QwikConnect

GLENAIR • JANUARY 2023 • VOLUME 27 • NUMBER 1

Turn Your Radio On

INTERCONNECT SOLUTIONS FOR HIGH-FREQUENCY RF

Glenair®

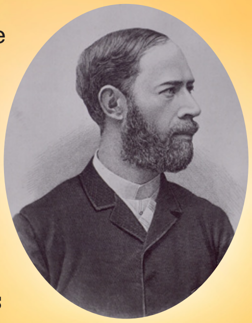
Turn Your Radio On

INTERCONNECT SOLUTIONS FOR HIGH-FREQUENCY RF

RF (Radio Frequency) refers to generated electromagnetic radiation (AKA radio signals) propagated through free air or space via a transmit antenna for collection and use by a receive antenna and its associated electronics. More simply, RF refers to the use of emitted electromagnetic radiation to (wirelessly) transfer information between two circuits that have no direct electrical connection. Common day-to-day systems such as over-the-air TV and cell phones employ digital RF due to the massive data rates afforded by Very and Ultra high-frequency electromagnetic wavelengths. Analog RF is found in less data-intensive systems:

- Radio station RF signals captured by the antenna of your car
- Police speed-gun RF signals sent and received by the officer's hand-held unit
- Television remote control units sending RF signals from the couch to the box

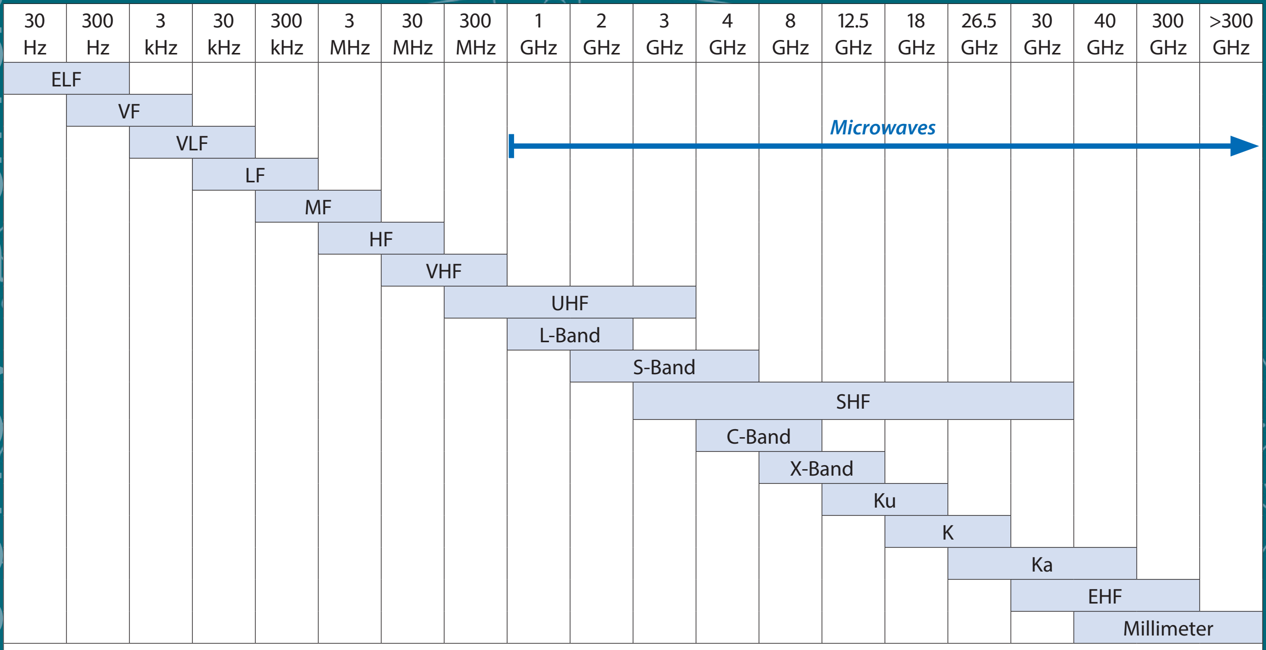
History buffs may appreciate a brief homage to Heinrich Hertz, the gifted German physicist who successfully demonstrated the existence of electromagnetic waves. In recognition of his achievement, Heinrich's peers eponymously attached his name to the unit of measure used for frequency (the rate one wavelength travels in one second) forever enshrining it as one "Hertz."



Heinrich Hertz

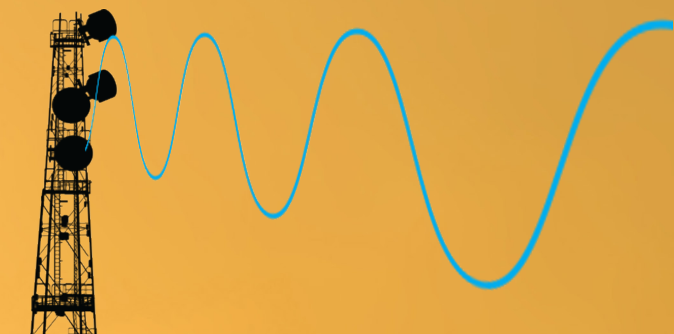
Radio Wave frequencies (RF, Microwave, and Millimeter Wave) occupy the low-end of the electromagnetic spectrum. The RF segments, or frequency bands. span from ELF (Extremely Low Frequency, 30 to 300 Hz) to VHF (Very High Frequency, 30 MHz to 300 MHz). Frequency bands ranging from UHF (Ultra High Frequency, 300 MHz – 3 GHz) to Ka (30 GHz) are conventionally referred to as the Microwave spectrum. Millimeter wave form frequencies fall between 40GHz and 300GHz. Interestingly, as electromagnetic frequency increases

COMMON Frequency Bands



Relative positions of the most common frequency bands (not to scale).

ELF = Extremely Low Frequency
VF = Voice Frequency
VLF = Very Low Frequency
LF = Low Frequency
MF = Medium Frequency
HF = High Frequency
VHF = Very High Frequency
UHF = Ultra High Frequency
SHF = Super High Frequency
EHF = Extremely High Frequency



beyond the highest RF frequency bands, it manifests as light—from infrared radiation (IR), to visible, ultraviolet, X-rays, and gamma rays.

The physical design of RF circuits is generally determined by the wavelengths present within the radiation band of interest. The two basic design strategies are either 1) to keep all the devices and features so small (say smaller than 1/10th of a wavelength) to ensure there is minimal opportunity for the radiation to escape or couple in unwanted ways or 2) to work on a larger scale and guide or manage the radiation fields in an environment optimized for their propagation. Examples of the former approach would be a transistor on a computer chip circuit, where the dimensions are so small compared to the natural wavelength propagation that size can be neglected to first order. A waveguide or coax cable on the other hand has dimensions optimized to "guide" the radiation modes between metallic surfaces. The performance of such devices is highly sensitive to variance in physical size.

Designing a system capable of operating over a broad range of frequencies and scale can, in this regard, be a significant challenge. The division of the electromagnetic spectrum into bands is helpful, as one can typically design a device optimized for the largest possible area within each band, and then work to minimize the damage in the remaining frequencies.

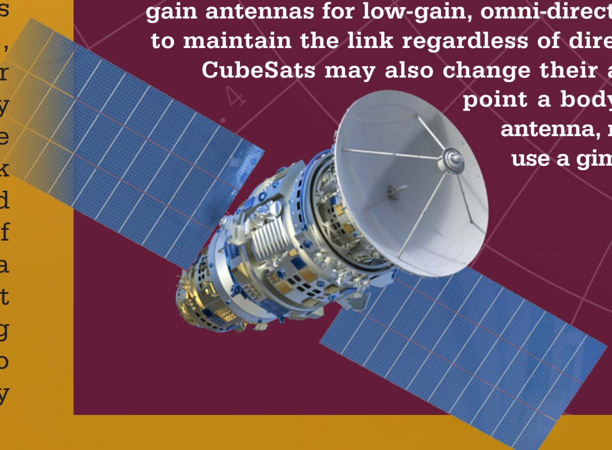
A classic example of this challenge is the design of an antenna, a device used to convert a current/voltage on a conductor into an electromagnetic radiation. In its simplest form, an antenna consists of a symmetric disposition of two conductors, both fed from their center. This is called a dipole or Hertz antenna. Dipole antennas create a relatively homogeneous radiation strength-pattern in the plane perpendicular to the arms and will work over a reasonably broad spectrum centered around the half wavelength of the system (the length of the two arms equals half a wavelength). But for a fixed point-to-point communication system, it is not optimal because radiation is not concentrated along the direction of the link. This illustration points to two key figures of merit for an antenna: directivity

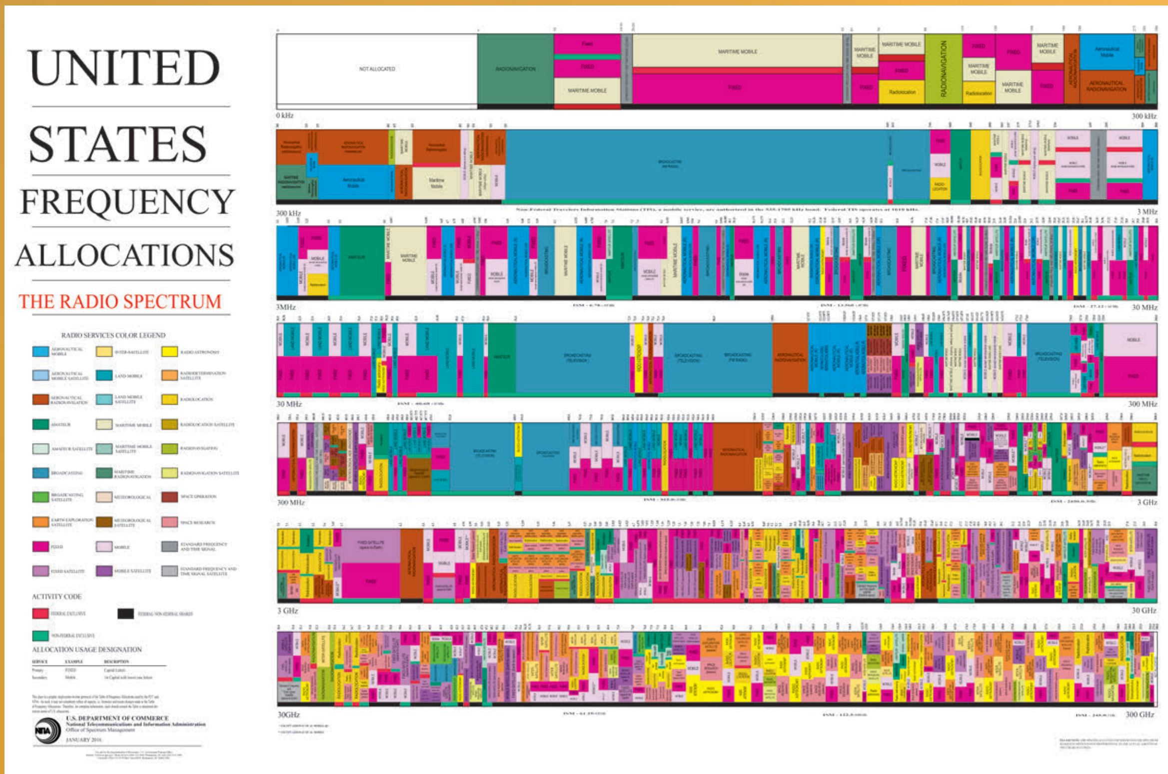
RF Application Example
SATCOM

The RF communications subsystem is an essential part of every spacecraft. It is required to transmit important health and telemetry data down to Earth, as well as receive commands from ground operators. As with all spacecraft subsystems, there are power and mass constraints placed on the comm system, and engineers must make numerous compromises in performance and efficiency.

