CPI
Electron Device Business

Microwave Products

For radar, electronic warfare, industrial, medical, communications and scientific applications

Electron Device Business
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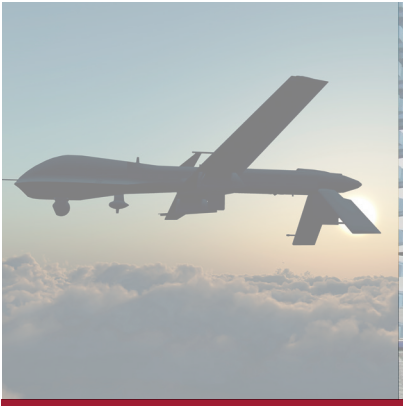



CPI Electron Device Business

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

Medical

- Image-guided radiosurgery
- MRI
- IMRT

Industrial

- EMI/EMC testing
- Cargo screening
- DMP MMR

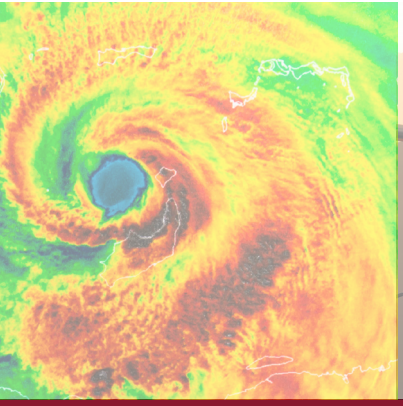
Scientific

- High-energy particle accelerators
- Superconductors

Communications

- Direct broadcast satellite
- Satellite uplink market
- Satellite transmissions and terrestrial broadcasting
- Tactical communications sets
- High-frequency communications networks

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

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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
- Utlized 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 / 100 W

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

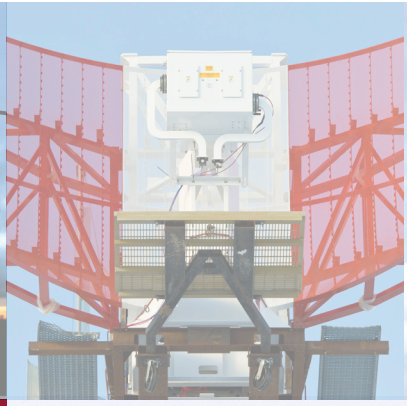
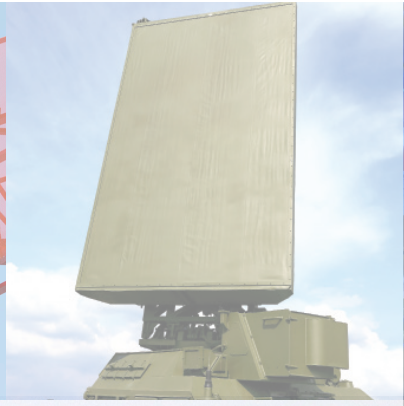
Transmitter Technology

