

Before the  
Federal Communications Commission  
Washington, D.C. 20554

In the Matter of

IBOC Digitalization )  
 )  
MM Docket No. 99-325 )  
 )  
Reply Comment Date: March 21, 2002 )

**IBOC Does Not Serve The Public Interest, Convenience and Necessity At The Present Time**

The Commission is considering IBOC Digitalization within the current analog FM band. We believe IBOC digital subcarriers are NOT in the public interest, convenience and necessity. We are filing these Reply Comments and generally support of The Virginia Center For The Public Press. We are opposed to implementation of In Band On Channel (IBOC) Digitalization. We are concerned that IBOC could displace or disrupt the frequency for which we have applied, and currently operate. IBOC could displace both established stations, such as ours, and aspiring stations as well.

History: Edwin Howard Armstrong invented analog FM radio approximately 70 years ago. Armstrong's FM invention not only eliminated static, it also produced a better sound, three times better than AM. Listeners could distinguish the on-air differences between the whine of a rip saw and the huff of a cross cut. Furthermore, FM delivered sounds that spanned the full range of the human ear -- from the deep rumble of a kettle drum to the delicate keening of a flute, spanning a range between 50 cycles and 15,000 cycles. At best, AM delivered 5,000 cycles on an average receiver. Armstrong had discovered hi-fi broadcast!

## **Analog FM Radio Is Not “Ailing” And In Need Of A Digital “Elixir”**

Discussion: FM is a high-quality medium for broadcast transmissions. FM is NOT broken, if it was then why would FM stations continue to sell at a blazing pace with purchase prices going higher and higher? The general public is not clamoring for digital radio. Sure, the general public has CD changers in their automobiles but that is because the lack of diversity in radio formats (mainly since The Telecommunications Act of 1996) and the ability to hear your favorite music instantly. The owner of a CD player has “instant gratification” by playing their favorite song at any given moment. While a CD player has a better signal to noise ratio, in the reality of a home, car, or workplace environment this advantage is *de minimus* over ambient noise. Recent technology such as receiver “blending” and more selective IF filters have significantly improved FM radio in recent years. Automobiles equipped with two “diversity” antennas have also shown an improvement in FM reception. Why should we “scrap” the current analog FM system just because digital offers a marginally better signal to noise ratio?

We are concerned about elevated interference between first adjacent FM stations. IBOC digital “hash” has the potential of reducing the effective coverage area of existing stations (see chart below). Some have likened interference of the IBOC to a SCA subcarrier. I disagree; first subcarriers are frowned upon in the industry as modulation robbing “bandits”. So most stations do not use 92 kHz or 67 kHz subcarriers for that reason. Also, no one will use more subcarrier injection than what is required to accomplish the task at hand. The typical SCA is used for Muzak or telemetry backhaul. These are subcarriers at a low injection level and use FM modulation at low deviation levels. IBOC on the other hand is very wideband and “hash” will be much farther out from the main

carrier. This can cause destructive interference to first adjacents. We therefore request that the FCC not increase the allowed occupied bandwidth of FM stations. The FCC should be tightening occupied bandwidth specifications for FM Stations as the medium becomes more crowded. *(In Europe they often put stations spaced 100 kHz apart from each other. At some point down the road the FCC may wish to consider doing that and effectively doubling the number of FM channels available. IBOC could severely inhibit the ability to use 100 kHz channel spacing.)*

Why are we in a rush to impose a mandatory digital standard when we are only in the infancy of the digital audio age? Can the current IBOC system still be a viable system 70 years from now as Armstrong's FM system has been? Not likely. We know that uncompressed mediums such as compact discs or an even an uncompressed wave file are likely to be widely accepted for several generations. Compression algorithms are likely to become obsolete quickly because newer and better ones are being invented all the time. Obsolete compression algorithms are everywhere (ie: A-law, U-law, Microsoft ADPCM, IMA ADPCM, MP1, MP2, RA, WMF, GSM, etc). MPEG 4 is out now, which will probably obsolete MP3. Why should we switch to IBOC if the audio quality is only subjectively better than analog FM? In 10 years we may have a better idea what is the best method for transmitting digital audio. DAB audio should be transmitted preferably in an uncompressed audio format with over-sampling (for "drop out" reduction). Uncompressed audio is more pristine and will stand the rigors of time. Also these systems should be coordinated on a worldwide basis to insure global receiver compatibility.

We urge the Commission to evaluate the Eureka-147 alternative Digitalization technology, which would avoid the displacement problem. Even then, of course, the Eureka-147 technology should first be tested and evaluated. A timetable should be discussed with the Military on turning over the “L – Band” for audio services. In no event should IBOC Digitalization be adopted without full and complete testing and evaluation of the less disruptive Eureka-147 Digitalization technology.

Conclusion: Analog receivers should not be forced in obsolesce based on a government timetable. A forced conversion would not be in the public interest, convenience and necessity. And if DAB standard is picked it should be placed on a separate band using a “timeless” technology with uncompressed audio.

Respectfully Submitted,

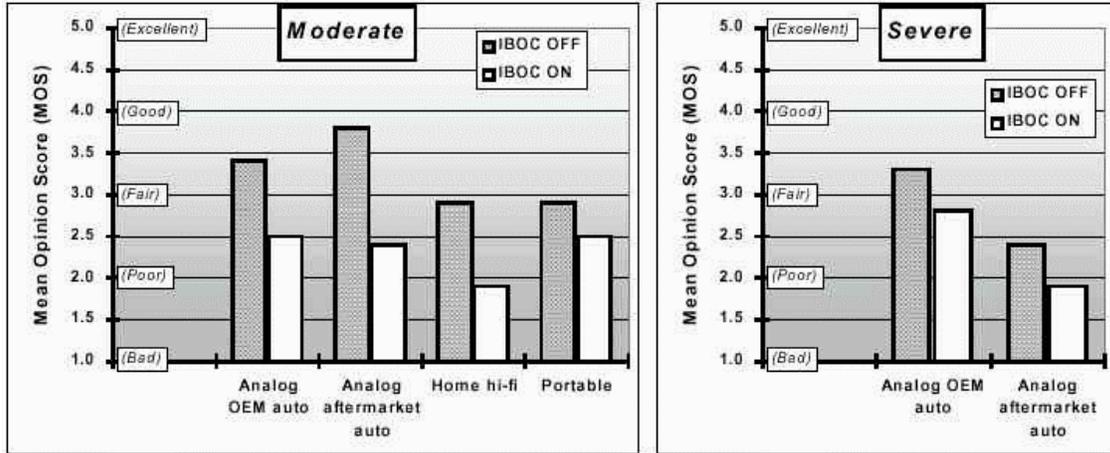
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Interference Chart



**Figure 10. 1st-adjacent compatibility - subjective evaluation results of audio recordings obtained in the field (speech programming)**

**Moderate: +16 to +6 dB D/U**

**Severe: +6 to -9 dB D/U**