QwikConnect

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STAR-PAN™ Mission Manager

Plug-and-play EUD/USB peripheral data exchange device for STAR-PAN Systems

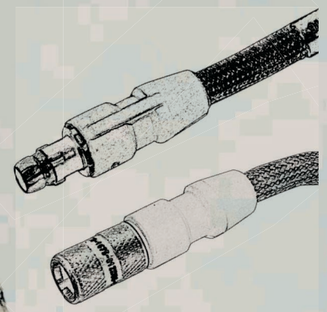
Remember when adding a printer or scanner to your office PC meant hours of work, installing drivers or struggling with complicated network protocols? Nowadays, it's far more common for standard PC network devices—from routers to monitors to printers—to be instantly recognized by the PC or server operating system for immediate use. Unfortunately, the same cannot be said for soldier Personal Area Networks (PAN). In the C4ISR world of today's ground combat forces, peripheral device support for both general use and mission-specific profiles remains a complicated and time-consuming process—one that often must be repeated for each and every mission.

Individual command, control and communication devices are designed for specific mission profiles, and generally for use within a particular branch of service. Soldier radios, for example (perhaps the single most important communication device in ground combat), are typically engineered for use within a carefully-defined IT domain where everything from supported frequencies to power supplies has been accounted for. But much of this careful attention flies out the window when soldiers need their equipment to interoperate seamlessly in a joint service or multi-national operation.

The challenge grows even greater when it comes to support for specialized peripheral devices selected for use in unique missions. While plug-and-play configuration and management of standard USB / Ethernet and radio devices is much talked about in soldier systems, the reality is that seamless connectivity between the soldier's tablet computing device (EUD) and the dynamic array of C4ISR equipment he has been tasked with using, remains a distant goal. That many device manufacturers resort to proprietary board-level technologies exacerbates the problem—often beyond the skillset (or the deadlines) of squad and platoon-level IT specialists.

By way of illustration, let's take a look at a complicated, but fairly common mission-profile, that of Digitally Aided Close Air Support or DACAS. DACAS is defined as "air action by fixed-wing and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces and requires detailed integration of each air mission with the fire and movement of those forces". The Joint Terminal Attack Controller, or JTAC, is the specialized authority on the ground who, in coordination with air and ground commanders, controls the maneuvering and targeting of air assets and ultimately grants weapons release clearance to attacking aircraft. Each service branch organizes, trains, and equips its own JTAC specialists, which means both a wide range of aircraft may be engaged in the mission, as well as a dizzying array of supporting digital equipment on the ground.

The illustration depicts a typical ensemble for the JTAC engaged in Digitally Aided Close Air Support. In this application, the soldier's digital equipment set is a virtual personal area network (PAN) that includes radio comms, targeting, video downlink, GPS location, primary and secondary battery power and of course the soldier's computing device or EUD with its DACAS software.



Dismounted soldier C4ISR technologies integrated on vest and interconnected with NATO STANAG 4695 / Nett Warrior connectors and cables (Glenair Mighty Mouse 807)

The many ruggedized soldier-worn electronics employed by the JTAC have revolutionized DACAS mission effectiveness. But the ongoing evolution and utilization of this broad array of digital equipment—including precision targeting, ground and air radio communications, real-time video downlink, GPS/navigation, and personal area network computing—has added significant weight, configuration complexity, and battery power consumption to this special soldier ensemble.

STAR-PAN™ Power / Data Hub Technology

In a previous issue of QwikConnect (October, 2017) we introduced our readers to our STAR-PAN USB Hub / Power Distribution System which enables dismounted soldiers—from standard light infantry to Joint Terminal Attack Controllers (JTACs)—to make the utmost of their C4ISR devices while optimizing power monitoring and power-distribution efficiency. STAR-PAN™ is a soldier-worn power / Personal Area Network (PAN) hub and interconnect cabling system that delivers open system network data access, peripheral device connectivity and user-controlled charging, scavenging, and battery power distribution / management. STAR-PAN™ hubs and cables provide the soldier with:

- Ethernet, USB, and RS232 peripheral support
- Software-defined radio support for all Mil-Std. and NATO platforms
- Charging, scavenging and battery power control
- Android and Windows compatible power management and monitoring, and
- Across-the-board interoperability with US and NATO standards.

2020 marks a milestone in STAR-PAN technology development and battlefield deployment. This scalable solution (see sidebar, opposite page) is now offered in a cable-only solution called STAR-PAN Light, and four different hub configurations. Each variant supports battery and EUD hook-ups as well as data and power connectivity for radios and peripheral devices—from as few as one to as many as six individual pieces of C4ISR equipment.

Introducing STAR-PAN™ Mission Manager

As useful a tool as STAR-PAN has become, these power and data sharing hubs cannot by themselves resolve the "plug-and-play" device configuration requirements discussed earlier. Enter the STAR-PAN Mission Manager, the newest member of the STAR-PAN system, designed to directly address the field device integration needs of today's battlefield warriors.

In-the-field addition of peripheral devices for both general use and mission-specific profiles is a complicated and time-consuming process that often must be repeated for each and every operation. The Glenair STAR-PAN Mission Manager solves this problem by providing an integration bridge between the soldiers' End User Device (EUD) and the C4ISR peripherals he depends on for mission success.

The STAR-PAN Mission Manager is a Linux ARM-based embedded computing device that acts as a full-time host, brokering data between soldier USB peripherals and the EUD. The STAR-PAN Mission Manager makes connecting multiple digital devices to any computing device—before, during, or between missions—easier than ever before.

STAR-PAN Mission Manager is End User Device independent—no device rooting or custom ROM images are needed—and is equipped with a dedicated port for connection to the downstream EUD. It provides real-time, plug-and-play device integration and also supports multiple simultaneous Ethernet interconnections.

Other key attributes of the Mission Manager include:

- Minimal power demands
- Seamless integration into the STAR-PAN™ system
- NATO standard Mighty Mouse connector interface

STAR-PAN Mission Manager is available now. Consult the factory or your local Glenair office for test data and battlefield heritage.

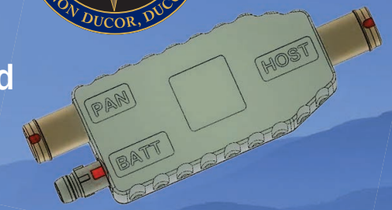
SCALABLE SOLDIER NETWORKS

Glenair®

JTAC-TOUGH™
STAR-PAN™

All technologies equipped with NATO STANAG 4695 / Nett Warrior soldier connectors

Multiport USB hubs, cables, and power management software for digitally-aided close air support and other soldier-worn power / data network applications



STAR-PAN™ I

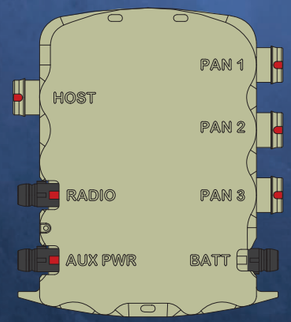
- **Flexible hub architecture: select cable types and lengths per mission requirements**
- **Minimal Personal Area Network configuration: host, battery, and single peripheral**

STAR-PAN™ Light

- **Ultra-lightweight cable-only solution for fast-moving ground forces**
- **Provides basic Personal Area Networking, host, and battery connectivity**

STAR-PAN™ II
Hub / Cable Assembly and Connectorized Hub

- **Compact dismounted infantry hub with hookups for host/EUD, comms, selected peripheral, and primary and secondary battery power**



STAR-PAN™ IV

- **A multi PAN and radio port solution for mission commanders, team leaders, SUAS and UGV controllers and others**
- **Supports all popular radio and primary and secondary power sources**

STAR-PAN™ VI

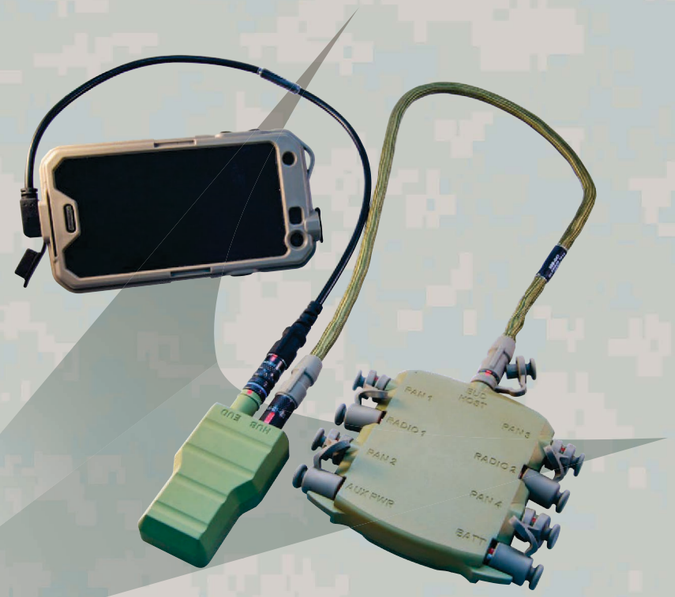
- **The ideal soldier power and data hub solution for Digitally Aided Close Air Support (DACAS)**
- **Supports multiple radios, four peripheral devices, host/EUD, and primary and secondary power**

STAR-PAN™ Mission Manager with MX Quick-Configuration Software

MISSION MANAGER with Stauder Technologies' MX quick-configuration software eliminates the need for costly EUD OS development, and / or complicated device provisioning, by providing an intelligent interconnection bridge between the soldier's EUD and his C4ISR peripherals. The secure datalink software runs directly on the EUD providing a graphical user interface for configuration and management of USB / Ethernet datalink connections and radios. STAR-PAN™ MISSION MANAGER with MX software eliminates the need to retest or recertify complex systems after EUD update or replacement.

