

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

In the Matter of)	
)	
Service Rules for 1.7/2.1 GHz AWS Stations	)	WT Docket 02-353
)	
Service Rules for Below 3 GHz AWS Stations	)	WT Docket 04-356
)	
Below 3 GHz Spectrum for AWS/3G Stations	)	ET Docket 00-258
)	
Modification of the ULS to Allow TV Pickup Stations and Remote Pickup Stations to Document the Locations and Heights of Their Receive-Only Sites	)	RM-11308
)	
Improving Public Safety Communications in the 800 MHz Band	)	WT Docket 02-55
)	
Request by Globalstar, Inc. To Expand Its Ancillary Terrestrial Component (ATC) Authority to Encompass Its Full Assigned Spectrum	)	RM-11339
)	
Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service (MSS) Systems in the 1.6/2.4 GHz Bands (MSS ATC on Former TV BAS Channel A10)	)	IB Docket 02-364
)	

To: The Commission

Petition for Reconsideration

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 Petition for Reconsideration of the March 8, 2007, WT Docket 02-353 Report and Order (R&O).¹

¹ Although the R&O is dated March 8, 2007, it was not released until the next day, March 9, 2007.

**SBE Petition for Reconsideration: WT Docket 02-353
Service Rules for 1.7 GHz/2.1 GHz AWS Stations**

I. SBE Comments To the Combined 04-356/02-353 Rulemaking Not Considered

1. In the September 24, 2004, WT Docket 04-356 Notice of Proposed Rulemaking (NPRM) the Commission elected to combine the in-progress WT 02-353 rulemaking with the new WT 04-356 rulemaking, with the WT 04-356 rulemaking docket number listed first; see the attached Figure 1, reproducing the first page of the WT 04-356 NPRM.
2. It is not unusual for the Commission to combine related rulemakings, and in this case the two rulemakings were particularly closely related: WT 02-353 dealing with service rules for 1.7/2.1 GHz Advanced Wireless Services (AWS) stations, and WT 04-356 dealing with service rules for below-3 GHz AWS stations. As has been its long-standing practice, SBE filed its comments to the lead docket, expecting that, as before, such a filing would also constitute comments to the related and now combined WT 02-353 rulemaking.
3. However, nowhere in the WT 02-353 R&O are the timely filed SBE comments and reply comments to the WT 04-356 rulemaking even mentioned. Further, and as shown by the attached Figure 2, the Commission changed the rulemaking title from showing it to be a combined WT 04-356/WT 02-353 rulemaking to a combined ET 00-258/WT 02-353 rulemaking.
4. Because at Paragraph 31 the WT 02-253 R&O addressed the issue of AWS interference into TV BAS operations at 2,025–2,110 MHz, SBE believes that the R&O was obligated to have either addressed the SBE WT 04-356 comments, or, alternatively, to have acknowledged the SBE comments regarding BAS/AWS interference and indicated that those issues would be addressed in a separate WT 04-356/WT 02-353 R&O. The current R&O could give the impression that there will be no change in the present $43 + 10\log(\text{TPOwatts})$ dB out of band emission (OOBE) suppression requirement now in Section 27.53(g) of the FCC Rules, as opposed to the more stringent OOBE suppression requirement of $67 + 10\log(\text{TPOwatts})$ dB proposed by SBE in its WT 04-356 comments. Further, the WT 02-353 R&O did not address another SBE proposal, again in the SBE comments to the WT 04-356 rulemaking, that if an AWS station proposes a cell site that would be located within 0.5 kilometers of an electronic news gathering (ENG) receive-only (ENG-RO) site, then the AWS entity would first have to file a site-specific application, and that any such site-specific AWS authorization would include an equipment test condition. That is, before the AWS base station could commence regular service to subscribers, the AWS licensee would first have to conduct equipment tests with the licensee of the nearby ENG-RO site, and confirm that no interference was caused to the sensitive receivers at that site. If the equipment tests demonstrated interference, the tests would have to be suspended until the appropriate filters could be installed on the AWS base station transmitter, on

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the ENG receiver, or both, in order to eliminate the interference (which could be due to brute force overload (BFO) to the ENG receiver, or due to AWS OOB appearing as an in-channel interfering signal with the incoming ENG signal, or could be a combination of both problems). Once the appropriate filters had been installed the equipment tests could re-commence. If those re-commenced tests demonstrated that the mitigation measures had been effective, the AWS licensee could then activate the base station and commence regular service to subscribers. If the re-commenced equipment tests indicated that interference still existed, transmissions from the new AWS base station would again have to be terminated until further, and successful, mitigation measures were in place.

5. SBE therefore requests that the Commission reconsider its WT 02-353 R&O. SBE requests that a Memorandum, Opinion and Order (MO&O) be issued, either addressing the SBE WT 04-356/WT 02-353 comments in their entirety, or clarifying that in the still pending WT 04-356/WT 02-353 rulemaking that the WT 04-356/WT 02-353 R&O will fully address the SBE comments, and that the instant ET 00-258/WT 02-253 R&O does not constitute a decision that a tighter OOB mask for AWS base stations won't be required, or that there will be no restrictions on how closely an AWS base station can be situated to an ENG-RO site.

II. Actual AWS-into-BAS Interference Has Occurred in New York City

6. In late 2004 and early 2005, when SBE filed its WT 04-356 comments and reply comments, interference from AWS stations to 2 GHz TV BAS operations was theoretical, although a situation that could certainly be predicted using standard engineering calculations, which the SBE comments provided. All that has now changed. Beginning in mid-December 2006, a New York City (NYC) TV station, WABC-TV, began receiving interference to several of its ENG-RO sites. The North Shore ENG-RO site in Queens² received interference regardless of the orientation of the remotely controlled, steerable receiving antenna at that site, and other WABC-TV ENG-RO sites received interference when their directional receiving dishes were aimed towards the Queens area.

