

## Instruction Manual



# OM4000A

## SHORTWAVE POWER AMPLIFIER

FCC ID: X8NOM4000A

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## 1. GENERAL INFORMATION

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### 1.1. Introduction

**T**he OM Power model OM4000A is a fully automatic power amplifier, designed for use on all short wave amateur bands from 1.8 to 29.7 MHz (including WARC bands) and all modes. It is equipped with a two pieces of ceramic tetrode FU728F.

#### *THE ADVANTAGES OF OM4000A*

*Full compatibility with: ICOM, ELECRAFT, KENWOOD, TEN-TEC ORION, YAESU, FLEX RADIO SERIES 6XXX and Icom transceiver protocol using by MicroHAM devices ( CI-V output ).*

*Automatic switching between bands*

*Automatic tuning within the band according to segments*

*Automatic switching of band pass filter*

*Automatic switching of antenna switches*

*The possibility to use 2 different antennas within one band or segment*

### 1.2. Specification

#### 1.2.1. Parameters

Frequency Coverage	Amateur Bands 1.8 - 29.7 MHz including WARC
Power Output	1500W continuous output - no time limit
Input Power	Usually 50 to 70W for full Output Power Input power can not exceed 100W !
Input Impedance	50 Ohm, VSWR < 1.5 : 1
Power Gain	15 dB
Output Impedance	50 Ohm unbalanced
Maximum Output SWR	2 : 1
SWR protection	Automatic switching to STBY, when reflected power is 350W or higher
Intermodulation distortion	32dB below nominal output
Suppression of harmonics	< -50 dBc
Tubes	2x FU728F Ceramic tetrode
Cooler	Centrifugal blower + Axial blower
Power supply	240V - 60 Hz
Transformers	2 pcs of toroidal transformer 3kVA
Dimensions	485x200x455mm (width x height x depth) (19"x8"x18")
Weight	46 kg (101.5 lbs)

### 1.2.2. Protection Circuits

There are 11 special protection circuits used in the amplifier. They are activated when one or more of next parameters exceed defined values or some unwanted occasion occurs.

- VSWR too high
- Input power too high
- Output power too high
- Plate voltage too low
- Anode current too high
- Screen current too high
- Grid current too high
- Mistuning of PA
- Hot switching protection
- Soft start for protecting your fuses
- “switch-on blocking “ at opened amplifier

### 1.2.3. Indicators

There are couples of LED and bar graph indicators visible on the front panel to inform you about value of some parameters or operation status:

Bar graph indicators	Power output	- 50 LEDs
	Reflected power	- 20 LEDs
	Ig2 current	- 10 LEDs
	Anode voltage, anode current, tuning	- 30 LEDs
LED Indicators	Current at control grid (I <sub>g1</sub> )	- 2 LEDs
	WAIT	- preheating of tube (150 sec.)
	STBY	- standby
	OPR	- operation mode
	FAULT	- failure, switching off for abt. 2 sec.
	INHIBIT	- operating condition
	ANT 1	- which ANT is in use
	ANT 2	- which ANT is in use
Buttons	ANT	- ANT selection
	UP - DWN	- listing in menu
	MAN	- manual operating
	AUTO	- automatic operating
	TUNE	- tuning
OSD Indicator	SET	- confirms selected parameter
	LCD Display	2 x 16 characters

## 2. SAFETY INSTRUCTIONS

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### **WARNING!**

#### **DANGEROUS HIGH VOLTAGE INSIDE!**

The power amplifier is using high voltage up to 3400V DC, which is very dangerous for human life! Read next safety instructions carefully first, before you will start to install and operate power amplifier! **NEVER VIOLATE NEXT RULES!**

### **WARNING!**

**NEVER ALLOW CHILDREN** to play around PA or to touch power amplifier or connected cables in working condition, or to push anything into the case holes!

### **WARNING!**

The amplifier contains high voltage circuits. Never turn the amplifier on without the upper lid in place. **DO NOT ATTEMPT TO SHORT OR BYPASS** safety switch under upper lid!

### **WARNING!**

The OM4000A amplifier can be operated **ONLY** if both of supply cables are connected!

### **WARNING!**

The OM4000A amplifier is neither to be used in a **WET** or **HUMID** environment nor to be exposed to **RAINFALL!**

### **WARNING!**

Do not turn the amplifier **ON** without having connected the **ANTENNA** or properly rated **DUMMY LOAD!** A hazardous HF voltage may build up on the antenna connector after turning the amplifier on with no antenna or dummy load connected!

### **WARNING!**

Before opening the upper lid of the amplifier make sure that power supply has been disconnected **AT LEAST 5** minutes allowing the electrolytic capacitors to discharge fully. Disconnect power cord from the outlet!

### CAUTION

The amplifier must be installed in such a way that free flow of hot air from the tube is allowed. The amplifier must not be installed in a constrained surrounding (i.e. tight shelves etc.). During long time operation ventilation grid can reach high temperature. Do not touch the top cover of the PA in these places during operation.

### CAUTION

The amplifier must be properly grounded during operation.

### CAUTION

During operation the amplifier must be installed in such a way that the rear side remains accessible.

### CAUTION

The amplifier is an A category product. In a household it can influence other electric appliances. In such cases the user is to take proper actions to mitigate this disturbance.

### CAUTION

Make sure that all screws holding the case together are properly in place and tightened before carrying the amplifier with the handles!

### CAUTION

Read this manual carefully. Follow all of instructions during installation and operation to avoid damage to the amplifier not covered by manufacturer's warranty! Do not attempt to perform any change of hardware or software!

## 3. GENERAL DESCRIPTION

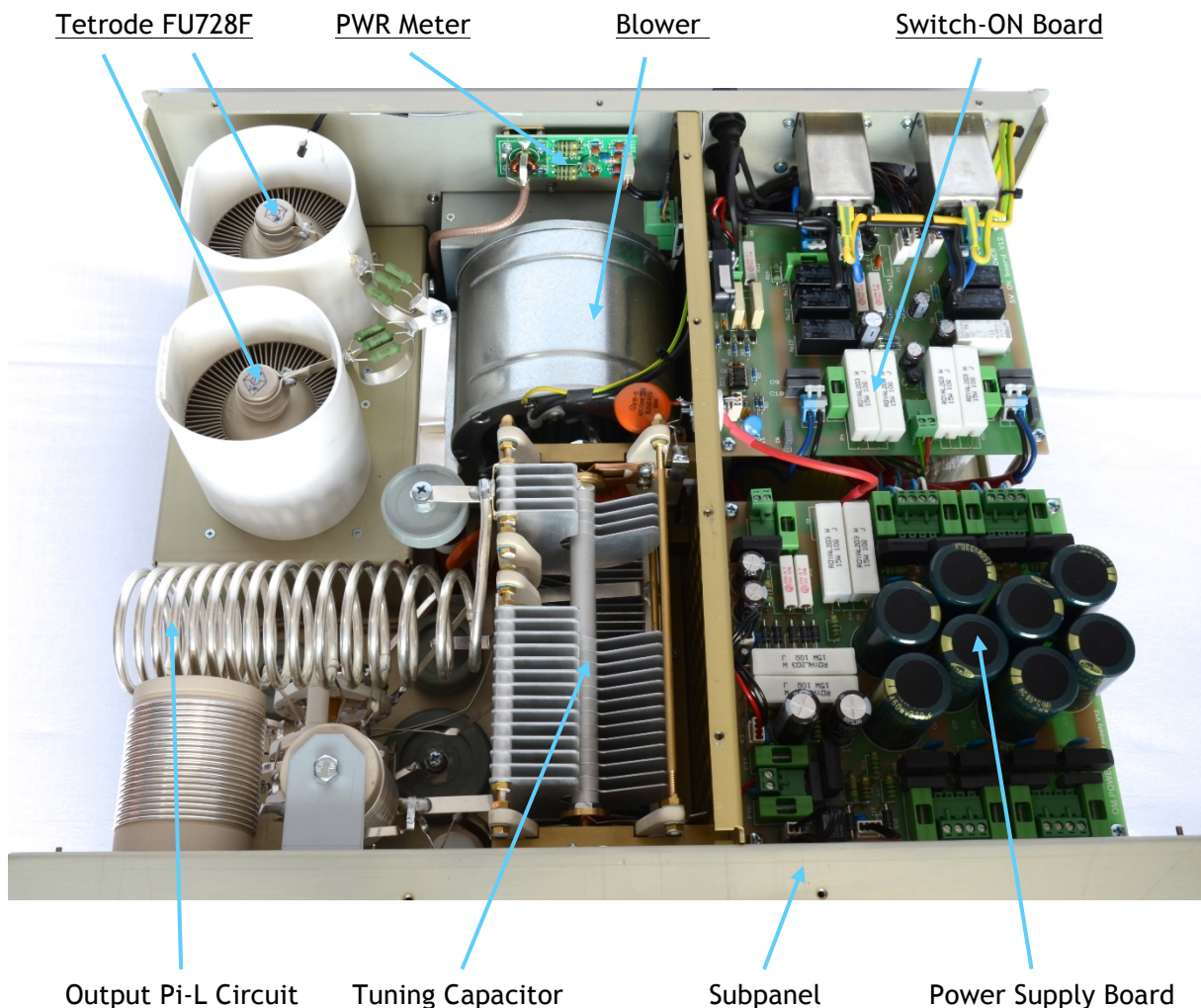
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### 3.1. HF part

This amplifier is using two pieces of ceramic tetrode FU728F in a grounded-cathode circuit (input into control grids). OM4000A amplifier achieves excellent linearity by the voltage stabilization of the control grid bias and the screen voltage. The power input is given to the control grids, using a broadband input circuit with an input impedance of 50 Ohms. This adaptable input circuitry ensures a good input SWR (better than 1.2:1) on all amateur bands.

The output of the amplifier is a Pi-L circuit. The ceramic capacitor for TUNE and LOAD are divided. This enables the amplifier to be tuned exactly and makes it possible to easily return to the previously set positions after band changes.

