

Technical Manual

Field Radio Unit

Manpack Transceiver

SE 6861/12 mod

Frequency Range 1.5 MHz to 30 MHz

**Downloaded by
RadioAmateur.EU**

TELEFUNKEN SYSTEMTECHNIK GMBH
Fachbereich Empfaenger und Peiler
Sedanstraße 10
Postfach 1730

W-7900 Ulm (Donau)
Bundesrepublik Deutschland

Technical Manual No. 5X.0172.232.78
Issue 1012 Bs/Di/Gud/Mi (Gr)

Copying of this document, and giving it to others and the use or communication of the contents thereof, are forbidden without express authority. Offenders are liable to the payment of damages. All rights are reserved in the event of the grant of a patent or the registration of a utility model or design.

FOREWORD

This technical manual is valid for Field Radio Units of the Type Series SE 6861/12 mod and /22 mod.

Separate technical manuals exist for the auxiliary equipment units listed below.

Transmitter Amplifier	SV 6863
Vehicle Mount	FH 6865/24
Battery Charger	LG 6874/3
Antenna Tuning Unit	ASG 6861

Remotely controllable 20 W HF-Transceiver with/without antenna tuning unit.
SE 6861/32 mod or /42 mod with control unit BG 6861/1 mod.

Note: In the operating instructions the 20 W Field Radio Unit SE 6861/12 mod is called "20 W HF Manpack Transceiver SE 6861".



1-9072/11

Field Radio Unit SE 6861/12 mod as Manpack

CONTENTS

		Page
1	DESCRIPTION	
1.1	General Information	1-01
1.1.1	Designation	1-01
1.1.2	Possible Utilization and Versions	1-01
1.1.3	General Description	1-01
1.1.3.1	Modular Construction	1-02
1.1.3.2	Power Supply Units	1-04
1.2	Scope of Delivery	1-05
1.2.1	Standard Version	1-05
1.2.2	Special Accessories	1-05
1.2.3	Replacement Parts	1-06
1.3	Technical Data	1-07
1.3.1	Electrical Data	1-07
1.3.2	Mechanical Data	1-08
1.3.3	Dimensions and Weights	1-09
1.4	Functional Principles	1-10
1.4.1	Transmission	1-10
1.4.2	Reception	1-11
1.5	Accessories	1-12
1.5.1	Antennas	1-12
1.5.2	Modulation Devices	1-12
1.5.3	Carrying Bags	1-12
1.5.4	Vehicle Mount FH 6864	1-12
1.5.5	Separated Manual Control Unit	1-13
2	OPERATING INSTRUCTIONS	
2.1	Special Precautions to Prevent Accidents	2-01
2.2	Setting-Up and Taking-Down	2-01
2.2.1	Explanation of the Plug Connectors	2-01
2.2.1.1	Antenna Connection	2-01
2.2.1.2	Connection the Battery Pack	2-01
2.2.1.3	Connecting Accessories	2-01
2.3	Checks before Commissioning	2-02
2.4	Commissioning and Operation	2-02
2.4.1	Functions of the Manual Control Elements	2-02
2.4.2	Operation	2-02
2.4.2.1	Switching-On	2-03
2.4.2.2	Switching-Off	2-03
2.4.2.3	Manual Frequency Setting	2-03

2.4.2.4	Setting or Changing a Memory-Stored Frequency	2-03
2.4.2.5	Operating Procedure	2-04
2.4.3	Operational Monitoring	2-04
2.5	Operation under Severe Environmental Conditions	2-06
2.6	Care	2-06
3	MAINTENANCE AND REPAIRS BY OPERATING STAFF	
3.1	Maintenance by Operating Staff	3-01
3.1.1	Special Tools	3-01
3.1.2	Maintenance Time Schedule	3-01
3.1.3	Illumination	3-02
3.1.3.1	Volume Control	3-02
3.1.3.2	Channel Selection	3-02
3.1.3.3	Channel Memory	3-02
3.1.3.4	RF Output Power	3-02
3.1.3.5	Tuning Time	3-02
3.1.3.6	AF Amplification	3-03
3.1.3.7	Battery Pack	3-03
3.1.3.8	Discontinuation of Operation	3-03
3.2	Repairs by Operating Staff	3-04
3.2.1	Special Tools, Measuring Units and Test Equipments	3-04
3.2.2	Simple Fault Tracing	3-04
3.2.3	Replacing Modules	3-04
3.2.3.1	Basic Unit	3-04
3.2.3.1.1	Front Head	3-04
3.2.3.1.2	20 W Amplifier	3-05
3.2.3.1.3	Antenna Tuning Unit ASG	3-05
3.2.3.1.4	Plug-In Modules	3-05
3.2.3.1.5	Synthesizer	3-05
3.2.3.2	Battery Pack BT 6861/11	3-05
3.2.3.2.1	Front Head	3-05
3.2.3.2.2	Battery Blocks	3-06
3.2.3.2.3	DC/DC Converter	3-06
3.2.3.2.4	Charging Device	3-06
3.2.3.3	Fuses	3-06
3.3	Material conservation during long idle periods	3-06
4	REPAIRS BY TRAINED PERSONNEL	
4.1	Special Tools, Measuring Units and Test Equipments	4-01
4.1.1	General Measuring Equipment	4-01
4.2	Functional Principles	4-02
4.2.1	Front Heads	4-02
4.2.1.1	Standard Front Head	4-02

4.2.1.2	Power Reduction/HF-Attenuation	4-02
4.2.2	20 W Amplifier	4-03
4.2.3	Harmonics Filter Subassembly	4-04
4.2.4	RF Module	4-05
4.2.5	IF Filter Module	4-07
4.2.6	IF/AF Module	4-08
4.2.7	Organizer	4-10
4.2.7.1	Channel Memory	4-12
4.2.8	Synthesizer	4-13
4.2.8.1	Programmable Frequency Divider	4-13
4.2.8.2	Converter Mixer Converter Module	4-16
4.2.8.3	Vernier Frequency Control Loops	4-17
4.2.8.4	9.91 MHz Phase Locked Loop	4-18
4.2.8.5	Phase Comparator	4-18
4.2.8.6	Oscillator	4-19
4.2.8.7	Digital Setting of the Oscillator	4-21
4.2.9	Power supply Units	4-22
4.2.9.1	Battery Pack BT 6861/11	4-22
4.2.9.1.1	Battery Pack Circuit Board	4-22
4.2.9.1.2	DC/DC Converter	4-23
4.2.9.2	Vehicle Mount FH 6865/24 (Fig. 21)	4-24

4.5 Illustrations

Frontispiece	Field Radio Unit SE 6861/12 mod as Manpack	V
Fig. 1	Basic unit with standard fronthead and Battery pack BT 6861/11	B 01
Fig. 2	Basic unit in Vehicle Mount FH 6865/24	B 02
Fig. 3	100 W HF Transceiver Equipment SE 6863, with external antenna matching unit	B 03
Fig. 4	Basic unit, removed from shielding can	B 04
Fig. 5	Standard front head, front view	B 05
Fig. 6	Standard front head, rear view	B 06
Fig. 7	20 W power amplifier	B 07
Fig. 8	Antenna matching unit, opened	B 08
Fig. 9	Harmonics filter module, dismantled	B 09
Fig. 10	RF module, dismantled	B 10
Fig. 11	IF filter module, dismantled	B 11
Fig. 12	IF/AF module, dismantled	B 12
Fig. 13	Organizer/memory module, dismantled	B 13
Fig. 14	Channel memory (front) organizer	B 14
Fig. 15	Synthesizer, complete	B 15
Fig. 16	Synthesizer, opened	B 16
Fig. 17	Motherboard of Synthesizer	B 17
Fig. 18	Frame of the basic unit	B 18
Fig. 19	Battery pack BT 6861/11	B 19
Fig. 20	Battery pack 6861/31	B 20
Fig. 21	Vehicle Mount FH 6865/24	B 21
Fig. 22	Rod antenna, folded	B 22
Fig. 23	Morse key	B 23
Fig. 24	Handset voice equipment	B 24
Fig. 25	Backpack carrying bag	B 25
Fig. 26	Vehicle Mount FH 6864	B 26

Fig. 27	SE 6861/12 mod, front side with indication, manual control elements and connectors	B 27
Fig. 28	Linking screws on the basic unit	B 28
Fig. 29	Taking out the modules	B 29
Fig. 30	Taking out the plug-in modules	B 30
Fig. 31	Front head and frame, separated	B 31
Fig. 32	Taking out the modules	B 32
Fig. 33	Basic unit, topside and rear side	B 33
Fig. 34	Battery pack front head BT 6861/11	B 34
Fig. 35	Battery pack front head BT 6861/11 with removed fuse cover	B 35
Fig. 36	Battery pack front head BT 6861/31 with removed fuse cover	B 36
Fig. 37	Battery pack BT 6861/11, dismantled into front head, shielding can and battery blocks	B 37
Fig. 38	Battery pack BT 6861/31, with Lithium/Mangan Battery, removed from shielding can	B 38
Fig. 39	Lithium/Mangan dioxyde Battery 39.2 V, 10 Ah	B 39
Fig. 40	Taking out the DC/DC converter	B 40
Fig. 41	3 soldered connections on the DC/DC converter	B 41
Fig. 42	Soldered connections on the battery charger	B 42
Fig. 43	Loudspeaker LS 6861	B 43

4.6 List of Components

4.6.1	Battery Pack Circuit Board	SA 01
4.6.2	Standard Front Head	SA 01
4.6.3	Chassis	SA 02
4.6.4	Standard Front Head	SA 02
4.6.5	Chassis	SA 02
4.6.6	Converter	SA 03
4.6.7	Fuse Plate	SA 04
4.6.8	Cable	SA 04
4.6.9	Mother Board (not valid for SE 6861/12 mod)	SA 05
4.6.10	Standard Front Head	SA 05
4.6.11	AF Volume Control	SA 06
4.6.12	Relay Circuit Board	SA 06
4.6.13	Amplifier	SA 07
4.6.14	Mother Board	SA 09
4.6.15	Coil Assembly	SA 09
4.6.16	Relay Assembly	SA 09
4.6.17	Sensor 1	SA 10
4.6.18	Sensor 2	SA 13
4.6.19	CPU	SA 15
4.6.20	Harmonic Filter	SA 16
4.6.21	RF Circuit Board	SA 18
4.6.22	IF Filter	SA 22
4.6.23	IF/AF Module	SA 24
4.6.24	Memory	SA 28
4.6.25	Organizer	SA 28
4.6.26	Programm. Frequency Divider	SA 31
4.6.27	Mixer Converter Module	SA 32

4.6.28	Vernier Control Loop	SA 34
4.6.29	Control Loop 9.91 MHz	SA 36
4.6.30	Phase Comparator	SA 37
4.6.31	Oscillator	SA 38
4.6.32	Digital Oscillator Drive Circuit	SA 40
4.6.33	Mother Board	SA 40
4.6.34	Mother Board	SA 41
4.6.35	Standard Front Head	SA 41
4.6.36	Power Reduction	SA 42
4.6.37	Sideband Frequency Generation	SA 44
4.6.38	Synthesizer	SA 45

4.7 Annexes

Annex 1	General Circuit Diagram Field Radio Unit SE 6861/12 mod
Annex 2	Signal Level Diagram Field Radio Unit SE 6861/12 mod
Annex 3	Signal Level Diagram "Reception" Field Radio Unit SE 6861/12 mod
Annex 4 Sheet 1 ... 7	Contact Functions List Field Radio Unit SE 6861/12 mod
Annex 5 Sheet 1	Circuit Diagram of Fronthead Field Radio Unit SE 6861/12 mod
Sheet 2	Components Layout Diagram of Fronthead Field Radio Unit SE 6861/12 mod
Annex 6	General Circuit Diagram of 20 W Amplifier Field Radio Unit SE 6861/12 mod
Annex 7	Circuit Diagram of 20 W Amplifier Field Radio Unit SE 6861/12 mod
Annex 8	Circuit Diagram of Power Reduction Field Radio Unit SE 6861/12 mod
Annex 9	Circuit Diagram of Harmonics Filter Filter Radio Unit SE 6861/12 mod
Annex 10	General Circuit Diagram of RF Circuit Board Field Radio Unit SE 6861/12 mod

- Annex 11 Circuit Diagram
 of RF Circuit Board
 Field Radio Unit SE 6861/12 mod
- Annex 12 General Circuit Diagram
 of IF Filter and
 Sideband Frequency Generation
 Field Radio Unit SE 6861/12 mod
- Annex 13 Circuit Diagram
 of IF Filter
 Field Radio Unit SE 6861/12 mod
- Annex 14 Circuit Diagram
 of Sideband Frequency Generation
 Field Radio Unit SE 6861/12 mod
- Annex 15 General Circuit Diagram
 of IF/AF Circuit Board
 Field Radio Unit SE 6861/12 mod
- Annex 16 Circuit Diagram
 of IF/AF Circuit Board
 Field Radio Unit SE 6861/12 mod
- Annex 17 General Circuit Diagram
 of Organizer
 Field Radio Unit SE 6861/12 mod
- Annex 18 Circuit Diagram
 of Organizer
- Annex 19 Circuit Diagram
 of Memory
 Field Radio Unit SE 6861/12 mod
- Annex 20 General Circuit Diagram
 of Synthesizer
 Field Radio Unit SE 6861/12 mod
- Annex 21 Circuit Diagram
 for Mothercard of Synthesizer
 Field Radio Unit SE 6861/12 mod
- Annex 22 General Circuit Diagram
 of a four-stage Frequency Divider
 Configuration for four-digit N
 Field Radio Unit SE 6861/12 mod
- Annex 23 General Circuit Diagram
 of a programmable Frequency Divider
 according to the "swallow counting" Principle
 Field Radio Unit SE 6861/12 mod

**Downloaded by
RadioAmateur.EU**

- Annex 24 Circuit Diagram
for programmable Frequency Divider
Field Radio Unit SE 6861/12 mod
- Annex 25 General Circuit Diagram
of Mixer Converter Module
Field Radio Unit SE 6861/12 mod
- Annex 26 Circuit Diagram
for Mixer Converter Module
Field Radio Unit SE 6861/12 mod
- Annex 27 General Circuit Diagram
of 10 MHz Processing Circuit
Field Radio Unit SE 6861/12 mod
- Annex 28 General Circuit Diagram
of 1 kHz Phase Locked Loop
Field Radio Unit SE 6861/12 mod
- Annex 29 General Circuit Diagram
of Range Selection for Master Oscillator
Field Radio Unit SE 6861/12 mod
- Annex 30 General Circuit Diagram
of Vernier Frequency Control Loop
Field Radio Unit SE 6861/12 mod
- Annex 31 Circuit Diagram
for Vernier Frequency Control Loop
Field Radio Unit SE 6861/12 mod
- Annex 32 Pulse Diagrams
for Sampling Discriminator
Field Radio Unit SE 6861/12 mod
- Annex 33 Circuit Diagram
for 9.91 MHz Phase Locked Loop
Field Radio Unit SE 6861/12 mod
- Annex 34 General Circuit Diagram
of Phase Comparator
Field Radio Unit SE 6861/12 mod
- Annex 35 Circuit Diagram
for Phase Comparator
Field Radio Unit SE 6861/12 mod
- Annex 36 General Circuit Diagram
of Oscillator
Field Radio Unit SE 6861/12 mod

- Annex 37 Subdivision of the
Oscillator Frequency Range
41.59 MHz to 70.0899 MHz
Field Radio Unit SE 6861/12 mod
- Annex 38 Circuit Diagram
for Oscillator
Field Radio Unit SE 6861/12 mod
- Annex 39 Circuit Diagram
for Digital Setting of the Oscillator
Field Radio Unit SE 6861/12 mod
- Annex 40 Circuit Diagram
of Mothercard
Field Radio Unit SE 6861/12 mod
- Annex 41 Circuit Diagram
of Battery Pack BT 6861/11
Field Radio Unit SE 6861/12 mod
- Annex 42 Circuit Diagram
of Battery Pack BT 6861/31
Field Radio Unit SE 6861/12 mod
- Annex 43 General Circuit Diagram
of DC/DC Converter
Field Radio Unit SE 6861/12 mod
- Annex 44 Circuit Diagram
of DC/DC Converter
Field Radio Unit SE 6861/12 mod
- Annex 45 Components Layout Diagram
of Fuse Board
Field Radio Unit SE 6861/12 mod

1 DESCRIPTION

1.1 General Information

1.1.1 Designation

The unit described in this technical manual bears the designation "Field Radio Unit SE 6861/12 mod".

1.1.2 Possible Utilization and Versions

The field radio unit without power supply unit is called the basic unit.

Depending on the particular application, the basic unit is available with or without antenna tuning unit and it can be equipped with various front heads. This gives the following possible equipment combinations for various tasks and/or together with a 100 W transmitter amplifier:

- 1) Portable versions
 - SE 6861/12 mod basic unit with antenna tuning unit, not remotely controllable
 - SE 6861/22 mod basic unit without antenna tuning unit, not remotely controllable
 - SE 6861/32 mod basic unit with antenna tuning unit, remotely controllable
 - SE 6861/42 mod basic unit without antenna tuning unit, remotely controllable

A battery pack is required for each equipment unit.

- 2) Mobile and stationary versions

A 20 W transceiver station (mobile or stationary) consists of one of the basic units listed under 1) and a Vehicle Mount FH 6864 or FH 6865/24.

Further accessories are described in Section 1.5.

The basic unit is powered by a Battery Pack BT 6861/11 or BT 6861/31 when using the Vehicle Mount FH 6864 (Fig. 26) or by the vehicle mount itself when using a Vehicle Mount FH 6865/24 (Fig. 2).

A 100 W transceiver station (mobile or stationary) consists of one of the basic units listed under 1), a Vehicle Mount FH 6865/24 and the 100 W Transmitter Amplifier SV 6863. A basic unit without antenna matching unit may be used, provided that it always remains in the vehicle mount. Antenna matching is made in this case with the external Antenna Matching Unit AC 150 (Fig. 3).

When using the basic unit SE 6861/32 mod or SE 6861/42 mod, a remote control cable and the separated Manual Control Unit BG 6861/1 mod are required too.

1.1.3 General Description

The 20 W Field Radio Unit SE 6861 (Fig. 1) is a double sideband transceiver with double frequency conversion. It covers the frequency range from 1.5 MHz to 30 MHz in 100 Hz tuning steps. Thus a total of 285 000 frequency channels are available.

Manual control procedure for the field radio unit is as simple as for a VHF unit, so that this transceiver can be operated even by unskilled staff after brief introduction. The procedure for changing the operating frequency is particularly simple: the wanted operating frequency is entered in digital form. Four memory-stored frequencies (channel 1 to 4) and the manually established setting of the frequency keys (channel 0) are available.

The heart of the field radio unit is a synthesizer employing the latest technology (CMOS integrated circuits) with a power consumption of about two Watts. The transmitter and receiver sections of the unit are constructed in modern wideband technology with high-side intermediate frequency (40 MHz). This obviates all mechanical tuning devices and thus the chief sources of breakdown in former technology.

The transmitter output power is 20 Watts and can be switched over to 2 Watts.

The built-in Antenna Tuning Unit ASG 6861 automatically matches the antennas of the field radio unit to the transmitter output. The available service types are A1A (CW) and J3E (SSB) either in the upper (USB) or lower sideband (LSB). Service types F1B or J7B (AFSK) LSB or USB are possible too with an external modem.

By virtue of its light weight, small dimensions and insensitivity to climatic and mechanical stress, the Field Radio Unit SE 6861 is particularly suitable for operation under the most severe environmental conditions in all branches of the armed forces (it fulfils the requirements of the VG 95332).

For use as portable unit, a battery pack and various voice sets are available. The Field Radio Unit SE 6861 can be carried as a man-pack in the corresponding carrying bag, and it can be operated at the same time.

Operation is also possible with accessory units in motor vehicles, in fixed stations and on board ships. In these applications the field radio unit can be extended with the wideband Transmitter Amplifier SV 6863 to constitute a complete 100 W HF band transceiver equipment.

1.1.3.1 Modular Construction

The basic unit is housed in a metal can which is attached with six captive screws from the front head (Fig. 4).

The individual modules are accessible after removing the metal can. These are:

- Front head
- 20 W amplifier
- Antenna tuning unit
- Harmonics filter x)
- RF module x)
- IF filter x)
- IF/AF module x)
- Organizer/memory x)
- Synthesizer

All functional units have been designed as self-contained modules, i.e. they can be replaced without requiring realignment. These modules are merely screwed to the frame of the basic unit and linked electrically via plug connectors, so that replacements can be carried out very rapidly.

Note: Modules of the basic units in the type series SE 6861/12 mod, /22 mod, /32 mod and /42 mod cannot be interchanged with modules from basic units of the earlier type series SE 6861/12, /22, /32 and /42 respectively SE 6861/11, /21, /31 and /41.

Attention: Due to the additional electrical functions of the type series SE 6861/XY mod interchanging with modules of the earlier type series is only admissible if they had been modified accordingly before!

When replacing the organizer-memory or the harmonics-filter modules between basic units belonging to different type series, circuit compatibility considerations require that in case of the former type series SE 6861/11, /12, /31 and /41 always both these modules must be replaced together.

The front head (Fig. 5 and 6) carries all manual control elements which are required for operating the equipment, and the AF and antenna connectors (see Section on operating procedure).

The modules designated with x) in the above list are particularly easy to replace. They can be pulled out of the unit with a special holder which is used as tool, without any need to release screw attachments.

The 20 W amplifier circuit board is screwed to the left side frame section of the field radio unit. Thermal conduction paste is used at the fixing point (see "instructions for dismantling") to improve heat removal.

The antenna tuning unit is located as complete functional subunit in a metal case which is screwed to the left frame side underneath the antenna jack. The electrical connections are routed via a plug strip connector and via plugged coaxial cables for the RF lines. See Fig. 8.

Its internal construction is based on the same principle. The case contains four plug-in subassemblies which are connected together via an internal motherboard with plug strip connectors.

The five plug-in modules harmonics filter (Fig. 9), RF module (Fig. 10), IF filter (Fig. 11), IF/AF module (Fig. 12) and Organizer are also mounted in respective metal cans which are linked via plug strip connectors to the motherboard of the basic unit. The RF signals are routed internally and to other modular subassemblies via plugged coaxial cables.

The organizer contains two printed circuit cards which have different functions. These are the organizer board and the channel memory board. They are screwed together in the common case (Fig. 13 and 14).

The synthesizer (Fig. 15, 16 and 17) is a complete functional subunit like the antenna tuning unit. It is housed in a metal case which is screwed to the right side of the frame. The electrical connections are established via a plug strip connector which is plugged onto the motherboard of the basic unit. The RF connections are routed via plugged coaxial cables.

The circuitry comprises seven plug-in printed circuit cards which are linked together via an internal motherboard and plug strip connectors in the top part of the synthesizer case.

Fig. 18 shows the frame of the basic unit.

1.1.3.2 Power Supply Units

The basic unit and the power supply unit are linked electrically via a ten-pole plug connector. Locating pins and snap catches provide firm and quickly established mechanical attachment.

The power supply unit Battery Pack BT 6861/11 (Fig. 19) or BT 6861/31 (Fig. 20) are used in the portable version of the field radio unit and when using the simple Vehicle Mount FH 6864.

The power supply unit Vehicle Mount for 24 V Board Electrical Systems FH 6865/24 is used when the field radio unit is used as drive unit for a 100 W transmitter amplifier in a 100 W transceiver equipment.

Each power supply unit contains an easily replaceable DC/DC converter which converts the battery or board electrical system input voltage to 14.5 V output voltage. The Battery Pack BT 6861/11 can be connected to battery chargers or external power supplies via a ten-pole plug connector (see Section 4.2.9.1).

The board system supply voltage is connected to the battery plug connector ST 1 on the vehicle Mount-FH 6865/24.

1.2 Scope of Delivery

1.2.1 Standard Version

Pos.	Qty.	Description	Part Number
1	1	Field Radio Unit SE 6861/12 mod, optionally consisting of:	
1.1	1	Basic unit with antenna tuning unit, not remotely controllable, SE 6861/12 mod	52.6871.001.00
1.2	1	Basic unit without antenna tuning unit, not remotely controllable, SE 6861/12 mod	52.6871.971.00
2	1	Power supply, comprising: Battery Unit BT 6861/11 (NiCd 1.8 Ah, rechargeable)	51.6861.600.00
2.1	1	The battery pack is not required when using the Vehicle Mount FH 6865/24	52.6875.701.00
3	1	Rod antenna	5L.7611.001.49
4	1	Handset voice equipment	5L.7716.001.45 or 5L.7716.001.44
5		Technical Manuals	
5.1		20 W HF Manpack Transceiver SE 6861/12 mod	5X.0172.232.78
5.2		Antenna Tuning Unit ASG 6861	5X.0172.227.97

1.2.2 Special Accessories (must be ordered separately)

Pos.	Qty.	Description	Part Number
1	1	Transmitter Amplifier SV 6863	51.6873.009.00
2	1	Vehicle Mount FH 6865/24	52.6875.701.00
3	1	Morse Key	51.6864.305.01 LV
4	1	Battery Unit BT 6861/31 (Lithium 10 Ah, not rechargeable)	52.6871.721.00
5	1	Carrying bags	52.6871.920.00 or 52.6871.925.00

1.2.3 Replacement Parts

The following modules, which can be replaced according to the dismantling instructions are available as replacement parts for repairs which can be carried out by the operating staff:

Front head (basic unit)	52.6871.050.00
20 W transmitter amplifier	52.6861.070.00
Antenna tuning unit	52.6861.100.00
Harmonics filter module	52.6861.250.00
RF circuit board	52.6861.270.00
IF filter module	52.6861.290.00
IF/AF module	52.6861.310.00
Organizer	52.6861.350.00
Memory	52.6861.330.00
Synthesizer	52.6871.400.00
Front head (battery pack)	51.6861.615.00
DC/DC converter	51.6861.630.00
Fuses	5L.4811.003.87
Fuses	5L.4811.003.90
Fuses	5L.4811.003.85

The plugged RF cables between the modules are also required as replacement parts. The set of replacement parts to be held in stock must be determined individually.

1.3 Technical Data

1.3.1 Electrical Data

Service types:	A1A, J3E (LSB, USB), with external modem also F1B (AFSK)
Frequency range:	1.5 to 29.9999 MHz
Frequency setting:	In 100 Hz steps by six decade switches (can be illuminated) Five preset channels selectable with the digital switches and can be called by pressing a button
Frequency stability:	1 ppm (-20 to +55 °C), 2 ppm (-40 to < -20 °C)
Antenna tuning:	Fully automatic; microprocessor controlled, max. tuning time 5 s, typ. 2...3 s
Antennas:	3.3 m whip or long-wire antennas
Transmitter	
Output power:	nominally 20 Watts into 50 Ohms, can be switched to 2 W
Harmonics rejection:	50 dB with respect to PEP
Off-channel frequencies rejection:	50 dB with respect to PEP
Intermodulation rejection (two-tone test):	36 dB with respect to PEP
Carrier suppression:	40 dB with respect to PEP
Sideband suppression:	40 dB with respect to PEP
AF response:	300 to 2700 Hz (-6 dB)
Receiver	
Noise figure:	10 dB or better
Parasitic oscillator voltage:	10 μ V or less, measured at antenna footpoint with 50 Ohm termination
IF breakthrough rejection:	80 dB
Image frequency rejection:	80 dB
Automatic gain control:	\pm 2 dB max. output fluctuation for input level range 1 μ V to 1 V

AGC time constant:	response time about 70 ms; decay time about 700 ms
Signal/noise ratio:	12 dB SINAD for $U_i = 1 \mu\text{V}$ EMF (J3E) 18b dB SINAD for $U_i = 1 \mu\text{V}$ EMF (A1A)
Bandwidth:	2400 Hz (-6 dB) for J3E 500 Hz (-6 dB) for A1A
AF outputs:	a) 0 dBm across 600 Ohms (775 mV) b) nom. 2.75 V across R_L at least 100 Ohms; adjustable via AF volume control
Automatic noise limiter:	incorporated
BFO for A1A service type:	1000 Hz fixed
Dynamic range:	Intermodulation 3rd. order 75 dB Blocking 120 dB
Power supply optionally with:	
Battery Pack BT 6861/11:	NiCd accumulator 30 V, 1.8 Ah (rechargeable)
Battery Pack BT 6861/31:	Lithium battery 39.2 V/10 Ah (not rechargeable)
External via battery pack:	22.5 to 38 V DC, negative pole to chassis, wrong polarity protection incorporated. Simultaneous charging of the NiCd accumulators possible via incorporated charging regulator
Mobile or stationary:	When operating with Vehicle Mount FH 6865/24 24 V (19 V - 36 V)

1.3.2 Mechanical Data

Ambient temperature range Basic unit:	-40 °C to +70 °C operational -40 °C to +85 °C storage
Battery Pack BT 6861/11: (NiCd 1.8 Ah)	-25 °C to +55 °C operational -40 °C to +60 °C storage
Battery Pack BT 6881/31: (Lithium 10 Ah)	-30 °C to +60 °C operational -40 °C to +70 °C storage

Mechanical stress according
to VG 95 332

Equipment class 1 (portable)

**Downloaded by
RadioAmateur.EU**

Drop test
(with special carrying bag)

From 120 cm height onto conifer wood, on each side, edge and corner in shipping packing (26 times)

Vibration:

10 to 55 Hz, up to 2 g

Shock:

30 g, 11 mg

Equipment class 2 (mobile),
with shock mount frame

Impact:

2000 bumps in all planes with 40 g, 6 ms \pm 15%

Shock:

50 g, 6 ms

Vibration:

10 to 500 Hz, total amplitude 0.7 mm, max. 5 g

Water protection:

up to 1 m water depth/2 h

1.3.3

Dimensions and Weights

	Width mm	Height mm	Depth mm	Weight kg
Basic unit:	285	81	187	4.9
Basic unit with Battery Pack BT 6861/11:	285	81	296	8.5
Battery Pack BT 6861/11:	285	80.5	120	3.6
Battery Pack BT 6861/31:	285	81	170	4.4

1.4 Functional Principles

(General circuit diagram, Annex 1)

The Field Radio Unit SE 6861/12 mod is a transceiver with operating frequency range 1.5 to 29.9999 MHz in 100 Hz digital tuning steps. The digital tuning function is implemented with a synthesizer which operates on the frequency analysis principle. Two intermediate frequencies are used for transmission as well as for reception.

The higher intermediate frequency (1st intermediate frequency for reception or 2nd intermediate frequency for transmission) is 40.09 MHz. Selectivity on this intermediate frequency is provided by a crystal filter which has a bandwidth of 8 kHz.

The lower intermediate frequency (2nd IF for reception or 1st IF for transmission) is 9.910 MHz (carrier). The main adjacent channel selectivity is provided on this intermediate frequency band, using a crystal filter with center frequency $f_{IF} + 1.5 \text{ kHz} = 9.9115 \text{ MHz}$ and bandwidth 2.4 kHz. This determines the 300 to 2700 Hz passband of the system.

The transmitter amplifier itself is a regulated wideband amplifier with no mechanical tuning devices, except for an automatically switched harmonics filter which suppresses harmonics of the operating frequency to the required extent.

Simple operating procedure for the equipment is established by two further measures:

A built-in memory in conjunction with a channel switch permits rapid switching between five operating frequencies. The fully automatic antenna tuning unit permits connection of antennas having different matching impedance and automatically adjusts for a voltage standing wave ratio of typ. 1.5.

1.4.1 Transmission

(Signal levels diagram, Annex 2)

The Field Radio Unit SE 6861/12 mod has a balanced to ground microphone input. The permitted input level range is 2 to 20 mV.

In the IF/AF module, the AF signal is passed through a dynamic range compressor and then converted to the 1st (lower) intermediate frequency of 9.91 MHz in a mixer, from the output of which it is taken via a buffer amplifier to the IF filter module. The transfer level is 150 mV across 500 Ohms (measured selectively, because both sidebands are present).

In the IF filter module, the upper sideband is selected and converted either with 50.0 MHz (USB) or with 30.18 MHz (LSB) to 40.09 MHz which is taken via a gain controlled amplifier to the 40.09 MHz crystal filter. The output level depends on the actual transmitter power and is typically 12.5 mV across 50 Ohms for 20 W transmitter power and max. 40 mV without signal level regulation.

In the RF module, the difference frequency between the intermediate frequency and the oscillator frequency delivered from the synthesizer is produced in the mixer stage, filter-selected and amplified to a maximum level of 1 V across 50 Ohms in a two-stage amplifier.

In the tuning phase, the output of the amplifier is connected to the automatic antenna tuning unit (ASG). Thus the tuning process is carried out at low power level (virtually muted tuning). The power thereby radiated by the antenna is less than 10 mW.

The signal is applied with a level of about 0.6 V to the power amplifier which boosts it to 20 W into 50 Ohms.

The transmitter output power from the power amplifier is fed via the harmonics filter, the directional coupler and the antenna tuning unit to the antenna connection.

The directional coupler is used for power level control and power level indication of the power amplifier. It measures the outgoing and reflected RF power and gives two metering voltages. The first metering voltage, which is proportional to the sum of the forward and reflected RF voltages, drives a regulator circuit. The implemented regulator function acts such that the RF output power is reduced when the standing wave ratio (mismatch) increases, to prevent overload of the power output stage (see Section 4.2.2).

The second metering voltage U_v is proportional to the forward wave and is used to indicate the transmitter output power (RF level indicator on the front head; green LED).

The microprocessor-controlled antenna tuning unit (ASG) performs fully automatic matching of the various antenna types. It checks and if necessary corrects the matching setting each time the transmitter is switched on.

1.4.2 Reception (Signal levels diagram, Annex 3)

Normally the receiver input (antenna connection) is connected via the tuning unit to the transmit/receive relay (T/R relay) on the harmonics filter. When operating with an external power amplifier (wideband operation), the antenna tuning unit is bypassed.

The control threshold of the AGC system lies at typically 0.3 μ V. The noise figure is about 10 (10 dB). The RF section has a transfer gain of +1 dB and thus approximately compensates for the losses in the antenna tuning unit and in the harmonics filter. This low gain is adequate for good sensitivity and gives good large signal behaviour of the receiver. The third order intercept point (IP 3) of the receiver lies at about +0 dBm without gain control and rises to over +20 dBm with increasing gain control.

The IF filter module has 50 Ohms input impedance. The AGC threshold lies at 0.3 μ V here too.

After frequency selection in the 40.09 crystal filter, the signal is amplified and then converted again to the second intermediate frequency (9.910 MHz). Another crystal filter allows only the wanted sideband of the signal to pass to the IF/AF module.

The IF/AF module has an input impedance of 500 Ohms. The AGC threshold is here 3 μ V. The AF signal voltage at the output of this module is about 2.75 V. The output stage delivers this voltage to the volume control on the front head and also via a fixed voltage divider to the line output (0 dBm into 600 Ohms).

The volume control switch is provided to adjust the signal voltage at the AF output.

1.5 Accessories

1.5.1 Antennas

The field radio unit can be equipped with various antennas, according to the particular application.

As portable unit it is operated with a folding rod antenna which is screwed directly onto the front head. This antenna covers the entire frequency range from 1.5 to 30 MHz. It consists of glass fiber reinforced material and is available in the length of 3.3 m (Fig. 22).

1.5.2 Modulation Devices

Modulation devices are connected for operating the field radio unit. The following are required, depending on the application task:

- Morse key (Fig. 23)
- Handset voice equipment (Fig. 24)

The transmit/receive changeover switching (T/R switching) required during operation is partly effected via the modulation device. The Morse key automatically initiates switchover on the first code element. The voice equipments have a push to talk transmission key.

1.5.3 Carrying Bags

The back pack carrying bag is available optionally with or without padding (Fig. 25).

It includes compartments for accessory parts. Additional carrying bags are available for extensive accessories.

1.5.4 Vehicle Mount FH 6864

The Vehicle Mount FH 6864 (Fig. 26) is provided to accommodate a field radio unit together with a battery pack. This simple mount is equipped with four shock absorbers but incorporates no electronic circuitry. A transceiver unit mounted therein can be removed quickly at any time and used as portable transceiver (manpack).

1.5.5 Separated Manual Control Unit

The Manual Control Unit BG 6861/1 mod can be used to operate the transceiver equipment via a 53-pole remote control cable over a distance of up to 25 m.

When using the Manual Control Unit BG 6861/1 mod, the basic field radio unit is fitted with a remote control front head which carries the jack connector required for the remote control cable.

The separated manual control unit carries manual control elements and connectors for the basic unit SE 6861/12 mod:

- Volume control switch
- Channel selector switch
- Operating mode switch
- Output power switch
- Memory key
- Frequency selector switch
- AF input
- AF output

The functional principles of the circuitry correspond to the front head of the basic field radio unit. The switches S 1 to S 11 and the jack BU 1 have the same functions.

The separated manual control unit also contains status indicators for the basic unit and for the transmitter amplifier:

- | | |
|------------|---------------------------------------|
| “On” | (only transmitter amplifier) |
| “Fault” | (basic unit or transmitter amplifier) |
| “Tuning” | (transmitter amplifier with ASG) |
| “Transmit” | (basic unit or transmitter amplifier) |

2 OPERATING INSTRUCTIONS

2.1 Special Precautions to Prevent Accidents

The equipment is operated with DC voltages up to 38 V, so that no special precautions are required against electric shock hazard (safe low voltage equipment).

2.2 Setting-Up and Taking-Down

2.2.1 Explanation of the Plug Connectors

See Annex 4.

2.2.1.1 Antenna Connection

Rod antenna

- Unfold the antenna by whip movement and check that the individual sections have latched correctly.
- Screw the antenna foot onto the field radio unit.

2.2.1.2 Connecting the Battery Pack

- Stand the basic unit on the battery pack, making sure that the locating pins engage.
- Lock the two units together with the snap catches on the sides.

2.2.1.3 Connecting Accessories

Voice equipments and the morse key are connected in the same manner:

- Connect the AF plug to one of the AF jacks on the front head. The red mark on the AF plug must coincide with the red spot on the AF jack.
- To connect the AF plug, press it into the jack and turn the bayonet catch to the right hand stop position.

2.3 Checks before Commissioning

Before switching on for the first time, check that all plug connectors are connected correctly and seated firmly.

2.4 Commissioning and Operation

2.4.1 Functions of the Manual Control Elements

The manual controls and indicator elements are shown and explained in Fig. 27.

2.4.2 Operation

The 20 W field radio unit is an HF band transceiver which is as simple to operate as a VHF radio unit. Thus it can also be used by unskilled persons after brief instruction.

The few manual control elements are located on the front head of the unit and on the AF accessories (handset voice equipment, Morse key). These manual control elements are:

- Illumination push button
- AF volume control switch
- PTT key on the voice equipment
- Operating mode switch, also functions as ON/OFF switch
- Output power switch
- Frequency selector switch
- Channel selector switch
- Memory key

The writing panels of the protection flap are intended for service remarks.

When the protection flap is closed, the frequency setting and the memory key are covered, thus preventing accidental displacement of the preset channels.

The simple manual control procedure for the field radio unit is made possible by the incorporated electronic circuitry (organizer) which performs most of the tasks which the operator would otherwise have had to perform manually. Electronic protection circuits safeguard against manual control errors (e.g. attempt to transmit without antenna).

In particular, antenna matching is performed automatically by the microprocessor-controlled antenna tuning unit (ASG). A check and if necessary correction of the antenna matching is initiated every time the PTT key is pressed.

This process is heard in the earpiece as a brief 1 kHz check tone.

Note: In order to exploit the full sensitivity of the receiver, it is advisable after every frequency change to match the antenna by briefly pressing the PTT key.

2.4.2.1 Switching-On

- Connect the voice equipment
- Select the operating mode; the equipment is ready for operation after 2 seconds
- Adjust the AF volume control with respect to the background noise of the receiver
- Select the operating frequency with the channel selector switch or set it with the frequency selector switches
- Select the output power (with or without antenna tuning unit)

2.4.2.2 Switching Off

The equipment is switched off with the operating mode selector switch.

2.4.2.3 Manual Frequency Setting

- Set the channel selector switch to position 0
- Set the desired operating frequency

The frequency selector switches are mechanical setting devices, so that the equipment may be left switched off.

2.4.2.4 Setting or Changing a Memory-Stored Frequency

- Set the channel selector switch to the desired position (1, 2, 3 or 4)
- Switch the equipment on (select any arbitrary operating mode)
- Make the desired frequency setting
- Press the memory storage key

The channel memory contents can be recalled at any time with the channel selector switch, even when the field radio unit has been switched off for a long time. When the battery unit is disconnected, the channel memory contents are still preserved for at least 10 minutes.

2.4.2.5 Operating Procedure

After switching on, the following functions can be switched in any desired sequence:

- operating mode change
- output power change
- frequency change
- T/R switching

For voice traffic, T/R switching is made with the PTT key on the voice equipment.

In keyed traffic mode, T/R switching is controlled by the Morse key. The first code element switches to transmission. After the last code element and a delay time of about 0.7 s, the equipment switches back to reception.

The antenna matching is checked automatically each time the transmitter is switched on and a tuning correction is made if necessary. Thus after a frequency change, the required antenna tuning process is automatically initiated on switching to "transmission".

The green RF indicator lights when about 20% of the nominal transmitter output power is reached, i.e. it lights only during key-on times for A1A service type and only during peak modulation times for J3E service type.

2.4.3 Operational Monitoring

Light emitting diodes (LEDs) are provided for operational monitoring. These LEDs are located partly on the front head of the field radio unit and partly on the indicator panel of the transmitter amplifier. The separated manual control panel carries parallel indicators for all operational displays.

The basic field radio unit contains:

Green indicator LED. This indicator lights when about 20% of the nominal transmitter output power is reached, i.e. it lights during key-on times for A1A service type and only during peak modulation times for J3E service type.

Yellow indicator LED. This indicator lights when the battery voltage drops below about 27 V.

Reception is then possible only for a few further minutes. Transmission is still possible only for short messages with 2 W output power.

The field radio unit switches off automatically when the battery voltage has dropped to about 24 V. This deep discharge battery protection is disabled when operating with an external power supply, so that the SE 6861/12 mod can then be operated also with voltages in the range below 24 V.

When operating with an external power supply voltage in the range 22.5 to about 27 V, the yellow "BAT." indicator is lit permanently.

When an attempt is made to transmit on a frequency under 1.5 MHz or using a memory channel which has not been programmed previously, the field radio unit switches off automatically and the "BAT." warning LED lights at the same time.

To restore operational status in this case, set the operating mode switch to "OFF", set the correct frequency and then select the former operating mode again.

A transmitter amplifier contains four LED status indicators:

"ON". This green pilot indicator lights when the basic unit has been switched on and the transmitter amplifier is ready for operation.

"Tuning". When the basic unit has been switched to "transmission" with the PTT key, this yellow indicator lights as long as the transmitter amplifier and where applicable the antenna tuning unit are carrying out a tuning routine (i.e. as long as the switch-on program of the transmitter amplifier has not yet terminated).

"Transmit". This green indicator shows that the basic unit has been switched to "transmission" with the PTT key, that the switch-on program in the transmitter amplifier has terminated and that RF output power is being delivered to the antenna system. When the test switch is pressed, operational readiness of the transmitter is indicated without regard to the antenna system.

"Fault". The yellow fault indicator flashes or lights steadily when a fault is present in the transmitter amplifier:

- Uniform flashing indicates that a "minor fault" is present and the transmitter output power has been reduced to 25% of the normal value.
- Flashing with short dark phases indicates a "major fault". The transmitter amplifier is delivering no output power and the equipment reverts to "reception" mode after four unsuccessful reset attempts. In this operating status, the fault indicator changes to steady illumination after the four flash cycles, each of which indicated a reset attempt. In this case emergency transmission with 20 W output power is possible with the basic unit. After releasing the PTT key, when the complete equipment is switched to "reception", the automatic circuitry again checks whether a fault is still present.
- Steady illumination without reset attempts, persisting after releasing the PTT key, indicates a "tuning fault". This indication is given when a tuning run of the external antenna tuning unit can not be taken to completion. Neither transmission nor reception is possible in this case.

**Downloaded by
RadioAmateur.EU**

2.5 Operation under Severe Environmental Conditions

See specifications for ambient temperature range in Section 1.3.2.

Set up the equipment such that adequate ventilation is ensured. Protect the equipment against intense solar radiation, dust and moisture.

2.6 Care

Regular care preserves dependability and availability of the equipment. The care tasks should be carried out by the operating staff as far as possible daily, but at least once a week.

The care tasks comprise:

- Cleaning of external parts
- Removing deposits of moisture
- Checking that the plug connectors are seated firmly
- Checking the mountings of the equipment units

Important: Do not use methylated spirit or other aggressive solvents to clean the equipment.

3 MAINTENANCE AND REPAIRS BY OPERATING STAFF

3.1 Maintenance by Operating Staff

The field radio unit requires little maintenance. Simple functional checks serve to verify operational readiness. Recharge the battery pack when necessary.

3.1.1 Special Tools

No special tools are required for maintenance.

3.1.2 Maintenance Time Schedule

Task	Period	Remarks
1 Clean the equipment	monthly	and after use
2 Functional tests	daily	when commencing operation
3 Check indicator LEDs	daily	replace when necessary
4 Check frequency stability	annually	

The 10 MHz frequency normal (TCX0) determines the frequency stability and accuracy of the transceiver frequencies. Thus its correct frequency setting should be checked annually, because of the unavoidable ageing of the quartz crystal in the TCX0 the frequency adjustment should be realigned to get best accuracy.

Readjustment of the setting of the frequency normal:

- The readjustment has to be done at an ambient temperature of $25\text{ °C} \pm 1\text{ °C}$ in order to obtain the specified stability behaviour. The equipment must have stabilized long enough at this temperature.
- Remove the shielding can from the basic unit and take out the IF-filter module (see 3.2.3.1.4).
- Remove the cover of the module and connect the module via a suitable adapter cable with the motherboard.
- Connect output A of the module via a adapter cable with the 50 Ohm input of a frequency counter (stability $1 \cdot 10^{-8}$, resolution 0.1 Hz).
- Connect the basic unit with a battery unit, that must either contain a charged battery pack or be connected to a external power supply.
- Switch on the transceiver.
- After 15 min. check the output frequency of the TCX0. If the measured frequency deviation in Hz referenced to 10.000.000 MHz differs from the nominal value stamped on the front side of the module can it must be corrected with potentiometer R 41 to this nominal value (accuracy of setting: better 0.3 Hz).
- After readjusting of the frequency setting reassemble the transceiver.

3.1.3 Illumination

When the equipment is switched on, press the illumination key. If no lamp lights, then the power supply is switched off or the battery pack is discharged.

Partial failure of the illumination does not impair the function of the equipment. Replace defective illumination lamp bulbs at the time of the next overhaul.

3.1.3.1 Volume Control

Connect a voice equipment. Set the volume control to position 5. Background hiss should be audible clearly.

3.1.3.2 Channel Selection

Set the channel selector switch to position 0 and set the frequency selector switches to 09.9990 MHz. A 1 kHz tone should be heard in the earpiece.

3.1.3.3 Channel Memory

Enter the following four frequencies to check the channel memory:

Channel 1 = 09.9990 MHz

Channel 2 = 09.9991 MHz

Channel 3 = 09.9992 MHz

Channel 4 = 09.9993 MHz

Make these entries using the procedure described in Section 2.4.2.4.

On recalling the channels 1 to 4, a tone sequence in 100 Hz steps should be heard (tone scale).

3.1.3.4 RF Output Power

Set the operating mode selector switch to A1A/20 W and press the PTT key.

The green indicator on the front head should light. If the yellow indicator (battery check) lights, then the batteries are discharged. In this case recharge or replace the battery pack.

3.1.3.5 Tuning Time

Set frequency 3 MHz and switch to any operating mode. Press the transmission key (PTT key). An antenna is not required. The tuning time should be about 2.5 s. After checking a tuning process, switch the unit off or make a transmission attempt with a different frequency.

3.1.3.6 AF Amplification

For checking the AF amplification, a distinction must be made between the two service types A1A and J3E.

A1A:

Set the operating mode selector switch to position A1A/2 W and press the PTT key. The 1 kHz tone should be heard clearly in setting 5 to 7 of the AF volume control.

J3E:

Set the operating mode selector switch to position J3E/2 W. Press the PTT key and speak into the microphone. The spoken words should be heard clearly in the earpiece in setting 5 to 7 of the AF volume control.

3.1.3.7 Battery Pack

The battery is nearly discharged and should be recharged when the yellow warning indicator lights on the front head of the basic unit.

A long time recharge with twice the normal charging time should be given after 20 charge/discharge cycles but not later than after 3 months. This overcharge does no damage and ensures that any individual accumulator cells connected in series with low efficiency will be fully recharged again.

For batteries in storage, maintain operational readiness by compensating for self-discharge with regular recharge cycles.

For this purpose, recharge the batteries at intervals of two weeks for six hours with the Battery Charger LG 6874/3 (this corresponds to about 60% of a normal full recharge).

After several weeks of storage without recharging, batteries must be subjected to a normal recharge cycle. Batteries which have not been used for longer than 6 months will reach their full capacity again only after several charge/discharge cycles.

Note:

If the basic unit is left without power supply whilst the battery pack is being recharged, then the frequency information of the preset channels 1 to 4 will be preserved for at least 10 min.

The Battery Pack BT 6861/11 should be charged with the Battery Charger LG 6874/3. For further details, please consult the technical manual for the Battery Charger LG 6874/3 and the data sheets of the manufacturer of the NiCd batteries.

3.1.3.8 Discontinuation of Operation

Operation of the field radio unit can be discontinued at any time without special measures. However, bear in mind that the frequency information in the preset channels 1 to 4 will be lost.

This information is lost not earlier than after 10 minutes when storing the basic unit without battery pack. If the basic unit is left connected to a battery pack, then the frequency information is lost only when the battery voltage has disappeared after about 2 to 3 months as a result of self-discharge (storage temperature in range 20 to 30 °C).

If maintenance of the battery pack is not carried out (Section 3.1.3.7) during storage, then the following tasks must be carried out before recommencing operation:

- Recharge the battery pack
- Program the preset channels 1 to 4

3.2 Repairs by Operating Staff

Repairs which can be carried out by the operating staff are confined to tasks which do not require a service shop and which can be performed with simple measuring equipment and tools. No alignment tasks are involved.

3.2.1 Special Tools, Measuring Units and Test Equipments

Special tools are not required.

3.2.2 Simple Fault Tracing

The modules which are found to be defective should be replaced following the procedure described in Section 3.2.3.

3.2.3 Replacing Modules

Before taking out any modules or other parts, disconnect the field radio unit from the power supply. For this purpose, open the two snap catches on the sides and separate the basic unit from the battery pack or pull it out of the vehicle mount.

3.2.3.1 Basic Unit

- Release the 6 captive link screws (1) on the front head
- Pull the unit out of the shielding can (Fig. 28)

3.2.3.1.1 Front Head

- Disconnect the plug connector of the RF cable "M" (Fig. 29)
- Release the 12 screws (2) and (3a) (Fig. 29)
- Pull off the front head upwards (Fig. 27)

3.2.3.1.2 20 W Amplifier

- Disconnect the RF cable plug connectors “H”, “J”, “L”, “M” and “K” on the amplifier (Fig. 7). “H” is located on the underside of the amplifier (Fig. 29)
- Release the 4 screws (3) (Fig. 29)
- Pull out the amplifier together with the side frame section in the upward direction. This frame section serves as heat sink and is permanently attached to the amplifier
- Before mounting the amplifier, apply thermal conduction paste to the contact surfaces.

3.2.3.1.3 Antenna Tuning Unit ASG

- On the rear side of the basic unit, disconnect the RF cable plug connectors “F” and “L”
- Release the 5 captive screws (4) (Fig. 29)
- Push out the ASG by applying light pressure against its motherboard

3.2.3.1.4 Plug-In Modules

- Remove the modules securing holder. For this purpose, release the 3 screws (5) (Fig. 30)
- Release the RF plugs belonging to the module. For the RF module, note that the RF plug “H” must be disconnected on the side of the module which faces the front head
- Insert the hooks on the narrow edge of the holder into the corresponding breakouts of the modules (Fig. 33)
- Pull out the modules individually

3.2.3.1.5 Synthesizer

- Disconnect the RF cables “A”, “B”, “C” and “N”
- Release the 8 screws (6) (Figs. 30 and 32)
- Press out the synthesizer upwards. Thereby make sure that pressure is applied equally distributed, so that the synthesizer is not skewed

3.2.3.2 Battery Pack BT 6861/11

3.2.3.2.1 Front Head

- Release the 6 screws (1) and (3) (Fig. 34)
- Carefully pull off the case bottom part

3.2.3.2.2 Battery Blocks

- Pull the front head off the case bottom part
- Pull the battery blocks upwards away from the locating and contact pins (Fig. 37)

3.2.3.2.3 DC/DC Converter (Figs. 37, 40 and 41)

- Remove the case bottom part and the batteries
- Release the 5 screws (5)
- Fold aside the chassis plate
- Release the 4 screws (6)
- Remove the coverplate
- Release the 4 screws (8)
- Unsolder the 3 connections
- Take out the DC/DC converter

3.2.3.2.4 Charging Device

The components of the charging device are accessible after releasing the 5 screws (7) (Fig. 40). The connections must be unsoldered if it is necessary to replace the printed circuit board (Fig. 42).

3.2.3.3 Fuses

- Release the 3 screws (2) (Figs. 34, 35 and 36)
- Take off the fuse panel
- Replace the blown fuses

3.3 Material conservation during long idle periods

This equipment contains some modules for which the instructions given in Section 3.1.3.8 for discontinuation of operation must be observed in all instances.

It is advisable to take out the battery pack and to subject it to regular maintenance as specified in Section 3.1.3.7. Protect the equipment against intense solar radiation, moisture and dust. In this respect, see the specifications given in Section 1.3.2 for ambient temperature range.

4 REPAIRS BY TRAINED PERSONNEL

These tasks comprise fault tracing and repairs for which a service shop with extensive measuring equipment is required.

4.1 Special Tools, Measuring Units and Test Equipments

Special tools are not required.

4.1.1 General Measuring Equipment

No.	Qty.	Description	Recommended Manufacturer and Type	Recommended Specifications
1	1	Power attenuator network	R+S	50 Ohm/100 W/30 dB
2	1	Mains power unit	R+S NGG35-6	
3	2	AF signal generators	R+S SRB	
4	1	RF signal generator	R+S SMDU	Radio equipment version
5	1	RF signal generator	R+S SMLR	
6a	1	RF millivoltmeter	R+S URV/BN10913	
6b	1	Leadthrough probe	BN10914/50	50 Ohms
6c	1	Signal probe	URV	
7	1	Terminating resistor	Tektronix	50 Ohm/2 W
8	2	Attenuator network	Tektronix	50 Ohm/2 W/20 dB
9	1	Attenuator network	Tektronix	50 Ohm/2 W/6 dB
10	1	Thermal power meter with signal probe	HP 435A HP 8482A	
11	1	Spectrum analyzer	HP 141T, 8552B, 8553B	up to 100 MHz
12	1	Tracking generator	HP 8443A	
13	1	Digital voltmeter	HP 34702A/B, 4740A	RE greater than 1 MOhm
14	1	Reflection measuring bridge	HP 8721A	
15	1	RMS voltmeter	HP 3400A	
16	1	Oscilloscope	HP, Philips	100 MHz, 2 channels
17	1	Pulse generator	HP 8011A	
18	1	Frequency counter	Philips PM6622/04	
19	1	Mains power unit	Philips PE1509	30 V/400 mA
20	1	μ A-Multizet	Siemens	
21	1	Current sink	Litronix Mod. 9108A	
22	2	Resistors		2.7 kOhm/0.5 W
23	1	Load resistor		50 Ohms/5 W
24	1	Adjustable load resistor		2...20 Ohms/6.5 A
25	1	Vector impedance meter	HP 4815A	
26	1	Triple branch adapter	R+S BN 42441	50 Ohm
27	1	Frequency counter	Philips PM 6620	

4.2 Functional Principles

4.2.1 Front Heads

4.2.1.1 Standard Front Head (Circuit diagram, Annex 5)

The front head chiefly contains the components of the manual control elements and the jack and plug connectors. These are:

S 1	100 Hz frequency setting
S 2	1 kHz frequency setting
S 3	10 kHz frequency setting
S 4	100 kHz frequency setting
S 5	1 MHz frequency setting
S 6	10 MHz frequency setting
S 7	Channel selector switch
S 8	Volume control switch with resistors R 1 to R 11 (see Section 4.2.6)
S 9	Operating mode selector switch
S 10	Memory pushbutton
S 11	Illumination and HF attenuation pushbutton/output power switch
BU 1, BU 2	7-pole jack connectors
BU 3	50 Ohm connector for operation with external power output stage
BU 5	Output of the antenna tuning unit
BU 6	Internal jack connector
BU 7	Grounding terminal
ST 1	Antenna connector
ST 2	Output of 20 W amplifier

RS 1 switches BU 3 from the ASG output to the amplifier output for wideband operation. This manner of operation is given when using the Transmitter Amplifier SV 6863 in conjunction with the Vehicle Mount FH 6865/24.

The modulation devices are connected to the AF jack connectors BU 1, BU 2.

4.2.1.2 Power Reduction/HF-Attenuation

The PC board "Power reduction" in the front head contains the elements for the electrical functions "Power reduction" and "HF-attenuation".

Power reduction

This function prevents thermal overheating of the transmitter section. Comparator IS 1 monitors the signal U_v (forward voltage) from the directional coupler of the 20 W power amplifier. The time constant, given by the resistors R 1 and R 2 together with capacitor C 2, is set to nominally 60 s. By this means, after 60 s constant transmitting in the CW mode (A1A), IS 1 will switch to the low output state. Switching transistor TS 1 then reduces the PEP output power via the automatic level control (ALC) of the transmitter from 23 W PEP to appr. 20 W PEP. This power reduction function will be not activated in the normal SSB mode (J3E, speech modulation).

HF-attenuation

This function gives the possibility to switch in appr. 25 dB of HF-attenuation into the receiver signal path. Thus intermodulation distortion due to high receiving signal levels can be reduced to a certain extent.

The behaviour of the attenuation circuit is determined by the actual setting position of the two plugs ST 1 and ST 2. Factory setting is ST 1: position 2-3 and ST 2: position 1-2. In this case the attenuation function is disabled.

Plug setting ST 1: position 1-2 and ST 2: position 1-2 enables the attenuation function. The HF-attenuation will be activated via the illumination push button together with Flipflop IS 1/1 and switching transistor TS 1. TS 1 decreases the amplification factor of the first amplifier section in the RF unit. The activated attenuation function is indicated by the blinking green LED "RF" on the front head. This LED is controlled by the astable multivibrator IS 1/2 and switching transistor TS 2. Deactivation of the attenuation function takes place with the next pushing of the illumination button. The attenuation function is automatically deactivated during the switching on routine of the transceiver unit.

Plug setting ST 1: position 1-2 and ST 2: position 2-3 gives almost the same functioning as described before, however the attenuation function is automatically activated during the switching-on routine of the transceiver unit.

4.2.2 20 W Amplifier

The 20 W Amplifier (Annex 7) is designed for wideband operation. It has a nominal input impedance of 50 Ohms (VSWR less than 2) and good linearity. Power efficiency greater than 50% is achieved. A power measurement is made with a directional coupler for reducing the signal levels and power output of the amplifier to safe values via the RF circuit board and the IF filter circuit board in the case of large voltage standing wave ratio.

The driver stage is a class A amplifier using a BLY 87A transistor in grounded emitter circuit. Constant input impedance and good linearity largely independent of transistor parameter tolerances, are obtained by combination transformer/resistor voltage negative feedback (T 1, R 3, C 3).

The output stage is a class B push-pull configuration using the transistors TS 3 and TS 4 (ON 617) in grounded emitter circuit.

Advantages:

1. The heat dissipation is distributed over two transistors
2. The symmetrical configuration eliminates even harmonics in the output frequency spectrum
3. A power efficiency greater than 50% is achieved, because AB operating mode is possible in push-pull configuration

The input transformer T 2 (Guanella transformer) matches the single ended output of the prestage to the push-pull inputs of the output stage transistors. This is achieved with a transformation ratio of 2, with simultaneous isolation of the base bias voltage from the prestage.

The resistors R 17 to R 22 and the chokes L 2 and L 3 correct the input impedance and linearize the frequency response.

The push-pull output transformer in the collector circuits of the push-pull output stages recombines the two signal half-periods. Each transistor operates into one half of the transformer winding. The transformer transforms the load resistance $R_l = 3.14$ Ohms of the individual transistors to $R_{cc} = 12.5$ Ohms. The power supply voltage is connected via the transformer windings. The resistors R 24 and R 25 prevent parasitic oscillation of the amplifier.

A further Guanella transformer (T 4) with transformation ratio 2 is used for final matching to the 50 Ohm load impedance and for the transition from balanced to single-ended signal at the output. Galvanic isolation of the output is established with the aid of blocking capacitors.

A base bias voltage is required for class B operating point of the power output stage transistors TS 3 and TS 4. The quiescent current is about 150 mA and can be adjusted with resistor R 9.

The source impedance of the base bias voltage supply is very low, because otherwise the operating point would be displaced towards class C due to the rectifier action of the power transistors in operation.

The regulator circuit IS 1 and TS 2 provides the base bias voltage, with simultaneous compensation of the temperature coefficients of the base-emitter diodes of TS 3 and TS 4.

For this temperature compensation function, the sensing diode GR 711 is mounted on the heat sink, in good thermal contact therewith, in the immediate vicinity of the output stage transistors.

The directional coupler with separated regulator amplifier (RF circuit board) and setting element (IF filter circuit board) completes the 20 W amplifier. The current transformer consists of a bifilar wound ring core which is mounted on a line section. Alignment is made (directional attenuation factor adjustment) with the resistor R 27 in series with the choke L 5 and the resistor R 29.

The voltage $U_{forward}$ and $U_{reflected}$ are rectified by the diodes GR 3 and GR 4. The sum of the two rectified voltages is taken to the output power regulator circuit and the rectified forward voltage is taken to the output power monitoring circuit.

The sum voltage is compared on the RF circuit board (see Section 4.2.4) with a nominal value corresponding to the nominal RF output power (2 W or 20 W). The control loop adjusts the input signal level to the power amplifier, via the setting element mentioned above, such that the rectified sum voltage remains constant. Resistor R 31 in conjunction with diode GR 5 cause a delayed reduction of the output power in such a way that up to a VSWR of typ. 1.3 it is hold constant to about 23 W PEP. Further increasing of the VSWR leads to a reduction of the actual output power depending on the actual VSWR.

4.2.3 Harmonics Filter Subassembly (Circuit diagram, Annex 9)

The automatically switched harmonics filter subassembly is connected to the output side of the power amplifier. This subassembly attenuates unwanted harmonics produced in the transmitter amplifier by more than 50 dB (with respect to PEP).

The circuit contains seven Cauer low-pass filter networks (Filter 1 to 7). The filter with 32 MHz cut-off frequency (Filter 7) is in circuit in all frequency subranges. The other filters are switched into circuit with relays as required.

The control signals for the relays come from the organizer, which determines the frequency subrange in which the present transmitter operating frequency lies, to select the corresponding low-pass filter.

In reception mode only the 32 MHz filter is used at the receiver input as image frequency rejection filter.

4.2.4 RF Module (Circuit diagram, Annex 11)

The RF module chiefly contains separate branches for reception and transmission respectively, the AGC circuit and a common filter and mixer stage (passive ring mixer).

This printed circuit board also contains a control amplifier for the PIN diode attenuator network in the receiver input circuit, an oscillator amplifier, a tuning regulator, two transmitter power regulators and a circuit for monitoring the RF output power. The latter drives the green "RF" indicator on the front head of the field radio unit (Annex 10).

Reception path in the RF module

The RF signal coming from the harmonics filter is routed via a high-pass filter to the PIN diode attenuator network.

The high-pass filter network has 1.4 MHz cut-off frequency and attenuates signal frequencies below 1.3 MHz by at least 24 dB. This suppresses unwanted intermodulation products in the receiver section, especially in the PIN diode attenuator network, which could otherwise be produced by strong MF band broadcast signals.

The PIN diode attenuator network is constructed as pi-section and attenuates the RF signal spectrum (when the wanted signal level is large enough) by up to 40 dB ahead of the amplifier and mixer stage. This improves the intermodulation rejection of the receiver.

The temperature-compensated AGC difference amplifier TS 3 amplifies the AGC voltage of the receiver and provides the corresponding control current to the PIN diode attenuator network.

The PIN diode attenuator network is followed by a wideband RF amplifier stage (TS 1) with voltage negative feedback and a gain of about 9 dB. After RF amplification, the signal is taken via the diode switch GR 7/GR 8 to the junction of the reception path/transmission path and is then passed through a 32 MHz low-pass filter. After this filter, the signal spectrum which is available for further processing has been confined to the range 1.5 MHz to 30 MHz.

The passive ring mixer MI 1, with the aid of the amplified synthesizer signal (41.59 to 70.0899 MHz), converts the selected input frequency spectrum to the receiver 1st intermediate frequency of 40.09 MHz, which is then further processed by the IF filter printed circuit board.

The total gain of the reception path is about +2 dB.

Transmission path in the RF module

The transmission 2nd intermediate frequency corresponds to the reception 1st intermediate frequency (40.09 MHz).

With the aid of the amplified synthesizer signal, the common mixer and filter stage MI 1 reconverts the IF signal to the output spectrum of 1.5 to 30 MHz. This spectrum appears at the filter output and is routed via a RF diode switch GR 7/GR 8 to the wideband RF amplifier (IS 1 and TS 2).

This is a two-stage amplifier. AGC is applied to the first stage IS 1. The second stage TS 2 employs voltage negative feedback and provides a signal at its output which is adequate for driving the power output stage (maximum output voltage 1 V across 50 Ohms, corresponding to 20 mW).

