

**Norfolk ESV Interference Analysis**  
**Prepared for Intelsat**

**Prepared by Skjei Telecom**  
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Section 1: ESV Parameters

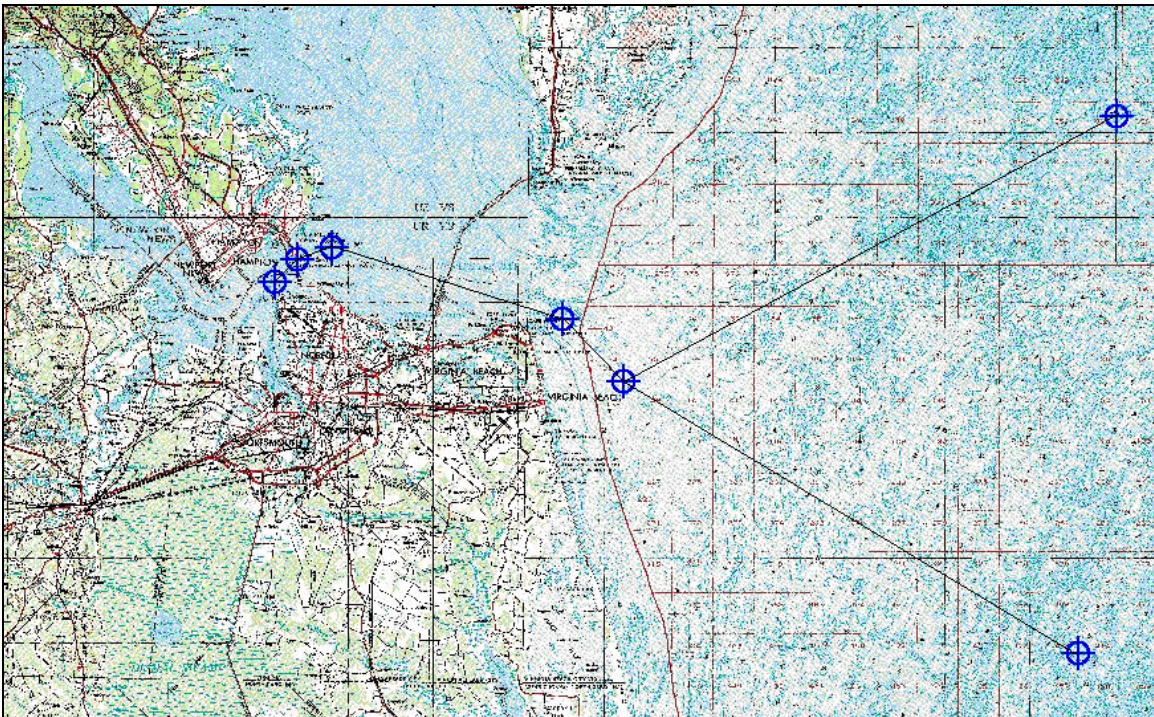
An interference analysis to determine the interference potential from of a C-band Earth Station onboard Vessel (ESV) has been performed for the Norfolk, VA area. The analysis considers a port-side location in Norfolk and the ESV approach route out to a distance 200 km from the shoreline. The Earth Station operating parameters are shown in Table 1 below. Table 2 below lists the breakpoints of the ESV approach route, as shown in Figure 1 below.

SATELLITE EARTH STATION		FREQUENCY COORDINATION DATA	
05/20/2005			
Company	INTELSAT ESV		
Earth Station Name, State	NORFOLK, VA		
Latitude (DMS) (NAD83)	36 56 55.0 N		
Longitude (DMS) (NAD83)	76 19 56.0 W		
Ground Elevation AMSL (Ft/m)	5.00 / 1.52		
Antenna Centerline AGL (Ft/m)	61.00 / 18.59		
Transmit Antenna Type:	FCC32	FCC Reference	
		32-25LOG(THETA)	
6.0 GHz Gain (dBi) / Diameter (m)	35.0 / 1.2		
3 dB / 15 dB Half Beamwidth	1.45 / 3.45		
Operating Mode	TRANSMIT ONLY		
Modulation	DIGITAL		
Emission / Transmit Band (MHz)	614KG7D / 5925.0000 - 6425.0000		
Max. Available RF Power (dBW)/4 kHz	-10.90		
(dBW)/MHz)	13.10		
Max. EIRP	24.10		
(dBW)/4 kHz)	46.00		
(dBW)/MHz)			
Max permissible Interference Power			
6.0 GHz, 20% (dBW/4 kHz)	-154.0		
6.0 GHz, 0.0025% (dBW/4 kHz)	-131.0		
Range of Satellite Arc (Geostationary)			
Degrees Longitude	20.0 W / 53.0 W		
Azimuth Range (Min/Max)	111.8 / 144.3		
Corresponding Elevation Angles	18.0 / 40.6		
Radio Climate	B		
Rain Zone	1		
Max Great Circle Coordination Distance (Mi/Km)			
6.0 GHz	133.3 / 214.5		
Precipitation Scatter Contour Radius (Mi/Km)			
6.0 GHz	62.1 / 100.0		
Note: Horizon is less than 0.2 degrees at all azimuths			
<b>Table 1 - Norfolk Earth Station Data Sheet</b>			

Norfolk Virginia Route  
Breakpoints (ddd.mmsss)

Point Name	Latitude	Longitude
Norfolk		
Piers	36.57495	76.19408
Break PT 1	36.58205	76.19588
Break PT 2	36.59485	76.18088
Break PT 3	37.00355	76.15278
Break PT 4	36.56105	75.57088
Break Pt NE	37.09185	75.13167
Break Pt 5	36.52165	75.52137
Break Pt SE	36.35096	75.16186

**Table 2 - Norfolk ESV Route Break Points**



**Figure 1 - Norfolk ESV Route**

### Section 3: The Critical Contour Point Technique

The Critical Contour Point (CCP) Technique has been developed to assist in the determination of interference from an ESV. The technique involves calculating the interference from all points along the route of the ESV and determining which point produces the worst case interference into a victim microwave receiver. The worst case interference level is then calculated for this point. If the calculated interference exceeds the maximum long-term permissible level of interference, which is shown in Table 1 above, then the licensed or coordinated receive frequencies for that site must be avoided in order to preclude interference.

The following section is excerpted from ITU-R SF 1649, which describes the CCP in more detail:

For any interference exposure of a particular FS receiver from an ESV terminal on a moving ship, there are three position-related variables in the calculation:

- propagation loss exceeded for all but a percentage of time. This loss depends on the length of the interference path, the Radio-Climatic Zones and may include the effects of any blockage that may exist on the interference path;
- FS receiver antenna gain; and
- ESV antenna horizon gain.

