The widest range of mission-critical interconnect technologies in the world

Glenair®

STAR-PAN Tactical Soldier Systems: Multiport Data and Power Management Hubs

Soldier-Based C4ISR

Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance technology providing Situational Awareness (SA) to dismounted soldiers, allowing fast and accurate decisions and actions on the battlefield

Typical Ensemble Configuration:

- End User Device (EUD): chest mounted computer tablet

- Communications: Tactical radio

- Peripherals: GPS Navigation, ISR Receiver, Laser Range Finder, etc.

- Auxiliary Power: Battery packs

Communications: Tactical radio

End User Device: Chest-mounted computer tablet

Auxiliary Power: Battery pack

Peripherals: GPS device

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STAR-PAN Mission Profile

## Digitally Aided Close Air Support (DACAS)

- JTAC and JTAC support
  - Joint Terminal Attack Controller
- Key digital technologies include:
  - Radio communications
  - Video downlink
  - Digital targeting
  - Blue force tracking

Smart Power = Longer Missions, Lighter Load

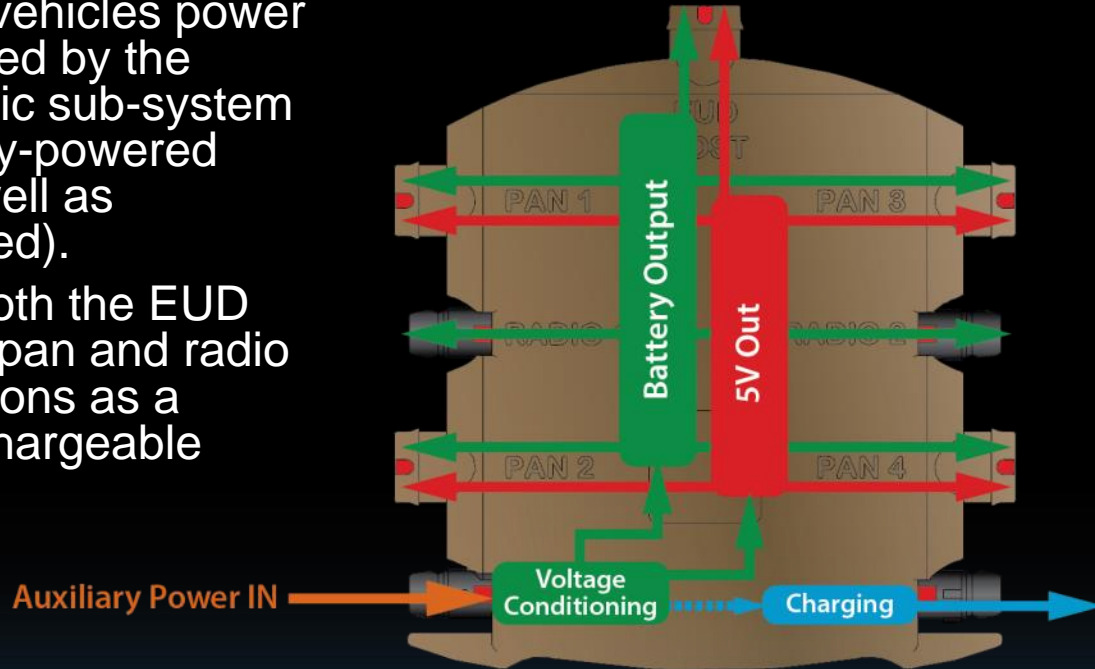## Battery power utilization and management

- STAR-PAN distributes battery power to radios, peripheral devices, and the EUD/host (green) via designated ports

- On-board power conversion capability can also deliver 5 Volt power (red) for USB power.

*Glenair*
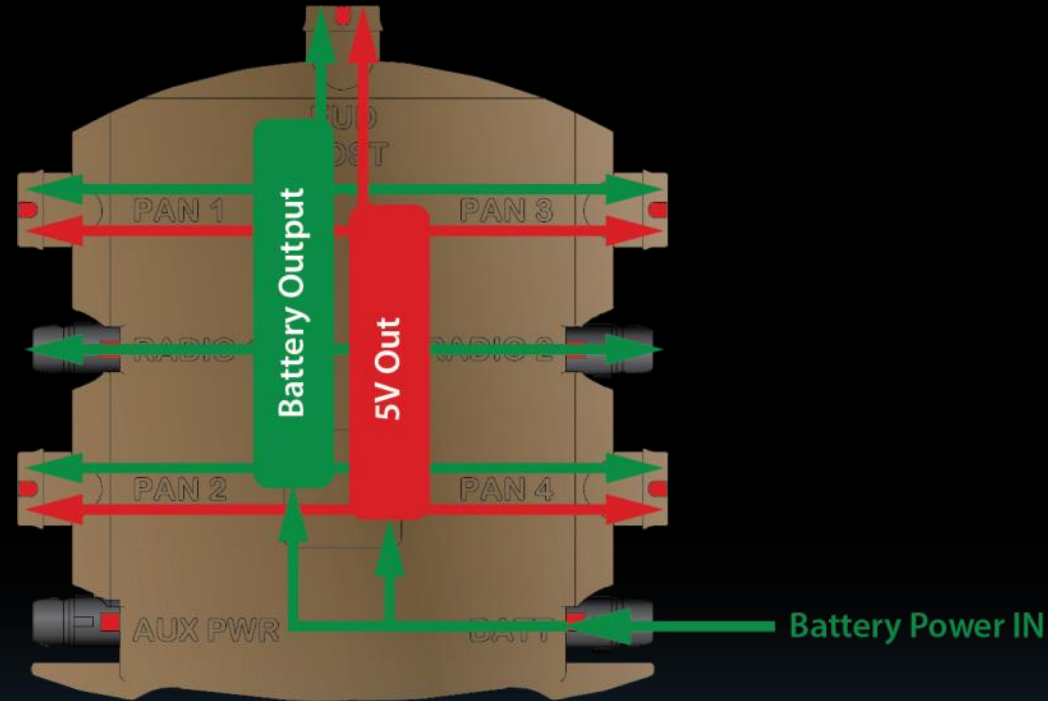
Smart Power = Longer Missions, Lighter Load

Auxiliary power utilization and management

- Regulated DC power, such as vehicles power (orange 10 to 36V) is conditioned by the STAR-PAN embedded electronic sub-system for use by both standard battery-powered devices (green 10 to 20V) 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 (blue) to a rechargeable lithium ion smart battery.

