PATHFINDER

An informal electronic newsletter published for the GPS user community by PM GPS. Information presented is based on published and submitted news items of interest to the general user. Widest dissemination and reproduction is encouraged. Newsworthy items are solicited for inclusion. Editor Don Mulligan at PM GPS, Ft Monmouth NJ DSN 992-6137 or (732) 532-6137 or email: Donald.Mulligan1@us.army.mil

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New Contract Awarded for Embedded GPS

Follow-on Contract Assures War-fighters and Weapon System Managers of a Continued Supply of the Ground-Based GPS Receiver Applications Module (GB-GRAM) for the Next Decade.

From The Product Manager

Hello GPS Users!

The award of the "follow-on" contract for embedded GPS as described in the lead article of this issue is an important event as it provides our military users with a stable consistent source of top quality GPS for years to come.

Embedded GPS is the future and our military/ civilian partnering team with Rockwell Collins provides an affordable embeddable military GPS receiver for many command, control, communications and computer systems that support a wide range of combat and combat support functions.

Another important development to report has to do with the authorization to use commercial GPS under certain conditions. Please read the article on page 3 carefully! If you have questions, please contact me or any member of my staff!

Jay Spencer

LTC, QM,
Product Manager, GPS

2LT Randall Bergh, Product Manager for GB-GRAM joins Mr. Don Manlove (left), his deputy from the GPS Wing at Los Angeles and Mr. Trevor Overton (center), GB-GRAM Product Director at Rockwell Collins at the recent signing of the contract for embedded GPS.

PM, GPS recently announced the award of the "follow-on" production contract for embedded military GPS receivers to Rockwell Collins of Cedar Rapids, Iowa. The 5-year contract for the Ground-Based GPS Receiver Applications Module (GB-GRAM) has a total potential value of $300 million dollars and was awarded by the CE-LCMC Acquisition Center here at Fort Monmouth, NJ. ***(continued page 2)***

Precise Positioning Service (PPS) is Secure GPS. Commercial GPS Is Not.

GB-GRAM Contract Award

Continued from Page One

Concurrent with contract award, an initial Delivery Order was placed for over 14,000 units valued in excess of $14M. The GB-GRAM is a component part purchased by various weapon systems managers for installation to their command, control, communications and computer systems. Each system manager sends funds to Product Director, Common Hardware System (PD CHS) at Fort Monmouth, NJ, where their orders are combined into larger Delivery Orders that qualify for volume discounts.

GB-GRAM is a lightweight 12-channel GPS receiver incorporating the Selective Availability Anti-Spoofing Module (SAASM) security device. It provides extremely accurate and robust Position, Navigation and Timing information to the host system. The current version GB-GRAM measures about 3 X 5 inches and weighs about 100 grams. PM GPS is working with weapons system managers across DoD to accommodate an even wider variety of host systems including handheld devices. Navigation functions supported by GB-GRAM include location, target location, time synchronization, rendezvous and en-route and terminal navigation.

PM GPS is also developing an accessory "box" that puts GB-GRAM inside the shell of a legacy GPS receiver. This item will allow systems using the older model GPS receiver to upgrade to SAASM performance without opening their host system for circuit card installation! This works for platforms that use the legacy receiver remotely without operator interface. This accessory can also be used to replace multiple legacy GPS receivers on a single platform since it provides GB-GRAM output to three data ports. (The "box" is called the DASH, see article on page 3).

The GB-GRAM contract was awarded after a competitive bid process and it is a "follow-on" to the original production contract awarded in 2003 under which the DoD procured over 15,000 GB-GRAM. The new contract has the potential value of $300M and will assure a stable source of embedded GPS through 2017 if the contract option is exercised.

The GB-GRAM team at PM GPS is proud to provide state-of-the-art precision military GPS for warfighters and their weapons systems worldwide!

