

QwikConnect

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JTAC-TOUGH™
STAR-PAN™

USB HUB / POWER DISTRIBUTION SYSTEMS





JTAC-TOUGH™

Few things impact the course of a battle like a precision air strike. But few things are as fraught with risk as controlling the actions of a fighter pilot or drone speeding over a battlefield at high elevation with orders to deliver ordnance. Imagine a complex battlefield concentrated within a single square mile, and packed with civilian domiciles, friendly and hostile personnel, military ground vehicles, hidden terrain, exposed elevations, bad visibility and intense weapons fire. Directing an air strike under such conditions is no piece of cake—and certainly well beyond the training of the average infantryman. That's where the JTAC comes in.

Joint Terminal Attack Controller (JTAC) is the common term used throughout the United States

Armed Forces as well as other militaries for the highly-trained specialist who calls in and directs close air support from a forward position. Simply put, JTACs work alongside ground soldiers to control precision air strikes on enemy targets. JTACs use a broad range of specialized digital equipment and tactical expertise to ensure the safe and effective integration of air power into ground warfare operations. The JTAC's role in support of Digitally Aided Close Air Support (DACAS) is

powered with a phalanx of specialized equipment including targeting lasers, night-vision goggles and target-marking devices, rugged field radios, video datalink devices and more.

JTACs are highly trained experts that earn their place on the battlefield through an intense and ongoing program of physical, mental and technical training. In addition to the weight of the digital equipment and power resources JTACs carry, they shoulder the heavy responsibility of calling in and directing air strikes on the right target at the right time to protect our soldiers in the field and achieve mission success.

As reported in *Air Force Times*, "Staff Sgt. Richard Hunter, a combat controller with the 23rd Special Tactics Squadron, will receive the Air Force Cross for his actions during a 2016 battle in Kunduz Province, Afghanistan. During the battle, Hunter called in 31 danger-close air strikes in support of his 12-man Army

Special Forces team. Some of those air strikes were as close as 13 meters from friendly forces. The Air Force Cross is second only to the Medal of Honor".



STAFF SGT. RICHARD HUNTER
COMBAT CONTROLLER



DACAS missions are absolutely critical in modern military operations, where dismounted special operations





teams operate throughout an asymmetrical battlespace to find, target, and destroy the enemy with airpower.

This is not your grandfather's battlefield. The art of military operations has grown far beyond the linear battles of World War II and Korea into a non-linear battlespace where forces operate fluidly within a joint area of operations. In order to achieve maximum effectiveness in this new environment, the number of personnel in JTAC-type positions has exploded to well over 1500 in active service within US armed forces alone. The worldwide number is much greater.

Even so, all service branches face shortages of qualified JTAC personnel, as qualification and training for these positions is so time-consuming and intense. The sheer number of daily combat air patrols, or CAPs, now flown by both piloted and remotely piloted aircraft, is just one measure of the value of airpower in close support of ground soldier missions. Increasingly, the key element in forward military operations has become the Joint Terminal Attack Controller with his ability to maximize the impact of available airpower.

As described above, JTACs rely on a suite of digital devices to perform their vital function in the field. Glenair technology plays an important ancillary role in attack controller and other soldier equipment sets. Glenair STAR-PAN™ Integrated Soldier Power / Data Hubs are personal area network (PAN) hub and interconnect systems that provide network data access, peripheral device connectivity and smart battery power management for JTAC electronics in Digitally Aided Close Air Support missions. Typical missions call for precision targeting, tactical radio communications, real-time video downlink, night vision capabilities, GPS/navigation, blue force tracking, personal computing and smart phone integration.

Core capabilities of STAR-PAN include

- USB compatible peripheral interconnection and support
- Software-defined radio support and power
- Common interconnect interface
- Smart charging and battery power management

Ruggedized soldier-worn electronics have revolutionized mission effectiveness. But the evolution of integrated C4ISR technology for the Joint Terminal Attack Controller (JTAC) has added significant mission weight to the soldier ensemble. Battery power management for this broad range of integrated electronic gear is a significant challenge in terms of mission time, weight and supply logistics.

The Glenair integrated STAR-PAN™ soldier data hub and power distribution system enables soldiers to make the most of Personal Area Network (PAN) devices – improving situational awareness, surveillance, intelligence and reconnaissance.

Glenair JTAC-Tough™ STAR-PAN™ technologies optimize power monitoring, conditioning, and distribution performance with on-board smart power management for longer missions and lighter loads. Importantly, all STAR-PAN™ technologies, from high-density Glenair Mighty Mouse quick-disconnect connectors to the low-profile hub enclosure itself, are designed for optimal size and weight reduction. All STAR-PAN™ systems deliver ruggedized mil-spec / battle-tested environmental sealing and EMC shielding.

This special issue of *QwikConnect* introduces our latest evolutions of the JTAC-TOUGH™ STAR-PAN™ family of integrated soldier USB / Power hubs. For complete information, please visit our website www.glenair.com/star-pan.

Available now: the complete *STAR-PAN USB Hub / Power Distribution Systems* catalog with complete technical specifications and how-to-order information for STAR-PAN soldier hubs, interconnect cables, power adapters and boosters, X-frames, MOLLE pouches, and more





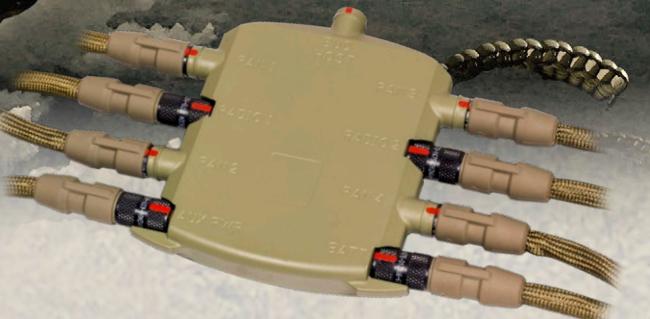
JTAC-TOUGH™ STAR-PAN™

Multiport power and data hubs for digitally aided close air support

Ruggedized soldier-worn electronics have revolutionized mission effectiveness. But the ongoing evolution of Digitally Aided Close Air Support (DACAS) missions, including precision targeting, tactical radio communications, real-time video downlink, night vision technologies, GPS/navigation, blue force tracking, personal computing and smart phones have added significant mission weight to the dismounted soldier ensemble. Battery power management for this broad range of electronic gear is a significant challenge in terms of mission time, weight and supply logistics. The Glenair STAR-PAN™ data hub and power distribution system enables soldiers—particularly in Joint Terminal Attack Controller (JTAC) roles—to make the most of C4ISR devices, improving situational awareness, surveillance, intelligence and reconnaissance while optimizing power monitoring, conditioning, and distribution performance. Importantly, all STAR-PAN™ technologies, from the high-density Glenair Mighty Mouse quick-disconnect connectors and cables to the low-profile hub enclosure itself are designed for optimal size, weight, and ruggedized mil-spec performance with battle-tested environmental and EMC sealing and shielding.



Glenair's Tactical Interconnect Solutions team is backed by six decades of proven, made-in-America interconnect industry performance in service of US and allied armed forces.



STAR-PAN™ packaging reduces heat and increases power efficiency and battery life

- **Versatile 2 and 6-port USB high-speed hub configurations**
- **Compatible with USB 1.1, USB 2.0, and SMBus**
- **Embedded power charging/conditioning electronics in all designs**
- **Smart power monitoring for longer mission life**
- **Robust circuit protection**
- **Sealed IAW the MIL-STD-810 harsh-environment standard**

Export of STAR-PAN™ USB Hub/Power Distribution Systems is restricted and/or controlled by U.S. Department of Commerce Export Administration Regulations

JTAC-TOUGH™

STAR-PAN™

**Multiport USB Hub / Power
Distribution Technology for DACAS Applications**

GLENAIR



STAR-PAN™ II 2-PORT USB DATA / POWER HUB

Universal C4ISR system hub with compliant ports for up to 2 peripheral devices and dedicated support for host/End User Device (EUD), video downlink receiver, and dismounted soldier radio. Available STAR-PAN II core kit adds MOLLE pouch, USB host adapters, accessory cables, and AC/DC power adapter



STAR-PAN™ VI MULTIPORT USB DATA / POWER HUB

Universal JTAC system hub with compliant ports for up to 6 peripheral devices plus Personal Area Network (PAN) support for host/EUD and dismounted soldier radio. Available STAR-PAN VI core kit adds MOLLE pouch, STAR-PAN extension cable, USB host adapters, accessory cables, and AC/DC adapter



STAR-PAN™ SYSTEM HOST / EUD CABLES, ADAPTERS, AND ACCESSORIES

Broad, open-system cable support for all popular special forces/DACAS host computers and ruggedized dismounted soldier devices



STAR-PAN™ SYSTEM PERIPHERAL DEVICE AND STANDARD PROTOCOL DATA CONVERSION CABLES

The industry's broadest network/cable support for DACAS mission C4ISR peripherals including DAGR, PLRF, TacRover-e, TacRover-p, and others



STAR-PAN™ SYSTEM RADIO CABLES AND ADAPTERS

Ruggedized, small form-factor radio cables and adapters for the broad range of current signal communication systems including AN/PRC-152A, AN/PRC-154, AN/PRC-117G, PRC-148, Wave Relay, RT-1922, and others



STAR-PAN™ SYSTEM POWER CABLES AND BATTERY ADAPTERS

Complete power sourcing for BA5590 / BB2590 batteries, hand-held radio batteries, and other primary batteries and direct current auxiliaries

STAR-PAN™ II

Integrated USB data/power distribution hub for radio communications, video downlink and other mission-critical dismounted soldier applications



Lightweight,
non-reflective,
power and data
hub for tactical
radios and
peripheral devices

STAR-PAN™ II

- Universal PAN compliant ports (up to two devices)
- 1 designated host/EUD port
- 1 designated radio peripheral port
- 1 expandable PAN port for up to two USB peripherals
- Hot-swappable power sources
- Radio-supplied backup power
- Glenair power port management
- Brazed construction, integrated connectors



STAR-PAN™ HUB AND BOARD TECHNOLOGIES



Glenair multiport STAR-PAN™ USB hub and power distribution systems are engineered and manufactured under one ISO 9001 and AS9100 certified quality system in our 1,000,000 sq. ft Southern California factory. All components, from the I/O interconnects to the precision-machined enclosures are produced in-house by Glenair. The STAR-PAN™ system is designed for maximum compatibility with non-proprietary Ethernet* and USB data interfaces, and is capable of smart charging and power distribution for the broad range of military batteries, as well as from Direct Current (DC) power sources including vehicle power, solar panels, kinetic energy devices and fuel cells.