Battery Output

5V Out

PAN 1   PAN 3

RADIO   RADIO 2

PAN 2   PAN 4

Auxiliary Power IN   Voltage Conditioning   Charging

Glenair.

Smart Power = Longer Missions, Lighter Load

Symbiotic radio / battery power utilization and management
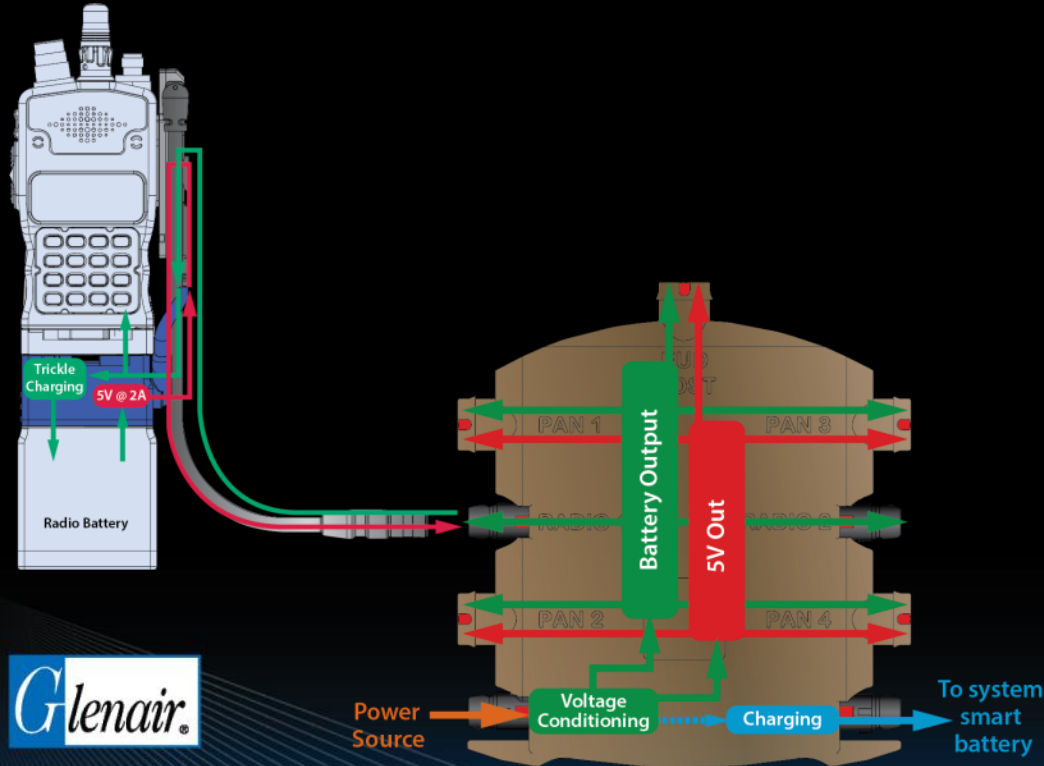
- STAR-PAN VI configured with available 808-063 Radio Power Booster

- While operating from the main Power Source, trickle charge is provided to the radio battery

- If the main power source is depleted, STAR-PAN's smart power management utilizes 5V power from the radio battery to power the system's critical 5V lines.

808-063 Power Booster
Carry less • interchange more • go further

- L3
- TNR
- Thales
- MBITR, IMBITR
- AN/PRC 154(A)
- Harris
- RF-7850S
- AN/PRC 152(A)
- Persistent Systems
- MPU4, MPU5

Solider Host Interface (End User Device, EUD)

The EUD, typically an Android-based smartphone or tablet, provides a link into command and control networks plus applications to call in fire support, plan and coordinate operations, and track friendly forces.

Connectorized
Juggernaut.Case™

Tough Mobile

Getac MX50

- Android smartphones
- USB open-system tablets
- Pads with interconnect-equipped frames / cases / base pads

Kägwerks
Galaxy S7
Case

Samsung
Tablet

ToughPad FZ-M1
and FZ-B2

Tactical Radio / Communications

Tactical communications (Comms) systems are built around software-defined radios in the Joint Tactical Radio System (JTRS) family

Hand-held

Man-pack

Vehicular

Tactical Radio / Communications

Additional tactical radios used in international programs

Harris 7800S

Persistent Systems
MPU4

Elbit Systems
PNR-1000

Glenair

USB / Ethernet / SMBus Peripherals

Common peripherals providing advanced navigation, situational awareness, and information sharing capabilities

GPS/navigation systems

Analog video receiver / controller

TNR send and receive controller

Vector 21

PLRF 25C

- GPS navigation
- Blue Force tracking
- Laser range finders
- Night vision goggles
- Intelligence, Surveillance, and Reconnaissance (ISR) video receivers

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Power Sources: Batteries and Auxiliaries

Compatible access to military-approved battery power can affect mission time, weight, and logistics

- Mil-standard batteries and COTS innovations
- Legacy interconnect requirements (MIL-DTL-26482)

BB-2590/BA-5590 battery

Universal field charging station

Ultralife lightweight smart battery

Conformal wearable battery (CWB)

Auxiliary power sources

Glenair.

