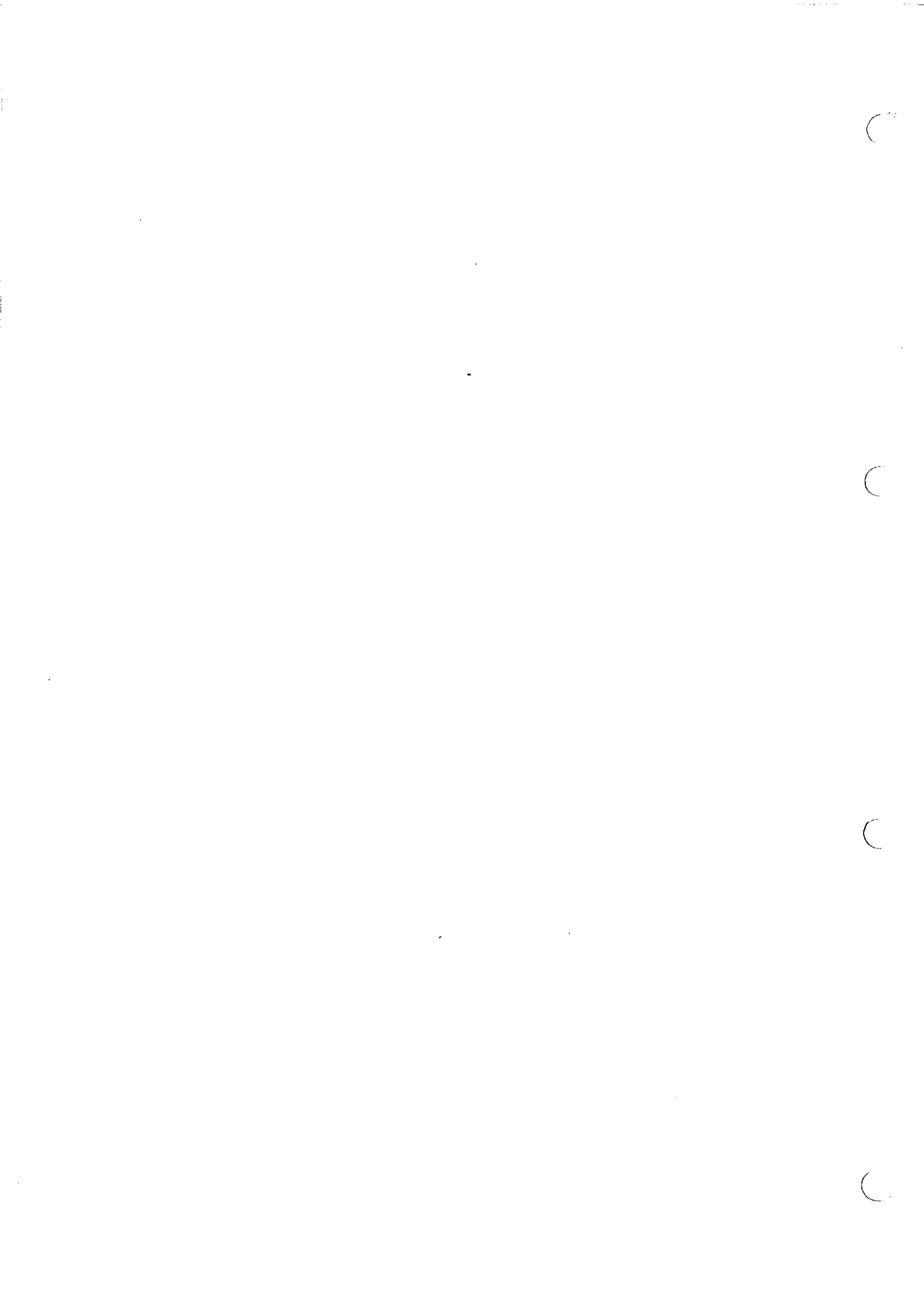
Typical values are

- -56 dBc for the residual carrier with all coders
- -56 dBc for the unwanted sideband with GMSK, ADC and CT coder and
- -50 dBc with the DECT coder.
- ▶ Fasten the adhesive label for the option on the upper cover of the module, remove the service adapter, install the broadband modulator and connect the SMB cables.
- ▶ Reassemble the instrument in the reverse order. Fasten the adhesive cable for the option identification on the rear panel above the serial number.

In the case of the options SMHU-B3/B4/B5 check whether "GMSK" or "DM" is printed on the identification plate. In the event that the text "GMSK" is still printed there, cover it with the label 836.4255 "DM".

- ▶ Switch on the instrument, OP.2/3/4/5 must be displayed.
- ▶ Calibrate the I/Q modulator using SF 320; no error message may be displayed any more after the calibration.

The provided calibration data and the stored instrument setups and fast mode data are not affected by the replacement of the EPROMs.





ROHDE & SCHWARZ

Liste mechanischer Teile

List of mechanical parts

Bilder und Erklärung zur Liste mechanischer Teile

Figures and explanation pertaining to list of
mechanical parts

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Liste mechanischer Teile

List of Mechanical Parts

Der SMHU ist in *R&S-Kompaktbauweise 90* aufgebaut.

The SMHU is designed in accordance with the *R&S design 90*.

Gehäusegröße:
4E, 1/1,T460

Cabinet size:
4E, 1/1,T460

Maße über alles:
426,7 x 176,5 x 460(B x H x T)

Overall dimensions:
426.7 x 176.5 x 460 (width x height x depth)

Ergänzungen:
19"-Adapter ZZA-94
Tragegriff, Nachrüstsatz
(falls ein zweiter Tragegriff gewünscht wird)

Accessories:
19"-Adapter ZZA-94
Carrying handle, retrofit set
(if a second carrying handle is desired)

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
1		1	Haube, oben 4E 1/1 T460 Cover, top	819.0426
2		1	Haube, unten 4E 1/1 T460 Cover, bottom	396.3815
3		1	Führungsschiene, rechts Guide rail, right	396.4757
4		1	Führungsschiene, links Guide rail, left	396.4763
5		1	Bedienhinweiskarte 1 User guide card 1	
6		1	Bedienhinweiskarte 2 User guide card 2	
7		1	Bedienhinweiskarte 3 User guide card 3	
8		2	Gerätefuß, vorne Instrument foot, front	396.4534
9		2	Aufstellfuß, unten Foot, bottom	396.4540
11		2	Gerätefuß, hinten Instrument foot, rear	396.4586
15		2	Seitenleiste T460 Side strip	396.3080

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
16		4	M3 x 6 DIN 965 A4	081.9378
17		1	Rückwandfuß, links 4E Rear-panel foot, left	396.4363
18		1	Rückwandfuß, rechts 4E Rear-panel foot, right	396.4157
19		4	Ansatzschr. M4 K.D 7985 Screw	396.4492
21		1	Tragegriff T... Carrying handle	396.3221
22		2	Griffbuchse Washer	396.3321
23		2	M4 x 10 DIN 965 A4	081.9478
24		2	Abdeckung, Griffseite Cover, handle side	396.3338
25		2	Abdeckung, Leerseite Cover, blank side	396.3344
30		1	Frontrahmen 4E 1/1 Front frame	396.2131
31		4	Seitenfuß Side foot	396.4692
32		2	Stapelnutabdeckung Cover for groove	396.4711
33		2	Frontgriff Front grip	
34		4	M4 x 8 DIN 965	396.1087
35		1	Rückrahmen 4E 1/1 Rear frame	396.2377
36		4	Rahmenschiene T460 Frame rail	396.2377
37		16	M3 x 8 DIN 965 A4	081.9384
40		4,95 m	HF-Dichtschnur RF seal	396.1035
50		1	Deckel Netzteil Cover for Power Supply Unit	819.1697
51		1	DIN 7985 - M2,5 x 6	088.0030

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/ Comp.No	Qty	Designation	Stock No.
52		1	DIN 137 - A2,6 - A2	005.0280
53	A41	1	Gleichrichtung VAR 02 Rectification	819.1716.02
54		10	DIN 7985 - M3 x 6 - A4	081.9061
55		10	DIN 137 - A3 - A2	005.0296
56		10	DIN 125 - A3,2 - A4	082.4670
57		4	Mutter für Rückrahmen M3 Nut for rear frame	396.3167
58	A42	1	Schaltregler VAR 02 Switching regulator	819.1916.02
59		1	Deckel oben Cover, top	819.2070
60		2	DIN 7985 - M2,5 x 5 - A4	088.1543
61		2	DIN 137 - A2,6 - A2	005.0280
62		2	DIN 125 - A2,7 - A4	082.4663
65		1	Deckel unten Cover, bottom	819.2087
66		2	DIN 7985 - M2,5 x 10 - A4	088.0053
67		2	DIN 137 - A2,6 - A2	005.0280
70		1	Netzteilrahmen Frame for Power Supply Unit	819.1639
71		4	Zyl. Schr. M 2,5 x 5 A2 Screw	088.7693
72		4	DIN 137 - A2,6 - A2	005.0280
73		1	Winkel mit Haltefeder Angle with spring	819.1874

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
74		1	Winkel links Angle, left	819.1897
75		2	DIN 927 M 3 x 4	032.4447
76		2	DIN 137 - A3 - A2	005.0296
77		2	Durchf. Tülle 8 x 10 x 15 Feedthrough	099.3536
80	22	1	Netzfilter Chassis power plug with filter	819.1739
81		1	Kabelbinder Rd 1,6 bis 76 B 3,6 Cable clamp	015.9044
82		1	Schirmung Netzeingang Shielding power input	819.1651
83		4	DIN 7985 - M2,5 x 6 - A4	088.0030
84		4	DIN 137 - A2,6 - A2	005.0280
90		1	Kühlprofil Heat sink	819.1674
91		3	DIN 7985 M3 x 10 - A4	081.9084
92		3	DIN 137 - A3 - A2	005.0296
93		3	DIN 125 - A3,2 - A4	082.4670
94		8	Kombischraube M 2,5 x 8 Screw	071.5705
95		2	DIN 965 - M 3 x 6 - A4	081.9378
100		1	Rückplatte, engl. Rear plate	819.1597
101		2	Sicherungshalter GR Fuse holder	087.5022
102	S2	1	Spannungsumschalter 115/220 Voltage selector	292.5387

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/ Comp.No	Qty	Designation	Stock No.
103		2	DIN 7985 - M 3 x 8 - A4	081.9078
104		4	DIN 125 - A3,2 - A4	082.4670
105		2	DIN 137 - A3 - A2	005.0296
106		2	DIN 934 - M3 - A4	016.4398
110	Z1	1	Einbaust. mit Netzfilter 3A Power plug with filter	006.0977
111		2	DIN 965 - M3 x 8 - A4	081.9384
112		2	DIN 137 - A3 - A2	005.0296
113		2	DIN 125 A3,2 - A4	082.4670
114		2	DIN 934 - M3 - A4	016.4398
115	S1	1	Wippschalter 2polig Aus SW Rocker switch 2pole	553.2925
117		1	Flachstecker GR 6,3 Flat connector	543.6705
118		1	DIN 7985 - M4 x 8 - A4	081.9178
119		1	DIN 137 - A4 - A2	005.0315
120		1	DIN 433 - 4,3 - A4	082.4586
121		1	DIN 6797 - A4,3 - A2	016.2837
122		1	DIN 934 - M4 - A4	016.4400
124		1	Schutzkappe f. BNC-Buchse Protective cover for BNC socket	250.3840
125		1	Kombischraube M2,5 x 8 Screw	071.5705

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
126	A4	1	Netzteil (Pos. 50...125) VAR 02 Power Supply Unit	819.1568.02
127		6	DIN 7985 - M3 x 8 - A4	081.9078
128		6	DIN 137 - A3 - A2	005.0296
129		6	DIN 125 - A3,2 - A4	082.4670
130		2	DIN 965 - M3 x 10 - A4	081.9390
131		2	Mutter für Rückrahmen M3 Nut for rear frame	396.3167
135		1	Buchsenträger hinten Socket support, rear	819.0326
136		4	DIN 965 - M3 x 8 - A4	081.9384
137	E1	1	Lüftereinheit Blower set	819.0332
138		4	DIN 7340 - B4 x 6 - MS - E1D	031.2805
139		4	DIN 125 - A4,3 - A4	082.4686
140		4	DIN 7985 - M3 x 16 - A4	081.9103
141	X131 - X434	4	Einbaubuchse Syst. BNC Panel mounting socket BNC	099.9186
142		1	Lötöse 18 x 10 Solder tag	035.0813
145		1	Verschlußstopfen Stopper	528.8598
146		7	Verschlußstopfen Stopper	528.8500
147		1	Verschlußstopfen Stopper	681.744
148	W43	1	DX HF-Kabel W43 RF cable	820.3102

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/ Comp.No	Qty	Designation	Stock No.
149		2	Verriegelungsschraube Lock screw	099.2830
155		1	Führungspl. links BL Guide panel, left	396.7185
156		1	Führungspl. rechts sw Guide panel, right	396.7179
157		20	Massefeder 4E Earth clip	396.7233
158		1	Stützplatte 4E Supporting plate	396.7779
159		2	DIN 965 - M3 x 10 - A4	081.9390
160		1	Sicherung für Führungsleisten Securing for guide rails	819.0484
161		2	DIN 7985 - M2,5 x 10 - A4	088.0053
162		2	DIN 137 - A2,6 - A2	005.0280
165	A2	1	Motherboard VAR 02	819.0910.02
166		2	Schiene Rail	819.0278
167		1	Zahnstange links Toothed rack, left	819.0284
168		1	Zahnstange rechts Toothed rack, right	819.0290
169		4	DIN 923 - M2,5 x 3 - 5,8 - A3P	088.0976
170		6	DIN 7985 - M3 x 6 - A4	081.9061
171		6	DIN 137 - A3 - A2	005.0296
172		6	DIN 125 - A3,2 - A4	082.4670
173		2	Querwand Transverse panel	819.0261

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
174		4	DIN 7985 - M2,5 x 6 - A4	088.0030
175		4	DIN 137 - A2,6 - A2	005.0280
176		4	Abstandsrohr Spacer	302.7740
177		4	DIN 7985 - M2,5 x 8 - A4	088.0047
178		4	DIN 137 - A2,6 - A2	005.0280
179		4	DIN 965 - M3 x 10 - A4	081.9390
180		4	DIN 7985 - M2,5 x 10 - A4	088.0053
181		4	DIN 137 - A2,6 - A2	005.0280
185	W17	1	DX-Kabel W17 Cable	820.3077
186	W18	1	DX-Kabel W18 Cable	820.3083
187	W1E	1	DX-Kabel W1E Cable	819.2158
188	X4		DX-Kabel X4 Cable	819.2135
189	W16		DX-Kabel W16 Cable	843.4040
191	A5	1	Rechner ohne Software Controller w/o software	819.2164.02
192	A6	1	NF-Generator AF generator	819.3260.02
193	A7	1	FRN-Synthese FRN synthesis	819.3860.02

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
194	A8	1	Stepsynthese Step synthesis	819.4944.02
195	A9	1	Festfrequenzen Fixed frequencies	819.6060.02
196	A10	1	Summierschleifen Summing Loops	819.7166.02
197	A11	1	RF-Oszillator RF oscillator	819.8262.02
198	A12	1	Filtersatz Filter set	819.9369.02
199	A13	1	Ausgangsteil Output section	820.0461.02
200		1	Luftleitblech Cooling baffle	819.0461
205	W121	1	DX HF-Kabel W121 RF cable	820.2941
206	W41	1	DX HF-Kabel W41 RF cable	820.2987
207	W111	1	DX HF-Kabel W111 RF cable	820.2929
208	W122	1	DX HF-Kabel W122 RF cable	820.2958
209	W93	1	DX HF-Kabel W93 RF cable	820.2870
210	W162	1	DX HF-Kabel W162 RF cable	820.3002
211	W131	1	DX HF-Kabel W131 RF cable	820.2993
212	W123	1	DX HF-Kabel W123 RF cable	820.2964
213	W71	1	DX HF-Kabel W71 RF cable	820.2787
214	W81	1	DX HF-Kabel W81 RF cable	820.2812

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
215	W94	1	DX HF-Kabel W94 RF cable	820.2887
216	W101	1	DX HF-Kabel W101 RF cable	820.2906
217	W83	1	DX HF-Kabel W83 RF cable	820.2835
218	W72	1	DX HF-Kabel W72 RF cable	820.2793
219	W82	1	DX HF-Kabel W82 RF cable	820.2829
220	W91	1	DX HF-Kabel W91 RF cable	820.2858
224		1	Längswand Side panel	819.0255
225		8	DIN 965 - M3 x 8 - A4	081.9384
226		19	Führungsleiste f. GS 4E GR Guide rail	396.7427
227		20	DIN 965 - M3 x 8 - A4	081.9384
229		1	Buchsenträger vorne Socket support, front	819.0226
230		4	DIN 965 - M3 x 8 - A4	081.9384
231		1	Federplatte Spring plate	819.0249
232	X171 X172 X173	3	Einbaubuchse Syst. BNC Panel mounting socket BNC	099.9186
233		3	Lötöse 18 x 10 Solder tag	035.0813
235		1	Schirmwand Shielding panel	819.0232
236		6	DIN 965 - M2,5 x 6 - A4	088.0101

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
240		1	Halteblech Retaining plate	819.0384
241		1	Haltebügel Bracket	819.0378
242		2	DIN 965 - M2,5 x 6 - A4	088.0101
243		1	Versteifungsplatte Reinforcing plate	819.0361
244		3	DIN 7985 - M2,5 x 8 - A4	088.0047
245		3	DIN 137 - A2,6 - A2	005.0280
246		3	DIN 125 - A2,7 - A4	082.4663
247	A163	1	Verdopplermodul Doubler PCB	835.8763.02
248		11	DIN 7985 - M2,5 x 25 - A4	088.0099
249		11	DIN 137 - A2,6 - A2	005.0280
250	A162	1	HF-Verstärker 4,4 GHz RF Amplifier 4.4 GHz	836.0766.02
253	A164	1	Ansteuerplatte Control PCB	836.2269.02
254		3	DIN 7985 - M2,5 x 10 - A4	088.0053
255		3	DIN 137 - A2,6 - A2	005.0280
256		3	DIN 125 - A2,7 - A4	082.4663
257		1	Kühlklotz Heat sink	836.2317
258		2	Kombischraube M2,5 x 6 Screw	071.5040

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/ Comp.No	Qty	Designation	Stock No.
260	W163	1	DX HF-Kabel W163 RF cable	836.3465
261	W164	1	DX HF-Kabel W164 RF cable	836.3459
262	A16	1	Erweiterung 4 GHz (Pos. 240 - Pos. 261) Extension 4 GHz	835.8711.02
263	W10	1	DX Kabel W10 Cable	836.1056
264	W30	1	DX Kabel W30 Cable	835.9318
265		3	DIN 965 - M2,5 x 6 - A4	088.0101
266		3	DIN 7985 - M2,5 x 10 - A4	088.0053
267		3	DIN 137 - A2,6 - A2	005.0280
268		3	DIN 125 - A2,5 - A4	082.4657
269		1	DIN 7985 - M2,5 x 6 - A4	088.0030
270		1	DIN 137 - A2,6 - A2	005.0280
271	A18	1	Eichleitung SMHU Precision Attenuator SMHU	835.8234.02
272		1	Bügel für Eichleitung Bracket for Precision Attenuator	819.0310
273		3	DIN 7340 - B4 x 6 - MS - E1P	031.2805
274		3	DIN 125 - A4,3 - A4	082.4686
275		3	DIN 7985 - M3 x 10 - A4	081.9084
276		2	DIN 7985 - M2,5 x 6 - A4	088.0030
277		2	DIN 137 - A2,6 - A2	005.0280

Lfd. Nr.	Kennzeichen	Menge	Benennung/Beschreibung	Sachnummer
No	Unit/Comp.No	Qty	Designation	Stock No.
278		2	DIN 965 - M2,5 x 6 - A4	088.0101
279	W181	1	DX HF-Kabel W181 RF cable	820.3060
280	W161	1	DX HF-Kabel W161 RF cable	820.3048
282	A3	1	Anzeige / Tastatur Display/ Keyboard	819.1122.02
283		1	Montageplatte Mounting plate	819.1239
284		13	DIN 965 - M2 x 16 - A4	081.9290
285		1	Beschriftungsplatte Identification plate	SMHU52: 835.8292 SMHU56: 835.8270 SMHU58: 835.8311
286		2	Senkschraube M1,6 x 3 lichtgr. Screw	396.1070
287		4	DIN 965 - M3 x 8 - A4	081.9384
288		4	Schei. Rd 3,1/7,2 H 1,8 CR Washer	396.5518
289		1	Führungskragen Guide frame	396.0897
290		1	Dreh. M. Mulde Rd 37 Rd 6 Rotary knob	078.1192
291		3	Fenster Window	801.1466
292	X1	1	Flachbandkabel Ribbon cable	820.3019

Gehäuse

Casing

Aufbau

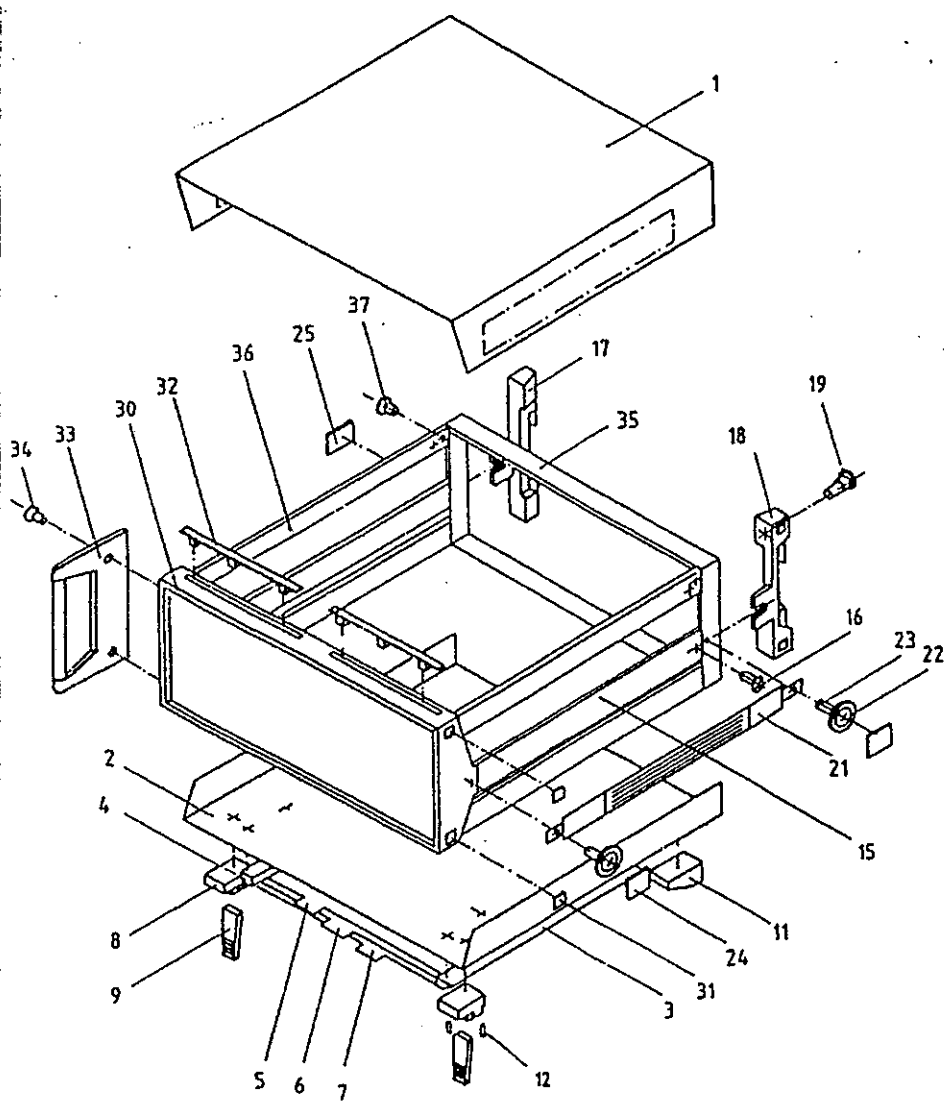
Der Aufbau besteht aus einer tragenden Aluminium-Druckguß-Rahmenkonstruktion mit gerätespezifischer Front-, Montage- und Rückplatte, die mit einer Ober- und Unterhaube (= Beplankung) ummantelt ist.

Construction

The construction consists of a self-supporting aluminium-cast frame with front, mounting and rear panel, top and bottom covers (= panelling).

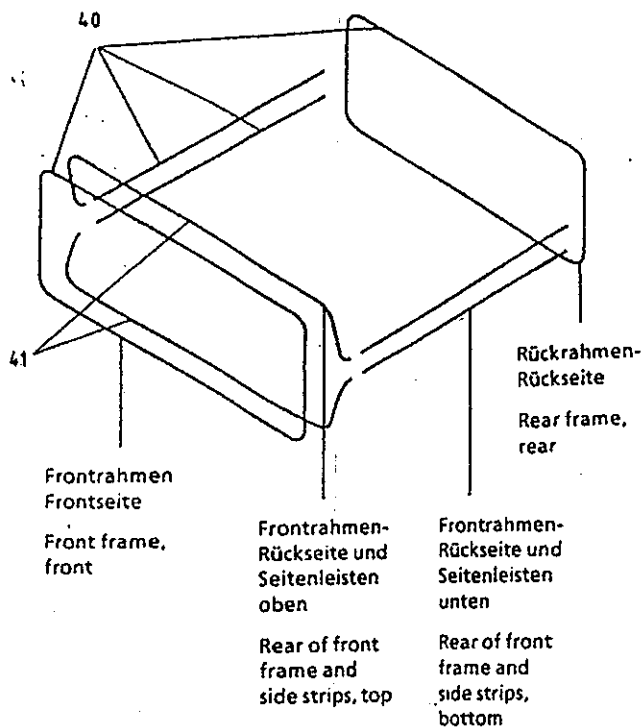
Rahmen und Beplankung:

Frame and panelling:



Dichtschnur (nur bei Geräten mit erhöhtem Schirmdämpfungsbedarf vorhanden) jeweils in die umlaufende Nut einlegen.

Insert the braided cord (provided only for instruments requiring a high degree of shielding) into the respective groove.



Die Dichtschnüre in der Frontrahmen-Frontseite und in der Rückrahmen-Rückseite müssen durch Klebepunkte in Abständen von ca. 80 mm fixiert werden. Dazu Klebepunkte mit ca. ø2 mm im Nutgrund anbringen und Dichtschnur aufdrücken.

The braided cords in the front of front frame and rear of rear frame must be fixed by glued joints approx. every 80 mm. Make joints (ø approx. 2 mm) on the bottom of the groove and press braided cord firmly on it.

Dauerhaft elastischen Kleber wie z.B. Si-Kautschuk 3145 RTV (R&S-Sachnr. WV 088.3152) verwenden.

Use a permanently elastic adhesive, such as Si-rubber 3145 RTV (R&S Part No. WV 088.3152).

Bei Geräten mit geteilten Rückplatten müssen beim Zusammenbau die Einzelelemente über die gesamte Gehäusebreite waagrecht zueinander ausgerichtet werden.

Instruments with separate rear panels require the individual components to be adjusted to the same level over the complete instrument width.

Ober- und Unterhaube müssen mit den Erhöhungen am Rückrahmen fixiert sein.

Top and bottom cover must be fastened by way of the catches on rear frame.

Achtung: bei hohen Rückwandfüßen (CMS) werden die Fixier-Erhöhungen verdeckt, hier Rückwandfüße erst anschrauben, wenn die Ober- u. Unterkante sicher in den Erhöhungen am Rückrahmen fixiert sind.

Note that with high rear panel feet (CMS) the catches are concealed; here tighten the rear feet screws only after the top and bottom cover have been securely fitted into the catches.

Öffnen und Schließen des Gehäuses

Opening and closing the cabinet

Die gute Schirmdämpfung der Kompaktbauweise 90 erfordert häufige Kontaktstellen und hohe Paßgenauigkeit. In Verbindung mit einem leichten Anlagedruck, der mit dem Festziehen der Rückwandfußschrauben erreicht wird, erhält man einen straffen Sitz der Ober- und Unterhaube auf dem Rahmen.

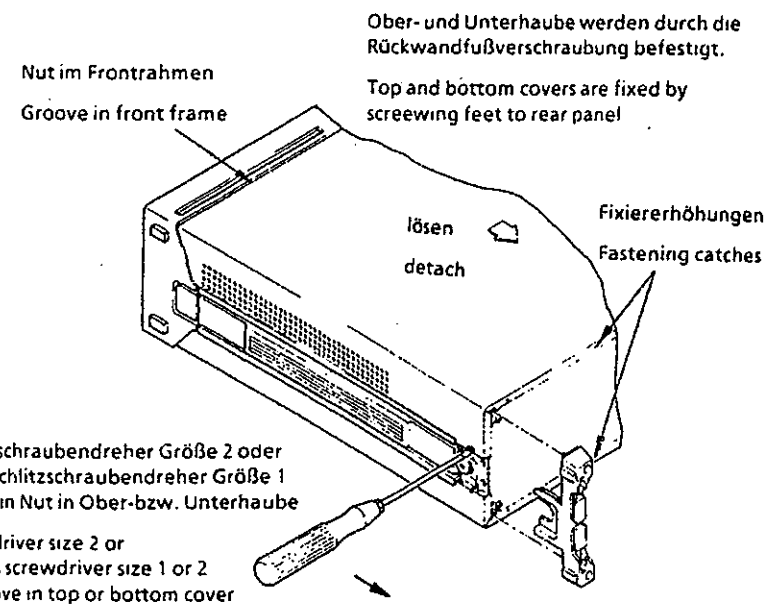
To obtain the high degree of shielding of design 90, many points of contact and accurate fitting are employed. When exerting a slight pressure by tightening the rear-panel feet, tight fitting of the top and bottom covers is ensured.

Zum Öffnen muß man die Rückwandfußverschraubung lösen und die Füße nach rückwärts abziehen (Schrauben bleiben im Fuß haften). Je nach Bedarf läßt sich nun Ober- bzw. Unterhaube ebenfalls nach rückwärts abnehmen. Sitzen die Hauben sehr fest, erleichtert man das Abziehen durch abwechselndes Hebeln in Pfeilrichtung mit einem Schraubenzieher an beiden Geräteseiten (siehe Bild).

To open the cabinet, first undo the rear panel feet screws and withdraw the feet (captive screws). It is now possible to detach top and bottom cover if required. If the fitting of these cover plates is very tight, removal can be facilitated by alternately levering on both sides of the instrument using a screwdriver (see illustration).

Zum Schließen des Gehäuses werden erst die Frontkanten der Hauben in die umlaufende Nut des Frontrahmens und der Seitenleisten eingeführt und dann in die Erhöhungen am Rückrahmen bis Anschlag eingerastet. Das Gerät ist wieder geschlossen, wenn die Rückwandfüße eingeschoben und die Schrauben festgezogen sind.

To close the cabinet, insert the front edges of the covers into the groove of the front frame and the side strips and lock them into the catches on the rear frame into detent position. The cabinet is closed when the rear-panel feet are inserted and the screws tightened.



A3 TASTATUR/ANZEIGE
KEYBOARD/DISPLAY

A7 FRN-SYNTHESE
FRN-SYNTHESIS

A10 SUMMIERSCHLEIFEN
SUMMING LOOPS

A11 RF-OSZILLATOREN
RF-OSCILLATORS

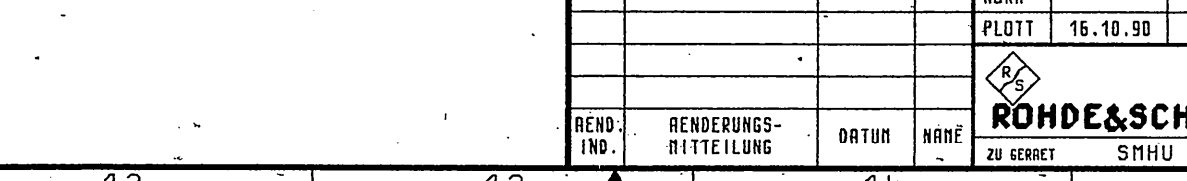
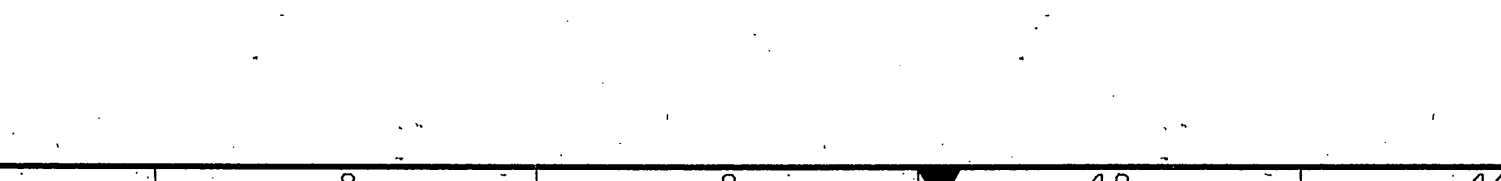
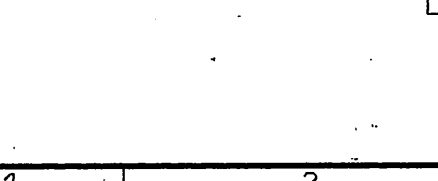
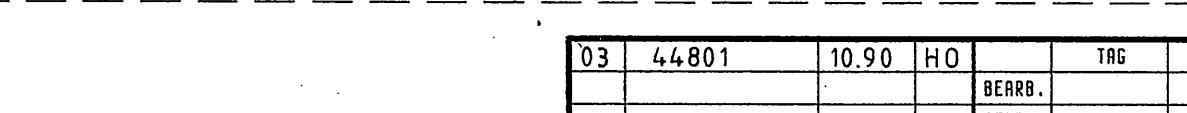
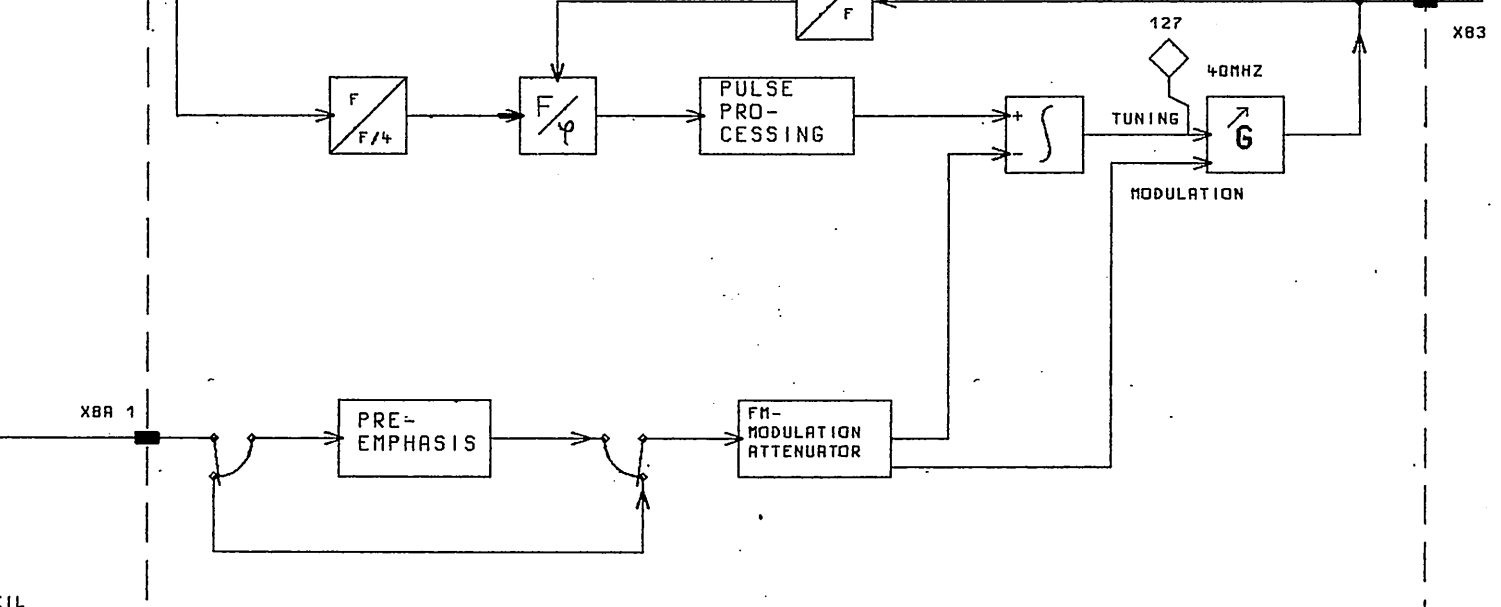
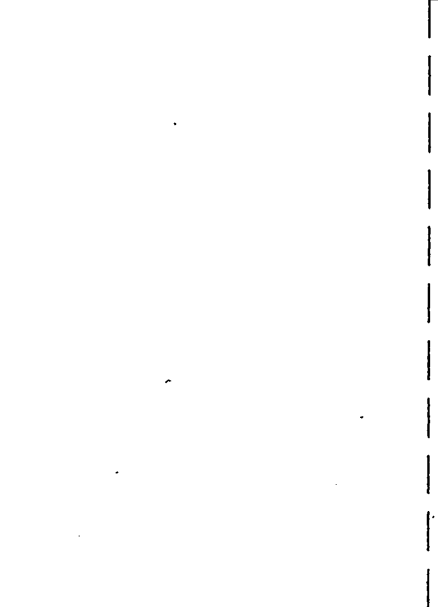
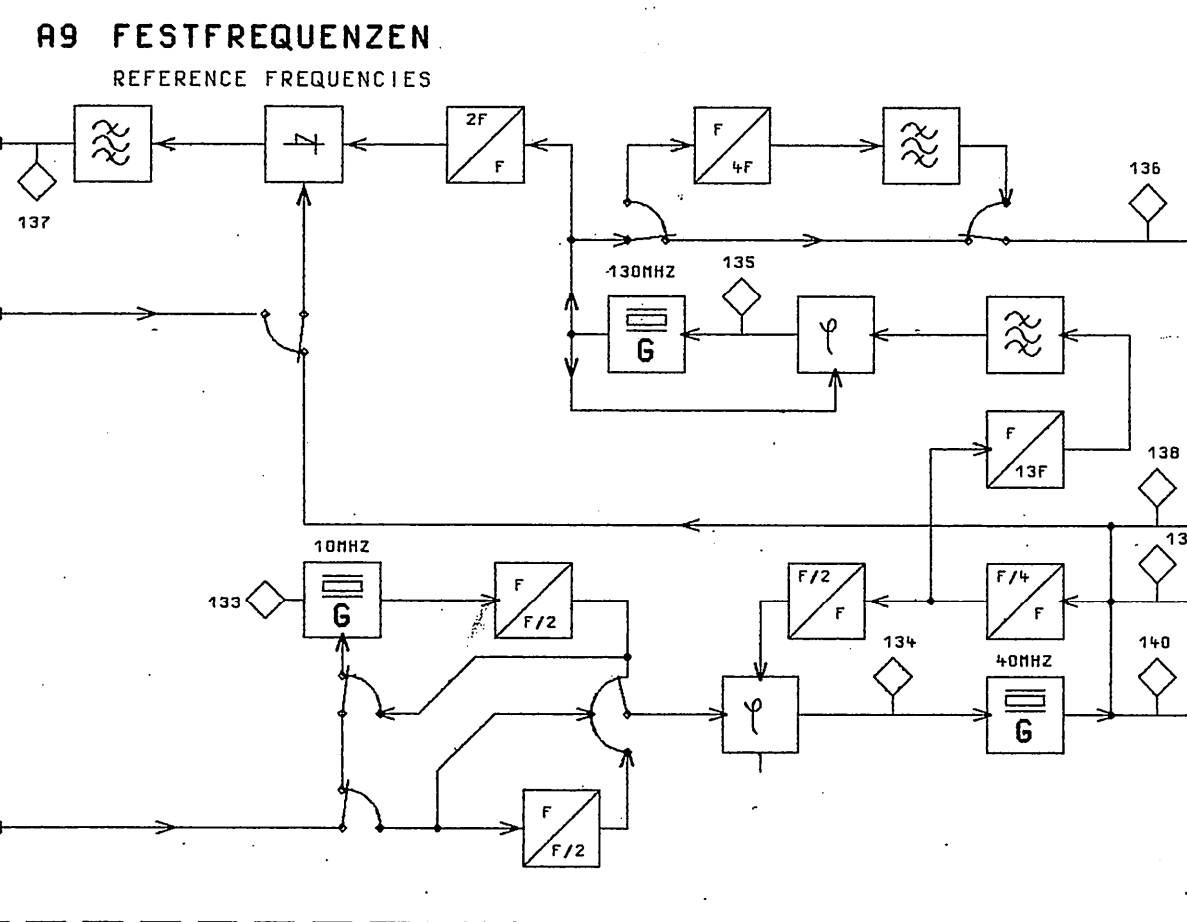
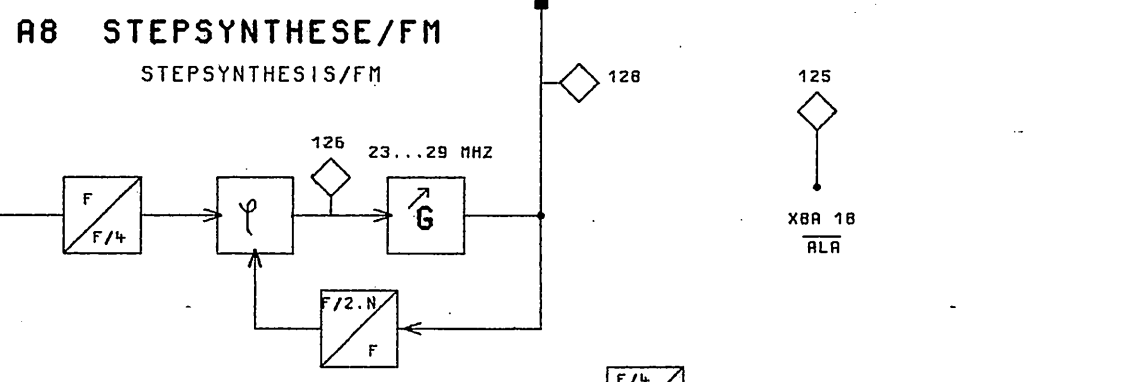
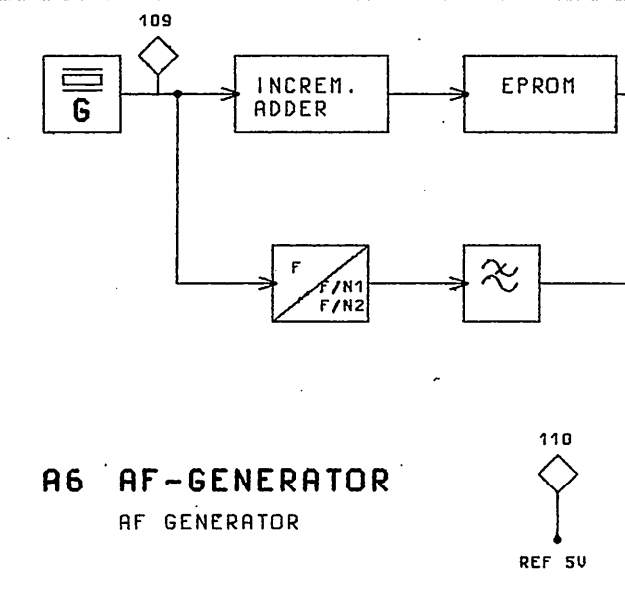
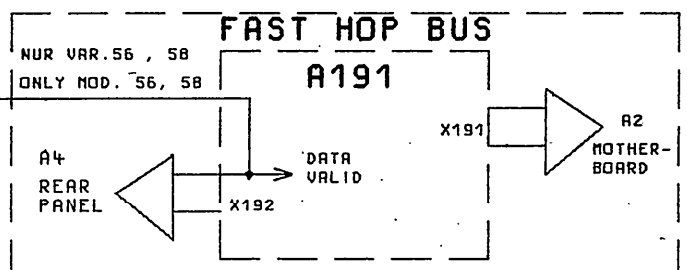
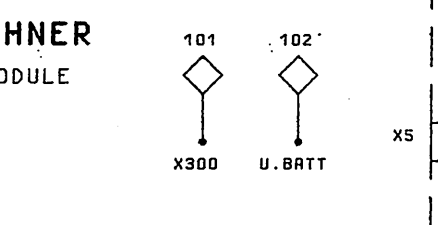
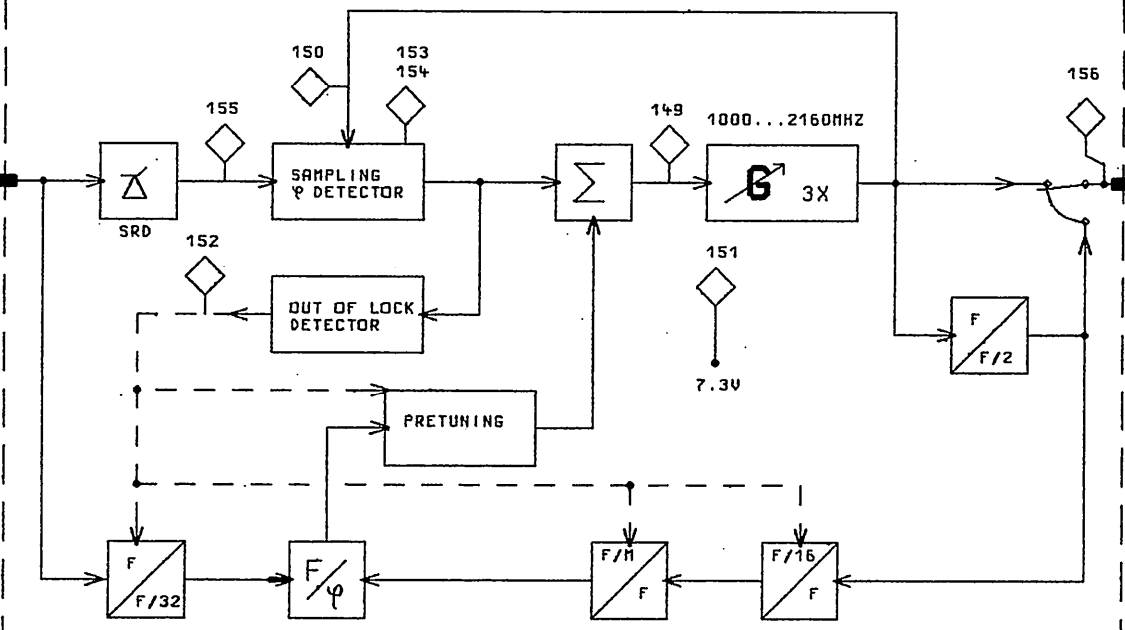
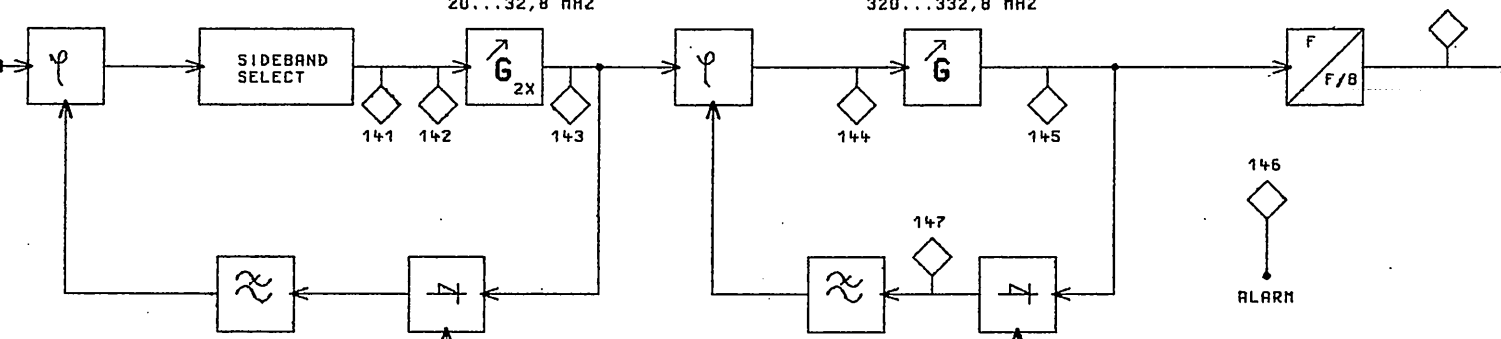
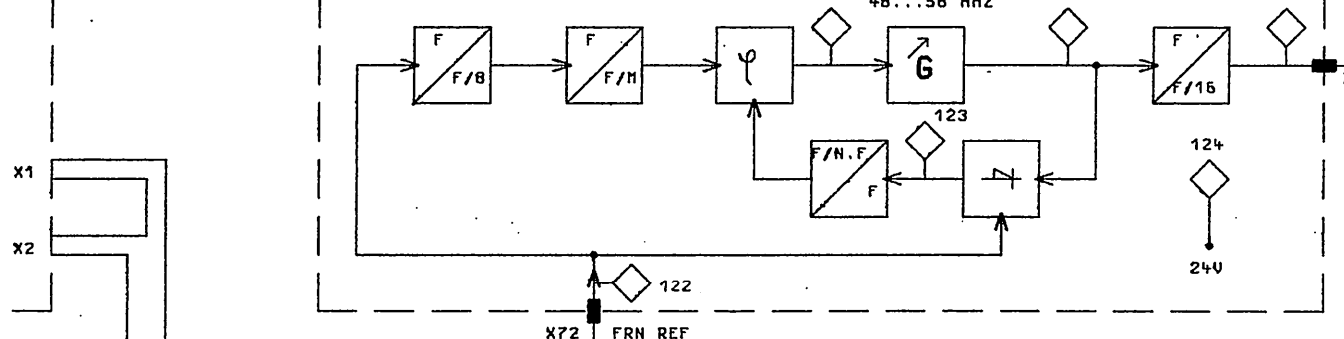
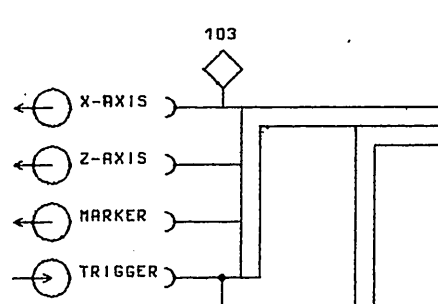
A5 RECHNER
UP-MODULE

FAST HOP BUS
A191

A6 AF-GENERATOR
AF GENERATOR

A8 STEPSYNTHESE/FM
STEPSYNTHESIS/FM

A9 FESTFREQUENZEN
REFERENCE FREQUENCIES

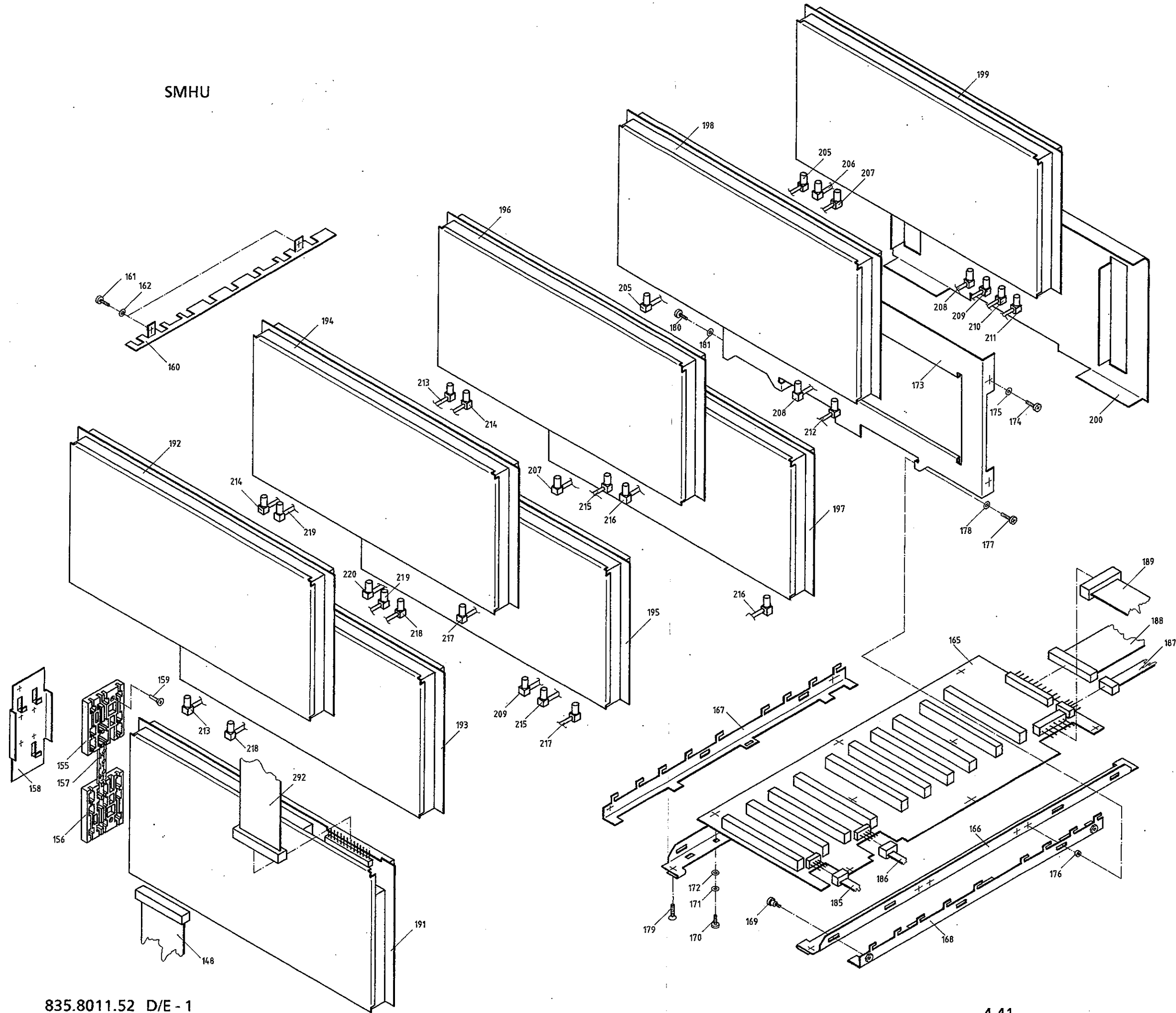


◇ -DIAGNOSE-SPEZIALFUNKTIONEN
◇ DIAGNOSTIC SPECIAL FUNKTION

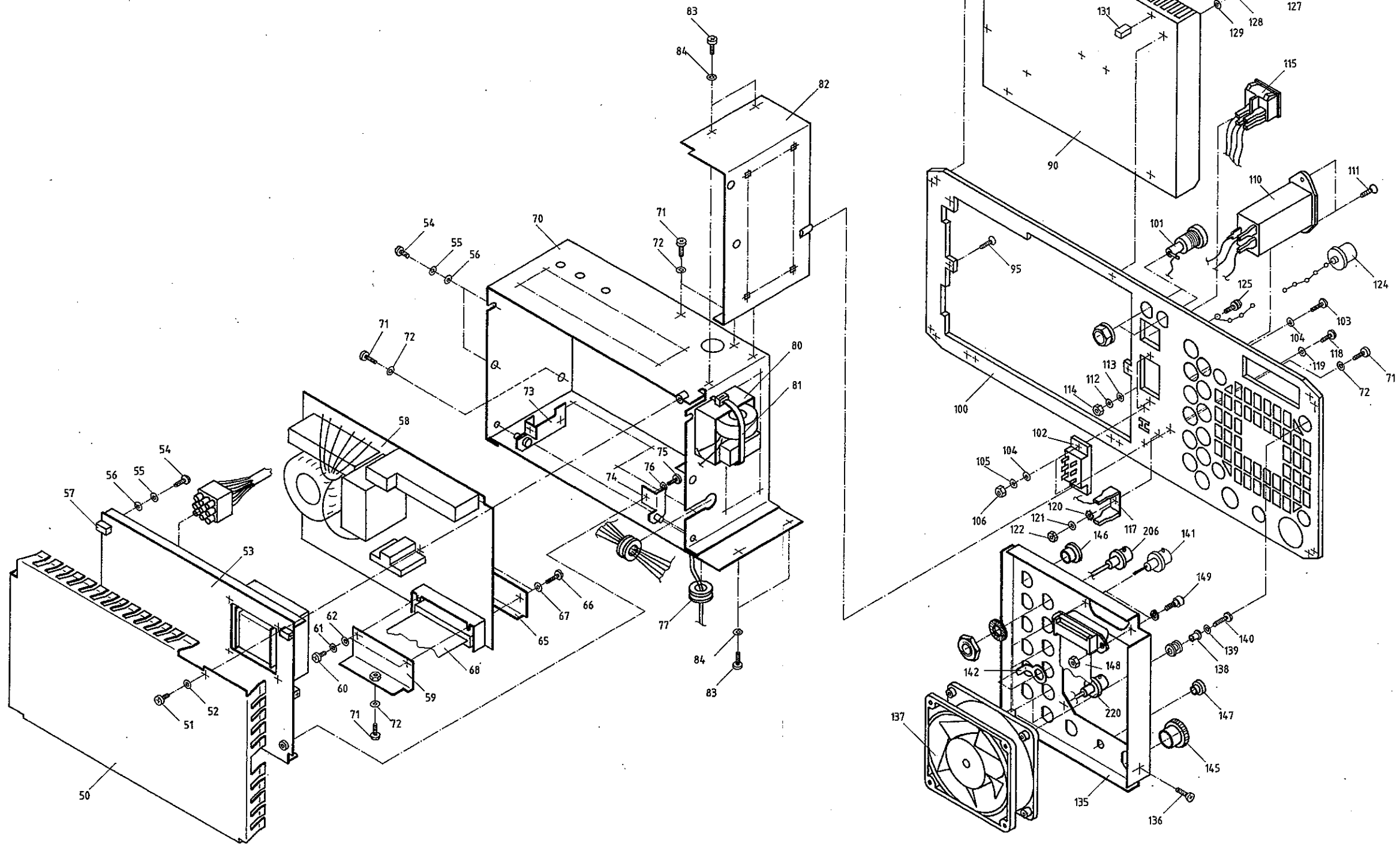
STROMLAUF GILT F. VAR. 52/56/58
CIRCUIT DIAGRAM IS VALID FOR MOD. 52/56/58

03	44801	10.90	HO	BEARB.	TAG	NARE	BENENNUNG	
				BEPR.		UL	SMHU-SIGNALGENERATOR	
				NORR		SP		
				PLOTT	16.10.90	*		
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							835.8011. FS	1
							REG. I.V.	ERSTE Z.
							835.8011	

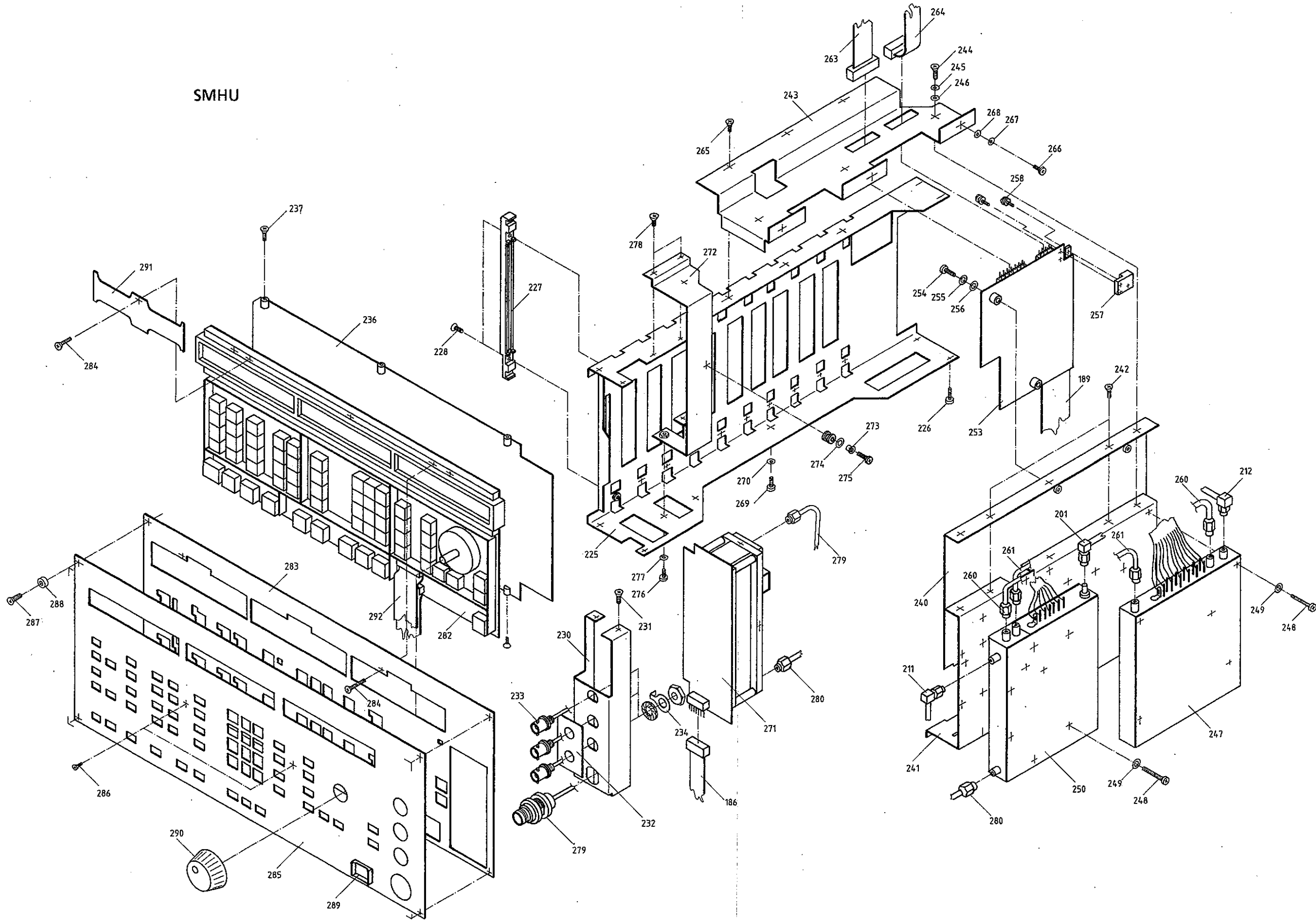
SMHU



SMHU



SMHU





ROHDE & SCHWARZ

**Schlüsselliste
für Bauteile-Sachnummern
Code list
for component stock Nos.
Liste
des références des composants**



R&S-Schlüsselliste

R&S key list

Liste des symboles de référence R&S

Die R&S-Schaltteillisten nennen in der Spalte "Benennung/Beschreibung" die technischen Daten der Bauelemente in Kurzform. Die Art des Bauelements (z.B. Schicht-, Draht-Widerstand usw.) beschreiben die 2 Kennbuchstaben vor der "Benennung" (evtl. auch vor der "Sachnummer"), die nachfolgend erklärt werden. In Ersatzteil-Bestellungen an R&S ist stets die Angabe der vollständigen Sachnummer erforderlich.

The R&S Parts Lists give the technical data of the components in short form in the column "Benennung/Beschreibung" (designation). The type of component (e.g. depos.-carbon resistor, wire-wound resistor etc.) is indicated by 2 identification letters before the designation, possibly also before the "Sachnummer" (order number), which are explained below. When ordering spare parts from R&S, the complete order number must always be specified.

La colonne «Désignation/description» des listes de pièces de R&S indique les caractéristiques des éléments sous forme abrégée. Le type d'élément (p. ex. résistance à couche, résistance bobinée etc. ...) est décrit par les deux lettres précédant la désignation (et éventuellement le numéro de référence), dont voici l'explication. Prière d'indiquer le numéro de référence («Sachnummer») complet dans toute commande de pièces de rechange.

Teilefamilie	Art des Bauelementes	Parts family	Type of component	Familie	Type d'élément
A	Aktive Bauelemente, Halbleiter	A	Active components, semiconductors	A	Composants actifs, semiconducteurs
AD	Universaldiode, z.B. Gleichrichter, Sperrdiode	AD	General-purpose diode, e.g. rectifier, high-resistance diode	AD	Diode d'usage général, p.ex. redresseur, diode à haute résistance
AE	Spezialdiode, z.B. Tunnel-, Kapazitäts-, Zener-Diode	AE	Diode (special), e.g. tunnel diode, varactor, Zener diode	AE	Diode spéciale, p.ex. diode tunnel, varactor, diode Zener
AF	Fotohalbleiter, z.B. Foto-Diode, -Transistor, -Widerstand, Leuchtdiode	AF	Photo-semiconductor, e.g. resistor, diode, transistor, LED	AF	Semiconducteur photoélectrique, p.ex. diode, transistor, résistance photoél., DEL
AG	Leistungs-Gleichrichter, z.B. Thyristor, Triac, Selengleichrichter	AG	Power rectifier, e.g. thyristor, triac, selenium rectifier	AG	Redresseur de puissance, p.ex. thyristor, triac, redresseur, au sélénium
AK	Kleinsignal-Transistor	AK	Small-signal transistor	AK	Transistor faible puissance
AL	Leistungs-Transistor	AL	High-power transistor	AL	Transistor grande puissance
AM	Spezial-Transistor, z.B. FET, MOSFET	AM	Transistor (special), e.g. FET, MOS-FET	AM	Transistor spécial, p.ex. TEC, MOSTEC
AP	Peltier-, Hall-Element	AP	Peltier element, Hall element	AP	Element Peltier, élément Hall
AR	Röhre für Empfänger, Verstärker, Gleichrichter	AR	Valve for receiver, amplifier, rectifier	AR	Tube pour récepteur, amplificateur, redresseur
AS	Spezialröhre, z.B. Senderöhre, EW-Widerstand, Stabilisator	AS	Valve (special), e.g. for transmitter, baretter, ballast valve	AS	Tube (spécial), p.ex. pour émetteur, résistance fer-hydrogène, ballast
AT	Katodenstrahlröhre, z.B. Bildröhre, Ziffern-Anzeigeröhre	AT	Cathode ray tube, e.g. picture tube, digital indicator tube	AT	Tube à rayon cathodique, p.ex. tube à image, tube à affichage numérique
AZ	Zubehör für Halbleiter u. Röhren	AZ	Accessories for semiconductors and valves	AZ	Accessoires pour semiconducteurs et tubes
B	Bausteine	B	PC boards, chips	B	Cartes imprimées, puces
BC	Integr. Schaltkreis (Microcomp.)	BC	Integrated circuit (interface, A/D)	BC	Circuit intégré (microprocesseur)
BD	R&S-Dünnschicht- und Dickschichtschaltung	BD	R&S thinfilm or thickfilm circuit	BD	Circuit R&S à couche mince ou épaisse
BG	R&S-spezifische Gate-Arrays	BG	R&S gate arrays	BG	Circuits intégrés prédiffusés R&S
BJ	Integrierter Schaltkreis (Interface, A/D-Wandler)	BJ	Integrated circuit (interface, A/D converter)	BJ	Circuit intégré (interface, convertisseur A/N)
BL	Log. Schaltkreis z.B. DTL, TTL, HTL, ECL, C-MOS	BL	Logic circuit, e.g. DTL, TTL, HTL, ECL, C-MOS	BL	Circuit logique, p.ex. DTL, TTL, HTL, ECL, C-MOS
BM	Hybridbaustein, z.B. Mischer, Tuner, Modulator	BM	Hybrid chip, e.g. mixer, tuner, modulator	BM	Puce hybride, p.ex. mélangeur, tuner, modulateur
BO	Analogschaltkreis, z.B. Operationsverstärker	BO	Analog circuit, e.g. operational amplifier	BO	Circuit analogique, p.ex. amplificateur opérationnel
BP	Optoelektronischer Baustein, z.B. Anzeigeeinheit, Koppler	BP	Optoelectronic component, e.g. display, coupler	BP	Composant optoélectronique, p.ex. afficheur, coupleur
BS	Schalt- und Steuerbaustein, elektronischer Sensor	BS	Switching and control modul. electronic sensor	BS	Modul de commutation et de commande, sonde électronique
BV	Stromversorgung, Übersp-Schutz	BV	Power pack, protective circuit	BV	Alimentation, protection surcharge
BZ	Zubehör	BZ	Accessories	BZ	Accessoires



Teile- familie	Art des Bauelementes	Parts family	Type of component	Famil- le	Type d'élément
F	Fassungen, Steckverbindungen	F	Sockets, connectors	F	Douilles, connecteurs
FG	Koax-Umrüstsatz	FG	Coaxial screw-in assembly	FG	Ensemble vissable coaxial
FH	Koax-Übergang auf Fremdsystem	FH	Coaxial adapter	FH	Adaptateur coaxial
FJ	BNC-Systemteil	FJ	BNC screw-in assembly	FJ	Ensemble vissable BNC
FK	Koaxial-UHF-Systemteil	FK	Coaxial UHF screw-in assembly	FK	Ensemble vissable coaxial UHF
FM	Mehrfachstecker, Buchsenleiste	FM	Multipoint connector	FM	Connecteur multiple
FN	Netz-Steckverbindung	FN	AC-supply connector	FN	Connecteur secteur
FO	Runde Mehrfach-Steckverbindung	FO	Round multipoint connector	FO	Connecteur multipoles rond
FP	Druckschalt-Steckverbindung	FP	Multipoint connector for PC boards	FP	Connecteur multipoles pour cartes imprimées
FR	Fassung für Lampe, Sicherung, usw.	FR	Socket for lamp, fuse, etc.	FR	Douille pour lampe, fusible etc. . . .
FT	Schwachstrom-Steckverbindung	FT	LV plug and socket	FT	Connecteur pour faible courant
FU	Hochspannungs-Steckverbindung	FU	HV plug and socket	FU	Connecteur pour haute tension
FV	Verbinder (z.B. AMP)	FV	Push-on connector	FV	Connecteur à enfichage
FZ	Zubehör für koax. Bauelemente	FZ	Accessories for coax. components	FZ	Accessoires pour composants coax.
H	Software	H	Software	H	Logiciel
HP	Software-Komponenten und Software-Module	HP	Rights to software components and software modules	HP	Droits d'utilisation de composants et modules logiciel
HS	Auf Informationsträger geladene Software	HS	Software data media	HS	Logiciel sur support d'information
J	Meßinstrumente	J	Indicators	J	Indicateurs
JD	Drehspul-Anzeigeeinstrument	JD	Moving-coil meter	JD	Galvanomètre à cadre mobile
JE	Dreheisen-Anzeigeeinstrument	JE	Moving-iron meter	JE	Galvanomètre à fer mobile
JF	Frequenzmesser	JF	Frequency meter	JF	Fréquence-mètre
JG	Drehspulinstrument mit Gleichrichter	JG	Moving-coil meter with rectifier	JG	Galvanomètre à cadre mobile avec redresseur
JH	Betriebsstundenzähler	JH	Operating-hours counter	JH	Compteur d'heures de fonctionnement
JJ	Impulszähler	JJ	Pulse counter	JJ	Compteur d'impulsions
JK	Kleinst-Instrument, z.B. Abstimmanzeiger	JK	Mini-instrument, e.g. tuning indicator	JK	Petit indicateur, p.ex. indicateur d'accord
JM	Mechanisches Zählwerk	JM	Mechanical counter	JM	Compteur mécanique
JP	Projektions-Instrument (Leuchtziffer)	JP	Digital display	JP	Afficheur numérique
JQ	Quotientenmesser (Kreuzspulinstrum.)	JQ	Ratiometer (cross coul)	JQ	Quotientmètre (à cadres croisés)
JU	Uhrwerk	JU	Clockwork	JU	Mouvement d'horlogerie
JW	Elektrodyn. Anzeigeeinstrument	JW	Electrodynamic meter	JW	Instrument électrodynamique
L	Induktivitäten, Magnetik	L	Inductors, magnetic components	L	Composants inductifs et magnétiques
LB	Blech- und Schnittbandkern mit Zubehör	LB	Laminated and C-cores with accessories	LB	Noyaux feuilletés et noyaux de type C, avec accessoires
LC	Keramische Spule	LC	Ceramic coil	LC	Bobine céramique
LD	Netz-, HF-Drossel, Df-Filter	LD	Choke, lead-through filter	LD	Self de choc, filtre de traversée
LE	Einzelkreis, Bandfilter	LE	Single tuned circuit, bandpass filter	LE	Circuit accordé, filtre passe-bande
LF	Ferritkern mit Zubehör	LF	Ferrite cores with accessories	LF	Noyaux en ferrite avec accessoires
LK	Karbonyleisenkern und elektrischer Kupferkern mit Zubehör	LK	Iron carbonyl slugs and copper slugs with accessories	LK	Noyaux en fer carbonyle et en cuivre, avec accessoires
LL	Luftspule	LL	Air-core coils	LL	Bobines à air
LM	Magnetband und -platte	LM	Magnetic tapes and disks	LM	Bandes et disques magnétiques
LS	Schirmbecher	LS	Screening cans	LS	Boîtiers de blindage
LT	Netztransformator	LT	Power transformer	LT	Transformateur secteur
LU	NF-Übertrager	LU	AF transformer	LU	Transformateur BF
LV	Variometer	LV	Variometer	LV	Variometre
LW	Wickelkörper, allgemein	LW	Coil formers, general	LW	Carcasses de bobine, en general



Zusammenstellung der lieferbaren Netzkabel
List of power cables available
Liste des câbles d'alimentation disponibles

Sach-Nr. Stock No. Référence	Schutzkontaktstecker nach: Earthed-contact connector: Fiche à contact de protection:	Vorzugsweise verwendet in: Preferably used in: Utilisé de préférence en:
DS 006.7013	BS 1363: 1967' 13A entspr. IEC 83: 1975 Standard B2 BS 1363: 1967' 13A complying with IEC 83: 1975 Standard B2 BS 1363: 1967' 13A suivant CEI 83: 1975 norme B2	Großbritannien Great Britain Grande-Bretagne
DS 006.7020	Typ 12 nach SEV-Vorschrift 1011.1059, Normblatt S 24 507 Type 12 complying with SEV regulation 1011.1059, standard sheet S 24 507 Type 12 suivant la norme SEV 1011.1059, feuille S 24 507	Schweiz Switzerland Suisse
DS 006.7036	Typ 498/13 nach USA-Vorschrift UL 498, bzw. IEC 83 Type 498/13 complying with US regulation UL 498 or with IEC 83 Type 498/13 suivant la norme E.U.A. UL 498 ou la norme CEI 83	USA / Kanada USA / Canada E.U.A. / Canada
DS 006.7107	Typ SAA3 10 A, 250 V, nach AS C112-1964 Ap. Type SAA3 10 A, 250 V, complying with AS C112-1964 Ap. Type SAA3 10 A, 250 V, suivant AS C112-1964 Ap.	Australien Australia Australie
DS 025.2365	DIN 49 441, 10 A, 250 V	Europa (ohne Schweiz) Europe (Switzerland not included) Europe (Suisse non comprise)

Cross-Reference List of Class Designation Letters

IEC Publication 113-2 (1971) Item Designations, Letter Codes
ANSI Y32.2-1975 (IEEE Std 315-1975), Section 22, Class Designation Letters

Note: The designation letters used in the R&S Manuals correspond to the letter codes of the IEC Standard identified in the first column!

IEC Publication 113-2 Terminology	Letter Code		IEC Publication 113-2 Terminology	Letter Code	
	IEC	Y32.2		IEC	Y32.2
Acoustical indicator	H	LS	Magnetic tape recorder	D	A
Adjustable resistor	R	R	Maser	A	A
Aerial	W	E	Measuring equipment	P	M
Amplifier	A	AR	Microphone	B	MK
Amplifier (with tubes)	A	AR	Miscellaneous	E	E
Arrester	F	E	Modulator	U	A
Assemblies	A	A,U	Monostable element	D	A,U
Auxiliary switch	S	S	Motor	M	B
Battery	G	BT	Optical indicator	H	DS
Distable element	D	U,A	Oscillator	G	Y,G
Brake	Y	MP	Overvoltage discharge device	F	F,E
Busbar	W	W	Parabolic aerial	W	E
Cable	W	W	Photoelectric cell	B	V
Cable balancing network	Z	Z	Pickup	B	PU
Capacitor	C	C	Plug	X	P
Changer	U	A,B,G,MT	Pneumatic valve	Y	MP
Circuit breaker	Q	CB	Potentiometer	R	R
Clutch	Y	MP	Power switchgear	Q	CB,S
Coder	U	U,A	Protective device	F	F
Compander	Z	A	Pushbutton	S	S
Connecting stage	S	S	Quartz-oscillator	G	Y
Contactors	K	K	Recording device	P	A,M
Control switch	S	S	Register	D	A,U,M
Converter	U	A,U,MG	Relay	K	K
Core, storage	D	E	Resistor	R	R
Crystal filter	Z	FL	Resolver	B	B
Crystal transducer	B	Y	Rheostat	R	R
Current transformer	T	T	Rotating frequency generator	G	G,MG
Delay device	D	DL	Rotating generator	G	G
Delay line	D	DL	Selector	S	S
Demodulator	U	A	Selector switch	S	S
Dial contact	S	S	Semiconductor	V	D,CR,Q
Diode	V	D	Shunt (resistor)	R	R
Dipole	W	E	Signal generator	P	A
Disconnecting plug	X	P	Signaling device	H	DS
Disconnecting socket	X	X	Socket	X	X
Discriminator	U	A	Soldering terminal strip	X	E,TB
Disk recorder	D	A	Static frequency changer	U	A
Dynamotor	B	MG	Storage device	D	A,U
Electrically operated mechanical device	Y	MT	Subassembly	A	A
Electronic tube	V	V	Supply	G	A,PS
Equalizer	Z	EQ	Supply device	G	A,PS
Filter	Z	FL	Synchro	B	B
Frequency changer	U	A,B,G	Telegraph translator	U	A
Fuse	F	F	Terminal	X	E
Gas discharge tube	V	V	Terminal board	X	TB
Generator	G	G	Termination	Z	AT
Heating device	E	HR	Test jack	X	E,J
Hybrid	Z	Z	Testing equipment	P	A
Indicating device	P	DS	Thermistor	R	RT
Induction coil	L	L	Thermo cell	B	A,TC
Inductors	L	L	Thermoelectric sensor	B	A
Integrating measuring device	P	M,MT,Z	Thyristor	V	Q
Inverter	U	A,U,PS,MG	Transducer (nonelectrical quantity to electrical quantity)	B	A,BT
Isolator	Q	AT	Transformer	T	T
Jumper wire	W	W	Transmission path	W	W
Laser	A	MT,A	Transistor	V	Q
Lighting device	E	DS	Tube (electron)	V	V
Limit switch	S	S	Voltage transformer (potential)	T	T
Limiter	Z	MT,RE	Waveguide	W	W
Line trap	L	FL,MP,V	Waveguide directional coupler	W	DC
Loudspeaker	B	LS			
Magnetic amplifier	A	AR			

Schaltteillisten
Stromläufe
Bestückungspläne
Part lists
Circuit diagrams
Components plans
Listes des pièces détachées
Schémas de Circuit
Plans des composants

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A2	ED MOTHERBOARD MOTHERBOARD	0819.0932.02			0819.0055.01
A3	ED ANZEIGE/TASTATUR DISPLAY/KEYBOARD NUR VAR/ONLY MOD: 52 56	0819.1122.02			0835.8040.01
A3	ED ANZEIGE/TASTATUR DISPLAY/KEYBOARD NUR VAR/ONLY MOD: 58	0819.1122.04			0835.8040.01
A4	ZJ NETZTEIL POWER SUPPLY	0819.1568.02			0819.0055.01
A5	EE RECHNER OHNE SOFTWARE PROC.WITHOUT SOFTWARE NUR VAR/ONLY MOD: 52	0819.2164.02			0835.8040.01
A5	EE RECHNER OHNE SOFTWARE COMPUTER WITHOUT SOFTWARE NUR VAR/ONLY MOD: 56 58	1002.5258.02			0835.8040.01
A6	EE NF-GENERATOR AF-GENERATOR	0819.3260.02			0819.0055.01
A7	EE FR-N-SYNTHESE FRN-SYNTHESIS	0819.3860.02			0819.0055.01
A8	ZE STEPSYNTHESE/FM STEPSYNTHESIS/FM	0819.4944.02			0819.0055.01
A9	EE FESTFREQUENZEN REFERENCE FREQUENCIES	0819.6060.02			0819.0055.01
A10	EE SUMMIERSCHLEIFEN SUMMING LOOPS	0819.7166.02			0819.0055.01
A11	EE RF-OSZILLATOR RF-OSCILLATOR	0819.8262.02			0819.0055.01
A12	EE FILTERSATZ FILTER-MODULE	0819.9369.02			0819.0055.01
A13	EE AUSGANGSTEIL OUTPUT-MODULE	0820.0461.02			0819.0055.01
A14	EE BREITBANDMODULATOR BROADBANDMODULATOR NUR VAR/ONLY MOD: 58	1002.4251.02			0835.8040.01
A16	ZE ERWEITERUNG 4GHZ EXTENSION UNIT	0835.8711.02			0835.8040.01
A18	ZE EICHLITUNG (SMHU) ATTENUATOR (SMHU)	0835.8234.02			0835.8040.01
A19	ED FAST HOP BUS FAST HOP BUS NUR VAR/ONLY MOD: 56 58	1002.5558.02			0835.8040.01
E1	DX LUEFTEREINHEIT BLOWER UNIT	0819.0332.00			0819.0055.01
W17	DY KABEL W17 CABLE	0820.3077.00			0836.3320.01
W41	DV HF KABEL W41 RF-CABLE	0820.2987.00			0836.3265.01
W43	DY HF-KABEL W43 RF-CABLE W3	0820.3102.00			0836.3320.01
W71	DV HF KABEL W71 RF-CABLE	0820.2787.00			0836.3265.01
W72	DV HF KABEL W72 RF-CABLE	0820.2793.00			0836.3265.01
W81	DV HF KABEL W81 RF-CABLE	0820.2812.00			0836.3265.01
W82	DV HF KABEL W82 RF-CABLE	0820.2829.00			0836.3265.01
W83	DV HF KABEL W83 RF-CABLE	0820.2835.00			0836.3265.01
W91	DV HF-KABEL W91 RF-CABLE	0820.2858.00			0836.3265.01
W92	DV HF-KABEL W92 NUR VAR/ONLY MOD: 04	0836.3342.00			0836.3265.01
W93	DV HF KABEL W93 RF-CABLE	0820.2870.00			0836.3265.01
W94	DV HF KABEL W94 RF-CABLE	0820.2887.00			0836.3265.01
W101	DV HF KABEL W101 RF-CABLE	0820.2906.00			0836.3265.01
W111	DV HF KABEL W111 RF-CABLE	0820.2929.00			0836.3265.01
W121	DV HF KABEL W121 RF-CABLE	0820.2941.00			0836.3265.01
W122	DV HF-KABEL W122 RF-CABLE	0820.2958.00			0836.3265.01

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ROHDE & SCHWARZ

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Schalttailliste für
Parts list for

GG SMHU SIGNALGENERATOR

Sachnummer
Stock No


0835.8011.01 SA

Blatt-Nr
Page

1+

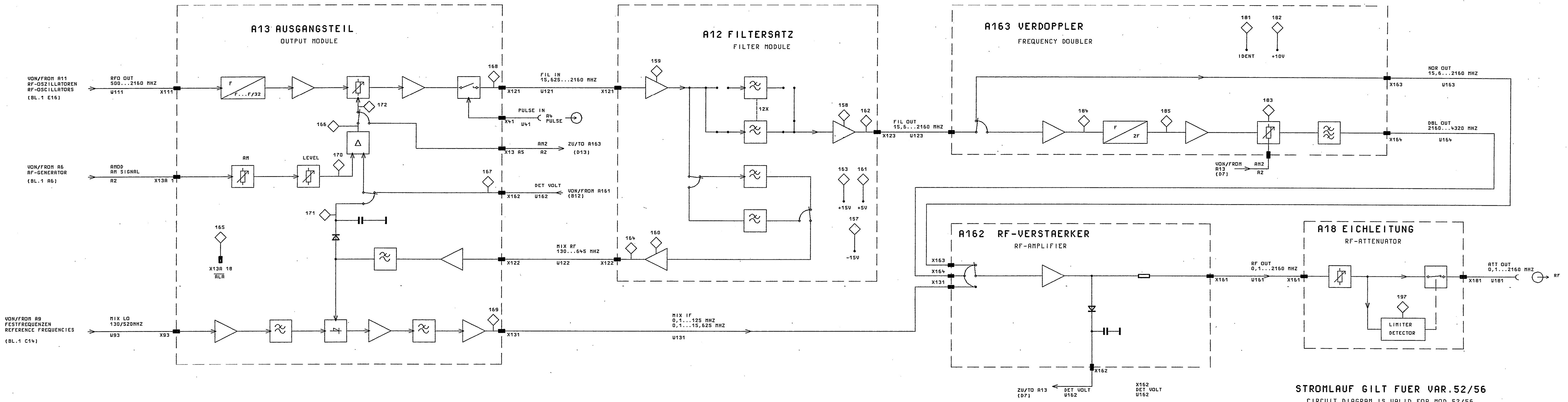
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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
W123	DV HF KABEL W123 RF CABLE	0836.3271.00			0836.3265.01
W131	DV HF KABEL W131 RF CABLE	0836.3288.00			0836.3265.01
W141	DV HF-KABEL W141 NUR VAR/ONLY MOD: 04	0836.3359.00			0836.3265.01
W142	DV HF-KABEL W142 NUR VAR/ONLY MOD: 04	0836.3365.00			0836.3265.01
W143	DV HF-KABEL W143 NUR VAR/ONLY MOD: 04	0836.3371.00			0836.3265.01
W144	DV HF-KABEL W144 NUR VAR/ONLY MOD: 04	0836.3388.00			0836.3265.01
W145	DV HF-KABEL W145 RF CABLE W145 NUR VAR/ONLY MOD: 04	0836.3394.00			0836.3265.01
W146	DV HF-KABEL W146 NUR VAR/ONLY MOD: 04	0836.3407.00			0836.3265.01
W151	DW HF-KABEL W151 NUR VAR/ONLY MOD: 04	0836.3471.00			0836.3442.01
W152	DW HF-KABEL W152 NUR VAR/ONLY MOD: 04	0836.3488.00			0836.3442.01
W153	DV HF-KABEL W153 NUR VAR/ONLY MOD: 04	0836.3413.00			0836.3265.01
W161	DX HF KABEL W161 RF CABLE	0836.3313.00			0836.3336.01
W162	DV HF KABEL W162 RF CABLE	0836.3294.00			0836.3265.01
W163	DX HF KABEL W163 RF CABLE NUR VAR/ONLY MOD: 02	0836.3465.00			0836.3442.01
W164	DX HF KABEL W164 RF CABLE (SIEHE VGT) NUR VAR/ONLY MOD: 02	0836.3459.00			0836.3442.01
W165	DW HF-KABEL W165 NUR VAR/ONLY MOD: 04	0836.3494.00			0836.3442.01
W166	DW HF-KABEL W166 NUR VAR/ONLY MOD: 04	0836.3507.00			0836.3442.01
W181	DW HF KABEL W181 RF-CABLE W181	0820.3060.00			0836.3336.01
W196	DX HF KABEL W196 NUR VAR/ONLY MOD: 04	0820.3119.00			0836.3320.01
X171	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	0819.0055.01
X172	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	0819.0055.01
X173	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	0819.0055.01
X431 ..434	FJ EINBAUBUCHSE SYST.BNC BNC-CONNECTOR UG 625CIU	FJ 0099.9186.00	ROSENBERGE	51K-503-200-N4	0819.0055.01

MENPS	502 3PUA	AI	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
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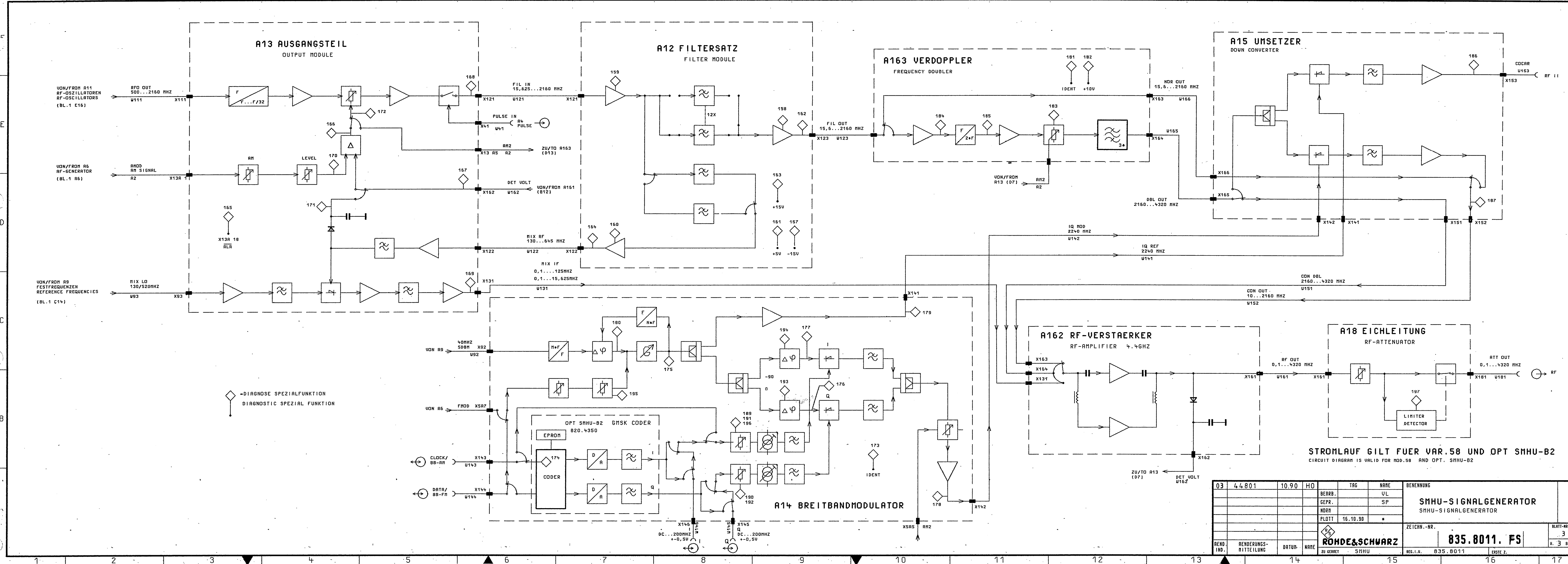
BEHALTEN WIR UNS ALLE RECHTE VOR
FUER DIESE UNTERLAGE



◇ -DIAGNOSE SPEZIALFUNKTION
◇ -DIAGNOSTIC SPEZIAL FUNKTION

03	44801	10.90	HO	TAG	NAME	BENENNUNG
				BEARB.	VL	SMHU-SIGNALGENERATOR SMHU-SIGNALGENERATOR
				GEPR.	SP	
				NORN		
				PLOTT	18.10.90	*
ROHDE & SCHWARZ			ZEICHN.-NR.	835.8011. FS		BLATT-NR. 2
REND. IND.	RENDERUNGS-NITTEILUNG	ORTUM	NAME	ZU GERÄT	SMHU	REG. I. V. 835.8011
						ERSTE Z.

FÜR DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

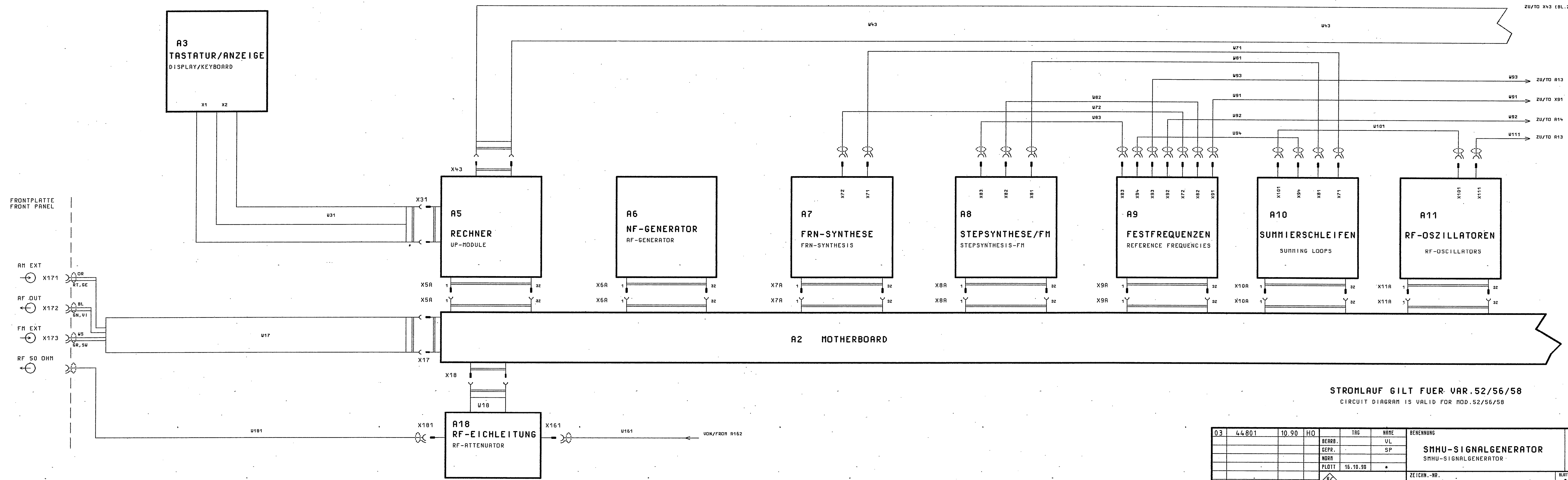


03	44801	10.90	HO	TAG	NARE	BENENNUNG
				BEARB.	VL	SMHU-SIGNALGENERATOR SMHU-SIGNALGENERATOR
				GEPR.	SP	
				NDRH		
				PLOTT	16.10.90	
				ZEICHN.-NR.		835.8011. FS
				REG. I.V.		
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	NARE	ZU GERÄT	SMHU	835.8011
						ERSTE Z.

ZEICHN.-NR.

BLATT-NR.
3
V. 3 BL.

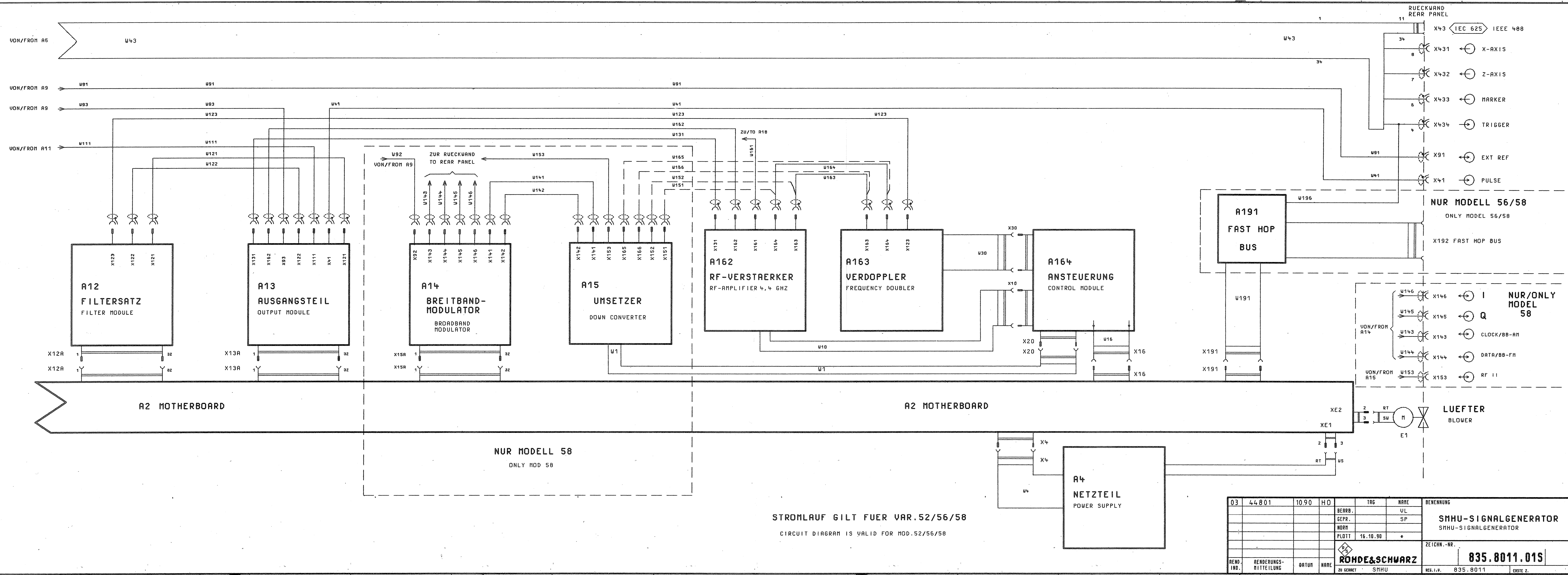
BEHALTEN WIR UNS ALLE RECHTE VOR



STROMLAUF GILT FUER VAR. 52/56/58
 CIRCUIT DIAGRAM IS VALID FOR MOD. 52/56/58

03	44801	10.90	HO		TAG	NAME	BENENNUNG
				BEARB.		VL	SMHU-SIGNALGENERATOR SMHU-SIGNALGENERATOR
				GEPR.		SP	
				NDRR			
					PLOTT	16.10.90	*
						ZEICHN.-NR.	
						835.8011.015	
REND. IND.	ÄNDERUNGS-MITTEILUNG	DATUM	NAME	ROHDE & SCHWARZ		REG.-I.V.	835.8011
				ZU GERÄT SMHU		ERSTE Z.	

FÜR DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR



STROMLAUF GILT FUER VAR.52/56/58
CIRCUIT DIAGRAM IS VALID FOR MOD.52/56/58

03	44801	1090	HO	TAG	NARE	BENENNUNG
				BEARB.	VL	SMHU-SIGNALGENERATOR SMHU-SIGNALGENERATOR
				GEPR.	SP	
				NORN	*	
				PLOTT	16.10.90	
REND. IND.	RENDERUNGS-MITTEILUNG	DATUM	NARE	ZU GEHART	SMHU	ZEICHN.-NR. 835.8011.015
						REG. I.V. 835.8011
						BLATT-NR. 2 v. 2 BL.




ROHDE & SCHWARZ

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
.	XX ZUEH.STROML. CIRC.DIAGR. 835.8011 S				
A162	ZE HF-VERSTAERKER 4,4 GHZ RF AMPLIFIER	0836.0766.02			
A163	ZE VERDOPPLERMODUL DOUBLER UNIT	0835.8763.04			
A164	ED ANSTEUERPLATTE CONTROL/MODUL	0836.2269.02			
W151	DW HF-KABEL W151 NUR VAR/ONLY MOD: 04	0836.3471.00			0836.3442.01
W152	DW HF-KABEL W152 NUR VAR/ONLY MOD: 04	0836.3488.00			0836.3442.01
W163	DX HF KABEL W163 RF CABLE	0836.3465.00			0836.3442.01
W164	NUR VAR/ONLY MOD: 02 DX HF KABEL W164 RF CABLE (SIEHE VGT) NUR VAR/ONLY MOD: 02	0836.3459.00			0836.3442.01
W165	DW HF-KABEL W165 NUR VAR/ONLY MOD: 04	0836.3494.00			0836.3442.01
W166	DW HF-KABEL W166 NUR VAR/ONLY MOD: 04	0836.3507.00			0836.3442.01


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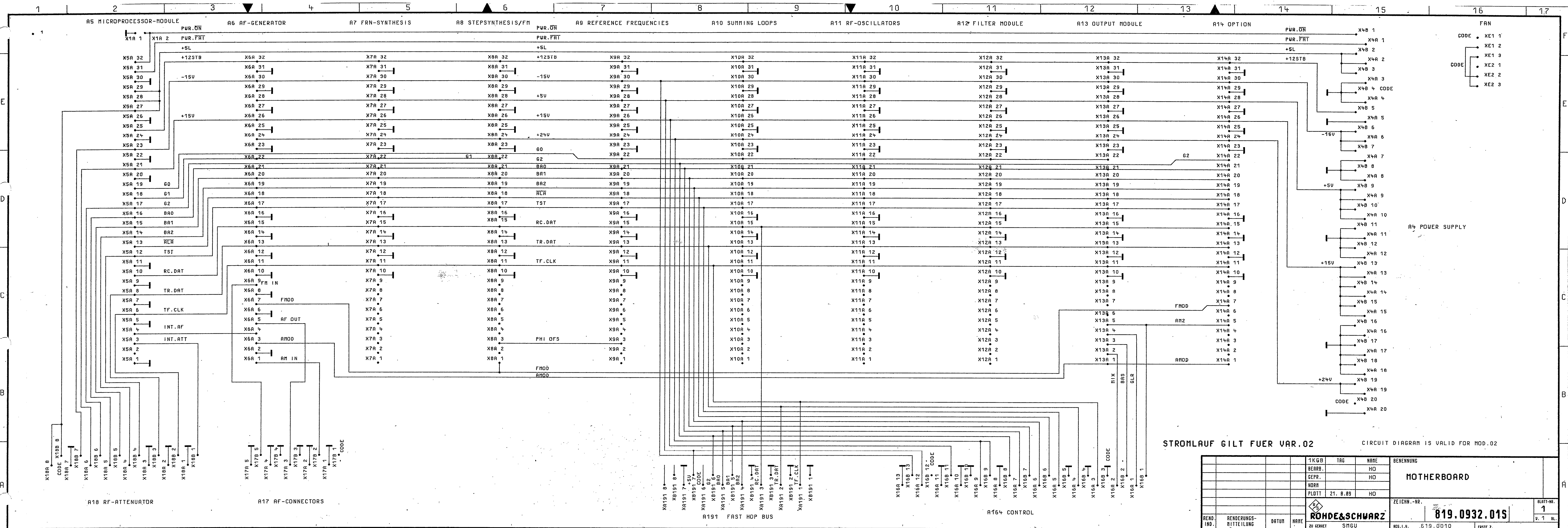
MENP5	502 3PUA	AI	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
	ROHDE & SCHWARZ	07	04.02.98	ZE ERWEITERUNG 4GHZ EXTENSION UNIT	0835.8711.01 SA	1-

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
XE1	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
XE2	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X1A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 3-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X10A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X11A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X12A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X13A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X14A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X16A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 13-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X16B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 13-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X17A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 5-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X17B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 5-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X18A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 8-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X18B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 8-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X191A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 8-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X191B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 8-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X4A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 20-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X4B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 20-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X5A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X6A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X7A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X8A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	
X9A	FP BUCHSENLEISTE 32POL. FEMALE MULTIPOINT CONNECT	FP 0514.4120.00	SIEMENS	V42254-B2201-B641	

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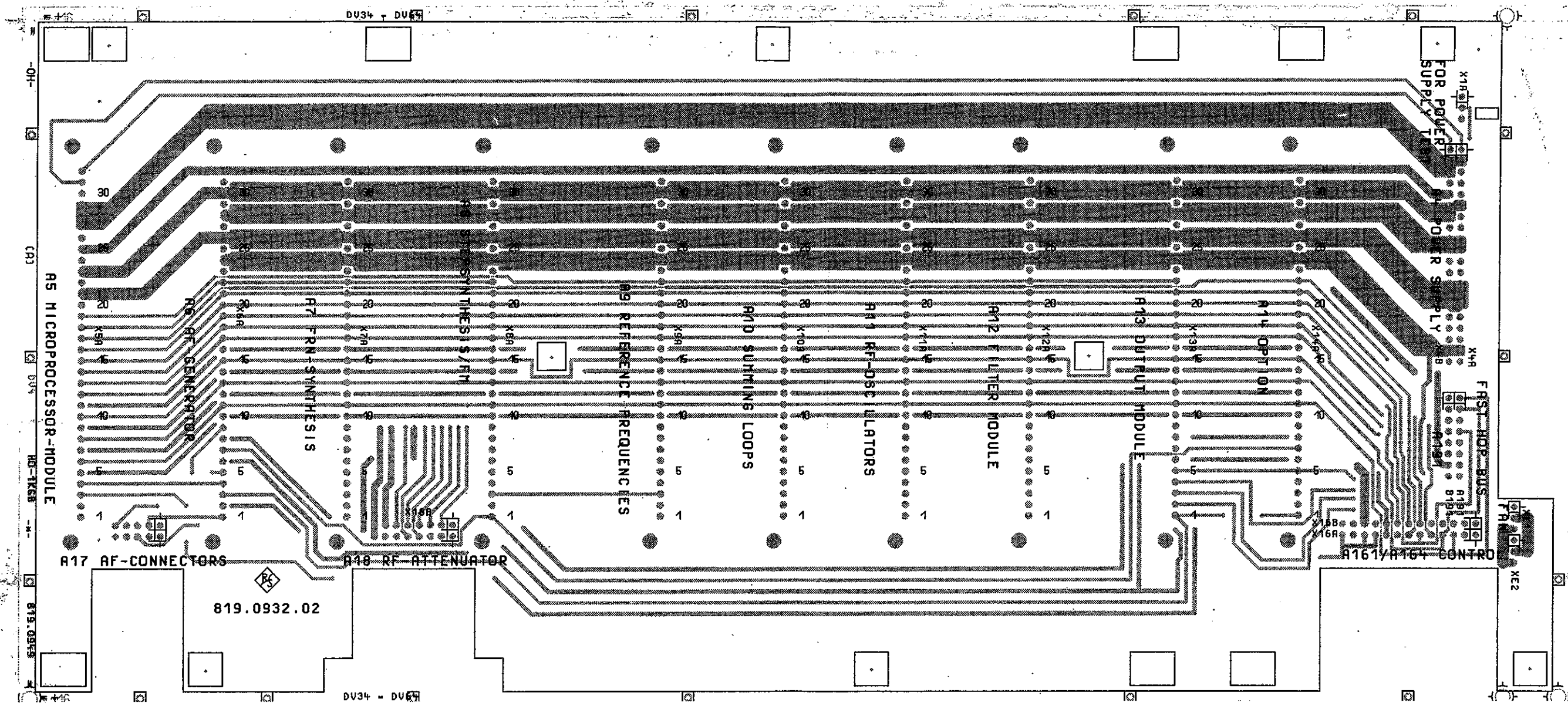
MENP5	502	3PUA	AI	Datum Date	Schalttafeliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
 ROHDE & SCHWARZ				02	04.02.98	ED MOTHERBOARD	0819.0932.01 SA 1-



STROMLAUF GILT FUER VAR.02 CIRCUIT DIAGRAM IS VALID FOR MOD.02

1KGB	TAG	NAME	BENENNUNG
BEARB.		HO	MOTHERBOARD
GEPR.		HO	
NORN			
PLOTT	21. 8.89	HO	
			ZEICHN.-NR.
			819.0932.015
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	REG. I.V.
			619.0010
			ERSTE Z.
			1
			v. 1. BL.

