TRIMBLE M7 GPS SURVEY
(GPS-S) SYSTEM

Designed for tough conditions anywhere in the world, the Trimble® M7 GPS-Survey System provides a complete, light-weight yet rugged solution for military surveying and positioning requirements.

The M7 GPS-S system is a turn-key solution for the precise positioning and orientation of artillery weapon systems and for geodetic and construction survey applications. At the heart of the system is Trimble’s M7 GPS-S Receiver with SGE-41 24 Channel SAASM GPS Engine, capable of Precise Positioning Service (PPS) surveying; accurate to 5 mm (postprocessed) and 10 mm (real-time). The brain of the system is the Trimble TSC3 Handheld Data Collector. The TSC3 is capable of supporting both GPS and conventional (optical) surveying, to include full interoperability with existing Trimble military surveying and construction machine control systems. The TSC3’s simple Graphical User Interface (GUI) is tailored to support any military survey mission.

REAL TIME AND POSTPROCESSED PERFORMANCE
Reduce the duration of survey missions while accessing outstanding positioning results in real-time and through postprocessing applications. Initialization time is typically less than 8 seconds with a 99.9% reliability performance.

The Trimble TSC3 handheld data collector is loaded with Trimble Access™ Surveying software for performance in the field, and Trimble Business Center software is provided for postprocessing. This software provides a streamlined interface with a simplified setup, collection, postprocessing, and adjustment system.

This system supports the use of military map standard coordinates systems (UTM/MPS and MGRS/USNG), along with all other defined coordinate systems throughout the world, and supports the use of local and worldwide geoid models.

FIELD TESTED RUGGED FOR MILITARY USE
This system is designed for rugged field operation.

The receiver, handheld, and other hardware components are fully sealed and environmentally tested under MIL-STD-810G guidelines.

The system is designed to be both man-portable and vehicle mounted. Using the supplied brackets, quick release and magnetic mount, the GPS receiver, handheld and radio can remain in the vehicle, while the range pole and GPS antenna are the only items outside the vehicle.

Long life battery support includes two rechargeable, removable lithium ion batteries in the receiver, which also includes a 10-year memory battery; and a rechargeable, 34-hour battery in the handheld data collector. The Trimble M7 GPS-S receiver has been granted Security Approval by the GPS Directorate.
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SYSTEM COMPONENTS

- Trimble M7 GPS-5 Receiver with SGE-41 24 Channel SAA/SA GPS Engine capable of Precise Positioning Service (PPS) tracking (Receiver Part Number 100010-00)
- Trimble 735C Handheld Data Collector with Trimble Access Surveying Software
- Trimble Zephyr® 2 GPS Micro-anchored Antenna
- Trimble Business Center Office Software package for post-processing of Survey data
- Capability with Military Radios
  - AN/PRC-117
  - AN/PRC-152
- Mounts on Range Pole with Handheld and GPS Antenna
- Kit includes all components required to deploy as a base station or rover receiver
- Walk around weight of Rover System (without Radio) is less than 6.8 kgs (15 lbs)
- Complete system fits in one transport case

TECHNICAL SPECIFICATIONS

Physical

Receiver .......................... 18.5 cm W x 6.7 cm D x 18.0 cm H (7.3 in W x 2.6 in D x 7.1 in H)
Handheld ......................... 14.1 cm W x 6.4 cm D x 27.8 cm H (5.6 in W x 2.5 in D x 10.9 in H)
Antenna .................................. 16.5 cm diameter x 7.6 cm (6.5 in x 3.95 in) height

Electrical

Receiver ............................... 2 Rechargeable, removable 7.4 V, 2 Ah Lithium-ion battery in internal battery compartments
- Power consumption is 3.2 W in base or rover mode
- Operating times on internal battery is 4 hours each (8 hours total)
- Internal 10 year memory battery
- Ruggedized all aluminum housing
- Supports CVR®, RTCM type 1 and 2 messages (base / rover), RTCM type 9 messages (rover)
- Complies with requirements with GPU-03-105

Antenna

- Low voltage, low power consumption with an operating range of 3.5 V DC to 20 V DC input, 125 mA maximum current
- 13 dB amplifier margin supports cable runs of over 60 m without special coaxial cable or in-line amplifiers
- 50 dB signal gain for reliable tracking in difficult environments
- Integral advanced LNA (low noise amplifier) to reduce jamming by high power 5/8” x 11 female threaded stainless steel mount point

