



VLF-HF RECEIVER

10 kHz to 30 MHz

EK 085

consisting of:

Volume I

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

Volume II

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

Volume II

Repair Manual



ROHDE & SCHWARZ

VLF-HF RECEIVER

10 kHz to 30 MHz

EK 085

POWER SUPPLY / EMC FILTER IN 085P1

DEMODULATOR GM 085P1

SYNTHESIZER GF 852P1

TEST RELAY GX 085P3

ALTERNATIVE CONFIGURATION
OF BASIC UNIT

SYNTHESIZER GF 852P1

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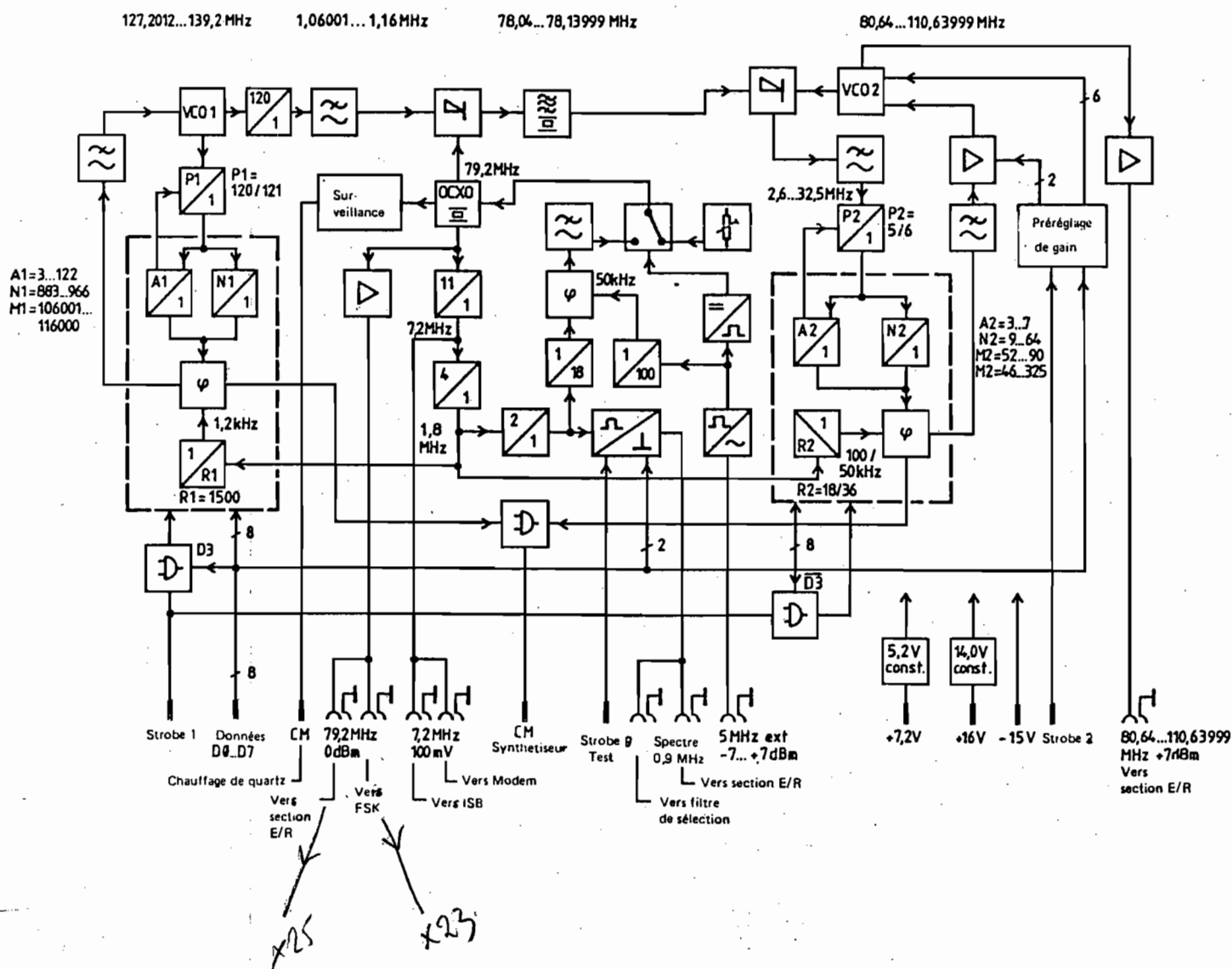


Fig. 5.1 Synthesizer GF 852P1, Block Diagram



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Repair Manual

**POWER SUPPLY / EMC FILTER
IN 085P1**

651.7614



POWER SUPPLY / EMC FILTER
IN 085P1

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5. Description of Function

5.1 Capacitor Board

(See Circuit Diagram 651.7914.01S)

Filter Z1 is responsible for the EMC filtering of the AC voltage between 100 and 240 V that is fed in on connector X448. Power transformer T5 is matched to the available line voltage with the voltage selector so that an AC voltage of 31 V is produced on the secondary winding. Following fullwave rectification by rectifier V13 and filtering by capacitors C18 and C23, an unregulated, floating DC voltage of approx. 43 V appears on connectors X431 and X432.

The battery voltage of 19 to 31 V that is fed in on connector X447 is filtered by filter choke L14 and isolated by diode V24 so that in line operation and with the battery connected at the same time, there will be uninterrupted switch-over of the supply voltage if the mains supply fails.

5.2 Regulator Board

(See Circuit Diagram 651.7714.01S)

The unregulated DC voltage on connectors X431 and X432 is fed to the converter circuit, which produces the stabilized DC voltages that are necessary for the operation of the receiver. The converter circuit is made up of a control section and a power section.

The actual control section is the pulse-width modulator N1, which supplies the driving signals for the pulse-width-modulated power switch V1 and the push-pull switches V2 and V3. The clock signal that is necessary for this is applied to pulse-width modula-

tor N1 on pin 5 by the presettable dividers D2 and D3. These dividers divide the 5-MHz clock produced by the crystal oscillator by 50, 51 or 53. The crystal oscillator consists of crystal B1 and NAND gate D1. The divider factors are switched by the signals < 400 kHz and frequency switching, which are generated by the processor and applied to connectors X43.a11 and X43.b11.

The two signals drive transistors V40 and V42, which then switch the preselection pins 11 and 5 of divider D2 via optocouplers U1, pins 10 and 15. Diode V36 causes a divider factor of 50 to be set when the frequency switching signal (High) is not activated, independently of the < 400 kHz signal. The switchover of the divider factors is made when the microprocessor in the processor detects a risk of interference to the received signal from the harmonics of the clock signal. This may be the case when the margin between the received frequency and the harmonics of the clock signal is < 3 kHz.

From the clock of 94 kHz, 98 kHz or 100 kHz that is produced in this way, pulse-width modulator N1 generates a switching signal which, after inversion by NAND gate D1, drives pin 3 of FET V50. The latter produces, with transformer T2 and FET V46, the driving pulses for power switch V1, which chops the unregulated DC voltage. As a result of storage choke L7 and diode V4, to which the current flow is applied in the clock pauses, a DC voltage of approx. 13 V is produced on the centre taps of the primary windings of transformers T3 and T4.

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---(Continuation) Regulator Board

The push-pull transformer is likewise driven by pulse-width modulator N1. The clock signal that is output on pin 14 of pulse-width modulator N1 is inverted by FET V52 and applied to flipflop D5. This divides the frequency by two and generates a push-pull signal that drives power switches V2 and V3 via drivers D4. The power switches produce an AC voltage on the primary windings of transformers T3 and T4 that is transformed to the secondary side according to the number of turns.

The output voltages are determined by the turn ratios of the transformers, so it is sufficient to take just one of these voltages as a real value for voltage stabilization. In this case the voltage of ± 5.3 V is evaluated as a real value. Operational amplifier N3, output 8 compares this real value to the nominal value on potentiometer R38 and generates a control voltage that readjusts pulse-width modulator N1 via optocoupler U1, pin 14 and thus the duty cycle of the driving pulses. Comparators N3, outputs 1 and 14, monitor whether the control voltage for pulse-width modulator N1 is still within the control range of approx. 0 to 10 V. If this is not so, the RESET signal is issued to the microprocessor controller via transistor V41.

The control voltage is set to 5.3 V with potentiometer R64 for normal loading of the output voltages.

Resistors R1 and R51 serve as sensors for current limiting. The voltage drop across these resistors is applied to pin 8 of pulse-width modulator N1. If the voltage goes above the comparison value (approx. 200 mV) on pin 9 of pulse-width modulator N1, the latter terminates the particular driving pulse for the push-pull transformer and thus prevents the current from increasing any further. This monitor-

ing is performed singly for each driving pulse.

5.3 Filter Board

(See Circuit Diagram 651.8010.01S)

Circuit diagram 651.8010.01S includes filter board 651.8010 and filter 651.8110.

In the filter there is EMC filtering of all signal lines that are routed to external connections of the receiver. This filtering is accomplished with R/C or L/C lowpass filters whose cut-off frequencies are matched to the particular signal frequency.

In the EMC filter there is also the coder circuit for the EXTERNAL connector. The coding of the signals on socket X421 (EXTERNAL) is made by 1-out-of-10 decoder D101 and the four jumpers X100. If jumpers X100 are inserted between A and B, the BCD signal from connector X4 is coded out 1-out-of-10, i.e. according to the selected number the associated pin on socket X421 (EXTERNAL) switches to ground via transistor arrays V101 and V102. This is an open-collector output for a voltage up to 30 V and a maximum current of 30 mA.

If the four jumpers X100 are inserted between B and C, the first six digits (0 to 5) are also coded 1-out-of-10, but on the last four digits (6 to 9) the selected number is BCD-coded ("6" = 1, "7" = 2, "8" = 4, "9" = 8).

On the filter board there is further an amplifier for the LINE output with a driving amplifier for the indicator, the FSK keying stage plus the lithium battery for buffering the RAMs and the timer circuit in the control unit.

(Continuation)---

POWER SUPPLY / EMC FILTER IN 085P1

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---(Continuation) Filter Board

Lithium battery G1 supplies the timer circuit and the RAMs in the control unit when the receiver is switched off. The battery voltage of 3.6 VDC is isolated from the supply voltage of +5 V by diode V1 so that the battery takes over when the +5-V voltage drops. The timer circuit is powered directly, while the RAMs are supplied via switch S2 (MEM). If switch S2 is set to OFF, the RAMs will no longer be supplied when the receiver is switched off and thus they lose their content. The lithium battery is only drained to a small extent by the connected circuits and consequently has a lifetime of approx. ten years in normal conditions of operation.

AF amplifier N3 together with its circuitry forms an AF output stage of 2 W. An additional 4-ohms loudspeaker or headphones can be connected to socket X423.19 (INPUT/OUTPUT).

Amplifier N4, output 1 boosts the line signal that is applied via the series-connected transformers T1 and T2 floating to socket X423.14/15 (power output). The level at this output can be set with potentiometer R124 in a range of -10 to +10 dBm. On X423.23 there is also an unbalanced output for the line signal with an output impedance of 600 ohms.

Amplifier N4, output 7 boosts the line signal that is rectified by diode V41

and fed to amplifiers N5. These amplifiers drive the meter on the front panel of the receiver. The combination of diodes V51 to V54 produces matching of the control-voltage characteristic to the scale of the meter.

On connector X424.8/.9 (TTY) a teleprinter is connected for single-current or polar-current working. Selection between the two is made with switch S1. In settings 13-3 and 14-7 of switch S1 single-current working is engaged. Via transistors V4 and V10 the resistors R5 and R24 are switched parallel to resistors R4 and R23 and at the same time X424.8 (- line current) is connected via R26 to the operating voltage of -30 V. The driving of transistor V7 with +10 V or -10 V means that transistors V5 and V6 are alternately switched on. Transistors V5 acts as a line-current source of 40 mA.

In settings 13-1 and 14-5 of switch S1 polar-current working is effective. Transistors V4 and V10 receive no base voltage and are switched off. X424.8 (- line current) is on zero potential. If the transistors are driven alternately, the line current that flows is +20 mA and -20 mA.

The line-current circuit is isolated from the equipment ground by optocoupler U1 and U2.

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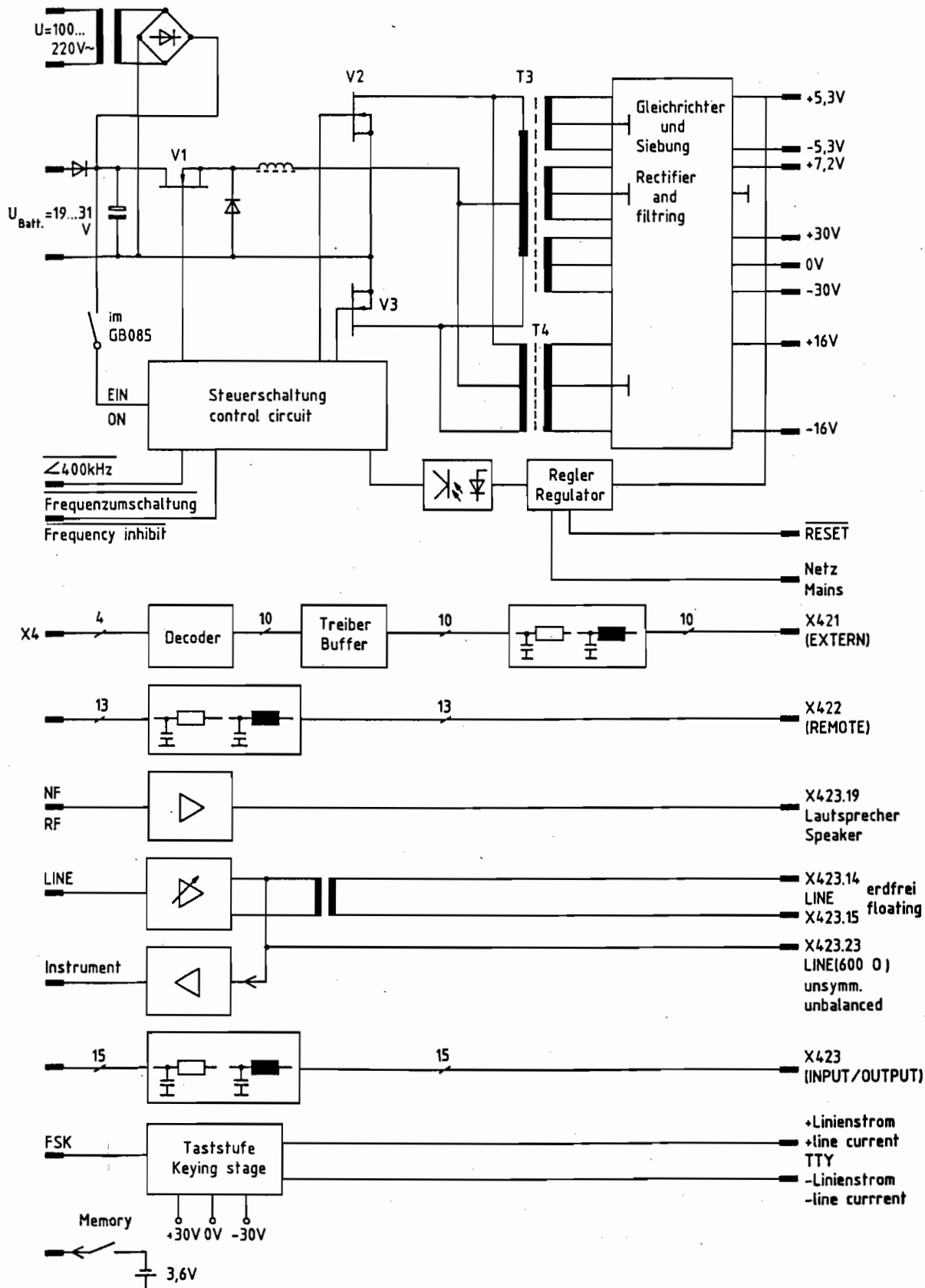


Fig. 5.1 Power Supply/EMC Filter IN 085P1, Block Diagram

6. Repair

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

6.1 Preliminary Remarks

The repair of the Power Supply/EMC Filter IN 085P1 consists of troubleshooting and fault elimination, of measurements, alignments and functional checks, of exchanging subassemblies and components as well as of a final test.

All the information required for repairing the power supply/EMC filter down to component level is given in this part.

6.1.1 Troubleshooting Instructions

Localize any fault that occurs by checking the nominal values on the testpoints with the aid of the troubleshooting flowcharts in 6.3.

6.1.2 Restoring the Nominal Characteristics

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

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

Once any component has been replaced, it is absolutely essential that the

final test of the power supply/EMC filter be performed as detailed in 6.7.

6.1.3 Alignment

Following manufacture and before entering the test department, the power supply/EMC filter is artificially aged according to requirement XVN 016.

This guarantees high stability of the nominal values once they have been set. If non-aged components should be used for repair, a certain drift of values has to be expected.

For this reason it is advisable to make an occasional check of the values in 6.4.

6.1.4 Spare Parts

All components and subassemblies are subjected to strict quality control before they are incorporated in the power supply/EMC filter.

For components from outside suppliers, e.g. resistors, capacitors, diodes, transistors and integrated through to highly integrated circuits, R&S have set down their own delivery specifications for the purpose of ensuring maximum reliability. For this reason we recommend that only original spare parts be used as replacements for defective components.

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---(Continuation) Spare Parts

When ordering a spare part please state the following:

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

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

6.1.5 Important User Information

The following points are important when carrying out any repairs. These are mentioned to avoid any misunderstandings.

- o All measurements are referred to ground, unless stated otherwise.
- o The abbreviations that appear in the text, e.g. X424.8 and N4.7, are to be interpreted as follows:

X424.8 connector X424, pin 8

N4.7 integrated circuit 4, pin 7

- o The circuit diagram in which the components mentioned are to be found are stated in every case in the following troubleshooting flowcharts.
- o For all alignments and measurements the power supply/EMC filter has to be supplied with the operating voltages given in the circuit diagrams.
- o Disconnect the operating voltage before undertaking any soldering work on the unit or an assembly of it.

CAUTION! CMOS!!!

- o Among the components incorporated in the power supply/EMC filter there are MOS, MOSFET and CMOS devices. Devices of this kind are extremely sensitive to high extraneous voltages. Static discharge can produce very high voltage spikes, which are capable of destroying these devices. Electrostatic charge is not felt until voltages are more than 3000 V. Sparks are only produced upwards of 5000 V. Less than 10 % of these values is sufficient to destroy semi-conductors, however, or degrade their parameters, e.g. bipolar transistors (400 V), ECL and Schottky (300 V), VMOS and CMOS (150 V), MOSFETS (100 to 200 V). A person sitting at a workbench alone produces about 500 V of static.

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

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

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6.2 Test Equipment and Special Tools

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

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

6.2.1 Test Equipment List

Test equipment, required technical data	Recommended R&S unit	Ordering code
Dual-channel oscilloscope 30 MHz	BOP	374.0020.02
Power supply 25 V/3 A	NGRU 35	192.0210.03
Digital multimeter	UDL 33	388.8011.02
AF voltmeter	URE	342.1214.02
Frequency counter 1 MHz, 100 mV		
Resistor 2.4 ohms/12 W		
Resistor 14 ohms/20 W		
Resistor 5 ohms/2 W		
Service kit	KA 085C1	699.4015.02

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6.3 Troubleshooting Flowcharts

The troubleshooting is based on the following premises:

- o the power supply/EMC filter has been pinpointed as defective
- o no dual faults

The troubleshooting covers the following functional groups:

- o power supply
- o decoder circuit
- o AF amplifier
- o line amplifier
- o FSK keying stage
- o EMC filtering

6.3.1 Troubleshooting: Power Supply

The troubleshooting described here clarifies the possible causes of missing operating voltages.

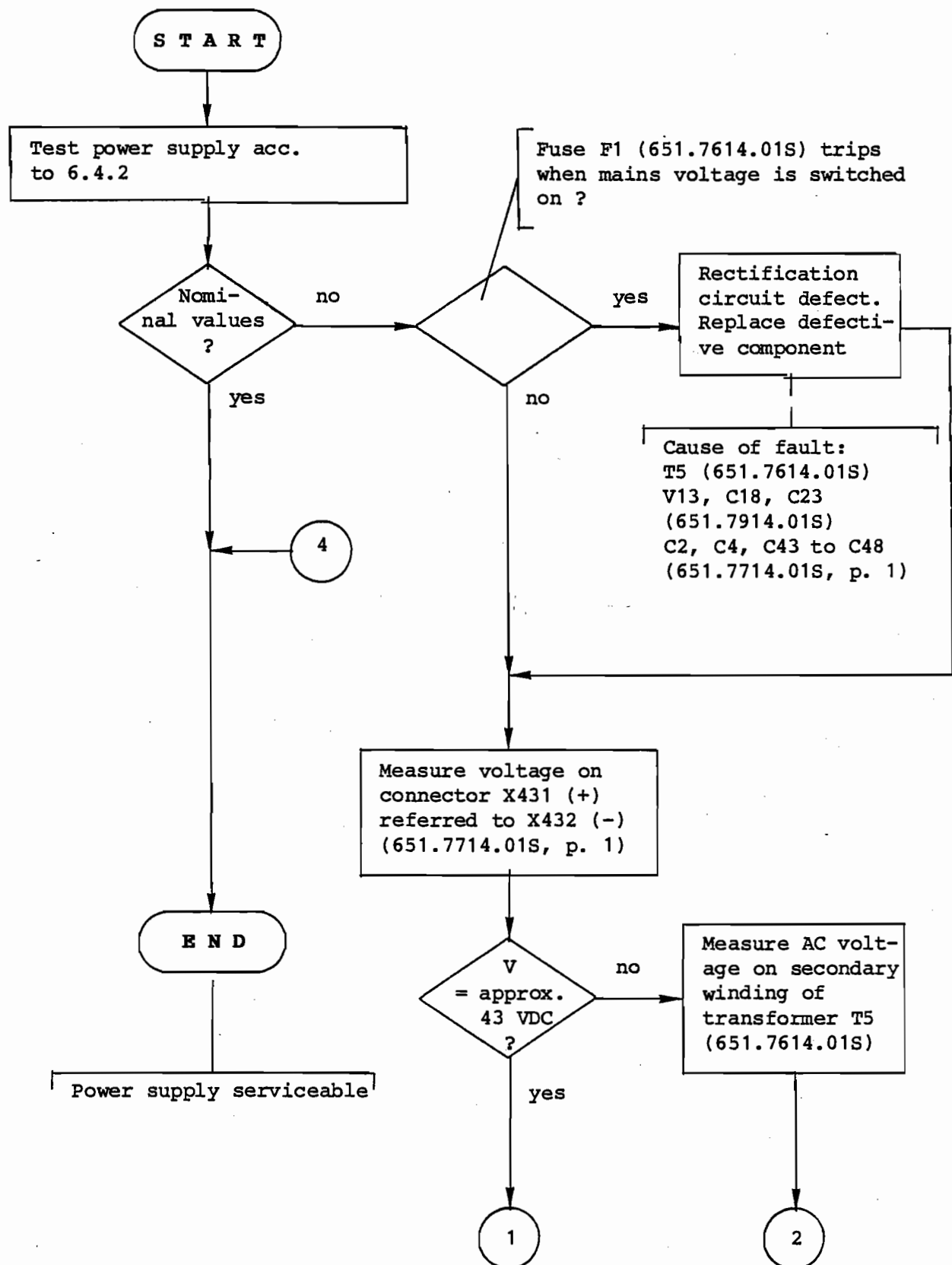
Requirement for troubleshooting:

- o fuses F1 and F2 (651.7614.01S) are serviceable
- o voltage selector set for available mains voltage
- o power supply/EMC filter is not installed in the receiver

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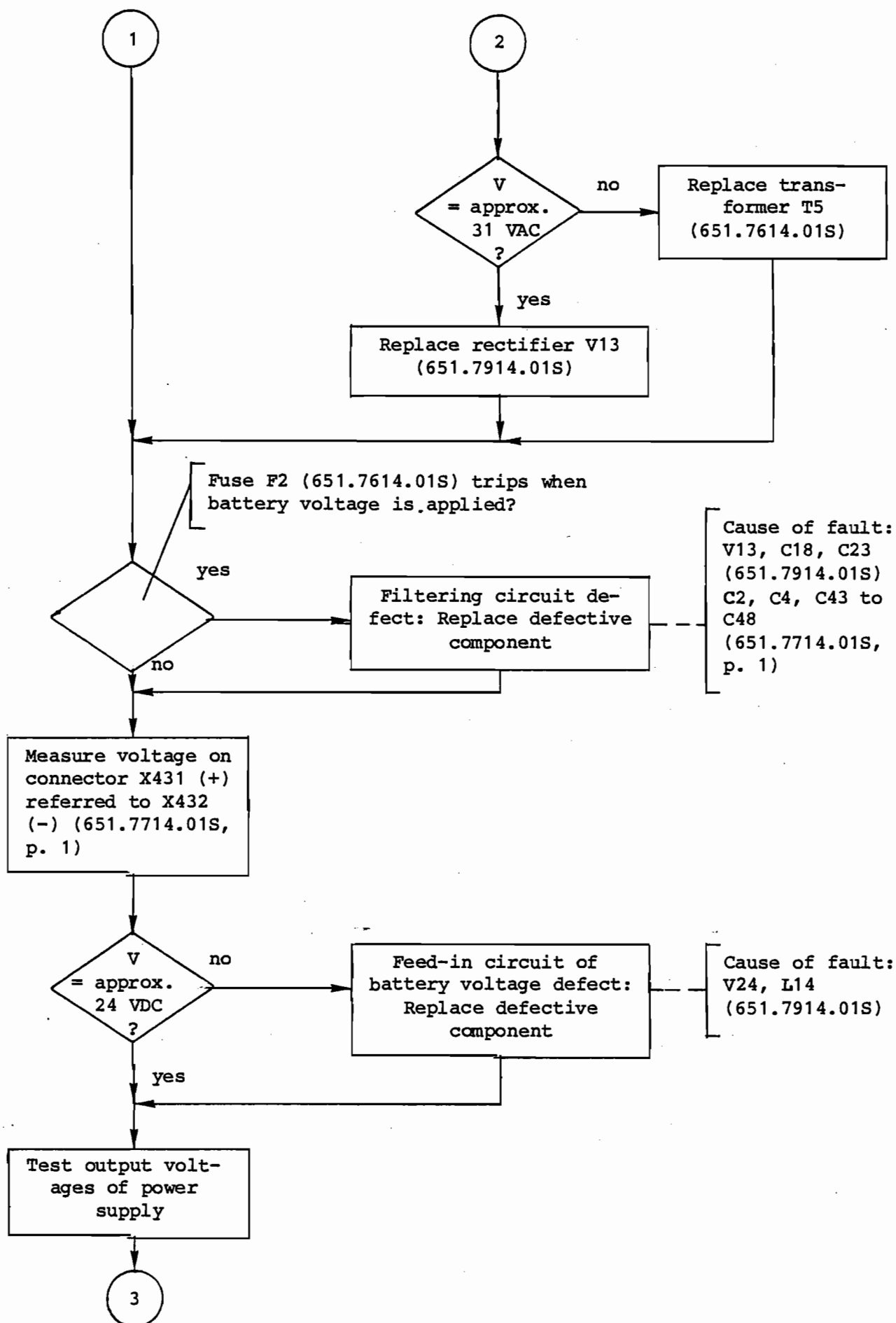
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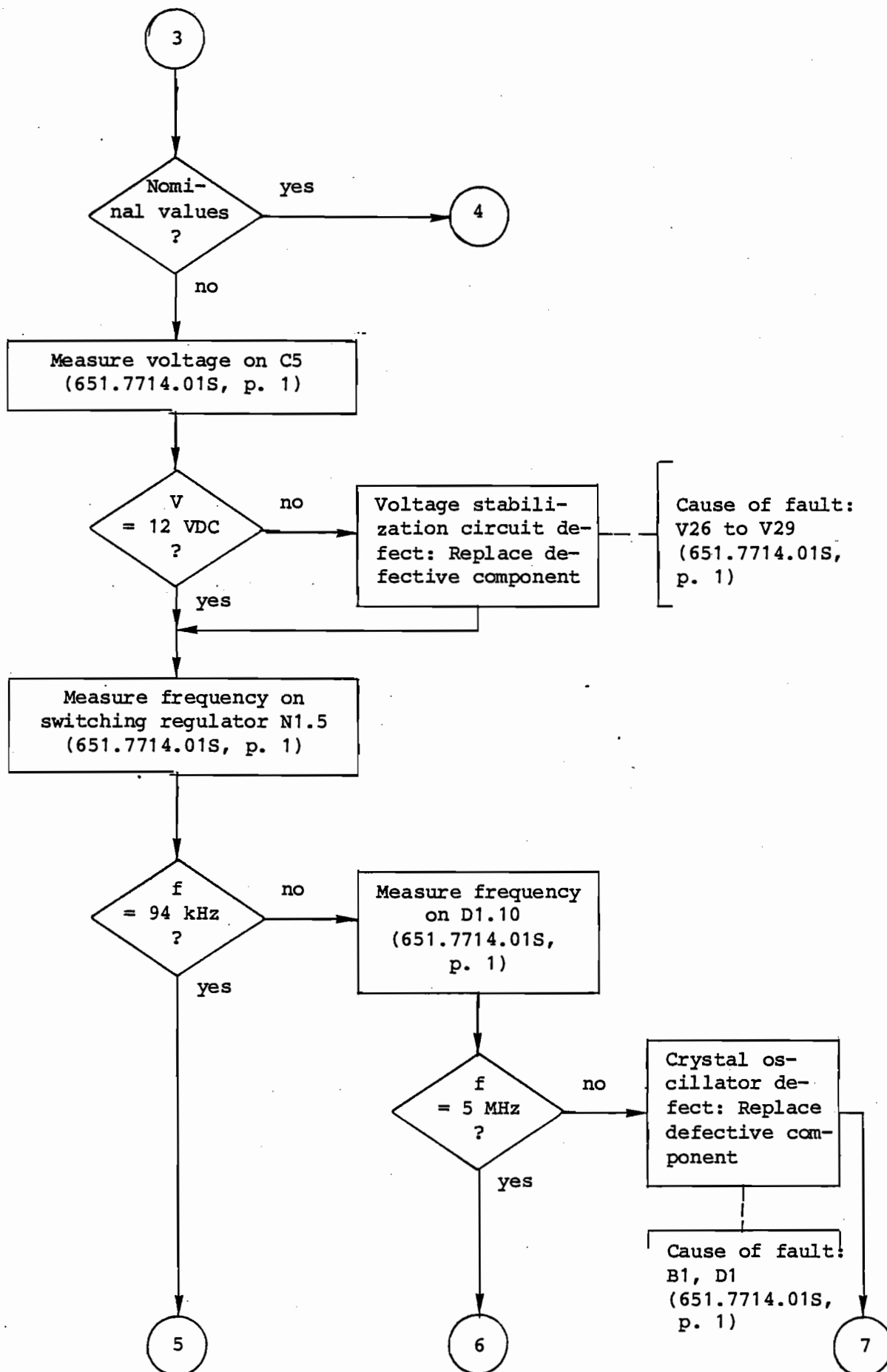
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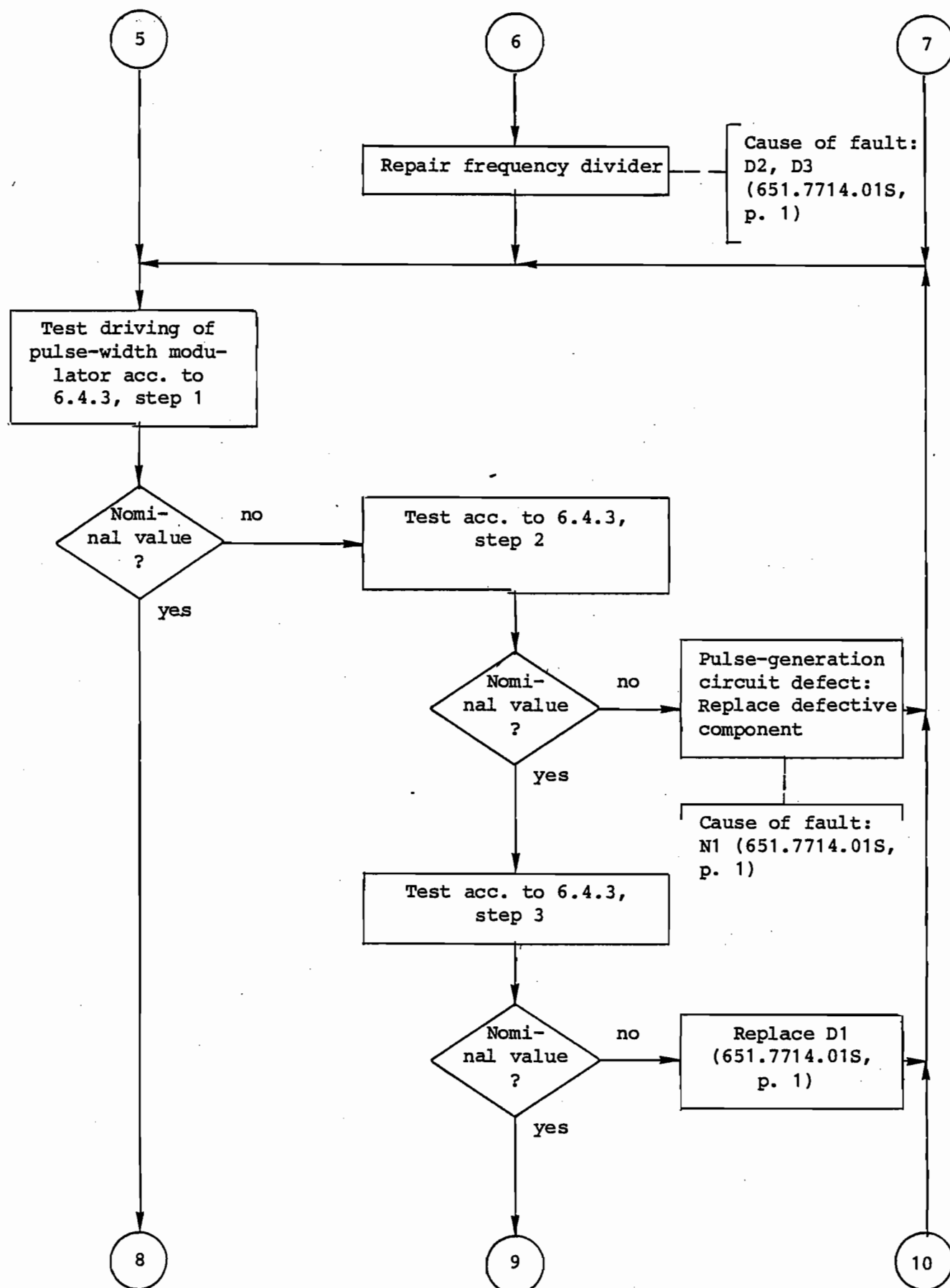
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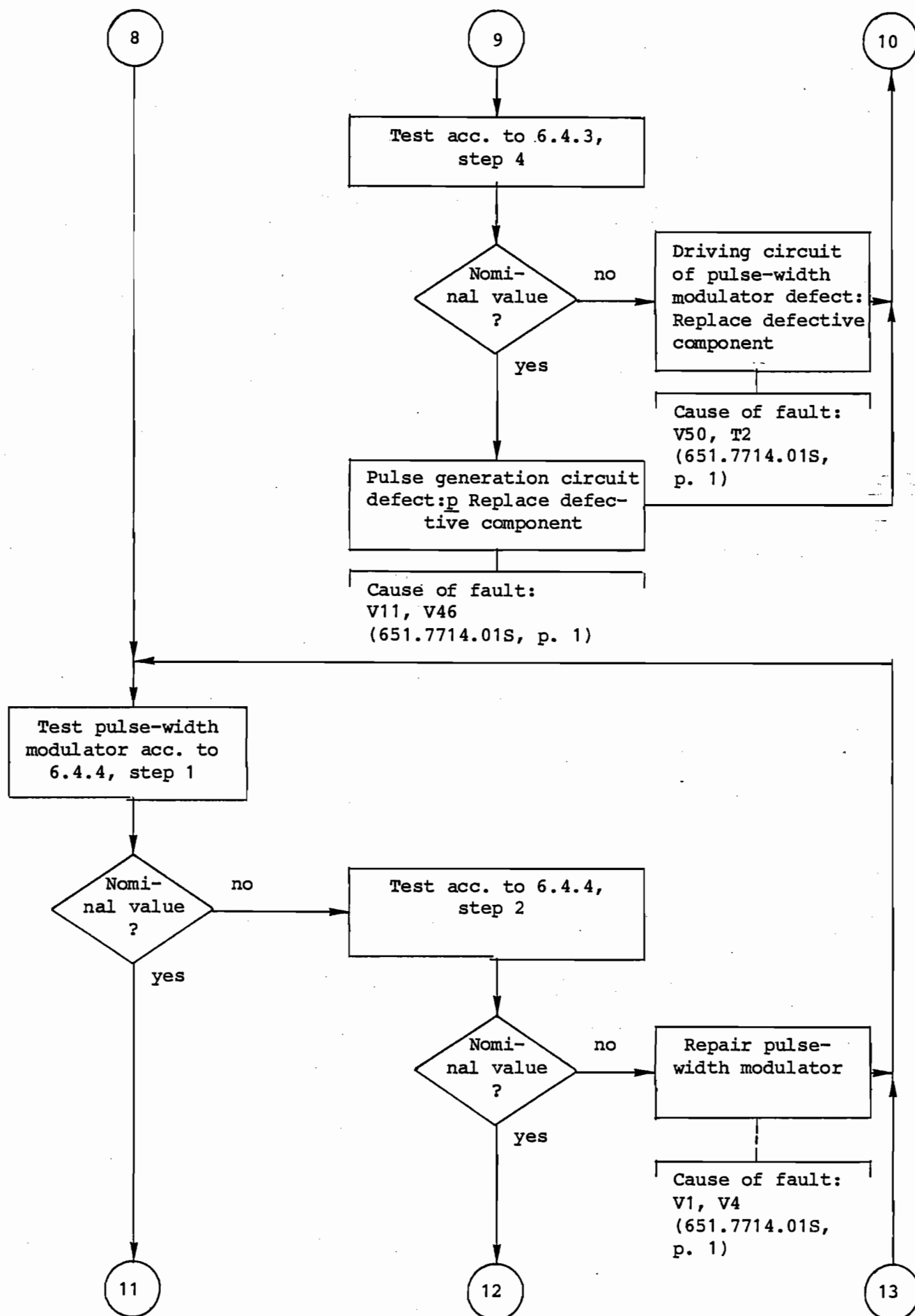
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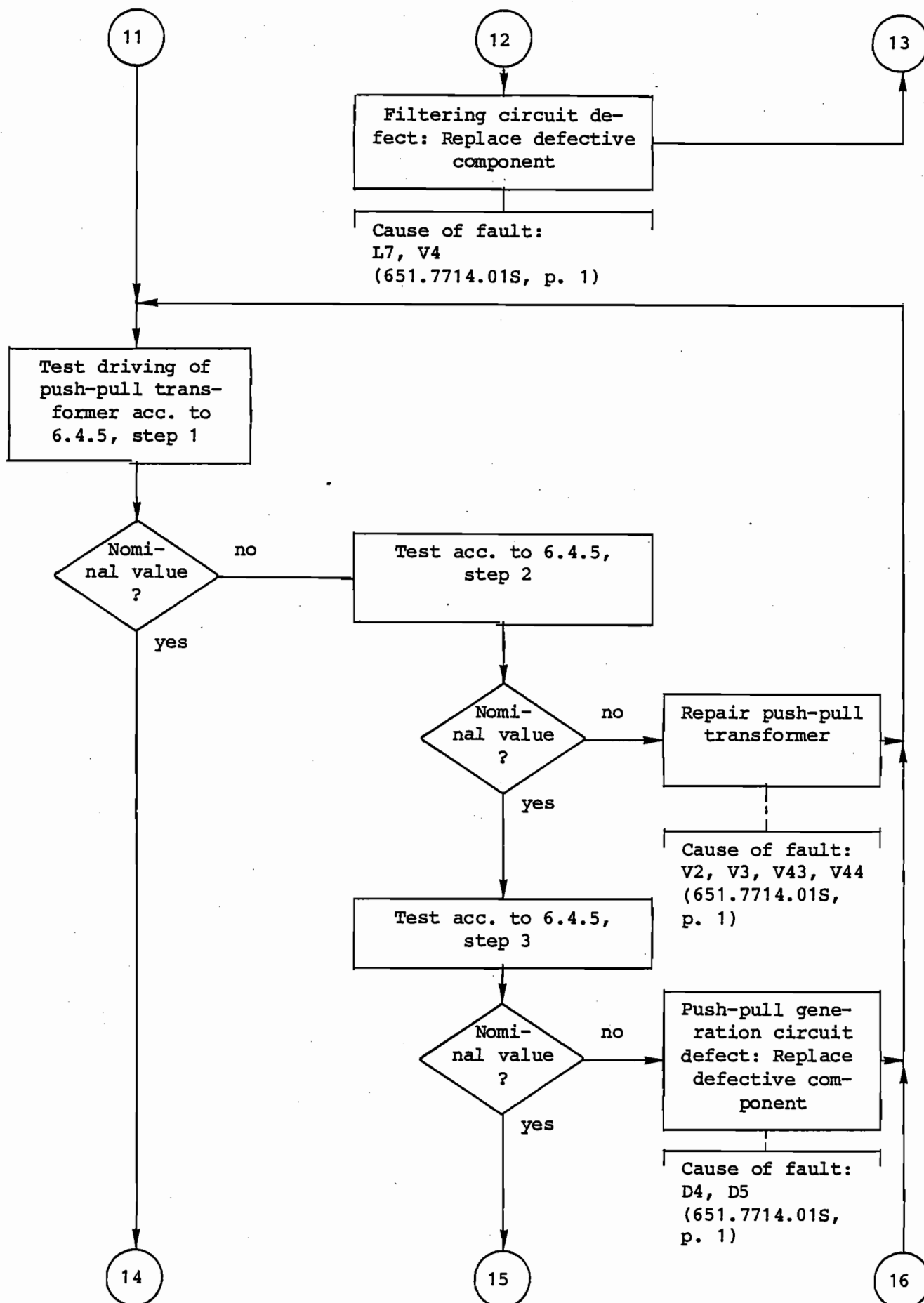
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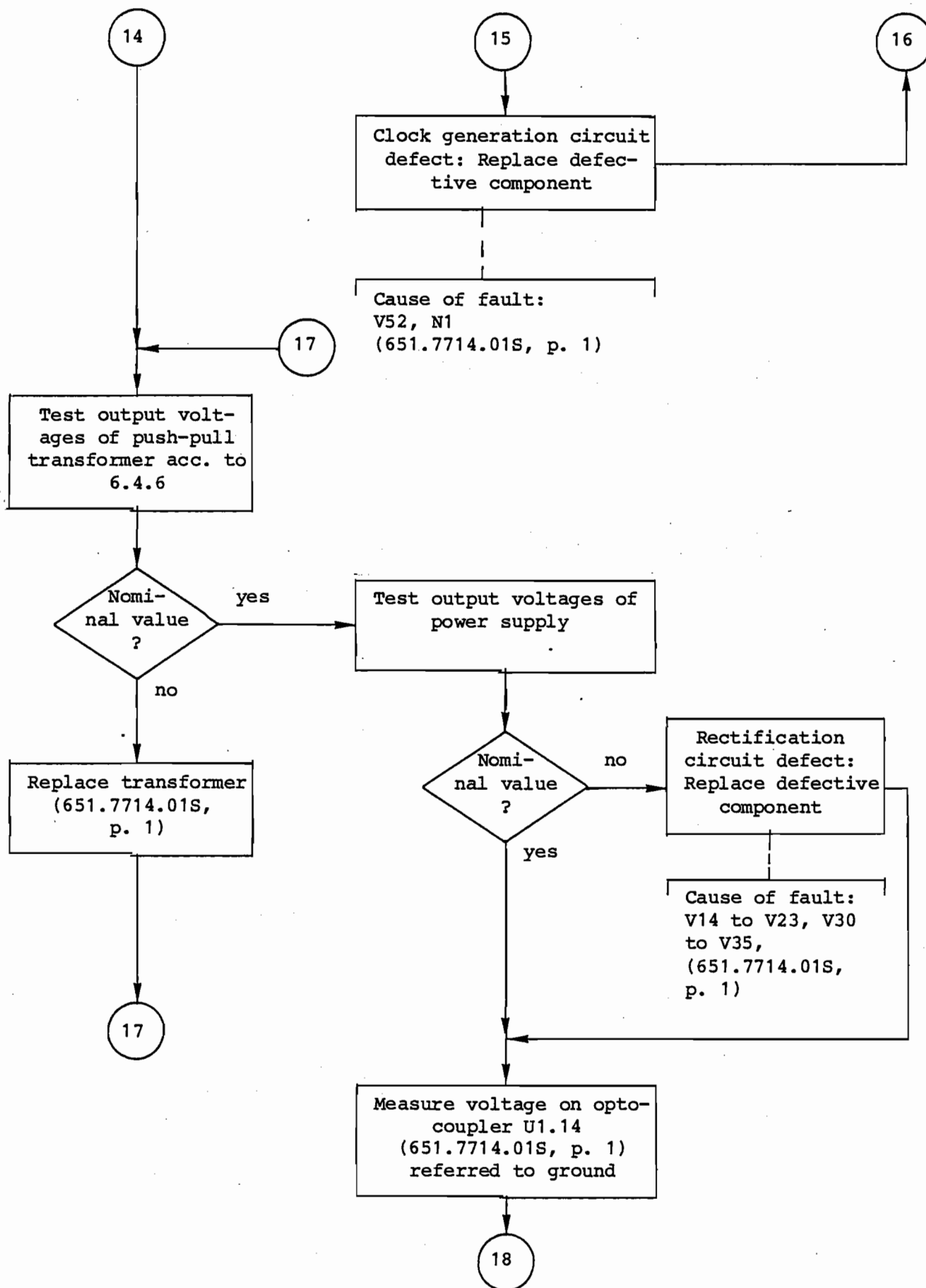
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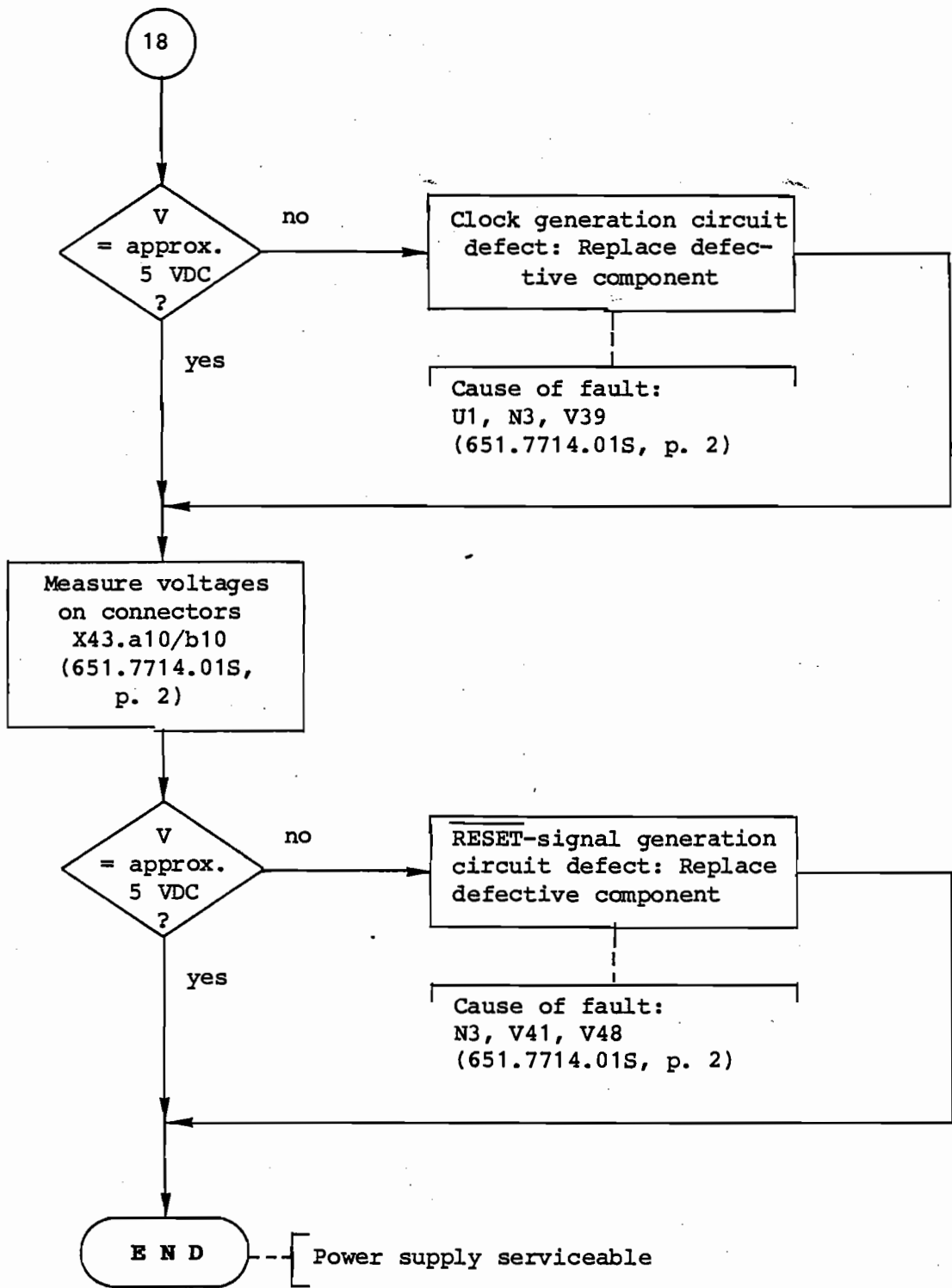
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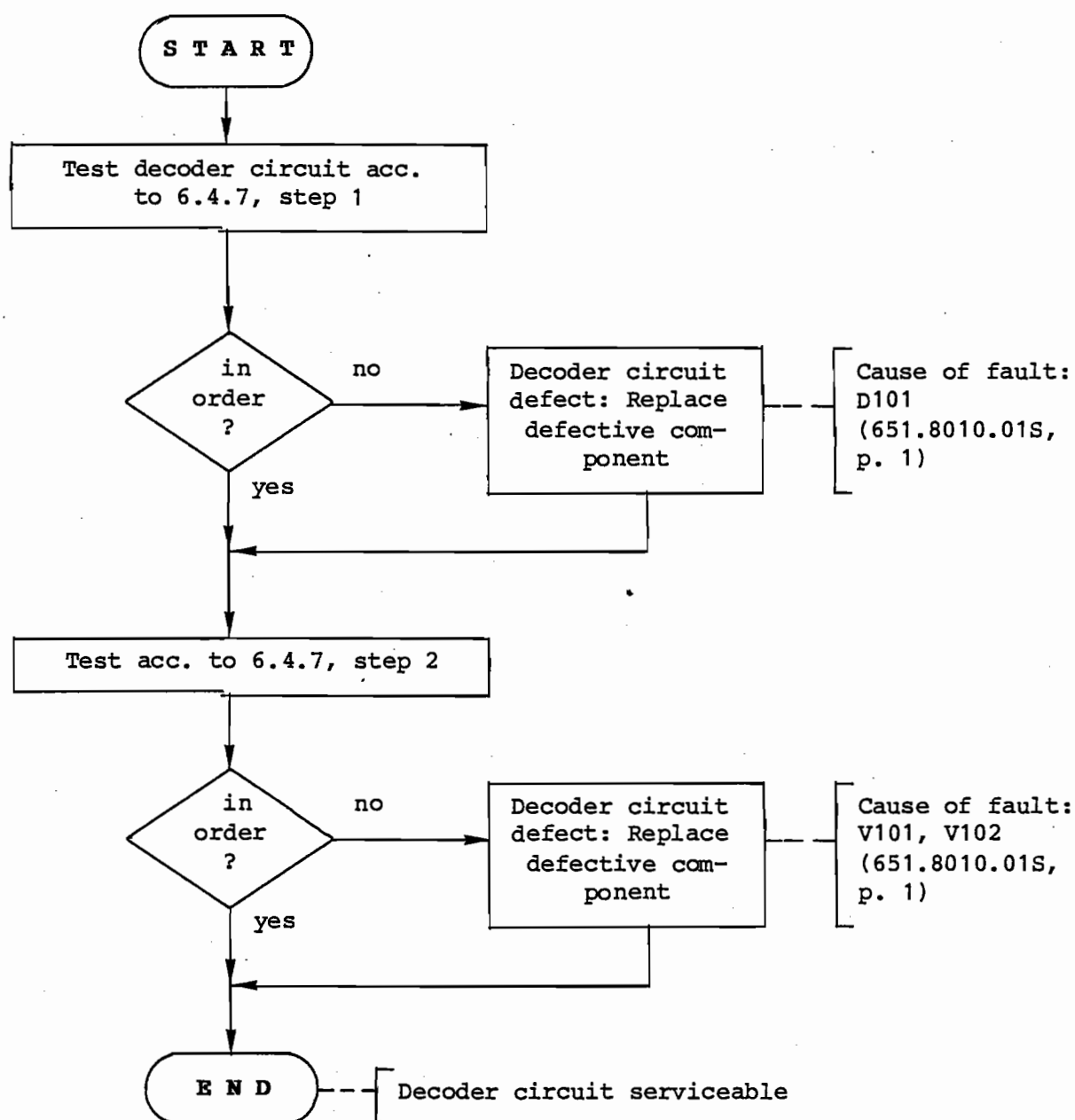
- 6.13 -

6.3.2 Troubleshooting: Decoder Circuit

The troubleshooting described here clarifies the possible causes of defective signal output on the EXTERNAL connector.

Requirement for troubleshooting:

- o power supply/EMC filter is adapted in receiver
- o supply voltages are present



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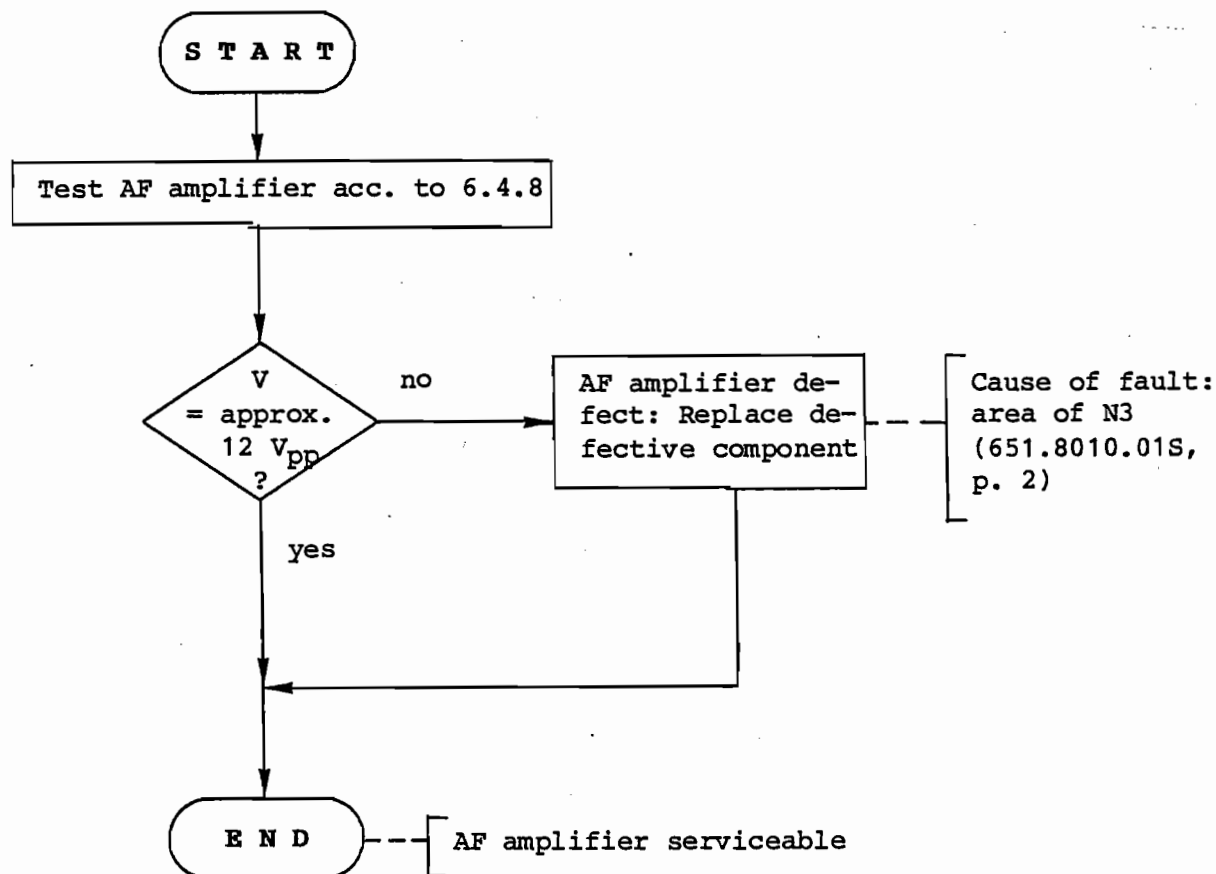
- 6.14 -

6.3.3 Troubleshooting: AF Amplifier

The troubleshooting described here clarifies the possible causes of a missing AF signal for the additional loudspeaker/headphones.

Requirement for troubleshooting:

- o power supply/EMC filter is adapted in receiver
- o supply voltages are present



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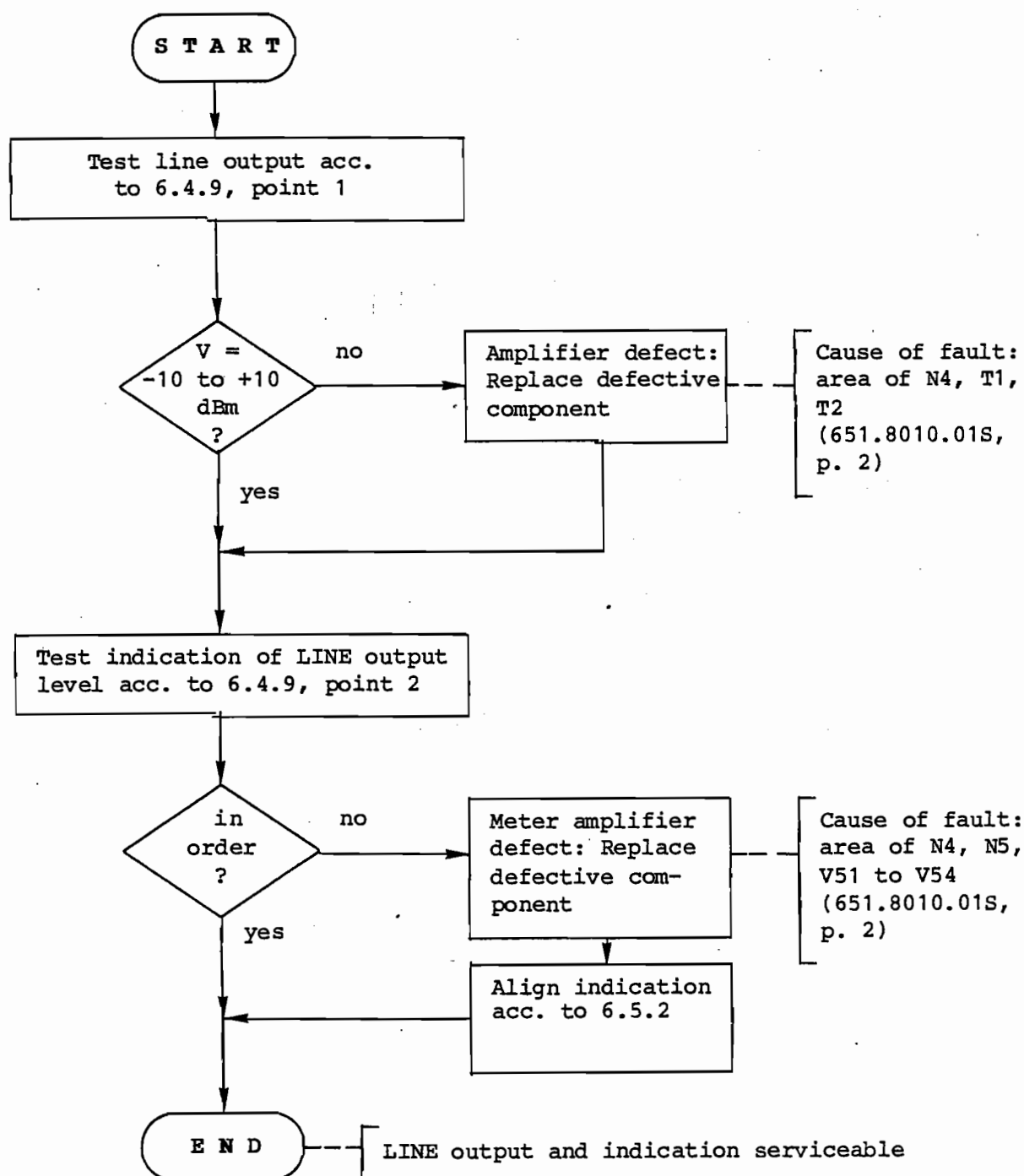
- 6.15 -

6.3.4 Troubleshooting: LINE Amplifier and Indicator

The troubleshooting described here clarifies the possible causes of a missing LINE signal or faulty indication of the LINE output level.

Requirement for troubleshooting:

- o power supply/EMC filter is adapted in receiver
- o supply voltages are present



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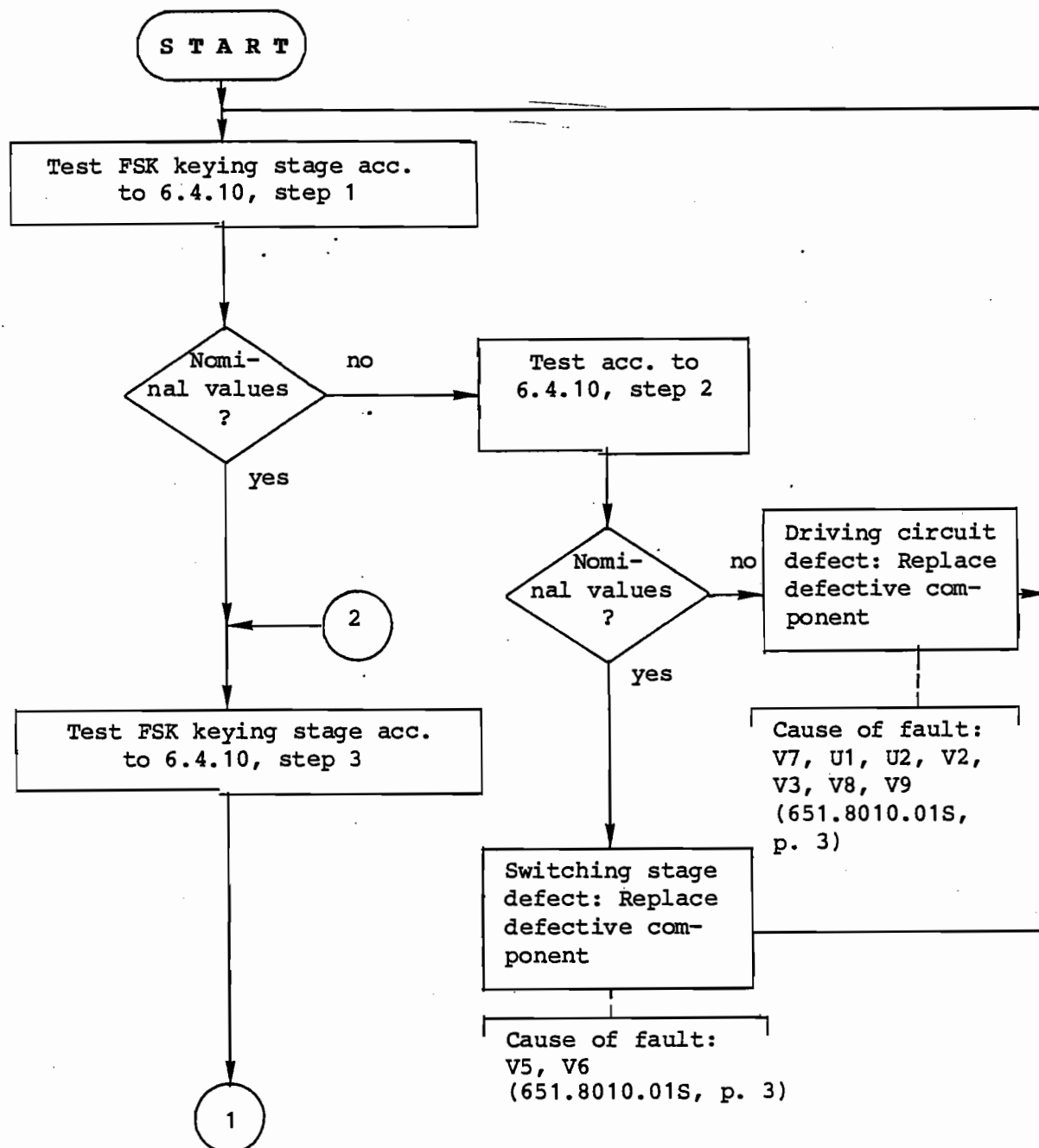
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6.3.5 Troubleshooting: FSK Keying Stage

The troubleshooting described here clarifies the possible causes of a faulty line-current generation.

