

SCOUT

A REVOLUTION In Electromagnetic Tracking Science

SCOUT Tracker, now in Full Rate Production, Provides the Highly Acclaimed HMCS (Helmet Mounted Cueing System) Accuracy in U.S. Military F-16, A-10 and C-130 Aircraft

SCOUT™ is the only self-contained 6 Degree-of-Freedom (6DOF) head-tracker in the world, and incorporates such features as:

- U.S. military flight qualification
- Simplified, fleet-level, common calibration
- Lightweight, embeddable within the helmet module, pilot head sensor
- Ultrafast update rate providing absolute minimal data latency
- Pilot cockpit head position and rotation angles relative to the aircraft are native outputs



EMBEDDABLE HELMET SENSOR
AND COMPLETE TRACKER ELECTRONICS DONGLE

REAL-TIME TRACKING FOR THE REAL WORLD

Polhemus proprietary magnetic tracking technology offers unprecedented tracking performance that can be visually coupled to deliver critical off-boresight, heads-up display capability to the pilot's helmet. The solid-state SCOUT helmet tracker provides pilot point-of-regard tracking information accurately and in real-time. This allows for proven situational awareness and cueing capability without the introduction of risks associated with sensor fusion technology: aircraft movement, inertial drift, and optical (camera-based) alignment sensitivities.

Now in its second generation release and in full rate production, the SCOUT advanced electromagnetic tracker uses a helmet mounted sensor with an embedded system electronics dongle. It communicates the pilot's head position and orientation directly to the host PC, internal control unit, image generator, or the fire control computer. This removes the need to plan for tracker electronics space within an airframe or high-fidelity simulator. It also eliminates sensitive inter-component wiring risks via breakaway connectors—a big plus for the system integrator!



SCOUT IS IN THE AIR ON A-10, F-16 AND C-130 AIRCRAFT

TWO FLIGHT QUALIFIED SOURCE OPTIONS: CANOPY SOURCE AND STANDARD SOURCE

The tracker source fastens to the aircraft or simulator and creates the specially tuned A/C magnetic field in which the head/helmet sensor is tracked. Either source size allows for full spherical coverage, as well as simultaneous position and orientation tracking in real-time. With the only differences being size and tracking range, both SCOUT tracker sources are in use today on United States Military aircraft, including the A-10 Warthog, the F-16 Viper, and the C-130 Gunship, as well as high-fidelity simulators throughout the country.

ULTRA LIGHTWEIGHT, FLIGHT QUALIFIED, HEAD/HELMET TRACKING SENSOR

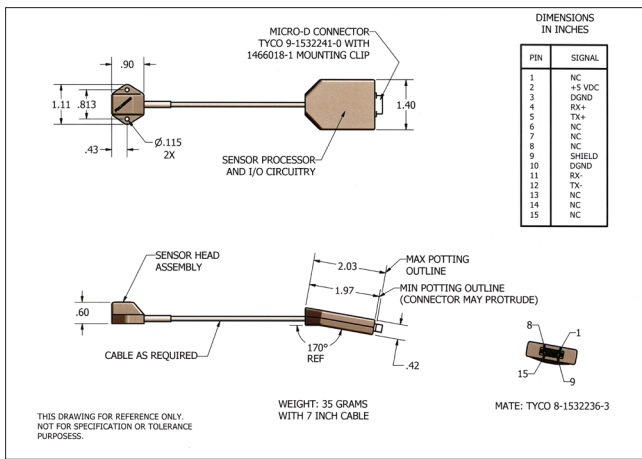
The entire SCOUT head/helmet tracking sensor, including cabling and embedded electronics, weighs only 35 grams in the most common flight configuration. With built-in computational electronics in-line with the magnetic tracking sensor, wiring to connections from the helmet to the aircraft interface is simple, requiring only six high-level signal wires to be passed through breakaway connectors.

