SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Exhibit 11: Tuning Procedure and Parts List

External Radio Frequency
Linear Amplifier
Model Expert 1K-FA

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Tuning Procedure

TUNER

The amplifier has an automatic tuner that handles load mismatches up to 3:1 VSWR (2,5:1 for 50 MHz).
The circuit used is a PI – L network with excellent harmonic suppression.
The amplifier contains a look-up table with all the permitted bands.
For tuner management, antenna data and other working data are stored.
Every band has a sub-band set, and for each of those, data related to the antenna and auto-ATU tuning is stored.
The CAT and the frequency counter detect the operating frequency and the correct sub-band. Thanks to the stored data, the tuner and the antenna are automatically set correctly.
For every input there is a different table. If two exciters are connected at the same time, each exciter can have different configurations.
It is possible to use the two different tables when the amplifier operates at two different locations. In fact it is possible to use the INPUT 1 at one and INPUT 2 on the other. In this way repeated reprogrammings are not needed
In the US version, operation on the 12 m and 10 m bands has been inhibited following FCC regulations. Authorized 12/10m operation of the amplifier by licensed radio amateurs will be enabled by the dealer there in accordance with current rules.
The auto-tuner and antenna selection via the amplifier are still enabled even in 12/10m inhibited units.
All auto-tuner functions remain, on standby, whilst using the transceiver only.
Setting of the match data to write in the tables is performed automatically by pressing the [TUNE] key The system will then find the correct match for minimum SWR.
To achieve a better match than that achieved with the automatic tune routine (most unlikely) it is possible to set the tuning manually by using the keys [◄ C], [C ►], [◄ L],
[L ►].
When manual tuning has been performed, it is possible to read the tuning value, the working frequency and the associated sub-band on the appropriate screen page.
Both the types of tuning are always effected in “STANDBY“ state.

NOTE: The tuner, like all analog circuits, introduces a loss (0,8 dB max.) that may vary with tuning conditions.The power meter of the amplifier does not show this loss as the power is measured at the tuner input where the load resistance is always constant (50 ohm).

NOTE: ATTENTION, When the amplifier is on the ‘STANDBY’ or ‘OPERATE’ modes, always disable the automatic tuner in your transceiver.

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Use of Automatic Tuner

To complete the programming it is necessary to match the antennas to the amplifier by operating "TUNE" (read the "TUNER" chapter of this manual).
We recommend you to select each band (with available antenna) and then program the tuner for the sub-bands within which you will operate.
Refer to the table in section 18 of the manual to select the appropriate sub-bands for your operating preferences.

Progress as follows:

1) Find the central frequency of the sub-band to tune in the table (refer to section 18 of the manual) and set the transceiver to that frequency.
2) Press the [TUNE] key.
3) Set your transceiver to transmit a continuous tone in RTTY or CW. The procedure for automatic tuning will start and then it will stop when SWR is at a minimum. Sometimes it is possible to improve tuning by pressing the [TUNE] key again.
4) Repeat the previous steps for all bands and sub-bands you want.

NOTE: If the ALC link is not used, it is preferable to reduce the transceiver power to about 50 Watts during this operation.

NOTE: As a default, the table is programmed for standard 50 ohm out. If, for a band, you want to reset to default programming,progress as follows:

- *Go to the "ANTENNA" menu page and set this band to "NONE", then exit from that page.*
- *Go to the "ANTENNA" menu page again, assign the appropriate antenna to this band, then exit from that page.*

The programming will be reset for 50 ohm output.

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Parts List

Item	Qty	Part	Type	%	W	VDC	COD SPE
1	1	DRIVING TRANSFORMER					BT000040
2	1	TLV272CD					CA243001
3	5	TL084CN					CA112013
4	1	TL082CP					CA112014
5	1	UA741					CA112015
6	1	KA555					CA692010
7	1	NE592N					CA152001
8	4	DG201ACJ					CA492001
9	2	MAX232CPE					CA532004
10	1	LM7805					CB412001
11	1	LM7812					CB422001
12	1	LM7912					CB422002
13	1	MC1723CP					CB491004
14	1	470uF	ELE			16V	CC111006
15	1	100uF	ELE			16V	CC119001
16	1	100uF	ELE	20%		25V	CC121021
17	4	10uF	ELE			16V	CC119002
18	3	2200uF	ELE			25V	CC121019
19	5	47uF	ELE	20%		25V	CC121020
20	1	47uF	ELE			16V	CC129001
21	1	47000uF	ELE			80V	CC141017
22	6	100nF	CER	20%		25V	CC221007
23	6	100nF	CER	20%		50V	CC231001
24	0	100pF	CER NP0	5%		50V	CC231017
25	1	470nF	CER	20%		50V	CC233005
26	11	1uF	CER	20%		25V	CC223001
27	4	10nF	CER	20%		50V	CC231003
28	4	1nF	CER	5%		63V	CC231028
29	1	1uF	CER	5%		50V	CC231037
30	2	22pF	CER	5%		25V	CC232004
31	1	10pF	CER	5%		50V	CC232003
32	7	470pF	CER	5%		50V	CC232012
33	57	100nF	CER	20%		50V	CC233001
34	1	2.2nF	CER	10%		50V	CC233007
35	0	4,7 nF	CER	10%		50V	CC232014
36	7	1nF	CER	10%		50V	CC233011
37	148	10nF	CER	10%		63V	CC233016
38	3	220nF	CER	10%		50V	CC233026
39	1	220pF	CER	5%		50V	CC233030
40	0	47nF	POL	10%		63V	CC431007
41	18	47nF	POL	5%		100V	CC441027