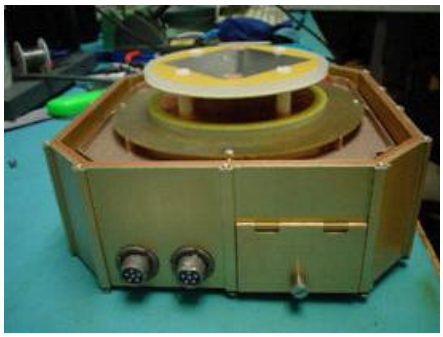
For more information about GB-GRAM, please contact MAJ Kelley McIntyre, PM GPS, Fort Monmouth NJ at (732) 427-5222 or Mike Vincelli, Integration Engineer, also at Fort Monmouth at (732) 532-4769 or visit the GPS website at https://gps.army.mil.

How the Army Uses Embedded GPS

for Combat Service Support in the Movement Tracking System (MTS)

The GB-GRAM provides a military GPS receiver capability to a wide range of military systems as noted in the lead article of this issue. So maybe you're from the "Show Me" state? Okay, here is an example of how this circuit card is used to support one of those end-item systems.

GB-GRAM provides position location data to the Movement Tracking System (MTS). Here is an illustration of how GB-GRAM fits into the MTS. Below left is the GB-GRAM installed on the left side of the MTS "motherboard". Below right is the assembled MTS unit (without its radome). The GB-GRAM is inside this unit.



The bottom picture shows a typical cargo vehicle where the MTS box has been installed to the cab roof to provide the GPS and communications antenna with clear reception and broadcast capabilities.

Other GB-GRAM are installed to MTS base stations and mobile units that utilize the system to direct cargo shipments to get food, fuel and bullets to the war-fighters that need them. The GB-GRAM plays a small but critical part in making MTS a reliable element of combat support and service support operations.

Updated Joint Chiefs of Staff Navigation Policy Reiterates: PPS is Critical for Combat Operations!

JCS Navigation policy defines Precise Positioning Service (PPS) GPS as one of two acceptable Position Navigation Timing (PNT) systems authorized for combat, combat support and combat service support operations. The other DoD-approved PNT system is Inertial Navigation System (INS). The mandate to use PPS GPS dates back to 1992 so the recent JCS policy update is nothing new.

The US Government supports the use of commercial GPS for a variety of non-military applications including Coast Guard and FAA civil air traffic control. These commercial systems are not intended for combat operations and are not capable of providing the level of security and survivability found in military GPS systems.

PM GPS has consistently advised military users of the DoD mandate to use only keyed PPS-rated GPS user equipment for critical operations. This advice is unchanged!

DoD has long been concerned about the use of commercial GPS by war-fighters. Yes, commercial GPS receivers may be more readily available than PPS systems and they may have more attractive operating features but these benefits do not outweigh the risks of relying on the Standard Positioning Service (SPS) civil signal when operating in a hostile environment.

When President Clinton ordered DoD to "turn off" Selective Availability a few years ago, many people misunderstood the meaning of that action. It did not make civil and military signals or User Equipment "equal".

Significant differences remain between civil and military GPS and the mandate that combat operations use only keyed PPS-rated GPS user equipment is unchanged!

Visit the PM GPS website to view the war-fighter video that addresses "commercial versus military" GPS! The link to the video is right there on the front page.

Recently, the Chairman of the Joint Chiefs of Staff issued an update of the Master Positioning, Navigation and Timing Plan which contained an update on GPS policy.

The document, CJCSI 6130.01D dated 13 April 2007 is classified as FOUO and is available to authorized DoD agencies through appropriate security channels. You can also find most policy documents via internet search.

The GPS security policy is essentially unchanged from the previously published guidance stating that all military weapon systems shall use keyed PPS-rated GPS User Equipment for all combat, combat support and combat service support operations.

Any agency seeking to use commercial SPS User Equipment must apply for waiver permission before using SPS equipment. Again this is no change from previous policy.

The "new" element in the policy allows commanders to purchase commercial SPS receivers for limited non-critical applications subject to five specific limitations spelled out in Enclosure D to CJCSI 6130.01D. Key among them is the continued prohibition that SPS receivers may not be used for any critical military operations!

Commanders seeking to use SPS receivers are cautioned to review the JCS Navigation Policy carefully!

