MADE IN SLOVAKIA



OM2000A+

SHORTWAVE PLUS 50 MHz POWER AMPLIFIER



WWW.OM-POWER.COM

OM Power, s.r.o. 93030 Báč 126, SLOVAKIA

Contact : +421 905 321 410

e-mail : <u>om-power@om-power.com</u>

TABLE OF CONTENTS

1.				
	GENER	AL INFORMATION		5
	1.1.	Introduction		5
	1.2.	Specification		5
	1.2.1	. Parameters		5
	1.2.2	Protection Circuits		6
	1.2.3	. Features		6
	1.2.4	. The Advantages of O	M2000A+	6
2.	SAFETY	INSTRUCTIONS		7
3.	GENER	AL DESCRIPTION		8
	3.1.	HF part		8
	3.2.	Power Supply		10
	3.3.	Safety Devices		10
Λ	ινιςται	ATION		10
4.	INJIAL	LATION		10
4.	4.1.	Grounding	rower	10
4.	4.1. 4.2.	Grounding Coaxial Cable		10 11 11
4.	4.1. 4.2. 4.3.	Grounding Coaxial Cable Control Cable		10 11 11 12
7.	4.1.4.2.4.3.4.4.	Grounding Coaxial Cable Control Cable Cooling		10 11 11 12 12
7.	4.1. 4.2. 4.3. 4.4.	Grounding Coaxial Cable Control Cable Cooling		10 11 11 12 12
5.	4.1. 4.2. 4.3. 4.4.	Grounding Coaxial Cable Control Cable Cooling		10 11 11 12 12 13
5.	4.1. 4.2. 4.3. 4.4. OPERA	Grounding Coaxial Cable Control Cable Cooling FION OM2000A+ Front Panel		10 11 11 12 12 13 13
5.	 4.1. 4.2. 4.3. 4.4. OPERA^T 5.1. 5.2. 	Grounding Coaxial Cable Control Cable Cooling TION OM2000A+ Front Panel OM2000A+ Control		10 11 11 12 12 13 13 13
5.	 4.1. 4.2. 4.3. 4.4. OPERA^T 5.1. 5.2. 5.3. 	Grounding Coaxial Cable Control Cable Cooling TION OM2000A+ Front Panel OM2000A+ Control Preparing for operation		10 11 12 12 13 13 14 21
5.	 4.1. 4.2. 4.3. 4.4. OPERATION 5.1. 5.2. 5.3. 5.4. 	Grounding Coaxial Cable Control Cable Cooling TION OM2000A+ Front Panel OM2000A+ Control Preparing for operation Operation mode		10 11 12 12 13 13 14 21 28
5.	 4.1. 4.2. 4.3. 4.4. OPERA^T 5.1. 5.2. 5.3. 5.4. MAINTI 	Grounding Grounding Coaxial Cable Control Cable Cooling TION OM2000A+ Front Panel OM2000A+ Control Preparing for operation Operation mode		10 11 12 12 13 13 14 21 28 32
5.	4.1. 4.2. 4.3. 4.4. OPERA ^T 5.1. 5.2. 5.3. 5.4. MAINTE	Grounding Grounding Coaxial Cable Control Cable Cooling TION OM2000A+ Front Panel OM2000A+ Control Preparing for operation Operation mode ENANCE Indication of Fault Cond	itions	10 11 11 12 12 13 13 14 21 28 32 32

	6.3.	Tube Replacement		34
	6.4.	Cleaning		34
7.	APPEN	DIX		34
	7.1.	Primary AC selection		34
	7.2.	Removing the HV Trans	former	36
	7.3.	Controlling OM200A+ w	ith FLEX Radio Series 6xxx	37
	7.4.	OM2000A+ Remote Cor	itrol	39
	7.5.	Remote Control using o	wn public IP Address	44
	7.5	.1. Changing OM2000	A+ connection settings	44
	7.5	.2. Setting up in the Re	mote software	45
	7.5	.3. Remote Control wit	hout own IP Address, behind a router	46
	7.6.	OM2000A+ firmware up	grade	47
	7.7.	Icom connection with Ol	M2000A+	53
	7.8.	Yaesu plus BPF plus ANT	Switch connection with OM2000A+	54
	7.9.	Control panel connector	rs pin-out	55
	7.10.	Block Diagram of the OI	M2000A+ Power Amplifier	59
	7.11.	Troubleshooting	Power	60



FCC ID: X8NX8NOM2000 for US Market

1. GENERAL INFORMATION

1.1. Introduction

he OM Power model OM2000A+ is designed for all short wave amateur bands from 1.8 to 29.7 MHz (including WARC bands) plus 50 MHz and all modes. It is equipped with a ceramic tetrode FU-728F.

1.2. Specification

1.2.1. Parameters

Frequency Coverage	Amateur Bands 1.8 – 29.7 MHz including WARC + 50 MHz
Power Output	2000+ W in SSB/CW on HF bands, 1500 W in CW/SSB on 6m
	1500 W in RTTY, 1500W for US models
Input Power	Usually 40 to 60W for full Output Power
Input Impedance	50 Ohm, VSWR < 1.5 : 1
Power Gain	15 dB
Output Impedance	50 Ohm unbalanced
Maximum Output SWR	3:1 POWER
SWR protection	Automatic switching to STBY, when reflected power
	is 350W or higher
Intermodulation distortion	32dB below nominal output
Suppression of harmonics	< -50 dBc ; <-70dBc on 50 MHz
Tubes	FU-728F Ceramic tetrode
Cooler	Centrifugal blower + Axial blower
Power supply	switchable 220V, 230V, 240V, 50/60 Hz or other primary
	voltages (200V 50/60Hz for Japan, 230, 240, 250V for US models)
Transformers	One toroidal transformer 3kVA
Dimensions	390 x 195 x 370 (width x height x depth in mm), 15.3" x 7.7"x 14.5".
Weight	24 kg (53 lb)

1.2.2. Protection Circuits

There are several 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
- Anode current too high
- Anode voltage error
- Screen current too high
- Screen voltage error
- Grid current too high
- Grid voltage error
- Heating voltage error
- Mistuning of PA
- Temperature to high
- Soft start for fuses protection
- "switch-on blocking" at opened amplifier

1.2.3. Features

The manufacturer implemented some of the company's newest development results with most wanted operating and safety features into this new model:

- High level of protection
- Memory for faults and warnings, easy maintenance
- Automatic set-up anode current (BIAS) no need to adjust manually after changing the tube
- Three programmable working modes of the centrifugal blower (turbine) + axial blower
- Full QSK with silent relay
- Many operational parameters to display
- Easy transport due to detachable HV transformer
- The smallest and lightest 2000 W Power Amplifier on the market

1.2.4. The Advantages of OM2000A+

- Full compatibility with: ICOM, ELECRAFT, KENWOOD, TEN-TEC ORION, YAESU, Icom transceive protocol using by MicroHAM devices (CI-V output), FLEX Radios and Anan.
- RF sensitive, that is why the PA is usable also with radios, which doesn't have CAT. By NO CAT using we recommend to use BAND DATA information due to the much faster band changing. Possibility of using BAND DATA information.
- Automatic switching between bands. Automatic tuning within the band according to segments.
- Automatic switching of Band Pass Filter BAND DATA output compatible with YAESU radios (BCD code).
- Automatic switching of Antenna switches. The maximum number of antennas is 10, controlled by BCD output code.
- Remote control possibility (remote software as accessory no extra price) <u>http://www.om-power.com/download/HF PA_Manager_</u>

2. SAFETY INSTRUCTIONS



DANGEROUS HIGH VOLTAGE INSIDE!

The power amplifier is using high voltage up to 3200V 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!

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!

Never turn the amplifier on without the upper lid in place. DO NOT ATTEMPT TO SHORT OR BYPASS safety switch under upper lid!

The OM2000A+ amplifier is neither to be used in a WET or HUMID environment nor to be exposed to RAINFALL!

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!

Before opening the upper lid of the amplifier make sure that power supply has been disconnected AT LEAST 10 minutes allowing the electrolytic capacitors to discharge fully. Disconnect power cord from the outlet!

Any work inside the PA (internal fuses replacement, tube replacement, etc.) can be carried out only by professionally qualified person!



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 it!

The amplifier must be properly grounded during operation.

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

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.