From the output of the amplifier, the signal is taken via a second diode switch (GR 10/GR 11) which either enables the path to the power output stage or routes the signal to the tuning regulator. In the tuning phase the latter drives the first gain controlled transmitter amplifier stage IS 1 and maintains a constant level of 800 mV at the tuning output. This signal is then taken to the antenna tuning unit for further processing.

The fast proportional controller TS 6 suppresses peak power levels during the settle time of the integrator. This keeps the power dissipated in the power amplifier within tolerable limits.

The U_{forward} voltage of the directional coupler to IS 3 is evaluated for RF power level indication. The RF indicator lamp on the front head is switched via transistor TS 5. This indicator lights when the actual RF output power reaches about 20% of the nominal output power.

The ALC voltage for driving the setting element in the IF filter module is obtained by comparing the sum voltage from the directional coupler with a fixed reference value and then integrating the resulting signal (IS 5, IS 4).

4.2.5 IF Filter Module (Circuit diagram, Annex 13)

The IF filter circuit board converts the higher intermediate frequency (40.09 MHz) to the lower intermediate frequency (9.91 MHz), with the aid of either a 50 MHz signal (USB) or a 30.18 MHz signal (LSB) which are obtained by frequency multiplication of internal reference frequencies (Annex 12).

All disturbing combination frequencies on the circuit board are rejected by the crystal filter, with a rejection attenuation factor greater than 80 dB. Since the 40.09 MHz crystal filter has a larger passband width, the upper sideband is selected by the 9.91 MHz crystal filter.

The 50 MHz signal (USB) and the 30.18 MHz signal (LSB) for conversion of the intermediate frequencies stem from the sideband frequency generation module. The 50 MHz signal is obtained from a frequency multiplier which is fed from a 10 MHz crystal-reference frequency oscillator (TCX0), where as the 30.18 MHz signal is generated by a mixing process, using the 50 MHz signal and a 9.91 MHz signal from the synthesizer.

Reception path in the IF filter module

The reception signal is taken via the 40.09 MHz crystal filter Q 2 (bandwidth 8 kHz), the coil L 3 and the FET amplifier TS 4 at high impedance to the coil L 4.

The coil L 4 matches the reception signal to the gain-controlled amplifier IS 2 which has 500 Ohms input impedance.

The AGC voltage, which is regulated by the IF/AF circuit board according to the actual magnitude of the input signal, is connected to pin 7 of the amplifier IS 2.

The AGC threshold voltage lies at 2 V; the maximum possible AGC voltage is 5 V. This corresponds to a gain reduction of about 50 dB.

The voltage divider R 34/R 35 to match the gain-controlled amplifier IS 2 with a load of at least 200 Ohms to the next following mixer MI 1 which has an input impedance of 50 Ohms. The resistor R 33 is connected in parallel with the voltage divider R 34/R 35 for gain correction option.

In the mixer M 1 the 1st intermediate frequency (40.09 MHz) is mixed with 50 MHz in case of USB reception and with 30.18 MHz in case of LSB reception to give the 2nd intermediate frequency 9.91 MHz (USB in "normal" position, LSB in "inverted" position).

The T-section R 38/R 39/R 40 with 3 dB attenuation factor connects the mixer to the crystal filter Q 3 and gives improved wideband matching of the mixer to the crystal filter. The crystal filter has 2.4 kHz bandwidth and 500 Ohms output impedance. L 6 and L 7 are provided for applying the switching voltage to the diode GR 3. The reception path is disconnected by the switch diode GR 3 in transmission mode.

Transmission path in the IF filter module

In transmission mode, the IF signal (150 mV) comes from the IF/AF circuit board, passes through the crystal filter Q 3 (upper sideband filter), is converted to the transmission 2nd intermediate frequency in the mixer MI 1 and is then applied to the input of the now powered-up amplifier IS 1. This amplifier too requires a load impedance of at least 200 Ohms at its output. This condition is fulfilled by the transistor amplifier TS 5 which operates with a collector circuit load of 25 Ohms. The setting element IS 1 for the transmitter signal level is driven from the regulator amplifier on the RF circuit board by the ALC voltage.

The gain-controlled amplifier IS 2 (reception branch) is cut-off during transmission by an AGC voltage of 5 V.

Oscillator with frequency multiplier

The temperature-compensated crystal oscillator operates at 10 MHz. Deviations from the nominal frequency can be corrected with the potentiometer R 41.

The 10 MHz signal for the synthesizer is coupled out via the buffer amplifier TS 1. From the collector of the transistor TS 1, the amplified 10 MHz signal is taken to the base of the frequency multiplier amplifier TS 2. The signal is amplitude limited. The 5th harmonic is selected from the resulting distorted waveform, with the aid of the tuned circuit L 1, C 6, C 7, C 8.

The 50 MHz signal is matched to the base of the transistor amplifier TS 3 via the capacitive voltage divider C 7, C 8. A further selection of the frequency 50 MHz is made in the collector tuned circuit L 2, C 11, C 12, from which the signal is coupled out capacitively and fed to the sideband frequency generation module. The transfer level is about 5 mW (+7 dBm).

Sideband frequency generation module:

This circuit delivers either in the transmitting or receiving mode the appropriate local oscillator signals 30.18 MHz (LSB) or 50 MHz (USB).

In case of operating in the upper sideband the 50 MHz signal from input C is fed over the diodes GR 4, 5 and 6 to the output D, which is connected with the local oscillator input of mixer M 1. The diodes are switched to the conducting state through the control voltage 14.5 V USB (input A).

In case of operating in the lower sideband the diodes GR 4, 5 and 6 are in their nonconducting state. Via the control voltage 14.5 V LSB (input B) the essential part of the circuit is activated. The 9.91 MHz signal from input ST 1 is doubled in the balanced modulator IS 1 to 19.82 MHz. The second balanced modulator IS 2 with the input signals 19.82 MHz and 50 MHz gives also the wanted output signal 30.18 MHz. Transistor TS 1 and TS 2 act as amplifiers and the resonant circuits L 3/C 14 and L 4/C 14 act not only as rejectors for the 50 MHz and other spurious frequencies but also as acceptors for the wanted output signal 30.18 MHz. The voltage level at the output D is in both cases (USB/LSB) 7 dBm/50 Ohms.

4.2.6 IF/AF Module (Circuit diagram, Annex 16)

In reception mode, the 2nd intermediate frequency is amplified on the IF/AF circuit board and then converted to the AF signal which is amplified to nominal output level. The output voltage is held constant by the automatic gain control (AGC). In A1A service type, an amplifier stage is connected as active Wien bridge filter to serve as telegraphy filter (Annex 15).

In J3E transmission mode, the microphone signal is taken via a dynamic range compressor (VOGAD module) to the mixer which converts it to the intermediate frequency (9.91 MHz).

In A1A transmission mode, the dynamic range compressor is disconnected and a 1 kHz signal (telegraphy and tuning signal) is fed into the transmission path in the rhythm of the code elements to be transmitted.

The various power supply and control lines are efficiently filtered, to give adequate suppression of interference voltages.

Reception path in the IF/AF module

The 9.9 MHz intermediate frequency (upper or lower sideband) is routed at the input of this module to the two-stage IF amplifier IS 1, IS 2. The two wideband amplifiers IS 1 and IS 2 have a typical total gain of 68 dB, which can be reduced by typically 70 dB by applying AGC voltage to the first IF amplifier IS 1.

In the following mixer IS 3 (product detector), the 2nd intermediate frequency is converted to the AF signal with the 9.91 MHz local oscillator frequency of the synthesizer. The AF signal is amplified in the amplifier IS 4. Pulse interference spikes are thereby clipped in the output signal with the rectifier diodes GR 8 and GR 9.

The amplifier thus functions as noise limiter.

The output of the amplifier IS 4 is connected to an AGC generator (TS 2, TS 3, TS 4). When the output signal level overshoots or undershoots an adjustable nominal value, then the AGC generator automatically produces the required AGC voltage to change the gain of the reception branch such that the nominal signal level is restored at the output of the amplifier IS 4. The rise time (about 70 ms) and the decay time (about 700 ms) of the AGC voltage are determined chiefly by the components R 24, R 25, C 49 and C 24.

In service type A1A the transistor TS 5 switches the amplifier IS 4 to tone filter operating mode. The amplifier is then connected as Wien bridge filter and constitutes the telegraphy filter.

The AF signal is then applied to the AF-amplifier (IS 5, TS 7, TS 8).

The AF volume level can be switched in seven steps with S 8 in the front head (Annex 5) and the associated resistors R 1 to R 11.

Transmission path in the IF/AF module

The AF signal feed-in is different for J3E and for A1A service type. The required changeover switching is performed by the AF switching stage TS 9/TS 10.

TS 9 switches the dynamic range compressor IS 7 into circuit for J3E service type. This dynamic range compressor processes the microphone signal. It contains an AF amplifier with an internal automatic gain control amplifier which holds the output signal level nearly constant for more than 40 dB variation range of the input signal. The bandwidth and the gain control time constants are determined by external components. For A1A service type, TS 10 switches the keying transistor TS 11 into circuit. This transistor is switched via the keying line in the rhythm of the code elements to be transmitted and thus can inject a 1 kHz signal from the synthesizer into the transmission path accordingly.

The 1 kHz signal is used not only for A1A service type, but also for each tuning cycle for the duration of the tuning process. This makes possible aural monitoring of the tuning process (control tone) via the AF amplifier and the listening device.

From the AF switching stage TS 9/TS 10, the AF signal is taken to the transmitter mixer IS 6 (balanced modulator), where it is converted to the 1st intermediate frequency (9.91 MHz). The double sideband signal (DSB) is amplified to nominal signal level by the transistor TS 12 (150 mV across 500 Ohms). The AF signal is also taken to the AF amplifier via R 33 and C 28 so, that the transmitted signals are also injected into the reception path for simultaneous aural monitoring.

The dynamic range compressor, the AF switching stage and the transmitter mixer obtain power supply voltage only in transmission mode. This reduces power consumption and prevents interference generation from these stages in reception mode.

However, the reception branch obtains its power supply voltage in transmission mode too, but it is muted in this mode because the IF amplifiers IS 1 and IS 2 are cut off completely by the rectifier diodes GR 2 and GR 3.

4.2.7 Organizer (Circuit diagram, Annex 18)

The organizer coordinates and controls the interplay of the individual modules of the field radio unit. It contains:

- Voltage stabilizer for 13.5 V
- Control inputs from manual control elements
- Logic for modules control
- Read only memory (UV-EPRM) for harmonics filter control

The 13.5 V operating voltage (adjustable with R 5) is produced from the 14.5 V output voltage of the DC/DC converter by a short-circuit protected voltage regulator IS 1.

This voltage is partly taken directly to the consumer loads in the individual modules, and partly via RS 1 and RS 2 so that it is disconnected from unused circuit sections in transmission (T) or reception (R) mode.

The field radio unit obtains a further power supply voltage from the power supply, in addition to the 14.5 V output voltage of the DC/DC converter. This additional voltage (28 V) is permanently present to power the channel frequency memory.

Transmission without external power output stage

After actuating the T/R key (transmit/receive changeover switching, PTT key), pin 1 of IS 2 is connected to ground potential via resistor R 6, diode GR 2 and resistor R 10. In service type A1A this ground connection is held for about 700 ms with the aid of the capacitor C 4.

A positive pulse results at the output 3 of the NOR gate (IS 1). This pulse triggers a monoflop and switches the relay RS 1 via the transistor TS 2. This produces the voltage +13.5 V "T" and switches the T/R relay on the harmonics filter circuit board.

The monoflop (IS 2/10) triggered by the positive output pulse of the gate produces a 150 ms duration pulse which is passed through the following NOR gates (IS 2/4, IS 3/11, IS 3/3) to the transistors TS 3 and TS 4. A condition for this is that the pulse is not disabled by the inputs "ASG answer-back" (jack BU 38) or "External power output stage" (Jack BU 7).

Transistor TS 3 switches the voltage 13.5 V tuning ASG via relay RS 2. The power supply voltage for the prestage of the 20 W amplifier (jack BU 13) is switched off at the same time.

The control signal "tuning and A1A" is routed via the transistor TS 4 and jack BU 4 to the IF/AF circuit board which is therewith switched to service type A1A.

The voltage 13.5 V tuning and A1A gives the tuning command for the antenna tuning unit. The antenna tuning unit returns a +13.5 voltage (ASG answer-back) for the duration of the tuning phase, via jack BU 38. This voltage holds the keying line at ground potential via the following NOR gates.

When the antenna is matched, transmission is possible on pressing the PTT key on the voice equipment, after an interrogation time of about 150 ms. If the antenna is not yet matched correctly, the transmission delay time is increased by the tuning time of the ASG.

At the start of transmission, at the start or end of a tuning process, the organizer sends a carrier disable pulse to the RF circuit board (jack BU 33).

During a tuning process, irrespective of the operating mode setting, the basic unit is set by the organizer to service type A1A/20 W.

When the T/R key is pressed, the basic unit is switched from reception to transmission mode and at the same time the EPROM (IS 5/18) is activated. The frequency data applied to the inputs are compared with the table of values stored in the EPROM. The respective activated output switches the corresponding low-pass filter into circuit on the harmonics filter circuit board, via the relay driver IS 6.

A voltage greater than 13 V is present at the D-bit output for frequency settings less than 8.3 MHz. For higher frequency settings, this output lies at ground potential. The D-bit information is required by the ASG.

For frequency settings less than 1.5 MHz, output 17 of the EPROM switches to ground potential and thus disables the voltage regulator IS 1. As a result thereof, the basic unit is switched off and the warning indicator "BAT." lights.

Remedy: Release the push to talk key and select a frequency setting equal to or less than 1.5 MHz. The battery warning indication thereby extinguishes automatically.

Transmission with external output stage

Here the normal signal path is blocked by a positive voltage on the signal line "External power output stage" (jack BU 7). Relay RS 2 is not switched and the antenna tuning unit receives no tuning command. When the PTT key is actuated, the organizer switches the 13.5 V "T" voltage (jack BU 43) and the 13.5 V "Prestage" voltage (jack BU 13) to the corresponding outputs.

The control line "A0 request" delivers a 13.5 V voltage during the tuning process of the externally connected antenna tuning unit when setting the harmonics filter and measuring the VSWR (BU 37).

At the start of the transmission process, this control line delivers pulses to the organizer which generate a correspondingly long carrier blocking pulse (jack BU 33). On A0 request, the organizer switches the basic unit to the operating mode A1A/20 W, irrespective of the actually set operating mode.

Battery check

When the battery voltage drops below the threshold value of 27 V, the transistor TS 8 switches on the yellow warning indicator "BAT." on the front head, via the transistors TS 9 and TS 10.

This yellow warning indicator also lights up when the stabilized 13.5 V is missing due to a short circuit or due to an attempt to transmit on a frequency less than 1.5 MHz (cf. Section 2.4.3).

Power supply voltage for channel frequency memory

The battery voltage is taken, even when the field radio unit is switched off, via jack BU 41 to a stabilizer circuit consisting of the resistor R 49 and the Zener diode GR 18. The stabilized voltage is taken via the decoupling diode GR 16 to the channel frequency memory.

Switch-on and switch-off of the power supply

The DC/DC converter in the power supply section must be switched on to obtain the +14.5 V power supply voltage. The +28 V switch-on voltage (input voltage to the DC/DC converter) required for this purpose is routed via the plug connector power supply section/basic unit onto the motherboard of the field radio unit and from there to the operating mode selector switch on the front head. When this switch is set to operation, the switch-on voltage is returned to the control input of the DC/DC converter and switches the latter on. The DC/DC converter then produces the +14.5 V operating voltage for the field radio unit.

4.2.7.1 Channel Memory (Circuit diagram, Annex 19)

The channel memory is located in the organizer/memory module. It is provided for electronic storage of four different frequency settings. It is constructed with three COS/MOS integrated circuits. The memory capacity is 4 words of length 24 bits each.

A fifth storage possibility is given by switch-through of the frequency selector switches. The frequency set with these switches is then effective directly.

The procedure for programming the channel memory is described in the operating instructions given in Section 2.4.2.4.

In setting "0" of the channel selector switch (memory bypass setting), the frequency information present at the inputs is connected through directly to the outputs.

The frequency information stored in the channels "1" to "4" is preserved even when the battery pack is disconnected, in which case the channel memory circuit board is powered from the capacitor C 2 (150 μ F).

C 2 can power the channel memory circuit board for at least 10 minutes.

4.2.8 Synthesizer (General circuit diagram, Annex 20)

The synthesizer is the master oscillator of the field radio unit. It provides the output frequencies 41.59 to 70.0899 MHz. These frequencies are decimally adjustable in smallest steps of 100 Hz.

The output frequencies are produced in a phase locked loop circuit. The oscillator whose frequency is controlled by varicap diodes, operated directly on the desired output frequency.

This frequency is divided down in a programmable frequency divider and then compared with a certain fixed reference frequency in a phase comparator. In the case of a phase difference between the two signals, the phase comparator produces a corresponding DC output voltage, or an alternating voltage if the two signals differ in frequency. This output voltage is taken via a low-pass filter as frequency control voltage for the oscillator which acts such that the oscillator frequency is readjusted to make the divided-down output frequency equal to the reference frequency. Thus the output frequency can be set as an integer multiple of the reference frequency.

The accuracy of the output frequency is determined by the reference frequency.

The synthesizer has a coarse control loop and a vernier control loop. The coarse control loop operates with a 10 kHz reference frequency. This achieves a short settle time of the frequency control loop and the bandwidth is sufficiently large to cancel microphony interference of the oscillator. The vernier control loop operates with 1 kHz reference frequency. This loop is constructed as a fully integrated circuit and contains no components which are sensitive to microphonic effects, such as coils. The signal from the vernier control loop is mixed into the coarse frequency control loop in the converter mixer circuit.

The synthesizer also provides two fixed output frequencies of 9.91 MHz. This frequency is produced by a tunable oscillator which is synchronized to the 10 MHz reference frequency by a phase locked loop.

A 1 kHz signal is produced by direct frequency division of the 10 MHz reference frequency and filtering with a RC network. This 1 kHz signal is used as tuning and aural monitoring tone, and as modulation signal for A1A service type.

4.2.8.1 Programmable Frequency Divider (Circuit diagram, Annex 24)

The circuit has the following performance characteristics

f_{in}	21.5 MHz ... 49.99 MHz
$f_{in\ max.}$	at least 52 MHz
U_{fin}	greater than 250 mV
f_{out}	10 kHz constant
division ratios N	2150 ... 4999
power consumption	max. 1 W at $U = 13.5\ V$

Task

The programmable divider divides down input frequencies in the range 21.5 MHz to 49.99 MHz to a constant output frequency of 10 kHz. For this purpose, it can be set to division ratios in the range $N = 2150$ to 4999. The power consumption has been made as small as possible.

Functional principles of the programmable divider

To keep the power consumption as small as possible, the programmable frequency divider is constructed entirely with COS-MOS integrated circuits. However, an ECL prescaler IS 13 is used at the input (units position) of the counter chain, on account of the high input frequencies (21.5 MHz to 49.99 MHz). Since the prescaler can only be switched between division factor 10 or 11, a special circuit arrangement must be used in order to resolve the units decade of the frequency division ratio. This technique is called "swallow counting". Thereby the fast but not fully programmable prescaler IS 13 (ECL) is combined with a relatively slow but fully programmable control counter IS 12 (COS-MOS) to give a fast and fully programmable frequency divider.

Three functional blocks must be distinguished in a programmable frequency divider which operates according to the "swallow counting" principle (Annex 23):

1. Prescaler with control counter (swallow counter)
2. Three-stage program counter
3. Decoder

The prescaler IS 13 with swallow counter IS 12 is responsible for the units decade and the three-stage programmable counter IS 7, 8, 9 is responsible for the tens, hundreds and thousands decade (digit) of the frequency division ratio N.

Basic functional principles (Annex 22)

The circuit consists of a counter chain and the decoder. After every 10 input pulses, a counter sends one output pulse to the next counter stage. This gives increasing ranks in the counter chain from left to right. At the start of a counting cycle, each counter stage is set to a certain state (corresponding to the chosen frequency division factor) by activating the preset line. Each counted input pulse increments the count state of the counter chain by one. After exactly N (set frequency division ratio) input pulses, the counter chain has reached its highest count state (final state). The final state is detected by the decoder which monitors the output states of the individual counter stages. The decoder issues an output pulse on the last counted input pulse. This output pulse at the same time presets the counter chain again, according to the set frequency division ratio N.

The following example will make the principle of "swallow counting" clear:

N = 3 4 5 6	
Settings on programmable counter	Control counter (swallow counter)
3 4 5	6
thousands hundreds tens	

Thus the programmable counter must receive 345 output pulses from the prescaler in order to reach its final count state. The setting 6 on the swallow counter thereby has the following effect:

For the duration of 6 output pulses (= input pulses for the programmable counter), the prescaler IS 13 is set to frequency division factor 11 by the swallow counter IS 12, i.e. 1 output pulse then comes after every 11 input pulses. Thereafter the swallow counter IS 12 switches the prescaler IS 13 to frequency division factor 10 and delivers the remaining $345 - 6 = 339$ output pulses to the programmable counter IS 7, 8, 9.

Thus altogether the counter chain counts

$$\begin{array}{r} 6 \times 11 = 66 \\ 339 \times 10 = \underline{3390} \\ \text{total } 3456 = N \text{ input pulses.} \end{array}$$

The last input pulse to be counted is detected by the decoder circuit IS 1, 2, 3, 4, 5, 10, 11 which monitors the output logic states of the individual counter stages, and an output pulse $f_{\text{out}} = f_{\text{in}}/N$ is issued. At the same time as this output pulse is produced, the individual counter stages are preset again according to the valid frequency division factor, via the preset line.

Although the prescaler IS 13 can be switched only between frequency division factor 10 or 11, this circuit principle nevertheless resolves the units decade of the frequency division ratio.

The swallow counter IS 12 and the prescaler IS 13 thereby function as a single fully programmable frequency divider decade on which the units digit is set. Whether the prescaler divides down by a factor of 10 or 11 is immaterial for the program counter. The latter merely requires the correct number of input pulses.

For setting 0 in the units digit the prescaler IS 13 is held permanently in the state with frequency division factor 10. A suitable arrangement of the decoder ensures that the transit time differences between ECL and COS-MOS logic will not impair correct functioning of the frequency divider system.

Special circuit features

A BCD-encoded counter chip (CD 4029) IS 8 is used in the 1 MHz digit position of the programmable counter instead of a Johnson-encoded counter chip (CD 4018). This obviates the control line. The circuit contains a voltage stabilizer (IS 14) which provides a regulated power supply voltage (13.5 V) for the entire synthesizer. This voltage is produced from the power supply input voltage (14.5 V) to the synthesizer.

The ECL prescaler IS 13 requires a separate power supply voltage. For this purpose a voltage regulator (IS 6, LM 120 H-5.2 V) is connected in parallel with IS 13 to hold the voltage drop across the prescaler constant at 5.2 V. The rest voltage of 8.3 V (13.5 V minus 5.2 V) is used to power the converter mixer circuit.

The transition from the prescaler outputs (ECL, IS 13) to the subsequent COS-MOS integrated circuits IS 3, 9, 12, i.e. the required level translation, is implemented by the transistor switch stages TS 1, TS 2. To ensure correct functioning of the prescaler IS 13, both outputs 8 and 9 (Q and /Q) must be loaded identically. The level translation from COS-MOS to ECL which is required at the control inputs of the prescaler IS 13 (frequency division factor setting), is performed with two clamp diodes GR 3, GR 4. These diodes ensure that the logic level at the control inputs 2 and 3 can become more negative than the negative potential of the prescaler (8.3 V) by an amount equal to the forward bias voltage (0.7 V) of the diodes.

The RF input of the prescaler is biased to the correct DC voltage level by a voltage divider (GR 2, R 2 and R 6). The Zener diode GR 1 functions as overvoltage protection for the prescaler.

4.2.8.2 Converter Mixer Converter Module (Circuit diagram, Annex 26)

$f_{in 1}$	41.59 MHz ... 70.0899 MHz
$u_{fin 1}$	at least -10 dBm
$f_{in 2}$	10 MHz
$u_{fin 2}$	at least -6 dBm
$f_{in 3}$	90 kHz ... 99.9 kHz
$u_{fin 3}$	at least -10 dBm
f_{out}	21.5 MHz ... 49.99 MHz
$u_{f out}$	at least 300 mV/200 Ohms

$U_B = 8.3 \text{ V}$ $I_B = \text{about } 40 \text{ mA}$

Functional task

The converter mixer circuit combines the vernier loop signal (90 kHz to 99.9 kHz) and the coarse loop signal (41.59 to 79.0899 MHz). At the same time a frequency conversion is made to the frequency band 21.5 to 49.99 MHz (Annex 25).

Basic functional principles

The oscillator signal 41.59 MHz to 70.0899 MHz is amplified by a two-stage wideband amplifier TS 3 and TS 4 which employs negative feedback. To reduce power consumption, the transistor TS 4 operates into the inductive collector load impedance T 1. The voltage required to drive the mixer diodes MI 1 is obtained with a suitable transformation ratio of T 1.

The 10 MHz signal is frequency doubled in the balanced modulator IS 1. In the second balanced modulator IS 2, the signal from the vernier control loop (90 kHz to 99.9 kHz) is converted with the 20 MHz signal and then fed to the crystal filter Q 1.

The monolithic crystal filter Q 1 suppresses all unwanted combination frequencies and passes only the sum frequency 20.09 MHz to 20.0999 MHz. Matching to the crystal filter is made with the resistor R 1, the output capacitance of IS 2, the resistor R 4 and the input capacitance of the transistor TS 1.

The signal is fed via the impedance converter transistor TS 1 to the selective amplifier TS 2. The capacitively coupled-out signal frequency is applied to the mixer MI 1, where it is converted with the oscillator signal.

The four-pole bandpass filter suppresses all unwanted combination frequencies and passes only the difference frequencies 21.5 MHz to 49.99 MHz. One pole of the bandpass filter lies at 20.095 MHz, to give additional attenuation for signal frequency breakthrough.

The two-stage wideband amplifier TS 5 and TS 6 boosts the signal level beyond the bandpass filter to greater than 300 mV/200 Ohms. Transistor TS 6 too operates into an inductive load (T 2, to reduce current drain). To compensate for the capacitively caused gain drop at higher frequencies, the load impedance of transistor TS 5 is made frequency-independent with the inductance L 6.

4.2.8.3 Vernier Frequency Control Loop (Circuit diagram, Annex 31)

The vernier control loop printed circuit board carries three circuits:

- a) 10 MHz processing (Annex 27)
- b) 1 kHz control loop (Annex 28)
- c) Range selection for master oscillator (Annex 29)

With regard to a)

In the 10 MHz processing circuit, the 10 kHz reference frequency signal is produced from the 10 MHz reference frequency signal (100 mV/50 Ohms). The 10 kHz reference signal appears as logic levels. For this purpose, the 10 MHz signal is first of all amplified to a sufficiently large output level in the resonant amplifier TS 31, in order to drive the flipflop IS 8. The output signal of IS 8 (2.5 MHz) is divided down in the programmable frequency divider IS 7, which is set to division factor 250 to give 10 kHz output frequency.

With regard to b)

The vernier control loop produces output frequencies in the range 90 kHz to 99.9 kHz. These frequencies are adjustable in steps of 1 kHz and 100 Hz.

A phase locked loop (PLL circuit) is used to produce the output frequencies. The output frequency of the astable RC multivibrator IS 2 (900 kHz to 999 kHz) is divided down in the programmable frequency divider (IS 4, $N = 900$ to 999) whose output frequency is compared with a 1 kHz reference frequency (obtained by frequency division of the 10 kHz reference frequency, IS 6) in a phase comparator (controlled switch IS 5). The resulting control voltage is buffered via an impedance converter and then applied to the multivibrator. The control voltage thereby modifies the charging curve of the multivibrator capacitor C 12 via the diode GR 1 and thus controls the multivibrator frequency. The oscillation frequency of the multivibrator is divided down by a factor of ten (IS 3) to give the output signal (90 kHz to 99.9 kHz) of the 1 kHz control loop.

The use of a 1 kHz reference frequency instead of a 100 kHz reference frequency gives a shorter settle time of the control loop. Furthermore, the 1:10 frequency division of the multivibrator signal suppresses the 1 kHz sidelines by a further 20 dB. The RC filter network R 7/C 3, R 5/C 2/R 4, C 13 and R 17 converts the 1 kHz reference signal into the tuning/keying tone.

With regard to c)

The master oscillator (41.59 to 70.0899 MHz) operates with the power supply voltage B I or B II. The power supply voltage B I is switched on for oscillator frequencies below 54.09 MHz. The power supply voltage B II is switched on for 54.09 MHz and higher operating frequencies.

The switchover frequency 54.09 MHz corresponds to setting 14 MHz on the frequency selector switches. The inputs J 1, J 2, J 5 and J 6 are suitably connected to the frequency selector switches. A small logic circuit (IS 1) detects whether the frequency setting is smaller than or greater than/equal to 14 MHz. Depending thereon, either the power supply voltage B I or the power supply voltage B II is switched on by the transistor stages TS 51 or TS 52.

4.2.8.4 9.91 MHz Phase Locked Loop (Circuit diagram, Annex 33)

The circuit delivers a constant output frequency of 9.91 MHz. This signal is synchronized to the 10 MHz crystal reference frequency in a phase locked loop (Annex 30).

A 9.91 MHz crystal oscillator operates in grounded collector circuit (TS 1). The crystal frequency is converted with the 10 MHz reference frequency in a mixer circuit (dual gate FET, TS 2). The difference frequency of 90 kHz is selected by the low-pass filter R 9/C 10 and then amplified by the transistor TS 3.

The signal is taken via a further low-pass filter to the phase comparator circuit IS 1. A 10 kHz frequency, obtained by dividing down the 10 MHz reference frequency, is applied to the second input of the phase comparator IS 1. A DC voltage depending on the mutual phase relationship between the two signals appears at the output of the comparator. This DC control voltage is applied to the varicap diodes GR 1 and GR 2 which hold the oscillator circuit tuned to the nominal frequency of 9.91 MHz.

The power supply voltage for the circuit is filtered by the low-pass filter R 5/C 2.

A sampling discriminator is used as phase comparator circuit (Annex 32). It consists of a controlled switch and a storage capacitor. The switch is closed by a very brief sampling pulse (10 kHz reference frequency, time = 1 μ s), whereby the capacitor charges to the instantaneous value of the input voltage. After the switch opens, the capacitor holds the voltage until the next sampling pulse comes. Thus in the locked state, the sample is taken at the same point on the input waveform on every 9th period of the 90 kHz signal (harmonic sampling). A constant DC voltage is then present at the storage capacitor.

If the frequency of the 90 kHz signal changes (e.g. due to temperature drift of the crystal oscillator), then as a result the 90 kHz signal is sampled at different phase time points. The DC voltage at the output of the phase comparator circuit then becomes smaller or greater, until the crystal oscillator is again operating with the nominal frequency.

The control voltage range has been dimensioned such that the crystal oscillator will operate with the nominal frequency without any problems, in the entire operating temperature range.

4.2.8.5 Phase Comparator (Circuit diagram, Annex 35)

In the "phase comparator", the output signal /QA of the programmable frequency divider is compared with the 10 kHz reference frequency in a phase comparator circuit. A DC voltage appears at the output of the comparator. The magnitude of this DC voltage depends on the mutual phasing of the two signals. The direct voltage controls the frequency of the master oscillator. Annex 34 shows the general circuit diagram.

The 10 kHz reference frequency is first converted to rectangular pulses with a monoflop, and then into a sawtooth voltage with capacitor C 5 and charging resistor R 4 (ramp voltage).

The ramp voltage is sampled by a pulse which is produced from /QA. When this sampling pulse is synchronous with respect to the reference frequency, then always the same voltage value is sampled.

For this purpose, a 2 μs duration sampling pulse is produced by a monoflop from the pulse/QA and this sampling pulse drives the first stage of the sampling discriminator (output at the hold capacitor C 7). The semiconductor switch IS 2 is closed for the duration of the sampling pulse, so that the hold capacitor is charged to the instantaneous voltage value on the ramp. In order to obtain complete decoupling between the input voltage and the output voltage, this sample and hold circuit is repeated after an amplifier stage IS 4 (gain = 2). Since the drive pulse for the second sampling circuit (output at hold capacitor C 10) is initiated only by the negative flank of the first sampling pulse, galvanic isolation is established and an interference voltage suppression factor of about 80 dB is achieved.

The voltage on the second hold capacitor C 10 is applied via the impedance converter IS 3 to the notch filter F 1, which has attenuation poles at 10 kHz and at 20 kHz, each with attenuation factor greater than 40 dB. This dependably achieves the required noise voltage suppression factor of more than 100 dB for the 10 kHz reference frequency. The control voltage URF is taken off via the buffer transistor TS 2.

In the settled state of the synthesizer, the 10 kHz reference frequency and the output frequency of the programmable divider are equal. The output voltage (control voltage URF) of the phase discriminator results from the position of the sampling time point, i.e. the phase difference between the reference signal and the sampling signal. Changes of the oscillator frequency (e.g. an operating frequency change) cause a corresponding change of the output frequency of the programmable divider. The ramp voltage is then sampled at different time instants, until the correspondingly changing control voltage URF has brought the oscillator to a frequency for which it is true again that the 10 kHz reference frequency is equal to the output frequency of the programmable divider.

4.2.8.6 Oscillator (Circuit diagram, Annex 38)

A voltage controlled oscillator (VCO) is used to produce the oscillator frequencies in the range 41.59 to 70.0899 MHz. This VCO is part of a phase locked loop. The oscillator circuit consists of a transistor with tuned circuit and capacitive feedback. The oscillation frequency of the oscillator can be switched in steps with the switched tuned circuit inductance, and varied continuously via a number of varicap diodes (Annex 36).

A field effect transistor TS 3 with a relatively large slope is used in the oscillator circuit. This transistor operates in grounded gate circuit. The utilized transistor is an intrinsically conducting type, so that no gate bias voltage divider is required.

The required operating frequency range of the oscillator from 41.59 MHz to 70.0899 MHz calls for a 3:1 ratio variation range of the tuned circuit capacitance.

This pulling range for the oscillator can not be achieved with the available range of the control voltage URF (1.5 V to 10.5 V) with the varicap diodes GR 2 and GR 3 alone. Thus the frequency range is subdivided according to the step-switched tuned circuit inductance. The switchover frequency lies at 54.09 MHz. The inductance switching is performed by shorting a part of the tuned circuit inductance by changing the power supply voltage injection point. The switchover point has been fixed at 54.09 MHz because this frequency setting is easy to decode and leads to nearly equal required C-variation ranges for both subranges.

In the lower subrange (f_{osc} less than 54.09 MHz), the tuned circuit inductance consists of the two coils L 2 and L 3 in series (power supply voltage B I). The capacitor C 16 acts to further increase the effective inductance value at low frequencies.

In the upper subrange (f_{osc} equal to or greater than 54.09 MHz), the coil L 3 is shorted out via the diode GR 8 and the capacitor C 18 (power supply voltage B II).

The RF signal is blocked on the power supply voltage lines by the chokes L 4, L 5 and the capacitors C 8, C 9.

In both oscillator subranges, the tuned circuit capacitance consists of the transistor and circuit stray capacitances, the resultant capacitance of the feedback loop and the six varicap diodes GR 2 to GR 7.

The smaller the oscillator slope $k = \Delta f / \Delta U_{RF}$, the smaller is the effect of interference voltages (e.g. noise voltages) on the control voltage in the oscillator signal. A small slope value also has control loop performance advantages. In order to keep the slope as small as possible, the two oscillator frequency subranges are divided again tenfold. A D/A converter is used for this purpose. Depending on which output of the BCD to decimal converter (CD 4028) is activated at a given time, a corresponding DC voltage is results at the summation point R 23 as a result of the resistor network connected to the outputs. With this voltage the oscillator can be preset to 10 base frequencies via four switched varicap diodes (GR 4 to GR 7) in the tuned circuit. The diode characteristic is linearized by suitable selection of the resistor values R 13 to R 21, i.e. the frequency difference between any two successive preset frequencies is always approximately the same (see also Annex 37).

Any frequency between two preset frequencies can be set with the control voltage U_{RF} , i.e. the possible frequency variation by the control voltage U_{RF} is always greater than the frequency difference between two successive preset frequencies.

The control voltage U_{RF} acts via the low-pass filter R 11/C 14 on the varicap diodes GR 2 and GR 3. The varicap diodes GR 2 and GR 3, GR 4 and GR 5 are connected in series opposition.

The series combination of the two varicap diodes achieves good linearization.

A frequency setting takes place as follows (Annex 36):

Depending on the chosen frequency, either the operating voltage BI (f_{osc} less than 54.09 MHz) or the operating voltage BII (f_{osc} equal to or greater than 54.09 MHz) is connected through. This determines the main subrange of the oscillator frequency. If it is not possible to pull the VCO onto the nominal frequency with the control voltage U_{RF} in the present oscillation range (the D/A converter has a certain output state = a certain preset frequency) then the D/A converter is clocked on to the next state. Each new output state of the D/A converter persists for about 4 ms. In this time it is checked again whether the control voltage U_{RF} can pull the VCO onto the nominal frequency (the settle time of the control loop is shorter than 2 ms). In one of the 10 subranges this will be the case; the VCO can be set to the nominal frequency. The output state of the D/A converter then remains constant. Frequency changes of the VCO resulting from temperature changes are cancelled by the control voltage U_{RF} . The trimmer is provided for making basic adjustment, i.e. for aligning the oscillator.

The oscillator voltage is coupled out via the capacitor C 5 from the high point of the tuned circuit and applied to the amplifier TS 2. The signal voltage is taken off at the output for the converter mixer circuit (level greater than 50 mV/50 Ohms) and also as RF output voltage (level greater than 80 mV/50 Ohms).

The power supply voltage for the output amplifier is filtered by the transistor stabilizer TS 1. The power supply voltages B I and B II are produced in the "vernier control loop" circuit and they too are filtered efficiently.

4.2.8.7 Digital Setting of the Oscillator (Circuit diagram, Annex 39)

The digital oscillator setting function is provided for presetting the oscillator. The oscillator operating frequency range is subdivided into 2 main subranges and each of these into 10 secondary subranges. The latter are set with the aid of a D/A converter whose output voltage controls the oscillator frequency via varicap diodes (see also functional principles of the oscillator).

The D/A converter is driven by the "digital oscillator setting" circuit (Annex 38) which compares the output signal QA of the programmable divider (produced by dividing down the oscillator signal) with a 10 kHz reference frequency, in a frequency discriminator IS 6. In the locked state, i.e. when the oscillator is operating with nominal frequency, the two input frequencies are equal, i.e. the output signal frequency of the programmable divider is equal to the 10 kHz reference frequency (cf. Section 4.2.8.5).

If the two frequencies are different, e.g. after a frequency change, then the frequency discriminator produces error output pulses (pin 10, IS 2). These pulses can increment the BCD counter (CD 4029, IS 3) every 4 ms, via a monoflop IS 1. Each new count state of the counter produces a change of the output state of the D/A converter and thus a change of the oscillator frequency.

Starting from the new oscillator frequency, a phase locked loop checks whether the oscillator can now be brought to the nominal frequency by the control voltage URF. The control loop has a settle time shorter than 2 ms. If the oscillator can not be brought to the nominal frequency, the counter and thus also the D/A converter in the oscillator, are clocked again to the next state after 4 ms. This is repeated until the secondary subrange has been reached in which the oscillator is set to the nominal frequency. The frequency discriminator then no longer produces any error pulses and the output state of the counter and of the D/A converter remain constant.

The counting direction of the counter is selected via a special control input. A logic level "1" at this input sets the counter to "count up", and a logic level "0" produces "count down" function.

A subrange change is necessary when temperature changes cause the control voltage URF to reach one of its end values. If a change to the next higher subrange is required, then with fixed counting direction "count down", all 10 subranges would have to be run through to find the correct new subrange. This would interrupt transmission or reception for an unacceptably long time. The counting direction control ensures that only one subrange step change is necessary in the right direction.

The counting direction setting is made via the window comparator (IS 4, IS 5) which sets the correct counting direction according as to which end value (URF min, URF max) the control voltage has reached. The counter is set to count down mode when the control voltage reaches URF min. When URF max is reached, the counter is set to count up mode.

The power supply voltage is filtered by the low-pass filter R 1/C 1.

4.2.9 Power Supply Units

4.2.9.1 Battery Pack BT 6861/11 (Circuit diagram, Annex 41)

The field radio unit requires a stabilized DC operating voltage of 14.5 V (negative pole connected to chassis). This voltage is provided by a DC/DC power converter, which is present in every power supply section and gives the 14.5 V output voltage over a very wide range of input voltages. The 14.5 V output voltage is available at pins K, J (plus) and A, B (minus) of the battery pack jack connector BU 6151. The input voltage for the DC/DC converter comes either from the built-in battery pack (two NiCd accumulator blocks connected in series or one Lithium battery block) from an external voltage or current source.

External voltage or current sources are connected to the battery pack plug connector ST 6151. The following power supply versions are possible:

- Operation with connected Battery Charger LG 6874/3 (see also technical manual for the Battery Charger LG 6874/3). During charging of the battery pack the batteries set remains connected to the input of the DC/DC converter. Due to the low charging current, simultaneous operation of a basic unit is not possible.
- Charging of the battery pack with an external voltage source (see also brief operating instructions for SE 6861/12 mod).
In this arrangement, an external charging voltage supply (21.5 to 32 V) is connected to the pins C, J (plus) and A, B (minus) of the battery pack plug connector ST 6151. Thereby the batteries set is disconnected from the DC/DC converter input by the relay RS 6101. One accumulator block at a time is charged via the built-in constant current sources TS 6102, TS 6103. The charging time is 14 hours for a fully discharged battery pack.
- External power supply voltage.
For this purpose an external voltage source (22.5 V to 38 V) is connected to pins D, E (plus) and A, B (minus) of the plug connector ST 6151. This voltage is routed via a built-in wrong polarity and overvoltage protection to the input of the DC/DC converter which then powers the connected basic unit. In this operating mode too, the batteries set is disconnected from the DC/DC converter input by the relay RS 6101.

4.2.9.1.1 Battery Pack Circuit Board (Circuit diagram, Annex 41 and 42)

The battery pack circuit board (51.6861.610.00) contains the following circuit sections:

- Low voltage switch-off

When the battery voltage drops below 24.5 V, the DC/DC converter is switched off by a threshold switching circuit which chiefly consists of the transistors TS 4 and TS 5. This prevents deep discharge of the battery which could damage individual cells by polarity reversal.

The threshold switching circuit is reset automatically when switching on the Field Radio Unit SE 6861/12 mod.

- Overvoltage protection at DC/DC converter output.

If the nominal 14.5 V output voltage increases to intolerably high values (about 19 V) due to a fault condition, then the thyristor TY 1 is switched on via the Zener diode GR 11. The resulting current overload causes the fuse to blow in the primary circuit, so that the input power circuit is switched off immediately.

- Wrong polarity and overvoltage protection at the DC/DC converter input (GR 2, TS 1).
- Two constant current sources (TS 2, TS 3) for charging the batteries set. The charging process is indicated by the light emitting diode GR 6151.

The fuses SI 1 to SI 6 in the battery pack blow, depending on the type of a fault in the complete unit.

4.2.9.1.2 DC/DC Converter (Circuit diagram, Annex 44)

The DC/DC converter transforms the battery voltage with about 25 kHz switching frequency and about 80% power efficiency, into the 14.5 V output voltage for operating the field radio unit (Annex 43).

In reception mode the DC/DC converter delivers about 0.3 A. In transmission mode with average modulation drive it delivers about 1.7 A and at full power 5 A.

The input voltage is switched periodically via the storage choke L 1 to the load, with the switching circuit consisting of the transistors TS 3 and TS 4. The output voltage applied to the load is equal to the input voltage multiplied by the on/off ratio. Thus voltage regulation is achieved via the on/off ratio. The load current has only a slight effect on the output voltage. This is of advantage in particular on account of the large load changes encountered with a SSB amplifier.

The diode GR 4 takes over the load current in the cut-off phase of the power switch circuit.

The pulse generator TS 5 (unijunction transistor) generates the drive pulses (needle pulses with an amplitude of about 2 V peak-peak), which trigger the monoflop TS 6, TS 7. The reset time of the monoflop and thus the on/off ratio of the power switch is controlled within the range 10 to 45 μ s, via the comparator TS 8 and the reference diode GR 3, such that the output voltage is held constant.

The voltage regulator IC 1 feeds TS 5 to TS 7 with the supply voltage which is stabilized to 12 V and which is looped via the basic unit (SI 1 and control input E 2). Thus the DC/DC converter is activated only when the basic unit is switched on.

4.2.9.2 Vehicle Mount FH 6865/24 (Fig. 21)

The vehicle mount is intended for installation of the field radio unit in fixed-wired T/R equipments. The vehicle mount thus contains:

- the mechanical mount
- connectors for auxiliary devices
- the connector for the board electrical system
- the transient protection circuit
- the DC/DC power converter
- the loudspeaker amplifier

The vehicle mount is required for installing the equipment in motor vehicles, to increase the transmitter output power with a 100 W Transmitter Amplifier SV 6863 or when using a separated manual control unit.

For further details, please consult the technical manual "Vehicle Mount FH 6865/24".



1-9072/11

Fig. 1 Basic unit with standard fronthead and Battery pack BT 6861/11



1-9072114

Fig. 2 Basic unit in Vehicle Mount FH 6865/24

1-8916/31

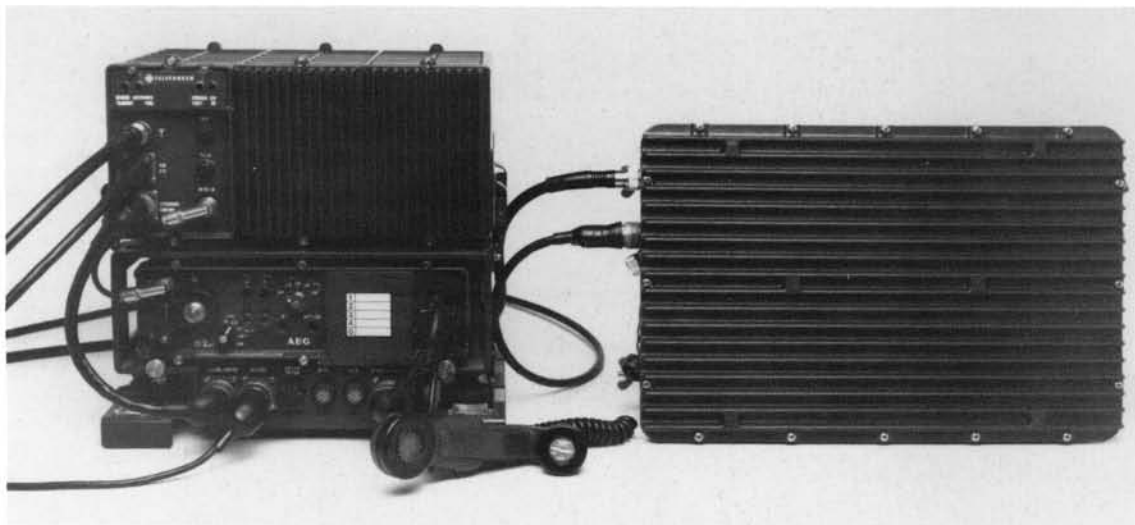


Fig. 3 100 W HF Transceiver Equipment SE 6863,
with external antenna matching unit

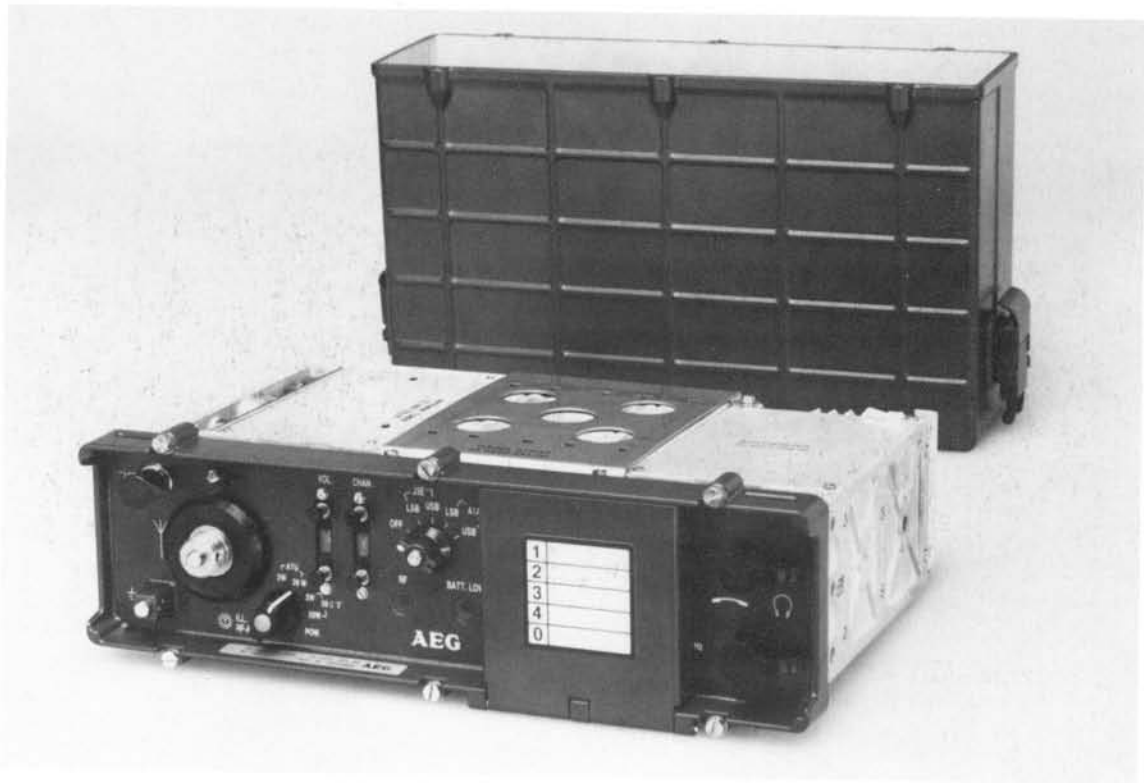


Fig. 4 Basic unit, removed from shielding can

1-9072/16

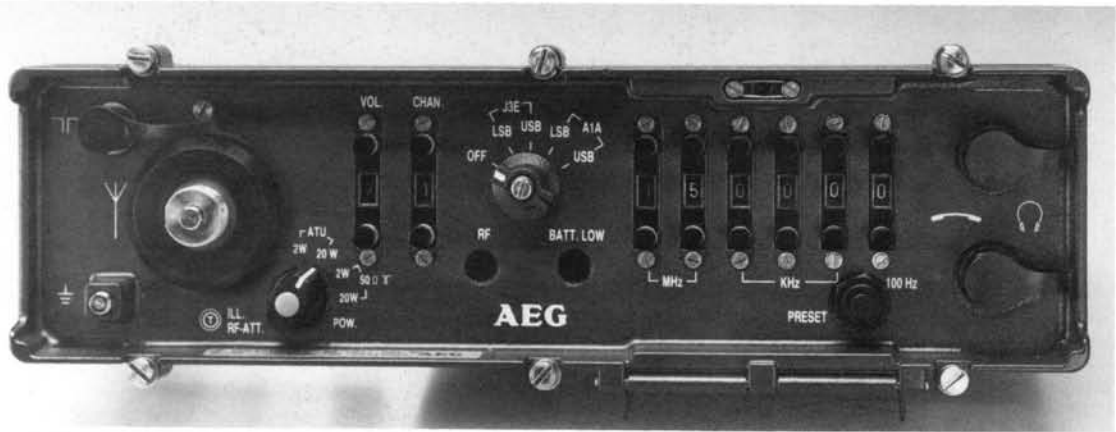


Fig. 5 Standard front head, front view

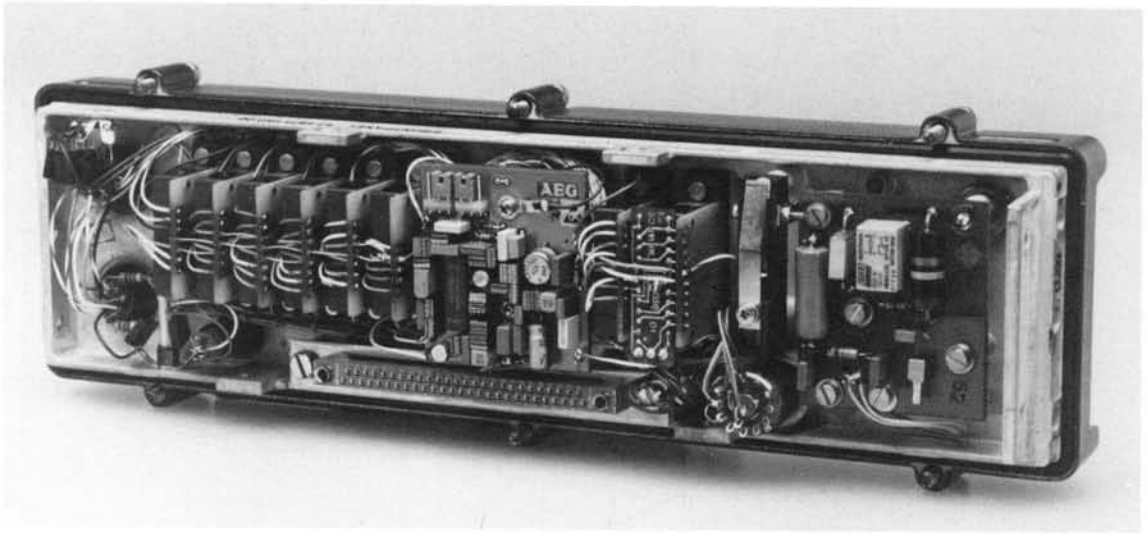


Fig. 6 Standard front head, rear view

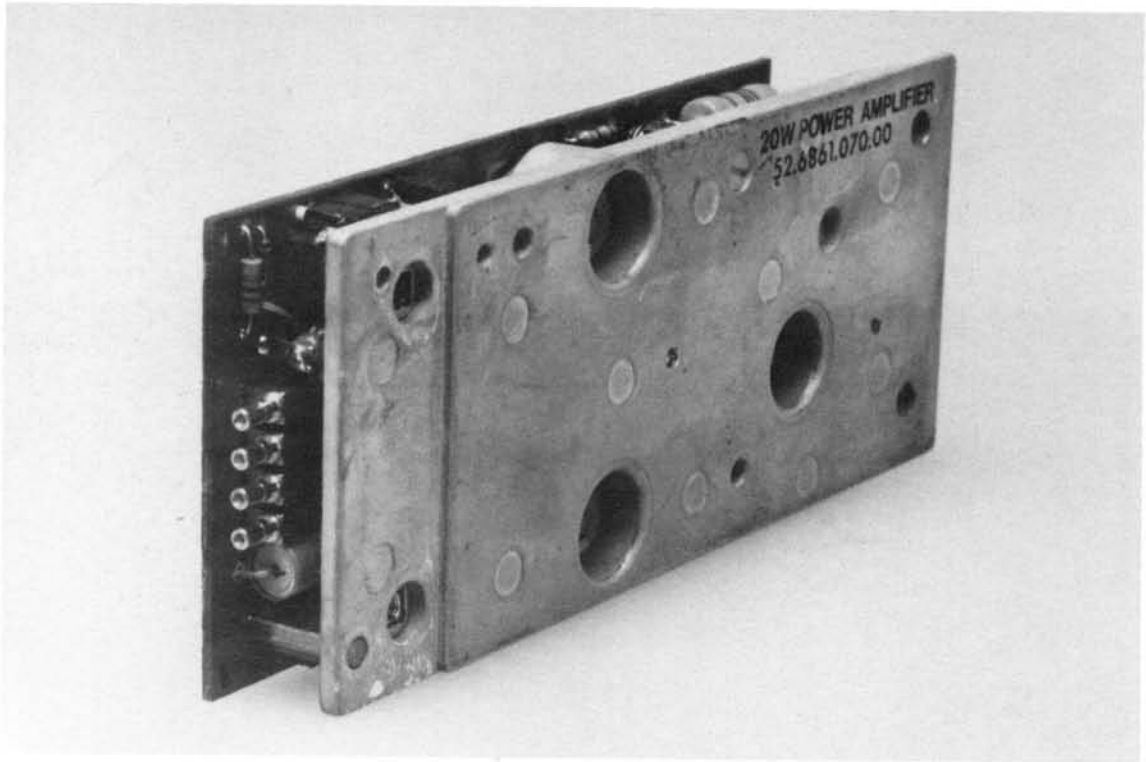
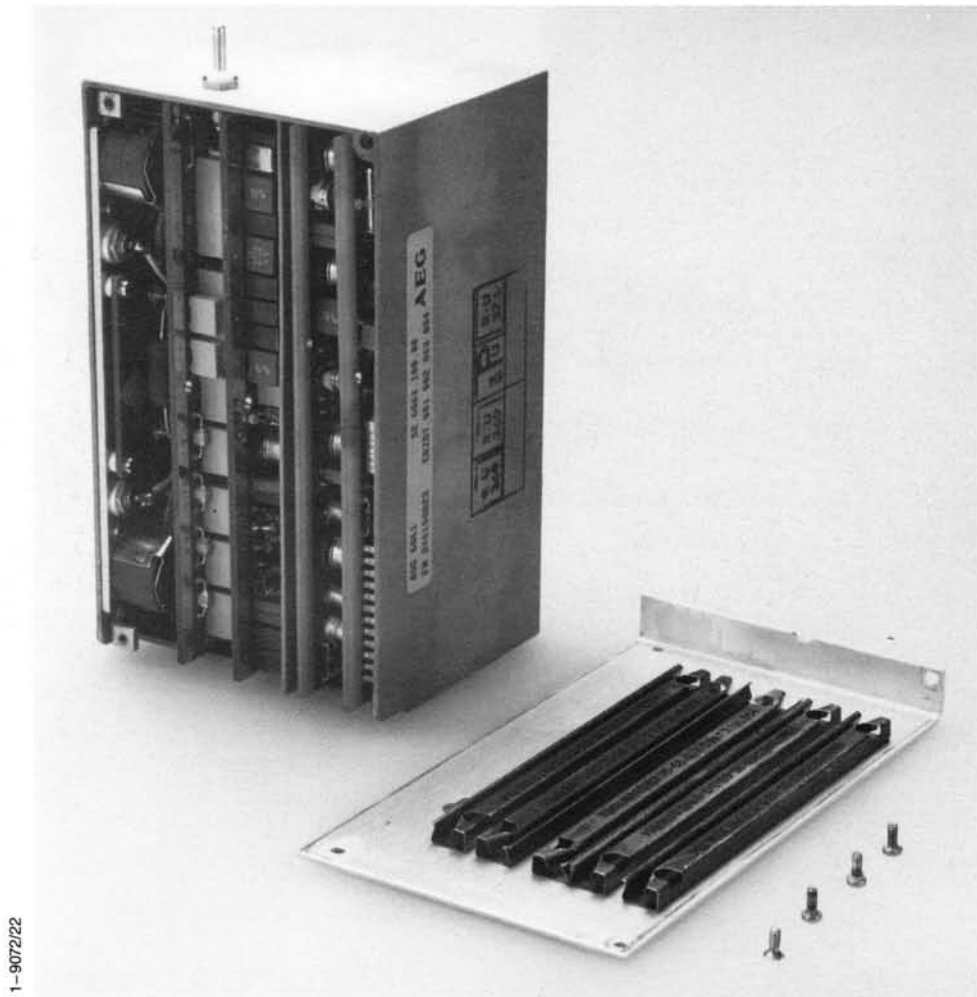