### Top view on the opened OM4000A



### 3.2. Power Supply

**P**ower supply of the amplifier is comprised of two of 3 kVA toroidal transformers. A soft start is provided using relays and resistors.

The high anode voltage is made by combining 8 x 420 V (total 3360V) @ 2.5A. Each has its own rectifier and filter. In the high voltage circuit, safety resistors are employed to protect the amplifier against overload.

The source for screen grid is regulated by parallel stabilization with BU941 NPN Darlington transistors and delivers a voltage of 350V at 200mA. The -120V for the control grid is regulated with Zener diodes.



### 3.3. Safety Devices

Control and monitoring circuits ensure control and safety during malfunctions of the PA. These are on the Control board, which is located on the chassis subpanel.

## 4. INSTALLATION

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### NOTE

Read this chapter carefully prior you will start installation. Before unpacking inspect shipping woody container first, if it is not damaged. Keep all of packing parts for possible future shipment. Check unpacked power amplifier. If you find some damaging, contact your dealer immediately to keep full warranty.

During installation go step by step according to next parts.

### 4.1. Grounding

### CAUTION

The amplifier has to be grounded properly! Connect the screw on the rear panel of the amplifier to your local grounding system with a copper cable; use a cross-section of 4 mm<sup>2</sup> at least.

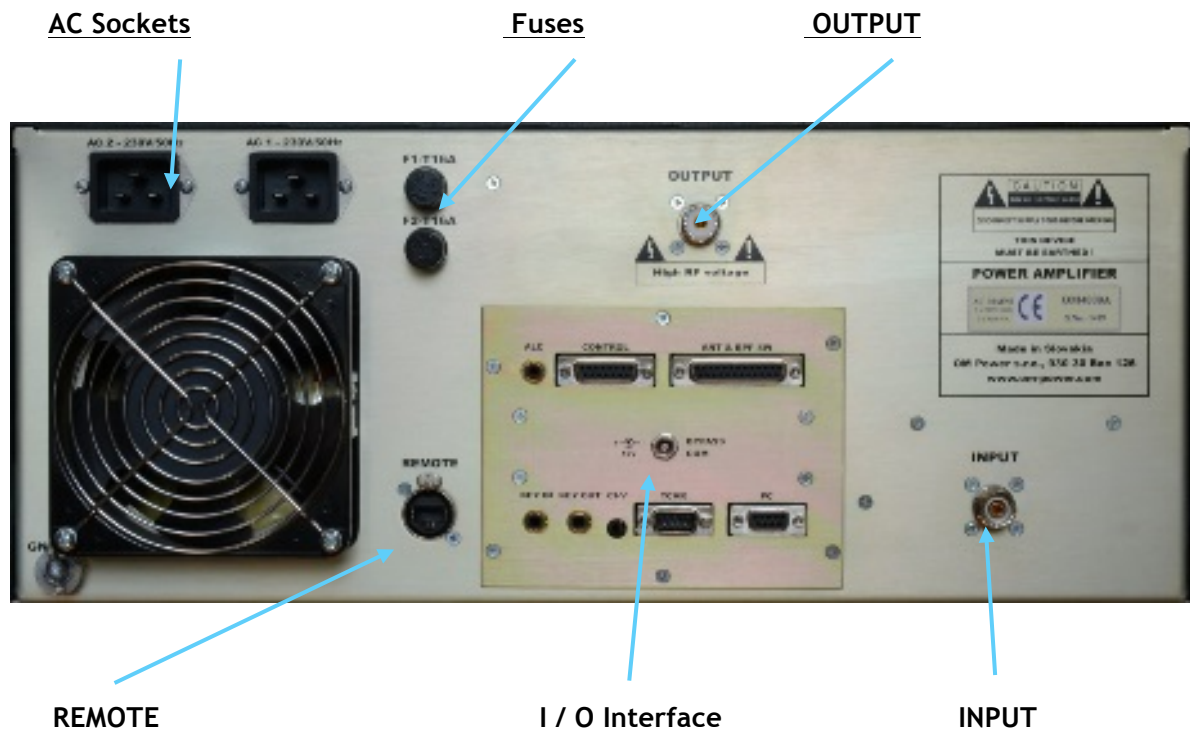
Connect your transceiver to the same grounding system of your shack carefully!

Use minimum length cables and make certain that the connections are both physically and electrically sound. With poor grounding, you may risk damaging your equipment, having problems with TVI/BCI or your transmitted signal may be distorted.

### 4.2. Coaxial Cable

The output of the transceiver is to be connected to the input of the amplifier via RG58 or similar cable. For the connection between the power amplifier and the antenna, RG213 or similar coaxial cable suited for high power is recommended. Both the INPUT and OUTPUT SO-239 sockets with Teflon insulation is used.

## Rear view of the amplifier OM4000A



### 4.3. I/O Box and Interface

Control of Amplifier and communication with TCVR as well as Antennas / BPF switching can be done via the rear panel I/O Interface.

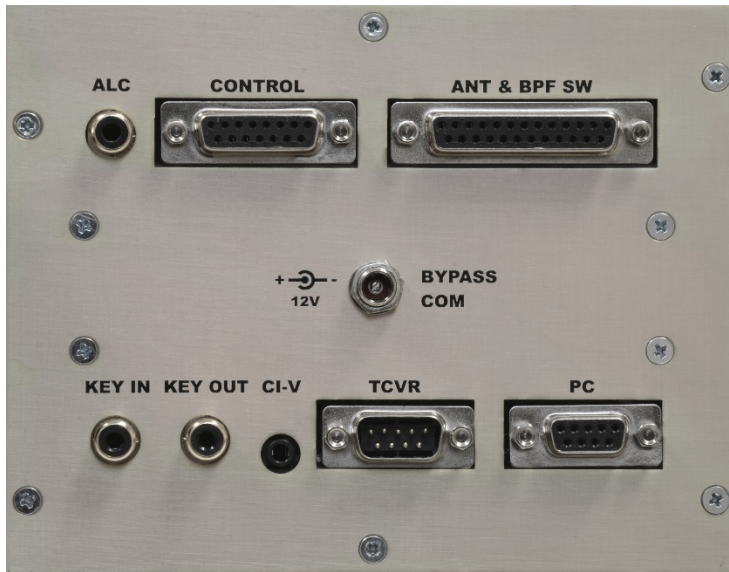
Control cable maintains TX / RX switching of the PA (TX GND). The cable is shielded. On the side of the power amplifier a CINCH-socket is used. On the side of your transceiver you have to use a socket suitable for this transceiver. During transmitting the middle pin is connected to the ground.

The relays of the OM4000A have to be switched earlier than HF is applied (cold switching). Modern transceivers they have a time delay between PTT switching and power output.

#### CAUTION

If you are using an older transceiver or transmitters without time delay, we recommend to connect the PA in such a way that the transmit/receive switch (foot switch for example) is connected with the KEY IN socket of the amplifier. The KEY OUT socket is to be connected with the PTT socket at the transceiver.

The amplifier is equipped with two safety devices, which ensure that the output relay is not switched under power mistakenly (hot switching).



**KEY IN** RCA Phono - Input signal PTT (switching voltage / current 5V / 2 mA)

**KEY OUT** RCA Phono - Output signal PTT (maximum switching of 30V / 50mA)

**CI-V** Mono 3.5mm Jack for connection of ICOM TCVRs or devices that provide compatible CI-V protocol. Correct baud rate is important.

**TCVR** DB9 serial port RS232 for KENWOOD, YAESU and ELECRAFT TCVRs. Correct baud rate and type is required for successful operation. If both CI-V and TCVR cables are connected then CI-V disables RS232. Otherwise selection of interface is done via TCVR type.

**PC** DB-9 RS232 port is used for communication with your PC. Please use setting you would normally use if using direct TCVR - PC connection.

**ALC** RCA Phono - Automatic Level Control is used when tuning the PA to block drive level.

**BYPASS COM** Connector (5.5/2.1mm) allows you to connect an external 12V DC power supply (rated at 200mA max.), which allows independent communication between the PC and the TCVR. It means the ability to communicate even if the PA is turned OFF. External source is separated from the internal supplying; this means that it can remain permanently connected to the PA.

**CAUTION!**

We only recommend using ALC feature while operating RTTY, FM and other 100% duty modes.

**CONTROL**            The CONTROL socket is a single DB-15 connector that provides many connections to the amplifier from your transceiver. Use shielded cable for all connections to this connector. You will need to fabricate a cable with the proper connector for your transceiver or use individual connectors as described below.

**PIN OUT:**

1. ALC Out
2. NC
3. INHIBIT Control voltage
4. TX INHIBIT for Yaesu and Elecraft - this supersedes ALC output
5. NC
6. KEY OUT
7. NC
8. KEY IN
9. -
15. GND

**ANT & BPF SW**            DB-25 is used for switching of external HP BPF or external Antenna Switch. Maximum switching of 30V / 0.5A is possible.

**PIN OUT:**

1. antenna port 1
2. antenna port 2
3. antenna port 3
4. antenna port 4
5. antenna port 5
6. antenna port 6
7. antenna port 7
8. antenna port 8
9. antenna port 9
10. antenna port 10
11. COMMON port of ANT SW
12. NC
13. GND
14. BPF 160m
15. BPF 80m
16. BPF 40m
17. BPF 30m
18. BPF 20m
19. BPF 17m
20. BPF 15m

- 21. BPF 12m
- 22. BPF 10m
- 23. COMMON BPF port
- 24. NC
- 25. GND

#### 4.4. Mains Supply

**CAUTION**

Be sure you got PA with properly terminated line cable, corresponding with your power system's outlet. If not, contact your dealer. In such a case you should make the necessary changes using a licensed electrician.

**CAUTION**

Be sure that your power system is correctly wired and properly rated! To use adequately sized and connected grounding system is also very important.

#### 4.5. Cooling

**CAUTION**

The amplifier must be installed in such a way that free flow of hot air from the tube is allowed. Do not obstruct air intake and exhaust areas of the PA.

