



Detect the Difference

5793 Widewaters Parkway Dewitt, NY 13214
Phone: 315-445-0550 Fax: 315-445-9401
Ken Rogers
Program Manager
Sensis Corporation
315-445-5011

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To: Federal Communications Commission

Re: File Number 0076-EX-PL-2005

This is an explanation to item 6a in the application form 442.

The antenna system is located at the Minneapolis-St. Paul International Airport (MSP)

Sensis Corporation is submitting FCC form 442, file number 0076-EX-PL-2005, for ten (10) transmit antenna placement locations within the property of the Minneapolis-St. Paul International Airport (MSP). The system at MSP consists of fixed positioned antennas by which one (1) transmits at 1090MHz, six (6) transmit at 1030MHz, and three (3) transmit at 5.8GHz (5.725GHz-5.85GHz). The remaining antennas are receive-only (RO).

Sensis is currently applying for a new experimental license through the FCC by the form 442. The antenna system to be installed at MSP is a Multistatic Dependent Surveillance (MDS) System which provides identification of transponder equipped aircraft on the airport surface. The MDS system is configured with non-movement, non-rotating, stationary antennas. The data provided by this system is used only for situational awareness and will be used primarily by Northwest Airlines for operational purposes. The objective is to provide airlines increased efficiency by understanding the positioning of aircraft in relationship to gate availability, de-ice pad availability, with the goal of operational cost savings in positioning manpower and reducing fuel costs. This system is not used for safety purposes.

The following is a description of the MDS system:

The MDS (Multistatic Dependent Surveillance) System is a ground based sensor system which uses aircraft transponder data to locate and identify an aircraft position on the surface of the airport. For accuracy, at least three (3) antennas must track an aircraft to accurately locate its position.

For MSP, the MDS System installed consists of antenna placements throughout the airport grounds.

Each antenna placement consists of the following components:

One (1) Antenna

One (1) Remote Unit (RU)

Power and Communications Cabling

The following is a brief overview of each component:

Note: Table A lists the placement locations, the type of antenna, and the RU type.

Antennas: Three types of antennas are used for the transmitters in the antenna system.

Antenna	Wireless 10° Sector Antenna	Wireless Omni Antenna	RefTran and R/T Omni Antenna
Gain	23	10	2.8dBi
Frequency	5.15GHz – 5.875GHz	5.725 GHz – 5.875 GHz	1030 MHz +/-5MHz 1090 MHz +/-10 MHz
Vertical 3dB beamwidth	9.5°	45°	45°
Dimensions	12” x 12” x 0.6”	0.85” x 0.85” x 15.25”	6.5” x 20”
Weight	3 lbs.	2 lbs.	7 lbs.

Remote Unit (RU):

For each antenna placement, an RU is connected to an antenna by an RF cable. The RU is bolted to a concrete ground surface or bolted on a concrete pad on a roof near the antenna placement.

The RU enclosure is rugged and weatherproof. The basic function of this unit is to process the transponder information (ADS-B, Mode S, ATCRABS) received at the antenna and convey the information to a Central Processing System for target tracking identification. The RU’s for MSP will consist of three types: Receive-Transmit (R/T), Receive Only (RO), and Reference Transmitter (RefTran). An R/T includes additional electronic hardware compared to an RO, and can interrogate transponders (1030MHz) for Mode A and Mode C information. A RefTran will not be linked via communications lines to a Central Processing System but provides transmitted system synchronization (1090MHz) for the RT and RO units.

The dimensions of a RT, RO, or RefTran are identical.
Specifications: 24” x 18” x 42”, 176 lbs., 120V, 60Hz.

Remote Unit



Communications Cabling:

For each antenna placement RF communications cabling is routed from the antenna to an RU. All cabling is strapped down to comply with local code and airport commission compliance standards. For communications from the RU to a Central Processing System, a Telco service (56-Kbps Digital Data Service (DDS)) line is run.

Wireless Communications:

Due to restrictions and feasibility for wired communications to Glide Slopes 12L (Table A, site ID 07) and 30R (Table A, site ID 06), RF communications will be used. A central wireless transceiver location will collect data (Table A, site ID WR1). A low-power 5.8 GHz solution will be used to provide communications for the processing equipment to the RUs that cannot be connected otherwise with commercial lines. The FireTide 1500R is a commercial-off-the-shelf product typically used for last-mile, campus, and metropolitan networks. Sensis will utilize these wireless routers (transceivers) to provide links to site ID 06 and site ID 07 and the central processing system site (via WR1).

