

# Modification Sheet

Jochen Heilemann (DG2IAQ)  
German Amateur Radio Station

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## Yaesu FT-7100M

Version 1.3

VHF/UHF Duoband Transceiver

### Introduction

I started on doing modifications of CB- and HAM-radios since 1980 at the age of 12 years. I mostly wasn't satisfied with the sound of the modulation or reception of my rigs. This is normally founded by restrictions of the local law or by rationalize productions. Only expensive high-class amateur radios have a good sound on their basic state.

Therefore there must be some possibilities for improvements. So I learned the basics of RF electronics on myself and did a lot of modifications until today and I would like to spend my experiences to all other electronic interested people, CB- or HAM-radio stations.

You have to recognize your local laws. Mostly modifications aren't allowed by the local law or by the manufactures. So you do it on your own risk. Also the brandnew HAM rigs are mostly build with a lot of teeny-weeny SMD parts. You have to use special equipment and you also must have a great expert knowledge. So some modifications aren't for only hobby electronic technicians.

***So this and all of my Modification Sheet are for education purposes only !***

All pix with Fujifilm „FinePix 6800 Zoom“ on resolution „6M/Normal“. Pictures reduced for this publication to 640x480.

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## General


# Modification Sheet

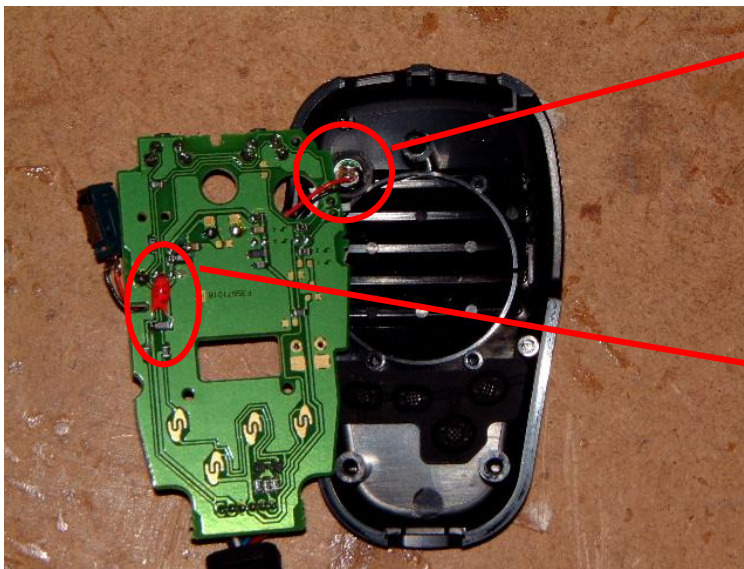
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## Transmitter



Remove the electret microphone capsule and **remove their black foam** in front of the capsule. Also **remove the additional black foam in the mic hole** of the mic front.

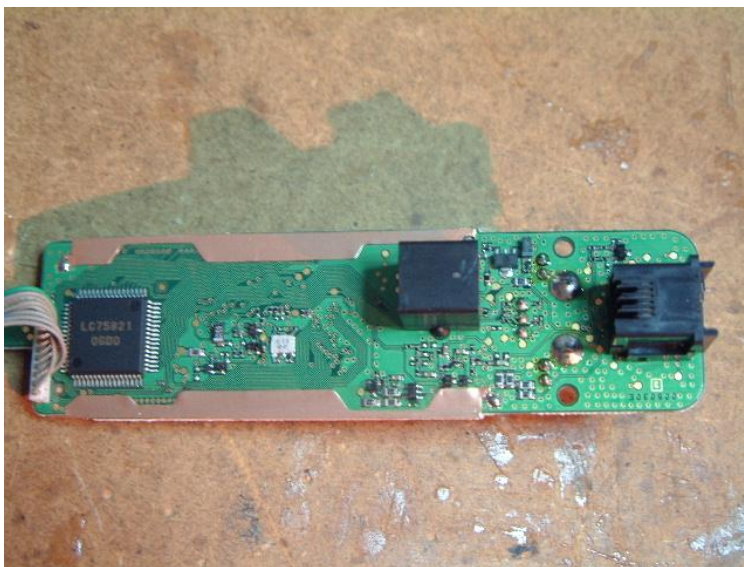
Reassemble the electret capsule.