Read this manual carefully. Fallow 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

3.1. HF part

his amplifier is using a **ceramic tetrode FU-728F** in a grounded-cathode circuit (input into control grids). The OM2000A+ 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 1.5 : 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 OM2000A+



3.2. Power Supply

Power amplifier is using one 3 KVA toroidal transformer. A soft start is provided using relays and resistors (placed on the switch-ON board). The high voltage is made by combining 4 x 575V AC (total abt. 3200V DC) @ 1.2A. Each has its own rectifier and filter. In the high voltage circuit, safety resistors are employed to protect the amplifier against overload (placed on the power supply board).

The separated supply for screen grid is regulated by stabilization with MOSFET and delivers abt. 330V DC at 100mA. Control grid voltage is also stabilized (-120V DC). Change of stabilized first grid voltage is controlled by the software (EBS for example).

Primary section of the transformer is adjustable for 220 - 240 VAC (230 – 250VAC for US). Factory setting is 230VAC. If the AC voltage in your network is 220 or 240 Volts, you need to set the correct value before first starting of the PA. See part 7.1. for more information. Other primary voltage is possible on request (for example 200V 50/60 Hz for Japan).

3.3. Safety Devices

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





One of the important safety element is mechanical switch for AC blocking at opened amplifier.

4. INSTALLATION



Read this chapter carefully prior you will start installation. Before unpacking inspect shipping carton 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 the next parts.

4.1. Grounding

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 mm² 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. At the INPUT and OUTPUT SO-239 sockets with Teflon insulation are used.



4.3. Control Cable

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 OM2000A+ have to be switched earlier than HF is applied (cold switching). Modern transceivers they have a time delay between PTT switching and power output.

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. If there is possible to adjust TX delay in your TCVR, set the delay to 10ms, please.

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

KEY INRCA Phono - Input signal PTT switching voltage / current - 5V /2mA)KEY OUTRCA Phono - Output signal PTT (maximum switching of 30V / 50mA)

See section 7.6. for Control and ANT/BPF connectors PIN-OUT.

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

4.4. Cooling



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 blower provides the necessary cooling of the amplifier, even during long contests. The 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). Blower working mode is programmable (3 modes). See page 19 for more details.

5. OPERATION



Before switching PA on, make sure that amplifier is grounded, antenna or dummy load is connected, and line cord is putted to the outlet. Be sure you selected AC input by 7.1.



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.



We do not recommend to take antenna off during a transmission.



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

5.1. OM2000A+ Front Panel

Front panel of the OM2000A is almost empty...There is only touch TFT display accessible plus two switches.



ON - **Main Switch.** After turning ON small 12V APU for logic, protection circuits and the display will be activated. High voltage and RF circuits are still OFF.

OPR/STBY - Short press for switching between STBY and OPERATION mode.

ON/OFF - Long press (1 sec.) for switching the PA ON (tube heating first), 2 seconds for PA OFF. Do NOT use the green button for switching the PA OFF as first! Every time use ON/OFF button as first to give chance for cooling the tube and inside area of the PA.

5.2. OM2000A+ control

Turn ON the Main switch and the home screen will lights up. In the bottom line touch buttons are visible



Remember that the home screen is active for some information and settings , while PA is still OFF!

BAND

Touch the left side of BAND button to go down, touch the right site to go up with band displayed above the button.

ANTENNA

Transmitting antenna choice. Functional ONLY when the antenna switch is programmed and antennas are defined (see next parts). It allows switching between antennas authorized for the current band. An external antenna switch is controlled by BCD code at the ANT/BPF output.

INFO

Information display shows basic information about the PA: serial number, software version, time ON, tube serial number and nominal Main voltage. Some of them manufacturer can requested in case of any failure, etc.

Coftware version: 1.15 Time ON: 39:48 Tube serial number: 08807195 Cominal mains voltage: 230 V			1.001
Time ON: 39:48 Ube serial number: 08807195 Iominal mains voltage: 230 V	Amplifier ser	al number:	1601
Time ON: 39:48 Tube serial number: 08807195 Iominal mains voltage: 230 V	Software ver	sion:	1.15
ube serial number: 08807195 Iominal mains voltage: 230 V	Time ON:		39:48
Iominal mains voltage: 230 V	Tube serial n	umber:	08807195
	Nominal main	ns voltage:	230 V
	Tube serial n Nominal mai	umber: ns voltage:	08807195 230 V
	NINGS	FAULTS	

Also it provides an overview of the last 20 warnings and faults:

Touch FAULTS.

	LAST 2	0 FAULTS
1.	-0:40 High screen current	1110:13 Low plate voltage
2.	-8:44 Low plate voltage	1210:13 Low plate voltage
3.	-8:44 Low plate voltage	1310:13 Low plate voltage
4.	-8:44 Low screen voltage	1410:13 Low plate voltage
5.	-8:44 Low screen voltage	1510:13 Low plate voltage
6.	-8:44 Low screen voltage	1610:24 Low plate voltage
7.	-8:44 Low screen voltage	1710:25 Low plate voltage
8.	-8:44 Low screen voltage	1810:25 Low plate voltage
9.	-10:11 Low plate voltage	1910:27 Low plate voltage
10.	-10:13 Low plate voltage	2010:27 Low plate voltage

Press **EXIT** to go back to the home screen.

OM 2000A AUTOMATIC POWER AMPLIFIER

Now press **SETTINGS.** Display shows menu which allows to set CAT, NO CAT, ANTENNA, DISPLAY, EBS, CLEAR user settings for one or all bands, BLOWER mode and another INFO.

E D									
10.100-10.150 MHz				NO ANTENNA SWITCH					
<	BAND	>	INFO	SETTING					

SETTINGS ANTENNA SETTING DSPLAY SETTING DSPLAY SETTING EBS EBS CLEAR USER SETTINGS - BAND: 14 MHz CLEAR USER SETTINGS - ALL BANDS BLOWER TURN TEMP. PT ALWAYS	Screen shows settings possibilities for CAT, ANTENNA, DISPLAY, NETWORK SETTING, EBS, BLOWER and other infos. Scroll to CAT SETTINGS (up or down) and touch SET.
CAT SETTINGS	
NO CAT YAESU Bd ICOM NEW 4800 9600 19200 Bd TT ORION 57600 Bd Bd KENWOOD, ELECR. K3 4800 9600 19200 38400 Bd FLEXRADIO 4800 9600 19200 38400 Bd	Scroll to your TCVR family (up or down) and select bit rate (left or right), then press SET .
14.000-14.350 MHz NO ANTENNA SWITCH	of select NO CAT and press SET .
SET EXIT < >	Power

We recommend to use CAT connection always when possible, because in such a case OM2000A+ has permanent information about the transmit frequency and is immediately ready for transmitting.

With setting NO CAT the OM2000A+ detects transmit frequency from the input signal. With the input signal frequency changing the PA automatically reacts and tune itself to optimal output parameters. Tuning takes abt. 1sec. inside the band, abt. 2 sec if band is changed. By NO CAT using we recommend to use BAND DATA information due to the much faster band changing.

CAT SETTINGS									
NO CAT YAESU ICOM NEW									
ICOM	4800	9600	19200			Bd			
TT ORION					57600	Bd			
KENWOOD, ELECR. K3	4800	9600	19200	38400		Bd			
FLEXRADIO	4800	9600	19200	38400		Bd			
14.000-14.350	MHz		NO AN	TENNA	SWITC	н			
~ ~	SET	E	хіт	<		>			

If you choose **YAESU** or **ICOM NEW**, after **SET** pressing you will go to deeper level which allows you to select specific type of TCVR. See the following picture for **ICOM NEW** selection, for example.

CAT SETTINGS								
IC7100 ADDR. 88H	4800	9600	19200)	Bd			
IC7600 ADDR. 7AH	4800	9600	19200)	Bd			
IC7700 ADDR. 74H	4800	9600	19200)	Bd			
IC7800 ADDR. 6AH	4800	9600	19200)	Bd			
IC7850/51. 8EH	4800	9600	19200)	Bd			
IC9100 ADDR. 7CH	4800	9600	19200)	Bd			
SET OTHER ADDRESS	4800	9600	19200)	Bd			
14.000-14.350	MHz		NO AN	NTENNA S	SWITCH			
~ ~	SET	E	XIT	<	>			

You selected IC7800 addr.6AH and 19200 Bd. Press **SET** to write to the memory, then press **EXIT** to go back to the SETTINGS possibilities.

"SET OTHER ADDRESS" means that you must add here a new type of used ICOM TCVR which is not defined in the table (its address plus bitrate in Bd) to have possibility to communicate with it.



