

HOOK3[®] Combat Survival Radio (CSR)

Search and Rescue with Confidence



Smaller, lighter, and better power efficiency
than previous CSAR radios

Auto-activation – G-Force & saltwater

Supports multiple Global Navigation Satellite Systems (GNSS)

Shorter time to first GPS fix

Option for P(Y) SAASM GPS Receiver -Radio designed to be
upgradeable to M-Code receiver when available

Overview

The HOOK3 Combat Survival Radio (CSR) provides direct, line-of-sight voice and encrypted two-way data communications that help combat search and rescue teams quickly locate and rescue downed pilots and isolated military personnel. The radio sends encrypted global positioning information, user identification and situation reports to provide rescue teams and aircraft operating in hazardous conditions with quick and accurate location information.

The new HOOK3 radio is significantly smaller, lighter and has better power efficiency than previous CSAR radios. Multi-mode capability allows a crew member to carry a single radio as opposed to multiple pieces of equipment. The radio is equipped with a new auto-activation feature that automatically transmits location data when G-Force or salt water is detected. In addition the new GPS module now has 32 channels enabling a faster acquisition time, better resolution due to increased satellite detection, better performance under canopy and near structures and supports multiple Global Navigation Satellite Systems (GNSS). With over 38,000 radios delivered to 39 different countries since 2001, HOOK radios have been the worldwide CSAR radio of choice when lives are on the line.

Additional Features & Benefits

- Fully compatible with existing HOOK2[®] assets (HOOK2 radios, Quickdraw2[®], SATCOM Base Station)
- User friendly, software-defined transceiver enables waveforms, crypto and software upgrades to be added as they become available
- Smaller size allows crew members to carry a single radio to satisfy Emergency Location Transmitter (ELT) or Personal Locator Beacon (PLB) functions
- Single, short encrypted bursts sent to CSAR aircraft significantly lowers risk of detection and interception
- Two-way SATCOM and 406 SARSAT beacon modes provide a real-time, over-the-horizon communications path between survivor and rescue personnel
- Swept tone beacon on any supported frequency including 121.5 MHz & 243 MHz
- PLS DME transponder and beacon provides Terminal Area Guidance (TAG)
- Can be interrogated by the Rockwell Collins RSC 125G and Cubic PLS AN/ARS-6(V12) and (V14)
- Automatic response to interrogations enables rescue forces to be able to extract the survivor's GPS coordinates from the radio without operator intervention
- Web browser administration using USB Provisioning Cable

Designed and manufactured at the General Dynamics Mission Systems Scottsdale, AZ facility

HOOK3® Combat Survival Radio (CSR)

General Radio Characteristics

- **Frequency range**
 - 121.5, 123.1 MHz; 225–320 MHz; hardware capable of 100 - 512 MHz; 406 SARSAT
- **Tuning increments**
 - 25 KHz steps (LOS)
 - 5 KHz steps (SATCOM)
- **Frequency stability:** ± 1ppm
- **Modulation**
 - AM voice, AM swept-tone beacon
 - PLS DME Transponder mode: BPSK/OOK
 - HOOK mode: MSK 1200 BPS
 - SARSAT mode: BPSK
 - SATCOM mode: BPSK
 - FM (future)
- **Data burst**
 - Encrypted (LOS and SATCOM) includes ID, GPS Coordinates and Text Message
- **Operating modes**
 - Voice
 - Swept-tone beacon
 - PLS DME transponder
 - GPS Interrogation (LOS or SATCOM)
 - 406 SARSAT
 - UHF SATCOM
- **Weight:** 24 oz. with battery
- **Size (with battery)**
 - 6.4 in x 2.90 in x 1.56 in
- **Operational temp.**
 - - 40°C to +55°C
 - - 20°C to +55°C (for SARSAT)
- **Storage temp.:** -40°C to +80°C
- **Primary and Rechargeable Batteries**
 - For SARSAT operation use MAI-150801
- **Battery life:** SARSAT certification for 24 hours with MAI-150801

Receiver Characteristics

- **Sensitivity (typical)**
 - -116 dBm (VHF AM Voice)
 - -114 dBm (UHF AM Voice)
 - -138 dBm (UHF SATCOM data)
- **Bandwidth (typical)**
 - Narrow Band: 60 KHz (min)
 - Wide Band: 5 MHz (min)
- **Spurious response:** 50 dB(typical)
- **Image response:** 40 dB min.
- **Audio response:** 500 Hz to 3500 Hz
- **Distortion (typical):** 2 percent
- **Audio output (typical):** 50 milliwatts