- 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 100 W to 1000 W



CPI Electron Device Business

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

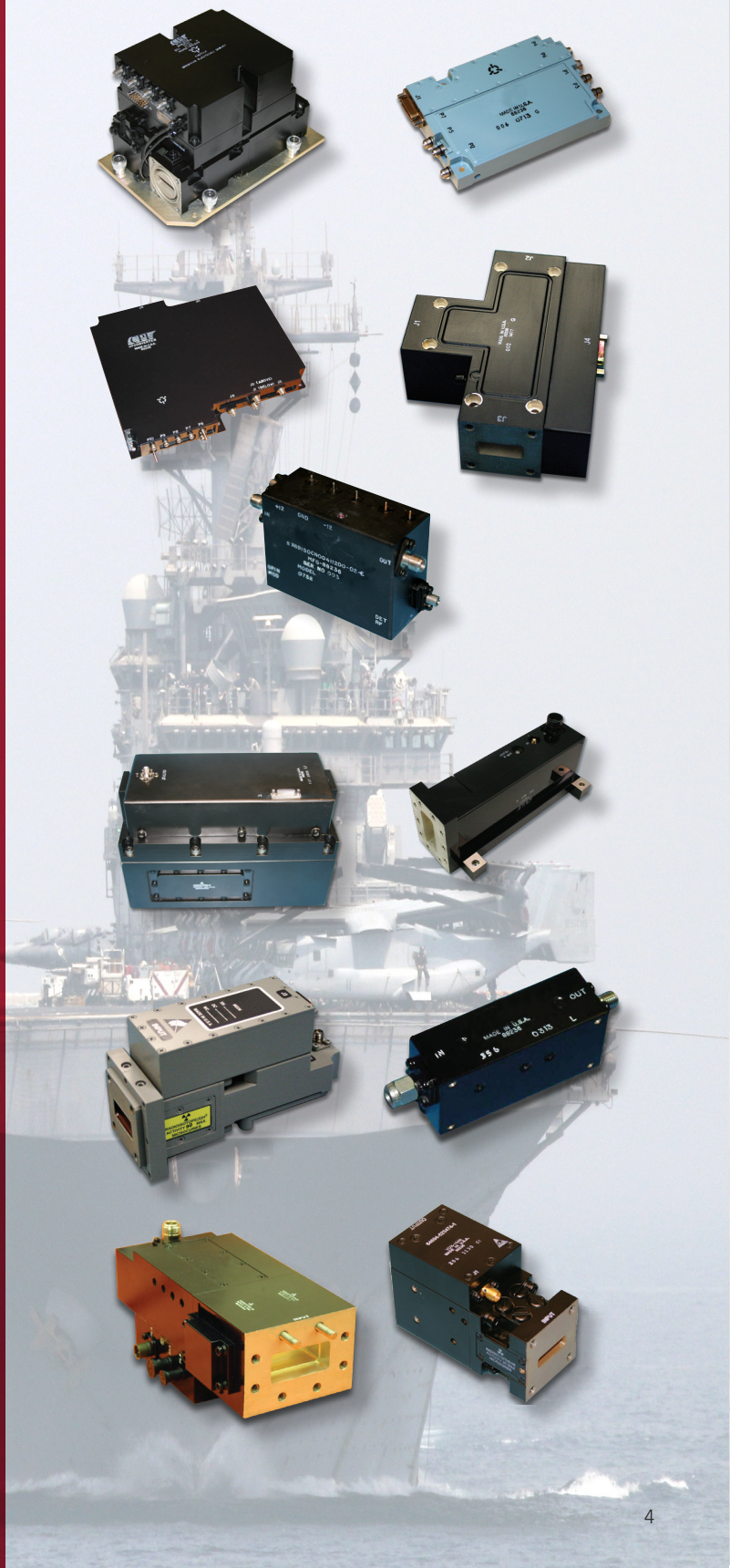
- Frequencies from 100 MHz to 40 GHz

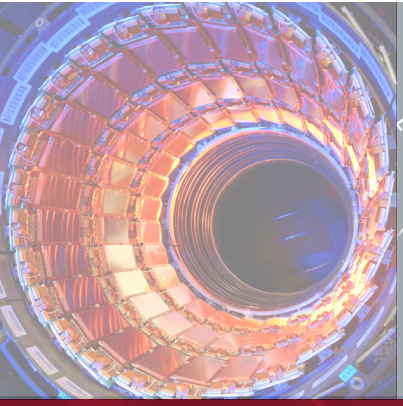
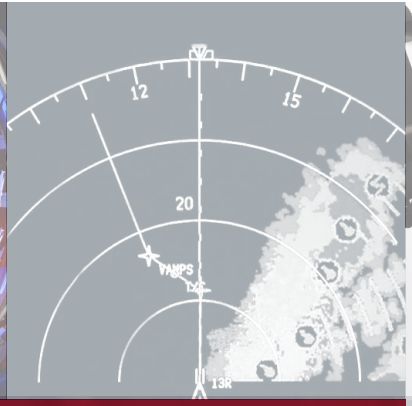
Receiver Protectors

