YAESU

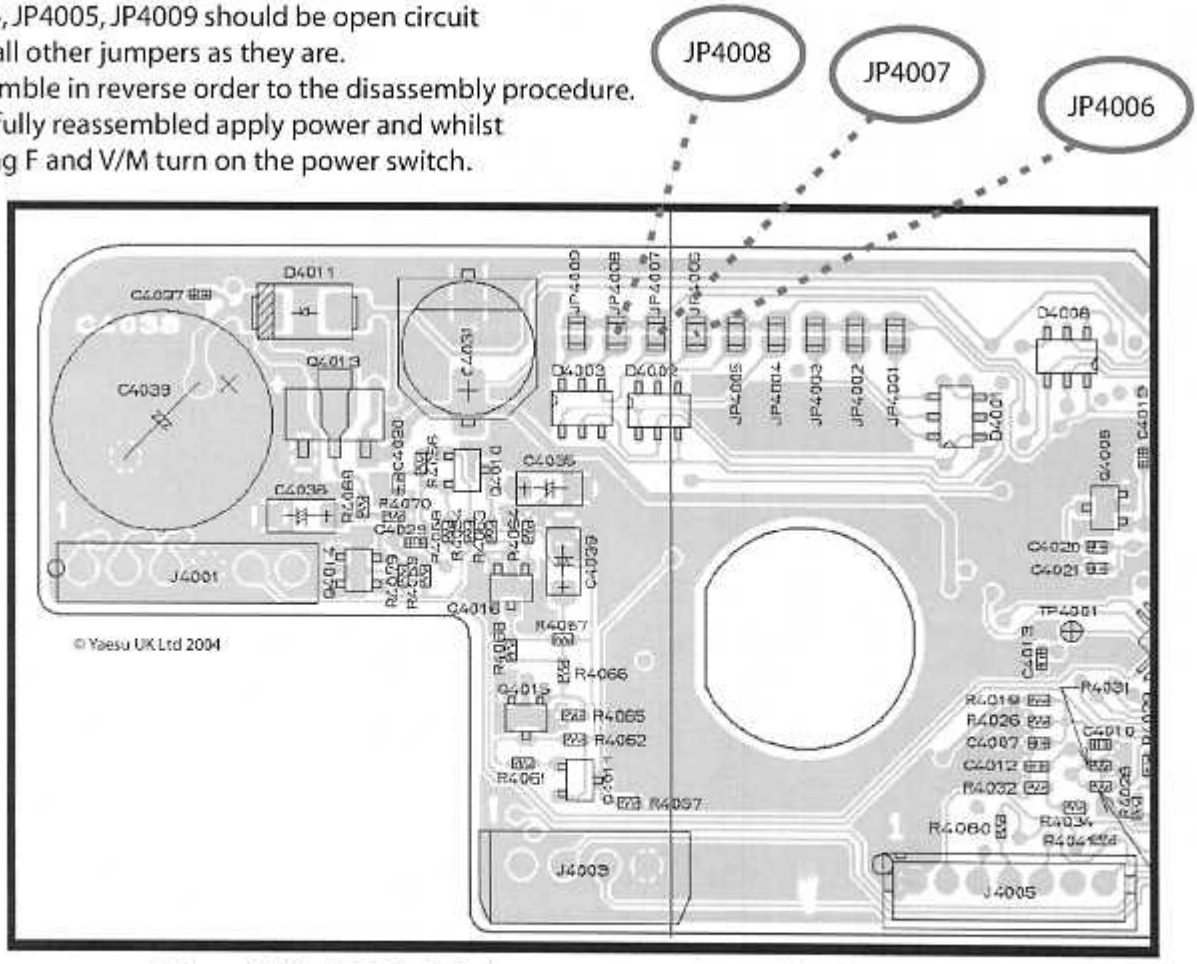
FT-817

Modification instructions for wideband HF settings.

These instructions are to enable you to expand the HF coverage of your transceiver to 500kHz per band. Also the modification will extend VHF and UHF coverage and modify some settings as per the table on the next page. **Don't forget it is YOUR responsibility to ensure that you do not transmit out of your permitted bands.** This modification will also clear any memories and individual changes to settings so make a note of these before you carry out this procedure.

Please note that you are taking full responsibility for any damage caused to the transceiver during this modification exercise. All normal precautions to protect against static electricity should be followed.

Firstly remove the battery and disconnect the radio from any power source.
Next remove the top and bottom covers
Looking at the front of the radio there are 2 clips on the top and 2 on the bottom.
Ease these clips free of the main body of the radio and slide the front panel off
(taking care not to overstretch the attached ribbon cable)
Next unclip the ribbon cable from the main body of the radio.
Now the front panel should come free and you can then see the jumper positions.
To extend the HF range JP4006, JP4007, JP4008 should be shorted and
JP4004, JP4005, JP4009 should be open circuit
Leave all other jumpers as they are.
Reassemble in reverse order to the disassembly procedure.
When fully reassembled apply power and whilst
pressing F and V/M turn on the power switch.



YAESU

FT-817

Frequency coverage after modifications

Transmit coverage	
1.80MHz	2.00MHz
3.50MHz	4.00MHz
7.00MHz	7.50MHz
10.00MHz	10.50MHz
14.00MHz	14.50MHz
18.00MHz	18.50MHz
21.00MHz	21.50MHz
24.50MHz	25.00MHz
28.00MHz	30.00MHz
50.00MHz	54.00MHz
140.00MHz	154.00MHz
420.00MHz	470.00MHz

Receive coverage	
0.10MHz	30.00MHz
33.00MHz	56.00MHz
76.00MHz	108.00MHz
108.00MHz	154.00MHz
420.00MHz	470.00MHz

The VHF and UHF default channel spacing is set at 12.5kHz and 25 kHz.

Repeater shifts are set to
0.1 MHz for HF
0.5MHz for 50MHz
0.6MHz for VHF
1.6MHz for UHF

The stock filter is a MURATA CFJ455K14 (2.4 kHz). It is soldered on the PCB.

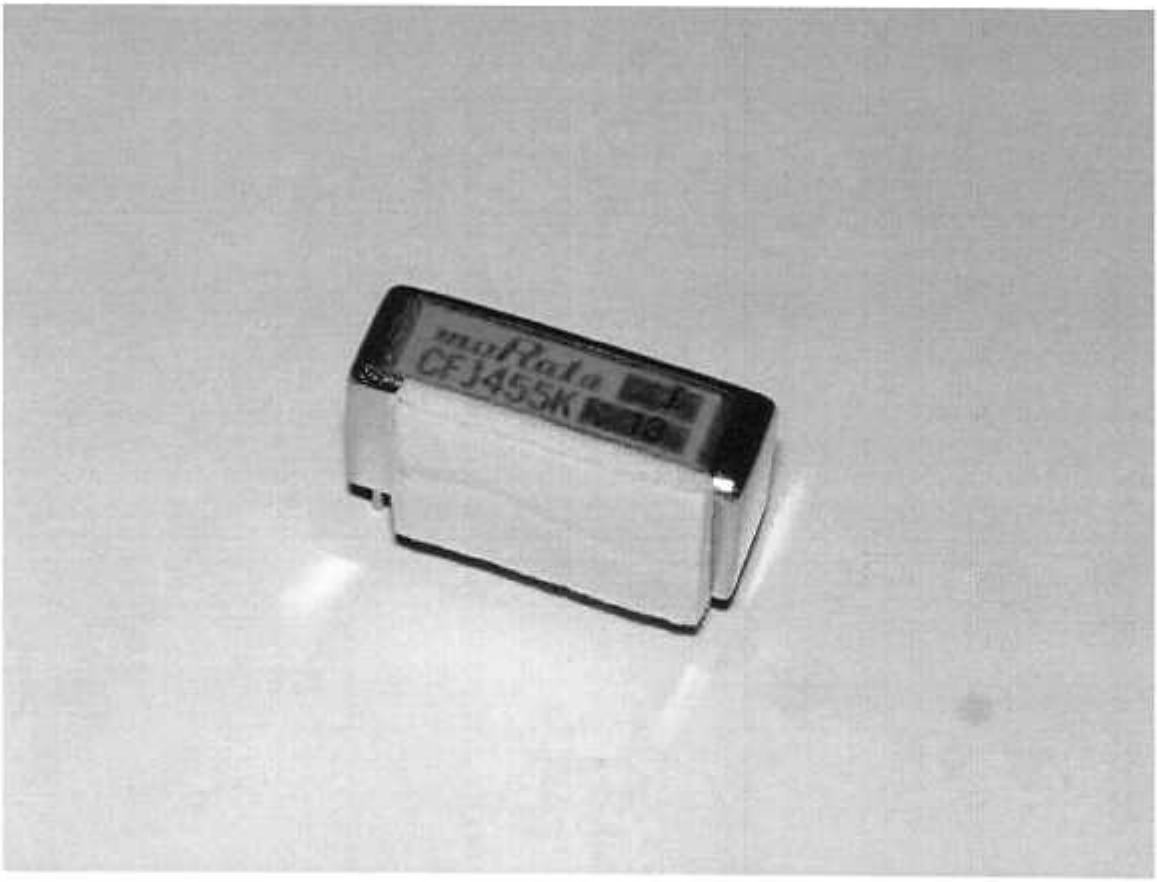
The optional filter is selected with a MURATA CFJ455K13 (2.7 kHz) which you can easily solder to the optional filter socket.

You can buy the MURATA CFJ455K13 at www.qrp-service.de for example.

The wider MURATA 2.7 kHz filter adds much more intelligibility both for RX and TX and gives the modulation more "punch". It is much cheaper than the usual Collins filters, e.g. the MURATA costs about 25 EUR while the Collins would cost about 125 EUR !! Of course the cut-off curve is not so sharp as on the Collins filters but for me this doesn't matter on a portable TRX like the YAESU FT-817 where you usually should NOT HAVE such strong signals besides. And it is usually not used on contests besides strong stations.

So for me the advantage of the better and powerful sound is much more important than the (possible) disadvantages on the RX side. A narrow filter only had help me to suppress interferences on about 10% of all situations but I had lose much more audio sound dynamics. So for me only the 2.7 kHz is the one-and-only solution for the future.

Installation:



Just add a little piece of double sided adhesive tape to the front side.

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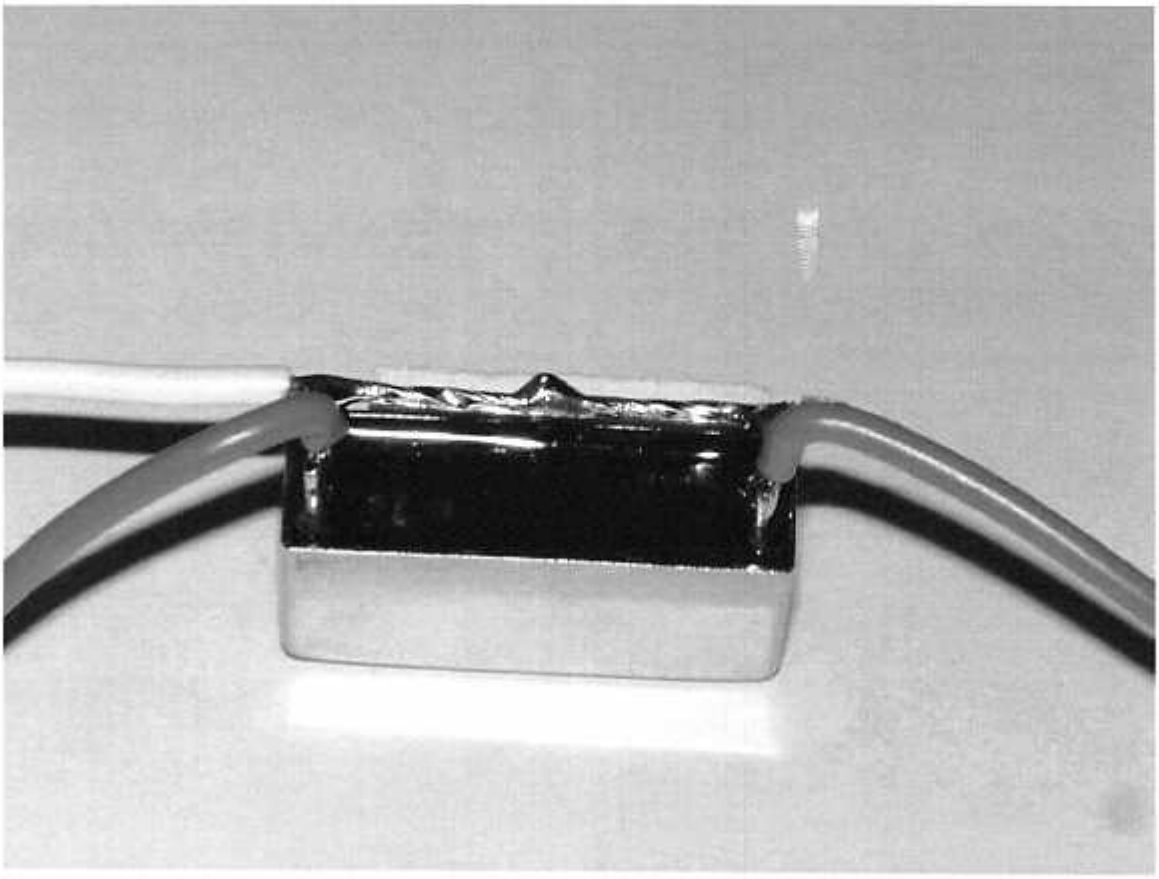

Solder 3 short wires for INPUT, OUTPUT and GROUND.

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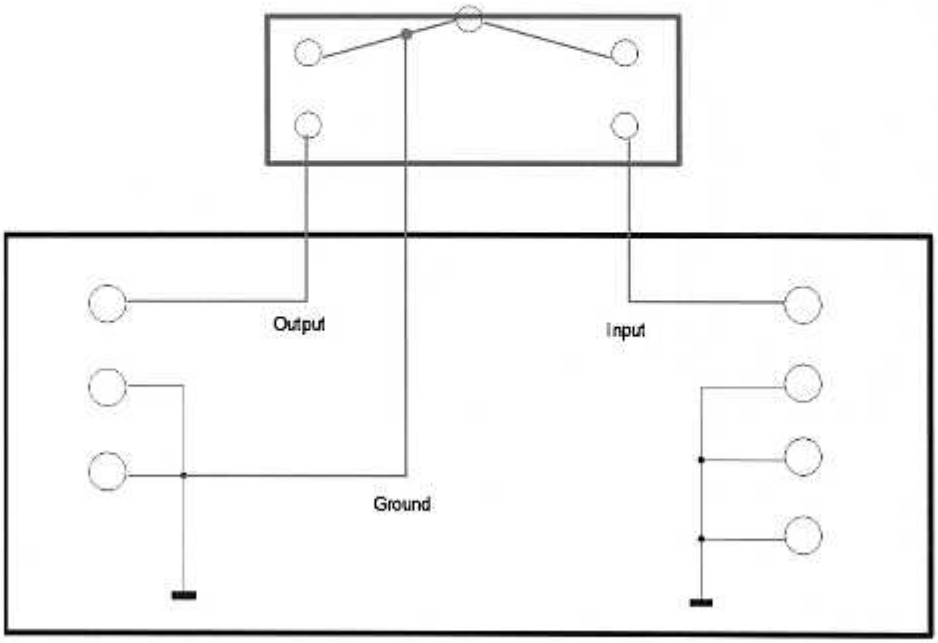
MURATA CFJ455K13 (bottom view)



Optional Filter Socket (upper view, looking onto the PCB)

Wiring schematic.

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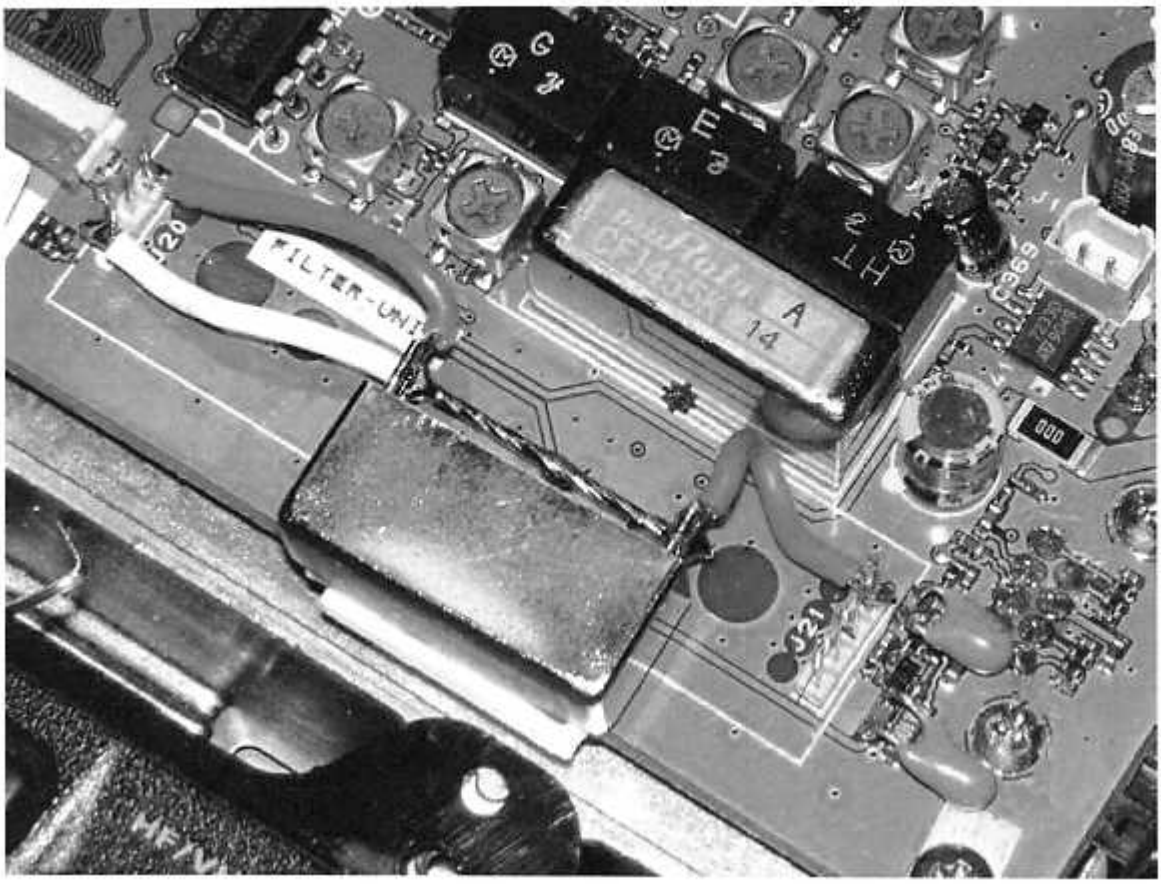

The final wiring.

