

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
DoD Uplinks Relocated to the) ET Docket No. 00-258
2,025–2,110 MHz TV BAS Band) Fourth NPRM
So As To Make Still More Spectrum)
Available for Third-Generation Wireless)
Services at 1.7 GHz)

To: The Commission

Reply Comments of the Society of Broadcast Engineers, Inc.

The Society of Broadcast Engineers, Incorporated (SBE), the national association of broadcast engineers and technical communications professionals, with more than 5,000 members world wide, hereby respectfully submits its reply comments in the above-captioned Notice of Proposed Rulemaking (NPRM) relating to the relocation of 11 Department of Defense (DoD) tracking, telemetry and command (TT&C) Earth-to-space satellite uplink stations from 1.8 GHz to the 2,025–2,110 MHz TV Broadcast Auxiliary Services (BAS) band.

I. Lack of Comments by NTIA or DoD Is Telling

1. SBE is quite surprised that the National Telecommunications and Information Administration (NTIA) did not bother to file comments to this rulemaking; apparently NTIA doesn't support its own proposal.¹ SBE believes that the Commission should treat as telling this lack of participation by the proposing party, suggesting that NTIA now realizes how bad a proposal this is.

II. Keeping DoD Uplinks in the SGLS Band Makes Far More Sense

2. As proposed in Paragraph 1 of the SBE comments, it makes far more sense for federal government terrestrial operations² being displaced from 1,710–1,755 MHz to frequency coordinate around the existing 11 DoD uplinks in the 1,761–1,842 MHz Space Ground Link System (SGLS)

¹ SBE notes that NTIA did file comments to other recent FCC Rulemakings, such as to ET Docket 03-122 (the "Unlicensed National Information Infrastructure" rulemaking) and to ET Docket 03-104 (the "Carrier Current Systems" rulemaking).

² According to the November 25, 2003, Report & Order (R&O) to WT Docket 02-253, re-allocating two 45-MHz wide blocks of spectrum at 1,710–1,755 MHz, and 2,110–2,155 MHz, from the federal government to the private sector, for Advanced Wireless Services (AWS) use, 1,710–1,755 MHz is currently used by DoD and by the Department of Agriculture (USDA), the Department of Energy (DOE), the Department of Justice (DOJ), the Federal Aviation Administration (FAA), the Department of the Interior (DOI), the Tennessee Valley Authority (TVA), the U.S. Coast Guard (USCG), the Federal Power Administration (FPA), and the Department of the Treasury.

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band, rather than to try to create a fundamentally incompatible sharing with 2 GHz TV BAS operations. Keeping DoD uplinks at 1.8 GHz and requiring the displaced 1.7 GHz military and non-military federal operations to frequency coordinate with the DoD uplinks would result in a more equitable balance between the coordinating parties: one federal government application versus another federal government application, as opposed to a DoD operation versus a commercial BAS operation. This would not change the requirement that AWS entities would still be required to reimburse the federal government for its cost in clearing 1,710–1,755 MHz. The fact that the interference would be entirely one way if the DoD uplinks were moved from 1.8 GHz to 2.0 GHz, from DoD uplinks into BAS, is an additional reason why DoD would have little incentive to do frequency coordination, much less the real-time or near real-time frequency coordination that is the life-blood of modern-day electronic news gathering (ENG) operations in the major TV markets. Finally, the fact that such frequency coordination would require DoD personnel to repeatedly have to work with "mere" civilian users of the supposedly shared spectrum is not realistic, and, frankly, surprisingly naive on the Commission's part.

3. Of course, it does not help that the Universal Licensing System ("ULS") is currently incapable of allowing broadcasters to document the location(s) and height(s) of their ENG receive only (RO) sites, nor that the Commission found SBE's comments to the ET Docket 01-75 rulemaking (a broadly based rulemaking intended to update and harmonize the Part 74 BAS Rules) requesting that FCC Form 601 and the ULS be modified to allow TV Pickup licensees to enter the locations and heights of their ENG-RO sites as "outside the scope of the rulemaking." SBE anticipates that it will take the Commission up on its suggestion, in the October 20, 2003, ET Docket 01-75 Memorandum, Opinion & Order (MO&O), that SBE should file a separate Petition for Rulemaking to implement this change.