Soldier-based Personal Area Networking (PAN)

Electronic hub and interconnect system providing network data access, peripheral connectivity and battery power management to dismounted soldier electronics

Range of Capabilities may include:

- Ethernet networking
- USB compatible peripheral support
- Software-defined radio support
- Common interconnect interface
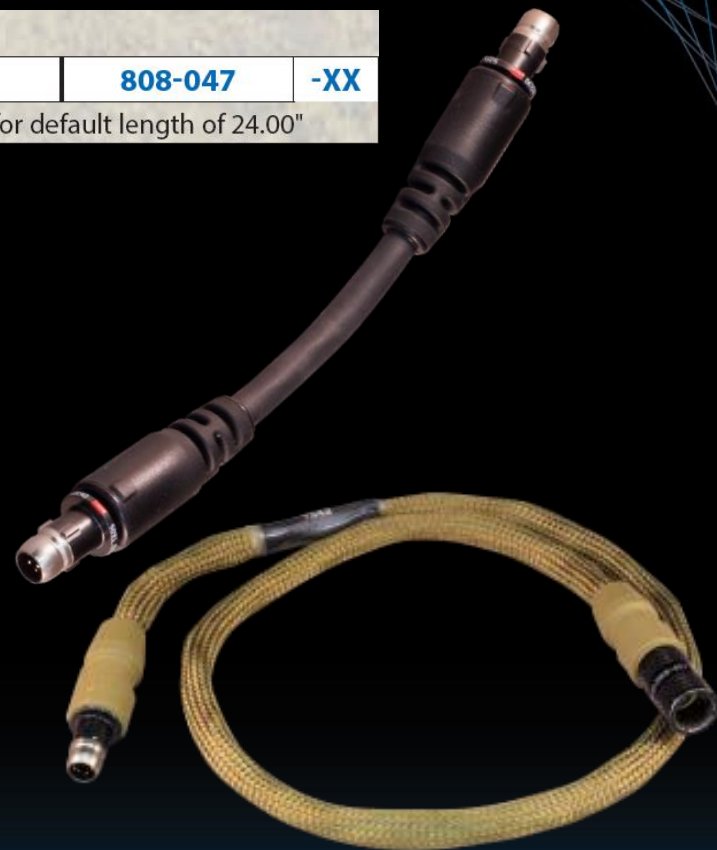- Charging and battery power management

Glenair.
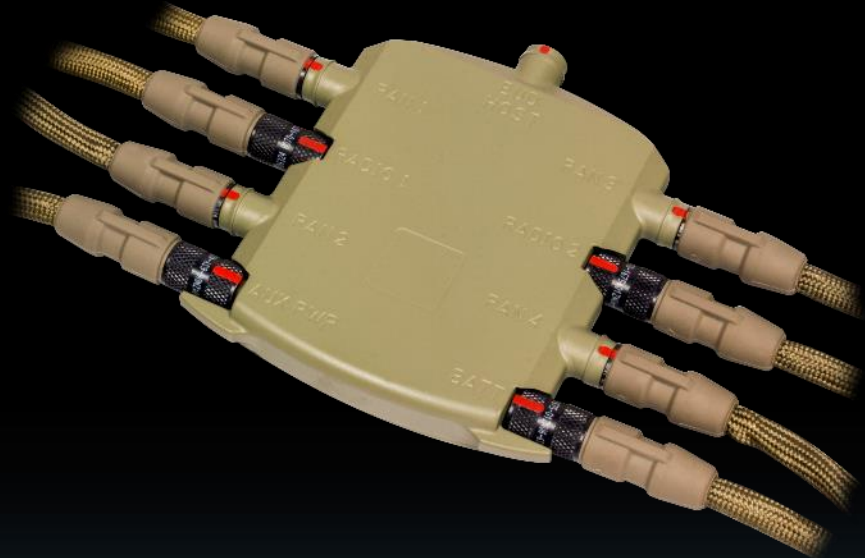
Cables Modular and Flexible

Any length you like

The cables come in:

- Nomex with the most common colors black, green or tan

- Santoprene which is similar to polyurethane but softer and more flexible. It's also the same material we use for the connector over molding

Glenair®

Concept of Operation is the Same the World Over

High-performance, COTS solutions are the order of the day

System Cables

Peripheral Cables

Radio Data Cables

Radio Data Adapters

Battery Adapters

MOLLE Pouches

Smartphone X-Frames

USB / Power Distribution Hubs

Glenair.

