Some info for FT90

Serial Numbers

For all Yaesu/Vertex radios that I've seen, the serial numbers are in the format of YPXXXXXX where "Y" is the production year, "P" is the production run and "XXXXXX" is the radio's unique number.

Slow CTCSS De-response

The FT-90R (along with the FT-2600M) uses the MX-Com MX165C CTCSS Encode/Decode IC. The way that Yaesu incorporates it into the 90, makes the receiver mute several hundred mS late. Even though the FT-2600M uses the same chip, the de-response time on it is much more desirable. I figure that replacing the following FT-90R components with the same values that are used in the 2600M will give better performance: R2132-2.2MΩ, R2135-330kΩ, C2100-0.1uF. If anyone has a chance to test out these values in the FT-90R configuration, please let me know your results. I will try this out as soon as I have a chance.

Squelch Problems

The FT-90R has an infamous squelch problem that makes the receiver squelch and un-squelch at a very high rate while receiving a signal. This seems to be caused by extreme temperatures, high or low. Yaesu will do a squelch alignment for the price of $30 plus shipping. If you have access to a service monitor, you can align the squelch yourself with the aid of a $20 service manual.

Radio Alignment

Connect the radio to a 13.8VDC regulated power source for use on all steps. Signal levels in dB are based on 0dB-??=0.5-??V. It is suggested that you refer to the "FT-90R Technical Supplement" provided by Vertex Standard. I am not responsible for any damage you may cause your radio.

Internal Alignment

To access your Alignment Menu, you must build a plug that plugs into the microphone jack of the radio. Wire it so pins 1,4, and 6 are shorted together. Insert the plug while turning the radio on. Upon entering the Alignment Menu, take the plug out. The following is what you will find in the Alignment Menu of your FT-90. The numeric values may be different, however. For Receiver adjustments, use the RF signal generator set for 1kHz tone at -??3.5kHz deviation. Use the arrow buttons on the front panel to switch between each alignment item. To save levels when the RF Sig Gen is used, press the DIAL or the microphone's [VFO/MR] button. To adjust manual settings, rotate the DIAL. To change bands while in the Alignment Menu, press [SET] on the front panel. Press [DISP SS] on the front panel to save settings and exit (once alignment is complete).

Item	Ad144/Ad433		Description	Adjust/Level	Method
DC V	203	203	VDC From The A/D?	No Info	No Adjust
FLPO	255	255	Always 255?	No Info	No Adjust
HIPO	222	210	High Power Adjust	50/35W Out	Manual
MID1	122	142	Mid1 Power Adjust	20W Out	Manual
MID2	69	88	Mid2 Power Adjust	10W Out	Manual
LOW	36	49	Low Power Adjust	5W Out	Manual
MOD	177	177	Modulation Adjust	-??4.0kHz Dev.	Manual
TUNE	0	0	Receiver Tune?	No Info	Manual
CTR-	185	152	?	No Info	Sig Gen
CTR+	154	184	?	No Info	Sig Gen
SQ-S	59	61	Sql Threshold	-11dB-?? RF In	Sig Gen
SQ-T	21	22	Sql Tight	-2dB-?? RF In	Sig Gen
S-1	86	99	S-1 Adjust	-2dB-?? RF In	Sig Gen
S-F	155	171	S-Full Adjust	+25dB-?? RF In	Sig Gen

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Item	Description	Adjust/Level	Method
HIPO	High Power Adjust	50/35W Out	Manual
MID1	Mid1 Power Adjust	20W Out	Manual
MID2	Mid2 Power Adjust	10W Out	Manual
LOW	Low Power Adjust	5W Out	Manual
MOD	Modulation Adjust	±4.0kHz Deviation	Manual
SQ-S	Squelch Threshold	Inject -11dBµ from 0.5µV	Sig Gen
SQ-T	Squelch Tight	Inject -2dBµ from 0.5µV	Sig Gen
S-1	S-1 Adjust	Inject -2dBµ from 0.5µV	Sig Gen
S-F	S-Full Adjust	Inject +25dBµ from 0.5µV	Sig Gen

Mic Switch Signals

The Mic Switch lines are signal outputs from the microphone to control some functions of the radio from the mic end. This is done by changing the voltage on each line to a specified value. The following table shows which function corresponds with which voltage level combination. The labels listed below are according to the socket pin diagram. The levels listed below are those measured from my radio only.

