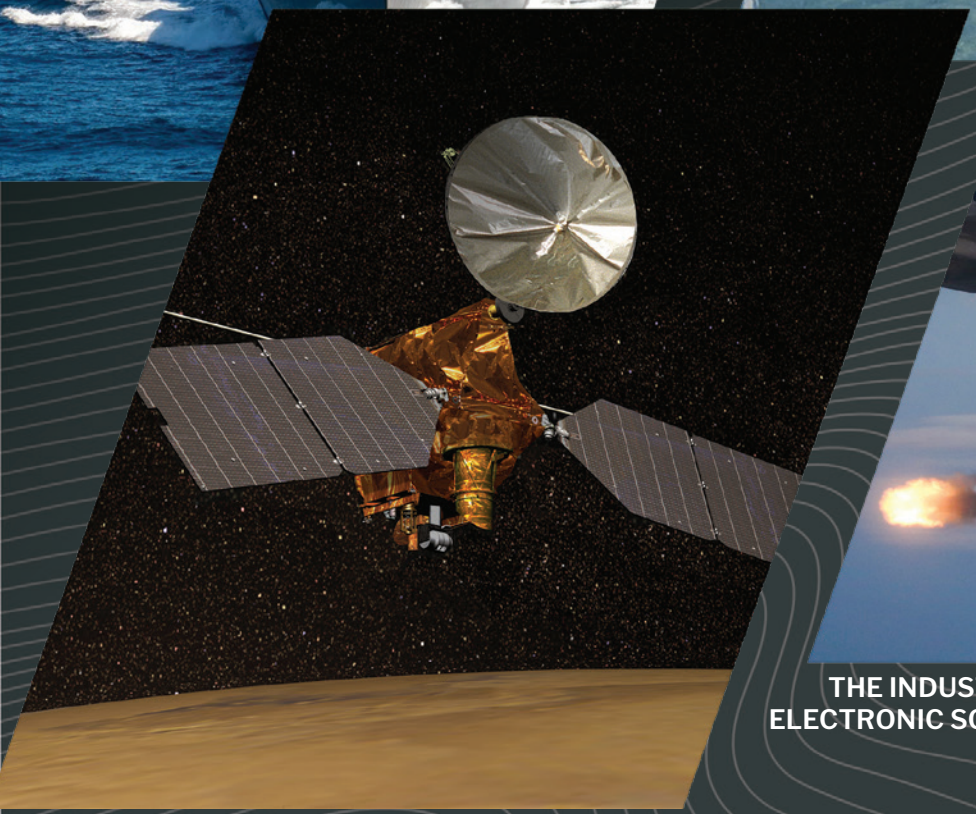
CAES PIONEERING ADVANCED ELECTRONICS

Mission Critical Solutions and Services



THE INDUSTRY'S MOST TRUSTED AND RELIABLE ELECTRONIC SOLUTIONS FOR AEROSPACE AND DEFENSE

Pioneering Advanced Electronics for the World's Most Critical Missions

WHO WE ARE

CAES technology pioneers the future of aerospace and defense electronics and underpins many of the world's most critical missions. We have become a leading provider of advanced RF technology to the United States aerospace and defense industry. We are proud to be a leading supplier and value the relationships we have with our customers as a trusted partner of choice. Our leadership team from across the aerospace and defense industry brings decades of experience and appreciation for supporting the Armed Forces.

Quality and Reliability are built into everything we do.

Our engineers are at the forefront of defense and aerospace innovation. We help make the world safer by creating key technologies integrated into missile defense radars, electronic warfare systems, and missile seekers that protect the datalinks that keep the warfighters connected.

WHAT WE DO

CAES accelerates the pace of customer innovation by leveraging an extensive experience base across sea, land, air and space domains and high-reliability, specialized RF, microwave, and millimeter wave (mmW) technologies.

Our capabilities include advanced engineering, manufacturing, testing, and tuning solutions uniquely conceived to overcome our customers' toughest design challenges.

As a proven, reliable partner throughout the entire lifecycle of your most ambitious, mission-critical programs, CAES engages at every phase of product development by providing design, manufacturing, assembly, test, and sustainment solutions.

CAES Design and Manufacturing Capabilities

Advanced Engineering Solutions

Leveraging product know-how and engineering experience, CAES provides specialized, mission-critical solutions for electronic warfare, communication, navigation and identification (CNI), guided munitions, missiles, radar, security and surveillance, and commercial applications. We work side-by-side with our customers to drive producibility early in the design phase.