III. Comments of Cingular, Sirius Satellite Radio/XM Radio, and Motorola

4. The Cingular Wireless, Sirius Satellite Radio/XM Radio, and Motorola comments all have one thing in common: they think that moving high-power DoD uplinks to 2,025–2,110 MHz, where they would be *co-channel* with TV BAS operations, is just fine, but express concern that there be no out of band emissions (OOBE) from those very same re-farmed DoD uplinks to their operations in adjacent bands. SBE can only shake its head at such comments and logic: if these parties think that OOBE leakage is a threat to their adjacent-band operations, how can they possibly think that these DoD uplinks won't cause interference to TV BAS, where they would be *co-channel*?

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IV. Comments of Space Imaging

5. Space Imaging points out that it uses 2,042 MHz as primary, and 2,052 MHz as secondary, for 100 kHz wide TT&C communications to its commercial remote-sensing satellites, from uplinks at Thorton, CO; Fairbanks, AK; Norman, OK; and Garland, TX, all on a secondary basis to TV BAS operations, and requests that should DoD uplinks be moved to 2,025–2,110 MHz that any nearby DoD uplinks be required to frequency coordinate with the existing Space Imaging uplinks. Although it is SBE's position that DoD uplinks should not be moved to 2,025–2,110, should that frequency shift nevertheless happen, then SBE agrees that, in addition to successfully frequency coordinating with terrestrial TV BAS operations (which SBE does not believe can be achieved as long as analog TV BAS is in use), any DoD uplinks in the vicinity of the four Space Imaging uplink sites also be required to successfully frequency coordinate with those facilities.

V. U.S. Footnote 222 (NOAA 2 GHz Uplinks)

6. SBE research regarding U.S. Footnote 222 to Section 2.106 of the FCC Rules (Table of Frequency Allotments) could not be completed in time for the inclusion of this information in the initial SBE comments. However, information about the uplinks has now been obtained, and is being included in these SBE reply comments. U.S. Footnote 222 indicates that 2,025–2,035 MHz (entirely within the present TV BAS Channel A3, 2,025–2,042 MHz) is reserved for federal government uplinks at Wallops Island, VA; Seattle, WA; and Honolulu, HI, on a co-equal basis with TV BAS, yet SBE is not aware of interference to TV ENG in the Seattle or Honolulu TV markets (Wallops Island is sufficiently removed from TV markets with significant ENG use so as not to be a problem). SBE research has revealed that these allotments are for National Oceanic and Atmospheric Administration (NOAA) uplinks, and that the Seattle (actually, Naval Supply Center, Manchester Annex, Bremerton, Washington, according to the provided geographic coordinates) and the Honolulu uplinks do not exist, so that explains the lack of interference to TV BAS operations on Channel A3 in those markets.

7. As documented by the attached Figure 1A, it would appear that the same inability to provide accurate geographic coordinates for uplink locations that plagued the NTIA/DoD proposal also affects NOAA. The geographic coordinates given in U.S. Footnote 222 for the Wallops Island uplink plot about 1 kilometer into the Atlantic Ocean. Figure 1A also shows SBE's best estimate of the actual uplink location. Figure 1B shows the communities in the vicinity of the Wallops Island uplink, and Figure 1C shows the line-of-sight conditions for the uplink, based on the best estimate SBE coordinates and an assumed uplink feed horn height of 15.2 meters (50 feet) AGL.

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8. As shown by Figure 1C, the Wallops Island uplink is terrain shielded to the Washington, DC, area, which, as TV Market Number 8, has heavy ENG use. The Wallops Island NOAA uplink is also well terrain shielded to most of the Norfolk-Portsmouth-Newport News, VA, TV market, which is Number 41. Combined with the information that SBE has learned about the low transmitter power output (TPO) of between 10 and 30 watts used by the NOAA Wallops Island uplink, SBE is not surprised that this use of a portion of TV BAS Channel A3 has not caused interference to TV BAS operations.