Key	2 (Pin 1)	1 (Pin 6)
None	4.40V	4.40V
PTT	4.40V	1.02V
Down	4.40V	1.85V
Up	4.40V	2.73V
ACC	4.40V	3.53V
VFO/MR	1.01V	4.40V
P1	1.85V	4.40V
P2	2.72V	4.40V

Yeasu FT-90 TX 130-180, 410-480 MHz.

I just figured out the mod for the Yaesu FT-90. It will give you TX 130-180 MHz / 410-480 MHz.

1. Remove 4 screws from bottom of radio.
2. Remove R2156 (connected to pin# 21 on Q2021, the CPU HD6473337YTF16)
3. Replace cover and screws.
4. Perform a Master Reset (hold down DISP/SS, <| |>) and turn on power.

That's it!
Perform this Mod at your own risk.

This modification works both for the US and the european version. So the use same R for mod, but different firmware
73
Jim - KA8ZGP

FT-90R squelch problem and solution

Contact author: KD5E

The Infamous FT-90R Squelch Problem and Solution

THE PROBLEM: The squelch on 2-meters opens and closes at a fast rate when receiving signals. This makes it impossible to receive a signal without manually opening the squelch, then you have to listen to white noise when the other station is not transmitting. The problem seems to affect some signals and not others, some repeaters and not others. There does not seem to be a problem with the 440MHz side. There have been many different solutions to this problem, including sending the radio back to Yaesu, a full squelch alignment at a shop with the proper test equipment, etc.

THE CAUSE: None of the above listed solutions will create a permanent fix, the problem can come back because the problem is actually a bug in the radio's SOFTWARE. If the 2-meter frequency step in a memory location is set to anything other than 10KHz, the problem can manifest itself. The problem is much worse when the frequency step is set to 5KHz.

THE SOLUTION: Either with programming software, or manually with keypad entry, go through ALL memory locations where a 2-meter frequency is stored and CHANGE THE FREQUENCY STEP TO 10KHz. My radio was in the shop twice for the same problem and it kept intermittently and unpredictably returning until this was done. I've had no problem since which was not directly attributable to a different frequency step being stored in a memory location.

Dave, KD5E

FT-90R - Squelch Response Time

Contact author: DJ3NRA

Symptom:

After an RX signal disappears, the time until the squelch closes is too long. When scanning, the radio will stop on a busy frequency, however, when it resumes scanning it stops again on the adjacent frequency because the squelch response is too slow. Example: Frequency 145.500 MHz is busy, scanner reaches the frequency and stops correctly. After 5 seconds the radio continues scanning but stops at 145.5125 Mhz. After another 5 seconds scanning continues normally.

Solution:

Change value of C1209 (100nF) into 47nF, and change R1258 (470k) into 100k. Please note that these are SMD conponents. Special tools and experience in SMT are required for this task.

Disassemble the radio to get access to the main unit. Locate the IF circuit TK10930 (in the middle between the RF PA modules). Remove the rubber pad between XF1002 and X1001. C1209 is next to XF1002. Replace it by a 47nF SMD capacitor. R1258 is next to X1001 and its orientation is 90 degrees to C1209. Replace it by a 100 kOhm SMD resistor.

Circuit theory:

From the AF output of TK10930 (pin 12) the noise portion is separated by an active high pass filter built by an internal amp (pin 19 and 20). The output (pin 20) is rectified by the double diode D1039 and buffered by C1209. The resulting DC is low-pass filtered by R1258 and C1381 and then fed to the CMOS microcontroller. Please refer to yaesu's FT-90R technical supplement for details.