→ more heights, no more „foam“ modulation, much more clearance

Solder a **1 $\mu$ F electrolyt capacitor** over the output electrolyt capacitor (0,1 $\mu$ F) for more basses.

The direction of the electrolyt is like in the left view:

- O +



Now remove the Panel-Unit.

The following modification will get the most drastic improvement for the modulation sound.

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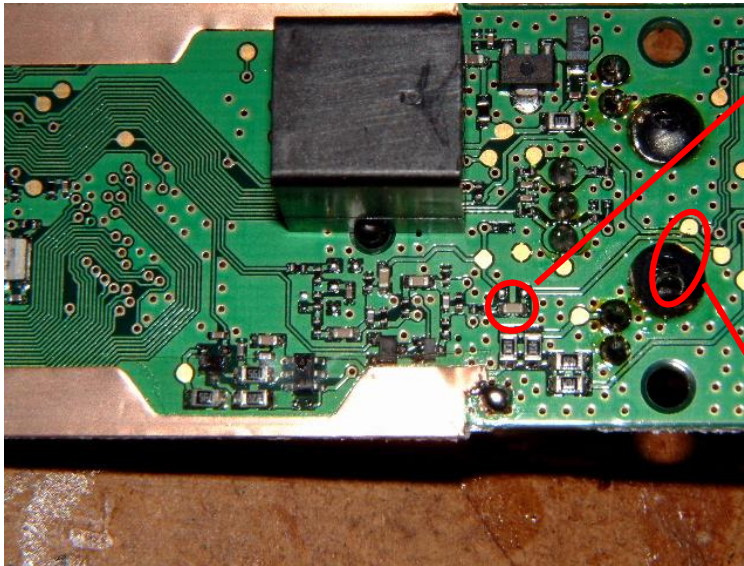
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Solder a **0,47 $\mu$ F** electrolyt capacitor **parallel C2062** (5,6nF) on the Panel-Unit.

This gives much more basses, volume and loudness. You now can't compare the modified rig to the original sound before !

- O +

Values can be between 100nF or 4,7 $\mu$ F, depending on the sound of your voice and your personal prefer. *Remark on 13.10.2002: Better use a 100nF type.*

Add a **10 $\mu$ F/16V** capacitor here to suppress RF problems by using the 9V line for voltage supply of a external microphone. Plus toward the thin line, minus to the big solder point.

+  
O  
-



Now it looks like this.

Reassemble the Panel-Unit.

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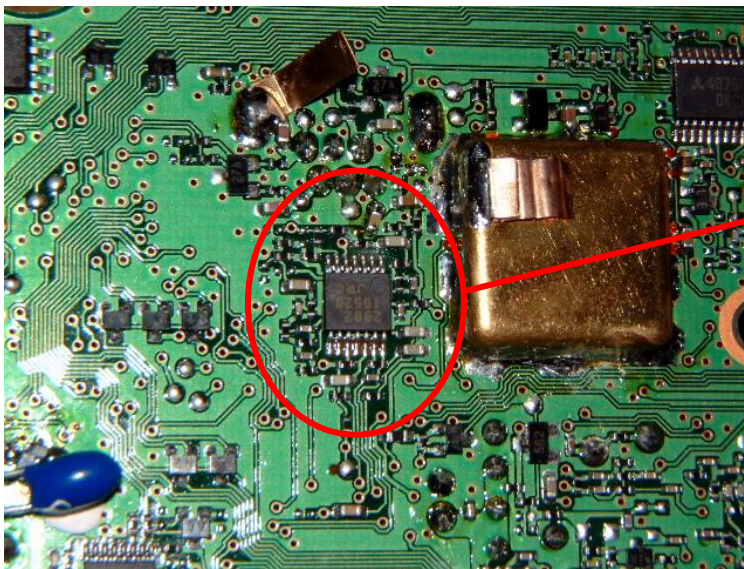
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For the optimum of sound clearance I opened the TX af lowpass filter.

