Defense Program Product Training
by
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www.gpsssource.com
Purpose: Introduce DEFENSE PROGRAM PRODUCTS to Partners & Provide Path Forward for Product Marketing & Sales

- GPSS Competencies
- GPS Retransmission
  - “Snake” Kits
  - GLI-ECHO II
- GLI-FLO
GPS Source is an AS9100 company in business since 1999. We design, produce and support innovative GPS/GNSS and RF solutions in aerospace, commercial and defense arenas. Our products can be found all over the world in aircraft and military vehicles, aircraft hangars, municipal buildings and commercial manufacturing facilities. A 100% veteran owned small business, we are proud to offer solutions, service and support that increase reliability and lower operational costs for our customers.

**Technical Expertise Can be Found in:**
- Global Positioning Satellite Technology
- RF System Predictive Circuit Modeling
- Antenna Design Predictive Modeling
- Design, Fabrication, Testing and Certification of Airworthy and Military Grade Electronics
- Wireless Digital Communications Systems Research, Design & Analysis
GNSS Systems Research Design and Analysis
Concept Development and Requirements Analysis
Rapid Prototyping and Short-Run Manufacturing
System Design, Engineering and Integration
Test and Evaluation
Integrated Logistics Support
Contract Electronics Manufacturing
Reverse Engineering
Product Offerings

- RF Signal Distribution Equipment:
  - Signal Splitters / Power Dividers
  - Amplifiers
  - Attenuators
  - Antennas
  - GPS Retransmission Controllers & Kits
  - PNT Hub
Defense Product Applications

• Applications:
  – Radio & Network Systems Integration
  – Sensor Integration
  – OEM Aircraft, Ships, & Ground Vehicles
  – HALO / HAHO
  – Soldier Modernization Programs
  – Aircraft Maintenance Hangars
  – Systems Integration Labs
  – Timing & Synchronization
GPS Retransmission
Air & Ground Mobile Applications
Problem Statement

- Problem Statement:
  - 10 Years of Conflict Has Significantly Improved Situational Awareness Tools for the Warfighter – **GPS Enabled**
    - ISR
    - Comms (Secure Text & Voice)
    - Blue/Red Force Tracking, *etc.*
  - While Mounted, How Does the Warfighter Maintain This High Level of Situational Awareness?
    - Wired Connections Not an Option
    - Clear View of the Sky Unavailable Under Ballistic/Blast Protection
Problem Statement

- The Warfighter Is Creative, He Will Create His Own Solution
Problem Statement

The Shortcomings of GPS:
- Weak Signals
  - Line Of Sight Between Receiver And Satellites
  - Poor Penetration of Structures
- GPS Receiver Cold Start
- Signal Errors

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What Is GPS Retransmission?

- Typical Retransmission System w/ GLI-ECHO II:

  ![Diagram of GPS Retransmission System]

Enables All GPS Devices Inside An Aircraft, Ground Vehicle, or Hangar!
Where Does It Apply?

- The Solution Is to Provide the Warfighter With Wireless GPS Signals Inside the Platform: **GPS Retransmission**
  - Definition: GPS Retransmission is the Art of Making Live GPS Signals Available to Handheld or Mobile GPS Applications at Locations Where the Signal is Not Otherwise Available
  - Successful Applications:
    - Ground Vehicles
    - Aircraft
    - Naval / Ship
    - Hangar
    - Manufacturing / Labs
Benefits of GPS Retransmission?