73,
Reinhard
DJ3NRA

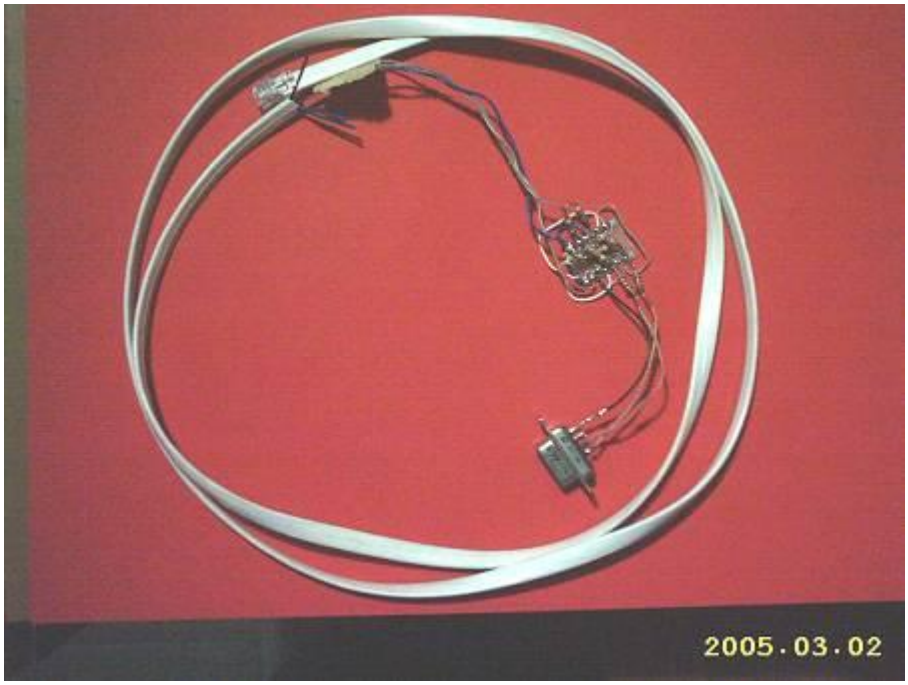
Cloning interface for FT-90R

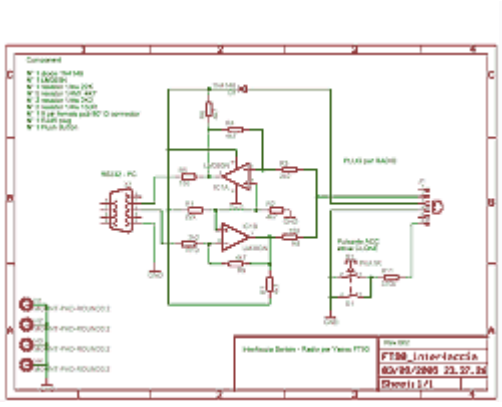
Contact author: Andrea, IW2FAG

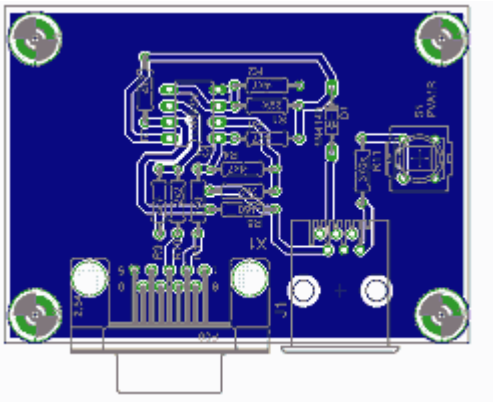
FT-90R interface cable for cloning PC software.

