GENERAL

Model 715 RF Speech Processor is a high performance true RF-type speech processor designed to operate with most modern HF Amateur Radio transceivers. RF speech processing is a superior system to traditional AF clipping, AF compression, or RF compression found in a typical HF transceiver for achieving the highest ratio of average-to-peak power from an SSB transmitter.

The purpose of a speech processor is to increase the readability of your signal at the other end of a QSO. Speech processors do not increase peak power; they increase average power output. An up to 6 dB increase in average power output in SSB service can be achieved with the proper use of this device. This can mean the difference between a signal buried under band noise or an intelligible, copyable signal.

The clipping function of the RF speech processor removes low energy, high amplitude peaks which do not contribute to articulation while leaving lower level speech components unaltered.

Model 715 mixes an input audio signal from the microphone with a local oscillator to output a 455 kHz DSB suppressed carrier signal. Filters remove the opposite sideband. The resulting signal is amplified and clipped, generating harmonic distortion and intermodulation distortion. The harmonics are removed by a clean-up filter. This is unlike an AF clipper where it is not possible to remove or change either harmonic distortion or intermodulation distortion. Of the two, harmonic distortion tends to be more “grating” than IM distortion. The resulting amplified and clipped 455 kHz SSB signal is then converted back to audio for output to the transceiver.

Unlike conventional clipper or compressor systems which use a single level control to determine output characteristics, the model 715 provides the capability to tailor the low frequency response of the system for optimum processor punch.

PACKING KIT

Included with your model 715 RF Speech Processor are the following items:

#21195 - 110 VAC wall transformer
#74425 - Instruction manual
#74430 - W6JES January 1969 QST article

SPECIFICATIONS

Power requirements: 12-20 VDC
Microphone Input Impedance: Max 50k ohms.
Microphone Input Sensitivity: 1 mv or greater
Polarizing Voltage: +9 VDC at input pin 2
Low Freq Response: With passband control centered, -3 dB @ 800 Hz. Max low frequency with passband control full clockwise, -3 db at 450 Hz. Minimum with control full counterclockwise -3 dB @ 1300 Hz. All specified without clipping. Low frequency response will vary with the amount of clipping added.
High Frequency Response: -3 dB @ 4500 Hz.

Clipping: Max 15 dB as indicated by bargraph.

INSTALLATION

Model 715 is installed in-line between the microphone and the input of the transmitter. The front panel is equipped with dual microphone inputs. The conventional 8 pin mic connector is wired the same as Ten-Tec HF transceivers and can accept input from a similar wired microphones (Yaesu microphones utilize the same mic pin-out). See Figure 1-1.

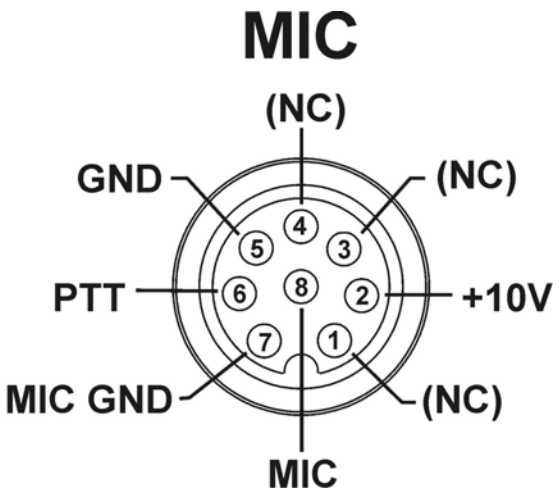


Figure 1-1. Mic wiring, model 715, front view.

The secondary mic input is a 1/8" mono connector as used by popular headset/microphone combinations like those manufactured by Heil Sound.

The output connection to the transceiver is via a ¼" stereo connector that is wired via a cable to an 8 pin microphone connector. Cables are available wired for the 4 pin Ten-Tec connector, 8 pin Ten-Tec connector (also used by Yaesu), Icom, and Kenwood (also used by Elecraft) transceivers. Connect the male end of the ¼" stereo plug to model 715 and the opposite 8-pin connector end to your transceiver mic jack.

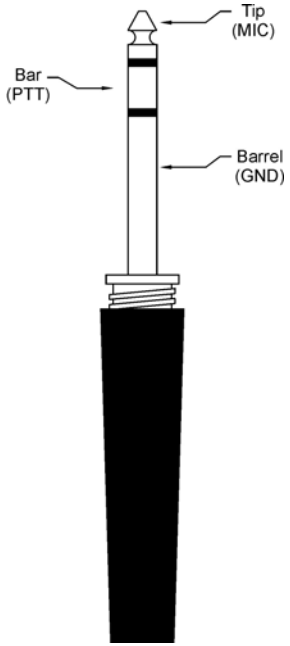


Figure 1-2. Plug wiring, 1/4" output jack for connection to transceiver.