9. Somewhat disconcerting to SBE is the discovery that NOAA has built a backup uplink facility at the Goddard Space Flight Center (GSFC) at Blossom Point, Prince George's County, Maryland, only 52 kilometers from Washington, DC, without benefit of first having U.S. Footnote 222 amended to include that site. SBE understands that this uplink is only used in the event the main Wallops Island uplink is out of service (most likely due to a hurricane since, as shown by Figure 1, the Wallops Island uplink is on the Eastern seaboard of the United States and is accordingly at storm risk). However, and to NOAA's credit, SBE has learned that interference tests were first conducted with the Washington Executive Broadcast Engineers (WEBE), which is the group that frequency coordinates 2 GHz TV BAS operations for the Washington, DC, area. SBE understands that WEBE found that no interference to the Washington, DC, ENG-receive only (ENG-RO) sites was caused for the normal uplink TPO of 10 to 30 watts due to the fortunate geometry between the uplink site and the normal aiming directions of the Washington, DC, area ENG-RO sites, which place GSFC in the back lobe of the most often used orientations of the steerable ENG-RO dishes. However, these same tests showed that should NOAA ever deem it necessary to use its 2 kW "emergency" power level, interference to supposedly co-equal TV BAS operations would be caused, and probably at a time of maximum need by broadcasters for ENG feeds (since emergency situations and the most urgent need for ENG feeds usually coincide). So, SBE has to wonder if NOAA would object if the tables were turned, and it was (a) NOAA operations, and not terrestrial TV BAS operations, that were at risk of suffering one-way interference and (b) that it was broadcasters rather than NOAA that had built an uplink facility without first getting the FCC Rules³ modified to reflect the new location? But, apparently, when you are the federal government, it's "do as I say, not do as I do."

³ SBE is well aware that NOAA and other federal government radio stations are authorized by the Interdepartmental Radio Allocations Committee (IRAC), and not by the FCC. However, when a federal agency wishes to operate on frequencies not reserved solely for federal government use, that is, on a shared basis with licensees under FCC jurisdiction, then SBE believes that FCC concurrence is required.

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VI. NASA 2 GHz Uplinks

10. SBE opened a dialog with NASA regarding this NPRM, on July 8, 2003, the day after the Fourth NPRM was released. SBE and NASA have a history of cooperation, culminating in the SBE support of the rulemaking to upgrade NASA's use of 2 GHz TV BAS spectrum from secondary to co-primary, first by supporting IRAC RM #30063, and then by supporting that change in the ET Docket 95-18 Second NPRM. As the November 3 comment deadline got closer and closer, more and more telephone calls and emails were sent to NASA, requesting details regarding the existing NASA 2 GHz uplinks, which have proven to be a compatible sharing with TV BAS operations over the years. SBE wanted these details in order to show how different the "few" NASA uplinks in "remote" areas are from the multitude of proposed 2 GHz DoD uplinks, many of which would be located in major TV markets.

11. Unfortunately, a spreadsheet showing NASA 2 GHz uplinks was not provided by NASA until October 31, 2003, only one business day before the initial round of comments to the ET Docket 00-258 Fourth NPRM were due. And, to SBE's shock and surprise, that list showed 16 sites, including, to SBE's amazement, Berkeley, California, in the heart of the San Francisco-San Jose-Oakland TV market, which has extensive ENG use daily on all seven 2 GHz ENG channels. Further, the NASA list showed a TPO of 100 watts (50 dBm) into an 11-meter dish with a gain of 45.5 dBi for the Berkeley uplink, resulting in a main beam equivalent isotropic radiated power (EIRP) of 95.5 dBm. According to the NASA spreadsheet the Berkeley uplink transmits on two frequencies, 2,030.2533 MHz with a bandwidth of 84 kHz, and 2,039.6458 MHz with a bandwidth of 36 kHz. Both of these uplink frequencies are in TV BAS Channel A3, 2,025–2,042 MHz. Accordingly, SBE would expect serious interference to home channel operations on Channel A3 if the Berkeley uplink were to radiate during weekday daylight and early evening hours, when ENG use is the heaviest. Yet, SBE was not aware of any reports of such interference.