Size, Weight and Power (SWaP) Optimization

CAES is the industry's leading partner for SWaP optimization. CAES provides high performance, compact, rugged RF filters for radar, electronic warfare, and missile applications. Our offerings include Small Custom Form Factors, Alumina Thin Film, and Chip-and-Wire Bare Die.

High Frequency

CAES is an industry leader in custom and off-the-shelf designs for RF, microwave, and mmW bands that meet exacting requirements for both benign and harsh environments. Our frequency expertise covers microwave to the high millimeter wave bands.

High Reliability

CAES has been providing high reliability design, manufacturing, and support services to the defense industry for more than 60 years. CAES serves as the foundation on which many high-availability and safety-critical applications are built.

High Power Transmit

CAES provides a multitude of microwave and mmW technologies, including a variety of antennas and high power aperture solutions ideal for military and commercial avionics applications.

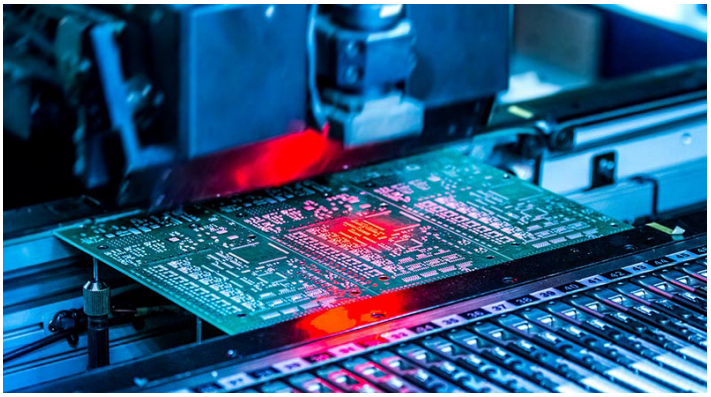
Manufacturing Solutions

Our world-class factories incorporate the latest lean principles, where employee engagement and visual factory designs drive quality and efficiency to reduce lead times. Our capabilities include solder, assembly, thin film substrates, and metal fab; automated processes such as pick-and-place, wire bonding, and optical inspection; environmental screening; plating and etch; paint; and laser seal and design-for-manufacturing.

CAES manufacturing facilities offer anechoic chambers, wedge wire bonding, conformal coating, fast prototypes, and clean room operations. Certifications include MIL-PRF-38534, IPC and NASA, Nadcap for plating and DMEA Trusted Accreditation.

Automated Assembly

CAES offers a full array of electronic and RF design and assembly manufacturing services. Our factories are capable of manufacturing complex microwave and mmW assemblies at reduced costs.



Advanced Microelectronics Packaging, Test, and Modeling

CAES supports a large range of services from rapid, small-batch prototyping for validation and characterization to full-volume production in our DMEA-accredited facility.

Build to Print/Build to Spec

Accredited by the U.S. Department of Defense as a Trusted Source and a Category 1A supplier of assembly services, CAES offers build-to-print and build-to-specification services such as high-volume automated circuit card assembly, COTS and commercial up-screening for high-reliability applications, packaging, and qualified assembly and test services meeting the requirements of MIL-PRF-38534 Class H and K.

Electronic Manufacturing Solutions (EMS)

CAES has a broad range of EMS offerings, including environmental and radiation testing and failure analysis, device screening, packaging solutions, and rapid prototype IC assembly with full ITAR compliance.

Microwave through Millimeter Wave Solutions

Our extensive expertise manufacturing complex microwave and mmW solutions for electronic warfare, radar and other mission critical needs adhering to established industry and military-specified standards up to and including MIL-STD-883.

CAES capabilities include thin-film substrate and package manufacturing and a suite of automated services, including pick-and-place, wire bonding, optical inspection, hermetic sealing, environmental screening, painting, and electrical test over temperature.

Systems Engineering

We offer complete systems engineering services for the development of advanced technologies applicable to complex platforms as well as missile seekers, datalinks, electronic warfare systems, and next generation radar and communications systems.

Testing and Tuning

CAES offers an extensive infrastructure and support staff dedicated to the design and implementation of automated test equipment, environmental and dynamics testing, TID radiation testing, high power testing (featuring radiated testing), and antenna radiation pattern and gain measurements.

Automated Testing

Our capabilities include hundreds of automated RF SMART™ test stations in addition to automation software and processes that minimize test time and maximize first-pass yield.

Environmental and Dynamics Testing

CAES offers comprehensive test laboratory services, including environmental, dynamic and vibration testing and analysis, that address commercial, military, and aerospace requirements.

