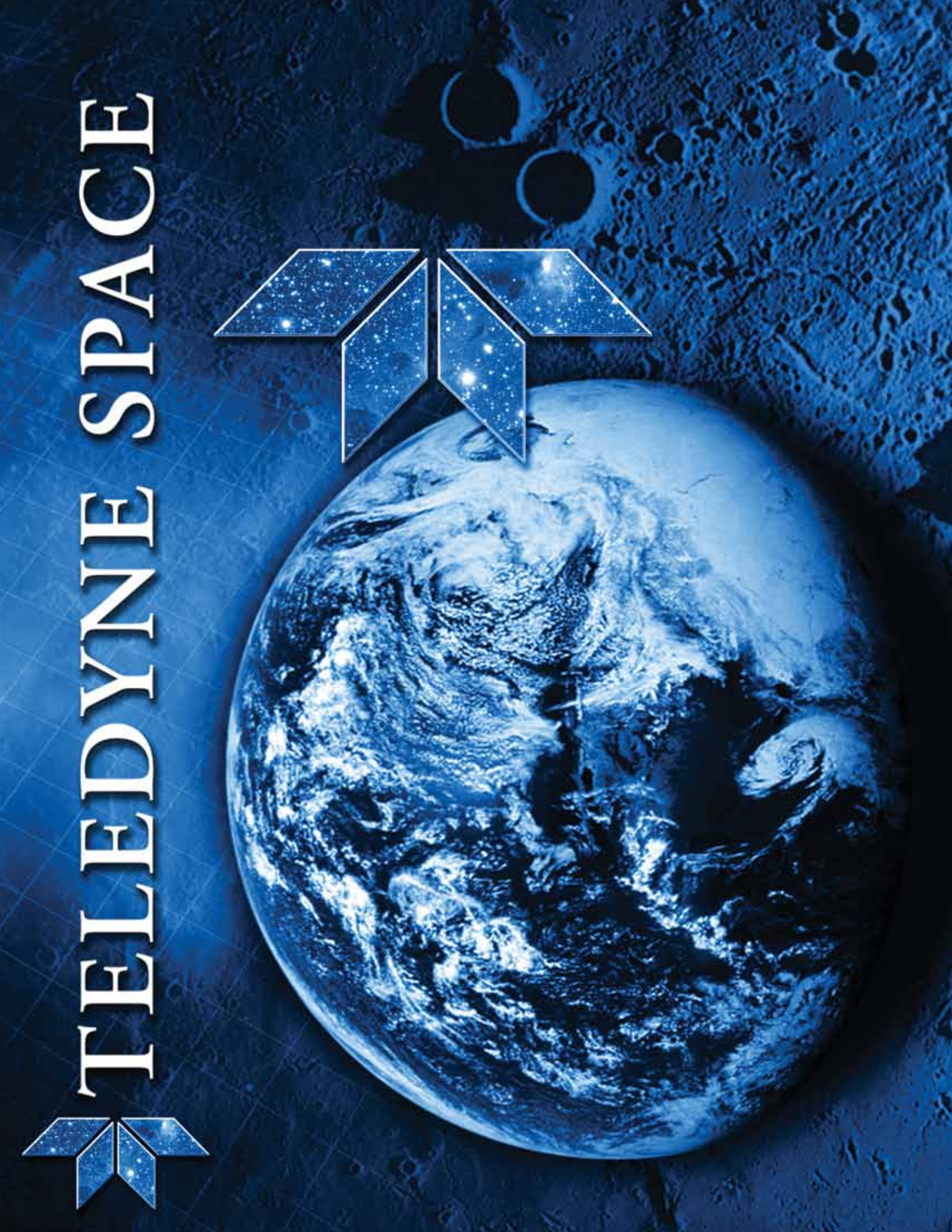
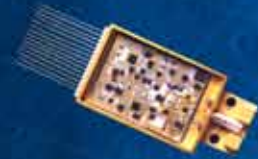


TELLEDYNE SPACE





TELEDYNE SPACE



SPACE COMPONENTS

Components are self-contained, simple function parts that go into a variety of spacecraft systems and subsystems such as rockets, satellites, probes, robots, and experiment assemblies.



SPACE SUBSYSTEMS

Subsystems incorporate many components and are assembled into an operating unit.



SPACE ENGINEERING

Engineering is at the front end of a design problem. The goal of engineering is a design specification that meets all functional and performance requirements of a subsystem or component.



SPACE MANUFACTURING

Manufacturing is building parts and assembling units per engineering and design specifications.



SPACE SOLUTIONS

Solutions are total top to bottom, engineering, manufacturing, and assembling of components, subsystems, and operating units.

Teledyne Space represents the collected capabilities of several Teledyne Technologies companies. Each company plays a role in one or more of the following five key areas of the space market: space components, space subsystems, space engineering, space manufacturing, and space solutions.