When designing a RF comm system, the first trades performed are for data rate, power consumption, and total mass. For example, a mission with high data rate needs would select a high frequency such as X-band for downlink and a directional high-gain antenna. Based on the ground station locations available, engineers would perform link budget analyses to determine the minimum power needed for a specific ground station antenna. This analysis would factor in rain and atmospheric attenuation, as well as modulation and coding. A few different link budget trades will be run, varying antenna size, RF output power and data rate. Each link will return a different margin of decibels, representing the reliability of the system. The engineers will proceed to calculate the final mass and power for each configuration. The mission designer will have a limit on mass and power constraints for the communications subsystem. Each configuration traded will compare data rate, power, and mass. A high data rate downlink may cost a high amount of mass for the antenna and power for the amplifier and radio. Conversely, a low-power, low-mass system may have a lower data rate.

Another factor that is considered in the design phase is pointing. Depending on the orbit of the satellite and whether the link is UL/DL or XL, the system may have a specific pointing requirement. Large satellites frequently use gimbals—platforms that can pivot to point their antennas. The addition of a gimbal will increase the overall mass and power draws of the system. CubeSats frequently trade high-gain antennas for low-gain, omni-directional ones to maintain the link regardless of directionality. CubeSats may also change their attitude to point a body-mounted antenna, rather than use a gimbal.





U.S. Department of Commerce / NTIA poster shows frequency allocations across the radio spectrum. AM and FM radio, TV broadcast, as well as WiFi, Cellular, maritime navigation, and even space communication frequencies may be identified on the chart.

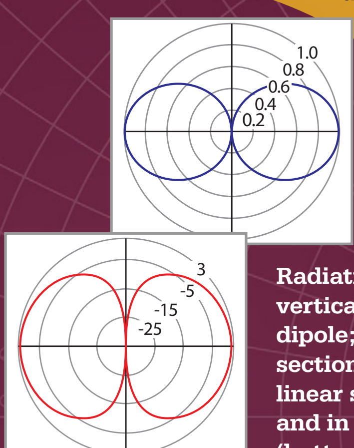
and efficiency. Directivity is the measure of how the energy of the radiation is directed in space, while efficiency is the measure of how much of the feed power was converted into useful electromagnetic radiation. Obviously the most efficient frequency of a dipole antenna is when the excitation frequency matches the half-wavelength size of the arms.

The starting point for the RF circuit is the signal generator. In a laboratory, an RF signal generator produces the signal to test the proper functionality of RF circuits to ensure proper field functionality. RF generators produce a well-defined signal frequency, amplitude, and phase. This signal is then fed into a device under test, and the resulting amplitude and phase changes are measured. The changes are captured in a matrix called the "S" parameter matrix. In real-world applications, such as a satellite comms system (see sidebar), the role of the generator is assumed by the transmit/receive radio that combines multiple functions including RF signal generation, modulation, encoding and transmission of the signal to and from the antenna. In practice, signals are transmitted between LRU's and antennas on purpose-built coaxial cables, the construction of which consists of:

- Center Conductor
- Dielectric
- Outer Conductor
- Jacket (if required for environmental protection)

The term coaxial refers to the inner conductor and the outer shield sharing a geometric axis. The electromagnetic field carrying the signal exists only in the space between these two conductors. Flexible coaxial cables may be selected with a stranded center conductor which aids flexibility but increases loss in like-for-like designs. Conformable or Semi-Rigid cables typically have a solid center conductor which is friendlier to loss-budgets but more difficult to route.

The outer conductor on flexible cables can be a conductive braid screen, tape, or combination. Better screening, such as a double-screen or screen-plus-tape, offer lower loss, but again can affect flexibility. Special "conformable" cables have a tin-dipped outer braid (sometimes with a tape serving as an auxiliary shield underneath). Semi-Rigid cable types have solid outer conductor (commonly copper or aluminium). See sidebar for more cable details.



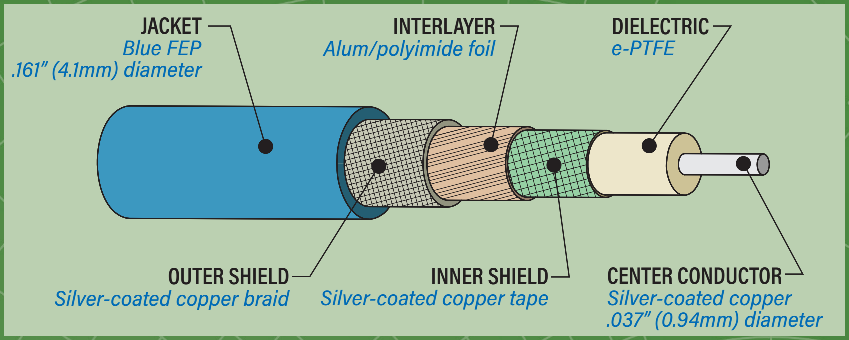
Radiation pattern of vertical half-wave dipole; vertical section shown in linear scale (top) and in decibels (bottom)

Performance and Loss in an RF Transmission Line

When passing an RF signal through a transmission line, some of the power is invariably lost in a phenomenon known as attenuation. Attenuation is frequency dependent, with high frequency transmissions almost always leading to higher levels of power (signal) loss. Signal loss through coaxial cable can occur for various reasons, such as radiation exiting the cable via apertures or imperfections in the outer shield, resistive losses in the cable conductors, and signal absorption in the cable dielectric—particularly in long-length cable runs. Better attenuation performance can be achieved through the use of more conductive shielding materials, such as silver plated versus non-plated copper and by lowering the dielectric constant. Using larger-diameter coaxial cable increases the surface area of metal and thus reduces the resistive losses per unit length.

COAX Cable Construction

Coax cables are typically supplied in 50-Ohm and 75-Ohms impedances, created by altering the ratio of the inner conductor to the outer conductor. 50-Ohm cable is a "best of both worlds" design, as 30-Ohms delivers best power handling while 70-Ohm delivers lowest signal attenuation (loss). 50-Ohm cable is thus preferred for higher power and frequency video and digital audio signals. For less power intensive interconnection to a radio or RF receiver, 75-Ohm Coax cable is ideal.



The center conductor in the Coax cable carries the signal, with the electromagnetic energy traveling on the outermost portion of the center conductor in a phenomenon called "skin-effect." Some larger diameter cables may use a hollow tube, as the dielectric constant of dry air in low-frequency applications delivers acceptable low-loss performance. Smaller form-factor cables may use a variety of core and shield plating materials as well as various thicknesses of plating to optimize the electrical signal.

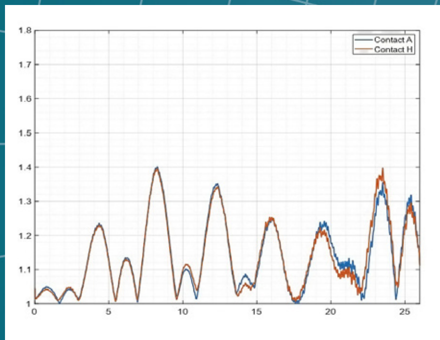
The insulator or dielectric surrounding the inner conductor may be solid plastic, a foam plastic, or air with spacers supporting the inner wire. The dielectric helps maintain the concentricity of the center conductor and contributes significantly to the electrical performance of the cable. Dielectric materials used by Glenair include PTFE and extended ETFE for low attenuation at microwave frequencies. We also utilize LPCF to minimize phase shift caused by temperature change with less than 250 ppm/°C phase change from -40 to +60 °C.

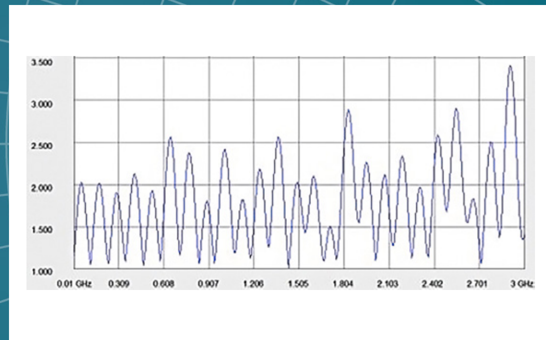
Many conventional coaxial cables use braided copper wire forming the outer conductive shield. While this improves flexibility compared to solid outer conductors it may result in gaps in the shield layer which can lead to higher attenuation and cross-talk. For this reason, high-performance applications with low-loss budgets typically rely on more highly engineered designs. Glenair constructed cable may incorporate as many as four metallic layers for greater than 90 dB of shielding effectiveness including designs with flat SPC (Silver-Plated Copper braid) flat tape inner shield, aluminum/polyimide foil interlayer, and round SPC braid outer shield.

Cables with a solid outer conductor facilitate shape-memory forming where required, are electrically stable, and ideal for use in areas with limited space and high vibration resistance requirements. Semi-rigid cable with solid outer conductors are also used on higher-frequency applications to take advantage of the low-impedance solid tube performance. Designs supplied by Glenair are available with PTFE dielectric and in special low loss / higher temperature versions.

The outer jacket, when used, serves as a protective barrier to the coaxial cable. FEP is a typical outer jacket material, however, there are other jacket materials available to meet unique application requirements such as resistance to ultraviolet light, harsh chemical environments, radiation, oxidation, high heat, abrasion, cutting, and so on. For internal chassis applications the insulating jacket is typically omitted.

VSWR





Think of the signal flow as liquid traveling through a hose. You want as smooth a "flow" as possible. The plot on the left is good to 26.5 GHz, 1.40:1 VSWR, the one on the right is very bad almost 3.5:1 @ 3 GHz

Back reflections in a transmission line also impact electrical performance and are the result of discontinuity in the RF line caused by changes of impedance. This can be a result of changing conductor and dielectric diameters, interface dimensions, or gaps between parts. Reflections are generally measured in two ways:

Return Loss—this is expressed in dB and indicates the ratio of transmitted to reflected power. Ideal return loss is a high number (infinity = no reflection). An RL of 3dB means 50% of the power is reflected, 6dB means 25% reflected. An RL of 0dB would be caused by a short or open circuit (100% reflected)

VSWR—Voltage Standing Wave Ratio. Two waves will propagate along a mismatched line – one travels forward, while the other is reflected. Both waves have the same frequency, and the reflected voltage is added to the transmitted voltage. This causes a standing wave. The size of the reflected wave to the transmitted wave (max to min) is the ratio. An ideal line gives a VSWR of 1 (no reflection). More reflections equal a higher ratio (e.g. 1.2:1).

dBi—Decibel isotropic is the logarithm of the ratio of power emitted by the antenna, divided by the power of an isotropic radiator.

Power Handling

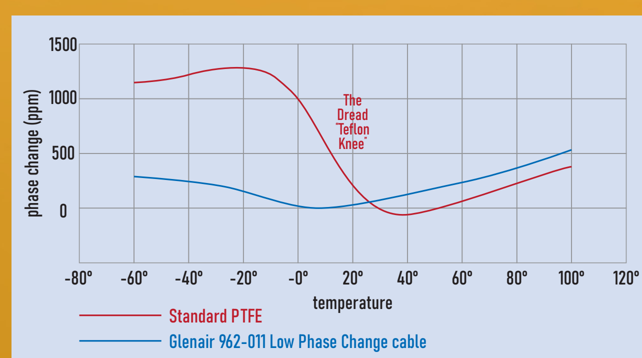
Larger cables can handle more power than smaller types (when using the same materials). Changing dielectric and jacket materials can help improve power handling, but this can have an impact on insertion loss. Trapped air pockets within cables or other components are of concern in power transmission on satellites. Power handling needs to be de-rated for frequency, ambient temperature, pressure, and reflections (VSWR/Return Loss).