Range of Applications
STAR-PAN is a commercial, off-the-shelf (COTS) solution

Law Enforcement

Military tactical radio ensembles

Fire / Rescue

Underground, Highwall, and Surface Mining
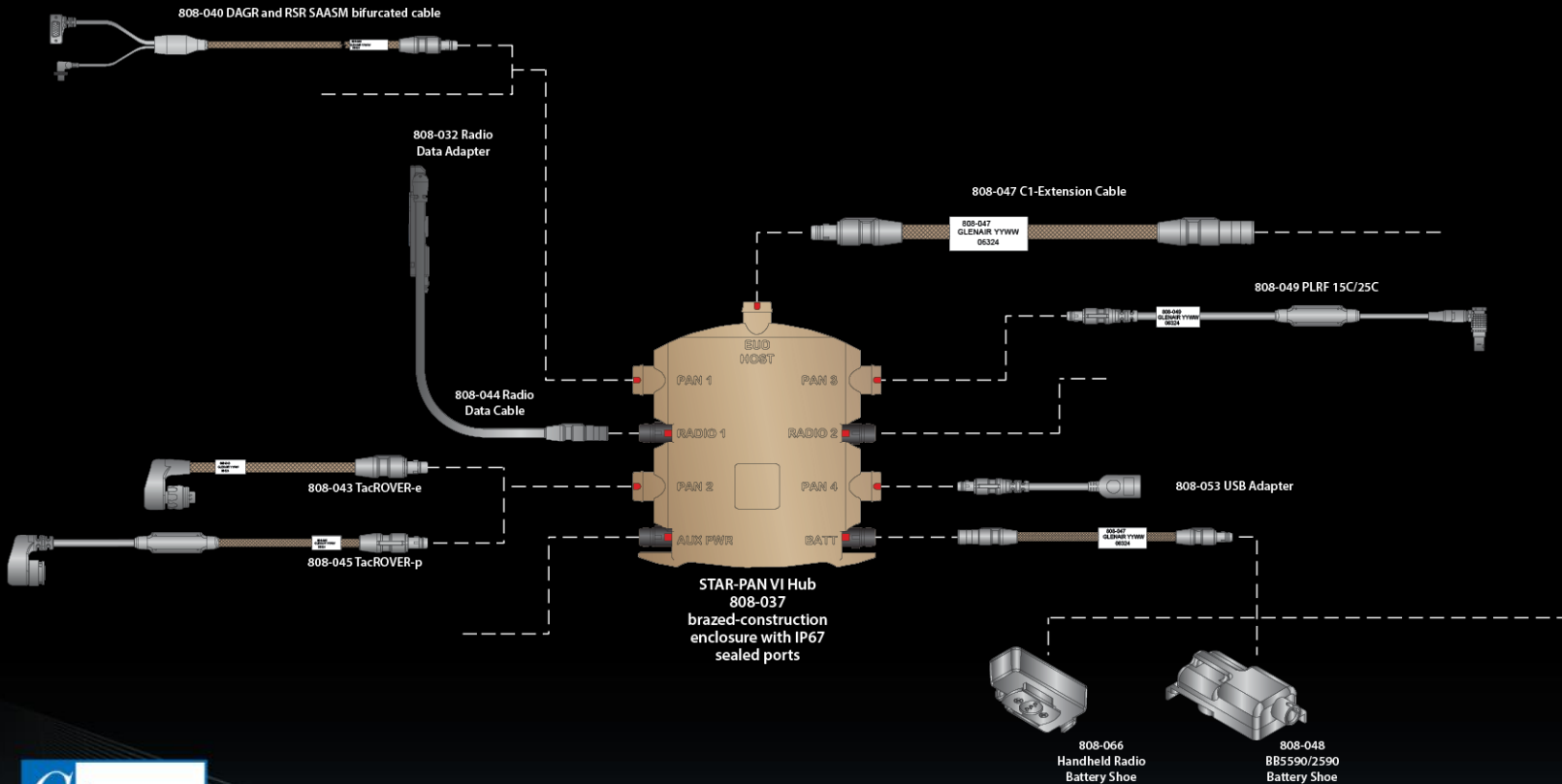
Glenair.

Commercial Applications for STAR-PAN

Power/data management for "first responder" electronic systems

- Body-worn cameras
- Embedded sensors (health, environmental threats, suspect tracking)
- Field radios and microphones
- Robot/bomb squad control monitors
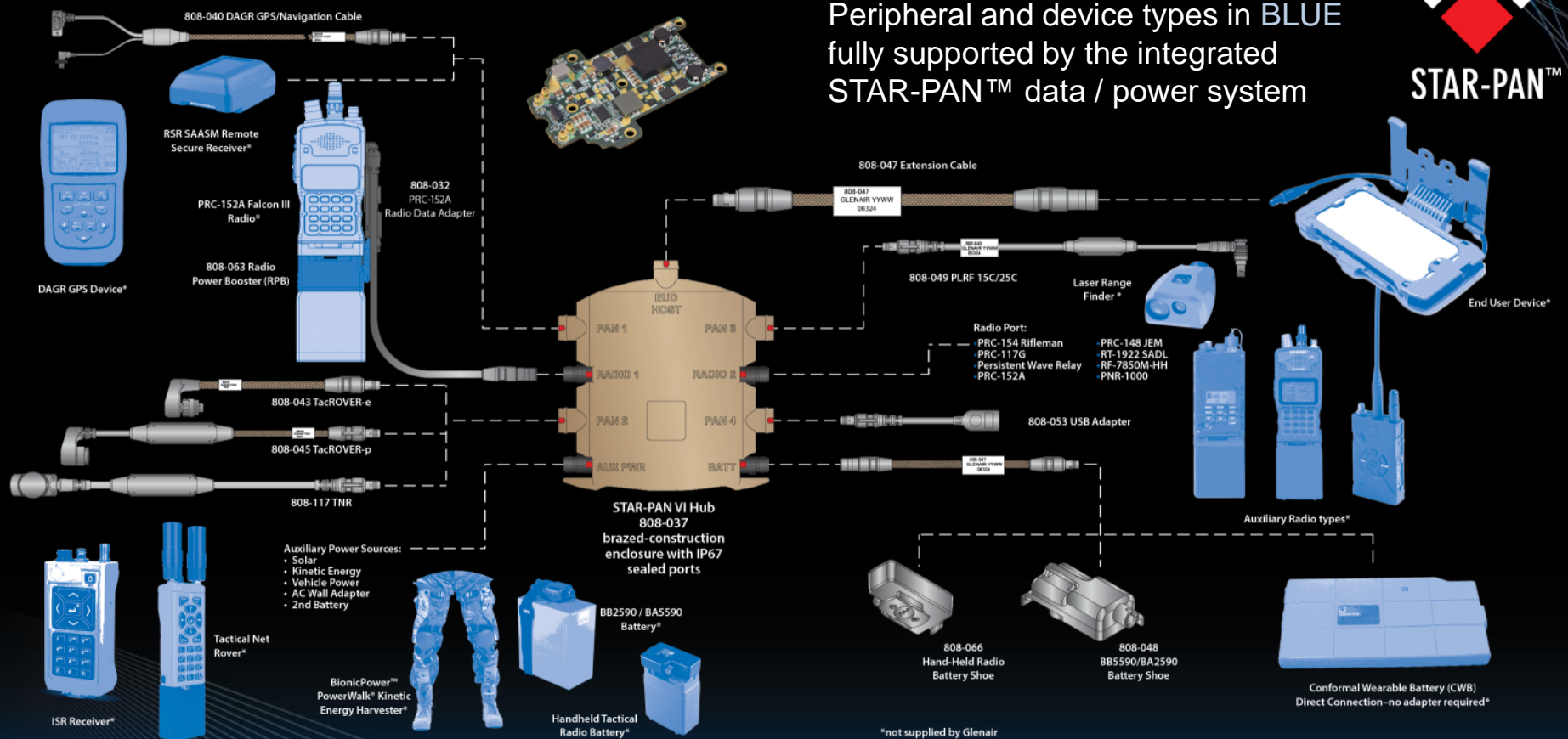- Border control inspection sensors
- Vest antennas

