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FILED/ACCEPTED

SEP 15 2009

Federal Communications Commission
Office of the Secretary

September 15, 2009

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
c/o Natek, Inc.
236 Massachusetts Avenue, NE
Suite 110
Washington, DC 20002

ORIGINAL

**Re: Ex Parte Filing**
**WT Docket No. 07-293; IB Docket No. 95-91;**
**GEN Docket No. 90-357**

Dear Ms. Dortch:

As the Commission may be aware, on September 11th this office filed an Ex Parte Notification on behalf of the Aerospace and Flight Test Radio Coordinating Council. It has come to our attention that the electronic version of the file residing in ECFS cannot be opened.

Accordingly, we are re-filing the Ex Parte Notice in paper form for the Commission's records.

If you have any questions regarding this filing, do not hesitate to contact the undersigned.

Sincerely,

William K. Keane

WKK:sml

List ABCDE

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September 11, 2009

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

**Re: Ex Parte Filing**
**WT Docket No. 07-293; IB Docket No. 95-91;**
**GEN Docket No. 90-357**

Dear Ms. Dortch:

This is to confirm that yesterday, September 10, 2009, the undersigned, together with Giselle Creeser, Lockheed Martin Corporation; Joseph Cramer, The Boeing Company; Marc Ehudin, Textron; and Daniel G. Jablonski, Johns Hopkins University Applied Physics Lab, met with Renee Crittendon, Chief of Staff, Commissioner Clyburn; David Goldman, Legal Advisor to Chairman Genachowski; and Erin McGrath, Acting Legal Advisor to Commissioner Baker regarding the position of Aerospace and Flight Test Radio Coordinating Council ("AFTRCC") in the above-referenced proceedings.

The AFTRCC representatives distributed the materials attached. The points covered during the meeting are reflected in those materials, as well as in AFTRCC's earlier filings in the Dockets.

A copy of this ex parte statement is being submitted for the record in above-referenced proceedings.

Sincerely,

William K. Keane

WKK:tmc
Enclosures
cc: Renee Crittendon
David Goldman
Erin McGrath

DM3\1143227.1


# Aerospace and Flight Test Radio Coordinating Council (AFTRCC)

# "Impact to Flight Test Safety of WCS Proposals "

Presentation in
WT Docket No. 07-293 and
IB Docket No. 95-91

September 10, 2009

# Aerospace and Flight Test Radio Coordinating Council Members


Bell Helicopter
A Textron Company

BOEING

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L3 communications

SPECTRUM CERTIFICATION SOLUTIONS INC

# Characteristics of Telemetry in the 2360-2390 MHz Band


- Band utilized for testing aircraft and missiles.
- Telemetry transmitted over distances of 200 miles to highly sensitive parabolic antennas, typically mounted on towers, buildings, or mobile vans.
- Telemetry measures a multitude of parameters from engine temperature, to fluid pressures, to vibration levels, to name a few.
- Data is telemetered to ground engineers who 1) monitor the performance of the aircraft on a real-time basis and 2) warn the pilot of any trouble detected.
- Signal levels are weak and subject to dramatic fades due to maneuvers of test aircraft and multipath.
- Interference-free telemetry is vital to flight safety in an inherently dangerous operation, as well as to aerospace industry productivity.
- Hence, 2360-2390 MHz is a Restricted Band off-limits to fundamental emissions of all other services. Rule 15.205.

# WCS Protection of Flight Testing


- WCS allocated in the 2305 – 2320 MHz and 2345 – 2360 MHz
- WCS OOBE has been limited to 43 + 10 log (P) dB from band edge to 2370 MHz, and 70 + 10 log (P) above 2370 MHz. However,
- WCS power is measured on peak basis per Rule 27.50(a); and
- The current OOBE limit into the SDARS band, 2320 – 2345 MHz (110 + 10 log (P) dB), has effectively precluded mobile use of the WCS band, and provided de facto protection to AMT.
- There has been little use of the band to date.

# Results of WCS Field Tests

- Recent field tests of WCS devices have confirmed the interference threat.
- A low noise flight test telemetry receiver was tuned to a center frequency of 2362.5 MHz with a 12 MHz bandwidth (2356.5-2368.5 MHz).
- Test conducted at a distance of approximately 60 feet with an omni-directional antenna having zero dB gain given (typical large AMT antenna not available).
- Despite the frequency separation (the WCS band edge was 2352.5 MHz), the WCS signal caused severe interference to the AMT receiver.
- If a typical, higher gain Aeronautical Mobile Telemetry antenna had been used for the test, the interference would have been experienced at over 11 miles – even farther had the antenna been tower-mounted as is usually the case.