For every point within the operating contour as defined by the deep-draft channel (see Fig. 2), each of these three factors can be readily determined.

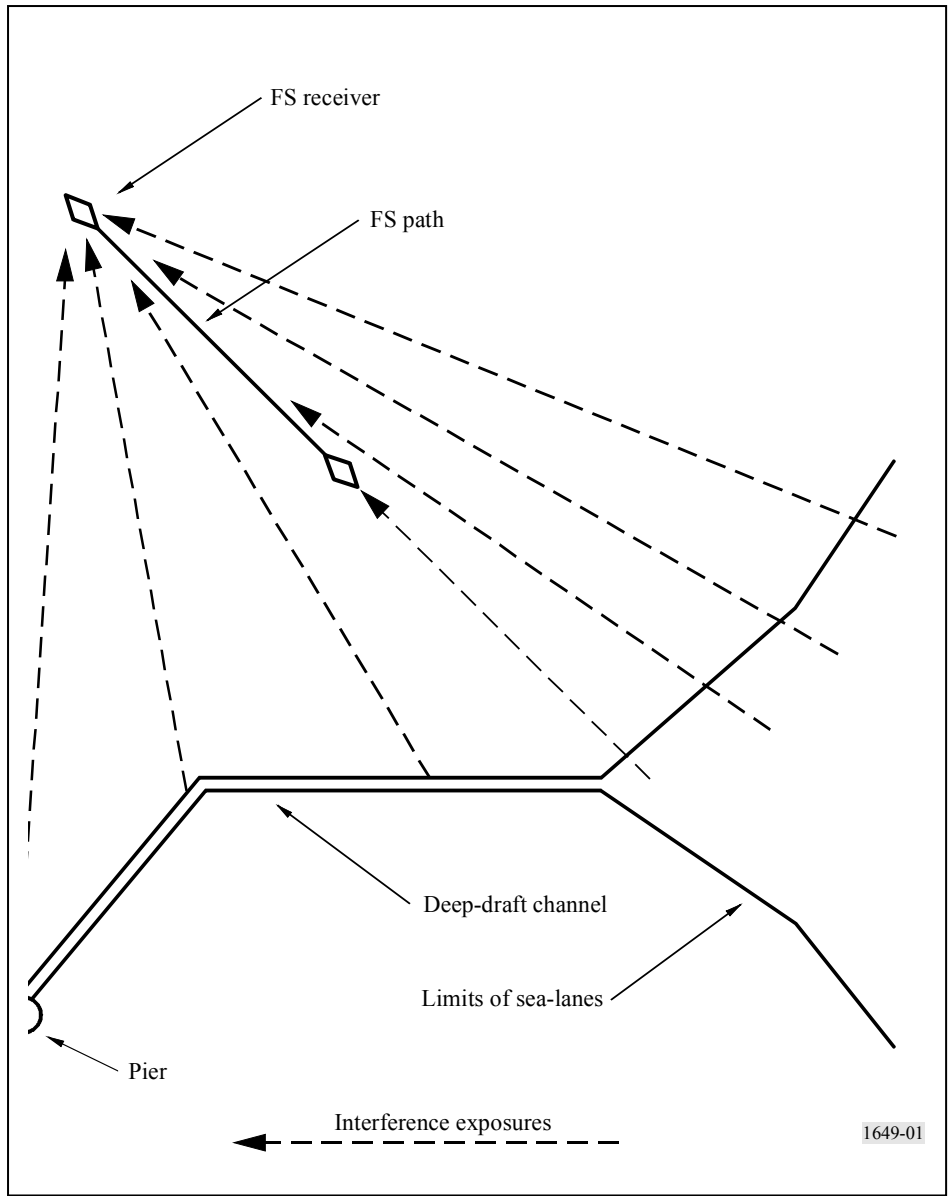


Figure 2 - Basic Interference Geometry

For the purpose of evaluating the potential interference the operating contour is approximated by a set of straight-line segments. The identification of the CCPs depends on the position and alignment of the FS path with respect to the operating contour, and several cases need to be distinguished. In those cases where the azimuth of the main beam axis of the FS antenna does not intersect with any portion of the operating area of the ESV, the critical contour points are the points along the operating contour where the contour changes direction or reaches the off-shore limit beyond which coordination is not required. In those cases where the azimuth of the main beam axis of the FS antenna intersects the operating contour it is necessary to augment and/or modify the number of CCPs. In any event, the same CCPs should be used to consider both the long-term and the short-term interference to any FS station under consideration. Interference from in-motion ESV operations to any FS receiver within the area where the potential interference from the ESV needs to be evaluated is assessed by consideration of the operation at each of the CCPs for each receiver using propagation loss models such as those given in Recommendation ITU-R P.452. The goal of this assessment is the identification of frequencies that can be used for in-motion ESV operations without causing unacceptable levels of interference to FS stations. For the identification of the CCPs with respect to a specific FS receiver, the following three cases need to be distinguished:

*Case 1:* In this case the main beam axis of the FS receiving antenna does not intersect any portion of the operating contour. The only CCPs required for this case are the points where the operating contour of the ESV changes direction.

*Case 2:* In this case, the main beam of the FS antenna (within 10 dB of the maximum antenna gain) lies entirely within one segment of the operating contour. The points on the operating contour where the antenna gain is 10 dB below the maximum, determine two additional CCPs. The segment of the operating contour between these two CCPs contains the natural intersection point (NIP), the point where the main beam axis of the FS antenna intersects the operating contour. The NIP is always taken as a CCP.

Case 3: In this case, the NIP is close enough to one of the points where the operating contour changes direction that the main beam of the FS antenna extends over more than one segment of the operating contour. This case is most likely to arise when the NIP is close to one of the points where the operating contour of the ESV changes direction. The intersection of the operating contour with the antenna 10 dB points determine two additional CCPs as in Case 2; however, in this case the original point within the main beam does not need to be considered as a CCP.

*A further possibility:* If there is a point on the operating contour of an ESV from which the maximum horizon gain of the ESV antenna is directed toward a FS receiver, that point on the contour may be identified as an additional CCP for that FS receiver regardless of which of the three cases applies.



Section 4 - Interference Results

Table 3 below list the interference cases calculated for the Port at Norfolk.

