ASSOCIATION FOR **MAXIMUM SERVICE TELEVISION, INC.**

P.O. Box 9897
4100 Wisconsin Avenue, NW
Washington, DC 20016

Tel (202) 966-1956
Fax (202) 966-9617

April 8, 2009

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

RE: Ex Parte Communication
Improving Public Safety Communications in the 800 MHz Band,
Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile Satellite Service
WT Docket No. 02-55; ET Docket No. 00-258; ET Docket No. 95-18

Dear Ms. Dortch:

On Tuesday April 7, 2009 David Donovan, Bruce Franca and Victor Tawil of MSTV met with the following members of the FCC's Office of Engineering and technology: Ms. Geraldine Matise, Mr. Jamison Prime; Mr. Alan Stillwell and Mr. Nick Oros. We discussed the following issues, in the above referenced proceeding, concerning the relocation of broadcasters in the BAS band.

We restated our compromise proposal that MSS operations may become primary in the band in markets that have been cleared through the relocation process. This would allow MSS operations to begin service to 41% of the US populations or more that 121 million people. This is more than a sufficient market for MSS to roll out its purported new services. **Incumbent BAS operations should remain primary in markets that have not been cleared. MSS operations would remain secondary in these "uncleared" markets.** This compromise proposal strikes the appropriate balance between protecting a broadcaster's ability to provide coverage for live local news, while at the same time allowing MSS operations to operate in areas that will provide more than an adequate market. There are several key considerations.

First, we noted that ICO has provided no technical evidence in the record suggesting that it would be able to share with BAS services. Indeed, the exact technical configuration of ICO's system is not completely known at this time. Apparently, experiments are being conducted in two markets. At a minimum, further technical data is needed assess the true interference impact of this system.

To its credit, TerreStar has submitted a study by du Triel, Lundin & Rackley, Inc.[1] Unfortunately; the analysis submitted into the record does not prove that there will be no interference to existing BAS operations. First, the *du Triel Study* observed that there would be little or no interference to BAS digital operations. This misses the point, as stations generally do not use BAS digital equipment in un-cleared markets. These stations will be using analog equipment. Second, the study suggests that interference would be less if stations used an analog "narrow in place" approach. We noted that the *du Triel Study* did not conclude there would be no interference with analog "narrow in place" BAS systems. Moreover, there is no justification for forcing stations to bear the expense of trying to use a "narrow in place approach" for a few months until their respective markets are cleared. Indeed, in their pleadings, MSS interests have made no offer to compensate stations. Given their desire to avoid any financial obligation in this proceeding, we would not expect them to do so now.

We submitted the attached analysis prepared by Hammett and Edison, Inc., which outlined several shortcomings of the *du Triel Study*. For example, the *du Triel Study* made certain assumptions about the spectrum that would be used and focused on adjacent channel interference. However, in many of the uncleared Class I and Class II markets, stations employ analog "split channel" techniques to use the spectrum more efficiently. In this regard, the *du Triel Study* should have examined co-channel interference. In addition, the *du Triel Study* did not examine representative analog equipment still being used by stations in uncleared markets. The analysis also failed to examine the impact on ENG relay vans or the reality of using TDD and FDD handsets in close proximity.

Second, we noted that there is the potential that ENG trucks in uncleared markets, under certain conditions, may interfere with MSS transponders. This would happen when ENG trucks are aiming in a southerly direction to connect to their receive sites. If MSS operations are given primary status nationwide, and BAS operations are given secondary status, then MSS operators could effectively shut down all local newsgathering ENG operations in un-cleared markets across the country, including Los Angeles, New York, Boston and many large metropolitan areas that have not been cleared. The FCC should avoid this unintended consequence at all cost. Broadcast BAS operations must remain primary in all uncleared markets.

Third, granting primary status to MSS operators would wreak havoc on the orderly clearing process. At this juncture, the order in which markets will be cleared is relatively stable. Stations have worked together to create the most efficient approach to transition each market. In 2008, we readjusted the schedule to accommodate MSS experimental markets requiring equipment system integrators to be reassigned. In the end, it created inefficiencies in the overall band clearing process. If MSS were given primary status nationwide, we can expect a similar result as some stations and some markets demand to be cleared first in order to avoid the possibility of interference to their new operations. The result will be to delay the relocation process. We need not take this risk.