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Ansicht und Leitungsfuehrung Bauteilseite
View of tracks on component side

VARIANTENERKLAERUNG/VERSION
VAR02-GRUNDAUSFUEHRUNG/BASIC MODEL

05	12-97	EI	Maße ohne Toleranzangabe	Maßstab 1:1	Benennung MOTHERBOARD	Z
				Halbzeug, Werkstoff		
			MENP Tag Name	Zeichn.-Nr. 819.0932.01		Blatt-Nr. 2+
			Bearb. 08.89 HO	reg. i. V. 819.0010 V		v. 3 Bl.
			Gepr. 12-97 EI	erste Z.		
			Norm			
				zu Gerät SMGU		
Änd. Zust.	Änderungs-Mitteilung	Tag	Name			



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



ROHDE & SCHWARZ

SERVICE DOCUMENTS

Display/Keyboard

819.1122.02

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5 Service Manual "Display / Keyboard"

5.1 Function Description

(See circuit diagram 819.1122 S and Fig. 5-1)

The circuit of the subassembly comprises the following blocks:

- ▶ *LCD drive circuit*
- ▶ *LED drive circuit*
- ▶ *Keyboard matrix*
- ▶ *Spinwheel*
- ▶ *Standby*

5.1.1 LCD Drive Circuit

The three liquid-crystal displays (frequency, modulation, level) are each driven by a driver module in multiplex mode. The segment voltage can be varied using potentiometer R16 in order to adjust the contrast of the segments. Data transfer between the controller subassembly and the drive modules is in serial mode.

5.1.2 LED Drive Circuit

The LEDs are controlled by means of shift registers (D30, D40, D50, D60, D70, D80, D100) connected in series which are loaded serially via a data line (DIS.DAT) and which output the data by means of a common strobe connection.

One output bit is used to program the LCD backlighting.

The timer module D105 generates a flashing signal for the status LED H105. Two bits are also used to program the operating states "On" and "Off".

5.1.3 Keyboard Matrix

The 58 keys are arranged in an 8x8 matrix whose row and column lines are connected to the controller subassembly.

Pressing a key connects the corresponding row line to the column line. The interface module on the controller subassembly recognizes the code characteristic for this key.

A more detailed description of the function can be obtained from the service manual for the module A5, "Controller".

5.1.4 Tachogenerator

The tachogenerator is a magnetized ferrite ring on the spinwheel shaft. The ring is split up into segments whose magnetic field direction alternates. Two Hall sensors offset from one another about the ring's circumference provide information on the direction and angle of rotation.

5.1.5 Standby

The standby LED H110 is powered by the +12 V standby voltage when the instrument is switched on. When the instrument is in operation, the +15 V supply prevents a flow of current through H110 (standby lamp goes out).

5.4 Interfaces

5.4.1 Analog Interfaces

Supply voltage	+ 5 V	X1,17 X2,17
GND (ground)	⊥	X1, 1, 2, 10, 15, 18, 19, 20 X2, 2
	+ 12 V STBY	X2, 20
	+ 15 V	X2, 19

5.4.2 Digital Interfaces

Signal name	Meaning	I = input O = output	Test point	Level
DIS.CLK	Serial data transmission	I	X1, 3	TTL
DIS.DAT		I	X1, 4	TTL
DIS.BUSY	Display handshake output	O	X1, 11	TTL
DIS.C/D	Display control	I	X1, 8	TTL
DIS.RES	Display reset	I	X1, 16	TTL
DIS.STB1	Display strobe 1 (FREQ.)	I	X1, 5	TTL
DIS.STB2	Display strobe 2 (MODUL.)	I	X1, 6	TTL
DIS.STB3	Display strobe 3 (LEVEL)	I	X1, 7	TTL
LED.STB	LED strobe	I	X1, 9	TTL
KEYB.COL 1	Keyboard matrix column 1	O	X2, 10	TTL
KEYB.COL 2	Keyboard matrix column 2	O	X2, 7	TTL
KEYB.COL 3	Keyboard matrix column 3	O	X2, 8	TTL
KEYB.COL 4	Keyboard matrix column 4	O	X2, 5	TTL
KEYB.COL 5	Keyboard matrix column 5	O	X2, 6	TTL
KEYB.COL 6	Keyboard matrix column 6	O	X2, 3	TTL
KEYB.COL 7	Keyboard matrix column 7	O	X2, 4	TTL
KEYB.COL 8	Keyboard matrix column 8	O	X2, 1	TTL
KEYB.ROW 1	Keyboard matrix row 1	O	X2, 18	TTL
KEYB.ROW 2	Keyboard matrix row 2	O	X2, 15	TTL
KEYB.ROW 3	Keyboard matrix row 3	O	X2, 16	TTL
KEYB.ROW 4	Keyboard matrix row 4	O	X2, 13	TTL
KEYB.ROW 5	Keyboard matrix row 5	O	X2, 14	TTL
KEYB.ROW 6	Keyboard matrix row 6	O	X2, 11	TTL
KEYB.ROW 7	Keyboard matrix row 7	O	X2, 12	TTL
KEYB.ROW 8	Keyboard matrix row 8	O	X2, 9	TTL
DREHG. PULS		O	X1, 14	TTL
DREHG. DIR		O	X1, 13	TTL
PWR.ON		O	X1, 12	



ROHDE & SCHWARZ

Schaltteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées


Schémas de Circuit

Plans des composants

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
B115	BS UGN3120U HALL-EFF.SW. HALL-EFF.SWITCH	BJ 0336.4750.00	ALLEGRO	UGN3120U	
B116	BS UGN3120U HALL-EFF.SW. HALL-EFF.SWITCH	BJ 0336.4750.00	ALLEGRO	UGN3120U	
C1	CE 1UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3905.00	VALVO	2222 128 37108	
C2	CE 1UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3905.00	VALVO	2222 128 37108	
C5	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C6	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C7	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C10	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C11	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C12	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C15	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C20	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C25	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C26	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C27	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C105	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C107	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C110	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C111	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
D5	BJ UPD7225G00 LCD DRIV ALPHANUM.LCD CONTR/DRIVER	BJ 0392.5320.00	NEC	D7225G (JG)	
D10	BJ UPD7225G00 LCD DRIV ALPHANUM.LCD CONTR/DRIVER	BJ 0392.5320.00	NEC	D7225G (JG)	
D25	BJ UPD7225G00 LCD DRIV ALPHANUM.LCD CONTR/DRIVER	BJ 0392.5320.00	NEC	D7225G (JG)	
D30	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D40	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D50	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D60	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D70	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D80	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D105	BO NE555V TIMER TIMER	BO 0418.1383.00	NSC	LM555CN	
H31	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
..38	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H41	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
..48	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H52	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
..58	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H61	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
..67	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H74	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
..78	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H81	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
..84	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H85	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H86	NUR VAR/ONLY MOD: 04 AF HLMP1790 LED3 GN569N LED NUR VAR/ONLY MOD: 04	0007.5250.00	QUALITY	HLMP-1790.7418D	

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	ROHDE & SCHWARZ	10	04.02.98	ED ANZEIGE/TASTATUR DISPLAY/KEYBOARD	0819.1122.01 SA	1+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
H87	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
H90	NUR VAR/ONLY MOD: 04	EF 0063.6906.00	ALBA	715	
.93	LAMP				
H105	AF HLMP1700 LED3 RT626N LED	0099.9134.00	QUALITY	HLMP-1700(Q7182C6RO)	
H110	AF HLMP1790 LED3 GN569N LED	0007.5250.00	QUALITY	HLMP-1790.7418D	
L1	LD 0,33UH10%,220HMO,830A CHOKE	LD 0067.2805.00	DALE	IM2	
N20	BO CA3240AE 2XMOSFETOPAMP DUAL MOSFET-INPUT OPAMP	0302.7040.00	RCA	CA3240AE	
P5	BP AN 127 LCD-MODULE	0826.8587.00	VARITRONIX	R&S 0826.8587	
P10	BP AN 155 LC-DISPLAY	1002.4939.00	PHILIPS	1002.4939	
P25	BP AN 152 LC DISPLAY	0801.1437.00	DATA_MODUL	LC 01092 AN 152	
R1	RN 9X47 KOHM+-2% SIL10 H5 RESISTOR NETWORK	RN 0341.9286.00	BOURNS	4610X-T09-473	
R2	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R3	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R5	RG 182 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5989.00	ROEDERSTEI	D25	
R6	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R7	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R8	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R10	RG 182 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5989.00	ROEDERSTEI	D25	
R11	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R12	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R13	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R15	RG 46,4KOHM+-1%TK100 1206 CHIP RESISTOR	0007.1860.00	DRALORIC	CB 1206 ...	
R16	RS 0,5W5KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7890.00	SPECTROL	63 M ... TO 10	
R17	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R20	RG 21,5KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0906.00	DRALORIC	CB 1206 ...	
R21	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R22	RL 0,60W 681 KOHM+-1%TK50 RESISTOR	RL 0083.2735.00	RESISTA	MK2	
R25	RG 182 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5989.00	ROEDERSTEI	D25	
R26	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R27	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R28	RG 100,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R30	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R31	RN 4X1,0KOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R35	RN 4X1,0KOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R40	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R41	RN 4X1,0KOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R45	RN 4X1,0KOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	

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ROHDE & SCHWARZ

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Datum Date

04.02.98

Schaltteilliste für Parts list for

ED ANZEIGE/TASTATUR
DISPLAY/KEYBOARD

Sachnummer Stock No

0819.1122.01 SA


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R50	RG 10,OKOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R51	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R55	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R60	RG 10,OKOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R61	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R65	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R70	RG 10,OKOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R71	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R75	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R80	RG 10,OKOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R81	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R85	RN 4X1,OKOHM+-2%SIL 8 H5 RESISTOR NETWORK	RN 0291.4370.00	BECKMAN	L 08 3 S 102 M*	
R90	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R105	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R106	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R107	RG 475 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6079.00	ROEDERSTEI	D25	
R108	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R109	RG 10,OKOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R110	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R111	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R112	RG 3,16KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0670.00	DRALORIC	CB 1206 ...	
R115	RG 3,16KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0670.00	DRALORIC	CB 1206 ...	
R116	RG 3,16KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0670.00	DRALORIC	CB 1206 ...	
S1	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..8					
S11	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..18					
S21	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..28					
S31	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..38					
S41	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..48					
S51	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..58					
S61	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
..67					
S68	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH NUR VAR/ONLY MOD: 04	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
S71	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH NUR VAR/ONLY MOD: 04	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
S72	SB TASTER 1XA OHNE KNOFF PUSHBUTTON SWITCH NUR VAR/ONLY MOD: 04	SB 0238.3850.00	SIEMENS	V42 263-D32-M2	
S90	SB TASTER 1XA OHNE KNOFF PUSH BUTTON SWITCH	0834.9020.00	SIEMENS	V42263-D11-K9	
V20	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
V90	AL BD139 N 80V 1A0 TRANSISTOR	AL 0274.8994.00	VALVO	BD139	


095.0028-0693

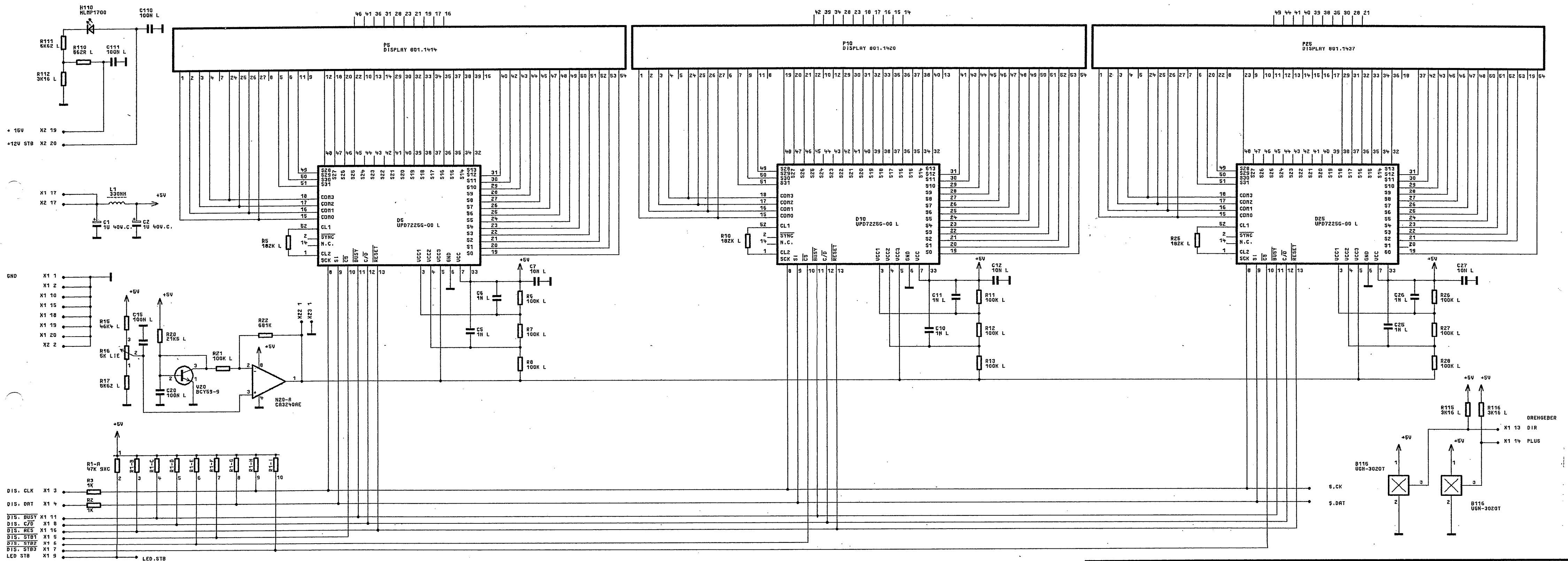
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		10	04.02.98	ED ANZEIGE/TASTATUR DISPLAY/KEYBOARD	0819.1122.01 SA	3+

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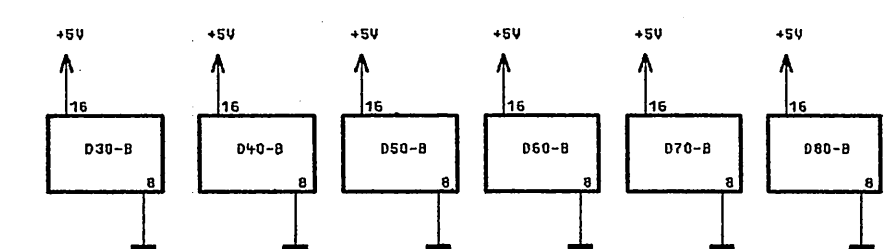
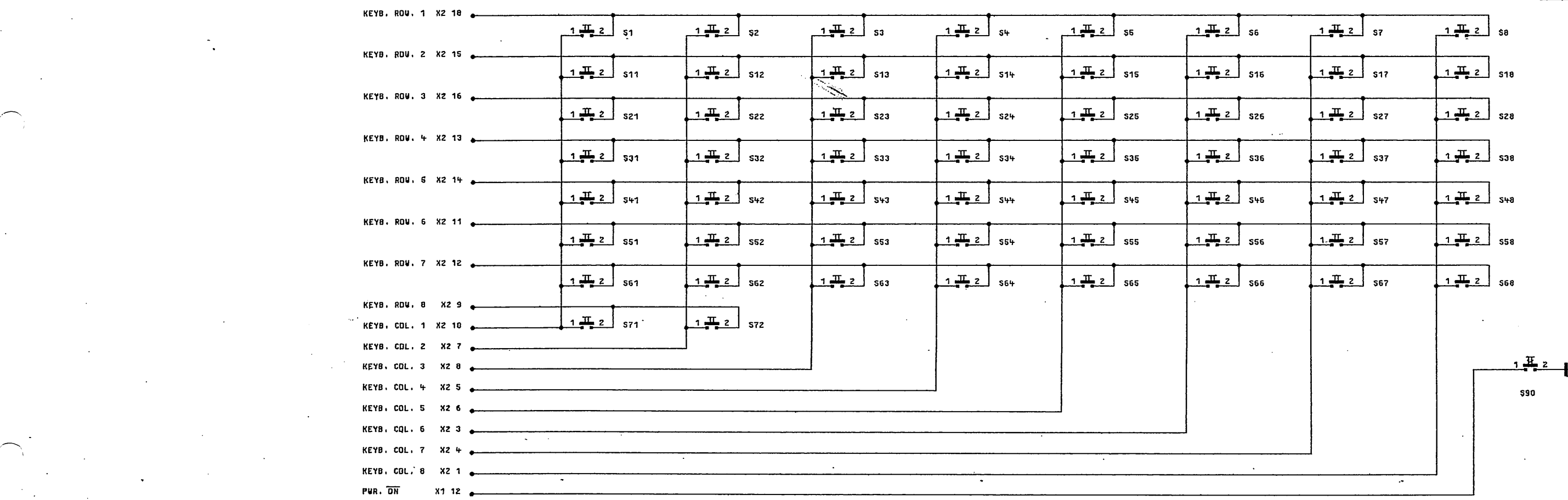
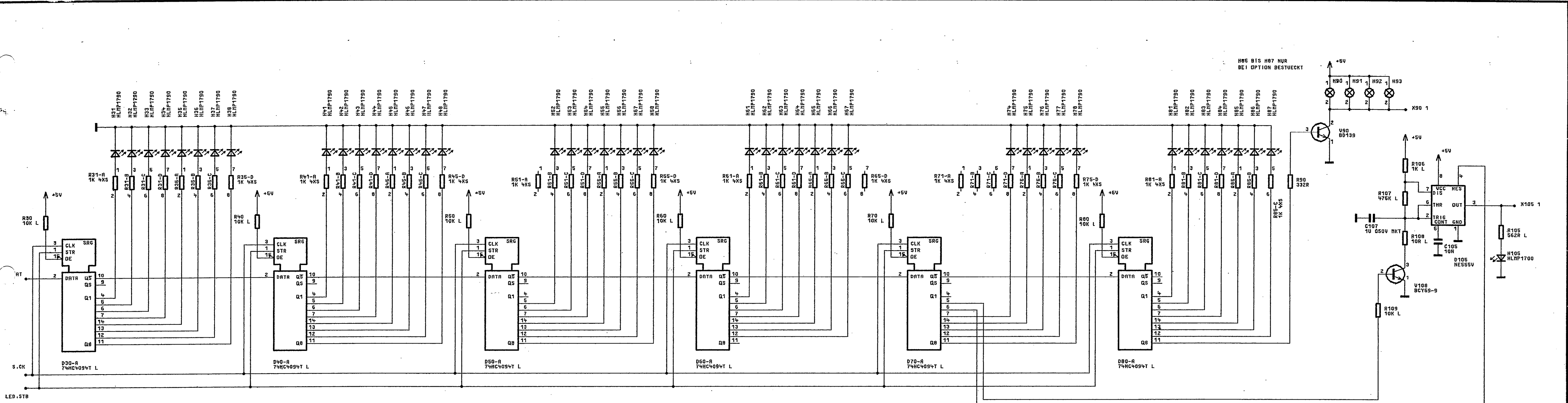
Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V108	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
X1	DY BUCHSENEINHEIT CONNECTOR UNIT	0820.3019.00			
X2	XX ENTHALTEN IN INCLUDED IN X1"				
X22	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X23	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X90	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X105	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR 1-POLIG	FP 0242.3600.00	BINDER	742-11-0179-00-36	

095 0026 0893

MENP5	502 3PUA	AI	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt Nr Page
	ROHDE & SCHWARZ	10	04.02.98	ED ANZEIGE/TASTATUR DISPLAY/KEYBOARD	0819.1122.01 SA	4-

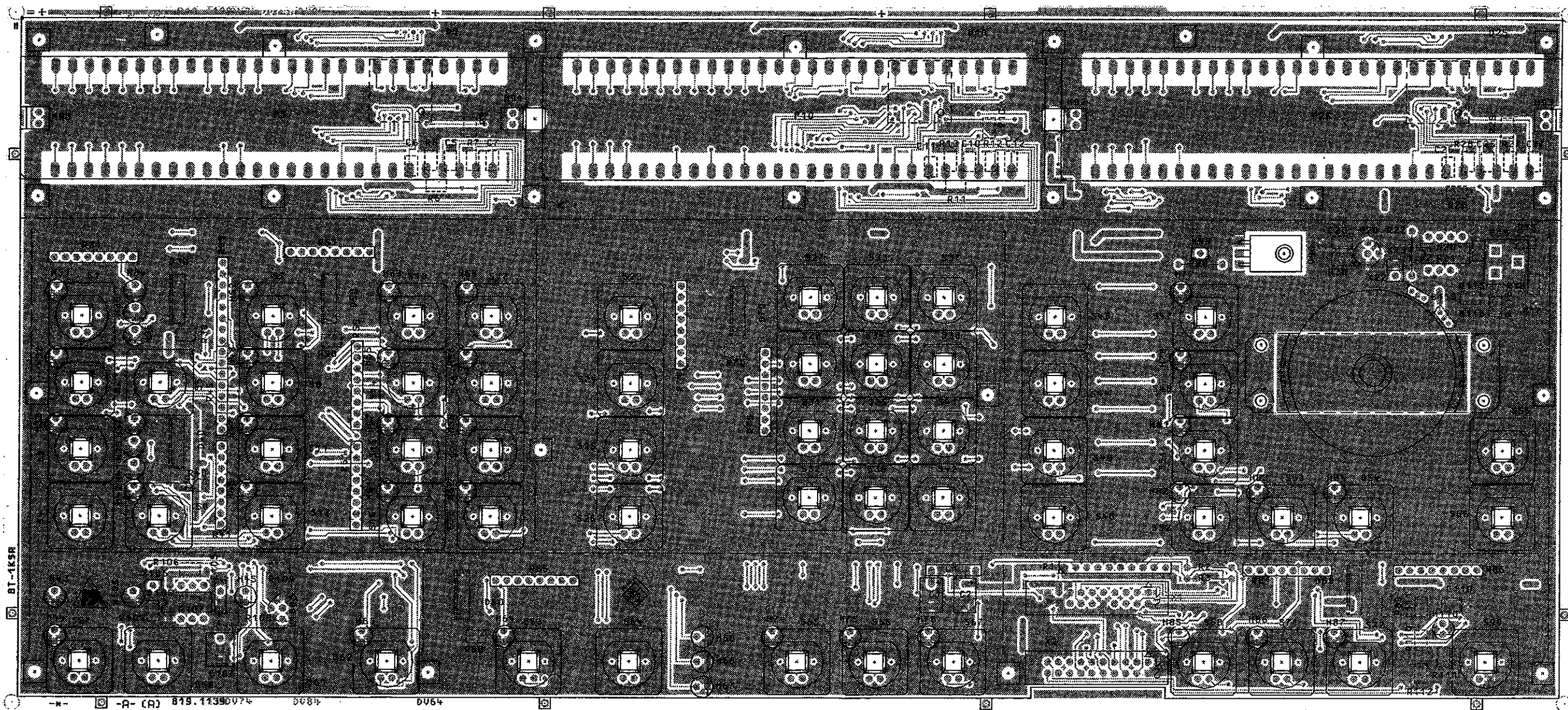


1 KG8	TAG	NAME	BENENNUNG
BEARB.		BT	ANZEIGE/TASTATUR DISPLAY/KEYBOARD
GEPR.		ROD	
NDRH			
PLOTT	6. 5. 88	*	
			ZEICHN.-NR.
ROHDE & SCHWARZ			819.1122.015
REND. IND.	BEREICH	DATUM	REG.-I.V.
	SMGU		819.0010
			ERSTIE Z.
			BLATT-NR.
			1
			v. 2 BL.



1 KG B	TAG	NAME	BENENNUNG	BLATT-NR.
BEARB.		BT	ANZEIGE/TASTATUR DISPLAY/KEYBOARD	2
GEPR.		ROD		
NORN				
PLOTT	6. 5. 88	*	ZEICHN.-NR.	U. 2 BL.
			REG. I.V. 819.0010	ERSTE Z.
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	NAME	ZU GERÄT SMGU

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



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VARIANTENERKLÄRUNG / VERSION
VAR02 - GRUNDAUSFÜHRUNG / BASIC MODEL

Maße ohne Toleranzangabe		Maßstab 1 : 1	
		Halbzeug, Werkstoff	
1KGA	Tag	Name	Benennung ANZEIGE/TASTATUR DISPLAY / KEY BOARD
Bearb.	06.88	BT	
Gepr.			
Norm			
		Zeichn.-Nr.	
		819.1122.01 ED	
		Blatt-Nr.	
		3	
		v. 4 Bl.	
zu Gerät SMGU		reg. i. V. 819.0010 V	
		erste Z.	



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



ROHDE & SCHWARZ

SERVICE DOCUMENTS

Switched-mode Power Supply

819.1568.02

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5.2.1.1	Testing the AC Rectification and the Standby Power Supply
5.2.1.2	Brief Power Supply Test
5.2.2	Testing and Adjustment of PCB A42
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5 Service Manual "Switched-mode Power Supply"

5.1 Function Description

(See circuit diagrams 819.1568 S, 819.1716 S and 819.1916 S)

The module is a primary switched-mode power supply. Five secondary voltages are generated:

+ 24 V, + 15 V, -15 V, + 5 V for analog circuits and + 5 V for digital circuits.

The power supply also contains a mains transformer, rectifier and linear regulator so that the crystal reference of the SMGU can still be operated when in standby mode. The power supply has a power fail circuit to detect AC power brought-outs and failures.

5.1.1 Description of AC Power Input Circuit

The AC voltage is applied via fuses F1 and F2, AC filter, AC power switch and voltage selector to the input of circuit board A41.

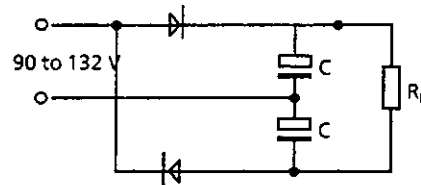
The AC power supply ranges are 90 to 132 V or 190 to 260 V.

5.1.2 Description of PCB A41

Following the EMI suppression filter containing L100 and C100, the AC voltage is applied to the AC transformer T100 and also via the NTC resistor V101 (inrush current limiting) to rectifier V110.

Rectification of the AC supply is by means of a bridge rectifier for the voltage range from 190 to 260 V and as a voltage doubler in the range from 90 to 132 V. The magnitude of the hum voltage is the same in both cases as a result of the electrolytic capacitors switched over in the process.

Range from 90 to 132 V:



Range from 190 to 260 V:

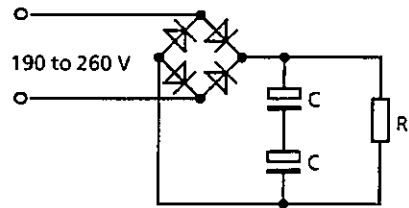


Fig. 5-1 Rectifier principle

The rectified AC supply voltage is then applied to connector X20 via the noise suppression inductor L102.

The VDR (V102) prevents spikes from reaching the switching transistor.

The mains transformer T100 has two primary windings and two secondary windings.

The two primary windings are selected according to the AC voltage ranges.

One of the secondary windings powers the components connected to the AC supply potential, the second winding is connected to the instrument ground (earth) and is used to supply the power supply and the crystal oven in the SMGU.

The secondary voltages are applied to the bridge rectifiers V111 and V112 via fuses F100 and F101. + 12 V are then generated by each of the linear regulators N101 and N102. The function of the component D100 and the associated parts of the circuit is described in Section 5.1.3.1.

The three inputs fulfil the following tasks:

- ▶ **Pin 8**, slow start-up, hum precontrol and limiting of duty factor

Duty factor limiting is implemented in conjunction with the hum precontrol.

A voltage is derived from the rectified AC supply voltage by means of the divider R110, R111 and R107. This voltage is then smoothed by C116. The voltage at pin 8 together with the hum modulation of the sawtooth voltage at pin 10 results in hum precontrol and therefore compensation of the secondary hum voltage.

The time constant for C115 is dimensioned such that the voltage at pin 10 with the minimum AC supply voltage cannot rise to more than half the period of the oscillator frequency. A maximum duty factor of 0.5 is therefore not exceeded.

- ▶ **Pin 7**, current limitation for power transistor

The voltage between pins 6 and 7 is compared using an internal comparator. R117 and R118 define the voltage for the switch-off threshold. The precision resistor R202 is connected between the source of V220 and ground. The voltage drop across this resistor is applied to pin 7 via X20. The maximum current in the power transistor is then calculated as follows:

$$I_{pmax} = V_p (\text{Pin 6}) / R202$$

where I_{pmax} = max. peak current
 V_p (Pin 6) = voltage at pin 6 (approx. 1 V)
 $R202 = 0.15 \Omega$

The power supply is switched off if the peak current exceeds 6.6 A.

- ▶ **Pin 18**, control voltage input

Pin 18 is the input of a voltage follower. The control voltage of the switching controller is connected to this input. The control voltage comes from the module A42 via the opto isolator U101 and X20.

The duty factor v_t can be adjusted from 0 to v_{tmax} by means of the control voltage.

- **Switching the power supply on and off**

A switching signal generated by the standby switch and the following circuit on PCB 842 is applied to the opto isolator U100 via plug connector X20.

This opto isolator switches pin 2 of D100 either to approx. 6 V (= on) or 0 V (= off).

5.1.3.2 Design of Control Loop

The following block diagram represents the control loop for controlling the +6 V of the switched-mode power supply:

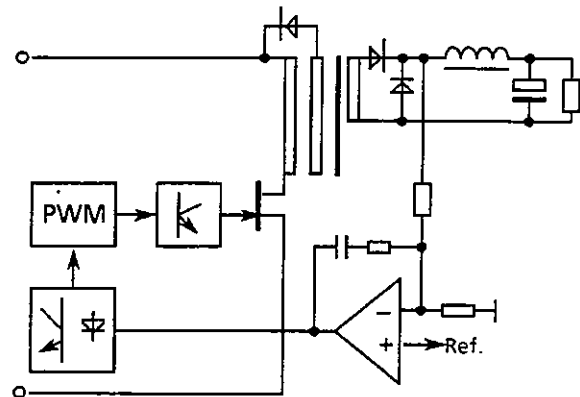


Fig. 5-3 Control of switched-mode power supply

5.1.3.3 Generation of Output Voltages

All voltages after the storage inductors are subject to further regulation from the linear regulators.

The regulators (some of which are of discrete design) and the switching controller have a common reference voltage of +5 V (V300, N300, adjustment using R304).

- +5 V controller for supplying the digital circuit

This consists of an integrated linear regulator N290.

- +5 V controller for supply of analog circuit

The regulator is a series regulator and has N300-B as an amplifier.

L281 and C287 are the noise suppression filter for 100 kHz.

- -15-V controller

This is implemented with the positive controller N270. The output voltage is generated by applying the positive voltage output of the controller to ground. The negative reference point serves as the output.

L270 and C275 are the EMI suppression filter for 100 kHz.

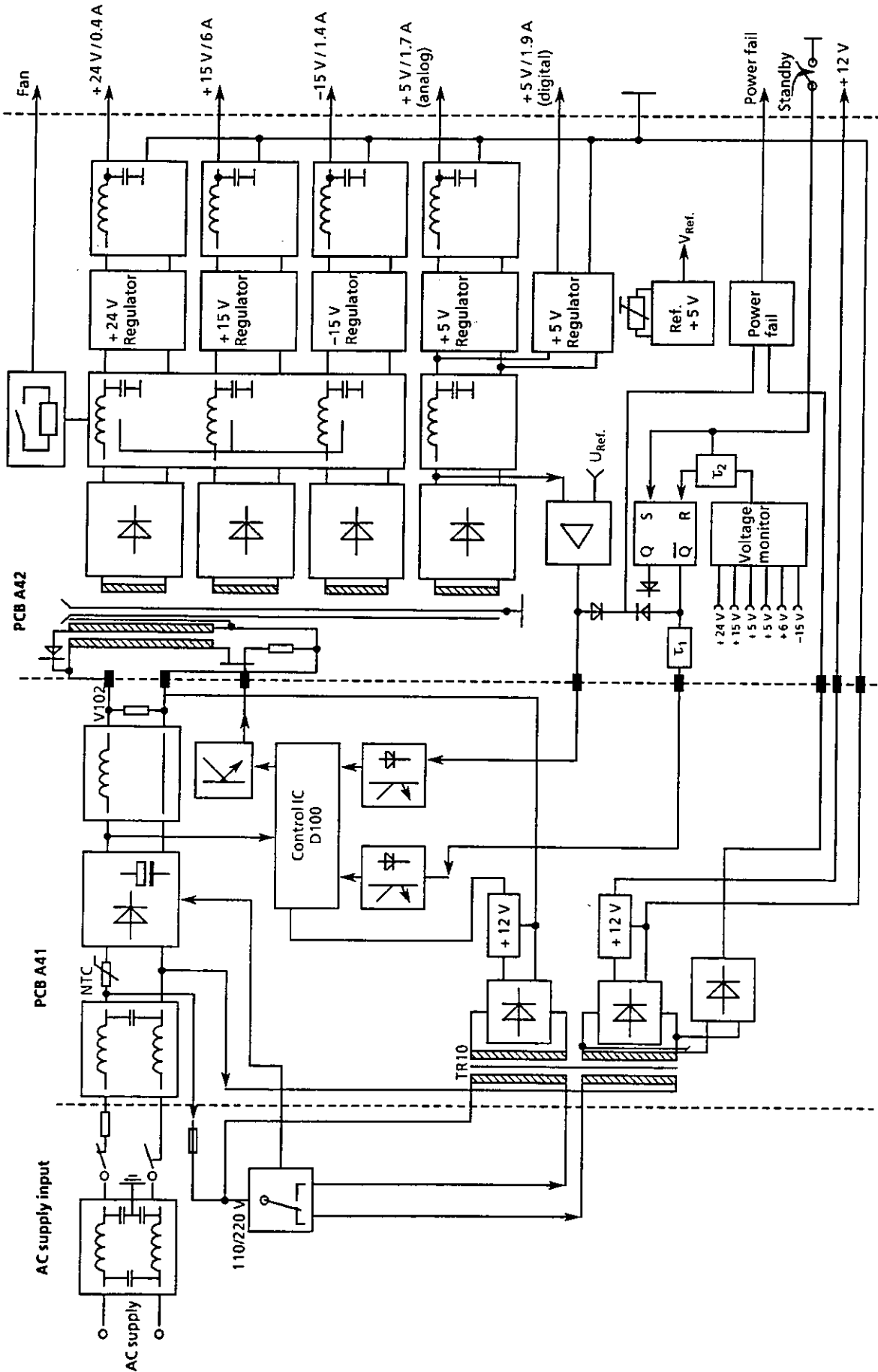


Fig. 5-4 Block diagram of switched-mode power supply

5.2.2.4 Testing the Control Voltage Monitoring

Check the power supply using the following table:

Test point	DC voltage	± Tol.
P322	2.18 V	0.1 V
P323	1.75 V	0.1 V
P327	3.75 V	0.1 V
P324	11.5 V	1.0 V

Short-circuit the voltages at the output one after the other:
the power supply must cut out each time.

5.2.2.5 Testing the Power Fail Circuit

Connect DC voltmeter to P325. Set AC power selector to 90 to 132 V. The voltmeter must indicate a voltage between 4 and 5 V.

Slowly reduce the AC supply using the transformer:

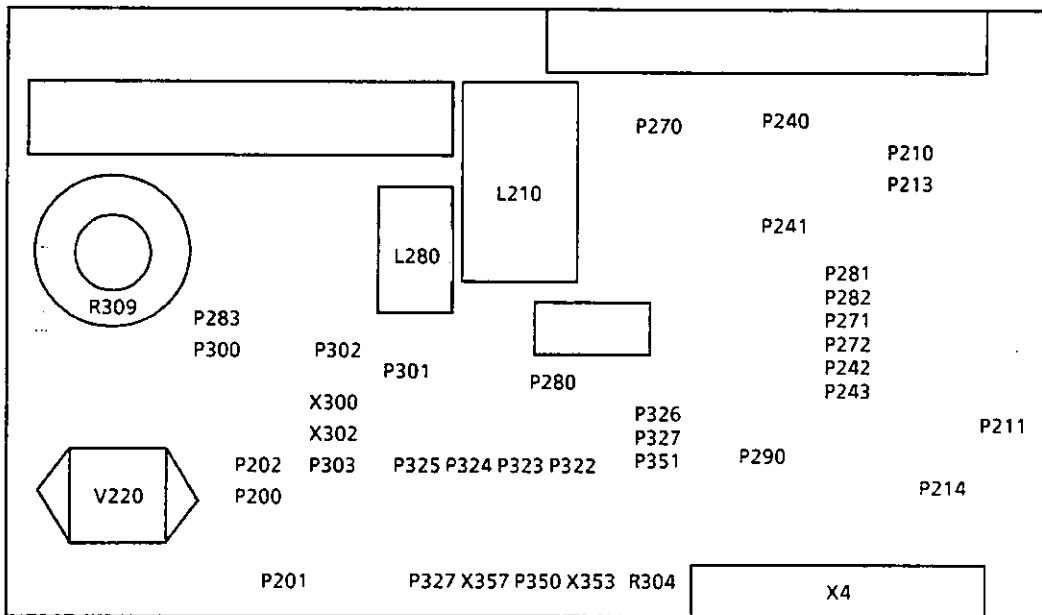
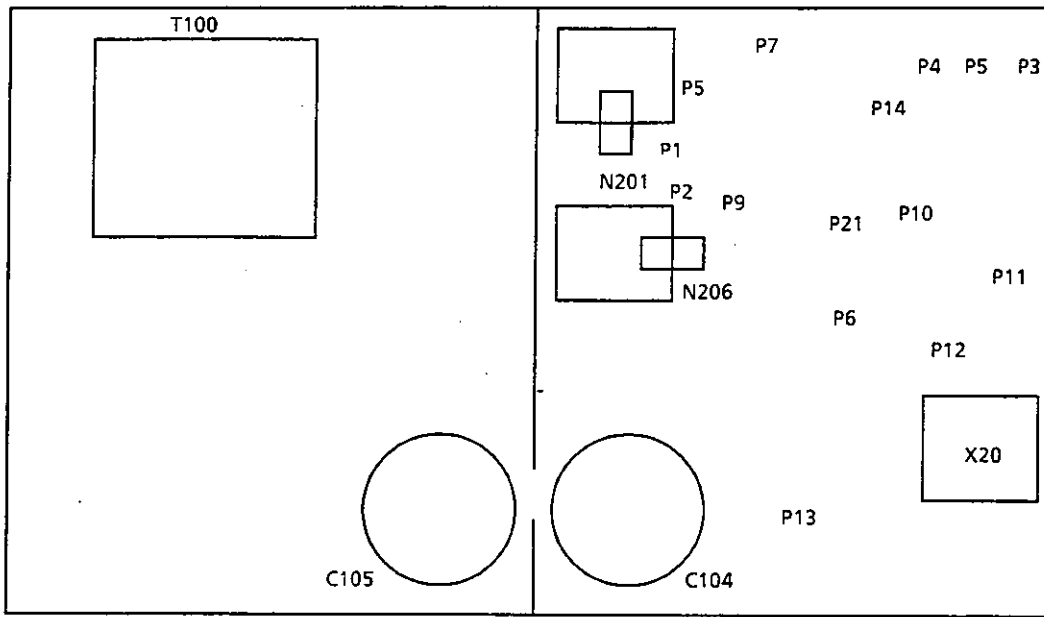
the voltage at P325 must drop to 0 V at <90 V.

Table 5-1 Checking the unregulated and output voltages of the regulators

Voltage	Test point/ unregulated voltage	Test point/ output voltage	Noise voltage 15 Hz to 100 kHz
+24 V	P210: +26 to +28 V	P213: +23.5 to +24.6 V	X4.19 <1 mV
+15 V	P240: +16.5 to +17.5 V	P242: +14.9 to +15.3 V	X14.14 <2 mV
-15 V	P271: +1.8 to +2.5 V	P271: -15.25 to -14.5 V	X4.6 <2 mV
+5.2 V	P280: +5.7 to +6 V	P290: +5.1 to +5.4 V	X4.2 <4 mV
+5.1 V	P280: +5.7 to +6 V	P292: +5.0 to +5.2 V	X4.9 <1 mV
+12 V		Z300: +11.0 to +12.1 V	X4.85 <30 mV

5.4 Interfaces

A41 Rectification



A42 Switching controller



ROHDE & SCHWARZ

Schaltteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées


Schémas de Circuit

Plans des composants

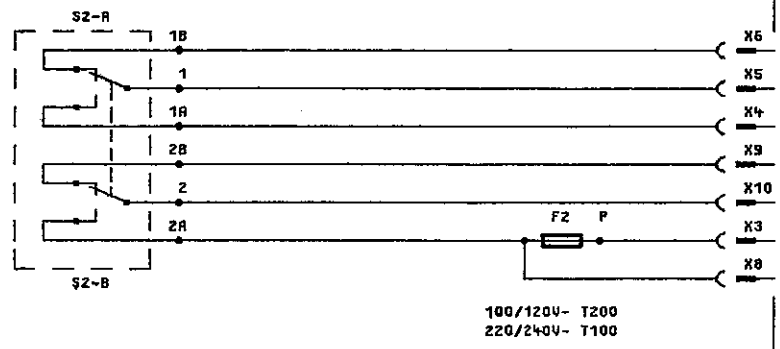
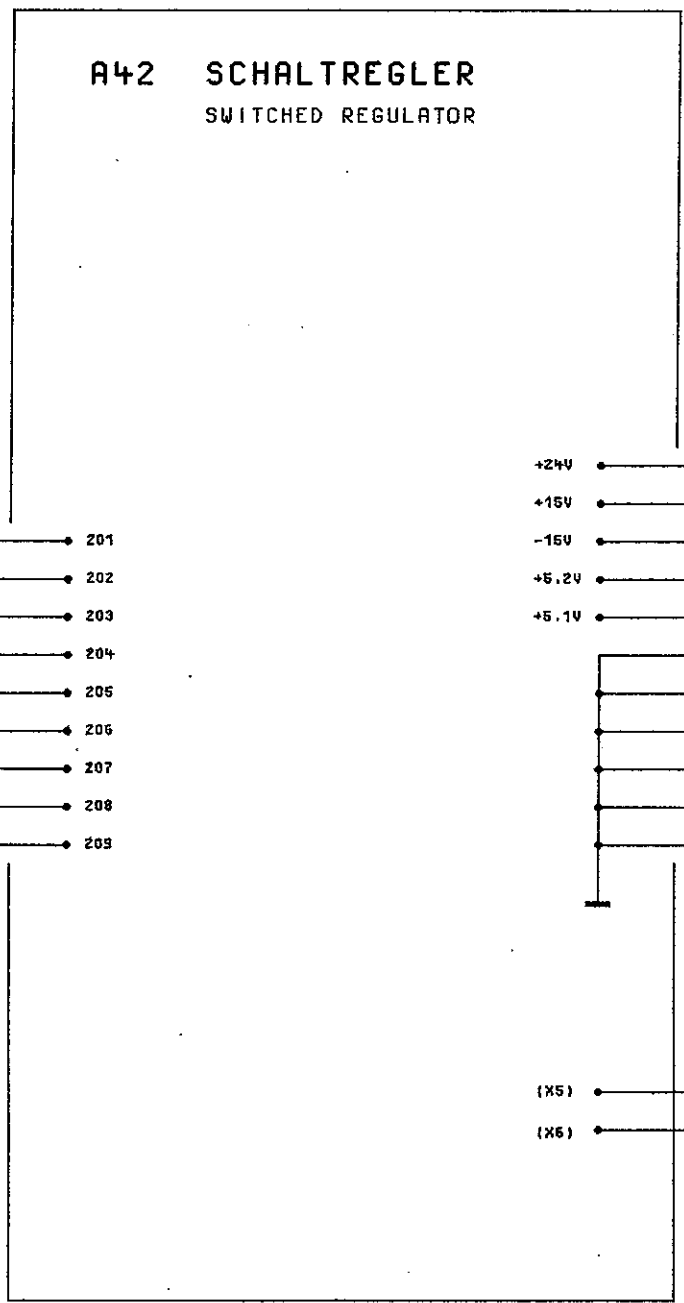
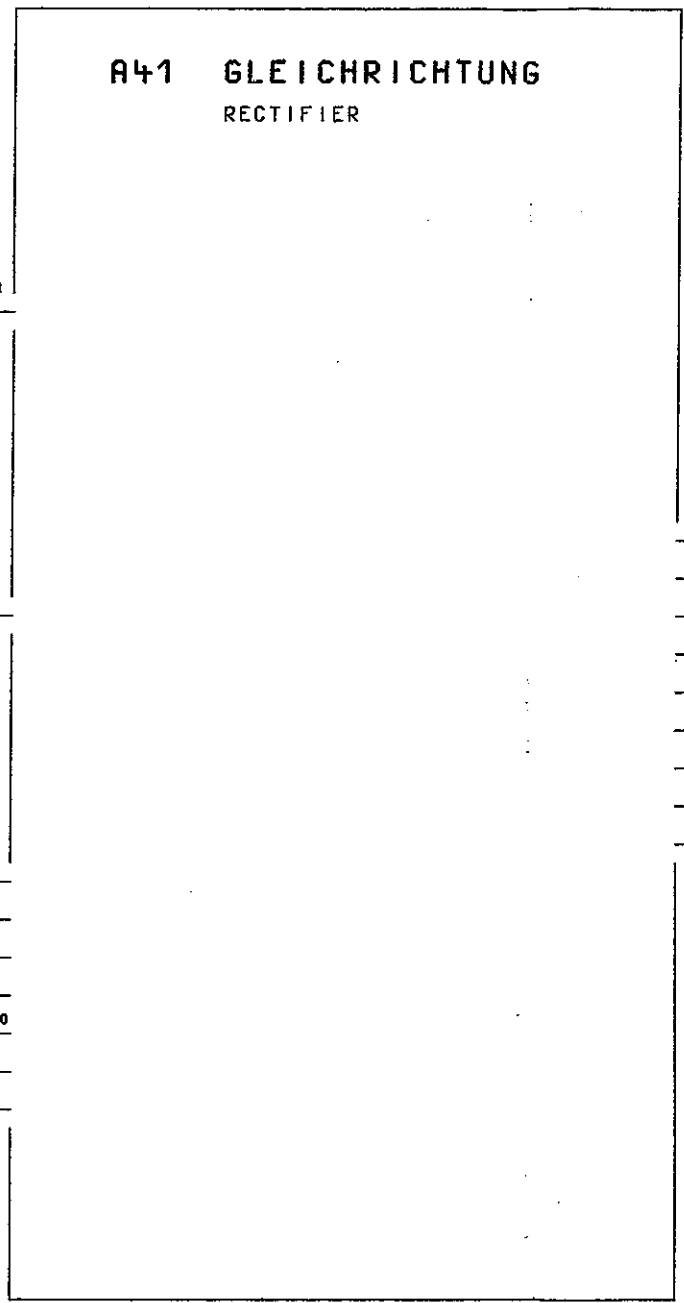
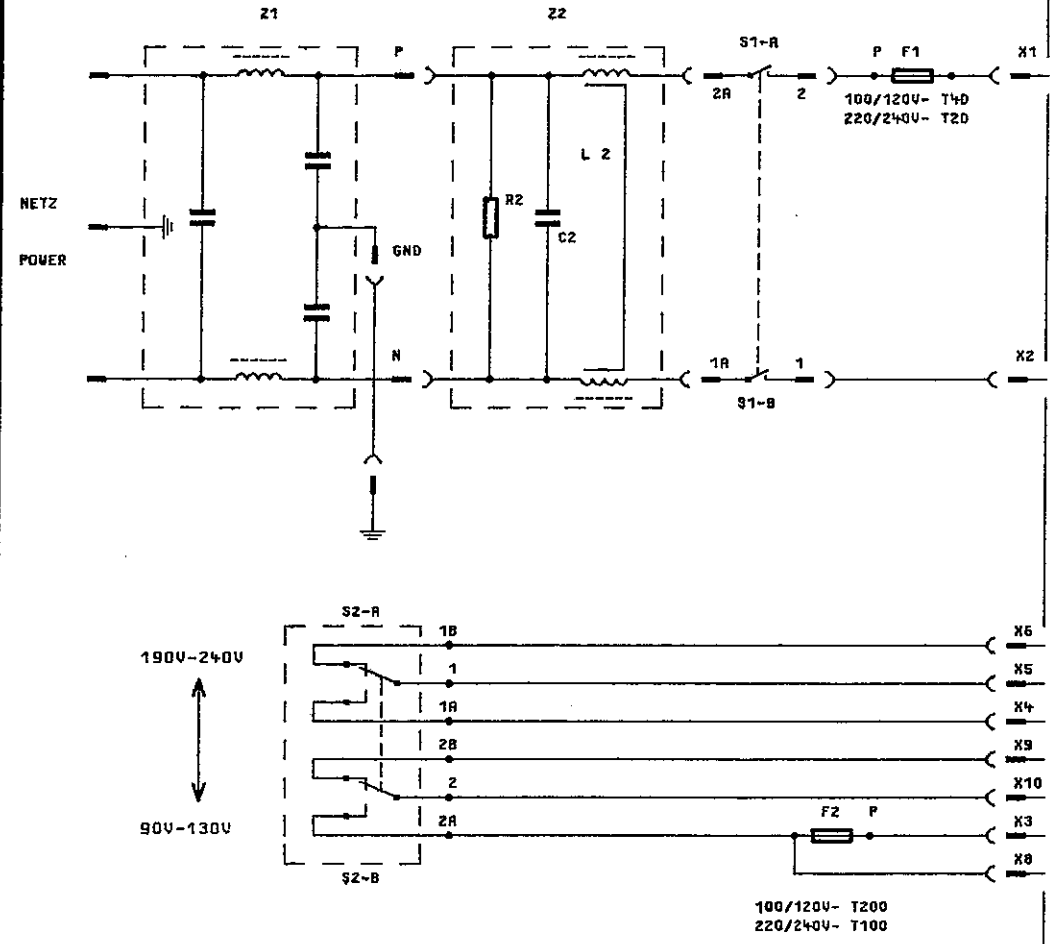
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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A41	ED GLEICHRICTUNG RECTIFIER BOARD	0819.1716.02			
A42	ED SCHALTREGLER SWITCHED REGULATOR	0819.1916.02			
C2	CS 1,0UF+-20% 250V RM27,5 CAPACITOR ENTHALTEN IN/INCLUDED IN Z2	0811.2542.00	SIEMENS	B81121-C-B132	0819.1739.00
F1	SS SCHMELZ.T2,0IEC127-2/3 FUSE T2,0	SS 0009.0578.00	WICKMANN	T2 L NR.19195	
F2	SS SCHMELZS.T100 IEC127/3 FUSE	SS 0020.7146.00	WICKMANN	T100 L NR.19195	
L2	LD STROMKOMPENS.DROSSEL COMPENSATION INDUCTOR ENTHALTEN IN/INCLUDED IN Z2	0811.2571.00			0819.1739.00
R2	RL 1W 182 KOHM+-1%TK100 METAL FILM RESISTOR ENTHALTEN IN/INCLUDED IN Z2	RL 0006.5927.00	ROEDERSTEI	MK 5	0819.1739.00
S1	SK WIPPSCH.2POL.AUS SW SWITCH	SK 0553.2925.00	MARQUARDT	1802.1102	
S2	SK SPANNUNGSUMSCH.115/230 VOLTAGE SWITCH	0292.5387.00	MARQUARDT	4021.0501	
X1	XX ENTHALTEN IN INCLUDED IN Z1				
Z1	FN EINBAUST.M.NETZFILT.3A POWER LINE FILTER	FN 0006.0977.00	SCHAFFNER	FN329-3/05	
Z2	LD NETZFILTER POWER LINE FILTER	0819.1739.00			

095.0028-0693

MENP5	502 3PUA	AI	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
		17	04.02.98	ZJ NETZTEIL POWER SUPPLY	0819.1568.01 SA	1-


FÜR DIESE ZEICHNUNG BEHALTEN WIR UNS ALLE RECHTE VOR.
 FÜR TECHNISCHE ÄNDERUNGEN, REVISIONEN KÖNNEN NUR DURCH ÄNDERUNG
 DES DATENSATZES ERFOLGEN
 DIESE ZEICHNUNG IST FÜR DIE VERWENDUNG IN DER
 DRUCKFORM GÜLTIG.



1 KSB	TAG	NARE	BENENNUNG
BEARB.		LS	SCHALTNETZTEIL POWER-SUPPLY
GEPR.		*	
NORM			
PLOTT	12. 4.89	*	
ROHDE & SCHWARZ			ZEICHN.-NR.
ZU GERÄT SMGU			819.1568.015
REND. IND.	RENDERUNGS-MITTEILUNG	DATUM	REG. I.V. - 819.0010
			ERSTE Z.
			BLATT-NR. 1
			V. 1 BL.

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C100	CS 1,0UF+-20% 250V RM27,5 CAPACITOR	0811.2542.00	SIEMENS	B81121-C-B132	
C102	CK 68NF+-20%250V QUADER CAPACITOR	CK 0087.4184.00	ROEDERSTEI	MKC 1862 368/25	
C103	CK 68NF+-20%250V QUADER CAPACITOR	CK 0087.4184.00	ROEDERSTEI	MKC 1862 368/25	
C104	CE 470UF-10+30%250V40X45 ELECTROLYTIC CAPACITOR	0006.9939.00	VALVO	2222 052 43471	
C105	CE 470UF-10+30%250V40X45 ELECTROLYTIC CAPACITOR	0006.9939.00	VALVO	2222 052 43471	
C106	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C107	CK 330NF+-5%63VRD4,5H10 CAPACITOR	CK 0099.2969.00	ROEDERSTEI	MKT 1826-433-06-4	
C108	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C109	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C110	CK 330NF+-5%63VRD4,5H10 CAPACITOR	CK 0099.2969.00	ROEDERSTEI	MKT 1826-433-06-4	
C111	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C112	CK 2,2NF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7617.00	ROEDERSTEI	KP1830-222 01 1 3 W	
C115	CK 1,0NF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7598.00	ROEDERSTEI	KP1830-210 01 1 3 W	
C116	CE 15 UF+-20%16V 7X 5X11 ELECTROLYTIC CAPACITOR	CE 0087.9328.00	KEMET	T340 C156M016 AS	
C117	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C118	CC 330PF+-2%6X9N750 CERAMIC CAPACITOR	CC 0087.6964.00	PHILIPS_CO	2222 678 58331	
C122	CS 1NF+-20%250V/50HZ VDE Y-CAPACITOR (DISC)	0834.9143.00	ROEDERSTEI	WY 7	
C123	CK 10NF+-20%630V QUADER CAPACITOR	CK 0024.7763.00	PLESSEY	R60 PF2100AAM	
C124	CK 10NF+-20%630V QUADER CAPACITOR	CK 0024.7763.00	PLESSEY	R60 PF2100AAM	
D100	BO UC2840J OA2 SCH.REGL REG.PULSE WIDTH MODULATOR	0374.9904.00	UNITRODE	UC2840J	
F100	SS SCHMELZS.T 0,5A TR5-T FUSE TR5T 0,5A	SS 0815.8239.00	WICKMANN	TR5-T/NR.19372 K	
F101	SS SCHMELZS.T 0,315A TR5T FUSE TR5T 0,315A	SS 0377.6906.00	WICKMANN	TR5-T/NR.19372K	
L100	LD STROMKOMPENS.DROSSEL COMPENSATION INDUCTOR	0811.2571.00			
L102	LD 100UH 20% 1A 0,650OHM CHOKE	LD 0155.9446.00	SIEMENS	B82111-E-C25	
N101	BO LM7812CT+12V1A0 VREGL VOLTAGE REGULATOR	BO 0344.9641.00	NSC	LM340T12	
N102	BO MC78M12CT+12VOA5 VREGF VOLTAGE REGULATOR	0820.3331.00	MOTOROLA	MC78M12CT	
P1 ..14	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
P21	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
P31 ..34	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
R101	RL 0,60W 221 KOHM+-1%TK50 RESISTOR	RL 0083.2270.00	RESISTA	MK2	
R102	RL 0,60W 221 KOHM+-1%TK50 RESISTOR	RL 0083.2270.00	RESISTA	MK2	
R103	RL 0,60W 3,92KOHM+-1%TK50 RESISTOR	RL 0083.1039.00	DRALORIC	SMA 0207	
R104	RL 0,60W 3,92KOHM+-1%TK50 RESISTOR	RL 0083.1039.00	DRALORIC	SMA 0207	
R105	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R106	RL 0,60W 4,99KOHM+-1%TK50 RESISTOR	RL 0083.1116.00	RESISTA	MK2	
R107	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	


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		05	04.02.98	ED GLEICHRICHTUNG RECTIFIER	0819.1716.01 SA	1+

095.0026-0693

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Kennz. Comp. No.	Benennung Designation		Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R108	RL 0,60W	210 KOHM+-1%TK50	RL 0083.2258.00	RESISTA	MK2	
R109	RL 0,35W	300KOHM+-1%TK50	RL 0082.7840.00	RESISTA	MK2	
R110	RL 0,60W	475 KOHM+-1%TK50	RL 0083.2593.00	RESISTA	MK2	
R111	RL 0,60W	681 KOHM+-1%TK50	RL 0083.2735.00	RESISTA	MK2	
R112	RL 0,60W	1,82KOHM+-1%TK50	RL 0082.2277.00	RESISTA	MK2	
R113	RL 0,60W	825 OHM+-1%TK50	RL 0082.2502.00	RESISTA	MK2	
R114	RL 0,60W	475 OHM+-1%TK50	RL 0083.0390.00	RESISTA	MK2	
R115	RL 0,60W	10,0 OHM+-1%TK50	RL 0082.8852.00	RESISTA	MK2	
R116	RL 0,60W	1KOHM+-1%TK50	RL 0082.2160.00	RESISTA	MK2	
R117	RL 0,60W	6,81KOHM+-1%TK50	RL 0082.2560.00	RESISTA	MK2	
R118	RL 0,60W	1,82KOHM+-1%TK50	RL 0082.2277.00	RESISTA	MK2	
R119	RL 0,60W	825 OHM+-1%TK50	RL 0082.2502.00	RESISTA	MK2	
R120	RL 0,60W	562 OHM+-1%TK50	RL 0083.0461.00	RESISTA	MK2	
R125	RL 0,60W	475 OHM+-1%TK50	RL 0083.0390.00	RESISTA	MK2	
R127	RL 0,60W	511 KOHM+-1%TK50	RL 0083.2629.00	RESISTA	MK2	
R128	RL 0,60W	511 KOHM+-1%TK50	RL 0083.2629.00	RESISTA	MK2	
R150	RL 0,60W	681 OHM+-1%TK50	RL 0083.0490.00	RESISTA	MK2	
R153	RL 0,60W	221 OHM+-1%TK50	RL 0083.0084.00	RESISTA	MK2	
R185	RL 0,60W	1KOHM+-1%TK50	RL 0082.2160.00	RESISTA	MK2	
T100	LT NETZTRANSFORMATOR LINE TRANSFORMER		0819.1851.00			
U100	BP H11A550	OPTOCOUPLER OPTO COUPLER	BP 0006.0948.00	QUALITY	MCT22XX.4910	
U101	BP H11A550	OPTOCOUPLER OPTO COUPLER	BP 0006.0948.00	QUALITY	MCT22XX.4910	
V101	RK HEISSL	4.7 OHM, 10% 1.5W THERMISTOR	0820.3319.00	SIEMENS	B57234-S479-M	
V102	RK VARISTOR	300V 1W VARISTOR	0820.3348.00	SIEMENS	Q 69-X3234	
V103	AD 1N4448	75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V104	AD 1N4448	75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V105	AK 2N2222A	N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V110	AG KBU4K	560V 4A0 BRGL RECTIFIER	0820.3302.00	GEN_INSTRU	KBU4K	
V111	AG B80C800	BRGL RECTIFIER	AG 0013.2042.00	GEN_INSTRU	B80C800G	
V112	AG B80C800	BRGL RECTIFIER	AG 0013.2042.00	GEN_INSTRU	B80C800G	
V115	AD 1N4448	75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V116	AD 1N4448	75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
X1	FV FLACHSTECKER	2,8X0,8 FLAT PLUG 2,8X0,8	FV 0279.1998.00	VOGT	3775 A/O.8/MS-SN8	
X8	FV FLACHSTECKER	2,8X0,8 FLAT PLUG 2,8X0,8	FV 0279.1998.00	VOGT	3775 A/O.8/MS-SN8	
X20	FP STIFTSOCKEL	F.GS 9P. CONNECTOR 9POL	0681.1150.00	AMP	350712-1	

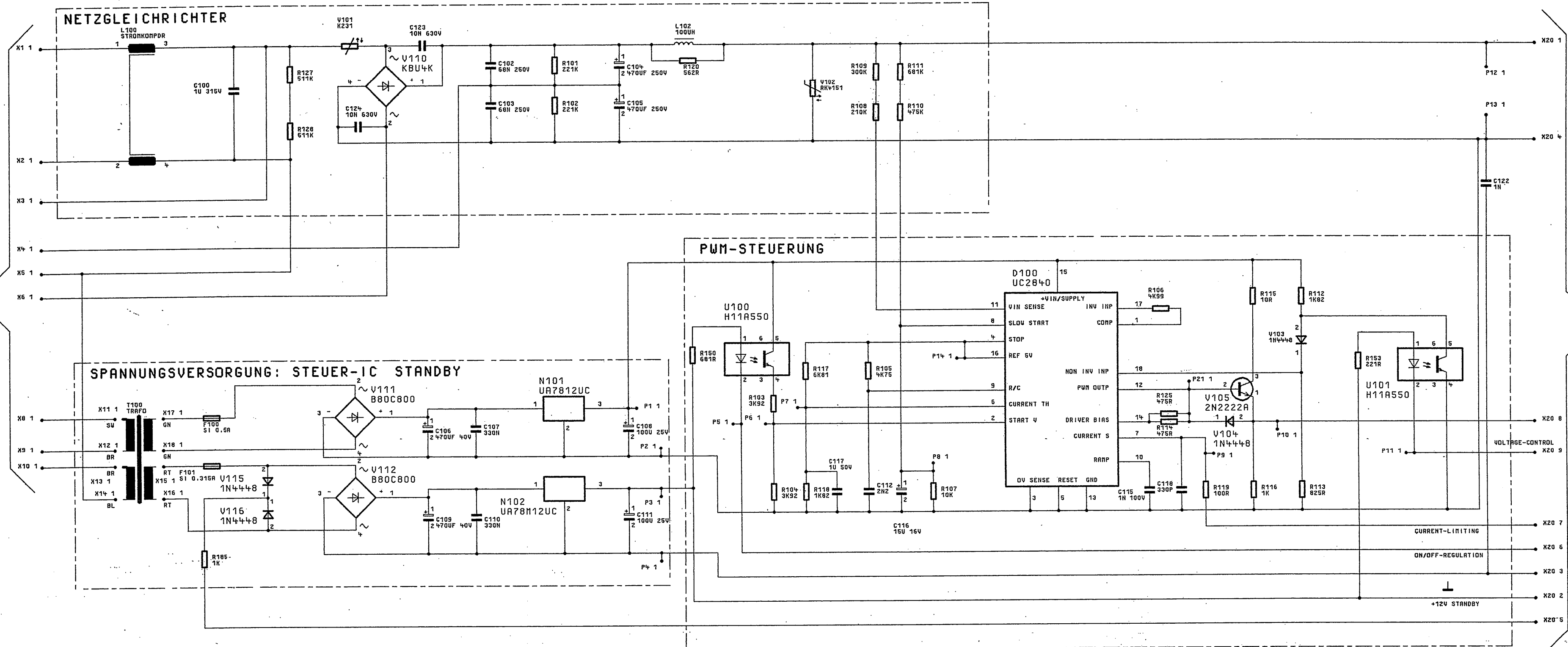
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	ROHDE & SCHWARZ	05	04.02.98	ED GLEICHRICTUNG RECTIFIER	0819.1716.01 SA	2-

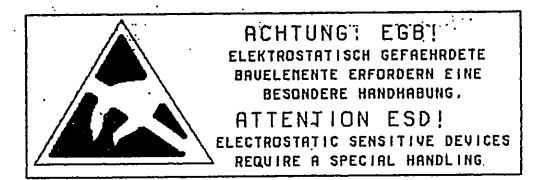
FÜR DIESE UNTERLAGE
BEHALTEN SICH UNS ALLE RECHTE VOR.

ZU/TO Z1

ZU/TO SCHALTNETZTEIL-A2/POWERSUPPLY-A2



STROMLAUF GILT FÜR VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02.

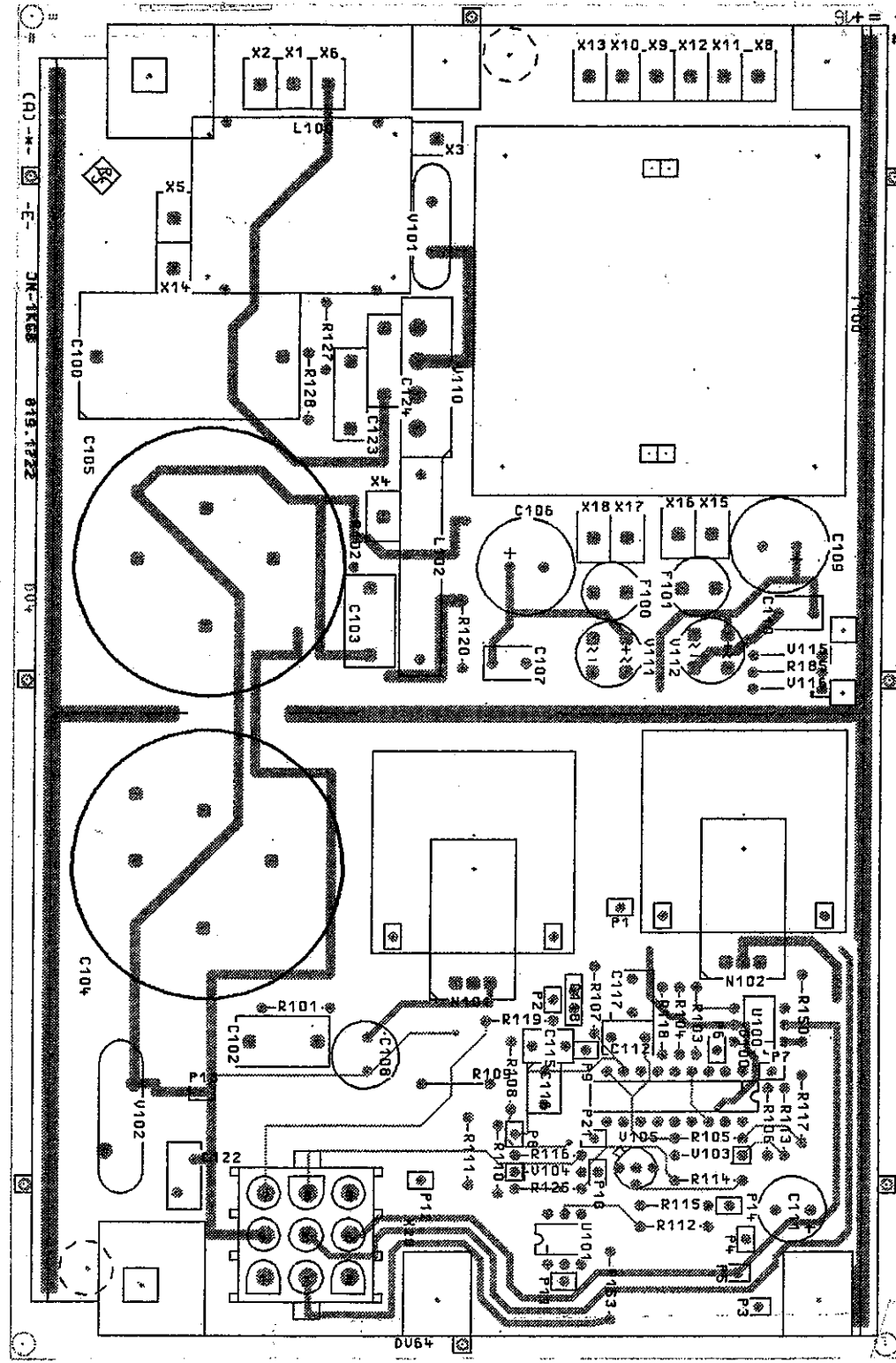


02	43071	11.89	JN	1KGB	TAG	NAME	BENENNUNG
						JN	GLEICHRICHTUNG RECTIFIER
						JN	
						*	
							ZEICHN.-NR.
							819.1716.015
							REG. I. V. 819.0010
							ERSTE Z.
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	NAME	ZU GERÄT	SMGU		BLATT-NR. 1 u. 1 BL.

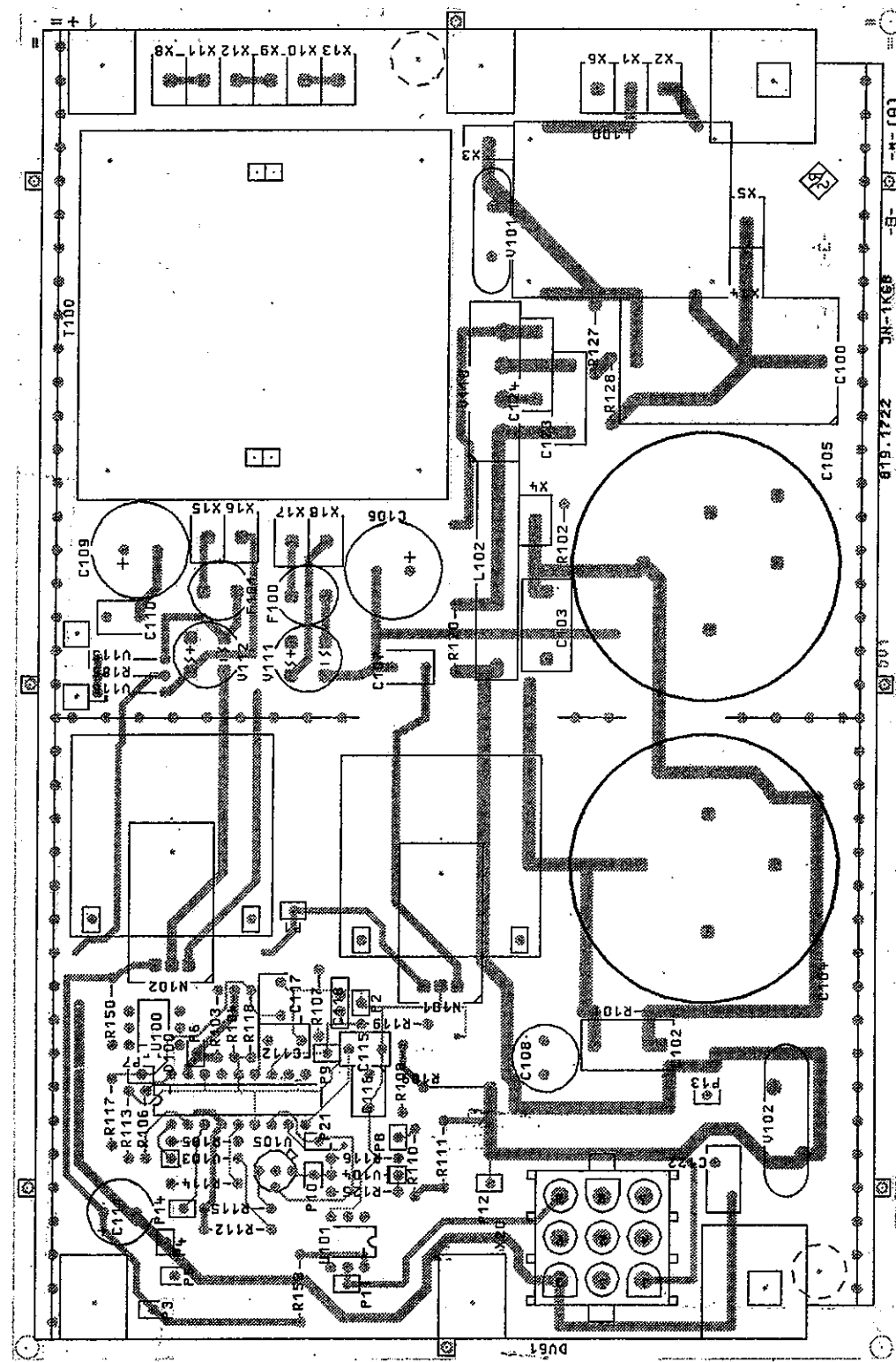
ZEICHN.-NR.

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Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Loetseite
View of tracks on solder side



07	43071	11.89	JN	Maße ohne Toleranzangabe		Maßstab 1 : 1		
						Halbzeug, Werkstoff		
				1KGB	Tag	Name	Benennung	
				Bearb.	11.89	JN	GLEICHRICHTUNG	
				Gepr.				
				Norm				
						Zeichn.-Nr.		Blatt-Nr.
						819.1716		2
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	zu Gerät SMGU		reg. i. V. 819.0010 V		erste Z.

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C200	CK 2,2UF+-5%400V RM27,5 FILM-CAPACITOR	0681.2133.00	SIEMENS	B32654-A4225-J	
C210	CC 150PF+-20% HDK700 RD5 CERAMIC CAPACITOR	0006.0448.00	VALVO	2222 655 **151	
C211	CC 100PF+-20% HDK700 RD5 CERAMIC CAPACITOR	0006.0431.00	VALVO	2222 65553(09<16000)	
C212	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C213	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C214	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C215	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W	
C216	CE 2,2UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3911.00	VALVO	2222 128 37228	
C217	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C218	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C219	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C240	CC 1 NF+50-20%500V HDK CERAMIC CAPACITOR	0006.0490.00	VALVO	2222 65553(09<16000)	
C241	CC 1 NF+50-20%500V HDK CERAMIC CAPACITOR	0006.0490.00	VALVO	2222 65553(09<16000)	
C242	CE 1000UF 40V 16RDX30 ELECTROLYTIC CAPACITOR	0573.9931.00	SIEMENS	B 41293-B7108-T	
C243	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C244	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C245	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C246	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C247	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C270	CC 100PF+-20% HDK700 RD5 CERAMIC CAPACITOR	0006.0431.00	VALVO	2222 65553(09<16000)	
C271	CC 100PF+-20% HDK700 RD5 CERAMIC CAPACITOR	0006.0431.00	VALVO	2222 65553(09<16000)	
C272	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C273	CK 330NF+-5%63VRD4,5H10 CAPACITOR	CK 0099.2969.00	ROEDERSTEI	MKT 1826-433-06-4	
C274	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C275	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C280	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C281	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C282	CE 1000UF-10+50%25V 17X26 ALUMINIUM CAPACITOR	0565.9513.00	FROLYT	EKR 00 JH 410E	
C284	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C285	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C286	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C287	CE 470UF+-20%50V RM5 ELECTROLYTIC CAPACITOR	CE 0008.7504.00	PANASONIC	ECA 1 HFG 471 B	
C290	CK 330NF+-5%63VRD4,5H10 CAPACITOR	CK 0099.2969.00	ROEDERSTEI	MKT 1826-433-06-4	
C291	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C292	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C300	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C301	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C302	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W	
C303	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	

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ROHDE & SCHWARZ

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ED SCHALTREGLER


SWITCHED REGULATOR

0819.1916.01 SA

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in	
C304	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W		
C305	CC 3,3NF+-10%6X7R2000 CAPACITOR	CC 0087.7083.00	PHILIPS_CO	2222 630 5(1)1332		
C306	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R		
C320	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R		
C321	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103		
C322	CC 47PF+-2%3X4N750 CAPACITOR	CC 0087.6864.00	PHILIPS_CO	2222 678 58479		
C323	CC 47PF+-2%3X4N750 CAPACITOR	CC 0087.6864.00	PHILIPS_CO	2222 678 58479		
C324	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI	MKT 1826-422-06-4		
C350	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R		
C351	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R		
C352	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R		
C353	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W		
C354	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R		
L210	LD DREIFACHDR.650UH/4A STORAGE CHOKE	0820.3377.00	VACUUMSCHM	T60405-A4198-X064-XX		
L211	LD 100UH 20% 1A 0,6500HM CHOKE	LD 0155.9446.00	SIEMENS	B82111-E-C25		
L212	LD 680 UH10%60,00HMO,030A CHOKE	LD 0067.3201.00	DALE	IM-2		
L240	LD 9UH 6A 0,0120HM CHOKE	LD 0026.4826.00	SIEMENS	B82111-B-C22		
L241	LD 680 UH10%60,00HMO,030A CHOKE	LD 0067.3201.00	DALE	IM-2		
L270	LD 56UH 1,5A 0,30HM CHOKE	LD 0099.5197.00	SIEMENS	B82111-E-C24		
L280	LD SPEICHERDR.63UH/10A CHOKE	0686.9565.00	VACUUMSCHM	T60405-A4194-X780		
L281	LD 25UH 3A 0,0460HM CHOKE	LD 0026.4849.00	SIEMENS	B82111-B-C24		
L300	RL 0-OHM-WIDERST. 0204 O-OHM RESISTOR	RL 0069.0000.00	DRALORIC	OMA 0204		
N210	BO LM358P 2X OPAMP OPERATIONAL AMPLIFIER	BO 0377.3813.00	NSC	LM358P		
N240	BO LM358P 2X OPAMP OPERATIONAL AMPLIFIER	BO 0377.3813.00	NSC	LM358P		
N270	BO SI3152V +15V2AO VREGL VOLTAGE REGULATOR	0803.0615.00	SANKEN	(SI)-3152V (ROEDERS)		
N290	BO SI3052V + 5V2AO VREGL VOLTAGE REGULATOR	0641.8553.00	SANKEN	SI-3052V(ROEDERST.)		
N300	BO TLO74IN LN 4XFET OPAMP OPERATIONAL AMPLIFIER	0568.7528.00	TEXAS	TLO74IN		
N320	BO LM339N 4X COMPAR COMPARATOR	BO 0342.2062.00	NSC	LM339N		
N350	BL CD4025BE 3X3INP.NORG NOR GATE	0086.7121.00	RCA	CD4025BE		
P200	FP STIFTLASTE 36P.R2,54 PIN CONNECTOR P202 2-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P201	FP STIFTLASTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P210	FP STIFTLASTE 36P.R2,54 PIN CONNECTOR P212,P213 3-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P211	FP STIFTLASTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P214	FP STIFTLASTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P240	FP STIFTLASTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
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	11	26.02.98	ED SCHALTREGLER SWITCHED REGULATOR	0819.1916.01 SA	2+	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in	
P241	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P270	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P280	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P281	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR P243,P271,P272,P242,P282 6-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P283	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P290	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P300	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P301	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR P302 2-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P303	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR 11X1-POLIG	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P322	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR P323-P325 4-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P326	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR P321,P351 3-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P327	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR P350,X350-X356 8-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
R200	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2		
R201	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02		
R202	RD 0,8W 0,15 OHM+-1% WIRE-WOUND RESISTOR	RD 0087.5222.00	DALE	LVR-1 ... (RS-1A)		
R210	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2		
R211	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2		
R212	RD 0,8W 100 OHM+-1% WIRE WOUND RESISTOR	RD 0082.6420.00	DALE	LVR-1 ... (RS-1A)		
R213	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2		
R214	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2		
R220	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R221	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25		
R222	RL 0,60W 18,2KOHM+-1%TK50 RESISTOR	RL 0083.1480.00	RESISTA	MK2		
R223	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02		
R224	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25		
R225	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R230	RG 221 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6004.00	ROEDERSTEI	D25		
R231	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02		
R232	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02		
R233	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25		
R234	RD 0,8W 0,33 OHM+-1%TK80 WIRE WOUND RESISTOR	RD 0450.6670.00	TEPRO	TS 1 A ...		
R235	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02		
R240	RD 0,8W 47 OHM+-1% WIRE-WOUND RESISTOR	RD 0082.0680.00	TEPRO	TS 1 A ...		
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	ROHDE & SCHWARZ	11	26.02.98	ED SCHALTREGLER SWITCHED REGULATOR	0819.1916.01 SA	3+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R241	RD 0,8W 47 OHM+-1% WIRE-WOUND RESISTOR	RD 0082.0680.00	TEPRO	TS 1 A ...	
R245	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R246	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R247	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R248	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R249	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R250	RG 3,57KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5795.00	ROEDERSTEI	D25	
R251	RL 0,60W 909 KOHM+-1%TK50 RESISTOR	RL 0083.2858.00	RESISTA	MK2	
R252	RL 0,60W 909 KOHM+-1%TK50 RESISTOR	RL 0083.2858.00	RESISTA	MK2	
R253	RG 1,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9951.00	ROEDERSTEI	D25	
R254	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R255	RD 2,4W 0,05 OHM+-1%TK20 RESISTOR	RD 0069.1964.00	DALE	RS-2B	
R260	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R261	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R262	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R263	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R270	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R271	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R280	RD 0,8W 15 OHM+-1% WIRE-WOUND RESISTOR	RD 0087.5316.00	DALE	LVR-1 ... (RS-1A)	
R281	RD 0,8W 15 OHM+-1% WIRE-WOUND RESISTOR	RD 0087.5316.00	DALE	LVR-1 ... (RS-1A)	
R283	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R285	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R286	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R287	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R288	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R290	RG 162 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8932.00	ROEDERSTEI	D25	
R291	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R292	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R300	RG 825 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.7259.00	ROEDERSTEI	D25	
R301	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R302	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R303	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R304	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7526.00	SPECTROL	63X ... TO10	
R305	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R306	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R307	RL 0,60W 5,23KOHM+-1%TK50 RESISTOR	RL 0083.1122.00	RESISTA	MK2	
R308	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R309	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R310	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in	
R311	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02		
R312	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2		
R320	RL 0,60W 6,04KOHM+-1%TK50 RESISTOR	RL 0082.6089.00	RESISTA	MK2		
R321	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2		
R322	RL 0,60W 15,0KOHM+-1%TK50 RESISTOR	RL 0083.1400.00	RESISTA	MK2		
R323	RL 0,60W 14,3KOHM+-1%TK50 RESISTOR	RL 0083.1380.00	RESISTA	MK2		
R324	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02		
R325	RG 130,0KOH+-1%TK100 1206 RESISTOR CHIP	RG 0007.5966.00	ROEDERSTEI	D25		
R326	RG 82,5KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1925.00	ROEDERSTEI	D25		
R327	RG 82,5KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1925.00	ROEDERSTEI	D25		
R328	RG 3,01KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5772.00	ROEDERSTEI	D25		
R329	RG 750 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9097.00	ROEDERSTEI	D25		
R330	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25		
R331	RG 12,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0841.00	PHILIPS_CO	RC02		
R332	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R333	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25		
R334	RG 82,5KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1925.00	ROEDERSTEI	D25		
R335	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25		
R336	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25		
R337	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02		
R338	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2		
R339	RL 0,60W 33,2KOHM+-1%TK50 RESISTOR	RL 0083.1674.00	RESISTA	MK2		
R340	RL 0,60W 24,3KOHM+-1%TK50 RESISTOR	RL 0083.1574.00	RESISTA	MK2		
R341	RL 0,60W 15,0KOHM+-1%TK50 RESISTOR	RL 0083.1400.00	RESISTA	MK2		
R342	RL 0,60W 4,99KOHM+-1%TK50 RESISTOR	RL 0083.1116.00	RESISTA	MK2		
R343	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2		
R350	RG 1,0MOHM+-1%TK100 1206 CHIP RESISTOR	RG 0815.7532.00	PHILIPS_CO	RC 02		
R351	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R352	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R353	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25		
R354	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R355	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02		
R356	RG 1,0MOHM+-1%TK100 1206 CHIP RESISTOR	RG 0815.7532.00	PHILIPS_CO	RC 02		
R357	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25		
R358	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25		
R359	RG 68,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1902.00	ROEDERSTEI	D25		
S3	ST TEMP.SCHALT.45GRSCHL TEMPERATURE SWITCH	0801.8325.00	MIDWEST_CO	MTS 45 A		
T200	LT SCHALTTRAFO TRANSFORMER	0819.2112.00				
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	ROHDE & SCHWARZ	11	26.02.98	ED SCHALTREGLER SWITCHED REGULATOR	0819.1916.01 SA	5+

095.0026-0893

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V200	AE TVS310 10V SUPPR SUPPRESSOR	0811.2594.00	UNITRODE	TVS310(T/R)	
V202	AG BYV96E GL1000V OAB RECTIFIER	0099.9034.00	PHILIPS_SE	BYV 96E	
V210	AG BYV32/200 2GL200V10AO RECTIFIER	0803.0644.00	PHILIPS_SE	BYV32E/200	
V211	AE BZY93/C3OR 20W ZDI ZENER DIODE (SUPPR.)	0464.9160.00	PHILIPS_SE	BZY93C3OR	
V212	AL BD438 P 45V 4AO TRANSISTOR	AL 0010.0403.00	VALVO	BD438	
V213	AE BZX79/B6V8 0,5W ZDI ZENER DIODE	AE 0586.9906.00	PHILIPS	BZX79B6V8	
V214	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V220	AM BUZ58 N-E1000V MOSF POWER MOSFET	0820.3354.00	SIEMENS	BUZ58	
V240	AG BYV32/200 2GL200V10AO RECTIFIER	0803.0644.00	PHILIPS_SE	BYV32E/200	
V241	AL BD810 P 80V 10AO TRANSISTOR	0803.0650.00	MOTOROLA	BD808	
V242	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V243	AL BD139 N 80V 1AO TRANSISTOR	AL 0274.8994.00	VALVO	BD139	
V244	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V270	AG BYV32/200 2GL200V10AO RECTIFIER	0803.0644.00	PHILIPS_SE	BYV32E/200	
V280	AG BYV32/200 2GL200V10AO RECTIFIER	0803.0644.00	PHILIPS_SE	BYV32E/200	
V281	AM BUZ10 N-E 50V MOSF MOS-FET	AM 0608.9490.00	SIEMENS	BUZ10S2	
V300	AE 1N827 6,2V REFDI REFERENCE DIODE	AE 0418.0029.00	COMPENSATE	1N827(A)	
V301	AG 1N4007 GL1000V 1AO RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V302	AG 1N4007 GL1000V 1AO RECTIFIER	AG 0013.0310.00	ITT-SEMICO	1N4007	
V320	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V321	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V322	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V350	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V351	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V352	AF HLMP1503 LED GN RD3 LED	0252.5570.00	QUALITY	HLMP1503-(74)19(D)	
V353	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V354	AE BZX79B3V9 2% 0.5W ZDI ZENER	AE 0008.7685.00	PHILIPS_SE	BZX79B3V9	
W20	DX KABEL (W20) CABLE	0819.2106.00			
WE1	DY KABEL WE1 CABLE	0819.2158.00			
X4	DY BUCHSENEINHEIT CONNECTOR UNNIT	0819.2135.00			
X5	VL LOETOESE 11,5 X 1,4 SOLDERING PIN	0082.5247.00	VOGT	N.ZEICHNUNG 082.5247	
X6	VL LOETOESE 11,5 X 1,4 SOLDERING PIN	0082.5247.00	VOGT	N.ZEICHNUNG 082.5247	
X300	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR X301	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X302	2-POLIG/PINS FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X353	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X357	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	


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	11	26.02.98	ED SCHALTREGLER SWITCHED REGULATOR	0819.1916.01 SA	6+	

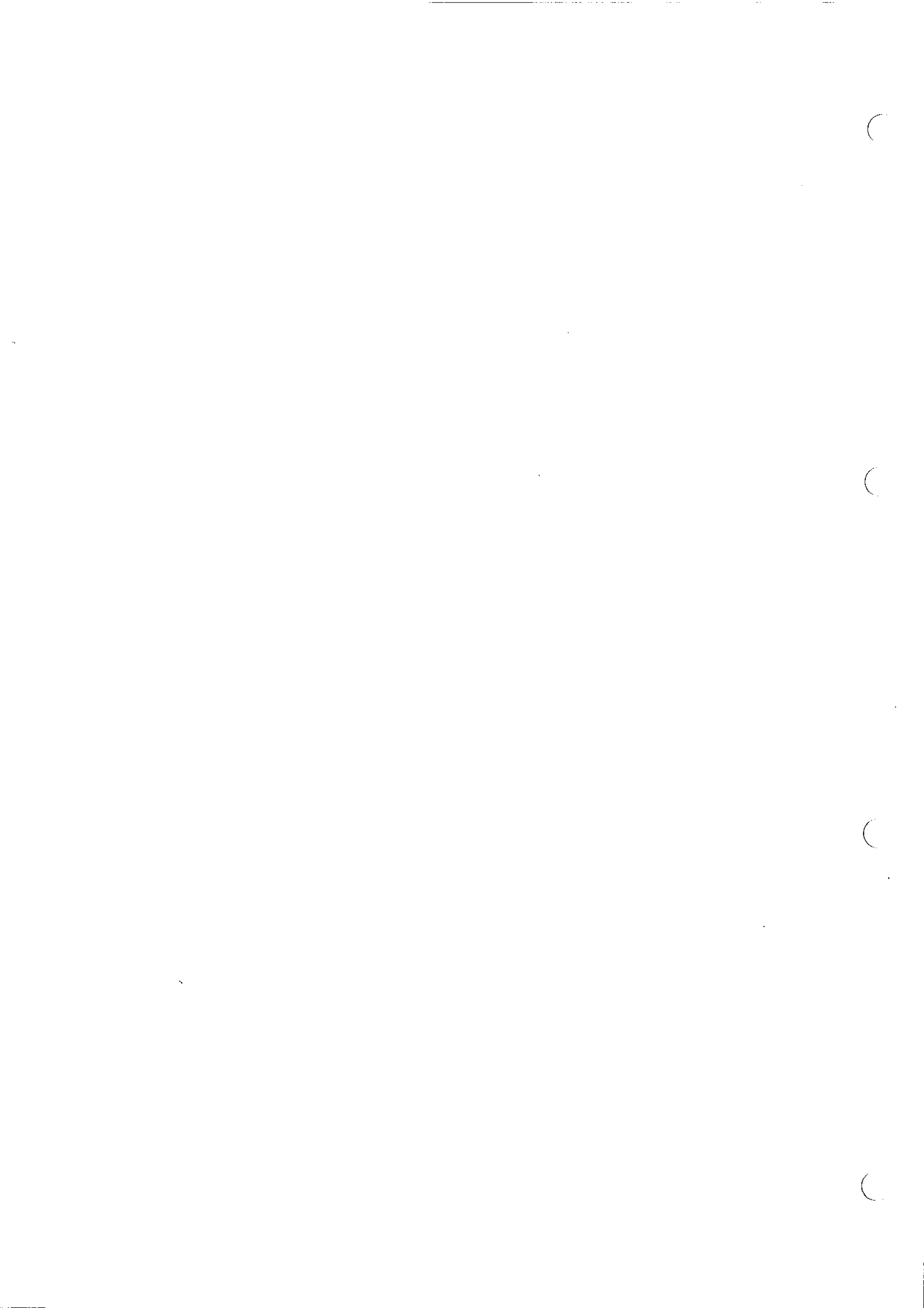
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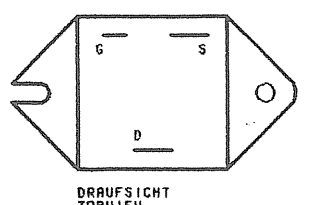
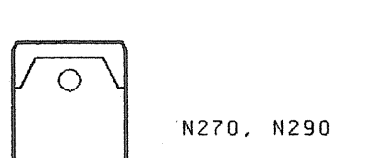
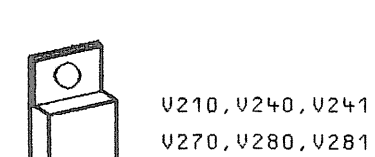
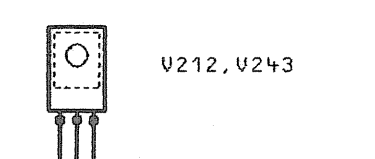
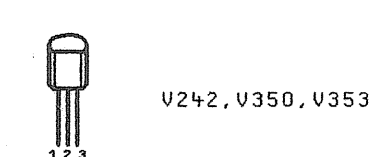
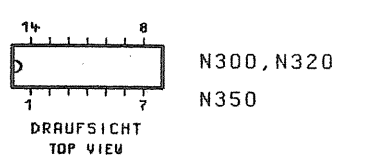
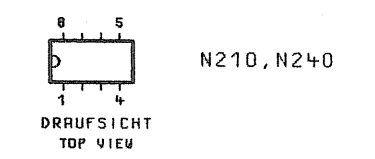
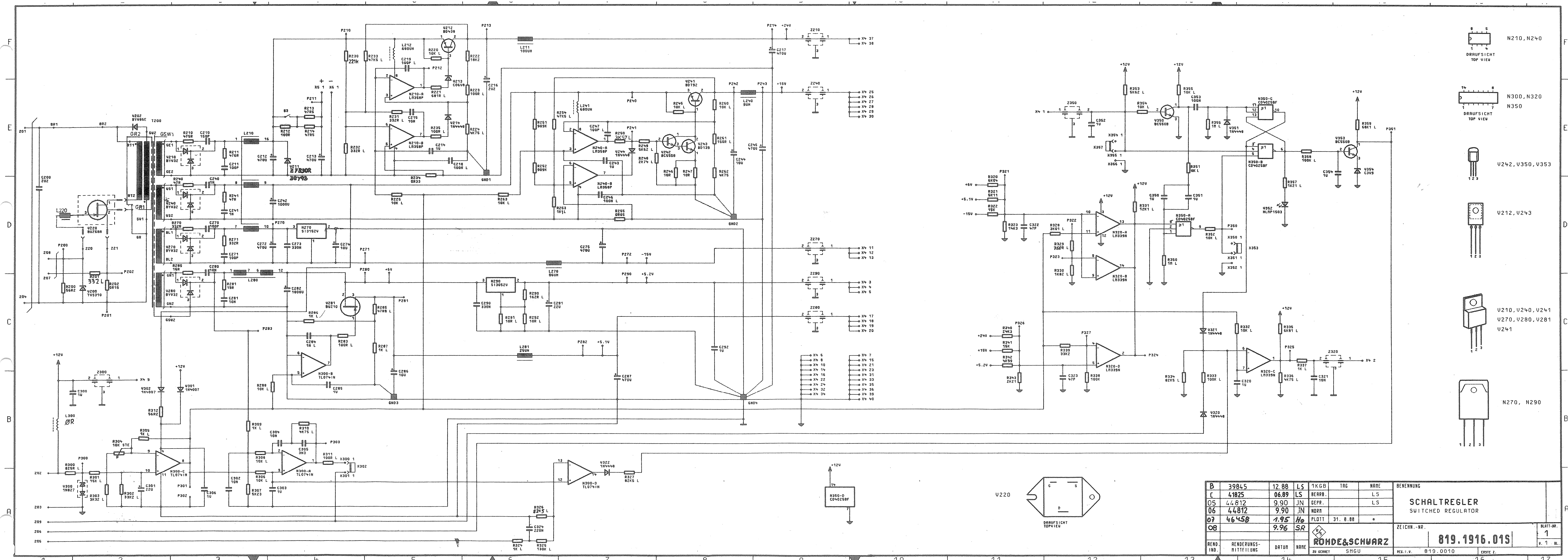
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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
Z210	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z240	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z270	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z280	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z290	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z300	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z320	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z350	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	

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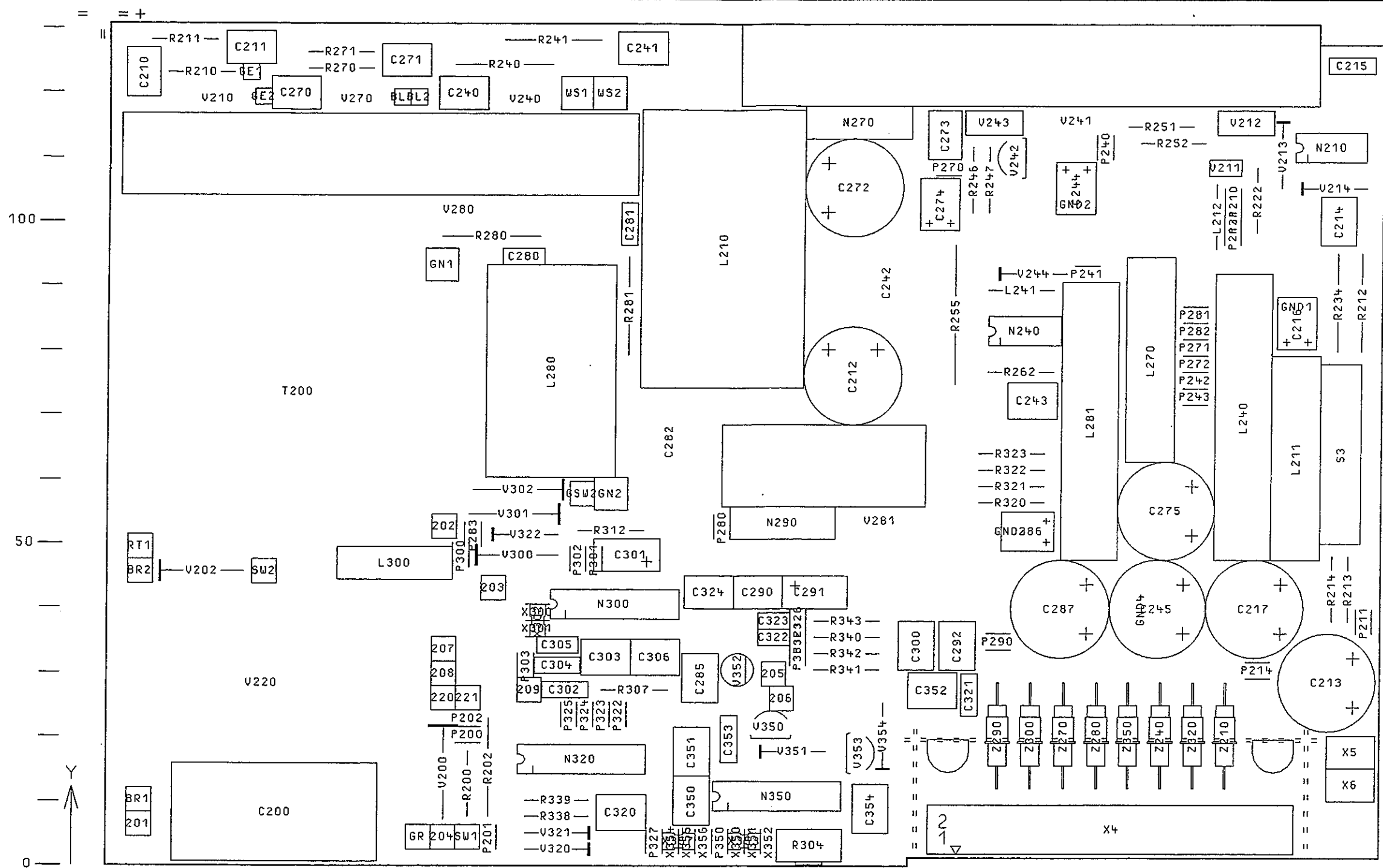




B	39845	12.88	LS	1KGB	TAG	NAME	BENENNUNG	
C	41825	06.89	LS	BEARB.		LS	SCHALTREGLER SWITCHED REGULATOR	
05	44812	9.90	JN	GEPR.		LS		
06	44812	9.90	JN	NORM		LS		
07	46458	1.95	Ho	PLOTT	31. 8.88	*		
08		9.96	SR				ZEICHN.-NR.	
REND. IND. RENDUNGS-NITTEILUNG DATUM NAME ROHDE & SCHWARZ ZU GERÄT SMGU							REG.-I.V. 819.0010 ERSTE Z.	BLATT-NR. 1 V. 1. BL.

TUCH DIESE UNTERLEGE
BEHALTEN NUR UNS ALLE RECHTE VOR

DIESE ZEICHNUNG IST EIN RECHNERAUSDRUCK, ÄNDERUNGEN KOENNEN NUR DURCH GEBERN DES DATENSATZES ERFOLGEN



DARSTELLUNG SEITE B
VIEW ON SIDE B



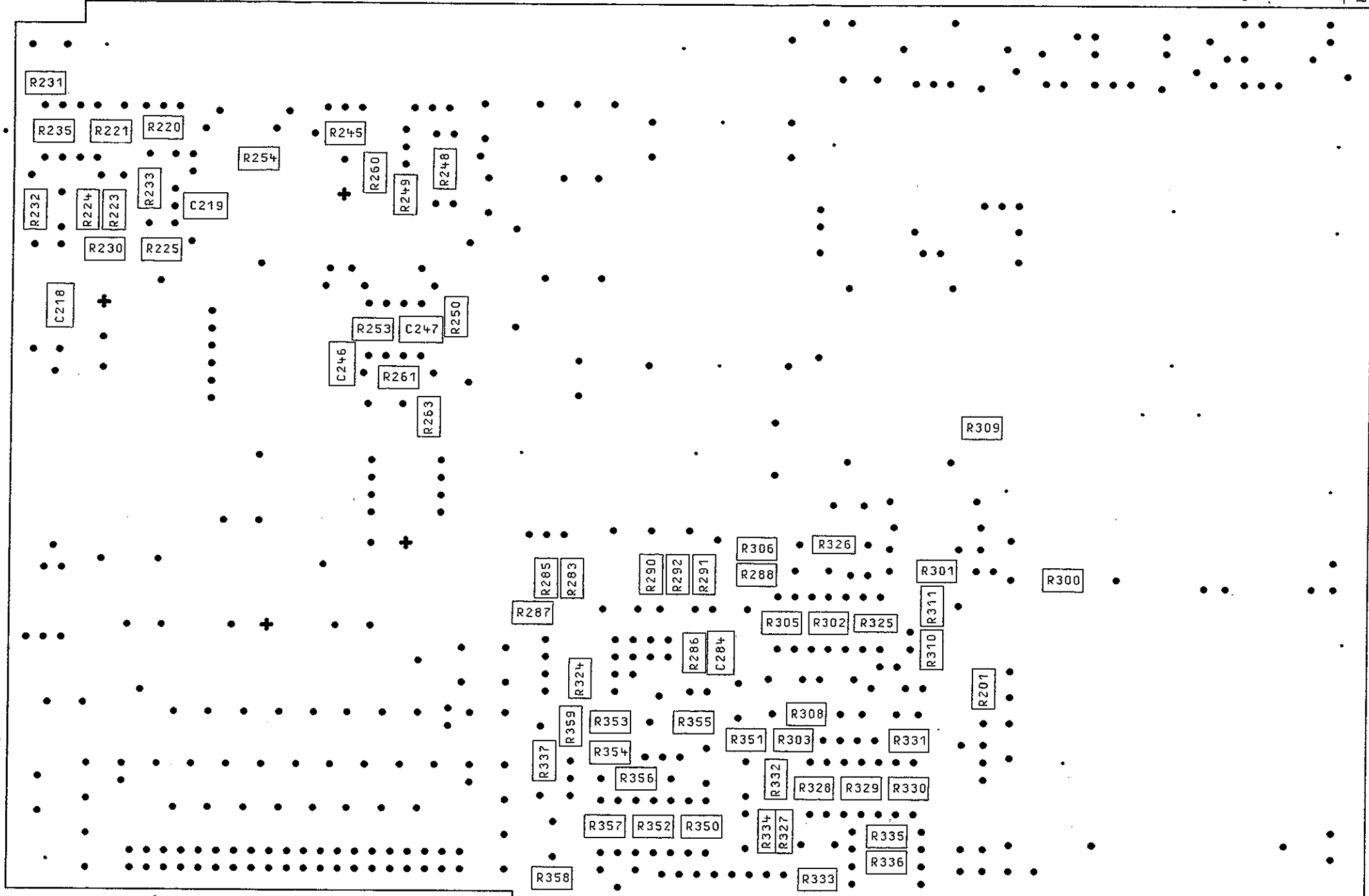
ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.
ATTENTION ESD!
ELECTROSTATIC SENSITIVE DEVICES
REQUIRE A SPECIAL HANDLING

BINDENDE ANGABEN UEBER VARIANTEN,
TRIMMWERTE, BAUTEILWERTE UND
NICHT BESTUECKTE BAUTEILE SIEHE SA.

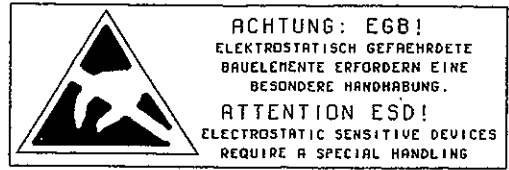
FOR BINDING INFORMATION ON MODELS,
TRIMMING AND COMPONENTS VALUES AND
NONFITTED COMPONENTS SEE PARTS LIST.

09.30	10.02.97	E I	MENP	TAG	NAME	BENENNUNG	
			BEARB.		E I	ED SCHALTREGLER SWITCHED REGULATOR	Z
			GEPR.				
			NORM				
			PLOTT	10.02.97		ZEICHN.-NR.	
09/10	09.96	DR			819.1916.01		BLATT-NR.
REND. IND.	ÄNDERUNGS- MITTEILUNG	DATUM			NAME	REG.-I.V.	819.0010
			20 GERÄT		SMGU		1+
							v. 4 BL.

DIESE ZEICHNUNG IST EIN RECHNERAUSDRUCK. ÄNDERUNGEN KÖNNEN NUR DURCH HENDUNG DES DATENSATZES ERFOLGEN



DARSTELLUNG SEITE A
VIEW ON SIDE A



BINDENDE ANGABEN UEBER VARIANTEN,
TRIMMWERTE, BAUTEILWERTE UND
NICHT BESTUECKTE BAUTEILE SIEHE SA.

FOR BINDING INFORMATION ON MODELS,
TRIMMING AND COMPONENTS VALUES AND
NONFITTED COMPONENTS SEE PARTS LIST.

09/10	10.02.97	EI	MENP	TAG	NAME	BENENNUNG	Z
			BEARB.		EI	ED SCHALTREGLER	
			GEPR.			SWITCHED REGULATOR	
			NORM				
			PLOTT	10.02.97			
09/10	09.96	OR			ZEICHN.-NR.	BLATT-NR.	
REND. IND.	ÄNDERUNGS-MITTEILUNG	DATUM			NAME	819.1916.01	1.1 -
			ZU GERÄT	SMGU	REG. I.V.	V. 4 BL.	
					819.0010	ERSTE Z.	

