Exhibit 11: Tuning Procedure and Parts List

External Radio Frequency Power Amplifier OM2000+

Model 2000+

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1.2. Tuning of the Power Amplifier

The OM2000+ power 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.

CAUTION

The operation of a mistuned PA will cause malfunctions, the increase of grid current and problems with TVI/BCI.

CAUTION

If the input power is higher than 10W and the power amplifier is NOT correctly tuned, the safety devices will switch it to STBY. After switching the amplifier to STBY, you need to switch it back to the **OPER** mode by pressing **RESET** button shortly.

A tuning table is delivered with the power amplifier. For **coarse tuning** select a band with **BAND** switch and choose the setting of "**TUNE**" and "**LOAD**" capacitors according to the table.

Band (MHz)	Tune	Load	Input PWR (W)	Output PWR (W)
1.845	70	45	75	1500
3.630	69	51	72	1500
7.050	50	90	71	1500
10.125	72	28	72	1500
14.175	69	40	70	1500
18.150	81	48	69	1500
21.230	47	67	65	1500
24.940	61	64	59	1500
28.450	33	76	52	1500
50.200	22	90	64	1500

NOTE

Delivered tuning table was made for 50 Ohm loading of PA (dummy load). Each amplifier should have different values depending on used frequency and used type of antenna. Make your own table valid for your real conditions.

There are two ways how to do fine tuning. **The first method** uses a gradual increase in the input power when tuning the PA (as most operators accustomed). In every case we recommend adjust the display for both of methods so it shows two parameters important for fine tuning - **TUNE** and **Is graph** (> I <).

Press **OPER** to enter operation mode. Apply **low input power** and press PTT. Be sure you selected right BAND, TUNE and LOAD knob positions. If you made some mistake, fault message appears:

Safety circuit stopped transmitting, fault LED is **ON** (Fault code 4 is saving to the memory).

Release PTT, set proper positions of BAND, TUNE and LOAD according to the table and **press PTT** again.

Another mistake can occur, if you have antenna connected to the wrong output. In such a case „**SWR is too high**" error message appears. Change antenna output using **S4** button.

This is not an optimal result, TUNE indicator must go between both arrows. Use **TUNE** knob **to get maximum output power** and LOAD knob **to get indicator between arrows.**

Another example of not optimal result, TUNE indicator must go between both arrows. Use **TUNE** knob **to get maximum output power** and **LOAD** knob **to get indicator between arrows** (in arrows direction)**.**

This is a **good result** of tuning.

Now increase input power slowly and watch the display.

Two of important information is visible – **screen current increased**, but still is within the allowed limits. Turn **LOAD** knob slightly in arrows direction **to get TUNE indicator between arrows.**

Display indicates **correct tuning** of the Power amplifier.

Remember

Always use **TUNE** knob to get maximum output power. Use **LOAD** knob to get TUNE indicator on the display to the middle position between both arrows. Simultaneously check if **Is graph** indicator stays within the boundaries. Repeat both steps more times.

Proper operation mode of FU-728F requires the plate voltage to be close to 3 kV. If anode voltage without RF power is much lower, watch the heating voltage, too. Normally, heating voltage must be in boundaries from 8.5 to 9 V without RF signal (DSP3). **Heating voltage level is a reliable indicator of correct AC selector adjustment**. If you see heating voltage lower than 8.5V without RF signal, change primary AC voltage selector one step down (if possible). Conversely, if the voltage is higher than 9V, try to move AC selector one step up (for example from 220 to 230 VAC). Check heating voltage under full load (full output power), also. If the heating voltage without RF signal is OK but under full load drops more than 1.5 V, this relates to the „soft“ AC network and is solvable only by „changing“ the AC network...

Without RF power the plate voltage is OK.

Without RF power the plate voltage is 2.85 kV. Check the heating voltage, too. If it is below 8.5 V, this indicates the need to change AC selector position one step down (for example from 230 to 220 VAC).

To **start the second method** of fine tuning, press **S2 (TUNE**) button in **OPER** mode.

PA is in the operation mode. After **TUNE** button (S2) was pressed, it changes its function. Now **STOP** is blinking.