# WCS Proposals Will Adversely Impact Flight Testing


- WCS wants power measured on an average basis, not peak as required by Rule 27.50(a),with a peak-to-average ratio of 13 dB
- Measuring WCS power on an average basis -- much less allowing a peak-to-average ratio of 13 dB -- will significantly increase OOBE into 2360-2370 MHz.
- Effectively relaxes the OOBE limit from 43+10 log(P) to only 30+10 log(P).

# WCS Proposals Will Adversely Impact Flight Testing (cont.)

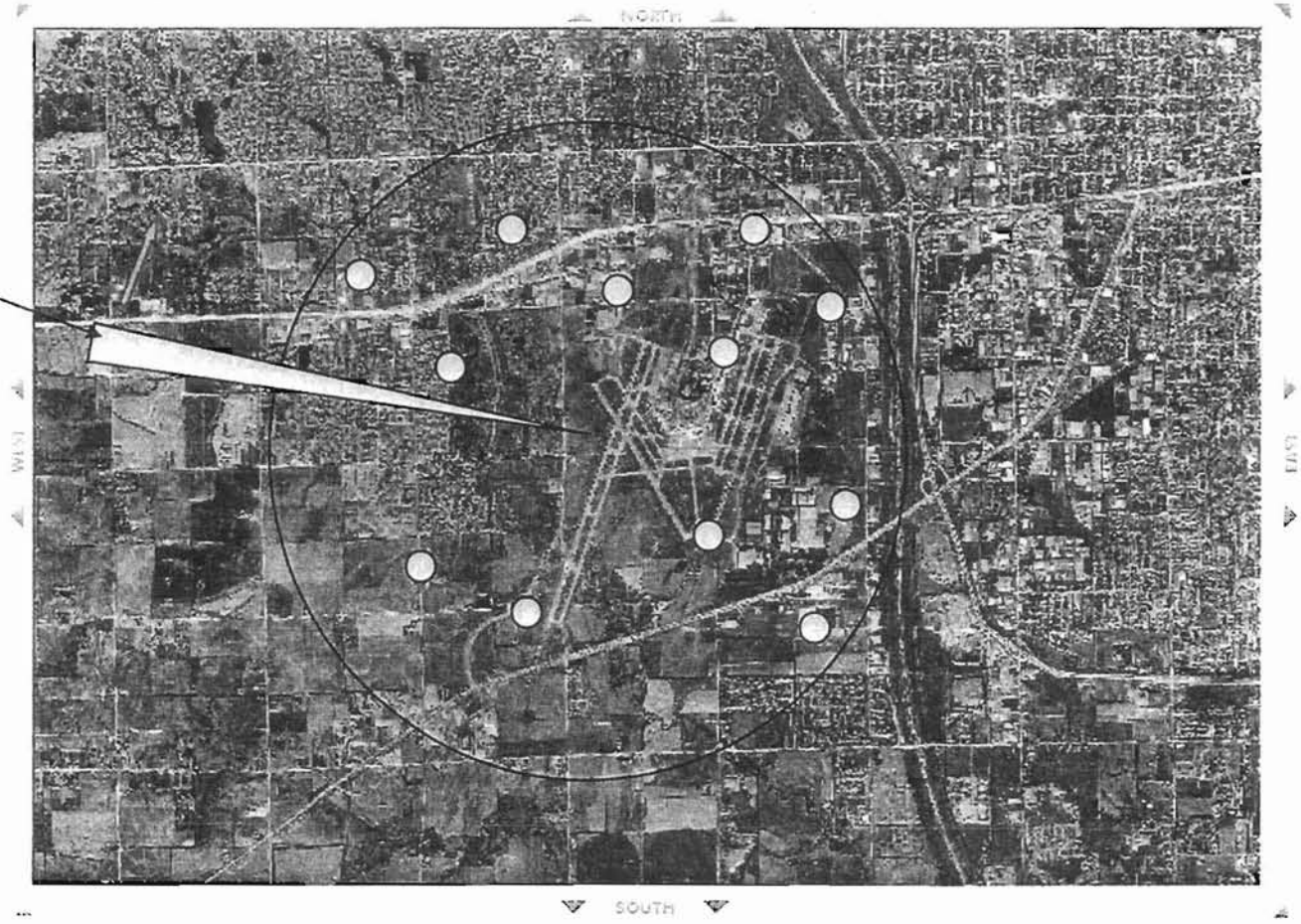

- *This would greatly increase the risk of telemetry drop-outs, and reduce maximum aircraft range by 30 percent . By operation of $\pi r^2$, this results in a 51 percent reduction in reliable airspace operating area.*