COMMON CALIBRATION

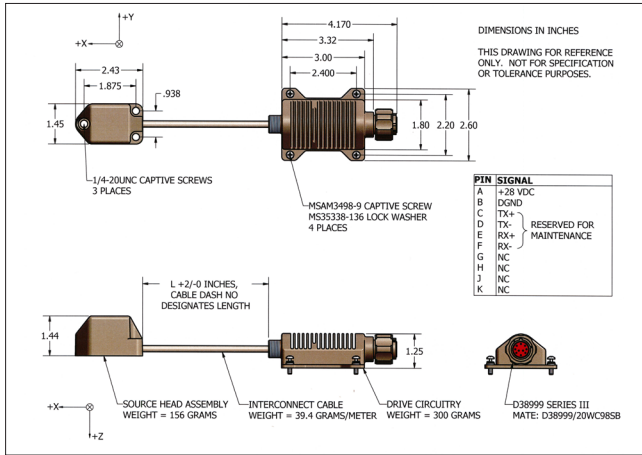
In use today, and operationally meeting fielding requirements for A-10 and F-16, Polhemus has developed a calibration capability that produces highly accurate tracking, using what is known as Common Map. This common calibration across an aircraft platform eliminates the need to individually map each tail number specific aircraft (or simulator) while achieving high performance accuracy across the fleet. Simply put, Common Map saves you time and money.



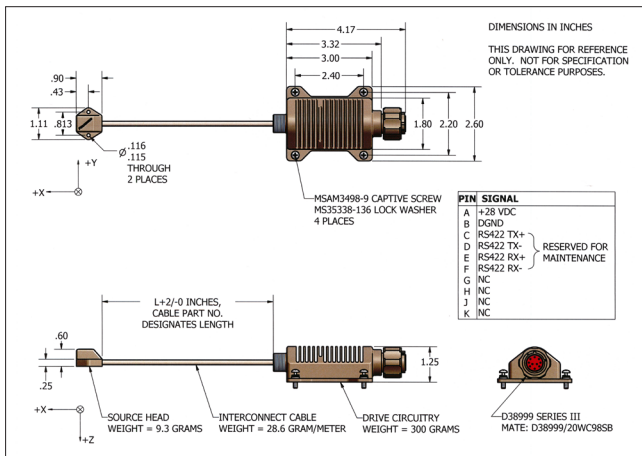
CANOPY SOURCE AND CONNECTOR



SENSOR AND TRACKER ELECTRONICS MODULE



STANDARD SOURCE AND CONNECTOR



CANOPY SOURCE AND CONNECTOR

POLHEMUS
INNOVATION IN MOTION™

POLHEMUS.COM

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SPECIFICATIONS

The system will operate at the specified performance in a magnetically distortion-free environment. Simplified calibration is now available for mitigating the effects of magnetic distortion typically caused by highly conductive metals or fibers of significant mass that are proximate to the tracker's operational envelope.

UPDATE RATE

240 updates per second

LATENCY

3.5 milliseconds (filters off); [approximately 7 ms with dynamic filters on]

INTERFACE (SENSOR DONGLE)

RS-422 (115 KB)

STATIC ACCURACY

0.18 degrees (3.14mr) RMS for sensor orientation; 0.03 inches (0.8mm) RMS for the X,Y, and Z position

DYNAMIC ACCURACY

Dynamic accuracy is predominantly range dependent (sensor to source) and is NOT influenced by the movement of the aircraft or simulator platform (SCOUT is a solid state device with no gyros, accelerometers, or magnetometers). For typical operating ranges, accuracy degradation due to dynamic motion of the head/helmet sensor is minimal to statistically insignificant, relative to static accuracy specifications.

RESOLUTION

0.00015 inches (0.0038mm) at 12 inches (0.3m); 0.0012 degrees (.021mr) orientation

RANGE

36-inch (.82m) diameter with the Canopy Source; 60 inches (1.52m) in diameter with the larger Standard Source

ANGULAR COVERAGE

The sensor is all-attitude with no limits providing full spherical coverage along with X, Y, and Z axis position/location output.

SLEW RATE

SCOUT is an advanced, solid state, tuned A/C magnetic tracking device utilizing no gyros, accelerometers, or magnetometers. Therefore slew max/min rates are unlimited.

PHYSICAL CHARACTERISTICS/SIGNAL/PINOUTS

See drawings to the left

POWER REQUIREMENTS

Sensor: 5 VDC, 200 MA (regulated)

Canopy Source: 7 to 36 VDC (1 watt)

Standard Source: 7 to 36 VDC (4 watt)

OPERATIONAL TEMPERATURES

Sensor: -20C to +50C (-4F to +122F)

Source: -40C to +70C (-40F to + 158F)

STORAGE TEMPERATURES

-50C to +125C (-58F to + 257F)

MECHANICALS

The source and sensor microelectronics are fully encapsulated, providing robust physical and mechanical characteristics. Qualified SCOUT systems are in full rate production and available with minimal lead-time for real aircraft implementation and simulation & training needs. Contact Polhemus directly for full discussions.