7. It was subsequently discovered that the source of the interference was an experimental Special Temporary Authority (STA) authorization, WC9XSK, issued to Ericsson Inc, a major manufacturer of AWS radios. It was learned that Ericsson had deployed approximately fifty 2.1 GHz AWS base stations in the Queens area, under contract to T-Mobile USA, Inc., which is the

² Located at 40-45-16.3 N, 73-43-17.4 W, NAD83. The street address is 71 Grand Central Parkway, New York. This is also the location of WABC-TV Inter City Relay (ICR) Station WHS328, operating on TV BAS Channel B4 (6,950-6,975 MHz), which relays incoming ENG signals back to the WABC-TV studios.

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auction winner for the AWS A-block for the New York-Nassau-Suffolk cellular market area (CMA001), and now holds AWS License WQGB263. In a March 8, 2007, meeting held between NYC TV BAS licensees, Ericsson, and T-Mobile, to address the interference problem, it was learned that eventually the T-Mobile system will have approximately 300 cell sites, meaning that no matter where a NYC-area ENG-RO receive site is located, it will eventually be close to a 2.1 GHz AWS base station. See the attached Figure 3, showing the locations of the NYC-area ENG-RO sites. This will eventually mean that regardless of the orientation of the ENG-RO antenna, the antenna will be aimed towards an AWS base station.

8. Special Condition 2 to the Ericsson WC9XSK STA required that

Operations are subject to prior coordination with local point-to-point microwave, Advanced Wireless Service (AWS) and **TV Pickup** licenses (**bolding added**).

Yet the Ericsson representative acknowledged that no such prior coordination with TV Pickup licensees had taken place before to the commencement of the WC9XSK experimental operation. Indeed, one of the tasks agreed to at that meeting is that the locations of the NYC ENG-RO sites would be provided to Ericsson/T-Mobile, now that the NYC area broadcasters knew who was causing the interference. SBE finds it unfortunate, though, that it was WABC-TV that had to suffer several weeks of interference to its ENG operations before tracking down that interference to the newcomer Ericsson/T-Mobile 2.1 GHz operations. At least when informed of the interference, SBE understands that Ericsson did shut down the tests, and has since refrained from transmitting during the late afternoon period, when WABC-TV has the heaviest use of its TV BAS Channel A7 (2,093–2,110 MHz) "home" channel. Still, SBE finds this to be a rather dubious fix. For example, what if there is need for news coverage in the Queens area at other times? Will that coverage just have to wait until Ericsson can be persuaded to once again shut down its interfering experimental operation?

9. Of course, Ericsson didn't have much of a choice in electing to initially shut down its experimental operation, since Section 5.111(a)(2) of the FCC Rules makes it clear that an experimental station may not cause harmful interference to any station operating in accordance with the Table of Frequency Allocations in Part 2 of the FCC Rules. The WABC-TV Part 74, Subpart F, KA40716 TV Pickup station is such a station, and is therefore entitled to interference protection. Further, had Ericsson complied with Special Condition 2 of its WC9XSK STA, the extent and duration of the interference could have been minimized.

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10. To solve the problem, Ericsson has agreed to shift its experimental operations to the AWS B block at 2,1152,120 MHz, thus providing a 5 MHz frequency separation to TV BAS Channel A7, to relocate the experimental operation to Parsippany, NJ, and to prior-coordinate those operations with NYC-area TV Pickup licensees and the NYC Above-1 GHz TV BAS frequency coordinator. Ericsson has also expressed its regrets about the failure to prior coordinate the initial WC9XSK Queens, NY, operation. Further, Ericsson has agreed to provide a hot-line telephone number that will be staffed at all times the experimental operation is on the air, and gave assurances to SBE that all of the experimental operations could be shut-down in real time, by remote control, from the hot line number location, if necessary (that is, if interference to 2 GHz TV BAS operations is caused). Because of this understanding, SBE has now withdrawn its Informal Objection to the Ericsson Parsippany experimental STA application, which has now been granted, as a modified WC9XSK authorization.

11. The Ericsson experimental STA operation suggests that if mitigation measures are not taken, the interference to ENG-RO sites will get much worse once T-Mobile has completed its build out, and there are 300 or so AWS base stations instead of just 50 or so AWS base stations. Further, once operations commence under the T-Mobile WQGB263 license, those operations will be co-primary with, rather than secondary to, TV BAS operations. Although as a newcomer licensee T-Mobile would still be required to eliminate interference that its operations cause to other licensed services, once service to subscribers has commenced SBE believes that T-Mobile will be reluctant to shut down activated cell sites, even if they are causing interference to BAS operations. SBE is not singling out T-Mobile in this regard; SBE believes that such reluctance would apply to any commercial mobile radio service (CMRS) licensee that has made a large financial investment to obtain a license, and needs to generate revenue from paying subscribers, just as quickly as possible, to start making that investment pay off.³

12. At the March 8 NYC meeting, and also at an earlier March 2 meeting in Chicago, between the Chicago TV BAS licensees and T-Mobile representatives, the need for T-Mobile base stations to be built with a tighter emission mask of $67 + 10\log(\text{TPOwatts})$ dB instead of $43 + 10\log(\text{TPOwatts})$ dB got a very cool reception by the T-Mobile representatives. Essentially broadcasters were told that since the FCC Rules currently require only a $43 + 10\log(\text{TPOwatts})$ dB suppression level, that's all that would be installed. However, this is an incomplete reading of the Part 27 AWS rules, in that Section 27.54(m) of the FCC Rules states

³ According to FCC records, T-Mobile paid \$396 million for its NYC AWS A-Block spectrum, and \$255 million for its Chicago AWS A-Block spectrum.