**Table 3 - Summary of Interference at Norfolk, VA Port**

Path	Band (GHz)	Azimuth (Deg)	Dist (Km)	Margin dB	EST OH Loss dB	EST Margin dB	
1. MAY AVENUE -FROM-HAMPTON	6	152.4	11.7	26.5	0.00	26.5	***
2. HAMPTON -FROM-MAY AVENUE	6	328.2	8.7	23.8	0.00	23.7	***
3. CARSON -FROM-WAVERLY	6	277.5	94.5	22.9	28.69	-5.7	
4. LEE HALL -FROM-HAMPTON	6	322.8	36.6	22.3	4.46	17.8	***
5. HAMPTON -FROM-MAY AVENUE	6	328.2	8.7	21.6	0.00	21.5	***
6. CARSON -FROM-WAVERLY	6	277.5	94.5	20.5	30.93	-10.4	
7. LEE HALL -FROM-HAMPTON	6	322.8	36.6	19.6	5.59	13.9	***
8. EDGEWATER -FROM-COINJOCK	6	153.1	86.8	18.2	30.94	-12.7	
9. MAY AVENUE -FROM-HAMPTON	6	152.4	11.7	17.8	0.00	17.8	***
10. LEE HALL -FROM-HAMPTON	6	322.8	36.6	14.1	5.43	8.6	***
11. YORKTOWN -FROM-HAMPTON	6	327.1	34.4	10.9	3.42	7.5	***
12. YORKTOWN -FROM-HAMPTON	6	327.1	34.4	9.8	3.42	6.4	***
13. YORKTOWN -FROM-HAMPTON	6	327.1	34.4	9.5	4.63	4.9	***
14. NORFOLK VITR-FROM-NEWPORT NEWS	6	166.6	3.8	9.0	0.00	8.9	***
15. YORKTOWN -FROM-HAMPTON	6	327.1	34.4	8.6	4.63	3.9	***
16. LEE HALL -FROM-HAMPTON	6	322.8	36.6	8.1	4.46	3.6	***
17. NEWPORT NEWS-FROM-NORFOLK VITR	6	291.2	8.8	6.4	0.00	6.4	***
18. LIGHTFOOT -FROM-NEWPORT NEWS	6	319.3	57.6	4.7	15.42	-10.6	
19. 168 BYPASS -FROM-PORTSMOUTH	6	163.1	30.6	4.3	3.91	0.3	***
20. 168 BYPASS -FROM-PORTSMOUTH	6	163.1	30.6	4.1	2.97	1.1	***
21. WAKEFIELD -FROM-BENNS CHURC	6	271.1	54.5	3.5	14.60	-11.0	
22. WAKEFIELD -FROM-BENNS CHURC	6	271.1	54.5	3.4	13.97	-10.6	
23. NEWPORT NEWS-FROM-PORTSMOUTH T	6	291.2	8.8	3.3	0.00	3.3	***
24. NEWPORT NEWS-FROM-PORTSMOUTH T	6	291.2	8.8	3.3	0.00	3.3	***
25. LIGHTFOOT -FROM-NEWPORT NEWS	6	319.3	57.6	2.9	15.79	-12.8	
26. MANTEO -FROM-MAMIE	6	152.6	129.3	2.8	38.68	-35.8	
27. BARCO -FROM-CHESAPEAKE	6	152.7	71.7	2.8	21.66	-18.8	
28. PORTSMOUTH T-FROM-NEWPORT NEWS	6	176.8	11.0	2.1	0.00	2.1	***
29. PORTSMOUTH T-FROM-NEWPORT NEWS	6	177.7	10.9	1.5	0.00	1.4	***
30. HAMPTON -FROM-BENNS CHURCH	6	319.4	9.2	1.4	0.00	1.4	***
31. HAMPTON -FROM-BENNS CHURC	6	319.3	9.2	1.4	0.00	1.4	***
32. TOANO -FROM-LEE HALL	6	319.9	63.7	1.1	19.03	-17.8	
33. TOANO -FROM-LEE HALL	6	319.9	63.7	1.1	19.03	-17.8	
34. BARCO -FROM-CHESAPEAKE	6	152.7	71.7	0.9	22.34	-21.4	
35. HICKORY -FROM-MAY AVENUE	6	163.1	39.2	0.8	6.20	-5.3	
36. HICKORY -FROM-MAY AVENUE	6	163.1	39.2	0.8	7.30	-6.4	

Table 4 below summarizes the interference cases for the ESV route into the Norfolk, VA port.

Table 3 - Summary of ESV Route Interference Cases

Case #		Interference Margin (dB)	Dist (km)	Victim Receiver	state	Terrestrial Transmitter	state
33	2	34.6	27.3	NEWPORT NEWS	VA	HAMPTON	VA
106	1	33.3	35.5	LEE HALL	VA	HAMPTON	VA
452	2	31.5	26.2	YORK COU EOC	VA	POQUOSON MUN	VA
367	1	29.5	61.6	TOANO	VA	LEE HALL	VA
348	2	28.1	43.3	HICKORY	VA	PUNGO	VA
104	1	27.8	49.0	DRIVER	VA	MAY AVENUE	VA
442	2	27.2	43.3	HICKORY	VA	MAY AVENUE	VA
366	1	27.0	83.0	WALKER	VA	TOANO	VA
32	1	26.4	55.6	LIGHTFOOT	VA	NEWPORT NEWS	VA
449	1	26.3	61.1	JAMES CTY LF	VA	BERKELEY SCH	VA
419	2	24.8	61.2	BUCKHORN	VA	DRIVER	VA
450	1	24.7	77.2	BERKELEY SCH	VA	JCC REG JAIL	VA
295	1	24.5	83.8	BENNS CHURCH	VA	NORFOLK	VA
552	2	23.6	89.7	EDGEWATER	NC	COINJOCK	NC
451	1	23.6	56.1	JCC REG JAIL	VA	POQUOSON MUN	VA
270	1	23.6	92.1	HERTSFORD	NC	ELIZABETH C	NC
493	1	23.0	71.1	ELIZABETH CT	VA	HICKORY	VA
96	1	22.9	93.5	WAKEFIELD	VA	BENNS CHURC	VA
453	2	22.8	63.6	ROY LANE	VA	YORK HS	VA
552	2	22.5	89.7	EDGEWATER	NC	COINJOCK	NC
184	2	22.2	114.0	WINFALL	NC	BARCO	NC
30	2	22.1	144.9	MT PLEASANT	VA	LIGHTFOOT	VA
454	2	22.0	74.7	OWENS BROCKW	VA	ROY LANE	VA
553	2	21.6	101.1	POWELLS PT	NC	EDGEWATER	NC
101	1	21.0	131.6	CARSON	VA	WAVERLY	VA
101	1	20.7	94.7	CARSON	VA	WAVERLY	VA
36	1	20.5	132.5	RICHMOND	VA	NANCES SHOP	VA
3	2	20.3	174.8	WAVES	NC	MANTEO	NC