FEATURES

- End User Device independent—no device rooting or custom ROM images needed
- Real-time, plug-and-play device integration
- Supports multiple simultaneous Ethernet devices
- Dedicated EUD port for connection to downstream End User Device
- Minimal power demands



Provide data and power to EUD without compromising security

- Seamless integration into STAR-PAN systems
- NATO standard Mighty Mouse connector interface
- Android, iOS, Windows and Linux compatible
- Export classification EAR99

Mission Manager: the plug-and-play bridge between soldier EUD and C4ISR devices

QUALIFIED FOR USE WITH
ALL STAR-PAN POWER / DATA HUBS:
LIGHT, I, II, IV, AND VI
NATO STANAG 4695 / NETT WARRIOR
CONNECTOR INTERFACE

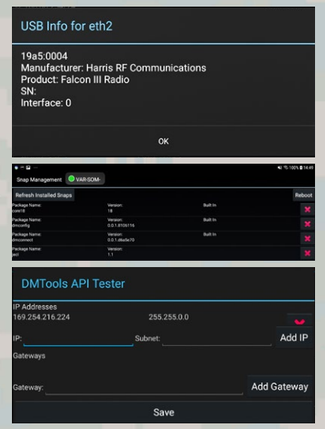
HOW TO ORDER	
Sample Part Number:	**TS2-002**
STAR-PAN device	MISSION MANAGER

PERFORMANCE SPECIFICATIONS

Operating Conditions	
Storage Temperature	-40°C to +80°C
Operating Temperature	-32°C to +49°C
Operation Altitude	9754m
Storage Altitude	15240m
Water Immersion, Mated	MIL-STD-810, Method 512, 1m for 1 hr.; IP67 rated dust / water resistant

FULL-TIME HOST TO BROKER DATA EXCHANGE BETWEEN SOLDIER USB PERIPHERALS AND THE EUD

Headless data management and routing for all open-system peripheral devices (lightweight single-radio configuration also supported for plug-and-play integration between radio and EUD).



MISSION MANAGER MX software runs directly on the soldier's EUD to provide plug-and-play configuration and management of USB/Ethernet datalink connections and radios

STAR-PAN™ MISSION MANAGER
Seamless Integration with 808-047 General-Purpose STAR-PAN Cable

MISSION MANAGER

STAR-PAN™ Mission Manager with MX Software

Supported plug-and-play EUD / USB peripheral
data exchange devices

STAR-PAN SYSTEM SUPPORTED HAND-HELD RADIOS (MISSION MANAGER PLUG-AND-PLAY SOLUTIONS)

AN/PRC-152A Radio

AN/PRC-154 Rifleman Radio

AN/PRC-148 MBITR / JEM Radio

Elbit PNR 1000 Radio

Persistent Systems MPU4

Harris RF-7850S-TR

Harris RF-7800S

AN/PRC-161 BATS-D Radio

AN/PRC 163 Radio

TrellisWare TW-875 TSM Ghost

Silvus SC4200

STAR-PAN™ Mission Manager with MX Software

Supported plug-and-play EUD / USB peripheral
data exchange devices

STAR-PAN SYSTEM SUPPORTED MAN-PACK AND OTHER RADIOS (MISSION MANAGER PLUG-AND-PLAY SOLUTIONS)

AN/PRC-117F, AN/PRC-150, RF-5800H, RF-7800H-MP Radio

AN/PRC-117G, RF-7800M-MP, RF7800H-MP Radio

Raytheon RT-1922 Microlight Situational Awareness Data Link (SADL) Radio

STAR-PAN SYSTEM SUPPORTED TARGETING DEVICES (MISSION MANAGER PLUG-AND-PLAY SOLUTIONS)

Vector 21/21B

PLRF 15C / 25C

STERNA True North Finder (TNF)

JIM-LR

JIM Compact

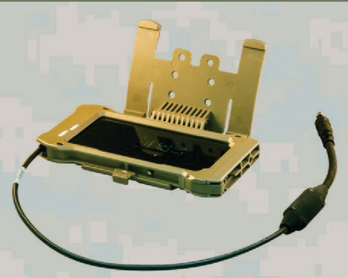
Moskito TI

STAR-PAN™ Mission Manager with MX Software

Supported plug-and-play EUD / USB peripheral
data exchange devices

STAR-PAN SYSTEM SUPPORTED END USER DEVICES (MISSION MANAGER PLUG-AND-PLAY SOLUTIONS)

Toughpad®
FZ-M1 / FZ-B2



Galaxy S7 in
Tactical EUD Juggernaut.Case

Galaxy S7 in
Kägwerks tactical EUD case

STAR-PAN SYSTEM SUPPORTED VIDEO DOWNLINK / GPS DEVICES (MISSION MANAGER PLUG-AND-PLAY SOLUTIONS)

DAGR GPS and
Micro DAGR-V

Tactical Net
Rover (TNR)

TacROVER-p
SIR 2.0

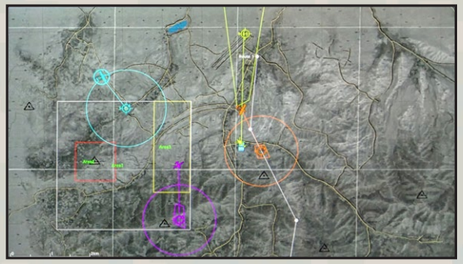
StrikeHawk
Digital

TacROVER-p
and -e SIR 2.5

Aerovironment
pDDL

About Tactical Rover Video and Data Receivers

Battlefield Digitally Aided Close Air Support missions, controlled by JTAC warriors, depend on real-time video footage and stills for critical situational awareness and reconaissance data. The video downlink devices shown on this page, principally the TacRover series, are hand-held full-motion video and data receivers, purpose-desiged for JTACs and other ground force commanders. These harsh-environment, fully-encrypted receivers support a broad range of End User Device interfaces, allowing the JTAC to interoperate seamlessly with tablets, smart phones and other ruggedized display devices.



JTAC-TOUGH™

STAR-PAN™ System Cables and Adapters

Cables and adapters qualified for use with all
STAR-PAN hubs: Light, I, II, IV, and VI

RADIO CABLES AND ADAPTERS

AN/PRC-152A
Radio Adapter
Cable

AN/PRC-117G /
RF-7800M-MP /
RF7800H-MP
Radio Adapter
Cable

RT-1922
Microlight
SADL
Radio Data Cable

POWER CABLES AND BATTERY ADAPTERS

BA5590/
BB2590
Battery Shoe

Radio Power Booster
For Harris, L3, Silvus,
and other radios

Conformal Battery
Adapter Cable

TARGETING CABLES AND ADAPTERS

Safran Vectronix Vector 21/21B
and Moskito Data Cable

PLRF 15C/25C
Laser Range Finder Cable

Safran Vectronix
STERNA TNF
Data Cable

VIDEO / GPS AND AUXILIARY C4ISR CABLES

DAGR GPS
Navigation
Cable

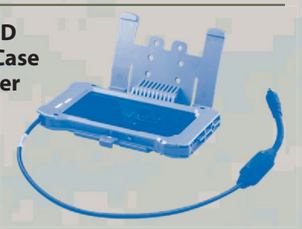
TacRover-e
Adapter Cable

StrikeHawk
Adapter Cable

HOST / EUD CABLES AND ADAPTERS

Kägwerks
tactical
EUD case
with
Adapter
Cable

USB-C EUD Charging Cable



Tactical EUD
Juggernaut.Case
with Adapter
Cable

Mighty Mouse 807: The NATO 4695 Standard

The worldwide (NATO) quick-disconnect (QDC) standard for tactical soldier system battery and C4ISR device interconnection

The STAR-PAN™ System grew out of capabilities gained by designing Mighty Mouse 807 into a broad range of soldier electronic devices and power supplies. Today, the Mighty Mouse 807 QDC dismounted soldier interconnect has both US and NATO STANAG 4695 compatibility—with broader battlefield application than all other tactical soldier connectors combined.

NATO 4695

NATO STANAG 4695 currently defines the standard dismounted soldier power connector interface (extension of the standard to encompass data connectivity is pending). Interoperability with this standard allows soldiers from different nations to share battery supplies and battlefield data, either directly or via available adapters. NATO STANAG 4695 ensures soldiers experiencing low battery power have greater likelihood of obtaining energy in the field from both national and NATO coalition primary or secondary power sources, reducing the logistical burden on the soldier while enabling prolonged mission duration and mission success.

Peripheral Device Interoperability

Due to the broad range of devices employed in ground-force missions, an open system architecture is vital. All STAR-PAN hubs, cables, and new Mission Manager utilize this US and NATO standard quick-disconnect connector interface as well as its power and data pin assignments. In fact, the 807 Mighty Mouse QDC has become an enabling technology which directly contributes to the easy integration of peripheral devices across the broad range of systems.

STAR-PAN and the 807 Mighty Mouse QDC have changed the landscape regarding interoperability and interconnect standardization. As more branches of the military—both US and NATO—adopt these two key technologies, the flexibility and versatility of C4ISR soldier systems is significantly improved, allowing these devices and the soldiers who use them to more consistently contribute to mission success.