- Aircraft are routinely required to operate out to maximum range from AMT ground stations in order to cope with FAA restrictions, weather conditions, local air traffic congestion, etc. That essential flexibility will be lost.
- Mission re-flights increase risk. Mission re-flights increase costs. Mission re-flights cause delivery delays, and reduce global competitiveness.

# Impact to Flight Testing

AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

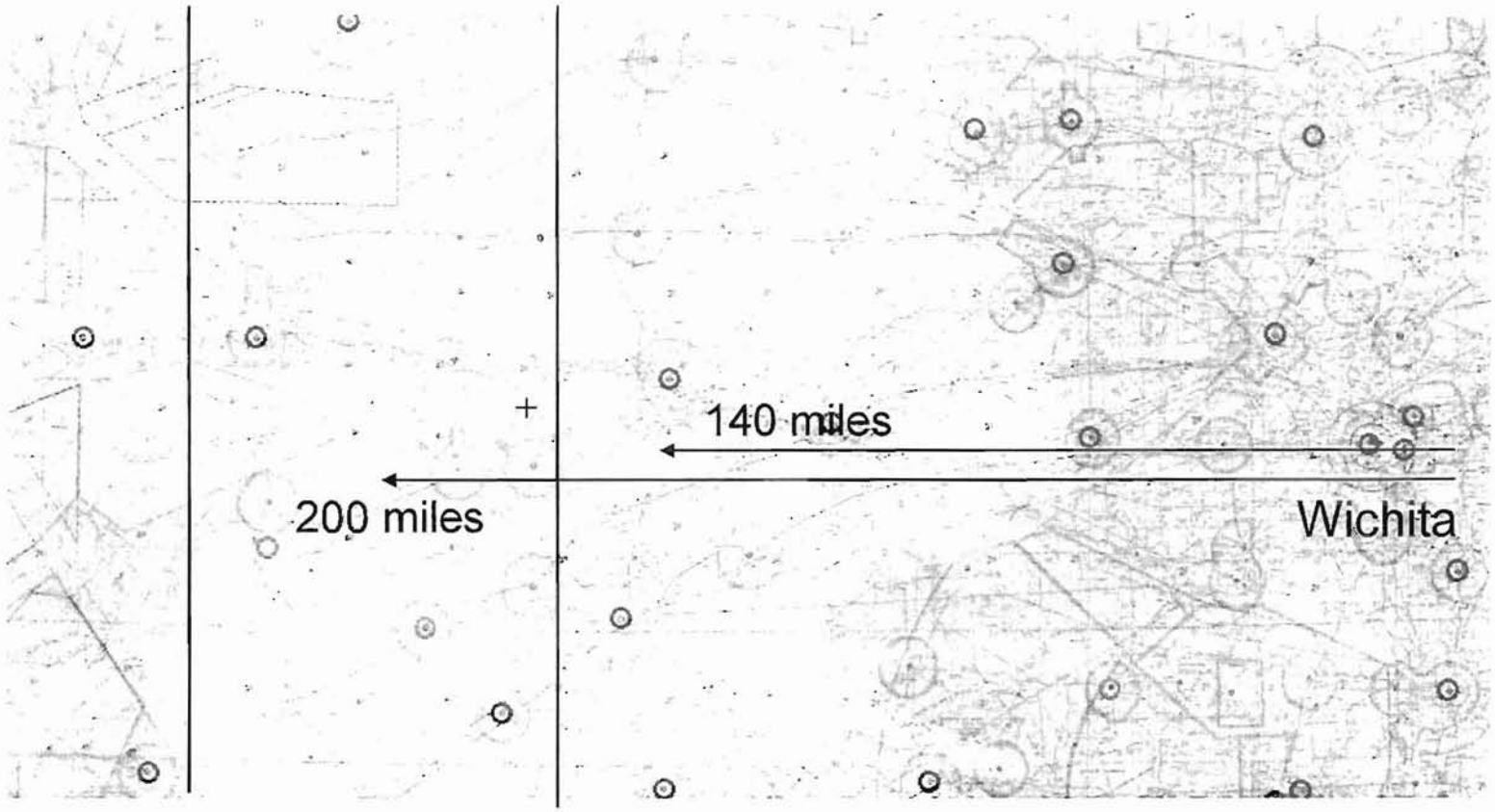
Geography near Wichita, Kansas showing possible WCS base station tower placement within 2 miles of Mid-Continent Airport, where Cessna, Learjet, and others conduct their flight tests

