

FREQUENCY COORDINATION AND INTERFERENCE  
ANALYSIS REPORT

PREPARED FOR  
ORBITAL COMMUNICATIONS

HERNDON, VA  
SPECIAL TEMPORARY AUTHORIZATION  
2004/2005 REQUEST  
L BANDS

PREPARED BY  
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NOVEMBER 12, 2004

# ORBITAL COORDINATION REPORT

## TABLE OF CONTENTS

1. CONCLUSIONS
2. SUMMARY OF RESULTS
3. SUPPLEMENTAL SHOWING, RE: PART 25.203(C)
4. EARTH STATION COORDINATION DATA
5. CERTIFICATION

# ORBITAL COORDINATION REPORT

## 1. CONCLUSIONS

AN INTERFERENCE STUDY CONSIDERING ALL EXISTING, PROPOSED AND PRIOR COORDINATED MICROWAVE AND SATELLITE FACILITIES WITHIN THE COORDINATION CONTOURS OF THE PROPOSED GSO SATELLITE TEST BED IN HERNDON, VA DEMONSTRATES THAT THIS SITE WILL OPERATE SATISFACTORILY WITH OTHER LICENSED IN-BAND AND ADJACENT SYSTEMS BASED UPON THE OPERATIONS NOTED IN THE SUMMARY OF RESULTS (SECTION 2).

# ORBITAL COORDINATION REPORT

## 2. SUMMARY OF RESULTS

ORBITAL'S INTEGRATION AND TESTING OF COMMERCIAL COMMUNICATIONS SATELLITES EXPERIMENTAL AUTHORIZATION INVOLVES OPERATING, AT LOW POWER LEVELS, WITHIN TWO SEGMENTS OF THE L-BAND. SPECIFICALLY, THE FACILITY IN HERNDON WILL OPERATE TWO 25 MHZ CHANNELS AT 1176.45 MHZ AND 1575.42 MHZ, RESULTING IN SPECTRUM REQUIREMENTS BETWEEN 1163.95-1188.95 MHZ AND 1562.92-1587.92 MHZ. THE FACILITY WILL BE IN OPERATION STARTING AROUND FEBRUARY 2005 AND WOULD LIKE TO OPERATE FOR A PERIOD OF UP TO THREE (3) MONTHS. THE LICENSED SERVICES OPERATING WITHIN THESE FREQUENCY BANDS INCLUDE AERONAUTICAL RADIONAVIGATION, RADIONAVIGATION SATELLITE (EARTH-TO-SPACE) IN THE FIRST BAND SEGMENT, AND AERONAUTICAL RADIONAVIGATION IN THE SECOND BAND SEGMENT NOTED ABOVE. IT SHOULD BE NOTED THAT ALL TRANSMISSIONS WILL BE PERFORM INSIDE THE TEST FACILITY IN HERNDON, WHICH CONSIST OF A FULLY ENCLOSED METALLIC BUILDING AND THAT THE AREA OF TRANSMISSION INSIDE THE BUILDING HAS BEEN SPECIFICALLY DESIGN WITH RF ABSORBING MATERIALS TO REDUCE RF LEVELS.

COMSEARCH HAS PERFORMED AN INTERFERENCE ANALYSIS FOR THE 1176 MHZ AND 1575 MHZ CHANNELS. USING THE PROPOSED GSO FSS TEST CONFIGURATION THE COMSEARCH AND FCC DATABASES (USL AND IBFS) WERE SCANNED TO DETERMINE IF ANY INBAND LICENSEES OPERATE IN CLOSE PROXIMITY TO SITE. DETAILS OF THE TECHNICAL PARAMETERS USED IN THE ANALYSIS ARE INCLUDED IN SECTION 4. COMPLETE ANALYSIS DETAILS ARE INCLUDED AS ATTACHMENTS TO THIS REPORT.

BASED UPON THE RESULTS OF THE STUDIES NO POTENTIAL FOR INTERFERENCE IS EXPECTED FROM THIS FACILITY. THE ANALYSIS INDICATES THAT DUE TO THE RELATIVELY LOW POWER LEVELS AND THE ATTENUATING AFFECTS OF THE TEST

## ORBITAL COORDINATION REPORT

ENCLOSURE AND BUILDING THAT THE RESULTING POWER FLUX DENSITY OF THESE TWO CHANNELS WILL NOT CAUSE ANY INTERFERENCE ISSUES.