Mighty Mouse 807 in action on Glenair STAR-PAN II

Mighty Mouse 807: NATO-standard interconnect interface for C4ISR-equipped warriors

Cable Plug

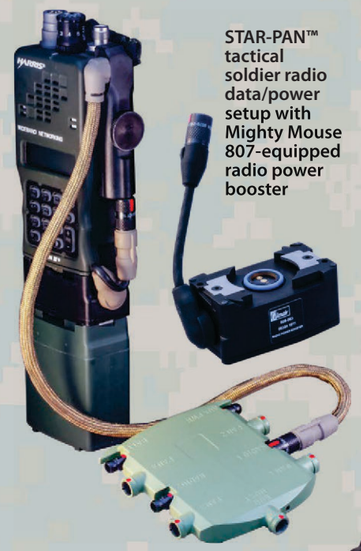
Cobra Plug

Panel Plug

Cable Receptacle

Panel Receptacle

Hermetic Receptacle



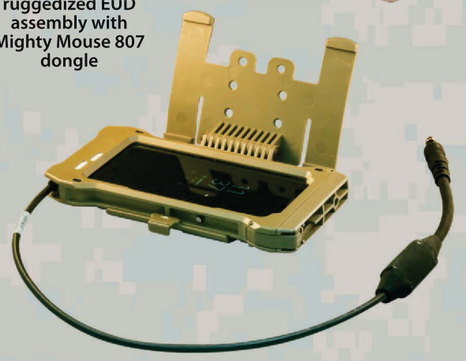
STAR-PAN™ tactical soldier radio data/power setup with Mighty Mouse 807-equipped radio power booster

Kägwerks ruggedized EUD case with Mighty Mouse 807 dongle

Ultralife lightweight wearable battery with Mighty Mouse 807 panel mount receptacle

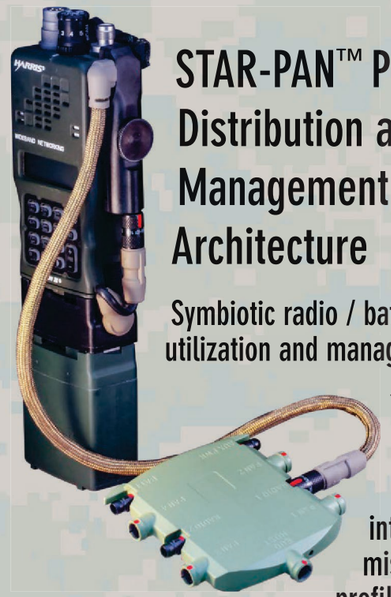
Inventus Lithium Ion conformal battery with plug-and-play Mighty Mouse 807 receptacle connector

Juggernaut.Case ruggedized EUD assembly with Mighty Mouse 807 dongle



BB-2590 /BA-5590 standard soldier battery with Mighty Mouse 807 power adapter

TacROVER-e video downlink receiver with Mighty Mouse high-speed I/O connector and STAR-PAN interface cable



STAR-PAN™ Power Distribution and Management Architecture

Symbiotic radio / battery power utilization and management for JTAC and other battery-power-intensive mission profiles

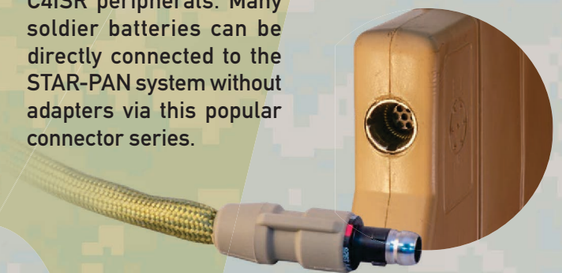
Board-level, embedded system power monitoring, conditioning and charging makes STAR-PAN the most powerful tool for extended mission life and operational effectiveness. Smart power equals longer missions and lighter loads by significantly reducing the number of batteries that must be carried by C4ISR-equipped soldiers. Available interconnect cabling and power adapter accessories facilitate accelerated charging of the EUD, radio and peripherals as well as power scavenging from conditioned DC power sources such as vehicles.

STAR-PAN Embedded System Power Management

- API interface for user-controlled power management
- Port priority, charge state, system battery state, and temperature protection
- Charge-circuitry for a wide range of smart batteries

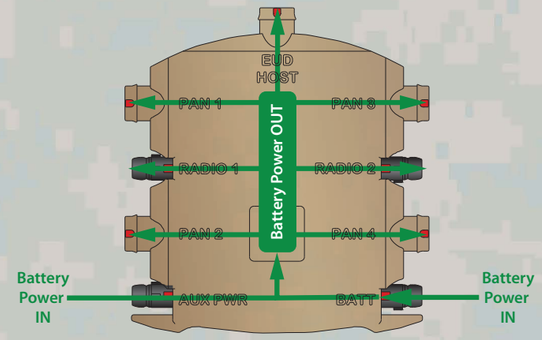
Universal power and data connector interface

The STAR-PAN system uses Glenair Mighty Mouse connectors which are fully compliant to US and NATO standards for EUDs, radios, batteries, and C4ISR peripherals. Many soldier batteries can be directly connected to the STAR-PAN system without adapters via this popular connector series.

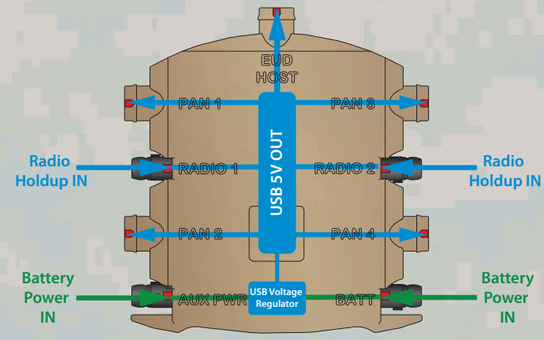


SMART POWER = LONGER MISSIONS AND LIGHTER LOADS

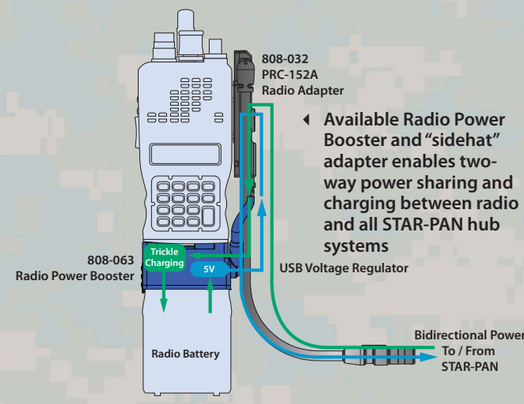
STAR-PAN POWER DISTRIBUTION / CHARGING ARCHITECTURE (STAR-PAN VI SYSTEM SHOWN)



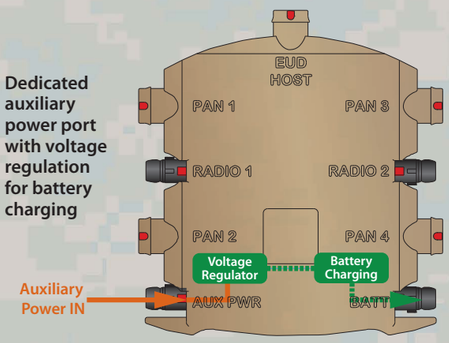
▲ Primary power distribution supports dual hot-swappable battery inputs routed to PAN, EUD, and Radio ports



▲ USB power layer supports regulation of input battery power for distribution to USB 2.0 devices and radio "holdup power IN" functionality



◀ Available Radio Power Booster and "sidehat" adapter enables two-way power sharing and charging between radio and all STAR-PAN hub systems



▶ Dedicated auxiliary power port with voltage regulation for battery charging

STAR-PAN POWER BOOSTER AND SUPPORTED BATTERIES

The STAR-PAN system utilizes the standard SMBus battery protocol for compatibility with a wide range of military standard batteries, and standards-compliant smart battery charging. Power scavenging is supported from a variety of sources. Trickle charging of radio batteries and radio holdup-to-hub is fully enabled with the STAR-PAN radio power booster.

808-063 Radio Power Booster for two-way power sharing

BB-2590 /BA-5590 batteries

Handheld radio batteries

Conformal wearable batteries

Soldier smart batteries

STAR-PAN™ Android / Windows Apps and ATAK Plug-In

User-controlled charging and battery power management touch-screen applications

STAR-PAN system software offers microprocessor-controlled power management as well as firmware-controlled power management via SPAR (STAR-PAN Android Remote) and WASP (Windows Application STAR-PAN) apps. These two open-system applications deliver seamless integration with Android- and Windows-based End User Devices.

An additional STAR-PAN app, the ATAK plug-in, integrates STAR-PAN battery and power management directly into ATAK (Android Tactical Assault Kit), the leading DACAS software application used by the JTAC community. Familiar touch-screen controls and easy-to-read graphical user interface allows soldiers in the field to quickly and easily view and manage port priority, charge state, and system battery state for the STAR-PAN system and all interconnected peripherals.

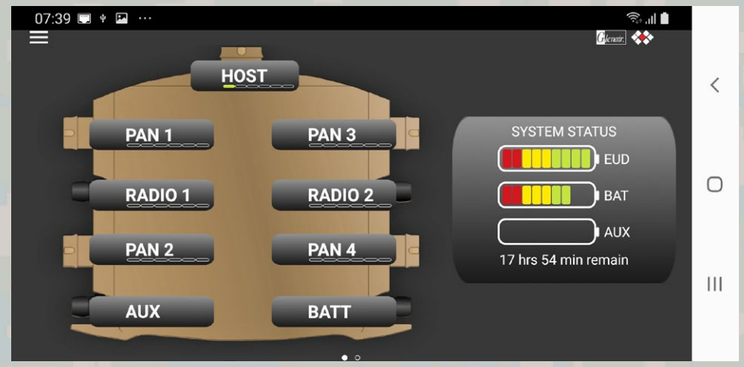
- Android / Windows apps with seamless ATAK integration
- Independent port power management
- System battery state management
- API interface for software integration
- Power protection

The STAR-PAN VI hub integrates a ruggedized smartphone running ATAK software and plug-in, a Conformal Wearable Battery, and handheld radio with data adapter.

STAR-PAN ANDROID REMOTE (SPAR) POWER MANAGEMENT APP

STAR-PAN power and data hubs may be supported with an Android-based power management app displaying system battery status and power usage by port/device. Touch-screen functionality allows user to easily turn power on and off to individual ports. Requires Android 4.4.4.