Beam of AMT receive antenna as it cuts across WCS towers and their associated portable and mobile terminals while tracking an aircraft



# Impact to Flight Testing

AFTRCC
AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL




Maximum operational distance near Wichita of 200 miles is reduced to 140 miles if WCS placement doubles the AMT noise floor.

# FCC Has Repeatedly Recognized Protected Status for Flight Test Band


- Recognized that flight testing is a safety service which must be protected "from harmful interference that could result in loss of life."[1/]
- Determined that telemetry bands should be classified as "Restricted" and protected from fundamental emissions of unlicensed devices -- agency stressed that the telemetry band "involv[es] safety of life." [2/]

[1/] *In the Matter of Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva,* 1979. FCC 84-306, released July 2, 1984, at 2.

[2/] *In the Matter of Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License,* 4 FCC Rcd 3493, 3502 (1989).

# FCC Has Repeatedly Recognized Protected Status for Flight Test Band (cont.)


- Recognized potential cost to manufacturers and the taxpayer from even brief telemetry drop-outs is significant:

  "[F]light test, telemetry, and telecommand operations are vital to the U.S. aerospace industry to produce, deliver, and operate safe and efficient aircraft and space vehicles."[3/]

[3/] *Second Notice of Inquiry in GEN. Docket No. 89-554, In the Matter Of An Inquiry Relating to Preparation for the International Telecommunication Union World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum,* FCC 90-316, 5 FCC Rcd 6046, 6060, para. 101 (1990).

# U.S. Has Protected Flight Test Band Internationally

- U.S. took extraordinary measures at WRC-07 to protect S-band telemetry:

  "The United States of America and Canada refer to footnote number 5.394 of Article 5 of the Radio Regulations concerning the use of the 2 300-2 390 MHz band in the United States and the 2 300-2 400 MHz band in Canada and state that, in application of the Final Acts of the World Radiocommunications Conference (Geneva, 2007) in those bands, *the aeronautical mobile service for telemetry has priority over other uses by the mobile services.*"[4/]

[4/] Declaration No. 78, Document 427-E (WRC-07) (emphasis added).

# WCS Arguments

- WCS argues that there is no change in the "nature of service," i.e. fixed and mobile allocations and that AFTRCC participated in the rulemaking establishing the allocations.
  - But the allocations are not the issue -- it is the WCS attempt to change the service rules applicable to the allocations. This would entail an enormous change from a largely unused band, to a band potentially widely used. This can be accomplished without endangering a spectrum neighbor's operations.
- WCS argues that it is not proposing to change the OOBE Rule of 43+10 Log(P) dB
  - But it is proposing to change the Rule by which OOBE compliance is measured (average versus peak power) -- exacerbating the interference to AMT.

# WCS Arguments

AFTRCC
AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

- The same WCS parties opposed average power measurement when WCS Wireless sought a waiver just three years ago incident to a prospective merger with XM Satellite Radio. Quoted in AFTRCC ex parte of May 7, 2008 at 3.

- AT&T has argued that there should be a 10 MHz guardband to protect its operations at 2110-2155 MHz (AWS-1) from any adjacent interference from 2155-2180 MHz band (AWS-3). See AFTRCC ex parte of August 18, 2008.