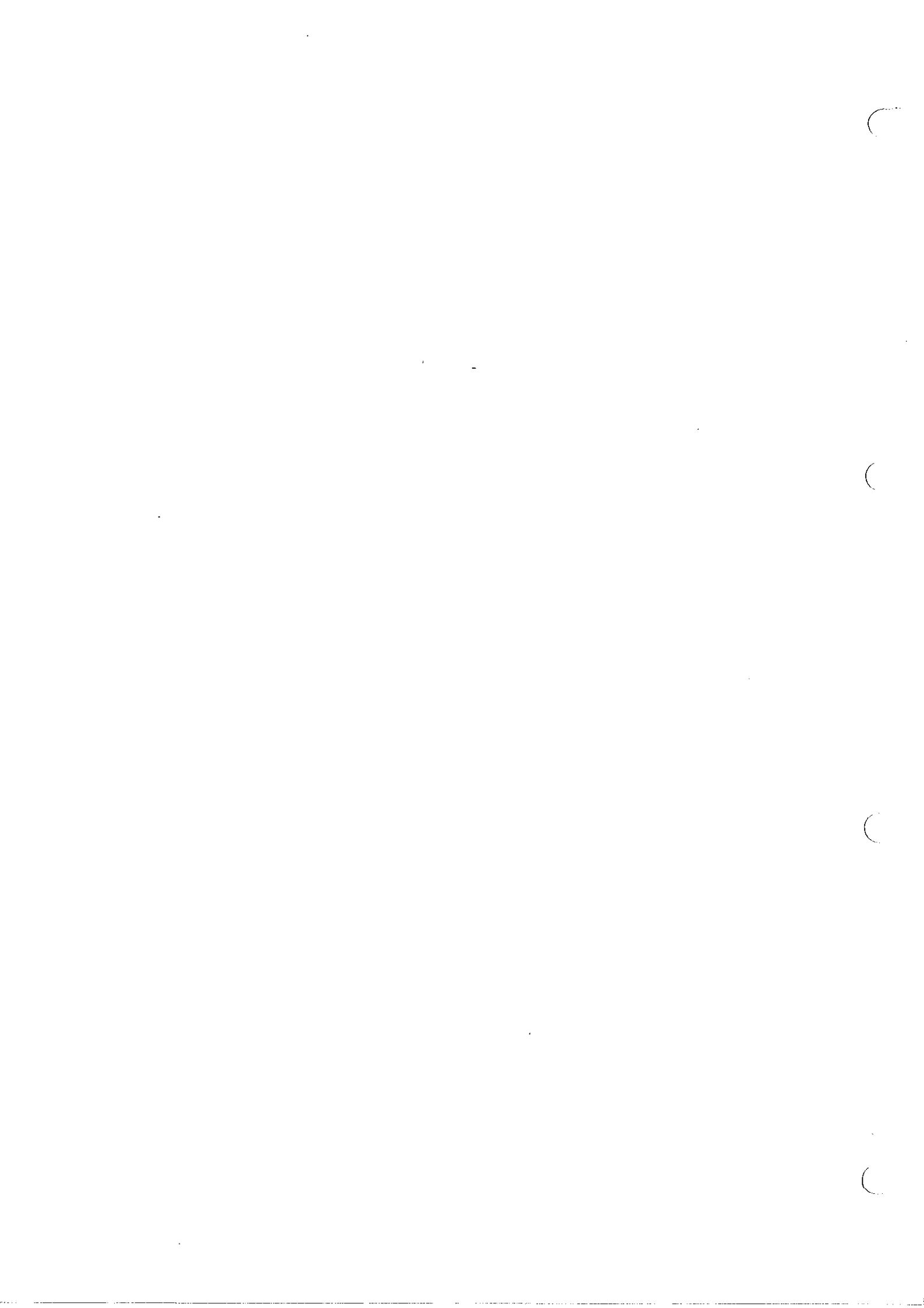


ROHDE & SCHWARZ

SERVICE DOCUMENTS

Controller

819.2164.02



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5.1.3.2	Digital Diagnostics Circuit
5.1.4	X Output
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	Component layout plans

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5 Service Manual "Controller"

5.1 Function Description

(See circuit diagram 819.2164 S and Fig. 5-1)

The module comprises the following function units:

- ▶ CPU with program and data memories
- ▶ Interface to module "Display/keyboard" and for data transmission
- ▶ Diagnostics circuit
- ▶ X output
- ▶ IEC interface

5.1.1 CPU with Program and Data Memories

The CPU is an 80186 operated at 8 MHz. To ensure correct starting of the program, N101 generates a RESET signal for the CPU. A total of 128 kbytes (D135, D140) is provided for the program memories. The RAMs D170, D175 with battery back-up are used as data memories and for storing instrument settings. The EEPROMs D145, D150 contain correction tables determined from instrument-specific parameters (e.g. level and modulation frequency response flatness).

5.1.2 Interface to "Display/Keyboard" subassembly and for Data Transmission

The custom gate array "IFPAS" (D225) contains three independent circuits:

- *Interface for tachogenerator (RMK)*

The tachogenerator signals ("Display/keyboard" subassemblies) 90° out of phase, are applied to the input pins RMK.PLS and RMK.DIR. The pulses are added internally, the direction of rotation detected, and the CPU informed by means of an interrupt (RMK.INT).

- *Interface for the key matrix*

The outputs KC1 to KC8 at low potential are connected via the key matrix (column lines) of the "Display/keyboard" subassembly to the high-impedance CMOS inputs KR1 to KR8 (row lines). With the keys open, C210 to C217 are at high potential. Pressing a key combines one row line with one column line, and the corresponding input KR1 to KR8 is set to Low. The interrupt generated (KEY.INT) requests the CPU to read the key code. To generate it, the pins KC1 to KC8 become inputs and thus go into a high-impedance state. The "open" column lines now rapidly go high.

The appropriate capacitor (C210 to C217) must first be charged via the column line of the pressed key. A 1-out-of-64 code is generated from this signal status shortly before the end of the read access.

- *Interface to serial bus*

This serial bus consists of the three unidirectional lines TRF.CLK (transfer clock), TR.DAT (transmit data) and RC.DAT (receive data). The data (TR.DAT) are loaded into shift registers (of the other subassemblies) by means of TRF.CLK. The transfer to the "Display/keyboard" subassembly is made via the gates D250. The data are either accepted for the LCD controller with the strobe (DIS.STB) generated by D275, or they are accepted for the LEDs with the LED strobe (LED.STB) and applied to the outputs of the shift registers. Group lines and address lines (G0 to G2, BA0 to BA2) are output via D270 in order to generate the strobes on the remaining modules. Each module decodes the required strobes from this binary code.

The input shift register of the IFPAS is linked to TRF.CLK and TR.DAT and accepts all transmitted data.

5.1.3 Diagnostics Circuit

5.1.3.1 Analog Diagnostics Circuit

Various sources can be connected to the input of the 12-bit analog/digital converter N320 using the multiplexer D300:

- Voltages of various subassemblies on TST
- Vacant input as voltmeter
- Battery voltage
- Frequency-proportional voltage of X output

Each voltage can be provided with a gain of 1 or 10 by means of N304, N308 prior to conversion. The ADC module has its own reference voltage. Its measuring range is ± 5.12 V and is set using R323 (gain) and R321 (offset).

5.1.3.2 Digital Diagnostics Circuit

The external hardware status can be sent to the CPU via the 8-bit input port D265 to indicate for example whether interrupt requests are present or whether the overvoltage protection is still active. In addition, the status signal of the EEPROMs is monitored during programming, as is an external trigger signal.

5.1.4 X Output

The 12-bit DAC N355 generates a voltage ramp from 0 to 10 V proportional to the start and stop frequencies of the sweep. The converter is programmed via the latches D360, D365.

A signal "PEN LIFT" (Z output) is output by D365 to control the recorder. A MARKER signal whose polarity is software selectable can be selected using the software can be output for observations on an oscilloscope.

5.1.5 IEC Interface

The IEC/IEEE bus interface consisting of the modules D370, D375, D380 is based on the remote-control interface to IEC 625/IEEE 488. The interface can write data directly to the data memory or read data from it via the lines DRQ0, DACK and a DMA channel of the microprocessor. The handshake on the IEC/IEEE bus is handled automatically by the interface. Service requests are passed on to the CPU via the interrupt input INT1.

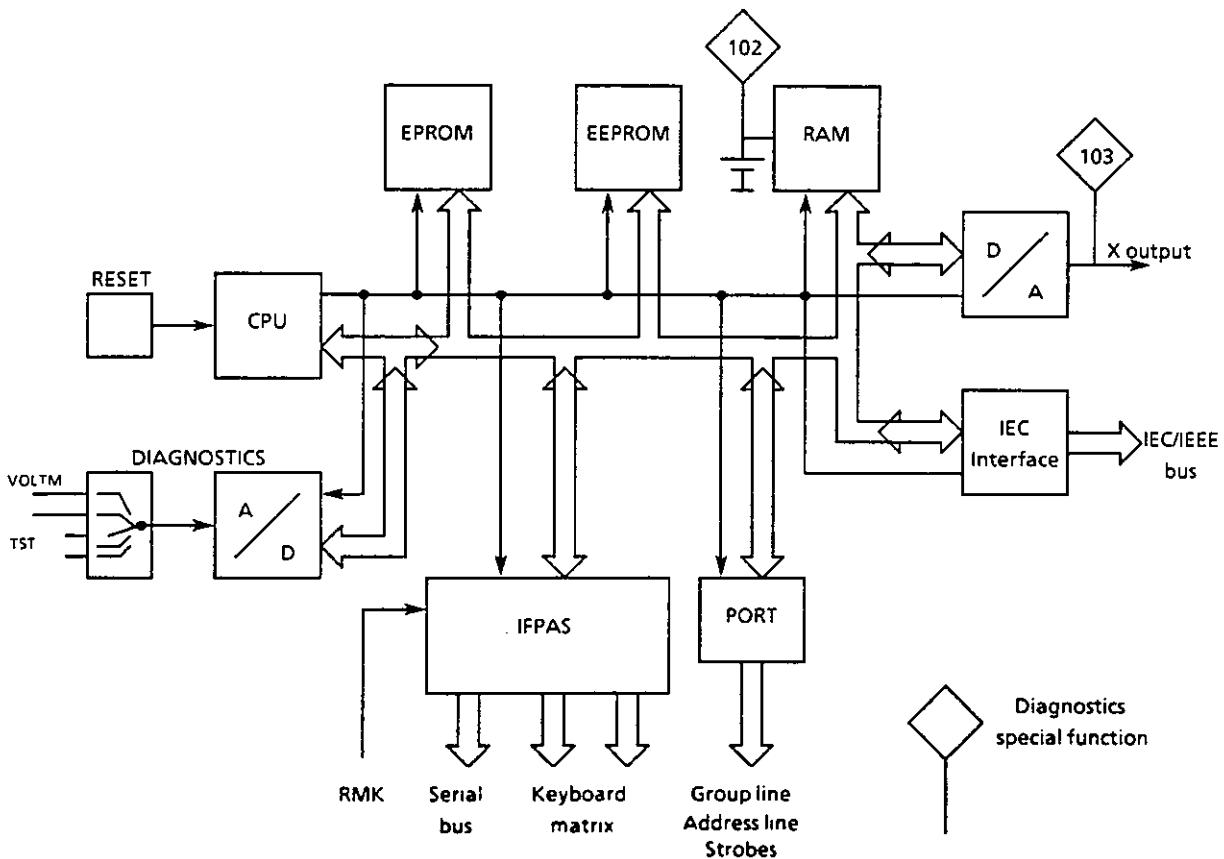


Fig. 5-1 Block diagram "Controller"

5.2 Testing and Adjustment

5.2.1 Checking the RAM Back-up Voltage

The battery voltage must be 3.2 V to 3.5 V at test point P160 without the supply voltage of the module.

5.2.2 Checking the Reference Voltage for the X Output

A reference voltage of 10.0 V to 10.4 V for the DAC should be measured at test point P350.

5.2.3 Adjusting the ADC (Diagnostics)

- Input: SHIFT SPEC 109
- Connect a DC voltage source of 0 to 5 V to plug X5A 12 (TST).

a) Offset adjustment

0 V: adjust display to 0.0 mV using R321.

b) Gain adjustment

5.000 V: adjust display to 5.000 V using R323.

5.4 Interfaces

5.4.1 Motherboard Interface

Test point	Type of line	Signal direction	Meaning	
X5, 1, 2, 5, 7, 9, 11, 20, 22, 24, 26, 30	⊥		GND	
3	TTL	I	INT ATT	Interrupt precision attenuator
4	TTL	I	INT AF	Interrupt AF
6	CMOS	O	TF.CLK	Serial data transmission
8	CMOS	O	TR.DAT	
10	TTL	I	RC.DAT	
12	DC	I	TST	Test input (-5V to +5V)
13	TTL	I	ALA	LOOP OK
14	CMOS	O	BA2	Subassembling address
15	CMOS	O	BA1	Subassembling address
16	CMOS	O	BA0	Subassembling address
17	CMOS	O	G2	Group line
18	CMOS	O	G1	Group line
19	CMOS	O	G0	Group line
21	DC		+15 V	Power supply
23	DC		-15 V	Power supply
25	DC		+12 V STB	STANDBY
27, 28, 29	DC		+5 L	Power supply
31	TTL	I	PWR.FAIL	Power fail
32	DC	O	PWR.ON	Power on following standby

5.4.2 IEC bus/X Output Interface

Test point	Type of line	Signal direction	Meaning	
X43A 1, 5, 6 B 1, 2, 3, 5 to 12	⊥		GND	
A14...17 B14...17	TTL	I/O	IEC/IEEE data bus	IEC/IEEE data bus
	TTL	I/O	IEC/IEEE data bus	
A12	TTL	I/O	DAV	IEC/IEEE control signals
A11	TTL	I/O	NRFD	
A10	TTL	I/O	NDAC	
A7	TTL	I/O	ATN	
A9	TTL	I/O	IFC	
A8	TTL	I/O	SRQ	
B13	TTL	I/O	REN	
A13	TTL	I/O	EOI	
A4	DC: 0 to +10 V	O	X OUTPUT	
B4	CMOS	O	MARKER	Programmable Z output
A3	CMOS	O	Polarity	
A2	TTL	I	Ext trigger	

5.4.3 Voltmeter Interface

X300, 1 -40 V to +40 V input Voltmeter input
 X300, 2 ⊥

5.4.4 Display/Keyboard Interface

Test point	Type of conductor	Signal direction	Meaning	
X31.A1, 5, 9, 10, 11 B1, 8, 10	⊥		GND	
X31.A6	DC	E	PWR.ON	Power on following standby
B19, 9	DC	A	+5 L	
B20	DC	A	+15 V	
A20	DC	A	+12 V STB	
A8	CMOS	A	DIS.RES	Reset
B2	CMOS	A	DIS.CLK	Serial data
A2	CMOS	A	DIS.DAT	transmission
A4	CMOS	A	C/D	Control of
B3	CMOS	A	DIS.STB1	LCD controller
A3	CMOS	A	DIS.STB2	
B4	CMOS	A	DIS.STB3	
B5	CMOS	A	LED.STB	Strobe for LED
B6	CMOS	E	DIS.BUSY	Handshake signal of LCD controller
A7	CMOS	E	DREHG.PULS	Tachogenerator
B7	CMOS	E	DREHG.DIR	information
B11 to B14 A12 to A15	DC	E	KEYB.COL	Key matrix
B15 to B18 A16 to A19	DC	E	KEYB.ROW	

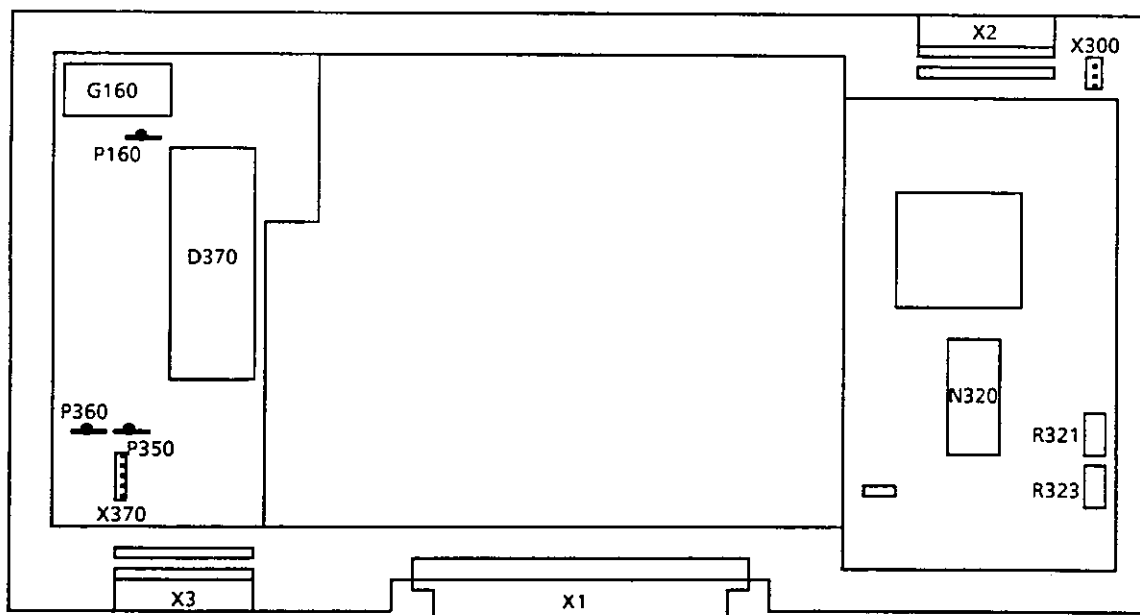


Fig. 5-2 Layout of test points and adjustment points

5.5 List of Required Test Equipment

- | | | |
|-------------------|------------|---------------|
| - DC voltmeter | (0 to 20V) | eg R&S URE |
| - DC power supply | (0 to 6V) | eg R&S NGT 20 |



ROHDE & SCHWARZ

Schaltteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées

Schémas de Circuit

Plans des composants

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B100	EQ 16,000000MHZ CL30HC43U CRYSTAL 16MHZ	EQ 0091.0321.00	PHILIPS	N. R&S SACHNUMMER	
C100	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C101	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C102	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C103	CE 4,7UF+-20%10V 5X 4X 7 ELECTROLYTIC CAPACITOR	CE 0022.8056.00	KEMET	T340 A475MD10 AS	
C110	CC 22PF+-2%4X5NPO CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C111	CC 22PF+-2%4X5NPO CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C117	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C120	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C125	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C130	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C135	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C140	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C145	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C150	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C160	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C170	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C175	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C180	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C181	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C190	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C191	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C200	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
..207					
C210	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W	
..217					
C220	CC 2,2NF+-10%5X6R2000 CAPACITOR	CC 0087.7060.00	PHILIPS_CO	2222 630 51222	
C221	CC 2,2NF+-10%5X6R2000 CAPACITOR	CC 0087.7060.00	PHILIPS_CO	2222 630 51222	
C222	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C225	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C235	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C240	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C245	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C250	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C255	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C260	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C261	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C262	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C265	CK 1,0NF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7598.00	ROEDERSTEI	KP1830-210 01 1 3 W	
C270	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
..275					

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C280 .287	CC 100PF+-2%63V6,5X9 NPO CAPACITOR	0092.7442.00	STETTNER	EGPZ	
C290	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C291	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C292	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C293	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C294	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C295	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C296	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C297	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C298	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C300	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C301	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C302	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C303	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C304	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C305	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C306 .309	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C320	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C321	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C322	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C323	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C324	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C325	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C330	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C335	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C350	CE 100UF+-20%25V RD8X9,5 ELECTROLYTIC CAPACITOR	0803.0580.00	MATSUSHITA	ECE-A1ESS-101	
C351	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C352	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C353	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C355	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C356	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C357	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C358	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C360	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C365	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C370	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C371	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C372	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C375	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	

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C380	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C390	CC 68PF+-2%6X7NPO CAPACITOR	CC 0087.6529.00	PHILIPS_CO	2222 678	
C392	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
D100	BC N80C186XL10 16B.EBC IC EMBEDDED PROCESSOR	BC 0007.7930.00	INTEL	N80C186XL12	
D107	BL PC74HCTOOP 4X2I.NAND QUAD 2-INPUT NAND GATE	0571.3394.00	PHILIPS_SE	(PC)74HCT00(N)	
D108	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D120	BL PC74HCT573P 8XD-LATCH OCTAL D-TYPE LATCH	0620.3146.00	PHILIPS_SE	(PC)74HCT573N(P)	
D125	BL MM74HC75N 4B.BIST.LA 4BIT BISTABLE LATCH	0099.9511.00	PHILIPS_SE	(PC)74HC75N(P)	
D130	BL PC74HCT573P 8XD-LATCH OCTAL D-TYPE LATCH	0620.3146.00	PHILIPS_SE	(PC)74HCT573N(P)	
D135	BC SOFTW.N.BESTUECKUNGSPL SOFTW. SEE COMPONENTSPLAN 819.0049 BP	0669.2808.90			
D140	BC SOFTW.N.BESTUECKUNGSPL SOFTW. SEE COMPONENTSPLAN 819.0049 BP	0669.2808.90			
D142	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D145	BC D2817A-3 2KX8 EEPROM EEPROM	0394.0248.00	ATMEL	AT28C17-25DC	
D150	BC D2817A-3 2KX8 EEPROM EEPROM	0394.0248.00	ATMEL	AT28C17-25DC	
D170	BC HM6264LP10 8KX8 SRAM SRAM	0813.9738.00	HYUNDAI	HY6264ALP-10	
D175	BC HM6264LP10 8KX8 SRAM SRAM	0813.9738.00	HYUNDAI	HY6264ALP-10	
D225	BG CLA3726 IFPAS ASIC IC GATEARRAY	0801.8348.00	PLESSEY	CLA3726(PLCC)	
D235	BL PC74HCT86P 4X2IN EXOR QUAD 2-INPUT EXOR GATE	0266.7228.00	PHILIPS	(PC)74HCT86N(P)	
D240	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D245	BL PC74HCT74P 2XD-FF DUAL D-FLIP-FLOP	0571.3436.00	PHILIPS_SE	(PC)74HCT74N(P)	
D250	BL PC74HCT08P 4X2IN AND QUAD 2-INPUT AND GATE	0571.3413.00	PHILIPS	(PC)74HCT08N(P)	
D255	BL PC74HCT123P 2MULTIVIB DUAL MONOST.MULTIVIBRATOR	0352.7367.00	PHILIPS	(PC)74HCT123N(P)	
D260	BL PC74HCT138P LINE DEC 1-OF-8 DECODER/DEMUX	0571.3459.00	PHILIPS	(PC)74HCT138N(P)	
D265	BL PC74HCT244P 8XBUFF.3S OCTAL BUFFER	0352.7473.00	PHILIPS_SE	(PC)74HCT244N(P)	
D270	BL PC74HCT273P 8XD-FF CL OCTAL D-FLIPFLOP	0815.8080.00	PHILIPS_SE	(PC)74HCT273N(P)	
D275	BL MM74HC259N 8B.A.LATCH 8 BIT ADDRESSABLE LATCH	0394.9097.00	PHILIPS_SE	(PC)74HC259N(P)	
D280	BL PC74HCT08P 4X2IN AND QUAD 2-INPUT AND GATE	0571.3413.00	PHILIPS	(PC)74HCT08N(P)	
D285	BL PC74HCT04P 6XINVERT. HEX-INVERTER	0379.6726.00	PHILIPS	(PC)74HCT04N(P)	
D300	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D310	BL MM74HC259N 8B.A.LATCH 8 BIT ADDRESSABLE LATCH	0394.9097.00	PHILIPS_SE	(PC)74HC259N(P)	
D325	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D330	BL PC74HCT244P 8XBUFF.3S OCTAL BUFFER	0352.7473.00	PHILIPS_SE	(PC)74HCT244N(P)	
D335	BL PC74HCT244P 8XBUFF.3S OCTAL BUFFER	0352.7473.00	PHILIPS_SE	(PC)74HCT244N(P)	
D360	BL PC74HCT273P 8XD-FF CL OCTAL D-FLIPFLOP	0815.8080.00	PHILIPS_SE	(PC)74HCT273N(P)	
D365	BL PC74HCT273P 8XD-FF CL OCTAL D-FLIPFLOP	0815.8080.00	PHILIPS_SE	(PC)74HCT273N(P)	
D370	BC UPD7210C GPIB IF CONTR GPIB INTERFACE CONTROLLER	BC 0620.3130.00	NEC	(UP)D7210C	
D375	BJ SN75160AN 8XBUS TRANSC BUS TRANSCEIVER	BJ 0345.6517.00	TEXAS	SN75160BN	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D380	BJ SN75161AN 8XBUS TRANC BUS TRANSCEIVER	BJ 0345.6523.00	TEXAS	SN75161BN	
G160	EB 3,4V LITHIUM-BATTERIE LI BATTERY	0565.1687.00	ACCU_SONNE	SL-750/P/009 1110750	
L260	LD 25UH 3A 0,0460HM CHOKE	LD 0026.4849.00	SIEMENS	B82111-B-C24	
L292	LD 150UH BEI 0,17A 6,20HM CHOKE	LD 0026.4055.00	DALE	IM 6	
L295	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L298	LD 150UH BEI 0,17A 6,20HM CHOKE	LD 0026.4055.00	DALE	IM 6	
N101	BO TL7705ACP UPSUPERVISOR IC RESET/POWER-CONTROLLER	0347.1170.00	TEXAS	TL7705ACP	
N304	BO LF156J FET OPAMP OPERATIONAL AMPLIFIER	BO 0645.7251.00	ANALOG_DEV	PM156Z	
N308	BS TL601CP 1X ANALOGSCH ANALOG SWITCH	BJ 0213.4530.00	TEXAS	TL601CP [MJG]	
N320	BJ AD574AKD 1X12B-ADC A/D-CONVERTER	0006.9774.00	ANALOG_DEV	AD-574AKD	
N350	BO LF412CN 2XFET OPAMP OPERATIONAL AMPLIFIER	0356.0521.00	NSC	LF412CN	
N355	BJ AM6012F 1X12B-DAC D/A-CONVERTER	0805.1425.00	SIGNETICS	AM6012F	
N370	EO 4,00000MHZ-QU.OSZ. 5V CLOCK OSZILLATOR	0377.4232.00	PHILIPS_CO	XO 5860 W(XO 5850 W)	
R100	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R101	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R102	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R103	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R104	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R105	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R106	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R107	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R110	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R111	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R112	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R113	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R114	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R115	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R116	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R117	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R118	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R125	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R129	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R130	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R145	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R160	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R161	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R162	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R180	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R181	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R190	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R191	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R195	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R196	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R200	RN 9X3,3KOHM+-2%SIL10 H5 RESISTOR NETWORK	RN 0340.2765.00	BI_TECHNOL	L 10 1 S 332 M*	
R210 . . 217	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R220	RN 9X47 KOHM+-2% SIL10 H5 RESISTOR NETWORK	RN 0341.9286.00	BOURNS	4610X-T09-473	
R232	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R233	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R235	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R236	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R237	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R240	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R241	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R245	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R246	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R247	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R248	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R250	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R251	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R252	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R253	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R254	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R255	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R256	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R257	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R260	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R270 . . 275	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R276	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R280 . . 290	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R295	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R299	RL 0,35W42,7KOHM+-0,1%T25 RESISTOR	RL 0084.4277.00	DRALORIC	SMA0207	
R300	RL 0,60W 866 KOHM+-1%TK50 METAL-FILM-RESISTOR	RL 0083.2835.00	RESISTA	MK2	
R301	RL 0,35W100KOHM+-0,1%TK25 RESISTOR	RL 0084.4983.00	DRALORIC	SMA0207	
R302	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R303	RL 0,60W 2,05KOHM+-1%TK50 RESISTOR	RL 0083.0832.00	RESISTA	MK2	
R304	RL 0,60W 1MOHM+-1%TK50 RESISTOR	RL 0082.7862.00	RESISTA	MK2	
R305	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R306	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R308	RL 0,35W13,5KOHM+-0,1%T25 RESISTOR	RL 0084.3312.00	ROEDERSTEI	MK2	
R309	RL 0,35W1,50KOHM+-0,1%T25 RESISTOR	RL 0083.9481.00	DRALORIC	SMA0207	
R310	RL 0,60W 68,1KOHM+-1%TK50 RESISTOR	RL 0082.2602.00	RESISTA	MK2	
R311	RL 0,60W 27,4KOHM+-1%TK50 RESISTOR	RL 0082.2583.00	RESISTA	MK2	
R320	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R321	RS 0,5W100 OHM+-10%10X10X CERMET POTENTIOMETER	RS 0247.7932.00	SPECTROL	63X ... T010	
R322	RL 0,60W 49,9 OHM+-1%TK50 RESISTOR	RL 0082.9520.00	DRALORIC	SMA 0207	
R323	RS 0,5W200 OHM+-10%10X10X CERMET POTENTIOMETER	RS 0247.7949.00	BI_TECHNOL	72X-R	
R335	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R336	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R337	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R339	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R350	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R351	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R355	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMA0207	
R356	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMA0207	
R357	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R358	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R359	RL 0,35W2,49KOHM+-0,1%T25 RESISTOR	RL 0083.9900.00	DRALORIC	SMA0207	
R360	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R363	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R365	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R371	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R372	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R379	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R390	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
V103	AK BCY79IX P 45V 200MA TRANSISTOR	AK 0010.3777.00	VALVO	BCY79IX	
V105	AE BZX79B3V3 2% 0.5W ZDI ZENER	AE 0008.7704.00	PHILIPS_SE	BZX79B3V3	
V160	AK BCY79IX P 45V 200MA TRANSISTOR	AK 0010.3777.00	VALVO	BCY79IX	
V161	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
V162	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V163	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V260	AE ICT5/1N5907 5V SUPPR SUPPRESSOR DIODE	AE 0012.5502.00	GEN_SEMICO	ICT5 (1N5907)	
V303	AE BZX55/B4V7 0,5W ZDI ZENER DIODE	AE 0080.4014.00	VALVO	BZX79B4V7	
V310	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
V390	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
X5	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X6	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR 10-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X235	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR 2-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X300	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 2-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X335	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR 3-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X370	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR 5-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X31A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 20-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X31B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 20-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X4A	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR 12-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X4B	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR 12-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X43A	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 17-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X43B	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 17-POLIG/PINS	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	

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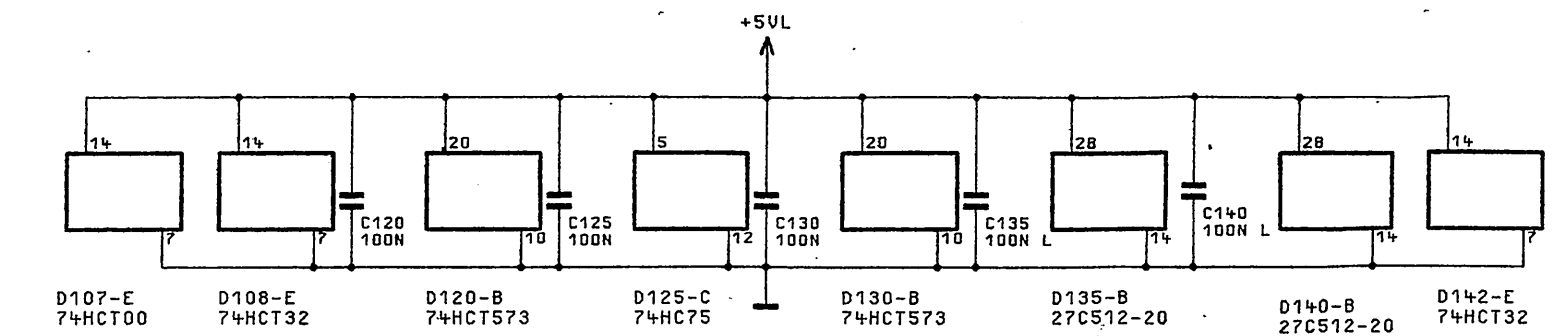
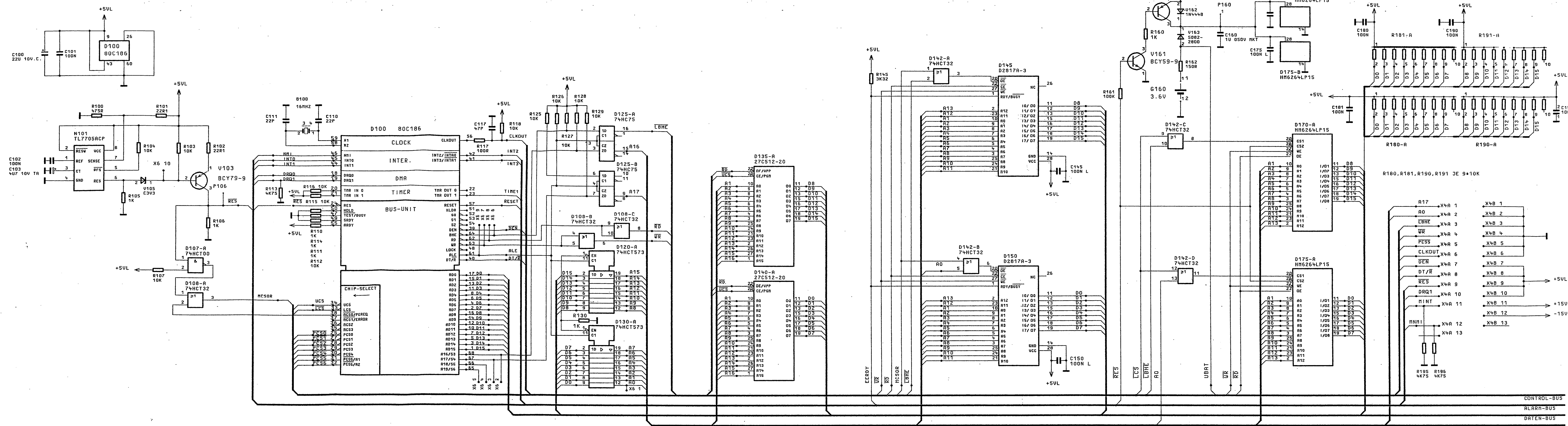
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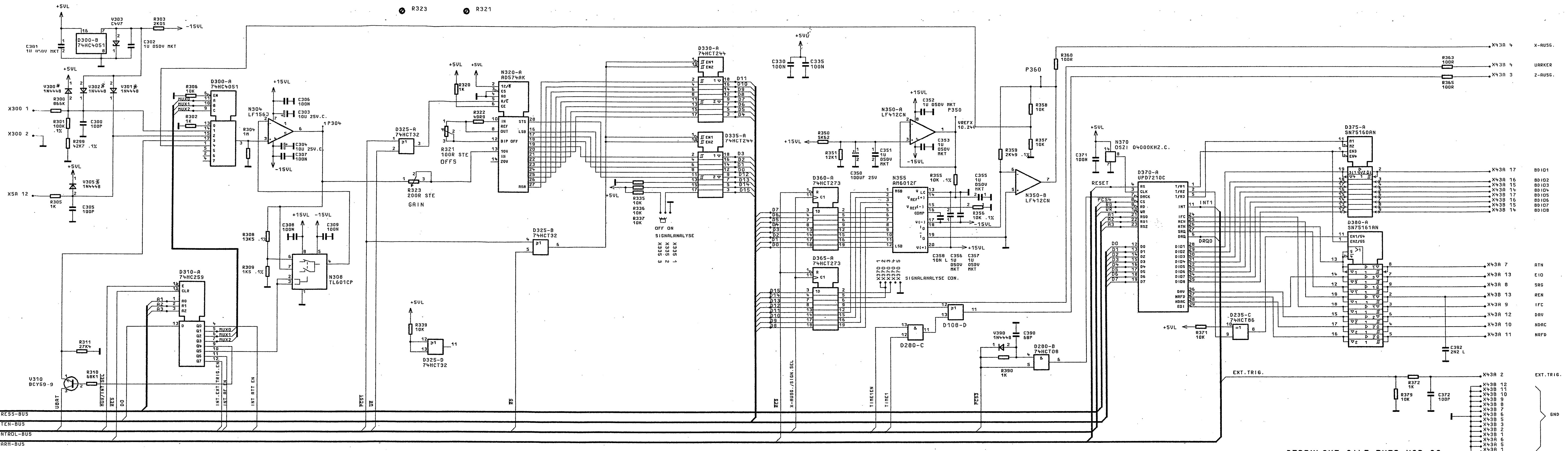
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STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

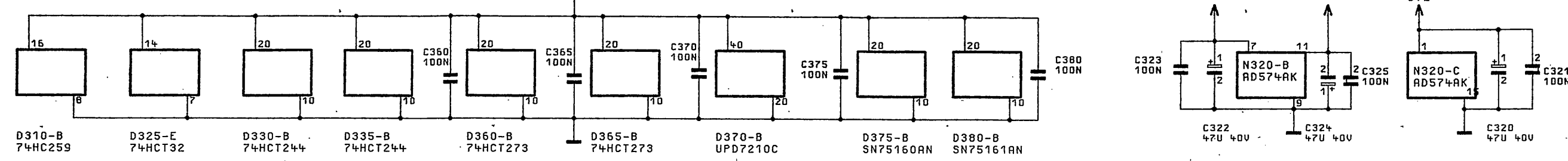
ACHTUNG: ESB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.
ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

E	43071	11.89	DR	1KGB	TAG	NAME	BENENNUNG	
F	44800	05.90	HM	BEARR.		DOR	RECHNER	
08	44823	11.90	DR	GEPR.		DR	MICROPROCESSOR	
				NDR				
				PLOTT	5.10.89	*		
REND. IND.							ZEICHN.-NR.	1
RENDERUNGS-NITTEILUNG							ROHDE&SCHWARZ	819.2164.015
DATUM							REG. I.V.	819.0010
NAME							ERSTE Z.	
ZU GERÄT							SMGU	
BLATT-NR.							1	
V. 3							BL.	



STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

* nicht bestückt/
not in PCB

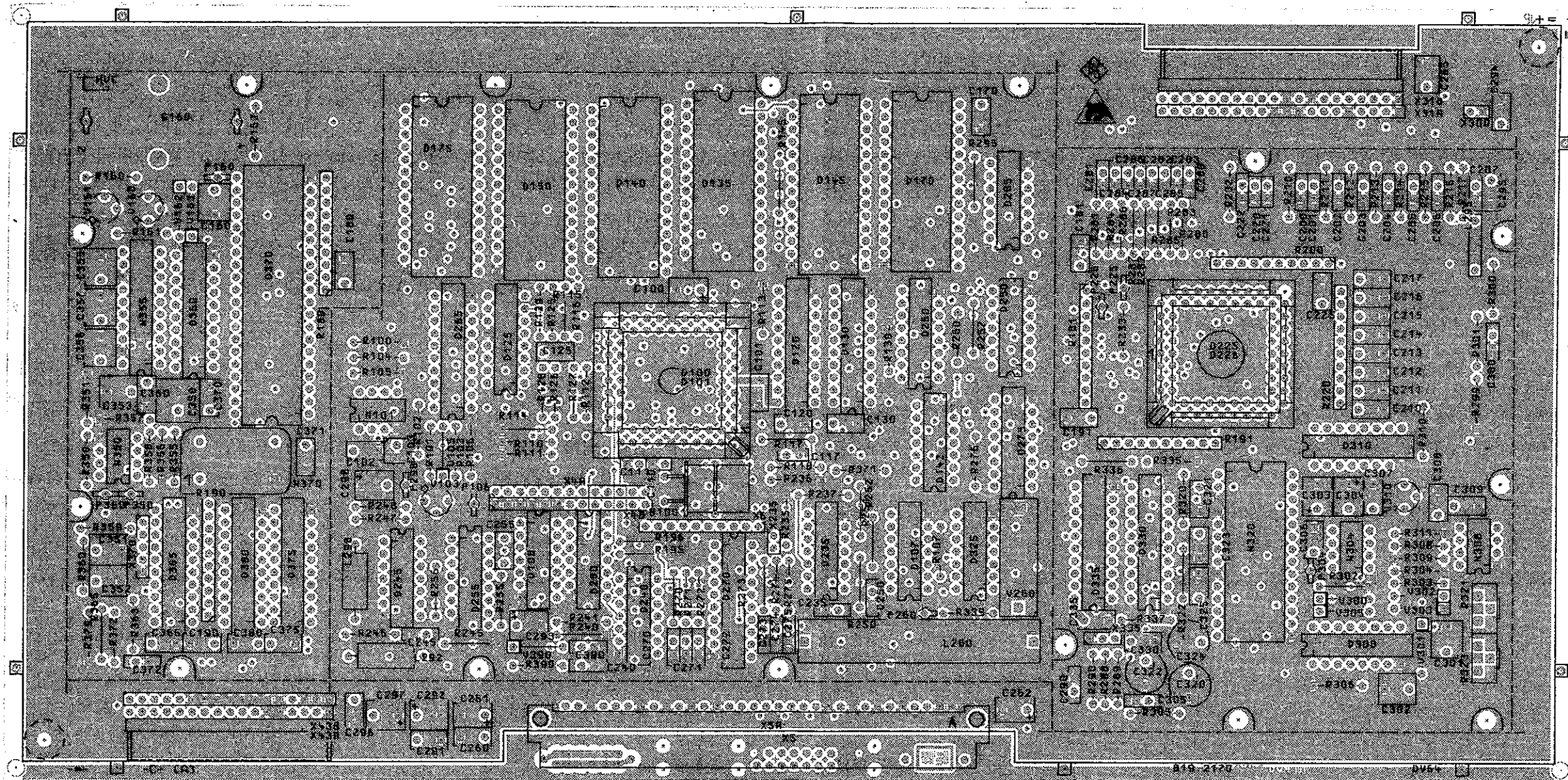


ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

E	43071	11.89	DR	1KGB	TAG	NAME	BENENNUNG	
F	44800	05.90	HM	BEARB.		DOR	RECHNER	
08	44823	11.90	DR	GEPR.		DR	MICROPROCESSOR	
				NORM				
				PLOTT	5.10.89	*		
							ZEICHN.-NR.	BLATT-NR.
							819.2164.015	3
REND. IND.	ÄNDERUNGS-NITTEILUNG	DATUM	NAM	ZU GERÄT	SMGU	REG. I. V.	819.0010	ERSTE Z.

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Ansicht und Leitungsfuehrung Bauteilseite
View of tracks on component side

DV41

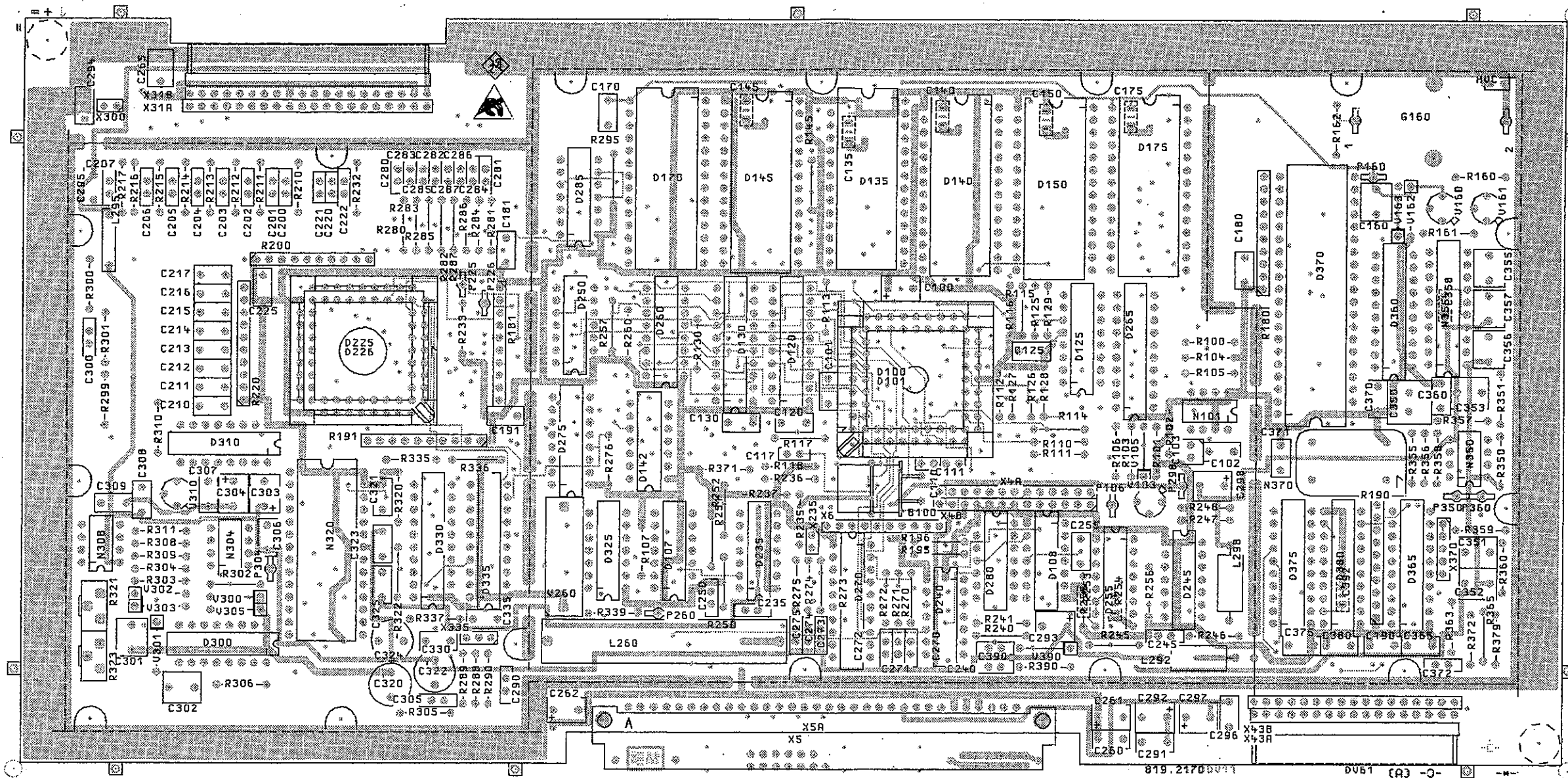
(hierzu MVC 250)



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

E	43071	11.89	DR	Mafle ohne Toleranzangabe	Maßstab 1 : 1	
					Halbzeug, Werkstoff	
				1KGB Tag Name	Benennung	RECHNER Z
				Bearb. 08.89 DR		
				Gepr. Norm		
					Zeichn.-Nr.	Blatt-Nr.
				ROHDE & SCHWARZ	819.2164	3
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	zu Gerät SMGU	reg. i. V. 819.0010 V	v. Bl.
					erste Z.	

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Ansicht und Leitungsfuehrung Loetseite
View of tracks on solder side
DV11

(hierzu HVIC 258)



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

E	43071	11.89	DR	Maße ohne Toleranzangabe	Maßstab 1 : 1			
					Halbzeug, Werkstoff			
				1KGB Tag Name	Benennung		Z	
				Bearb. 08.89 DR	RECHNER			
				Gepr.				
				Norm				
					Zeichn.-Nr.	819.2164	Blatt-Nr. 6	
And. Zust.	Änderungs-Mitteilung	Tag	Name		zu Gerät SMGU	reg. i. V. 819.0010 V	erste Z.	v. Bl.

BESTUECKUNGSPLAN / COMPONENTS PLAN

BENENNUNG SOFTWARE SOFTWARE DESIGNATION		BEN. DER ZUEH. INFORMATIONSTRAEGER NAMES OF APPERTAINING DATA MEDIA	SACHNUMMER STOCK NO
		HS EPROM-KIT RECHNER	819.2764.02
EL. KENNZEICHEN DER BAUGRUPPE EL. DESIGNATION OF SUBASSEMBLY	EL. KENZ. DES PROG. INFOTRAEGERS EL. DESIGNATION OF DATA MEDIA USED	BENENNUNG DESIGNATION	SACHNUMMER STOCK NO
A5		EE RECHNER OHNE SOFTWARE PROCESSOR WITHOUT SOFTWARE	819.2164.02
	D135	HS 27C512-20 PROG. (D135)	819.2770
	D140	HS 27C512-20 PROG. (D140)	819.2787

PRUEFANWEISUNG / TESTING INSTRUCTIONS : T

ANMERKUNG: BESTEHT EINE SOFTWARE AUS MEHREREN INFORMATIONSTRAEGERN, MUESSEN BEI AUSTAUSCH
IMMER ALLE INFORMATIONSTRAEGER DIESER SOFTWARE GEWECHSELT WERDEN !!
(ADRESSENAENDERUNG MOEGLICH !)


NOTE: IF SOFTWARE IS STORED ON SEVERAL DATA MEDIA, ALL MEDIA MUST BE EXCHANGED IN CASE OF
A REPLACEMENT OF SOFTWARE (ADDRESS-MODIFICATIONS POSSIBLE !)

R O H D E & S C H W A R Z				DRUCK	ABT	NAME	BENENNUNG / DESIGNATION :	
				11.04.89	1KGB	LS	BESTUECKUNGSPLAN	
				TYP	:	SMGU	ZEICHN.-NR./DRAWING NO	BLATT
AEI	AEND.M.	DATUM	NAME	REG.I.V	819.0010.00	V	819.0049.00	BP v.

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
B100	EQ 16,000000MHZ CL30HC43U CRYSTAL 16MHZ	EQ 0091.0321.00	PHILIPS	N. R&S SACHNUMMER	
C100	CE 22UF+-20%10V SAL ELECTR. CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C101	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C102	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C103	CE 4,7UF+-20%10V 5X 4X 7 ELECTROLYTIC CAPACITOR	CE 0022.8056.00	KEMET	T340 A475M010 AS	
C110	CC 22PF+-2%4X5NPO CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C111	CC 22PF+-2%4X5NPO CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C117	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C120	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C125	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C130	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C135	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C140	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C145	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C150	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C160	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C170	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C175	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C180	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C181	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C190	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C191	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C200	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
..207					
C210	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W	
..217					
C220	CC 2,2NF+-10%5X6R2000 CAPACITOR	CC 0087.7060.00	PHILIPS_CO	2222 630 51222	
C221	CC 2,2NF+-10%5X6R2000 CAPACITOR	CC 0087.7060.00	PHILIPS_CO	2222 630 51222	
C222	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C225	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C235	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C240	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C245	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C250	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C255	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C260	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C261	CE 22UF+-20%10V SAL ELECTR. CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C262	CE 22UF+-20%10V SAL ELECTR. CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C265	CK 1,0NF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7598.00	ROEDERSTEI	KP1830-210 01 1 3 W	
C270	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	


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		11	04.02.98	EE RECHNER	1002.5258.01 SA	1+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C271	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C272	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
..275	CAPACITOR				
C280	CC 100PF+-2% 63V NPO CAPACITOR	0092.7442.10	STETTNER	EGPZ	
..287	CAPACITOR				
C290	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C291	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C292	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C293	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C294	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
..296	CAPACITOR				
C297	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C298	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C300	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C301	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C302	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C303	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C304	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C305	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C306	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
..309	CAPACITOR				
C320	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C321	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C322	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C323	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C324	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C325	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C330	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C335	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C350	CE 100UF+-20%25V RD8X9,5 ELECTROLYTIC CAPACITOR	0803.0580.00	MATSUSHITA	ECE-A1ESS-101	
C351	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
..353	CAPACITOR				
C355	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
..357	CAPACITOR				
C358	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C360	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C365	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C370	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C371	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C372	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C375	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C380	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C390	CC 68PF+-2%6X7NPO CAPACITOR	CC 0087.6529.00	PHILIPS_CO	2222 678	
C392	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	

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		11	04.02.98	EE RECHNER	1002.5258.01 SA	2+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D100	BC N80C186XL10 16B.EBC IC EMBEDDED PROCESSOR	BC 0007.7930.00	INTEL	N80C186XL12	
D107	BL PC74HCT00P 4X2I.NAND QUAD 2-INPUT NAND GATE	0571.3394.00	PHILIPS_SE	(PC)74HCT00(N)	
D108	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D120	BL PC74HCT573P 8XD-LATCH OCTAL D-TYPE LATCH	0620.3146.00	PHILIPS_SE	(PC)74HCT573N(P)	
D125	BL MM74HC75N 4B.BIST.LA 4BIT BISTABLE LATCH	0099.9511.00	PHILIPS_SE	(PC)74HC75N(P)	
D130	BL PC74HCT573P 8XD-LATCH OCTAL D-TYPE LATCH	0620.3146.00	PHILIPS_SE	(PC)74HCT573N(P)	
D135	BC SOFTW.N.BESTUECKUNGSP	0669.2808.90			
D140	SOFTW. SEE COMPONENTSPLAN	0669.2808.90			
D142	BC SOFTW.N.BESTUECKUNGSP				
D142	SOFTW. SEE COMPONENTSPLAN				
D142	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D145	BC D2817A-3 2KX8 EEPROM	0394.0248.00	ATMEL	AT28C17-25DC	
D150	BC D2817A-3 2KX8 EEPROM	0394.0248.00	ATMEL	AT28C17-25DC	
D170	BC TC551001FL 128KX8 SRAM STATIC RAM 128KX8	1046.3938.00	HYUNDAI	HY628100ALLG-70	
D175	BC TC551001FL 128KX8 SRAM STATIC RAM 128KX8	1046.3938.00	HYUNDAI	HY628100ALLG-70	
D225	BG CLA3726 IFPAS ASIC IC GATEARRAY	0801.8348.00	PLESSEY	CLA3726(PLCC)	
D235	BL PC74HCT86P 4X2IN EXOR QUAD 2-INPUT EXOR GATE	0266.7228.00	PHILIPS	(PC)74HCT86N(P)	
D240	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D245	BL PC74HCT74P 2XD-FF DUAL D-FLIP-FLOP	0571.3436.00	PHILIPS_SE	(PC)74HCT74N(P)	
D250	BL PC74HCT08P 4X2IN AND QUAD 2-INPUT AND GATE	0571.3413.00	PHILIPS	(PC)74HCT08N(P)	
D255	BL PC74HCT123P 2MULTIVIB DUAL MONOST.MULTIVIBRATOR	0352.7367.00	PHILIPS	(PC)74HCT123N(P)	
D260	BL PC74HCT138P LINE DEC 1-OF-8 DECODER/DEMUX	0571.3459.00	PHILIPS	(PC)74HCT138N(P)	
D265	BL PC74HCT244P 8XBUFF.3S OCTAL BUFFER	0352.7473.00	PHILIPS_SE	(PC)74HCT244N(P)	
D270	BL PC74HCT273P 8XD-FF CL OCTAL D-FLIPFLOP	0815.8080.00	PHILIPS_SE	(PC)74HCT273N(P)	
D275	BL MM74HC259N 8B.A.LATCH 8 BIT ADDRESSABLE LATCH	0394.9097.00	PHILIPS_SE	(PC)74HC259N(P)	
D280	BL PC74HCT08P 4X2IN AND QUAD 2-INPUT AND GATE	0571.3413.00	PHILIPS	(PC)74HCT08N(P)	
D285	BL PC74HCT04P 6XINVERT. HEX-INVERTER	0379.6726.00	PHILIPS	(PC)74HCT04N(P)	
D300	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D310	BL MM74HC259N 8B.A.LATCH 8 BIT ADDRESSABLE LATCH	0394.9097.00	PHILIPS_SE	(PC)74HC259N(P)	
D325	BL PC74HCT32P 4X2IN.ORG QUAD 2-INPUT OR GATE	BL 0571.3420.00	PHILIPS	(PC)74HCT32N(P)	
D330	BL PC74HCT244P 8XBUFF.3S OCTAL BUFFER	0352.7473.00	PHILIPS_SE	(PC)74HCT244N(P)	
D335	BL PC74HCT244P 8XBUFF.3S OCTAL BUFFER	0352.7473.00	PHILIPS_SE	(PC)74HCT244N(P)	
D360	BL PC74HCT273P 8XD-FF CL OCTAL D-FLIPFLOP	0815.8080.00	PHILIPS_SE	(PC)74HCT273N(P)	
D365	BL PC74HCT273P 8XD-FF CL OCTAL D-FLIPFLOP	0815.8080.00	PHILIPS_SE	(PC)74HCT273N(P)	
D370	BC UPD7210C GPIB IF CONTR GPIB INTERFACE CONTROLLER	BC 0620.3130.00	NEC	(UP)D7210C	
D375	BJ SN75160AN 8XBUS TRANSC BUS TRANSCEIVER	BJ 0345.6517.00	TEXAS	SN75160BN	
D380	BJ SN75161AN 8XBUS TRANSC BUS TRANSCEIVER	BJ 0345.6523.00	TEXAS	SN75161BN	
G160	EB 3,4V LITHIUM-BATTERIE LI BATTERY	0565.1687.00	ACCU_SONNE	SL-750/P/009 1110750	
L260	LD 25UH 3A 0,046OHM CHOKE	LD 0026.4849.00	SIEMENS	B82111-B-C24	
L292	LD 150UH BEI 0,17A 6,2OHM CHOKE	LD 0026.4055.00	DALE	IM 6	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L295	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L298	LD 150UH BEI 0,17A 6,2OHM CHOKE	LD 0026.4055.00	DALE	IM 6	
N101	BO TL7705ACP UPSUPERVISOR IC RESET/POWER-CONTROLLER	0347.1170.00	TEXAS	TL7705ACP	
N304	BO LF156J FET OPAMP OPERATIONAL AMPLIFIER	BO 0645.7251.00	ANALOG_DEV	PM156Z	
N308	BS TL601CP 1X ANALOGSCH ANALOG SWITCH	BJ 0213.4530.00	TEXAS	TL601CP [MJG]	
N320	BJ AD574AKD 1X12B-ADC A/D-CONVERTER	0006.9774.00	ANALOG_DEV	AD-574AKD	
N350	BO LF412CN 2XFET OPAMP OPERATIONAL AMPLIFIER	0356.0521.00	NSC	LF412CN	
N355	BJ AM6012F 1X12B-DAC D/A-CONVERTER	0805.1425.00	SIGNETICS	AM6012F	
N370	EO 4,000000MHZ-QU.OSZ. 5V CLOCK OSZILLATOR	0377.4232.00	PHILIPS_CO	XO 5860 W(XO 5850 W)	
R100	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R101	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R102	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R103	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R104	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R105	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R106	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R107	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R110	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R111	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R112	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R113	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R114	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R115	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R116	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R117	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R118	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R125	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R129	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R130	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R145	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R160	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R161	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R162	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R180	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R181	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R190	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R191	RN 9X 10KOHM+-SIL10 H5 RESISTOR NETWORK	RN 0343.4523.00	BI_TECHNOL	L 10 1 S 103 M*	
R195	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R196	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R200	RN 9X3,3KOHM+-2% RESISTOR NETWORK	RN 0340.2765.00	BI_TECHNOL	L 10 1 S 332 M*	
R210 . . 217	RL 0,60W 100 OHM+-1% RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R220	RN 9X47 KOHM+-2% RESISTOR NETWORK	RN 0341.9286.00	BOURNS	4610X-T09-473	
R232	RL 0,60W 1KOHM+-1% RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R233	RL 0,60W 100KOHM+-1% RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R235 . . 237	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R240	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R241	RL 0,60W 100 OHM+-1% RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R245	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R246	RL 0,60W 100 OHM+-1% RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R247	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R248	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R250	RL 0,60W 100 OHM+-1% RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R251	RL 0,60W 22,1KOHM+-1% RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R252	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R253	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CD	RC02	
R254	RG 10,0KOHM+-1%TK100 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CD	RC02	
R255	RL 0,60W 100KOHM+-1% RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R256	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R257	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R260	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R270 . . 275	RL 0,60W 100 OHM+-1% RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R276	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R280 . . 290	RL 0,60W 100 OHM+-1% RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R295	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R299	RL 0,35W42,7KOHM+-0,1% RESISTOR	RL 0084.4277.00	DRALORIC	SMA0207	
R300	RL 0,60W 866 KOHM+-1% METAL-FILM-RESISTOR	RL 0083.2835.00	RESISTA	MK2	
R301	RL 0,35W100KOHM+-0,1% RESISTOR	RL 0084.4983.00	DRALORIC	SMA0207	
R302	RL 0,60W 1KOHM+-1% RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R303	RL 0,60W 2,05KOHM+-1% RESISTOR	RL 0083.0832.00	RESISTA	MK2	
R304	RL 0,60W 1MOHM+-1% RESISTOR	RL 0082.7862.00	RESISTA	MK2	
R305	RL 0,60W 1KOHM+-1% RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R306	RL 0,60W 10,0KOHM+-1% RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R308	RL 0,35W13,5KOHM+-0,1% RESISTOR	RL 0084.3312.00	ROEDERSTEI	MK2	
R309	RL 0,35W1,50KOHM+-0,1% RESISTOR	RL 0083.9481.00	DRALORIC	SMA0207	
R310	RL 0,60W 68,1KOHM+-1% RESISTOR	RL 0082.2602.00	RESISTA	MK2	
R311	RL 0,60W 27,4KOHM+-1% RESISTOR	RL 0082.2583.00	RESISTA	MK2	
R320	RL 0,60W 1KOHM+-1% RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R321	RS 0,5W100 OHM+-10% CERMET POTENTIOMETER	RS 0247.7932.00	SPECTROL	63X ... T010	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R322	RL 0,60W 49,9 OHM+-1%TK50 RESISTOR	RL 0082.9520.00	DRALORIC	SMA 0207	
R323	RS 0,5W200 OHM+-10%10X10X CERMET POTENTIOMETER	RS 0247.7949.00	BI_TECHNOL	72X-R	
R335 . . 337	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R339	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R350	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R351	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R355	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMA0207	
R356	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMA0207	
R357	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R358	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R359	RL 0,35W2,49KOHM+-0,1%T25 RESISTOR	RL 0083.9900.00	DRALORIC	SMA0207	
R360	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R363	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R365	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R371	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R372	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R379	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R390	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
V103	AK BCY79IX P 45V 200MA TRANSISTOR	AK 0010.3777.00	VALVO	BCY79IX	
V105	AE BZX79B3V3 2% 0.5W ZDI ZENER	AE 0008.7704.00	PHILIPS_SE	BZX79B3V3	
V160	AK BCY79IX P 45V 200MA TRANSISTOR	AK 0010.3777.00	VALVO	BCY79IX	
V161	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
V162	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V163	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V260	AE ICT5/1N5907 5V SUPPR SUPPRESSOR DIODE	AE 0012.5502.00	GEN_SEMICO	ICT5 (1N5907)	
V303	AE BZX55/B4V7 0,5W ZDI ZENER DIODE	AE 0080.4014.00	VALVO	BZX79B4V7	
V310	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
V390	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
X5	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
X6	FP STIFTL. WIN 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X235	FP STIFTL. WIN 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X300	FP STIFTL. WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X335	FP STIFTL. WIN 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X31A	FP STIFTL. WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	
X31B	FP STIFTL. WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	

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11

Datum
Date
04.02.98

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Schaltteilliste für
Parts list for

Sachnummer
Stock No.

1002.5258.01 SA


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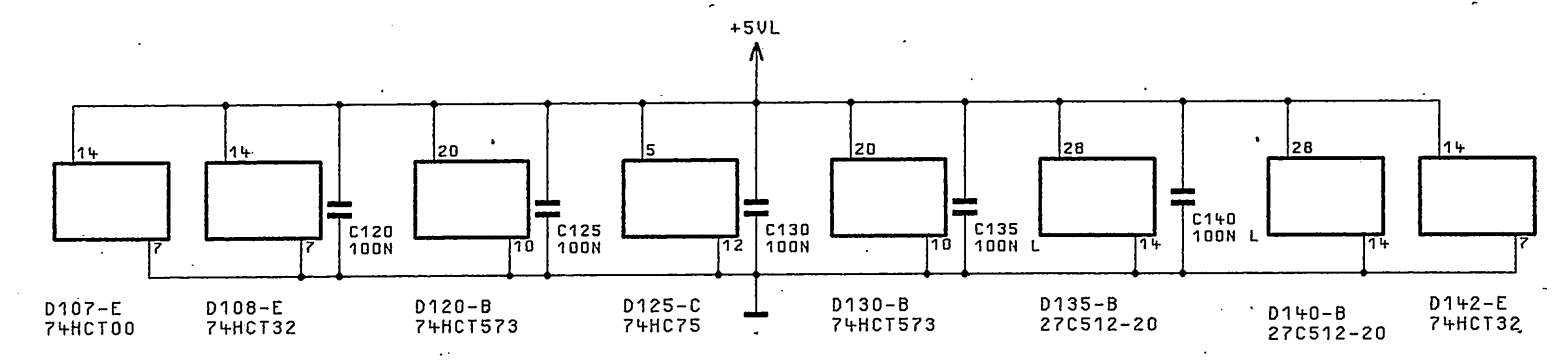
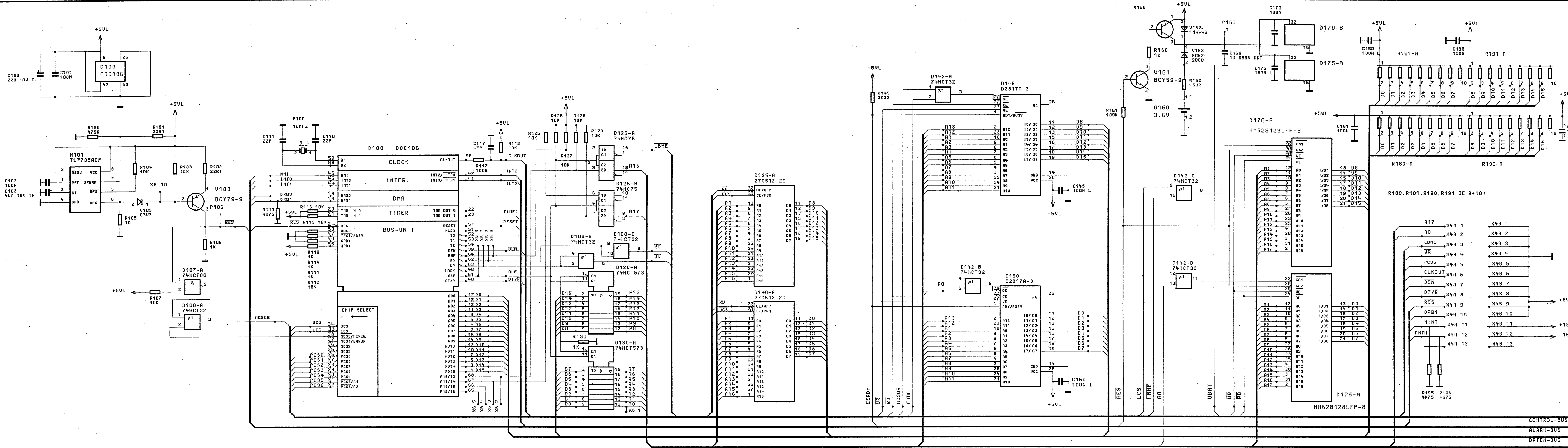
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X4A	20-POLIG FP STIFTL. LEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X4B	13-POLIG FP STIFTL. LEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X43A	17-POLIG FP STIFTL. WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X43B	17-POLIG FP STIFTL. WIN 36P.R2,54 ANGLE PIN CONNECTOR	FP 0087.9105.00	BINDER	742-5-11-0191-00-36	

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STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

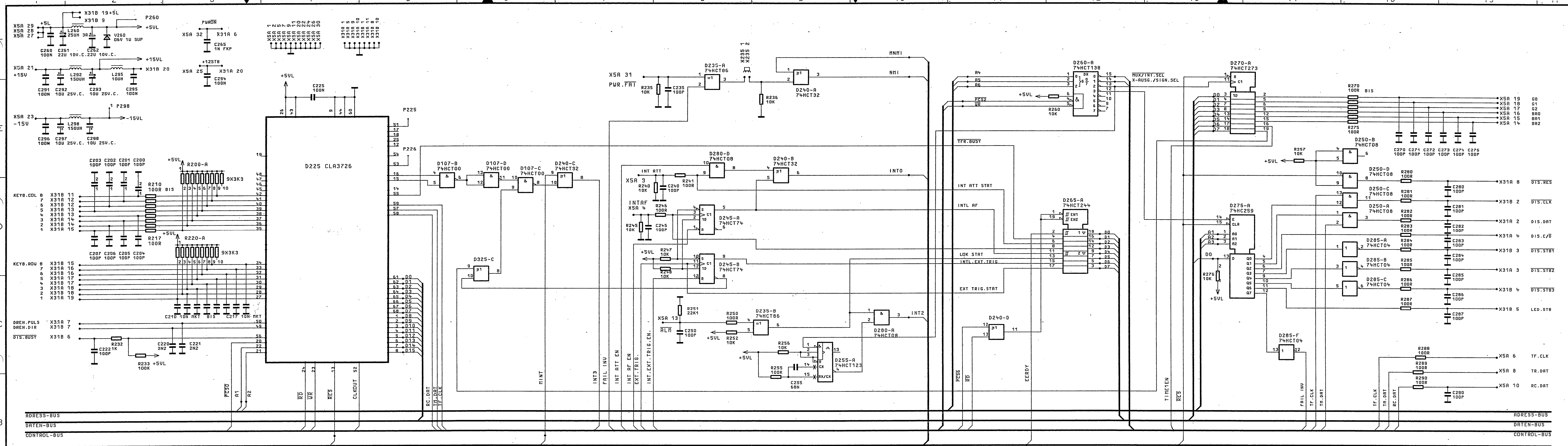
ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

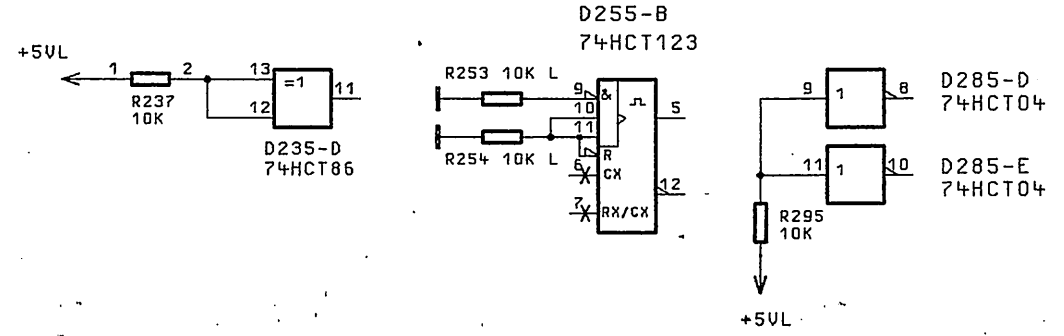
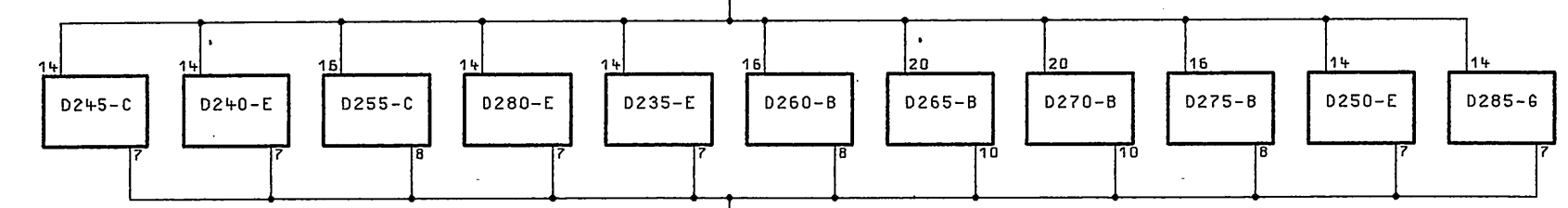
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BEARB.		DOR	
GEPR.		DOR	
NORM			
PLOTT	4.10.89	*	
			ZEICHN.-NR. 1002.5258.01S
REND. IND.	RENDERUNGS-MITTEILUNG	DATUM	NAMEN
ZU GERÄT SMGU			REG.I.V. 819.0010 ERSTE Z.
BLATT-NR. 1			v. 3 BL.

BEHALTEN WIR UNS ALLE RECHTE VOR

ZEICHN.-NR.



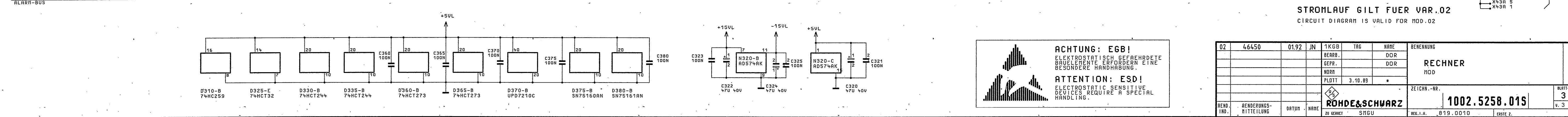
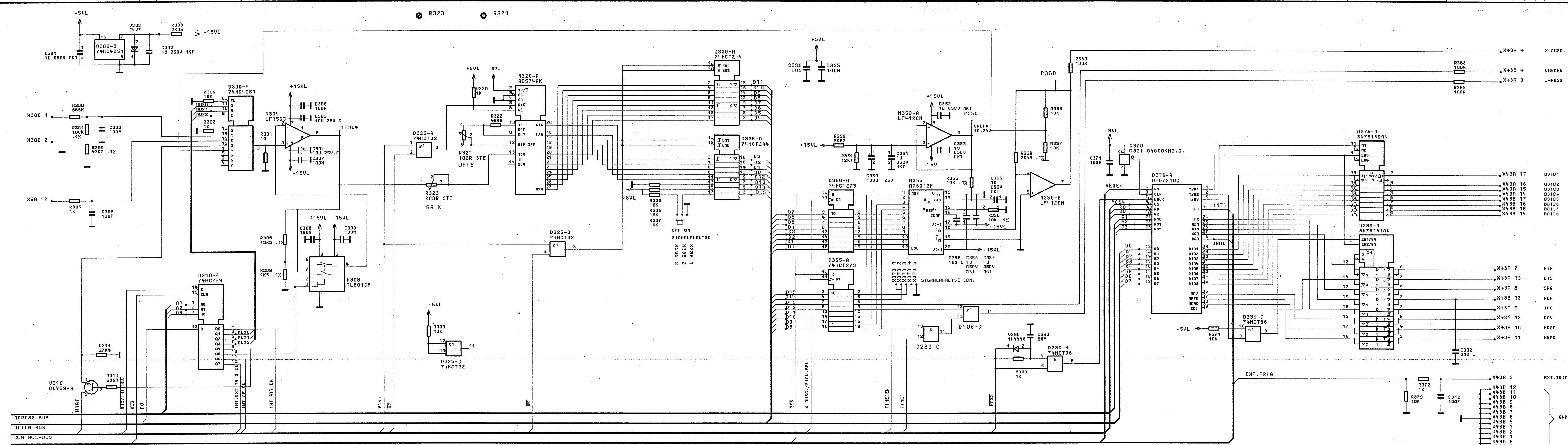
STROMLAUF GILT FUER VAR.02
 CIRCUIT DIAGRAM IS VALID FOR MOD.02



ACHTUNG: EGB!
 ELEKTROSTATISCH GEFÄHRDETE
 BAUELEMENTE ERFORDERN EINE
 BESONDERE HANDHABUNG.
ATTENTION: ESD!
 ELECTROSTATIC SENSITIVE
 DEVICES REQUIRE A SPECIAL
 HANDLING.

02	46450	01.92	JN	1KGB	TRG	NAME	BENENNUNG
						BERRB.	DOR
						GEPR.	DOR
						NORM	
						PLOTT	3.10.89
							ROHDE & SCHWARZ ZEICHN.-NR. 1002.5258.01S
BEND. IND.	RENDERUNGS-MITTEILUNG	DATUM	NAME	ZU GERÄT	SHGU	REG. I. V.	819.0010
						ERSTZ.	

FUER DIESE UNTERLAGE
BEHALTEN SIE UNS ALLE RECHTE VOR



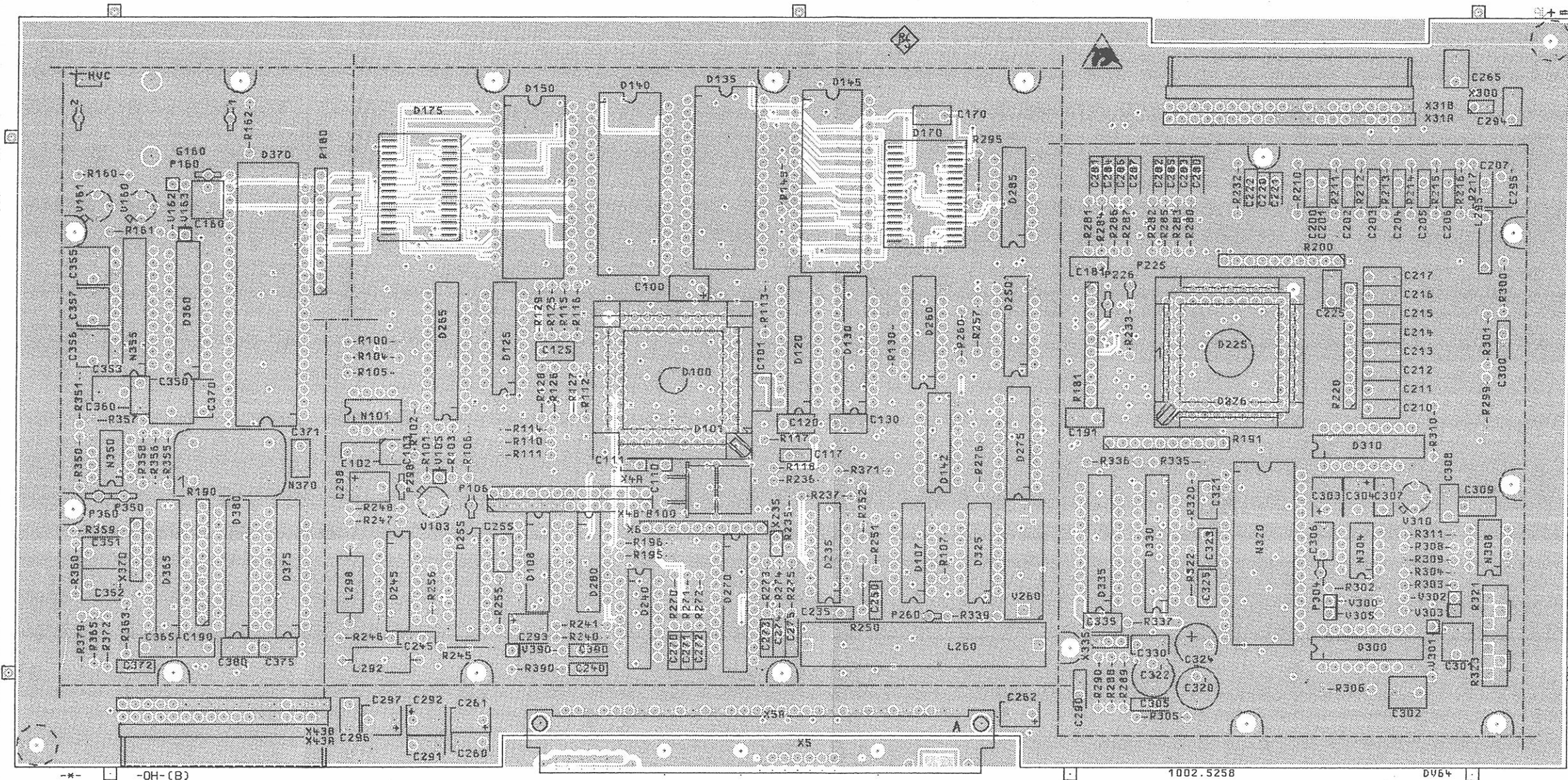
STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDLUNG!

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

02	46450	01.92	JN	1KGB	TAG	NAME	BENENNUNG	
				BEARR.		DDR	RECHNER	
				GEPR.		DDR	MOD	
				NORM				
				PLOTT	3.10.89	*		
							ZEICHN.-NR.	BLATT-NR.
ROHDE & SCHWARZ							1002.5258.01S	3
REND. IND.	ÄNDERUNGS- MITTEILUNG	DATUM	NAME	ZU GERÄT	SMGU	REG. I. V.	819.0010	ERSTE Z.

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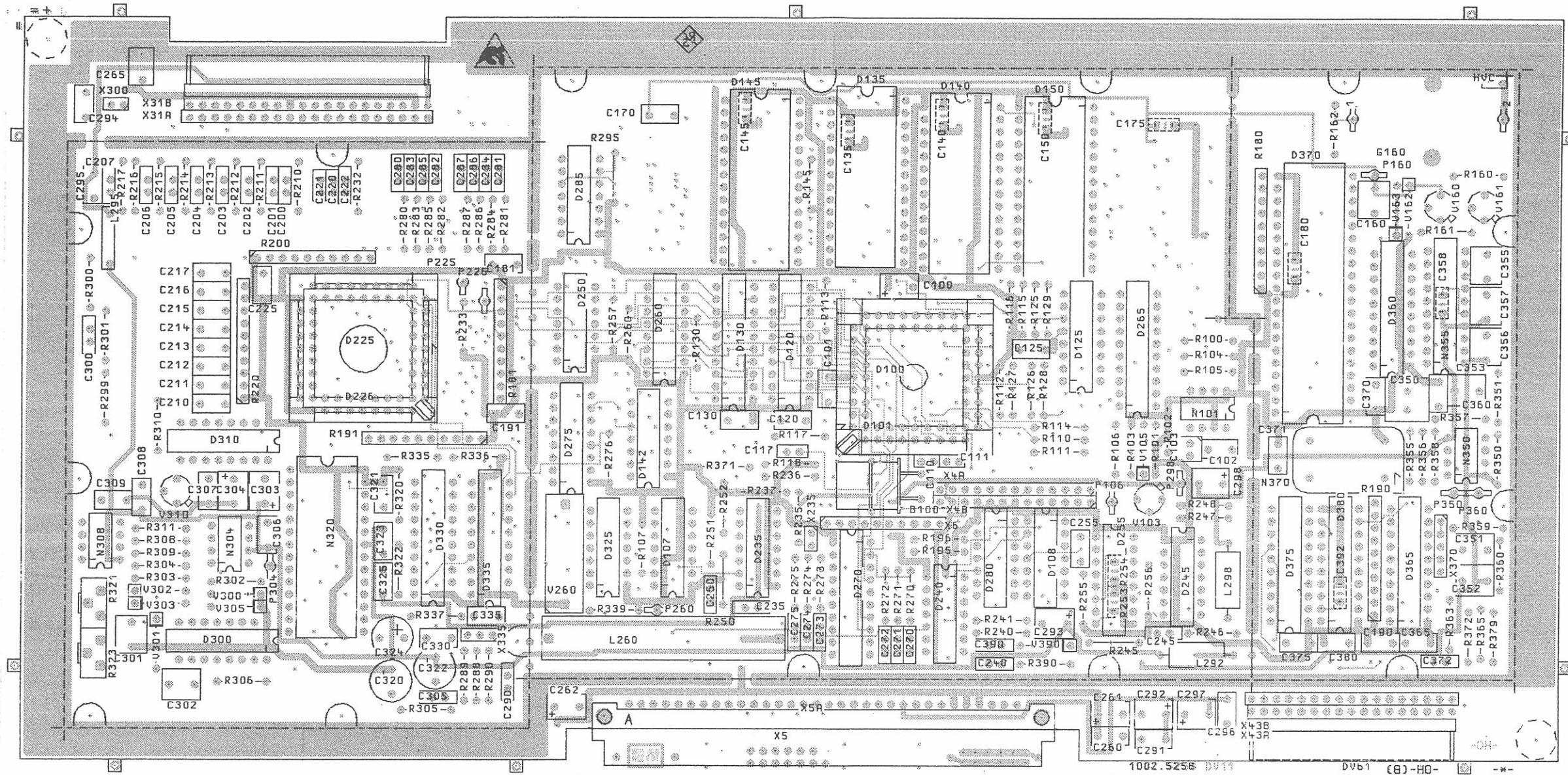
Ansicht und Leitungsfuehrung Bauteilseite
View of tracks on component side
DV41



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

		Maße ohne Toleranzangabe		Maßstab 1:1	
				Halbzeug, Werkstoff	
		1KGB	Tag	Benennung	
		Bearb.	10.89	RECHNER MOD 56	
		Gepr.			
		Norm			
				Zeichn.-Nr.	
				1002.5258	
And. Zust.	Änderungs-Mitteilung	Tag	Name	Blatt-Nr. 2	
		zu Gerät SMGU		v. Bl.	
				reg. i. V. 819.0010 V	
				erste Z.	

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Ansicht und Leitungsfuehrung Loetseite
View of tracks on solder side

DV11



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

Maße ohne Toleranzangabe		Maßstab 1 : 1	
		Halbzeug, Werkstoff	
1KGB	Tag	Name	Benennung RECHNER MOD 56
Bearb.	10.89	DR	
Gepr.			
Norm			
		Zeichn.-Nr. 1002.5258	
Änd. Zust.	Änderungs-Mitteilung	Tag	Name
		zu Gerät SMGU	
		reg. i. V. 819.0010 V	
		erste Z.	
			Blatt-Nr. 5
			v. Bl.



ROHDE & SCHWARZ

SERVICE DOCUMENTS

AF-Generator

819.3260.02



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Circuit diagrams
Parts lists
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5 Service Manual "AF Generator"

5.1 Function Description

(See circuit diagram 819.3260 S and Fig. 5-1)

The module "AF generator" consists of the following function units:

- ▶ *AF synthesizer*
- ▶ *Fixed-frequency generators*
- ▶ *AM/FM input selection circuits*
- ▶ *Diagnostics*

5.1.1 AF Synthesizer

This contains a digital waveform generator which generates output frequencies from 1 Hz to 100 kHz with a resolution of 1 Hz. The main part is the gate array D16. This contains a 10:1 divider for the clock frequency, a 20-bit adder and an interface for the serial data transmission. In the adder, an increment I read in via the serial interface is added cyclically to an internal clock frequency of 1.04858 MHz. The most significant 12 bits of the total represent an addresses in the waveform EPROM D5. The amplitudes for one period of sinewave, squarewave and sawtooth-wave are stored in the EPROM with a 12-bit resolution. Following intermediate storage of the data in D6, the DAC D9 generates a staircase signal whose transient response is suppressed by the subsequent sample-and-hold circuit. The active lowpass with a selectable cutoff frequency of 20 kHz/100 kHz smooths the output signal and suppresses the clock frequency. The adder increment I is a function of the desired AF frequency F_{af} and is given by the following equation: $I = F_{af}(\text{Hz})$.

5.1.2 Fixed-frequency Generators

The two fixed frequencies of 1.024 kHz and 409.6 Hz (usually stated as 1 kHz and 400 Hz) are obtained by dividing the adder clock (2^{10} for 1.024 kHz, $2^8 * 10$ for 409.6 Hz). Active lowpasses (N10, N15) filter the fundamental out of the square-wave signal.

The sinewave signal, and also that of the AF synthesizer if required, is applied to the AF level attenuator via switch D14 and buffer stage N15. This is implemented using a 10-bit DAC and a selectable 1:1/10:1 divider and enables the level at the output AF OUT to be set from 0 to 2 Vp which in turn can also be connected to the internal modulation outputs.

5.1.3 AM/FM Input Selection Circuits

The AM and FM input circuits are of almost identical design. The following text describes the AM circuit, the corresponding components for the FM circuit are shown in brackets. The input selectors D40 to D42 (D30 to D32) are used to distinguish between AM EXT AC, AM EXT DC, AM EXT SQUARE and AM INT (FM EXT AC, FM EXT DC, FM EXT FSK and FM INT).

The EXT signal is applied via the plug connection X6A1 (X6A9). An input impedance of 600 or 100 k Ω can be selected with jumper X3 (X2). The diodes V40 and V41 (V30 and V31) are used for overvoltage protection. The EXT signal is applied via the input amplifier N30 (N20) and C135 (C100) to the input selection switch D40 (D30). C135 (C100) is bypassed with AM EXT DC (FM EXT DC). A signal with a logic level and a selectable phase of 0° or 180° is generated from the EXT signal via D40-A with AM EXT SQUARE (D30-B with FM EXT FSK) by means of D45 (D33). An offset is added using N33 (N22) and the level adjusted for max. AM (FM).

For AM-INT (FM-INT), the AF synthesizer can be switched either via D41-A (D32-D) for an adjustable level or via D42-C (D31-D) for a fixed level. The same applies to the two fixed frequencies of 1 kHz and 400 Hz, these having a fixed level via D41-D (D31-A).

The selected modulation signal is applied to further modules via X6A3 (X6A7) by means of the following amplifier N32 (N21). The gain is dimensioned for maximum AM (FM). The corresponding modulation signal is also applied to a window comparator via an analog switch D46. This is required for level monitoring. Voltages above or below the threshold voltage trigger the monostable D47 (D36) whose pulse width is selected such that T is $1/F_{min}$, where F_{min} is the minimum modulation frequency. The four items of data AM LOW, AM HIGH, FM LOW and FM HIGH are applied to the parallel input of the shift register D52. They are ORed and generate an interrupt signal. When read in serial mode, they are latched in D52 and output via driver D52 to X6A15.

5.1.4 Diagnostics

Multiplexer D50 can be used to switch various module voltages to the "TST" line, for example the supply voltages, reference voltage, AM/FM output voltages.

The subassembly is driven via a serial data bus. The data are read into the latch modules D10, D16 (gate array), D20, D31, D51, D44, D34 with two strobes which are decoded from the subassembly addresses BA0 to BA2.

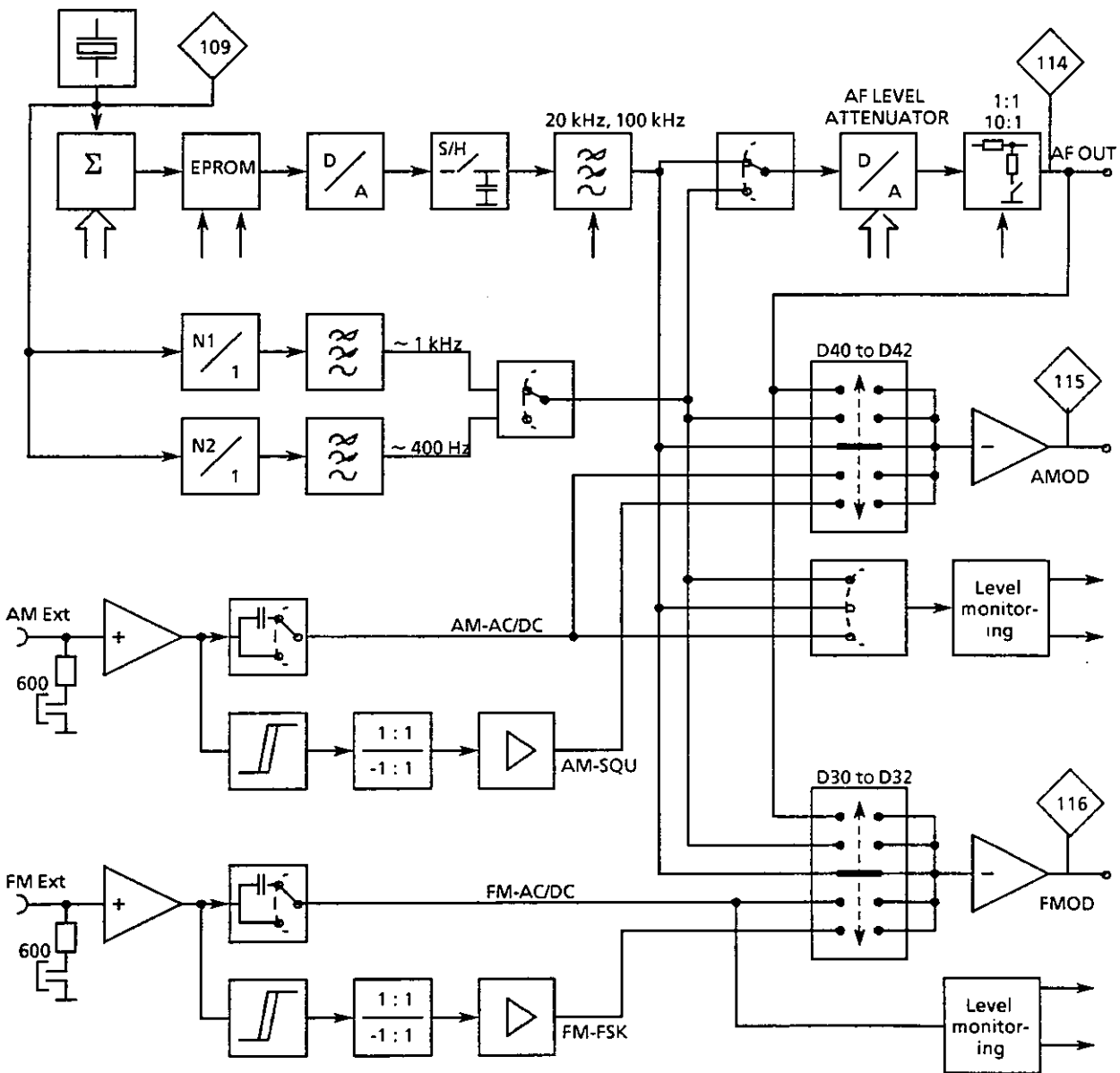


Fig. 5-1 Block diagram "AF generator"

5.2 Testing and Adjustment

- Setting: SHIFT PRESET

5.2.1 Adjustment of 5-V Reference

- Connect DC voltmeter to P31B1.
- Adjust the reference voltage to 5.00 V using R166.

5.2.2 Level/Offset Adjustment of AF Synthesizer

- Connect AC/DC voltmeter to P31 via 1:1 probe.
- Adjust AC voltage to $1 V_p \pm 2 \text{ mV}$ using R11.
- Adjust DC voltage to $0 V \pm 1 \text{ mV}$ using R19.

5.2.3 Level Adjustment of Fixed Frequencies

- Connect AC voltmeter to P113 via 1:1 probe.
- Setting: SHIFT AF 400 Hz.
- Adjust to $1 V_p \pm 2 \text{ mV}$ using R59.
- Setting: SHIFT AF 1 kHz.
- Adjust to $1 V_p \pm 2 \text{ mV}$ using R71.

5.2.4 Level Adjustment at AF Output

- Setting: SHIFT PRESET
- Connect AC voltmeter to AF OUT socket.
- Adjust to $1.00 V \pm 1 \text{ mV}$ using R99.
- Check the sawtooth and square curve shapes at an AF of 2 kHz.
The overshoots should be $< 10\%$.

5.2.5 Measurements at AMOD Output X6A3

5.2.5.1 Testing the Signal Path "Internal Modulation"

- Setting: SHIFT PRESET, AM INT ON

5.2.5.2 Sinewave Signal Level

- Connect AC voltmeter to P32.
- Check nominal value of level: $6 V_p \pm 1 \%$, and at the following settings as well: SHIFT AF 1 kHz, SHIFT AF 400 Hz.

5.2.5.3 Checking the "AM SQUARE" Mode

- Input: AM SQU 100 %
- Connect the pulse generator to the AMEXT socket
- Set square pulses, pulse duty factor 1:1, amplitude $+5 V_{\text{peak}}$ with a repetition frequency of 5 kHz.
- Connect oscilloscope to P32.
- Measure the overshoots of the output signal.
Nominal value: $\leq 10 \%$.

5.2.5.4 Checking the "External Modulation" Signal Branch

- Setting: SHIFT PRESET, AM EXT AC
- Connect AF sinewave generator, 1 kHz, $1 V_p \pm 0.2 \%$ to AM EXT socket.

Output level

- Connect AC voltmeter to P32.
- Measure and check the level.
Nominal value: $6 V_p \pm 1 \%$.

Checking the level monitoring

Measure the input level at the AM EXT socket using an AC voltmeter. "EXT HIGH" should be displayed with levels over $1.03 \pm 0.01 V_{\text{peak}}$ and "EXT LOW" with levels below $0.97 \pm 0.01 V_{\text{peak}}$, respectively.

5.2.6 Measurements at FMODE Output X6A7

5.2.6.1 Testing and Adjustment of the "Internal Modulation" Signal Branch

- Setting: SHIFT PRESET, FM INT ON

5.2.6.2 Output Level with Sinewave Signal

- Connect AC voltmeter to P60.
- Check nominal value of level: $1 V_{\text{rms}} \pm 1 \%$, and at the following settings as well: SHIFT AF 1 kHz, SHIFT AF 400 Hz

5.2.6.3 Testing the "FSK" Mode

- Input: FSK 1 kHz
- Connect oscilloscope to P60.
- Connect the pulse generator to the FM/ΦM EXT socket
- Set square pulses, pulse duty factor 1:1, amplitude $+5 V_{peak}$ with a repetition frequency of 5 kHz.
- Measure output signal overshoots. Nominal value: $\leq 10 \%$.

5.2.6.4 Testing and Adjustment of the "External Modulation" Signal Branch

- Input: SHIFT PRESET, FM EXT AC, FM/ΦM EXT
- Connect AF sinewave generator, $1 V_p \pm 0.2 \%$ to connector FM/ΦM EXT.

Output level

- Connect AC voltmeter to P60.
- Measure and check the level.
Nominal value: $1 V_{rms} \pm 1 \%$

Offset adjustment

- Connect DC voltmeter to P60.
- Input: SHIFT PRESET
- Short-circuit FM/AM EXT input.
- Adjust the offset to $0 V \pm 1 mV$ using R260.
- Input: FM EXT DC 1 kHz
- Adjust the offset to $0 V \pm 1 mV$ using R125.

Testing the level monitoring

Measure the input level at the FM/ΦM EXT socket using an AC voltmeter. "EXT HIGH" should be displayed with levels over $1.03 \pm 0.01 V_{peak}$ and "EXT LOW" with levels below $0.97 \pm 0.01 V_{peak}$, respectively.

5.2.7 Testing the Diagnostics Interface

- Connect DC voltmeter to P41.
- Input: SHIFT PRESET
- After having entered the following special functions measure the voltage at P41 and check the indication in the right-hand display.