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STAR-PAN Multiport System Architecture

STAR-PAN™ Device Support (STAR-PAN™ VI shown)

GLENAIR

STAR-PAN™

Peripheral and device types in BLUE
fully supported by the integrated
STAR-PAN™ data / power system

808-040 DAGR GPS/Navigation Cable

RSR SAASM Remote
Secure Receiver*

PRC-152A Falcon III
Radio*

808-032
PRC-152A
Radio Data Adapter

808-063 Radio
Power Booster (RPB)

DAGR GPS Device*

808-047 Extension Cable

808-047
GLENAIR YYWW
06324

808-049
GLENAIR YYWW
06324

808-049 PLRF 15C/25C

Laser Range
Finder *

End User Device*

EUD
HOST

PAN 1   PAN 3

RADIO 1   RADIO 2

PAN 2   PAN 4

AUX PWR   BATT

Radio Port:
• PRC-154 Rifleman
• PRC-117G
• Persistent Wave Relay
• PRC-152A

• PRC-148 JEM
• RT-1922 SADL
• RF-7850M-HH
• PNR-1000

808-043 TacROVER-e

808-045 TacROVER-p

808-053 USB Adapter

808-047
GLENAIR YYWW
06324

808-117 TNR

Auxiliary Radio types*

STAR-PAN VI Hub
808-037
brazed-construction
enclosure with IP67
sealed ports

Auxiliary Power Sources:
• Solar
• Kinetic Energy
• Vehicle Power
• AC Wall Adapter
• 2nd Battery

Tactical Net
Rover*

ISR Receiver*

BionicPower™
PowerWalk® Kinetic
Energy Harvester*

BB2590 / BA5590
Battery*

Handheld Tactical
Radio Battery*

808-066
Hand-Held Radio
Battery Shoe

808-048
BB5590/BA2590
Battery Shoe

Conformal Wearable Battery (CWB)
Direct Connection–no adapter required*

*not supplied by Glenair

STAR-PAN USB Hub/Power Distribution Interconnect System

Key features and advantages

- 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

* Requires STAR-PAN™ Ethernet Adapter

STAR-PAN™ II

808-057 · 2+ port smart power and data hub / cable

- 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 inputs ports for extended missions or battery hot swap
- SMBus, USB2.0 (Full & HighSpeed), USB1.1 compatible interface
- Glenair's power monitoring and management for each voltage rail and port
- Compatible PAN pin configuration and Smart Battery interface
- SMBus, USB2.0, USB1.1 compatible interfaces
- Built-in SMBus to USB converter to USB host devices
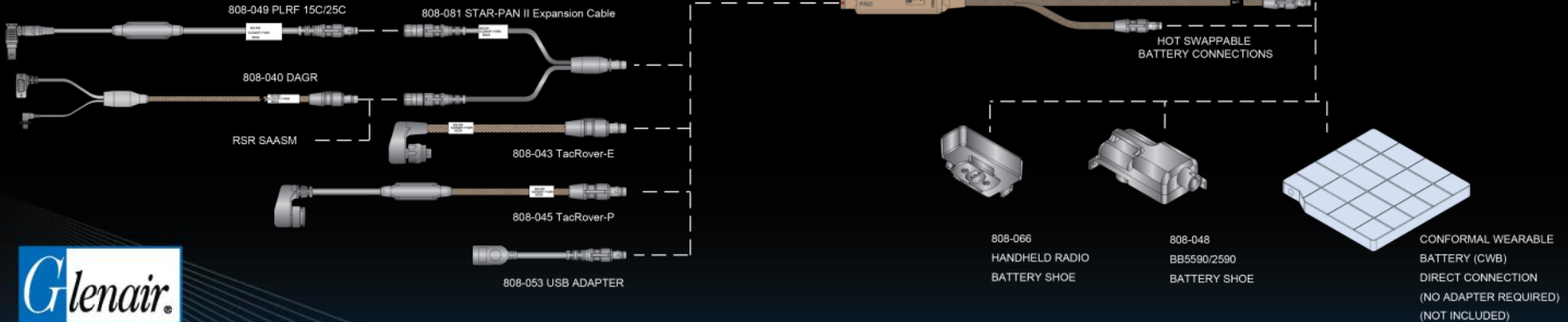- IP67 rated dust and water resistant

STAR-PAN™ II
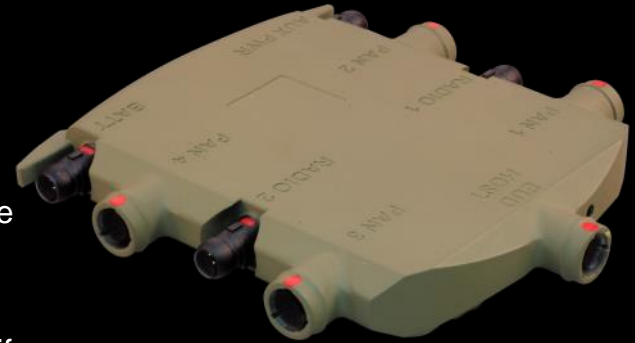
STAR-PAN II Capability Diagram

- 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

808-032
PRC-152A

END USER DEVICE
(NOT INCLUDED)