Touch **ANTENNA SETTINGS**. First select **ANTENNA SWITCH** (No switch, Standard). Use left or right arrows. If you select some switch, 10 ports for different antennas displays. Generally all of antennas are allowed in every band (green squares). To disable some square select port (up/down), touch **SET** for antenna name and then select band (left/right). Touch **SET**.

DAMAN

Four types of antenna for four different bands were disabled.

Black square means disabled combination.

Press EXIT to go back to SETTINGS menu.



BCD code (4 bits) is using for automatic antenna and BPF switching (see Antenna/BPF connector on the Control panel (rear side of the PA). See section 7.8. for Control and ANT/BPF connectors pin-out.



Next **SETTINGS** position is for display parameters. First choose the background color. Scroll on it and choose the color (left/right).

Press SAVE twice, then scroll to OWN CALL.





Use next lines and set brightness and sound volume (use up/down and left/right). Confirm with **SAVE.**



SET

Press **NETWORK SETTING** and then press **ENTER.**

NETWORK SETTINGS

IP ADDRESS:

NETWORK MASK: DEFAULT GATEWAY: PORT NUMBER: IP setting through LAN: MAC ADDRESS:

192.168.1.211

EXIT

255.255.255.0 192.168.1.1 10001 ON DFF 00-80-A3-A6-B3-BB

Here the user have possibility to set IP Address, Network mask, Default gateway, Port number.

User can enable or disable IP parameter setting via LAN connection.



SETTINGS										
CAT SETTING ANTENNA SETTING DISPLAY SETTING EBS EBS LEVEL CLEAR USER SETT CLEAR USER SETT BLOWER TURN INFO	CAT SETTING ANTENNA SETTING DISPLAY SETTING EBS OFF ON EBS LEVEL 0.1 W CLEAR USER SETTINGS - BAND: 14 MHz CLEAR USER SETTINGS - ALL BANDS BLOWER TURN TEMP. PTT ALWAYS									
~ ~	SAVE	EXIT	OFF	ON						

Next lines are for EBS (Electronic Bias Setting) ON/OFF and for EBS level selection.

We recommend **EBS ON**. See next comment for more details.

Electronic Bias Settings (EBS) is one of significant feature of the power amplifier. It allows to set low plate current after pressing the PTT regardless of whether you have CW or SSB mode, until RF signal is no present at the input. At the moment when RF signal comes to the input of PA, bias will automatically change to its working value.

EBS level means level of the Input power, where EBS starts working. Default EBS value is 0.1 W. We recommend using EBS ON. Significant accompaniment of used EBS is temperature reducing.

If you are not using compressor in your TCVR or you are speaking not good enough loud, some syllables can be cutted off. In such a case you have possibility to turn OFF the EBS.

SETTINGS								
CAT SETTING ANTENNA SETTING DISPLAY SETTING								
EBS OFF ON EBS LEVEL 0.1 W								
CLEAR USER SETTINGS - BAND. 14 MHZ CLEAR USER SETTINGS - ALL BANDS BLOWER TURN TEMP. PTT ALWAYS INFO								
~ ~	CLEAR	EXIT	<	>				

Next two lines allow delete user settings of antenna tunings for selected band or for all bands.

Settings in all segments will return to the factory default values (for 50 Ohms).



In the next line you can define working mode of the blower. In the first case speed depends on the temperature (**TEMP**), during **PTT** speed increased to maximum, **ALLWAYS** means maximum speed all the time during PA operation (recommended for DIGI modes).

Press **SAVE** to write the mode to the memory.



5.3. Preparing for operation

In STBY the amplifier is in bypass-mode and your transceiver is directly connected to the antenna. Maximum allowed power in bypass mode is 200 Watts! Passing RF power is displayed if PA is in standby mode.

To turn PA ON press ON/OFF button on the front panel (black one) and **hold it abt. 1 second**. PA will start tube heating. It will take 180 seconds. Turning PA ON is possible **ONLY** from the home screen! If you have other display active, press EXIT more times to go back to the home screen.



Depending on **CAT** settings you would have two possible situation illustrated. If **NO CAT** was saved, above display will be visible. To set band and segment for transmitting, use **BAND** and **SEGMENT** buttons. In this mode exact frequency will be read from RF input and PA will set up on it automatically.

Another display appears, if CAT was defined but TCVR is not connected with the PA (CAT cable). See the following pictures.

FORWARD POWER, KW 1.0 1.6 0.1 0.5 0 W Pref 0 3 10 30 60 100 Screen 200 40 -20 20 40 mA Drive 0 1 3 6 12 25 40 60 LAST EVENTS DEFAULT COM. LOST STBY 3.781-3.810 ANT 1 YAGI MHz MENU ANTENNA FREQ

FREQ button has two functions. It allows to display working frequency or active band segment.

Also in this case frequency will be read directly from the TCVR in operation mode.



Use **ANTENNA** (left/right) to select one of preprogramed antenna for that band.



Menu display allows to go deeper to the SETTINGS mode, MEASuring mode or to SERVICE mode.

Press SETTING button.



We are in the settings mode again, but with little difference in **INFO** part.

Scroll to INFO and press SET.



	ι	Inor	m:	23	0_				
1	2	3	4	5	6	7	8	9	0
1	!	@	#	\$	%	&	;	()
ABC + - = ★ / ? \ ←									
EXIT, . :				19:11	S	PAC	E	EN	IT

Type proper value of the primary voltage and press ENT.

Press EXIT twice to go back to the Menu display.



This means not programmable setting of the primary voltage. It is just information for the processor, which protects the permitted limits (up or down) for a given value of the primary voltage (protection circuit).

FORWARE	POWER,	kW			
0 0.1	0.	5 1.0	1.6	2.4	0 W
					011
FWD pow REF powe Drive pow U plate I plate U screen I screen U grid I grid	rer er ver 3 0 - -	0 W 0 W 0.0 W 3.22 kV 0.00 A 0 V 0 MA 125 V 0.0 mA	SWR Frequence Gain Tempera U heating Plate RF Mains vo DC input Efficiency	cy g voltage ltage power y	1.00 3799 kHz 0.00 dB 29.0 °C 8.2 V 0 V 234 V 0 W 0.0 %
	FREEZE	BARG1	BARG2	BARG3	EXIT

MEAS pressing shows this screen. Instantaneous values of the basic parameters are displayed.

You can **FREEZE** the screen and measure **AGAIN**.

FORWAR 0 0.	D POWER	, KW 5 1.0) 1.6	2.4	0 W
FWD pov REF pow Drive pov U plate I plate U screen U screen U grid I grid	ver er wer C	0 W 0 W 0.0 W 3.22 kV 0.00 A 0 V 0 mA 125 V 0.0 mA	SWR Freque Gain Tempe U heati Plate R Mains DC inpe Efficien	ncy ng F voltage voltage ut power icy	1.00 3799 kHz 0.00 dB 29.0 °C 8.2 V 0 V 234 V 0 W 0.0 %
AGAIN	FREEZE	BARG	BARG2	BARG3	EXIT

Three different bar graphs can be defined using BARG1, BARG2 or BARG3 button.

Press BARG1.



Green graph may show one of the 8 parameters. Scroll to request parameter and press **SAVE**. Screen jumps back.



Touch **BARG2** in the next step, then the same way **BARG3**.



Press **EXIT** to go back to the **Menu display**, then press **SERVICE**.



SERVICE SETTINGS

LAST 20 FAULTS LAST 20 WARNINGS	5			
SET EBS1 MANUAL				
SET EBS2 MANUAL				
SWR PROTECT			on 📄	
>	SHOW	EXIT		

Now we are in the **SERVICE** settings mode.

Scroll to selected line and press **SHOW** or **SET** (depending on the line).

	LAST	20 FAULTS
1.	-7:25 High refl. power	1119:11 High refl. power
2.	-7:25 High refl. power	1219:12 High refl. power
3.	-7:29 High refl. power	1319:13 High refl. power
4.	-7:29 High refl. power	1419:13 High refl. power
5.	-7:29 High refl. power	1519:14 High refl, power
6.	-7:29 High refl. power	1619:14 High refl. power
7.	-19:10 High refl. power	1719:14 High refl, power
8.	-19:10 High refl. power	1819:15 High refl. power
9.	-19:10 High refl. power	1919:15 High refl. power
10.	-19:11 High refl. power	2019:15 High refl. power

We selected last 20 WARNINGS to show.

Press **EXIT** and go to the **SET EBS1 AUTO** and press **SET**.



PA will automatically set 20mA of EBS.

EXIT

You can try to do this manually, too.

Scroll to SET EBS1 MANUAL and press SET.

