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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARYComments by Isaac S. Blonder on MM Docket No. 87-268

December 4, 1995

The human side of engineering should be foremost in the development of television systems for the mass audience. The current stage of Advanced Television Systems is defective on two major fronts - 1) human vision is totally satisfied with the current NTSC pixel counts for the average home viewing screen, 2) The Grand Alliance system, offering 1000 lines, is too rich for the home and inadequate to match 35mm film quality for the commercial market. With the small home screen, there is no psychological value to an aspect ratio of 16/9, and especially with the increased receiver cost.

ATSC has had a futile record for eight years except for the work engaged in digital compression. The greatest gift digital compression can give to the American TV Viewer is the multiplication of Free Broadcast channels by four or more times. These extra channels, in my view, is of extreme value to our society in providing the bandwidth for Distance Learning, an educational resource soon to match our conventional school offerings.

I suggest that the FCC abandon the HDTV effort, and concentrate on standardizing digital compression to achieve the lowest cost decoder with the least visible artifacts. As soon as the system is agreed upon, the FCC should require all new TV receivers to include the decoder. My personal experience with this subject was very strenuous. In the 60's, I joined channel 47 to broadcast to the NYC market as a UHF station to an audience without the ability to watch us. If we hadn't broadcast in Spanish, to the Spanish literate NYC audience, we would have gone bankrupt!

The FCC, skillfully represented by Commissioner Robert Lee, appointed the CAB committee to find a solution to the UHF TV station dilemma. I was delighted to be a member of that august group. We studied the all channel antenna design, UHF tuner interfering signals, high power TV transmitters, cable TV channel capacities, comparative coverage of UHF versus VHF signals etc. The most worthwhile recommendation by CAB was to require all TV receivers to include the UHF tuner.

Digital compression will have to parallel the UHF tuner path if the multi program concept is to succeed. As for HDTV, whatever form this imperfect science will coalesce into, the audience can be reached by satellite or laser disc without penalizing the average citizen. My particular interest is in three dimension TV which, as time will prove, is the ultimate form of viewing.

Two other problems are addressed in the Third Notice of Inquiry - income to be gained by auctioning of the spectrum, and the potential for Free Broadcasters to serve commercial customers with signals hidden in the digital compressed format. The solution rests in my belief that a short term income from auctions is unwise. We should not depend on the revenue from auctions or income taxes to be the price to pay for such a valuable prize as a piece of scarce spectrum space. Why not ask for a value added tax of 10% on the services offered by the licensee? This would apply to all holders of radiation space as well as the TV station. Isn't that a great way to cut yours and my income taxes?

Finally if the above recommendations are implemented, the FCC will cut its workload by 90% (maybe 95%).

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More Comments by Isaac S. Blonder on MM Docket No. 87-268

December 4, 1995

I submitted comments on MM docket No. 86-268 in January 1988 concerning my belief that now was the time to convert all UHF channels to a 12 Mhz bandwidth. Although a detailed analysis has not been made of the number of available channels that would appear, I believe that an increase in broadcast bandwidth would be about 25%. The 1988 comments are attached herein.

12 Mhz will facilitate the emergence of three dimension TV and a HDTV technology that would rival 35 mm film. Two full power UHF stations feeding into a common antenna would afford greater area coverage than than located at two different sites with two different antenna patterns.

For the past five years I have been duplicating the 12 mhz experience with my experimental license WEXP TV channels 27,28 on a common antenna covering New York City from Stevens Institute of Technology, Hoboken, NJ. These are only 100 watters but the principle is showcased.

**HDTV 3DTV**  
**BLONDER BROADCASTING CORP.**

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Submitted to the FCC, January 1988.

Comments on MM docket No. 87-268  
in the matter of

Advanced Television Systems and Their Impact on the Existing Broadcast Service.  
Review of Technical and Operational Requirements: Part 73-E, Television Broadcast Stations.  
Reevaluation of the UHF Television Channel and Distance Separation.  
Requirements of Part 73 of the Commission's Rules.

What is suggested is a reassignment of the UHF TV frequencies to accomplish these desirable objectives:

1. Allow more UHF broadcast licenses.
2. Assign 12 mhz on a contiguous basis in order to provide spectrum space for the ATV systems requiring more than 6 mhz of bandwidth.
3. Preserve compatibility of the NTSC signal, so that none of the home TV's are ever rendered obsolete.
4. Provide additional spectrum space for landmobile, paging, data etc.
5. All of the above benefits with minor expense to the UHF TV broadcaster.