Case #		Interference Margin (dB)	Dist (km)	Victim Receiver	state	Terrestrial Transmitter	state
543	- 1	20.1	134.3	MIDWAY	NC	EDENTON	NC
31	- 1	19.4	160.1	LYELLS	VA	HEATHSVILLE	VA
368	- 2	19.1	115.5	CHARLES CITY	VA	LEE HALL	VA
365	- 1	19.0	195.0	SHOCKOE	VA	QUINTON	VA
34	- 2	19.0	166.9	FLAT IRON	VA	LYELLS	VA
324	- 1	18.8	157.2	JAMESVILLE	NC	EDENTON	NC
219	- 1	18.8	152.3	NW ASHLAND	VA	STUDLEY	VA
563	- 2	18.6	179.1	SEAFORD	DE	SALISBURY	MD
335	- 1	18.6	161.6	SALISBURY	MD	PRINCESS ANN	MD
312	- 1	18.2	198.3	GREENVILLE	NC	WILLIAMSTON	NC
555	- 1	17.9	199.1	PETERSBURG	VA	WAVERLY RPTR	VA
544	- 2	17.7	155.5	JAMESVILLE	NC	MIDWAY	NC
536	- 1	17.3	174.1	CAMBRIDGE	MD	WINGATE	MD
269	- 2	17.3	129.5	EDENTON	NC	HERTSFORD	NC
324	- 1	16.9	195.5	JAMESVILLE	NC	EDENTON	NC
439	- 1	16.9	159.0	VIENNA	MD	PRINCESS ANN	MD
208	- 1	16.8	146.3	SALISBURY	MD	POCOMOKE	MD
498	- 2	16.7	138.3	RUMFORD	VA	WEST POINT A	VA
245	- 1	16.5	190.7	BREMO RPTR	VA	MIDLOTHIAN	VA
73	- 1	16.4	199.3	GREENVILLE	NC	JAMESVILLE	NC
446	- 2	15.7	174.7	CAMBRIDGE	MD	BUCKTOWN	MD
207	- 1	15.7	165.0	SALISBURY	MD	PRINCESS AN	MD
161	- 2	15.5	190.7	BREMO RPTR	VA	MIDLOTHIAN	VA
444	- 2	15.4	199.2	EASTON MSP	MD	CAMBRIDGE	MD
479	- 1	15.1	191.9	SEAFORD	DE	WBOC	DE
409	- 2	15.1	198.7	WALDORF IND	MD	NEW LANDFILL	MD
508	- 1	14.5	187.8	SOUTH HILL A	VA	BRUNSWICK CC	VA
465	- 2	14.4	198.7	WALDORF IND	MD	NEW LANDFILL	MD
561	- 2	13.6	195.5	LAWRENCEVIL	VA	EMPORIA	VA
Case #		Interference	Dist	Victim	state	Terrestrial	state

		Margin (dB)	(km)	Receiver		Transmitter	
431	- 1	13.5	176.0	SUTHERLAND	VA	S CRATER RD	VA
105	- 2	10.4	13.1	MAY AVENUE	VA	HAMPTON	VA
420	- 1	9.0	178.8	QUINTON	VA	WALKER	VA
390	- 2	8.0	33.2	YORKTOWN	VA	HAMPTON	VA
364	- 2	5.7	13.1	MAY AVENUE	VA	HAMPTON	VA
427	- 1	5.4	5.4	NORFOLK VITR	VA	NEWPORT NEWS	VA
97	- 1	4.5	26.4	BENNS CHURC	VA	HAMPTON	VA
427	- 2	3.7	8.7	NEWPORT NEWS	VA	NORFOLK VITR	VA
126	- 2	2.2	33.1	168 BYPASS	VA	PORTSMOUTH	VA
364	- 1	2.0	7.0	HAMPTON	VA	MAY AVENUE	VA
158	- 2	1.8	130.6	MANTEO	NC	MAMIE	NC
183	- 2	1.7	73.0	BARCO	NC	CHESAPEAKE	VA
105	- 1	1.6	7.0	HAMPTON	VA	MAY AVENUE	VA
437	- 1	1.2	8.7	NEWPORT NEWS	VA	PORTSMOUTH T	VA

## Section 5 - Summary of Results

The detailed interference calculation data is included in the attached Appendix A. It contains licensee and frequency information for each path. There are many potential interference cases for this ESV Route and Port. The clearable spectrum for this ESV Route and in Port is:

### Clearable Spectrum

5925.0 - 5930.2 MHz

6167.7 - 6182.2 MHz

6419.8 - 6425.0 MHz

This is the so-called "4 percent solution" since it represents roughly 4% of the 500 MHz 6 GHz C-band spectrum available. It is available due to the fact that standard microwave frequency plans generally do not encumber these small portions of the band.