SERVICE SETTINGS

~	<	SAVE	EXIT	<	>
SWR PRO	TECT			= 🔲 OM	I
SET EBS2	MANUAL				
SET EBS1	TO p = 20)mA 📖	lp	: 19 mA	Ug: -86 \
SET EBS1	AUTO				
LAST 20 V	VARNINGS	S			
LAST 20 F	AULTS				

Use left/right button to set 20mA or as close as possible value and press **SAVE**.

Similar ways **EBS2** can be preprogrammed (300mA by AUTO set).



Or another value of EBS2 by MANUAL Set.

SERVICE SETTINGS



Scroll to **CALIBRATION Ip, Is** and press **SET**. Calibration will be done automatically.

Go to the bottom line.



SERVICE SETTINGS

LAST 20 FAULTS				
LAST 20 WARNINGS	S			
SET EBS1 AUTO				
SET EBS1 MANUAL				
SET EBS2 AUTO				
SET EBS2 MANUAL				
CALIBRATION Ip, Is				
SWR PROTECT		🗆 OFF	= 🔲 ON	
6				
	SET	FXIT	OFF	ON
	OL.		011	

This feature allows user to switch OFF the SWR protection.

We recommend to set it **ON** (SWR protection circuit will stay active, max. allowed SWR is 3:1). If **OFF** is selected, higher SWR is allowed, but reflected power is measured. If it exceeds 350W, transmit will be blocked.

Press EXIT.

5.4. Operation mode



Before switching to operation mode, check all connections between PA and TCVR.



We are back in the **Main display**, bar graphs were defined, antennas were preprogrammed, CAT was set. We are ready to go to the operation mode.

Press shortly black **STBY/OPER** button on the front panel.



We are in the operation mode.





Now try to press PTT (foot switch for example).

We are in the transmit mode (without RF).

We have new button here. M-TUNE.

M-TUNE means entry to the manual tuning mode. It allows fine tuning of the PA, especially in the case when antenna impedance is different from real 50 Ohms. For proper adjustment we need to show **Screen** current (at least). Press **M-TUNE**. New screen is visible. Slides on the left and right side represent both variable capacitors.

Adjustment process: Move TUNE left or right until maximum of FWD power reached. Then move LOAD carefully so that Ig2 Screen (I Screen on the display) current will be not higher than 20mA. Optimum means maximum FWD power and Screen current between 0–20mA for the used power output. Repeat more times. When using lower power, Ig2 can go to negative values.

Result of the tuning process is optimal, when PA was tuned to the maximum forward power and Ig2 current stays in the range from 0 to +20mA. At that time maximum efficiency and optimal linearity are achieved. This applies to each power application. It is not necessary to retune the PA, if we decrease the output power. The PA stays in linear mode with little lower efficiency. If we increase the output power, retuning is necessary only if Ig2 exceeds +20mA.



After adjustment press **SAVE** for writing values to the memory and press **EXIT**.

Repeat adjustment process for other segments / bands.

-		

Now one example from real situation. First we will check driving power from the transceiver. Stay in **STBY** mode, press **PTT** and apply **RF** power.

FORWARD POW 0 0.1	ER, KW 0.5 1.	0	1.6	2.4	5	53 W
Pref 0 3 10 30 60 1 W	00 200 300	Scr	een -40 1A	-20	0 2	20 40
Drive 0 1 3 6 12 W	25 40 60	80	L	AST EV	ENT:	S
ІСОМ	DEFAULT		STBY			
3.79	98 мн:	z	ANT 1		YAC	GI
	SETTIN	1G	MEAS	SERV	ICE	EXIT

Measured driving power is 53 Watts.

Now switch to **OPER**, press **PTT** and apply **RF** from TCVR. See the following picture.

FOR ^V	WA	RE 0.1) F	°01	VER, o.	kW s	1.0) Lecislis	1.6		2.4	5	0	7 W
Pref 0 W	3 1	0	30	60	100	200	300		Screen mA	-40	-20	0	20	40
Drive ₀ W	1 Selected	3	6	12	25	40	60	80		L	ASTE	VEN	٢S	
	CO	M			DE	FAL	JLT		OP	ERA	TE	TR	AN	SMIT
			3	3.7	'98		MHz		ANT	1		YA	AGI	
			M	1-T	UNE	SET	ITIN	G	MEA	AS	SER	VICE	I	EXIT

1.0

62%

MHz

SAVE

1.6

-40

Screen

iplate 0

ANT 1

EXIT

^{2.4} **1585W** ⁻²⁰ ⁰ ²⁰ ⁴⁰ ^{1.5} ^{1.0} ^{1.5} ^{2.0} LOAD max

adjustment.

mA.

These parameters were **SAVED**.

Output power is 1507W, reflected power reached abt. 4W and screen current is abt. -8

If your antenna has **different** impedance than real 50 Ohms then is necessary to start the **M**-**TUNE procedure** to optimize PA adjustment (press **MENU**, **M**-**TUNE**) and make the manual

Notice: OM2000A+ is factory adjusted to maximum output power of 2000W (1500W for US models) to the real load 50 Ohms. Unique Tuning table with TUNE and LOAD values for every band is supplied with each PA.

YAGI

LOAD

42%

When the antenna impedance has greater tolerance, it may be the case that the PA cannot deliver the full power 2000W, or some of protection circuits will be automatically activated. In such a case we recommend to do manual tuning.

The best indication of proper PA tuning is the Screen Current. In the properly tuned PA to be within 0 to + 20mA (at full or used output power).

Tuning procedure:

ORWARD POWER

3 6 12

12

TUNE

781-3.810

TUNE

Gain

dl

25 40 60

18 21

max

15

- Press M-TUNE button. IF CAT is active, TCVR will automatically tune itself to the middle frequency of the segment. If NO CAT, you must tune TCVR manually to the segment center frequency. If NO CAT but BCD, band will be changed but segment will be set after keying. Set CW or RTTY mode in the TCVR. Set input power to abt. 50%.
- Press PTT, check the Ig2 (I Screen on the display). If it is ok (0-20mA), increase gradually the input power of the PA to reach abt. 70% of its maximum output power.
- With TUNE buttons adjust maximum FORWARD POWER while monitoring the Screen current.

- When Screen current exceeds +20mA, use right LOAD button to decrease current to abt. 0 mA.
- Increase the input power until you reach the used maximum output power. Again watch the Screen current. If exceeds +20mA, decrease it using right LOAD button.
- Repeat TUNE buttons using to reach maximum FORWARD POWER and check Screen current.
- If Screen current is lower than 0 mA (negative value), change it with pressing left LOAD button until 0 mA is set and check again the maximum output power. Do not start with very low input power, set abt. 50% before beginning M-tune process.
- If you reached maximum output power and Screen current is inside 0 / +20mA, press SAVE button.

Notice 1: If tuning process takes more than 1 minute, make a short brake to prevent temperature overloading of the PA.

Notice 2: If you will use PA with the output power lower than maximum, Screen current can take negative values. There is no necessary to readjust the PA, it is working still in the linear mode.

														- 71
FORV 0	NΑ	RI 0.1	D F	201	WER 0	, kW .5	1.0	1	1.6		2.4	C	17	14/
Prof		in state					64444	i ile	Screen			6	4	VV
w 🛯	3	10	30	60	100	200	300		mA _	-40	-20		20	40
Drive 0 W	1 Kenn	3	6	12	25	40	60	80		L	ASTE	EVEN	TS	
	С	ON				USE	R		OP	ERA	TE	TF	RANS	MIT
			~	3.7	'98		MHz]	ANT	Г1		Y,	AGI	
			N	1-T	UNE	SE	TTIN	G	ME	AS	SER	VICE	E	XIT

We can see new small yellow window. **USER** means that we used manual tuning feature to optimize the PA adjustment.

If you want to go back to the default factory settings, use CLEAR USER SETTINGS in the MENU settings (page 15) – for one band or all bands.

If the amplifier demonstrate any malfunctions during tuning or it does not behave in accordance witch the description, interrupt the tuning procedure immediately and check the amplifier! Be sure not to do any mistakes in choosing antennas, bands or segments! Be sure that VSWR is not higher than 3:1 and input power is LOW!

