

ATR 57

VHF TRANSCEIVER



MAINTENANCE and REPAIR MANUAL

Handbook No.:001.1000

The following
MAINTENANCE and REPAIR MANUAL
 Has validity for the **ATR 57 Communications Transceiver**

LIST OF EFFECTIVE PAGES

The List of effective pages lists all the pages contained in the Maintenance Manual.

Page No.:	Issue
Cover	3-01
Section I 5 to 7	3-01
Section II 8 to 11	3-01
Section III 14 to 15	3-01
Section IV 17 to 17	3-01
Section V 18 to 23	3-01
Section VI 26 to 36	3-01
Section VII 38	3-01
Section VIII 39 to 40	3-01

Tabel of Contents

1 SECTION I GENERAL INFORMATION..... 5

1.1 INTRODUCTION 5

1.2 PURPOSE OF EQUIPMENT 5

1.3 Purpose of this equipment 5

1.4 DESIGN FEATURES 5

1.5 POWER REQUIREMENTS 5

1.6 Technical Characteristics 6

1.7 Manufacturer 7

1.8 Units and Accessories Supplied 7

1.9 Accessories Required but not Supplied..... 7

2 SECTION II Installation and Operation 8

2.1 General..... 8

2.2 Unpacking and Inspecting 8

2.3 Electrical Bench Test..... 8

2.4 Microphone connection 9

2.5 Intercom mode 10

2.6 ATR 57 INSTALLATION 10

2.7 Antenna Installation..... 10

2.8 Cabling..... 11

3	SECTION III Operation Instructions.....	14
3.1	Turn on.....	14
3.2	Volume control.....	14
3.3	Squelch level control.....	14
3.4	VOX level control for Intercom	14
3.5	Memory selector	14
3.6	Selecting and storing a frequency	14
3.7	Low-battery.....	15
3.8	Automatic frequency control	15
3.9	Transmitting mode	15
3.10	Receiving indication.....	15
4	SECTION IV Circuit Description.....	17
4.1	Introduction.....	17
4.2	General Circuit Theory	17
5	SECTION V Maintenance	18
5.1	INTRODUCTION	18
5.2	TEST EQUIPMENT	18
5.3	Alignment.....	19
5.4	IN AIRCRAFT TROUBLESHOOTING.....	20
5.5	OVERHAUL	21
5.6	GENERAL.....	23
6	SECTION VI PART LIST.....	26
6.1	PC Board: HF Platine (Rev 1.4).....	26
6.2	PC Board: NF Platine (Rev 1.5).....	32
6.3	PC Board: Kopf1 (Rev 1.2).....	36
7	SECTION VII PERFORMANCE TEST REPORT ATR57.....	38
8	SECTION VIII Certifications.....	39
	EuroCAE EC-Type Approval Certificate Ecanadian Certificate.....	39
	Ecanadian Certificate	40

Schmatics see ANNEX

1 SECTION I GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains information relative to the physical, mechanical and electrical characteristics of the communications transceiver ATR 57 manufactured by Filser Electronic GmbH .

1.2 PURPOSE OF EQUIPMENT

1.3 Purpose of this equipment

The Filser ATR 57 is a VHF Communication transceiver covering the aeronautical radio frequency range from 118,00MHz to 136,975 MHz in 25 KHz increments with 720 channels.

The ATR 57 was designed that all operational requirements encountered in VFR flying can be met. The Communication transceiver is designed as a single block unit with 57mm diameter for instrument panel or consul mounting. It is fastened by four (4mm) screws. All controls and indicating displays are located on the front panel. The rear panel of the unit locates the connector (sub D9) for connecting the aircraft wiring. The VHF Antenna is connected to the BNC socket.

The volume and squelch level can be selected easily.

The Unit can store 9 VHF frequencies in the memory for faster access in operation. The Filser ATR 57 also contains an Intercom facility controlled by a special feature VOX (Voice Operated X-mission). This is a voice level controlled switch for the headset to turn off the background while no speaking. For good VOX performance identical Microphones should be used and a correct input level must be set. Two Microphones and Two Headphones and an additional speaker can be connected to the unit. For Intercom operation with a bad Microphone selection an optional Intercom switch can be installed to turn off the background manually.

1.4 DESIGN FEATURES

A. Controls

- Multi Function Control
- On Off Switch
- Volume Control
- Automatic squelch eliminates pilot responsibility for continuously monitoring squelch adjustment. Squelch threshold automatically adjusts to open on readable signals. SQ switch in pulled opens squelch to test COMM receiver sensitivity and to listen extremely weak signals.

B. Electronics

- Transistorized transmitter provides 1 watts minimum output power and long term reliability.
- The digital frequency synthesizers utilize state of the art integrated circuits to replace all but 1 crystal.
- Crystal filter selectivity.
- Carrier controlled squelch with carrier squelch back up functionally described above.
- Tight AGC (typically 0.5 dB from μV to 100 mV) minimizes audio level variations.

C. Construction

- Modular construction for simple maintenance.
- Rack mounted, removable from the front panel.
- Anti-theft locking mechanism.

1.5 POWER REQUIREMENTS

The ATR 57 requires 10,5V DC to 16V DC for proper operation.

1.6 Technical Characteristics

ATR 57 Transceiver	
Specification	Characteristic
Certification:	Reg TP 321 ZV 034
Environmental Temperature Range Altitude	-20°C to +55°C 35.000 ft
MOUNTING:	Panel mounted, no shock mounting
SIZE:	57x57x160 mm
WEIGHT:	500 gr. excluding external connectors and harness.
Power Requirements: COMM Receive COMM Transmit (Tone) CHRYSTAL CONTROLLED: FREQUENCY RANGE: FREQUENCY STABILITY:	13.75 V (10,5V to 16V) 100mA 1.0 amps 760 channels 118.00 to 136.975 MHz with 25 kHz ± 0.002 %

ATR 57 TRANSMITTER	
Specification	CHARACTERISTICS
VHF POWER OUTPUT:	Min. 1W/50 Ω load
Modulation:	70% modulation capability with 90% limiting, less than 15 % distortion at 80 % mod.
Microphone:	Electret or dynamic mike (adjustable)
Duty Cycle:	5 minutes on, 5 minutes off (50 %)

ATR 57Receiver	
Specification	Characteristics
Sensitivity:	1.5 µV will provide a 6 dB minimum signal plus noise to noise ratio
Selectivity:	Typical 6 dB at ± 8 kHz, 70 dB at ± 25 kHz
Spurious Responses:	Down al least 60 dB
Squelch:	Automatic squelch (carrier to noise) with manual disable and carrier squelch override.
AGC-	From 5 µV to 20.000 µV audio output will not vary more than 0.5 dB.

1.7 Manufacturer

Filser Electronic GmbH
Gewerbstrasse 2, 86875 Waal, GERMANY
Tel.: +49 8246/9699-0, Fax.: +49 8246/1049
email: filser_electronic@t-online.de
Homepage: www.filser.de

1.8 Units and Accessories Supplied

- ATR 57 COMM
- ATR 57 installation kit includes mating connectors, radio rack mounting hardware, etc.

1.9 Accessories Required but not Supplied

- Communication antenna and cables
- Headphones and speaker
 - Headphones: Low impedance types, 200 to 1000 ohms.
 - Speaker: Voices coil impedance 4 to 8 ohms nominal.
- Microphone: Low impedance carbon, or dynamic with transistor pro-amp, when using „Carbon-Mike-adjustment“, low impedance dynamic microphone when using „Dynamic-Mike-adjustment“.

2 SECTION II Installation and Operation

2.1 General

This section contains suggestion and factors to consider before installing the ATR 57. Close adherence to these suggestions will assure a more satisfactory performance from the equipment.

2.2 Unpacking and Inspecting

Exercise care when unpacking each unit. Make a visual inspection of each unit for evidence of damage incurred during shipment. If a claim for damage is to be made, save the shipping container to substantiate the claim. When all equipment is removed, place in the shipping all packing materials for use in unit storage or reshipment. The ATR 57 installation will conform the standards designated by the customer, installing agency and existing conditions as to unit location and type of installation.

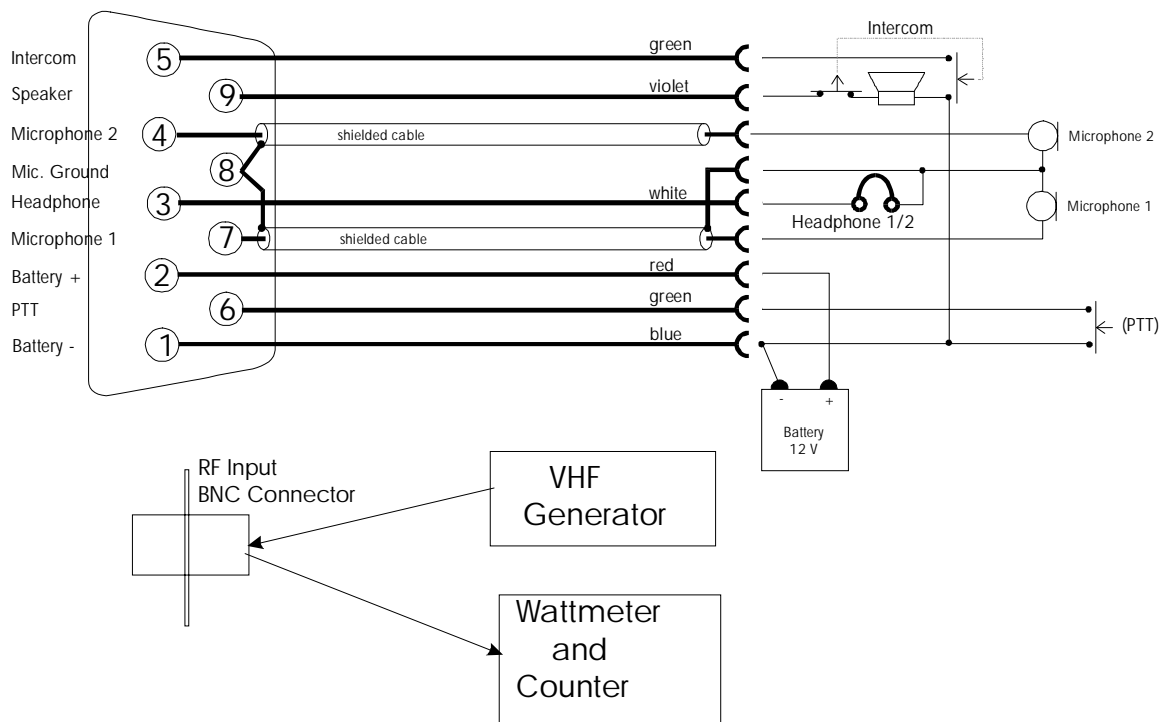


Figure 2-1 BENCH TEST SET UP

2.3 Electrical Bench Test

Test Equipment Recommended

1. VHF Signal Generator: HP Model 608D or equivalent.
2. RF Power Wattmeter: Bird Truline Model 43 or equivalent.
3. Regulated DC Supply with 12 to 15 Vdc at 2 amperes capability.
4. Frequency Counter: HP Model 5383 A or equivalent.
5. Oscilloscope: National VP 5510 A or equivalent
6. Speaker Load Box: with 4 watt capability.
8. Audio-Detector: Texscan Model DC-50 or equivalent.
9. Low Impedance microphone that will be used in the aircraft.

2.3.1 Test Procedure

1. Connect the Comm Unit into the test set-up, diagramed in Figure 2-1, and set the DC supply for 13,75 VDC.
2. Connect the VHF signal generator to the RF input, set the generator output level to 1.5 μ V with 30 % - 1 kHz modulation.
3. Set the COMM VOLUME CONTROL for a 100 mw reading on the speaker output.
4. Remove the modulation, look for a 6 dB change on the speaker output meter.
5. Disconnect the signal generator. Connect the RF wattmeter and frequency counter as diagramed in Figure 2-1.
6. Connect the wattmeter to RF input. Key the transmitter and talk into the microphone.
7. With the transmitter keyed, use the frequency counter to check the Unit's frequency programming. Check all kHz steps from 118.000 MHz to 118.975 MHz and all MHz steps form 118.000 MHz to 135.000 MHz.