Isaac S. Blonder desires to comment on Docket No. 87-268 particularly from his experience as an independent UHF broadcaster since 1964, and also from his activities in the fields of engineering, manufacturing, and cable systems management.

Listed below are the recommended actions to be implemented by the FCC. Statements on these actions will parallel the FCC table of contents in order to serve a dual purpose for presenting Mr. Blonder's views on the specific issues discussed therein as well as to support his presentation.

1. Assign 12mhz of continuous bandwidth to each UHF station as follows:  
Set 1. 17,18; 21,22; 25,26; 29,30; 33,34; 38,39; 42,43; 46,47; 50,51; 54,55; 58,59;  
62,63; 66,67,  
Set 2. 15,16; 19,20; 23,24; 27,28; 31,32; 35,36; 40,41; 44,45; 48,49; 52,53; 56,57;  
60, 61; 64,65; 68,69.

Thus a total of 27 12mhz channels would be available, sans taboos, observing only the present on channel and adjacent channel spacings, with channel 37 left open, resulting in two sets for assignments by adjacent channels rules.

2. Authorize the station to use the additional channel of bandwidth in any fashion it may find advantageous, e.g. two independent standard NTSC programs; one NTSC advertiser-supported program, landmobile, data, teletext, paging etc. Within the adjacent 6 mhz; HDTV; 3D-TV; etc.
3. Authorize the station to use a single transmitter and antenna to deliver any of the services suggested in 2.
4. Revise the taboos to recognize that the comparatively minor reductions due to taboo artifacts are

not only temporary, but that the advantage of transmitting 12mhz is a positive economic gain for the established UHF broadcaster even with some reduction in his coverage area.

5. Avoid any requirement for an increased aspect ratio. There have appeared intriguing proposals for compatible ATV within the 6 Mhz current bandwidth that will enable the 12mhz broadcaster to deliver simultaneously two ATV signals with the usual 4:3 aspect ratio. Also for the first time ever, two independent channels will permit the viewing of high quality 3D-TV in a satisfactory fashion for both the monocular and binocular displays.

6. Consider turning back the clock somewhat and assign the 14-20 channels as follows: 15,16; 19,20. 14 would be assigned to landmobile. The current occupants on 15-19 could make their deals with the UHF stations who now have a far greater bandwidth available for lease than the present assignments for land mobile, and ultimately these channels would be freed to become full service broadcast facilities.

7. Low power TV would also benefit from the new 12mhz bandwidth.

8. Technology exists for the delivery of four channels within 12 mhz at a quality level similar to today's standards. None of the published multiplex systems are compatible with NTSC. Unimaginable but not impossible to see an extraordinary effort on the parts of both the broadcasters and manufacturers in order to achieve a doubling of the channels in the major metropolitan areas to 38.

#### Responses to the Table of Contents.

Paragraph 3. As a UHF broadcaster since 1964, Mr. Blonder is intimately acquainted with the red ink so often associated with the disadvantaged UHF spectrum. It is not too late to save the day for UHF, and award every UHF station 12 mhz, with all the implied technical and economical benefits. The general public will be rewarded with superior picture quality, more programs, more stations, and more coverage. Although cable will continue to be the preferred source of TV for the majority, the lower income, and rural citizens deserve consideration for their plight from the FCC. One estimate gives 40 million as the long term uncabled viewers who need TV service at a low price, only available by land-based broadcast TV facilities.

Paragraph 17. Mr. Blonder takes sharp issue with the subject of "compressed aspect ratio" relative to a "cinema like aspect ratio". His views are expressed in a printed editorial, exhibit 2. Besides the historical and technical arguments presented in exhibit 2, two more issues are either ignored or patronized - cost and home viewing habits. None of the published psychological studies investigating the preference for 16:9 versus 4:3 horizontal to vertical dimensions (incidentally, 16:9 is a rather feeble increase in ratio), gave the increased cost of 16:9 as one of the factors in the viewers choice of format. One company in limited production, charges \$3,000 for a HDTV receiver. What percentage of the US public wants to pay six times as much for 16:9? Of course the futurist will predict competitive prices in the gloaming, but even if you believe him, why do you need 16:9 in the home? The home viewing area is extremely variable and mostly small. Typically the screen size goes according to the pocketbook. Indeed 20% are still black and white. The angle subtended by the eye, in most cases, is around 10 degrees, whether in the format of 16:9, or 4:3, and substantially below the human field of vision (140), and thus there is little psychological stimulus from the minor increase in aspect ratio. Why burden the pocketbook of Mr. Average Citizen with the added cost of 16:9 and the extra bandwidth which may be better used for additional programming? Even in motion picture theaters where Cinerama was born, the vast majority are screened with the standard 4:3 35mm film and often with masking the top and bottom of the screen to simulate a wide screen format.