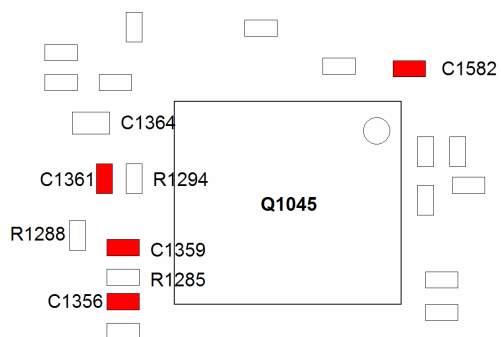
First you have to remove the Main-Unit.



So that's a very critical mod, cause the SMD parts are very, very small and near each other.

Be careful !!

Now have a closer look to this area.



locate:

- C1582
- C1361
- C1359
- C1356

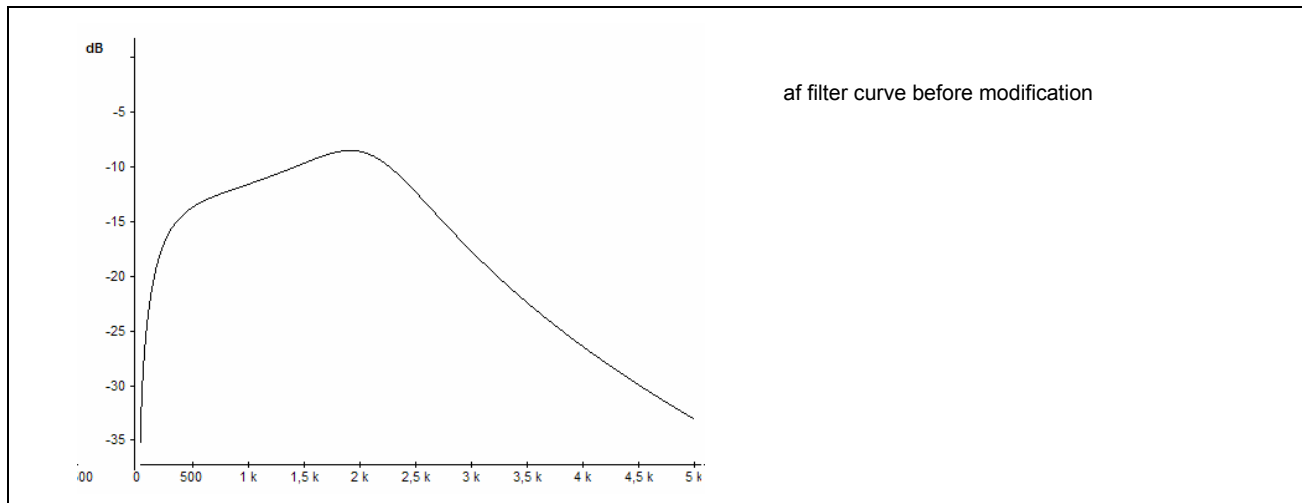
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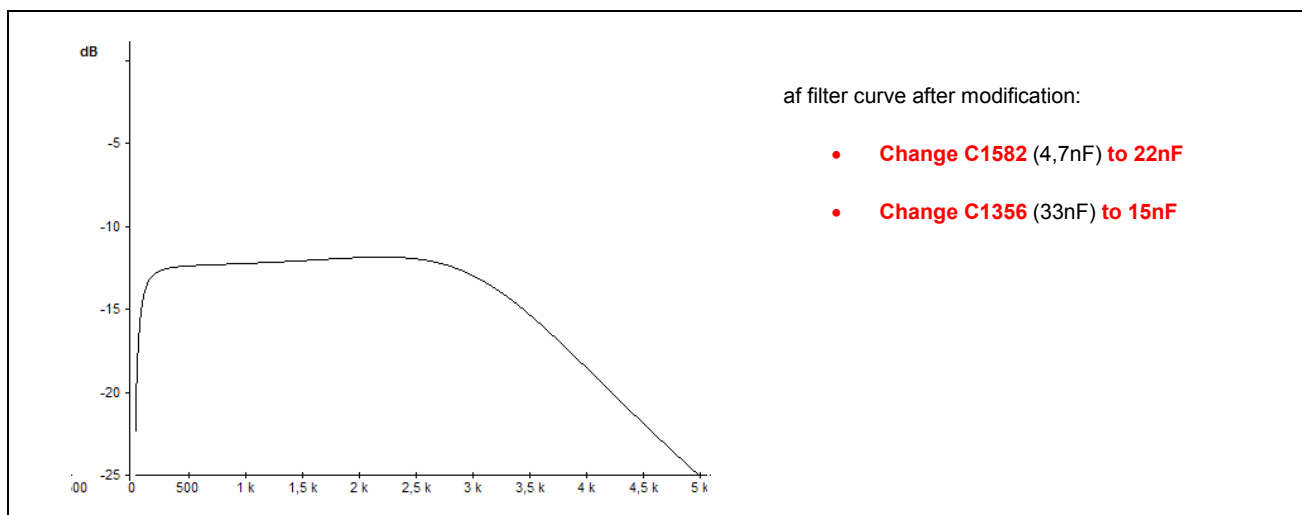
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*You have to check and maybe re-align the FM deviation after these mods !*