Special function	Nominal value	Display
109	0.75 to 1.25 V	1.5 to 2.5 V
110	1.63 to 1.7 V	4.9 to 5.1 V
111	2.25 to 2.6 V	4.5 to 5.3 V
112	3.5 to 3.9 V	14.0 to 15.5 V
113	-3.9 to -3.5 V	-15.5 to -14 V

5.3 Troubleshooting

5.3.1 Checking the Clock Frequency

- Input: SHIFT PRESET
- Measure using frequency counter at the defined test points.
Test point: Frequency (TTL level)
 - P13 1.048 MHz
 - P10B 1.024 kHz
- Input: SHIFT AF 400 Hz
 - P10A 409.6 Hz

5.4 Interfaces

5.4.1 Digital Interfaces

Test point	Meaning
X6 A21 X6 A20 X6 A19	BA0 BA1 BA2 Reference impedance
X6 A22	G1 Group line
X6 A11 X6 A13 X6 A15	TF.CLK TM.DAT RC.DAT Serial data transmission
X6 A4	INT.AF Interrupt signal

5.4.2 Analog Interfaces

Test point	Level	Input/output	Meaning
X6 A28 X6 A26 X6 A30 X6 A2, 4, 6, 8, 10, 12, 14, 16, 23, 25, 27, 28, 31	+ 5 V + 15 V -15 V GND		Power supply
X6 A5	0 to 2 V _p	A	AF.OUT
X6 A1	1 V _p , HC-TTL	E	AM.IN Ext. mod. input
X6 A3	0 to 6 V _p	A	AMOD Mod. output
X6 A9	1 V _p , HC-TTL	E	FM.IN Ext. mod. input
X6 A7	1 V _{rms}	A	FMOD Mod. output
X6 A17	-5V to +5V	A	TST Diagnostics circuit

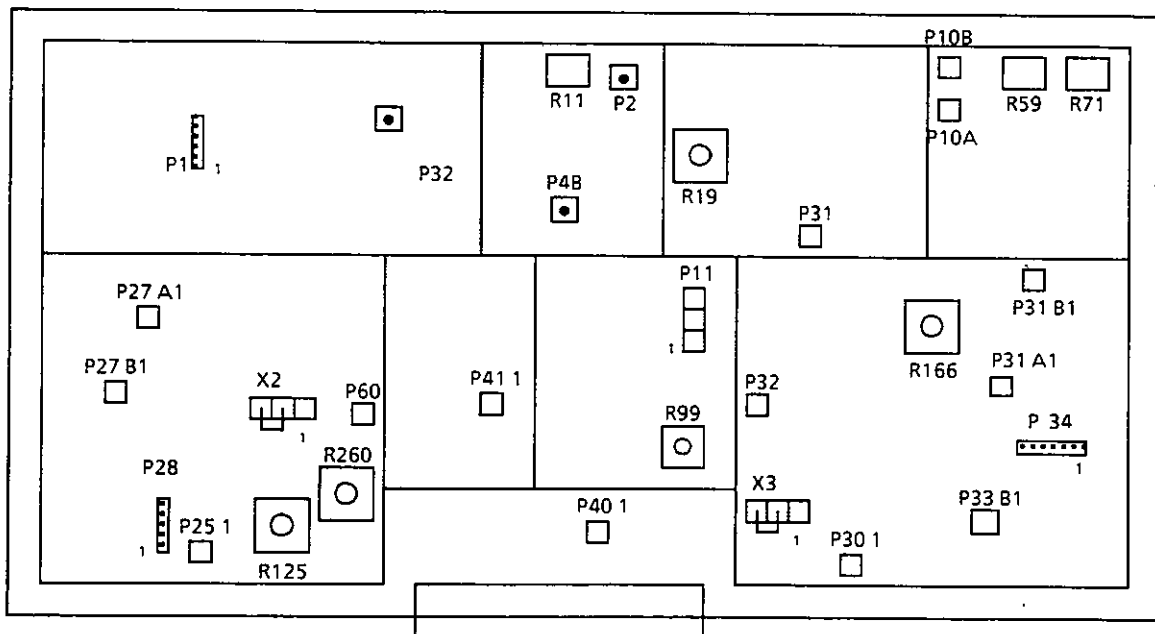


Fig. 5-2 Layout of test points and adjustment points

5.5 List of Required Test Equipment

- AC/DC voltmeter ($R_i \geq 100 \text{ k}\Omega$ AC: 10 Hz to 3 MHz, $5 V_{rms}$
DC: 0 to 30 V)
eg R&S UDS 4
- Oscilloscope
- AF generator (1 kHz, 0 to $2 V_{rms}$) eg R&S APN
- Frequency counter (up to 20 MHz)



ROHDE & SCHWARZ

Schaltteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées

Schémas de Circuit

Plans des composants

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
B1	EQ 10,485800MHZ CL30HC43U QUARTZ CRYSTAL UNIT	0091.8345.00	PHILIPS	N. R&S SACHNUMMER	
C1	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C2	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C3	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C4	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C5	CC 56PF+-2%5X6NPO CAPACITOR	CC 0087.6512.00	PHILIPS_CO	2222 678	
C6	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C7	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C9	CE 22UF+-20%10V SAL ELECTR. CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C10	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C12	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C13	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C14	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C15	CC 10PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6429.00	PHILIPS_CO	2222 678 10109	
C16	CC 150PF+-2%5X6N750 CAPACITOR	CC 0087.6929.00	PHILIPS_CO	2222 678 58151	
C17	CC 8,2PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6412.00	VALVO	2222 678	
C20	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C21	CC 6,8PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6406.00	PHILIPS_CO	2222 678	
C30	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C31	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C32	CK 4,7NF +-1% 63V RM5 KP POLYPROPYLENE CAPACITOR	0007.7630.00	ROEDERSTEI	KP1830-247 06 1 3 W	
C33	CK 4,7NF +-1% 63V RM5 KP POLYPROPYLENE CAPACITOR	0007.7630.00	ROEDERSTEI	KP1830-247 06 1 3 W	
C34	CK 18NF+-1%63V7,5OAX13 KP CAPACITOR	CK 0099.1933.00	SIEMENS	B33531-A5183-F	
C35	CK 18NF+-1%63V7,5OAX13 KP CAPACITOR	CK 0099.1933.00	SIEMENS	B33531-A5183-F	
C36	CK 330PF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7569.00	ROEDERSTEI	KP1830-133 01 1 3 W	
C37	CK 330PF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7569.00	ROEDERSTEI	KP1830-133 01 1 3 W	
C50	CK 470NF+-5%63V RD5H10MKT CAPACITOR	CK 0099.2975.00	ROEDERSTEI	MKT 1826-447-06-4	
C51	CK 68NF+-1%63V12X12X12 PP CAPACITOR	CK 0303.7067.00	SIEMENS	B33531-A5683-F	
C52	CK 470NF+-5%63V RD5H10MKT CAPACITOR	CK 0099.2975.00	ROEDERSTEI	MKT 1826-447-06-4	
C53	CK 330NF+-5%63VRD4,5H10 CAPACITOR	CK 0099.2969.00	ROEDERSTEI	MKT 1826-433-06-4	
C54	CK 820PF+-1%63V6,3QUX11KP CAPACITOR	CK 0340.6748.00	SIEMENS	B33531-A5821-F	
C55	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C56	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C57	CK 68NF+-1%63V12X12X12 PP CAPACITOR	CK 0303.7067.00	SIEMENS	B33531-A5683-F	
C58	CK 470NF+-5%63V RD5H10MKT CAPACITOR	CK 0099.2975.00	ROEDERSTEI	MKT 1826-447-06-4	
C59	CK 330NF+-5%63VRD4,5H10 CAPACITOR	CK 0099.2969.00	ROEDERSTEI	MKT 1826-433-06-4	
C60	CK 820PF+-1%63V6,3QUX11KP CAPACITOR	CK 0340.6748.00	SIEMENS	B33531-A5821-F	
C61	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	

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	ROHDE & SCHWARZ	33	04.02.98	EE NF-GENERATOR AF-GENERATOR	0819.3260.01 SA	1+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C62	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C63	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C66	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C70	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C71	CK 18NF+-1%63V7, 50AX13 KP CAPACITOR	CK 0099.1933.00	SIEMENS	B33531-A5183-F	
C72	CK 150NF+-5%63VRD3, 5H9MKT CAPACITOR	CK 0099.2946.00	ROEDERSTEI	MKT 1826-415-06-4	
C74	CK 200PF+-1%63V6, 3QUX11KP CAPACITOR	CK 0341.8515.00	SIEMENS	B33531-A5201-F	
C77	CK 18NF+-1%63V7, 50AX13 KP CAPACITOR	CK 0099.1933.00	SIEMENS	B33531-A5183-F	
C78	CK 150NF+-5%63VRD3, 5H9MKT CAPACITOR	CK 0099.2946.00	ROEDERSTEI	MKT 1826-415-06-4	
C80	CK 200PF+-1%63V6, 3QUX11KP CAPACITOR	CK 0341.8515.00	SIEMENS	B33531-A5201-F	
C86	CK 1UF+-5%50V7, 5X5, 5X10, 5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C91	CC 22PF+-2%4X5NPD CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C92	CC 22PF+-2%4X5NPD CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C93	CC 22PF+-2%4X5NPD CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C94	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C95	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C96	CC 22PF+-2%4X5NPD CAPACITOR	CC 0087.6464.00	PHILIPS_CO	2222 678	
C100	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
..107					
C108	CC 6, 8PF+-0, 25PF3X4NPD CAPACITOR	CC 0087.6406.00	PHILIPS_CO	2222 678	
C109	CE 47UF+-20%50V RM5BIPOL ELECTROLYTIC CAPACITOR	CE 0008.9688.00	FROLYT	EKS28DC247H	
C110	CC 2, 2PF+-0, 25PF3X4NPD CAPACITOR	CC 0087.6341.00	PHILIPS_CO	2222 678	
C112	CC 330PF+-2%6X9N750 CERAMIC CAPACITOR	CC 0087.6964.00	PHILIPS_CO	2222 678 58331	
C113	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C117	CK 1UF+-5%50V7, 5X5, 5X10, 5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C118	CK 1UF+-5%50V7, 5X5, 5X10, 5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C130	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
..133					
C135	CE 10UF+-20% 63V RM5BIPOL ELECTROLYTIC CAPACITOR	CE 0008.9742.00	PHILIPS_CO	2222 036 92103	
C136	CC 2, 7PF+-0, 25PF3X4NPD CERAMIC CAPACITOR	CC 0087.6358.00	PHILIPS_CO	2222 678	
C137	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C138	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C140	CE 10UF+-20%63V RD9XH12 ELECTROLYTIC CAPACITOR	0008.7910.00	PHILIPS_CO	2222 036 90362	
C141	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C142	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C143	CK 1UF+-5%50V7, 5X5, 5X10, 5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C144	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C145	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C146	CC 3, 3PF+-0, 25PF3X4NPD CAPACITOR	CC 0087.6364.00	PHILIPS_CO	2222 678	
C147	CK 1UF+-5%50V7, 5X5, 5X10, 5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C148	CK 1UF+-5%50V7, 5X5, 5X10, 5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	

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		33	04.02.98	EE NF-GENERATOR AF-GENERATOR	0819.3260.01 SA	2+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C150 ..153 C154	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR CC 4,7NF+-10%6X9R2000 CAPACITOR	CK 0099.2930.00 CC 0087.7102.00	ROEDERSTEI PHILIPS_CO	MKT 1826-410-06-4W 2222 630 01 472	
C160	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C161	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C164	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C165	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C166	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C167	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C168	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C173	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C194	CC 4,7NF+-10%6X9R2000 CAPACITOR	CC 0087.7102.00	PHILIPS_CO	2222 630 01 472	
C195	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C196	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C230 ..233 C235	CC 10NF-20+50%7X8R4000 CAPACITOR CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CC 0087.7525.00 CK 0099.2930.00	VALVO ROEDERSTEI	2222 640 51103 MKT 1826-410-06-4W	
C300	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C301	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C302	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C305	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C306	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C308	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C309	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C310	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C319	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C382	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
D1	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D5	HS 27C256 PROGRAM (D5)	0819.3760.00			
D6	BL MM74HC175N 4XD-FF CL. QUAD D-FLIP-FLOP	0099.9528.00	PHILIPS_SE	(PC)74HC175N(P)	
D7	BL MM74HC175N 4XD-FF CL. QUAD D-FLIP-FLOP	0099.9528.00	PHILIPS_SE	(PC)74HC175N(P)	
D8	BL MM74HC273N 8XD-FF/REG OCTAL D-FLIPFLOP	0099.9611.00	PHILIPS_SE	(PC)74HC273N(P)	
D9	BJ DAC80-CPI-I 1X12B-DAC D/A-CONVERTER	0300.6330.00	BURR_BROWN	DAC80CBI-I	
D10	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D12	BL MM74HC4040N 12ST.B.CTR 12 STAGE BINARY COUNTER	0394.8784.00	PHILIPS_SE	(PC)74HC4040N(P)	
D13	BL MM74HC390N 2X4B.COUNT DUAL 4-BIT DECADE COUNTER	0099.9640.00	PHILIPS_SE	(PC)74HC390N(P)	
D14	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D15	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D16	BG CLA2116 ADDER1 ASIC GATE ARRAY	0801.8183.00	PLESSEY	CLA2116	
D17	BL PC74HCT08P 4X2IN AND QUAD 2-INPUT AND GATE	0571.3413.00	PHILIPS	(PC)74HCT08N(P)	
D20	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	

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ROHDE & SCHWARZ

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EE NF-GENERATOR
AF-GENERATOR

Schaltteilliste für
Parts list for

Sachnummer
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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D21	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D22	BJ AD7533CQ 1X10B-DAC D/A-CONVERTER	0300.8740.00	ANALOG_DEV	AD7533CQ(CD)	
D23	BS TL604CP 2X ANALOGSCH ANALOG SWITCH	0300.6199.00	TEXAS	TL604CP	
D30	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D31	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D32	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D33	BL MM74HC132N 4X2IN.NAND QUAD 2INP.NAND SCHMITT TR	0099.9557.00	PHILIPS_SE	(PC)74HC132N(P)	
D34	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D35	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D36	BL PC74HC123 2XMULTIVIB DUAL MONOST.MULTIVIBRATOR	0099.9540.00	PHILIPS_SE	(PC)74HC123N(P)	
D40	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D41	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D42	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D43	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D44	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D45	BL MM74HC132N 4X2IN.NAND QUAD 2INP.NAND SCHMITT TR	0099.9557.00	PHILIPS_SE	(PC)74HC132N(P)	
D46	BS TL604CP 2X ANALOGSCH ANALOG SWITCH	0300.6199.00	TEXAS	TL604CP	
D47	BL PC74HC123 2XMULTIVIB DUAL MONOST.MULTIVIBRATOR	0099.9540.00	PHILIPS_SE	(PC)74HC123N(P)	
D50	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D51	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D52	BL MM74HC165N 8B.SH.REG. 8 BIT SHIFT REGISTER	0641.7128.00	PHILIPS_SE	(PC)74HC165N(P)	
D53	BL MM74HC126N 4XBUFF. 3S QUAD BUFFER TRISTATE	0099.9792.00	PHILIPS_SE	(PC)74HC126N(P)	
D54	BL PC74HCT86P 4X2IN EXOR QUAD 2-INPUT EXOR GATE	0266.7228.00	PHILIPS	(PC)74HCT86N(P)	
D55	BL PC74HCT4075P 3X3IN ORG OR GATE	0811.7780.00	RCA	CD74HCT4075E	
D60	BL PC74HC238P 3T08 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
L1	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L17	LD 15,OUH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L18	LD 15,OUH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L160	LD 15,OUH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L161	LD 15,OUH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L162	LD 15,OUH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L300	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L301	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
N1	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN	
N2	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN	
N3	BO LT318AJB OPAMP OPERATIONAL AMPLIFIER	0805.1454.00	LINEAR_TEC	LT 318 AJB /SL 30001	
N4	BO MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER	0275.0816.00	TEXAS	MC1558JG	
N10	BO TLO74IN LN 4XFET OPAMP OPERATIONAL AMPLIFIER	0568.7528.00	TEXAS	TLO74IN	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in	
N15	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN		
N16	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE		
N17	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE		
N20	BO HA7-2525-5 OPAMP OPERATIONAL AMPLIFIER	0352.7544.00	HARRIS	HA7-2525-5		
N21	BO HA7-2525-5 OPAMP OPERATIONAL AMPLIFIER	0352.7544.00	HARRIS	HA7-2525-5		
N22	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN		
N23	BO LM119J 2X COMPAR COMPARATOR	0007.5337.00	LINEAR_TEC	LM119J (AJ)		
N30	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN		
N31	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN		
N32	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN		
N33	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN		
N34	BO LM119J 2X COMPAR COMPARATOR	0007.5337.00	LINEAR_TEC	LM119J (AJ)		
P1	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR 4 PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P11	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P28	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR 6 PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P34	FP STIFTFLEISTE 36P.R2,54 PIN CONNECTOR 5 PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36		
R1	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R2	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R3	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2		
R4	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2		
R6	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2		
R7	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2		
R8	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2		
R9	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2		
R11	RS 0,5W200 OHM+-10%10X10X CERMET POTENTIOMETER	RS 0247.7949.00	BI_TECHNOL	72X-R		
R12	RL 0,60W 909 OHM+-1%TK50 RESISTOR	RL 0083.0584.00	RESISTA	MK2		
R13	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R14	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2		
R15	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2		
R16	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2		
R17	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R18	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R19	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7577.00	SPECTROL	63 M ... TO 10		
R20	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2		
R21	RL 0,35W2,05KOHM+-0,1%T25 RESISTOR	RL 0083.9746.00	DRALORIC	SMA0207		
R22	RL 0,35W1,87KOHM+-0,1%T25 RESISTOR	RL 0083.9669.00	DRALORIC	SMA0207		
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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R23	RL 0,35W2,10KOHM+-0,1%T25 RESISTOR	RL 0083.9769.00	DRALORIC	SMAO207	
R24	RL 0,60W 1MOHM+-1%TK50 RESISTOR	RL 0082.7862.00	RESISTA	MK2	
R25	RL 0,35W432 OHM+-0,1%TK25 RESISTOR	RL 0083.8440.00	DRALORIC	SMAO207	
R26	RL 0,35W402 OHM+-0,1%TK25 RESISTOR	RL 0083.8385.00	DRALORIC	SMAO207	
R27	RL 0,35W294 OHM+-0,1%TK25 RESISTOR	RL 0083.8127.00	DRALORIC	SMAO207	
R28	RL 0,60W 1MOHM+-1%TK50 RESISTOR	RL 0082.7862.00	RESISTA	MK2	
R29	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R30	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R31	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R32	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
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R39	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R50	RL 0,60W 243 OHM+-1%TK50 DEPOS.-CARBON RESISTOR	RL 0083.0126.00	RESISTA	MK2	
R55	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R57	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R58	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2	
R59	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER	RS 0247.7961.00	SPECTROL	63X ... TO10	
R60	RL 0,60W 3,01KOHM+-1%TK50 RESISTOR	RL 0083.0961.00	RESISTA	MK2	
R61	RL 0,60W 13,0KOHM+-1%TK50 RESISTOR	RL 0083.1368.00	RESISTA	MK2	
R62	RL 0,60W 130 KOHM+-1%TK50 RESISTOR	RL 0083.2093.00	RESISTA	MK2	
R63	RL 0,60W 1,43KOHM+-1%TK50 RESISTOR	RL 0083.0710.00	RESISTA	MK2	
R64	RL 0,60W 15,0KOHM+-1%TK50 RESISTOR	RL 0083.1400.00	RESISTA	MK2	
R65	RL 0,60W 130 KOHM+-1%TK50 RESISTOR	RL 0083.2093.00	RESISTA	MK2	
R66	RL 0,60W 1,43KOHM+-1%TK50 RESISTOR	RL 0083.0710.00	RESISTA	MK2	
R70	RL 0,60W 16,2KOHM+-1%TK50 RESISTOR	RL 0083.1439.00	RESISTA	MK2	
R71	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7526.00	SPECTROL	63X ... TO10	
R72	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R73	RL 0,60W 16,9KOHM+-1%TK50 RESISTOR	RL 0083.1451.00	PHILIPS_CO	MRS 25	
R74	RL 0,60W 23,7KOHM+-1%TK50 RESISTOR	RL 0083.1568.00	RESISTA	MK2	
R75	RL 0,60W 25,5KOHM+-1%TK50 RESISTOR	RL 0083.1580.00	RESISTA	MK2	
R76	RL 0,60W 23,7KOHM+-1%TK50 RESISTOR	RL 0083.1568.00	RESISTA	MK2	
R77	RL 0,60W 23,7KOHM+-1%TK50 RESISTOR	RL 0083.1568.00	RESISTA	MK2	
R78	RL 0,60W 25,5KOHM+-1%TK50 RESISTOR	RL 0083.1580.00	RESISTA	MK2	
R90	RL 0,35W10,9KOHM+-0,1%T25 RESISTOR	RL 0084.3135.00	DRALORIC	SMAO207	
R91	RL 0,35W1,21KOHM+-0,1%T25 RESISTOR	RL 0083.9300.00	DRALORIC	SMAO207	
R92	RL 0,60W4,75 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8021.00	ROEDERSTEI	MK2	
R93	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R94	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R95	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R96	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R97	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R98	RL 0,60W 4,32KOHM+-1%TK50 RESISTOR	RL 0082.6572.00	RESISTA	MK2	
R99	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7884.00	SPECTROL	63 M ... TO 10	
R100	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R101	RL 0,60W 604 OHM+-1%TK50 RESISTOR	RL 0082.2425.00	RESISTA	MK2	
R102	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R103	RL 0,60W 33,2KOHM+-1%TK50 RESISTOR	RL 0083.1674.00	RESISTA	MK2	
R104	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R105	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R106	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R107	RL 0,60W 11,0KOHM+-1%TK50 RESISTOR	RL 0083.1322.00	RESISTA	MK2	
R109	RL 0,35W31,2KOHM+-0,1%T25 RESISTOR	RL 0084.4019.00	DRALORIC	SMAO207	
R111	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R112	RL 0,60W 8,25KOHM+-1%TK50 RESISTOR	RL 0083.1239.00	RESISTA	MK2	
R113	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R116	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R119	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R125	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7577.00	SPECTROL	63 M ... TO 10	
R126	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R127	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R128	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R129	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R130	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R132	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R136	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMAO207	
R137	RL 0,35W4,99KOHM+-0,1%T25 RESISTOR	RL 0084.2480.00	DRALORIC	SMAO207	
R138	RL 0,35W4,99KOHM+-0,1%T25 RESISTOR	RL 0084.2480.00	DRALORIC	SMAO207	
R139	RL 0,35W 1 KOHM+-0,1%TK25 RESISTOR	0083.9146.00	DRALORIC	SMAO207	
R140	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R141	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMAO207	
R145	RL 0,35W39,7KOHM+-0,1%T25 RESISTOR	RL 0084.4219.00	DRALORIC	SMAO207	
R146	RL 0,35W412 OHM+-0,1%TK25 RESISTOR	RL 0083.8404.00	DRALORIC	SMAO207	
R147	RL 0,35W9,76KOHM+-0,1%T25 RESISTOR	RL 0084.3041.00	DRALORIC	SMAO207	
R148	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R149	RL 0,60W 274 KOHM+-1%TK50 RESISTOR	RL 0083.2364.00	RESISTA	MK2	
R150	RL 0,60W 274 KOHM+-1%TK50 RESISTOR	RL 0083.2364.00	RESISTA	MK2	
R151	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R160	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R161	RL 0,60W 604 OHM+-1%TK50 RESISTOR	RL 0082.2425.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R162	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R163	RL 0,60W 33,2KOHM+-1%TK50 RESISTOR	RL 0083.1674.00	RESISTA	MK2	
R164	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R165	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R166	RS 0,3W 1KOHM+-10%CERMET TRIMMING POTENTIOMETER	RS 0006.6681.00	BECKMAN	67 W	
R167	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R170	RL 0,35W100KOHM+-0,1%TK25 RESISTOR	RL 0084.4983.00	DRALORIC	SMAO207	
R171	RL 0,35W32,4KOHM+-0,1%T25 RESISTOR	RL 0084.4048.00	DRALORIC	SMAO207	
R174	RL 0,60W 11,0KOHM+-1%TK50 RESISTOR	RL 0083.1322.00	RESISTA	MK2	
R179	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R180	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R181	RL 0,60W 15,0KOHM+-1%TK50 RESISTOR	RL 0083.1400.00	RESISTA	MK2	
R182	RL 0,60W 11,0KOHM+-1%TK50 RESISTOR	RL 0083.1322.00	RESISTA	MK2	
R185	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R187	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R188	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R192	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R193	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R194	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R208	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMAO207	
R209	RL 0,35W4,99KOHM+-0,1%T25 RESISTOR	RL 0084.2480.00	DRALORIC	SMAO207	
R210	RL 0,35W4,99KOHM+-0,1%T25 RESISTOR	RL 0084.2480.00	DRALORIC	SMAO207	
R211	RL 0,35W 1 KOHM+-0,1%TK25 RESISTOR	0083.9146.00	DRALORIC	SMAO207	
R212	RL 0,35W22,1KOHM+-0,1%T25 RESISTOR	RL 0084.3729.00	DRALORIC	SMAO207	
R215	RL 0,35W39,7KOHM+-0,1%T25 RESISTOR	RL 0084.4219.00	DRALORIC	SMAO207	
R216	RL 0,35W417 OHM+-0,1%TK25 RESISTOR	RL 0083.8410.00	DRALORIC	SMAO207	
R217	RL 0,35W9,76KOHM+-0,1%T25 RESISTOR	RL 0084.3041.00	DRALORIC	SMAO207	
R218	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R219	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R220	RL 0,60W 274 KOHM+-1%TK50 RESISTOR	RL 0083.2364.00	RESISTA	MK2	
R221	RL 0,60W 274 KOHM+-1%TK50 RESISTOR	RL 0083.2364.00	RESISTA	MK2	
R230	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R231	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R233	RL 0,60W 20,0KOHM+-1%TK50 RESISTOR	RL 0083.1522.00	RESISTA	MK2	
R234	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R235	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R236	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R237	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R238	RL 0,60W 8,25KOHM+-1%TK50 RESISTOR	RL 0083.1239.00	RESISTA	MK2	

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ROHDE & SCHWARZ

33

04.02.98

EE NF-GENERATOR
AF-GENERATOR

0819.3260.01 SA

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R241	RL 0,60W 8,25KOHM+-1%TK50 RESISTOR	RL 0083.1239.00	RESISTA	MK2	
R242	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R243	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R244	RL 0,60W 8,06KOHM+-1%TK50 RESISTOR	RL 0083.1222.00	RESISTA	MK2	
R245	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R246	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R248	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R250	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R251	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R252	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R260	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7577.00	SPECTROL	63 M ... TO 10	
R261	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R270	RS 0,3W 200 OHM+-10% CERM. TRIMMING POTENTIOMETER	RS 0006.6669.00	BECKMAN	67 W	
R271	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R272	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R273	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R274	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R275	RL 0,60W 8,25KOHM+-1%TK50 RESISTOR	RL 0083.1239.00	RESISTA	MK2	
R276	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R307	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2	
R308	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R309	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R310	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R311	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2	
R312	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R313	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R314	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2	
R315	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R316	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2	
R318	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R319	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R338	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R343	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R344	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
..347					
R380	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R381	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R382	RL 0,60W 11,0KOHM+-1%TK50 RESISTOR	RL 0083.1322.00	RESISTA	MK2	
R383	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	

095.0026-0693

MENP5	502 3PUA	Äi	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr Page
		33	04.02.98	EE NF-GENERATOR AF-GENERATOR	0819.3260.01 SA	9+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V1	AK BCY59IX N 45V 200MA TRANSISTOR	AK 0010.5163.00	VALVO	BCY59IX	
V2	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V3	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V11	AM SD210DE N-E 30V MOSF MOS-FET	0844.7637.00	SILICONIX	SD210DE	
V12	AM 2N4857A N-D 40V JFET FET	0092.9422.00	PHILIPS_SE	2N4857A(LV3683)	
V13	AM 2N4857A N-D 40V JFET FET	0092.9422.00	PHILIPS_SE	2N4857A(LV3683)	
V14	AM 2N4857A N-D 40V JFET FET	0092.9422.00	PHILIPS_SE	2N4857A(LV3683)	
V15	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V16	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V25	AE BZX55/B8V2 0,5W ZDI ZENER DIODE	AE 0012.2178.00	VALVO	BZX79B8V2	
V26	AE BZX55/B8V2 0,5W ZDI ZENER DIODE	AE 0012.2178.00	VALVO	BZX79B8V2	
V30	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V31	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V40	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V41	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V42	AE 1N827 6,2V REF DI REFERENCE DIODE	AE 0418.0029.00	COMPENSATE	1N827(A)	
V43	AE BZX55/B8V2 0,5W ZDI ZENER DIODE	AE 0012.2178.00	VALVO	BZX79B8V2	
V50	AE BZX55/B4V7 0,5W ZDI ZENER DIODE	AE 0080.4014.00	VALVO	BZX79B4V7	
V97	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V98	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V260	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V261	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V301	AK 2N3906 P 40V 200MA TRANSISTOR	0010.3225.00	MOTOROLA	2N3906	
V305	AK 2N3904 N 40V 200MA TRANSISTOR	0010.4996.00	FAIRCHILD	2N3904	
V306	AE BZX79/B6V8 0,5W ZDI ZENER DIODE	AE 0586.9906.00	PHILIPS	BZX79B6V8	
V307	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V308	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V309	AE BZX55/B12 0,5W ZDI ZENER DIODE	AE 0218.8940.00	VALVO	BZX79B12	
X2	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X3	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X6	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
Z1	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z2	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	

MENP5	502 3PUA	Äi	Datum Date	Schalttailliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
		33	04.02.98	EE NF-GENERATOR AF-GENERATOR	0819.3260.01 SA	10-

095.0026-0693

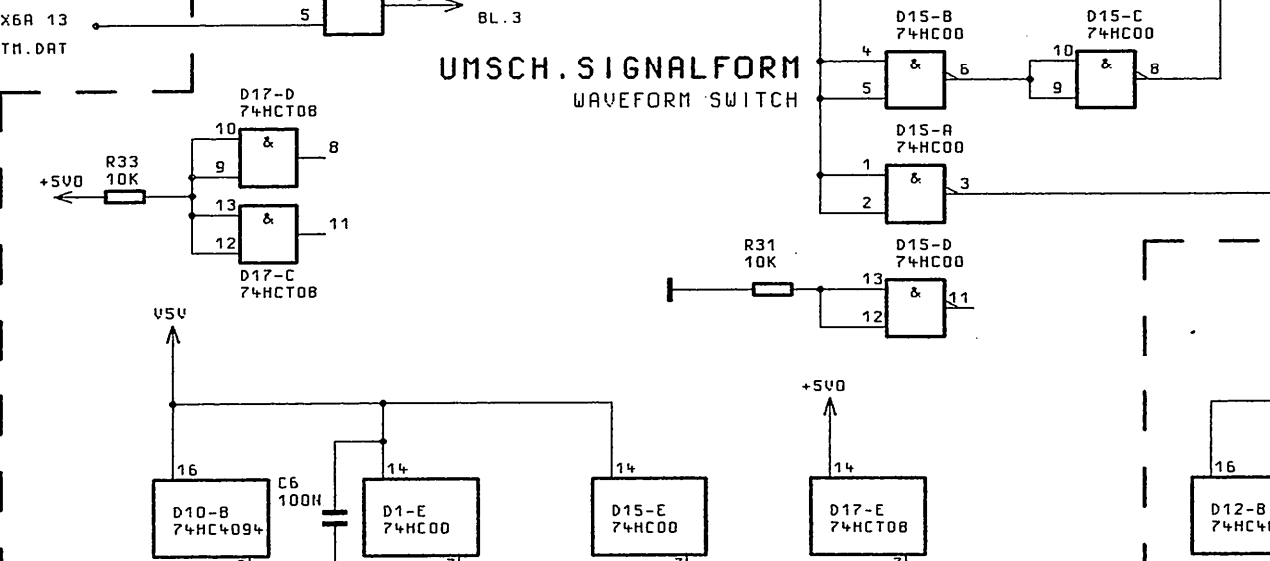
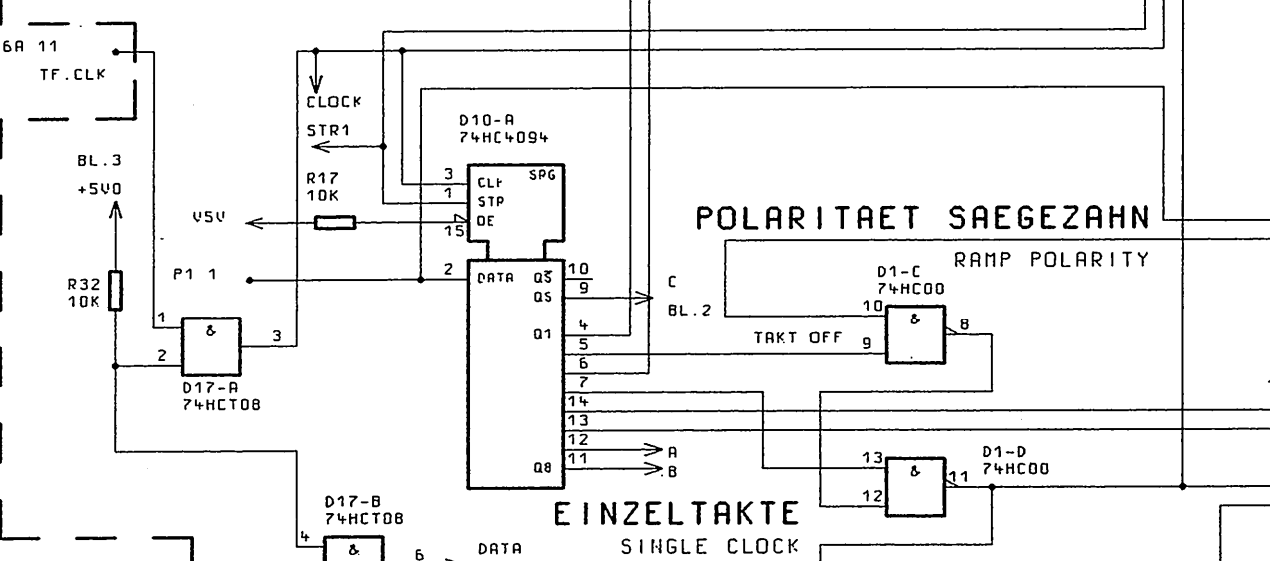
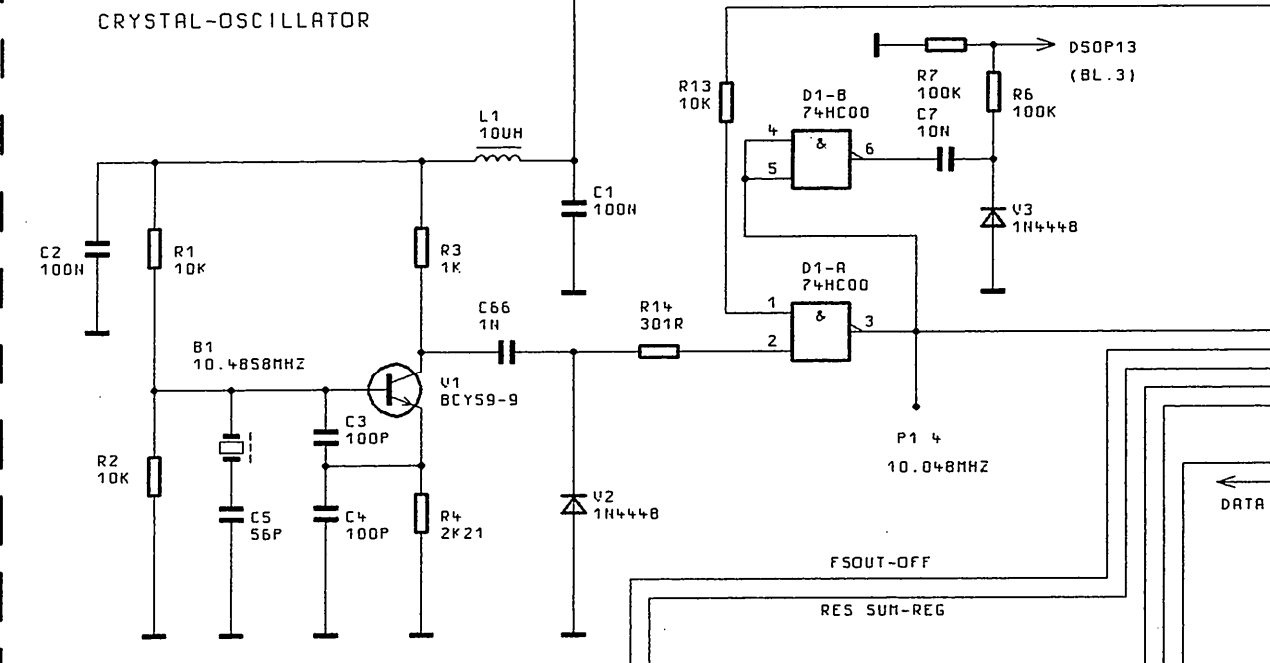
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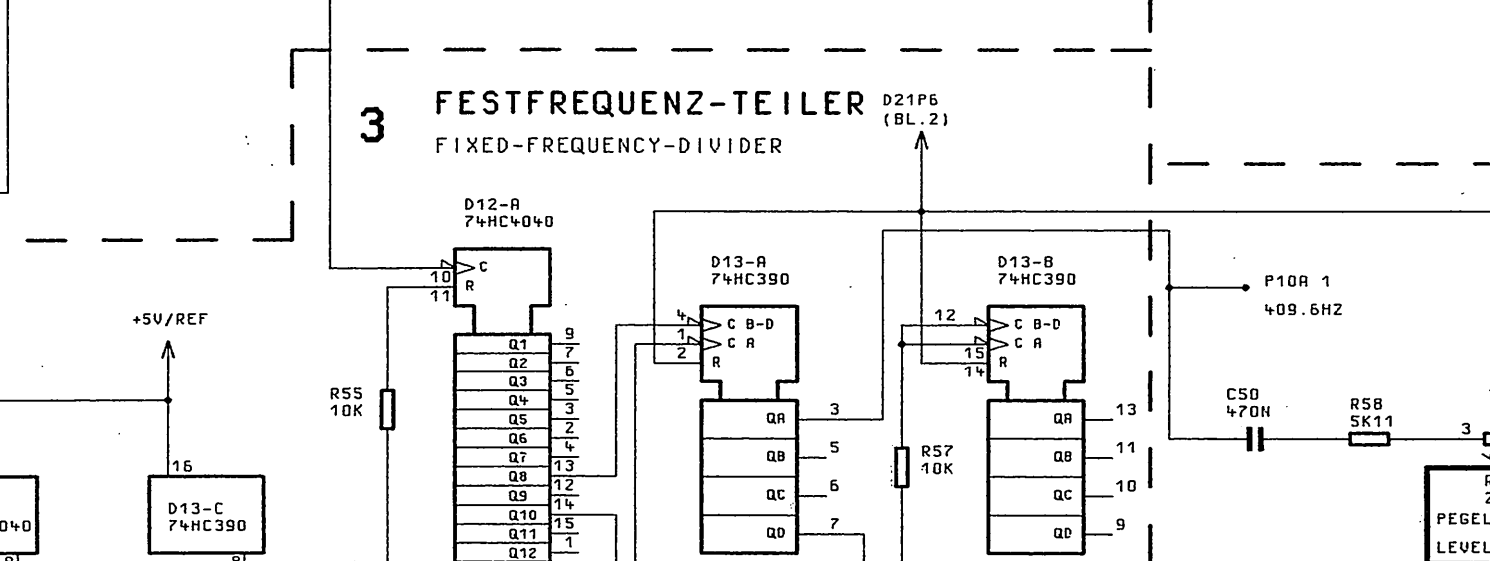
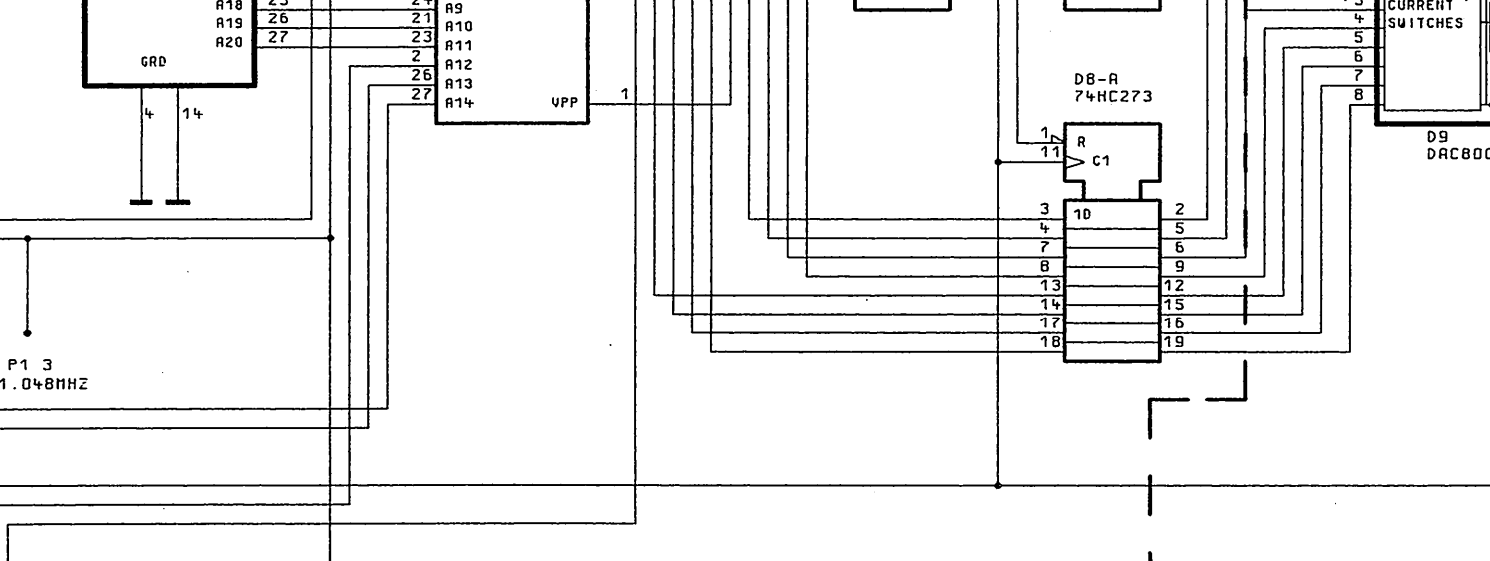
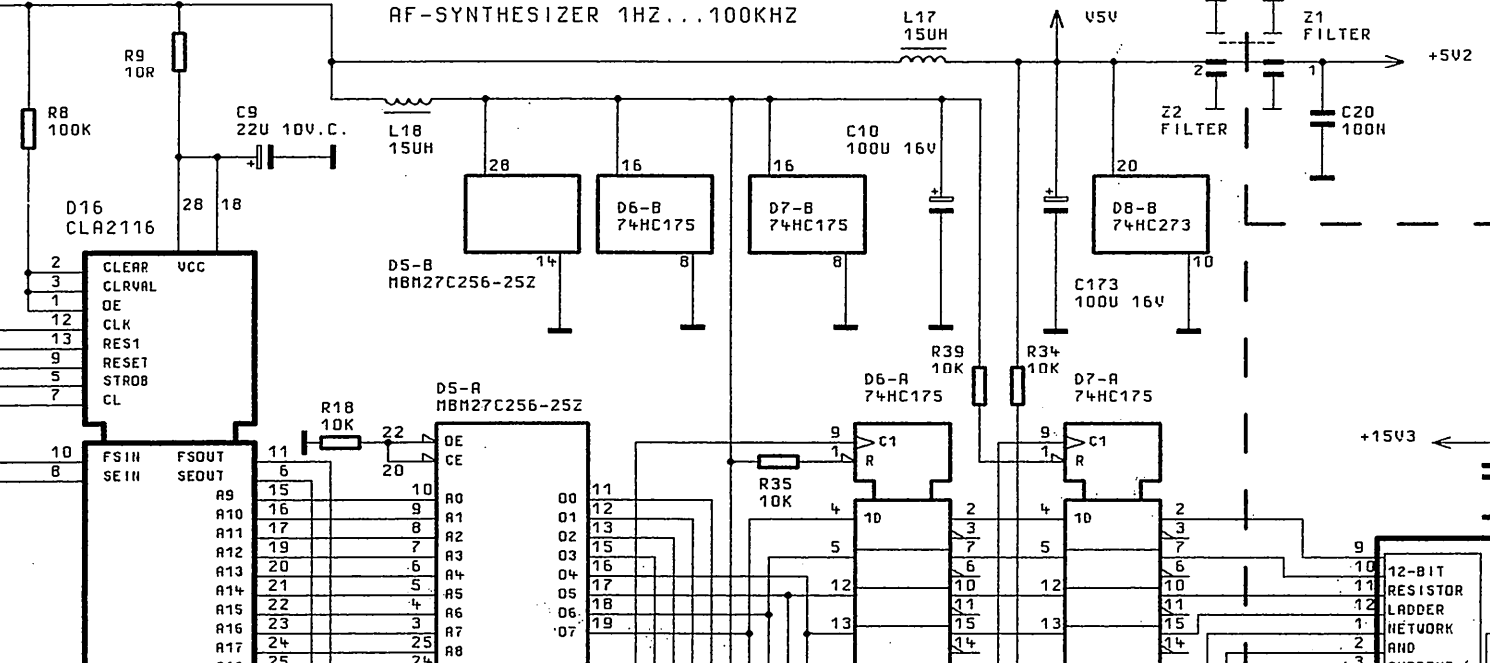
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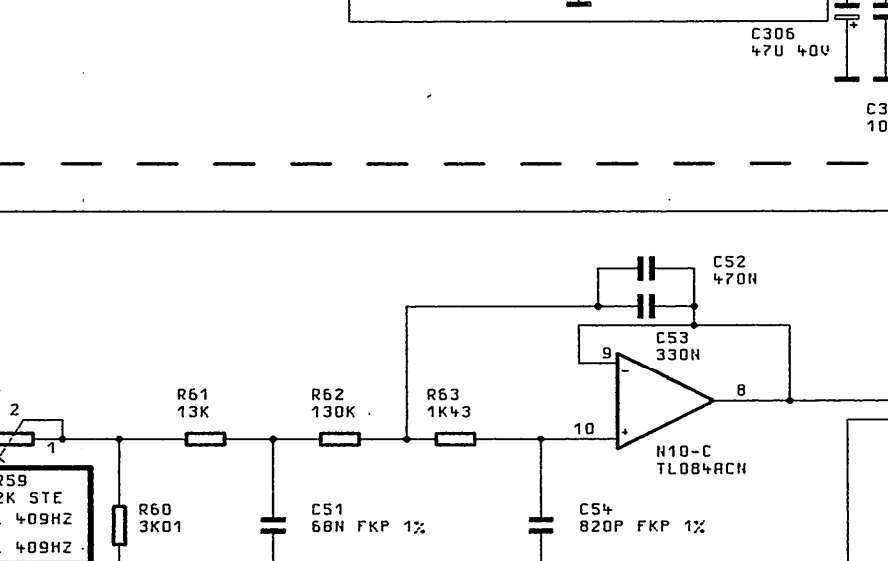
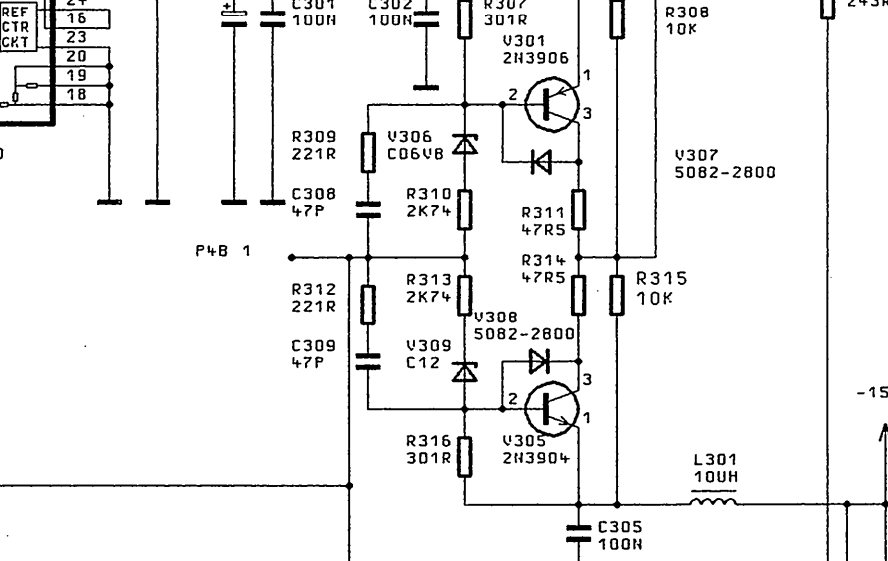
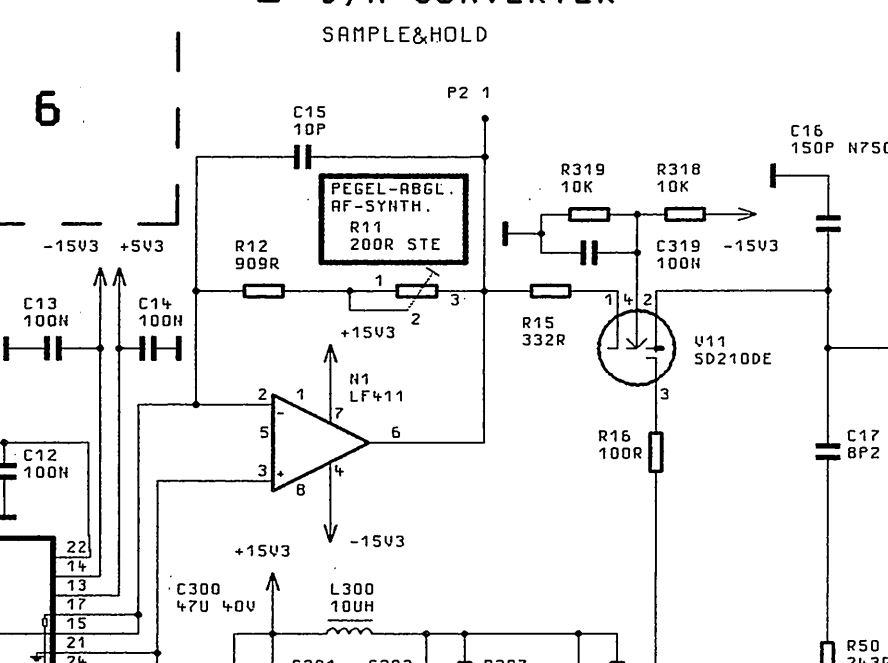
1 TAKTOSZILLATOR 10.048MHZ
CRYSTAL-OSCILLATOR



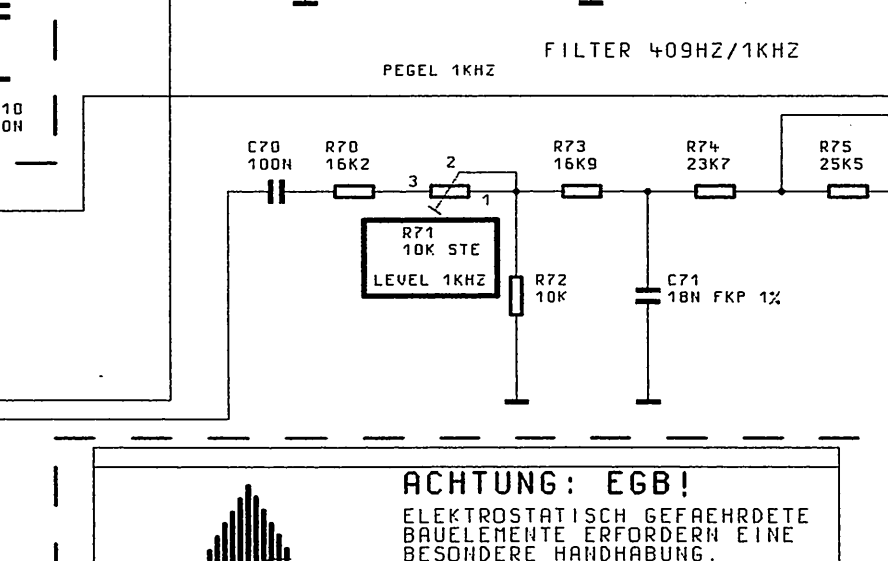
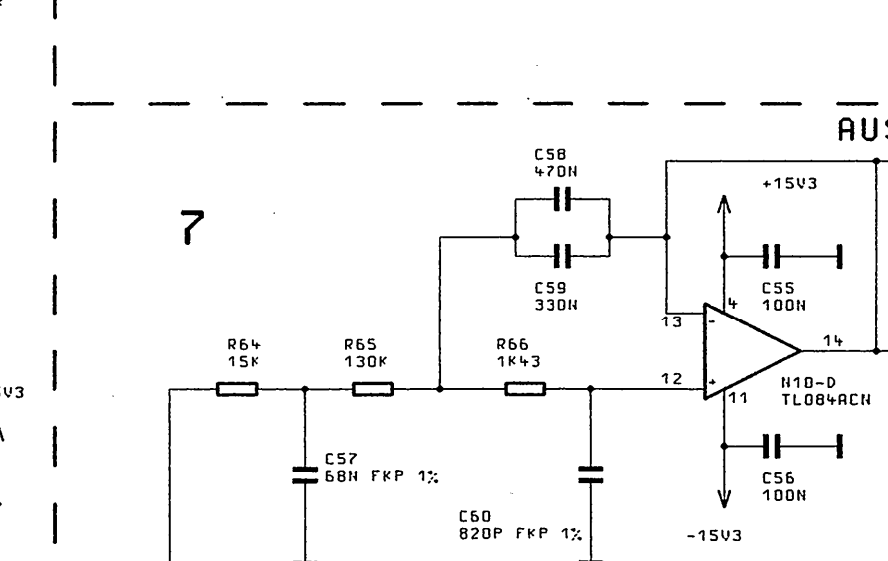
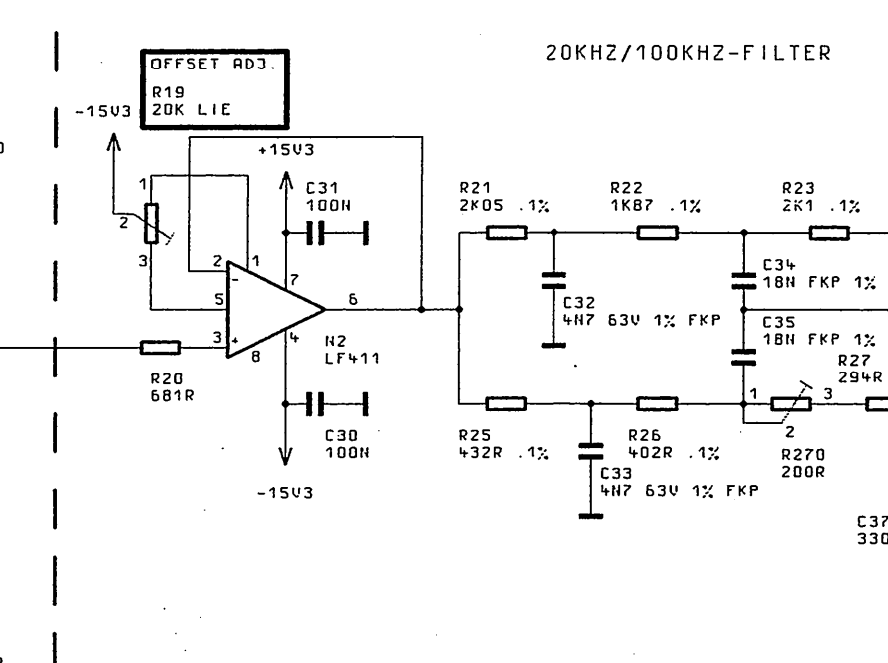
2 D/A-CONVERTER
SAMPLE&HOLD



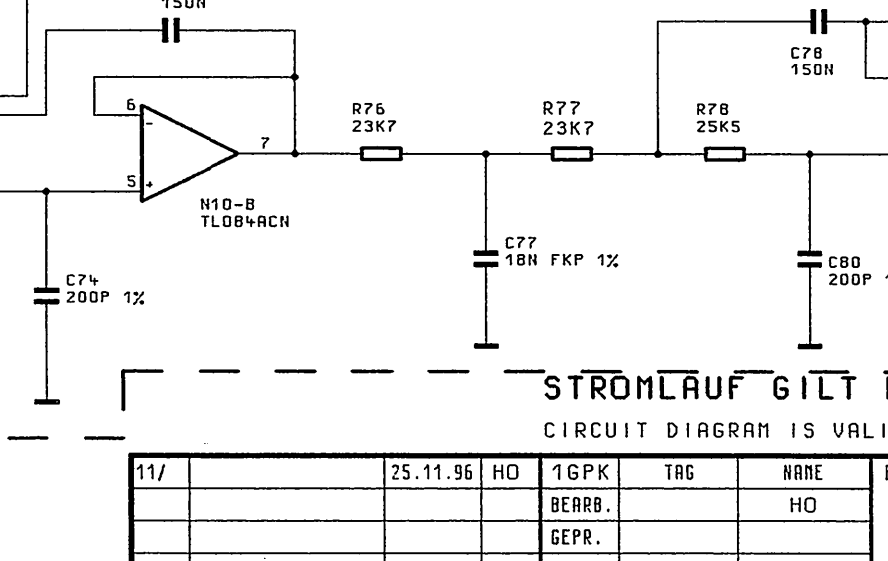
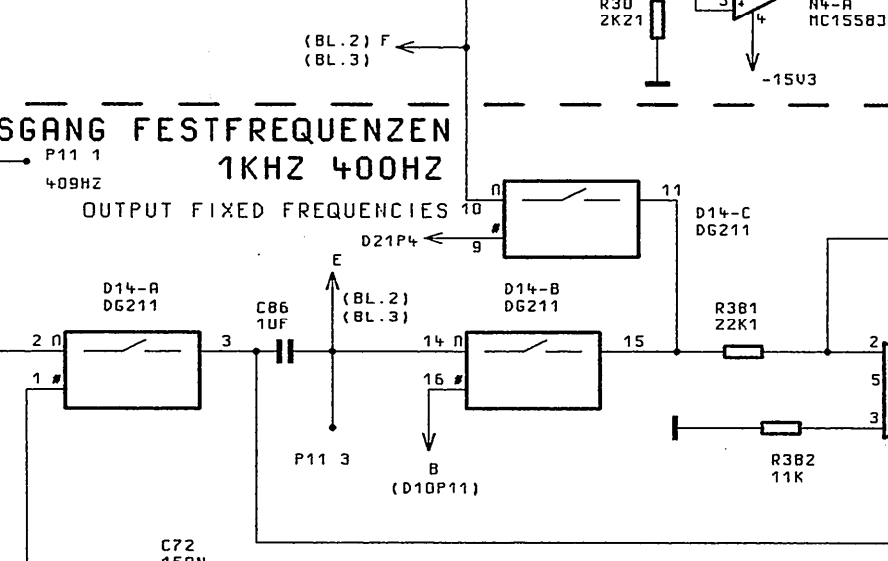
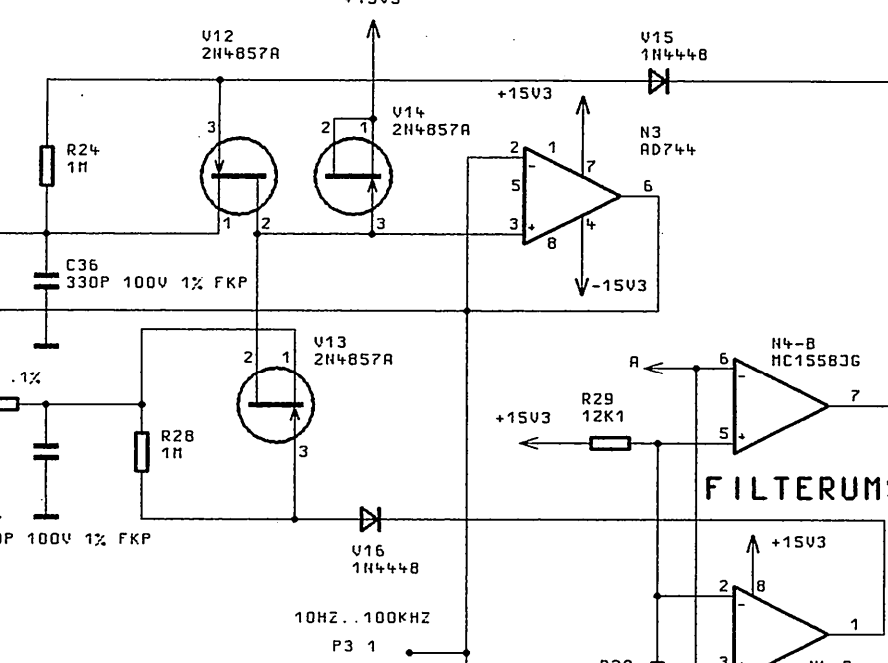
3 FILTERUMSCHALTUNG
FILTER CHOICE



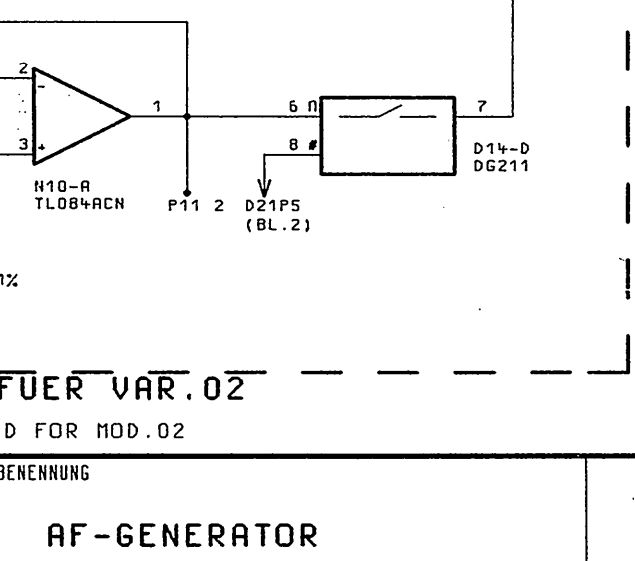
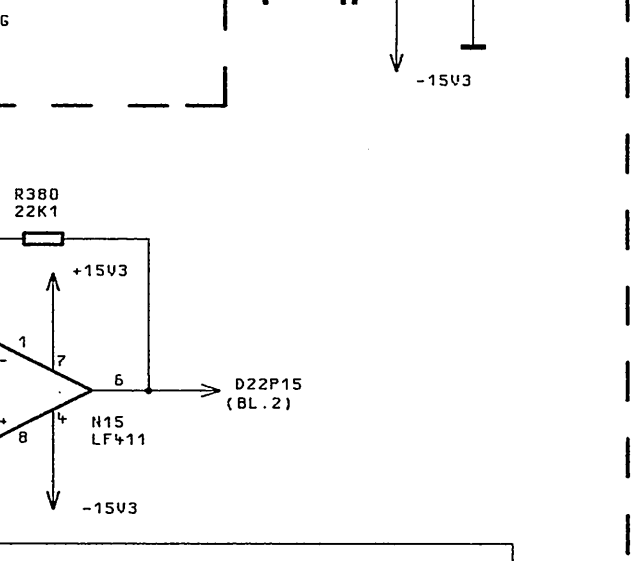
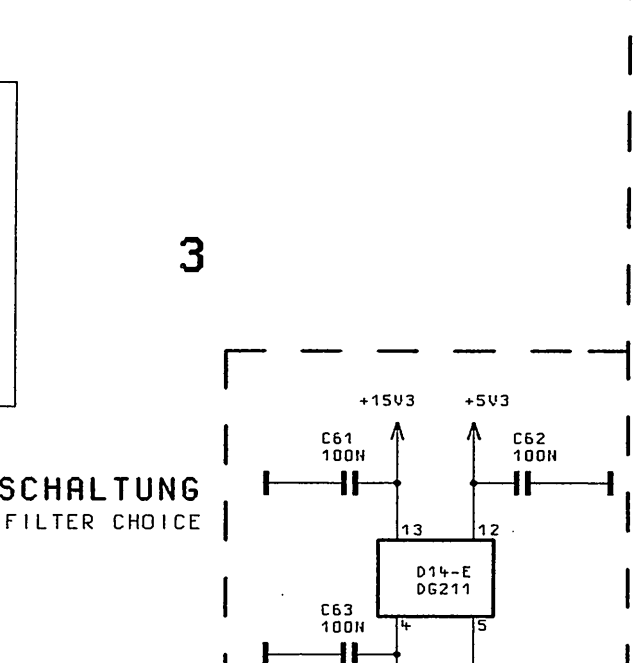
4 AF-SYNTHESIZER
1HZ...100KHZ



5 PEGEL-ABGL.
AF-SYNTH.



6 PEDEL-ABGL.
AF-SYNTH.



ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDLUNG.

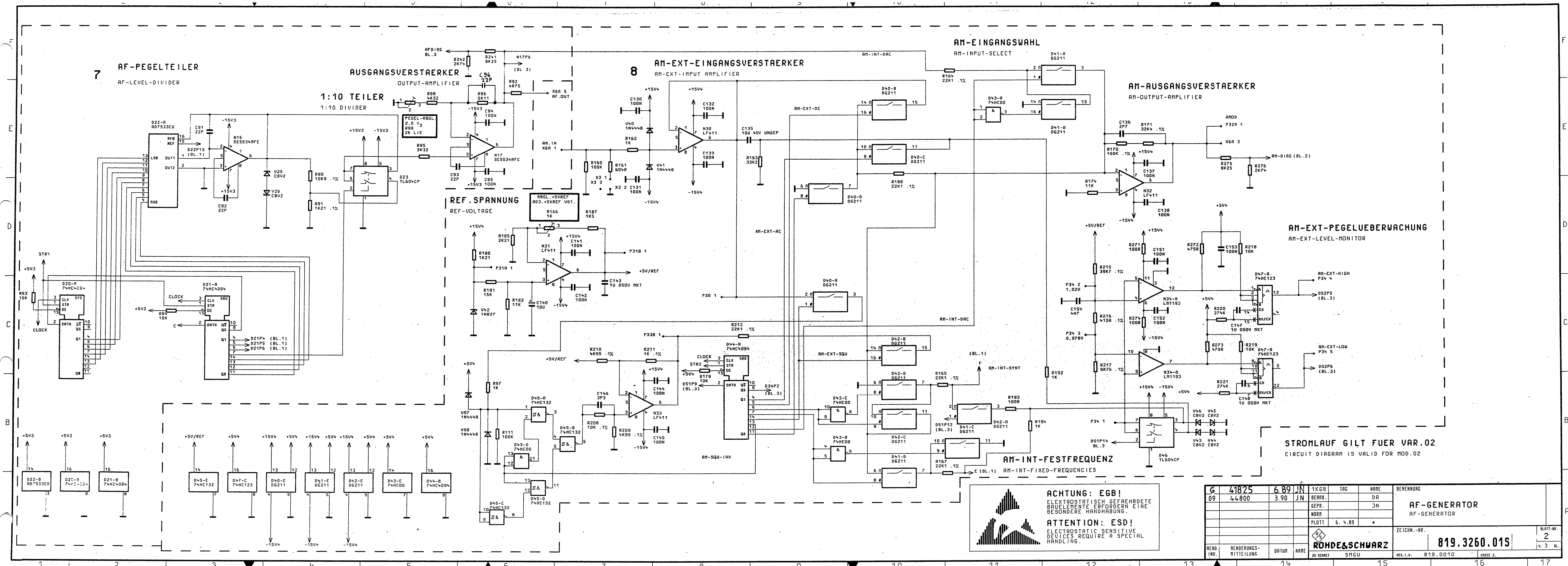
ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

11/	25.11.96	HO	1GPK	TAG	NARE	BENENNUNG
			BEARB.		HO	AF-GENERATOR AF-GENERATOR
			GEPR.			
			NDRN			
			PLOTT	25.11.96		
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	NARE			ZEICHN.-NR.
						819.3260.015
						BLATT-NR.
						1+
						u. BL.
						REG. I.V. 819.0010
						ERSTE Z.

FUER DIESE UNTERLAGE BEHALTEN UIR UNS ALLE RECHTE VOR

ZEICHN.-NR.

BEHALTEN SIE DIESE UNTERLEGE BEHALTEN SIE UNS ALLE RECHTE VOR



ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

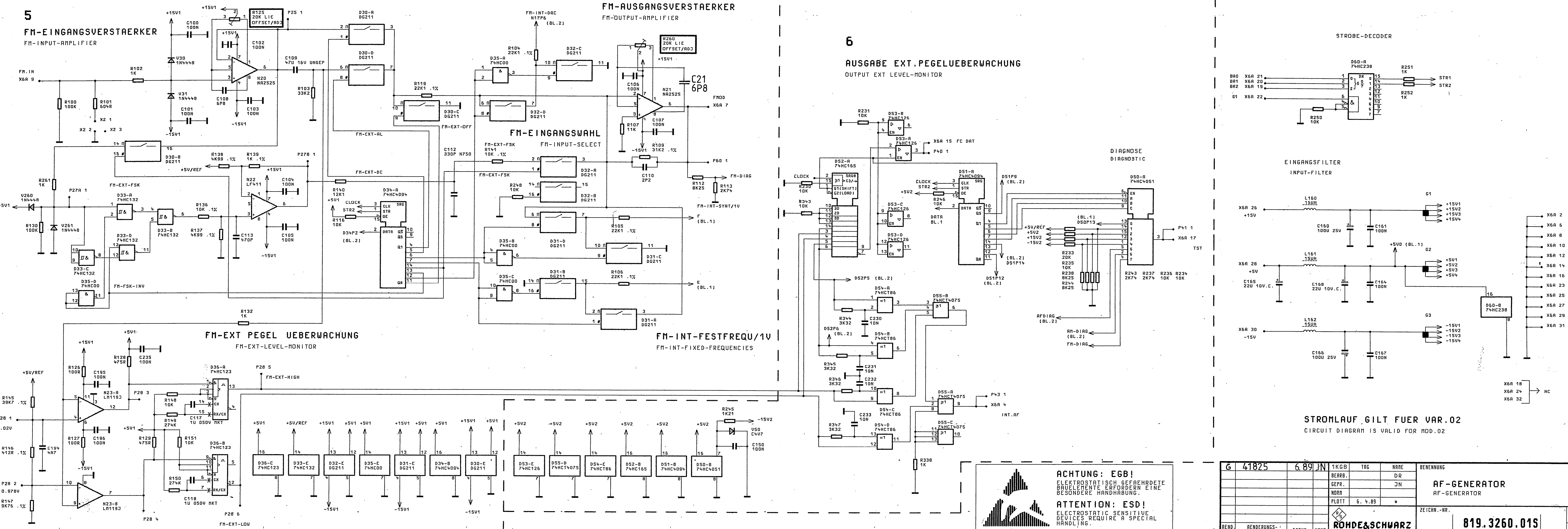
STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

G	41825	6.89 JN	1KGB	TAG	NAME	BENENNUNG
09	44800	3.90 JN	BEARB.		DR	AF-GENERATOR
			GEPR.		JN	AF-GENERATOR
			NORM			
			PLOTT	6. 4.89	*	
RENDRUNGS- MITTEILUNG		DATUM	NAME	ZEICHN.-NR.		
ZU GERÄT		SIGU	819.3260.015			
REG. I. V.		819.0010	BLATT-NR.			
ERST. Z.		2				
		v. 3. BL.				

5
FM-EINGANGSVERSTÄRKER
FM-INPUT-AMPLIFIER

FM-AUSGANGSVERSTÄRKER
FM-OUTPUT-AMPLIFIER

6
AUSGABE EXT. PEGELUEBERWACHUNG
OUTPUT EXT. LEVEL-MONITOR



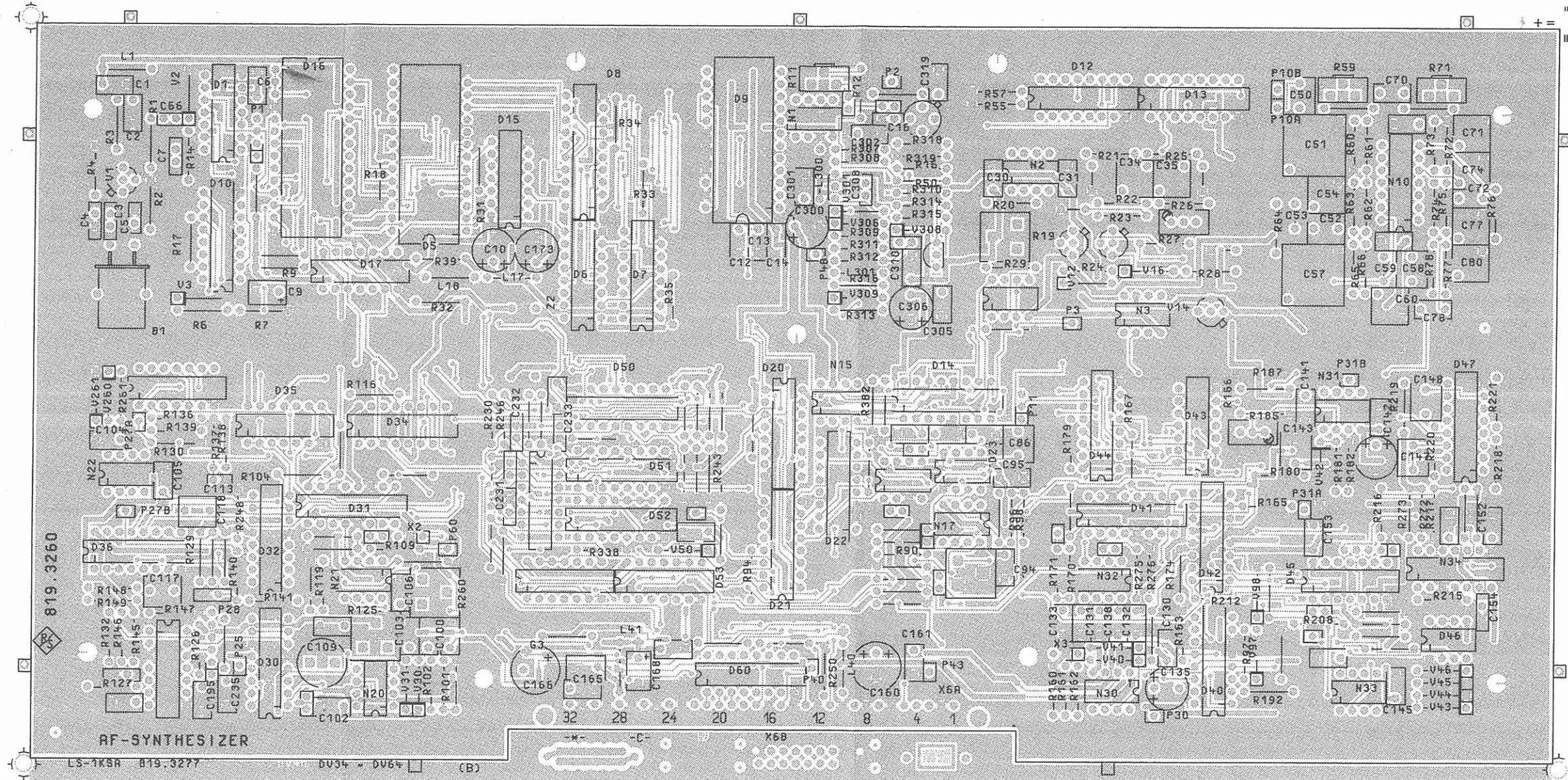
ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRLICHE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDhabUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

6	41825	6.89 JUN	1KGB	TAG	NARE	BEKENNUNG
			BEARR.		DR	AF-GENERATOR AF-GENERATOR
			GEPR.		JN	
			NORM		*	
			PLOTT	6. 4.89		ZEICHN.-NR.
						819.3260.015
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	NARE	ZU GEHÖRT	SMGU	REG. I.V.
						819.0010
						ERSTE Z.

BEHALTEN DIR UNS RILLE RECHTE UDR
FUER DIESE UNTERLEGGE

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



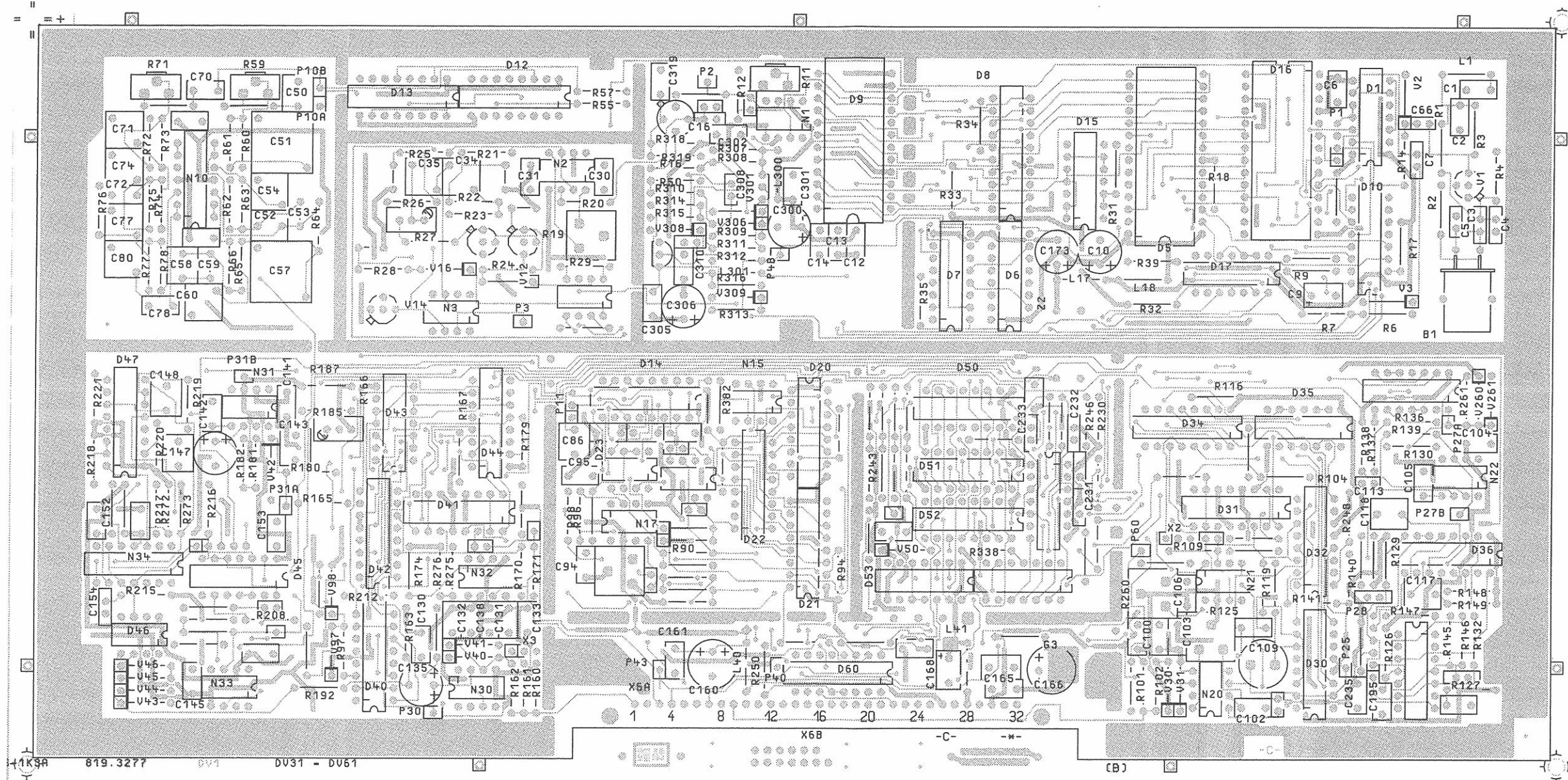
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ACHTUNG: EGB!
Elektrostatisch gefährdete Bauelemente erfordern eine besondere Handhabung.
ATTENTION ESD!
Electrostatic sensitive devices require a special handling.

I 41825		6.89 JN		Maße ohne Toleranzangabe		Maßstab 1:1	
						Halbzeug, Werkstoff	
				1KGB Tag Name		Benennung	
				Bearb. 04.89 JN		AF - GENERATOR	
				Gepr.			
				Norm			
				zu Gerät SMGU		Zeichn.-Nr. 819.3260	
				reg. i. V. 819.0010 V		Blatt-Nr. 2	
And. Zust.		Änderungs-Mitteilung		Tag Name		v. Bl.	
						erste Z.	

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



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

41825		6.89 JN		Maße ohne Toleranzangabe		Maßstab 1:1	
						Halbzeug, Werkstoff	
1KGB		Tag		Name		Benennung	
Bearb. 04.89				JN		AF - GENERATOR	
Gepr.						Z	
Norm						Zeichn.-Nr. 819.3260	
				zu Gerät SMGU		reg. i. V. 819.0010 V	
And. Zust.		Änderungs-Mitteilung		Tag		erste Z.	
						Blatt-Nr. 3	
						v. Bl.	

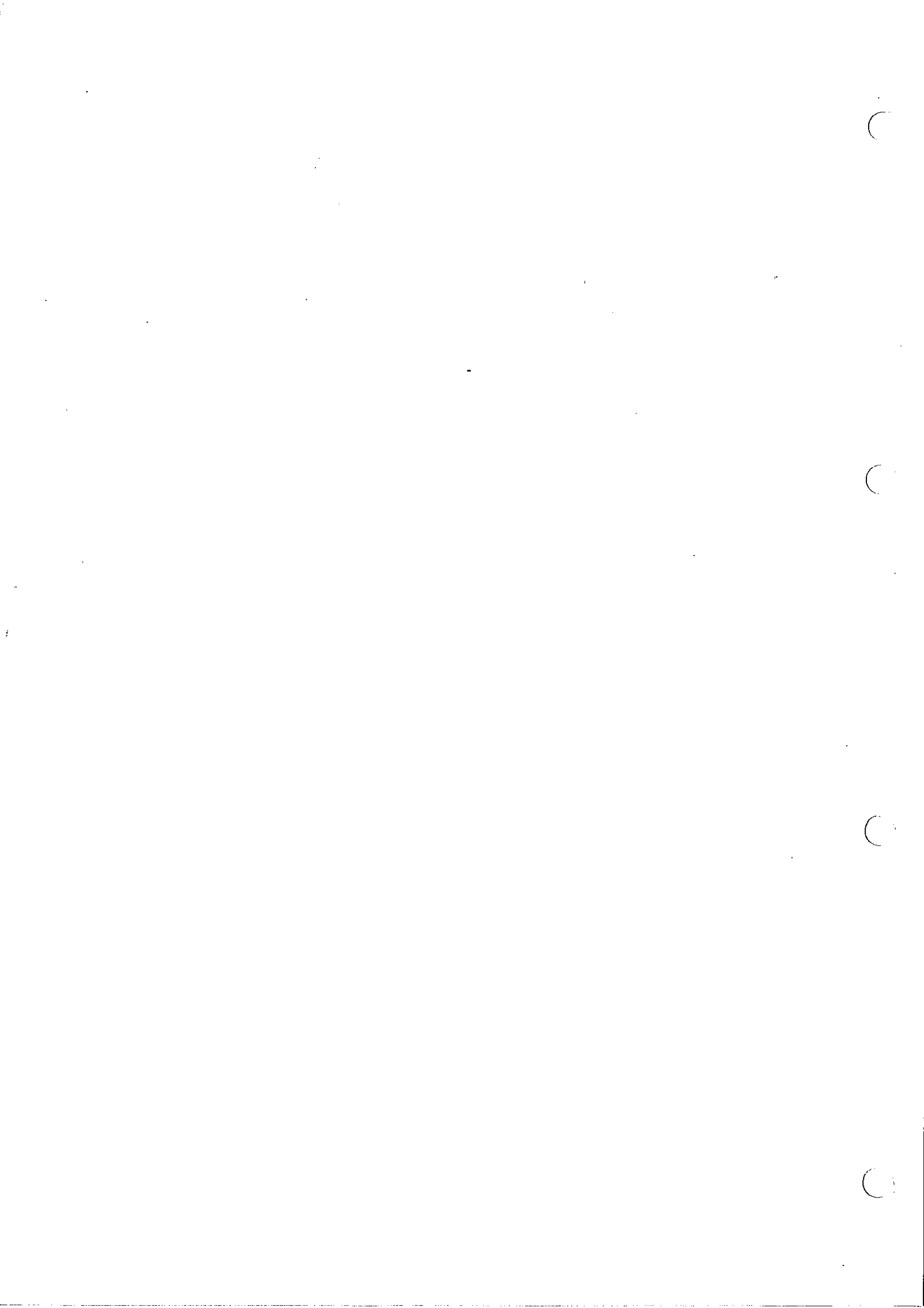


ROHDE & SCHWARZ

SERVICE DOCUMENTS

FRN-Synthesis

819.3860.02



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5 Service Manual "FRN Synthesis"

5.1 Function Description

(See circuit diagram 819.3860 S)

The FRN synthesis subassembly contains an oscillator generating frequencies from 48 to 58 MHz to produce the fine resolution in the frequency synthesis circuit of the SMGU/SMHU following mixing-down with 40 MHz in a fractional-N PLL. The output frequency of the subassembly (3 to 3.625 MHz) is obtained after dividing by 16 to improve the spectral purity.

5.1.1 VCO 48 to 58 MHz with Down-mixing and 16:1 Divider

The VCO in a Clapp circuit with the FET V310 as the active element oscillates over the range 48 to 58 MHz. Its negative input resistance cancels the resistance in the oscillator circuit which is tuned using the diodes V58-71. The frequency range is adjusted using C70, 71. The output of the buffer stage with V90 contains a diagnostics detector which monitors the output level of the VCO. The signal is amplified to TTL levels by V120 following a further buffer stage (V100) and divided down in the following divider by a factor of 16 to the output frequency of the subassembly of 3 to 3.625 MHz. The output level is monitored by a diagnostics detector. The output signal of the buffer stage is amplified to 17 dBm by V111 and mixed down in U140 with 40 MHz to an IF of 8 to 18 MHz. The signal is amplified to TTL levels by V150, 155 following lowpass filtering. The signal is then applied to the divider of the fractional-N PLL.

5.1.2 40-MHz Amplifier and M Divider

The 40-MHz input signal at X72 with a level of 5 dBm is amplified in an buffer stage by V355 and monitored by a diagnostics detector. Following an amplifier with a common-gate FET circuit (V372), the signal is applied to a diode limiter in which variations in the input level and the amplifier stages are eliminated. The signal is available as an RF signal at mixer U140 following lowpass filtering. The 40-MHz signal is amplified to TTL levels by V380 via a second stage in the gate circuit (V360). After being fed to D387 a 8:1 fixed divider the signal is passed to the programmable M divider with a division factor that can be varied between 25 and 54. The output signal of 94 to 200 kHz following D390, 395 is the reference frequency for the fractional-N PLL. V112 and D380 ensure that a new M factor is loaded synchronously when the frequency is changed.

5.1.3 Fractional-N PLL

Operating Principle

Changing the division factor from N to N + 1 in a fractional-N divider now and again causes the VCO frequency to be a fractional multiple of the reference frequency, i.e. $f_{VCO} = N,F \times f_{REF}$. This procedure results in a PLL with a high frequency resolution.

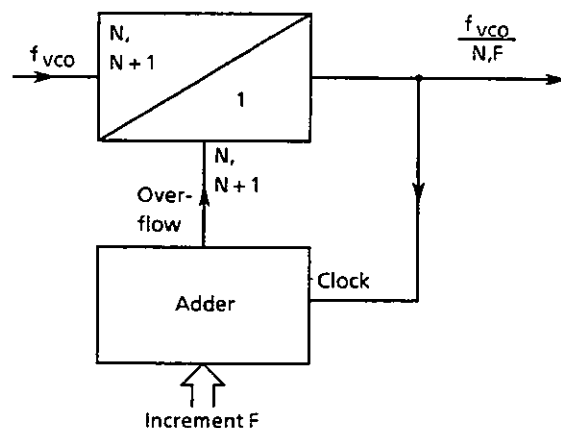


Fig. 5-1 Block diagram of N.F divider

An increment F is added on each output pulse from the divider. The division factor is switched to N + 1 for one reference frequency period if the adder overflows.

Example:

$$F = 0,1 \rightarrow \overline{N} = \frac{(9 \times N) + (N+1)}{10} = N,1 = N,F$$

This switch-over of the division factor produces a phase discontinuity which leads via the PLL to spurious modulation of the oscillator. Spurious signal can be reduced by 60 to 80dB by a compensation circuit.

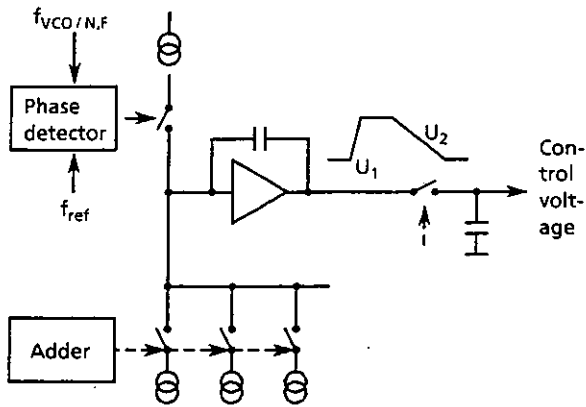


Fig. 5-2 Block diagram of N,F PLL

With its output signal, the phase detector switches a current source which charges the integration capacitor from V1 to V2. This voltage is sampled by the sample-and-hold circuit. The compensation current sources then discharge the integrator to V1. The on period of these current sources is controlled by the respective value in the adder, a current source being assigned to each digit. A bias current source also ensures that the phase shift in the PLL is constant.

Circuit description

The gate array D165 contains an interface for data transmission, the N.F divider with 8-digit adder and the control circuit for the compensation circuit sources of the first four digits after the decimal point.

D160 generates the clock for various parts of the circuit, the level is monitored by a diagnostics detector. The control signal for the sample-and-hold circuit is generated in D175. D180, 185, 186 synchronize the compensation and divider output pulses with the input clock. Crosstalk between the output signals of the gate array is thus reduced.

The output frequency of the N.F divider is compared with the reference frequency from the M divider in the phase detector comprising a J-K flipflop D220 and D221.

The current sources which determine the accuracy of the compensation consist of transistor current sources in a common array V235 followed by FET cascode stages. Diode selectors controlled by HCMOS levels are used to switch the currents for the phase detector, bias and compensation. The most important resistors for determining the current are fitted in an array (R235) in order to achieve as high a temperature stability as possible.

A sample-and-hold circuit controlled by the level converter V323 samples the output voltage of integrator N300 at the reference frequency. The control gain is switched over by D40 depending on the division factor. A preset voltage generated by the transistor current source V12 is added in N2 to the PI controller output voltage.

The output stages V20, 21 and V22, 23 are used to quick charge and discharge capacitors C15, 24 of the lag filter when the frequency is changed. The lag filter is also bypassed by the FET switch N20. The time constant of the PI controller is switched over by V303. The FET switch control triggered by the subassembly strobe is generated by the monostable D10 with the level converter V13. This ensures that the subassembly frequency settles rapidly.

The output voltages of the PI controller and the IF diagnostics detector are monitored by the alarm detector N410. Error message 42 is output if voltages are not within the limits.

5.2 Tests and Adjustments

5.2.1 Testing and Adjusting the 48 to 58-MHz Oscillator

The bottom screen cover should be screwed on when adjusting the VCO. Connect spectrum analyzer to jumper X1 using the adapter cable, connect power supply unit (0 to +20 V) to jumper X2, 1-3. Preliminary adjustment of VCO to following frequency range using C70, 71:

2.5 V --> $f = 48 \pm 0.2$ MHz
17.5 V --> $f = 58 \pm 0.2$ MHz.

Vary the tuning voltage from 1 to 19 V, the VCO should oscillate over the complete frequency range without drop-outs, spurious sidebands or marked increases in noise.

- * Level at X1: -14 to -11 dBm
- * Diagnostics voltage (SF 120): +0.4 to +0.7 V

5.2.2 Testing the Buffer Amplifier and 16:1 Divider

Connect spectrum analyzer to X3 using adapter cable, the power supply unit remains connected to X2.

- * Level at X3: -6 to -4 dBm.

Connect oscilloscope to X4 using 10:1 probe. HCMOS levels must be reached in the tuning range of the VCO (1 to 19 V).

Connect spectrum analyzer to X71, set jumper X4 to 1-2.

- * Measure level at X71: 3.000 to 3.625 MHz, +3 to +7 dm
- * Diagnostics voltage (SF 121): +0.2 to +0.5 V.

5.2.3 Checking the 40-MHz Signal

Connect signal generator set to 40 MHz, +5 dBm to X72.

- * Diagnostics voltage (SF 122): +0.8 to +1.2 V.

Measure signal at X5 using adapter cable, vary the input power at X72 from +2 to +8 dBm.

- * Level at X5: -17.5 to -14.5 dBm.

Measure the signal at P25 using an oscilloscope and 10:1 probe. HCMOS levels must be reached at an input power of +2 to +8 dBm. The signal generator set to 40 MHz, +5 dBm remains connected to X72.

5.2.4 Testing the M Divider

Connect frequency counter to P26 with 10:1 probe. Increment the M factor from 25 to 53, the output frequency at P26 is 5 MHz/M.

Setting on SMGU/SMHU: $f_{RF} = 1002.5$ MHz ($M = 25$) to $f_{RF} = 2125.3$ MHz ($M = 53$) step size $\Delta f_{RF} = 40.1$ MHz, this corresponds to an increase in the M factor of 1.

5.2.5 Checking the IF signal 8 to 18 MHz

Connect power supply unit (0 to +20 V) to jumper X2, 1-3. Measure the signal at P6 using an oscilloscope and 10:1 probe. Vary the tuning voltage from 1 to 19 V, HCMOS levels must be achieved over the complete tuning range.

- * Diagnostics voltage (SF 123): +1.1 to +2.7 V.

5.2.6 Commissioning the PLL

5.2.6.1 Checking the Preset Voltage

Insert jumper X6 at 2-3. Measure the present voltage of the VCO at the following frequency settings using the diagnostics voltmeter (SF 118).

$f_{\text{SMGU/SMHU}} / \text{MHz}$	Diagnostics voltage (SF 118) / V
1020,478000	12,8 ± 0,7
1019,648000	6,4 ± 0,35
1019,228000	3,2 ± 0,2
1019,434000	4,8 ± 0,3
1019,336000	4 ± 0,25
1019,277000	3,6 ± 0,25
1019,252000	3,4 ± 0,25
1019,238000	3,3 ± 0,25

5.2.6.2 PLL Function Test

Insert jumpers X6 and X2 at 1-2. Measure signal at P19 using oscilloscope and 10:1 probe.

Setting on SMGU/SMHU:

- ▶ RF 1019.53125 MHz
- * Signal at P19: see Fig. 5-3
- * Diagnostics voltage (SF 118): + 5 to + 6 V.

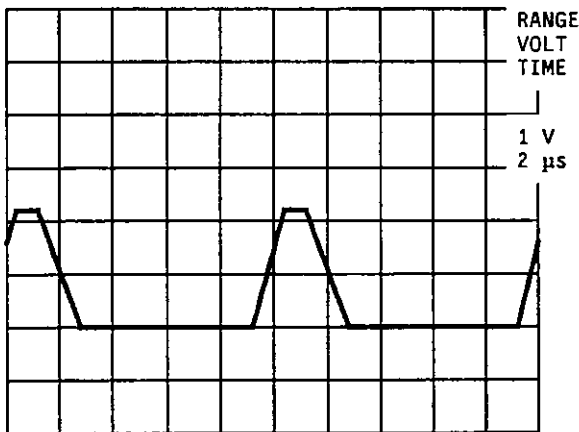


Fig. 5-3 Voltage at P19

5.2.6.3 Checking the Settling Time

Connect storage oscilloscope to P20 using probe (external triggering at P30,5).

Setting on SMGU/SMHU:

RF sweep, $f_{\text{START}} = 1019.140625$,

$f_{\text{STOP}} = 1021.093750$, $f_{\text{STEP}} = 1.953125 \text{ MHz}$.

Figs. 5-4 and 5-5 show the typical settling behaviour of the PI controller voltage at P20.

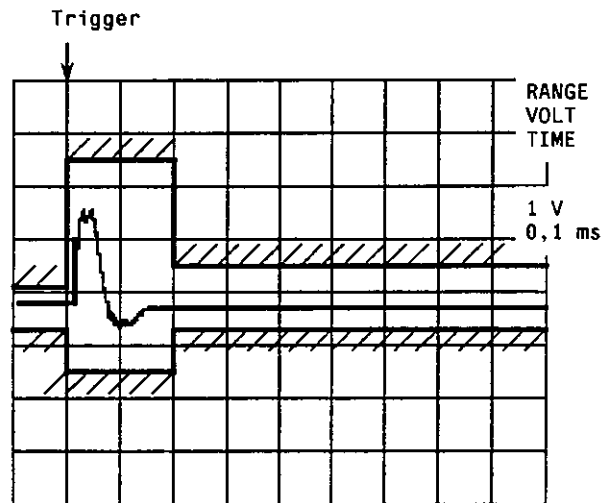


Fig. 5-4 PI controller voltage at P20,
 $f_{\text{SMGU/SMHU}}: f_{\text{START}} \rightarrow f_{\text{STOP}}$

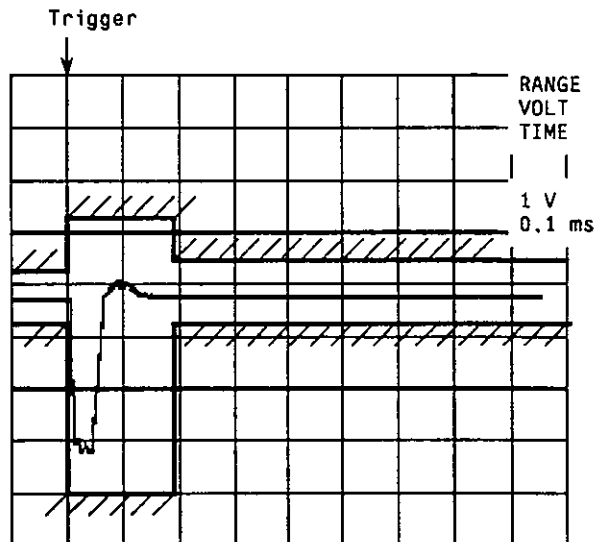


Fig. 5-5 PI controller voltage at P20,
 $f_{\text{SMGU/SMHU}}: f_{\text{STOP}} \rightarrow f_{\text{START}}$

5.2.6.4 Checking Oscillator Linearity

The top and bottom screening covers must be screwed on. Adjust the output voltage of the PI controller on the diagnostics voltmeter (SF 117) to $\leq |0.3 \text{ V}|$ alternately at $f_{\text{SMGU/SMHU}} = 2038.281$ and $f_{\text{SMGU/SMHU}} = 2042.187$ using C70, 71.

The magnitude of the diagnostics voltage must be $\leq 2 \text{ V}$ at the following settings.

$f_{\text{SMGU/SMHU}} / \text{MHz}$	Diagnostics voltage (SF 117) / V
2038,672000	≤ 2
2039,062000	≤ 2
2039,453000	≤ 2
2039,844000	≤ 2
2040,234000	≤ 2
2040,625000	≤ 2
2041,015	≤ 2
2041,406000	≤ 2
2041,796000	≤ 2

5.2.6.5 Setting and Checking Compensation

Insert jumper X4 at 2-3. Connect spectrum analyzer to X71 and cable W72 to X72 again. The top and bottom screen covers must remain screwed on for this adjustment, the spectrum analyzer and the SMGU/SMHU must be synchronized at the same reference frequency.

Setting on SMGU/SMHU: $f_{\text{RF}} = 2038.281641$ MHz, SF 25 (control bandwidth of FRN loop too wide).

Setting on spectrum analyzer:
CF = 52 MHz, REF level = 5 dBm, RES BW = 30 Hz, video BW = 1 Hz, sweep time = 20 s, span = 0 Hz.

Adjust the level of the spurious signals to a minimum ($\leq -83 \text{ dBc}$) using R261.

Setting on SMGU/SMHU: $f_{\text{RF}} = 2038.281289$ MHz.

Setting on spectrum analyzer:
CF = 52.0011 MHz, otherwise as above.
Adjust the level of the spurious signals to a minimum ($\leq -83 \text{ dBc}$) using R263.

Check the spurious signals at $n \times 1 \text{ kHz}$ ($n = 1$ to 5) from the carrier with the following frequency settings on the SMGU/SMHU ($\leq -78 \text{ dBc}$).

Spectrum analyzer setting:
CF = 52 MHz, REF level = 5 dBm, span = 10 kHz, RES BW = 30 Hz.

SMGU/SMHU settings: SF 25

$f_{\text{SMGU/SMHU}} / \text{MHz}$

2038.281641

2038.281289

2038.281254

2038.281250

Spectrum analyzer settings:
CF = 57 MHz, otherwise as above.

SMGU/SMHU settings:
SF 49, $f_{\text{SMGU/SMHU}} = 2041.797266$ MHz.

Then remove top cover and insert jumper X4 at 1-2. Switch the control bandwidth of the FRN loop to narrow using SF 26.

5.2.7 Checking the Alarm

SMGU/SMHU setting: $f_{\text{RF}} = 1000 \text{ MHz}$.

Disconnect the 40-MHz signal at X72, the display "Err 42" must light up. Connect the cable to X72 again. Connect a power supply unit (0 to $\pm 20 \text{ V}$) to X6, 2-3.

The display "Err 42" must light up at $< -8.8 \text{ V}$ and $> +8.8 \text{ V}$ and must disappear again at $> -8.2 \text{ V}$ and $< +8.2 \text{ V}$. Disconnect the power supply unit and connect the jumper X6 at 1-2 again, screw the top screen cover on again.

5.3 Troubleshooting

Faults in the FRN synthesis can be recognized at the RF output of the SMGU/SMHU by means of a small frequency error ($\Delta f < 1.95$ MHz at $f_{RF} = 1$ GHz) and a poor spectrum close to the carrier. The PLL function is monitored by an alarm detector for the PI controller voltage and a detector for the input clock of the FRN divider. No synchronization errors occur in the following PLLs (summing loops 1 and 2) if there is a PLL fault because of the low frequency variation of the output signal (3.000 to 3.625 MHz). If "Err 42" (FRN synthesis) and "Err 46" (summing loops) occur nevertheless, either the 48 to 58 MHz oscillator, a series-connected buffer stage for the FRN synthesis or the 40-MHz signal for the fixed frequencies has failed.

5.3.1 Failure of the PLL (Err 42)

- Use the diagnostics function to check which voltage is out of tolerance:
SF 117, PI controller: -8 to +8 V,
SF 123, IF level: +1.1 to +2.7 V.
- If only the PI controller voltage is out of tolerance and if the output frequency at X71 displayed by SF 78 is correct, check the preset voltage and the adjustment of the oscillator using C70, 71 according to Section 5.2.6.1.
- If the PI controller voltage is out of tolerance and if the output frequency of the sub-assembly is incorrect, check the following parts of the circuit:
 1. The M divider with test points P25 (5 MHz) and P26 (5 MHz/M); the M factor is displayed using SF 83.
 2. The fractional-N divider with P8 ($f_{IF} = 8$ to 18 MHz, $f_{IF} = 16 \times f_{FRN} - 40$ MHz) P9 ($f_{IF}/N.F$, N.F = 40 to 194, N.F = M/5 MHz ($f_{FRN} \times 16 - 40$ MHz), P11 ($f_{IF}/N.F$). The output frequency f_{FRN} is displayed using SF 78, the M factor using SF 83.
 3. The operating points of the compensation current sources, the voltage stabilization, the integrator with test point P19, the sample-and-hold stage with P20, P21 and the function of the preset voltage according to Section 5.2.6.2.

- If the IF level is out of tolerance and there is an error message (the PI controller voltage may still be within tolerance), use the diagnostics function to check the oscillator level (SF 120) and the 40-MHz signal (SF 122). If these are still correct, check the 40-MHz buffer stage with V372, the oscillator buffer stage with V111, the mixer N140 and the IF amplifier with V150, V155.
It should be noted that no further settings (N, F and M dividers, preset voltage) can be carried out apart from the diagnostics function if there is no IF signal from the sub-assembly.

5.3.2 Occurrence of Spurious near the Carrier

If spurious with an amplitude of -70 to -15 dBc occur ≤ 2 kHz from the carrier, and if their frequency and amplitude change by a large amount when the output frequency of the SMGU/SMHU is slightly adjusted ($f = 10$ to 100 Hz), check the adjustment according to Section 5.2.6.5. If this cannot be carried out, check the control signals for the compensation current sources at test points P12 (bias) and P13 to P16 (1st to 4th digits after the point), the voltage stabilization, the operating points of the current sources, the integrator and the sample-and-hold stage.

5.3.3 Signals at Test Points and DC Operating Points

Oscillator 48 to 58 MHz
V75 source: +0.5 to +2.5 V
V90 collector: +5 to +6 V
X1: 48 to 58 MHz, -14 to -11 dBm into 50 Ω

Buffer stages
V100 source: +0.7 to +2 V
V111 emitter: +4 to +4.5 V
X3: 48 to 58 MHz, -6 to 4 dBm into 50 Ω

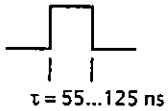
16:1 Divider
V125 emitter: +4.8 to +5.2 V
P4: 48 to 58 MHz, HCMOS levels
P5: 3.000 to 3.625 MHz, HCMOS levels

IF amplifier 8 to 18 MHz
 V150, 155 collector: +1 to +3 V DC
 P6: 8 to 18 MHz, HCMOS levels

40-MHz isolating amplifier
 V355 collector: +5.5 to +6.5 V
 V360, 372 source: +0.7 to +2 V
 X5: 40 MHz, -17.5 to -14.5 dBm into 50 Ω

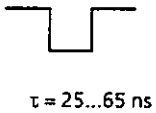
M divider
 V405 emitter: +4.7 to +5.1 V
 P25: 40 MHz, HCMOS levels
 P26: 5 MHz/M, HCMOS levels

Fractional divider with synchronization
 P7, P8: 8 to 18 MHz, HCMOS levels, duty factor ≈ 50 %
 P9: narrow pulse, 94 to 200 kHz, HCMOS levels

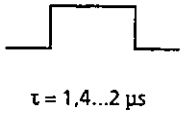


P10: as P9

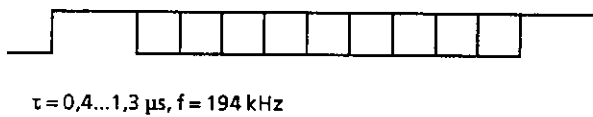
P11: narrow pulse, 90 to 194 kHz, HCMOS levels



P12: pulse, HCMOS levels



P13: pulse train, HCMOS levels,
 $f_{SMGU/SMHU} = 1040$ MHz



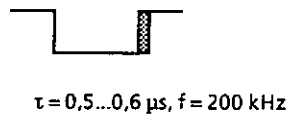
P14: pulse train as with P13
 $f_{SMGU/SMHU} = 1040$ MHz

P14: pulse train as with P13
 $f_{SMGU/SMHU} = 1040$ MHz

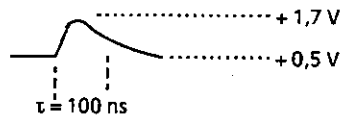
P14: pulse train as with P13
 $f_{SMGU/SMHU} = 1040.000001$ MHz

Phase detector

P17: pulse, HCMOS levels
 $f_{SMGU/SMHU} = 1040$ MHz



P18: narrow pulse, $f_{SMGU/SMHU} = 1040$ MHz



Compensation current sources

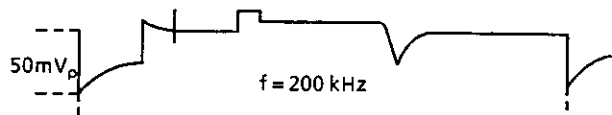
V230 emitter: -14 V
 V275 emitter: +14 V
 V235.2: +6.75 V to +7.25 V
 V236, 240, 245, 250 source: -7 to -10 V

Voltage stabilization

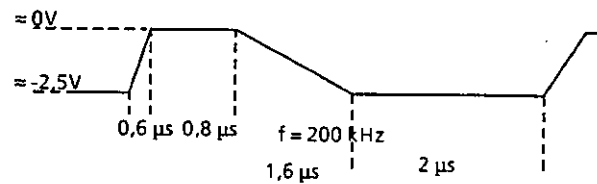
V332 emitter: +4.7 to +4.95 V
 V331 emitter: +2.3 to +2.5 V

Integrator

N300.2: = 2.4 V DC

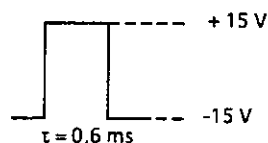


P19: $f_{SMGU/SMHU} = 1040$ MHz



Sample-and-hold stage

P21: f = 94 to 200 kHz



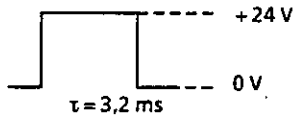
Loop filter with gain correction and preset voltage

P20: -8 to +8 V DC, typ. -2 to +2 V DC with adjusted VCO

V26 emitter: -14 V

V12 emitter: -6.7 to -7.7 V

N20.3: pulse



SMGU/SMHU setting:

RF sweep, sweep time = 10 ms

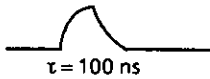
P22: +2.5 to +17.5 V DC

Diagnostics multiplexer and latch

SMGU/SMHU setting:

RF sweep, sweep time = 10 ms

P30: very narrow pulse, HCMOS levels, period 10 ms, pulse width 100 ns



P31: as with P30

5.4 Interfaces

Signal		D	T	Range of values	Connection Point	Remarks
Name	Description					
+24 V	Power supply +24 V	I	P	23,4 ... 24,5 V 10 ... 30 mA	X7A24	Power supply
+15 V	Power supply +15 V	I	P	14,8 ... 15,3 V 240 ... 300 mA	X7A26	Power supply
+5 V	Power supply +5 V	I	P	4,9 ... 5,1 V 100 ... 150 mA	X7A28	Power supply
-15 V	Power supply -15 V	I	P	-15,2 ... -14,2 V 40 ... 70 mA	X7A30	Power supply
GND	Ground	R	P	HC-MOS	X7A10 X7A12 X7A14 X7A16 X7A23 X7A25 X7A27 X7A29 X7A31	
BA0	Subassembly address	I	D	HC-MOS	X7A21	Subassembly addressing
BA1	Subassembly address	I	D	HC-MOS	X7A20	Subassembly addressing
BA2	Subassembly address	I	D	HC-MOS	X7A19	Subassembly addressing
G1	Strobe 1	I	D	HC-MOS	X7A22	Subassembly addressing
TF.CLK	CLOCK	I	D	HC-MOS	X7A11	Data transmission
TR.DAT	Data	I	D	HC-MOS	X7A13	Data transmission
TST	Diagnostics	O	A	-5 ... +5 V	X7A17	Selftest
Ala	Alarm	O	L	Open collector	X7A18	Selftest
FRNREF	Reference	I	A	40 MHz 3 ... 7 dBm	X72	RF interface 50 Ω
FRN	FRN output	O	A	3,000 ... 3,625 MHz 3 ... 7 dBm	X71	RF interface 50 Ω

Direction

I Input
O Output
R Reference
M Measurement

Type

A Analog
H Digital High
L Digital Low
P Power

5.5 Positions of Plug-in Jumpers

X2 at 2-3
 X4 at 1-2
 X6 at 1-2

5.6 Required Measuring Equipment

Spectrum analyzer (... 200 MHz)
 (e.g. FSA)

RF generator, high spectral purity, 40 MHz
 (e.g. SMG)

Oscilloscope > 100 MHz
 (e.g. BOL)

Digital storage oscilloscope
 (e.g. BOS)

RF adapter cable

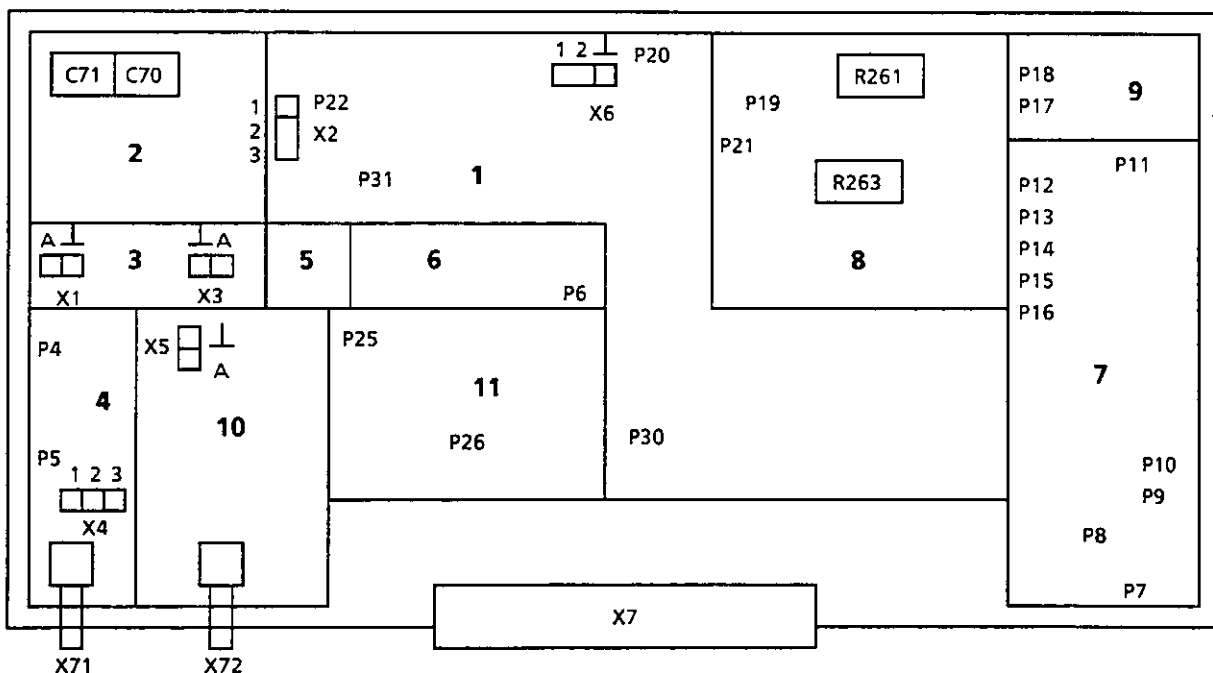
Test adapter

Frequency counter

Voltmeter
 (e.g. URE)

Controller
 (e.g. PUC)

Layout diagram



Schalteillisten
Stromläufe
Bestückungspläne
Part lists
Circuit diagrams
Components plans
Listes des pièces détachées
Schémas de Circuit
Plans des composants

1


2

3

4

Für diese Unterlage behalten wir uns alle Rechte vor.


Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C1	CK 1,5NF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7600.00	WESTERMANN	FKP2	
C2	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C3	CC 4,7NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8450.00	PHILIPS_CO	2238 581 16623	
C4	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C5	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C6	CC 2,2PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8171.00	MURATA	GRM42-6C0G 2R2 C50PT	
C10	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C11	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C12	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C13	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C15	CK 33NF+-1% 63V 10QARD. CAPACITOR	CK 0294.6351.00	SIEMENS	B33531-A5333-F	
C19	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C22	CK 47NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2917.00	ERO	MKR 1826-347-06-4	
C23	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C24	CK 1UF+-5%250V RM22,5 CAPCITOR	0711.6747.00	SIEMENS	B32650-L3105-J	
C26	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C30	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C35	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C36	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6C0G 220F 50PT	
C37	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C38	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	PHILIPS_CO	2238 863 18471	
C50	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C70	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C71	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C72	CG 33 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9274.00	TAB	L1M	
C74	CC 22PF 2% N470/IA 3 ROHR CERAMIC CAPACITOR	0022.3019.00	DRALORIC	RDLL 3X10	
C75	CC 68PF+- 5%100V NPO VIEL CERAMIC CAPACITOR	CC 0060.0759.00	AVX	MRO51 A680JAA	
C76	CC 56PF+- 5%100V NPO VIEL CERAMIC CAPACITOR	CC 0060.0742.00	AVX	MRO51A560JAA	
C77	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C78	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C80	CC 330PF+- 5%100V NPO VIE CERAMIC CAPACITOR	CC 0060.0836.00	AVX	MRO5 1 A 331 JA...	
C81	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C83	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C87	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C90	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C91	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C92	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C93	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C95	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C96	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C100	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C101	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C102	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C103	CC 22PF+-2%6X9P100 CAPACITOR	CC 0087.6335.00	PHILIPS_CO	2222 678	
C104	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C110	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C112	CC 18PF+-2%3X4N750 CAPACITOR	CC 0087.6812.00	PHILIPS_CO	2222 678 58 189	
C113	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C114	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C120	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C126	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C127	CE 220UF+-20%16V RMS ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKS00CC322D	
C128	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C130	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C134	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C135	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C136	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C137	CC 680PF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8421.00	MURATA	GRM42-6 X7R681K50PT	
C138	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C140	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C142	CC 220PF+-2%6X7N750 CAPACITOR	CC 0087.6941.00	PHILIPS_CO	2222 678 58221	
C143	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C145	CC 270PF+-2%6X9N750 CAPACITOR	CC 0087.6958.00	PHILIPS_CO	2222 631 58271	
C146	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C147	CC 270PF+-2%6X9N750 CAPACITOR	CC 0087.6958.00	PHILIPS_CO	2222 631 58271	
C148	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6COG 150F 50PT	
C149	CC 120PF+-2%6X9NPO CAPACITOR	CC 0087.6558.00	PHILIPS_CO	2222 678 10121	
C150	CC 56PF+-2%5X6NPO CAPACITOR	CC 0087.6512.00	PHILIPS_CO	2222 678	
C152	CC 56PF+-2%5X6NPO CAPACITOR	CC 0087.6512.00	PHILIPS_CO	2222 678	
C155	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C156	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C157	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C158	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C159	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C160	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C161	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C162	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C163	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C165	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C166	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C167	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C168	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C169	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C170	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C171	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C175	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C182	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C185	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C186	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C188	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C189	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C190	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C200	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C201	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C202	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C203	CC 390PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8880.00	PHILIPS_CO	2238 863 18391	
C212	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C50PT	
C215	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C223	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C224	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C225	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C228	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C230	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C235	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C240	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C245	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C250	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C251	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C265	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C276	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C280	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C281	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C290	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C292	CK 470PF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7575.00	ROEDERSTEI	KP1830-147 01 1 3 W	
C293	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C301	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C305	CC 2,2PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8171.00	MURATA	GRM42-6COG 2R2 C50PT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C320	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C321	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C322	CC 3,3PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6364.00	PHILIPS_CO	2222 678	
C323	CC 47PF+-2%3X4N750 CAPACITOR	CC 0087.6864.00	PHILIPS_CO	2222 678 58479	
C326	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C327	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C330	CE 220UF+-20%16V RMS ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKS00CC322D	
C331	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C332	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C333	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C334	CE 47UF+-20%6,3V SAL ELECTR. CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C350	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C351	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C360	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C362	CC 27PF+-2%3X4N750 CAPACITOR	CC 0087.6835.00	VALVO	2222 678 58279	
C365	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C366	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C367	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C369	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C370	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C371	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C372	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C373	CC 18PF+-2%3X4N750 CAPACITOR	CC 0087.6812.00	PHILIPS_CO	2222 678 58 189	
C374	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C375	CC 82PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8821.00	MURATA	GRM42-6COG 820F 50PT	
C376	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C377	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C378	CC 6,8PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8236.00	MURATA	GRM42-6COG 6R8 C50PT	
C379	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6COG 150F 50PT	
C380	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C381	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C385	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C387	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C388	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C389	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C390	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C391	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C392	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C393	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C394	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C395	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C396	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C397	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C402	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C405	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C407	CE 220UF+-20%16V RMS ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKSOCC322D	
C420	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C421	CE 47UF+-20%6.3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C422	CE 47UF+-20%6.3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C425	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C426	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C430	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C431	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C435	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C436	CE 2,2UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3911.00	VALVO	2222 128 37228	
D10	BL MM74HC4538N 2XMULTIVIB DUAL MULTIVIBRATOR	0099.9740.00	PHILIPS_SE	(PC)74HC4538(N)	
D40	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D126	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D160	BL PC74HCOOT 4X2IN.NAND QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HCOOD(T)	
D165	BG L5A0429 FRACDIV ASIC GATE-ARRAY	0820.3290.00	LSI_LOGIC	L5A0429	
D175	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D180	BL PC74HCTOOT 4X2IN.NAND NAND GATE	BL 0007.6156.00	PHILIPS_SE	(PC)74HCTOOD(T)	
D185	BL PC74HCT175T 4XD-FF RES QUAD D-TYPE FLIPFLOP	BL 0007.6462.00	PHILIPS	(PC)74HCT175(T)	
D186	BL PC74HCT175T 4XD-FF RES QUAD D-TYPE FLIPFLOP	BL 0007.6462.00	PHILIPS	(PC)74HCT175(T)	
D200	BL PC74HC238P 3TO8 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
D201	BL MM74HC4538N 2XMULTIVIB DUAL MULTIVIBRATOR	0099.9740.00	PHILIPS_SE	(PC)74HC4538(N)	
D205	BL MM74HC11N 3X3IN.ANDG TRIPLE 3-INPUT AND GATE	0099.9486.00	PHILIPS_SE	(PC)74HC11N(P)	
D210	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D211	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D215	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D216	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D220	BL PC74HCT112T 2XJK-FF CL DUAL JK-FF	BL 0007.6327.00	PHILIPS	(PC)74HCT112(T)	
D221	BL PC74HCTOOT 4X2IN.NAND NAND GATE	BL 0007.6156.00	PHILIPS_SE	(PC)74HCTOOD(T)	
D380	BL 74AC74SC 2XD-FLIPFL DUAL D-TYPE FLIPF	BL 0820.3602.00	NSC	74AC74(SC)	
D385	BL PC74HCOOT 4X2IN.NAND QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HCOOD(T)	
D387	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D390	BL PC74HCT161T BIN.COUNT. BINARY COUNTER	BL 0007.6427.00	PHILIPS_SE	(PC)74HCT161(D/T)	

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	ROHDE & SCHWARZ	33	04.02.98	EE FR-N-SYNTHESE FRN-SYNTHESIS	0819.3860.01 SA	5+

095.0026-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D395	BL PC74HCT161T BIN.COUNT. BINARY COUNTER	BL 0007.6427.00	PHILIPS_SE	(PC)74HCT161(D/T)	
L12	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L35	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L60	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L61	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L72	LD 287NH 8,5W CM18P FE-K COIL+CORE	0613.6289.00	TOKO	E521HNO80023	
L75	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L80	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L90	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L101	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L102	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L111	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L113	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L142	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L143	LD 0,56UH10%0,500HMO,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L146	LD 0,56UH10%0,500HMO,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L148	LD 0,56UH10%0,500HMO,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L155	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L175	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L280	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L326	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L333	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L362	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L365	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L372	LD 0,82UH10%0,850HMO,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L375	LD 0,27UH10%0,160HMO,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L376	LD 0,27UH10%0,160HMO,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L377	LD 0,22UH10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L405	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L420	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L422	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L425	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L426	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L430	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L431	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L435	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L436	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
N1	BO LF156J FET OPAMP OPERATIONAL AMPLIFIER	BO 0645.7251.00	ANALOG_DEV	PM156Z	

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		33	04.02.98	EE FR-N-SYNTHESE FRN-SYNTHESIS	0819.3860.01 SA	6+

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
N2	BO AD744AQ FET OPAMP OPERATIONAL AMPLIFIER	0820.3590.00	ANALOG_DEV	AD744AQ	
N20	BS SD5000N 4X ANALOGSCH BJ SD5000N 4XANALOGSWITCH	BJ 0342.2340.00	TEMIC	SD5000N(I)	
N300	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE	
N330	BO NE5532AFE 2XLN OPAMP OPERATIONAL AMPLIFIER	BO 0356.0450.00	SIGNETICS	NE5532AFE	
N410	BO LM339N 4X COMPAR COMPARATOR	BO 0342.2062.00	NSC	LM339N	
P4	VL WIRE-WRAP PIN L=11,6	0088.4542.00	DUPONT CON	75403-003	
..22	WIRE-WRAP PIN				
P25	VL WIRE-WRAP PIN L=11,6	0088.4542.00	DUPONT CON	75403-003	
	WIRE-WRAP PIN				
P26	VL WIRE-WRAP PIN L=11,6	0088.4542.00	DUPONT CON	75403-003	
	WIRE-WRAP PIN				
P30	VL WIRE-WRAP PIN L=11,6	0088.4542.00	DUPONT CON	75403-003	
	WIRE-WRAP PIN				
P31	VL WIRE-WRAP PIN L=11,6	0088.4542.00	DUPONT CON	75403-003	
	WIRE-WRAP PIN				
R1	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R2	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R3	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R6	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R7	RL 0,60W 210 KOHM+-1%TK50 RESISTOR	RL 0083.2258.00	RESISTA	MK2	
R8	RL 0,60W 107 KOHM+-1%TK50 RESISTOR	RL 0083.2035.00	RESISTA	MK2	
R9	RL 0,60W 53,6KOHM+-1%TK50 RESISTOR	RL 0082.2590.00	RESISTA	MK2	
R10	RG 221 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6004.00	ROEDERSTEI	D25	
R11	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R12	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R13	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R14	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R15	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R16	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R17	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R18	RL 0,35W27,4KOHM+-0,1%T25 RESISTOR	RL 0084.3906.00	DRALORIC	SMA0207	
R19	RL 0,35W13,7KOHM+-0,1%T25 RESISTOR	RL 0084.3329.00	DRALORIC	SMA0207	
R20	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R21	RL 0,35W6,81KOHM+-0,1%T25 RESISTOR	RL 0084.2745.00	DRALORIC	SMA0207	
R22	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R23	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R24	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R25	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R26	RL 0,60W 825 OHM+-1%TK50 RESISTOR	RL 0082.2502.00	RESISTA	MK2	
R27	RL 0,60W 392 KOHM+-1%TK50 RESISTOR	RL 0083.2512.00	RESISTA	MK2	
R28	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R29	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R30	RL 0,60W 182 KOHM+-1%TK50 RESISTOR	RL 0083.2193.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R33	RL 0,35W3,40KOHM+-0,1%T25 RESISTOR	RL 0084.2168.00	DRALORIC	SMAO207	
R34	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R35	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R36	RL 0,35W6,98KOHM+-0,1%T25 RESISTOR	RL 0084.2768.00	DRALORIC	SMAO207	
R37	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R39	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R40	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R41	RG 1,3 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5708.00	ROEDERSTEI	D25	
R42	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R43	RG 2,43KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5750.00	ROEDERSTEI	D25	
R44	RG 3,57KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5795.00	ROEDERSTEI	D25	
R45	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R46	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R47	RG 27,4KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5895.00	ROEDERSTEI	D25	
R49	RL 0,60W 365 KOHM+-1%TK50 RESISTOR	RL 0083.2487.00	RESISTA	MK2	
R50	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R51	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R52	RL 0,60W 422 KOHM+-1%TK50 RESISTOR	RL 0083.2541.00	RESISTA	MK2	
R53	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R54	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R56	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R60	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R61	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R75	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R80	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R81	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R84	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R85	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R86	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R87	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R88	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R89	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R90	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R95	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R100	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R101	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R104	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R110	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R111	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	

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		33	04.02.98	EE FR-N-SYNTHESE FRN-SYNTHESIS	0819.3860.01 SA	B+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R112	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R113	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R114	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R115	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R116	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R117	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R120	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R121	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R122	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R123	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R124	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R126	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R128					
R129	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R135	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R136	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R137	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R140	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R141	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R142	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R143	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R144	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R145	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R146	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R150	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R151	RG 10,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.0793.00	PHILIPS_CO	RC02	
R152	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R153	RG 3,32OHM+-1%TK100 1206 CHIP-RESISTOR	RG 0007.8388.00	PHILIPS	RC 02	
R155	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R156	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R159	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R160	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R161	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R162	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R163	RL 0,60W22, 10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R164	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R165	RN 9X 1KOHM+-2%SIL10 H5 RESISTOR NETWORK	RN 0343.4323.00	BI_TECHNOL	L 10 1 S 102 M*	
R166	RN 9X 1KOHM+-2%SIL10 H5 RESISTOR NETWORK	RN 0343.4323.00	BI_TECHNOL	L 10 1 S 102 M*	
R167	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R168	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R169	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R173	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R175	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R176	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R177	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R180	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R182	RL 0,60W22, 10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R185	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R186	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R187	RL 0,60W22, 10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R188	RL 0,60W22, 10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R190	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
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R200	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R201	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R202	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R205	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R206	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R207	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R208	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R210	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R211	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R212	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R213	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R214	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R215	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R216	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R217	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R218	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R219	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R220	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R221	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R222	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R223	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R224	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R225	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R228	RL 0,60W22, 10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R229	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R230	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R231	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	


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Kennz. Comp. No.	Benennung Designation	Sechnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R235	RN 1X30K1/4X3K/1X2,74K/2X RESISTOR NETWORK	0801.4842.00	EBG	UPRN 11	
R236	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R237	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R240	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R241	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R245	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R246	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R250	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R251	RL 0,60W 75,0KOHM+-1%TK50 RESISTOR	RL 0083.1916.00	RESISTA	MK2	
R252	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R253	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R254	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R260	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R261	RS 0,75W10KOHM+-10% CERMET DEPOS.-CARBON POTENTIOMET	RS 0037.7396.00	BOURNS	3006 P-XXXXX	
R262	RL 0,60W 17,4KOHM+-1%TK50 RESISTOR	RL 0083.1468.00	RESISTA	MK2	
R263	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7903.00	SPECTROL	63 M ... TO 10	
R264	RL 0,60W 13,0KOHM+-1%TK50 RESISTOR	RL 0083.1368.00	RESISTA	MK2	
R265	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R267	RL 0,60W 301 KOHM+-1%TK50 RESISTOR	RL 0083.2406.00	RESISTA	MK2	
R268	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2	
R269	RL 0,60W 301 KOHM+-1%TK50 RESISTOR	RL 0083.2406.00	RESISTA	MK2	
R270	RL 0,60W 301 OHM+-1%TK50 RESISTOR	RL 0083.0210.00	RESISTA	MK2	
R275	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R276	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R280	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R281	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R282	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R290	RL 0,60W 7,50KOHM+-1%TK50 RESISTOR	RL 0083.1197.00	RESISTA	MK2	
R300	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R307	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R310	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R315	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
..318 R320	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R321	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R322	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R323	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R324	RL 0,60W 2,61KOHM+-1%TK50 RESISTOR	RL 0083.0903.00	RESISTA	MK2	
R330	RL 0,60W 1,24KOHM+-1%TK50 RESISTOR	RL 0083.0661.00	RESISTA	MK2	
R331	RL 0,60W 1,24KOHM+-1%TK50 RESISTOR	RL 0083.0661.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R332	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2	
R333	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R334	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R350	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R351	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R353	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R354	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R355	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R360	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R361	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R362	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R363	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R364	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R370	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R371	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R372	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R373	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R375	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R376	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R380	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R381	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R386	RN 9X4,7KOHM+-2% SIL10 H5 NETWORK	RN 0327.0804.00	BI_TECHNOL	L 10 1 S 472 M*	
R387	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R388	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R399	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R405	RL 0,60W 121 OHM+-1%TK50 RESISTOR	RL 0082.9859.00	RESISTA	MK2	
R406	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R407	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R408	RG 9,09KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0787.00	ROEDERSTEI	D25	
R409	RL 0,60W 36,5KOHM+-1%TK50 RESISTOR	RL 0083.1716.00	RESISTA	MK2	
R410	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R411	RL 0,60W 10,5KOHM+-1%TK50 RESISTOR	RL 0083.1300.00	RESISTA	MK2	
R412	RL 0,60W 3,48KOHM+-1%TK50 RESISTOR	RL 0083.1016.00	RESISTA	MK2	
R413	RL 0,60W 174 KOHM+-1%TK50 RESISTOR	RL 0083.2170.00	RESISTA	MK2	
R414	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R415	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R416	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R417	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R430	RL 0,60W4,75MOHM+-1%TK50 METALFILMRESISTOR	RL 0099.8250.00	RESISTA	MK2	

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
U140	BM TAK1WH MIXER 750MHZ MIXER	0820.3483.00	MINI-CIRCU	TAK-1WH	
V10	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V12	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V13	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V14	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V20	AK BC337-40 N 45V 800MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V21	AK BC327-40 P 45V 800MA TRANSISTOR	AK 0815.7678.00	PHILIPS_SE	BC327-40GEGURTET	
V22	AK BC327-40 P 45V 800MA TRANSISTOR	AK 0815.7678.00	PHILIPS_SE	BC327-40GEGURTET	
V23	AK BC337-40 N 45V 800MA TRANSISTOR	AK 0815.7684.00	PHILIPS	BC337-40 GEGURTET	
V24	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V25	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V26	AK 2N2907A P 60V 600MA TRANSISTOR	AK 0010.3583.00	VALVO	2N2907A	
V28	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V37	AE BZX55/B10 0,5W ZDI ZENER DIODE	AE 0289.4302.00	VALVO	BZX79B10	
V38	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V45	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V49	AE 1N827 6,2V REF DIODE	AE 0418.0029.00	COMPENSATE	1N827(A)	
V50	AE BB620 45/03PF CDI TUNING DIODE	0848.5251.00	SIEMENS	BB620	
V52	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V58	AK BFR91A N 12V 35MA TRANSISTOR	0644.0730.00	VALVO	BFR 91A	
V71	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V75	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V90	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V95	AK BFR96S N 15V 100MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR 96S	
V100	AK BSX46-16 N 60V1000MA TRANSISTOR	AK 0010.6847.00	TEXAS	BSX46-16	
V111	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V120	AK BFR96S N 15V 100MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR 96S	
V125	AK BFR96S N 15V 100MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR 96S	
V135	AK BFR96S N 15V 100MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR 96S	
V150	AK BFR96S N 15V 100MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR 96S	
V155	AK BFR96S N 15V 100MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR 96S	
V164	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V212	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V215	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V230	AK 2N2907A P 60V 600MA TRANSISTOR	AK 0010.3583.00	VALVO	2N2907A	
V235	AK MATO4FP 4XN TR.ARRAY TRANSISTOR ARRAY	0820.3577.00	PMI	MATO4FP	
V236	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V240	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V245	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V250	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V260	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V264 . . 269	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V270 . . 273	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V275	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V280	AK BF450 P 40V 25MA TRANSISTOR	AK 0342.2240.00	SIEMENS	BF450	
V303	AM SD210DE N-E 30V MOSF MOS-FET	0844.7637.00	SILICONIX	SD210DE	
V307	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V308	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V315	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V316	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V320	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V321	AE BZX79/B9V1 0,5W ZDI ZENER DIODE	AE 0491.7507.00	VALVO	BZX79B9V1	
V322	AM SD210DE N-E 30V MOSF MOS-FET	0844.7637.00	SILICONIX	SD210DE	
V323	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V324	AE BZX55/B12 0,5W ZDI ZENER DIODE	AE 0218.8940.00	VALVO	BZX79B12	
V325	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V331	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V332	AK 2N2222A N 40V 800MA TRANSISTOR	AK 0010.5405.00	VALVO	2N2222A	
V355	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V356	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V360	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V370	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V372	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V375 . . 378	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V380	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V405	AK BSX46-16 N 60V1000MA TRANSISTOR	AK 0010.6847.00	TEXAS	BSX46-16	
W1	DX KABEL W1 CABLE	0819.4496.00			0819.4473.00
W2	DX KABEL W2 CABLE	0819.4480.00			0819.4473.00
X2	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X4	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X6	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X7	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
X71	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X72	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X1A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X1B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X3A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X3B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X5A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	


MENPS	502 3PUA	Ai	Datum Date	Schaltteilleiste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
	ROHDE & SCHWARZ	33	04.02.98	EE FR-N-SYNTHESE FRN-SYNTHESIS	0819.3860.01 SA	14+

095.0028-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X5B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
Z1 ..6	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	

095.0026-0693

MENP5	502 3PUA	Äl	Datum Date	Schalteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
		33	04.02.98	EE FR-N-SYNTHESE FRN-SYNTHESES	0819.3860.01 SA	15-

C

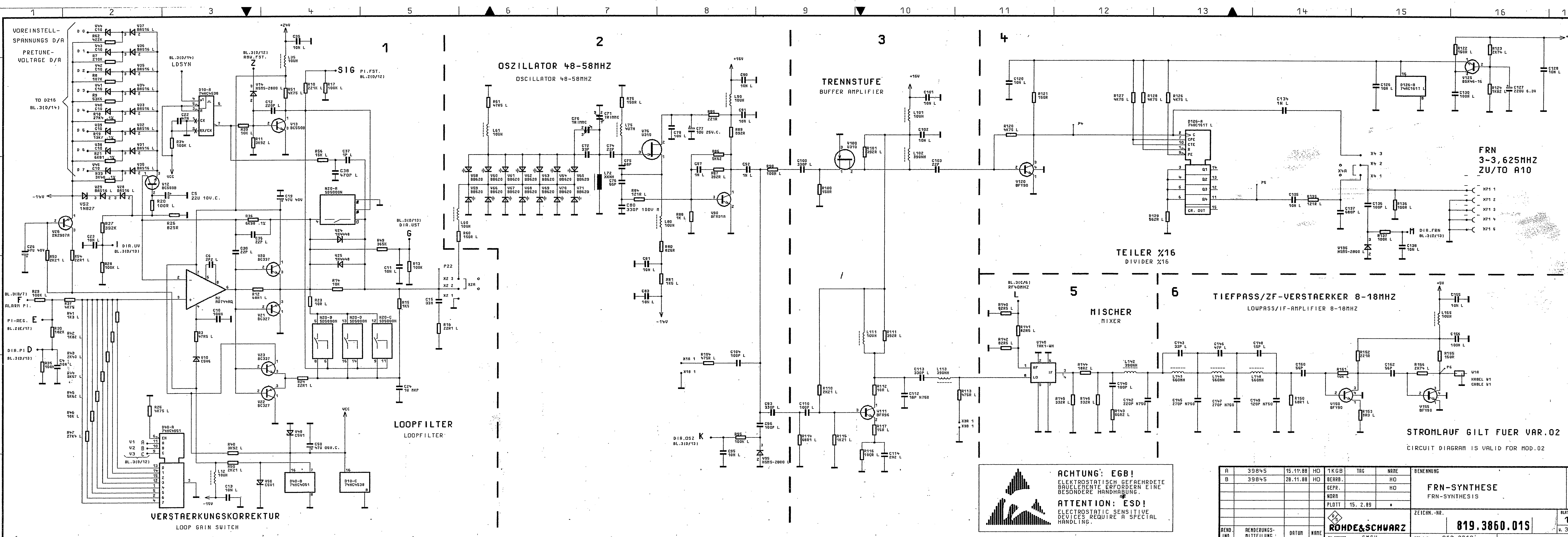
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BEHALTEN SIE DIESE UNTERLAGE VOR

ZEICHN.-NR.



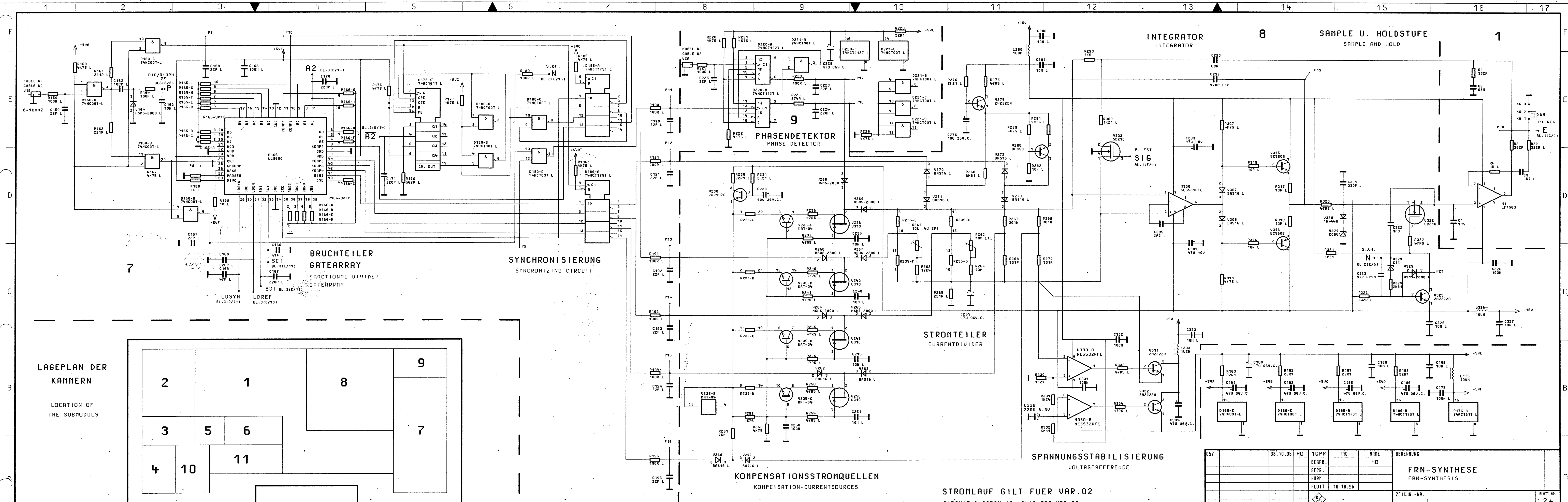
ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

A	39845	15.11.88	HO	1KGB	TAG	NANE	BENENNUNG
B	39845	28.11.88	HO	BEARB.		HO	FRN-SYNTHESE FRN-SYNTHESIS
				GEPR.		HO	
				NORN			
				PLOTT	15. 2.89	*	
REND. IND.	ÄNDERUNGS-MITTEILUNG	DATUM	NAMEN			ZEICHN.-NR. 819.3860.015	
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						ERSTE Z.	

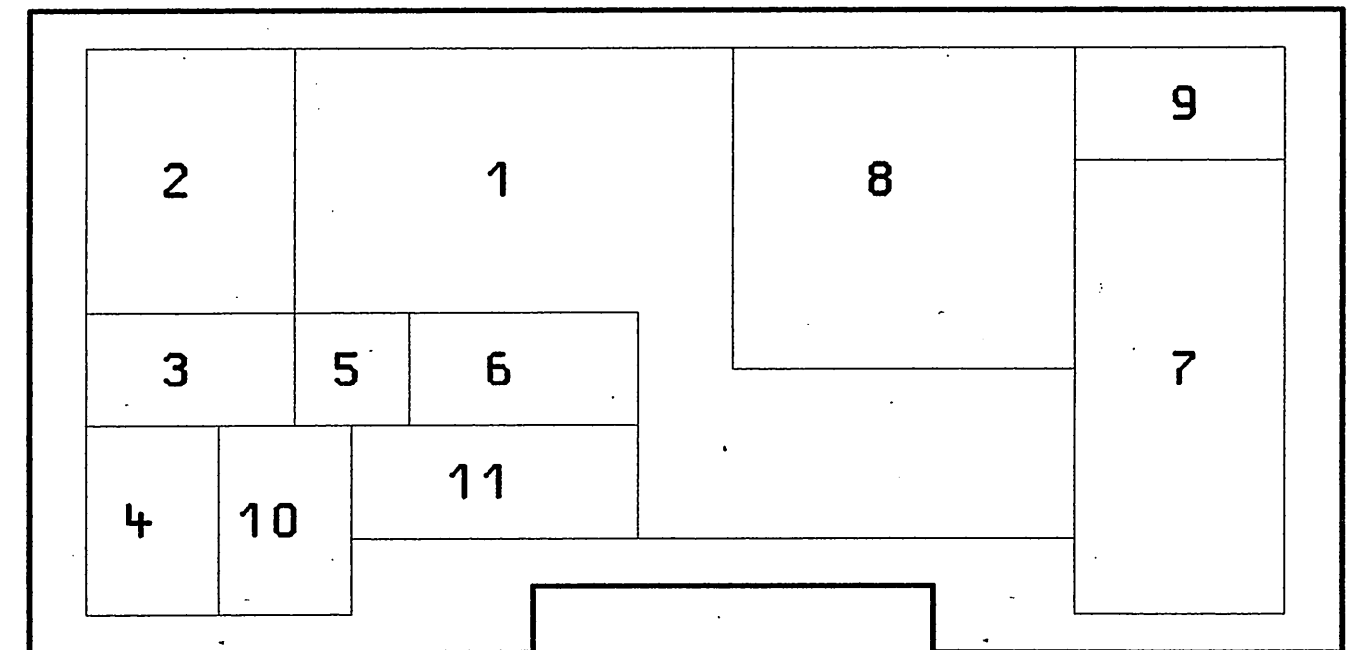
BLATT-NR. 1 v. 3 BL.

FUER DIESE INTEGRALRE BEHALTEN SIE UNS ALLE RECHTE UDF



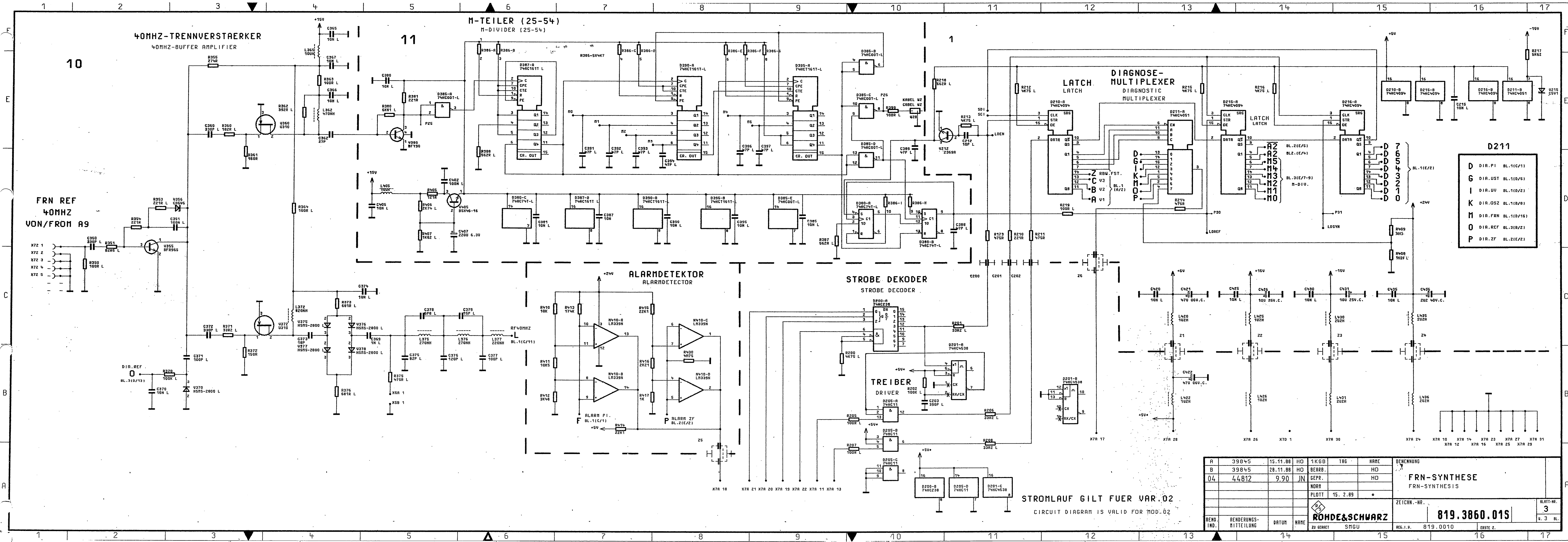
LAGEPLAN DER KAMMERN

LOCATION OF THE SUBMODULES



STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

OS/	08.10.96	HO	1GPK	TRG	NAME	BENENNUNG
			BEAPB.		HO	
			GEPP.			
			NOPH			
			PLOTT	10.10.96		
ROHDE & SCHWARZ						ZEICHN.-NR.
20 GEPRÜFT S1GU						819.3860.015
REND. IND.	RENDERUNGS-MITTEILUNG	DATUM	NAME	VER. I.V.	819.0010	ERSTE Z.
						BLATT-NR. 2+
						V. BL.

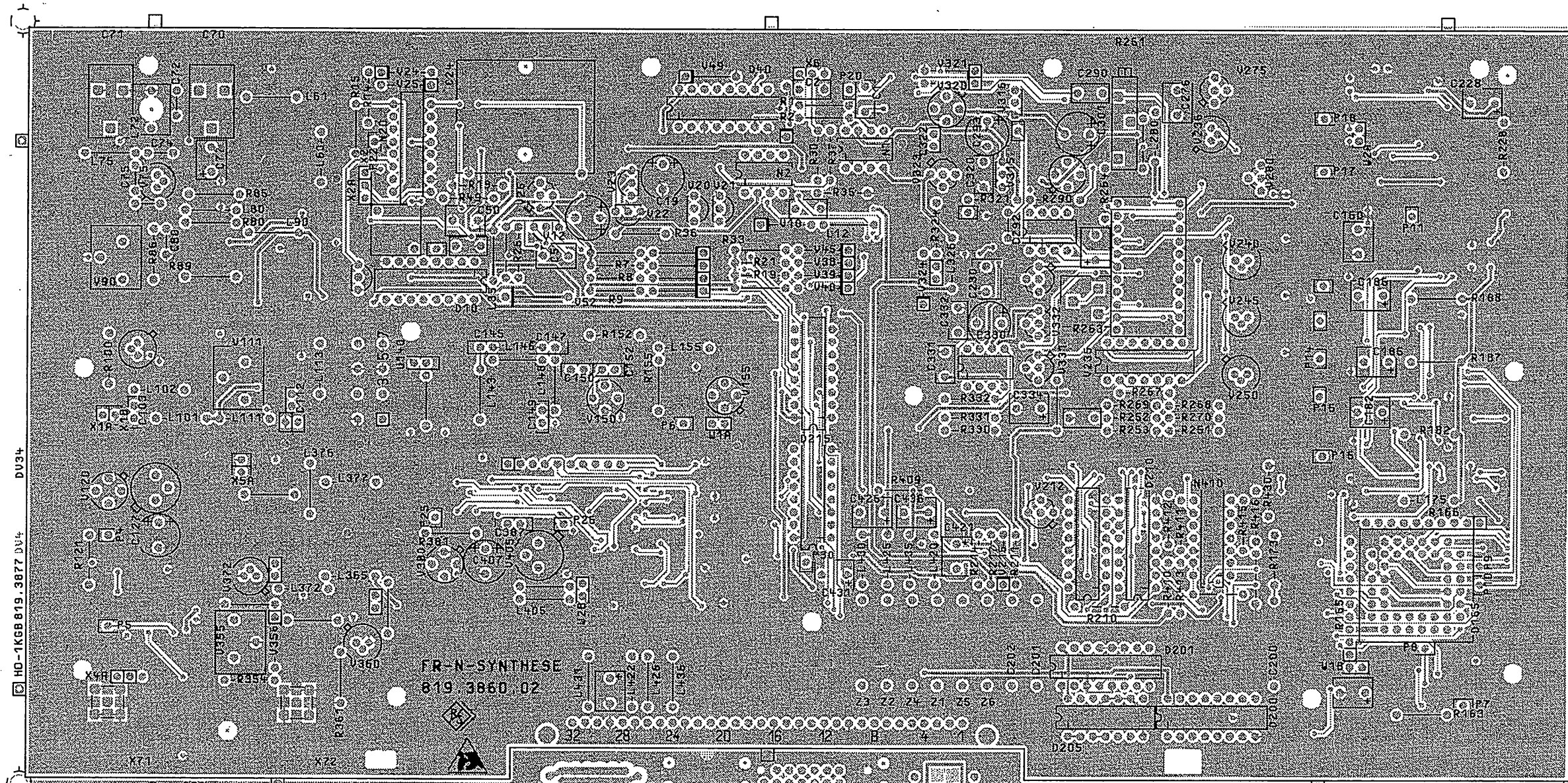


STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

A	39845	15.11.88	HO	1KG6	TAG	NARE	BENENNUNG	
B	39845	28.11.88	HO	BEARR.		HO	FRN-SYNTHESIS FRN-SYNTHESIS	
04	44812	9.90	JN	GEPR.		HO		
				NDRH				
				PLOTT	15.2.89	*		
							ZEICHN.-NR.	3
REND. IND. RENDUNGS-NITTEILUNG DATUM NAME ZU GERÄT SMGU							REG.I.V.	819.0010
							ERSTE Z.	3

BEHALTEN UNS ALLE RECHTE VOR

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



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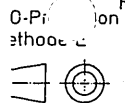
VARIANTENERKLÄRUNG / VERSION
VAR02 - GRUNDAUSFÜHRUNG / BASIC MODEL

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				1KGB Tag Name	Benennung		
				Bearb. 02.89 HO	FRN-SYNTHESE	Z	
				Gepr.			
				Norm			
					Zeichn.-Nr.	Blatt-Nr.	
					819.3860.02	2	
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	zu Gerät SMGU	reg. i. V. 819.0010 V	erste Z.	

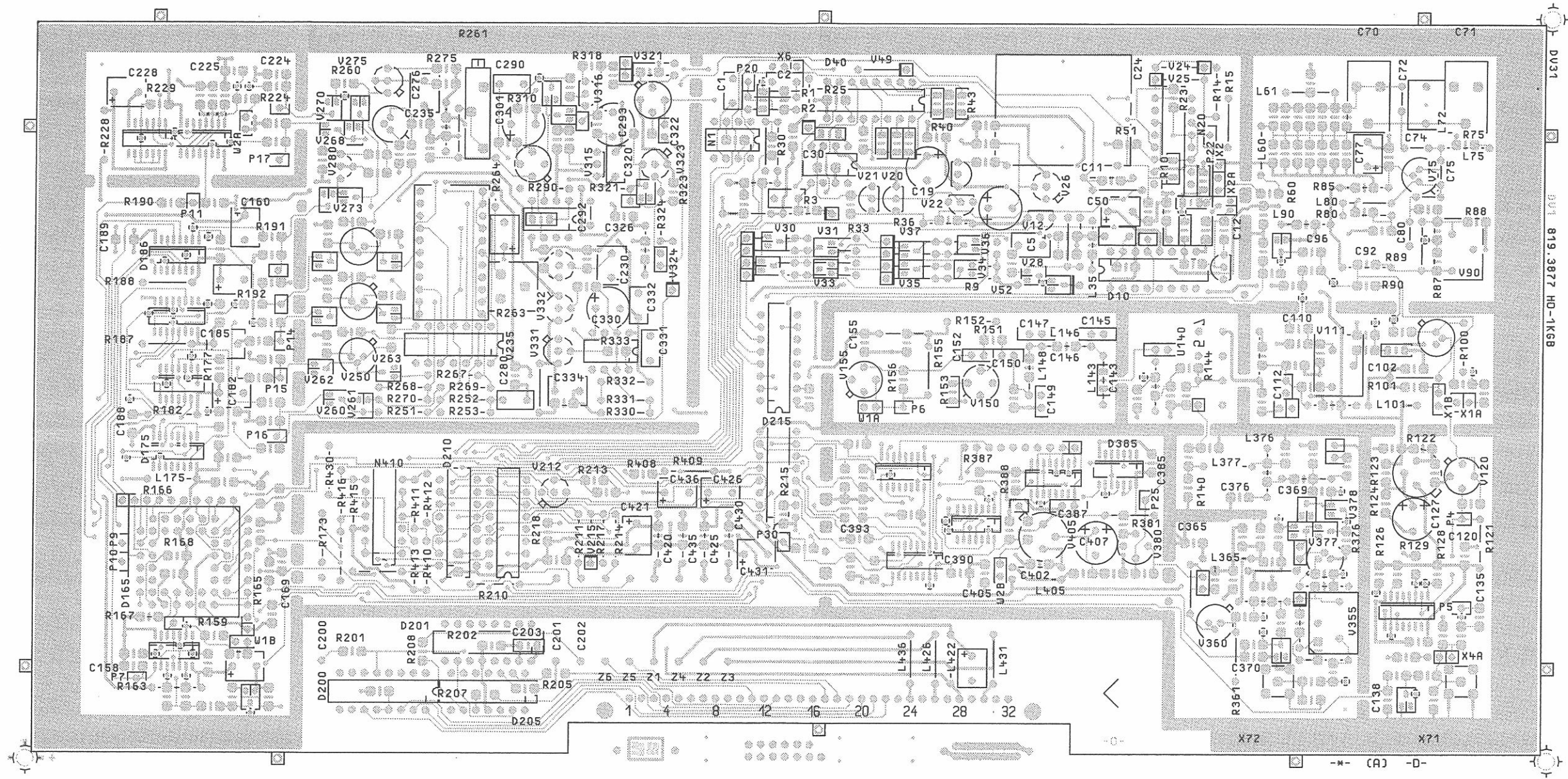
Hierzu HVC 2501



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



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Für diese Unterlage behalten wir uns alle Rechte vor.

VARIANTENERKLÄRUNG / VERSION
VAR02 - GRUNDAUSFÜHRUNG / BASIC MODEL

D	39845	02.89	HO	Maße ohne Toleranzangabe	Maßstab 1 : 1		
					Halbzeug, Werkstoff		
				1KGB Tag Name	Benennung	Z	
				Bearb. 02.89 HO	FRN-SYNTHESE		
				Gepr			
				Norm			
					Zeichn.-Nr.	Blatt-Nr.	
				zu Gerät SMGU	819.3860.02	3	
And. Zust.	Anderungs-Mitteilung	Tag	Name	reg. i. V.	819.0010 V	v. Bl.	
				erste Z.			



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ATTENTION ESD!
Electrostatic sensitive devices require a special handling.



ROHDE & SCHWARZ

SERVICE DOCUMENTS

Step Synthesis / FM

819.4944.02

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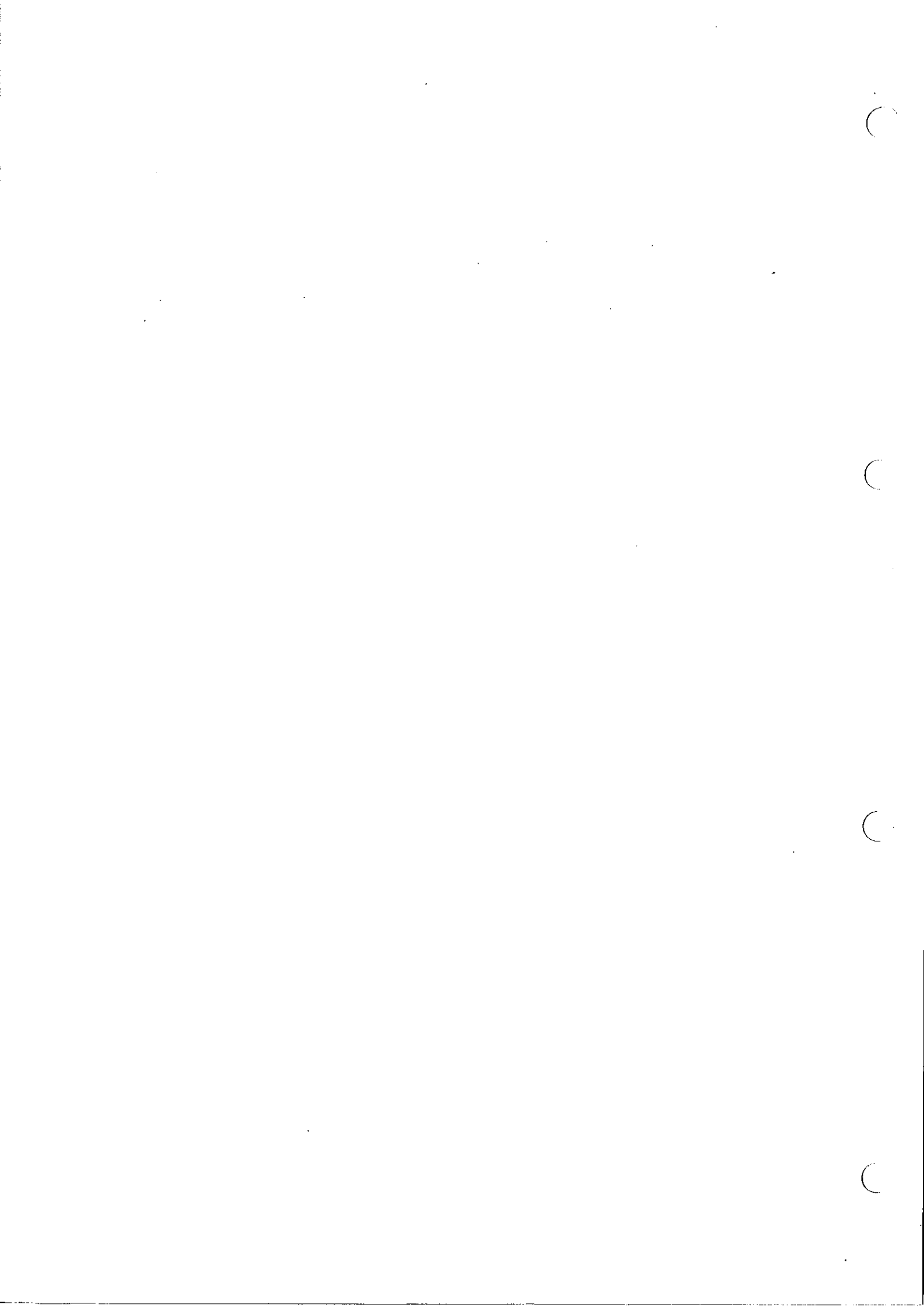
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Parts lists
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5 Service Manual "Step Synthesis / FM"

5.1 Function Description

(See circuit diagram 819.4967 S and Fig. 5-1)

The module "FM stage" contains three separate function units:

- ▶ 625-kHz step synthesizer with PLL
- ▶ FM oscillator with PLL
- ▶ FM attenuator

5.1.1 625-kHz Step Synthesizer

The oscillator tuned with a total of 12 varicap diodes covers the frequency range from 23.125 MHz to 29.375 MHz in steps of 625 kHz. The active element (V217) is inductively coupled to the loop. The signal is output via a buffer amplifier and lowpass filter. To enable level monitoring (diagnostics), the RF voltage is rectified and applied to the multiplexer. By means of a second amplifier/level converter (V222/V270) the oscillator signal is compared in the phase detector with the reference frequency, integrated (N200) and applied to the varicap diodes. The accelerator circuit V201, V202 ensures fast settling. The output frequency is set by the place after the decimal point of the second n-divider. This decimal place is generated by D205 and D206 by blanking a pulse with each carry at the adder D205 via D203-D. D205 is a 4-bit full adder. The place after the decimal point has thus a significance of 1/16th resulting in 625-kHz steps with a clock frequency of 10 MHz. The tuning voltage is monitored in the window comparator N201 and, if necessary, an error signal is generated (LOW active).

5.1.2 FM Oscillator with PLL

The 40-MHz Colpitts oscillator is fine tuned using V13. The frequency is modulated using V9 to V12. The signal is applied to the output connector via buffer amplifiers and to the phase detector via the level converter V100. The level of the FM signal is monitored by detector diode V15. The oscillator and 40-MHz reference signal are each divided by a factor of 3 (D50, D51) and applied to the digital phase detector.

If the frequencies are different, one of the two outputs of the phase detector (P25 or P26) supplies a pulse sequence whose duty factor changes according to a sawtooth function. The repetition frequency is the difference between the frequencies. The sawtooth voltage is obtained from a lowpass and differentiated (C142, C143).

The steep edge of the sawtooth voltage triggers PULSE BLANKING, which generates from the reference frequency pulses with 3 selectable durations, depending on the deviation ranges. Using D63 either a positive or a negative voltage (depending on the offset) with this pulse duration can be applied to the FM INTEGRATOR N51 via the selector D64. An analog control current is applied to the integrator during the time elapsing between the pulses. The modulation signal is also applied to the integrator, however with reverse polarity. The control voltage is changed, if there is a time difference between the two signals.

5.1.3 FM Attenuator

The modulation signal FMOD is applied to the amplifier N8 using the switches D1 and D12 either directly, via the differentiator PHI-MOD or via the distortion circuit PREEMPHASIS. The amplifier N8 feeds the D/A converter D2/N1 (SPAN FINE) and the SPAN FIXED DIVIDERS via N2. The signal for the control circuit (X20/15) is coupled out via N3, the control signal UMOD for the FM oscillator via D4, respectively.

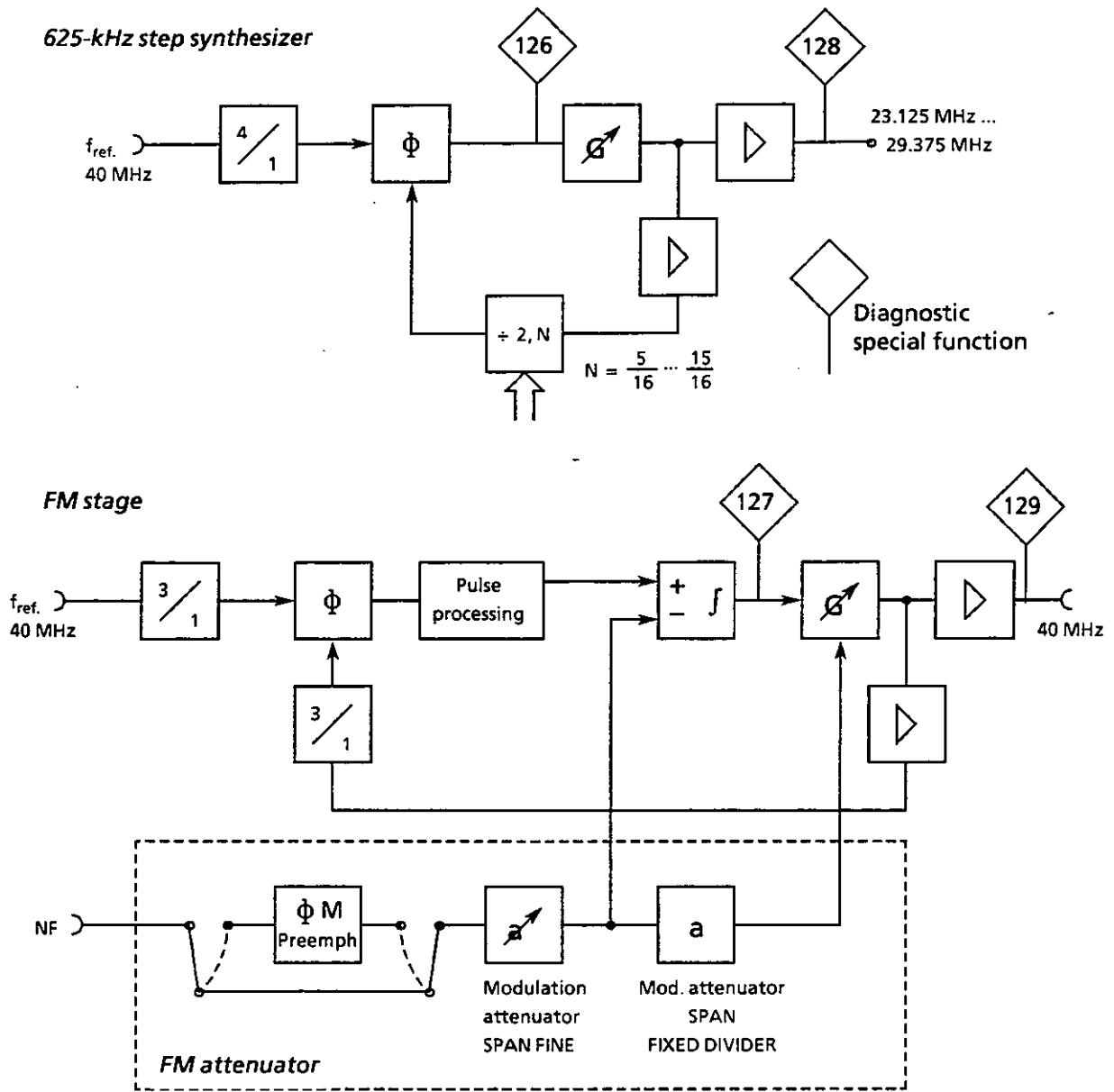


Fig. 5-1 Block diagram "Step Synthesis" and "FM Stage"

5.2 Testing and Adjustment

5.2.1 625-kHz Step Synthesizer

5.2.1.1 Frequency Adjustment

Adjusting the VCO using C211, C212

Preparations:

- Remove jumper X111 and connect a DC supply to X111/2.
- Connect a frequency counter to X81.

Adjustment:

- 1) with 2.5 V applied to X111/2 adjust to 23.125 \pm 0.2 MHz using C211
- 2) with 19.5 V applied to X111/2 adjust to 29.375 \pm 0.2 MHz using C212.

Repeat points 1) and 2) alternately until the tolerance limits can be adhered to for both points.

5.2.1.2 Level Adjustment

- Frequency entry: 1010 MHz
Adjust the output level at X81 to +10 dBm (\pm 0.2 dB) using R230.

5.2.2 FM Stage

5.2.2.1 Frequency and Control Voltage Adjustment

The following adjustment requires operation of the control circuit, which, however, need not be adjusted. Adjustments 5.2.2.1 to 5.2.2.3 must always be performed together. When changing R30, FM control must also be adjusted (5.2.2.6).

Setting:

- Set the DC voltage at P13 to 8 V \pm 0.2 V using R43.

Adjustment:

- Adjust the DC voltage at P11 to 7 V \pm 0.5 V using C42.

5.2.2.2 Span Adjustment

- Connect modulation analyzer with distortion meter to X83.
- Setting: SHIFT PRESET, RF 322 MHz, FM INT ON
- Span setting: 256 kHz

Adjustment: adjust the span to 256 kHz using R30.

5.2.2.3 Distortion Adjustment

- Connect modulation analyzer with distortion meter to X83.
- Setting: SHIFT PRESET, RF 322 MHz, FM INT ON
- Span setting: 256 kHz

Adjustment:

- Minimize distortion using C35 and R43 while keeping the DC voltage at P11 within the range 7 \pm 1 V using C42.

5.2.2.4 Level Adjustment

- Connect RF power meter to X83 1.
Adjust level to 5 dBm \pm 1 dB using R29.

5.2.2.5 Offset Adjustment

- Setting: SHIFT PRESET, RF 322 MHz, FM EXT DC ON, span 256 kHz

With the FM EXT input short-circuited, adjust the DC offset voltage at X7 1 to 0 \pm 0.1 mV using R39.

5.2.2.6 Adjustment of FM Control

- Close the oscillator compartment (4) with screening cover.
 - Setting as in 5.2.2.4
 - Connect DC voltage source V_{DC} to input FM EXT.
- Measure the tuning voltage at P11 with $V_{DC} = 0$ V.
- $V_{DC} = 1.00$ V. Adjust to a minimum change in the tuning voltage with a set DC span.

Span	Adjust using	Tolerance at P11 1
256 kHz	R169	\pm 1 mV
32 kHz	R170	\pm 0.5 mV
4 kHz	R171	\pm 0.1 mV

This adjustment can easily and conveniently be made under computer control without opening the instrument up using the program included in the Service Kit SMGU-Z2.

5.3 Troubleshooting

5.3.1 Step Synthesis

In the case of synchronization errors (error code 43) it is recommended to open the control loop at X111 and to connect a DC supply to X111/2.

With an RF setting of 1005 MHz the divider factor 8/16 is switched on. The adder D205 generates a carry upon every second clock edge so that it is divided by 2 and 3 alternately. The nominal oscillator frequency is 25 MHz with a control voltage of about 9 V.

The signal path from the oscillator, or respectively from the reference frequency to the phase detector can be followed.

Test point	Level	Frequency	Meaning
P100	Oscillator frequency	1 to 2 (V_{peak})	
P110	"	TTL level	
P111	10 MHz (average value)	TTL level	
D202/11	40 MHz	TTL level	
P112	10 MHz	TTL level	

The output voltage of the integrator N200 must assume values between -2 and +22 V when varying the oscillator frequency around 25 MHz. To check the individual steps repeat this test with the following RF settings:

RF in MHz	Factor 2	f_{osc} in MHz	O_{vco} in V
1000.3	5	23.125	4
1001	6	23.750	5.6
1003	7	24.375	7.1
1005	8	25.000	8.5
1007	9	25.625	9.8
1009	10	26.250	11.1
1011	11	26.875	12.4
1013	12	27.500	13.6
1015	13	28.125	14.8
1017	14	28.750	16.0
1019	15	29.375	17.2

The reference voltages of the comparator N201 are:

N201/6 2 + -0.2 V
N201/3 20 + -0.5 V

5.3.2 FM Stage

With synchronization errors (error code 45) first check, whether the FM attenuator operates correctly. The voltage V_{MOD} at the cable W2 must be 0 + -2 mV_{dc} with a span of 0 Hz.

For testing the control circuit apply a control voltage to the oscillator at the feed-through L17 (interruption is unnecessary due to R174): With an RF of 322 MHz the FM span at the module is equal to the output span. Trace the signal according to the following table:

Test point	Level	Frequency	Meaning
P20	TTL	40 MHz	Oscillator
P24	TTL	13.333 MHz	$f_{osc}/3$
P21	TTL	40 MHz	Reference
P23	TTL	13.333 MHz	Reference/3
P25/26	TTL	13.333 MHz	1)
P27	TTL		Offset direction 2)
P28	TTL	$(f_{osc}-f_{ref})/3$	Trigger for pulse blanking
P29	TTL	104.166 MHz 833.333 kHz 6.66666 MHz	Span setting 4 kHz Span setting 32 kHz Span setting 256 kHz
D63	14; 15.4 ± 6 V	$(f_{osc}-f_{ref})/3$	Pulses for integration
P32	6.2 V DC		
P33	-6.2 V DC		-U(P32) must be + -5 mV

- 1) The pulse duty factor always varies only at one test point upon a change in the tuning voltage, the second test point exhibits constantly narrow pulses.
- 2) Alters the logic level when tuning the oscillator, "H" for $f_{osc} > f_{ref}$, "L" for $f_{osc} < f_{ref}$.

5.4 Interfaces

5.4.1 Analog Interfaces

Test point	Meaning	Level
X1 A1	FMOD Modulation freq.	0 Hz to 100 kHz, 1V _{rms}
X1 A3	PHI OFFS Phase offset	DC
X1 A17	TEST Analog diagnostics line	-5 V to +5 V
X1 A24	Power supply	+24 V
X1 A26	Power supply	+15 V
X1 A28	Power supply	+5 V
X1 A30	Power supply	-15 V
X1 A32	Power supply	+12 V STBY
X2	FM output	40 MHz. 5 dBm ± 1 dB
X3	Reference input	40 MHz. 5 dBm ± 2 dB
X4	Step synthesizer output	23.125 MHz to 29.375 MHz, 10 dBm ± 1 dB

5.4.2 Digital Interfaces

Test point	Meaning
X1 A11	TFR.CLK Clock for data transmission
X1 A13	TF.DAT Data line from controller
X1 A15	RC.DAT Data line from controller
X1 A18	LOK Open-collector alarm line
X1 A19,20,21	BA2 to BA0 Strobe addresses
X1 A22	G1 Group line of strobe address

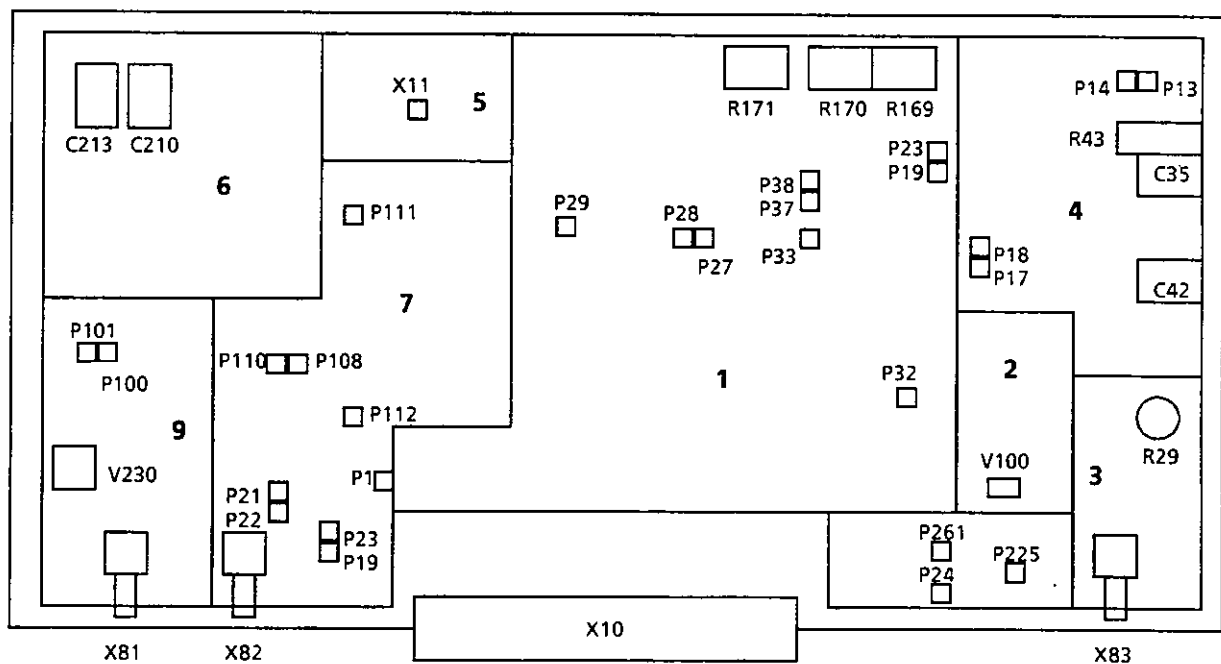
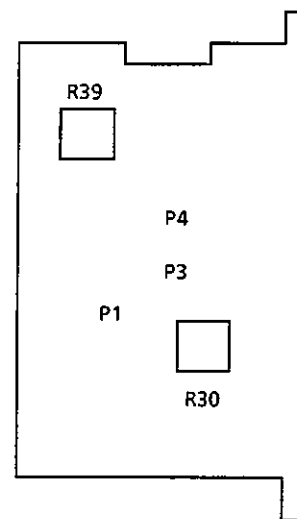


Fig. 5-2 Layout of test points and adjustment points

5.5 List of Required Test Equipment

AC/DC precision voltmeter		R & S UDS 5
RF power meter	50 MHz, 15 dBm	R & S NRV
Modulation analyzer	50 MHz, span 300 kHz, with distortion meter	R & S FAM
DC power supply		R & S NGT 20
Frequency counter	50 MHz	



ROHDE & SCHWARZ

Schaltteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées

Schémas de Circuit

Plans des composants

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A81	ED FM-INTERPOL-OSZILLATOR	0819.4967.02			
A82	EM-INTERPOL-OSCILLATOR ED FM-EICHLITUNG FM-ATTENUATOR	0819.4980.02			

MENP5	502 3PUA	ÄI	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
	ROHDE & SCHWARZ	01	04.02.98	ZE STEPSYNTHESE/FM STEPSYNTHESESIS/FM	0819.4944.01 SA	1-

095.0026-0593

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C1	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C2	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C6	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C12	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
..18					
C28	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C34	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C35	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C36	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C37	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C38	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C39	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C40	CE 100UF+-20%25V RD8X9,5 ELECTROLYTIC CAPACITOR	0803.0580.00	MATSUSHITA	ECE-A1ESS-101	
C41	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C42	CT 9,2PF TAUCHTR.RD 7X12 AIR-TYPE TRIMMER	CT 0025.7373.00	TEKELEC	TL 191	
C43	XX TRIMMWERT SELECTED 22PF S.NR.006.9251 27PF S.NR.006.9268 33PF S.NR.006.9274				
C44	CG 33 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9274.00	TAB	L1M	
C45	CC 5,6PF+-0,25PF3X4NPD CAPACITOR	CC 0087.6393.00	PHILIPS_CO	2222 678	
C46	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C47	CG 100PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9339.00	TAB	L1M	
C48	CG 56 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9300.00	TAB	L1M	
C49	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C50	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C52	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C53	CC 2,7PF+-0,25PF3X4NPD CERAMIC CAPACITOR	CC 0087.6358.00	PHILIPS_CO	2222 678	
C55	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C58	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C59	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C60	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C50PT	
C61	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C63	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C64	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C65	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C66	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C69	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C70	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C71	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C80	CC 39PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8796.00	MURATA	GRM42-6COG 390F 50PT	

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	ROHDE & SCHWARZ	27	04.02.98	ED FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR	0819.4967.01 SA	1+

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C90	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C93	CC 33PF+-1%50V NPD 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C94	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C95	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C96	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C100	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C101	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C102	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C103	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR	CC 0099.8844.00	PHILIPS_CO	2238 863 18181	
C104	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR	CC 0099.8844.00	PHILIPS_CO	2238 863 18181	
C105	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C106	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C107	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C109	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C110	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C111	CC 330NF+-10%50V X7R 1812 CERAMIC CHIP CAPACITOR	CC 0007.7475.00	PHILIPS_CO	2222 594 16647	
C112	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C113	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C114	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C115	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C116	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C117	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C119	CE 100UF+-20%25V RD8X9,5 ELECTROLYTIC CAPACITOR	0803.0580.00	MATSUSHITA	ECE-A1ESS-101	
C121	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C122	CE 100UF+-20%25V RD8X9,5 ELECTROLYTIC CAPACITOR	0803.0580.00	MATSUSHITA	ECE-A1ESS-101	
C123	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C124	CE 10UF+-20%35V RD5,5XH6 ELECTROLYTIC CAPACITOR	0803.0667.00	NAT_PANASO	ECE-A1VKS-100	
C130	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C133	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C134	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C135	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C137	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C138	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C142	CC 180PF+-2%6X7N750 CAPACITOR	CC 0087.6935.00	PHILIPS_CO	2222 678 58181	
C143	CC 180PF+-2%6X7N750 CAPACITOR	CC 0087.6935.00	PHILIPS_CO	2222 678 58181	
C144	CC 33NF+-10% 50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5172.00	PHILIPS_CO	2238 581 16634	
C145	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C149	CC 82PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8821.00	MURATA	GRM42-6COG 820F 50PT	
C150	CE 220UF+-20%25V RD8X19 ELECTROLYTIC CAPACITOR	0803.1063.00	NCC	SXE 25 VB 220 8X14	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C154	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C157	CC 330NF+-10%50V X7R 1812 CERAMIC CHIP CAPACITOR	CC 0007.7475.00	PHILIPS_CO	2222 594 16647	
C181	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C199	CC 1,8NF+-10%4X5R2000 CAPACITOR	CC 0087.7054.00	PHILIPS_CO	2222 630 01182	
C200	CE 15 UF+-20%16V 7X 5X11 ELECTROLYTIC CAPACITOR	CE 0087.9328.00	KEMET	T340 C156M016 AS	
C207	CK 2,2UF+-5% 50V RD7,2H13 CAPACITOR	CK 0350.5944.00	ROE	MKT1826-522/054	
C208	CK 2,2UF+-5% 50V RD7,2H13 CAPACITOR	CK 0350.5944.00	ROE	MKT1826-522/054	
C209	CC 180NF+-10%50V K1200VI CAPACITOR	0060.1178.00	UNION_CARB	CK 06 BX 184K	
C210	CG 39 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9280.00	TAB	L1M	
C211	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C212	CT 13PF TAUCHTR.RD7X12 AIR-TYPE TRIMMER	CT 0092.4266.00	TEKELEC	AT 5401 1-14PF 250V-	
C213	CG 10 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9216.00	TAB	L1M	
C214	CG 10 PF+-1PF 250V TK+100 MICA CAPACITOR	CG 0006.9216.00	TAB	L1M	
C219	CC 270PF+-10%63V3X5D2000 CAPACITOR	CC 0099.5622.00	PHILIPS_CO	2222 630 21271	
C220	CC 4,7NF+-10%6X9R2000 CAPACITOR	CC 0087.7102.00	PHILIPS_CO	2222 630 01 472	
C221	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C222	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C223	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C224	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C225	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C233	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C234	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C236	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C241	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C242	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C244	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C247	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C248	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C249	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C251	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR	CC 0099.8844.00	PHILIPS_CO	2238 863 18181	
C252	CC 68PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8815.00	MURATA	GRM42-6COG 680F 50PT	
C253	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C254	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C266	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C50PT	
C270	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C271	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C273	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
..278					
C280	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C281	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	

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		27	04.02.98	ED FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR	0819.4967.01 SA	3+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C301	CK 100NF+-5%63VRD2, 5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C303	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C304	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C306	CE 1UF +-10% 25V EIA3528 TANTALUM SMD-CAPACITOR	CE 0007.7217.00	KEMET	T 491 B105 K025 AS	
C307	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C309	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C310	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C311	CC 39PF+-2%4X5NPO CAPACITOR	CC 0087.6493.00	PHILIPS_CO	2222 678	
C312	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C316	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222.640 51103	
C320	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C322	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C323	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C406	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C420	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C431	CE 22UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7433.00	PHILIPS_CO	2222 116 90111	
C435	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C437	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C438	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C450	CE 22UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7433.00	PHILIPS_CO	2222 116 90111	
D9	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE	(PC)74HC4094(D/T)	
D10	BL PC74HC238P 3TO8 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
D11	BL PC74HCT11T 3X3IN ANDG AND GATE	BL 0007.6191.00	PHILIPS_SE	(PC)74HCT11(D/T)	
D50	BL 74ACT74SC 2XRSFLIPFLOP IC DUAL D-FLIPFLOP	BL 0008.0680.00	TOSHIBA	(TC74)ACT74(FN)	
D51	BL 74ACT74SC 2XRSFLIPFLOP IC DUAL D-FLIPFLOP	BL 0008.0680.00	TOSHIBA	(TC74)ACT74(FN)	
D52	BL 74ACT74SC 2XRSFLIPFLOP IC DUAL D-FLIPFLOP	BL 0008.0680.00	TOSHIBA	(TC74)ACT74(FN)	
D53	BL 74ACT74SC 2XRSFLIPFLOP IC DUAL D-FLIPFLOP	BL 0008.0680.00	TOSHIBA	(TC74)ACT74(FN)	
D54	BL 74ACTOOSC 4X 2-NAND IC QUAD 2INP NAND GATE	BL 0008.0668.00	RCA	CD74ACTOOM	
D55	BL MM74HC132N 4X2IN.NAND QUAD 2INP.NAND SCHMITT TR	0099.9557.00	PHILIPS_SE	(PC)74HC132N(P)	
D56	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D57	BL MM74HC393N 2X4B.B.CTR DUAL 4-BIT BINARY COUNTER	0395.2950.00	PHILIPS_SE	(PC)74HC393N(P)	
D58	BL MM74HC132N 4X2IN.NAND QUAD 2INP.NAND SCHMITT TR	0099.9557.00	PHILIPS_SE	(PC)74HC132N(P)	
D59	BL MM74HC10N 3X3IN.NAND TRIPLE 3-INPUT NAND GATE	0571.3294.00	PHILIPS_SE	(PC)74HC10N(P)	
D60	BL MM74HC161N BIN.COUNT. SYNC.BIN.COUNTER	0641.7111.00	PHILIPS_SE	(PC)74HC161N(P)	
D61	BL MM74HC30N 8IN.NAND G 8-INPUT NAND GATE	0099.9505.00	PHILIPS_SE	(PC)74HC30N(P)	
D62	BL MM74HC74N 2XD-FLIPFL DUAL D FLIP-FLOP	0571.3171.00	PHILIPS_SE	(PC)74HC74N(P)	
D63	BL PC74HC4053P 3X2CH.MUX ANALOG MULTIPLEXER	0807.6247.00	PHILIPS	(PC)74HC4053N(P)	
D64	BL MM74HC4052N 2X4CH. MUX DUAL 4CHANNEL MUX/DEMUX	0099.9686.00	PHILIPS	(PC)74HC4052N(P)	

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	ROHDE & SCHWARZ	27	04.02.98	ED FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR	0819.4967.01 SA	4+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D200	BL 74F74PC 2XD-FLIPFLOP DUAL D-FLIPFLOP	BL 0344.6694.00	PHILIPS_SE	N74F74N	
D201	BL 74F74PC 2XD-FLIPFLOP DUAL D-FLIPFLOP	BL 0344.6694.00	PHILIPS_SE	N74F74N	
D202	BL 74F74PC 2XD-FLIPFLOP DUAL D-FLIPFLOP	BL 0344.6694.00	PHILIPS_SE	N74F74N	
D203	BL 74FOOPC 4X2IN.NANDG QUAD-NAND-GATE	BL 0344.6659.00	PHILIPS_SE (N)	74FOON	
D204	BL PC74HC4094T 8ST.BUSREG BUS REGISTER	BL 0804.0977.00	PHILIPS_SE (PC)	74HC4094(D/T)	
D205	BL 74F283PC 4BIT-BIN.ADD 4BIT BINARY FULL ADDER	BL 0373.6482.00	PHILIPS_SE (N)	74F283N	
D206	BL 74F374PC 8B.D-FLIPF 3S 8BIT-D-REGISTER	BL 0344.6642.00	PHILIPS_SE	N74F374N	
D207	BL CD4051BE 8CH. MUX MULTIPLEXER	0339.4174.00	RCA	CD4051BE	
L1	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L7	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L8	LD 5,60UH10%1,800HMO,195A CHOKE	LD 0067.2957.00	DALE	IM2	
L10	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L11	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L12	LD 287NH 8,5W CM18P FE-K COIL+CORE	0613.6289.00	TOKO	E521HNO80023	
L15	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L16	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L17	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L18	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L20	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L22	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L25	LD 0,56UH10%0,500HMO,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L26	LU UEBERTRAGER TRANSFORMER	0451.1937.00			
L91	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L94	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L100	LD 100 UH10%8,000HMO,084A CHOKE	LD 0067.3101.00	DALE	IM2	
L101	LD 100 UH10%8,000HMO,084A CHOKE	LD 0067.3101.00	DALE	IM2	
L102	LD 120 UH10%13,00HMO,066A CHOKE	LD 0067.3118.00	DALE	IM2	
L103	LD 120 UH10%13,00HMO,066A CHOKE	LD 0067.3118.00	DALE	IM2	
L105	LD 1000UH10%72,00HMO,028A CHOKE	LD 0037.8005.00	DALE	IM2	
L106	LD 1000UH10%72,00HMO,028A CHOKE	LD 0037.8005.00	DALE	IM2	
L107	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L108	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L112	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L116	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L150	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L153	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L200	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L201	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L205	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L206	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	

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		27	04.02.98	ED FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR	0819.4967.01 SA	5+

095.0026-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L207	LD SPULE COIL	0819.5386.00			
L208	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L209	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L220	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L221	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L222	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L224	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L226	LD 0,27UH10%0,160HMO,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L227	LD 0,18UH10%0,120HM1,120A CHOKE	LD 0067.2770.00	DALE	IM2	
L228	LD 0,15UH10%0,100HM1,230A CHOKE	LD 0067.2763.00	DALE	IM2	
L270	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L272	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L274	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L300	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L400	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L402	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L405	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L406	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L407	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L410	LD 10UH BEI 0,81A 0,660HM CHOKE	LD 0026.4126.00	DALE	IM 6	
L419	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L420	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L430	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L431	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L460	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L461	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L462	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L470	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L471	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L472	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
N4	BO NE5532AFE 2XLN OPAMP OPERATIONAL AMPLIFIER	BO 0356.0450.00	SIGNETICS	NE5532AFE	
N5	BO LM393N 2X COMPAR COMPARATOR	BO 0803.0696.00	NSC	LM393N	
N51	BO OP07CZ OPAMP OPERATIONAL AMPLIFIER	BO 0303.6960.00	PMI	OP 07 CZ	
N52	BO OP200GP 2XLP OPAMP OPERATIONAL AMPLIFIER	0351.1636.00	ANALOG_DEV	OP200G(P)	
N200	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE	
N201	BO LM393N 2X COMPAR COMPARATOR	BO 0803.0696.00	NSC	LM393N	
P1	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
P2	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
P11 ..14	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P16	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P17	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P19 ..26	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P27	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
P28	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
P29	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P32	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P33	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P36	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P37	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P100	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P101	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P109 ..112	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
R1	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R2	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R3	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R4	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R5	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R6	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R7	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R8	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R9	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R11	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R12	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R13	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R14	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R29	RS 0,5W 500 OHM+-20%KURV1 DEPOS.-CARBON POTENTIOMET	RS 0069.8023.00	BI_TECHNOL	82P R500	
R31	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R32	RG 39,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5937.00	ROEDERSTEI	D25	
R42	RG 2,15KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0635.00	DRALORIC	CB 1206 ...	
R43	RS 0,75W10KOHM+-10%ERMET DEPOS.-CARBON POTENTIOMET	RS 0037.7396.00	BOURNS	3006 P-XXXXX	
R44	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R50	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R51	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R52	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R53	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R54	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	

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		27	04.02.98	ED FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR	0819.4967.01 SA	7+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R55	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R56	RL 0,60W 3,92KOHM+-1%TK50 RESISTOR	RL 0083.1039.00	DRALORIC	SMA 0207	
R59	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R60	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R61	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R62	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R63	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R64	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R65	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R66	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R67	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R70	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R72	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R73	RG 30,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5908.00	ROEDERSTEI	D25	
R74	RG 2,61KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0658.00	DRALORIC	CB 1206 ...	
R75	RG 2,61KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0658.00	DRALORIC	CB 1206 ...	
R76	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R77	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R78	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R79	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R80	RL 0,40W 100 OHM2% UNGEW. RESISTOR	RL 0092.5956.00	DRALORIC	SMA 0204	
R82	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R83	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R84	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R85	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R86	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R90	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R96	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R100	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R101	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R102	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R103	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R104	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R105	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R106	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R107	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R108	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R109	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R110	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	

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	ROHDE & SCHWARZ	27	04.02.98	ED FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR	0819.4967.01 SA	8+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R111	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R112	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R113	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R114	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R116	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R117	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R119	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R120	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R121	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R122	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R125	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R126	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R127	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R128	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R131	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R140	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R142	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
..146	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R148	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R150	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
..152	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R155	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R156	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R157	RG 4,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5814.00	ROEDERSTEI	D25	
R158	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R159	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
..161	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R162	RL 0,60W 499 KOHM+-1%TK50 RESISTOR	RL 0083.2612.00	DRALORIC	SMA 0207	
R164	RG 56,2KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1883.00	ROEDERSTEI	D25	
R165	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R166	RL 0,60W 274 KOHM+-1%TK50 RESISTOR	RL 0083.2364.00	RESISTA	MK2	
R167	RG 30,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5908.00	ROEDERSTEI	D25	
R168	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R169	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER	RS 0247.7961.00	SPECTROL	63X ... TO10	
R170	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7526.00	SPECTROL	63X ... TO10	
R171	RS 0,5W100KOHM+-10%10X10X CERMET POTENTIOMETER T	RS 0087.7683.00	SPECTROL	63X ... TO10	
R172	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R173	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R174	RL 0,60W 68,1KOHM+-1%TK50 RESISTOR	RL 0082.2602.00	RESISTA	MK2	
R175	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R176	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	

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095.0026-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R177	RL 0,35W12,1KOHM+-0,1%T25 RESISTOR	RL 0084.3229.00	DRALORIC	SMA0207	
R178	RL 0,35W12,1KOHM+-0,1%T25 RESISTOR	RL 0084.3229.00	DRALORIC	SMA0207	
R179	RG 464 OHM+-1%TK100 1206 CHIP RESISTOR	0006.9045.00	DRALORIC	CB 1206 ...	
R180	RG 464 OHM+-1%TK100 1206 CHIP RESISTOR	0006.9045.00	DRALORIC	CB 1206 ...	
R181	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R182	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R183	RL 0,60W 3,01KOHM+-1%TK50 RESISTOR	RL 0083.0961.00	RESISTA	MK2	
R184	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R186	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R198	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R199	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R200	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R201	RG 1,78KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0006.00	DRALORIC	CB 1206 ...	
R203	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R207	RL 0,60W 110 OHM+-1%TK50 RESISTOR	RL 0082.9813.00	RESISTA	MK2	
R208	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R209	RG 5,62KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0735.00	ROEDERSTEI	D25	
R210	RS 0,5W1KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7560.00	SPECTROL	63 M ... TO 10	
R211	RL 0,60W 1,82KOHM+-1%TK50 RESISTOR	RL 0082.2277.00	RESISTA	MK2	
R212	RL 0,60W 27,4KOHM+-1%TK50 RESISTOR	RL 0082.2583.00	RESISTA	MK2	
R213	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R214	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R215	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R216	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R217	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R220	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R222	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R223	RL 0,60W 121 OHM+-1%TK50 RESISTOR	RL 0082.9859.00	RESISTA	MK2	
R228	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R229	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R230	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R232	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R235	RG 8,25OHM+-1%TK100 1206 CHIP-RESISTOR	RG 0007.8488.00	PHILIPS	RC 02	
R240	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R270	RG 383 OHM+-1%TK100 1206 CHIP RESISTOR	0006.9022.00	DRALORIC	CB 1206 ...	
R271	RG 383 OHM+-1%TK100 1206 CHIP RESISTOR	0006.9022.00	DRALORIC	CB 1206 ...	
R272	RG 383 OHM+-1%TK100 1206 CHIP RESISTOR	0006.9022.00	DRALORIC	CB 1206 ...	
R273	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R274	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
..277					


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095.0026-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R279	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R280	RG 2,61KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0658.00	DRALORIC	CB 1206 ...	
R281	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R282	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R283	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R285	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R287	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R288	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R291	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R292	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R293	RL 0,60W 68,1 OHM+-1%TK50 RESISTOR	RL 0082.9636.00	RESISTA	MK2	
R294	RL 0,60W 68,1 OHM+-1%TK50 RESISTOR	RL 0082.9636.00	RESISTA	MK2	
R295	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R296	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R300	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R301	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R302	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R303	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R304	RG 2,0 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5737.00	ROEDERSTEI	D25	
R305	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R306	RG 17,8KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0887.00	ROEDERSTEI	D25	
R307	RG 3,83KOHM+-1%TK100 1206 CHIP RESISTOR	0007.0693.00	DRALORIC	CB 1206 ...	
R308	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R309	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R310	RL 0,60W 2,00KOHM+-1%TK50 RESISTOR	RL 0083.0826.00	RESISTA	MK2	
R311	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R313	RL 0,60W 1,82KOHM+-1%TK50 RESISTOR	RL 0082.2277.00	RESISTA	MK2	
R320	RG 2,0 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5737.00	ROEDERSTEI	D25	
R321	RG 182 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5989.00	ROEDERSTEI	D25	
R322	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R323	RL 0,60W 3,92KOHM+-1%TK50 RESISTOR	RL 0083.1039.00	DRALORIC	SMA 0207	
R324	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R325	RL 0,60W 2,00KOHM+-1%TK50 RESISTOR	RL 0083.0826.00	RESISTA	MK2	
R326	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R400	RL 0,60W 33,2 OHM+-1%TK50 RESISTOR	RL 0082.9359.00	RESISTA	MK2	
R450	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R456	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
V1	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V2	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V5	AK BFS17 N 30V 50MA TRANSISTOR	AK 0010.6460.00	VALVO	BFS17	
V9	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V10	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V11	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V12	AE BB909B 25/ 3PF CDI TUNING DIODE	AE 0092.9600.00	PHILIPS	BB909B	
V13	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V15	AE HSMS2810 SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS2810	
V16	AE 1N823 6,2V REF DI REFERENCE DIODE	0012.2278.00	SIEMENS	1N823	
V90	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V100	AK BFS17 N 30V 50MA TRANSISTOR	AK 0010.6460.00	VALVO	BFS17	
V101	AK BFS17 N 30V 50MA TRANSISTOR	AK 0010.6460.00	VALVO	BFS17	
V102	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V104	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V105	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V106	AE BZX55/B10 0,5W ZDI ZENER DIODE	AE 0289.4302.00	VALVO	BZX79B10	
V107	AE 1N827 6,2V REF DI REFERENCE DIODE	AE 0418.0029.00	COMPENSATE	1N827(A)	
V190	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V200	AK BCY79IX P 45V 200MA TRANSISTOR	AK 0010.3777.00	VALVO	BCY79IX	
V201	AK 2N2905A P 60V 600MA TRANSISTOR	AK 0010.3919.00	VALVO	2N2905A	
V202	AK 2N2219A N 40V 800MA TRANSISTOR	0083.6953.00	VALVO	2N2219A	
V203	AE BB620 45/03PF CDI TUNING DIODE	0848.5251.00	SIEMENS	BB620	
V215	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V217	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V218	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V221	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V222	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V224	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V226	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800 (#L31)	
V270	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V304	AE BZX55/B12 0,5W ZDI ZENER DIODE	AE 0218.8940.00	VALVO	BZX79B12	
V305	AD BAV99 70V DUO UDI DIODE	AD 0911.0092.00	VALVO	BAV99	
V307	AD BAV99 70V DUO UDI DIODE	AD 0911.0092.00	VALVO	BAV99	
V321	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
W1	DX KABEL W1 CABLE	0819.5405.00			
W2	DX KABEL W2 CABLE	0819.5486.00			
W3	DW KABEL W3 CABLE	0819.5470.00			
X11	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	


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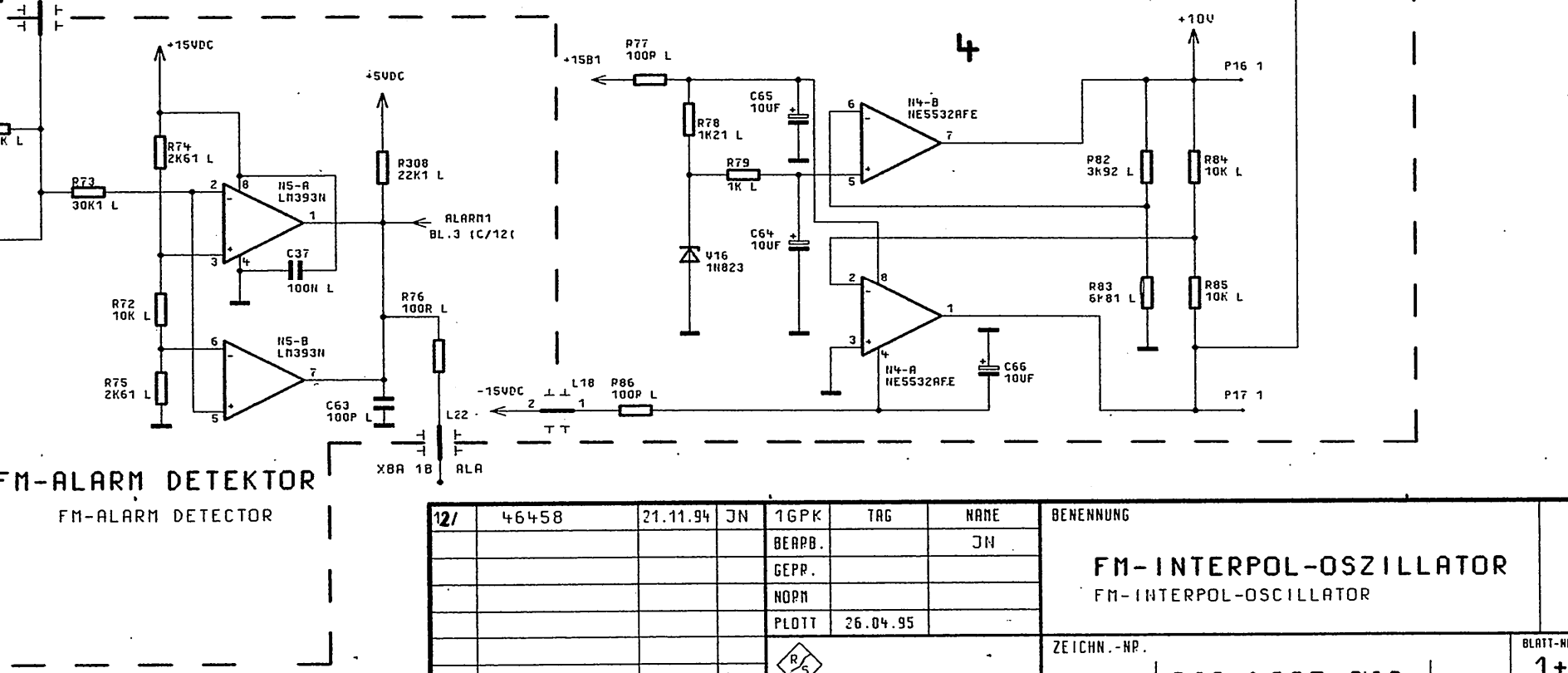
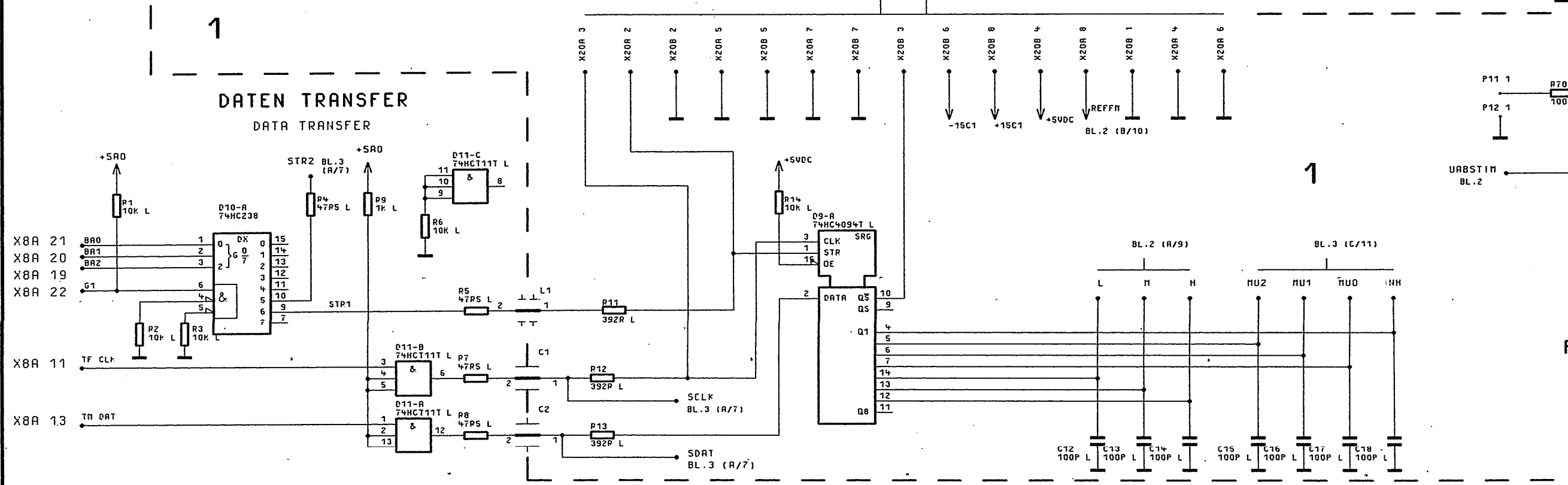
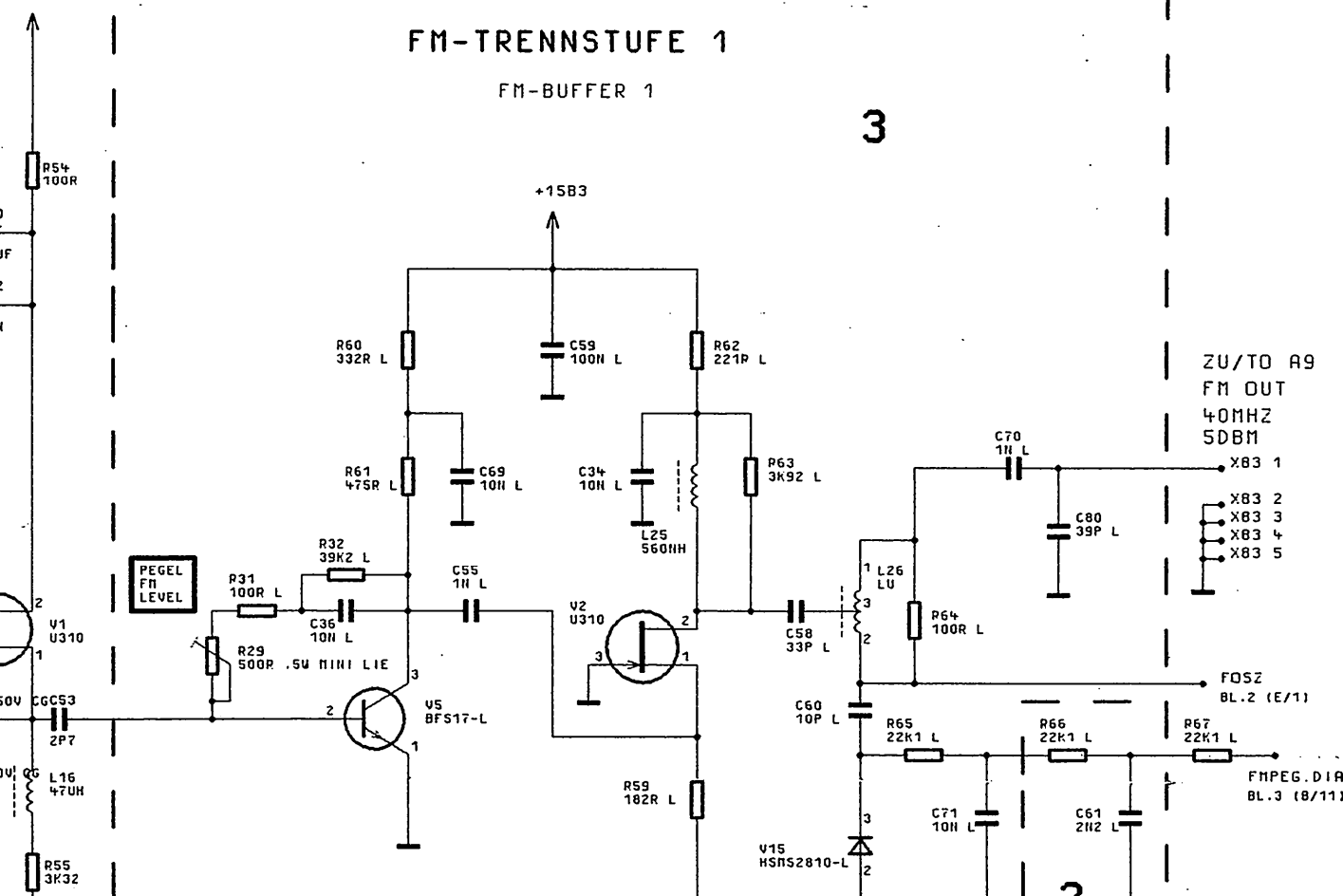
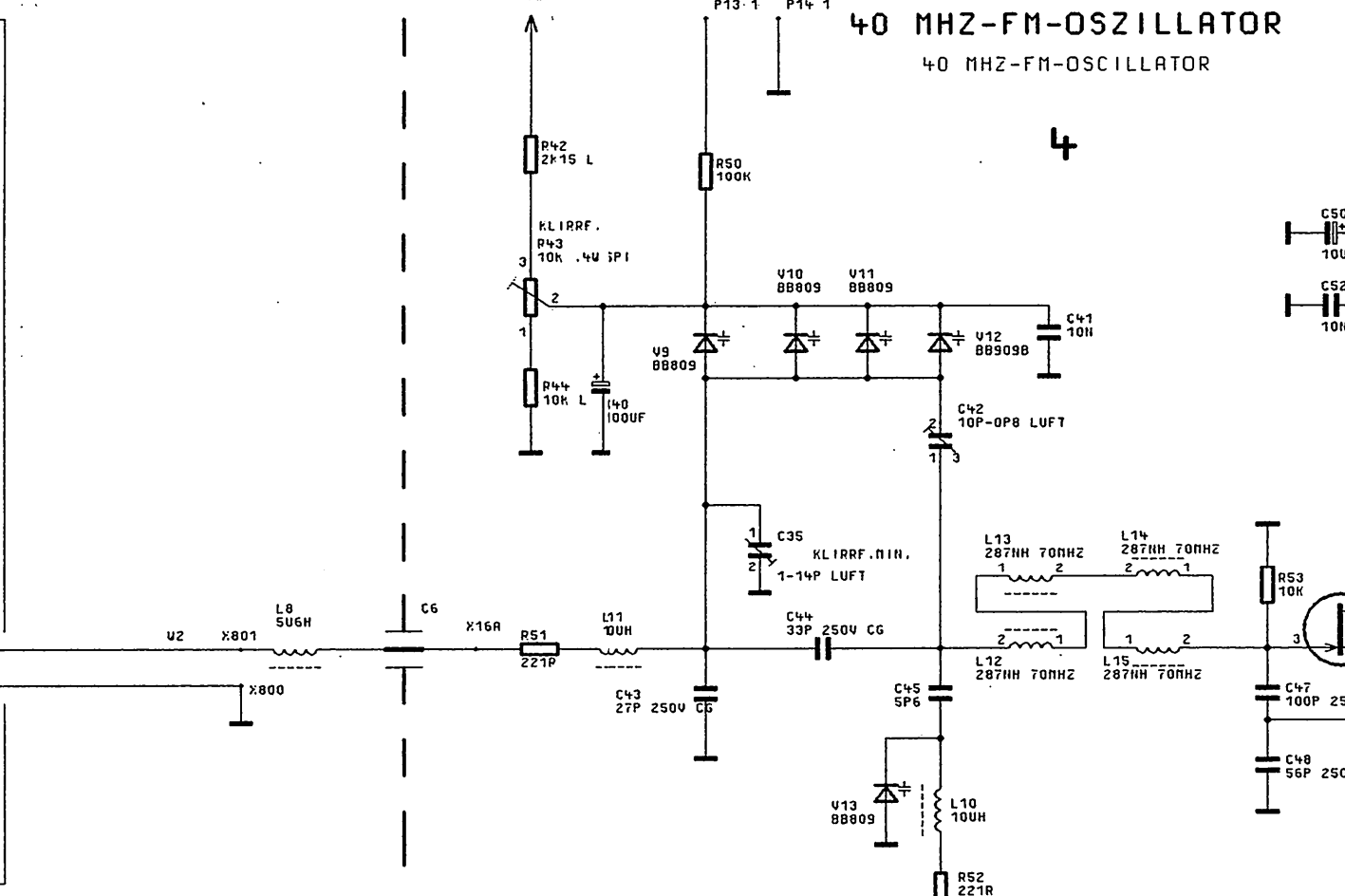
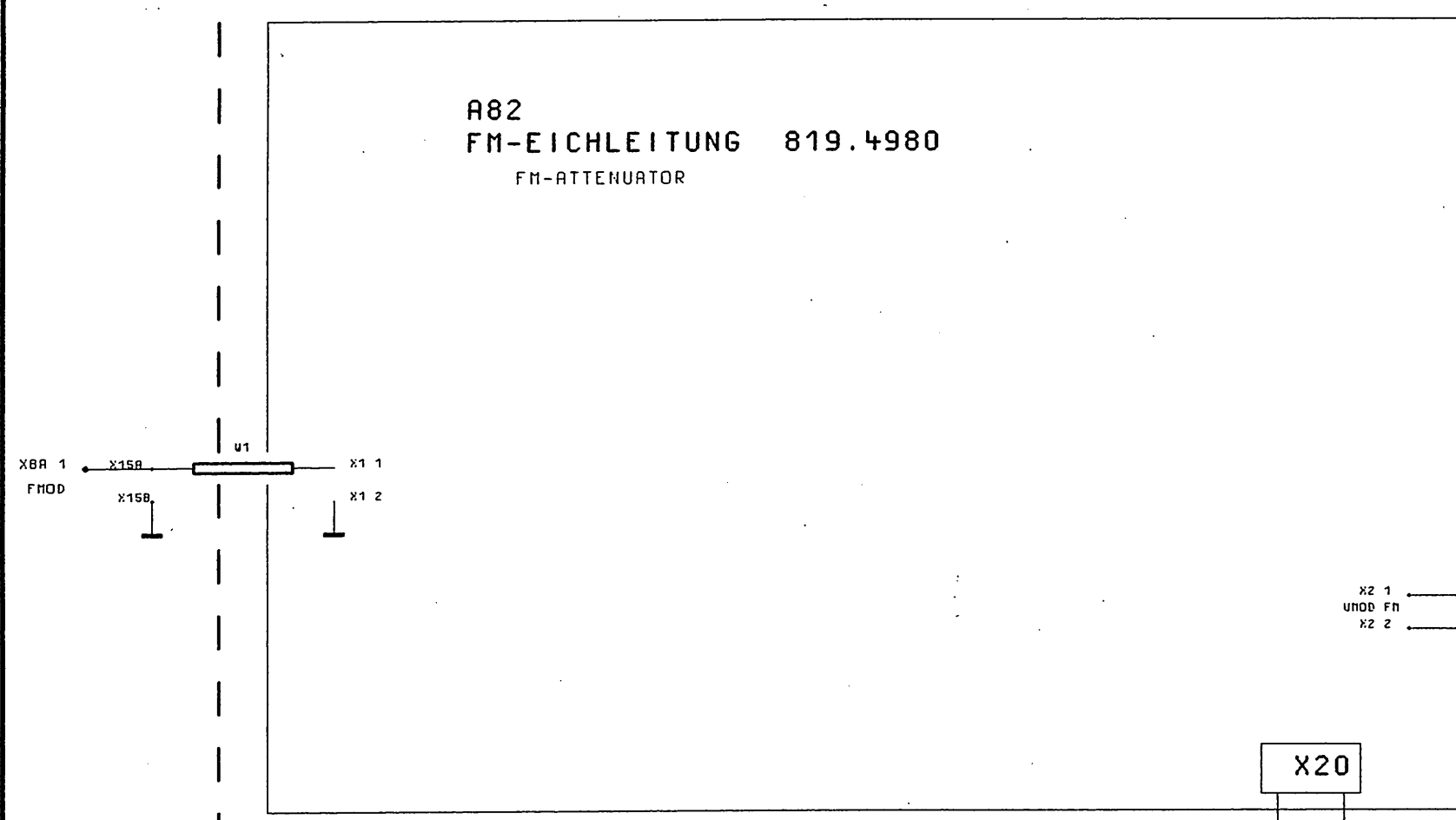
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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X81	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X82	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X83	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X800	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
X801	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
X15A	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
X15B	VL LOETOESE 8,5 X 0,9 SOLDER LUG	0455.9384.00	VOGT	1001 T BZ SN-8 VERZI	
X16A	VL STECKLOETOESE 7,5X1,1 PLUG-IN SOLDERING LUG	VL 0078.2747.00	-	R&S-ZCHNG.078.2747	
X20A	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X20B	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X8A	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	

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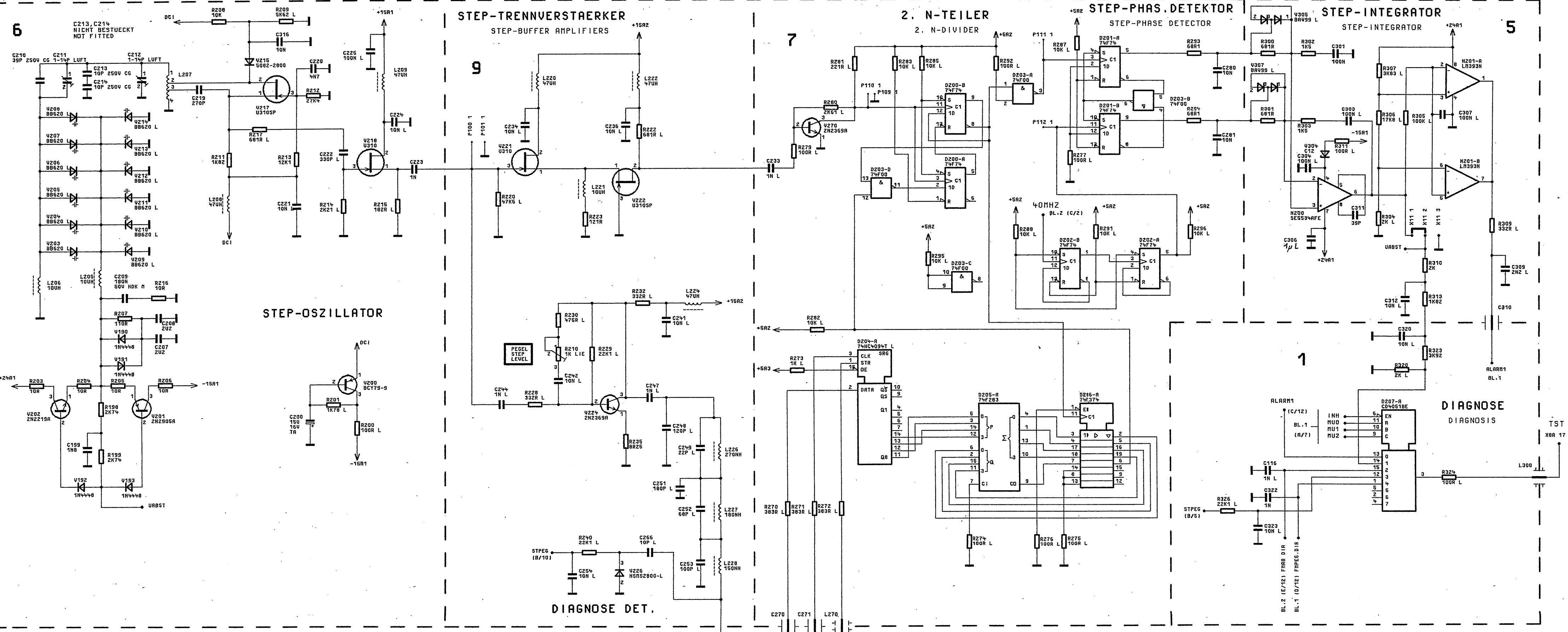
DIESE ZEICHNUNG IST EIN RECHNEPRAEDUCK. AENDERUNGEN KOENNEN NUR DURCH RENDERN DES DATENSATZES ERFOLGEN



STROMLAUF GILT FUER VAR.02 CIRCUIT DIAGRAM IS VALID FOR MOD.02

12/	46458	21.11.94	JN	1GPK	TAG	NARE	BENENNUNG
						JH	FM-INTERPOL-OSZILLATOR
							FM-INTERPOL-OSCILLATOR
							ZEICHN.-NR.
							819.4967.015
							BLATT-NR.
							1+
REND. IND.	RENDUNGS-NITTEILUNG	DATUM	NARE	ROHDE&SCHWARZ		REG. I.V. 819.0010	
				ZU GERÄT	SMGU	ERSTE Z.	