The Velocity of Propagation or Vp of the cable is represented as a percentage of the speed of light. Extruded PTFE (Teflon) cables have a Vp of 69.5%. Taped PTFE and ePTFE have more air and have much higher velocities (80% & higher)

Phase Matching and Phase Stability

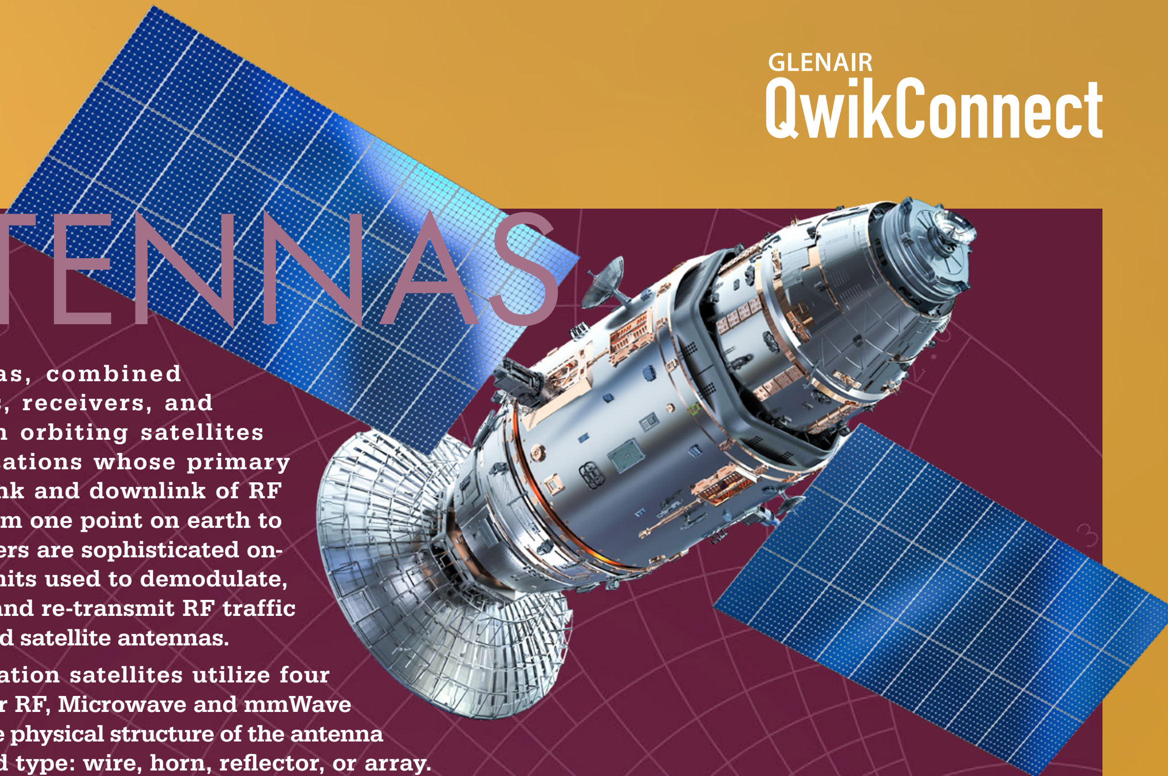
A signal travelling through a medium will have a particular phase length in degrees (one wavelength adds 360° to the phase). Phase length is determined by the transmission medium (cable type) and the mechanical length. Cables that are made from the same material and matched in phase will also be mechanically matched. Matching can be undertaken to a particular value, or in relation to other cables—important in cases where signals need to arrive at a given point at the same time (i.e. antenna arrays). The phase length of an assembly can vary with flexure and temperature, which needs to be compensated for. Different materials and cable constructions can help reduce the problem, often the goal is to eliminate the "Teflon Knee".

The mechanical properties of PTFE affect electrical length (phase) dramatically in the 18° – 25° C range, causing the phase shift described above. A plot of this change resembles a knee. Glenair 962-011 cable greatly reduces this "knee" from 1300–1500 (ppm) to below 200 (ppm). Available in -402 and -200 sizes, with FEP or Tefzel jacketing.



The graph above plots the performance of standard PTFE coax cable (the red line) vs. Glenair 962-011 Low Phase Change Cable (the blue line). Note the "Teflon Knee" phase shift.

ANTENNAS



Satellite antennas, combined with transmitters, receivers, and transponders turn orbiting satellites into radio relay stations whose primary mission is the uplink and downlink of RF communications from one point on earth to another. Transponders are sophisticated on-board processing units used to demodulate, decode, re-encode, and re-transmit RF traffic captured via on-board satellite antennas.

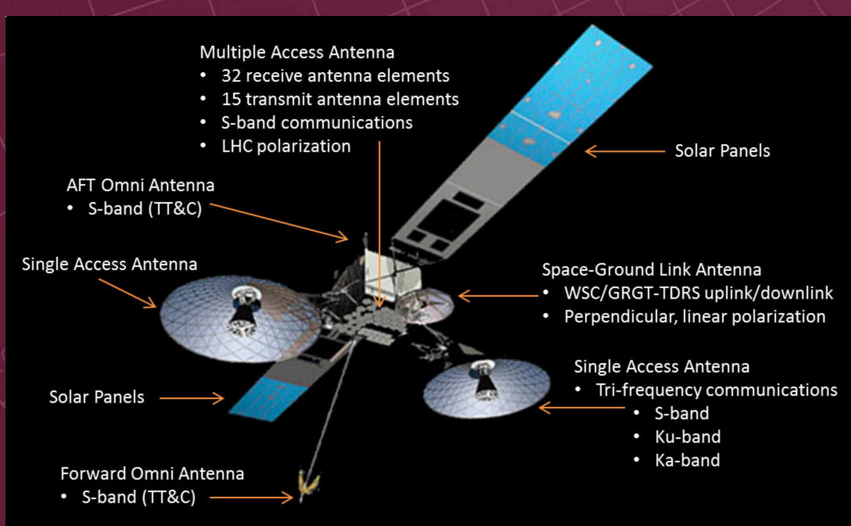
Modern communication satellites utilize four types of antennas for RF, Microwave and mmWave communications. The physical structure of the antenna defines its name and type: wire, horn, reflector, or array. Let's take a brief look at each.

Wire antennas were commonly employed on large form-factor GEO satellites such as those launched for INTELSAT, the international telecom consortium. Wire antennas are omnidirectional; that is, they transmit and receive signal strength in all directions. Monopole and dipole are two common configurations. Wire length is critical to managing gain and impedance performance. On early versions of INTELSAT, antenna gain in the neighborhood of 4 dBi for receive and 9 dBi for transmit was typical. In today's modern satellite networks, wire antennas are considered suitable for use in tracking, telemetry, and command (TT&C) functions.

Horn or aperture antennas are employed on satellites for microwave frequency signals. The antenna consists of a flared metal waveguide that concentrates the radio wave in a beam. For transmission, radio waves are introduced into the waveguide via a coaxial cable attached to the side, with the central conductor projecting into the waveguide to form a quarter-wave monopole antenna. The waves then radiate out of the horn end in a focused beam. At the receiving end, horns are frequently employed as feeds for reflector antennas.

The reflector antenna is most popular format used in communications satellites due its rugged structure, small form-factor, and high-gain performance. Types include paraboloid, hyperboloid, and spheroid. A reflector antenna consists of a curved reflecting surface and a feed system. Curved reflectors increase the strength of a signal for all wave forms, including lower frequency RF, microwave as well as optical energy. Deployable reflector antenna utilizing collapsed aluminum or mesh sides are widely used to provide larger aperture and increased gain strength.

Array antennas generate directional beams via a patterned array or grouping of individual radiators, called elements. The many individual elements of the array antenna allow flexibility in modulating frequencies, phases as well as steering the signal. An array antenna is essentially a set of connected antennas which work together to transmit or receive radio waves. The individual elements are typically connected to a single receiver or transmitter by feedlines that feed the power to the elements in a specific phase relationship.



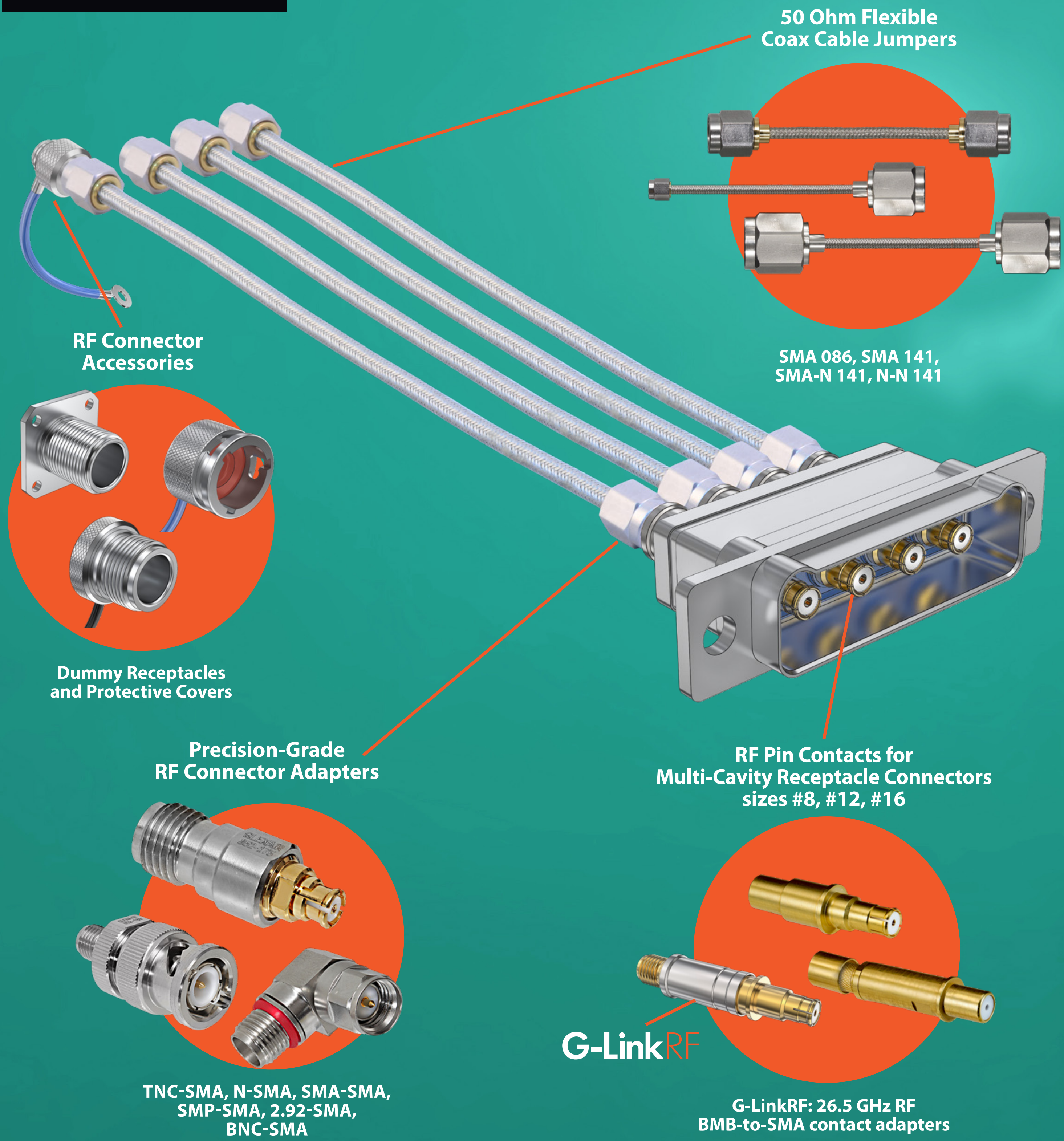
Third-Generation Tracking and Data Relay Satellite (TRDS) Capabilities. Note the numerous antenna types and functions. (Source: NASA)

AEROSPACE-GRADE

RUGGEDIZED RF, MICROWAVE, AND mmWAVE COAXIAL CABLE ASSEMBLIES

RF

The Glenair ecosystem of mission-critical RF technologies: contacts, connectors, cables, and fully-integrated interconnect assemblies.




