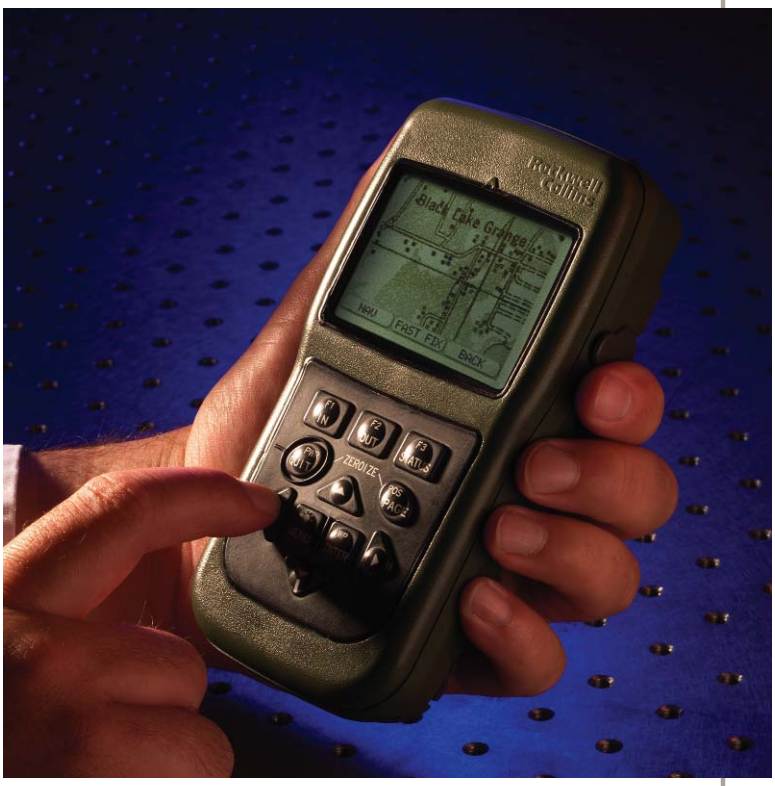
ROCKWELL COLLINS DAGR

Defense Advanced GPS Receiver

MILITARY HANDHELD GPS RECEIVER.



Rockwell Collins' DAGR — providing increased capabilities while reducing size, weight and power requirements.

For surface mobility, Rockwell Collins' GPS-based equipment is unsurpassed. Our portable, versatile GPS receiver provides precision guidance capabilities for vehicular, hand-held, sensor and gun laying applications. The Defense Advanced GPS Receiver (DAGR) offers the smallest and lowest weight hand-held receiver for the warfighter, with an easy-to-use man-machine interface (Graphical User Interface (GUI) and moving maps) and a proven design that passes environmental, serial port and software testing for a low risk, field ready unit.

The DAGR incorporates anti-jam improvements for enhanced protection and is the first U.S. hand-held GPS receiver program to include the next generation security device, Selective Availability Anti-Spoofing Module (SAASM). The Rockwell Collins SAASM includes:

- Proven capabilities of the Rockwell Collins' NightHawk 12-channel GPS signal processor
- All-In-View navigation using up to 12 GPS satellites
- Advanced correlator engine for accelerated Direct-Y code and C/A code acquisitions
- Next-generation security architecture using Key Data Processor (KDP-II)
- Unclassified-when-keyed operation and updated security features

The DAGR's dual frequency RF front end allows continuous track of both the L1 and L2 GPS satellite frequencies. Even when turned off, a precision time source (HAL) runs continuously to allow rapid acquisition of the GPS satellites when the receiver is turned on.

Rockwell Collins

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The DAGR Web site (www.shopcollins.com/dagr) provides information related to the hardware and operations of the DAGR. It also provides government access for more detailed information on documentation and training.

Users of the DAGR can provide feedback to Rockwell Collins Engineering for potential future DAGR improvements. Links are also available to Customer Service for the DAGR.