# AFTRCC Proposal Enhances Spectral Usage and Aviation Safety


- Retain peak power measurement consistent with existing Rule 27.50(a) and various other wireless services (1390-1392; 1390-1392/1432-1435 MHz; and 1670-1675 MHz; see Rules 27.50(e)-(f))

- Increase existing protection levels (from 43 + 10 log (P) in 2360 – 2370 MHz and 70 + 10 log (P) in 2370 – 2390 MHz) to
  - 70 + 10 log (P) in 2360 - 2370 and 90 + 10 log( P) in 2370 - 2390 MHz for mobiles and portables
  - 75 + 10 log (P) before transmit antenna in 2360 -2370 MHz and 95 + 10 log (P) in 2370 - 2390 MHz for base stations

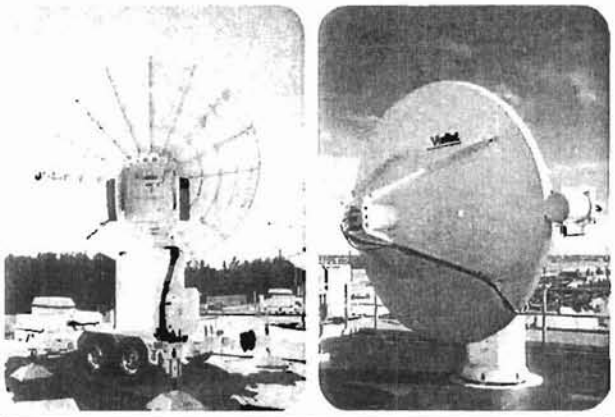
- Require power control for WCS base stations, mobiles and portables

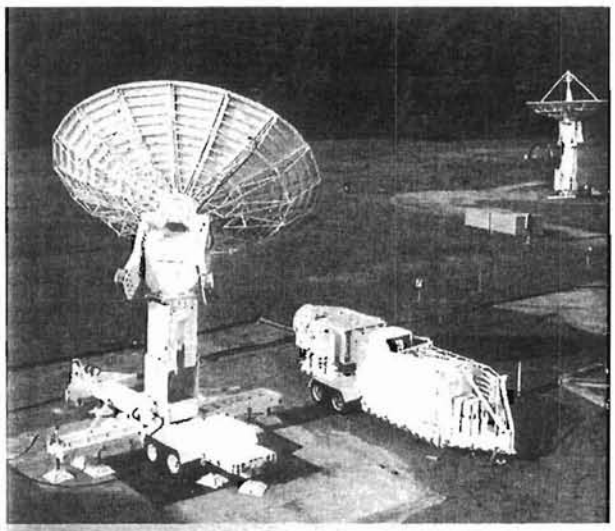
- AFTRCC's proposal will enable the FCC to 1) protect aviation safety and 2) increase the utility of the 2345-2360 MHz band.

ViaSat

# L- and S-band Range Telemetry Systems

L-Band, S-Band, Fixed and Mobile





**For Decades ViaSat has been a leading supplier of high quality tracking antennas to the telemetry users of the world. Using our experience we have refined our products into simple, robust, and technically superior telemetry systems.**

The Patented ESCAN tracking feed provides low sidelobes, high scanning rates, and superior multi-path resistance. We also produce conical scan and single channel monopulse tracking feeds to fit a wide range of requirements.

The series 13000 pedestal features patented bearing technology that combines long trouble free life with ease of service and maintenance. Pulse Width Modulated (PWM) servo power amplifiers are matched with brushless DC servo motors to assure long trouble free operation. These pedestals are in service around the world, some in extreme harsh environments providing daily service.

The heart of the control system is ViaSat's 3880 Antenna Control Unit (ACU). The 3880 is ViaSat's fourth generation ACU and provides unequalled performance for tracking systems. The 3880 provides for control, testing, and mission monitor (track files), far better than any previous control unit.

Telemetry Systems are available in fixed and mobile configurations as well as many size offerings (in addition to those listed here).

