Public Radio Engineering Conference 2008

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ELECTRONICS RESEARCH, INC. ERI

iBOC @ 10dB- Brief FM History

- 1945 – FCC allocates 88-108 MHz
  - 46 stations, 1500 allocations

iBOC @ 10dB- Brief FM History

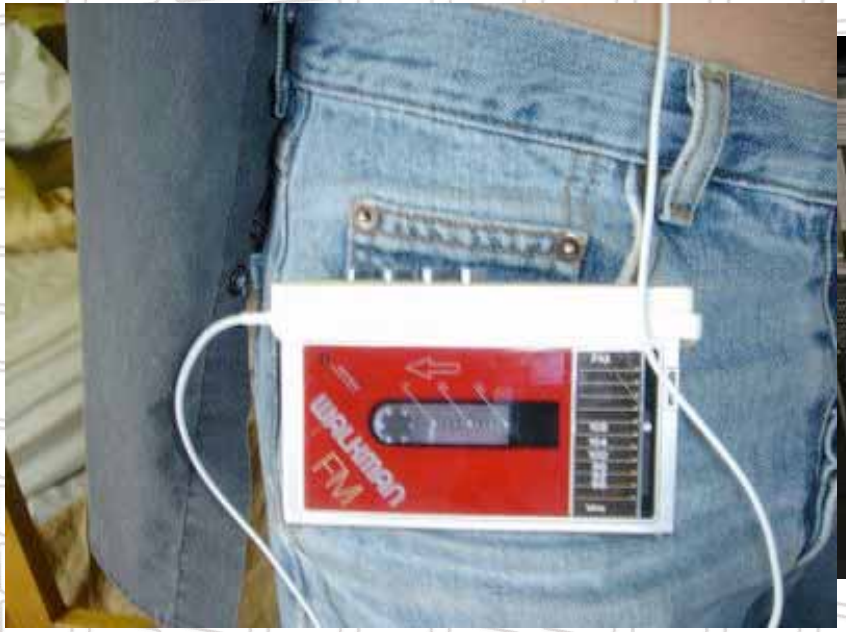
- 1955 – SCA service grants

iBOC @ 10dB- Brief FM History

- 1961 – Stereo multiplex service
- 1962 – Class A, B, C, Zone I-II

iBOC @ 10dB- Brief FM History

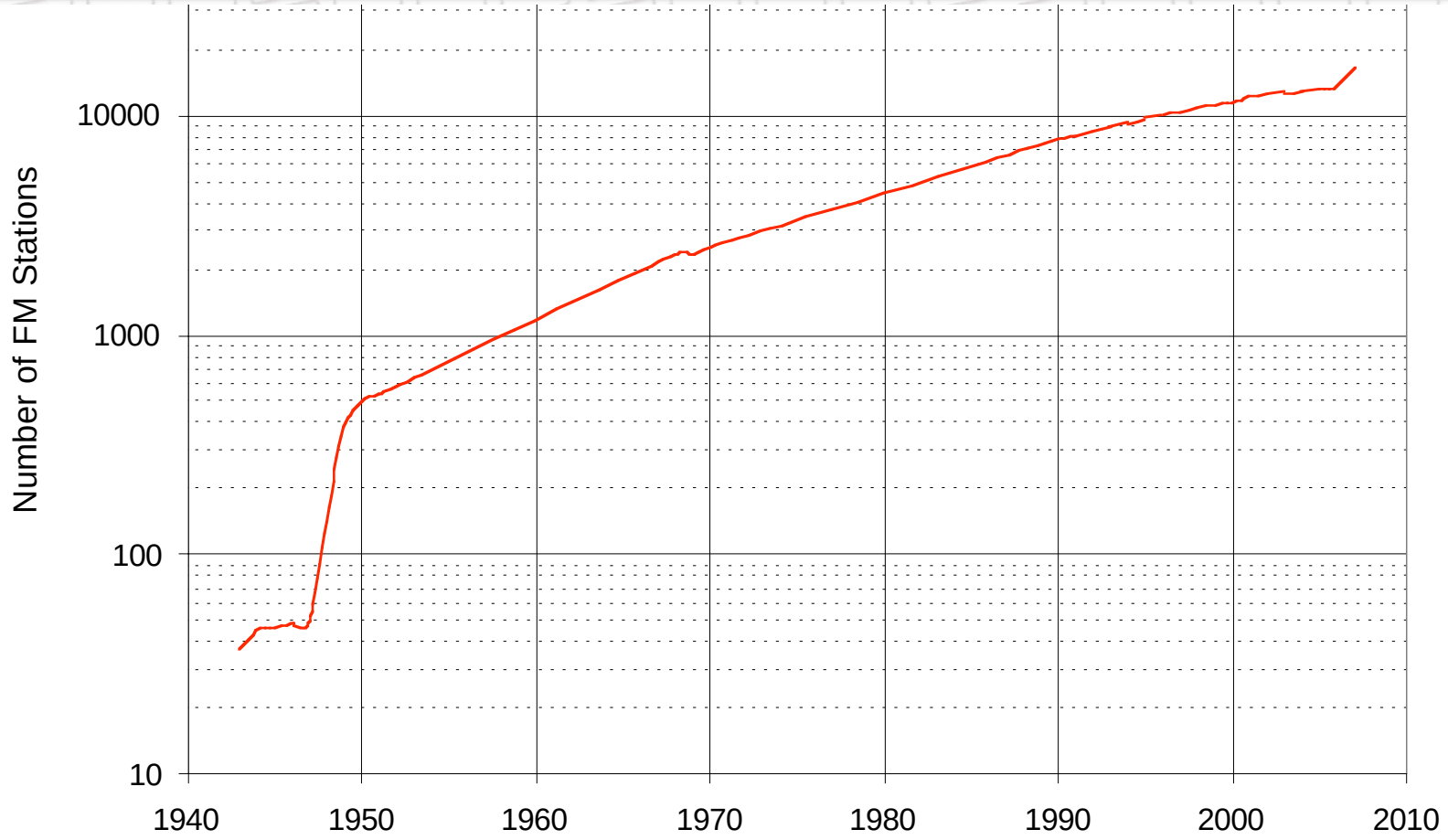
- 1983 – 80-90 Docket
  - Tweaked Classes and Zones