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When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

Further, Section 27.1133 of the FCC Rules, applying to Part 27, Subpart L 1,710–1,755 and 2,110–2,155 MHz AWS stations, requires that

...AWS licensees must, before constructing and operating any base or fixed station, determine the location and licensee of all BAS or CARS stations authorized in their area of operation, and coordinate their planned stations with those licensees.

Although the T-Mobile representative indicated that up until the meeting he had not been aware of the 2 GHz TV BAS band, or of how broadcasters so intensively use that band for ENG operations, it should be noted that in the AU Docket 06-30 rulemaking, for Auction 66⁴ where T-Mobile was the winning bidder for the NYC and Chicago AWS spectrum, Paragraph 33 of that April 12, 2006, document repeated the Section 27.1133 requirement, as follows:

AWS licensees operating in the 2110–2155 MHz band must protect previously licensed BAS and CARS operations in the adjacent 2025–2110 MHz band. In satisfying this requirement AWS licensees must, before constructing and operating any base station, determine...[same text as from the above Section 27.1133 citation].

Further, at Section 5 ("Due Diligence"), Paragraph 37 states that

We caution potential applicants formulating their bidding strategies to investigate and consider the extent to which AWS frequencies are occupied. [bolding in the original]

and

Bidders should become familiar with the status of these operations and relocation requirements, and applicable Commission rules, orders and any pending proceedings related to the service, in order to make reasoned, appropriate decisions about their participation in Auction No. 66 and their bidding strategy.

The AU 06-30 record shows that T-Mobile was a participant in the rulemaking, filing both initial and reply comments. Thus, T-Mobile had clearly been informed that the 2.1 GHz of the AWS A-block spectrum came with restrictions and adjacent-band incumbent licensees that had to be protected.

13. It should be noted that the SBE WT 04-356 comments showed that if the suppression requirement for 2.1 GHz AWS base stations was increased from $43 + 10\log(\text{TPOwatts})$ dB to $67 + 10\log(\text{TPOwatts})$, the OOBE threat distance to an ENG-RO site would drop to 0.42 km, and

⁴ Held on June 29, 2006.

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thus a keep-away distance of 0.5 km would ensure that 2.1 GHz AWS base stations do not cause OOB interference to TV BAS ENG-RO sites. In contrast, the SBE WT 04-356 comments showed that the AWS base station OOB threat distance can be up to 7.5 km if only a $43 + 10\log(\text{TPOwatts})$ suppression level is required. Given the large number of cells that a large-metro AWS build would require, it is likely that existing ENG-RO sites would have at least one, and probably several, AWS base stations within a 7.5-km distance. Not only would this make interference to existing ENG-RO sites likely, it would also likely preclude the creation of new ENG-RO sites. For the NYC area, which suffered major microwave infrastructure damage on September 11, 2001, the ability to establish new ENG-RO sites, such as at the under-construction Freedom Tower, is important. Thus, newcomer AWS base stations need to be built to the tighter $67 + 10\log(\text{TPOwatts})$ emission mask from the start, if they are to avoid a fundamental conflict with 2 GHz TV BAS operations.

14. In any event, it has now been demonstrated that AWS-into-BAS interference is an actual, rather than just a theoretical, threat. Thus, it is all the more critical and important that the Commission consider the SBE comments and reply comments in the WT 04-356 rulemaking.

III. DRL Channels

15. Another complication are the Data Return Link (DRL) channels, created by the November 10, 2003, ET Docket 95-18 Third R&O and Third MO&O. These channels were in response to an SBE filing, pointing out that instead of one 14.5-MHz wide TV BAS channel and six 41.1 MHz wide TV BAS channels, all with center frequencies that would not be integer multiples of the 250-kHz synthesizer steps used by most modern-day BAS microwave radios, the creation of seven equal-bandwidth, 12-MHz wide BAS channels would solve the synthesizer resolution center-frequency problem, while also allowing the creation of the narrow-band DRL channels. These channels could then be used for ENG control functions, such as automatic transmitter power control (ATPC) for the transmitters in ENG platforms, or for other applications permitted by the BAS rules. However, these DRL channels cannot be used until a TV market has transitioned from the old 1,990–2,110 MHz TV BAS band plan to the new 2,025–2,110 MHz TV BAS band plan. See the attached Figure 4. Unfortunately, the upper DRL channels will be even more at risk of OOB interference from 2.1 GHz AWS base stations than ENG operations on band-edge TV BAS Channel A7, making it all the more imperative that the tighter $67 + 10\log(\text{TPOwatts})$ emission mask be adopted.

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IV. Summary

16. The March 8, 2007, ET Docket 00-258/WT Docket 02-353 R&O, dealing with service rules for 1.7/2.1 GHz AWS stations, makes no mention of the detailed SBE comments and reply comments timely filed in the WT Docket 04-356/WT Docket 02-353 rulemaking. SBE therefore requests that an MO&O be issued, addressing this oversight.

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Service Rules for 1.7 GHz/2.1 GHz AWS Stations**

List of Figures

17. The following figures or exhibits have been prepared as a part of this WT Docket 02-353 Petition for Reconsideration:

1. Copy of the first page of the September 24, 2004, WT Docket 04-356 NPRM
2. Copy of the first page of the March 8, 2007, ET 00-258/WT 02-353 R&O
3. Map showing the locations of the NYC-area ENG-RO sites
4. Old versus new 2 GHz TV BAS band plans
5. Copy of SBE's December 8, 2004, initial comments to the WT Docket 04-356 rulemaking
6. Copy of SBE's February 8, 2005, reply comments to the WT Docket 04-356 rulemaking.