Alignment:

1. Switch menu **#38** ("OP FILTER") from "OFF" to "**SSB**".
2. Set menu items **#54**, **#55**, **#56** and **#57** to "**0**" (SSB Carrier Shift).

   Go into the servicemenu (alignment menu) and do a re-calibration of service menu items #75 and #76. Or just try out my values I verified on two FT-817 yet:

#75 (LSB-CP)	→	**+10**	(+99 is bassy, -99 is pitched)
#76 (USB-CP)	→	**- 10**	(-99 is bassy, +99 is pitched)

3. Save and leave the service menu.
4. You can do a further fine alignment by adjusting the SSB Carrier Shift again now, if you like. Here are my values which add some more basses and "heaviness" but without cutting the high tones:

#54 (R LSB CAR)	→	**+50**	(+300 is bassy, -300 is pitched)
#55 (R USB CAR)	→	**- 50**	(-300 is bassy, +300 is pitched)
#56 (T LSB CAR)	→	**+50**	(+300 is bassy, -300 is pitched)
#57 (T USB CAR)	→	**- 50**	(-300 is bassy, +300 is pitched)

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Disclaimer • Disclaimer of liability

This modifications mostly need to be done by a electronic specialist who had enough practise and who has knowledge in SMD soldering. **You do the modifications on your own risk !**

Radio modifications shown here are provided for properly licensed operators only! The user is solely responsible for making sure that any modifications made to the radio unit must meet all Federal and State Regulations or the Country of use! Liability of damages to any equipment is the sole responsibility of the user! Downloading , viewing, or using any information provided on these pages automatically accepts the user to the terms of this agreement! Modifications are provided for information purposes only!

Although the greatest care has been taken while compiling these documents, we cannot guarantee that the instructions will work on every radio presented.

Copyright

Some circuit details are password-protected because of legal reasons. Please contact me via e-mail.

If your company would like to provide technical information to be featured on this pages please contact me at: dg2iaq@freenet.de .

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Overview collected from Jochen Heilemann, DG2IAQ
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Yaesu FT-817 -- Servicemenu

28.10.2004

no	content	description	alignment / remarks	Factory "HOME"	actually DG2IAQ	default DG2IAQ	SGC SG-239	DL5GBL	AM Mod K6XX	5/10 W Mod DK9VZ	HD-Elektr. DJ8UA	10W Mod DO1HMA	KE4IAP	s/n 1K45 K7HI	10W Mod K7HI	s/n 2L60 K7HI	10W Mod K7HI	DF2DO
1	HF1RXG	RX GAIN 1.8MHz	The higher, the more sensitive the RX is	160	160	100		181		70		100	102	80		71		64
2	HF2RXG	RX GAIN 7MHz		128	128	80		91		68		90	87	74		69		63
3	HF3RXG	RX GAIN 21MHz		128	128	105		123		81		100	120	89		83		71
4	50MRXG	RX GAIN 50MHz		128	128	80		66		67		75	72	76		72		64
5	VHFRXG	RX GAIN 144MHz		128	128	90		90		73		100	94	87		79		67
6	UHFRXG	RX GAIN 430MHz		128	150	117		117		93		110	82	155		77		67
7	SSB-S9	SSB S-Meter S9	The higher, the more shown level	80	66	66		70		66		70	65	65		66		66
8	SSB-FS	SSB S-Meter Vollausschlag		48	59	58		59		58		59	58	60		58		57
9	FM-S1	FM S-Meter S1	60 = S0	48	80	77		76		77		76	84	78		79		74
10	FM-FS	FM S-Meter Vollausschlag	The higher, the higher the S-value is	100	111	113		109		113		109	116	113		113		111
11	DISC-L	FM Center Meter (untere Grenze, -3kHz)	Press "A" at test signal given "-3kHz" and "+3kHz"	0	35	35		35		40		35	35	36		40		38
12	DISC-H	FM Center Meter (obere Grenze, + 3kHz)		255	69	69		69		71		69	68	69		72		71
13	FM-TH1	FM Squelch	open/close level without RX signal (Threshold / Hysteresis)	50	72	75		82		72		50	79	77		76		76
14	FM-TH2	FM Squelch		64	75	75		82		72		82	80	77		74		76
15	FM-TI1	FM Squelch	on RX signal of 3 dBµ (Tight = Enge)	12	12	3		14		3		14	2	4		1		2
16	FM-TI2	FM Squelch		16	16	3		14		3		14	3	4		1		2
17	VCC	Power Supply Voltage	at Ub=13,8V	138	138	138		138		138		138	138	122		123		136
18	HF1-IC	Over-current Protection 1.8MHz	the lower, the more sensitive the protection is	130	111	103		111		135	103	135	80	112	122	79	89	99
19	HF2-IC	Over-current Protection 7MHz		130	116	103		116		135	103	140	83	112	121	79	86	98
20	HF3-IC	Over-current Protection 21MHz		130	111	106		111		135	106	140	83	114	123	82	86	102
21	50M-IC	Over-current Protection 50MHz		130	103	103		113		92	103	113	82	112	130	80	89	98
22	VHF-IC	Over-current Protection 144MHz		130	105	105		126		93	105	126	83	112		80		100
23	UHF-IC	Over-current Protection 430MHz		130	106	106		113		95	106	113	84	115		83		102
24	HF1-HI	RF Power HI 1.8MHz	5,0W (10,0W)	200	116	100		116		150	100	160	117	99	150	100	205	98
25	HF1-L3	RF Power L3 1.8MHz	2,5W (5,0W)	133	77	77		67		95	58	90	62	59	108	58	109	58
26	HF1-L2	RF Power L2 1.8MHz	1,0W (2,5W)	40	23	23		21		21	20	32	119	21	61	22	58	22
27	HF1-L1	RF Power L1 1.8MHz	0,3W (1,0W)	18	10	10		4		1	3	10	2	4	26	4	22	4

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28	HF2-HI	RF Power HI 7MHz	5,0W (10,0W)	200	105	95		119		160	105	190	119	104	173	105	180	101
29	HF2-L3	RF Power L3 7MHz	2,5W (5,0W)	133	65	70		65		95	60	105	63	60	106	58	100	58
30	HF2-L2	RF Power L2 7MHz	1,0W (2,5W)	40	21	19		21		21	21	50	20	21	60	21	59	21
31	HF2-L1	RF Power L1 7MHz	0,3W (1,0W)	18	9	0		3		1	3	10	2	4	24	4	21	4
32	HF3-HI	RF Power HI 21MHz	5,0W (10,0W)	200	101	95		117		170	99	190	116	99	158	100	190	98
33	HF3-L3	RF Power L3 21MHz	2,5W (5,0W)	133	60	55		63		100	60	100	60	57	106	57	100	57
34	HF3-L2	RF Power L2 21MHz	1,0W (2,5W)	40	20	19		20		25	20	45	18	20	60	20	57	21
35	HF3-L1	RF Power L1 21MHz	0,3W (1,0W)	18	9	0		2		1	2	10	1	4	25	4	20	4
36	50M-HI	RF Power HI 50MHz	5,0W (10,0W)	200	99	92		115		97	92	150	118	96	200	97	190	96
37	50M-L3	RF Power L3 50MHz	2,5W (5,0W)	133	66	55		64		54	61	80	66	52	102	55	104	53
38	50M-L2	RF Power L2 50MHz	1,0W (2,5W)	40	20	16		23		19	16	23	19	19	63	19	55	20
39	50M-L1	RF Power L1 50MHz	0,3W (1,0W)	18	9	0		1		7	1	5	2	7	26	6	19	7
40	VHF-HI	RF Power HI 144MHz	5,0W (10,0W)	200	100	100		140		78	90	100	95	76		83		86
41	VHF-L3	RF Power L3 144MHz	2,5W (5,0W)	133	59	59		93		44	52	66	52	42		46		50
42	VHF-L2	RF Power L2 144MHz	1,0W (2,5W)	40	23	23		28		13	16	20	16	13		14		16
43	VHF-L1	RF Power L1 144MHz	0,3W (1,0W)	18	3	0		12		3	3	5	0	3		3		3
44	UHF-HI	RF Power HI 430MHz	5,0W (10,0W)	200	105	113		103		96	94	103	106	97		94		95
45	UHF-L3	RF Power L3 430MHz	2,5W (5,0W)	133	63	63		68		56	55	68	58	57		55		57
46	UHF-L2	RF Power L2 430MHz	1,0W (2,5W)	40	21	29		21		23	19	21	20	23		22		23
47	UHF-L1	RF Power L1 430MHz	0,3W (1,0W)	18	9	0		9		6	6	9	4	6		6		6
48	HF1TXG	TX Gain 1.8MHz	the higher, the higher the TX amplification of driver is (alignment that 5 W FM come out for sure)	128	85	76		67		90	65	100	63	77		64		91
49	HF2TXG	TX Gain 7MHz		128	75	65		62		90	65	100	59	64		61		66
50	HF3TXG	TX Gain 21MHz		128	85	79		67		90	65	100	60	73		64		93
51	50MTXG	TX Gain 50MHz		128	90	95		69		94	65	90	70	108		83		243
52	VHFTXG	TX Gain 144MHz		128	85	95		79		92	65	85	72	98		71		133
53	UHFTXG	TX Gain 430MHz		128	85	126		69		116	65	85	64	140		79		114
54	HF1POM	Power Meter Sensitivity 1.8MHz		60	60	65		71		69	60	50	66	69		69		69
55	HF2POM	Power Meter Sensitivity 7MHz		60	60	62		72		70	60	50	68	70		70		70

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56	HF3POM	Power Meter Sensitivity 21MHz	the lower, the more level on power meter (alignment to 8 dots)	60	60	62		71		72	60	50	73	72		73		73
57	50MPOM	Power Meter Sensitivity 50MHz		60	60	60		70		70	50	50	69	69		70		72
58	VHFPOM	Power Meter Sensitivity 144MHz		60	60	53		83		59	45	50	64	58		60		60
59	UHFPOM	Power Meter Sensitivity 430MHz		60	60	50		64		70	55	45	68	70		69		71
60	ALC1-M	ALC Meter	measured: 180 -> value + 4 dots	160	184	180		204		180	184	204	188	183		185		185
61	ALC-M	ALC Meter		80	122	122		125		122	122	125	121	122		122		121
62	HF1-RV	Reverse ALC 1.8MHz	the lower, the more sensitive protection and reduction of output power	25	10	10	20	13		0	10	13	4	3		5		3
63	HF2-RV	Reverse ALC 7MHz		25	15	15	25	11		12	15	11	11	12		12		12
64	HF3-RV	Reverse ALC 21MHz		25	20	20	30	21		18	20	21	21	18		18		18
65	50M-RV	Reverse ALC 50MHz		25	20	20		15		17	20	15	18	17		17		18
66	VHF-RV	Reverse ALC 144MHz		25	11	10		7		11	10	7	11	11		11		10
67	UHF-RV	Reverse ALC 430MHz		25	25	25		28		34	25	28	27	30		31		32
68	CW-CAR	Carrier Level CW		255	255	255		252		255		252	255	255		255		255
69	AM-CAR	Carrier Level AM	the lower the higher modulation level	128	200	225		210	187	232		210	225	200		185		201
70	DEV-W	FM Modulation	deviation = 5 kHz	200	200	180		211		216		211	216	220		215		204
71	DEV-N	FM Modulation	deviation = 2.5 kHz	100	110	115		103		108		103	108	110		106		101
72	M-MTR	FM Modulation	the lower, the more meter level	128	128	90		188		176		188	167	176		176		176
73	CTCSS	FM Modulation	the higher, the more deviation	128	178	178		151		180		151	186	180		178		178
74	DCS	FM Modulation	the higher, the more deviation	128	135	135		129		135		129	137	135		135		135
75	LSB-CP	SSB Carrier Point	edge where RF output on 150 Hz + 2.600 Hz test tones is equal (depends on IF filter)	0	15	-6		-19		-6		-19	13	-5		-5		-6
76	USB-CP	SSB Carrier Point		0	-15	-8		-20		-8		-20	16	-11		-11		-11
					with INRAD 2.3													

A+B+C + Power on = start **alignment menu**

Power off = leave **alignment menu** WITHOUT STORING

HOME = **pre-setting factory defaults on each separate content** — see remarks (**)

A = auto measuring **of levels and storing them**

F = leave **alignment menu** WITH STORING ALL PARAMETERS

(**) These pre-settings are only "common" values as factory defaults, but they are *NO* exactly or individual alignments !!! They are good starting values, can sometimes be used without any changes, but it don't replace an exactly alignment as described in the Service Manual !!!

Especially the factory "RF POWER" contents might be dangerous on the OLD PA MODULES (FET 2SK2975) as they give a RF output of more than 5 Watts on "HI" position.

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no.	content	description	alignment / remarks	Factory "HOME"	actually DG2IAQ	default DG2IAQ	7W Mod DF2DD	817-onair.de DL7VDX	10W Mod OZ1FIT	conservative CT2IWG
1	HF1RXG	RX GAIN 1.8MHz	The higher, the more sensitive the RX is	160	160	100		70	160	65
2	HF2RXG	RX GAIN 7MHz		128	128	80		68	128	62
3	HF3RXG	RX GAIN 21MHz		128	128	105		81	128	71
4	50MRXG	RX GAIN 50MHz		128	128	80		72	128	63
5	VHFRXG	RX GAIN 144MHz		128	128	90		74	79	65
6	UHFRXG	RX GAIN 430MHz		128	150	117		99	128	66
7	SSB-S9	SSB S-Meter S9	The higher, the more shown level	80	66	66		66	80	62
8	SSB-FS	SSB S-Meter Vollausschlag		48	59	58		58	48	56
9	FM-S1	FM S-Meter S1	60 = S0 The higher, the higher the S-value is	48	80	77		77	48	75
10	FM-FS	FM S-Meter Vollausschlag		100	111	113		111	100	109
11	DISC-L	FM Center Meter (untere Grenze, -3kHz)	Press "A" at test signal given "-3kHz" and "+3kHz"	0	35	35		37	0	36
12	DISC-H	FM Center Meter (obere Grenze, + 3kHz)		255	69	69		70	255	71
13	FM-TH1	FM Squelch	open/close level without RX signal (Threshold / Hysteresis)	50	72	75		78	50	76
14	FM-TH2	FM Squelch		64	75	75		78	64	77
15	FM-TI1	FM Squelch	on RX signal of 3 dBµ (Tight = Enge)	12	12	3		3	12	2
16	FM-TI2	FM Squelch		16	16	3		3	16	2
17	VCC	Power Supply Voltage	at Ub=13,8V	138	138	138		138	138	138
18	HF1-IC	Over-current Protection 1.8MHz	the lower, the more sensitive the protection is	130	111	103	135	103	130	95
19	HF2-IC	Over-current Protection 7MHz		130	116	103	135	102	130	94
20	HF3-IC	Over-current Protection 21MHz		130	111	106	135	106	130	98
21	50M-IC	Over-current Protection 50MHz		130	103	103		103	130	95
22	VHF-IC	Over-current Protection 144MHz		130	105	105		103	130	96
23	UHF-IC	Over-current Protection 430MHz		130	106	106		106	130	99
24	HF1-HI	RF Power HI 1.8MHz	5,0W (10,0W)	200	116	100	132	101	200	101
25	HF1-L3	RF Power L3 1.8MHz	2,5W (5,0W)	133	77	77	100	59	133	59
26	HF1-L2	RF Power L2 1.8MHz	1,0W (2,5W)	40	23	23	60	21	40	22
27	HF1-L1	RF Power L1 1.8MHz	0,3W (1,0W)	18	10	10	7	4	18	4

Yaesu FT-817 – Servicemenu

no.	content	description	alignment / remarks	Factory "HOME"	actually DG2IAQ	default DG2IAQ	7W Mod DF2DD	817-onair.de DL7VDX	10W Mod OZ1FIT	conservative OT2IWG
28	HF2-HI	RF Power HI 7MHz	5,0W (10,0W)	200	105	95	132	105	200	105
29	HF2-L3	RF Power L3 7MHz	2,5W (5,0W)	133	65	70	102	60	133	59
30	HF2-L2	RF Power L2 7MHz	1,0W (2,5W)	40	21	19	59	22	40	22
31	HF2-L1	RF Power L1 7MHz	0,3W (1,0W)	18	9	0	6	4	18	4
32	HF3-HI	RF Power HI 21MHz	5,0W (10,0W)	200	101	95	132	101	200	102
33	HF3-L3	RF Power L3 21MHz	2,5W (5,0W)	133	60	55	104	58	133	58
34	HF3-L2	RF Power L2 21MHz	1,0W (2,5W)	40	20	19	58	21	40	21
35	HF3-L1	RF Power L1 21MHz	0,3W (1,0W)	18	9	0	6	4	18	4
36	50M-HI	RF Power HI 50MHz	5,0W (10,0W)	200	99	92		99	200	99
37	50M-L3	RF Power L3 50MHz	2,5W (5,0W)	133	66	55		56	133	56
38	50M-L2	RF Power L2 50MHz	1,0W (2,5W)	40	20	18		19	40	20
39	50M-L1	RF Power L1 50MHz	0,3W (1,0W)	18	9	0		7	18	7
40	VHF-HI	RF Power HI 144MHz	5,0W (10,0W)	200	100	100		79	200	95
41	VHF-L3	RF Power L3 144MHz	2,5W (5,0W)	133	59	59		44	133	53
42	VHF-L2	RF Power L2 144MHz	1,0W (2,5W)	40	23	23		14	40	17
43	VHF-L1	RF Power L1 144MHz	0,3W (1,0W)	18	3	0		3	18	3
44	UHF-HI	RF Power HI 430MHz	5,0W (10,0W)	200	105	113		98	200	101
45	UHF-L3	RF Power L3 430MHz	2,5W (5,0W)	133	63	63		57	133	60
46	UHF-L2	RF Power L2 430MHz	1,0W (2,5W)	40	21	29		22	40	25
47	UHF-L1	RF Power L1 430MHz	0,3W (1,0W)	18	9	0		6	18	6
48	HF1TXG	TX Gain 1.8MHz	the higher, the higher the TX amplification of driver is (alignment that 5 W FM come out for sure)	128	85	76	90	76	128	58
49	HF2TXG	TX Gain 7MHz		128	75	65	90	65	128	55
50	HF3TXG	TX Gain 21MHz		128	85	79	90	79	128	59
51	50MTXG	TX Gain 50MHz		128	90	95		95	128	68
52	VHFTXG	TX Gain 144MHz		128	85	95		95	128	60
53	UHFTXG	TX Gain 430MHz		128	85	126		126	128	60
54	HF1POM	Power Meter Sensitivity 1.8MHz		60	60	65		69	60	69
55	HF2POM	Power Meter Sensitivity 7MHz		60	60	62		70	60	70