* Requires STAR-PAN™ Ethernet Adapter

WARRIOR TOUGH

STAR-PAN™ II

808-057

2+ port smart power and data hub / cable



STAR-PAN™ II



808-057 STAR-PAN II hub with dedicated host and radio cables

RECOMMENDED CORE CAPABILITIES KIT

Part No. SPK808-057-001 contains:

- 1x Micro-B USB 2.0 Adapter (808-092)
- 1x Type A USB Host Adapter (808-079)
- 1x USB-A Accessory Cable (808-053)
- 1x AC/DC Power Adapter (808-064)
- 1x MOLLE Pouch (808-057-MP)



The Glenair STAR-PAN™ II Hub is a lightweight, durable, compact data and power distribution hub, ruggedized for harsh environment dismounted soldier applications. The hub provides a data backplane with power monitoring and management to connected external peripherals. The hub is compatible with USB1.1, USB2.0 (full and high-speed), and SMBus protocols.

The Glenair STAR-PAN™ II contains two power inputs for extended missions or battery substitution to minimize down time. Power distribution manages power to host devices such as a smart phone or tablet as well as downstream USB devices.

KEY FEATURES/BENEFITS

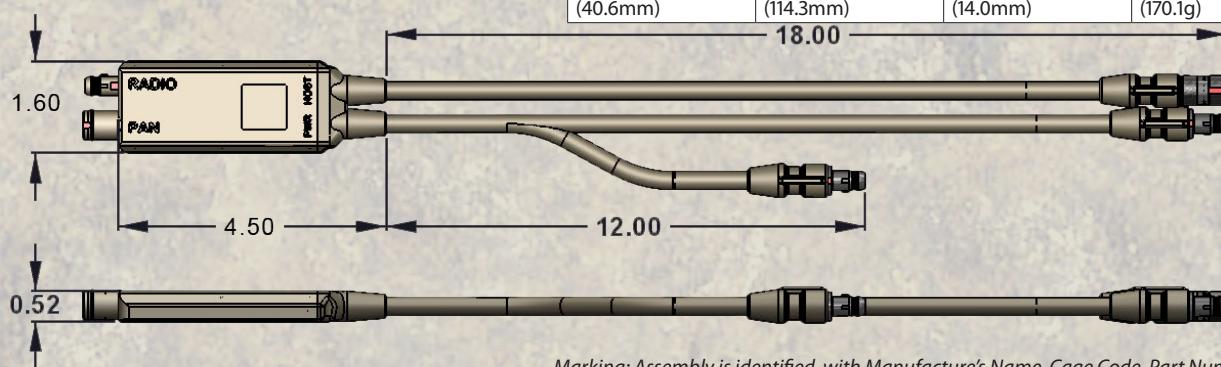
- Provides battery power and +5VBus power to up to 3 USB peripheral devices (requires 808-081 for 3rd device)
- Heat-efficient electronics packaging to optimize efficiency and extend battery life
- 2 power input ports for extended missions or battery hot swap
- SMBus, USB2.0 (full and high-speed), USB1.1 compatible interface
- Glenair's power monitoring and management for each voltage rail and port
- Compatible Personal Area Network (PAN) pin configuration and Smart Battery interface
- Built-in SMBus to USB converter to USB host devices
- IP67 rated dust and water resistant

APPLICATIONS

- Military tactical radio ensembles
- Video download
- Law enforcement data communications
- Fire rescue field communications and logistics
- Underground, highwall, and surface mining wireless communications

Export of STAR-PAN™ USB Hub/Power Distribution systems is restricted and/or controlled by U.S. Department of Commerce Export Administration Regulations

ULTRA LOW-PROFILE DESIGN



Marking: Assembly is identified with Manufacturer's Name, Cage Code, Part Number, Date Code and Serial Number. Dimensions are for reference only.

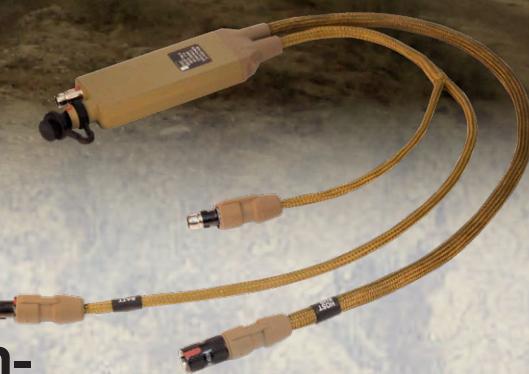
STAR-PAN™ II



MISSION PROFILE STAR-PAN™ II

Ultra-lightweight, small form-factor USB data / power hub for dismounted soldier applications

Mission flexibility is key in meeting the warfighter's ever-evolving duties in the field. The STAR-PAN™ II USB data/power hub is designed for core C4ISR capabilities including End User Device (EUD) integration, radio comm support, video downlink (Rover) as well as robust management of battery and auxiliary power sources.



- Multi-mission flexibility
- Open-system USB 2.0 support
- Video downlink receiver support for advanced situational awareness
- Turnkey radio comms and power management

TYPICAL RANGE OF SUPPORTED EUD AND PERIPHERALS (STAR-PAN™ II)



USB 2.0 compatible tablets and smart phones



TacROVER ISR receiver



STAR-PAN™ II incorporates embedded charge control circuitry for smart battery interface within a wide charge voltage range.



WARFIGHTER TOUGH

STAR-PAN™ II

**808-057 2+ port smart power and data hub / cable
DATA DOWNLOAD**



STAR-PAN™ II

STAR-PAN™ II

PERFORMANCE SPECIFICATIONS

| Operating Conditions | | | | | |
|------------------------------|--|------|-------|-------|--|
| Parameter | Min | Typ | Max | Units | Notes |
| Storage Temperature | -40 | | +80 | °C | |
| Operating Temperature | -32 | | +49 | °C | |
| Operation Altitude | | | 9754 | m | |
| Storage Altitude | | | 15240 | m | |
| Water Immersion, Mated | MIL-STD-810, Method 512, 1 meter for 1 hour; IP67 rated dust and water resistant | | | | |
| Host & Pan | | | | | |
| Battery Voltage | 10.0 | 14.8 | 20.0 | V | |
| Battery Supply Current | | | 3.5 | A | Maximum per individual port |
| Battery Supply Total Current | | | 5 | A | Total system |
| 5VUSB Supply Voltage | 4.75 | 4.90 | 5.1 | V | |
| 5VUSB Supply Current | | | 3 | A | Maximum per individual port |
| USB +/USB - | -0.5 | | +3.5 | V | |
| Radio Port | | | | | |
| Battery Voltage | 10.0 | 14.8 | 20.0 | V | Highest Priority for Power Management |
| Battery Supply Current | | | 5 | A | Maximum per individual port |
| +5V Back Up Supply Current | | 1.2 | 3 | A | Based on Radio Supply, Radio 1 Primary |
| +5V Back Up Supply Current | | | .5 | A | Per port |
| USB +/USB - | -0.5 | | +3.5 | V | |
| Battery Port | | | | | |
| Battery Input Voltage | 10 | | 20 | V | |
| Battery Supply Current | | | 5 | A | Maximum system supply current |
| SMBus Data | -0.5 | | +3.5 | V | P5 Only |

COMPATIBLE CABLES AND ADAPTERS

| Part Number | Description | Part Number | Description |
|-------------------------|---------------------------------------|----------------------------|--|
| 808-032 | PRC-152A Radio Data Adapter | 808-055 | HH Radio Battery Shoe |
| 808-039 | PRC-148 JEM Radio Adapter | 808-048 | BA5590/BB2590 Battery Shoe |
| 808-051 | PRC-154 Rifleman Radio Adapter | 808-047 | STAR-PAN General-Purpose Extension Cable |
| 808-035 | PRC-117G Radio Adapter | 808-092 | Micro-B USB 2.0 Adapter |
| 808-043 | TacRover-e ISR Receiver Cable | 808-080 | Radio Adapter |
| 808-045 | TacROVER-p SIR 2.0 ISR Receiver Cable | 808-053 | USB-A Peripheral Cable |
| 808-040 | DAGR GPS/Navigation Cable | 808-079 | Type A USB Host Adapter |
| 808-049 | PLRF 15C/25C Laser Range Finder Cable | 808-057-MP | MOLLE Pouch |
| 808-117 | Tactical Net Rover Cable | 808-132 | PNR-1000 Radio Cable |
| 808-067 | TacRover-p SIR 2.5 Cable | 808-041 | Vector-21 B LRF Cable |