The centrifugal blowers provide the necessary cooling of the amplifier, even during long contests. The main blower is activated by switching the PA on and it is turned off when cooling is finished (approx. 1-5 min after switching off the PA depending on the temperature of the tube). The supplemental fan is turned on depending on the temperature of the air exiting from the amplifier. It is switched on at 158°F and switched off at 140°F.

#### 4.6. Remote Control

Control of the amplifier is possible remotely by using **REMOTE BOX** (optional). Connection is done by REMOTE socket, maximum cable length should be 10 meters.

## 5. OPERATION

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**WARNING!**

Before switching PA on, make sure that amplifier is grounded, antenna or dummy load is connected, and line cord is putted to the outlet.

**CAUTION**

Before switching PA on, check all connections between PA and TCVR.

**CAUTION**

Do not turn PA on for at least 2 hours after unpacking it and locating in its operating location. Especially when amplifier is moved from a cold place to a warm one because not visible condensation may develop, and this could result in damage to the high voltage circuits of the PA.

**CAUTION**

Never try to change antenna output during a transmission to avoid warranty loss.

**NOTE**

When you decide to have a short operating break, place the amplifier in the standby mode rather than switch it off.

**5.1. Operation Elements**

There is couple of operational elements accessible or visible on the front panel.



<b>TUNE</b>	Anode capacitor for tuning, tuning of higher frequencies to "0", lower frequencies to "100".
<b>LOAD</b>	Output capacitor tunes antenna load resistance to amplifier. Capacity is low at „100“ and high at "0" on the scale.
<b>OFF</b>	You switch off the amplifier by pressing this button.
<b>ON</b>	You switch on the amplifier by pressing this button. After 3 min. of warm-up delay, amplifier will be ready for operation.
<b>OPR/STBY</b>	„OPERATE“ sets the amplifier ready for transmit operation. In STBY, if WAIT-LED is on or the amplifier is OFF, the amplifier is in bypass-mode and your transceiver is directly connected to the antenna. Maximum allowed power in bypass mode is 200W.
<b>RF OUTPUT</b>	Bar graph - shows output power .
<b>REFLECTED POWER</b>	Bar graph - shows reflected power from the antenna. Maximum level is 350W otherwise amplifier switches to STANDBY mode.
<b>Ig2 +120mA.</b>	Bar graph - measures the current of the second grid from -80mA to +120mA.
<b>HV/IP/TUNE</b>	Bar graph - measure the anode voltage, anode currenecy or tuning of the amplifier.



<b>INHIBIT</b> retune After	Indicates interruption of transmission during the tuning process of the PA. If indicated by RED LED then PA is in STBY mode. If during a operations within the same BAND, then the PA will retune according to the frequency of the transceiver. When changing the BAND - INHIBIT will stay lit until the KEY IN is released and the tuning process will start. that PA is automatically ready for operation.
<b>ANT, ANT1, ANT2</b>	The amplifier is capable of automatic antenna switching (ie. 80m CW and 80m SSB can be split between two antennas). The amplifier will automatically select desired antenna by selecting last used antenna on a given frequency.
<b>SET</b>	button for: <ul style="list-style-type: none"> <li>- MAIN MENU</li> <li>Confirmation of selection</li> <li>Saving of selected value</li> <li>Saving of tuning parameters</li> </ul>
<b>TUNE</b>	Push button for selection of TUNE mode
<b>AUTO</b>	Push button for selection of AUTOMATIC mode
<b>MAN</b>	Push button for selection of MANUAL mode
<b>DWN / UP</b>	Push button for selection of band, segment or parameter

## 5.2. Configuration of Power Amplifier

**W**hen the ON button is pressed the amplifier will start to heat the final amplifier tube. During the warm-up period, the STBY and WAIT LEDs will be illuminated. If a transceiver is connected to the correct port and all communication settings are right, the operating frequency, AUTO, and the type of transceiver will be indicated on the alphanumeric display. After successful heating of the TUBE you can enter operating mode by pressing the OPR button.





Example of Automatic mode with ICOM TCVR.

Type of supported TCVR and working frequency is visible on the display.

AUTO LED is ON

### 5.2.1. TCVR Support Settings



Supported transceivers : ICOM, ELECRAFT, KENWOOD, TEN-TEC, ORION, YAESU.

Press SET button and scroll UP/DWN to CHOOSE TCVR



Confirm CHOOSE TCVR by pressing SET again and scroll UP / DWN to your transceiver type. Confirm the selection by pressing SET



Continue by selecting Baud Rate.

Press SET button and scroll using UP / DWN to BAUD RATE. Press SET again.

Baud rate for TCVR - PA communication is shown on the display.

By scrolling UP / DWN select desired Baud Rate which must be the same as baud rate used by your transceiver (please refer to your transceiver user manual). To confirm your selection press SET.

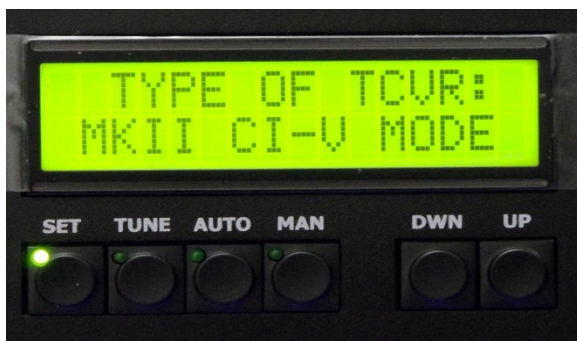
When using Yaesu TCVR you need to configure the STOP BIT parameter correctly and confirm selection with SET.

The communication settings menu can be left by pressing the AUTO button. The amplifier will enter AUTO mode only if all settings are correct and connection has been established with your transceiver. You can verify that the correct frequency and transceiver type is shown on the LCD display.

### 5.2.2. Connection with not supported TCVRs

For communication with TCVRs, that are not supported by OM4000A (for example JST-245 and older types of Kenwood), an external IF-232 converter is to be used. You can also use devices from several companies that produce compatible CI-V output which deliver frequency information in ICOM format through the CI-V output. Then the PA will be connected in the following configuration:

JST-245 <> DB37- JST-245 cable <> MKII ( or other device which has a CI-V output ) <> PC.  
OM4000A is connected to the CI-V output of the CI-V device (MicroHam for example).



Confirm CHOOSE TCVR by pressing SET again and scroll UP / DWN to your transceiver type. Confirm the selection by pressing SET.



TCVR is connected via CI-V of MKII.

Transceiver frequency is visible on the display.

### 5.2.3. Communication loss

If TCVR is not connected or communication settings are incorrect, the message “COMMUNICATION LOST” will be displayed. You can still use PA by entering MANUAL mode (MAN Button) or by correcting the transceiver connection problem.



Example of Communication loss message.

### 5.2.4. Antenna Switching Menu

If you have 3<sup>rd</sup> party external antenna switch connected to your amplifier ( i.e. MicroHAM TEN SWITCH), you need to configure the assignment of each port to a specific band /or antenna.



By pressing SET and scrolling to ANTENNA SETTINGS and confirming by SET you get current band and its antenna selection.



By scrolling UP / DWN you can select BAND which you want to assign to current ANTENNA selected.



Then select how many antennas you want per current band (1 or 2) and always confirm your selection by pressing SET.



By scrolling UP / DWN you assign which PORT is used on your external antennas switch for this particular antenna. (ANT 1 ON PORT 01).

Shall you decide to use 2 antennas for this band, then after confirming that with SET configuration continue to the other antenna selection / port selection.

To finish Antenna switch configuration you can either press AUTO or MAN.

### 5.2.5. Bandpass filter switching

Switching of external band pass filters is automatic and needs to follow pin out of BPF connector. For more details see *Example of connection with antenna switch and BPF* in the Appendix.

### 5.2.6. Loading factory default settings

In the rare case of needing to restore factory default settings press SET and scroll using UP / DWN to LOAD DEF VALUES and confirm by SET.



In the rare case of needing to restore factory default settings press SET and scroll using UP / DWN to LOAD DEF VALUES and confirm by SET.



Then select if you want to erase all settings (pressing TUNE) or just one setting value (SET button).



In the case of resetting a single parameter use UP / DWN to select which option and confirm by SET.

### 5.2.7. MUTE option

When operating the OM4000A with an Icom transceiver without TX INHIBIT for disabling TX, we recommend to block transmitting during tuning of the PA (mainly while operating FM /RTTY/ AM) using ALC connection. The ALC Input of your transceiver should be connected to the "ALC Out" of OM4000A. It is important to notice, that this is **not a true ALC**, only the transmitter will be blocked in this way during the process of PA tuning.



Using SET and scrolling UP / DWN select SET MUTE and confirm it by SET.



Then configure MUTE LEVEL for each band so it results in no power being transmitted by TX when performing TUNE procedure.

### 5.2.8. LCD Settings Menu



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Using SET and scrolling UP / DWN select SET LCD CONTRAST and confirm it by SET.



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By pressing Up or DWN you can vary contrast of the LCD display. Finally press SET to confirm selected value.

### 5.2.9. Operation in MANUAL mode



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To enter Manual mode of the PA press MAN. By pressing MAN repeatedly you select BAND and band segment. You can control the segment or band by scrolling the UP / DWN buttons.

### 5.3. Tuning of Power Amplifier

**T**he OM4000A amplifier is operated in class AB. Thus it's possible to obtain a maximum output power at excellent linearity. For this purpose the amplifier has to be tuned carefully.

#### **WARNING!**

Before starting tuning you have to check if the right antenna or a 50 Ohms load resistance is connected at the antenna output!

#### **CAUTION**

The operation of a mistuned PA will cause malfunctions, the increase of grid current (the GRID-MAX-LED will light up) and problems with TVI/BCI.

#### **CAUTION**

The grid-current is shown with 2 LED diodes. It's normal if the green LED is flashing or may be shining a little bit during peak operation. If you overload the amplifier the output power increases the grid current at very small rates and the red GRID-MAX-LED is shining and the safety devices switch the PA to STBY. You must decrease the input power.