Yaesu FT-817 -- Servicemenu

no.	content	description	alignment / remarks	Factory "HOME"	actually DG2IAQ	default DG2IAQ	7W Mod DF2DD	817-onair.de DL7VDX	10W Mod OZ1FIT	conservative CT2IWG
56	HF3POM	Power Meter Sensitivity 21MHz	the lower, the more level on power meter (alignment to 8 dots)	60	60	62		73	60	73
57	50MPOM	Power Meter Sensitivity 50MHz		60	60	60		71	60	71
58	VHFPOM	Power Meter Sensitivity 144MHz		60	60	53		58	60	62
59	UHFPOM	Power Meter Sensitivity 430MHz		60	60	50		69	60	73
60	ALC1-M	ALC Meter	measured: 180 -> value + 4 dots	160	184	180		180	160	189
61	ALC-M	ALC Meter		80	122	122		122	80	122
62	HF1-RV	Reverse ALC 1.8MHz	the lower, the more sensitive protection and reduction of output power	25	10	10		7	25	3
63	HF2-RV	Reverse ALC 7MHz		25	15	15		12	25	11
64	HF3-RV	Reverse ALC 21MHz		25	20	20		18	25	18
65	50M-RV	Reverse ALC 50MHz		25	20	20		17	25	17
66	VHF-RV	Reverse ALC 144MHz		25	11	10		11	25	7
67	UHF-RV	Reverse ALC 430MHz		25	25	25		32	25	29
68	CW-CAR	Carrier Level CW		255	255	255		255	255	255
69	AM-CAR	Carrier Level AM	the lower the higher modulation level	128	200	225		227	128	218
70	DEV-W	FM Modulation	deviation = 5 kHz	200	200	160		212	200	210
71	DEV-N	FM Modulation	deviation = 2.5 kHz	100	110	115		107	100	104
72	M-MTR	FM Modulation	the lower, the more meter level	128	128	90		176	128	176
73	CTCSS	FM Modulation	the higher, the more deviation	128	178	178		180	128	178
74	DCS	FM Modulation	the higher, the more deviation	128	135	135		135	128	135
75	LSB-CP	SSB Carrier Point	edge where RF output on 150 Hz + 2.600 Hz test tones is equal (depends on IF filter)	0	15	-6		0	0	-3
76	USB-CP	SSB Carrier Point		0	-15	-8		254	0	-5
					with INRAD 2.3					
	A+B+C + Power on = start **alignment menu**									
	Power off = leave **alignment menu** WITHOUT STORING									
	HOME = **pre-setting factory defaults on each separate content** --- see remarks (**)									
	A = auto measuring **of levels and storing them**									
	F = leave **alignment menu** WITH STORING ALL PARAMETERS									

DYC-817 Mic.Compressor
Improvements from DG2IAQ

last modified: 12. Sep. 2004

This modification sheet easily fixes some problems the original external DYC-817 microphone compressor has. The same would be for the "MH-31 internal" version of the DYC-817, but unfortunately I haven't one so I can't publish its pictures here too.

1. **Improving performance on "OFF" position**
   Originally the SSM2165 is designed to have an "OFF" position where the input signal isn't compressed (1:1). This is the original behaviour of the DYC-817 too when the switch is on the "OFF" position.
   By comparing the audio of a pure mic capsule to the DYC-817 on its "OFF" position you will hear that WITH the DYC-817 the sound is much lower than with the pure capsule !! So you will raise up the internal menu levels for the AM/FM/SSB mic input levels. But this is the wrong way, cause when you activate the DYC-817 the input is too high now and it will produce distortions ! So how to eliminate this effect ? The solution is simple.
   You have to cut the direct ground line of the switch "OFF" position and solder a resistor of 10k in serial with that instead. So on "OFF" position the SSM2165 has nearly 1:1 behaviour but WITHOUT reducing the output signal significant.
   Now on "OFF" position you have a serial resistance of 10k (=1:1). On the "ON" position you have a serial resistance of R3+P3, meaning 47k up to 147k (=4:1 to 9:1)

2. **Eliminating "popping sound effects" of the noisegate**
   The noisegate always adds a popping signal to your modulation. This can be nearly eliminated by smoothing the open/close curve of the noisegate stage.
   And the original value of C6 (3,3µF) was to small too and sometimes cuts the modulation a little bit. The resulting sound was "wabering", as you have a bad cold.
   Adding a parallel resistor of 100k to C6 (3,3µF) and replacing C6 with a value of 10µF to get back the fast open/close time delay greatly solves both problems.

3. **Improving DC supply**
   The +5V line coming out from the Yaesu FT-817 can be stressed with 10mA only, like described in the 817 handbook. So the more mA current an external compressor use the more could the DC voltage fluctuate when coming close up to the 10mA limit. I added a 100µF or 220µF electrolyt parallel to C10 (100nF) to make the DC line more stable under the "limit conditions". This could prevent some RFI problems too, which never came from real RFI irradiation but from an unstable DC power supply. The resulting RFI sound problems are the same as real RFI irradiation so you can't hear the difference and you mostly try to reduce RFI first and never have the idea to check the DC voltage stability.

4. **Improving performance by using an electret capsule**
   The stock DYC-817 is designed to be used with the stock dynamic mic capsule of the MH-31 handmike. But when using the external compressor version it would be possible to easily use electret capsules too, maybe by using a headset or so. But an electret capsule has a much higher AF output level than a dynamic capsule. So the electret capsule would overdrive the T1 mic preamp of the DYC-817, which was only need and build in for the dynamic capsule usage. Of course you can AND HAVE TO reduce the AF output level with P3, but you will have unneeded additional distortions from T1 and you have unneeded additional amplification noise of T1 too, so the S/N ratio is real bad under that conditions.
   As I mainly use an external headset with an electret capsule on my DYC-817 I removed the T1 mic amp stage, or I should better say I BRIDGED that stage and go directly via C2 to he input pin of the SSM2165.
   This could be easily done and could be removed as fast too if you still need the mic preamp on a later mike again. I cutted the one leg of C9 which is connected to the DrL2 RF-choke. And I cutted one leg from C2 which is connected to P3. Then I soldered a short piece of isolated wire from DrL2 to the open leg of C2. Later I changed C2 to an elelctrolyt of 4,7µF to get more basses and a better voice dynamic but this step depends on your own voice characteristic and the audio characteristic of your mike. The pluspole of the C2-electrolyt goes toward PIN4 of the SSM2165, the minuspole toward DrL2. But as the input level of my electret capsule still was too high (!!) I added a resistor of 4,7k to ground after DrL2. This removes all distortions.

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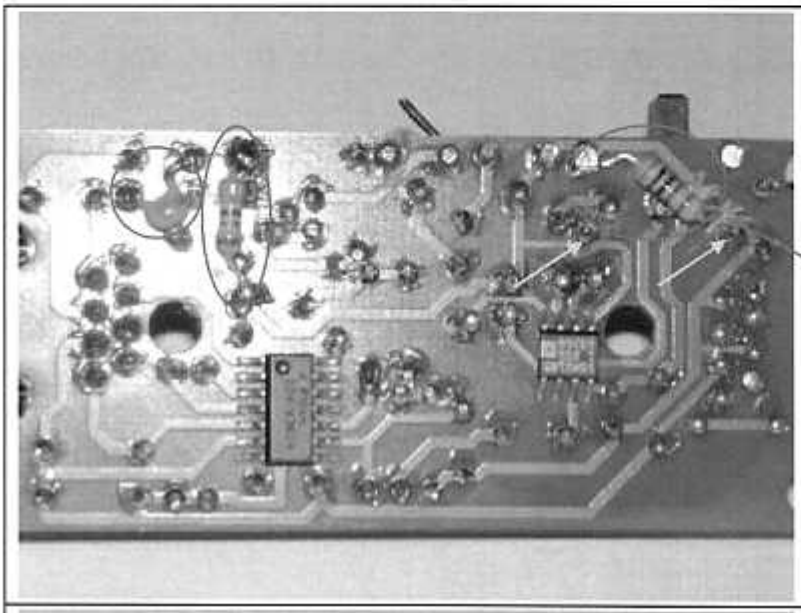
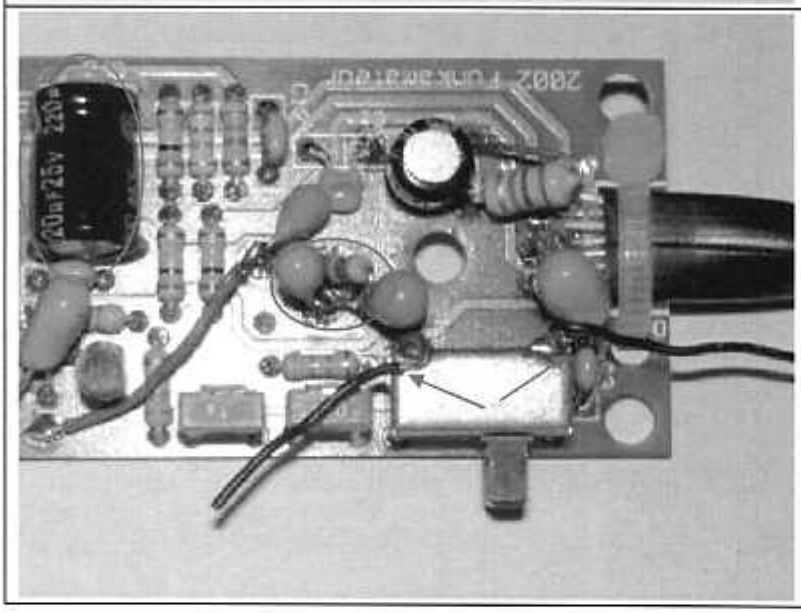
5. **Improfing against RFI problems**
You can paint the internal sides of the both plastic cases with silver fluid (known from repairing model railways) and fix two wires there with glue to have an electronic connection. Then you would have a nearly "metallic case" which is great for RFI shielding.

As I had a lot of spare copper foil I cutted two pieces which fit into the inside of the both cases and fixed them with glue too.



(see 4. – electret capsule improvement))
Added a 4k7 to reduce input level. Added a 1nF to remove RFI.

(see 1. – low compression level improvement)
Cutted the ground line here and added a 10k for the "OFF" position.
The total ground line isn't cutted of course ! Otherwise the DYC-817 wouldn't work at all now. As you can see on the yellow arrows the case of the switch make a bridge from left to right, so actually only the direct connection to the "OFF" position switch is cutted, but not all the ground line at all.



(see 3. – DC improvement)
Added a parallel 220µF electrolyt

(see 2. – noise gate improvement))
Added a parallel 100k and changed C6 to 10µF

(see 5. – RFI improvement)
Here you can see the connections of the two black "ground wires" which go to the both copper foils later.
(I had to cut them only to get a better photo so please make them longer !! Hihi.).

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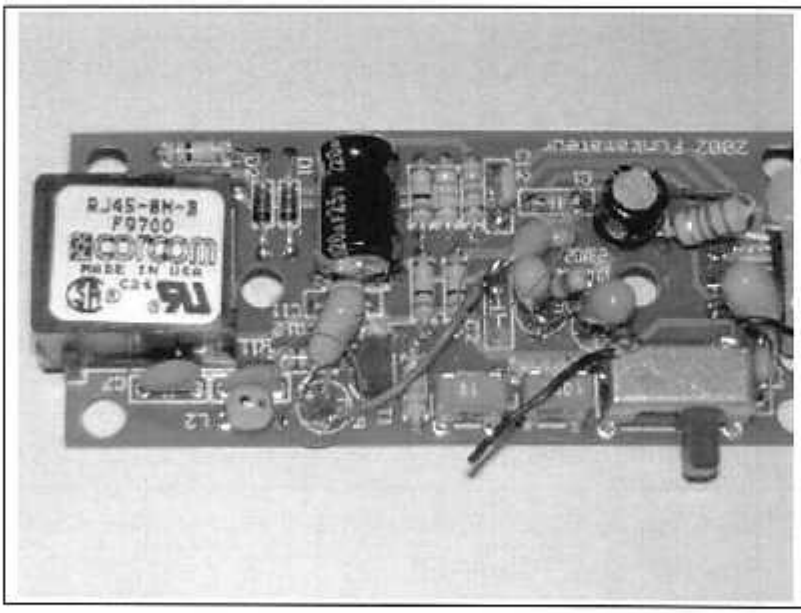

(see 4.)
Cutted one leg of C9, cutted one leg of C2 (later changed C2 to a 4,7µF as shown here) and soldered an isolated wire from DrL2 to C2.

This bridges the internal mic.preamp of the DYC-817 to be usable with electret capsules.

To prevent distortions and overmodulation a proper alignment is necessary !!!

Here are my optimum results which I have with my Dierking GD-5 Headset:

FT-817 menu

05	AM Mic	= 50	
29	FM Mic	= 9	(!!)
46	SSB Mic	= 60	
51	VOX Gain	= 30	

The low value of the "FM Mic" is only cause of my "FM-Modulation mod", you can find on "www.mods.dk -> Yaesu FT-817". Normally this value should be much higher too as the others are. So I would expect a value of "50" on a non-modified FT-817 too.

DYC-817

Mic.Preamp removed
P3 turn full anticlockwise (= compression 4:1, minimum)

I never would go up more than "P3 = middle" which means a compression level of "6:1" as the distortions greatly raise up too and that wouldn't be helpful under poor conditions. On FM the compressor is switched off.

Hope you enjoy that sheet.

73,
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This modifications mostly need to be done by a electronic specialist who had enough practise and who has knowledge in SMD soldering. **You do the modifications on your own risk !**

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If your company would like to provide technical information to be featured on this pages please contact me at: dg2iaq@web.de

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FT-817 Alignment

Local Oscillator Adjustment

Reference Frequency Adjustment

a. Connect a frequency counter to J5002 2pin (TP1047).

b. Adjust the trimmer capacitor (TC5001) for 22.625000MHz +/- 5Hz on the frequency counter.

c. Connect a RF millivoltmeter or an oscilloscope to the J5002 2pin (TP1047) and confirm that the output level is at least 70mVrms or 200mVp-p.

PLL Adjustment

VCO VCV Adjustment

a. Connect a DC voltmeter to J2002 6pin (TP1007) and referring to the table below, tune the transceiver to each frequency listed. Then confirm that the correct voltage is present, or adjust the listed components for the required voltage.

Tune to :	Adjust / Confirm	For
13.895MHz	Adjust TC2003	4.5V +/- 0.1V
76.000MHz	Confirm	At least 0.5V
32.995MHz	Adjust TC2002	4.5V +/- 0.1V
13.900MHz	Confirm	At least 0.8V
55.995MHz	Adjust TC2001	4.5V +/- 0.1V
88.000MHz	Confirm	At least 0.8V
153.995MHz	Adjust L2010	4.5V +/- 0.1V
108.000MHz	Confirm	At least 0.5V
469.995MHz	Adjust L2011	4.5V +/- 0.1V
420.000MHz	Confirm	At least 0.8V

1st Local Output Level

a. Connect a RF millivoltmeter to J2002 11pin and tune the transceiver to 28.000MHz.

b. Confirm that the RF level is at least +5dBm or 400mVrms.

PLL Unlock

a. Connect a DC voltmeter to J2002 1pin (TP1001).

b. When the reference input is not activated, the voltmeter shows less than 0.5V and "UNLOCK" is displayed on the LCD.

c. When the reference input is activated, the voltmeter shows at least 3.5V and LCD displays as it normally should do.

PA Unit Adjustment

Before alignment, set the mode on CW and tune the transceiver to 1.800MHz. Nothing should be connected to the CW Key Jack.

Driver Stage Idling Current

a. Remove the jumper connector J3005 and insert an ammeter.

b. Press the PTT and adjust VR3001 for an indication of 28mA +/- 2mA on the ammeter.

c. Disconnect the ammeter and reinstall the jumper connector at J3005

d. Remove the jumper connector J3006 and insert an ammeter.

e. Press the PTT and adjust VR3002 for an indication of 18mA +/- 2mA on the ammeter.

f. Disconnect the ammeter and reinstall the jumper connector at J3006.

Final Stage Idling Current

a. Connect an ammeter at each "13US" pin on PA Unit and Final Unit. If the "13US" line has already been connected by a wire, remove it and connect an ammeter.

b. Turn both VR5401 and VR5402 fully to counterclockwise.

c. Press the PTT and adjust VR5401 for an indication of 38mA +/- 2mA on the ammeter.

d. Press the PTT and adjust VR5402 for an indication of 76mA +/- 4mA on the ammeter.

e. Connect the "13US" line between PA unit and Final Unit again as it should be.

Local Oscillator Adjustment

2nd Local Adjustment

a. Connect a RF millivoltmeter or an oscilloscope to Q1038 5pin (TP1067).

b. Adjust T1024 and T1026 alternately for the maximum indication on the millivoltmeter or for the maximum amplitude on the oscilloscope.

c. Confirm the indicated voltage is at least 120mVrms or 330mVp-p.