Fig. 7 20 W power amplifier



1-9072/22

Fig. 8 Antenna matching unit, opened

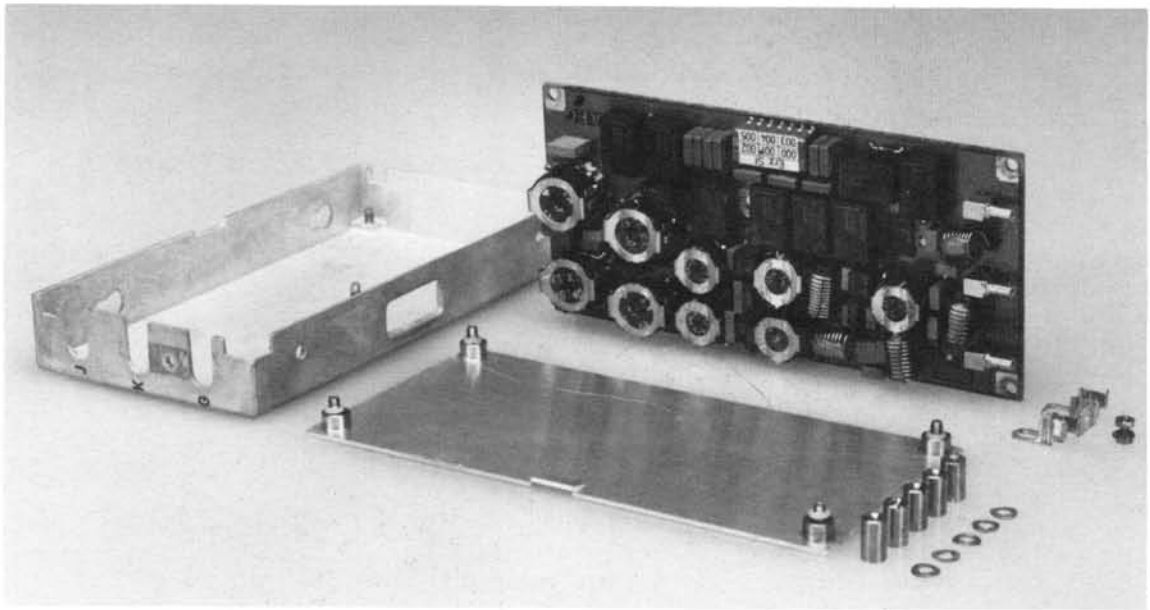


Fig. 9 Harmonics filter module, dismantled

Downloaded by
RadioAmateur.EU

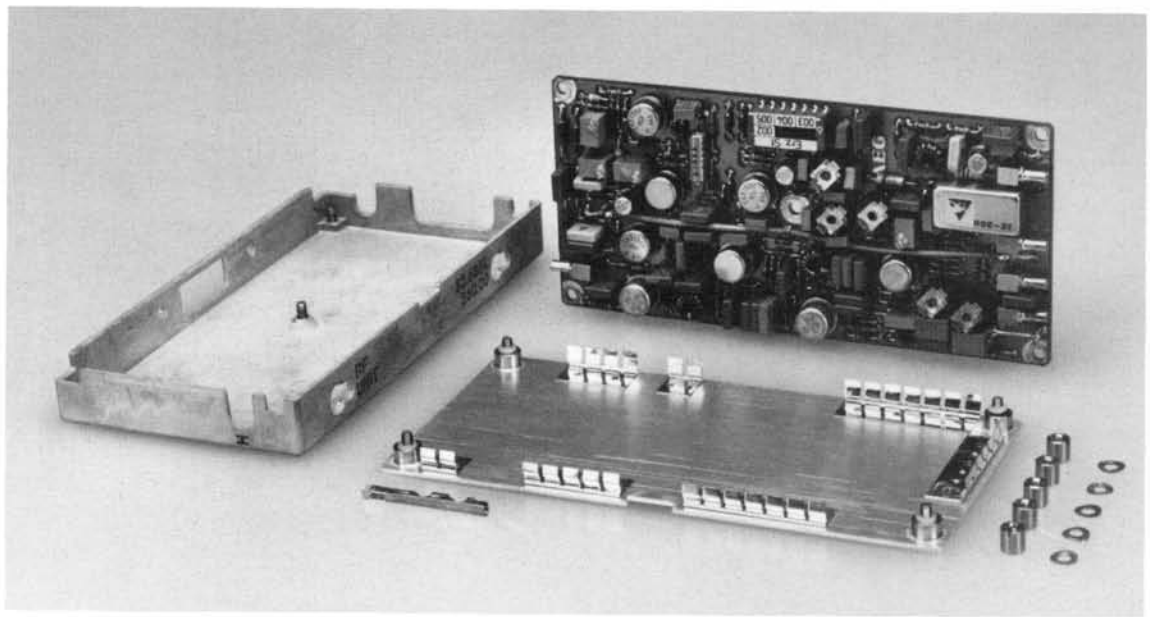


Fig. 10 RF module, dismantled

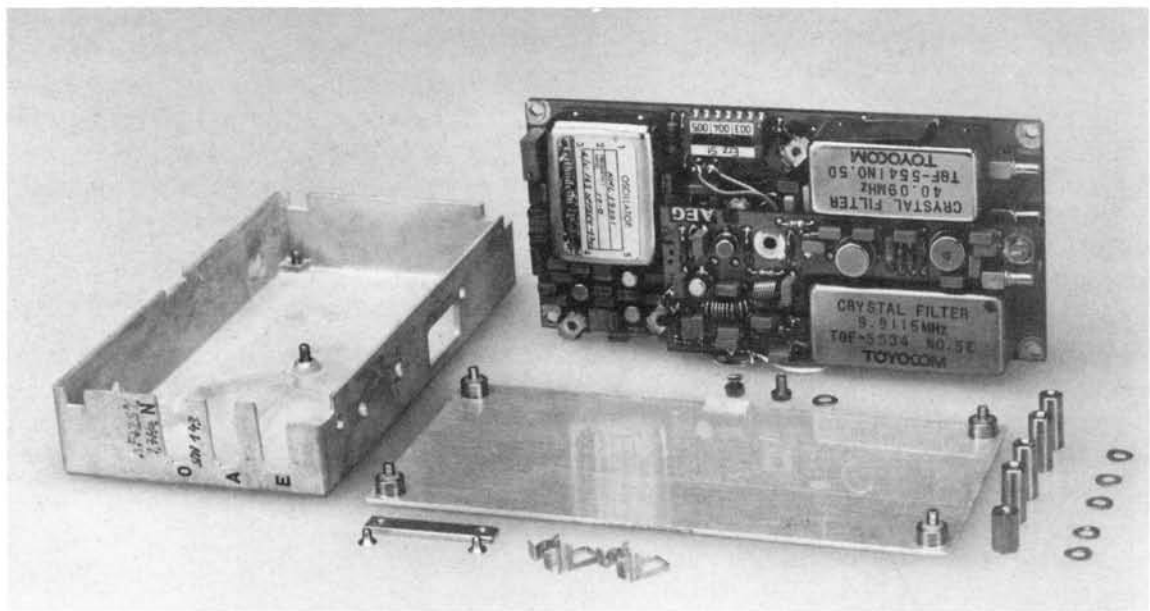


Fig. 11 IF filter module, dismantled

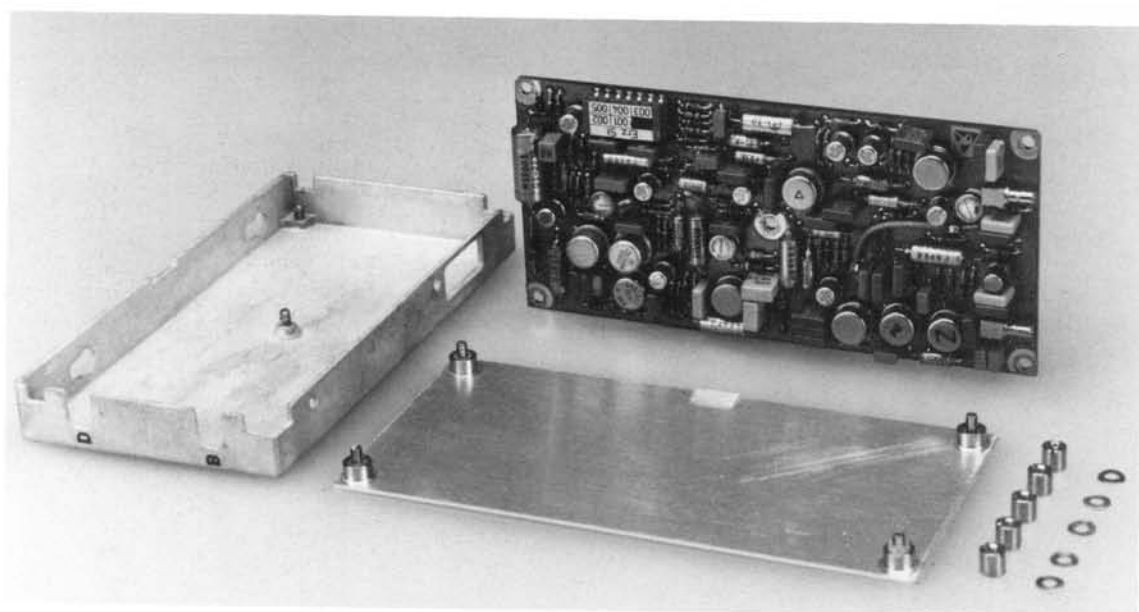


Fig. 12 IF/AF module, dismantled

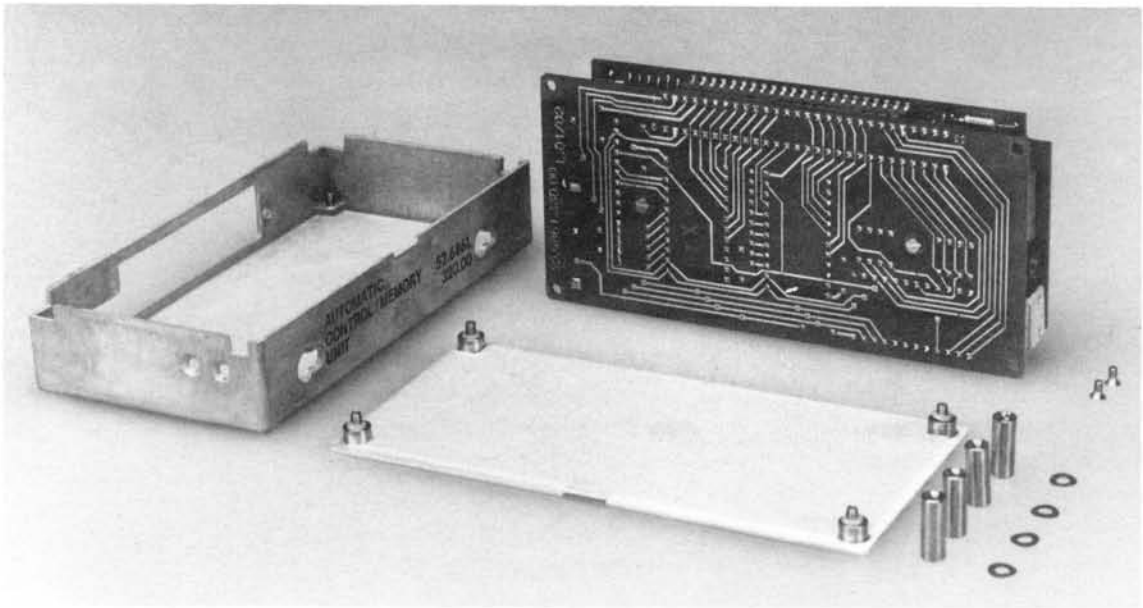


Fig. 13 Organizer/memory module, dismantled

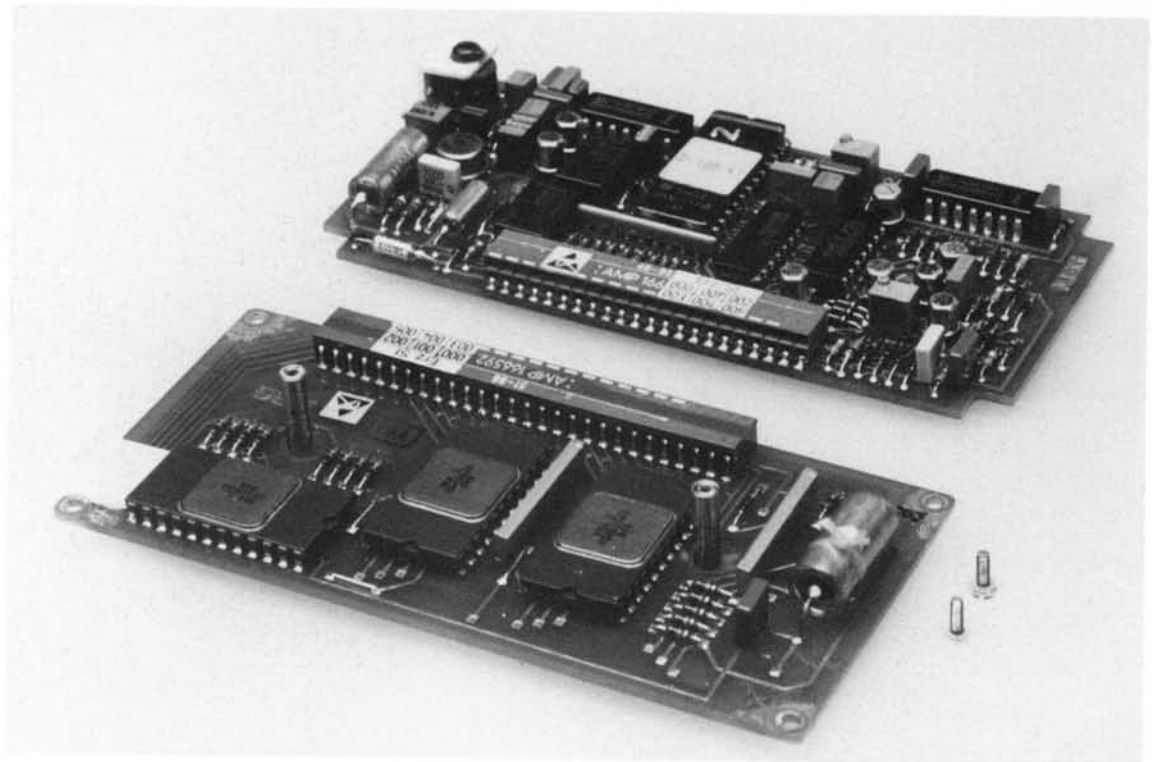
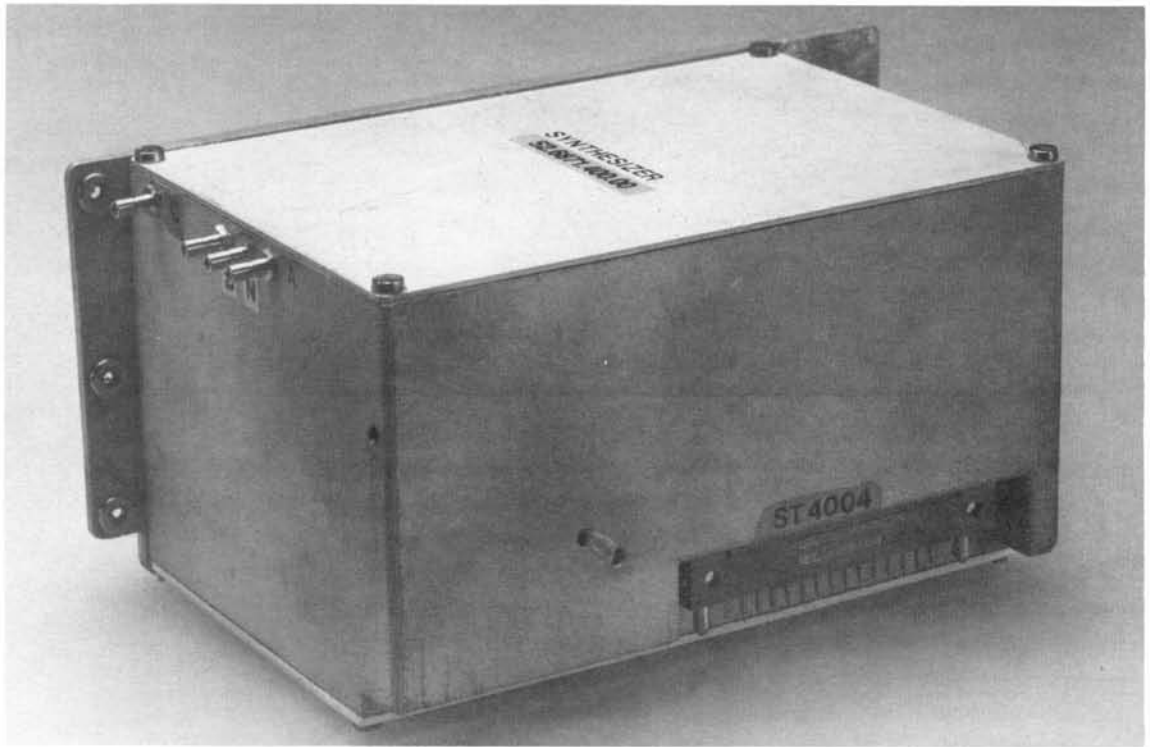


Fig. 14 Channel memory (front) organizer



1-9072/19

Fig. 15 Synthesizer, complete

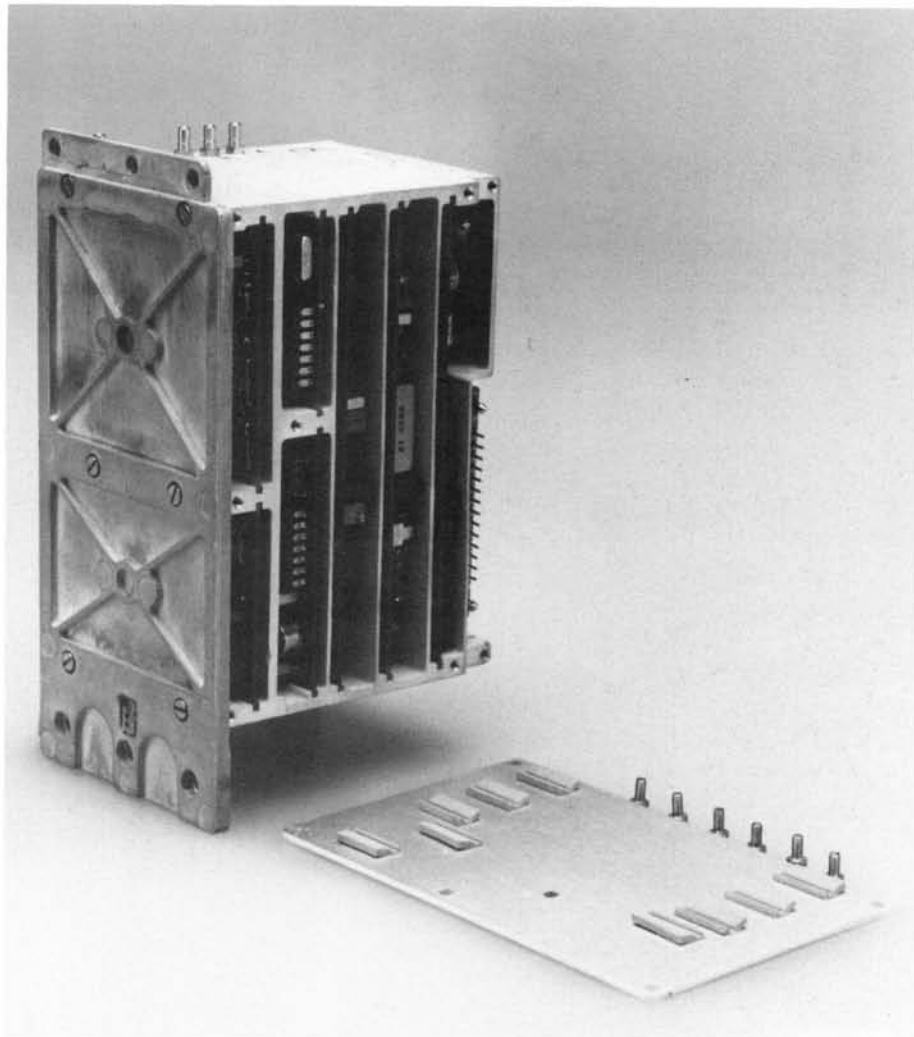
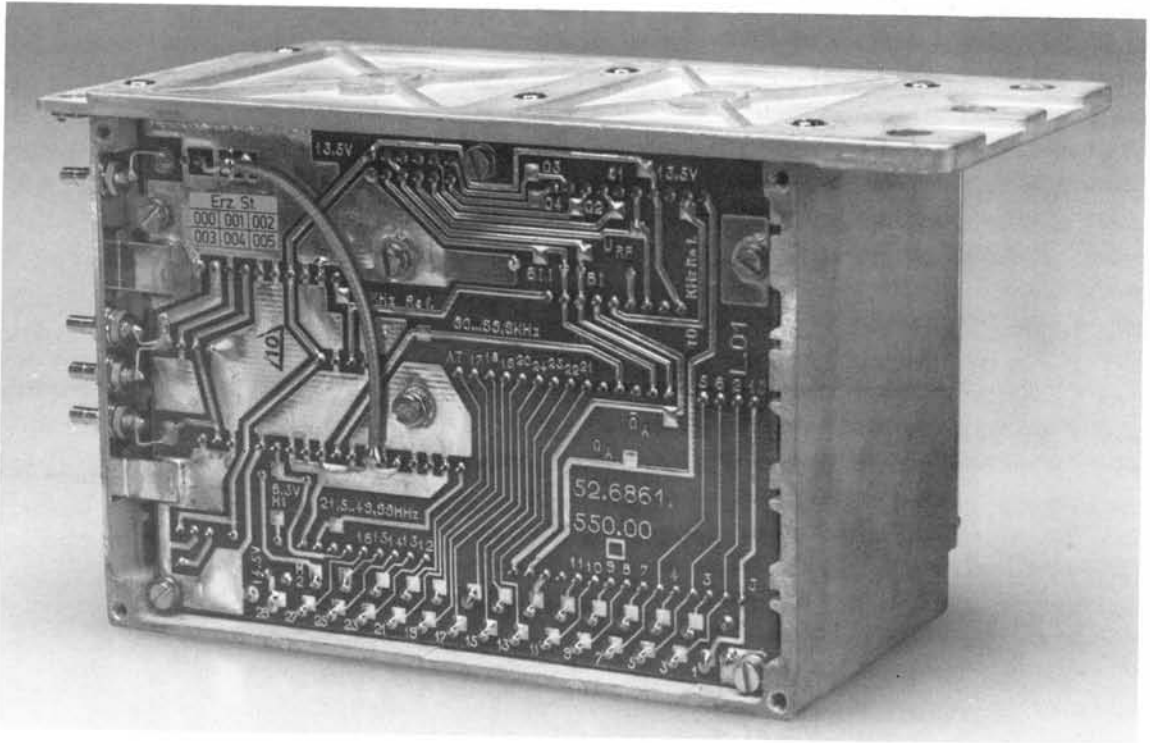


Fig. 16 Synthesizer, opened



1-9072/20

Fig. 17 Motherboard of Synthesizer

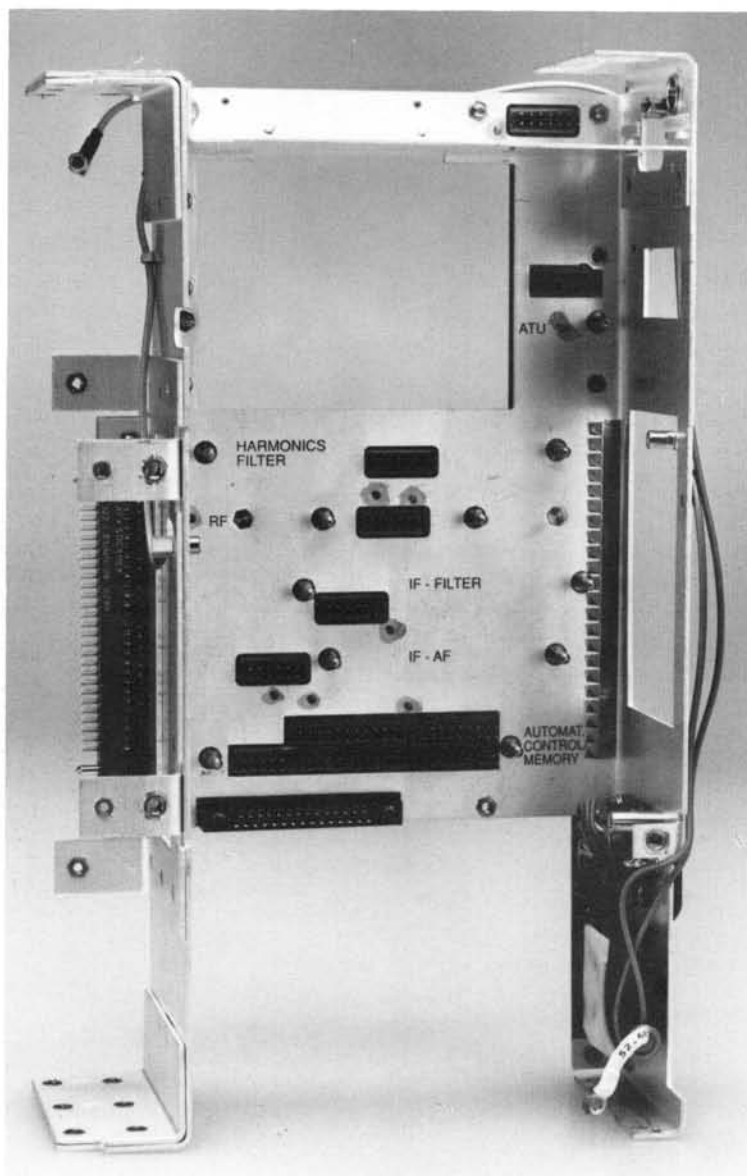


Fig. 18 Frame of the basic unit



Fig. 19 Battery pack BT 6861/11

**Downloaded by
RadioAmateur.EU**



Fig. 20 Battery pack 6861/31



1-9072/12

Fig. 21 Vehicle Mount FH 6865/24

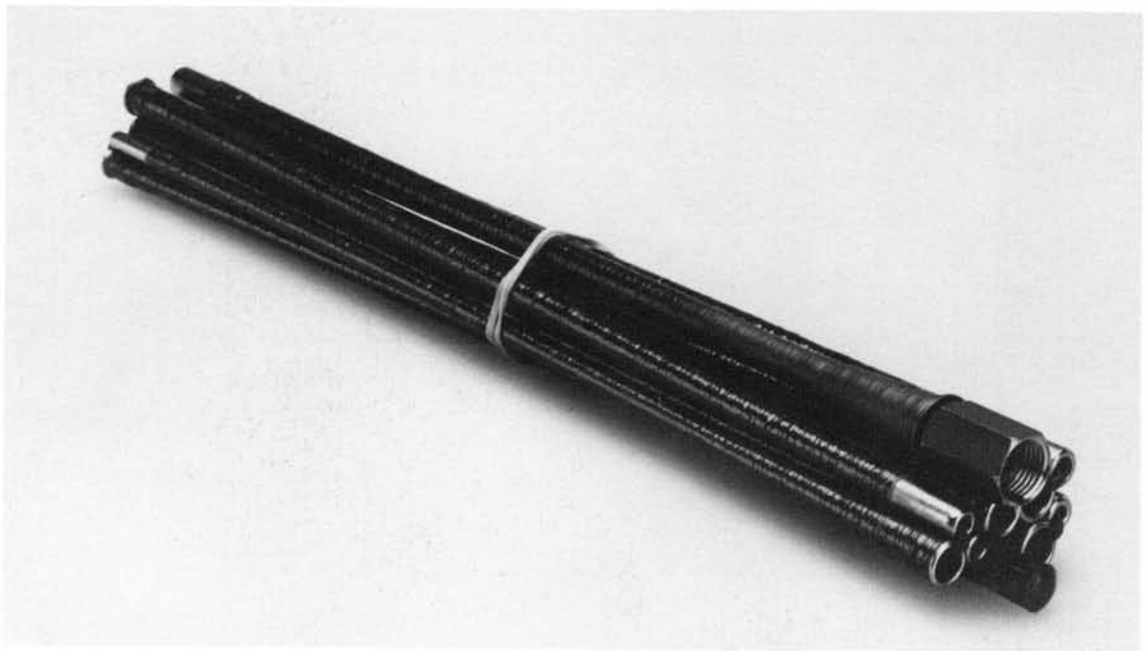


Fig. 22 Rod antenna, folded



1-8265/10

Fig. 23 Morse key

1 - 8265/12



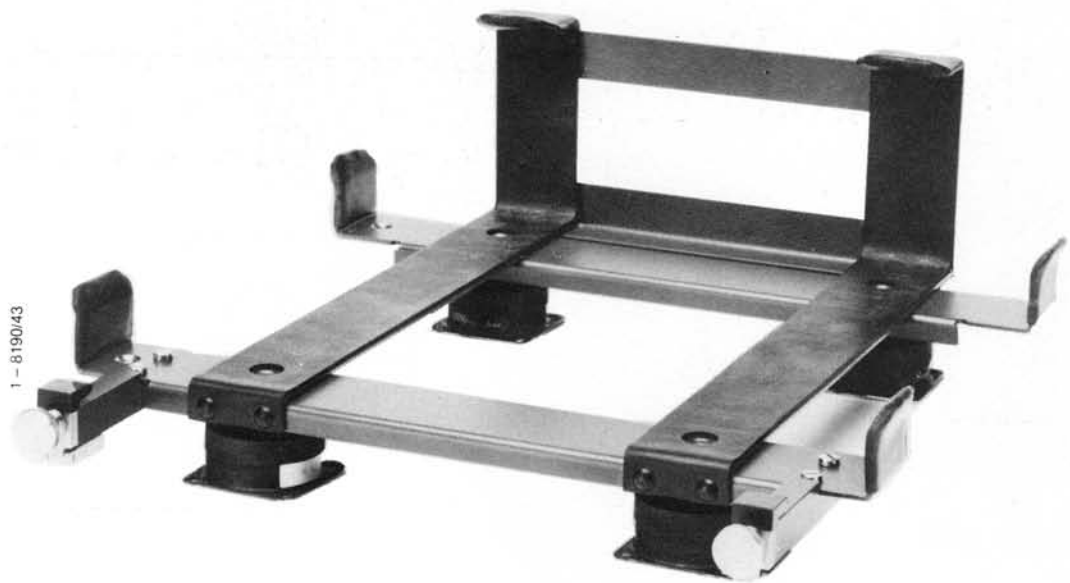
Fig. 24 Handset voice equipment

Accessories
Compartment 2



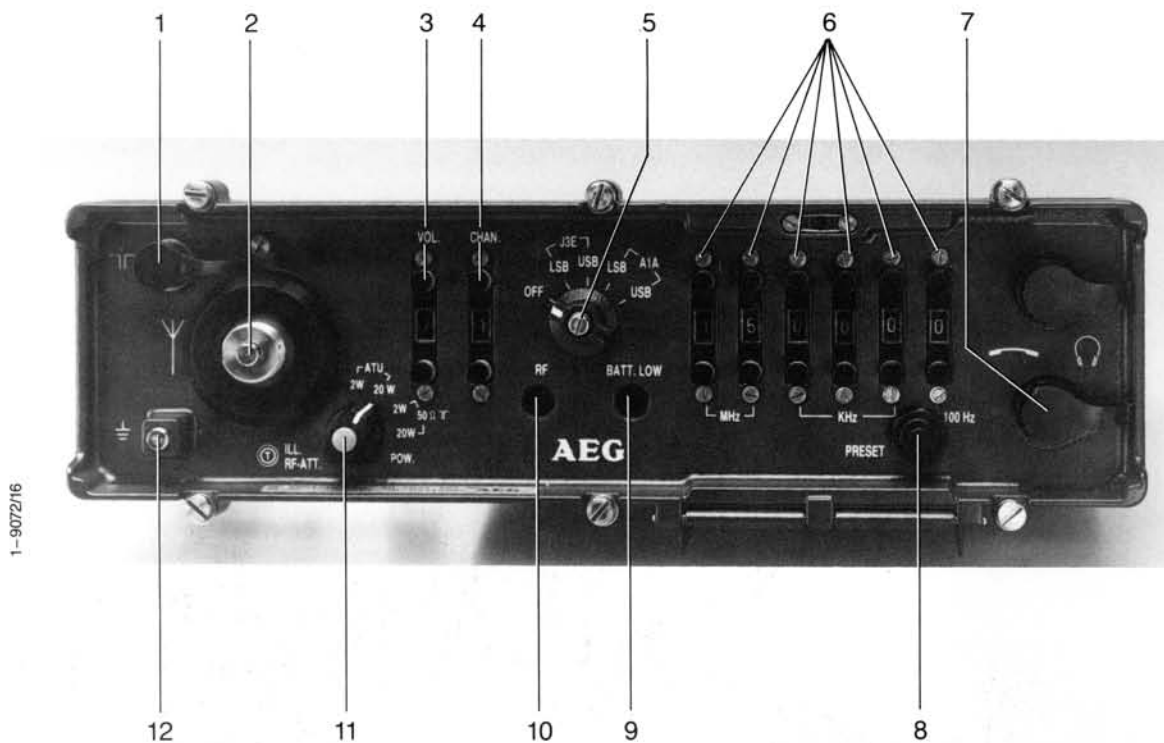
Accessories
Compartment 1

Fig. 25 Backpack carrying bag



1-8190/43

Fig. 26 Vehicle Mount FH 6864



1-9072/16

Fig. 27 SE 6861/12 mod, front side with indication, manual control elements and connectors

- 1 Connector for high-angle antenna or 50 Ω output
- 2 Connector for rod or long-wire antenna
- 3 AF volume control switch
- 4 Channel selector switch
- 5 Mode selector switch
- 6 Frequency setting switch
- 7 AF connectors BU 501/BU 502
- 8 Memory key
- 9 Battery warning LED
- 10 RF output power indication
- 11 Illumination and HF attenuation pushbutton/output power switch
- 12 Ground connector

1-9072/16



Fig. 28 Linking screws on the basic unit

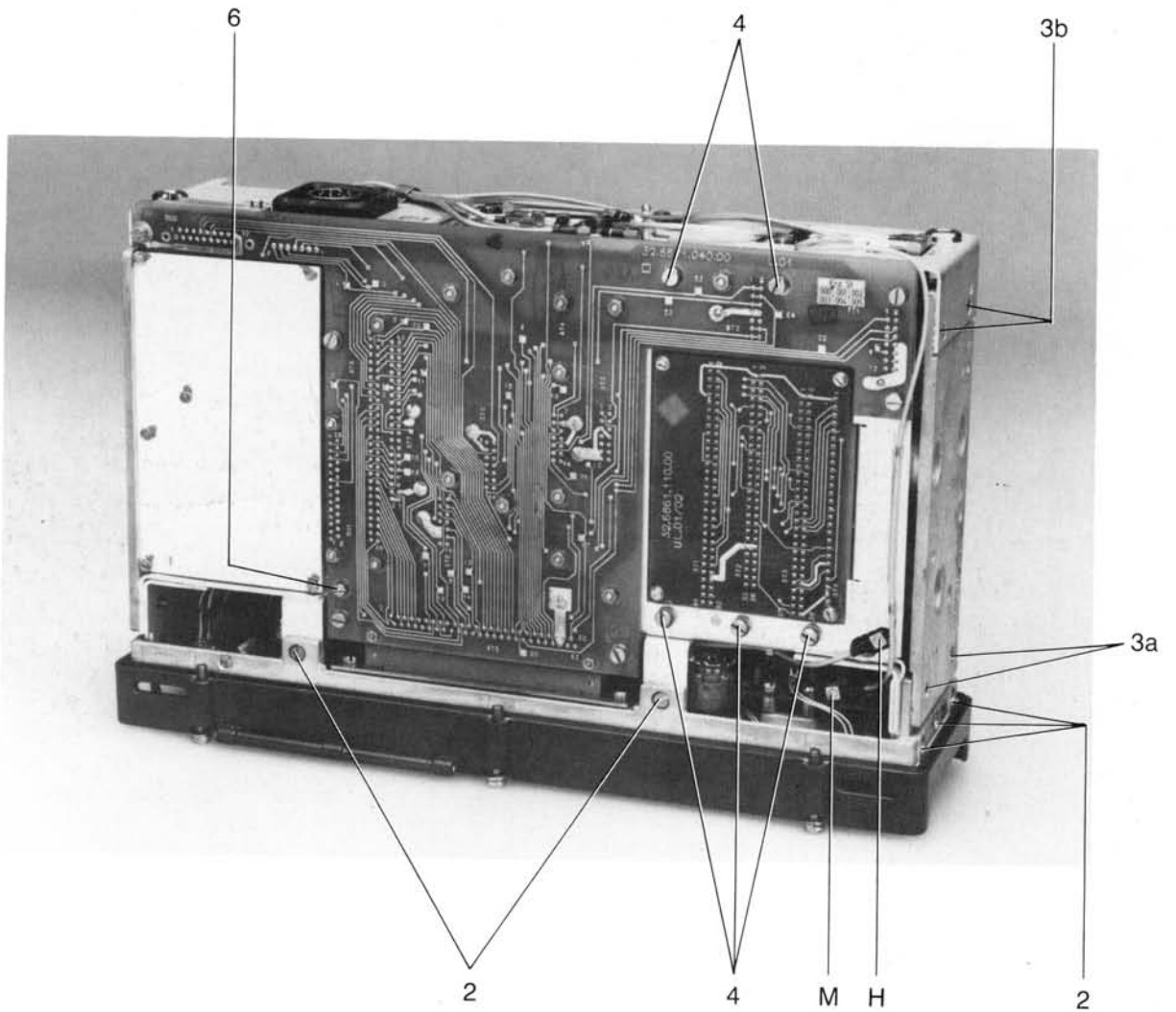


Fig. 29 Taking out the modules

Downloaded by
 RadioAmateur.EU

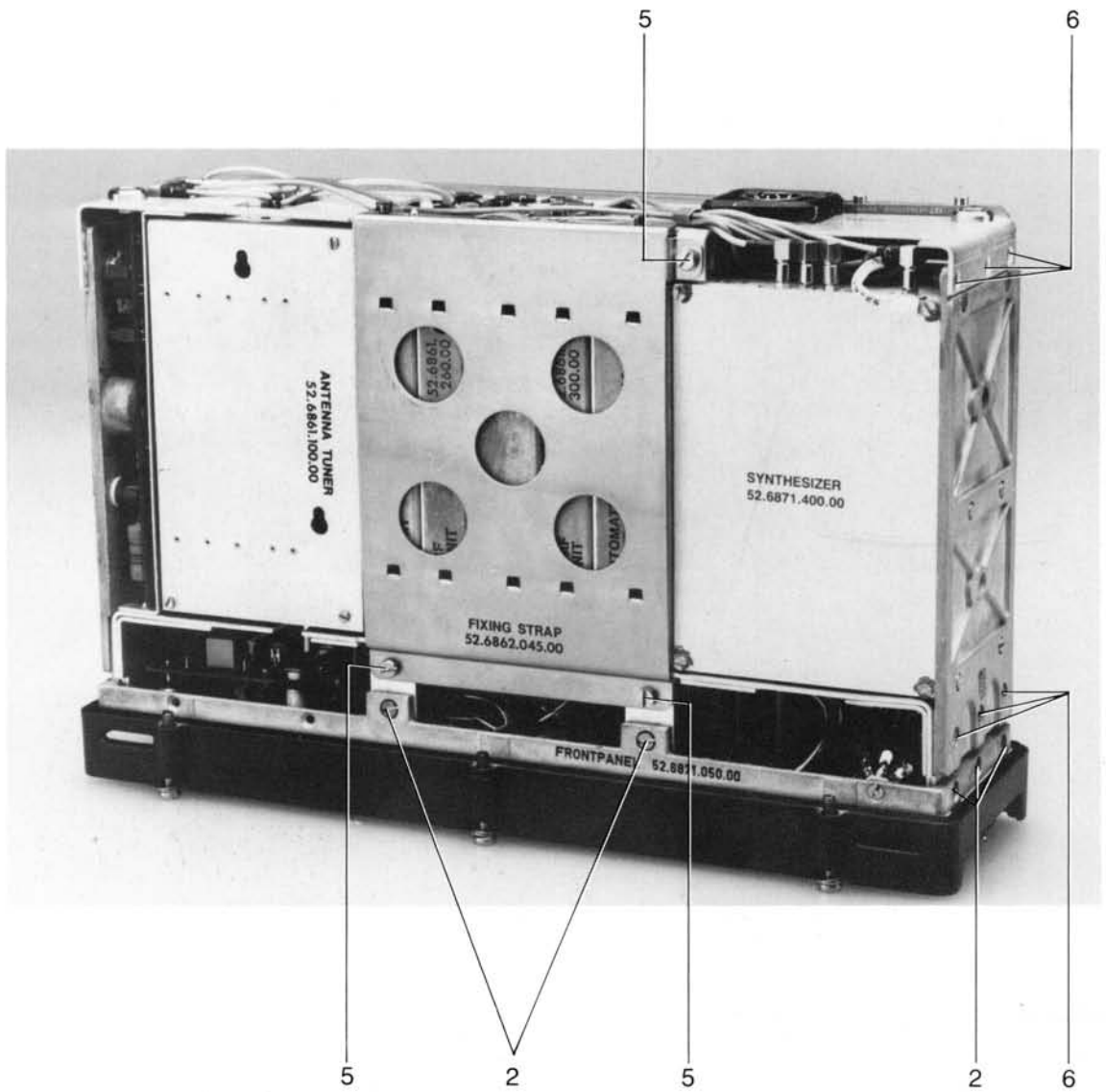


Fig. 30 Taking out the plug-in modules

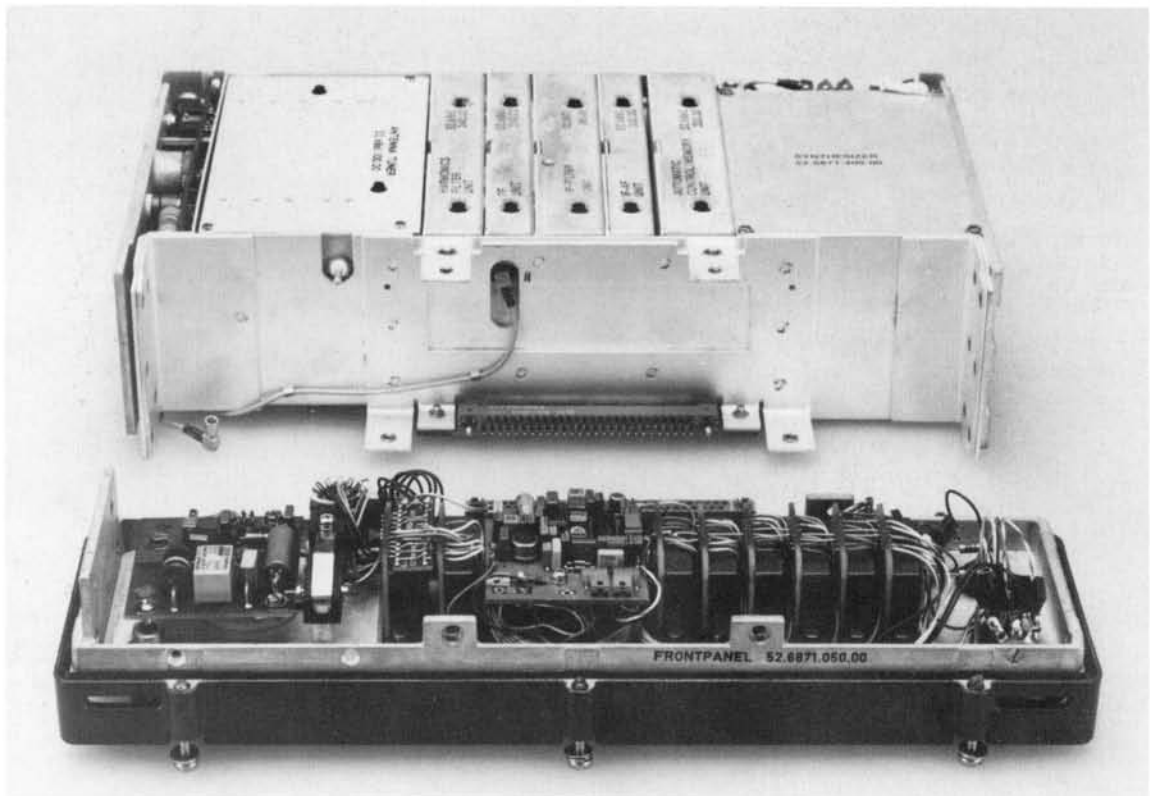


Fig. 31 Front head and frame, separated

H See Fig. 31

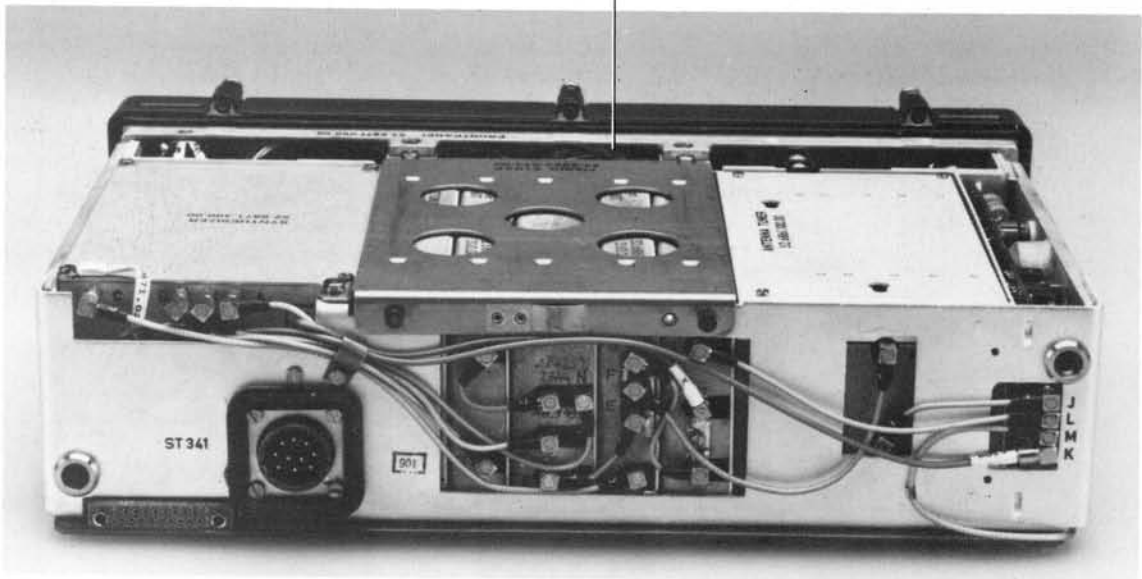


Fig. 32 Taking out the modules

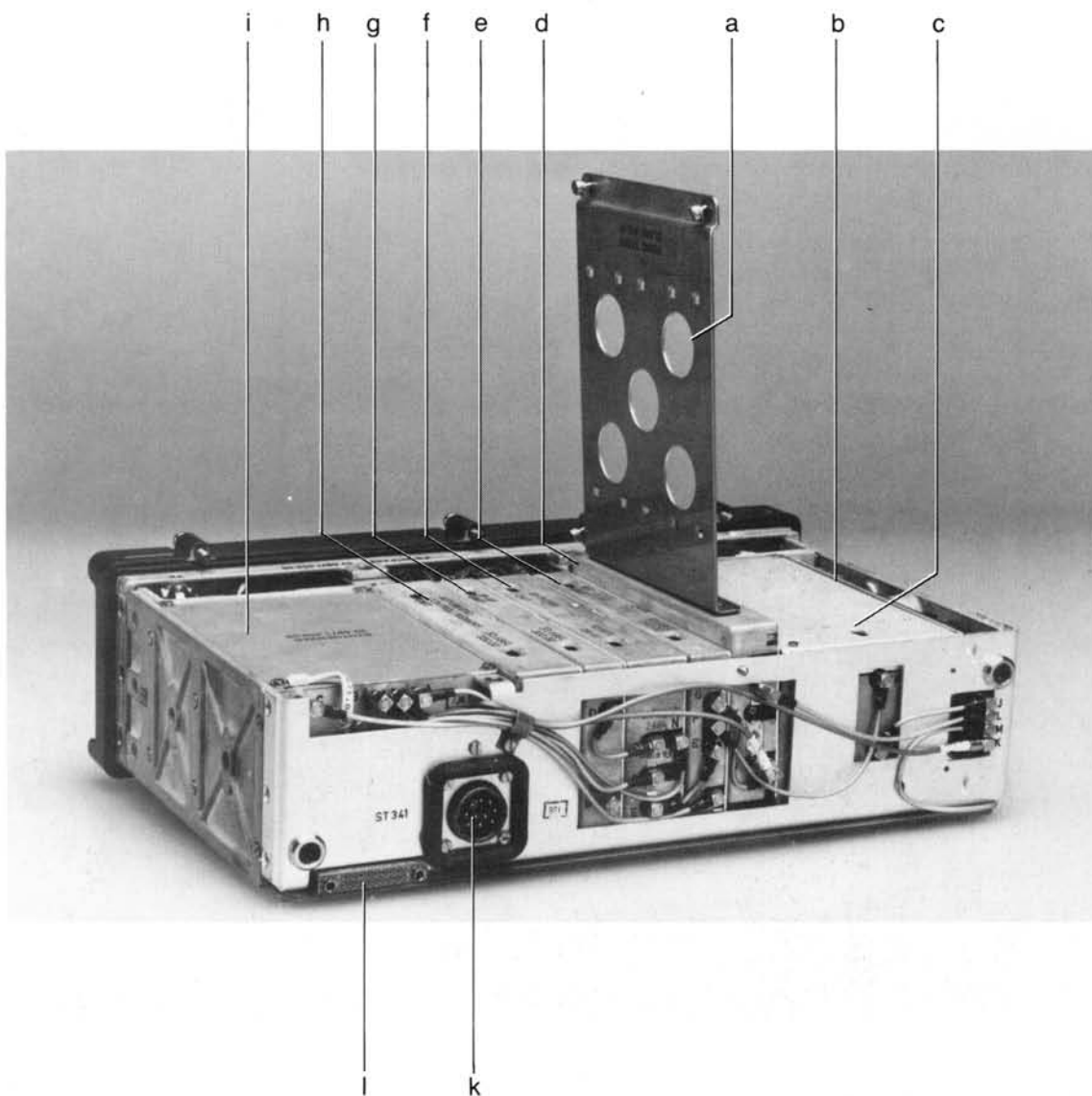


Fig. 33 Basic unit, topside and rear side

a Special holder, in working position
 b 20 W amplifier
 c Antenna tuning unit
 d Harmonics filter
 e RF module
 f IF filter
 g IF/AF module

h Organizer/memory
 i Synthesizer
 k Plug connector, 10pole
 l Test jack

d, e, f, g, h are chanceable with holder a

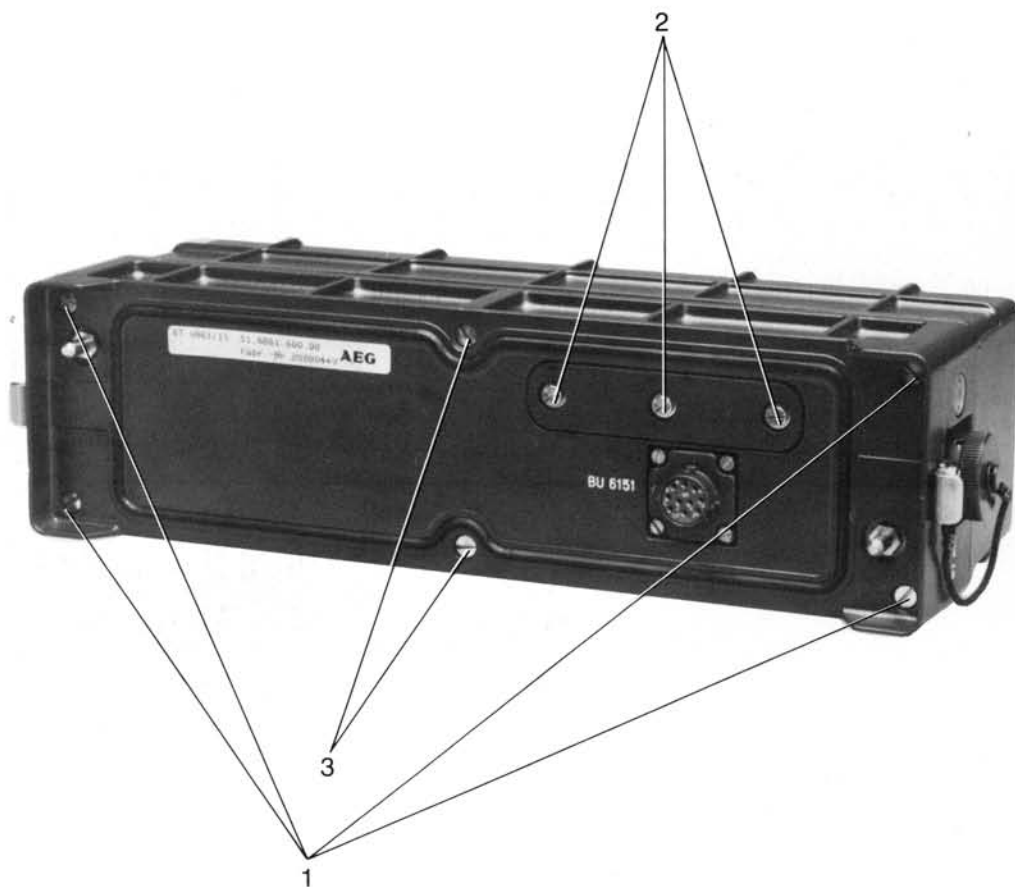


Fig. 34 Battery pack front head BT 6861/11



Fig. 35 Battery pack front head BT 6861/11
with removed fuse cover



Fig. 36 Battery pack front head BT 6861/31
with removed fuse cover

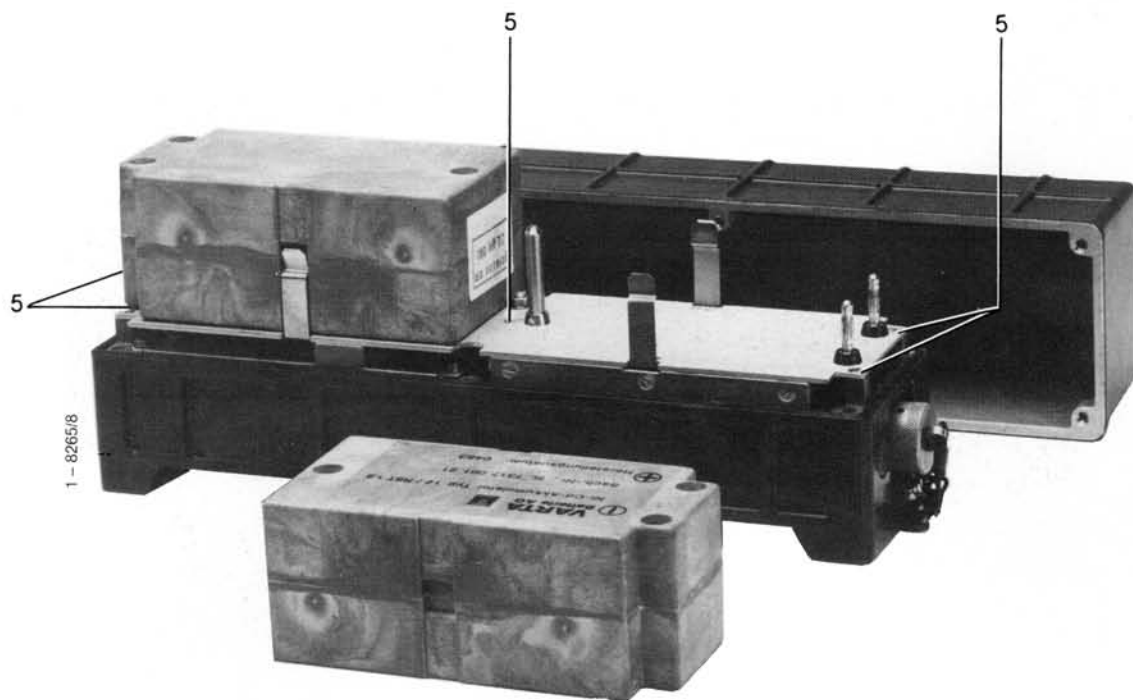


Fig. 37 Battery pack BT 6861/11, dismantled into front head, shielding can and battery blocks

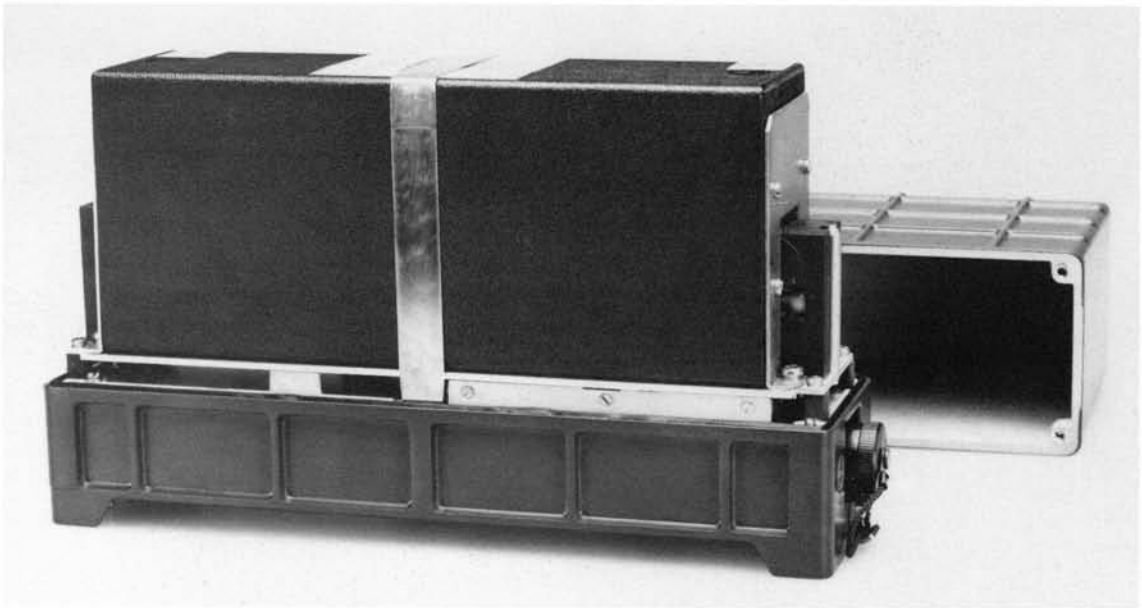


Fig. 38 Battery pack BT 6861/31, with Lithium/Mangan Battery,
removed from shielding can

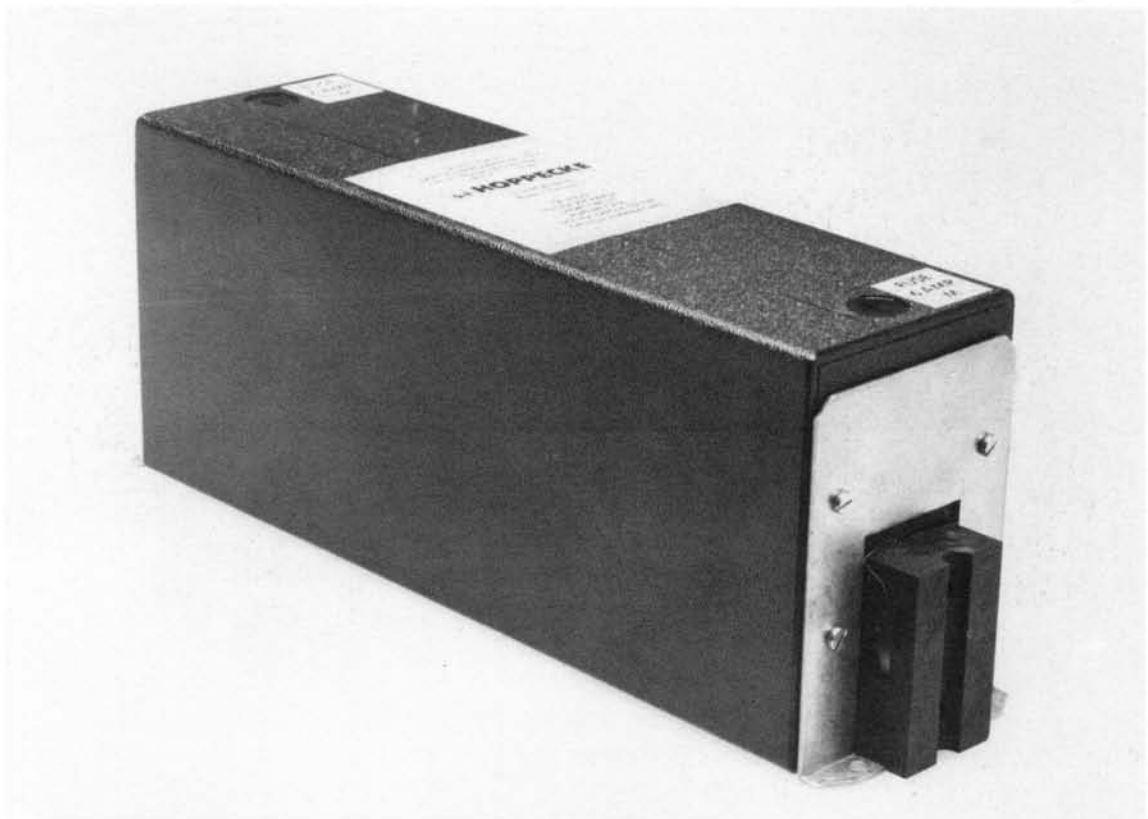


Fig. 39 Lithium/Mangan dioxide Battery 39.2 V, 10 Ah

**Downloaded by
RadioAmateur.EU**

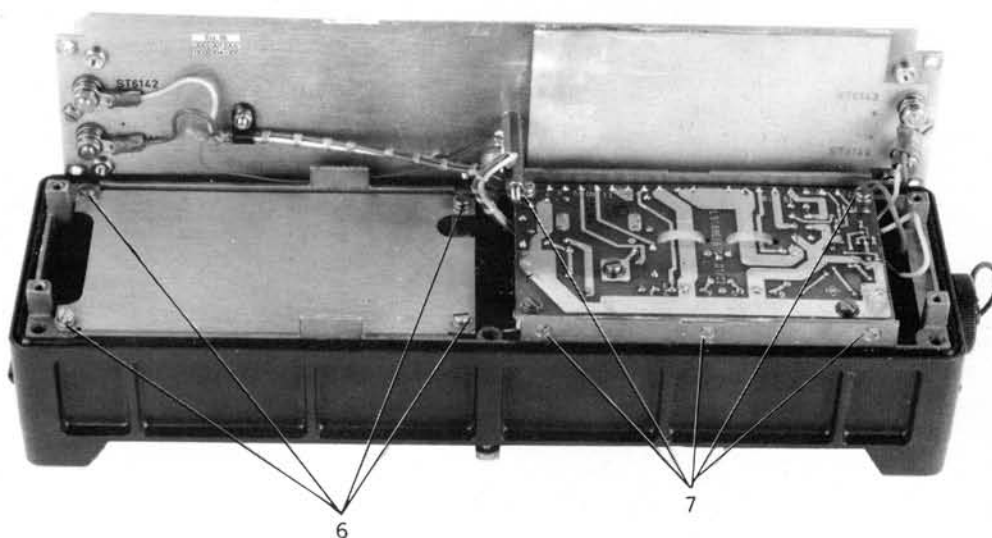
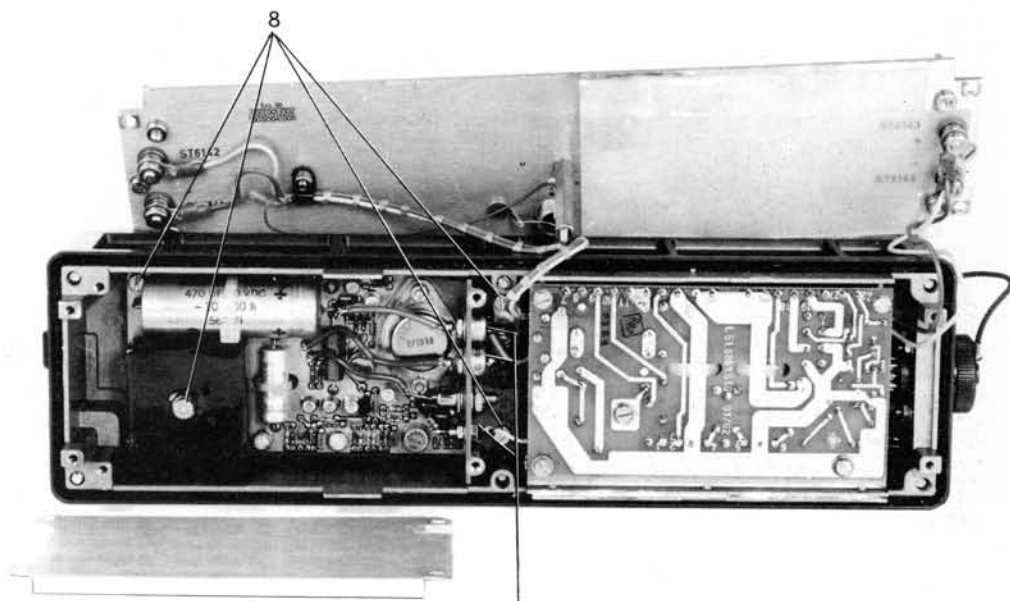
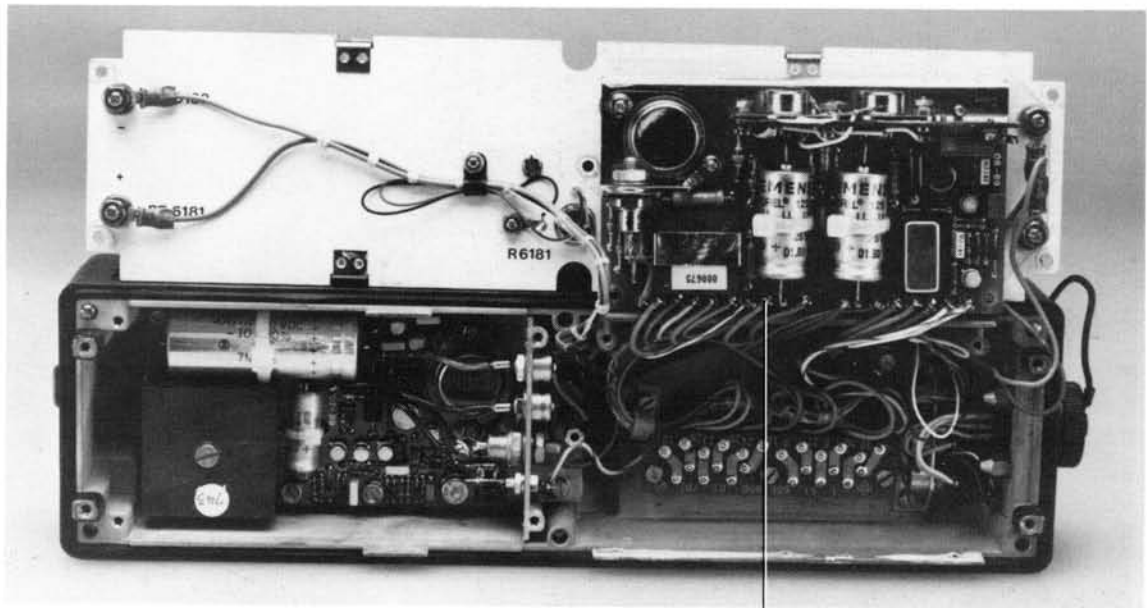


Fig. 40 Taking out the DC/DC converter



Soldered connections

Fig. 41 3 soldered connections on the DC/DC converter



Soldered connections

Fig. 42 Soldered connections on the battery charger

1 - 8265/5



Fig. 43 Loudspeaker LS 6861

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
4.6 Lists of Components				
4.6.1	Battery Pack Circuit Board	51.6861.610.00 SA (04)		
C 6101	ELECTROL. CAPACIT.	5L.5271.064.59	UF 470 + 50-10% 25 V	
C 6102	ELECTROL. CAPACIT.	5L.5271.064.59	UF 470 + 50-10% 25 V	
C 6103	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 6104	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 6105	CAP.PLASTIC FILM	5L.5245.001.76	UF 1 +-10 % 50 V MKS 2	
GR 6101	SI-DIODE	5L.5532.404.35	1N 5550	
GR 6102	SI-DIODE	5L.5532.405.26	MR 1122	
GR 6103	SI-DIODE	5L.5532.405.11	1N 5614 S2M	
GR 6104	SI-DIODE	5L.5532.405.11	1N 5614 S2M	
GR 6105	SI-DIODE	5L.5532.404.35	1N 5550	
GR 6107	REFERENCE DIODE	5L.5536.001.34	BEGRENZER- 1N 5648 A	
GR 6108	SI-DIODE	5L.5532.405.11	1N 5614 S2M	
GR 6109	SI-DIODE	5L.5532.405.11	1N 5614 S2M	
GR 6110	REFERENCE DIODE	5L.5536.001.62	Z- BZX 55/B 22	
GR 6111	REFERENCE DIODE	5L.5536.001.33	Z- BZX 55/B 18	
L 6101	CHOKE	5L.5053.006.37	UH 160 +-15 % 2,5 A 0,060 OHM	
			TYP ZKB 461/099-02-H2	
R 6101	FILM RESISTOR	5N.5102.022.19	OHM 5,6 +- 5 % 1 W RC 32 GF 5R6 J	
R 6102	FILM RESISTOR	5N.5102.010.57	OHM 220 +- 5 % 0,5 W RC 20 GF 221 J	
R 6103	FILM RESISTOR	5N.5102.010.19	OHM 5,6 +- 5 % 0,5 W RC 20 GF 5R6 J	
R 6104	FILM RESISTOR	5N.5102.010.19	OHM 5,6 +- 5 % 0,5 W RC 20 GF 5R6 J	
R 6105	RESISTOR WIREWOUND	5M.5112.222.76	KOHM 1 +- 1 % 5 W/275GRD	
			RE 60 G 1001	
R 6106	FILM RESISTOR	5N.5102.051.20	KOHM 150 +- 5 % 0,125W RC 05	
			GF 154 J	
R 6107	FILM RESISTOR	5M.5102.223.60	KOHM 39 +- 5 % 0,125W RC 05	
			GF 393 J	
R 6108	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05	
			GF 473 J	
R 6109	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05	
			GF 473 J	
R 6110	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05	
			GF 333 J	
R 6111	FILM RESISTOR	5N.5102.051.40	MOHM 1 +- 5 % 0,125W RC 05 GF 105 J	
R 6112	RESISTOR WIREWOUND	5M.5112.222.44	OHM 0,39 +-10 % 3 W/350GRD	
			RW 69 V R39	
R 6113	FILM RESISTOR	5N.5102.002.49	OHM 100 +- 5 % 0,25 W RC 07	
			GF 101 J	
R 6114	FILM RESISTOR	5N.5102.002.81	KOHM 2,2 +- 5 % 0,25 W RC 07	
			GF 222 J	
RS 6101	RELAY	5L.4751.008.20	26 VGS 21-21 2 A 28VGS	
			HERM. TYP SIEHE LV	
TS 6101	SI-NPN-TRANSISTOR	5L.5512.201.81	2N 3773	
TS 6102	SI-PNP-TRANSISTOR	5L.5512.101.89	2N 5954	
TS 6103	SI-PNP-TRANSISTOR	5L.5512.101.89	2N 5954	
TS 6104	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A	
TS 6105	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX	
TY 6101	THYRISTOR	5L.6861.610.30	HS 47	
4.6.2	Standard Front Head	51.6861.612.00 SA (02)		
BU 6151	SOCKET	5L.4531.008.62	10POL 7,5A 400 V GERADE FLANSCH	
			QUETSCH TYP 32592-012	