2.3.2 Microphone Adjustment

It is recommended that the microphone adjustment be performed while the Unit is on the bench using the aircraft's microphone(s). This adjustment can be made in the aircraft, however, it would require removal and insertion of the unit since the MIKE SELECTOR is located on the side of the chassis. Should the aircraft be equipped with more than one microphone, then the type of microphones should be identical.

2.4 Microphone connection

The ATR57 has two microphone inputs :Mic 1 and Mic 2.

- Mic 1 input for Electret microphone or dynamic microphone with preamplifier (50 mV to 2Vpp) adjustable with the Mic Level control. This input provides a bias voltage of 9V at 330 Ohm. For dynamic microphone a switch (Mic Setting) located at the top side of the unit (see diagram below) is used to select the input level for 5mV to 10mV without the bias . Factory setting is Electret.
- Mic 2 input is for Electret microphone only (50 mV to 2Vpp) adjustable with the Mic Level control.

The Mic Level control is located at the top of the unit.

If two Electret microphone are used they must have equal output levels for proper intercom operation, also the Mic Level controls for Mic 1 and 2 are simultaneous.

Factory setting is to standard Electret (ECM) microphone (50mV to 2V).

2.4.1 Microphone level check

- To get a reference for a correct MIC-level make sure that the VOX-value is at 16. With a headset the level can be checked, by speaking at the normal distance to the Mic and increasing the Mic Level until the VOX turns on and off at a satisfying level.

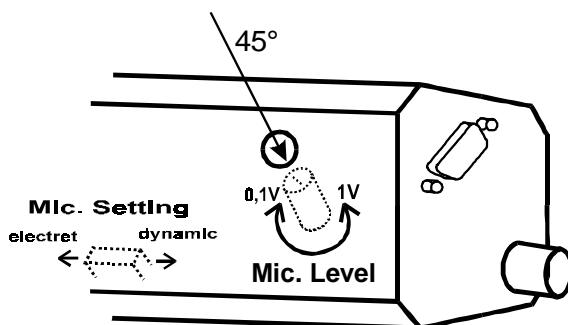


Diagram for Mic Level and Mic Switch

2.5 Intercom mode

With Intercom two crew members can talk to each other over the ATR 57 system. This of communication takes place only internally, there is no transmission.

A special feature is the **VOX (Voice Operated Transmission(x))**. The Intercom is opened only if one of the crew members is speaking. This avoids having all the time surrounding noise on the headphone. The opening level for the VOX is adjusted as described in para. 3.4.(VOX level control for intercom). Only if the transmission key (PTT) is pressed, the radio will change to the transmission mode. For best results microphones which produce almost the same output level should be used. The use of very different microphones can lead to the fact, that the member with the lower output level can not open the VOX.

The best solution are identical amplified electret-microphones.

The optional Intercom for operation without VOX switch must be mounted externally. If it is not used the corresponding wire must be connected (switched) to GND.

2.6 ATR 57 INSTALLATION

Listed below are factors and suggestions to consider before installing your ATR 57 system. Close adherence to these suggestions will assure more satisfactory performance from your equipment.

- The ATR 57 is mounted in the panel with the four screws in instrument head. The cut-out diameter for placing the ATR 57 in the panel is standard 57mm.
Tip: Look for a place in the panel which provides easy installing, a good view and reachability for the pilot sitting in normal position.
- Avoid mounting near hot places. You do not need any external cooling device like a fan or similar.
 - You should pay attention having enough space behind the backside of the ATR 57 for connectors and cables. The cable harness should be as short as possible. Avoid that cables run near strong RF noise sources like the ignition coil, generator or battery charger. This can cause a low frequency noise in the speaker.
 - Avoid mounting close to any high external heat source. If this is done, no blower will be required.
 - The installing agency will supply and fabricate all external cables. The plugs required are supplied.
 - Secure the ATR 57 to instrument panel per Figure 2-3. The mounting holes must be attached to a structural segment of the panel by means of support brackets, in order to avoid vibration.

2.7 Antenna Installation

A conventional 50 ohm vertically polarized COMM antenna is required. Vertical bent whip antennas are not recommended. Wideband COMM antennas provide efficient operation over the COMM band. Antennas should be installed by manufactures recommendations. Additional recommendations are as follows:

- Unsymmetrical antennas (e.g. $\lambda/4$ -Antenna) should be mounted on plane metal surfaces or metal plates of at least 50 x 50cm.
- The COM-antenna should have the maximal possible distance to the NAV-antenna in order to avoid interference.
- The antenna should be well distant from the engine(s) and propeller.
- The COMM antenna should be well separated form any NAV Antenna to minimize COMM interference to NAV while transmitting.

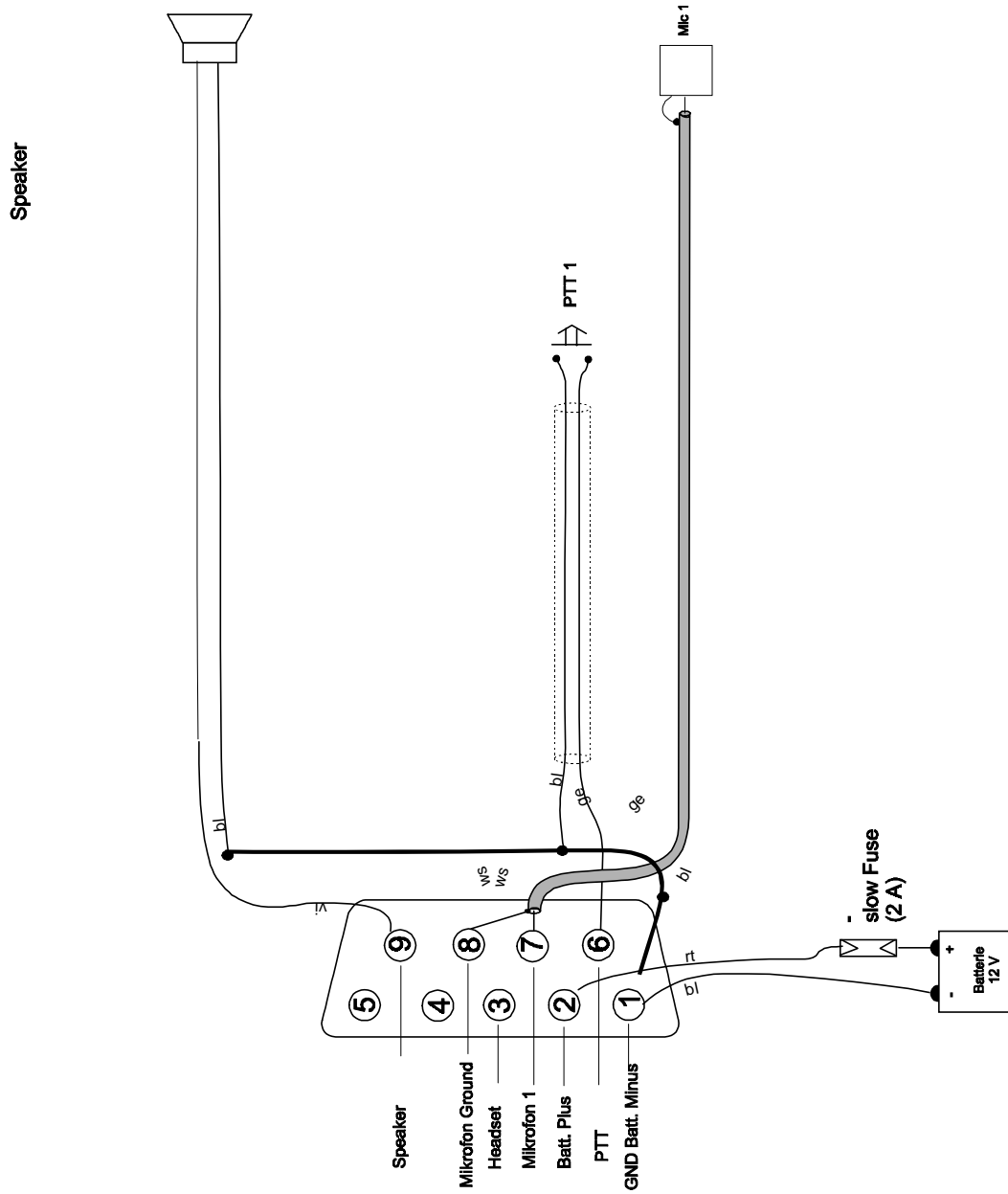
2.8 Cabling

- The length and routing of the external cables must be carefully planned prior to installation. Avoid sharp curve.
- Fabricate the external cables in accordance with the installation drawing that fulfills the system requirement.

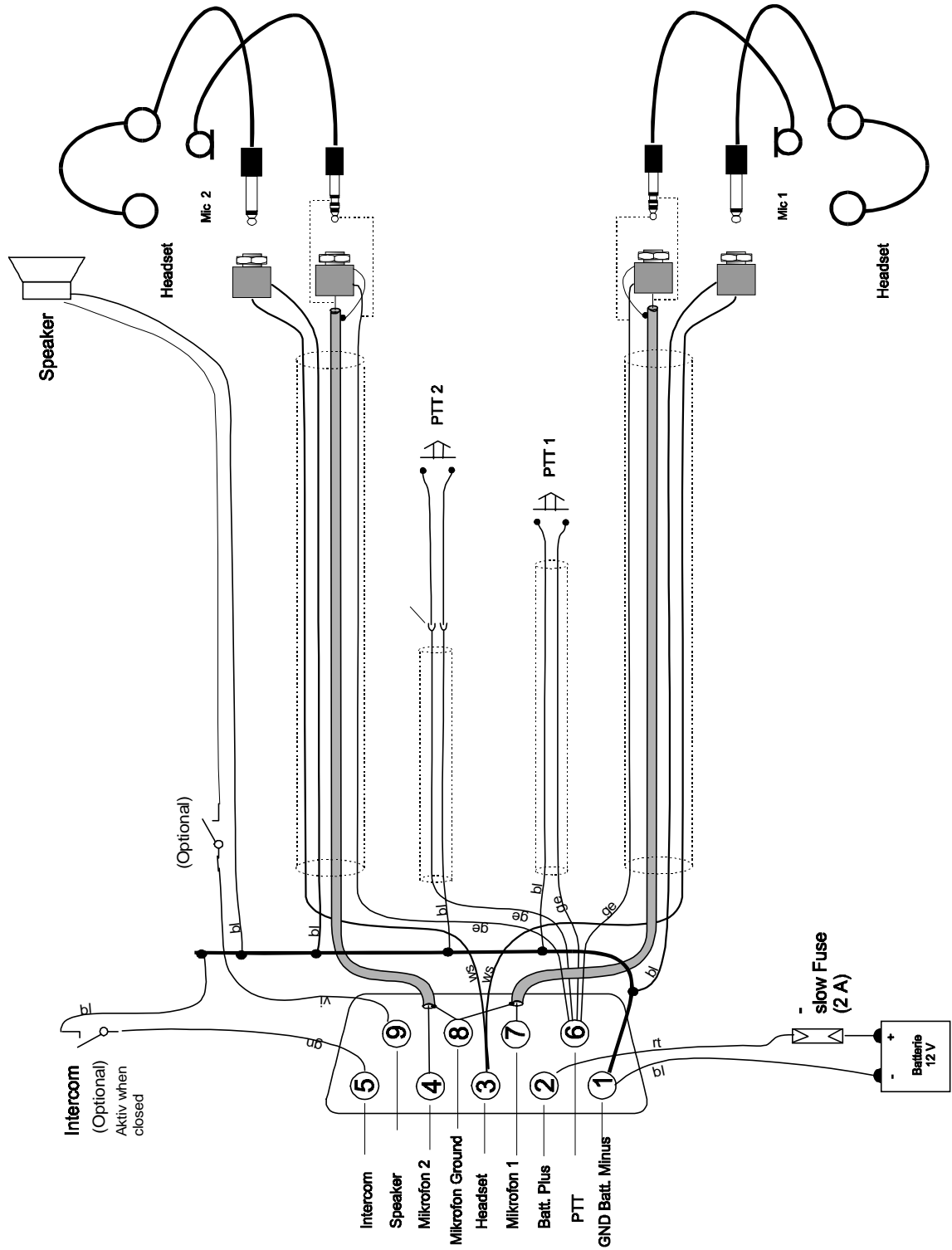
N O T E

Use good quality avionic stranded cables (for example RG58) with at least 600 volt insulation. It is recommended that the mike audio line is shielded.

