

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 brand new 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 !

Used pix are mostly done with my Fujifilm „FinePix 6800 Zoom“ on resolution „6M/Normal“.
The pictures are reduced for this publication to 640 x 480 due to the file size of this publication.

The Astatic D-104 Silver Eagle desktop microphone has a very sharp sound due to its crystal microphone capsule and it has also a great preamp to get enough voice level into the transceiver. That gives you a great advantage for DX. Also the sharp modulation is heard better through the noise on your partners side.

But the mic doesn't sound well on all transceivers cause of their internal high-, low- or bandpass af filters. On most modern transceivers the modulation sound too much sharp or tiny cause of the lost basses.

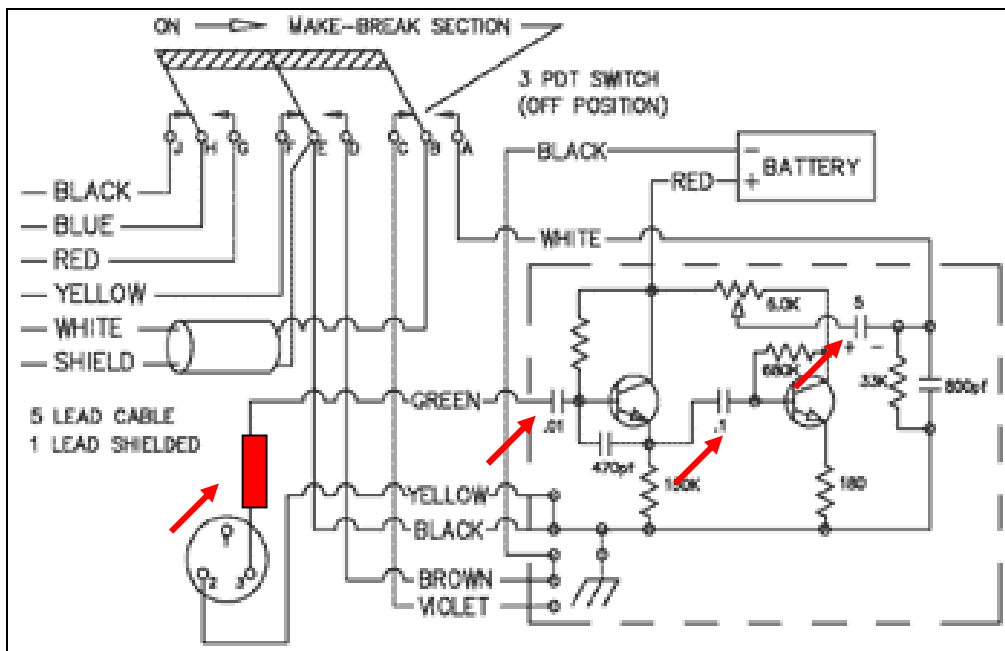
So in according to other HAM's modification I found out my best results by doing this:

- [Put 3 holes with a needle in the front of the capsule](#)
- [Change 3 capacitors](#) of the internal preamp
- [Add a resistor in the preamp input](#)
in the green line which is coming from the capsule and is going to the input of the preamp
- On some transceivers it's possible to [shorten the "Mic Line" of the PTT switch](#) to suppress contact losses on old or dirty PTT contacts. This eliminates the scratch sound on your transmission.
- On some transceivers you can [use the + 9V line of the mic socket to supply the D-104](#) and to save the 9V battery for future. That also gives the same audio output and sound all the time cause the 9V don't get down (like on used 9V batteries).
I did this on my Yaesu FT-7100 for VHF/UHF and it also works on my Kenwood TS-570D(G).

