



**EEC**

**ENDURANCE SERIES**

**C-BAND**



**Solid State C-Band**

Single and dual-polarity configurations • 350kW equivalent transmitter power (ETP)

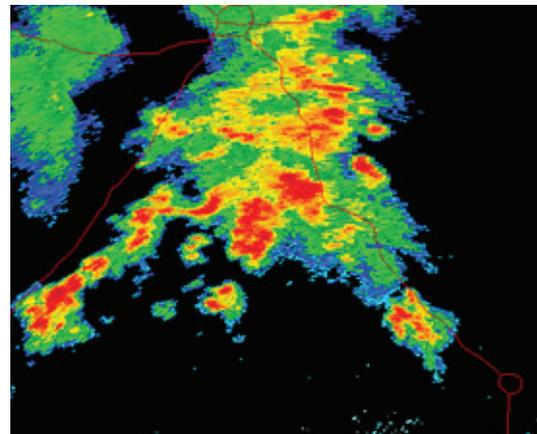
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# ENDURANCE C-BAND SYSTEMS FROM EEC

## The solid-state of things to come

EEC is proud to introduce Endurance C, our fully solid-state C-Band radar product line. Endurance C systems provide for ultra-wideband performance and low life-cycle costs thanks to advanced solid-state power amplifiers operating in the widest C-Band frequency range available. For geographic areas with diverse and dynamic weather conditions, nothing offers greater return on your investment than the Endurance C.



## EEC C-Band radar - the benchmark standard around the world

For most areas of the world, nothing offers a better value than the proven line-up of C-Band radar systems from EEC. Even in challenging environments, our C-Band systems provide powerful and accurate information. Perhaps most importantly, the specifications of our C-Band radars can be customized to meet a wide range of demands and uses.

**ENDURANCE C:** EEC's solid-state Endurance C-Band radars are the most advanced weather radar systems in the world. Thanks to their perfect balance of power and effective range, these systems are the ideal choice for customers with a diverse set of weather detection demands. You can choose to equip them in either single or dual-polarity configurations.

With any EEC C-Band radar, our turn-key design, manufacturing, and installation processes allow us to configure your system to your exact specifications. Among the many options are single or dual-polarity transmitters and a variety of full-featured control and display systems. For a clean and true picture of mid to long range weather events, we will match your EEC C-Band system with the precise Doppler processing of our super-sensitive IQ2 signal processor and digital receiver. You can even choose the installation and radome that best fits your environmental needs.

## ENDURANCE C SYSTEM ADVANTAGES

- Systems come standard with a fully solid-state transmitter
- Reduced life-cycle maintenance costs thanks to no reliance on consumable magnetron or klystron tubes
- Ultra-wideband performance from 5200-5900 MHz virtually removes any risk of frequency interference
- Hot-swapping of solid-state power amplifiers means no system downtime during transmitter maintenance
- Safe, low voltage solid-state power amplifiers provide no high voltages to endanger technicians and preventative maintenance engineers
- Algorithms developed and specifically tuned for performance at C-Band
- Designed for high-resolution medium to long range weather detection
- Innovative architecture provides the highest receiver sensitivity
- Advanced radar motion control system provides better spatial resolution resulting in more accurate data
- Industry leading clutter suppression technology
- Patented fiber-optic technology provides noise free, ultra-high speed data throughput
- Adaptive spectrum-based clutter mitigation algorithms
- Improved data quality achieved through advanced continuous calibration techniques
- Advanced Polarimetric rainfall estimation and attenuation correction techniques
- Super-high resolution IQ2 16-bit digital signal-processor
- Over 500 configurable diagnostic points monitored in real-time
- Systems configured with IQ data recording and playback
- Flexible configuration options that maximize available bandwidth on any standard TCP/IP network.
- Comprehensive suite of radar data exchange protocols