Since other radio equipment will possibly utilize the same speaker circuits for muting, speaker selection and microphone switching must be devised by the installing agency.



Installation wiring diagram for glider installation



Installation wiring diagram for double installation with intercom

3 SECTION III Operation Instructions

3.1 Turn on

The „ON-OFF“-switch (2) is mounted on the left side of the unit. The radio is active, when the switch position is in „ON“ (upper position).

3.2 Volume control

Push the **VOL-SQ** button once to get into the Volume mode (Display shows **VOL: 01** to 33). By turning the big knob (4) the Volume can be changed to the desired volume. The unit will leave the Volume mode, if a another frequency is selected by **MEM** or if the **VOL-SQ** push-button is pressed again. The selected level is active until the ATR 57 is switched off. To use this level as switch on default, push the **STORE** button (6) while the device is in the Volume mode. For confirmation the ATR 57 shows „**ST**“ in its display.

3.3 Squelch level control

Push the **VOL-SQ** button twice to get into the Squelch mode (Display shows **SQ: 01** to 16). By turning the big knob (4) the Squelch setting can be changed to the desired level. The unit will leave the Squelch mode, if a another frequency is selected by **MEM** or if the **VOL-SQ** push-button is pressed again. The selected level is active until the ATR 57 is switched off. To use this level as switch on default, push the **STORE** button (6) while the device is in the Squelch mode. For confirmation the ATR 57 shows „**ST**“ in its display.

The normal Squelch setting is about 3. With higher settings weak signals may not let be heard. The Squelch setting has no influence in the intercom mode.

3.4 VOX level control for Intercom

Push the **VOL-SQ** button three times to get into the Intercom mode (Display shows **VOX: 01** to 32). By turning the big knob (4) the Intercom setting can be changed to the desired level. The unit will leave the Intercom mode, if a another frequency is selected by **MEM** or if the **VOL-SQ** push-button is pressed again. The selected level is active until the ATR 57 is switched off. To use this level as switch on default, push the **STORE** button (6) while the device is in the Intercom mode. For confirmation the ATR 57 shows „**ST**“ in its display.

The higher the selected value is, the louder you have to talk to open the Intercom path.

Note: The Volume control described in 3.2 adjusts only the received signal and not the Intercom level.

3.5 Memory selector

The memory selector **MEM** (7) is located in the upper middle of the unit. It is used for selecting previous stored frequencies or for saving a frequency on one of the 9 memories. Between memory **M1** and **M9** (the white line on the memory selector shows downward) you will find the **SET** operation mode for selecting manually a frequency in the standby list (lower line) .

3.6 Selecting and storing a frequency

Turn the memory selector in the **SET** position between memory MEM1 and MEM9 (the white line on the memory selector shows downward). The upper line of the display shows the actual active frequency, in the second line the changeable frequency is displayed >.

Setting a new Frequency or changing an existing Frequency

The standby Frequency (lower column) can be changed in the following way:

- With the ↔ button (3) select MHz- or kHz . A small arrow > on the display (9) shows to MHz- or kHz that can be changed by the big frequency knob (4).
- With the ↑↓ button on the lower right side (5) this new frequency can be activated. Now it is displayed on the upper line, the old active frequency is deactivated and displayed in the second line.

Storing a Frequency

Turn the memory selector **MEM** (7) to **M** 1... 9 where the new frequency is to be stored and then press the **STORE** button (6).

3.7 Low-battery

If the battery voltage falls below 10,5V a „**B**“ will be displayed in upper left corner. A save operation of the unit can not be guaranteed.

3.8 Automatic frequency control

If the actual used frequency has an intolerable frequency drift a "-" (12) will appear in the upper right corner of the display. Transmitter than can not be activated.

In this case the ATR 57 is not working properly and must be returned to the manufacturer.

Notice: Sometimes the "-" may be displayed, but it disappears when the frequency is changed or the device is switched off and on. This can be due to strong noise from outside the ATR 57. This is no mal-function of the ATR 57

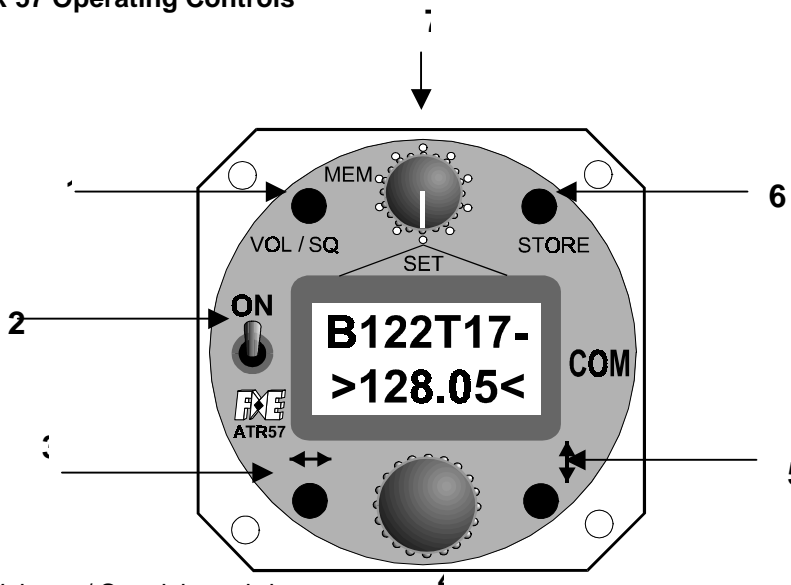
3.9 Transmitting mode

By using the transmitting key (PTT), the ATR 57 will change to the transmit mode and transmit on the frequency shown on the upper position of the display. As long as the transmission takes place a "**T**" will be shown instead of the decimal point between the MHz- and kHz-value of the actual frequency (upper line), to control the proper function of the device. By checking the Sidetone in the headphone you have a further control for a proper transmission.

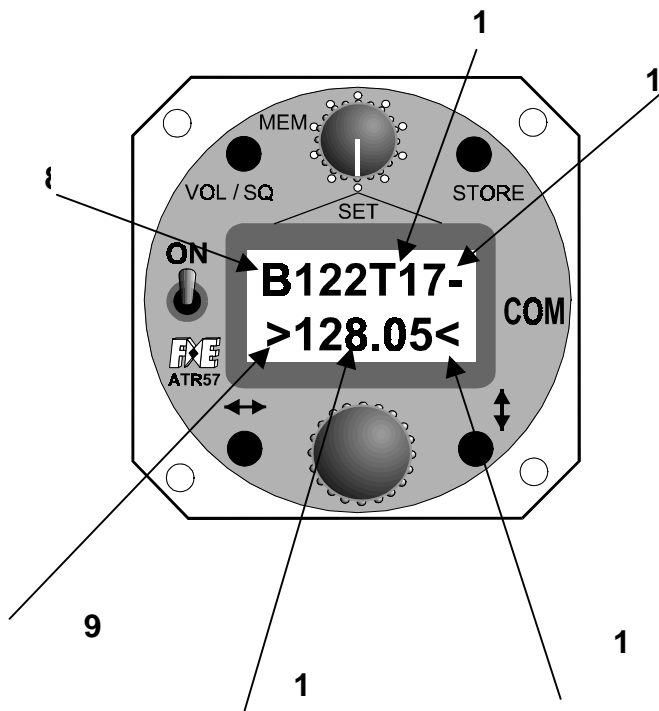
3.10 Receiving indication

As long as a receiving signal takes place or the squelch is open a "**R**" will be shown instead of the decimal point between the MHz- and kHz-value of the actual frequency (upper line).

ATR 57 Operating Controls



1. Volume / Squelch push-button
 2. ON / OFF switch
 3. MHz / kHz push-button
 4. Tuningknob for Volume, Squelch, VOX and standby frequency
 5. Change selected frequency to active frequency
 6. **Store**-button
 7. **MEM** Select stored frequency
- ATR 57 Display



8. "B" Low-Battery display, shown when voltage is < 10,5V
9. "><" changing MHz or kHz range
10. MHz-range of standby frequency
11. kHz-range of standby frequency
12. "-" shown at lost of transmitting or receiving frequency (active frequency)
13. "T" shown during transmitting mode and
 "R" shown during receiving mode (active frequency)

4 SECTION IV Circuit Description

4.1 Introduction

Figure 6-1 presents a simplified block diagram of the ATR 57 This diagram is intended to show flow between the modules and basic switching functions. Each section of the diagram will be discussed in general.

4.2 General Circuit Theory

Refer to Annex A SCHEMATICS

4.2.1 Transmitter PC BOARD: PLATINE HF

RF signals from the synthesizer module enter the transmitter and are amplified in by the Transmitter Preamplifier Stage and the Transmitter Power Amplifier Stage. The Power Amplifier Stage (T7/T8) is drain modulated with audio signals from the modulator (IC9-LM317) . Before being applied to the antenna, the modulated RF signals passes through a antenna filter PC board FILTER).

The modulator consists of the Audio Power Amplifier (IC9-LM317) .

The TX/RX switch consist of Pin diodes (D19 and D1)that are controlled by (ANT-SW) the processor (IC1 PC Board Kopf1)

4.2.2 Receiver PC BOARD: PLATINE HF

RF signals from the antenna are applied to varactor tuned (D9,D10,D13) RF Amplifier. The amplified signal is then applied to the Mixer (T5), whose other input is the local oscillator injection signal from the VCO. The resultant IF signal is filtered by IF-Crystal-Filter (F2) and amplified by the IF-Amplifier (IC5-MC3363). This filtered and amplified signal is applied to the internal Demodulator Section of IC5-MC3363. Demodulator drives the AGC Amplifier (IC3 OP4) and the preaudio amplifier IC 3 OP1.

The Squelch-Switch is controlled by the AGC –output. A compactor compares the AGC signal from AGC-Amplifier with an adjustable DC voltage SQ-ADJ processor controlled (IC1 PC Board Kopf1) .

When the RF carrier level is between 1 μ V and 10 μ V, the comparator activates the Squelch-Switch. This function can be overridden by the SQ-Switch-control for listening to weak RF-input signals and for testing the receiver function (SQ-00).

The output of the AGC-Amplifier is applied to the varactor tuned RF-Amplifier.

4.2.3 Audio Amplifier and AF-Switches PC BOARD: PLATINE NF

The AF output of the Demodulator is applied via preaudio amplifier IC 3 OP1 and volume controller IC3 (on PC Board Kopf1) to the AF-Amplifier IC2. The microphone input is applied across the Microphone Selector Switch (SW1) to the Microphone Amplifier (IC1-OP2). The output is applied to the Intercom switch IC7-1 and the Modulator. In the Intercom-mode the AF-signal passes the Intercom switch to the headset Amplifier (T7,T8). The output of the volume controller is applied to the AF Power Amplifier.

4.2.4 Frequency Synthesizer PC BOARD: PLATINE HF

In the digital frequency synthesis, the transmit and local oscillator signals are generated in 25 kHz from:

118.000 – 136.975 MHz in the transmit mode and

139.400 – 158.375 MHz in the receive mode.