Part Number:

- **01-P58100R004**

Transmitter Characteristics

- **Average power**
 - 1 Watt – UHF; capable of 5W (FM) (future)
 - 200 mW – VHF; capable of 2W (FM) (future)
 - 406 SARSAT 5.0W min.
 - UHF SATCOM 5.0W ± 2 dB
- **Modulation:** 86% AM
- **Harmonics:** ≤30 dB below carrier
- **Distortion:** 3% typical at 86% modulation

GPS/Navigation

- **GPS General Characteristics**
 - Civilian: C/A state-of-the-art 32 channel GPS Receiver, parallel L1 band only; multiple international constellations supported
 - SAASM (opt): 12 channel, L1 and L2 bands.
- **Sensitivity**
 - Civilian: -145 dBm
- **Accuracy:** Civilian: < 25 meters
- **Navigation:** up to 250 waypoints
- **Coordinate system**
 - Geodetic (lat./long.) GEO, GEO2, UTM, MGRS

Benefits:

- **Accurate**
 - Position accuracy to <25 meters
 - Configurable GPS position updates up to 1 second
- **Secure**
 - HOOK2 waveform
 - 256 bit AES encryption - SATCOM
- **Rugged**
 - Immersible to 50 feet for 15 minutes and to 3 feet for 24 hours
 - MIL-STD-464 and MIL-STD-810
 - Smaller Handheld, lightweight design
 - Auto-Activation upon Ejection and/or Saltwater Detection
 - Operable underwater with Remote Antenna Kit
- **Easy to use**
 - Automatically responds to interrogation without user intervention
 - Acquires GPS position automatically when unit is turned on
 - Single-hand operation
 - Situation report feature
 - Large non-glare, daylight visible backlit display
 - Intuitive keypad and UI menu system
 - Web based configuration utility supports fast configuration and cloning
 - Single button EMERGENCY feature
- **Flexible**
 - Software Defined Radio; upgradeable with future waveforms and crypto

- Configurable with any mainstream browser
- Indicates detection and relative strength of GPS interference
- LOS and OTH communications paths
- Voice and Databurst modes
- Canned, pre-programmed, free-format, and Situation Report encrypted message formats
- Interoperates with a variety of interrogators with multiple interrogation modes (SATCOM, LOS, PLS)
- Onboard and Remote VHF/UHF and GPS antennas
- 25 programmable Communication Presets selectable by either the 7 position, easy access selector knob or the User Interface
- Configurable battery saving options
- Low risk of interception/detection
- Encrypted 2-way burst data transmission (messaging and position)
- Advanced forward error correction (FEC) for burst data
- **Fully compatible with the existing HOOK2 CSAR ecosystem**
 - Quickdraw2
 - HOOK SATCOM Base Station
 - Embedded Interrogator
 - PRC-112B1 and PRC-112G radios
 - ARS-6, ARS-6 (v12)
 - RSC-125G

Ancillaries:

- **Primary and rechargeable batteries**
- **Replaceable primary communication antenna**
- **Easy-to-use test set**
- **Remote antenna kit**
- **Earphones**
- **Headset with microphone (future)**
- **USB provisioning cable**
- **Protective faceplate/display cover**
- **AC/DC battery eliminator(s) (future)**
- **Pouch**
- **Antenna adapters**
- **Battery charger (4 and 10 bay)**

CTS-6025 CSAR Radio Test Set

- **Designed by Astronics Test Systems, the CTS-6025 is the preferred test set for the HOOK2 and HOOK3 radio**
 - Offers fault detection and operational verification of radio communications at all levels of deployment
 - Guided scripted radio testing that quickly provides consistent, cataloged test results
 - Removable solid state hard drive protects mission critical data
 - Most comprehensive communications tester for field testing

**COSPAS/SARSAT approval pending*

GENERAL DYNAMICS
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CTS-6025 CSAR Radio Test Set

Extensive Field Testing for Your Most Critical Radios



Powerful - 16+ instruments in one

Reliable - Fewer frustrating "no fault found" results

Flexible - Modular, customizable architecture makes it future-proof

Intuitive - Windows-based interface

Overview

Ensure mission readiness of your most critical radios with the CTS-6025 CSAR Radio Test Set from Astronics. Combining over 16 instruments into one, this portable, upgradeable tester offers fault detection and operational verification for both the General Dynamics Mission Systems HOOK2® and HOOK3® radios.

