Baron Gen3 Radar
1 MW S-Band Klystron System

Applications:
- Superior weather detection in every meteorological environment, from convective and tropical to arctic environments.
- Enables more effective weather alerting, helping reduce loss of life during hydrometeorological events.

Features and Benefits

Powered by a 1 MW klystron transmitter
The klystron’s stable transmission delivers better clutter suppression and velocity data, plus more average available power—superior performance in every weather situation.

Dual-polarization as standard option
Simultaneous horizontal and vertical transmission results in more precise analysis for flooding, hail, winter precipitation and tornadoes.

Next-generation radar processor
The onboard Baron signal processor delivers value-added product creation and automated storm tracking, along with full command and control. RHI and sector scans can be performed at the operator’s discretion.

Superior clutter suppression
Available exclusively from Baron though a license of technology with the University of Oklahoma, CLEAN-AP™ enables superior ground clutter suppression, in addition to optimally and dynamically adapting the suppression process to the ground clutter environment.

Radial-by-radial ZDR calibration
This new patent-pending technology provides reliable and continuous network-wide calibration during any weather conditions, with less maintenance and on-site expertise required.

Open data architecture
All Baron Gen3 radars feature an open architecture for easier access to data at various points throughout the processing chain.

Reliable and easy to maintain
Klystrons deliver longer operational lifespan compared to magnetrons. In addition, wide-access panels provide easy access to major components, reducing man hours on preventive maintenance and repair. Pedestal motors deliver rugged durability, and can be easily replaced without removing the elevation head. Spare parts can be shared across multiple systems in the field, which reduces costs and maximizes uptime.

Remote system monitoring and 24/7 support
Built-in test equipment provides automatic notification to personnel if potential issues occur. Additionally, meteorologists from the Baron operations center are available to address questions and troubleshooting around the clock.

CLEAN-AP (TM) trademark owned by The Board of Regents of the University of Oklahoma.
### General
- **Peak Power**: 1 MW
- **Operational Frequency**: 2700 to 2900 MHz
- **Polarization**: Single: Horizontal; Dual: Simultaneous Transmit and Receive (STAR), Horizontal-Only
- **Pulse Width Modes**: Adjustable, 0.8 – 4.5 μsec
- **Pulse Repetition Frequency**: 250 - 1875 Hz
- **Typical Operational Range**: Up to 480 km
- **Range Resolution**: Down to 25 m

### Transmitter
- **Type**: Klystron
- **Peak Output Power**: 1 MW
- **RF Duty Cycle**: 0.0015
- **Internal Protection**: Reverse Power Detection, Waveguide Pressure, External Interlock Monitoring
- **Pulse Widths (nominal)**: 0.8 μs, 1.5 μs and 3.0 μs
- **Modulator**: Solid-State IGBT Switched
- **Pulse Repetition Frequency (nominal)**: 0.8 μs: 250 – 1875 Hz, 1.5 μs: 250 – 1000 Hz

### Receiver
- **Type**: Super-heterodyne, Image Reject
- **Noise Figure**: 2 dB maximum
- **Linear Dynamic Range**: ≥ 95 dB for a 2 μs pulse
- **Minimum Detectable Signal**: ≥ -114 dBm for a 2 μs pulse

### Doppler Signal Processor
- **Type**: Four (4) channel, 16-bit per polarization
- **IF Frequency**: 60 MHz
- **Maximum Range Bins**: 2700
- **Minimum Range Resolution**: 25 m
- **Processing Modes**: PPP, FFT, Dual PRF, Staggered PRF
- **Clutter Filters**: CLEAN-AP

### Antenna
- **Type**: Prime Focus Parabolic w/ Orthomode Linear feed, Dual-Pol Standard
- **Construction**: Lightweight Composite Reflector
- **Diameter**: 8.5 m
- **Gain**: 44.5 dB typical at 2.8 GHz
- **Beam-width**: ≤ 1.0°
- **Side-lobes**: 27 dB typical Principal Planes
- **Cross-Polarization Isolation**: 30 dB minimum
- **Polarization**: Single: Horizontal; Dual: Simultaneous Transmit and Receive (STAR), Horizontal-Only

### Pedestal
- **Pedestal Type**: Elevation over Azimuth
- **Azimuth Movement**: 360° continuous
- **Elevation Movement**: -2° to 90°
- **Positional Accuracy**: ≤ 0.1°
- **Scanning Rates**: Up to 36°/sec

### Radome
- **Construction**: Fiberglass Foam Sandwich w/ Quasi Random Panel Geometry
- **Diameter**: 11.5 m
- **Transmission Loss, Dry Condition, One-way**: ≤ 0.2 dB
- **Coating**: Hydrophobic Gel Coat with 25 year service life

### Calibration
- **System dBZ, determination accuracy**: ≤ 1 dB
- **System ZDR bias determination accuracy**: ≤ 0.1 dB
- **System PHI_{DP} determination accuracy**: ≤ 1°

### Meteorological Data
- **Single Polarimetric Mode**: T, Z, V, W
- **Dual Polarimetric Mode**: T, Z, V, W, ZDR, PHI_{DP}, RHO_{HV}, K_{DP}, LDR_{H} (in Horizontal-Only configuration)
- **Radar Products**: Optional. Ask your Baron representative about available products.