808-049 PLRF 15C/25C

808-081 STAR-PAN II Expansion Cable

808-040 DAGR

RSR SAASM

808-043 TacRover-E

808-045 TacRover-P

808-053 USB ADAPTER

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)

Glenair

STAR-PAN™ VI

808-037 · 6-port smart power and data hub system

- Battery Power and +5VBus power for up to 4 USB peripheral devices, 2 dedicated radio ports
- Glenair's power monitoring and management for each voltage rail and port
- Fault mode protection for surge, reverse voltage, over current and others
- Embedded level 3 controller for smart battery with a wide charge voltage range
- Able to draw from auxiliary DC power sources
- APS port for system power and battery charging for extending missions
- Heat efficient electronics packaging to optimize efficiency and extend battery life
- Radio port VBUS system hold for extended mission time and SWaP
- Compatible PAN pin configuration and Smart Battery interface
- SMBus, USB2.0, USB1.1 compatible interfaces
- Built-in SMBus to USB converter to USB host devices
- Power-ON Night Vision Goggle (NVG) compatible LED Signal
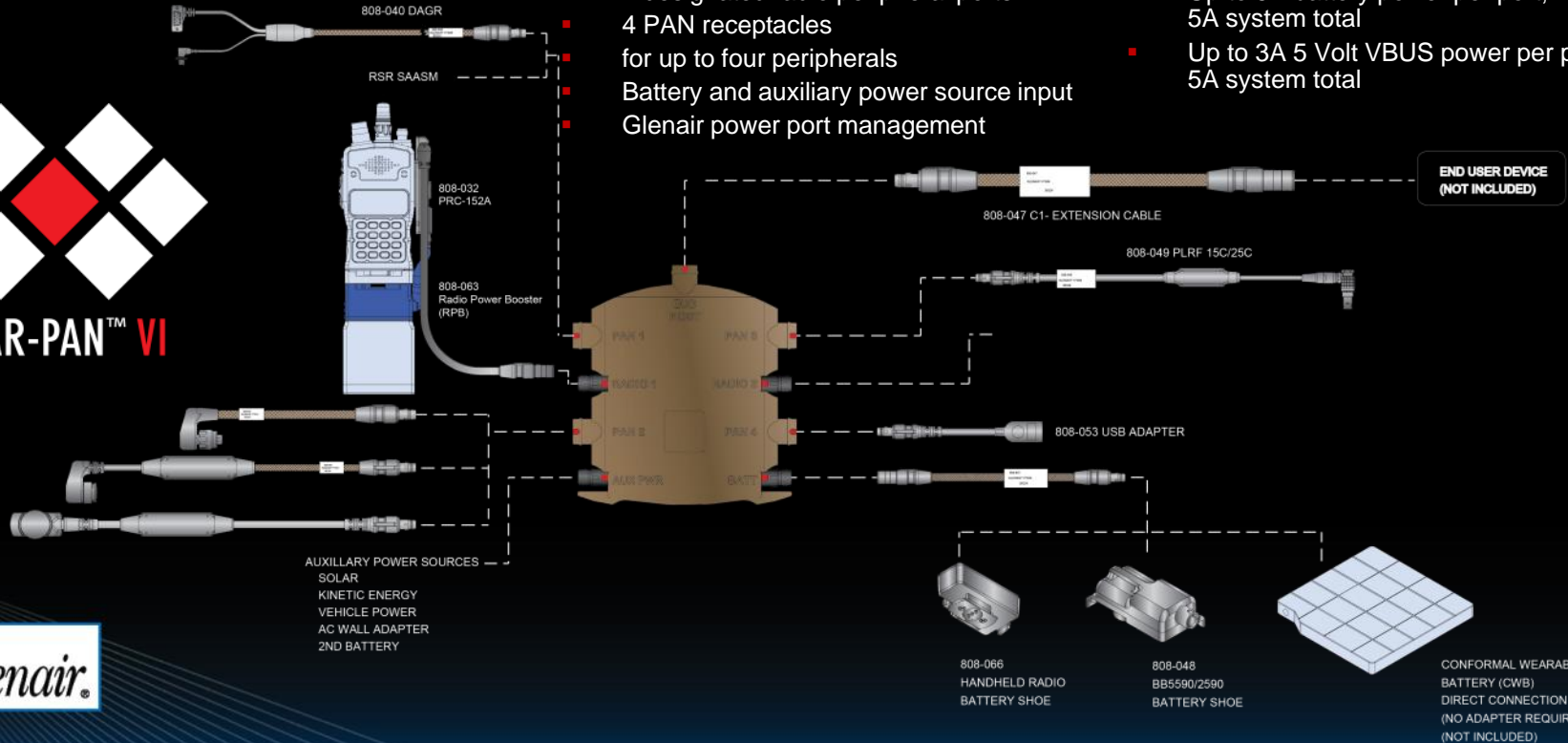- IP67 rated dust and water resistant

Glenair.

STAR-PAN™ VI

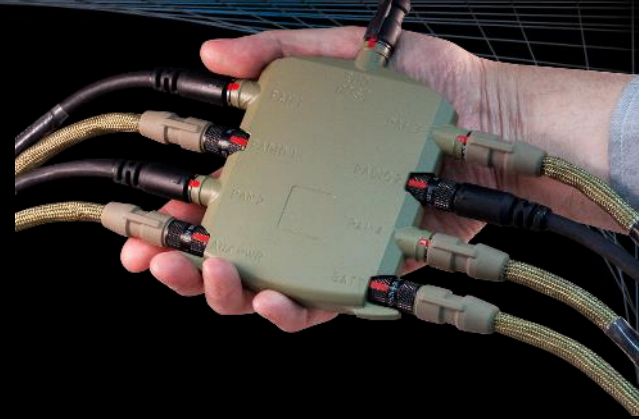# STAR-PAN VI Capability Diagram

- 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

808-040 DAGR

RSR SAASM

808-032 PRC-152A

808-063 Radio Power Booster (RPB)