MATERIALS AND FINISHES

Hub body and interface connector shells: Aluminum alloy
Corrosion-resistant/conductive plating: Electroless nickel
Chemical agent resistant coating: Epoxy, desert tan
Fasteners: Stainless steel with desert tan CARC
Electrical contacts: Copper alloy, gold plated
Connector dielectric: Liquid crystal polymer
Mighty Mouse plug interfacial seals: Fluorosilicone elastomer
Environmental seals/O-rings: Fluorosilicone
EMI ground spring: Gold plated beryllium copper
Protective connector cover: Santoprene

Hub sealing gasket: Silver-filled fluorosilicone
Connector backpotting: Hysol 2%
Solder type: RoHS compliant Sn95/Sb5 (232°C melting temp) and RoHS compliant Sn96.5/Ag3.0/Cu0.5 (217°C Melting)
Cable overmold compound: Santoprene
Electrical wires: TPU insulated high flex wire
EMI/RFI braided shielding: Tin-plated copper
EMI/RFI shield termination band: Stainless steel
Abrasion-resistant overbraid: Tubular Nomex®

WARFIGHTER TOUGH

STAR-PAN™ II

808-057 2+ port smart power and data system

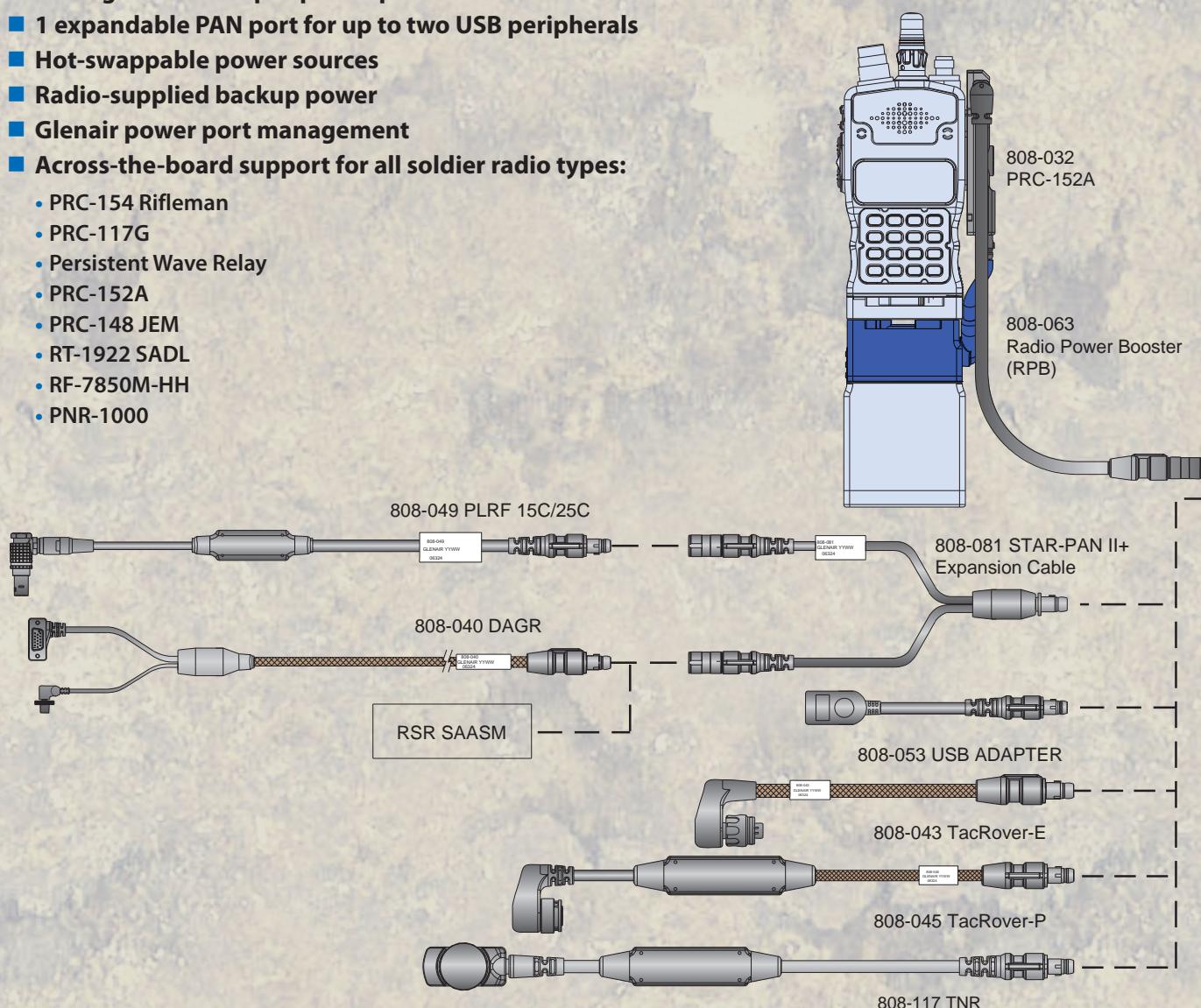
TURNKEY INTEGRATION



STAR-PAN™ II

STAR-PAN II CAPABILITY DIAGRAM

- Universal PAN compliant ports (up to two devices)
- 1 designated host/EUD port
- 1 designated radio peripheral port
- 1 expandable PAN port for up to two USB peripherals
- Hot-swappable power sources
- Radio-supplied backup power
- Glenair power port management
- Across-the-board support for all soldier radio types:
 - PRC-154 Rifleman
 - PRC-117G
 - Persistent Wave Relay
 - PRC-152A
 - PRC-148 JEM
 - RT-1922 SADL
 - RF-7850M-HH
 - PNR-1000



WARFIGHTER TOUGH

STAR-PAN™ II

808-057 2+ port smart power and data system
TURNKEY INTEGRATION



STAR-PAN™ II

STAR-PAN™ II

GLENAIR STAR-PAN TECHNOLOGY ILLUSTRATED IN THIS CAPABILITY DIAGRAM

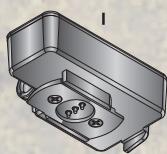
| STAR-PAN Component Description | Part Number |
|--|-------------|
| STAR-PAN II Multiport USB and Power Distribution Hub | 808-057 |
| STAR-PAN Expansion Cable | 808-081 |
| PRC 152A Radio Data Adapter | 808-032 |
| DAGR GPS/Navigation Cable | 808-040 |
| PLRF 15C/25C Laser Range Finder Cable | 808-049 |
| TacROVER-p SIR 2.0 ISR Receiver Cable | 808-045 |
| TacROVER-e ISR Receiver Cable | 808-043 |
| Tactical Net Rover ISR Receiver Cable | 808-117 |
| USB 2.0 Adapter Cable | 808-053 |
| Hand-Held Radio Battery Shoe | 808-066 |
| BA5590/BB2590 Battery Shoe | 808-048 |
| Radio Power Booster | 808-063 |

STAR-PAN II Hub
808-057
brazed-
construction
enclosure with
IP67 sealed ports

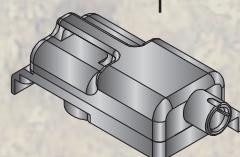
END USER DEVICE
(NOT INCLUDED)



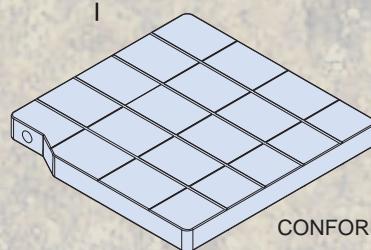
HOT SWAPPABLE
BATTERY CONNECTIONS



808-066
HANDHELD RADIO
BATTERY SHOE



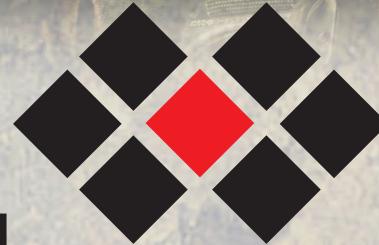
808-048
BB5590/2590
BATTERY SHOE



CONFORMAL WEARABLE
BATTERY (CWB)
DIRECT CONNECTION
(NO ADAPTER REQUIRED)
(NOT INCLUDED)

STAR-PAN™ VI

Integrated USB data/power distribution hub for digitally aided close air support (DACAS) and other complex multimission dismounted soldier applications



STAR-PAN™ VI

STAR-PAN™ VI

- Universal PAN compliant ports (up to six devices)
- 1 designated host/EUD port
- 2 designated radio peripheral ports
- 4 PAN receptacles for up to four peripherals
- Battery and auxiliary power source input
- Glenair power port management
- Radio-supplied backup power
- Smart battery charging from auxiliary power
- Up to 5A battery power per port, 5A system total
- Up to 3A 5 Volt VBUS power per port, 5A system total
- Brazed construction, integrated connectors



The ultimate data backplane, power monitoring and distribution hub for tactical soldier systems

Export of STAR-PAN™ USB Hub/Power Distribution systems is restricted and/or controlled by U.S. Department of Commerce Export Administration Regulations

STAR-PAN™ HUB AND BOARD TECHNOLOGIES



Glenair multiport STAR-PAN™ USB hub and power distribution systems are engineered and manufactured under one ISO 9001 and AS9100 certified quality system in our 1,000,000 sq. ft Southern California factory. All components, from the I/O interconnects to the precision-machined enclosures are produced in-house by Glenair. The STAR-PAN™ system is designed for maximum compatibility with non-proprietary Ethernet* and USB data interfaces, and is capable of smart charging and power distribution for the broad range of military batteries, as well as from Direct Current (DC) power sources including vehicle power, solar panels, kinetic energy devices and fuel cells.