### Mod variety 1



# Modification Sheet

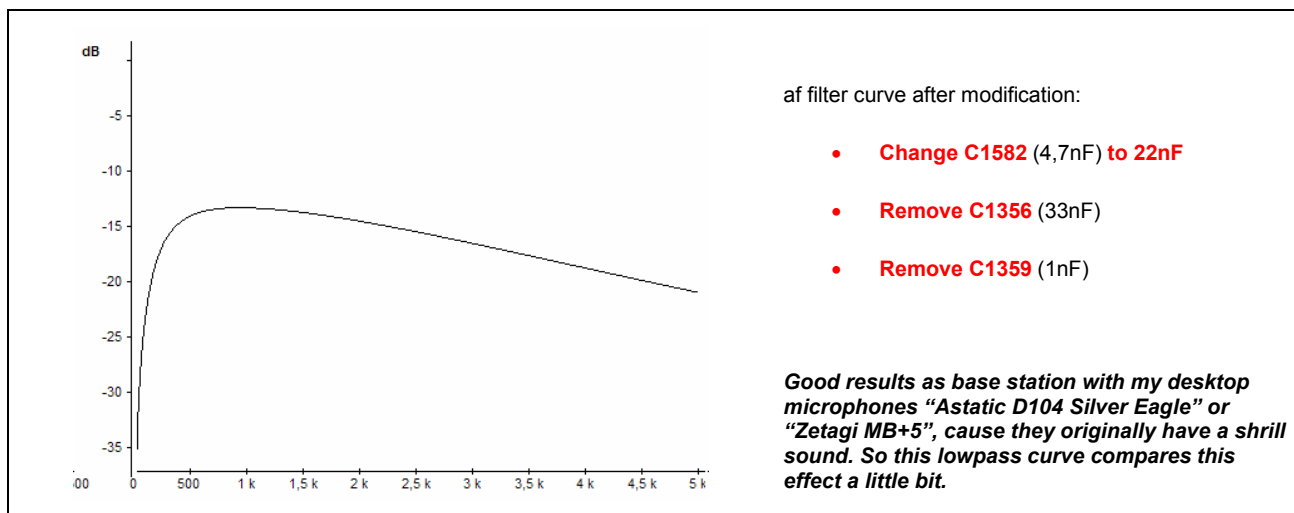
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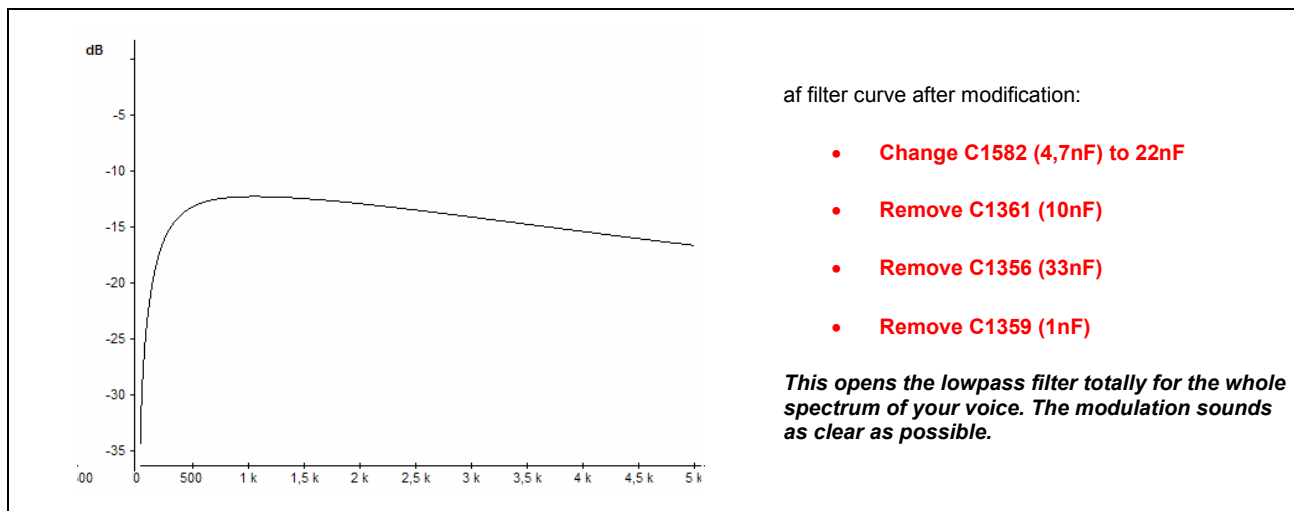
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## Mod variety 2