SYSTEM		ENDURANCE C
Operating Frequency	5200 - 5900 MHz	
Pulse Width	0.2us - 100us	
Range Resolution	Minimum 16m	
Pulse Repetition Frequency	200-2400 Hz, user selectable	
Range	Minimum 600km	
Maximum Velocity (unambiguous)	up to 128 m/s	
Sensitivity-reflectivity	- 18 dBz at 30 km	
Clutter Suppression Capability	≥ 46 dB	
Data Output	UZ, Z, V, SW (dual-polarization moments Zdr, Phv, Φdp, KDP, LDR)	

ANTENNA/PEDESTAL	
Type	Parabolic, Prime Focus Reflector
Reflector Diameter	4.2m (typical) - other sizes available
Gain-Minimum	> 45.0 dB
Half Power Beam Width (typical)	0.95°
Polarization	Single Polarization - Linear Horizontal Dual-Polarization - Linear Horizontal/Vertical
Angular Positioning Accuracy	≤ 0.05°
Scanning Speed	Up to 10 rpm

TRANSMITTER	
Type	Solid State
Peak Power	10 kW
Equivalent Transmitter Power (ETP)	350 kW

RECEIVER	
Type	Superheterodyne, Single or Dual Down Conversion with Image Reject Mixing
Minimum Discernible Signal	- 114 dBm typical
Linear Dynamic Range	Up to 105 dB

DIGITAL RECEIVER/ SIGNAL PROCESSOR	
Type	16-bit Modular, multi-channel Digital Receiver, Signal Processor
Maximum No. of Processed Range Bins	up to 8192
Minimum Processing Resolution	as low as 16m
Clutter Filters	Time Domain or Spectrum-Based Time Estimation and Processing (STEP) - An advanced adaptive clutter identification, mitigation and noise reduction algorithm

METEOROLOGICAL USER SOFTWARE	
Meteorological User Software	PULSE
Computer System	Commercial off-the-Shelf PC
Meteorological Products	See PULSE Data Sheet for additional details.

## The Solid-State of Things to Come...

We've been defining the industry since 1971 and we're not done yet. Introducing Endurance; fully solid-state weather radar systems from EEC. Powered by solid-state power amplifiers, EEC's Endurance radars use modern solid-state technologies to provide you with decreased life-cycle maintenance costs, a smaller hardware footprint, and increased operational up-time. Here's how...

Klystron and magnetron tubes are considered consumables within a radar system. This means they require replacement every few years at a significant cost. EEC's Endurance systems come standard with fully solid-state power amplifiers. These amplifiers last far longer than klystron and magnetron tubes, rarely requiring replacement. This results in an immediate life-cycle maintenance cost savings over klystron and magnetron tube-based systems.

Traditional weather radar systems utilize klystron or magnetron tubes as the core component of the transmitter. Although these tubes have a long track record of success and stability, they are older technologies, stemming back to the 1940's. In addition to older technology, klystron and magnetron tube systems also require large high-voltage power supply units housed in the transmitter cabinet. Utilizing low-power solid-state amplifiers, combined with pulse compression technology, Endurance radars do not require these large power supply components and cut the transmitter hardware footprint in half!

Every Endurance solid-state weather radar comes with redundancy built into the transmitter. Each system includes 4 solid-state power amplifiers. In the rare case that an amplifier breaks down, all replacement activities can take place without taking the system offline.

The other amplifiers will continue to operate while the broken unit is swapped out. Unlike magnetron and klystron radars, where the system must be completely shut off during maintenance work, Endurance systems continue to function, ensuring maximum operational up-time.

Working with world-renowned experts and the University of Oklahoma, we have developed better algorithms tuned specifically for C-Band radar and end-to-end dual-polarization measurements. This not only results in more accurate estimates of rainfall, but also provides better discrimination between different types of precipitation and non-meteorological signals such as birds, insects, dust storms, or even the debris field of an approaching tornado.

We have also developed proprietary technology to significantly improve clutter suppression performance in our Endurance systems. The final result is obvious – EEC dual-polarization systems provide the best weather detection capability in the industry today.



*Rack-Mounted Endurance  
Solid-State Power Amplifiers*



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