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Application Note: K1 QSK Improvement in High QRM Situations

Date: March 26, 2001

Background:

Some K1 users have reported audible artifacts ("thump") during break-in keying when moderate-to-strong signals are present in the receive passband. This is not a problem in normal QSOs, since presumably you're the only station transmitting. It's more likely when there's heavy QRM inside the filter bandwidth, such as during contests. The audible artifacts are only noticeable if you use headphones with good bass response. If you use less-sensitive headphones, or the speaker, you may not notice the effect at all.

This application note describes a simple modification that reduces "thump" significantly, by 10-20 dB, under high-QRM transceive conditions.

Changes Required:

You'll need a **resistor of 150-270 ohms (nominal: 220)** and a miniature electrolytic **cap of 15-50 uF (nominal: 22)**. Values are not critical.

The two parts will be attached on the bottom of the RF board in the vicinity of Q11 (muting transistor). Use very short leads.

1. Connect the (-) lead of the cap to ground; the nearest available ground pad is the (-) lead of C10 (220 uF).
2. Connect the (+) lead of the cap to one end of the 220-ohm resistor.
3. Connect the other end of the resistor to the drain lead of Q11. This lead also connects to C68 and C73.

Technical details:

This modification eliminates DC level changes at the input to the LM380 AF amp that are caused by keying of the mute transistor, Q11 (J309). It is these level changes that are perceived as low-frequency artifacts when using headphones with good low-frequency sensitivity. The "thump" is most noticeable when a strong received signal is present, because the DC shift amplitude-modulates the received audio.

On power-up, the added capacitor charges up to the DC voltage that's present at pin 5 of the LM386 (U3). From then on, the cap impedes any DC shift at the drain of Q11 that might

normally occur during keying of the gate. The resistor is needed to prevent the capacitor from attenuating the audio signal.