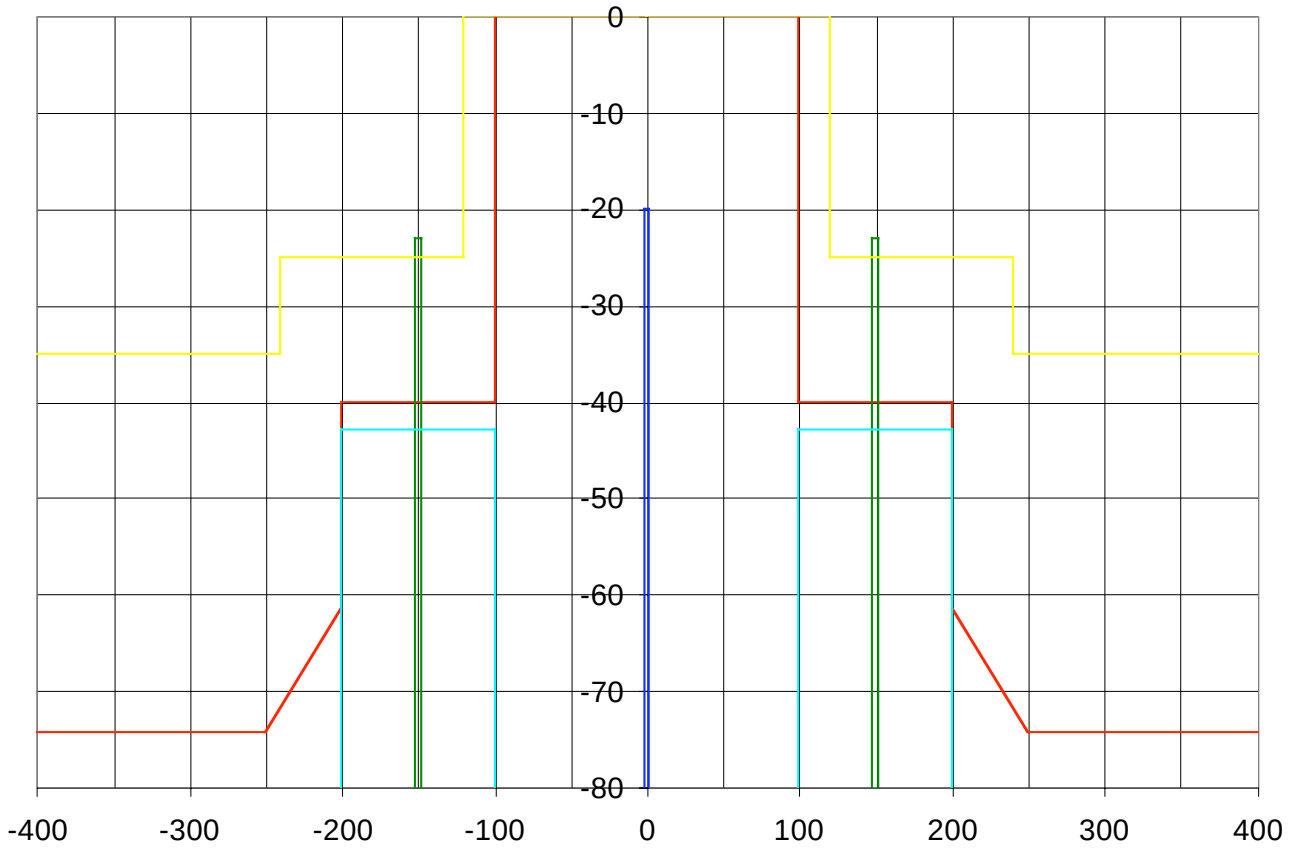
iBOC @ 10dB- Brief FM History

- 1995 – New Ownership Rules
- 2000 – LPFM

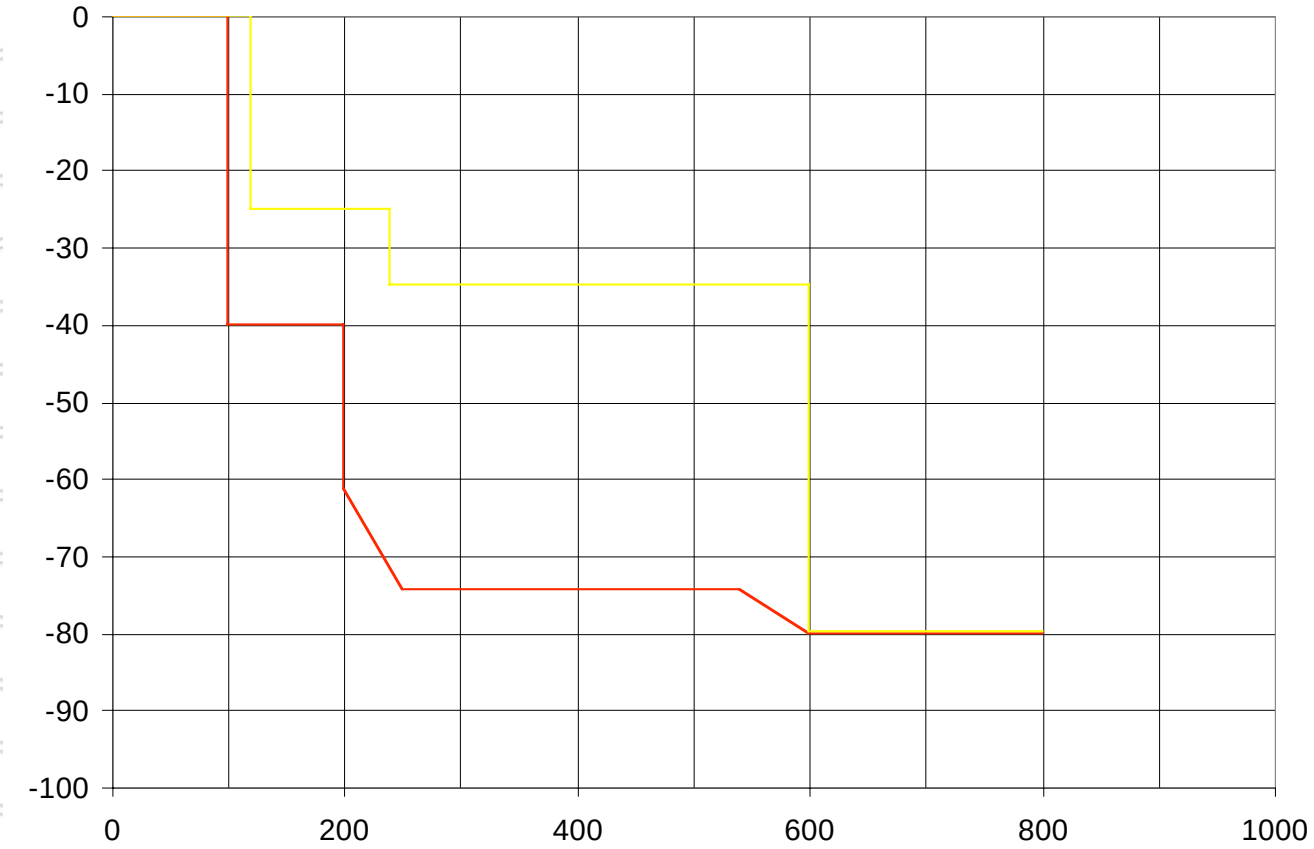
iBOC @ 10dB – FM Stations OTA



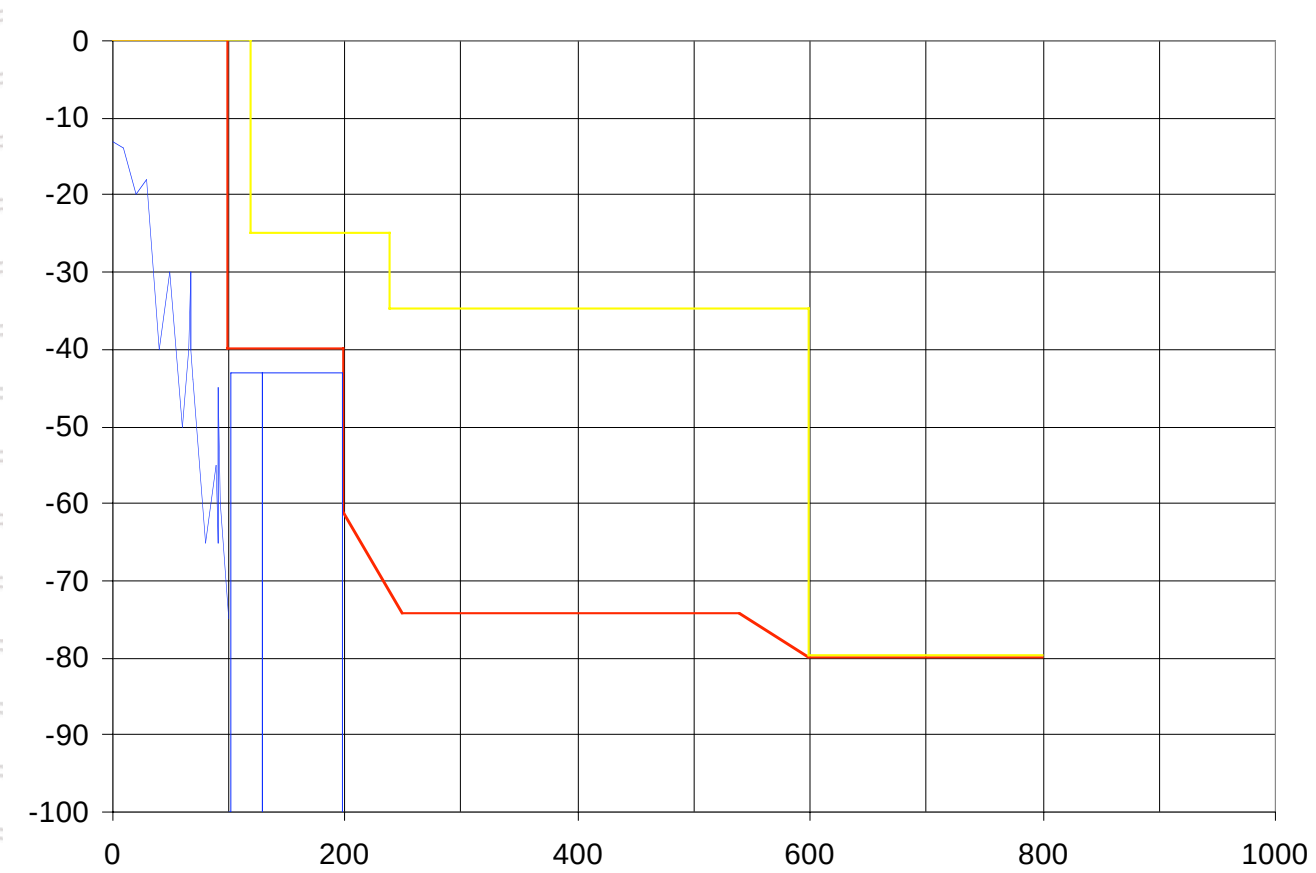
iBOC @ 10dB – Signal Power



