

Appendix K. Parts List / Tune up Procedure

Please see the following page

8. PARTS LIST
CONTROL BOARD

NO	Parts Name	Specifications	UNIT	Q'TY	Description
1	CAP,TANTAL,SMD,0.1U/35,A	35MCS104MATER	EA	1	C618
2	CAP,TANTAL,SMD,0.47U/35,A	35MCS474MATER	EA	2	C669,687
3	CAP,TANTAL,SMD,2.2U/16,A	16MCS225MATER	EA	2	C667,671
4	CAP,TANTAL,SMD,4.7U/16,A	16MCM475MATER	EA	2	C624,649
5	CAP,TANTAL,SMD,1U/25,A	25MCS105MATER	EA	1	C675
6	CAP,TANTAL,SMD,10U/10,A	10MCM106MATER	EA	1	C677
7	HIGH CAPACTOR	GRM42-6Y5V225Z16PE	EA	4	C609,622,655,681
	CAP,TANTAL,SMD,4.7U/16,A	16MCM475MATER			
8	CAP-CER,1608,SMD	GRM39COG020C50PT	EA	1	C619
9	CAP-CER,1608,SMD	GRM39COG220J50PT	EA	1	C652
10	CAP-CER,1608,SMD	GRM39COG101J50PT	EA	4	C651,674,676,686
11	CAP-CER,1608,SMD	GRM39COG221J50PT	EA	6	C657-661,673
12	CAP-CER,1608,SMD	GRM39COG331J50PT	EA	2	C627,631
13	CAP-CER,1608,SMD	GRM39COG471J51PT	EA	1	C663
14	CAP-CER,1608,SMD	GRM39X7R102K50PT	EA	28	C601,603,604,608,611,612,614,615-617,620,621,623, C625,626,650,654,664,682,684,688-691,696,709-711
15	CAP-CER,1608,SMD	GRM39X7R122K50PT	EA	1	C670
16	CAP-CER,1608,SMD	GRM39X7R472K50PT	EA	1	C678
17	CAP-CER,1608,SMD	GRM39X7R562K50PT	EA	2	C628,630
18	CAP-CER,1608,SMD	GRM39X7R103K51PT	EA	1	C701
19	CAP-CER,1608,SMD	GRM39X7R153K51PT	EA	1	C629
20	CAP-CER,1608,SMD	GRM39X7R333K50PT	EA	2	C685,699
21	CAP-CER,1608,SMD	GRM39X7R473K50PT	EA	1	C683
22	CAP-CER,1608,SMD	GRM39Y5V104Z25PT	EA	8	C610,613,665,668,695,679,680,694
23	CAP-CER,1608,SMD	GRM39Y5V224Z50PT	EA	2	C653,656
24	RES,CF,5%,SMD	CR1/16W 000JV	EA	4	R702,807,823,825
25	RES,CF,5%,SMD	CR1/16W 4R7JV	EA	2	R694,695
26	RES,CF,5%,SMD	CR1/16W 100JV	EA	1	R662
27	RES,CF,5%,SMD	CR1/16W 220JV	EA	2	R628,681
28	RES,CF,5%,SMD	CR1/16W 101JV	EA	1	R611
29	RES,CF,5%,SMD	CR1/16W 471JV	EA	3	R609,610,708
30	RES,CF,5%,SMD	CR1/16W 681JV	EA	1	R800
31	RES,CF,5%,SMD	CR1/16W 821JV	EA	1	R657
32	RES,CF,5%,SMD	CR1/16W 102JV	EA	3	R685,697,699
33	RES,CF,5%,SMD	CR1/16W 122JV	EA	1	R656
34	RES,CF,5%,SMD	CR1/16W 222JV	EA	1	R615