#### **CAUTION**

In SSB mode you will have good output power if the green LED lights up a bit. The current of screen grid is measured and shown in a Bar graph Indicator. The amplifier has to be tuned in such a way that the current is between - 80 mA to +80 mA. At currents beyond these values the operating point will be shifted and IM-products will be rapidly increased. If a value of + 100mA is exceeded, the safety devices will switch the amplifier to STBY mode.

#### **5.3.1. AUTO or MANUAL**

There are two possibilities of operation mode in OM4000A - AUTO or MANUAL. Normally, when you are using CAT interface connection between TCVR and PA, in AUTO mode PA will tune automatically to the TCVR frequency. If you do not have or use CAT connection, you will use MANUAL mode. You must manually select proper band and segment, corresponding to TCVR's band and frequency. Then OM4000A will tune automatically to this manually selected band/segment.

#### **5.3.2. Manual tuning instructions**

The OM4000A has been design to deliver maximum output power at 50 Ohms load. Parameters for PA auto tuning using real 50 Ohm loads are stored in the memory (**factory default**). To deliver maximum output power to a real load you need to adjust the tuning according to your real antenna impedance. **This has to be done manually in TUNE mode (see 5.3.3. for details).** First off all PA must be switched on.

1. Set the multimeter switch to the **HV** position
2. Set the OPR/STBY switch to the **STBY** position
3. Press the **ON** button

The amplifier is prepared for operation with the following automatic steps:

- Toroidal transformers are switched on step by step.
- The cooling blower for the final tube is switched on.
- The multi-meter bar graph measures the high voltage; the normal value is **3.3 KV**
- The WAIT LED lights up.

#### CAUTION

After switching on, please confirm that the blower is operating properly. Air must be flowing from the ventilating aperture above the tube. If there is any concern, or no air flow, press the "OFF" button immediately!

Heating of the tube takes about **180 seconds**. After this time the WAIT LED goes out and the amplifier is ready for operation.

Enter **TUNE** mode. Depending on the input power level and antenna parameters, two situations can occur. **First**, when your antenna parameters are close to real 50 Ohms, and input power not exceeds allowed maximum, PA stay in OPR mode and you will see the output power. You have to do just little adjustment (steps 8, 9, 12, 13) to get maximum output power. **Second**, if your antenna parameters are not very good and input power is higher than 15watts, safety devices will switch PA automatically to STBY. In such a case start with step 4, go thru all next steps.

4. Reduce the power output of your transceiver to the **minimum!**
5. Switch OPR/STBY to **OPR** position (OPR LED lights up).
6. Choose the **TUNE** position of multimeter.
7. Transmit and increase driver power to cca **10W**.

#### CAUTION

If the input power is higher than 15W and the power amplifier is not correctly tuned, the safety devices will switch to STBY. The amplifier will automatically reset and switch back to OPR mode after approximately 2 seconds. Meanwhile, reduce the input power.

8. Set TUNE knob in such a way, that the TUNE-LED lights up maximum left (multimeter in TUNE position).
9. Set LOAD knob in such a way, that the TUNE LED on the TUNE scale lights up under the "V" sign. If it is possible to obtain the LOAD in 2 positions, set the position that is further to the right.
10. Repeat tuning several times according to 8 and 9, output power should be abt. 400W.
11. Increase the input power (to about 50-70W) until an output power of approximately 1500W will be reached.

#### WARNING!

**Input power can not exceed 100W, otherwise PA will be damaged !**

12. Repeat steps 8 and 9.



13. Set TUNE knob to maximum output power (RF POWER LED lights up max. right).

After this procedure the amplifier is tuned correctly and ready to give 1500W output power in all operation modes with no time limited operation possibility.

At optimal tuning and full output power a positive max. 80mA current goes through the second grid. On 24 and 28 MHz bands optimal tuning can be achieved when one or two LEDs are lit up to the right from the position "V". If less output is desired you can simply decrease the load of the transceiver.

**CAUTION**

Should the amplifier demonstrate any malfunctions during tuning or should it not behave in accordance with the description, interrupt the tuning procedure immediately and check the amplifier! Be sure to have not done any mistakes in choosing bands or TUNE/LOAD values! Be sure that VSWR is not higher than 2:1 and input power is LOW!

After excluding possible human mistakes you will be able to work for long time with this amplifier!

**5.3.3. Tuning Adjustment**

Entering the **TUNE mode** is done by pressing the TUNE button. The OM4000A then switches the transceiver to RTTY and sets the frequency to corresponding segment. By changing the values of TUNE and LOAD capacitors we tune the PA as per manual tuning instructions (see 5.3.2.). The optimally tuned amplifier will deliver full output without approaching the maximum Screen Current of 80mA!

After tuning the amplifier save the settings by pressing SET and PA will automatically tune frequency of your transceiver to next band segment. Follow the same procedure for all bands and segments if needed.



By pressing MAN or AUTO buttons PA and TCVR will return to standard operating mode.

**Dividing of bands into segments**

Band (MHz)	1,8	3,5	7	10	14	18	21	24	28
Width of the segments (kHz)	15	30	30	30	30	50	60	60	70

## 6. MAINTENANCE

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### 6.1. Indication of fault conditions

OM4000A has the following indication LED on the front panel:

GRID MIN	- indication of first grid current
GRID MAX	- max. First grid current exceeded
HV	- measuring of anode voltage by bar graph
IP	- measuring of anode current by bar graph
FAULT	- fault
OPR	- amplifier in operation mode
STBY	- amplifier in standby mode
WAIT	- heating of tube after switching on the amplifier

#### NOTE

Should a fault condition appear during the tuning or operation of the amplifier, the safety circuits of OM4000A will react. The amplifier will be turned to STBY mode. After approx. 2 sec the control circuits will switch the amplifier back to OPR.

#### CAUTION

If the fault will repeat 3 times after each other the control circuits will turn the amplifier to STBY mode. Bringing the amplifier back to OPR mode is enabled by using the OPR/STBY switch only.

After reaction of safety circuits the FAULT LED will be lit up for approx. 5 sec, depending on the nature of the fault.

Flashing LED signalizes:

IP	- anode current exceeded
HV	- low anode voltage
FAULT	- reflected output exceeded
GRID MAX	- first grid current exceeded - screen grid current exceeded
GRID MAX + HV	- maximum input power exceeded
GRID MAX + IP	- zero output power during tuning
HV + IP	- tuning fault, incorrect tuning of the Pi-L output circuit

In case your OM4000A amplifier is not working correctly, please contact the manufacturer or your dealer.

Manufacturer contacts:

OM POWER, s.r.o.  
930 30 Bac 126  
SLOVAKIA  
Email: [om-power@om-power.com](mailto:om-power@om-power.com)

Dealer in USA:

Array Solutions  
2611 North Belt Line Road  
Suite # 109  
Sunnyvale, TX 75182  
Tel: [\(214\)954-7140](tel:(214)954-7140)  
Email: [sales@arraysolutions.com](mailto:sales@arraysolutions.com)

## 6.2. Fuse Replacement

The user is allowed to change mains fuses (6,3 x 32mm), accessible from the rear panel, only. In the case of interrupted fuse (fuses) inside the power amplifier, contact your dealer, please.

## 6.3. Tube Replacement

In the case of vacuum tube damaging, contact the manufacturer or your dealer for ordering new one. You will get instructions how to change tube and how to preset proper parameters, too. **Be very careful, you will do it only on your own risk!**

If you are not comfortable to replace vacuum tube itself, contact your Service Center, please.

## 6.4. Cleaning

To prevent damage of amplifier surfaces and plastic components do not use aggressive chemicals for cleaning. Do not open the amplifier for cleaning. Outer surface may be safely accomplished by using piece of soft cotton cloth moistured with clean water or window cleaner.

## 7. APPENDIX

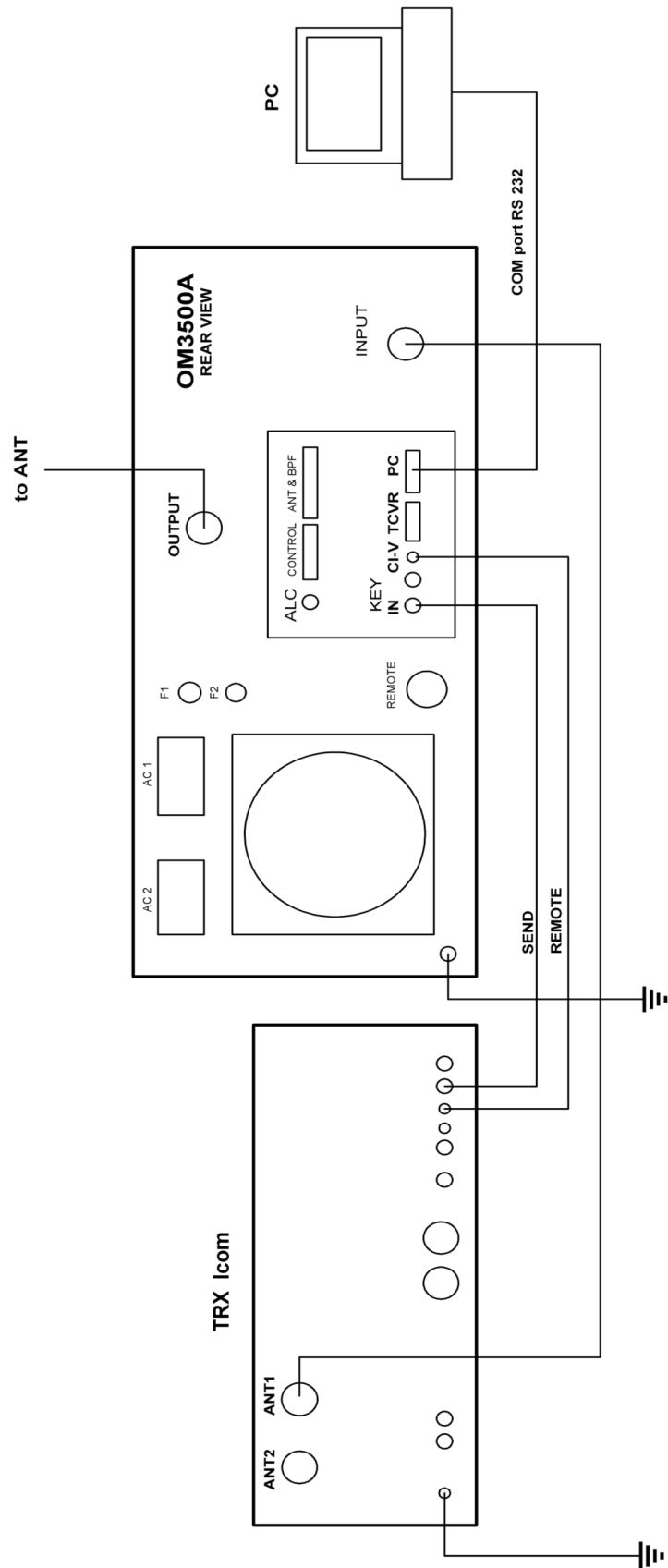
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### NOTICE