Handheld

- Processor: Texas Instrument StaRAM® 3715 series ARM® Cortex™-A8 Processor (800 MHz)
- 8 GB non-volatile NAND Flash onboard for data storage
- SDHC memory slot for expanded storage
- Battery life of 34 hours under normal operating conditions
- Display: 4.2 in (107 mm) landscape VGA display, 640 x 480 pixels, Sunlight-readable color TFT with LED backlight, resistive touchscreen
- VO: USB Host (full speed), USB Client (high speed), DC power port, 9-pin serial RS-232
- Optional VO: Bluetooth®, Wi-Fi and 2.4 GHz radio can be added to the handheld, as per military requirements
- Supports all data lists in NIMA Technical Report (TR) 8350.2 and user-defined datums
- Supports the use of military map standard coordinates systems (UTM/UPS and MGRS/USNG), along with all defined coordinate systems and datums listed in National Imagery and Mapping Agency (NIMA) Technical Report (TR) 8350.2

Environmental

Meets or exceeds

- Operating Temperature: ................. –22 °F (–30 °C) to +120 °F (+49 °C)
- Storage Temperature: ................. –40 °F (–40 °C) to +158 °F (70 °C)
- Humidity: ............................... 100% RH temp cycle –20 °C/60 °C (–4 °F/140 °F)

Sand & dust .......................... 12 hour exposure with dust concentrations of 0.3 ± 0.2 grams per cubic foot and air velocity from 300 ft/min (1.5 m/s) to 1750 ft/min (8.9 m/s) IAW MIL-STD-810G, Method 510.5, Procedure I

Water .............................. 5 minute submersion unprotected in fresh or salt water at a depth of 1 meter (in transit case)

Rain ....................................... exposure to rain at a rate not less than 4 in/hr (10 cm/hr)

Salt Fog .................................. exposure to salt fog at a rate not less than 4 in/hr (10 cm/hr)

Shock ..................................... 26 drops at room temperature from 1.22 m (4 ft) onto plywood over concrete and standard free fall drop from desk height 0.76 m (2.5 ft) onto plywood over concrete

Vibration ................................ General Minimum Integrity and Loose Cargo test MIL-STD-810G, Method 514.6

Altitude .................................. 4,572 m (15,000 ft) at 23 °C (73 °F)

Vibration ................................ General Minimum Integrity and Loose Cargo test MIL-STD-810G, Method 514.6

Electromagnetic radiation ............. conform to the performance specified for RE102 (2 MHz up to 1 GHz or 10 times the highest intentionally generated frequency within the Equipment Under Test, whichever is greater Measurements beyond 18 GHz are not required); RE102 limit for ground applications (Navy Mobile & Arm), and RS103 (2 MHz to 18 GHz); RS103 limit levels for ground platform – Army (50 Volts/meter;)

1. Any military radio capable of Asynchronous data transmission using 4800 bps baud rate.
2. All items except the Tripod, Range Pole with Base Station battery fit into the transport case, fully loaded transport case weighs less than 16.8 lbs (37 lb). 3. Unit is side with backlight turned on, moderate temperatures. 4. Precision and reliability may be subject to anomalies due to multipath, obstructions, satellite geometry, and atmospheric conditions. The specifications stated recommend the use of stable mounts in an open sky view, EMI and multipath clean environment, optimal GPS constellation configurations, along with the use of survey practices that are generally accepted for performing the highest-order surveys for the applicable application including occupation times appropriate for baseline length. 5. Local Area DGPS positioning is only available in GPS mode. 6. May be affected by atmospheric conditions, signal multipath, obstructions and satellite geometry. Initialization reliability is continuously monitored to ensure highest quality. 7. Note: U.S. Government policy restricts the sale of Precise Positioning Service (PPS) equipment to those authorized by the U.S. Department of Defense. Non-U.S. authorized users must purchase PPS equipment through the Foreign Military Sales (FMS) process. Please visit our website at www.trimble.com/defense for sales information. Made in U.S.A. Approved for public release under Case # 14-103 and 14-104. Specifications subject to change without notice.

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