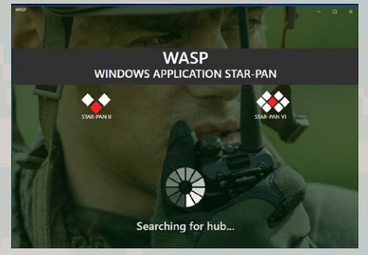
- **Root not required**
- **Supports multiple connections via Android API**
- **Power logging feature**
- **Available with all hubs**

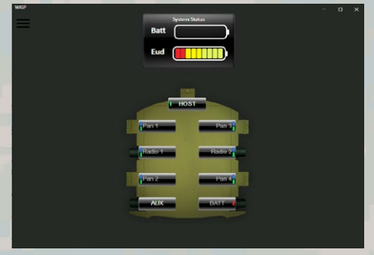


WINDOWS APPLICATION for STAR-PAN (WASP) POWER MANAGEMENT APP

For Windows-based End User Devices, the WASP power management app displays system battery status and power usage by port/device. Touch-screen functionality allows user to easily turn power on and off to individual ports.

- **Touchscreen and mouse compatible**
- **Enables power management from Windows devices**

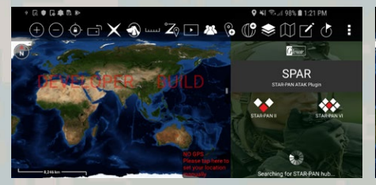




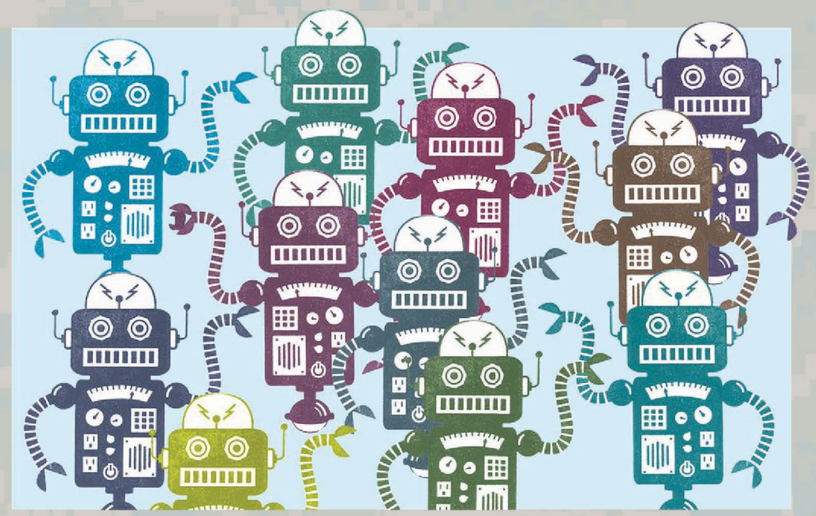
STAR-PAN ATAK PLUG-IN

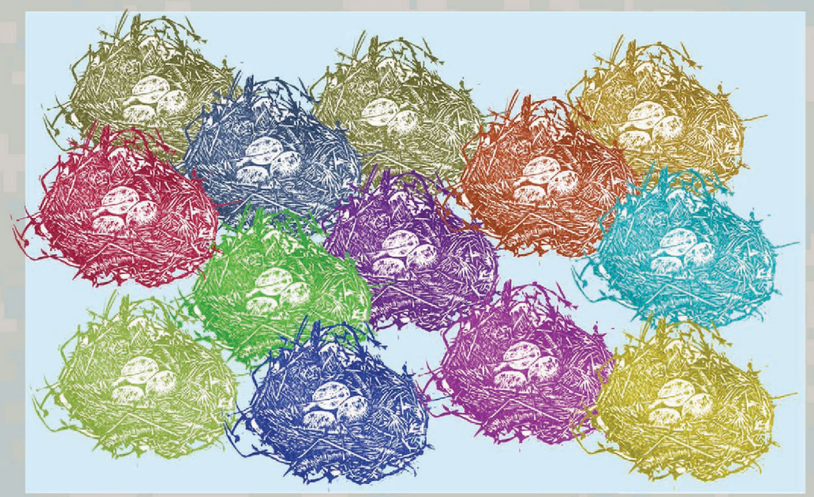
A STAR-PAN power management system status plug-in is also available for Android Tactical Assault Kit (ATAK) software, which enables the user to quickly monitor hub and battery status without leaving the main ATAK application.

- **Available on request if not provided with ATAK build**
- **Works simultaneously with SPAR**
- **Allows for quick power management without switching applications**



One of these things is not like the others…





answers: www.glenair.com/qwikconnect

STAR-PAN™ Light

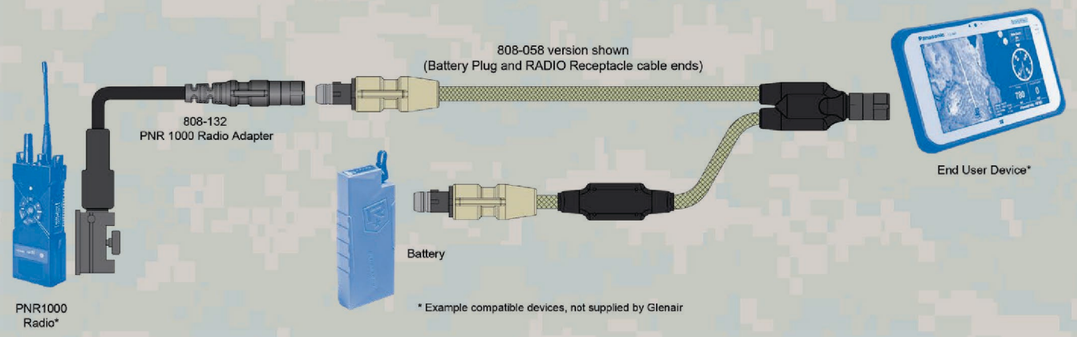
Enabling situational awareness, comms, and improved battery power autonomy for light dismounted infantry

FEATURES

- **Supports power and data connectivity between soldier's EUD, pDDL (or radio), plus battery**
- **5V regulator bifurcated cable optimized for plug-and-play connectivity to US- and NATO-standard devices**
- **Interconnect interface is Glenair Series Mighty Mouse (NATO STANAG 4695) quick-disconnect connectors**
- **Radio connectivity requires additional adapter cable**

STAR-PAN LIGHT CAPABILITY DIAGRAM

- **1 designated host / EUD port**
- **1 battery cable / port**
- **1 designated peripheral cable / port (expandable for radio use with adapter cable**



WARFIGHTER TOUGH

STAR-PAN™ Light

808-054

Bifurcated power and data cable with 5V regulator

OVERVIEW

The Glenair STAR-PAN™ Light is a lightweight bifurcated data and power cable, ruggedized for harsh environment dismounted soldier applications. The cable is compatible with USB1.1, USB2.0 (full and high-speed), and SMBus protocols and contains a single power port, EUD port, and single C4ISR peripheral port. For the standard dismounted soldier, STAR-PAN Light enhances soldier situational awareness and tempo on the battlefield while maintaining flexibility, scalability, interoperability and increased autonomy. All connector interfaces are compliant to the NATO STANAG 4695 standard for Soldier Power Connectors

PAN APPLICATIONS

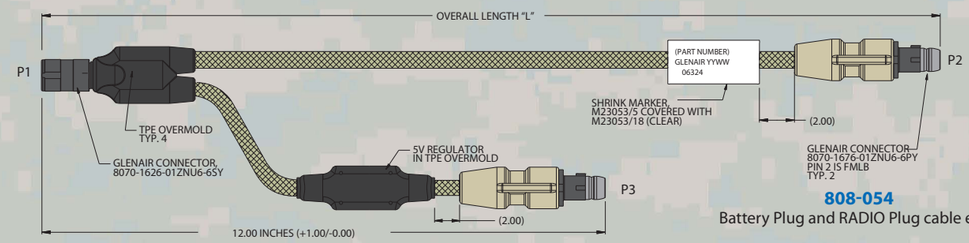
- **Dismounted infantry soldier situational awareness and battery management**
- **Fast-moving special operations forces communications and situational awareness**

HOW TO ORDER

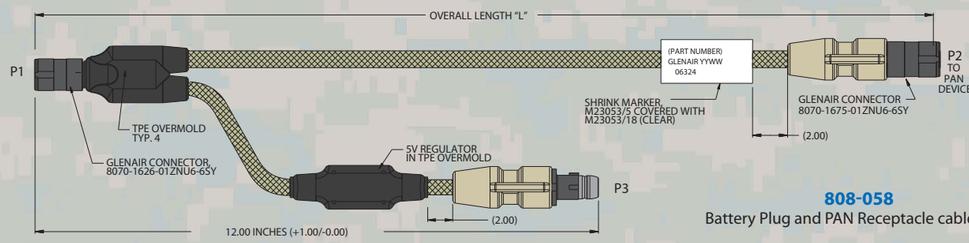
Sample Part Number:	**808**	**-054**	**-36**
STAR-PAN Series	STAR-PAN Light bifurcated cable **808-054** = battery plug and RADIO plug ends **808-058** = battery plug and PAN receptacle ends		
Length Designator	In inches Omit for default length of 24.00"		

PERFORMANCE SPECIFICATIONS

Operating Conditions	
Storage Temperature	-40°C to +80°C
Operating Temperature	-32°C to +49°C
Operation Altitude	9754m
Storage Altitude	15240m
Water Immersion, Mated	MIL-STD-810, Method 512, 1m for 1 hr.; IP67 rated dust / water resistant
Host & Pan	
Battery Voltage	10.0V to 20.0V, 14.8V typical
Battery Supply Current	3.5A Maximum per individual port
Battery Supply Total Current	5A total system
5VUSB Supply Voltage	4.75V to 5.1 V, 4.90V typical
5VUSB Supply Current	3A Maximum per individual port
USB +/USB -	-0.5V to +3.5V
Radio Port	
Battery Voltage	10.0V to 20.0V, 14.8V typical. Highest priority for power management
Battery Supply Current	5A maximum per individual port
+5V Back Up Supply Current	1.2A typical, 3A max, based on radio supply, radio 1 primary
+5V Back Up Supply Current	.5A per port
USB +/USB -	-0.5V to +3.5V
Battery Port	
Battery Input Voltage	10V to 20V
Battery Supply Current	5A maximum system supply current
SMBus Data	-0.5V to +3.5V, P5 only



808-054
Battery Plug and RADIO Plug cable ends



808-058
Battery Plug and PAN Receptacle cable ends

Dimensions are subject to change without notice.