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[1] du Triel, Lundin, & Rackley, Inc., Predicted Impact to 2 GHz Broadcast auxiliary Operation from Proposed Handset to Satellite Emissions TerreStar Networks, January 30, 2008. (du Triel Study)

Fourth, we urged the FCC not to repeal the top 30-market rule. Under the rule, MSS operators must pay to relocate stations' BAS operations in the top 30 markets, prior to commencing nationwide service. The top 30 rule operates independently of any relocation obligation by Sprint/Nextel. In other words, MSS operations must provide relocation compensation to stations in the top 30 markets before the station is relocated. Outside the top 30 markets, stations may be required to relocate first, and then MSS operators would provide relocation compensation.

Eliminating the top 30-market rule would effectively relieve MSS operators from having to compensate stations for relocation. Absent this rule, all local stations, including some of the largest un-cleared news markets in the world, would have to bear the economic burden of the relocation, and then try to recover money from MSS operators. The realities of today's economy make this an impossible burden. Many stations may be unable to bear the up-front costs of relocation. Moreover, the FCC must bear in mind the history of this proceeding, in which MSS operators have essentially avoided any relocation payments for nearly a decade. In today's economy, even the most stable firms are subject to unpredictable economic fluctuations. Accordingly, it would be unwise for the Commission to effectively relieve MSS of its relocation compensation obligations at this time. Retaining the top 30 market rule will insure that the obligation to provide relocation compensation remains.

For relocation to be successful, relocation compensation to stations must be provided first. This is precisely the process now embodied in the Sprint/broadcast industry relocation plan.

Under the MSTV/NAB/Sprint compromise plan, MSS operators would be able to commence service in uncleared markets to 121 million Americans –right now! This number increases everyday, as more are cleared. For example, BAS operations in Dallas were relocated today. In effect, we would be modifying the top 30-market rule to allow such operation on a market-by-market basis. At the same time, the compromise plan will protect live, local news coverage. Because they BAS operations in uncleared markets would remain primary, MSS hand held devices would not be able to cause interference to these operations. This would include handhelds entering the market from other "cleared" markets. Moreover, to the extent there is any interference from BAS to MSS transponders, the MSS operators could not force the shut down of live local ENG coverage. Finally, it insures that MSS operators to independently responsible for relocating BAS operations and that relocation payments be made prior to a station relocating its operations.

Sincerely,

David L. Donovan

Analysis of dLR "Predicted Impact To 2 GHz Broadcast Auxiliary Operations from Proposed Handset To Satellite Emissions" Document

Statement of Hammett & Edison, Inc., Consulting Engineers

The firm of Hammett & Edison, Inc., Consulting Engineers, has been retained by the Association of Maximum Service Television, Inc. (MSTV) to analyze and comment on a document prepared by the firm of du Treil, Lundin & Rackley, Inc., *Predicted Impact To 2 GHz Broadcast Auxiliary Operation from Proposed Handset to Satellite Emissions TerreStar Networks*, dated January 30, 2008.

Background

In the ET Docket 95-18 rulemaking, the Commission reallocated the bottom 35 MHz of the 1,990–2,110 MHz TV Broadcast Auxiliary Services (BAS) band to the Mobile Satellite Services (MSS). Subsequent rulemakings have further reallocated portions of this spectrum to the Advanced Wireless Services (AWS) and to Sprint Nextel; however, MSS is still allocated 20 MHz of bandwidth, at 2,000–2,020 MHz. In the WT Docket 02-55 rulemaking, funding for the conversion of all 2 GHz TV BAS operations from the old 1,990–2,110 MHz band plan to the new 2,025–2,110 MHz band plan was adopted. The old band plan consisted of one 18 MHz wide channel and six 17 MHz wide channels. The new MHz band plan consists of seven 12 MHz wide channels, plus twenty 25 kHz wide lower Data Return Link (DRL) channels and twenty 25 kHz wide upper DRL channels; see the attached Figure 1.