12. The geographic coordinates given for the Berkeley uplink, 37° 52' 48" N, 122° 14' 38" W (datum not specified, NAD27 presumed), were then plotted, and found to be close to the Lawrence Hall of Science on the UC Berkeley campus, as shown by the attached Figure 2. The Chairman of the SBE FCC Liaison Committee is personally familiar with that location, and did not recall ever seeing an 11-meter diameter satellite uplink antenna in the vicinity (which would be hard to miss). To verify this recollection, the site was recently visited by the Chairman of the SBE's San Francisco Chapter, with the specific goal of seeing if a satellite uplink antenna, 11-meter or otherwise, was at or near the geographic coordinates given in the October 31 NASA spreadsheet. That visit found *no* uplink antenna at or near the claimed coordinates, which are reported to be the location of the UC

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Berkeley Space Sciences Laboratory. An uplink dish may have existed at the Space Sciences Lab in the past, but one is not found there now. Therefore, SBE concludes that the reason no interference to Channel A3 ENG operations in the San Francisco Bay Area have been caused is that there is no high-power, co-channel NASA uplink at Berkeley, California.

13. This brings into question the veracity of some of the other sites on the NASA list, and SBE is continuing to attempt to work with NASA on verifying its list but, regrettably, progress has been glacial. So, at this time, SBE continues to believe that the reason that NASA's use of 2 GHz frequencies for Earth-to-space communications has proven compatible with terrestrial TV BAS operations on those same frequencies is because the NASA uplinks are at relatively remote locations, such as Edwards AFB, CA; Goldstone, CA; and Wallops Island, VA.

VII. Homeland Security

14. SBE has previously pointed out the importance of ENG to Homeland Security , particularly in preventing public panic in other FCC filings, but this bears repeating. ENG is a critical tool used by broadcasters to inform the public and prevent panic in emergency situations. Especially since September 11, even *bona fide* natural disasters can raise public fear that something more ominous is going on. In the event of a serious terrorist incident, increased activity of DoD uplinks could come at the very time of the heaviest use of 2 GHz TV BAS frequencies. Setting up such a "train wreck waiting to happen" would not be in the public interest, nor in the interest of Homeland Security. Further, for those who believe that cable television could replace broadcast television in providing news and information to the public, it must be noted that this exact same 2 GHz spectrum is required for cable ENG.

VIII. Summary

15. Neither DoD nor NTIA bothered to file comments to this rulemaking. Moving high-power DoD uplinks to 2,025–2,110 MHz, where they would be co-channel with TV BAS operations, would cause massive interference to analog ENG operations in markets such as Boston, Denver, Colorado Springs, Los Angeles, Orlando, and San Francisco. This could impact Homeland Security in those markets. Real time and near real-time frequency coordination with DoD is unrealistic, first because the interference threat would be just one way, giving DoD no incentive to cooperate, and second because of the very nature of DoD, and the military's reluctance to share any information with mere civilian commercial users, as evidenced by the fact that SBE emails to DoD regarding the true Kirtland AFB uplink location and requesting additional technical details for the Naval Satellite Control Network (NSCN) uplink at Laguna Peak, have still not been responded to.

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To reiterate the point made at paragraph 16 of the initial SBE comments, the preliminary frequency coordination with DoD has failed, and unfortunately nothing has occurred in the intervening 28 days to change this SBE conclusion.

16. It would make far more sense for DoD uplinks to stay where they are, where the likelihood of successful frequency coordination with terrestrial federal government links displaced from 1,710–1,755 MHz is much better than the likelihood of successful frequency coordination with multiple high-elevation ENG-RO sites. High-power DoD uplinks and sensitive, high-elevation ENG-RO sites are simply a bad mix. SBE hopes that both the FCC and NTIA, as well as DoD, will now appreciate this reality.

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IX. List of Figures

17. The following figures or exhibits have been prepared as a part of these SBE reply comments to the ET Docket 00-258 Fourth NPRM:

1. Wallops Island maps
2. "Berkeley" uplink map.

Respectfully submitted,

Society of Broadcast Engineers, Inc.