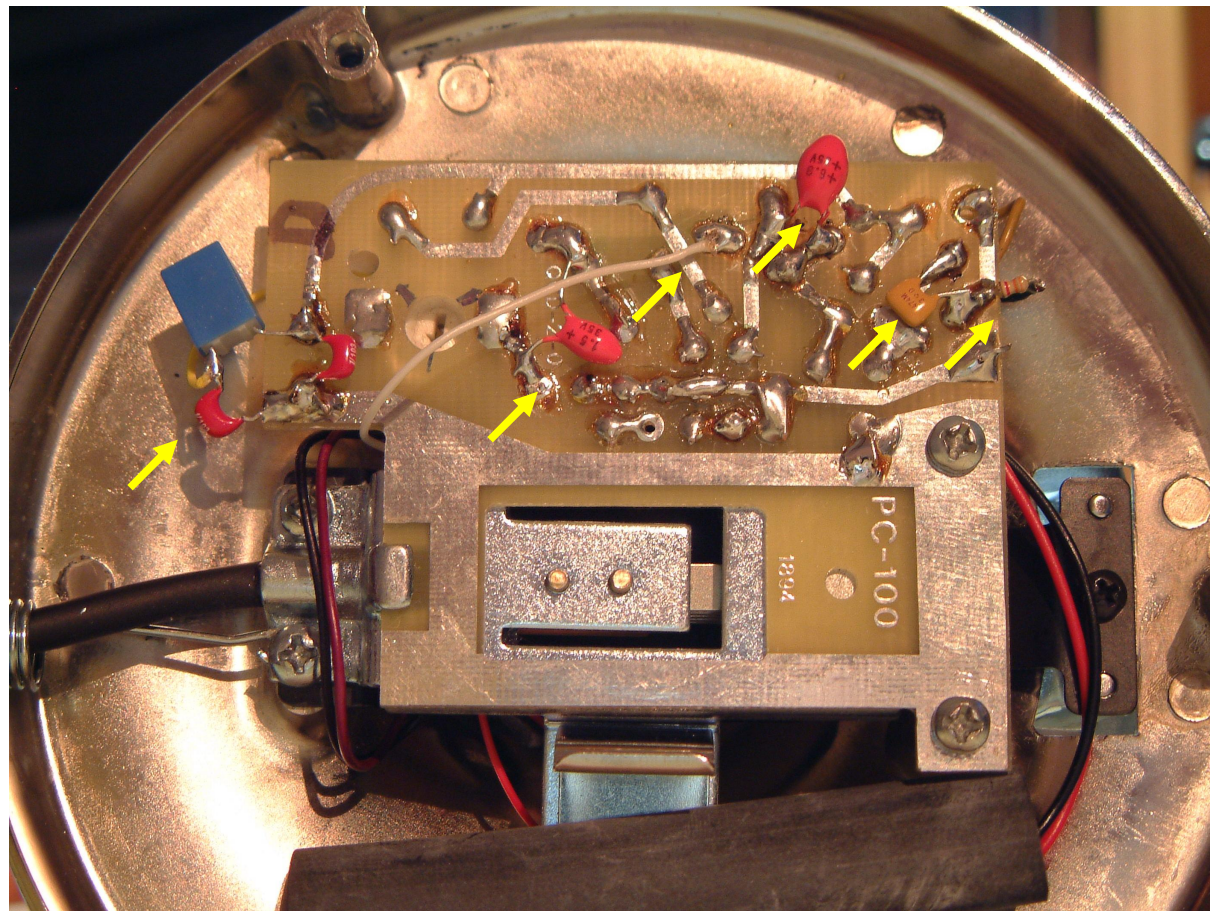
These mods will give you a very powerful crisp clear modulation with additional basses and the D-104 should work with all transceivers very well.

But it surely depends on their build in af filters. You can't get a superb modulation when the TRX doesn't sound good as well.

Schematic



...and modifications:



Modifications

(from left to right on the circuit diagram, not on the picture of the bottom side !!!)

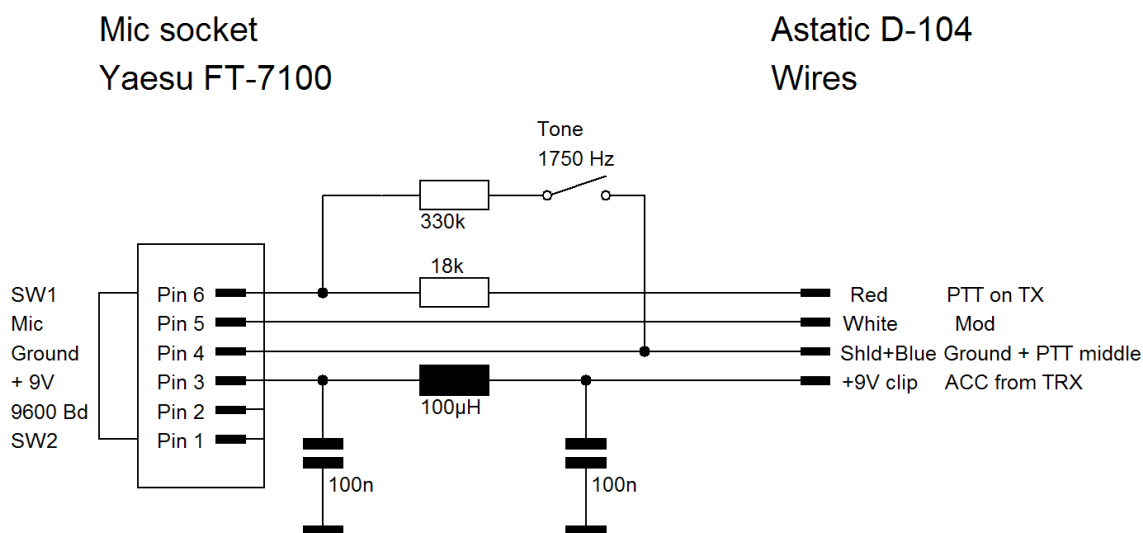
1. Add a **33 kOhm resistor** in the green line which is coming from the capsule to the preamp input.
2. Change the 10 nF capacitor to **220 nF** (ceramic type, no electrolyt type !!!)
3. Change the 100 nF capacitor to **4,7 – 6,8 µF/25V**, electrolyt type
4. Change the 5 µF capacitor to **1,5 µF/25V**, electrolyt type
5. For ACC supply from the TRX add a **100 µH coil** and **two 100 nF capacitors** to the pcb line where the +9V (red) line of the 9V clip goes to. You can see the necessary circuit in the "Connection to my Yaesu FT-7100" below.