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Item	Qty	Part	Type	%	W	VDC	COD SPE
43	4	100nF	POL	10%		100V	CC441029
44	1	470nF	POL	10%		63V	CC431015
45	1	1uF	POL	10%		63V	CC431020
46	2	220pF WIMA	POL	2,5%		100V	CC441002
47	2	1nF	POL	10%		100V	CC441005
48	6	560pF	CER	5%		100V	CC241012
49	0	3.3nF	POL	20%		100V	CC441012
50	1	4.7nF	POL	5%		100V	CC441013
51	29	10nF	POL	5%		100V	CC441020
52	2	9.8/68pF compensator	CER			100V	CC541002
53	6	10nF	CER	20%		250V	CC451008
54	2	10pF	MICA	+-0.5PF		500V	CC651001
55	6	7,5pF	MICA	+-0.5PF		500V	CC651029
56	7	22pF	MICA	+-0.5PF		500V	CC651002
57	3	62pF	MICA	1%		500V	CC651025
58	3	39pF	MICA	+-0.5PF		500V	CC651003
59	3	82pF	MICA	1%		500V	CC651006
60	3	100pF	MICA	1%		500V	CC651007
61	3	910pF	MICA	1%		500V	CC651028
62	4	150pF	MICA	1%		500V	CC651008
63	3	270pF	MICA	1%		500V	CC651011
64	2	330pF	MICA	1%		500V	CC651012
65	3	680pF	MICA	1%		500V	CC651014
66	3	2200pF	MICA	1%		500V	CC651016
67	6	240pF	MICA	1%		500V	CC651026
68	3	15pF	MICA	+-0.5PF		500V	CC651019
69	3	33pF	MICA	+-0.5PF		500V	CC651020
70	10	120pF	MICA	1%		500V	CC651021
71	3	1500pF	MICA	1%		500V	CC651022
72	3	1000pF	MICA	1%		500V	CC651027
73	3	27pF	MICA	+-0.5PF		500V	CC651024
74	2	2,5pF	RG58				CC999002
75	1	CD74HCT27E					CD111023
76	1	MC74HCT04					CD111010
77	1	74HCT08N					CD111035
78	2	74HC86					CD114006
79	1	M74HCT245B1					CD121005
80	1	CD74HCT138E					CD131004
81	1	SN74HCT139E					CD131010
82	1	CD74HCT238E					CD131011
83	7	SN74HCT374N					CD141007
84	1	74HCT390P					CD151001
85	2	74HCT373N					CD161006

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Item	Qty	Part	Type	%	W	VDC	COD SPE
87	6	ULN2004AN					CD921005
88	7	Ferrite T130-2 (Red)					MC000060
89	3	Ferrite T130-6 (Yellow)					MC000061
90	2	Ferrite FB-37-77					MC000057
91	27	Ferrite FB-43-6301					MC000058
92	4	Ferrite FB-43-1020					MC000059
93	5	TSL0807-680KR91(68uH)					CF600014
94	5	TSL0807-220K1RS (22uH)					CF600002
95	3	NL322522T-470J (47uH)					CF600037
96	5	AL0307-3R3K					CF600003
97	0	NL322522T-221J (220uH)					CF600038
98	10	1N4148	D				CH111001
99	43	LL4148	D				CH119001
100	30	SM4007	D				CH119002
101	2	BYV95C	D				CH221003
102	8	1N4007	D				CH311001
103	2	ZPD6V2	D		0.5W		CH551016
104	0	BZX55C7V5	D				CH551032
105	4	TZMC5V1	D		0.5W		CH559003
106	1	ZMMC3V3	D		0.5W		CH559010
107	4	1N34	D				CH911004
108	1	LM336-5.0V	D				CH912001
109	1	LM336-2.5V/TO	D				CH912002
110	2	SCR 40TPS08	D				CH972001
111	2	SCR 70TPS12					CH972002
112	1	LCA 0021205					CI321003
113	1	TQ2-5V					CI111001
114	2	TQ2-12V					CI111004
115	35	M25A001012					CI131003
116	1	PKM17EPP-4001					CJ111003
117	1	HM62256LP-12					CM121002
118	1	EEPROM NM93C86A					CM394006
119	1	AM29F010-70PC					CM431003
120	2	LED RED					CO111006
121	2	LED YELLOW					CO121003
122	2	LED GREEN					CO131004
123	1	4N35					CO691002
124	1	AT89C51					CP122001
125	1	80C196KB					CP232001
126	1	LM35DZ					CW911022
127	1	11.0592MHz					CQ111027
128	1	560	R	5%	13W		CR411055
129	1	0.005 (Constantan wire)	R	5%	20W		FF000012