3ad Local Adjustment

a. Connect a RF millivoltmeter or an oscilloscope to Q1055 5pin (T1087).

b. Key the transceiver on CW mode and adjust T1021 for the maximum indication on the RF millivoltmeter.

c. Confirm that the indicated voltage is at least 70mVrms or 200mVp-p.

TX IF Adjustment

CW TX IF Adjustment

a. Tune the frequency to 1.8MHz band. Connect a RF millivoltmeter to J1002 terminated by 50ohm

dummy load.

b. Key the transceiver and adjust T1020, T1012, and T1005 alternately for the maximum indication on the RF millivoltmeter.

FM TX IF Adjustment

a. Tune the frequency to 28MHz band. Connect a RF millivoltmeter to J1002 terminated by a 50ohm dummy load.

b. Key the transceiver and adjust T1012 and T1013 alternately for the maximum indication on the RF millivoltmeter.

c. Connect a frequency counter to TP1008.

d. Key the transceiver on FM mode without microphone input. Adjust T1018 for 68.3300MHz +/- 50Hz.

Carrier Balance Adjustment

a. Terminate J1002 by a 50ohm dummy load and connect a spectrum analyzer or a RF millivoltmeter.

b. Key the transceiver on USB mode in 28MHz band without microphone input. Adjust VR1001 for the maximum carrier suppression on the spectrum analyzer or for the minimum indication on the RF millivoltmeter.

VHF TX BPF Adjustment

a. Set the frequency at 145.995MHz. Connect RF millivoltmeter to J1002 terminated by a 50ohm dummy load.

b. Key the transceiver on FM mode and adjust T1011, T1010, and T1009 alternately for the minimum indication on RF millivoltmeter.

UHF TX BPF Adjustment

a. Set the frequency at 439.995MHz. Connect a RF millivoltmeter to J1002 terminated by a 50ohm dummy load.

b. Key the transceiver on FM mode and adjust TC1005, TC1004 and TC1002 alternately for the minimum indication on RF millivoltmeter.

RX Adjustment

PA Unit must be connected in RX adjustment. Signal Generator should not be connected to J1002 directly because DC voltage comes on there.

RX IF Adjustment

Connect a signal generator to the antenna connector and a SINAD meter to the speaker jack.

FM IF Adjustment

a. Tune the transceiver to 51.995MHz. Inject a RF signal from a signal generator at 10dBu output, 1KHz AF FM modulation of 3.5KHz deviation.

b. Adjust T1023, T1025, T1028, T1030 and T1034 alternately for the best SINAD sensitivity.

c. Increase the output level of the signal generator up to 12dBu approximately and adjust T1023 and T1025 alternately for the best SINAD sensitivity.

SSB IF Adjustment

a. Connect a DC voltmeter to TP1063.

b. Tune the transceiver to 51.995MHz. Inject a RF signal from a signal generator at 40dBu output.

c. Adjust T1033 and T1029 alternately for the minimum indication on the DC voltmeter.

Air-Band Reception Adjustment

a. Connect a DC voltmeter to TP1063.

b. Tune the transceiver to 128.00MHz on AM mode. Inject a RF signal from a signal generator at 40dBu output, 40% AM modulation of 400Hz AF.

c. Adjust T1001, T1003 and T1007 for the minimum indication on the DC voltmeter.

VHF Band Alignment

a. Connect a DC voltmeter to TP1063.

b. Tune the transceiver to 145.995MHz. Inject a RF signal from a signal generator at 40dBu output.

c. Adjust T1002, T1004 and T1008 alternately for the minimum indication on the DC voltmeter.

UHF Band Alignment

a. Connect a DC voltmeter to the TP1063.

b. Tune the transceiver to 439.995MHz. Inject a RF signal from a signal generator at 40dBu output.

c. Adjust TC1001 for the minimum indication on the DC voltmeter.

W-FM Reception Adjustment

a. Connect a SINAD meter to the speaker jack.

b. Tune the transceiver to 88.00MHz. Inject a RF signal from a signal generator at 30dBu output, 22.5KHz deviation FM modulation of 1KHz AF.

c. Adjust TC1003 for the best SINAD sensitivity. Then reduce the output level of the signal

generator and adjust TC1003 again.

Image Rejection Trap Adjustment

a. Connect an AF millivoltmeter to the speaker jack.

b. Tune the transceiver to 51.995MHz on CW mode. Inject a RF signal from a signal generator at 68.330MHz, 50dBu output.

c. Adjust T1014 for the minimum indication on the AF millivoltmeter. Then increase the output level of the signal generator slightly and adjust T1014 again.

Noise Blanker Adjustment

a. Connect a DC voltmeter to TP1072 or the base of Q1074. Tune the transceiver to 51.995MHz and inject a RF signal from a signal generator at 40dBu output.

b. Activate the noise blanker and adjust T1027 for the minimum indication on the DC voltmeter at TP1072, for the maximum indication at the base of Q1074.

CM Coupler Balance Adjustment

a. Terminate the antenna jack with a 50ohm dummy load. Set the mode on CW, connect a DC voltmeter to J3004 7pin.

b. Tune the transceiver in 28MHz band and key the transceiver.

c. Adjust TC3003 for the minimum indication on the DC voltmeter.

d. Tune the transceiver in 145.995MHz band and key the transceiver.

e. Adjust TC3001 for the minimum indication on the DC voltmeter.

f. Tune the transceiver in 439.995MHz band and key the transceiver.

g. Adjust TC3002 for the minimum indication on the DC voltmeter.

Software Menu Alignment

Antenna connector should be connected to a dummy load in case of transmission or a signal generator in case of reception. General alignment conditions are as follows in case otherwise noted.

AF-gain knob : Center

RF-gain knob : Fully clockwise

SQL : Fully counterclockwise

ATT / IPO / CTCSS / DCS : Off

Output power : High

AGC : Auto

Break-in : On CW Keyer : Off

VOX : Off

Keep pressing the Multi Function Key [A],[B],[C] simultaneously and turn on the transceiver, the alignment menu will be activated.

In the alignment procedure, each alignment parameter is selected by rotating the main dial. Alignment item is selected by rotating VFO/M-CH knob.

To store the alignment parameters, press the [MENU] key for longer than half second.

RX Gain Adjustment

a. Select the CW mode. Tune the transceiver to 1.8MHz band. Select "HF1RXG" in the menu by rotating VFO/M-CH knob. Inject a RF signal from a signal generator at 2dBu output.

b. Set the parameter "HF1RXG" at the value of lighting the first dot of the S-meter (S1) on the LCD by rotating the main dial.

c. Other RX gain adjustment should be performed as this routine. Output levels of the signal generator at each frequency are shown as follows.

Frequency	Output Level of SG
1.8MHz Band	12dBu
7MHz Band	12dBu
21MHz Band	9dBu
50MHz Band	6dBu
144MHz Band	3dBu
430MHz Band	3dBu

SSB S-Meter Adjustment

a. Tune the transceiver to 21MHz band on CW mode. Inject a RF signal from a signal generator at 36dBu output.

b. Set the parameter "SSB-S9" at the value of lighting the 6 dots of the S-meter (S9) on the LCD by rotating the main dial.

c. Tune the transceiver to 21MHz band on CW mode. Inject a RF signal from the signal generator at 86dBu output.

d. Set the parameter "SSB-FS" at the value of lighting all the dots of the S-meter on the LCD by rotating the main dial.

FM S-Meter Adjustment

a. Tune the transceiver to 144MHz band on FM mode. Inject a RF signal from a signal generator at 3dBu output, 3.5KHz deviation FM Modulation of 1KHz AF.

b. Select the menu item "FM-S9" and press [A] key to set the parameter.

c. Increase the output level of the signal generator up to 25dBu. Select the menu item "FM-FS" and press [A] key to set the parameter.

FM Center Meter Adjustment

a. Tune the transceiver to 144MHz band on FM mode. Inject a RF signal from a signal generator at 10dBu output, 3.5KHz deviation FM Modulation of 1KHz AF.

b. Set the frequency of the signal generator 3KHz below the receiving frequency of the transceiver. Select the menu item "DISC-L" and press [A] to set the parameter.

c. Set the frequency of the signal generator 3KHz above the receiving frequency of the transceiver. Select the menu item "DISC-H" and press [A] to set the parameter.

FM Squelch Adjustment

a. Tune the transceiver to 144MHz band on FM mode. Confirm that the squelch knob is turned to fully counterclockwise.

b. Select the menu item "FM-TH1" and press [A] key without antenna input to set the parameter. Select the menu item "FM-TH2" and press [A] key again.

c. Inject a RF signal from a signal generator at 5dBu output, 3.5KHz deviation FM modulation of 1KHz AF. Select the menu item "FM-TI1" and press [A] key to set the parameter. Select the menu item "FM-TI2" and press [A] key again.

Power Supply Voltage Adjustment

a. Tune the transceiver to 144MHz band on FM mode. Confirm that the power supply voltage is 13.8V +/- 0.1V.

b. Select the menu item "VCC" and adjust the parameter for "138" displayed on LCD.

Over-current Protection Adjustment

a. Set the mode on CW. Select the menu item "HF1-IC". Tune the transceiver to 1.8MHz band and key the transceiver. Adjust the parameter for 6.0W transmission power.

b. Other over-current protection adjustment menu, "HF2-IC", "HF3-IC", "50M-IC", "VHF-IC", and "UHF IC" should be adjusted as the same routine on 7MHz, 21MHz, 50MHz, 144MHz, and 430MHz band respectively.

RF Power Adjustment

a. Tune the transceiver to 1.8MHz band on CW mode. Select the menu item "HF1-HI". Key down and adjust the parameter for 5.0W +/- 0.1W transmission power.

b. Select the menu item "HF1-L3" Key down and confirm that the output power is 2.5W +/- 0.5W. In case the transmission power is not within the tolerance, adjust the parameter for 2.5W +/- 0.1W transmission power.

c. Select the menu item "HF1-L2" Key down and confirm that the output power is 1.0W +/- 0.3W. In case the power is not within the tolerance, adjust the parameter for 1.0W +/- 0.1W transmission power.

d. Select the menu item "HF1-L1". Key down and confirm that the output power is 0.5W +/- 0.2W. In case the power is not within the tolerance, adjust the parameter for 0.5W +/- 0.1W transmission power.

e. Other RF power adjustment menu, such as [HF2-**], [HF3-**], [50M-**], [VHF-**], [UHF-**] should be adjusted as the same routine on 7MHz, 21MHz, 50MHz, 144MHz and 430MHz band respectively.

TX Gain Adjustment

a. Select the USB mode. Inject a 0.5mV audio signal at 1KHz from an AF generator into the microphone jack.

b. Tune the transceiver to 1.8MHz band and key the transmitter. Select the menu item "HF1TXG" and adjust the parameter for 2.5W +/- 0.1W transmission power.

c. Other TX gain adjustment menu, such as [HF2TXG], [HF3TXG], [50MTXG], [VHFTXG] and [UHFTXG] should be adjusted as the same routine on 7MHz, 21MHz, 50MHz, 144MHz and 430MHz band respectively.

Power Meter Sensitivity Adjustment

a. Set the mode on CW, output power HIGH. Select the menu item "HF1POM" and key the transceiver.

b. Set the parameter at the value of lighting 7 dots of the power meter on the LCD.

c. Other power meter sensitivity adjustment menu, such as [HF2POM], [HF3POM], [50MPOM], [VHFPOM] and [UHFPOM] should be adjusted as the same routine on 7MHz, 21MHz, 50MHz, 144MHz and 430MHz band respectively.

ALC Meter Adjustment

a. Tune the transceiver to 21MHz band on USB. Select the menu item "ALC-1". Key the transceiver without microphone input and press [A] key. Then a value which microprocessor computes is displayed on the LCD.

b. Set the parameter taken four away from the displayed value.

c. After setting the parameter, confirm that all the dots of the ALC meter go out.

d. Select the menu item "ALC-M". Inject a 2.0mV AF signal at 1KHz from an audio generator and key the transceiver.

e. Press [A] key and confirm that 5 dots of ALC meter light on the LCD.

Reverse ALC Adjustment

a. Set the mode on CW, connect a 150ohm dummy load to the antenna connector. Tune the transceiver to 1.8MHz band and select the menu item "HF1-RV".

b. Key the transceiver and set the parameter at the value of lighting 5 dots of the power meter on the LCD.

c. Other reverse ALC adjustment menu, such as [HF2-RV], [HF3-RV], [50M-RV], [VHF-RV] and [UHF-RV] should be adjusted as the same routine on 7MHz, 21MHz, 50MHz, 144MHz and 430MHz band respectively.

Carrier Level Adjustment

a. Tune the transceiver to 21MHz band. Connect a 50ohm dummy load to the antenna connector. Set the mode on CW. Select the menu item "CW-CAR" and key the transceiver.

b. Set the parameter at the value of lighting 5 dots of the ALC meter on the LCD.

c. Connect an oscilloscope to the antenna connector via an appropriate attenuator.

d. Set the mode on AM. Select the menu item "AM-CAR". Inject a 0.5mV AF at 1KHz from an audio generator into the microphone jack.

e. Key the transceiver and adjust the parameter for 50% AM modulation on the oscilloscope.

FM Modulation Adjustment

a. Tune the transceiver to 144MHz band on FM mode. Connect a FM linear detector to the antenna connector via an appropriate attenuator. Select the menu item "DEV-W". Inject a 15mV AF at 1KHz from an audio generator.

b. Key the transceiver and adjust the parameter for maximum deviation of 4.5KHz +/- 0.2KHz on the FM linear detector.

c. Change the menu item to "DEV-N". Key the transceiver and adjust the parameter for maximum deviation of 2.25KHz +/- 0.1KHz on the FM linear detector.

d. Change the menu item to "M-MTR". Key the transceiver and set the parameter at the value of lighting 5 dots of the MOD Meter on the LCD.

e. Change the menu item to "CTCSS". Key the transceiver without microphone input and adjust the parameter for maximum deviation of 0.7KHz +/- 0.1KHz on the FM linear detector.

f. Change the menu item to "DCS". Key the transceiver without microphone input and adjust the parameter for maximum deviation of 0.7KHz +/- 0.1KHz on the FM linear detector.

SSB Carrier Point Adjustment

a. Tune the transceiver to 21MHz band. Select the menu item "LSB-CP". Set the mode on LSB,

inject a 0.5mV AF from an audio generator into the microphone jack.

b. Vary the AF frequency of the audio generator to search the maximum output power of the transceiver. Confirm that the output power is at least 2.5W. Then adjust the AF output level of the audio generator for 2.0W +/- 0.1W output power of the transceiver.

c. Lower the AF frequency down to 400Hz and adjust the parameter for 0.6W +/- 0.1W output power of the transceiver.

d. Change the AF frequency to 2600Hz and confirm that the output power is at least 0.5W.

e. The adjustment for the USB carrier point is performed in the same routine as done for LSB by changing the transmission mode to USB and menu item to "USB-CP".

Yaesu FT-817 charge modification

Author: Edwin PE1PWF

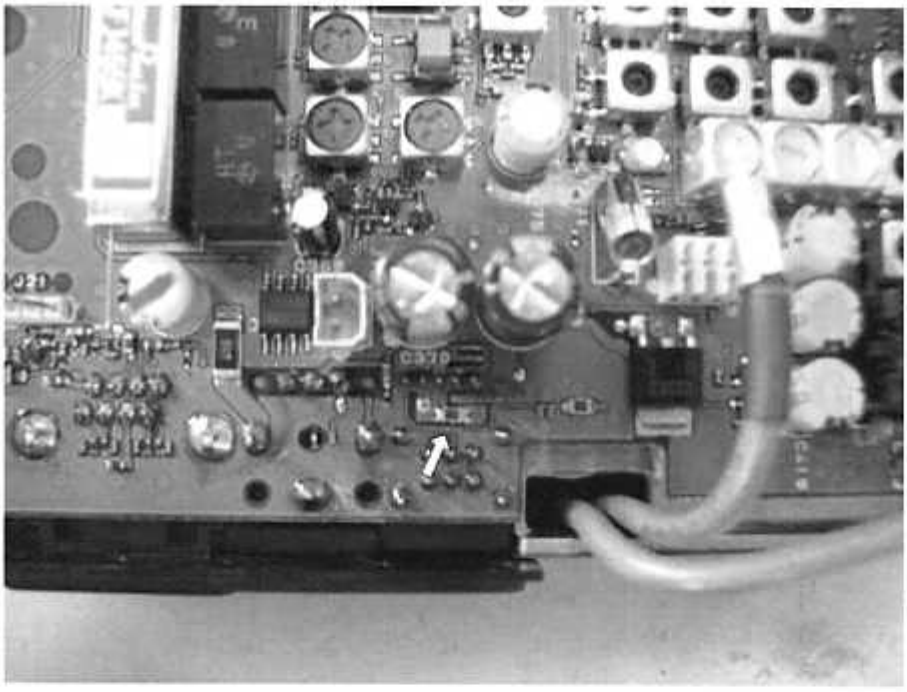
By PE1PWF.

The FT-817 has the capability to charge a battery of about 1000mAh. Unfortunately larger batteries can not be charged overnight. The only thing you can do is pressing the charge button for a second time to get the full capacity in your battery.

I did not really like this, so I took a peek at the charging circuit, and found it should be easy to charge at a greater current.

The initial charging current is now about 180 mA, and could easily be doubled for charging a 2000mAh NiMH battery.

Before you start with the modification, REMOVE THE BATTERY!!!!