35	RES,CF,5%,SMD	CR1/16W 472JV	EA	9	R617,620,629,636,645,704,706,715,813
36	RES,CF,5%,SMD	CR1/16W 562JV	EA	3	R716,717,799
37	RES,CF,5%,SMD	CR1/16W 682JV	EA	1	R693
38	RES,CF,5%,SMD	CR1/16W 822JV	EA	1	R630
39	RES,CF,5%,SMD	CR1/16W 103JV	EA	1	R707
40	RES,CF,5%,SMD	CR1/16W 123JV	EA	1	R690
41	RES,CF,5%,SMD	CR1/16W 153JV	EA	1	R680
42	RES,CF,5%,SMD	CR1/16W 183JV	EA	2	R647,651
43	RES,CF,5%,SMD	CR1/16W 223JV	EA	8	R619,633,639,666~669,705
44	RES,CF,5%,SMD	CR1/16W 273JV	EA	1	R641
45	RES,CF,5%,SMD	CR1/16W 333JV	EA	2	R613,622
46	RES,CF,5%,SMD	CR1/16W 393JV	EA	7	R626,627,631,632,650,654,688
47	RES,CF,5%,SMD	CR1/16W 473JV	EA	7	R623,637,649,653,660,684,686
48	RES,CF,5%,SMD	CR1/16W 683JV	EA	2	R643,646
49	RES,CF,5%,SMD	CR1/16W 823JV	EA	2	R655,691
50	RES,CF,5%,SMD	CR1/16W 104JV	EA	22	R601~604,608,612,621,634,638,679,682,683 R,692,696,698,700,701,703,719,802,803,808
51	RES,CF,5%,SMD	CR1/16W 124JV	EA	2	R663,689
52	RES,CF,5%,SMD	CR1/16W 154JV	EA	1	R618
53	RES,CF,5%,SMD	CR1/16W 224JV	EA	3	R614,635,644
54	RES,CF,5%,SMD	CR1/16W 274JV	EA	1	R624
55	RES,CF,5%,SMD	CR1/16W 334JV	EA	1	R616
56	RES,CF,5%,SMD	CR1/16W 105JV	EA	1	R676
57	C/RESISTOR	RC2012 9.1KF	EA	1	R678
58	C/RESISTOR	RC2012 15KF	EA	1	R677
59	IC,VOLTAGE DET	XC61AN4002MR	EA	1	U611
60	IC,LINER,OPAMP,SMD	LM2902M	EA	2	U601,603
61	IC,LINER,SWITCH,SMD	MC14066BDR2	EA	1	U610
62	IC,ASP,SMD	FX828D5	EA	1	U606
63	IC,CPU,SMD	UPD75P3018AGK-be9	EA	1	U605
64	IC,MEM,EEPROM,SMD	24C16I-2.7	EA	1	U604
65	IC,LINER,REG,SMD	TK11250AM	EA	1	U602
66	IC,LINER,AUDIO AMP,DIP	NJM2073D	EA	1	U607
67	TR,SW,SMD	KRA302	EA	4	Q601,602,603,617
68	TR,SW,SMD	KTA2014	EA	1	Q612
69	TR,SW,SMD	BCX-51	EA	1	Q615
70	TR,SW,SMD	KTA1001Y	EA		
71	TR,SW,SMD	KTC4075GR	EA	3	Q609,610,616
72	TR,SW,SMD	KRC411	EA	9	Q605~607,613,614,619,620~622
73	TR,SW,SMD	KRC412	EA	3	Q604,608,611
74	DIODE,SW,SMD	KDS121	EA	2	D601,602
75	C-MIC	OB-27P44	EA	1	MIC601

76	LCD	LCD16	EA	1	LCD601
77	TACT-SW	TM117	EA	3	SW601-603
78	DOME-SW,SMD	EVQPQ55	EA	2	SW604,605
79	SP/MIC JACK	HSJ1594-010015	EA	1	J601
80	OSC,X-TAL,SMD	CS20(4.032MHz)	EA	1	X601
81	POTENTIALMETER	TP76NOON(A CUVE)	EA	1	SVR601
82	LED-LAMP,DUAL,SMD	SLSYGUR302TM	EA	1	LED601
83	LED-LCD,SMD,LCD,LAMP	SLSNNYG401TM	EA	1	LED602
84	SPEAKER, 16Ω ,1.0W,40PI	G-4016-01	EA	1	SP601
85	CONNECTOR	CH-20ASG-M-C	EA	1	CON601
86	PCB,CONTROL,4LAYER,1.2T	AT-SERIES	EA		

