

When properly aligned the stock DF4ZS RF SpeechProcessor is a great improvement. Mainly used for the nice Yaesu FT-817, ..like on mine.

But I wasn't satisfied with the very high sounding audio characteristics. I read a lot about speech compressing and speech processing before and normally the basses are reduced to prevent harmonics, distortions and intermodulation. A real RF speechprocessor produces a "sharp and metallic sound" and you can hear it on the air.

So what improvements ?

On a "real" RF speechprocessor the clipping is done on the "RF" side to prevent these disadvantages. So for my idea the harmonics of a "whole human audio range" should be outside and therefore filtered too.

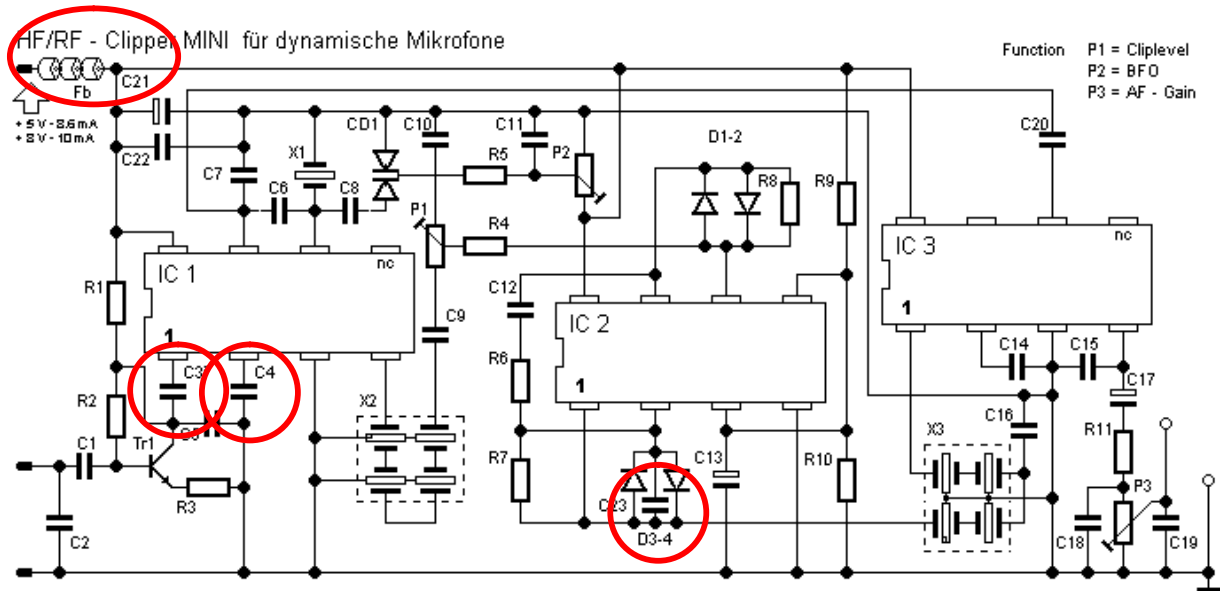
As I did some tests I found out some improvements for the very great DF4ZS RF SpeechProcessor:

- **C4** (100nF) → **1µF** tantalum electrolyt
- **C3** (100nF) → **1µF** tantalum electrolyt
- **47 – 100pF** SMD **parallel to R7/D3-4**
- For hard RFI environments or rubber antennas you might **use some ferrit breads in the +5V line**

The both tantalum can be soldered parallel to the existing C3 and C4 and this modification sets the original AF highpass filter of the NE612 input **from about 1.060 Hz down to about 100 Hz**. You have to change both capacitors, not only C4 on the input pin of IC1 !

The additional 47pF (up to 100pF) parallel to R7/D3-4 has a RF lowpass function and reduces the high noiselevel of the 1N4148 clipping diodes drastically. The background noise gets more less and the audio S/N-ratio is raising drastically. As it works on the RF side (455 kHz) it only reduces the total clipping level a little bit, which can be compensated by turning P1 (Clip) clockwise, but it has no change in the audio range or characteristic ! Joachim Münch, DF4ZS, has done this in some later productions too. The audio range is limited by an AF lowpass of R11/C18 on the output side of the second NE612 (IC3).

Now you get the whole audio range from 100 Hz – 8.800 Hz.