/s/ Ray Benedict, CPBE
SBE President

/s/ Dane E. Ericksen, P.E., CSRTE
Chairman, SBE FCC Liaison Committee

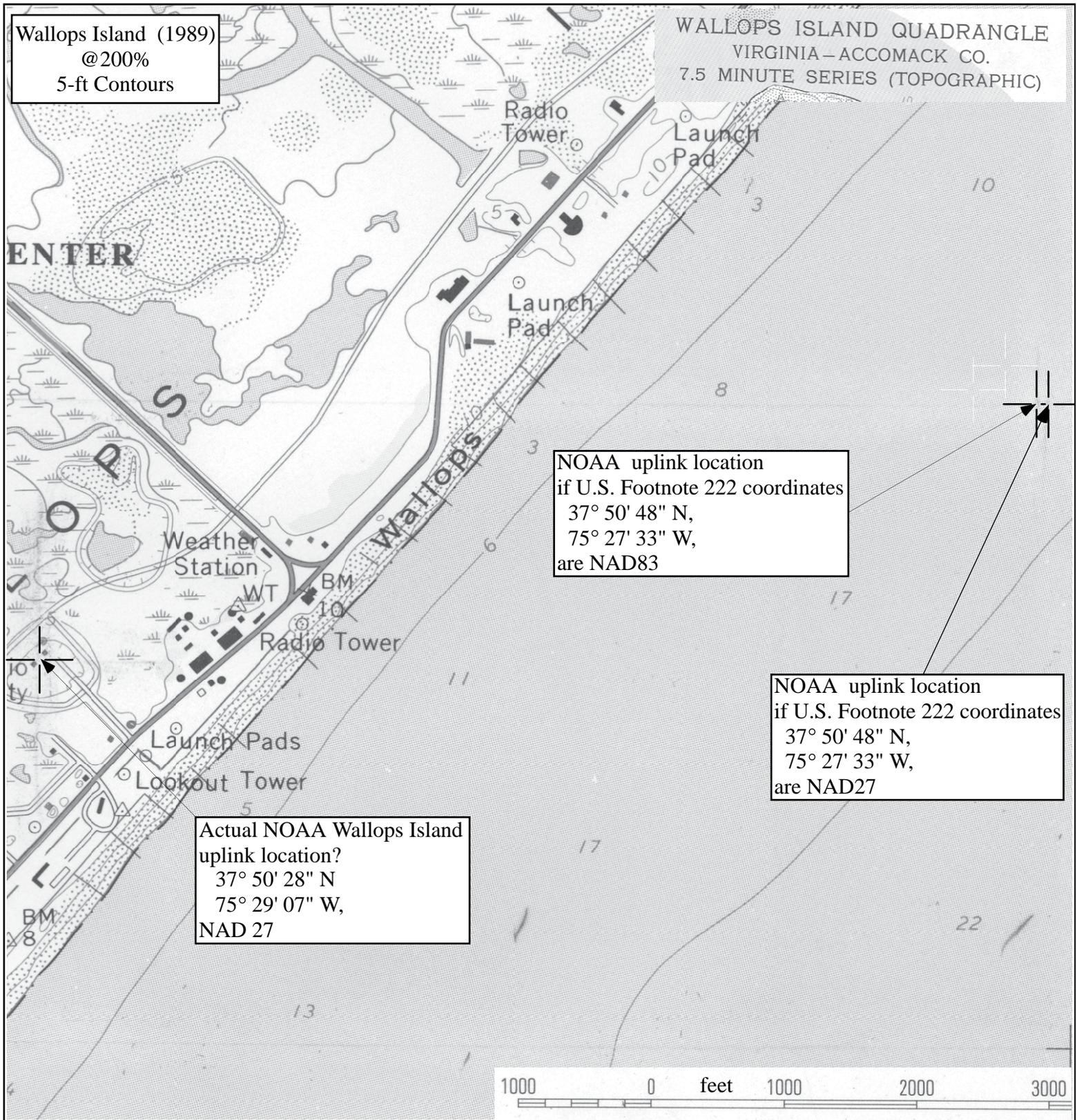
/s/ Christopher D. Imlay, Esq.
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December 1, 2003