Mil/Aero-Grade
Flexible Coax Cables
047, 086, 160, 200, 235, 300, 450
Glenair GMMD
Modular Micro-D
Micro Miniature Board
and I/O-to-Board
Hybrid Coax Connectors
Rugged, Shielded, Vibration-
Resistant Mil-Aero Grade
Multi-Cavity RF Connectors
RF Socket Contacts for
Multi-Cavity Plug Connectors
sizes #8, #12, #16
G-LinkRF
G-LinkRF: 26.5 GHz RF
BMB-to-SMA contact adapters
SuperNine, Mighty Mouse,
Series 806 RF, and Series 795 RF I/O
and Cable Connectors

GLENAIR

RF, Microwave, and mmWave

INTEGRATED RF ASSEMBLIES BUILT FROM AEROSPACE-GRADE CONNECTORS, CONTACTS, ADAPTERS, AND COAX CABLE

Glenair is a market leader in RF and Microwave interconnect innovations, Our signature contacts and connectors support a mix of standard and special interface types, and provides solutions for all stages in the transmission line.

High-frequency RF interconnects from Glenair include a specialized range of high-frequency drop-in contacts for multipin I/O connectors, high-frequency and phase-stable coax cables, and Glenair signature G-Link RF adapters. We also have the ability to offer customers fully integrated and connectorized assemblies incorporating discrete RF connectors including SMAs, SMPs, BMBs, and others.

Glenair manufactures an extensive range of high-frequency RF contacts for drop-in use in Glenair signature series connectors including Series 23 SuperNine, Series 80 Mighty Mouse, Series 806 RF, and the newly-released Series 795 high-density rectangular. The use of aerospace-grade sealed and shielded multiport connectors of this type is advantageous both as a mechanism to ruggedize the I/O interface as well as for size- and space-savings. All designs are optimized for packaging in Glenair signature series connectors and fall into three contact cavity sizes: #8, #12, and #16.

These are 50 and 75 Ohm contacts in BMB, SMPM, and SMPS formats. Selected contacts utilize millimeter-wave spring-loaded architecture to achieve frequencies up to 65 GHz. All are designed for direct attachment of coaxial cables and snap-in insertion to multi-cavity connectors.

Coax CONTACTS

SIZE #8
for Sr. 23 SuperNine/ Series 80

50 Ohm 26.5 GHz	**75 Ohm 4 GHz**	**75 Ohm 12 GHz**

SIZE #8
for Series 795/ Series 806 RF

50 Ohm 6 GHz	**50 Ohm 26.5 GHz**	**75 Ohm 4 GHz**

SIZE #12
for SuperNine Series 795 Series 806 RF

50 Ohm 3 GHz	**50 Ohm 40 GHz**	**75 Ohm 3 GHz**

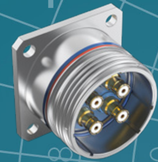
SIZE #16
for SuperNine Series 795 Series 806 RF

50 Ohm 4 GHz	**50 Ohm 65 GHz**

Glenair Signature multi-port connectors for RF applications

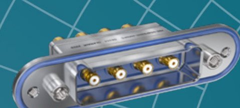
SuperNine® RF

Series 23



SERIES 806 RF MIL-AERO

Series 806 RF



SERIES 795 RF

Series 795

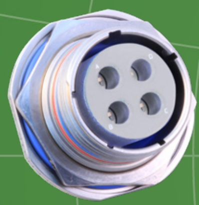
GMMD

GMMD

G-LinkRF

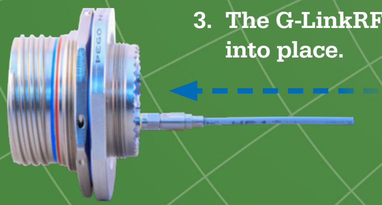
G-LinkRF is a unique contact technology with a BMB style mating interface, and a female SMA back-end interface. The design allows for easy termination of SMA cables to size #8 BMB mating interface contacts. The technology is, in other words, a BMB-to-SMA adapter that facilitates mating and routing of coaxial cables.

Application and Use



1. **SuperNine receptacle connector with Size #8 contact cavities**

2. **Ready to accept the size #8 BMB G-Link RF contact with its threaded SMA back end.**



3. **The G-LinkRF is simply snapped into place.**

The G-LinkRF contact is equipped with an integral release sleeve, and may be combined with 45° and 90° adapters for improved cable routing. The Size #8 50 Ohm 26.5 GHz BMB contact is rated to 1000 VAC RMS DWV, with VSWR of 1.5 max.

Our capabilities are built around the delivery of custom point-to-point and multibranch assemblies, including rugged environmental I/O, cable and board designs with hybrid signal, power and RF. We specialize in high-availability, fast-turnaround solutions, with custom cable delivered in just 4 to 6 weeks from receipt of PO.

Series 962 50 Ohm Coax Cables are available in seven size categories and frequencies. These high-frequency, low-loss cables are suitable for aerospace applications and test equipment. Jacket options include FEP and radiation-resistant space-grade ETFE. Triple-shielded high-performance cables have expanded PTFE dielectric core for low loss up to 40 GHz. Application selection is based on compatibility with a particular RF / microwave connector type and size, as well as flexibility, EMI screening, weight considerations, temperature tolerance, and altitude.

Glenair Signature 50 Ohm CABLE

047

26.5 GHz
Hand Formable
Tin-Soaked Braid
.047 (1.2) Diameter

086

40 GHz
FEP Jacket
Tape + Braid Shield
.104 (2.6) Diameter

40 GHz
ETFE Jacket
Tape + Braid Shield
.097 (2.5) Diameter

160

40 GHz
FEP Jacket
Triple Shield
.161 (4.1) Diameter

18 GHz
FEP Jacket
Tape + Braid Shield
.163 (4.1) Diameter

18 GHz
ETFE Jacket
Tape + Braid Shield
.163 (4.1) Diameter

18 GHz
ETFE Jacket
Triple Shield
.145 (3.7 Diameter

40 GHz
Low Phase Change
FEP Jacket
.157 (4.0) Diameter

40 GHz
Low Phase Change
ETFE Jacket
.157 (4.0) Diameter

200

26.5 GHz
FEP Jacket
Triple Shield
.204 (5.2) Diameter

26.5 GHz
ETFE Jacket
Triple Shield
.187 (4.7) Diameter

235

18 GHz
FEP Jacket
Triple Shield
.235 (6.0) Diameter

18 GHz
ETFE Jacket
Triple Shield
.205 (5.2) Diameter

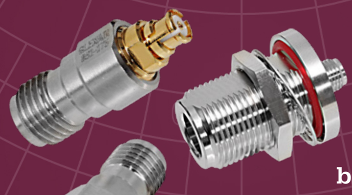
300

18 GHz
FEP Jacket
Triple Shield
.310 (7.9) Diameter

450

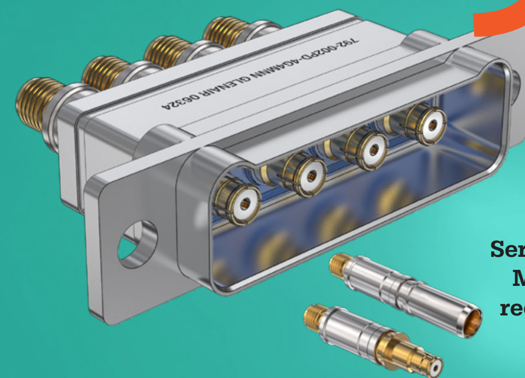
10 GHz
FEP Jacket
Triple Shield
.448 (6.0) Diameter

Series 852 RF ADAPTERS



Precision - grade Series 852 RF Adapters are used to connect between series or within a series. Frequently used as connector savers, male-female adapters protect RF jacks on instruments from excessive wear-and-tear. 45° and 90° angled SMA male-female adapters provide extra clearance in cramped quarters.

SERIES 795 RF



Series 795 RF Multiport rectangular

Temperature changes can cause phase shift in coax cables with PTFE dielectric cores. Low Phase Change Fluoropolymer (LPCF) cables replace the PTFE core with a fluoropolymer material yielding improved phase stability over a wide temperature range.

While not particularly in the business of selling industry-standard single-line coax connectors, Glenair is able to supply a complete range of these board, cable, and panel TNC, SMA, N, SMP, BNC, SMPM and other RF connectors for use in integrated cable assemblies.

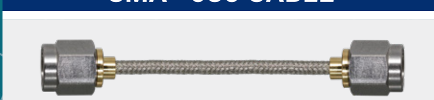
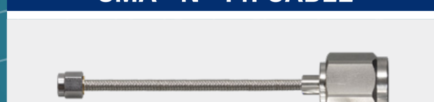
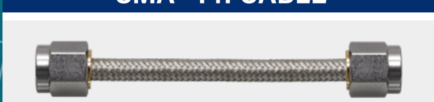
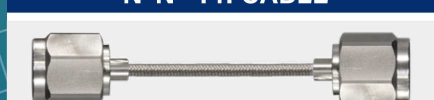
The same range of single-line RF connectors may be supplied—again, principally for use in complex RF cable assemblies—as turnkey point-to-point jumpers. Glenair RF Jumper Assemblies are unjacketed tinned copper braid 50 ohm SMA jumpers that deliver ultra-flexible, tight bend-radius performance. Back-to-back jumpers feature low-loss cable and are 100% tested and serialized.

RF Jumper Assemblies are designed for 55°C to 165°C operating temperature environments with frequency ranges from DC to 26.5 GHz. Minimum bend radius for these turnkey assemblies is just 6 mm or about ¼ of an inch.

Series 795 connectors accommodate up to nine size 8 BMB-style coax contacts. Contacts snap into the connector body and are removable. Connectors are environmentally protected with fluorosilicone face seals and rear grommets. The one-piece connector shell design provides a common ground plane and also eliminates EMI radiation through the connector. Panel mount receptacles have conductive fluorosilicone O-rings for ingress protection.

50 Ohm Coax RF JUMPERS

Series GRF02 50 Ohm Coax Cable Assemblies include SMA jumper cables with 086 or 141 flexible high frequency cable. Also included are N-to-SMA and N-N jumpers.

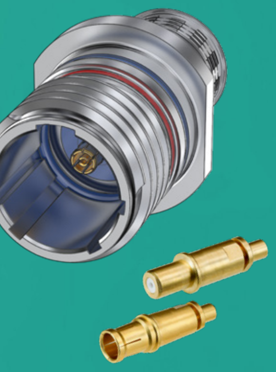
SMA • 086 CABLE	SMA - N • 141 CABLE
 GRF02-001-086	 GRF02-004-141
SMA • 141 CABLE	**N-N • 141 CABLE**
 GRF02-001-141	 GRF02-0010-141

Turnkey series GRF02 50 point-to-point jumpers offer excellent flexibility with a bend radius of 6mm 1/4 in.