APPENDIX A - ANALYSIS RESULT TABLES

Case #	Interference Level (dBW/4kHz)	Interference Margin (dB)	CCP Lat	CCP Lon	Dist (km)	Disc Angle (deg.)	Victim Receiver	state	Terrestrial Transmitter	state	Licensee	Emission Designator	
33	-2	-119.4	34.6	37.00871	76.2617	27.3	0	NEWPORT NEWS	VA	HAMPTON	VA	AT&T COMMUNICATIONS OF VIRGINIA INC	30M0A7W
106	-1	-120.7	33.3	36.96375	76.328	35.5	359.6	LEE HALL	VA	HAMPTON	VA	Cellco Partnership - Virginia	30M0D7W
363	-1	-121.8	32.2	36.96375	76.328	35.5	359.6	LEE HALL	VA	HAMPTON	VA	Cellco Partnership - Virginia	30M0D7W
452	-2	-122.5	31.5	37.00622	76.27021	26.2	0	YORK COU EOC	VA	POQUOSON MUN	VA	YORK COUNTY VIRGINIA	30M0D7W
367	-1	-124.5	29.5	36.98897	76.31225	61.6	0	TOANO	VA	LEE HALL	VA	Cellco Partnership - Virginia	30M0D7W
522	-1	-124.5	29.5	36.98897	76.31225	61.6	0	TOANO	VA	LEE HALL	VA	Cellco Partnership - Virginia	30M0D7W
348	-2	-125.9	28.1	36.84689	75.81894	43.3	0	HICKORY	VA	PUNGO	VA	Cellco Partnership - Virginia	30M0D7W
110	-2	-126.0	28.0	36.84681	75.81876	43.3	0	HICKORY	VA	PUNGO	VA	Cellco Partnership - Virginia	30M0D7W
104	-1	-126.2	27.8	36.91456	75.92505	49.0	0	DRIVER	VA	MAY AVENUE	VA	Cellco Partnership - Virginia	30M0D7W
442	-2	-126.8	27.2	36.99163	76.30892	43.3	0	HICKORY	VA	MAY AVENUE	VA	Cellco Partnership - Virginia	30M0D7W
366	-1	-127.0	27.0	37.00115	76.22135	83.0	0	WALKER	VA	TOANO	VA	Cellco Partnership - Virginia	30M0D7W
523	-1	-127.0	27.0	37.00115	76.22135	83.0	0	WALKER	VA	TOANO	VA	Cellco Partnership - Virginia	30M0D7W
32	-1	-127.6	26.4	36.97466	76.33013	55.6	0	LIGHTFOOT	VA	NEWPORT NEWS	VA	AT&T COMMUNICATIONS OF VIRGINIA INC	30M0A7W
449	-1	-127.7	26.3	37.00866	76.26187	61.1	0	JAMES CTY LF	VA	BERKELEY SCH	VA	YORK COUNTY VIRGINIA	30M0D7W
419	-2	-129.2	24.8	36.96537	76.07271	61.2	0	BUCKHORN	VA	DRIVER	VA	Cellco Partnership - Virginia	30M0D7W
515	-2	-129.2	24.8	36.96537	76.07271	61.2	0	BUCKHORN	VA	DRIVER	VA	Cellco Partnership - Virginia	30M0D7W
450	-1	-129.3	24.7	36.9407	75.97078	77.2	0	BERKELEY SCH	VA	JCC REG JAIL	VA	YORK COUNTY VIRGINIA	30M0D7W
295	-1	-129.5	24.5	36.7702	75.65719	83.8	0	BENNS CHURCH	VA	NORFOLK	VA	Cellco Partnership - Newark-Dallas-Route	30M0D7W
552	-2	-130.4	23.6	36.98298	76.31973	89.7	0	EDGEWATER	NC	COINJOCK	NC	Cellco Partnership - Virginia	30M0D7W
451	-1	-130.4	23.6	36.96137	76.05618	56.1	0	JCC REG JAIL	VA	POQUOSON MUN	VA	YORK COUNTY VIRGINIA	30M0D7W
562	-1	-130.4	23.6	36.96133	76.05599	56.1	0	JCC REG JAIL	VA	POQUOSON MUN	VA	YORK COUNTY VIRGINIA	30M0D7W
270	-1	-130.4	23.6	36.79764	75.71497	92.1	0	HERTSFORD	NC	ELIZABETH C	NC	North Carolina RSA #9 Inc.	10M0D7W
493	-1	-131.0	23.0	36.9753	76.1139	71.1	0	ELIZABETH CT	VA	HICKORY	VA	Cellco Partnership - Virginia	30M0D7W
96	-1	-131.1	22.9	36.89329	75.89823	93.5	0	WAKEFIELD	VA	BENNS CHURC	VA	ALLTEL Communications of VA No. 1, Inc.	30M0D7W
453	-2	-131.2	22.8	36.98195	76.14149	63.6	0	ROY LANE	VA	YORK HS	VA	YORK COUNTY VIRGINIA	30M0D7W
552	-2	-131.5	22.5	36.98298	76.31973	89.7	0	EDGEWATER	NC	COINJOCK	NC	Cellco Partnership - Virginia	30M0D7W
184	-2	-131.8	22.2	36.58592	75.27175	114.0	359.8	WINFALL	NC	BARCO	NC	Virginia Electric & Power Company	30M0D7W
30	-2	-131.9	22.1	37.04811	75.58116	144.9	0	MT PLEASANT	VA	LIGHTFOOT	VA	AT&T COMMUNICATIONS OF VIRGINIA INC	30M0A7W
454	-2	-132.0	22.0	36.97939	76.13086	74.7	0	OWENS BROCKW	VA	ROY LANE	VA	YORK COUNTY VIRGINIA	30M0D7W
553	-2	-132.4	21.6	36.99893	76.2952	101.1	0	POWELLS PT	NC	EDGEWATER	NC	Cellco Partnership - Virginia	30M0D7W
101	-1	-133.0	21.0	36.90979	75.91903	131.6	0	CARSON	VA	WAVERLY	VA	Petersburg Cellular Partnership	30M0D7W
101	-1	-133.3	20.7	36.96375	76.328	94.7	359.2	CARSON	VA	WAVERLY	VA	Petersburg Cellular Partnership	30M0D7W
36	-1	-133.5	20.5	36.99364	76.19008	132.5	0	RICHMOND	VA	NANCES SHOP	VA	Cellco Partnership - Newark-Dallas-Route	30M0D7W
3	-2	-133.7	20.3	36.98236	76.32051	174.8	0	WAVES	NC	MANTEO	NC	WILCAT TRANSMISSION COMPANY	25M0F8W