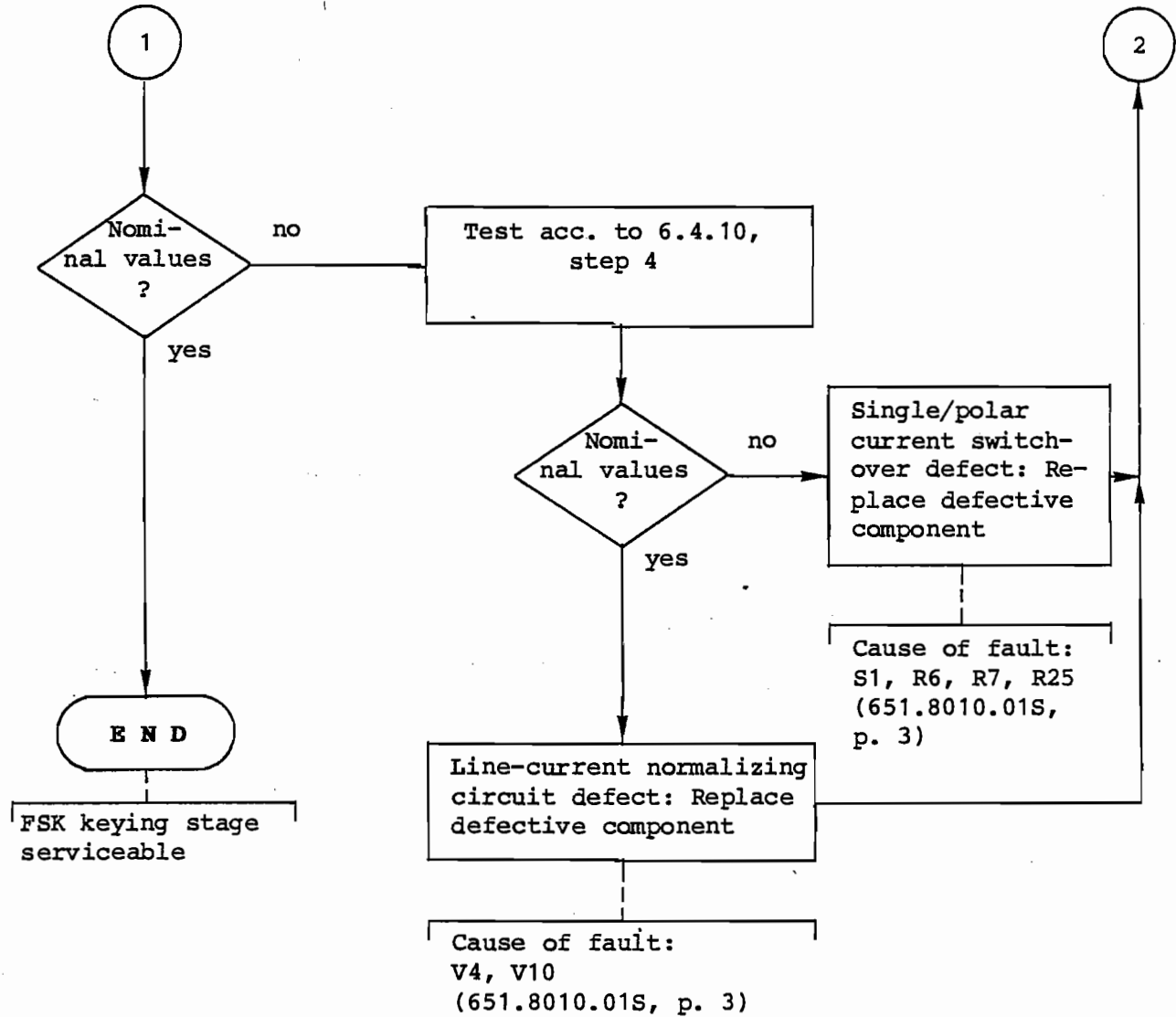
Requirement for troubleshooting:

- o power supply/EMC filter is adapted in receiver
- o supply voltages are present



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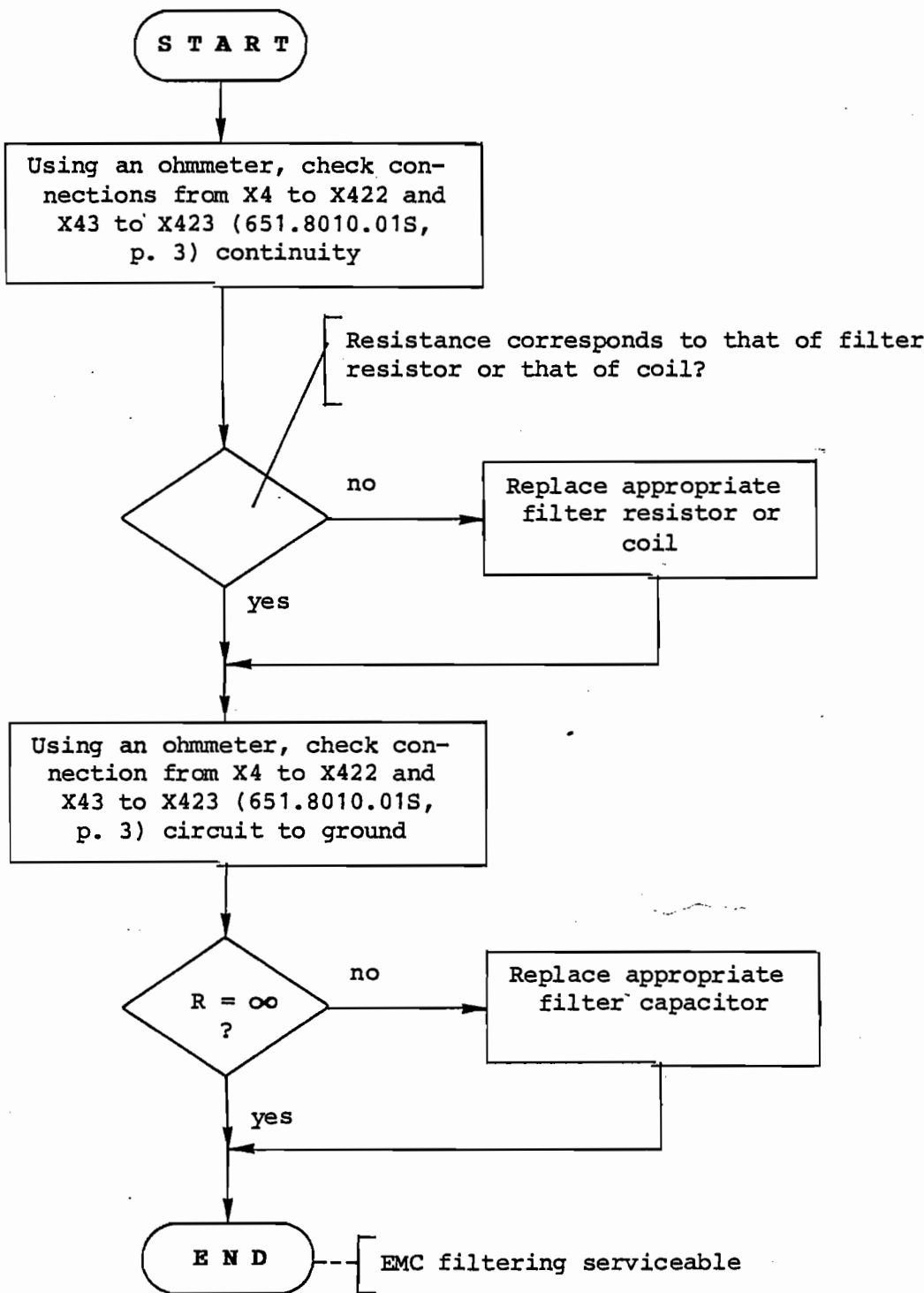
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6.3.6 Troubleshooting: EMC Filtering of Through-connected Lines

The troubleshooting described here clarifies the possible causes of defective EMC filtering.

Requirement for troubleshooting:

o power supply/EMC filter is adapted in receiver



6.4 Measurements and Functional Tests

The measurements and functional tests that are described below are the more detailed procedures to the instructions given in condensed form in the troubleshooting flowcharts. Consequently one will usually undertake these measurements and functional checks by branching out of the troubleshooting flowchart at a particular point. When the measurement or functional test has been performed, return to the troubleshooting flowchart at the same point where it was left.

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

6.4.1 Compiled Measured Values

Output voltages of power supply:

±5.3 V
+7.2 V
±16 V
±30 V (floating)

AF output level:

12 V_{pp} (max. volume)

LINE output level:

-10 to +10 dBm

LINE current:

±20 mA or 0 mA/40 mA

6.4.2 Test of Power Supply

1. Arrange test set-up acc. to Fig. 6.1.
2. Set power-supply unit on battery terminal X447.1/.2 (651.7614.01S) to 0 V. Turn up isolating transformer from 0 to 220 V.
3. Measure output voltages of power supply on connector X43 (651.7714.01S, p. 2).

Nominal values referred to ground (X43.a2):

X43.a6	+5.3 V
X43.a9	-5.3 V
X43.a17	+7.2 V
X43.a12	+16 V
X43.a9	-16 V

Nominal values referred to 0 V (X43.a15):

X43.a16	+30 V
X43.a15	-30 V

4. Set power-supply unit on battery terminal X447.1/.2 (651.7614.01S) to 24 V. Turn down isolating transformer to 0 V.
5. Measure output voltages of power supply on connector X43 (651.7714.01S, p. 2).

The nominal values should be the same as in line operation.

6.4.3 Test of Driving of Pulse-width Modulator

1. Retain test set-up acc. to Fig. 6.1.

Withdraw jumper X1 (651.7714.01S, p. 1).

Set isolating transformer to 0 V and power-supply unit to 24 V.

(Continuation)---

POWER SUPPLY / EMC FILTER IN 085P1

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Part 6: Repair

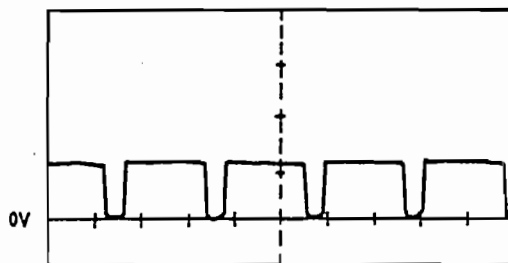
- 6.20 -

---(Continuation) Test of Driving of Pulse-width Modulator

Produce oscillogram on the cathode of diode V11 (651.7714.01S, p. 1).

Reference ground is testpoint MP2 (651.7714.01S, p. 1).

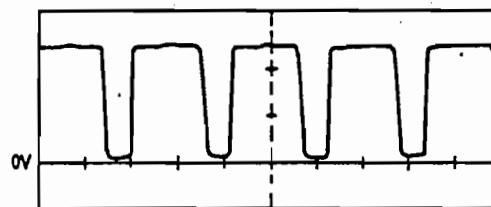
Nominal value:



Scale: 10 V/div, 5 μ s/div

3. Produce oscillogram on NAND gate D1.3 (651.7714.01S, p. 1). Reference ground is testpoint MP1 (651.7714.01S, p. 1).

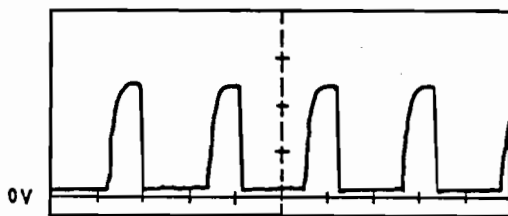
Nominal value:



Scale: 5 V/div, 5 μ s/div

2. Produce oscillogram on switching regulator N1.13 (651.7714.01S, p. 1). Reference ground is testpoint MP1 (651.7714.01S, p. 1).

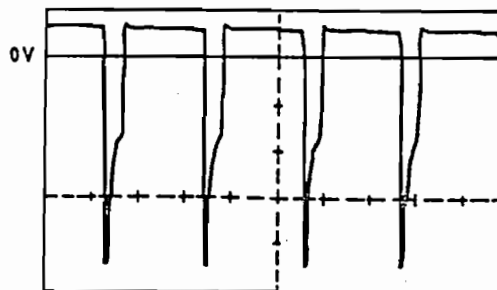
Nominal value:



Scale: 5 V/div, 5 μ s/div

4. Produce oscillogram the on anode of diode V11 (651.7714.01S, p. 1). Reference ground is testpoint MP2 (651.7714.01S, p. 1).

Nominal value:



Scale: 20 V/div, 5 μ s/div

POWER SUPPLY / EMC FILTER
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6.4.4 Test of Pulse-width
Modulator

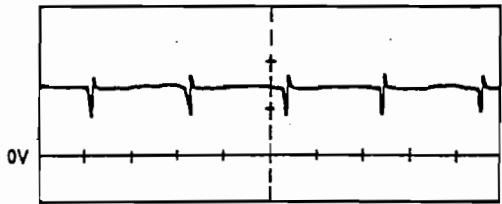
1. Retain test set-up acc. to Fig. 6.1.

Replace jumper X1 (651.7714.01S, p. 1).

Set isolating transformer to 0 V and power-supply unit to 24 V.

Produce oscillogram on centre tap pin 10a/9a of transformer T3 (651.7714.01S, p. 1).
Reference ground is testpoint MP1 (651.7714.01S, p. 1).

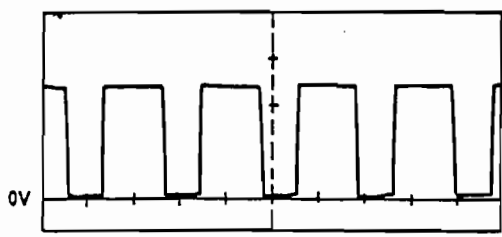
Nominal value:



Scale: 10 V/div, 5 µs/div

2. Produce oscillogram on source of MOSFET V1 (651.7714.01S, p. 1).
Reference ground is testpoint MP1 (651.7714.01S, p. 1).

Nominal value:



Scale: 10 V/div, 5 µs/div

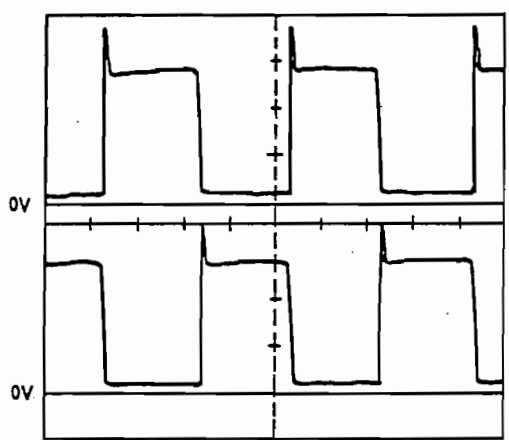
6.4.5 Test of Driving of Push-pull
Transformer

1. Retain test set-up acc. to Fig. 6.1.

Set isolating transformer to 0 V and power-supply unit to 24 V.

Produce oscillogram on consumptions of MOSFETs V2 and V3 (651.7714.01S, p. 1). Reference ground is testpoint MP1 (651.7714.01S, p. 1).

Nominal values:



Top: consumption V2,
below: consumption V3
Scale: 10 V/div, 5 µs/div

POWER SUPPLY / EMC FILTER IN 085P1

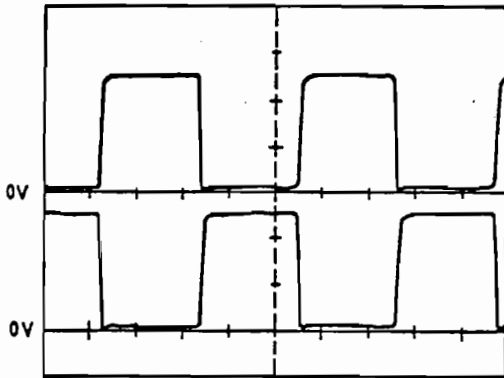
Repair Manual
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- 6.22 -

---(Continuation) Test of Driving of Push-pull Transformer

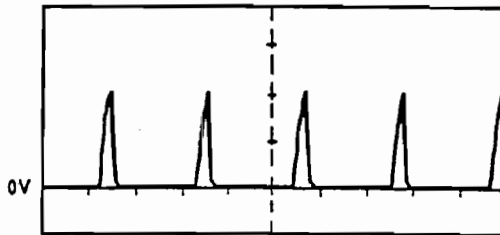
2. Produce oscillograms on the gates of MOSFETs V2 and V3 (651.7714.01S, p. 1). Reference ground is test-point MP1 (651.7714.01S, p. 1).

Nominal values:



Top: gate V3, below: gate V2
Scale: 5 V/div, 5 μ s/div

3. Produce oscillogram on the consumption of MOSFET V52 (651.7714.01S, p. 1). Reference ground is test-point MP1 (651.7714.01S, p. 1).



Scale: 5 V/div, 5 μ s/div

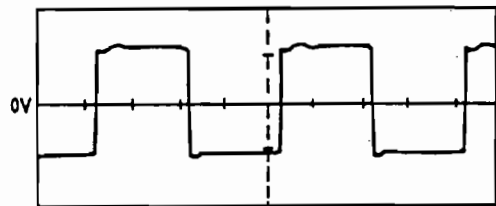
6.4.6 Test of Rectification

Retain test set-up acc. to Fig. 6.1.

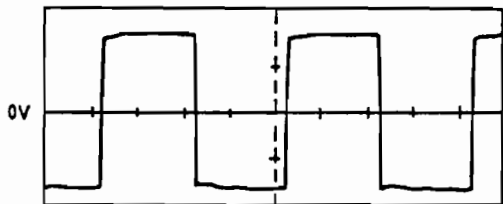
Set isolating transformer to 0 V and power-supply unit to 24 V.

Produce oscillograms on the secondary windings of transformers T3 and T4 (651.7714.01S, p. 2). Reference ground is the metal casing.

Nominal values:



5-V winding of T3
Scale: 5 V/div, 5 μ s/div



16-V winding of T4
Scale: 10 V/div, 5 μ s/div

POWER SUPPLY / EMC FILTER IN 085P1

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Part 6: Repair

- 6.23 -

6.4.7 Test of Decoder Circuit

1. Adapt power supply/EMC filter in receiver.

Insert jumpers X1 to X4 (651.8010.01S, p. 1) in position A-B.

On receiver set EXTERNAL numbers 0 to 9 one after the other.

Check with digital voltmeter whether appropriate output of 1-out-of-10 decoder D101 (651.8010.01S, p. 1) goes High (+5 V).

2. Connect lead of digital voltmeter across a resistor of 1 kohm to connector X421.15 (+5.3 V).

On receiver set EXTERNAL numbers 0 to 9 one after the other.

Check with digital voltmeter whether appropriate output on connector X421 (651.8010.01S, p. 1) goes low (0 V).

6.4.8 Test of AF Amplifier

Adapt power supply/EMC filter in receiver.

Connect X423.19/37 (651.8010.01S, p. 2) to a resistor of 5 ohms.

On receiver set mode CW, frequency 0 kHz and BFO 1 kHz.

Turn volume control to right-hand stop (max. volume).

Using oscilloscope measure output signal on connector X423.19 (651.8010.01S, p. 2).

Nominal value: approx. 12 V_{pp}

6.4.9 Test of LINE Output and Indication of LINE Output Level

1. Adapt power supply/EMC filter in receiver.

Terminate connector X423.23 (651.8010.01S, p. 2) with 600 ohms or connect X423.15/14 (651.8010.01S, p. 2) to a resistor of 600 ohms.

On receiver set mode CW, frequency 7.2 MHz; withdraw cable K2 from preselection and connect to socket X78 (7.2-MHz output on synthesizer).

Measure output level on connectors X423.23 and X423.15/14 (651.8010.01S, p. 2) as function of setting of potentiometer R124 (651.8010.01S, p. 2).

Nominal values:

R124 at left-hand stop: -10 dBm
R124 at right-hand stop: +10 dBm

2. On receiver set selector switch for meter to AF.

Turn potentiometer R124 (651.8010.01S, p. 2) from left-hand to right-hand stop and observe meter.

Indication of meter must rise from < -10 dBm to end of scale.

6.4.10 Test of FSK Keying Stage

1. Adapt power supply/EMC filter in receiver.

Turn switch S1 (651.8010.01S, p. 3) to setting  (single current).

(Continuation)---

POWER SUPPLY / EMC FILTER
IN 085P1

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---(Continuation) Test of FSK Keying
Stage

Connect milli-ammeter to connectors
X424.9 (+) and X424.8 (-)
(651.8010.01S, p. 3).

On receiver set mode FSK3 and
frequency 400 Hz. With POL key set
FSK polarity to -.

Read display on milli-ammeter.

Nominal value: 40 ±3 mA

With POL key set FSK polarity to +.

Read display on milli-ammeter.

Nominal value: < 1 mA

2. With POL key switch FSK polarity
from + to -.

Measure voltage on U1.4
(651.8010.01S, p. 3) referred to
+30 V.

Nominal values:

polarity +	-0.2 V
polarity -	-6.3 V

Measure voltage on base of V6
(651.8010.01S, p. 3) referred to
-30 V.

Nominal values:

polarity +	-6.3 V
polarity -	0 V

3. Turn switch S2 to setting 
(polar current).

With POL key set FSK polarity to -.

Read display on milli-ammeter.

Nominal value: +20 ±2 mA

With POL key set FSK polarity to +.

Nominal value: -20 ±2 mA

4. Leave switch S1 set for polar
current.

Measure voltage on base of V4
(651.8010.01S, p. 3) referred to
+30 V.

Nominal value: -0.6 V

Measure voltage on base of V10
(651.8010.01S, p. 3) referred to
-30 V.

Nominal value: +0.6 V

POWER SUPPLY / EMC FILTER IN 085P1

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Part 6: Repair

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6.5 Setting and Alignment

6.5.1 Setting and Alignment of Power Supply

1. Arrange test set-up acc. to Fig. 6.1.
2. Set isolating tranformer to 220 V and power-supply unit to 0 V.
3. Connect digital voltmeter to connectors X43.a6 (+) and X43.a2 (-) (651.7714.01S, p. 2).
4. Set output voltage to 5.300 V with potentiometer R38 (651.7714.01S, p. 2).
5. Connect digital voltmeter to testpoint MP4 (+) and connector X43.a2 (-) (651.7714.01S, p. 2).
6. Set control voltage to 5.01 V with potentiometer R64 (651.7714.01S, p. 2).
7. Connect oscilloscope to connectors X43.a6 (+) and X43.a2 (-) (651.7714.01S, p. 2).
8. Attune ripple voltage to minimum with potentiometer R52 (651.7714.01S, p. 1).

6.5.2 Alignment of Indication of LINE Output Level

1. On receiver set mode CW, frequency 0 kHz and BFO 1 kHz.
2. Withdraw cable K2 from preselection and connect to socket X78 (7.2-MHz output on synthesizer).
3. Set selector switch for meter to AF.
4. Set potentiometer R124 (651.8010.01S, p. 2) so that there is 0 dBm (775 mV) on connector X423.23 (651.8010.01S, p. 2) terminated with 600 ohms.
5. With potentiometer R49 (651.8010.01S, p. 2) align indication on meter to 0 dBm.

Si pb à chaud, pas de reset à la mise sous tension, vérifier MP4

POWER SUPPLY / EMC FILTER IN 085P1

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6.6 Replacement of Subassemblies

CAUTION

The power and battery cables must be detached before removing the power supply/EMC filter from the housing of the receiver.

Note:

With the desktop model the panelling has to be removed before the power supply/EMC filter can be removed/replaced. Proceed as follows:

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

6.6.1 Removal of Power Supply/EMC Filter

1. Withdraw ribbon cable from each of connectors X41 and X4 and three RF cables, not on power supply/EMC filter but on "matching ends"; unscrew cable clamp.
2. Undo five screws (6 and 11, Fig. 6.2) and pull out power supply/EMC filter (5) towards rear.

6.6.2 Removal of Filter Board with Filter

1. Undo two screws (4 and 5, Fig. 6.3) and remove cover panel (2).
2. Undo seven screws (1) and remove frame with heatsink (3).
3. Withdraw ribbon cable with connector from X43 on regulator board.
4. Undo 15 screws (1, Fig. 6.4) and remove filter board with filter.

6.6.3 Removal of Regulator Board

1. Remove cover after undoing ten screws.
2. Undo three screws (1, Fig. 6.5) and remove power supply from spacer bolts.

6.6.4 Reassembly of Power Supply/EMC Filter

The Power Supply/EMC Filter IN 085P1 is reassembled in the reverse order of the removal described above.

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6.7 Final Test

After any repairs have been carried out, the power supply/EMC filter must be subjected to the following final test to ensure that its technical data can still be guaranteed.

If the final test is positive, repair can be considered as completed, otherwise the troubleshooting 6.3.1 to 6.3.6 will have to be repeated. The procedure should be repeated as often as is necessary to detect and remedy all faults.

6.7.1 Test of Frequency Switching

1. Arrange test set-up acc. to Fig. 6.1.
2. Set isolating transformer to 220 V and power-supply unit to 0 V.
3. Connect frequency counter to N1.5 (651.7714.01S, p. 1) of the switching control.
4. Link connectors X43.a11 and X43.b11 (651.7714.01S, p. 1) to 0 V or 5 V acc. to following table and measure clock frequency.

Frequency switching X43.b11	< 400 kHz X43.a11	Clock frequency
1	1	100.000 kHz
0	1	98.039 kHz
1	0	100.000 kHz
0	0	94.340 kHz

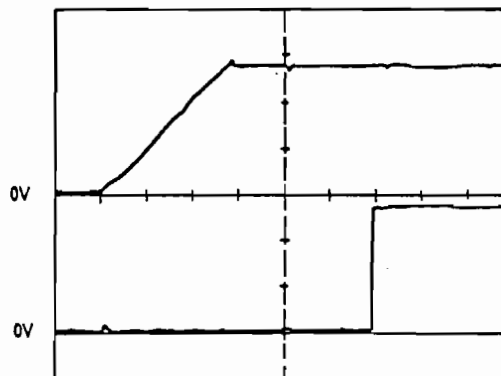
0 = 0 V

1 = 5 V

6.7.2 Test of RESET-signal Generation

1. Arrange test set-up acc. to Fig. 6.1.
2. Connect channel 1 of oscilloscope to connector X43.a6 (+5.3 V) and channel 2 to connector X43.a10 (RESET) (651.7714.01S, p. 2).
3. Set power-supply unit for 0 V, turn up isolating transformer from 0 V to 220 V and produce oscillograms.

Nominal value:



Top: channel 1, below: channel 2
Scale: 2 V/div, 200 ms/div

(Continuation)---

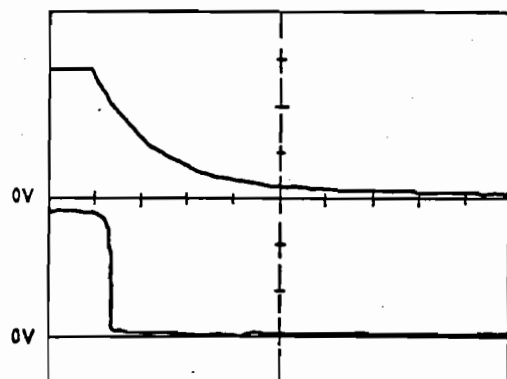
POWER SUPPLY / EMC FILTER
IN 085P1

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---(continuation) Test of RESET-signal
Generation

Nominal value:



Top: channel 1, below: channel 2
Scale: 2 V/div, 500 μ s/div

6.7.3 Test of Remote Switch-on

1. Adapt power supply/EMC filter in receiver.
2. Connect power supply to connector X447.1/2 (651.7614.01S) and set for 24 V.
3. Turn power switch on receiver to OFF.
4. Link connector X423.17 to X423.35 (651.8010.01S, p. 2).

Receiver switches itself on.

POWER SUPPLY / EMC FILTER IN 085P1

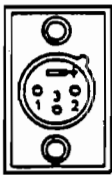
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6.8 External Interfaces

All interfaces, with the exception of the battery and power connector of the power supply/EMC filter, are shown in circuit diagram 651.7614.01S. This summary shows the pin assignments and types of signal on the connectors and sockets.

<u>External Interfaces</u>		
Mains connector	Contact	Signal designation/level
Matching socket with power cable R&S Id. No. 025.2365.00 	1 2 3	Mains voltage Mains voltage 100/120/220/240 VAC Non-fused grounded 47 to 420 Hz conductor

10 to 31 V	Contact	Signal designation/level
Manufacturer: Binder matching socket R&S Id. No. 591.1997 	1 2 3	Battery connector Plus pole of battery (+) Minus pole of battery (-) Output of high-end voltage of power supply for accessory units 35 to 48 V Shield

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NOTES

POWER SUPPLY / EMC FILTER IN 085P1

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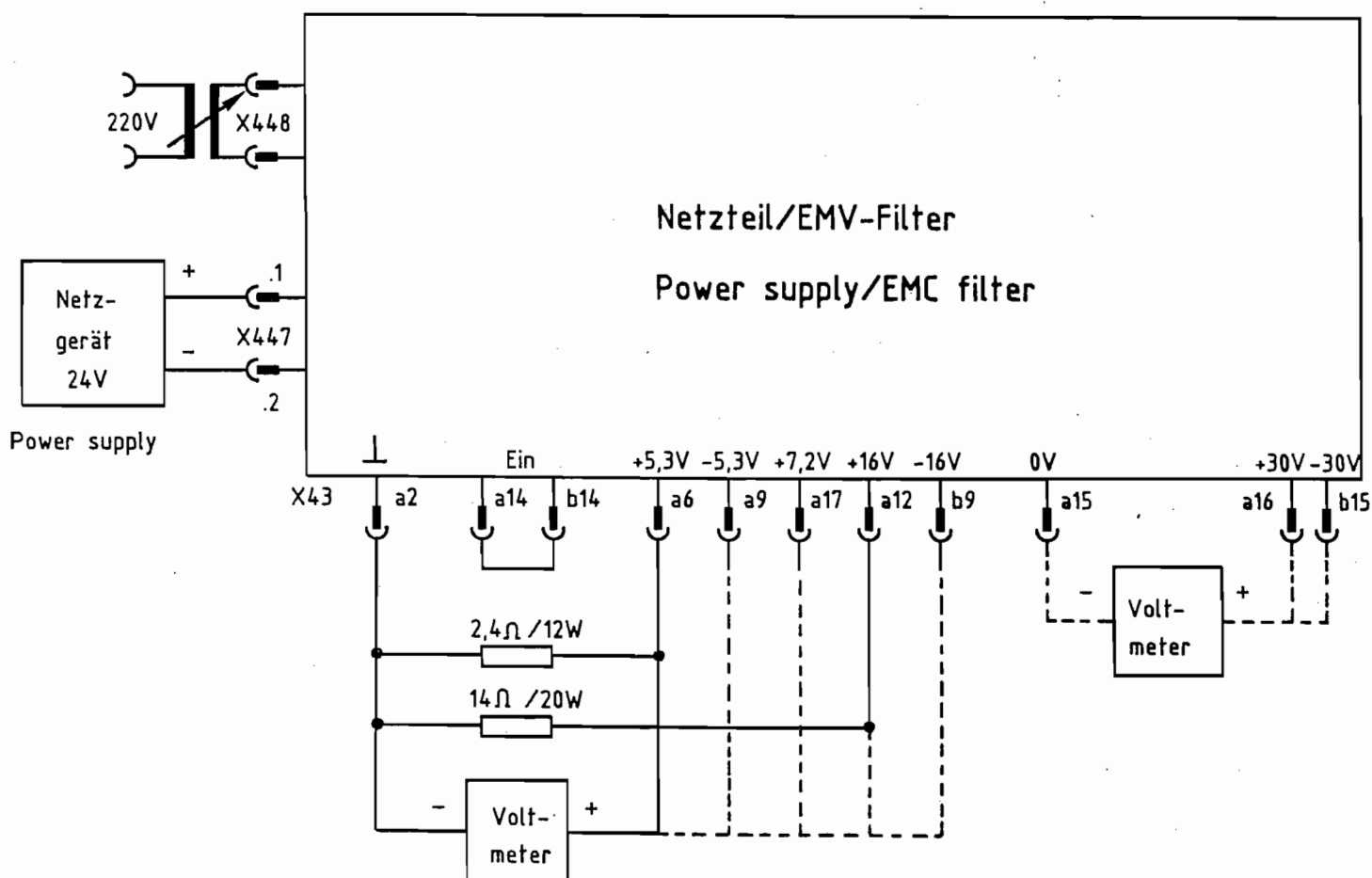


Fig. 6.1 Test Set-up for Power Supply/EMC Filter

POWER SUPPLY / EMC FILTER
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- 6.33/6.34 -

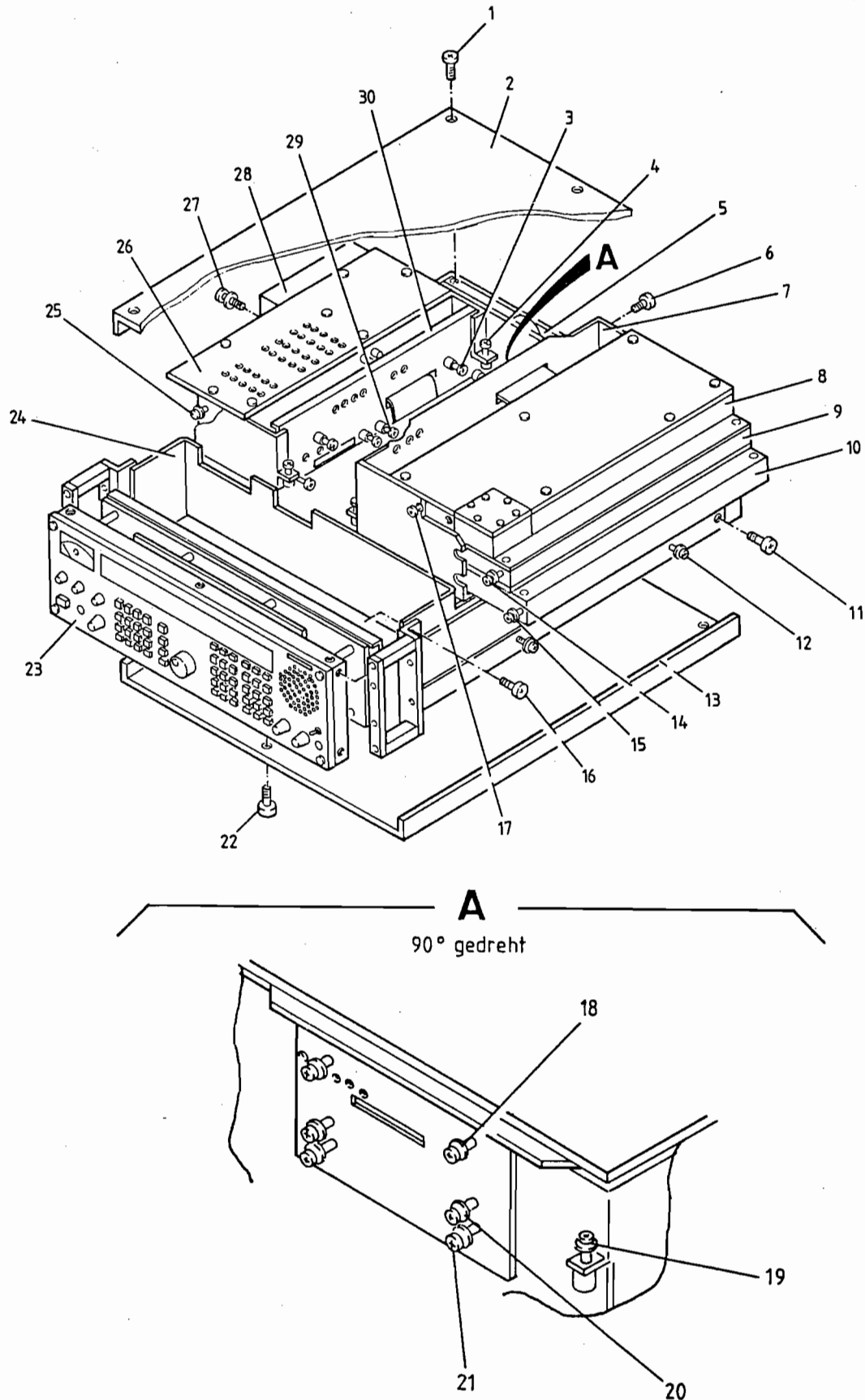


Fig. 6.2 Removal of Power Supply/EMC Filter IN 085P1

POWER SUPPLY / EMC FILTER IN 085P1

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- 6.35/6.36 -

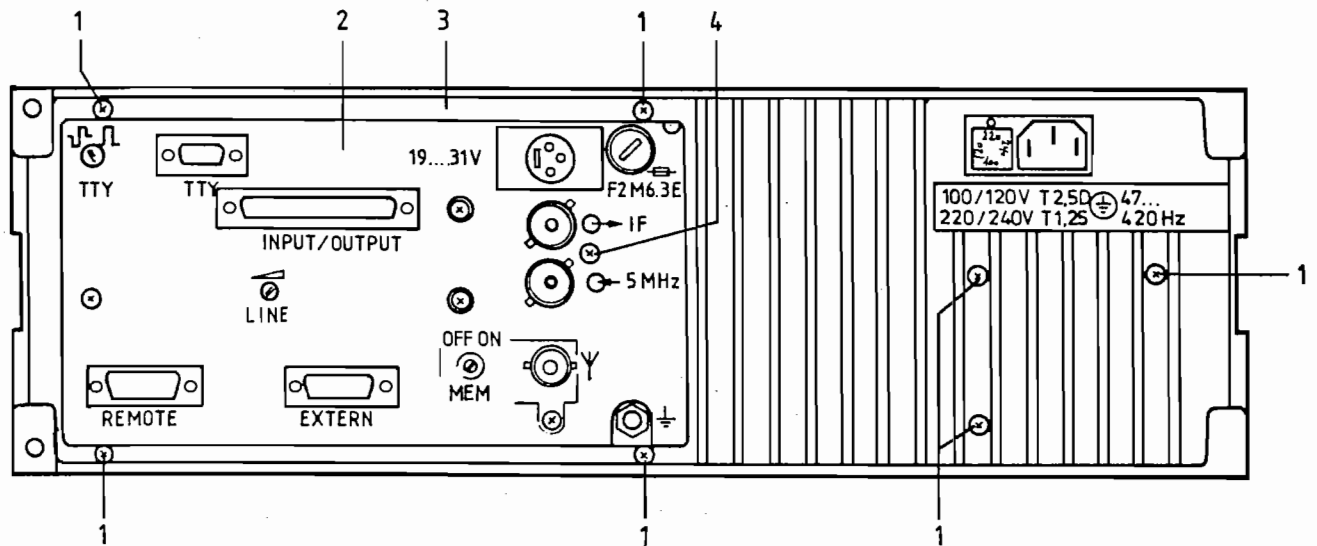


Fig. 6.3 Rear View of Power Supply/EMC Filter IN 085P1

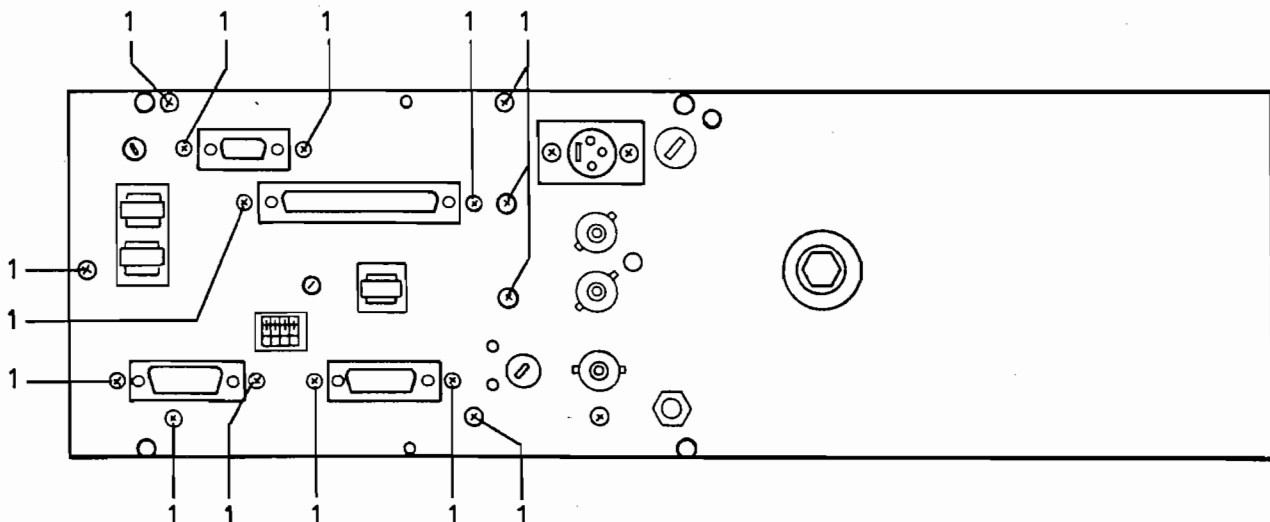


Fig. 6.4 Rear View without Cover Panels

POWER SUPPLY / EMC FILTER
IN 085P1

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- 6.37/6.38 -

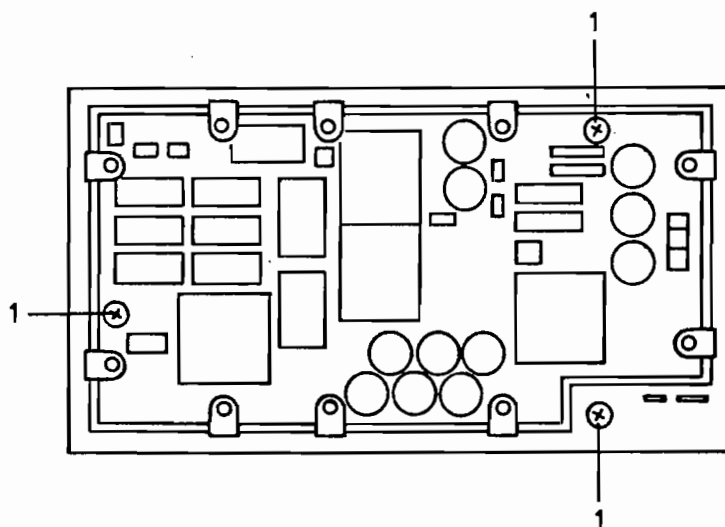
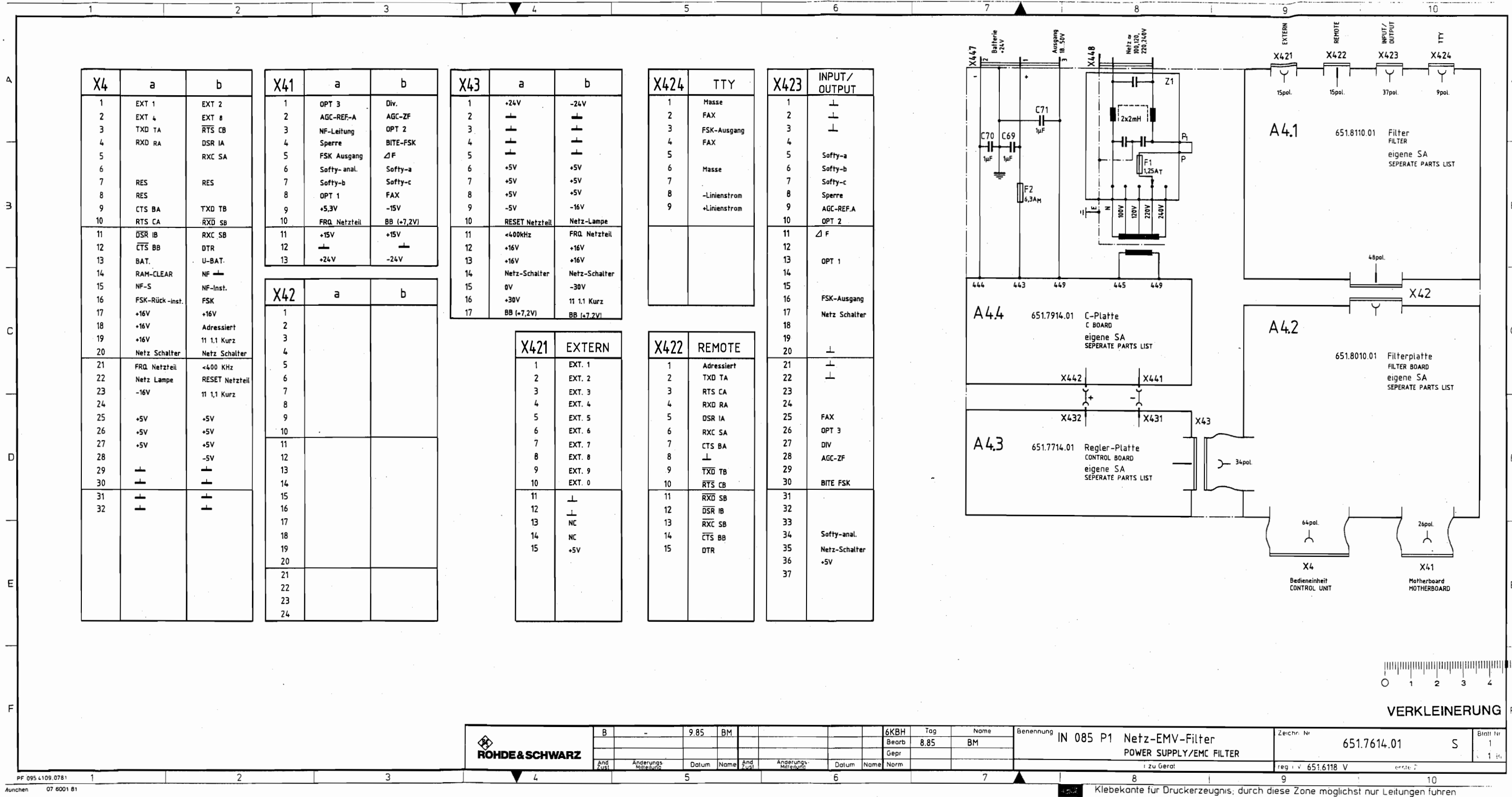


Fig. 6.5 Removal of Regulator Board



ROHDE & SCHWARZ
MÜNCHEN

Schalteillisten
Stromläufe
Bestückungspläne
Parts lists
Circuit diagrams
Components plans



**ROHDE & SCHWARZ**

ÄZ

Datum
DateSchaltteilliste für
Parts list forSachnummer
Stock No.Blatt
Page

06

1085

IN085P1 NETZT./EMV-FILTER
IN085P1 POW/SUP.EMC FILT.

651.7614.01 SA

1

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

-

VARIANTENERKL. / VERSIONS
VAR 02 = GRUNDAUSFUEHRUNG

A4.1

ED FILTERPLATTE
FILTER BOARD

651.8010.02

A4.2

ED FILTER
FILTER

651.8110.02

A4.3

ZM REGLER

654.5335.02

A4.4

ED C-PLATTE
CAPACITOR BOARD

651.7914.02

A4.3.1

ED REGLERPLATTE
CONTROL BOARD
HIERZU STROML.651.7714.01S

651.7714.02

654.5335.0

C69

CK 1,0UF+-10% 63V RUNDB.
PLASTIC-FOIL CAPACITOR
ROEDERST MKT1813-510/06

024.6867

C70

CK 1,0UF+-10% 63V RUNDB.
PLASTIC-FOIL CAPACITOR
ROEDERST MKT1813-510/06

024.6867

C71

CK 1,0UF+-10% 63V RUNDB.
PLASTIC-FOIL CAPACITOR
ROEDERST MKT1813-510/06

024.6867

F1

SS SCHMELZ.T1,25 DIN41662
FUSE

SS 020.7475

F2

WICKMANN T1,25 DIN 41662 TROP
SS SCHMELZS.M6,3 EDIN41571
FUSE
WICKMANN M6,3 E DIN41571 TROP

SS 020.7623

T5

LT RINGK.TR160VA RD117X42
TRANSFORMER
TALEMA N.R&S-ZCHNG.651.7995

651.7995

W1

DX HF-KABEL

651.6876

W4

DX HF-KABEL

651.6882

W9

DX HF-KABEL

651.6899

X48

FN NETZFILT.M.SPANNUNGSW.
FILTER

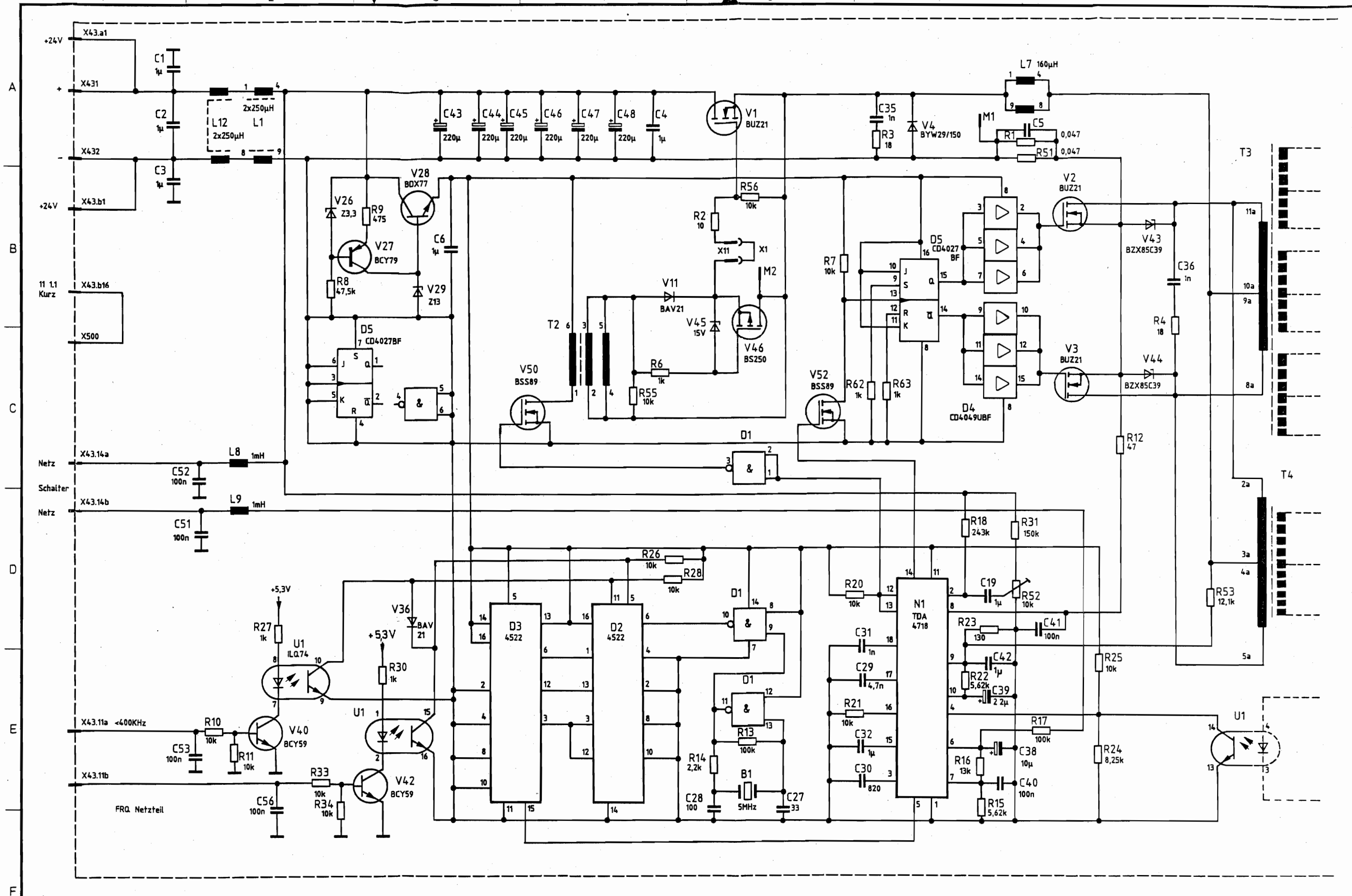
FN 099.3313

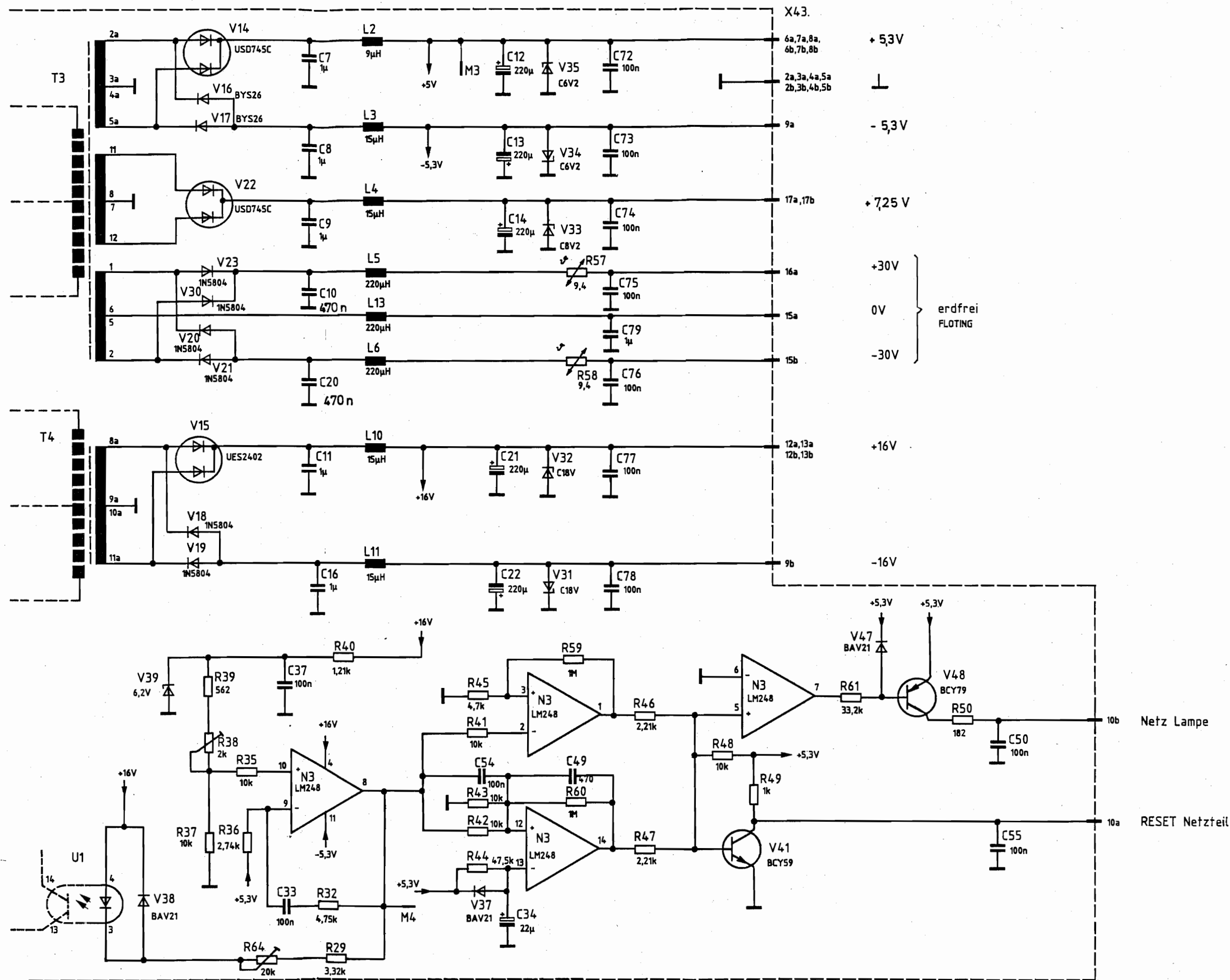
X447

SCHAFFNER FN 369-2/01
FO EINBAUSTECKER 3POL.
3-PIN CONNECTOR
BINDER 09-0257-00-03

591.2006

- ENDE -





**RONDE & SCHWARZ**ÄZ Datum
Date
01 0785Schaltteilliste für
Parts list for
**ED REGLERPLATTE
CONTROL BOARD**Sachnummer
Stock No.**651.7714.01 SA**Blatt
Page**1**

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
B1	EQ 5,000 MHZ CL30PF HC43U CRYSTAL 5,000MHZ	EQ 091.0280	
C1	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
BIS/TO			
C11			
C12	CE 220UF-10+50%40V12,5X20 ALUMINIUM CAPACITOR ROEDERST EKRO0FE322G	565.9494	
C13	CE 220UF-10+50%40V12,5X20 ALUMINIUM CAPACITOR ROEDERST EKRO0FE322G	565.9494	
C14	CE 220UF-10+50%40V12,5X20 ALUMINIUM CAPACITOR ROEDERST EKRO0FE322G	565.9494	
C16	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C19	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C20	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C21	CE 220UF-10+50%40V12,5X20 ALUMINIUM CAPACITOR ROEDERST EKRO0FE322G	565.9494	
C22	CE 220UF-10+50%40V12,5X20 ALUMINIUM CAPACITOR ROEDERST EKRO0FE322G	565.9494	
C27	CC 33PF+-10%200V5K1200VIE CAPACITOR UNION CARB M39014/01-1370	CC 084.5196	
C28	CC 100PF+-10%200V5K1200VI CAPACITOR UNION CARB M39014/01-1379	CC 084.5250	
C29	CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB M39014/01-1409	CC 068.4053	
C30	CC 820PF+- 5%100V NPO VIE CERAMIC CAPACITOR ERIE 8133-100C0G-820PF	CC 060.0888	
C31	CC 1NF+-10%100V5K1200VIEL CAPACITOR UNION CARB M39014/01-1397	CC 068.4047	
C32	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
C33	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C34	CE 22 UF+-20% 16V 6X4X8 ELECTROLYTIC CAPACITOR TEKELEC MT4R22UF16V20%		CE 087.5874		
C35	CC 1NF+-10%100V5K1200VIEL CAPACITOR UNION CARB M39014/01-1397		CC 068.4047		
C36	CC 1NF+-10%100V5K1200VIEL CAPACITOR UNION CARB M39014/01-1397		CC 068.4047		
C37	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C38	CE 10 UF+-20%20V 6X3X8 ELECTROLYTIC CAPACITOR TEKELEC MT3R10UF20V20%		CE 450.7254		
C39	CE 22 UF+-20% 16V 6X4X8 ELECTROLYTIC CAPACITOR TEKELEC MT4R22UF16V20%		CE 087.5874		
C40	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C41	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C42	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%		CK 099.2998		
C43	CE 220UF-10+50%63V15X25 ELECTROLYTIC CAPACITOR ROEDERST. EKRO0HG322J		651.8004		
BIS/TO C48					
C49	CC 470PF+-10%200V5K1200VI CAPACITOR UNION CARB M39014/01-1391		CC 060.2274		
C50	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C51	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C52	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C53	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C54	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		
C55	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433		CC 084.5350		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C56	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C72	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
BIS/TO C78 C79	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
D1	BL 4011BDM 4X2IN.NANDG NAND GATE FAIRCHILD 4011BDM	BL 587.9116	
D2	BL HEF4522BD BCD COUNTER PROGR.BCD DOWN COUNTER VALVO HEF4522BD	645.7022	
D3	BL HEF4522BD BCD COUNTER PROGR.BCD DOWN COUNTER VALVO HEF4522BD	645.7022	
D4	BL CD4049UBF 6XINVERTER HEXINVERTER RCA CD4049UBF	BL 086.8192	
D5	BL CD4027BF 2XJK FLIPFL FLIP FLOP RCA CD4027BF	BL 086.8128	
L1	LD SPEICHERDR. 5A/10A LOADING COIL VAC ZKB 422/060-XX-H2	565.9536	
L2	LD 9UH BEI 6 A 0,012 OHM CHOKE	LD 026.4826	
L3	LD 15UH BEI 4 A 0,024 OHM CHOKE SIEMENS B82111-B-C23	LD 026.4832	
L4	LD 15UH BEI 4 A 0,024 OHM CHOKE SIEMENS B82111-B-C23	LD 026.4832	
L5	LD 220UH BEI 0,5A 2,6 OHM CHOKE SIEMENS B 82111-E-C26	LD 099.5200	
L6	LD 220UH BEI 0,5A 2,6 OHM CHOKE SIEMENS B 82111-E-C26	LD 099.5200	
L7	LD SPEICHERDR.630UH 3,15A STORAGE CHOKE VAC 422/059-XX-H2	335.9359	
L8	LD 1000UH10%72,00HMO,028A CHOKE DELEVAN DROSSEL1025-92	LD 037.8005	
L9	LD 1000UH10%72,00HMO,028A CHOKE DELEVAN DROSSEL1025-92	LD 037.8005	
L10	LD 15UH BEI 4 A 0,024 OHM CHOKE SIEMENS B82111-B-C23	LD 026.4832	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
L11	LD 15UH BEI 4 A 0,024 OHM CHOKE SIEMENS B82111-B-C23	LD 026.4832	
L12	DOPPELDROSSEL	651.6847	
L13	LD 220UH BEI 0,5A 2,6 OHM CHOKE SIEMENS B 82111-E-C26	LD 099.5200	
N1	B0 TDA4718 SCHALTREGLER REGUL. PULSE WIDTH MODUL. SIEMENS TDA4718	565.9413	
N3	B0 LM248J 4X OPAMP OPERATIONAL AMPLIFIER NSC LM248J	B0 586.8022	
R1	RD 1,2W 47 MIOHM+-3% WIRE-WOUND RESISTOR SAGE 1000S/0,040HM/3%	RD 069.1458	
R2	RL 0,35W 10,0 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/100HM-F-D	RL 082.8852	
R3	RJ 1W 18 OHM+-5%TK200 RESISTOR RESISTA 180HM+-5% TK200	451.5055	
R4	RJ 1W 18 OHM+-5%TK200 RESISTOR RESISTA 180HM+-5% TK200	451.5055	
R6	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R7	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R8	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800	
R9	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/475OHM-F-D	RL 083.0390	
R10	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R11	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R12	RL 0,35W 47,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/47,5OHM-F-D	RL 082.9507	
R13	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R14	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	
R15	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	


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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R16	RL 0,35W 13,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/13,0K-F-D	RL 083.1368	
R17	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R18	RL 0,35W 243 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/243K-F-C	RL 083.2312	
R20	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R21	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R22	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R23	RL 0,35W 130 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/130OHM-F-D	RL 082.9888	
R24	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R25	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R26	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R27	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R28	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R29	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R30	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R31	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C	RL 083.2129	
R32	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R33	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R34	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R35	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	

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Kennzeichen Component No.	Benennung/Beschreibung Designation			Sachnummer Stock No.	enthalten in contained in	
R36	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D			RL 083.0926		
R37	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297		
R38	RS 0,5W2KOHM+-10%10X10X5 CERMET POTENTIOMETER BOURNS 3386X-1-202			RS 247.7961		
R39	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D			RL 083.0461		
R40	RL 0,35W 1,21KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,21K-F-D			RL 083.0655		
R41	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297		
R42	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297		
R43	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297		
R44	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C			RL 083.1800		
R45	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D			RL 083.1097		
R46	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C			RL 082.2477		
R47	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C			RL 082.2477		
R48	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297		
R49	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C			RL 082.2160		
R50	RL 0,35W 182 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/182OHM-F-D			RL 083.0010		
R51	RD 1,2W 47 MIOHM+-3% WIRE-WOUND RESISTOR SAGE 1000S/0,04OHM/3%			RD 069.1458		
R52	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386X1-103			RS 247.7526		
R53	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D			RL 083.1351		
R55	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297		

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.		enthalten in contained in
R56	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D		RL 083.1297		
R57	RK KALTL.80V-195/20MA PTC-RESISTOR SIEMENS Q63100-P2390-C970		RK 565.8175		
R58	RK KALTL.80V-195/20MA PTC-RESISTOR SIEMENS Q63100-P2390-C970		RK 565.8175		
R59	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D		RL 082.7862		
R60	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D		RL 082.7862		
R61	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C		RL 083.1674		
R62	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
R63	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
R64	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386X-1-203		RS 087.7660		
T2	LU ZUENDUEBERTR.0,4W IGNATION TRANSFORMER VAC ZKB 409/020-01-PF		645.7316		
T3	LU GEGENT.UEB.1 34X30X27 TRANSFORMER VAC ZKB 478/207-51-W		651.7895		
T4	LU GEGENT.UEB.2 34X30X27 TRANSFORMER VAC ZKB 478/208-51-W		651.7908		
U1	BP IQL74 4XOPTOCOUPLER OPTO COUPLER LITRONIX ILQ74		BP 216.1803		
V1	AM BUZ21 NKAN POW.MOSF POWER MOSFET SIEMENS BUZ21 C67078-A1308		645.7300		
V2	AM BUZ21 NKAN POW.MOSF POWER MOSFET SIEMENS BUZ21 C67078-A1308		645.7300		
V3	AM BUZ21 NKAN POW.MOSF POWER MOSFET SIEMENS BUZ21 C67078-A1308		645.7300		
V4	AG BYW29/150 GL 150V 7A0 RECTIFIER VALVO BYW29/150		AG 300.6799		
V11	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21		AD 082.6837		