A voltage controlled oscillator (VCO) generates these RF-signals. The output is fed to a two buffer amplifier (IC2, IC4). The output of the first buffer amplifier is applied to the switch D21. In the receive mode the RF Signal is applied to the receiver mixer stage, in the transmit mode to the transmitter stage IC10. The output of the second buffer amplifier is applied to the PLL IC 1. The division-ratio of this frequency divider is controlled by the Processor. The output of this PLL is pulsing DC voltage (VT), which is proportional to the phase or frequency error. This pulsing DC voltage is applied to the Low-Pass-Filter, which smoothies the pulsating DC. The output of this loop filter controls the VCO frequency and generates the tuning voltage for the varactor tuned RF Amplifier of the receiver.

5 SECTION V Maintenance

5.1 INTRODUCTION

This section present maintenance and alignment procedures for the ATR 57. Realignment should not be necessary unless the unit has been repaired. These procedures require disassembly and reassemble of the unit.

5.2 TEST EQUIPMENT

Table 4-1 lists the test equipment required to perform the alignment, test, and trouble procedures described in this manual.

Table 4-1. Test Equipment List

Type	Characteristics	Example
Oscilloscope	Frequency Range: DC to 100 MHz Input Impedance: 1 megohm	National Model VP 5510 A
Frequency Counter	Frequency Range: 10 Hz to 520 MHz , Input Impedance: 1 megohm/50 ohms	Hewlett Packard Model 5383 A Rhode & Schwarz SMDU
Modulation Meter	AM Modulation Percent: 0-100 %	Racal Model 9009
Detector	Part of Modulation Meter	
Regulated DC Power Supply	Output: 0 to 30 VDC, 0 to 5 Amp.	
RF Signal Generator	Frequency: 0.14 – 525 MHz RF Output: 1 μ V to 1 V Modulation: 30 to 85 % Generator Impedance: 50 Ohms	Rhode & Schwarz Model SMDU
Audio Signal Generator	Frequency: 10 Hz to 10 kHz Distortion 1 % maximum	National Model VP 7101 A
RF Power Meter	Power Range: 0 to 5 watts	Bird Electronics Model 43
RF Sweep Generator	Sweep Range: 110 – 140 MHz minimum	Wavetek Model 1061
Digital Multimeter	Input Impedance: 10 megohms DC Volts: \pm 10 mV to \pm 100 V DC Amperes 0 to 2 A Accuracy: 1 % min.	Kontrom Model DMM 3020
Audio Voltmeter and Distortion Analyzer	Frequency Range: 10 Hz to 10 kHz Sensitivity: 1 mV to 100 V Distortion Range: 1 % to 100 %	
RF-Attenuate	Frequency Range: DC to 1 GHz Attenuation: 20 dB/20 watts	Narda Model 766-20
RF-Test Probe	Frequency Range: 200 kHz – 300 MHz. Input Impedance: 20 K Ohms at 100 MHz	Grundig Model HK6

5.3 Alignment

The alignment procedure requires that the cover is removed .

5.3.1 Supply Voltage Stabilization Alignment

- Connect the unit into the test set-up diagrammed in Figure 4-1. Set the DC power supply for 13.75 VDC.
- Adjust P1 for a 13.0 VDC (± 50 mV DC) reading on the DVM (test point : Collector TR1).
- Check the + 9 VDC supply voltage. The nominal reading on the DVM is 9.0 VDC (± 50 mV DC). (test point IC LM2940 PIN 3).
- Check the + 5 VDC supply voltage. The nominal reading on the DVM is 5.0 VDC (± 50 mV DC). (test point IC6 PIN 1).

5.3.2 Frequency Synthesis Alignment

Connect the unit into the test set-up diagramed in Figure 4-2.

Connect the frequency counter to the ANT output. Set the Frequency Selector to 127.00 MHz. The unit is in the transmit-mode.

- Adjust C 46PC Board HF for a frequency reading of 127.00 MHz ± 100 Hz

Set the Frequency Selector to 118.00 MHz. The unit is in the receive-mode.

- Disconnect the DVM to R30. The meter should read approximately 2,0 V. If necessary the voltage can be set by L7(through the hole of the VCO).

5.3.3 Receiver Alignment

- Connect the unit into the test set-up. Set the Frequency Selector to 127.00 MHz.
- Tune the RF VHF signal generator to 127.00 MHz and apply a 30% a AM 1KHz modulation signal with a RF output of 1,5 μ V. Adjust P2 for maximum AF output.

5.3.4 Modulator Alignment

- Connect the unit to the test set-up.
- Set P3 (MIC LEVEL) to full counter clockwise position (Electret microphone sensitivity) and apply a 300 mV(RMS) signal with a frequency of 1 kHz to the microphone input MIC1.
- Set the Frequency Selector to 127.00 MHz and go to transmit mode.
- Adjust P7 for 70% modulation reading on the modulation meter.

5.4 IN AIRCRAFT TROUBLESHOOTING

A step-by-step check out procedure is presented in Section 2.7.3 and is entitled Post Installation Tests. Figure 4-9 presents an in aircraft troubleshooting chart to assist isolating a problem to either the aircraft system of the ATR 57.

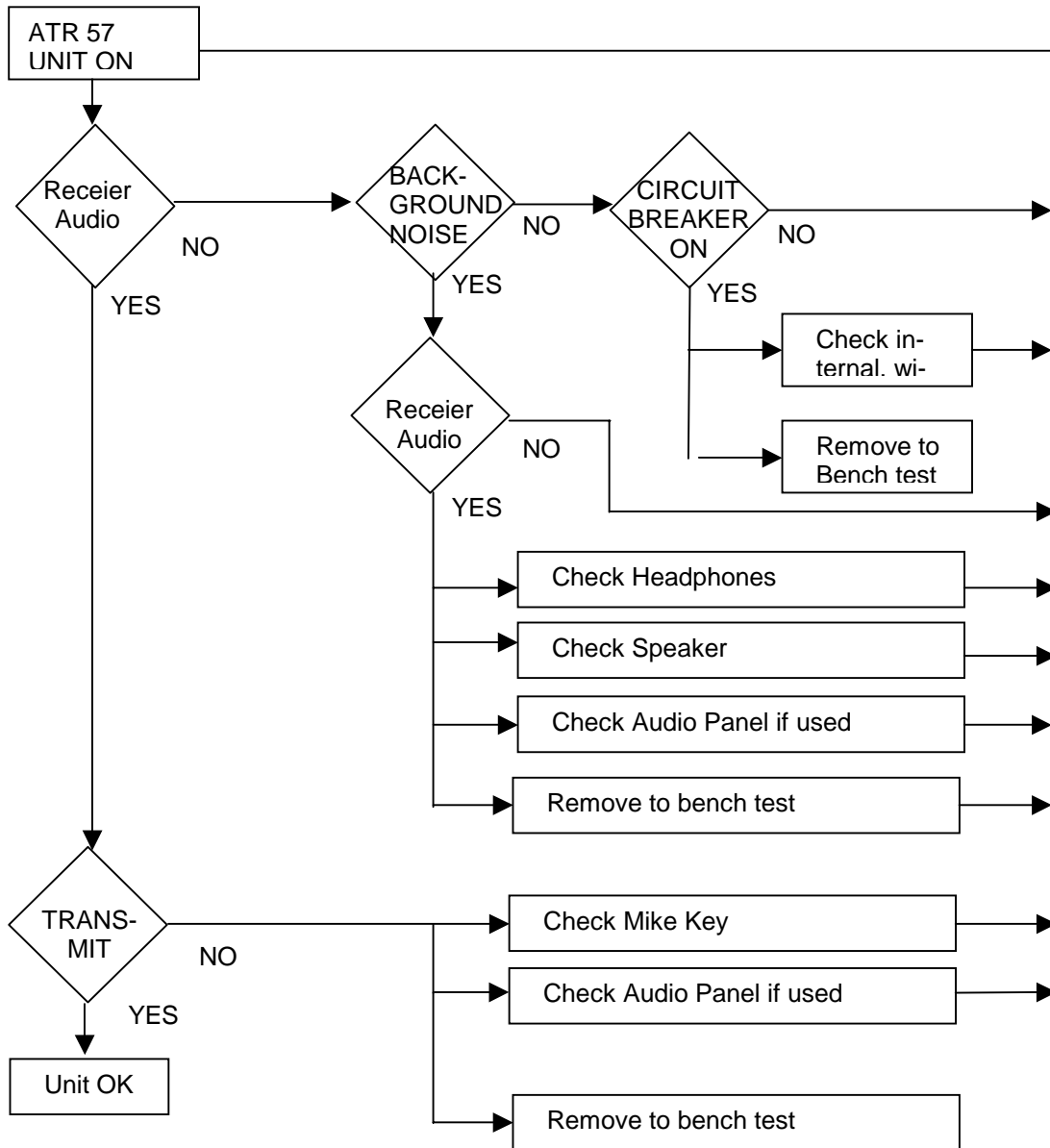


FIGURE 4-9. IN AIRCRAFT TROUBLESHOOTING

5.5 OVERHAUL

5.5.1 VISUAL INSPECTION

This section contains instructions to assist in determining, by inspection, the condition of the ATR 57 unit. Defects resulting from wear, physical damage, deterioration, or other causes can be found by these inspection procedures. To aid inspection, detailed procedures are arranged in alphabetical order.

A. Capacitors, Fixed

Inspect capacitors for case damage, body damage, and cracked, broken or charred insulation. Check for loose, broken or improperly soldered connections.

B. Capacitors, Variable

Inspect trimmers for chipped and cracked bodies, damaged dielectrics and damaged contacts.

C. Chassis

Inspect the chassis for deformation, dents, punctures, badly worn surfaces, damaged connectors, damaged fastener devices, loose or missing hardware, component corrosion, and damaged to finish.

D. Connectors

Inspect connector for broken parts, deformed shells or clamps, and other irregularities. Inspect for cracked or broken insulation and for contacts that are broken, deformed, or out of alignment. Also, check for corroded or damaged plating on contacts and for loose, improperly soldered, broken or corroded terminal connections.

E. Covers and Shields

Inspect covers and shields for punctures, deep dents, and badly worn surfaces. Also, check for damaged fastener devices, corrosion, and damage to finish.

F. Fuse and Clips

Inspect for blown fuse and check clips for loose or corroded connection.

G. Insulators

Inspect all insulators for evidence of damage, such as broken or chipped edges, burned areas, and presence of foreign matter.

H. Jacks

Inspect all jacks for corrosion, rust, deformations, loose or broken parts, cracked insulation, bad contacts, or other irregularities.

I. Potentiometers

Inspect all potentiometer for evidence of damaged or loose terminals, cracked insulation or other irregularities.

J. Relay

Inspect enclosure for physical damage and contacts for improper alignment, damaged plating or corrosion.

K. Resistors, Fixed

Inspect the fixed resistors for cracked, broken, blistered, or charred bodies and loose, broken, or improperly soldered connections.

L. RF Coils

Inspect all RF coils for broken leads, loose mountings, and loose improperly soldered, or broken terminal connections. Check for crushed, scratched, cut or charred windings. Inspect the windings, leads, terminals, and connections for corrosion or physical damage. Check for physical damage to forms and tuning slug adjustment screws.

M. Terminal Connections Soldered

- Inspect for cold-soldered or resin joints. These joints present a porous or dull, rough appearance. Check for strength of bond using the points of a tool.
- Examine the terminals for excess solder, protrusions from the joint, pieces adhering to adjacent insulation, and particles lodged between joints, conductors, or other components.
- Inspect for insufficient solder and unsoldered strands of wire protruding from conductor at the terminal. Check for insulation that is stripped back too far from the terminal.
- Inspect for corrosion at the terminal.

N. Transformers

- Inspect for signs of excessive heating, physical damage to case, cracked or broken insulation, and other abnormal conditions.
- Inspect for corroded, poorly soldered, or loose connecting leads or terminals.