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

6. MAINTENANCE

6.1. Indication of Fault Conditions

If a fault condition appears during the operation of the amplifier, the safety circuits of OM2000A+ will react. There are several warning or fault messages possible to appear on the display, when some of the protection will be activated. The OM2000A+ power amplifier can report one of the following messages:

Power Out is too high Refl. power too high Power In is too high Low output power (tune) Plate current too high Grid current is high Screen current error Heating voltage error HARD FAULT Plate voltage error Grid voltage is low Screen voltage error SWR is too high Amplifier is too hot



Most of safety circuits are preset for two levels of exceedances. First level is a warning level. In such a case a warning message appears on the display, but power amplifier will stay in **normal operation**. See the table below for warning and fault conditions.



When a fault condition appears during the tuning or operation of the amplifier, the safety circuits will **block transmitting**. The amplifier stays in **OPER** mode. After approx. 1 sec the control circuits will automatically switch the amplifier back to the transmitting mode. If problem persists, safety circuit will react again.



If the fault will repeat 3 times during 10 seconds, the safety circuits will turn the amplifier to STBY mode. To cancel fault status, press STBY/OPER shortly. Power amplifier will stay in STBY mode.

All the warning and fault messages are stored in the memory. You can display particularly warning messages and particularly error messages. They are stored one by one to the memory. You can see them on the display. If memory is full, every new message will delete oldest one and move rest of them one position back. It means that every time last 20 messages are visible on the display.

FORWARD POWER, KW 0 0.1 0.5 1.0 Pref 0 3 10 30 60 100 200 300 W Drive 0 1 3 6 12 25 40 60 8 W ICOM DEFAULT 3.797 MHz SEGM	1.6 24 248W Screen 40 20 40 MA Reflected power too high OPERATE TRANSMIT ANT 1 YAGI MENU ANTENNA	This an example from previous attempt, when antenna was disconnected from the PA during transmitting. Reflected power was higher than 250W, warning message "Reflected power too high" appeared.
ALL WARNING Reflected power too high	S IN LAST TIME	If you touch the yellow box, warning details will be visible.
Check you antenna! Reduce	input power!	
SEGM		Λ.
In the case of some hardware manufacturer or your dealer.	failure or if your power ampli	fier is not working properly, please contact the
Never try to change of parts may void intrins	r move any part inside the amp sic safety!	lifier except of tube or fuses. Substitution of
Manufacturer's contacts:	OM POWER, s.r.o. 930 30 Báč 126 SLOVAKIA Email: om-power@om-powe	er.com
Dealer in the USA:	Array Solutions 2611 North Belt Line Road Suite # 109 Sunnyvale, TX 75182 Tel: <u>(214)954-7140</u> Email: <u>sales@arraysolutions.co</u>	<u>m</u>
		33

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 fuse (fuses) interruption inside the power amplifier, **exchange can be carried out only by professionally qualified person!** Internal fuses are located mainly on the SWITCH-on board (next to the HV transformer).



One

special fuse filled with sand is used in the model OM2000A+. In the case of an accidental discharges in the tube this fuse (4 Amps fast, filled with sand) saves HV supply circuits.

<u>Fuse</u>

6.3. Tube Replacement

In the case of vacuum tube damaging, contact the manufacturer or your dealer for ordering new one. You will get instructuions how to change it. Exchange can be carried out only by professionally qualified person! After tube replacing automatic BIAS adjustment must be done.

6.4. Cleaning

To prevent damage to amplifier surface 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

7.1. Primary AC voltage selection

Primary section of the HV transformer is switchable for three values of AC voltage (220, 230, 240V), resp. 230, 240, 250V for US models. Factory settings is 230VAC. Before first starting of the PA we recommend to check the correct value according to the AC voltage in your network. Change the settings, if necessary. The correctness of the selected network voltage indicates Uf voltage, which must be in the range 8.5 - 9.5V. If it is lower, change the digression down and vice versa.

Side view on the opened OM2000A+



Remove the upper lid first. On the right side of the PA, next to the HV transformer there are two PCBs mounted. On the left upper side of the front (Switch-ON) board connector J6 is located.



flat screwdriver or finger and press carefully the white stick to release contact and move upper end of the white jumper to the proper position, if necessary.

Jumper must be connected between bottom contact and one of remaining contacts. AC voltage is marked next to every contact.



AC selector range can be changed in the production according to the specific conditions in individual countries. Default settings is 220V - 240V / 50 Hz for EU market and 230V - 250V / 60Hz for US market. If you need different settings in the range of 200 - 260V, this should be specified in the order!

Use

7.2. Removing HV Transformer

For simpler and easier transport of the PA, HV transformer can be removed and taken separately. This distributes the weight of the PA (24 kg) about half and half. Follow next steps to do it.

- 1. Remove upper lid from the PA (use Phillips screwdriver bit PH1 !).
- 2. Turn the PA on the left side (transformer is up).
- 3. Disconnect **3 connectors** from the front board and **1 connector** from the rear board.
- 4. Release **4 screws** from the bottom side of the PA. Use Philips screwdriver bit P2. During the release of the last 2 screws hold the transformer by hand. Do not worry about its weight, it will move down just 1 cm and remains on the central rung of the PA.
- 5. Use both hands to take transformer away from the chassis.



Watch the released terminals, when moving the transformer!

Do not damage transformer insulation during removing and transportation.





Weight of the PA was distributed (transformer has 12 kg, rest of the PA has cca 12 kg, too).

When refitting the transformer, watch to the correct location of individual sections and wires.



Manufacturer reserves the right to make future changes in the way of connecting the transformer to the board. Allways mark the position of the terminals before disconnecting the transformer.

7.3. Controlling the OM2000A+ with Flex Radios Series 6xxx

There are two possible methods to connect Flex Radio series 6xxx belong to OM2000A+:

- Using SmartSDR CAT program
- Using USB connector at Flex 6xxx

Flex Radio 6xxx series connection using SmartSDR CAT

Choose the control port in the SmartSDR CAT window that you will use to control the power amplifier. It must be an existing serial port – a hardware COM port in your PC or an USB to serial port adapter. Connect the chosen COM port and the transceiver port (TCVR DB9)to the OM Power amplifier with a null modem serial cable (both ends of the cable with a female DB-9 connector and pins 2 and 3 are crossed).



You must use it for the TX slice that is associated to the connecting port otherwise the amplifier will not to be set on the proper frequency.

SmartSDR CAT	Edit CAT Port	n
v1.7.30 Radio Connected		1
C TCP: Port 5002 Slice: A	Port Protocol: CAT -	
C Serial: COM5 Slice: A Process: (None)	Port Type: Serial TCP Serial Port: ElexVSP Existing	
Serial: COM4 Slice: A (Auto Switch TX) Process: (None)		
Serial: COM1 Slice: A (Auto Switch TX)	CAT COM: COM1	h W/0
	VFO A Slice: A	PWG
Add Edit Log Remove	Auto Switch TX Slice: Enabled Cancel Save	



In the CAT SETTINGS menu select FLEXRADIO, baud rate 9600 and press SET.

Flex Radio 6xxx series connection using USB output

Connect USB from Flexradio directly to TCVR port on OM2000A+ using USB – serial port adapter and a null modem serial cable (both ends of the cable with a female DB-9 connectors (pins 2 and 3 are crossed).

File Set	ngs Profiles Help	
	Radio Setup	
	FlexControl	
+R)	Network	
+TN	Memory 9 +20+40	
Ban	USB Cables	
ANT	Channel: 2	
Display		
DAX		
		_
		-

Activate the smartSDR and choose Settings / USB Cables

(USB adapter to serial connect to USB port of Flexradio). Line with connected USB adapter will appear.

1 8 7 1 7

11 h

NBNRANFOSK 7.0 4.6 5 5 7 9 +20-1 DSP USB X/RT el: 2	08 +40 DAX							
	New CAT	Name Cable Log	A	Serial Nur A403LCRD ve	mber	Type CAT	Enabled Enabled	

Make double click on the line (with connected USB adapter after that appears possibility) to open configuration window for COM port .

Set all parameters in the table according the picture below. In both windows ENABLED must be selected.

File Settings Profiles H	ielp			≪FlexRadio Systems
+RX +RX +TNF Band DSP USB X/R/ ANT DSP USB X/R/ DSP USB X/R/ DSP USB X/R/ DSP USB X/R/	TX A 681		X	
DAX	Name New CAT Cable	Serial Number A403LCRD	Type Enabled	Name: New CAT Cable Serial: A403LCRD
	Edit Log R	emove		Cable Type: CAT Source: TX Slice
				Auto-report: Enabled
				Data bits: 8 Parity: None
	/			Stop bits: 1 • Flow control: None •

Close both windows. (USB adapter connect trough null modem cable to TCVR port on OM2000A+).