Please note that the output connection on model 715 only provides MIC, GND, and signal. If you have connected a microphone to the input that includes UP/DOWN frequency controls or other features, they will not be operable when model 715 is connected to your transceivers' mic jack.

Connect the supplied DC transformer to the 12-20 VDC jack on the rear panel of the unit. Plug the opposite end into a 110 VAC source. We recommend the use of this "wall wart" to power the unit as opposed to your transceiver and accessory DC source as every installation is unique and this can help prevent possible problems with ground loops introducing distortion into your transmitted audio.

USE

When all connections have been made, set the IN/OUT button on the front to OUT. When set to OUT, mic audio is bypassed directly through the unit, unprocessed, to the input of the transceiver.

When using the processor, it is convenient to have both the unprocessed and the processed signal level equal at the transceiver microphone input. This will allow you to turn on and turn off the processor without readjusting the gain on your transceiver. The processor will allow you to adjust equal outputs on microphones, or amplified microphones, with an output from approximately 1mv to 14mv. If your microphone has a greater output than 14mv, then it will not be possible to adjust the processed output to equal the unprocessed microphone output as described in steps 1 through 3 below. If you are not able to adjust the processor output to drive the transmitter into ALC, back off from the microphone and increase the microphone gain in the transceiver.

1) With the IN/OUT button set to OUT, speak into your microphone and adjust the mic gain control on your transceiver to the typical operation level.

2) Press the IN/OUT button to IN. Speak into the microphone and adjust the PROC GAIN control on the front until some clipping is observed on the LED bargraph. 1, 2 or 3 bars lit is enough for this initial setting.

3) Adjust the rear panel PROC LEVEL control while speaking into the microphone until the mic gain or ALC level set on your transceiver is approximately equivalent to the one set in step 1.

4) Adjust the front panel PROC GAIN and PASSBAND controls for best results.

'Best results' can generally be accomplished by having another station on the air listen to your transmitted SSB audio while the processor is in use. Keep in mind that the goal of the processor is to increase average SSB output power for a louder, more readable signal on the receiving end rather than vastly improved audio fidelity.

Some transceivers like the Orion and Orion II provide a monitor for actual transmitted audio signal; this can also be useful for adjustments for best results using model 715.

PROC GAIN controls the clipping level of high amplitude, low energy voice peaks. Depth of clipping is indicated on the 5 LED bargraph scale, measured in dB.

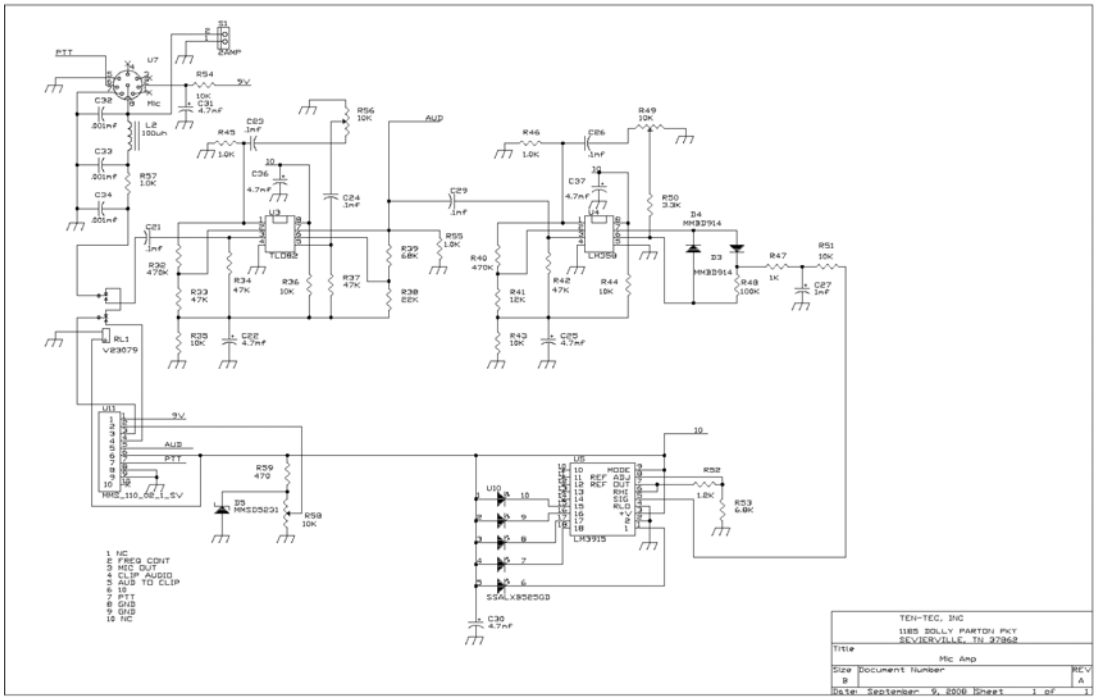
The PASSBAND control on model 715 is unique. This control permits a precise setting of the beat frequency oscillator