808-047 C1- EXTENSION CABLE

END USER DEVICE (NOT INCLUDED)

808-049 PLRF 15C/25C

808-053 USB ADAPTER

PAN 1 · PAN 3 · RADIO 1 · RADIO 2 · PAN 2 · PAN 4 · AUX PWR · BATT

AUXILLARY POWER SOURCES
SOLAR
KINETIC ENERGY
VEHICLE POWER
AC WALL ADAPTER
2ND BATTERY

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

Glenair

STAR-PAN Core Capabilities Kit

Smart hub and essential cables for STAR-PAN II and VI

Core Capabilities Kit	
Part Number	**Description**
SPK808-057-001	2X C1 Cables
	1X C4 cable
	1X Host USB-Type A cable
	1X USB-A Accessory Cable
	1X MOLLE Pouch

Core Capabilities Kit	
Part Number	**Description**
SPK808-037-001	2X C1 Cables
	1X C4 cable
	1X Host USB-Type A cable
	1X USB-A Accessory Cable
	1X MOLLE Pouch

STAR-PAN™ II

STAR-PAN™ VI

Glenair®

STAR-PAN Competitive Strengths

12 design and technology advantages unique to STAR-PAN

(1) Universal / Mil-Std. Protocol Support

Non-Proprietary USB, Ethernet, and SMBus

- Legacy systems featured proprietary software interfaces and peripheral devices

- Current worldwide requirements are for non-proprietary Ethernet, USB 1.1, USB 2.0, and SMBus data/battery interfaces to COTS peripherals

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(2) Broad support for Mil-Std. / NATO Radios

Field radio variability is unpredictable and so requires across-the-board support for all common types, including available power and data adapters

- AN/PRC 148 MBITR
- AN/PRC 152(A) Handheld Falcon III
- AN/PRC 117G Manpack Falcon III
- AN/PRC 154(A) Rifleman
- RT-1922 SADL
- RF-7800S
- RF-7850S
- PNR 1000
- KDA MH600
- MPU4 (MANET)
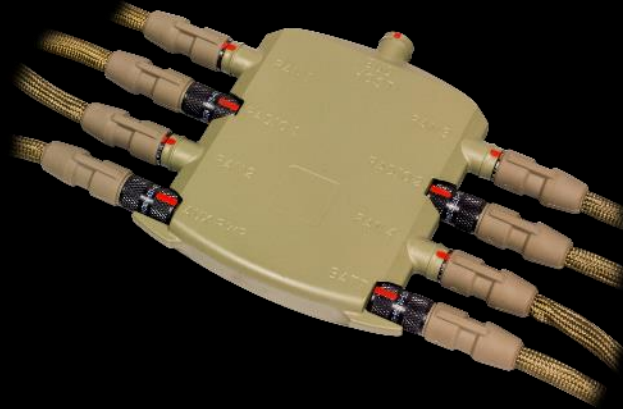
Thales
AN/PRC 148 MBITR

Harris
AN/PRC 152(A)

(3) Scalable, Customizable Hub Packaging

Versatile hub configurations, geared to common unit roles, easily customizable into standard COTS solutions

2-Port System for
Ground Soldiers

6-Port System for
Mission Commanders

(4) Industry-Standard I/O Connector Interface

Glenair Series 804 Mighty Mouse, designed and qualified for Nett Warrior, is the de facto soldier system standard

- Ultra small form-factor push-pull Series 804 Mighty Mouse: proven worldwide performance and availability
- STAR-PAN hub, EUD, radio, battery, and peripheral I/O interfaces all use the 804 quick-disconnect

(5) Ongoing Reduction of Size and Weight

innovations such as brazed-in connector mounts contribute to ongoing package size reduction

- Relentless attention to size and weight reduction is perhaps the most important requirement from the soldier's perspective

- Requirement extends from hub to connector to cable

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(6) Effective Thermal Management

Heat efficient electronics packaging must be optimized to extend system and battery life

- Internally-generated heat may damage C4ISR electronics, hub, and interconnect technologies and sap battery power

- Effective thermal management requires optimization of embedded circuit board electrical performance as well as enclosure design

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(7) Smart Power Monitoring and Embedded Charging /Conditioning

## Power management and distribution are a core capability

- Support for both standard battery and auxiliary power sources
- Board-level firmware power monitoring and conditioning for extended mission life
- Interconnect hub-to-power source adapters
- Support for scavenged power from direct current sources
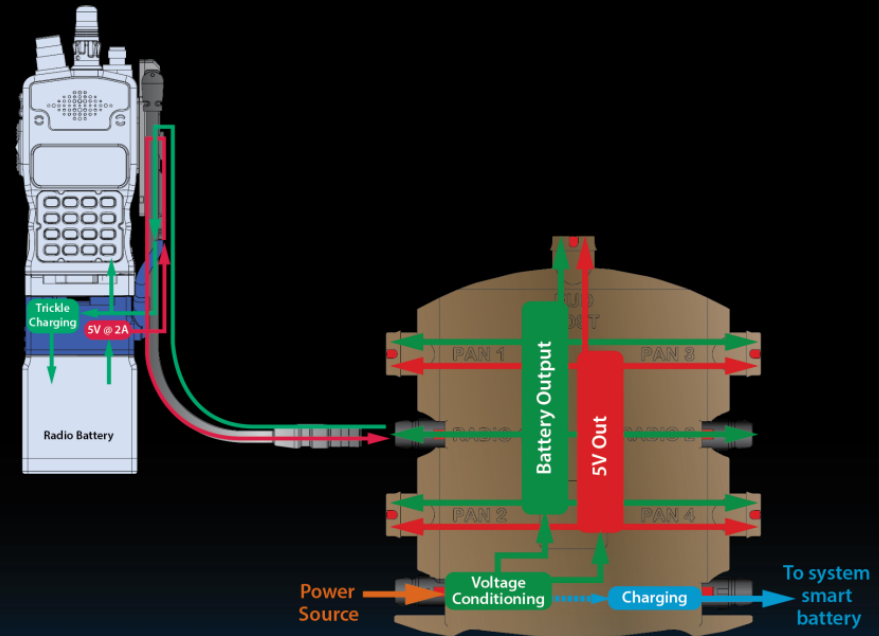
(8) Android-Based Power Management App