STAR-PAN™ I

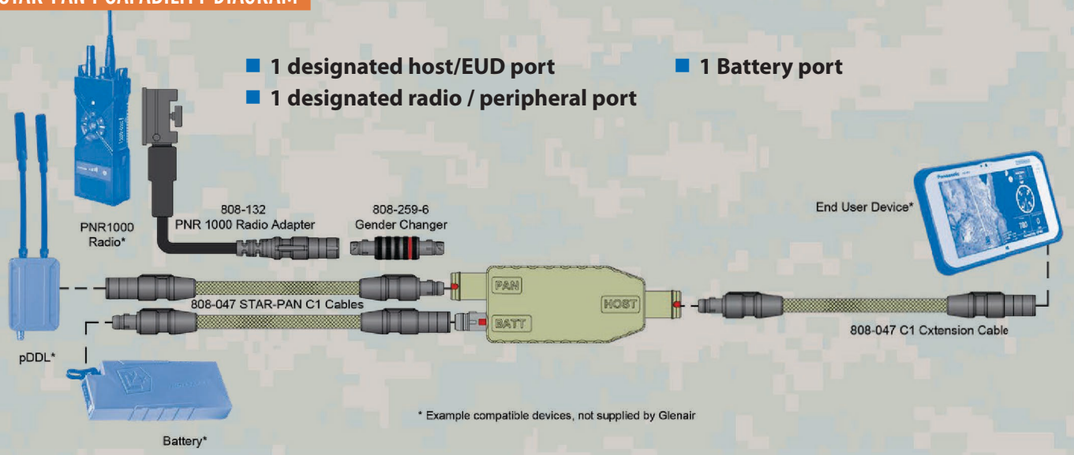
Enabling enhanced situational awareness, comms, and improved battery power autonomy for light dismounted infantry

FEATURES

- **Supports power and data connectivity between soldier's EUD, radio or pDDL, plus battery**
- **5V regulated hub optimized for plug-and-play connectivity to US- and NATO-standard devices**
- **Interconnect interface is Glenair Series Mighty Mouse (NATO STANAG 4695) quick-disconnect connectors**
- **All cables supplied separately for optimal configuration flexibility**

STAR-PAN I CAPABILITY DIAGRAM

- **1 designated host/EUD port**
- **1 designated radio / peripheral port**
- **1 Battery port**



* Example compatible devices, not supplied by Glenair

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

WARFIGHTER TOUGH

STAR-PAN™ I

TS2-004

1 port smart power and data hub with 5V regulator

OVERVIEW

The Glenair STAR-PAN™ I is a lightweight data and power hub, ruggedized for harsh environment dismounted soldier applications. The hub is compatible with USB1.1, USB2.0 (full and high-speed), and SMBus protocols and contains a single power port, EUD port, and single C4ISR peripheral port. For the standard dismounted soldier, STAR-PAN I enhances soldier situational awareness and tempo on the battlefield while maintaining flexibility, scalability, interoperability and increased autonomy. All connector interfaces are compliant to the NATO STANAG 4695 standard for Soldier Power Connectors

PAN APPLICATIONS

- **Dismounted infantry soldier situational awareness and battery management**
- **Fast-moving special operations forces communications and situational awareness**

HOW TO ORDER

Sample Part Number:	TS2-004
Connectorized Hub	STAR-PAN I power and data hub

STAR-PAN I PORT CONFIGURATION

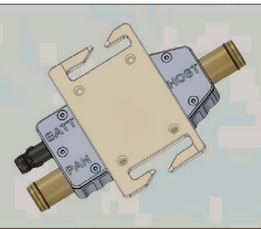
EUD	1
RADIO	0
PAN	1
POWER	1

PERFORMANCE SPECIFICATIONS (preliminary)

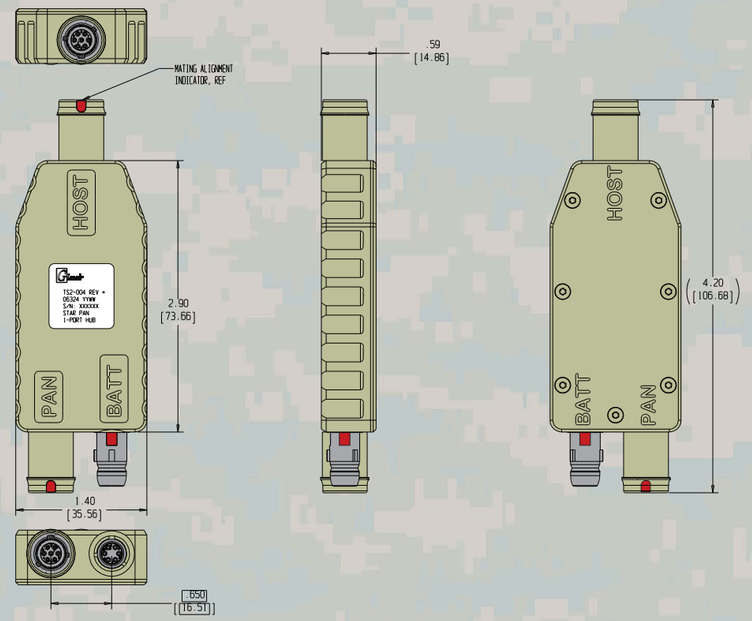
Operating Conditions	
Storage Temperature	-40°C to +80°C
Operating Temperature	-32°C to +49°C
Operation Altitude	9754m
Storage Altitude	15240m
Water Immersion, Mated	MIL-STD-810, Method 512, 1m for 1 hr.; IP67 rated dust / water resistant
Host & Pan	
Battery Voltage	10.0V to 20.0V, 14.8V typical
Battery Supply Current	3.5A Maximum
5VUSB Supply Voltage	4.75V to 5.1 V, 4.90V typical
5VUSB Supply Current	2A Maximum
USB +/USB -	-0.5V to +3.5V
Battery Port	
Battery Input Voltage	10V to 20V
Battery Supply Current	5A maximum system supply current
SMBus Data	-0.5V to +3.5V, P5 only

MOLLE ATTACHMENT

Part No. TS2-004-MC



Hub supplied with MOLLE clip attachment



STAR-PAN™ II

Integrated USB data/power distribution hub for fast-moving special operation forces and small-squad team leaders

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 just the most 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. Two versions are available: a pre-cabled hub assembly with integrated EUD and power cables equipped with NATO STANAG 4695 standard connectors; and a connectorized hub, ready for configuration with customer-specified cables and adapters.

KEY FEATURES/BENEFITS

- **Provides battery power and +5VBus power via 2 cabled power input ports for extended missions or battery hot swap**
- **Supports soldier EUD/Host, Radio, and up to 2 USB peripheral devices (with bifurcated 808-081 cable for 2nd device)**
- **SMBus, USB2.0 (full and high-speed), USB1.1 compatible interface**
- **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**

FEATURES

- **STAR-PAN II 808-057 with integrated cables, or 808-194 standard hub**
- **Designated host/EUD port, designated radio/peripheral port, and Universal PAN compliant port (expandable for up to two devices)**
- **Supports hot-swappable power sources and radio-supplied backup power**
- **Heat-efficient electronics packaging to optimize efficiency and extend battery life**

PAN APPLICATIONS

- **Dismounted infantry soldier situational awareness and battery management**
- **Fast-moving special operations forces communications and situational awareness**
- **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

WARFIGHTER TOUGH

STAR-PAN™ II

808-194 / 808-057

2 port (expandable) power and data hub / cabled hub assembly

OVERVIEW

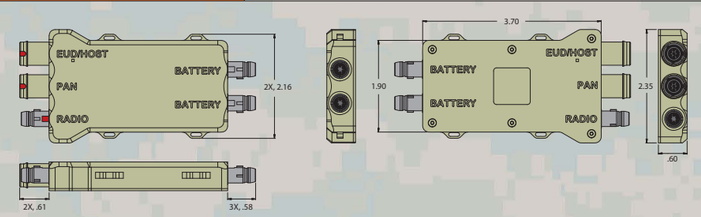
The Glenair STAR-PAN™ II Hub is a lightweight, durable, compact data and power distribution hub, ruggedized for harsh environment dismounted soldier applications. STAR-PAN II provides a data backplane for up to 3 USB devices with power monitoring and management for connected external peripherals, radio, and the soldier's EUD/Host. STAR-PAN II is compatible with USB1.1, USB2.0 (full and high-speed), and SMBus protocols, and incorporates dual power input ports for extended missions or battery substitution, minimizing down time. All connector interfaces are compliant to the NATO STANAG 4695 standard for Soldier Power Connectors

PERFORMANCE SPECIFICATIONS

Operating Conditions	
Storage Temperature	-40°C to +80°C
Operating Temperature	-32°C to +49°C
Operation Altitude	9754m
Storage Altitude	15240m
Water Immersion, Mated	MIL-STD-810, Method 512, 1m for 1 hr.; IP67 rated dust / water resistant
Host & Pan	
Battery Voltage	10.0V to 20.0V, 14.8V typical
Battery Supply Current	3.5A Maximum per individual port
Battery Supply Total Current	5A total system
5VUSB Supply Voltage	4.75V to 5.1 V, 4.90V typical
5VUSB Supply Current	3A Maximum per individual port
USB +/USB -	-0.5V to +3.5V
Radio Port	
Battery Voltage	10.0V to 20.0V, 14.8V typical. Highest priority for power management
Battery Supply Current	5A maximum per individual port
+5V Back Up Supply Current	1.2A typical, 3A max, based on radio supply, radio 1 primary
+5V Back Up Supply Current	.5A per port
USB +/USB -	-0.5V to +3.5V
Battery Port	
Battery Input Voltage	10V to 20V
Battery Supply Current	5A maximum system supply current
SMBus Data	-0.5V to +3.5V, 808-194 P5 only