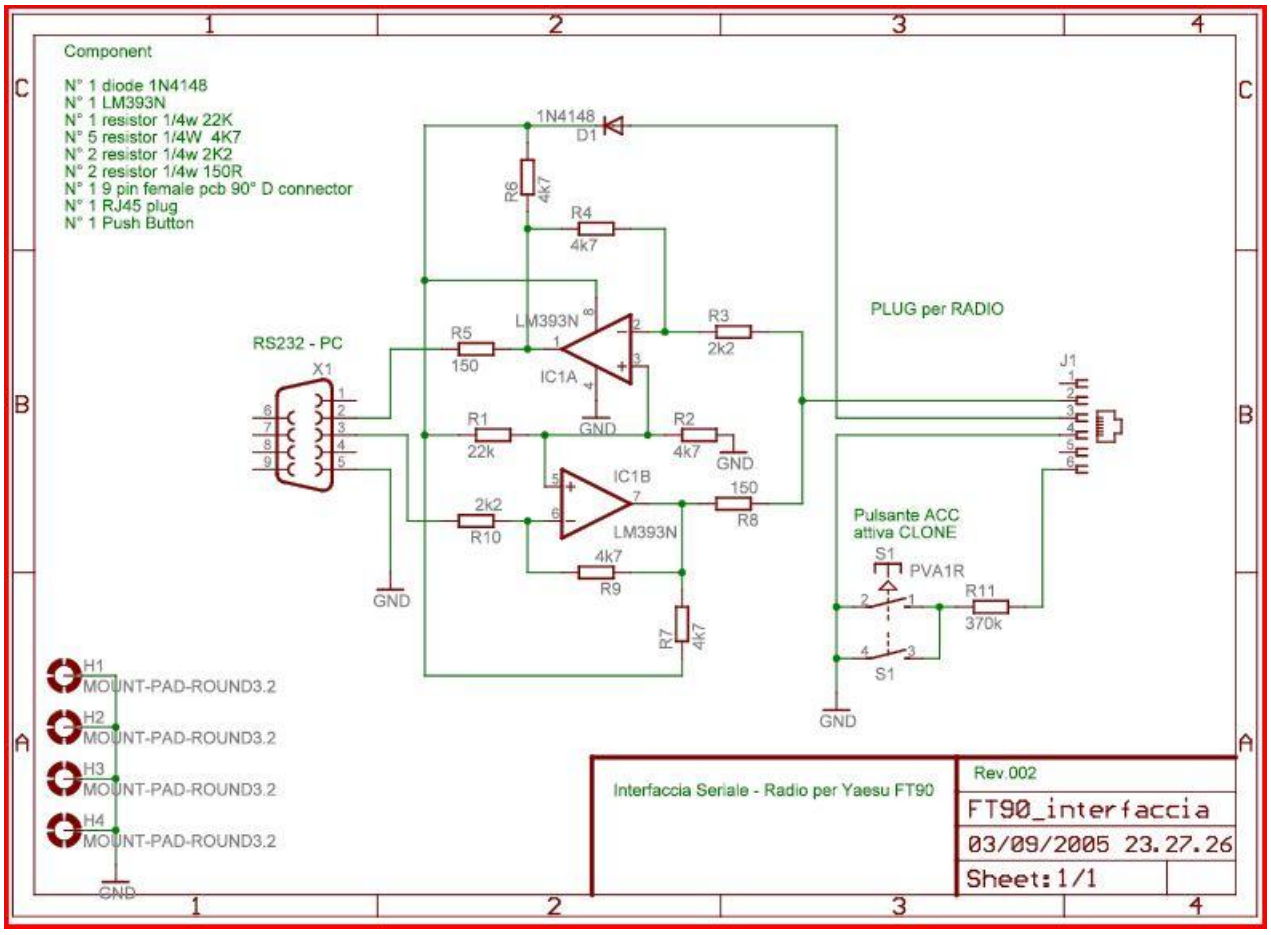
It's a little ad not expensive home made one.

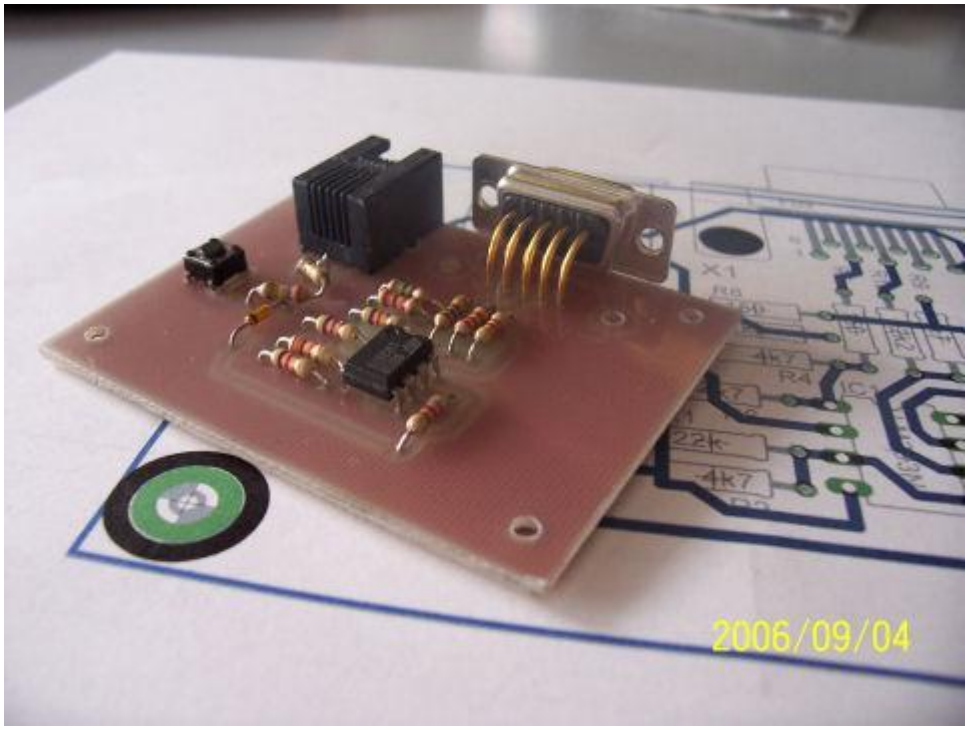
Here there's the schematic and the photo of my first prototype.