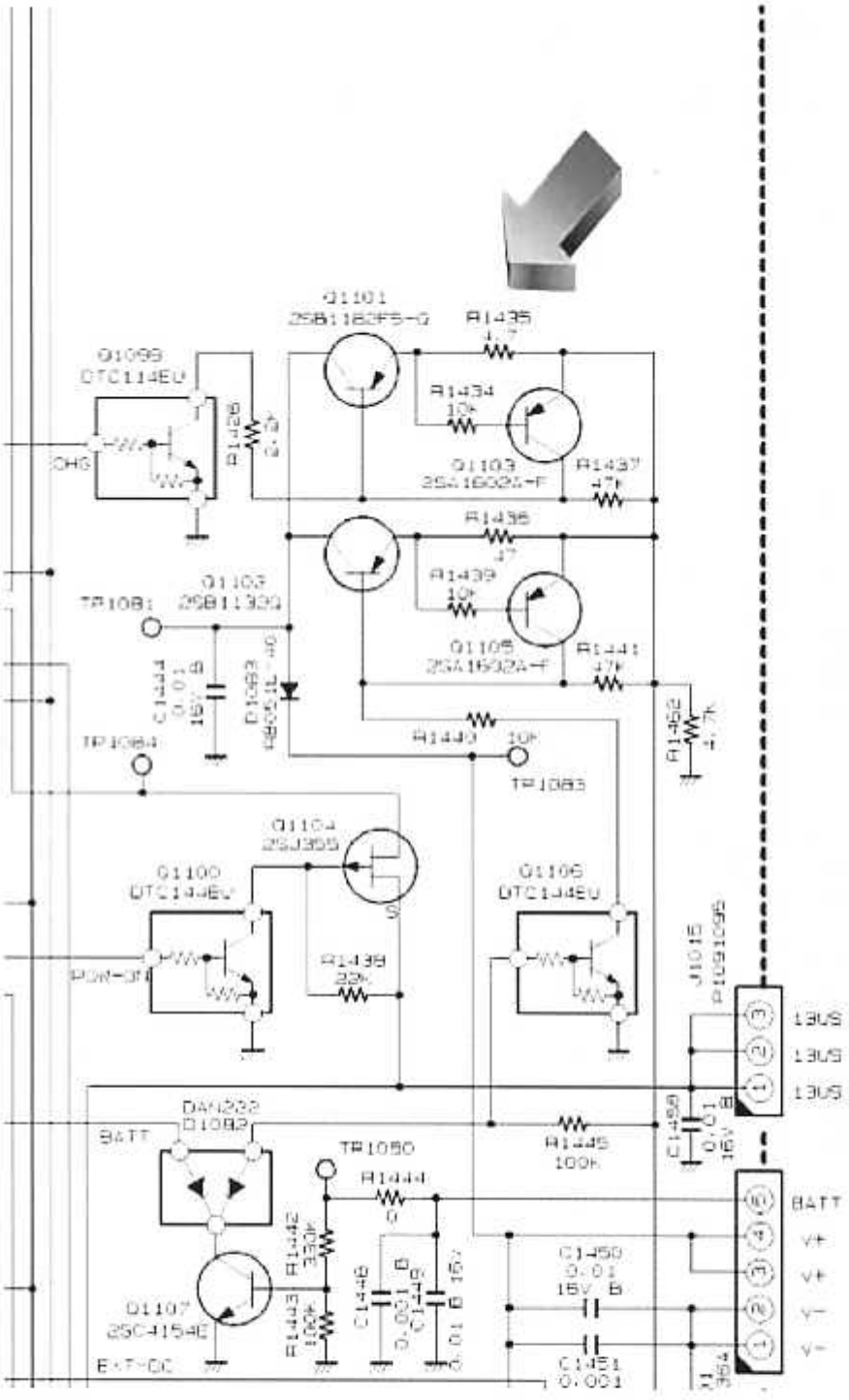
Or else you will blow this fuse!

This small fuse (near the battery-leads) is a 3A smd fuse or a 0 Ohm smd resistor.

So if our battery does not work, check this fuse.

Note that it does not seem to be in the schematics.

The 2SB1182 is the transistor that takes care of switching on/off charging, R1435 4.7Ohm, limits the current that can flow to the battery. If the value is lowered by putting a resistor parallel, you can charge a bigger battery in the same time.



I used to have a 1600 mAh battery which I charged in 10 hours with a 10 ohms resistor parallel to R1435, lately I got a 2200 mAh battery so I had to lower the resistance even more. Now I use a 4.7 ohms resistor parallel to R1435, and it seems that 8 hours is enough to charge this battery.

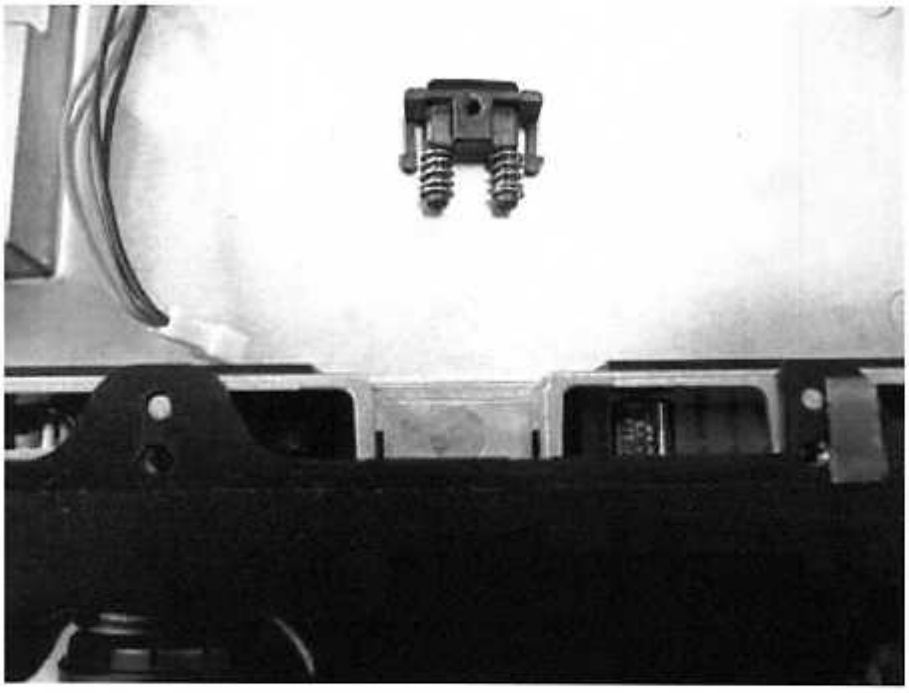
The modification:

Open the top cover by removing these 7 screws.

Remove the cover carefully and disconnect the speakerwires.

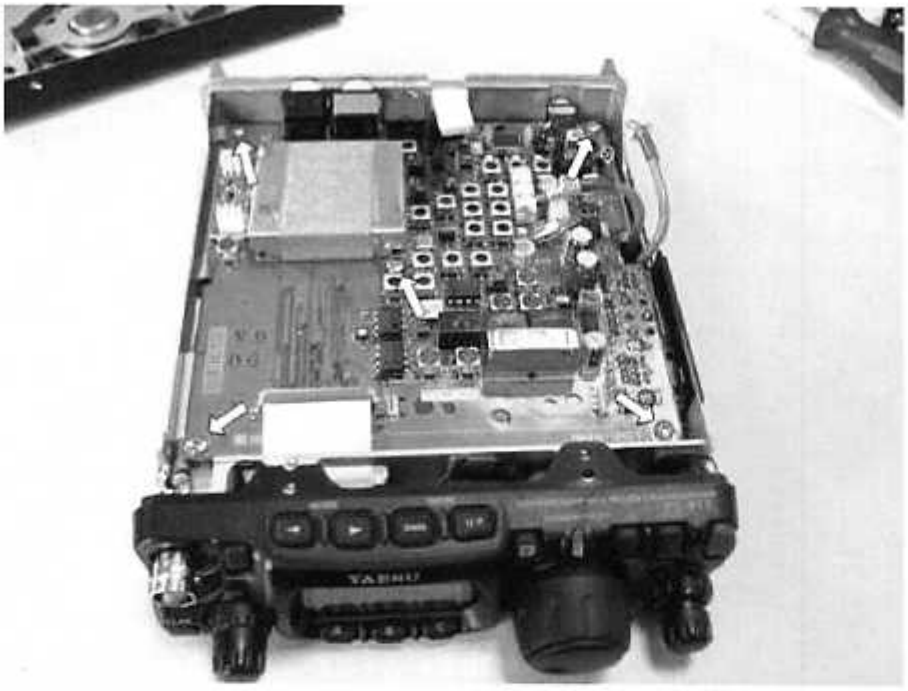
It works best if you also remove the bottom cower by removing these 9 screws. Be careful with the battery compartment lock!

Remove the bottom cover and this little plastic part and the springs, so you will not loose this or the springs.



Disconnect the four cables from the front and RF/amplifier unit. The cable from the front can not be just pulled out of the connector, you have to lift the brown "lock" be careful, do not break the hinges.

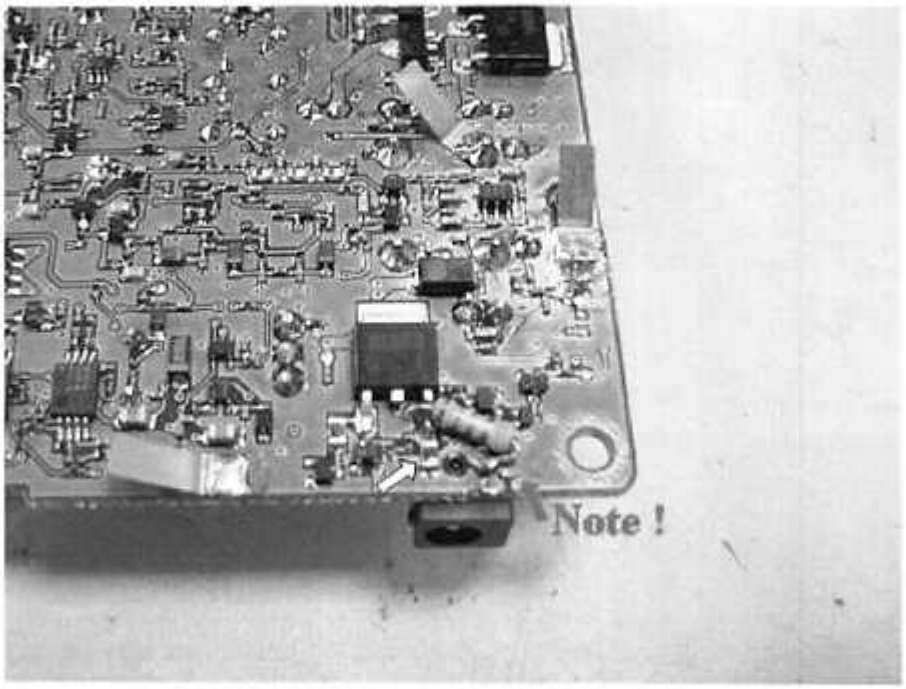
Now you can remove the 5 screws that hold the PCB and then you can lift the PCB out of the housing.



The battery wire has to be pulled trough a hole so be careful!

Turn the PCB upside-down and locate the 4.7 Ohm Resistor.

Solder a resistor parallel to this one to increase the current.



Be careful to keep the resistor away from the hole on the right, your resistor could easily touch the housing of the FT-817.

Since the 4.7 ohm resistor is used for 1000mAh, you can easily calculate the new value for your battery.

4.7 for 1000

4.7+15 // = 3.6 for 1300

4.7+10 // = 3.2 for 1500

4.7+8.2 // = 3 for 1600

4.7+6.8 // = 2.8 for 1700

4.7+4.7 // = 2.35 for 2000

You can change the charge-time to make sure your battery gets fully charged.

Assemble your 817, be careful with the 3-pin connector when you put the board back in.

I made this mod a few times without problems, even 4.7 // to 4.7 ohms worked well, please don??????t blame me if you mess up your FT-817.

Any updates should appear on the website of my radiogroup PI4FRG in the section hobbyclub.

73?????? Edwin PE1PWF

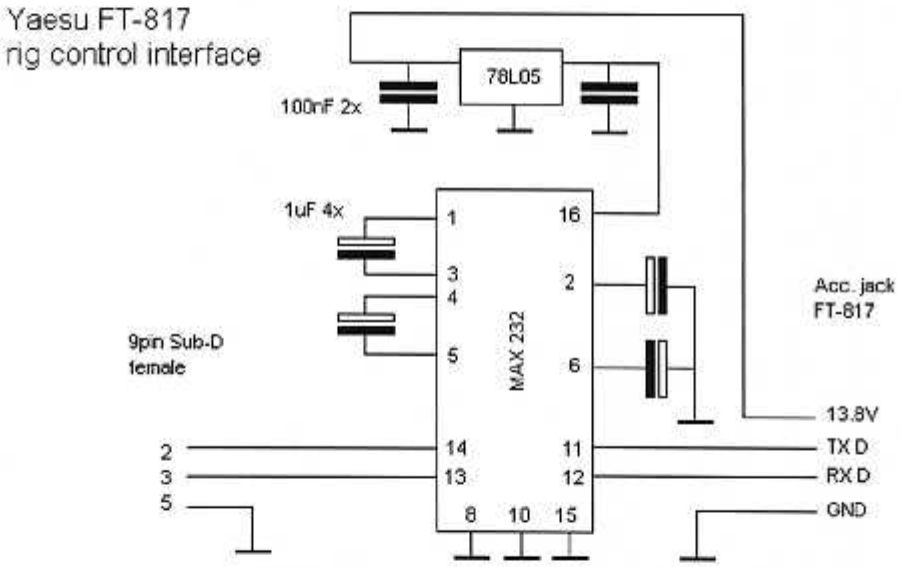
This article can also be found at http://home.wanadoo.nl/~e.houwertjes/charge817.html.

Yaesu FT-817 CAT interface

Author: Edwin - PE1PWF

Dit interface is bedoeld om een Yaesu FT-817 te besturen via de PC. Het kan worden gebruikt om modes, frequenties of geheugenkanalen aan te passen met verschillende programma's zoals: MixW, RATS FT-817, TRX Manager, FT-basic enz.
Yeasu verkoopt volgens mij een dergelijke kabel onder de naam CT-62, maar die heb ik zelf nog niet gezien.
Het IC, de MAX232 is veelgebruikt om RS232 signalen om te zetten naar TTL, maar omdat niet iedereen hem kent heb ik er onderstaand schema bij gemaakt. Let op, ik heb het zelf gebouwd, en het werkt goed, maar als je zelf gaat knutselen is het natuurlijk voor eigen risico.
Oh ja, let wel op dat je de juiste "CAT rate" insteld, anders kan de set verkeerde dingen gaan doen, zoals zenden op de verkeerde band of zo.
Uitschakelen gaat dan slecht, helemaal als ook de accu er nog in zit!

Rev.1



FT-817 interface circuit by PE1PWF for use with tranceiver control software like MIXW, RATS FT-817, FT-Basic, TRXmanager and others. I build it and tested it with many of these programs, works fine, but be carefull wrong voltages on rxd and txd might damage the cpu. Buying a original CT-62 is much safer and should work te same.

73' PE1PWF

Rev.2

Opmerkingen bij rev.2

Het heeft even geduurd maar hier is dan eindelijk ook een lay-out bij de interface. Voor deze lay-out heb ik de 2 andere poorten van de MAX232 gebruikt, dus dit schema ziet er iets anders uit als de vorige.
Ik had zelf het geheel al eens op de swhh methode in een 9-pins sub-d connector gemonteerd, maar binnenkort hoop ik hier ook een SMD lay-out te kunnen plaatsen die geschikt is om in een 9pins connector te monteren.
De lay-out voor de interface is een BMP bestand, helaas gaat printen dan wat onhandig, maar met

bijvoorbeeld Irfanview kun je het afdrukformaat mooi verschalen. Ik gebruik versie 3.17 en als ik het plaatje afdruk op 1.05x dan is het formaat precies goed. (ik zal proberen dit binnenkort in een PDF bestand te zetten of zoiets).
De maten van de print zijn 69 x 42,5mm, de steek van alle condensatoren is 5mm. Irfanview kunt u vinden op http://www.irfanview.com/ of bijvoorbeeld via TUCOWS .

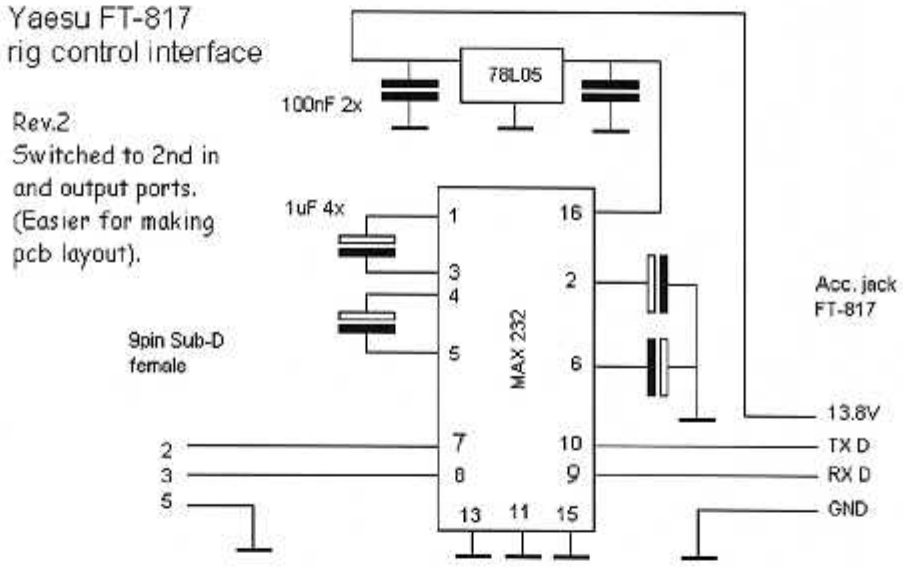
ENGLISH TRANSLATION:

Notes with revision 2

It took a while, but here is the layout for the interface. I made a modification to the "original" circuit because the second set of ports in the MAX232 are better for making a nice PCB.
I hope I can present a second PCB within a few weeks that can fit in a 9 pin sub-d connector, unfortunately this means soldering some SMD.
Unfortunately I had to use a bitmap-file for the layout, you have to scale this to a PCB size of 69/42.5 mm.
I use IrfanView (version 3.17) for printing my PCB-layout scaled x 1.05 gives me the correct size. (I will try to use PDF file later, or some other format)

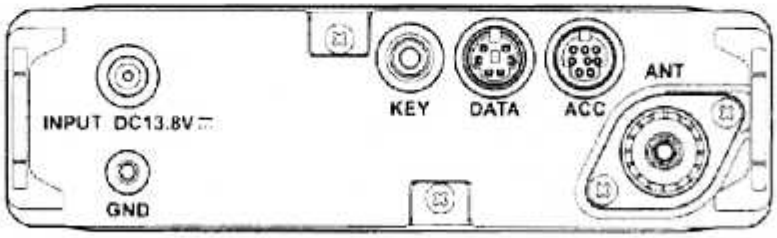
You should be able to find IrfanView on Homepage IrfanView.