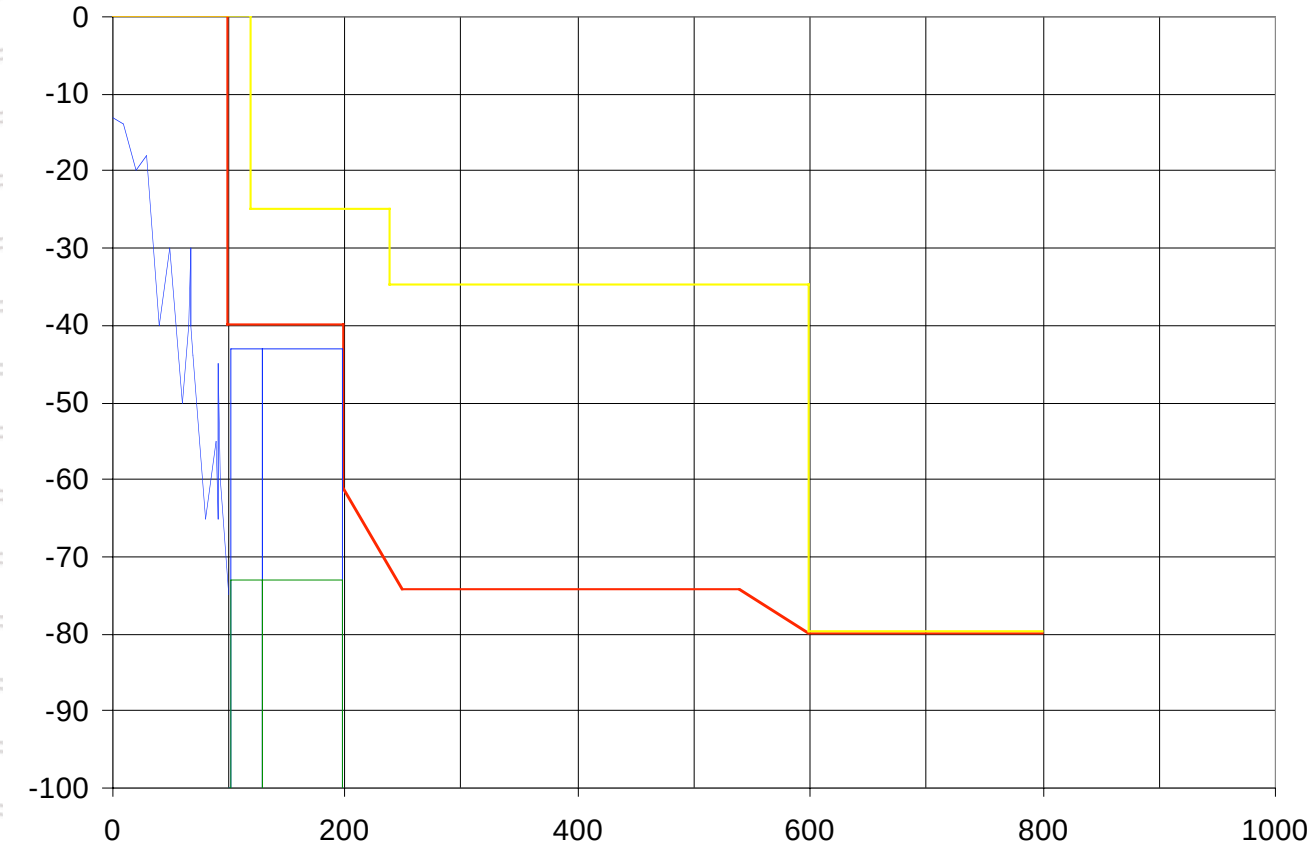
iBOC @ 10dB – NRSC & Pt.73 Masks



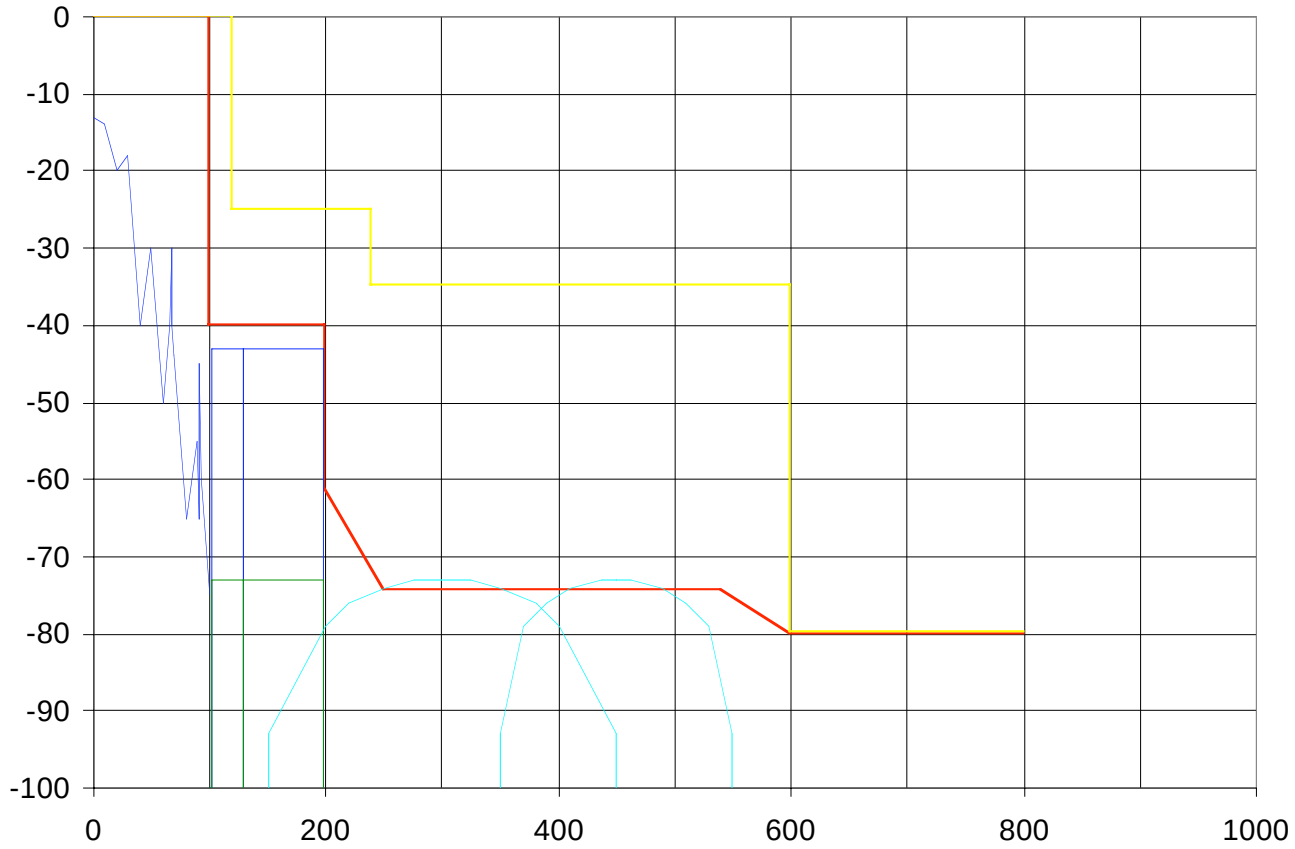
iBOC @ 10dB – Hybrid Transmission



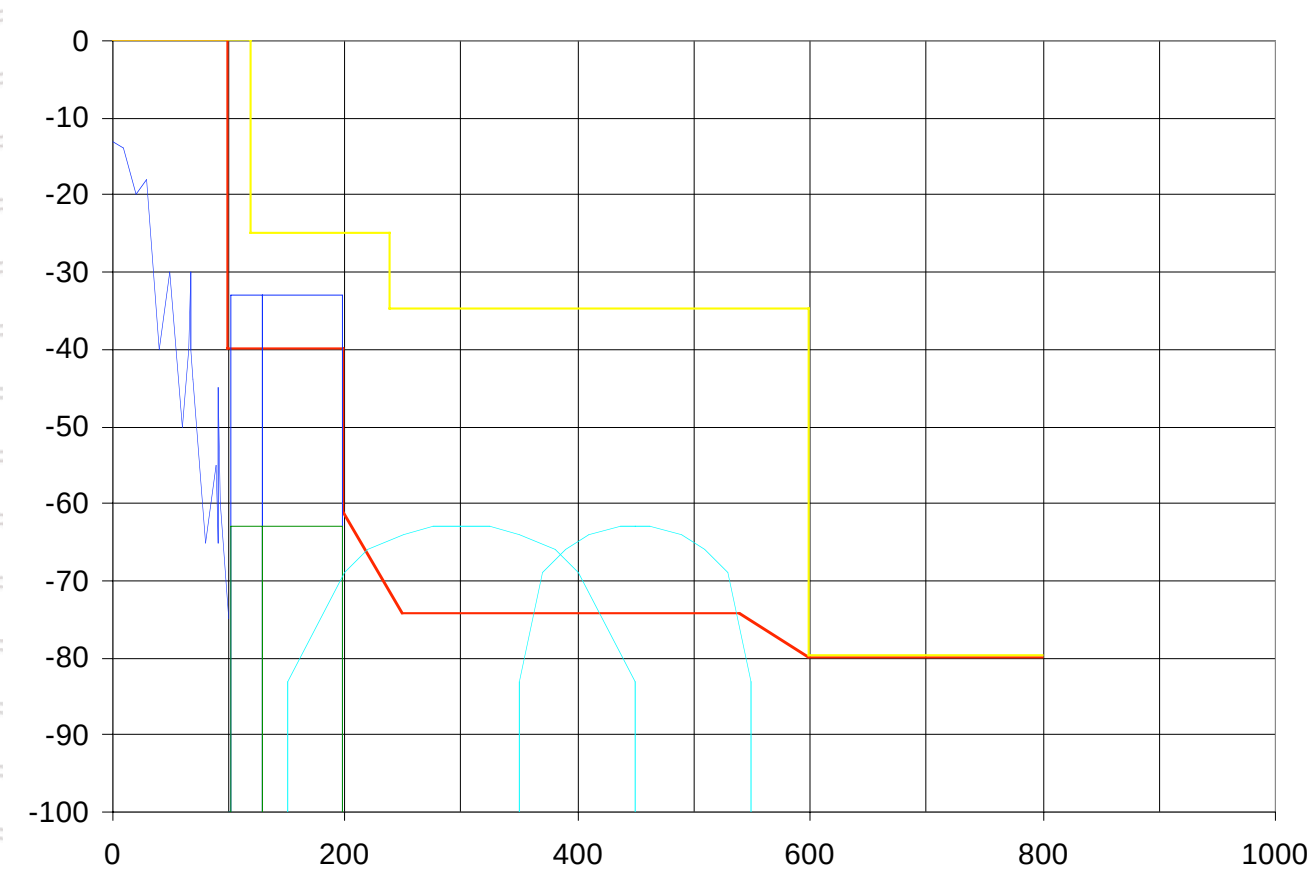
iBOC @ 10dB – 30dB Isolation



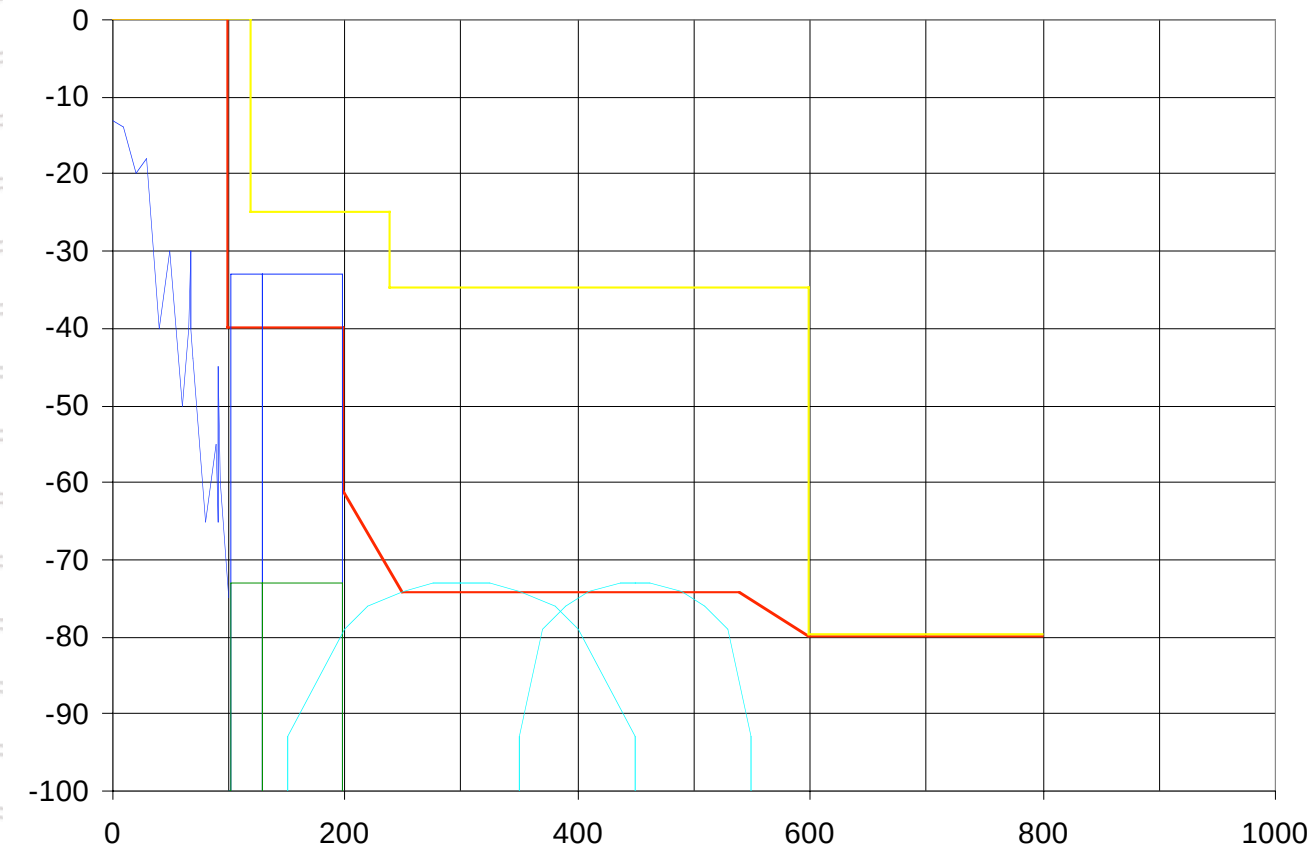
