



*Electron Device  
Business*

# Microwave Products

For radar, electronic warfare,  
industrial and scientific applications



**Electron Device Business**

ElectronDevices@cp-edb.com

www.cpi-edb.com



## Radar & Electronic Warfare Markets

CPI EDB products are found in military radar systems around the world.

### Airborne radar, ECM and missile-seeker technology

- Navigation
- Terrain following
- Ground mapping
- Air and ground surveillance
- Weapons control
- Anti-ship missiles
- Cruise missiles
- Air defense systems
- Missile defense systems

### Naval radar

- Naval and air surveillance
- Navigation
- Fire control
- Shipboard defense systems
- Air traffic control
- Aircraft landing systems

### Ground-based radar

- Air defense radar
- Missile control
- Radar simulators
- Air surveillance and tracking
- Range tracking
- Satellite tracking systems
- Ground and sea surveillance
- Artillery locating systems

## Commercial & Industrial Applications

CPI EDB is a major supplier of microwave and millimeter-wave components and subsystems generating and controlling RF power in radar systems and radar-based sensors.

### Air traffic control radar

- Air surveillance radar
- Air route surveillance radar
- Surface movement radar
- Terminal doppler weather radar (TDWR)
- Precision approach control and landing systems

### Industrial

- EMI/EMC testing
- Cargo screening

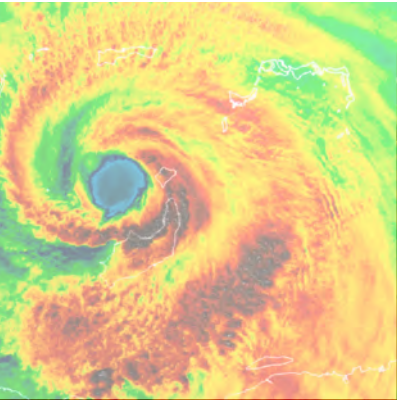
### Scientific

- High-energy particle accelerators
- Superconductors

### Weather radar

- Weather prediction
- Storm tracking
- Severe weather monitoring
- Aviation safety
- Marine radar
- Coastal weather monitoring
- Climate research

*CPI EDB provides innovative proven technology, for legacy sustainment programs and for system and platform upgrades*



## Solid State Power Amplifiers (SSPAs)

- Gallium Nitride (GaN) transistor technology
- Air- or liquid-cooled
- Hermetically sealed for harsh environments
- Pulsed up to 20% duty
- Designed for demanding applications
- Ruggedized for use in pulse airborne, naval and ground radar
- Deployed in weather forecasting Doppler radar systems
- Utilized worldwide in air traffic control and precision approach radar systems

### Frequencies and power

- Frequencies from 1 GHz to 10 GHz
- Power levels from 1 kW to 50 kW

## Transmitters

- Fully integrated systems
- 19-inch rackmount versions
- Wide RF bandwidth
- High-voltage switched-mode power supply
- Built-in test electronics (BITE)
- Single phase, triple phase and DC input voltage versions
- Forced-air and liquid-cooled options
- Designed for the harshest environments; mil-spec compliant

### Transmitter Technology

- Magnetron-based
- Klystron-based
- Helix and Coupled Cavity based
- IOT-based
- Gyrotron-based
- Ring-loop-based

### Frequencies and power

- Frequencies from 1 GHz to 40 GHz
- Power levels from 1 kW to 2 MW





## Integrated Microwave Assemblies (IMAs)

- High-power handling
- Low-noise figure
- Calibrated couplers
- Variable attenuation
- Integrated assemblies
- Receivers
- Upconverters
- Pulse compressors
- Voltage-controlled oscillators
- Low-noise amplifiers
- Switches
- Multifunction components