RF BOARD

NO	Parts Name	Specifications	UNIT	Q'TY	Description
1	CAP,TANTAL,SMD,0.22U/35,A	35MCS224MATER	EA	1	C134
2	CAP,TANTAL,SMD,1U/25,A	25MCS105MATER	EA	1	C316
3	CAP,TANTAL,SMD,4.7U/16,A	16MCM475MATER	EA	1	C328
4	CAP,TANTAL,SMD,10U/16,A	10MCM106MATER	EA	1	C325
5	HIGH CAPACTOR	GRM42-6Y5V225Z16PE	EA	13	C136,154,156,216,219,220,301,304,305,312,323 409,509
	CAP,TANTAL,SMD,4.7U/16,A	16MCM475MATER			
6	CAP-CER,1608,SMD	GRM39COG0R5C50PT	EA	1	C215
7	CAP-CER,1608,SMD	GRM39COG010C50PT	EA	2	C213,432
8	CAP-CER,1608,SMD	GRM39COG020C50PT	EA	1	C108
9	CAP-CER,1608,SMD	GRM39COG030C50PT	EA	1	C119
10	CAP-CER,1608,SMD	GRM39COG040C50PT	EA	2	C116,204
11	CAP-CER,1608,SMD	GRM39COG050C50PT	EA	2	C104,423
12	CAP-CER,1608,SMD	GRM39COG060D50PT	EA	2	C407,416
13	CAP-CER,1608,SMD	GRM39COG070D50PT	EA	2	C111,113
14	CAP-CER,1608,SMD	GRM39COG080D51PT	EA	3	C123,129,402
15	CAP-CER,1608,SMD	GRM39COG100D52PT	EA	5	C109,121,125,157,434
16	CAP-CER,1608,SMD	GRM39COG120J52PT	EA	1	C422
17	CAP-CER,1608,SMD	GRM39COG150J50PT	EA	5	C101,131,202,225,420
18	CAP-CER,1608,SMD	GRM39COG180J50PT	EA	4	C403~405,421
19	CAP-CER,1608,SMD	GRM39COG220J50PT	EA	2	C228,433
20	CAP-CER,1608,SMD	GRM39COG270J50PT	EA	1	C203
21	CAP-CER,1608,SMD	GRM39COG330J50PT	EA	3	C141,205,206
22	CAP-CER,1608,SMD	GRM39COG680J50PT	EA	1	C105
23	CAP-CER,1608,SMD	GRM39COG820J50PT	EA	1	C142
24	CAP-CER,1608,SMD	GRM39COG101J50PT	EA	5	C118,133,135,314,320
25	CAP-CER,1608,SMD	GRM39COG221J50PT	EA	2	C148,149
26	CAP-CER,1608,SMD	GRM39COG471J50PT	EA	7	C208,211,308~311,324
27	CAP-CER,1608,SMD	GRM39X7R102K50PT	EA	37	C102,107,112,114,115,120,124,127,128,132,140,151,
					C152,155,209,210,217,218,221,223,226,227,321,322,
					C406,408,411,412,415,417~419,425,431,435,505,511
28	CAP-CER,1608,SMD	GRM39X7R472K50PT	EA	1	C150
29	CAP-CER,1608,SMD	GRM39X7R103K50PT	EA	2	C144,145
30	CAP-CER,1608,SMD	GRM39Y5V104Z25PT	EA	16	C146,147,153,302,303,306,313,315,318,401,410,503,
					C506~508,510
31	CAP-CER,1608,SMD	GRM39Y5V224Z50PT	EA	3	C229,501,502
32	RES,CF,5%,SMD	CR1/16W 000JV	EA	4	R111,303,312,517
33	RES,CF,5%,SMD	CR1/16W 100JV	EA	3	R106,112,204
34	RES,CF,5%,SMD	CR1/16W 560JV	EA	1	R405