Remove the 9V clip or isolate it !!

On the left side of the coil you see the yellow cable which I removed from the PTT switch. I use it now for the ACC support.

This mod couldn't work with transceivers when their RX audio line is also connected via the PTT (on RX position). You'll get audio regenerations cause the mic is also supplied and the mic preamp is working on RX position ! And you can't do mod no. 6.

6. You also see the white audio wire which is coming directly from the winding cable (to the TRX). So I bypassed the audio PTT and I never had any problems with old and scratching PTT switches on the audio side.

Connection to my Yaesu FT-7100

The "Mic socket" is seen from its front. So if you look toward the mic socket of the FT-7100.

Modifications for even more basses and warmer sound



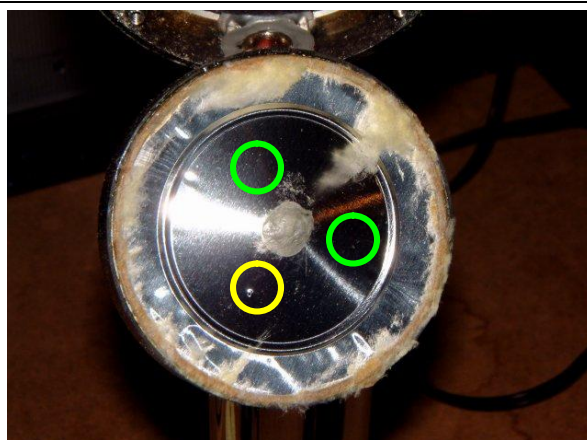
Open the mic head on the 4 screws **of the back-side !!** Most people try to open the mic on the frontside (what normally would be the only logical thing), but you damage the screw-sockets !



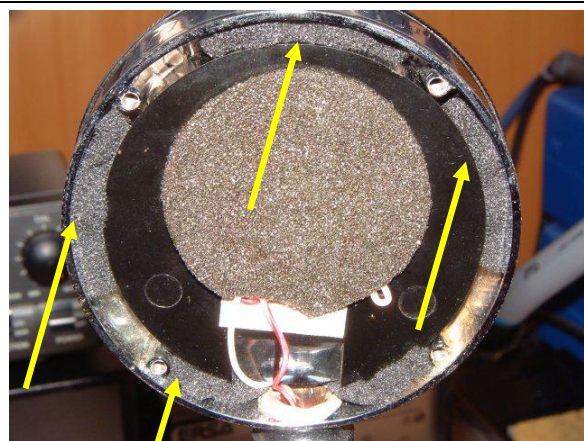
Remove the yellow foam (..and throw it away..). You don't need it in the future.



Now the mic capsule can be seen. You can also see 1 very small hole in the front of the capsule (in the picture on the lower left corner).



The mic capsule normally has 1 hole. Put 2 new holes with a needle in the mic capsule carefully.



Reassemble the capsule. I put some pieces of foam around the capsule to suppress mechanical swing (when you move the mic while transmitting).

Remark !!!

If you would like to check the enhancements of the capsule mod you always have to reassemble and close the mic head !!

The audio characteristic of the opened head is totally different to the real sound when the head is closed.

So as I discovered the mod I did it step by step and always reassembled the head between each step.

1. remove the yellow foam
2. one additional hole
3. the second additional hole

If you're satisfied with the sound on your TRX you haven't to do all 3 steps. Stop if it's OK.

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 !**

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