in relation to the ceramic filters used for SSB generation and distortion elimination. In more general terms, this allows for more or less bass response from audio when the processor is clipping. The result is the ability to best tailor the total response of the transmitting system so your audio will sound most like your natural voice. The optimum setting for this control is best determined by having another station listen to your audio and listening to IN/OUT comparisons when the processor is taken in and out of line. Turning the PASSBAND control clockwise results in more bass response; counter-clockwise for less bass response. The PASSBAND control has no effect on the amount of clipping. Amount of clipping is determined with the PROC GAIN control.

NOTES

You may find the article "Ordinary And Processed Speech In S.S.B. Application" written by Harold G. Collins, W6JES, in the January 1969 QST magazine to be instructive about the basic theory and use of RF speech processing. A copy of this article is provided packed separately from this manual with your speech processor.

Part # 74425
Revision 1
January 2009



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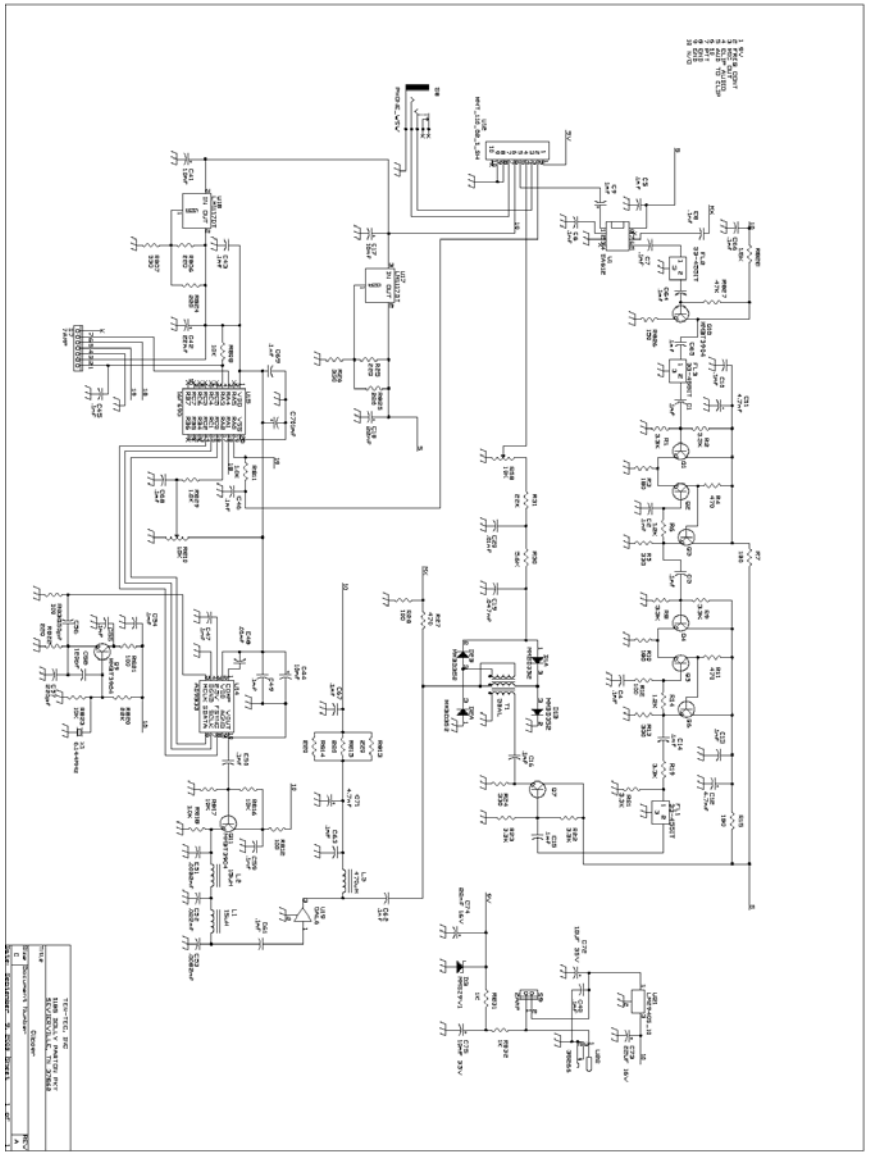

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