80	-2	-133.7	20.3	36.98236	76.32051	174.8	0	WAVES	NC	MANTEO	NC	WILCAT TRANSMISSION COMPANY	25M0F8W
81	-2	-133.7	20.3	36.98236	76.32051	174.8	0	WAVES	NC	MANTEO	NC	WILCAT TRANSMISSION COMPANY	25M0F8W
159	-2	-133.7	20.3	36.98236	76.32051	174.8	0	WAVES	NC	MANTEO	NC	WILCAT TRANSMISSION COMPANY	25M0F8W
543	-1	-133.9	20.1	36.7358	75.5849	134.3	0	MIDWAY	NC	EDENTON	NC	North Carolina RSA #9 Inc.	30M0D7W
477	-1	-134.4	19.6	36.99905	75.7446	210.6	0	FARMINGTON	DE	TROOP 5	DE	DELAWARE STATE	30M0D7W
222	-2	-134.6	19.4	37.13802	75.27912	202.2	0	MILFORD	DE	GEORGETOWN	MD	FIRST TELEVISION CORP.(MID-ATLANTIC)	30M0F8W
31	-1	-134.6	19.4	37.1447	75.25655	160.1	0	LYELLS	VA	HEATHSVILLE	VA	Washington D.C. SMSA L.P.	4M94D7W
566	-2	-134.8	19.2	36.96508	75.85719	221.8	0	WYE MILLS	MD	TRAPPE	MD	BAY BROADBAND COMMUNICATIONS LLC	28M0D7W
368	-2	-134.9	19.1	37.03337	75.63035	115.5	0	CHARLES CITY	VA	LEE HALL	VA	Cellco Partnership - Virginia	30M0D7W
521	-2	-134.9	19.1	37.03337	75.63035	115.5	0	CHARLES CITY	VA	LEE HALL	VA	Cellco Partnership - Virginia	30M0D7W
365	-1	-135.0	19.0	37.13821	75.27848	195.0	0	SHOCKOE	VA	QUINTON	VA	Cellco Partnership - Virginia	30M0D7W
34	-2	-135.0	19.0	37.02019	75.6743	166.9	0	FLAT IRON	VA	LYELLS	VA	Washington D.C. SMSA L.P.	4M94D7W
324	-1	-135.2	18.8	36.82955	75.7823	157.2	0	JAMESVILLE	NC	EDENTON	NC	North Carolina RSA #9 Inc.	10M0D7W
219	-1	-135.2	18.8	36.9817	76.14047	152.3	0	NW ASHLAND	VA	STUDLEY	VA	HANOVER COUNTY	4M94D7W
563	-2	-135.4	18.6	37.05317	75.56424	179.1	0	SEAFORD	DE	SALISBURY	MD	BAY BROADBAND COMMUNICATIONS LLC	28M0D7W
335	-1	-135.4	18.6	36.95424	75.893	161.6	0	SALISBURY	MD	PRINCESS ANN	MD	New Cingular Wireless PCS - VA, MD, DC	30M0D7W
312	-1	-135.8	18.2	36.90969	75.91891	198.3	0	GREENVILLE	NC	WILLIAMSTON	NC	UNIVERSITY OF NORTH CAROLINA	30M0D7W
455	-1	-136.0	18.0	36.9479	75.91396	202.7	0	EASTON	MD	CAMBRIDGE	MD	New Cingular Wireless PCS - VA, MD, DC	30M0D7W
555	-1	-136.1	17.9	36.59619	75.29311	199.1	0	PETERSBURG	VA	WAVERLY RPTR	VA	VIRGINIA COMMONWEALTH STATE POLICE	30M0D7W
544	-2	-136.3	17.7	36.88951	75.89346	155.5	0	JAMESVILLE	NC	MIDWAY	NC	North Carolina RSA #9 Inc.	30M0D7W
536	-1	-136.7	17.3	37.0068	76.2449	174.1	0	CAMBRIDGE	MD	WINGATE	MD	Verizon Maryland, Inc.	10M0D7W
269	-2	-136.7	17.3	36.64693	75.39886	129.5	0	EDENTON	NC	HERTSFORD	NC	North Carolina RSA #9 Inc.	10M0D7W
324	-1	-137.1	16.9	37.07765	75.48229	195.5	0	JAMESVILLE	NC	EDENTON	NC	North Carolina RSA #9 Inc.	10M0D7W
439	-1	-137.1	16.9	37.15074	75.23612	159.0	0	VIENNA	MD	PRINCESS ANN	MD	Maryland, State of - DBM	30M0D7W
208	-1	-137.2	16.8	37.09716	75.41681	146.3	0	SALISBURY	MD	POCOMOKE	MD	FIRST TELEVISION CORP.(MID-ATLANTIC)	
498	-2	-137.3	16.7	36.97117	75.83705	138.3	0	RUMFORD	VA	WEST POINT A	VA	VIRGINIA COMMONWEALTH STATE POLICE	30M0D7W
245	-1	-137.5	16.5	36.9781	76.32583	190.7	0	BREMO RPTR	VA	MIDLOTHIAN	VA	Virginia Electric & Power Company	30M0D7W
73	-1	-137.6	16.4	36.70656	75.52357	199.3	0	GREENVILLE	NC	JAMESVILLE	NC	North Carolina RSA #9 Inc.	30M0D7W
438	-1	-137.8	16.2	36.9705	75.83926	221.4	0	WYE MILLS	MD	EASTON	MD	New Cingular Wireless PCS - VA, MD, DC	30M0D7W
144	-1	-137.8	16.2	36.99267	76.18604	230.8	0	JERICO PARK	MD	LEELAND	MD	Washington D.C. SMSA L.P.	30M0D7W
72	-2	-138.0	16.0	36.93925	75.96481	327.8	0	ROCK ENON S	VA	WINCHESTERJ	VA	MCI Worldcom Network Services, Inc.	30M0D7W
478	-1	-138.0	16.0	36.94574	75.99156	204.3	0	TROOP 5	DE	SEAFORD	DE	DELAWARE STATE	30M0D7W
565	-1	-138.1	15.9	37.11021	75.37288	243.6	0	FAIRLEE	MD	WYE MILLS	MD	BAY BROADBAND COMMUNICATIONS LLC	28M0D7W
446	-2	-138.3	15.7	36.98992	75.77489	174.7	0	CAMBRIDGE	MD	BUCKTOWN	MD	Maryland, State of - DBM	30M0D7W