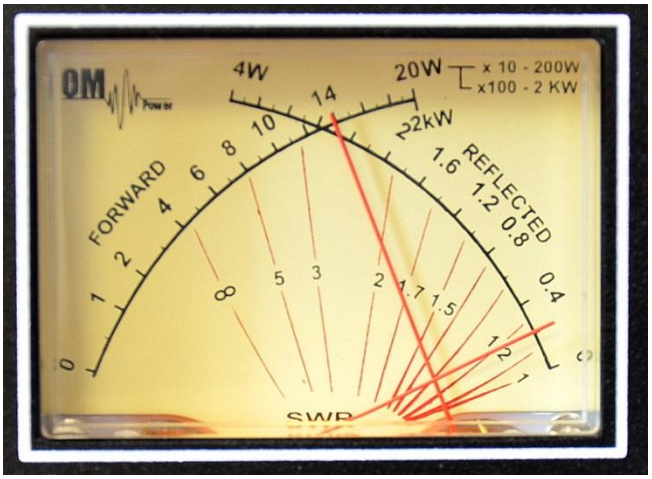
Do not press STOP button yet!

Apply input power according tune table (or lower) for selected band and press **PTT**. Use **TUNE** knob to get maximum output power. Use **LOAD** knob to get Is graph indicator within the boundaries.

Display shows properly tuned PA.

TUNE indicator is in the middle, Screen current is higher, but still inside the limits.

After proper fine tuning release **PTT** and press **STOP** button. PA is now prepared for operation.



View on the properly tuned PA. Analog wattmeter shows forwarded and reflected power.

After this procedure the amplifier is tuned correctly and ready to give 1500 W output power in all operation modes. At optimal tuning and full output power a positive max. 50mA current goes through the second grid.

CAUTION

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 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!

OM2000+ PARTS LIST

Item No.		Description		Qty.
1	Analog meter FWD / REF	70x70mm		1
2	Band switch 8x3	8x3 position		1
3	Blower	24V 5,28W	PE92252V1-000U	1
4	Blower ebm-papst	230V 30W	G2E085-AA01-01	1
5	Bridge	KBU8J	8A 600V	4
6	Bridge	B380C	0,8A 900V	1
7	Bridge	DB157S	1,5A 1000V	2
8	Capacitor ceramic	4n7 6kV	15,24mm	4
9	Cap ceramic disc	2n2 10kV	Φ 40mm	1
10	Cap ceramic disc	330 3,5kV	Φ 30mm	1
11	Cap ceramic disc	1n 12kV	Φ 30mm	1
12	Cap ceramic disc	470 16kV	Φ 25mm	1
13	Capacitor ceramic	1µF 50V	1206	4
14	Capacitor ceramic	100pF 50V	1206	12
15	Capacitor ceramic	100n 50V	0805	5
16	Capacitor ceramic	100n 50V	1206	66
17	Capacitor ceramic	100n 500V	5mm	5
18	Capacitor ceramic	100nF/1kV	10mm	6
19	Capacitor ceramic	10n 50V	1206	19
20	Capacitor ceramic	10n / 1kV	5mm	1
21	Capacitor ceramic	10nF 500V	5mm	10
22	Capacitor ceramic	10nF / 1kV	10mm	9
23	Capacitor ceramic	10pF 500V	1210	2
24	Capacitor ceramic	15pF 50V	1206	2
25	Capacitor ceramic	1n /50V	0805	4
26	Capacitor ceramic	1n 500V	5mm	2
27	Capacitor ceramic	1nF 50V	1206	9

28	Capacitor ceramic	22 50V	1206	1
29	Capacitor ceramic	2n2 500V	7,62mm	1
30	Capacitor ceramic	2nF 500V	7,62mm	1
31	Capacitor ceramic	3,3pF 500V	5mm	1
32	Capacitor ceramic	3n3 500v	5mm	1
33	Capacitor ceramic	4.7pF 500V	1210	2
34	Capacitor ceramic	47n 250V	15,24mm	2
35	Capacitor ceramic	47pF 500V	1210	1
36	Capacitor ceramic	59pF 500V	1210	1
37	Capacitor ceramic	76pF 500V	1210	1
38	Capacitor electrolytic	330µF 450V	10,16 SNAP-IN	8
39	Capacitor electrolytic	47µF 250V	7,62_ELKO	2
40	Capacitor electrolytic	47µF 450V	7,62_ELKO	2
41	Capacitor electrolytic	1000µF / 35V	1411_ELKO	1
42	Capacitor electrolytic	10µF / 16V	SMD 1210	6
43	Capacitor electrolytic	22µF / 16V	1206	1
44	Capacitor electrolytic	10M /16V	1206	1
45	Capacitor electrolytic	330µF / 6V	SMD_R7X7_ELKO	1
46	Capacitor electrolytic	47µF/10V	1206	1
47	Coil	Stopper coil		1
48	Coil	anode choke on PTFE		1
49	Coil	choke 100uH 2,5A		1
50	Coil	Air coil		1
51	Coil	L coil on ceramics		2
52	Coil	choke coil on PTFE		2
53	Connector	PV02-5,08-H-P	5,08	1
54	Connector	PV03-5,08-H-P	5,08	1
55	Connector	PV06-5,08-V-P	5,08	1
56	Connector	PV04-5,08-H-P	5,08	2
57	Connector	LPH10	10-S	1
58	Connector	LPH06	6-S	2