Respectfully submitted,

Society of Broadcast Engineers, Inc.

/s/ Chriss Scherer, CPBE, CBNT
SBE President

/s/ Dane E. Ericksen, P.E., CSRTE, 8-VSB, CBNT
Chairman, SBE FCC Liaison Committee

/s/ Christopher D. Imlay, Esq.
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April 4, 2007

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Service Rules for 1.7 GHz/2.1 GHz AWS Stations**

First Page of the Combined WT 04-356/WT 02-353 NPRM

Federal Communications Commission

FCC 04-218

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)	
)	
Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands	)	WT Docket No. 04-356
)	
Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands	)	WT Docket No. 02-353
)	

NOTICE OF PROPOSED RULE MAKING

Adopted: September 9, 2004

Released: September 24, 2004

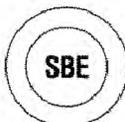
Comment Date: November 23, 2004

Reply Comment Date: January 7, 2005

By the Commission: Chairman Powell, Commissioners Abernathy, Copps, and Adelstein issuing separate statements.

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Federal Communications Commission

DA 07-1120

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)	
)	
Amendment of Part 2 of the Commission's Rules to	)	ET Docket No. 00-258
Allocate Spectrum Below 3 GHz for Mobile and)	
Fixed Services to Support the Introduction of New)	
Advanced Wireless Services, including Third)	
Generation Wireless Systems)	
)	
Service Rules for Advanced Wireless Services	)	WT Docket No. 02-353
In the 1.7 GHz and 2.1 GHz Bands)	

ORDER

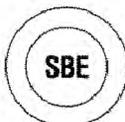
Adopted: March 8, 2007

Released: March 8, 2007

By the Chief, Wireless Telecommunications Bureau:

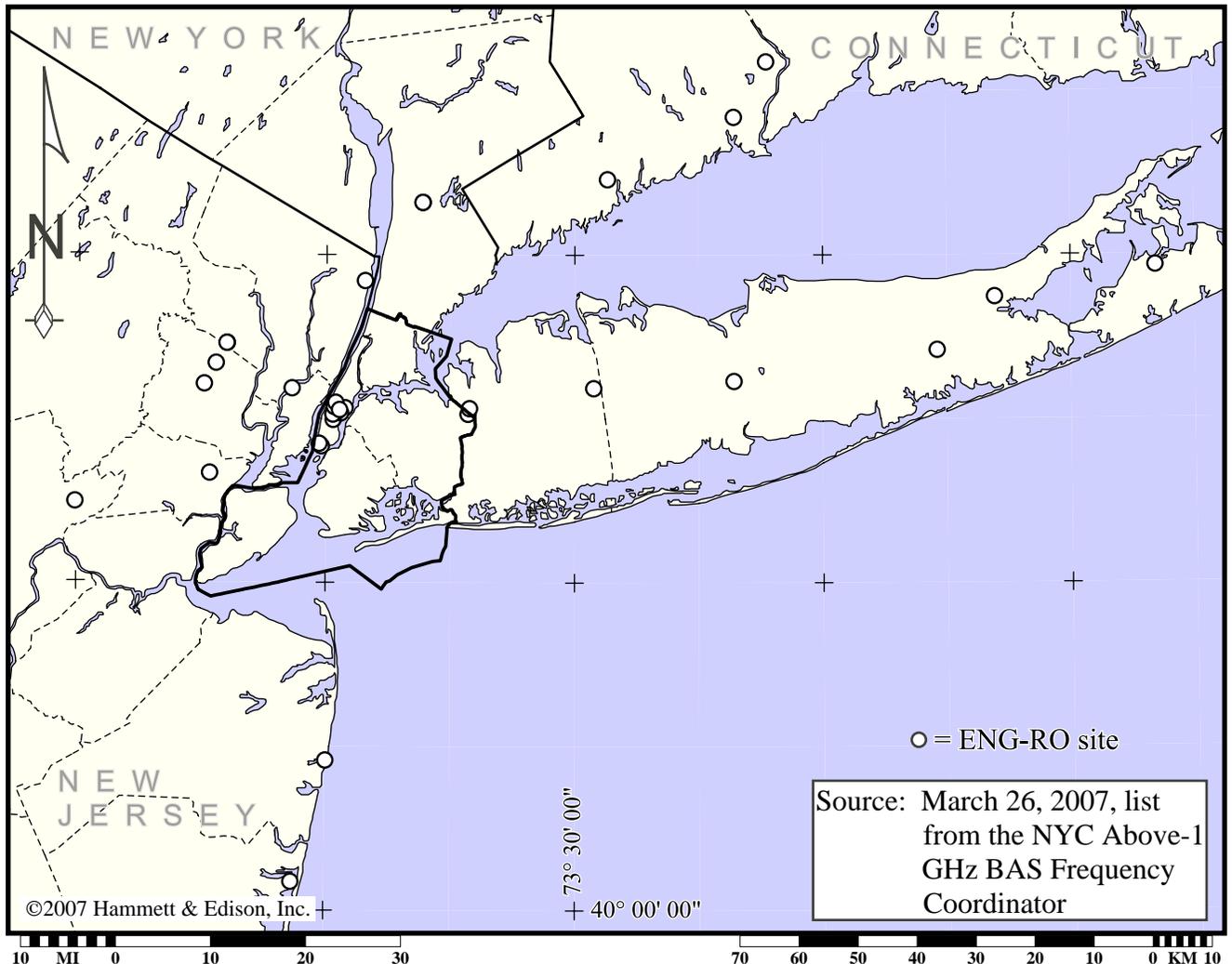
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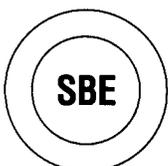


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NYC-Area ENG-RO Sites



Lambert conformal conic map projection. Map data taken from Sectional Aeronautical Charts, published by the National Ocean Survey. Geographic coordinate marks shown at 30-minute increments. City limits shown taken from U.S. Census Bureau TIGER/Line 2000 data.