### Frequencies and power

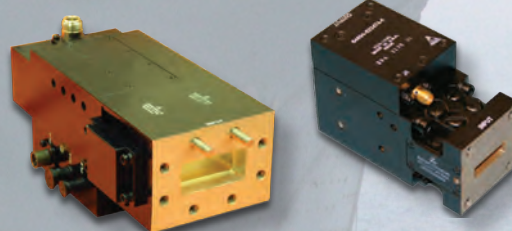
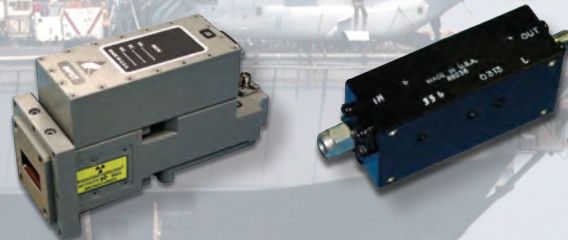
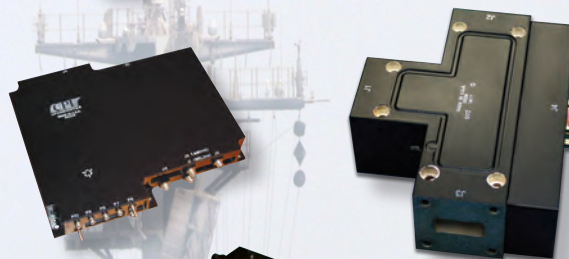
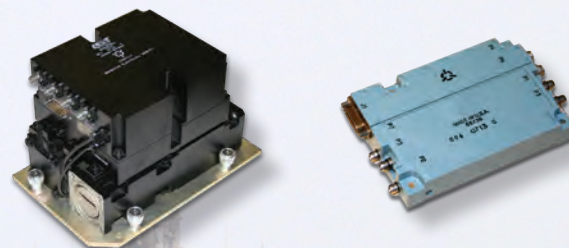
- Frequencies from 100 MHz to 40 GHz

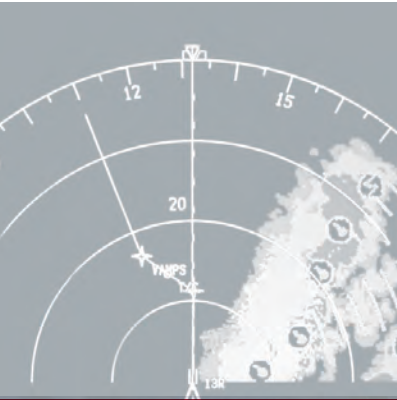
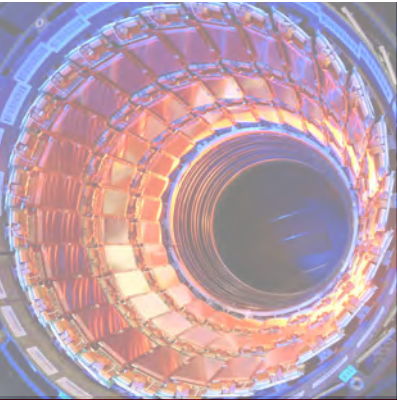
## Receiver Protectors

- Fast switching time
- High peak power
- Very fast recovery times
- Low output leakage
- Superior broadband isolation
- Active and passive receiver protectors
- Solid state, plasma, ferrite limiters
- Multipactors
- High-power solid state switches
- Duplexers
- Digital or analog attenuators
  - Waveguide, coax or microstrip
- Pressure windows

### Frequencies and power

- Frequencies from 100 MHz to 40 GHz
- Power levels from milliwatts to megawatts





## Power Couplers

- Proven designs
- Full class 10 (ISO-4) cleaning & assembly
- Vast expertise building an array of power couplers and electron devices

### Power couplers for:

- Superconducting accelerators
- Free electron lasers
- Spallation neutron sources
- Energy recovery LINACs
- Third harmonic cavities