O. Wiring/Coaxial Cable

Inspect open and laced wiring of chassis, subassembly chassis, and parts of equipment for breaks in insulation, conductor breaks, cut or broken lacing and improper dress in relation to adjacent wiring or chassis.

5.5.2 CLEANING

- Using a clean, lint-free cloth lightly moistened with a mild cleaning detergent, remove all foreign matter from the equipment case and unit front panels. Wipe dry using a clean, lint-free cloth.
- Using a hand controlled dry air jet (not more than 15psi), blow the dust from inaccessible areas. Care should be taken to prevent damage by the air blast.
- Clean the receptacle and plugs with a hand controlled dry air jet (not more than 25psi) and a clean lint-free cloth lightly moistened with an approved mild cleaning solvent. Wipe dry with a clean, dry, lint-free cloth.

5.5.3 REPAIR

This section describes the procedure, along with any special techniques for replacing damage or defective components.

A. Connectors

When replacing a connector, refer to the appropriate PC board assembly drawing and follow notes to insure correct mounting and mating of each connector.

B. Crystal

The use of other than an Avionic crystal is considered an unauthorized modification.

C. Diodes

Diodes used are silicon or germanium. Use long nose pliers as a heat sink under normal soldering conditions. Note the diode polarity before removal.

D. Feed through Capacitors

The feed through capacitors mounted on the printed circuit board should be removed carefully to avoid damage to the board. Avoid excessive heat. When replacing a feed through capacitor,

removal of nearby components may be necessary to protect them from the heat. Never apply heat directly to a feed through capacitor. Instead heat the mounting surface around it.

E. Integrated Circuits

Refer to Section 4.8 for removal and replacement instructions.

F. Wiring/Coaxial Cable

When repairing a wire that has broken from its terminal, remove all old solder and pieces of wire the terminal, strip the wire to the necessary length and solder the wire to the terminal. Replace a damaged wire or coax with one of the same type, size and length.

5.5.4 DISASSEMBLY/ASSEMBLY PROCEDURES

The disassembly procedure presented here are those required for alignment or troubleshooting the unit. Section 5 presents the procedures for cover removal and disassembly of the entire unit.

After fixing the PC-Boards to the chassis with the screws, the coaxial cables W 5001 and W 3001 have to be fixed to the solder side of the Transmitter/Receiver- and the Frequency-Synthesizer PC-Boards. Use some drops of silicone rubber (Wacker Elastosil 33 or equivalent) to prevent a damaging of the cables by the wire ends of the components.

Insert the Mylar foils between the solder side of the PC-Boards (Transmitter/Receiver-. And AFBoard.) and the cover, before reinstalling the chassis into the cover.

5.6 GENERAL

Due to wide utilization of semiconductors in this electronic equipment somewhat different techniques are necessary in maintenance procedures. In solid state circuits the impedance's and resistance encountered are of much lower values than those encountered in vacuum-tube circuits. Therefore, a few ohms discrepancy can greatly effect the performance of the equipment. Also, coupling and filter capacitors are of larger values and usually are of the tantalum type. Hence, when measuring values of capacitors, an instrument accurate in the high ranges must be employed. Capacitor polarity must be observed when measuring resistance. Usually more accurate measurements can be obtained if the semiconductors are removed or disconnected from the circuits.

5.6.1 SEMICONDUCTOR TEST EQUIPMANT

Damage to semiconductors by test equipment is usually the result of accidentally applying too much voltage to the elements. Common causes of damage from test equipment are discussed in the following paragraph.

A. Transformer-less Power Supplies

Test equipment with transformer-less power supplies is one source of high current. However, this type of test equipment can be used by employing an isolation transformer in the AC power line

B. Line Filter

It is still possible to damage semiconductors from line current, even though the test equipment has a power transformer in the power supply, if the test equipment is provided with a line filter. This filter may functions as a voltage divider and apply half voltage to the semiconductor. To eliminate this condition, connect a ground wire from the chassis to the test equipment to the chassis of the equipment under test before making any other connections.

C. Low-Sensitivity Mutimeters

Another cause of semiconductor damage is a multimeter that requires excessive current to provide adequate indications multimeter with sensitivities of less than 20.000 ohms-per-volt should not be used on semiconductors. When in doubt as to the amount of currant supplied by a mul-

timer, check the multimeter circuits on all scales with an external, low-resistance multimeter connected in series with the multimeter leads. If more than one milliampere is drawn on any range, this range cannot be safely used on small semiconductors.

D. Power Supply

When using a battery-type power supply, always use fresh batteries of the proper value. Make certain that the polarity of the power supply is correct for the equipment under test. Do not use power supplies having voltage regulation.

5.6.2 SEMICONDUCTOR VOLTAGE AND RESISTANCE MEASUREMENTS

When measuring voltage or resistance in circuits containing semiconductor devices, remember that these components are polarity and voltage conscious. Since the values of capacitors used in semiconductor circuits are usually large, time is required to charge these capacitors when they appear. Thus, any reading obtained is subject to error if sufficient time is not allowed for the capacitor to fully charge. When in doubt it may be best in some cases to isolate the components in question and measure them individually.

5.6.3 TESTING OF TRANSISTORS

A transistor checker should be used to properly evaluate transistors. If a transistor tester is not available, a good multimeter may be used. Make sure that the multimeter meets the requirements outlined in the preceding paragraph.

A. PNP Transistor

To check a PNP transistor, connect the positive lead of the multimeter to the base of the transistor and the negative lead to the emitter or collector. With the positive lead connected to the emitter or collector a resistance value of 500 ohms or less should be obtained.

B. NPN Transistor

Similar tests made on an NPN transistor should produce the following results:

With the negative lead of the multimeter connected to the base of the transistor the value of resistance between the base and the collector or emitter should be high. With the positive lead of the multimeter connected to the base, the value of resistance between the base and the collector or emitter should be low. If these results are not obtained, the transistor is probably defective and should be replaced.

CAUTION

IF A TRANSISTOR IS FOUND TO BE DEFECTIVE, MAKE CERTAIN THAT THE CIRCUIT IS IN GOOD OPERATING ORDER BEFORE INSTALLING A REPLACEMENT TRANSISTOR. IF A SHORT CIRCUIT EXISTS IN THE CIRCUIT, PUTTING IN ANOTHER TRANSISTOR WILL MOST LIKELY RESULT IN BURNING OUT THE NEW COMPONENT. DO NOT DEPEND UPON FUSES TO PROTECT TRANSISTORS.

Always check the value of the bias resistors in series with the various elements. A transistor is very sensitive to improper bias voltage. Therefore, a short or open circuit in the bias resistors may damage the transistor.

5.6.4 REPLACING SEMICONDUCTORS

Never remove or replace a semiconductor with the supply voltage turned on. Transients thus produced may damage the semiconductor or others remaining in the circuit. If a semiconductor is to be evaluated in an external test circuit, be sure that no more voltage is applied to the semiconductor than normally is used in the circuit from which it came.

- A. Use only a low heat soldering iron when installing or removing soldered-in semiconductors. Grasp the lead to which heat is applied between the solder joint and the semiconductor with long nosed pliers. This will dissipate some of the heat that would otherwise be conducted into the semiconductor from the soldering iron. Make certain that all wires soldered to semiconductor terminals have

first been properly tinned so that the necessary connection can be made quickly. Excessive heat will permanently damage a semiconductor.

- B. In some cases, power transistors are mounted on heat-sinks that are designed to dissipate heat away from them. In some power circuits, the transistor must also be insulated from ground. This insulating is accomplished by means of an isolating washer made of mica. When replacing transistors mounted in this manner, be sure that the insulating washers are replaced in proper order. After the transistor is mounted, and before making any connections, check from the case of the transistor to ground with a multimeter to see that the insulation is effective.

6 SECTION VI PART LIST

6.1 PC Board: HF Platine (Rev 1.4)

<u>Num-ber</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
1	C57	10p	0805	Chip Vielschicht NP0	80510P
7	C102	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C37	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C40	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C66	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C67	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C71	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C73	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
1	C58	100n/50V	1206	Chip Vielschicht 10% X7R	1206100N
7	C103	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
	C104	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
	C106	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
	C34	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
	C50	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
	C59	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
	C76	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
4	C41	18p	0805	Chip Vielschicht NP0	
	C43	18p	0805	Chip Vielschicht NP0	
	C45	18p	0805	Chip Vielschicht NP0	
	C48	18p	0805	Chip Vielschicht NP0	
31	C13	1n/50V	0805	Chip Vielschicht NP0	8051N
	C14	1n/50V	0805	Chip Vielschicht NP0	8051N
	C72	1n/50V	0805	Chip Vielschicht NP0	
	C88	1n/50V	0805	Chip Vielschicht NP0	
	C115	1n/50V	0805	Chip Vielschicht NP0	
	C116	1n/50V	0805	Chip Vielschicht NP0	
	C75	1n/50V	0805	Chip Vielschicht NP0	
	C10	1n/50V	0805	Chip Vielschicht NP0	
	C17	1n/50V	0805	Chip Vielschicht NP0	8051N
	C80	1n/50V	0805	Chip Vielschicht NP0	
	C114	1n/50V	0805	Chip Vielschicht NP0	
	C117	1n/50V	0805	Chip Vielschicht NP0	8051N
	C21	1n/50V	0805	Chip Vielschicht NP0	8051N
	C3	1n/50V	0805	Chip Vielschicht NP0	8051N
	C38	1n/50V	0805	Chip Vielschicht NP0	8051N
	C39	1n/50V	0805	Chip Vielschicht NP0	8051N
	C5	1n/50V	0805	Chip Vielschicht NP0	8051N
	C51	1n/50V	0805	Chip Vielschicht NP0	8051N
	C6	1n/50V	0805	Chip Vielschicht NP0	8051N
	C63	1n/50V	0805	Chip Vielschicht NP0	8051N
	C68	1n/50V	0805	Chip Vielschicht NP0	8051N
	C83	1n/50V	0805	Chip Vielschicht NP0	8051N
	C84	1n/50V	0805	Chip Vielschicht NP0	8051N
	C86	1n/50V	0805	Chip Vielschicht NP0	8051N
	C87	1n/50V	0805	Chip Vielschicht NP0	8051N
	C90	1n/50V	0805	Chip Vielschicht NP0	8051N
	C109	1n/50V	0805	Chip Vielschicht NP0	8051N
	C85	1n/50V	0805	Chip Vielschicht NP0	8051N
	C78	1n/50V	0805	Chip Vielschicht NP0	8051N
	C100	1n/50V	0805	Chip Vielschicht NP0	8051N
	C44	1n/50V	0805	Chip Vielschicht NP0	8051N

