New Kennedy Space Center 50-MHz Launch Support Radar Wind Profiler

System Features & Components



Three-bit phase shifter

- Scalable by using small building blocks
- Full Beam Steering with specific pointing directions
- Phase shifter per Yagi antenna element
- Solid-state transmitters (previous 50 MHz used triodes)
- Maximum power is 250-kW
- 20 feeds, each with max of 12.5 kW
- Each feed powers 32 Yagi elements
- 20 Transmit/Receive switches
- 20-way divider to feed transmitters 20-way combiner to feed single receiver





Partially populated rack undergoing EMI testing



144 m / 640 Yagi elements





REFERENCES

Wilfong, T. L., S. A. Smith, and R. L. Creasey, 1993: High temporal resolution velocity estimates from a wind profiler, J. Spacecraft and Rockets, 30(3), 348-354 Brian E. Harrington, 2011: Space Shuttle Day-of-Launch Trajectory Design Operations, United Space Alliance, LLC, Houston, TX.

3 or 4 Beam Modes for Launch Ops

NASA 49.25 DRWP for Launch



- High resolution (150 m range resolution)
- Continuous data (every 5 minutes)
- Optional manual QC through MFFG process
- Minimal single points of failure
- Designed for soft fail
- ✓ Antenna segment failures result in lower gain, higher slidelobe levels
- Transmitter failures result in lower power, and

Compare old system

- Twin to White Sands Missile Range (WSMR), New Mexico (c. 1989)
- ✓ 404 MHz (NOAA) 40' (12 m) diameter



✓ 50-MHz 400' (125 m) diameter

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Median Filter First Guess (MFFG) Processing







- Implements Modern, Modular Software Technology
- Preserves the Original MFFG Signal Processing
- Graphical User Interface for manual QC
- Control the near real time processing parameters
- First Guess Velocity
- Search Window Width
- Integration Window Width
- ✓ Control Marking of "Bad" Gates
- ✓ Control Release of Data to Users