Available smart device app for real-time power monitoring and management

- SPAR: STAR-PAN Android Remote

- User-configurable

- Device enable/disable function

- "Sleep", "Up", "Kill", and "FUBAR" modes
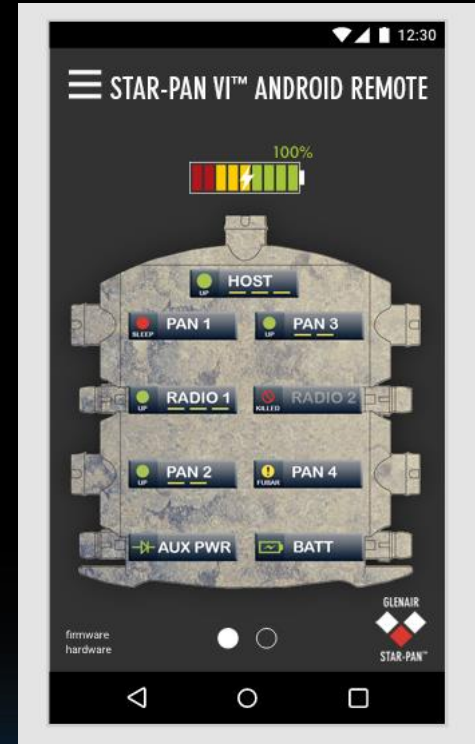
(9) Robust Circuit Protection

Long-term durability depends on anticipating and preventing damage to internal circuits

- Board-level support for hot-swapping during charging
- Corner-case testing and validation of extreme electrical events such as short circuits, surge and reverse voltage
- Robust environmental and mechanical hardening of all system components
- EMI shielding IAW MIL-STD-464C

Glenair.

(10) Full Validation Testing and Standards Compliance

Short list of most common qualification requirements

- MIL-STD-810G: Environmental Engineering Considerations and Laboratory Tests
- MIL-STD-461F: Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
- MIL-STD-1275E: 28V Vehicular Power Standard
- MIL-HDBK-217F: Reliability Prediction of Electronic Equipment
- MIL-STD-464C: Electromagnetic Environmental Effects
- DoDI 8500.2: Information Assurance (IA) Implementation

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(11) Laser-Focused Mission Profile

Digitally Aided Close Air Support (DACAS)

- Purpose-designed and developed for JTAC use in Digitally Aided Close Air Support

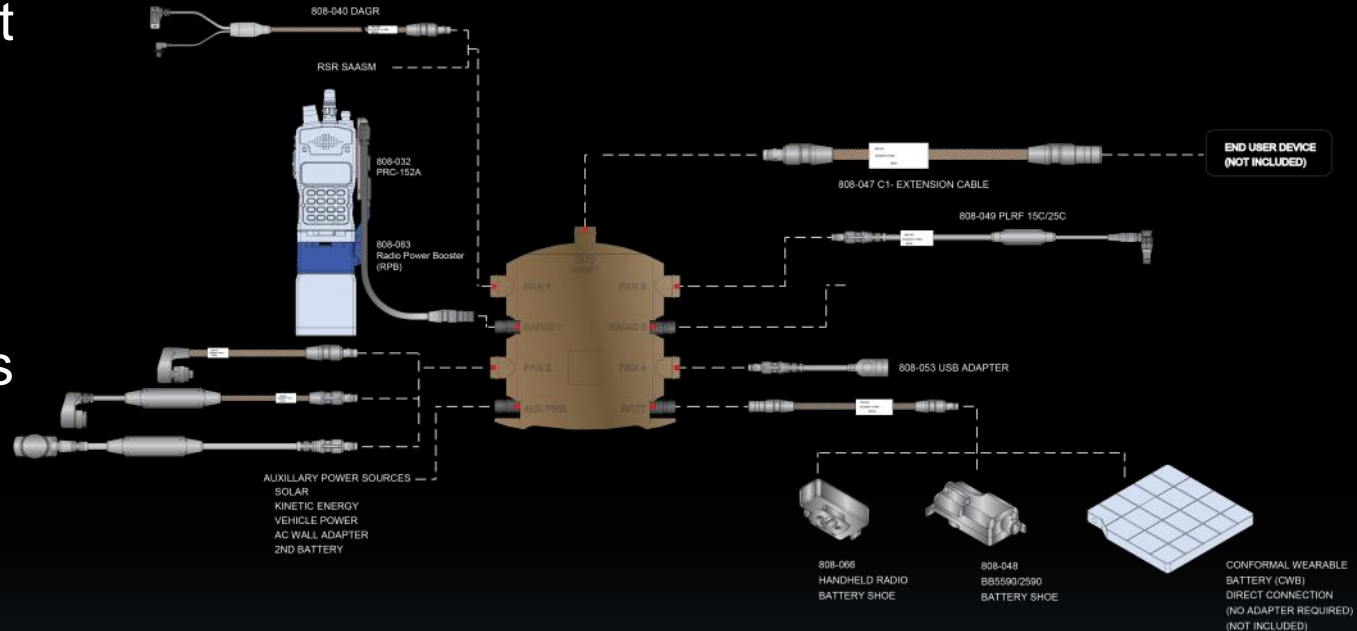- No compromise power and data support for JTAC C4ISR missions

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(12) High Availability COTS SOLUTION

Demand — when it exists — is immediate

- COTS component model
  - Bagged, tagged, ready-to-ship
- "No gaps" in compatible cables and adapters

The widest range of mission-critical interconnect technologies in the world

STAR-PAN Tactical Soldier Systems: Multiport Data and Power Management Hubs