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
FI 6151	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000
FI 6152	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000
FI 6153	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000
GR 6121	REFERENCE DIODE	5L.5536.001.23	Z- BZX 85/C 36 ZPY 36
GR 6151	LIGHT EMITT. DIODE	5L.5538.001.03	ROT HLMP0102 (5082-4403)
R 6121	FILM RESISTOR	5N.5102.010.61	OHM 330 +- 5 % 0,5 W RC 20 6F 331 J
ST 6151	PLUG	5M.4541.221.07	10POL TYP H12-10PN (MS3112E12-10P)
ST 6152	PLUG	5L.4541.013.27	1POL GERADE 4 D QUETSCH TYP 165590-1
ST 6153	PLUG	5L.4541.013.27	1POL GERADE 4 D QUETSCH TYP 165590-1
4.6.3	Chassis		51.6861.614.00 SA (01)
ST 6141	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
ST 6142	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
ST 6143	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
ST 6144	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
4.6.4	Standard Front Head		51.6861.615.00 SA (02)
BU 6151	SOCKET	5L.4531.008.62	10POL 7,5A 400 V GERADE FLANSCH QUETSCH TYP 32592-012
FI 6151	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000
FI 6152	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000
FI 6153	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000
GR 6151	LIGHT EMITT. DIODE	5L.5538.001.03	ROT HLMP0102 (5082-4403)
R 6151	FILM RESISTOR	5N.5102.003.10	KOHM 33 +- 5 % 0,25 W RC 07 6F 333 J
ST 6151	PLUG	5M.4541.221.07	10POL TYP H12-10PN (MS3112E12-10P)
4.6.5	Chassis		51.6861.618.00 SA (03)
B 6181	STEEL ACCUMULATOR	5L.7317.001.21	14,4 V 1,8 AH NICD BUCHSE ISOL. 133X 69X 53 TYP BT 12/RST 1,8
B 6182	STEEL ACCUMULATOR	5L.7317.001.21	14,4 V 1,8 AH NICD BUCHSE ISOL. 133X 69X 53 TYP BT 12/RST 1,8
R 6181	RESISTOR NTC	5L.5173.001.49	KOHM 6 +-10% 0,4 W B 3950 TYP K252 Q63025-K2063-K
ST 6181	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
ST 6182	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
ST 6183	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080
ST 6184	CONTACT PIN	5L.4432.001.71	BUESCHEL 4 D 34 L CUZN AU SCHRAUB TYP SA400 NR 22.1080

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
4.6.6	Converter	51.6861.630.00 SA (03)		
C 6301	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 6302	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 6303	ELECTROL. CAPACIT.	5M.5271.222.60	UF 470 + 30-10% 50 V CU 17 M39018/03-0639	
C 6304	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)	
C 6305	CAPACITOR CERAMIC	5M.5224.220.11	PF 100 +-10 % 200 V CK 05 BX 101 K	
C 6306	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)	
C 6307	CAP.PLASTIC FILM	5L.5241.057.56	PF 680 +- 5 % 100 V FKC 2 /KC1850	
C 6308	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 6309	CAPACITOR CERAMIC	5M.5221.233.08	PF 150 +-10 % 200 V CK 05 BX 151 K	
C 6310	ELECTROL. CAPACIT.	5M.5271.222.62	UF 82 + 30-10% 30 V CU 13 M39018/01-0624	
FI 6301	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000	
FI 6302	FILTER INTERFER.	5L.5365.001.10	10 A 200 VGS NF 1,5 1250-003/51-712-001/.	
FI 6303	FILTER INTERFER.	5L.5362.001.11	15 A 50 VGS 9053-101-0000/1021000	
GR 6301	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 6302	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 6303	REFERENCE DIODE	5L.5532.205.10	Z- BZX 55/C 6 V 2 ZPD 6,2	
GR 6304	SI-DIODE	5L.5532.006.53	BYT 12-400 R	
IS 6301	SEMICONDUCTOR CIRC	5L.5443.003.38	CA 3085 A SPANNUNGSREGLER	
L 6301	CHOKE	5L.5053.006.56	UH 250 +-15 % 4 A2X0,045 OHM TYP ZKB 416/361-XX-H2	
R 6301	RESISTOR WIREWOUND	5L.5112.008.83	OHM 0,03 +- 3 % 3 W/275GRD LVR-3	
R 6302	RESISTOR NTC	5L.5173.002.85	KOHM 10 +-10% 0,5 W B 4275 TYP 2322 642 62103	
R 6303	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J	
R 6304	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J	
R 6305	FILM RESISTOR	5N.5102.050.57	OHM 220 +- 5 % 0,125W RC 05 GF 221 J	
R 6306	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J	
R 6307	FILM RESISTOR	5N.5102.002.81	KOHM 2,2 +- 5 % 0,25 W RC 07 GF 222 J	
R 6308	FILM RESISTOR	5N.5102.050.63	OHM 390 +- 5 % 0,125W RC 05 GF 391 J	
R 6309	FILM RESISTOR	5N.5102.050.31	OHM 18 +- 5 % 0,125W RC 05 GF 180 J	
R 6310	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J	
R 6311	FILM RESISTOR	5N.5102.050.29	OHM 15 +- 5 % 0,125W RC 05 GF 150 J	
R 6312	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J	
R 6313	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J	
R 6314	VARIABLE RESISTOR	5L.5135.004.16	KOHM 50 +-20% 0,5 W LIN TYP 3329H-1-503/3321H-1-503	
R 6315	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05 GF 473 J	
R 6316	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J	
R 6317	FILM RESISTOR	5N.5102.050.57	OHM 220 +- 5 % 0,125W RC 05 GF 221 J	
R 6318	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J	
R 6319	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 6320	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 6321	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J	
R 6322	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J	
R 6323	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 6324	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J	

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 6325	FILM RESISTOR	5N.5102.050.74	KOHM 1,2 +- 5 % 0,125W RC 05 GF 122 J
R 6326	FILM RESISTOR	5N.5102.050.92	KOHM 6,8 +- 5 % 0,125W RC 05 GF 682 J
R 6327	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 6328	VARIABLE RESISTOR	5L.5135.004.11	KOHM 5 +-20% 0,5 W LIN TYP 3329H-1-502/3321H-1-502
TS 6301	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 6302	SI-NPN-TRANSISTOR	5L.5512.204.20	2N 2222 A
TS 6303	SI-NPN-TRANSISTOR	5L.5512.001.73	2N 6354
TS 6304	SI-PNP-TRANSISTOR	5L.5512.101.75	2N 4033 BFW 72
TS 6305	UJ-TRANSISTOR	5L.5512.501.01	2N 2646
TS 6306	SI-NPN-TRANSISTOR	5L.5512.203.47	2N 3700
TS 6307	SI-NPN-TRANSISTOR	5L.5512.204.20	2N 2222 A
TS 6308	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A

4.6.7 Fuse Plate 51.6861.650.00 SA (00)

SI 6501	FUSE	5L.4811.003.87	2 A 125V FF TYP 272002 / 19278K
SI 6502	FUSE	5L.4811.003.90	5 A 125V FF TYP 272005 / 19278K
SI 6503	FUSE	5L.4811.003.85	1 A 125V FF TYP 272.001 / 19278K
SI 6504	FUSE	5L.4811.003.90	5 A 125V FF TYP 272005 / 19278K
SI 6505	FUSE	5L.4811.003.90	5 A 125V FF TYP 272005 / 19278K
SI 6506	FUSE	5L.4811.003.85	1 A 125V FF TYP 272.001 / 19278K

4.6.8 Cable 52.6861.010.00 SA (01)

BU 1	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 2	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 3	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 4	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 5	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 6	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 7	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 8	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 9	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 10	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 11	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 12	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 13	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 14	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 15	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 16	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 17	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 18	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 19	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
BU 20	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 21	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 22	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 23	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 24	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 25	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
BU 26	RF SOCKET	5L.4511.003.32	NANO 51-428-3196/35K202-301D2 Z- 50 TEFLON WINKELIG QUETSCH
4.6.9	Mother Board	52.6861.040.00 SA (00)	
BU 401	SOCKET STRIP	5L.4551.011.03	29POL 3 A 350V BECU AU1 8611.29.71.14.200.018/.
BU 402	SOCKET STRIP	5L.4551.015.12	17POL 3 A 350V CUZN NI AU DUROPL. GV TYP 838-17FL-203
ST 401	PLUG CONNECTOR	5L.4561.011.83	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 826 105-7
ST 402	PLUG CONNECTOR	5L.4561.011.83	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 826 105-7
ST 403	PLUG CONNECTOR	5L.4561.011.83	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 826 105-7
ST 404	PLUG CONNECTOR	5L.4561.011.83	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 826 105-7
ST 405	PLUG CONNECTOR	5L.4561.011.83	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 826 105-7
ST 406	PLUG CONNECTOR	5L.4561.011.83	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 826 105-7
ST 407	PLUG CONNECTOR	5L.4561.011.84	44POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 2-826 105-2
ST 408	PLUG CONNECTOR	5L.4561.011.85	56POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 2-826 105-8
ST 409	PLUG CONNECTOR	5L.4561.024.61	53POL 3 A 350V CUZN NI AU DUROPL.GV TYP 838-53ML-204
4.6.10	Standard Front Head	52.6861.050.00 SA (00)	
BU 501	SOCKET	5L.4531.009.29	7POL 0,5A 42 V WASSERDICHT LOET TYP NF07C1L0 1435 0161923
BU 502	SOCKET	5L.4531.009.29	7POL 0,5A 42 V WASSERDICHT LOET TYP NF07C1L0 1435 0161923
BU 503	RF SOCKET	5M.4511.220.86	BNC UG 657A/U Z- 50 TEFLON GER.ZENTRAL LOET
BU 505	SPRING CONTACT	52.6862.050.18	
BU 506	SOCKET STRIP	5L.4551.012.72	53POL 3 A 250V BZNI AU DAP TYP 127-53 800 018
C 501	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 502	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 503	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 504	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 505	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 506	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 507	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
C 508	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K
GR 501	LIGHT EMITT. DIODE	5L.5586.002.83	GRUEN TLUG5500 (V312P)
GR 502	LIGHT EMITT. DIODE	5L.5586.002.82	GELB TLUY5500 (V313P)
L 501	CHOKE	5L.5053.003.35	UH 100 +-10 % 0,084A 8 OHM TYP MS75085-7

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
L 502	CHOKE	5L.5053.003.35	UH 100 +-10 % 0,084A 8 OHM TYP MS75085-7
R 501	FILM RESISTOR	5N.5102.010.65	OHM 470 +- 5 % 0,5 W RC 20 GF 471 J
R 502	FILM RESISTOR	5N.5102.010.65	OHM 470 +- 5 % 0,5 W RC 20 GF 471 J
R 503	RESISTOR COMPOSITE	5L.5101.091.19	KOHM 2 +- 5 % 0,5 W RCR20 G 202 JS
S 501	ENCODING SWITCH	5L.4661.004.69	1STLLG. BCD 0 - 9 LOET TYP 48481 16305/28142-1
S 502	ENCODING SWITCH	5L.4661.004.69	1STLLG. BCD 0 - 9 LOET TYP 48481 16305/28142-1
S 503	ENCODING SWITCH	5L.4661.004.65	1STLLG. JOHNSON 0 - 9 LOET TYP 48481 16301/28113-1
S 504	ENCODING SWITCH	5L.4661.004.65	1STLLG. JOHNSON 0 - 9 LOET TYP 48481 16301/28113-1
S 505	ENCODING SWITCH	5L.4661.004.69	1STLLG. BCD 0 - 9 LOET TYP 48481 16305/28142-1
S 506	ENCODING SWITCH	5L.4661.004.68	1STLLG. DEZIMAL 0 - 2 LOET TYP 48481 16304/28119-1
S 507	ENCODING SWITCH	5L.4661.004.67	1STLLG. DEZIMAL 0 - 4 LOET TYP 48481 16303/28115-1
S 508	ENCODING SWITCH	5L.4661.004.66	1STLLG. DEZIMAL 1 - 7 LOET TYP 48481 16302/28167-1
S 509	SWITCH ROTARY	5L.4601.009.72	1EB. 2POLE/EB. 5STELLG. DAP 200VWS 6 VA TYP SM 252 48432 64196
S 510	PUSH BUTTON	5L.4623.005.69	IPOL 1X21 24VGS 2,25A TYP 17 17252 30
S 511	PUSH BUTTON	5L.4623.005.69	IPOL 1X21 24VGS 2,25A TYP 17 17252 30
ST 501	ANTENNA CONNECTOR	52.6862.054.00	

4.6.11 AF Volume Control 52.6861.056.00 SA (01)

GR 561	REFERENCE DIODE	5L.5532.205.17	Z- BZX 55/C 12 ZPD 12
R 561	FILM RESISTOR	5N.5102.050.65	OHM 470 +- 5 % 0,125W RC 05 GF 471 J
R 562	FILM RESISTOR	5N.5102.050.59	OHM 270 +- 5 % 0,125W RC 05 GF 271 J
R 563	FILM RESISTOR	5L.5102.003.33	OHM 1 +- 5 % 0,125W SK1
R 564	FILM RESISTOR	5L.5102.003.33	OHM 1 +- 5 % 0,125W SK1
R 565	FILM RESISTOR	5L.5102.003.39	OHM 1,8 +- 5 % 0,125W SK1
R 566	FILM RESISTOR	5L.5102.003.47	OHM 3,9 +- 5 % 0,125W SK1 BB
R 567	FILM RESISTOR	5L.5102.003.55	OHM 8,2 +- 5 % 0,125W SK1 BB
R 568	FILM RESISTOR	5N.5102.050.31	OHM 18 +- 5 % 0,125W RC 05 GF 180 J
R 569	FILM RESISTOR	5N.5102.050.39	OHM 39 +- 5 % 0,125W RC 05 GF 390 J
R 570	FILM RESISTOR	5N.5102.050.47	OHM 82 +- 5 % 0,125W RC 05 GF 820 J
R 571	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J

4.6.12 Relay Circuit Board 52.6861.063.00 SA (04)

C 1	CAPACITOR CERAMIC	5L.5224.034.73	PF 330 +- 5 % 10,5 X9,9 3,6KV ATC100EJAW3600X
C 2	CAPACITOR CERAMIC	5L.5224.003.04	PF 18 +- 5 % COG 5,1 X5,1 100 V MC04CE0180JHB/.
C 3	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
L 1	CHOKE	5L.5053.003.31	UH 47 +-10 % 0,11 A 4,5 OHM TYP MS75085-3

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
R 1	FILM RESISTOR	5L.5105.020.12	OHM 15 +- 5 % 4 W SXA 0922	
R 2	FILM RESISTOR	5N.5102.041.22	KOHM 100 +- 5 % 2 W RC 42 GF 104 J	
R 3	FILM RESISTOR	5N.5102.002.35	OHM 27 +- 5 % 0,25 W RC 07 GF 270 J	
RS 1	RELAY	5L.4759.003.06	12 VGS 21 3 A 250VWS 360 OHM TYP DS1E-M-DC12V	
ST 1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE	
4.6.13	Amplifier	20 W	52.6861.070.00 SA (03)	
BU 701	SOCKET STRIP	5L.4551.008.23	14POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 166 592-7	
C 701	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 702	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 703	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 704	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 705	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 706	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 707	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 708	CAP.PLASTIC FILM	5L.5241.057.92	PF 4700 +- 5 % 100 V FKC 2	
C 709	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 710	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 711	ELECTROL. CAPACIT.	5M.5271.222.59	UF 47 + 75-10% 30 V CU 13 M39018/01-0723	
C 712	CAPACITOR CERAMIC	5M.5221.238.29	UF 0,1 +-10 % 100 V CK 06 BX 104 K	
C 713	CAPACITOR CERAMIC	5M.5221.238.29	UF 0,1 +-10 % 100 V CK 06 BX 104 K	
C 714	CAPACITOR CERAMIC	5M.5221.238.29	UF 0,1 +-10 % 100 V CK 06 BX 104 K	
C 715	CAPACITOR CERAMIC	5M.5221.238.29	UF 0,1 +-10 % 100 V CK 06 BX 104 K	
C 716	CAPACITOR CERAMIC	5M.5221.238.29	UF 0,1 +-10 % 100 V CK 06 BX 104 K	
C 717	CAPACITOR CERAMIC	5M.5221.238.29	UF 0,1 +-10 % 100 V CK 06 BX 104 K	
C 718	CAPACITOR CERAMIC	5L.5224.015.64	PF 10 +- 2 % COG 5,1 X5,1 100 V MC04CE0100GHB	
C 719	CAPACITOR CERAMIC	5L.5224.003.13	PF 100 +- 5 % COG 5,1 X5,1 100 V MC05CE0101JHB/.	
C 720	CAP.PLASTIC FILM	5L.5241.057.62	PF 2200 +- 5 % 100 V FKC 2	
C 721	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 722	CAP.PLASTIC FILM	5L.5241.057.60	PF 1500 +- 5 % 100 V FKC 2	
C 723	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
GR 702	REFERENCE DIODE	5L.5532.205.09	Z- BZX 55/C 5 V 6 ZPD 5,6	
GR 703	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800	
GR 704	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800	
GR 705	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800	
IS 701	SEMICONDUCTOR CIRC	5L.5443.001.43	741 /.BE/CA..T/LM..H/RM..T/PM..J OPERATIONSVERST.	
L 701	CHOKER	5L.5053.006.38	UH 8,2 +-10 % 0,360A 0,6 OHM TYP MS14046-03	
L 702	CHOKER	5L.5053.006.38	UH 8,2 +-10 % 0,360A 0,6 OHM TYP MS14046-03	
L 703	CHOKER	5L.5053.006.38	UH 8,2 +-10 % 0,360A 0,6 OHM TYP MS14046-03	
L 704	CHOKER	5L.5051.001.13	1 A 2,5 WDG TYP 4312 020 3664	
L 705	CHOKER	5L.5053.003.03	UH 0,22 +-10 % 1,025A 0,14 OHM TYP MS75083-5	

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 701	FILM RESISTOR	5N.5102.002.69	OHM 680 +- 5 % 0,25 W RC 07 GF 681 J
R 702	FILM RESISTOR	5N.5102.002.19	OHM 5,6 +- 5 % 0,25 W RC 07 GF 5R6 J
R 703	FILM RESISTOR	5N.5102.002.65	OHM 470 +- 5 % 0,25 W RC 07 GF 471 J
R 704	FILM RESISTOR	5N.5102.002.51	OHM 120 +- 5 % 0,25 W RC 07 GF 121 J
R 705	FILM RESISTOR	5N.5102.002.49	OHM 100 +- 5 % 0,25 W RC 07 GF 101 J
R 706	FILM RESISTOR	5N.5102.002.19	OHM 5,6 +- 5 % 0,25 W RC 07 GF 5R6 J
R 707	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 708	FILM RESISTOR	5N.5102.002.73	KOHM 1 +- 5 % 0,25 W RC 07 GF 102 J
R 709	VARIABLE RESISTOR	5M.5135.222.30	OHM 200 +-10% 0,5 W LIN RJ 24 FW 201
R 710	FILM RESISTOR	5N.5102.002.73	KOHM 1 +- 5 % 0,25 W RC 07 GF 102 J
R 711	FILM RESISTOR	5N.5102.002.73	KOHM 1 +- 5 % 0,25 W RC 07 GF 102 J
R 712	FILM RESISTOR	5N.5102.002.73	KOHM 1 +- 5 % 0,25 W RC 07 GF 102 J
R 713	FILM RESISTOR	5N.5102.003.06	KOHM 22 +- 5 % 0,25 W RC 07 GF 223 J
R 714	FILM RESISTOR	5N.5102.040.35	OHM 27 +- 5 % 2 W RC 42 GF 270 J
R 715	FILM RESISTOR	5N.5102.002.97	KOHM 10 +- 5 % 0,25 W RC 07 GF 103 J
R 716	FILM RESISTOR	5N.5102.002.35	OHM 27 +- 5 % 0,25 W RC 07 GF 270 J
R 717	FILM RESISTOR	5N.5102.002.25	OHM 10 +- 5 % 0,25 W RC 07 GF 100 J
R 718	FILM RESISTOR	5N.5102.002.25	OHM 10 +- 5 % 0,25 W RC 07 GF 100 J
R 719	FILM RESISTOR	5N.5102.002.29	OHM 15 +- 5 % 0,25 W RC 07 GF 150 J
R 720	FILM RESISTOR	5N.5102.002.25	OHM 10 +- 5 % 0,25 W RC 07 GF 100 J
R 721	FILM RESISTOR	5N.5102.002.25	OHM 10 +- 5 % 0,25 W RC 07 GF 100 J
R 722	FILM RESISTOR	5N.5102.002.29	OHM 15 +- 5 % 0,25 W RC 07 GF 150 J
R 723	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 724	FILM RESISTOR	5N.5102.002.65	OHM 470 +- 5 % 0,25 W RC 07 GF 471 J
R 725	FILM RESISTOR	5N.5102.002.65	OHM 470 +- 5 % 0,25 W RC 07 GF 471 J
R 726	FILM RESISTOR	5L.5105.021.27	OHM 120 +- 2 % 0,5 W 526-0 TK+-100PPM
R 727	VARIABLE RESISTOR	5M.5135.222.83	OHM 100 +-10% 0,25 W LIN RJ 26 FX 101
R 728	FILM RESISTOR	5N.5102.003.02	KOHM 15 +- 5 % 0,25 W RC 07 GF 153 J
R 729	VARIABLE RESISTOR	5M.5135.222.90	KOHM 20 +-10% 0,25 W LIN RJ 26 FX 203
R 730	FILM RESISTOR	5L.5105.021.95	KOHM 82 +- 2 % 0,5 W 526-0 TK+-100PPM
R 731	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0 TK+-100PPM
RS 701	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
ST 701	CONNECTOR PLUG RF	52.6861.070.10	
ST 702	CONNECTOR PLUG RF	52.6861.070.10	
ST 703	CONNECTOR PLUG RF	52.6861.070.10	
ST 704	CONNECTOR PLUG RF	52.6861.070.10	
ST 705	CONNECTOR PLUG RF	52.6861.070.10	
T 701	TRANSFORMER	52.6871.073.00	T3-0540
T 702	TRANSFORMER	52.6871.075.00	T3-0544
T 703	TRANSFORMER	52.6871.077.00	T3-0546
T 704	TRANSFORMER	52.6871.083.00	T3-0545
T 705	TRANSFORMER	52.6871.081.00	T3-0543
TS 701	SI-NPN-TRANSISTOR	5L.5512.204.01	BLY 87 A
TS 702	SI-NPN-TRANSISTOR	5L.5512.201.45	2N 2102
TS 703	SI-NPN-TRANSISTOR	5L.5512.001.93	ON 617 MIT SECHSKANTMUTTER
TS 704	SI-NPN-TRANSISTOR	5L.5512.001.93	ON 617 MIT SECHSKANTMUTTER

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES -	REMARKS
4.6.14	Mother Board	52.6861.110.00	SA (01)	
ST 1	PLUG CONNECTOR	5L.4561.024.86	62POL CUSN6 NI AU	POLYEST. GV TYP 3-826658-1
ST 2	PLUG CONNECTOR	5L.4561.024.89	56POL CUSN6 NI AU	POLYEST. GV TYP 2-826658-8
ST 3	PLUG CONNECTOR	5L.4561.024.87	58POL CUSN6 NI AU	POLYEST. GV TYP 2-826658-9
ST 4	PLUG CONNECTOR	5L.4561.024.88	26POL CUSN6 NI AU	POLYEST. GV TYP 2-826648-6
4.6.15	Coil Assembly	52.6861.120.00	SA (00)	
L 1	COIL	52.0501.697.00	SI-1362	
L 2	COIL	52.0501.698.00	SI-1363	
L 3	COIL	52.0501.698.00	SI-1363	
L 4	COIL	52.0501.698.00	SI-1363	
L 5	COIL	52.0501.699.00	SI-1364	
L 6	COIL	52.0501.699.00	SI-1364	
L 7	COIL	52.0501.699.00	SI-1364	
L 8	COIL	52.0501.699.00	SI-1364	
L 9	COIL	52.0501.699.00	SI-1364	
L 10	COIL	52.0501.699.00	SI-1364	
R 1	RESISTOR WIREWOUND	5M.5112.222.68	OHM 2,2 +- 5 % 3 W/350GRD	RW 69 V 2R2
S 1	SWITCH THERMAL	5M.4671.220.30	FEST M24236/19-CMC	
S 2	SWITCH THERMAL	5M.4671.220.30	FEST M24236/19-CMC	
4.6.16	Relay Assembly	52.6861.125.00	SA (02)	
BU 1	SOCKET STRIP	5L.4551.013.07	62POL 3 A 250V BZ NI AU	POLYEST. GV TYP 3-166 592-1
BU 2	CONTACT SOCKET	5L.4423.002.55	FUER STIFT 1,02D L 5,8 CU	AU TYP 450-1801-01-03-00
C 1	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	/MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	/MKT1,85/1,68/MMK05/IRD607/B32529-A
C 3	CAPACITOR CERAMIC	5L.5224.032.47	PF 5,1 +- 0,5 PF	500 V ATC100B-AW/C17.
C 4	CAPACITOR CERAMIC	5L.5224.032.48	PF 10 +- 5 % 500 V	ATC100B-AW/C17.
C 5	CAPACITOR CERAMIC	5L.5224.032.49	PF 20 +- 5 % 500 V	ATC100B-AW/C17.
C 6	CAPACITOR CERAMIC	5L.5224.032.50	PF 43 +- 5 % 500 V	ATC100B-AW/C17.
C 7	CAPACITOR CERAMIC	5L.5224.032.51	PF 91 +- 5 % 500 V	ATC100B-AW/C17.
C 8	CAPACITOR CERAMIC	5L.5224.032.52	PF 180 +- 5 % 300 V	ATC100B-AW/C17.
C 9	CAPACITOR CERAMIC	5L.5224.032.53	PF 390 +- 5 % 200 V	ATC100B-AW/C17
C 10	CAPACITOR CERAMIC	5L.5224.032.53	PF 390 +- 5 % 200 V	ATC100B-AW/C17
C 11	CAPACITOR CERAMIC	5L.5224.032.53	PF 390 +- 5 % 200 V	ATC100B-AW/C17
C 12	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	/MKT1,85/1,68/MMK05/IRD607/B32529-A
C 13	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	/MKT1,85/1,68/MMK05/IRD607/B32529-A
GR 1	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 2	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 3	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 4	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 5	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 6	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 7	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 8	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B
GR 9	SI-DIODE	5L.5532.101.66	IN 4448	IN 914 B

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
GR 10	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 11	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 12	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 13	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 14	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 15	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 16	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 17	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 18	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 19	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 20	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 21	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 22	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 23	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 24	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 25	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 26	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 27	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 28	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 29	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 30	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
RS 1	RELAY	5L.4742.002.19	12 VGS 21-21 2 A 250VWS 400/400 OHM TYP DS2E-ML2-DC12V	
RS 2	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 3	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 4	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 5	RELAY	5L.4742.002.19	12 VGS 21-21 2 A 250VWS 400/400 OHM TYP DS2E-ML2-DC12V	
RS 6	RELAY	5L.4742.002.19	12 VGS 21-21 2 A 250VWS 400/400 OHM TYP DS2E-ML2-DC12V	
RS 7	RELAY	5L.4742.002.19	12 VGS 21-21 2 A 250VWS 400/400 OHM TYP DS2E-ML2-DC12V	
RS 8	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 9	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 10	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 11	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 12	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 13	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 14	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
RS 15	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS 400 OHM TYP DS1E-ML2-DC12V	
4.6.17	Sensor	1	52.6861.130.00 SA (03)	
BU 1	SOCKET STRIP	5L.4551.008.23	14POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 166 592-7	
BU 2	SOCKET STRIP	5L.4551.008.25	56POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 2-166 592-8	
C 1	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 2	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 3	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 4	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 5	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
C 6	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 7	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 8	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 9	CAPACITOR MICA	5L.5231.016.25	PF 51 +- 5 % 500 V TK -100	
C 10	CAPACITOR MICA	5L.5231.016.25	PF 51 +- 5 % 500 V TK -100	
C 11	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 12	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 13	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 14	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 15	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 16	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 17	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 18	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 19	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 20	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 21	CAPACITOR CERAMIC	5L.5224.027.25	UF 0,010 +-10 % X7R	
C 22	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 23	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 24	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 25	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 26	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 27	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2	
C 28	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 29	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2	
C 30	CAP.PLASTIC FILM	5L.5241.055.50	UF 0,022 +-10 % 63 V MKS 2	
C 31	CAPACITOR CERAMIC	5L.5224.027.25	UF 0,010 +-10 % X7R	
GR 1	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 2	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 3	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 4	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 5	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 6	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 7	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 8	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 9	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 10	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 11	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 12	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 13	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 14	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 15	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800	
IS 1	SEMICONDUCTOR CIRC	5L.5441.023.99	SP 9687 DG KOMPARATOR	
IS 2	SEMICONDUCTOR CIRC	5L.5443.003.22	SL 610 C/CM HF/ZF-VERSTAERKER	
L 1	COIL	52.0500.996.04		
L 2	COIL	52.0500.993.38		

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
L 3	COIL	52.0500.993.39		
L 4	COIL	52.0500.993.75		
L 5	COIL	52.0500.993.75		
L 6	COIL	52.0500.993.75		
L 7	CHOKE	52.0500.992.17		
L 8	CHOKE	5L.5053.003.02	UH 0,18 +-10 % 1,105A 0,1 OHM	TYP MS75083-4
M 1	INTEGR. CIRCUIT	5L.5422.003.89	TFM-3-N /EMT-3N	DOPPEL-BALANCE-MISCHER
R 1	FILM RESISTOR	5L.5105.021.43	OHM 560 +- 2 % 0,5 W 526-0	TK+-100PPM
R 2	FILM RESISTOR	5L.5105.021.19	OHM 56 +- 2 % 0,5 W 526-0	TK+-100PPM
R 3	VARIABLE RESISTOR	5L.5135.004.02	OHM 20 +-20% 0,5 W LIN	TYP 3329H-1-200/3321H-1-200
R 4	FILM RESISTOR	5L.5105.021.27	OHM 120 +- 2 % 0,5 W 526-0	TK+-100PPM
R 5	FILM RESISTOR	5L.5105.021.27	OHM 120 +- 2 % 0,5 W 526-0	TK+-100PPM
R 6	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0	TK+-100PPM
R 7	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0	TK+-100PPM
R 8	FILM RESISTOR	5L.5105.021.13	OHM 33 +- 2 % 0,5 W 526-0	TK+-100PPM
R 9	FILM RESISTOR	5L.5105.021.13	OHM 33 +- 2 % 0,5 W 526-0	TK+-100PPM
R 10	FILM RESISTOR	5L.5105.021.71	KOHM 8,2 +- 2 % 0,5 W 526-0	TK+-100PPM
R 12	FILM RESISTOR	5L.5105.021.23	OHM 82 +- 2 % 0,5 W 526-0	TK+-100PPM
R 13	FILM RESISTOR	5L.5105.021.33	OHM 220 +- 2 % 0,5 W 526-0	TK+-100PPM
R 14	FILM RESISTOR			
R 15	FILM RESISTOR			
R 16	FILM RESISTOR	5L.5105.021.33	OHM 220 +- 2 % 0,5 W 526-0	TK+-100PPM
R 17	FILM RESISTOR	5L.5105.021.17	OHM 47 +- 2 % 0,5 W 526-0	TK+-100PPM
R 18	VARIABLE RESISTOR	5L.5135.004.11	KOHM 5 +-20% 0,5 W LIN	TYP 3329H-1-502/3321H-1-502
R 19	FILM RESISTOR	5L.5105.021.67	KOHM 5,6 +- 2 % 0,5 W 526-0	TK+-100PPM
R 20	FILM RESISTOR	5L.5105.021.55	KOHM 1,8 +- 2 % 0,5 W 526-0	TK+-100PPM
R 21	FILM RESISTOR	5L.5105.021.29	OHM 150 +- 2 % 0,5 W 526-0	TK+-100PPM
R 22	FILM RESISTOR	5L.5105.021.01	OHM 10 +- 2 % 0,5 W 526-0	TK+-100PPM
R 23	VARIABLE RESISTOR	5L.5135.004.11	KOHM 5 +-20% 0,5 W LIN	TYP 3329H-1-502/3321H-1-502
R 24	FILM RESISTOR	5L.5105.021.67	KOHM 5,6 +- 2 % 0,5 W 526-0	TK+-100PPM
R 25	FILM RESISTOR	5L.5105.021.57	KOHM 2,2 +- 2 % 0,5 W 526-0	TK+-100PPM
R 26	RESISTOR PTC	5L.5172.001.51	KOHM 1 +- 1% 0,75% TYP KTY 83-110	
R 27	VARIABLE RESISTOR	5L.5135.004.09	KOHM 2 +-20% 0,5 W LIN	TYP 3329H-1-202/3321H-1-202
RS 1	RELAY	5L.4759.003.06	12 VGS 21 3 A 250VWS	360 OHM TYP DS1E-M-DC12V
RS 2	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS	400 OHM TYP DS1E-ML2-DC12V
RS 3	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS	400 OHM TYP DS1E-ML2-DC12V
RS 4	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS	400 OHM TYP DS1E-ML2-DC12V
RS 5	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS	400 OHM TYP DS1E-ML2-DC12V
RS 6	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS	400 OHM TYP DS1E-ML2-DC12V
RS 7	RELAY	5L.4742.002.20	12 VGS 21 2 A 250VWS	400 OHM TYP DS1E-ML2-DC12V

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
RS 8	RELAY	5L.4759.003.06	12 VGS 21 3 A 250VMS 360 OHM TYP DS1E-M-DC12V	
ST 1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002	Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002	Z- 50 TEFLON WINKELIG LEITERPLATTE
TR 1	TRANSFORMER	52.0501.669.00	T3-0907	
TR 2	TRANSFORMER	52.0501.668.00	T3-0905	
TR 3	TRANSFORMER	52.0501.671.00	T3-0906	
4.6.18	Sensor	2	52.6861.135.00 SA (02)	
BU 1	SOCKET STRIP	5L.4551.013.08	58POL 3 A 250V BZ NI AU POLYEST. GV TYP 2-166 592-9	
C 1	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 2	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 3	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 4	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 5	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 6	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 7	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 8	CAPACITOR CERAMIC	5M.5224.220.52	PF 1000 +-10 % 200 V CK 05 BX 102 K	
C 9	CAPACITOR CERAMIC	5M.5224.220.52	PF 1000 +-10 % 200 V CK 05 BX 102 K	
C 10	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 11	CAPACITOR TANTALUM	5N.5271.021.47	UF 15 +-20% 20 V M39003/01-2290 (CSR13)	
C 12	CAPACITOR CERAMIC	5M.5224.220.11	PF 100 +-10 % 200 V CK 05 BX 101 K	
C 13	CAPACITOR CERAMIC	5M.5221.238.28	PF 56 +-10 % 200 V CK 05 BX 560 K	
C 14	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 15	CAPACITOR TANTALUM	5N.5271.021.47	UF 15 +-20% 20 V M39003/01-2290 (CSR13)	
C 16	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 17	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)	
C 18	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
GR 1	REFERENCE DIODE	5L.5532.205.22	Z- BZX 55/C 20 ZPD 20	
GR 2	REFERENCE DIODE	5L.5532.205.22	Z- BZX 55/C 20 ZPD 20	
GR 3	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 4	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 5	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
GR 6	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B	
IS 1	SEMICONDUCT.COMB.	5L.5412.001.49	ULS2003 H /SG..J TRANSISTOR-ARRAY DARLINGTON	
IS 2	SEMICONDUCT.COMB.	5L.5412.001.49	ULS2003 H /SG..J TRANSISTOR-ARRAY DARLINGTON	
IS 3	SEMICONDUCT.COMB.	5L.5412.001.49	ULS2003 H /SG..J TRANSISTOR-ARRAY DARLINGTON	
IS 4	SEMICONDUCT.COMB.	5L.5412.001.49	ULS2003 H /SG..J TRANSISTOR-ARRAY DARLINGTON	
IS 5	SEMICONDUCT.COMB.	5L.5412.001.49	ULS2003 H /SG..J TRANSISTOR-ARRAY DARLINGTON	
IS 6	SEMICONDUCTOR CIRC	5L.5442.003.23	4094 /CD...BF/CD...BMJ -MOS- SCHIEBEREGISTER	
IS 7	SEMICONDUCTOR CIRC	5L.5442.003.23	4094 /CD...BF/CD...BMJ -MOS- SCHIEBEREGISTER	

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
IS 8	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T	-MOS- OPERATIONSVERST.
IS 9	SEMICONDUCTOR CIRC	5L.5444.001.01	CA 3130 AT	-MOS- OPERATIONSVERST.
IS 10	SEMICONDUCTOR CIRC	5L.5444.001.45	4066 /CD...BF/MC1..BAL/CD..BMJ	-MOS- ANALOG-SCHALTER
IS 11	SEMICONDUCTOR CIRC	5L.5443.001.47	723 /CA..T/LM..H/MC1..G	SPANNUNGSREGLER
IS 12	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T	-MOS- OPERATIONSVERST.
R 1	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 2	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 3	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 4	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 5	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 6	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 7	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 8	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05	GF 273 J
R 9	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05	GF 273 J
R 10	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05	GF 273 J
R 11	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 12	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 13	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05	GF 273 J
R 14	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05	GF 273 J
R 15	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 16	FILM RESISTOR	5N.5102.002.59	OHM 270 +- 5 % 0,25 W RC 07	GF 271 J
R 17	FILM RESISTOR	5N.5102.002.59	OHM 270 +- 5 % 0,25 W RC 07	GF 271 J
R 18	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05	GF 333 J
R 19	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05	GF 123 J
R 20	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05	GF 103 J
R 21	VARIABLE RESISTOR	5L.5135.004.11	KOHM 5 +-20% 0,5 W LIN	TYP 3329H-1-502/3321H-1-502
R 22	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05	GF 100 J
R 23	FILM RESISTOR	5N.5102.051.24	KOHM 220 +- 5 % 0,125W RC 05	GF 224 J
R 24	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05	GF 100 J
R 25	FILM RESISTOR	5N.5102.051.26	KOHM 270 +- 5 % 0,125W RC 05	GF 274 J
R 26	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05	GF 333 J
R 27	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 28	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 29	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 30	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 31	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 32	FILM RESISTOR	5L.5105.021.83	KOHM 27 +- 2 % 0,5 W 526-0	TK+-100PPM
R 33	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05	GF 102 J
R 34	FILM RESISTOR	5N.5102.050.69	OHM 680 +- 5 % 0,125W RC 05	GF 681 J
R 35	VARIABLE RESISTOR	5L.5135.004.09	KOHM 2 +-20% 0,5 W LIN	TYP 3329H-1-202/3321H-1-202

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 36	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J
R 37	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 38	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05 GF 333 J
R 39	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05 GF 333 J
R 40	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 41	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 42	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 43	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 44	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 45	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 46	FILM RESISTOR	RESERVE	
R 47	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J
R 48	FILM RESISTOR	5N.5102.051.24	KOHM 220 +- 5 % 0,125W RC 05 GF 224 J
R 49	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 50	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05 GF 273 J
R 51	FILM RESISTOR	RESERVE	
R 52	FILM RESISTOR	RESERVE	
TS 1	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 2	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 3	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 4	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 5	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX

4.6.19

CPU

52.6861.140.00 SA (03)

BU 1	SOCKET STRIP	5L.4551.002.80	26POL 3 A 250V BZ NI AU POLYEST. 6V TYP 2-166 591-6
BU 2	SOCKET STRIP	5L.4551.002.73	10POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 1-166 591-0
C 1	CAPACITOR TANTALUM	5N.5271.019.47	UF 10 +-20% 20 V M39003/01-2287 (CSR13)
C 2	CAPACITOR CERAMIC	5L.5224.003.05	PF 22 +- 5 % C0G
C 3	CAPACITOR CERAMIC	5L.5224.003.11	5,1 X5,1 100 V MC04CE0220JHB/. PF 68 +- 5 % C0G
C 4	CAPACITOR CERAMIC	5N.5224.001.08	5,1 X5,1 100 V MC05CE0680JHB/.
C 5	CAPACITOR TANTALUM	5N.5271.019.47	UF 0,1 +-10 % 50 V CK 05 BX 104 K
C 6	CAPACITOR CERAMIC	5L.5224.003.15	UF 10 +-20% 20 V M39003/01-2287 (CSR13)
C 7	CAPACITOR CERAMIC	5M.5224.220.56	PF 150 +- 5 % C0G
C 8	CAPACITOR CERAMIC	5N.5224.001.08	5,1 X5,1 100 V MC05CE0151JHB/. UF 0,01 +-10 % 100 V CK 05 BX 103 K
GR 1	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 2	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
IS 1	SEMICONDUCTOR CIRC	5L.5453.003.21	MM 82PC12 JI -MOS- EIN/AUSGABE-BAUST.
IS 2	SEMICONDUCT.STORE	52.9544.135.03	
IS 2/1	SEMICONDUCT.STORE	5L.5452.002.95	NMC 27C32 QE-45 -MOS- PROM 4KX8 TS
IS 3	SEMICONDUCTOR CIRC	5L.5453.003.22	NSC 800 D-3I -MOS- MIKROPROZESSOR
IS 4	SEMICONDUCTOR CIRC	5L.5453.003.39	NSC 810 AD-3I -MOS- RAM-I/O-TIMER
IS 5	SEMICONDUCTOR CIRC	5L.5446.001.53	ADC 0804 LCJ /ADC..LCD -MOS- A/D-WANDLER 8 BIT
IS 6	SEMICONDUCTOR CIRC	5L.5442.004.11	4011 /CD...BF/MC1..BAL/HCC..BF/ CD..BMJ -MOS- GATTER

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
L 1	CHOKE	5L.5053.003.23	UH 10 +-10 % 0,13 A 3,7 OHM TYP MS75084-12
Q 1	CRYSTAL QUARTZ	5L.5561.004.06	MHZ 2,4576 +-50 X10-6 +25GRD ATB -0/+70 HC-18/U TYP TQ5300/M-TRON
R 1	FILM RESISTOR	5N.5102.051.38	KOHM 820 +- 5 % 0,125W RC 05 GF 824 J
R 3	R COMBINATION	5L.5413.004.10	7X KOHM 10 +- 2 % 0,19W TYP CSC08A01103G/L-08-1-103G
R 4	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 5	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 6	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 7	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 8	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 9	FILM RESISTOR		
R 10	FILM RESISTOR	5N.5102.050.92	KOHM 6,8 +- 5 % 0,125W RC 05 GF 682 J
R 11	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J

4.6.20 Harmonic Filter

52.6861.250.00 SA (04)

BU 2501	SOCKET STRIP	5L.4551.008.23	14POL 3 A 250V PZ NI1,3 AU0,8 POLYEST. 6V TYP 166 592-7
C 2501	CAPACITOR CERAMIC	5L.5224.015.95	PF 820 +- 2 % COG 7,7 X7,7 100 V MR061A821G
C 2502	CAPACITOR CERAMIC	5L.5224.015.90	PF 390 +- 2 % COG 5,1 X5,1 100 V MR051A391G/C052
C 2503	CAPACITOR CERAMIC	5L.5224.015.98	PF 1600 +- 2 % COG 7,7 X7,7 100 V MR061A162G
C 2504	CAPACITOR CERAMIC	5L.5224.010.29	PF 1800 +- 2 % COG 5,1 X5,1 100 V MR051A182G
C 2505	CAPACITOR CERAMIC	5L.5224.015.85	PF 270 +- 2 % COG 5,1 X5,1 100 V MR051A271G
C 2506	CAPACITOR CERAMIC	5L.5224.015.92	PF 510 +- 2 % COG 7,7 X7,7 100 V MC08CE5101GHB
C 2507	CAPACITOR CERAMIC	5L.5224.015.83	PF 220 +- 2 % COG 5,1 X5,1 100 V MC05CE2201GHB/.
C 2508	CAPACITOR CERAMIC	5L.5224.015.97	PF 1000 +- 2 % COG 7,7 X7,7 100 V MR061A102G
C 2509	CAPACITOR CERAMIC	5L.5224.010.28	PF 1200 +- 2 % COG 5,1 X5,1 100 V MR051A122G
C 2510	CAPACITOR CERAMIC	5L.5224.015.79	PF 150 +- 2 % COG 5,1 X5,1 100 V MC05CE1501GHB/.
C 2511	CAPACITOR CERAMIC	5L.5224.015.89	PF 360 +- 2 % COG 5,1 X5,1 100 V C052G361G165CA
C 2512	CAPACITOR CERAMIC	5L.5224.015.80	PF 160 +- 2 % COG 5,1 X5,1 100 V MC05CE1601GHB
C 2513	CAPACITOR CERAMIC	5L.5224.015.94	PF 680 +- 2 % COG 7,7 X7,7 100 V MC08CE6801GHB/.
C 2514	CAPACITOR CERAMIC	5L.5224.015.94	PF 680 +- 2 % COG 7,7 X7,7 100 V MC08CE6801GHB/.
C 2515	CAPACITOR CERAMIC	5L.5224.015.79	PF 150 +- 2 % COG 5,1 X5,1 100 V MC05CE1501GHB/.
C 2516	CAPACITOR CERAMIC	5L.5224.015.83	PF 220 +- 2 % COG 5,1 X5,1 100 V MC05CE2201GHB/.
C 2517	CAPACITOR CERAMIC	5L.5224.015.75	PF 91 +- 2 % COG 5,1 X5,1 100 V MC05CE0910GHB
C 2518	CAPACITOR CERAMIC	5L.5224.015.91	PF 430 +- 2 % COG 7,7 X7,7 100 V MC08CE4301GHB
C 2519	CAPACITOR CERAMIC	5L.5224.015.91	PF 430 +- 2 % COG 7,7 X7,7 100 V MC08CE4301GHB
C 2520	CAPACITOR CERAMIC	5L.5224.015.74	PF 82 +- 2 % COG 5,1 X5,1 100 V MC05CE0820GHB/.

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 2521	CAPACITOR CERAMIC	5L.5224.015.80	PF 160 +- 2 % COG 5,1 X5,1 100 V MC05CE1601GHB
C 2522	CAPACITOR CERAMIC	5L.5224.015.71	PF 51 +- 2 % COG 5,1 X5,1 100 V MC05CE0510GHB
C 2523	CAPACITOR CERAMIC	5L.5224.015.85	PF 270 +- 2 % COG 5,1 X5,1 100 V MR051A271G
C 2524	CAPACITOR CERAMIC	5L.5224.015.88	PF 330 +- 2 % COG 5,1 X5,1 100 V MR051A331G
C 2525	CAPACITOR CERAMIC	5L.5224.024.38	PF 56 +- 2 % COG 5,1 X5,1 100 V MR051A560G
C 2526	CAPACITOR CERAMIC	5L.5224.024.36	PF 62 +- 2 % COG 5,1 X5,1 100 V MR051A620G
C 2527	CAPACITOR CERAMIC	5L.5224.024.38	PF 56 +- 2 % COG 5,1 X5,1 100 V MR051A560G
C 2528	CAPACITOR CERAMIC	5L.5224.015.80	PF 160 +- 2 % COG 5,1 X5,1 100 V MC05CE1601GHB
C 2529	CAPACITOR CERAMIC	5L.5224.015.81	PF 180 +- 2 % COG 5,1 X5,1 100 V MC05CE1801GHB/.
C 2530	CAPACITOR CERAMIC	5L.5224.015.69	PF 39 +- 2 % COG 5,1 X5,1 100 V MC04CE0390GHB/.
C 2532	CAPACITOR CERAMIC	5L.5224.015.69	PF 39 +- 2 % COG 5,1 X5,1 100 V MC04CE0390GHB/.
C 2533	CAPACITOR CERAMIC	5L.5224.024.58	PF 100 +- 2 % COG 5,1 X5,1 100 V MR051A101G
C 2534	CAPACITOR CERAMIC	5L.5224.015.74	PF 82 +- 2 % COG 5,1 X5,1 100 V MC05CE0820GHB/.
C 2535	CAPACITOR CERAMIC	5L.5224.015.72	PF 68 +- 2 % COG 5,1 X5,1 100 V MC05CE0680GHB/.
C 2536	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2537	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2538	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2539	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2540	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2541	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2542	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2543	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2544	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
GR 2501	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
L 2501	COIL	52.6871.201.00	S1-0902
L 2502	COIL	52.6871.203.00	S1-0903
L 2503	COIL	52.6871.205.00	S1-0904
L 2504	COIL	52.6871.207.00	S1-0905
L 2505	COIL	52.6871.209.00	S1-0906
L 2506	COIL	52.6871.211.00	S1-0907
L 2507	COIL	52.6871.213.00	S1-0908
L 2508	COIL	52.6871.215.00	S1-0909
L 2509	COIL	52.6871.217.00	S1-0910
L 2510	AIR-CORED COIL	51.6861.250.08	
L 2511	AIR-CORED COIL	51.6861.250.10	
L 2512	AIR-CORED COIL	51.6861.250.07	
L 2513	AIR-CORED COIL	51.6861.250.09	
L 2514	AIR-CORED COIL	51.6861.250.09	
RS 2501	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 2502	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 2503	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 2504	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 2505	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
RS 2506	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 2507	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 2508	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
ST 2501	PLUG	52.6871.295.05	
ST 2501/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-40002/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2502	PLUG	52.6871.295.05	
ST 2502/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-40002/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2503	PLUG	52.6871.295.05	
ST 2503/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-40002/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE

4.6.21 RF Circuit Board 52.6861.270.00 SA (04)

BU 2701	SOCKET STRIP	5L.4551.008.23	14POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 166 592-7
C 2701	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2702	CAPACITOR CERAMIC	5L.5224.003.30	PF 2700 +- 5 % COG 7,7 X7,7 100 V B106BY272J/MR06
C 2703	CAPACITOR CERAMIC	5L.5224.011.82	PF 5600 +- 5 % COG 7,7 X7,7 50 V G505BY562J/MR06
C 2704	CAPACITOR CERAMIC	5L.5224.003.28	PF 1800 +- 5 % COG 7,7 X7,7 100 V B105BY182J/MR06
C 2705	CAPACITOR CERAMIC	5L.5224.003.28	PF 1800 +- 5 % COG 7,7 X7,7 100 V B105BY182J/MR06
C 2706	CAPACITOR CERAMIC	5L.5224.011.82	PF 5600 +- 5 % COG 7,7 X7,7 50 V G505BY562J/MR06
C 2707	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2708	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2709	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2710	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2711	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2712	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2713	CAPACITOR CERAMIC	5M.5224.220.74	UF 0,47 +-10 % 50 V CK 06 BX 474 K
C 2714	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2715	CAPACITOR CERAMIC	5M.5224.220.11	PF 100 +-10 % 200 V CK 05 BX 101 K
C 2716	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2717	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2718	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2719	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2720	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2721	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2722	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2723	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2724	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2725	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 2726	CAP.PLASTIC FILM	5L.5241.057.62	PF 2200 +- 5 % 100 V FKC 2
C 2727	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2728	CAPACITOR CERAMIC	5L.5224.003.03	PF 15 +- 5 % COG
C 2729	CAP.PLASTIC FILM	5L.5245.001.64	5,1 X5,1 100 V MC04CE0150JHB/. UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2730	CAPACITOR CERAMIC	5L.5224.003.11	PF 68 +- 5 % COG
C 2731	CAPACITOR CERAMIC	5L.5224.003.08	5,1 X5,1 100 V MC05CE0680JHB/. PF 39 +- 5 % COG
C 2732	CAPACITOR CERAMIC	5L.5224.003.13	5,1 X5,1 100 V MC04CE0390JHB/. PF 100 +- 5 % COG
C 2733	CAPACITOR CERAMIC	5L.5224.003.14	5,1 X5,1 100 V MC05CE0101JHB/. PF 120 +- 5 % COG
C 2734	CAPACITOR CERAMIC	5L.5224.003.11	5,1 X5,1 100 V MC05CE0121JHB/. PF 68 +- 5 % COG
C 2735	CAP.PLASTIC FILM	5L.5241.057.58	5,1 X5,1 100 V MC05CE0680JHB/. PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2736	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2737	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2738	CAPACITOR CERAMIC	5M.5224.220.35	PF 33 +-10 % 200 V CK 05 BX 330 K
C 2739	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2740	CAPACITOR TANTALUM	5N.5271.015.67	UF 4,7 +-20% 50 V M39003/01-2369 (CSR13)
C 2741	CAPACITOR CERAMIC	5M.5221.232.97	PF 180 +-10 % 200 V CK 05 BX 181 K
C 2742	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2743	CAPACITOR CERAMIC	5M.5221.232.97	PF 180 +-10 % 200 V CK 05 BX 181 K
C 2744	CAPACITOR CERAMIC	5M.5221.232.97	PF 180 +-10 % 200 V CK 05 BX 181 K
C 2745	CAPACITOR CERAMIC	5L.5224.003.06	PF 27 +- 5 % COG
C 2746	CAPACITOR CERAMIC	5L.5224.031.50	5,1 X5,1 100 V MC04CE0270JHB/. PF 1200 +- 5 % COG CHIP 1206 50 V VNI/VZIN
GR 2701	REFERENCE DIODE	5L.5532.205.44	Z- BZX 85/C 15 ZPY 15
GR 2702	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 2703	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 2704	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2705	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2706	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2707	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2708	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2709	REFERENCE DIODE	5L.5532.205.10	Z- BZX 55/C 6 V 2 ZPD 6,2
GR 2710	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2711	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
GR 2712	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 2713	REFERENCE DIODE	5L.5532.205.07	Z- BZX 55/C 4 V 7 ZPD 4,7
GR 2714	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 2715	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 2716	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 2717	REFERENCE DIODE	5L.5532.205.01	Z- BZX 55/C 2 V 7 ZPD 2,7
GR 2718	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 2719	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
IS 2701	SEMICONDUCTOR CIRC	5L.5443.004.15	SL 611 C/CM VERSTAERKER
IS 2702	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
IS 2703	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
IS 2704	SEMICONDUCTOR CIRC	5L.5443.001.43	741 /.BE/CA./T/LM../H/RM../T/PM../J OPERATIONSVERST.
IS 2705	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
L 2701	COIL	52.6871.272.00	S1-0880
L 2702	COIL	52.6871.274.00	S1-0881
L 2703	CHOKE	5L.5053.003.01	UH 0,15 +-10 % 1,2 A 0,1 OHM TYP MS75083-3
L 2704	CHOKE	5L.5053.003.33	UH 68 +-10 % 0,092A 6,7 OHM TYP MS75085-5
L 2705	COIL	52.6871.276.00	S1-0882
L 2706	COIL	52.6871.276.00	S1-0882
L 2707	COIL	52.6871.292.00	S1-0883
MI 2701	INTEGR. CIRCUIT	5L.5421.001.06	IE 300 A /SM910/117A/26238 DOPPEL-BALANCE-MISCHER

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 2701	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 2702	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 2703	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 2704	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2705	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 2706	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 2707	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 2708	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J
R 2709	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 2710	FILM RESISTOR	5N.5102.050.61	OHM 330 +- 5 % 0,125W RC 05 GF 331 J
R 2711	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J
R 2712	FILM RESISTOR	5N.5102.050.78	KOHM 1,8 +- 5 % 0,125W RC 05 GF 182 J
R 2713	FILM RESISTOR	5L.5102.003.41	OHM 2,2 +- 5 % 0,125W SK1
R 2714	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 2715	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2716	FILM RESISTOR	5L.5102.003.33	OHM 1 +- 5 % 0,125W SK1
R 2717	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2718	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 2719	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 2720	FILM RESISTOR	5N.5102.050.39	OHM 39 +- 5 % 0,125W RC 05 GF 390 J
R 2721	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 2722	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J
R 2723	FILM RESISTOR	5N.5102.050.74	KOHM 1,2 +- 5 % 0,125W RC 05 GF 122 J
R 2724	FILM RESISTOR	5N.5102.002.43	OHM 56 +- 5 % 0,25 W RC 07 GF 560 J
R 2725	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 2726	FILM RESISTOR	5N.5102.050.69	OHM 680 +- 5 % 0,125W RC 05 GF 681 J
R 2727	FILM RESISTOR	5N.5102.051.12	KOHM 68 +- 5 % 0,125W RC 05 GF 683 J
R 2728	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 2729	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J
R 2730	FILM RESISTOR	5N.5102.050.76	KOHM 1,5 +- 5 % 0,125W RC 05 GF 152 J
R 2731	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2732	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 2733	FILM RESISTOR	5N.5102.050.78	KOHM 1,8 +- 5 % 0,125W RC 05 GF 182 J
R 2734	FILM RESISTOR	5N.5102.050.55	OHM 180 +- 5 % 0,125W RC 05 GF 181 J
R 2735	VARIABLE RESISTOR	5M.5135.222.70	KOHM 2 +-10% 0,25 W LIN RJ 26 FW 202
R 2737	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J
R 2738	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 2739	FILM RESISTOR	5N.5102.051.32	KOHM 470 +- 5 % 0,125W RC 05 GF 474 J
R 2740	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2741	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 2742	VARIABLE RESISTOR	5M.5135.222.69	KOHM 1 +-10% 0,25 W LIN RJ 26 FW 102
R 2743	FILM RESISTOR	5M.5106.227.44	KOHM 2,21 +- 1 % 0,1 W RN 55 E 2211 F
R 2744	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 2745	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2746	FILM RESISTOR	5M.5106.228.11	KOHM 3,32 +- 1 % 0,1 W RN 55 E 3321 F

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 2747	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 2748	FILM RESISTOR	5N.5102.050.53	OHM 150 +- 5 % 0,125W RC 05 GF 151 J
R 2749	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2750	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 2751	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 2752	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 2753	FILM RESISTOR	5N.5102.050.65	OHM 470 +- 5 % 0,125W RC 05 GF 471 J
R 2755	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2756	FILM RESISTOR	5N.5102.050.76	KOHM 1,5 +- 5 % 0,125W RC 05 GF 152 J
R 2757	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J
R 2758	FILM RESISTOR	5N.5102.051.40	MOHM 1 +- 5 % 0,125W RC 05 GF 105 J
R 2759	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 2761	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 2762	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 2763	FILM RESISTOR	5N.5102.051.20	KOHM 150 +- 5 % 0,125W RC 05 GF 154 J
R 2764	FILM RESISTOR	5M.5102.050.82	KOHM 2,7 +- 5 % 0,125W RC 05 GF 272 J
R 2765	FILM RESISTOR	5N.5102.050.61	OHM 330 +- 5 % 0,125W RC 05 GF 331 J
R 2766	FILM RESISTOR	5N.5102.051.32	KOHM 470 +- 5 % 0,125W RC 05 GF 474 J
R 2767	FILM RESISTOR	5N.5102.050.86	KOHM 3,9 +- 5 % 0,125W RC 05 GF 392 J
R 2768	VARIABLE RESISTOR	5M.5135.222.69	KOHM 1 +-10% 0,25 W LIN RJ 26 FW 102
R 2769	FILM RESISTOR	5N.5102.051.24	KOHM 220 +- 5 % 0,125W RC 05 GF 224 J
R 2771	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J
R 2772	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 2773	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2774	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 2775	VARIABLE RESISTOR	5M.5135.222.70	KOHM 2 +-10% 0,25 W LIN RJ 26 FW 202
R 2776	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 2777	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05 GF 273 J
R 2778	FILM RESISTOR	5N.5102.050.86	KOHM 3,9 +- 5 % 0,125W RC 05 GF 392 J
R 2779	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 2780	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 2781	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2782	FILM RESISTOR	5L.5107.003.60	KOHM 220 +- 5 % 0,25W CHIP TK +- 250 PPM MCR 18/ RC01/D25/CR1202
R 2783	NTC RESISTOR	5L.5172.001.51	KOHM 1 +- 1 % 0,75 % TYP KTY 83 - 110
ST 2701	PLUG	52.6871.295.05	
ST 2701/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2702	PLUG	52.6871.295.05	
ST 2702/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2703	PLUG	52.6871.295.05	
ST 2703/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
ST 2704	PLUG	52.6871.295.05	
ST 2704/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2705	PLUG	52.6871.295.05	
ST 2705/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
TR 2701	TRANSFORMER	52.6871.266.00	T3-0542
TR 2702	TRANSFORMER	52.6871.266.00	T3-0542
TR 2703	TRANSFORMER	52.6871.442.00	T3-0538
TS 2701	SI-NPN-TRANSISTOR	5L.5512.202.71	2N 5109
TS 2702	SI-NPN-TRANSISTOR	5L.5512.202.71	2N 5109
TS 2703	SEMICONDUCT.COMB.	5L.5512.801.06	2N 2917 /BFY81 DOPPEL-TRANSISTOR NPN/NPN
TS 2704	SI-NPN-TRANSISTOR	5L.5512.202.38	BFY 90
TS 2705	SI-NPN-TRANSISTOR	5L.5512.204.20	2N 2222 A
TS 2706	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
4.6.22	IF Filter	52.6861.290.00 SA (04)	
BU 2901	SOCKET STRIP	5L.4551.008.23	14POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 166 592-7
C 2901	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2903	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2904	CAP. PLASTIC FILM	5M.5224.220.52	PF 1000 +- 10 % 200 V CK 05 BX 102 K
C 2905	CAP. PLASTIC FILM	5L.5241.055.71	UF 0,01 +- 10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529 - A
C 2906	CAPACITOR CERAMIC	5L.5224.003.04	PF 18 +- 5 % C0G 5,1 X5,1 100 V MC04CE0180JHB/.
C 2907	CAPACITOR CERAMIC	5L.5224.015.63	PF 8,2 +- 0,5 PF C0G 5,1 X5,1 100 V MC04CE08290HB/.
C 2908	CAPACITOR CERAMIC	5L.5224.003.05	PF 22 +- 5 % C0G 5,1 X5,1 100 V MC04CE0220JHB/.
C 2909	CAPACITOR CERAMIC	5L.5224.003.08	PF 39 +- 5 % C0G 5,1 X5,1 100 V MC04CE0390JHB/.
C 2910	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2911	CAPACITOR CERAMIC	5L.5224.003.14	PF 120 +- 5 % C0G 5,1 X5,1 100 V MC05CE0121JHB/.
C 2912	CAPACITOR CERAMIC	5L.5224.003.07	PF 33 +- 5 % C0G 5,1 X5,1 100 V MC04CE0330JHB/.
C 2913	CAPACITOR CERAMIC	5L.5224.015.61	PF 2,2 +- 0,5 PF C0G 5,1 X5,1 100 V MC04CE02290HB/.
C 2914	CAPACITOR CERAMIC	5L.5224.029.56	PF 39 +- 2 % N 750 EGPU5/EGPT5 63 V
C 2915	CAP. PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V RKC 2 /KC1850
C 2916	CAP. PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2917	CAPACITOR CERAMIC	5L.5224.029.56	PF 39 +- 2 % N 750 EGPU5/EGPT5 63 V
C 2918	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2919	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2920	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2921	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2922	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2923	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2924	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2925	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2926	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 2927	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2928	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 2929	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 2930	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 2931	CAPACITOR CERAMIC	5L.5224.003.08	PF 39 +- 5 % CGG 5,1 X5,1 100 V MC04CE0390JHB/.
GR 2901	REFERENCE DIODE	5L.5532.205.10	Z- BZX 55/C 6 V 2 ZPD 6,2
GR 2902	REFERENCE DIODE	5L.5532.205.11	Z- BZX 55/C 6 V 8 ZPD 6,8
GR 2903	DIODE MICROWAVE	5L.5532.102.30	PIN- HP 5082-3081
IS 2901	SEMICONDUCTOR CIRC	5L.5443.004.15	SL 611 C/CM VERSTAERKER
IS 2902	SEMICONDUCTOR CIRC	5L.5443.004.15	SL 611 C/CM VERSTAERKER
L 2901	COIL	52.6871.298.00	S1-0883
L 2902	COIL	52.6871.298.00	S1-0883
L 2903	COIL	52.6871.278.00	S1-0884
L 2904	COIL	52.6871.278.00	S1-0884
L 2905	CHOKE	5L.5053.003.23	UH 10 +-10 % 0,13 A 3,7 OHM TYP MS75084-12
L 2906	CHOKE	5L.5053.003.23	UH 10 +-10 % 0,13 A 3,7 OHM TYP MS75084-12
L 2907	CHOKE	5L.5053.003.23	UH 10 +-10 % 0,13 A 3,7 OHM TYP MS75084-12
MI 2901	INTEGR. CIRCUIT	5L.5421.001.04	IE 500 A /SM-911/117A/2616 DOPPEL-BALANCE-MISCHER
Q 2901	COMBIN COMP EXC	5L.5419.002.80	QUARZ-OSZILLATOR 10 MHZ 13,5V TYP FS5846-00S-ZZA
Q 2902	BAND-PASS FILTER	5L.5353.001.69	QUARZFILTER MHZ 40,09 +- 4KHZ TYP QF 40,09/7-1
Q 2903	BAND-PASS FILTER	5L.5353.001.68	QUARZFILTER MHZ 9,9115 +-1,2KHZ TYP QF 9,9115/2,4-2
R 2901	FILM RESISTOR	5L.5105.021.41	OHM 470 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2902	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2903	FILM RESISTOR	5L.5105.021.75	KOHM 12 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2904	FILM RESISTOR	5L.5105.021.49	KOHM 1 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2905	FILM RESISTOR	5L.5105.021.53	KOHM 1,5 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2907	FILM RESISTOR	5L.5105.021.65	KOHM 4,7 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2908	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2909	FILM RESISTOR	5L.5105.021.61	KOHM 3,3 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2911	FILM RESISTOR	5L.5105.021.73	KOHM 10 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2912	FILM RESISTOR	5L.5105.021.73	KOHM 10 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2913	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2914	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2915	FILM RESISTOR	5L.5105.021.57	KOHM 2,2 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2916	FILM RESISTOR	5L.5105.021.99	KOHM 120 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2917	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05 GF 473 J
R 2918	FILM RESISTOR	5L.5105.021.77	KOHM 15 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2920	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 2921	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 2922	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2923	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2924	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 2925	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 2926	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 2928	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2929	FILM RESISTOR	5L.5105.021.09	OHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2930	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2931	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2932	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 2933	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2934	FILM RESISTOR	5N.5102.050.63	OHM 390 +- 5 % 0,125W RC 05 GF 391 J
R 2935	FILM RESISTOR	5N.5102.050.45	OHM 68 +- 5 % 0,125W RC 05 GF 680 J
R 2936	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 2937	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05 GF 473 J
R 2938	FILM RESISTOR	5L.5102.003.55	OHM 8,2 +- 5 % 0,125W SK1 BB
R 2939	FILM RESISTOR	5L.5102.003.55	OHM 8,2 +- 5 % 0,125W SK1 BB
R 2940	FILM RESISTOR	5N.5102.050.53	OHM 150 +- 5 % 0,125W RC 05 GF 151 J
R 2941	RESIST WIRE WD VAR	5M.5145.220.15	KOHM 10 +- 5% 0,75W LIN RT24 C 2 W 103
R 2942	RESISTOR	5L.5107.003.08	OHM 39 +- 5 % 0,25 W CHIP TK+-250PPM MCR18/RC01/D25/CR1206
ST 2901	PLUG	52.6871.295.05	
ST 2901/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2902	PLUG	52.6871.295.05	
ST 2902/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 2903	PLUG	52.6871.295.05	
ST 2903/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
TS 2901	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918
TS 2902	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918
TS 2903	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918
TS 2904	N CHANNEL FET	5L.5512.401.19	2N 4416
TS 2905	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918
4.6.23	IF/AF Module	52.6861.310.00 SA (03)	
BU 3101	SOCKET STRIP	5L.4551.008.23	14POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 166 592-7
C 3101	CAPACITOR CERAMIC	5M.5224.220.31	PF 15 +-10 % 200 V CK 05 BX 150 K
C 3102	CAPACITOR CERAMIC	5M.5224.220.52	PF 1000 +-10 % 200 V CK 05 BX 102 K
C 3103	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 3104	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)
C 3105	CAPACITOR CERAMIC	5M.5224.220.11	PF 100 +-10 % 200 V CK 05 BX 101 K
C 3106	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3107	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3108	CAPACITOR CERAMIC	5M.5224.220.11	PF 100 +-10 % 200 V CK 05 BX 101 K
C 3109	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3110	CAPACITOR TANTALUM	5N.5271.019.47	UF 10 +-20% 20 V M39003/01-2287 (CSR13)
C 3111	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3112	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3113	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 3114	CAPACITOR TANTALUM	5N.5271.019.47	UF 10 +-20% 20 V M39003/01-2287 (CSR13)