SERIES 806 RF MIL-AERO

The Series 806 RF Mil-Aero is a ruggedized, shielded micro miniature circular optimized for use in high-altitude and high vibration and shock aerospace applications.

The RF series is available in an -072 plug, -073 square-flange, -079 in-line, and -080 jam nut receptacle. The -082 is a special RF hermetic



Series 806 RF Micro miniature multi-port circular

A complete range of tooled inserts supports from one to six size #8, 1-8 size #12, and 1-12 size #16 high-frequency 50 and 75 Ohm contacts in BMB, SMPM, and SMPS formats. G-LinkRF BMB-to-SMP adapters are also fully supported in this common ground plane connector series.

For customers that prefer a mil-spec pedigree multi-pin RF solution, Glenair offers our "better-than-QPL" SuperNine D38999 series connector. SuperNine has the advantage of being supplied in the widest range of supported connector styles of any Glenair RF circular. Available insert arrangements range from a single size #8 BMB in a shell size 11, to a shell size 25 with 29 size #16 SMPS contacts.

RF SuperNine®

Series 23 SuperNine Multi-port D38999 circular

GMMD

The Series GMMD is an innovative modular rectangular Micro-D connector for RF coax and high-speed differential datalink applications. It is one of the smallest ruggedized multiport RF coax connectors available on the market today. The unique micro miniature design of the GMMD also accommodates standard analog signal and power contacts, making it extremely versatile. Coax versions are supplied in prewired pigtail plug and receptacle assemblies. Coax insert arrangements support up to 16 discrete lines of 50 Ohm coax.

Glenair Modular Micro-D (GMMD)

High-temperature RF solutions are required for certain applications to ensure ultra-high phase stability, ultra-low impedance loss, and optimal VSWR. Glenair offers stainless steel material solutions for high temperature tolerance to over 600°C with hermetic sealing options.

And coming soon, Glenair will do a comprehensive review of the VITA specification RF backplane connectors, including 67.1, 67.2, and potentially signature hybrid versions incorporating RF, MT fiber optics, and high-speed signal in order to supply a complete end-to-end RF solution from I/O to backplane.

Precision-Grade RF ADAPTERS

TNC-SMA adapters

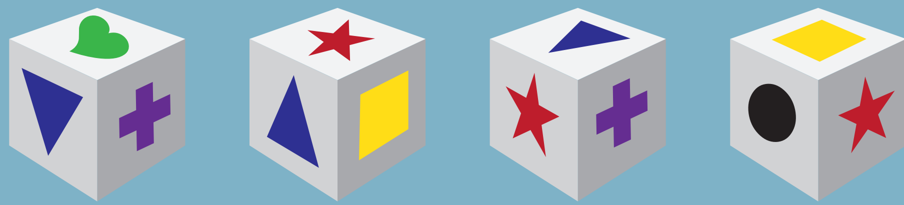
N-SMA adapters

SMA-SMA adapters

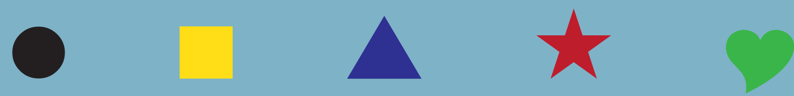
SMP-SMA adapters

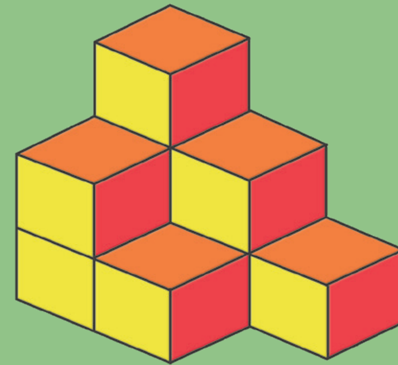
2.92-SMA adapters

QwikConnect Puzzle–Palooza



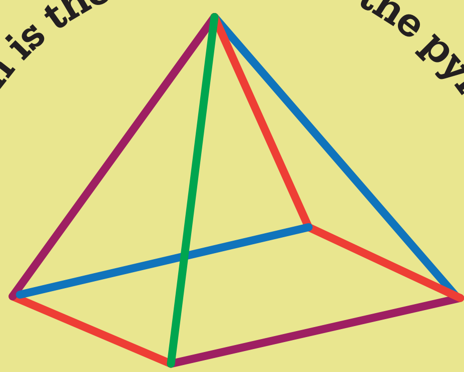
Which shape is opposite to ✚ in dice?

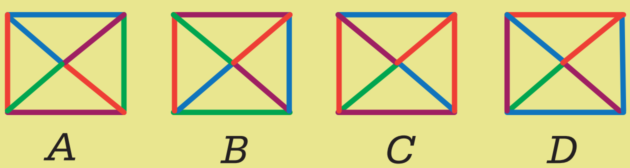




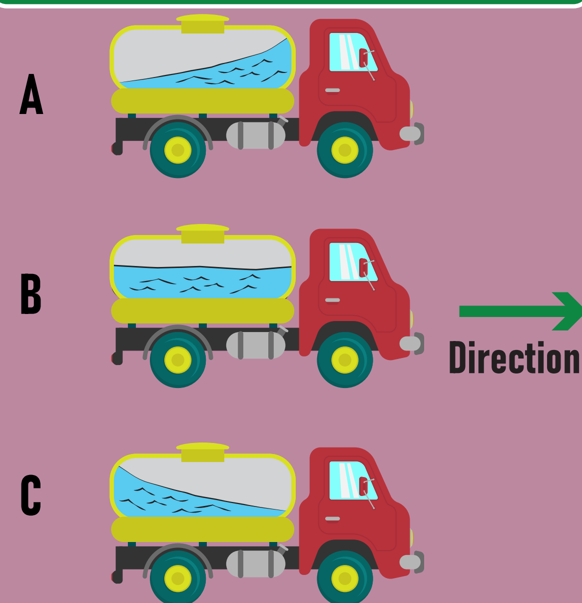
How many cubes are there?

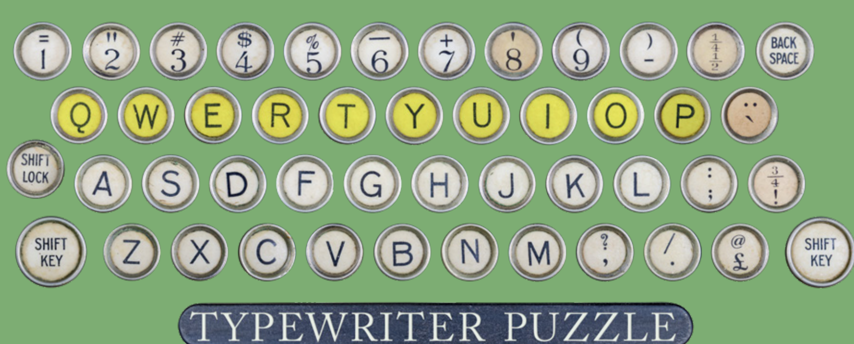
Which is the top view of the pyramid?



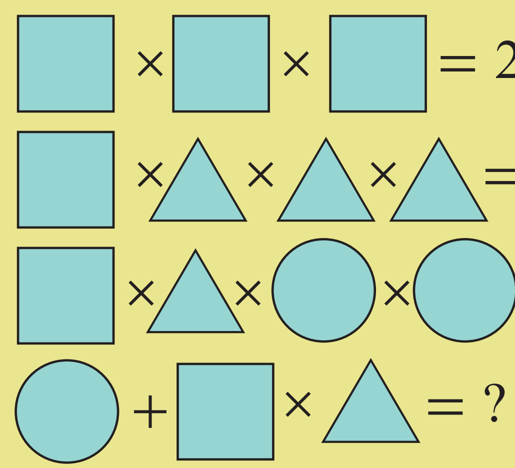


WHICH OF THESE TRUCKS ARE DRIVING?





Spell out the longest word possible using only the letters from the highlighted row of the keyboard



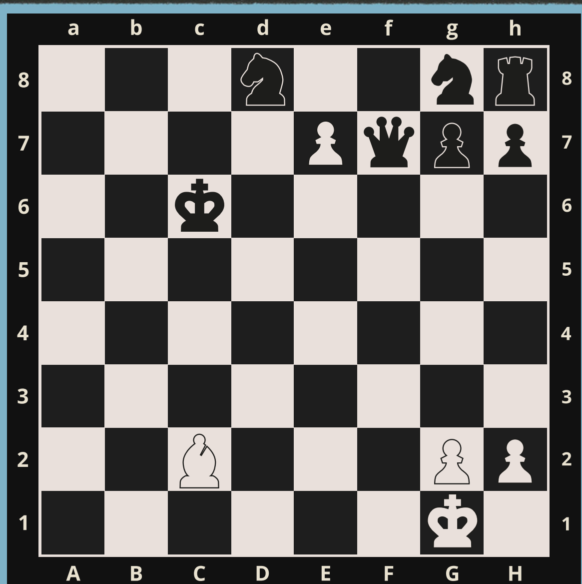
27

= 24

) = 96

How many animals are partying with this elephant?

① musically
② temperature
③ CHANCE
④ pay
⑤ ↓ end
⑥ LU CKY
⑦ ECNALG
⑧ LEAST

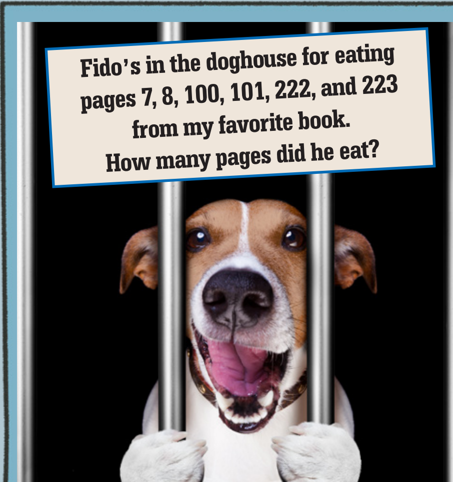


White to move and win in one

The lock has a 3-digit combination.
Can you open it with these hints?

7 9 3	One number is correct and in the right place
7 2 5	One number is correct but in the wrong place
3 1 7	Two numbers are correct but in the wrong place
8 4 9	Nothing is correct
8 9 1	One number is correct but in the wrong place

Draw lines connecting 1 to 1, 2 to 2, 3 to 3, and 4 to 4.
Lines must stay inside the rectangle, and may not cross each other.



Answers: www.glenair.com/qwikconnect

APPLICATIONS for Glenair RF Assemblies

Glenair high-frequency RF technologies are typically used in line-replaceable units and chassis that are part of an RF data transmission chain. The rugged, environmental construction of Glenair RF connectors and contacts, combined with our dimensionally stable RF cables, makes these elements ideally suited for mission-critical air, sea, land and space applications. Glenair is one of just a few interconnect manufacturers that can also supply turnkey RF cable assemblies – fully connectorized and ready for immediate use. Glenair RF interconnect solutions have proven performance – from sub-sea to outer space – in a wide range of high reliability application environments.

Military DEFENSE

Examples include fighter-jet radar applications, RF/microwave signal processing, as well as various forms of GPS navigation, jamming, and EW platforms in air-, sea- and land-based systems. Across-the-board, RF platforms designed for use in defense aviation require high levels of hermetic and/or barrier sealing in connectors and cables to prevent moisture absorption from afffecting data transmission performance.