73's de iw2fag

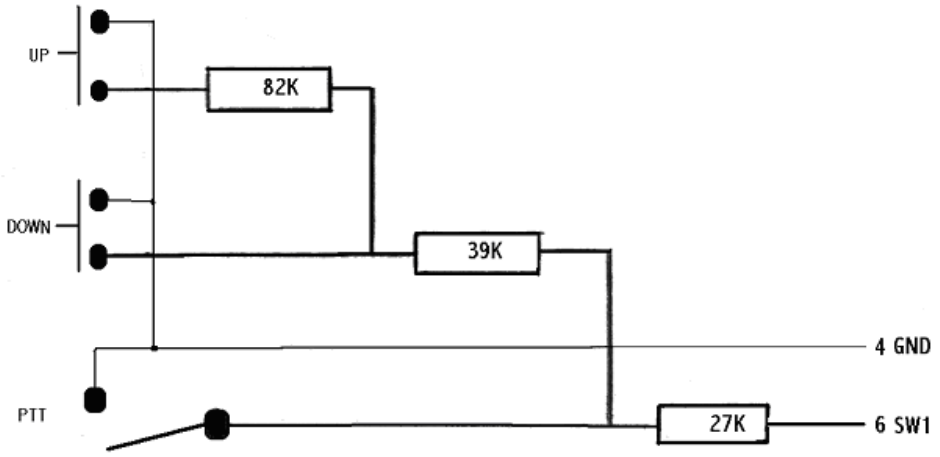
Connect other microphone to Yaesu FT90 & FT100

Contact author: Bj+??rn Karlsson

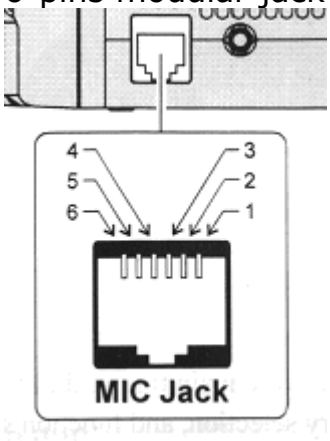
This modification is originally made for FT-100 but should also work for FT-90.

Here-??s a description on how connect UP/DOWN and PTT to Yaesu FT-100.

Here below does I a description how components shall connect to radio.



6-pins modular jack



Mic-jack Yaesu FT-100 / 90 / 8100.

Pin 1: SW 2 multi-function switching
Pin 2: N.C. (9600bps packet data output FT-90)
Pin 3: + 9 v
Pin 4: GND
Pin 5: Microphone Input
Pin 6: SW 1 PTT, UP och DOWN

73 Bjorn SM5SWI

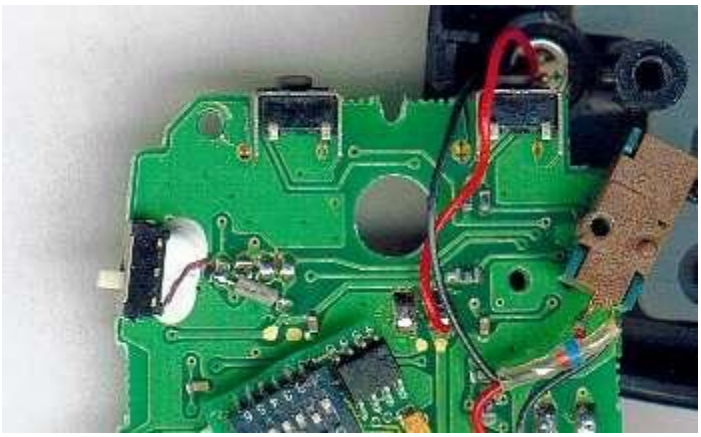
FT90 Microphone PTT Lock Mod

Author: Kevin (K7KCN) - kcnovak@home.com

Microphone MH-36, to use the "Lock" switch to lock the PTT as well as the top buttons.

Inside microphone,

1. Cut circuit trace between solder jumpers 3 and 4.
2. Solder jumpers 1, 3, and 4.
3. Place wire jumper from solder pad below jumper 4 to jumper 1.



Happy RFing!
Kevin, Gresham Oregon USA