The 2 GHz TV BAS band conversion was originally scheduled to be completed by September 2007; however, this process has been delayed, and Sprint Nextel has requested a 29-month extension, until August 2009.* This means that there are still many TV markets with active 2 GHz TV BAS operations still on TV BAS Channel A1 (1,990–2,008 MHz) and TV BAS Channel A2 (2,008–2,025 MHz). This delayed clearing of the 2,000–2,020 MHz MSS portion of the reallocated portion of the 2 GHz TV BAS band in turn means that there would be a conflict should MSS Earth-to-space handsets start operating in a TV market where the 2 GHz TV BAS band has not yet been transitioned.

The TSN Proposal

Because of this delay in band clearing, TerreStar Networks (TSN) has proposed that it be allowed to commence MSS operations. This would involve MSS handsets operating in either MSS Band A (2,000–2,010 MHz) or MSS Band B (2,010–2,020 MHz). TSN indicates that it does not yet know which of these two bands would be used for such early deployment. TSN claims that the early deployment of handsets would "be limited to a discrete number of test markets that have either been cleared or coordinated." Additionally, TSN apparently proposes to initially use only a few

* See "Consensus Plan of Sprint Nextel Corporation, the Association for Maximum Service Television, Inc., the National Association of Broadcasters, and the Society of Broadcast Engineers, Inc.," filed on December 7, 2007.

narrowband MSS channels, centered at the top of TV BAS Channel A1, or at the bottom of TV BAS Channel A2, in an attempt to make the operation adjacent-channel rather than co-channel to operations on existing TV BAS Channels A1 and A2.† That is, even though the narrowband MSS channel would be entirely inside TV BAS Channel A1, because of the presumed center-of-the-channel only BAS operation, and the presumed electronic news gathering (ENG) receiver selectivity, the proposed operation would supposedly be *de facto* adjacent-channel operation, and not co-channel operation, which would clearly never work.

To justify this proposed *de facto* adjacent-channel operation, TSN commissioned the firm of du Treil, Lundin & Rackly, Inc. (dLR) to make bench and field interference tests of MSS handsets-into-analog TV BAS receivers and MSS handsets-into-digital TV BAS receivers. However, only two late-model ENG receivers were tested: a NüComm Model 22CR6 analog receiver, and a NuComm Model CR6D digital receiver. Since adjacent-channel interference is a function of both the potentially interfering transmitter's adjacent-channel leakage ratio (ACLR), also referred to as out of band emissions (OOBE), and the victim receiver's adjacent channel rejection ratio (ACRR), also referred to as selectivity, it follows that a test of two relatively late model ENG receivers not a sufficient universe of receivers on which to draw any conclusions. This is especially true given that older ENG receivers will eventually be replaced with new, state-of-the-art receivers by Sprint Nextel, at no cost to the TV BAS licensee. It is therefore virtually guaranteed that older ENG receivers, with poorer ACRRs, will not be voluntarily replaced prior to a TV market being transitioned by Sprint Nextel.

The total adjacent-channel interference is defined as the adjacent channel interference ratio (ACIR), and has the relationship ACIR = {1/[(1/ACLR) + (1/ACRR)]}‡. That is, the adjacent-channel interference potential is a function of the OOBE of the potentially interference transmitter (seen as in-channel interference by the victim receiver) and the ability of the victim receiver to reject an undesired adjacent-channel signal. Thus, testing of only two late-model ENG receivers where the interference mode is effectively adjacent-channel is inadequate. Older generation ENG receivers, most likely having poorer ACRRs, must also be tested.

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† The top-of-Channel A1 frequencies in the report are 2,007.0313 2,007.3438, 2,007.5625 and 2,007.7500 MHz. The bottom-of-Channel A2 frequencies in the report are 2,010.0160, 2,010.2040, 2,010.4223 and 2,010.7348 MHz. It is unclear from the report whether TSN is proposing to limit operation on these eight frequencies, or whether TSN would want to use other narrowband channels in this range.

‡ See Section 6.2.3 of the Advanced Television Systems Committee (ATSC) Data Return Link (DRL) Standard, ATSC Document Number TSG-696r5, November 7, 2007.