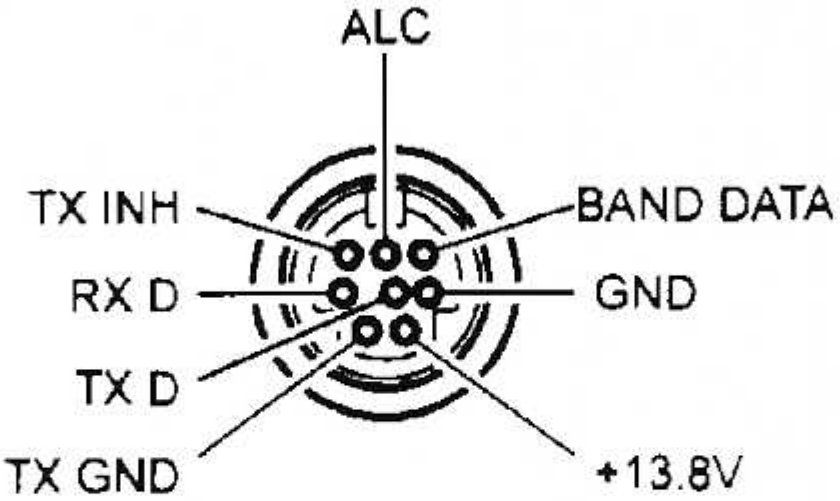
73, Edwin / PE1PWF

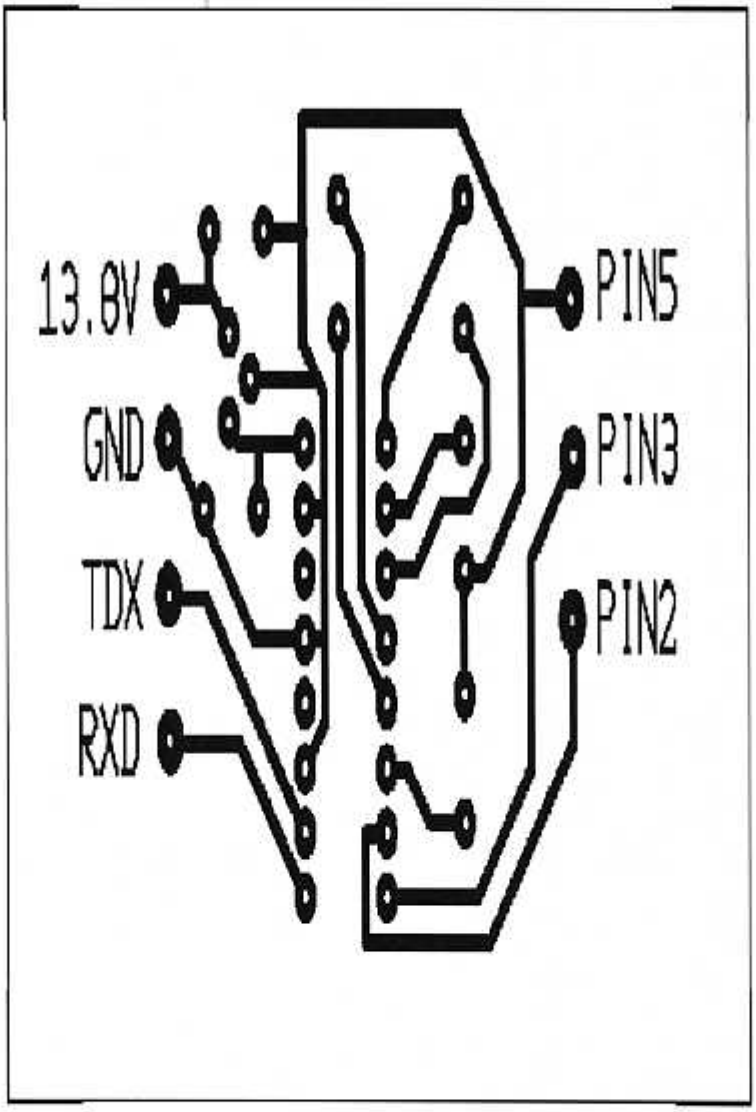


FT-817 interface circuit by PE1PWF for use with tranceiver control software like MX/V, RATS FT-817, FT-Basic, TRXmanager and others. I build it and tested it with many of these programs, works fine, but be carefull wrong voltages on rxd and txd might damage the cpu. Buying a original CT-62 is much safer and should work te same.

73' PE1PWF

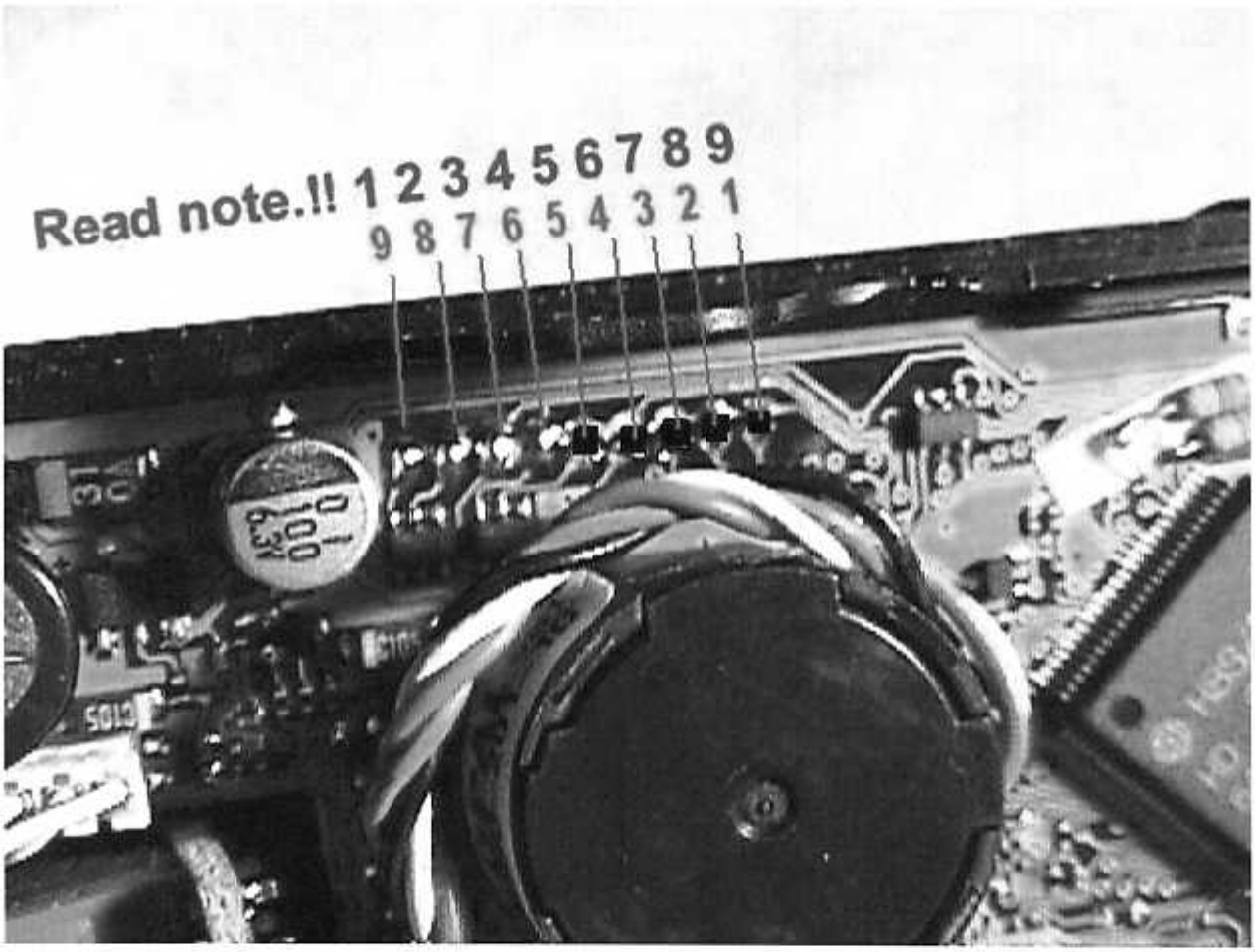



ALC
TX INH
BAND DATA
RX D
GND
TX D
TX GND
+13.8V


13.8V
GND
TDX
RXD
PIN5
PIN3
PIN2

Extended TX for FT-817

1. Remove the front panel
2. Look down on the back of front panel, with the VFO knob just left of center. Look at the jumper locations just above the VFO knob on the circut board. Solder the first four jumpers and remove the solder at location five.
3. Reassemble the radio, and reset the cpu by pressing the HOME and the power button.



This will extend the xmit freqs. on HF,VHF and UHF

Another mod.

The following Yeasu FT-817 frequency expansion modification is identical to the version provided by the manufacturer for MARS/CAP application.

1. Remove any power or battery from the Radio.
2. Remove the 14 screws holding the top and bottom covers to the radio.

3. Remove the battery cover latch.
4. Remove the covers.
5. Remove the BNC retaining nut.
6. Carefully lift the 4 plastic tabs holding the front panel to the chassis and slightly move the front panel forward.
7. Disconnect the ribbon cable that connects the chassis and the front panel.
8. Remove the jumper at location on Front Panel (J4005)
9. Press and hold the "VFO/MR" key and the "F" key while turning on the radio.
10. Reassemble the radio.

Note: The manufacturer states that "this modification opens up transmit coverage for MARS/CAP ONLY!" Other published modifications also have the user bridge the "first four jumpers". The difference between the two modification schemes has not been tested by the author.

Proceed at your own risk.

AA7W

pigeon3@gte.net

Improvement of the ALC - better modulation and throughput

Author: Andreas Duessler

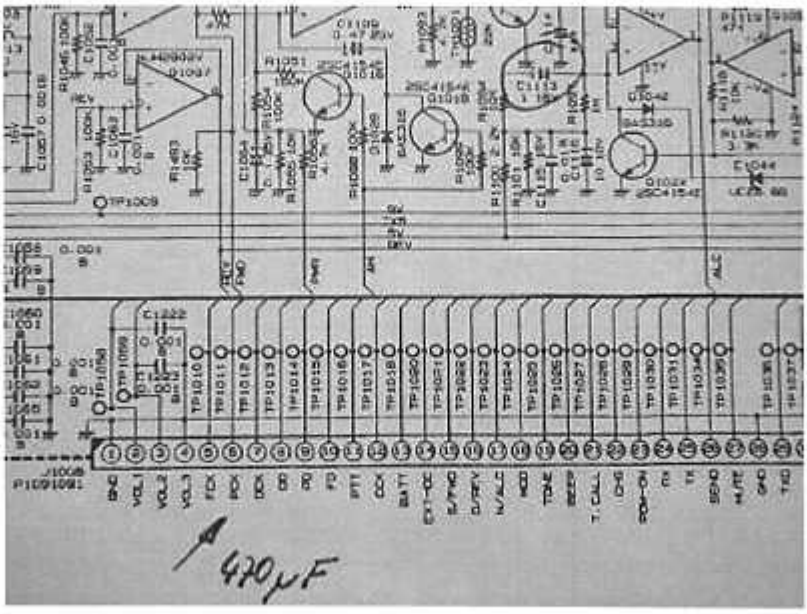
Hi ladies and gents,

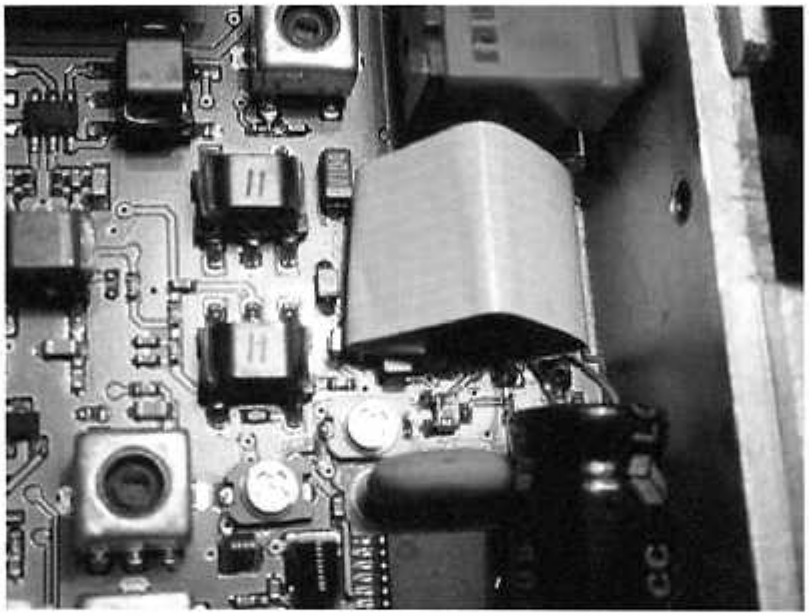
The FT-817 is a lovely rig, isn-??t it? This is a radio one must have - without special reasons. But anyway, when I got the radio one week ago, I started to test it against excisting others. (like TS-870). Everything was quite okay, but the output in SSB is not reaching the 5W-mark, even when the CW-tone and in FM the rig runs on specified power. I walked through the curcuit-diagram and found the reason. The capacitor C1113 on the mainboard is too small. This has to be changed to bigger values. In my case it-??s now 470 uF insted of former 1uF.

To find the place inside the rig .... boy! This took some time. But after locating the place, it-??s now easy to descibe:

Open the upper side (where the loudspeaker fits) and locate the red jack on the rear side. Inside a flatband-cable comes up and is connected. Right beside this cable you find C1113, but it-??s not labeled. But anyhow, look for the pictures taken and I-??m sure you find the place. The new C is visible in the lower right corner of the picture (big and black) I removed the original C from the board before - but it-??s still not necessary.

After finalizing, close the rig and test the output in SSB in comparison to FM and CW. The throughput is now there. And believe me, you get better voicereports. And running qrp - it-??s sometimes the needed peace of junk !





Best wishes and good luck !

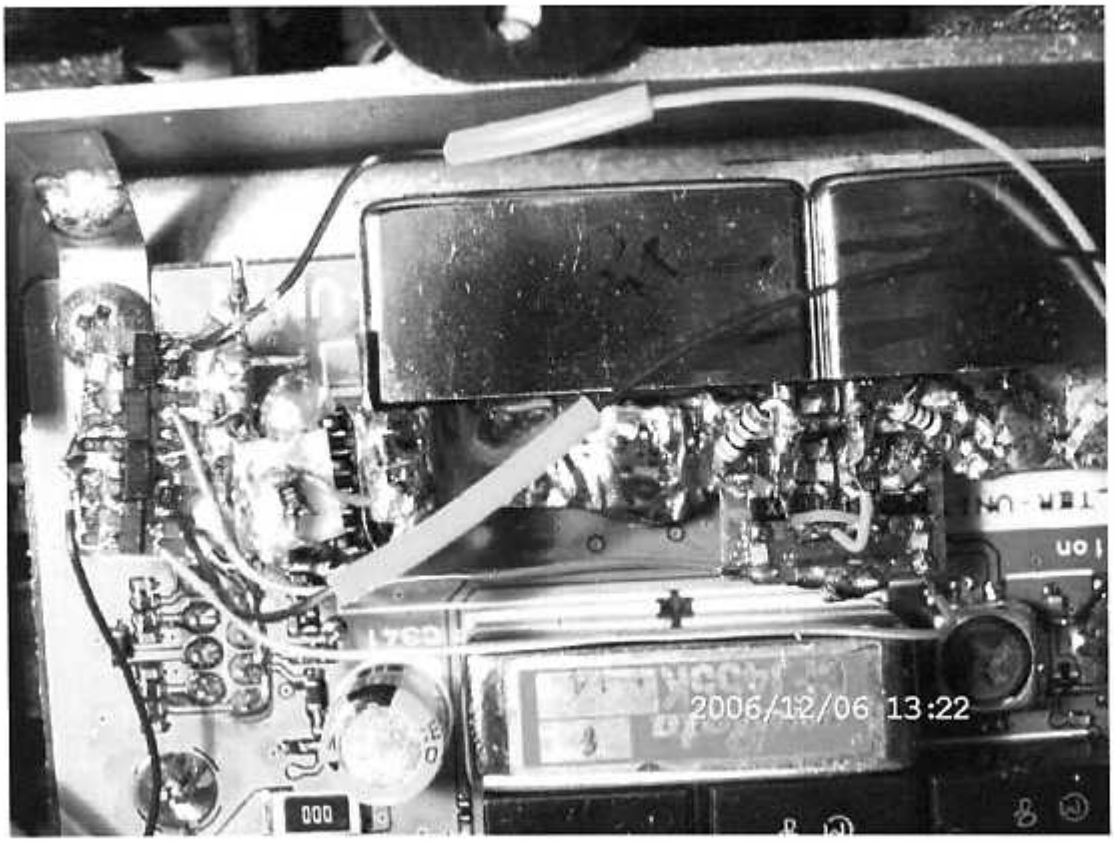
Andreas
DL6EAT

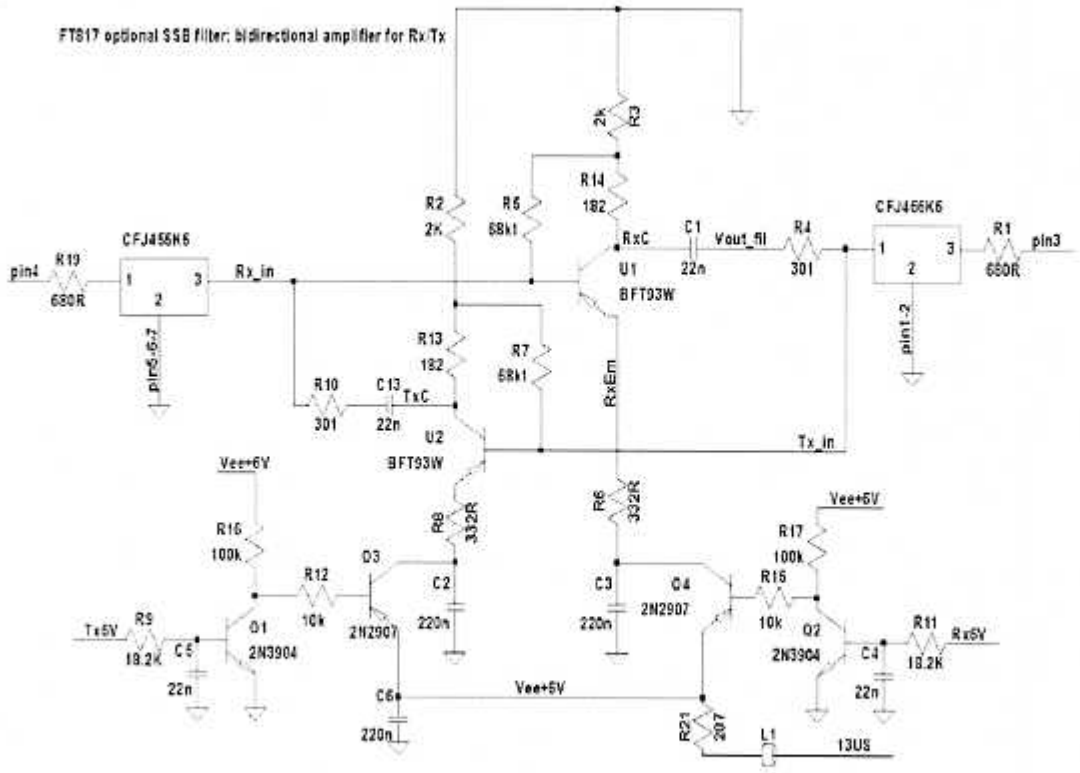
External SSB ceramic filter for FT-817

Author: dc0ik

In my design to improve the filter edges, I've used two filters connected in serial, to compensate the insertion loss of 2 ceram filter I use a bidirect amplifier (two BFR93) de bidirect-amplifier is controlled by signal Rx/Tx5V.