HOW TO ORDER: POWER AND DATA HUB

Sample Part Number:	808-194
STAR-PAN Hub	STAR-PAN II 2 port power/data hub



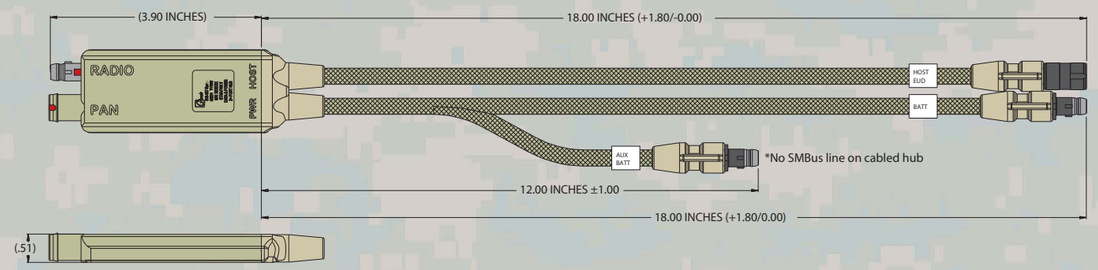
STAR-PAN II PORT CONFIGURATION

EUD	1
RADIO	1
PAN	1
POWER	2

Both versions of STAR-PAN II provide identical capabilities. Hub-only version is designed more for users with unique EUD or battery-power configuration requirements. All cables supplied separately.

HOW TO ORDER: HUB / CABLE ASSEMBLY VERSION

Sample Part Number:	808-057
Hub with Integrated Cables	STAR-PAN II 2 port power/data hub with integrated cables



STAR-PAN™ II

808-057 and 808-194 Configuration diagram
2 port (expandable) power and data system

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:**
  - L3HARRIS [AN/PRC-117G, AN/PRC-152A]
  - THALES [AN/PRC-154 Rifleman, AN/PRC-148 JEM]
  - Domo Tactical Communications (DTC) [SOL8SDR-H]
  - ELBIT [PNR-1000, MCTR-7200HH]
  - Silvus Technologies [SC4200, SC4400]
  - Bittium [Tough SDR Handheld™]
  - Persistent Systems [Wave Relay]

DAGR
GPS Receiver*

Hand-Held
Radio*

808-032
AN/PRC-152A
Radio Data Adapter

808-063
Radio Power Booster
(RPB)

808-049 PLRF 15C/25C

808-081 STAR-PAN II+
Expansion Cable

808-040 DAGR

808-053 USB ADAPTER

808-043 TacRover-E

808-045 TacRover-P

808-117 TNR

Tactical Net Rover*

WARFIGHTER TOUGH

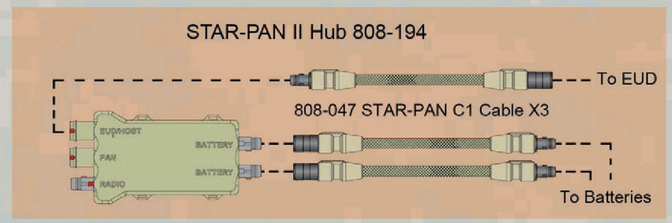
STAR-PAN™ II

808-057 and 808-194 Configuration diagram
2 port (expandable) power and data system

STAR-PAN™ HUBS

GLENAIR STAR-PAN TECHNOLOGY ILLUSTRATED IN THIS CAPABILITY DIAGRAM

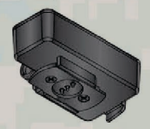
STAR-PAN Component Description	Part Number
STAR-PAN II Multiport USB and Power Distribution Hub	808-057
STAR-PAN Expansion Cable	808-081
PRC 152A Radio Data Adapter	808-032
DAGR GPS/Navigation Cable	808-040
PLRF 15C/25C Laser Range Finder Cable	808-049
TacROVER-p SIR 2.0 ISR Receiver Cable	808-045
TacROVER-e 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



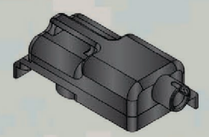
End User Device*

STAR-PAN II Hub
808-057
Integrated Cable Version

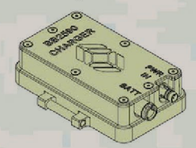
HOT SWAPPABLE
BATTERY CONNECTIONS



808-066 Battery Shoe
for Harris and Bren-Tronics
Handheld Radios



808-048 Battery Shoe
for BA5590 / BB2590
Batteries



808-242
Charging Battery Adapter
for BB2590 Batteries

Conformal Wearable Battery*
(direct connection, no adapter required)

* Example compatible devices, not supplied by Glenair

* Example compatible devices, not supplied by Glenair

STAR-PAN™ IV

Integrated USB data/power distribution hub for ground force commanders, UAS and UGV controllers, and other complex tactical mission specialists

KEY FEATURES/BENEFITS

- Battery Power and +5VBus power to up to 4 USB devices, 2 dedicated Radio ports
- 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
- 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

FEATURES

- 1 designated host/EUD port
- 1 designated radio peripheral port
- 3 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
- Heat-efficient electronics packaging to optimize efficiency and extend battery life

JTAC-TOUGH™

STAR-PAN™ IV

808-273

4 port smart power and data hub system

OVERVIEW

The Glenair STAR-PAN™ IV Hub is a lightweight, durable, compact data and power distribution hub, ruggedized for harsh environment dismounted soldier applications. The connectorized hub provides a data backplane with power monitoring and management to connected external peripherals used in Digitally Aided Close Air Support (DACAS) and other mission applications. The hub is compatible with USB1.1, USB2.0 (full and high speed), and SMBus protocols. STAR-PAN™ IV contains two power inputs for extended missions. One radio port capable of powering up the USB Data backplane and host connection. A dedicated charge port for use with smart batteries and auxiliary power sources including multiple DC power sources such as vehicle power, solar panels, kinetic energy devices or fuel cells. All connector interfaces are compliant to the NATO STANAG 4695 standard for Soldier Power Connectors

PAN APPLICATIONS

- Ground force commander
- Special operations force team leader
- Search and rescue commander
- SUAS and UGV controller

HOW TO ORDER

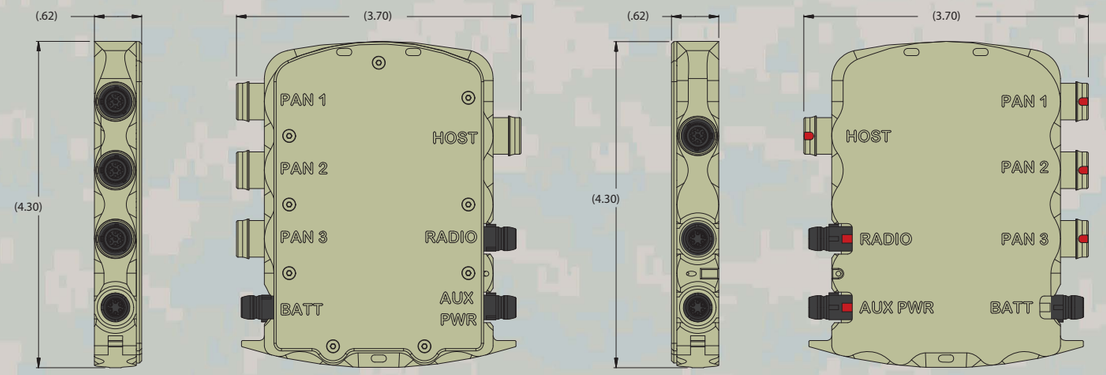
Sample Part Number:	808-273
Connectorized Hub	STAR-PAN IV 4-port power/data hub

STAR-PAN IV PORT CONFIGURATION

EUD	1
RADIO	1
PAN	3
POWER	2

PERFORMANCE SPECIFICATIONS

Operating Conditions	
Storage Temperature	-40°C to +80°C
Operating Temperature	-32°C to +49°C
Operation Altitude	9754m
Storage Altitude	15240m
Water Immersion, Mated	MIL-STD-810, Method 512, 1m for 1 hr.; IP67 rated dust / water resistant
Host & Pan 1–3	
Battery Voltage	10.0V to 20.0V, 14.8V typical
Battery Supply Current	5A Maximum per individual port
+5V Backup Total Supply Current	5A based on radio supply, Radio 1 primary
USB +/USB -	-0.5V to +3.5V
Radio Port	
Battery Voltage	10.0V to 20.0V, 14.8V typical. Highest priority for power management
Battery Supply Current	5A maximum per individual port
+5V Back Up Supply Current	1.2A typical, 3A max, based on radio supply, radio 1 primary
+5V Back Up Supply Current	.5A per port
USB +/USB -	-0.5V to +3.5V
Auxiliary Power Supply Port	
Auxiliary Voltage Source	10V to 36V
Auxiliary Supply Current	5 A maximum system supply current
Battery Port	
Battery Input Voltage	10V to 20V
Battery Supply Current	5A maximum system supply current
Battery Charge Current	3A