Together, the companies of Teledyne Space address the full spectrum of spacecraft needs by providing our customers with more complete and efficient products and services.

Teledyne Companies	NASA	U.S. Military Space	Commercial	Sensing, Mapping, Astronomy
Brown Engineering	●	●	●	
Cougar	●	●	●	
Energy Systems	●			
Imaging Sensors	●	●	●	●
Impulse	●	●	●	
Judson	●	●	●	●
Microelectronic Technologies	●	●	●	
Printed Circuit Technologies	●	●	●	
Relays and Coax Switches	●	●	●	●
Reynolds	●	●	●	●
Scientific Company	●	●	●	

Teledyne Companies	Space Components	Space Subsystems	Space Engineering	Space Manufacturing	Space Solutions
Brown Engineering			●	●	●
Cougar	●	●			
Energy Systems		●			
Imaging Sensors		●			
Impulse	●				
Judson	●				
Microelectronic Technologies	●		●	●	●
Printed Circuit Technologies	●				
Relays and Coax Switches	●				
Reynolds	●				
Scientific Company			●		



Company Headquarters: Huntsville, AL

Phone: 256.726.5065

Number of Employees: 1,398

Certifications: AS/EN/JISQ9100-Rev. B and ISO 9001:2008 Registered;
SSP-41173 – Space Station; CMMI Level 3; ASME Stamps: N, NPT, U

TELEDYNE BROWN ENGINEERING

Established in 1953 to support the engineering and manufacturing needs of the Wernher von Braun rocket team, Teledyne Brown Engineering, Inc. (TBE) was the first full-service, high-technology firm in Huntsville, Alabama. Throughout our long history, TBE has supported essentially every U.S. space initiative from early experiments on high-altitude balloons and the first U.S. satellite through the International Space Station, Constellation Program, and Commercial Orbital Transportation Services (COTS) Program.

TBE is a recognized leader in providing technology solutions to a broad base of customers. We are a major participant in the support of America's most significant space, defense, environmental, and homeland security programs, and we have major thrusts in a number of emerging activities.

From concept exploration to production and delivery, we also have full manufacturing capabilities. Our capability to define, engineer, manufacture, and integrate complex systems differentiates Teledyne Brown from its competitors, making us an ideal, "one-stop" provider of high-technology engineered systems.



Space Market Segments Served:

- NASA
- U.S. Military Space
- Commercial Space
- International Space

Capabilities:

- Systems engineering and integration
- Space systems and subsystems design, development, test, and integration
- Payload/cargo analytical and physical integration
- Space operations and training



Image Credit: NASA

Space Business Focus:

- Full-spectrum engineering and advanced manufacturing
 - Space flight hardware
 - Ground support equipment
 - Spacecraft and vehicle systems
 - Design and analysis
- Training and operations planning and execution
- Payload/cargo integration
- Space science and technology development
- Test and launch services



2009 Alabama
Large Manufacturer
of the Year Award

Previous winner:

- NASA MSFC Contractor Excellence Award (three consecutive years)
- NASA George M. Low Award



**TELEDYNE
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company

www.tbe.com



Company Headquarters: Sunnyvale, CA

Phone: 408.522.3838

Number of Employees: 157

Certifications: MIL-PRF-38534 Class H and Class K, TRB Option; AS9100; ISO 9001:2000

TELEDYNE COUGAR

With over 22 years of unparalleled space heritage, Teledyne Cougar has successfully delivered over 60,000 individual space components on more than 50 programs to over 35 domestic and international customers. As a fully certified MIL-PRF-38534 Class K manufacturer, engineers can safely and easily select any RF or microwave components from Teledyne Cougar's extensive 700-plus model catalog for their government or commercial space requirements. Teledyne Cougar uses leading-edge hybrid technology to offer the broadest selection of performance-focused RF and microwave components, integrated subassemblies, and custom-integrated assemblies for the aerospace, defense, and industrial markets. All space components and integrated subassemblies are manufactured in Cougar's MIL-PRF-38534 Class K certified facility, ensuring that hardware meets all governing specifications while achieving the highest performance and reliability levels. Teledyne Cougar's products cover frequencies from 100 kHz to 20 GHz and include cascadable RF amplifiers, voltage-controlled amplifiers and attenuators, limiters, detectors, frequency doublers, microwave amplifiers, IQ networks, frequency mixers, VCOs, power dividers, switches, and more. Teledyne Cougar also offers a full line of space-requirement, value-added services, including die testing and up-screening, full element evaluation, quality conformance and qualification testing, and more.