FÜR DIESE ZEICHNUNG BEHALTEN WIR UNS ALLE RECHTE VOR
 DIESE ZEICHNUNG IST EIN RECHNERDRAUCK, ÄNDERUNGEN KÖNNEN NUR DURCH HÄNDLICHES ERGÄNZEN



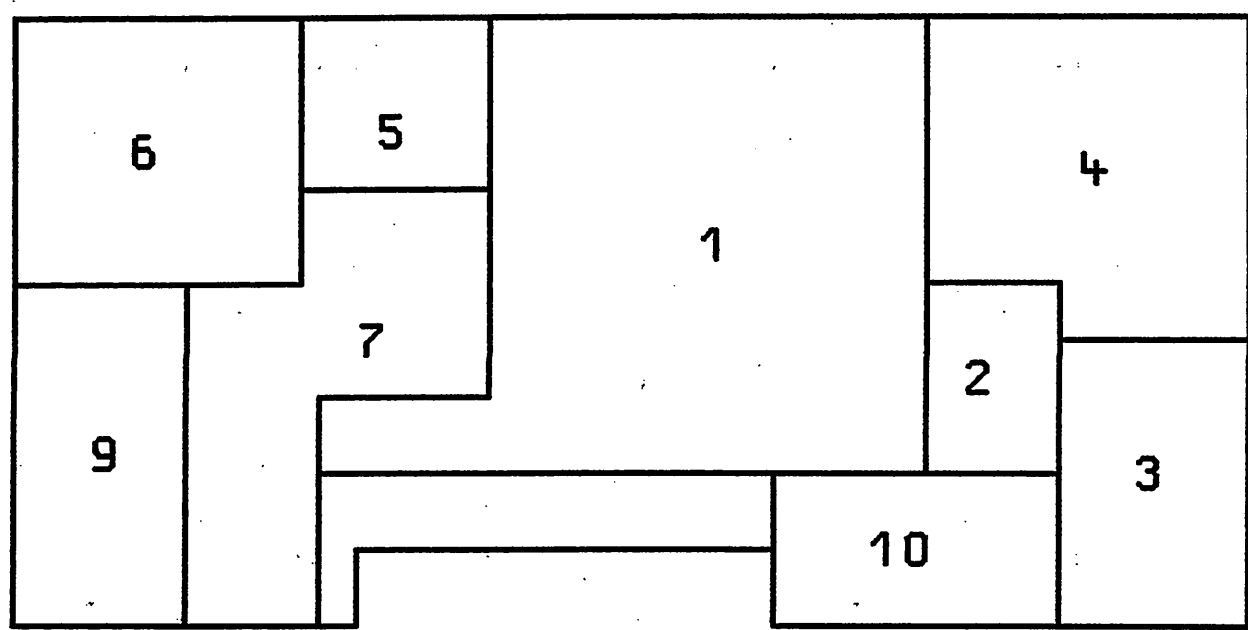
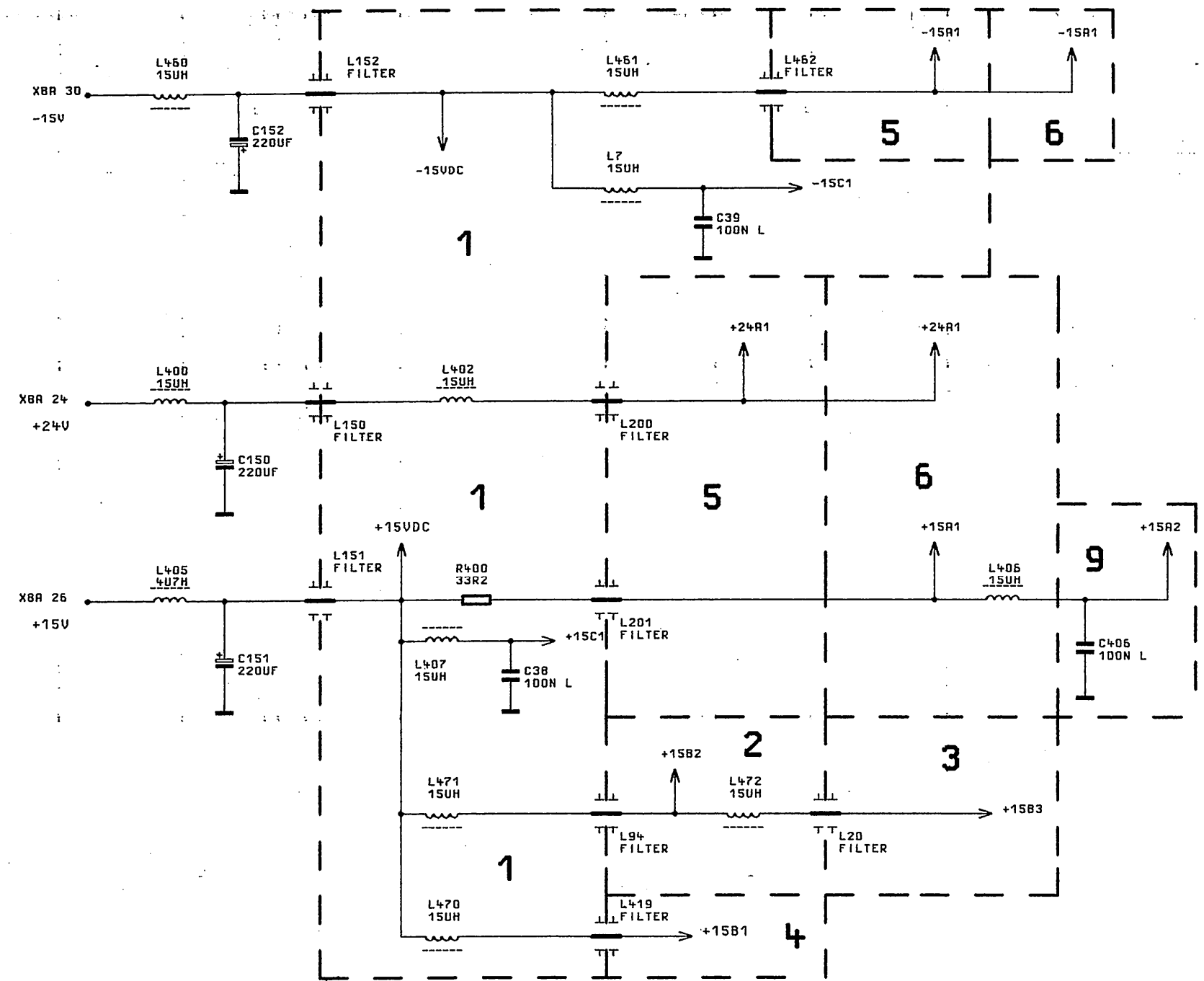
23, 125MHZ ...
 29, 375MHZ
 10DBM
 STEP
 ZU/TO A10

STROMLAUF GILT FÜR VAR.02
 CIRCUIT DIAGRAM IS VALID FOR MOD.02

B	39845	2.89	LS	1KGB	TAG	NAME	BENENNUNG	
C	39845	3.89	JN	BEARR.		HO	FM-INTERPOL-OSCILLATOR FM-INTERPOL-OSCILLATOR	
7	44812	5.90	HO	GEPR.		HO		
09	46458	6.91	HO	NDRN		HO		
							PLOTT	30. 5.90 *
							ZEICHN.-NR.	819.4967.015
							REG.-I.-V.	819.0010
							ERSTE Z.	
							BLATT-NR.	3
							V. 4	BL.

ROHDE & SCHWARZ
 ZU GERÄT SMGU

FÜR DIESE UNTERLAGE
BEHALTEN WIR UNS ALLE RECHTE VOR

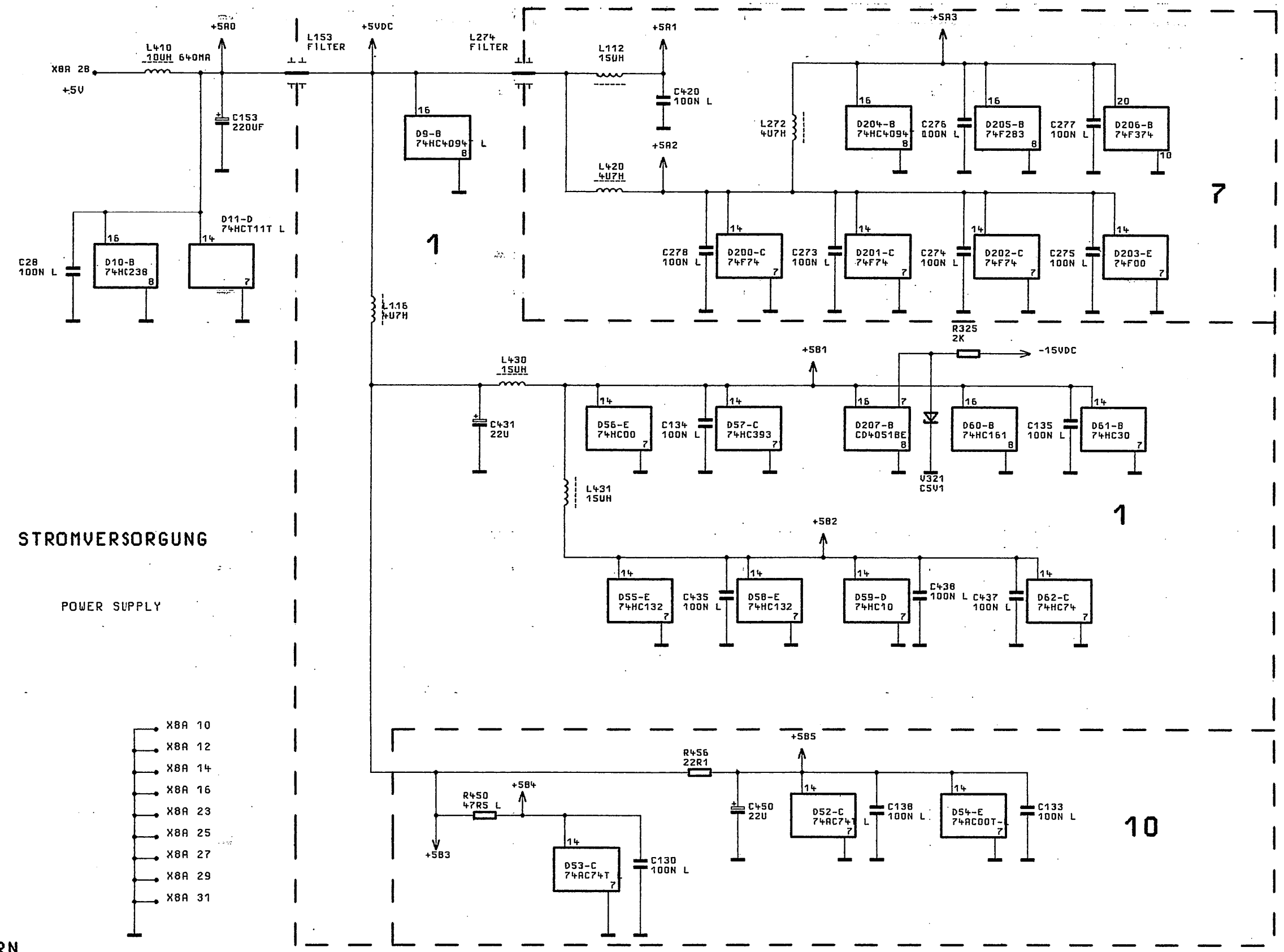


LAGE DER KAMMERN
LOCATION OF SUBMODULES

STROMVERSORGUNG

POWER SUPPLY

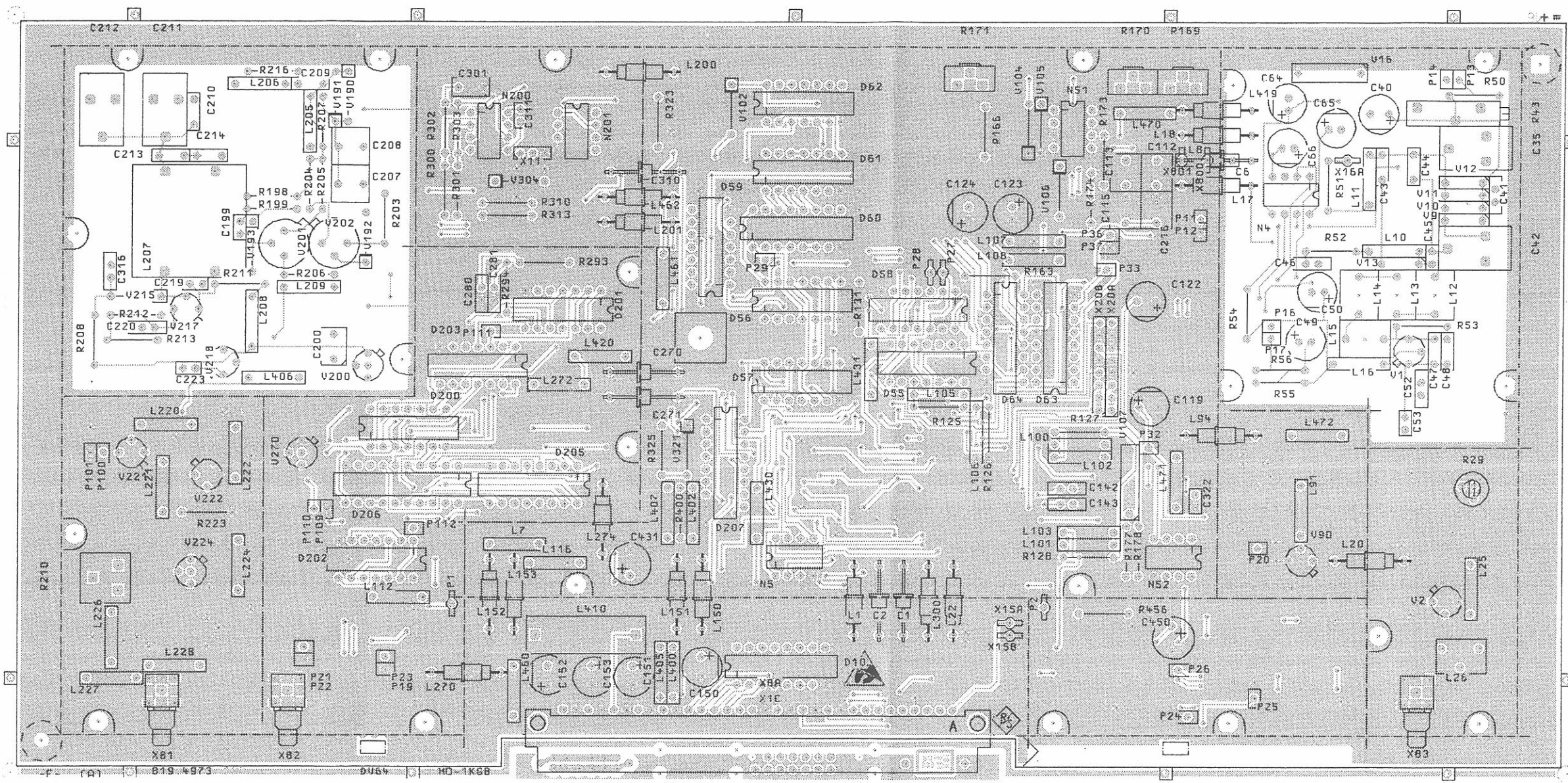
- X8A 10
- X8A 12
- X8A 14
- X8A 16
- X8A 23
- X8A 25
- X8A 27
- X8A 29
- X8A 31



STROMLAUF GILT FÜR VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02



B	39845	2.89	LS	1KGB	TAG	NAME	BENENNUNG
C	39845	3.89	JN	BEARB.		HO	FM-INTERPOL-OSZILLATOR FM-INTERPOL-OSCILLATOR
7	44.812	5.90	HO	GEPR.		HO	
					PLOTT	30. 5.90	*
REND. IND.	RENDERUNGS-NITTEILUNG	DATUM	NAME	ROHDE & SCHWARZ		ZEICHN.-NR.	BLATT-NR.
				ZU GERÄT	SMGU	819.4967.015	4
				REG. I.V.	819.0010	ERSTE Z.	v. 4. BL.



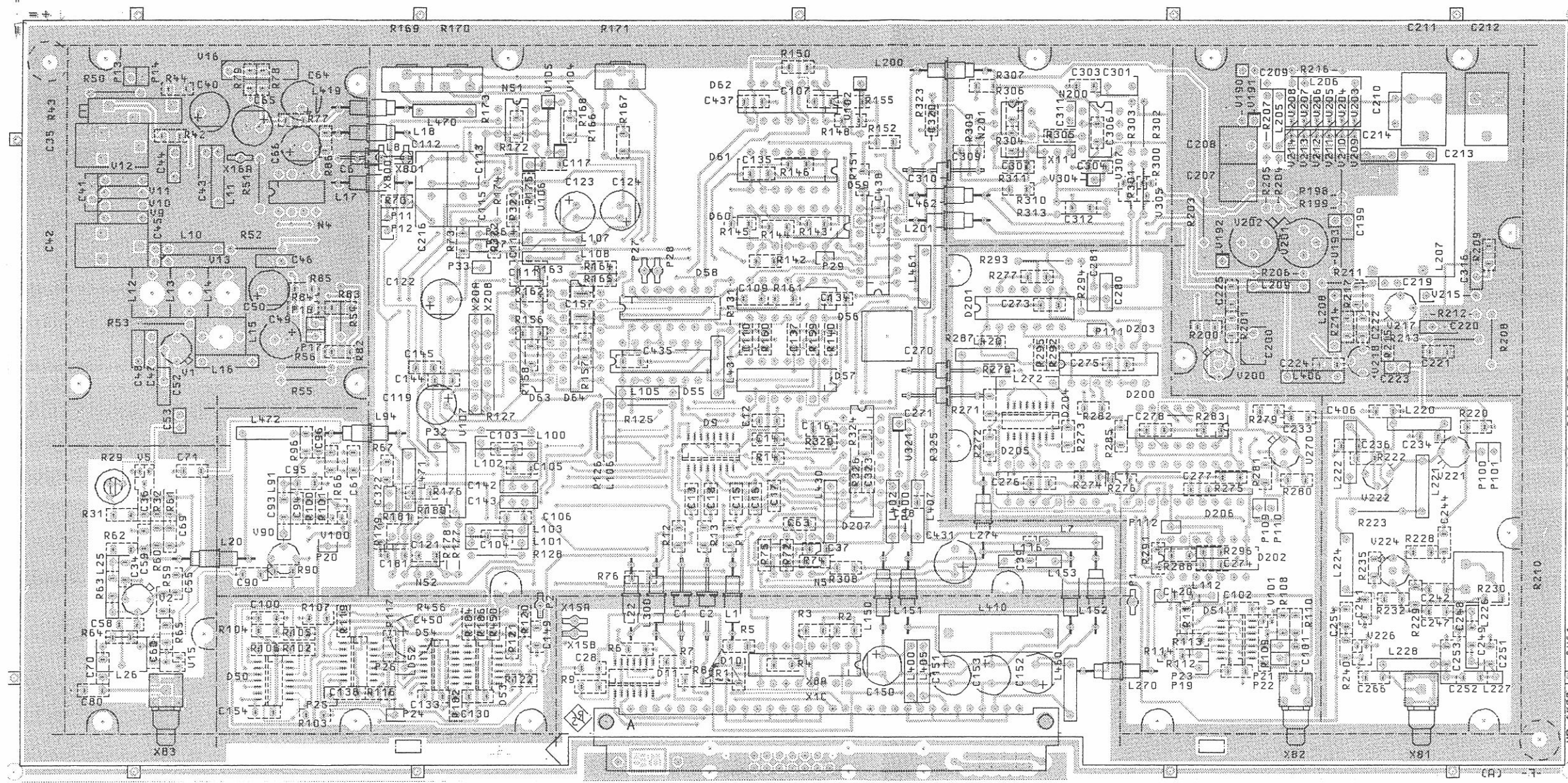
Ansicht und Leitungsführung Bauteilseite
View of tracks on component side

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ATTENTION ESD!
Electrostatic sensitive devices require a special handling.

07	44812	05.90	HO	Maße ohne Toleranzangabe	Maßstab 1 : 1		
					Halbzeug, Werkstoff		
				1KGB Tag Name	Benennung	Z	
				Bearb. 05.90 HO	FM-INTERPOL-OSZILLATOR		
				Gepr.			
				Norm			
				zu Gerät SMGU	Zeichn.-Nr. 819.4967	Blatt-Nr. 2	
And. Zust.	Änderungs-Mitteilung	Tag	Name	reg. i. V. 819.0010V	erste Z.	v. 4 Bl.	



Ansicht und Leitungsführung Lötseite
View of tracks on solder side

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(hierzu HVC 250)




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07	4 4 812	05.90	HO	Maße ohne Toleranzangabe	Maßstab 1 : 1		
					Halbzeug, Werkstoff		
				1KGB Tag Name	Benennung	Z	
				Bearb. 05.90 HO	FM-INTERPOL-OSZILLATOR		
				Gepr.			
				Norm			
				ROHDE & SCHWARZ	Zeichn.-Nr.	Blatt-Nr.	
				zu Gerät SMGU	819.4967	3	
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	reg. i. V. 819.0010V	erste Z.	v 4 Bl.	


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C1	CK 10NF +-1% 63V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7652.00	ROEDERSTEI	KP1830-310 06 1 3 W	
C3	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C7	CC 100PF+-2%6X7N150 CAPACITOR	CC 0087.6712.00	PHILIPS_CO	2222 678 34 101	
C10	CK 10NF +-1% 63V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7652.00	ROEDERSTEI	KP1830-310 06 1 3 W	
C11	CC 10PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6429.00	PHILIPS_CO	2222 678 10109	
C15	CC 10PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6429.00	PHILIPS_CO	2222 678 10109	
C17	CC 1PF+-0,25PF3X4P100 CAPACITOR	CC 0087.6170.00	PHILIPS_CO	2222 678	
C18	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C20	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C21	CK 470PF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7575.00	ROEDERSTEI	KP1830-147 01 1 3 W	
C22	CK 330PF +-1% 100V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7569.00	ROEDERSTEI	KP1830-133 01 1 3 W	
C24	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C25	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C26	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C28	CK 10NF +-1% 63V RM5 KP POLYPROPYLENE CAPACITOR	CK 0007.7652.00	ROEDERSTEI	KP1830-310 06 1 3 W	
C29	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C30	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C31	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C32	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C45	CC 150PF+-2%5X6N750 CAPACITOR	CC 0087.6929.00	PHILIPS_CO	2222 678 58151	
D1	BS LF13331N 4X ANALOGSCH ANALOG SWITCH	BJ 0356.0515.00	NSC	LF13331N	
D2	BJ AD7533CQ 1X10B-DAC D/A-CONVERTER	BJ 0300.8740.00	ANALOG_DEV	AD7533CQ(CD)	
D3	BS LF13331N 4X ANALOGSCH ANALOG SWITCH	BJ 0356.0515.00	NSC	LF13331N	
D4	BS LF13331N 4X ANALOGSCH ANALOG SWITCH	BJ 0356.0515.00	NSC	LF13331N	
D6	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D7	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D8	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D12	BS LF13331N 4X ANALOGSCH ANALOG SWITCH	BJ 0356.0515.00	NSC	LF13331N	
L3	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L4	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L5	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
N1	BO LT318AJ8 OPAMP OPERATIONAL AMPLIFIER	0805.1454.00	LINEAR_TEC	LT 318 AJ8 /SL 30001	
N2	BO LT318AJ8 OPAMP OPERATIONAL AMPLIFIER	0805.1454.00	LINEAR_TEC	LT 318 AJ8 /SL 30001	
N3	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN	
N6	BO LF411CN FET OPAMP OPERATIONAL AMPLIFIER	0349.3058.00	NSC	LF411CN	
N8	BO HA7-2525-5 OPAMP OPERATIONAL AMPLIFIER	0352.7544.00	HARRIS	HA7-2525-5	
P1	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	

095.0026-0693

MENP5	502 3PUA	Äi	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
	ROHDE & SCHWARZ	13	04.02.98	ED FM-EICHLAUFUNG FM-ATTENUATOR	0819.4980.01 SA	1+


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in	
P3	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P4	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P9	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
P10	FP STIFTLAISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36		
R14	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R15	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2		
R16	RL 0,60W 475 KOHM+-1%TK50 RESISTOR	RL 0083.2593.00	RESISTA	MK2		
R17	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R18	RL 0,35W7,50KOHM+-0,1%T25 RESISTOR	RL 0084.2822.00	DRALORIC	SMA0207		
R19	RL 0,60W 475 KOHM+-1%TK50 RESISTOR	RL 0083.2593.00	RESISTA	MK2		
R20	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2		
R21	RL 0,60W 30,1KOHM+-1%TK50 RESISTOR	RL 0083.1639.00	RESISTA	MK2		
R22	RL 0,35W2KOHM+-0,1%TK25 RESISTOR	RL 0083.9723.00	DRALORIC	SMA0207		
R23	RL 0,35W 1 KOHM+-0,1%TK25 RESISTOR	0083.9146.00	DRALORIC	SMA0207		
R24	RL 0,35W 1 KOHM+-0,1%TK25 RESISTOR	0083.9146.00	DRALORIC	SMA0207		
R25	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2		
R26	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2		
R27	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2		
R28	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2		
R29	RL 0,60W 7,50KOHM+-1%TK50 RESISTOR	RL 0083.1197.00	RESISTA	MK2		
R30	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7577.00	SPECTROL	63 M ... TO 10		
R31	RL 0,35W481 OHM+-0,1%TK25 RESISTOR	RL 0083.8533.00	DRALORIC	SMA0207		
R33	RL 0,35W120 OHM+-0,1%TK25 RESISTOR	RL 0083.7372.00	DRALORIC	SMA0207		
R34	RL 0,35W120 OHM+-0,1%TK25 RESISTOR	RL 0083.7372.00	DRALORIC	SMA0207		
R37	RL 0,60W 20,0KOHM+-1%TK50 RESISTOR	RL 0083.1522.00	RESISTA	MK2		
R38	RL 0,60W 20,0KOHM+-1%TK50 RESISTOR	RL 0083.1522.00	RESISTA	MK2		
R39	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7577.00	SPECTROL	63 M ... TO 10		
R42	RL 0,60W 5,11KOHM+-1%TK50 RESISTOR	RL 0082.2348.00	RESISTA	MK2		
R43	RL 0,60W 6,19KOHM+-1%TK50 RESISTOR	RL 0082.2283.00	RESISTA	MK2		
R45	RL 0,60W4,32 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8015.00	ROEDERSTEI	MK2		
R46	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2		
R48	RL 0,60W4,32 OHM+-1%TK50 METALFILMRESISTOR	RL 0099.8015.00	ROEDERSTEI	MK2		
R50	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R51	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2		
R52	RL 0,60W 3,92KOHM+-1%TK50 RESISTOR	RL 0083.1039.00	DRALORIC	SMA 0207		
R53	RL 0,60W 82,5 OHM+-1%TK50 RESISTOR	RL 0082.9707.00	RESISTA	MK2		
V5	AE BZX55/B7V5 0,5W ZDI ZENER DIODE	AE 0349.3041.00	VALVO	BZX79B7V5		
V6	AE BZX55/B7V5 0,5W ZDI ZENER DIODE	AE 0349.3041.00	VALVO	BZX79B7V5		
MENP5	502 3PUA	Äi	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
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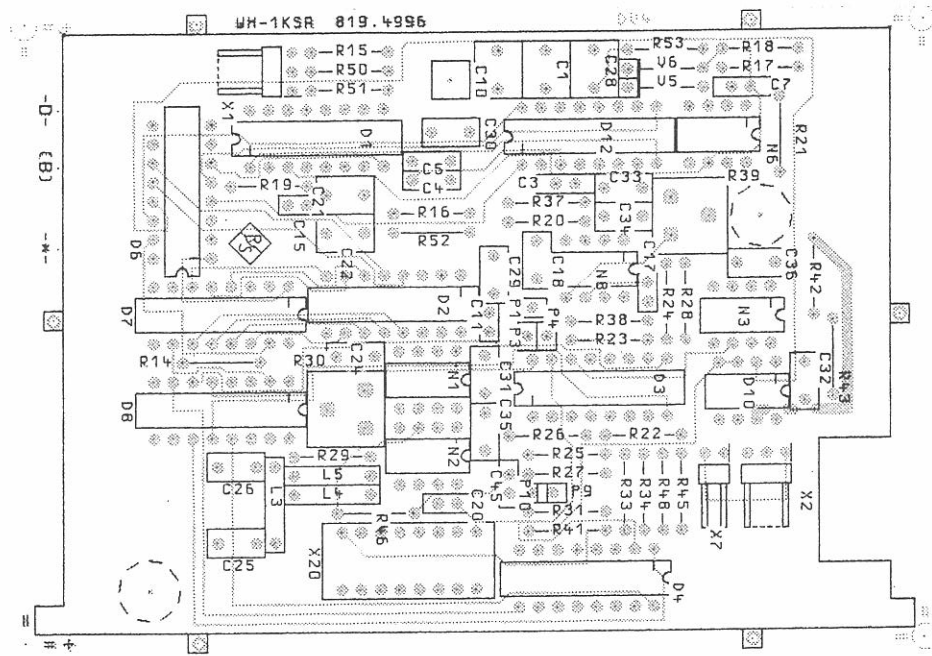
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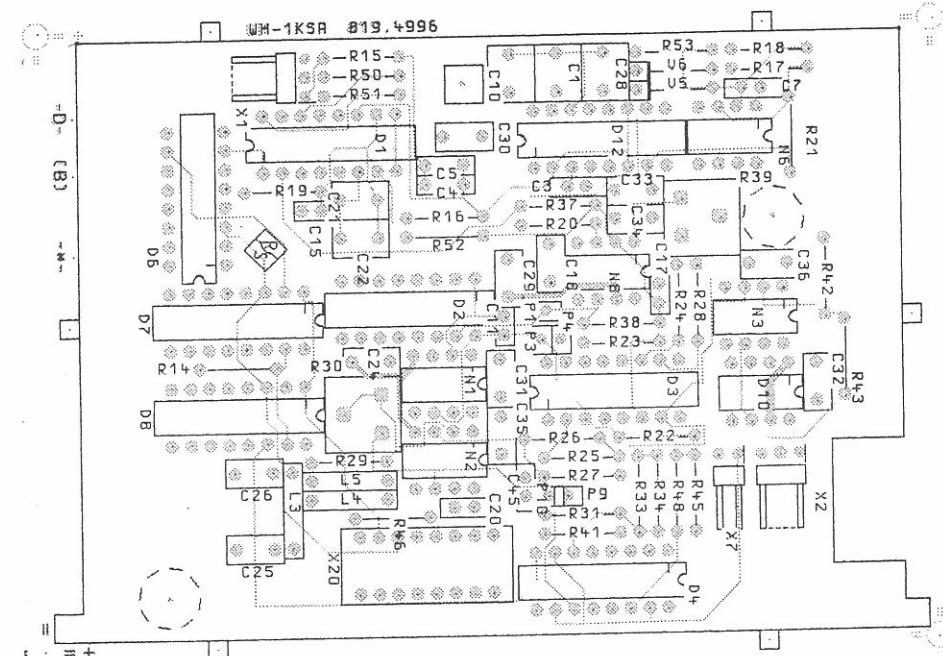
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W4	DY KABEL W4 CABLE	0819.5392.00			
X1	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 3-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X2	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 3-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	
X7	FP STIFTL.WIN 36P.R2,54 ANGLE PIN CONNECTOR 2-POLIG/PINS	FP 0243.3578.00	BINDER	742-5-11-0187-00-36	

MENP5	502 3PUA	Äl	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
	ROHDE & SCHWARZ	13	04.02.98	ED FM-EICHLITUNG FM-ATTENUATOR	0819.4980.01 SA	3-

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



DV41



DV43

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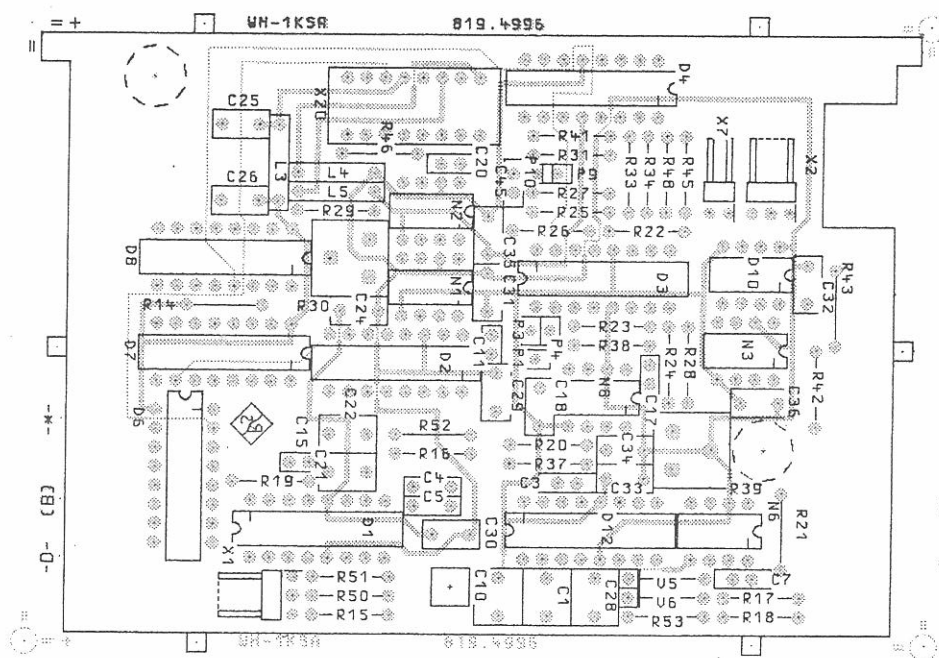


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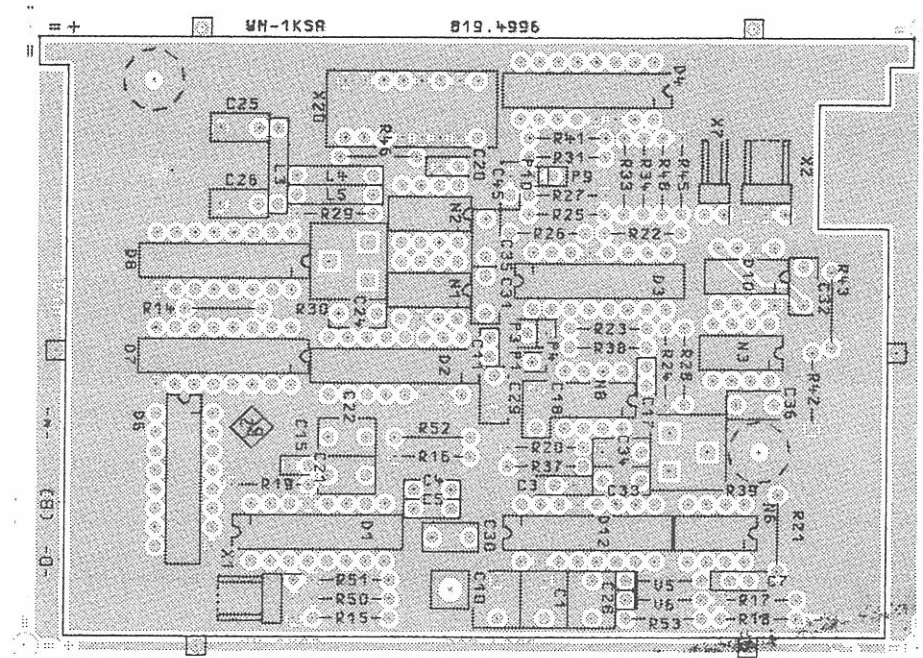
D	39845	4.89	JN	Maße ohne Toleranzangabe	Maßstab	1 : 1	
					Halbzeug, Werkstoff		
				IKGB	Tag	Name	Benennung
				Bearb.	02.89	JN	
				Gepr.			
				Norm			FM - EICHLITUNG
					Zeichn.-Nr.	819.4980	
And. Zust.	Anderungs-Mitteilung	Tag	Name		zu Gerät	SMGU	reg. i. V.
						erste Z.	
							Blatt-Nr.
							2
							v. Bl.

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Ansicht und Leitungsführung Lötseite
View of tracks on solder side



DV13



DV11



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D	39845	4.89	JN	Maße ohne Toleranzangabe	Maßstab 1:1		Benennung	Z
					Halbzeug, Werkstoff			
				1KGB	Tag	Name	FM - EICHLEITUNG	Blatt-Nr. 3
				Bearb.	02.89	JN		
				Gepr.				
				Norm			Zeichn.-Nr.	Blatt-Nr. 3
				zu Gerät SMGU		819.4980	reg i. V. 819.0010 V	erste Z.

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ROHDE & SCHWARZ

SERVICE DOCUMENTS

Fixed Frequencies

819.6060.02

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	Component lists
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5 Service Manual "Fixed Frequencies"

5.1 Function Description

(See circuit diagrams 819.6060 S and 819.0010 S, sheet 1)

The "fixed frequencies" subassembly generates the reference frequency for all SMGU/SMHU sub-assemblies. The subassembly consists of an oven-controlled, highly-stable 10-MHz crystal oscillator, which generates the reference frequency for the instrument. The 40 and 130-MHz crystal oscillators are each synchronized to this frequency by means of a PLL. The 130-MHz and the 520-MHz frequencies (4 x 130 MHz) are used in the output section as the LO for the mixing range. The 300-MHz signal for the summing loops is generated by doubling the 130-MHz signal mixing it with the 40-MHz crystal signal for CW or the 40-MHz FM oscillator for FM.

5.1.1 10-MHz OCXO

The module G10 contains a 10-MHz oven-controlled crystal oscillator. This gives a good temperature stability and good long-term characteristics.

The power supplies to the oven and the oscillator circuit are separate, the oven being permanently supplied by the +12 V standby voltage. This means that the oven does not have to heat up when the instrument is switched on (duration approx. 5 min.). The bridge voltage of the thermostat can be tapped at G10.4 for monitoring purposes and can be polled by the diagnostics function (test point SF 133) via the voltage follower N30-A. The processor also controls the "Oven cold" display using this voltage. The supply voltage for the crystal oscillator is generated by the voltage stabilizer V10. This is derived via V11 if an external reference is used.

There is a 10-MHz signal at terminal G10.1.

The frequency is adjusted using an externally-accessible trimmer.

5.1.2 40-MHz Crystal Oscillator with Buffer Stages and Control

5.1.2.1 40-MHz Crystal Oscillator

The 40-MHz crystal oscillator uses a common-base transistor circuit (V305). This gives the highest possible crystal and the lowest possible oscillator phase noise. The amplitude of the oscillations is stabilized by the biased Schottky diode V306. The four tuning diodes V300 to 303 in a push-pull circuit are used to tune the crystal frequency. The supply voltage to the crystal oscillator is also filtered via the emitter follower V310. A buffer stage in the common-base circuit (V315) decouples the oscillator from the following stages and increases the output power to 13 dBm.

5.1.2.2 40-MHz Amplifier

The output signal of the oscillator buffer stage is applied via a power divider (L320) to four amplifiers based on a FET in gate configuration. Diagnostics detectors (SF 138 to 140) are present on the three output stages (V330, 340, 350) for level monitoring. The fourth stage with V360 controls an ACMOS gate (D401) which generates the level for the following frequency divider.

5.1.2.3 40-MHz Amplifier PLL with Reference Switchover

A PLL locks the 40-MHz crystal oscillator onto the output frequency of the OCXO or - with the setting "Ref. ext." to the applied reference frequency. The 40-MHz signal is divided down to 5 MHz in divider D400 and compared in phase detector D50 with the frequency of the OCXO divided by two (D20, 21-A).

The output signal of D50 tracks the oscillator frequency via the differential amplifier N50-A with the following PI controller. The output voltage of the PI controller is monitored by the alarm detector N90-C/D (Err 40) and can also be interrogated by a diagnostics test point (SF 134).

The bandwidth of the PLL can be changed using plug-in jumper X55 and thus matched to the requirements in the "Ref. ext." mode:

- X55A-B 1 Level bandwidth 100 Hz, e.g. use of a very low-noise external reference to improve the SMGU/SMHU spectrum; inherent noise of PLL approx -130 dBc/Hz at FAF = 30 Hz, referred to 10 MHz.
- X55A-B 2 Level bandwidth 10 Hz, standard setting, optimum adaptation to internal OCXO
- X55A-B 3 Level bandwidth 1 Hz, for suppression of hum sidebands and noise from the external reference outside the control bandwidth

After passing through a lowpass filter, the output signal of the OCXO in the "Ref. int." mode is available as a reference frequency at X91 and can be switched between 5 and 10 MHz using D20, 21-A (SF 13, 14). The input signal at X91 in the "Ref. ext." mode is amplified by V43 to HCMOS levels and applied to the phase detector D50 via the frequency divider D21-B with a selector for 5 or 10 MHz.

5.1.3 130-MHz Crystal Oscillator with PLL

5.1.3.1 130-MHz Crystal Oscillator

The circuit of the 130-MHz crystal oscillator corresponds to that of the 40-MHz oscillator (5.1.2.1) except that the tuning circuit only has one varicap diode and the co-compensation of the crystal is adjustable with L111.

A buffer stage with compensated feedback which amplifies the output power to 17 dBm feeds a power divider containing L130. The following stages are connected to the decoupled outputs of the divider.

5.1.3.2 130-MHz Oscillator PLL

The 130-MHz crystal oscillator is synchronized by a PLL to the 40-MHz crystal oscillator, and this in turn is locked to the 10-MHz OCXO or the external reference. Optimum phase noise for the 130-MHz signal is achieved by the cascaded control and corresponding adaptation of the bandwidths.

The signal from the 40-MHz crystal oscillator divided by four in D400, 401 is differentiated by the LC network L410, C410. The pulse stage V410 triggered by the positive edge generates a 3-ns needle pulse which the following sampling mixer uses to sample the 130-MHz signal.

The output signal tracks the 130-MHz oscillator via voltage follower N430-B and control amplifier N430-A. The output voltage of the PI controller is again monitored via an alarm comparator N40-A/B and can also be interrogated by the diagnostics function (SF 135).

A two-stage isolating amplifier (V440, 445) with common gate FETs circuit decouples the sampling mixer from the 130-MHz crystal oscillator.

5.1.4 130/520-MHz LO Signal

The 130/520-MHz signal, which is used in the output section as the LO signal for the two mixer ranges, is generated directly or by quadrupling the 130-MHz crystal oscillator.

In the direct case, the signal is applied via two diode switches (V195, 234) - with an intermediate attenuator for matching the level - to the output amplifier N240 which boosts the power to 5 dBm. The output power can be monitored using a diagnostics detector (SF 136).

The output frequency of 520 MHz is generated by a quadrupler consisting of a balancing transformer (L191, 192) with a full-wave rectifier (V200, 201). The filter L203 and the coupled bandpass filter L221, 222 suppress the resulting subharmonics ($1/2f$, $3/2f$), and the intermediate amplifier N204 compensates the loss in level in the multiplier.

The operational amplifiers N250-A/B control the diode switches of the 130 and 520-MHz branches.

5.1.5 Processing the 300-MHz Reference Signal

The 300-MHz signal is generated by mixing 260 MHz and 40 MHz, where the 260 MHz signal is obtained by doubling the frequency of the 130-MHz crystal oscillator. A two-stage IF amplifier with filter provides an output power of 5 dBm.

5.1.5.1 130/260-MHz Doubler with LO Amplifier

The frequency doubler also consists of a balance-to-unbalance transformer (L142, 143) with a full-wave rectifier. The following bandpass filter (L145, 146) suppresses the resulting subharmonics. The power amplifier with V146 controls the high-level mixer D150 with a Low power of 17 dBm.

5.1.5.2 300-MHz Amplifier with Filter

The IF amplifier has two stages with a bandpass filter between the stages and a bandpass at the output. These filters suppress the spurious signals generated during mixing.

The first stage has a common gate circuit FET (V160) which terminates the IF port of mixer D150 in 50Ω .

Input matching is adjusted by setting the drain current.

There is a coupled bandpass filter between the first and second stage which has a common-base transistor circuit (V170). This gives good decoupling between the two bandpass filters.

A diagnostics detector at the output (SF 137) is for monitoring the output power.

5.1.5.3 40-MHz Amplifier with FM/CW Selector

The FM/CW selector has two T-networks (V370-372, V375-377) for high crosstalk attenuation between the two filters.

The following amplifier is adjustable so that variations in gain in the 300-MHz IF amplifier can be eliminated.

A lowpass with a subsequent highpass/lowpass branching filter improves the harmonic ratio and terminates the RF port.

5.2 Checks and Adjustments

5.2.1 Checking the Alarm

Connect two power supply units (0 to 25 V) to X50 B-C and X43 B-C (C = ground). Set both voltages to +10 V, the display "Err 40, 41" must not light up. Then set the voltage at X50 to +0.5 V and +20.5 V, the display "Err 40" must light up in each case. Repeat the same test at X43 (Err 41).

5.2.2 Testing the 10-MHz OCXO

Disconnect the SMGU/SMHU from the AC power supply for at least 15 minutes (AC power switch on rear panel) so that the crystal oven cools down. Switch on the AC supply and measure the bridge voltage using the diagnostics function.

- ▶ Diagnostics voltage (SF 133): +3.6 to +4.5 V

The display "OVEN COLD" should come on. This display should go off after a warm-up time of 2 to 5 minutes.

- ▶ Diagnostics voltage (SF 133): +5.5 to +6.5 V

Connect oscilloscope to P1 using 10:1 probe, setting on instrument: REF.EXT.

- ▶ Signal at P1: +5 V

Switch SMGU/SMHU to "REF.INT".

- ▶ Signal at P1: 10 MHz, HCMOS levels.

Connect spectrum analyzer to X91.

Setting on SMGU/SMHU:

REF.INT., SF 14 (reference frequency 10 MHz).

- ▶ Signal at X91: 10 MHz, +5 to +9 dBm, k2 k3 <20 dBc.

Setting on SMGU/SMHU:

SF 13 (reference frequency 5 MHz).

- ▶ Signal at X91: 5 MHz, +5 to +9 dBm.

5.2.3 Testing and Trimming the 40-MHz Crystal Oscillator with PLL

5.2.3.1 Adjusting the Crystal Oscillator

Connect power supply unit (0 to 20 V) to jumper X50 B-C (C = ground), set voltage to 10 V. Connect voltmeter to P7 and spectrum analyzer to jumper X32 using the adapter cable from the service kit. Adjust L305 for minimum display on voltmeter.

- * Voltage at P7: +10.7 to +11.2 V.

Adjust L312 for max. level at X32.

Vary the voltage on the power supply unit from 1 to 20 V and observe the signal on the spectrum analyzer (span 0 to 100 MHz). The oscillation must be continuous over the tuning range and there must be no sidebands or noise peaks.

- * Signal at X32: 40 MHz, -11.5 to -8.5 dBm.

5.2.3.2 Testing the Output Amplifiers

Connect spectrum analyzer to X72, 82, 92 in succession. Adjust voltage on power supply unit to 10 V.

- * Signal at X72, 82, 92: 40 MHz, +3 to +7 dBm.

Then check the diagnostics detector.

- * Diagnostics voltage (SF 138, 139, 140): +0.3 to +1.2 V.

5.2.3.3 Testing the PLL

Disconnect power supply unit from X50, use jumper X50 to connect A-B and jumper X55 A-B to 2.

Instrument setting: REF.INT., SF 14 (reference frequency 10 MHz).

Checking the control voltage of the 40-MHz oscillator.

* Diagnostics voltage (SF 134): +7 to +13 V.

Connect signal generator set to 5 MHz, 0 dBm for REF. INT./EXT. The frequency accuracy of the generator must be better than 10-6.

Instrument setting: SF 13 (reference frequency 5 MHz).

* Diagnostics voltage (SF 134): +7 to +13 V.

Instrument setting: SF 14 (reference frequency 10 MHz).

Adjust signal generator frequency to 9.999850 MHz and then to 10.000150 MHz.

* Diagnostics voltage (SF 134): +2 to +18 V.

5.2.4 Testing and Adjustment of 130-MHz Crystal Oscillator

5.2.4.1 Adjusting the Crystal Oscillator

Connect power supply unit (0 to 20 V) to X43 B-C (C = ground). Adjust voltage to 10 V. Connect spectrum analyzer to X41 using adapter cable and connect voltmeter to P6. Adjust voltage on voltmeter to minimum using L117, then vary the tuning voltage from 1 to 20 V and adjust L111 so as to keep the voltage as constant as possible at P6.

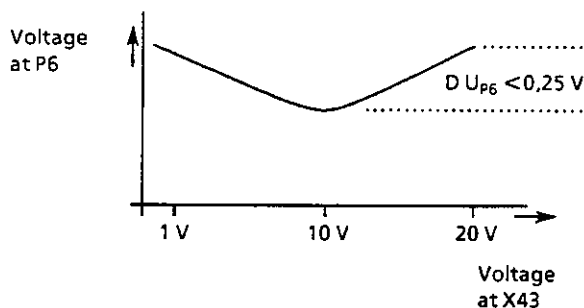


Fig. 5-1 Voltage at P6

* Voltage at P6: +9.9 to +10.7 V.

Adjust L125 for maximum signal at X41. Then vary the tuning voltage from 1 to 20 V and observe the signal on the spectrum analyzer (span 0 to 500 MHz). The oscillator must oscillate properly over the whole tuning range and there must be no noise peaks or sidebands.

* Signal at X41: 130 MHz, -8 to -5 dBm.

5.2.4.2 Testing of PLL

Connect oscilloscope to P10. Vary the power supply voltage from 1 to 20 V, a sinewave signal must be displayed on the oscilloscope.

* Signal at P10: 0 to 5 kHz, 1.0 to 1.5 Vpp.

Connect jumper X43 to A-B, connect signal generator with 10 MHz ($\Delta f < 10^{-6}$), 0 dBm to REF.INT./EXT. Setting on SMGU/SMHU: REF.EXT., SF 14 (reference frequency 10 MHz).

Check the control voltage for the 130-MHz oscillator.

* Diagnostics voltage (SF 135): +7 to +13 V.

Set the signal generator frequency to 9.999850 MHz and then to 10.000150 MHz.

* Diagnostics voltage (SF 135): +2 to +18 V.

Disconnect signal generator from X91, switch over to REF.INT.

5.2.5 Checking and Adjusting the 130/520-MHz LO Signal

The lower screening cover must be screwed down. Connect spectrum analyzer to X93, setting: REF. INT., SF 22 RF = 10 MHz (normal mixer range).

* Signal at X93: 130 MHz, +3 to +7 dBm.

Testing diagnostics detector.

* Diagnostics voltage (SF 136): +0.3 to +0.7 V.

Setting: SF 21 (mixer range with large span). Adjust L203 for maximum level at 520 MHz. Then alternately set L221 and L222 for maximum.

* Signal at X93: 520 MHz, +3 to +7 dBm, spurious sidebands at 260 and 780 MHz ≤ -60 dBc.

Setting: SF 22, RF = 1 GHz. No output signal must be displayed on the spectrum analyzer.

5.2.6 Checking and Adjusting the 300-MHz Reference Signal

5.2.6.1 Testing and Adjusting the 130/260-MHz Doubler and LO Amplifier

Connect spectrum analyzer to X15 using adapter cable. Adjust for maximum level at 260 MHz using L145, 146 alternately.

* Signal at X15: 260 MHz, -8 to -4 dBm.

5.2.6.2 Testing and Adjusting the 300-MHz Amplifier

The bottom screening cover must be screwed down when you adjust the bandpass filter. Connect network analyzer to X94, see Fig. 5-2 for settings. Adjust the bandpass filter L172, 180 by measuring the reflection coefficient at X94, see Fig. 5-2 for values. Then connect the network analyzer to X16 B-C (channel A) and X94 (channel B) using the adapter cable, see Fig. 5-3 for settings. Adjust the input reflection coefficient S11 at X16 B-C to -16 to -20 dB at 100 MHz using R160, see Fig. 5-3 for measured values.

The bandpass filter L162, 163 is adjusted by measuring the forward transmission coefficient S21 from X16 B-C to X94. See Fig. 5-4 for measured values. The settings of L172, 180 should not be changed in the process.

Disconnect network analyzer and insert jumper X16 to A-B. Connect spectrum analyzer to X94. Setting on instrument: REF. INT., FM OFF.

Adjust the level at X94 to +5 to +6 dBm using R390. Check the diagnostics detector.

* Diagnostics voltage (SF 137): +0.3 to 0.7 V.

The top and bottom screening covers must be screwed down for the following measurements. Check the spurious signals at the following frequencies:

f / MHz	P / dBm
220	≤ -74
260	≤ -74
310	≤ -104
320	≤ -100
340	≤ -104

5.2.6.3 Checking of FM/CW Selection

Spectrum analyzer remains connected to X94. Connect signal generator with 41 MHz, 5 dBm to X83.

Setting on instrument: REF. INT., FM OFF.

Level at X94 at 301 MHz ≤ -85 dBm.

Setting on instrument: REF. INT., FM. EXT. AC.

Level at X94 at 301 MHz: +4 to +6 dBm,

Level at X94 at 300 MHz: ≤ -85 dBm.

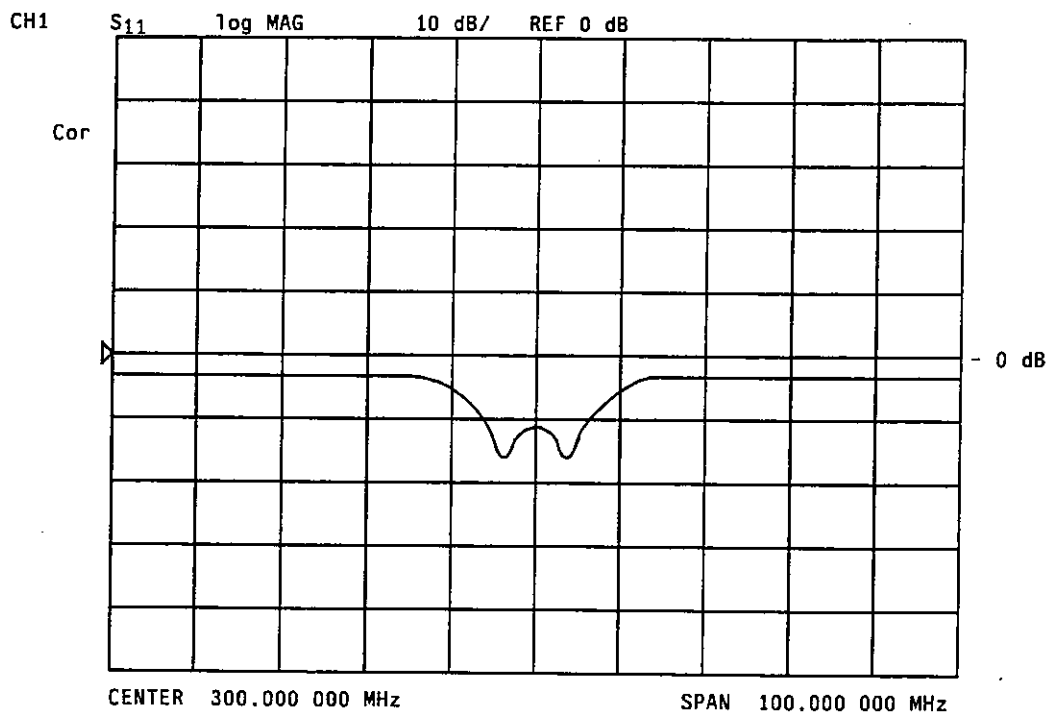


Fig. 5-2 S11 at X94, adjustment of L172, 180

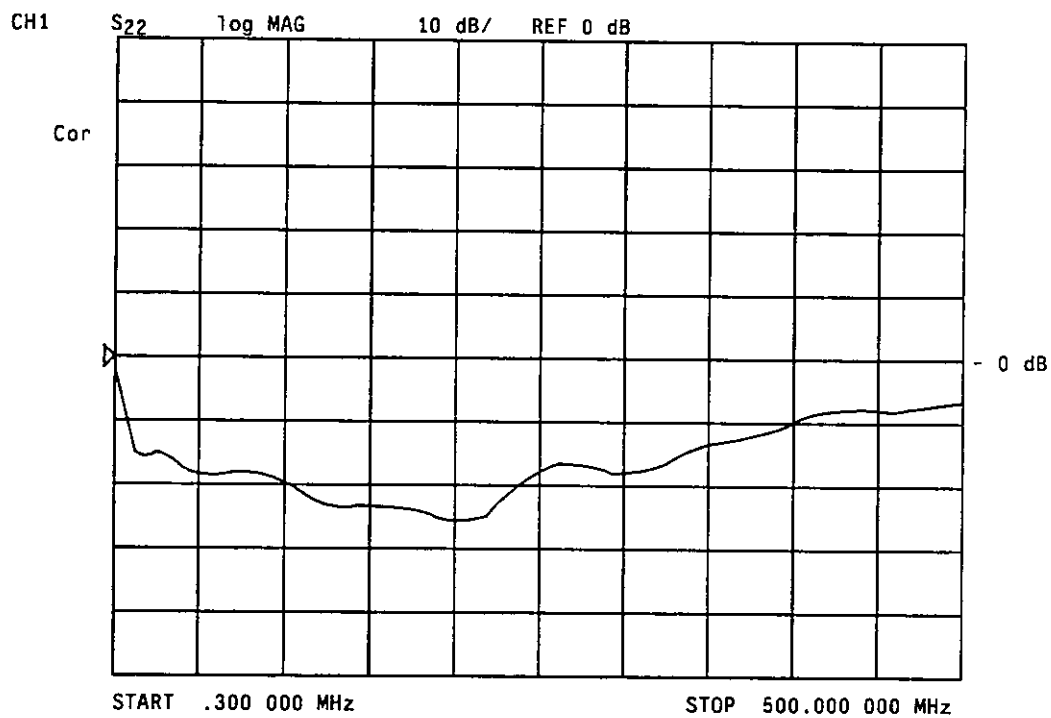


Fig. 5-3 S11 at jumper X16 B-C, adjustment of R160

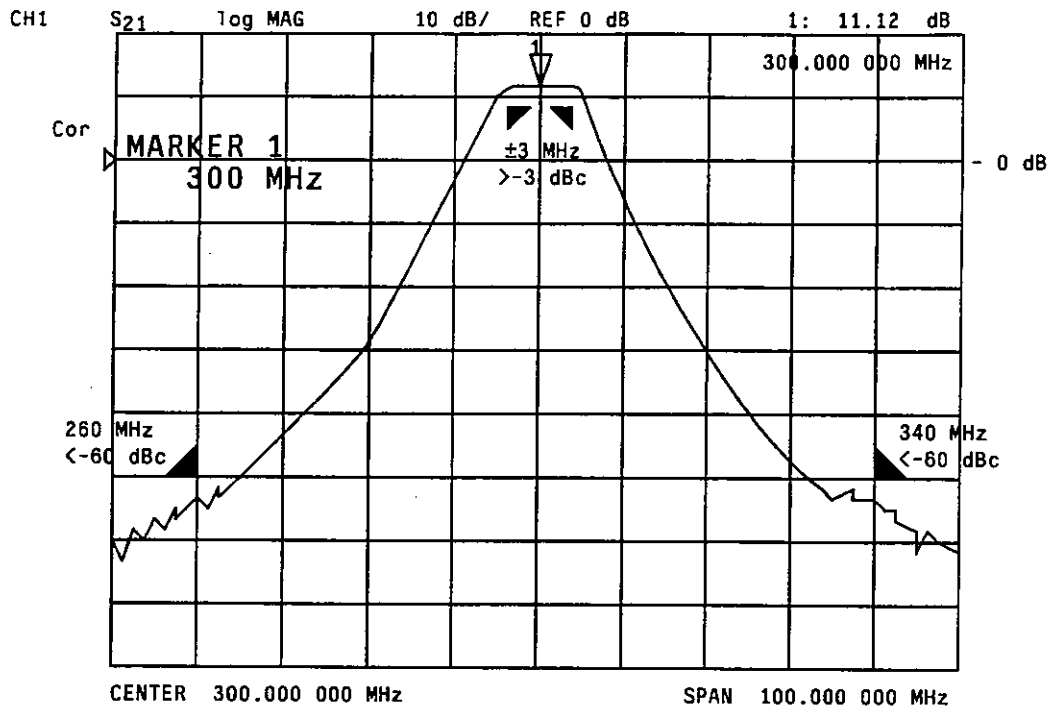


Fig. 5-4 S21 from X16 B-C to X94, adjustment of L162, 163
 Gain 9 to 13 dB
 Measured attenuation referred to gain at 300 MHz

5.3 Troubleshooting

With only one of the error messages "Err 40, 41", the cause of the fault is in the PLL of the 40 or 130-MHz crystal oscillator in the 10-MHz reference frequency. If the error messages "Err 42" (FRN synthesis) and "Err 43" (step synthesis/FM) both occur, the 40-MHz crystal oscillator or the buffer stage has failed. In a similar manner, the fault is in the 130-MHz crystal oscillator or the buffer stage if the error messages "Err 46" (summing loop) and "Err 48" (output stage with mixer range switched over) occur simultaneously.

5.3.1 Failure of PLLs (Err 40, 41)

- With REF.EXT on, check the frequency (5/10 MHz \pm 5 ppm) and level (0.1 to 2 V) of the external reference frequency.
- Use the diagnostics function to check which PLL has failed
(40 MHz: Err 40, SF 134;
130 MHz: Err 41, SF 135).
- If both PLLs have failed, the cause is in the reference frequency (P1, P3 with internal reference, P5, P3 with external reference) or in the 40-MHz divider 1:4/8 (test points P8, P2, P9).
- If only the PLL of the 40-MHz crystal oscillator has failed, check the 40-MHz divider 1:4/8 D400, 401 at test point P8, the phase detector D50 at test points P2, P3 and the PI controller N50 at the plug-in jumpers X50, X55 and test point P4.
- If the PLL of the 130-MHz crystal oscillator has failed, check the test point P9, the IF voltage at P10 (apply external tuning voltage to X43 B-C), the PI controller N430 at jumper X43 and test point P11 and the 130-MHz isolating amplifier at X41 and X40.

5.3.2 Failure of the 40-MHz Signals at X72, 82, 92 (Err 40, 41)

- Use the diagnostics function (SF 138 to 140) to check which output signal has failed.
- If there are no signals at all and if the PLL has failed, the cause is in the 40-MHz crystal oscillator with V305, 310, 315 (test points P7 and X32).

5.3.3 Failure of 130/520-MHz Signal at X93 and 300-MHz Signal at X94 (Err 40, 41, 46, 48)

- Use the diagnostics function to check which output signal has failed (SF 136, 137).
- If both output signals are missing, the cause is in the 130-MHz crystal oscillator with V111, 125 (test points P6 and X14).
- If the 130/520-MHz signal is missing, check the drive signal for the 130/520-MHz selector containing N250 and the amplifiers N204, 240 (N204 only when the 520-MHz signal fails).
- If the 300-MHz signal is missing, check whether it is missing when FM and CW are selected. If it is only missing in one of these modes, check the 40-MHz FM signal at X83, the FM/CW selector and drive (N250). If it is missing in both modes, check the n 260-MHz amplifier (V146, test points X14, X15), the 40-MHz amplifier (V380, test point X3) and the 300-MHz amplifier (V160, 170).

5.3.4 Signals at Test Points and DC Operating Points

10-MHz OCXO

G10.3:	+ 11.5 to 12.5 V with REF.INT. and 0 to + 0.5 with REF.EXT.
N30.1:	+ 5.5 to + 6.5 V with oven heated-up, + 4 V with cold oven.
P1:	10-MHz HCMOS levels with REF.INT., + 5 V with REF.EXT.

40-MHz crystal oscillator

V305 emitter:	+ 3.8 V
V310 emitter:	+ 13.8 V
V315 emitter:	+ 1.6 V
P7:	+ 10.7 to + 11.2 V with oscillator working, + 11.5 V with oscillator not working

40-MHz amplifier

X32:	40 MHz, -9 to -11 dBm into 50 Ω
V330, 340, 350, 360 source:	+ 1.0 to + 2.5 V

40-MHz PLL and reference selector

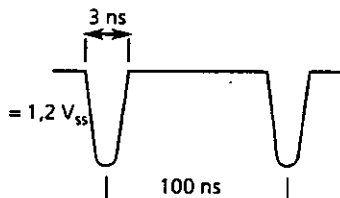
D401.8: 40 MHz, 3 to 4 V_{pp}
P8: 40 MHz, HCMOS levels
P9: 10 MHz, HCMOS levels
P2, 3: 5 MHz, HCMOS levels
N50.1: = 0 V
P5: + 1 to + 3 V DC without input signal at X91, 5/10 MHz, HCMOS levels with input signal
N90.4: + 1 V
N90.7: + 20 V

130-MHz crystal oscillator

V111 emitter: + 3.5 V
V125 emitter: + 2.4 V
P6: + 9.9 to + 10.7 V with oscillator working, + 10.9 V with oscillator not working
X40: 130 MHz, -9 to -6 dBm into 50 Ω

130-MHz PLL

X40: 130 MHz, -12 to -8 dBm into 50 Ω
X41:



Measurement using oscilloscope with 50 Ω- input impedance and bandwidth ≥ 250 MHz

P10: = 0 V with synchronous PLL, 0.5 to 0.7 V_{pp} with asynchronous PLL
P9: 10 MHz, HCMOS levels

130/520-MHz LO Signal

N250.1: + + 13 V/-14 V with 130 MHz on/off
N250.7: + 13 V/-14 V with 520 MHz on/off
N204.3: + 5.5 V DC
N240.3: + 5.5 V DC

260-MHz LO amplifier

V146 collector: + 6,5 V
X15: 260 MHz, -8 to -5 dBm into 50 Ω

300-MHz amplifier

V160 source: 0 to + 1,5 V
V161 emitter: + 3.4 V

FM/CW selector with 40-MHz amplifier

N250.8: -14/ + 13 V with FM/CW
N250.14: + 13 V/-14 V with FM/CW
V380 collector: + 9.7 V
X38: 40 MHz, -18 to -15 dBm into 50 Ω

5.4 Interfaces

Signal		D	T	Range	Connection Point	Remarks
Name	Designation					
+ 24 V	Power supply + 24 V	I	P	23,4 ... 24,5 V 10 ... 30 mA	X9A24	Power supply
+ 15 V	Power supply + 15 V	I	P	14,8 ... 15,3 V 350 ... 450 mA	X9A26	
+ 5 V	Power supply + 5 V	I	P	4,9 ... 5,1 V 40 ... 70 mA	X9A28	
-15 V	Power supply -15 V	I	P	-15,2 ... -14,8 V 30 ... 50 mA	X9A30	
+ 12 STB	Power supply + 12 V Standby	I	P	+ 11 ... + 13 V 20 ... 150 mA	X9A32	
GND	Ground	B	P		X9A10 X9A12 X9A14 X9A16 X9A23 X9A25 X9A27 X9A29 X9A31	
BA0	Subassembly address	I	D	HC-MOS	X9A21	Subassembly addressing
BA1	Subassembly address	I	D	HC-MOS	X9A20	
BA2	Subassembly address	I	D	HC-MOS	X9A19	
G0	Strobe 0	I	D	HC-MOS	X9A22	
TF.CLK	CLOCK	I	D	HC-MOS	X9A11	Data transmission
TR.DAT	Data	I	D		X9A13	
TST	Diagnostics	O	O	-5 ... + 5 V	X9A17	Selftest
ALA	Alarm	O	L	Open collector	X9A18	
REF	5 / 10-MHz reference	B	O	Output level + 5 ... + 9 dBm	X91	RF interface 50 Ω
INOUT	Input/Output	O	O	Input level -6 ... + 19 dBm		RF interface 50 Ω
FMREF	40-MHz reference for step synthesis/FM	O	O	Output level + 3 ... + 7 dBm	X82	RF interface 50 Ω
FRMREF	40-MHz reference for FRN synthesis	O	O	Output level + 3 ... + 7 dBm	X72	RF interface 50 Ω
BBREF	40-MHz reference for option WBM	O	O	Output level + 3 ... + 7 dBm	X92	RF interface 50 Ω
MIXLO	LO signal 130 / 520 MHz for OPM	O	O	Output level + 3 ... + 7 dBm	X93	RF interface 50 Ω
REF300	300-MHz reference for SUM	O	O	Output level + 3 ... + 7 dBm	X94	RF interface 50 Ω
FMOUT	40 MHz	I	O	Input level + 4 ... + 6 dBm	X83	RF interface 50 Ω

Direction

I Input
O Output
B Bidirectional
M Measurement

Type

A Analog
H Digital high
L Digital low
P Power

5.5 Positions of Plug-in Jumpers

X55 A-B to 2
 X50 to A-B
 X43 to A-B
 X16 to A-B

5.6 Required Equipment

Power supply unit
 +4.9 to +5.1 V, 0.2 A
 +14.9 to +15.1 V, 0.5 A
 +23.8 to +24.2 V, 50 mA
 -14.4 to -15.1 V, 0.1 A
 2 x 0 to 25 V, 10 mA
 (e.g. NGT35)

Spectrum analyzer (1 GHz)
 (e.g. FSA)

RF generator 10 MHz, 40 MHz
 (e.g. SMG)

Network analyzer (to 500 MHz)

Oscilloscope
 (e.g. BOL)

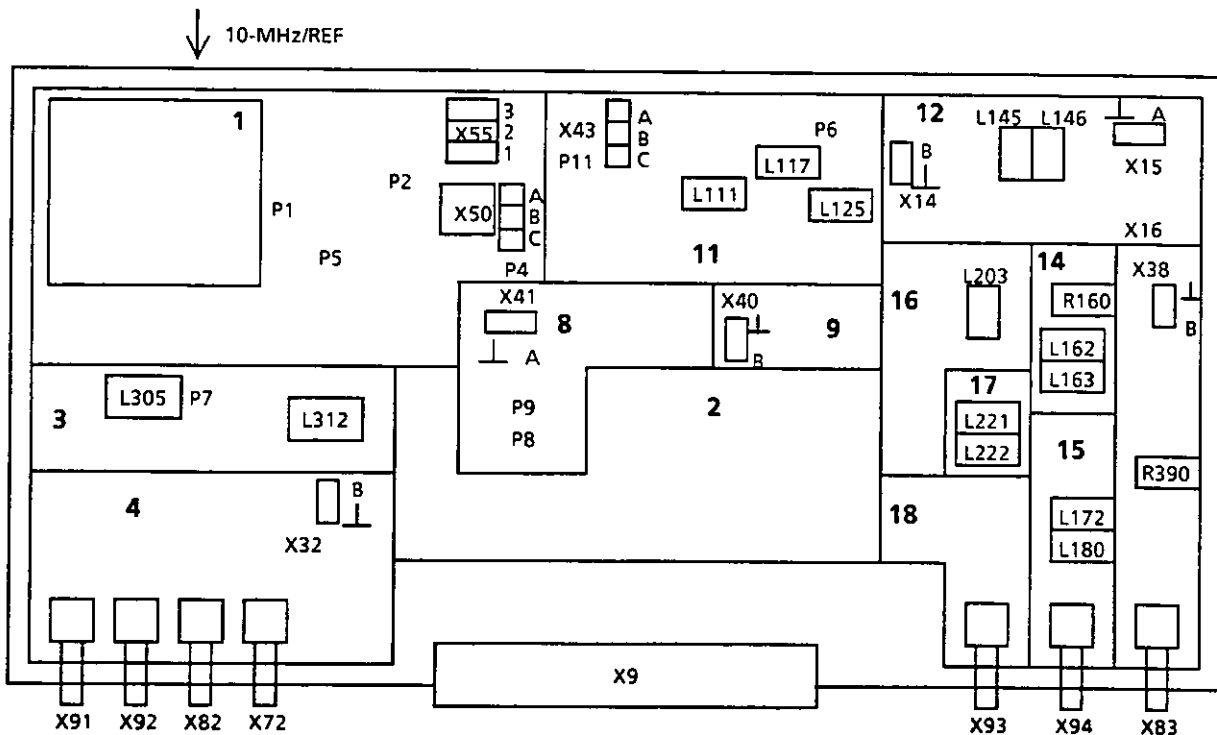
RF adapter cable

Test adapter

2 x voltmeter (1 x $Z_{in} = 1 \text{ M}\Omega$; 1 x $Z_{in} \geq 10 \text{ M}\Omega$)
 (e.g. URE)

Controller
 (e.g. PUC)

Layout diagram





ROHDE & SCHWARZ

Schalteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées

Schémas de Circuit

Plans des composants

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(

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Für diese Unterlage behalten wir uns alle Rechte vor.


Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
	XX VARIANTENERKLAERUNG IDENTIFICATION OF MODELS VAR 02 = GRUNDAUSFUEHRUNG VAR 02 = BASIC VERSION				
C10	CE 1UF +-10% 25V EIA3528 TANTALUM SMD-CAPACITOR	CE 0007.7217.00	KEMET	T 491 B105 K025 AS	
C11	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C12	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C13	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C15	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C20	CC 330PF+-2%6X9N750 CERAMIC CAPACITOR	CC 0087.6964.00	PHILIPS_CO	2222 678 58331	
C21	CC 560PF+-10%3X4R2000 CAPACITOR	CC 0087.7002.00	PHILIPS_CO	2222 632 51561	
C22	CC 330PF+-2%6X9N750 CERAMIC CAPACITOR	CC 0087.6964.00	PHILIPS_CO	2222 678 58331	
C23	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C25	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C26	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C30	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C31	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C32	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C33	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C35	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C40	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C42	CC 220PF+-2%6X7N750 CAPACITOR	CC 0087.6941.00	PHILIPS_CO	2222 678 58221	
C43	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C45	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C46	CE 4,7UF+-10% 10V 3528 TANTALUM SMD-CAPACITOR	CE 0007.7275.00	KEMET	T491 B 475 K 010 AS	
C48	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C49	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C50	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C51	CK 68NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2923.00	ROEDERSTEI	MKT 1826-368-06-4	
C52	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C53	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI	MKT 1826-422-06-4	
C54	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERD	MKT 1826-510/054-R	
C55	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C56	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C60	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C69	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C70	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C71	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C75	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C80	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

MENP5	502 3PUA	A1	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
		39	04.02.98	EE FESTFREQUENZEN REFERENCEF REQUENCIES	0819.6060.01 SA	1+

095 0026-0893

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C81	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C82	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C83	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C84	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C85	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C86	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C87	CE 2,2UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3911.00	VALVO	2222 128 37228	
C88	CE 47UF+-20%6,3V SAL ELECTR.CAPACITOR	CE 0007.3957.00	VALVO	2222 128 33479	
C105	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C110	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C111	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W	
C112	CC 12PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8744.00	MURATA	GRM42-6COG 120 F50PT	
C115	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C117	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C118	CC 180PF+-5% 300V PELL CAPACITOR	CC 0556.8701.00	TEKELEC	301 CHB 181 JW(V)L	
C119	CC 150PF+-5% 300V PELL CAPACITOR	CC 0556.8718.00	TEKELEC	301 CHB 151 JWL	
C120	CC 18PF+-2% 500V PELL CAPACITOR	CC 0552.1660.00	TEKELEC	501 CHB 180 GWL	
C121	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C122	CE 47UF+-20%63V RM5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C123	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C124	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C125	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C126	CC 150PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8509.00	PHILIPS_CO	2238 863 18151	
C128	CC 12PF+-2%3X4NPO CAPACITOR	CC 0087.6435.00	VALVO	2222 678	
C129	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C140	CC 10PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6429.00	PHILIPS_CO	2222 678 10109	
C141	CC 15PF+-2%3X4NPO CAPACITOR	CC 0087.6441.00	PHILIPS_CO	2222 678	
C142	CC 15PF+-2%3X4NPO CAPACITOR	CC 0087.6441.00	PHILIPS_CO	2222 678	
C143	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C144	CC 10PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6429.00	PHILIPS_CO	2222 678 10109	
C145	CC 6,8PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6406.00	PHILIPS_CO	2222 678	
C146	CC 2,2PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6341.00	PHILIPS_CO	2222 678	
C147	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C148	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C149	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C150	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C153	CC 3,3PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8194.00	MURATA	GRM42-6COG 3R3 C50PT	
C161	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C162	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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			39	04.02.98	EE FESTFREQUENZEN REFERENCEF REQUENCIES	0819.6060.01 SA	2+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C163	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C164	CC 3,9PF/0,25PF63V3X5N150 CAPACITOR	CC 0099.5545.00	ROEDERSTEI	ROP 744 J4	
C165	CC 8,2PF+-0,25PF3X4N150 CAPACITOR	CC 0087.6587.00	VALVO	2222 678 33828	
C170	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C171	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C172	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C173	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C174	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C175	CC 10PF+-0,25PF3X4N150 CAPACITOR	CC 0087.6593.00	PHILIPS_CO	2222 678 34109	
C176	CC 3,3PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8194.00	MURATA	GRM42-6COG 3R3 C50PT	
C180	CC 12PF+-2%3X4N150 CAPACITOR	CC 0087.6606.00	PHILIPS_CO	2222 678 34129	
C181	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C182	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C183	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C184	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C185	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C186	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C190	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C191	CC 18PF+-2%3X4NPO CAPACITOR	CC 0087.6458.00	PHILIPS_CO	2222 678	
C192	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C194	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C195	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C200	CC 15PF+-2%3X4NPO CAPACITOR	CC 0087.6441.00	PHILIPS_CO	2222 678	
C201	CC 15PF+-2%3X4NPO CAPACITOR	CC 0087.6441.00	PHILIPS_CO	2222 678	
C202	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C203	CC 2,7PF+-0,25PF3X4NPD CERAMIC CAPACITOR	CC 0087.6358.00	PHILIPS_CO	2222 678	
C204	CC 1PF+-0,25PF3X4P100 CAPACITOR	CC 0087.6170.00	PHILIPS_CO	2222 678	
C206	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C207	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C212	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C220	CC 3,9PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6370.00	PHILIPS_CO	2222 678	
C222	CC 1PF+-0,25PF3X4P100 CAPACITOR	CC 0087.6170.00	PHILIPS_CO	2222 678	
C231	CC 2,7PF+-0,25PF3X4NPO CERAMIC CAPACITOR	CC 0087.6358.00	PHILIPS_CO	2222 678	
C232	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C233	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C239	CC 1,8PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8165.00	MURATA	GRM42-6COG 1R8 C50PT	
C240	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C241	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C242	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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		39	04.02.98	EE FESTFREQUENZEN REFERENCEF REQUENCIES	0819.6060.01 SA	3+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C243	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C244	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C245	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C246	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C300	CK 47NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2917.00	ERO	MKR 1826-347-06-4	
C301	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C302	CC 27PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8409.00	MURATA	GRM42-6COG 270F 50PT	
C303	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C304	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C305	CC 620PF+-5% 100V PELL CAPACITOR	0556.8724.00	ATC	ATC100B 621 JW100R	
C307	CC 470PF+-5% 200V PELL CERAMIC CAPACITOR	CC 0469.5905.00	TEKELEC	201 CHB 471 JWL	
C309	CC 56PF+-5% 500V PELL CAPACITOR	CC 0556.8660.00	TEKELEC	501 CHB 560 J(W/V)LE	
C310	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C311	CE 47UF+-20%63V RMS5 ELECTROLYTIC CAPACITOR	0008.7440.00	PHILIPS_CO	2222 116 90112	
C312	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C313	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C314	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C315	CC 27PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8409.00	MURATA	GRM42-6COG 270F 50PT	
C316	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C319	CC 33PF+-2%4X5NPO CAPACITOR	CC 0087.6487.00	PHILIPS_CO	2222 678	
C320	CC 150PF+-2%5X6N750 CAPACITOR	CC 0087.6929.00	PHILIPS_CO	2222 678 58151	
C322	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C330	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C331	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C333	CC 18PF+-2%3X4NPO CAPACITOR	CC 0087.6458.00	PHILIPS_CO	2222 678	
C334	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C336	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C340	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C341	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C342	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C343	CC 18PF+-2%3X4NPO CAPACITOR	CC 0087.6458.00	PHILIPS_CO	2222 678	
C344	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C345	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C346	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C350	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C351	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C352	CC 18PF+-2%3X4NPO CAPACITOR	CC 0087.6458.00	PHILIPS_CO	2222 678	
C353	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C356	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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	39	04.02.98	EE FESTFREQUENZEN REFERENCEF REQUENCIES	0819.6060.01 SA	4+	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C360	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C361	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C362	CC 12PF+-2%3X4NPO CAPACITOR	CC 0087.6435.00	VALVO	2222 678	
C370	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C371	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C372	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C374	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C375	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C376	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C379	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C380	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C381	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C382	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C383	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C384	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C385	CC 68PF+-2%6X7NPO CAPACITOR	CC 0087.6529.00	PHILIPS_CO	2222 678	
C386	CC 120PF+-2%6X9NPO CAPACITOR	CC 0087.6558.00	PHILIPS_CO	2222 678 10121	
C387	CC 82PF+-2%6X7NPO CAPACITOR	CC 0087.6535.00	PHILIPS_CO	2222 678 10 829	
C388	CC 8,2PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8242.00	MURATA	GRM42-6COG 8R2 C50PT	
C389	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C390	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C391	CE 220UF+-20%16V RM5 ELECTROLYTIC CAPACITOR	0008.7562.00	FROLYT	EKS00CC322D	
C392	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C393	CC 3,3PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8194.00	MURATA	GRM42-6COG 3R3 C50PT	
C400	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C401	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C410	CC 10PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6429.00	PHILIPS_CO	2222 678 10109	
C411	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C412	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C413	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C414	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C415	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C420	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C430	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C431	CK 10NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2869.00	ROEDERSTEI	MKT 1826-310-014W	
C432	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C433	CK 100NF+-5%63VRD2,5H7MKT CAPACITOR	CK 0099.2930.00	ROEDERSTEI	MKT 1826-410-06-4W	
C435	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C436	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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	ROHDE & SCHWARZ	39	04.02.98	EE FESTFREQUENZEN REFERENCEF REQUENCIES	0819.6060.01 SA	5+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C440	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C441	CC 4,7PF+-0,25PF3X4NPO CAPACITOR	CC 0087.6387.00	PHILIPS_CO	2222 678	
C442	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C443	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C444	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C445	CC 8,2PF+-0,25PF3X4N150 CAPACITOR	CC 0087.6587.00	VALVO	2222 678 33828	
C446	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
D20	BL 74AC00SC 4X2IN NAND QUAD NAND GATTER	BL 0820.3477.00	NSC	74AC00(SC)	
D21	BL PC74HCT74T 2XD-FLIPFL DUAL D-TYPE FLIP FLOP	BL 0007.6262.00	PHILIPS_SE	(PC)74HCT74D(T)	
D40	BL PC74HC00T 4X2IN.NAND QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HC00D(T)	
D41	BL PC74HC00T 4X2IN.NAND QUAD 2INPUT NAND GATE	BL 0007.3463.00	PHILIPS_SE	(PC)74HC00D(T)	
D50	BL PC74HCT112T 2XJK-FF CL DUAL JK-FF	BL 0007.6327.00	PHILIPS	(PC)74HCT112(T)	
D70	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D71	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D72	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D100	BL PC74HC238P 3T08 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
D101	BL MM74HC11N 3X3IN.ANDG TRIPLE 3-INPUT AND GATE	0099.9486.00	PHILIPS_SE	(PC)74HC11N(P)	
D150	BM SRA1WH MIXER 0.7GHZ MIXER	BM 0252.5363.00	MINI-CIRCU	SRA-1WH	
D400	BL 74AC161SC 4B.BIN CNT 4BIT SYNC.PRES.BIN COUNT.	BL 0820.3519.00	NSC	74AC161(SC)	
D401	BL 74AC02SC 4X2IN NORG QUAD NOR GATE	BL 0820.3490.00	NSC	74AC02(SC)	
G10	ED 10MHZ-QU.OSZ.DCXO 12V 10MHZ CRYSTAL OSCILLATOR	0835.0091.00	QUARZKERAM	2100T-S153 (H)	
G110	EQ QUARZ 130MHZ SELECT	0820.3625.00			
G300	EQ QUARZ 40MHZ SELECT QUARTZ 40MHZ SELECT	0820.3631.00			
K35	SR 5V 1XU DIL M.DIODE+SCH RELAY	SR 0282.5003.00	HAMLIN	HE721C0530	
L10	LD 3,30UH10%,85DHMO,285A CHOKE	LD 0067.2928.00	DALE	IM2	
L20	LD 1,20UH10%,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L21	LD 1,20UH10%,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L32	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L80	LD 2,20UH10%,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L81	LD 2,20UH10%,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L82	LD 1,20UH10%,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L83	LD 5,6UH BEI 1,15A0,330HM CHOKE	LD 0026.4090.00	DELEVAN	1840-24	
L84	LD 2,20UH10%,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L110	LD 0,15UH10%,100HM1,230A CHOKE	LD 0067.2763.00	DALE	IM2	
L113	LF ROHRK.U17 VI TUBULAR CORE	LF 0026.9286.00	VOGT	231 16 110 10	
L117	LD 85NH 3,5W CM30P FE-K COI-CORE	0801.4865.00	TOKO	E521 HN-030023	
L123	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L124	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L125	LD 85NH 3,5W CM30P FE-K COI-CORE	0801.4865.00	TOKO	E521 HN-030023	
L126	LD 1,20UH10%, 180HMO, 620A CHOKE	LD 0067.2870.00	DALE	IM2	
L130	LU UEBERTRAGER TRANSFORMER	0451.1937.00			
L140	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L141	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L142	LU UEBERTRAGER 1 TRANSFORMER	0819.7072.00			0819.7066.00
L144	LD 0,18UH10%, 120HM1, 120A CHOKE	LD 0067.2770.00	DALE	IM2	
L145	LD 36NH 2,5W CM70P ALU-K COIL	0820.3548.00	TOKO	E521-AN-020013	
L146	LD 36NH 2,5W CM70P ALU-K COIL	0820.3548.00	TOKO	E521-AN-020013	
L148	LD 1,00UH10%1,000HMO, 390A CHOKE	LD 0067.2863.00	DALE	IM2	
L150	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L160	LD 1,00UH10%1,000HMO, 390A CHOKE	LD 0067.2863.00	DALE	IM2	
L161	LD 1,00UH10%1,000HMO, 390A CHOKE	LD 0067.2863.00	DALE	IM2	
L162	LD 36NH 2,5W CM70P ALU-K COIL	0820.3548.00	TOKO	E521-AN-020013	
L163	LD 36NH 2,5W CM70P ALU-K COIL	0820.3548.00	TOKO	E521-AN-020013	
L165	LD 0,22UH10%, 140HM1, 045A CHOKE	LD 0067.2786.00	DALE	IM2	
L170	LD 1,00UH10%1,000HMO, 390A CHOKE	LD 0067.2863.00	DALE	IM2	
L171	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L172	LD 24NH 1,5W CM105P ALU-K MOLDED COIL+ALU-CORE	0840.2753.00	TOKO	E 521 AN 010013	
L180	LD 24NH 1,5W CM105P ALU-K MOLDED COIL+ALU-CORE	0840.2753.00	TOKO	E 521 AN 010013	
L181	LD 0,15UH10%, 100HM1, 230A CHOKE	LD 0067.2763.00	DALE	IM2	
L190	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L191	LU UEBERTRAGER 2 TRANSFORMER	0819.7089.00			0819.7066.00
L194	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L200	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L201	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L202	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L203	LD 24NH 1,5W CM105P ALU-K MOLDED COIL+ALU-CORE	0840.2753.00	TOKO	E 521 AN 010013	
L206	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L220	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L221	LD 24NH 1,5W CM105P ALU-K MOLDED COIL+ALU-CORE	0840.2753.00	TOKO	E 521 AN 010013	
L222	LD 24NH 1,5W CM105P ALU-K MOLDED COIL+ALU-CORE	0840.2753.00	TOKO	E 521 AN 010013	
L230	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L233	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L240	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L241	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L300	LD 1,20UH10%, 180HMO, 620A CHOKE	LD 0067.2870.00	DALE	IM2	
L301	LD 8,20UH10%2,700HMO, 160A CHOKE	LD 0067.2970.00	DALE	IM2	


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L305	LD 287NH 8,5W CM18P FE-K COIL+CORE	0613.6289.00	TOKO	E521HN080023	F
L306	LF ROHRK.U17 VI TUBULAR CORE	LF 0026.9286.00	VOGT	231 16 110 10	
L310	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L311	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L311	LD 220NH 6,5W CM24P FE-K CHOKE	1004.3700.00	TOKO	E 521-HN060023	
L312	LD 500NH 11,5W CM10P FE-K CHOKE	0300.8856.00	TOKO	E521 HN-110023	
L320	LU UEBERTRAGER TRANSFORMER	0451.1937.00			
L330	LD 0,82UH10%,850HMO,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L340	LD 0,82UH10%,850HMO,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L341	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L350	LD 0,82UH10%,850HMO,420A CHOKE	LD 0067.2857.00	DALE	IM2	
L360	LD 1,20UH10%,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L380	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L381	LD 0,27UH10%,160HMO,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L382	LD 0,33UH10%,220HMO,830A CHOKE	LD 0067.2805.00	DALE	IM2	
L383	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L390	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L410	LD 0,047 UH 10% CHOKE	0249.5995.00	DELEVAN	1026-08	
L411	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L412	LU UEBERTRAGER 3 TRANSFORMER	0819.7095.00			
L440	LD 0,15UH10%,100HM1,230A CHOKE	LD 0067.2763.00	DALE	IM2	
L441	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L443	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L445	LD 0,15UH10%,100HM1,230A CHOKE	LD 0067.2763.00	DALE	IM2	
N30	BO TLO72ACD 2XFET OPAMP OPERATIONAL AMPLIFIER	0803.1057.00	TEXAS	TL 072 ACDR	
N50	BO TLO72ACP 2XFET OPAMP OPERATIONAL AMPLIFIER	0340.6054.00	TEXAS	TL 072 ACP	
N90	BO LM339N 4X COMPAR COMPARATOR	BO 0342.2062.00	NSC	LM339N	
N204	BM MSA0335-21 MMIC BROADBAND AMPLIFIER	0670.7116.00	HEWLETT_PA	MSA-0335	
N240	BM MSA0335-21 MMIC BROADBAND AMPLIFIER	0670.7116.00	HEWLETT_PA	MSA-0335	
N250	BO LM124J 4XLP OPAMP OPERATIONAL AMPLIFIER	0300.6353.00	NSC	LM124J	
N430	BO TLO72ACP 2XFET OPAMP OPERATIONAL AMPLIFIER	0340.6054.00	TEXAS	TL 072 ACP	
P1 ..11	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
R10	RG 11,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0806.00	ROEDERSTEI	D25	
R11	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R12	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R13	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CD	RC02	
R14	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	


0819.7066.00

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R15	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R16	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R17	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R18	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R20	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R22	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R23	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R25	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R30	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R31	RG 182 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5989.00	ROEDERSTEI	D25	
R32	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R35	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R40	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R41	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R45	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R46	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R47	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R48	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R49	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R50	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R51	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R52	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R53	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R54	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R55	RL 0,60W 221 KOHM+-1%TK50 RESISTOR	RL 0083.2270.00	RESISTA	MK2	
R56	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R57	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R58	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R59	RG 12,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0841.00	PHILIPS_CO	RC02	
R60	RL 0,60W 365 KOHM+-1%TK50 RESISTOR	RL 0083.2487.00	RESISTA	MK2	
R61	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R62	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R63	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R64	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R65	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R66	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R67	RL 0,60W2,21MOHM+-1%TK50 METALFILMRESISTOR	RL 0099.8173.00	RESISTA	MK2	
R68	RG 12,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0841.00	PHILIPS_CO	RC02	
R69	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	

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095.0026-0693

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R70	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R71	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R72	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R73	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R74	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R75	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R76	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R77	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R90	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R91	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R92	RL 0,60W 18,2KOHM+-1%TK50 RESISTOR	RL 0083.1480.00	RESISTA	MK2	
R93	RL 0,60W 3,92KOHM+-1%TK50 RESISTOR	RL 0083.1039.00	DRALORIC	SMA 0207	
R100	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R104	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R105	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R106	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R109	RL 0,60W 39,2 OHM+-1%TK50 RESISTOR	RL 0082.9420.00	RESISTA	MK2	
R110	RL 0,60W 39,2 OHM+-1%TK50 RESISTOR	RL 0082.9420.00	RESISTA	MK2	
R111	RL 0,60W 39,2 OHM+-1%TK50 RESISTOR	RL 0082.9420.00	RESISTA	MK2	
R112	RL 0,60W 1,82KOHM+-1%TK50 RESISTOR	RL 0082.2277.00	RESISTA	MK2	
R113	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R114	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R115	RL 0,60W 4,64KOHM+-1%TK50 RESISTOR	RL 0082.1687.00	RESISTA	MK2	
R116	RL 0,60W 2,37KOHM+-1%TK50 RESISTOR	RL 0083.0878.00	RESISTA	MK2	
R117	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R118	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R119	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R120	RL 0,60W 432 OHM+-1%TK50 DEPOS.-CARBON RESISTOR	RL 0083.0355.00	RESISTA	MK2	
R121	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R122	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R123	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R124	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R125	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R126	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R127	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R128	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R129	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R130	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R140	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R141	RL 0,60W 82,5 OHM+-1%TK50 RESISTOR	RL 0082.9707.00	RESISTA	MK2	
R145	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	ROEDERSTEI	D25	
R146	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R147	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R148	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R150	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R152	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R155	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R156	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	ROEDERSTEI	D25	
R157	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R160	RS 0,5W100 OHM+-20%KURVE1 DEPOS.-CARBON POTENTIOMET	RS 0069.8081.00	BOURNS	3329 H-1	
R161	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R162	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R163	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R164	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R170	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R171	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R172	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R173	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R174	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R180	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R181	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R183	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R184	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R185	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R186	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R190	RG 150 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5589.00	ROEDERSTEI	D25	
R191	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R192	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R193	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R194	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R195	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R196	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R197	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R200	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R207	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R210	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R211	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R230	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R231	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R235	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R240	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R241	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R242	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R244	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CD	RC02	
R245	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R250	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R251	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R300	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R301	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R302	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R303	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CD	RC02	
R304	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R305	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R306	RL 0,60W4,64KOHM+-1%TK50 RESISTOR	RL 0082.1687.00	RESISTA	MK2	
R307	RG 2,43KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5750.00	ROEDERSTEI	D25	
R308	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R310	RL 0,60W 432 OHM+-1%TK50 DEPOS.-CARBON RESISTOR	RL 0083.0355.00	RESISTA	MK2	
R311	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R312	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R313	RG 75,0 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8855.00	ROEDERSTEI	D25	
R314	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CD	RC02	
R315	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R316	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R317	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R318	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R319	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R320	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R321	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R322	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R323	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R330	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R331	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R332	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R333	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R340	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R341	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R342	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R343	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R344	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R347					
R350	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R351	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R352	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R353	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R360	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R361	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R370	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R371	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R372	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R373	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R374	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R375	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R376	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R377	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R378	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RCO2	
R379	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R380	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R381	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R382	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R383	RG 12,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8661.00	ROEDERSTEI	D25	
R384	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R385	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R386	RL 0,60W18,20 OHM+-1%TK50 RESISTOR	RL 0082.9107.00	RESISTA	MK2	
R387	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R388	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R389	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R390	RS 0,5W 200 OHM+-20%KURV1 DEPOS.-CARBON POTENTIOMET	RS 0069.8017.00	BI_TECHNOL	82 P	
R392	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R393	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R394	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R395	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R396	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R400	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R402	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RCO2	
R403	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R410	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R412	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R413	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R415	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R416	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R417	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R418	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R419	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R420	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R421	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R430	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RCO2	
R431	RL 0,60W 1,21KOHM+-1%TK50 RESISTOR	RL 0083.0655.00	RESISTA	MK2	
R432	RL 0,60W 15,0KOHM+-1%TK50 RESISTOR	RL 0083.1400.00	RESISTA	MK2	
R434	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R435	RL 0,60W 365 KOHM+-1%TK50 RESISTOR	RL 0083.2487.00	RESISTA	MK2	
R436	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R437	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R440	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R441	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R442	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R443	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
V5	AK BCX69-16 P 20V 1 A TRANSISTOR	AK 0007.5420.00	SIEMENS	BCX69-16	
V6	AD BAS32 75V UDI DIODE	AD 0006.7288.00	PHILIPS	BAS32 (L)	
V10	AK BCX68-16 N 20V 1 A TRANSISTOR	AK 0801.8383.00	SIEMENS	BCX 68-16 E-6327	
V11	AK BCX70H N 45V 200MA TRANSISTOR	AK 0007.3105.00	VALVO	BCX 70 H	
V12	AK BCX68-16 N 20V 1 A TRANSISTOR	AK 0801.8383.00	SIEMENS	BCX 68-16 E-6327	
V35	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V40	AD BAV99 70V DUO UDI DIODE	AD 0911.0092.00	VALVO	BAV99	
V43	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V52	AE BZX55/B10 0,5W ZDI ZENER DIODE	AE 0289.4302.00	VALVO	BZX79B10	
V71	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V110	AE BB909B 25/ 3PF CDI TUNING DIODE	AE 0092.9600.00	PHILIPS	BB909B	
V111	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V121	AE 5082-2810 SCHOTTKY DIODE	AE 0012.9389.00	HEWLETT_PA	5082-2810 GEGURTET	
V125	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V140	AE HSMS2820T31 SCHOTTKY DIODE	0820.3502.00	HEWLETT_PA	HSMS2820L31	
V141	AE HSMS2820T31 SCHOTTKY DIODE	0820.3502.00	HEWLETT_PA	HSMS2820L31	
V145	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V146	AK BFQ34T N 18V 150MA TRANSISTOR	0801.8283.00	PHILIPS	BFQ34T	
V160	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V161	AK BFR91 N 15V 35MA TRANSISTOR	AK 0210.6049.00	VALVO	BFR91	
V180	AE HSMS2810 SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS2810	
V190	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V195	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V200	AE HSMS2820T31 SCHOTTKY DIODE	0820.3502.00	HEWLETT_PA	HSMS2820L31	
V201	AE HSMS2820T31 SCHOTTKY DIODE	0820.3502.00	HEWLETT_PA	HSMS2820L31	
V230	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V232	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V234	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V235	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V240	AE HSMS2810 SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS2810	
V300	AE BBY40 30/05PF CDI TUNING DIODE	AE 0007.2109.00	VALVO	BBY40	
V301	AE BB909B 25/ 3PF CDI TUNING DIODE	AE 0092.9600.00	PHILIPS	BB909B	
V302	AE BBY40 30/05PF CDI TUNING DIODE	AE 0007.2109.00	VALVO	BBY40	
V303	AE BB909B 25/ 3PF CDI TUNING DIODE	AE 0092.9600.00	PHILIPS	BB909B	
V305	AK BFR90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFR90	
V306	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V310	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V315	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V330	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V335	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V340	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V345	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V350	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V355	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V360	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V370	AE BAT18 BER.SCH.DI.VHF DIODE	0820.3260.00	VALVO	BAT18	
V371	AE BAT18 BER.SCH.DI.VHF DIODE	0820.3260.00	VALVO	BAT18	
V372	AE BAT18 BER.SCH.DI.VHF DIODE	0820.3260.00	VALVO	BAT18	
V375	AE BAT18 BER.SCH.DI.VHF DIODE	0820.3260.00	VALVO	BAT18	
V376	AE BAT18 BER.SCH.DI.VHF DIODE	0820.3260.00	VALVO	BAT18	
V377	AE BAT18 BER.SCH.DI.VHF DIODE	0820.3260.00	VALVO	BAT18	
V380	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V381	AE BZX55/B8V2 0.5W ZDI ZENER DIODE	AE 0012.2178.00	VALVO	BZX79B8V2	
V391	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V410	AK BFQ34T N 18V 150MA TRANSISTOR	0801.8283.00	PHILIPS	BFQ34T	
V411	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V420	AE HSMS2810 SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS2810	
..423					
V431	AE BZX55/B10 0.5W ZDI ZENER DIODE	AE 0289.4302.00	VALVO	BZX79B10	

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095 0026-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V440	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V445	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICDNIX	U310	
V450	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V451	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
X1	FP STECKERLEISTE 32POL. MULTIPPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
X16	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X50	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X55	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X72	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X82	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X83	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X91	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
.94					
X430	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X14A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X14B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X15A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X15B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X16A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X16B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X16C	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X32A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X32B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X38A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X38B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X40A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
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X41B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
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X43C	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X50A	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X50B	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X50C	VL WIRE-WRAP PIN L=11,6 WIRE-WRAP PIN	0088.4542.00	DUPONT CON	75403-003	
X55A	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X55B	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR 3POLIG	FP 0242.3600.00	BINDER	742-11-0179-00-36	
Z10	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	

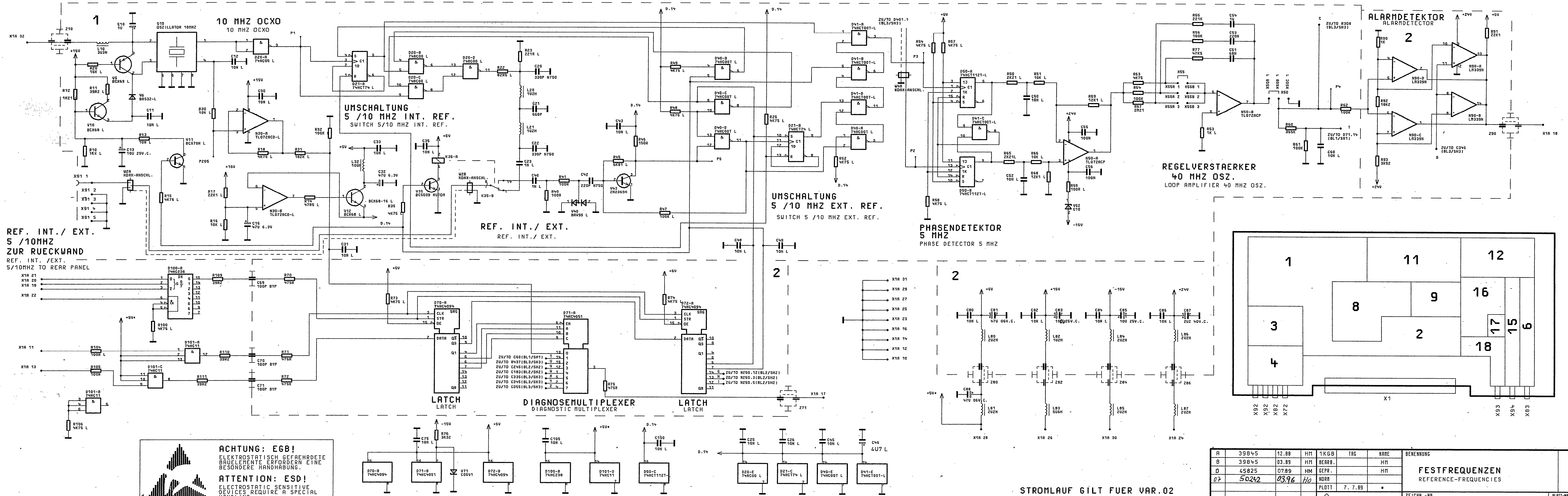
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095 0028-0093

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Z71	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z80	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z82	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z84	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z86	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z90	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z150	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	

MENP5	502 3PUA	Äl	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr Page
		39	04.02.98	EE FESTFREQUENZEN REFERENCEF REQUENCIES	0819.6060.01 SA	17-



REF. INT./ EXT.
5 / 10MHZ
ZUR RUECKWAND
REF. INT./ EXT.
5/10MHZ TO REAR PANEL

UMSCHALTUNG
5 / 10 MHZ INT. REF.
SWITCH 5/10 MHZ INT. REF.

UMSCHALTUNG
5 / 10 MHZ EXT. REF.
SWITCH 5 / 10 MHZ EXT. REF.

PHASENDETEKTOR
5 MHZ
PHASE DETECTOR 5 MHZ

REGELVERSTAEKER
40 MHZ OSZ.
LOOP AMPLIFIER 40 MHZ OSZ.

ALARMDETEKTOR
ALARM DETECTOR

ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.
ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

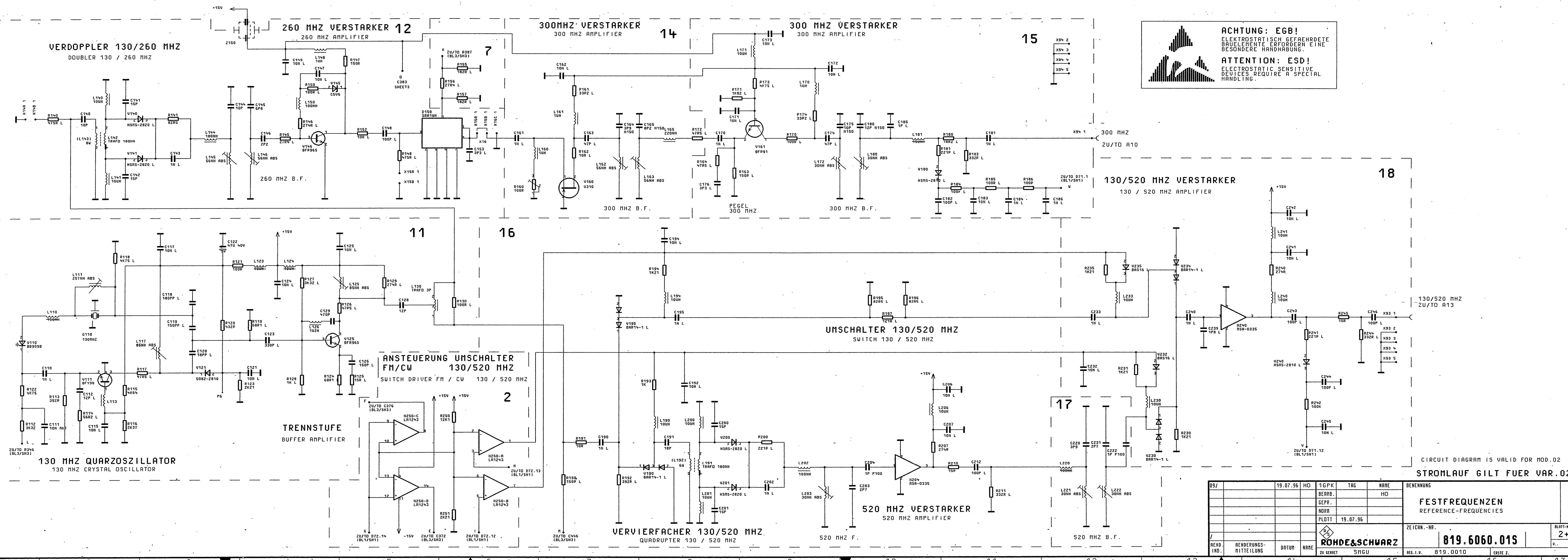
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B	39845	03.89	HM	BEARR.		HM		
D	45825	07.89	HM	GEPR.		HM	FESTFREQUENZEN REFERENCE-FREQUENCIES	
07	50242	03.96	HM	NORM				
				PLOTT	7.7.89	*		
REND. IND. BENDERUNGS- MITTEILUNG DATUM NAME							ZEICHN.-NR.	BLATT-NR.
ROHDE&SCHWARZ							819.6060.015	1
ZU GERÄT SMGU							REG.-I.V. 819.0010	BL. 3
							ERSTE Z.	

FÜR DIESE UNTERLEGE BEHALTEN WIR UNS ALLE RECHTE VOR

ZEICHN.-NR.

FUER DIESE UNTERLAGE
BEHALTEN SIE UNS ALLE RECHTE VOR

ZEICHN.-NR.