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SOCIETY OF BROADCAST ENGINEERS, INC.
Indianapolis, Indiana

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NYC-Area ENG-RO Sites



Google Earth satellite photograph showing the locations of the Manhattan ENG-RO sites.



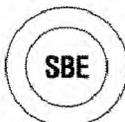
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NYC-Area ENG-RO Sites

**2 GHz ENG Receive Sites
New York City Metropolitan Area**

March, 2007

Station	Site	Latitude N			Longitude W			Height AGL (ft.)	Notes
		d	m	s	d	m	s		
WNYW and WWDR (shared)	Empire State Building	40	44	54	73	59	08.5	1060	See Note 1.
	Secaucus, NJ	40	47	46.4	74	04	08.5	80	
	E. 67th Street	40	45	58.3	73	57	42.8	100	
	1 Central Park West	40	46	08.4	73	58	53.5	600	
	Verona, NJ	40	50	03	74	13	20.5	225	
	Plainview, NY	40	47	48.3	73	27	42.4	250	
WPIX	Alpine Tower	40	57	38	73	55	22	410	
	Citicorp Building	40	45	30	73	58	15	324	
	Empire State Building	40	44	54	73	59	10	940	
	North Shore Towers	40	45	26	73	42	52	367	
WNBC	GE Building	40	45	33	73	58	48	785	See Note 1.
	Plainview, NY	40	47	19	73	27	09	220	
	Valhalla, NY	41	04	49	73	48	24	115.8	
	Empire State Building	40	44	54	73	59	08.5	1038	
	West Orange, NJ	40	48	08.7	74	14	45	265	
News 12	Happauge Tower	40	46	56	73	10	42	170	Operational 4/07
	North Shore Towers	40	45	26	73	42	52	367	
	Riverhead Tower	40	56	10	72	39	12	300	
	Sag Harbor Tower	40	58	58	72	19	43	167.3	
	Alpine Tower	40	57	38	73	55	22	425	
	Brck Tower	40	02	37	74	03	57	194.9	
	Bridgeport Tower	41	12	37	73	10	44	105	
	Norwalk Tower	41	06	56	73	26	03	373.7	
	Shelton Tower	41	17	43.27	73	06	47.51	200	
WXTV	4 Times Square	40	45	22.4	73	59	10.5	782	
	Alpine Tower	40	57	38	73	55	22	520	
	Empire State Building	40	44	54.3	73	59	8.5	1016	
	Little Falls, NJ	40	51	53.3	74	12	01.5	393	
	Islandia-Central Islip, NY	40	48	26.5	73	10	45.6	400	
GNN	1 Chase Plaza	40	42	29.3	74	00	33.3	328	
	1 Time Warner Center	40	46	04.9	73	59	00.1	755	
	Empire State Building	40	44	54	73	59	08.5	1000	
WABC	Grasslands Tower	41	04	46	73	48	26	470	
	North Shore Towers	40	45	26	73	42	52	385	
	Verona, NJ	40	50	05	74	13	20.5	178	
	Alpine Tower	40	57	38	73	55	22	400	
	Manorville, NY	40	51	18	72	46	12	485	
	Empire State Building	40	44	54.3	73	59	08.5	1225	
	Asbury Park, NJ	40	13	44	73	59	53	264	
	Millennium Building	40	46	28	73	58	51	540	
	Citicorp Building	40	45	30	73	58	15	324	
	4 Times Square	40	45	22	73	59	12	782	
ABC Network -see Note 5	Empire State Building	40	44	54.3	73	59	10	1225	
	Millennium Building	40	46	28	73	58	51	540	
WCBS	Empire State Building	40	44	54	73	59	08.5	1000	See Note 1.
	Plainview, NY	40	47	48.3	73	27	42.4	200	
	Verona, NJ	40	50	03	73	13	20.5	500	
	GM Building	40	45	49	73	58	22.5	550	
WRNN	Portchester Hospital	40	59	37.75	73	40	35.67	120	
	Beacon Mountain	41	29	18.33	73	56	54.49	300	
WNJU	Alpine Tower	40	57	38	73	55	22	60#	northwest southeast
	Empire State Building	40	44	54	73	59	08.5	960	
	Empire State Building	40	44	54	73	59	08.5	960	
New Jersey Network	Montclair, NJ	40	51	53	74	12	03	560	
	New Brunswick, NJ	40	37	17	74	30	13	345	



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NYC-Area ENG-RO Sites

Station	Site	Latitude N			Longitude W			Height AGL (ft.)	Notes
		d	m	s	d	m	s		
QuickLink Connections -see Note 2.	Empire State Building	40	44	54	73	59	08.5	1040	south side
	Empire State Building	40	44	54	73	59	08.5	900	north side
Dean Relay Press & Radio -see Note 3.	Elizabeth, NJ	40	39	59.7	74	14	01.2	50	
Known future site for multiple tenants.	Freedom Tower	40	42	43	74	00	49	1400	Under construction.