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Item	Qty	Part	Type	%	W	VDC	COD SPE
131	2	39	R	5%	15W		CR411056
132	1	47	R	5%	8W		CR411028
133	1	3K9	R	5%	2W		CR411058
134	6	56	R	5%	6W		CR411054
135	2	4K7	R	5%	0.25W		CR211003
136	1	22K	R	5%	0.25W		CR211004
137	1	1K5	R	5%	0.25W		CR211007
138	1	15	R	5%	0.25W		CR211013
139	3	100	R	5%	0.25W		CR211014
140	2	270	R	5%	0.25W		CR211019
141	2	820	R	5%	0.25W		CR211026
142	2	1K8	R	5%	0.25W		CR211031
143	4	2K	R	5%	0.25W		CR211032
144	1	2K7	R	5%	0.25W		CR211035
145	1	2.2	R	5%	0.25W		CR211036
146	2	10K	R	5%	0.25W		CR211005
147	1	6K8	R	5%	0.25W		CR211038
148	1	8K2	R	5%	0.25W		CR211042
149	0	10	R	5%	0.25W		CR211047
150	1	33K	R	5%	0.25W		CR211052
151	1	100K	R	5%	0.25W		CR211059
152	2	180	R	5%	0.25W		CR211075
153	1	18	R	5%	0.25W		CR211087
154	4	10K	R	1%	0.25W		CR221002
155	4	1K	R	1%	0.25W		CR221013
156	2	1	R	1%	0.25W		CR221015
157	4	30K1	R	1%	0.25W		CR221215
158	1	10	R	1%	0.25W		CR221022
159	1	75	R	1%	0.25W		CR221068
160	1	40K2	R	1%	0.25W		CR221221
161	1	470	R	1%	0.25W		CR221111
162	1	560	R	1%	0.25W		CR221115
163	1	820	R	1%	0.25W		CR221126
164	1	866	R	1%	0.25W		CR221128
165	1	953	R	1%	0.25W		CR221130
166	1	1K5	R	1%	0.25W		CR221140
167	2	1K87	R	1%	0.25W		CR221145
168	1	2K	R	1%	0.25W		CR221147
169	1	2K74	R	1%	0.25W		CR221153
170	1	3K32	R	1%	0.25W		CR221159
171	8	4K7	R	1%	0.25W		CR221168
172	1	3K48	R	1%	0.25W		CR221160
173	2	10K5	R	1%	0.25W		CR221191