This solution improves the total SSB noise (in VHF/UHF) and reduces also interferences of crowed HF bands





FT-817 Mod. 2 Collins Filter (CW AND SSB)

Author: Lutz, W4/DH7LK

Risk: You will loose the warranty.
Fun: You will have a fantastic rig with a 2.4 Khz Collinsfilter in SSB transmit and receive path and a 500Hz CW filter in the Narrow position for CW and DIG (Pactor, PSK31 etc.

The FT-817 comes with only one slot for additional filters but there is sufficient space to mount both SSB and CW if you remove the PCBs of the filters and wire them directly to the MAIN UNIT.

For the details see the Operation Manual on page 74.

The original filter CF4 will be removed and replace by the YF-122S SSB filter. The YF-122C CW filter will be directly wired to the mounting pins og the optional filter socket.

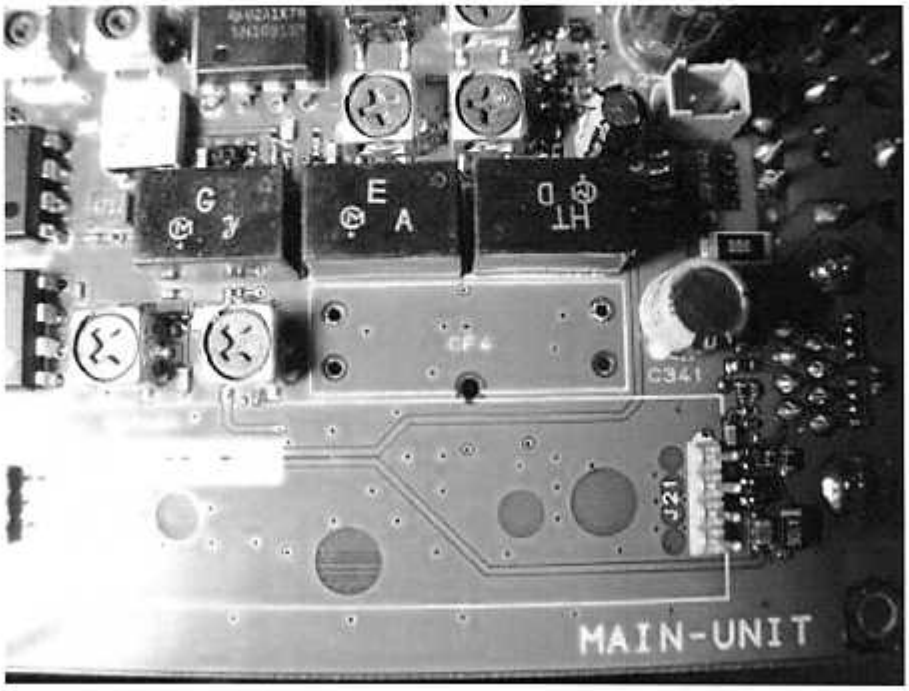
There is no need to work on SMD components, but you should be very familiar with the tiny circiuts and have the right equipment, if not ask a expirienced OM to help you.

1. See page 74 of the Operating Manual and follow steps 1 and 2.
2. Remove the PCB MAIN UNIT, watch on the battery conector and the 3 pin connector in the middle of the board. Remeber or mark the position of the 2 coax-connectors.
3. Desolder and remove the original ceramic SSB filter, see picture
4. Desolder and remove the filters from there original PCBs
5. Connect the SSB Filter with 3 short wires instead of the ceramic filter, see picture
6. Connect the CW filter with 3 short wires to the pins of the optional filter connector, see picture
7. Fix the filters in there position with a small ammount of glue
8. Reassemble the Main Unit, look carefully to the battery connector and the 3 pin connection in the center of the board
9. Follw the steps 4 to 7 on page 74 of the Operating Manual

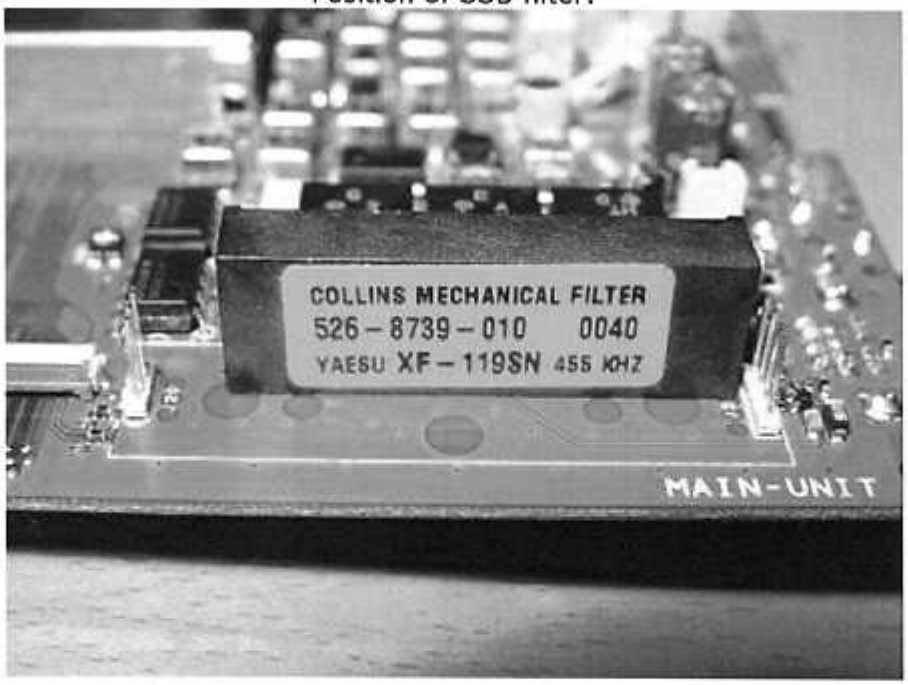
...and enjoy the clear signals from the Collins filters.

Vy 73 de Lutz, W4/DH7LK

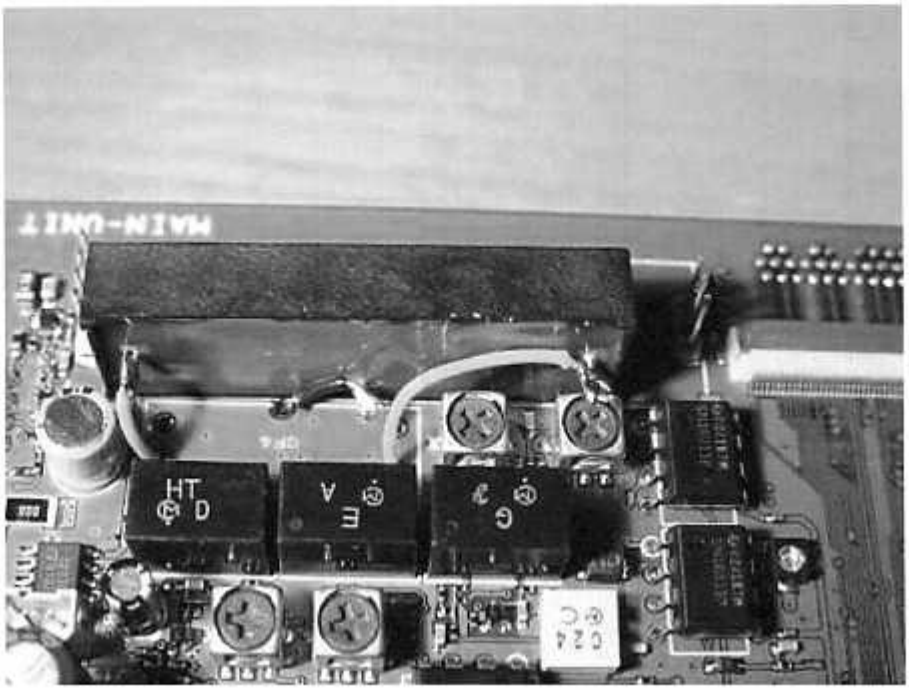
Original SSB Ceramic Filter removed:



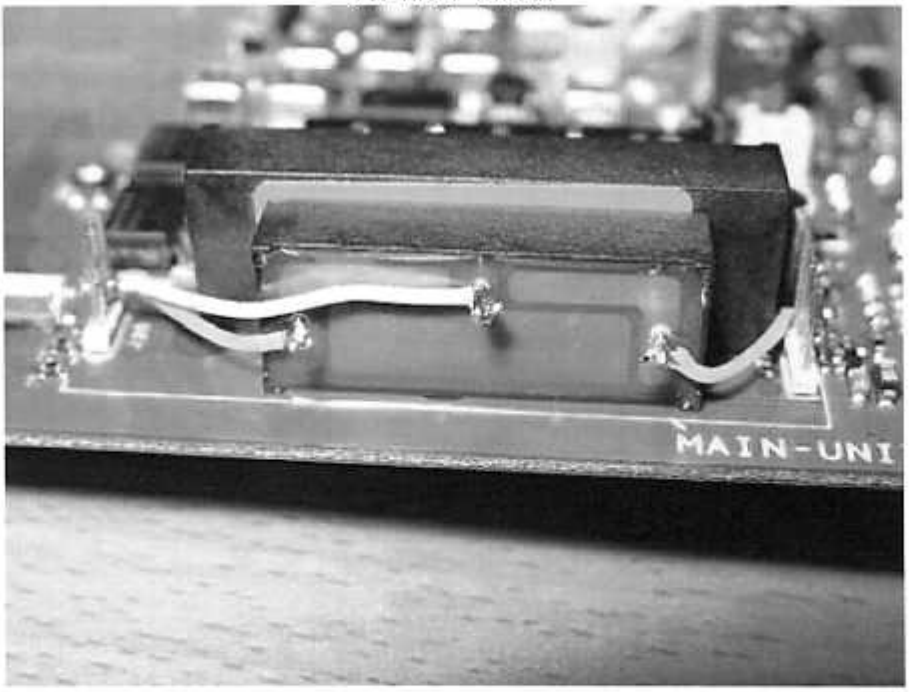
Position of SSB filter:



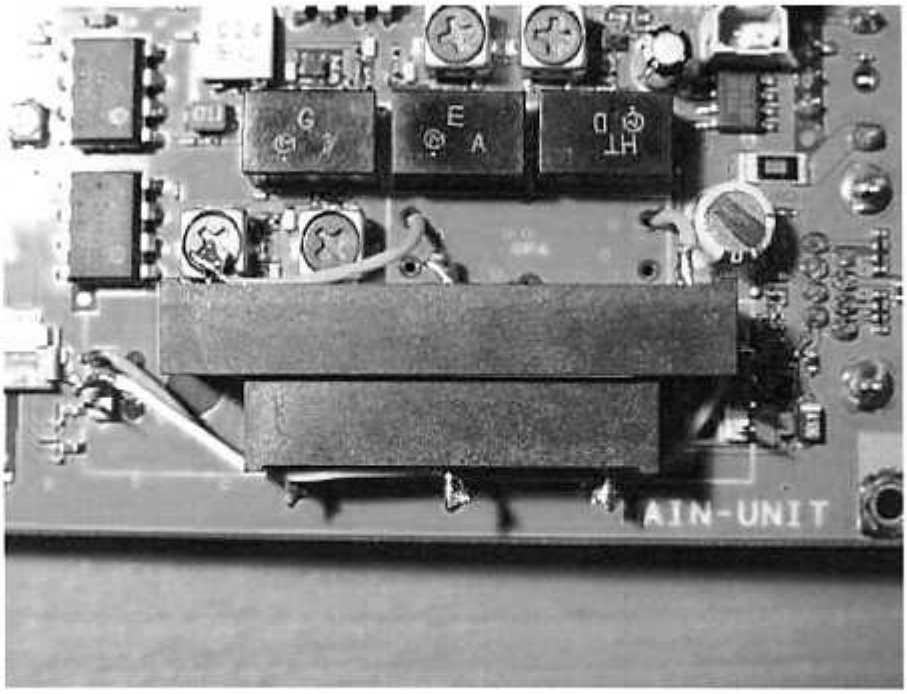
SSB filter wired:



CW filter wired:



Ready:



AGC modification for FT-817

Author: Andreas Duessler

Hi YL-??s XYL-??s and OM-??s,

Regarding the AGC (RX) of the FT817 I got some questions from some users. The dynamic of the AGC-regulation isn-??t really nice researched. If you use the rig specially on 40m and/or 80m where often high signal strenths are present, the RX sounds like the AGC is switched completely "off". If using with small signal amplitudes it sounds much better. This seems to be a general problem of the FT817.

To fix this is only recommened for let me call it "advanced users". The rig has to be opended on the upper side (where the loudspeaker fits). Now you remove all connected cables from the visible main board and all srews. After this you can remove the board.

Please turn the board to the soldered side and locate C1324, which is nearest to the connected data-cable going to the user-interface (front panel).

Near this C you find R1305. Original values are 1 K and 2,2uF.

Now the mod:

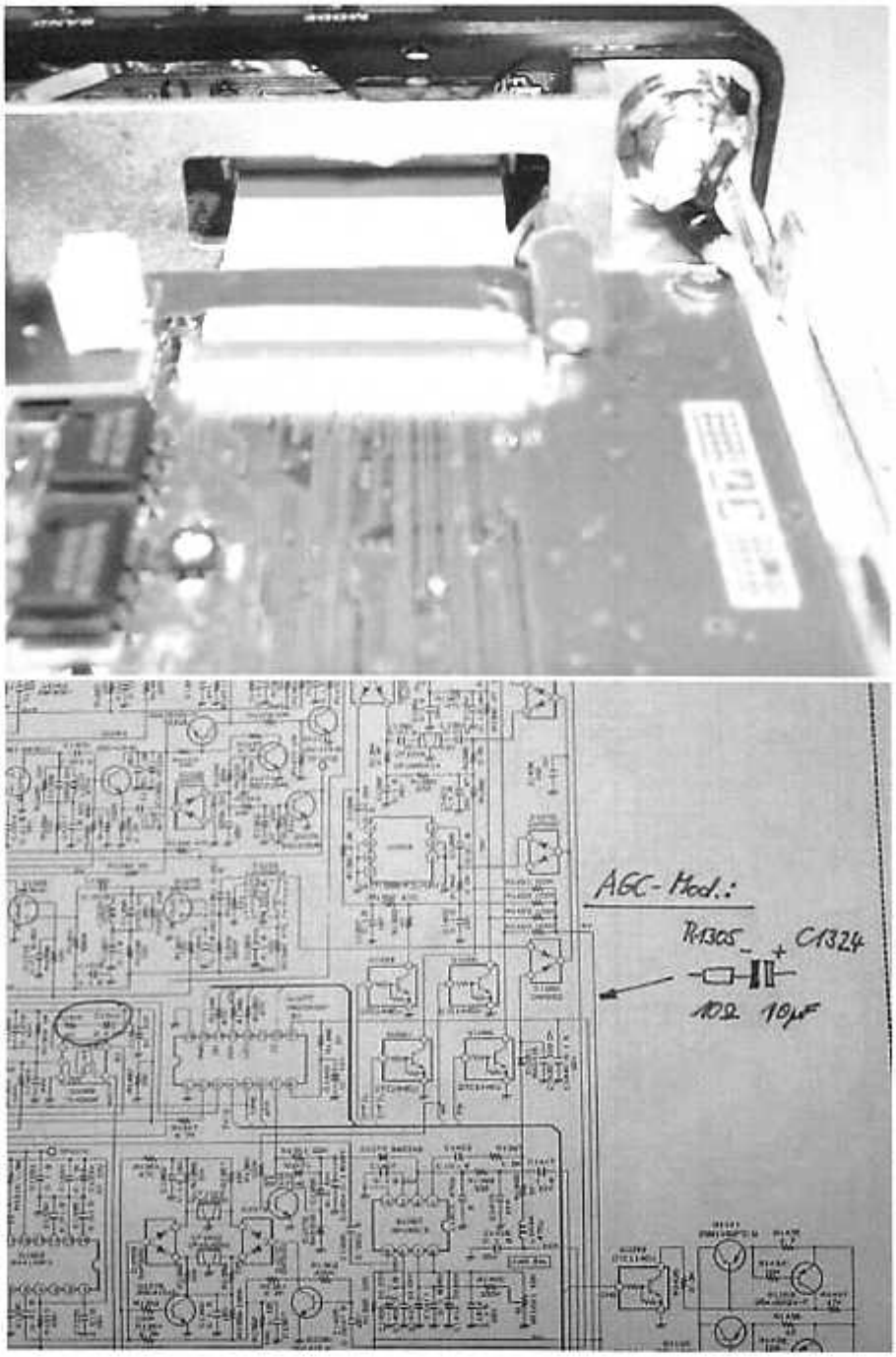
Please put 10 Ohms in parallel with R1305 and 10uF parallel to C1324.