CA	T SI	ETT	ING	S		
NO CAT YAESU						
ICOM	4800	9600	19200			Bd
TT ORION KENWOOD, ELECR. K3	4800	9600	19200	38400	57600	Bd Bd
FLEXRADIO	4800	9600	19200	38400		Bd
14.000-14.350	MHz		NO AN	TENNA	SWITC	Н
~ ~	SET	E	XIT	<		>

In the CAT SETTINGS menu select FLEXRADIO, baud rate 9600 and press SET.

Power

7.4. OM2000A+ Remote Control

The OM Power team developed special software which allows control the PA OM2000A+ remotely. Download it from the official OM Power website <u>http://www.om-power.com/downloads</u>. First unzip the downloaded file, then open software.

The software allows user:

- Switch PA ON and OFF
- Switch between STBY and OPERATE
- Switch between preprogrammed antennas
- Read and reset last 20 warnings and fault statuses
- Fine tuning of the PA
- To check almost all operation parameters of the PA

- To select different screens
- Antenna retuning if parameters changed

Have a look on the next pictures and follow instructions to setup remote control properly.

Connection setting.



Connect / disconnect to OM2000A+

Manager Amplifier View Tunning Info Connect Alt+C FOR DISCONNECT Alt+D 0 Last 20 Faults Alt+E
Connect Alt+C DISCONNECT Alt+D 0 Last 20 Faults Alt+F
FOR DISCONNECT Alt+D 0
0 Last 20 Faults Alt+F 0.00 0.0 1.0 1.2 1.4 1.0 1.0 2.0 2.2 2.4
Last 20 Warnings Alt+W
Antennas Settings Alt+A
Frefi 0 50 100 150 200 250 Iscreen -50 -40 -30 -20 -10 0 10 20 30 40 50
ma
YAGI PA ON
OPER/STBY PA ON/OFF
Version: 3.18 © 2016 Amplifier connected on IP: 192.168.1.211 / port: 10001

View last 20 PA faults



Anennas Settings

OM2000A+ Power A	n Settings	of the antennas in PA						-	23			X	- 🗆 🗙
Manager Amplifie	Port	Name	Using 160m	for bar 80m	nd 40m	30m	20m	17m	15m	12m	10m	6m	
FORWARD	1.	YAGI	v	\checkmark	\checkmark	\checkmark	V	1	v	v	v	\checkmark	
Ĭ	2.	FD4	1	\checkmark	\checkmark	\checkmark	√	1	1	1	1	\checkmark	
	3.	DIPOLE	v	v	v	v	V	v	v	v	v	\checkmark	J VV
P., 0	4.	YAGI40	1	\checkmark	√	v	√	1	v	v	v	v	40 50
W	5.	YAGI 20	1	V	v	V	V	1	1	v	v	\checkmark	
P . 0	6.	GP 160	v	\checkmark	\checkmark	v	v	1	v	v	v	\checkmark	
Input V	7.	INV 160	1	\checkmark	1	v	1	1	1	1	1	V	7
	8.	GP 80	1	\checkmark	\checkmark	v	v	1	v	v	v	\checkmark	
	9.	YAGI 10	v	\checkmark	\checkmark	v	√	1	v	\checkmark	v	v	
N/L OL	10.	YAGI 15	V	v	v	v	V	v	v	v	v	\checkmark	
< ANT 1 Version: 3.18 © 2010		Antenna Switch : No Antenna S Standard Ante	witch enna Sw	itch						SAVE			A ON

There are three possible screen selectable

🔍 OM2000A	+ Power Amplifier Remo	ote Control M	lanager by OM Powe	r s.r.o OM2000A-1		
Manager	Amplifier View Tu	unning Info				
FOD	Connect	Alt+C				
FOR	DISCONNECT	Alt+D	06 08	10 12 14	16 18 20 22 24	
ľ ľ	Last 20 Faults	Alt+F	0.0 0.0	1.0 1.2 1.4	1.0 1.0 2.0 2.2 2.4	0.144
	Last 20 Warnings	Alt+W				U VV
Р	Antennas Settings	Alt+A	150 200 250	-50 -40		0 20 20 40 E0
refl			150 200 250	screen -50 -40		
input	0 10	20 30 -	40 50 60 70 80	Frequency	3 515	kH7
VV				i ioquolioj	0010	
	YAGI				OPERATE	PA ON
< A	NT 1 >				ΟΠΕΠ/ΘΤΡΥ	
					OPER/STBY	PA UN/UFF
Version: 3.18	© 2016 Amplifier co	onnected on I	P: 192.168.1.211 / po	ort: 10001		

Minimal view

🔍 OM	2000A Re	emote Co	ntrol - ON	12000A-1	lanager	3		1	7. 5. 2010	12:35	A	3
o	0.2	0.4	0.6 D	npman 0.8 ac	N 1,0	1,2 k	4 c11;4: F	rof 1,6	1.8	2.0	2.2.	enre tovj
									5, <mark>2,20</mark> 3	<mark>5 1</mark> 8:84	Aplika	
			i M	icrosoft.	VisualBa	sic Powe	PacksVs.r	an s	3.2.2016	20:13	Rozšie	nie
				-		10 TOY	100 A 1					



To go back from Minimal view click with right mouse button and close it. Normal view will appear back.

Normal view

OM2000A Power Amplifier Remote Control Manager by OM Power s.r.o OM2000A-1	
Manager Connection View Tunning	
FORWARD POWER - kW 0 0,2 0,4 0,6 0,8 1,0 1,2 1,4 1,6 1,8	20 22 2155 W
P _{refl} 0 25 50 75 100 125 150 175 200 225 W MA	0 -30 -20 -10 0 10 20 30 40
Pinput 0 10 20 30 40 50 60 70 W Frequency	21 149 kHz
YAGI40	TRANSMIT PA ON
< ANT 4 >	OPER/STBY PA ON/OFF
Version: 3.14 © 2016 Amplifier connected on IP: 192.168.1.220 / port: 10001	

Advanced view

A OM2000A Power Amplifier Remote Control Manager by OM Power s.r.o OM2000A-1	×
Manager Connection View Tunning	
FORWARD POWER - KW	
P _{refi} 0 25 50 75 100 125 150 175 200 225 W mA	
Pinput 0 10 20 30 40 50 60 70 Frequency 21 149 kHz	
ſ Measurements	
I_{plate} = 1.3 A U_{plate} = 2698 V P_{output} = 2182 W Temp = 29 °C U_{mains} = 0 V	
$'_{grid}$ = 0 mA U'_{grid} = -73 V P_{input} = 47.0 W SWR = 1.0 U'_{heat} = 7.9 V	
' _{screen} = 50 mA U _{screen} = 326 V P _{reflect} = 0 W Gain = 17 dB FREEZE	
YAGI40 TRANSMIT PA ON	
< ANT 4 > OPER/STBY PA ON/OFF	
Version: 3.14 © 2016 Amplifier connected on IP: 192.168.1.220 / port: 10001	

Fine tune screen. It is possible to retune the PA remotely (if antenna parameters changed, for example), too. Proceed the same way than with local control (page 28).

🧟 OM2000A Power Amplifier Remote Control Manager by OM Power s.r.o OM2000A-1
Manager Connection View Tunning
FORWARD POWER - KW
P _{refl} 0 25 50 75 100 125 150 175 200 225 W mA
Pinput 0 10 20 30 40 50 60 70 W W HIZ
Measurements
$r_{screen} = 2 \text{ mA} $
TUNE POSITION: 51.7 LOAD POSITION: 60.8 0 10 20 30 40 50 60 70 80 90
SAVE TUNE LOAD TRANSMIT PA ON EXIT <
Version: 3.14 © 2016 Amplifier connected on IP: 192.168.1.220 / port: 10001

7.5. Remote Control using own public IP address

7.5.1 Changing OM2000A+ connection settings

Connect LAN connector on OM2000A+ to PC with ethernet cable.

Open up a WEB browser and enter the OM2000A+ current IP address (default is 192.168.1.211).

Authentication Required					
8	Enter user name and password for http://192.168.1.104				
User Name:					
Password:					
	OK Cancel				

An authentication window will show up. Leave the fields empty and click OK.

Open Network menu and change the IP address, Subnet mask, Default Gateway and DNS Server settings to the ones given by the internet provider. When done, click OK.