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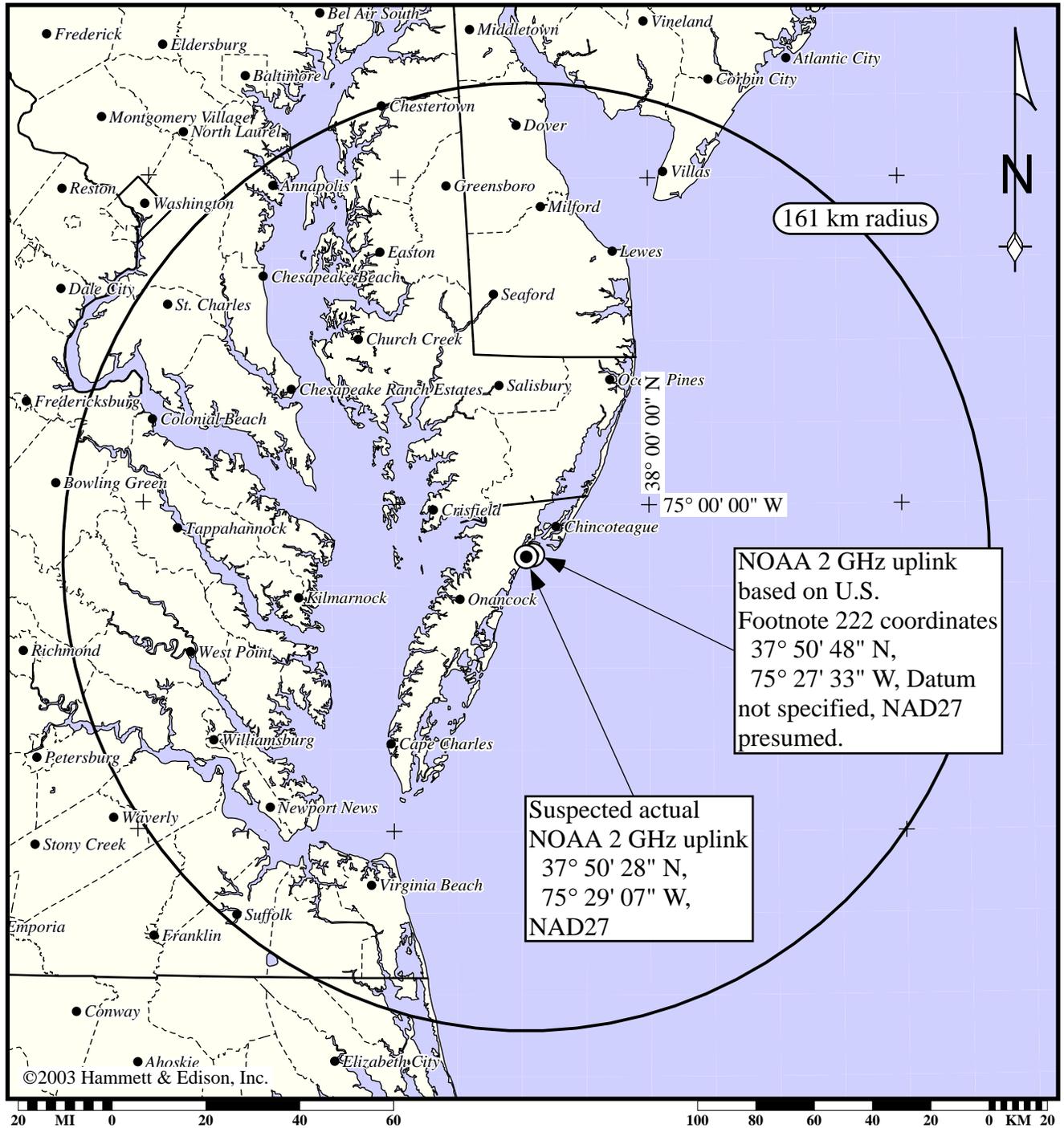
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NOAA Wallops Island Uplink