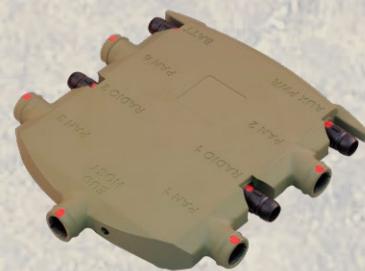
* Requires STAR-PAN™ Ethernet Adapter

JTAC TOUGH™

STAR-PAN™ VI

808-037

6 port smart power and data hub system



808-037 STAR-PAN VI hub with six PAN ports, two battery/auxiliary battery ports, and one universal host/EUD port

RECOMMENDED CORE CAPABILITIES KIT

Part No. SPK808-037-001 contains:

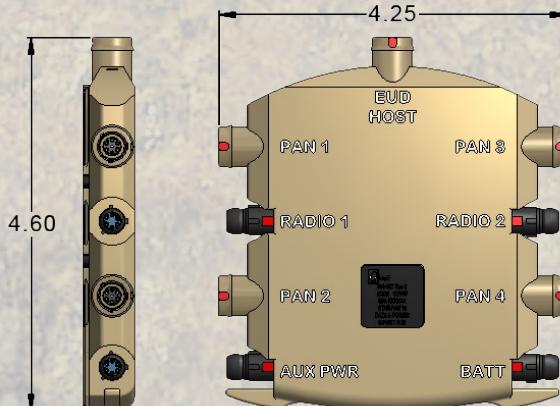
- 1x STAR-PAN Extension Cable (808-047)
- 1x Micro-B USB 2.0 Adapter (808-092)
- 1x Type A USB Host Adapter(808-079)
- 1x USB-A Accessory Cable (808-053)
- 1x AC/DC Power Adapter (808-064)
- 1x MOLLE Pouch (808-037-MP)



- **Battery Power and +5VBus power to up to 4 USB devices, 2 dedicated Radio ports**
- **Power monitoring and management for each voltage rail and port**
- **Robust fault mode protection circuitry for surge, reverse voltage, and over current**
- **Embedded level 3 charge control circuitry for smart battery interface, within a wide charge voltage range**
- **Compatible with DC power sources**
- **APS port for system power and main system battery charging on extended missions**
- **Heat efficient electronics packaging optimizes efficiency and extends battery life**
- **Radio Port Vbus System Hold Up for extended mission time and weight reduction**
- **Compatible Personal Area Network (PAN) pin configuration and Smart battery interface**
- **Built-in SMBus to USB converter to USB host device**
- **Power-on Night Vision Goggle (NVG) compatible LED Signal**
- **IP67-rated dust and water resistant**

808-037-001 STAR-PAN VI core capabilities kit

ULTRA LOW-PROFILE DESIGN



| | | | |
|---------------------|--------------------|------------------------|-------------------|
| Length \leq 4.60" | Width \leq 4.25" | Thickness \leq 0.65" | Weight 12.50 oz.* |
| (116.9mm) | (108.0mm) | (16.5mm) | (354.4g) |

Tolerance: $0.xx \pm 0.03$ · $0.xxx \pm 0.005$. * Weight does not include MOLLE POUCH or dust caps. Dimensions are for reference only.

APPLICATIONS

- **Digitally Aided Close Air Support (DACS)**
- **Video data uplink**
- **SATCOM GPS**
- **Search and rescue**
- **Strategic UAV support**

STAR-PAN™ VI

MISSION PROFILE

STAR-PAN™ VI

**Supported peripherals, radios,
hosts, and power supplies**



EXAMPLES OF STAR-PAN™ SUPPORTED PERIPHERALS / EUDs



EXAMPLES OF STAR-PAN™ SUPPORTED RADIOS



STAR-PAN™ SUPPORTED PRIMARY BATTERIES AND DIRECT CURRENT AUXILIARIES

STAR-PAN™ incorporates embedded charge control circuitry for smart battery interface with a wide charge voltage range.



JTAC-TOUGH™

STAR-PAN™ VI

808-037 6 port smart power and data hub system DATA DOWNLOAD

**STAR-PAN™ VI**

PERFORMANCE SPECIFICATIONS

| Operating Conditions | | | | | |
|----------------------------------|--|------|-------|-------|--|
| Parameter | Min | Typ | Max | Units | Notes |
| Storage Temperature | -40 | | +80 | °C | |
| Operating Temperature | -32 | | +49 | °C | |
| Operation Altitude | | | 9754 | m | |
| Storage Altitude | | | 15240 | m | |
| Water Immersion, Mated | MIL-STD-810, Method 512, 1 meter for 1 hour; IP67 rated dust and water resistant | | | | |
| Host & Pan 1-4 | | | | | |
| Battery Voltage | 10.0 | 14.8 | 20.0 | V | |
| Battery Supply Current | | | 3.5 | A | Maximum per individual port |
| Battery Total Supply Current | | | 5 | A | Total System |
| 5VUSB Supply Voltage | 4.75 | 4.90 | 5.1 | V | |
| 5VUSB Supply Current | | | 3 | A | Maximum per individual port |
| USB +/USB - | -0.5 | | +3.5 | V | |
| Radio 1 and 2 Ports | | | | | |
| Battery Voltage | 10.0 | 14.8 | 20.0 | V | Highest Priority for Power Management |
| Battery Supply Current | | | 5 | A | Maximum per individual port |
| +5V Back Up Total Supply Current | | | .5 | A | Based on Radio Supply, Radio 1 Primary |
| USB +/USB - | -0.5 | | +3.5 | V | |
| Auxiliary Power Supply Port | | | | | |
| Auxiliary Voltage Source | 10 | | 36 | V | |
| Auxiliary Supply Current | | | 5 | A | Max system supply current |
| Battery Port | | | | | |
| Battery Input Voltage | 10 | | 20 | V | |
| Battery Supply Current | | | 5 | A | Max system supply current |
| Battery Charge Current | | | 3 | A | |

COMPATIBLE CABLES AND ADAPTERS

| Part Number | Description | Part Number | Description |
|----------------|---------------------------------------|-------------------|--|
| 808-032 | PRC-152A Radio Data Adapter | 808-055 | HH Radio Battery Shoe |
| 808-039 | PRC-148 JEM Radio Adapter | 808-048 | BA5590/BB2590 Battery Shoe |
| 808-051 | PRC-154 Rifleman Radio Adapter | 808-047 | STAR-PAN General-Purpose Extension Cable |
| 808-035 | PRC-117G Radio Adapter | 808-092 | Micro-B USB 2.0 Adapter |
| 808-043 | TacRover-e ISR Receiver Cable | 808-080 | Radio Adapter |
| 808-045 | TacRover-p SIR 2.0 ISR Receiver Cable | 808-053 | USB-A Peripheral Cable |
| 808-040 | DAGR GPS/Navigation Cable | 808-079 | Type A USB Host Adapter |
| 808-049 | PLRF 15C/25C Laser Range Finder Cable | 808-037-MP | MOLLE Pouch |
| 808-117 | Tactical Net Rover Cable | 808-132 | PNR-1000 Radio Cable |
| 808-067 | TacRover-P SIR 2.5 Cable | 808-041 | Vector-21 B LRF Cable |

MATERIALS AND FINISHES

Hub body and interface connector shells: Aluminum alloy
 Corrosion-resistant plating: Black chromate over zinc nickel
 Chemical agent resistant coating: Epoxy, desert tan
 Fasteners: Stainless steel with desert tan CARC
 Electrical contacts: Copper alloy, gold plated
 Connector dielectric: Liquid crystal polymer
 Mighty Mouse plug interfacial seals: Fluorosilicone elastomer
 LED: Green/NVG compatible per MIL-L-85762A and MIL-STD-3009

Environmental seals/O-rings: Fluorosilicone
 EMI ground spring: Gold plated beryllium copper
 Protective connector cover: Santoprene
 Hub sealing gasket: Silver-filled fluorosilicone
 Connector backpotting: Hysol 2%
 Solder type: RoHS compliant Sn95/Sb5 (232°C melting temp)
 and RoHS compliant Sn96.5/Ag3.0/Cu0.5 (217°C Melting)



EXPORT CONTROL RIDDLE

Export of STAR-PAN™ USB Hub/Power Distribution systems may be made directly to government entities in any "friendly country" from The US Department of Commerce country group list A:5 under GOV exception without need for a licence. Here's the list—oh, sorry, nobody said it was gonna be easy.

TANGERNIA
ACIATOR

ERTHDALENNIS

TUPROGLA

ISNAP

**HOTSU
ROKEA**

EARLDIN

RATUSIA

NARCEF

**FALDINN
ANMORIA**

NAMGERY

LAYIT

WRAN

LIG

LARGU

LD on MERCATORS PROJECTION

g all
the different Circum-Navigators.