Please be carefull in doing this, the SMD-parts are very small !

In my case, I had no SMD-C available (and I didn-??t want to use Tantal-C-??s), therefor I connected the 10uF via cable to the upper side of the main board. It-??s not looking nice, but nevertheless it-??s working.
Values over 10uF (470uF) are better, but the S-meter stand still at approx. S6-7 afterwards. It-??s not recommended to go over 10uF.

Good luck and again: be carefull!!!

Thanks for reading this and I apologize for the picture, which is not exactly focused. (I saw it too late...)



Andreas
DL6EAT

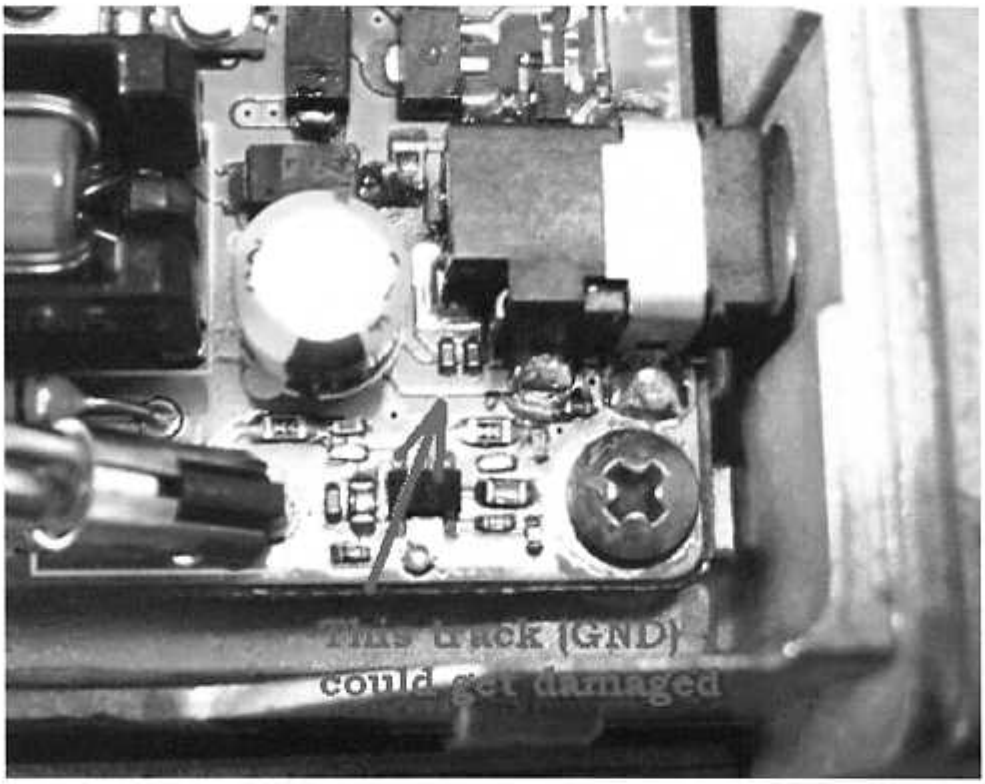
Voltage protection for FT-817

Author: Edwin PE1PWF

Over-voltage and reverse polarity protection for Yaesu FT-817!

This trick can allso be used with other 13.8V equipment.

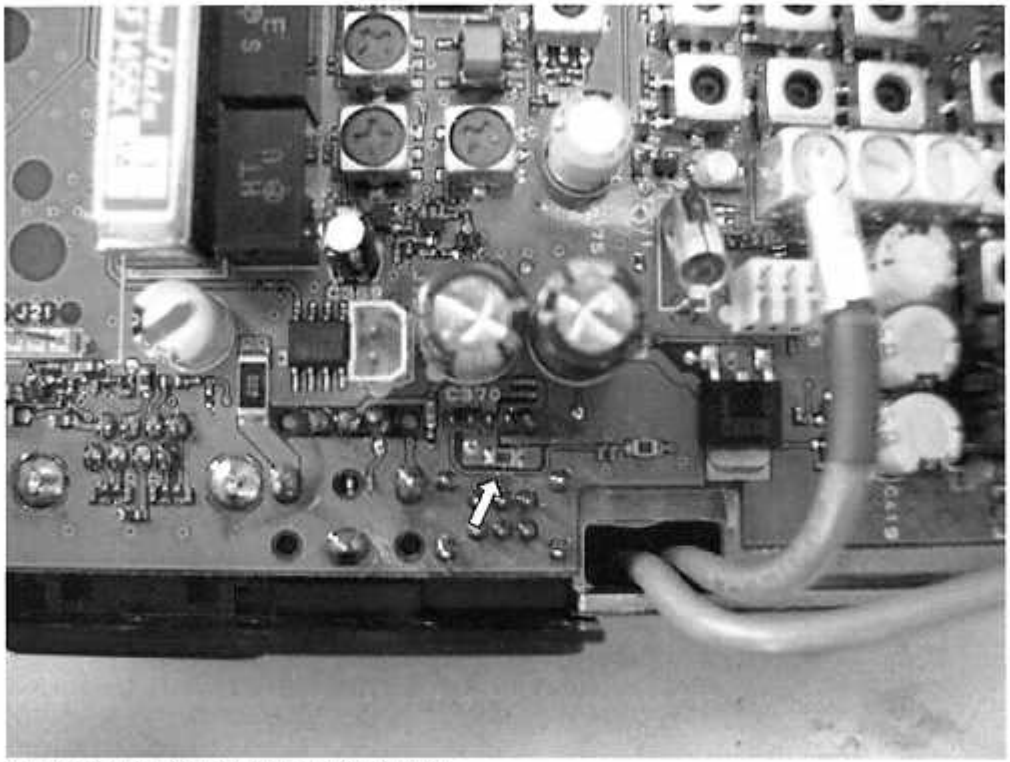
Allthough I think it should not be possibe in a tranceiver, the Yaesu FT-817 can burn out a PCB-track when reversing polarity and who knows what more.
One of my friends recently experienced this in the field with his newly bought tranceiver. The fact that he was shure not to reverse his wires is strange, Yaesu service man insisted it was caused by reverse polarity.



The trick is to place a "transil" (transient volrage suppressor) like the 1.5KE15A directly on the powersupply terminals where they enter the FT817.

The 1.5KE15A acts like a big zener diode, this makes it suitable not onely for reverse polarity, but allso when the voltage rises well over 15V it will try to blow the fuse.
When this happened, and the fuse keeps blowing the transil could be damaged, the tranceiver should be allright.

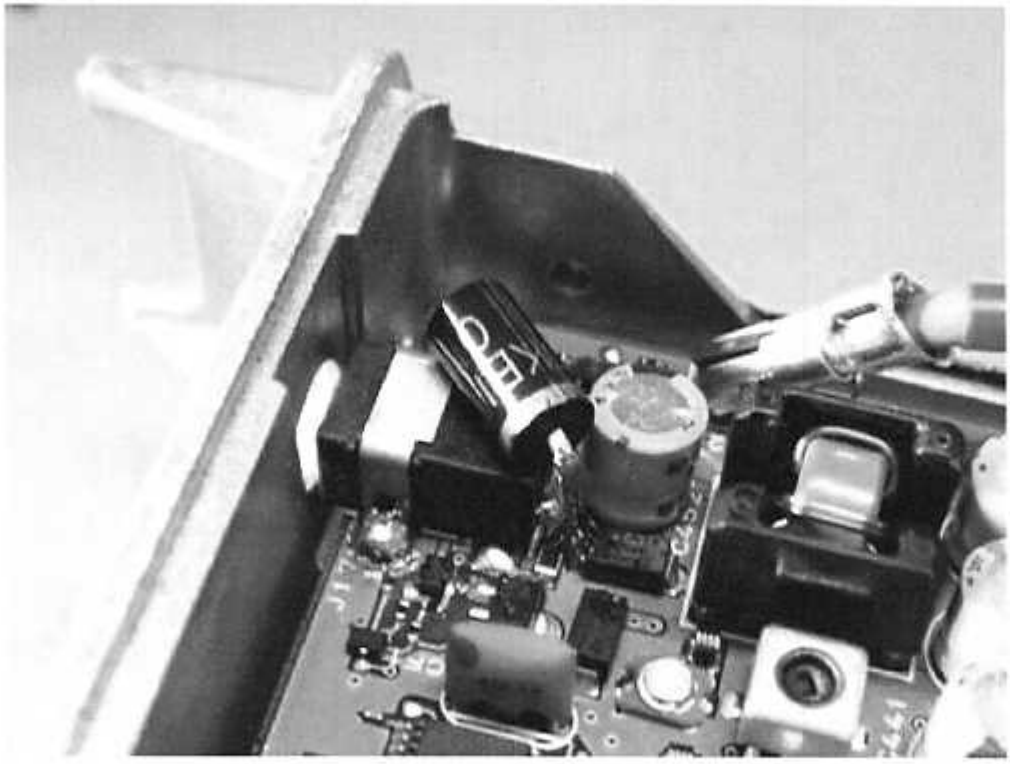
Before you start with the modification, remove the POWERSUPPLY-CABLE and REMOVE THE BATTERY!!!!

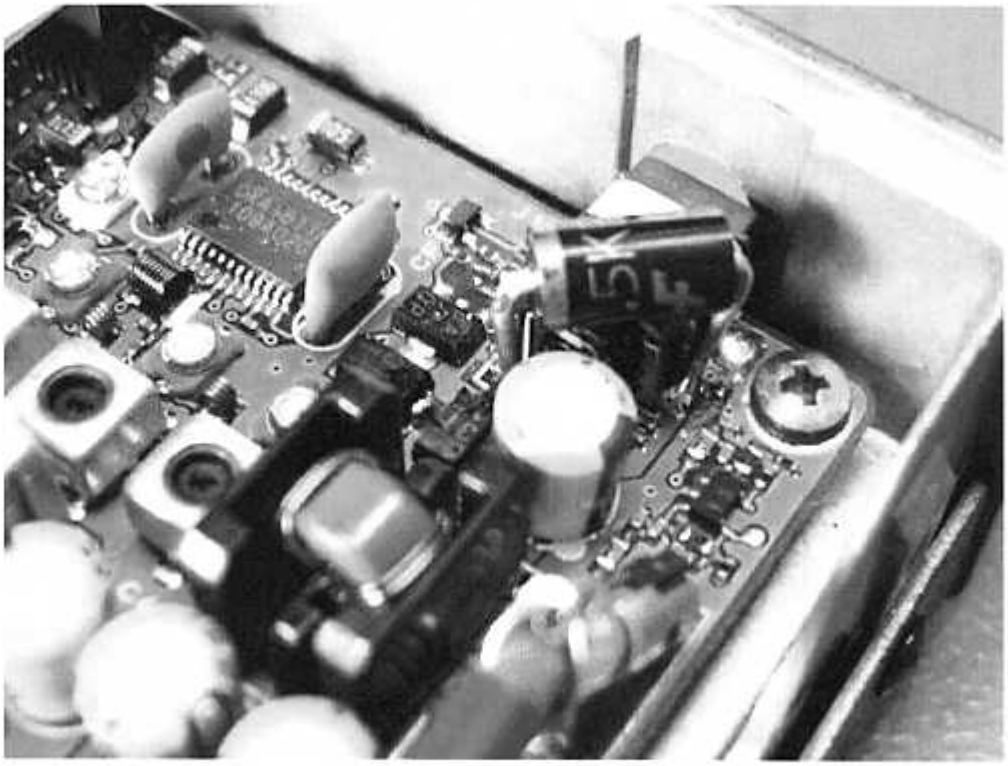


Or else you could blow this fuse!

This small fuse (near the battery-leads) is a 3A smd fuse or a 0 Ohm smd resistor.
So if our battery does not work, check this fuse.
Note that it does not seem to be in the schematics.

The transil should be mounted this way, because the anode of the transil was hard to solder to the connector, I used a spot on the nearby diode.





Offcource one could allso use this transil in the powersupply cord, but since I have more cords, this was the easiest way for me and it looks better.
Other people suggested a series diode in the power cord, but this lowers operating voltage => lower output, and it does not protect for overvoltage.
For extra safety one can allso use a fuse in the negative powerline.

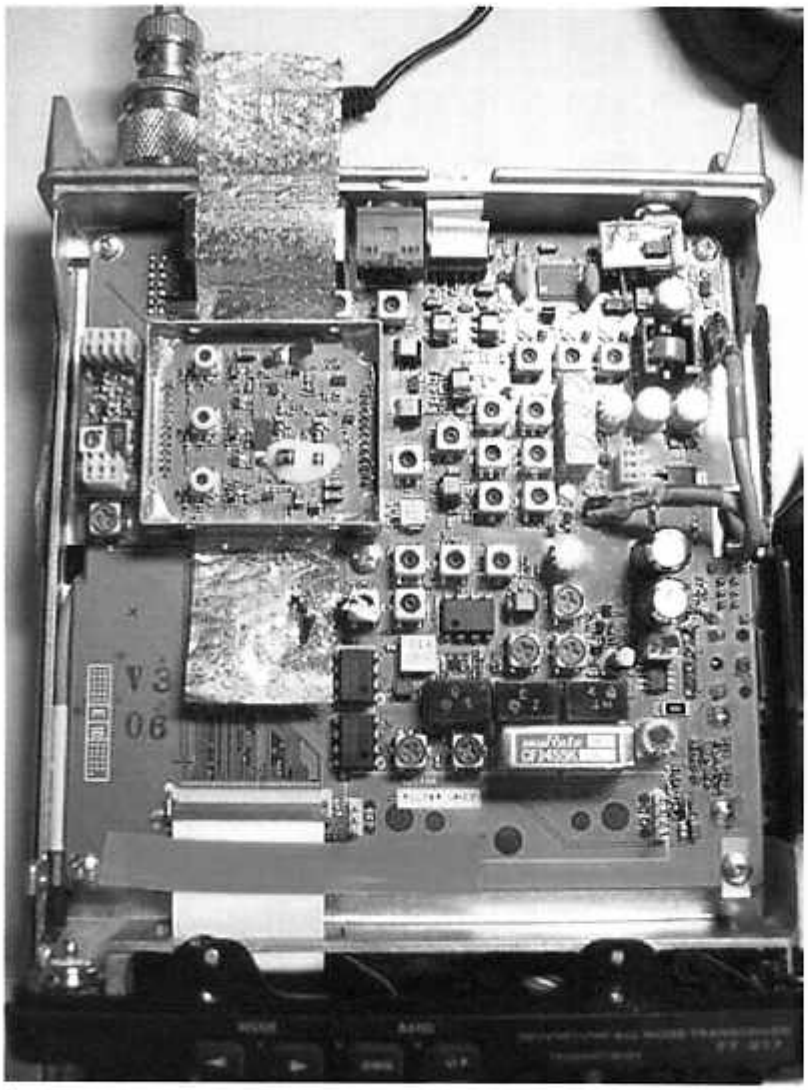
73?????? Edwin

Easy cure for microphonic VHF VCO in Yaesu FT-817

Author: Erik OH2LAK

Some manufacturing series of the Yaesu FT-817 has problem with a microphonic VCO, at least on 2m band, when using radio??????s internal speaker. The PLL tin box including the VCO components is too close to the internal speaker, and with high volume or suitable audio signal the PLL box starts to resonate with the speaker resonation. This effect disturbs highly CW operations as it garbles the sidetone, or just creates howling sound from the speaker when the volume level is increased enough.

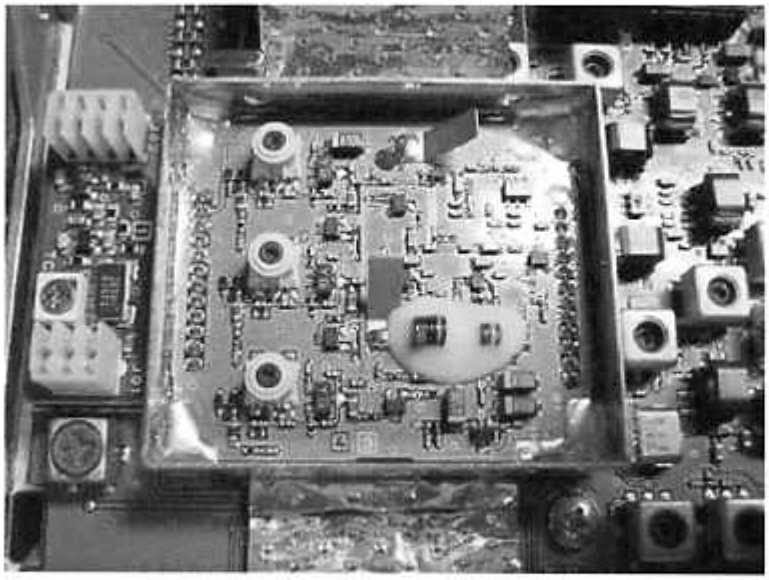
Fix is to insert muffle in to the PLL box. I??????ve used antistatic foam mat used for IC??????s, and it works well.



Open the top side of the FT-817 by removing screws on the side and top and back. When the hood is loose, carfully lift it and disconnect the speaker cable when reachable.

The PLL box has copper tape around it, peel the tape open carefully to be able to re-use it,

then open the PLL box. It might be soldered from some of its corners, remove the solderings carefully.



Inside the PLL box there are three coils, which cause the problem. Cut a suitable piece of muffle material, eg. the IC mat and place it around the coils as seen in the picture. Close the lid of the box, solder it from all four corners to improve grounding and restore the copper tape on it.
Reassemble the top cover and you??????re done!