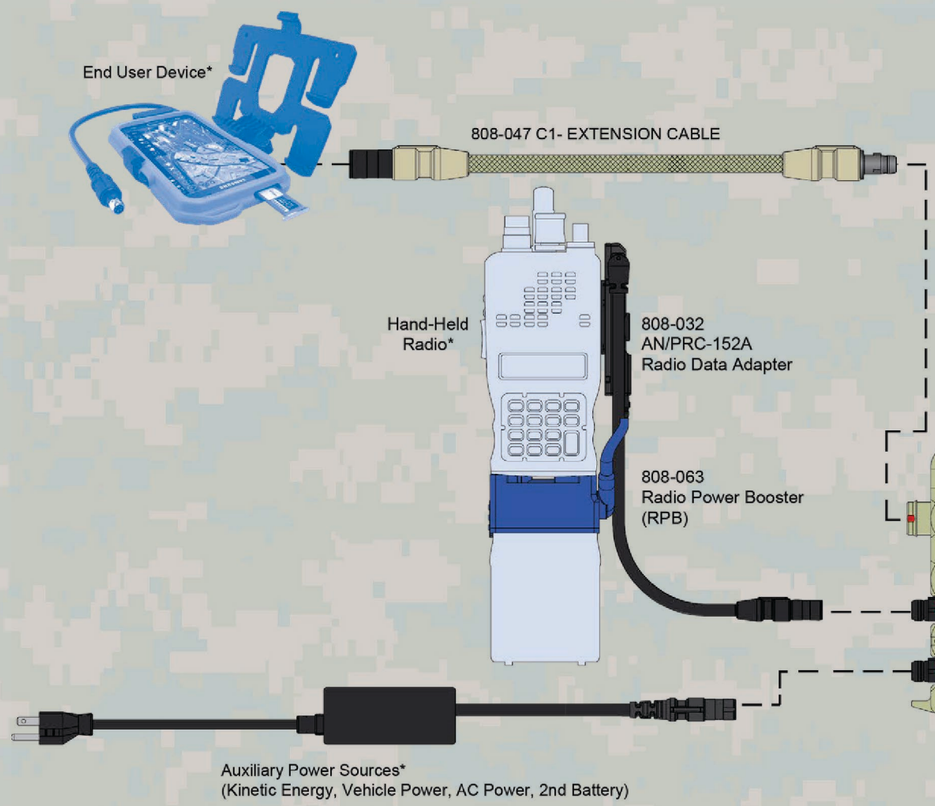
Dimensions are subject to change without notice.

STAR-PAN™ IV

808-273 4 port smart power / data hub system
Configuration diagram

STAR-PAN VI CAPABILITY DIAGRAM

- 1 designated host/EUD port
- 1 designated radio peripheral port
- 3 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™

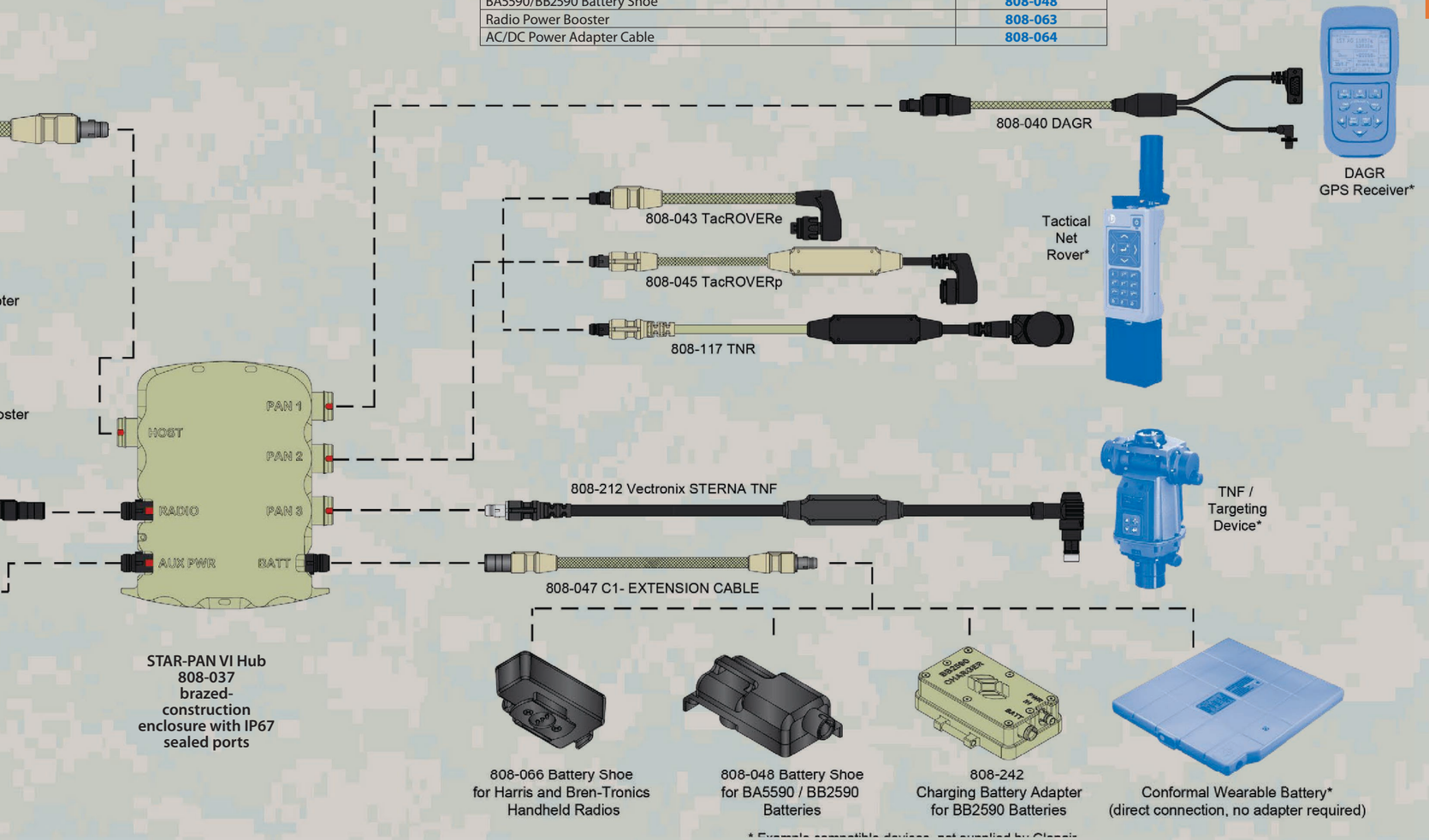
STAR-PAN™ IV

808-273 4 port smart power / data hub system
Configuration diagram

STAR-PAN™ HUBS

GLENAIR STAR-PAN TECHNOLOGY ILLUSTRATED IN THIS CAPABILITY DIAGRAM

STAR-PAN Component Description	Part Number
STAR-PAN IV Multiport USB and Power Distribution Hub	808-273
STAR-PAN General-Purpose Extension Cable	808-047
DAGR GPS/Navigation Cable	808-040
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
STERNA TNF Adapter Cable	808-212
Hand-Held Radio Battery Shoe	808-066
BA5590/BB2590 Battery Shoe	808-048
Radio Power Booster	808-063
AC/DC Power Adapter Cable	808-064



STAR-PAN™ VI

Integrated USB data/power distribution hub for digitally aided close air support (DACAS) and other combined mission commander / JTAC applications

KEY FEATURES/BENEFITS

- Battery Power and +5VBus power to up to 4 USB devices, 2 dedicated Radio ports
- 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
- 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

FEATURES

- 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
- Heat-efficient electronics packaging to optimize efficiency and extend battery life

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™ VI

808-037

6 port smart power and data hub system

OVERVIEW

The Glenair STAR-PAN™ VI Hub is a lightweight, durable, compact data and power distribution hub, ruggedized for harsh environment dismounted soldier applications. The connectorized hub provides a data backplane with power monitoring and management to connected external peripherals used in Digitally Aided Close Air Support (DACAS) and other mission applications. The hub is compatible with USB1.1, USB2.0 (full and high speed), and SMBus protocols. STAR-PAN™ VI contains two power inputs for extended missions. Two radio ports capable of powering up the USB Data backplane and host connection. A dedicated charge port for use with smart batteries and auxiliary power sources including multiple DC power sources such as vehicle power, solar panels, kinetic energy devices or fuel cells. All connector interfaces are compliant to the NATO STANAG 4695 standard for Soldier Power Connectors

PAN APPLICATIONS

- JTAC Digitally Aided Close Air Support (DACAS)
- Tactical ops center operations commander
- Search and rescue commander

HOW TO ORDER

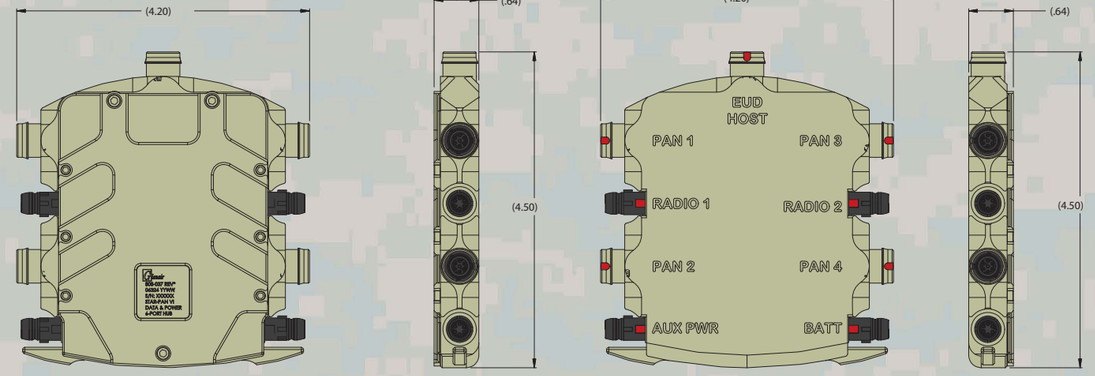
Sample Part Number:	**808-037**
Connectorized Hub	STAR-PAN VI 6-port power/data hub

