

This circuit will work with either a Electret or dynamic microphone. For the Electret microphone, TR1 can be omitted and the microphone is connected as in the circuit. For the Dynamic microphone, you would need TR1 for extra amplification.

The audio signal is fed to one of U1 (SA612) inputs and is modulated with the 455KHz oscillator frequency. The double sideband signal is passed to a Ceramic filter (F1) to filter out one of the side bands and also some carrier that might still leak out of the SA612. The output of the filter F1 is passed on to U2 (LM833) which task is to clip the RF signal set by the Clip level trim pot (T2).

The output of the two clipping OpAmps is passed on to the Ceramic Filter F2 & F3. These two Filters filter out all the harmonics generated by the clipping circuits and only leaves the desired sideband to reach U3 (SA612) where it is de-modulated similar to the function of the BFO and de-modulator circuit in the HF radio receiver to resolve SSB or CW. U3 receives it's "BFO" frequency from U1 and this insures that the demodulation of the SSB signal is perfectly matched.

The resolved audio is connected to the audio level trim pot (T3). This allows you to set the audio level out of the processor to match your TX microphone input. RF is decoupled to ground with C13.

To setup the Speech Processor:

When the audio sound "metallic" with processor, the clip level is turned to high. Here is an easy way how to tune the processor. Bypass the processor and talk into the microphone with a normal voice. Watch the ALC level and tune this as described in the handbook of your radio. You can also watch the power meter till it shows peaks.

Locate the audio output trim pot (T3) and tune it exactly to 3 o'clock. Locate the clip level trim pot (T2) and tune this completely to the left. Watch your SWR meter or Power-meter by speaking with normal voice into the mike and tuning the trim pot ccw to the right. It is tuned properly when the needle just shows max power out. You can also watch the ALC level.

The technical way:

Locate the diodes side which is soldered to PIN 1 of the LM833N (U2) and connect the scope probe to pin 1. Talk into the mike in a normal voice by not!!!! pushing the PTT switch on the mic, but still connected to the rig. The processor uses the +5V supplied by the FT-897D on the microphone cable. Tune the clip level trim pot (T2) as described before and watch the scope. Stop adjustment when the scope just shows clipping. You see this at the flattop of the sinus-wave (just around 300 mV pp).

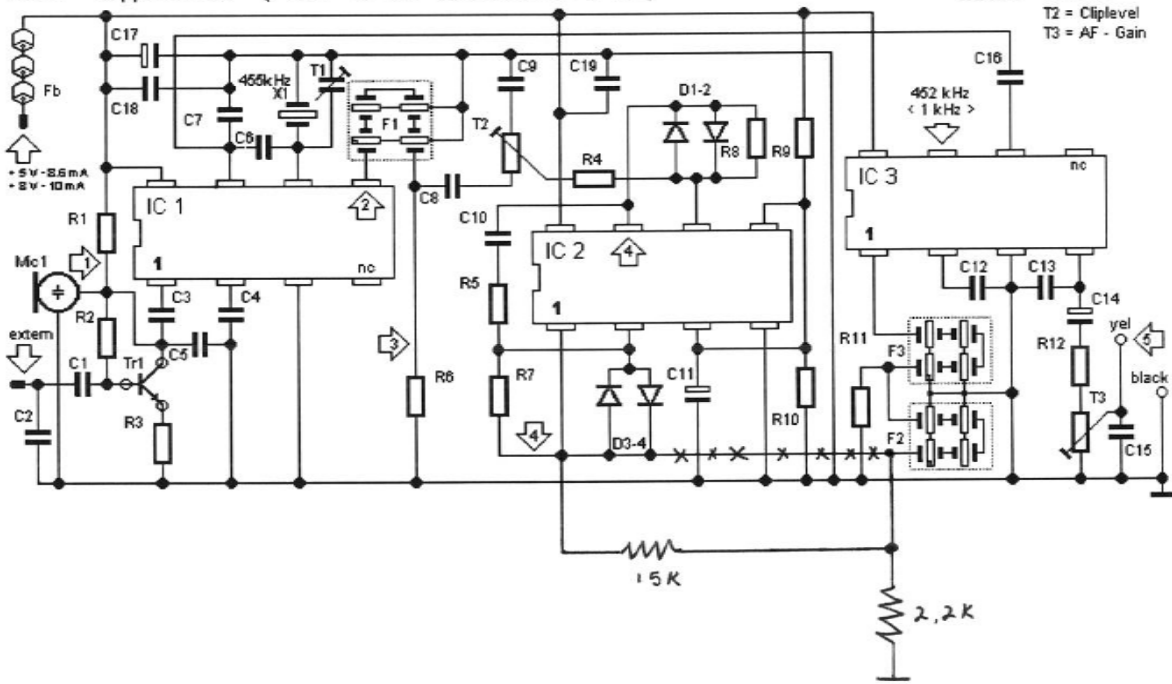
That's it.... The Module is tuned to prefer high tone audio. If you want to change this you can do it by tuning T1 (Trim capacitor).

There is plenty of space to add a small 5V power supply. In my case, the space is empty as the FT-897D has 5V available on the microphone cable. The microphone and radio connections can be replaced with the type of connectors used on your specific radio. In my case, the 897 uses RJ45 connectors.

I have to mention some changes I did to the circuit. R8 is changed to a 22K resistor. This was done to reduce the amplification of U2b. I added the 15K and 2.2K resistors as in the circuit (between F2 and pin 1 of U2), to lower the RF level entering U3. I found that U3 was overdriven and caused the audio to sound horrible. These changes cleaned up the audio signal out processor.

This circuit was originally designed by *Joachim Münch DF4ZS*

HF/RF - Clipper Mini3V (FT-817 - 5 Volt - other RIGs 5 - 8 Volt)



Function
 T1 = Pitch
 T2 = Cliplevel
 T3 = AF - Gain

Quant	Label-Value	Designation(s)
2	100K	R2 R7
1	22K	R 8
1	15K	R 14
1	8.2K	R 1
1	4.7K	R 4
6	2.2K	R10 R11 R15 R5 R6 R9
1	1.2K	R 13
1	1K	R 12
1	470R	R 3
1	10K Single turn Horizontal Mount	T2
1	1K Single turn Horizontal Mount	T3
1	10uF 16V	C14
2	2.2uF 16V	C11 C17
7	100nF Disc Ceramic	C1 C10 C12 C3 C4 C8
1	10nF Disc Ceramic	C9
1	10nF Disc Ceramic	C13
6	1nF Disc Ceramic	C15 C16 C18 C19 C2
2	330pF Disc Ceramic	C5
1	60pF Variable	C6 C7
1	60pF Variable	T1
2	BAT85	D3 D4
2	1N4148	D1 D2
1	455KHz	X1
2	SA612	U1 U3
1	LM833	U2
3	455 KHz Filter (±3KHz B/W)	F1 F2 F3

1	BC547	Q1
1	450uH (+ Supply Rail)	L1