Space Market Segments Served:

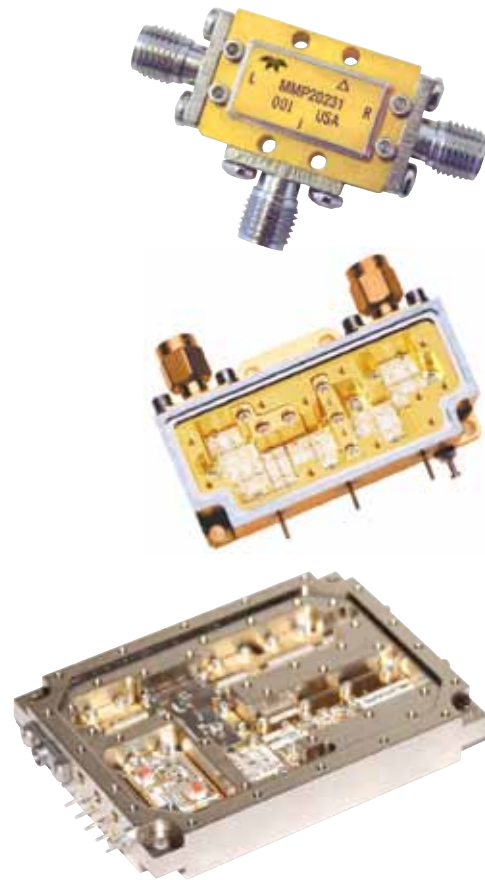
- Military, Scientific, and Commercial Satellites
- Ground-Based Satellite Control Systems

Capabilities:

- Space-qualified RF and microwave components and subassemblies
- Dedicated program management staff for all space efforts, ensuring:
 - Single point of contact from PO placement to program completion
 - Consistent and timely schedule information
 - Dedicated in-house customer advocate
- Complete reliability services, including:
 - Worst-case circuit analysis
 - Circuit derating
 - Mean time between failure calculations
 - Failure in test calculations

Space Business Focus:

- Provide leading-edge catalog and custom components and subassemblies:
 - Catalog and custom RF and microwave components
 - Custom-integrated assemblies, combining multiple component functions and integrated subassemblies
 - Value-added die and component services



**TELEDYNE
COUGAR**

A Teledyne Technologies Company

www.teledyne-cougar.com



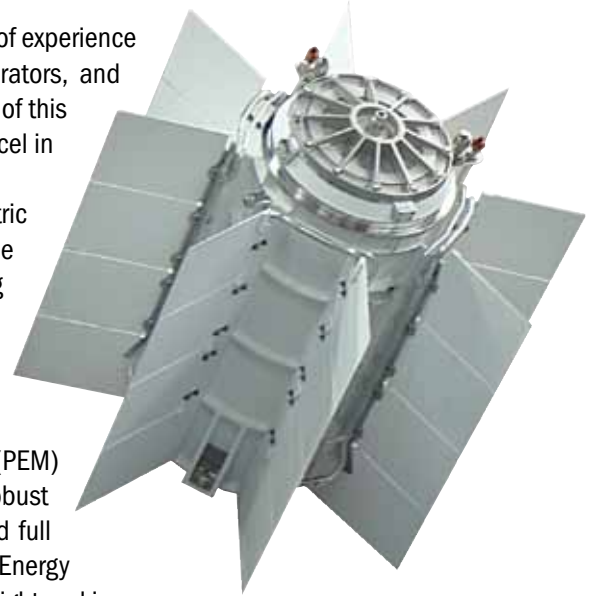
Company Headquarters: Hunt Valley, MD
Phone: 410.771.8600
Number of Employees: 130
Certifications: ISO 9001:2000, ASME Boiler and Pressure Vessel U and UM Certified

TELEDYNE ENERGY SYSTEMS

Teledyne Energy Systems, Inc. (TESI) draws from more than 40 years of experience in the design and manufacture of fuel cells, hydrogen/oxygen generators, and nuclear power systems. Energy Systems is a global leader in the supply of this equipment for both commercial and government uses. TESI products excel in industrial, defense, renewable energy, and space applications.

TESI is currently the only U.S. supplier of radioisotope thermoelectric generators (RTGs) used by NASA for powering spacecraft deep into the solar system. Teledyne RTGs have flown on Pioneer 10 and 11 and Viking 1 and 2 Landers, and the new Multi-Mission RTG (MMRTG), produced with Pratt & Whitney/Rocketdyne, will fly on the Mars Science Lab in 2011. TESI has the capability to develop new RTGs to meet a range of spacecraft needs.

TESI is one of the leading developers of proton exchange membrane (PEM) fuel cell technology for space power applications. Specializing in robust and reliable hydrogen/oxygen fuel cells, TESI has produced stacks and full systems for NASA that are among the most durable ever developed. Energy Systems continues to produce innovative hardware to reduce system weight and increase reliability, and they have complete facilities to design, build, and test these systems.



