

## The "Not So Scratchy" Apache

by

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Back in late May of 1959, I made my very first contact as a novice using an Apache transmitter. Now, before anyone starts thinking about over power and VFO operation, let me say that this was K9BPV's (ex W2ZSK) Apache and he plugged in a crystal for the 40 meter novice band and cut the power back to 75 watts input (the requirements at that time). Using his S20R (highly modified) as the receiver, I was able to work KN9SPO, who lived one state over (he was in Illinois and I was in Indiana).

From that day on, I always wanted an Apache. The closest that I got for years was my second primary station (original novice station was a Globe Chief 90A and Hallicrafters S-107) which included the Apache's older brother, the DX-100, that I obtained in early 1960.

Well, a few weeks ago, I suddenly became "Apache poor"! I obtained two Apache(s) for doing some repair work for a local amateur, then, another one (along with the Mohawk that I was really after) in a trade "deal".

After redoing the first two, I put one of them on the air. Reports from stations that I worked on 75 meters (and who were not local) said that the audio sounded "OK". Then, I worked a friend of mine. He asked if I were going through puberty again! The audio sounded fine, but certainly did not sound like me. Although I definitely have a higher pitched voice than many, the "scratchy" Apache was taking it much higher.

Well, I "pulled" the book and took a look at the schematic. Also, my friend sent me E-Mails with all sorts of sites on the Internet that talked about modifications for the Apache audio. After taking a look at the various "suggestions", I decided to go it on my own.

Now it is a fairly well known fact that disc ceramic capacitors are not the best things for audio, and Heath used a few of them in the Apache. Also, to get some decent "lows", a "fair" amount of capacity is needed.

Although some of the Internet suggestions said to eliminate the "clipper" stage, I decided to try to avoid this if at all possible. Frankly, I was looking for a very simple method of improving the Apache audio without having to do a lot of modifications. This is keeping with my beliefs of the "principles of the conservation of my finances and energy" (you can read "cheap and lazy").

Looking at the schematic, there are three capacitors that are very "subject" to cause problems. Two of them are low value, and the third is a disc ceramic. All three are coupling capacitors in the lower audio stages.

What I did was to change capacitors C60, C61, and C64 to 0.01 mfd 400 volt "orange drop" capacitors. C61 and C64 are 510 pf capacitors in the original circuit and C60 is a 0.01 mfd disc ceramic. All three of these capacitors are located on the terminal board located next to the audio preamplifier stages. You may ask why I used 400 volt capacitors. Well, I just happened to have quite a few on hand! You can use higher voltage capacitors, but I wouldn't go any lower.

I took one end of each of the 510 pf capacitors loose and bridged the 0.01 mfd capacitor across the terminals. That way, if I ever decided to return the transmitter to its original configuration I could do it with a minimum of effort.

The 0.01 mfd disc ceramic capacitor is "buried" although it is also on the same terminal board as the other two capacitors. To replace this one, I took loose the wire that goes to pin 1 of the 6AL5 and the input to the "low pass filter". Then, I connected the "orange drop" from the side of C60 that connects to R39 (100K) and

the wire that I removed from the terminal board. The capacitor "floats", but, if you keep the leads short enough, it "self-supports" from the terminal board very nicely.

After these three capacitors were changed, my "local" friend was contacted. He said that the audio was much more "natural" sounding. Then, I submitted it to the "acid" test, the local 3880 morning "net". Well, the stations that are the most critical of how the AM signal sounds gave it "rave" reviews! My friend E-Mailed me that I had finally "arrived"!

I have described this modification to several other amateurs. Those who have made the modification have E-Mailed me that they also are getting "rave" reviews on their audio.

I do not know if those stations are setting their audio levels the same as I do, but I am setting the audio gain control (behind the key jack) at about 40 percent. The gain control on the front panel is at about 8-o'clock. The reading on the meter in the modulation position is about 150 mA on peaks. That seems to give about 100 percent modulation without over-modulating.

I know that there are many modifications that have been suggested on improving the Apache's audio characteristics, some are very complicated and some are fairly simple. This one is about as simple as it gets. If you are looking for a way to make your Apache sound better, and are basically "lazy" like me, you might just try this modification. It sure works for me!

#### Addendum

If you "unplug" the 6AL5 clipper tube, the audio is improved even more. This does not require any modification of the circuitry and can be "restored" at any time by just reinserting the 6AL5.