Analysis of dLR "Predicted Impact To 2 GHz Broadcast Auxiliary Operations from Proposed Handset To Satellite Emissions" Document

The Study Ignores Split-Channel Operations

In Class I ENG markets§ broadcasters routinely use split-channel, or frequency offset, operation. This is because the seven 2 GHz TV BAS channels are not sufficient to accommodate the news demands of a larger TV market with multiple stations having fleets of ENG platforms (both vans and helicopters). Split-channel operation also occurs in Class II ENG markets, although not to the extent that it does in Class I ENG markets. Therefore in Class I ENG markets, and to a lesser degree in Class II ENG markets, the TSN presumption of only center-of-the-channel ENG operations is not valid, and the model of an adjacent-channel interference mode rather than a co-channel interference mode is also not valid. This means that for a TV BAS station operating not in the center of TV BAS Channel A1 at 1,999 MHz as assumed by TSN, but rather on TV BAS Channel A1+ with a +4.25 MHz center frequency offset, the proposed early MSS operation in the upper portion of TV BAS Channel A1 would be seen as *co-channel* interference, not *adjacent-channel* interference. The magnitude of the interference would therefore be worsened by between 30 to 50 dB, depending on the ACRR (selectivity) of the victim receiver. Clearly, an increase of this magnitude in the MSS handset-into-BAS receiver interference would result in massive interference. Indeed, it was the realization that MSS (or any commercial mobile radio service (CMRS) handsets, for that matter) could not simultaneously operate on the same frequencies at the same time in the same area that prompted the refarming of the 2 GHz TV BAS band in the ET Docket 95-18 rulemaking. This fact alone makes the TSN proposal unworkable.

It should be noted that even for "narrow in place" digital operation on the old 2 GHz TV BAS channel plan, split-channel or frequency offset digital operation is still possible; that is, digital operation does not have to be limited to only the exact center of the channel. For example, for a digital ENG signal with an 8 MHz pedestal, the center frequency could be within 4 MHz of the old TV BAS Channel A1 upper boundary without causing the digital signal to spill over into the adjacent TV BAS channel. In that event, the digital ENG receiver would again see a narrowband MSS handset signal as a co-channel interfering signal, and not an adjacent-channel interfering signal.

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§ At Paragraph 19, the July 3, 2000, ET Docket 95-18 Second Report and Order (R&O) and Second Memorandum Opinion and Order (MO&O) defined four categories of 2 GHz BAS usage:

Category I. "Los Angeles" or "LA." Extremely heavy use, mostly split channel. There is lots of itinerant use and channel borrowing and sharing; even so, seven channels aren't enough.

Category II. "Metro." Spectrum is heavily used, especially during the news hours. There is some split channel use, not a lot, and some itinerant use. There is regular channel borrowing and sharing.

Category III. "Light." There is some electronic news gathering ("ENG"), some fixed link, maybe even some channels mostly vacant most of the time. Typically, a small-market, low-competition situation.

Category IV. "Rural." ENG is unheard of, the use is for fixed, long-haul relays to small-market TV stations, to TV translator stations, and to cable television headends. In some areas not all channels are even used

Analysis of dLR "Predicted Impact To 2 GHz Broadcast Auxiliary Operations from Proposed Handset To Satellite Emissions" Document

Inability To Limit MSS Handsets To A Limited Number of Test Markets

Another flaw in the TLN plan is that while it is proposed that MSS handsets would be restricted to only markets that have already been transitioned, doing so would not appear to be possible for an MSS handset. While limiting handset operation would be possible for a terrestrial architecture, where the lack of cell sites would mean that and handset wouldn't work, there is no such ability to restrict the operation of an MSS handset once it has been released to a user. This is because the handset is communicating not with nearby base stations, but rather with satellites in low earth orbit. Thus, TSN's claim that the MSS handset operation could be restricted to only transitioned or otherwise frequency coordinated TV BAS markets would appear to be unenforceable.

Even if TLN could somehow limit handset operation only to TV BAS markets that have been transitioned, TLN is not the only MSS provider. Other MSS providers would undoubtedly similarly request authority to commence operations before completion of the 2 GHz TV BAS transition, further aggravating the MSS-into-BAS interference that would then result.

No Consideration of ENG Relay Vans, Or the "Hertz Bus" Reality

For both MSS handsets-into-analog BAS interference, and MSS handsets-into-digital BAS interference, the dLR report concedes that if (1) the MSS handset is in the main beam of the BAS receiving antenna; (2) if the MSS handset is operating relatively close to the BAS receiving antenna; (3) if the MSS handset has an unobstructed or nearly-unobstructed path to the BAS receiving antenna; and (4) if the incoming BAS signal is weak (that is, near the BAS receiver's threshold), then MSS handset-into-BAS interference would occur. The implication is that such a string of conditions would be unlikely to ever occur in practice.