High Power Test Solutions

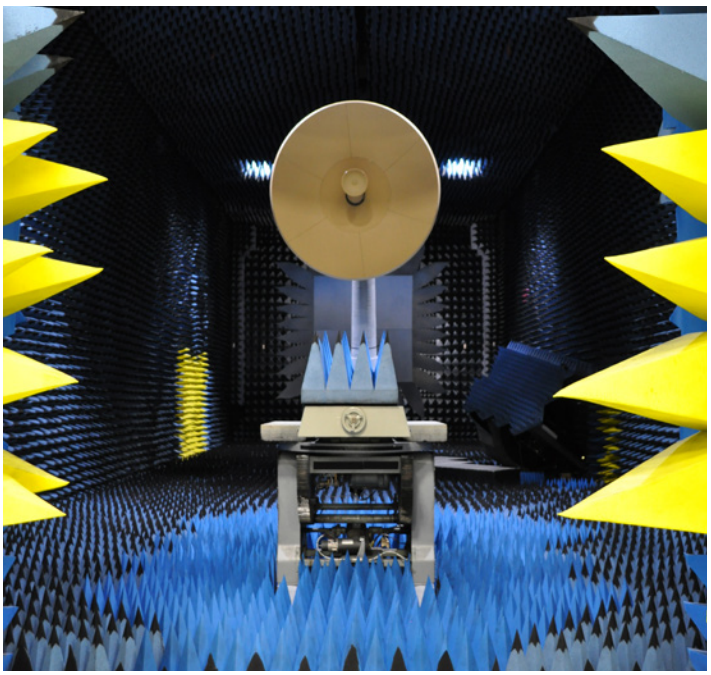
CAES engineers are experts in the design and implementation of cooling techniques for high-density, tightly-packaged electronic assemblies. CAES couples this capability with specialized test equipment, including high-gamma, load-pull resources, and unique, high-radiated-power, ferrite-lined environmental test chambers.

Automated Robotic Tuning

CAES is making a significant investment in advanced manufacturing through its Automated Robotic Tuning (ART) system. Machine learning was a key technology capability CAES utilized in the development of ART. By automating the tuning process, CAES is able to manufacture a much more consistent product in significantly less time.

Antenna Test Ranges

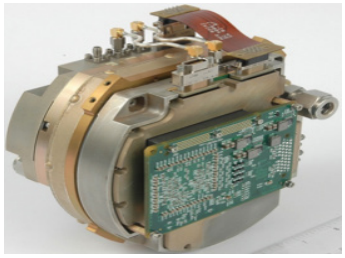
With both indoor anechoic chambers and outdoor pattern test ranges, all of which provide real-time, digitally-captured data, CAES quickly and accurately characterizes all aspects of antenna performance from high frequency through W-Band.



CAES Products

CAES integrated RF assemblies and subsystems cover narrow and wideband frequencies up through W-Band and are used for radar, EW, missile, communications, and 5G test and measurement applications.

RF Subsystems



- Data Links and Telemetry
- Digital Receiver Exciter
- Frequency Converters
- Frequency Generation
- High-Power Front-End Protection
- Interferometers
- Power Amplifiers
- Preselectors and Switch Filter Banks
- Signal Conditioning and RF Distribution
- Transmit/Receive

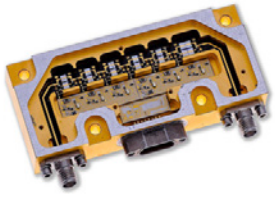
CAES' wide range of high-frequency RF microwave products are designed to withstand the extreme conditions of aerospace, military, and industrial environments to ensure top-notch performance and reliability.

RF Microwave Assemblies

- Converters
- Integrated Microwave Assemblies
- Oscillators
- Receiver Protection
- Single-function Assemblies
- Switched Filter Banks
- Synthesizers

CAES has a broad portfolio of commercial and military grade RF, microwave and mmW components used in radar, EW, missiles, CNI, test and commercial wireless systems.

RF, Microwave & mmWave Components



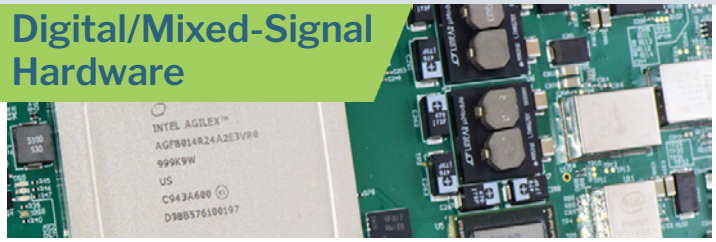
- Amplifiers
- Attenuators
- Channelizers
- Combiners/Dividers
- Couplers (RF)
- Detectors
- Filters and Multiplexers
- Limiters
- Mixers
- MMICs
- Modulators
- Phase Shifters
- Proximity Sensors
- Seekers
- Switches

Antennas

CAES is a leading designer and manufacturer of antennas and antenna arrays. Our antennas portfolio encompasses the high frequency to the millimeter wave (mmW) band with an extensive product line of advanced antennas and antenna arrays customized to withstand the most challenging environments.