iBOC @ 10dB-IM Products



iBOC @ 10dB – 10dB Power Increase



iBOC @ 10dB – 40dB Isolation



iBOC @ 10dB

- Will cause problems if analog to digital coupling is greater than -40 dB
  - Must be stable with time and weather conditions
- Because of 7 dB peak to average in digital signals will cause some interference in excess of FCC mask for FM

Solutions

- Separate antennas
  - Spatial diversity
    - Interleaved
    - Not interleaved
      - Same tower
      - Separate tower
  - Polarization diversity
- Same antenna
  - Polarization diversity

Cogwheel Antenna

- Pedestal top mounted antenna
- Dual input design
- Typically -30 dB coupling
- Excellent analog VSWR
- Digital requires circulator
- Excellent pattern circularity
- Designed for multiplex analog and digital

Oklahoma City Broadcast Facility

Filters And Combiners

- Used with Cogwheel
  - Analog output
  - Digital back fed
- Provide excellent bandwidth
- Proven product

Lynx Series II Dual Input Antenna

- Designed for single station use
  - Can by multiplexed if custom ordered
- VSWR for digital and analog inputs <1.05 : 1
- Analog to digital coupling 40 dB or better
- Will work without circulator on digital, but we recommend using one

Summary

- Increase of ten dB in iBOC can be a problem if analog to digital coupling >-40 dB
- There are many solutions to choose from