207	-1	-138.3	15.7	36.95259	76.01984	165.0	0	SALISBURY	MD	PRINCESS AN	MD	FIRST TELEVISION CORP.(MID-ATLANTIC)	
251	-1	-138.3	15.7	36.94767	75.99953	165.1	0	SALISBURY	MD	PRINCESS AN	MD	FIRST TELEVISION CORP.(MID-ATLANTIC)	
148	-1	-138.4	15.6	36.83047	75.78424	276.1	0	JACKSONVILL	NC	MAYSVILLE	NC	AT&T CORP	30M0A7W
161	-2	-138.5	15.5	36.9781	76.32583	190.7	0	BREMO RPTR	VA	MIDLOTHIAN	VA	Virginia Electric & Power Company	30M0D7W
444	-2	-138.6	15.4	36.94864	76.00353	199.2	0	EASTON MSP	MD	CAMBRIDGE	MD	Maryland, State of - DBM	30M0D7W
479	-1	-138.9	15.1	36.94323	75.92936	191.9	0	SEAFORD	DE	WBOC	DE	DELAWARE STATE	30M0D7W
409	-2	-138.9	15.1	36.96117	76.05534	198.7	0	WALDORF IND	MD	NEW LANDFILL	MD	Charles County	30M0D7W
1	-1	-139.4	14.6	36.83047	75.78424	276.1	0	JACKSONVILL	NC	MAYSVILLE	NC	AT&T CORP	30M0A7W
288	-2	-139.4	14.6	37.148	75.24537	225.3	0	CEDON	VA	ANTIOCH FORK	VA	New Cingular Wireless PCS LLC - DC	1M60D7W
55	-2	-139.4	14.6	37.03973	75.60914	330.0	0	STAUNTON	VA	CROZET	VA	AT&T COMMUNICATIONS OF VIRGINIA INC	30M0A7W
508	-1	-139.5	14.5	36.95427	76.02681	187.8	0	SOUTH HILL A	VA	BRUNSWICK CC	VA	VIRGINIA COMMONWEALTH STATE POLICE	30M0D7W
556	-1	-139.6	14.4	36.95191	76.01705	188.6	0	SOUTH HILL A	VA	BRUNSWICK CC	VA	VIRGINIA COMMONWEALTH STATE POLICE	30M0D7W
474	-1	-139.6	14.4	36.99949	75.74312	270.3	0	MIDDLETOWN	DE	HARTLEY	DE	DELAWARE STATE	30M0D7W
465	-2	-139.6	14.4	36.96117	76.05534	198.7	0	WALDORF IND	MD	NEW LANDFILL	MD	Charles County	30M0D7W
94	-1	-140.2	13.8	37.00428	76.23441	270.3	0	MIDWAY	NC	BELGRADE	NC	ALLTEL Communications, Inc.	30M0D7W
236	-1	-140.2	13.8	36.99886	76.29543	222.8	0	TUSCARORA	NC	VANCEBORO	NC	North Carolina RSA #9 Inc.	30M0D7W
307	-2	-140.3	13.7	36.98828	76.16778	254.9	0	PINK HILL	NC	KINSTON	NC	North Carolina RSA #9 Inc.	30M0D7W
262	-2	-140.4	13.6	36.76432	75.64482	229.3	0	WILSON	NC	TARBORO	NC	North Carolina RSA #9 Inc.	30M0D7W
99	-2	-140.4	13.6	37.07904	75.47764	202.3	0	MIDLOTHIAN	VA	GOODES BRIDG	VA	RCTC Wholesale Corporation	10M0D7W
561	-2	-140.4	13.6	36.76766	75.65184	195.5	0	LAWRENCEVIL	VA	EMPORIA	VA	Cellco Partnership - Virginia	30M0D7W
447	-2	-140.5	13.5	36.97236	76.333	230.1	359.7	SAFETY DR	MD	EASTON MSP	MD	Maryland, State of - DBM	30M0D7W
431	-1	-140.5	13.5	37.01691	75.68522	176.0	0	SUTHERLAND	VA	S CRATER RD	VA	Petersburg Cellular Partnership	30M0D7W
448	-2	-140.6	13.4	37.0028	75.73213	248.4	0	CHESTERTOWN	MD	SAFETY DR	MD	Maryland, State of - DBM	30M0D7W
136	-1	-140.6	13.4	37.00666	76.24434	240.2	0	ANNAPOLIS JC	MD	JERICO PARK	MD	Cellco Partnership - Virginia	30M0D7W
198	-1	-140.8	13.2	36.77333	75.66377	262.9	0	CAPE CARTER	NC	HAVELOCK	NC	ALLTEL Communications, Inc.	30M0D7W
133	-1	-140.9	13.1	36.96238	75.86611	267.9	0	BULL RUN	VA	INDEPENDENT	VA	Washington D.C. SMSA L.P.	30M0D7W
488	-1	-140.9	13.1	36.96329	75.8631	267.9	0	BULL RUN	VA	INDEPENDENT	VA	Washington D.C. SMSA L.P.	30M0D7W
194	-2	-141.2	12.8	37.15515	75.22118	230.7	0.796	MONTPELIER	VA	NW ASHLAND	VA	HANOVER COUNTY	4M94D7W
417	-2	-141.2	12.8	36.64058	75.38561	243.9	0	SOUTH HILL	VA	LAWRENCEVIL	VA	Cellco Partnership - Virginia	30M0D7W
393	-2	-141.3	12.7	36.61033	75.32254	322.6	0	CLINTON CELL	NC	MT OLIVE	NC	North Carolina RSA #9 Inc.	30M0D7W
24	-1	-141.4	12.6	36.88637	75.8895	334.4	0	SANFORD	NC	HOLLY SPNGS	NC	AT&T COMM. OF THE SOUTHERN STATES	30M0A7W
175	-1	-141.6	12.4	36.73564	75.58457	260.0	0	KENLEY	NC	SPEEDWAY	NC	ALLTEL Communications, Inc.	30M0D7W
93	-2	-141.7	12.3	36.83133	75.78605	304.1	0	LYNCHBURG	VA	APPOMATTOX	VA	Cellco Partnership - Newark-Dallas-Route	30M0D7W
180	-1	-141.7	12.3	36.87371	75.87356	265.3	0	SMITHFIELD	NC	KENLEY	NC	ALLTEL Communications, Inc.	30M0D7W