Space Market Segments Served:

- NASA

Capabilities:

- Systems engineering
- Systems design and analysis
- Manufacturing
- Testing
- Systems operation

Space Business Focus:

- Thermoelectric power systems
- PEM fuel cell systems
- Advanced power system development
- Power technology development



TELEDYNE
ENERGY SYSTEMS, INC.
 A Teledyne Technologies Company

www.teledyneees.com



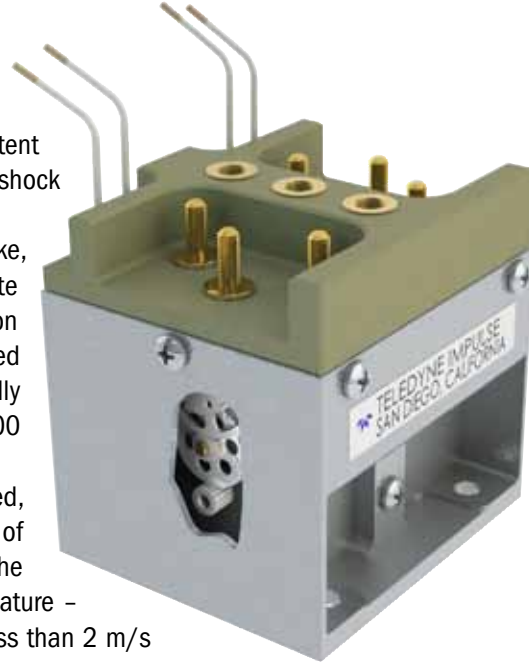
Company Headquarters: San Diego, CA
Phone: 858.842.3100
Number of Employees: 100
Certifications: ISO 9001:2008, NASA 8739.3

TELEDYNE IMPULSE

Teledyne Impulse's aerospace switches are custom engineered for high performance and reliability for use on missiles, launch vehicles, and a variety of spacecraft. The switches have been designed for consistent and reliable performance, will operate under extreme vibration and shock environments, and are qualified to government and space requirements.

Small-brush-type DC motors, equipped with a solenoid-controlled brake, drive the switch contacts from one position to the other. The motors operate through a gear train and are electrically disconnected and locked in position upon completion of the transfer. The entire switch is contained in a sealed inert atmosphere. Electrical power is required only during transfer, usually less than 100 m/s. Contacts are single or double throw, with ratings to 500 Amps.

Each model is designed for a unique application and customer need, with size and weight, current ratings, method of actuation, number of contacts, sequence of operation, and packaging exactly matching the vehicle requirements of which it becomes an integral part. A unique feature – “contained contacts” – ensures operation with low-contact resistance, less than 2 m/s of bounce, virtually no chatter, and high-contact force.



Space Market Segments Served:

- Launch vehicles
- Spacecraft
- Missiles

Capabilities:

- 5 to 500 AMP DC
- MBB and BBM configurations and combinations
- 1 to 22 circuits
- Double throw and single throw
- High thermo-shock
- High vibration and shock

Space Business Focus:

Provide custom engineered motorized power transfer switches and mechanically actuated switches for the following applications:

- Power transfer
- Safing/arming
- Position and event sensing
- Range safety
- Separation/ignition



TELEDYNE IMPULSE

A Teledyne Technologies Company

www.teledyneimpulse.com



Company Headquarters: Camarillo, CA
Phone: 805.373.4545
Number of Employees: 167
Certifications: ISO 9001:2008

TELEDYNE IMAGING SENSORS

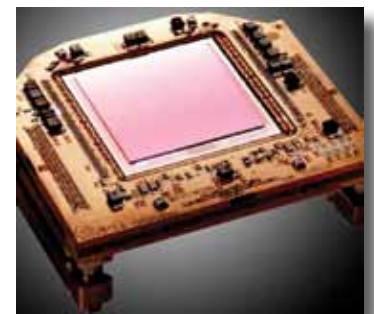
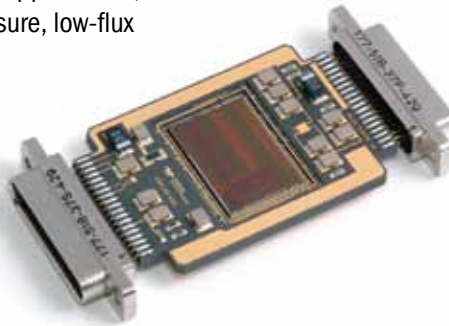
Teledyne Imaging Sensors is a world leader in the design and production of high-performance imaging sensors, focal plane electronics, and spaceflight packaging. The sensors enable the leading missions in astronomy, civil, national, and DoD space. Missions include the Hubble Space Telescope, James Webb Space Telescope, Mars Reconnaissance Orbiter, Artemis, and GOES weather satellite. Imaging Sensors is the only manufacturer with a combined visible-infrared sensor operating in space, enabling a new generation of hyperspectral imaging instruments such as NASA's Moon Mineralogy Mapper and DoD's Tactical Satellites. The company delivers integrated imaging subsystems that combine state-of-the-art image sensors with advanced focal plane electronics and packaging. In addition, Teledyne Imaging Sensors' advanced thin film optics facility produces specialized filters for unique customer requirements.