HITNUALIA

KRAMDEN

GERCEE

**TUNIED
MODKING**

NOY

BEUM

WESDEN

NALPOD

ANITOSE

BIA

WEN DEALNAZ

**ZECHC
PILBEURC**

NALDZERWITS

REXBOLMUGU

KAVIOSLA

ATASLIRUA

DANCIEL

ADACNA

HUNYRAG

YURTEK

NAPJA

VITAAL

VINOESLA

Answers published November 15th
www.glenair.com/qwikconnect

STAR-PAN™ VI

808-037 6 port smart power and data system

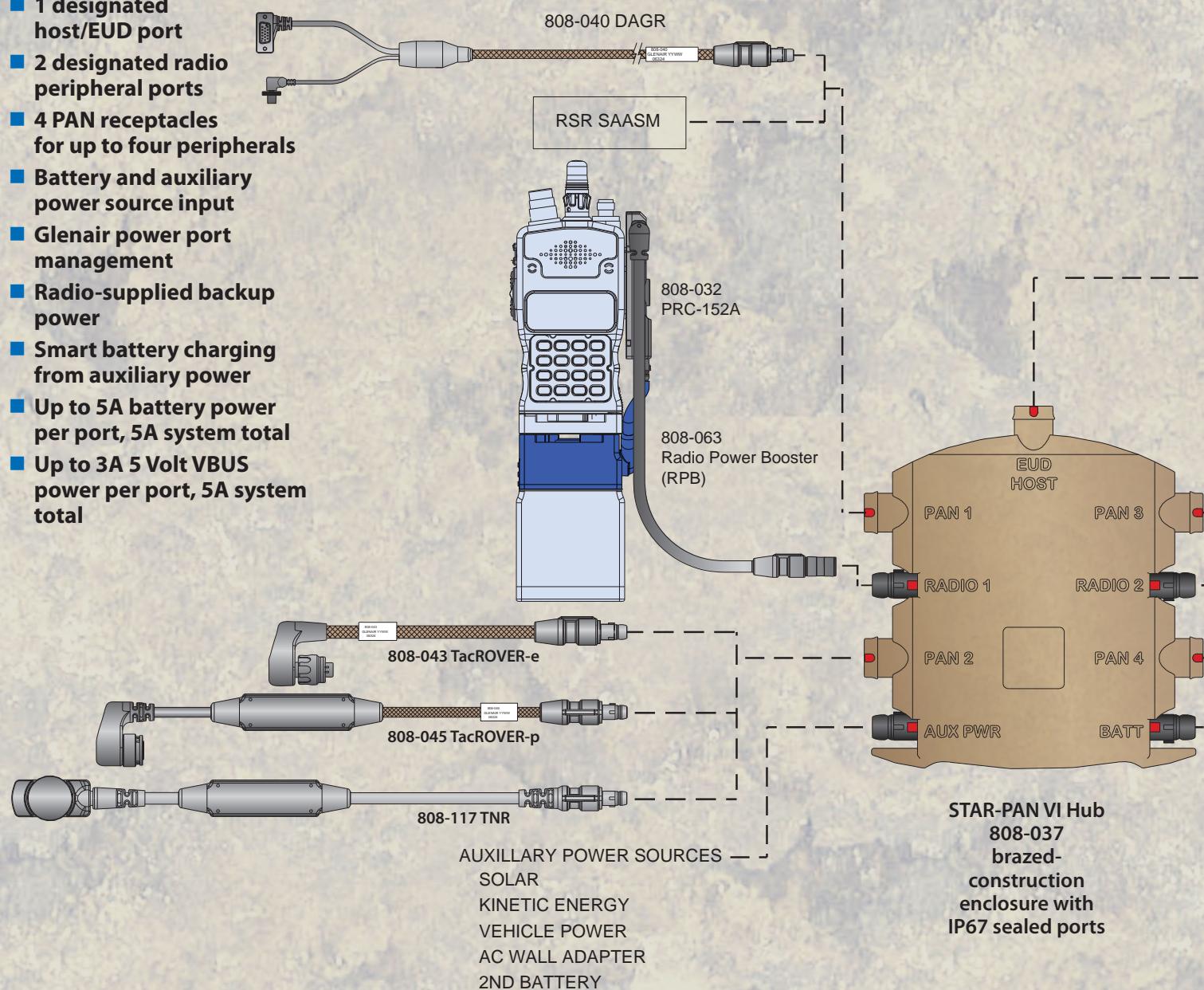
TURNKEY INTEGRATION



STAR-PAN™ VI

STAR-PAN VI CAPABILITY DIAGRAM

- Universal PAN compliant ports (up to six devices)
- 1 designated host/EUD port
- 2 designated radio peripheral ports
- 4 PAN receptacles for up to four peripherals
- Battery and auxiliary power source input
- Glenair power port management
- Radio-supplied backup power
- Smart battery charging from auxiliary power
- Up to 5A battery power per port, 5A system total
- Up to 3A 5 Volt VBUS power per port, 5A system total



JTAC TOUGH™

STAR-PAN™ VI

808-037 6 port smart power and data system TURNKEY INTEGRATION



GLENAIR STAR-PAN TECHNOLOGY ILLUSTRATED IN THIS CAPABILITY DIAGRAM: BILL OF MATERIALS

| STAR-PAN Component Description | Part Number |
|--|-------------|
| STAR-PAN VI Multiport USB and Power Distribution Hub | 808-037 |
| STAR-PAN General-Purpose Extension Cable | 808-047 |
| DAGR GPS/Navigation Cable | 808-040 |
| RT-1922 MicroLight SADL Radio Cable | 808-044 |
| PRC 152A Radio Data Adapter | 808-032 |
| TacROVER-e ISR Receiver Cable | 808-043 |
| TacROVER-p SIR 2.0 ISR Receiver Cable | 808-045 |
| Tactical Net Rover ISR Receiver Cable | 808-117 |
| PLRF 15C/25C Laser Range Finder Cable | 808-049 |
| USB 2.0 Adapter Cable | 808-053 |
| Hand-Held Radio Battery Shoe | 808-066 |
| BA5590/BB2590 Battery Shoe | 808-048 |
| Radio Power Booster | 808-063 |



808-047 C1- EXTENSION CABLE

END USER DEVICE
(NOT INCLUDED)

808-049 PLRF 15C/25C

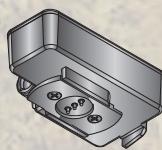


Radio Port:

- PRC-154 Rifleman
- PRC-117G
- Persistent Wave Relay
- PRC-152A
- PRC-148 JEM
- RT-1922 SADL
- RF-7850M-HH
- PNR-1000

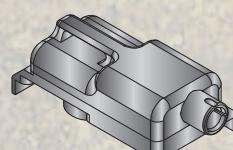


808-053 USB ADAPTER



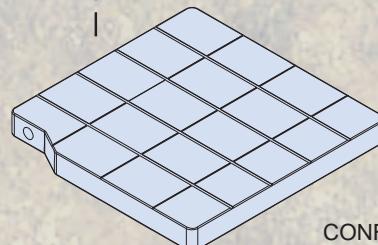
808-066

HANDHELD RADIO
BATTERY SHOE



808-048

BB5590/2590
BATTERY SHOE

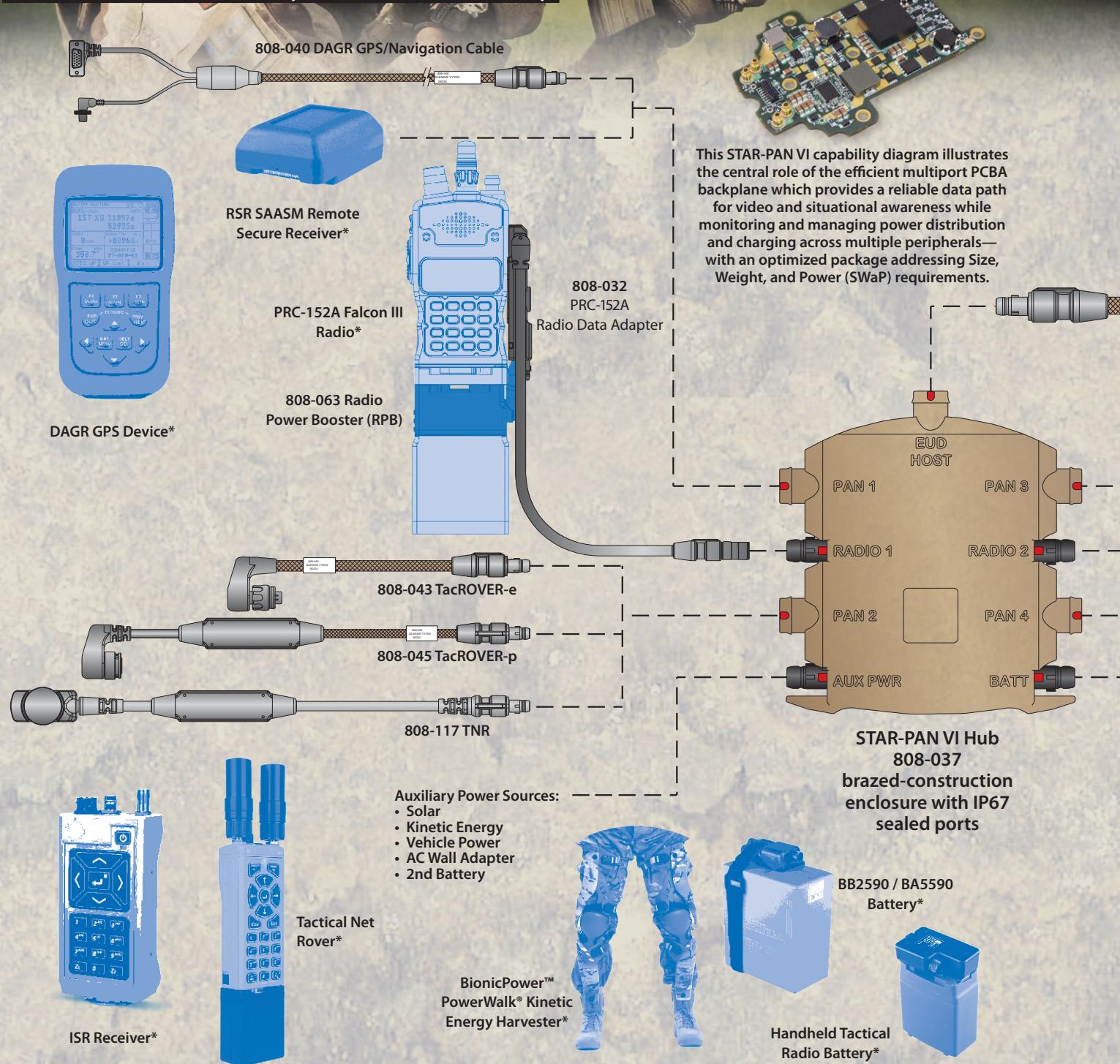


CONFORMAL WEARABLE
BATTERY (CWB)
DIRECT CONNECTION
(NO ADAPTER REQUIRED)
(NOT INCLUDED)

