Before the
Federal Communications Commission
Washington, D.C.

In the matter of:		
	)	
Revitalization of the AM Radio Service	)	MB Docket No. 13-249
	)	

REPLY COMMENTS OF SELLMEYER ENGINEERING

The engineering consulting firm of Sellmeyer Engineering hereby submits these reply comments in response to the Commission's Further Notice of Proposed Rulemaking.

We are pleased with the items which the Staff has adopted in its initial response to comments in this proceeding.

We fully endorse and concur with the Further Comments of DuTreil, Lundin & Rackley, Inc. and Hatfield & Dawson, Inc. with respect to the proposed changes in the allocation standards. We believe the recommendations are well reasoned and reflect the maturity of the band. We also concur with the correct definition of the term "interface" and its proper calculation as noted in the comments cited. The so called "interference" cited by the "Alliance" is nothing more than overlap of two contours of the same magnitude and vastly exaggerates the amount of interference.

REVISION OF CONDUCTIVITY MAP M-3/R-3

We believe it is long past time for the Commission to update Conductivity Map M-3/R-3 in the Rules. Sufficient measured data is available in the Directional Antenna Applications and Proof of Performance reports filed since the early 1950's to materially improve the accuracy of the map. We caution that incorporation of data filed by certain 'practitioners', known to the Commission Staff, which contain unreasonably low conductivity figures for certain areas of the country be viewed with extreme caution and compared to other data for the same area before being considered. If no other data is available, for confirmation of the submitted data, and

Map R-3 shows significantly higher conductivity, the value shown on the map should not be changed.

We have some additional comments concerning general noise levels in the medium wave band and the causes of this serious problem and transmission system generated interference in the band.

MAN MADE NOISE IN THE MEDIUM WAVE BAND

It is generally recognized that the noise floor in the medium wave band has materially increased over the past thirty to forty years due to several factors such as the introduction of new lighting technologies and reduced maintenance activity on high voltage transmission and local power distribution lines, among other factors. The magnitude varies with location, but in most metropolitan areas the magnitude is generally on the order of 10 to 20 db over that of thirty to forty years ago. Significant contributors to this increase are lighting devices such as CFL and LED light bulbs. CFL bulbs, absent proper line bypassing, generate a broad spectrum of noise in the medium wave to low H.F. spectrum. LED's employ switching power supplies to control the current into the lighting cells which generate light in the visible spectrum. The switching power supplies generate high levels of radio frequency energy due to the very steep transitions of the pulses which contribute to the extremely high efficiency of the lamps. Input filtering is typically accomplished by a filter topology consisting of a shunt capacitor across the power line input with two series inductors in the power line conductors and a second shunt capacitor on the output of the line filter. The steep slope of the transitions from off to on and on to off generates spectral components beginning in the low frequency spectrum extending well into the H.F. bands and, in some cases, well into the microwave spectrum. U.S. standards require the radiated and conducted emissions in the radio communications bands to be suppressed to levels which do not harm radio communications services. FCC Part 15 sets out general conditions for compliance of devices capable of generating significant noise or interference to radio communications including the broadcasting service. Before the

FCC Laboratory was eviscerated in the 1980's it was responsible for evaluation of potential RFI generators including lighting devices. This mission included laboratory evaluation of samples of lighting devices such as fluorescent lighting systems, High Pressure Sodium Lamps and those of other technologies. Initial samples were evaluated by the Laboratory and, as the technologies matured and were proven to be free of significant interference potential, no further FCC involvement was required. For many years, devices capable of causing RFI, imported into this country were sampled at the Port of Entry and the samples were evaluated by the FCC Laboratory. If the sampled devices were found to be out of compliance with U.S. regulations the samples were returned and the entire shipments were denied entry into the country. That is no longer the case as there is no FCC Involvement in random sampling of shipments. Only a "Certification of Compliance" with no formal verification is required.