## Mod variety 3



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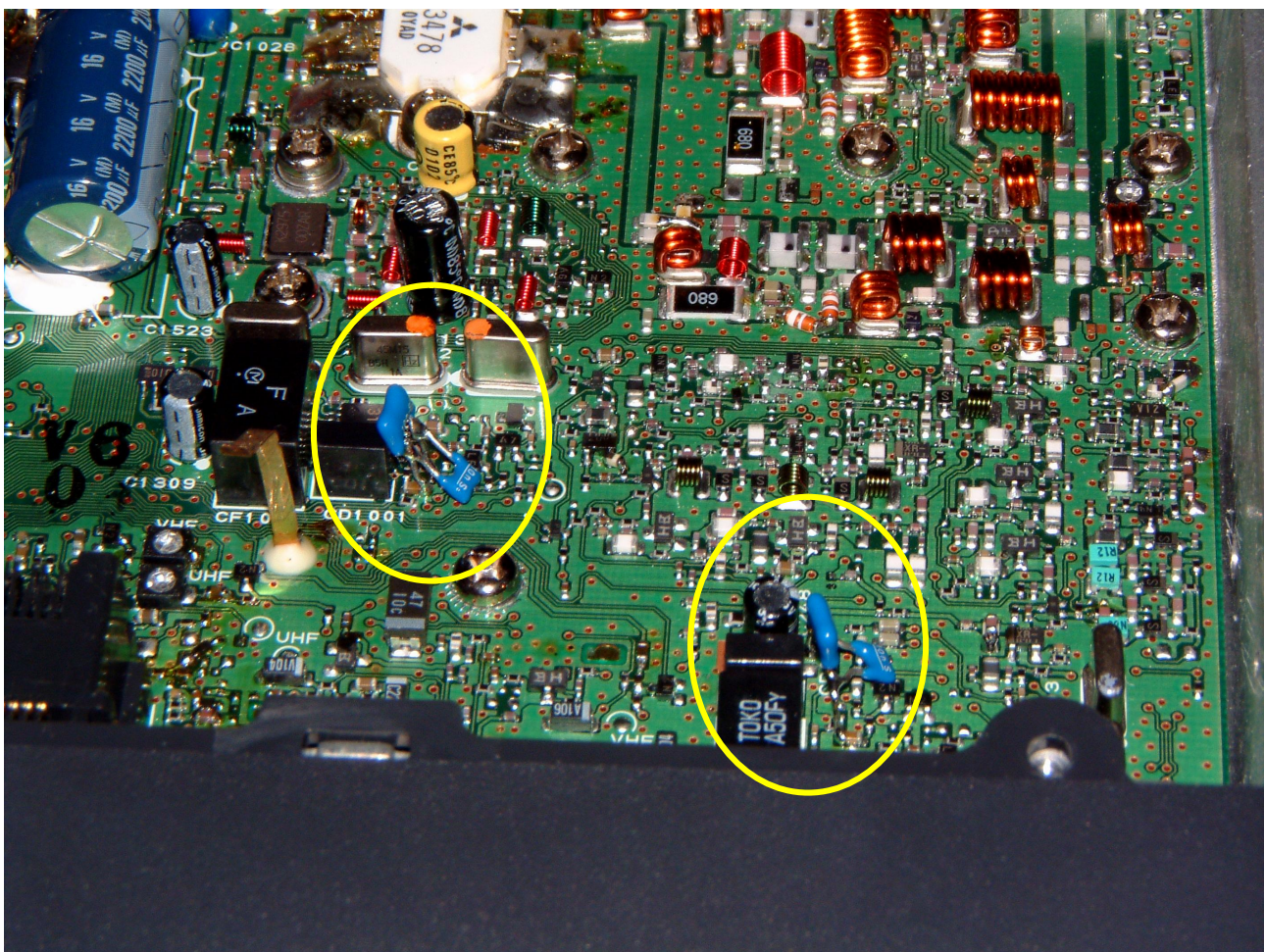
### Receiver