Space Market Segments Served:

- Astronomy and Civil Space
- National and DoD Space

Capabilities:

- Infrared, visible, ultraviolet, and x-ray focal plane arrays
- Sensors optimized for a wide range of applications, from very-high-speed imaging to long-exposure, low-flux astronomy and space tracking
- Focal plane electronics, including specialized application-specific integrated circuits
- Spaceflight packaging
- Radiation tolerant designs
- Thin film optics with high-performance multi-layer coatings, including large format and curved surfaces



Space Business Focus:

- High-performance imaging and spectroscopy applications
- Space astronomy
- Planetary missions
- Earth science
- Space situational awareness
- Space surveillance
- Missile Defense applications



**TELEDYNE
IMAGING SENSORS**
 A Teledyne Technologies Company

www.teledyne-si.com



Company Headquarters: Montgomeryville, PA
Phone: 215.368.6900
Number of Employees: 69
Certifications: ISO 9001:2000

TELEDYNE JUDSON TECHNOLOGIES

Teledyne Judson Technologies has demonstrated consistent, reliable performance in a variety of space missions for more than 20 years. The company manufactures high-performance, space-qualified infrared photodetectors using a variety of detector materials such as germanium, indium gallium arsenide, indium arsenide, indium antimonide, and mercury cadmium telluride. These devices are packaged into space-qualified, integrated Dewar/cooler assemblies along with the associated electronics. Teledyne Judson also manufactures and packages focal plane arrays using indium gallium arsenide, indium antimonide, and mercury cadmium telluride.



Space Market Segments Served:

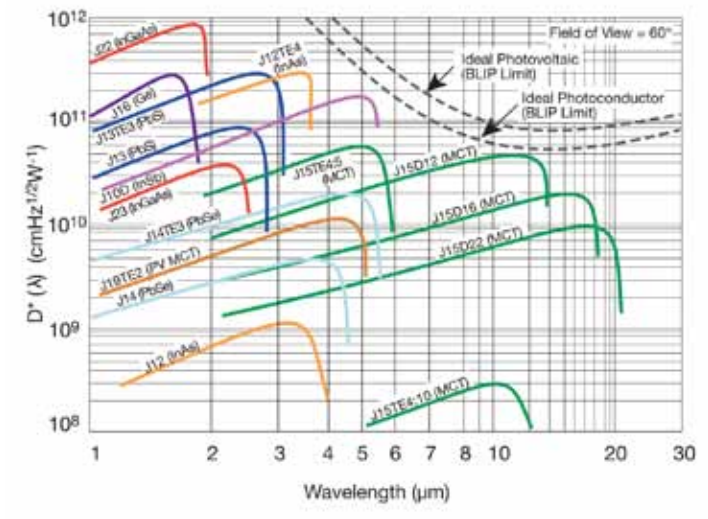
- Infrared Photodetectors
 - Commercial and military weather satellites
 - Remote sensing satellites
 - Atmospheric chemistry
 - Imaging satellites
 - Scientific missions
- Infrared detectors for DoD proprietary space missions

Capabilities:

- Space-qualified, integrated infrared photodetector/package/electronic subsystems
- Space-qualified, infrared detector design/wafer fabrication
- InGaAs and InSb focal plane arrays and integrated Dewar cooler assemblies

Space Business Focus:

- High-performance infrared photodetectors
- Focal plane arrays
- Integrated Dewar cooler assemblies for weather
- Remote sensing
- Imaging satellites



TELEDYNE
JUDSON TECHNOLOGIES
 A Teledyne Technologies Company

www.teledynejudson.com



Company Headquarters: Los Angeles, CA
Phone: 310.574.2082 or 800.518.1015
Number of Employees: 240
Certifications: MIL-PRF-38534, Class H and Class K; AS9100; ISO 9001:2000;
 DoD/DMEA Microelectronics Trusted Source

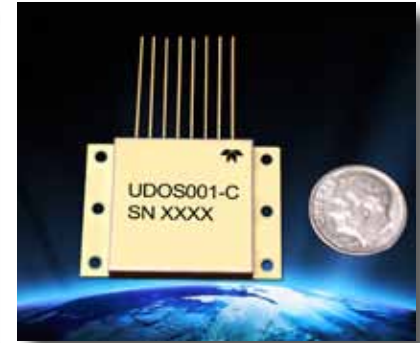
TELEDYNE MICROELECTRONIC TECHNOLOGIES

For over 45 years, Teledyne Microelectronic Technologies has enjoyed a remarkable record of achievement on a variety of space programs. The company has pioneered thousands of multichip modules and custom microelectronics packaging solutions for space applications. Microelectronic Technologies will enhance your design for improved reliability and performance, miniaturize for size, reduce weight, test and screen, and offer expertise in obsolescence management. In addition to having MIL-PRF-38534 Class K certification, the company is a DoD trusted source for microelectronics.