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 3115	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)
C 3116	CAP.PLASTIC FILM	5L.5241.057.92	PF 4700 +- 5 % 100 V FKC 2
C 3117	CAP.PLASTIC FILM	5L.5241.057.54	PF 470 +- 5 % 100 V FKC 2 /KC1850
C 3118	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3119	CAP.PLASTIC FILM	5L.5241.057.92	PF 4700 +- 5 % 100 V FKC 2
C 3120	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3122	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 3123	CAPACITOR TANTALUM	5N.5271.015.67	UF 4,7 +-20% 50 V M39003/01-2369 (CSR13)
C 3124	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)
C 3125	CAPACITOR CERAMIC	5M.5224.220.74	UF 0,47 +-10 % 50 V CK 06 BX 474 K
C 3127	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)
C 3128	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3129	CAPACITOR TANTALUM	5N.5271.011.47	UF 2,2 +-20% 20 V M39003/01-2284 (CSR13)
C 3130	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3131	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 3132	CAPACITOR CERAMIC	5M.5224.220.52	PF 1000 +-10 % 200 V CK 05 BX 102 K
C 3133	CAPACITOR TANTALUM	5N.5271.017.17	UF 6,8 +-20% 6 V M39003/01-2243 (CSR13)
C 3134	CAPACITOR TANTALUM	5N.5271.017.17	UF 6,8 +-20% 6 V M39003/01-2243 (CSR13)
C 3135	CAPACITOR CERAMIC	5M.5224.220.52	PF 1000 +-10 % 200 V CK 05 BX 102 K
C 3136	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3137	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3138	CAPACITOR TANTALUM	5N.5271.027.17	UF 47 +-20% 6 V M39003/01-2245 (CSR13)
C 3139	CAPACITOR TANTALUM	5N.5271.013.37	UF 3,3 +-20% 15 V M39003/01-2269 (CSR13)
C 3140	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 3141	CAPACITOR TANTALUM	5N.5271.019.47	UF 10 +-20% 20 V M39003/01-2287 (CSR13)
C 3142	CAPACITOR TANTALUM	5N.5271.013.37	UF 3,3 +-20% 15 V M39003/01-2269 (CSR13)
C 3143	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3144	CAPACITOR TANTALUM	5N.5271.011.47	UF 2,2 +-20% 20 V M39003/01-2284 (CSR13)
C 3145	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3146	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3147	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3148	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 3149	CAPACITOR TANTALUM	5L.5275.001.50	UF 3,3 +-20% 16 V ETR 1/TAD 45322/B45181/T340/7900
C 3150	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3151	CAPACITOR CERAMIC	5M.5224.220.38	PF 68 +-10 % 200 V CK 05 BX 680 K
C 3152	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 3153	CAPACITOR TANTALUM	5N.5271.019.47	UF 10 +-20% 20 V M39003/01-2287 (CSR13)
C 3154	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 3155	CAPACITOR TANTALUM	5N.5271.029.37	UF 68 +-20% 15 V M39003/01-2275 (CSR13)
C 3156	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
GR 3101	REFERENCE DIODE	5L.5536.001.30	Z- BZX 55/B 7 V 5
GR 3102	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
GR 3103	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3104	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3105	REFERENCE DIODE	5L.5536.001.29	Z- BZX 55/B 6 V 8
GR 3106	REFERENCE DIODE	5L.5536.001.29	Z- BZX 55/B 6 V 8
GR 3107	REFERENCE DIODE	5L.5532.205.05	Z- BZX 55/C 3 V 9 ZPD 3,9
GR 3108	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3109	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3110	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 3111	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
IS 3101	SEMICONDUCTOR CIRC	5L.5443.004.13	SL 612 C/CM VERSTAERKER
IS 3102	SEMICONDUCTOR CIRC	5L.5443.004.13	SL 612 C/CM VERSTAERKER
IS 3103	SEMICONDUCTOR CIRC	5L.5443.004.14	SL 640 C/CM BALLANCE-MODULATOR
IS 3104	SEMICONDUCTOR CIRC	5L.5443.001.43	741 /..BE/CA..T/LM..H/RM..T/PM..J OPERATIONSVERST.
IS 3105	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
IS 3106	SEMICONDUCTOR CIRC	5L.5443.004.14	SL 640 C/CM BALLANCE-MODULATOR
IS 3107	SEMICONDUCTOR CIRC	5L.5443.004.16	SL 622 C/CM VERSTAERKER
R 3101	FILM RESISTOR	5N.5102.051.20	KOHM 150 +- 5 % 0,125W RC 05 GF 154 J
R 3102	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 3103	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 3104	FILM RESISTOR	5N.5102.051.24	KOHM 220 +- 5 % 0,125W RC 05 GF 224 J
R 3105	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 3106	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 3107	FILM RESISTOR	5N.5102.050.82	KOHM 2,7 +- 5 % 0,125W RC 05 GF 272 J
R 3108	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 3109	FILM RESISTOR	5N.5106.002.48	KOHM 34 +- 1 % 0,1 W RN 55 C 3402 F
R 3110	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J
R 3111	FILM RESISTOR	5N.5102.050.86	KOHM 3,9 +- 5 % 0,125W RC 05 GF 392 J
R 3112	VARIABLE RESISTOR	5L.5135.004.09	KOHM 2 +-20% 0,5 W LIN TYP 3329H-1-202/3321H-1-202
R 3113	FILM RESISTOR	5N.5106.002.48	KOHM 34 +- 1 % 0,1 W RN 55 C 3402 F
R 3114	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 3115	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 3116	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J
R 3117	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3118	FILM RESISTOR	5N.5102.051.24	KOHM 220 +- 5 % 0,125W RC 05 GF 224 J
R 3119	FILM RESISTOR	5N.5102.051.32	KOHM 470 +- 5 % 0,125W RC 05 GF 474 J
R 3120	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 3121	FILM RESISTOR	5N.5102.050.57	OHM 220 +- 5 % 0,125W RC 05 GF 221 J
R 3122	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 3123	FILM RESISTOR	5N.5102.051.38	KOHM 820 +- 5 % 0,125W RC 05 GF 824 J
R 3124	FILM RESISTOR	5N.5102.050.61	OHM 330 +- 5 % 0,125W RC 05 GF 331 J
R 3125	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3126	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3127	FILM RESISTOR	5N.5102.050.82	KOHM 2,7 +- 5 % 0,125W RC 05 GF 272 J
R 3128	RESISTOR NTC	5L.5173.002.85	KOHM 10 +-10% 0,5 W B 4275 TYP 2322 642 62103
R 3129	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J
R 3130	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 3131	FILM RESISTOR	5N.5102.050.65	OHM 470 +- 5 % 0,125W RC 05 GF 471 J
R 3132	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 3133	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J
R 3134	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 3135	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 3136	FILM RESISTOR	5N.5102.050.76	KOHM 1,5 +- 5 % 0,125W RC 05 GF 152 J
R 3137	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J
R 3138	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J
R 3139	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J
R 3140	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J
R 3141	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J
R 3143	FILM RESISTOR	5N.5102.051.40	MOHM 1 +- 5 % 0,125W RC 05 GF 105 J
R 3144	FILM RESISTOR	5N.5102.050.92	KOHM 6,8 +- 5 % 0,125W RC 05 GF 682 J
R 3145	FILM RESISTOR	5N.5102.051.18	KOHM 120 +- 5 % 0,125W RC 05 GF 124 J
R 3146	FILM RESISTOR	5N.5102.050.74	KOHM 1,2 +- 5 % 0,125W RC 05 GF 122 J
R 3147	FILM RESISTOR	5N.5102.050.59	OHM 270 +- 5 % 0,125W RC 05 GF 271 J
R 3148	FILM RESISTOR	5N.5102.050.59	OHM 270 +- 5 % 0,125W RC 05 GF 271 J
R 3149	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 3150	FILM RESISTOR	5N.5102.051.12	KOHM 68 +- 5 % 0,125W RC 05 GF 683 J
R 3151	FILM RESISTOR	5N.5102.051.24	KOHM 220 +- 5 % 0,125 W RC 05 GF 224 J
R 3152	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 3153	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125 W RC 05 GF 472 J
R 3154	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 3155	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J
R 3156	VARIABLE RESISTOR	5L.5135.004.05	OHM 200 +-20% 0,5 W LIN TYP 3329H-1-201/3321H-1-201
R 3157	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 3158	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 3159	VARIABLE RESISTOR	5L.5135.004.08	KOHM 1 +-20% 0,5 W LIN TYP 3329H-1-102/3321H-1-102
R 3160	FILM RESISTOR	5N.5102.002.13	OHM 3,3 +- 5 % 0,25 W RC 07 GF 3R3 J
R 3161	FILM RESISTOR	5N.5102.002.13	OHM 3,3 +- 5 % 0,25 W RC 07 GF 3R3 J
R 3162	FILM RESISTOR	5N.5102.050.71	OHM 820 +- 5 % 0,125W RC 05 GF 821 J
R 3163	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J
R 3164	FILM RESISTOR	5N.5105.003.01	OHM 10 +- 2 % 0,5 W RL 20 S 100 G
ST 3101	PLUG	52.6871.295.05	
ST 3101/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
ST 3102	PLUG	52.6871.295.05	
ST 3102/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE
TS 3101	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3102	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3103	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3104	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3105	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3106	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3107	SI-NPN-TRANSISTOR	5L.5512.203.20	2N 2219 A
TS 3108	SI-PNP-TRANSISTOR	5L.5512.101.31	2N 2905 A
TS 3109	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3110	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3111	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3112	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
4.6.24	Memory	52.6861.330.00 SA (02)	
BU 3301	SOCKET STRIP	5L.4551.008.25	56POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 2-166 592-8
C 3301	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 3302	CAPACITOR TANTALUM	5N.5271.033.36	UF 150 +-10% 15 V M39003/01-2277 (CSR13)
GR 3301	SI-DIODE	5L.5532.101.66	IN 4448 IN 914 B
IS 3301	SEMICONDUCT.STORE	5L.5442.001.34	CD 4039 AD /CD..AMD/HBC..AD -MOS- RAM 4X8
IS 3302	SEMICONDUCT.STORE	5L.5442.001.34	CD 4039 AD /CD..AMD/HBC..AD -MOS- RAM 4X8
IS 3303	SEMICONDUCT.STORE	5L.5442.001.34	CD 4039 AD /CD..AMD/HBC..AD -MOS- RAM 4X8
R 3301	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 3302	R COMBINATION	5L.5413.001.04	9X KOHM 100 +- 2 % 0,2 W MSP10A011046/420CK104X2PD/4310R-101-
R 3303	R COMBINATION	5L.5413.001.04	9X KOHM 100 +- 2 % 0,2 W MSP10A011046/420CK104X2PD/4310R-101-
R 3304	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3305	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3306	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3307	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3308	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3309	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3310	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3311	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3312	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3313	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3314	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3315	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3316	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
4.6.25	Organizer	52.6861.350.00 SA (03)	
BU 3501	SOCKET STRIP	5L.4551.008.24	44POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 2-166 592-2
C 3501	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)
C 3503	CAPACITOR TANTALUM	5N.5271.029.37	UF 68 +-20% 15 V M39003/01-2275 (CSR13)
C 3504	CAPACITOR TANTALUM	5N.5271.017.57	UF 6,8 +-20% 35 V M39003/01-2305 (CSR13)
C 3505	CAP.PLASTIC FILM	5L.5241.055.54	UF 0,047 +-10 % 63 V MKS 2 /MKT1,68/1,85/MMK05/IRD607/B32529-A
C 3506	CAPACITOR TANTALUM	5L.5275.001.69	UF 1 +-20% 35 V ETR 1/TAD 45322/B45181/T340/7900
C 3507	CAPACITOR TANTALUM	5L.5275.001.69	UF 1 +-20% 35 V ETR 1/TAD 45322/B45181/T340/7900
C 3508	CAPACITOR TANTALUM	5L.5275.001.69	UF 1 +-20% 35 V ETR 1/TAD 45322/B45181/T340/7900

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 3509	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2
C 3510	CAPACITOR CERAMIC	5N.5224.001.10	/MKT1,68/1,85
C 3511	CAP.PLASTIC FILM	5L.5241.055.54	UF 0,22 +-10 % 50 V CK 06 BX 224 K
C 3512	CAP.PLASTIC FILM	5L.5241.055.77	UF 0,047 +-10 % 63 V MKS 2
C 3513	CAP.PLASTIC FILM	5L.5241.057.64	/MKT1,68/1,85/MMK05/IRD607/B32529-A
C 3514	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,015 +- 5 % 63 V MKS 2
C 3515	CAPACITOR CERAMIC	5N.5224.001.11	/MKT1,68/1,85/MMK05/IRD607/B32529-A
C 3516	CAP.PLASTIC FILM	5L.5245.001.64	PF 3300 +- 5 % 100 V FKC 2
C 3517	CAPACITOR CERAMIC	5M.5224.220.74	UF 0,1 +-10 % 50 V MKS 2
C 3518	CAP.PLASTIC FILM	5L.5241.057.58	/MKT1,68/1,85
GR 3501	SI-DIODE	5L.5532.101.66	UF 1 +-10 % 50 V CK 06 BX 105 K
GR 3502	SI-DIODE	5L.5532.101.66	UF 0,1 +-10 % 50 V MKS 2
GR 3503	SI-DIODE	5L.5532.101.66	/MKT1,68/1,85
GR 3504	SI-DIODE	5L.5532.102.36	UF 0,47 +-10 % 50 V CK 06 BX 474 K
GR 3505	SI-DIODE	5L.5532.101.66	PF 1000 +- 5 % 100 V FKC 2 /KC1850
GR 3506	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3507	REFERENCE DIODE	5L.5536.002.45	1N 4448 1N 914 B
GR 3508	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3509	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3510	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3511	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3512	REFERENCE DIODE	5L.5536.002.49	1N 4448 1N 914 B
GR 3513	REFERENCE DIODE	5L.5532.205.01	Z- BZX 55/B 5 V 1
GR 3514	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3515	REFERENCE DIODE	5L.5536.001.63	Z- BZX 55/C 2 V 7 ZPD 2,7
GR 3516	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3517	SI-DIODE	5L.5532.102.36	1N 4448 1N 914 B
GR 3518	REFERENCE DIODE	5L.5536.001.32	1N 4448 1N 914 B
GR 3519	REFERENCE DIODE	5L.5532.205.15	1N 5711 5082-2800
GR 3520	REFERENCE DIODE	5L.5536.006.93	Z- BZX 55/B 15
IS 3501	SEMICONDUCTOR CIRC	5L.5443.003.38	Z- BZX 55/C 10 ZPD 10
IS 3502	SEMICONDUCTOR CIRC	5M.5442.220.35	STABILISIER- BZX 75/C 2 V 1
IS 3503	SEMICONDUCTOR CIRC	5M.5442.220.35	CA 3085 A SPANNUNGSREGLER
IS 3504	SEMICONDUCTOR CIRC	5M.5442.220.38	4001 /CD...BF/MC1...BAL/HCC...BF
IS 3505	SEMICONDUCTOR CIRC	52.9544.105.41	-MOS- 5L.5442.004.08 MIL-STD-883
IS 3505/1	SEMICONDUCT.STORE	5L.5452.003.60	4001 /CD...BF/MC1...BAL/HCC...BF
IS 3506	SEMICONDUCT.COMB.	5L.5412.001.49	-MOS- 5L.5442.004.08 MIL-STD-883
R 3501	FILM RESISTOR	5L.5105.021.09	4023 /CD...BF/MC1...BAL/HCC...BF
R 3503	FILM RESISTOR	5M.5106.229.97	-MOS- 5L.5442.004.13 MIL-STD-883
R 3504	FILM RESISTOR	5N.5106.001.87	2048X8 BIT
R 3505	VARIABLE RESISTOR	5M.5135.222.85	NMC 27C16 QE-45 -MOS- PROM 2KX8 TS
R 3506	FILM RESISTOR	5N.5102.050.49	ULS2003 H /SG..J
R 3507	FILM RESISTOR	5N.5102.050.88	TRANSISTOR-ARRAY DARLINGTON
R 3508	FILM RESISTOR	5L.5105.021.97	OHM 22 +- 2 % 0,5 W 526-0
R 3509	FILM RESISTOR	5N.5102.051.30	TK+-100PPM
R 3510	FILM RESISTOR	5L.5105.021.97	KOHM 14,7 +- 1 % 0,1 W RN 55
R 3511	FILM RESISTOR	5N.5102.051.28	C 1472 F
R 3512	FILM RESISTOR	5L.5105.021.77	KOHM 1,87 +- 1 % 0,1 W RN 55
R 3513	FILM RESISTOR	5M.5102.223.58	C 1871 F
R 3514	FILM RESISTOR	5L.5105.021.69	OHM 500 +-10% 0,25 W LIN
			RJ 26 FX 501
			OHM 100 +- 5 % 0,125W RC 05
			GF 101 J
			KOHM 4,7 +- 5 % 0,125W RC 05
			GF 472 J
			KOHM 100 +- 2 % 0,5 W 526-0
			TK+-100PPM
			KOHM 390 +- 5 % 0,125W RC 05
			GF 394 J
			KOHM 100 +- 2 % 0,5 W 526-0
			TK+-100PPM
			KOHM 330 +- 5 % 0,125W RC 05
			GF 334 J
			KOHM 15 +- 2 % 0,5 W 526-0
			TK+-100PPM
			KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
			KOHM 6,8 +- 2 % 0,5 W 526-0
			TK+-100PPM

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 3515	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 3516	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3517	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J
R 3518	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 3519	FILM RESISTOR	5N.5102.002.79	KOHM 1,8 +- 5 % 0,25 W RC 07 GF 182 J
R 3520	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 3522	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3523	FILM RESISTOR	5N.5102.051.40	MOHM 1 +- 5 % 0,125W RC 05 GF 105 J
R 3524	FILM RESISTOR	5L.5105.006.66	KOHM 330 +- 2 % 0,5 W 526-0 TK+-100PPM
R 3525	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3526	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 3527	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3528	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 3529	FILM RESISTOR	5N.5102.051.26	KOHM 270 +- 5 % 0,125W RC 05 GF 274 J
R 3530	VARIABLE RESISTOR	5M.5135.222.78	KOHM 500 +-10% 0,25 W LIN RJ 26 FW 504
R 3531	FILM RESISTOR	5N.5102.050.92	KOHM 6,8 +- 5 % 0,125W RC 05 GF 682 J
R 3532	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 3533	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3534	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3535	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3536	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3537	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3538	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3539	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3540	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3541	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 3542	R COMBINATION	5L.5413.001.03	9X KOHM 47 +- 2 % 0,2 W MSP10A01473G/420CK473X2PD/4310R-101-
R 3543	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 3544	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 3545	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 3546	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 3547	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 3548	VARIABLE RESISTOR	5M.5135.222.75	KOHM 50 +-10% 0,25 W LIN RJ 26 FW 503
R 3549	FILM RESISTOR	5N.5102.051.12	KOHM 68 +- 5 % 0,125W RC 05 GF 683 J
R 3550	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 3551	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05 GF 333 J
RS 3501	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V
RS 3502	RELAY	5L.4759.003.46	12 VGS 2X21 1 A 125V 1,03KOHM TYP TQ2-12V

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
TS 3501	SI-PNP-TRANSISTOR	5L.5512.102.04	BSS 44
TS 3502	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3503	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3504	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 3506	SI-PNP-TRANSISTOR	5L.5512.101.22	2N 3964 BFX 65
TS 3507	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3508	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 3509	SI-NPN-TRANSISTOR	5L.5512.204.20	2N 2222 A
TS 3510	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
4.6.26	Programm. Frequency Divider	52.6861.410.00 SA (01)	
BU 4101	SOCKET STRIP	5L.4551.008.30	15POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 1-166 591-5
BU 4102	SOCKET STRIP	5L.4551.008.29	9POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 166 591-9
BU 4103	SOCKET STRIP	5L.4551.008.27	3POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 166 591-3
C 4101	CAPACITOR CERAMIC	5N.5224.001.08	UF 0,1 +-10 % 50 V CK 05 BX 104 K
C 4102	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4103	CAPACITOR TANTALUM	5N.5271.011.47	UF 2,2 +-20% 20 V M39003/01-2284 (CSR13)
C 4104	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)
C 4105	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4106	CAPACITOR TANTALUM	5N.5271.007.67	UF 1 +-20% 50 V M39003/01-2357 (CSR13)
C 4107	CAPACITOR CERAMIC	5M.5224.220.11	PF 100 +-10 % 200 V CK 05 BX 101 K
C 4108	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4109	CAPACITOR TANTALUM	5N.5271.019.47	UF 10 +-20% 20 V M39003/01-2287 (CSR13)
GR 4101	REFERENCE DIODE	5L.5532.205.35	Z- BZX 85/C 6 V 2 ZPY 6,2
GR 4102	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 4103	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 4104	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
IS 4101	SEMICONDUCTOR CIRC	5M.5442.220.37	4011 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.11 MIL-STD-883
IS 4102	SEMICONDUCTOR CIRC	5M.5442.220.36	4002 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.09 MIL-STD-883
IS 4103	SEMICONDUCTOR CIRC	5L.5442.005.20	4013 /HEF..BD -MOS- FLIPFLOP
IS 4104	SEMICONDUCTOR CIRC	5M.5442.220.37	4011 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.11 MIL-STD-883
IS 4105	SEMICONDUCTOR CIRC	5M.5442.220.37	4011 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.11 MIL-STD-883
IS 4106	SEMICONDUCTOR CIRC	5L.5443.004.11	SG 120 05,2T REGLER - 5,2V
IS 4107	SEMICONDUCTOR CIRC	5M.5442.220.75	4018 /CD...BF/CD..BMJ/MC1..BAL -MOS- 5L.5442.005.86 MIL-STD-883
IS 4108	SEMICONDUCTOR CIRC	5M.5442.220.77	4029 /CD...BF/CD..BMJ/HCC..BF -MOS- 5L.5442.005.88 MIL-STD-883
IS 4109	SEMICONDUCTOR CIRC	5M.5442.220.75	4018 /CD...BF/CD..BMJ/MC1..BAL -MOS- 5L.5442.005.86 MIL-STD-883
IS 4110	SEMICONDUCTOR CIRC	5M.5442.220.35	4001 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.08 MIL-STD-883
IS 4111	SEMICONDUCTOR CIRC	5M.5442.220.35	4001 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.08 MIL-STD-883
IS 4112	SEMICONDUCTOR CIRC	5M.5442.220.75	4018 /CD...BF/CD..BMJ/MC1..BAL -MOS- 5L.5442.005.86 MIL-STD-883
IS 4113	SEMICONDUCTOR CIRC	5L.5441.022.15	SP 8647 ADG FREQUENZTEILER
IS 4114	SEMICONDUCTOR CIRC	5L.5443.003.38	CA 3085 A SPANNUNGSREGLER
L 4101	CHOKE	5L.5053.003.19	UH 4,7 +-10 % 0,23 A 1,2 OHM TYP MS75084-8
L 4102	CHOKE	5L.5053.003.19	UH 4,7 +-10 % 0,23 A 1,2 OHM TYP MS75084-8

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 4101	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J
R 4102	FILM RESISTOR	5N.5102.050.55	OHM 180 +- 5 % 0,125W RC 05 GF 181 J
R 4103	FILM RESISTOR	5N.5102.050.47	OHM 82 +- 5 % 0,125W RC 05 GF 820 J
R 4104	FILM RESISTOR	5N.5102.050.61	OHM 330 +- 5 % 0,125W RC 05 GF 331 J
R 4105	FILM RESISTOR	5N.5102.050.59	OHM 270 +- 5 % 0,125W RC 05 GF 271 J
R 4106	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J
R 4107	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4108	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4109	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4110	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4111	FILM RESISTOR	5L.5105.021.19	OHM 56 +- 2 % 0,5 W 526-0 TK+-100PPM
R 4112	FILM RESISTOR	5M.5106.229.97	KOHM 14,7 +- 1 % 0,1 W RN 55 C 1472 F
R 4113	FILM RESISTOR	5L.5105.021.41	OHM 470 +- 2 % 0,5 W 526-0 TK+-100PPM
R 4114	FILM RESISTOR	5N.5106.001.87	KOHM 1,87 +- 1 % 0,1 W RN 55 C 1871 F
R 4115	VARIABLE RESISTOR	5M.5135.222.85	OHM 500 +-10% 0,25 W LIN RJ 26 FX 501
TS 4101	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 4102	SI-PNP-TRANSISTOR	5L.5512.102.20	2N 2907 A
TS 4103	SI-PNP-TRANSISTOR	5L.5512.102.04	BSS 44

4.6.27 Mixer Converter Module

52.6861.430.00 SA (01)

BU 4301	SOCKET STRIP	5L.4551.008.31	18POL 3 A 250V BZ N11,3 AU0,8 POLYEST. 6V TYP 1-166 591-8
C 4301	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4302	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4303	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4304	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4305	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4306	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4307	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4308	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4309	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4310	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4311	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4312	CAP.PLASTIC FILM	5L.5241.057.55	PF 560 +- 5 % 100 V FKC 2 /KC1850
C 4313	CAPACITOR CERAMIC	5L.5224.015.79	PF 150 +- 2 % COG 5,1 X5,1 100 V MC05CE1501GHB/.
C 4314	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4315	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4316	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4317	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4318	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4319	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 4320	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2
C 4321	CAPACITOR CERAMIC	5L.5224.003.12	/MKT1,85/1,68/MMK05/IRD607/B32529-A PF 82 +- 5 % COG
C 4322	CAPACITOR CERAMIC	5L.5224.015.75	5,1 X5,1 100 V MC05CE0820JHB/. PF 91 +- 2 % COG
C 4323	CAPACITOR CERAMIC	5L.5224.003.15	5,1 X5,1 100 V MC05CE0910GHB PF 150 +- 5 % COG
C 4324	CAPACITOR CERAMIC	5L.5224.015.79	5,1 X5,1 100 V MC05CE0151JHB/. PF 150 +- 2 % COG
C 4325	CAPACITOR CERAMIC	5L.5224.015.69	5,1 X5,1 100 V MC05CE1501GHB/. PF 39 +- 2 % COG
C 4326	CAPACITOR CERAMIC	5L.5224.003.11	5,1 X5,1 100 V MC04CE0390GHB/. PF 68 +- 5 % COG
C 4327	CAPACITOR CERAMIC	5L.5224.015.99	5,1 X5,1 100 V MC05CE0680JHB/. M69670H +- 2 % COG
C 4328	CAPACITOR CERAMIC	5L.5224.015.72	5,1 X5,1 100 V MC04CE0220GHB/. PF 68 +- 2 % COG
C 4329	CAPACITOR CERAMIC	5L.5224.015.75	5,1 X5,1 100 V MC05CE0680GHB/. PF 91 +- 2 % COG
C 4330	CAPACITOR CERAMIC	5L.5224.003.09	5,1 X5,1 100 V MC05CE0910GHB PF 47 +- 5 % COG
C 4331	CAP.PLASTIC FILM	5L.5241.055.71	5,1 X5,1 100 V MC04CE0470JHB/. UF 0,01 +-10 % 63 V MKS 2
C 4332	CAP.PLASTIC FILM	5L.5241.055.71	/MKT1,85/1,68/MMK05/IRD607/B32529-A UF 0,01 +-10 % 63 V MKS 2
C 4333	CAP.PLASTIC FILM	5L.5245.001.64	/MKT1,85/1,68/MMK05/IRD607/B32529-A UF 0,1 +-10 % 50 V MKS 2
C 4334	CAP.PLASTIC FILM	5L.5241.055.71	/MKT1,68/1,85 UF 0,01 +-10 % 63 V MKS 2
C 4335	CAP.PLASTIC FILM	5L.5241.055.71	/MKT1,85/1,68/MMK05/IRD607/B32529-A UF 0,01 +-10 % 63 V MKS 2
C 4336	CAP.PLASTIC FILM	5L.5241.055.71	/MKT1,85/1,68/MMK05/IRD607/B32529-A UF 0,01 +-10 % 63 V MKS 2
GR 4301	REFERENCE DIODE	5L.5536.006.93	STABILISIER- BZX 75/C 2 V 1
IS 4301	SEMICONDUCTOR CIRC	5L.5443.004.14	SL 640 C/CM BALLANCE-MODULATOR
IS 4302	SEMICONDUCTOR CIRC	5L.5443.004.12	SL 641 C/CM BALLANCE-MODULATOR
L 4301	COIL	52.6871.432.00	S1-0875
L 4302	COIL	52.6862.434.00	S1-0876
L 4303	COIL	52.6862.436.00	S1-0877
L 4304	COIL	52.6871.438.00	
L 4305	COIL	52.6871.440.00	S1-0879
L 4306	CHOKE	5L.5053.003.05	UH 0,33 +-10 % 0,815A 0,22 OHM TYP MS75083-7
MI 4301	DOUBLE BALANCE MIXER	51.6861.430.10	
Q 4301	CRYSTAL FILTER	53.5026.904.00	20,095MHZ
R 4301	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4302	FILM RESISTOR	5N.5102.050.74	KOHM 1,2 +- 5 % 0,125W RC 05 GF 122 J
R 4303	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J
R 4304	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4305	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05 GF 273 J
R 4306	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05 GF 333 J
R 4307	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 4308	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J
R 4309	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 4310	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 4311	FILM RESISTOR	5N.5102.050.76	KOHM 1,5 +- 5 % 0,125W RC 05 GF 152 J
R 4312	FILM RESISTOR	5N.5102.050.35	OHM 27 +- 5 % 0,125W RC 05 GF 270 J
R 4313	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES -	REMARKS
R 4314	FILM RESISTOR	5N.5102.050.45	OHM 68 +- 5 % 0,125W RC 05 GF 680 J	
R 4315	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 4316	FILM RESISTOR	5N.5102.050.27	OHM 12 +- 5 % 0,125W RC 05 GF 120 J	
R 4317	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J	
R 4318	FILM RESISTOR	5L.5102.003.53	OHM 6,8 +- 5 % 0,125W SK1 BB	
R 4319	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J	
R 4320	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J	
R 4321	FILM RESISTOR	5N.5102.050.39	OHM 39 +- 5 % 0,125W RC 05 GF 390 J	
R 4322	FILM RESISTOR	5N.5102.050.45	OHM 68 +- 5 % 0,125W RC 05 GF 680 J	
R 4323	FILM RESISTOR	5N.5102.050.35	OHM 27 +- 5 % 0,125W RC 05 GF 270 J	
R 4324	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 4325	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 4326	FILM RESISTOR	5N.5102.050.71	OHM 820 +- 5 % 0,125W RC 05 GF 821 J	
R 4327	FILM RESISTOR	5N.5102.050.45	OHM 68 +- 5 % 0,125W RC 05 GF 680 J	
R 4328	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J	
R 4329	FILM RESISTOR	5N.5102.050.65	OHM 470 +- 5 % 0,125W RC 05 GF 471 J	
R 4330	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J	
R 4331	FILM RESISTOR	5N.5102.050.69	OHM 680 +- 5 % 0,125W RC 05 GF 681 J	
T 4301	TRANSFORMER	52.6871.442.00	T3-0538	
T 4302	TRANSFORMER	52.6871.444.00	T3-0539	
TS 4301	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918	
TS 4302	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918	
TS 4303	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918	
TS 4304	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918	
TS 4305	SI-NPN-TRANSISTOR	5L.5512.202.38	BFY 90	
TS 4306	SI-NPN-TRANSISTOR	5L.5512.202.38	BFY 90	

4.6.28 Vernier Control Loop 52.6861.450.00 SA (01)

BU 4501	SOCKET STRIP	5L.4551.008.32	19POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 1-166 591-9
BU 4502	SOCKET STRIP	5L.4551.008.28	4POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 166 591-4
BU 4503	SOCKET STRIP	5L.4551.008.27	3POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 166 591-3
C 4501	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)
C 4502	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4503	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4504	CAP.PLASTIC FILM	5L.5241.057.62	PF 2200 +- 5 % 100 V FKC 2
C 4505	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4506	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4507	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4508	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4509	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4510	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4511	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4512	CAPACITOR CERAMIC	5M.5221.232.77	PF 47 +-10 % 200 V CK 05 BX 470 K
C 4513	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4531	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4532	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 4533	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 4534	CAPACITOR CERAMIC	5L.5224.003.13	PF 100 +- 5 % COG 5,1 X5,1 100 V MC05CE0101JHB/.
C 4535	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4536	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4551	CAPACITOR TANTALUM	5N.5271.015.27	UF 4,7 +-20% 10 V M39003/01-2255 (CSR13)
C 4552	CAPACITOR TANTALUM	5N.5271.015.27	UF 4,7 +-20% 10 V M39003/01-2255 (CSR13)
C 4553	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
GR 4501	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 4551	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 4552	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
IS 4501	SEMICONDUCTOR CIRC	5M.5442.220.37	4011 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.11 MIL-STD-883 4007 /CD...UBF/MC1..UBAL/CD..BMJ MIL-STD883 -MOS- INVERTER
IS 4502	SEMICONDUCTOR CIRC	5L.5442.006.83	4018 /CD...BF/CD..BMJ/MC1..BAL -MOS- 5L.5442.005.86 MIL-STD-883
IS 4503	SEMICONDUCTOR CIRC	5M.5442.220.75	4018 /CD...BF/CD..BMJ/MC1..BAL -MOS- 5L.5442.005.86 MIL-STD-883
IS 4504	SEMICONDUCTOR CIRC	5L.5442.007.28	4059 /CD..AF -MOS- ZAEHLER
IS 4505	SEMICONDUCTOR CIRC	5M.5444.220.14	4066 /CD...BF/MC1..BAL/CD..BMJ -MOS- 5L.5444.001.45 MIL-STD-883
IS 4506	SEMICONDUCTOR CIRC	5M.5442.220.75	4018 /CD...BF/CD..BMJ/MC1..BAL -MOS- 5L.5442.005.86 MIL-STD-883
IS 4507	SEMICONDUCTOR CIRC	5L.5442.007.28	4059 /CD..AF -MOS- ZAEHLER
IS 4508	SEMICONDUCTOR CIRC	5L.5442.005.20	4013 /HEF..BD -MOS- FLIPFLOP
L 4531	COIL	52.6871.452.00	S1-0874
R 4501	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 4502	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 4503	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 4504	FILM RESISTOR	5N.5102.050.92	KOHM 6,8 +- 5 % 0,125W RC 05 GF 682 J
R 4505	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 4506	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05 GF 273 J
R 4507	FILM RESISTOR	5N.5102.050.92	KOHM 6,8 +- 5 % 0,125W RC 05 GF 682 J
R 4508	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 4509	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05 GF 473 J
R 4510	FILM RESISTOR	5N.5102.050.33	OHM 22 +- 5 % 0,125W RC 05 GF 220 J
R 4511	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 4512	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 4513	FILM RESISTOR	5N.5102.050.67	OHM 560 +- 5 % 0,125W RC 05 GF 561 J
R 4514	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05 GF 473 J
R 4515	VARIABLE RESISTOR	5M.5135.222.90	KOHM 20 +-10% 0,25 W LIN RJ 26 FX 203
R 4516	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 4517	FILM RESISTOR	5N.5102.051.44	MOHM 1,5 +- 5 % 0,125W RC 05 GF 155 J
R 4518	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J
R 4531	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 4532	FILM RESISTOR	5N.5102.051.08	KOHM 47 +- 5 % 0,125W RC 05 GF 473 J
R 4533	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
R 4534	FILM RESISTOR	5N.5102.050.25	OHM 10 +- 5 % 0,125W RC 05 GF 100 J	
R 4535	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J	
R 4536	FILM RESISTOR	5L.5105.021.63	KOHM 3,9 +- 2 % 0,5 W 526-0 TK+-100PPM	
R 4537	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J	
R 4538	FILM RESISTOR	5L.5105.021.69	KOHM 6,8 +- 2 % 0,5 W 526-0 TK+-100PPM	
R 4551	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J	
R 4552	FILM RESISTOR	5N.5102.050.93	KOHM 7,5 +- 5 % 0,125W RC 05 GF 752 J	
R 4553	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J	
R 4554	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J	
R 4555	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J	
TS 4501	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX	
TS 4502	N CHANNEL FET	5L.5512.401.16	2N 4392	
TS 4531	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX	
TS 4551	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX	
TS 4552	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX	

4.6.29 Control Loop 9.91 MHz 52.6861.470.00 SA (00)

BU 4701	SOCKET STRIP	5L.4551.002.73	10POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 1-166 591-0	
C 4701	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 4702	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)	
C 4703	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 4704	CAPACITOR CERAMIC	5L.5224.003.16	PF 180 +- 5 % COG 5,1 X5,1 100 V MC05CE0181JHB/.	
C 4705	CAPACITOR CERAMIC	5L.5224.003.13	PF 100 +- 5 % COG 5,1 X5,1 100 V MC05CE0101JHB/.	
C 4706	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 4707	CAPACITOR CERAMIC	5L.5224.003.15	PF 150 +- 5 % COG 5,1 X5,1 100 V MC05CE0151JHB/.	
C 4708	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 4709	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 4710	CAP.PLASTIC FILM	5L.5241.057.59	PF 1200 +- 5 % 100 V FKC 2	
C 4711	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 4712	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
C 4713	CAP.PLASTIC FILM	5L.5241.057.53	PF 390 +- 5 % 100 V FKC 2 /KC1850	
C 4714	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85	
GR 4701	VARICAP DIODE	51.6861.510.09		
GR 4702	VARICAP DIODE	51.6861.510.09		
IS 4701	SEMICONDUCTOR CIRC	5M.5444.220.14	4066 /CD...BF/MC1..BAL/CD..BMJ -MOS- 5L.5444.001.45 MIL-STD-883	
Q 4701	CRYSTAL QUARTZ	5L.5561.001.58	MHZ 9,91 +- 5 X10-6 ATB -55/+105 TYP TQ31 0724 30PF	
R 4701	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J	
R 4702	FILM RESISTOR	5N.5102.051.03	KOHM 22 +- 5 % 0,125W RC 05 GF 223 J	
R 4703	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J	
R 4704	FILM RESISTOR	5N.5102.050.82	KOHM 2,7 +- 5 % 0,125W RC 05 GF 272 J	

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 4705	FILM RESISTOR	5N.5102.050.57	OHM 220 +- 5 % 0,125W RC 05 GF 221 J
R 4706	FILM RESISTOR	5N.5102.050.57	OHM 220 +- 5 % 0,125W RC 05 GF 221 J
R 4707	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 4708	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 4709	FILM RESISTOR	5N.5102.050.74	KOHM 1,2 +- 5 % 0,125W RC 05 GF 122 J
R 4710	FILM RESISTOR	5N.5102.050.59	OHM 270 +- 5 % 0,125W RC 05 GF 271 J
R 4711	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 4712	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 4713	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 4714	FILM RESISTOR	5N.5102.050.51	OHM 120 +- 5 % 0,125W RC 05 GF 121 J
R 4715	FILM RESISTOR	5N.5102.050.57	OHM 220 +- 5 % 0,125W RC 05 GF 221 J
R 4716	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J
R 4717	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 4718	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
TS 4701	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918
TS 4702	N CHANNEL FET	5L.5501.001.06	3N 201 DUAL-GATE -MOS-
TS 4703	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX

4.6.30 Phase Comparator 52.6861.490.00 SA (01)

BU 4901	SOCKET STRIP	5L.4551.008.29	9POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 166 591-9
C 4901	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)
C 4902	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)
C 4903	CAP.PLASTIC FILM	5L.5241.057.55	PF 560 +- 5 % 100 V FKC 2 /KC1850
C 4904	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4905	CAP.PLASTIC FILM	5L.5241.055.75	UF 0,01 +- 5 % 63 V MKS 2 /MKT1,68/1,85/MK05/IRD607/B32529-A
C 4906	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4907	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4908	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4909	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4910	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 4911	CAPACITOR CERAMIC	5L.5224.003.16	PF 180 +- 5 % COG 5,1 X5,1 100 V MC05CE0181JHB/.
C 4912	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 4913	CAPACITOR CERAMIC	5L.5224.003.10	PF 56 +- 5 % COG 5,1 X5,1 100 V MC05CE0560JHB/.
C 4914	CAPACITOR CERAMIC	5L.5224.003.16	PF 180 +- 5 % COG 5,1 X5,1 100 V MC05CE0181JHB/.
C 4915	CAPACITOR CERAMIC	5L.5224.003.06	PF 27 +- 5 % COG 5,1 X5,1 100 V MC04CE0270JHB/.
C 4916	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
FI 4901	NOTCHFILTER	50.7102.010.00	
GR 4901	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 4902	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 4903	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
IS 4901	SEMICONDUCTOR CIRC	5M.5446.220.03	4049 /CD...UBF/MC1..UBAL/CD..MJ
IS 4902	SEMICONDUCTOR CIRC	5M.5444.220.14	-MOS- 5L.5442.004.49 MIL-STD-883 4066 /CD...BF/MC1..BAL/CD..BMJ
IS 4903	SEMICONDUCTOR CIRC	5L.5444.001.01	-MOS- 5L.5444.001.45 MIL-STD-883
IS 4904	SEMICONDUCTOR CIRC	5L.5444.001.01	CA 3130 AT -MOS- OPERATIONSVERST.
IS 4905	SEMICONDUCTOR CIRC	5M.5442.220.37	CA 3130 AT -MOS- OPERATIONSVERST. 4011 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.11 MIL-STD-883
R 4902	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05 GF 273 J
R 4903	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J
R 4904	FILM RESISTOR	5M.5106.228.83	KOHM 16,9 +- 1 % 0,1 W RN 55 C 1692 F
R 4905	FILM RESISTOR	5N.5102.050.53	OHM 150 +- 5 % 0,125W RC 05 GF 151 J
R 4906	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J
R 4907	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J
R 4908	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4909	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 4910	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J
R 4911	FILM RESISTOR	5N.5102.050.98	KOHM 15 +- 5 % 0,125W RC 05 GF 153 J
R 4912	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 4913	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 4914	FILM RESISTOR	5N.5102.051.12	KOHM 68 +- 5 % 0,125W RC 05 GF 683 J
TS 4901	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 4902	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
4.6.31	Oscillator	52.6861.510.00 SA (02)	
BU 5101	SOCKET STRIP	5L.4551.008.27	3POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 166 591-3
BU 5102	SOCKET STRIP	5L.4551.008.26	12POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. 6V TYP 166 592-6
C 5101	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)
C 5102	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 5103	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 5104	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 5105	CAPACITOR CERAMIC	5L.5224.014.89	PF 1,5 +- 0,5 PF C0G 5,1 X5,1 100 V MC04CE0159DHB/.
C 5106	CAPACITOR CERAMIC	5M.5224.220.38	PF 68 +-10 % 200 V CK 05 BX 680 K
C 5107	CAPACITOR CERAMIC	5L.5224.003.16	PF 180 +- 5 % C0G 5,1 X5,1 100 V MC05CE0181JHB/.
C 5108	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 5109	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 5110	CAPACITOR CERAMIC	5L.5224.015.62	PF 4,7 +- 0,5 PF C0G 5,1 X5,1 100 V MC04CE0479DHB/.
C 5111	CAPACITOR VAR AIR	5L.5264.002.93	PF 0,8 - 8 500 V TK+0+-50PPM TYP 27291/MTR128C
C 5112	CAPACITOR CERAMIC	5L.5224.003.08	PF 39 +- 5 % C0G 5,1 X5,1 100 V MC04CE0390JHB/.
C 5113	CAPACITOR CERAMIC	5L.5224.003.06	PF 27 +- 5 % C0G 5,1 X5,1 100 V MC04CE0270JHB/.
C 5114	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850
C 5115	CAPACITOR CERAMIC		22PF ODER 27PF
C 5115/1	CAPACITOR CERAMIC	5L.5224.003.05	PF 22 +- 5 % C0G 5,1 X5,1 100 V MC04CE0220JHB/.

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 5115/2	CAPACITOR CERAMIC	5L.5224.003.06	PF 27 +- 5 % COG 5,1 X5,1 100 V MC04CE0270JHB/.
C 5116	CAPACITOR CERAMIC		4,7PF ODER 6,8PF
C 5116/1	CAPACITOR CERAMIC	5L.5224.015.62	PF 4,7 +- 0,5 PF COG 5,1 X5,1 100 V MC04CE0479DHB/.
C 5116/2	CAPACITOR CERAMIC	5L.5224.024.54	PF 6,8 +- 0,25PF COG 5,1 X5,1 100 V MC04CE0689CHB/.
C 5117	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 5118	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
GR 5102	VARICAP DIODE	51.6861.510.09	
GR 5103	VARICAP DIODE	51.6861.510.09	
GR 5104	VARICAP DIODE	51.6861.510.09	
GR 5105	VARICAP DIODE	51.6861.510.09	
GR 5106	VARICAP DIODE	51.6861.510.09	
GR 5107	VARICAP DIODE	51.6861.510.09	
GR 5108	SI-DIODE	52.6862.510.11	
GR 5109	SI-DIODE	52.6862.510.11	
GR 5110	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5111	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5112	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5113	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5114	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5115	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5116	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5117	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 5118	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
IS 5101	SEMICONDUCTOR CIRC	5M.5442.220.71	4028 /CD...BF/MC1..BAL/CD..BMJ/ -MOS- 5L.5442.005.79 MIL-STD-883
L 5101	CHOKE	5L.5053.003.15	UH 2,2 +-10 % 0,395A 0,4 OHM TYP MS75084-4
L 5102	COIL	5L.5311.001.50	NH 330 +- 5% Q100/100 KER. 4 DX 7 TYP 50.87.0192.0
L 5103	COIL	5L.5311.001.49	NH 234 +- 5% Q100/100 KER. 4 DX 7 TYP 50.87.0191.8
L 5104	CHOKE	5L.5053.003.20	UH 5,6 +-10 % 0,185A 1,8 OHM TYP MS75084-9
L 5105	CHOKE	5L.5053.003.20	UH 5,6 +-10 % 0,185A 1,8 OHM TYP MS75084-9
R 5101	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 5102	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 5103	FILM RESISTOR	5N.5102.050.41	OHM 47 +- 5 % 0,125W RC 05 GF 470 J
R 5104	FILM RESISTOR	5N.5102.050.35	OHM 27 +- 5 % 0,125W RC 05 GF 270 J
R 5105	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 5106	FILM RESISTOR	5M.5102.223.58	KOHM 1 +- 5 % 0,125W RC 05 GF 102 J
R 5107	FILM RESISTOR	5N.5102.050.65	OHM 470 +- 5 % 0,125W RC 05 GF 471 J
R 5108	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 5109	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 5110	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 5111	FILM RESISTOR	5M.5102.942.36	KOHM 33 +- 5 % 0,125W RC 05 GF 333 J
R 5112	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 5113	FILM RESISTOR	5N.5102.051.12	KOHM 68 +- 5 % 0,125W RC 05 GF 683 J
R 5114	FILM RESISTOR	5M.5102.223.60	KOHM 39 +- 5 % 0,125W RC 05 GF 393 J
R 5115	FILM RESISTOR	5N.5102.051.05	KOHM 27 +- 5 % 0,125W RC 05 GF 273 J
R 5116	FILM RESISTOR	5N.5102.051.01	KOHM 18 +- 5 % 0,125W RC 05 GF 183 J
R 5117	FILM RESISTOR	5N.5102.050.96	KOHM 12 +- 5 % 0,125W RC 05 GF 123 J

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
R 5118	FILM RESISTOR	5N.5102.050.94	KOHM 8,2 +- 5 % 0,125W RC 05 GF 822 J
R 5119	FILM RESISTOR	5N.5102.050.90	KOHM 5,6 +- 5 % 0,125W RC 05 GF 562 J
R 5120	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J
R 5121	FILM RESISTOR	5N.5102.050.78	KOHM 1,8 +- 5 % 0,125W RC 05 GF 182 J
R 5122	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 5123	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
TS 5101	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 5102	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918
TS 5103	N CHANNEL FET	5L.6861.510.10	U310A

4.6.32 Digital Oscillator Drive Circuit 52.6861.530.00 SA (01)

BU 5301	SOCKET STRIP	5L.4551.002.73	10POL 3 A 250V BZ NI1,3 AU0,8 POLYEST. GV TYP 1-166 591-0
C 5301	CAPACITOR TANTALUM	5N.5271.023.37	UF 22 +-20% 15 V M39003/01-2272 (CSR13)
C 5302	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 5303	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
IS 5301	SEMICONDUCTOR CIRC	5M.5442.220.35	4001 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.08 MIL-STD-883
IS 5302	SEMICONDUCTOR CIRC	5M.5442.220.37	4011 /CD...BF/MC1..BAL/HCC..BF -MOS- 5L.5442.004.11 MIL-STD-883
IS 5303	SEMICONDUCTOR CIRC	5M.5442.220.77	4029 /CD...BF/CD..BMJ/HCC..BF -MOS- 5L.5442.005.88 MIL-STD-883
IS 5304	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
IS 5305	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
IS 5306	SEMICONDUCTOR CIRC	5M.5442.220.39	4013 /CD...BF/CD..BMJ/HCC..BF -MOS- 5L.5442.004.41 MIL-STD-883
R 5301	FILM RESISTOR	5N.5102.050.49	OHM 100 +- 5 % 0,125W RC 05 GF 101 J
R 5302	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J
R 5303	FILM RESISTOR	5N.5102.051.10	KOHM 56 +- 5 % 0,125W RC 05 GF 563 J
R 5304	FILM RESISTOR	5M.5102.223.60	KOHM 39 +- 5 % 0,125W RC 05 GF 393 J
R 5305	FILM RESISTOR	5N.5102.051.14	KOHM 82 +- 5 % 0,125W RC 05 GF 823 J
R 5306	FILM RESISTOR	5N.5102.051.38	KOHM 820 +- 5 % 0,125W RC 05 GF 824 J

4.6.33 Mother Board 52.6861.550.00 SA (02)

L 5501	CHOKE	5L.5053.006.38	UH 8,2 +-10 % 0,360A 0,6 OHM TYP MS14046-03
R 5501	FILM RESISTOR	5N.5102.051.26	KOHM 270 +- 5 % 0,125W RC 05 GF 274 J
R 5502	FILM RESISTOR	5N.5102.051.22	KOHM 180 +- 5 % 0,125W RC 05 GF 184 J
R 5503	FILM RESISTOR	5M.5102.223.62	KOHM 10 +- 5 % 0,125W RC 05 GF 103 J
R 5504	FILM RESISTOR	5N.5102.051.16	KOHM 100 +- 5 % 0,125W RC 05 GF 104 J

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
ST 5501	PLUG CONNECTOR	5L.4561.011.73	10POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 1-825 433-0
ST 5502	PLUG CONNECTOR	5L.4561.011.51	6POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-6
ST 5503	PLUG CONNECTOR	5L.4561.011.51	6POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-6
ST 5504	PLUG CONNECTOR	5L.4561.011.49	3POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-3
ST 5505	PLUG CONNECTOR	5L.4561.011.72	9POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-9
ST 5506	PLUG CONNECTOR	5L.4561.011.73	10POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 1-825 433-0
ST 5507	PLUG CONNECTOR	5L.4561.011.50	4POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-4
ST 5508	PLUG CONNECTOR	5L.4561.011.74	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 1-825 433-4
ST 5509	PLUG CONNECTOR	5L.4561.011.50	4POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-4
ST 5510	PLUG CONNECTOR	5L.4561.011.49	3POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-3
ST 5511	PLUG CONNECTOR	5L.4561.011.74	14POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 1-825 433-4
ST 5512	PLUG CONNECTOR	5L.4561.011.49	3POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-3
ST 5513	PLUG CONNECTOR	5L.4561.011.75	15POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 1-825 433-5
ST 5514	PLUG CONNECTOR	5L.4561.011.72	9POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-9
ST 5515	PLUG CONNECTOR	5L.4561.011.49	3POL CUSN6 NI1,2 AU0,8 PA66 GV13 TYP 825 433-3

4.6.34 Mother Board 52.6871.040.00 SA (00)

BU 401	SOCKET STRIP	5L.4551.011.03	29POL 3 A 350V BECU AU1 8611.29.71.14.200.018/.
BU 402	SOCKET STRIP	5L.4551.015.12	17POL 3 A 350V CUZN NI AU DUROPL. GV TYP 838-17FL-203
ST 401	PLUG CONNECTOR	5L.4561.026.11	14POL CUSN6 NI AU POLYEST. GV TYP 0-826658-7
ST 402	PLUG CONNECTOR	5L.4561.026.11	14POL CUSN6 NI AU POLYEST. GV TYP 0-826658-7
ST 403	PLUG CONNECTOR	5L.4561.026.11	14POL CUSN6 NI AU POLYEST. GV TYP 0-826658-7
ST 404	PLUG CONNECTOR	5L.4561.026.11	14POL CUSN6 NI AU POLYEST. GV TYP 0-826658-7
ST 405	PLUG CONNECTOR	5L.4561.026.11	14POL CUSN6 NI AU POLYEST. GV TYP 0-826658-7
ST 406	PLUG CONNECTOR	5L.4561.026.11	14POL CUSN6 NI AU POLYEST. GV TYP 0-826658-7
ST 407	PLUG CONNECTOR	5L.4561.026.10	44POL CUSN6 NI AU POLYEST. GV TYP 2-826658-2
ST 408	PLUG CONNECTOR	5L.4561.024.89	56POL CUSN6 NI AU POLYEST. GV TYP 2-826658-8
ST 409	PLUG CONNECTOR	5L.4561.024.61	53POL 3 A 350V CUZN NI AU DUROPL.GV TYP 838-53ML-204

4.6.35 Standard Front Head 52.6871.050.00 SA (03)

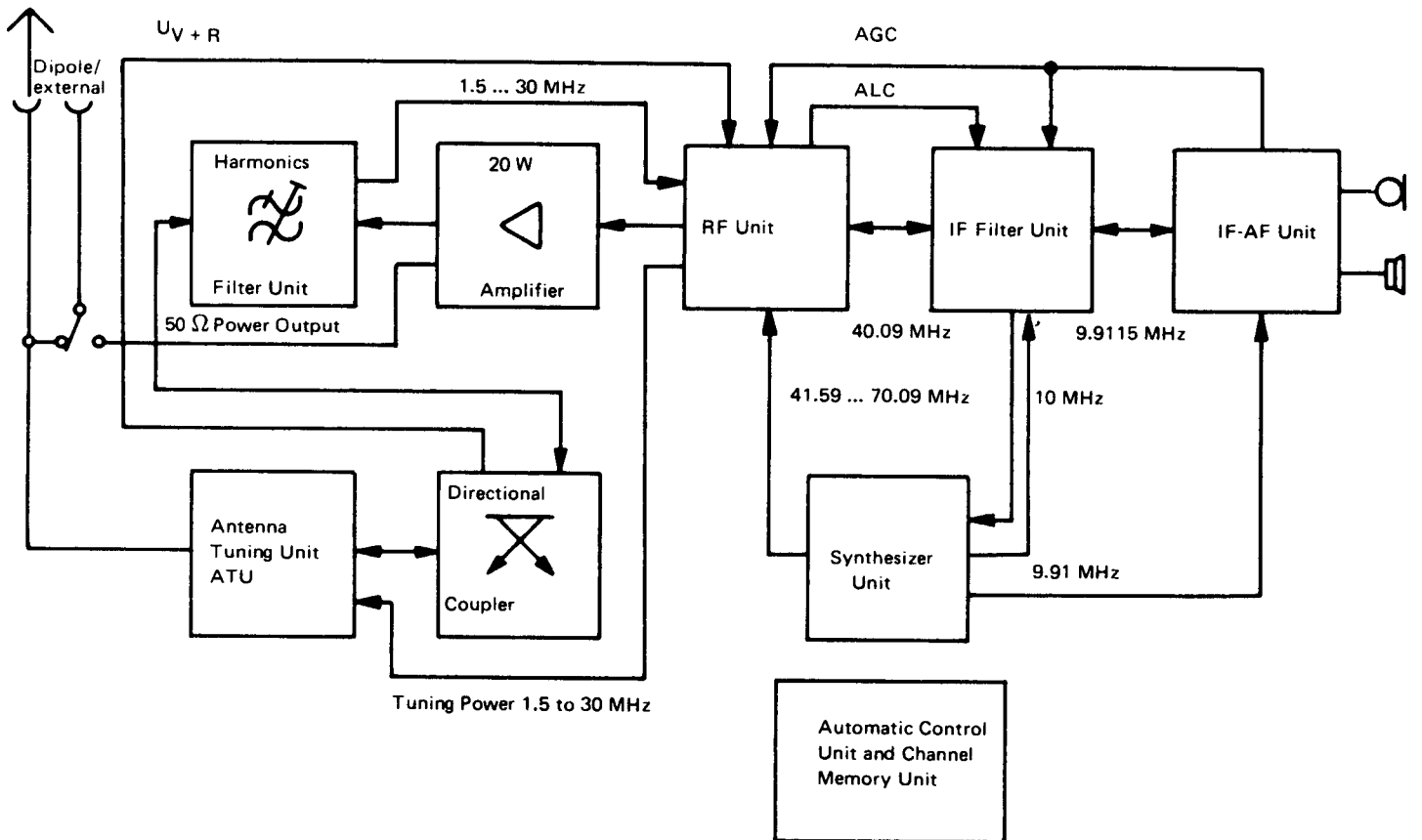
BU 501	SOCKET	5L.4531.009.29	7POL 0,5A 42 V WASSERDICHT LOET TYP NF07C1L0 1435 0161923
BU 502	SOCKET	5L.4531.009.29	7POL 0,5A 42 V WASSERDICHT LOET TYP NF07C1L0 1435 0161923
BU 503	RF SOCKET	5M.4511.220.86	BNC UG 657A/U
BU 505	SPRING CONTACT	52.6862.050.18	Z- 50 TEFLON GER.ZENTRAL LOET

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
C 501	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 502	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 503	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 504	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 505	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 506	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 507	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
C 508	CAPACITOR CERAMIC	5N.5224.001.09	UF 0,01 +-10 % 200 V CK 06 BX 103 K	
GR 501	LIGHT EMITT. DIODE	5L.5586.003.04	GRUEN HLMP3502	
GR 502	LIGHT EMITT. DIODE	5L.5586.001.44	GELB HLMP3401 (5082-4555)	
L 501	CHOKE	5L.5053.003.35	UH 100 +-10 % 0,084A 8 OHM TYP MS75085-7	
L 502	CHOKE	5L.5053.003.35	UH 100 +-10 % 0,084A 8 OHM TYP MS75085-7	
R 501	FILM RESISTOR	5N.5102.010.65	OHM 470 +- 5 % 0,5 W RC 20 6F 471 J	
R 502	FILM RESISTOR	5N.5102.010.65	OHM 470 +- 5 % 0,5 W RC 20 6F 471 J	
R 503	RESISTOR COMPOSITE	5M.5108.220.05	KOHM 2 +- 5 % 1 W RCR32 6 202 JS	
S 501	ENCODING SWITCH	5L.4661.004.69	1STLLG. BCD 0 - 9 LOET TYP 48481 16305/28142-1	
S 502	ENCODING SWITCH	5L.4661.004.69	1STLLG. BCD 0 - 9 LOET TYP 48481 16305/28142-1	
S 503	ENCODING SWITCH	5L.4661.004.65	1STLLG. JOHNSON 0 - 9 LOET TYP 48481 16301/28113-1	
S 504	ENCODING SWITCH	5L.4661.004.65	1STLLG. JOHNSON 0 - 9 LOET TYP 48481 16301/28113-1	
S 505	ENCODING SWITCH	5L.4661.004.69	1STLLG. BCD 0 - 9 LOET TYP 48481 16305/28142-1	
S 506	ENCODING SWITCH	5L.4661.004.68	1STLLG. DEZIMAL 0 - 2 LOET TYP 48481 16304/28119-1	
S 507	ENCODING SWITCH	5L.4661.004.67	1STLLG. DEZIMAL 0 - 4 LOET TYP 48481 16303/28115-1	
S 508	ENCODING SWITCH	5L.4661.004.66	1STLLG. DEZIMAL 1 - 7 LOET TYP 48481 16302/28167-1	
S 509	SWITCH ROTARY	5L.4601.009.72	1EB. 2POLE/EB. 5STELLG. DAP 200VWS 6 VA TYP SM 252 48432 64196	
S 510	PUSH BUTTON	5L.4623.005.69	1POL 1X21 24VGS 2,25A TYP 17 17252 30	
S 511	SWITCH ROTARY	5L.4601.011.64	1EB. 3POLE/EB. 4STELLG. DAP 30V 0,1 A TYP SBI16 4843230893	
ST 501	ANTENNA CONNECTOR	52.6862.054.00		
4.6.36	Power Reduction	52.6871.080.00 SA (00)		
BU 1	SOCKET	5L.4531.010.68	1POL 2,5A KURZSCHLUSS BLAU 313 1366 000 406	
BU 2	SOCKET	5L.4531.010.68	1POL 2,5A KURZSCHLUSS BLAU 313 1366 000 406	
C 1	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 2	ELECTROL. CAPACIT.	52.6871.080.03		
C 4	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 5	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A	
C 6	CAPACITOR TANTALUM	5L.5275.001.50	UF 3,3 +-20% 16 V ETR 1/TAD 45322/B45181/T340/790D	
C 7	CAPACITOR CERAMIC	5M.5221.238.28	PF 56 +-10 % 200 V CK 05 BX 560 K	
C 8	CAP.PLASTIC FILM	5L.5241.055.75	UF 0,01 +- 5 % 63 V MKS 2 /MKT1,68/1,85/MMK05/IRD607/B32529-A	
C 9	CAP.PLASTIC FILM	5L.5241.057.58	PF 1000 +- 5 % 100 V FKC 2 /KC1850	
C 10	CAPACITOR TANTALUM	5L.5275.001.51	UF 10 +-20% 16 V ETR 2/TAD 45322/T340	