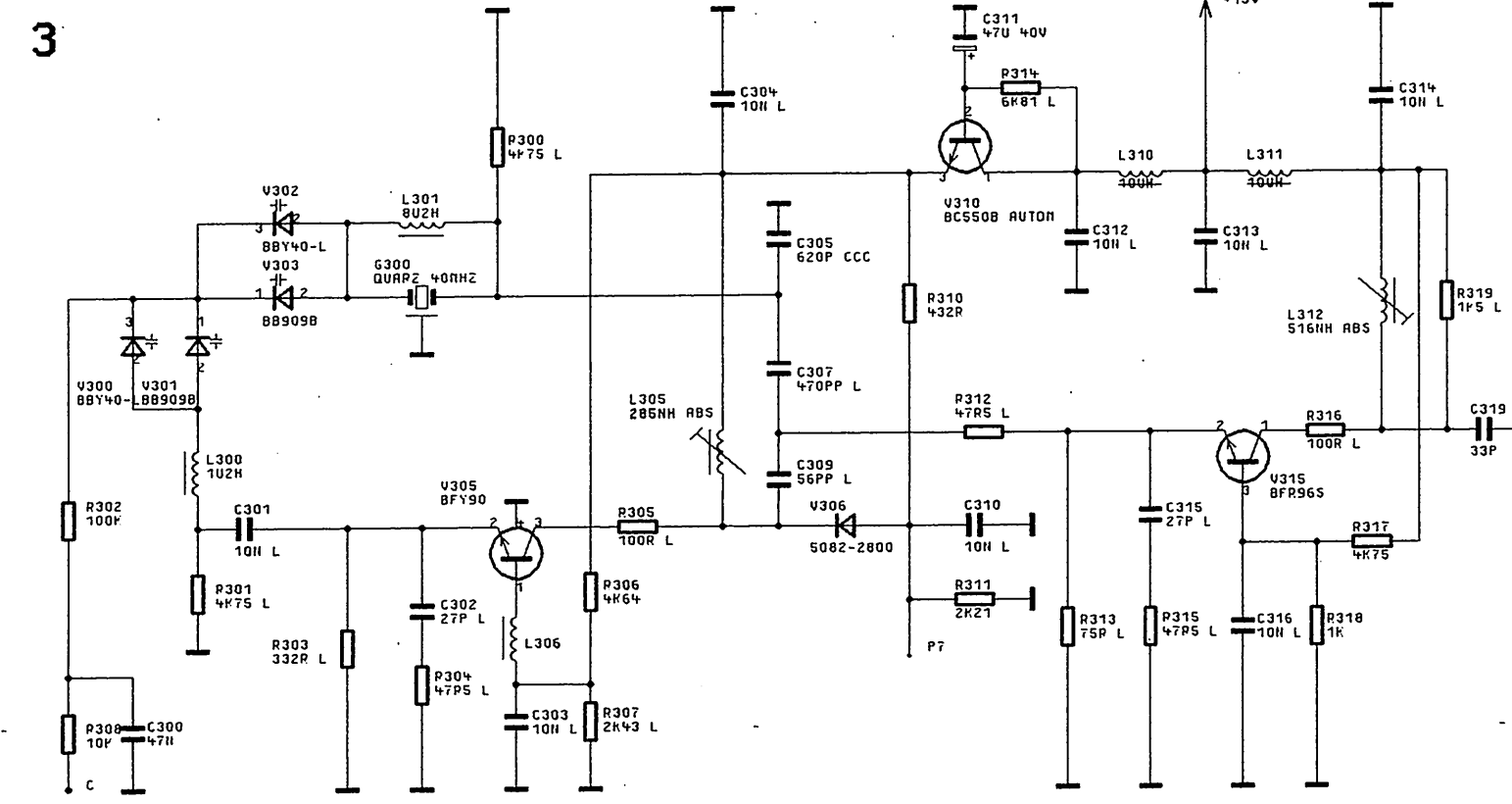


NO.	DATE	BY	CHKD	NAME	DESCRIPTION
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			GEPR.		
			NDR		
			PLOTT	19.07.96	

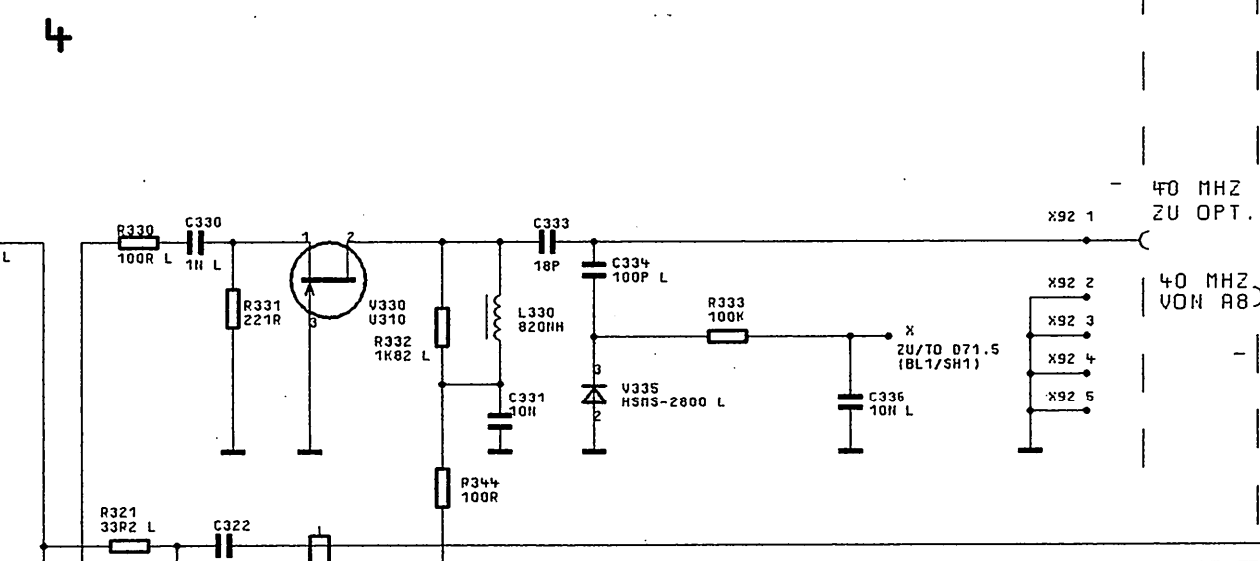
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FESTFREQUENZEN		819.6060.015		2+	
REFERENCE-FREQUENCIES					
REND. IND.	ÄNDERUNGS- MITTEILUNG	DATUM	NAME	ZU GERÄT	SIGU
REG. I. V.	819.0010	ERSTE Z.			

CIRCUIT DIAGRAM IS VALID FOR MOD.02
STROMLAUF GILT FUER VAR.02

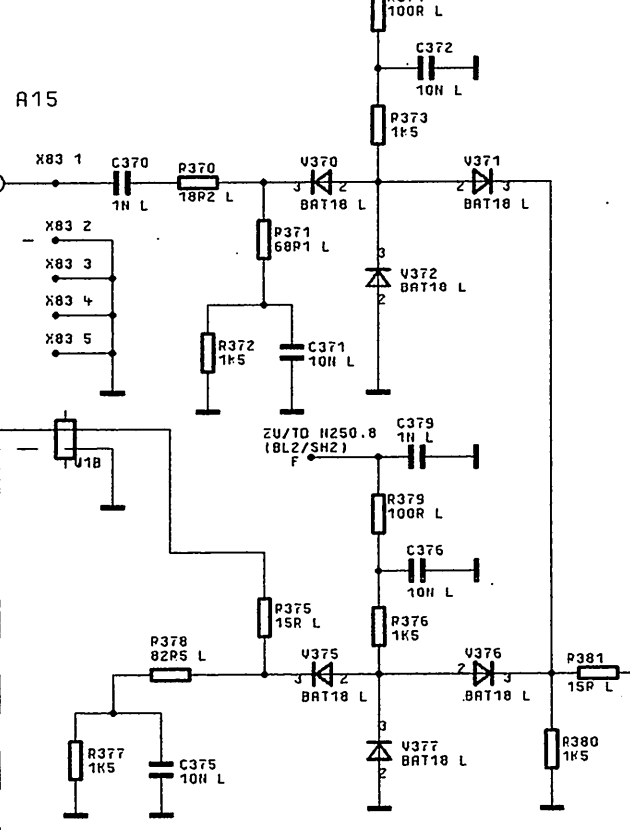
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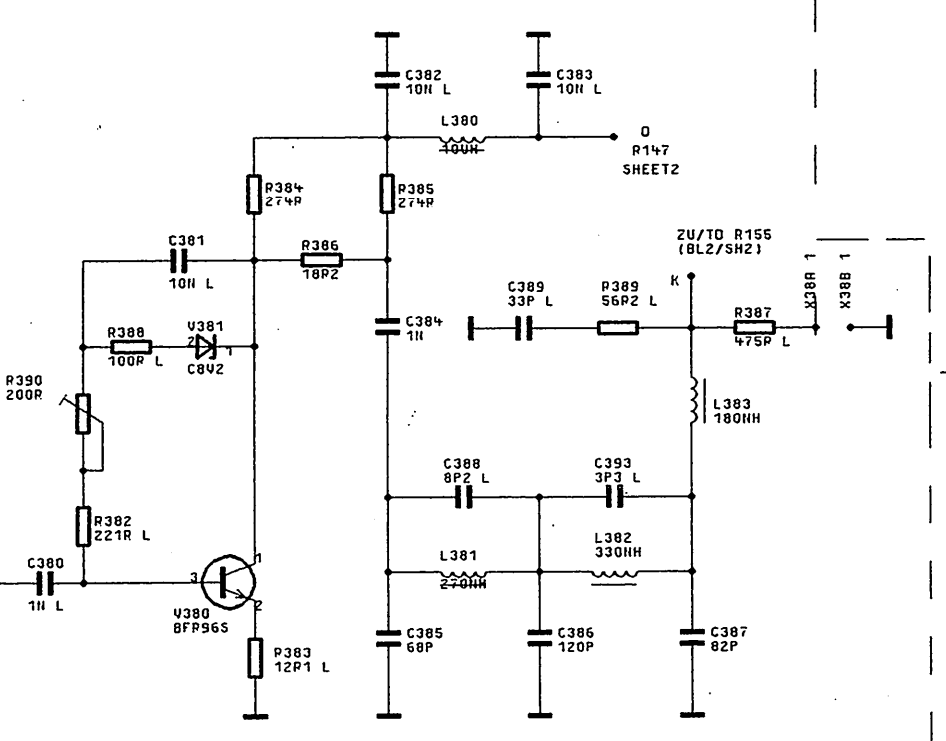
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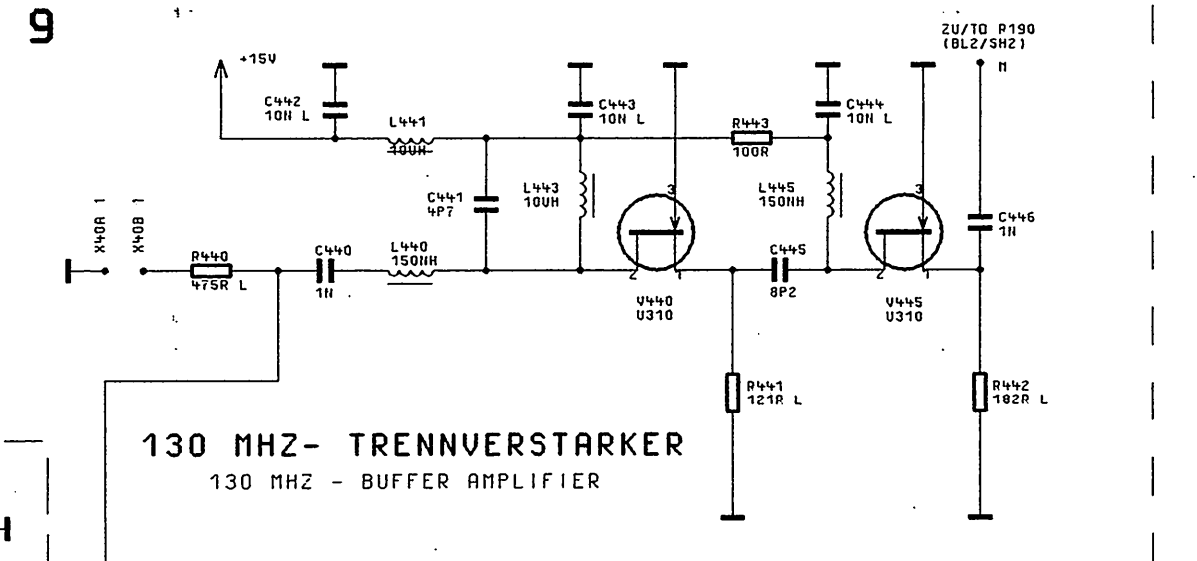
UMSCHALTER
CW/FM
SWITCH CW/FM



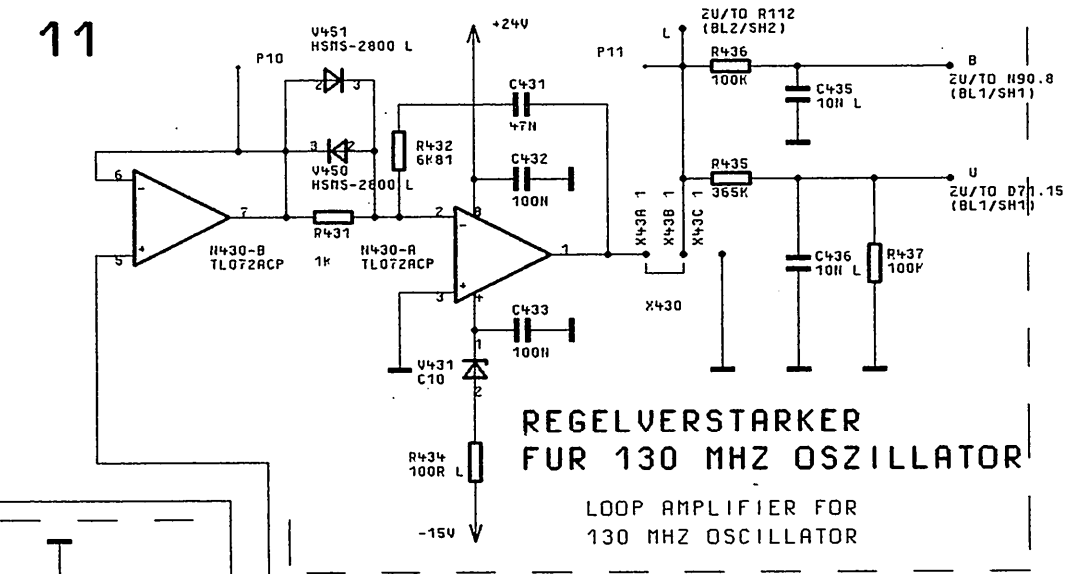
6
40 MHZ- VERSTÄRKER MIT TIEFPASS
40 MHZ - AMPLIFIER WITH LOWPASS



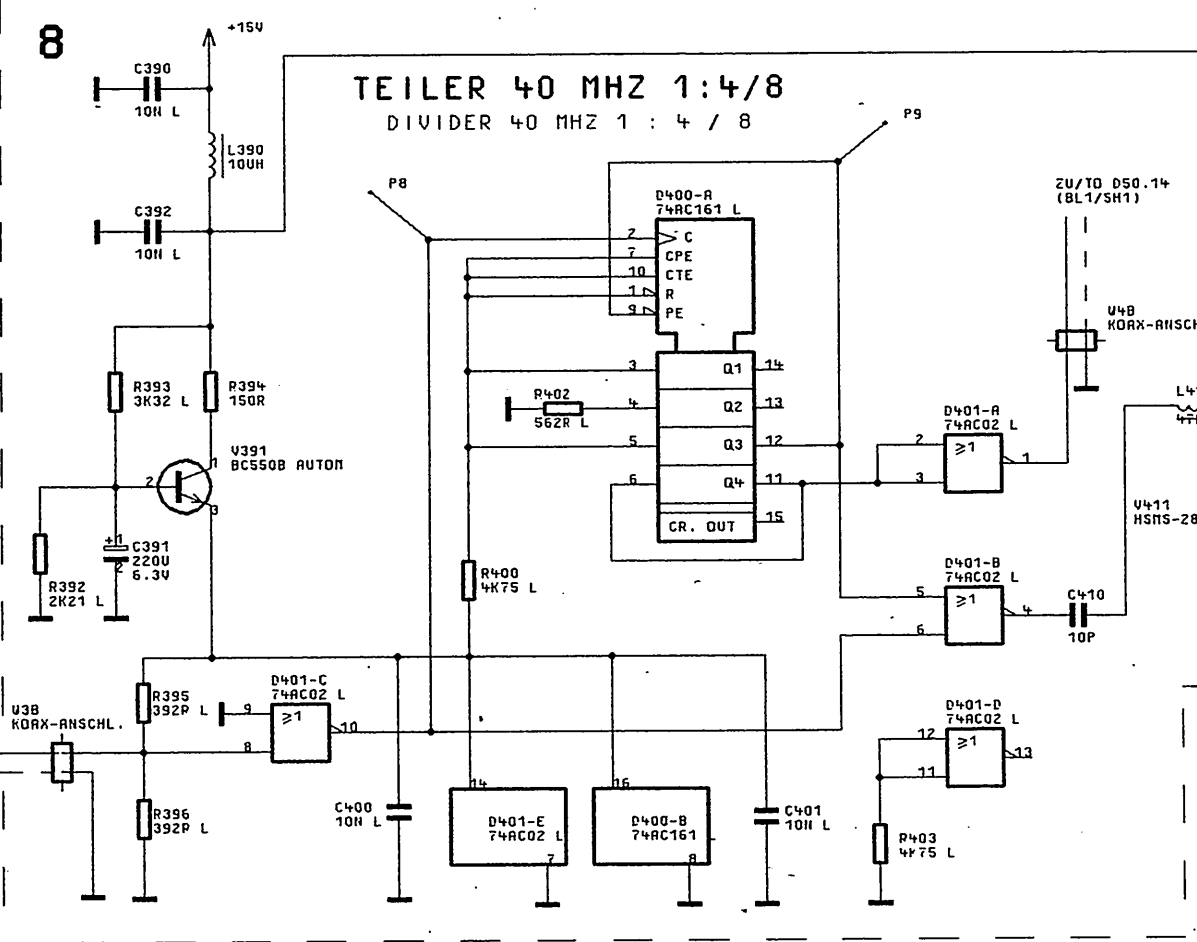
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11

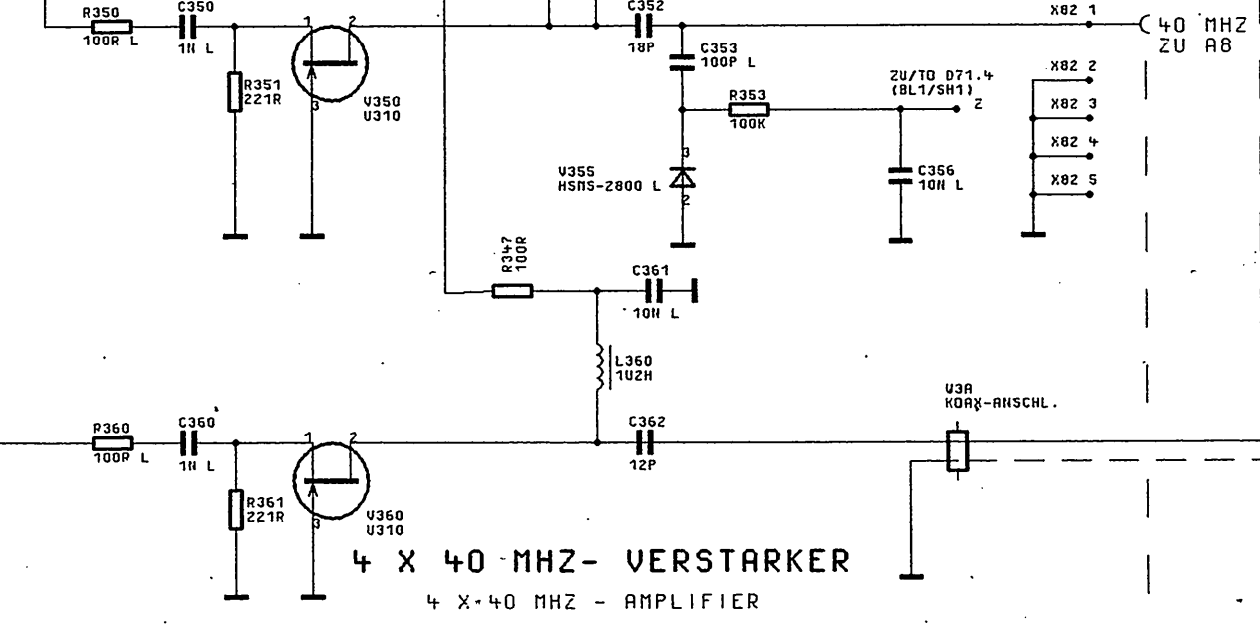


8



PULSSTUFE
PULS SHAPER

SAMPLINGMISCHER
SAMPLING MIXER

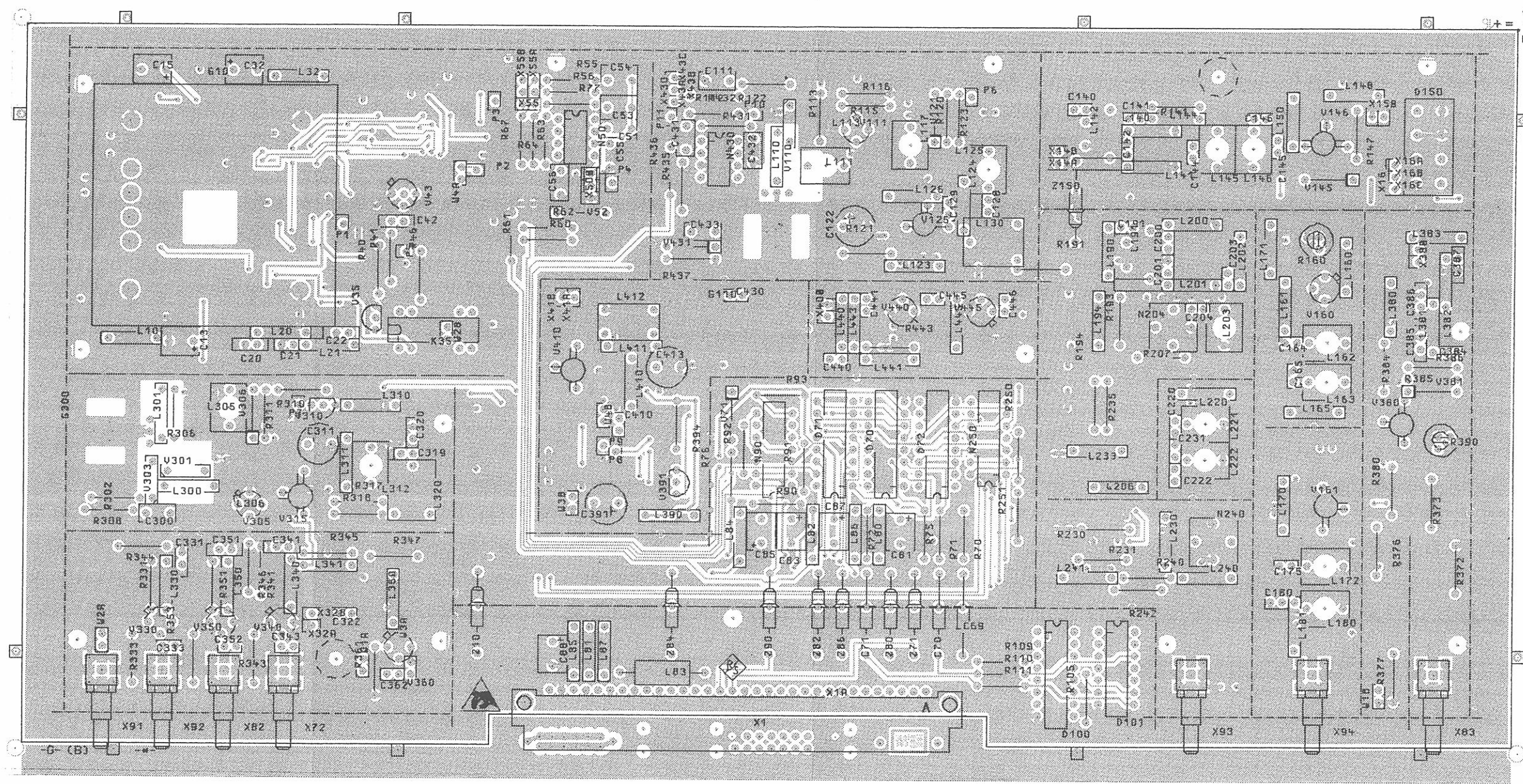


ACHTUNG: EGB!
ELEKTROSTATISCH GEFAHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

STROMLAUF GILT FÜR VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

09/	19.07.96	HO	1GPK	TAG	NAME	BENENNUNG
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			GEPP.			REFERENCE-FREQUENCIES
			NDRP			
			PLOTT	19.07.96		
RECHN. IND.	RECHNUNGS-NITTEILUNG	DATUM	NAME	ROHDE&SCHWARZ		ZEICHN.-NR.
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				PEC. I. V.	819.0010	BLATT-NR. 3+
					ERSTE Z.	u. BL.



Ansicht und Leitungsfuehrung Bauteilseite
View of tracks on component side

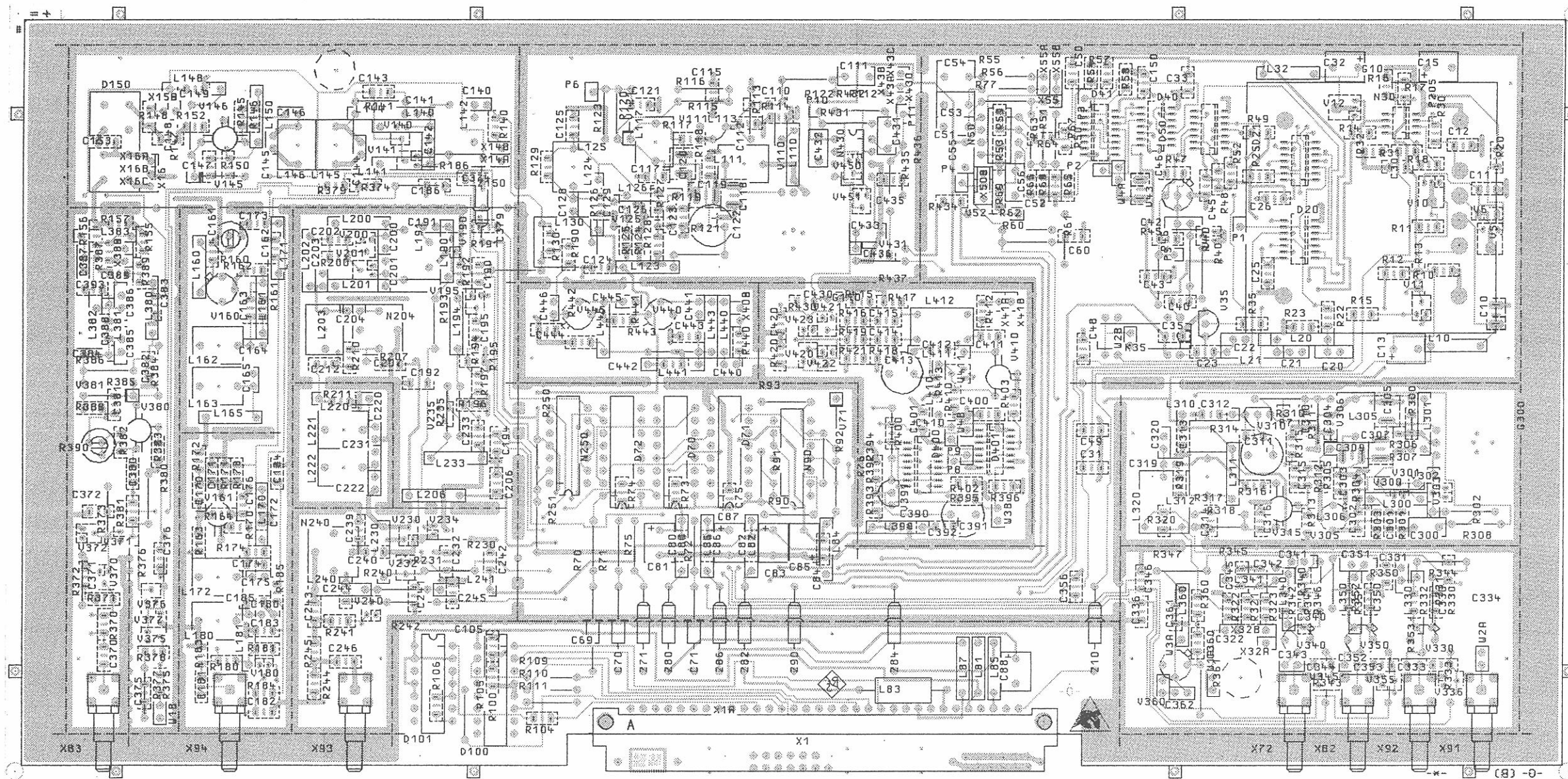
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Electrostatic sensitive devices require a special handling.

VARIANTENERKLÄRUNG/VERSION
VAR02-GRUNDAUSFUEHRUNG/BASIC MODEL

F	41825	07.89	HM	Maße ohne Toleranzangabe	Maßstab 1:1	
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				Norm		
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				zu Gerät SMGU	819.6060.01	2
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	reg. i. V.	819.0010 V	EE v. 4 Bl.
				erste Z.		



Ansicht und Leitungsfuehrung Loetseite
View of tracks on solder side

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VARIANTENERKLÄRUNG/VERSION
VAR02-GRUNDAUSFUEHRUNG/BASIC MODEL

F	41825	07.89	HM	Maße ohne Toleranzangabe	Maßstab 1 : 1		
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				Gepr.		REFERENCE-FREQUENZIES	
				Norm			
						Zeichn.-Nr.	Blatt-Nr.
						819.6060.01	3
						EE	v. 4 Bl.
And. Zust.	Änderungs-Mitteilung	Tag	Name	zu Gerät SMGU	reg. i. V. 819.0010 V	erste Z.	





ROHDE & SCHWARZ

SERVICE DOCUMENTS

Summing Loops

819.7166.02

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5 Service Manual "Summing Loops"

5.1 Function Description

(See circuit diagram 819.7166 S and Fig. 5-1)

The summing loop module contains two PLLs, "summing loop 1" and "summing loop 2" and a frequency divider circuit, "pulse blanking divider".

In summing loop 1, the frequency of the external FRN signal at X71 (3 to 3.625 MHz; fine resolution) and the frequency of the external STEP signal at X81 (23.125 to 29.375 MHz; resolution 0.625 MHz) are added or subtracted such that the output is a frequency of 20 to 32.8 MHz with a fine resolution. If only an addition were used, the frequency range at the output would only be half as large.

The frequency of summing loop 1 is added in loop 2 to the external fixed frequency of 300 MHz, resulting in a signal overing 320 to 332.8 MHz. The reference frequency of 40 to 41.6 MHz required for the RF oscillator module is then obtained by dividing by 8 in the pulse blanking divider.

5.1.1 Summing loop 1 (see Fig. 5-1)

The addition or subtraction is performed with a PLL containing a double balance mixer which carries out frequency subtraction. A PLL, i.e. indirect frequency synthesis, has been selected to keep the unwanted mixer products as low as possible at the output of the summing loop.

Switch over between the addition and subtraction of the STEP frequency and the FRN frequency is achieved by inverting the digital phase detector D1, D2. The control signal required is designated as BAND and also switches over the oscillator between two bands (20 to 26.4 MHz/26.4 to 32.8 MHz).

BAND phase det. $f_{(OSC1)} =$
0 *inverted* $f_{(STEP)} - f_{(FRN)} = 20 \text{ to } 26.4 \text{ MHz}$
1 *not inv.* $f_{(STEP)} + f_{(FRN)} = 26.4 \text{ to } 32.8 \text{ MHz}$

The above frequencies are shown in Fig. 5-1.

The oscillator has three adjustment points: OSC1 TOP, OSC1 BOTTOM and OSC1 LEVEL.

The digital phase detector D1, D2 (two edge-triggered D flip-flops), which also operates as a frequency detector prior to synchronization of the control loop, delivers two pulse signals to the control amplifier N15. The width of these pulses corresponds to the phase offset.

The control amplifier converts the pulses into a DC voltage for controlling the oscillator, and provides the control loop with the required transfer function (PI network).

The amplifiers V85, V90, V95 and the attenuator R102 to R104 prevent feedback of the frequencies $f_{(STEP)}$, $f_{(IF)}$, $f_{(OSC1)} + f_{(STEP)}$ from the mixer to the output so that they do not appear as spurious signals at the output of the instrument.

As a result of the frequency detector property of the phase detector, the locking range is always large enough to enable the PLL to capture at switch on. It may be, however, that the frequency detector controls in the incorrect direction and the control amplifier is driven to full-range and remains there. If e.g. $f_{(OSC1)} = f_{(STEP)} - f_{(FRN)}$ is the target frequency, the frequency at the IF output of the mixer is equal to the FRN frequency $f_{(FRN)}$ even with $f_{(OSC1)} = f_{(STEP)} + f_{(FRN)}$ so that the frequency difference at the phase detector is equal to zero. This means, however, that the sign of the frequency control is changed and that the control for $f_{(OSC1)} > f_{(STEP)} + f_{(FRN)}$ go in the wrong direction.

The second case in which the frequency control fails is if the IF becomes so large that it falls within the stop band of the IF filter, meaning that there is no IF signal at the phase detector.

A capture circuit has therefore been installed which forces the tuning voltage into a range in which the frequency detector controls correctly. If the control loop synchronizes, the tuning voltage and the preset voltage agree sufficiently exactly that the diodes V423 and V424 block and isolate the preset value from the oscillator.

Since the preset voltages depend on the oscillator characteristic, which in turn is subject to manufacturing tolerances, aging and temperature drift, these factors can be taken into consideration by a calibration routine (SF 67). The controller in the instrument measures the characteristic by means of the Diagnostics function, generates a table of values and stores this table.

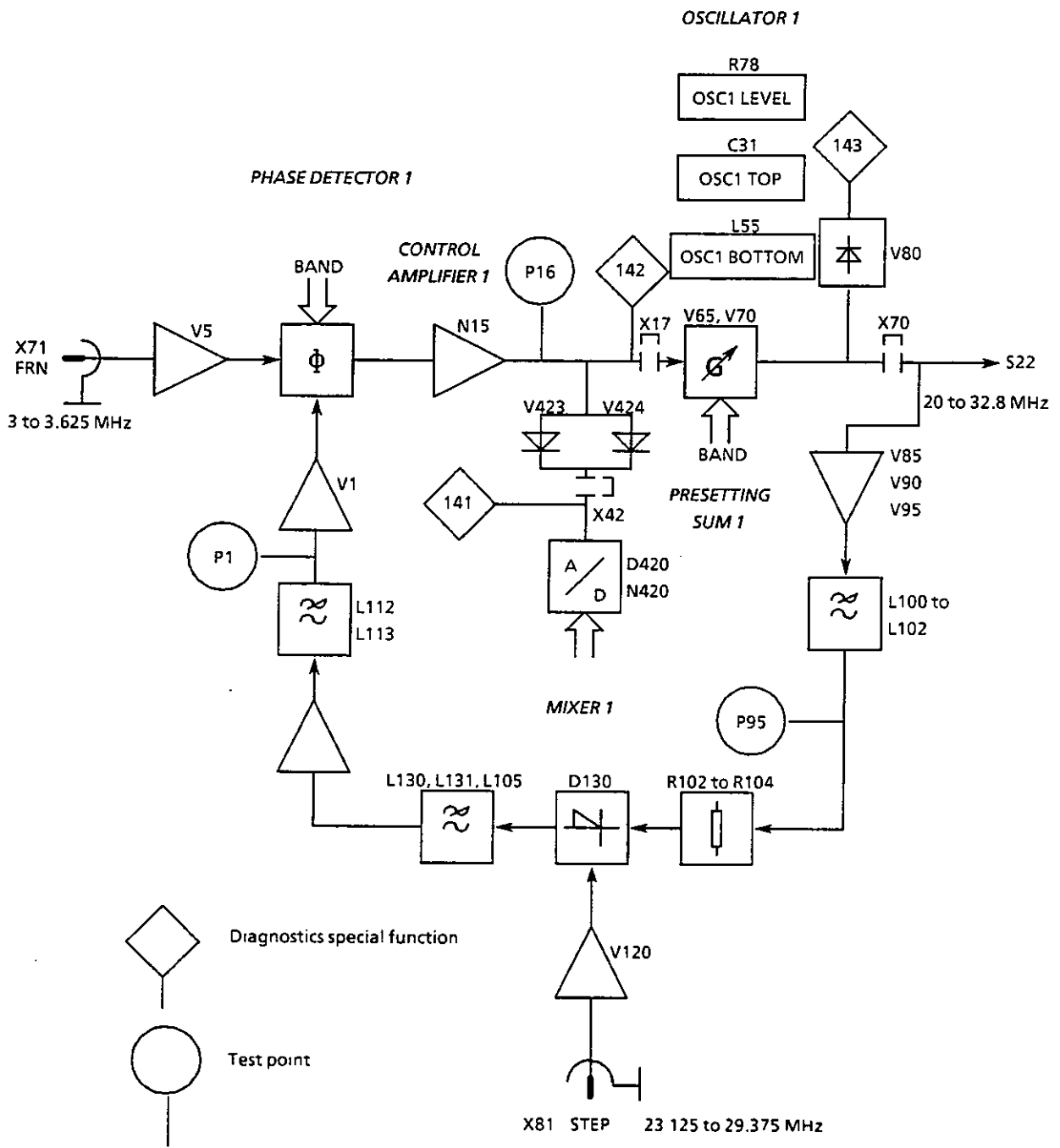


Fig. 5-1 Function diagram of "Summing loop 1"

5.1.2 Summing loop 2 (see Fig. 5-3)

The phase detector is a ring mixer which is overdriven (both input signals have the same level) so that amplitude variations cannot be transmitted and interfere with the control. The phase detector characteristic is triangular so that positive and negative output voltages are possible.

The oscillator does not have a range switchover and is designed for the frequency range from 320 to 332.8 MHz. The PLL can therefore only be synchronized at the total frequency of $f_{(OSC1)}$ and $f_{(FIXED)}$.

The oscillator has two adjustment points OSC2 BOTTOM and OSC2 TOP.

The lowpass filter L210 to L212 suppresses the reference signal from oscillator 1 and its harmonics. The cutoff frequency of approx. 10 MHz is a compromise between suppression of the reference signal and phase shift. The latter must not be too large as this would affect the stability of the loop.

The control amplifier consists of the operational amplifier N245 acting as a PI element and the transistor amplifier V240 which takes over the operational amplifier function in the proportional band above 500 kHz. This circuit improves the phase noise of the loop above 500 kHz since the transistor amplifier has a smaller noise figure.

Since the mixer D205 does not act as a frequency detector, the frequency of the oscillator must be pulled into the capture range of the loop by the capture circuit. The capture circuit and the control amplifier constitute a triangular-wave generator which applies the signal shown in Fig. 5-2 to the oscillator input.

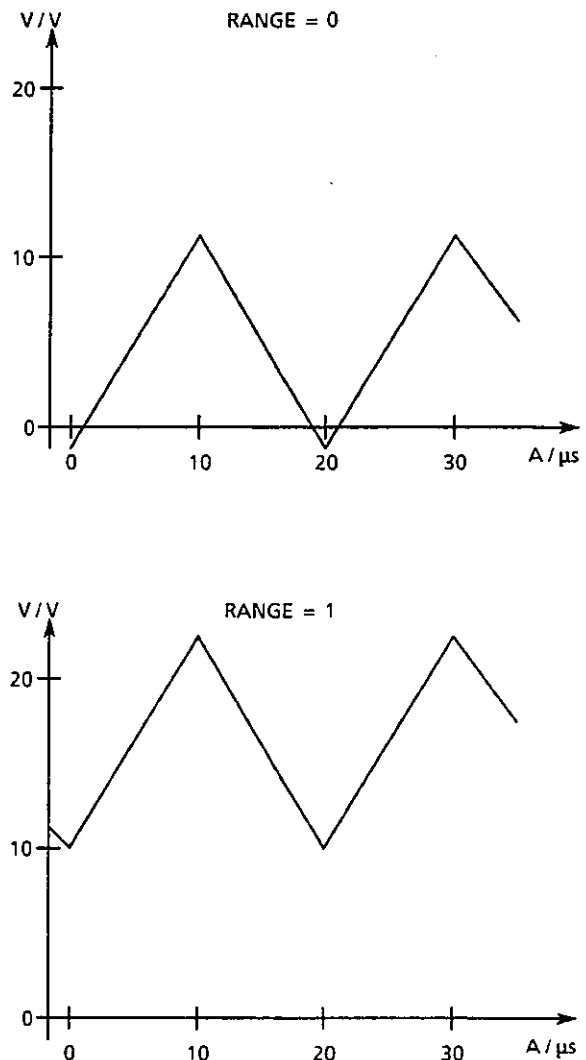


Fig. 5-2

The circuit operates in two ranges which are switched over by the RANGE signal by the controller depending on the frequency setting. The triangular-wave curve means that the oscillator is swept and reaches the lock-in range at some time so that the loop is synchronized. Synchronization of the loop is registered by the capture circuit which is then switched off. An unlocked loop detected either by the out-of-lock detector or by the window comparator of the capture circuit, and the triangular-wave signal is switched on again.

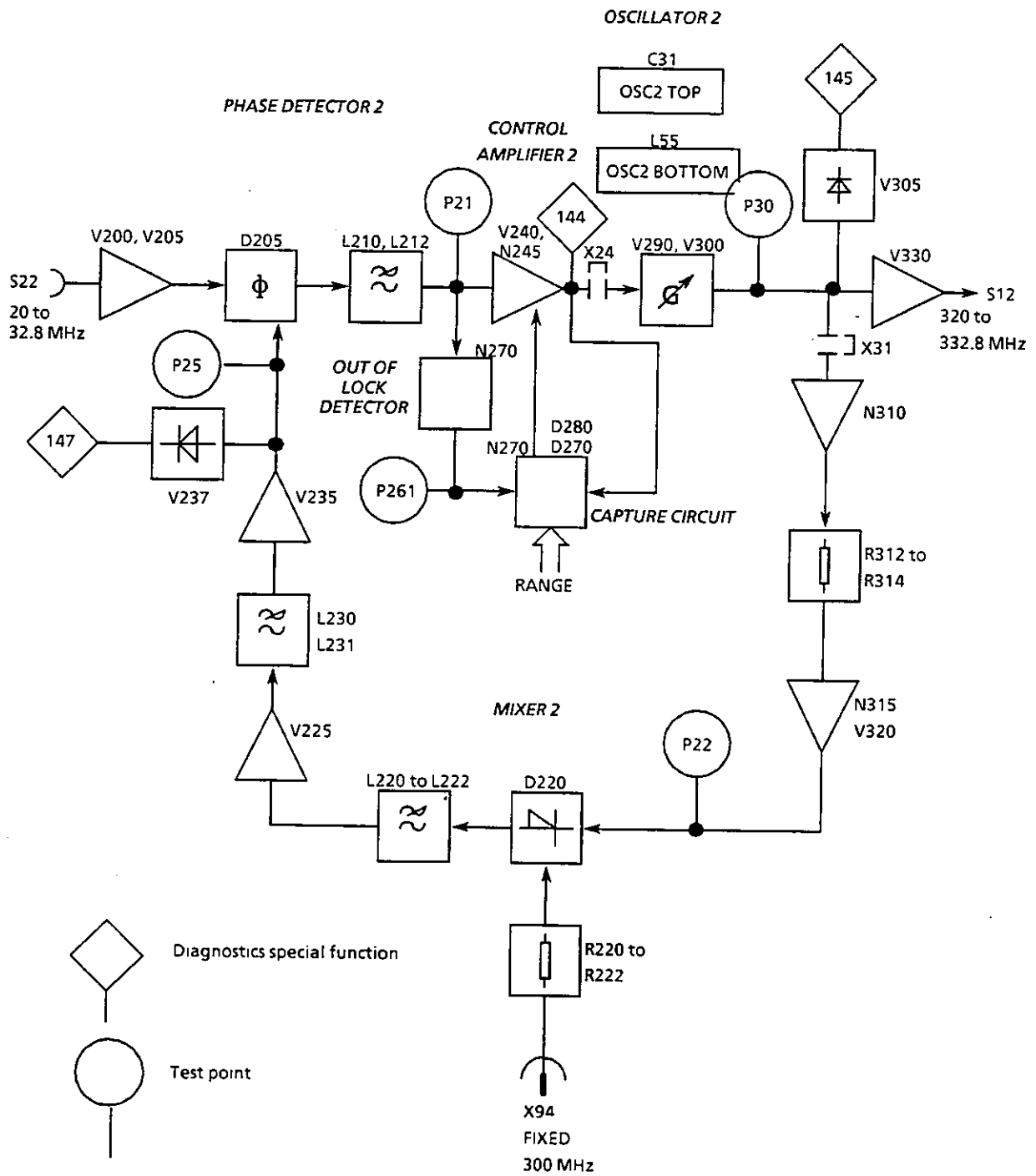


Fig. 5-3 Function diagram of "Summing loop 2"

5.1.3 Pulse blanking divider (see Fig. 5-4)

The output signal of the digital divider D450, D451 with the frequency $f_{OSC2}/8$ is applied via pulse shaper V455, V460 to the control input of the electronic switch V470 with which the input signal is switched on or off at the frequency f_{OSC2} . In this manner, one of the eight periods of the input signal is connected through to the output so that a pulse signal with the frequency $f_{OSC2}/8$ is present there.

Fig. 5-4 shows that the input signal is connected to the switch (adjustment point DELAY TIME) via a delay line which can be adjusted using varicap diodes. The tuning range corresponds to a phase shift of 180 degrees. Shifting by a total of 360 degrees is possible since the signal from the divider can be inverted using a plug-in jumper (adjustment point POLARITY).

The pulse width of the control signal can also be adjusted (adjustment point WIDTH).

The selective amplifier V440 is tuned to resonance using the adjustment point AMPLITUDE.

5.1.4 Control and Diagnostics Circuit

The module is controlled via a serial data bus. The data for the preset values, range switching and diagnostics multiplexer are read into two shift registers D410 and D411.

Eight different diagnostics points (DC values) can be applied to output X1.A17 via the multiplexer component D412.

The "Alarm line" at output X1.A18 is switched from 5 V to 0 V if the tuning voltage of oscillator 1 leaves the range of 1.6 V to 21.6 V (window comparator N20) or if the capture circuit of summing loop 2 is in operation.

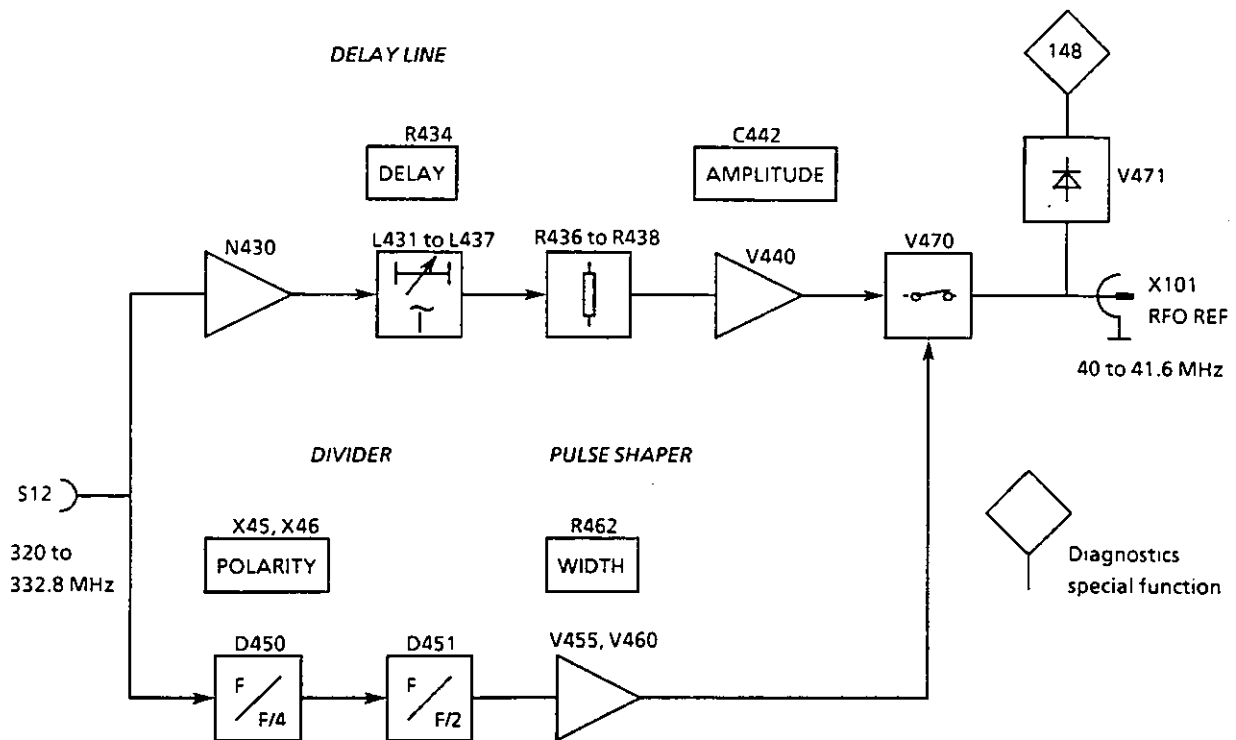


Fig. 5-4 Function diagram of "Pulse blanking divider"

5.2 Testing and Adjustment

- Unscrew top cover.
- Connect module to service adapter.
- Enter PRESET.

5.2.1 Adjustment of "Oscillator 1"

- Remove jumper X17.
- Apply DC voltage of 3 to 20 V to X17B.
- Connect a frequency counter or power meter to P95 (50 Ω).
- Adjust the frequency using coil L55 and trimmer C31 and the level using potentiometer R78 as shown in Table 5-1.

Table 5-1

Entry	Adjust	Marking	Voltage at X17B	Nominal frequency or level at X70	Remarks
RF 1010 MHz	L55	OSZ1 BOTTOM	3 V \pm 0.1 V	19.9 MHz \pm 0.1 MHz	Shift windings of ring core to adjust
RF 1025 MHz	C31	OSZ1 TOP	19.7 V \pm 0.1 V	32.9 MHz \pm 0.1 MHz	Alternately with adjustment OSC1 BOTTOM
RF 1010 MHz			19.7 V \pm 0.1 V	26.25 MHz to 28 MHz	If frequency is too large/small, correct adjustment OSC1 BOTTOM downwards/upwards
RF 1025 MHz			3 V \pm 0.1 V	24.5 MHz to 26.25 MHz	If frequency is too large/small, correct adjustment OSC1 TOP downwards/upwards (within tolerance range)
RF 1025 MHz	R78	OSZ1 LEVEL	10 V \pm 0.1 V	-15 dBm +0 dB -0.5 dB	

- Insert jumper X17 again.

5.2.2 Testing the Oscillator and RF Amplifier Levels of "Summing loop 1"

- Remove jumper X17.
- Apply DC voltage of 3 to 20 V (1-V steps) to X17.B.
- Remove jumper X70 and connect power meter to X70.A, C.
- The level must be -3 dBm \pm 2 dB after entering RF 1010 MHz and RF 1025 MHz on the instrument and 3 to 20 V at X17.A.
- Insert jumper X70 again.
- Connect a power meter to P95.
- The level at P15 must be -15 dBm + 1 dB -1.5 dB after entering RF 1010 MHz and RF 1025 MHz on the instrument and 3 to 20 V at X17.A.
- Insert jumper X17 again.

5.2.3 Testing the Closed "Summing loop 1"

- Connect two voltmeters to the plug-in jumpers X42 and X17 or use the diagnostics function 141 or 142 (SHIFT SPECIAL 141 ENTER).
- Connect a frequency counter to P95.
- Enter RF 1010 MHz on the instrument.
- Enter the frequencies listed in Table 5-2 on the instrument and check the frequencies and voltages. The sequence in Table 5-2 must always be followed as otherwise hysteresis will affect the subassembly setting.

Table 5-2

Entry on instrument	Nominal frequency at P95	Nominal voltage at X70
RF 1000.078125 MHz	20.025 MHz \pm 2 kHz	3.0 V \pm 1 V
RF 1010.46875 MHz	23.35 MHz \pm 2 kHz	10 V \pm 1 V
RF 1019.609375 MHz	26.275 MHz \pm 2 kHz	17 V \pm 1 V
RF 1038.984375 MHz	32.475 MHz \pm 2 kHz	18.5 V \pm 1 V
RF 1029.53125 MHz	29.45 MHz \pm 2 kHz	11 V \pm 1 V
RF 1019.453125 MHz	26.225 MHz \pm 2 kHz	4.3 V \pm 1 V

- The voltage difference between X42 and X17 must be \leq 2 V.
If this is not the case call a calibration routine using SHIFT SPECIAL 67 ENTER and attempt to reduce the voltage difference to below 2 V.

5.2.4 Testing the IF Amplifier Level of the "Summing loop 1"

- Connect a level meter to test point P1 (test frequency = 3 to 3.265 MHz).
- Set the following sweep on the instrument:

START	1000.39	MHz
STOP	1002.35	MHz
STEP	10	kHz
TIME/STEP	25	ms
- The level at P1 must be -15.5 dBm \pm 3 dB.

5.2.5 Testing the Settling of "Summing loop 1"

- Connect the signal input of a storage oscilloscope to test point P16 and the trigger input to X1.A22. Set the trigger to a positive slope and a 2.5-V threshold voltage.
- Enter RF 1001 MHz on the instrument, then RF 1019 MHz and then RF 1001 MHz again. With the second and third settings, the voltage at P16 must reach the full-scale value \pm 10 % of the voltage jump within 250 μ s.

5.2.6 Adjustment of "Oscillator 2"

- Remove jumper X24 and apply a variable DC voltage of 3 V to 20 V to X24.B.
- Connect a frequency counter to test point P22.
- Adjust the oscillator using coil L287 and trimmer C285 according to Table 5-3. When reading the frequency, the oscillator chamber (chamber 7) must be covered by a metal plate.

Table 5-3

Adjust	C285	L287
Marking	OSZILLATOR 2 BOTTOM	OSZILLATOR 2 TOP
Voltage at X24B	3.6 V \pm 0.1 V	19.6 V \pm 0.1 V
Nominal frequency at P22	319.75 MHz \pm 0.25 MHz	333.05 MHz \pm 0.25 MHz
Remarks	Alternately with adjustment OSCILLATOR 2 TOP	To adjust, bend windings of air core

- Insert jumper X24 again.

5.2.7 Testing of Levels of "Summing loop 2"

- Remove jumper X24 and apply a variable DC voltage (5 V to 22.6 V) to X24.B.
- Enter RF 1019 MHz on the instrument.
- Connect a power meter to P30 or P22 and P25 and vary the voltage at X24.B. The levels must have the values as in Table 5-4.

Table 5-4

Test point	Nominal level	Frequency range
P30	-8 dBm \pm 2 dB	310 to 335 MHz
P22	-4 dBm \pm 2 dB	310 to 335 MHz
P25	-6.5 dBm \pm 2 dB	10 to 35 MHz

- Insert jumper X24 again.

5.2.8 Testing the Capture Circuit

- Connect an oscilloscope to plug-in jumper X24.
- Disconnect RF interface plug X94.
- Enter RF 1010 MHz on the instrument.
- A triangular signal with
with $V(\text{MIN}) = -1 \text{ V} \pm 2 \text{ V}$
and $V(\text{MAX}) = 15 \text{ V} \pm 2 \text{ V}$
must now be present at X24.
- Enter RF 1025 MHz on the instrument.
- A triangular signal with
with $V(\text{MIN}) = 6 \text{ V} \pm 2 \text{ V}$
and $V(\text{MAX}) = 23 \text{ V} \pm 2 \text{ V}$
must now be measured at X24.

5.2.9 Testing the Closed "Summing loop 2"

- Connect a voltmeter to plug-in jumper X24 or use the diagnostics function (SHIFT SPECIAL 144 ENTER).
- Connect a frequency counter to P30.
- Cover the oscillator chamber using a metal cover.
- Enter RF 1000.25 MHz on the instrument, then RF 1020 MHz and then RF 1040 MHz.
- The voltage at X24 should be 3 V \pm 2 V, 12 V \pm 2 V and 20 V \pm 2 V.

5.2.10 Adjustment and Testing of "Pulse blanking divider"

- Cover the pulse blanking divider chamber (chamber 9) using a metal cover.
- Enter RF 1020 MHz on the instrument.

Adjustment

- Connect an oscilloscope to the RF output X101. The 3-dB bandwidth should be at least 250 MHz. Use a low-reflection 50-Ω input. Connect attenuator to oscilloscope input if necessary.
- If the Tektronix oscilloscope 475A is used, the vertical deviation has to be calibrated at 250 MHz by means of a sinewave generator.
- DC coupling has to be switched on at the oscilloscope and the 0-V line must be fixed.
- Adjust WIDTH (R462) to the left maximum.
- Adjust V_1 (amplitude of main pulse, see Fig. 5-5) for maximum using AMPLITUDE (C442).
- Adjust V_1 alternately for maximum using WIDTH (R462) and DELAY (R434) (tolerance = $3.5 \text{ V} \pm 1 \text{ V}$).
- Adjust V_3 (amplitude of second adjacent pulse, see Fig. 5-5) for $V_3/V_1 = 0.25 \pm 0.05$ using DELAY (R434).
- If this adjustment is unsuccessful, change the position of jumper X45/X46 (POLARITY) and repeat.
- V_1 should be $3.5 \text{ V} \pm 1 \text{ V}$.
- Enter RF 1001 MHz and RF 1039 MHz on the instrument. The amplitude of the main and adjacent pulses should then change by less than 0.3 V.
- Enter RF 1020 MHz, FM EXT AC on the instrument.
- Connect RF output X101 to the instrument again.
- Connect a phase noise test setup to the instrument output and measure the phase noise at 1020.45 MHz (if necessary a spectrum analyzer - overloaded by 10 dB - may be used).
- The phase noise test setup should be below 130 dBc/Hz.

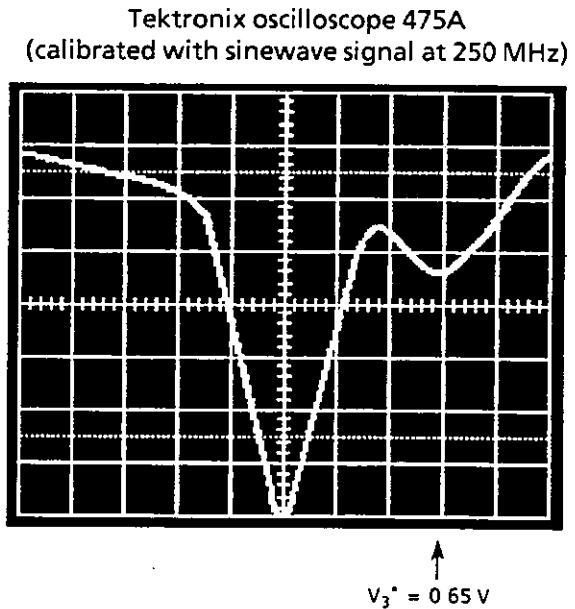
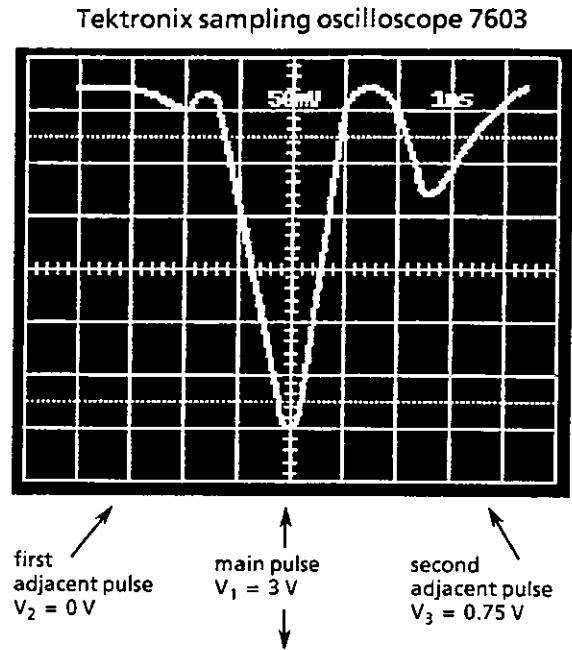


Fig. 5-5 Typical oscillograms of the output signal at X101 (RFO REF) after adjusting the pulse blanking divider

5.3 Troubleshooting

- Troubleshooting can be carried out using the DC voltage values and signal levels listed.
- Unscrew both covers, connect the module to the service adapter and enter PRESET RF 1000 MHz on the instrument.

Table 5-5 (DC voltage values)

Test point	Entry on instrument	DC voltage
P60	RF 1010 MHz	-14.2 V ± 1 V
P62	RF 1025 MHz	23.8 V ± 1 V
Source of V65		-6.0 V ± 0.5 V
Source of V70		6.7 V ± 0.5 V
Emitter of V85		-0.8 V ± 0.5 V
Emitter of V90		-0.7 V ± 0.5 V
Collector of V95		6.2 V ± 0.5 V
Collector of V120		7.1 V ± 0.5 V
Collector of V110		6.2 V ± 0.5 V
Collector of V200		7.3 V ± 0.5 V
Collector of V205		7.0 V ± 0.5 V
Collector of V240		6.3 V ± 0.5 V
Emitter of V290		-7.7 V ± 0.5 V
Emitter of V300		14.6 V ± 0.5 V
Collector of V330		13.8 V ± 0.5 V
Output of N310		4.4 V ± 0.5 V
Output of N315		4.3 V ± 0.5 V
Collector of V320		7.2 V ± 0.5 V
Collector of V225		6.3 V ± 0.5 V
Collector of V235		7.3 V ± 0.5 V
Output of N430		4.4 V ± 0.5 V
Kollektor of V440		4.0 V ± 0.5 V
Emitter of V455		-1.9 V ± 0.5 V
Drain of V470		14.6 V ± 0.5 V
Collector of V270	RF 1010 MHz	0.0 V ± 0.5 V
Collector of V270	RF 1025 MHz	8.6 V ± 0.5 V
Collector of V275	RF 1010 MHz	13.0 V ± 0.5 V
Collector of V275	RF 1025 MHz	21.6 V ± 0.5 V
X42	RF 1039 MHz	Voltage at X17 ± 0.5 V
	Set SF 67	

Table 5-6 (Control signals (CMOS))

Test point	Entry on instrument	Control signal
D410 / pin 14	RF 1010 MHz	1
D410 / pin 14	RF 1025 MHz	0
D410 / pin 13	RF 1010 MHz	0
D410 / pin 13	RF 1025 MHz	1
D412 / pin 6	SHIFT SPECIAL 141 ENTER	0
D412 / pin 6	SHIFT SPECIAL 0 ENTER	1

Table 5-7 (Signal level)

Test point	Frequency	Level	Remarks
P2	3 to 3.625 MHz	CMOS	
P3	3 to 3.625 MHz	CMOS	
P10	3 to 3.625 MHz	CMOS	
P11	3 ...to 3.625 MHz	CMOS	
X24	50 kHz ± 20 kHz	Triangular-wave signal with 16 V _{pp} ± 3 V	Plug-in jumper X29 removed

RF levels

The RF levels are measured using a plug-in jumper to which a 50-Ω cable is soldered.

Table 5-8

Test point	Entry on instrument RF	Frequency	Level
X70	1000 to 1040 MHz	20 to 32.8 MHz	-2 dBm ± 3 dB
P95	1000 to 1040 MHz	20 to 32.8 MHz	-15.5 dBm ± 3 dB
P1	1000 to 1003 MHz	3 to 3.625 MHz	-15.5 dBm ± 3 dB
P30	1000 to 1040 MHz	320 to 332.8 MHz	-10 dBm ± 2 dB
P22	1000 to 1040 MHz	320 to 332.8 MHz	-4 dBm ± 2 dB
P25	1000 to 1040 MHz	20 to 32.8 MHz	-6.5 dBm ± 2 dB

5.4 Interfaces

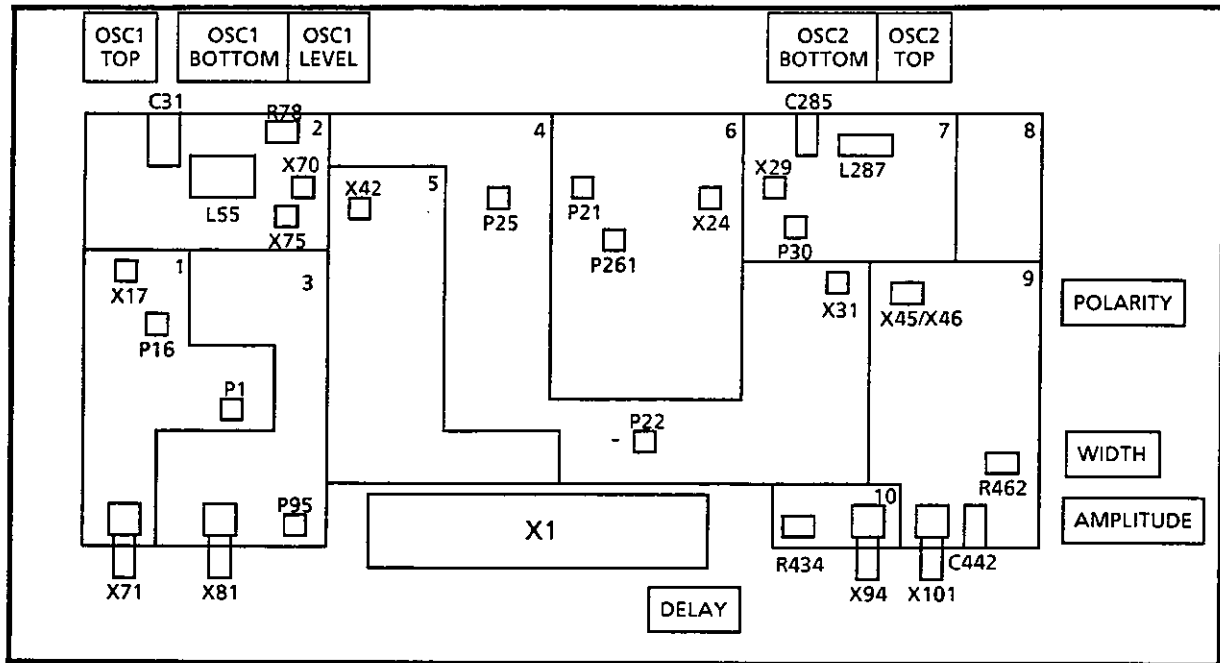


Fig. 5-6 Layout of test points and trimmers

5.4.1 Analog interfaces

Designation	Function	Frequency	Level
X71	RF input	3 to 3.625 MHz	5 dBm \pm 1 dB
X81	RF input	23.125 to 29.375 MHz	10 dBm \pm 1 dB
X94	RF input	300 MHz	5 dBm \pm 2 dB
X101	RF output	40 to 41.6 MHz	3.5 V, \pm 1 V
X1.A17	Diagnostics output		-5 to +5 V
X1.A18	Alarm line		CMOS

5.4.2 Digital interfaces

Designation	Function
X1.A21	LSB of address
X1.A20	
X1.A19	
X1.A22	MSB of address
X1.A11	Strobe
X1.A13	Clock
	Data

5.4.3 Supply voltages

Designation	Voltage
X1.A24	+24 V +0.5 V to -0.7 V
X1.A26	+15 V \pm 0.3 V
X1.A28	+5 V \pm 0.2 V
X1.A30	-15 V +0.8 V to +0.3 V
X1.A10, A12, A14, A16, A23, A25, A27, A29, A31	Ground

5.5 List of Required Test Equipment

DC power supply	0 to 20 V	eg NGT 25
Frequency counter	0 to 350 MHz	eg FAM
Power meter	50 Ω , -20 to 5 dBm	eg NRV
Multimeter		eg UDL 33
Storage oscilloscope		eg BOS
Oscilloscope	min. 250 MHz, 3-dB bandwidth	



ROHDE & SCHWARZ

Schaltteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées

Schémas de Circuit

Plans des composants

C

C


C

C

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C1	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C5	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C6	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C7	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C8	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI MKT	1826-422-06-4	
C9	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI MKT	1826-422-06-4	
C10	CC 1,8NF+-10%4X5R2000 CAPACITOR	CC 0087.7054.00	PHILIPS_CO	2222 630 01182	
C11	CC 1,8NF+-10%4X5R2000 CAPACITOR	CC 0087.7054.00	PHILIPS_CO	2222 630 01182	
C12	CK 15NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2875.00	ROEDERSTEI MKT	1826-315-06-4	
C13	CK 15NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2875.00	ROEDERSTEI MKT	1826-315-06-4	
C14	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI MKT	1826-422-06-4	
C15	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI MKT	1826-422-06-4	
C16	CK 470NF+-5%63V RD5H10MKT CAPACITOR	CK 0099.2975.00	ROEDERSTEI MKT	1826-447-06-4	
C17	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C18	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C30	CC 33PF+- 5% 63V N750 VIE CERAMIC CAPACITOR	0060.0265.00	ERIE	RPE110 U2J 330J 50	
C31	CT 9,2PF TAUCHTR.RD 7X12 AIR-TYPE TRIMMER	CT 0025.7373.00	TEKELEC	TL 191	
C40	CC 3,9PF+-0,25PF3X4NPD CAPACITOR	CC 0087.6370.00	PHILIPS_CO	2222 678	
C55	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C56	CC 33PF+- 5% 63V N750 VIE CERAMIC CAPACITOR	0060.0265.00	ERIE	RPE110 U2J 330J 50	
C59	CC 1,2NF+-1% 50V NPD 1206 CERAMIC CHIP CAPACITOR	CC 0007.7400.00	PHILIPS_CO	2222 863 18122	
C60	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C61	CC 27NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8473.00	PHILIPS_CO	2238 581 16633	
C65	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C66	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB CK	05 BX 104K	
C67	CC 56PF+-2%5X6NPD CAPACITOR	CC 0087.6512.00	PHILIPS_CO	2222 678	
C70	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C71	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C75	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C76	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C80	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C81	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C85	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C87	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C90	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB CK	05 BX 104K	
C95	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C96	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C100	CC 82PF+-2%6X7NPD CAPACITOR	CC 0087.6535.00	PHILIPS_CO	2222 678 10 829	
C101	CC 180PF+-2%6X7N750 CAPACITOR	CC 0087.6935.00	PHILIPS_CO	2222 678 58181	
C102	CC 4,7PF+-0,25PF3X4NPD CAPACITOR	CC 0087.6387.00	PHILIPS_CO	2222 678	

095 0026-0893

MENP5	502 3PUA	AI	Datum Date	Schaltlistenliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
	ROHDE & SCHWARZ	39	04.02.98	EE SUMMIERSCHLEIFEN SUMMING LOOPS	0819.7166.01 SA	1+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C103	CC 180PF+-2%6X7N750 CAPACITOR	CC 0087.6935.00	PHILIPS_CO	2222 678 58181	
C104	CC 82PF+-2%6X7NPO CAPACITOR	CC 0087.6535.00	PHILIPS_CO	2222 678 10 829	
C105	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C106	CC 180PF+-2%6X7N750 CAPACITOR	CC 0087.6935.00	PHILIPS_CO	2222 678 58181	
C107	CC 47NF+-10%50V5K1200VIEL CAPACITOR	CC 0082.7810.00	UNION_CARB	CK 05 BX 473K	
C108	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C5OPT	
C110	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB	CK 05 BX 104K	
C111	CC 680PF+-10%4X5R2000 CAPACITOR	CC 0087.7019.00	PHILIPS_CO	2222 630 51681	
C112	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C113	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C114	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C115	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	PHILIPS_CO	2222 863 18681	
C120	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C121	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C126	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C127	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C130	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C131	CC 390PF+-10%3X4R2000 CAPACITOR	CC 0087.6987.00	PHILIPS_CO	2222 630 51391	
C132	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C200	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C201	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI	MKT 1826-422-06-4	
C202	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C203	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C204	CK 220NF+-5%63VRD3,5H9MKT CAPACITOR	CK 0099.2952.00	ROEDERSTEI	MKT 1826-422-06-4	
C205	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C206	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C210	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C211	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	PHILIPS_CO	2238 863 18471	
C212	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C213	CC 470PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8515.00	PHILIPS_CO	2238 863 18471	
C214	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C215	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C220	CC 27PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8409.00	MURATA	GRM42-6COG 270F 50PT	
C221	CC 150PF+-2%5X6N750 CAPACITOR	CC 0087.6929.00	PHILIPS_CO	2222 678 58151	
C222	CC 150PF+-2%5X6N750 CAPACITOR	CC 0087.6929.00	PHILIPS_CO	2222 678 58151	
C223	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C224	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C225	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C226	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C5OPT	

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C230	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C231	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C232	CC 47PF+-2%5X6NPO CAPACITOR	CC 0087.6506.00	PHILIPS_CO	2222 678	
C233	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C235	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB	CK 05 BX 104K	
C236	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C237	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C238	CC 1PF+-0,25PF3X4P100 CAPACITOR	CC 0087.6170.00	PHILIPS_CO	2222 678	
C239	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C240	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C241	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C242	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C243	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C244	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C245	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C246	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB	CK 05 BX 104K	
C247	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB	CK 05 BX 104K	
C248	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C249	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C251	CC 82PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8821.00	MURATA	GRM42-6COG 820F 50PT	
C252	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C255	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C256	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C257	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 0084.5350.00	UNION_CARB	CK 05 BX 104K	
C258	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C270	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C271	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C272	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C283	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C284	CC 3,9PF/0,25PF63V3X5N750 CAPACITOR	CC 0099.5568.00	ROEDERSTEI	ROU 744 J4	
C285	CT 3PF LUFTTR.3,6X13F.G.S PISTON TRIMMER	CT 0037.7121.00	TEKELEC	AT 5801	
C286	CC 1,8PF+-0,25PF63V3X5NPO CAPACITOR	CC 0099.5539.00	PHILIPS_CO	2222 678	
C287	CC 33PF+-2%3X4N750 CAPACITOR	CC 0087.6841.00	PHILIPS_CO	2222 678 58339	
C288	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C289	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C290	CC 18PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8767.00	MURATA	GRM42-6COG 180F 50PT	
C291	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6COG 150F 50PT	
C292	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C293	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C300	CC 22NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8467.00	PHILIPS_CO	2238 581 16632	
C301	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C302	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C303	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C305	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C308	CC 120PF+-2%6X9NPO CAPACITOR	CC 0087.6558.00	PHILIPS_CO	2222 678 10121	
C310	CC 100PF+-2%6X9NPO CAPACITOR	CC 0087.6541.00	PHILIPS_CO	2222 678	
C311	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C312	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C313	CC 1,8PF+-0,25 50V NPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8165.00	MURATA	GRM42-6COG 1R8 C50PT	
C315	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C316	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C317	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C318	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C319	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C320	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C321	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C322	CC 2,2NF+-10%5X6R2000 CAPACITOR	CC 0087.7060.00	PHILIPS_CO	2222 630 51222	
C323	CC 10NF-20+50%7X8R4000 CAPACITOR	CC 0087.7525.00	VALVO	2222 640 51103	
C324	CC 470PF+-10%3X4R2000 CAPACITOR	CC 0087.6993.00	PHILIPS_CO	2222 630 51471	
C330	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C331	CC 6,2PFO,25PF50V NPO1206 CERAMIC CHIP CAPACITOR	CC 0099.8709.00	MURATA	GRM42-COG6R2 C 50PT	
C332	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C335	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C336	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C337	CC 1,5PF+-0,25 50V NPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8159.00	MURATA	GRM42-6COG 1R5 C50PT	
C401	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C402	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C410	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C411	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C412	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C419	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C420	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C421	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR	CC 0022.0784.00	PHILIPS_CO	2222 630	
C422	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C423	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C425	CE 10UF+-20%25V SAL ELECTR. CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C426	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CO	2222 116 90042	
C427	CE 22UF+-20%10V SAL ELECTR. CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C428	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C430	CC 150PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8509.00	PHILIPS_CO	2238 863 18151	
C431	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	PHILIPS_CO	2222 863 18681	
C432	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C433	CE 2,2UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3911.00	VALVO	2222 128 37228	
C434	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	PHILIPS_CO	2222 863 18681	
C435	CC 3,9PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8207.00	MURATA	GRM42-6COG 3R9 C5OPT	
C436	CC 150PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8509.00	PHILIPS_CO	2238 863 18151	
C437	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C440	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C441	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C442	CT 9,2PF TAUCHTR.RD 7X12 AIR-TYPE TRIMMER	CT 0025.7373.00	TEKELEC	TL 191	
C443	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C444	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C450	CC 150PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8509.00	PHILIPS_CO	2238 863 18151	
C451	CC 150PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8509.00	PHILIPS_CO	2238 863 18151	
C452	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C453	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C454	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C455	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C456	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C460	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C461	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C462	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C470	CC 18PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8767.00	MURATA	GRM42-6COG 180F 50PT	
C472	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C473	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C474	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C475	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C476	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C477	CE 2,2UF+-20%40V SAL ELECTR.CAPACITOR	CE 0007.3911.00	VALVO	2222 128 37228	
C478	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C479	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C481	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C483	CC 1NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8438.00	MURATA	GRM42-6 X7R 102 K50	
C484	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C490	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C492	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
D1	BL PC74HC74T 2XD-FF DUAL D-TYPE FLIPFLOP	BL 0007.3505.00	PHILIPS_SE	(PC)74HC74D(T)	
D2	BL PC74HC10T 3X3IN NAND TRIPLE 3 INPUT NAND GATE	BL 0804.1115.00	PHILIPS_SE	(PC)74HC10(D/T)	
D130	BM TAK 1H-A SELECT MIXER SELECTED	0819.7337.00			0819.7320.00
D205	BM TAK 1H-B SELECT MIXER SELECTED	0819.7343.00			0819.7320.00
D220	BM SFK 1H-C SELECT MIXER SELECTEC	0819.7350.00			0819.7320.00
D270	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D280	BS TL607CP 2X ANALOGSCH ANALOG SWITCH	BJ 0339.6160.00	TEXAS	TL607CP	
D400	BL PC74HC08T 4X2IN.ANDG QUAD 2INPUT AND GATE	BL 0007.3486.00	PHILIPS_SE	(PC)74HC08(D/T)	
D401	BL PC74HC238T 3TO8 L.DEC DECODER/DEMULTIPLXER	BL 0820.3277.00	PHILIPS_SE	(PC)74HC238(D/T)	
D410	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D411	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D412	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D420	BJ AD7523JN 1X8B-DAC D/A CONVERTER	0801.8219.00	ANALOG_DEV	AD-7523JN	
D450	BL CA3199 4:1 PRESC IC PRESCALERDIVBY4	0372.1106.10	RCA	CA3199E	
D451	BL MC10H131P 2XD FLIPFL DUAL-D-MS-FLIPFLOP	0345.8190.00	MOTOROLA	MC10H131P (L)	
L1	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L17	LD 39,0UH10%3,600HMO,125A CHOKE	LD 0067.3053.00	DALE	IM2	
L20	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L30	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L31	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L40	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L50	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L51	LD 50UH 0,4A 3,00HM CHOKE	LD 0026.4649.00	FASTRON_GE	SMSC-500M-00	
L55	LD SPULE 0,94 UH COIL	0819.7214.00			0819.7208.00
L95	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L100	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L101	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L102	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L105	LD 1,50UH10%0,220HMO,560A CHOKE	LD 0067.2886.00	DALE	IM2	
L106	LD 100 UH10%8,000HMO,084A CHOKE	LD 0067.3101.00	DALE	IM2	
L110	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L112	LD 2,70UH10%0,550HMO,355A CHOKE	LD 0067.2911.00	DALE	IM2	
L113	LD 2,70UH10%0,550HMO,355A CHOKE	LD 0067.2911.00	DALE	IM2	
L114	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L120	LD 15,0UH10%2,800HMO,157A CHOKE	LD 0067.3001.00	DALE	IM2	
L121	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L130	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L131	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L210	LD 0,56UH10%0,500HMO,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L211	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L212	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L220	LD 0,18UH10%0,120HM1,120A CHOKE	LD 0067.2770.00	DALE	IM2	
L221	LD 0,33UH10%0,220HMO,830A CHOKE	LD 0067.2805.00	DALE	IM2	
L222	LD 0,15UH10%0,100HM1,230A CHOKE	LD 0067.2763.00	DALE	IM2	
L223	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L230	LD 0,27UH10%0,160HMO,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L231	LD 0,27UH10%0,160HMO,975A CHOKE	LD 0067.2792.00	DALE	IM2	
L251	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L255	LD 56,0UH10%5,700HMO,100A CHOKE	LD 0067.3076.00	DALE	IM2	
L265	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L285	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L286	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L287	LD LUFTSPULE 80 NH COIL	0819.7220.00			0819.7208.00
L288	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L290	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L300	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L310	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L311	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L315	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L316	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L317	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L320	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L329	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L330	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L331	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L401	LD 100 UH10%8,000HMO,084A CHOKE	LD 0067.3101.00	DALE	IM2	
L402	LD 10UH BEI 0,81A 0,660HM CHOKE	LD 0026.4126.00	DALE	IM 6	
L403	LD 10UH BEI 0,81A 0,660HM CHOKE	LD 0026.4126.00	DALE	IM 6	
L404	LD 10UH BEI 0,81A 0,660HM CHOKE	LD 0026.4126.00	DALE	IM 6	
L410	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L415	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L416	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L430	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L431	LD LUFTSPULE 15NH COIL	0819.7250.00			0819.7208.00
L432	LD LUFTSPULE 29NH COIL	0819.7266.00			0819.7208.00
L433	LD LUFTSPULE 29NH COIL	0819.7266.00			0819.7208.00
L434	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L435	LD LUFTSPULE 29NH COIL	0819.7266.00			0819.7208.00
L436	LD LUFTSPULE 29NH COIL	0819.7266.00			0819.7208.00
L437	LD LUFTSPULE 15NH COIL	0819.7250.00			0819.7208.00
L440	LD 0,47UH10%,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L441	LD 0,47UH10%,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L442	LD LUFTSPULE 15NH COIL	0819.7250.00			0819.7208.00
L443	LD 47,0UH10%,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L450	LD 5MHZ/20DB 10A CHOKE	LD 0453.4404.00	SPECTRUM	51-750-302	
L451	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L452	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L453	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L454	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L455	LD LUFTSPULE 29NH COIL	0819.7266.00			0819.7208.00
L456	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
L460	LD 10 UH 10% 3R3 144 MA CHOKE	LD 0026.4184.00	DALE	IM2	
L470	LD 0,47UH10%,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L471	LD 4,70UH10%,1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L472	LD 4,70UH10%,1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L481	LD 2,20UH10%,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
N15	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE	
N20	BO LM393N 2X COMPAR COMPARATOR	BO 0803.0696.00	NSC	LM393N	
N245	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE	
N270	BO LM339N 4X COMPAR COMPARATOR	BO 0342.2062.00	NSC	LM339N	
N310	BM MSA0304 MMIC BROADBAND AMPLIFIER	0840.6094.00	AVANTEK	MSA0304	
N315	BM MSA0304 MMIC BROADBAND AMPLIFIER	0840.6094.00	AVANTEK	MSA0304	
N330	BM MSA0304 MMIC BROADBAND AMPLIFIER	0840.6094.00	AVANTEK	MSA0304	
N420	BO SE5534AFE LN OPAMP OPERATIONAL AMPLIFIER	BO 0301.3335.00	SIGNETICS	SE5534AFE	
N430	BM MSA0304 MMIC BROADBAND AMPLIFIER	0840.6094.00	AVANTEK	MSA0304	
P2	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P3	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P10	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P11	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P15	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P16	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P21	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P26	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P27	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P28	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	

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Kennz. Comp. No.	Benennung Designation	Sechnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
P60	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P75	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P261	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P1A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P1B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P22A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P22B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P25A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P25B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P30A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P30B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P95A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
P95B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
R1	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R2	RL 0,60W 68,1 OHM+-1%TK50 RESISTOR	RL 0082.9636.00	RESISTA	MK2	
R3	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R4	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R5	RL 0,60W 100 OHM+-1%TK50 RESISTOR	RL 0082.6543.00	RESISTA	MK2	
R6	RL 0,60W 68,1 OHM+-1%TK50 RESISTOR	RL 0082.9636.00	RESISTA	MK2	
R7	RL 0,60W 2,74KOHM+-1%TK50 RESISTOR	RL 0083.0926.00	RESISTA	MK2	
R8	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R9	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R11	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R14					
R15	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R16	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R17	RL 0,60W 33,2KOHM+-1%TK50 RESISTOR	RL 0083.1674.00	RESISTA	MK2	
R18	RL 0,60W 316 OHM+-1%TK50 RESISTOR	RL 0083.0232.00	RESISTA	MK2	
R19	RL 0,60W 121 OHM+-1%TK50 RESISTOR	RL 0082.9859.00	RESISTA	MK2	
R20	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R21	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R22	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R23	RL 0,60W 18,2KOHM+-1%TK50 RESISTOR	RL 0083.1480.00	RESISTA	MK2	
R24	RL 0,60W 1,37KOHM+-1%TK50 RESISTOR	RL 0083.0690.00	RESISTA	MK2	
R25	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R55	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R56	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R59	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R60	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R61	RL 0,60W 100KOHM+-1%TK50 RESISTOR	RL 0082.1764.00	RESISTA	MK2	
R62	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R63	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R64	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R65	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2	
R66	RL 0,60W 27,4KOHM+-1%TK50 RESISTOR	RL 0082.2583.00	RESISTA	MK2	
R67	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R68	RL 0,60W 1,82KOHM+-1%TK50 RESISTOR	RL 0082.2277.00	RESISTA	MK2	
R70	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R71	RL 0,60W 18,2KOHM+-1%TK50 RESISTOR	RL 0083.1480.00	RESISTA	MK2	
R72	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R73	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R74	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R75	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R76	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R77	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R78	RS 0,5W200 OHM+-10%10X10X CERMET POTENTIOMETER	RS 0247.7949.00	BI_TECHNDL	72X-R	
R80	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R81	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R82	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R85	RL 0,60W 121 OHM+-1%TK50 RESISTOR	RL 0082.9859.00	RESISTA	MK2	
R86	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R87	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R88	RL 0,60W22,10 OHM+-1%TK50 RESISTOR	RL 0082.9188.00	RESISTA	MK2	
R89	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R90	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R91	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2	
R92	RL 0,60W 182 OHM+-1%TK50 RESISTOR	RL 0083.0010.00	RESISTA	MK2	
R95	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R96	RL 0,60W 1,50KOHM+-1%TK50 RESISTOR	RL 0083.0732.00	RESISTA	MK2	
R97	RL 0,60W 562 OHM+-1%TK50 RESISTOR	RL 0083.0461.00	RESISTA	MK2	
R98	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R99	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R100	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2	
R101	RL 0,60W 47,5 OHM+-1%TK50 RESISTOR	RL 0082.9507.00	RESISTA	MK2	
R102	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R103	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R104	RG 82,5 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8861.00	PHILIPS_CO	RC02	
R105	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R106	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R107	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R108	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R110	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R111	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R112	RL 0,60W 51,1 OHM+-1%TK50 RESISTOR	RL 0082.9536.00	RESISTA	MK2	
R120	RL 0,35W271 OHM+-0,1%TK25 RESISTOR	RL 0083.8056.00	DRALORIC	SMA0207	
R121	RL 0,60W18,20 OHM+-1%TK50 RESISTOR	RL 0082.9107.00	RESISTA	MK2	
R122	RL 0,35W271 OHM+-0,1%TK25 RESISTOR	RL 0083.8056.00	DRALORIC	SMA0207	
R123	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R124	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R125	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R126	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R127	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R130	RL 0,60W 51,1 OHM+-1%TK50 RESISTOR	RL 0082.9536.00	RESISTA	MK2	
R200	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2	
R201	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R202	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R203	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R204	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R205	RL 0,60W 10,0 OHM+-1%TK50 RESISTOR	RL 0082.8852.00	RESISTA	MK2	
R206	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R207	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R208	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R209	RL 0,60W12,10 OHM+-1%TK50 RESISTOR	RL 0082.8930.00	RESISTA	MK2	
R210	RL 0,60W 51,1 OHM+-1%TK50 RESISTOR	RL 0082.9536.00	RESISTA	MK2	
R211	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R219	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R220	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R221	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R222	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R223	RG 51,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8810.00	ROEDERSTEI	D25	
R224	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R225	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R226	RL 0,60W12,10 OHM+-1%TK50 RESISTOR	RL 0082.8930.00	RESISTA	MK2	
R227	RL 0,60W12,10 OHM+-1%TK50 RESISTOR	RL 0082.8930.00	RESISTA	MK2	
R228	RL 0,60W 392 OHM+-1%TK50 RESISTOR	RL 0082.2183.00	RESISTA	MK2	
R230	RL 0,60W 51,1 OHM+-1%TK50 RESISTOR	RL 0082.9536.00	RESISTA	MK2	
R231	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R235	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R236	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R237	RL 0,60W 12,10 OHM+-1%TK50 RESISTOR	RL 0082.8930.00	RESISTA	MK2	
R238	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R239	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R240	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2	
R241	RL 0,35W 511 OHM+-1%TK50 RESISTOR	RL 0083.0426.00	RESISTA	MK2	
R242	RL 0,60W 121 OHM+-1%TK50 RESISTOR	RL 0082.9859.00	RESISTA	MK2	
R243	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R244	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2	
R245	RL 0,60W 681 OHM+-1%TK50 RESISTOR	RL 0083.0490.00	RESISTA	MK2	
R246	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R247	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R248	RL 0,60W 2,00KOHM+-1%TK50 RESISTOR	RL 0083.0826.00	RESISTA	MK2	
R249	RL 0,60W 825 OHM+-1%TK50 RESISTOR	RL 0082.2502.00	RESISTA	MK2	
R250	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R251	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R255	RL 0,60W 562 OHM+-1%TK50 RESISTOR	RL 0083.0461.00	RESISTA	MK2	
R256	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R257	RL 0,60W 2,21KOHM+-1%TK50 RESISTOR	RL 0082.2477.00	RESISTA	MK2	
R258	RL 0,60W 221 KOHM+-1%TK50 RESISTOR	RL 0083.2270.00	RESISTA	MK2	
R259	RL 0,60W 681 KOHM+-1%TK50 RESISTOR	RL 0083.2735.00	RESISTA	MK2	
R260	RL 0,60W 681 KOHM+-1%TK50 RESISTOR	RL 0083.2735.00	RESISTA	MK2	
R261	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R262	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R265	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R266	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R267	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R270	RL 0,60W 10,0KOHM+-1%TK50 RESISTOR	RL 0083.1297.00	RESISTA	MK2	
R271	RL 0,60W 7,87KOHM+-1%TK50 RESISTOR	RL 0083.1216.00	RESISTA	MK2	
R272	RL 0,60W 1,54KOHM+-1%TK50 RESISTOR	RL 0083.0749.00	PHILIPS_CO	MRS 25	
R273	RL 0,60W 13,0KOHM+-1%TK50 RESISTOR	RL 0083.1368.00	RESISTA	MK2	
R274	RL 0,60W 22,1KOHM+-1%TK50 RESISTOR	RL 0083.1545.00	RESISTA	MK2	
R275	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R276	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R277	RL 0,60W 33,2KOHM+-1%TK50 RESISTOR	RL 0083.1674.00	RESISTA	MK2	
R278	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R279	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R280	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R281	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R282	RL 0,60W 5,62KOHM+-1%TK50 RESISTOR	RL 0082.2190.00	RESISTA	MK2	
R283	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R285	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R286	RG 825 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.7259.00	ROEDERSTEI	D25	
R287	RL 0,60W 182 OHM+-1%TK50 RESISTOR	RL 0083.0010.00	RESISTA	MK2	
R290	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R291	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R292	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R300	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R301	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R302	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R303	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R304	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R305	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R307	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R308	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R310	RL 0,60W 182 OHM+-1%TK50 RESISTOR	RL 0083.0010.00	RESISTA	MK2	
R311	RL 0,60W 182 OHM+-1%TK50 RESISTOR	RL 0083.0010.00	RESISTA	MK2	
R312	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R313	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R314	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R315	RL 0,60W 150 OHM+-1%TK50 RESISTOR	RL 0082.9942.00	RESISTA	MK2	
R316	RL 0,60W 182 OHM+-1%TK50 RESISTOR	RL 0083.0010.00	RESISTA	MK2	
R320	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R321	RL 0,35W470 OHM+-0,1%TK25 RESISTOR	RL 0083.8510.00	DRALORIC	SMA0207	
R322	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R323	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R324	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R325	RL 0,60W 221 OHM+-1%TK50 RESISTOR	RL 0083.0084.00	RESISTA	MK2	
R328	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R329	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R330	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R331	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R332	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R333	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R334	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R335	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R336	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R337	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R400	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R401	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R402	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R410	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R411	RL 0,60W 475 OHM+-1%TK50 RESISTOR	RL 0083.0390.00	RESISTA	MK2	
R412	RL 0,60W 4,75KOHM+-1%TK50 RESISTOR	RL 0083.1097.00	RESISTA	MK2	
R420	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R421	RL 0,60W 9,09KOHM+-1%TK50 RESISTOR	RL 0082.2177.00	RESISTA	MK2	
R422	RL 0,60W 5,23KOHM+-1%TK50 RESISTOR	RL 0083.1122.00	RESISTA	MK2	
R423	RL 0,60W 47,5KOHM+-1%TK50 RESISTOR	RL 0083.1800.00	RESISTA	MK2	
R424	RL 0,60W 12,1KOHM+-1%TK50 RESISTOR	RL 0083.1351.00	RESISTA	MK2	
R430	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R431	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R432	RL 0,60W 274 OHM+-1%TK50 RESISTOR	RL 0083.0178.00	RESISTA	MK2	
R433	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R434	RS 0,5W50KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0087.7677.00	SPECTROL	63X ... T010	
R435	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R436	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R437	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R438	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R439	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R440	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R441	RG 1,21KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9968.00	ROEDERSTEI	D25	
R442	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R443	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R444	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R450	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R451	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R452	RG 392 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5672.00	ROEDERSTEI	D25	
R455	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R456	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R457	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R458	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R460	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R461	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R462	RS 0,5W500 OHM+-10%10X10X CERMET POTENTIOMETER	RS 0247.7955.00	SPECTROL	63X ... T010	
R463	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R464	RL 1W 182 OHM+-15TK100 METAL FILM RESISTOR	RL 0006.3799.00	ROEDERSTEI	MK 5	


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R465	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R470	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R476	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R477	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RCO2	
R480	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RCO2	
R481	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R482	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RCO2	
R483	RL 0,60W 1KOHM+-1%TK50 RESISTOR	RL 0082.2160.00	RESISTA	MK2	
R484	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RCO2	
R485	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RCO2	
R487	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R488	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R489	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
T110	LU HF-UEBERTR. 0,2-350MHZ WIDE-BAND TRANSFORMER	0276.3619.00	MINI-CIRCU	T 4-1 W38	
T205	LU HF-UEBERTR. 0,2-350MHZ WIDE-BAND TRANSFORMER	0276.3619.00	MINI-CIRCU	T 4-1 W38	
T225	LU HF-UEBERTR. 0,2-350MHZ WIDE-BAND TRANSFORMER	0276.3619.00	MINI-CIRCU	T 4-1 W38	
T235	LU HF-UEBERTR. 0,2-350MHZ WIDE-BAND TRANSFORMER	0276.3619.00	MINI-CIRCU	T 4-1 W38	
V1	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V5	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V15	AE BZX79B3V3 2% 0.5W ZDI ZENER	AE 0008.7704.00	PHILIPS_SE	BZX79B3V3	
V30	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V49	AE BA483 BER.SCH.DI.UHF DIODE	AE 0568.2290.00	VALVO	BA483	
V50	AE BA483 BER.SCH.DI.UHF DIODE	AE 0568.2290.00	VALVO	BA483	
V55	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V60	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V61	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V65	AM U310 N-D 25V JFET FET	AM 0454.6217.00	SILICONIX	U310	
V70	AM BF247A N-D 25V JFET FET	AM 0247.6536.00	TEXAS	BF247A	
V75	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V80	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V85	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V90	AK BFY90 N 15V 25MA TRANSISTOR	AK 0010.4550.00	VALVO	BFY90	
V95	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V110	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V120	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V121	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V200	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V201	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V205	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	


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V206	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V225	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V235	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V236	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V237	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V240	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V241	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V246	AE BZX79B3V3 2% 0.5W ZDI ZENER	AE 0008.7704.00	PHILIPS_SE	BZX79B3V3	
V255	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V256	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V270	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V275	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V276	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V277	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V278	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V285	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V286	AE BB809 26/ 6PF CDI TUNING DIODE	AE 0092.9616.00	VALVO	BB809	
V290	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V300	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V305	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V320	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V321	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V330	AK BFR91A N 12V 35MA TRANSISTOR	0644.0730.00	VALVO	BFR 91A	
V423	AE BZV86/2V6 STABISTOR ZENER DIODE	AE 0086.8292.00	PHILIPS_SE	BZV86-2V6	
V424	AE BZV86/2V6 STABISTOR ZENER DIODE	AE 0086.8292.00	PHILIPS_SE	BZV86-2V6	
V430	AE BB621 11/ 2PF CDI TUNING DIODE	0840.6188.00	ITT-SEMICO	BB621	
V434					
V440	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V455	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V460	AK BFR96S N 15V 100MA TRANSISTOR	0644.0830.00	VALVO	BFR 96S	
V470	AM BF963 20V N-D DG MOSF DUALGATE MOSFET	2020.4704.00	SIEMENS	BF963 (Q62702-F937)	
V471	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V480	AE BZX79/B5V6 0,5W ZDI ZENER DIODE	AE 0012.5254.00	VALVO	BZX79B5V6	
V494	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
W1	DV KABEL W1 CABLE	0819.7366.00			
X1	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
X71	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X81	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X94	FJ EINBAUKABELSTECKER SMB CONNECTOR	FJ 0063.7631.00	IMS	81.1213.311	0819.7366.00

MENP5	502 3PUA	AI	Datum Date	Sachteiliste für Parts list for	Sachnummer Stock No	Blatt-Nr. Page
	39	04.02.98	EE SUMMIERSCHLEIFEN SUMMING LOOPS	0819.7166.01 SA	16+	

095 0026-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
X101	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X17A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X17B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X24A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X24B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X29A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X29B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X31A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X31B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X31C	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X31D	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X42A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X42B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X45A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X45B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X46A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X46B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X47A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X47B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X70A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X70B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X70C	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X70D	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X75A	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	
X75B	VL WIRE-WRAP PIN L=8,7 WIRE-WRAP PIN	0088.4507.00	DUPONT CON	75403-001/75401-001	

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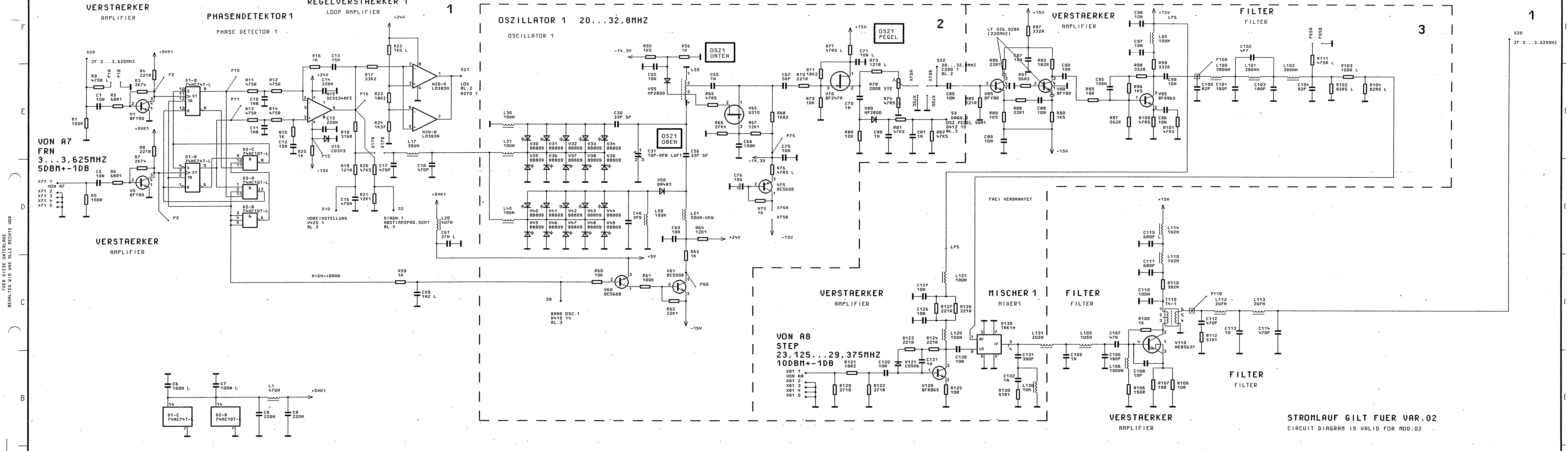
Äi Datum
Date
04.02.98

Schaltteilliste für
Parts list for
EE SUMMIERSCHLEIFEN
SUMMING LOOPS

Sachnummer
Stock No.
0819.7166.01 SA

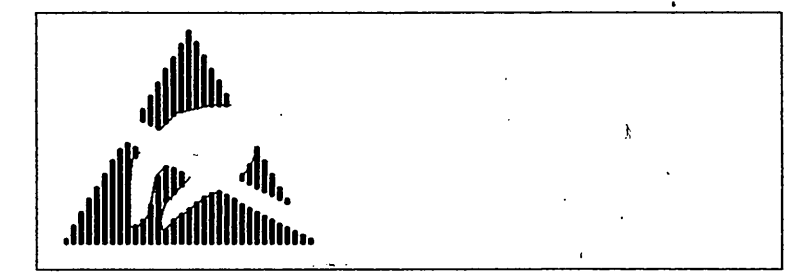
Blatt-Nr.
Page

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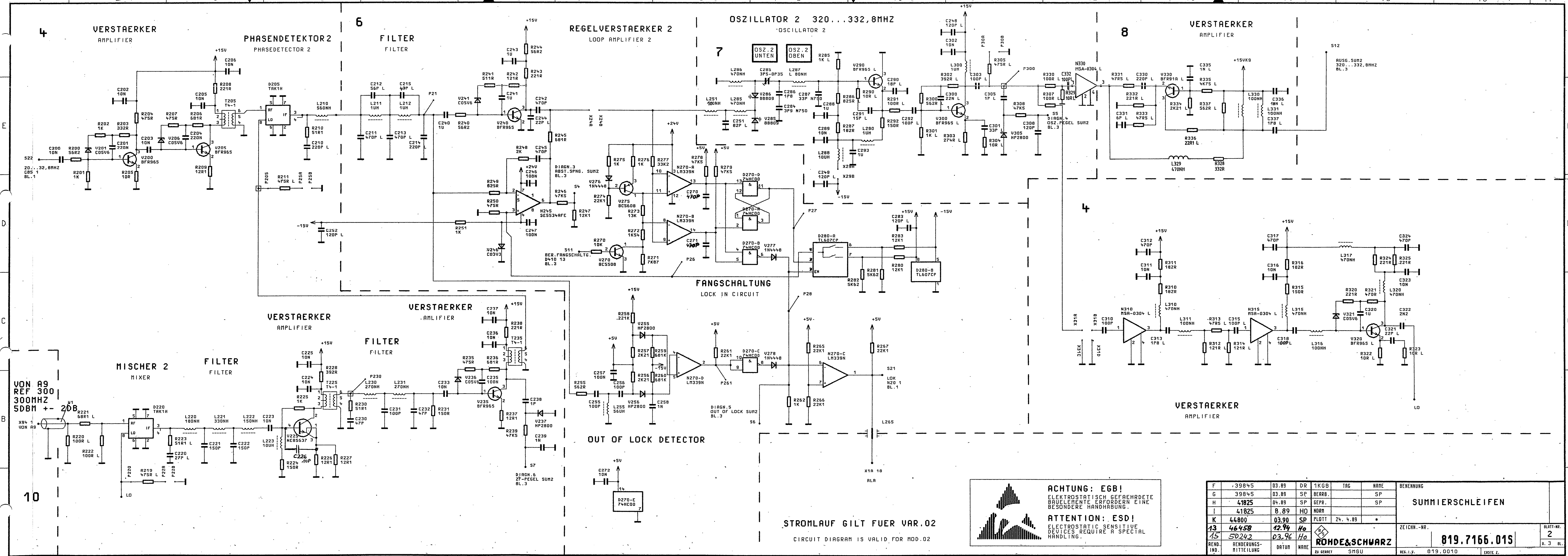


FÜR DIESE ANLEGE
 BEHALTEN WIR UNS ALLE RECHTE VOR

ZEICHN.-NR.



14/	S0242 01	06.07.95	HO	16PK	TAG	NAME	BENENNUNG
				BEARR.		HO	SUMMIERSCHLEIFEN
				GEPR.			
				NDR			
				PLOTT.	08.11.95		
1/				ROHDE & SCHWARZ ZU GERÄT SMGU			ZEICHN.-NR. 819.7166.015
REND. IND.	RENDERUNGS-MITTEILUNG	DATUM	NAME				REG.-I.V. 819.0010 ERSTE Z.
							BLATT-NR. 1+



STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDLUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

F	39845	03.89	DR	1KGB	TAG	NAME	BENENNUNG
G	39845	03.89	SP	BEARB.		SP	
H	41825	04.89	SP	GEPR.		SP	
I	41825	8.89	HO	NORM			
K	44800	03.90	SP	PLOTT	24.4.89	*	
13	46458	12.94	Ho				
15	50242	03.96	Ho				

REND. IND. HENDRINGS- MITTEILUNG DATUM NAME

ZU GERÄT SMGU

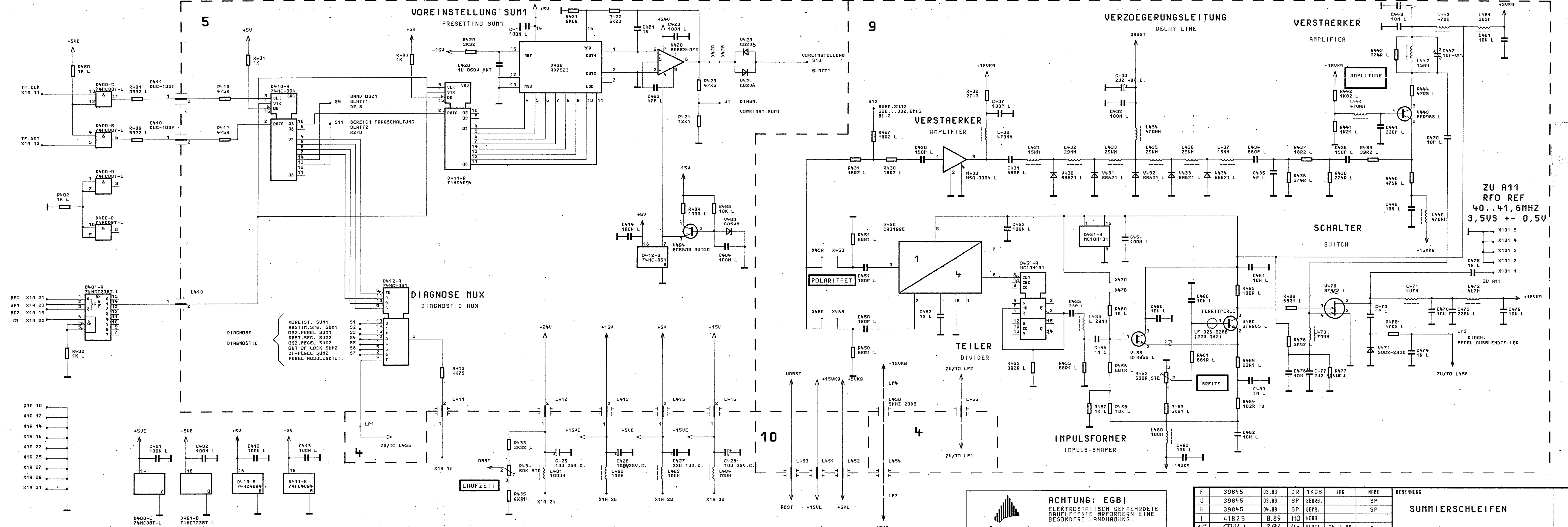
ROHDE & SCHWARZ

REG. I. V. 819.0010 ERSTE Z.