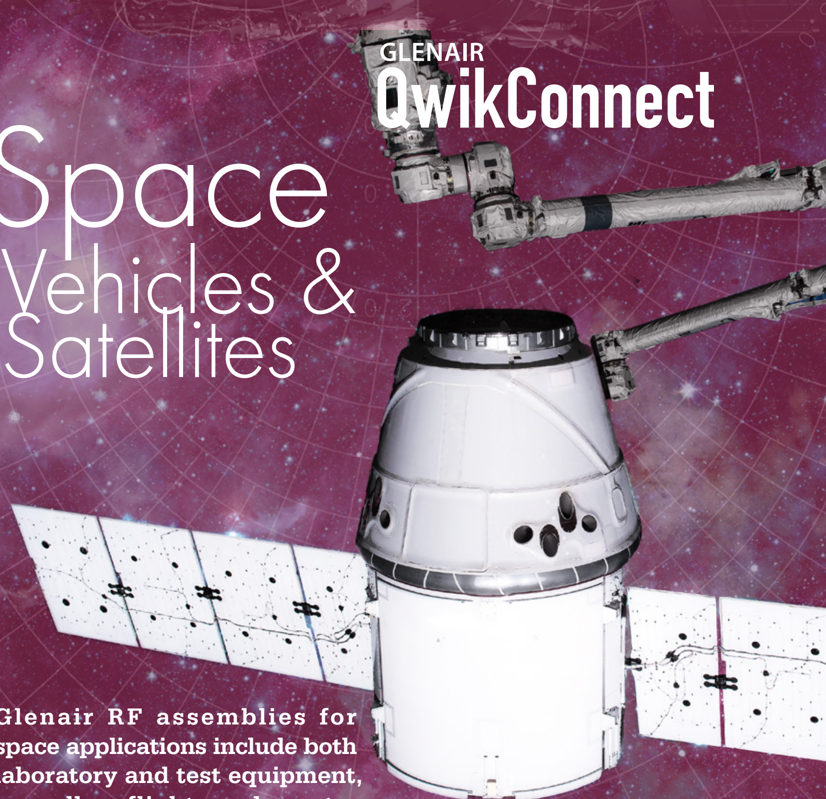
Commmercial AEROSPACE

RF systems in commercial aerospace include radio communications, inertial navigation systems, global GPS navigation, air traffic control radar, collision-avoidance and other RF transmission chains crucial for the safe and efficient operation of aircraft.

Subsea
Oil & Gas

The primary use of RF in the subsea oil and gas industry is for data transmission between subsea factory and underwater ROV sensors and instrument assets, and onshore and rig facilities for analysis and monitoring. This includes transmitting data sets such as pressure and temperature readings essential to the safe operation of the installation. RF communication is also used to transmit images and video from underwater cameras and other imaging systems.

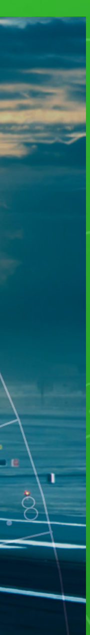
Space
Vehicles & Satellites



Glenair RF assemblies for space applications include both laboratory and test equipment, as well as flight-grade systems for space vehicles and satellites. Glenair RF connectors and cables are optimized for use in telemetry systems vital for the transmission of data and command controls between satellite and ground stations. Other applications include satellite navigation, altitude and orbit control, and interconnection of antenna arrays with transponders and other electronics. Coax cable jacket options for space include FEP and radiation-resistant space-grade ETFE.

LAND Systems

RF technology is ubiquitous in land-based systems including cable and interconnect interfaces to ground vehicle antennas, soldier communication systems, hand-held and vehicle console radios, radar, and IED countermeasures.



FLIGHT-GRADE
MULTI-PORT CIRCULAR COAX CONNECTOR IAW MIL-DTL-38999

SuperNine®

"BETTER THAN QPL"

High-altitude, mission-critical **Coax connector** series for RF, Microwave, and mmWave applications

Glenair Series 23 SuperNine connectors support one to twenty-nine high-frequency RF contacts. The "better than QPL" series features precision-machined aluminum or stainless steel shells and fluorosilicone grommets for excellent mating and environmental performance. Fifteen contact layouts, eight shell sizes, and support for #8 BMB, #12 SMPM, or #16 SMPS contacts. Glenair signature G-LinkRF contacts with fast RF cable termination reduce assembly time and skilled labor requirements. Series supports RF frequencies from DC–65 GHz.

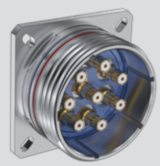
G-LinkRF

Save time and improve reliability. Series 23 SuperNine RF connectors are optimized for use with 26.5 GHz G-Link RF contacts with integral female SMA adapter for attaching SMA plug directly to the contact.

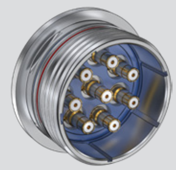
- **Fifteen MIL-STD-1560 layouts** for size #8, #12, or #16 RF contacts (sold separately)
- **Rugged aluminum or stainless steel shells**
- **Environmentally-sealed and shielded** for mission-critical application performance
- **Scoop-proof** mating interface
- **EMI spring on plugs** for low connector-to-connector resistance
- **Snap-in, rear-release contacts**
- **Available extended-length backshells** improve routing and protect coaxial cables

SuperNine RF Connector Selection Guide

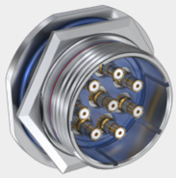
233-290-G6
Plug, EMI Spring (Socket Contacts)



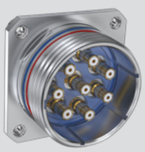
233-290-00
Wall-Mount Receptacle (Pin Contacts)



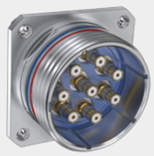
233-290-05
In-Line Receptacle (Pin Contacts)



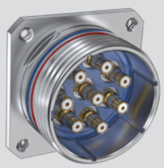
233-290-07
Jam Nut Receptacle (Pin Contacts)



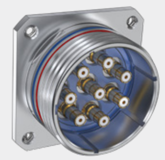
233-290-CS
Wall Mount Receptacle, Standard Clinch Nuts (Pin Contacts)



233-290-CM
Wall Mount Receptacle, Metric Clinch Nuts (Pin Contacts)

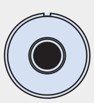


233-290-HS
Wall Mount Receptacle, Standard Helicoils (Pin Contacts)

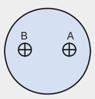


233-290-HM
Wall Mount Receptacle, Metric Helicoils (Pin Contacts)

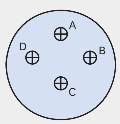
SHELL SIZE / CONTACT LAYOUT



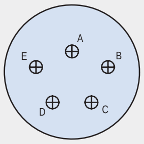
11RF1
Shell Sz. 11 • 1 #8 contact



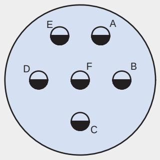
11RF2
Shell Sz. 11 • 2 #16 contacts



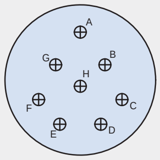
13RF4
Shell Sz. 13 • 4 #16 contacts



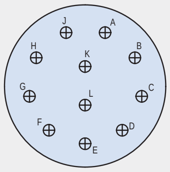
15RF5
Shell Sz. 15 • 5 #16 contacts



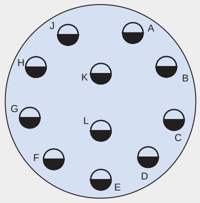
17RF6
Shell Sz. 17 • 6 #12 contacts



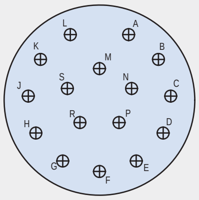
17RF8
Shell Sz. 17 • 8 #16 contacts



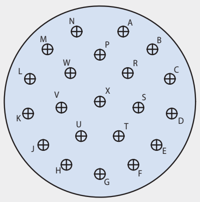
19RF11
Shell Sz. 19 • 11 #16 contacts



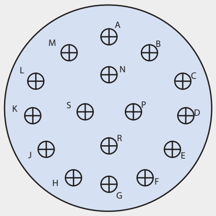
21RF11
Shell Size 21 • 11 #12 contacts



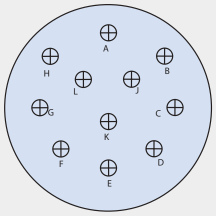
21RF16
Shell Size 21 • 16 #16 contacts



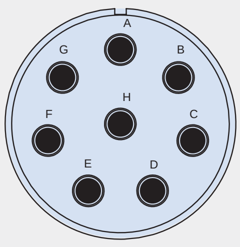
23RF21
Shell Size 21 • 21 #16 contacts



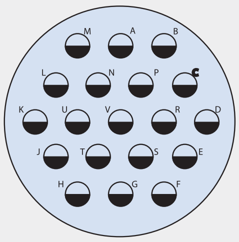
23RF97
Shell Size 23 • 16 #16 contacts



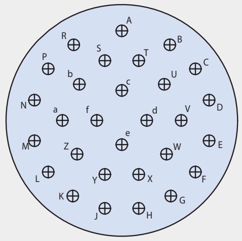
23RF99
Shell Size 23 • 11 #16 contacts



25RF8
Shell Size 25 • 8 #8 contacts



25RF19
Shell Size 25 • 19 #12 contacts



25RF29
Shell Size 25 • 29 #16 contacts

FLIGHT HERITAGE
MICRO MINIATURE RF CIRCULAR WITH MISSION-CRITICAL PERFORMANCE

SERIES 806 RF MIL-AERO

OPTIMIZED SWaP

Reduced size and weight **micro miniature circular** series for RF, Microwave, and mmWave applications

Series 806 RF connectors are micro miniature circulars with true MIL-DTL-38999 Series III-level performance including high altitude immersion, DWV, and shock and vibe resistance. Precision-machined aluminum or stainless steel shells, fluorosilicone grommets, and auxiliary shielding delivers space-grade environmental, mechanical, and electrical performance. Eighteen contact layouts, eleven shell sizes, with support for #8 BMB, #12 SMPM, or #16 SMPS contacts. RF frequency from DC–65 GHz. G-LinkRF contacts save time and reduce labor.

G-LinkRF

Save time and improve reliability. Series 806 RF connectors are optimized for use with 26.5 GHz G-Link RF contacts with integral female SMA adapter for attaching SMA plug directly to the contact.

- **Mil-spec performance, micro miniature package**
- **Space-grade TRL of 9**
- **Eighteen layouts** for size #8, #12, or #16 RF contacts (sold separately)
- **Rugged aluminum or stainless steel shells**
- **Environmentally-sealed**
- **Scoop-proof** mating interface
- **EMI spring on plugs** for low shell-to-shell resistance
- **Snap-in, rear-release contacts**
- **Hermetic versions** and extended backshells available

Series 806 RF Connector Selection Guide

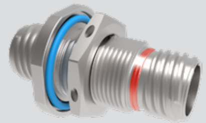
806-072
Cable Plug
(Socket Contacts)

806-073
Wall-Mount Receptacle
(Pin Contacts)

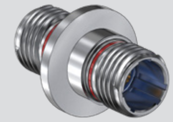
806-079
In-Line Receptacle
(Pin Contacts)

806-080
Jam Nut Receptacle
(Pin Contacts)

806-083-02
Hermetic Bulkhead Feedthru,
Panel Mount



806-083-07
Hermetic Bulkhead Feedthru,
Jam Nut Mount

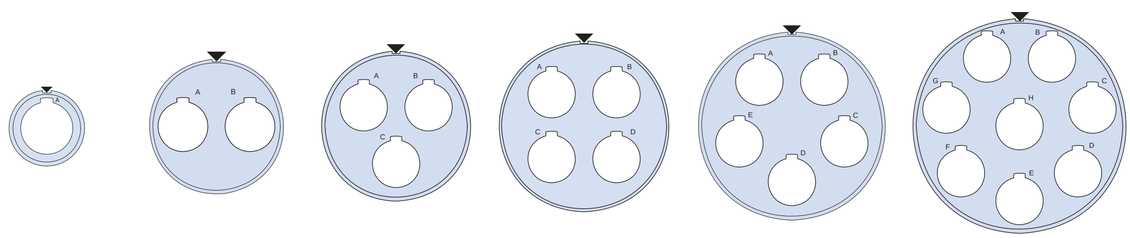


806-083-13
Hermetic Bulkhead Feedthru,
Weld Mount

Series 806 Size 8 RF Contact Arrangements

Mating face of pin connector. Socket numbering is reversed.