### Frequencies and power

- Frequencies from 175 MHz to 3.9 GHz
- Power levels from 5 kW to 1 MW

## Capacitor Charging Power Supplies

- Designed for harsh environment
- High pulse repetition rates
- Modular design for flexibility
- High voltage output resilience
- Independent output control voltage control
- Compact and efficient design
- Enhanced reliability
- Integrated trigger module
- Advanced system controller
- High-voltage, high-power outputs
- Broad voltage options
- Robust monitoring and control





## Magnetrons

- High-power handling
- Long life
- Exceptional frequency stability
- Frequency agile magnetrons
- Beacon magnetrons
- Injection locked magnetrons

### Frequencies and power

- Frequencies from 896 MHz to 35 GHz
- Power levels from 100 W to 35 MW

## Traveling Wave Tubes (TWTs)

- Helix
- Ring Loop

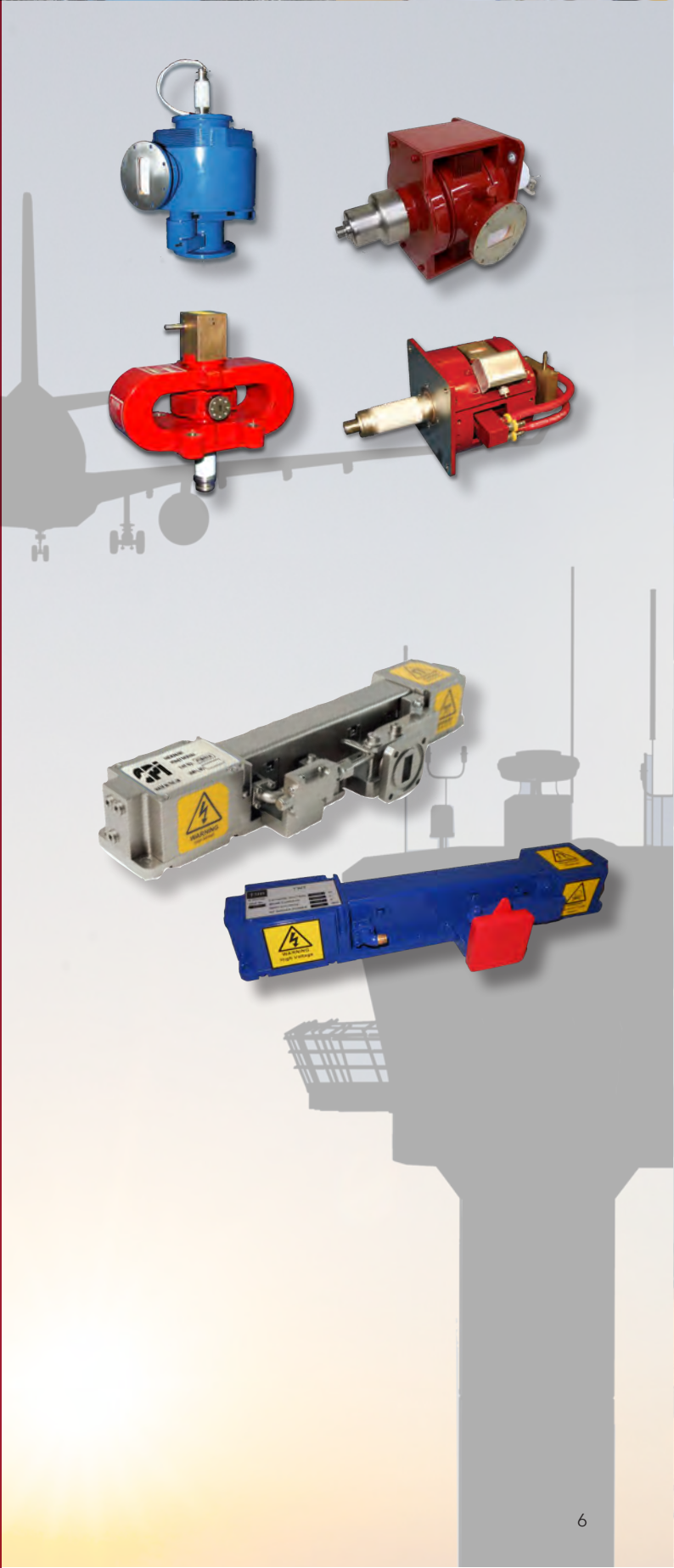
### Frequencies and power

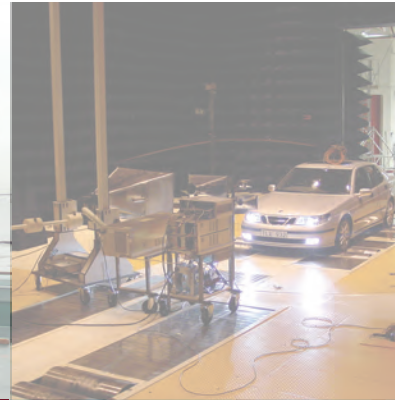
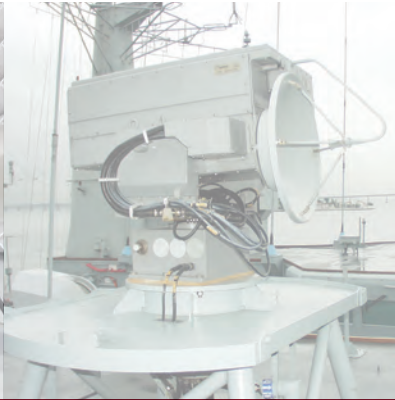
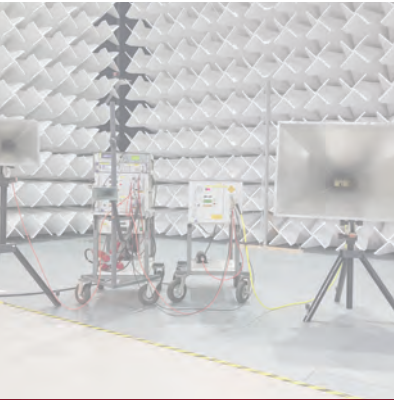
#### Mini helix

- Frequencies from 6 GHz to 18 GHz
- Power levels upto 150 W CW & Pulsed

#### Ring Loop Traveling Wave Tubes:

- Frequencies from 8 GHz to 180 GHz
- Power levels from 1 kW to 10 kW





# Instrumentation Amplifiers

- EMC HIRF testing
- PIM testing
- Military testing for MIL-Std 461200 V/m