59	Connector	LPH16S	16-S	3
60	Connector	FASTIN	1X01	1
61	Connector	FASTON	MKDSN1,5/2-5,08	2
62	Connector	LPH20	LPH20SMD	1
63	Connector	LPH20RA	LPH20RA	1
64	Connector	LPH16RA	LPH16RA	4
65	Connector	LPH10RA	LPH10RA	2
66	Connector	LPH06RA	LPH06RA	3
67	Connector	WWS 10G	1X06	1
68	Connector	NSL 25-2W	PSS254/2W	3
69	Connector	NSL 25-4W	PSS254/4W	2
70	Connector	NSL 25-4 G	PSS254/2G	3
71	Connector	NSL 25-2G	PSS254/2G	9
72	Connector	NSL 25-3G	PSS254/2G	1
73	Connector cinch	CHINCH CC133B		1
74	Connector cinch	CHINCH CC133B		1
75	Diode	1N5408	DO27	1
76	Diode	1N4148	DO35	1
77	Diode Schottky	TMMBAT46	MINIMELF_DIODE	4
78	Diode Schottky	BAT41	MINIMELF	2
79	Diode Si	1N4007 1A 1000V	DO41	3
80	Diode SMD	TS4148	1206-D	3
81	Diode SMD	SM4007	MELF	1
82	Diode SMD	LL4148	MINIMELF_DIODE	13
83	Diode SMD	BAR43C	SOT23/3	3
84	Diode SMD	SKL34	MINIMELF_DIODE	2
85	Diode Zenner	18v	DO41	1
86	Diode Zenner	1N5349 12V 5W	DO201AD	2
87	Diode Zenner	1N5363 30V 5W	DO41	1
88	Diode Zenner	1N5384 160V 5W	DO201AD	2
89	Diode Zenner	BZV85C 20V	DO41	1

90	Diode Zenner	BZV85C 30V	DO41	1
91	Diode Zenner	BZV85C 4V7	DO41	1
92	Diode Zenner	BZV85C 5V1	MINIMELF_DIODE	1
93	Diode Zenner	BZV85C 6V8	MINIMELF_DIODE	19
94	Diode Zenner	SK54	SMB	1
95	Diode Zenner	ZD 5V1	SOD80	1
96	Diode Zenner	ZD 8V	SOD80	1
97	EMI filter	BLM31	1206	12
98	EMI filter	BLM21PG221	0805	15
99	EMI filter	BLM31PG221	1206	6
100	Filter EPCOS	250V20A	B84771A0020A000	1
101	Fuse	F4A	5 x 20mm	1
102	Fuse	250mA	5 x 20mm	1
103	Fuse	T2A	5 x 20mm	4
104	Fuse	1A	5 x 20mm	1
105	Fuse	T500mA	5 x 20mm	2
106	Fuse	T3,15	5 x 20mm	1
107	Fuse	T2A	5 x 20mm	1
108	Fuse	10A	5 x 20mm	1
109	Fuse 6,3x32mm Slow	T 16A Fuse Slow	6,3x32mm	2
110	Choke	1mH	0207	1
111	Choke	100uH	0207	6
112	IC	TLC272ACP	DIL8	1
113	IC SMD	74AHC74	SO14	1
114	IC SMD	MAX232CSE	SO16_SOT109-1	1
115	IC SMD	TLC272	SO8_SOT96-1	1
116	IC SMD	ICL7660ACPA	SO8	1
117	IC SMD	MCP4017T-5	SC70-6	1
118	IC SMD	LM358AD	SO8_SOT96-1	3
119	IC SMD	TA78L08F	SOT89	1
120	IC SMD	TA78L05F	SOT89	1