STAR-PAN VI PORT CONFIGURATION

EUD	1
RADIO	2
PAN	4
POWER	2

PERFORMANCE SPECIFICATIONS

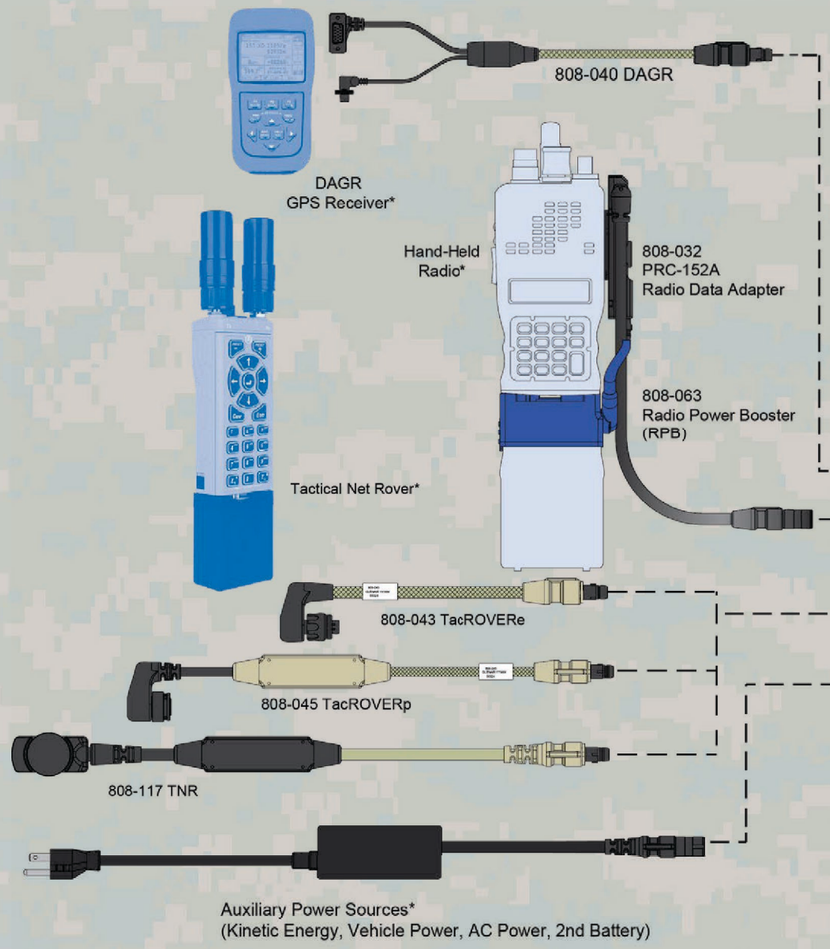
Operating Conditions	
Storage Temperature	-40°C to +80°C
Operating Temperature	-32°C to +49°C
Operation Altitude	9754m
Storage Altitude	15240m
Water Immersion, Mated	MIL-STD-810, Method 512, 1m for 1 hr.; IP67 rated dust / water resistant
Host & Pan 1–4	
Battery Voltage	10.0V to 20.0V, 14.8V typical
Battery Supply Current	5A Maximum per individual port
+5V Backup Total Supply Current	5A based on radio supply, Radio 1 primary
USB +/USB -	-0.5V to +3.5V
Radio 1 and 2 Ports	
Battery Voltage	10.0V to 20.0V, 14.8V typical. Highest priority for power management
Battery Supply Current	5A maximum per individual port
+5V Back Up Supply Current	1.2A typical, 3A max, based on radio supply, radio 1 primary
+5V Back Up Supply Current	.5A per port
USB +/USB -	-0.5V to +3.5V
Auxiliary Power Supply Port	
Auxiliary Voltage Source	10V to 36V
Auxiliary Supply Current	5 A maximum system supply current
Battery Port	
Battery Input Voltage	10V to 20V
Battery Supply Current	5A maximum system supply current
Battery Charge Current	3A



Dimensions are subject to change without notice.

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

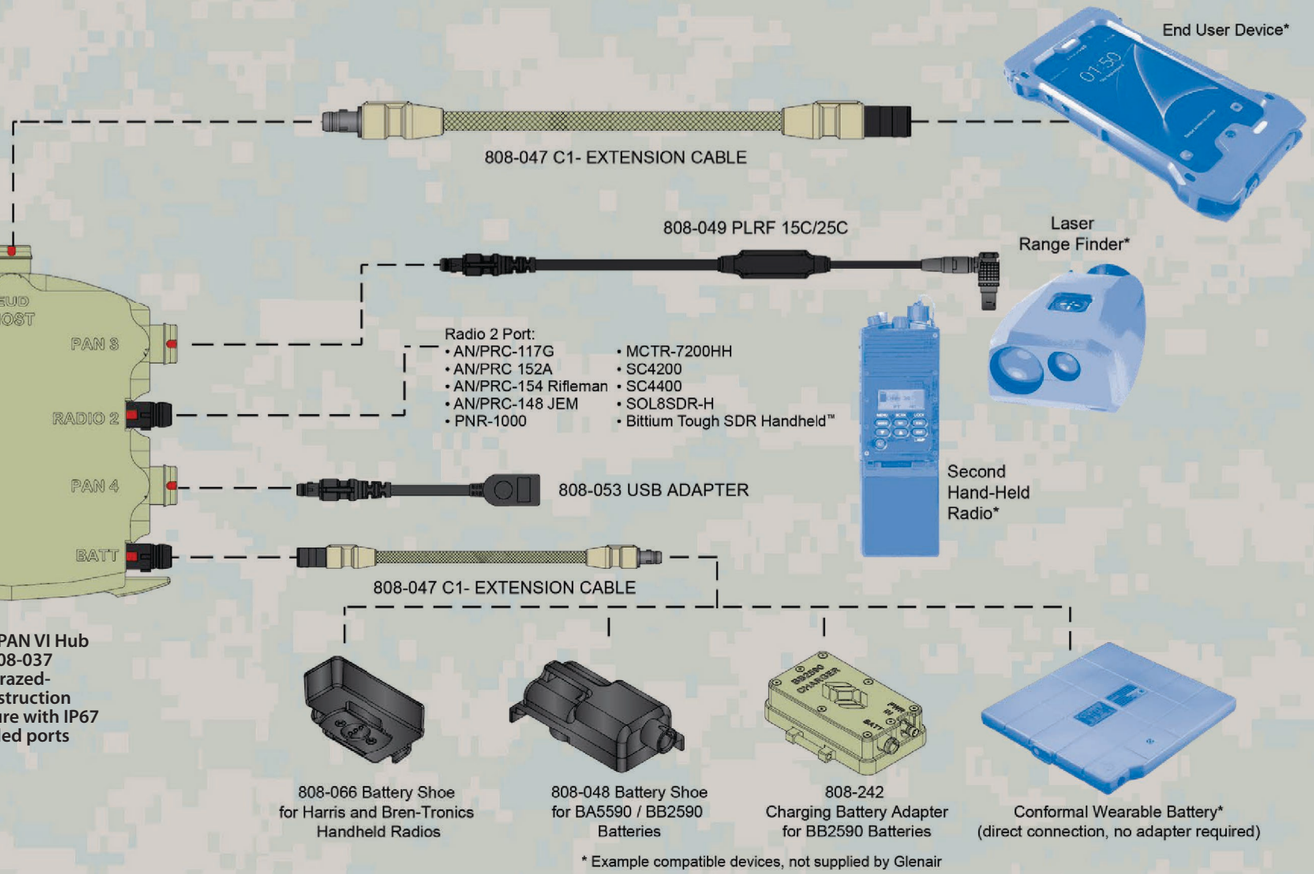


JTAC-TOUGH™
STAR-PAN™ VI
808-037 6 port smart power and data system
Configuration diagram

STAR-PAN™ HUBS

GLENAIR STAR-PAN TECHNOLOGY ILLUSTRATED IN THIS CAPABILITY DIAGRAM

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
AC/DC Power Adapter Cable	808-064



* Example compatible devices, not supplied by Glenair

Outlook

The Right Place at the Right Time

Over twenty years ago, by my count, Glenair worked with an outfit called Booz Allen and Hamilton on a dismounted soldier project called the Joint Expeditionary Digital Information System, or JEDI. Our role was to provide Glenair-made junction box assemblies equipped with early versions of our Series 80 Mighty Mouse connector. Over the next many years we played similar roles on any number of Dismounted Soldier System (DSS) projects—especially for Land Warrior and ultimately Nett Warrior—a program named in honor of Robert B. Nett, a WWII Medal of Honor recipient (thanks for your service and RIP, Colonel Nett).

Much of this work came our way due to problems with existing connectors and cables that were simply too big and heavy for soldier applications or, in other cases, suffered from durability issues.

The first Mighty Mouse connectors used on soldier systems had threaded coupling mechanisms. But what soldier gear really needed was a connector that would snap-to-mate and then de-mate with a calibrated tug on the cable. In 2001, we started work on a new push-pull design that actually saw its first use on a pilot headset for Eurocopter. It wasn't until 2003 that this quick-disconnect version of the Mighty Mouse was in full use on the major soldier program of the day, Land Warrior. Forever a salesman, I can't help but crow that we supplied tens of thousands of connectors and cables to Land Warrior. And as many of you are no doubt aware, this work was instrumental in establishing our six-pin Mighty Mouse Push-Pull as the de facto standard on soldier hubs, EUDs, batteries, as well as many of the critical C4ISR devices now used in Dismounted Soldier Systems.

Fun story, I was at a trade show a few years back and was chatting with a competitor, a manufacturer of soldier power and data hubs (a system in close competition with our STAR-PAN series). Now, we were both going out of our way to be polite and cordial, but at one point this fellow commented on what a shame it was that we (Glenair) felt compelled to "get into their business" with STAR-PAN. You could have knocked me over with a feather! And I admit I was none too shy in explaining that we had been in the soldier systems business for decades, and had absolutely helped shape it into what it had become with our innovative connector designs and years of effective customer service.

They say business success is a little bit of skill, combined with fair share of courage, and a whole lot of luck. Did we enjoy some luck in our now 20-year-plus ride with Mighty Mouse? You bet we did. To this day it surprises me that our principal competitors have always (and somewhat patronizingly) thought of Mighty Mouse as a "nice little product line," and largely left us alone to grow the market for small form-factor mil-grade circulars. What else can you call that besides luck? Or perhaps it's better to say we were just in the right place at the right time—all tooled up and perfectly positioned to serve a growing, mission-critical market that desperately needed a partner just like Glenair.

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