The CTS-6025 CSAR Radio Test Set is the most comprehensive communications tester for field testing, reducing testing time and cost, maintenance and calibration costs, lifecycle ownership costs, and the number of "no fault found" results.

With more than 20 years of radio test expertise, Astronics offers this customized solution exclusively with General Dynamics Mission Systems for the Hook Series CSAR Radios.

Built with synthetic, modular instrumentation, the CTS-6025 CSAR Radio Test Set always has access to the latest technology upgrade for future-proof field radio test.

The CTS-6025 CSAR Radio Test Set offers a synthetic instrument architecture to provide a migration path for easy customization, upgrades, and alignment with future radio communications technologies. Additionally, Astronics' long history of field support and obsolescence management ensure long term success and maximum utilization of your radio test set investment. Rely on Astronics' global team for installation, calibration, training, field support, and maintenance.

Built-in Military Optimizations.

- Guided, scripted testing for your Hook Series radios from General Dynamics Mission Systems that quickly provides consistent, cataloged test results
- Removable solid state hard drive protects mission critical data

Key Features

- RF signal generator, receiver, power meter
- RF analyzers – spectrum, VSWR, cable distance-to-fault
- AF signal generator
- Audio meters – SINAD/distortion, frequency, audio filters
- Oscilloscope, reference oscillator
- Digital interfaces
- Tracking generator
- Error vector magnitude (EVM)
- Wideband streaming TX and RX
- Real-time RF burst trigger
- Power analyzer
- NVM and data loader

CTS-6025 CSAR Radio Test Set

CTS-6025 CSAR Radio Test Set Key Specifications

RF Signal Generator

- **Frequency:**
 - Range: 1.0 MHz to 6.0 GHz
 - Resolution: 1 Hz
 - T/R output range: -120 dBm to -50 dBm
 - ANT output range: -90 dBm to -30 dBm

RF Receive Meters

- **Frequency:**
 - Range: 1.0 MHz to 6.0 GHz
 - Resolution: 1Hz
 - T/R input range: -50 dBm to +47 dBm (50 Ω)
 - ANT input range: -120 dBm to +20 dBm (50 Ω)
 - RSSI range: -100 dBm to +47 dBm

RF Power Meter

- **Frequency:**
 - Range: 1.0 MHz to 6.0 GHz
 - Accuracy: +/-1 dB

Audio Function Generator

- **Waveform:**
 - Sine, square, triangle, ramp up, ramp down, & DC
- **Frequency:**
 - Range: Sine: 0 Hz to 40 kHz
 - Resolution: 0.1 Hz
 - Accuracy: 100 ppm

Dimensions

- **Size:** 11.8" x 10" x 3.3" (300 mm x 255 mm x 85 mm)
- **Weight:** <10.6 lbs. (4.8 kg)

Accessories

- AC power cord, carry handle, operator's manual, 2 batteries

RF Spectrum Analyzer

- **Frequency:**
 - Range: 1.0 MHz to 6.0 GHz
 - Resolution: 1 Hz

Oscilloscope

- **Display:**
 - Channels: 2
 - Trace types: Live, captured
 - Measure: frequency, Vrms, Vmin, Vmax, Vpp, Vavg, pulse width (neg. & pos.)
 - Frequency range: DC to 25 MHz
 - Input range: +/-40 V

Reference Oscillator

- **Accuracy:** +/- 0.15 ppm

Audio Analyzer

- **Channels:**
 - 2 Channels
 - Demodulated RF
 - Audio signal is automatically detected and measured

Power Requirements

- **AC/DC**
 - AC voltage: 100 to 240 VAC, 50/60 Hz
 - DC voltage: using battery

Host System

- Rugged tablet running Windows 10
- Solid state drive with 128 GB



The CTS-6025 CSAR Radio Test Set is developed exclusively for use with Hook Series Radios from General Dynamics Mission Systems

Quickdraw2® Handheld GPS Interrogator

Turns any aircraft into a CSAR aircraft



Portability allows for plug-and-play on over 50 aircraft;
no aircraft modifications required

Encrypted, direct, cockpit to survivor communications (TAC)

Displays survivor GPS coordinates in multiple formats

Quickdraw2 functionality embeddable in other systems

Direct, Cockpit-Survivor Communications

The handheld General Dynamics Quickdraw2® Interrogator quickly plugs into the intercom system of virtually any aircraft, both rotor and fixed-wing, transforming it into a Combat Search and Rescue (CSAR) platform. The Quickdraw2 Interrogator is more flexible and much more economical than existing radios/interrogators built into aircraft.

