

20 Terrace Ave
Stamford, Conn.
July 29, 1964

Mr. I. V. McDaniel, Director
Broadcast Engineering
Oklahoma State University

Dear Mr. McDaniel:

Please excuse my delay in answering your last letter. However it arrived at WRSU after I had returned to Stamford for the summer and was not forwarded immediately. I hope the attached information will be of use to you.

Enclosed are copies of our transmitter schematics. The first is a diagram of the master oscillator located at the studios. The 42.5 kc output of this oscillator is mixed with the audio that is distributed to each of the transmitters. 42.5 kc was chosen because: 1) it is an even sub-multiple of 680 kc (our frequency)

- 2) any lower frequency (say 21.25 kc) was found too difficult to separate from the audio at the transmitter to prevent it from swamping the modulator
- 3) the line losses encountered at any higher frequency made this use impractical

The next four diagrams are the four units that make up each transmitter. Each unit is built on a separate chassis to make substitution servicing a practicable policy. The four units are interconnected as shown in the last diagram. Essentially the inputs to the modulator and multiplier units are connected in parallel. The R-C network is to reduce the audio level, since the modulator has more than ample gain, and to provide some measure of tone control. The values of R and C vary at each location as length and quality of the lines vary considerably.

The multiplier consists of a preamplifier stage that also serves as an audio filter followed by four doubler stages. The output of the last doubler is fed to the rf driver and from there to the modulated rf output stage. The choke across the output is to keep any 60 cycle hum from getting into the last stage and modulating the signal. The signal is coupled through a blocking capacitor to the hot side of the AC power line. Since the transmitter is plugged in on the building side of the building power transformer, the signal is injected into the AC wiring inside the building and prevented by the building transformer from leaking out. This system keeps us well within FCC requirements and we have no hum problems. Although the hum

on the detected carrier is more than is usually found on a commercial AM carrier, in no case where the equipment is working properly does the hum come anywhere near the objectionable level.

I hope this answers your questions. You may use any of the enclosed material as long as you credit it to WRSU in your paper. Please let me know if I can be of further assistance.

Sincerely yours,

Clive Knowles
Chief Engineer