• How Does GPS Retransmission Benefit the Warfighter?
  1. Hot JPADS AGU Exits Ramp – Accuracy!
  2. GPS Signal During Transport – Jump With a GPS Signal!
  3. Improved Capability Under Armor – Survivability!
  4. Efficiency in Task Execution – Reduced Fatigue, Improved SA
  5. Improved Speed, Accuracy, & Survivability of Assault Team
  6. Eliminate Time-to-First-Fix (TTFF) When Exiting Vehicle
  7. Improved Battery Life on GPS Devices – Reduce Load
  8. Enabled Tactical Radios for Secure Comms, Wirelessly

“GPS re-radiating systems will allow soldiers to remain oriented on the battlefield, reduce time from the exit of vehicles to initial breach, and aid in ensuring the right structure is targeted. The GPS re-radiating systems will increase speed and accuracy, thus increasing survivability.”
- 7SFG (A) Company Commander
Family of Five Kits for All Applications:
- GLI-COBRA
- GLI-VIPER
- GLI-DIAMONDBACK
- GLI-COPPERHEAD
- GLI-COTTONMOUTH

The Solution: GLI Kits
GLI-Cobra Retransmission Kit

User’s Manual

GLI-ECHO II

Passive Antennas & Mounting Plates

Active Antenna

“Self Contained”

Cables, Mounting Items
## GLI GPS Retrans Kits

<table>
<thead>
<tr>
<th>GPS LIVE INSIDE Kit</th>
<th>Kit Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLI-Cobra</td>
<td>GPS Retrans Kit for Use in Aircraft, Rotorcraft, &amp; Ground Vehicles for the Special Forces Community</td>
</tr>
<tr>
<td>GLI-Diamondback</td>
<td>GPS Retrans Kit for Small &amp; Medium Rotorcraft &amp; Aircraft</td>
</tr>
<tr>
<td>GLI-Viper</td>
<td>GPS Retrans Kit for Medium &amp; Large Rotorcraft &amp; Aircraft</td>
</tr>
<tr>
<td>GLI-Cottonmouth</td>
<td>GPS Retrans Kit for HMMWV &amp; Small Tactical Wheeled Vehicle Applications</td>
</tr>
<tr>
<td>GLI-Copperhead</td>
<td>GPS Retrans Kit for Medium Tactical Wheeled Vehicles (Stryker, Pandur, Boxer), Heavy Tracked Vehicles (Bradley), and MRAP Applications</td>
</tr>
</tbody>
</table>
GLI-ECHO II Features

- GLI-ECHO II Offers:
  1. Manual Output Power Control at the Push of a Button
  2. Automatic Output Power Control to Maintain User Set Levels
  3. Automatic Oscillation Detection & Mitigation
  4. Compatible with Aircraft Antenna Systems (Including AEU/GAS-1)
  5. Seamless L1, L2 GPS Signal to Any Commercial or Military Receiver (C/A, P(Y), & M Code capable)
  6. NVG Compatible Display & Backlight Brightness Control
  7. Built in Test (BIT) & Fault Isolation
  8. 1 Input, 4 Output RF Ports (Up to 4 Antennas)
  9. Compliant with JPADS Mission Equipment

- MIL-SPEC Compliance:
  - MIL-STD-810G
  - MIL-STD-461F
  - MIL-PRF-23377
  - MIL-DTL-5541
  - MIL-STD-1472B
  - MIL-PRF-85285
  - MIL-E-5400
  - MIL-STD-704F OR MIL-STD-1275B
  - MIL-STD-1275B
  - MIL-PRF-85285
Suggested Selling Tips

• Who is the Competition?
  – Qinetiq NA
    • USAF JPADS Program Selection – “Self-Contained Kit”
    • User Has Experienced Technical Issues
    • Specific to C-130 and C-17 Platforms Only
    • Brand: QinetiQ
  – GPS Networking
    • Low Cost, “Radio Shack” Solution
    • Brand: GPS Networking
Suggested Selling Tips

What Sets GLI Kits Apart?