- Rugged, ultra-reliable design
- Advanced self-diagnostics
- Ethernet interfaces
- VSWR protection
- Plug-and-play field replaceable power supplies

### Frequencies and power

- Frequencies from 2.0 GHz to 50 GHz
- Power levels from 0.2 kW to 50 kW

# Quantum

- gMOT cold atom platform
- Optical clock under development
- Quantum inertial navigation system under development

# Tracking Radar Transponders

- Single antenna port for receive and transmit
- Synthesized transmit frequency source
- Sensitive receiver
- Preset single- or double-pulse code setting
- Displacement volume of 140 cm<sup>3</sup>
- Typical weight of 280 g.
- Operates from unregulated 28 VDC





### Frequencies and power

- Frequencies from 5.4 GHz to 9.5 GHz
- Power levels from 1.2 W to 400 W





## Electron Device Business

### Beverly Microwave Division

-  150 Sohier Road  
Beverly, MA 01915-5536 USA
-  +1 (978) 922-6000  
or +1 (978) 922-6004
-  +1 (978) 922-2736
-  ElectronDevices@cpi-edb.com

### TMD Technologies Division

-  Swallowfield Way  
Hayes, Middlesex UB3 1DQ  
United Kingdom
-  +44 (0)20 8573 5555
-  ElectronDevices@cpi-edb.com



For full details of all CPI EDB's products and capabilities, please go to [www.cpi-edb.com](http://www.cpi-edb.com)



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