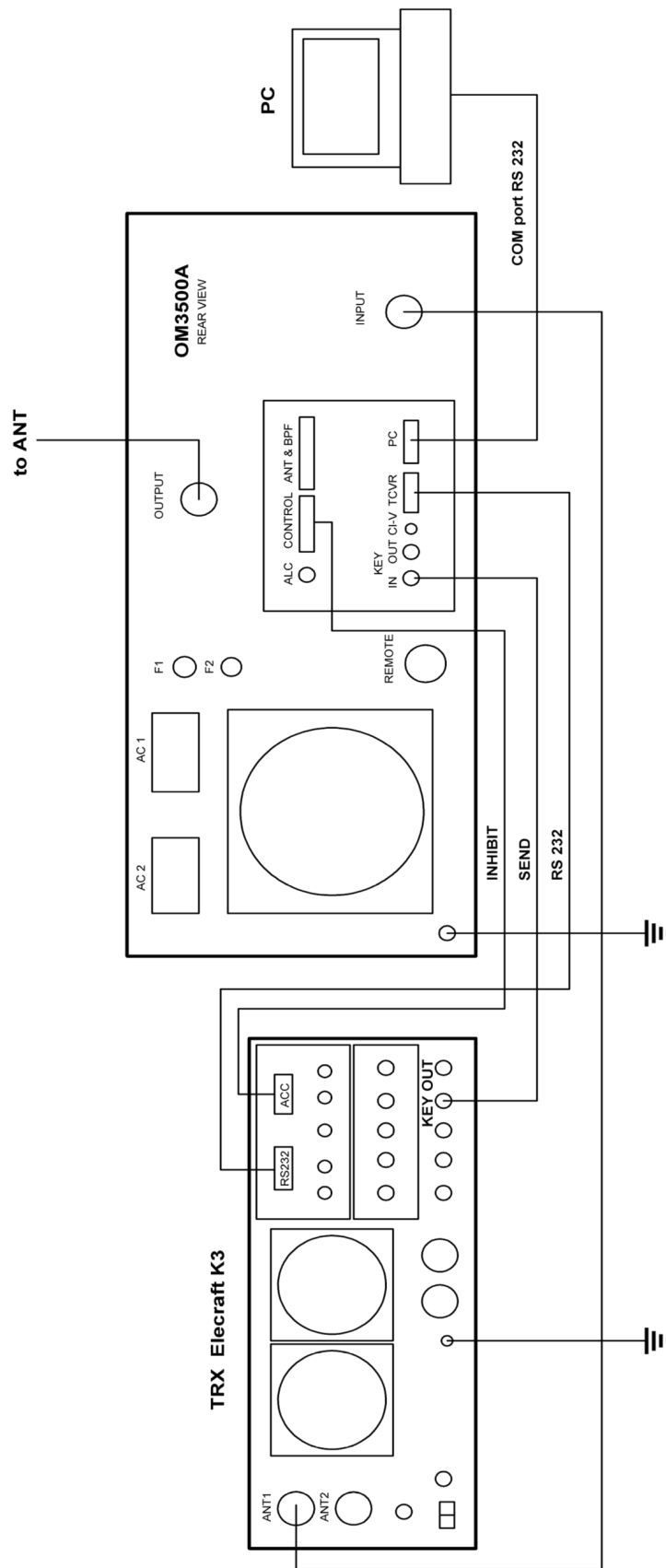
The following block diagrams of connection between OM3500A and different types of TCVRs are also valid for use with OM4000A.

7.1.

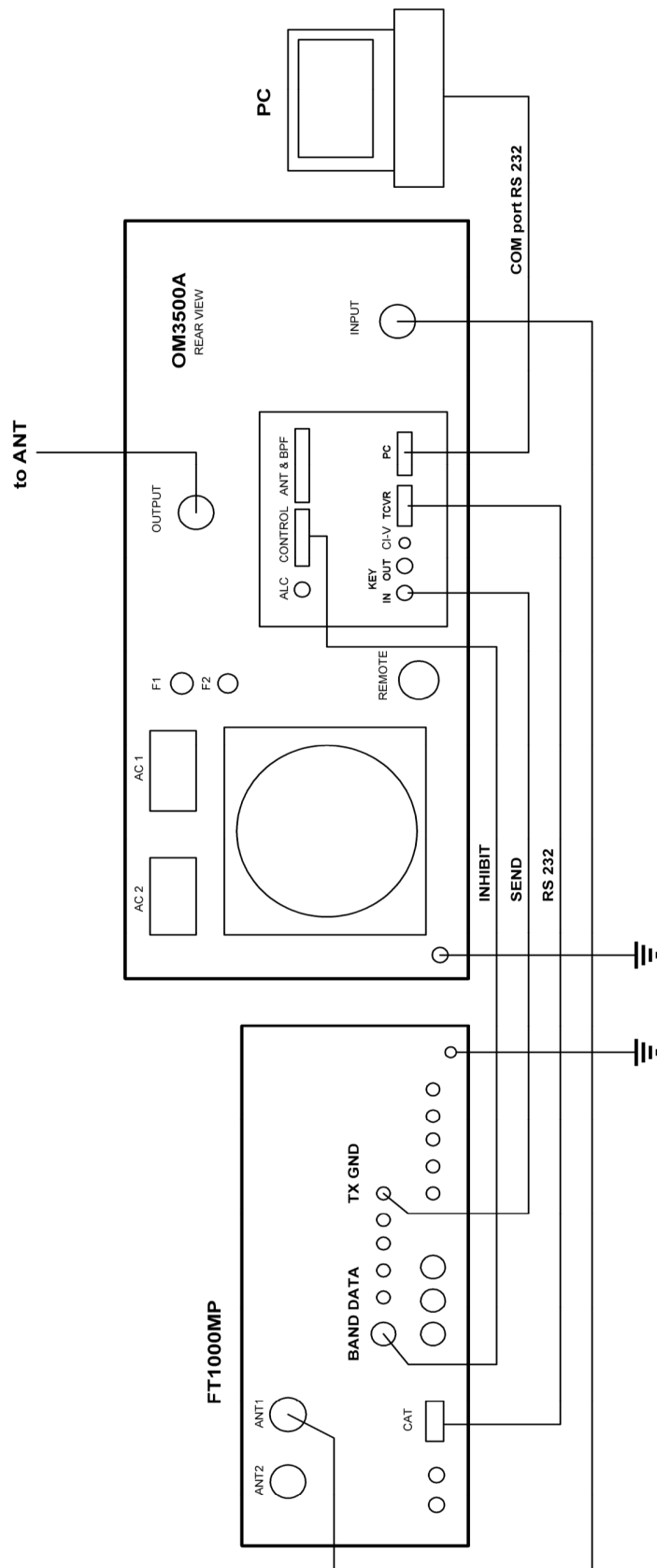
Example of connection for Icom



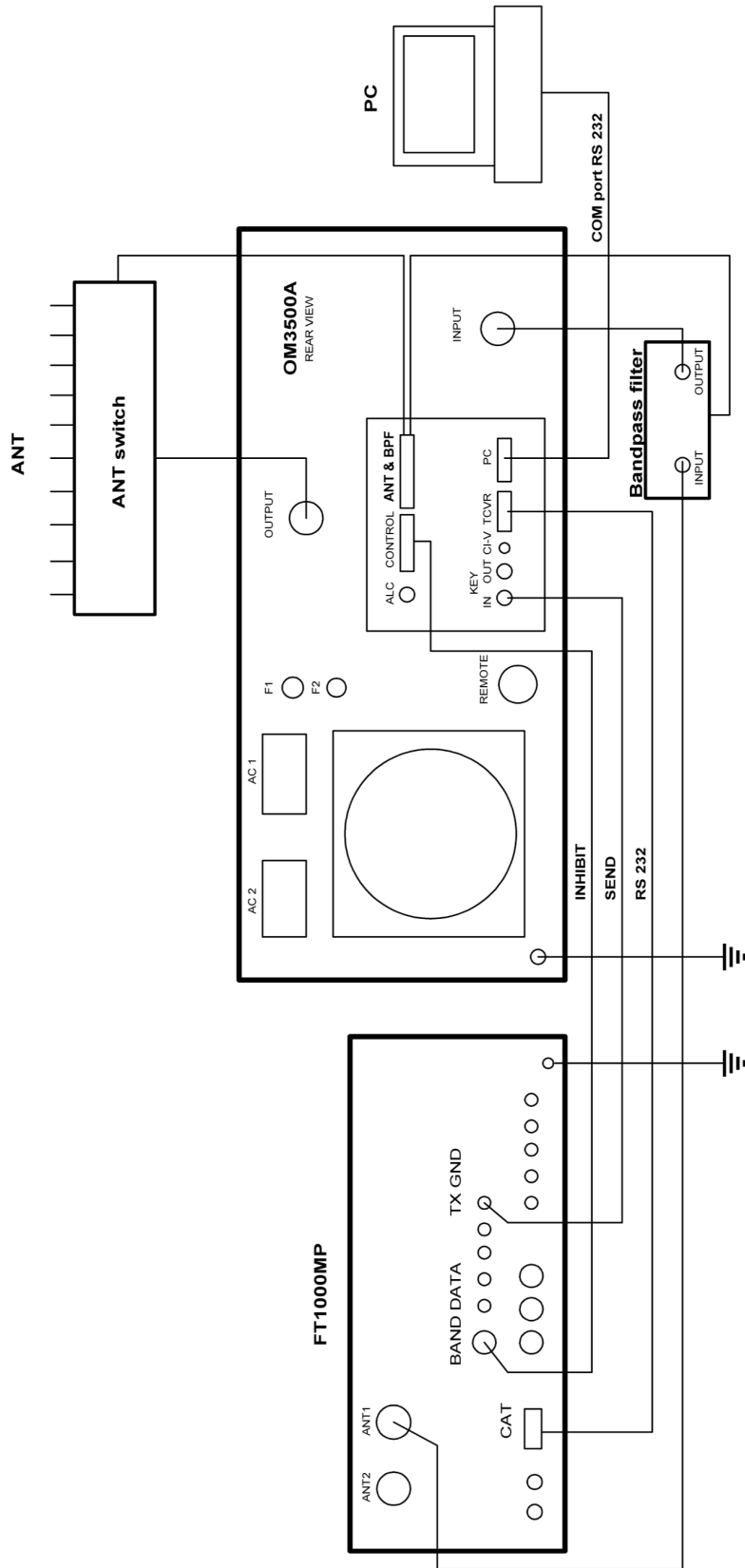
## 7.2. Example of connection for ELECRAFT