Space Market Segments Served:

- Military
 - Surveillance and reconnaissance satellites
 - Launch and reentry vehicles
 - Missiles
- Commercial and Scientific
 - Spacelabs, Space Station, and probes
 - Communication and scientific satellites
 - Scientific telescopes

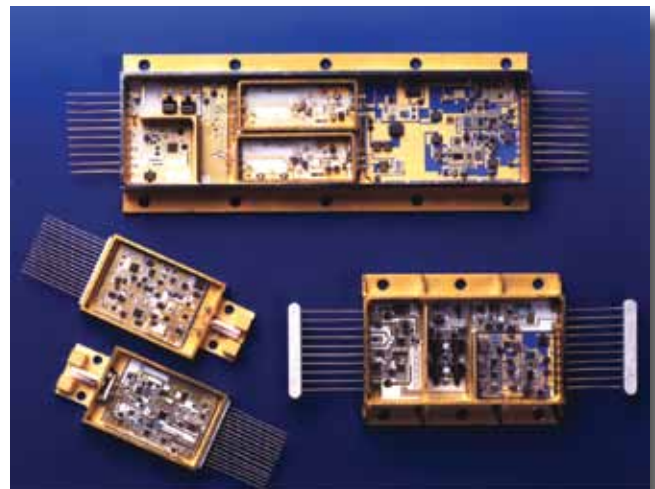


Capabilities:

- High-reliability design and packaging
 - Microwave
 - Optoelectronics
 - Ultra-high-speed networking
 - Secure communications
 - Power and control
 - Mixed signal

Space Business Focus:

- Radiation Dosimeter
 - Total ionizing dose measurement
 - Alert for hazardous conditions or hostile action
 - Diagnose anomalies
 - Improve system design and life estimates
 - Improve future radiation models



**TELEDYNE
 MICROELECTRONIC TECHNOLOGIES**
 A Teledyne Technologies Company

www.teledynemicro.com



Company Headquarters: Hudson, NH
Phone: 603.889.6191 or 800.866.7456
Number of Employees: 138
Certifications: AS-9100, MIL-P-50884, UL Materials, IPC 6013 Class 3, J-STD-001 Class 3, NADCAP

TELEDYNE PRINTED CIRCUIT TECHNOLOGY

From its early days as a flex circuit pioneer for the Gemini Space Program, Teledyne Printed Circuit Technology has evolved into an innovative, full-service provider of interconnect technologies that include multi-layer flexible and rigid-flex-printed circuits, assemblies, backplanes, VME-Flex™, and chassis-level assembly. These advanced technologies combine to create a flexible region that eliminates connectors, daughter/mezzanine cards, and other hardware. Serving the needs of the industrial, space, medical, avionics, and defense industries, Teledyne Printed Circuit Technology offers capabilities that include full engineering services, applications design, concurrent engineering, mock-ups, prototypes, and full-rate production up to 30 layers.



Space Market Segments Served:

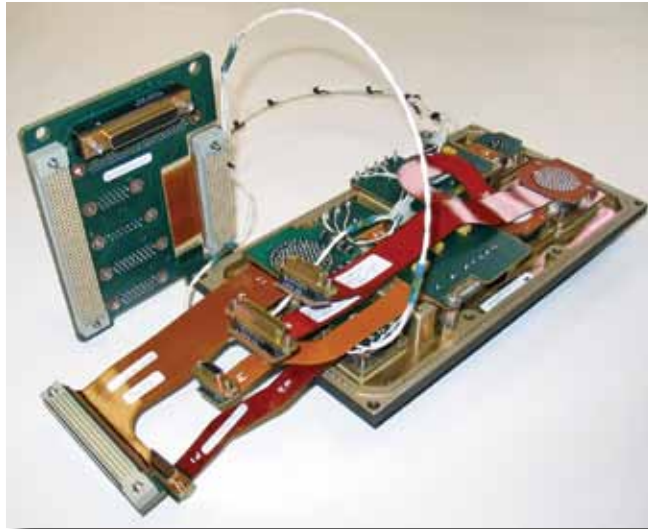
- Environmental Satellite
- Defense Space-Based Weapon Systems
- Shuttle Avionics

Capabilities:

- Flexible and rigid-flex circuits/assemblies
- Layer count range of 1-30
- Thin material processing capability
- Global shielding, including Pt, Cu, and Ag metals system
- Stitched via technology

Space Business Focus:

- High-reliability, flexible circuit interconnection systems



TELEDYNE
PRINTED CIRCUIT TECHNOLOGY
A Teledyne Technologies Company

www.tetpct.com



Company Headquarters: Los Angeles, CA
Phone: 310.823.5491
Number of Employees: 265
Certifications: ISO9001:2008, AS9100B

TELEDYNE REYNOLDS

Teledyne Reynolds designs and manufactures high-reliability connectors, cable assemblies, and ceramic-to-metal hermetic feedthroughs. The company has an extensive heritage as a key supplier to the space community and is the preferred high-voltage interconnect solution provider. Teledyne Reynolds has provided products used in such scientifically critical missions as Cassini, Huygens, Hubble Space Telescope, SOHO, and Deep Space 1, among others.