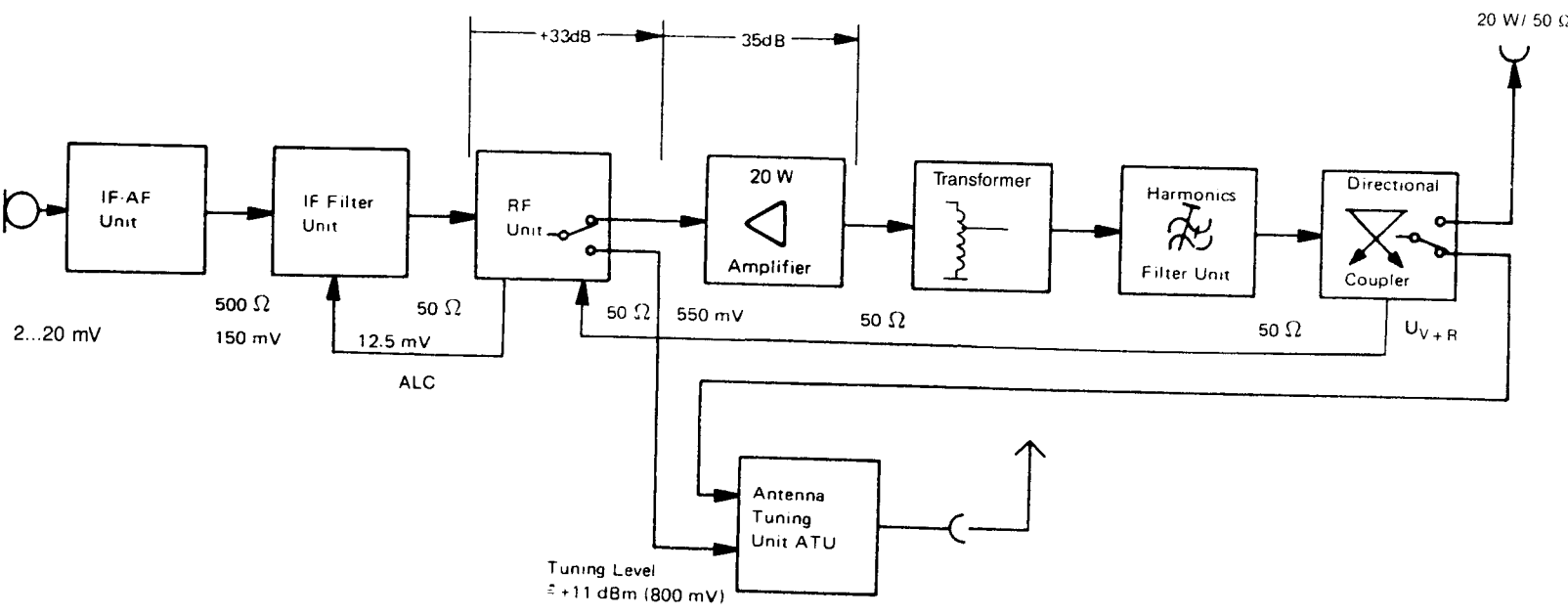
ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
C 11	CAPACITOR CERAMIC	5N.5224.001.10	UF 0,22 +-10 % 50 V CK 06 BX 224 K
C 12	CAP.PLASTIC FILM	5L.5245.001.64	UF 0,1 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 13	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
C 14	CAP.PLASTIC FILM	5L.5245.001.69	UF 0,27 +-10 % 50 V MKS 2 /MKT1,68/1,85
C 15	CAPACITOR TANTALUM	5L.5275.001.50	UF 3,3 +-20% 16 V ETR 1/TAD 45322/B45181/T340/790D
C 16	CAP.PLASTIC FILM	5L.5241.055.71	UF 0,01 +-10 % 63 V MKS 2 /MKT1,85/1,68/MMK05/IRD607/B32529-A
GR 1	SI-DIODE	5L.5532.102.36	1N 5711 5082-2800
GR 2	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
GR 3	REFERENCE DIODE	5L.5536.001.37	Z- BZX 55/B 8 V 2
GR 4	SI-DIODE	5L.5532.101.66	1N 4448 1N 914 B
IS 1	SEMICONDUCTOR CIRC	5L.5444.001.04	CA 3130 T -MOS- OPERATIONSVERST.
IS 2	SEMICONDUCTOR CIRC	5M.5442.220.39	4013 /CD...BF/CD...BMJ/HCC...BF -MOS- 5L.5442.004.41 MIL-STD-883
R 1	FILM RESISTOR	5L.5105.006.70	KOHM 470 +- 2 % 0,5 W 526-0 TK+-100PPM
R 2	FILM RESISTOR	5L.5105.006.70	KOHM 470 +- 2 % 0,5 W 526-0 TK+-100PPM
R 3	FILM RESISTOR	5L.5105.021.81	KOHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 4	FILM RESISTOR	5L.5105.006.58	KOHM 150 +- 2 % 0,5 W 526-0 TK+-100PPM
R 5	FILM RESISTOR	5L.5105.021.81	KOHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 6	FILM RESISTOR	5L.5105.006.78	MOHM 1 +- 2 % 0,5 W 526-0 TK+-100PPM
R 7	FILM RESISTOR	5L.5105.021.81	KOHM 22 +- 2 % 0,5 W 526-0 TK+-100PPM
R 8	FILM RESISTOR	5L.5105.021.73	KOHM 10 +- 2 % 0,5 W 526-0 TK+-100PPM
R 9	FILM RESISTOR	5L.5105.021.69	KOHM 6,8 +- 2 % 0,5 W 526-0 TK+-100PPM
R 10	FILM RESISTOR	5L.5105.021.49	KOHM 1 +- 2 % 0,5 W 526-0 TK+-100PPM
R 11	FILM RESISTOR	5L.5105.021.97	KOHM 100 +- 2 % 0,5 W 526-0 TK+-100PPM
R 12	FILM RESISTOR	5L.5105.021.97	KOHM 100 +- 2 % 0,5 W 526-0 TK+-100PPM
R 13	FILM RESISTOR	5L.5105.021.25	OHM 100 +- 2 % 0,5 W 526-0 TK+-100PPM
R 14	FILM RESISTOR	5L.5105.021.25	OHM 100 +- 2 % 0,5 W 526-0 TK+-100PPM
R 15	FILM RESISTOR	5L.5105.021.31	OHM 180 +- 2 % 0,5 W 526-0 TK+-100PPM
R 16	FILM RESISTOR	5L.5105.021.49	KOHM 1 +- 2 % 0,5 W 526-0 TK+-100PPM
R 17	FILM RESISTOR	5L.5105.021.97	KOHM 100 +- 2 % 0,5 W 526-0 TK+-100PPM
R 18	FILM RESISTOR	5L.5105.021.49	KOHM 1 +- 2 % 0,5 W 526-0 TK+-100PPM
R 19	FILM RESISTOR	5L.5105.006.66	KOHM 330 +- 2 % 0,5 W 526-0 TK+-100PPM
R 20	FILM RESISTOR	5L.5105.021.73	KOHM 10 +- 2 % 0,5 W 526-0 TK+-100PPM
R 21	FILM RESISTOR	5L.5105.021.73	KOHM 10 +- 2 % 0,5 W 526-0 TK+-100PPM
R 22	FILM RESISTOR	5L.5105.021.49	KOHM 1 +- 2 % 0,5 W 526-0 TK+-100PPM
ST 1	PLUG CONNECTOR	5L.4561.017.67	3POL 5 A CU-LEG NI AU PA TYP 511.280.007.003
ST 2	PLUG CONNECTOR	5L.4561.017.67	3POL 5 A CU-LEG NI AU PA TYP 511.280.007.003
TS 1	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX
TS 2	SI-NPN-TRANSISTOR	5L.5512.202.92	BCY 59 IX

ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES	REMARKS
4.6.37	Sideband Frequency Generation	52.6871.295.00 SA (01)		
C 1	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 2	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 3	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 4	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 5	CAPACITOR CERAMIC	5L.5224.015.99	UF 0,01 +-10 % 100 V CK 05 BX 103 K M69670H +- 2 % COG 5,1 X5,1 100 V MC04CE0220GHB/.	
C 6	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 7	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 8	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 10	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 12	CAPACITOR CERAMIC	5L.5224.003.10	UF 0,01 +-10 % 100 V CK 05 BX 103 K PF 56 +- 5 % COG 5,1 X5,1 100 V MC05CE0560JHB/.	
C 13	CAPACITOR CERAMIC	5L.5224.003.12	UF 0,01 +-10 % 100 V CK 05 BX 103 K PF 82 +- 5 % COG 5,1 X5,1 100 V MC05CE0820JHB/.	
C 14	CAPACITOR CERAMIC	5L.5224.015.74	UF 0,01 +-10 % 100 V CK 05 BX 103 K PF 82 +- 2 % COG 5,1 X5,1 100 V MC05CE0820GHB/.	
C 15	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 16	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 17	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
C 18	CAPACITOR CERAMIC	5L.5224.015.62	UF 0,01 +-10 % 100 V CK 05 BX 103 K PF 4,7 +- 0,5 PF COG 5,1 X5,1 100 V MC04CE0479DHB/.	
C 19	CAPACITOR CERAMIC	5L.5224.015.62	UF 0,01 +-10 % 100 V CK 05 BX 103 K PF 4,7 +- 0,5 PF COG 5,1 X5,1 100 V MC04CE0479DHB/.	
C 20	CAPACITOR CERAMIC	5M.5224.220.56	UF 0,01 +-10 % 100 V CK 05 BX 103 K	
GR 1	REFERENCE DIODE	5L.5536.001.29	Z- BZX 55/B 6 V 8	
GR 2	REFERENCE DIODE	5L.5536.001.29	Z- BZX 55/B 6 V 8	
GR 3	SI-DIODE	5L.5532.102.42	BA 244	
GR 4	SI-DIODE	5L.5532.006.97	BA 682	
GR 5	SI-DIODE	5L.5532.006.97	BA 682	
GR 6	SI-DIODE	5L.5532.006.97	BA 682	
IS 1	SEMICONDUCTOR CIRC	5L.5443.004.14	SL 640 C/CM BALLANCE-MODULATOR	
IS 2	SEMICONDUCTOR CIRC	5L.5443.004.14	SL 640 C/CM BALLANCE-MODULATOR	
L 1	CHOKE	5L.5053.003.19	UH 4,7 +-10 % 0,23 A 1,2 OHM TYP MS75084-8	
L 2	CHOKE	5L.5053.003.48	UH 0,1 +-10 % 1,35 A 0,08 OHM TYP MS75083-1	
L 3	AIR-CORED COIL	52.6871.295.03		
L 4	AIR-CORED COIL	52.6871.295.02		
L 5	CHOKE	5L.5053.003.23	UH 10 +-10 % 0,13 A 3,7 OHM TYP MS75084-12	
R 1	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 2	FILM RESISTOR	5N.5102.050.43	OHM 56 +- 5 % 0,125W RC 05 GF 560 J	
R 3	FILM RESISTOR	5N.5102.050.63	OHM 390 +- 5 % 0,125W RC 05 GF 391 J	
R 4	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
R 5	FILM RESISTOR	5N.5102.050.47	OHM 82 +- 5 % 0,125W RC 05 GF 820 J	
R 6	FILM RESISTOR	5N.5102.050.84	KOHM 3,3 +- 5 % 0,125W RC 05 GF 332 J	
R 7	FILM RESISTOR	5N.5102.050.80	KOHM 2,2 +- 5 % 0,125W RC 05 GF 222 J	
R 8	FILM RESISTOR	5N.5102.050.74	KOHM 1,2 +- 5 % 0,125W RC 05 GF 122 J	
R 9	FILM RESISTOR	5N.5102.050.88	KOHM 4,7 +- 5 % 0,125W RC 05 GF 472 J	
ST 1	PLUG	52.6871.295.05		
ST 1/1	CONNECTOR PLUG RF	5L.4521.003.86	NANO 35S201-400D2/31.1520.002 Z- 50 TEFLON WINKELIG LEITERPLATTE	
TS 1	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918	
TS 2	SI-NPN-TRANSISTOR	5L.5512.201.03	2N 918	

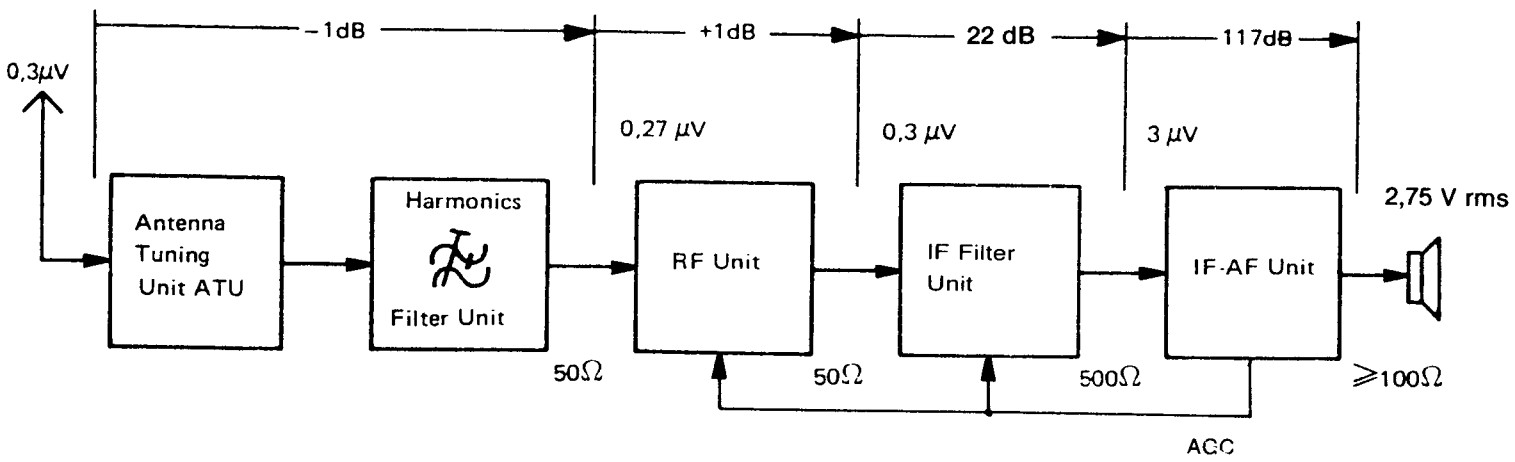
ITEM	DESCRIPTION	PART NUMBER	ELECTRICAL VALUES - REMARKS
4.6.38	Synthesizer		52.6871.400.00 SA (01)
ST 4001	CONNECTOR PLUG RF	5L.4521.003.84	NANO 35S601-200D2/31.1211.192 Z- 50 TEFLON GER.ZENTRAL LOETSTIFT
ST 4002	CONNECTOR PLUG RF	5L.4521.003.84	NANO 35S601-200D2/31.1211.192 Z- 50 TEFLON GER.ZENTRAL LOETSTIFT
ST 4003	CONNECTOR PLUG RF	5L.4521.003.84	NANO 35S601-200D2/31.1211.192 Z- 50 TEFLON GER.ZENTRAL LOETSTIFT
ST 4005	CONNECTOR PLUG RF	5L.4521.003.84	NANO 35S601-200D2/31.1211.192 Z- 50 TEFLON GER.ZENTRAL LOETSTIFT



**Downloaded by
RadioAmateur.EU**



Signal Level Diagram
 Field Radio Unit SE 6861/12 mod
Annex 2



Signal Level Diagram
 "Reception"
 Field Radio Unit SE 6861/12 mod
Annex 3

Contact

Functions

Standard front head**Jack Connectors BU 1 and BU 2**

A		Standard signal output, 0 dBm/600 Ω
B		AF output
C		Microphone
D		T/R key (PTT key)
E		
F		Microphone
G	0 V	Chassis/Ground

Jack Connector BU 3Dipole (50 Ω)**Jack Connector BU 5**

Antenna tuning unit

Jack Connector BU 6

1 to 4		1 kHz
5 to 8		100 Hz
9 and 10		10 MHz
11 and 12		1 MHz
13		LSB
14 and 15		1 MHz
16 and 17		100 kHz
18		RF-Preattenuation
19		A1A tuning
20	+14.5 V	A1A
21 and 22		100 kHz
23		AF output
24	+13.5 V	
25		T/R key line
26 and 27		Microphone
28 to 30		10 kHz
31		K 1
32		Memory bypass
33		Programming
34		K 2
35		K 4
36		K 3
37		Relay drive, wideband operation
38		RF indicator
39		U _v
40		Battery voltage
41		USB
42		Battery indicator
43		100 kHz
44 and 45		10 kHz

Contact		Functions
46		ON from switch
47		Power reduction
48 to 50	0 V	Chassis/Ground
51	+14.5 V	
52		Switchover 2 W/20 W
53	+14.5 V	
Jack Connector BU 7		Chassis/Ground
Plug Connector ST 1		Whip antenna
Plug Connector ST 1/M		Output 20 W amplifier (50 Ω)

Contact

Functions

Mother card**Jack Connector BU 401, to the synthesizer**

1		
2 to 5		1 kHz
6 to 9		100 Hz
10 and 11		10 MHz
12 to 15		1 MHz
16		100 kHz
17	+14.5 V	
18 to 21		100 kHz
22 and 24		10 kHz
23		P 2
25		P 1
26		10 kHz
27		1 kHz
28 and 29		10 kHz

Jack Connector BU 402, Test jack

1		
2		P 2–RF
3		
4		P–ALC
6		
7		P 3–IF
8		P 4–IF
9		P 1–AF
10		P 2–AF
11		P–AGC
12		P 1–20 W amplifier
13		P 2–20 W amplifier
14		P 1–Synthesizer
15		P 2–Synthesizer
16		
17	0 V	Chassis/Ground

Plug Connector ST 341, Power supply

A	0 V	Chassis/Ground
B	0 V	Chassis/Ground
C	+13.5 V	"T" external
D		AO request
E	+14.5 V	External output stage
F		U forw. + U refl. external
G		Power ON
H		Battery voltage
J	+14.5 V	
K	+14.5 V	

Contact		Functions
Plug Connector ST 401, 20 W amplifier		
1	+13.5 V	Prestage/External
2		
3	+14.5 V	
4		U forw. + U refl.
5	+14.5 V	
6		U forw.
7	+14.5 V	
8	0 V	Chassis/Ground
9	+14.5 V	
10	0 V	Chassis/Ground
11		P 2
12	0 V	Chassis/Ground
13		P 1
14	0 V	Chassis/Ground
Plug Connecetor ST 402, Antenna Tuning Unit		
1 and 2	+13.5 V	Tuning
3 and 4		Voltage antenna tuning unit
5 and 6		Antenna tuning unit, answer-back signal
7 and 8	0 V	Chassis/Ground
9 and 10	+14.5 V	
11 and 12		OTL
13 and 14		D-Bit
Plug Connector ST 403, Harmonics Filter		
1		T/R relay
2		RS 4
3		RS 7
4		D-Bit
5	0 V	Chassis/Ground
6		RS 5
7		RS 6
8	0 V	Chassis/Ground
9		RS 1
10		RS 3
11	0 V	Chassis/Ground
12		RS 2
13	0 V	Chassis/Ground
14	+14.5 V	

Contact

Functions

Plug Connector ST 404, RF Card

1		U forw. + U refl. external
2	+13.5 V	"R"
3		AGC
4	0 V	Chassis/Ground
5		Blocking pulse ALC
6		Preattenuation P 1
7		RF indicator
8		ALC
9	0 V	Chassis/Ground
10		U forw. input
11		P 2
12	+13.5 V	"T"
13		U forw. + U refl.
14		Switchover 2 W/20 W

Plug Connecetor ST 405, IF Filter Card

1	+13.5 V	"T"
2 and 3	0 V	Chassis/Ground
4		P 4
5		ALC
6		USB
7		P-AGC
8		P 3
9		P-ALC
10	0 V	Chassis/Ground
11	+13.5 V	"R"
12		LSB
13	+13.5 V	
14		AGC

Plug Connector ST 406, IF-AF Card

1	+13.5 V	"T"
2		Chassis/Ground
3		Microphone
4		T/R keying line
5		Microphone
6		AGC
7		P 2
8		1 kHz
9	0 V	Chassis /Ground
10	+13.5 V	
11	0 V	Chassis/Ground
12		AF output
13		Tuning and A1A
14		P 1

Contact	Functions
Plug Connector ST 407, Organizer	
1	+14.5 V
2	+14.5 V
3	0 V
4	Chassis/Ground
5	Tuning and A1A
6	to T/R relay
7	1 MHz
8	External power output stage
9	1 MHz
10	"R"
11	100 kHz
12	T/R keying line
13	1 MHz
14	Prestage
15	1 MHz
16	to front head, A1
17	10 MHz
18	+13.5 V
19	10 MHz
20 and 21	Tuning, Antenna tuning unit
22	100 kHz
23	0 V
24	Chassis/Ground
25	RS 6
26	RS 1
27	RS 3
28	RS 2
29	D-Bit
30	RS 5
31	RS 7
32	RS 4
33	Switchover 2 W/20 W
34	Memory power supply
35	Blocking pulse ALC
36	Battery check indicator
37	+13.5 V
38	"T" external
39	ON from switch
40	AO request
41	Antenna tuning unit answer-back signal
42	Power ON
43	Battery voltage
	"T"
	2 W/20 W from front head

Contact

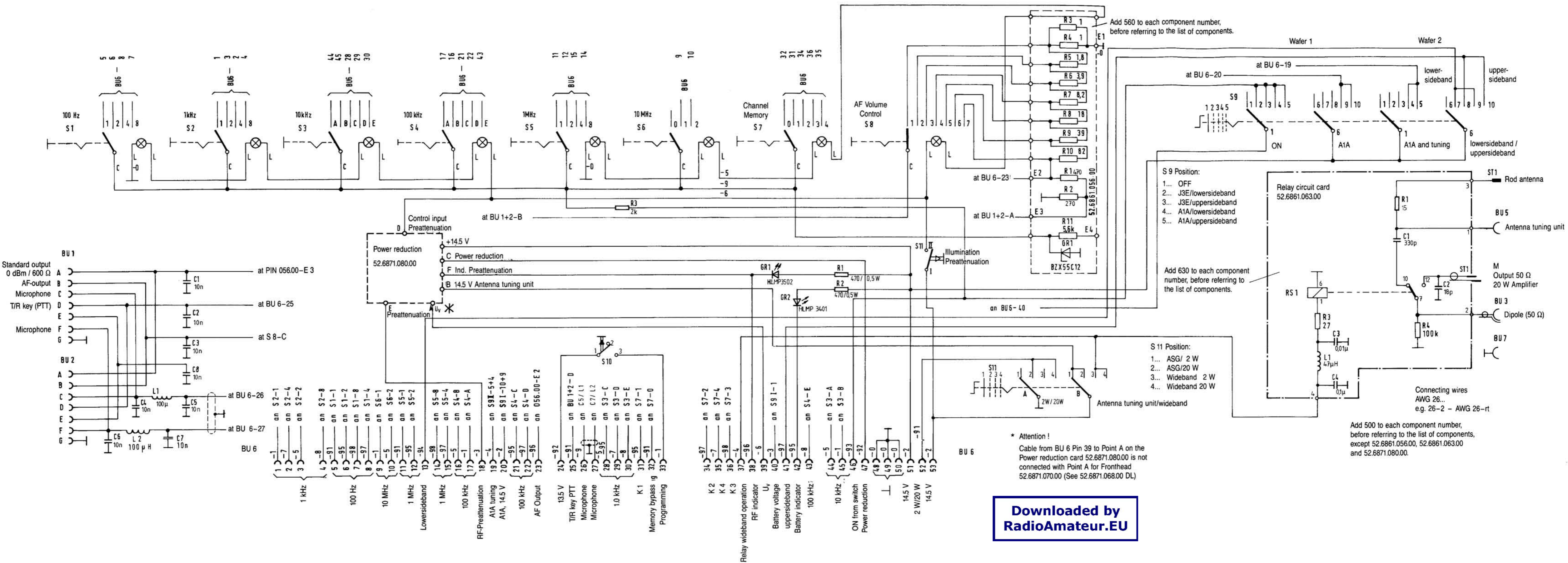
Functions

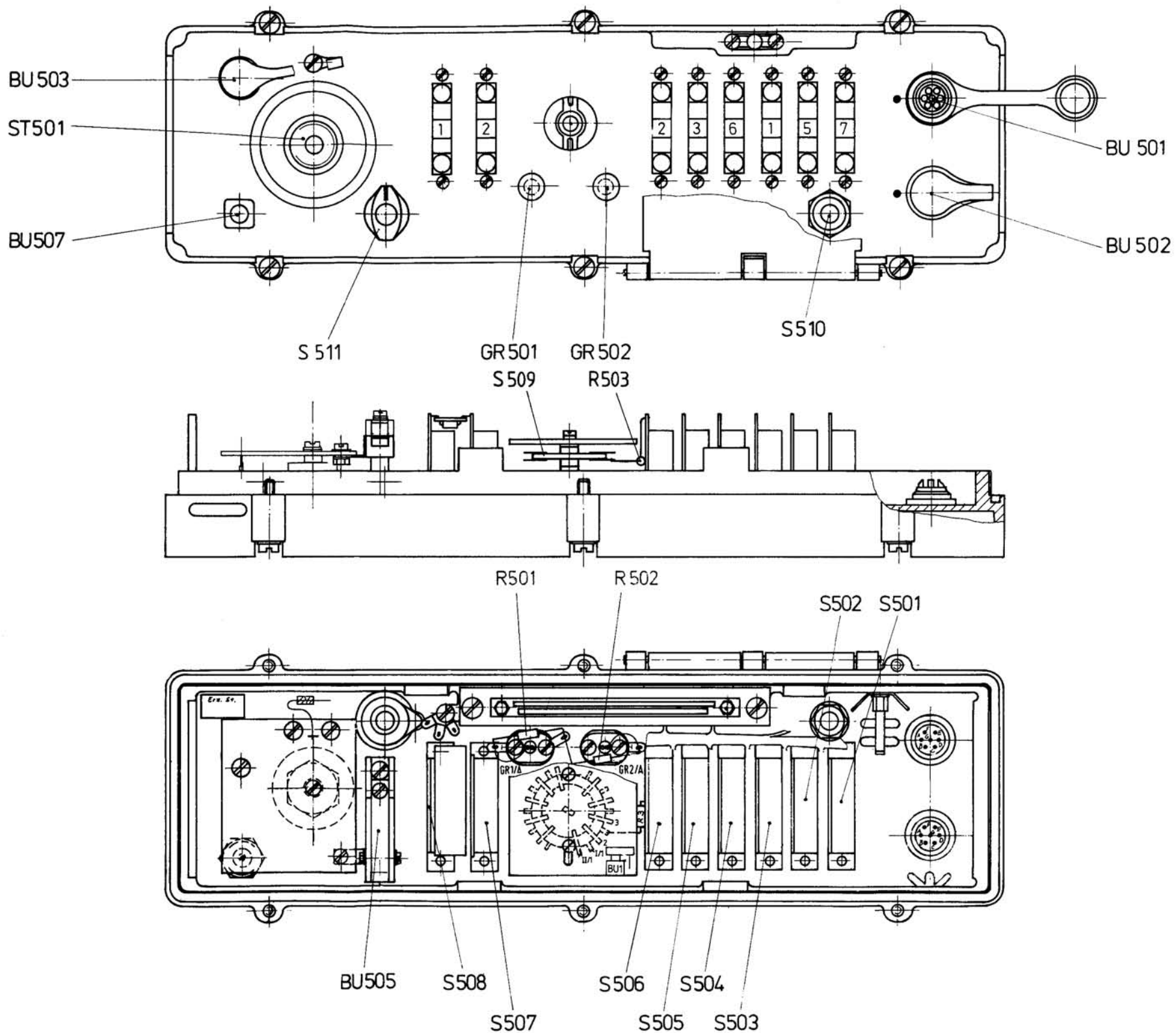
Plug Connector ST 408, Channel Memory

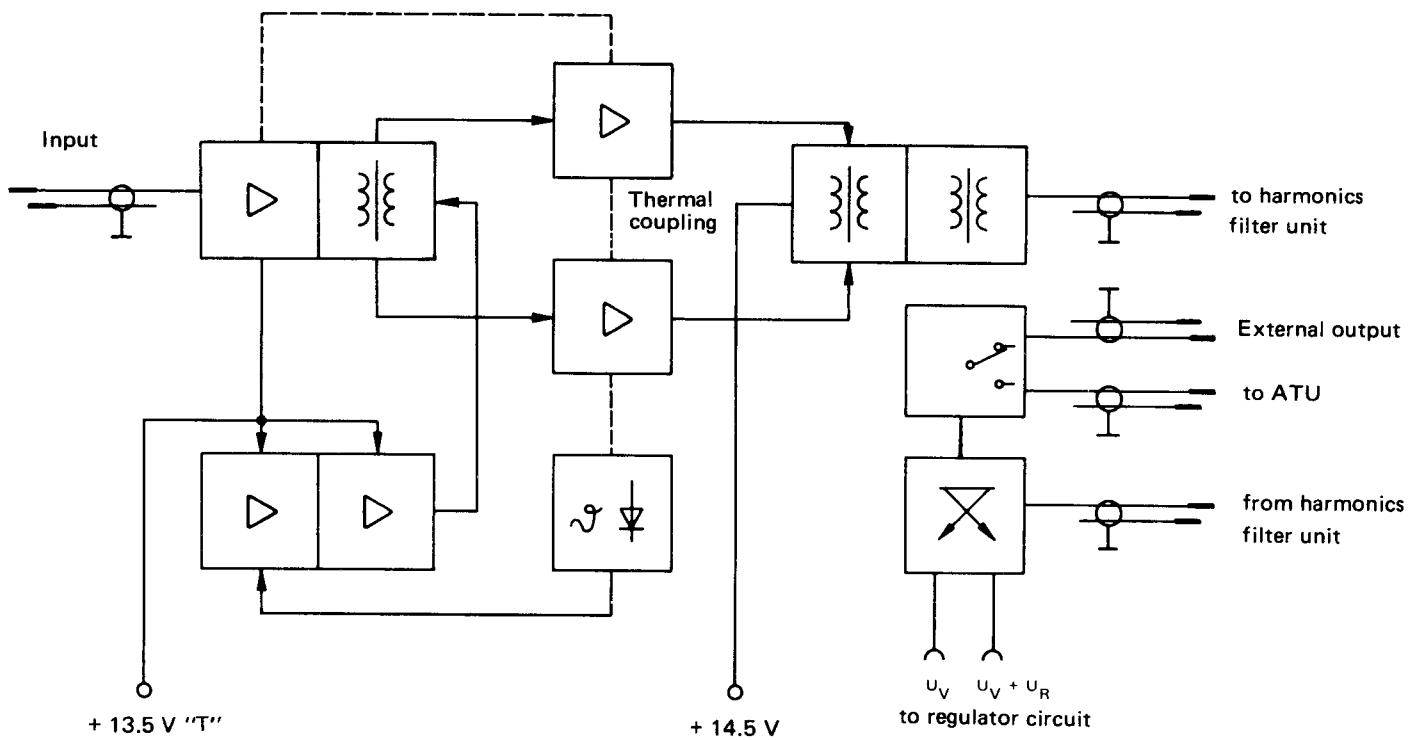
1		Channel 2
2		Memory bypass
3		Channel 4
4		Programming
5		Channel 3
6		Channel 1
7		Memory power supply
8 to 17		10 kHz
18 to 23		100 kHz
24		1 MHz
25 to 28		100 kHz
29		1 MHz
30	0 V	Chassis/Ground
31 to 36		1 MHz
37 to 40		10 MHz
41 to 48		100 Hz
49 to 56		1 kHz

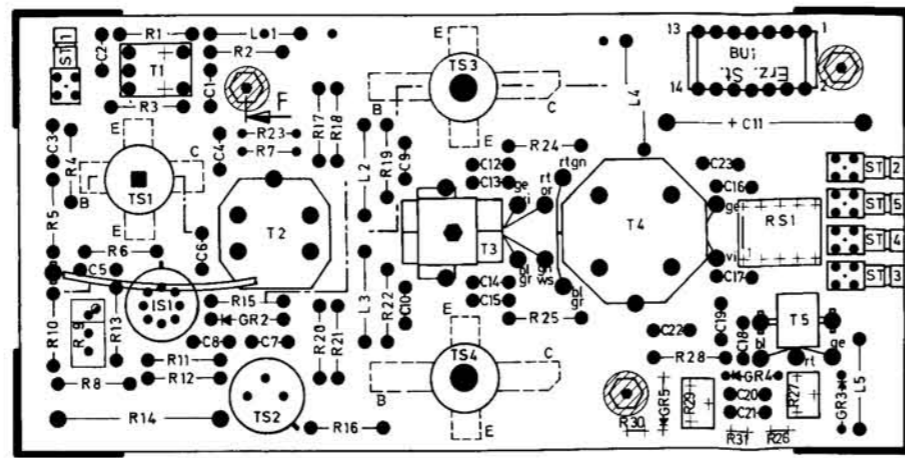
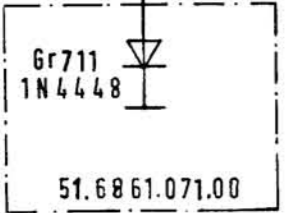
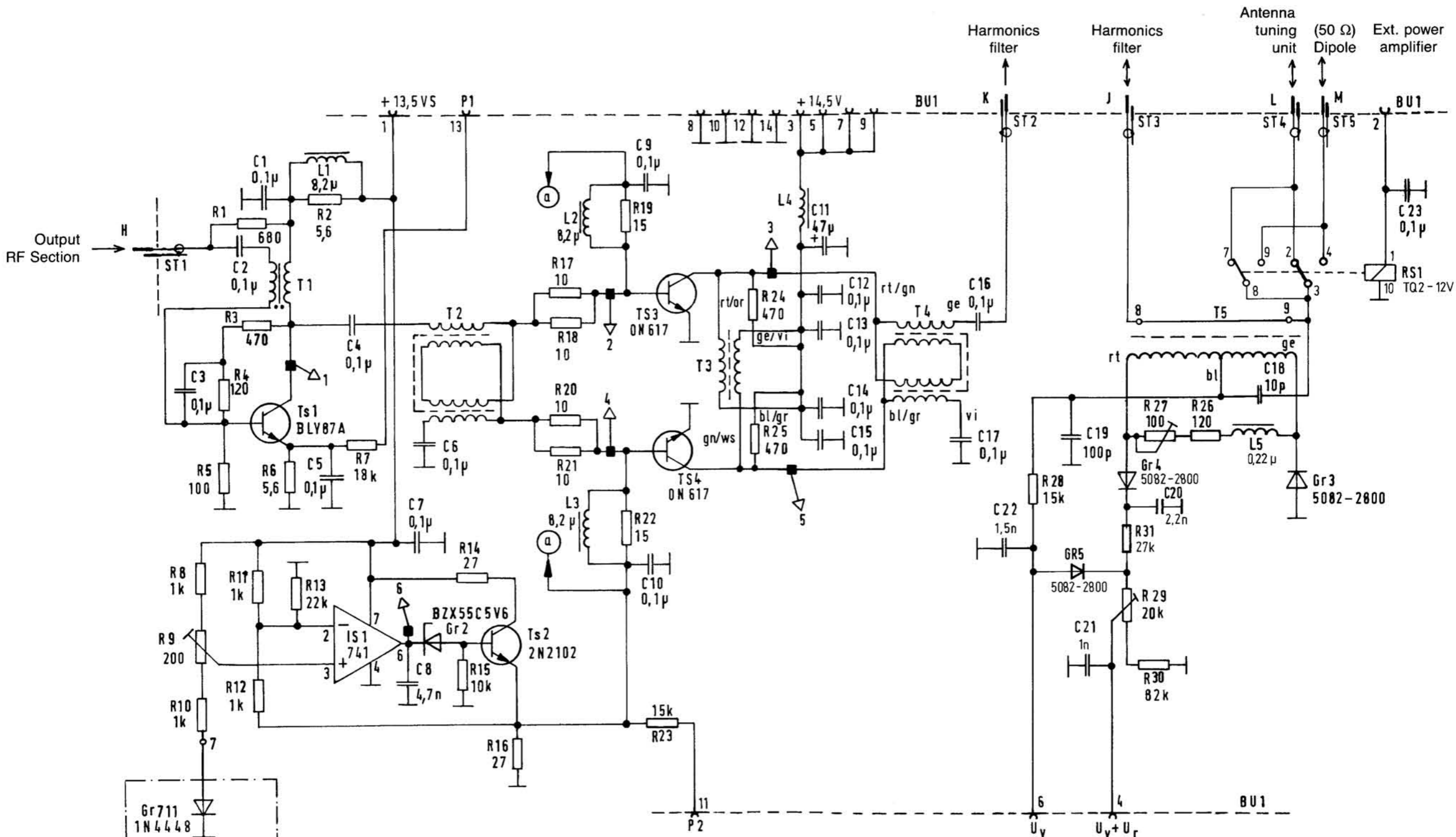
Plug Connector ST 409, to front head

1 to 4		1 kHz
5 to 8		100 Hz
9 and 10		10 MHz
11 and 12		1 MHz
13		LSB
14 and 15		1 MHz
16 and 17		100 kHz
18		RF-Preattenuation
19		A1A tuning
20	+14.5 V	A1A
21 and 22		100 kHz
23		AF output
24	+13.5 V	
25		T/R keying line
26 and 27		Microphone
28 to 30		10 kHz
31		Channel 1
32		Memory bypass
33		Programming
34		Channel 2
35		Channel 4
36		Channel 3
37		Relay control, wideband operation
38		RF indicator/HF-Attenuation indicator
39		U_v
40		Battery voltage
41		USB
42		Battery indicator
43		100 kHz
44 and 45		10 kHz
46		ON from switch
47		Power reduction
48 to 50	0 V	Chassis/Ground
51	+14.5 V	
52		Switchover 2 W/20 W
53	+14.5 V	





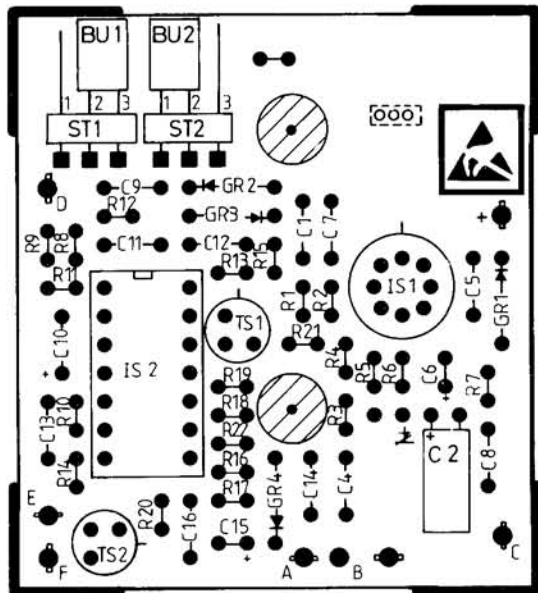




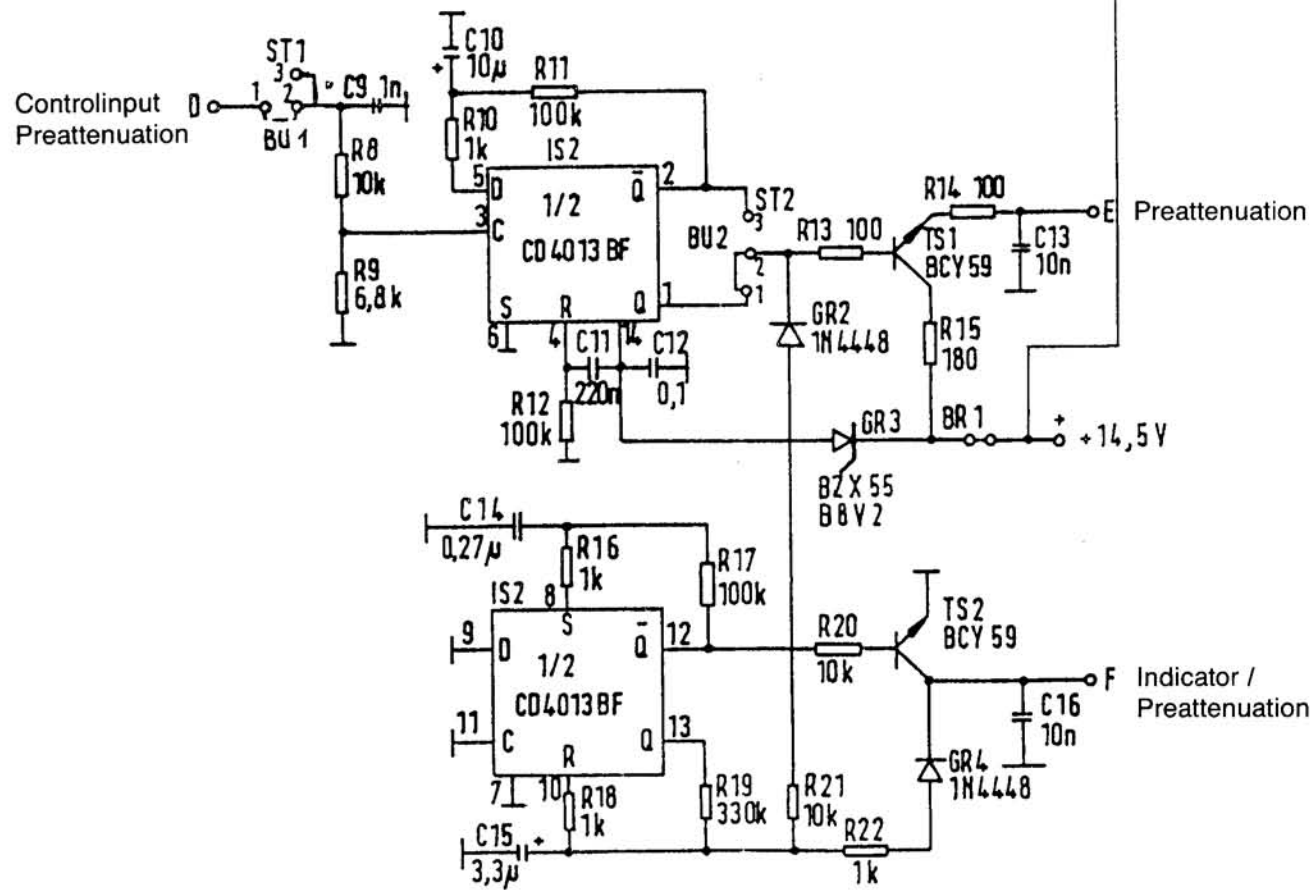
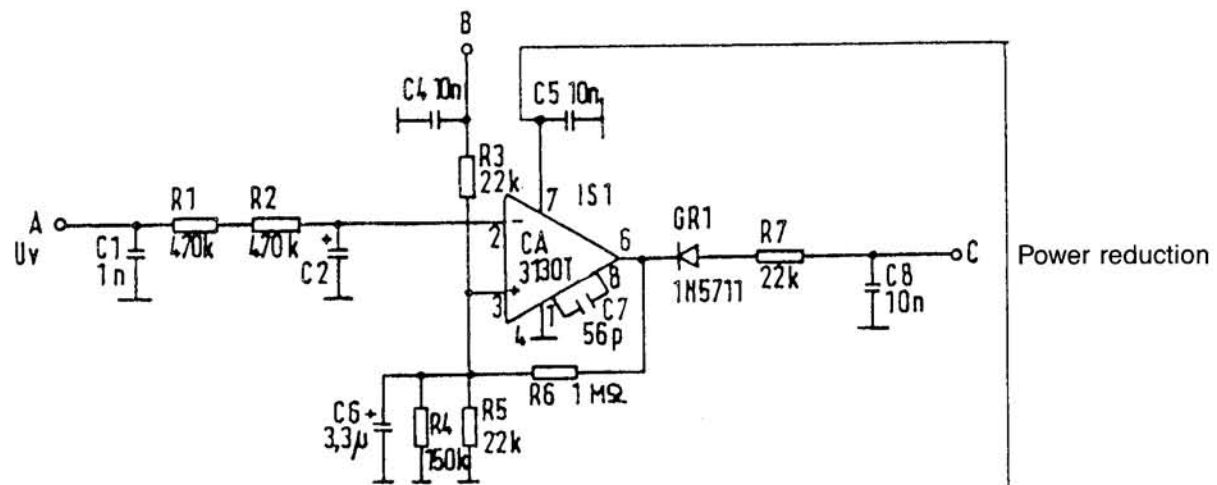
- Colour code
- bl = blue
 - ge = yellow
 - gn = green
 - gr = grey
 - rt = red
 - or = orange
 - vi = violet
 - ws = white

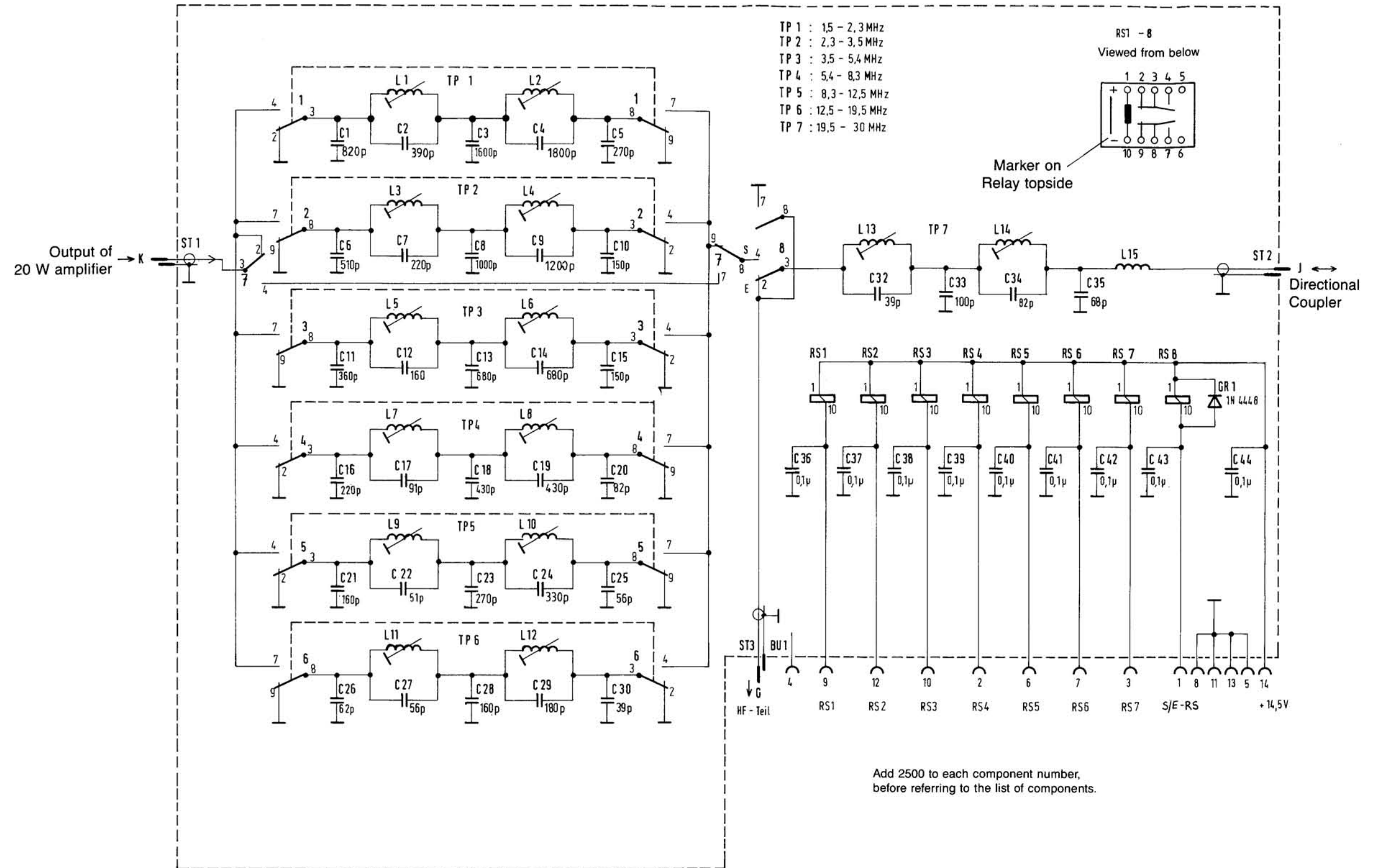
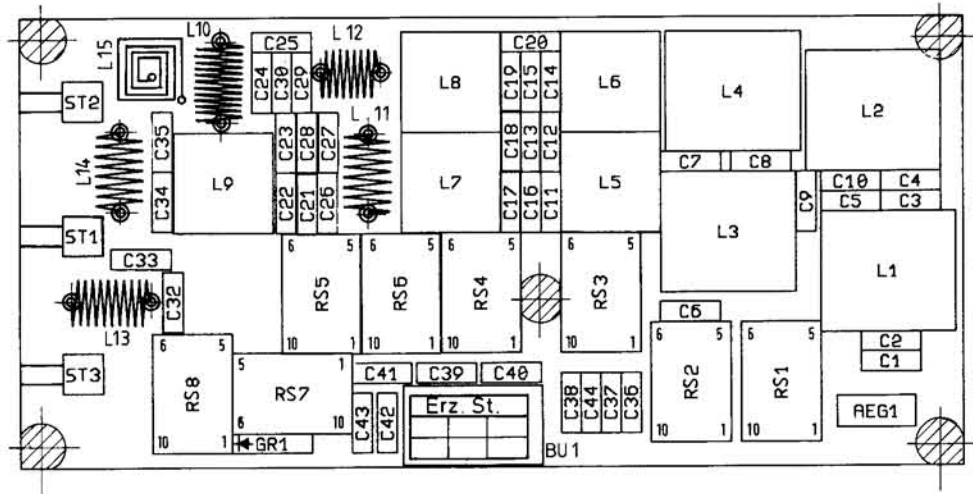
Add 700 to each component number, before referring to the list of components.

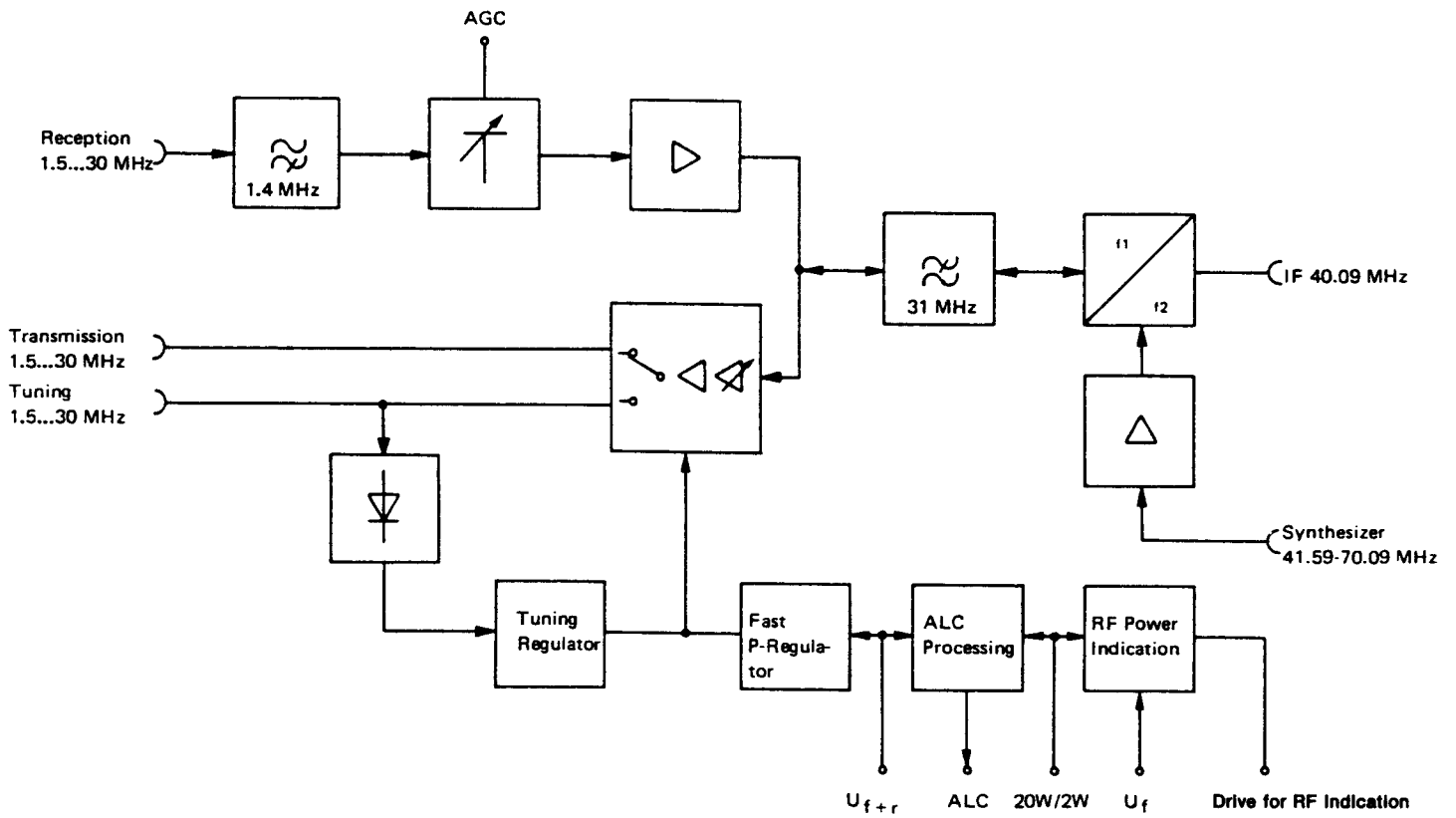
Circuit Diagram of 20 W Amplifier
Field Radio Unit SE 6861/12 mod
Annex 7



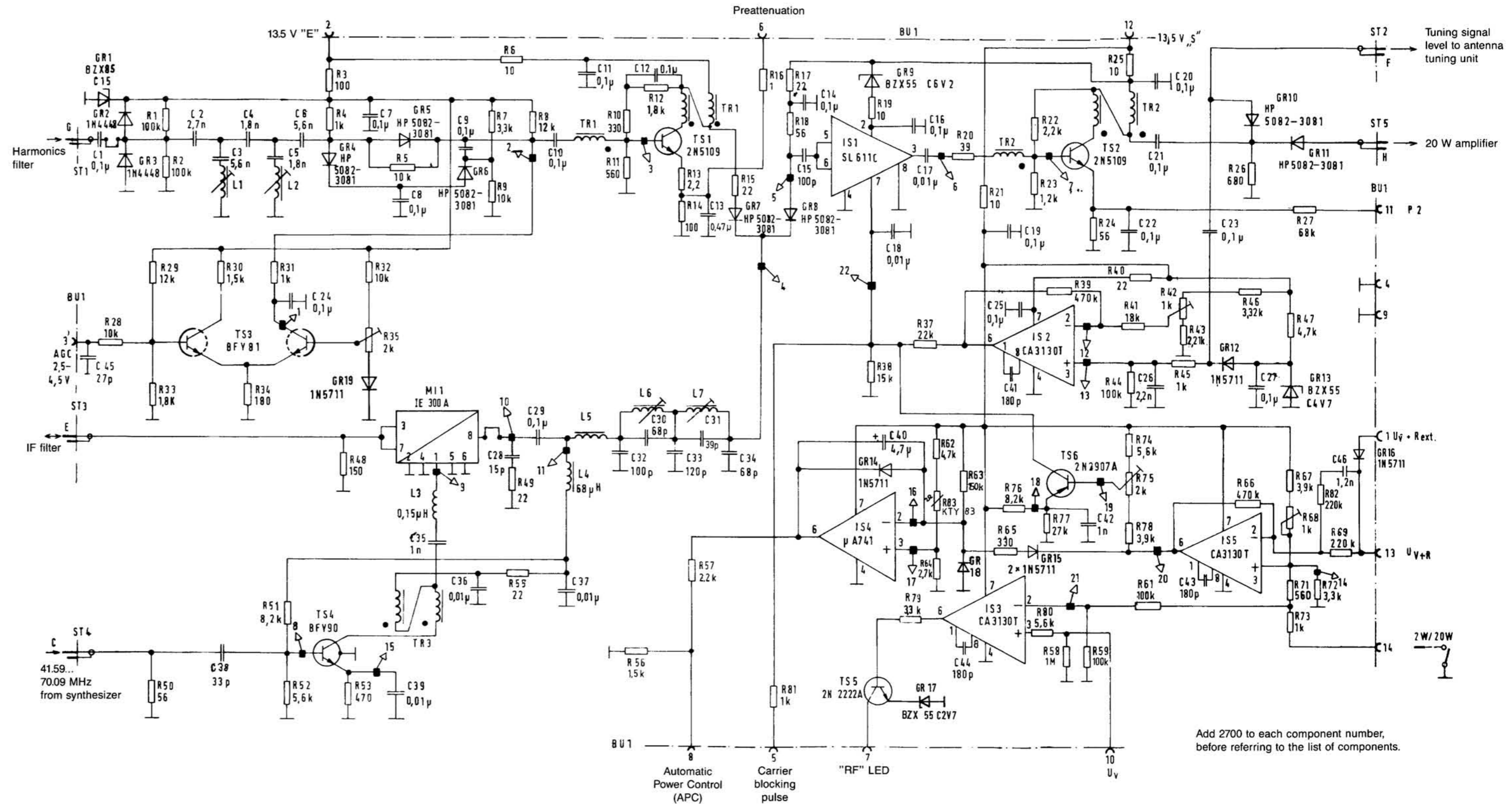
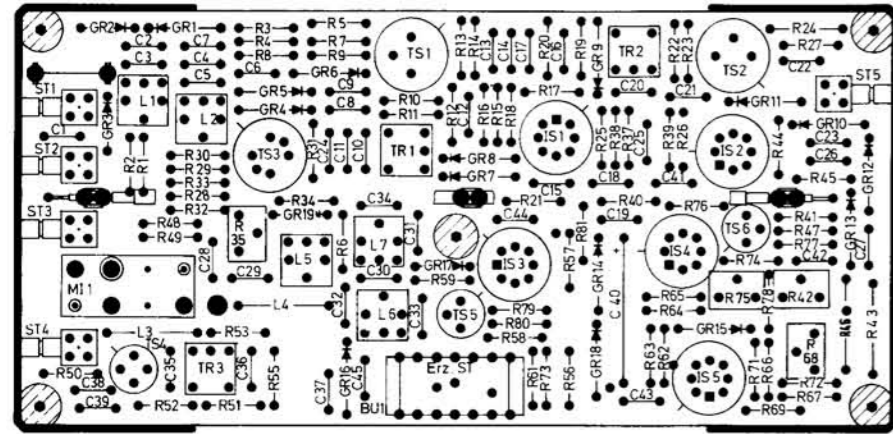
14.5 V Antenna tuning unit



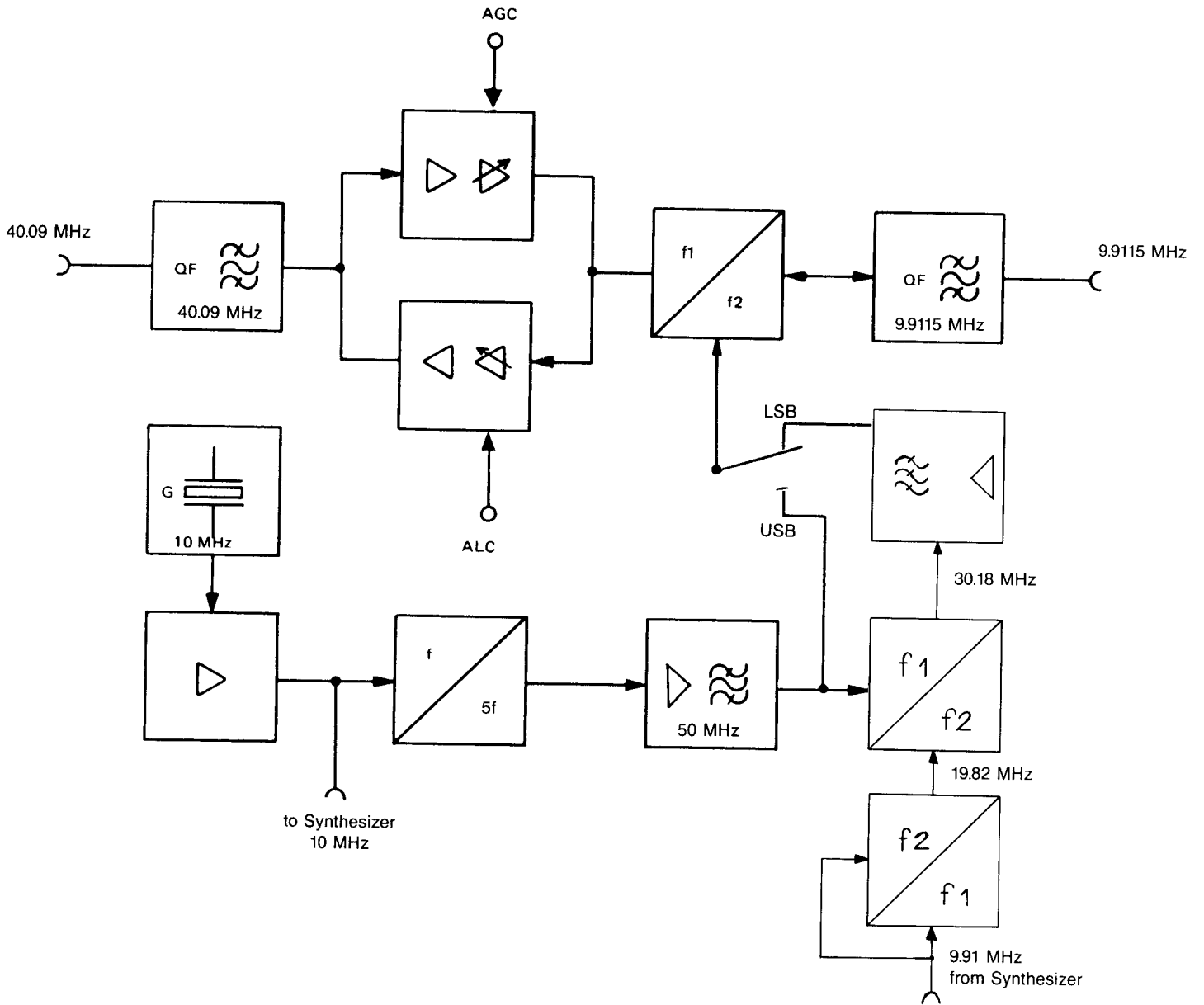




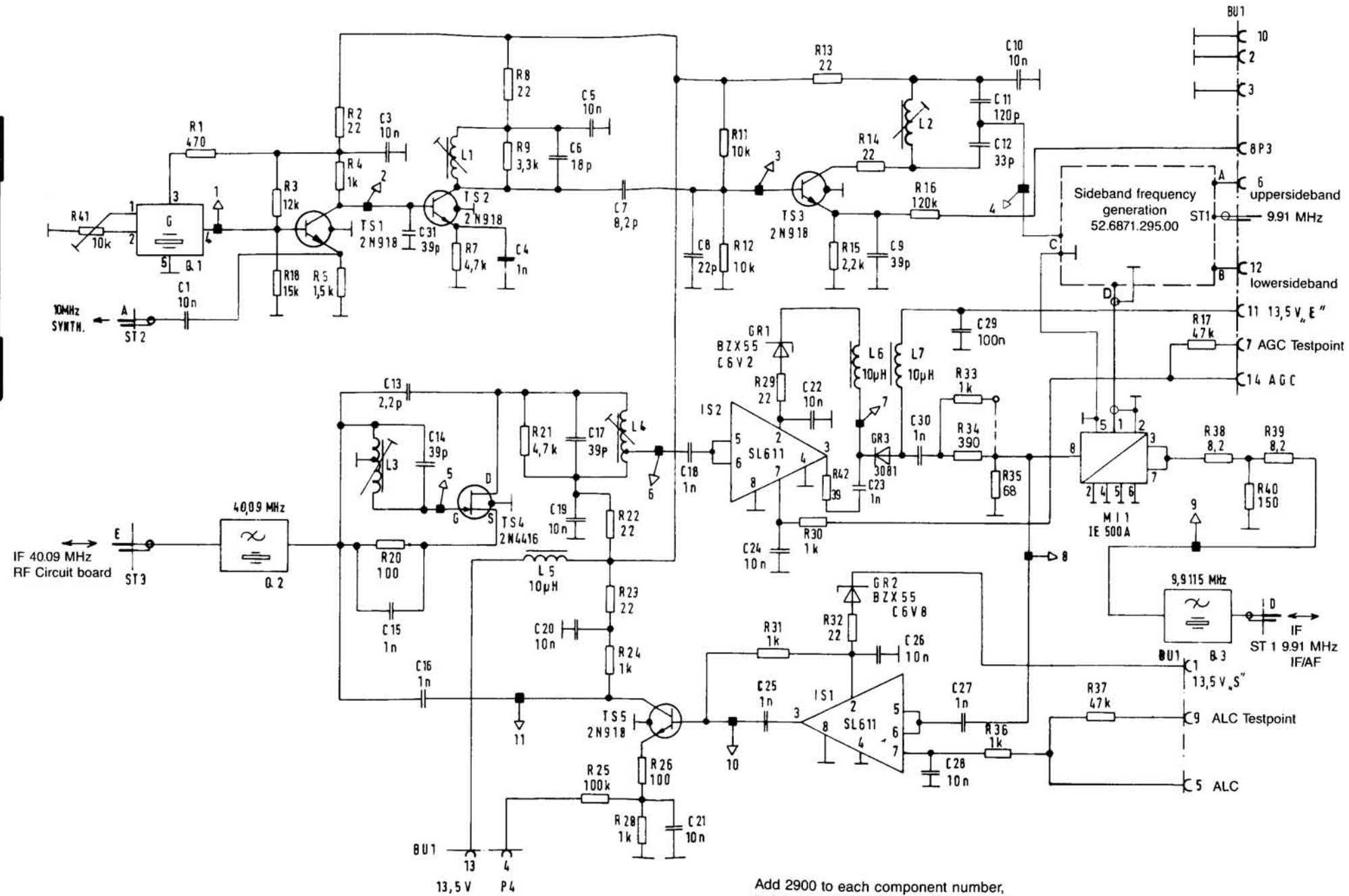
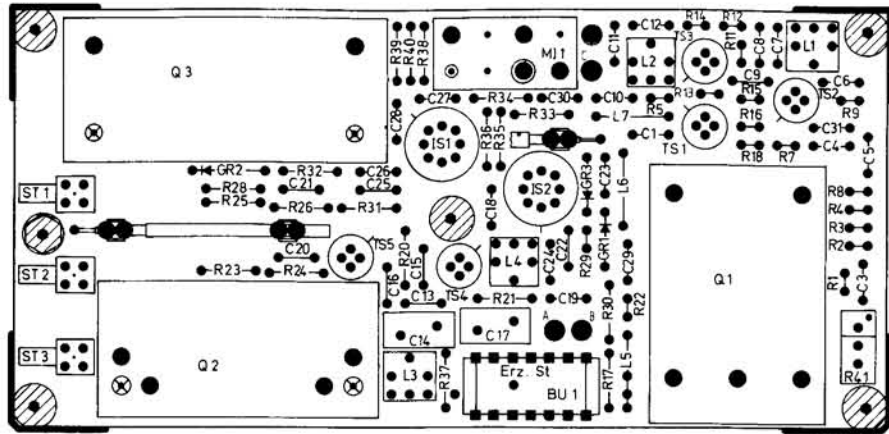
General Circuit Diagram
of RF Circuit Board
Field Radio Unit SE 6861/12 mod
Annex 10



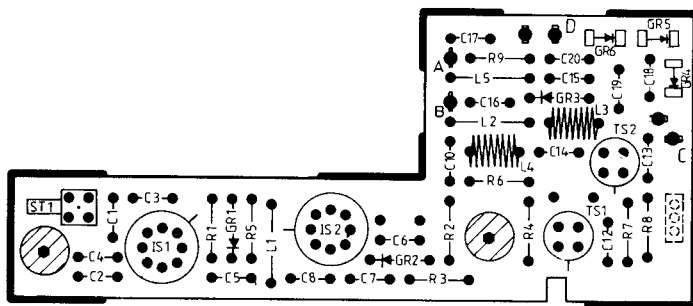
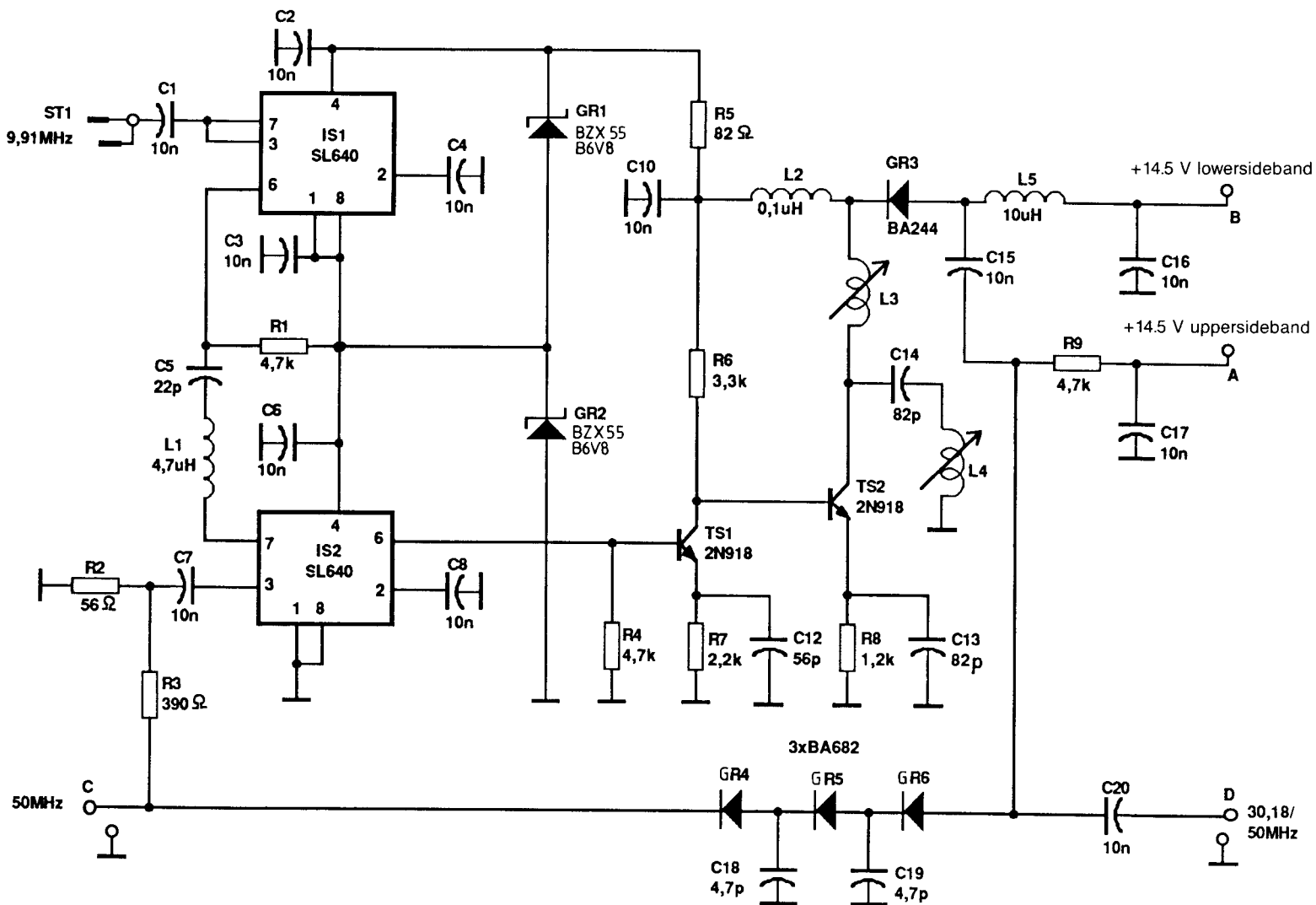
Add 2700 to each component number, before referring to the list of components.