35	RES,CF,5%,SMD	CR1/16W 101JV	EA	6	R207,314,315,406,411,503
36	RES,CF,5%,SMD	CR1/16W 221JV	EA	4	R202,305,306,308
37	RES,CF,5%,SMD	CR1/16W 331JV	EA	1	R302
38	RES,CF,5%,SMD	CR1/16W 471JV	EA	2	R164,433
39	RES,CF,5%,SMD	CR1/16W 681JV	EA	1	R113
40	RES,CF,5%,SMD	CR1/16W 821JV	EA	1	R309
41	RES,CF,5%,SMD	CR1/16W 102JV	EA	2	R121,211
43	RES,CF,5%,SMD	CR1/16W 182JV	EA	4	R115,116,501,506
44	RES,CF,5%,SMD	CR1/16W 222JV	EA	4	R301,401,404,413
45	RES,CF,5%,SMD	CR1/16W 332JV	EA	1	R507
46	RES,CF,5%,SMD	CR1/16W 392JV	EA	2	R310,410
47	RES,CF,5%,SMD	CR1/16W 472JV	EA	2	R416,508
48	RES,CF,5%,SMD	CR1/16W 562JV	EA	1	R435
49	RES,CF,5%,SMD	CR1/16W 682JV	EA	1	R509
50	RES,CF,5%,SMD	CR1/16W 822JV	EA	1	R155
51	RES,CF,5%,SMD	CR1/16W 103JV	EA	4	R307,311,408,412
52	RES,CF,5%,SMD	CR1/16W 123JV	EA	1	R127
53	RES,CF,5%,SMD	CR1/16W 223JV	EA	10	R117,126,129,205,319,402,403,414,415,504
54	RES,CF,5%,SMD	CR1/16W 333JV	EA	1	R128
55	RES,CF,5%,SMD	CR1/16W 473JV	EA	4	R105,109,110,434
56	RES,CF,5%,SMD	CR1/16W 683JV	EA	4	R101,103,107,108
57	RES,CF,5%,SMD	CR1/16W 823JV	EA	3	R114,118,502
58	RES,CF,5%,SMD	CR1/16W 104JV	EA	4	R119,123,510,519
59	RES,CF,5%,SMD	CR1/16W 154JV	EA	3	R122,124,165
60	RES,CF,5%,SMD	CR1/16W 224JV	EA	2	R313,511
61	THERMISTOR,SMD	NTCC16Y50KΩ J395H	EA	2	TH501,502
62	IC,LINEAR,REG,SMD	TK11250AM	EA	1	U502
63	IC,LINEAR,REG,SMD	TK11455AM	EA	1	U302
64	IC,IF DET,SMD	BA4116FV	EA	1	U101
65	IC,LINEAR,OPAMP,SMD	NJM2107F	EA	1	U210
66	IC,SMD	PF0313	EA	1	U201
67	IC,PLL,SMD	U2781B-FS	EA	1	U301
68	FET,MIXER,SMD	3SK240	EA	1	Q102
69	TR,RF,SMD	2SC4226(R25)	EA	6	Q101,301,401,403,405,408
70	TR,SW,SMD	2SC3356(R25)	EA	1	Q202
71	TR,SW,SMD	KRC411	EA	4	Q105,406,501,505
72	TR,SW,SMD	KRC412	EA	1	Q402
73	TR,SW,SMD	KTC4080Y	EA	1	Q103
74	TR,SW,SMD	KTC4377C	EA	1	Q201
75	TR,SW,SMD	KTA2014	EA	2	Q106,502
76	TR,SW,SMD	KRA302	EA	3	Q302,407,503
77	TR,SW,SMD	XP4311(TX)	EA	1	Q203

78	DIODE,SW,SMD	HSM88ASTL	EA	2	D102,202
79	DIODE,SW,SMD	UPP9401	EA	2	D101,201
80	DIODE,SW,SMD	KDS120	EA	2	D107,108
81	DIODE,SW,SMD	KDS121	EA	1	D110
82	DIODE,VVC,SMD	1SV270 TF	EA	7	D401 ~ 404,407 ~ 409
83	DIODE,VVC,SMD	1SV229 T8	EA	10	D103 ~ 106,111 ~ 114,405,406
84	DIODE,RECTI,SMD	S1G	EA	1	D109
85	FUSE,3A,SMD	3216CP(3A)	EA	1	F101
86	REZONATOR	JTBM455C24	EA	1	X101
87	OSC,2nd LO, X-TAL	20.945/5PPM	EA	1	X102
88	VC TCXO	VX-23VB(12.8MHZ)	EA	1	TCX301
89	CRYSTAL FILTER	21M08B(21.4MHZ)	PAIR	1	FL101
90	CERAMIC FILTER	LTM455HT	EA	1	FL122
91	CERAMIC FILTER	LTM455FW	EA	1	FL102
92	SEMI VR,3pi,SMD	TMC3KB502	EA	1	VR502
93	SEMI VR,3pi,SMD	TMC3KB203	EA	5	VR101,301,302,303,501
94	TRANS,MC152,SMD	E558HNA-100095	EA	6	T101 ~ T104,401,402
95	CHIP,COIL,SMD,0805	0805AS-R12J-01(120nH)	EA	4	L102,207,404,409
96	CHIP,COIL,SMD,0805	0805AS-R33J-01(330nH)	EA	1	L105
97	CHIP,COIL,SMD,0805	0805AS-R68J-01(680nH)	EA	2	L401,402
98	CHIP,COIL,SMD,1008	1008AS-1R0J-01(1uH)	EA	3	L204,206,501
99	CHIP,COIL,SMD,1008	1008AS-3R3J-01(3.3uH)	EA	1	L107
100	CHIP,COIL,SMD,1008	1008AS-4R7J-01(4.7uH)	EA	1	L106
101	COIL,AIR,SMD	35169TL	EA	4	L101,201 ~ 203
102	CONNECTOR	CH-20ASG-F	EA	1	CON101
103	WIRE(6mm)	57mm/AWG#30(RED)UL	EA	1	JPW501
104	PCB (4LAYER 1.2T)	70-112B/AT-100/200-M1	EA		