Space Market Segments Served:

- Military and commercial satellites
- Astrophysics research
- Propulsion
- Planetary exploration
- Launch vehicles
- Deep-space probes
- Telecommunications

Capabilities:

- Connector and cable harness manufacturing and testing
 - Vented and non-vented connectors
 - Ceramic-to-metal brazing (hermetic)
 - Low-loss, fiber-optic termination
 - “Red Plague” resistant conductors
 - Non-magnetic materials
- Custom-engineered solutions
 - Mechanical stress/thermal analysis
 - Electro-static analysis
- Lean manufacturing facility
- Worldwide operations

Space Business Focus:

- Rocket engine spark igniter systems
- Satellite ion propulsion
- Satellite arcjet thrusters
- Spectrometers
- Electrodynamic tethers
- Space-based sensors
- Miniature, high-voltage power supplies



(Items not to scale)



**TELEDYNE
REYNOLDS**

A Teledyne Technologies Company

www.teledynereynolds.com



Company Headquarters: Hawthorne, CA
Phone: 323.777.0077 or 800.274.7007
Number of Employees: 242
Certifications: MIL-STD-790, Boeing D6-82479, MIL-I-45208, MIL-PRF-39016, MIL-PRF-28776, AS/EN/JISQ9100 - Rev. B, and ISO 9001:2000

TELEDYNE RELAYS AND TELEDYNE COAX SWITCHES

Teledyne Relays and Coax Switches offer a comprehensive selection of highly reliable, competitively priced electromechanical switches to meet your requirements. With more than 40 years of technical experience, these Teledyne companies ensure the design, development, and manufacture of quality products.

Teledyne's electromechanical switch product line consists of a variety of switches designed for commercial, defense, and space applications. Our space-qualified product line consists of coaxial switches, switch matrices, and switch blocks. These products are typically custom-designed and manufactured according to specific performance requirements. Teledyne also provides a complete line of standard, off-the-shelf, high-reliability switches that offers its customers significant cost savings, while satisfying most typical requirements for scientific, meteorological, and communication satellite applications.

Through numerous challenges over the past 40 years, Teledyne has developed and established a complete line of space-qualified switches for high-power applications in L, S, C, Ku, and Ka bands. Teledyne is the sole-source supplier for the S-band space-qualified switches and switch matrices used in the Space Shuttle's and TDRSS' hot-switching applications. The same design for the hot-switching capability can be extended to other frequency ranges.

Teledyne's fully equipped laboratories are certified for the development and production of space-qualified coaxial switches, and the companies have the capacity to support several large switch production programs.

Space Market Segments Served:

- Deep-space probes
- Manned programs
- Communication satellites
- Launch vehicles
- Earth observation/weather satellites



Capabilities:

- Logistic infrastructure
- Chemical analysis lab
- Scanning electron microscope
- In-house plating shop
- Environmental test lab
- Field technical support

Space Business Focus:

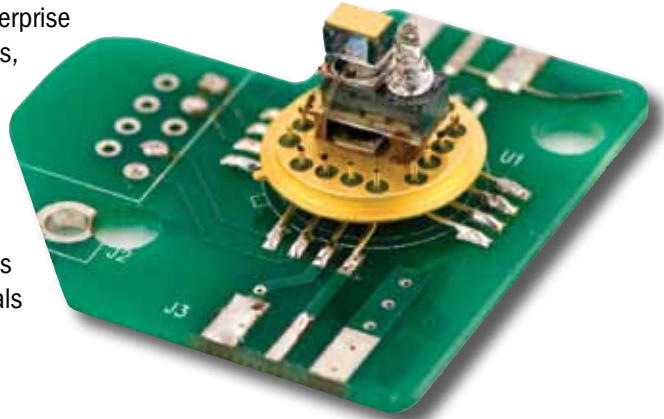
- Complete line of space-qualified switches for high-power applications in L, S, C, Ku, and Ka bands
- Miniature electromechanical relays, coaxial switches, and switch matrices



Company Headquarters: Thousand Oaks, CA
Phone: 805.373.4545
Number of Employees: 201
Certifications: ISO 9001:2000

TELEDYNE SCIENTIFIC COMPANY

Teledyne Scientific Company is a high-technology enterprise focused on leading-edge R&D and niche products in electronics, micro-electromechanical systems (MEMS), optics, materials, and information sciences. Teledyne Scientific works with government and commercial partners to create innovative solutions addressing the extreme environments and unique requirements of space applications. In March 2009, the company was named by NASA and the United States Air Force as the National Hypersonic Science Center for Hypersonic Materials and Structures.