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Kennzeichen Component No.	Benennung/Beschreibung Designation			Sachnummer Stock No.	enthalten in contained in
V14	AG USD745C 2XGL 45V16A0 RECTIFIER			645.7322	
V15	UNITRODE USD 745 C AG UES2402 2XGL 100V16A0 RECTIFIER			645.7339	
V16	UNITRODE UES2402 AG BYS26 SGL 40V 2A6 RECTIFIER			586.8574	
V17	SIEMENS BYS26 AG BYS26 SGL 40V 2A6 RECTIFIER			586.8574	
V18	SIEMENS BYS26 AG 1N5804 GL 100V 2A5 RECTIFIER			AG 453.4762	
V19	UNITRODE 1N5804 AG 1N5804 GL 100V 2A5 RECTIFIER			AG 453.4762	
V20	UNITRODE 1N5804 AG 1N5804 GL 100V 2A5 RECTIFIER			AG 453.4762	
V21	UNITRODE 1N5804 AG 1N5804 GL 100V 2A5 RECTIFIER			AG 453.4762	
V22	UNITRODE 1N5804 AG USD745C 2XGL 45V16A0 RECTIFIER			645.7322	
V23	UNITRODE USD 745 C AG 1N5804 GL 100V 2A5 RECTIFIER			AG 453.4762	
V26	UNITRODE 1N5804 AE BZX79/C3V3 0,5W Z-DI ZENER DIODE			AE 012.2390	
V27	ITT ZPD3,3 AK BCY79IX PNP 45V 200MA TRANSISTOR			AK 010.3777	
V28	SIEMENS BCY79IX AL BDX77 NPN 80V 8A0 TRANSISTOR			AL 300.6318	
V29	VALVO BDX77 AE BZX79/C13 0,5W Z-DI ZENER DIODE			AE 012.2549	
V30	VALVO BZX79/C13 AG 1N5804 GL 100V 2A5 RECTIFIER			AG 453.4762	
V31	UNITRODE 1N5804 AE BZX85/C18 1,3W Z-DI ZENER DIODE			AE 092.8310	
V32	THOMSON BZX85/C18 AE BZX85/C18 1,3W Z-DI ZENER DIODE			AE 092.8310	
V33	THOMSON BZX85/C18 AE BZX85/C8V2 1,3W Z-DI ZENER DIODE			AE 092.8526	
V34	THOMSON BZX85/C8V2 AE BZX85/C6V2 1,3W Z-DI ZENER DIODE			AE 092.8249	
	THOMSON BZX85/C6V2				
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V35	AE BZX85/C6V2 1,3W Z-DI ZENER DIODE THOMSON BZX85/C6V2	AE 092.8249	
V36	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21	AD 082.6837	
V37	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21	AD 082.6837	
V38	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21	AD 082.6837	
V39	AE 1N827 6,2V REF-DI REFERENCE DIODE CDI 1N827	AE 418.0029	
V40	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V41	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V42	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V43	AE BZX85/C39 1,3W Z-DI ZENER DIODE THOMSON BZX85/C39	AE 092.8390	
V44	AE BZX85/C39 1,3W Z-DI ZENER DIODE THOMSON BZX85/C39	AE 092.8390	
V45	AE BZX79/C15 0,5W Z-DI ZENER DIODE VALVO BZX79/C15	AE 012.2555	
V46	AM BS250 PKAN POW.MOSF MOS-FET INTERMETAL BS250	AM 566.1216	
V47	AD BAV21 250V 0,25A UDI DIODE INTERMETAL BAV21	AD 082.6837	
V48	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
V50	AM BSS89 NKAN200V FET FET SIEMENS BSS89	651.7666	
V52	AM BSS89 NKAN200V FET FET SIEMENS BSS89	651.7666	
X1	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X11	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
X43	2-POLIG/2 PINS FP STIFTELEISTE 34P.GERADE CONNECTOR 34P		FP 645.7145		
X431	PANDUIT 050-034-133BC FV FLACHSTECKER GR.6,3 FLAT-CABLE PLUG		FV 530.5457		
X432	VOGT 3866B/MS-SN8 FV FLACHSTECKER GR4,8X0,8 PLUG		FV 545.4000		
X500	VOGT&CO 3826 MS/0,8 VERZINNT FV FLACHSTECKER GR4,8X0,8 PLUG		FV 545.4000		
	VOGT&CO 3826 MS/0,8 VERZINNT				
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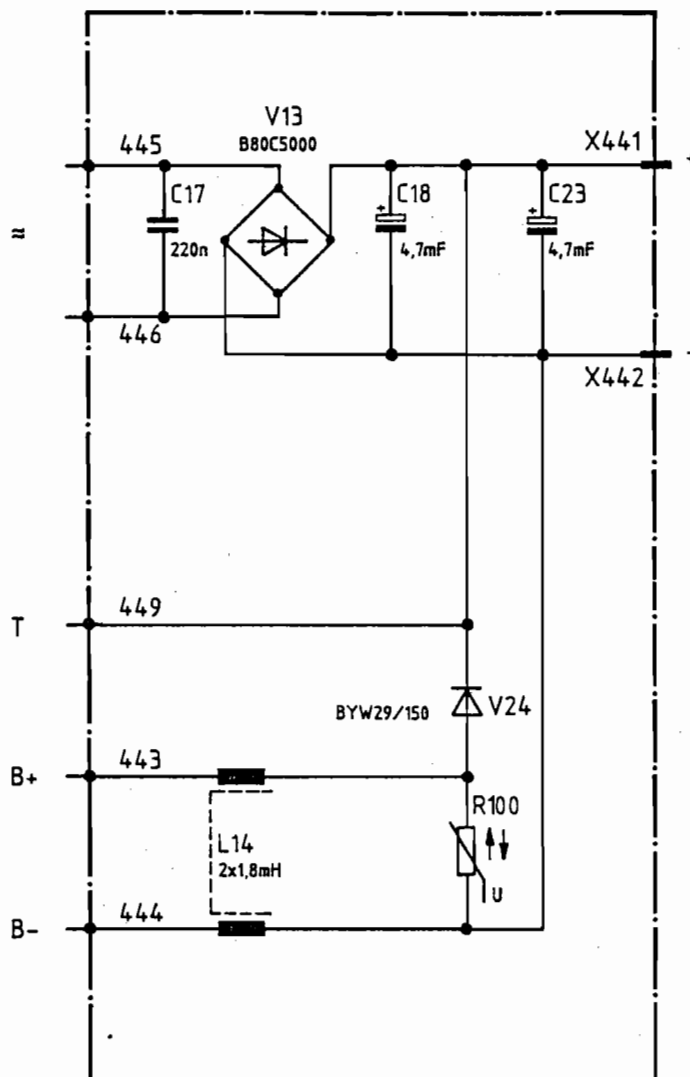
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				Tag	Name	Benennung C-Platte C-BOARD	
			Bearb	7.85	BM		
			Gepr				
			Norm				
						Zeichn.-Nr	Blatt-Nr
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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.		enthalten in contained in
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL				
C17	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%		CK 099.2952		
C18	CE 4700UF-10+50%63V35X80 ELECTROLYTIC CAPACITOR ROEDERST EYV 00CF447J		CE 292.9024		
C23	CE 4700UF-10+50%63V35X80 ELECTROLYTIC CAPACITOR ROEDERST EYV 00CF447J		CE 292.9024		
L14	LD FUNKENTST.DR.2X1,8M/H RADIO-SCREENING-CHOKE SIEMENS B82724-G2-A14		681.1250		
R100	:: VARISTOR / 6EKF/W0		654.5329		
V13	AG B80C5000/3300 BRGL RECTIFIER SIEMENS B80C5000/3300		AG 084.5109		
V24	AG BYW29/150 GL 150V 7A0 RECTIFIER VALVO BYW29/150		AG 300.6799		
X441	FV FLACHSTECKER GR.6,3 FLAT-CABLE PLUG VOGT 3866B/MS-SN8		FV 530.5457		
X442	FV FLACHSTECKER GR4,8X0,8 PLUG VOGT&CO 3826 MS/0,8 VERZINNT		FV 545.4000		
X443	VL LOETOESE 6,9 X 0,9 SOLDERING PIN		VL 082.5253		
BIS/TO X447					

- ENDE -

Für diese Unterlage behalten wir uns alle Rechte vor

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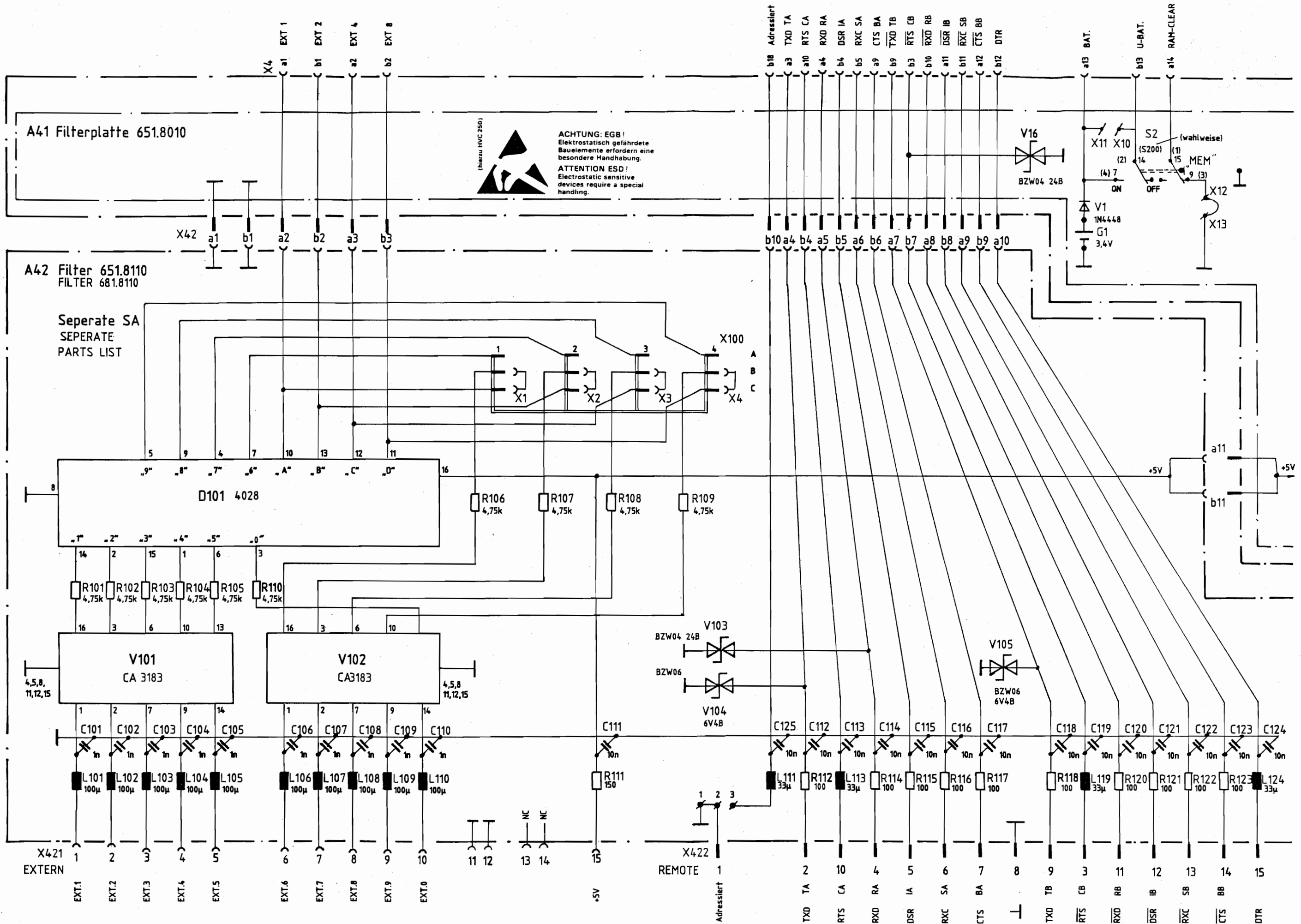
C



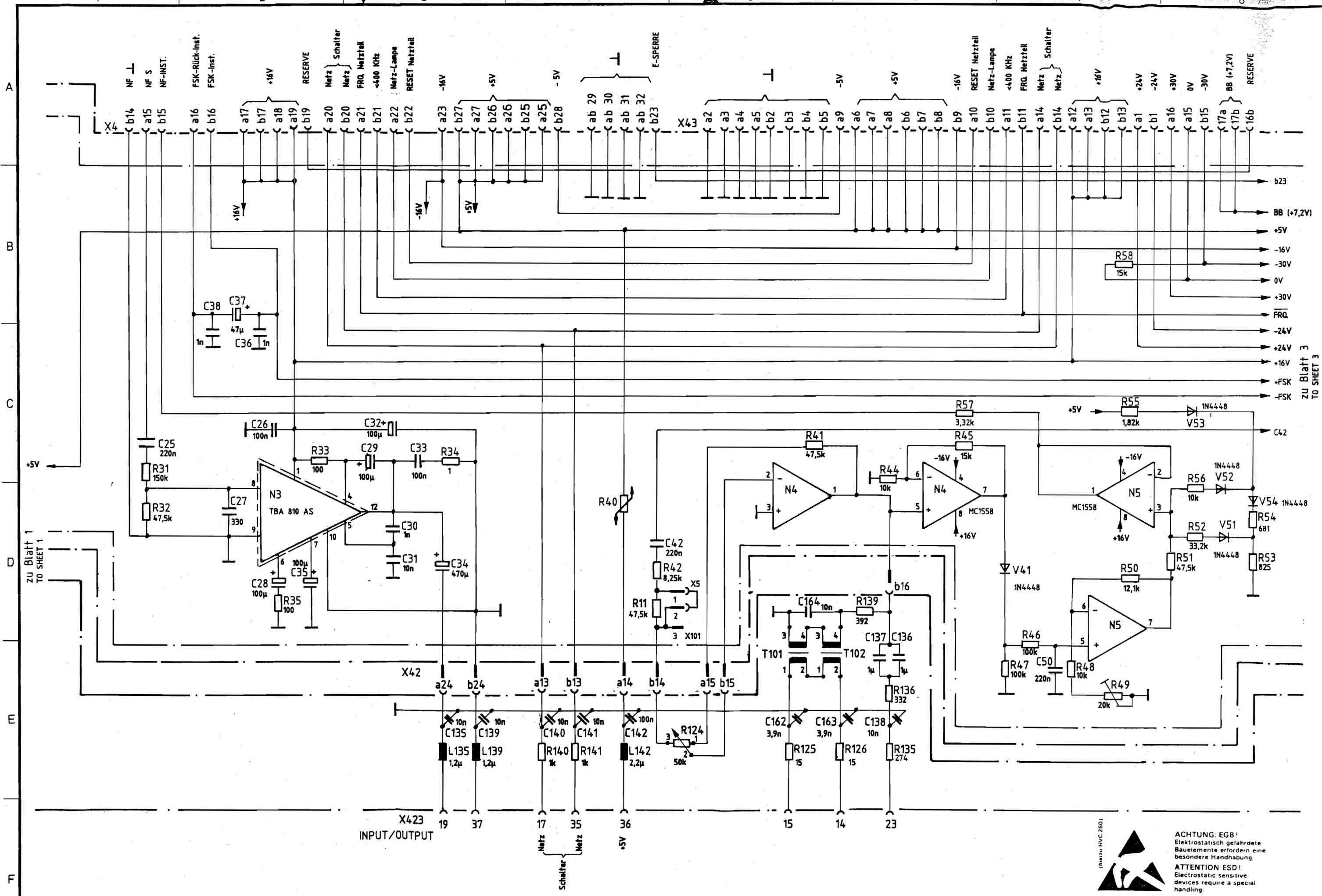
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zu Blatt 2
TO SHEET 2

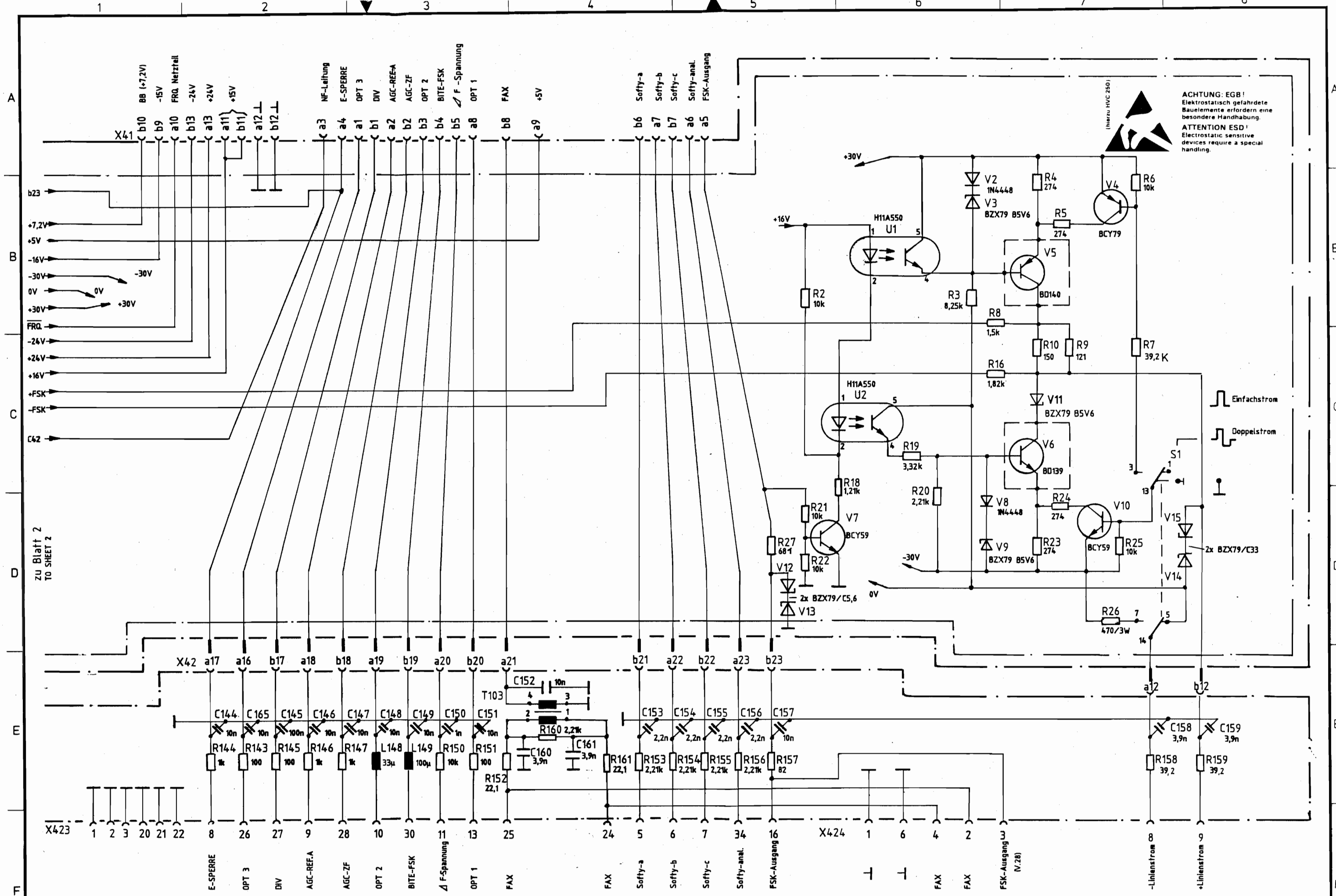


ACHTUNG: EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung.
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling.

ROHDE & SCHWARZ

And. Zust.	Anderungs-Mitteilung	Datum	Name	And. Zust.	Anderungs-Mitteilung	Datum	Name	Norm
			A				TA	6KBH
			B				BM	Bearb.
								Gepr.

Benennung	Zeichn.-Nr.	Blatt-Nr.
Filterplatte	651.8010.01 S	2
zu Gerät: IN 085 P1	reg. i. V. 651.7614.01V	v. 3 Bl.
	erste Z. 681.7614.01	



And. Zust.	Änderungs-Mitteilung	Datum	Name	And. Zust.	Änderungs-Mitteilung	Datum	Name	Norm	Benennung	zu Gerät:	reg. i. V.	erste Z.	Blatt-Nr.
			A				A		Filterplatte	IN 085 P1	651.7614.01V	651.7614.01	3
			B				B						v 3 Bl.

**ROHDE & SCHWARZ**

ÄZ

Datum
Date

02

0985

Schaltteilliste für
Parts list for
ED FILTERPLATTE
FILTER BOARDSachnummer
Stock No.

651.8010.01 SA

Blatt
Page

1

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

.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
C25	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	
C26	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C27	CC 330PF+-2%6X9N750 CERAMIC CAPACITOR VALVO 2222 678 58331	CC 087.6964	
C28	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C29	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C30	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C31	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
C32	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C33	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C34	CE 470UF-10+50%16V 10X25 ELECTROLYTIC CAPACITOR ROEDERST EB00GD347D	651.8185	
C35	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK100/25	CE 208.4007	
C36	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C37	CE 47UF-10+50% 40V 9X13 ELECTROLYTIC CAPACITOR ROEDERST EK 00 CB 247 G	CE 006.7142	
C38	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C42	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	
C50	CK 220NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,22UF/5%	CK 099.2952	
G1	EB LITHIUM-BATT.3,4V AA/P BATTERY 1,34V SONNENSCH 11101-60300	651.6901	

 ROHDE & SCHWARZ		AZ Datum Date	Schalteilliste für Parts list for ED FILTERPLATTE FILTER BOARD	Sachnummer Stock No.	Blatt Page
		02	0985	651.8010.01 SA	2
Kennzeichen Component No.	Benennung/Beschreibung Designation			Sachnummer Stock No.	enthalten in contained in
N3	B0 TBA810AS LF POW.AMPL POWER AMPLIFIER			645.8312	
N4	AEG-TELEF TBA810AS B0 MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER			B0 275.0816	
N5	NSC LM1558J B0 MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER			B0 275.0816	
R2	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR			RL 083.1297	
R3	DRALORIC SMA0207/10K-F-D RL 0,35W 8,25KOHM+-1%TK50 RESISTOR			RL 083.1239	
R4	DRALORIC SMA0207/8,25K-F-D RL 0,35W 274 OHM+-1%TK50 RESISTOR			RL 083.0178	
R5	DRALORIC SMA0207/274OHM-F-D RL 0,35W 274 OHM+-1%TK50 RESISTOR			RL 083.0178	
R6	DRALORIC SMA0207/274OHM-F-D RL 0,35W 10,0KOHM+-1%TK50 RESISTOR			RL 083.1297	
R7	DRALORIC SMA0207/10K-F-D RL 0,35W 39,2 OHM+-1%TK50 RESISTOR			RL 082.9420	
R8	DRALORIC SMA0207/39,2OHM-F-D RL 0,35W 1,50KOHM+-1%TK50 RESISTOR			RL 083.0732	
R9	DRALORIC SMA0207/1,50K-F-D RL 0,35W 121 OHM+-1%TK50 RESISTOR			RL 082.9859	
R10	DRALORIC SMA0207/121OHM-F-D RL 0,35W 150 OHM+-1%TK50 RESISTOR			RL 082.9942	
R16	DRALORIC SMA0207/150OHM-F-D RL 0,35W 1,82KOHM+-1%TK50 RESISTOR			RL 082.2277	
R17	DRALORIC SMA0207/1,82K-F-C RL 0,35W 68,1 OHM+-1%TK50 RESISTOR			RL 082.9636	
R18	DRALORIC SMA0207/68,1OHM-F-D RL 0,35W 1,21KOHM+-1%TK50 RESISTOR			RL 083.0655	
R19	DRALORIC SMA0207/1,21K-F-D RL 0,35W 3,32KOHM+-1%TK50 RESISTOR			RL 083.0990	
R20	DRALORIC SMA0207/3,32K-F-D RL 0,35W 2,21KOHM+-1%TK50 RESISTOR			RL 082.2477	
R21	DRALORIC SMA 0207/2,21K-F-C RL 0,35W 10,0KOHM+-1%TK50 RESISTOR			RL 083.1297	
	DRALORIC SMA0207/10K-F-D				
651.8010.01 SA BL 2+					

**ROHDE & SCHWARZ**

AZ

Datum
Date

02

0985

Schaltteilliste für
Parts list for
ED FILTERPLATTE
FILTER BOARDSachnummer
Stock No.

651.8010.01

SA

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

R22

RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

R23

DRALORIC SMA0207/10K-F-D
RL 0,35W 274 OHM+-1%TK50
RESISTOR

RL 083.0178

R24

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

RL 083.0178

R25

DRALORIC SMA0207/274OHM-F-D
RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

R26

DRALORIC SMA0207/10K-F-D
RD 3W 470 OHM+-3%
WIRE WOUND RESISTOR

RD 087.5151

R27

SAGE 1200S/4700HM/3%
RL 0,35W 681 OHM+-1%TK50
RESISTOR

RL 083.0490

R31

DRALORIC SMA0207/6810HM-F-D
RL 0,35W 150 KOHM+-1%TK50
RESISTOR

RL 083.2129

R32

DRALORIC SMA/207/150K-F-C
RL 0,35W 47,5KOHM+-1%TK50
RESISTOR

RL 083.1800

R33

DRALORIC SMA/207/47,5K-F-C
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR

RL 082.6543

R34

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

RL 099.7860

R35

RESISTA MK2 1,00 OHM 1% TK50
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR

RL 082.6543

R40

DRALORIC SMA0207/100/HM-F-D
RK KALTL. 80V-195/20MA
PTC-RESISTOR

RK 565.8175

R41

SIEMENS Q63100-P2390-C970
RL 0,35W 47,5KOHM+-1%TK50
RESISTOR

RL 083.1800

R42

DRALORIC SMA/207/47,5K-F-C
RL 0,35W 8,25KOHM+-1%TK50
RESISTOR

RL 083.1239

R44

DRALORIC SMA0207/8,25K-F-D
RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

R45

DRALORIC SMA0207/10K-F-D
RL 0,35W 15,0KOHM+-1%TK50
RESISTOR

RL 083.1400

R46

DRALORIC SMA0207/15K-F-D
RL 0,35W 100KOHM+-1%TK50
RESISTOR

RL 082.1764

R47

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

RL 082.1764

R48

DRALORIC SMA0207/100K-F-C
RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

DRALORIC SMA0207/10K-F-D

651.8010.01 SA BL 3+

 ROHDE & SCHWARZ		AZ Datum Date 02 0985	Schalteilliste für Parts list for ED FILTERPLATTE FILTER BOARD	Sachnummer Stock No. 651.8010.01 SA	Blatt Page 4
Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.		enthalten in contained in	
R49	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-203	RS 087.7577			
R50	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D	RL 083.1351			
R51	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800			
R52	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674			
R53	RL 0,35W 825 OHM+-1%TK50 RESISTOR DRALORIC SMA 0207/825OHM-F-C	RL 082.2502			
R54	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/681OHM-F-D	RL 083.0490			
R55	RL 0,35W 1,82KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,82K-F-C	RL 082.2277			
R56	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297			
R57	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990			
R58	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400			
S1	MB DREHSCHALTER	654.5312			
S2	MB DREHSCHALTER	654.5312			
U1	BP H11A550 OPTOCOUPLER OPTO COUPLER GEN-ELECTR H11A550	BP 006.0948			
U2	BP H11A550 OPTOCOUPLER OPTO COUPLER GEN-ELECTR H11A550	BP 006.0948			
V1	AD BAY88M 350V 0,25A UDI DIODE AEG-TELEF. BAY88M	012.1507			
V2	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700			
V3	AE BZX79/B5V6 0,5W Z-DI ZENER DIODE VALVO BZX79/B5V6	AE 012.5254			
V4	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777			
V5	AL BD140 PNP 80V 1A0 TRANSISTOR VALVO BD140	AL 335.9642			
651.8010.01 SA BL 4+					

**ROHDE & SCHWARZ**

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Datum
Date

02

0985

Schaltteilliste für
Parts list for
ED FILTERPLATTE
FILTER BOARDSachnummer
Stock No.

651.8010.01 SA

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

V6

AL BD139 NPN 80V 1A0
TRANSISTOR
VALVO BD139

AL 274.8994

V7

AK BCY59IX NPN 45V 200MA
TRANSISTOR

AK 010.5163

V8

SIEMENS BCY59IX
AD 1N4448 75V 0,15A UDI
DIODE

AD 012.0700

V9

VALVO 1N4448
AE BZX79/B5V6 0,5W Z-DI
ZENER DIODE

AE 012.5254

V10

VALVO BZX79/B5V6
AK BCY59IX NPN 45V 200MA
TRANSISTOR

AK 010.5163

V12

SIEMENS BCY59IX
AE BZX79/C15 0,5W Z-DI
ZENER DIODE

AE 012.2555

V13

VALVO BZX79/C15
AE BZX79/C15 0,5W Z-DI
ZENER DIODE

AE 012.2555

V14

VALVO BZX79/C15
AE BZX79/C33 0,5W Z-DI
ZENER DIODE

AE 012.2632

V15

VALVO BZX79/C33
AE BZX79/C33 0,5W Z-DI
ZENER DIODE

AE 012.2632

V41

VALVO BZX79/C33
AD 1N4448 75V 0,15A UDI
DIODE

AD 012.0700

V51

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

AD 012.0700

VALVO 1N4448

BIS/TO
V54

X4

FP BUCHSENLEISTE 64POL.
CONNECTOR 64POL.
BERG 76787-464

FP 645.6790

651.8210

X41

FP BUCHSENLEISTE 26POL.
CONNECTOR

FP 344.4640

651.8227

X42

PANDUIT 050A-026-435A
FP STECKERLEISTE 36POL.
PIN CONNECTOR

FP 289.4554

X43

BERG 75160-105-36
2X24-POLIG
FP BUCHSENLEISTE 34POL.
CONNECTOR 34POL.
PANDUIT 050A-034-435A

FP 099.9457

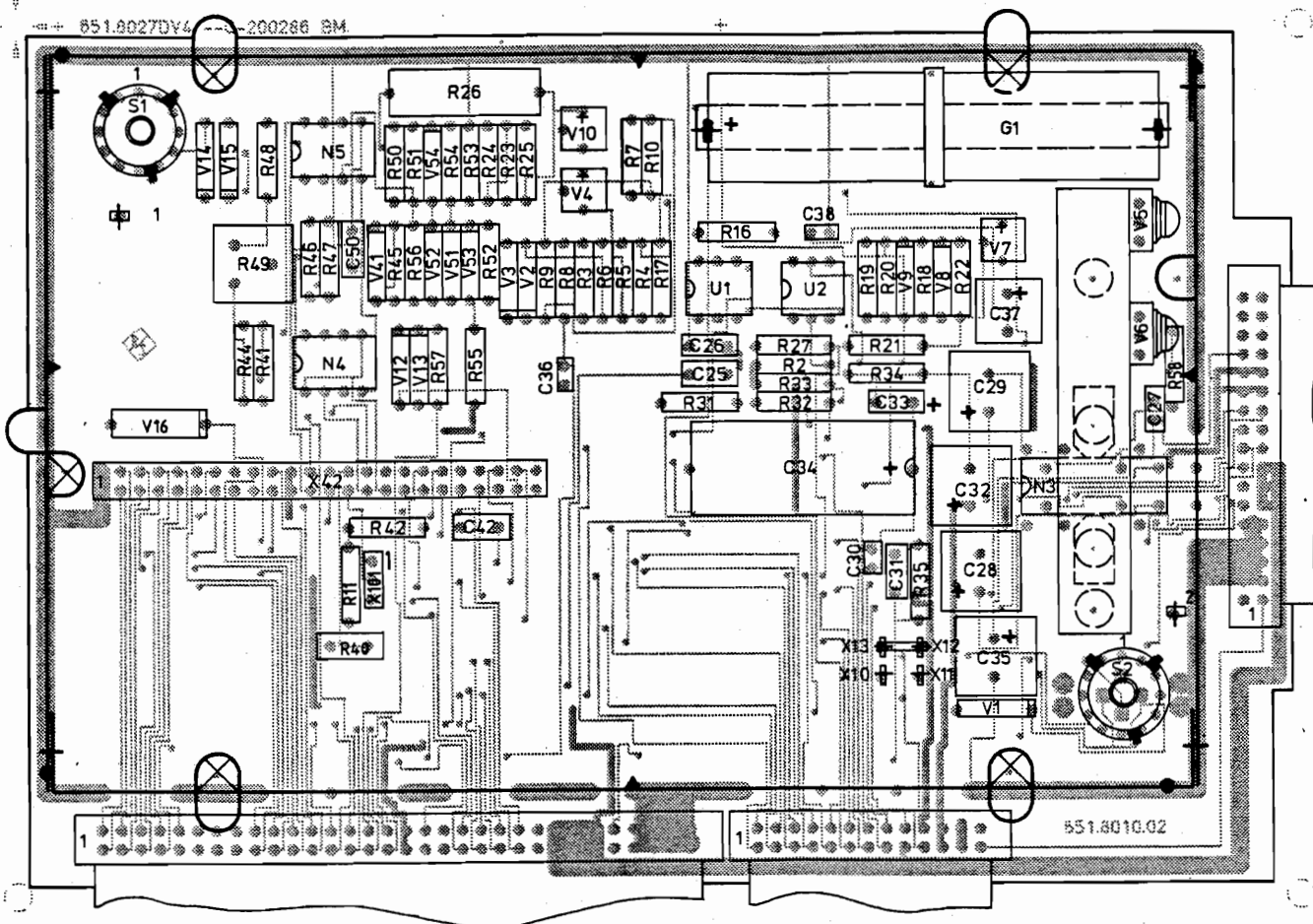
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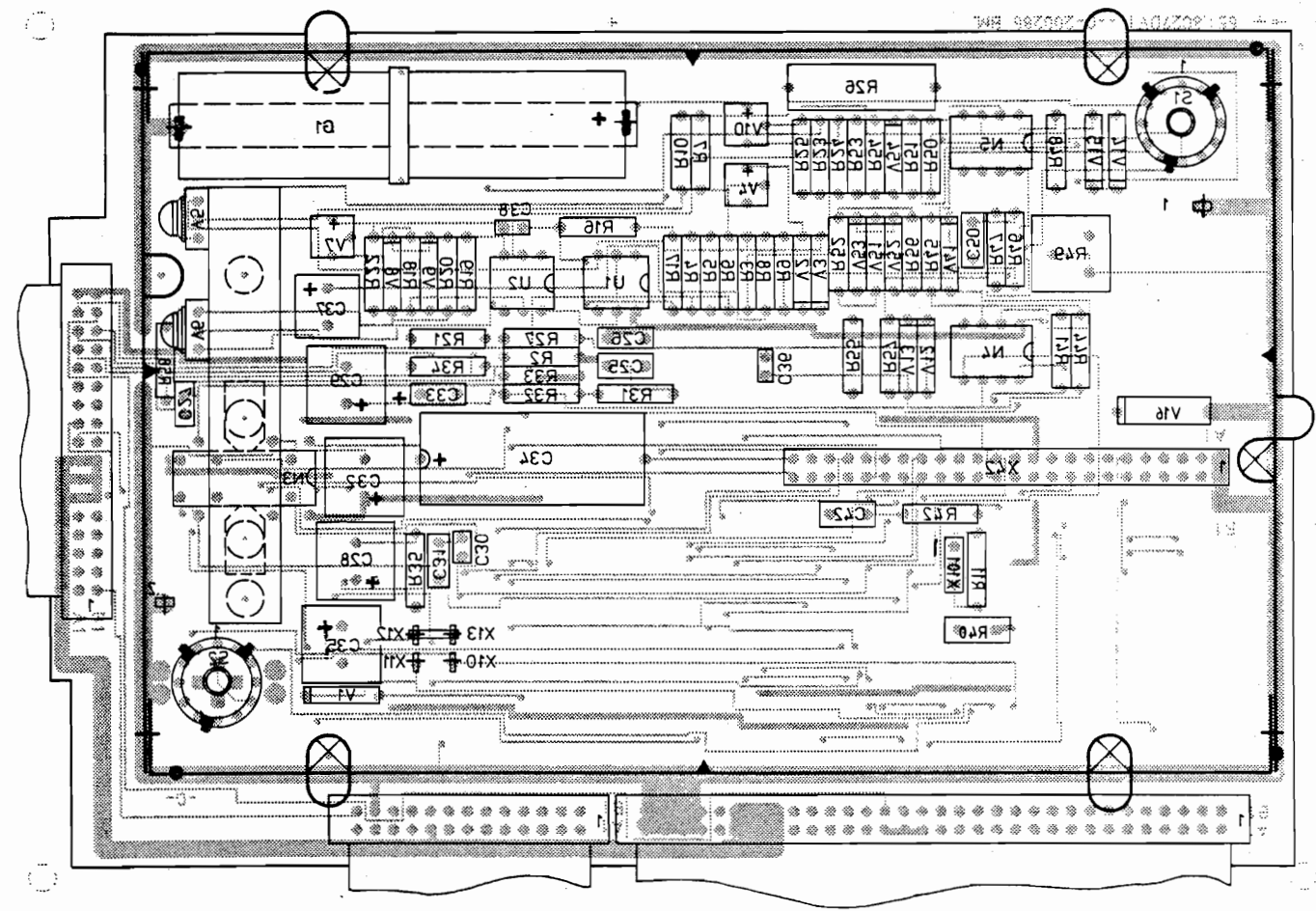
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651.8010.01 SA BL 5-

Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Varianteerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST

(hierzu HVC 250)



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

B	—	2.86	BM	Maße ohne Toleranzangabe		Maßstab 1 : 1		
						Halbzeug, Werkstoff		
				6KBH	Tag	Name	Benennung FILTERPLATTE FILTER BOARD	Z
				Bearb.	2.86	BM		
				Gepr.				
				Norm				
							Zeichn.-Nr. 651.8010.01	Blatt-Nr. 2
				 ROHDE & SCHWARZ				
Änd. Zust.	Änderungs- Mitteilung	Tag	Name	zu Gerät IN 085 P1		reg. i. V. 651.7614 V	erste Z. 651.7614.01	v. BI


ROHDE & SCHWARZ

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Date

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 Schalteilliste für
Parts list for
ED FILTER
FILTER

 Sachnummer
Stock No.

651.8110.01 SA

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 Kennzeichen
Component No.

 Benennung/Beschreibung
Designation

 Sachnummer
Stock No.

 enthalten in
contained in

-	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL ZUGEH. STROML. / CIRC. DIAGR. 651.8010 S		
..			
C101	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
BIS/TO			
C110			
C111	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C112	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
BIS/TO			
C125			
C135	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
C136	CC 1UF+-10%50V7K1200VIEL CAPACITOR UNION CARB M39014/02-1403	CC 084.5538	
C137	CC 1UF+-10%50V7K1200VIEL CAPACITOR UNION CARB M39014/02-1403	CC 084.5538	
C138	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
BIS/TO			
C141			
C142	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C144	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
C145	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C146	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
BIS/TO			
C149			
C150	CC 1NF+-10%63V K2000 CERAMIC CAPACITOR VALVO 2222 63051 102	CC 022.0784	
C151	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
C152	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	

651.8110.01 SA BL 1+

ROHDE & SCHWARZ	ÄZ Datum Date 02 1085	Schaltteilliste für Parts list for ED FILTER FILTER	Sachnummer Stock No. 651.8110.01 SA	Blatt Page 2
Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in	
C153	CC 2,2NF+-10%5X6R2000 CAPACITOR VALVO 2222 63051 222	CC 087.7060		
BIS/TO C156 C157	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525		
C158	CC 3,9NF+-10%500V5X5X7W5R CAPACITOR ERIE 8121-500-W5R-392K	565.3138		
BIS/TO C163 C164	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869		
C165	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869		
D101	BL SCL4028BC-BCD/DEC.DEC BCD/DECADE DECODER MOTOROLA MC14028BAL	BL 290.1178		
L101	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101		
BIS/TO L110 L111	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047		
L112	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047		
L113	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047		
L118	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047		
L119	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047		
L124	LD 33,0UH10%3,400HMO,130A CHOKE DELEVAN DROSSEL 1025-56	LD 067.3047		
L135	LD 1,20UH10%0,180HMO,620A CHOKE DELEVAN DROSSEL1025-22	LD 067.2870		
L139	LD 1,20UH10%0,180HMO,620A CHOKE DELEVAN DROSSEL1025-22	LD 067.2870		
L142	LD 2,20UH10%0,400HMO,415A CHOKE DELEVAN DROSSEL1025-28	LD 067.2905		
651.8110.01 SA BL 2+				

**ROHDE & SCHWARZ**
 ÄZ Datum
 02 1085

 Schalteilliste für
 Parts list for
**ED FILTER
 FILTER**

 Sachnummer
 Stock No.

651.8110.01 SA

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
L148	LD 33,0UH10X3,400HMO,130A CHOKE	LD 067.3047	
L149	DELEVAN DROSSEL 1025-56 LD 100 UH10X8,000HMO,084A CHOKE DELEVAN DROSSEL 1025-68	LD 067.3101	
R101	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
BIS/TO R110 R111	RL 0,35W 150 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/150OHM-F-D	RL 082.9942	
R114	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
BIS/TO R117 R120	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
BIS/TO R123 R124	RS 0,5W50KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-503	RS 247.7910	
R125	RL 0,35W15 OHM 1%TK50 RESISTOR DRALORIC SMA0207/150HM-F-D	RL 082.9020	
R126	RL 0,35W15 OHM 1%TK50 RESISTOR DRALORIC SMA0207/150HM-F-D	RL 082.9020	
R135	RL 0,35W 274 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/274OHM-F-D	RL 083.0178	
R136	RL 0,35W 332 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/332OHM-F-D	RL 083.0255	
R139	RL 0,35W 392 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 082.2183	
R140	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R141	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R143	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R144	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	

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 ROHDE & SCHWARZ		ÄZ Datum Date	Schaltteilliste für Parts list for ED FILTER FILTER	Sachnummer Stock No.	Blatt Page
		02	1085	651.8110.01 SA	4
Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
R145	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D		RL 082.6543		
R146	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
R147	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
R150	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D		RL 083.1297		
R151	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D		RL 082.6543		
R152	RL 0,35W22,10 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/22,10HM-F-D		RL 082.9188		
R153	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C		RL 082.2477		
BIS/TO R156 R157	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
R158	RL 0,35W 39,2 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/39,20HM-F-D		RL 082.9420		
R159	RL 0,35W 39,2 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/39,20HM-F-D		RL 082.9420		
R160	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C		RL 082.2477		
R161	RL 0,35W22,10 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/22,10HM-F-D		RL 082.9188		
T101	LU NF-UEBERTR.0,5+0,5:1 TRANSFORMER HAUFE R&S-ZCHNG.586.7932		586.7932		
T102	LU NF-UEBERTR.0,5+0,5:1 TRANSFORMER HAUFE R&S-ZCHNG.586.7932		586.7932		
T103	LU NF-UEBERTR.0,5+0,5:1 TRANSFORMER HAUFE R&S-ZCHNG.586.7932		586.7932		
V101	BO CA3183AE 5XN TR.ARRAY TRANSISTOR ARRAY RCA CA3183AE		BO 249.8594		
V102	BO CA3183AE 5XN TR.ARRAY TRANSISTOR ARRAY RCA CA3183AE		BO 249.8594		
651.8110.01 SA BL 4+					

**ROHDE & SCHWARZ**

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Date

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Schaltteilliste für
Parts list for
ED FILTER
FILTERSachnummer
Stock No.

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Blatt
Page

5

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

V103

AE BZW04-24B 24V BISUPPR
BIDIRECT. SUPPRESSOR

586.9606

V104

THOMSON-CS BZW04-24B
AE BZW04-24B 24V BISUPPR

586.9606

V105

BIDIRECT. SUPPRESSOR
THOMSON-CS BZW04-24B

586.7749

AE BZW06-6V4B 6V4BISUPPR
SUPPRESSOR
THOMSON BZW06-6V4B

X1

FP KURZSCHLUSSBUCHSE
SHORTING PLUG
PK 452-70302

FP 491.7042

BIS/TO

X4

X42

FP BUCHSENLEISTE 48-POL.
SOCKET CONNECTOR
BERG 76325-224

FP 341.9240

X421

FM BUCHSENLEISTE 15P WRAP
CONNECTOR 15P

FM 651.8240

X422

FCT F15S.4
FM STECKERL.15P.WIREWRAP
454926800A DAM-15P-F179A

FM 502.1709

X423

FM BUCHSENLEISTE 37P.WRAP
CONNECTOR 37POL.

FM 680.2369

X424

FCT F37S.4
FM BUCHSENLEISTE 9P.W.WP.
CONNECTOR

FM 614.3760

X100A

FCT F9S4
FP INDIREKT.STECKERL.36P.
PIN CONNECTOR

FP 242.3600

X100B

BERG 75160-102-36
4-POLIG

FP 242.3600

X100C

FP INDIREKT.STECKERL.36P.
PIN CONNECTOR

FP 242.3600

BERG 75160-102-36
4-POLIG

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A

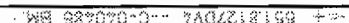
B

C

D

E

F



85131270V1 --C-040486 3M

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GM 085P1
651.88 10



DEMODULATOR
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5. Description of Function

(See Circuit Diagram 651.8810.01S, pages 1 to 9)

5.1 Reception of Amplitude-modulated Signals (AM, LSB/USB and CW)

The IF signal of 1.44 MHz from the RF/IF unit is fed to the demodulator via connector X56 with a level of between 200 and 280 mV and boosted to approx. 2 V_{pp} in the two-stage amplifier with transistors V210 and V209. In AM reception the IF signal is applied via analog switch N100 (pins 1, 2) to the envelope demodulator consisting of diode V102, resistor R101 and capacitor C103. The AF signal generated here is switched through to the AF amplifier N101.1 by analog switch N100 (pins 8, 9). There the AF signal is amplified and, following a 3.4-kHz lowpass filter, applied to switch N104 by operational amplifiers N102.1 and N102.7.

For the other classes of emission demodulation is in the push-pull demodulator consisting of analog switches N100 (pins 3, 4 and 10, 11). Analog switches N100 are clocked with approx. 1440 kHz, which is produced by dividing the BFO frequency of 5760 kHz in flipflops D101. The analog BFO is effective for the reception of CW signals (A1A) and the digital BFO for the reception of single-sideband signals (J3E) and FSK signals.

The AF signal that is obtained is also boosted in AF amplifier N101.1 and then, for CW class of emission, is applied to the 1.2-kHz lowpass filter, consisting of operational amplifiers N103, that is cut into the monitoring channel. For the other classes of emission the AF signal is fed to the 3.4-kHz lowpass filter consisting of N102.

In the LINE signal path there is an 80-Hz highpass filter, which attenu-

ates low frequencies that would cause the output transformer in the power supply/EMC filter to saturate.

Via connector X5.b22 it is possible to feed in an AF signal from an accessory unit (e.g. ISB modem) and apply it via switch N104 to the monitoring channel.

5.2 Reception of FSK and FAX Signals

The oscillator frequency of 1.46666 MHz that is required in the reception of FSK and FAX signals for converting the intermediate frequency of 1.44 MHz from the RF/IF unit into a further intermediate frequency of 26.6666 kHz is produced by dividing the 79.2-MHz oscillator frequency. This oscillator frequency of 79.2 MHz is derived from Synthesizer GF 852P1 and fed to the demodulator via connector X572 with a level of approx. 0 dBm. In the following two-stage amplifier with transistors V203 and V206 this is converted into TTL levels. The subsequent flipflops D200 and D201 produce a division of the oscillator frequency by six so that a push-pull signal of 13.2 MHz, which is required for demodulation, appears at outputs 5 and 6 of flipflop D201. The 13.2-MHz signal is then divided by nine in counter D202. The oscillator frequency that is produced in this manner with a frequency of 1.46666 MHz causes conversion of the intermediate frequency of 1.44 MHz in mixer U201 into the intermediate frequency of 26.6666 kHz.

(Continuation)---

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Part 5: Description of Function

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---(Continuation) Reception of FSK and FAX Signals

Operational amplifiers N1 and N2 or N17 and N18 form two bandpass filters that are matched to the bandwidths of the FSK and FAX signal. The bandpass filters are aligned by potentiometers R12, R14 and R446, R449 respectively. The bandpass filters are cut into the signal path by analog switches N19.

In the continuation of the signal path there is operational amplifier N3 as a limiter amplifier and transistor V2, which converts the IF signal into a 12-V logic signal and routes it to phase bridge D1. Here the IF of 26.6666 kHz is compared to the VCO frequency of 13.2 MHz, divided down to 26.6666 kHz by divider chain D2, D3 and D4. The VCO consists of transistor V10 and varactors V5 to V8. The VCO is corrected by the control voltage that is generated in phase bridge D1 and fed via active lowpass filter N6.1 and loop filter N6.7. The feedback resistors of loop filter N6.7 are cut into the feedback branch by analog switch N16 according to the size of the shift. This produces optimal band limiting according to the selected size of shift.

Because of the frequency modulation of the reference variable, the IF signal of 26.6666 kHz, the VCO is also frequency-modulated by the PLL, but which a shift that is greater by a factor of 495 (divider chain D2, D3 and D4). As a result of this multiplication of the shift the signal distortions produced by quantization are reduced to a negligible value. The VCO frequency that is coupled out by level converter N5.7 is then divided by two by flip-flop D6.5 and fed to the quadrature mixer stage consisting of flipflops D6.9 and D7.9.

The two antiphase 13.2-MHz signals from D flipflop D201 are designated Z1

and Z2. These form the virtual centre frequency and are applied to the clock inputs of D flipflops D5. At outputs D5.5 and D5.9 the phase shift is 90°. At mixer outputs D6.9 and D7.9 the phase shift is likewise 90°. Output D7.5 or D7.6 produces the information about the frequency, i.e. whether it is smaller or larger than the virtual centre frequency. According to the phase of signals Z1/Z2 after switch-on the correct output of D7 is switched through by D13 and switch D14.

The FSK or FAX signal that is produced in this way is fed via switchable integrator N8.1 and Schmitt trigger N9.1 to the non-inverting driver D10.11 and the inverting driver D10.12. One of these antiphase signals is, according to the selected polarity, applied to the continuation of the signal path by analog switches N11. The output of the FSK or FAX signal can be interrupted by the STOP signal on input 6 of operational amplifier N9. The FSK signal is applied from output 7 of operational amplifier N9 with a level of ± 10 V to connector X5.a16 and then on to the FSK keying stage in Power Supply/EMC Filter IN 085P1.

The FAX signal is fed from output 7 of operational amplifier N9 to the tone-keying stage. This consists essentially of astable multivibrator D15, which resonates at 1.7 kHz or 5 kHz depending on the setting of jumper X7. This tone frequency is keyed by analog switch N15 (pins 1, 2), whose pin 13 is driven by analog switch N15 (pins 3, 4) at the rate of the FAX signal. If the FAX mode is not selected, analog switch N15 (pins 10, 11) switches, if jumper X9 is inserted on 1-2 and controlled by signal F4,

(Continuation)---

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Part 5: Description of Function

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---(Continuation) Reception of FSK and FAX Signals

pin 13 of analog switch N15 to -7 V and disables the switch. When the STOP signal is activated, operational amplifier N14.7 switches pin 13 of analog switch N15 to -7 V. The keyed tone frequency is then applied via lowpass filter N14.1 (cut-off frequency 30 kHz) to connector X5.a22 and from there to Power Supply/EMC Filter IN 085P1.

5.2.1 SOFT DECISION Evaluation

The SOFT DECISION evaluation requires information about the level of the shift and the direction of the shift of the FSK signal. As information for the direction of the shift the FSK signal is tapped on pin 6 of AND gate D14 and output on connector X5.a21.

Conditioning of the signal for the level of the shift is made by counter D8, monoflop D9, comparators N7 and gates D10 and D11. The frequency of the pulse train on D6 (pin 9) is proportional to the offset of the received IF signal from the IF centre frequency. Via frequency divider D8 monoflop D9 is thus triggered, which generates pulses of constant duration that, after smoothing by integration network R45 to R47, C38 to C40, produce a DC voltage that is proportional to the frequency offset.

For matching to the particular shift the division ratio of counter D8 has to be switched as appropriate by signals H2 and H2.

For a shift of 42.5 Hz the division ratio of counter D8 is 1:1. Monoflop D9 is alternately triggered by inputs 5 and 4.

For a shift of 85 Hz the division ratio of counter D8 is likewise 1:1

but the doubler circuit of monoflop D9 is disabled by signal H0. Thus there is equality of frequency between the input signal on pin 5 and the output signal on pin 6 of monoflop D9.

For a shift of 425 Hz the division ratio of counter D8 is set to 5:1 by signals H2 and H2.

The DC voltage proportional to the frequency offset switches comparators N7. The comparators exhibit different switching points at 1/4, 1/2 and 3/4 of the maximum input voltage. The comparator outputs are gated by gates D10 and D11 so that the shift of the FSK signal appears in binary form for the SOFT DECISION evaluation on connector X5.a19 and .a20. The output signal of the integration network is additionally fed via impedance transformer N8 as an analog signal to connector X5.a18.

5.2.2 Δf Voltage Generation for Indication of Frequency Offset

A filtered^A voltage is required for indicating the frequency offset of the received signals. Because of the fast change of this voltage with FSK signals, however, the filtering cannot be managed by an RC section alone.

The generation of a voltage proportional to the frequency offset is performed in a similar manner of what is described in 5.2.1. At output 10 of monoflop D9 there is a train of pulses of constant width whose frequency is proportional to the frequency offset. By smoothing in the RC section R400/C79 a voltage proportional to the frequency offset is produced which is fed to operational amplifier N12.

(Continuation)---

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Part 5: Description of Function

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---(Continuation) Δf Voltage Generation for Indication of Frequency Offset

The operational amplifier works as an inverting or a non-inverting amplifier. Switchover between the two is made by transistor V26 as soon as the frequency offset crosses zero (sign of offset).

Operational amplifier N12.7 produces a DC voltage of approx. 7 V from the signal. Its output signal, filtered by RC combination R406 and C80, is fed to the inverting input of operational amplifier N13.1. The filtered voltage forms the mean value of the output voltage of operational amplifier N12.7. The momentary value of the output voltage of operational amplifier N12.7 is applied across resistor R407 to the non-inverting input of operational amplifier N13.1. If the momentary value is greater than the mean value, the output of operational amplifier N13.1 goes High, otherwise it is Low. The High level causes analog switches N21 (pins 3, 4 and 8, 9) to conduct and they switch, via filter section R417 and C82, the momentary voltage corresponding to the Δf voltage to operational amplifier N13.7.

A Low level at the output of operational amplifier N13.1 means that analog switches N21 (pins 1, 2 and 10, 11) are switched via inverter N20.1. They then switch the Δf voltage through to operational amplifier N13.7 via filter section R418 and C83. In FSK operation therefore, the disconnect element and the signal element are filtered separately. For classes of emission AM and CW filter section

R418/C83 is permanently cut in by transistor V34. From the output of operational amplifier N13.7 the filtered Δf voltage is applied to connector X5.a17 and from there it is taken for indication as well as to power supply/EMC filter.

5.3 BFO

5.3.1 Analog BFO

The analog BFO is used for the demodulation of CW signals. It consists of crystal oscillator V320, which works on a frequency of 5.7 MHz, plus the VCO V321, which oscillates at 5.76 MHz. The signals of the two oscillators are brought to TTL level by transistors V323 or V324 and fed to digital mixer D306. The difference frequency of 60 kHz from pin 5 of digital mixer D306 is applied to PLL circuit D307. The frequency of the VCO contained in D307 is also 60 kHz and can be varied by ± 6 kHz with the control voltage via connector X5.a3 and which can be set with the BFO potentiometer on the front panel of the receiver. The control voltage that is thus produced on pin 13 of the PLL circuit follows up VCO V321 appropriately by ± 6 kHz via integrator N303. The oscillator signal of 5760 ± 6 kHz of VCO V321 is fed decoupled and amplified by transistor V325 to the demodulator circuit.

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5.3.2 Digital BFO

The digital BFO is used for demodulating single-sideband signals. It consists of VCO V302, which oscillates at a frequency of 11.52 MHz. The oscillator signal is brought up to TTL level by transistor V301 and drives PLL synthesizer D301. As a reference PLL synthesizer D301 is fed a frequency of 900 kHz on pin 6 which is derived from the fixed frequency of 7.2 MHz fed in on connector X43 from Synthesizer GF 852P1 and divided by eight in counter D303. The 900 kHz are divided to a frequency of 800 Hz in the reference divider of PLL synthesizer D301, which is followed by phase comparison. With data lines DM0 to DM3, ADM0 to ADM2 and strobe 10 the division factor of PLL synthesizer D301 can be switched so that VCO V302, which is regulated by the control voltage produced on pin 12 via the two-stage loop filter N301, can be set in increments of 800 Hz.

Flipflop D302 divides the oscillator frequency by two, which is then fed to the push-pull demodulator by flipflop D101 after level matching by transistor V305.

5.3.3 BFO CM Signal

The output signals of PLL circuits D301 and D307 are used to generate the CM signal. These convey the information of whether the PLL circuits are locked or not.

The output signal of PLL circuit D301 on pin 13 is conditioned into the CM signal of the digital BFO in monoflop D304 and by gates D305 and then

combined with the CM signal of the analog BFO, which is output on pin 1 of PLL circuit D307. The large time constant of filter section R327, C353 and C330 and the circuitry with diodes V331 and V327 means that no error is signalled when switching between the BFOs or when the frequency alters.

5.4 Test Operation

For the selftest the IF signal path is interrupted via transistor V200 by the blocking of transistor V210. At the same time counter D203 is enabled, which divides the oscillator signal of 7.2 MHz fed from Synthesizer GF 852P1 via connector X571 by five and feeds the resulting oscillator signal of 1.44 MHz into the IF signal path. This simulated IF signal is applied to the demodulators and indicates whether a module is functioning correctly. For this purpose the AF signal is rectified by V106, converted into a logic signal by N111.7 and output on connector X5.a5.

5.5 Data Input

The demodulator is driven by the processor in Control Unit GB 085P1 on lines data 0 to data 7, strobe 6 and strobe 8 to 10. The control information on the data lines is stored in flipflops D207 to D210 and the control signals required in the demodulator are generated by the logic operation of gates D211. Drivers D204 to D206 convert the 5-VDC logic into 12-VDC logic.

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Part 5: Description of Function

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5.6 Voltage Supply

The operating voltages of ± 12 V, +5 V and -7 VDC that are required in the demodulator are derived from the operating voltages of +5.3 VDC and ± 16 VDC generated in Power Supply/EMC Filter IN 085P1.

The +12 VDC operating voltages are produced by fixed-voltage regulators N200 and N202 from the supply voltage of +16 VDC.

Voltage regulators N201 and N203 produce, with transistors V214 and

V216, the -12-VDC operating voltages from the supply voltage of -16 VDC. Transistors V213 and V217 form the current limiting with resistors R280 and R288.

The +5-VDC operating voltage for the FSK demodulator is switched on by transistors V215 and V211 and the operating voltage for the analog BFO by transistors V221 and V220.

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Part 5: Description of Function

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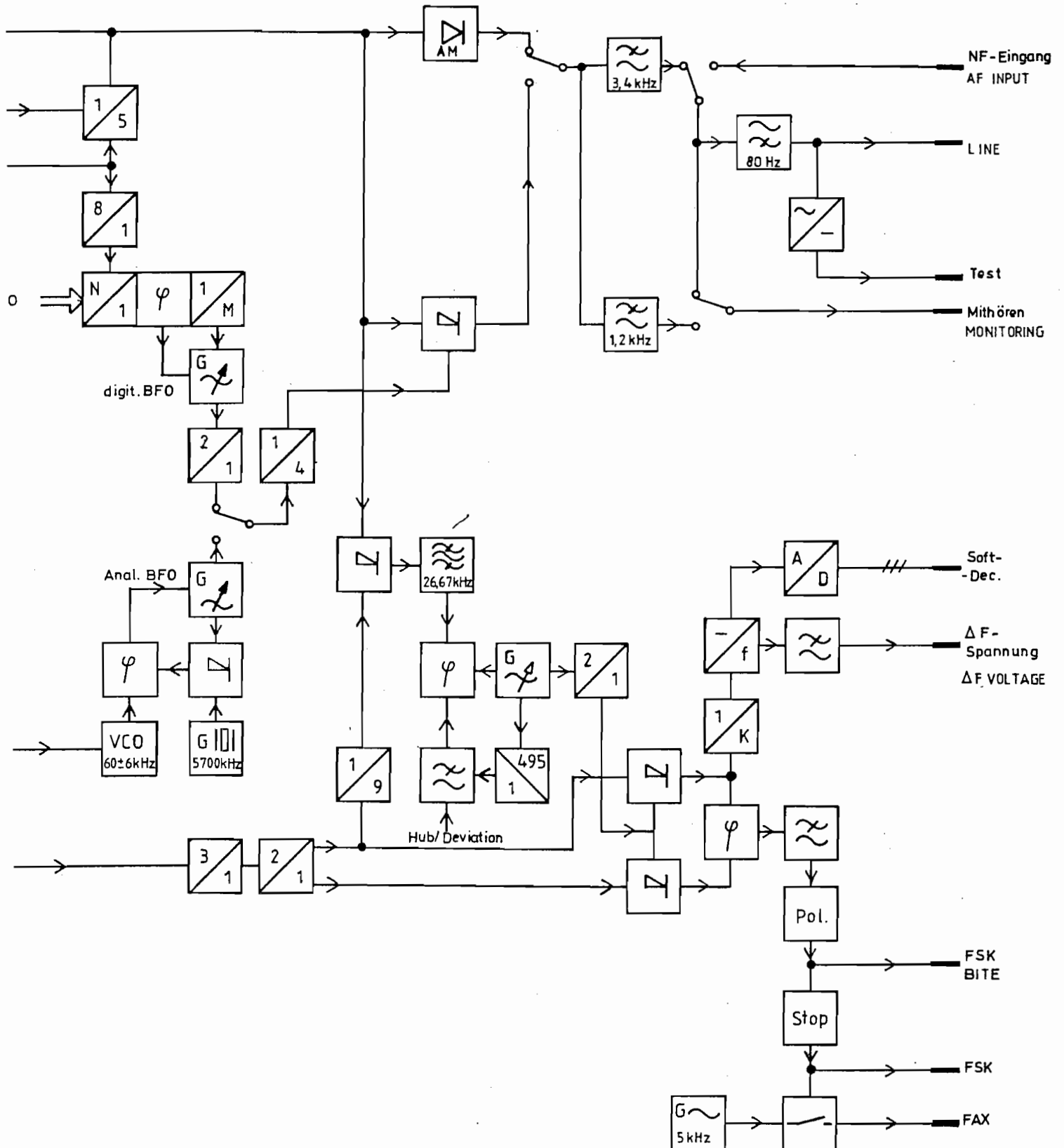


Fig. 5.1 Demodulator GM 085P1, Block Diagram

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Part 6: Repair

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6. Repair

See circuit diagram, parts list and component layout in the appendix to this repair manual (list on page 0.3).

6.1 Preliminary Remarks

The repair of Demodulator GM 085P1 consists of troubleshooting and fault elimination, of measurements and functional checks, of replacing components and of a final test.

All the information required for repairing the demodulator down to component level is given in this part.

6.1.1 Troubleshooting Instructions

Localize any fault by checking the nominal values on the testpoints with the aid of the troubleshooting flowcharts in 6.3.

6.1.2 Restoring the Nominal Characteristics

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

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

Once components have been replaced, it is absolutely essential that the final

test of the demodulator be performed as detailed in 6.7.

6.1.3 Spare Parts

All components and modules are subjected to strict quality control before they are installed in the demodulator.

For components from outside suppliers, e.g. resistors, capacitors, diodes, transistors and integrated through to highly integrated circuits, R&S have set down their own delivery specifications for the purpose of ensuring maximum reliability. For this reason we recommend that only original spare parts be used as replacements for defective components.

When ordering a spare part, please state the following:

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

All of these details are to be found in the circuit diagram, parts list and component layout attached to this manual.

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---(Continuation) Important User
Information

6.1.4 Important User Information

The following points are important when carrying out repairs. These are mentioned to avoid any misunderstandings.

- o All measurements are referred to ground unless stated otherwise.
- o The abbreviations that appear in the test, e.g. X5.a1 and D204.2, are to be interpreted as follows:

X5.a1 connector X5, pin a1

D204.2 integrated circuit 204,
pin 2

- o All components mentioned in the following text and diagrams are shown in circuit diagram 651.8810.01S, pages 1 to 9. Consequently the circuit diagram will not be repeatedly referred to in what follows, instead only the page concerned will be mentioned.
- o For all alignments and measurements the demodulator has to be supplied with the operating voltages given in the circuit diagram.
- o With HF measurements ensure that cables and connections are of the right characteristic impedance.
- o Disconnect the operating voltage before undertaking any soldering work on the module or a subassembly of it.

C A U T I O N ! C M O S ! ! !

- o Among the components installed in the demodulator there are MOS, MOSFET and CMOS devices. Devices of this kind are extremely sensitive to high extraneous voltages. Static discharge can produce very high voltage spikes, which are capable of destroying these devices.

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

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

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6.2 Test Equipment and Special Tools

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

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

6.2.1 Test Equipment List

Test equipment, required technical data	Recommended R&S unit	Ordering code
Signal generator modulated, -45 to 0 dBm, 2 MHz	SMK	348.0010.02
Frequency counter 10 mV, 5 MHz		
Digital multimeter	UDL 33	388.8011.02
Oscilloscope 20 MHz	BOP	374.2000.02
RF millivoltmeter	URV 4	292.5012.03
6-dBm junction box	DVU 3	100.5203.50
Service kit	KA 085C1	699.4015.02

6.3 Troubleshooting Flowcharts

Troubleshooting is based on the following premises:

- o the demodulator has been pinpointed as defective
- o the operating voltages are present

Troubleshooting covers the following functional groups:

- o AF demodulators
- o FSK demodulator
- o analog BFO
- o digital BFO
- o voltage supply

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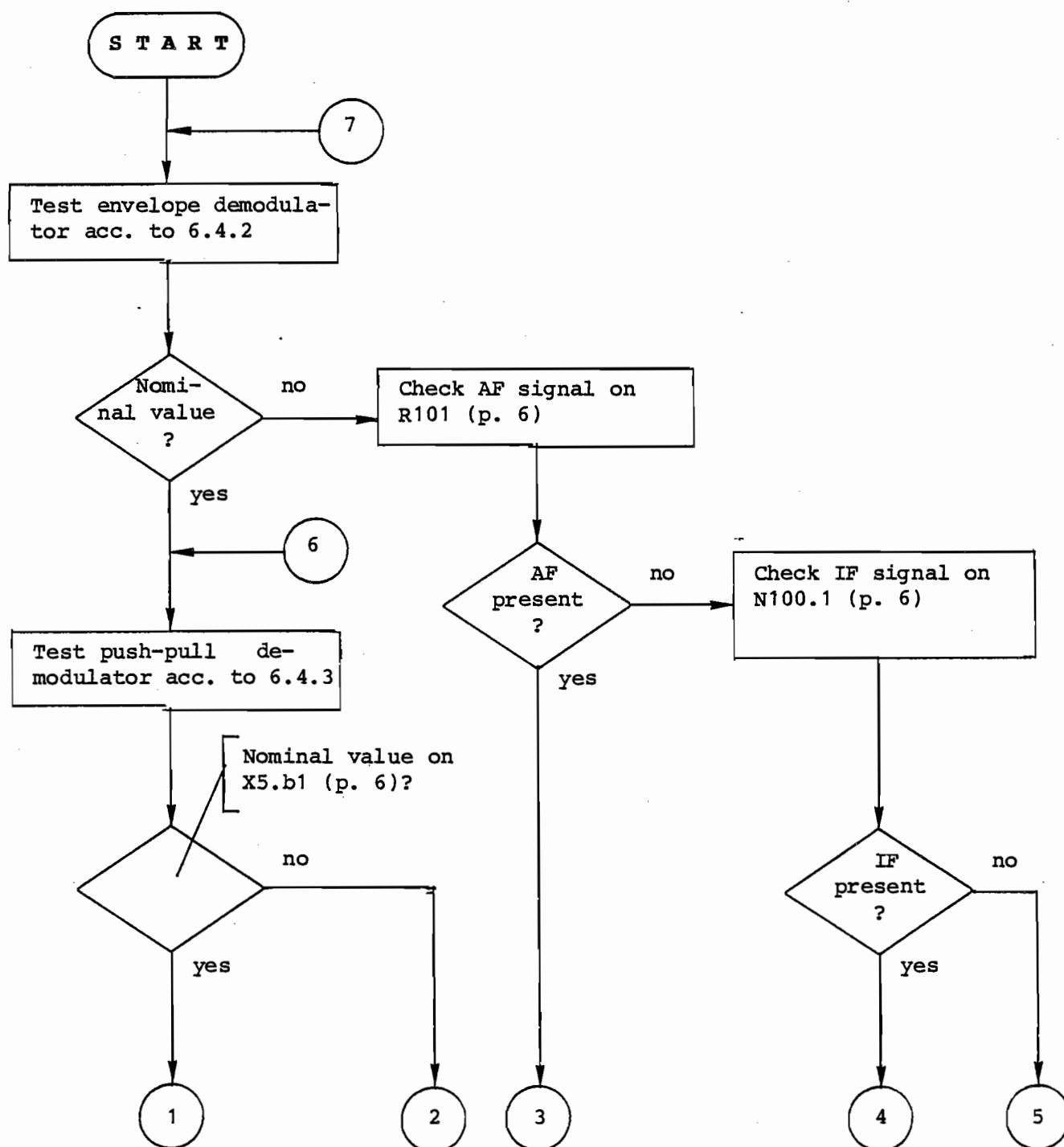
- 6.4 -

6.3.1 Troubleshooting: AM Demodulators

The troubleshooting described here clarifies the possible causes of a faulty AM demodulation.