There have been several articles published in various Amateur Radio Magazines and formal complaints have been filed with the Commission by The American Radio Relay League (ARRL), a respected amateur radio association dating to the mid 1920's, showing the absence of the required filtering components, two bypass capacitors and two series inductors, from the power line connections to the switching power supply inside the LED Lamp Assemblies. The four components contribute only a couple of cents to the manufacturing cost of the lamps. The manufacturers are well aware that there are no consequences in elimination of the four components on parts bound for the United States so, *in shipments bound for the U.S., they eliminate the shunt capacitors and replace the series inductors with jumper wires*, thereby saving a few cents in the manufacturing costs. While 'a few cents' seems trivial to an American, the quantities are in the millions of units and 'a few cents' can quickly add up to 'real money'. **Enforcement of Part 15 standards is the responsibility of the Federal Communications Commission and a necessary part of the reduction of manmade noise which is destroying the Medium Wave Band audience.**

TRANSMISSION SYSTEM GENERATED INTERFERENCE

Nighttime interference generated by the present AM "IBOC" Digital System can be best described as "*Transmission System Generated Interference*". With the digital sidebands operating on the upper and lower adjacent channels, useful skywave service on these channels is seriously compromised over large areas. This is particularly noticeable in the Eastern and Midwestern United States where there are many Class 1 and Class 2 stations with overlapping service areas operating on first or second adjacent channels with fifty kilowatts during nighttime hours. The relatively high level adjacent channel sidebands destroy large areas of each other's nighttime service area with their digital sidebands. This type of interference *far exceeds that generated by any interference caused by the proposed changes in the allocation standards opposed by the "Alliance".* This interference is significantly stronger than the power line noise generated by defective power line insulators, LED and CFL lamps and other home sources of noise in the medium wave band.

An excellent article written by James E. O'Neal in 2013 describing AM Band reception during nighttime hours in the eastern United States appears on the Radio World Website at: http://www.radioworld.com/article/iboc-at-night-five-years-later/218209AM.

A search was conducted on the Internet for AM/FM IBOC and digital home receivers with numerous results for FM receivers, but fewer than five sets with AM HD capability. All of the available receivers also had FM HD capability, but at costs exceeding $1000.00. Many automobile aftermarket receivers are available with AM and FM IBOC capability. Most current model automobiles have optional AM and FM IBOC reception capability.

Clearly the mass market for home and portable AM/FM IBOC receivers has failed to develop. This is largely because the U.S. "IBOC" HD system is a proprietary system controlled by a single entity. This results in unaffordable costs due to the receiver manufacturer's high royalty payments to the patent holder.

Never before in the history of the FCC has a proprietary system, the details of which were *not disclosed to the FCC*, been authorized as a US Standard.

The original NTSC monochrome and color TV systems, the FM Stereo system, the AM Stereo system and the ATSC High Definition Television systems standards proceedings were conducted in the open with all details available to potential manufacturers and all details of the systems disclosed to the FCC and the general public. This resulted in low cost consumer radios and television set due to low or non-existent royalty payments and high volume manufacturing.

This is not the case with the proprietary IBOC systems with the sole source proprietary IBOC system which has contributed to the high cost and very limited availability of consumer receivers and the corresponding failure of the system in the marketplace.

After more than a decade of AM IBOC operation without home receivers being available at a reasonable cost, we submit that it is time to drop the "marketplace" choice of national standards brought about in the original AM Stereo proceeding of the late 1970's. This led to the lack of any standards, which *are and always have been an FCC responsibility.* In the AM Stereo proceeding, the Commission made a decision based on the record and chose the Magnavox AM/PM system, the simplest system to implement, as the standard. This resulted in the threat of lawsuits from one of the losing proponents and a 'backfield attack' led by another losing proponent which led to confusion in the marketplace. The Commission withdrew the standard. This resulted in the ultimate failure of the system, though both the Magnavox and Motorola systems worked very well in the marketplace and Motorola and others made very low cost decoder chips compatible with both systems. The cost of implementation was very small to the OEM Manufacturers because the decoders were implemented in available space on existing silicon chips used in the receivers for their automobiles and trucks. Several aftermarket manufacturers made low cost automobile and portable receivers which worked well with both systems.

It is clearly the responsibility of the FCC to stand up and honor its responsibilities to create a U.S. Digital Radio Standard. We recommend that the European DRM standards, all of which are open standards, be adopted for the Medium Wave Band since it is being adopted in the rest of the world, with India being the latest country to adopt it as a national standard. Consumer receivers are now being produced in India with relatively low cost products beginning to arrive in retail stores. The system works well with both Groundwave and Skywave propagation modes.

Never again should an undisclosed proprietary system be granted exclusivity as a U. S. Standard.

We believe the medium wave band and 'expanded band' have the potential for many years of useful service in the future if the Commission will recognize and fully implement comments submitted by the many parties participating in this proceeding.

Respectfully Submitted,

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