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NOAA Wallops Island Uplink



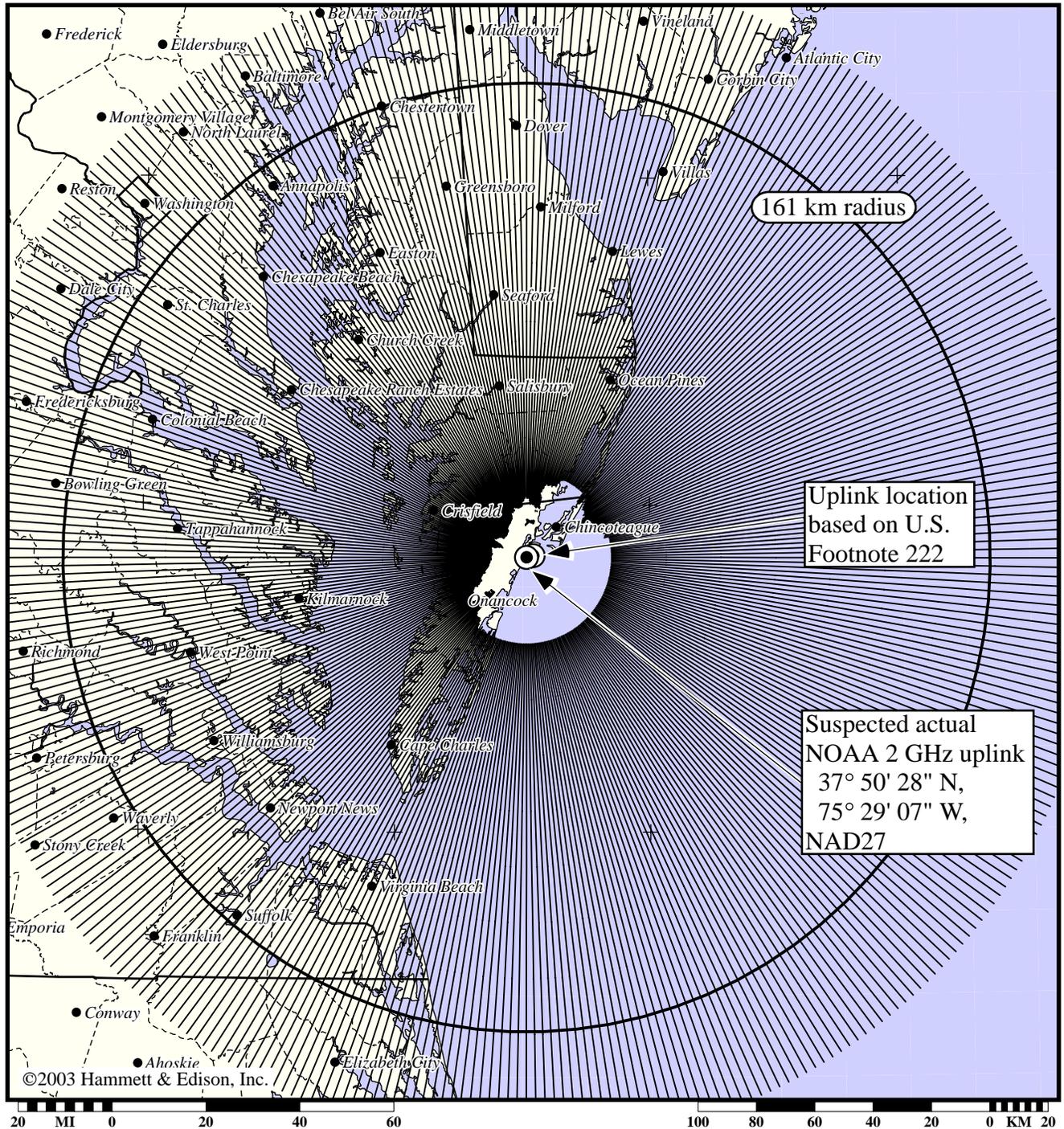
Lambert conformal conic map projection. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey. Geographic coordinate marks shown at 60-minute increments. City limits shown taken from U.S. Census Bureau TIGER/Line 2000 data.



SOCIETY OF BROADCAST ENGINEERS, INC.
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**Line-of-Sight Conditions for NOAA Wallops Island Uplink
Assumed C.O.R. = 15.7 meters AGL
RX Height = 9.1 meters AGL**



Lambert conformal conic map projection. Shadowing based upon 3-second USGS digitized terrain data and 4/3 earth radius. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey. Geographic coordinate marks shown at 60-minute increments. City limits shown taken from U.S. Census Bureau TIGER/Line 2000 data.



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NASA 2 GHz "Berkeley" Uplink