STAR-PAN™ VI



STAR-PAN CAPABILITY DIAGRAM (STAR-PAN VI SYSTEM SHOWN)



JTAC-TOUGH™

STAR-PAN™

Multiport USB Data and Power Distribution Technology for C4ISR

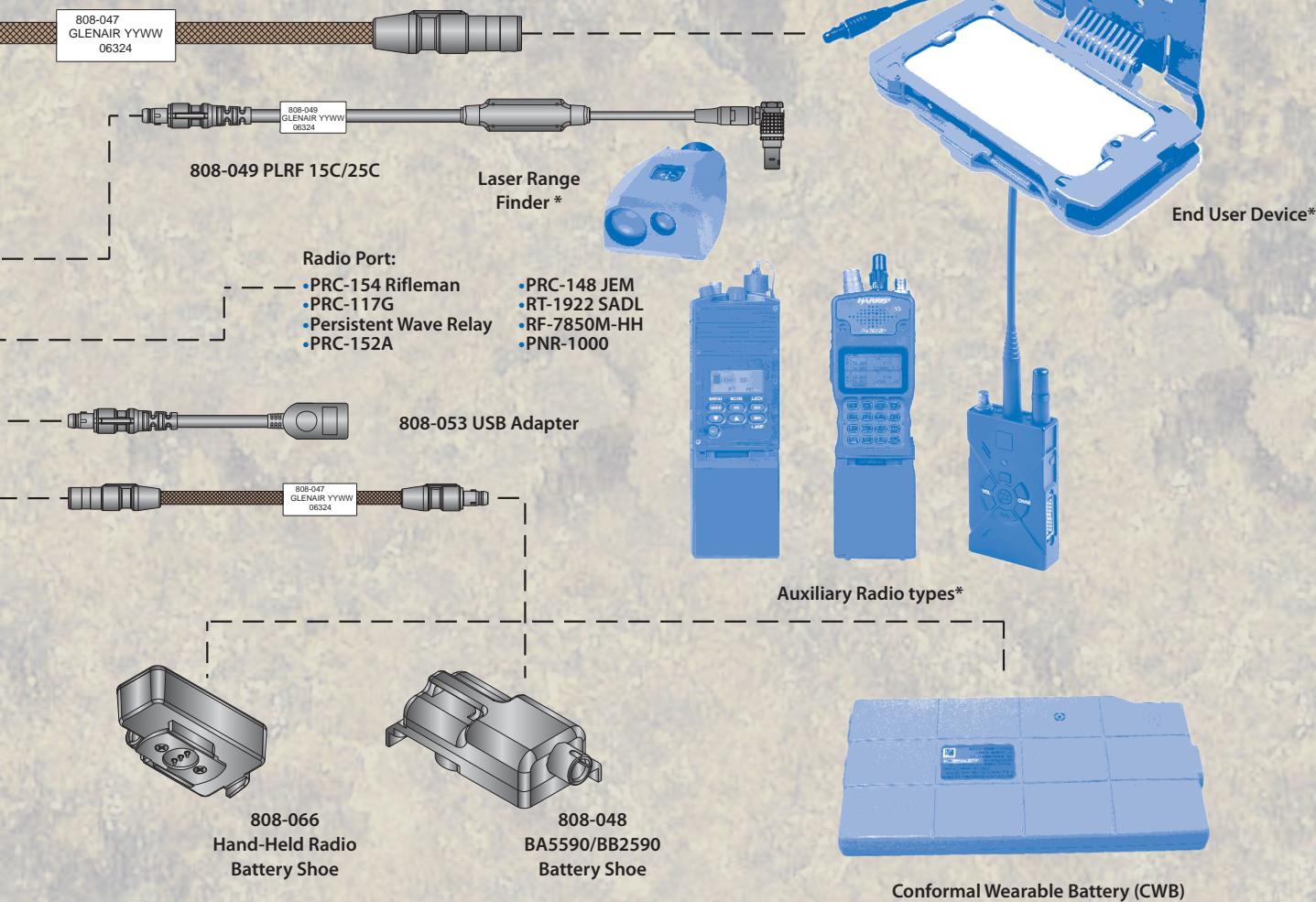
GLENAIR



GLENAIR STAR-PAN TECHNOLOGY ILLUSTRATED IN THIS CAPABILITY DIAGRAM

| | |
|--|---------|
| STAR-PAN VI Multiport USB and Power Distribution Hub | 808-037 |
| STAR-PAN General-Purpose Extension Cable | 808-047 |
| DAGR GPS/Navigation Cable | 808-040 |
| RT-1922 MicroLight SADL Radio Cable | 808-044 |
| PRC-152A Radio Data Adapter | 808-032 |
| TacROVER-e ISR Receiver Cable | 808-043 |
| TacROVER-p SIR 2.0 ISR Receiver Cable | 808-045 |
| Tactical Net Rover ISR Receiver Cable | 808-117 |
| PLRF 15C/25C Laser Range Finder Cable | 808-049 |
| USB 2.0 Adapter Cable | 808-053 |
| Hand-Held Radio Battery Shoe | 808-066 |
| BA5590/BB2590 Battery Shoe | 808-048 |
| Radio Power Booster | 808-063 |

808-047 Extension Cable



*not supplied by Glenair

STAR-PAN POWER DISTRIBUTION / CHARGING ARCHITECTURE (STAR-PAN VI SYSTEM SHOWN)

Smart power monitoring and embedded charging /conditioning are core capabilities in the STAR-PAN system. Support for both standard battery and auxiliary power sources is enabled with board-level electronics and firmware optimizing power monitoring and conditioning for extended mission life. The STAR-PAN system is available with all interconnect hub-to-power source adapters including support of scavenged power from direct current sources.

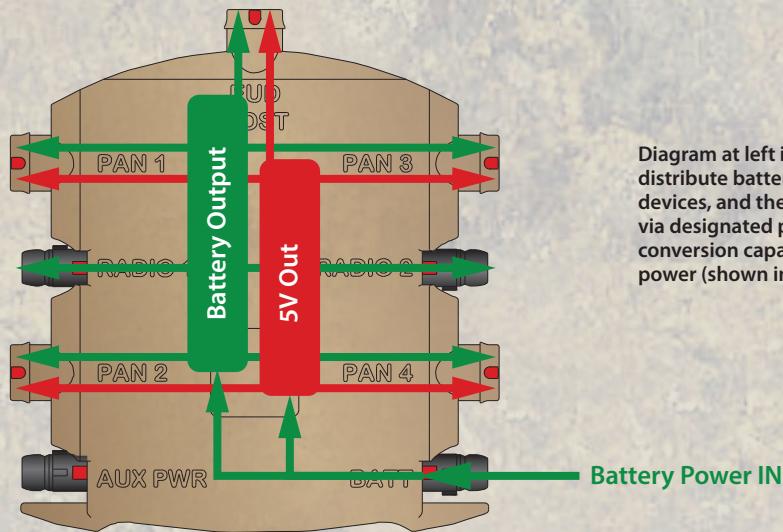
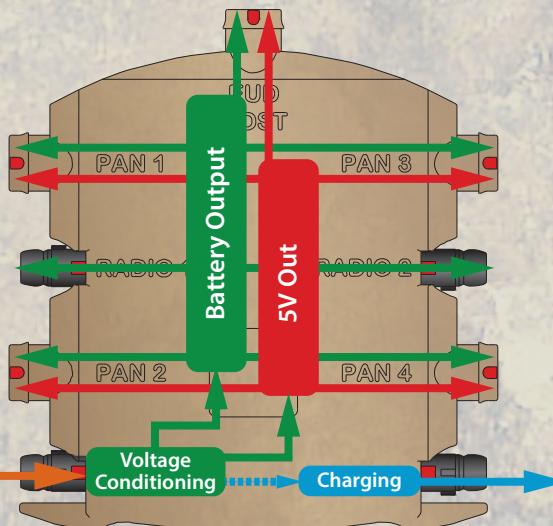


Diagram at left illustrates STAR-PAN's ability to distribute battery power to radios, peripheral devices, and the EUD/host (shown in green) via designated ports. On-board power conversion capability can also deliver 5 Volt power (shown in red) for USB power.



Auxiliary power sources, such as conditioned DC power from vehicles (shown in orange) is conditioned by the STAR-PAN embedded electronic subsystem for use by both standard battery-powered devices (green) as well as compatible 5 Volt equipment (red). The power may be served to both the EUD host port as well as to multiple PAN and radio ports. Finally, STAR-PAN functions as a charging station (shown in blue) to a rechargeable lithium ion smart battery.