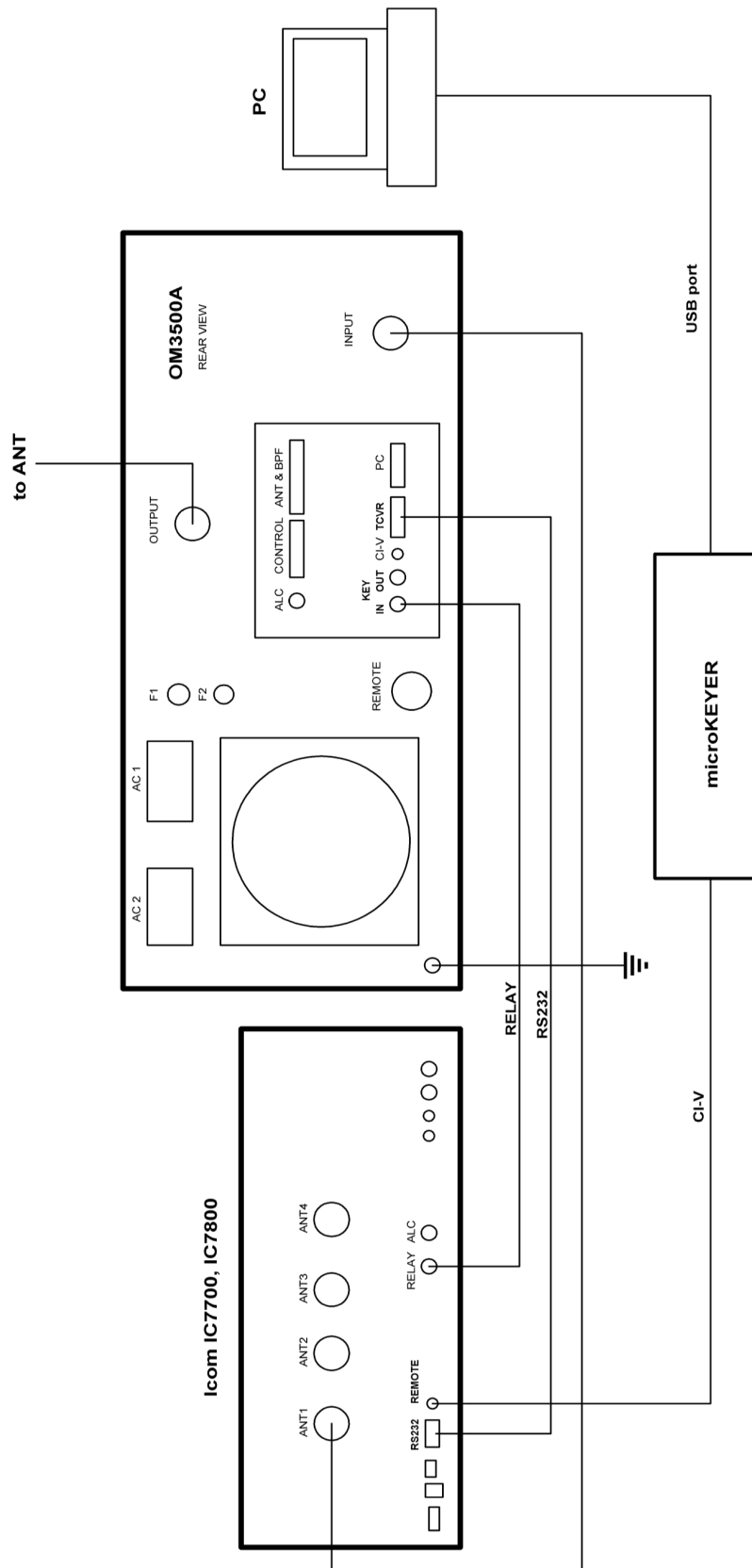
### 7.3. Example of connection with Yeasu