Num-ber	Part	Value	Package	Description	Lager Nummer
1	C49	1p	0805	Chip Vielschicht NP0	8051P
1	C70	220p	0805	Chip Vielschicht NP0	805220P
2	C7	22p	0805	Chip Vielschicht NP0	
	C9	22p	0805	Chip Vielschicht NP0	
1	C64	27p	0805	Chip Vielschicht NP0	80527P
3	C60	2n2/50V	0805	Chip Vielschicht 10% X7R	8052N2
	C61	2n2/50V	0805	Chip Vielschicht 10% X7R	8052N2
	C62	2n2/50V	0805	Chip Vielschicht 10% X7R	8052N2
2	C52	3p3	0805	Chip Vielschicht NP0	8053P3
	C12	3p3	0805	Chip Vielschicht NP0	8053P3
2	C18	33p	0805	Chip Vielschicht NP0	805330P
	C31	330p	0805	Chip Vielschicht NP0	805330P
	C118	330p	0805	Chip Vielschicht NP0	805330P
5	C11	33p	0805	Chip Vielschicht NP0	80533P
	C55	33p	0805	Chip Vielschicht NP0	80533P
	C92	33p	0805	Chip Vielschicht NP0	80533P
	C32	33p	0805	Chip Vielschicht NP0	80533P
2	C65	39p	0805	Chip Vielschicht NP0	80539P
	C2	39p	0805	Chip Vielschicht NP0	80539P
2	C81	5p6	0805	Chip Vielschicht NP0	8055P6
	C82	5p6	0805	Chip Vielschicht NP0	8055P6
3	C16	470p	0805	Chip Vielschicht NP0	805470P
	C53	470p	0805	Chip Vielschicht NP0	805470P
	C107	470p/50V	0805	Chip Vielschicht 10% NP0	805470P
5	C22	47n/50V	0805	Chip Vielschicht 10% X7R	80547N
	C26	47n/50V	0805	Chip Vielschicht 10% X7R	80547N
	C27	47n/50V	0805	Chip Vielschicht 10% X7R	80547N
	C4	47n/50V	0805	Chip Vielschicht 10% X7R	80547N
	C74	47n/50V	0805	Chip Vielschicht 10% X7R	80547N
2	C42	47p	0805	Chip Vielschicht NP0	80547P
	C8	47p	0805	Chip Vielschicht NP0	80547P
	C69	47p	0805	Chip Vielschicht NP0	80547P
1	C25	4n7	0805	Chip Vielschicht X7R	8054N7
2	C56	4p7	0805	Chip Vielschicht NP0	8054P7
	C24	4p7	0805	Chip Vielschicht NP0	8054P7
	C36	8,5p-40pf /100V	BxLxH:4x4,5x2,7	Chip-Scheibentrimmer Typ Stettner	TR3-40
1	C54	56p	0805	Chip Vielschicht NP0	80556P
1	C47	68p/50V	0805	Chip Vielschicht 10% NP0	80568P
1	C28	470nF/50V	1206	Chip Vielschicht 10% X7R	1206470N
	C89	22n/50V	0805	Chip Vielschicht 10% X7R	80522n
	C91	120p	0805	Chip Vielschicht 10% X7R	805120p
1	C20	1u/50V	1206	Chip Vielschicht 10% X7R	
1	C112	1u/50V	RM 5 Radial 5x3mm	Keramik Vielschichtkondensatoren 20%	55D742
3	C77	1u/16V	SMD Typ A	Tantal 20%	
	C79	1u/16V	SMD Typ A	Tantal 20%	
	C105	1u/16V	SMD Typ A	Tantal 20%	
	C1	1u/16V	SMD Typ A	Tantal 20%	
1	C15	4u7/16V	SMD Typ B	Tantal 20%	
1	C30	100u/16V	SMD Typ E	Tantal 20%	
1	C23	150u/16V	Tantal SMD Typ D	Elko 20%	
2	C29	10u/16V	SMD Typ C	Tantal 20%	
	C35	10u/16V	SMD Typ C	Tantal 20%	
1	C19	47u/16V	SMD Typ D	Tantal 20%	
2	C33	3,5p-10pf /100V	BxLxH:4x4,5x2,7	Chip-Scheibentrimmer Typ Stettner	TR3-10
	C36	3,5p-10pf /100V	BxLxH:4x4,5x2,7	Chip-Scheibentrimmer Typ Stettner	TR3-10
1	C46	5.5-20p /100V	BxLxH:4x4,5x2,7	Chip-Scheibentrimmer Typ Stettner	TR4-25
1	C120	8,5-40pF		Chip Scheibentrimmer	

<u>Num-ber</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
2	D19	MA4P1250-1	1210	Pin diode	MA4P1250
	D1	MA4P1250-1	1210	Pin diode	MA4P1250
4	D12	BAR63-03W	SOD323	Pin diode Siemens	BAR63
	D14	BAR63-03W	SOD323	Pin diode Siemens	BAR63
	D15	BAR63-03W	SOD323	Pin diode Siemens	BAR63
	D21	BAR63-03W	SOD323	Pin diode Siemens	BAR63
3	D2	LL4148	SOD80	Silicon Diode	LL4148
	D4	LL4148	SOD80	Silicon Diode	LL4148
	D6	LL4148	SOD80	Silicon Diode	LL4148
1	D5	5V6		Zener Diode	
1	D17	BAT17-04	SOT23	Schottky Diode Siemens	BAT17
6	D10	BB814	SOT23	Varicap Diode Siemens	BB814
	D13	BB814	SOT23	Varicap Diode Siemens	BB814
	D23	BB814	SOT23	Varicap Diode Siemens	BB814
	D3	BB814	SOT23	Varicap Diode Siemens	BB814
	D7	BB814	SOT23	Varicap Diode Siemens	BB814
	D9	BB814	SOT23	Varicap Diode Siemens	BB814
1	D8	BA592	SOT323	Pindiode	
1	D20	BZV/C6V2	SOD80	Zener Diode	ZMM6V2
2	D16	BZV55/C3V9	SOD80	Zener Diode	ZMM3V9
1	D11	BZV55/C4V7	SOD80	Zener Diode	ZMM4V7
	D18	BZV55/C 3V9	SOD80	Zener Diode	ZMM3V9
1	F2	21U8C	-	Helpert Bandbreite 3dB +/- 3,75kHz	21U8C
1	F3	CFW455D	-	Murata Bandbreite 6dB +/- 10kHz	CFWS455D
3	F1	0.047uH	NEOSID SMF 5.1	Smd spule abgleichbar Typ Neosid Nr 00560100	78D840
	F4	0.047uH	NEOSID SMF 5.1	Smd spule abgleichbar Typ Neosid Nr 00560100	78D840
	F5	0.047uH	NEOSID SMF 5.1	Smd spule abgleichbar Typ Neosid Nr 00560100	78D840
1	F10	0.068uH	NEOSID SMF 5.1	Smd spule abgleichbar Typ Neosid Nr 00560102	78D841
1	F6	Doppelloch Kern	Typ A7-x17,u17 (20nH)	Siemens	84D290
1	F7	Übertrager SMD		Neosid	
1	IC1	MB15E03L	FPT-16PM	Fujitsu PLL Synthetiseur	MB15E03
1	IC6	74HC04	SO14		74HC04M
1	IC3	MC33174D	SO14	Motorola Quad OP	MC33174D
1	IC5	MC3363DW	SO28	Motorola	MC3363DW
1	IC7	MC33172D	SO8	Motorola	MC33172D
2	IC2	INA51063	SOT363	Hewlett Packard	INA51063
	IC4	INA51063	SOT363	Hewlett Packard	INA51063
1	IC9	LM317	TO-220	Motorola	LM317T
1	IC8	LM317	TO-92	Motorola	LM317Z
1	IC10	INA03184	84 Plastic Package	HP	
3	L10	68nH	0805		
	L9	68nH	0805		
	L15	68nH	1008	Coilcraft 1008LS-68XKBC 10%	
1	L26	47nH	0805	Coilcraft 0805CS-470XMBC 20%	HS-470TJ
2	L14	1uH	1008	Coilcraft 1008CS-102XJBC 5%	1008L102
	L3	1uH	1008	Coilcraft 1008CS-102XJBC 5%	1008L102
1	L7	ca. 13 nH	selbst gewickelt	Kern: 1mm, Drahtdurchmesser: 0,22mm, 5 Wdg.	

<u>Num-ber</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
2	L13	330nH	1008	Coilcraft 1008CS-331XJBC 5%	1008L331
	L19	330nH	1008	Coilcraft 1008CS-331XJBC 5%	1008L331
2	L11	470nH	1008	Coilcraft 1008CS-471XKBC 5%	1008L471
	L12	470nH	1008	Coilcraft 1008CS-471XKBC 5%	1008L471
4	L2	6.8uH	1008	Coilcraft 1008LS-682XKBC 10%	1008L682
	L4	6.8uH	1008	Coilcraft 1008LS-682XKBC 10%	1008L682
	L5	6.8uH	1008	Coilcraft 1008LS-682XKBC 10%	1008L682
	L6	6.8uH	1008	Coilcraft 1008LS-682XKBC 10%	1008L682
1	L15	68nH	1008	Coilcraft 1008CS-681XKBC 10%	1008L681
1	L16	680nH	1008	Coilcraft 1008CS-681XKBC 10%	1008L681
1	L25	680nH	0805	Coilcraft 0805CS-681	
1	L20	68uH	1210	HF drosseln typ Siemens B82422-A 10%	76D912
3	L21	33nH	1008	Coilcraft 1008CS-330XJBC 10%	1008L330
	L22	33nH	1008	Coilcraft 1008CS-330XJBC 10%	1008L330
	L24	33nH	1008	Coilcraft 1008CS-330XJBC 10%	1008L330
1	L1	4.7uH	1210	Siemens typ B82412-A1	76D578
1	L23	47mH	-	Entstördrosseln Typ Neosid BS 75	75D6264
1	P2	22k	Trimpoti Typ Bourns 3364 W 25%		TP223SMD
1	P6	100k	Trimpoti Typ Bourns 3364 W 25%		TP104SMD
1	Koax	50R 8cm	KoaxKabel	Alcatel Cable RG178BU	RG178
1	Q1	6,4Mhz	HC45/U smd lötan- schlüsse	Lastkapazität 30pF Abgleichtoleranz <=+- 10ppm @+25°C Temperaturgang <=+- 15ppm@-20..+70°C Alterung<= 1,5ppm/Jahrr	6M4HZSMD
1	Q2	20Mhz945	HC18U o- der HC-49U	Standard Quarz	20MHZ945
3	R1	33R	0805	Chip Widerstand 5%	805R33R
	R49	33R	0805	Chip Widerstand 5%	805R33R
	R60	33R	0805	Chip Widerstand 5%	805R33R
1	R23	0R	0805	Chip Widerstand 5%	805R0R
11	R11	10k	0805	Chip Widerstand 5%	805R10K
	R2	10k	0805	Chip Widerstand 5%	805R10K
	R25	10k	0805	Chip Widerstand 5%	805R10K
	R33	10k	0805	Chip Widerstand 5%	805R10K
	R55	10k	0805	Chip Widerstand 5%	805R10K
	R56	10k	0805	Chip Widerstand 5%	805R10K
	R62	10k	0805	Chip Widerstand 5%	805R10K
	R69	10k	0805	Chip Widerstand 5%	805R10K
	R75	10k	0805	Chip Widerstand 5%	805R10K
	R37	10k	0805	Chip Widerstand 5%	805R10K
	R3	10k	0805	Chip Widerstand 5%	805R10K
1	R61	12k	0805	Chip Widerstand 5%	805R12K