Defense Advanced SSI Host (DASH) Box—Accessory for the GB-GRAM

PM GPS is developing a GB-GRAM accessory to provide a way for weapons systems that currently use the AN/PSN-11 (V) PLGR GPS receiver to upgrade to SAASM security architecture and the greater receiver performance and signal security of GB-GRAM without opening their weapon system computer to install a new circuit card.

Shown in orange at right is one of the prototype DASH units (without dust caps). Next to it is a standard PLGR. You can see the similarity in overall shape but notice that instead of a folding antenna (unnecessary since DASH can only be used installed with remote antenna), the DASH box provides additional output ports (arrows).

These multiple data ports allow the DASH box to replace multiple PLGRs. This is useful in certain host vehicles where separate command, fire control and navigation systems each require a GPS input. One DASH box can provide GPS data to three systems which frees up the other PLGR for handheld use. Contact PM GPS or PM GB-GRAM for technical information on the DASH box.

Contact PM GPS or PD CHS about borrowing a prototype or purchasing DASH accessories for your GB-GRAM!

What is a DAGR Battery Pack Worth: $28 or $500?

(Hint: Don't Keep the battery pack when returning DAGR for warranty repair!)

The AN/PSN-13A handheld DAGR GPS receiver is proving its value as the premiere PPS-rated military GPS receiver in use today. PM GPS continues a rapid pace of fielding and New Equipment Training (NET) to get the DAGR in the hands of soldiers everywhere.

Naturally, the operating tempo of today's combat and combat support operations generate a certain amount of wear and tear requiring warranty repair.

The folks at the DAGR repair depot in Cedar Rapids Iowa have reported several incidents where DAGR were returned for repair minus the battery pack.

That's not a good thing for a couple of reasons so we ask everyone involved in DAGR maintenance to be aware of the following information!

1. Although the $28 battery pack has its own part number and NSN, it is actually a component part of the DAGR receiver so if you return a DAGR for warranty repair without the battery pack, you returned an end-item missing a component part!

2. While it is recommended that the user remove the 4 main power batteries from the battery pack before returning a DAGR for warranty repair, don't forget to reattach the empty battery pack! The battery pack and its seal are part of the moisture barrier that protects the DAGR's guts and the battery pack protects the power connections from environmental exposures.

3. Help us avoid a warranty-void charge of $500 for repairing a receiver that is missing the battery pack! Return a "whole " DAGR so we can repair and re-issue it!

The DAGR battery pack, primary 4-cell is shown at left, detached from the rear of the DAGR receiver.

The DAGR battery pack has its own part number 987-6641-001 and NSN 6135-01-521-3064

In GPS, FOM stands for the Figure of Merit which estimates position error.

FOM values ranges from 1 to 9 (1 is the best). A FOM above 3 is considered to be a high level of position error. More information about FOM is found in table 9-1 of the DAGR TM TM 11-5820-1172-13, C2 date 1 Oct 06

GPS Articles in PS Magazine, "The Preventive Maintenance Monthly"

PM GPS is pleased to report our good friends at PS Magazine, the Preventive Maintenance Monthly, published by the US Army Logistics Support Agency at Redstone Arsenal AL have included two more GPS articles!

Part of the index page for issue # 657, Aug 2007, is shown at right, listing GPS articles under "Communications".

Since 1992, PS Magazine has published over 50 articles on GPS User Equipment operation, installation and maintenance.

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The latest articles address two key concerns for GPS Operations today, the importance of always using a keyed-PPS GPS receiver for all mission critical operations and the fact that DAGR has an extended warranty. So, if your DAGR has failed or been damaged, turn it in for repair or replacement from our depot facility.

Visit the PS Magazine website at https://www.logsa.army.mil for a lot of great information including other GPS articles. We also post the GPS articles from PS Magazine on our website!

Tan Legacy PLGRs - Get One More Lease on Life!

