

The Schlockwood 200 LPAM Broadcast Audio Processor and Compliance With the NRSC-2 RF Mask

THE SW200

The Schlockwood 200 (SW200) is an AM broadcast 'airchain' audio processor, integrating the functions of slow, 'gain-riding' AGC, NRSC (and alternative) program pre-emphasis, 3-band dynamics processing, program equalization, tight program peak control with variable asymmetry, and low-pass output filtering.

THE NRSC AND 'AM IMPROVEMENT'

As part of a 1980s movement to improve AM radio, the NRSC (National Radio Systems Committee, a joint venture of the Consumer Technology Association and the National Association of Broadcasters) established guidelines for the occupied bandwidth of the AM broadcast signal. The NRSC concurrently defined a formal program audio pre-emphasis characteristic for AM radio.

The low-pass audio filter that satisfies the bandwidth constraint permits audio response to 10kHz, with a precipitous 'brick wall' characteristic at cutoff. This assures that 'splatter' and 'chatter' interference with other stations would be a transmitter problem, as the audio feed is so curtailed as to normally preclude such interference. This audio signal path specification was known as NRSC-1.

THE NRSC-2 RF 'MASK'

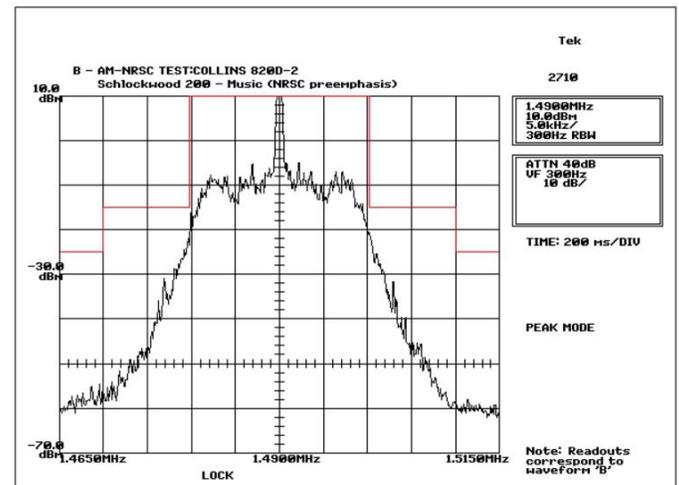
Despite the NRSC-1 audio-path measures to mitigate interference, the ultimate goal was to restrict the occupied bandwidth of the transmitted RF spectrum. Thus the NRSC established an RF 'mask,' which could be drawn on the face of a spectrum analyzer to give an operator visual assurance of compliance by noting anything that crept outside the mask outline. This specification was labeled NRSC-2 and became an FCC mandate (47 CFR 73.44).

SW200 COMPLIANCE

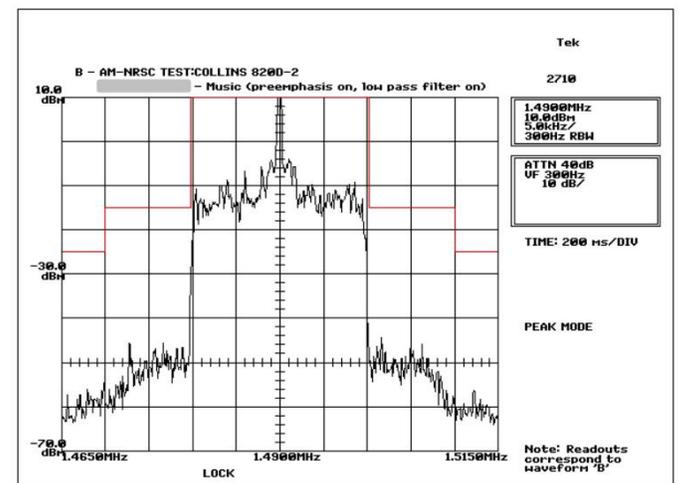
The RF-spectrum limitation of NRSC-2 is somewhat more forgiving than the NRSC-1 audio-path restriction. Indeed, the 10kHz output filter of the SW200, which admittedly falls a bit short of the NRSC-1 spec, still al-

lows a properly-adjusted transmitter to fit the NRSC-2 RF mask with room to spare.

The image below is an RF spectrum analysis of bright pop music feeding the SW200, which is coupled to a representative AM transmitter. The NRSC-2 mask is shown in red.



This next spectrum plot illustrates the behavior of another manufacturer's processor that fully complies with the NRSC-1 audio cutoff.



In this plot the 10kHz cutoff characteristic is very clearly defined, although the protection margin is far in excess of the requirement.

It's also interesting to note that the SW200 affords a few dB of additional program density (loudness), doubtless due to filter attributes.