# ORBITAL COORDINATION REPORT

## 3. SUPPLEMENTAL SHOWING RE: PART 25.203(C)

PURSUANT TO PART 25.203(C) AND 101.103(D) OF THE FCC RULES AND REGULATIONS, THE SATELLITE INTEGRATION AND TEST FACILITY PROPOSED IN THIS EXPERIMENTAL APPLICATION WAS COORDINATED BY COMSEARCH USING COMPUTER TECHNIQUES AND IN ACCORDANCE WITH PART 25 OF THE FCC RULES AND REGULATIONS.

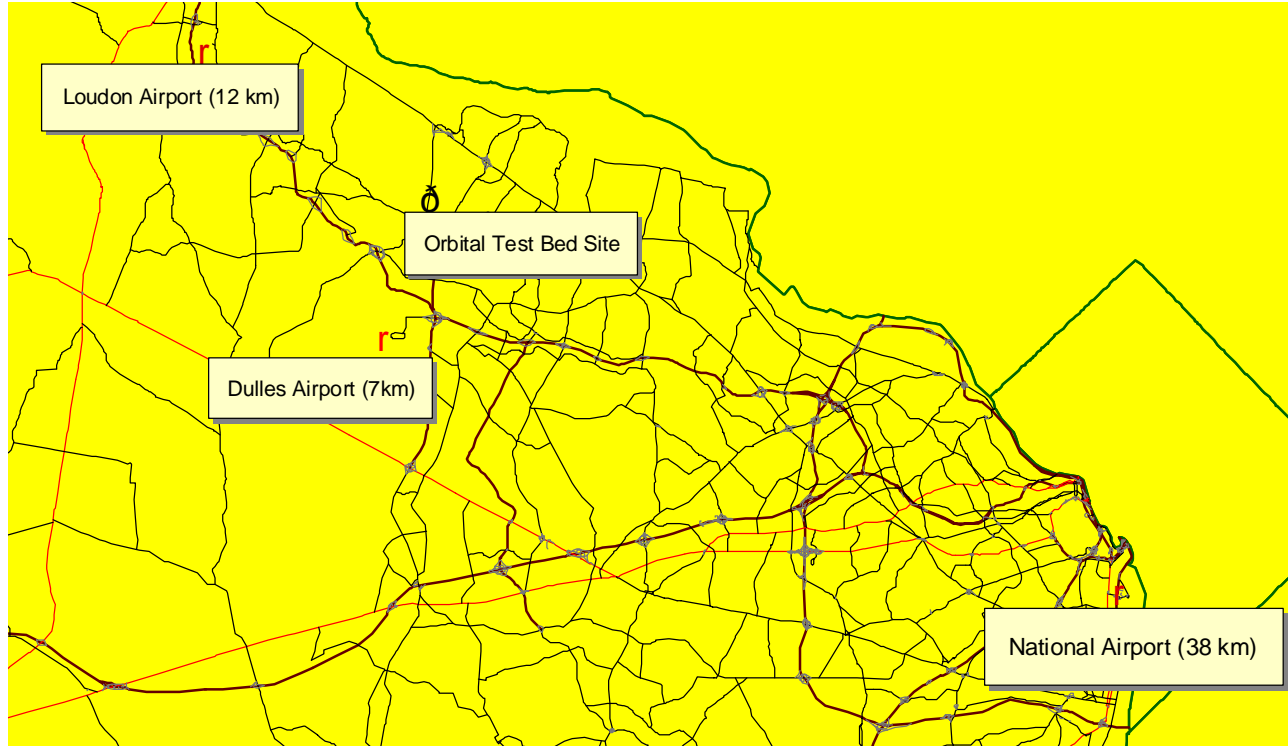
NO SITE SPECIFIC LICENSEES WERE FOUND WITHIN A 150 KM RADIUS OF THE SITE. A POWER DENSITY ANALYSIS WAS PERFORMED TO DETERMINE THE RELATIVE POWER LEVELS IN THE AREAS ADJACENT TO THE TEST WAS PERFORMED, OF PARTICULAR CONCERN WERE ANY LOCAL AIRPORTS, INCLUDING DULLES INTERNATIONAL, REAGAN NATIONAL, THE LOUDON COUNTY AIRFIELD. THE POWER LEVELS, NOT INCLUDING TERRAIN OR OTHER OVER-THE-HORIZON LOSSES ARE SHOWN IN THE TABLE BELOW:

## ORBITAL COORDINATION REPORT

TABLE OF RELATIVE POWER LEVELS IN AREAS ADJACENT TO TEST BED

CHANNEL	DISTANCE FROM TEST BED	FREE SPACE LOSS	EIRP	BUILDING ATTENUATION	INTERFERING POWER DENSITY
(MHZ)	(KM)	(DB)	(DBW)	(DB)	(DBW)
1176.45	50	127.833	10	-50	-167.8
	40	125.894	10	-50	-165.9
	30	123.396	10	-50	-163.4
	20	119.874	10	-50	-159.9
	15	117.375	10	-50	-157.4
	10	113.853	10	-50	-153.9
	5	107.833	10	-50	-147.8
	1	93.853	10	-50	-133.9
CHANNEL	DISTANCE FROM TEST BED	FREE SPACE LOSS	EIRP	BUILDING ATTENUATION	INTERFERING POWER DENSITY
(MHZ)	(KM)	(DB)	(DBW)	(DB)	(DBW)
1575.42	50	130.369	10	-50	-170.4
	40	128.431	10	-50	-168.4
	30	125.932	10	-50	-165.9
	20	122.410	10	-50	-162.4
	15	119.912	10	-50	-159.9
	10	116.390	10	-50	-156.4
	5	110.369	10	-50	-150.4
	1	96.390	10	-50	-136.4

# ORBITAL COORDINATION REPORT





# ORBITAL COORDINATION REPORT

## 4. EARTH STATION COORDINATION DATA

THIS SECTION PRESENTS THE DATA PERTINENT TO FREQUENCY COORDINATION OF THE PROPOSED TEST FACILITY, WHICH WAS CIRCULATED TO ALL COMMON CARRIERS WITHIN ITS COORDINATION CONTOURS. THE TEST WAS ANALYZED AND COORDINATED AS TWO SIMPLEX POINT-TO-POINT MICROWAVE LINKS, CENTERED ON CHANNELS AT 1176.45 MHZ AND 1575.42 MHZ. THE INITIAL ORBITAL EXPERIMENTAL AUTHORIZATION (FILE # 0018-EX-PL-2004) REQUEST HAS A COMPLETE DESCRIPTION OF THE INTEGRATION AND TEST FACILITY. THE WORST CASE POWER LEVELS EMINATING FROM THE TEST SETUP WERE CONSIDERED IN THIS ANALYSIS.

### 1176.45 MHZ CHANNEL TEST LINK

TRANSMIT SITE - TEST BAY, HERNDON, VA

TX LATITUDE: 39 00 56 N

TX LONGITUDE: 77 25 42 W

TX GND ELEVATION: 72.3 M

TX ANTENNA CENTERLINE: 6.1 M

RECEIVE SITE: TEST BAY, HERNDON, VA

TX LATITUDE: 39 00 56 N

TX LONGITUDE: 77 25 42 W

TX GND ELEVATION: 72.3 M

TX ANTENNA CENTERLINE: 25 M

# ORBITAL COORDINATION REPORT

THE TRANSMISSION AND POWER PARAMETERS ARE SHOWN BELOW

FREQUENCY SPAN, NULL-NULL BANDWIDTH (MHZ)	SIGNAL DESCRIPTION AND MODULATION TYPE	MAXIMUM EFFECTIVE RADIATED POWER (ERP)
1163.45 - 1188.95	L5-BAND DOWN, FM	+36.5 DBW, 10 DBW*
1562.42 - 1588.42	L1-BAND DOWN, FM	+38 DBW, 10 DBW*

ADDITIONAL DETAILS:

THE TYPE OF ANTENNA USED IN THE PRODUCTION OF OUR SATELLITES IS AS FOLLOWS:

1. DIRECTIVE ANTENNA - 20 DBI GAIN, 8.5 DEGREES BEAMWIDTH

\*THE SHIELDED TEST AREA AND ANECHOIC MATERIAL ARE USED TO ABSORB NEARLY ALL RADIATED ENERGY. A CONSERVATIVE ESTIMATE OF UP TO 25-30 DB OF ATTENUATION HAS BEEN ATTRIBUTED TO THE ANECHOIC MATERIAL; THE METAL WALLS OF THE BUILDING WILL PROVIDE A MINIMUM OF 40-50 DB OF ADDITIONAL ATTENUATION.

# ORBITAL COORDINATION REPORT

## 5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.



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