



# AP-50 Audio Processor

## Rev. C

### Specifications:

Power Source	+ 11 to 16 VDC at 8 mA.
Low Pass Filter Cutoff Frequency ( $F_c$ )	2500 to 5500 Hz.
Frequency Response (50 Hz - 90% $F_c$ )	+/- .25 dB typical
Minimum Audio Input Level	200 mV. P - P
Audio Input Impedance	Approx. 10K Ohm
Maximum Audio Output Level	Approx. 8V. P - P
Audio Output Impedance	Approx. 100 Ohms
LPF Roll Off	-30 dB at 144% $F_c$

### Hookup:

The Pinout of the 5 pin header is listed below. Pin 1 is marked in the silk-screen on the circuit board; it is closest to the center of the circuit board.

Pin	Function
1	Audio Input
2	Audio Output
3	Sub Audible Tone Input
4	Constant Supply Voltage (+12v)
5	Ground

**Note:** It is important that a constant source of power is used to power the board.

### Board Setup:

Place the audio jumpers in their appropriate locations as determined by the type and amount of audio being used as described below.

#### Output Jumpers:

- SJ4 – Normal – Provides approximately 3V P-P of audio output
- SJ5 – Normal w/Gain – Provides up to 8V P-P of audio output
- SJ6 – De-emph.

The normal type audio output described above describes audio that is ready to feed directly to a modulator diode. De-emphasized type audio is used when driving a radio's microphone input or a phase modulated exciter.

#### Input Jumpers:

- SJ1 – Normal – For Discriminator audio levels of 500mV P-P and greater
- SJ2 – Sensitive – Adds 8dB of gain to the normal position
- SJ3 – Pre-emph. – Requires at least 1V P-P. This input is needed if discriminator audio is **NOT** available from the radio set.

## **Audio Setup:**

### To set the rolloff frequency:

Using an audio generator, generate a 1 KHz tone into the unit and set the output pot to a level below where clipping occurs. Note the output level. Set the audio frequency of the generator to your selected  $F_c$ . While monitoring the output level on an oscilloscope, set the frequency potentiometer so the output at your  $F_c$  is  $\frac{1}{2}$  the level it was at 1 KHz. For instance, if your output level at 1KHz was 2Vp-p, then the level at your  $F_c$  should be 1Vp-p.

With the frequency pot set for mid-range,  $F_c$  is approximately 3.3 KHz. This is a good starting place for most repeaters.  $F_c$  can be increased to 4-5 KHz for links, voters, etc. Close spaced repeaters (15 KHz 2M pairs) could be limited to 2.5 KHz and still sound acceptable.

### To set the processing (clipping) level:

Use the audio input pot to set the amount of clipping by watching the output on a scope. Frequencies below  $F_c$  should be used to do this. Remember, enough audio needs to be delivered to the board to achieve clipping if desired. Set the pot to show desired amount of clipping of the peaks. More clipping results in audio with more punch at the compromise of more distortion and background noise. Usually some clipping is desired. If you are using this board for voting applications where multiple hops are encountered, clipping should not be used. The setting of this pot is based on the same concept as any other Mic Gain control.

### To set the deviation control:

Set this pot to the desired amount of deviation of the transmitted signal with an input audio signal that is being clipped. The setting of this control is based on the same concept as any other Deviation or IDC control.