Requirements for troubleshooting:

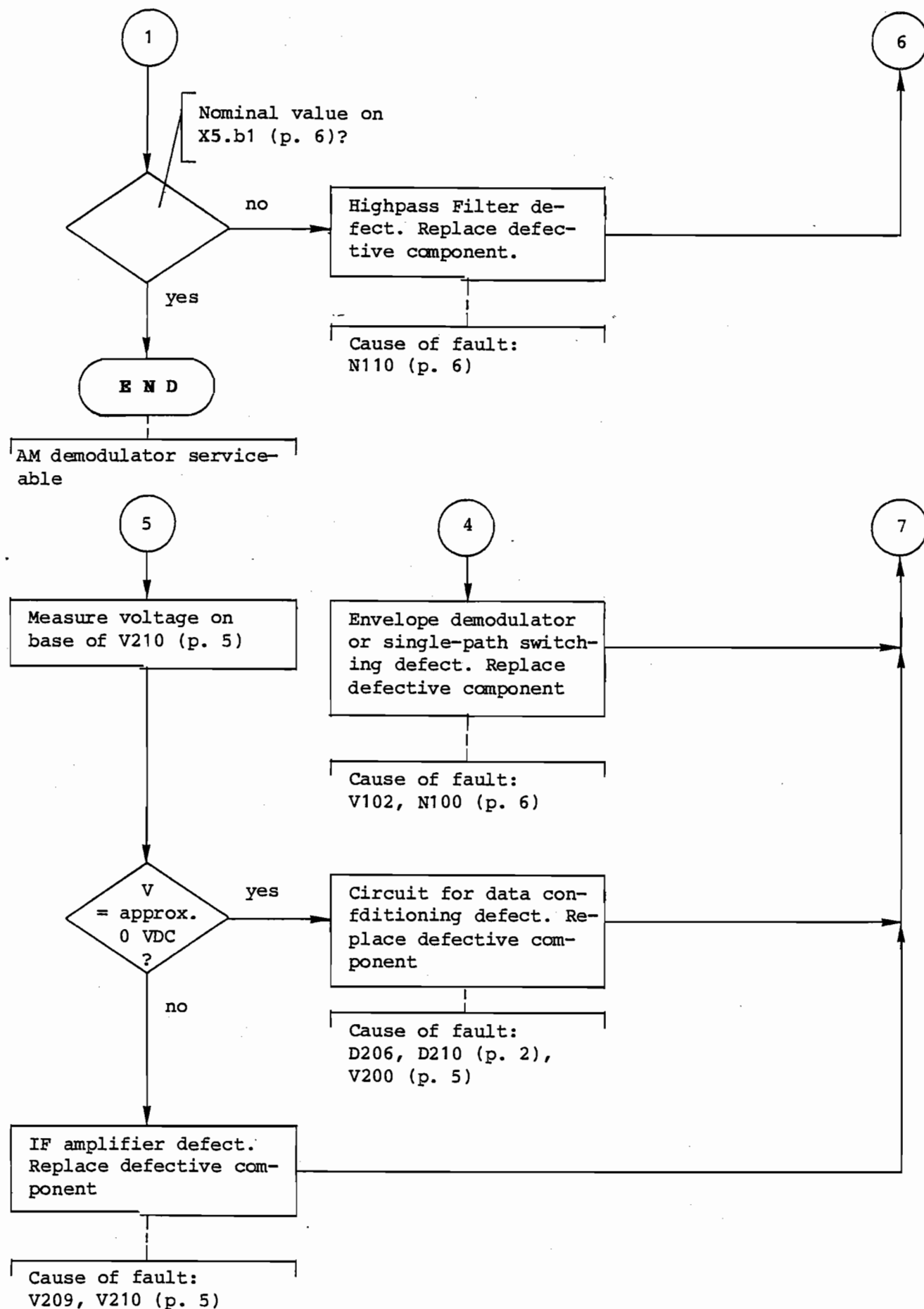
- o demodulator is adapted in receiver
- o supply voltages are present



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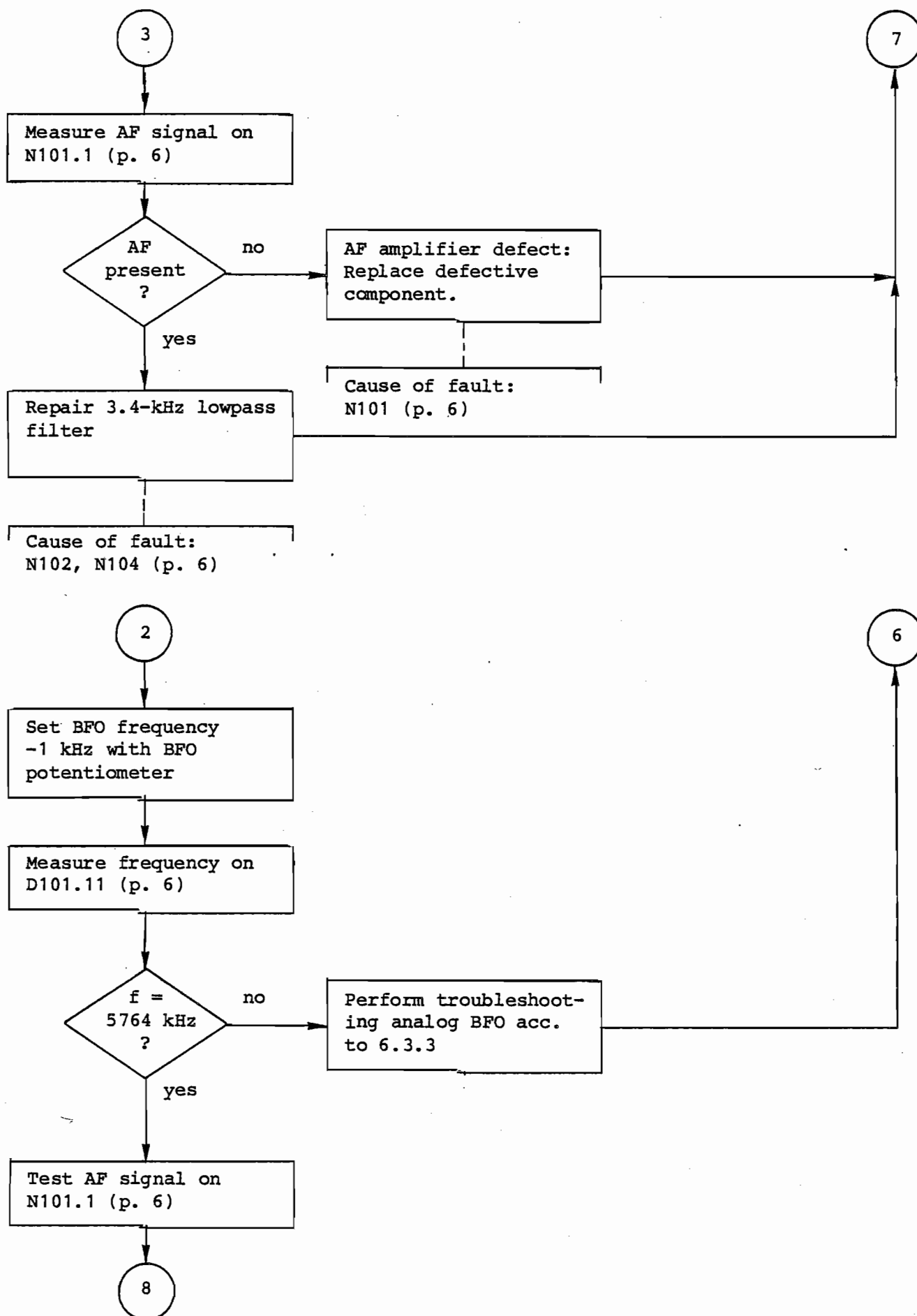
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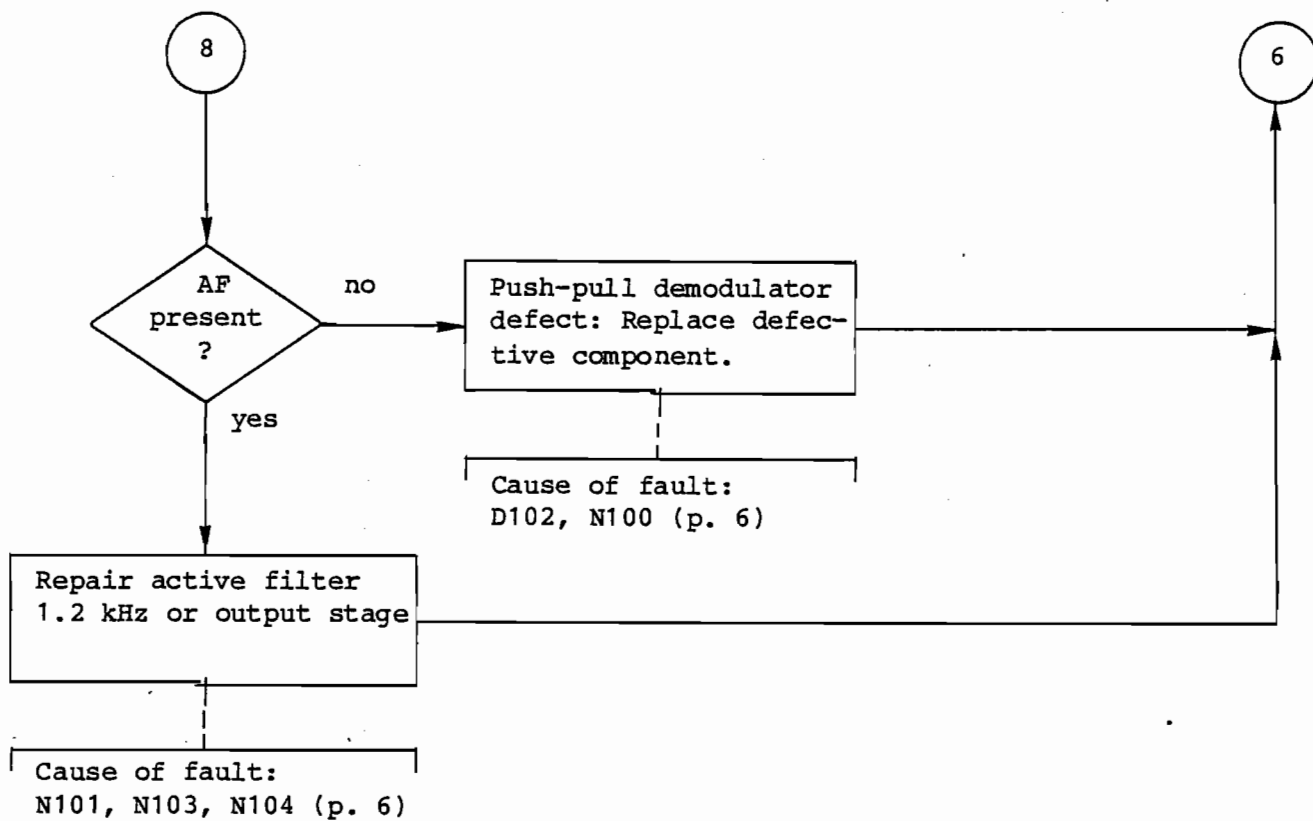
- 6.6 -



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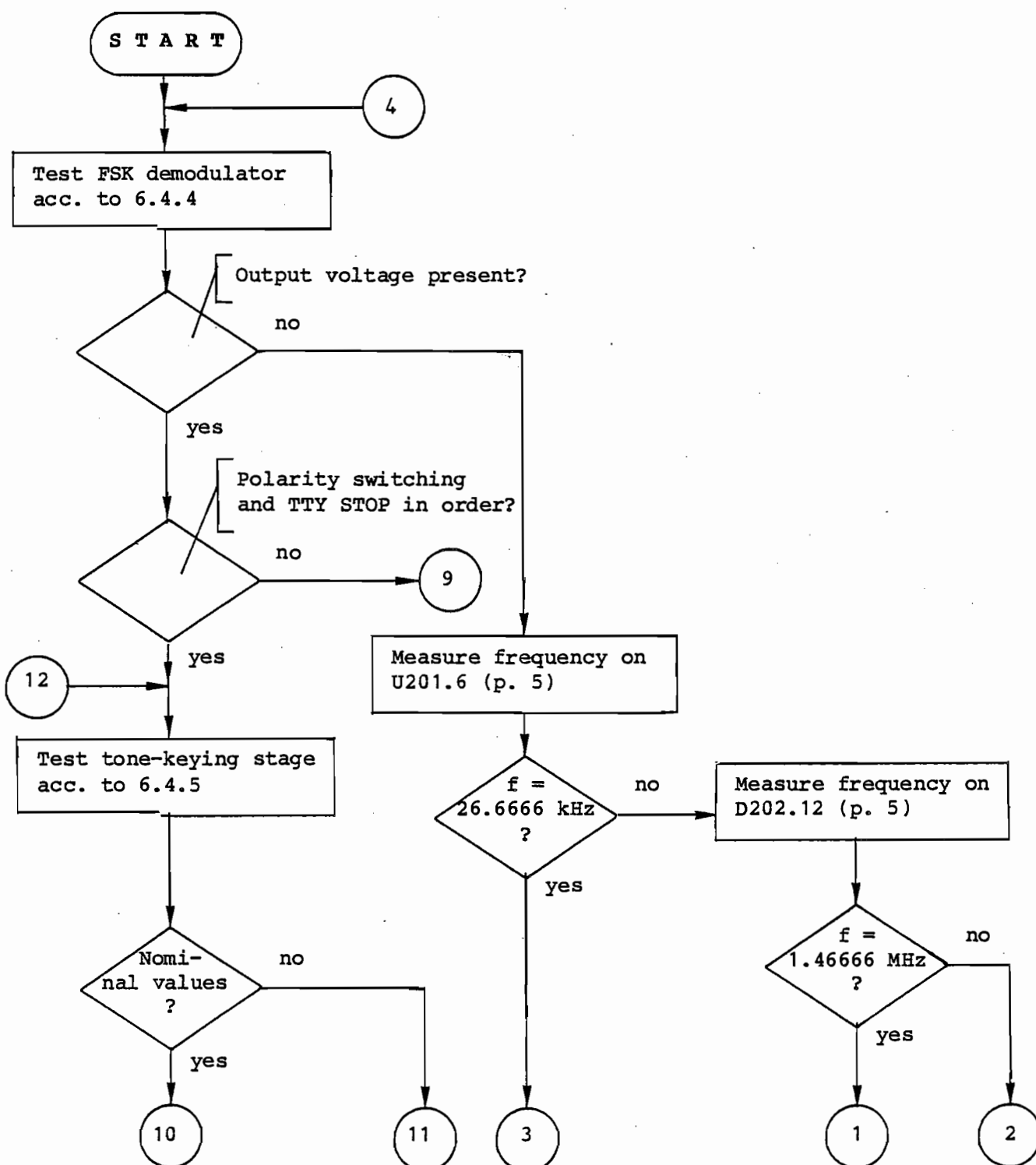
- 6.8 -

6.3.2 Troubleshooting: FSK Demodulator

The troubleshooting described here clarifies the possible causes of a faulty FSK demodulation.

Requirements for troubleshooting:

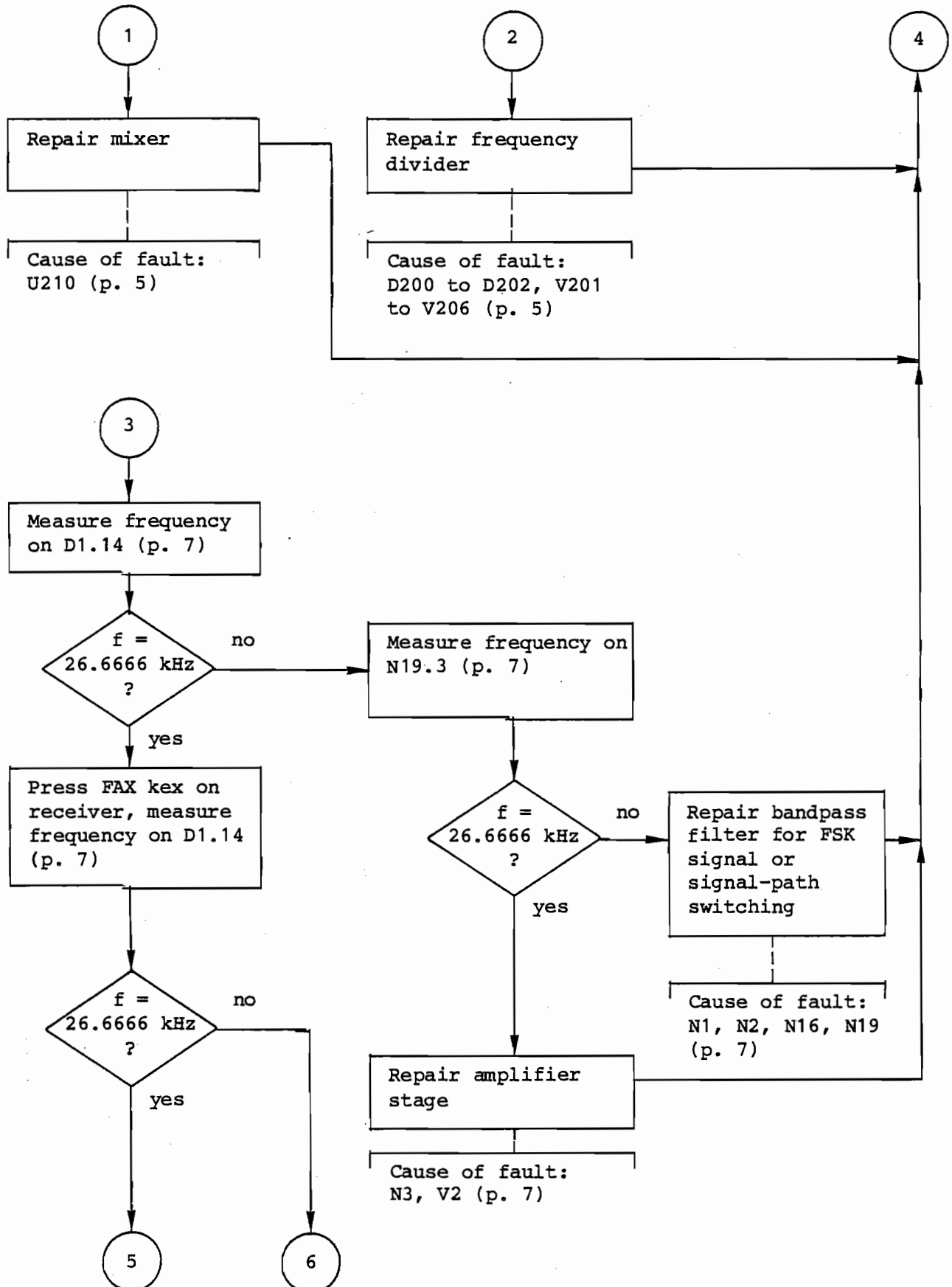
- o demodulator is adapted in receiver
- o supply voltages are present



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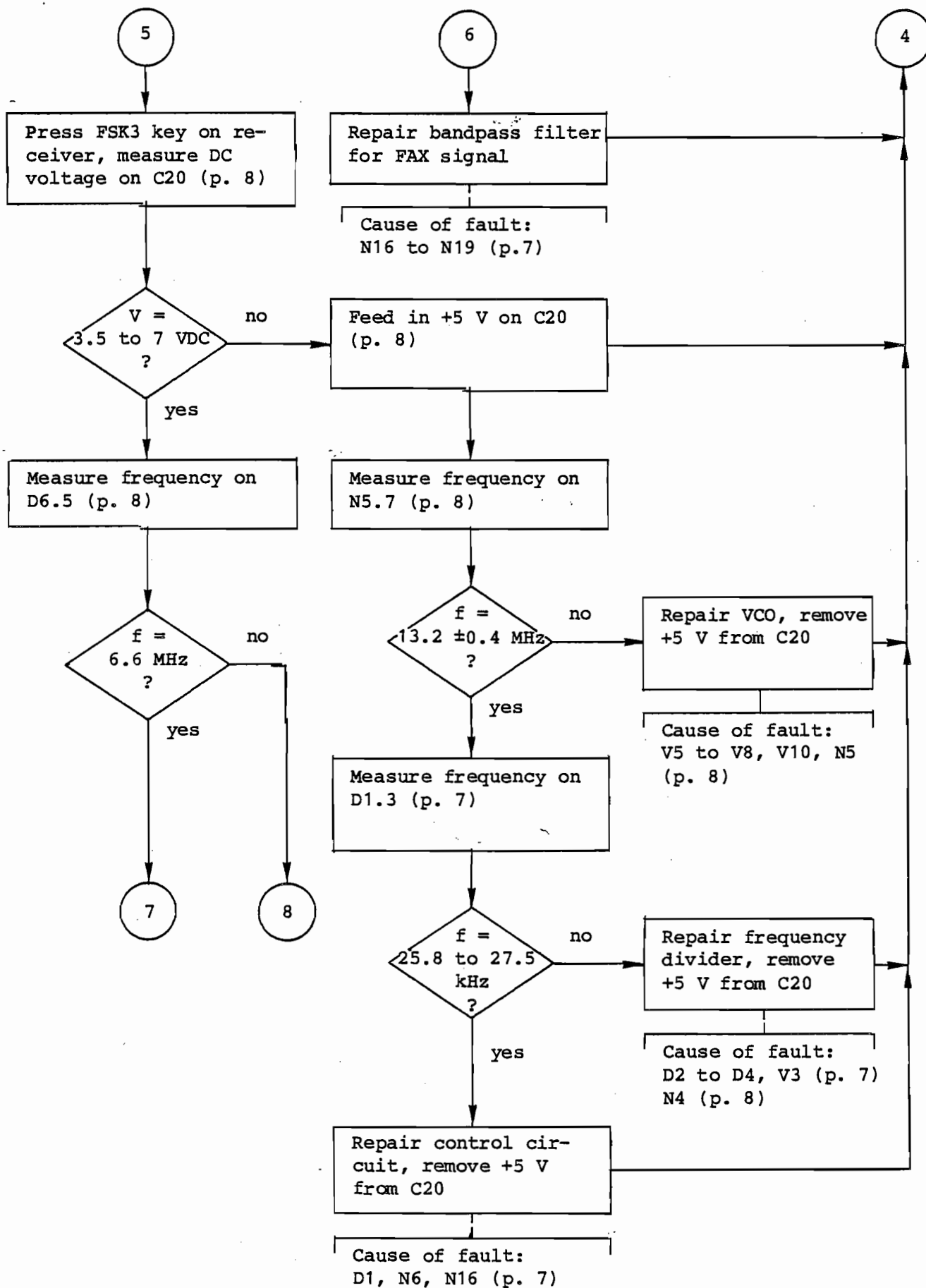
- 6.9 -



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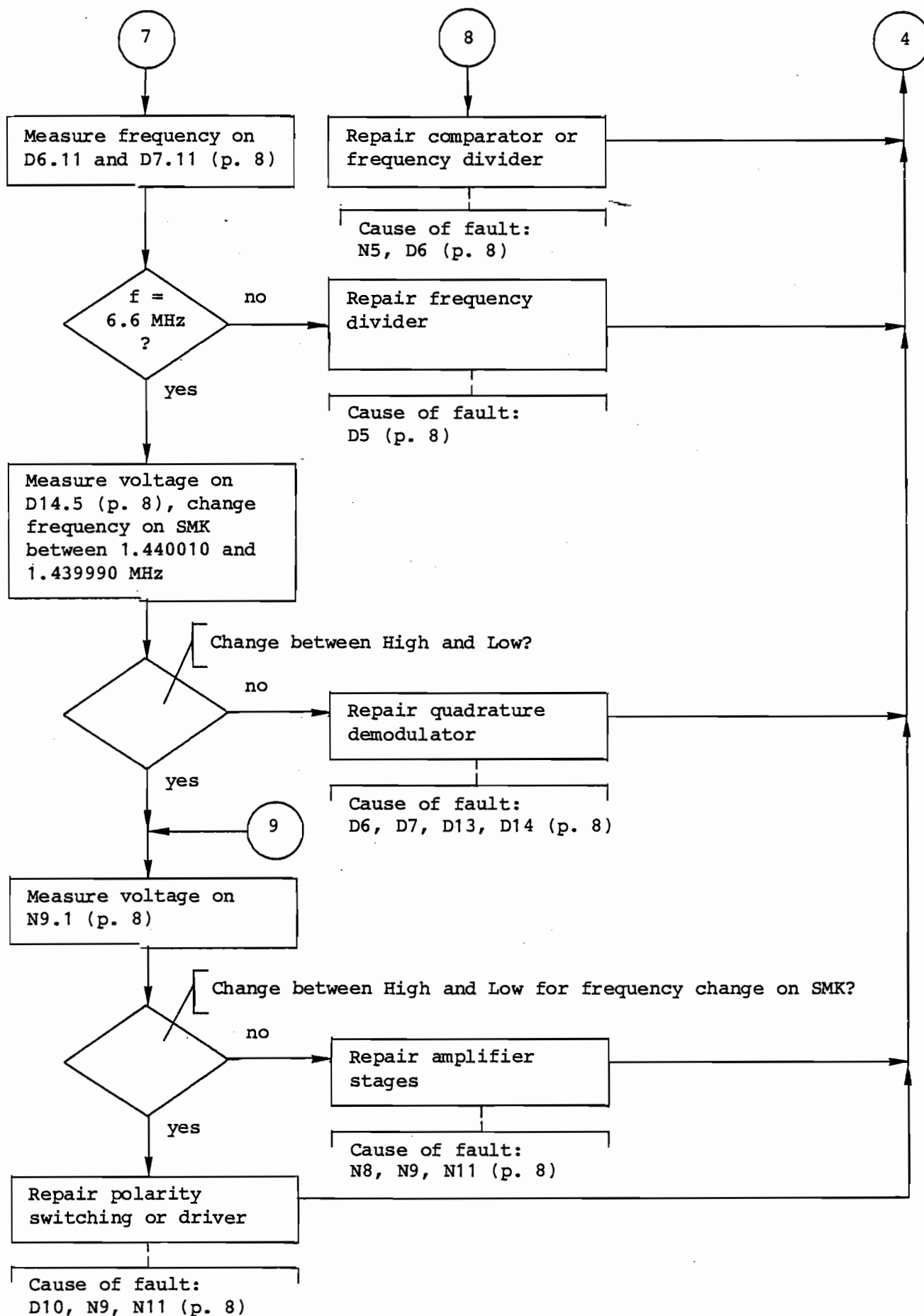
- 6.10 -



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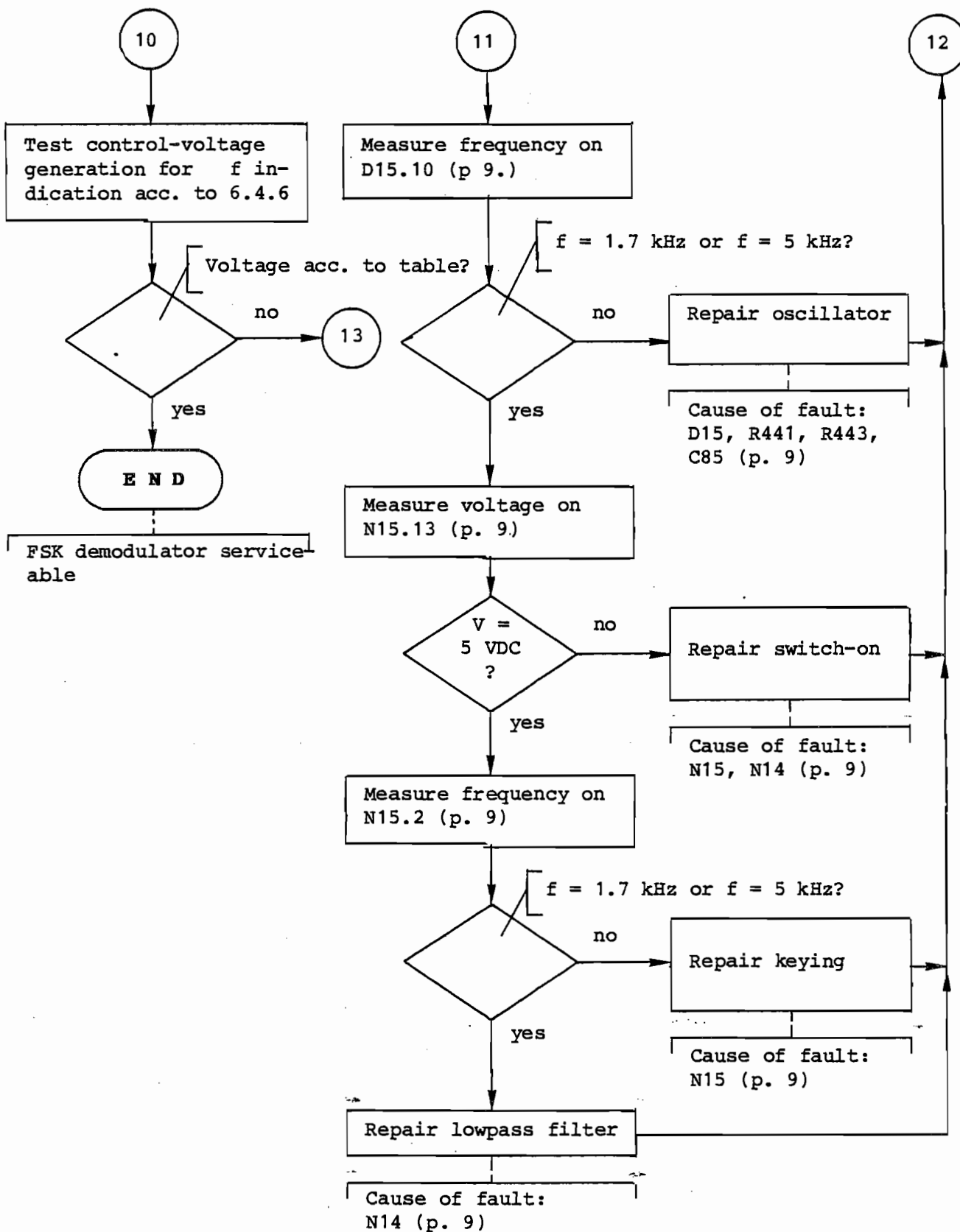
- 6.11 -



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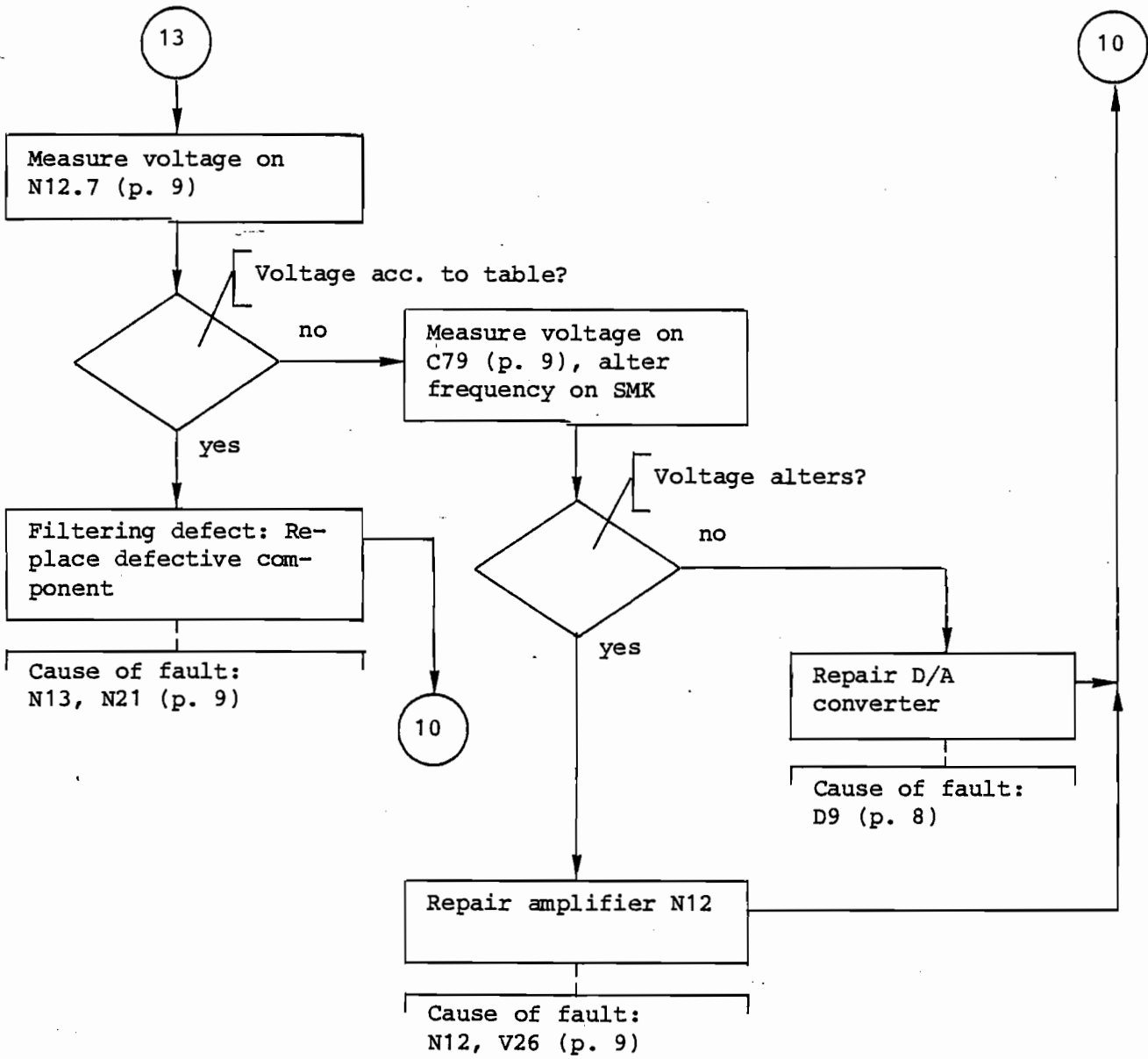
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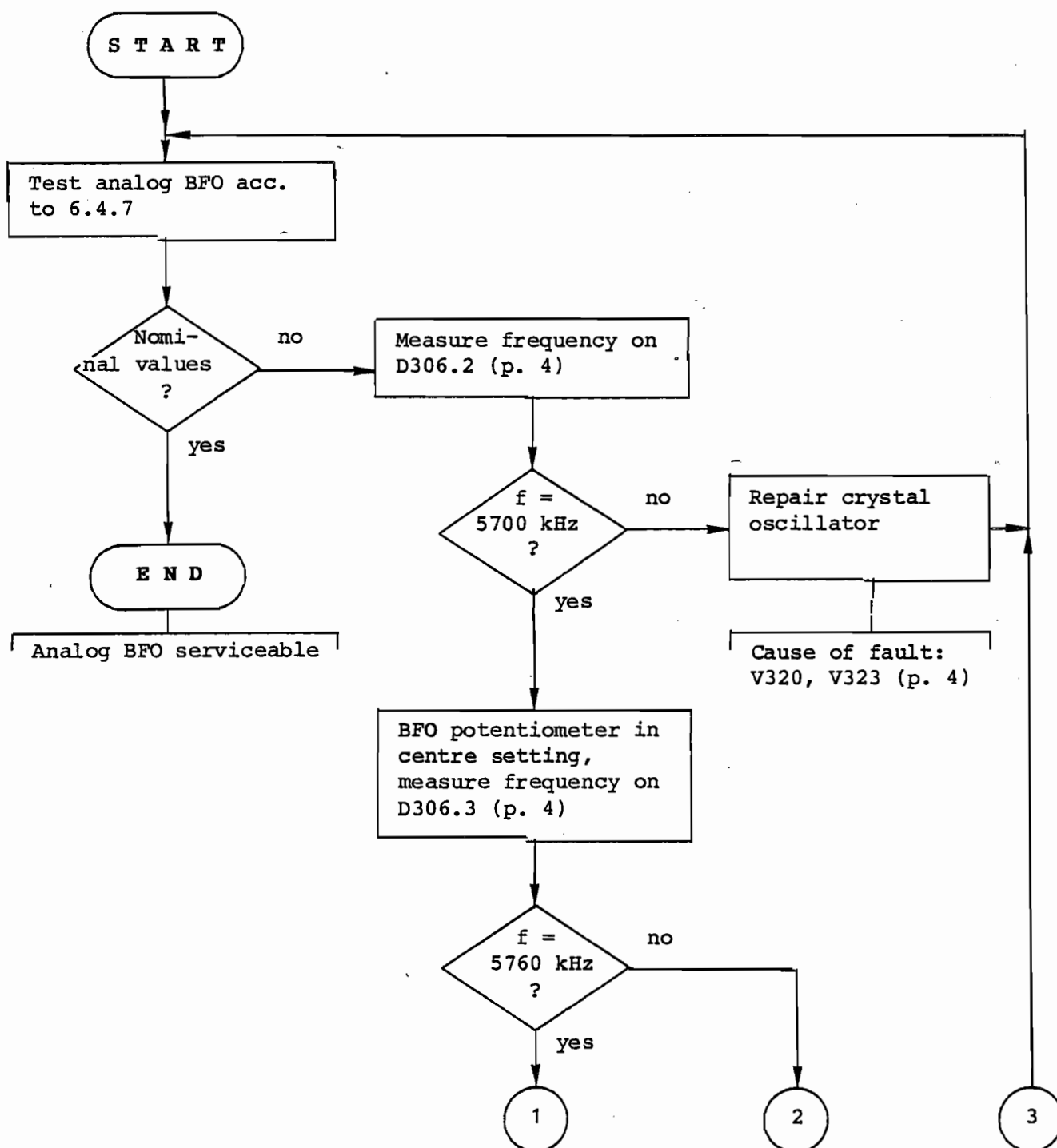
- 6.14 -

6.3.3 Troubleshooting: Analog BFO

The troubleshooting described here clarifies the possible causes of a faulty analog BFO.

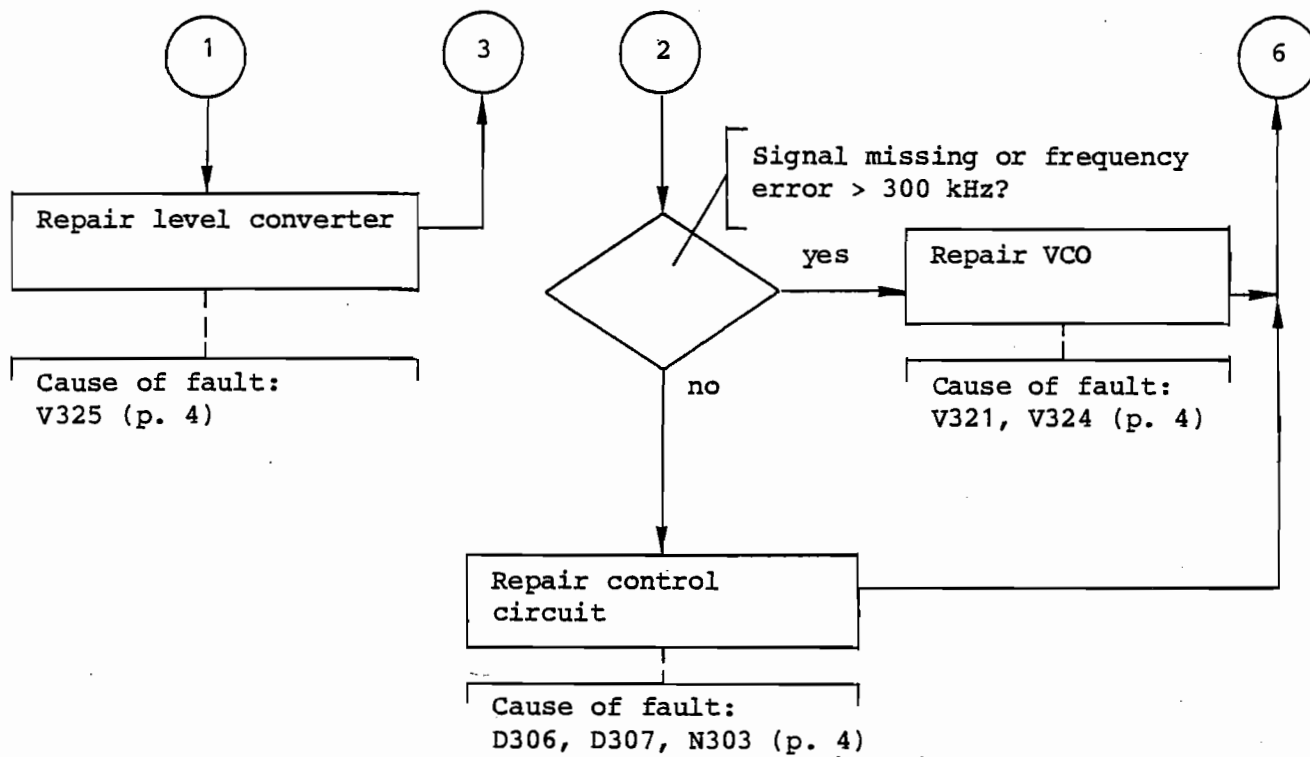
Requirements for troubleshooting:

- o demodulator is adapted in receiver
- o supply voltages are present



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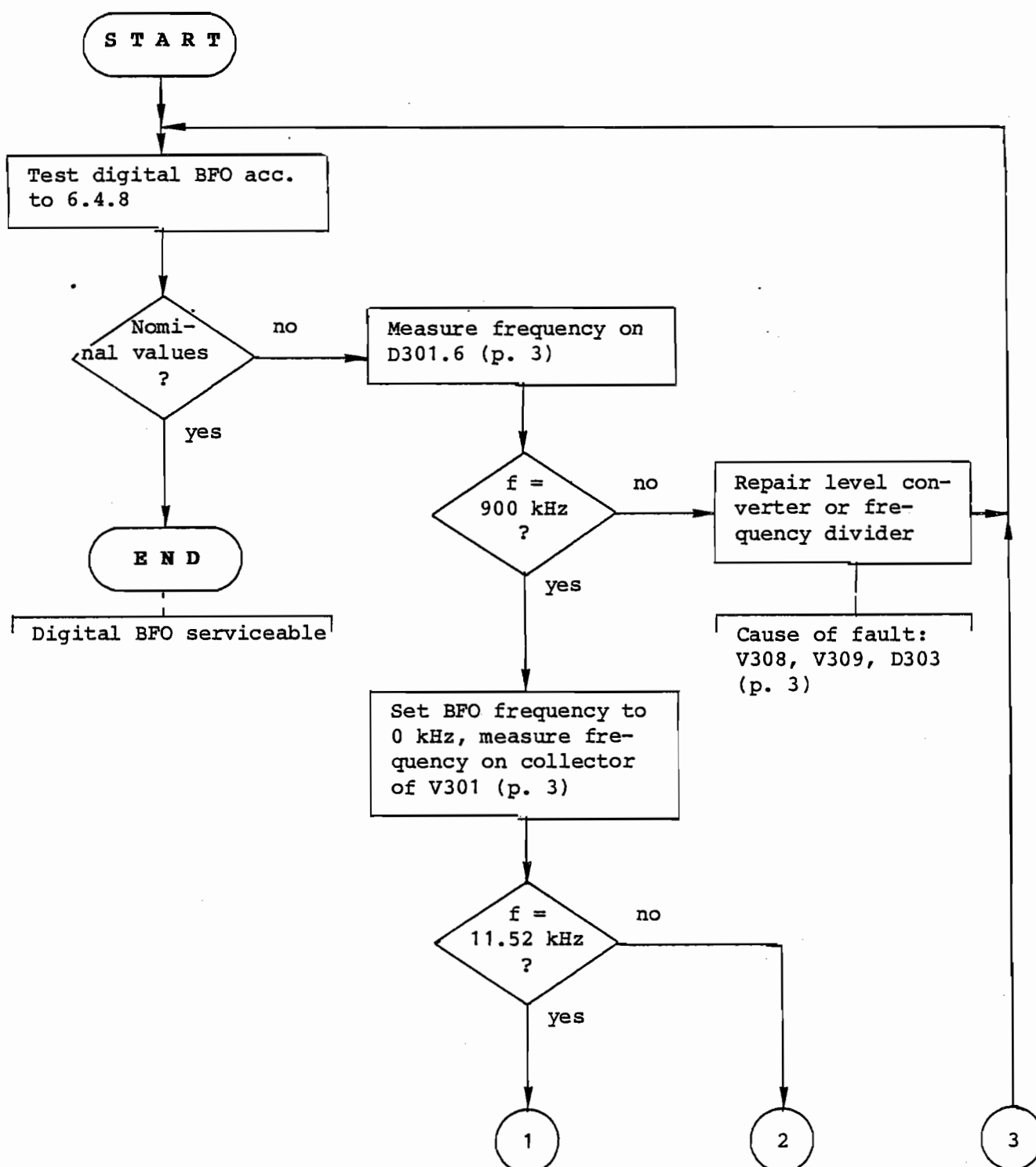
- 6.16 -

6.3.4 Troubleshooting: Digital BFO

The troubleshooting described here clarifies the possible causes of a faulty digital BFO.

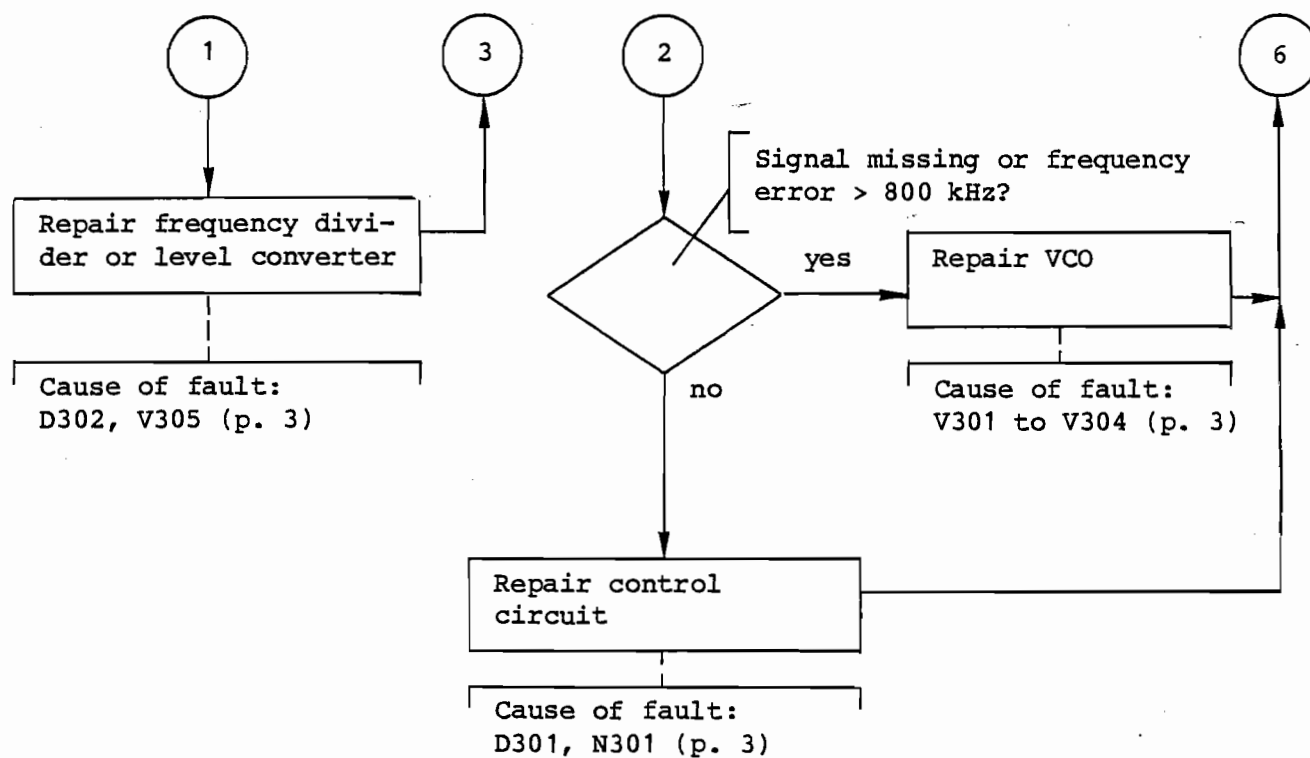
Requirements for troubleshooting:

- o demodulator is adapted in receiver
- o supply voltages are present



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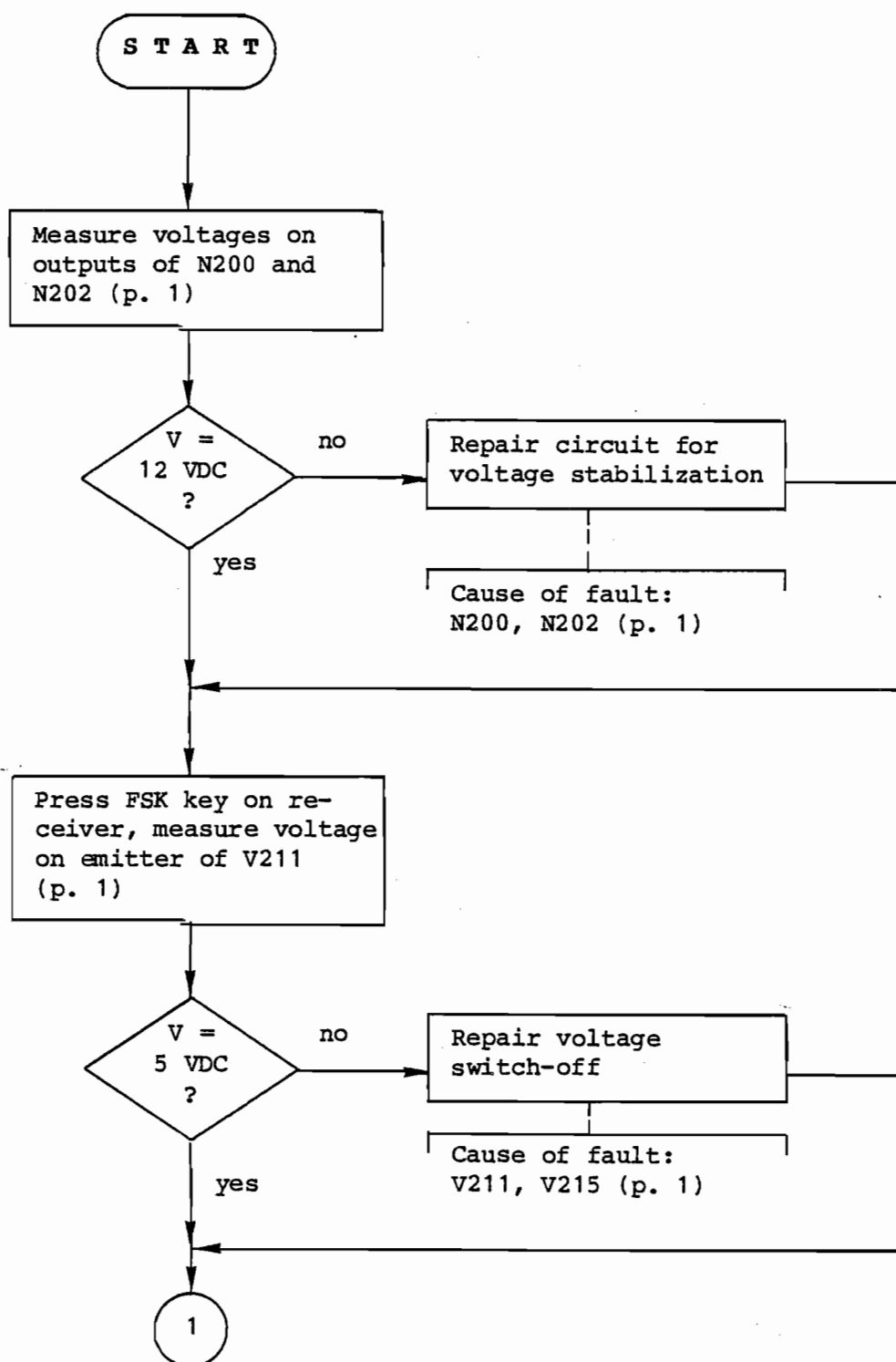
- 6.18 -

6.3.5 Troubleshooting: Voltage Supply

The troubleshooting described here clarifies the possible causes of a faulty supply voltages.

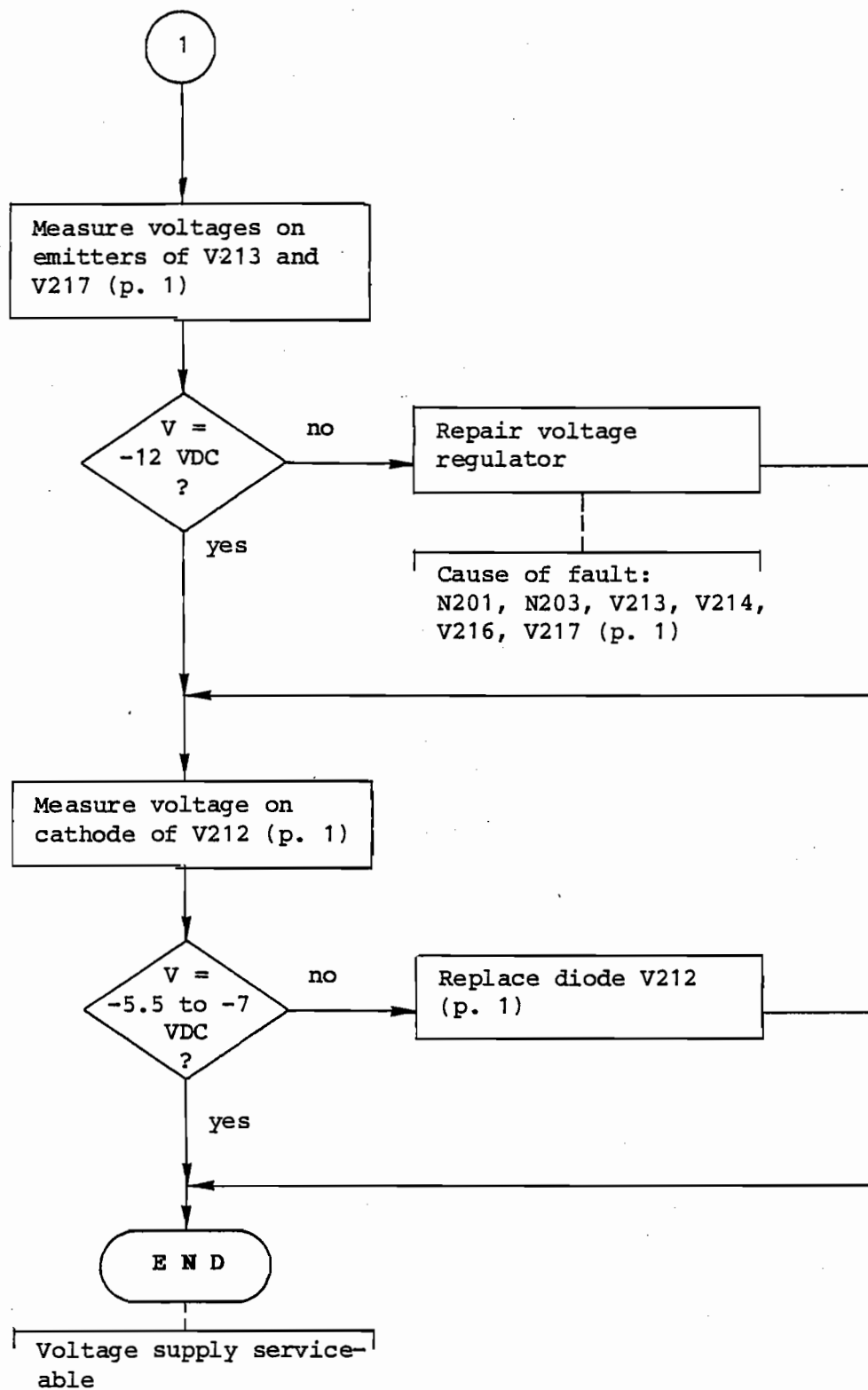
Requirement for Troubleshooting:

o demodulator is adapted in receiver



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6.4 Measurements and Functional Tests

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

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

6.4.1 Compiled Measured Values

AF output	X5.b1	: 300 ±50 mV
AF output	X5.b1, .a6	: 450 ±50 mV
FSK output	X5.a16	; ±10.2 ±1.2 V
FAX output	X5.a22	: 1.7 or 5 kHz
f voltage	X5.a17	: 4.3 to 10.3 V

6.4.2 Test of Envelope Demodulator

1. Arrange test set-up acc. to Fig. 6.1.
2. Press AM key on receiver.
3. On SMK set $f = 1.44$ MHz, amplitude-modulated with 1 kHz, $m = 0.6$ with a level of -2 dBm.
4. Measure AF level on connector X5.b1 (p. 6).

Nominal value: 300 ±50 mV

6.4.3 Test of Push-pull Demodulator

1. Arrange test set-up acc. to Fig. 6.1.
2. Press CW key on receiver.
3. On SMK set $f = 1.44$ MHz with a level of 0 dBm.
4. Measure AF level on connectors X5.b1 (p. 6) and X5.a6 (p. 6).

Nominal values: X5.b1 : 450 ±50 mV
X5.a6 : 450 ±50 mV

6.4.4 Test of FSK Demodulator

1. Arrange test set-up acc. to Fig. 6.1.
 2. Press FSK3 key on receiver and set FSK polarity to +.
 3. On SMK set $f = 1.440010$ MHz with a level of -6 dBm.
 4. Measure output voltage on connector X5.a16 (p. 8).
- Nominal value: -10.2 ±1.2 V
5. On SMK set $f = 1.439990$ MHz with level of -6 dBm.
 6. Measure output voltage on connector X5.a16 (p. 8).
- Nominal value: +10.2 ±1.2 V
7. Press POL key on receiver to set FSK polarity to -.
 8. Measure output voltage on connector X5.a16 (p. 8).

Nominal value: -10.2 ±1.2 V

(Continuation)---

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---(Continuation) Test of FSK Demodulator

9. Press POL key on receiver to reset FSK polarity to + and press STOP key to switch on TTY STOP function. LED assigned to STOP key illuminates.

10. Measure output voltage on connector X5.a16 (p. 8).

Nominal value: -10.2 ± 1.2 V

11. Press STOP key on receiver to switch off TTY STOP function. LED assigned to STOP key extinguishes.

2. Press AM key on receiver.

3. On SMK set frequencies acc. to the following table with a level of 0 dBm.

4. Measure voltage on connector X5.a17 (p. 9).

Nominal values:

f/MHz	V
1.440000	7.2 ± 0.2
1.440750	4.3 ± 0.4
1.439250	10.3 ± 0.4

5. Press FSK3 key on receiver.

6. On SMK set $f = 1.44$ MHz, frequency-modulated with 150 Hz and ± 300 Hz deviation.

7. Two LEDs should illuminate on tuning indication on control unit of receiver.

6.4.5 Test of Tone-keying Stage

1. Arrange test set-up acc. to Fig. 6.1.

2. Press FAX key on receiver and set polarity to +.

3. On SMK set $f = 1.440010$ MHz with a level of -6 dBm.

4. Measure output signal on connector X5.a22 (p. 9).

Nominal value: no signal

5. On SMK set $f = 1.439990$ MHz with a level of -6 dBm.

6. Measure frequency of output signal on connector X5.a22 (p. 9).

Nominal value is function of setting of jumper X7 (p. 9):
 $f = 1.7$ kHz or $f = 5$ kHz

6.4.7 Test of Analog BFO

1. Press CW key on receiver.

2. Turn BFO potentiometer to centre setting.

3. Measure frequency on collector of transistor V325 (p. 4).

Nominal value: $f = 5769$ kHz

4. Turn BFO potentiometer to right-hand and left-hand stop and measure frequency on collector of transistor V325 (p. 4).

Nominal values:

right-hand stop $f = 5754$ kHz
 ± 600 Hz
left-hand stop $f = 5766$ kHz
 ± 600 Hz

6.4.6 Test of Voltage Generation for Δf Indication

1. Arrange test set-up acc. to Fig. 6.1.

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6.4.8 Test of Digital BFO

1. Press USB key on receiver.
2. Set BFO frequency to 0 kHz.
3. Measure frequency on collector of transistor V305 (p. 3).

Nominal value: $f = 5760 \text{ kHz}$

4. Set BFO frequency $+2.5 \text{ kHz}$ and -2.5 kHz .
5. Measure frequency on collector of transistor V305 (p. 3).

Nominal values:

BFO $+2.5 \text{ kHz}$ $f = 5750 \text{ kHz}$

BFO -2.5 kHz $f = 5770 \text{ kHz}$

8. Align IF voltage for maximum with potentiometers R446 and R449 (p. 7), then turn R446 far enough left for IF voltage to reduce by 3 dB. Turn R449 far enough right for IF voltage to reduce by another 3 dB.

Nominal value of IF voltage:
 $> 1 V_{\text{rms}}$

6.5.2 Alignment of Digital BFO

1. Press USB key on receiver and set BFO frequency to 0 Hz.
2. Measure control voltage on pin 7 of operational amplifier N301 (p. 3).

Nominal value: $4.5 \pm 0.5 \text{ V}$

3. If necessary, correct control voltage with trimmer C316 (p. 3).

6.5 Setting and Alignment

6.5.1 Alignment of IF Bandpass Filters

1. Arrange test set-up acc. to Fig. 6.1.
2. Press FSL1 key on receiver.
3. On SMK set $f = 1.440 \text{ MHz}$ with a level of -6 dBm .
4. Measure IF voltage on pin 6 of operational amplifier N2 (p. 7).
5. Align IF voltage for maximum with potentiometers R12 and R14 (p. 7).

Nominal value of IF voltage:
 $> 1 V_{\text{rms}}$

6. Press FAX key on receiver.
7. Measure IF voltage on pin 6 of operational amplifier N18 (p. 7).

6.5.3 Alignment of Analog BFO

1. Arrange test set-up acc. to Fig. 6.1.
2. Press CW key on receiver, turn BFO potentiometer to centre setting.
3. On SMK set $f = 1.44 \text{ MHz}$ with a level of 0 dBm .
4. Turn the two potentiometers R338 and R339 (p. 4) to centre setting.
5. Measure voltage on N303.1 (p. 4) and align with coil L308 (p. 4) to 4.2 V .
6. Measure AF frequency on connector X5.a6 (p. 6).

(Continuation)---

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---(Continuation) Alignment of Analog BFO

7. Turn BFO potentiometer alternately to left-hand and right-hand stop and align alternately with potentiometers R338 and R339 (p. 4) so that the frequency is 1500 $\pm$ 50 Hz in both cases.
8. Then, with BFO potentiometer in centre setting, correct for 4.2 $\pm$ 0.1 V on N303.1 (p. 4) with coil L308 (p. 4).
3. Detach three HF cables.
4. Withdraw demodulator (10) sideways from cassette.

6.6.2 Installation of Demodulator

The demodulator is installed in the receiver in the reverse order to the removal described above.

6.6 Replacement of Assemblies

CAUTION!

Detach the power and battery cables before removing any modules from the housing of the receiver.

Note:

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

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

6.6.1 Removal of Demodulator

1. Undo four screws (12 and 19, Fig. 6.2) marked red. Lift cassette (7), push it sideways as far as it will go and set down on frame.
2. Undo four screws (15 and 21) marked red on cassette (7).

6.7 Final Test

After a repair has been carried out, the Demodulator GM 085P1 must be subjected to a final test to ensure that its technical data can still be guaranteed.

If this final test does not prove satisfactory, the troubleshooting ecc. to 6.3 will have to be performed again. Repeat the procedure as many times as is necessary to detect and remedy all faults.

6.7.1 Test of LINE Output

1. Arrange test set-up acc. to Fig. 6.1.
2. Press FSK3 key on receiver.
3. On SMK set $f = 1.44$ MHz with a level of 0 dBm.
4. Measure level on connector X5.a6 (p. 6).

Nominal value: 450 $\pm$ 50 mV

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6.7.2 Test of BITE AF output

1. Arrange test set-up acc. to Fig. 6.1.
2. Press FSK3 key on receiver.
3. On SMK set $f = 1.44$ MHz with a level of 0 dBm.
4. Measure voltage on connector X5.a5 (p. 6).

Nominal value: 4.4 ± 0.5 V
5. Reduce level on SMK. At -10 dBm at latest, level on connector X5.a5 (p. 6) must go to Low (< 1 V). Increase level of SMK. At -5 dBm at latest, level on connector X5.a5 must go to High again.
3. Detach cable from connector X571 (p. 5) After approx. 2 s level on connector X5.a13 must go to low.

6.7.4 Test of Sensitivity of FSK Demodulator

1. Arrange test set-up acc. to Fig. 6.1.
2. Press FSK3 key on receiver.
3. On SMK set $f = 1.4404$ MHz with a level of -30 dBm
4. Connect oscilloscope to connector X5.a19 (p. 8).
5. Reduce level on SMK until pulses appear on connector X5.a19 instead of High level.