- “Smart Repeater” Technology
  - Power Control
  - Jam Detection
  - GUI & Fault Isolation

- It Works!
- Designed for Military Application
Suggested Selling Tips

• Power Questions for GLI Kits:
  – Do You Use DAGR or GPS Receivers Inside Vehicles or Aircraft?
  – Did You Know You Can Get GPS Signals Inside Your Vehicle or Aircraft?
  – Have You Ever Used a GPS Repeater?
  – Have You Held Your GPS Out The Door of Your Vehicle?
Potential Markets

• Airborne Assault & Insertion:
  – 82\textsuperscript{nd} Airborne, EOD, SOF
  – High Percentage of Users Carrying GPS
  – Rotorcraft

• MFF Capable Units
  – Tier 1, EOD, TAC-P, CSAR
  – JPADS, Combo Drops, MFF
Potential Markets

- Ground Assault, Soldier Modernization
  - Night Ops, Fast Egress from Vehicles
  - Land Warrior, Nett Warrior
  - Platforms: Integrated PNT Devices
  - Convoy, Security

- Naval
  - Amphib Ships
  - Carriers
GLI Kit New Equipment Training

• GLI NET Course:
  – 2 Day Training Course
  – Syllabus:
    • Installation
    • Operations
    • Troubleshooting
  – Great Opportunity to Up Sell GLI Products
GLI-FLO
GPS Hub Solution
DAGR: “Defense Advanced GPS Receiver,” A Secure Handheld GPS Receiver. Similar to Garmin Colorado

GB-GRAM: “Ground Based GPS Receiver Application Module,” The Circuit Board Inside a DAGR and other Military-Grade GPS Devices, It is a COMSEC Device

• COMSEC: “Communications Security,” the Description of a Device Controlled by the USAF GPS Directorate
• PNT Information Leveraged by Ever Increasing Number of Devices in Ground Vehicles
  – Laptop Computers, Nav Computers, BFT, Tactical Radios, Laser Range Finders, Commercial Receivers, etc.

• Today’s Ground Vehicles Leverage SAASM GPS in One of Two Forms:
  1. DAGR Feeding Peripheral Device, or
  2. Embedded GB-GRAM
• Case Study:
  - Stryker Command & Control Variant (C2V)
    - 1 DAGR Feeding Radio A
    - 1 DAGR Feeding Radio B
    - 1 DAGR Feeding Onboard Computers
    - 1 DAGR Feeding Radio C
    - 1 GB-GRAM Embedded in EW Device
    - 2-3 DAGR Antennas Driving All GPS Enabled Equipment

4 DAGR + 1 GB-GRAM + 3 Antennas = Unsustainable
Unaffordable
Unrealistic
Unacceptable
Problem Statement

- Case Study:
  4 DAGR + 1 GB-GRAM + 3 Antennas
  +

Courtesy US Army
• GLI-FLO is a “GPS Hub”
  – Distributes Secure IS-GPS-153 PNT Data to Any GPS Enabled Application
  – Mimics AN/PSN-13A DAGR Output Data
  – Secure PNT Signal Distribution to 4 IS-GPS-153 Compliant Applications
  – Integrates to Existing DAGR Mount
  – Simplify C4I Systems Integration
    • Simplify PNT Signal Distribution Inside Vehicles
  – Low Cost, Sustainable
  – Enables Re-Distribution of DAGR Inventory
What Does GLI-FLO Do?

Distribute IS-GPS-153 Messages to Vehicle Mounted Systems:
- Tactical Radios
- FBCB2 / BFT
- Fire Control Computer
- Laptop / FalconView
- Electronic Warfare
- Rugged Smart Displays

“GPS Hub”

GB-GRAM SAASM Receiver Inside GLI-FLO

Standard DAGR Cables

RA-2 DAGR Antenna

Custom Cables

GB-GRAM SAASM Receiver Inside GLI-FLO
GLI-FLO Description

- **Outputs:**
  - 4 Serial Output Ports (Up to 8 Ports w/ Custom Cables)
  - Serves Independent GPS Data to Any Device
  - Same Output Info as DAGR

- **Inputs:**
  - Utilizes Existing GPS Antennas
  - Crypto Key Fill
  - Power Input