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Item	Qty	Part	Type	%	W	VDC	COD SPE
175	2	48K7	R	1%	0.25W		CR221227
176	1	71K5	R	1%	0.25W		CR221236
177	1	75K	R	1%	0.25W		CR221237
178	1	86K6	R	1%	0.25W		CR221240
179	1	205K	R	1%	0.25W		CR221260
180	4	68	R	5%	0.5W		CR311040
181	24	10	R	5%	1W		CR411057
182	1	6K8	R	5%	1W		CR411018
183	2	180	R	5%	1W		CR411010
184	2	10	R	5%	3W		CR411020
185	2	47	R	5%	2W		CR411049
186	1	20K	TRM				CR741003
187	8	5K	TRM		0.5W		CR741007
188	1	MCP42010-I/SL	D/TRM				CR742001
189	16	10K	R	5%	0.1W		CR912001
190	11	1K	R	5%	0.1W		CR912003
191	6	100	R	5%	0.1W		CR912006
192	8	3K9	R	5%	0.1W		CR912028
193	14	4K7	R	5%	0.1W		CR912009
194	3	100K	R	5%	0.1W		CR912012
195	2	470K	R	5%	0.1W		CR912014
196	2	180K	R	5%	0.1W		CR912013
197	8	220	R	5%	0.1W		CR912022
198	2	6K8	R	5%	0.1W		CR912029
199	1	220K	R	5%	0.1W		CR912048
200	1	56	R	5%	0.1W		CR912061
201	1	820	R	5%	0.1W		CR912076
202	2	330	R	5%	0.1W		CR912036
203	1	56.2	R	1%	0.1W		CR922166
204	1	1K2	R	5%	0.1W		CR912064
205	2	2M2	R	5%	0.1W		CR912067
206	2	470	R	5%	0.1W		CR912071
207	3	0	R	5%	0.1W		CR912080
208	1	2K7	R	5%	0.1W		CR912093
209	5	560	R	5%	0.1W		CR912100
210	6	100	R	1%	0.1W		CR912006
211	1	22K	R	1%	0.1W		CR922005
212	4	15K	R	1%	0.1W		CR922012
213	1	1K21	R	1%	0.1W		CR922015
214	1	1K91	R	1%	0.1W		CR922193
215	5	1M	R	1%	0.1W		CR922016
216	1	1K05	R	1%	0.1W		CR922022
217	1	1K13	R	1%	0.1W		CR922194

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Item	Qty	Part	Type	%	W	VDC	COD SPE
219	1	3K3	R	1%	0.1W		CR922024
220	2	10K	R	1%	0.1W		CR922028
221	1	1K8	R	1%	0.1W		CR922045
222	4	1K	R	1%	0.1W		CR922066
223	4	2K49	R	1%	0.1W		CR922073
224	1	8K25	R	1%	0.1W		CR922195
225	3	4K7	R	1%	0.1W		CR922083
226	7	100K	R	1%	0.1W		CR922093
227	1	20K5	R	1%	0.1W		CR922105
228	1	1K27	R	1%	0.1W		CR922106
229	1	1K69	R	1%	0.1W		CR922112
230	0	1K5	R	1%	0.1W		CR922189
231	1	17K8	R	1%	0.1W		CR922114
232	1	29K4	R	1%	0.1W		CR221214
233	0	47K	R	1%	0.1W		CR922124
234	2	3K57	R	1%	0.1W		CR922131
235	1	90K9	R	1%	0.1W		CR922142
236	2	2K87	R	1%	0.1W		CR922169
237	3	2K15	R	1%	0.1W		CR922184
238	1	3K32	R	1%	0.1W		CR922163
239	1	2K	R	1%	0.1W		CR922196
240	1	2K43	R	1%	0.1W		CR922192
241	0	2K61	R	1%	0.1W		CR922126
242	1	6K65	R	1%	0.1W		CR922197
243	1	BU806					CS112009
244	4	BC639					CS112002
245	14	BC547					CS112001
246	2	BC307					CS212002
247	3	IRF620					CS332003
248	6	MRF150					CS349001
249	1	BSS129					CS412001
250	1	THERMISTOR NTC10Kohm 25°C					CW911023
251	2	FASTON 6,3mm da CS					FK000079
252	7	CONN. 3P M/CS/DR					FP000173
253	1	ZIFLEX13					FP000172
254	5	AMP2 M/DR/CS					FP000006
255	1	AMP2 M/90°/CS					FP000013
256	4	AMP6 M/DR/CS					FP000010
257	7	AMP4 M/DR/CS					FP000011
258	4	FLAT26P					FP000071
259	3	FLAT20P					FP000075
260	2	FLAT16P					FP000166
261	1	FLAT10P					FP000105

SOCIETÁ PER L'ELETTRONICA s.r.l.

Via di Monteverde, 33
00152 Rome – Italy

Tel. (39-6) 58209429
Fax (39-6) 58209647

Website www.linear-amplifier.com
e-mail info@linear-amplifier.com

Item	Qty	Part	Type	%	W	VDC	COD SPE
263	6	JUMPER 2 F/DR					FS000001
264	1	PRINTED BOARD					PX000060M1
265	1	PRINTED BOARD					PX000061M1
266	1	PRINTED BOARD					PX000065M1
267	1	PRINTED BOARD					PX000067M0
268	1	PRINTED BOARD					PX000068M0
269	1	PRINTED BOARD					PX000064M0
270	1	PRINTED BOARD					PX000066M2
271	7	LABEL LL190015 FPE					ZE000019
272	1	SOKET DIP 32-600					FK000027
273	1	SOKET PLCC44					FK000025
274	1	SOKET PLCC68					FK000002
275	14	SONICSERT M3					MC000064