4. ALIGNMENT PROCEDURE

Measurement Condition

The following sections describes the alignment procedure for AT-100A LMR transceiver under the following reference environment conditions:

Temperature	:	25 \diamond C (77 \diamond F)
Relative Humidity	:	65%
Power Supply Voltage	:	7.5VDC +/- 5%

Test Equipment / Tools required

The following list of equipment is recommended for use in setting up the radio properly. Please ensure the test equipment are calibrated according to the manufacturer's instructions:

- Frequency counter more than 300MHz +/-100Hz tolerance, high input impedance and high sensitivity
- VHF FM Signal generator, 300MHz with adjustable frequency, FM deviation, and RF output attenuators. 50 Ω Output impedance.
- Oscilloscope, high input impedance.
- 16 Ω 1 Watt resistor as loudspeaker load
- Audio Signal Generator, 10Hz to 20KHz, 600 Ω impedance with attenuators.
- RF Watt meter, with 50 Ω 10 Watt termination resistor (Or RF Voltmeter with 50 Ω termination and external 50 Ω attenuators)
- Regulated Power Supply 7.5VDC 3A output
- Digital A-V-O Multi-meter
- SINAD Meter
- External Speaker Mic. plug (or special audio test jig)
- Interconnection test cable for RF and Control PCB
- Circuit Diagram for AT-100A
- PCB layout diagram for AT-100A
- Tuning tools for RF/IF transformer and the VR potentiometers

Disassembling the unit

The antenna

Disconnect the antenna

The Cover

- Remove the battery.
- Remove the 2 screws.
- The case could then be opened for servicing.
- Be careful NOT to disconnect the pin connector between RF board and Control board.

The PCBs

- The radio consists of two PCBs, the RF (rear side) and control board (front side)..
- On the RF Board, connect ANT1 to a signal generator or RF power meter.
- On the RF Board, connect Power Supply to the battery terminal contacts.
- Connect External Speaker Mic Plug (or Audio Test Jig) to J501.

Transmitter Circuit Adjustment

- Crystal frequency

On receiving mode, check Crystal output is at 12.8MHz

- Transmitter Frequency

Connect RF Power meter to ANT1, Activate PTT to transmit on 146.025MHz. And Set VR301 for transmitting frequency error is within +/- 150Hz.

- Transmitter Output Power

Activate PTT to transmit on 146.025MHz, Set VR501 for 5W power output at ANT1. And Set VR502 for 2W power output at ANT1 after changing Low power output mode.

- Transmitter Sub-Audible Tone Deviation

Set radio to transmit on M146.025MHz, with CTCSS code 01 (67Hz) and no audio modulation. Adjust VR302 for 0.45KHz deviation.

- Transmitter Deviation Limit

Set radio to transmit on 146.025MHz, with CTCSS code 01 (67Hz) and audio modulation. At the external microphone input, inject 1KHz tone at -20dBm. Adjust VR303 for 2.3KHz deviation.

Receiver Circuit Adjustment

- FM Demodulator Adjustment

Set radio to receive on 146.025MHz, No CTCSS or DCS. Connect RF Signal Generator to ANT1, Set generator to 146.025MHz at -60dBm (50Ω) output with 1KHz tone modulation at 1.5KHz deviation.

- Receiver Squelch Adjustment

After checking the receiver sensitivity, further lower the RF Signal Generator output to 8-10dB SINAD and observe the squelch circuit operates. Adjust VR101 if necessary.