	MAC Address: 00-20-4A-BA-2D-F6
<u>ቆ</u>	Network Settings
Network Server	Network Mode: Wired Only 💌
Serial Tunnel Hostlist Channel 1 Serial Settings Connection Email Trigger 1 Trigger 2 Trigger 3	IP Configuration Obtain IP address automatically Auto Configuration Methods BOOTP: Enable Disable DHCP: Enable Disable AutoIP: Enable Disable Ones given by the
Configurable Pins	DHCP Host Name: internet provider
Apply Settings Apply Defaults	 Use the following IP configuration: IP Address: 192.168.1.104 Subnet Mask: 255.255.255.0 Default Gateway: 192.168.1.1 DNS Server: 192.168.1.1
	Ethernet Configuration Auto Negotiate Speed: 100 Mbps Duplex: Full Half OK

You can change the OM2000A+ Port number too, if you need / want in the Connection menu. When done, click OK.

1n7			
	Connection Settings		
етwork	Channel 1		
erver	Connect Protocol		
erial Tunnel	Protocol: TCP		
HOSTIIST			
Coriol Cottinge			
Connection			
mail	Connect Mode		
Trigger 1	Passive Connection:	Active Connection:	
Trigger 2	Accept Incoming: Yes	Active Connect: None	
Trigger 3	Password		
onfigurable Pins	Required: OYes 💿 No	Start Character: 0x(00 (in Hex)	
apply Settings	Password:	Modem Mode: None	
nnhy Dofaulte	Modern Escane Sequence Pass	Show IP Address After	
	Remote Port: 0	Auto increment for active connect Remote Host: 0.0.0.0	
	Common Options:	Connect December 2	
	Teinet com Port Critri. Disable	Connect Response. None	
	Terminal Name:	Hostlist: OYes INO LED: Blink	
	Disconnect Mode		
		Hard Disconnect: () Yes (No	
	On Mdm_Ctrl_In Drop: 🔘 Yes 💿 No	163 0140	
	On Mdm_Ctrl_In Drop: ○Yes ④No Check EOT(Ctrl-D): ○Yes ④No	Inactivity Timeout: 0 : 0 (mins : secs)	

7.5.2 Setting up in the Remote software



In the Remote Control software open Settings and enter the IP Address and Port number that you set in point 7.5.1.

Click enter, when done. Now you are ready to work with OM2000A+ over the internet.

7.5.3 Remote Control without own IP Address, behind a router

Change router's settings

If you need to change the OM2000A+ connection setings for some reason, use point 7.5.1 writen above.

ookmarks <u>T</u> ools <u>H</u> elp router's IP	Open up a WEB browser and enter the routers's internal IP Address (usually 192.168.1.1)
Connect to 192.168.1.1 Image: Constant in the second se	An authentication window WILL APPEAR. You need to enter the routers login and password. Usualy a router's default login is "admin" or " administrator" and default password "admin" or an empty field.

Open Firewall Settings (depends on router software, can be called Forwarding, Port Forwarding, or something similar). As Server IP enter the OM2000A+ IP Address, 192.168.1.211 if you haven't changed it, or the one you changed to in point 7.5.1. Private port should be 10001 in default, or the one you changed to in point 7.5.1. Some routers THEY don't have a separate Public Port settings. If you got, enter a free port number (usually the default 10001 is free and usable). Check the Enable box too. When done, click OK (or Save).

Air Live	anick	Setup Status			6899	OvisLink Cor
+ Basic Setting			Virtual Serve	er		
- Port Forwarding • Virtual Server	ID	Public Port	Private Port	Server IP	Enable	Use Rule#
Special AP Oliscellaneous	1	10001	10001	192.168.1 107	V	0
+ Firewall Setting	2	4112 _these y	alues are important	192.168.1 5		0
+ Advanced Setting	3	4113	4113	192.168.1.5		0
+ Maintenance	4	10908	10001	192.168.1.106		0
	5	10002	10001	192.168.1.222		0
Log out	6			192.168.1		0

Open Basic Setup (or WAN Settings or similar, depending on router) and note the WAN IP Address value.

Air Liv	Cuick Setup Status	
- Basic Setting • Primary Setup		Primary Setup
 DHCP Server Port Forwarding Firewall Setting Advanced Setting Maintenance 	Item LAN IP Address WAN Type WAN IP Address WAN Subnet Mask WAN Subnet Mask WAN Gateway Primary DNS Secondary DNS Save Undo Virtual Computers Help	192.168.1.1 Static IP Address Change 10.72.43.164 255.255.255.0 10.72.43.163 10.72.43.163 10.72.43.163 10.72.161.1
OM2000A+ Power Amplifier Remote Co	ontrol Manager by OM Power s.r.o OM2000A-1	
Manager Amplifier View Tunning FORWARD POWER - 0 0.2 Profit 0 50 W 0 10 20 W 0 10 2	a Info OM2000A+ PA Remote Manager Settings Enter name of this Power Amplifier. For example: OM2000A-1 OM2000A-1 Enter host address and port in following format HOST:PORT. For example: 192.168.1.211:10001 IP2.168.1.211:10001 Check for updates on start DBY PA OFF COPER/STBY PA ON/OFF ected.	In Remote Control software, open Settings. Enter the IP Address and Port number you set up in previous point in your router. IP Address is the WAN IF Address in basic setup page and Port number is the Port (or Public Port in separate) in forwarding page. When done, click enter.

Now you are ready to work with OM2000A+ over the internet.

7.6. OM2000A+ firmware upgrade

Download firmware upgade software and latest firmware file for OM2000A+ from the official OM Power website <u>http://www.om-power.com/downloads</u>. Store it to OM2000A folder in your PC.

Use serial null modem cable and connect TCVR port on OM2000A+ rear panel with COM port on the PC.

Open folder OM2000A , find MX460L.exe file and run it.

File Settings Help	
Firmware version in data file N/A	
Waiting Rejects 0 Estimated remaining time	
Operation Image: Constraint of the second constraints Image:	tx rx
 14:53:40,140 Start 14:53:40,156 Mapping serials 14:53:40,468 Opening COM 1 - OK 	
COM1 115200Bd 8N1 Interface	٨

Select SETTINGS and choose COM port you want to use. Baud rate should be 115200. Close the window.

PIC 32MX460 loader, ver 2.4	// Power
File Settings Help Firmware EEPROM Settings	
Serial line COM COM4 Baud 115200 Format 8N1 Close serial port Set up Language tx rx Com tx rx Com tx rx Com tx rx	
17:45:01,253 Start 17:45:01,253 Mapping serials 17:45:01,326 Opening COM 4 - OK	
COM4 115200Bc 8N1 Interface tot connected	

E PIC 32MX460 loader, ver 2.4	
File Settings Help	
Firmware EEPROM	Select the Eirmware tab and click on
Firmware version in data file 02.13	LOAD BIN
	Choose OM2000A+ Vxxx.bin file in the
Waiting Rejects 0	OM2000A folder.
Estimated remaining time	
Operation tx rx Image: Dead bin Image: Dead bin	
14:55:53,406 Testing input data format	
14:55:53,421 Input data format OK 14:55:53,437 Firmware version found: 02.13	
14:55:53,437 Activate mode Update firmware on PA!	
14:55:53,437 Data ready, click button "Send to line"	
COM1 115200Bd 8N1 Interface	
Switch ON power amplifier using mains switch.	
OM 2000A+	Power
AUTOMATIC POWER AMPLIFIER	
PRESS ON BUTTON TO SWITCH AMPLIFIER ON	
	Press SETTINGS.
10.100-10.150 MHz NO ANTENNA SWITCH	
< BAND > INFO SETTING < ANTENNA >	

	SETT	INGS		
CAT SETTING ANTENNA SETTING DISPLAY SETTING	3			
EBS EBS LEVEL CLEAR USER SETT CLEAR USER SETT BLOWER TURN	0.1 NGS - BAI NGS - ALL	DFF ON W ND: 14 MHz BANDS TEMP. D PT	T 🗆 ALWAYS	Choose
	SHOW	EXIT		

Choose INFO and press SHOW.



PIC 32MX460 loader, ver 2.4	
File Settings Help	
Firmware EEPROM	
Firmware version in data file 02.13	
Ula Nice Defende	
Rejects 0	
Operation Image: Construction Image: Construction Image: Construction Image: Construction Image: Construction Image: Construction	tx rx
14:55:53,406 Testing input data format	~
14:55:53,421 Input data format OK	
14:55:53,437 Firmware version found: 02.13	
14:55:53,437 Data ready, click button "Send to line"	
	~
COM1 115200Bd 8N1 Interface	

Press SEND TO LINE.