Terminal Area Communications (TAC) with No Aircraft Modifications

The Quickdraw2 Interrogator interrogates the HOOK2® AN/PRC-112G®, B1 or HOOK3™ Combat Survival Radio via the aircraft's onboard UHF line-of-sight radio via the aircraft's onboard UHF line-of-sight radio. Field-tested and operational on a variety of deployed aircraft, the Quickdraw2 Interrogator has also been flight certified by the U.S. Navy. It has been effectively used on high-altitude reconnaissance aircraft to automatically relay the interrogation reply to another Quickdraw2 on the ground or onboard a manned aircraft. This same capability has been employed on a UAV as well.

UHF-Compatible — Compact Yet Powerful

The General Dynamics Quickdraw2 Interrogator is compatible with UHF radios for mobile or fixed applications.

The architecture includes:

- User interface consisting of a keypad and LCD display
- Alert features that notify the operator – via audio or a flashing LED – when a new message is received
- Modem with error correction and encryption
- Intercom interface with automatic level control
- Night vision goggle (NVG) compatible

Additional Compatible Systems

Embedded interrogators integrate the HOOK2 waveform into the Rockwell Collins RSC-125G1 Personnel Locator System and the Cubic AN/ARS-6 Version 12 PLS®2, providing Quickdraw functionality in a fixed-system airborne radio. This integrates Terminal Area Communications and Terminal Area Guidance into one platform.

Quickdraw2® Interrogator

Accurate

- Displays range/bearing to HOOK2 AN/PRC-112G, B or HOOK3 radios
- Includes error correcting communication and bit interleaving

Secure

- Provides data burst encryption (DES)

Rugged

- Isolated battery compartment
- Metal case for better EMI
- Rain resistant

Easy to use

- Provides handheld operation
- Easy to navigate menu structure
- Features a NVG-compatible backlit LCD display and keypad
- Custom aircraft communications cable incorporate Quickdraw2 communications without disabling voice communications
- Situation report feature present survivor status, threats, and landing zone info in one databurst
- Provides auto-interrogation and auto-forward

Flexible

- Integrated on over 50 different aircraft
- Interoperable with various aircraft intercoms and headsets
- Allows the user to employ normal PTT and audio communications
- Holds up to 25 mission-specific messages
- Supports canned and free-formatted text messages from HOOK2 and HOOK3 radios

Energy Efficient

- Powered by 4 AA batteries

Technical Specifications

- Power
 - Four commercially available AA batteries
- Size:
 - 42 cu. in. (688.26 cc)
- Weight:
 - 24 oz. (.68 kg) w/o batteries and cables
- Operational Temp:
 - -30°C to +55°C
- Storage Temp:
 - -40°C to +80°C
- Data Burst
 - 455ms
- Data Modulation
 - MSK 1200/2400BPS
- Data Encoding
 - Forward Error Correction
- Encryption
 - DES
- Audio Interface:
 - The audio interface meets the requirements of C-11746 (Model 449, "Communications System Control C-11746, Power and Signal Requirements" document) Compatible with various Tempest and non-Tempest headsets including the H-189/GR or H-250/U handsets

GSA Order: GS-35F-0060N
Schedule #70 • SIN 132-8



HOOK2 CSAR Radio HOOK3 CSR Radio



1. RSC-125G is manufactured by Rockwell Collins— France.
2. AN/ARS-6 is manufactured by Cubic Defense Systems, San Diego, CA. PLS is a registered trademark of Cubic Defense Systems.

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SATCOM Base Station (SBS)

Secure Over-the-Horizon Rescue Communications



Delivered as a self-contained, stand alone SATCOM Base Station - No SIPRNET connection

Network-based architecture supports integration into existing C4 assets to build multi-base station, multi-user communication networks

"Always On" auto acknowledgement feature provides instant feedback to isolated personnel

Built-in web server enables interface to mapping software to visually show survivors on a map

The SATCOM Base Station (SBS) is designed for global, in-theater and on-the-move operations. The Base Station provides secure Over-the-Horizon (OTH) data communications with HOOK2[®] AN/PRC-112G and HOOK3[™] Combat Survival radios. This system is a powerful, global, cost-effective solution that provides assured communications to military, special forces, law enforcement and government agencies.

The self-contained SBS is housed in a rugged carrying case, and includes a laptop computer, Base Station Radio, antenna, and cabling. It can be powered by batteries or standard AC power. The Base Station is lightweight, portable and easy-to-use and setup, making it ideal for mobile, rapid deployment or fixed locations.