Nominal value of sensitivity:

≤ -41 dBm

6.7.3 Test of CM BFO Output

1. Press FSK3 key on receiver.
2. Measure level on connector X5.a13 (p. 3).

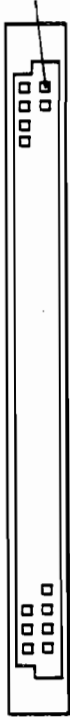
Nominal value: $+5 \pm 0.3$ V

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6.8 External Interfaces

<u>External Interfaces</u>		
Connector	Contact	Signal designation/level
X5 FP connector strip 64-way contact a1 	a1	BFO-E
	a2	Not used
	a3	BFO S
	a4	BFO A
	a5	BITE AF
	a6	AF LINE
	a7	BFO lamp
	a8	Not used
	a9	ST 10
	a10	] Not used
	a11	
	a12	
	a13	CM BFO
	a14	Not used
	a15	BITE FSK
	a16	FSK output
	a17	Δ f voltage
	a18	Soft decision analysis
	a19	Soft decision a
	a20	Soft decision b
	a21	Soft decision c
	a22	FAX
	a23	-16 VDC
	a24	] +5.3 VDC
	a25	] 7.25 VDC
	a26	
	a27	
	a28	] +16 VDC
	a29	
	a30	] Ground
	a31	
	a32	
	b1	AF-E
	b2	] Not used
	b3	
	b4	BFO A
	b5	ST9
	b6	] Not used
	b7	
	b8	] Not used
	b9	
	b10	
	b11	
	b12	ST10
	b10	DAT 0
	b11	DAT 1
	b12	DAT 2

(Continuation)---

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---(Continuation) External Interfaces

<u>External Interfaces</u>		
Connector	Contact	Signal designation/level
	b13	DAT 3
	b14	DAT 4
	b15	DAT 5
	b16	DAT 6
	b17	DAT 7
	b18	ST6
	b19	ST8
	b20	
	b21	☐ Not used
	b22	Aural monitoring
	b23	-16 VDC
	b24	
	b25	☐ +5.3 VDC
	b26	
	b27	☐ +7.25 VDC
	b28	Not used
	b29	+16 VDC
	b30	
	b31	☐ Ground
	b32	
X56, X571, X572 HF socket type SMB 	X56	IF, 1.44 MHz
	X571	7.2 MHz
	X572	79.2 MHz

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- 6.27/6.28 -

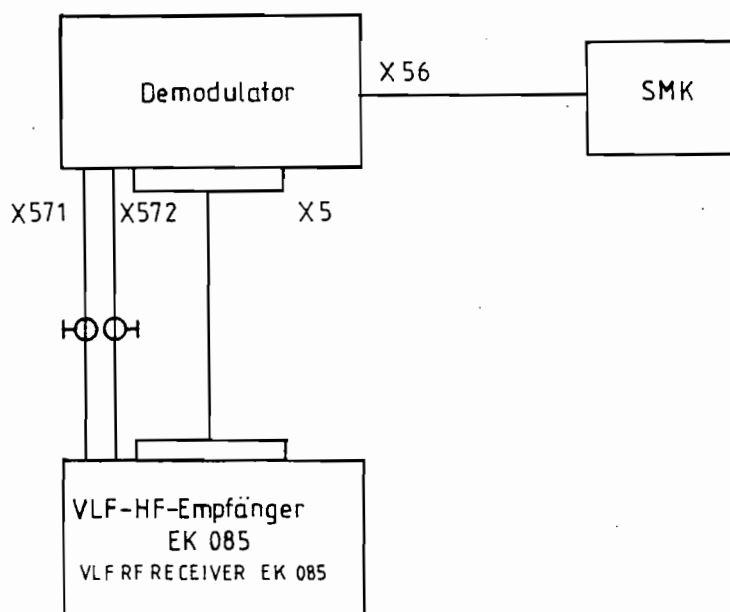


Fig. 6.1 Test Set-up for Demodulator GM 085P1

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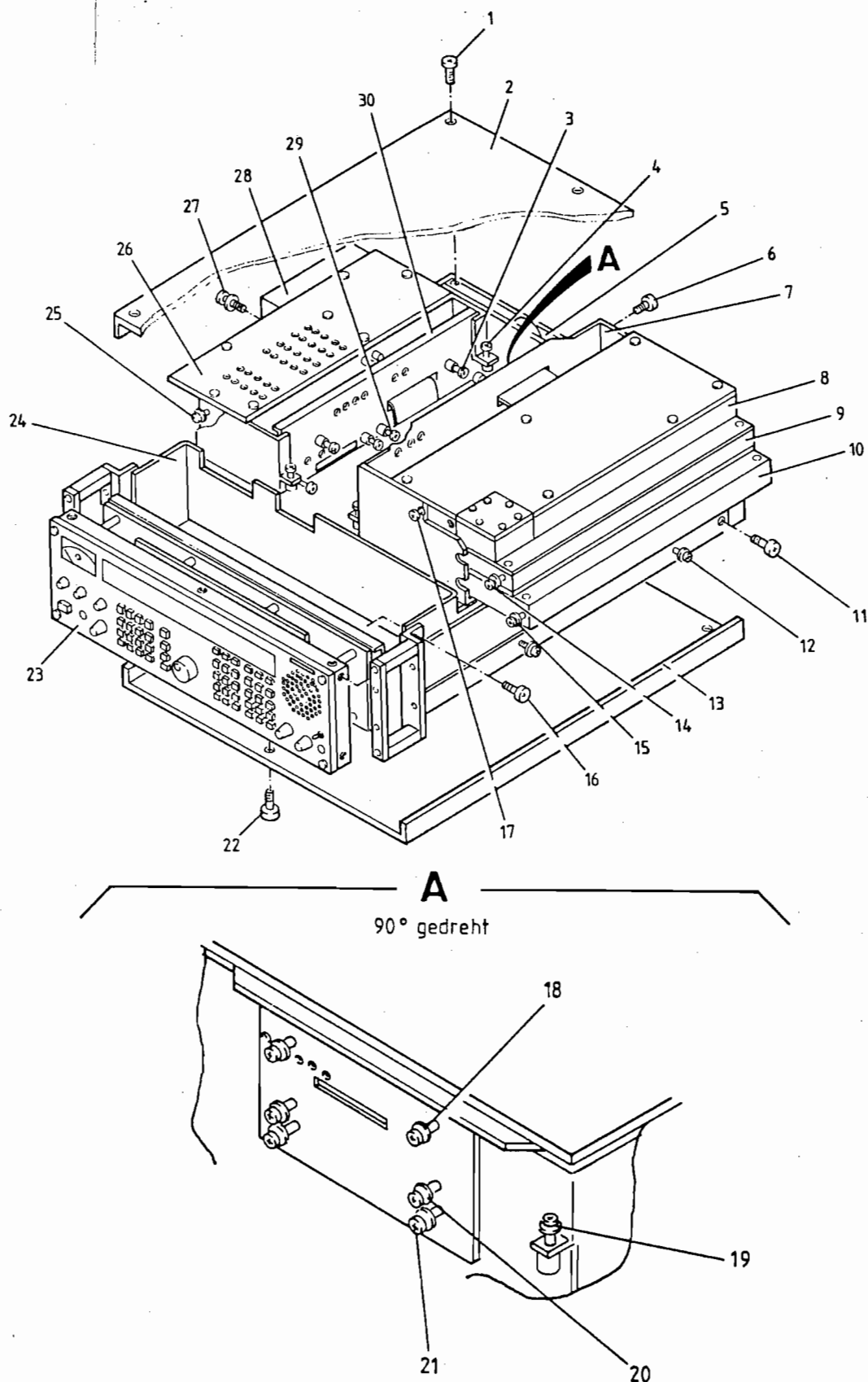


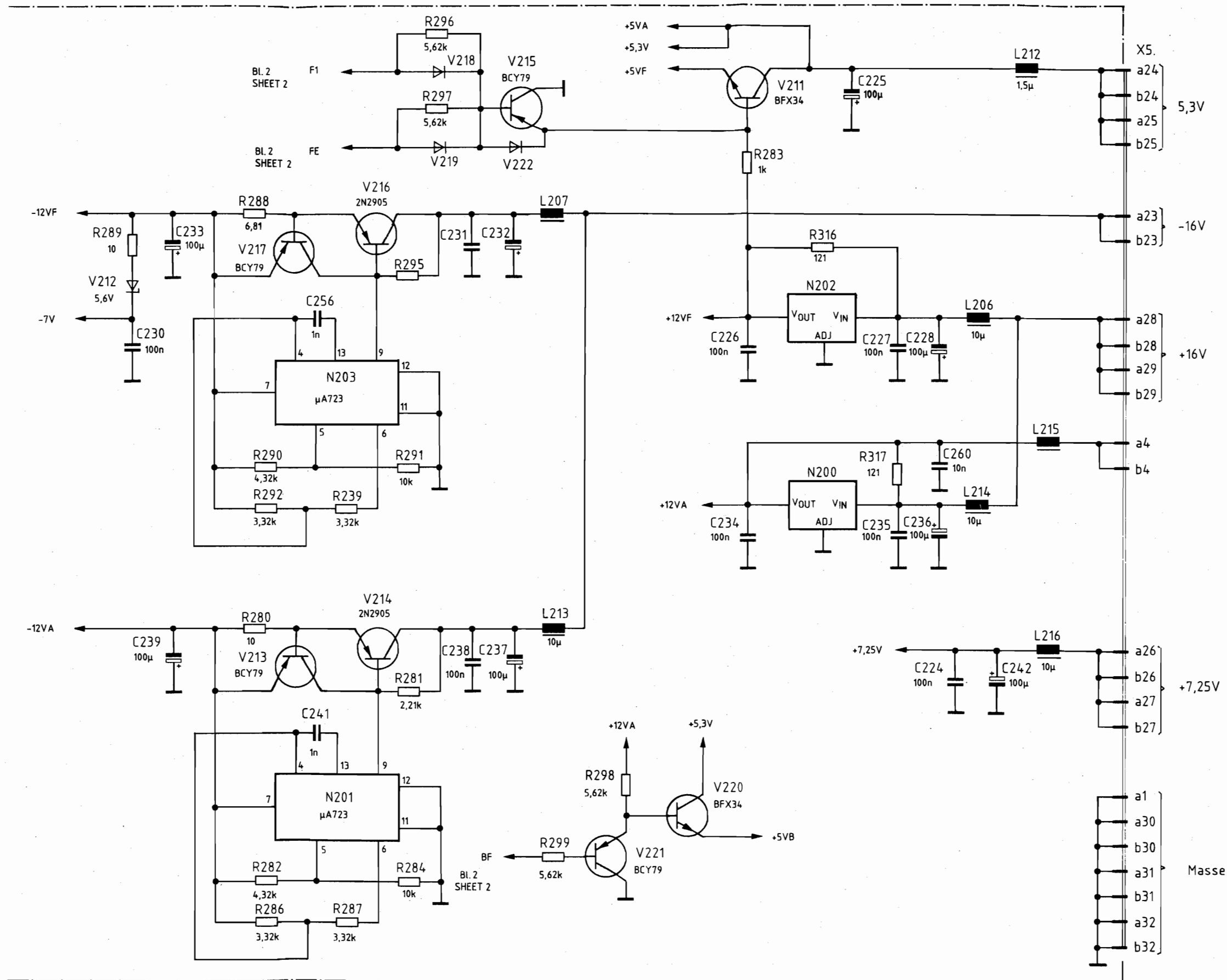
Fig. 6.2 Removal of Demodulator GM 085P1



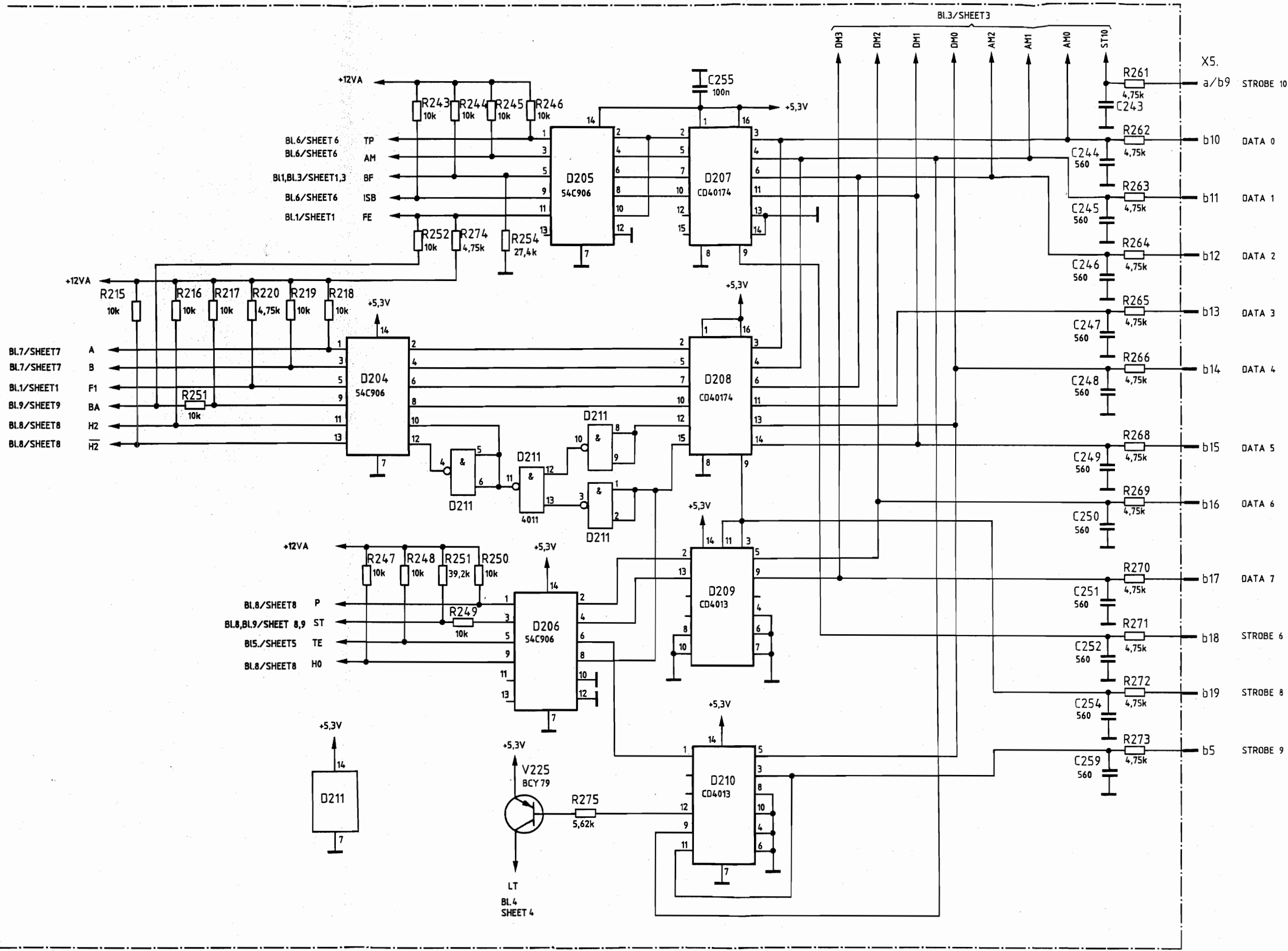
ROHDE & SCHWARZ
MÜNCHEN

Schalteillisten
Stromläufe
Bestückungspläne
Parts lists
Circuit diagrams
Components plans

A
B
C
D
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F



A
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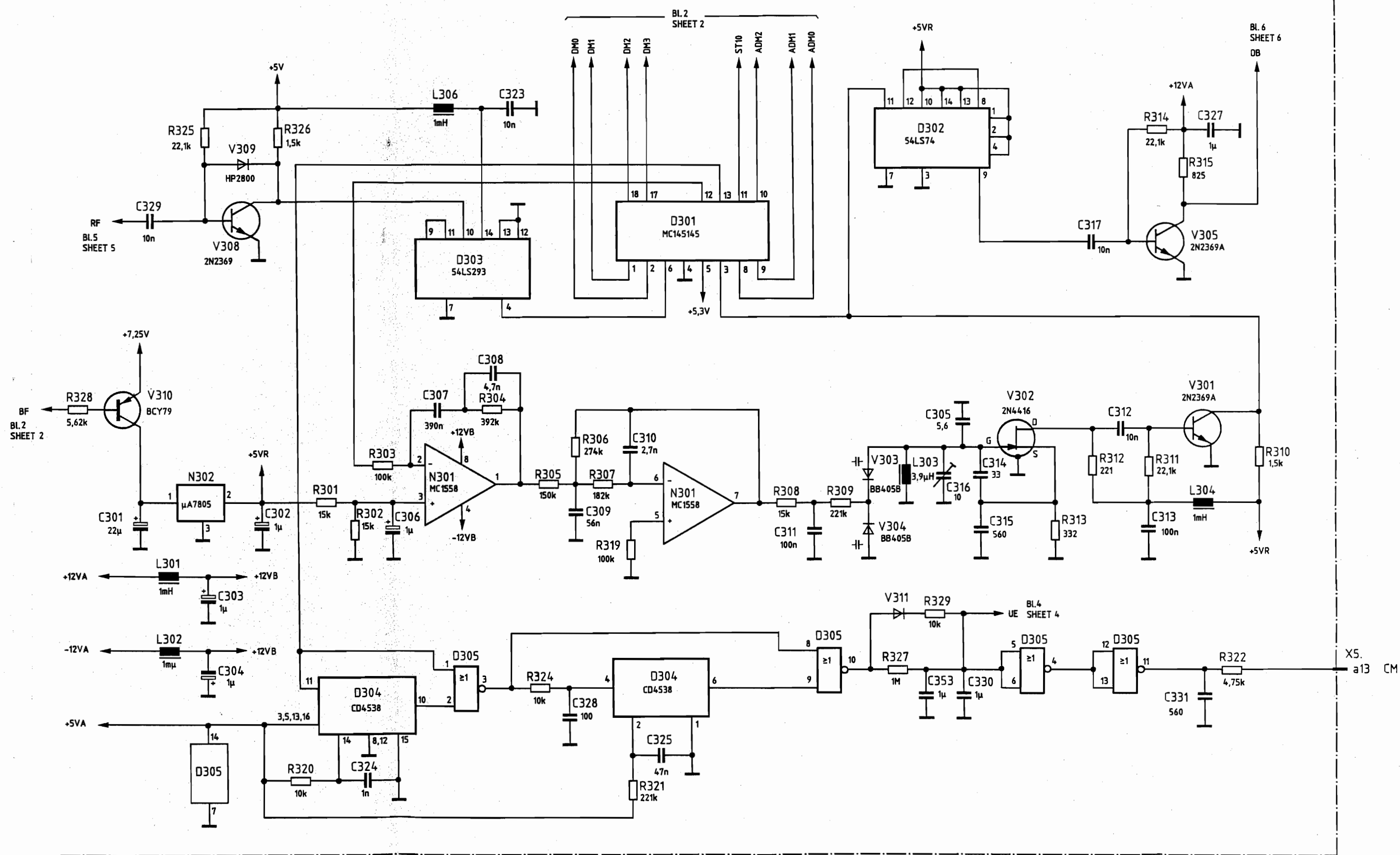
And. Zust.	Anderungs-Mittelung	Datum	Name	And. Zust.	Anderungs-Mittelung	Datum	Name	Norm	Tag	Name	Benennung	Zeichn.-Nr.	Blatt-Nr.
			A				B		10/85	BM	6KBE		2
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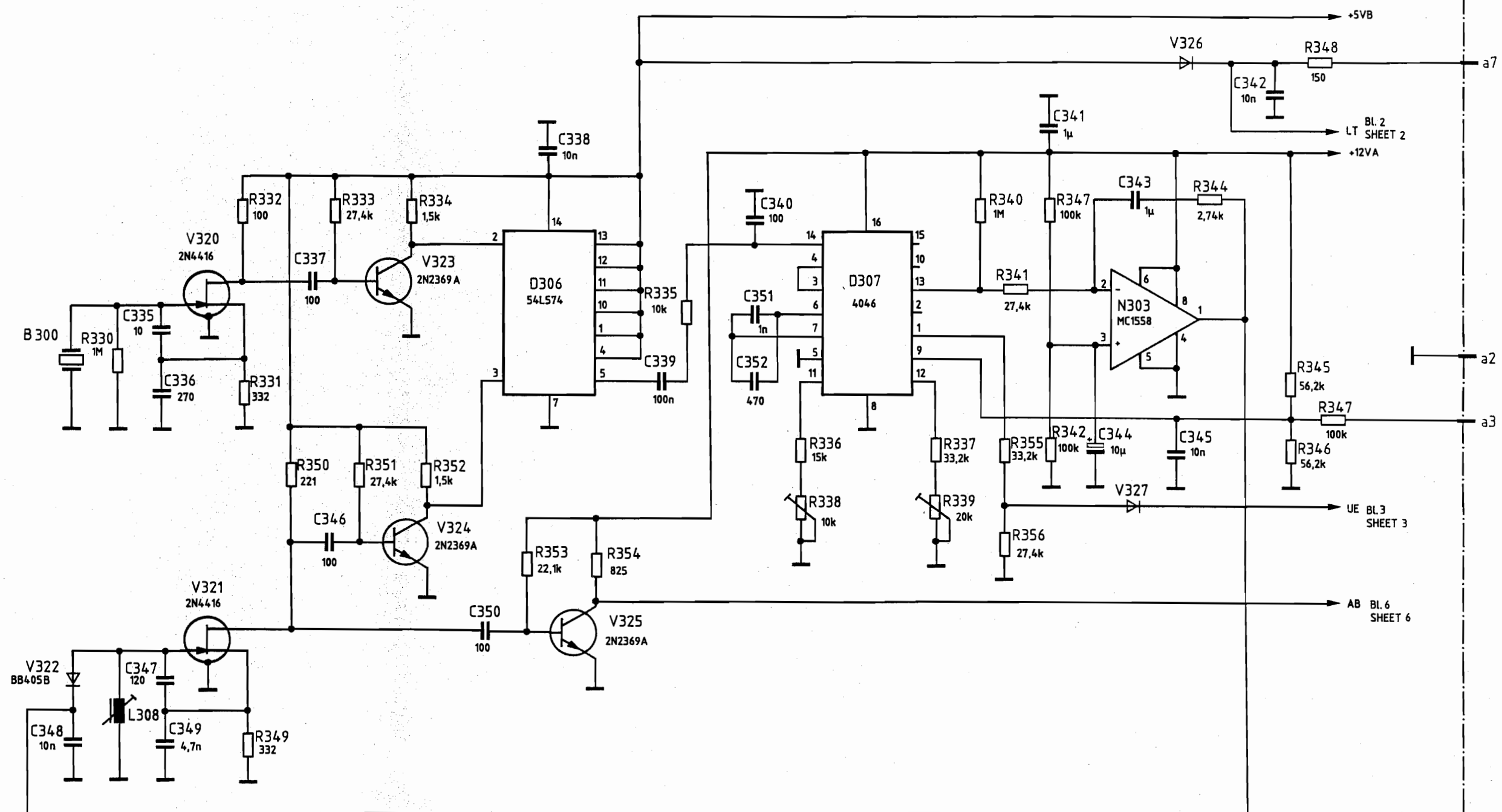
GM085 P1 Demodulator

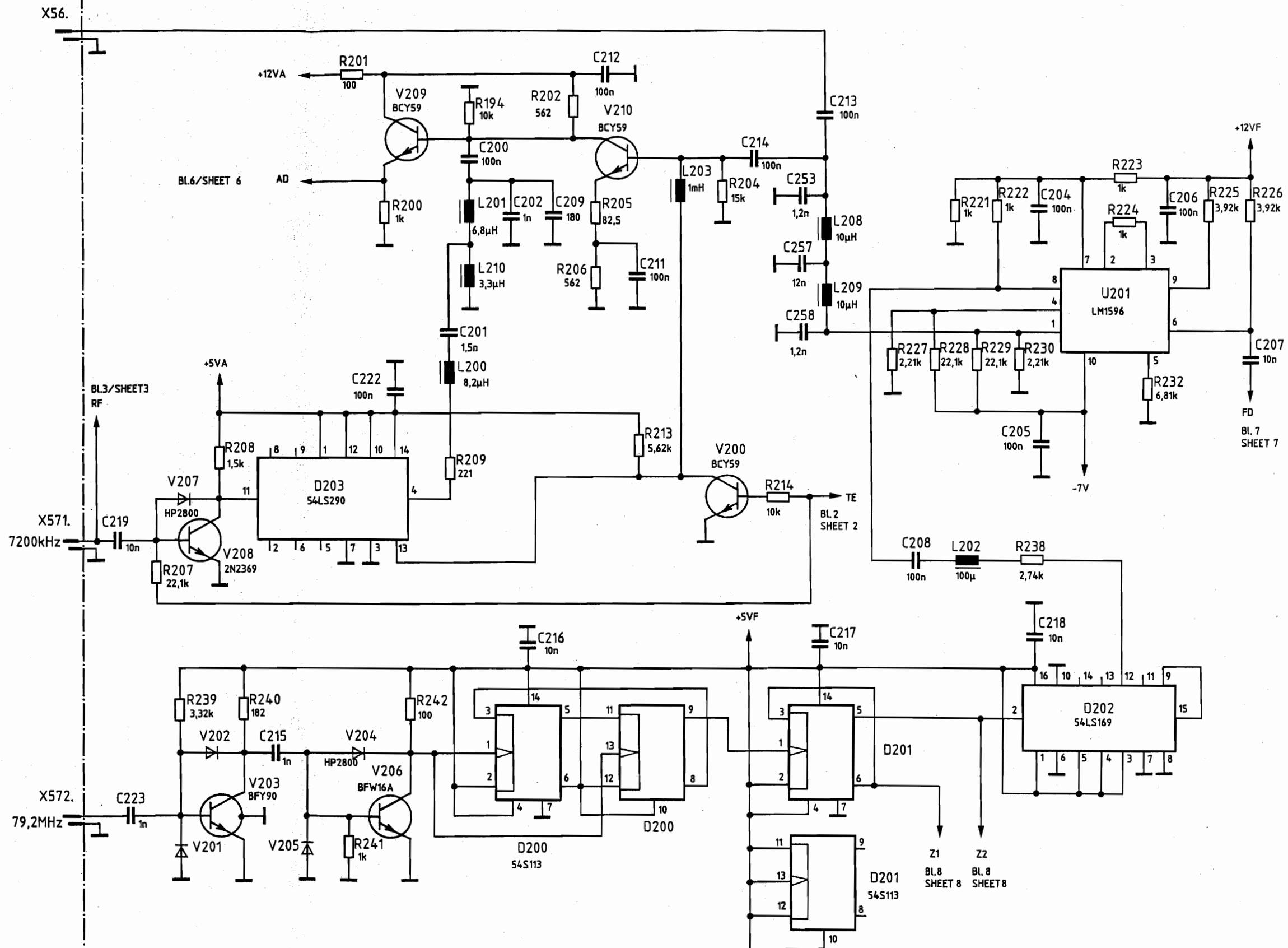
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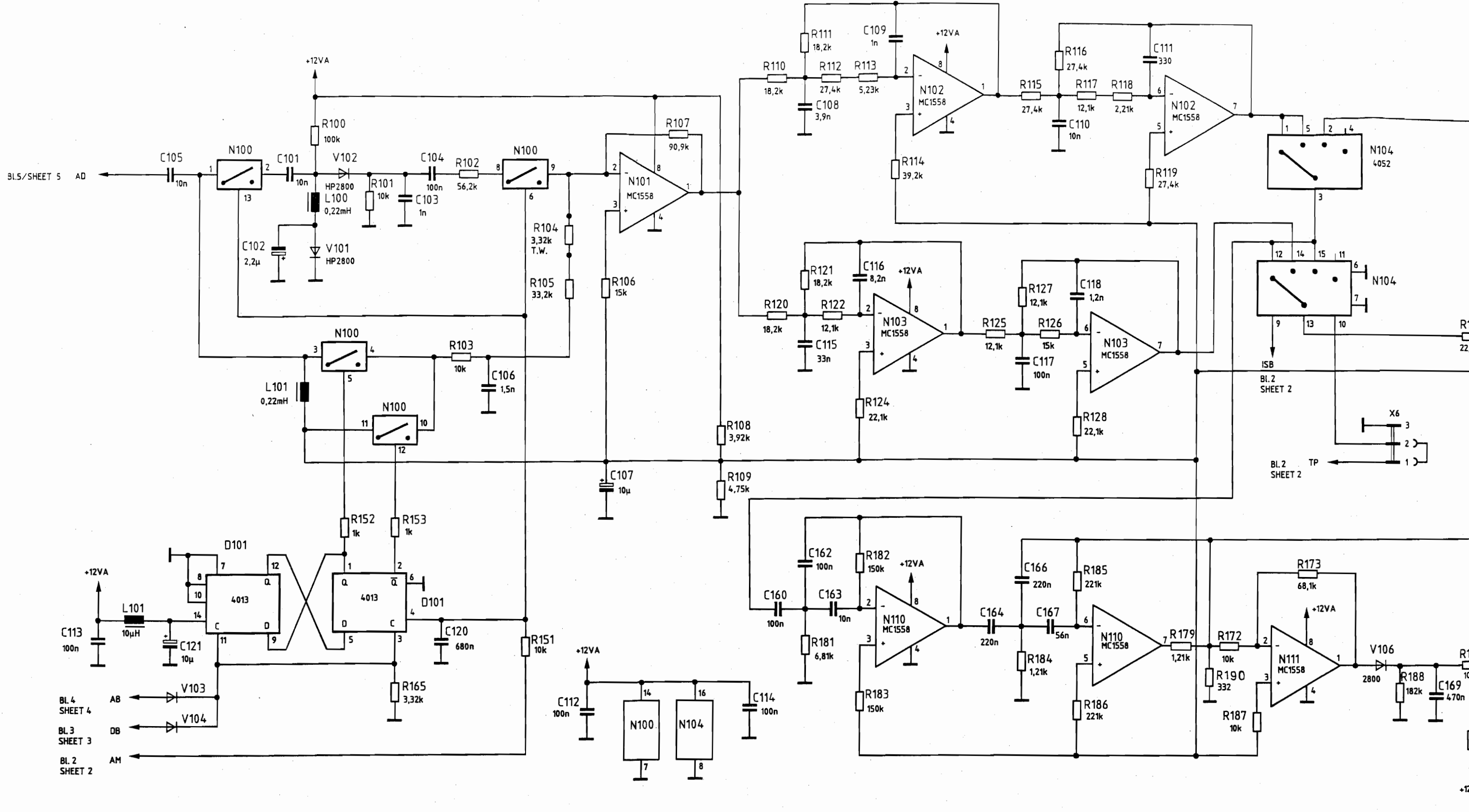
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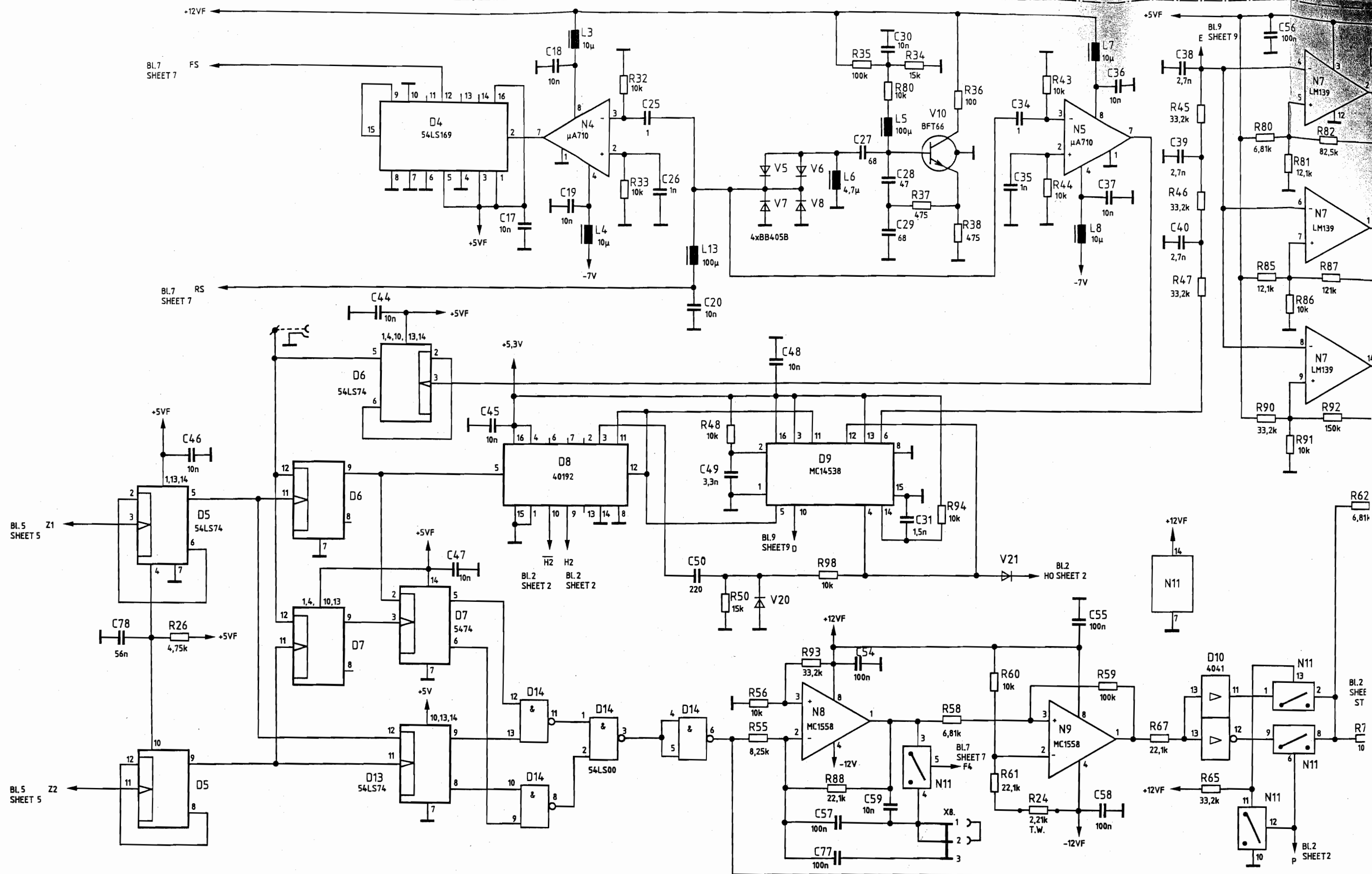
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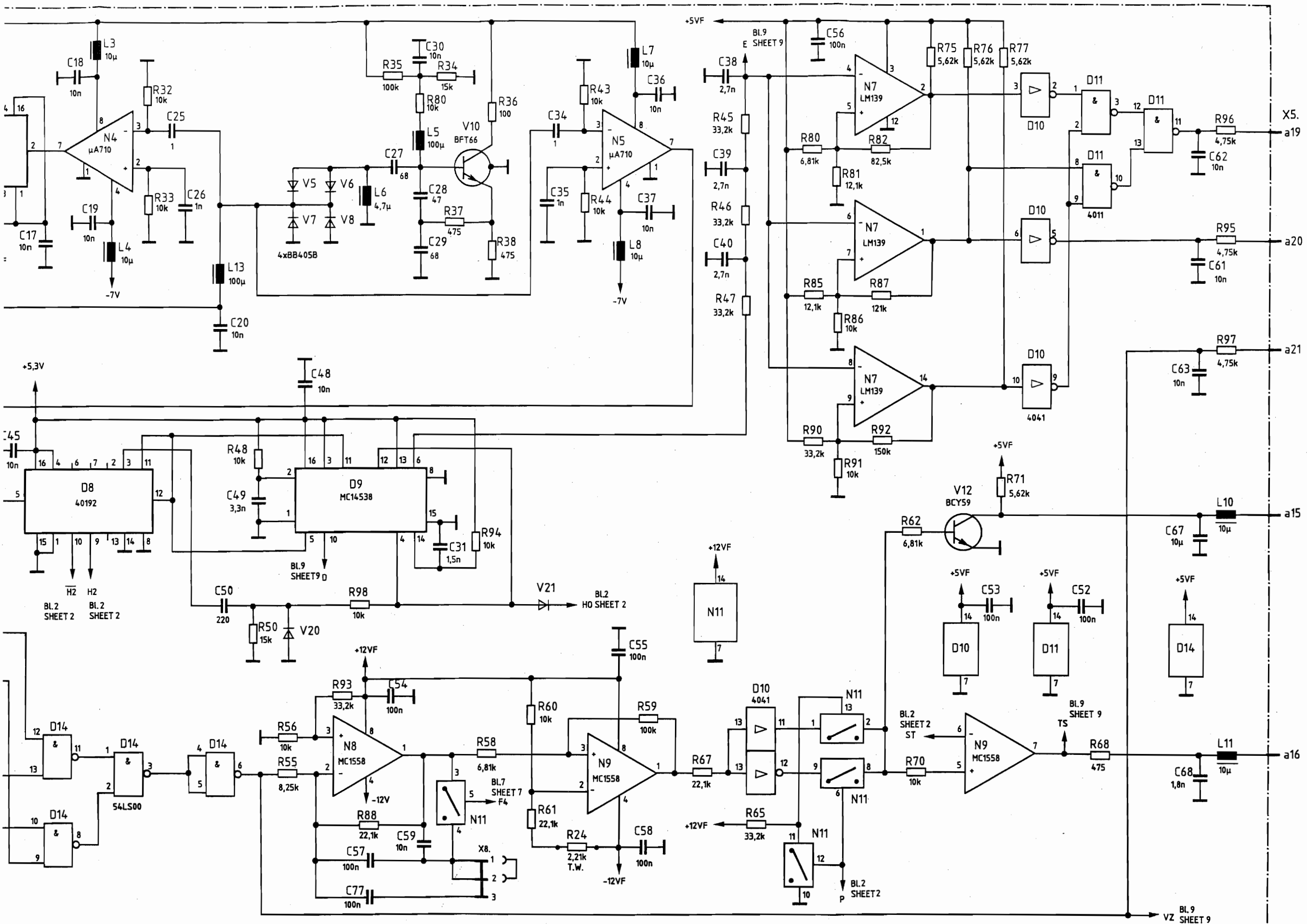


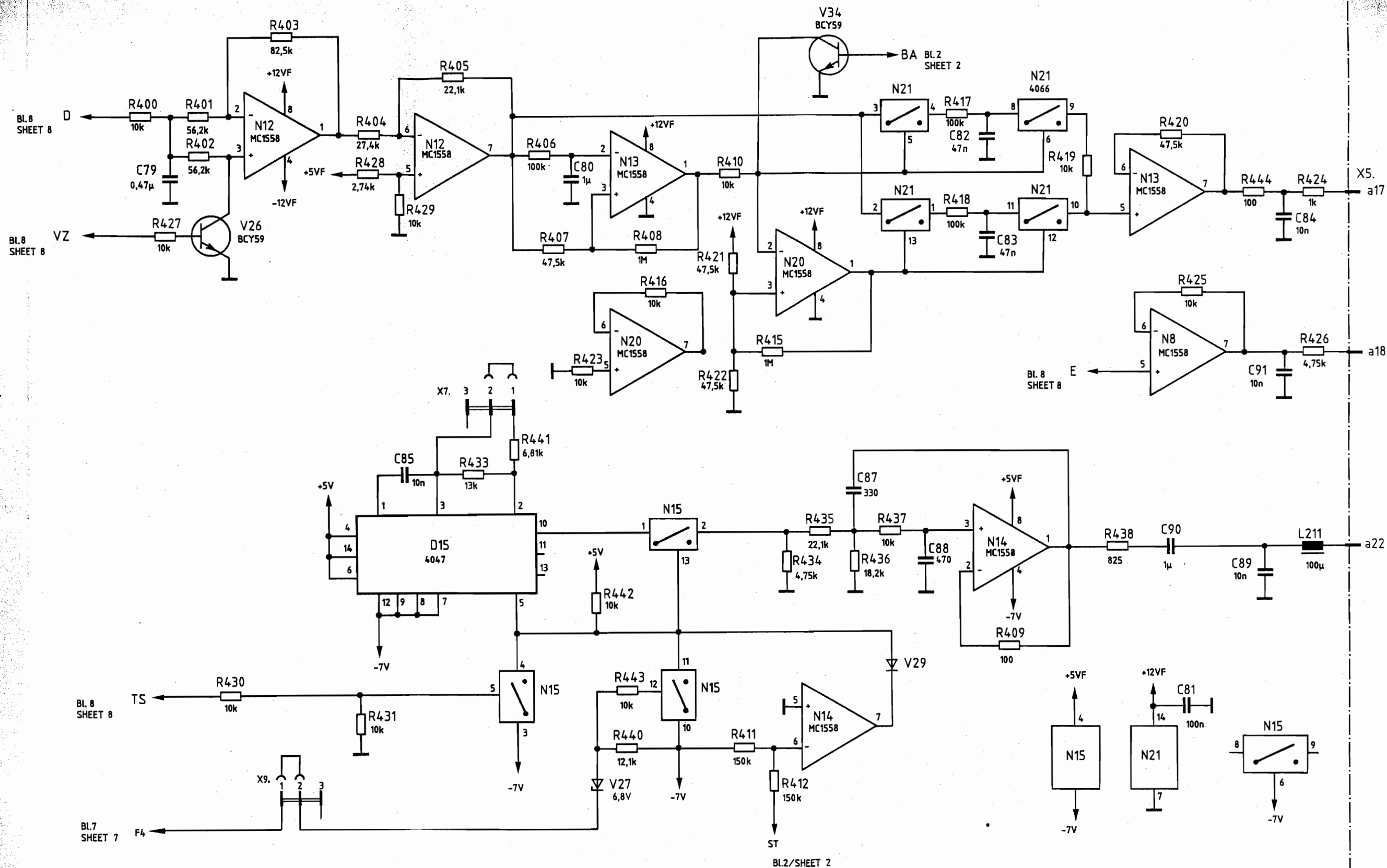
				A		10/85	BM	6KBE	Tag	Name	Benennung
				B		3.86	BM	Bearb.		HF	
And. Zust.	Anderungs-Mitteilung	Datum	Name	And. Zust.	Anderungs-Mitteilung	Datum	Name	Norm			

GM08

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VARIANTENERKL. / VERSIONS
VAR 02 = GRUNDAUSFUEHRUNG
MOD 02 = BASIC MODEL
ZUGEH.STROML./CIRC.DIAGR.
651.8810.01 S

A5.1

EE DEMODULATOR
HIERZ.STROML. 651.8810.01S
SEE CIRC.DIAG.651.8810.01S

651.8833.02

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VARIANTENERKL. / VERSIONS
VAR 02 = GRUNDAUSFUEHRUNG
MOD 02 = BASIC MODEL

B300

EQ 5,700 MHZ CL30PF HC43U
QUARTZ CRYSTAL UNIT
KVG R&S-ZCHNG.EQ091.0215

651.8991

C1

CK 3,9NF+-1%63V6,3QUX11KP
CAPACITOR
SIEMENS B33531-A5392-F

CK 340.8057

BIS/TO

C4

C5

CC 100NF+-10%50V5K1200VIE
CAPACITOR
UNION CARB CK05BX104K

CC 084.5350

BIS/TO

C7

C8

CC 100NF+-10%50V5K1200VIE
CAPACITOR
UNION CARB CK05BX104K

CC 084.5350

C9

CC 100NF+-10%50V5K1200VIE
CAPACITOR
UNION CARB CK05BX104K

CC 084.5350

C10

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C11

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C12

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C13

CK 8,2NF+-1%63V6,3QUX11KP
CAPACITOR
SIEMENS B33531-A5822-F

CK 340.9060

C14

CK 220PF+-1%63V6,3QUX11KP
CAPACITOR
SIEMENS B33531-A5221-F

CK 340.8040

C15

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C17

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C18

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C19

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

C20

CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR
UNION CARB CK05BX103K

CC 068.4060

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C25	CC 1,0PF+-0,25PF,63V NPO CAPACITOR	CC 092.7207	
C26	CC 1,0NF+-20%63V5X6 K2000 CAPACITOR	CC 092.7820	
C27	STETTNER EGPZ2,5 1000PF 20% CC 68 PF+-2%63V6,5X7,5NPO CAPACITOR	CC 092.7420	
C28	STETTNER EGPZ2,5 68PF2%NPO CC 47 PF+-2%63V5,5X6,5NPO CAPACITOR	CC 092.7407	
C29	STETTNER EGPZ2,5 47PF2%NPO CC 68 PF+-2%63V6,5X7,5NPO CAPACITOR	CC 092.7420	
C30	STETTNER EGPZ2,5 68PF2%NPO CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
C31	UNION CARB CK05BX103K CK 1,5NF+-1,25%63V7,5QUAD CAPACITOR	CK 213.4360	
C34	SIEMENS B33531-A5152-F CC 1,0PF+-0,25PF,63V NPO CAPACITOR	CC 092.7207	
C35	CC 1,0NF+-20%63V5X6 K2000 CAPACITOR	CC 092.7820	
C36	STETTNER EGPZ2,5 1000PF 20% CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
C37	UNION CARB CK05BX103K CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
C38	UNION CARB CK05BX103K CC 2,7NF+- 5%100V NPO VIE CAPACITOR	CC 060.0942	
C39	ERIE 8133-100-C0G-2,7NF-J CC 2,7NF+- 5%100V NPO VIE CAPACITOR	CC 060.0942	
C40	ERIE 8133-100-C0G-2,7NF-J CC 2,7NF+- 5%100V NPO VIE CAPACITOR	CC 060.0942	
C44	ERIE 8133-100-C0G-2,7NF-J CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
BIS/TO C48			
C49	UNION CARB CK05BX103K CK 3,3NF+-1%63V6,3QUX11KP CAPACITOR	CK 340.9030	
C50	SIEMENS B33531-A5332-F CC 220PF+-2%63V6,5X8 N750 CAPACITOR	CC 092.7771	
C52	STETTNER EGPZ2,5 220PF2%N750 CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
C53	UNION CARB CK05BX104K CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	UNION CARB CK05BX104K		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C54	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C55	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C56	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C57	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C58	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C59	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	
C61	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C62	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C63	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C67	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C68	CC 1,8NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB CK05BX182K	CC 084.5296	
C69	CC 1NF+-10%200V5K1200VIEL CAPACITOR UNION CARB CK05BX102K	CC 068.4047	
C75	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C76	CK 470NF+-5%63V5RM MKT CAPACITOR WIMA MKS2/63/0,47UF/5%	CK 099.2975	
C77	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C78	CC 56NF+-10%50V5K1200VIEL CERAMIC CAPACITOR UNION CARB CK05BX563K	CC 084.5338	
C79	CC 470NF+-10%50VK1200VIEL CAPACITOR UNION CARB CK06BX474K	CC 068.4082	
C80	CC 1UF+-10%50V7K1200VIEL CAPACITOR UNION CARB CK06BX105K	CC 084.5538	
C81	CC 100NF+-10%100V K1200VI CERAMIC CAPACITOR UNION CARB CK06BX104K	CC 060.1149	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in		
C82	CK 47NF+-5%63V5RM MKT CAPACITOR	CK 099.2917			
	WIMA MKS2/63/0,047UF/5%				
C83	CK 47NF+-5%63V5RM MKT CAPACITOR	CK 099.2917			
	WIMA MKS2/63/0,047UF/5%				
C84	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB CK05BX103K				
C85	CK 10NF+-1%63V7,5QUX13 KP CAPACITOR	CK 340.9076			
	SIEMENS B33531-A5103-F				
C87	CK 330PF+-1%63V6,3X11 KP PLASTC-FOIL CAPACITOR	CK 283.1647			
	SIEMENS B33531-A5331-F				
C88	CK 470PF+-1,25%63V7,5QUAD CAPACITOR	CK 213.4347			
	SIEMENS B33531-A5471-F				
C89	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB CK05BX103K				
C90	CK 1UF+-10%50V5RM MKT CAPACITOR	CK 099.2998			
	WIMA MKS2/50/1UF/10%				
C91	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB CK05BX103K				
C92	CK 3,9NF+-1%63V6,3QUX11KP CAPACITOR	CK 340.8057			
	SIEMENS B33531-A5392-F				
BIS/TO					
C95					
C96	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
	UNION CARB CK05BX104K				
C101	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB CK05BX103K				
C102	CE 2,2UF-10+50% 63V 9X13 ELECTROLYTIC CAPACITOR	CE 022.7637			
	ROEDERST ELKO EK 2/63				
C103	CC 1NF+-10%200V5K1200VIEL CAPACITOR	CC 068.4047			
	UNION CARB CK05BX102K				
C104	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
	UNION CARB CK05BX104K				
C105	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB CK05BX103K				
C106	CC 1,5NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 060.2374			
	UNION CARB CK05BX152K				
C107	CE 10UF -10+50% 63V 9X13 ELECTROLYTIC CAPACITOR	CE 022.7650			
	ROEDERST ELKOEK10/63				
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C108	CC 3,9NF+- 5%100V NPO VIE CAPACITOR ERIE 8737-100-COG-3,9NF-J	CC 060.0965	
C109	CC 1 NF+- 5%100V NPO VIEL CERAMIC CAPACITOR ERIE 8133-100-COG-1NF-J	CC 060.0894	
C110	CK 10NF+-1%63V7,5QUX13 KP CAPACITOR SIEMENS B33531-A5103-F	CK 340.9076	
C111	CC 330PF+- 5%100V NPO VIE CERAMIC CAPACITOR UNIONCARB C052C331J2G1CA	CC 060.0836	
C112	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C113	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C115	CK 33NF+-1% 63V 10QARD. CAPACITOR SIEMENS B33531-A5333-F	CK 294.6351	
C116	CK 8,2NF+-1%63V6,3QUX11KP CAPACITOR SIEMENS B33531-A5822-F	CK 340.9060	
C117	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C118	CK 1,2NF+-1%63V6,3X11 KP CAPACITOR SIEMENS B33531-A5122-F	CK 283.1682	
C120	CC 680NF+-10% 50V8K1200VI CAPACITOR UNION CARB CK06BX684K	CC 082.7785	
C121	CE 10 UF+-20%25V 7X 5X11 ELECTROLYTIC CAPACITOR ERO-TANTAL ETR3-10/25	CE 023.5980	
C145	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C152	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C153	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C154	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C160	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C162	CK 100NF+-5%63V5RM MKT CAPACITOR WIMA MKS/2/63/0,1UF/5%	CK 099.2930	
C163	CK 10NF+-5%63V5RM MKT CAPACITOR WIMA FKS 2/100/0,01UF/5%	CK 099.2869	

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
C164	CK 220NF+-5%63V5RM MKT CAPACITOR		CK 099.2952		
C166	WIMA MKS2/63/0,22UF/5% CK 220NF+-5%63V5RM MKT CAPACITOR		CK 099.2952		
C167	WIMA MKS2/63/0,22UF/5% CC 56 NF+-10% 50V5K1200LR CAPACITOR		CC 092.0748		
C169	AEROVOX CKR05BX563KLEVELR CC 470NF+-10%50VK1200VIEL CAPACITOR		CC 068.4082		
C171	UNION CARB CK06BX474K CK 1UF+-10%50V5RM MKT CAPACITOR		CK 099.2998		
C200	WIMA MKS2/50/1UF/10% CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C201	UNION CARB CK05BX104K CC 1,5NF+- 5%100V NPO VIE CAPACITOR		CC 060.0913		
C202	ERIE 8133-100-COG-1,5NF-J CC 1 NF+- 5%100V NPO VIEL CERAMIC CAPACITOR		CC 060.0894		
C204	ERIE 8133-100-COG-1NF-J CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C205	UNION CARB CK05BX104K CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C206	UNION CARB CK05BX104K CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C207	UNION CARB CK05BX104K CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR		CC 068.4060		
C208	UNION CARB CK05BX103K CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C209	UNION CARB CK05BX104K CC 180PF+- 5%100V NPO VIE CERAMIC CAPACITOR		CC 060.0807		
C211	UNION CARB C052C181J2G1CA CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C212	UNION CARB CK05BX104K CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
C213	UNION CARB CK05BX104K CK 100NF+-5%63V5RM MKT CAPACITOR		CK 099.2930		
C214	WIMA MKS/2/63/0,1UF/5% CK 100NF+-5%63V5RM MKT CAPACITOR		CK 099.2930		
C215	WIMA MKS/2/63/0,1UF/5% CC 1,0NF+-20%63V5X6 K2000 CAPACITOR		CC 092.7820		
	STETTNER EGPZ2,5 1000PF 20%				
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C216	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
BIS/TO C219			
C222	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C223	CC 1,0NF+-20%63V5X6 K2000 CAPACITOR STETTNER EGP22,5 1000PF 20%	CC 092.7820	
C224	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C225	CE 100UF-10+50% 16V 9X13 ELECTROLYTIC CAPACITOR ROEDERST EK 00CB 310 D	CE 006.7165	
C226	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C227	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C228	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	
C230	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C231	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C232	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	
C233	CE 100UF-10+50% 16V 9X13 ELECTROLYTIC CAPACITOR ROEDERST EK 00CB 310 D	CE 006.7165	
C234	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C235	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C236	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	
C237	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	
C238	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C239	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
C241	CC 1,0NF+-20%63V5X6 K2000 CAPACITOR		CC 092.7820		
C242	STETTNER EGP22,5 1000PF 20% CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR		CE 208.4007		
C243	ROEDERST ELK0EK100/25 CC 560PF+-10%200V5K1200VI CAPACITOR		CC 082.7462		
	UNION CARB CK05BX561K				
BIS/TO C252					
C253	CC 1,2NF+-10%100V5K1200VI CERAMIC CAPACITOR		CC 084.5280		
	UNION CARB CK05BX122K				
C254	CC 560PF+-10%200V5K1200VI CAPACITOR		CC 082.7462		
	UNION CARB CK05BX561K				
C255	CC 100NF+-10%50V5K1200VIE CAPACITOR		CC 084.5350		
	UNION CARB CK05BX104K				
C256	CC 1,0NF+-20%63V5X6 K2000 CAPACITOR		CC 092.7820		
	STETTNER EGP22,5 1000PF 20%				
C257	CK 12NF+-1%63V7,5QUX13 KP CAPACITOR		CK 340.6760		
	SIEMENS B33531-A5123-F				
C258	CK 1,2NF+-1%63V6,3X11 KP CAPACITOR		CK 283.1682		
	SIEMENS B33531-A5122-F				
C259	CC 560PF+-10%200V5K1200VI CAPACITOR		CC 082.7462		
	UNION CARB CK05BX561K				
C260	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR		CC 068.4060		
	UNION CARB CK05BX103K				
C301	CE 22UF-10+50% 63V 9X13 ELECTROLYTIC CAPACITOR		CE 006.7120		
	ROEDERST EK 00 CB 222 J				
C302	CE 1,0UF+-20%35V 5X 4X 7 ELECTROLYTIC CAPACITOR		CE 022.8185		
	ERO-TANTAL TA-ELKOETR1-1/35				
C303	CE 1,0UF+-20%35V 5X 4X 7 ELECTROLYTIC CAPACITOR		CE 022.8185		
	ERO-TANTAL TA-ELKOETR1-1/35				
C304	CE 1,0UF+-20%35V 5X 4X 7 ELECTROLYTIC CAPACITOR		CE 022.8185		
	ERO-TANTAL TA-ELKOETR1-1/35				
C305	CC 5,6PF+-0,25PF3X4NPO CAPACITOR		CC 087.6393		
	VALVO 2222 678 09568				
C306	CE 1,0UF+-20%35V 5X 4X 7 ELECTROLYTIC CAPACITOR		CE 022.8185		
	ERO-TANTAL TA-ELKOETR1-1/35				
C307	CC 390NF+-10% 50V8K1200VI CAPACITOR		CC 082.7756		
	UNION CARB CK06BX394K				
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C308	CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB CK05BX472K	CC 068.4053	
C309	CC 56NF+-10%50V5K1200VIEL CERAMIC CAPACITOR UNION CARB CK05BX563K	CC 084.5338	
C310	CC 2,7NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB CK05BX272K	CC 082.7404	
C311	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C312	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C313	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB CK05BX104K	CC 084.5350	
C314	CC 33PF+- 5%100V NPO VIEL CERAMIC CAPACITOR UNIONCARB C052C33QJ2G1CA	CC 060.0713	
C315	CC 560PF+-5%100V NP05X3X5 CAPACITOR ITW 302E0100RC561J	CC 099.0637	
C316	CT 9,5PF N750 LIEG.ABGL.0 DISC TRIMMER STETTNER 5S-TRIK004/4,5/15N75	CT 065.9690	
C317	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C323	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C324	CC 1NF+-10%200V5K1200VIEL CAPACITOR UNION CARB CK05BX102K	CC 068.4047	
C325	CC 47NF+-10%50V5K1200VIEL CAPACITOR UNION CARB CK05BX473K	CC 082.7810	
C327	CC 1UF+-10%50V7K1200VIEL CAPACITOR UNION CARB CK06BX105K	CC 084.5538	
C328	CC 100PF+-10%200V5K1200VI CAPACITOR UNION CARB CK05BX101K	CC 084.5250	
C329	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB CK05BX103K	CC 068.4060	
C330	CK 1UF+-10%50V5RM MKT CAPACITOR WIMA MKS2/50/1UF/10%	CK 099.2998	
C331	CC 560PF+-10%200V5K1200VI CAPACITOR UNION CARB CK05BX561K	CC 082.7462	
C335	CC 10 PF+-2%63V4X4,5 NPO CAPACITOR STETTNER EGP22,5 10PF2%NPO	CC 092.7320	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in		
C336	CC 270PF+- 5%100V NPO VIE CERAMIC CAPACITOR	CC 060.0820			
C337	UNIONCARB C052C271J2G1CA CC 100PF+-10%200V5K1200VI CAPACITOR	CC 084.5250			
C338	UNION CARB CK05BX101K CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
C339	UNION CARB CK05BX103K CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
C340	UNION CARB CK05BX104K CC 100PF+-10%200V5K1200VI CAPACITOR	CC 084.5250			
C341	UNION CARB CK05BX101K CC 1UF +-10% 50VK1200LR CAPACITOR	CC 092.1015			
C342	AEROVOX CKR06BX105KLEVELR CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
C343	UNION CARB CK05BX103K CC 1UF +-10% 50VK1200LR CAPACITOR	CC 092.1015			
C344	AEROVOX CKR06BX105KLEVELR CE 10 UF+-20%25V 7X 5X11 ELECTROLYTIC CAPACITOR	CE 023.5980			
C345	ERO-TANTAL ETR3-10/25 CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
C346	UNION CARB CK05BX103K CC 100PF+-10%200V5K1200VI CAPACITOR	CC 084.5250			
C347	UNION CARB CK05BX101K CC 120PF+-2%63V6,5X9 NPO CAPACITOR	CC 092.7459			
C348	STETTNER EGPZ2,5 120PF2%NPD CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
C349	UNION CARB CK05BX103K CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 068.4053			
C350	UNION CARB CK05BX472K CC 100PF+-10%200V5K1200VI CAPACITOR	CC 084.5250			
C351	UNION CARB CK05BX101K CC 1 NF+- 5% 63V N750 VIE CERAMIC CAPACITOR	CC 060.0359			
C352	ERIE 8131-U2J-102-J CC 470PF+-5%100V NP05X3X5 CAPACITOR	CC 099.0620			
C353	ITW 302E0100RC471J CK 1UF+-10%50V5RM MKT CAPACITOR	CK 099.2998			
	WIMA MKS2/50/1UF/10%				
D1	BL CD4046BF PHASE-L-L PHASE LOCKED LOOP RCA CD4046BF	BL 530.6060			
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D2	BL CD40192BF DEC.COUNTER COUNTER RCA CD40192BF	BL 302.7940	
D3	BL CD40192BF DEC.COUNTER COUNTER RCA CD40192BF	BL 302.7940	
D4	BL SN54LS169 J BIN.COUNT. IC BIN.COUNTER SN54LS69J FAIRCHILD 54LS169DM	580.9340	
D5	BL SN54LS74J 2XD-FLIPFLOP IC FLIP FLOP SN54LS74J TEXAS SN54LS74J	275.0697	
D6	BL SN54LS74J 2XD-FLIPFLOP IC FLIP FLOP SN54LS74J TEXAS SN54LS74J	275.0697	
D7	BL SN5474J DUAL-D-FLIP IC FLIP FLOP SN5474J TEXAS SN5474J	418.1219	
D8	BL CD40192BF DEC.COUNTER COUNTER RCA CD40192BF	BL 302.7940	
D9	BL MC14538BAL 2X MONOFLOP MONOSTABLE MULTIVIBRATOR MOTOROLA MC14538BAL	BL 526.5427	
D10	BL CD4041UBF 4X DRIVER DRIVER RCA CD4041UBF	BL 418.0012	
D11	BL CD4011BF 4X2IN.NANDG NAND GATE RCA CD4011BF	BL 517.7572	
D13	BL SN54LS74J 2XD-FLIPFLOP IC FLIP FLOP SN54LS74J TEXAS SN54LS74J	275.0697	
D14	BL SN54LS00J 4/2JNP.NAND. IC NAND GATE SN54LS00J TEXAS SN54LS00J	455.2838	
D15	BL CD4047AF MULTIVIBR MULTIVIBRATOR RCA CD4047AF	BL 086.8186	
D101	BL CD4013BF 2XD FLIPFL FLIPFLOP RCA CD4013BF	BL 086.8034	
D200	BL SN54S113J 2/JK-FLIPFL. IC FLIP FLOP SN54S113N TEXAS SN54S113J	475.1272	
D201	BL SN54S113J 2/JK-FLIPFL. IC FLIP FLOP SN54S113N TEXAS SN54S113J	475.1272	
D202	BL SN54LS169 J BIN.COUNT. IC BIN.COUNTER SN54LS69J FAIRCHILD 54LS169DM	580.9340	
D203	BL SN54LS290J DEZ.ZAEHLER IC COUNTER SN54LS290J TEXAS SN54LS290J	530.5805	
D204	BL MM54C906J 6XN-CH.BUFF N-CHANNEL BUFFER OD NSC MM54C906J	BL 418.0264	
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
D205	BL MM54C906J 6XN-CH.BUFF N-CHANNEL BUFFER OD NSC MM54C906J	BL 418.0264	
D206	BL MM54C906J 6XN-CH.BUFF N-CHANNEL BUFFER OD NSC MM54C906J	BL 418.0264	
D207	BL CD40174BF 6XD- FLIPFL FLIPFLOP RCA CD40174BF	BL 092.9474	
D208	BL CD40174BF 6XD- FLIPFL FLIPFLOP RCA CD40174BF	BL 092.9474	
D209	BL CD4013BF 2XD FLIPFL FLIPFLOP RCA CD4013BF	BL 086.8034	
D210	BL CD4013BF 2XD FLIPFL FLIPFLOP RCA CD4013BF	BL 086.8034	
D211	BL HEF4011BP 4X2IN.NANDG NAND GATE VALVO HEF4011BP	BL 565.1670	
D301	BL MC145145L PLL SYNTHES PLL FREQUENCY SYNTHESIZER MOTOROLA MC 145145 L	645.6755	
D302	BL SN54LS74J 2XD-FLIPFLOP IC FLIP FLOP SN54LS74J TEXAS SN54LS74J	275.0697	
D303	BL SN54LS293J BIN.COUNTER IC BIN.COUNTER SN54LS293J TEXAS SN54LS293J	570.4316	
D304	BL MC14538BAL 2X MONOFLOP MONOSTABLE MULTIVIBRATOR MOTOROLA MC14538BAL	BL 526.5427	
D305	BL CD4001BF 4X2INP.NORG NOR GATE RCA CD4001BF	BL 086.6990	
D306	BL SN54LS74J 2XD-FLIPFLOP IC FLIP FLOP SN54LS74J TEXAS SN54LS74J	275.0697	
D307	BL CD4046BF PHASE-L-L PHASE LOCKED LOOP RCA CD4046BF	BL 530.6060	
L1	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
BIS/TO L4 L5	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101	
L6	LD 4,7UH+-2%1,1A 0,21 OHM CHOKE JAHRE 74.4R70G	LD 567.3970	
L7	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
L8	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L10	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L11	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L13	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101	
L100	LD 220 UH10%21,00HMO,052A CHOKE DELEVAN DROSSEL1025-76	LD 067.3147	
L101	LD 220 UH10%21,00HMO,052A CHOKE DELEVAN DROSSEL1025-76	LD 067.3147	
L102	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L107	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101	
L108	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101	
L109	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101	
L110	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L200	LD 8,20UH10%2,700HMO,160A CHOKE DELEVAN DROSSEL1025-42	LD 067.2970	
L201	LD 6,80UH10%2,000HMO,185A CHOKE DELEVAN DROSSEL1025-40	LD 026.4178	
L202	LD 100 UH10%8,000HMO,084A CHOKE DELEVAN DROSSEL1025-68	LD 067.3101	
L203	LD 1000UH10%72,00HMO,028A CHOKE DELEVAN DROSSEL1025-92	LD 037.8005	
L206	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L207	LD 10,0UH10%3,300HMO,144A CHOKE DELEVAN DROSSEL1025-44	LD 026.4184	
L208	LD 10UH+-25 0,64A 0,6 OHM COIL JAHRE 74.11-10ROG	LD 591.0984	
L209	LD 10UH+-25 0,64A 0,6 OHM COIL JAHRE 74.11-10ROG	LD 591.0984	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in	
L211	LD 100 UH10%8,000HMO,084A CHOKE	LD 067.3101		
L212	DELEVAN DROSSEL1025-68 LD 1,50UH10%0,220HMO,560A CHOKE	LD 067.2886		
L213	DELEVAN DROSSEL 1025-24 LD 10,0UH10%3,300HMO,144A CHOKE	LD 026.4184		
BIS/TO	DELEVAN DROSSEL1025-44			
L216				
L301	LD 1000UH10%72,00HMO,028A CHOKE	LD 037.8005		
L302	DELEVAN DROSSEL1025-92 LD 1000UH10%72,00HMO,028A CHOKE	LD 037.8005		
L303	DELEVAN DROSSEL1025-92 LD 3,90UH10%1,000HMO,263A CHOKE	LD 067.2934		
L304	DELEVAN DROSSEL1025-34 LD 1000UH10%72,00HMO,028A CHOKE	LD 037.8005		
L306	DELEVAN DROSSEL1025-92 LD 1000UH10%72,00HMO,028A CHOKE	LD 037.8005		
L308	DELEVAN DROSSEL1025-92 LD SPULE COIL	651.8985		
N1	BO SE5534AFE LOW N.OPAMP OPERATIONAL AMPLIFIER	BO 301.3335		
N2	SIGNETICS SE5534AFE BO SE5534AFE LOW N.OPAMP OPERATIONAL AMPLIFIER	BO 301.3335		
N3	SIGNETICS SE5534AFE BO UA710HM DIFF COMPAR COMPARATOR	009.1039		
N4	FAIRCHILD UA710HM BO UA710HM DIFF COMPAR COMPARATOR	009.1039		
N5	FAIRCHILD UA710HM BO UA710HM DIFF COMPAR COMPARATOR	009.1039		
N6	FAIRCHILD UA710HM BO MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER	BO 275.0816		
N7	NSC LM1558J BO LM139J 4X COMPAR COMPARATOR	BO 455.2873		
N8	NSC LM139J BO MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER	BO 275.0816		
N9	NSC LM1558J BO MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER	BO 275.0816		
	NSC LM1558J			

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N11

BL MC14066BAL 4X ANALOGSW
ANALOG SWITCH

BL 418.0135

N12

MOTOROLA MC14066BAL
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N13

NSC LM1558J
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N14

NSC LM1558J
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N15

BL MC14066BAL 4X ANALOGSW
ANALOG SWITCH

BL 418.0135

N16

MOTOROLA MC14066BAL
BL CD4052BF 2X4CH.MUX
MULTIPLEXER/DEMULTIPLEXER

BL 567.3435

N17

RCA CD4052BF
BO SE5534AFE LOW N.OPAMP
OPERATIONAL AMPLIFIER

BO 301.3335

N18

SIGNETICS SE5534AFE
BO SE5534AFE LOW N.OPAMP
OPERATIONAL AMPLIFIER

BO 301.3335

N19

SIGNETICS SE5534AFE
BL CD4052BF 2X4CH.MUX
MULTIPLEXER/DEMULTIPLEXER

BL 567.3435

N20

RCA CD4052BF
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N21

NSC LM1558J
BL MC14066BAL 4X ANALOGSW
ANALOG SWITCH

BL 418.0135

N100

MOTOROLA MC14066BAL
BL MC14066BAL 4X ANALOGSW
ANALOG SWITCH

BL 418.0135

N101

MOTOROLA MC14066BAL
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N102

NSC LM1558J
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N103

NSC LM1558J
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N104

NSC LM1558J
BL CD4052BF 2X4CH.MUX
MULTIPLEXER/DEMULTIPLEXER

BL 567.3435

N110

RCA CD4052BF
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N111

NSC LM1558J
BO MC1558JG 2X OPAMP
OPERATIONAL AMPLIFIER

BO 275.0816

N200

NSC LM1558J
BO UA78M12HM+12VOA5 VREGL
VOLTAGE REGULATOR

BO 580.9362

FAIRCHILD MA78M12HM

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N201	B0 UA723DM ADJOA1 VREGL VOLTAGE REGULATOR THOMSON MA723MDG	B0 283.9425	
N202	B0 UA78M12HM+12VOA5 VREGL VOLTAGE REGULATOR FAIRCHILD MA78M12HM	B0 580.9362	
N203	B0 UA723DM ADJOA1 VREGL VOLTAGE REGULATOR THOMSON MA723MDG	B0 283.9425	
N301	B0 MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER NSC LM1558J	B0 275.0816	
N302	B0 UA78M05HM+ 5VOA5 VREGL VOLTAGE REGULATOR FAIRCHILD MA78M05HM	B0 092.8690	
N303	B0 MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER NSC LM1558J	B0 275.0816	
R1	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R2	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R3	RL 0,35W 33,2 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2OHM-F-D	RL 082.9359	
R4	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R5	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R6	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R7	RL 0,35W 33,2 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2OHM-F-D	RL 082.9359	
R8	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R9	RL 0,35W 47,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/47,5OHM-F-D	RL 082.9507	
R10	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R11	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R12	RS 0,5W50 OHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-500	RS 247.7861	

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R13	RL 0,35W 47,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/47,50HM-F-D	RL 082.9507	
R14	RS 0,5W50 OHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-500	RS 247.7861	
R15	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R16	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R17	RL 0,35W 475 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/475K-F-C	RL 083.2593	
R18	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
BIS/TO			
R22			
R23	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR	RL 083.1039	
R24	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C TRIMMWERT	RL 082.2477	
R25	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R26	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R27	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R30	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R31	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R32	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R33	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R34	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R35	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R36	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R37	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-D	RL 083.0390	
R38	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-D	RL 083.0390	
R40	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R43	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R44	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R45	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R46	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R47	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R48	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R50	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R55	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R56	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R58	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	
R59	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R60	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R61	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R62	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	
R65	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R67	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	


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 Kennzeichen
Component No.