Paragraph 40.5. The immediate advantage of augmenting the channel capacity of existing Television assignments from 6 mhz to a contiguous 12mhz, is the economic survival of the broadcaster during the research and shakeout period of the various proposed ATV schemes. The second important economic advantage of two contiguous channels is the ability to transmit two channels on a single transmitter and antenna investment. The UHF broadcaster needs the added income to survive the stormy seas of format battles. Third, and most important for quality, only a single antenna and transmission pattern will provide stable artifacts if more than 6 mhz is need for the ATV system. In the real world of ghosts, noise sources and atmospheric anomalies, non contiguous frequencies, particularly if emanating from physically displaced antennas, may even drop the ATV picture quality below the level of a normal NTSC transmission.

Paragraph 43 There is no pressure from the general public to replace NTSC. Viewers have been polled many times, both formally and informally, and they have usually expressed their satisfaction with the present NTSC quality level. Only if new rivals such as Super VHS tape recorders, and HDTV, DBS, appear, will there be a public outcry for change in the broadcast standards. Indeed the present VCR standards are lower than broadcast and yet have enjoyed a phenomenal reception by the general public. Remember that the same public is still buying black and white TVs, so it is obvious that the programs and price are the principal concerns of our citizenry

Paragraph 50. As has already been stated in the introduction, compatibility with the current receivers is of paramount importance, therefore the present 6 mhz bandwidth and technical standards should be retained. If finally a scheme is devised that will allow a single 6 mhz bandwidth to deliver the old NTSC picture and simultaneously ATV, with an appropriate TV receiver display, then VHF will be able to compete on equal picture terms with UHF. UHF will of course have two channels but this advantage will still not overcome the frequency superiority of VHF. And if it develops that UHF has a superior picture and a higher earning power than VHF, c'est la guerre!

No changes need be made in the cochannel and adjacent channel spacings. All other taboos would be dropped. The small reductions in service area are a minor tradeoff penalty to existing UHF stations who would now be blessed with two individual programs and superior technology. There should be no problem technically in either transmitting the two channels or receiving them, since the television receivers have proven their ability to operate satisfactorily with adjacent channels on a cable system.

Paragraph 51, 52, 53. Coverage of the service area by microwave has been proven to be so inferior to UHF that the commission would be well advised to drop this item from the agenda.

Paragraph 60. The UHF taboos may be reasonably grouped into two categories; 1. radiation from the tuner local oscillator, tending to interfere with neighboring TV receivers, 2. internal receiver problems arising from unequal strength received signals.

On March 22, 1978, Blonder Tongue Labs submitted an unsolicited proposal for the purpose of developing, building and demonstrating a TV receiver with improved performance in response to RFD 76-22 April 19, 1976, suggesting the elimination of all taboos except on channel. Our proposal was not approved, nevertheless we sent a prototype to Lawrence Middlekamp for evaluation by the FCC laboratory. On March 7, 1979, we received a phone call from Alex Felker that the booster would perform as claimed.

As for the internal receiver problems, we suggested that the manufacturer install a temporary single low cost trap in the tuner, manually tuned by the viewer to suppress the rare cases of interference as may arise due to one of the other taboos. Catv has undeniable proven that a spectrum as wide as UHF can be viewed if there exists an equal level of adjacent TV signals. In due course, the TV designer will be readily able to eliminate the tunable trap and substantially satisfy the requirements posed by RFD 76-22.

Section 1V. The proposal to allow 12mhz bandwidth for each UHF station with 6 mhz always programmed to the current NTSC standard, answers practically all of the concerns expressed by the FCC in section1V. ATV will arise by two methods, both cost effective and responsive to new technology, and the public purse. 1. New TV display technologies will markedly improve the reception of the 6mhz standard NTSCsignal. 2. the additional 6 mhz awarded to UHF broadcasting can be utilized in any way the market-place swings; digital sound, extended resolution, increased width-height ratios, 3D-TV format, and a myriad of non-TV clients who can be accommodated without having to beg the FCC for yet more spectrum space.

Paragraph 110, 111, 112, 113. In place of the present interference level standards as expressed by the taboos on a mileage basis, the commission might find it desirable the adopt the non -interference protection procedure as outlined below for low power TV.

First, set a standard loss of service area due to interference of between 10-20% and arbitrate the remaining potential disputes within the FCC administrative Law Judge procedures. As has been previously mentioned, the UHF station should be willing to adept a minor reduction in service area for the major income potential afforded by a 12 mhz bandwidth