-- nothing to do, I'm satisfied with the sound and the volume --

or if you like to remove the darkness:

**Change C1333** (100nF) to **22nF** for VHF-RX

**Change C1277** (100nF) to **22nF** for UHF-RX



I first did some tests with 10 nF capacitors but the sound was too sharp and the heights were too shrill for me. And the FM noise is raising too, of course.

So finally my best results are with 22 nF capacitors which give a lowpass of about 1,5 kHz.

The original lowpass was down on about 500 Hz !!! It is compensated by highpasses which suppress the basses but the resulting "middle" sound wasn't satisfied for me. So I easily put a 10 nF capacitor parallel to each, therefore you can see 4 caps in the picture.

**With this modification you should get best results for mobile operations too** cause a clearer and brighter sound is much better to understand in loud vehicles than the original dark sounds. And the raised FM noise doesn't matter in the car and even not at home. On most times the squelch is closed anyway, so the better audio result is the only difference.

I did those RX mods to all my mobile transceivers or handhelds and have best RX audio results, even with dark modulations of the conversational partners or while driving fast on the German "Autobahn".



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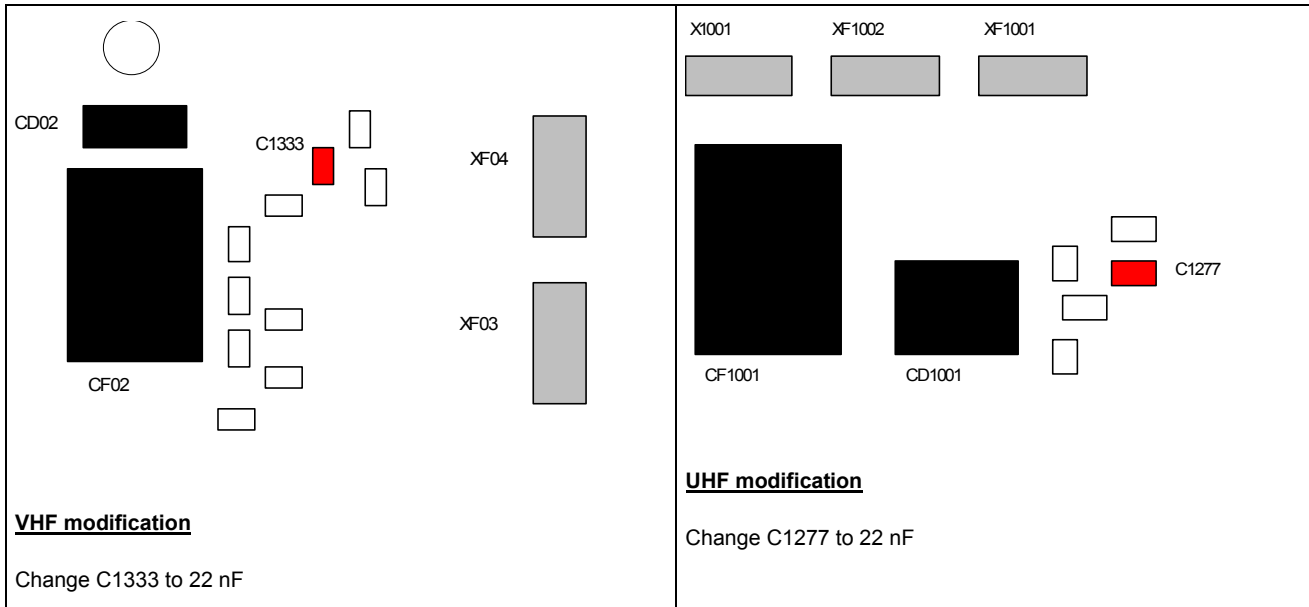
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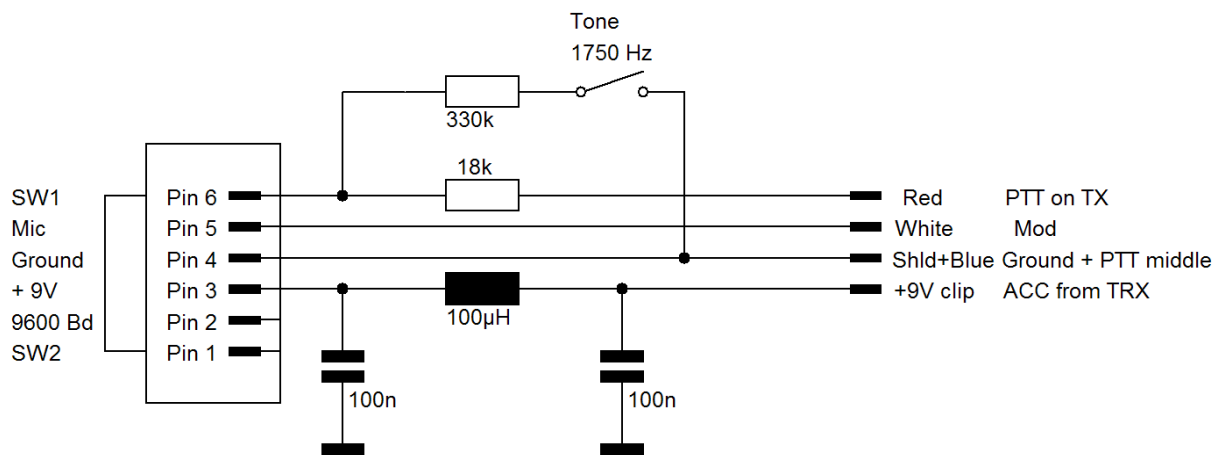
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## Astatic D-104 Silver Eagle base microphone

Mic socket  
Yaesu FT-7100

Astatic D-104  
Wires



I did some audio modifications to my D-104 to get the (originally lost) basses and to get a better audio on FM. Now I've got a loud crisp clear power modulation on VHF/UHF without any problems.