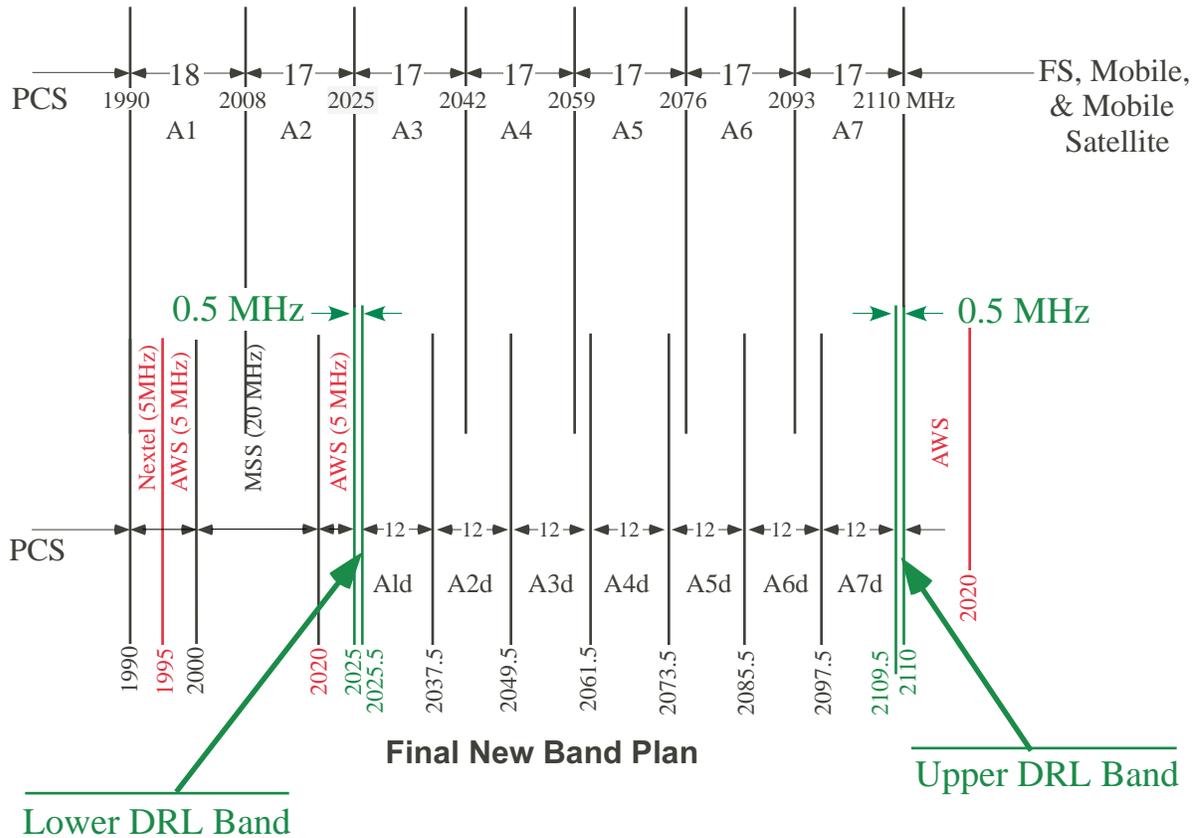
- Notes:
1. Plainview locations are two different towers. Note coordinates.
 2. QuickLink Connections is an independent receive site used by broadcasters on an as-needed basis.
 3. LTTS licensee providing services for broadcasters.
 4. News 12 service areas are Nassau and Suffolk Counties; the Bronx; northern NJ; Westchester County; and southwest CT.
 5. Distinct from WABC.

Note: This list is a work-in-progress. Interested parties should check with Mr. Leo Rosenberg, the NYC Above-1 GHz frequency coordinator, for the latest version. Mr. Rosenberg can be contacted at freq.coord@directbroadcast.com.



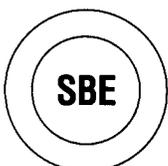
**SBE Petition for Reconsideration: WT Docket 02-353
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Existing v. Final 2 GHz BAS Band Plan



DRL = Data Return Link

All frequencies and bandwidths are in MHz.



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SOCIETY OF BROADCAST ENGINEERS, INC.
Indianapolis, Indiana

**SBE Petition for Reconsideration: WT Docket 02-353
Service Rules for 1.7 GHz/2.1 GHz AWS Stations**

SBE WT 04-356 Comments

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

In the Matter of)
)
Service Rules for Advanced Wireless Services in) WT Docket No. 04-356
the 1,915–1,920 MHz, 1,995–2,000 MHz,)
2,020–2,025 and 2,175–2,180 MHz Bands)
)
To: The Commission

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 comments in the above-captioned Notice of Proposed Rulemaking (NPRM) relating to service rules for Advanced Wireless Service (AWS) stations in the 2 GHz band.

**I. AWS Stations at 2,020–2,025 MHz Remain an Interference Threat to 2 GHz TV
BAS Operations**

1. At Paragraph 98 of the NPRM, the Commission tentatively concludes that AWS transmitters at 2,020–2,025 MHz should only be required to suppress their out of band emissions (OOBE) by $43 + 10\log P$, where P is the transmitter power output (TPO) in watts. At Paragraph 102 of the NPRM, the Commission tentatively concludes that AWS base stations would not be a brute force overload (BFO) interference threat to TV Broadcast Auxiliary Service (BAS) operations at 2,025–2,110 MHz because AWS base stations at 2,020–2,025 MHz will be limited to an equivalent isotropic radiated power (EIRP) of just 1 watt (30 dBm). The NPRM notes that in comments to IB Docket 01-185, SBE expressed concern about BFO interference from high-powered ancillary terrestrial component (ATC) base stations to highly sensitive electronic news gathering receive only (ENG-RO) sites, widely used by broadcasters in the large and medium TV markets.