- **Form Factor:** Existing DAGR Mount

- **MIL SPEC Qualified:** EMI/EMC, Environmental, Power
GLI-FLO Configurations

• One Form Factor, Two Configurations:

DAGR Driving GLI-FLO to Distribute Secure GPS:
• Low Cost Signal Distribution
• Existing Infrastructure
• Not a COMSEC Controlled Item
• Enables Use of DAGR for Navigation & Dismount Operations
• Enables Quick Integration of New GPS Enabled Equipment

Embedded GB-GRAM in GLI-FLO:
• Efficient Signal Distribution
• Compliant to HQA Directive
• Economical Solution for Comms Integration
• Eliminates Need for Multiple DAGR Devices
• Supports Radio Interface Standards
• Provides Long Term -153 Data Distribution Solution for Vehicles
Case Study with GLI-FLO Integrated:
- Stryker Command & Control Variant (C2V)
  - GLI-FLO Feeding
    - Radios A, B, & C
    - Onboard Computer
  - 1 GB-GRAM Embedded EW Suite
  - 1 1x4 GPS Splitter Feeding Two PNT Devices
  - 1 RA-2 Antenna Driving GLI-FLO

1 GLI-FLO + 1 GB-GRAM + 1 Antenna = Sustainable Affordable Efficient
How Does This Help Your Customer?

Benefits of Integrating GLI-FLO:

- Enables Recap of Existing DAGR Devices
  - Reduce Number of Onboard DAGR Units
- Efficient Systems Integration Efforts
  - Efficient Integration of Future Capabilities
- Low Cost Solution For Secure GPS
  - Cost Reduction for Platform LRU’s (No GB-GRAM)
- Simplified User Interface
- SWaP Improvements in System Level Design
- Maintain Existing Vehicle Infrastructure
- Simplified Keyfill Management Process
- Enables Other ADS Rep’d Equipment
GLI-FLO Applications

• Ground Vehicle & Aircraft Applications:
  – Ground Vehicle Integration:
    • OEM Integration to New Vehicles
    • Upgrades to Existing Vehicle Fleets, Recapitalization
  – Comms Integration Programs:
    • Modernize Radio & Navigation System
    • Units Integrating Their Own Systems
  – Rotorcraft Systems Integration
    • Similar Value Proposition to Ground Vehicles

• Key Question: Does Your Customer Use DAGR or Secure GPS Solutions Today?
• GLI-FLO is **NOT** Likely to be Purchased by:
  – Individual Soldiers
  – Supply Organizations

• GLI-FLO **IS** Likely to be Purchased by:
  – S6/S8 & G6/G8 Comms,/Force Mod/Requirements Organizations
  – C4ISR-Centric Organizations: Communicators, Maintainers, *etc*
  – Systems Integrators:
    • Industry Primes: GDC4, Harris Corp, *etc*
    • USG Stakeholders: PEO C3T, PD PNT, MARCORSYSCOM, *etc*
  – Units Can Assist in Driving Requirements Upward
GLI-FLO Competition

- No Products Exists That Can Match the Capabilities of GLI-FLO at this Price Point
  - First Product to Market, More Will Follow

- Competition:
  - Do Nothing (Maintaining Status Quo)
  - No Current Use of DAGR or SAASM Capability
  - More Complex Systems
    - Thales SOTAS
    - DRS Technologies DDU

- Barrier to Market:
  - Not Responsible for C4ISR Requirements
    - GLI-FLO is a Requirements Driven Product
• GLI-FLO is an ITAR Controlled Item
  – Export of this **Product** or **Technical Information** Requires a License From the US Department of State (DoS)
    • Process Takes Approximately 4-6 Weeks
  – Technical Info Has Not Been Shared in This Briefing
  – Open Source Product Info Sheets Are Available
• Technical Data Sheets Available With License
• Working with ADS to Establish a COMSEC/STARS Account to Support Resale of GLI-FLO
Questions/Comments?

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