- Arrays
- Blade
- Conformal
- Dipole
- Helix
- Horn/Notch
- Monopole
- Patch
- Reflector
- Sinuous
- Spiral
- UHF

Digital/Mixed-Signal Hardware



CAES has designed high-performance, complex digital solutions for land, sea, air and space. Our designs consist of a wide range of technology spanning from low-Cost, Size, Weight and Power (C-SWaP) embedded platforms to enterprise level solutions. No matter what your hardware requirements are, CAES can provide custom solutions.

Digital, Analog & Mixed Signal Solutions

- RF-System in Package (RF-SiP) & Discrete Components
- Analog-to-digital & Digital-to-analog Conversion Hardware & Software

Technology Agnostic

- X86, FPGAs, GPUs, ARM, PPC & More
- Custom & Standard Form Factors
- High-speed I/O
- Rapid Development—Prototype to Production

EW Radar and Test Systems

Our Electronic Warfare Simulation Technology solution specializes in market-leading, multi-spectral threat and countermeasure simulators that are designed to strengthen the defense industry's electronic warfare testing, evaluation, and training.

- Radar target generation and electronic countermeasure simulation
- Flight line test systems
- Portable radar simulator
- Radar threat simulation
- Open range systems

Missile Flight Instrumentation

Our Missile Flight Instrumentation solutions deliver autonomous flight safety systems and telemetry products used in missile, drone target and projectile applications.

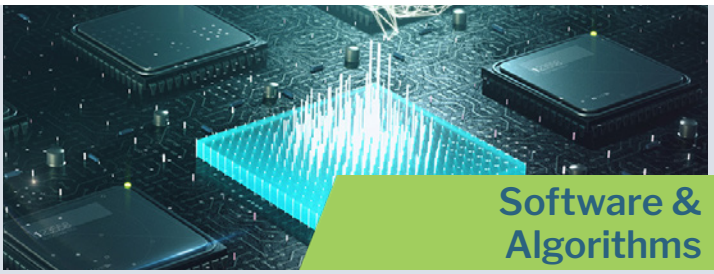
- Flight termination receivers
- Radar transponders
- Data acquisition devices
- Integrated test instrumentation kits
- Telemetry transmitters and receivers

CAES precision positioning systems are deployed in a range of military land, sea, and airborne applications, including: electronic surveillance/radar; SATCOM; EW/DF; directed energy; EO tracking, surveillance and instrumentation; satellite laser ranging; shipboard EW/ELINT; and weapons launchers.

Precision Positioning Systems

Our military Commercial Off the Shelf (COTS) products incorporate Line of Sight (LOS) stabilization with modular designs and sizes to accommodate a range of sensor payloads ranging from five to 2,000 pounds.

- Directed Energy Positioners
- Multi-axis Gimbal Platforms
- Precision Stabilized Positioners
- Weapons Positioners



Software & Algorithms

Software/Firmware Solutions

- Drivers to Enterprise Software Design
- Technology Agnostic — X86, FPGAs, GPUs, ARM, PPC & more

Advanced Algorithms

- AI
  - — Intelligent Agent Architectures
  - — Autonomous Mission Panning
  - — AI Enabled Sensor Fusion
- Radar
  - — DSP, Profile, Sense, Track & Avoid/Target
- Communications, SIGINT, ELINT, EW & C4ISR

Sub-/Systems Engineering

CAES sub-/system engineers leverage industry leading technology and the latest thinking to provide solutions for the rapidly changing products of tomorrow.

Sub-/Systems Solutions

- System / Subsystem Modeling Using Model Based System Engineering (MBSE)
- Systems Requirements Analysis & Design
- Capability Analysis & Design
- Component Development
- Integration & Test, System Integration Plans
- System / Subsystem Verification & Validation Plans

Tactical RF

Our range of tactical systems solutions span Identification of Friend or Foe (IFF) systems, weapons guidance datalinks, and radar altimeters.

- Identification of friend or foe
- Radar altimeter
- Weapons guidance data link

For more information, go to www.caes.com

We engineer solutions for the world's most critical missions.

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