- 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



CPI Electron Device Business

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

Klystrons and Gyrotrons

- High-reliability & efficiency
- Proven long-life designs
- Custom configuration available

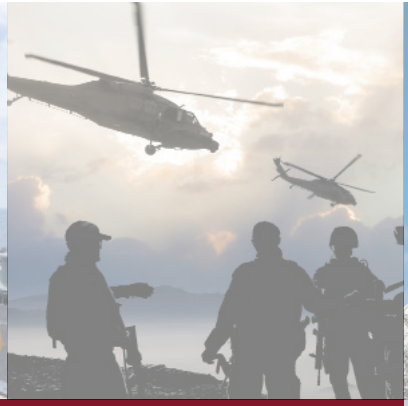
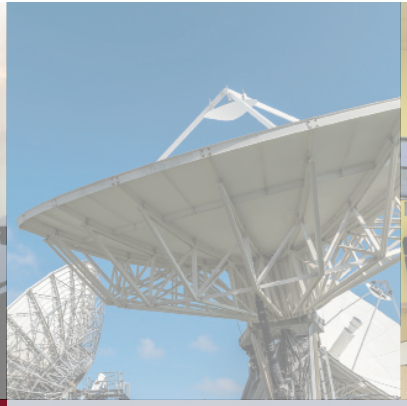
Frequencies and power

Klystrons:

- Frequency from 200 MHz to 600 GHz
- Peak power up to 150 MW
- Average (or CW) power up to 1 MW

Gyrotrons:

- Frequencies up to 600 GHz
- Power levels up to 1.5 MW CW


CPI Electron Device Business

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)

- Coupled Cavity
- Helix
- Ring Loop

Frequencies and power

Coupled Cavity Traveling Wave Tubes:

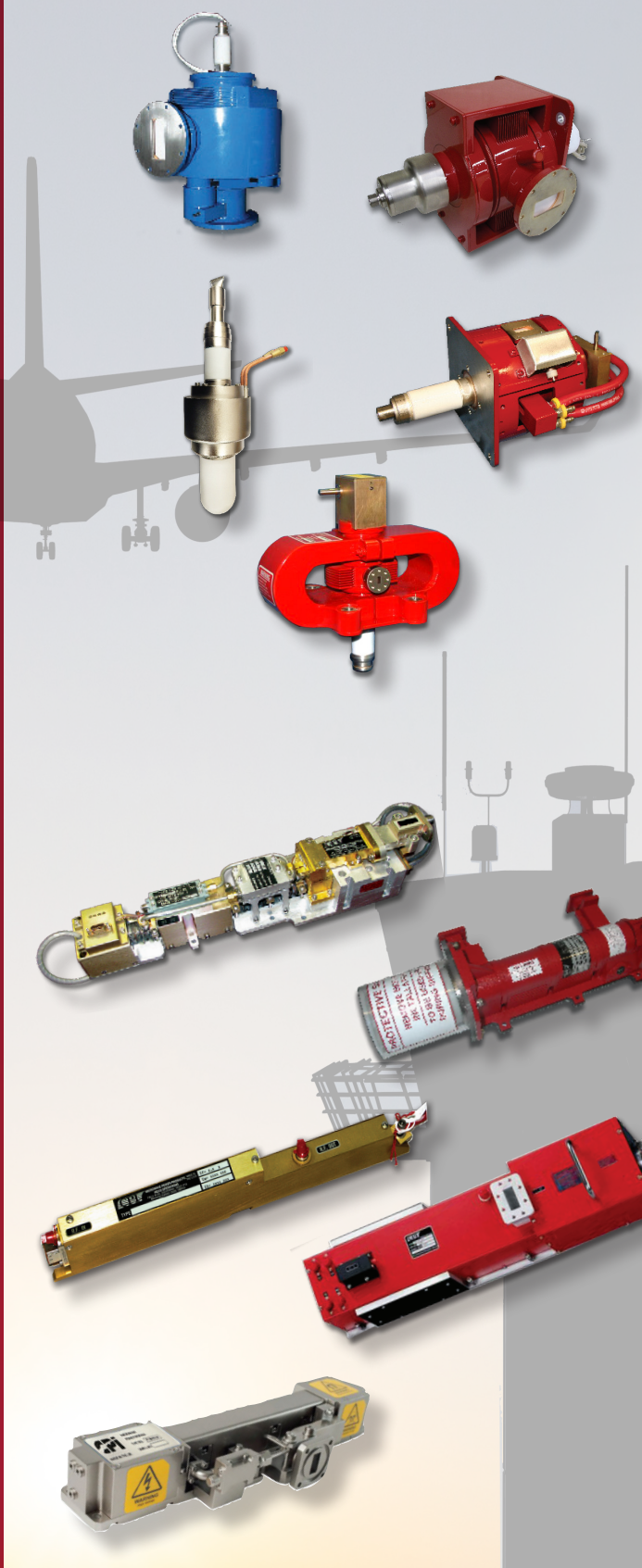
- Frequencies from 2.7 GHz to 37.5 GHz
- Power levels from 500 W to 180 kW