2. SBE agrees that a 30 dBm (1 watt) EIRP limit for AWS base stations at 2,020–2,025 MHz will ensure that those stations are not a BFO threat to ENG-RO sites. However, SBE disagrees with the Commission's conclusion that 2,020–2,025 MHz AWS base stations only need to suppress their OOBE by $43 + 10\log P$ decibels.

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Service Rules for 1.7 GHz/2.1 GHz AWS Stations**

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5. A suppression requirement of just $43 + 10\log P$ for a 1-watt TPO 2 GHz AWS transmitter with a unity gain transmitting antenna and negligible line loss means that OOB E of -13 dBm EIRP could be radiated into the 2,025-2,110 MHz TV BAS band. For a typical ENG-RO site with a 20 dBi gain, negligible line loss, and an analog receiver with a -87 dBm sensitivity threshold¹, and with line-of-sight to an AWS base station, this means that an AWS base station as far away as 0.587 km could result in an OOB receive carrier level (RCL) of -87 dBm; that is, of the same signal level as the desired ENG signal at its sensitivity threshold!

4. Because this OOB E would be seen as co-channel interference by the TV BAS receiver, no filtering of this undesired signal would be possible at the ENG-RO site; rather, the fix can only occur at the AWS base station site.

5. The effective thermal noise for a 17 MHz wide 2 GHz TV BAS receiver is -99 dBm, according to information provided by Microwave Radio Corporation (MRC), a major manufacturer of TV BAS microwave radios. If the benchmark is no more than a 0.5 dB degradation of the noise floor of the protected receiver,² then the OOB RCL from an AWS base station cannot exceed -108.1 dBm; that is, -99 dBm + $(-108.1$ dBm) = -98.5 dBm, or a 0.5 dB degradation in the noise floor. For an ENG-RO site with a 20 dBi gain receiving antenna and negligible line loss, this requires a free space path loss (FSPL) of 115.1 dB from a 30 dBm EIRP AWS base station that is suppressing its OOB E by just 43 dB. At 2,025 MHz, this would require a separation of about 6.7 km.

6. Nor is the upcoming conversion of 2 GHz TV BAS from analog to digital, and the narrowing of the channel width from 17 MHz to 12 MHz, likely to be a solution. A coded orthogonal frequency division multiplex (COFDM) digital receiver has a noise threshold of about -100 dBm, again based on information obtained from MRC. In order not to degrade this noise threshold by more than 0.5 dB, the RCL of the undesired, out-of-band AWS signal cannot exceed -109.1 dBm at the receiver input terminal. Again for the case of a 20 dBi gain receiving antenna with negligible line loss, an 30 dBm EIRP AWS base station that is only suppressing its OOB E by 43 dB must be at least 7.5 km from the ENG-RO site, if line-of-sight conditions exist.

7. Accordingly, SBE submits that a much stricter OOB E of $67 + 10\log P$ dB, is needed. This OOB E limit was recently adopted for Broadband Radio Service (BRS) base stations in the July

¹ This sensitivity threshold is defined as the RCL that will result in a demodulated video signal to noise ratio of 37 dB.

² This criteria was used by the Commission in the October 21, 2004, ET Docket 00-258 Seventh Report & Order (R&O), concerning allowing high-power Department of Defense (DoD) satellite uplink stations into the 2 GHz TV BAS band, on a co-primary basis. See Footnote 63, at pages 15-16, of that R&O.



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29, 2004, WT Docket 03-66 R&O; see new FCC rule section 27.53(l)(2). A 1-watt (30 dBm) EIRP AWS base station that is suppressing its OOB by 67 dB still has a non-trivial threat distance of 0.420 km to an analog ENG-RO site, and 0.472 km to a digital ENG-RO site, again using the 0.5 dB noise floor degradation criteria.

8. In the February 10, 2003, Third R&O to ET Docket 00-258, adopting spectrum for third-generation (3G) wireless services, at Paragraph 51 the Commission stated:

We believe that base stations could easily achieve limits of $70 + 10\log P$ at the band edge.

And the R&O to the IB Docket 01-185 rulemaking, regarding an Ancillary Terrestrial Component for the Mobile Satellite Service (MSS ATC), also dated February 10, 2003, adopted an OOB suppression requirement of $70 + 10\log P$, which is now Section 25.252(c)(2) of the FCC Rules. Thus, a 3 dB more lenient OOB limit of $67 + 10\log P$ dB should not be a problem for AWS base stations at 2,000-2,025 MHz.

9. While many ENG-RO sites use steerable antennas, it would be imprudent to assume that the ENG-RO antenna is not aimed at an AWS base station; therefore, the use of the full gain of 20 dBi for the ENG receiving antenna is proper in the above calculations.

10. Thus, SBE submits that AWS base stations at 2,020-2,025 MHz are most definitely an interference threat to ENG receive sites at 2,205-2,110 MHz. Accordingly, the Commission should a) require AWS base stations at 2,020-2,025 MHz to suppress their OOB by at least $67 + 10\log P$ decibels, and b) not allow a 2,020-2,025 MHz AWS base station to be located within 0.5 km of an ENG-RO site unless the AWS base station operator agrees to additionally suppress the station's OOB so that no more than a 0.5 dB degradation will be caused to the noise floor of the receiver in use at the ENG-RO site.

II. Identification of ENG-RO Sites in the ULS

11. Of course, the above rule will be of little help if AWS operators cannot quickly identify the locations of ENG-RO sites. So, once again,⁵ SBE asks the Commission to modify the Universal Licensing System (ULS) to allow TV Pickup licensees to upload information show the location(s) of their ENG-RO site(s) and height(s) of their receiving antennas (which are often substantial). Further, this information must be searchable by interested parties; that is, the ULS

⁵ See the July 9, 2001, SBE comments to ET Docket 01-75, at Section XXVI, Paragraph 70. Also see the April 4, 2003, SBE Petition for Partial Reconsideration of the ET Docket 01-75 R&O, at Section V, Paragraphs 12-14.