C3: Pluspole of 1 μ F to R1/R2, Minuspole to Pin1 IC1

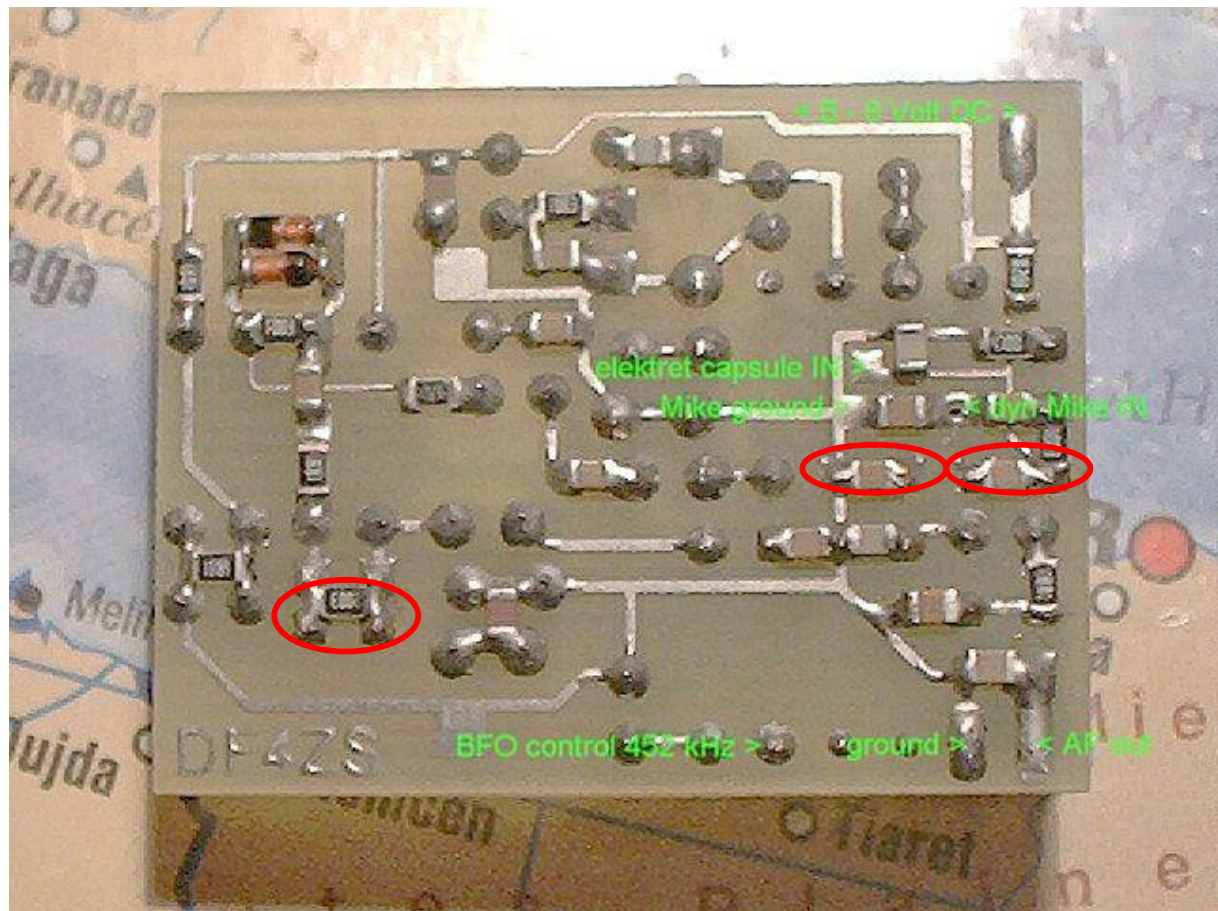
C4: Pluspole of 1 μ F to Pin2 IC1, Minuspole to ground

On some older productions the numbers of the parts of the schematic might be different !
I've got a very early board and C3 is C4 on mine, C4 is C3 on mine, and R7/D3-4 is R4/D2 on mine.

Please verify the correct parts and their position on the PCB with Y O U R version.