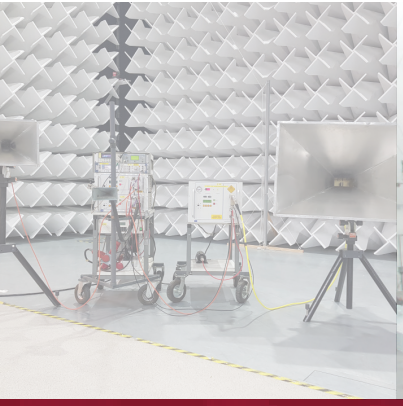
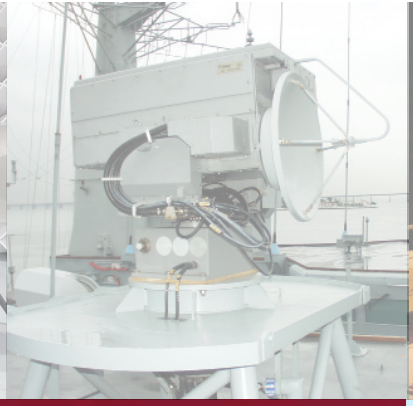
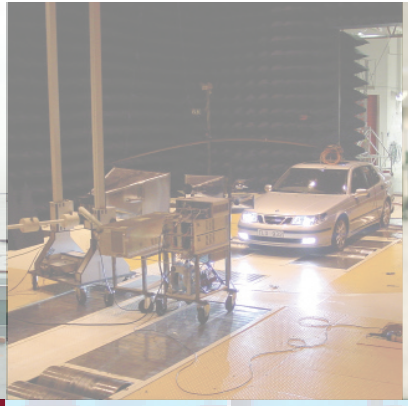
Helix Traveling Wave Tubes:

- Frequencies from 2 GHz to 40 GHz
- Power levels up to 2.5 kW
- CW & Pulsed
- Air and conduction cooled

Ring Loop Traveling Wave Tubes:

- Frequencies from 1 GHz to 5.9 GHz
- Power levels from 1 kW to 15 kW

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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 10 KHz to 50 GHz
- Power levels from 180 W to 30 kW

Quantum

- Capable of trapping 6 million alkali-metal atoms
- Precision-sensing capability
- Novel vacuum engineering and optical designs

Power

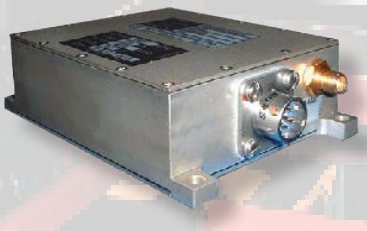
- Power level of 15 W - typical

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^3
- 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



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Electron Device Business

For full details of all CPI EDB's products and capabilities, please go to www.cpii.com

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