EXIT

LOADING NEW FIRMWARE Loading Firmware to External Memory 29 %

You can see loading progress on the bar graph

LOADING NEW FIRMWARE

PLEASE WAIT 30 sec. DO NOT TURN OFF THE POWER AMPLIFIER!!! You will see this screen after firmware was successfully loaded.

It is very important: Do not do any action. Wait until this screen disappears!

Usually, it takes about 30 seconds but sometimes it might take a little bit longer.

At the end you will see main screen of OM2000A+. Switch PA OFF, disconnect serial cable and you are ready to use OM2000A+ with the new firmware.

7.7. ICOM connection with OM2000A+



53

7.8. Yaesu plus BPF plus ANT Switch connection with OM2000A+



7.9. Control panel (rear side) connectors pin-out



ANT / BPF Connector - DB15 female

TCVR connector DB 9 male



6789

RS232 connection with TCVR. For CAT communication you need connect pin 2 RX-D, pin 3 TX-D and pin 5 GROUND



LAN connector

Straight Through Cable		
RJ-45 PIN RJ-45 PIN		
1 Tx+	1 Rc+	
2 Tx-	2 Rc-	
3 Rc+	3 Тх+	
6 Rc-	6 Tx-	



Use for connection to the LAN or WAN network.

CONTROL connector D-sub 15 female



Pin	1	- GROUND
Pin	2	- KEY OUT - ouput signal PTT (maximum switching of 30V / 50mA
Pin	3	- KEY IN - input signal PTT – switching voltage / current 5V / 2mA
Pin	4	- CI-V - CI-V input for Icom CAT. The same as CI-V jack connector
Pin	5	- BAND data A input - input BCD Yaesu compatibile code from TCVR - bit 0
Pin	6	- BAND data B input - input BCD Yaesu compatibile code from TCVR - bit 1
Pin	7	- BAND data C input - input BCD Yaesu compatibile code from TCVR - bit 2
Pin	8	- BAND data D input - input BCD Yaesu compatibile code from TCVR - bit 3
Pin	9	- GROUND
Pin	10	- CI-V SW - connect to Ground if you use CI-V input on pin 4. Not used for CI-V with Jack
3,5m	m	
Pin	11	 IC band data - Icom Band data input. Band data information from ICOM TCVR
Pin	12	- INHIBIT - Inhibit output for TCVR. +12V/2mA inhibit transmit, 0 V if transmit is allowed
Pin	13	- No connect
Pin	14	- No connect
Pin	15	- No connect

ANT / BPF Connector - D-sub 15 male



Pin 1 - ANT data D - output BCD code - bit 3 for antenna switching

Pin 2 - ANT data C - output BCD code - bit 2 for antenna switching Pin 3 - ANT data B -- output BCD code - bit 1 for antenna switching Pin 4 - ANT data A - output BCD code - bit 0 for antenna switching Pin 5 - Not connected Pin 6 - GND Pin 7 - GND Pin 8 - +12V /100mA - output supply 12V maximum 100mA for antenna BCD decoder Pin 9 - BAND data A - output BCD Yaesu BAND data compatibile code.Use for automatic bandpass filter OM6BPF Pin 10 - BAND data B - output BCD Yaesu BAND data compatibile code.Use for automatic bandpass filter OM6BPF Pin 11 - BAND data C - output BCD Yaesu BAND data compatibile code.Use for automatic bandpass filter OM6BP 12 - BAND data D - output BCD Yaesu BAND data compatibile code.Use for automatic bandpass filter Pin OM6BPF Pin 13 - Not connected Pin 14 - GND Pin 15 - 12V /100mA - the same as pin 8

Λ

OM2000A+ can address up to 10 antenna port, see antenna BCD code table below

			10		
D	С	В	Α	Logic value	Antenna port
0	0	0	0	0	UNDEFINED
0	0	0	1	1	ANT 1
0	0	1	0	2	ANT 2
0	0	1	1	3	ANT 3
0	1	0	0	4	ANT 4
0	1	0	1	5	ANT 5
0	1	1	0	6	ANT 6
0	1	1	1	7	ANT 7
1	0	0	0	8	ANT 8
1	0	0	1	9	ANT 9
1	0	1	0	А	ANT 10
1	0	1	1	В	UNDEFINED
1	1	0	0	С	UNDEFINED
1	1	0	1	D	UNDEFINED
1	1	1	0	E	UNDEFINED
1	1	1	1	F	UNDEFINED

58



OM 2000A+ blo Rev.: 15.3.2016

7.11 Troubleshooting

The OM2000A+ power amplifier contains several protection circuits, which checked operation. In the case when some of parameters exceeds normal level, WARNING appears in the LAST EVENS window with yellow back colour. If some of parameters exceeds critical level, FAULT is activated and the PA automatically switch to STBY mode. In the LAST EVENTS window with red back colour fault information will appear.

All of these events are written to the FAULT and WARNING memories. Last event is visible after LAST EVENTS button pressing together with information about possible causes.

There are several warning or fault messages possible to appear on the display:

Warning / Fault	Action	Description	
Power Out is too high	Reduce input power	Output power exceeds maximum level, reduce the input power.	
Refl. power too high	Check your antenna Reduce output power	Reflected power exceeds maximum allowed level. Check if proper antenna is connected. In the case of higher SWR reduce the input power and thus the output and reflected power will be lower.	
SWR is too high	Check your antenna Check antenna switch	Antenna SWR is too high (SWR 3 for WARNING and SWR 5 for FAULT). Check if proper antenna is connected. Check antenna switch configuration, resp. If you want to use antenna with higher SWR, this protection can be switch off (page 25). But reflected power will stay checked (max.350W).	
Power In is too high	Reduce input power Check amplifier tunning	At the PA input is too high input power – decrease it! If maximum output power is not achievable, check plate voltage and PA tuning.	
Low output power (tune)	Tune mistake. Tune your amplifier	The PA has lower gain, may not be properly tuned. Check plate voltage and Screen current. If they are ok, make optimal tuning of the PA.	
Plate current too high	Reduce input power Check amplifier tunning Check EBS setting	 Plate current too high may be for the following reasons: Too high input power – reduce it Improper tuning of the PA – bad antenna impedance matching. Tune the PA properly. Improper BIAS setting. Check EBS1 and EBS2. 	
Grid current is high	Reduce input power Check amplifier tunning	Grid current too high is due to overdriving the PA. Reduce the input power. If maximum output power is no reachable due to high plate current, check the PA tuning.	
Screen current error	Reduce input power Check amplifier tunning Check plate voltage fuse	 High screen current is usually of the following reasons: Overdriving the PA – reduce the input power Improper PA tuning. At maximum output power the screen current must be inside the range of 0 mA to +30 mA. Plate voltage is missing. Press PTT without driving If screen current is higher than +5mA, check plate fuse (page 32). 	

i late voltage elloi	Check place power supply	High voltage supply fault. Check fuses on HV board.	
Grid voltage is low	Check grid power supply	Low voltage on the grid. Check fuse F4 on SW ON board.	
Screen voltage error	Check screen power supply	Check fuse F5 on HV supply board and fuse F1 on the screen board.	
Amplifier is too hot	Check cooling system Set up aditional blower	Check the airflow (ventilation grid on the rear panel). Cooling exhaust must be free – no obstacle within 15cm. During long contest set additional blower ALLWAYS ON (page 18).	
HARD FAULT	Check HV circuits and Tube	Protection circuit saved HV against overload. I the case of too high current from the HV supply the HARD FAULT protection is activated and switched the PA automatically OFF. Check HV circuits, blocking capacitors and the tube.	
Heating voltage error	Set up properly transformer voltage selector	Usually is due to improper setting of the primary voltage on the transformer (page 33). In normal condition Uf should be 9V +/- 0,5V.	
Cooling error	Check blower rotation	Main blower lost the speed. Check its functionality.	
Mains error	Check mains voltage and set up nominal mains voltage Set up properly transformer voltage selector	This error may be caused by the improper setting of the nominal value of Um. Check your AC mains voltage and set it as nominal Um (page 21). Check primary voltage setting on the transformer. This fault may occurs also in the case of very "soft" mains, when during transmitting AC voltage dropped down to very low level.	

Factory reset

I the case of very abnormal behavior of OM2000A+ is possible to make factory reset. After that all the parameters will be changed to the factory default values.

MOP

Press ON/OFF button, hold it and press Main switch. ON/OFF button hold pressed several seconds, until next display will appear.





After finish the PA is ready for operation.

Important notice: Perform Factory reset unless it is really necessary, because subsequently you must recover all of personalized settings, mainly CAT communication with TCVR, antenna switch settings etc.