Improvements of DF4ZS RF SpeechProcessor

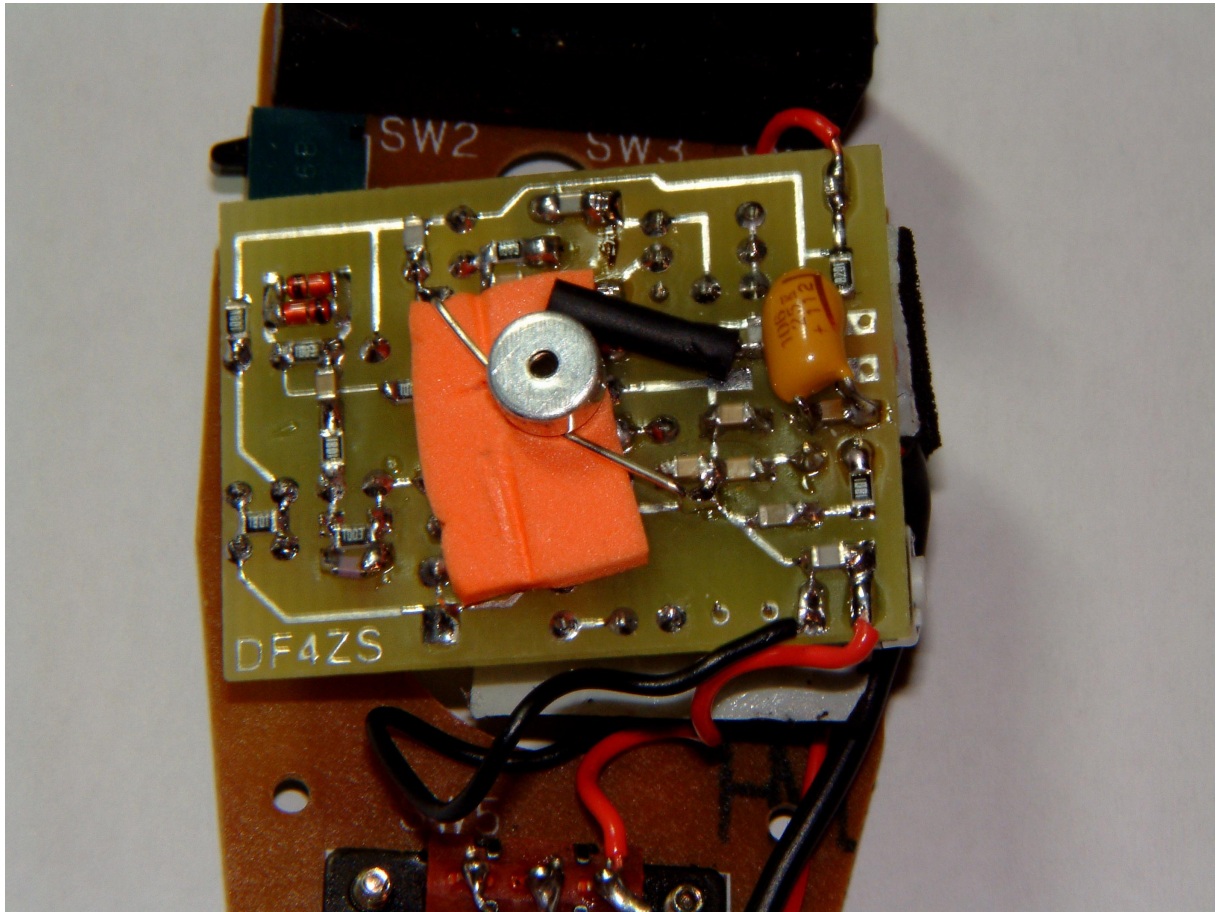
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47pF – 100pF
parallel to resistor (100k)

- + - +
C4 C3

Here you can see the mod of R7/D3-4 and C3 on my module (C4 was done afterwards).



For my first tests I was using a SMD capacitor on the left side (the violet one), and a 10 μ F tantalum parallel to C3.

Alignment:



Pots	My recommended alignment	Full clockwise (Turn to right end)	Full anti-clockwise (Turn to left end)
BFO (<> 500Hz)	Center (50%) ~ 452,3 kHz	Sounds higher = 452,1 kHz	Sounds more bassy = 452,6 kHz
Cliplevel	Center (50 – 60%) or Maximum (100%) when doing the R7/D3-4 capacitor mod too	More clipping	Less clipping
AF Gain	~10 – 20%	No audio	Full audio output

Depending on the menu settings or alignment of your rig the stock DF4ZS module might come with a very, very conservative pre-setting. You only might hear a change in the audio characteristics but maybe you won't hear a great volume or clipping improvement.

I did the alignment only by monitoring my FT-817 with my FT-847 and headphones, and additionally by saving some WAV files of this.

For the more accurate alignment you must use an AF generator and an oscilloscope.

Referring to the homepage of the designer Joachim Münch, DF4ZS:

<http://www.iwm.de>

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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