General Circuit Diagram
of IF Filter and
Sideband Frequency Generation
Field Radio Unit SE 6861/12 mod
Annex 12

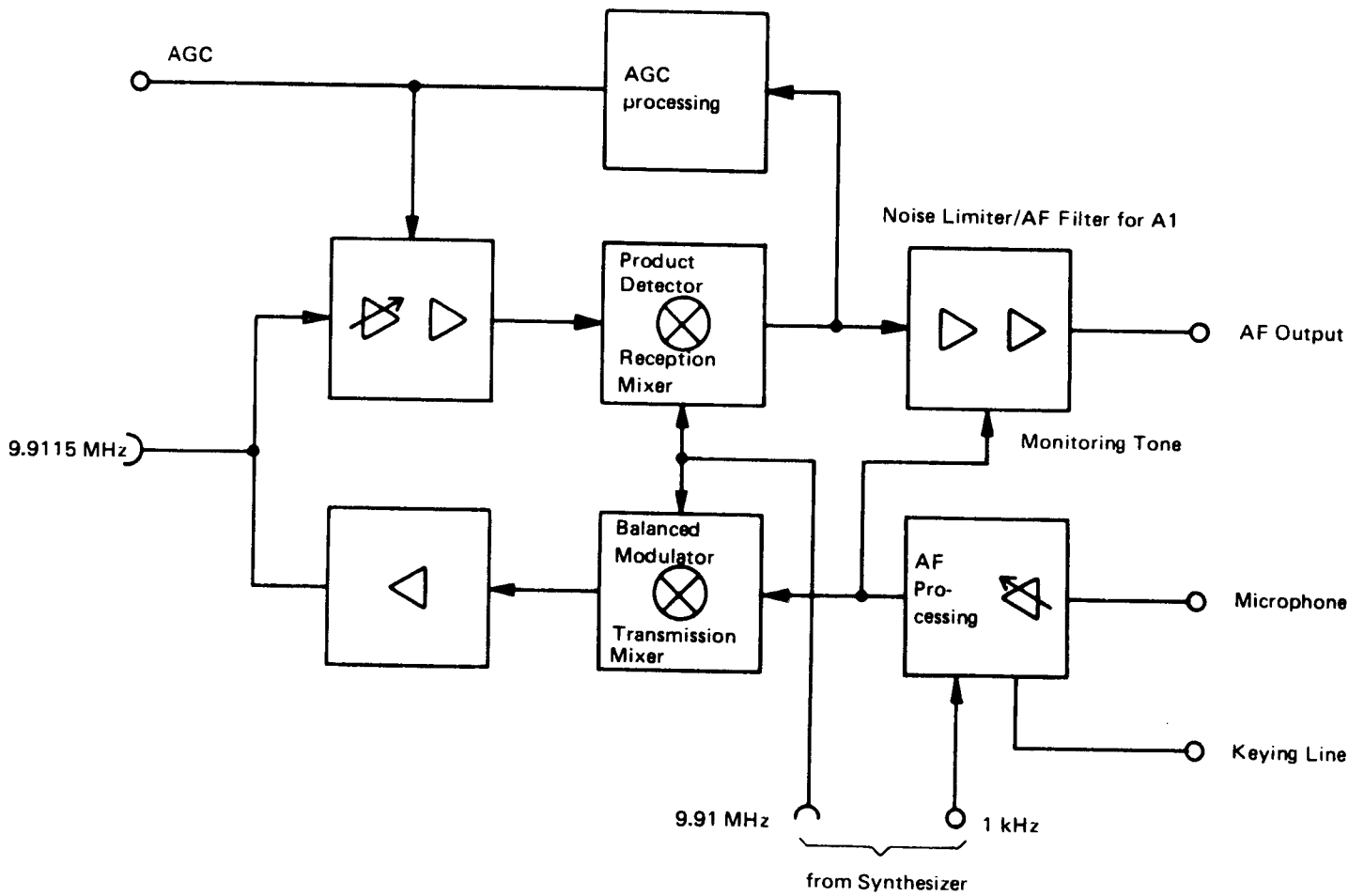


Add 2900 to each component number, before referring to the list of components.

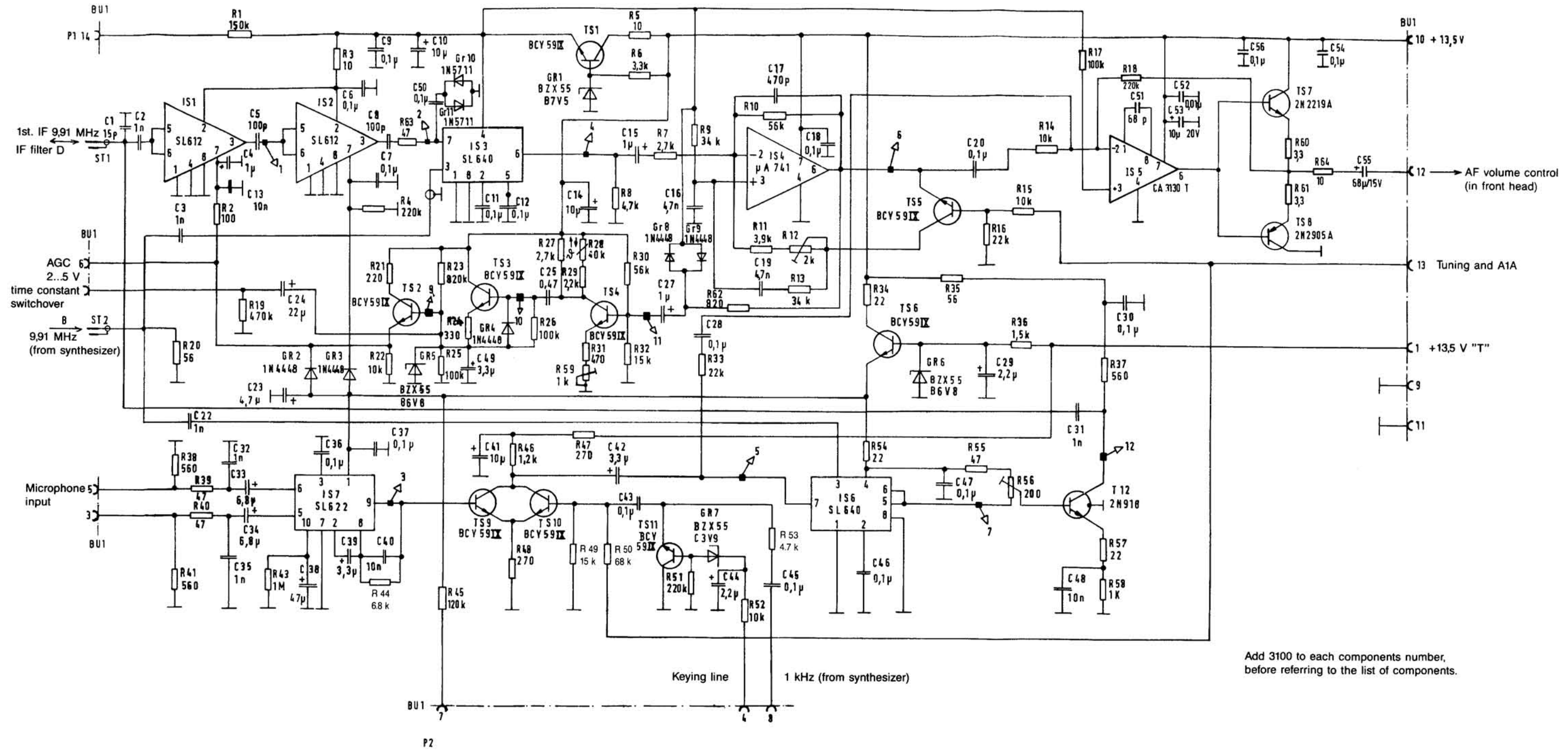
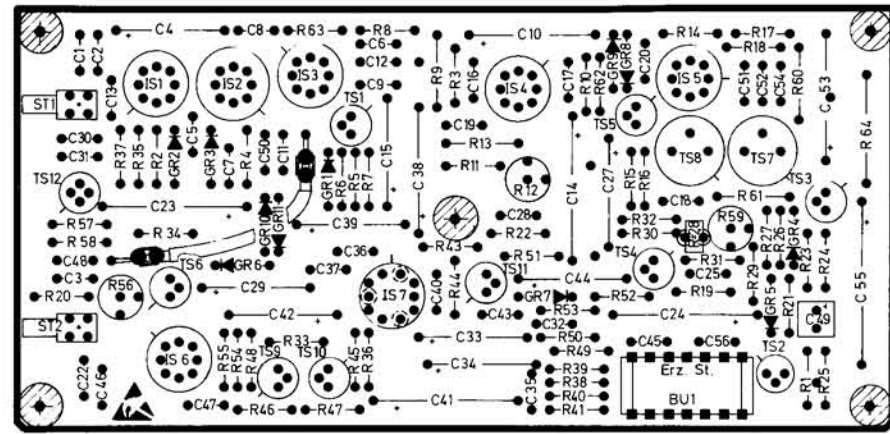


Downloaded by
RadioAmateur.EU

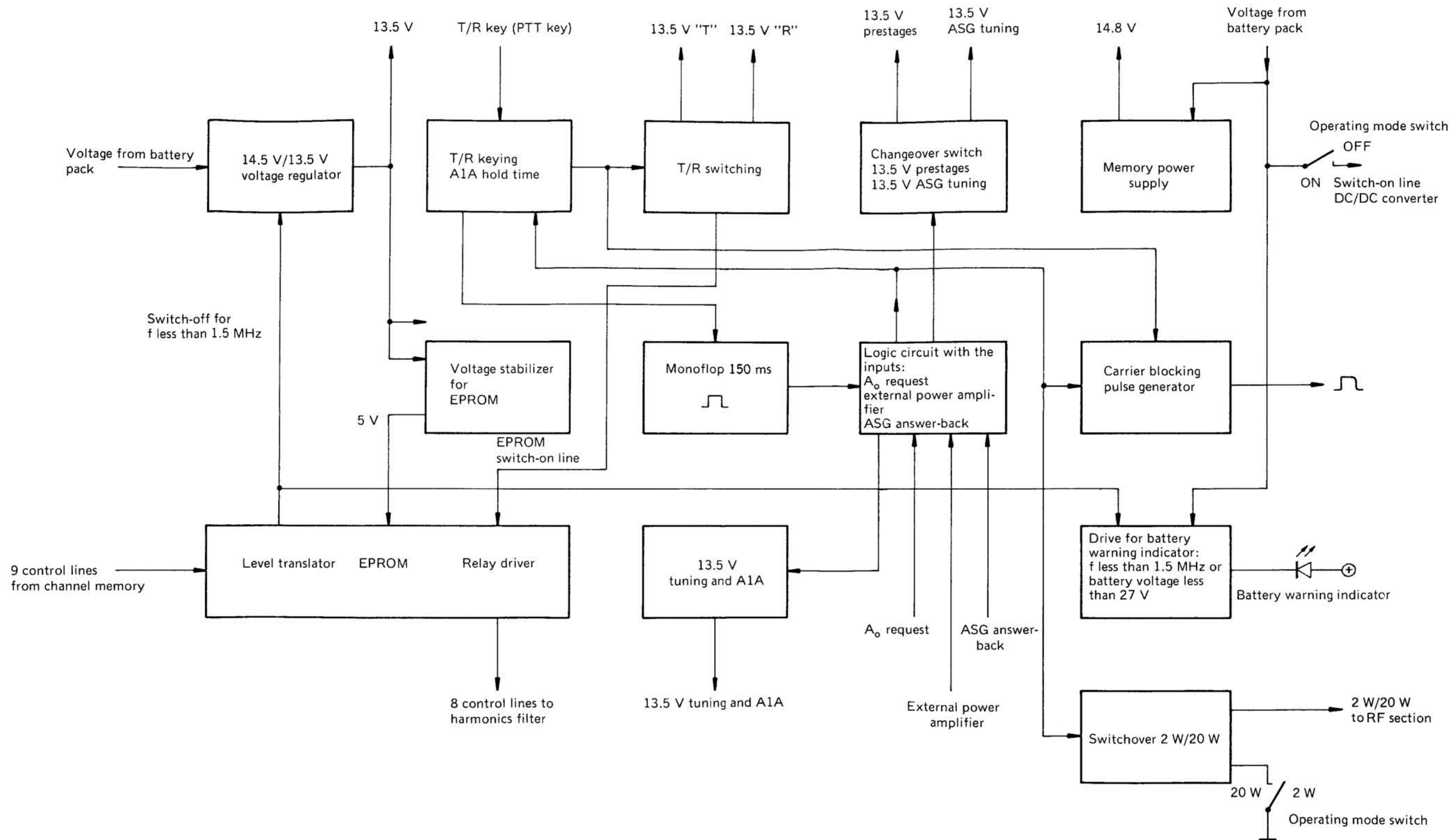
Circuit Diagram
 of Sideband Frequency Generation
 Field Radio Unit SE 6861/12 mod
Annex 14



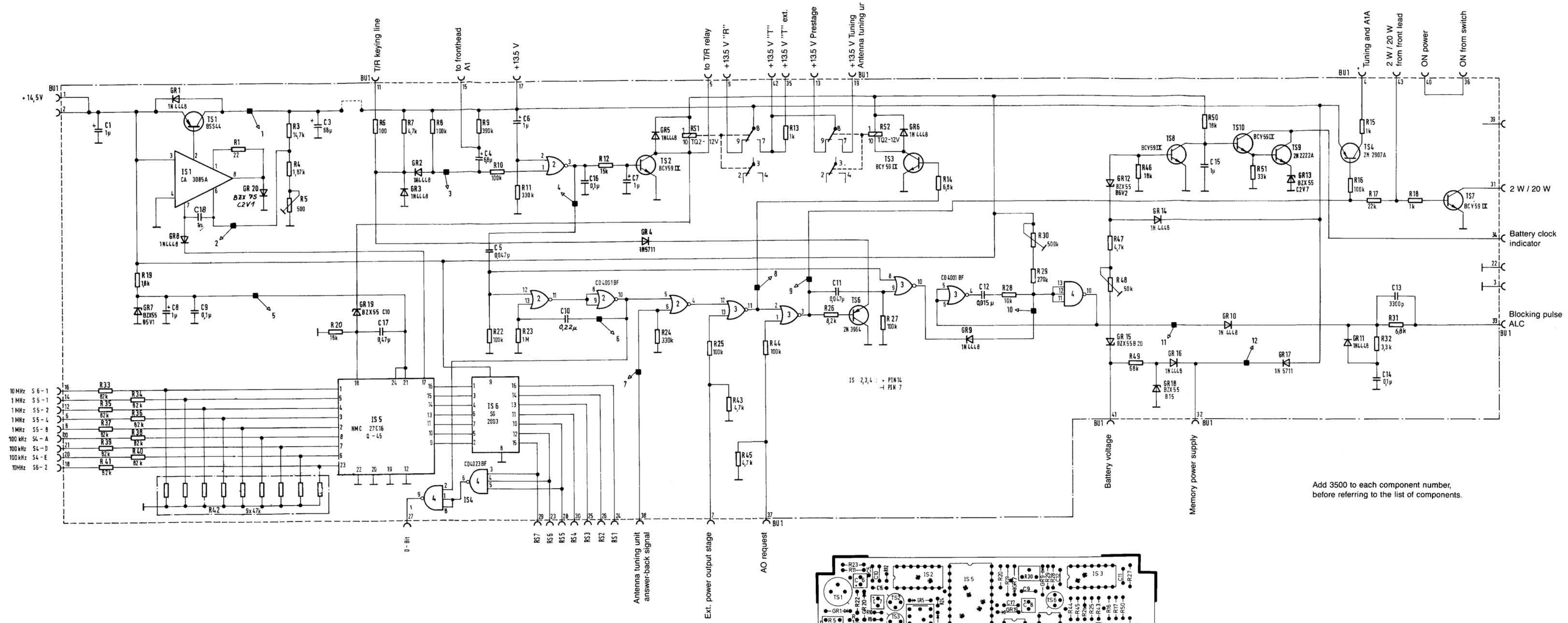
General Circuit Diagram
of IF/AF Circuit Board
Field Radio Unit SE 6861/12 mod
Annex 15



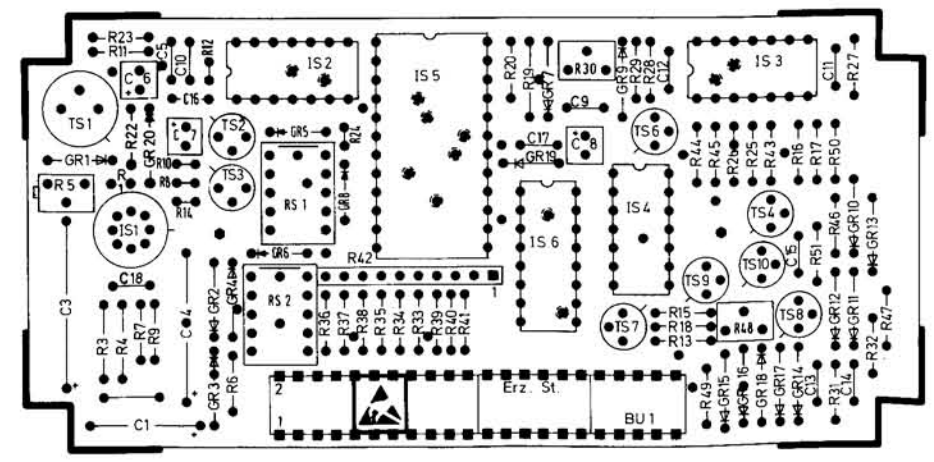
Add 3100 to each components number, before referring to the list of components.

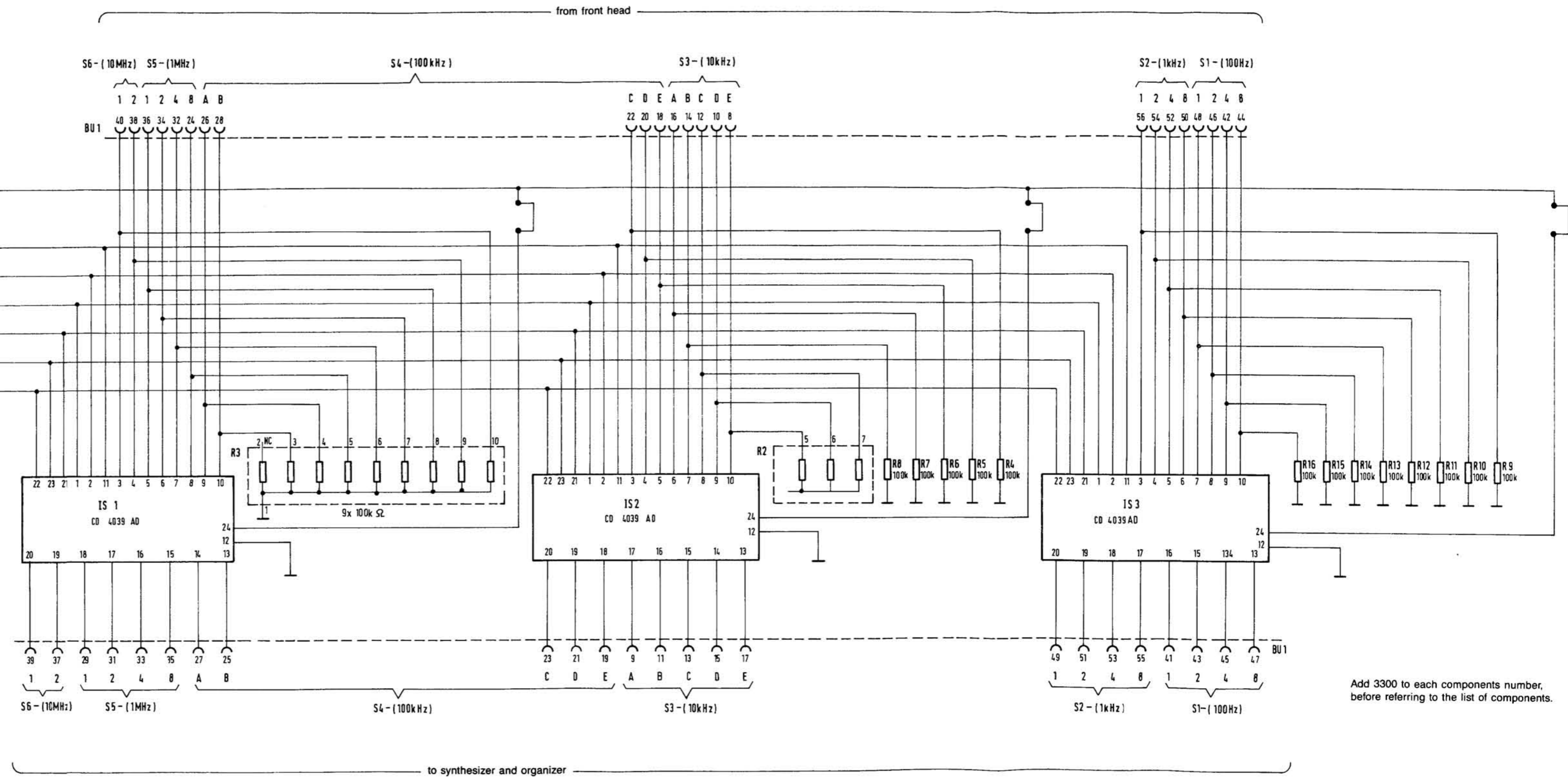
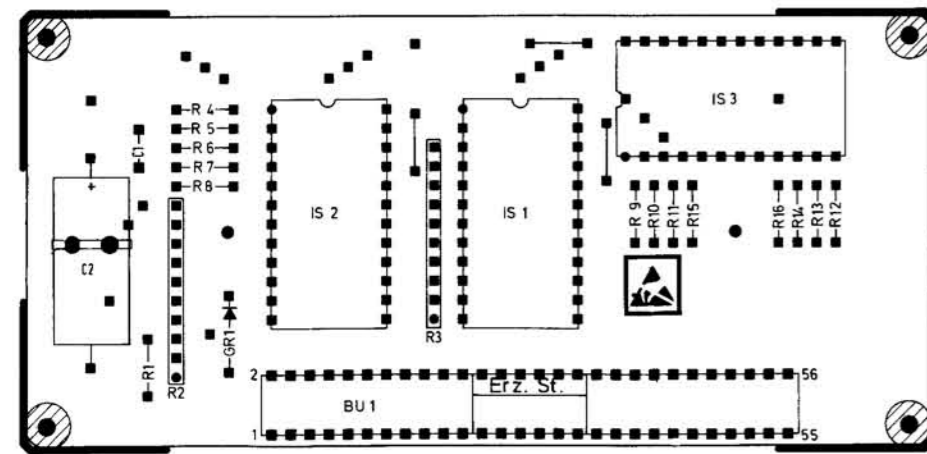


General Circuit Diagram
of organizer
Field Radio Unit SE 6861/12 mod
Annex 17

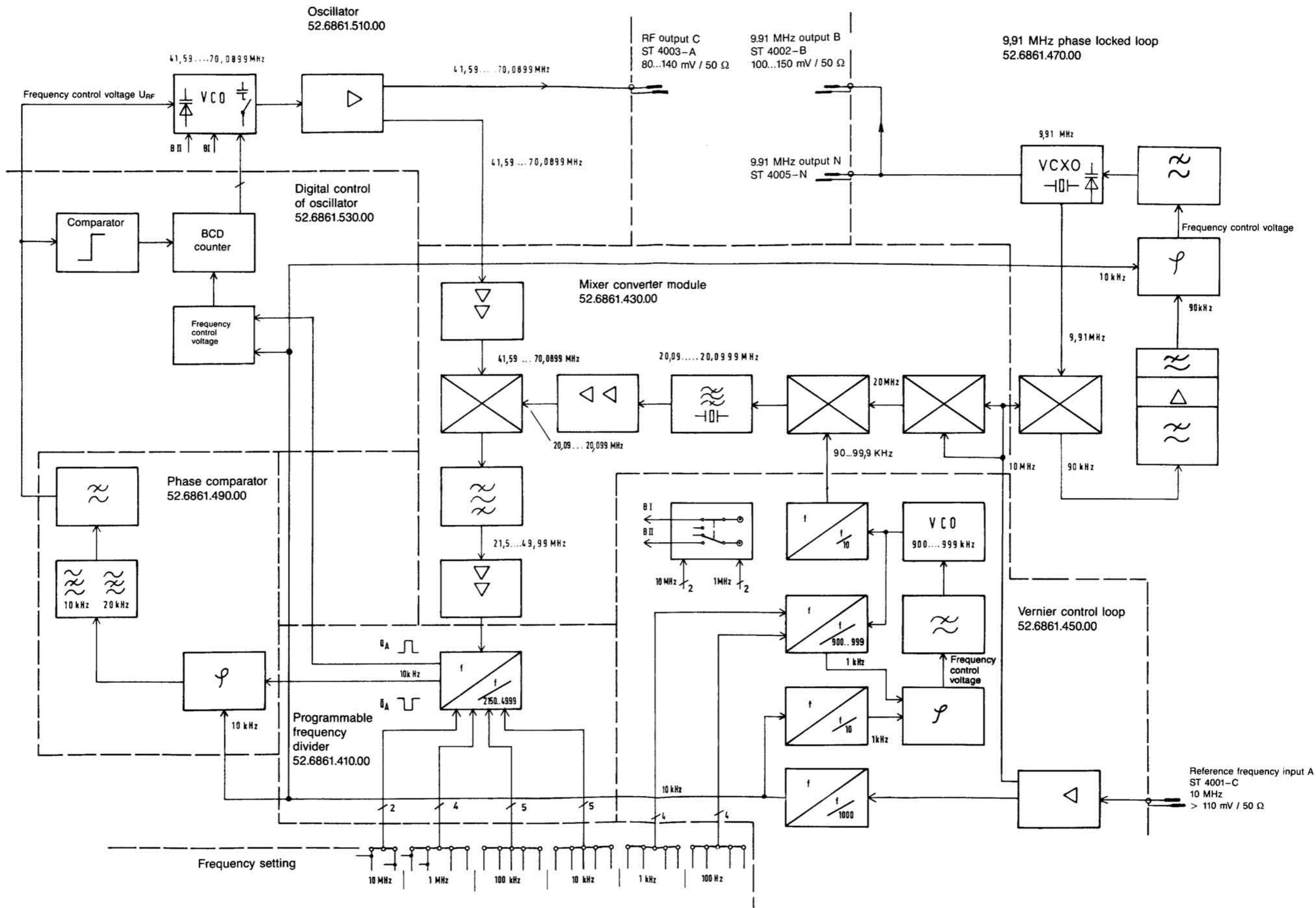


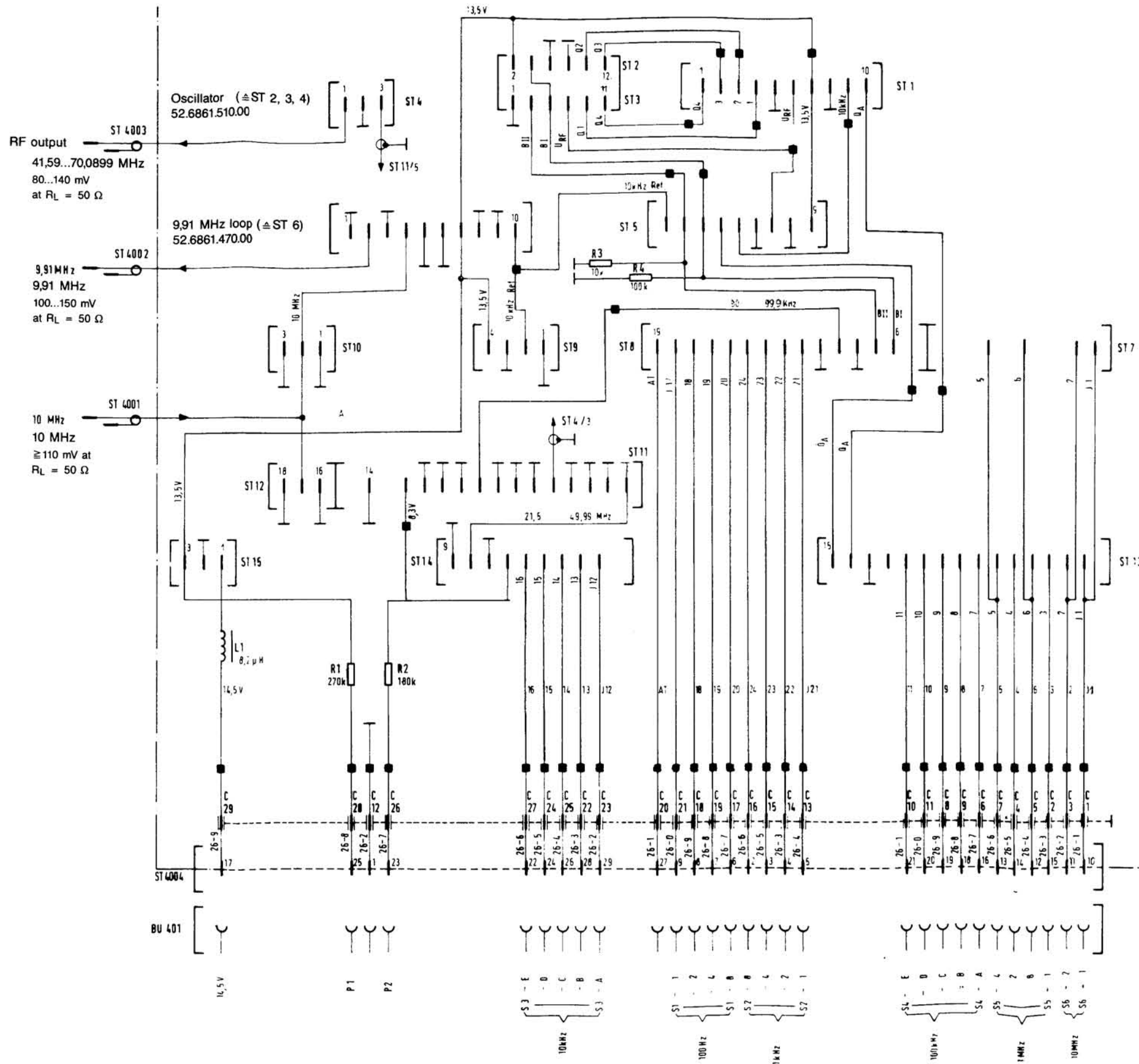
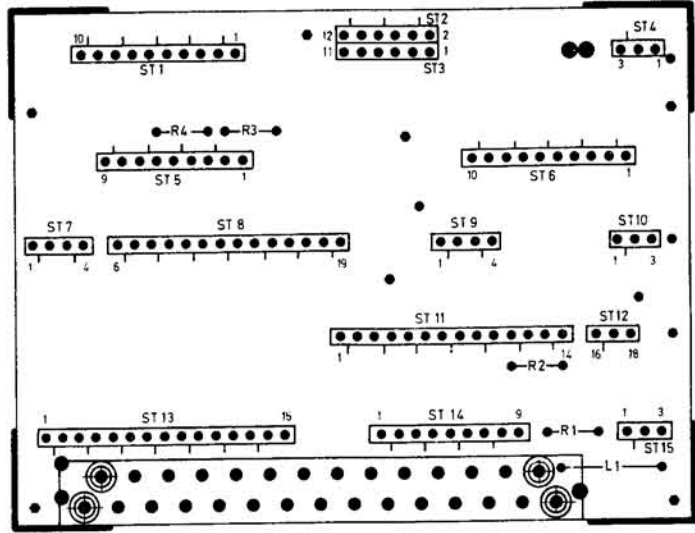
Add 3500 to each component number, before referring to the list of components.





Add 3300 to each components number, before referring to the list of components.





Digital presetting of oscillator (\approx ST 1)
52.6861.530.00

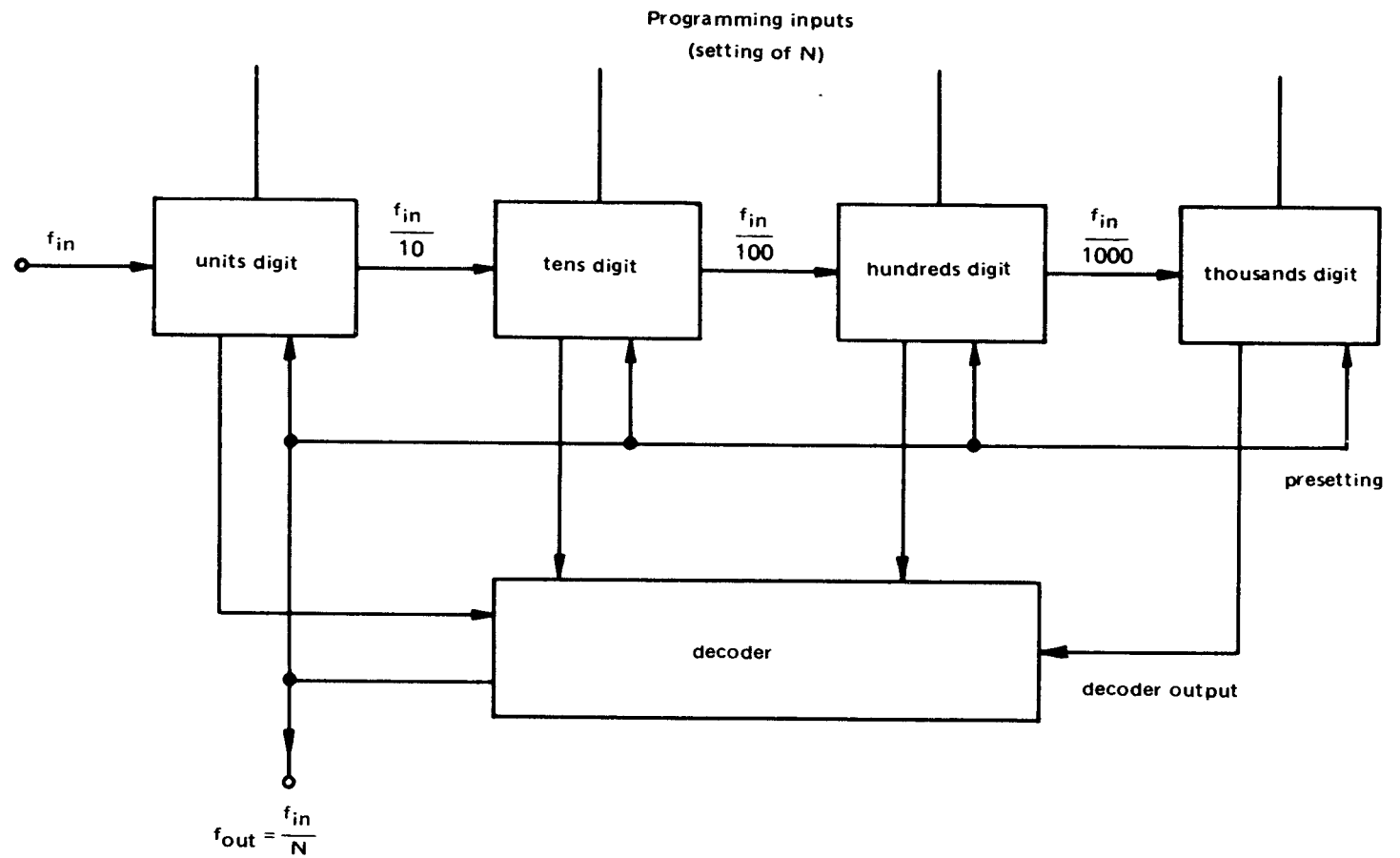
Measuring point	Reading
14,5 V	14,2...14,6 V
Phase comparator (\approx ST 5) 52.6861.490.00	13,5 V
8,3 V	8,1...8,5 V
$f_{RX} < 14$ MHz: B I	7,0...7,4 V
$f_{RX} > 14$ MHz: B II	7,3...7,7 V
10 kHz Ref.	>12 V
	<1 V
Vernier control loop 52.6861.450.00	0,25...0,5 μ s
90...90,9 kHz	400...600 mV
* 21,5...49,99 MHz	250...750 mV
Mixer converter module 52.6861.430.00	* Q4
	>12 V
	<1 V
	0,2...0,5 μ s
Programmable frequency divider 52.6861.410.00	* $\bar{Q}4$
	12 V
	1 V
	0,2...0,5 V

* Check voltages and signals at these measuring points at $f = 1.5$ MHz, 15 MHz and 29,9 MHz

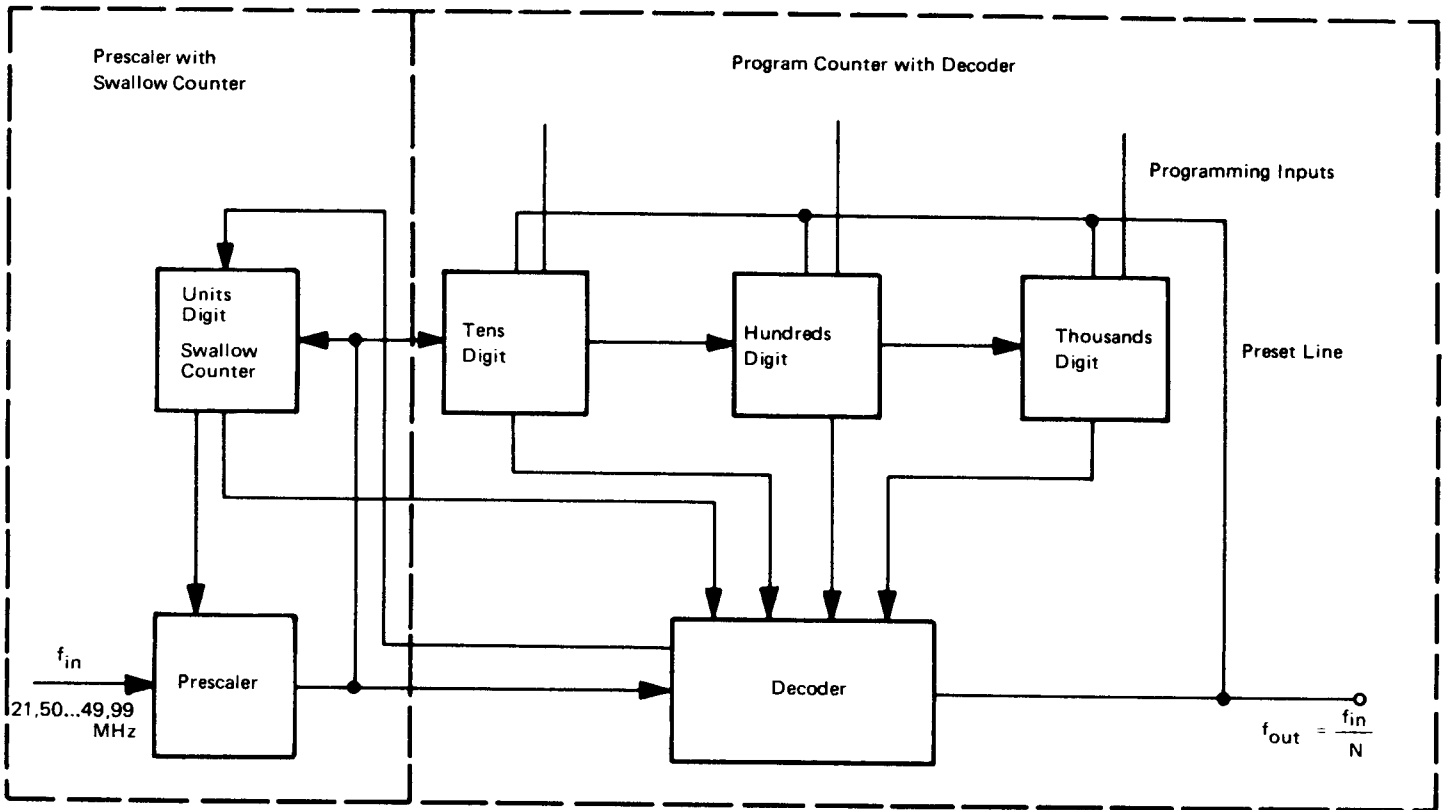
Measure RF voltage 21,5...49,99 MHz in high impedance circuit (> 100 k Ω) and with small stray capacitance (< 1 pF).
Measure the signal waveforms with oscilloscope (1 M Ω // ~ 15 pF) and 10:1 signal probe (10 M Ω // ~ 15 pF).

e.g. line AWG 26-2 = AWG 26-red

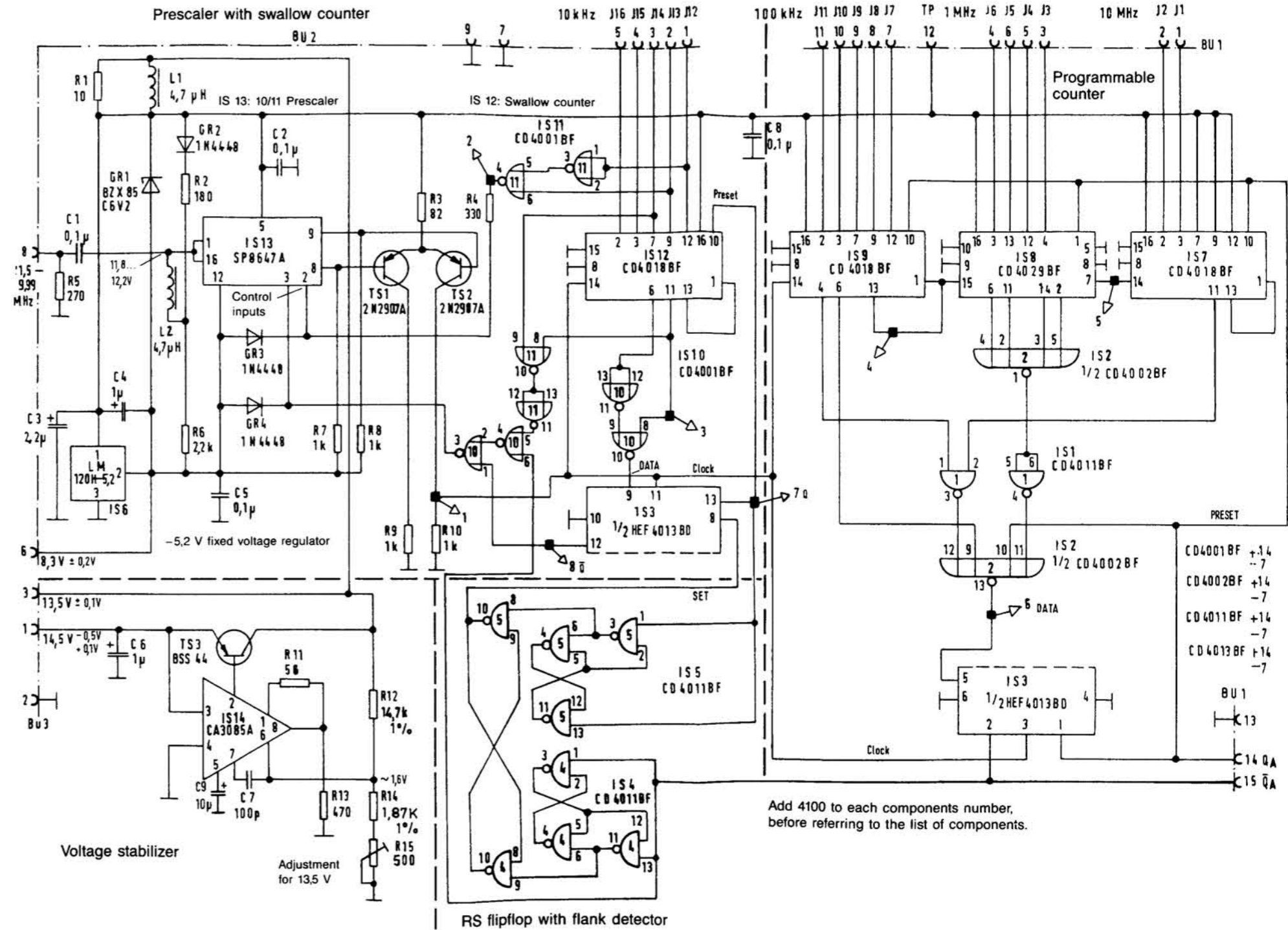
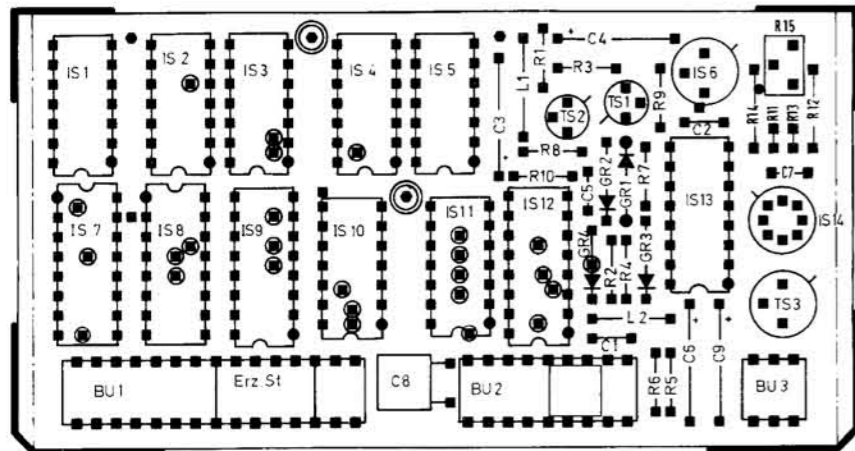
Add 5500 to each components number, before referring to the list of components.



General Circuit Diagram
of a four-stage Frequency Divider
Configuration for four-digit N
Field Radio Unit SE 6861/12 mod
Annex 22

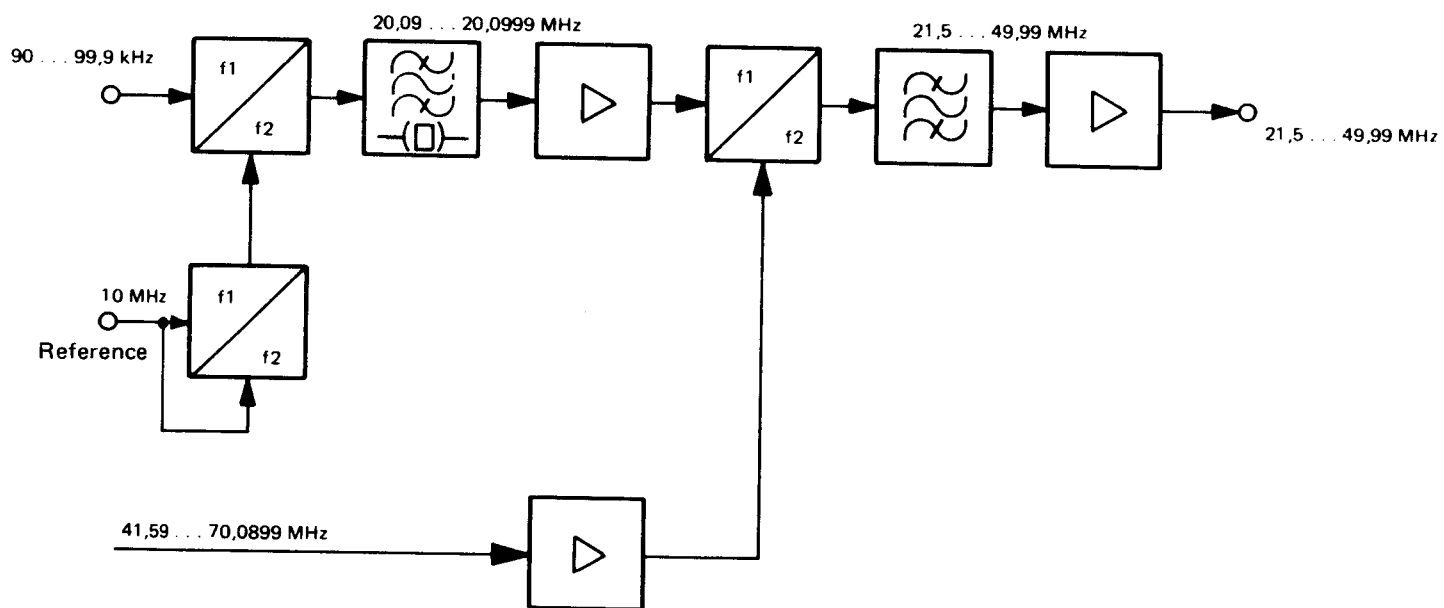


General Circuit Diagram
of a programmable Frequency Divider
according to the "swallow counting" Principle
Field Radio Unit SE 6861/12 mod
Annex 23

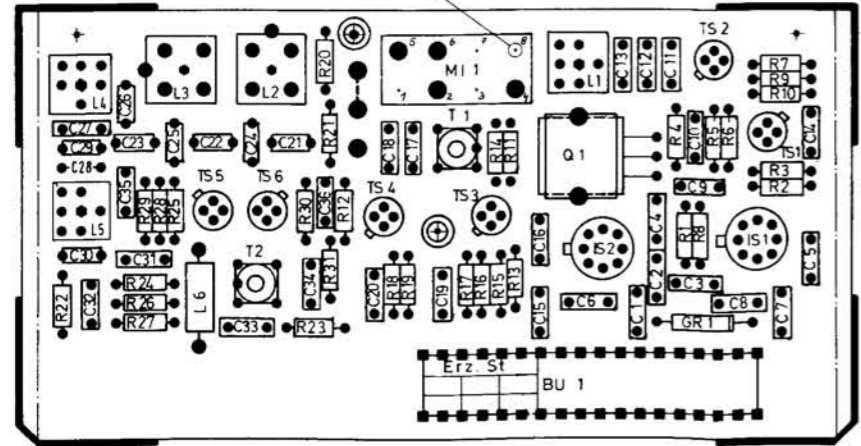
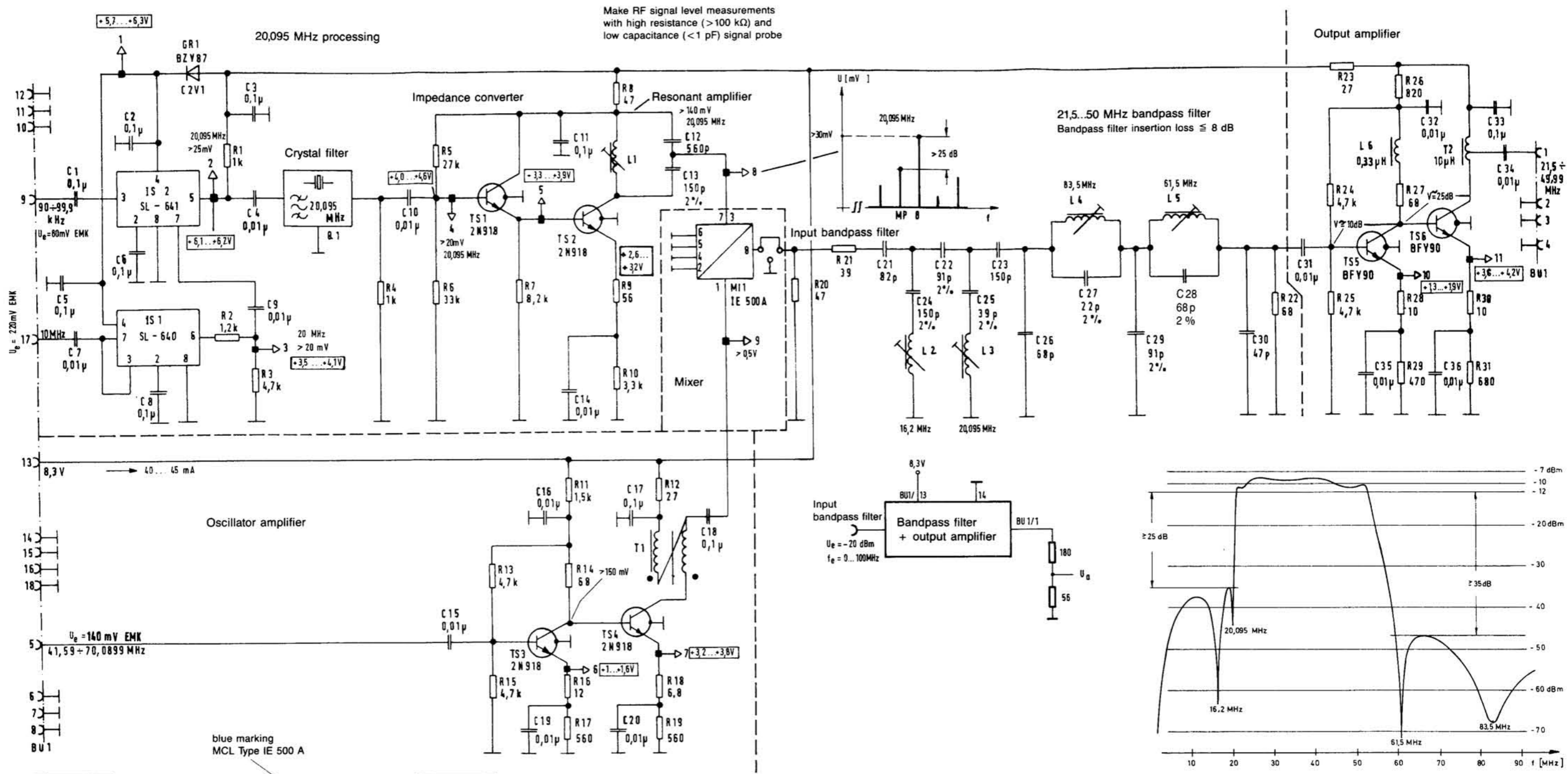


Downloaded by
RadioAmateur.EU

Circuit Diagram
for programmable Frequency Divider
Field Radio Unit SE 6861/12 mod
Annex 24

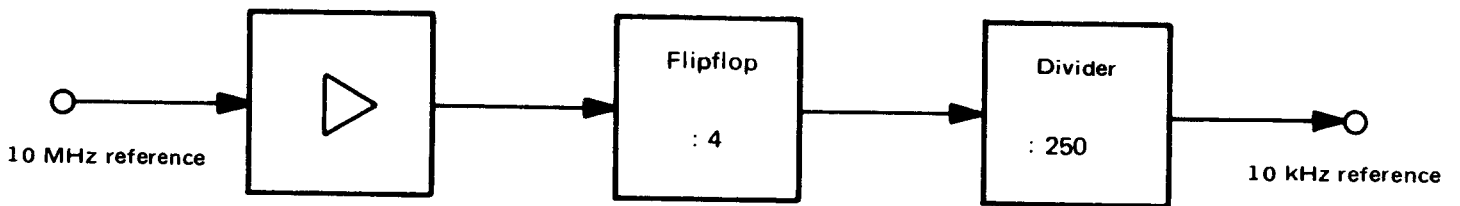


General Circuit Diagram
of Mixer Converter Module
Field Radio Unit SE 6861/12 mod
Annex 25

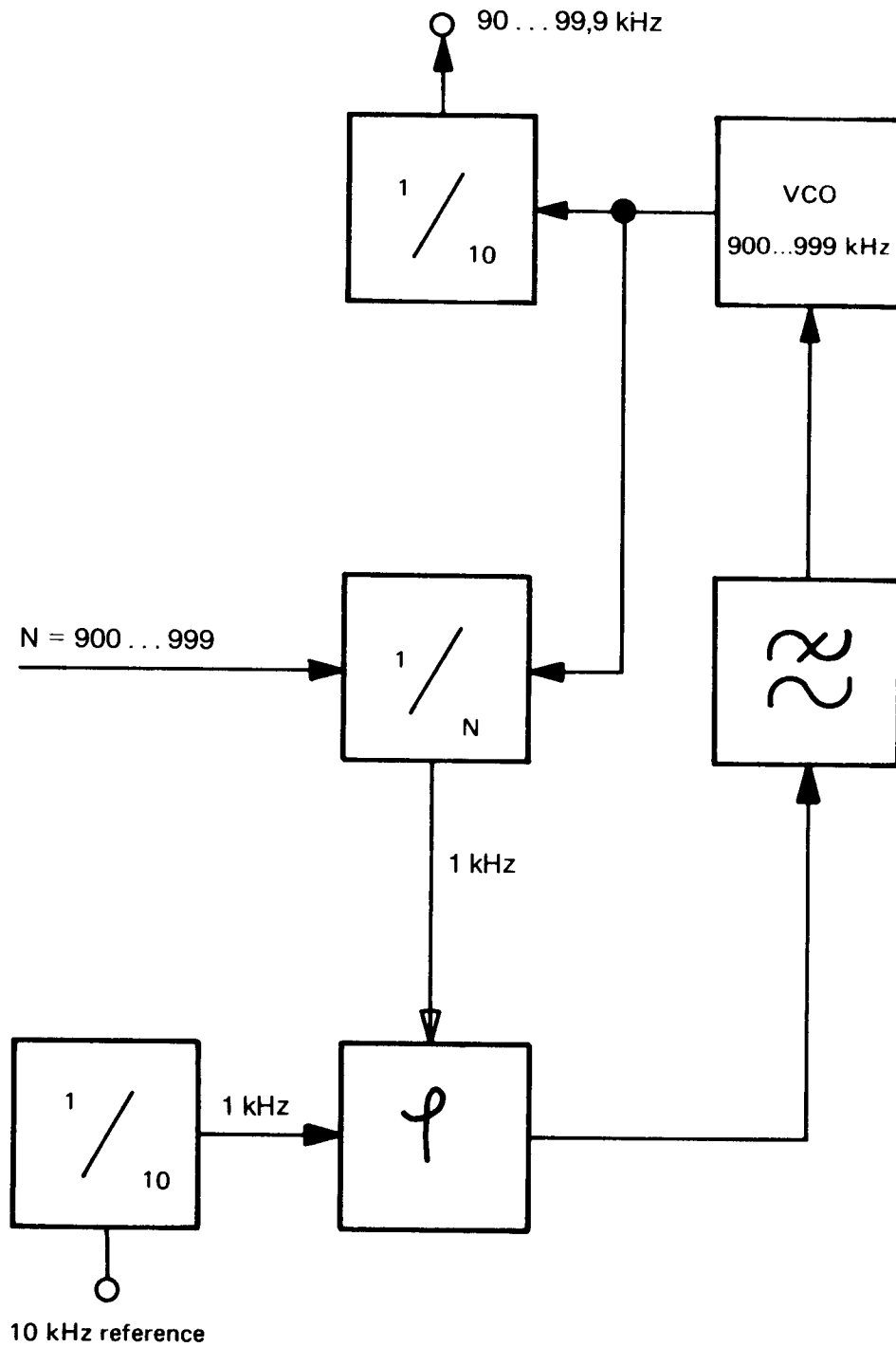


Add 4300 to each components number, before referring to the list of components.