### 7.4. Example of connection with antenna switch and BPF

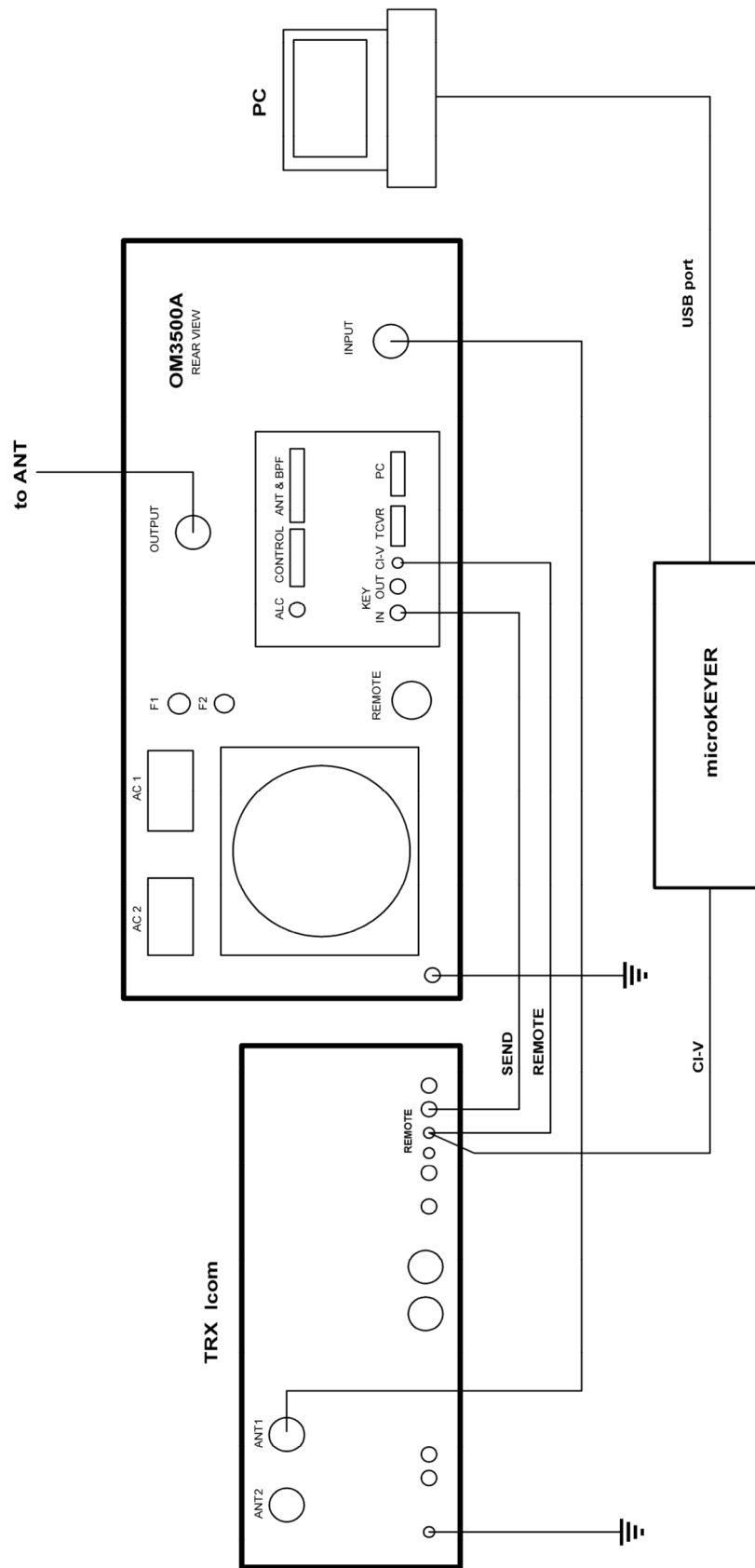


7.5. Example of connection USB micro KEYER II with IC7800 or IC7700

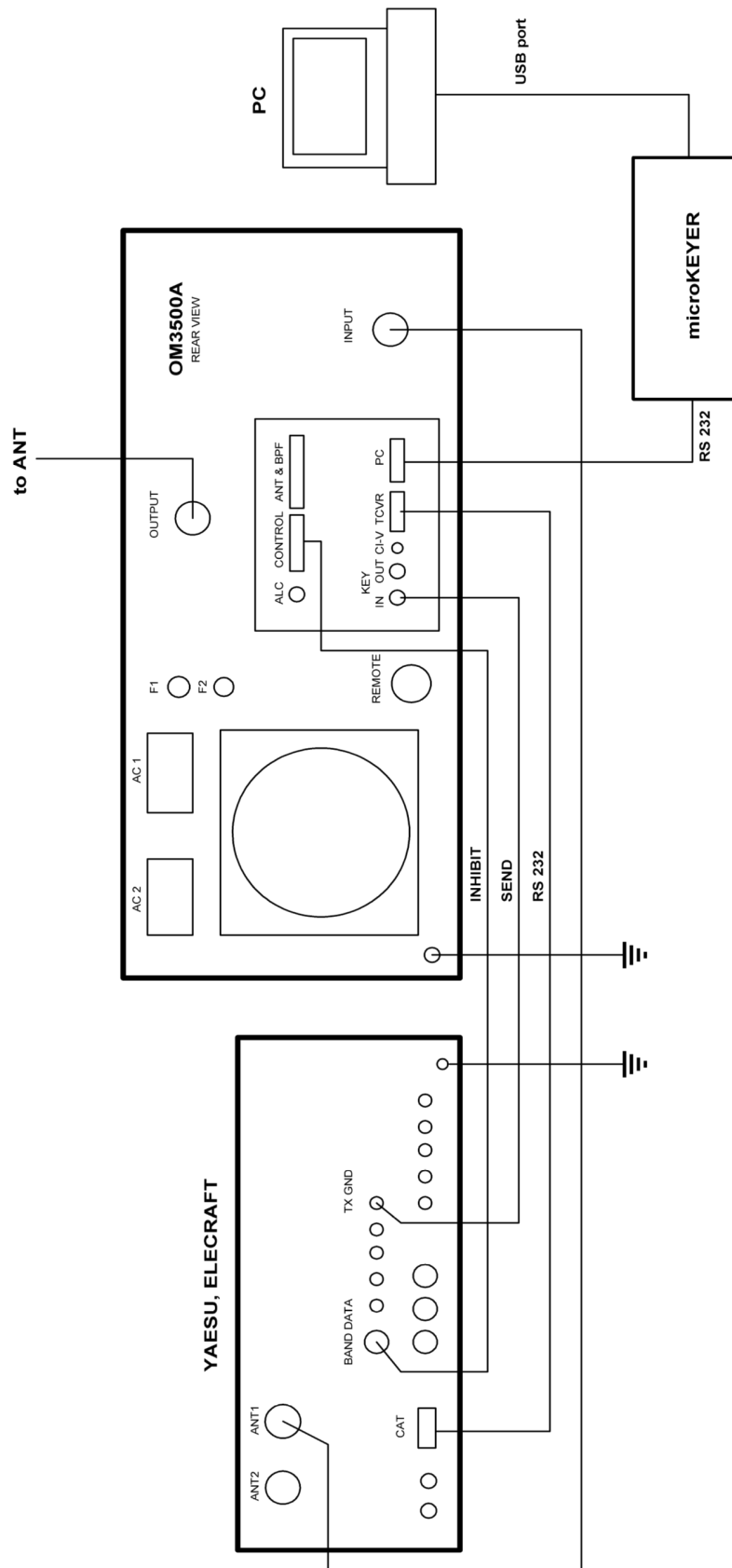




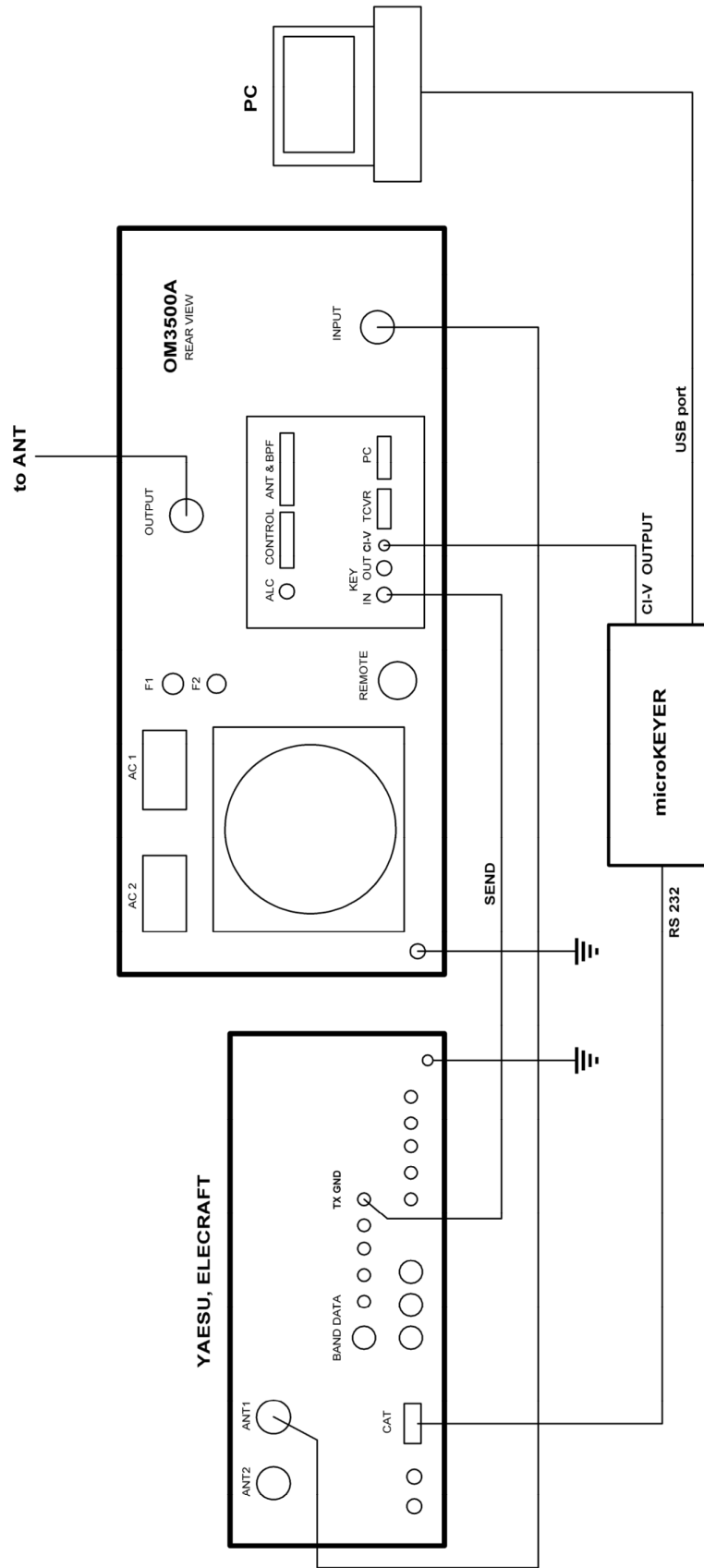
7.6. Example of connection USB micro KEYER II with another Icom