Yet there is an application where exactly this scenario can occur: ENG relay vans. An ENG relay van is an ENG truck equipped with a 2 GHz TV BAS receiving antenna and receiver, in addition to a 2 GHz TV BAS transmitter and a mast-mounted transmitting antenna. ENG relay vans are used in situations where the news or sports venue site lacks line-of-sight to an existing ENG receive-only site (ENG-RO), but there is an intermediate location where an ENG truck can be parked that has line-of-sight both to an originating ENG transmission at the news/event site and to an available ENG-RO site. These paths tend to be dog-leg, since the receiving antenna on the ENG relay truck is generally an omnidirectional, low-gain, roof-mounted (as opposed to mast-mounted) antenna, so the first hop has to be a short one. Another scenario where an ENG relay van might be used is to relay the signal from a low-power transmitter on the back of a portable ENG camera; that signal is then re-transmitted on a different ENG channel, at high power, for reception at a fixed ENG-RO site. Given that many battery-powered, man-pack, back-of-camera TV BAS transmitters have transmitter power outputs (TPOs) of

250 mW or less**, so as to take advantage to the equipment verification or certification exemption of Section 74.655(b) of the FCC rules, this increases the likelihood that the incoming signal from a portable ENG camera will be a relatively weak signal at the ENG relay van. Thus, it would be entirely possible that all of the conditions for interference given in the dLR report could easily happen: a weak signal could be received from a low-power ENG camera transmitter, being received by a low-height, omnidirectional, van rooftop receiving antenna, with an MSS handset user standing in the vicinity of the ENG relay van, and thus likely having an unobstructed line-of-sight to the van's receiving antenna, and being in the main beam of that antenna.

A similar combination of supposedly unlikely conditions was referred to as the "Hertz bus" scenario by Sprint engineers in the conference calls leading up to the 2002 joint Wireless Communications Association International (WCA)/National ITFS Association (NIA)/Catholic Television Network (CTN) white paper proposing to refarm the 2.6 GHz Multichannel Multipoint Distribution Service (MMDS) and Instructional Television Fixed Service (ITFS) bands. That white paper resulted in RM-10586, which in turn became WT Docket 03-66. It was the WT 03-66 rulemaking that refarmed the MMDS/ITFS bands into the Broadband Radio Service (BRS)/Educational Broadband Service (EBS) bands. The discussion involved the conflict between time division duplex (TDD) and frequency division duplex (FCC) handsets. Since a TDD handset transmits and receives on the same frequency, whereas an FDD handset transmits on separate frequencies, sufficiently separated so as to allow a physically small, inexpensive and lightweight duplexer to be built into each handset, interference could result if a TDD handset and an FDD handset tried to operate in close proximity to each other. At first blush this would appear to be an unlikely scenario between two mobile devices, until the Sprint engineers explained the "Hertz bus" scenario. In that scenario two businessmen get into an arriving Hertz bus at an airport pickup, sit next to each other, pull out their cell phones, and begin talking. One handset is TDD, the other FDD. Bingo, the close-proximity and supposedly unlikely worst case scenario has just been fulfilled. The same situation could easily occur between an ENG relay van and a nearby user of an MSS handset.

Summary

Allowing the early deployment of MSS handsets, even if temporarily limited to narrowband channels at the top of TV BAS Channel A1 or the bottom of TV BAS Channel A2, would likely result in chronic but hard to track down interference in Class I or Class II BAS markets where split-channel operation is either routine or at least not infrequent; in such markets, the interference mechanism would be co-channel, not adjacent-channel. Further, the proposal that MSS handsets could some how

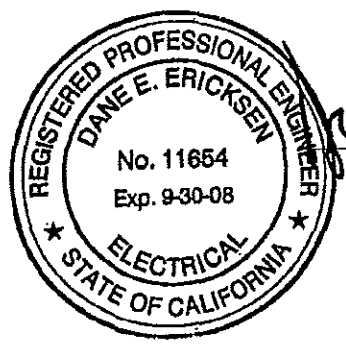
** For example, the Global Microwave Systems, Inc. (GMS) NT series transmitter, with a TPO of between 10 mW and 250 mW; or the NuCcomm CamPac2, with a TPO of between 10 mW and 200 mW.