 Benennung/Beschreibung
Designation

 Sachnummer
Stock No.

 enthalten in
contained in

R68

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

RL 082.2160

DRALORIC SMA0207/1K-F-C

R69

 RL 0,35W 2,74KOHM+-1%TK50
RESISTOR

RL 083.0926

DRALORIC SMA0207/2,74K-F-D

R70

 RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

DRALORIC SMA0207/10K-F-D

R71

 RL 0,35W 5,62KOHM+-1%TK50
RESISTOR

RL 082.2190

DRALORIC SMA0207/5,62K-F-C

R72

 RL 0,35W 2,74KOHM+-1%TK50
RESISTOR

RL 083.0926

DRALORIC SMA0207/2,74K-F-D

R73

 RL 0,35W 33,2KOHM+-1%TK50
RESISTOR

RL 083.1674

DRALORIC SMA0207/33,2K-F-C

R74

 RL 0,35W 3,32KOHM+-1%TK50
RESISTOR

RL 083.0990

DRALORIC SMA0207/3,32K-F-D

R75

 RL 0,35W 5,62KOHM+-1%TK50
RESISTOR

RL 082.2190

DRALORIC SMA0207/5,62K-F-C

R76

 RL 0,35W 5,62KOHM+-1%TK50
RESISTOR

RL 082.2190

DRALORIC SMA0207/5,62K-F-C

R77

 RL 0,35W 5,62KOHM+-1%TK50
RESISTOR

RL 082.2190

DRALORIC SMA0207/5,62K-F-C

R78

 RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

DRALORIC SMA0207/10K-F-D

R79

 RL 0,35W 33,2KOHM+-1%TK50
RESISTOR

RL 083.1674

DRALORIC SMA0207/33,2K-F-C

R80

 RL 0,35W 6,81KOHM+-1%TK50
RESISTOR

RL 082.2560

DRALORIC SMA 0207/6,81K-F-C

R81

 RL 0,35W 12,1KOHM+-1%TK50
RESISTOR

RL 083.1351

DRALORIC SMA0207/12,1K-F-D

R82

 RL 0,35W 82,5KOHM+-1%TK50
RESISTOR

RL 082.2302

DRALORIC SMA0207/82,5K-F-C

R83

 RL 0,35W 82,5KOHM+-1%TK50
RESISTOR

RL 082.2302

DRALORIC SMA0207/82,5K-F-C

R84

 RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

DRALORIC SMA0207/10K-F-D

R85

 RL 0,35W 12,1KOHM+-1%TK50
RESISTOR

RL 083.1351

DRALORIC SMA0207/12,1K-F-D

R86

 RL 0,35W 10,0KOHM+-1%TK50
RESISTOR

RL 083.1297

DRALORIC SMA0207/10K-F-D

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R87	RL 0,35W 121KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/121K-F-C	RL 083.2070	
R88	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R90	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R91	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R92	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C	RL 083.2129	
R93	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R94	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R95	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R96	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R97	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R98	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R100	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R101	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R102	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R103	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R104	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R105	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R106	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	

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Kennzeichen
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DesignationSachnummer
Stock No.enthalten in
contained in

R107

RL 0,35W 90,9KOHM+-1%TK50

RL 083.1980

RESISTOR

DRALORIC SMA0207/90,90HM-F-C

R108

RL 0,35W 4,75KOHM+-1%TK50

RL 083.1097

RESISTOR

DRALORIC SMA0207/4,75K-F-D

R109

RL 0,35W 4,75KOHM+-1%TK50

RL 083.1097

RESISTOR

DRALORIC SMA0207/4,75K-F-D

R110

RL 0,35W 18,2KOHM+-1%TK50

RL 083.1480

RESISTOR

DRALORIC SMA/207/18,2K-F-C

R111

RL 0,35W 18,2KOHM+-1%TK50

RL 083.1480

RESISTOR

DRALORIC SMA/207/18,2K-F-C

R112

RL 0,35W 27,4KOHM+-1%TK50

RL 082.2583

RESISTOR

DRALORIC SMA 0207/27,4K-F-C

R113

RL 0,35W 5,23KOHM+-1%TK50

RL 083.1122

RESISTOR

DRALORIC SMA0207/5,23K-F-D

R114

RL 0,35W 39,2KOHM+-1%TK50

RL 083.1745

RESISTOR

DRALORIC SMA/207/39,2K-F-C

R115

RL 0,35W 27,4KOHM+-1%TK50

RL 082.2583

RESISTOR

DRALORIC SMA 0207/27,4K-F-C

R116

RL 0,35W 27,4KOHM+-1%TK50

RL 082.2583

RESISTOR

DRALORIC SMA 0207/27,4K-F-C

R117

RL 0,35W 12,1KOHM+-1%TK50

RL 083.1351

RESISTOR

DRALORIC SMA0207/12,1K-F-D

R118

RL 0,35W 2,21KOHM+-1%TK50

RL 082.2477

RESISTOR

DRALORIC SMA 0207/2,21K-F-C

R119

RL 0,35W 27,4KOHM+-1%TK50

RL 082.2583

RESISTOR

DRALORIC SMA 0207/27,4K-F-C

R120

RL 0,35W 18,2KOHM+-1%TK50

RL 083.1480

RESISTOR

DRALORIC SMA/207/18,2K-F-C

R121

RL 0,35W 18,2KOHM+-1%TK50

RL 083.1480

RESISTOR

DRALORIC SMA/207/18,2K-F-C

R122

RL 0,35W 12,1KOHM+-1%TK50

RL 083.1351

RESISTOR

DRALORIC SMA0207/12,1K-F-D

R124

RL 0,35W 22,1KOHM+-1%TK50

RL 083.1545

RESISTOR

DRALORIC SMA/207/22,1K-F-C

R125

RL 0,35W 12,1KOHM+-1%TK50

RL 083.1351

RESISTOR

DRALORIC SMA0207/12,1K-F-D

R126

RL 0,35W 15,0KOHM+-1%TK50

RL 083.1400

RESISTOR

DRALORIC SMA0207/15K-F-D

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		09	0386	651.8833.01 SA	22
Kennzeichen Component No.	Benennung/Beschreibung Designation			Sachnummer Stock No.	enthalten in contained in
R127	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D			RL 083.1351	
R128	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C			RL 083.1545	
R151	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297	
R152	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C			RL 082.2160	
R153	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C			RL 082.2160	
R165	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D			RL 083.0990	
R169	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C			RL 083.1545	
R170	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C			RL 083.1545	
R172	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297	
R173	RL 0,35W 68,1KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/68,1K-F-C			RL 082.2602	
R174	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D			RL 083.1297	
R175	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C			RL 082.2583	
R176	RL 0,35W 332 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/332K-F-C			RL 083.2441	
R179	RL 0,35W 1,21KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,21K-F-D			RL 083.0655	
R181	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C			RL 082.2560	
R182	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C			RL 083.2129	
R183	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C			RL 083.2129	
R184	RL 0,35W 1,21KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,21K-F-D			RL 083.0655	
R185	RL 0,35W 221 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/221K-F-C			RL 083.2270	
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R186	RL 0,35W 221 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/221K-F-C	RL 083.2270	
R187	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R188	RL 0,35W 182 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/182K-F-C	RL 083.2193	
R189	RL 0,35W 18,2KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/18,2K-F-C	RL 083.1480	
R190	RL 0,35W 261 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/261OHM-F-D	RL 083.0155	
R194	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R196	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R197	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R200	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R201	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R202	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R204	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R205	RL 0,35W 82,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/82,5OHM-F-D	RL 082.9707	
R206	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R207	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R208	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732	
R209	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/221OHM-F-D	RL 083.0084	
R213	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R214	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
R215	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D		RL 083.1297		
BIS/TO					
R219					
R220	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D		RL 083.1097		
R221	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
BIS/TO					
R224					
R225	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR		RL 083.1039		
R226	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR		RL 083.1039		
R227	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C		RL 082.2477		
R228	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C		RL 083.1545		
R229	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C		RL 083.1545		
R230	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C		RL 082.2477		
R232	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C		RL 082.2560		
R238	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D		RL 083.0926		
R239	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D		RL 083.0990		
R240	RL 0,35W 182 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/182OHM-F-D		RL 083.0010		
R241	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C		RL 082.2160		
R242	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D		RL 082.6543		
R243	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D		RL 083.1297		
BIS/TO					
R251					
R252	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C		RL 083.1545		
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R253	RL 0,35W 39,2KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/39,2K-F-C	RL 083.1745	
R254	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R261	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
BIS/TO R266 R268	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
BIS/TO R273 R274	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R275	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R280	RL 0,35W 10,0 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/100HM-F-D	RL 082.8852	
R281	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	
R282	RL 0,35W 4,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,32K-F-D	RL 082.6572	
R283	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R284	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R286	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R287	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R288	RL 0,35W 6,81 OHM+-1%TK50 METALFILMRESISTOR RESISTA MK2 6,81 OHM 1% TK50	RL 099.8067	
R289	RL 0,35W 10,0 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/100HM-F-D	RL 082.8852	
R290	RL 0,35W 4,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,32K-F-D	RL 082.6572	
R291	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.		enthalten in contained in	
R292	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990			
R293	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990			
R295	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477			
R296	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190			
BIS/TO					
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R301	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400			
R302	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400			
R303	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764			
R304	RL 0,35W 392 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/392K-F-C	RL 083.2512			
R305	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C	RL 083.2129			
R306	RL 0,35W 274 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/274K-F-C	RL 083.2364			
R307	RL 0,35W 182 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/182K-F-C	RL 083.2193			
R308	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400			
R309	RL 0,35W 221 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/221K-F-C	RL 083.2270			
R310	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732			
R311	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545			
R312	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/221OHM-F-D	RL 083.0084			
R313	RL 0,35W 332 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/332OHM-F-D	RL 083.0255			
R314	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545			
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R315	RL 0,35W 825 OHM+-1%TK50 RESISTOR DRALORIC SMA 0207/825OHM-F-C	RL 082.2502	
R316	RL 0,35W 121 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/121OHM-F-D	RL 082.9859	
R317	RL 0,35W 121 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/121OHM-F-D	RL 082.9859	
R318	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/221OHM-F-D	RL 083.0084	
R319	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R320	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R321	RL 0,35W 221 KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/221K-F-C	RL 083.2270	
R322	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R324	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R325	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R326	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732	
R327	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	
R328	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R329	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R330	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	
R331	RL 0,35W 332 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/332OHM-F-D	RL 083.0255	
R332	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R333	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R334	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732	

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R335	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R336	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R337	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R338	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-103	RS 247.7903	
R339	RS 0,5W20KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-203	RS 087.7577	
R340	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	
R341	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R342	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R343	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R344	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D	RL 083.0926	
R345	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R346	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R347	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R348	RL 0,35W 150 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/150OHM-F-D	RL 082.9942	
R349	RL 0,35W 332 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/332OHM-F-D	RL 083.0255	
R350	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/221OHM-F-D	RL 083.0084	
R351	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R352	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732	
R353	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	


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R354	RL 0,35W 825 OHM+-1%TK50 RESISTOR DRALORIC SMA 0207/8250HM-F-C	RL 082.2502	
R355	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R356	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R400	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R401	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R402	RL 0,35W 56,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2K-F-C	RL 082.2231	
R403	RL 0,35W 82,5KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/82,5K-F-C	RL 082.2302	
R404	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R405	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R406	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R407	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800	
R408	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	
R409	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R410	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R411	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C	RL 083.2129	
R412	RL 0,35W 150 KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/150K-F-C	RL 083.2129	
R415	RL 0,35W 1MOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1M-F-D	RL 082.7862	
R416	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R417	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	

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Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
R418	RL 0,35W 100KOHM+-1%TK50 RESISTOR		RL 082.1764		
R419	DRALORIC SMA0207/100K-F-C RL 0,35W 10,0KOHM+-1%TK50 RESISTOR		RL 083.1297		
R420	DRALORIC SMA0207/10K-F-D RL 0,35W 47,5KOHM+-1%TK50 RESISTOR		RL 083.1800		
R421	DRALORIC SMA/207/47,5K-F-C RL 0,35W 47,5KOHM+-1%TK50 RESISTOR		RL 083.1800		
R422	DRALORIC SMA/207/47,5K-F-C RL 0,35W 47,5KOHM+-1%TK50 RESISTOR		RL 083.1800		
R423	DRALORIC SMA/207/47,5K-F-C RL 0,35W 10,0KOHM+-1%TK50 RESISTOR		RL 083.1297		
R424	DRALORIC SMA0207/10K-F-D RL 0,35W 1KOHM+-1%TK50 RESISTOR		RL 082.2160		
R425	DRALORIC SMA0207/1K-F-C RL 0,35W 10,0KOHM+-1%TK50 RESISTOR		RL 083.1297		
R426	DRALORIC SMA0207/10K-F-D RL 0,35W 4,75KOHM+-1%TK50 RESISTOR		RL 083.1097		
R427	DRALORIC SMA0207/4,75K-F-D RL 0,35W 10,0KOHM+-1%TK50 RESISTOR		RL 083.1297		
R428	DRALORIC SMA0207/10K-F-D RL 0,35W 2,74KOHM+-1%TK50 RESISTOR		RL 083.0926		
R429	DRALORIC SMA0207/2,74K-F-D RL 0,35W 10,0KOHM+-1%TK50 RESISTOR		RL 083.1297		
BIS/TO	DRALORIC SMA0207/10K-F-D				
R431					
R433	RL 0,35W 13,0KOHM+-1%TK50 RESISTOR		RL 083.1368		
R434	DRALORIC SMA0207/13,0K-F-D RL 0,35W 4,75KOHM+-1%TK50 RESISTOR		RL 083.1097		
R435	DRALORIC SMA0207/4,75K-F-D RL 0,35W 22,1KOHM+-1%TK50 RESISTOR		RL 083.1545		
R436	DRALORIC SMA/207/22,1K-F-C RL 0,35W 18,2KOHM+-1%TK50 RESISTOR		RL 083.1480		
R437	DRALORIC SMA/207/18,2K-F-C RL 0,35W 10,0KOHM+-1%TK50 RESISTOR		RL 083.1297		
R438	DRALORIC SMA0207/10K-F-D RL 0,35W 825 OHM+-1%TK50 RESISTOR		RL 082.2502		
	DRALORIC SMA 0207/8250HM-F-C				
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R440	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D	RL 083.1351	
R441	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	
R442	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R443	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R444	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R445	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R446	RS 0,5W200 OHM+-10%10X10X CERMET POTENTIOMETER T BOURNS 3386F-1-201	RS 087.7554	
R447	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R448	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R449	RS 0,5W500 OHM+-10%10X10X CERMET POTENTIOMETER T BOURNS 3386F-1-501	RS 247.7878	
R450	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R451	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R452	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R453	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D	RL 083.0926	
U201	BO LM1596 MOD/DEMOM MODULATOR/DEMOMULATOR NSC LM1596H	BO 417.0419	
V1	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	
V2	AK BFY90 NPN 15V >1GHZ TRANSISTOR VALVO BFY90	AK 010.4550	
V3	AK BFY90 NPN 15V >1GHZ TRANSISTOR VALVO BFY90	AK 010.4550	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V4	AE 5082-2800 SCHOTTKYDI DIODE	AE 012.9066	
V5	HEWLETT-P. 5082-2800 AE BB405B 11/ 2PF CDI TUNING DIODE VALVO BB405B	AE 596.6839	
BIS/TO V8			
V10	AK BFT66 NPN 15V >3GHZ TRANSISTOR SIEMENS BFT66	AK 252.5728	
V12	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V20	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V21	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V26	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V27	AE BZX79/C6V8 0,5W Z-DI ZENER DIODE VALVO BZX79/C6V8	AE 012.2478	
V29	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V34	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V101	AE 5082-2800 SCHOTTKYDI DIODE	AE 012.9066	
V102	HEWLETT-P. 5082-2800 AE 5082-2800 SCHOTTKYDI DIODE	AE 012.9066	
V103	HEWLETT-P. 5082-2800 AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V104	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V106	AE 5082-2800 SCHOTTKYDI DIODE	AE 012.9066	
V200	HEWLETT-P. 5082-2800 AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V201	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V202	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	



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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
V203	AK BFY90 NPN 15V >16HZ TRANSISTOR VALVO BFY90	AK 010.4550	
V204	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	
V205	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V206	AK BFW16A NPN 40V >16HZ TRANSISTOR VALVO BFW16A	AK 010.4644	
V207	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	
V208	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V209	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V210	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V211	AK BFX34 NPN 60V5000MA TRANSISTOR SGS BFX34	AK 010.5486	
V212	AE BZX79/C5V6 0,5W Z-DI ZENER DIODE VALVO BZX79/C5V6	AE 012.2455	
V213	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
V214	AK 2N2905A PNP 60V 600MA TRANSISTOR VALVO 2N2905A	AK 010.3919	
V215	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
V216	AK 2N2905A PNP 60V 600MA TRANSISTOR VALVO 2N2905A	AK 010.3919	
V217	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
V218	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V219	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V220	AK BFX34 NPN 60V5000MA TRANSISTOR SGS BFX34	AK 010.5486	
V221	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	

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V222	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V225	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
V301	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V302	AM 2N4416SELNKAN 30V FET FET AMELCO ATS213 AUSGESUCHT	218.8857	
V303	AE BB405B 11/ 2PF CDI TUNING DIODE VALVO BB405B	AE 596.6839	
V304	AE BB405B 11/ 2PF CDI TUNING DIODE VALVO BB405B	AE 596.6839	
V305	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V308	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V309	AE 5082-2800 SCHOTTKYDI DIODE HEWLETT-P. 5082-2800	AE 012.9066	
V310	AK BCY79IX PNP 45V 200MA TRANSISTOR SIEMENS BCY79IX	AK 010.3777	
V311	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V320	AM 2N4416SELNKAN 30V FET FET AMELCO ATS213 AUSGESUCHT	218.8857	
V321	AM 2N4416SELNKAN 30V FET FET AMELCO ATS213 AUSGESUCHT	218.8857	
V322	AE BB405B 11/ 2PF CDI TUNING DIODE VALVO BB405B	AE 596.6839	
V323	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V324	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V325	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V326	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	
V327	AD 1N4448 75V 0,15A UDI DIODE VALVO 1N4448	AD 012.0700	


ROHDE & SCHWARZ

ÄZ

 Datum
Date

09

0386

 Schalteilliste für
Parts list for
EE DEMODULATOR

 Sachnummer
Stock No.

651.8833.01 SA

 Blatt
Page

35

 Kennzeichen
Component No.

 Benennung/Beschreibung
Designation

 Sachnummer
Stock No.

 enthalten in
contained in

W1

DX KABEL

651.8962

X5

 FP STECKERL.INDIR.64POLIG
64-PIN INSERT
PANDUIT 100-064-033/999

FP 084.6470

X6

 FP INDIREKT.STECKERL.36P.
PIN CONNECTOR
BERG 75160-102-36
3-POLIG

FP 242.3600

X7

 FP INDIREKT.STECKERL.36P.
PIN CONNECTOR
BERG 75160-102-36
3-POLIG

FP 242.3600

X8

 FP INDIREKT.STECKERL.36P.
PIN CONNECTOR
BERG 75160-102-36
3-POLIG

FP 242.3600

X9

 FP INDIREKT.STECKERL.36P.
PIN CONNECTOR
BERG 75160-102-36
3-POLIG

FP 242.3600

X56

 FJ EINBAUSTECKER SYST.SMB
FIXED CONNECTOR
ROSENBERG 59S601-200D2

FJ 063.5116

X61

 FP KURZSCHL.BUCHSE OFFEN
SHORTING PLUG
BERG 76264-101

FP 342.1895

X71

 FP KURZSCHL.BUCHSE OFFEN
SHORTING PLUG
BERG 76264-101

FP 342.1895

X81

 FP KURZSCHL.BUCHSE OFFEN
SHORTING PLUG
BERG 76264-101

FP 342.1895

X91

 FP KURZSCHL.BUCHSE OFFEN
SHORTING PLUG
BERG 76264-101

FP 342.1895

X571

 FJ EINBAUSTECKER SYST.SMB
FIXED CONNECTOR
ROSENBERG 59S601-200D2

FJ 063.5116

X572

 FJ EINBAUSTECKER SYST.SMB
FIXED CONNECTOR
ROSENBERG 59S601-200D2

FJ 063.5116

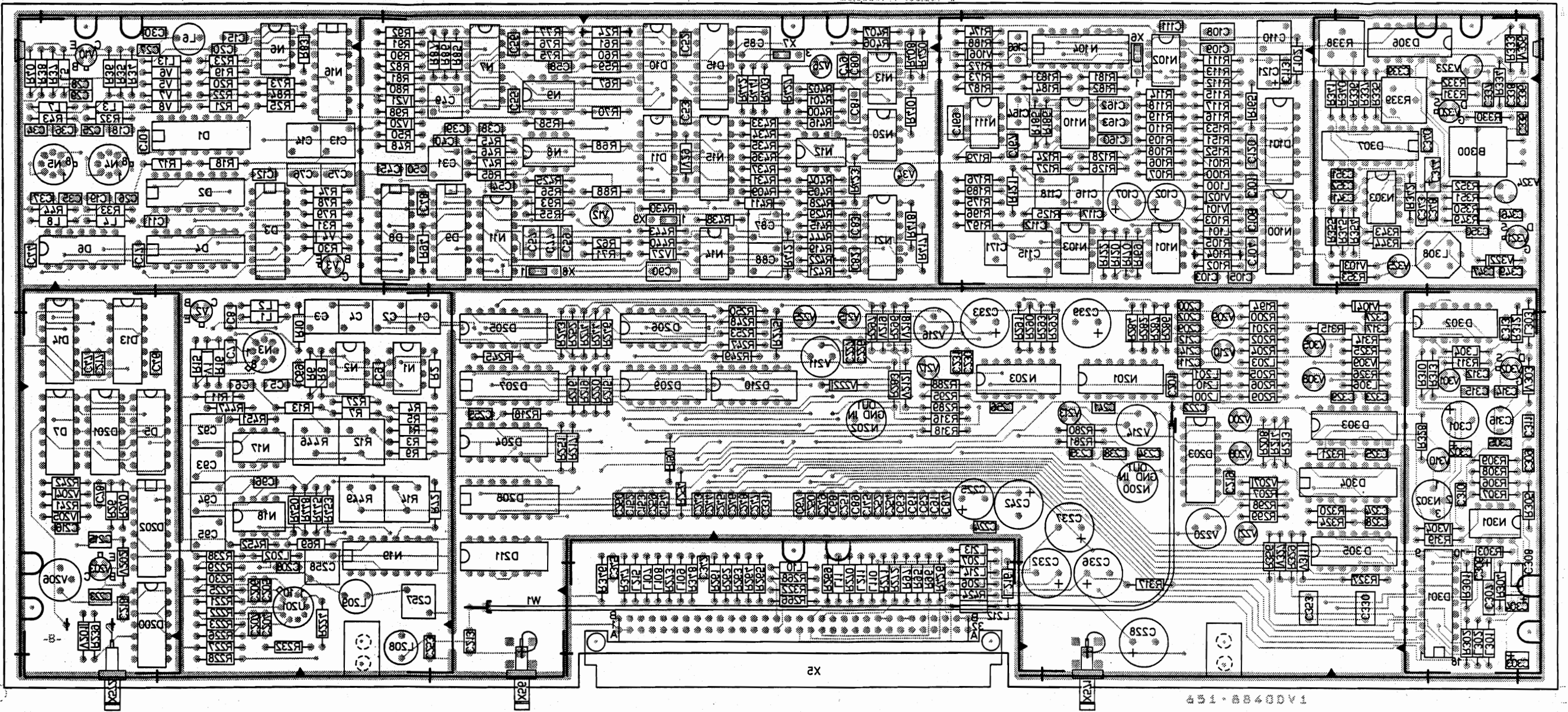
- ENDE -

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uns alle Rechte vor

5

7

Ansicht und Leitungsführung Lötseite
View of tracks on solder side



Variantenerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST

D	03.86	BM	Maße ohne Toleranzangabe		Maßstab 1 : 1	
					Halbzeug, Werkstoff	
			6KBE	Tag	Name	Benennung Demodulator
			Bearb.	03.86	BM	
			Gepr.			
			Norm			
						Z
			 ROHDE & SCHWARZ		Zeichn.-Nr.	Blatt-Nr.
					651.8833	01
Änd. Zust.	Änderungs-Mitteilung	Tag	Name	reg. i. V. 651.8810 V erste Z. 651.8810.01		
				zu Gerät GM 085 P1		
				v. Bl.		

Repair Manual
SYNTHESIZER
GF 852P1

646.1511

S Y N T H E S I Z E R
G F 8 5 2 P 1

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Circuit Diagram 646.1511S

Parts List 646.1511.01SA

Parts List 646.1528.01SA

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5. Description of Function

See circuit diagram 646.1511S, p. 1-3

5.1 Phase-locked Loop 1

The Synthesizer GF 852P1 works on the analysis principle with two phase-locked loops (PLLs). The first PLL serves for generating the frequency increments of 10 Hz, 100 Hz, 1 kHz and 10 kHz. This circuit includes VCO 1, which works in the frequency range 127.2012 through 139.2000 MHz. This high frequency range ensures a large control bandwidth within the loop short times for changing frequency. VCO 1 is made up essentially of transistor V11, coil L4, capacitors C11 through C14 and varicap diodes V1 and V2. The OR-NOR gates D1 and D2 that follow VCO 1 serve for buffering and reverse isolation between VCO 1 and the 120/121:1 prescaler D4 and D7. The flipflops included in these dividers produce interfering frequencies, which are suppressed by the digital buffer amplifiers D1 and D2 to prevent residual modulation of VCO 1. The 4-bit PLL synthesizer D8 is the actual programmable frequency divider of PLL 1. This receives the divided frequency of VCO 1 via pin 3. According to the frequency set on the control unit, the A and N dividers in synthesizer D8 are set by the processor of the HF transceiver so that the frequency of VCO 1 is divided to the reference frequency of 1.2 kHz. In this that A divider serves as an auxiliary divider, performing the setting of the switch-selected prescaler D4 and D7 (120/121:1) via NAND gate D5. The reference frequency 1.2 kHz of PLL 1 just produces the smallest frequency increment of 10 Hz with the prescaler factor of 120. Because the division ratio can be switched from 120 to 121 therefore, the loop can be controlled in 10-Hz increments.

The division factor of the N divider is in the range 833 through 966 and that of the A divider between 3 and 122. The frequency of VCO 1 is governed by the following relationship:

$$f_{VCO\ 1} = N \cdot 1.2\ \text{kHz} \cdot 120 + A \cdot 1.2\ \text{kHz}$$

If VCO 1 is to work on a frequency of 139.2000 MHz for instance, the N divider will divide by 966 and the A divider by 80. These division factors are governed by the following relationship:

$$M = \frac{f_{VCO\ 1}}{f_R} = \frac{139200\ \text{MHz}}{1.2\ \text{kHz}}$$

$$M = 116000$$

$$\frac{M}{D4, D6} = \frac{116000}{120}$$

$$= 966.667 \rightarrow N = 966$$

$$N \cdot f_R \cdot 120 = 966 \cdot 1.2\ \text{kHz} \cdot 120$$

$$= 139104\ \text{kHz}$$

$$f_{VCO1} - 139104\ \text{kHz} = 96\ \text{kHz}$$

$$A = \frac{96\ \text{kHz}}{f_R} = \frac{96\ \text{kHz}}{1.2\ \text{kHz}} = 80$$

In the phase discriminator of the synthesizer D8 a comparison is made between the frequency of VCO 1 divided down to 1.2 kHz and crystal-controlled 1.2-kHz frequency. For this purpose the frequency of the OCXO B1, divided down to 1.8 MHz, is divided by 1500 in the R divider of synthesizer D8 and fed to the internal phase discriminator. A difference in phase between the

(Continuation)---

---(Continuation) Phase-locked Loop 1

1.2-kHz frequencies will produce a control voltage for the varicap diodes V1 and V2, which is applied to integrator N9. Integrator means here that operational amplifier N9 exhibits very high gain at a frequency of 0 Hz. The result is that a high level appears at its output and that the operating point at the output of the phase discriminator does not alter over the frequency range. The following active low-pass filter with operational amplifier N10 serves for suppressing the reference frequency of 1.2 kHz and thus prevents modulation of VCO 1 by the residual FM.

5.2 Standard-frequency
Generation

The OCXO B1 is a temperature-stabilized crystal oscillator that resonates at a frequency of 79.200 MHz. This frequency as well as the frequencies that are derived from it serve as a reference source for other modules of the HF transceiver and as mixing and reference frequencies for PLL 1. The stability of temperature is produced by a built-in oven working with its own control circuit.

The frequency of VCO 1 in the range 127.2012 through 139.2000 MHz that is fed to the dividers D3 and D6 is divided by 120 and applied via a selective amplifier stage, made up of transistor V3, to mixer U1. Here it is mixed with the frequency of 79.2 MHz of the OCXO. The resulting, lower difference frequency of 78040 to 78139.99 kHz is fed via crystal filter Z1, with a bandwidth of 100 kHz, to mixer U2. Mixing with the frequency of VCO 2 in the range 80.64 to 110.63999 MHz produces the input frequency for PLL 2 between 2.6 and 32.5 MHz.

The frequency of 79.2 MHz of the OCXO serves as a reference source for the

Tx/Rx section and the FSK modem. The RF level necessary for these modules is produced by the two amplifiers V5 and V6.

In divider D10 the frequency of the OCXO is divided by 11 and applied via NAND gate D22 to the modem and ISB modem as well as to divider D9.

Divider D9 produces the frequency of 1.8 MHz for PLL 1 and the frequency of 900 kHz for generating a test spectrum. This 900-kHz line spectrum with a bandwidth of 30 MHz serves as a simulated antenna signal and is fed to the Tx/Rx section and the filter via connectors X28 and X29 respectively. When a test is triggered on the control unit of the HF transceiver, strobe 9 on connector X21.a5 is activated and transistor V9 is turned off by way of the quad latch D11 and the following logic formed with D25 and D26. Transistor V19 then conducts and the 900 kHz is applied to the delay-line circuit D13, which generated very narrow pulses from which the line spectrum is derived.

In a normal operating situation transistor V9 will be turned on, meaning that there is no generation of the line spectrum with its high interference component.

For producing even greater frequency accuracy of synchronization of the OCXO, there is a control loop that cuts in automatically when a frequency standard is connected. The control loop consists of two frequency dividers with phase discriminator D23 and control amplifier N7.1, which delivers the control voltage for the OCXO. The two frequency dividers divide the frequencies applied to them to 50 kHz. If the level of the external 5-MHz frequency on connector X26 is in the range 0.1 to 0.5 V_{rms}, comparator N7.7 will turn on transistor V36 and the

(Continuation)---

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Part 5: Description of Function

- 5.3 -

---(Continuation) Standard-frequency Generation

control loop is thus made. If a voltage is outside of this range, the control loop will not function and the OCXO oscillates at the set frequency.

When the synthesizer has been turned on, the OCXO will oscillate a few hundred Hz off the nominal frequency because the operating temperature will not have been reached. This turn-on criterion is detected by measuring the heater current with resistor R36. After approx. 1 min the heater current reduces from 0.7 A to the operating volume of 0.2 A. The output of the operational amplifier N3.7 is then High and there is an H level on connector X21.a3 as a continuous-monitoring signal for the processor of the HF transceiver.

5.3 Phase-locked Loop 2

The input frequencies of PLL 2 are in the range 2.6 to 32.5 MHz. A low-pass filter rejects the interfering mixture products from mixer U2. The two-stage amplifier V40 and V41 is followed by line receiver D19, which boosts the RF voltage to ECL levels. The switch-selected prescaler D18 divides the RF signal by 5 or 6, depending on the presetting given by synthesizer D20. The divided RF signal is applied via pin 3 to synthesizer D20, which includes the N and A dividers for controlling prescaler D18. The division factor of the N divider is between 9 and 64 and that of the A divider between 3 and 7. The way in which synthesizer D20 functions is identical to that of synthesizer D8 in PLL 1. Synthesizer D20 also handles the reference division and phase comparison. The frequency of 1.8 MHz produced in divider D9 is used for the reference division. The frequency range of 2.6 through 32.5 MHz is relatively large, so it is necessary to switch

the R divider in synthesizer D20. The reference frequency is either 50 kHz or 100 kHz.

If there is a phase difference, a control voltage is produced in the phase discriminator of synthesizer D20 and applied to integrator N4 (see also what is said about integrator N9 in PLL 1). The gain of the following operational amplifier N4 is switched as a function of the frequency with the analog switch D17. The Caer low-pass filter L50 and C175 through C178 serves for rejecting the reference frequency. The conditioned control voltage drives varicap diode V26 in VCO 2.

VCO 2 works in the range 80.64 through 110.63999 MHz and can be preset in increments of 1 MHz. Capacitances are connected in parallel with the oscillator circuit - L33, C116, C114 and V26 - of VCO 2, these being switched by PIN diodes V20 through V25. The PIN diodes are driven by transistors V42 through V47, which in turn receive their drive voltages from the two D latches D16 and D17.

The frequency of VCO 2 is applied via the two-stage amplifier V33 and V34, a low-pass filter and connector X24 to the Tx/Rx section. At the output of amplifier V33 part of the RF signal is coupled out, amplified by transistor V35 and fed to mixer U2.

5.4 Data Organization

The setting of Synthesizer GF 852P1 is made by the processor of the HF transceiver on four data lines, four address lines and the strobe lines 1 and 2. The memories in synthesizers D8 and D20 are driven on the address lines A0 through A3, and the division factors for the A, N and R dividers are entered on the data lines. Selec-

(Continuation)---

---(Continuation) Data Organization

tion is necessary when sending the data for the two synthesizers D8 and D20 to show whether they are intended for PLL 1 or PLL 2.

For this purpose the signal strobe 1 is sent in addition. Signals A3 and ST1 are gated in AND gate D21.7. If both lines are High, the data are for PLL 1, if A3 is Low and ST1 is High, they are intended for PLL 2.

When PLL 1 is locked in, synthesizer D8 sends a pulse sequence via pin 13 to the AND gate D21.9. This pulse sequence is detected in the dual monoflop D12. The first monoflop serves as a window, rejecting pulses up to a certain width. From a certain width onwards, however, the pulses are conditioned into a Low signal.

The second monoflop D12.9 serves for delay of the BITE (CM) signal on connector X21.a1. A continuous no-go message of the synthesizer in scan operation is prevented by logic interconnection with the NAND gate D26.6. When PLL 1 is locked in, the BITE (continuous monitoring) line on connector X21.a1 is High.

The frequency information for the presetting of VCO 2 also comes via the address and data lines with D latches D15 and D16. Here selection is made with the signal strobe 2 on connector X21.a4.

5.5 Power Supply

The supply voltages +14 V, +5.2 V and +5 V are shortcircuit-proof. In the case of the voltage of +14 V the somewhat unusual circuitry of voltage regulator N1 produces a difference of only 1 V between high-end and low-end voltage. Operational amplifier N3 together with resistor R2 serves for current monitoring.

This control circuit has a foldback feature, i.e. regulator N1 does not disconnect the output voltage completely when there is a short, instead a shortcircuit current flows so that transistor V15 is not thermally overloaded.

The regulated output voltages can be set with R4 and R5.

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Part 6: Repair

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6. Repair

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

6.1 Preliminary Remarks

The repair of the Synthesizer GF 852P1 consists of troubleshooting and fault elimination, of measurements, alignments and functional checks, of replacing assemblies and components as well as of a final test.

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

For all alignment work and measurements the synthesizer has to be supplied with the operating voltages stated in the circuit diagram.

All RF measurements on this module have to be performed with its covers screwed down in place; if necessary, a special test cover has to be produced for this purpose.

With RF measurements ensure that cables and connections are of the right characteristic impedance and that the connecting leads are as short as possible.

Among the components incorporated in the Synthesizer GF 852P1 there are MOS, MOSFET and CMOS devices. Devices of this kind are extremely sensitive to high extraneous voltages. Static discharge can produce very large voltage spikes, which are capable of destroying such devices.

For this reason, when work is being carried out in the vicinity of these devices, i.e. unless a special CMOS work station is available, the following minimum requirements should be observed:

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

6.1.1 Troubleshooting Instructions

Any fault that occurs should be localized with the aid of the troubleshooting flowcharts given in 6.3..

6.1.2 Restoring Nominal Characteristics

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

(Continuation)---

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---(Continuation) Restoring Nominal Characteristics

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

Once components have been replaced, it is absolutely essential that the final test of the synthesizer be performed as detailed in chapter 6.6.

6.1.3 Spare Parts

All components and assemblies are subjected to strict quality control before they are incorporated in the Synthesizer GF 852P1.

For components from outside suppliers, e.g. for resistors, capacitors, diodes, transistors and integrated through to densely integrated circuits, R&S has set down its own delivery specifications for the purpose of ensuring maximum reliability. For this reason we recommend that only original spare parts be used, if possible, when replacing defective components.

When ordering a spare part, please state the following:

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

All of these details are to be found in the circuit diagram, parts list and component layout attached to this manual.

6.1.4 Important User Information

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

- All voltage measurements are referred to ground, if not stated otherwise

- Abbreviations in the text, such as ST1.2, BU3.5a and B6.7 are to be understood as follows:

Plug 1 - Pin 2

Socket 3 - Pin 5a

Integrated Circuit 6 - Pin 7

- Every component mentioned is contained in Circuit Diagram 646.8016S. There are therefore no special references to this circuit diagram in the text.

6.2 Test Equipment

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

Equivalent items of test equipment may be used, provided that their technical data are as good as or better than those stated.

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6.2.1 Test Equipment List

Item no.	Test equipment, required technical data	Recommended R&S test equipment	Ordering code
1	Digital multimeter	UDL 33	388.8011.02
2	Polyscope 0...40 MHz with log. amplifier demodulator	SWOB 5 SWOB 5 E3 SWOB 5 Z1	333.0019.53 349.3512.02 333.7513.52
3	2 dual power supplies 0 to 15 V/1 A	NGMD 35	117.7127.02
4	Signal generator 0 to 150 MHz, 1 V _{rms} into 50 ohms, noise referred to 1 Hz bandwidth at 10 kHz from carrier < -140 dBc	SMPC	300.1000.55
5	Cauer or Chebyshev low-pass filter, f _c = 20 kHz		
6	AF analyzer, 5 Hz to 2/20 kHz, V _{test} 1 μV to 30 V, 8 = 120 Hz		
7	4 diode ring mixers, 50 to 200 MHz, 50-ohm version for oscillator level approx. +7 dBm		
8	Attenuator 10 dB/50 ohms	DPSP	334.6010.02
9	AF millivoltmeter with RF insertion unit 50 ohms and termination 50 ohms	URV 4 URV-Z2 RNA	292.5012.03 288.8010.55 272.4510.50
10	Frequency counter 0 to 150 MHz, V _{in} 0.1 to 5 V, Z _{in} 50 ohms, $\Delta f/f \leq 2 \times 10^{-9}$		
11	Spectrum analyzer, 0.1 to 100 MHz, sensitivity > -80 dBm, level-indication range 80 dB		
12	Frequency standard f = 5 MHz, 0.1 V _{rms} < V _{in} < 0.5 V _{rms} , $ \Delta f/f \leq 2 \times 10^{-9}$ Battery power supply	XSD 2 XSRM-Z	283.6010.02 237.8013.02
13	Service kit	KA 852C1	648.8513.02

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6.3 Troubleshooting Flowcharts

6.3.1 General

The following troubleshooting flowcharts (Fig. 6.1 through 6.4) cover troubleshooting and fault elimination on the Synthesizer GF 852P1.

For easy troubleshooting there are,

where necessary, cross-references to other measurements and procedures involved in repair. The given sequence for the troubleshooting should be kept to so that faults can be detected and remedied as speedily and rationally as possible.

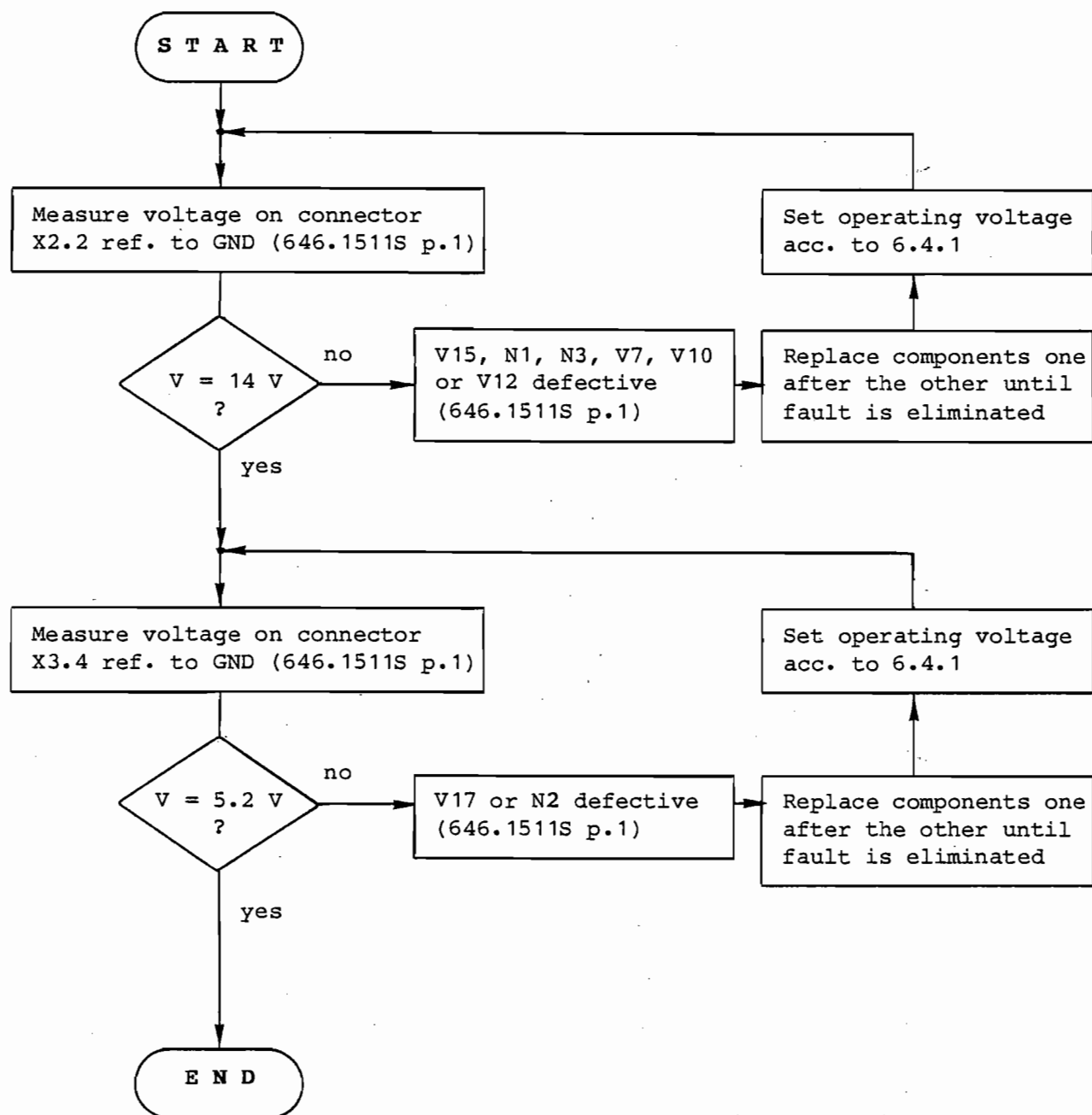


Fig. 6.1 Troubleshooting Flowchart, Operating-voltage Generation

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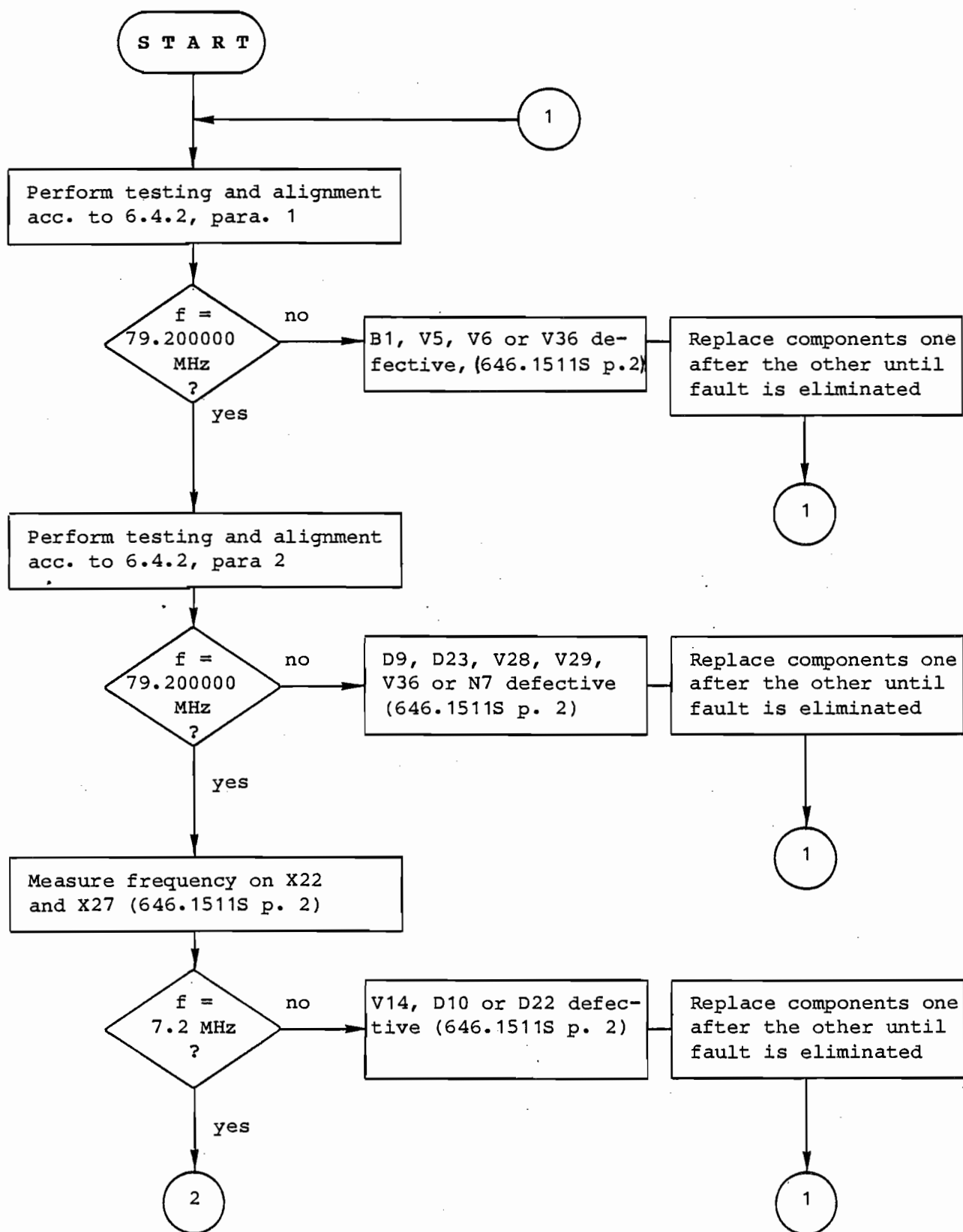


Fig. 6.2 Troubleshooting Flowchart, 79.2-MHz Oscillator (page 1 of 2)

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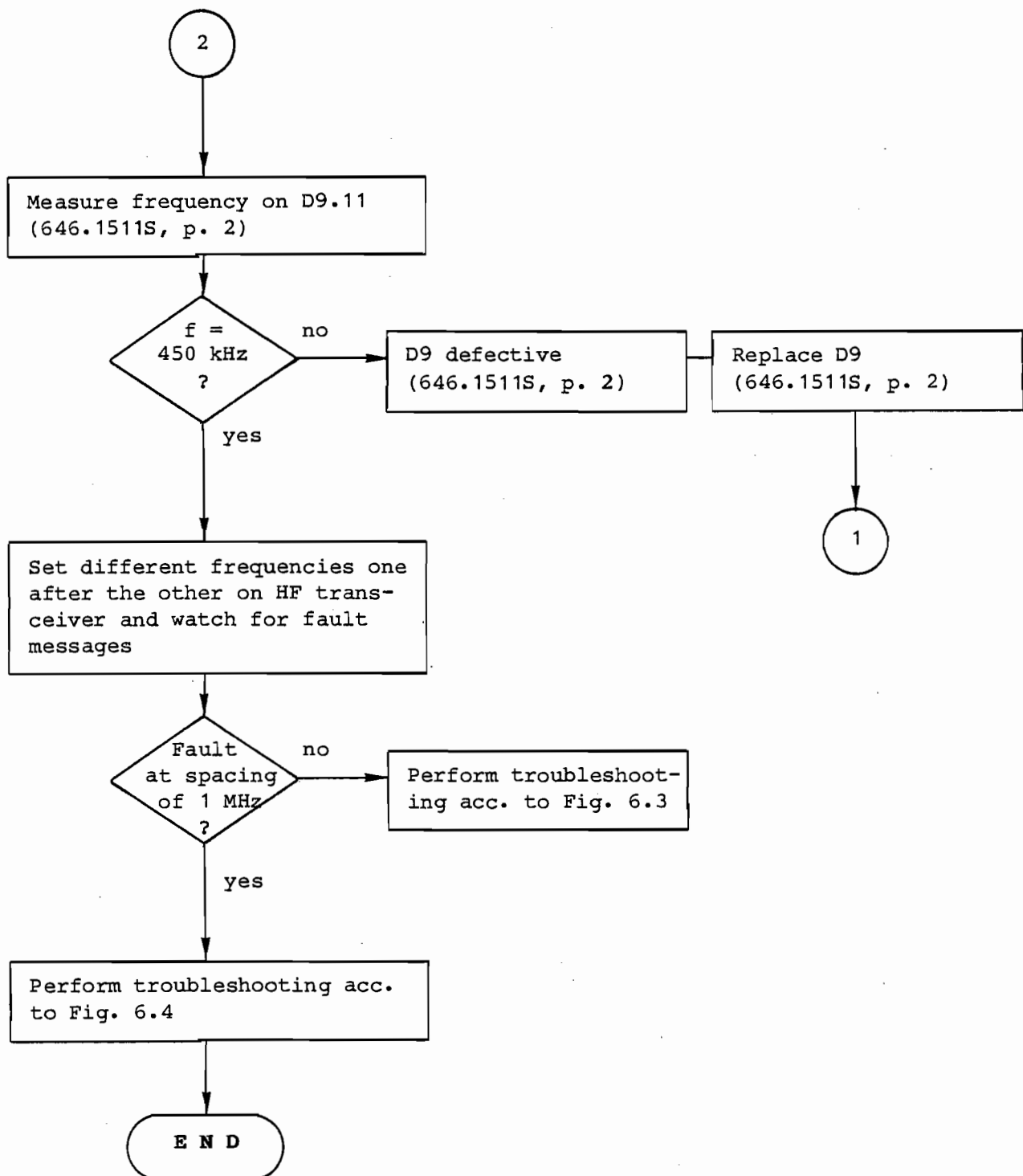


Fig. 6.2 Troubleshooting Flowchart, 79.2-MHz Oscillator (page 2 of 2)

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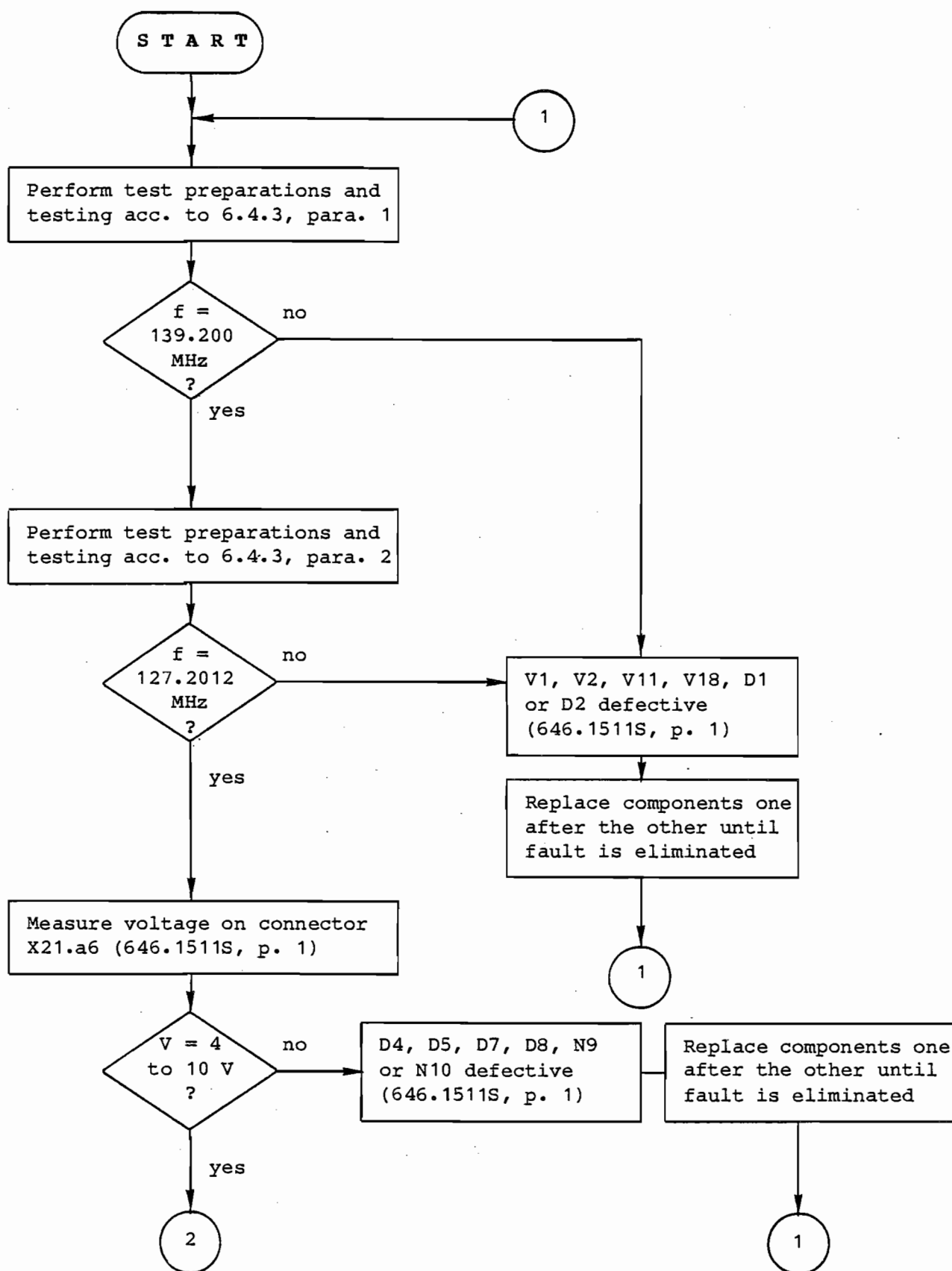


Fig. 6.3 Troubleshooting Flowchart, VCO 1 (page 1 of 2)

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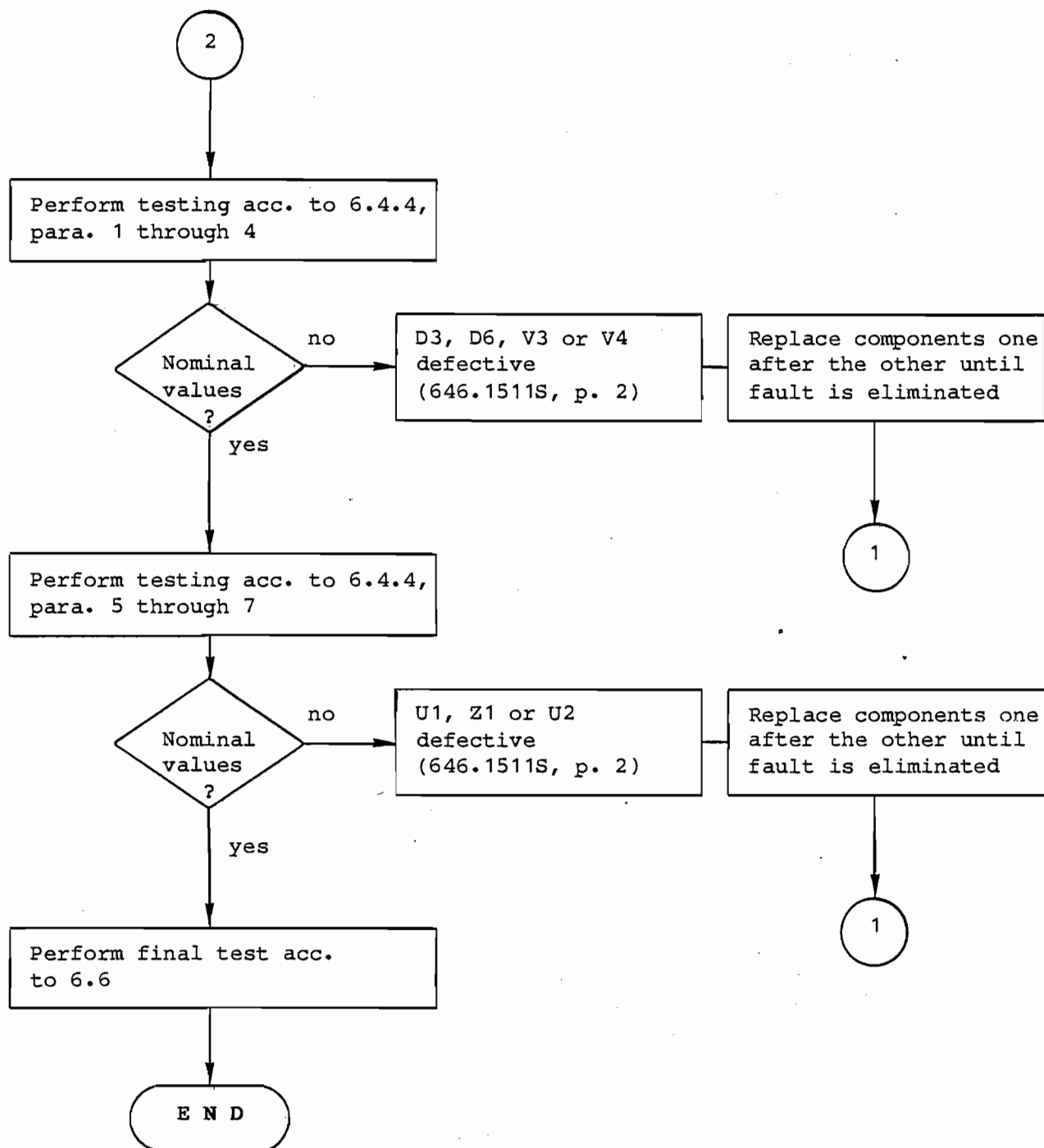


Fig. 6.3 Troubleshooting Flowchart, VCO 1 (page 2 of 2)

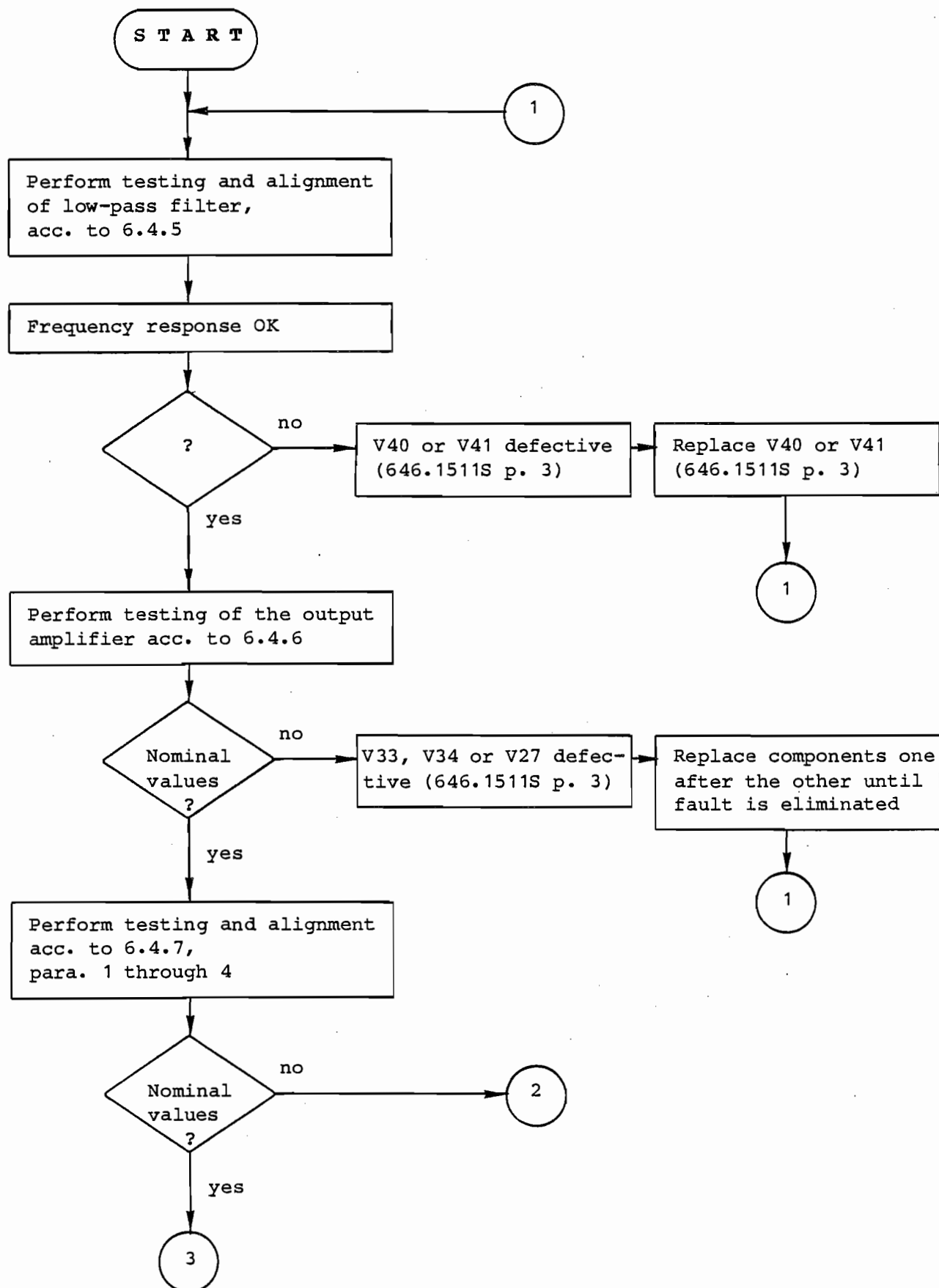


Fig. 6.4 Troubleshooting Flowchart, VCO 2 (page 1 of 3)

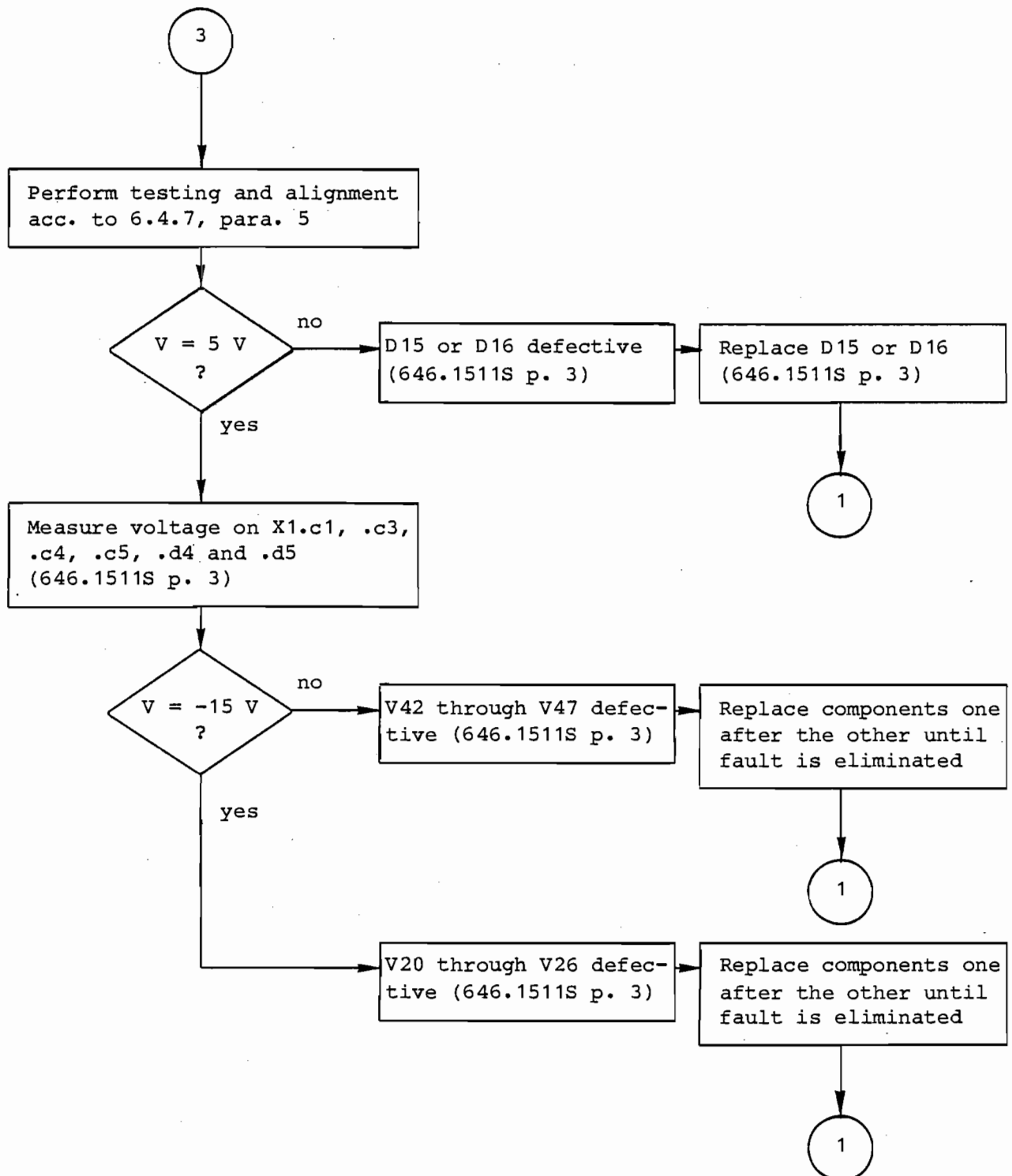
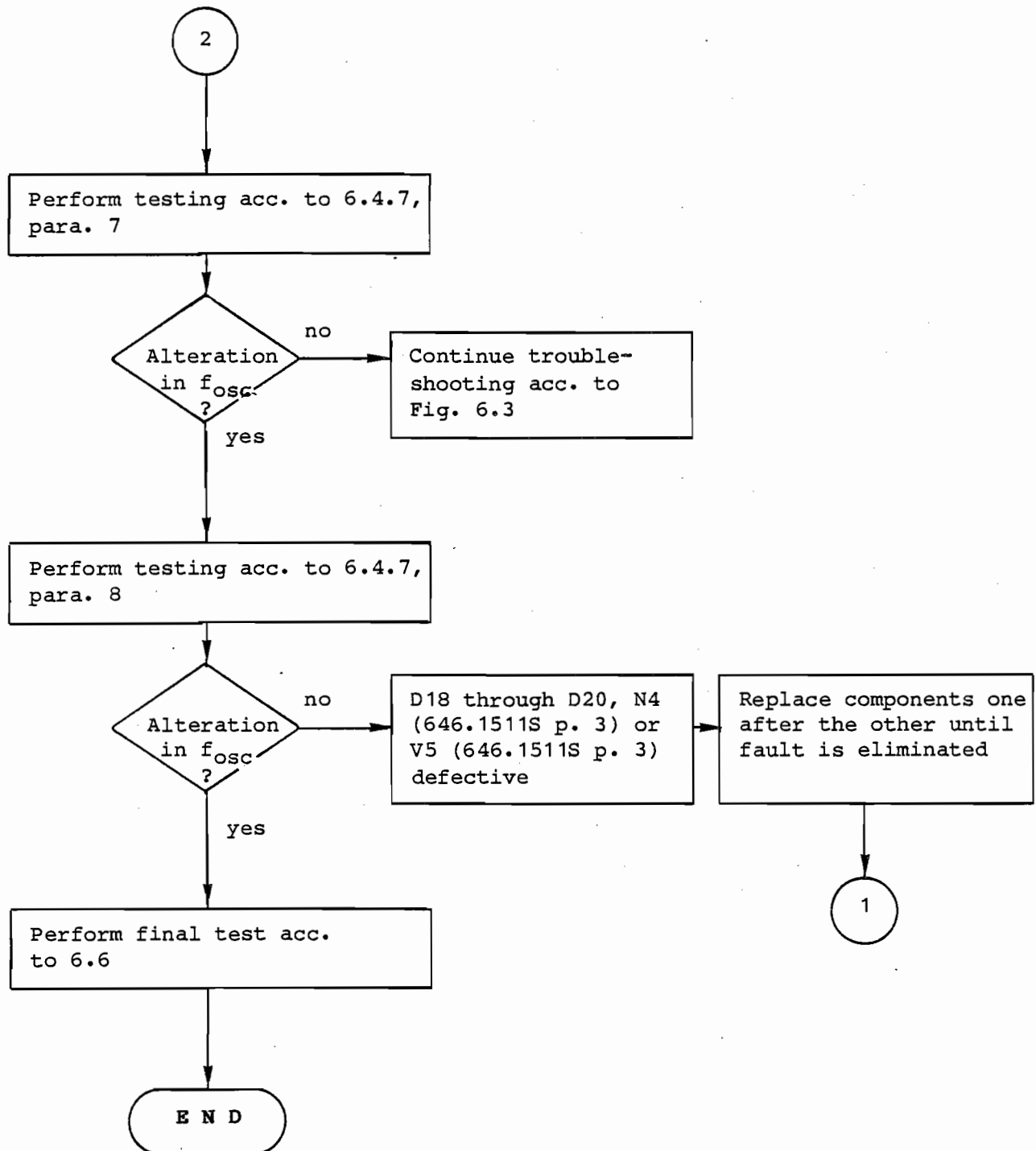


Fig. 6.4 Troubleshooting Flowchart, VCO 2 (page 2 of 3)



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6.4 Measurements, Alignments and Functional Checks

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

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

For all of these measurements and tests it is assumed that the Synthesizer GF 852P1 is properly adapted to an HF transceiver. When opening the synthesizer, refer to 6.5.