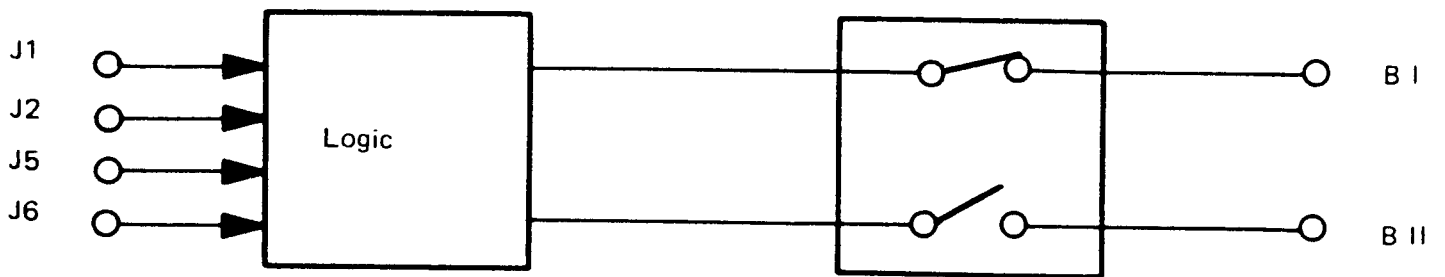
passband curve of bandpass filter and output amplifier



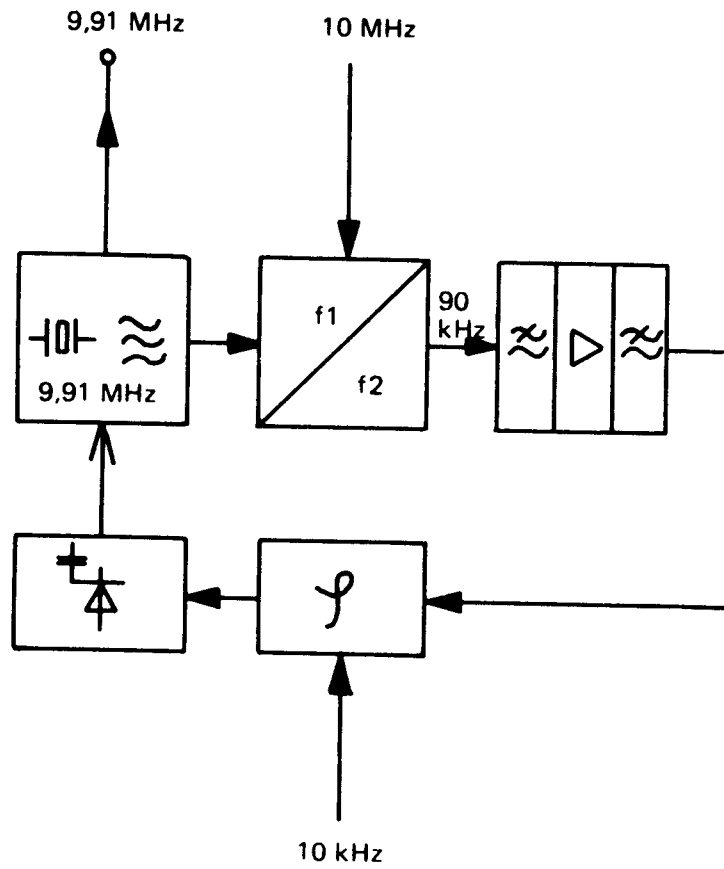
General Circuit Diagram
of 10 MHz Processing Circuit
Field Radio Unit SE 6861/12 mod
Annex 27



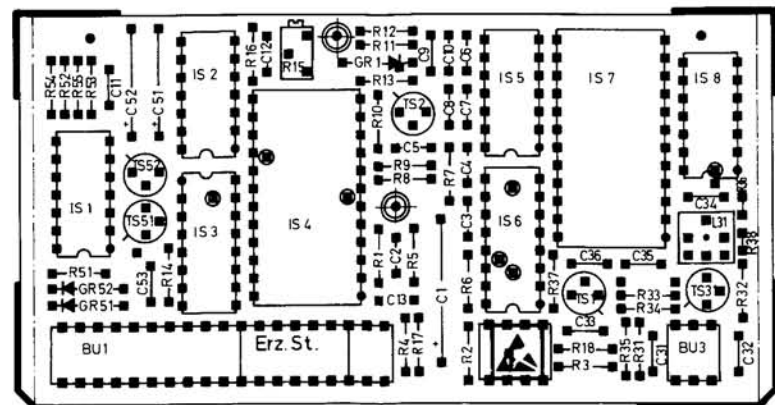
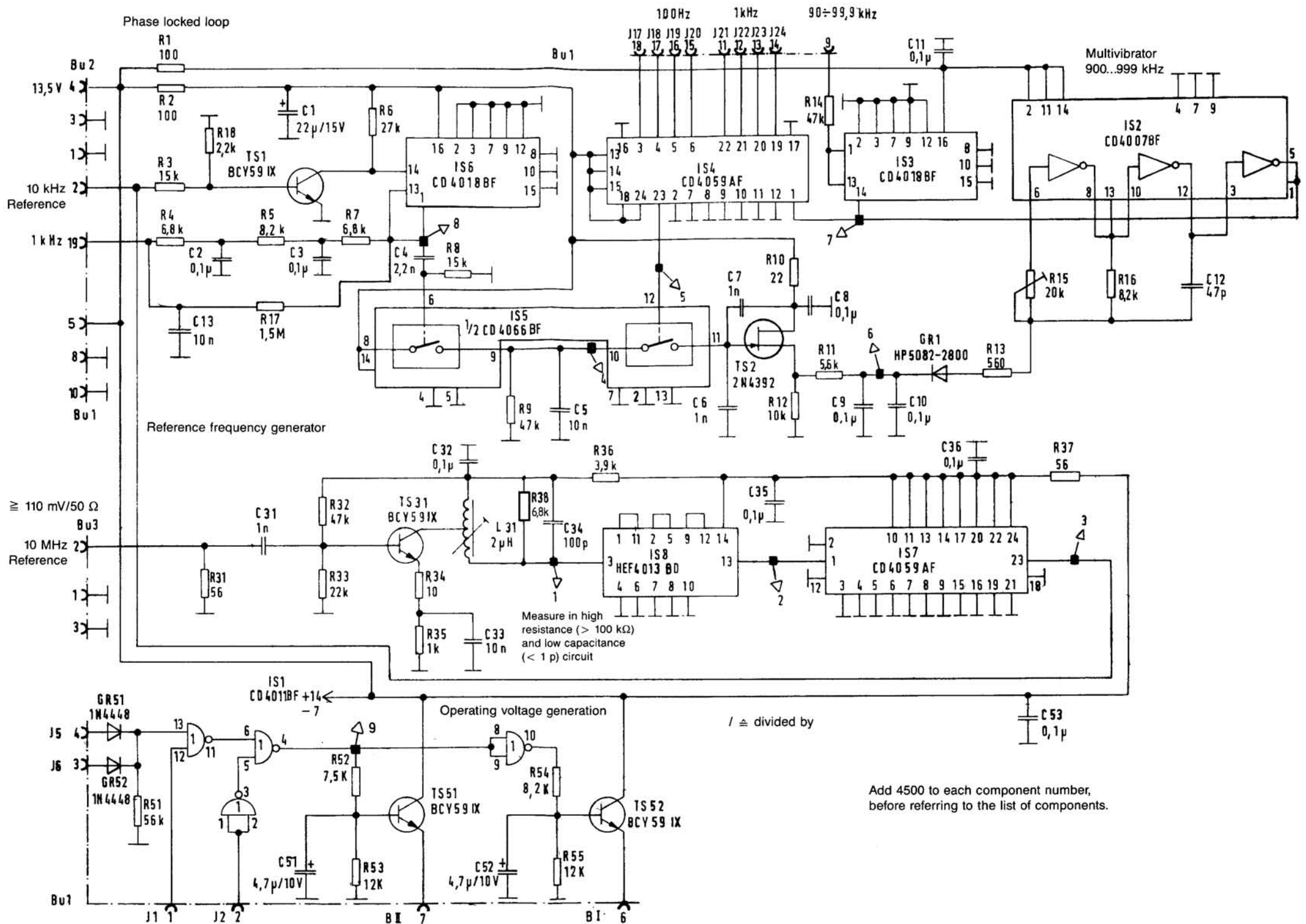
General Circuit Diagram
of 1 kHz Phase Locked Loop
Field Radio Unit SE 6861/12 mod
Annex 28

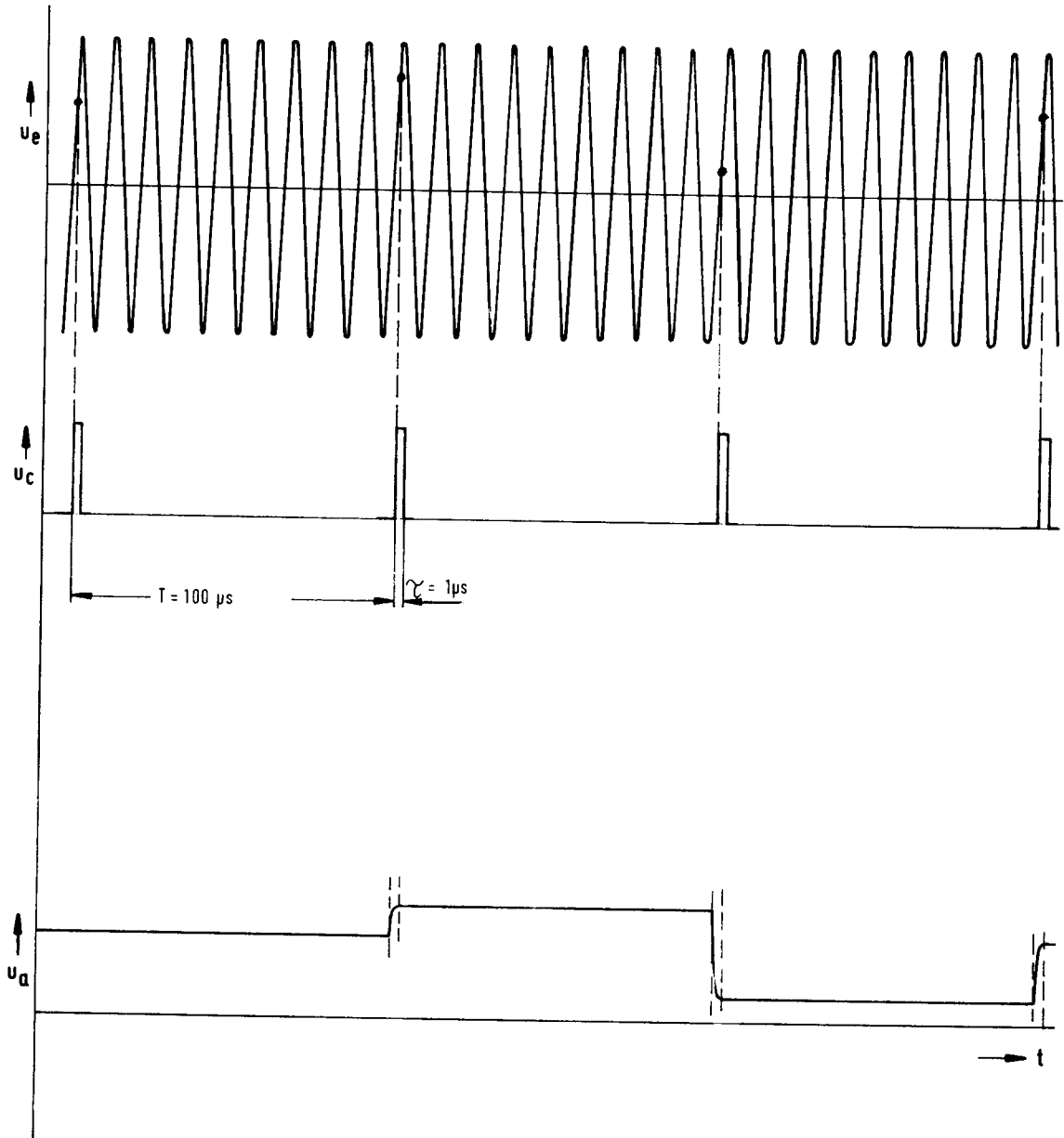
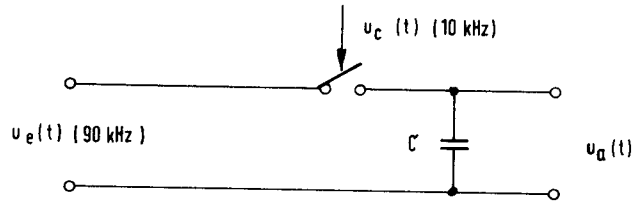


General Circuit Diagram
of Range Selection for Master Oscillator
Field Radio Unit SE 6861/12 mod
Annex 29

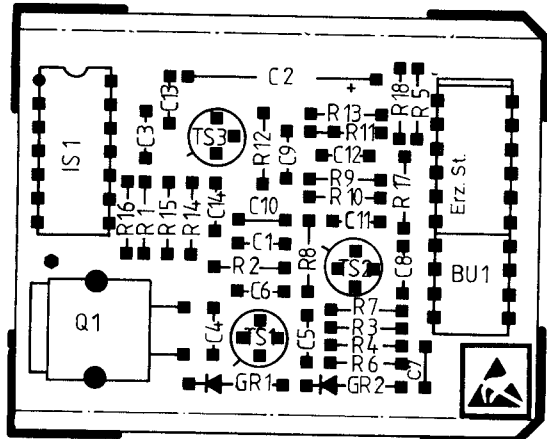
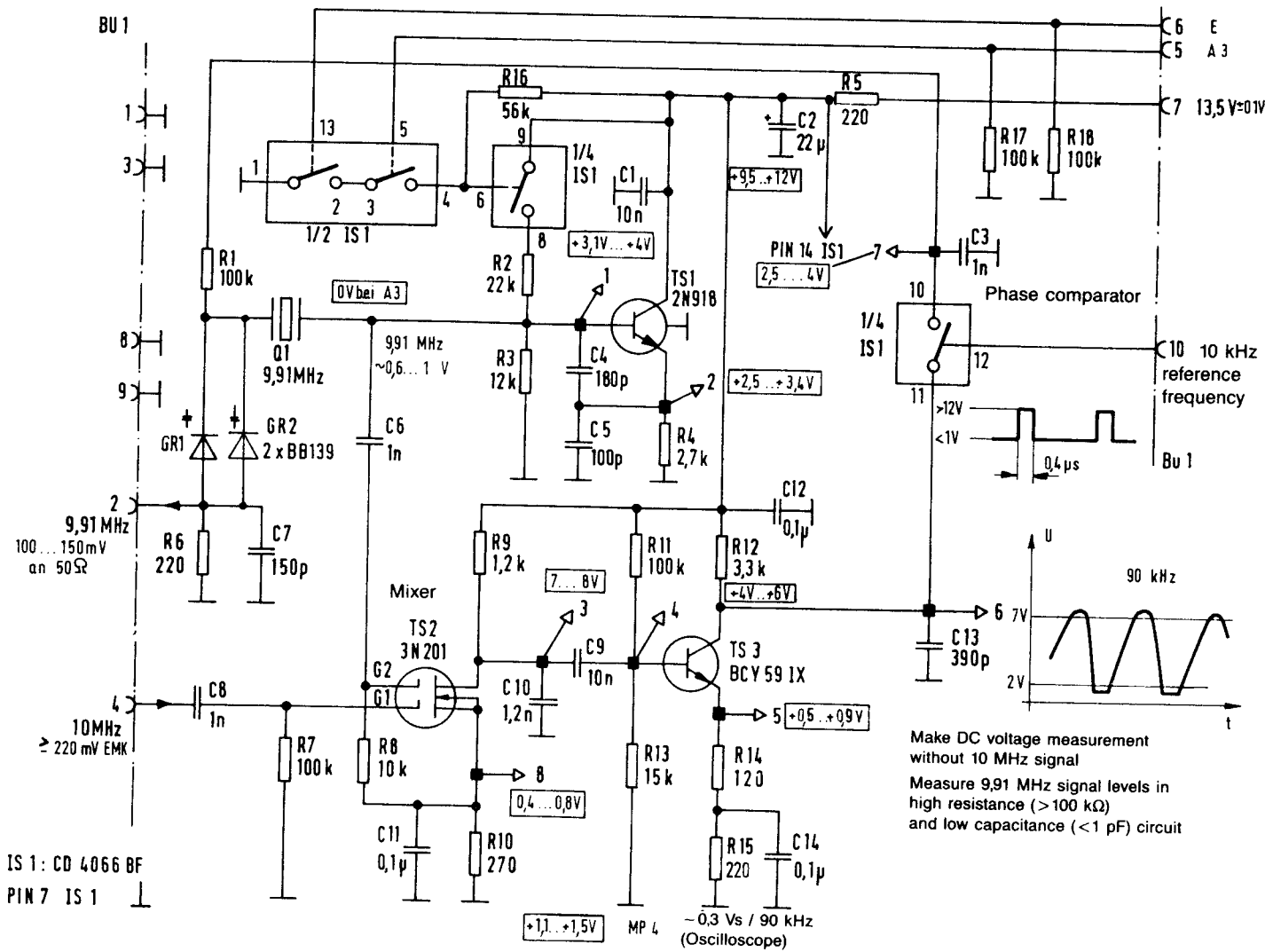


General Circuit Diagram
of Vernier Frequency Control Loop
Field Radio Unit SE 6861/12 mod
Annex 30



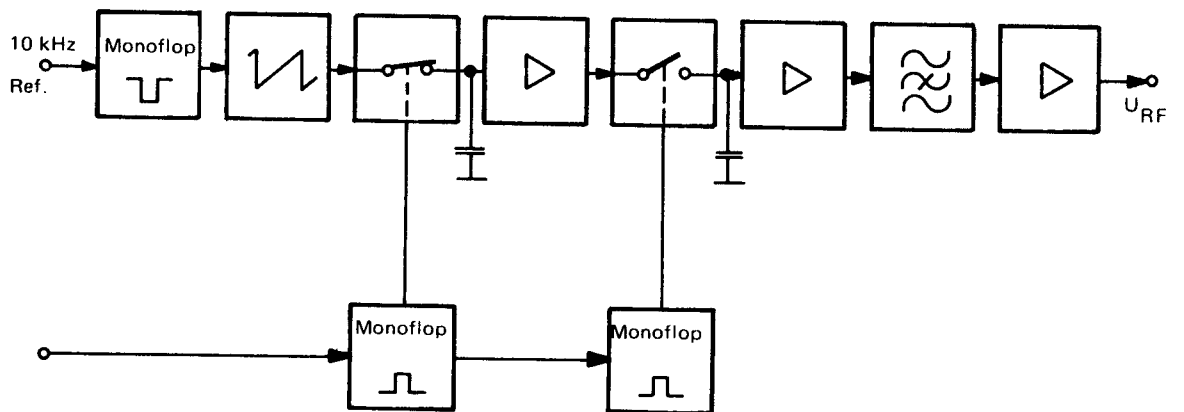


Pulse Diagrams
for Sampling Discriminator
Field Radio Unit SE 6861/12 mod
Annex 32



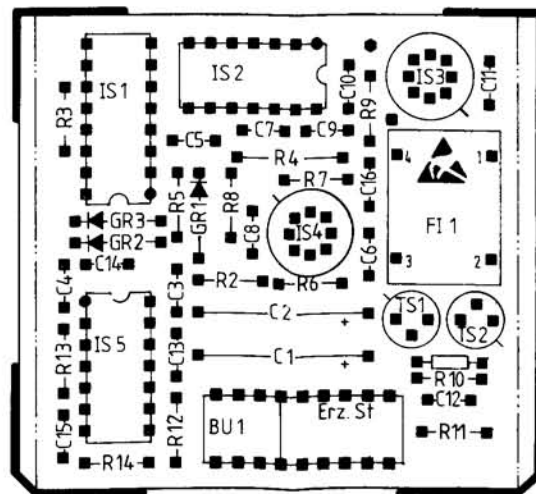
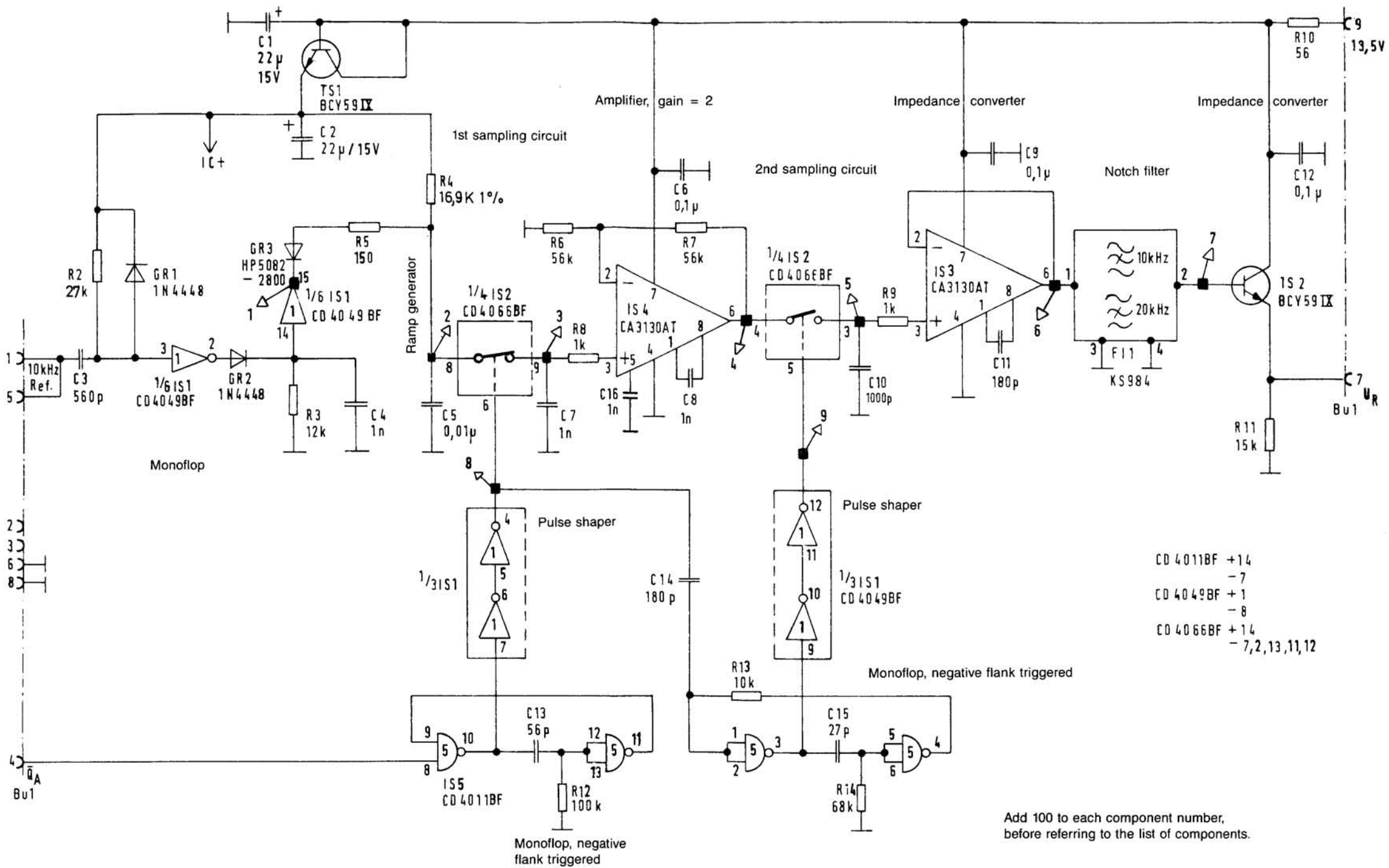
Add 4700 to each components number, before referring to the list of components.

Circuit Diagram
 for 9.91 MHz Phase Locked Loop
 Field Radio Unit SE 6861/12 mod
Annex 33

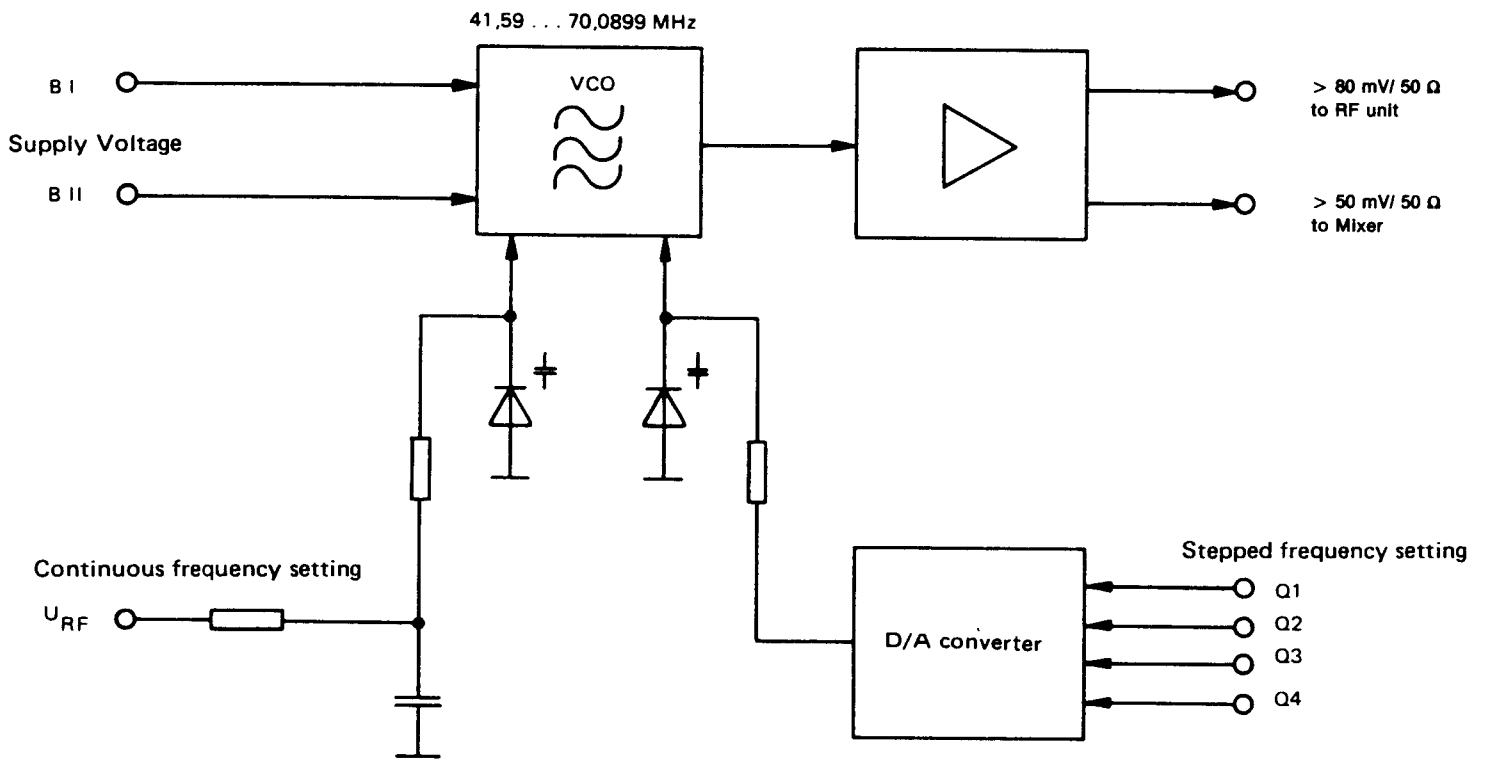


**Downloaded by
RadioAmateur.EU**

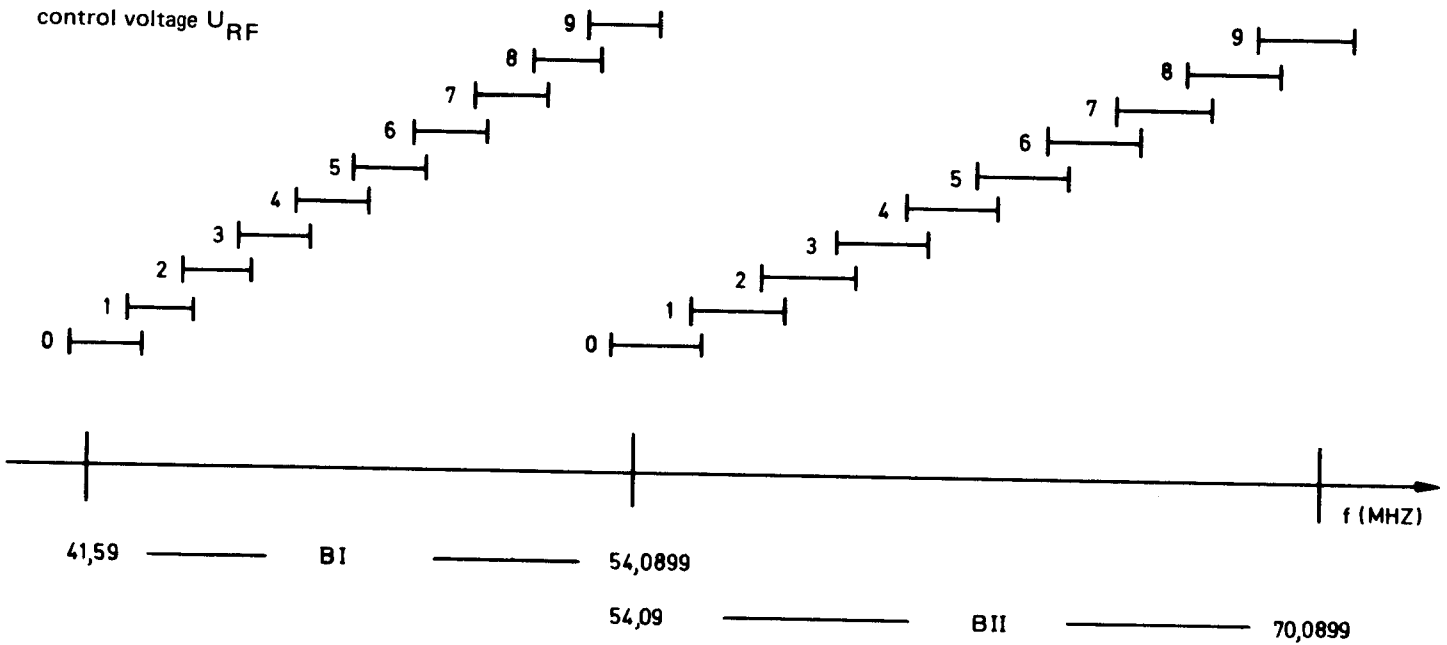
General Circuit Diagram
 of Phase Comparator
 Field Radio Unit SE 6861/12 mod
Annex 34



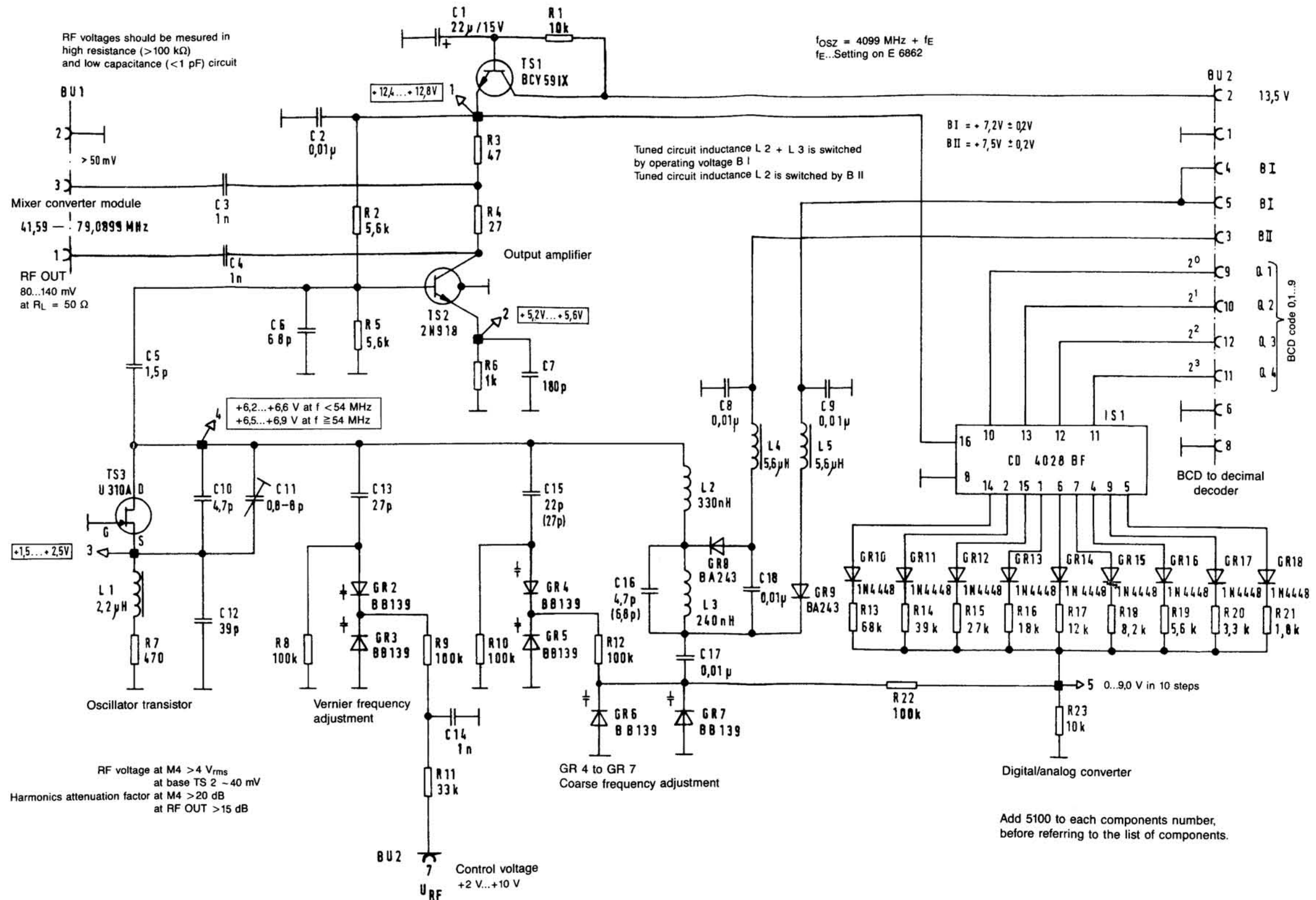
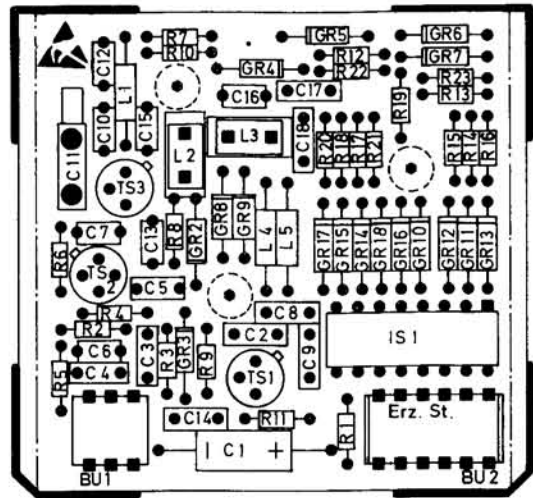
Circuit Diagram
for Phase Comparator
Field Radio Unit SE 6861/12 mod
Annex 35

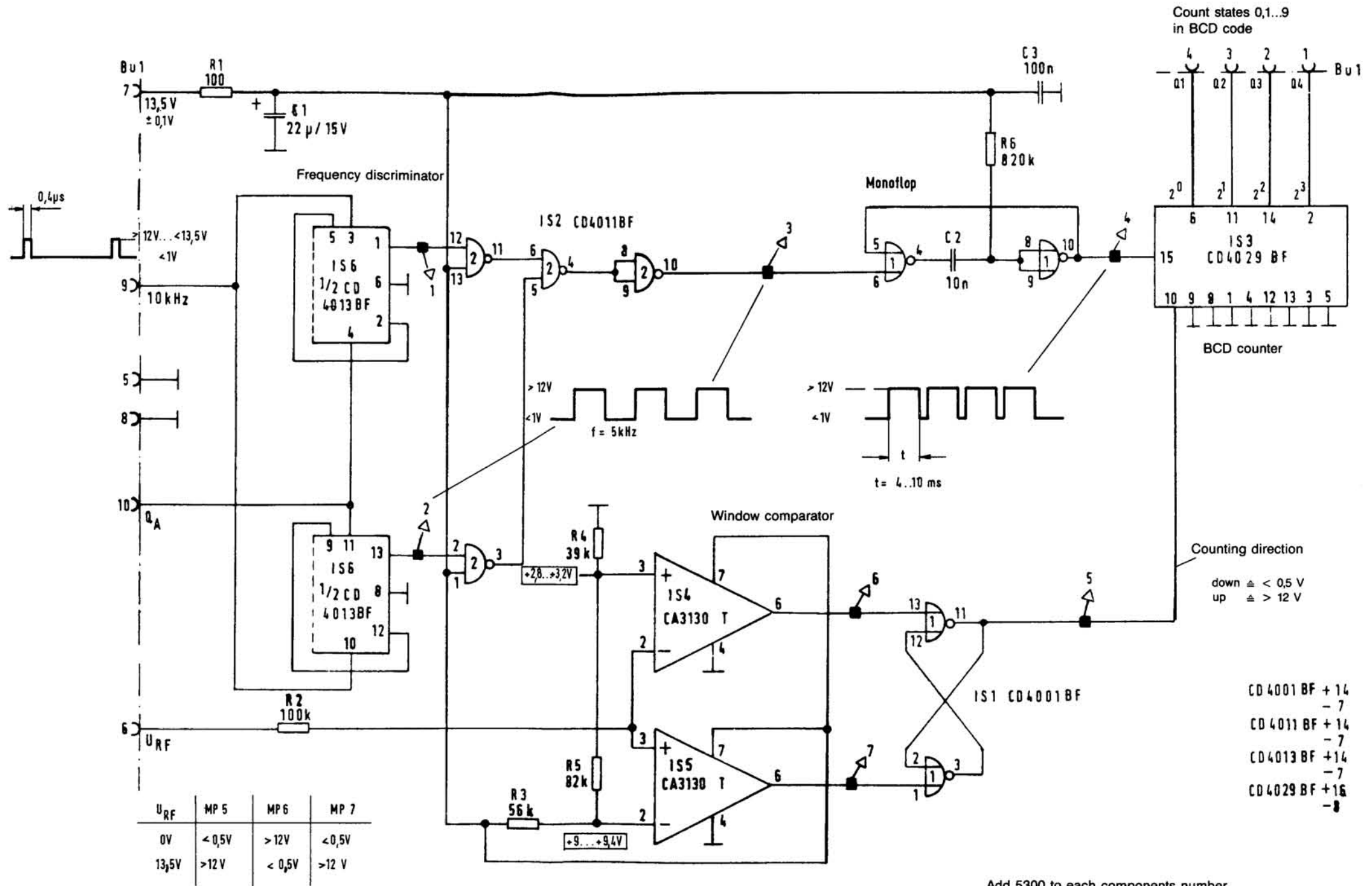
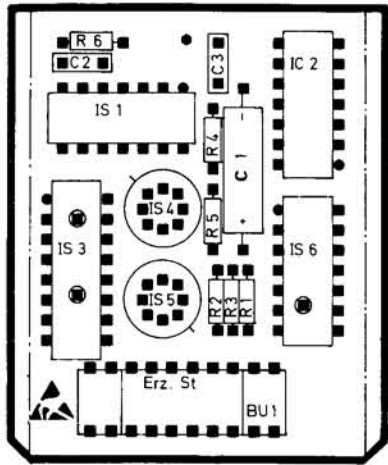


10 subranges
 are defined by 10 preset frequencies
 and the possible frequency variation with the
 control voltage U_{RF}



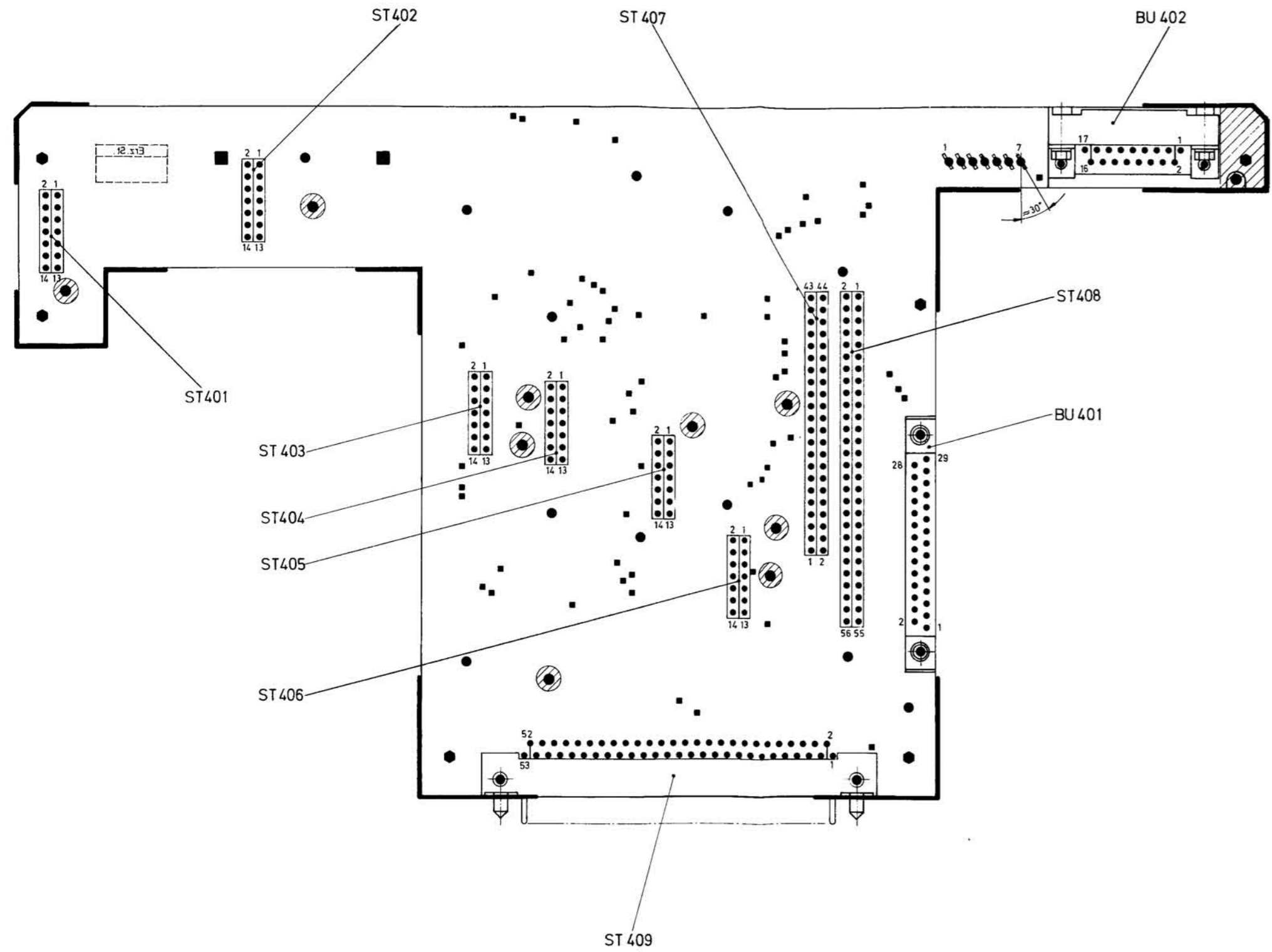
Subdivision of the
 Oscillator Frequency Range
 41.59 MHz to 70.0899 MHz
 Field Radio Unit SE 6861/12 mod
Annex 37



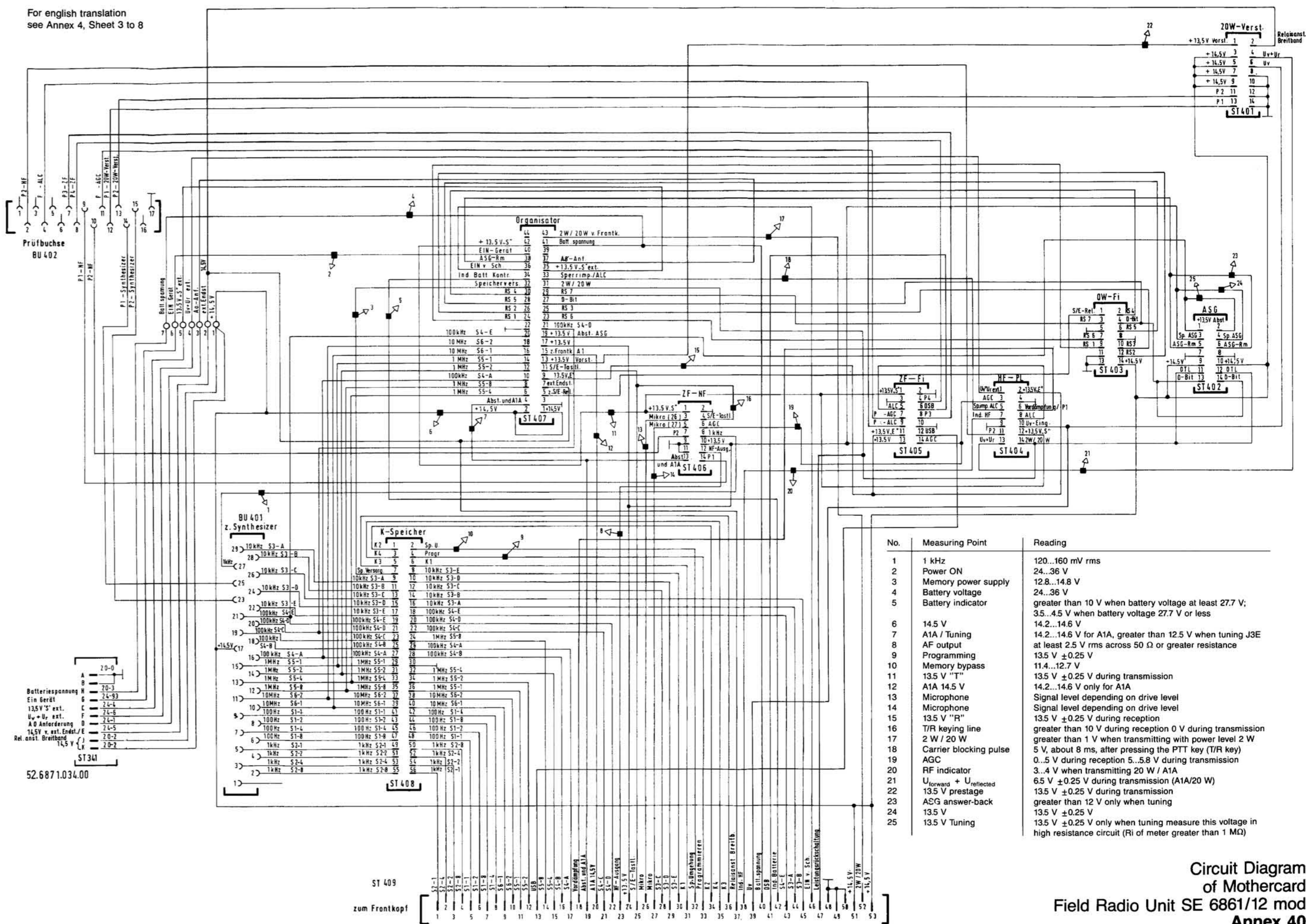


Add 5300 to each components number, before referring to the list of components.

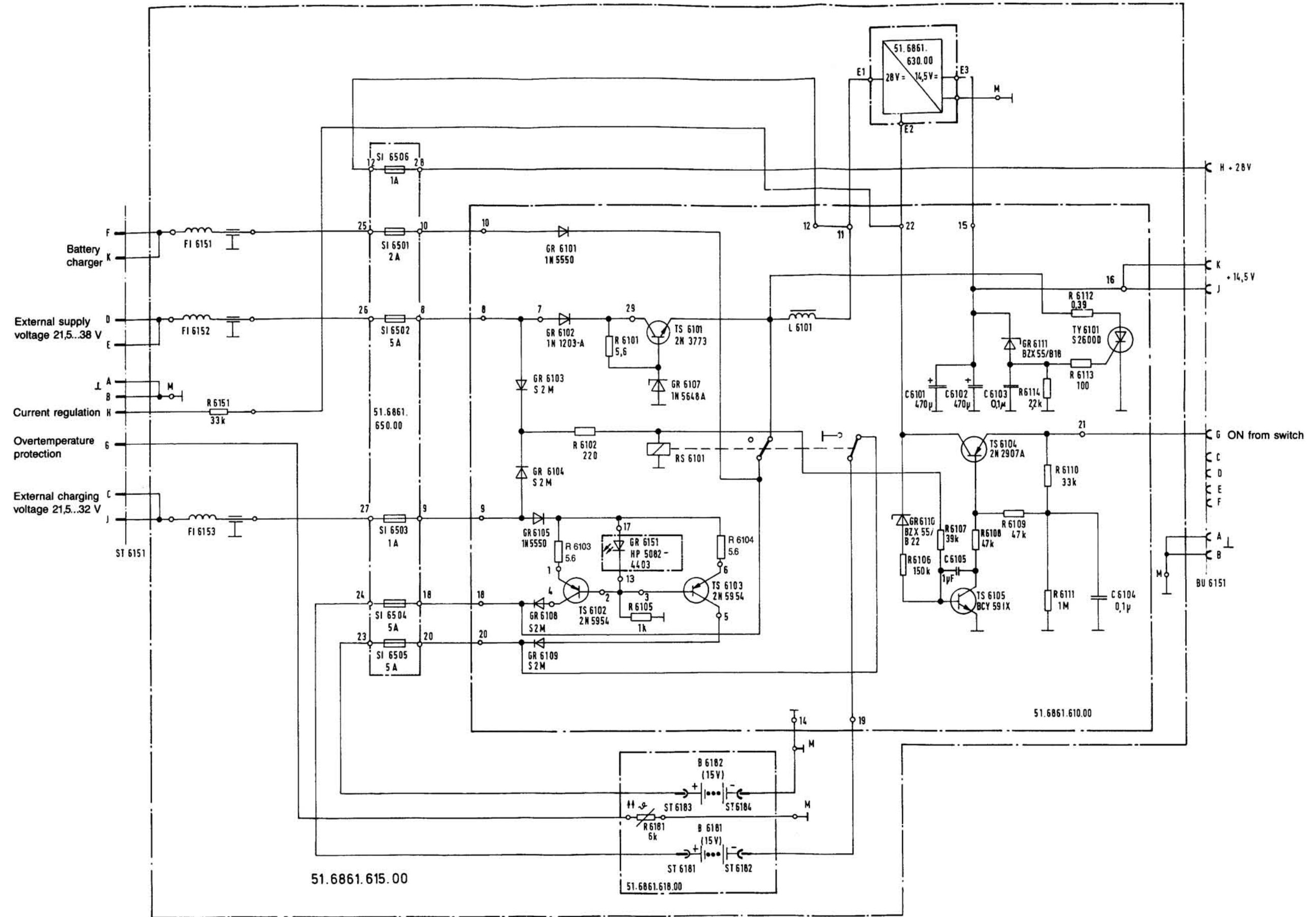
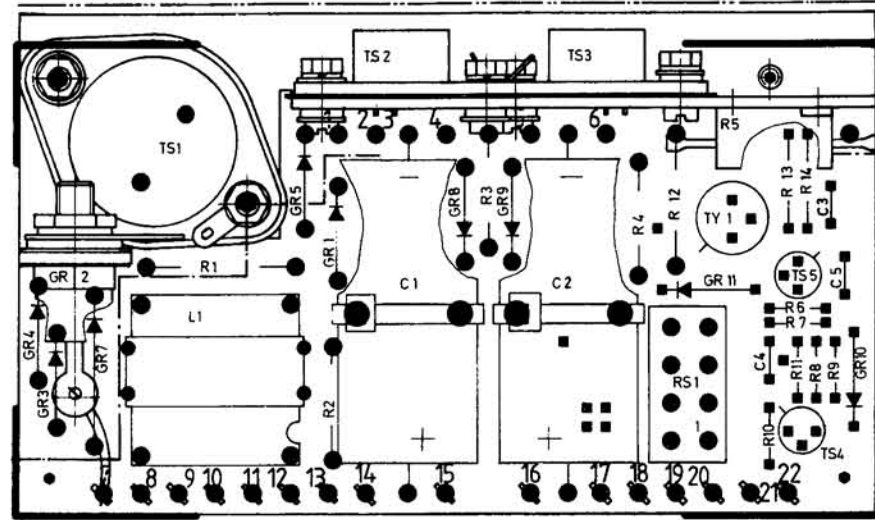
Circuit Diagram
for Digital Setting of the Oscillator
Field Radio Unit SE 6861/12 mod
Annex 39

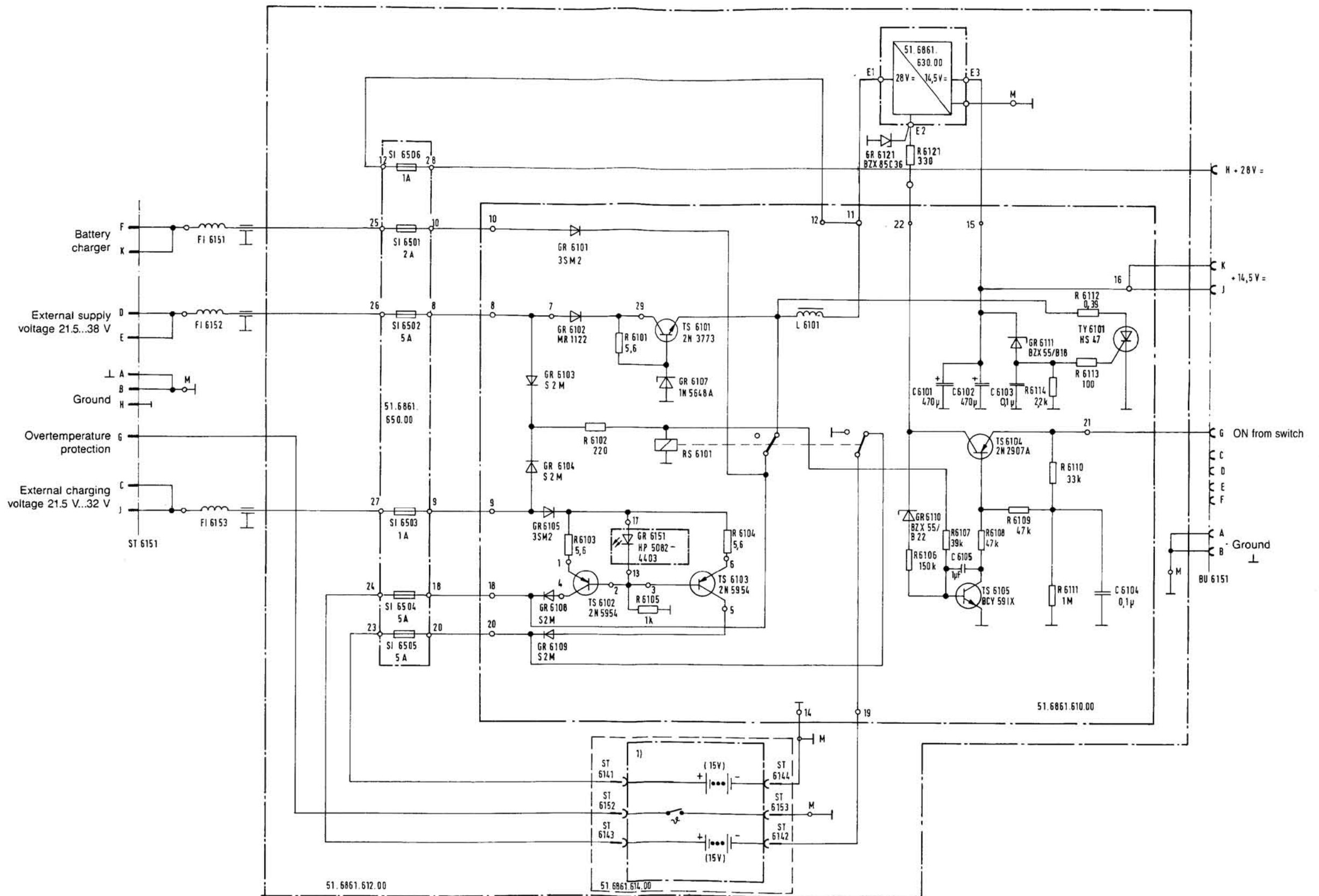


For english translation see Annex 4, Sheet 3 to 8

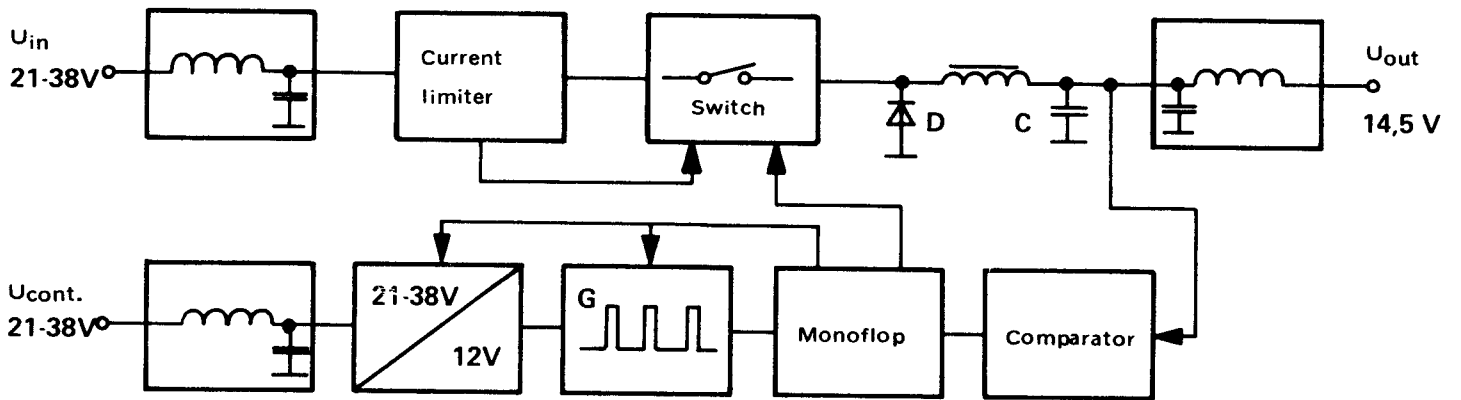


No.	Measuring Point	Reading
1	1 kHz	120...160 mV rms
2	Power ON	24...36 V
3	Memory power supply	12.8...14.8 V
4	Battery voltage	24...36 V
5	Battery indicator	greater than 10 V when battery voltage at least 27.7 V; 3.5...4.5 V when battery voltage 27.7 V or less
6	14.5 V	14.2...14.6 V
7	A1A / Tuning	14.2...14.6 V for A1A, greater than 12.5 V when tuning J3E
8	AF output	at least 2.5 V rms across 50 Ω or greater resistance
9	Programming	13.5 V ± 0.25 V
10	Memory bypass	11.4...12.7 V
11	13.5 V "T"	13.5 V ± 0.25 V during transmission
12	A1A 14.5 V	14.2...14.6 V only for A1A
13	Microphone	Signal level depending on drive level
14	Microphone	Signal level depending on drive level
15	13.5 V "R"	13.5 V ± 0.25 V during reception
16	T/R keying line	greater than 10 V during reception 0 V during transmission
17	2 W / 20 W	greater than 1 V when transmitting with power level 2 W
18	Carrier blocking pulse	5 V, about 8 ms, after pressing the PTT key (T/R key)
19	AGC	0.5 V during reception 5...5.8 V during transmission
20	RF indicator	3...4 V when transmitting 20 W / A1A
21	U _{forward} + U _{reflected}	6.5 V ± 0.25 V during transmission (A1A/20 W)
22	13.5 V prestage	13.5 V ± 0.25 V during transmission
23	ASG answer-back	greater than 12 V only when tuning
24	13.5 V	13.5 V ± 0.25 V
25	13.5 V Tuning	13.5 V ± 0.25 V only when tuning measure this voltage in high resistance circuit (Ri of meter greater than 1 MΩ)

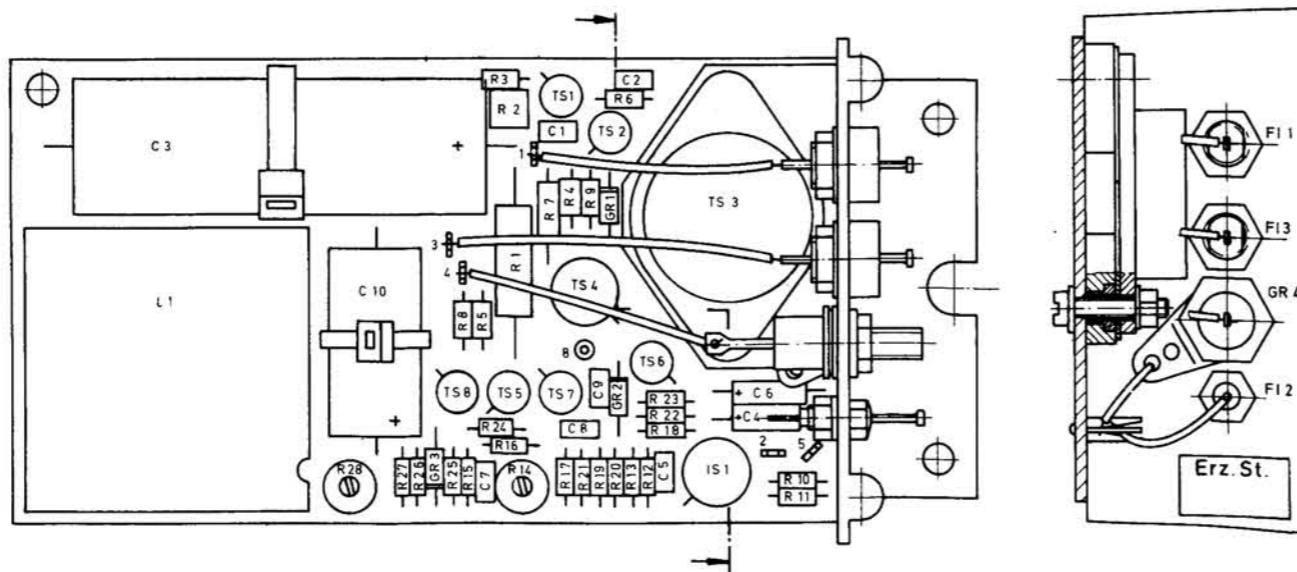
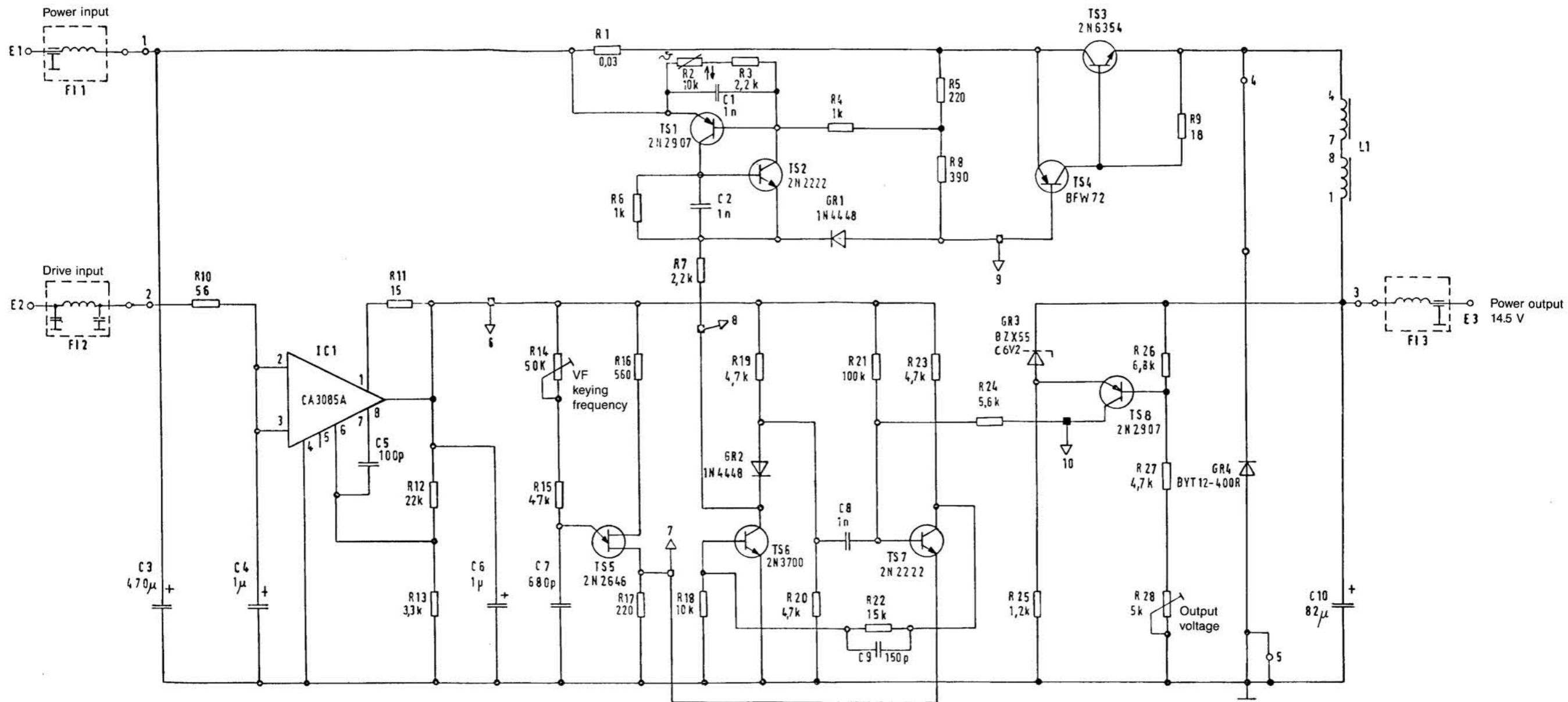




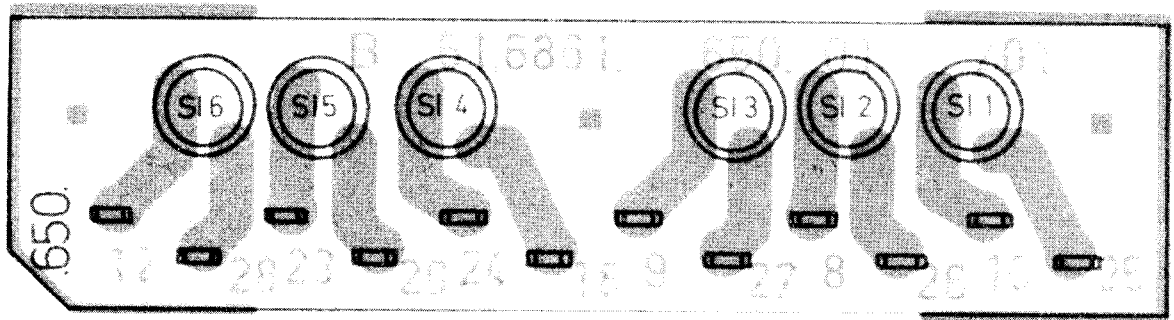
Circuit Diagram
of Battery Pack BT 6861/31
Field Radio Unit SE 6861/12 mod
Anlage 42



General Circuit Diagram
of DC/DC Converter
Field Radio Unit SE 6861/12 mod
Annex 43



Add 6300 to each component number, before referring to the list of components.



Add 6500 to each component number,
before referring to the list of components.