Symbol ▼ indicates master key location.

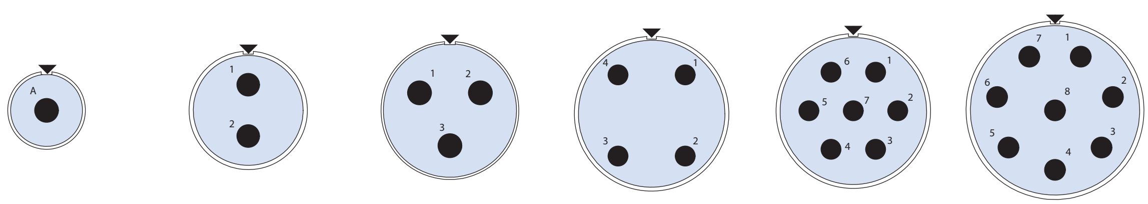


Arrangement No.	10R1	16R2	18R3	20R4	22R5	24R8

Series 806 Size 12 RF Contact Arrangements

Mating face of pin connector. Socket numbering is reversed.

Symbol ▼ indicates master key location.

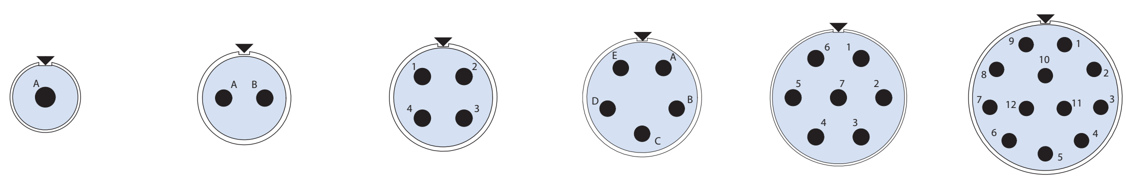


Arrangement No.	9R1	12R2	14R3	16R4	16R7	18R8

Series 806 Size 16 RF Contact Arrangements

Mating face of pin connector. Socket numbering is reversed.

Symbol ▼ indicates master key location.



Arrangement No.	8R1	10R2	11R4	12R5	14R7	16R12

FLIGHT-GRADE
MULTI-PORT HIGH-FREQUENCY RECTANGULAR COAX CONNECTOR

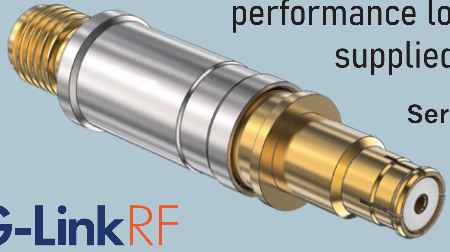
SERIES 795 RF

HIGH-DENSITY

Precision-machined, scoop-proof **aerospace-grade Coax connector** for RF, Microwave, and mmWave applications

The Glenair Series 795 is a multiport aerospace-grade coax connector designed for use with snap-in and removable size #8, #12, and #16 coax contacts from DC to 65 GHz frequency. Environmentally protected and EMI shielded for harsh application environments.

Series 795 high-density multiport connectors are designed for use with Glenair BMB-style and other high-frequency coax contacts. These contacts accept high performance low-loss flexible cable, also supplied by Glenair.

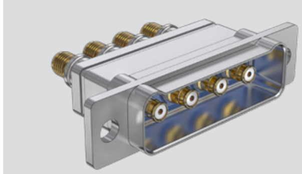
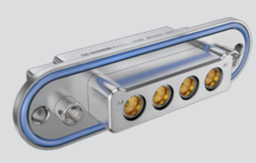
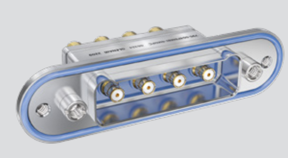
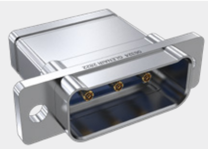
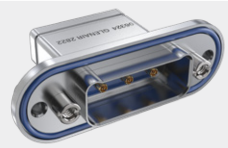
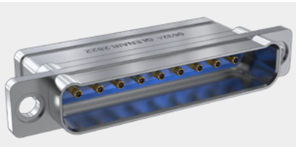
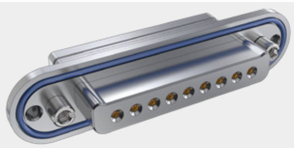
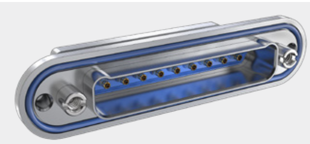


G-LinkRF

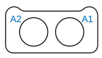
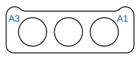
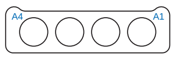
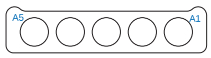
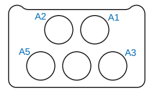
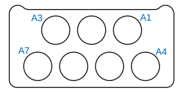
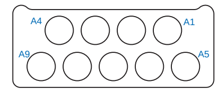
Series 795 connectors are optimized for use with 26.5 GHz G-Link RF contacts with integral female SMA adapter for attaching SMA plug directly to the contact.

- **Size #8, #12, and #16** coax contact arrangements
- **Single and double row** high-density configurations
- **Scoop-proof** design with dual-lobe polarization for reliable mate and demate
- **Precision-machined** aluminum alloy shell with common ground plane
- **Environmentally-protected** with fluorosilicone face seal and rear grommet
- **Shielded for EMI protection**
- **Available extended-length backshells**

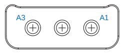
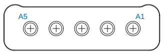
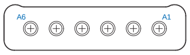
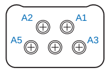
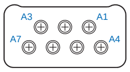
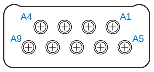
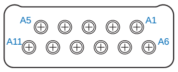
Series 795 RF Connector Selection Guide

Cable Plugs, Socket Contacts	Cable Receptacles, Pin Contacts	Panel Mount Plugs, Socket Contacts	Panel Mount Receptacles, Pin Contacts
 795-001S (#8 BMB Contacts)	 795-002P (#8 BMB Contacts)	 795-003S (#8 BMB Contacts)	 795-004P (#8 BMB Contacts)
 795-005S (#12 SMPM Contacts)	 795-006P (#12 SMPM Contacts)	 795-007S (#12 SMPM Contacts)	 795-008P (#12 SMPM Contacts)
 795-009S (#16 SMPS Contacts)	 795-010P (#16 SMPS Contacts)	 795-011S (#16 SMPS Contacts)	 795-012P (#16 SMPS Contacts)

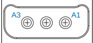
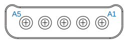
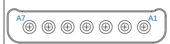
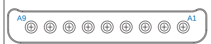
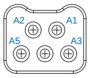
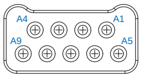
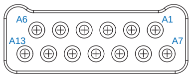
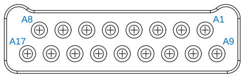
INSERT ARRANGEMENTS FOR SIZE #8 BMB TYPE RF CONTACTS

						
1-2	1-3	1-4	1-5	2-5	2-7	2-9
1 row, 2 contacts	1 row, 3 contacts	1 row, 4 contacts	1 row, 5 contacts	2 row, 5 contacts	2 row, 7 contacts	2 row, 9 contacts

INSERT ARRANGEMENTS FOR SIZE #12 SMPM TYPE RF CONTACTS

						
1-3	1-5	1-6	2-5	2-7	2-9	2-11
1 row, 3 contacts	1 row, 5 contacts	1 row, 6 contacts	2 row, 5 contacts	2 row, 7 contacts	2 row, 8 contacts	2 row, 11 contacts

INSERT ARRANGEMENTS FOR SIZE #16 SMPS TYPE RF CONTACTS

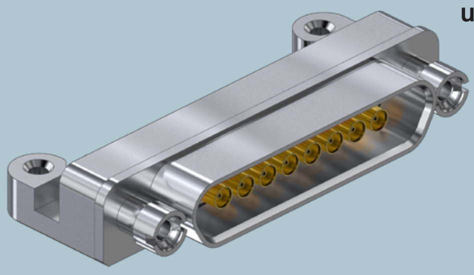
								
1-2	1-3	1-5	1-7	1-9	2-5	2-9	2-13	2-17
1 row, 2 contacts	1 row, 3 contacts	1 row, 5 contacts	1 row, 7 contacts	1 row, 9 contacts	2 row, 5 contacts	2 row, 9 contacts	2 row, 13 contacts	2 row, 17 contacts

GLENAIR MODULAR HIGH-SPEED, HIGH-FREQUENCY RF

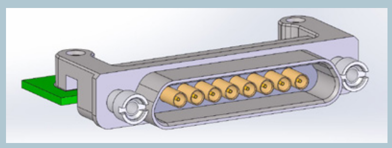
MICRO-D CONNECTOR

Modular Micro-D differential twinax / RF coax solution. Combo design accommodates both high-speed digital and high-frequency RF signals

The Series GMMD is an innovative modular Micro-D connector for RF coax and high-speed differential datalink applications. It is one of the smallest ruggedized multiport RF coax connectors available on the market today. The unique micro miniature design of the GMMD also accommodates standard analog signal and power contacts, making it extremely versatile. Coax versions are supplied in prewired pigtail plug and receptacle assemblies. Coax insert arrangements support up to 16 discrete lines of 50 Ohm coax.