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data fields containing this information must be capable of being found by a radius search around a given set of geographic coordinates. Until this is done, ULS will stand for the Un-helpful Licensing System as far as Part 74 TV Pickup BAS licensees are concerned. Or, in other words, isn't it about time for the Commission to finally make the ULS truly "universal"?

III. Summary

12. SBE agrees that 1-watt EIRP AWS base stations are not a BFO threat to 2 GHz TV BAS ENG-RO sites. However, such stations are definitely an interference threat to 2 GHz TV BAS ENG-RO sites if they are only required to suppress their OOB by just 43 dB. The suppression requirement should be increased to 67 dB, and even then no 2,020-2,025 MHz AWS base station should be permitted within 7.5 km of an analog ENG-RO site, or within 0.25 km of a digital ENG-RO site, unless additional OOB suppression is provided. Finally, the Commission needs to modify the ULS to allow TV Pickup stations to document the location(s) and height(s) of their ENG-RO sites.

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 8, 2004

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**SBE Petition for Reconsideration: WT Docket 02-353
Service Rules for 1.7 GHz/2.1 GHz AWS Stations**

SBE WT 04-356 Reply Comments

Before the
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In the Matter of)
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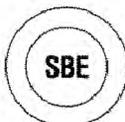
Reply Comments of the Society of Broadcast Engineers, Inc.

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 service rules for Advanced Wireless Service (AWS) stations in the 2 GHz band.

I. None of the CMRS Comments Addressed OOB E Interference To TV BAS

1. None of the comments filed by commercial mobile radio service (CMRS) operators addressed the out of band emissions (OOBE) interference threat to highly sensitive 2,025-2,110 MHz TV Broadcast Auxiliary Service (BAS) receive sites, widely used in support of electronic news gathering (ENG) operations. While several CMRS entities (e.g., Sprint) filed comments concluding that stricter OOB E limits were needed to avoid CMRS-into-CMRS adjacent channel/adjacent-band operations, these analyses did not address the impact of AWS OOB E into 2 GHz TV BAS operations.

2. Accordingly, SBE finds nothing in the filed comments to refute its contention that a more stringent OOB E mask of at least $67 + 10 \log P$ decibels (where P is the transmitter power output (TPO) in watts) is needed for 2,020–2,025 MHz AWS base stations to ensure that interference is not caused to ENG receive only (RO) sites, and further that no AWS base station may be located within 0.5 km of an existing ENG receive only site without installing stricter OOB E filters, sufficient to ensure that the noise floor of the ENG RO site is not degraded by more than 0.5 dB. To ensure that AWS base stations are not inadvertently sited close to an ENG RO site,



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proposed CMRS AWS base station sites within 0.5 km of a 2 GHz ENG receive only site should be another exception¹ to area licensing.

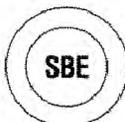
II. Reply Comments of NAB

3. The National Association of Broadcasters (NAB) filed reply comments on January 7, 2005, the initially specified reply comment deadline. However, pursuant to a November 19, 2004, Order, the reply comment deadline had been extended to January 24, 2005. Further, pursuant to an additional January 19, 2005, Order², the ET 04-356 reply comment deadline has been further extended, to February 8, 2005.

4. SBE is gratified to read in the early-filed NAB reply comments that NAB fully supports the SBE comments, including SBE's call for the Universal Licensing System (ULS) to at long last be modified to allow existing TV Pickup station licenses to enter the locations and heights of their ENG RO sites, and in a manner that is searchable on a radius around a given set of geographic coordinates basis. This will allow interested parties, especially 2.020-2.025 MHz CMRS AWS entities, to determine in advance whether a proposed base station is too close to an existing ENG receive only site to allow construction on an area licensing basis (that is, without a prior application and site-specific authorization).

¹ Existing exceptions to area licensing are (1) stations requiring coordination pursuant to an International agreement; (2) stations that would require an Environmental Assessment pursuant to Section 1.1307 of the FCC Rules; (3) stations that would affect a radio quiet zone; and (4) stations that would require FAA notification and approval, and an FCC Antenna Structure Registration (ASR).

² Although the Order states it was also released on January 19, 2005, it was not posted to the FCC Daily Digest until January 21, 2005.



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III. Summary

5. It is imperative that 2,020–2,025 MHz AWS CMRS base stations be required to suppress their OOB by at least $67 + 10\log P$ decibels, and that no AWS CMRS base station be allowed within 0.5 km of an ENG receive only site without being required to install whatever additional filtering is necessary so that the noise floor of the receiver at the ENG RO site is degraded by no more than 0.5 dB. Thus, as an additional exception to area licensing, any proposed 2,020–2,025 MHz AWS base station within 0.5 km of an ENG receive only site should be required to first submit an application and obtain a site-specific authorization. That site-specific authorization should be conditioned on a showing that the noise floor of the nearby ENG RO site is properly protected. To allow CMRS AWS entities to determine in advance the locations of TV BAS ENG RO sites, and thus have the option of avoiding a more stringent OOB requirement and the need to first obtain a site-specific authorization, the ULS should at long last be modified to allow TV Pickup licensees to document the locations and heights of their ENG receive only sites. Further, this information must be in fields that are searchable on a radius around a specified set of geographic coordinates basis.

Respectfully submitted,

Society of Broadcast Engineers, Inc.

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SBE President

/s/ Dane E. Erickson, P.E., CSRT
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