ADVANCED USERS FEATURES

- Situational awareness with moving maps
- Advanced laser range finder, fire support and CAS 9-line functions
- Capability to load maps from a PC or another DAGR
- Capability to reprogram a DAGR from a PC or another DAGR
- User programmable hot keys
- Display of minutes-since-fix after transition to Standby
- Area navigation with waypoint storage
- User setup of units, datums and coordinate formats

ADVANCED GPS FEATURES

- Selective Availability Anti-Spoofing Module (SAASM) security
- 12-channel continuous satellite tracking for All-In-View operation
- Simultaneous L1 and L2 dual frequency GPS signal reception
- Aggressive strategies to improve acquisition/reacquisition performance and reduce power consumption
- Cold start without time, position or almanac in less than 100 seconds from complete OFF
- Extended performance in a diverse jamming environment
  - 41 dB J/S maintaining state 5 tracking
  - 24 dB during initial C/A code acquisition
- Receiver Autonomous Integrity Monitoring (RAIM)
- Resistance to multi-path effects
- Outstanding GPS performance and history
- Mature, proven GPS technology

DAGR MAP SYSTEM

The DAGR Map System allows an operator to load and display map sets consisting of vector maps, raster maps, satellite imagery and non-geospatial (bitmap) images on the DAGR. These maps/images, along with waypoints, routes and alerts can then be viewed on the DAGR's moving map displays providing enhanced situational awareness to the operator. The DAGR Map System supports the Vector Map (VMap) Levels 0-2 and Urban Vector Map (UVMap) vector map formats. The DAGR Map System supports the Compressed Arc Digitized Raster Graphics (CADRG) and Controlled Image Base (CIB) raster map/imagery formats. The DAGR supports a map set size of up to 32 megabytes. Operators have the ability to transfer map sets contained in one DAGR to another DAGR. Support of additional map formats by the DAGR Map System is planned.

The DAGR Map System utilizes the National Geospatial-Intelligence Agency's Commercial Joint Mapping Toolkit (C/JMTK) software and Rockwell Collins' GPS Map Toolkit. For computer-to-DAGR map loading a PC-to-DAGR cable is required. To perform DAGR-to-DAGR map set transfer a DAGR-to-DAGR cable is required.

SPECIFICATIONS

Frequency	L1/L2 dual frequency tracking L1 – C/A, P(Y) L2 – P(Y)
Acquisition time	TTFF < 10 sec (hot) TTFF < 70 sec (warm) TTSF < 15 sec (OFF or STBY < 15 min) TTSF < 22 sec (STBY < 60 min) TTSF < 70 sec (OFF < 60 min)
GPS time accuracy	52 nanoseconds
Dynamics	Velocity: 250 m/s Acceleration: 20 m/s^2
Position accuracy	DGPS: < 2.28 m, 95% horizontal WAGE: < 4.82 m, 95% horizontal PPS: < 10.5 m, 95% horizontal
Velocity accuracy	0.4 m/sec 3D 95%
Coordinate system	30 predefined, 6 user defined
Storage capacity	999 waypoints 5 moving waypoints 15 user-definable reversible routes of up to 999 legs each
MTBF	10,000 hours
Datums	233 predefined, 6 user-defined
Compatibility	ICD-GPS-153

INTERFACES

- Three (3) independent serial data ports (full duplex)
  - Two (2) standard RS-232 serial data ports
  - One (1) standard RS-422 serial data port
    - ICD-GPS-153 compliant
  - NMEA-0183 data output
  - Laser range finder
- Timing interfaces
  - 1 PPS input
  - 1 PPS UTC and 10 PPS outputs
  - HAVEQUICK output
  - SINCGARS time fill output
- L1/L2 active RF antenna port, 3.3 V dc
- RTCM 194-93/SC 104 differential GPS (DGPS) correction data input
- KYK-13 / KOI-18 / AN/CYZ-10 / DS-101 / DS-102 key loading input
- External power, data and antenna inputs

PHYSICAL CHARACTERISTICS

Power	External: 9 to 32 VDC Typical power: ~1 W Batteries: 4 - 1.5V AA cells for prime power 1 - 3.6V 1/2 AA cell for memory power Battery life: > 14 hours
Weight (with L91 primary cells)	< 1 lb (454 g)
Size/volume	6.35 in x 3.46 in x 1.58 in maximum (16.14 cm x 8.79 cm x 4.02 cm)
Display size (viewable)	1.693 in (H) x 2.311 in (43.00 mm (H) x 58.7 mm)
Temperature range	Operating: -32°C (-26°F) to +70°C (+158°F) Storage: -57°C (-70°F) to +70°C (+158°F)
Humidity	0 to 100% (no precipitation)
Water resistant	Immersible to 1 meter
Altitude (operating)	-400 m to 9,100 m MSL

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Export of precise positioning service (PPS) units is authorized for GPS Memorandum of Understanding countries only. PPS security modules must be obtained through foreign military sales (FMS) procurement

For more information contact:

Rockwell Collins
400 Collins Road NE
Cedar Rapids, Iowa 52498
800.321.2223
319.295.5100
Fax: 319.295.4777
E-mail: collins@rockwell collins.com
Web site: www.rockwellcollins.com/gs
www.shopcollins.com/dagr

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