JTAC-TOUGH™

STAR-PAN™

Multiport USB Data and Power Distribution Technology for C4ISR

GLENAIR



STAR-PAN may be used to both trickle charge radio power boosters as well as distribute available radio power to other devices.

Smart Power = Longer Missions, Lighter Load

From the JTAC's perspective, STAR-PAN is primarily a high-speed data processing and routing device. But its second core function—smart power monitoring, conditioning and charging—turns STAR-PAN into a powerful tool for extended mission life and operational effectiveness. *Smart power equals longer missions, lighter load.* STAR-PAN significantly reduces the number of batteries that must be carried by the soldier. Available interconnect cabling and power adapter accessories facilitate accelerated charging of the EUD, radio and peripherals as well as scavenged power from DC sources such as vehicles.

STAR-PAN™ SUPPORTED PRIMARY BATTERIES AND DIRECT CURRENT AUXILIARIES

STAR-PAN incorporates embedded charge control circuitry for smart battery interface within a wide charge voltage range.



BB-2590 /BA-5590 batteries



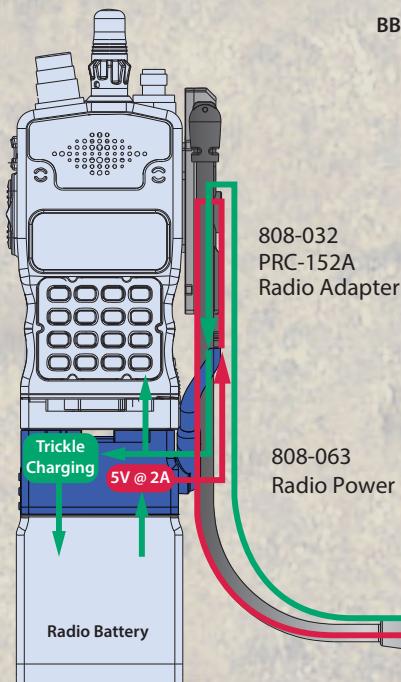
Conformal Wearable Battery (CWB)



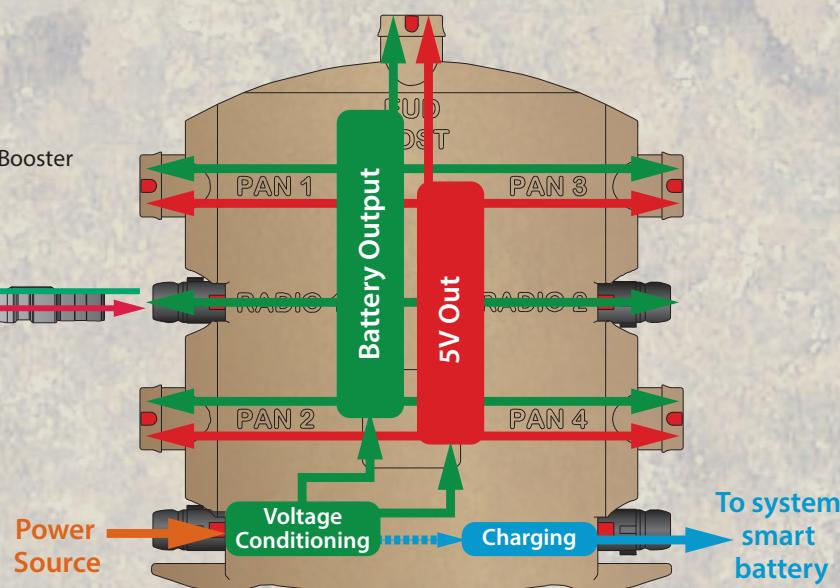
Universal field charging station



Handheld radio battery



This diagram illustrates the STAR-PAN VI configured with available 808-063 Radio Power Booster. While operating from the main Power Source, trickle charge is provided to the radio battery. If the main power source is depleted, the STAR-PAN's smart power management utilizes 5V power from the radio battery to power the system's critical 5V lines.





STAR-PAN™

Tactical Ground Soldier Cable Assemblies

GENERAL-PURPOSE STAR-PAN™ SYSTEM CABLES



NETT Warrior (C1) Extension Cable 808-047



Host USB-A Cable 808-079



C4 Micro USB EUD Host Cable 808-046

STAR-PAN™ PERIPHERAL DEVICE CABLES



TacROVER-e Cable 808-043



Radio Adapter Cable 808-080



USB 2.0 Adapter Cable 808-053



DAGR GPS/Navigation Cable 808-040



TacROVER-p ISR Receiver Cable 808-045



PLRF-15C/25C Laser Range Finder Cable 808-049

STAR-PAN™ RADIO DATA / POWER CABLES AND ADAPTERS



Microlight Radio Data Cable 808-044



PRC-117G Radio Data Cable 808-035



Harris Radio Adapter Cable 808-088



PRC-148 Radio Data Adapter 808-039



PRC-152A Radio Data Adapter 808-032



PRC-154 Rifleman Radio Data Adapter 808-051

**SMALL FORM-FACTOR
Tactical soldier interconnect cable assemblies
with Series 804 Mighty Mouse push-pull connectors**



HARSH ENVIRONMENT OVERMOLDED



Overmolded breakout assembly featuring 100% Glenair content; a true turnkey solution

ULTRAFLEXIBLE FABRIC OVERBRAID



Non-environmental aircraft cable with integrated circuit breakout box and Mighty Mouse 804 push-pull connectors



Multibranch cable assembly with Glenair Mighty Mouse, HiPer-D M24308 and customer-supplied power connector



Heads-up display (HUD) cable with custom Series 804 Mighty Mouse and low-profile cable routing



Turnkey overmolded GPS cable assembly with integrated switch



Military jet jumper cable with user-serviceable backshells and fabric overbraid for mechanical protection



Environmental cable with Glenair Series 804 Mighty Mouse, Series 79, and RF Coax terminations



Hybrid Mighty Mouse and Micro-D aircraft pilot helmet cable assembly

JTAC-TOUGH™

STAR-PAN™

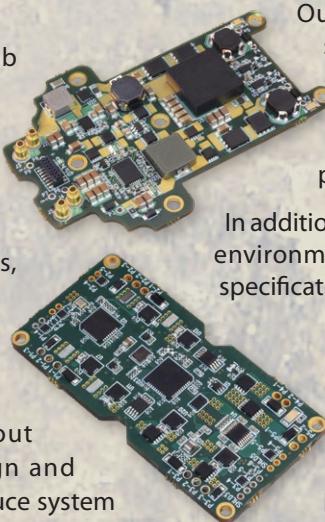
In-house embedded subsystem
design and fabrication



STAR-PAN™ RUGGEDIZED SMART POWER AND DATA HUB PCB TECHNOLOGY

GOING ALL-IN FOR THE WARFIGHTER

The heart of the Glenair STAR-PAN™ USB hub and power distribution interconnect system is a micro-controlled embedded system with surge and voltage protection, temperature sensors, smart-charge controllers, and USB/SMBus management circuits. Glenair provides complete system design solutions, from connectorized printed circuit boards, mechanical packaging (including stack-up, thermal, and vibration analysis), software, firmware and FPGA development. Glenair system engineers are available throughout the process with real-time, on-site design and troubleshooting support to dramatically reduce system integration design and cost.



Our design team is laser focused on optimized systems suited for applications such as ground soldier systems, unmanned aerial vehicles, robotic systems, field sensors, and other systems where attention to SWaP and rugged performance are paramount.

In addition, our PCB technologies are designed to stringent environmental, electromagnetic, and mechanical stress specifications including:

- MIL-STD-810G harsh environment
- MIL-STD-461 electromagnetic compatibility
- MIL-STD-1275 land vehicle power

Acceptance test stations and software, leveraging LabView, Visual Basic and other tools, have been developed in-house by Glenair to support comprehensive board qualification and testing.

> STAR-PAN™ ruggedized technology includes tactical nylon packaging built for easy integration and maximum durability



> Our Tactical Interconnect Solutions Team includes mechanical and electrical engineers who manage PCBA design and fabrication, FPGA / firmware programming, PCB layout, wet processing and more. System debug and acceptance test professionals also play key roles in every program.



Glenair certified Nadcap assembly technicians support both rapid prototyping as well as full-production programs. Our dedicated team ensures final subsystem assemblies meet every rugged performance requirement, including resistance to vibration, shock, and other mechanical stress factors.



JTAC-TOUGH™

STAR-PAN™

In-house tactical interconnect
design and fabrication



TACTICAL SOLDIER-SYSTEM INTERCONNECT SOLUTIONS

Unlike most suppliers of soldier C4ISR interconnect technology, Glenair is not just a system integrator. We design and manufacture all of the core components in our STAR-PAN™ hubs, ruggedized cable assemblies, flex circuit assemblies, and enclosures. This page presents six tactical Glenair connector series, field-proven in a broad range of warfighter applications.