- A leading source for more than 40 yeors
- Highly multi-path resistant ESCAN feed
- High dynamics, high accuracy tracking pedestal
- Fourth generation touch screen antenna control unit
- Mobil e and fixed configurations
- Remote control

# L- and S-Band Range Telemetry Systems

## SPECIFICATIONS AND FEATURES

| | 1.8m | 2.4m | 3.0m | 3.6m |
|---|---|---|---|---|
| **Frequency** [1] | 1435 – 2300 MHz | 1435 – 2300 MHz | 1435 – 2300 MHz | 1435 – 2300 MHz |
| **Feed Type** | ESCAN | ESCAN | ESCAN | ESCAN |
| **Gain** | 28.5 dB @ 2300 MHz | 31.0 dB @ 2300 MHz | 33.0 dB @ 2300 MHz | 35.0 dBI @ 2300 MHz |
| **HPBW @ 2300 MHz** | 5.1° @ 2300 MHz | 3.8° @ 2300 MHz | 3.0° @ 2300 MHz | 2.5° @ 2300 MHz |
| **First Side Lobes** | 16 dB Below Peak | 18 dB Below Peak | 18 dB Below Peak | 20 dB Below Peak |
| **Polarization** | LHC & RHC Sim | LHC & RHC Sim | LHC & RHC Sim | LHC & RHC Sim |
| **Axial Ratio** | 2.0 dB Max at beam peak | 2.0 dB Max at beam peak | 2.0 dB Max at beam peak | 2.0 dB Max at beam peak |
| **Guaranteed G/T** [2&3] | 5.8 dB/K @ 2300 MHz | 8.6 dB/K @ 2300 MHz | 10.5 dB/K @ 2300 MHz | 12.1 dB/K @ 2300 MHz |

### DYNAMICS

| | |
|---|---|
| **Velocity** | 30° sec |
| **Acceleration** | 30° per sec$^2$ |
| **Azimuth Travel** | +/- 375° |
| **Elevation Travel** | -10° to +110° |

### ENVIRONMENTAL

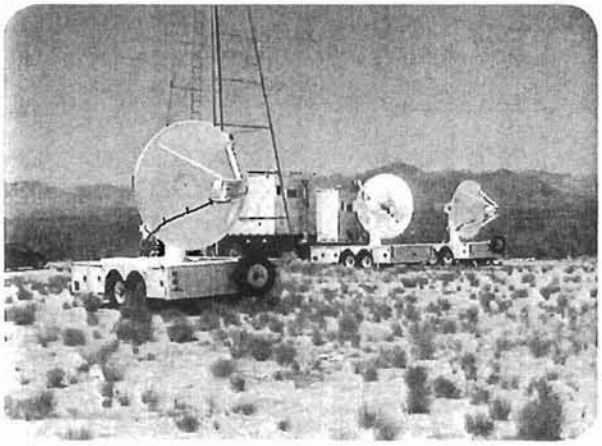
| | |
|---|---|
| **Temperature** | -30° to +70° C |
| **Rain** | Up to 5 inches per hour |
| **Ice** | 0.5 inch Radial |
| **Wind** | Operate in 45 MPH, Stow in 120 MPH |
| **Voltage/Frequency** | 120/208 VAC 50/60 Hz |

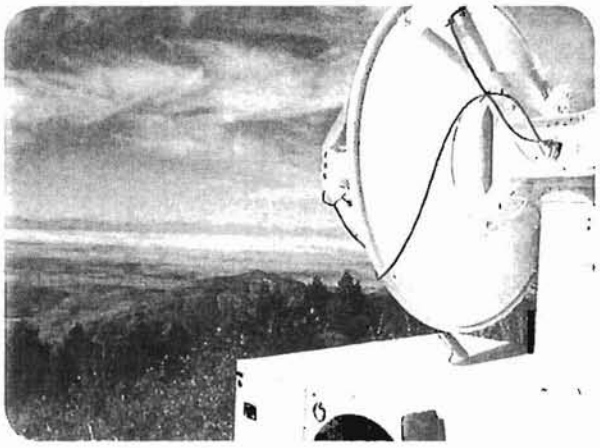
### OPTIONS

- Separate data and tracking channels for improved performance
- Dual drive pedestal
- Slip-rings and rotary joint for continuous azimuth rotation
- Transmit versions available in all frequency bands
- Video camera
- Alignment telescope
- Acquisition antenna
- Dual or selectable polarizations
- Larger reflector sizes as specifications may require
- 1435 to 2400 MHz frequency range

### NOTES

[1]Wider Frequency coverage available please consult Factory.
[2]G /T at 20° Elevation, 23° C, 7.5 gr/m$^3$ and under clear sky conditions.
[3]Separate Data and Tracking channels and other feed configurations with enhanced G/T performance are available as options.
[4]Above specifications are with one LNA and no Band Pass Filter.





White Sands Missle Range

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