ZEICHN.-NR. **819.7166.015**

BLATT-NR. **2**

V. 3 BL.



STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDENE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.
ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
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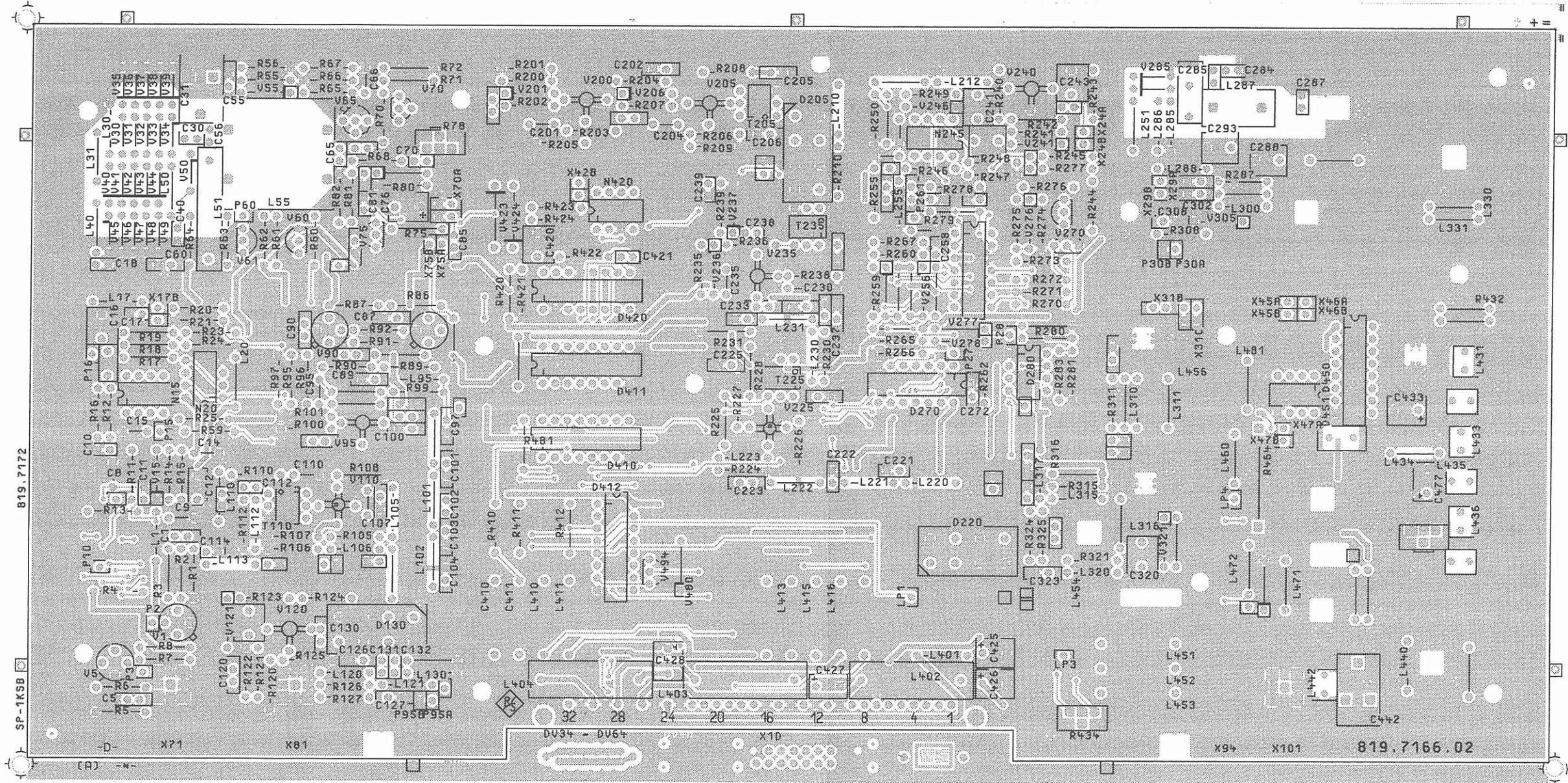
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G	39845	03.89	SP	BEARB.		SP		
H	39845	04.89	SP	GEPR.		SP		
I	41825	8.89	HO	NDRN				
15	50242	3.96	HO	PLOTT	24. 4.89	*		
							ZEICHN.-NR.	BLATT-NR.
							819.7166.015	3
RENDR.	RENDRUNGS- MITTEILUNG	DATUM	NAMEN	ZU. GERÄT	SMGU	REG. I. V.	819.0010	ERSTE Z.

ZU A11
RFO REF
40.41,6MHZ
3,5VS +- 0,5V

ZU A11
DIRGN.
PEGEL AUSLENDEITER

3
v. 3. BL.

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side





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VARIANTENERKLÄRUNG / VERSION
VAR 02 - GRUNDAUSFÜHRUNG / BASIC MODEL

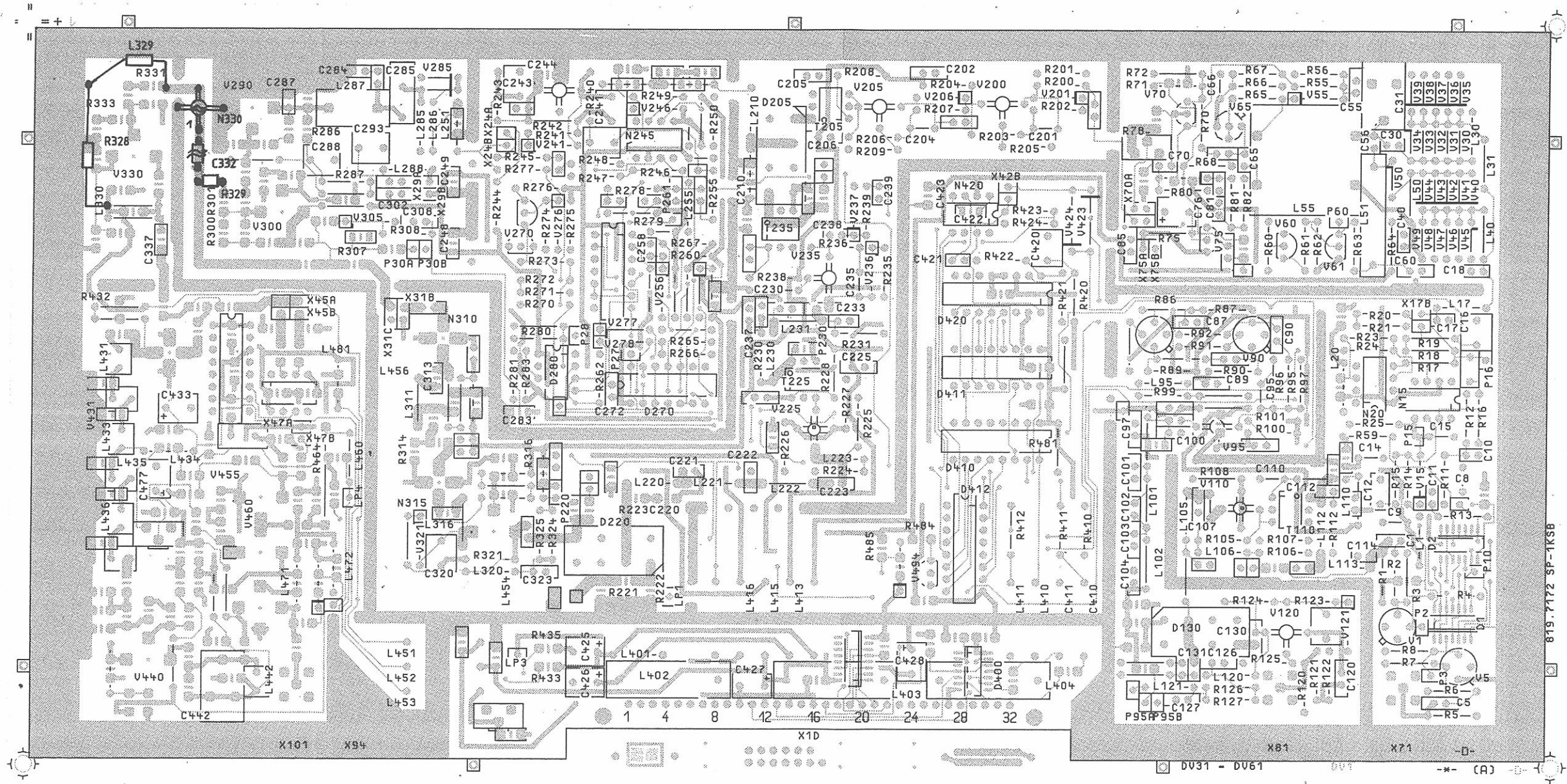
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					Halbzeug, Werkstoff		
				1KGB Tag Name	Benennung	Z	
				Bearb. 04.89 SP	SUMMIERSCHLEIFEN		
				Gepr.			
				Norm			
					Zeichn.-Nr.	Blatt-Nr.	
					819.7166.02	2	
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	zu Gerät SMGU	reg. i. V. 819.0010 V	v. Bl.	
					erste Z.		



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

 Leiterbahntrennung
 Lötstellen

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



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VARIANTENERKLÄRUNG / VERSION
VAR 02 - GRUNDAUSFÜHRUNG / BASIC MODEL

H	41825	04.89	SP	Maße ohne Toleranzangabe	Maßstab 1 : 1	Halbzeug, Werkstoff
L	44800	03.90	SP			
Bearb.	1KGB	Tag	Name	Benennung	Z	
Gepr.	04.89		SP			
Norm						
And. Zust.	Anderungs-Mitteilung	Tag	Name	Zeichn.-Nr.	Blatt-Nr.	
				819.7166.02	3	
				zu Gerät SMGU	v. Bl.	
				reg. i. V. 819.0010 V	erste Z.	



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ROHDE & SCHWARZ

SERVICE DOCUMENTS

RF-Oscillators

819.8262.02

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Component layout diagrams

5 Service Manual "RF Oscillators"

5.1 Function Description

(See circuit diagram 819.0010 FS)

The RF oscillator subassembly contains the three oscillators for the frequency band from 1000 to 2160 MHz from which the output signal is derived. The subassembly also contains the associated presetting and synchronization circuits.

A pulse train with a frequency of 40 to 41.6 MHz and a peak voltage of approx. -3 V is applied by subassembly A10 (summing loops) to input X101. The oscillators must be synchronized to the 25th to 53rd harmonics of this pulse train.

A 200-ps pulse is generated using a step recovery diode. The pulse train is fed into a harmonic mixer (sampler) acting as a phase detector for the PLL of the RF oscillators. Since synchronization would be possible at any input signal harmonic, a presetting circuit forces the oscillator to synchronize at the correct harmonic. This is achieved using a programmable divider - whose division ratio corresponds to the order of the desired harmonic - and using two frequency ramp circuits. The fast circuit ignores possible locking points of the PLL, the slow circuit does not.

If the oscillator is to be synchronized to a new harmonic, the fast frequency ramp is activated until just before the new harmonic is reached. The slow frequency ramp then takes over until the PLL has locked-in. This is determined by a circuit which constantly monitors the output voltage of the phase detector and which switches off the presetting circuit following a short protection time.

5.1.1 Oscillators

(Circuit diagram 819.8262, sheet 1)

The three oscillators (negative impedance type, V5, V25, V55) are turned on by the signals ENA.051 to ENA.053 and are each stabilized at the operating point by a current injection circuit. The oscillator which is on is connected by means of a diode (V8, V28, V58) to the RF driver V72 which distributes the signal to the PLL driver (N125 ff), the RF divider (D71) and the output (N73, X111).

5.1.2 PLL

(Circuit diagram 819.8262, sheet 2)

The RF signal from the oscillators (RF.PLL) is applied to the sampler via the four-stage PLL driver. The RF level ahead of the sampler is measured by the detector V128 (V129 for temperature compensation) and kept constant by means of the control amplifier N128 and the PIN diodes V125.

The pulses from the summing loops (A10) are limited and amplified by the pulse driver V102. V103 generates a bias current which can be adjusted using R106 (SRD BIAS). The step recovery diode V104 can thus be triggered and supplies the sampler with 200-ps pulses via the balancing transformer T102.

The output voltage of the sampler is applied to the integrator via the voltage follower V160. A dual transistor is used for stability. The sampler and amplifier offsets are compared at the second transistor (V160-B) by means of R164 (OFFSET). The asynchronous detector is fed via V161 (IF) and the input capacitance of V160-A is compensated (C163).

The currents (PRE.INT) from the presetting circuit are fed to the integrating capacitor C168 giving a voltage ramp which results in a frequency change.

The pull-in slopes of the oscillators are adjusted using the trimming potentiometers R202 to R204 (FMAX: OS1 OS2 OS3) in the control voltage switch. The emitter follower V183 is followed by a bandwidth selector (V184, V185) for the PLL. The small bandwidth gives better spectral purity, the large bandwidth enables large FM deviations with high modulation frequencies. The capacitor C174 is charged rapidly by means of V450 when changing the harmonic.

5.1.3 Monitoring and Presetting Circuit

(Circuit diagram 819.8262, sheet 3)

The output voltage of the sampler (IF) is applied to the asynchronous detector (D180 to D182) via a lowpass/highpass combination. D180 A-B is a Schmitt trigger circuit, D181 and D182 give a "time threshold" so that only signals with frequencies above 1 MHz trigger the asynchronous detector. This prevents an FM signal from resulting in incorrect triggering. D181-B delivers the signal ENA.DIV for turning on the presetting circuit and delaying turning off the presetting circuit so that the PLL does not unlock again during the switching process. The processor switches the presetting circuit on via D180 C-D if the harmonic is changed. This ensures that a new setting is triggered even when frequency jumps of exactly one locking point occur.

In order to force synchronization to the correct harmonic, an appropriate division factor is set on a programmable divider (M divider, D202 to D204). The output of this divider is compared with the frequency from the 40-MHz divider (D205, D206) - the pulse frequency from input X101 divided by 32 - by means of the difference frequency detector D208 A-B. The output voltage from this detector is evaluated by a window comparator (N201) and leads to application of a large current in the appropriate direction (fast ramp) to the integrator until the difference in frequency is so small that the voltage is within the window again.

There is a digital/analog directional detector (D207, D209-C, N200) in parallel with the analog difference frequency detector.

The output voltage of the directional detector changes the logic level if the frequencies are the same and controls the direction of the slow ramp which brings the frequency into the capture range of the PLL.

The PLL then locks, the signal of the detection circuit drops and the ramp currents and dividers are switched off again after the delay provided by D181-B.

5.1.4 Data Transmission, Power Supply

(Circuit diagram 819.8262, sheet 4)

The data (TF.DAT) and clock (TF.CLK) lines of the serial data bus are buffered by D350 and supply the latches D212 and D213. The data is transferred on the positive slope of the strobe which is decoded in decoder D351 from the subassembly address (BA0 to BA2) and the group line (G0).

Eight test points on the subassembly can be connected to the diagnostics line TST (X11A17) by means of D214 (diagnostics multiplexer). The alarm detector N350 and the asynchronous detector (V190, sheet 3) can set the alarm line ALA (X11A18), and the status LED on the front panel then flashes to signal the faulty function. Fault 47 is displayed during the status poll if the processor finds that the subassembly is faulty by means of its diagnostics routine.

The attenuator control (N202) generates the control voltages for the attenuators and diode switches on sheet 1. V350 powers all integrated RF amplifiers on the subassembly.

5.2 Testing and Adjustment

All results without tolerances must be considered as approximate values. Unless otherwise stated, voltages are DC voltages.

The Service Kit SMGU-Z1 contains an adapter for making connections to the subassembly. The adapter is plugged into the chassis instead of the subassembly and the RF connections made again to the female connectors on the base. The subassembly can then be plugged onto the adapter.

The kit also contains a probe which can be connected to a plug on the top right-hand edge of subassembly A5 (processor) and which enables special function 101, DC voltage measurements in the range -40 to +40 V. The result is output in the level display and can be polled via the IEC bus.

5.2.1 Oscillators, RF Driver, RF Divider (sheet 1)

5.2.1.1 Testing and Adjustment of the Oscillators

The first oscillator is switched on at the frequency setting RF 1200 MHz, the second oscillator at RF 1600 MHz and the third at RF 2 GHz. The other two oscillators are switched off in each case.

Using the 1st oscillator as an example, the data for the oscillator when switched on and off are listed below. These values should be found for the other two oscillators.

Signal at	Measured value "On"	Measured value "Off"
ENA.OS1 D215-A/14	>2,5 V (High)	<0,8 V (Low)
UB.OS1 P1	-14,5 V	0,8 V
Emitter V6	-12 V	
Emitter V5	-5 V	
Emitter V7	-5,7 V	
Output N1	4,5 V	4,5 V

Oscillator adjustments

Pull out jumper X161 and connect a DC voltage source (0 to 25 V) to X160/2. Connect a spectrum analyzer with synthesizer tuning and frequency counting function to output X111.

First set the lower cutoff frequency with a DC voltage of 1.8 V, and then the upper cutoff frequency with a DC voltage of 21 V for each oscillator.

Adjustment table

	f(1,8 V)	at	f(21 V)	at
Oscillator 1	1000 MHz	C1	1400 MHz	R202
Oscillator 2	1400 MHz	C21	1800 MHz	R203
Oscillator 3	1800 MHz	C51	2170 MHz	R204

The screening cover on the component side must be screwed on during the adjustment.

Check each oscillator over the whole tuning range for sidebands and increased noise using the spectrum analyzer (spans same as tuning range). These effects may be caused by faulty oscillator capacitors and the output stage.

5.2.1.2 RF Driver

Independent of the setting:
 Emitter V72 560 mV
 Collector V72 7 V

5.2.1.3 RF Divider

The divider is switched on at a frequency setting of RF 800 MHz and off at RF 1200 MHz.

Signal at	Measured value "On"	Measured value "Off"
SWI.DIV P209	13 V	-13 V
SWI.RAN P210	13 V	-13 V
D71/1	4,8 V	0 V
N71..73/3	4,5 V	4,5 V

5.2.1.4 Testing the RF Path up to the Output

A qualitative test is possible on the spectrum analyzer using an RF probe. It is essential to ensure that the ground connection is short and of low impedance (copper band).

The gain of the integrated amplifier MSA 0404 should be approx. 6 dB, that of MSA 0304 approx. 8 dB.

The level at the collector of the RF driver should be 7 to 10 dBm.

The level at output X111 should be between 3 and 9 dBm.

5.2.2 PLL (sheet 2)

5.2.2.1 PLL Driver

N125 to 127/3	4.5 V
Collector V127	7 V
Emitter V127	560 mV

Special diagnostics function 150 must indicate a constant voltage at all frequency settings (range 0 to 110 mV).

Output N128/6 must remain in the range from 0.8 to 12 V at all frequency settings.

5.2.2.2 Pulse Driver, Adjustment of R106

There must be no current at V102 if an input signal is not applied (voltage at emitter < 150 mV).

The voltage at collector V103/1 should vary from approx. 1 to 11 V when potentiometer R106 is rotated through its complete range.

The low-voltage end of R121 should be 1.15 V and -1.15 V at R114.

Adjustment of SRD bias using R106

A correctly set input signal (see subassembly A10, summing loops) must be present at input X101 with a frequency setting of RF 1020 MHz. The test voltage of the diagnostics detector V105 can be displayed using special function 155.

R106 should be set such that this voltage is a maximum; the maximum must be above 3 V.

5.2.2.3 Sampler, Adjustment of R152

Pull out jumper X161 at a frequency setting of RF 1200 MHz and connect a variable DC voltage source to X160/2. Observe the voltage at P159 (emitter of V161) on an oscilloscope and slowly vary the DC voltage from 0 to 22 V.

The IF voltage should reach a maximum of 600 to 800 mV (V_{pp}) approx. every 2 V. The trace should be sinusoidal. Large changes in the slope must not take place, especially at zero crossings.

Repeat the measurement with frequency settings of RF 1600 MHz and RF 2 GHz.

The nominal IF level value is set at R152. The control voltage must be checked after the adjustment (cf. section 5.2.2.1).

Distortions occurring even with low levels indicate a fault in the RF amplifiers whereas level frequency response is the result of a malfunction in the pulse driver or sample bridge circuits, provided that the PLL driver functions correctly (cf. section 5.2.2.1).

5.2.2.4 Voltage Follower, Adjustment of R164

The source voltages of V160/1 and /7 should be between 1 and 3 V without a signal at X101.

Offset checks and adjustments using R164

Requirement: correct signal at input X101, the SRD bias (see above) should already have been adjusted using R106.

Preparation: pull out jumpers X122, X161 and X166, connect X165/2 to ground so that the presetting circuit does not respond.

The voltage at V187 can now be measured using special function 153 and recorded as the reference. Then measure the voltage at V169 using special function 154 and adjust to the same value using R164 (offset) if there are deviations > 30 mV. Insert the jumpers again.

5.2.2.5 Integrator

Correct functioning of the integrator can be tested when you adjust the offset using R164 (see above). Connect an oscilloscope or voltmeter to X160/1 and observe how the output voltage jumps between -4 and +23 V when R164 is adjusted.

Voltage at C167: -5 V

The voltages at the emitter of the current sources V168 and V170 must be approx. 1 V above the voltage at C167.

The voltage drop across R180 and R181 should be approx. 100 mV.

5.2.2.6 Control Voltage Switch

One of the three lines UB.OS1 to UB.OS3 is connected to -15 V depending on which oscillator is selected (see 5.1.1), and the associated transistor V178 to V180 goes off so that the gate-source voltage of the corresponding field-effect transistor V175 to V177 is zero, and the transistor is then on. The gate voltage goes to -15 V for the other field-effect transistors so that they go off (test points P161 to P163).

5.2.2.7 Bandwidth Selector

V184 must conduct (gate at 0 V) and V185 must be off (gate at -13 V) in CW mode (FM OFF). The reverse is true in FM mode. V450 is normally off (gate at -13 V) and only conducts for the duration of the fast frequency ramp (max. 200 μ s) when the frequency is switched over.

5.2.2.8 Measuring the Transfer Function

The transfer function need only be measured if there are problems with the settling time or if the status LED starts flashing with large FM spans although all other parts of the circuit are operating correctly.

To measure the transfer function, a 10-k Ω resistor must be connected in parallel with the integrating capacitor C168 so that a DC operating point can be set.

Then disconnect the cable from X101, remove jumper X166, connect X165/2 to ground; X161 remains inserted.

Set operating point by adjusting R164 until approx. 1 to 3 VDC are present at P160.

The supply at V160/2 is 100 mVrms free of DC voltage components. The measurement is made at the cathode of V186 using a high-impedance probe with an input capacitance <40 pF.

The voltage measured at 1 kHz must be between 700 and 1100 mVrms and is the reference value for the transfer function.

Table of nominal values for the transfer function

Frequ./Hz	100	1k	1,8k	3,2k	5,6k	10k	18k	32k	56k
dB / FM EXT	0	-3,5	-8	-12	-18	-22	-24	-25	-25
dB / FM OFF	0	-3,5	-8	-12	-18	-25	-30	-35	-40
Frequ./Hz	100k	180k	320k	560k	1M	1,8M	3,2M	5,6M	10M
dB / FM EXT	-27	-30	-34	-37	-37	-37	-36	-35	-34
dB / FM OFF	-44	-46	-47	-48	-50	-52	-54	-55	-55

Remove the resistor when the measurements are complete and reset the offset correctly (see above).

5.2.3 Asynchronous Detector, Presetting Circuit (sheet 3)

5.2.3.1 Selection of Presetting Circuit

All dividers are switched off during synchronization, the ENA.DIV signal is low and P200 is at 0 Volt. The complete presetting circuit is continuous set in operation by repositioning jumper X166 to position 2-3 ("Divider on").

The PLL can now be disconnected by pulling jumper X161 (sheet 2) and the VCO can be tuned with a DC voltage applied to X160/2 (sheet 2). The set frequency is monitored using a frequency counter or spectrum analyzer at output X111.

The tuning range of the oscillators is shifted when the subassembly is open, and therefore at least the resonator chambers must be closed to test all settings.

Voltage at P200:

Jumper to X165 2-3 (divider on): 4.8 V
X165/2 to ground (divider off): 0 V

All following measurements are carried out in the position "Divider on".

5.2.3.2 RF Predivider, M Divider

With a frequency setting of RF 1015 MHz, also set this frequency at output X111 using the DC voltage at X160/2.

Using the spectrum analyzer and RF probe, test the divider stages up to D202/1 where the frequency must be 31.719 MHz. The frequency at P202 must be 1.26875 MHz. If the RF setting is now increased in steps of 40.6 MHz up to 2151.8 MHz and the corresponding frequency set each time at the output using the DC voltage, the frequency of 1.26875 MHz must always be present at P202.

5.2.3.3 40-MHz Divider

The signal at input X101 must be correct and the adjustment of the SRD bias using R106 (5.2.2.2) must have been carried out.

<0.8 V and >2.5 V must be achieved for the low and high levels respectively at the divider input D205/3 (40 MHz, use a suitable oscilloscope with appropriate probe). The frequency at P203 must be 1.26875 MHz with the frequency set to RF 1015 MHz.

5.2.3.4 Frequency Detector and Direction Detector

Testing and adjustment of frequency detector (F-DT.NULL) using R295.

The output frequency of the 40-MHz divider is applied to both inputs of the frequency detector by moving jumper X200 to position 2-3.

Approximately equal DC voltages of approx. 2.5 V must then be present at test points P206 and P207. Then set the voltage (P158) to 0 ± 20 mV using R295.

There should be a voltage of $+0.32 \pm 0.01$ V at pin 2 on comparator N201 and a voltage of -0.32 ± 0.01 V at pin 12.

Reinsert jumper X201 at position 1-2. With the frequency set to RF 1218 MHz, set the output frequency to the same value again using the applied DC voltage

Both comparator outputs N201/4 and /9 must be high (>2.5 V), the switches D211C and D block and there should be approx. 1.5 V at P208.

If the oscillator frequency is now offset in both directions using the DC voltage, the voltage at the direction detector P204 must vary between +4.7 and -0.7 V and must change at P205 from +15 to -13 V. The output N201/4 must jump to low at approx. +13 MHz, and output 9 at -13 MHz. The associated switch D211-D or C must be active in each case so that +15 V are present at P208 in the first case and -13 V in the second case.

5.2.3.5 Asynchronous Detector

The asynchronous detector is tested using the same setup.

The same frequency (RF 1218 MHz) is set again at the output using the applied DC voltage, and then detuned.

When detuned by more than 500 kHz, square-waves with an amplitude of 5 V_{peak} must be measured at the Schmitt trigger D180 using the oscilloscope at P164. The signal SYN at P165 must only jump to low at frequency differences above 1 MHz, which would cause the output signal of D181-B (at X165/1) to go high. If the frequency is detuned further until at a difference of 39.6 MHz the capture range of the adjacent locking point is reached, the signal at X165/1 must decrease while this is being done especially in the range around 20.3 MHz.

5.2.4 Data Transmission, Power Supply (sheet 4)

5.2.4.1 Data Transmission

The LSB of the lowest byte is the first to be transmitted. D212 therefore contains byte 2 and D213 contains byte 1 of the data record. The LSB of each byte is applied to Q8 (pin 11) of the corresponding latch, the MSB to Q1 (pin 4). See Section 5.4 for the settings and data.

5.2.4.2 Oscillator Decoder

The oscillator decoder selects one of the three oscillators.

RF setting	ENA.OS1	ENA.OS2	ENA.OS3
1200 MHz	1	0	0
1600 MHz	0	1	0
2000 MHz	0	0	1

"1" corresponds to 5 V, "0" corresponds to 0 V

5.2.4.3 Divider Controller

The RF divider is switched on at frequencies above 1 GHz only during the settling period, it is always on below this value.

To check the sweep mode, select RF SPAN and set SPAN 10 MHz, STEP 10 MHz, TIME/STEP 10 ms. The signal at P210 must be -13 V at a centre frequency RF/CF of 1400 MHz, and the voltage at P209 must jump from -13 to +13 V for approx. 0.4 ms each time the frequency changes. Both signals must remain constant at +13 V if an RF/CF of 700 MHz is now set.

5.2.4.4 Alarm Detector

The threshold voltages are 0.18 ± 0.005 V at N350/3 and 4.85 ± 0.1 V at N350/6.

To check the comparator, disconnect the cable from input X101, remove jumper X161 and apply a DC voltage to X160/2. The output N350/1/7 must go low (< 0.8 V) at voltages below approx. 0.5 and above approx. 22 V.

5.2.4.5 Power Supply

Collector	V350	11.5 V
Base	V350	8.2 V
Emitter	V350	7.5 V

5.2.5 Checking the Closed PLL

All plug-in jumpers must be set to their normal positions (see 5.5); select the sweep mode CF SPAN by entering the following: SPAN 5 MHz, STEP 5 MHz, TIME/STEP 10 ms. Start the sweep with AUTO at RF 1 GHz. The resonator chambers must be closed.

Fig. 5.2-1 shows a typical frequency jump when an oscillator changeover occurs and the largest jump in the tuning voltage. The following events are indicated:

- 1 Strobe connected to subassembly, trigger point
- 2 Switch-on of ramp currents and accelerator V450
Switching-over to small control bandwidth
- 3 Switch-off of fast ramp and accelerator
Switching-over to large control bandwidth
- 4 PLL locks
- 5 Switch-off of presetting circuit, switching-over to small control bandwidth when FM OFF.

Typical times:

1-2	25 μ s
2-3	0 to 150 μ s (proportional to number of locking points covered)
3-4	0 to 200 μ s
4-5	100 μ s

A storage oscilloscope is ideal for recording the waveforms in Fig. 5.3-1 so that the timing of a single transient can be determined. The oscilloscope is triggered externally by the subassembly strobe which can be tapped at the feed-through filter Z352 (sheet 4). The RF setting should be increased in steps of 40 MHz up to 2120 MHz in order to check all possible locking points. The settling time must not be longer than 500 μ s (typically 350 μ s), the fast change in the control voltage at X160/1-2 must not take more than 200 μ s.

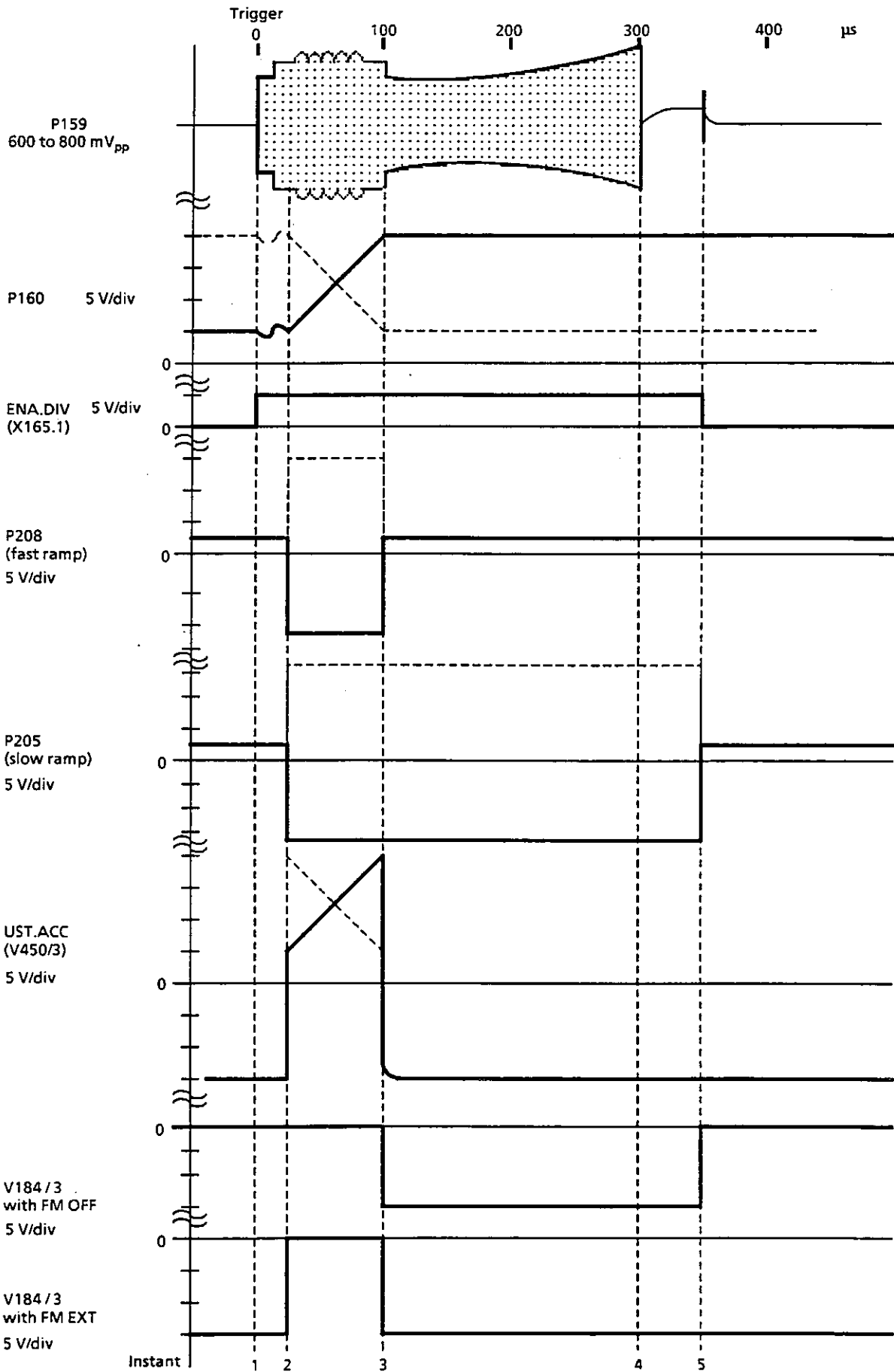


Fig. 5-2 Settling time traces

5.3 General Information, Troubleshooting

5.3.1 Switching Hysteresis

Harmonics and oscillator switchover has a hysteresis of 0.5 MHz. The 25th harmonic is used e.g. from 1000 to 1040.5 MHz, the 26th from 1040 to 1080.5 MHz. The RF divider is turned on at 1000 MHz and off at 1000.25 MHz.

5.3.2 Special Service Functions

All synthesized frequencies used in the device can be output on the RF/CF display using the service functions 78 to 85. The RF display appears when any other key is pressed.

Special function	Display
82	Frequency at input X101
83	Division factor for M divider (harmonic)
84	RF division factor
85	Oscillator frequency

The RF divider (sheet 1) is switched on at all RF division factors ≥ 2 , it is switched off with a division factor 1.

5.3.3 Troubleshooting

To locate a fault, first examine the frequency settings at which faulty signals occur. Use a spectrum analyzer connected to output connector X111.

- Frequency settings 1001 to 2159 MHz:

The frequency does not change:

Check data transmission (5.2.4).

There are only 3 different frequencies:

Check sampler, integrator and presetting circuit (5.2.3), divider controller (5.2.4.3) and RF divider (5.2.1.3).

No signal in one or two thirds of the range:

Check oscillator decoder (5.2.4) and oscillators (5.2.1).

Sidebands and flashing status LED at ends of oscillator range:

Readjust oscillators (5.2.1.1).

Sidebands and flashing status LED in smaller ranges, frequency approx. 40 MHz out:

Check data transmission (5.2.4, D213) and M divider (5.2.3.2).

Synchronization errors, large settling time, spurious sidebands and flashing status LED with large FM deviations and high modulation frequency:

Check sampler, integrator, control voltage switch and bandwidth switch, measure transfer function (5.2.2).

Frequency correct, level too low:

Check RF path (5.2.1.4).

- No signal at frequency settings below 1 GHz, ok otherwise:

Check N72 and diode switch V79 from RF divider to output.

5.4 Interfaces

5.4.1 Digital Interface

Strobe G0, subassembly address 2 (010)

Byte	Bit	Function	1	0
Byte 2	D 7	ENA.DIA, switch on diagnostics	Wide M new	Narrow M old
	D 6	MSB, diagnostics, test point address		
	:	:		
	D 4	LSB, diagnostics, test point address		
	D 3	RBW.FST, control bandwidth of PLL		
	D 2	NEW.M, change in M factor		
	D 1	MSB, oscillator selection		
	D 0	LSB, oscillator selection		
Byte 1	D 7	DIV. RF, switch on RF divider	On	Off
	D 6	MSB, M division factor N		
	:	:		
	:	:		
	D 3	LSB, M division factor N		
	D 2	MSB, M division factor A		
	:	:		
	D 0	LSB, M division factor A		

The M factor is expressed in terms of two factors (N and A) and sent to the M divider. The following relationships apply:

$$N = \text{INT}(M/5) \quad A = M - N * 5 + 1 \quad \text{N and A are transmitted in binary form.}$$

Setting table

Frequency / MHz	M	N	A	Osc.		Byte 2	Byte 1	Hex. code
				D1	D0			
1015	25	5	1	0	1	10001101	00101001	8D29H
1055,6	26	5	2	0	1	10001101	00101010	8D2AH
1096,2	27	5	3	0	1	10001101	00101011	8D2BH
1136,8	28	5	4	0	1	10001101	00101100	8D2CH
1177,4	29	5	5	0	1	10001101	00101101	8D2DH
1218	30	6	1	0	1	10001101	00110001	8D31H
1258,6	31	6	2	0	1	10001101	00110011	8D32H
1299,2	32	6	3	0	1	10001101	00110011	8D33H
1339,8	33	6	4	0	1	10001101	00110100	8D34H
1380,4	34	6	5	0	1	10001101	00110101	8D35H
1421	35	7	1	1	0	10001110	00111001	8E39H
1461,6	36	7	2	1	0	10001110	00111010	8E3AH
1502,2	37	7	3	1	0	10001110	00111011	8E3BH
1542,8	38	7	4	1	0	10001110	00111100	8E3CH
1583,4	39	7	5	1	0	10001110	00111101	8E3DH
1624	40	8	1	1	0	10001110	01000001	8E41H
1664,6	41	8	2	1	0	10001110	01000010	8E42H
1705,2	42	8	3	1	0	10001110	01000011	8E43H
1745,8	43	8	4	1	0	10001110	01000100	8E44H
1786,4	44	8	5	1	0	10001110	01000101	8E45H
1827	45	9	1	1	1	10001111	01001001	8F49H
1867,6	46	9	2	1	1	10001111	01001010	8F4AH
1908,2	47	9	3	1	1	10001111	01001011	8F4BH
1948,8	48	9	4	1	1	10001111	01001100	8F4CH
1989,4	49	9	5	1	1	10001111	01001101	8F4DH
2030	50	10	1	1	1	10001111	01010001	8F51H
2070,6	51	10	2	1	1	10001111	01010010	8F52H
2111,2	52	10	3	1	1	10001111	01010011	8F53H
2151,8	53	10	4	1	1	10001111	01010100	8F54H

5.4.2 Diagnostics

Spec. func.	Diag. Addr.	Test point	Measured value	Addr.
149	0	VCO control voltage	1 to 22 V	5
150	1	Level ahead of sampler	0 to 110 mV	1
151	2	Power supply to RF amplifier	7 to 7.5 V	5
152	3	PLL alarm	-50 to 800 mV	2
153	4	Offset of reference	1 to 3 V	4
154	5	Offset of adjustment	1 to 3 V	4
155	6	Pulse amplitude	3 to 10 V	1
156	7	Output level	20 to 200 mV	1

Only voltages below 5 V may be applied to the diagnostics multiplexer. Certain test voltages must therefore be passed through a divider. The division factor is taken into account by the processor. The measured value ahead of the divider is output on the display as shown in the table for the corresponding special function, but a voltage reduced by the division factor is measured on the line TST (X11A17).

5.4.3 Analog Interface

Input/output X11A1-32, 32-contact board connector

Power supply

X11A24 Power supply + 24 V
 X11A26 Power supply + 15 V
 X11A28 Power supply + 5 V
 X11A30 Power supply -15 V

Data transmission (HCMOS logic)

X11A22 Group line G0
 X11A21 Subassembly address BA0
 X11A20 Subassembly address BA1
 X11A19 Subassembly address BA2

X11A11 TF.CLK Clock line for data transmission

X11A13 TR.DAT Data line for data transmission

Monitoring

X11A17 TST Diagnostics line
 X11A18 ALA Low-active alarm line, open collector

X11A1-9 Not connected

All other contacts are connected to ground

Input X101, SMB system

Signal: pulse train with an amplitude of -3 to -5 V_{peak} , pulse width 2 ns, repetition frequency 40 to 41.6 MHz, impedance 50 Ω (see subassembly A10, summing loops).

Output X111, SMB system

Signal: sinewave plus harmonics, amplitude 3 to 9 dBm, frequency 500 to 2160 MHz, impedance 50 Ω .

5.5 Positions of Plug-in Jumpers

Caution:

Before securing, ensure that all jumpers are in their normal positions:

X122 at X121/1 - 2
 X161 at X160/1 - 2
 X201 at X200/1 - 2
 X166 at X165/1 - 2

5.6 Required Measuring Equipment

Spectrum analyzer with synthesizer tuning and frequency counting facility to 2.2 GHz
 (eg R&S FSB)

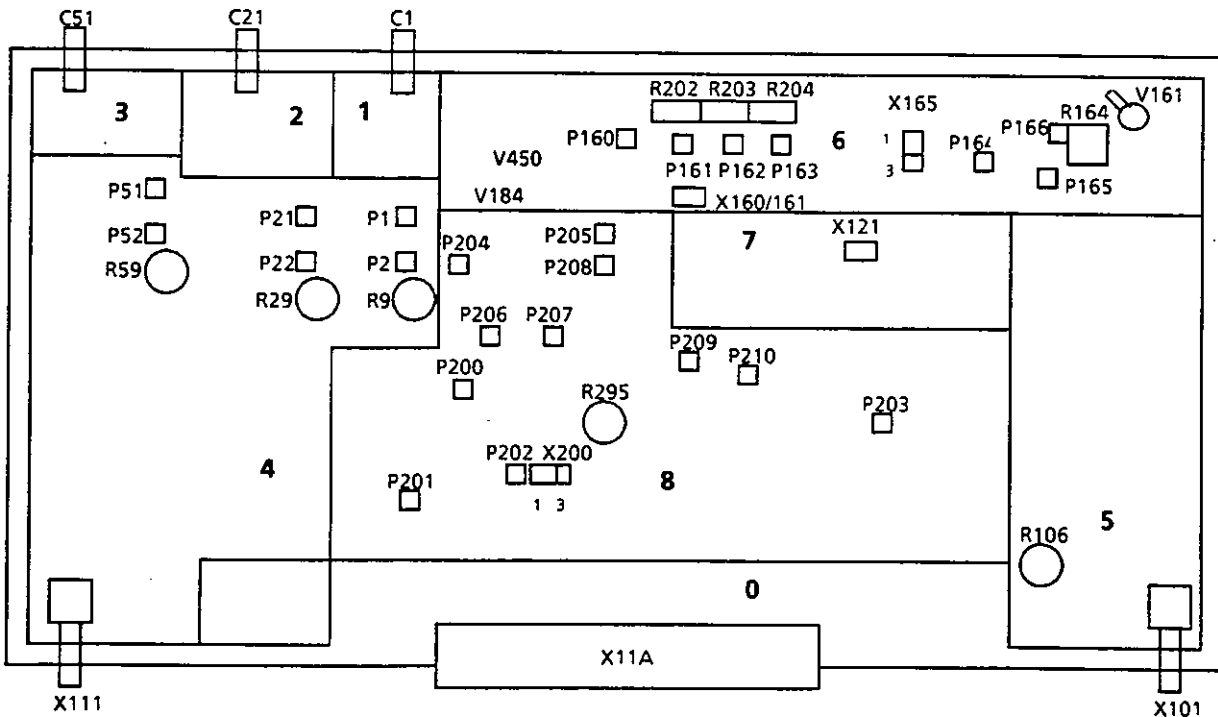
Storage oscilloscope, resolution 50 μ s/div

Oscilloscope, frequency range > 300 MHz

DC voltage source 0 to 25 V
 (eg R&S NGT 35)

Voltmeter
 (eg R&S UDL 33, URE)

Layout diagram





ROHDE & SCHWARZ

Schalteillisten

Stromläufe

Bestückungspläne

Part lists

Circuit diagrams

Components plans

Listes des pièces détachées

Schémas de Circuit

Plans des composants

C


C

C

C


Für diese Unterlage behalten wir uns alle Rechte vor.

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
A111	ED SAMPLERPLATTE SAMPLER BOARD ZUG.STROML. 819.8262 S CIRC.DIAGR. 819.8262 S	0819.8827.02			
C1	CT 9PF TAUCHTR.7RDX13 AIR-TYPE TRIMMER	CT 0249.5095.00	TEKELEC	AT 5202	
C2	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6COG 150F 50PT	
C3	CC 2,1PFO,25PF NPO 0805 CAPACITOR	CC 0093.5550.00	MURATA	GRM40 COG2R2C50PT	
C4	CC 220PF+-10% X7R 0805 CERAMIC CHIP CAPACITOR	CC 0099.8367.00	VITRAMON	VJ0805Y221KXAT	
C5	CC 7,8PFO,25PF NPO 0805 CERAMIC CHIP CAPACITOR	CC 0099.8296.00	PHILIPS_CO	2222 861 14788	
C6	CC 100PF+-10% NPO 0805 CAPACITOR	CC 0082.2948.00	MURATA	GRM40 COG 101 K50PT	
C7	CC 3,6PFO,25PF NPO 0805 CAPACITOR	CC 0093.5614.00	MURATA	GRM40COG3R6C50	
C9	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C10	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C11	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C12	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C13	CC 3,3PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8194.00	MURATA	GRM42-6COG 3R3 C50PT	
C14	CC 2,2PFO,25PF NPO 0805 CAPACITOR	CC 0093.5566.00	MURATA	GRM40 COG 2R2C 50PT	
C15	CC 2,2PFO,25PF NPO 0805 CAPACITOR	CC 0093.5566.00	MURATA	GRM40 COG 2R2C 50PT	
C17	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C18	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C21	CT 9PF TAUCHTR.7RDX13 AIR-TYPE TRIMMER	CT 0249.5095.00	TEKELEC	AT 5202	
C22	CC 10PF+-0,25 50VNPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C50PT	
C23	CC 1PF+-0,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6770.00	PHILIPS_CO	2222 861 15108	
C24	CC 220PF+-10% X7R 0805 CERAMIC CHIP CAPACITOR	CC 0099.8367.00	VITRAMON	VJ0805Y221KXAT	
C25	CC 5,2PFO,25PF NPO 0805 CAPACITOR	CC 0093.5650.00	MURATA	GRM40COG5R2C50PT	
C26	CC 33PF+-10% NPO 0805 CAPACITOR	CC 0082.7340.00	MURATA	GRM40COG330K50PT	
C27	CC 2,7PFO,25PF NPO 0805 CAPACITOR	CC 0093.5572.00	PHILIPS_CO	2222 861 15278	
C29	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C30	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C31	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C32	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C33	CC 2,7PFO,25PF NPO 0805 CAPACITOR	CC 0093.5572.00	PHILIPS_CO	2222 861 15278	
C34	CC 1,8PFO,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6806.00	PHILIPS_CO	2222 861 12188	
C35	CC 1,8PFO,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6806.00	PHILIPS_CO	2222 861 12188	
C37	CC 33PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8780.00	MURATA	GRM42-6COG 330F 50PT	
C38	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C51	CT 0,35/3,5PF RD3,6XL14,3 AIR-TYPE TRIMMER	CT 0037.9553.00	TEKELEC	TL 231/ VERS. B	
C52	CC 6,2PFO,25PF50V NPO1206 CERAMIC CHIP CAPACITOR	CC 0099.8709.00	MURATA	GRM42-COG6R2 C 50PT	
C54	CC 220PF+-10% X7R 0805 CERAMIC CHIP CAPACITOR	CC 0099.8367.00	VITRAMON	VJ0805Y221KXAT	
C55	CC 1,5PFO,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6793.00	PHILIPS_CO	2222 861 12158	

MENP5	502 3PUA	AI	Datum Date	Schaltteilleiste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
		54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	1+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C56	CC 33PF+-10% NPO 0805 CAPACITOR	CC 0082.7340.00	MURATA	GRM40COG330K50PT	
C57	CC 1,8PFO,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6806.00	PHILIPS_CO	2222 861 12188	
C59	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C60	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C61	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C62	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C63	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C67	CC 18PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8767.00	MURATA	GRM42-6COG 180F 50PT	
C69	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C71	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C72	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C73	CC 22NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8467.00	PHILIPS_CO	2238 581 16632	
C74	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C75	CC 1PF+-0,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6770.00	PHILIPS_CO	2222 861 15108	
C77	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C78	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C79	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C80	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C81	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C82	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C83	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C84	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C86	CC 10PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8480.00	MURATA	GRM42-6COG 100 C50PT	
C87	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C88	CC 3,3PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.8194.00	MURATA	GRM42-6COG 3R3 C50PT	
C89	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C90	CC 5,6PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.8220.00	MURATA	GRM42-6COG 5R6 C50PT	
C91	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C92	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C95	CC 1PF+-0,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6770.00	PHILIPS_CO	2222 861 15108	
C97	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C98	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C100	CC 4,7PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.8213.00	MURATA	GRM42-6COG 4R7C 50PT	
C101	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C102	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C103	CC 15PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8750.00	MURATA	GRM42-6COG 150F 50PT	
C104	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C105	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C106	CC 100PF+-10%400V N4700 CAPACITOR	0086.7467.00	DRALORIC	TEFK 7	

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C109	CC 8,2PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8242.00	MURATA	GRM42-6COG 8R2 C5OPT	0819.8827.01
C110	CC 8,2PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8242.00	MURATA	GRM42-6COG 8R2 C5OPT	0819.8827.01
C113	CC 1,8PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8165.00	MURATA	GRM42-6COG 1R8 C5OPT	
C114	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C125	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C126	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C127	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C128	CC 1,8PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8165.00	MURATA	GRM42-6COG 1R8 C5OPT	
C129	CC 1,8PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8165.00	MURATA	GRM42-6COG 1R8 C5OPT	
C130	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C131	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C132	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C133	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C134	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C135	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C136	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C137	CC 22PF+-10%100V NPO 0805 CAPACITOR	CC 0082.2931.00	PHILIPS_CO	2222 861 16229	
C138	CC 22NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8467.00	PHILIPS_CO	2238 581 16632	
C139	CC 22NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8467.00	PHILIPS_CO	2238 581 16632	
C140	CC 1NF+80-20%R4000 TRAP CERAMIC CAPACITOR	0086.7515.00	DRALORIC	TEFK 7	
C141	CC 3,3PF+-0,25 50VNP01206 CERAMIC CHIP CAPACITOR	CC 0007.8194.00	MURATA	GRM42-6COG 3R3 C5OPT	
C142	CC 1PF+-0,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6770.00	PHILIPS_CO	2222 861 15108	
C144	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C145	CC 1PF+-0,25 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8667.00	PHILIPS_CO	2238 863 15108	
C146	CC 47PF+-10% N1500 TRAPEZ CAPACITOR	0263.9694.00	STETTNER	TEFK 7	
C147	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C148	CC 1PF+-0,25PF NPO 0805 CHIP CAPACITOR	CC 0099.6770.00	PHILIPS_CO	2222 861 15108	
C156	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C157	CC 39PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8796.00	MURATA	GRM42-6COG 390F 50PT	
C158	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C160	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C161	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C162	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C163	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C164	CC 3,3NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8909.00	PHILIPS_CO	2238 581 16621	
C165	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C166	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C167	CK 1UF+-5%50V7,5X5,5X10,5 CAPACITOR	CK 0099.2998.00	ERO	MKT 1826-510/054-R	
C168	CK 15NF+-5%63V RD2,5H7MKT CAPACITOR	CK 0099.2875.00	ROEDERSTEI	MKT 1826-315-06-4	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
C169	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C170	CC 330PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8873.00	PHILIPS_CO	2238 863 18331	
C171	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C172	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C173	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C174	CK 33NF+-1% 63V 10QARD. CAPACITOR	CK 0294.6351.00	SIEMENS	B33531-A5333-F	
C175	CK 5,6NF+-1%63V6,3QUX11KP CAPACITOR	CK 0340.9047.00	SIEMENS	B33531-A5562-F	
C176	CC 2,7NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.3228.00	PHILIPS_CO	2238 581 16619	
C177	CC 22PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8396.00	MURATA	GRM42-6COG 220F 50PT	
C178	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C179	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C180	CC 47PF+-1%50V COG 1206 CERAMIC CHIP CAPACITOR	CC 0099.8496.00	MURATA	GRM42-6COG 470F 50PT	
C181	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C183	CC 68PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8815.00	MURATA	GRM42-6COG 680F 50PT	
C184	CC 4,7NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8450.00	PHILIPS_CO	2238 581 16623	
C186	CC 4,7NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8450.00	PHILIPS_CO	2238 581 16623	
C188	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C195	CC 6,8PF+-0,25 50VNPO1206 CERAMIC CHIP CAPACITOR	CC 0007.8236.00	MURATA	GRM42-6COG 6R8 C50PT	
C196	CC 100PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8415.00	MURATA	GRM42-6COG 101F 50PT	
C197	CC 56PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8809.00	MURATA	GRM42-6COG 560F 50PT	
C211	CC 1NF+-1% 50V NPO 1206 SMD CERAMIC CAPACITOR	CC 0007.7398.00	PHILIPS_CO	2222 863 *8102	
C212	CC 270PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8867.00	PHILIPS_CO	2222 863 18271	
C213	CC 120PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8838.00	MURATA	GRM42-6COG 121F 50PT	
C215	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR	CC 0099.8844.00	PHILIPS_CO	2238 863 18181	
C216	CC 180PF+-1%50V NPO 1206 CHIP CAPACITOR TRIMMWERT / SELECTED	CC 0099.8844.00	PHILIPS_CO	2238 863 18181	
C217	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C218	CC 2,2NF+-10%50VX7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8444.00	PHILIPS_CO	2222 581 16618	
C219	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	PHILIPS_CO	2222 863 18681	
C220	CC 390PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8880.00	PHILIPS_CO	2238 863 18391	
C221	CC 82PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8821.00	MURATA	GRM42-6COG 820F 50PT	
C222	CC 680PF+-1% 50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0007.7375.00	PHILIPS_CO	2222 863 18681	
C223	CC 390PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8880.00	PHILIPS_CO	2238 863 18391	
C224	CC 82PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8821.00	MURATA	GRM42-6COG 820F 50PT	
C225	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CO	2238 581 55649	
C240	CC 220PF+-1%50V NPO 1206 CERAMIC CHIP CAPACITOR	CC 0099.8850.00	PHILIPS_CO	2238 863 18221	
C325	CC 10NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0099.8521.00	MURATA	GRM42-6X7R103K 50PT	
C348	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	
C349	LD FILT.40DB/10GHZ10A300V LOWPASS-FILTER	0911.0705.00	SPECTRUM	SCI-9920-101HT	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthaltene in contained in
C350	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C351	CE 100UF+-20%35V RM5 ELECTROLYTIC CAPACITOR	0008.7510.00	PHILIPS_CD	2222 116 90042	
C352	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C353	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C354	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C355	CE 10UF+-20%25V SAL ELECTR.CAPACITOR	CE 0007.3934.00	VALVO	2222 128 36109	
C356	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
C357 .361	CC 100NF+-10%50V X7R 1206 CERAMIC CHIP CAPACITOR	CC 0007.5237.00	PHILIPS_CD	2238 581 55649	
C362	CE 22UF+-20%10V SAL ELECTR.CAPACITOR	CE 0007.3940.00	VALVO	2222 128 34229	
D71	BL UPB581C 2:1 PRESC IC PRESCALER/DIVIDER	0840.6113.00	NEC	(UP)B581C	
D180	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D181	BL PC74HC123 2XMULTIVIB DUAL MONOST.MULTIVIBRATOR	0099.9540.00	PHILIPS_SE	(PC)74HC123N(P)	
D182	BL MM74HC74N 2XD-FLIPFL DUAL D FLIP-FLOP	0571.3171.00	PHILIPS_SE	(PC)74HC74N(P)	
D205	BL 74F74PC 2XD-FLIPFLOP DUAL D-FLIPFLOP	BL 0344.6694.00	PHILIPS_SE	N74F74N	
D206	BL PC74HCT393P BIN COUNT BINARY COUNTER	0377.8909.00	PHILIPS	(PC)74HCT393N(P)	
D207	BL PC74HCT74P 2XD-FF DUAL D-FLIP-FLOP	0571.3436.00	PHILIPS_SE	(PC)74HCT74N(P)	
D208	BL MC54HC4538AJ2XMONOFLOP DUAL RETRIG.MULTIVIBR	0820.3554.00	MOTOROLA	MC54HC4538AJ (NEU)	
D209	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D210	BL MM74HCOON 4X2IN.NAND QUAD 2-INPUT NAND GATE	0571.3194.00	PHILIPS_SE	(PC)74HCOON(P)	
D211	BS DG211CJ 4X ANALOGSCH ANALOG SWITCH	0801.8260.00	SILICONIX	DG211CJ	
D212	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D213	BL PC74HC4094P 8ST.SH.REG 8ST.SHIFT A.STORE REGIST.	0099.9711.00	PHILIPS_SE	(PC)74HC4094N(P)	
D214	BL MM74HC4051N 8CH.AN.MUX 8CH.ANALOG MUX/DEMUX	0099.9670.00	PHILIPS	(PC)74HC4051N(P)	
D215	BL PC74HC238P 3TO8 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
D350	BL MM74HC11N 3X3IN.ANDG TRIPLE 3-INPUT AND GATE	0099.9486.00	PHILIPS_SE	(PC)74HC11N(P)	
D351	BL PC74HC238P 3TO8 L.DEC DECODER/DEMULTIPLEXER	0620.0847.00	PHILIPS	(PC)74HC238N(P)	
D2XX	EE TEILER DIVIDER ERSETZT D200, D201, D202,	0819.4009.02			
L1	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L3	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
.6 L21	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L23	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
.26 L30	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L51	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L53	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
.56 L70	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L71	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L73	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	

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		54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	5+

095.0028-0693

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L74	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	0819.8879.00
L75	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L76	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L77	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L78	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L101	LD 22,0UH10%3,300HMO,114A CHOKE	LD 0067.3024.00	DALE	IM2	
L102	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L103	LD HVB SPULE 12NH COIL	0820.3454.00			
L125	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L126	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L127	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L129	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L130	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L131	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L132	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L133	LD 1,00UH10%1,000HMO,390A CHOKE	LD 0067.2863.00	DALE	IM2	
L160	LD 22,0UH10%3,300HMO,114A CHOKE	LD 0067.3024.00	DALE	IM2	
L161	LD 22,0UH10%3,300HMO,114A CHOKE	LD 0067.3024.00	DALE	IM2	
L162	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L163	LD 0,39UH10%0,300HMO,710A CHOKE	LD 0067.2811.00	DALE	IM2	
L164	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L165	LD 0,56UH10%0,500HMO,550A CHOKE	LD 0067.2834.00	DALE	IM2	
L166	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L167	LD 0,47UH10%0,350HMO,660A CHOKE	LD 0067.2828.00	DALE	IM2	
L168	LD 1,20UH10%0,180HMO,620A CHOKE	LD 0067.2870.00	DALE	IM2	
L169	LD 12,0UH10%2,700HMO,160A CHOKE	LD 0067.2992.00	DALE	IM2	
L170	LD 47,0UH10%4,500HMO,110A CHOKE	LD 0067.3060.00	DALE	IM2	
L200	LD 100NH 10% 0,080HM 1,4A CHOKE	LD 0067.2740.00	DALE	IM2	
L201	LD 0,22UH10%0,140HM1,045A CHOKE	LD 0067.2786.00	DALE	IM2	
L202	LD 2,2MIH 10%99MIA33,80HM CHOKE	0073.1759.00	DALE	IMS-5	
L203	LD 1000UH10%72,00HMO,028A CHOKE	LD 0037.8005.00	DALE	IM2	
L204	LD 150 UH10%15,00HMO,061A CHOKE	LD 0067.3124.00	DALE	IM2	
L205	LD 560 UH10%46,00HMO,035A CHOKE	LD 0067.3199.00	DALE	IM2	
L206	LD 2,2MIH 10%99MIA33,80HM CHOKE	0073.1759.00	DALE	IMS-5	
L207	LD 1000UH10%72,00HMO,028A CHOKE	LD 0037.8005.00	DALE	IM2	
L208	LD 150 UH10%15,00HMO,061A CHOKE	LD 0067.3124.00	DALE	IM2	
L209	LD 560 UH10%46,00HMO,035A CHOKE	LD 0067.3199.00	DALE	IM2	
L350	LD 22,0UH10%3,300HMO,114A CHOKE	LD 0067.3024.00	DALE	IM2	
L351	LD 4,7UH BEI 1,35A0,240HM CHOKE	LD 0026.4084.00	DALE	IM 6	


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
L352	LD 4,7UH BEI 1,35AO,240HM CHOKE	LD 0026.4084.00	DALE	IM 6	
L353	LD 10UH BEI 0,81A 0,660HM CHOKE	LD 0026.4126.00	DALE	IM 6	
L354	LD 100 UH10%8,000HMO,084A CHOKE	LD 0067.3101.00	DALE	IM2	
L355	LD 100 UH10%8,000HMO,084A CHOKE	LD 0067.3101.00	DALE	IM2	
L356	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L357	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L358	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L359	LD 2,20UH10%0,400HMO,415A CHOKE	LD 0067.2905.00	DALE	IM2	
L360	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
L361	LD 4,70UH10%1,200HMO,239A CHOKE	LD 0067.2940.00	DALE	IM2	
N1	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N21	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N51	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N71	BM MSA0304 MMIC BROADBAND AMPLIFIER	0840.6094.00	AVANTEK	MSA0304	
N72	BM MSA0304 MMIC BROADBAND AMPLIFIER	0840.6094.00	AVANTEK	MSA0304	
N73	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N125	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N126	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N127	BM MSA0404 MMIC BROADBAND AMPLIFIER	0822.0075.00	MINI-CIRCU	MAV-4	
N128	BO LF156J FET OPAMP OPERATIONAL AMPLIFIER	BO 0645.7251.00	ANALOG_DEV	PM156Z	
N200	BO LF156J FET OPAMP OPERATIONAL AMPLIFIER	BO 0645.7251.00	ANALOG_DEV	PM156Z	
N201	BO NE521N 2X COMPAR COMPARATOR	0230.5602.00	SIGNETICS	NE521N(SE521F)	
N202	BO TL072ACP 2XFET OPAMP OPERATIONAL AMPLIFIER	0340.6054.00	TEXAS	TL 072 ACP	
N220	BO LF412CN 2XFET OPAMP OPERATIONAL AMPLIFIER	0356.0521.00	NSC	LF412CN	
N350	BO LM393N 2X COMPAR COMPARATOR	BO 0803.0696.00	NSC	LM393N	
P1	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P2	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P21	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P22	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P51	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P52	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P158	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P159	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P160	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
..165	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
P203	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
..210	FP STIFTELEISTE 36P.R2,54 PIN CONNECTOR	FP 0242.3600.00	BINDER	742-11-0179-00-36	
R1	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R2	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	


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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R3	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R4	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R5	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R6	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R7	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R8	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R10	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R11	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R12	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R13	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R14	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R15	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R16	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R17	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R18	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R19	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R20	RG 825 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.7259.00	ROEDERSTEI	D25	
R21	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R22	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R23	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R24	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R25	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R26	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R27	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R28	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R30	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R31	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R32	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R33	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R34	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R35	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R36	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R37	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R38	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R39	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R40	RG 825 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.7259.00	ROEDERSTEI	D25	
R44	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R45	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R46	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R47	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2	
R50	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R51	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R52	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R53	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R54	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R55	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R56	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R57	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R58	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R60	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R61	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R62	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R63	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R64	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R65	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R66	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R70	RG 825 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.7259.00	ROEDERSTEI	D25	
R71	RG 4,75OHM+-1%TK100 1206 CHIP-RESISTOR	RG 0007.8420.00	PHILIPS	RC 02	
R72	RL 0,40W 180 OHM2% UNGEW. RESISTOR	RL 0092.5985.00	DRALORIC	SMA 0204	
R73	RL 0,40W 180 OHM2% UNGEW. RESISTOR	RL 0092.5985.00	DRALORIC	SMA 0204	
R75	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R76	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R77	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R78	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R79	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R83	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R84	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R85	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R86	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R87	RG 15,0 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5450.00	ROEDERSTEI	D25	
R88	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CO	RC02	
R89	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R90	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R91	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R92	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R93	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R94	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R95	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R96	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CD	RC02	
R97	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CD	RC02	
R98	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R99	RG 22,1 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5489.00	ROEDERSTEI	D25	
R100	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R102	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R103	RG 11,0 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8655.00	ROEDERSTEI	D25	
R104	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R105	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R106	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER	RS 0247.7961.00	SPECTROL	63X ... TO10	
R107	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R108	RG 332 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5650.00	PHILIPS_CD	RC02	
R109	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R110	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R111	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R114	RL 0,40W 12,1KOHM+-1%TK50 RESISTOR	RL 0092.1573.00	RESISTA	MK1	
R115	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	0819.8827.01
R116	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	0819.8827.01
R117	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R118	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CD	RC02	
R119	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	0819.8827.01
R121	RL 0,40W 12,1KOHM+-1%TK50 RESISTOR	RL 0092.1573.00	RESISTA	MK1	
R125	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R126	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R127	RG 12,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8661.00	ROEDERSTEI	D25	
R128	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R129	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R130	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R131	RG 18,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5466.00	ROEDERSTEI	D25	
R132	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R133	RG 432 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5689.00	ROEDERSTEI	D25	
R134	RG 432 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5689.00	ROEDERSTEI	D25	
R135	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R136	RG 12,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0841.00	PHILIPS_CD	RC02	
R137	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R138	RG 0,05W 15R +-1% 0805 RESISTOR	RG 0007.8907.00	HONEST_JAP	RN 73 C(E)2X..F (1%)	
R139	RL 0,60W 56,2 OHM+-1%TK50 RESISTOR	RL 0082.9571.00	RESISTA	MK2	
R140	RL 0,40W 180 OHM2% UNGEW. RESISTOR	RL 0092.5985.00	DRALORIC	SMA 0204	

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	ROHDE & SCHWARZ	54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	10+

095.0026-0893

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R142	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R143	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R144	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R145	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R146	RG 332 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6033.00	ROEDERSTEI	D25	
R147	RG 681 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6110.00	ROEDERSTEI	D25	
R148	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R149	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R150	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R151	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R152	RS 0,5W 500 OHM+-20%KURV1 DEPOS.-CARBON POTENTIOMET	RS 0069.8023.00	BI_TECHNOL	82P R500	
R153	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R154	RL 0,40W 180 OHM2% UNGEW. RESISTOR	RL 0092.5985.00	DRALORIC	SMA 0204	
R155	RG 68,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1902.00	ROEDERSTEI	D25	
R156	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R157	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R158	RG 1,0MOHM+-1%TK100 1206 CHIP RESISTOR	RG 0815.7532.00	PHILIPS_CO	RC 02	
R159	RL 0,60W 3,32KOHM+-1%TK50 RESISTOR	RL 0083.0990.00	RESISTA	MK2	
R160	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R161	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R162	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R163	RG 150 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5972.00	ROEDERSTEI	D25	
R164	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T	RS 0247.7903.00	SPECTROL	63 M ... TO 10	
R165	RG 150 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5972.00	ROEDERSTEI	D25	
R166	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R167	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R168	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R169	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R170	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R171	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R172	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R173	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R174	RG 100,0KOH+-1%TK100 1206 CHIP RESISTOR	RG 0007.1948.00	ROEDERSTEI	D25	
R175	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R179	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R180	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R181	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R184	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R185	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	

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		54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	11+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R186	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R189	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R190	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R191	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R192	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R193	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R194	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R195	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R196	RG 10,0 OHM+-1%TK100 1206 CHIP -RESISTOR	RG 0006.8649.00	PHILIPS_CO	RC02	
R200	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	
R201	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R202	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER	RS 0247.7961.00	SPECTROL	63X ... TO10	
R203	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER	RS 0247.7961.00	SPECTROL	63X ... TO10	
R204	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER	RS 0247.7961.00	SPECTROL	63X ... TO10	
R205	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R206	RG 681 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6110.00	ROEDERSTEI	D25	
R207	RG 681 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6110.00	ROEDERSTEI	D25	
R208	RG 681 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.6110.00	ROEDERSTEI	D25	
R209	RG 100 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8884.00	PHILIPS_CO	RC02	
R210	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R211	RD 0,8W2,7KOHM+-1%TK20 WIRE-WOUND RESISTOR	RD 0463.1650.00	TEPRO	TS 1 A ...	
R212	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R213	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R214	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R215	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R216	RG 27,4 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5508.00	ROEDERSTEI	D25	
R217	RG 2,74KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5766.00	PHILIPS_CO	RC02	
R218	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R219	RG 121 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8903.00	ROEDERSTEI	D25	
R220	RG 56,2KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1883.00	ROEDERSTEI	D25	
R221	RG 56,2KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1883.00	ROEDERSTEI	D25	
R222	RG 56,2KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1883.00	ROEDERSTEI	D25	
R223	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R224	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R225	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R228	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R229	RG 47,5 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5566.00	ROEDERSTEI	D25	
R230	RG 68,1 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8849.00	ROEDERSTEI	D25	
R231	RG 1,5 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5714.00	ROEDERSTEI	D25	

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	54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	12+	

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Kannz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R232	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R233	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R234	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R236	RG 12,1KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0841.00	PHILIPS_CO	RC02	
R237	RG 274 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5637.00	ROEDERSTEI	D25	
R238	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R239	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R240	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R241	RG 10,0KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0793.00	PHILIPS_CO	RC02	
R242	RG 15,0KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5843.00	ROEDERSTEI	D25	
R243	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R244	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R245	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R246	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R247	RG 47,5KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5950.00	ROEDERSTEI	D25	
R248	RG 11,0KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0806.00	ROEDERSTEI	D25	
R249	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R250	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R251	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R252	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R253	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R255	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R260	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R270	RG 56,2 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.8826.00	ROEDERSTEI	D25	
R271	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R272	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R275	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R278	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R279	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R280	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R281	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R285	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
..290	RESISTOR CHIP				
R291	RL 0,35W1,82KOHM+-0,1%T25 RESISTOR	RL 0083.9646.00	DRALORIC	SMA0207	
R292	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R293	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R294	RL 0,60W 1,58KOHM+-1%TK50 RESISTOR	RL 0082.2525.00	RESISTA	MK2	
R295	RS 0,3W 500 OHM+-10% CERM. TRIMMING POTENTIOMETER	RS 0006.6675.00	BOURNS	3296W-001-501	
R296	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R297	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R298	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R300 ..303	RL 0,35W10,0KOHM+-0,1%T25 RESISTOR	RL 0084.3064.00	DRALORIC	SMA0207	
R304	RG 150 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5972.00	ROEDERSTEI	D25	
R305	RG 1,0 KO +-1%TK100 1206 CHIP RESISTOR	RG 0006.7271.00	PHILIPS_CO	RC02	
R306	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R307	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R308	RG 182 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5595.00	ROEDERSTEI	D25	
R309	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R310	RG 56,2KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.1883.00	ROEDERSTEI	D25	
R311	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R312	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R313	RG 6,81KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0758.00	ROEDERSTEI	D25	
R315	RG 182 KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5989.00	ROEDERSTEI	D25	
R317	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R318	RG 3,92KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5808.00	ROEDERSTEI	D25	
R319	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R320	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R321	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R322 ..325	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R326	RG 2,21KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5743.00	ROEDERSTEI	D25	
R327	RG 3,32KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5789.00	ROEDERSTEI	D25	
R328	RG 8,25KOHM+-1%TK100 1206 CHIP RESISTOR	RG 0007.0770.00	ROEDERSTEI	D25	
R329	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R330	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R331	RG 1,82KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5720.00	ROEDERSTEI	D25	
R350	RG 4,75KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5820.00	ROEDERSTEI	D25	
R351	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R352	RG 39,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5543.00	ROEDERSTEI	D25	
R353	RG 33,2KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5914.00	ROEDERSTEI	D25	
R354	RG 7,5KOHM+-1%TK100 1206 RG CHIP RESISTOR	RG 0007.0764.00	ROEDERSTEI	D25	
R355	RG 221 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5614.00	ROEDERSTEI	D25	
R356	RG 22,1KOHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5872.00	ROEDERSTEI	D25	
R357	RD 2,4W 10 OHM+-1% WIRE-WOUND RESISTOR	RD 0087.5097.00	TEPRO	TS-2B	
R358	RG 681 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9080.00	ROEDERSTEI	D25	
R359	RL 0,60W 332 OHM+-1%TK50 RESISTOR	RL 0083.0255.00	RESISTA	MK2	
R360	RG 33,2 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5520.00	ROEDERSTEI	D25	
R361	RG 562 OHM+-1%TK100 1206 CHIP RESISTOR	RG 0006.9068.00	PHILIPS_CO	RC02	
R470	RG 475 OHM+-1%TK100 1206 RESISTOR CHIP	RG 0007.5695.00	ROEDERSTEI	D25	
R500	RL 0,40W 2,21KOHM+-1%TK50 RESISTOR	RL 0092.1480.00	RESISTA	MK1	


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	ROHDE & SCHWARZ	54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	14+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
R501	RL 0,40W 2,21KOHM+-1%TK50 RESISTOR NUR WENN ONLY IF. D 200 - SP 4812	RL 0092.1480.00	RESISTA	MK1	
T101	LU UEBERTRAEGER	0819.8891.00			0819.8879.00
V1	AE BB405B 11/ 2PF CDI TUNING DIODE	AE 0596.6839.00	PHILIPS	BB405B	
V2	AE BB405B 11/ 2PF CDI TUNING DIODE	AE 0596.6839.00	PHILIPS	BB405B	
V3	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V4	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V5	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V6	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V7	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V8	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V21	AE BB405B 11/ 2PF CDI TUNING DIODE	AE 0596.6839.00	PHILIPS	BB405B	
V22	AE BB405B 11/ 2PF CDI TUNING DIODE	AE 0596.6839.00	PHILIPS	BB405B	
V23	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V24	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V25	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V26	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V27	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V28	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V51	AE BB405B 11/ 2PF CDI TUNING DIODE	AE 0596.6839.00	PHILIPS	BB405B	
V52	AE BB405B 11/ 2PF CDI TUNING DIODE	AE 0596.6839.00	PHILIPS	BB405B	
V53	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V54	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V55	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V56	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V57	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V58	AE MA4P274-287 200V PIN PIN DIODE	0843.3238.00	MA-COM	MA4P1110	
V71	AE 1N4689 5V1 0.3W ZDI ZENER DIODE	AE 0303.9418.00	SIEMENS	1N4689	
V72	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V74	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V75	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V76	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V77	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V78	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V79	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V80	AE HSMS2810 SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS2810	
V102	AK BFQ34T N 18V 150MA TRANSISTOR	0801.8283.00	PHILIPS	BFQ34T	
V103	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	


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MENP5	502 3PUA	AI	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No	Blatt-Nr Page
		54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	15+

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Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V104	AE 5082-0840 15V STEPRDI DIODE	AE 0300.6830.00	HEWLETT_PA	5082-0840	
V105	AE HSMS2810 SCHOTTKY DIODE	0520.7340.00	HEWLETT_PA	HSMS2810	
V106	AE 5082-2810 SCHOTTKY DIODE	AE 0012.9389.00	HEWLETT_PA	5082-2810 GEGURTET	
V125	AE BAR14-1 2X 100V PIN PIN DIODE	0820.3283.00	SIEMENS	BAR14-1	
V126	AE 1N4689 5V1 0.3W ZDI ZENER DIODE	AE 0303.9418.00	SIEMENS	1N4689	
V127	AK NE85637 N 12V 100MA TRANSISTOR	0801.8231.00	NEC	NE85637(2SC3358)	
V128	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V129	AE HSMS2800 SCHOTTKY DIODE	AE 0836.8421.00	HEWLETT_PA	HSMS-2800(#L31)	
V160	AM U431 N-D DUALJFET FET	AM 0511.8677.00	SILICONIX	U431	
V161	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V162	AK 2N3906 P 40V 200MA TRANSISTOR	0010.3225.00	MOTOROLA	2N3906	
V163	AK 2N3906 P 40V 200MA TRANSISTOR	0010.3225.00	MOTOROLA	2N3906	
V165	AK 2N3906 P 40V 200MA TRANSISTOR	0010.3225.00	MOTOROLA	2N3906	
V166	AK 2N3904 N 40V 200MA TRANSISTOR	0010.4996.00	FAIRCHILD	2N3904	
V171	AK 2N3906 P 40V 200MA TRANSISTOR	0010.3225.00	MOTOROLA	2N3906	
V172	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V173	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V174	AE BZX55/B10 0,5W ZDI ZENER DIODE	AE 0289.4302.00	VALVO	BZX79B10	
V175	AM J111A N-D 40V JFET FET	0214.7685.00	SILICONIX	J111A	
V176	AM J111A N-D 40V JFET FET	0214.7685.00	SILICONIX	J111A	
V177	AM J111A N-D 40V JFET FET	0214.7685.00	SILICONIX	J111A	
V178	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V179	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V180	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V181	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V182	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V183	AK 2N2219A N 40V 800MA TRANSISTOR	0083.6953.00	VALVO	2N2219A	
V184	AM J108 N-D 25V JFET FET	AM 0332.2660.00	SILICONIX	J108	
V185	AM J108 N-D 25V JFET FET	AM 0332.2660.00	SILICONIX	J108	
V186	AE 5082-2800 SCHOTTKY DIODE	AE 0012.9066.00	HEWLETT_PA	5082-2800	
V187	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V188	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V190	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V192	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V193	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V203	AK 2N2369A N 15V 200MA TRANSISTOR	AK 0010.4680.00	VALVO	2N2369A ODER BSX20	
V204	AE BZX55/B4V7 0,5W ZDI ZENER DIODE	AE 0080.4014.00	VALVO	BZX79B4V7	
V205	AE BZX79B2V7 2% 0.5W ZDI ZENER DIODE	AE 0008.7762.00	PHILIPS_SE	BZX79B2V7	
V206	AE BZX79B2V7 2% 0.5W ZDI ZENER DIODE	AE 0008.7762.00	PHILIPS_SE	BZX79B2V7	

MENP5	502 3PUA	Äi	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
	54		04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	16+

095 0026-0693

Für diese Unterlage behalten wir uns alle Rechte vor.

Kennz. Comp. No.	Benennung Designation	Sachnummer Stock No.	Hersteller Manufacturer	Bezeichnung Designation	enthalten in contained in
V207	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V208	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V209	AD BAS16 75V UDI DIODE	AD 0007.4924.00	VALVO	BAS16 (A6P)	
V213	AK BC560B P 45V 100MA TRANSISTOR	AK 0007.2044.00	SIEMENS	BC560B	
V214	AK BC550B N 50V 100MA TRANSISTOR	AK 0007.2050.00	SIEMENS	BC550B	
V255	AD 1N4448 75V UDI DIODE	AD 0012.0700.00	PHILIPS_SE	1N4448 "	
V350	AL BD139 N 80V 1A0 TRANSISTOR	AL 0274.8994.00	VALVO	BD139	
V351	AE BZX55/BBV2 0,5W ZDI ZENER DIODE	AE 0012.2178.00	VALVO	BZX79B8V2	
V352	AE BZX55/B5V1 0,5W ZDI ZENER DIODE	AE 0262.5837.00	TELEFUNKEN	BZX55B5V1	
V450	AM J111A N-D 40V JFET FET	0214.7685.00	SILICONIX	J111A	
X101	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X111	FJ EINBAUSTECKER F.GS SMB ANGLE CONNECTOR	FJ 0602.8804.00	IMS	81.1524.201	
X121	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR 2-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X122	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X160	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR 2-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X161	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X165	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR 3-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X166	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X200	FP STIFTLISTE 36P.R2,54 PIN CONNECTOR 3-POLIG/PINS	FP 0242.3600.00	BINDER	742-11-0179-00-36	
X201	FP KURZSCHLUSSBUCHSE SHORTING PLUG	FP 0491.7042.00	IS	IPC-254-BL01	
X11A	FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR	FP 0514.4550.00	SIEMENS	V42254-B1200-B641	
Z352	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z353	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z355	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z357	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z361	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z362	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z363	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z365	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	
Z366	LD 10GHZ 50DB100V10A4RDX9 LEAD-THROUGH FILTER	LD 0451.4636.00	SPECTRUM	51-713-036	

MENP5	502 3PUA	Ät	Datum Date	Schaltteilliste für Parts list for	Sachnummer Stock No.	Blatt-Nr. Page
		54	04.02.98	EE RF-OSZILLATOREN RF-OSCILLATORS	0819.8262.01 SA	17-

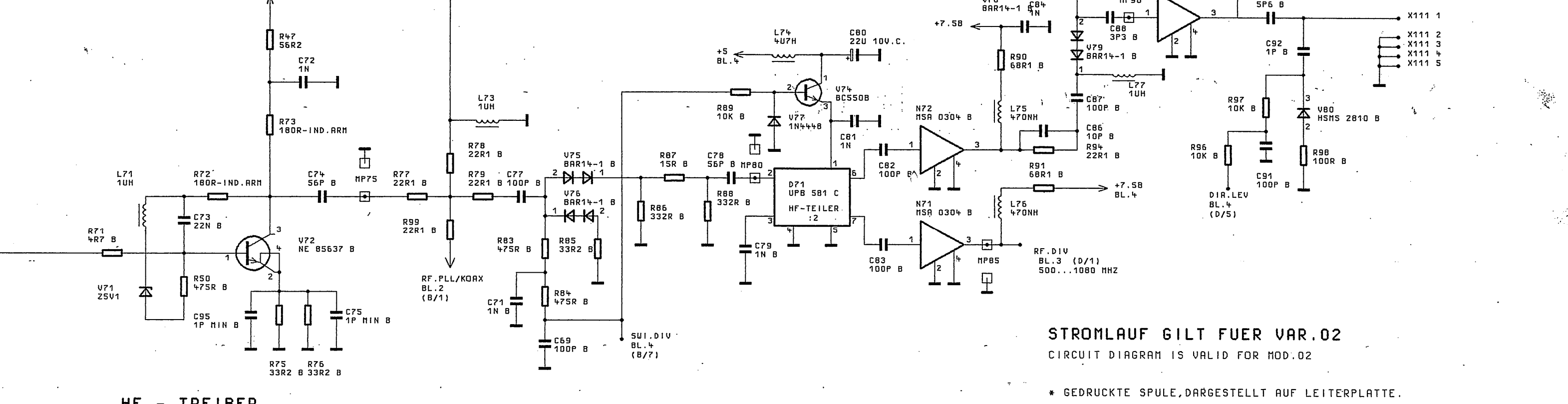
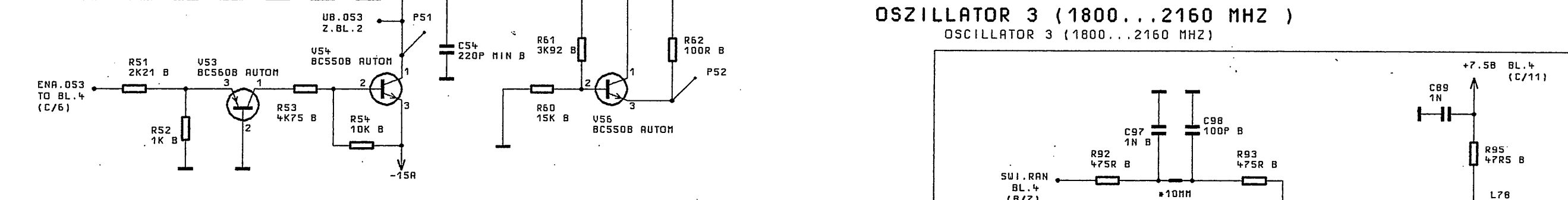
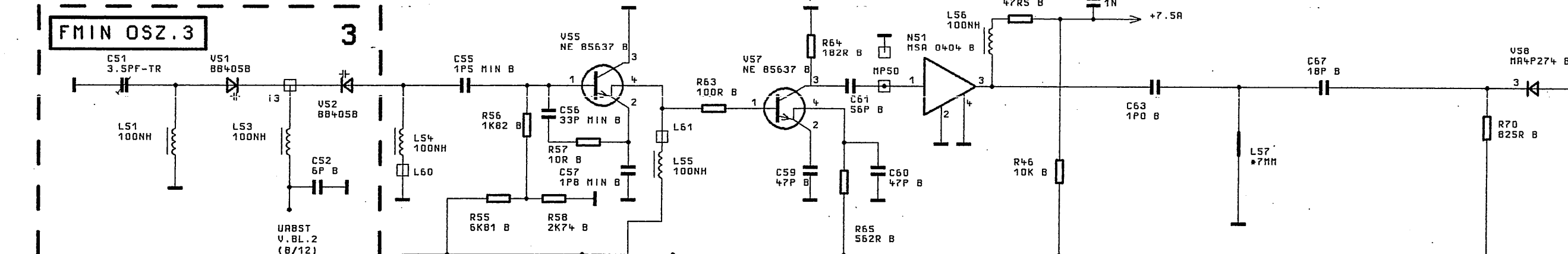
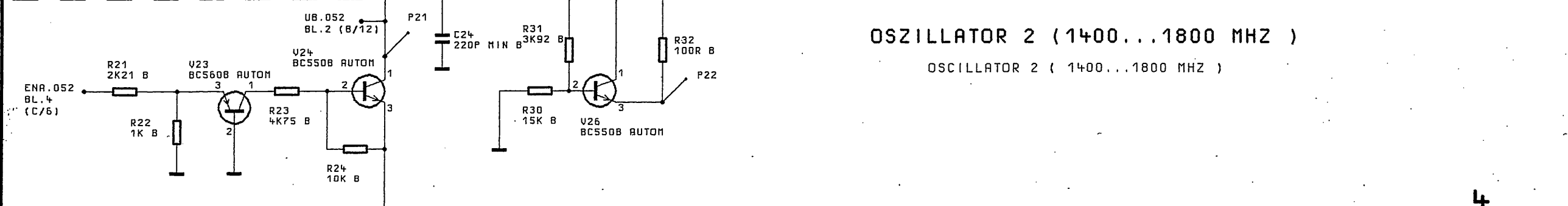
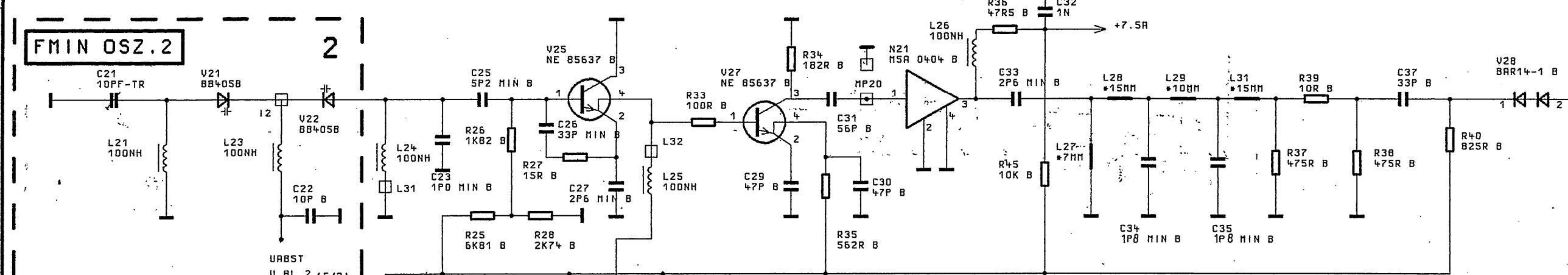
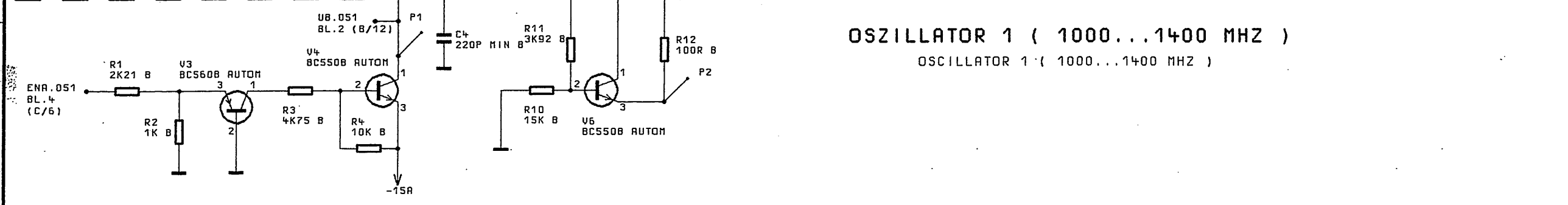
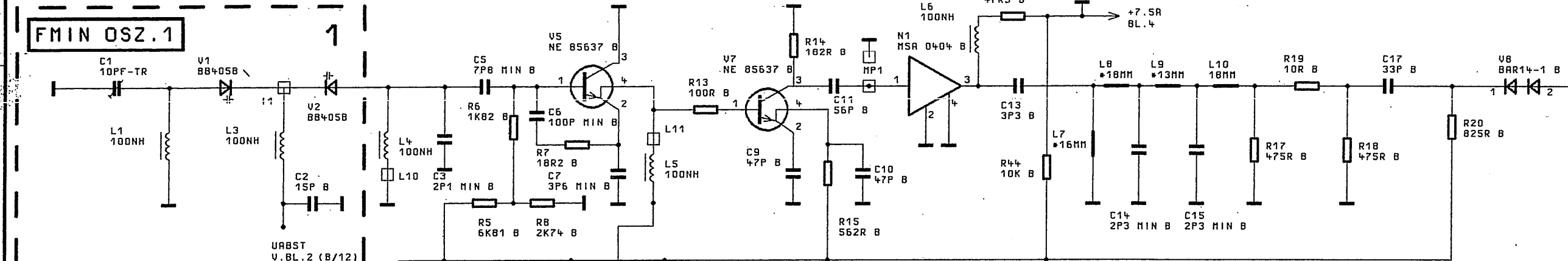
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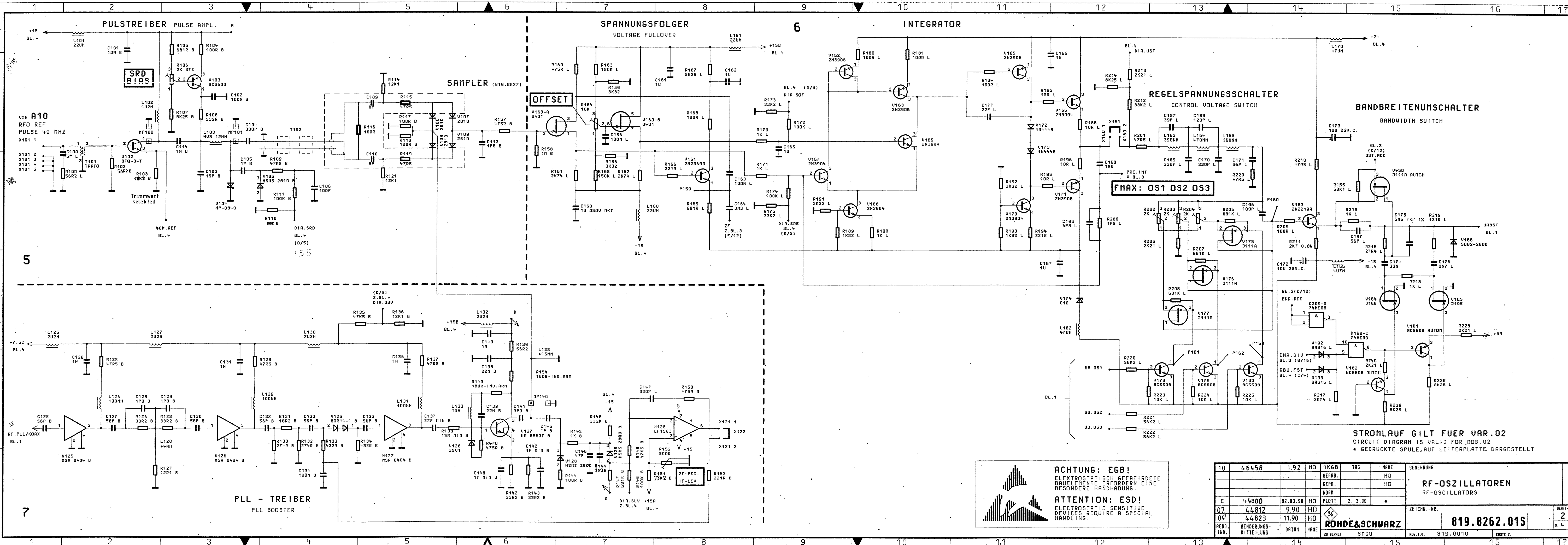
ZU/TO A13
RFO OUT
500...2160 MHz

STROMLAUF GILT FUER VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

* GEDRUCKTE SPULE, DARGESTELLT AUF LEITERPLATTE.

ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.
ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

A	B	C	D	E	08	REND. INO.	RENDERUNGS-NITTEILUNG	DATUM	NRAE.	ZU GERÄT	SMGU	REG. I. V.	819.0010	ERSTE Z.	
39845	10.88	HO	1KGB	TAG	KATE	BENENNUNG									
39845	11.88	HO	BEARB.		HO	RF-OSZILLATOREN RF-OSCILLATORS									
39845	23.02.89	HO	GEPR.		HO										
41825	13.05.89	HO	NORM												
44800	02.03.90	HO	PLOTT	-2. 3.90	*										
44823	11.90	HO													
											ROHDE&SCHWARZ		819.8262.015		BLATT-NR. 1
													ZEICHN.-NR. 819.0010	v. v. DL.	



ACHTUNG: EGB!
 ELEKTROSTATISCH GEFÄHRDETE
 BAUELEMENTE ERFORDERN EINE
 BESONDERE HANDHABUNG.

ATTENTION: ESD!
 ELECTROSTATIC SENSITIVE
 DEVICES REQUIRE A SPECIAL
 HANDLING.

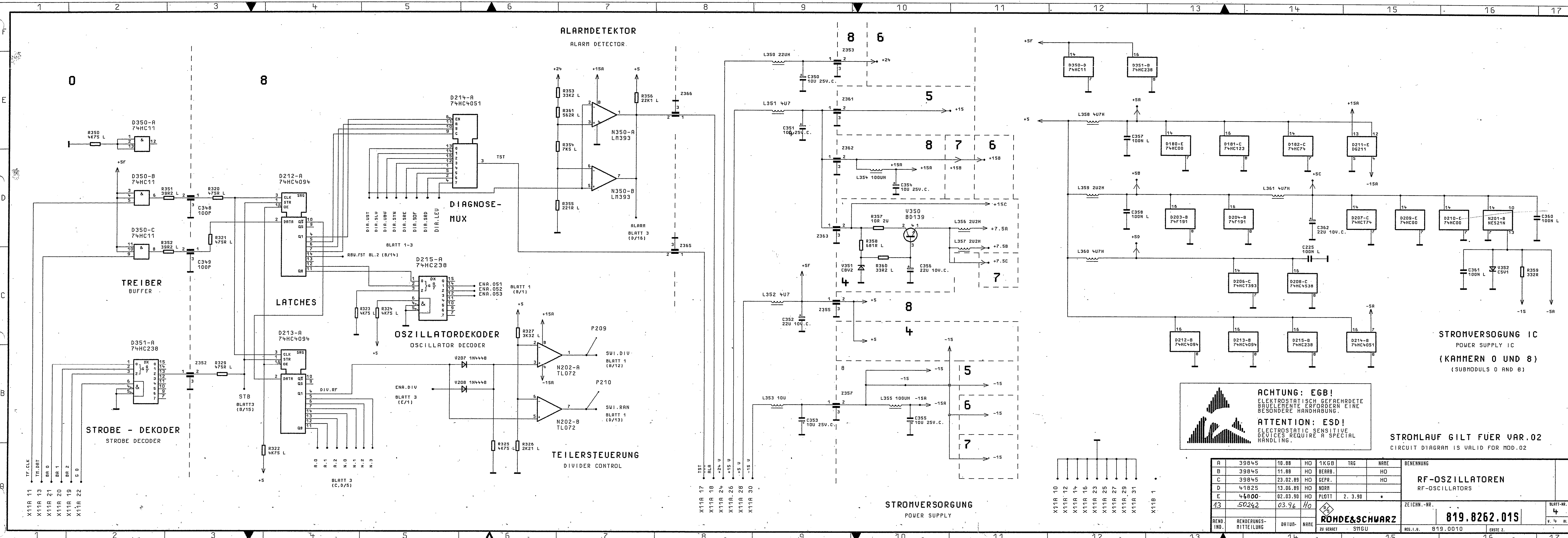
10	46458	1.92	HO	1KGB	TAG	NAME	BENENNUNG
E	44800	02.03.90	HO		PLOTT	2. 3.90	*
07	44812	9.90	HO				
09	44823	11.90	HO				
REND. IND.	RENDERUNGS- MITTEILUNG	DATUM	NAME	ZU GERÄT	SMGU	REG.-I.V.	819.0010
						ERSTE Z.	

RF-OSZILLATOREN
 RF-OSCILLATORS

ZEICHN.-NR.
819.8262.015

BLATT-NR.
 2

FÜR DIESE UNTERLAGE
BEHALTEN SICH ALLE RECHTE VOR



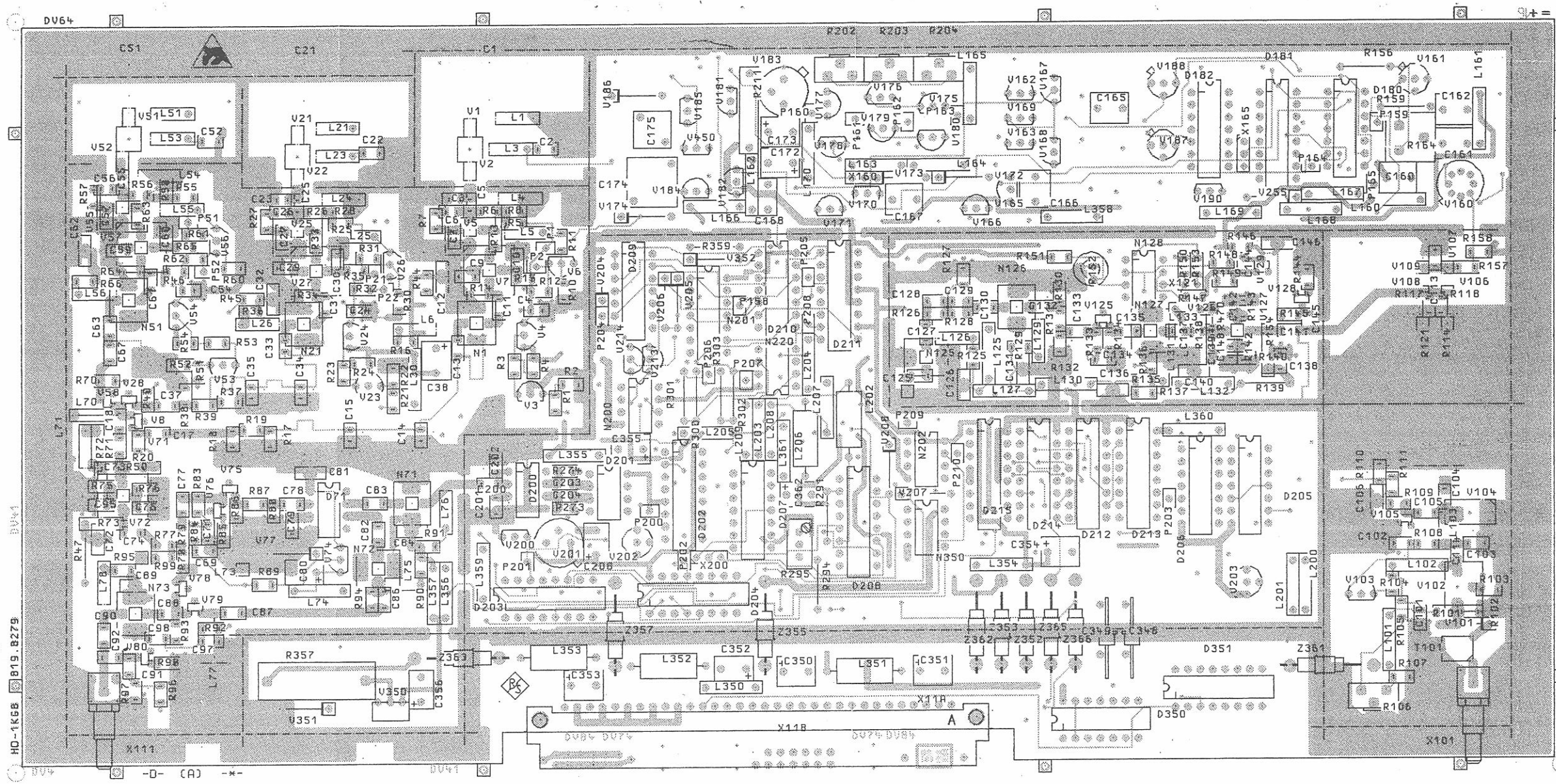
ACHTUNG: EGB!
ELEKTROSTATISCH GEFÄHRDETE
BAUELEMENTE ERFORDERN EINE
BESONDERE HANDHABUNG.

ATTENTION: ESD!
ELECTROSTATIC SENSITIVE
DEVICES REQUIRE A SPECIAL
HANDLING.

STROMLAUF GILT FÜR VAR.02
CIRCUIT DIAGRAM IS VALID FOR MOD.02

A	B	C	D	E	13	REND. IND.	RENDERUNGS-NITTEILUNG	DATUM-	NAMEN	ZU GERÄT	SMIGU	REG. I. V.	819.0010	ERSTE Z.
39845	39845	39845	41825	46800	50242									
10.88	11.88	23.02.89	13.06.89	02.03.90	03.96									
HO	HO	HO	HO	HO	HO									
1KGB	BEARB.	GEPR.	NORM	PLOTT	2. 3.90									
TRG				*										
NAMEN	HO	HO												
BEZEICHNUNG	RF-OSZILLATOREN RF-OSCILLATORS										ZEICHN.-NR.	819.8262.015	BLATT-NR.	4
											REG. I. V.	819.0010	ERSTE Z.	

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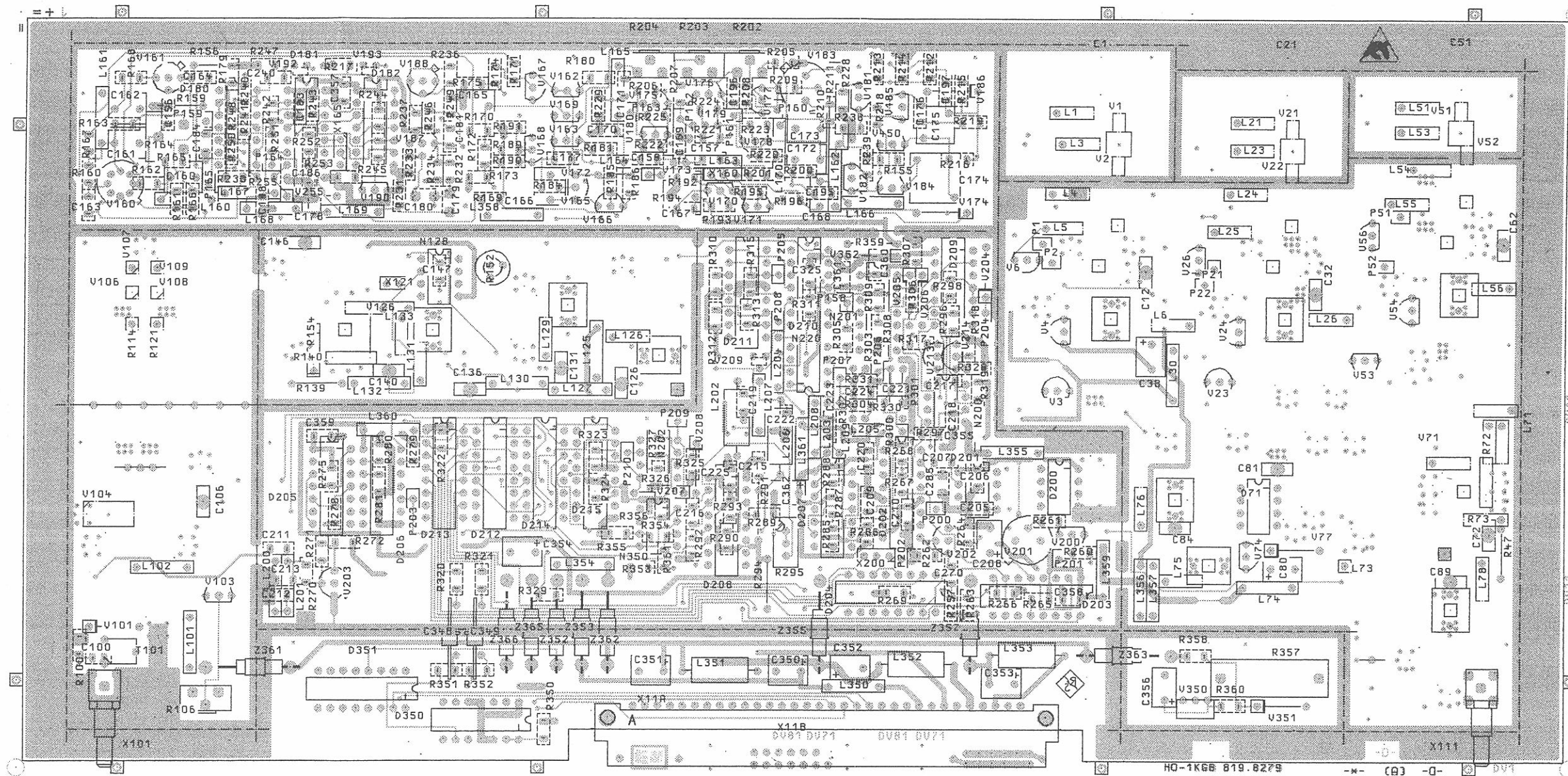
Ansicht und Leitungsfuehrung Bauteilseite
View of tracks on component side
DV41



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

09	44800	03.90	HO	Maße ohne Toleranzangabe	Maßstab	1 : 1		Z
					Halbzeug, Werkstoff			
				1KGB	Tag	Name		Benennung
				Bearb.	03.90	HO		
				Gepr.				
				Norm				Zeichn.-Nr.
				ROHDE & SCHWARZ		819.8262		Blatt-Nr.
				zu Gerät SMGU		reg. i. V. 819.0010 V		2
						erste Z.		v. Bl.

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Ansicht und Leitungsführung Loetseite
View of tracks on solder side

DV11

HO-1KGB 819.8279



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

09	44800	03.90	HO	Maße ohne Toleranzangabe	Maßstab 1:1 Halbzeug, Werkstoff	Benennung RF - OSZILLATOR	Z
				1KGB Tag Name	Benennung RF - OSZILLATOR	Zeichn.-Nr. 819.8262	Blatt-Nr. 5
				Bearb. 03.90 HO			
				Gepr. Norm			
				ROHDE & SCHWARZ	reg. i. V. 819.0010 V	erste Z.	v. Bl.
And. Zust.	Änderungs-Mitteilung	Tag	Name	zu Gerät SMGU			

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Für diese Unterlage behalten wir uns alle Rechte vor

		Masse ohne Toleranzangabe	Maßstab 1 : 1	
			Halbzeug, Werkstoff	
	1KGB	Tag Name	Benennung	Z
	Bearb. 09.88	HO	SAMPLER	
	Gepr.			
	Norm.			
			Zeichn.-Nr.	Blatt-Nr.
			819.8827	2
And. Zust.	Änderungs-Mitteilung	Tag (Name)	zu Gerät SMGU	v 2 Bl.
			reg. v 819.0010 V	erste Z