**MIGHTY
MOUSE**



Series 824 locking
quick-disconnect



Series 804 breakaway
quick-disconnect

SuperFly®



The ultimate
nanominiature tactical connector

MOUSEBUD™



Low-profile, snap-
lock, trigger-release
connector for wearable
soldier systems

**BB-2590
BA-5590 Battery
CONNECTORS AND CABLES**



Military battery connectors and cables

HiPer 55116



HiPer 55116 advanced-performance audio frequency connectors
Mil-qualified and Glenair signature solutions

**RJ45/USB
SUPER
SEAL™**



Small form-factor field USB connectors

MIL-SPEC PEDIGREE

MIL-DTL-38999 and other DLA QPLs

Qualified Products: Glenair is a Mil-Aero connector supplier. Our product quality begins in engineering (the largest team in the high-performance interconnect business) and is realized in our “made in the USA” vertically-integrated manufacturing cells. One of the key ways we ensure both areas are functioning smoothly is to submit designs and manufactured specimens into the military QPL process administered by the Defense Logistic Agency of the US government. These certification exercises are multi-year activities that test every aspect of a connector’s performance.



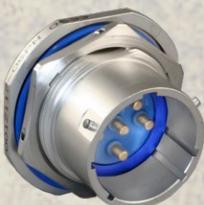
MIL-DTL-38999 Series III
environmental connectors



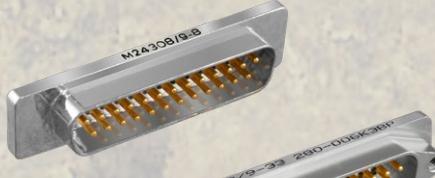
MIL-DTL-38999 Series IV environmental
connectors (pending)



MIL-DTL-28840 shipboard
connectors and accessories



MIL-DTL-38999 Series I, II, III, and IV
hermetic connectors



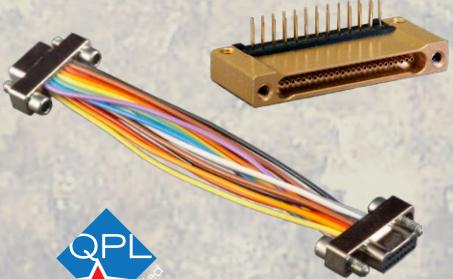
MIL-DTL-24308
hermetic connectors



MIL-DTL-28876
shipboard fiber optic



MIL-DTL-83513 Micro-D
connectors and accessories



MIL-DTL-32139 Nanominiature connectors and
accessories



MIL-DTL-29504 (fiber optic) and AS39029
(electrical) contacts

QwikConnect



M85049 (AS85049) backshells and connector accessories



MIL-DTL-83723 backshells and connector accessories



M81511 (AS81511) protective covers and connector accessories



M85049/140 series qualified / TACOM-approved environmental shrink boots



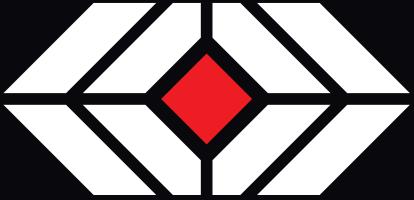
MIL-PRF-24758 Navsea-qualified conduit and fittings



M85049 composite backshells and covers for MIL-DTL-38999

MILITARY STANDARD PART NUMBERS AVAILABLE FROM GLENAIR

| | | | |
|-----------------------------------|---|--|--------------------------------------|
| D38999/20 | M39029/56, /57, /58, /83, /84, /106, /107 | MS25042 MS25043 | M28840/8 M28840/9 |
| D38999/21 | M55116/3, /4, /7 thru /10, /13, /14 | MS27291 MS27296 | M28840/13 M28840/15 |
| D38999/22 | M81511/13 | MS27297 | M28840/23 |
| D38999/23 | M81511/14 | MS27469 | M28840/24 |
| D38999/24 | M81511/16 | MS27470 | M28876/1 thru /15 |
| D38999/25 | M81511/17 | MS27471 | M29504/3, /14, /15 |
| D38999/26 | M81511/18 | MS27475 | MS3057 |
| D38999/27 | M81511/19 | MS27476 | MS3105 |
| D38999/28 | M83513/01 thru /33 | MS27477 | MS3115 |
| D38999/32 | M81914/1 thru /11 | MS27478 | MS3152 |
| D38999/33 | M83723/15 | MS27501 | MS3153 |
| D38999/40 | M83723/35 | MS27502 | MS3154 |
| D38999/41 | M83723/50 | MS27506 | MS3158 |
| D38999/42 | M83723/59 | MS27507 | MS3180 |
| D38999/43 | M83723/60 | MS27510 | MS3181 |
| D38999/44 | M83723/61 | MS27511 | MS3184 |
| D38999/45 | M83723/70 | MS27512 | MS3186 |
| D38999/46 | M83733/15 | MS27557 | MS3188 |
| D38999/47 | M85049/1 thru /31, /33 thru /47, /49, /51 thru /63, /69, /75 thru /96, /103 thru /130, /134 & /139 thru /142 | MS27558 MS27559 MS27741 MS28840/1 | MS3189 MS3410 MS3416 MS3417 |
| D38999/48 | M85528/1 thru /3 | MS28840/2 | MS3418 |
| D38999/49 | M32139/01, /02, /03, /04 | MS28840/3 | MS3419 |
| D38999/50 | MS17349 | MS28840/6 | MS3420 |
| M81824/1-1, -2, -3 | MS17350 | MS28840/7 | MS3437 |
| M38999/9, /10 | | | |
| M24308/9 | | | |
| M24758/1 thru /9, /11 thru /19 | | | |
| M29504/4 & /5 | | | |



TACTICAL INTERCONNECT SOLUTIONS

Our connector machining and box milling facilities are the largest in the interconnect industry, with ample capacity for both small and large production runs.



Glenair STAR-PAN™ hub assemblies feature integrated / welded I/O interconnects—the ultimate in low-profile, rugged design.



The Tactical Interconnect team runs its own dedicated STAR-PAN™ termination, assembly, and overmolded cable cell.



In-house clean room facilities for PCB and flex circuit fabrication as well as EMI/RFI filter array assembly distinguish Glenair from virtually every other supplier of tactical hubs and interconnect power systems.



Just a small slice of the engineering talent at work at Glenair. In addition to their interconnect design work, the team generates acceptance test requirements for printed circuit boards as well as complete systems.





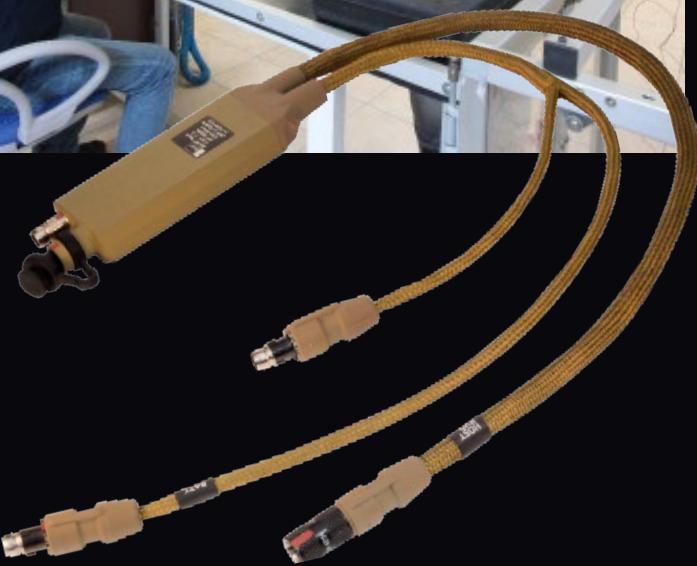
In-house
PCB/Flex
and cable
overmolding lines
enable Glenair to
quickly respond
to high volume
production
orders



The
largest
U.S. based
machining and
milling capacity
in the interconnect
industry (top)



Comprehensive
in-house
test labs



Glenair's entire operation, from design engineering to connector and hub fabrication is quality-controlled under a single ISO 9001 certified quality system.



Glenair®

For more information
contact Glenair at
818-247-6000 or
visit our website at
www.glenair.com
U.S. CAGE code 06324

Joint Terminal Attack Controllers (JTACs): The reason everyone in Glenair's Tactical Interconnect Solutions Team takes their work so seriously

Customer Loyalty

I have some thoughts on a couple of Glenair Guiding Principles and their impact on "customer loyalty:"

Protect the reputation of the organization: It is your primary responsibility to behave in a manner which reflects well on Glenair

Keep today's customer satisfied: It is cheaper to hold what you have than to retake what you have lost.

As I have said many times in the past, we call these things "guiding principles" because we understand that there is no possible way—and no sustainable value—in trying to get folks to follow a complex book of rules at work. Sure, we have our quality system, and that is very rules-based. But the wisdom still holds: if we all adhere to the goals and standards spelled out in our Guiding Principles we will continue to prosper for many years in a competitive marketplace.

Nick Saban, head coach at the University of Alabama, was once asked in an interview why he was so tough on people. Saban responded, "Well, I don't know if it's fair that I'm really tough on people. We create a standard for how we want to do things, and everybody's got to buy into that standard or you really can't have any team chemistry."

Customers visiting Glenair often comment on the healthy chemistry of our organization. How the folks out on the factory floor, for example, are so obviously happy and enthusiastic in their work. My friends, this is a priceless commodity, and there is no entitlement that says if you have it today it will be there for you tomorrow.

I am young enough to recall—with some emotion—the 1994 Major League Baseball player's strike that led to the cancellation of both the regular season and that year's World Series. Truth be told, I never really felt the same way about baseball after that. It took Boston going all the way in 2004 to bring me back to the game as an interested fan, but not the die-hard I once was.

Customer loyalty can turn on a dime. And we never want to experience a "1994" here at Glenair. So let's continue to keep our eyes on the ball by protecting our reputation with honest, ethical behavior, as well as a sincere commitment to keeping today's customers satisfied—two sure-fire ways to earn loyalty and keep our customers coming back for more.



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