LOCKHEED MARTIN

NEXRAD WSR-88D

Design innovation the world over

Lockheed Martin is the world leader in the design, production, turn-key delivery and support of Advanced Doppler Weather Radar Systems.

Lockheed Martin has delivered over 165 WSR-88D [Next Generation Weather Radars (NEXRAD)] to the U.S. Government on time or ahead of schedule. Systems have also been delivered to Taiwan and Shanghai.

The WSR-88D is the first integrated weather radar system incorporating advanced radar design, data processing, real-time dissemination to multiple users, networking and automated storm tracking, storm development trends and warnings. The klystrom based, S-band radar provides long range surveillance, unsurpsassed sensitivity and data accuracy for both clear air and precipitation of weather, biological targets and atmospheric phenomena throughout the operationally useful range of the radar. Its unique Volume Coverage Pattern (VCP) operational mode provides the meteorologist with not only traditional Plan Position Indicator (PPI) data but an integrated picture of the total volume surveyed. A thunderstorm or tropical storm's internal structure (horizontal and vertical), storm dynamics and liquid water content can be determined each 5 minutes.

The WSR-88D operator interfaces provide for total system control, selection of products available for display each VCP, designation of automated warnings alert areas and criteria, over 400 adaptation parameters to enable system "fine-tuning" for local conditions, quarter-screen displays with linked cursors on dual monitors, establishment of functional product display strings for specific weather threat situations, and detailed background map selection including airways, rivers, political boundaries and key geographical locations.

The radar's high reliability—over 800 hours Mean Time Between Failure (MTBF), low Mean Time to Repair (average less than 30 minutes) and backup diesel generator or Uninterruptible Power Supply insure WSR-88D will be available when needed to provide highly accurate, timely warnings. The result is improved weather services, lives saved and resources protected.

The system's 20 year life, with planned product improvement by Lockheed Martin and the U.S. Government, make the WSR-88D a cost-effective investment in a nations infrastructure modernization for today and tomorrow.

NEXRAD Specifications

Radar Data Acquisition (RDA) Unit

Radar Range

Reflectivity: 460 km (248 nm)

Velocity: 230 km (124 nm)

Antenna

Type: S-band, center-feed, parabolic dish

Size (dia.): 9m (28 ft.)

Beam-width: 0.95˚

Gain: 45.5 dB

Polarization: Linear horizontal

Side Lobes (with radome): -27 dB

Boresight Accuracy: 0.15˚

Pedestal Type: Elevation over azimuth

Pointing Accuracy: ± 0.2˚

Readout Precision: ± 0.1

Accleration: ± 17˚/sec^2

Azimuth Rate (max): +36˚/sec (6 rpm)

Elevation Rate (max) ± 30˚/sec

Transmitter

Frequency Range: 2.7 to 3.0 GHz

Peak Power Output: 750 kw

Average Power Output: 1.56 kw

Pulse Width: 1.6, 4.5-5.0 µ sec

Range Sample: 250m (0.13 nm)

Pulse Repetition Frequency:

Long: 318 to 452 pulses/sec

Short: 318 to 1304 pulses/sec

Wave Form Types: Contiguous, batch

Receiver/Signal Processor

Receiver Bandwidth: 0.795 MHz

Receiver Channels: Linear output I/Q, Log output

Dynamic Range: 95 dB

PC-Based Radar Control Processor

Signal Processor: Houses hard wired and programmable signal processor

Clutter Canceller: Map controlled digital filters, up to 56 dB

Archive Device: 8 mm tape (base data)

Radar Product Generator (RPG)

Meteorological Algorithm Hardware

Processor: 32-bit general-purpose digital computer, expandable to three CPUs

Shared Memory: 32-Mbyte semiconductor memory expandable to 96 Mbytes

Mass Storage Device: Up to three 600-Mbyte disks

Archive Device: Up to two 5.25-inch optical disks

Communications

Wideband Communication Ports:

Communications link up to two standard T1 (1.544 Mbytes/sec radar base data)

Narrowband Communications: Modems and interfacing modules—up to 46 9600/4800 bps, any mix of 4-wire dedicated and 2-wire dial-up lines

Principal User Processor (PUP)

Processor: Pentium-based graphics workstation

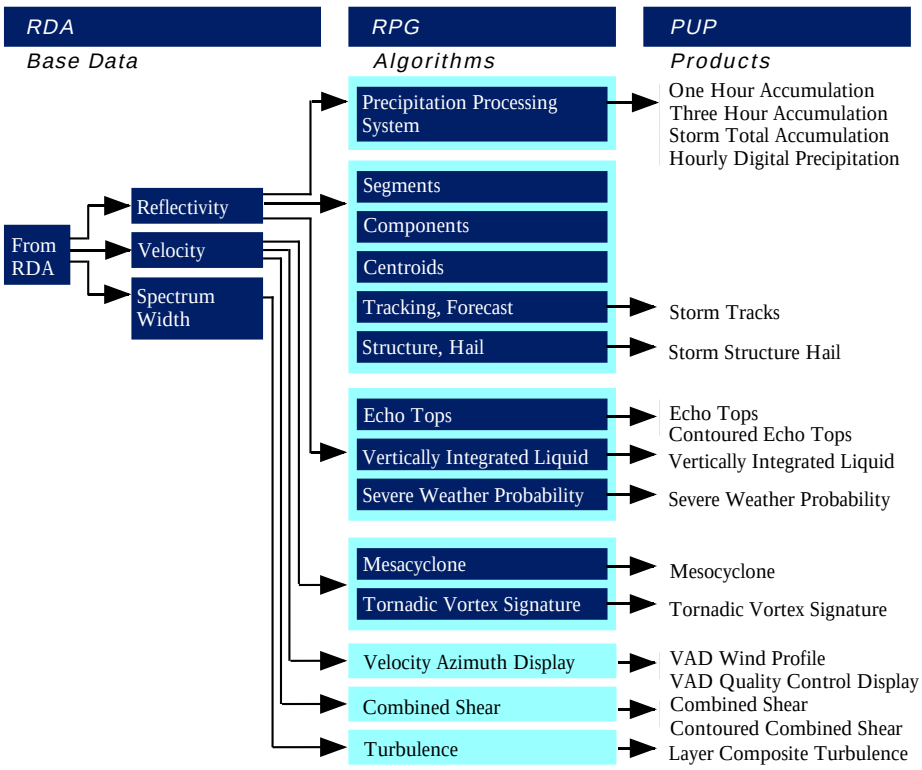
Video: Adaptable 16-million color palette look-up tables, split screen, zoom and time lapse functions

Dispay: Dual 19-inch CRT high-resolution color monitors, resolution 640x512 pixels per each split screen

Hardcopy Device: Color, dual-mode printer

Archive Device: Write once/read many 5.25 inch optical disk

Algorithm Processing/Products



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