<u>Num-ber</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
1	R64	27k	0805	Chip Widerstand 5%	805R27K
1	R5	270	0805	Chip Widerstand 5%	805R270R
2	R30	15k	0805	Chip Widerstand 5%	805R15K
	R42	15k	0805	Chip Widerstand 5%	805R15K
	R36	150R	0805	Chip Widerstand 5%	805R150R
2	R57	160R	0805	Chip Widerstand 5%	805R160R
	R63	160R	0805	Chip Widerstand 5%	805R160R
1	R41	1k1	0805	Chip Widerstand 5%	805R1K1
8	R20	1k	0805	Chip Widerstand 5%	805R1K
	R32	1k	0805	Chip Widerstand 5%	805R1K
	R6	1k	0805	Chip Widerstand 5%	805R1K
	R47	1k	0805	Chip Widerstand 5%	805R1K
	R51	1k	0805	Chip Widerstand 5%	805R1K
	R7	1k	0805	Chip Widerstand 5%	805R1K
	R73	1k	0805	Chip Widerstand 5%	805R1K
	R76	1k	0805	Chip Widerstand 5%	805R1K
	R43	1k	0805	Chip Widerstand 5%	
1	R26	1k2	0805	Chip Widerstand 5%	805R1K2
4	R10	220R	0805	Chip Widerstand 5%	805R220R
	R24	220	0805	Chip Widerstand 5%	805R220R
	R31	220	0805	Chip Widerstand 5%	805R220R
	R46	220	0805	Chip Widerstand 5%	805R220R
1	R19	100	0805	Chip Widerstand 5%	805R100R
5	R14	22k	0805	Chip Widerstand 5%	805R22K
	R34	22k	0805	Chip Widerstand 5%	805R22K
	R38	22k	0805	Chip Widerstand 5%	805R22K
	R72	22k	0805	Chip Widerstand 5%	805R22K
	R9	22k	0805	Chip Widerstand 5%	805R22K
1	R21	180R	0805	Chip Widerstand 5%	805R180R
2	R27	2k7	0805	Chip Widerstand 5%	805R2K7
	R28	2k7	0805	Chip Widerstand 5%	805R2K7
1	R8	2k2	0805	Chip Widerstand 5%	805R2K2
1	R54	33k	0805	Chip Widerstand 5%	805R33K
1	R39	390R	0805	Chip Widerstand 5%	805R330R
2	R40	330R	0805	Chip Widerstand 5%	805R330R
	R45	330R	0805	Chip Widerstand 5%	805R330R
2	R16	390k	0805	Chip Widerstand 5%	805R390K
1	R15	3k9	0805	Chip Widerstand 5%	805R3k9
	R4	390k	0805	Chip Widerstand 5%	805R470K
2	R59	470k	0805	Chip Widerstand 5%	805R470K
	R18	470k	0805	Chip Widerstand 5%	
2	R52	470R	0805	Chip Widerstand 5%	805R470R
	R71	470R	0805	Chip Widerstand 5%	805R470R
5	R12	47k	0805	Chip Widerstand 5%	805R47K
	R17	47k	0805	Chip Widerstand 5%	805R47K
	R22	47k	0805	Chip Widerstand 5%	805R47K
	R58	47k	0805	Chip Widerstand 5%	805R47K
	R77	47k	0805	Chip Widerstand 5%	805R47K
2	R102	47R	0805	Chip Widerstand 5%	805R47R
	R103	47R	0805	Chip Widerstand 5%	805R47R
5	R35	4k7	0805	Chip Widerstand 5%	805R4K7
	R66	4k7	0805	Chip Widerstand 5%	805R4K7
	R67	4k7	0805	Chip Widerstand 5%	805R4K7
	R68	4k7	0805	Chip Widerstand 5%	805R4K7
	R74	4k7	0805	Chip Widerstand 5%	805R4K7
1	R78	100k	0805	Chip Widerstand 5%	805R100K
1	R13	56R	0805	Chip Widerstand 5%	805R56R
2	R44	68R	0805	Chip Widerstand 5%	805R68R
	R48	68R	0805	Chip Widerstand 5%	805R68R
1	R70	68k	0805	Chip Widerstand 5%	805R68K
2	R79	750k	0805	Chip Widerstand 5%	805R750K
	R85	750k	0805	Chip Widerstand 5%	805R750K
1	R29	1M3	0805	Chip Widerstand 5%	

<u>Num-ber</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
1	ST1	Stiftleiste	2Reihe 8polig L=7mm		ST021618
2	STE1	Stiftleiste	2polig L=7mm		15F515
	STE2	Stiftleiste	2polig L=7mm		15F515
2	K1	Kurzschlussbrücke			3300092
	K2	Kurzschlussbrücke			3300092
3	MP1	Steckerstift	diam=1mm, L=6mm		ST010212
	STI1	Steckerstift	diam=1mm, L=6mm		ST010212
	STI2	Steckerstift	diam=1mm, L=6mm		ST010212
2	STR1	Stromschiene 6 Füße	RM:600		M825-28-06
	STR2	Stromschiene 4 Füße	RM:600		M825-28-06
3	T1	XRF9382T1	PLD-1	Motorola	
	T7	XRF9382T1	PLD-1	Motorola	
	T8	XRF9382T1	PLD-1	Motorola	
2	T2	BC847	SOT23	Siemens	BC847C
	T3	BC847	SOT23	Siemens	BC847C
2	T4	CF739	SOT143	Siemens	CF739
	T5	CF739	SOT143	Siemens	CF739
1	T6	BC858C	SOT23	Siemens	BC858C
1	T11	SST309	SOT23	Silikonix	SST309
1		Isolier Buchsen typ IB	int diam 3,1mm		61B515
1		Silikon Scheiben	Für TO220		61B642
1		Kupfer Draht isoliert 0.3mm 30cm			

6.2 PC Board: NF Platine (Rev 1.5)

<u>Num-ber</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
2		Schrumpf-schlauch CS-PF-008/6,4-sw	länge: 12mm		im Haus
4		Rohrnieten, Messing	A3x0,3x7		im Haus
17	C1	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C10	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
5	C106	100u/16V	SMD Typ E	Tantal 20%	
	C11	100nF	SMD		805100N
	C12	100u/16V	SMD Typ E	Tantal 20%	
	C13	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C14	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C15	4n7/50V	0805	Chip Vielschicht 10% X7R	
	C16	100u/16V	SMD Typ E	Tantal 20%	
1	C17	1n/50V	0805	Chip Vielschicht 10% NP0 X7R	8051N
	C18	100p	0805	Chip Vielschicht 10% NP0 X7R	
1	C19	27/50V	0805	Chip Vielschicht 10% X7R	
	C2	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C20	1uF/50V	0805	Chip Vielschicht 10% X7R	805100N
1	C21	2u2/16V	SMD Typ A	Tantal 20%	
	C22	220n/50V	0805	Chip Vielschicht 10% X7R	805220N
	C23	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
3	C24	220n/50V	0805	Chip Vielschicht 10% X7R	805220N
	C25	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
2	C26	100p/50V	0805	Chip Vielschicht 10% NP0 X7R	805100P
1	C27	220p/50V	0805	Chip Vielschicht 10% NP0 X7R	805470P
3	C28	22n/50V	0805	Chip Vielschicht 10% X7R	80522N
	C29	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
3	C3	10u/16V	SMD Typ C	Tantal 20%	
1	C30	1000uF/40V	RM 7,5 Radial 18x20mm	Elko 20%, 105°C	Bezeichnung bei Matronic: LXZ..... ..18x20
	C32	10n/50V	0805	Chip Vielschicht 10% NP0 X7R	8051N
	C33	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
3	C34	4u7/16V	SMD Typ B	Tantal 20%	
	C35	220n/50V	0805	Chip Vielschicht 10% X7R	805220N
	C36	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
2	C37	470n/50V	0805	Chip Vielschicht 10% X7R	805470N
	C38	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C39	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C4	1u/16V	SMD Typ A	Tantal 20%	
	C40	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
2	C41	2n2	0805	Chip Vielschicht 10% X7R	805100N
2	C42	4,7n/50V	0805	Chip Vielschicht 10% X7R	8054N7
	C43	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C44	100u/16V	SMD Typ E	Tantal 20%	

<u>Stück</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
	C45	10u/16V	SMD Typ C	Tantal 20%	
	C46	100u/16V	SMD Typ E	Tantal 20%	
	C47	2u2/20V 16V	SMD Typ A B	Tantal 20%	
2	C48	10n/50V	0805	Chip Vielschicht 10% X7R	80510N
1	C49	1u/20V	SMD Typ A	Tantal 20%	
	C5	10u/16V	SMD Typ C	Tantal 20%	
2	C50	1u/16V	SMD Typ A RM 2,5	Tantal 20%	
	C51	470n/50V	0805	Chip Vielschicht 10% X7R	805470N
1	C52	47p	0805	Chip Vielschicht 10% NP0 X7R	
	C53	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C54	4u7//16V	SMD Typ B	Tantal 20%	
	C55	4u7/16V	SMD Typ B	Tantal 20%	
1	C58	680p/50V	0805	Chip Vielschicht 10% X7R	805220P
	C6	22n	0805	Chip Vielschicht 10% X7R	
	C7	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C8	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C9	22n/50V	0805	Chip Vielschicht 10% X7R	80522N
2	D1	LL4148	SOD80	Schalt Dioden	LL4148
1	D2	MBR1645	TO220	Begrenzdiode	MBR1645
1	D3	BAV99	SOT23	Schalt Dioden	BAV99
1	D5	BAS40-04	SOT23	Schalt Dioden	BAS40
	D8	LL4148	SOD80	Schalt Dioden	LL4148
3	IC1	MC33172D	SO8	Motorola	MC33172D
1	IC2	TDA1015	SIP-9P	Philips	TDA1015
	IC4	MC33172D	SO8	Motorola	MC33172D
	IC5	TS 912	SO8	Signetics Thomson Mo- torola	MC33172D
1	IC6	TS 914 ID	SO14	Signetics Thomson	
1	IC7	4066D	SO14		4066SMD
1	J1	Einlötbuch- se 0,5 bis 1,5mm		AMP 380598	20F2655
1	J2	Einlötbuch- se 0,5 bis 1,5mm		AMP 380598	20F2655
0	J3	NC			
1	LED 1	RED	1206	Led SMD	BR1101W
2	P1	10k	Trimmpoti Typ Bourns 3364 W 25%		TP103SM D
1	P3	5k	Cermet Trimmpoti Typ P71 10%		65E2464
	P7	10k	Trimmpoti Typ Bourns 3364 W 25%		TP103SM D
	R1	10k	0805	Chip Widerstand 5%	805R10K
3	R10	56k	0805	Chip Widerstand 5%	805R56K
15	R11	47k	0805	Chip Widerstand 5%	805R47K
3	R12	27k	0805	Chip Widerstand 5%	805R27K
1	R13	180k	0805	Chip Widerstand 5%	805R180K
1	R14	22k	0805	Chip Widerstand 5%	805R33K
3	R15	4k7	0805	Chip Widerstand 5%	805R4K7
2	R16	1k8	0805	Chip -Widerstand 5%	805R1K8
	R17	47k	0805	Chip Widerstand 5%	805R47K
2	R18	100k	0805	Chip Widerstand 5%	805R100K
	R19	510R	0805	Chip Widerstand 5%	805R270R

<u>Stück</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
	R2	510R	0805	Chip Widerstand 5%	805R2K2
2	R20	1M	0805	Chip Widerstand 5%	805R1M
1	R21	100R	0805	Chip Widerstand 5%	805R100R
	R22	220k	0805	Chip Widerstand 5%	805R220K
	R23	10k	0805	Chip Widerstand 5%	805R10k
	R24	10k	0805	Chip Widerstand 5%	805R10k
	R25	10k	0805	Chip Widerstand 5%	805R10k
	R26	220R	0805	Chip Widerstand 5%	805R220R
	R27	220k	0805	Chip Widerstand 5%	805R220k
	R28	1M	0805	Chip Widerstand 5%	805R1M
2	R29	22k	0805	Chip Widerstand 5%	805R22K
4	R3	330R	0805	Chip Widerstand 5%	805R330R
	R30	330R	0805	Chip Widerstand 5%	805R330R
	R31	47k	0805	Chip Widerstand 5%	805R47K
	R32	56k	0805	Chip Widerstand 5%	805R56K
	R33	47k	0805	Chip Widerstand 5%	805R47K
4	R34	470R	0805	Chip Widerstand 5%	805R470R
8	R35	10k	0805	Chip Widerstand 5%	805R10K
1	R36	2M2	0805	Chip Widerstand 5%	8052M2
1	R37	10M	0805	Chip Widerstand 5%	
1	R38	3k3	0805	Chip Widerstand 5%	805R3K3
	R39	56k	0805	Chip Widerstand 5%	
2	R4	120R	0805	Chip Widerstand 5%	805R120R
	R40	27k	0805	Chip Widerstand 5%	805R27K
1	R41	20k	0805	Chip Widerstand 5%	805R20K
	R42	10k	0805	Chip Widerstand 5%	805R10K
	R43	47k	0805	Chip Widerstand 5%	805R47K
	R44	4k7	0805	Chip Widerstand 5%	805R4K7
	R45	4k7	0805	Chip Widerstand 5%	805R4K7
	R46	10k	0805	Chip Widerstand 5%	805R10K
	R47	47k	0805	Chip Widerstand 5%	805R47K
1	R48	1k5	0805	Chip Widerstand 5%	805R1K5
	R49	27k	0805	Chip Widerstand 5%	805R27K
	R5	120R	0805	Chip Widerstand 5%	805R120R
	R50	470R	0805	Chip Widerstand 5%	805R470R
	R51	1k8	0805	Chip -Widerstand 5%	805R1K8
	R53	470R	0805	Chip Widerstand 5%	805R470R
	R54	22k	0805	Chip Widerstand 5%	805R22K
1	R55	4R7	0805	Chip Widerstand 5%	805R4R7
	R57	47k	0805	Chip Widerstand 5%	805R47K
	R58	47k	0805	Chip Widerstand 5%	805R47K
2	R59	2k2	0805	Chip Widerstand 5%	805R2K4
	R6	47k	0805	Chip Widerstand 5%	805R47K