PM GPS recently received approval from Headquarters, US Army to provide legacy handheld AN/PSN-11 PLGRs to support National Guard Hurricane Relief operations. This is part of a larger effort to "cascade" over 2,000 older model GPS receivers to units that otherwise do not have their compliment of authorized military GPS receivers. Some organizations will get tan AN/PSN-11 PLGR limited to Hurricane Relief missions while other units will get the green AN/PSN-11(V)1 PLGR for use in combat, combat support or combat service support missions.

This effort provides one more "lease on life" for the oldest PLGRs remaining in the Army inventory. Most of these sets were returned to PM GPS custody when the owning units were equipped with the replacement handheld GPS receiver, the AN/PSN-13A DAGR.

The early production tan AN/PSN-11 PLGRs have a limited software capacity and cannot host the updated software used by the green PLGR, the AN/PSN-11(V)1 model.

The Puerto Rican Army National Guard received the first shipment of tan legacy PLGRs in June 2007. Another shipment went to units located in Guam.

PM GPS currently plans to distribute over 2,000 legacy PLGRs, tan and green, to National Guard units in 39 states.

While tan PLGRs are intended for training and Hurricane Relief contingency use only, the green PLGRs may supplement unit combat deployment operations.

Although tan PLGRs are not state-of-the-art, they are nevertheless reliable GPS receivers and in the wind and rain of hurricane weather, their rugged design may prove especially worthwhile.

For more information on the PLGR Cascade or Hurricane Relief efforts, contact PM GPS at the Fort Monmouth New Jersey office.

PPS AOC PPS-SM SAASM - Part of the GPS Alphabet Soup?

For readers not familiar with GPS terminology, please allow us to clarify some of the most commonly used GPS acronyms!

PPS stands for Precise Positioning Service. This is the military-only GPS signal compared to the Standard Positioning Service (SPS) signal which is available to military and civilian users alike.

PPS is better because it provides greater accuracy and signal security over SPS.

A military GPS receiver only gets PPS is if it has a good COMSEC crypto key for its "internal security device".

In the early days of GPS, the first security device was the Auxiliary Output Chip or (AOC).

By the mid-1990s, the Precise Positioning Service Security Module or PPS-SM became the new standard for security devices.

In turn, by early 2000, the next-generation of security devices arrived, the Selective Availability Anti-Spoof Module or SAASM. Today the SAASM remains the gold standard for GPS security devices although a lot of GPS equipment is still out there using PPS-SM or AOC.

These security devices are not interchangeable since they feature successive changes in design and capabilities. In most cases, weapons system managers deal with the issue of whether or not to upgrade the internal security device.

At the user level, you only need to know that the same COMSEC key operates any security device.

So, AOC, PPS-SM and SAASM are different models of the GPS security device that enables your military GPS receiver to access the PPS signal.

Important? Yes, because without the COMSEC key, your military receiver will not provide PPS accuracy!

Attention Weapon System Managers

PM GPS has extensive data concerning GPS receiver performance (PPS versus commercial) under a wide range of conditions. This information is not appropriate for publication in an unclassified newsletter but it is available to authorized DoD weapons system managers. Contact PM GPS.

How to Contact PM GPS https://gps.army.mil

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Who to Call for Army Issues?

Call the Army Logistics Manager for:

- Army GPS User Equipment Policy
- User Equipment Authorizations & Procurement
- Maintenance Status or GPS Loans

Call the Army Fielding Manager for Army DAGR fielding and NET issues.

Other Service/Civilian Agencies?

Contact our representatives at the GPS Joint Service Support Office at Warner Robins AFB, Georgia: Frank Rowe or Willie Jackson as listed in the column at left.

Or use the User Information Request Form

Go to https://gps.army.mil

Click on the "Contact PM GPS" tab at the homepage.

Or use the GPS Help Line

by contacting Mr Willie Jackson at Warner Robins GA (see his contact info at left column)

Please Note

We have had some recent personnel changes.

If you have trouble reaching anyone listed, please use the "contact PM GPS" tab at our homepage to submit your question or comment and we will route your query to the right person.

Why Use Military instead of Commercial GPS?

Soldier Safety! Mission Accuracy! Signal Protection!

View the video on the GPS homepage! https://gps.army.mil