6.4.1 Setting of Operating Voltages

If any of the components involved in the generation of the operating voltages have been replaced, the operating voltages will have to be reset:

+0.0
+14 VDC on connector X2.2
-0.1 V

with potentiometer R4

+0.0
+5.2 VDC on connector X3.4
-0.1 V

with potentiometer R5

6.4.2 Testing and Alignment of 79.2-MHz Oscillator

1. Measure frequency on connector X23. Using potentiometer R112 align to nominal frequency:

79.2000000 MHz ± 3 Hz

2. Connect frequency standard of 5 MHz to connector X26. Measure frequency on connector X23.

Nominal value

79.2000000 MHz

6.4.3 Testing of VCO 1

1. Withdraw connector jumper X4. Apply +8.5 VDC ref. to GND to connector X14.15. Measure frequency on connector X5.6 and X8.9.

Nominal value:

139.200 MHz

2. Apply +6.5 VDC to connector X14.15. Measure frequency on connector X5.6 and X8.9.

Nominal value:

127.2012 MHz

3. Alignment of VCO 1 is necessary after any components have been replaced. Carry out test preparations acc. to 6.4.3, para. 1 and set f to 139.200 MHz on connector X5.6 with coil L4.

4. Replace connector jumper X14.

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- 6.14 -

6.4.4 Testing of 79.2-MHz Mixer Stage

1. Withdraw connector jumper X11.
2. Measure voltage on U1.8 with RF probe.

Nominal value:

approx. 440 mV_{rms}

3. Replace connector jumper X11.
4. Measure voltage on X11.11 with RF probe.

Nominal value:

approx. 250 mV_{rms}

5. Withdraw connector jumper X36.
6. Measure voltage on X36.37 with RF probe.

Nominal value:

50 mV_{rms} into 50 ohms

7. Replace connector jumper X36.

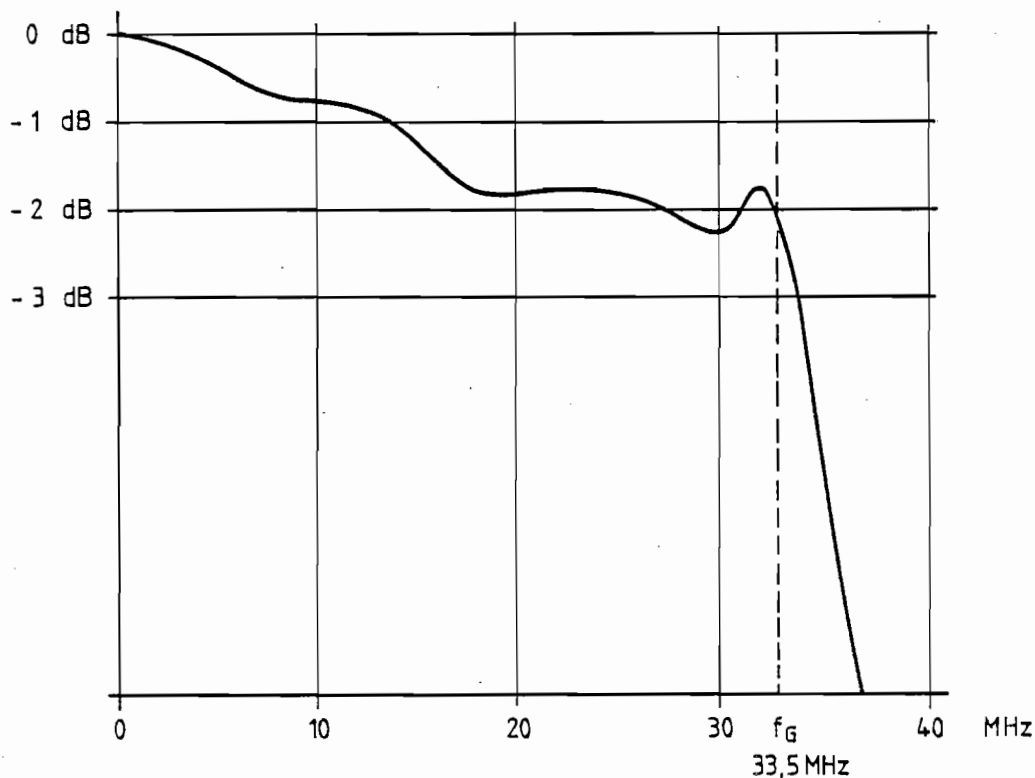
6.4.5 Testing and Alignment of Low-pass Filter

1. Withdraw connector jumper X36 and create test setup acc. to Fig. 6.5.

2. Set SWOB 5: output level 0 dB (0.5 V), frequency range 0.1 to 40 MHz.

3. Align for following frequency response with L45, L46 and L47.

4. After testing and alignment, replace connector jumper X36.



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6.4.6 Testing of Output Amplifier

Connect insertion unit terminated with 50 ohms to socket X24 and measure voltage.

CAUTION

Nominal value (adjustable with potentiometer R116):

Do not align without cover.

440 +150

-0 mV_{rms}

2. Connect synthesizer to test adapter (user construction, Fig. 6.7) and frequency counter to socket X24.

6.4.7 Testing and Alignment of VCO 2

3. Interrupt connection between X1.d6 and X201.d6.

1. Unscrew cover of VCO 2 and screw on test cover (user construction).

4. Perform following alignment:

A0	A1	A2	A3	D0	D1	Receive frequency	Oscillator frequency	Align with	Feed in on X201.d6
X1									
c3	c4	d5	c5	d4	c1	MHz	MHz		V
1	1	1	1	1	1	29.5	110.14	C116	7.0 ±0.25
0	1	1	1	1	1	28.5	109.14		6.5 ±0.25
1	0	1	1	1	1	27.5	108.14	C100	8.5 ±0.25
1	1	0	1	1	1	25.5	106.14	C101	7.0 ±0.25
1	1	1	0	1	1	22.5	103.14	C104	8.2 ±0.25
1	1	1	1	0	1	15.5	96.14	C106	7.0 ±0.25
1	1	1	1	1	0	6.5	87.14	C108	7.0 ±0.25

Enter data with strobe 2.

1 ≙ switch open,

0 ≙ switch closed.

5. On test adapter set A0 through A3 = 1 and D0, D1 = 1. Measure voltages ref. to GND on D15.1, .2, .10, .11 and D16.10, .2.

8. Alter frequency setting on HF transceiver in increments of greater than 100 kHz. Check with frequency counter whether oscillator frequency alters.

6. Adapt synthesizer to HF transceiver and connect frequency counter to socket X24.

6.5 Replacement of Components

7. Alter frequency setting on HF transceiver in increments of less than 100 kHz. Check with frequency counter whether oscillator frequency alters.

Before replacing any components open the synthesizer as follows:

1. Remove top cover after undoing ten screws.

(Continuation)---

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- 6.16 -

---(Continuation) Replacement of Components

2. Remove bottom cover after undoing ten screws.

Components are to be replaced following usual workshop procedure. No special instructions are required for this.

After replacing components continue with the troubleshooting acc. to Fig. 6.1 through 6.4.

6.6 Final Test of Synthesizer

After a repair has carried out, the Synthesizer GF 852P1 must be subjected to the following final test to ensure that its technical data can still be guaranteed.

6.6.1 Testing of 79.2-MHz Outputs

Connect the RF voltmeter with a terminated insertion unit (50 ohms) to connector X23 and X25 in turn and measure the voltage.

Nominal values:

X23 400 $\pm$ 180 mV_{rms}
X25 388 $\pm$ 80 mV_{rms}

6.6.2 Testing of 7.2-MHz Outputs

Connect the RF voltmeter with a terminated insertion unit (50 ohms) to connector X27 and X22 in turn and measure the voltage.

Nominal values:

X27 approx. 40 mV_{rms} (= -17 dBm)
X22 approx. 40 mV_{rms} (= -17 dBm)

6.6.3 Noise measurement

1. Install test set-up acc. to Fig. 6.6.
2. Carry out noise measurement at following frequencies:

Oscillator frequency (f_1)	Signal-generator frequency (f_0)
80.640 MHz 110.63999 MHz	80.650 MHz 110.64999 MHz

For analyzer frequency:

$$f_0 - f_1 = 10 \text{ kHz.}$$

At this frequency the analyzer is to be set to -5 dB in the 300-mV range.

The signal-generator frequency is to be increased by 30 kHz and the input divider of the analyzer is to be set to 10 mV. For the noise:

0 dB corr. to 25 dB +10 log B/1 Hz
(B = bandwidth in Hz)

0 dB corr. to 25 +21 dB = 46 dB
at B = 120 Hz

Nominal values:

$f_1 = 80.64 \text{ MHz, } A_N \geq 138 \text{ dBc}$
 $f_1 = 110.63999 \text{ MHz, } a_N \geq 135 \text{ dBc}$

6.6.4 Testing of 900-kHz Line Spectrum

1. Connect analyzer to connector X28 and X29 in turn. Turn on line spectrum by means of test adapter (acc. to Fig. 6.7) with settings:

	A0	A1	A2	A3	D0	D1	D2	D3	ST 9 TEST
X28	X	X	1	0	X	X	X	X	↓
X29	X	X	0	1	X	X	X	X	↓

Measure the liners in the range 900 kHz up to 29.7 MHz.

X28: 0.25 mV_{rms} +2/-7 dB into 50 ohms
with X29: ≤ -63 dBm

X29: 2.5 mV_{rms} +3/-6 dB into 50 ohms
with X28: ≤ -69 dBm

2. Turn off line spectrum with

A0	A1	A2	A3	D0	D1	D2	D3	ST 9 TEST
X	X	0	0	X	X	X	X	↓

and measure the lines with the analyzer.

X28: voltage should be max. 50 dB below 1 mV.

X29: voltage should be max. 40 dB below 1 mV.

6.6.5 Testing of Synthesizer Test Signals

1. BITE (continuous monitoring)

Connect digital voltmeter to test output X21.a1. For synchronization

Nominal value:

approx. 5 V

Without synchronization, e.g. by interrupting jumper in loop 1 or 2

Nominal value:

approx. 0 V

2. Crystal heating (continuous monitoring)

Check test output voltage on connector X21.a3 immediately after switching on supply voltages.

Nominal value:

approx. 0 V

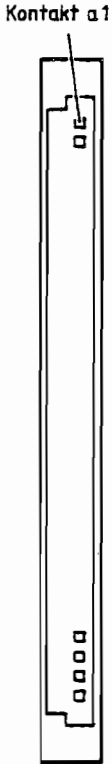
After crystal heating has warmed up for approx. 2 min

Nominal value:

approx. 5 V

If this final test does not prove satisfactory, the testing and troubleshooting acc. to Fig. 6.1 through 6.4 will have to be repeated until all faults have been detected and remedied.

6.7 External Interfaces

External Interfaces		
Connector X21	Pin	Signal designation/level
FP multipoint connector, 32-way 	a1	CM Synth. (TTL)
	a2	V_{reg2}
	a3	CM Thermostat (TTL)
	a4	Strobe 2 (TTL)
	a5	Strobe 9 (TTL)
	a6	V_{reg1}
	a7	☐ Not used
	a8	☐ Not used
	a9	Strobe 1 (TTL)
	a10	0
	a11	1
	a12	2
	a13	3
	a14	4
	a15	5
	a16	6
	a17	7
	a18	☐ Not used
	a19	☐ Not used
	a20	☐ Not used
	a21	☐ Not used
	a22	☐ Not used
	a23	-15 V
	a24	☐ Not used
	a25	☐ Not used
	a26	☐ +7.25 V
	a27	☐ +7.25 V
	a28	☐ +15 V
	a29	☐ +15 V
	a30	0 V
	a31	0 V
	a32	0 V
Connectors X22 through X29		
FJ fixed connector SMB system 	X22	7.2 MHz, approx. 0.7 V (squarewave)
	X23	79.2 MHz, 440 mV _{rms} into 50 ohms
	X24	80.64 to 110.639 MHz, 500 mV _{rms} into 50 ohms
	X25	79.2 MHz, 300 mV _{rms} into 50 ohms
	X26	5 MHz, 100 to 500 mV _{rms} into 50 ohms
	X27	7.2 MHz, approx. 0.7 V (squarewave)
	X28	Test spectrum
	X29	Test spectrum

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- 6.19/6.20 -

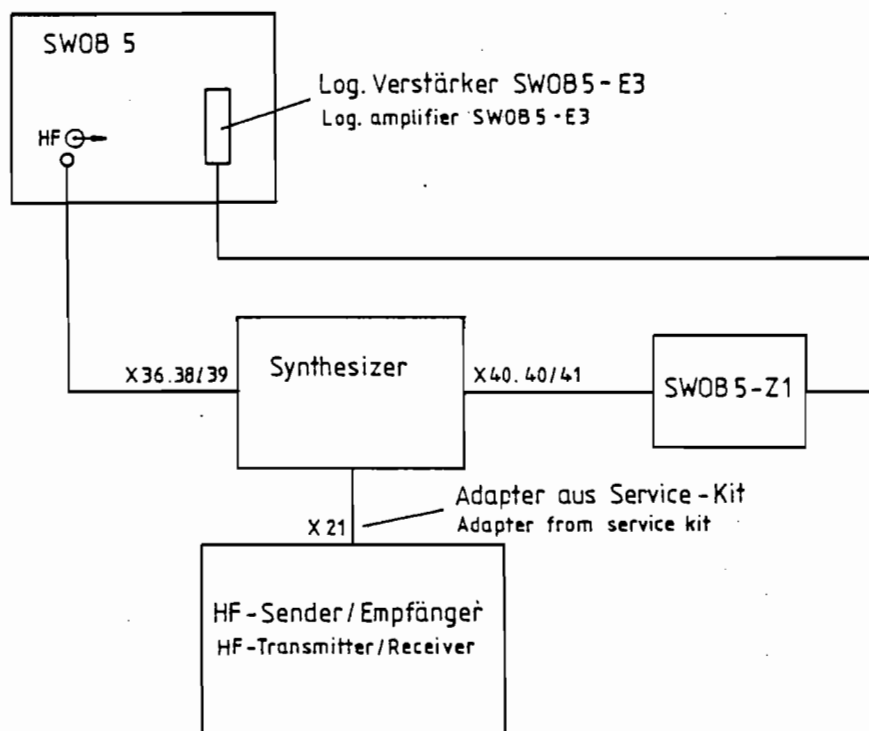


Fig. 6.5 Test Setup for Low-pass Filter

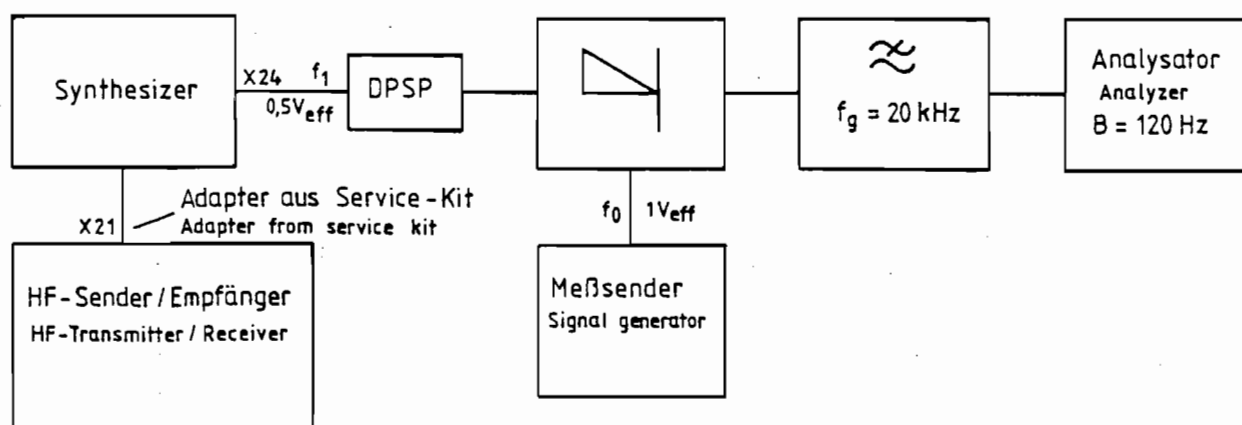


Fig. 6.6 Test Setup for Noise Measurement

S Y N T H E S I Z E R
G F 8 5 2 P 1

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- 6.21/6.22 -

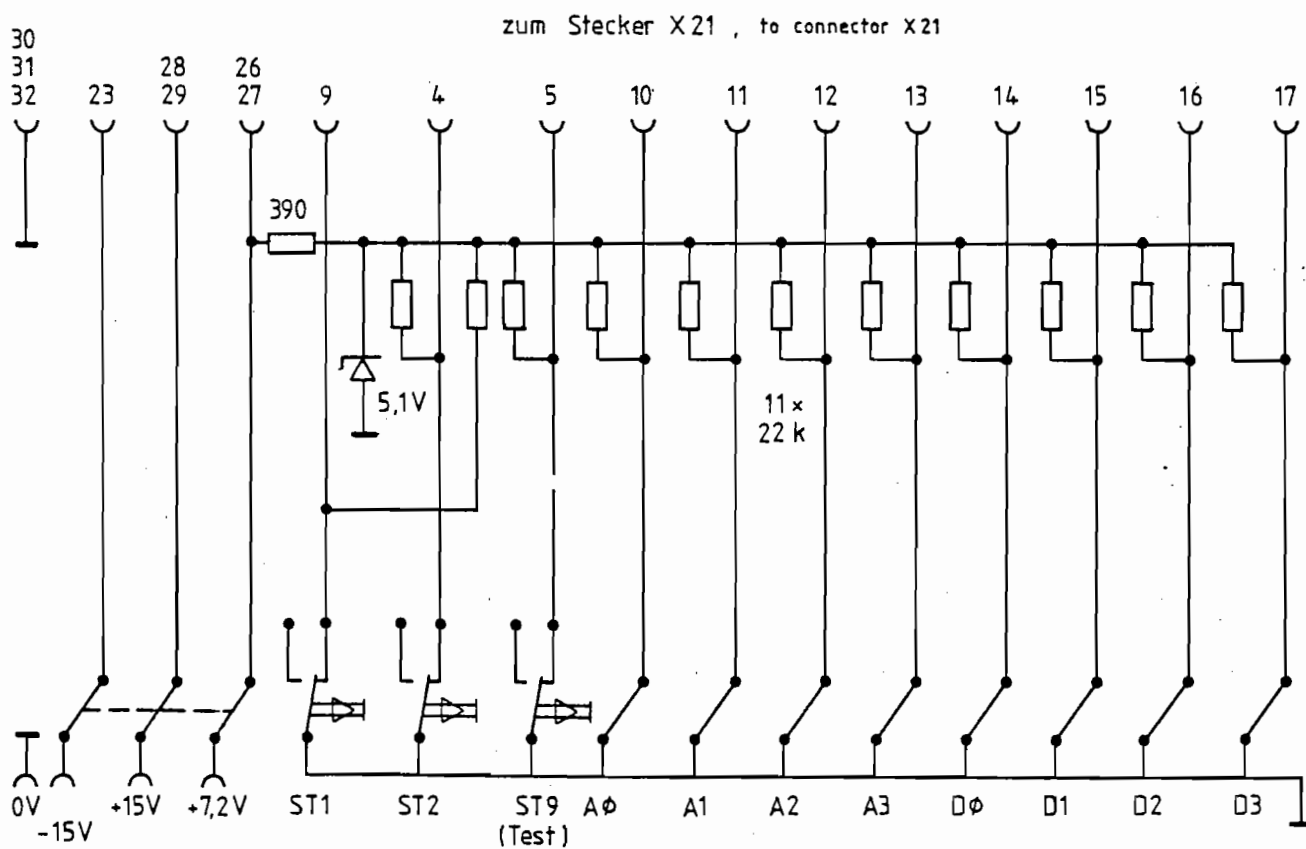
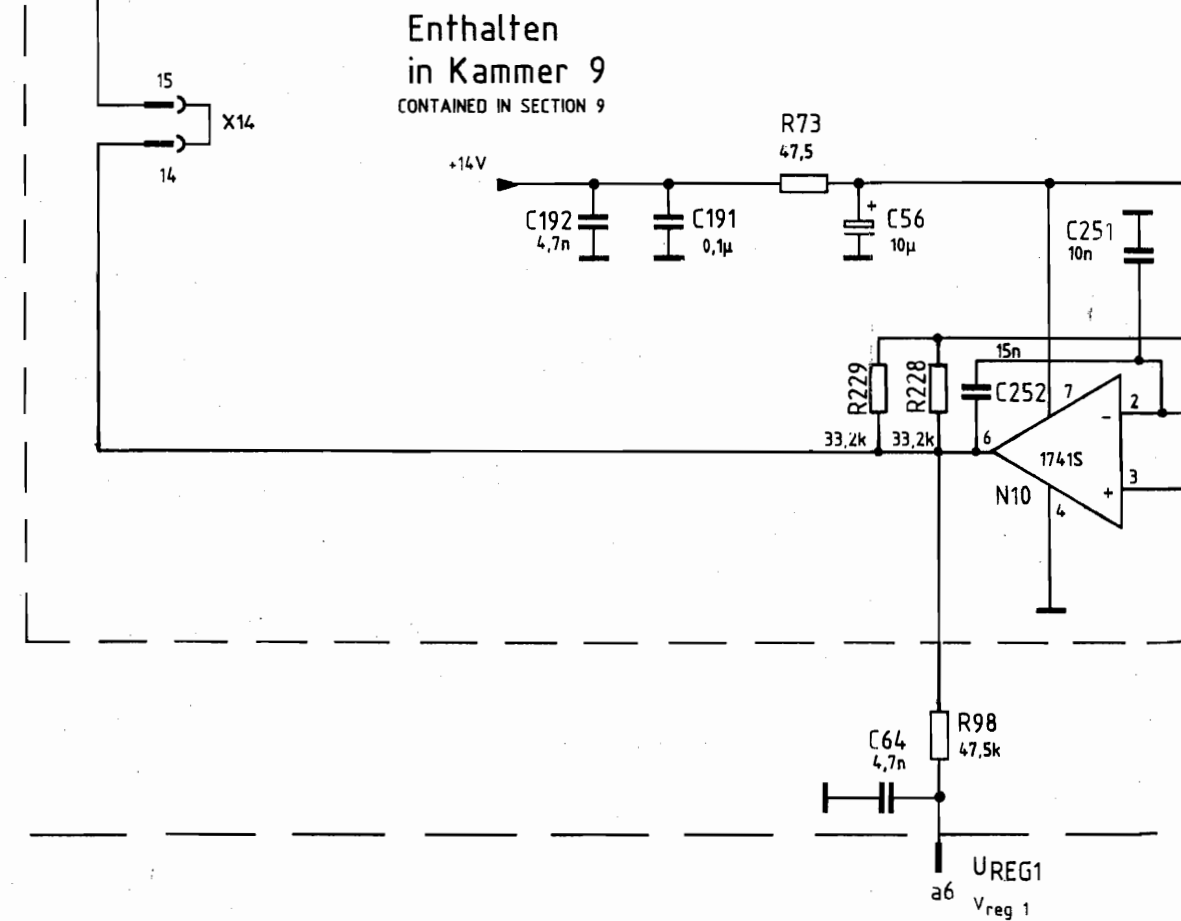
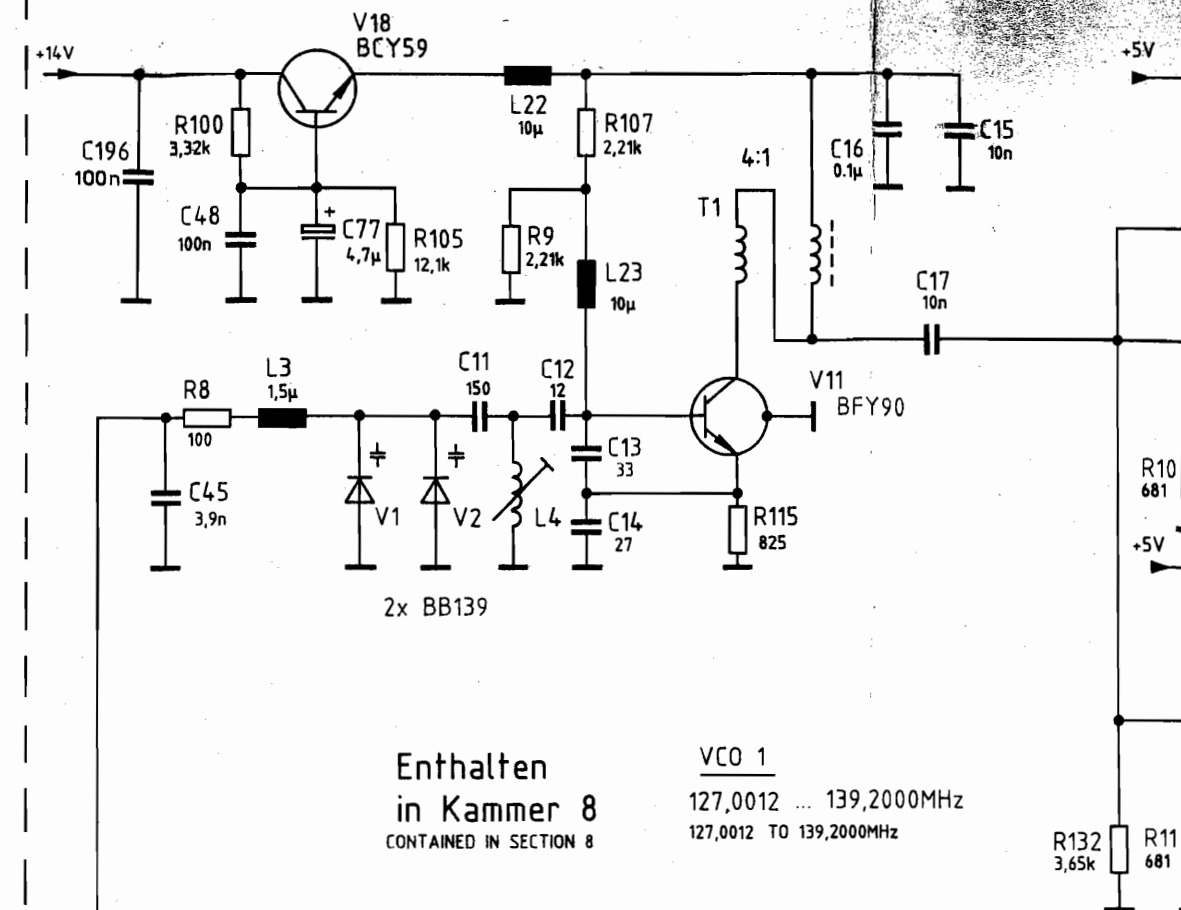
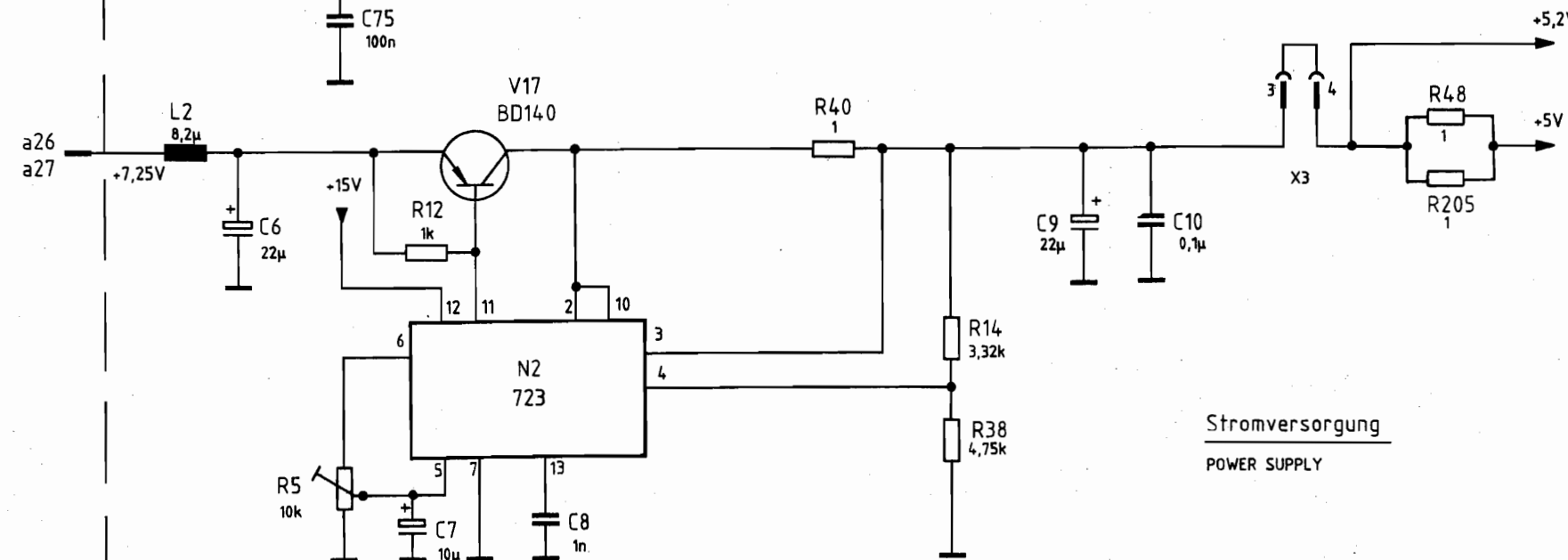
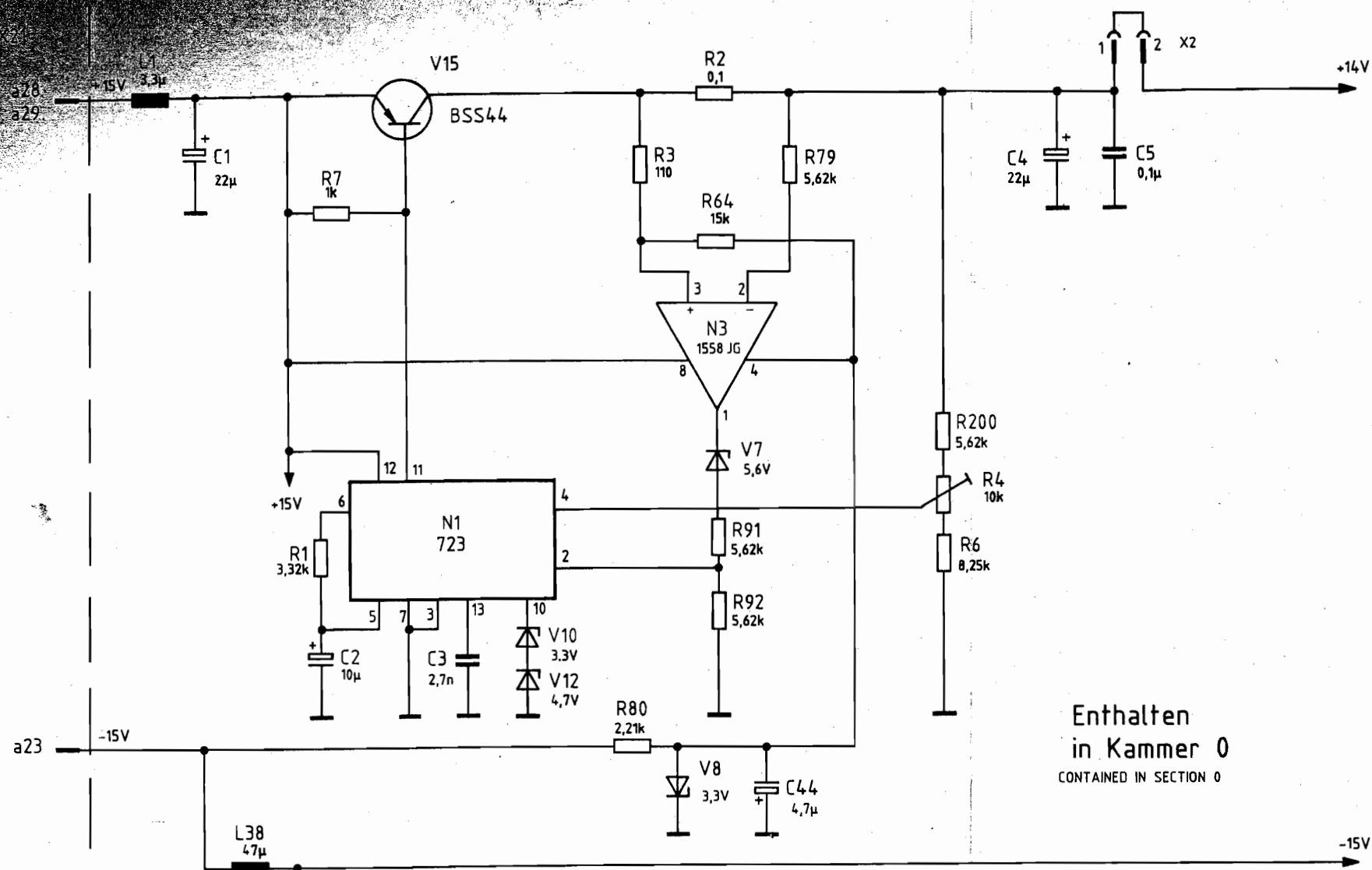


Fig. 6.7 Test Adapter for Synthesizer

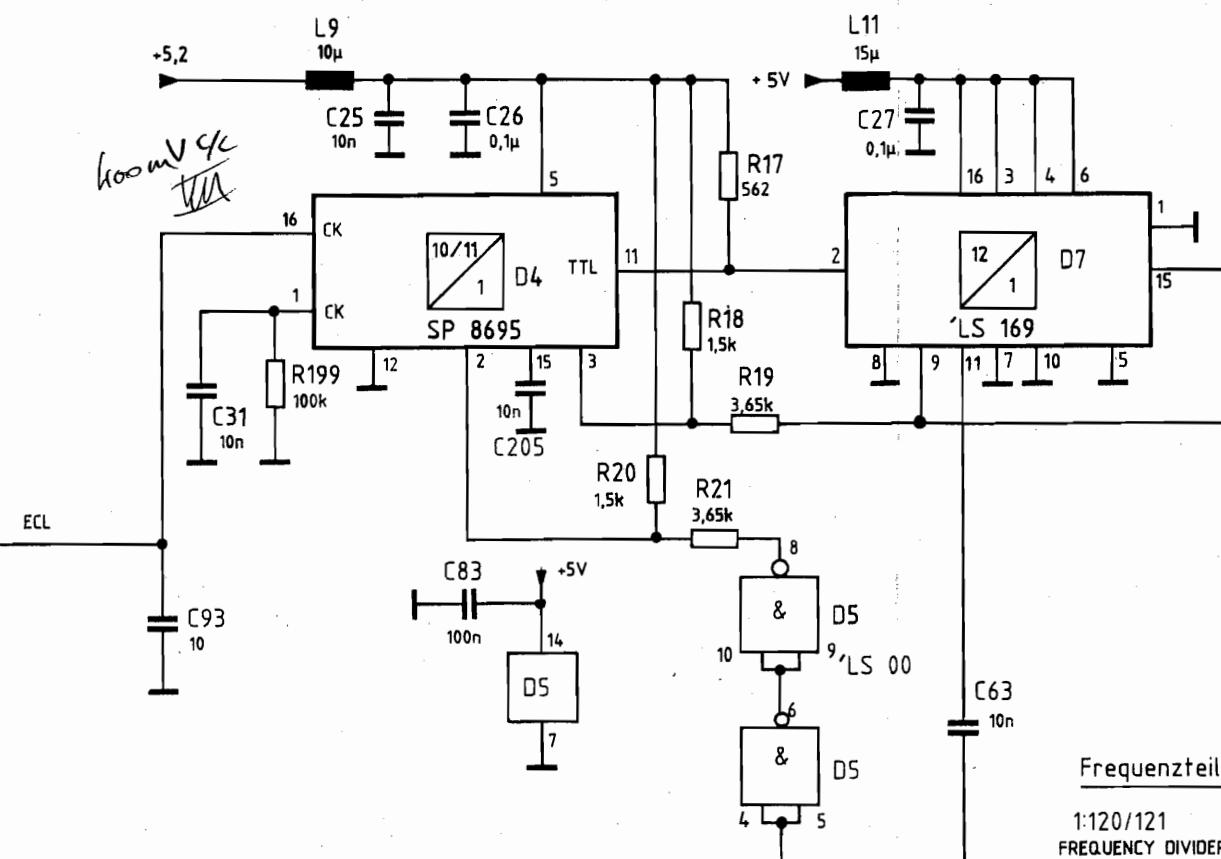
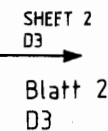


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MÜNCHEN

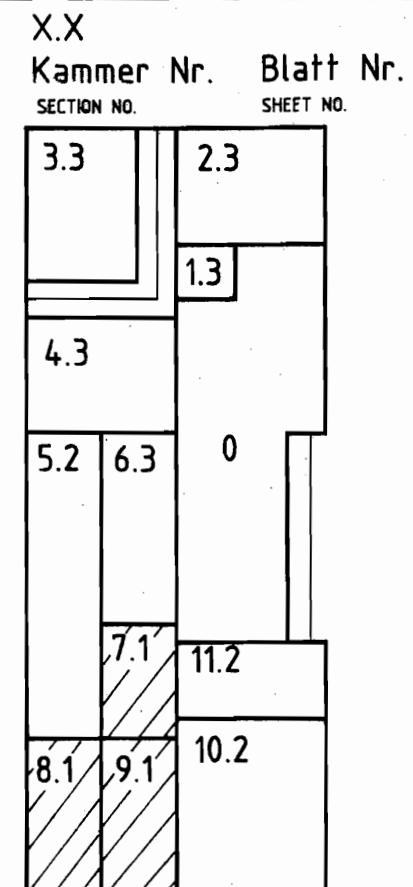
Schaltteillisten
Stromläufe
Bestückungspläne
Parts lists
Circuit diagrams
Components plans



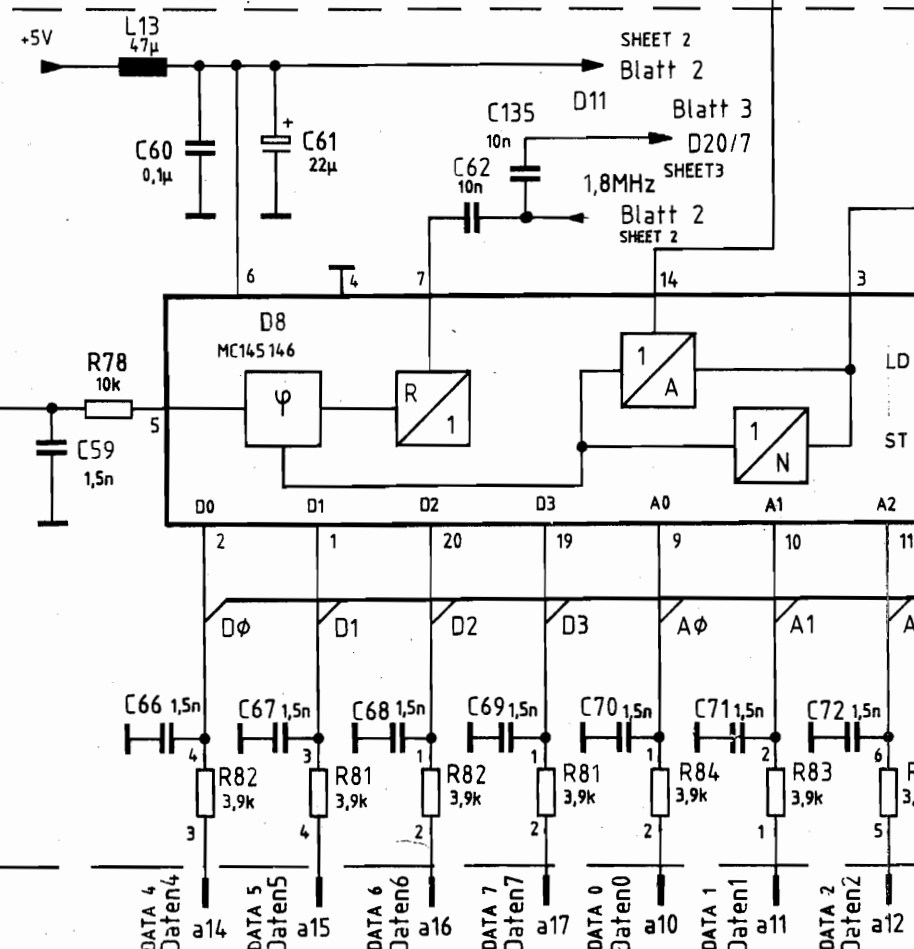
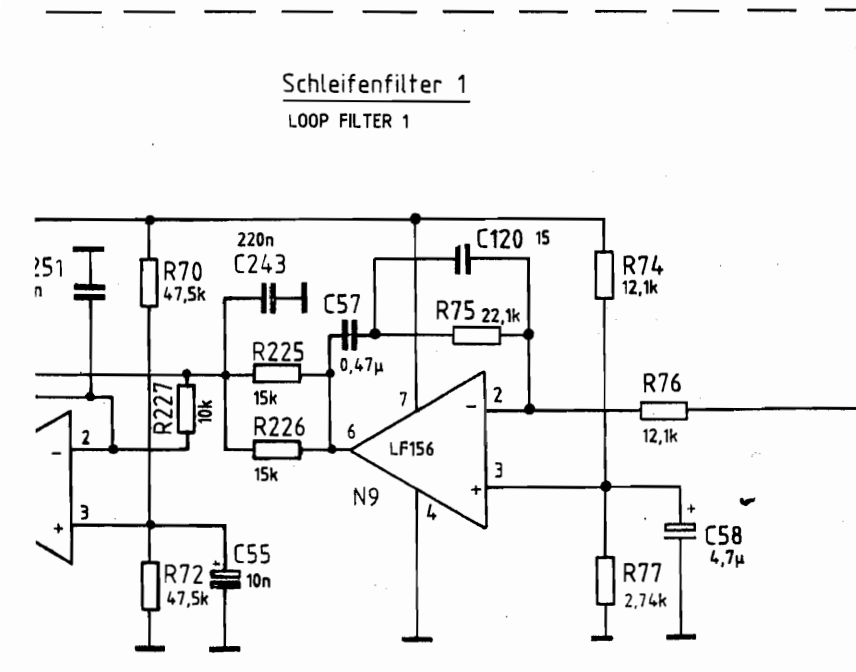
ACHTUNG: EGB!
Elektrostatisch gefährdete
Bauelemente erfordern eine
besondere Handhabung.
ATTENTION ESD!
Electrostatic sensitive
devices require a special
handling.



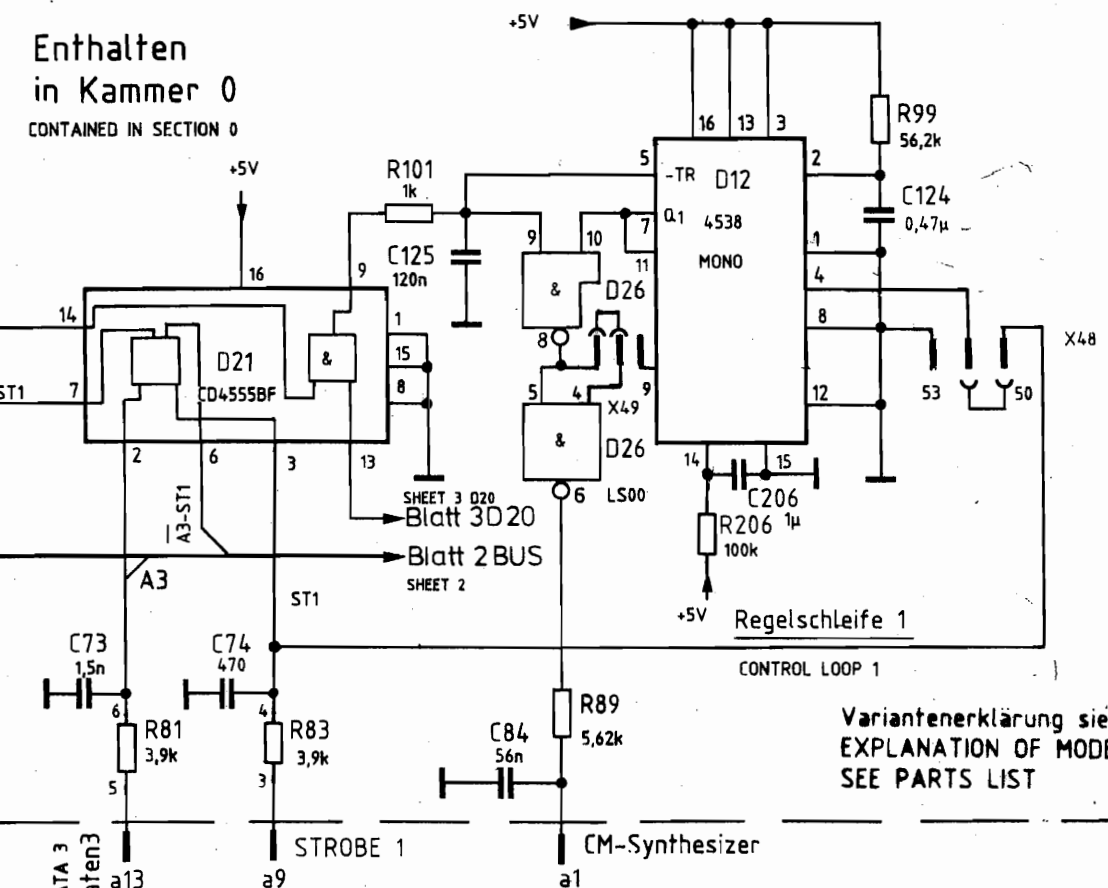
Enthalten
in Kammer 7
CONTAINED IN SECTION 7



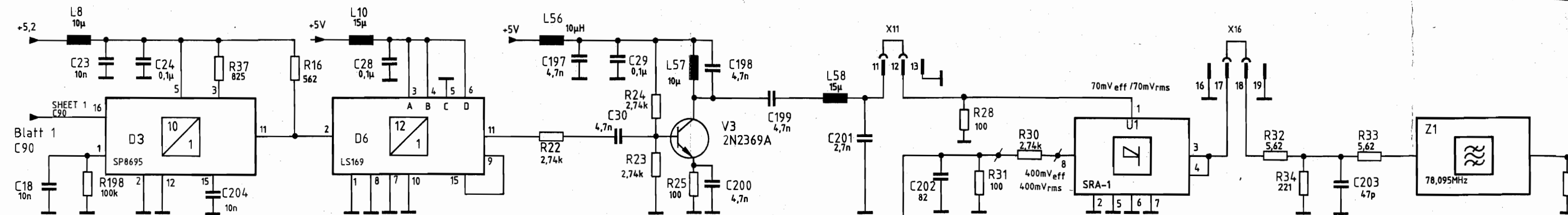
Schleifenfilter 1
LOOP FILTER 1



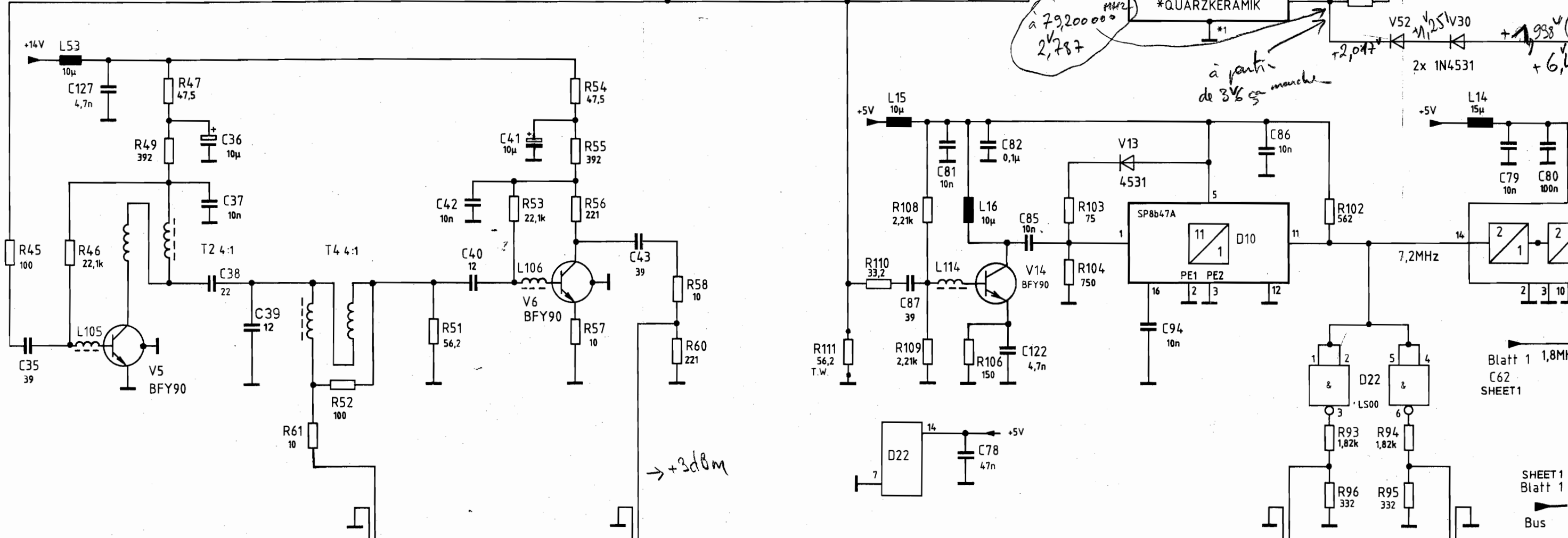
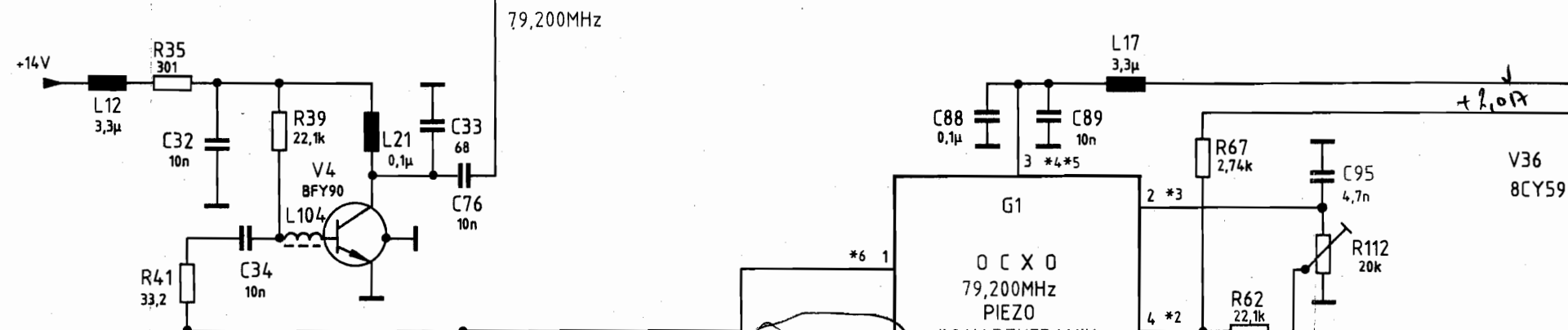
Enthalten
in Kammer 0
CONTAINED IN SECTION 0



Variantenerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST

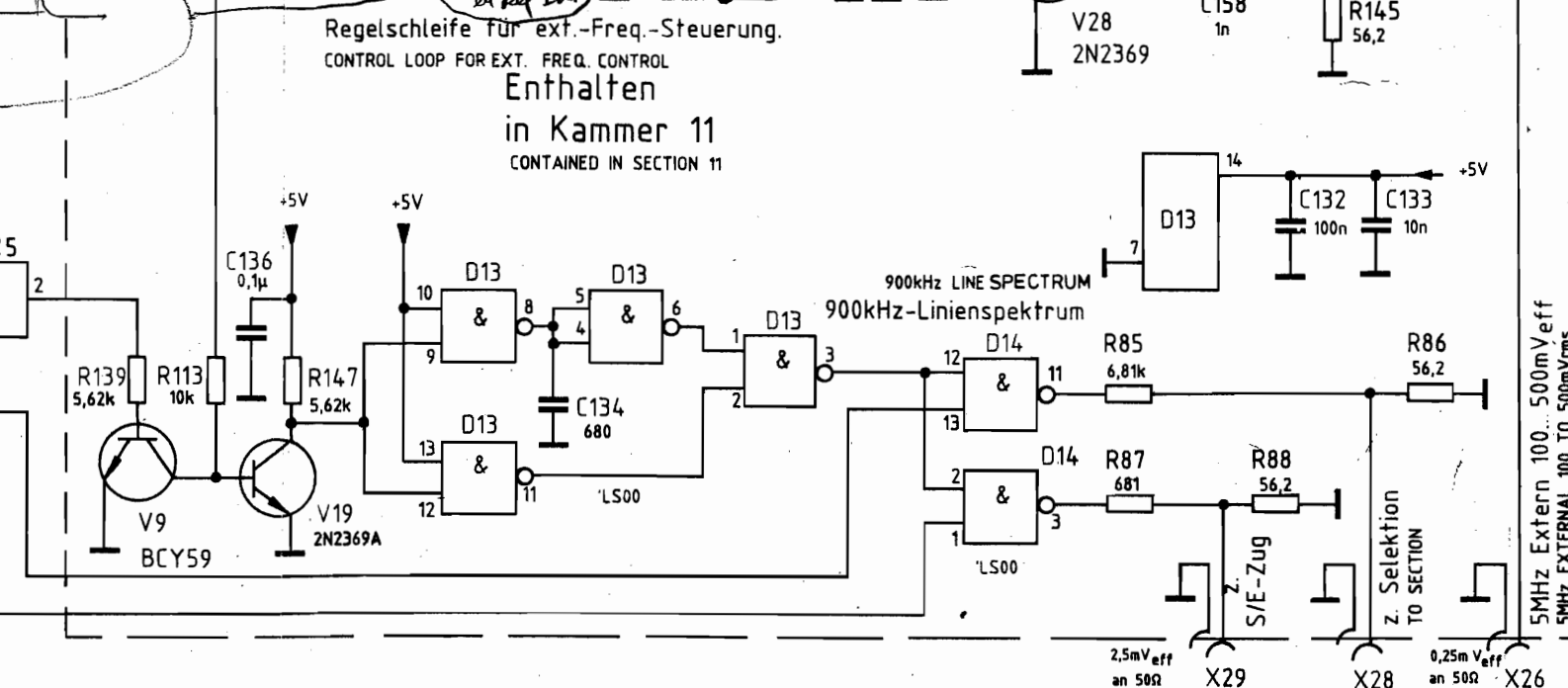
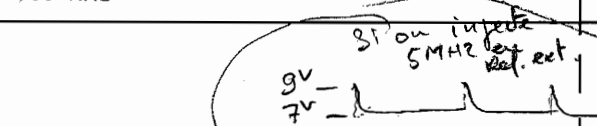
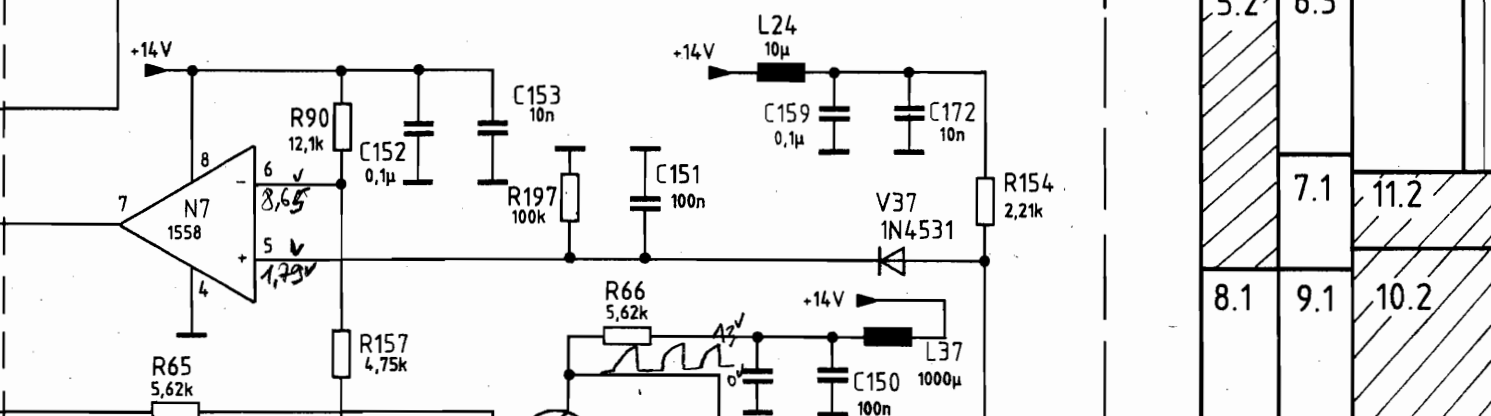
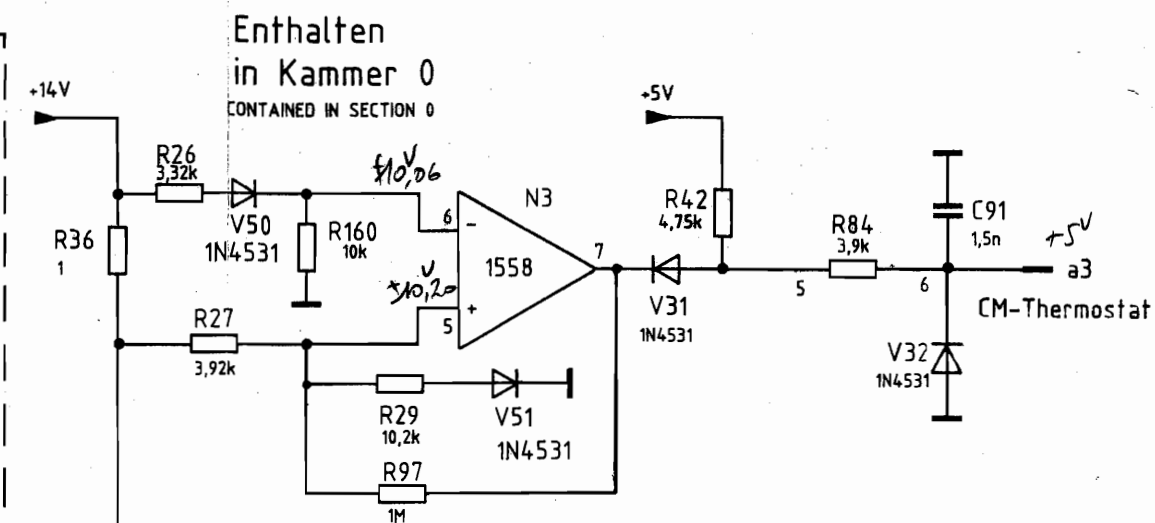


Enthalten
in Kammer 10
CONTAINED IN SECTION 10



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

X25 z. S/E-Zug TO TX/RX PATH 79.2MHz 300mV an 50Ω 300mV INTO 50Ω
X23 z. F1-Modem TO F1 MODEM 79.2MHz 400mV an 50Ω 400mV INTO 50Ω
X27 z. Modem TO MODEM 7.2 MHz
X22 z. ISB-Zusatz TO ISB MODEM 7.2MHz



X.X
Kammer Nr. Blatt Nr.
SECTION NO. SHEET NO.