<u>Stück</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
	R60	2k2	0805	Chip Widerstand 5%	805R2K5
	R61	10k	0805	Chip Widerstand 5%	805R10K
	R62	47k	0805	Chip Widerstand 5%	805R47K
	R63	47k	0805	Chip Widerstand 5%	805R47K
	R64	10k	0805	Chip Widerstand 5%	805R68K
	R65	47k	0805	Chip Widerstand 5%	805R47K
	R66	220k	0805	Chip Widerstand 5%	805R220K
	R67	330R	0805	Chip Widerstand 5%	805R330R
	R68	470R	0805	Chip Widerstand 5%	805R4K8
1	R69	22R	0805	Chip Widerstand 5%	805R47R
	R7	330R	0805	Chip Widerstand 5%	805R330R 1K
	R70	47k	0805	Chip Widerstand 5%	805R47K
	R71	47k	0805	Chip Widerstand 5%	805R47K
1	R72	330k	0805	Chip Widerstand 5%	
	R74	8k2	0805	Chip Widerstand 5%	805R8K2
	R75	10k	0805	Chip Widerstand 5%	805R10K
2	R76	8k2	0805	Chip Widerstand 5%	
	R8	100k	0805	Chip Widerstand 5%	805R100K
	R9	22k	0805	Chip Widerstand 5%	805R47K
1	ST1	Buchse	2 Reihe 8 Polig L=7mm		SBLD0822
1	ST2	Stiftleiste	2 Reihe 5 Polig L=7mm		ST021612
2	ST3	Stiftleiste	3 Reihe 3 Polig abdewin- ckelt 90°		ST0309AB
	ST4	Stiftleiste	3 Reihe 3 Polig abdewin- ckelt 90°		ST0309AB
1	SW 1	Umschalter	Typ NK236	RS: 181-0038	
1	T1	LM2940CT- 9	SOT23	Phillips	BC807-25
3	T10	BC857C	SOT23	Phillips	BC857C
1	T2	BC847C	SOT23	Phillips	BC847C
1	T3	2N7002	SOT 23	Phillips	
	T5	BC857C	SOT23	Phillips	BC857C
	T6	BC857C	SOT23	Phillips	BC857C
1	T7	BC807-40	SOT23	Phillips	BC807-40
1	T8	BC817-40	SOT23	Phillips	BC817-40
	TR1	BD438			BD438

6.3 PC Board: Kopf1 (Rev 1.2)

<u>Stück</u>	<u>Part</u>	<u>Value</u>	<u>Package</u>	<u>Description</u>	<u>Lager Nummer</u>
8	C10	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C5	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C6	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C7	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C8	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C23	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C9	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
	C25	100n/50V	0805	Chip Vielschicht 10% X7R	805100N
3	C18	1n/50V	0805	Chip Vielschicht 10% X7R	8051N
	C19	1n/50V	0805	Chip Vielschicht 10% X7R	8051N
	C20	1n/50V	0805	Chip Vielschicht 10% X7R	8051N
1	C21	220n/50V	0805	Chip Vielschicht 10% X7R	805220N
3	C1	220p	0805	Chip Vielschicht 5% NPO	805220P
	C15	220p	0805	Chip Vielschicht 5% NPO	805220P
	C16	220p	0805	Chip Vielschicht 5% NPO	805220P
2	C2	33p	0805	Chip Vielschicht 5% NPO	80533P
	C3	33p	0805	Chip Vielschicht 5% NPO	80533P
1	C22	470n/50V	1206	Chip Vielschicht 10% X7R	1206470N
1	C11	220u/16V	SMD Typ E	Elko 25%	T220SM16
2	C4	100u/16V	SMD Typ E	Elko 25%	T12USM16
	C24	100u/16V	SMD Typ E	Elko 25%	T12USM16
1	C14	4u7/16V	1210	Tantal 20%	T4U7SM16
3	D1	LL4148	SOD80	Schaltdiode	LL4148
	D2	LL4148	SOD80	Schaltdiode	LL4148
	D3	LL4148	SOD80	Schaltdiode	LL4148
1	D4	BAT 68-03		Shottky Diode	BAT68-03
1	IC1	P87C52SFBB	QFP-44	Siemens	P87C52SF
1	IC2	24C02	SO8	SGS	24C02
1	IC5	TL7705	SO8	Texas Instrument	TL7705
1	IC3	X9313U (50k)	SO8	Xicor	X9313U
2	IC4	X9313WS (10k)	SO8	Xicor	X9313WS
	IC8	X9313WS (10k)	SO8	Xicor	X9313WS
1	IC6	TA78L05	SOT-89B	Toshiba	78L05F
1	Q1	3.57MHz	HC49U-V	Standard Quarz	78D130
8	R1	10k	0805	Chip Widerstand 5%	805R10K
	R10	10k	0805	Chip Widerstand 5%	805R10K
	R11	10k	0805	Chip Widerstand 5%	805R10K
	R12	10k	0805	Chip Widerstand 5%	805R10K
	R4	10k	0805	Chip Widerstand 5%	805R10K
	R6	10k	0805	Chip Widerstand 5%	805R10K
	R8	10k	0805	Chip Widerstand 5%	805R10K
	R9	10k	0805	Chip Widerstand 5%	805R10K
1	R20	3k	0805	Chip Widerstand 5%	805R3K
1	R22	12k	0805	Chip Widerstand 5%	805R12K
3	R5	1k	0805	Chip Widerstand 5%	805R1K
	R3	1k	0805	Chip Widerstand 5%	805R1K
	R2	1k	0805	Chip Widerstand 5%	805R1K
1	R21	13K	0805	Chip Widerstand 5%	805R16K
3	R13	22k	0805	Chip Widerstand 5%	805R22K
	R14	22k	0805	Chip Widerstand 5%	805R22K
	R15	22k	0805	Chip Widerstand 5%	805R22K
1	R19	11k	0805	Chip Widerstand 5%	805R11K
1	R7	100k	0805	Chip Widerstand 5%	805R100K
1	RN1	10k	RNW (4 x10K)	RNW 4x10k	92E1570

1	ST6	Stiftleiste	2R/8pol/L=7		ST021612
1	T1	BC847C	SOT23	Siemens	BC847C
1	T3	TN2460T	SOT23	Siloconix	TN2460T
4			Abstandbolzen		18H2424

This section provides listings of the ATR 57.

7 SECTION VII PERFORMANCE TEST REPORT ATR57

Serial Nr.:	Software-Version:	Inspector and Date:

General

AFC (VCO) 2V at 118,00MHz	Crystal
VCO-Output (0 dbm)	Intercom
VOX- Output (50mV @15)	Dynamik- (ab 100mV)

Receiver

FM Broadcast-Filter (wobbeln)	
-------------------------------	--

Sensitivity m=30%, 1kHz, 1,5µV	
SNR. 118,00 MHz	dB(>6dB)
SNR. 127,00 MHz	dB(>6dB)
SNR. 136,97 MHz	dB(>6dB)

Distortion m=80%, 1kHz, 1mV	%(<10%)
AGC m=30%, 1kHz, 10µV – 10mV	dB(<3dB)
Squelch-Level @ 04	µV
AF-Output (min. 1W)	V(>2V)

Transmitter

	RF Power min 1 W	Frequency modulation max. 2kHz
RF Power @ 118,00 MHz	W	kHz
RF Power @ 127,00 MHz	W	kHz
RF Power @ 136,97 MHz	W	kHz
Modulation (Sinus @ 70%, 1kHz)		
Sidetone (Funktion)		

8 SECTION VIII Certifications

EuroCAE EC-Type Approval Certificate

CETECOM GmbH
EU-Kennnummer 0680

betrieben nach der Deleghungs- und Akkreditierungsverordnung vom Dezember 10, 1997
als Benannte Stelle der Bundesrepublik Deutschland, vertreten durch die
recognised in accordance with the Recognition and Accreditation Ordinance of 10 December 1997
as Notified Body for the Federal Republic of Germany, represented by

 **Regierungsbehörde für
Telekommunikation und Post**

**DEUTSCHE BAUMUSTERPRÜFBESCHEINIGUNG
GERMAN TYPE-EXAMINATION CERTIFICATE**

Registriernummer: **F 000 129 K**
Registration No.:

Bescheinigungsinhaber: **Filser Electronic GmbH**
Certificate Holder: **Gewerbstrasse 2
D-86875 Waal**

Produktbezeichnung: **UKW-Sprechfunkanlage des Beweglichen Flugfunks (Luftfunkstelle)**
Product Designation: **Airborne VHF Receiver - Transmitter**

Produktbeschreibung: **ATR 57 COM**
Product Description:

ProduktHersteller: **siehe Bescheinigungsinhaber**
Product Manufacturer: **see Certificate Holder**

Vorschrift: **Reg TP 321 ZV 034 : Juli 1998**
Specification: **EUROCAE ED-23B & EUROCAE ED-14C**

Prüfergebnis: **Das geprüfte Baumuster ist konform zu der genannten Prüfvorschrift.**
Examination Result: **The examined type is in conformity with the above-mentioned test specification.**

Diese Bescheinigung ist erstellt in Übereinstimmung mit der Telekommunikationszulassungsverordnung vom 20. August 1997 und gilt nur in Verbindung mit den nachfolgenden 2 Anlagen.
This certificate is issued in accordance with the Telecommunications Type Approval Ordinance of August 20th, 1997 and is only valid in conjunction with the following 2 annexes.

Essen, 16. Dezember 1998
Ort, Ausstellungsdatum
Place, Date of Issue


Unterschrift von/Signed by Volker Propach
Benannte Stelle/Notified Body



CETECOM GmbH • Im Teelbruch 122 D-45219 Essen, Germany • Tel.: +49 (0) 2054 / 9519-11 • Fax: +49 (0) 2054 / 9519-88



Industry Canada Industrie Canada

EINGEGANGEN 0 9. Juni 2000

<http://spectrum.ic.gc.ca>
Certification and Engineering Bureau
3701 Carling Ave, Bldg 94,
PO Box 11490, Station H
Ottawa, Ontario
K2H 8S2

FAX NO. (613)-990-4752
PHONE NO. (613)-990-5320

June 6, 2000

OUR FILE: 46327-3544
SUBMISSION: 32882A

Mr. Walter Dittel
Filser Electronics GmbH
Gewerbstrasse 2
Waal, D-86875
Germany

Dear Mr. Dittel,

We have completed the audit of the equipment listed below and are pleased to inform you that the equipment continues to meet the requirements of the Radio Standard Specification to which it has been certified.

MODEL NO.

CERTIFICATION NO

ATR57COM

3544411112

In closing, I would like to thank you for participating in our Audit Programme. You are able to keep informed of the latest Industry Canada regulations by visiting the Bureau's site on the World Wide Web;

<http://spectrum.ic.gc.ca/dehlab/english/dehintre.html>
or the Industry Canada main site at;
<http://strategis.ic.gc.ca>

Yours truly,

Brian Kasper

Brian Kasper
Head EMC and Standards

cc. Mr. Steven Dayhoff, National Certification Laboratory

Canada