When used with the HOOK2 or HOOK3 radio, the SBS provides a direct, secure, two-way, OTH communications path between isolated personnel and rescue forces. With its "Always-On" nature and its auto-acknowledgment feature, the Base Station provides the isolated personnel with an assured communications link. Its interrogation feature allows the SBS user to extract location and status information from the remote HOOK2 or HOOK3 radio. SBS users can send messages immediately, or queue messages for later transmission when the isolated personnel's radio is turned on and ready to receive.

SATCOM Base Station (SBS)

Proven HOOK System

Secure OTH Rescue Communications

- Sends an auto-acknowledgment message to the Isolated personnel to confirm their distress message was received
- Allows messages to be queued and sent later, when isolated personnel contact the SATCOM Base Station

Cost-Effective

- Uses existing Military UHF satellites, which avoids commercial SATCOM charges
- Dedicate SATCOM Base Station to single mission or user group

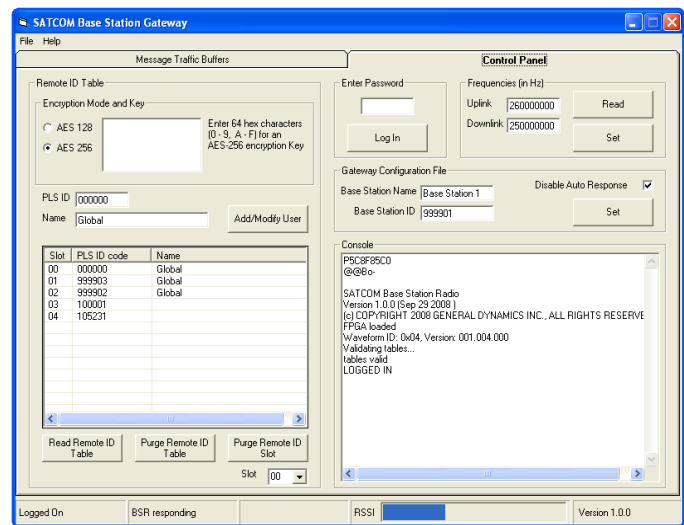
Portability and Ease of Use

- Lightweight and rugged, and can be carried by one person
- Minimal set-up and tear-down time facilitates on-the-move deployment
- Powered by batteries or standard 110/220 VAC 50/60Hz AC
- Includes an intuitive graphical user interface for configuring operating parameters
- Users Interface has the look and feel of a typical e-mail program
- Ease-of-use features include an integrated help system

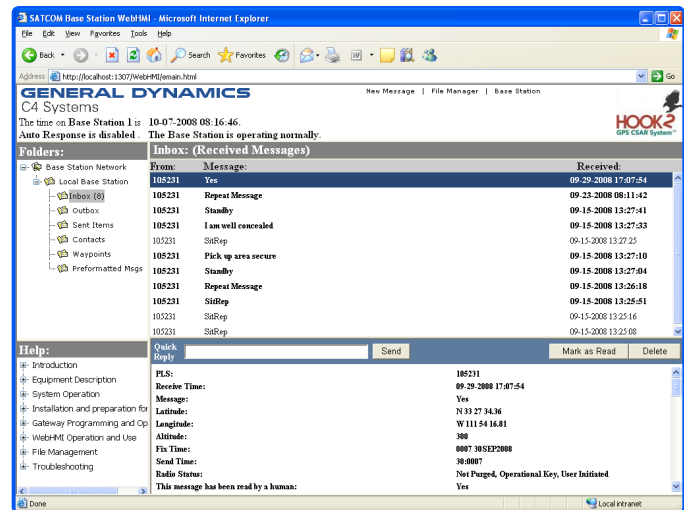
Scalable

- Operates as a complete, self contained, stand-alone SATCOM Base Station
- Network-based architecture supports integration into existing C4 assets to build multi-base station, multi-user communication networks
- Web-based Human/Machine Interface (HMI) allows operators to be located away from the SATCOM Base Station
- Message traffic can be integrated into existing Common Operating Picture (COP) tools

The SATCOM Base Station's net-centric architecture revolves around the Gateway application. Running on the Base Station's laptop, the Gateway provides the interface between the HOOK2 and HOOK3 radios SATCOM protocol and a standard network data format (XML). A web server, also running on the Base Station's laptop, delivers this data to users via the network in a standard HTML-based web form.



Gateway Control Panel



Web HMI

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