3.3		2.3
		1.3
4.3		0/1/2/3
5.2	6.3	
	7.1	11.2
8.1	9.1	10.2

à partir
de + 1dB
ça m'aide

A	—	5.84	HF	D	34260	7.85	TA	6KBE	Tag	Name
B	32483	1.85	SW					Bearb.	5.84	HF
C	33615	5.85	WI					Gepr.		
Änd. Zust.	Anderungs- Mitteilung	Datum	Name	Änd. Zust.	Anderungs- Mitteilung	Datum	Name	Norm		

Benennung

Synthesizer

SYNTHESIZER

zu Gerät: GF852 P1

Zeichn.-Nr.

646.1511 S

646.1511V

erste Z.	646.1511.01
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Blatt-Nr.

0.

1.01



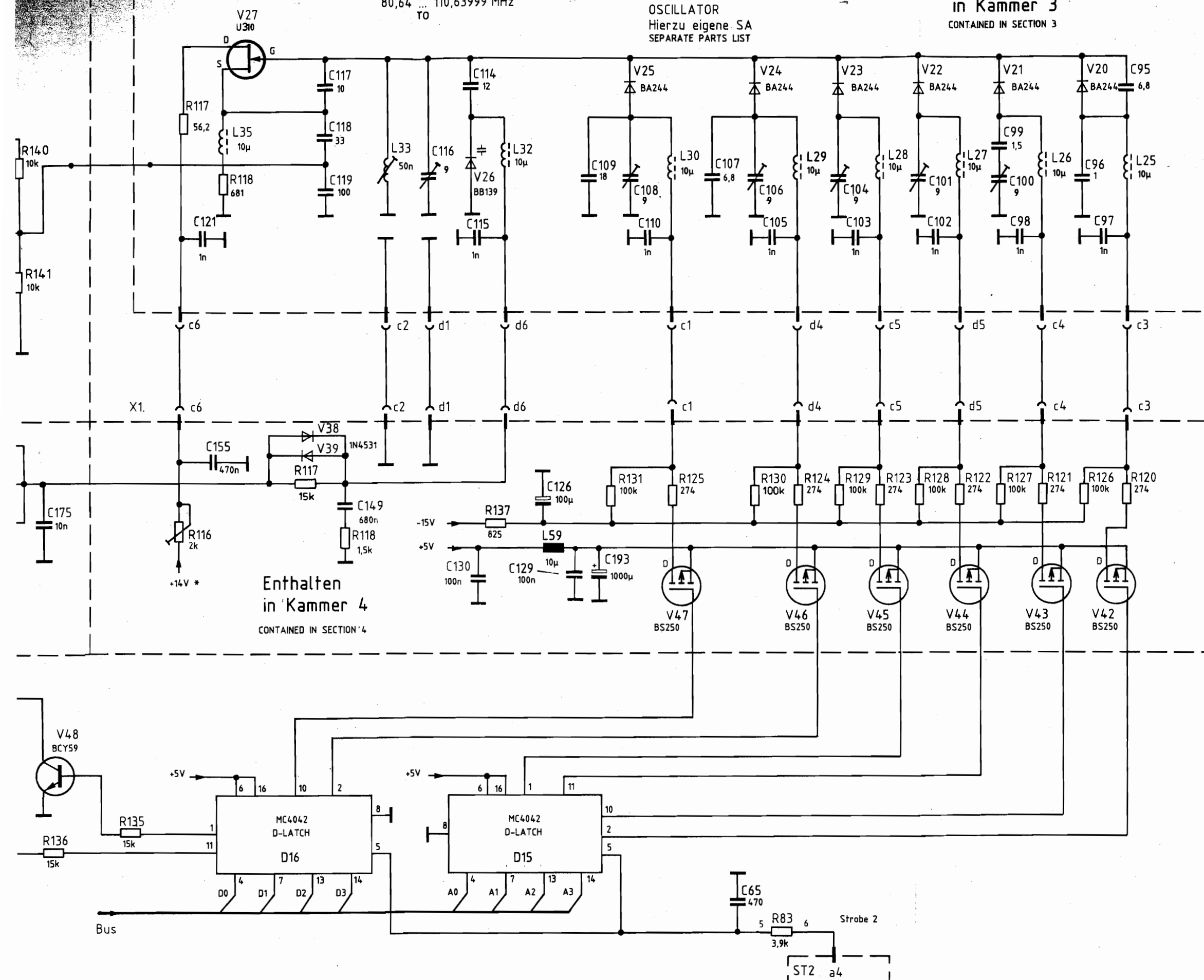
3.3	2.3
4.3	1.3
5.2	6.3
7.1	11.2
8.1	9.1
10.2	

A2.2 Oszillator 646.2330

OSCILLATOR
Hierzu eigene SA
SEPARATE PARTS LIST

Enthalten
in Kammer 3
CONTAINED IN SECTION 3

VCO 2
80,64 ... 110,63999 MHz
TO



Enthalten
in Kammer 4
CONTAINED IN SECTION 4

Regelschleife 2
CONTROL LOOP 2

Variantenerklärung siehe SA
EXPLANATION OF MODELS
SEE PARTS LIST

A	—	5.84	HF					6KBE	Tag	Name	Benennung
B	32483	1.85	SW					Bearb.	5.84	HF	
C	33615	5.85	WI					Gepr.			
And. Zust.	Anderungs-Mitteilung	Datum	Name	And. Zust.	Anderungs-Mitteilung	Datum	Name	Norm			

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Datum
Date

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Schaltteilliste für

Parts list for

GF852P1 SYNTHESIZER

Sachnummer
Stock No.

646.1511.01 SA

Blatt
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
.	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG VAR 05 = AUSF.EK085		
A2.1	ED SYNTHESIZER HIERZU STROML. 646.1511 S	646.1528.02	
A2.2	ZM OSZILLATORBAUGRUPPE NUR VAR : 02 HIERZU STROML. 646.1511 S	646.2218.02	
A2.2	ZM OSZILLATORBAUGRUPPE NUR VAR : 05 HIERZU STROML. 646.1511 S	646.2218.05	
A2.2.1	ED OSZILLATOR OSCILLATOR	646.2330.02	646.2218.01
W21	DX KABEL CABLE	646.2401	
X201	BUCHSE	646.2301	646.2299
X202	BUCHSE	646.2318	646.2299
			- ENDE -

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ED SYNTHESIZER

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1

Kennzeichen
Component No.

Benennung/Beschreibung
Designation

Sachnummer
Stock No.

enthalten in
contained in

-	VARIANTENERKL. / VERSIONS VAR 02 = GRUNDAUSFUEHRUNG MOD 02 = BASIC MODEL		
C1	CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR SIEMENS B41316-A7226-V	022.7572	
C2	CE 10UF -10+50% 63V 9X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK10/63	CE 022.7650	
C3	CC 2,7NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB M39014/01-1405	CC 082.7404	
C4	CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR SIEMENS B41316-A7226-V	022.7572	
C5	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C6	CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR SIEMENS B41316-A7226-V	022.7572	
C7	CE 10UF -10+50% 63V 9X13 ELECTROLYTIC CAPACITOR ROEDERST ELKOEK10/63	CE 022.7650	
C8	CC 1NF+-10%100V5K1200VIEL CAPACITOR UNION CARB M39014/01-1397	CC 068.4047	
C9	CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR SIEMENS B41316-A7226-V	022.7572	
C10	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C11	CC 150PF+-2%6X9N150 CAPACITOR VALVO 2222 678 34151	CC 087.6735	
C12	CC 12PF+-2%3X4NP0 CAPACITOR VALVO 2222 678 10129	CC 087.6435	
C13	CC 33PF+-2%4X5NP0 CAPACITOR VALVO 2222 678 10339	CC 087.6487	
C14	CC 27PF+-2%4X5NP0 CAPACITOR VALVO 2222 678 10279	CC 087.6470	
C15	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C16	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C17	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	

646.1528.01 SA BL 1+

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Datum
DateSchaltteilliste für
Parts list for
ED SYNTHESIZERSachnummer
Stock No.Blatt
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0885

646.1528.01 SA

2

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C18	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB M39014/01-1415	CC 068.4060	
C19	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C20	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C21	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C22	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C23	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C24	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C25	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C26	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
BIS/T0			
C29			
C30	CC 4,7NF+-20%63V7X8 K2000 CAPACITOR	CC 092.7907	
C31	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB M39014/01-1415	CC 068.4060	
C32	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB M39014/01-1415	CC 068.4060	
C33	CC 68 PF+-2%63V6,5X7,5NPO CAPACITOR STETTNER EGP22,5 68PF2%NPO	CC 092.7420	
C34	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB M39014/01-1415	CC 068.4060	
C35	CC 39 PF+-2%63V4,5X5,5NPO CAPACITOR STETTNER EGP22,5 39PF2%NPO	CC 092.7394	
C36	CE 10 UF+-20%25V 7X 5X11 ELECTROLYTIC CAPACITOR ERO-TANTAL ETR3-10/25	CE 023.5980	
C37	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C38	CC 22 PF+-2%63V4,5X5,5NPO CAPACITOR STETTNER EGP22,5 22PF2%NPO	CC 092.7365	



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3

Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
C39	CC 12 PF+-2%63V4X4,5 NPO CAPACITOR	CC 092.7336	
C40	STETTNER EGP22,5 12PF2%NPO CC 12 PF+-2%63V4X4,5 NPO CAPACITOR	CC 092.7336	
C41	STETTNER EGP22,5 12PF2%NPO CE 10 UF+-20%25V 7X 5X11 ELECTROLYTIC CAPACITOR	CE 023.5980	
C42	ERO-TANTAL ETR3-10/25 CC 10NF-20+50%7X8R6000 CAPACITOR	CC 087.7525	
C43	VALVO 2222 63051 64051103 CC 39 PF+-2%63V4,5X5,5NPO CAPACITOR	CC 092.7394	
C44	STETTNER EGP22,5 39PF2%NPO CE 4,7UF+-20%20V 7X 4X 8 ELECTROLYTIC CAPACITOR	CE 022.8110	
C45	ERO-TANTAL TA-ELK0ETR2-4,7/20 CC 3,9NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 082.7410	
C48	UNION CARB M39014/01-1408 CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
C55	UNION CARB M39014/01-1433 CE 10 UF+-20%25V 7X 5X11 ELECTROLYTIC CAPACITOR	CE 023.5980	
C56	ERO-TANTAL ETR3-10/25 CE 10 UF+-20%25V 7X 5X11 ELECTROLYTIC CAPACITOR	CE 023.5980	
C57	ERO-TANTAL ETR3-10/25 CC 470NF+-10%50VK1200VIEL CAPACITOR	CC 068.4082	
C58	UNION CARB M39014/02-1399 CE 4,7UF+-20%20V 7X 4X 8 ELECTROLYTIC CAPACITOR	CE 022.8110	
C59	ERO-TANTAL TA-ELK0ETR2-4,7/20 CC 1,5NF+-10%200V7K1200VI CAPACITOR	CC 084.5373	
C60	UNION CARB M39014/02-1362 CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
C61	UNION CARB M39014/01-1433 CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR	022.7572	
C62	SIEMENS B41316-A7226-V CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
C63	UNION CARB M39014/01-1415 CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
C64	UNION CARB M39014/01-1415 CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 068.4053	
C65	UNION CARB M39014/01-1409 CC 470PF+-10%200V5K1200VI CAPACITOR	CC 060.2274	
	UNION CARB M39014/01-1391		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in		
C66	CC 1,5NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB M39014/01-1400	CC 060.2374			
BIS/TO					
C73					
C74	CC 470PF+-10%200V5K1200VI CAPACITOR UNION CARB M39014/01-1391	CC 060.2274			
C75	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350			
C76	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB M39014/01-1415	CC 068.4060			
C77	CE 4,7UF+-20%20V 7X 4X 8 ELECTROLYTIC CAPACITOR ERO-TANTAL TA-ELK0ETR2-4,7/20	CE 022.8110			
C78	CC 47NF+-10%50V5K1200VIEL CAPACITOR UNION CARB M39014/01-1427	CC 082.7810			
C79	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525			
C80	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350			
C81	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525			
C82	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350			
C83	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350			
C84	CC 56NF+-10%50V5K1200VIEL CERAMIC CAPACITOR UNION CARB M39014/01-1429	CC 084.5338			
C85	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525			
C86	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525			
C87	CC 39 PF+-2%63V4,5X5,5NPO CAPACITOR STETTNER EGPZ2,5 39PF2%NPO	CC 092.7394			
C88	CC 100NF+-10%100V K1200VI CERAMIC CAPACITOR UNION CARB M39014/02-1391	CC 060.1149			
C89	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525			
C90	CC 10 PF+-2%63V4X4,5 NPO CAPACITOR STETTNER EGPZ2,5 10PF2%NPO	CC 092.7320			
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C91	CC 1,5NF+-10%100V5K1200VI CERAMIC CAPACITOR UNION CARB M39014/01-1400	CC 060.2374	
C92	CC 470PF+-10%200V5K1200VI CAPACITOR UNION CARB M39014/01-1391	CC 060.2274	
C93	CC 10 PF+-2%63V4X4,5 NPO CAPACITOR STETTNER EGP22,5 10PF2%NPO	CC 092.7320	
C94	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C95	CC 4,7NF+-20%63V7X8 K2000 CAPACITOR	CC 092.7907	
C120	CC 15PF+-10%200V5K1200VIE CAPACITOR UNION CARB M39014/01-1364	CC 084.5150	
C122	CC 4,7NF+-10%6X9R2000 CAPACITOR VALVO 2222 63051 472	CC 087.7102	
C124	CC 470NF+-10%50VK1200VIEL CAPACITOR UNION CARB M39014/02-1399	CC 068.4082	
C125	CC 120NF+-10%100V K1200VI CAPACITOR UNION CARB M39014/02-1392	CC 060.1155	
C126	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	
C127	CC 4,7NF+-20%63V7X8 K2000 CAPACITOR	CC 092.7907	
C128	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR ROEDERST ELK0EK100/25	CE 208.4007	
C129	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C130	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C131	CC 15PF+-10%200V5K1200VIE CAPACITOR UNION CARB M39014/01-1364	CC 084.5150	
C132	CC 100NF+-10%50V5K1200VIE CAPACITOR UNION CARB M39014/01-1433	CC 084.5350	
C133	CC 10NF-20+50%7X8R6000 CAPACITOR VALVO 2222 63051 64051103	CC 087.7525	
C134	CC 680PF+-20%63V4X5 K2000 CAPACITOR STETTNER EGP22,5 680PF 20%	CC 092.7807	
C135	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR UNION CARB M39014/01-1415	CC 068.4060	

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Kennzeichen Component No.	Benennung/Beschreibung Designation			Sachnummer Stock No.	enthalten in contained in
C136	CC 100NF+-10%50V5K1200VIE CAPACITOR			CC 084.5350	
C137	UNION CARB M39014/01-1433 CC 4,7NF+-20%63V7X8 K2000 CAPACITOR			CC 092.7907	
C138	CC 68 PF+-2%63V6,5X7,5NPO CAPACITOR			CC 092.7420	
C139	STETTNER EGPZ2,5 68PF2%NPO CC 33 PF+-2%63V4,5X5,5NPO CAPACITOR			CC 092.7388	
C140	STETTNER EGPZ2,5 33PF2%NPO CC 100NF+-10%100V K1200VI CERAMIC CAPACITOR			CC 060.1149	
C141	UNION CARB M39014/02-1391 CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR			CC 068.4060	
C142	UNION CARB M39014/01-1415 CC 1NF+-10%100V5K1200VIEL CAPACITOR			CC 068.4047	
C143	UNION CARB M39014/01-1397 CC 56PF+-10%200V5K1200VIE CAPACITOR			CC 084.5221	
C144	UNION CARB M39014/01-1375 CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR			CC 068.4053	
C145	UNION CARB M39014/01-1409 CC 470NF+-10%50VK1200VIEL CAPACITOR			CC 068.4082	
C146	UNION CARB M39014/02-1399 CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR			CC 068.4053	
C147	UNION CARB M39014/01-1409 CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR			CC 068.4060	
C148	UNION CARB M39014/01-1415 CC 1NF+-10%100V5K1200VIEL CAPACITOR			CC 068.4047	
C150	UNION CARB M39014/01-1397 CC 100NF+-10%50V5K1200VIE CAPACITOR			CC 084.5350	
BIS/TO	UNION CARB M39014/01-1433				
C152					
C153	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR			CC 068.4060	
C154	UNION CARB M39014/01-1415 CC 100NF+-10%100V K1200VI CERAMIC CAPACITOR			CC 060.1149	
C155	UNION CARB M39014/02-1391 CC 470NF+-10%50VK1200VIEL CAPACITOR			CC 068.4082	
C156	UNION CARB M39014/02-1399 CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR			CC 068.4060	
	UNION CARB M39014/01-1415				
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C157	CC 68 PF+-2%63V6,5X7,5NPO CAPACITOR	CC 092.7420	
C158	STETTNER EGP22,5 68PF2%NPO CC 1NF+-10%100V5K1200VIEL CAPACITOR	CC 068.4047	
C159	UNION CARB M39014/01-1397 CC 100NF+-10%100V K1200VI CERAMIC CAPACITOR	CC 060.1149	
C160	UNION CARB M39014/02-1391 CC 47 PF+-2%63V5,5X6,5NPO CAPACITOR	CC 092.7407	
C161	STETTNER EGP22,5 47PF2%NPO CC 15 PF+-2%63V4X4,5 NPO CAPACITOR	CC 092.7342	
C162	STETTNER EGP22,5 15PF2%NPO CC 150PF+-2%63V6,5X9 N150 CAPACITOR	CC 092.7607	
C163	STETTNER EGP22,5 150PF2%N150 CC 150PF+-2%63V6,5X9 N150 CAPACITOR	CC 092.7607	
C164	STETTNER EGP22,5 150PF2%N150 CC 10 PF+-2%63V4X4,5 NPO CAPACITOR	CC 092.7320	
C165	STETTNER EGP22,5 10PF2%NPO CC 10 PF+-2%63V4X4,5 NPO CAPACITOR	CC 092.7320	
C166	STETTNER EGP22,5 10PF2%NPO CC 120PF+-2%63V6,5X9 NPO CAPACITOR	CC 092.7459	
C167	STETTNER EGP22,5 120PF2%NPO CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
	UNION CARB M39014/01-1415		
BIS/TO C169			
C170	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350	
	UNION CARB M39014/01-1433		
C171	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
	UNION CARB M39014/01-1415		
C172	CC 10NF-20+50%7X8R6000 CAPACITOR	CC 087.7525	
	VALVO 2222 63051 64051103		
C173	CC 1UF+-10%50V7K1200VIEL CAPACITOR	CC 084.5538	
	UNION CARB M39014/02-1403		
C174	CC 10NF-20+50%7X8R6000 CAPACITOR	CC 087.7525	
	VALVO 2222 63051 64051103		
C175	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060	
	UNION CARB M39014/01-1415		
C176	CC 100PF+- 5%100V NPO VIE CERAMIC CAPACITOR	CC 060.0771	
	UNIONCARB C052C101J2G1CA		

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.		enthalten in contained in	
C177	CC 680PF+-5%100V NP05X3X5 CAPACITOR	CC 099.0643			
	ITW 302E0100RC681J				
C178	CC 6,8NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 060.2416			
	UNION CARB M39014/01-1412				
C179	CC 100PF+-10%200V5K1200VI CAPACITOR	CC 084.5250			
	UNION CARB M39014/01-1379				
C180	CC 4,7NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 068.4053			
	UNION CARB M39014/01-1409				
C181	CE 47UF -10+100%40V 11X13 ELECTROLYTIC CAPACITOR	022.7589			
	SIEMENS B41316-B7476-Z				
C182	CC 15PF+-10%200V5K1200VIE CAPACITOR	CC 084.5150			
	UNION CARB M39014/01-1364				
C183	CC 220NF+-10%50V7K1200VIE CERAMIC CAPACITOR	CC 084.5515			
	UNION CARB M39014/02-1395				
C184	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
	UNION CARB M39014/01-1433				
C185	CC 1,8NF+-10%100V5K1200VI CERAMIC CAPACITOR	CC 084.5296			
	UNION CARB M39014/01-1402				
C186	CE 100UF-10+50% 25V 13X13 ELECTROLYTIC CAPACITOR	CE 208.4007			
	ROEDERST ELKOEK100/25				
C187	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB M39014/01-1415				
C188	CC 10NF+-10%100V5K1200VIE CERAMIC CAPACITOR	CC 068.4060			
	UNION CARB M39014/01-1415				
C189	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
	UNION CARB M39014/01-1433				
C190	CE 22UF -10+100%40V 9X13 ELECTROLYTIC CAPACITOR	022.7572			
	SIEMENS B41316-A7226-V				
C191	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
	UNION CARB M39014/01-1433				
C192	CC 4,7NF+-20%63V7X8 K2000 CAPACITOR	CC 092.7907			
	CE 1000UF10+50% 16V 15X30				
C193	ELECTROLYTIC CAPACITOR	CE 087.0437			
	ROEDERST ELKO EK 1000/16				
C196	CC 100NF+-10%50V5K1200VIE CAPACITOR	CC 084.5350			
	UNION CARB M39014/01-1433				
C197	CC 4,7NF+-20%63V7X8 K2000 CAPACITOR	CC 092.7907			
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contained inBIS/T0
C200
C201CC 2,7NF+-20%63V6X7 K2000
CAPACITOR

CC 092.7871

C202

STETTNER EGP22,5 2700PF 20%
CC 82 PF+-2%63V6,5X7,5NPO
CAPACITOR

CC 092.7436

C203

STETTNER EGP22,5 82PF2%NPO
CC 47 PF+-2%63V5,5X6,5NPO
CAPACITOR

CC 092.7407

C204

STETTNER EGP22,5 47PF2%NPO
CC 10NF-20+50%7X8R6000
CAPACITOR

CC 087.7525

C205

VALVO 2222 63051 64051103
CC 10NF-20+50%7X8R6000
CAPACITOR

CC 087.7525

C206

VALVO 2222 63051 64051103
CC 1UF+-10%50V7K1200VIEL
CAPACITOR

CC 084.5538

C243

UNION CARB M39014/02-1403
CC 220NF+-10%50V7K1200VIE
CERAMIC CAPACITOR

CC 084.5515

C251

UNION CARB M39014/02-1395
CC 10NF+-10%100V5K1200VIE
CERAMIC CAPACITOR

CC 068.4060

C252

UNION CARB M39014/01-1415
CC 15NF+-10%50VSK1200VIEL
CAPACITOR

CC 086.5435

UNION CARB M39014/01-1418

D1

BL MC10109L 2X4 OR-NORG
OR NOR GATE

BL 302.5854

D2

MOTOROLA MC10109L
BL MC10109L 2X4 OR-NORG
OR NOR GATE

BL 302.5854

D3

MOTOROLA MC10109L
BL SP8695BDG10:1DIVID UHF
DIVIDER

BL 303.8970

D4

PLESSEY SP8695BDG
BL SP8695BDG10:1DIVID UHF
DIVIDER

BL 303.8970

D5

PLESSEY SP8695BDG
BL SN54LS00J 4/2JNP.NAND.
IC NAND GATE SN54LS00J

BL 455.2838

D6

TEXAS SN54LS00J
BL SN54LS169 J BIN.COUNT.
IC BIN.COUNTER SN54LS69J

BL 580.9340

D7

FAIRCHILD 54LS169DM
BL SN54LS169 J BIN.COUNT.
IC BIN.COUNTER SN54LS69J

BL 580.9340

D8

FAIRCHILD 54LS169DM
BL MC145146L 4B.PLL SYNT
4BIT PLL SYNTHESIZER

645.7222

D9

MOTOROLA MC145146L
BL SN54LS93J BIN.ZAEHLER
IC COUNTER SN54LS93J

BL 275.0722

TEXAS SN54LS93J

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.		enthalten in contained in	
D10	BL SP8647BDG10:1DIVID UHF DIVIDER	BL 300.6747			
D11	PLESSEY SP8647BDG BL CD4042BF 4XD- LATCH LATCH RCA CD4042BF	BL 086.8140			
D12	BL MC14538BAL 2X MONOFLOP MONOSTABLE MULTIVIBRATOR MOTOROLA MC14538BAL	BL 526.5427			
D13	BL SN54LS00J 4/2JNP.NAND. IC NAND GATE SN54LS00J TEXAS SN54LS00J	BL 455.2838			
D14	BL SN54LS00J 4/2JNP.NAND. IC NAND GATE SN54LS00J TEXAS SN54LS00J	BL 455.2838			
D15	BL CD4042BF 4XD- LATCH LATCH RCA CD4042BF	BL 086.8140			
D16	BL CD4042BF 4XD- LATCH LATCH RCA CD4042BF	BL 086.8140			
D17	BL MC14066BAL 4X ANALOGSW ANALOG SWITCH MOTOROLA MC14066BAL	BL 418.0135			
D18	BL MC12009L PRESCALER:5/6 PRESCALER MOTOROLA MC12009L	645.7239			
D19	BL MC10116L 3XL. RECEIV LINE RECEIVER MOTOROLA MC10116L	BL 282.3275			
D20	BL MC145146L 4B.PLL SYNT 4BIT PLL SYNTHESIZER MOTOROLA MC145146L	645.7222			
D21	BL CD4555BF 2X1:4 DECOD DECODER RCA CD4555BF	BL 568.7670			
D22	BL SN54LS00J 4/2JNP.NAND. IC NAND GATE SN54LS00J TEXAS SN54LS00J	BL 455.2838			
D23	BL MC14568BCL PH.COMP/CNT PHASE COMP.A.PR.COUNTER MOTOROLA MC14568BCL	645.7245			
D25	BL CD4050BF 6XCONVERTER HEXCONVERTER RCA CD4050BF	BL 086.8205			
D26	BL SN54LS00J 4/2JNP.NAND. IC NAND GATE SN54LS00J TEXAS SN54LS00J	BL 455.2838			
G1	EO 79,2MHZ-QU.OSZ.0CX014V 79,2MHZQUARTZ OSCILL.0CX0 PIEZO R&S-ZCHNG.089.5820	089.5820			
L1	LD 3,3UH BEI 1,63A0,160HM CHOKE JAHRE 72.10-3R30K	LD 026.4061			
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L2	LD 8,2UH BEI 0,94A0,490HM CHOKE JAHRE 72.10-8R20K	LD 026.4110	
L3	LD 1,50UH10%0,220HMO,560A CHOKE DELEVAN DROSSEL 1025-24	LD 067.2886	
L4	LD SPULE COIL	646.1986	
L6	LD 1,50UH10%0,220HMO,560A CHOKE DELEVAN DROSSEL 1025-24	LD 067.2886	
L7	LD 1,50UH10%0,220HMO,560A CHOKE DELEVAN DROSSEL 1025-24	LD 067.2886	
L8	LD 10UH NUR DELEVAN 1025. COIL DELEVAN 1025-44 W-RECHTS	451.5226	
L9	LD 10UH NUR DELEVAN 1025. COIL DELEVAN 1025-44 W-RECHTS	451.5226	
L10	LD 15,0UH10%2,800HMO,157A CHOKE DELEVAN DROSSEL1025-48	LD 067.3001	
L11	LD 15,0UH10%2,800HMO,157A CHOKE DELEVAN DROSSEL1025-48	LD 067.3001	
L12	LD 3,30UH10%0,850HMO,285A CHOKE DELEVAN DROSSEL1025-32	LD 067.2928	
L13	LD 47,0UH10%4,500HMO,110A CHOKE DELEVAN DROSSEL1025-60	LD 067.3060	
L14	LD 15,0UH10%2,800HMO,157A CHOKE DELEVAN DROSSEL1025-48	LD 067.3001	
L15	LD 10UH NUR DELEVAN 1025. COIL DELEVAN 1025-44 W-RECHTS	451.5226	
L16	LD 10UH NUR DELEVAN 1025. COIL DELEVAN 1025-44 W-RECHTS	451.5226	
L17	LD 3,3UH BEI 1,63A0,160HM CHOKE JAHRE 72.10-3R30K	LD 026.4061	
L20	LD 68,0UH10%6,700HMO,092A CHOKE DELEVAN DROSSEL1025-64	LD 067.3082	
L21	LD 0,10 UH 10% 935 MIA CHOKE DELEVAN DROSSEL0819-00	LD 092.3030	
L22	LD 10UH NUR DELEVAN 1025. COIL DELEVAN 1025-44 W-RECHTS	451.5226	
L23	LD 5,60UH10%1,800HMO,195A CHOKE DELEVAN DROSSEL1025-38	LD 067.2957	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.		enthalten in contained in	
L24	LD 10UH NUR DELEVAN 1025. COIL	451.5226			
L37	DELEVAN 1025-44 W-RECHTS LD 1000UH10%72,00HMO,028A CHOKE	LD 037.8005			
L38	DELEVAN DROSSEL1025-92 LD 47,0UH10%4,500HMO,110A CHOKE	LD 067.3060			
L39	DELEVAN DROSSEL1025-60 LD 10UH NUR DELEVAN 1025. COIL	451.5226			
L40	DELEVAN 1025-44 W-RECHTS LD 0,15UH10%0,100HM1,230A CHOKE	LD 067.2763			
L41	DELEVAN DROSSEL1025-00 LD 150UH BEI 0,17A 6,20HM CHOKE	LD 026.4055			
L45	JAHRE 72.10-1500K LD SPULE	646.1963			
L46	COIL				
L47	LD SPULE	646.1963			
L49	COIL				
L50	LD 10UH NUR DELEVAN 1025. COIL	451.5226			
L52	DELEVAN 1025-44 W-RECHTS LD SPULE	646.1970			
L53	COIL				
L54	LD 3,30UH10%0,850HMO,285A CHOKE	LD 067.2928			
L55	DELEVAN DROSSEL1025-32 LD 10UH NUR DELEVAN 1025. COIL	451.5226			
L56	DELEVAN 1025-44 W-RECHTS LD 0,10UH10%0,080HM1,400A CHOKE	LD 067.2740			
L57	DELEVAN DROSSEL1025-94 LD 0,10UH10%0,080HM1,400A CHOKE	LD 067.2740			
L58	DELEVAN DROSSEL1025-94 LD 10UH NUR DELEVAN 1025. COIL	451.5226			
L59	DELEVAN 1025-44 W-RECHTS LD 10UH NUR DELEVAN 1025. COIL	451.5226			
L104	DELEVAN 1025-44 W-RECHTS ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	LD 067.3001			
		451.5226			
		123.2317			

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
L105	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L106	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L114	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L133	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L134	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L135	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L140	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
L141	ZM ROHRK.RD3,5X1,2 K-UMH. TUBULARE CORE	123.2317	
N1	BO UA723DM ADJOA1 VREGL VOLTAGE REGULATOR THOMSON MA723MDG	BO 283.9425	
N2	BO UA723DM ADJOA1 VREGL VOLTAGE REGULATOR THOMSON MA723MDG	BO 283.9425	
N3	BO MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER NSC LM1558J	BO 275.0816	
N4	BO LF156J BIFET OPAMP OPERATIONAL AMPLIFIER MOTOROLA LF 156 J	645.7251	
N5	BO LF156J BIFET OPAMP OPERATIONAL AMPLIFIER MOTOROLA LF 156 J	645.7251	
N7	BO MC1558JG 2X OPAMP OPERATIONAL AMPLIFIER NSC LM1558J	BO 275.0816	
N9	BO LF156J BIFET OPAMP OPERATIONAL AMPLIFIER MOTOROLA LF 156 J	645.7251	
N10	BO MC1741SU OPAMP OPERATIONAL AMPLIFIER MOTOROLA MC1741SU	645.7268	
R1	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R2	RD 1,2W 0,1 OHM+-3% WIRE WOUND RESISTOR SAGE 1000S0,10HM+3%	RD 087.5216	
R3	RL 0,35W 110 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/110OHM-F-D	RL 082.9813	
R4	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-103	RS 247.7903	
R5	RS 0,5W10KOHM+-10%10X10X5 CERMET POTENTIOMETER T BOURNS 3386F-1-103	RS 247.7903	
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R6	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239	
R7	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R8	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R9	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	
R10	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/681OHM-F-D	RL 083.0490	
R11	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/681OHM-F-D	RL 083.0490	
R12	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160	
R13	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/475OHM-F-D	RL 083.0390	
R14	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R15	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/475OHM-F-D	RL 083.0390	
R16	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R17	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R18	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732	
R19	RL 0,35W 3,65KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,65K-F-C	RL 082.2260	
R20	RL 0,35W 1,50KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,50K-F-D	RL 083.0732	
R21	RL 0,35W 3,65KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,65K-F-C	RL 082.2260	
R22	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D	RL 083.0926	
R23	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D	RL 083.0926	
R24	RL 0,21W 2,74KOHM+-1%TK50 RESISTOR RESISTA MK1 2K74 1% TK50	RL 092.1496	



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R25	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R26	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990	
R27	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR	RL 083.1039	
R28	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R29	RL 0,1W 10,2KOHM+-1%TK50 RESISTOR DALE MF1/10 10,2K 1%TK50	RL 086.3278	
R30	RL 0,35W 2,74 OHM+-1%TK50 METALFILMRESISTOR RESISTA MK2 2,74 OHM+-1%TK50	RL 099.8973	
R31	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R32	RL 0,35W 5,62 OHM+-1% TK50 METALFILMRESISTOR RESISTA MK2 5,62 OHM 1% TK50	RL 099.8044	
R33	RL 0,35W 5,62 OHM+-1% TK50 METALFILMRESISTOR RESISTA MK2 5,62 OHM 1% TK50	RL 099.8044	
R34	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/221OHM-F-D	RL 083.0084	
R35	RL 0,21W 301 OHM+-1%TK50 RESISTOR RESISTA MK1 301OHM 1% TK50	RL 092.0183	
R36	RL 0,35W 1,0 OHM+-1%TK50 METALFILMRESISTOR RESISTA MK2 1,00 OHM 1% TK50	RL 099.7860	
R37	RL 0,35W 825 OHM+-1%TK50 RESISTOR DRALORIC SMA 0207/825OHM-F-C	RL 082.2502	
R38	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R39	RL 0,21W 22,1KOHM+-1%TK50 RESISTOR RESISTA MK1 22K1 1% TK50	RL 092.1609	
R40	RL 0,35W 1,0 OHM+-1%TK50 METALFILMRESISTOR RESISTA MK2 1,00 OHM 1% TK50	RL 099.7860	
R41	RL 0,21W 33,2 OHM+-1%TK50 RESISTOR RESISTA MK1 33,2OHM 1% TK50	RL 092.1244	
R42	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R43	RL 0,35W 5,62 OHM+-1% TK50 METALFILMRESISTOR RESISTA MK2 5,62 OHM 1% TK50	RL 099.8044	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in		
R44	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2210HM-F-D	RL 083.0084			
R45	RL 0,21W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR RESISTA MK1 1000HM 1% TK50	RL 092.1321			
R46	RL 0,21W 22,1KOHM+-1%TK50 RESISTOR RESISTA MK1 22K1 1% TK50	RL 092.1609			
R47	RL 0,21W 47,5 OHM+-1%TK50 RESISTOR RESISTA MK1 47,50HM 1% TK50	RL 092.1267			
R48	RL 0,35W 1,0 OHM+-1%TK50 METALFILMRESISTOR RESISTA MK2 1,00 OHM 1% TK50	RL 099.7860			
R49	RL 0,21W 392 OHM+-1%TK50 RESISTOR RESISTA MK1 3920HM 1% TK50	RL 092.1396			
R50	RL 0,21W 22,1KOHM+-1%TK50 RESISTOR RESISTA MK1 22K1 1% TK50	RL 092.1609			
R51	RL 0,21W 56,2 OHM+-1%TK50 RESISTOR RESISTA MK1 56,20HM 1% TK50	RL 092.1280			
R52	RL 0,21W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR RESISTA MK1 1000HM 1% TK50	RL 092.1321			
R53	RL 0,21W 22,1KOHM+-1%TK50 RESISTOR RESISTA MK1 22K1 1% TK50	RL 092.1609			
R54	RL 0,21W 47,5 OHM+-1%TK50 RESISTOR RESISTA MK1 47,50HM 1% TK50	RL 092.1267			
R55	RL 0,21W 392 OHM+-1%TK50 RESISTOR RESISTA MK1 3920HM 1% TK50	RL 092.1396			
R56	RL 0,21W 221 OHM+-1%TK50 RESISTOR RESISTA MK1 2210HM 1% TK50	RL 092.1367			
R57	RL 0,21W 10,0 OHM+-1%TK50 RESISTOR RESISTA MK1 10,00HM 1% TK50	RL 092.1715			
R58	RL 0,21W 10,0 OHM+-1%TK50 RESISTOR RESISTA MK1 10,00HM 1% TK50	RL 092.1715			
R59	RL 0,21W 2,21KOHM+-1%TK50 RESISTOR RESISTA MK1 2K21 1% TK50	RL 092.1480			
R60	RL 0,35W 221 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/2210HM-F-D	RL 083.0084			
R61	RL 0,21W 10,0 OHM+-1%TK50 RESISTOR RESISTA MK1 10,00HM 1% TK50	RL 092.1715			
R62	RL 0,21W 22,1KOHM+-1%TK50 RESISTOR RESISTA MK1 22K1 1% TK50	RL 092.1609			

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R64	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R65	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R66	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R67	RL 0,21W 2,74KOHM+-1%TK50 RESISTOR RESISTA MK1 2K74 1% TK50	RL 092.1496	
R70	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800	
R72	RL 0,35W 47,5KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/47,5K-F-C	RL 083.1800	
R73	RL 0,35W 47,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/47,5OHM-F-D	RL 082.9507	
R74	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D	RL 083.1351	
R75	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	
R76	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/12,1K-F-D	RL 083.1351	
R77	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D	RL 083.0926	
R78	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R79	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R80	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	
R81	RN 3X3,9KOHM+-2%SIL6 H 5 RESISTOR NETWORK BOURNS 4306R-102-392	RN 341.9970	
BIS/TO			
R84			
R85	RL 0,35W 6,81KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/6,81K-F-C	RL 082.2560	
R86	RL 0,35W 56,2 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,2OHM-F-D	RL 082.9571	
R87	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/681OHM-F-D	RL 083.0490	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R88	RL 0,35W 56,2 OHM+-1%TK50 RESISTOR	RL 082.9571	
R89	DRALORIC SMA0207/56,20HM-F-D RL 0,35W 5,62KOHM+-1%TK50 RESISTOR	RL 082.2190	
R90	DRALORIC SMA0207/5,62K-F-C RL 0,35W 12,1KOHM+-1%TK50 RESISTOR	RL 083.1351	
R91	DRALORIC SMA0207/12,1K-F-D RL 0,35W 5,62KOHM+-1%TK50 RESISTOR	RL 082.2190	
R92	DRALORIC SMA0207/5,62K-F-C RL 0,35W 5,62KOHM+-1%TK50 RESISTOR	RL 082.2190	
R93	DRALORIC SMA0207/5,62K-F-C RL 0,21W 1,82KOHM+-1%TK50 RESISTOR	RL 092.1473	
R94	RESISTA MK1 1K82 1% TK50 RL 0,21W 1,82KOHM+-1%TK50 RESISTOR	RL 092.1473	
R95	RESISTA MK1 1K82 1% TK50 RL 0,21W 332 OHM+-1%TK50 RESISTOR	RL 092.1380	
R96	RESISTA MK1 3320HM 1% TK50 RL 0,21W 332 OHM+-1%TK50 RESISTOR	RL 092.1380	
R97	RESISTA MK1 3320HM 1% TK50 RL 0,35W 1MOHM+-1%TK50 RESISTOR	RL 082.7862	
R98	DRALORIC SMA0207/1M-F-D RL 0,35W 47,5KOHM+-1%TK50 RESISTOR	RL 083.1800	
R99	DRALORIC SMA/207/47,5K-F-C RL 0,35W 56,2KOHM+-1%TK50 RESISTOR	RL 082.2231	
R100	DRALORIC SMA0207/56,2K-F-C RL 0,35W 3,32KOHM+-1%TK50 RESISTOR	RL 083.0990	
R101	DRALORIC SMA0207/3,32K-F-D RL 0,35W 1KOHM+-1%TK50 RESISTOR	RL 082.2160	
R102	DRALORIC SMA0207/1K-F-C RL 0,21W 562 OHM+-1%TK50 RESISTOR	RL 092.1415	
R103	RESISTA MK1 5620HM 1% TK50 RL 0,21W 75,0 OHM+-1%TK50 RESISTOR	RL 092.0119	
R104	DRALORIC SMA0204 75 OHM 1% RL 0,21W 750 OHM+-1%TK50 RESISTOR	RL 092.0231	
R105	RL 0,35W 12,1KOHM+-1%TK50 RESISTOR	RL 083.1351	
R106	DRALORIC SMA0207/12,1K-F-D RL 0,21W 150 OHM+-1%TK50 RESISTOR	RL 092.1344	
	RESISTA MK1 1500HM 1% TK50		


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R107

 RL 0,35W 2,21KOHM+-1%TK50
RESISTOR
DRALORIC SMA 0207/2,21K-F-C

RL 082.2477

R108

 RL 0,21W 2,21KOHM+-1%TK50
RESISTOR

RL 092.1480

R109

 RESISTA MK1 2K21 1% TK50
RL 0,21W 2,21KOHM+-1%TK50
RESISTOR

RL 092.1480

R110

 RESISTA MK1 2K21 1% TK50
RL 0,21W 33,2 OHM+-1%TK50
RESISTOR

RL 092.1244

R111

 RESISTA MK1 33,2OHM 1% TK50
RL 0,21W 56,2 OHM+-1%TK50
RESISTOR

RL 092.1280

R112

 RESISTA MK1 56,2OHM 1% TK50
TRIMMWERT
RS 0,3W20KOHM+-10% CERMET

087.8596

R113

 CERMET POTENTIOMETER
WESTON 548-00HS 20KOHM+-10%
RL 0,35W 10,0KOHM+-1%TK50

RL 083.1297

R115

 RESISTOR
DRALORIC SMA0207/10K-F-D
RL 0,35W 825 OHM+-1%TK50

RL 082.2502

R116

 RESISTOR
DRALORIC SMA 0207/8250HM-F-C
RS 0,5W2KOHM+-10%10X10X5

RS 247.7884

R117

 CERMET POTENTIOMETER T
BOURNS 3386F-1-202
RL 0,35W 15,0KOHM+-1%TK50

RL 083.1400

R119

 RESISTOR
DRALORIC SMA0207/15K-F-D
RL 0,35KOHM 1,24KOHM%TK50

RL 083.0661

R120

 RESISTOR
DRALORIC SMA0207/1,24K-F-D
RL 0,35W 274 OHM+-1%TK50

RL 083.0178

BIS/TO

R125

R126

 DRALORIC SMA0207/2740HM-F-D
RL 0,35W 100KOHM+-1%TK50
RESISTOR

RL 082.1764

BIS/TO

R131

R132

 DRALORIC SMA0207/100K-F-C
RL 0,35W 3,65KOHM+-1%TK50
RESISTOR

RL 082.2260

R133

 DRALORIC SMA0207/3,65K-F-C
RL 0,35W 22,1KOHM+-1%TK50
RESISTOR

RL 083.1545

R134

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

RL 083.1545

R135

 DRALORIC SMA/207/22,1K-F-C
RL 0,35W 15,0KOHM+-1%TK50
RESISTOR

RL 083.1400

DRALORIC SMA0207/15K-F-D

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R136	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R137	RL 0,35W 825 OHM+-1%TK50 RESISTOR DRALORIC SMA 0207/8250HM-F-C	RL 082.2502	
R139	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R140	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R141	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R142	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R143	RL 0,35W 47,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/47,50HM-F-D	RL 082.9507	
R144	RL 0,35W 825 OHM+-1%TK50 RESISTOR DRALORIC SMA 0207/8250HM-F-C	RL 082.2502	
R145	RL 0,35W 56,2 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/56,20HM-F-D	RL 082.9571	
R146	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 083.1039	
R147	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 082.2190	
R148	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097	
R149	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-D	RL 083.0390	
R150	RL 0,35W 475 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/4750HM-F-D	RL 083.0390	
R151	RL 0,35W 10,0 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/100HM-F-D	RL 082.8852	
R152	RL 0,35W 8,25 OHM+-1%TK50 METALFILMRESISTOR RESISTA MK2 8,25 OHM 1% TK50	RL 099.8080	
R153	RL 0,35W 27,4KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/27,4K-F-C	RL 082.2583	
R154	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	
R155	RL 0,35W 22,1KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/22,1K-F-C	RL 083.1545	


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**Kennzeichen
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**enthalten in
contained in**
R 156
**RL 0,35W 10,0KOHM+-1%TK50
RESISTOR**
RL 083.1297
R 157
**DRALORIC SMA0207/10K-F-D
RL 0,35W 4,75KOHM+-1%TK50
RESISTOR**
RL 083.1097
R 158
**DRALORIC SMA0207/4,75K-F-D
RL 0,35W 15,0KOHM+-1%TK50
RESISTOR**
RL 083.1400
R 159
**DRALORIC SMA0207/15K-F-D
RL 0,35W 100KOHM+-1%TK50
RESISTOR**
RL 082.1764
R 160
**DRALORIC SMA0207/100K-F-C
RL 0,35W 10,0KOHM+-1%TK50
RESISTOR**
RL 083.1297
R 161
**DRALORIC SMA0207/10K-F-D
RL 0,35W 47,5KOHM+-1%TK50
RESISTOR**
RL 083.1800
R 162
**DRALORIC SMA/207/47,5K-F-C
RL 0,35W 10,0KOHM+-1%TK50
RESISTOR**
RL 083.1297
R 163
**DRALORIC SMA0207/10K-F-D
RL 0,35W 100KOHM+-1%TK50
RESISTOR**
RL 082.1764
R 164
**DRALORIC SMA0207/100K-F-C
RL 0,35W 1KOHM+-1%TK50
RESISTOR**
RL 082.2160
R 165
**DRALORIC SMA0207/1K-F-C
RL 0,35W 27,40 OHM+-1%TK50
RESISTOR**
RL 082.9271
R 166
**DRALORIC SMA0207/27,40HM-F-D
RL 0,35W 27,40 OHM+-1%TK50
RESISTOR**
RL 082.9271
R 167
**DRALORIC SMA0207/27,40HM-F-D
RL 0,35W 47,5 OHM+-1%TK50
RESISTOR**
RL 082.9507
R 168
**DRALORIC SMA0207/47,50HM-F-D
RL 0,35W 5,62KOHM+-1%TK50
RESISTOR**
RL 082.2190
R 169
**DRALORIC SMA0207/5,62K-F-C
RL 0,35W 5,62KOHM+-1%TK50
RESISTOR**
RL 082.2190
R 170
**DRALORIC SMA0207/5,62K-F-C
RL 0,35W 1KOHM+-1%TK50
RESISTOR**
RL 082.2160
R 171
**DRALORIC SMA0207/1K-F-C
RL 0,35W 100 OHM+-1%TK50
DEPOS.-CARBON RESISTOR**
RL 082.6543
R 172
**DRALORIC SMA0207/100/HM-F-D
RL 0,35W 1KOHM+-1%TK50
RESISTOR**
RL 082.2160
R 173
**DRALORIC SMA0207/1K-F-C
RL 0,35W 475 OHM+-1%TK50
RESISTOR**
RL 083.0390
R 174
**DRALORIC SMA0207/4750HM-F-D
RL 0,35W 47,5 OHM+-1%TK50
RESISTOR**
RL 082.9507
DRALORIC SMA0207/47,50HM-F-D
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		11	0885	646.1528.01 SA	22
Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.		enthalten in contained in	
R175	RL 0,35W 1KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1K-F-C	RL 082.2160			
R176	RL 0,35W 2,74KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/2,74K-F-D	RL 083.0926			
R177	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297			
R178	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097			
R179	RL 0,35W 6,19KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/6,19K-F-C	RL 082.2283			
R180	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097			
R181	RL 0,35W 4,75KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/4,75K-F-D	RL 083.1097			
R182	RL 0,35W 20,0KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/20K-F-C	RL 083.1522			
R183	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297			
R184	RL 0,35W 47,5 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/47,5OHM-F-D	RL 082.9507			
R185	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297			
R186	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400			
R187	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239			
R188	RL 0,35W 8,25KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/8,25K-F-D	RL 083.1239			
R189	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/681OHM-F-D	RL 083.0490			
R190	RL 0,35W 681 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/681OHM-F-D	RL 083.0490			
R191	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297			
R192	RL 0,35W 18,2KOHM+-1%TK50 RESISTOR DRALORIC SMA/207/18,2K-F-C	RL 083.1480			
R193	RL 0,35W 3,32KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/3,32K-F-D	RL 083.0990			
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
R194	RL 0,35W 1,82KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/1,82K-F-C	RL 082.2277	
R195	RL 0,35W 3,92KOHM+-1%TK50 RESISTOR	RL 083.1039	
R196	RL 0,35W 2,21KOHM+-1%TK50 RESISTOR DRALORIC SMA 0207/2,21K-F-C	RL 082.2477	
R197	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R198	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R199	RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R200	RL 0,35W 5,62KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/5,62K-F-C	RL 082.2190	
R202	RL 0,35W 100 OHM+-1%TK50 DEPOS.-CARBON RESISTOR DRALORIC SMA0207/100/HM-F-D	RL 082.6543	
R203	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R204	RL 0,35W 562 OHM+-1%TK50 RESISTOR DRALORIC SMA0207/562OHM-F-D	RL 083.0461	
R205	RL 0,35W 1,0 OHM+-1%TK50 METALFILMRESISTOR	RL 099.7860	
R206	RESISTA MK2 1,00 OHM 1% TK50 RL 0,35W 100KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/100K-F-C	RL 082.1764	
R225	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R226	RL 0,35W 15,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/15K-F-D	RL 083.1400	
R227	RL 0,35W 10,0KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/10K-F-D	RL 083.1297	
R228	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
R229	RL 0,35W 33,2KOHM+-1%TK50 RESISTOR DRALORIC SMA0207/33,2K-F-C	RL 083.1674	
T1	LU UEBERTRAGER TRANSFORMER	646.2360	
T2	LU UEBERTRAGER TRANSFORMER	646.2360	

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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
T3	LU UEBERTRAGER TRANSFORMER	646.2376	
T4	LU UEBERTRAGER TRANSFORMER	646.2360	
T5	LU UEBERTRAGER TRANSFORMER	646.2376	
U1	BM SRA1 MIXER 0.5GHZ MIXER	BM 207.3465	
U2	MINI-CCTS SRA1 BM SRA1 MIXER 0.5GHZ MIXER MINI-CCTS SRA1	BM 207.3465	
V1	AE BB139 29/ 5PF CDI TUNING DIODE ITT BB139	AE 564.8394	
V2	AE BB139 29/ 5PF CDI TUNING DIODE ITT BB139	AE 564.8394	
V3	AK 2N2369A NPN 15V 200MA TRANSISTOR VALVO 2N2369A	AK 010.4680	
V4	AK BFY90 NPN 15V1.3GHZ TRANSISTOR VALVO BFY90	AK 010.4550	
V5	AK BFY90 NPN 15V1.3GHZ TRANSISTOR VALVO BFY90	AK 010.4550	
V6	AK BFY90 NPN 15V1.3GHZ TRANSISTOR VALVO BFY90	AK 010.4550	
V7	AE BZX79/C5V6 0,5W Z-DI ZENER DIODE VALVO BZX79/C5V6	AE 012.2455	
V8	AE BZX79/C3V3 0,5W Z-DI ZENER DIODE ITT ZPD3,3	AE 012.2390	
V9	AK BCY59IX NPN 45V 200MA TRANSISTOR SIEMENS BCY59IX	AK 010.5163	
V10	AE BZX79/C3V3 0,5W Z-DI ZENER DIODE ITT ZPD3,3	AE 012.2390	
V11	AK BFY90 NPN 15V1.3GHZ TRANSISTOR VALVO BFY90	AK 010.4550	
V12	AE BZX79/C4V7 0,5W Z-DI ZENER DIODE VALVO BZX79/C4V7	AE 012.2432	
V13	AD 1N4531 75V 0,15A UDI DIODE UNITRODE 1N4531	AD 082.6514	
V14	AK BFY90 NPN 15V1.3GHZ TRANSISTOR VALVO BFY90	AK 010.4550	

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

V15

AK BSS44 PNP 60V5000MA
TRANSISTOR

AK 086.8286

V17

AEG-TELEF. BSS44
AL BD140 PNP 80V 1A0
TRANSISTOR

AL 335.9642

V18

VALVO BD140
AK BCY59IX NPN 45V 200MA
TRANSISTOR

AK 010.5163

V19

SIEMENS BCY59IX
AK 2N2369A NPN 15V 200MA
TRANSISTOR

AK 010.4680

V26

VALVO 2N2369A
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V27

UNITRODE 1N4531
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V28

UNITRODE 1N4531
AK 2N2369A NPN 15V 200MA
TRANSISTOR

AK 010.4680

V29

VALVO 2N2369A
AK 2N2369A NPN 15V 200MA
TRANSISTOR

AK 010.4680

V30

VALVO 2N2369A
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V31

UNITRODE 1N4531
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V32

UNITRODE 1N4531
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V33

UNITRODE 1N4531
AK BFY90 NPN 15V1.3GHZ
TRANSISTOR

AK 010.4550

V34

VALVO BFY90
AK BFY90 NPN 15V1.3GHZ
TRANSISTOR

AK 010.4550

V35

VALVO BFY90
AK BFY90 NPN 15V1.3GHZ
TRANSISTOR

AK 010.4550

V36

VALVO BFY90
AK BCY59IX NPN 45V 200MA
TRANSISTOR

AK 010.5163

V37

SIEMENS BCY59IX
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V38

UNITRODE 1N4531
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V39

UNITRODE 1N4531
AD 1N4531 75V 0,15A UDI
DIODE

AD 082.6514

V40

UNITRODE 1N4531
AK BFY90 NPN 15V1.3GHZ
TRANSISTOR

AK 010.4550

VALVO BFY90

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		11	0885	646.1528.01 SA	26
Kennzeichen Component No.	Benennung/Beschreibung Designation		Sachnummer Stock No.	enthalten in contained in	
V41	AK BFY90 NPN 15V1.3GHZ TRANSISTOR		AK 010.4550		
V42	VALVO BFY90 AM BS250 PKAN POW.MOSF MOS-FET INTERMETAL BS250		AM 566.1216		
BIS/TO					
V47					
V48	AK BCY59IX NPN 45V 200MA TRANSISTOR		AK 010.5163		
V49	SIEMENS BCY59IX AK BCY59IX NPN 45V 200MA TRANSISTOR		AK 010.5163		
V50	SIEMENS BCY59IX AD 1N4531 75V 0,15A UDI DIODE		AD 082.6514		
V51	UNITRODE 1N4531 AD 1N4531 75V 0,15A UDI DIODE		AD 082.6514		
V52	UNITRODE 1N4531 AD 1N4531 75V 0,15A UDI DIODE		AD 082.6514		
W1	DX KABEL CABLE		646.2199		
W2	DX KABEL CABLE		646.2201		
X5	FP INDIREKT.STECKERL.36P. PIN CONNECTOR		FP 242.3600		
X8	BERG 75160-102-36 FP INDIREKT.STECKERL.36P. PIN CONNECTOR		FP 242.3600		
X11	BERG 75160-102-36 FP INDIREKT.STECKERL.36P. PIN CONNECTOR		FP 242.3600		
X14	BERG 75160-102-36 FP INDIREKT.STECKERL.36P. PIN CONNECTOR		FP 242.3600		
X16	BERG 75160-102-36 FP INDIREKT.STECKERL.36P. PIN CONNECTOR		FP 242.3600		
X21	BERG 75160-102-36 FP STECKERLEISTE 32POL. MULTIPOINT CONNECTOR		FP 514.4550		
X22	PANDUIT 100-232-033/999 FJ EINBAUSTECKER SYST.SMB FIXED CONNECTOR		FJ 063.5116		
BIS/TO	ROSENBERG 59S601-200D2				
X29					
X30	FP INDIREKT.STECKERL.36P. PIN CONNECTOR		FP 242.3600		
	BERG 75160-102-36				
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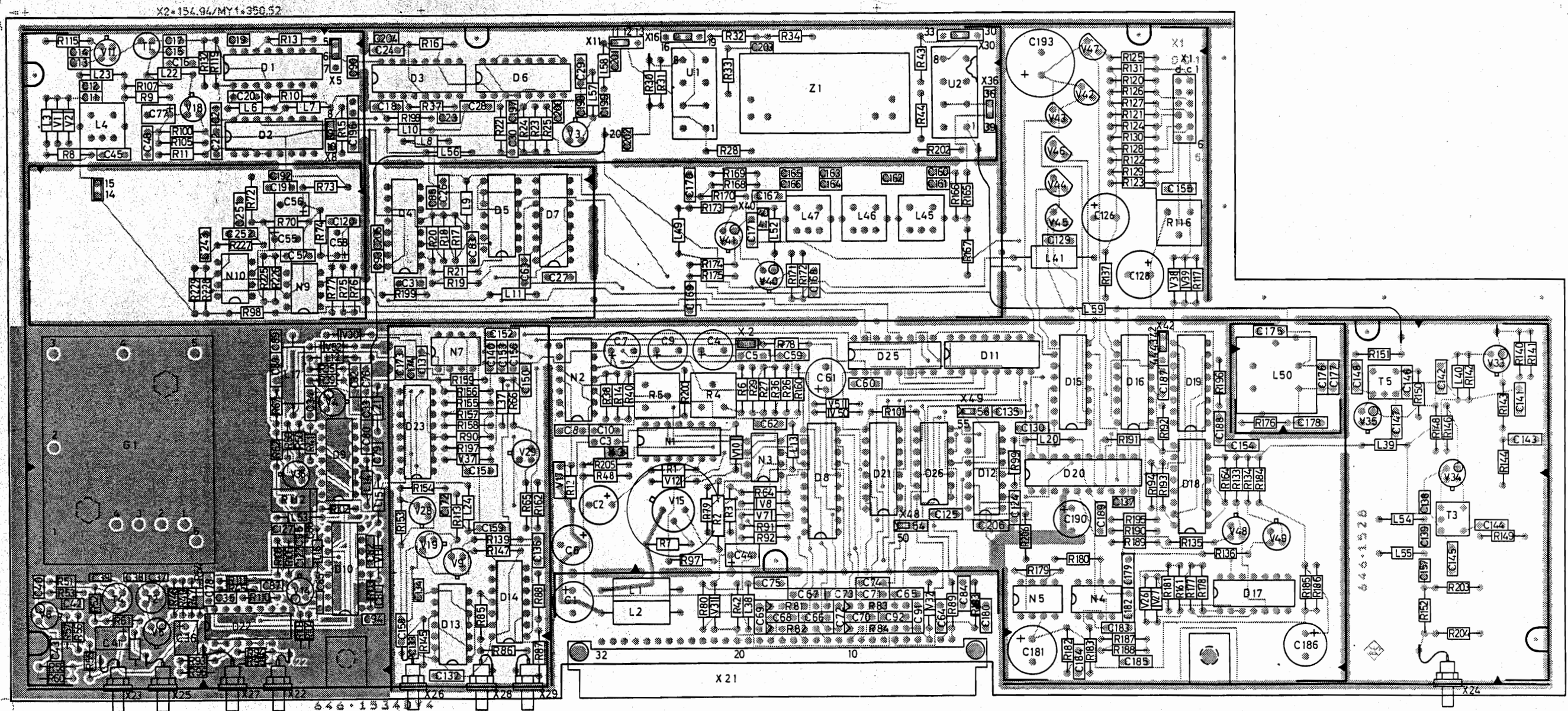
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Kennzeichen Component No.	Benennung/Beschreibung Designation	Sachnummer Stock No.	enthalten in contained in
X36	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X40	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X42	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X45	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X47	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X48	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X49	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X1C	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X1D	FP INDIREKT.STECKERL.36P. PIN CONNECTOR BERG 75160-102-36	FP 242.3600	
X11B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X14B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X16B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X30B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X36B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X40B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X42B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X45B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X47B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	
X48B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302	FP 491.7042	

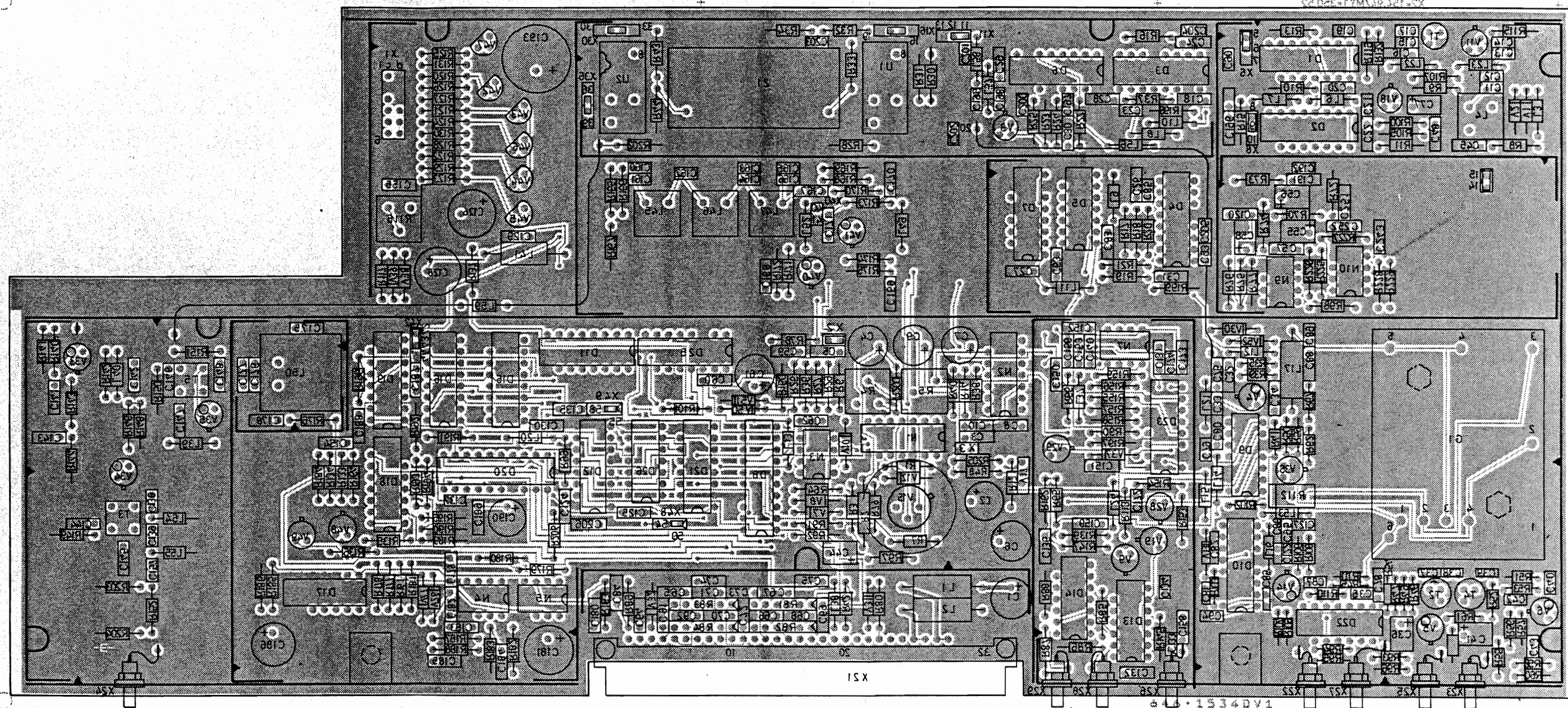
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		11	0885		646.1528.01 SA	28
Kennzeichen Component No.	Benennung/Beschreibung Designation			Sachnummer Stock No.	enthalten in contained in	
X49B	FF KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302			FP 491.7042		
X5B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302			FP 491.7042		
X8B	FP KURZSCHLUSSBUCHSE SHORTING PLUG PK 452-70302			FP 491.7042		
Z1	EP 78,095MHZ-BANDP.8:110K 78,095MHZ-BANDPASS,BW110K KVG R&S-ZCHNG.089.1147			089.1147		
						- ENDE -
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Ansicht und Leitungsführung Bauteilseite
View of tracks on component side



Ansicht und Leitungsführung Lötseite
View of tracks on solder side



(hierzu HVC 250)



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

E	35152	12.85	TA	Maße ohne Toleranzangabe		Maßstab 1 : 1			
						Halbzeug, Werkstoff			
				6KBE	Tag	Name	Benennung Synthesizer	Z	
				Bearb.	12.85	TA			
				Gepr.					
				Norm					
				 ROHDE & SCHWARZ			Zeichn.-Nr.	Blatt-Nr. 3	
									646.1528.01
Änd. Zust.	Änderungs- Mitteilung	Tag	Name	zu Gerät GF 852 P1			red. i. V. 646 1511 V	erste Z. 646 1511 01	v. Bl.