be restricted to only certain markets appears unrealistic and unenforceable. ENG relay trucks would be especially at risk of interference from MSS handsets. As so aptly stated by Mr. Tom Bentsen, formerly of NASA and now editorial Vice President of SMPTE, "Political solutions always produce suboptimal results." Hopefully, the Commission will rely on engineering reality and good spectrum policy rather than a political solution in determining whether MSS handsets are allowed to deploy prior to the completion of the 2 GHz TV BAS transition. The answer should be a clear and definite "no."

List of Figures

In carrying out these engineering studies, the following attached figure was prepared under my direct supervision:

1. Old versus new 2 GHz TV BAS band plans.

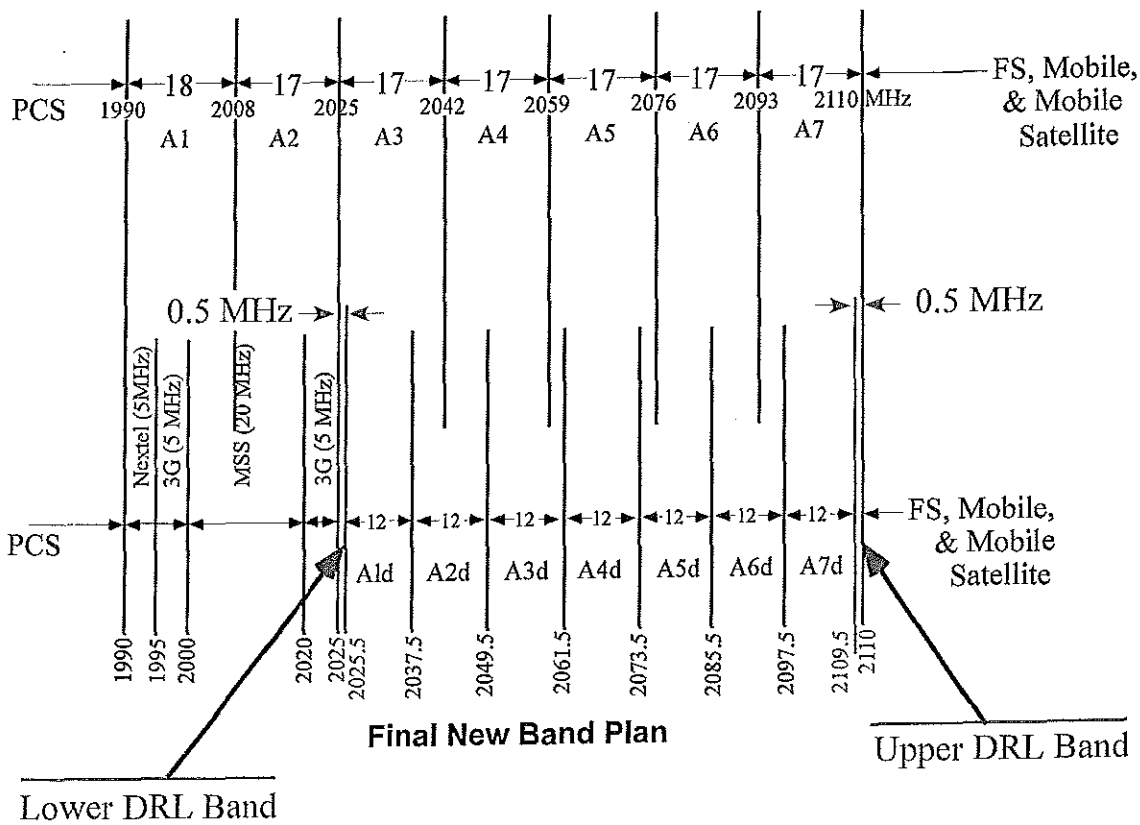


Dane E. Ericksen, P.E.

February 20, 2008

Analysis of dLR "Predicted Impact to 2 GHz Broadcast Auxiliary Operations from Proposed Handset to Satellite Emissions" Document

Existing v. Final GHz BAS Band Plan



DRL = Data Return Link

All frequencies and bandwidths are in MHz.