108	-2	-141.8	12.2	36.58592	75.27175	299.9	359.5	DIXON	NC	MIDWAY	NC	ALLTEL Communications, Inc.	30M0D7W
302	-2	-141.8	12.2	37.07868	75.47884	265.0	0	RESTON HUB	VA	LITTLE RIVER	VA	New Cingular Wireless PCS LLC - DC	30M0D7W
382	-1	-141.8	12.2	36.96375	76.328	228.9	359.5	MICRO	NC	ROCK RIDGE	NC	North Carolina RSA #9 Inc.	30M0D7W
198	-1	-142.0	12.0	37.08996	75.44099	303.3	0	CAPE CARTER	NC	HAVELOCK	NC	ALLTEL Communications, Inc.	30M0D7W
383	-1	-142.2	11.8	36.90058	75.90742	370.1	0	PINEHURST	NC	SANFORD	NC	North Carolina RSA #6 Inc.	30M0D7W
181	-1	-142.4	11.6	36.96375	76.328	228.9	359.5	MICRO	NC	ROCK RIDGE	NC	North Carolina RSA #9 Inc.	30M0D7W
323	-2	-142.5	11.5	37.14871	75.243	321.3	0	LOUDOUN HTS	VA	WATERFORD	VA	New Cingular Wireless PCS LLC - DC	30M0D7W
178	-1	-142.6	11.4	36.92026	75.93223	289.3	0	BENSON	NC	SMITHFIELD	NC	ALLTEL Communications, Inc.	30M0D7W
171	-1	-143.2	10.8	36.87994	75.8814	348.3	0	CAMERON	NC	SANFORD	NC	North Carolina RSA #9 Inc.	4M94D7W
152	-1	-143.2	10.8	36.96323	76.06388	250.2	0	STEM	NC	HENDERSON	NC	Carolina Power & Light Company	2M50D7W
340	-2	-143.2	10.8	37.0075	75.71651	307.9	0	LOUDOUN HGTS	VA	CYBER CENTER	VA	Local Communications Network, Inc.	30M0D7W
105	-2	-143.6	10.4	36.96375	76.328	13.1	6.66	MAY AVENUE	VA	HAMPTON	VA	Cellco Partnership - Virginia	30M0D7W
26	-1	-144.6	9.4	36.90058	75.90742	370.1	0	PINEHURST	NC	SANFORD	NC	North Carolina RSA #6 Inc.	30M0D7W
421	-2	-144.7	9.3	36.58592	75.27175	269.3	359.3	ROCK RIDGE	NC	WILSON	NC	North Carolina RSA #9 Inc.	30M0D7W
256	-2	-144.7	9.3	36.95344	75.89566	388.0	0	MARTINS RDGE	WV	LOST RIVER	WV	Virginia Electric & Power Company	30M0D7W
167	-2	-145.0	9.0	36.58592	75.27175	269.3	359.3	ROCK RIDGE	NC	WILSON	NC	North Carolina RSA #9 Inc.	30M0D7W
420	-1	-145.0	9.0	37.15515	75.22118	178.8	1.162	QUINTON	VA	WALKER	VA	Cellco Partnership - Virginia	30M0D7W
390	-2	-146.0	8.0	36.96375	76.328	33.2	355.1	YORKTOWN	VA	HAMPTON	VA	ALLTEL Communications, Inc.	30M0D7W
548	-1	-147.1	6.9	36.96375	76.328	33.2	355.1	YORKTOWN	VA	HAMPTON	VA	ALLTEL Communications, Inc.	30M0D7W
364	-2	-148.3	5.7	36.96375	76.328	13.1	6.66	MAY AVENUE	VA	HAMPTON	VA	Cellco Partnership - Virginia	30M0D7W
427	-1	-148.6	5.4	36.96375	76.328	5.4	47.78	NORFOLK VITR	VA	NEWPORT NEWS	VA	Virginia Port Authority Police	28M0D7W
156	-2	-148.9	5.1	36.99681	76.30244	304.0	1.325	CANE CREEK	NC	HILLSBOROUG	NC	MCNC	10M0D7W
97	-1	-149.5	4.5	36.99225	76.30815	26.4	11.96	BENNS CHURC	VA	HAMPTON	VA	ALLTEL Communications of VA No. 1, Inc.	30M0D7W
549	-1	-149.5	4.5	36.99225	76.30815	26.4	11.9	BENNS CHURCH	VA	HAMPTON	VA	ALLTEL Communications of VA No. 1, Inc.	30M0D7W
427	-2	-150.3	3.7	36.96375	76.328	8.7	333	NEWPORT NEWS	VA	NORFOLK VITR	VA	Virginia Port Authority Police	28M0D7W
126	-2	-151.8	2.2	36.97236	76.333	33.1	11.19	168 BYPASS	VA	PORTSMOUTH	VA	ALLTEL Communications, Inc.	30M0D7W
364	-1	-152.0	2.0	36.96886	76.33096	7.0	347	HAMPTON	VA	MAY AVENUE	VA	Cellco Partnership - Virginia	30M0D7W
158	-2	-152.2	1.8	36.96375	76.328	130.6	5.826	MANTEO	NC	MAMIE	NC	WILCAT TRANSMISSION COMPANY	25M0F8W
183	-2	-152.3	1.7	36.96375	76.328	73.0	7.125	BARCO	NC	CHESAPEAKE	VA	Virginia Electric & Power Company	30M0D7W
105	-1	-152.4	1.6	36.96886	76.33096	7.0	347	HAMPTON	VA	MAY AVENUE	VA	Cellco Partnership - Virginia	30M0D7W
437	-1	-152.8	1.2	36.96375	76.328	8.7	312	NEWPORT NEWS	VA	PORTSMOUTH T	VA	Virginia Port Authority Police	28M0D7W
428	-1	-153.0	1.0	36.96375	76.328	8.7	311.6	NEWPORT NEWS	VA	PORTSMOUTH T	VA	Virginia Port Authority Police	28M0D7W
437	-2	-154.4	-0.4	36.97236	76.333	13.6	29.18	PORTSMOUTH T	VA	NEWPORT NEWS	VA	Virginia Port Authority Police	28M0D7W

Case #	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol	Rx Freq (MHz)	Pol			
33	-2	6227	U	6256.54	H	6286.19	U	6315.84	H	6345.49	U	6375.14	G	6404.79	V	0	0
106	-1	6123	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
363	-1	5945	H	6004.5	H	6063.8	G	6093.45	V	6123.1	G	6152.75	V	0	0	0	0
452	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
367	-1	6197	V	6226.89	G	6256.54	V	6286.19	H	6315.84	V	6345.49	H	6375.14	U	0	0
522	-1	6197	V	6226.89	H	6256.54	V	6286.19	H	6315.84	V	6345.49	H	6375.14	V	0	0
348	-2	6227	V	6256.54	H	6286.19	V	6375.14	H	6404.79	V	0	0	0	0	0	0
110	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	-1	6197	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0
442	-2	6227	V	6286.19	V	6345.49	V	6375.14	H	0	0	0	0	0	0	0	0
366	-1	5945	H	5974.85	V	6004.5	H	6034.15	V	6063.8	G	6123.1	G	6152.75	U	0	0
523	-1	5945	H	5974.85	V	6004.5	H	6034.15	V	6063.8	H	6123.1	H	6152.75	V	0	0
32	-1	5945	V	5974.85	H	6004.5	V	6063.8	V	6123.1	V	6152.75	H	0	0	0	0
449	-1	6345	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0
419	-2	6227	G	6256.54	V	6286.19	G	6315.84	U	6345.49	G	6375.14	U	6404.79	G	0	0
515	-2	6227	H	6256.54	V	6286.19	H	6315.84	V	6345.49	G	6375.14	U	6404.79	G	0	0
450	-1	6034	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295	-1	6197	G	6226.89	U	6256.54	G	6286.19	U	6315.84	H	6345.49	U	6375.14	H	6405	U
552	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
451	-1	6375	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
562	-1	6375	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
270	-1	6005	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0
493	-1	6064	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	-1	6093	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
453	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
552	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
184	-2	6034	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	-2	6227	V	6256.54	H	6286.19	V	6315.84	H	6345.49	V	6375.14	H	6404.79	V	0	0
454	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
553	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	-1	5975	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
101	-1	5975	H	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	-1	5945	U	5974.85	H	6004.5	U	6034.15	H	6063.8	U	6093.45	G	6123.1	U	6153	G
3	-2	6234	G	6263.953	V	6293.603	G	6323.253	V	6352.903	G	0	0	0	0	0	0