Space Market Segments Served:

- Launch subsystem materials
- Payload materials and components
- Sensor subsystems

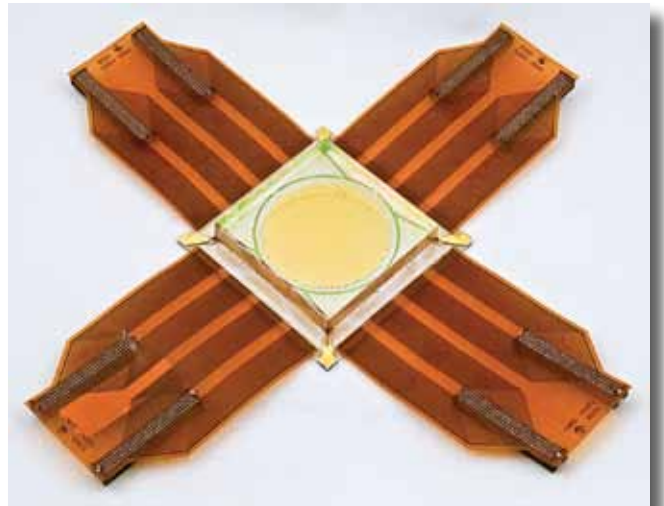
Capabilities:

- High-performance, lightweight composites
- Advanced thermal protection materials
- Multi-functional materials and morphing structures
- Compact thermal management devices
- Photonics and liquid crystal devices
- High-speed electronics (mixed signal and mmWave)
- MEMS devices and microfluidic systems
- Autonomous systems
- Sensor protection
- Multi-modal sensor fusion algorithms



Space Business Focus:

- Materials for extreme thermo-mechanical environments
- MEMS-based navigation and timing
- Autonomous navigation and platform positioning
- Image processing and data extraction
- Advanced sensor applications
- High-bandwidth communications



TELEDYNE SPACE



Teledyne Brown Engineering

(Headquarters)

300 Sparkman Drive
Huntsville, AL 35805
Phone: 256.726.5065
E-Mail: busdev2@tbe.com
www.tbe.com



Teledyne Cougar

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Sunnyvale, CA 94085
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E-Mail: cougar@teledyne.com
www.teledyne-cougar.com



Teledyne Energy Systems

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Hunt Valley, MD 21031
Phone: 410.771.8600
E-Mail: energysystems@teledynees.com
www.teledynees.com



Teledyne Impulse

9855 Carroll Canyon Road
San Diego, CA 92131
Phone: 858.842.3100
E-Mail: impulse@teledyne.com
www.teledyneimpulse.com



Teledyne Imaging Sensors

(Teledyne Scientific & Imaging)

5212 Verdugo Way
Camarillo, CA 93012
Phone: 805.373.4545
E-Mail: lkilmer@teledyne.com
www.teledyne-si.com



Teledyne Judson Technologies

(Teledyne Scientific & Imaging)

221 Commerce Drive
Montgomeryville, PA 18936
Phone: 215.368.6900
E-Mail: sjustice@teledynejudson.com
www.teledynejudson.com



Teledyne Microelectronic Technologies

12964 Panama Street
Los Angeles, CA 90066
Phone: 310.574.2082 or 800.518.1015
E-Mail: microelectronics@teledyne.com
www.teledynemicro.com



Teledyne Printed Circuit Technologies

110 Lowell Road
Hudson, NH 03051-0068
Phone: 603.889.6191 or 800.866.7456
E-Mail: pctsales@teledyne.com
www.tetpct.com



Teledyne Reynolds

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Los Angeles, CA 90066-6734
Phone: 310.823.5491
E-Mail: aalves@teledyne.com
www.teledynereynolds.com



Teledyne Coax Switches

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Hawthorne, CA 90250
Phone: 323.777.0077 or 800.274.7007
E-Mail: coax@teledyne.com
www.teledynecoax.com



Teledyne Relays

12525 Daphne Avenue
Hawthorne, CA 90250
Phone: 323.777.0077 or 800.274.7007
E-Mail: relays@teledyne.com
www.teledynerelays.com



Teledyne Scientific Company

(Teledyne Scientific & Imaging)

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Thousand Oaks, CA 91360
Phone: 805.373.4545
E-Mail: lkilmer@teledyne.com
www.teledyne-si.com



www.teledynespace.com