When I read all the negative articles about the FT-7100 on [www.eham.net](http://www.eham.net) those people wouldn't believe me that, hihi.

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## Alignment

VR1001	UHF deviation
VR1002	VHF deviation
VR1005	

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### Document History

Version 1.0	06.08.2002	My first hands-on experiences
Version 1.1	02.09.2002	Overworked TX af lowpass filter for better and clearer modulation. Add some diagnostic images of my used filter calculation program "Win-Elektronik 3.0" (from Erwin Rössler).
Version 1.2	13.10.2002	Change C2062 to parallel with only 100nF Not with 0,47µF Electrolyte like before in Version 1.1, cause of some growl, less and too dark modulation with the original handmike cause of a mismatch with the electret capsule of the original mike. But that was no problem with my Astatic D-104 base mike. It only happens with some types of microphones. Add a 10µF Elektrolyt between PIN 3 (+9V) and PIN 4 (Ground) of the mic socket. That suppresses some RF swinging by using the 9V line for the voltage supply of a microphone. I modified my Astatic D-104 Silver Eagle to get the 9V from the FT-7100 to save the internal battery and get the same maximum modulation output at any time of usage.
Version 1.3	26.01.2003	RX modifications for better audio and more heights. I mainly do this to get best audio results cause my FT-7100 now works as my Echolink linkstation too. You can connect me when I'm online: <b>DG2IAQ-L</b> node # <b>69306</b>

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### Disclaimer • Disclaimer of liability

This modifications mostly need to be done by a electronic profi 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: [dq2iaq@web.de](mailto:dq2iaq@web.de)

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### Remarks