### 7.7. Example for connection USB micro KEYER II with Yeasu or ELECRAFT

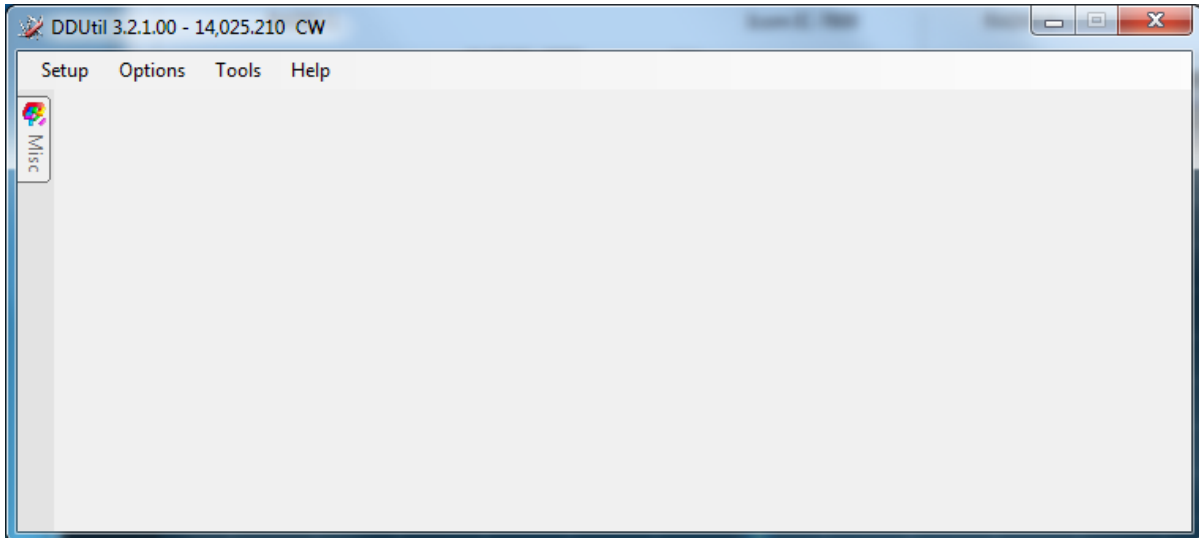


7.8. Example of connection PA with MicroHAM MKII, (MK2R+ etc ) with CI-V output

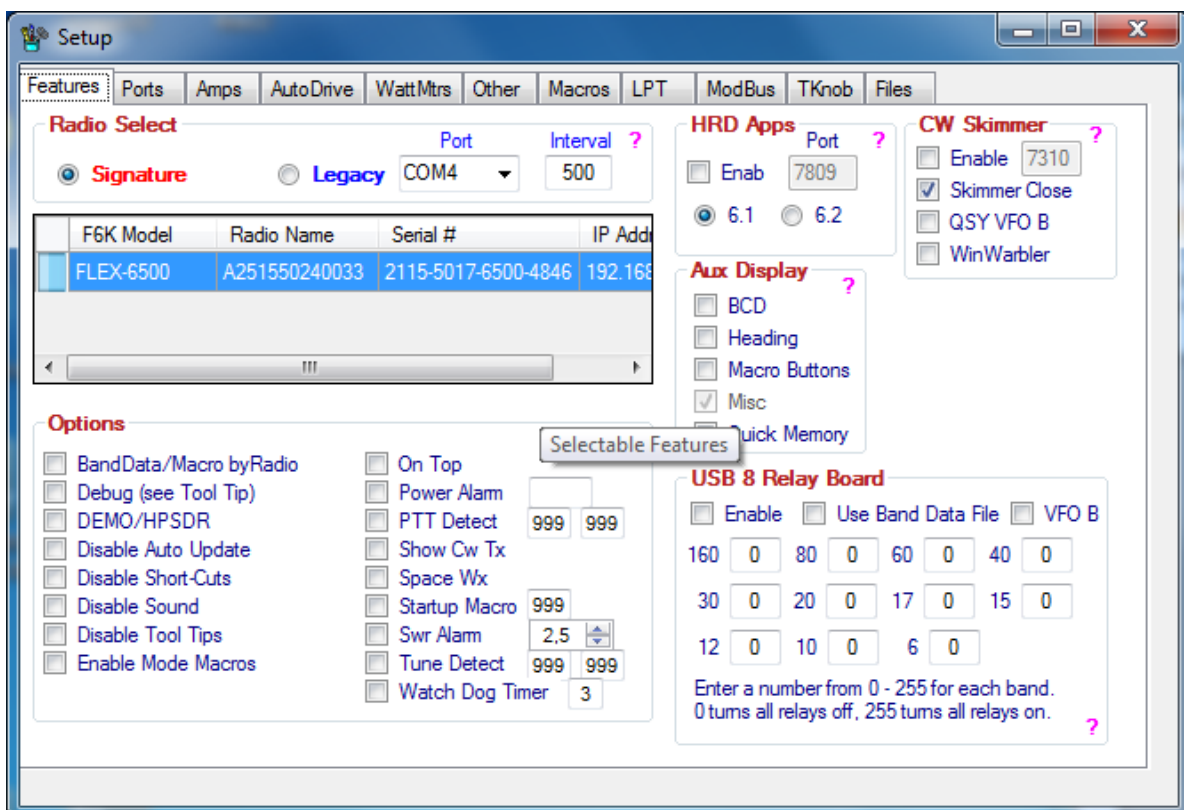


## 7.9. Controlling the OM Power automatic amplifiers with Flex Radios Series 6xxx

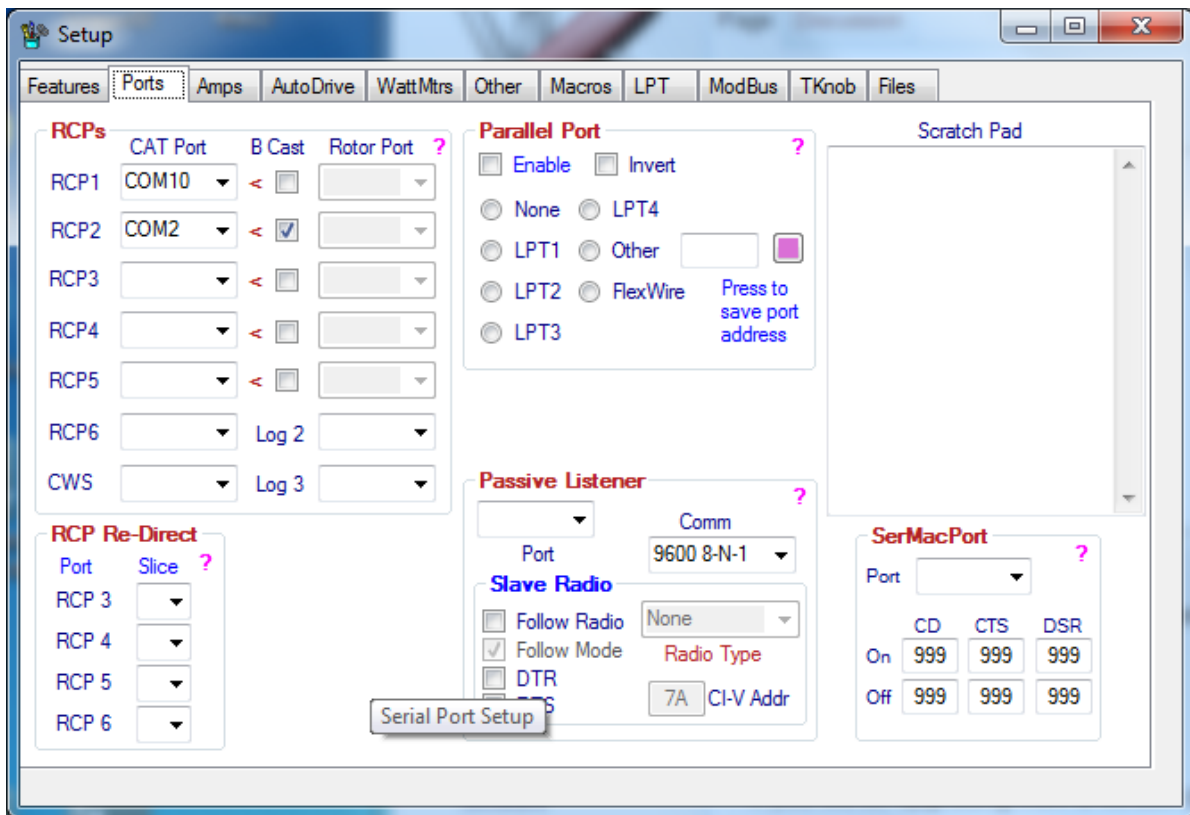
Download and install the software for rerouting the serial ports , for example DDUtil <http://k5fr.com/DDUtilV3wiki/index.php?title=Download>



In Setup / Features set connection for Flex radio {for example on COM4}



In Setup / Ports set rerouting ports / for example OM4000A is connected to COM2 trough USB/RS232 adapter.

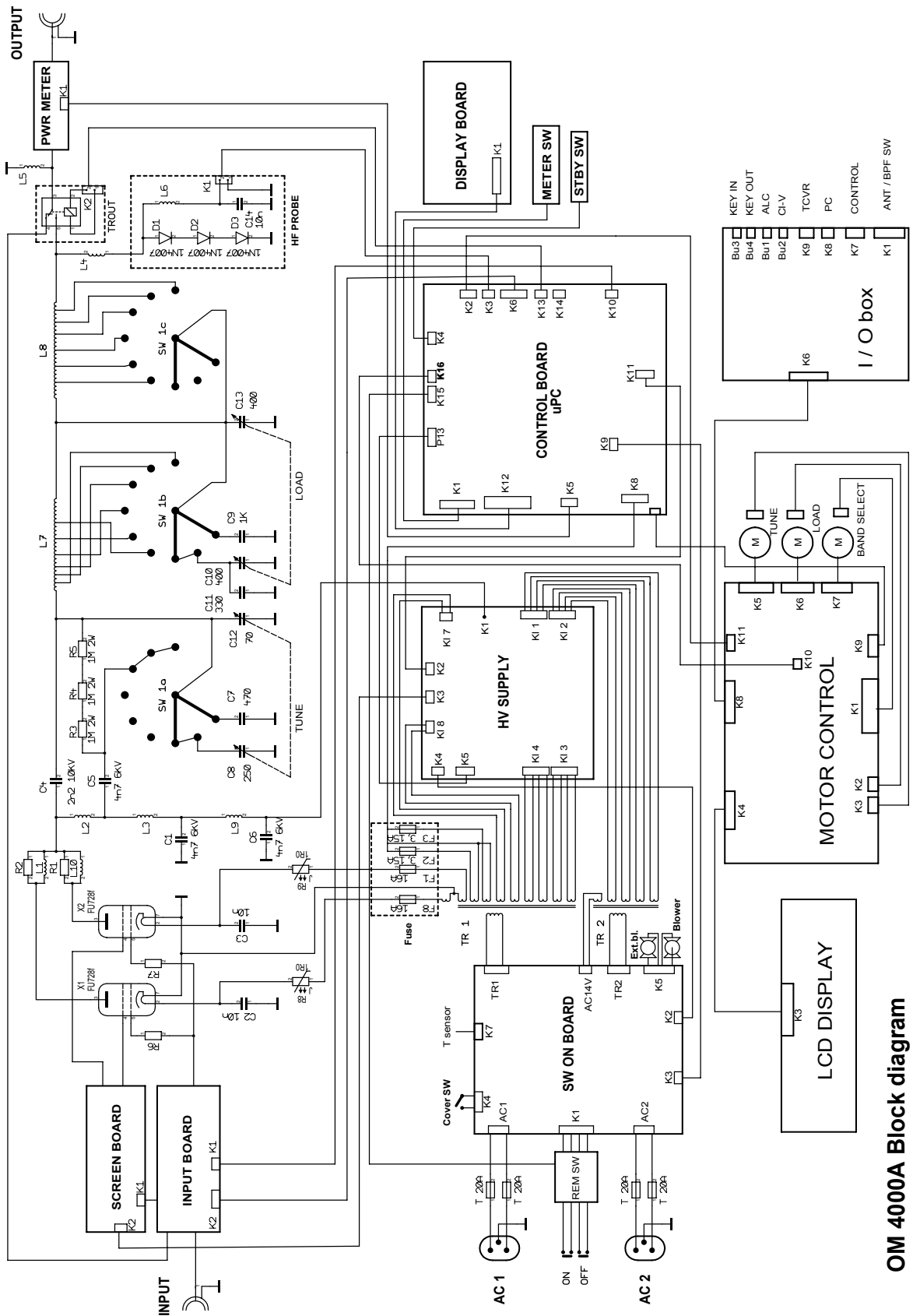


Amplifier connect to redirected port ( COM2 ) and on OM4000A into set up menu choose TCVR Kenwood and 9600baud rate .

**NOTE**  
This was just one of more connection possibilities with FLEX RADIO SERIES 6XXX

**NOTE**  
For the connection between PA and FLEX Radio use null modem serial cabel !

### 7.10. Block Diagram of the OM4000A Power Amplifier



OM 4000A Block diagram