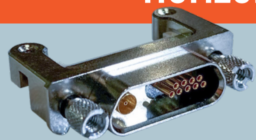


Edge-mount PCB versions support launching up to 20 GHz frequency signals from the board, and are compatible with RG-178 Coax, flexible and semi rigid 047, RG-179 and semi rigid 75Ω cables



- **Modular mixed signal RF / low speed solutions**
- **Micro miniature form-factor** for optimized SWaP
- **Shell packaging and contact technology** IAW MIL-DTL-83513
- **Pigtails, back-to-back cables, and surface-mount SMT PCB versions**
- **50Ω on 3.18mm pitch** for combo arrangements
- **50Ω on 2.54 pitch** for coax-only arrangements
- **Shield isolated** from connector shell
- **PCB edge-launched** for optimized 20GHz high-bandwidth performance

Horizontal PCB-Mount Coax and Combo Coax Receptacles



-HRE **Horizontal edge-launched receptacle**
-HRPE **Horizontal panel-sealed edge launched receptacle**

PCB edge-launched versions of Series GMMD connectors are optimized for 20 GHz high-bandwidth performance. The micro miniature form-factor interconnects are supplied in 50 Ohm versions on 3.18mm pitch for combo arrangements, and 2.54mm pitch for coax-only arrangements. Shielded element is isolated from connector shell. Mating interface Compatible with RG-178, semi-rigid and flexible 047 cables for 50Ω / RG-179 and semi-rigid cables for 75Ω

Coax and Combo Coax Jumpers and Pigtails

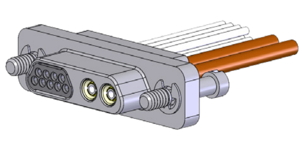
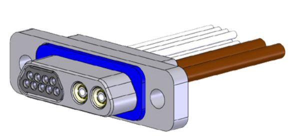
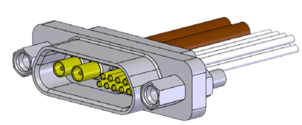
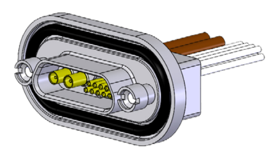
-FP **Cable plug connectors**
-FPE **Cable plug environmental connectors**
-FR **Cable receptacle connectors**
-FRP **Rear panel-mount cable receptacle connectors**

Factory-terminated back-to-back and single-ended GMMD Coax cable assemblies provide a turnkey solution for easy on-site installation. Assemblies are supplied with GMMD plug or receptacle as required with a choice of any coax or combo contact arrangement. Environmental seal options are available for plug connectors. 50Ω and 75Ω Coax cable may be ordered in flexible or semi-rigid configurations as follows:

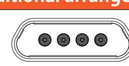
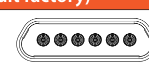
- **-C** = 50Ω RG178
- **-D** = 50Ω 047 Semi-Rigid
- **-E** = 50Ω 047 Flexible
- **-V** = 75Ω RG179
- **-W** = 75Ω Semi-Rigid

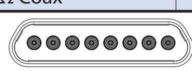
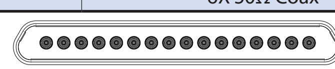
Integral backshells, hardware, and wire exit direction all supplied as standard catalog configurations.

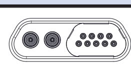
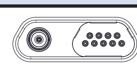
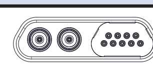
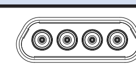
COAX AND COMBO COAX CABLE ASSEMBLY CONNECTOR SELECTION GUIDE

			
GMMD-FP Cable Plug	**GMMD-FPE** Cable Plug, Environmental	**GMMD-FR** Cable Receptacle	**GMMD-FRP** Rear Panel Mount Cable Receptacle

GMMD COAX AND COMBO COAX CONTACT ARRANGEMENTS (additional arrangements are available, consult factory)

			
Contact Arrangement	**2C**	**4C**	**6C**
Shell Size	9	21	25
No. / type of contacts	2 X 50Ω Coax	4X 50Ω Coax	6X 50Ω Coax

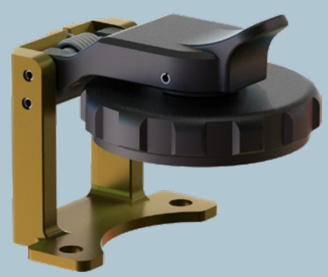
		
Contact Arrangement	**8C**	**16C**
Shell Size	37	67
No. / type of contacts	8 X 50Ω Coax	16X 50Ω Coax

				
Contact Arrangement	**2C9**	**1V9**	**2V9**	**4V**
Shell Size	21	21	31	21
No. / type of contacts	2X 50Ω Coax, 9 X #24	1 X 75Ω Coax, 9 X #24	2 X 75Ω Coax, 9 X #24	4 X 75Ω Coax

GLENAIR PRECISION-MACHINED

RF BACKSHELLS AND ACCESSORIES

Industry's most complete selection of EMI/RFI shrouded and environmentally-sealed multi-port connector backshells and accessories



667-448 (SuperNine) and **667-512 (Series 806 RF) ProSeal™ Protective Covers**

Threaded closure, full environmental seal. Glenair Signature ProSeal protective cover features positive spring-action in closed position. Locks open at 105° from receptacle face. Self-aligning gimballed lid and threaded closure.

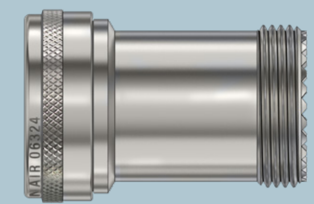
799-162 Plug Cover and 799-163 Receptacle Cover

Metal protective covers for Series 795 RF connectors. Machined Aluminum. IP68 ingress protection. Conductive fluorosilicone rubber gasket prevents moisture intrusion. Machined Aluminum

Series 65 and 66 RF Connector Protective Covers, Dust Caps, and Accessories

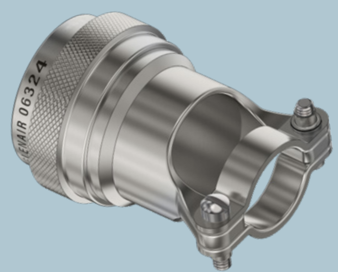
Glenair offers a complete range of protective covers, dummy stowage receptacles, and other accessories for MIL-PRF-39012 and other industry-standard single-line RF cable adapters. All components are precision-machined and equipped with a selection of rugged lanyard and attachment hardware.

Backshells for Direct-Attach Cables and Connectors (consult factory for G-LinkRF Backshells)



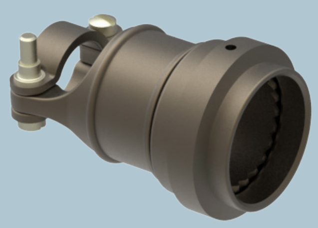
320*030 Environmental Extended Adapter (Series 806 RF and SuperNine)

Self-locking extender backshell provides extra clearance for direct-attach shielded coaxial contacts, size #8, #12, and #16. Consult factory for G-LinkRF backshells. Anti-decoupling mechanism provides audible detented coupling and prevents backoff under high vibration. Aluminum or stainless steel with silicone O-ring. Straight, 45°, and 90°. Use in conjunction with available saddle clamps.



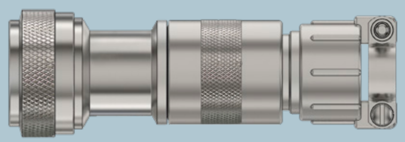
620*S090 Strain Relief Cable Clamp Backshell (Series 806 RF and SuperNine)

Self-locking full-radius saddle clamp with extra clearance for direct-attach shielded coaxial contacts, size #8, #12, and #16. Extra clearance helps prevent contact splay and damage. Full radius saddle bars have self-locking SST clinch nuts. Anti-decoupling mechanism provides audible detented coupling and prevents backoff under high vibration.



440*S232 EMI/RFI Shielded Cable Clamp Backshell with Banding Platform (Series 806 RF and SuperNine)

Strain relief cable clamp adapter with banding platform and self-locking coupling with extra clearance for direct-attach shielded coaxial contacts, size #8, #12, and #16. Extra clearance helps prevent contact splay and damage. Full radius saddle bars have self-locking SST clinch nuts. Anti-decoupling mechanism provides audible detented coupling and prevents backoff under high vibration.

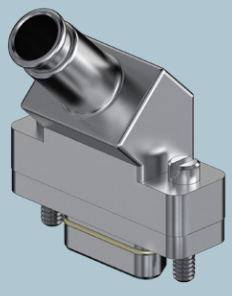


443*042 EMI/RFI Shielded Cable Clamp and Band-in-a-Can Banding Platform (Series 806 RF and SuperNine)

Unique "Band-in-a-Can" design protects shield termination zone. Extended length prevents splaying of size #8, #12, and #16 contacts and direct-attach cables. 45° and 90° profiles have large radius elbows for minimized bending of RF cables. Anti-decoupling mechanism provides audible detented coupling and prevents backoff under high vibration. Environmentally sealed with O-rings. Aluminum or stainless steel.

799-164 EMI/RFI Shielded Backshell for Series 795 RF Connectors

Prevents splaying of size #8, #12, and #16 contacts and direct-attach cables. Two-piece EMI shroud. 799-164 backshell is designed for Series 795 RF connectors with drop-in coaxial contacts. Internal cable clamp maintains proper cable/contact alignment. Non-environmental. Backshell fits securely into groove in connector shell.



GMMD Series EMI/RFI Shielded Banding Backshells for Factory-Terminated Back-to-Back Cables and Pigtails

Supplied as component element in GMMD series cable and pigtail assemblies. Prevents splaying of 50 and 75 Ohm coax-contact cables. Precision-machined and shrouded for reliable EMI/RFI protection. Available in straight, 45°, and 90° cable routing configurations. Banding platform accepts Glenair Band-Master ATS® Nano shield termination bands.

Outlook

"Mission-Critical" for the Full Business Cycle

Glenair didn't get its start making industrial-grade interconnect components and then diversify into the Mil-Aero space. In fact, we have always structured our business—and always will—to meet the needs of the most high-reliability air, sea, land, and space systems. Glenair's tagline, *Mission-Critical Interconnect Solutions*, spells this out loud and clear: we make high-reliability and high-durability interconnect components for harsh application environments—environments where product failure could be an existential threat to the systems and end-users employing our products. From high-speed avionic connectors, to space-grade wire harnesses, deep-sea cables, and battlefield power and data hubs, we design and build interconnect gear that delivers under the most brutal environmental conditions.

But Mission-Critical doesn't just mean conventional measures of product durability and quality. It isn't enough, at least in our minds, to make defect-free components that survive subsea pressures or trips to outer space. A big part of Mission-Critical is moving that ball down the field, it's designing and building interconnects that truly advance the capabilities and performance of the OEM systems and sub-systems where our products are used. When we engineer smaller and lighter connectors that still meet the most stringent industry performance benchmarks, that's Mission-Critical. When we invent a new plating process that delivers longer life and superior electrical resistance, that's Mission-Critical. When we master the art of high-speed data transmission with cables and contact-densities that enable customers to radically optimize the SWaP of their systems, that's Mission-Critical.

Which brings me, finally, to the main point of this column: the importance of Glenair being the Mission-Critical supplier our customers need us to be *not just some of the time, but for the full business cycle.* A 12/18/22 article in the NY Times presents a detailed look at the unprecedented level of defense spending anticipated over the coming years. Commercial aircraft backlogs have never been bigger. Space launch and satellite sectors are booming. And the world's thirst for energy that works (yes, oil and gas) has never been greater. But without exception, the readiness reviews we conduct for our most important customers and programs all say the same thing: Glenair has the factory capacity, the engineering, fabrication and assembly talent, raw materials, approvals, qualification and test resources, component-part and finished goods inventories (and more!) necessary to meet today's—and tomorrow's—most aggressive production requirements.

"Mission-Critical" puts high demands on an organization. It is a practice where even the smallest things can have a big impact. Most importantly, it is a discipline that anticipates the mercurial nature of the business cycle with a "be prepared" attitude and a commitment to meeting customer requirements during both the worst of times, and the best.

Chris Toomey

QwikConnect

GLENAIR • Volume 27 • Number 1

Publisher
Christopher J. Toomey

Managing Editor
Marcus Kaufman

Art Director/Editor
Mike Borgsdorf

Graphic Designer
George Ramirez

Editor
Meghan Taylor

Technical Consultant
Jim Donaldson

Issue Contributors
Dave Critelli
Mike Ghara
John van den Enden
Guido Hunziker
Ed O'Brien
Sam Peeling
Matt Shingleton
Tim Smith
Rob Valentine

Distribution
Terry White
Mirna Gonzalez

To subscribe or unsubscribe, please contact Terry White: twhite@glenair.com

GLENAIR, INC.
1211 AIR WAY
GLENDALE, CA 91201-2497
TEL: 818-247-6000
FAX: 818-500-9912
E-MAIL: sales@glenair.com
www.glenair.com