Power Cabling:

Power to an RU is provided by using a dedicated circuit breaker from an existing electrical panel in an electrical closet nearest the RU placement. The electrical cable routing is from an electrical panel to a cut off switch near the RU. All power cabling will conform to the local code and in compliance to the airport commission standards.

Central Processing System (CPS):

The CPS receives information from each RU via telco lines or wireless communications and target tracks are correlated to mapping software which identifies and displays target data on the surface of the airport to display monitors. The CPS for MSP consists of two (2) 24"x36"x72" racks for processing information and communications modems. The CPS rack is located in Room F-1227-AC of the MSP Lindbergh Terminal, Concourse F.

Best Regards,

Ken Rogers
315-445-5011 (office)
315-278-7077 (mobile)
kr Rogers@sensis.com

TABLE A
Reference of Antenna Placement Locations at
MSP

Site ID	Site	Type	Lat (D/M)	Lon (D/M)	Site AMSL	Height AGL	Height AMSL	Purpose	Antenna Type
X1	Lindbergh Terminal, Parking Garage Roof (Red-Blue Parking)	RefTran	44° 52' 53.22"	93° 12' 24.30"	818'	160'	978'	Reference	Omni
X2	<i>NOT PURSUED</i>	RefTran	-	-	-	-	-	-	-
01	Lindbergh Terminal, Concourse F	R/T	44° 53' 01.98"	93° 12' 58.14"	823'	44'	867'	Surface	Omni
02	Lindbergh Terminal, between Concourses E & F (Northstar Crossing)	RO	44° 53' 01.02"	93° 12' 42.60"	823'	65'	888'	Surface	Omni
03	Lindbergh Terminal, Concourse G	RO	44° 52' 55.62"	93° 12' 47.34"	824'	41'	865'	Surface	Omni
04	Lindbergh Terminal, Concourse D	R/T	44° 53' 06.40"	93° 12' 36.65"	823'	62'	885'	Surface	Omni
05	Lindbergh Terminal, Concourse B	R/T	44° 52' 51.78"	93° 11' 59.16"	817'	48'	865'	Surface	Omni
06	R/W 30R Glide Slope	Wireless Transceiver	44° 53' 02.69"	93° 11' 47.11"	813'	35'	848'	Surface	Wireless Sector
07	R/W 12L Glide Slope	Wireless Transceiver	44° 53' 31.12"	93° 12' 56.70"	830'	35'	865'	Surface	Wireless Omni
08	NWA Deicing Operation Bldg	RO	44° 53' 29.52"	93° 13' 27.60"	842'	42'	884'	Surface	Omni
09	Signature Bldg (E edge of R/W 30L)	RO	44° 52' 28.21"	93° 11' 50.12"	813'	30'	843'	Surface	Omni
10	Signature Bldg (by Fuel Farm on Post Rd.)	R/T	44° 52' 16.38"	93° 12' 12.78"	808'	32'	840'	Surface	Omni
11	MT Bus Garage	RO	44° 51' 51.06"	93° 14' 33.54"	827'	39'	866'	Surface	Omni
12	<i>NOT PURSUED</i>	R/T	-	-	-	-	-	-	-
13	MAC Trades Bldg	RO	44° 53' 29.46"	93° 13' 50.76"	848'	34'	882'	Surface	Omni
14	TAG Aviation Bldg	R/T	44° 52' 45.82"	93° 13' 18.90"	829'	56'	885'	Surface	Omni
15	<i>NOT PURSUED</i>	R/O	-	-	-	-	-	-	-
16	Lindbergh Terminal, Concourse A	RO	44° 52' 50.02"	93° 12' 02.46"	818'	63'	881'	Surface	Omni
17	Light Pole, Blast Fence, 30R Deicing Area	R/T	44° 52' 42.96"	93° 11' 43.26"	814'	35'	849'	Surface	Omni
WR1	Lindbergh Terminal Concourse F Ramp Tower	Wireless Transceiver	44° 53' 00.23"	93° 12' 50.42"	823'	52'	875'	Transceiver	Wireless Sector