121	IC SMD	LM4040-2.5	SOT23/3	1
122	LED_3mm	LED_3mm	LED_3MM	4
123	LED_yellow_5mm	Backlight	LED_5mm	1
124	OLED Display	EA-W204	EA-W204 DISP	1
125	Photo-coupler	PC817	DIL4	1
126	Power switch	250V 10A	Marquardt	1
127	Processor	PIC18F8722	TQFP80	1
128	Quartz crystal	20MHz	HC49_SMD	1
129	Relay	G2-RL	Omron_G2RL-1-E	2
130	Relay	LYCA024	Finder_34.51	2
131	Relay	SY-12W	RELAIS-SY	1
132	Relay	G6K	Omron_G6K-2F	3
133	Relay	FTR-B3	FTR-B3GA012Z	1
134	Relay	FTR K1	G2RL-1-E	3
135	Relay vacuum	RH4894	Siemens	1
136	Resistor Adj.	100k	PT10LV	2
137	Resistor	10	5X12R15,24	2
138	Resistor	10 / 15w	9X38R50,8	1
139	Resistor	100	1206	25
140	Resistor	100	0207_MET	6
141	Resistor	100k	R 2W	1
142	Resistor	100k	4X12R15,24	1
143	Resistor	100K	1206	13
144	Resistor	10K	0207_MET	6
145	Resistor	10k	1206	46
146	Resistor	10k	5X12R15,24	1
147	Resistor	120k	1206	1
148	Resistor	12k	1206	1
149	Resistor	150k	5X12R15,24	9
150	Resistor	150k	0207	1
151	Resistor	160k	1206	1

152	Resistor	180k	1206	1
153	Resistor	18k / 10W	0207	1
154	Resistor	1k	11X50R55,88	1
155	Resistor	1k	0207_MET	5
156	Resistor	1k	4X12R15,24	1
157	Resistor	1k	1206	24
158	Resistor	1k2	1206	1
159	Resistor	1k3	1206	1
160	Resistor	1M	R 2W	1
161	Resistor	1M	4X12R15,24	3
162	Resistor	20K	TRIMMER_23B	1
163	Resistor	22	1206	1
164	Resistor	22	10X46R50,8	1
165	Resistor	220	4X12R15,24	1
166	Resistor	220	1206	1
167	Resistor	220/2w	0207	1
168	Resistor	2k2 / 3w	4X12R15,24	1
169	Resistor	330k	0207_MET	2
170	Resistor	33k	0207	2
171	Resistor	3k9	1206	1
172	Resistor	3R3 /15w	9X50R55,88	1
173	Resistor	4k7	1206	23
174	Resistor	4R7 / 15w	9X50R55,88	1
175	Resistor	5.6k 2W	4X12R15,24	1
176	Resistor	50Ohm 250W		1
177	Resistor	51k	1206	1
178	Resistor	560	4X12R15,24	1
179	Resistor	5K	PT10LH	1
180	Resistor	68/2w	R 2W	1
181	Resistor	68k	0207_MET	2
182	Resistor	82/2w	R 2W	1

183	Resistor	91k	1206	1
184	Resistor	M15	1206	1
185	Resistor	150	2512	6
186	Resistor	47k	1206	4
187	Resistor	2k2	1206	4
188	Resistor metal oxide	2 x 330/7W		1
189	Resistor metal oxide	1M 2W		3
190	Variable capacitor	70 + 250pF		1
191	Variable capacitor	400 + 400pF		1
192	Suppressor	600V		1
193	Switch	TASTER_18,5MM		5
194	Switching regulator	TSR1-2450	TRACO-TSR1-24	1
195	Switching regulator	47154	12V 5W	1
196	Thermistor disk	32A 1Ohm		1
197	Transformer	220/230/240V 2410W		1
198	Transil	BZW 06-12B	DO41	4
199	Transil	BZW06 10B	DO41	1
200	Transistor	2N3904	TO92	1
201	Transistor	IRFPG50PBF	TO247	2
202	Transistor	BC846B	SOT23/3	11
203	Transistor	BCX55-16	SOT89	17
204	Transistor	BCX53	SOT89	3
205	Transistor	BU806	TO220	1
206	Transistor	FZT955	SOT223	1
207	TUBE	FU728f		1