The M7 GX GPS is a digital wireless UHF modem with built-in GPS for real-time tracking solutions. Programmable from 0.5 to 5 watts it provides coverage of up-to 25 square-miles making it ideal for vehicle and asset tracking applications. A “weatherproof” (IP65 rated) enclosure is also available. For a complete list of Raveon’s GPS enabled products see www.ravtrack.com.

**Product Overview**

The RavTrack™ Transponder lets you quickly locate: your co-workers, your trucks that break-down, your rented watercraft, your stolen vehicle, a drowsy driver, nearest help, lost people, and slow-moving golfers.

It is the fastest real-time GPS tracking transponder available. It uses commercial UHF radio channels without service fees or monthly charges, and it works virtually anywhere.

**Public Safety:** Know where your first-responders and officers are, and who is closest to the scene. See the tactical situation in real-time, so you can respond instead of reacting.

**Vehicle Monitor:** Track vehicles in real-time, monitor speed, door sensors, voltage, and operator behavior. Use the M7 GX for tracking, emergency location, and theft recovery.

**Mining:** Watch your machinery at work, monitoring for improper speed, location, and usage.

**Off-road Racing:** Quickly know where your chase truck and race-car are. Find it fast if it breaks or is stolen.

**Parks and Golf:** Easily locate all other vehicles in the park or golf-course. The location display may be in any vehicle, at the ranger-station, or even with a hand-held GPS.

**Marine:** Track all the vessels in your rental fleet, and ensure they are not abused, stolen, or misplaced. RADAR display can be used to display M7 position and status.

**Construction:** Know where all your equipment is, and how it is being used. Quickly locate anyone, as soon as you drive onto the site.
Features

Long-Range Operation
Operating in the UHF 450-480MHz frequency band, the M7 GX Transponder can communicate as far as 50 miles (depending upon terrain). All M7 GX Transponders also can store-and-forward repeat for wide-area coverage.

Real-time.
Position and status updates are available as quickly as every second. No other tracking system has as fast an update rate as RavTrack.

Complete.
Everything needed to track a vehicle or asset is provided. No secondary services like Internet, cell-service, GPRS, Edge, SMS, or satellite service is needed. Raveon is your one-stop-shop for a complete Tracking system.

Flexible Reporting
The M7 GX may be configured to transmit position and status reports at pre-set time intervals (programmable), when it has moved a certain distance (programmable), when an I/O changes, or a combination of these.

No monthly charges.
Because no external services are required, there are no recurring costs for a RavTrack system.

Works Everywhere.
RavTrack does not rely upon public wireless services, so RavTrack systems work in rural areas, mines, mountains, deserts and foreign countries.

Simple to Interface
The M7 GX Transponder is very simple to use and works with a multitude of other software, plotters, and GPS displays including:

- Lowrance GPS displays and navigation
- Garmin hand-held GPSs
- Any GPS with an RS-232 NMEA interface
- RavTrack PC software by Raveon
- Marine Radar Displays
- Your own custom application.

Over-The-Air Diagnostics
The configuration and operation of a M7 GX may be remotely tested using over-the-air commands from any other M7 in the system.

Secure
All position reports are 128-bit AES encrypted for secure communications. No other radio modem, Raveon’s or otherwise, will be able to listen in or monitor positions without knowing the security key.

Very Low Power Consumption
The M7 GX Transponder has some of the lowest power-consumption numbers in the industry. A remotely controlled sleep mode allows it to be active and consume almost no power at all and an external “Ignition Sense” input is provided to remotely turn on/off the product and not lose GPS ephemeral data.

Rugged and Weather Proof
Available with optional “weatherproof” (IP65 rated) connections and enclosure. (-WX option), all models include protection against damage from over-temperature, high VSWR, and reverse voltage.

High Speed and High Efficiency
The M7 GX Transponder operates with fast over the air data rates of 9,600bps. Its fast-switching radio enables it to send up to 20 position-transmissions per second.

Proximity Alerts
Each M7 GX may be configured to transmit an alert, as well as signal an output circuit whenever it is in proximity of another M7 GX. Used for collision avoidance or theft security.

For More Information
For more information about this or any other Raveon product, call in the U.S.A. 1-760-444-5995 or visit us at www.raveon.com.
For details on all of Raveon’s AVL and Tracking products, please visit our RavTrack web site at www.ravtrack.com.
How It Works

**Fastest real-time location updates in the industry.**

The M7 GX Transponder has many technological advantages over conventional tracking radios. These include:

- **Advanced modulation:** Most tracking radios operate at 1200 or 2400 baud over the air. The M7 series operate at 4-10X that speed using CPFSK2/4 modulation for data rates as high as 19.2K over the air.

- **TDMA Channel Access:** TDMA (Time-Division Multiplexing) is built in every M7 GX radio modem. With TDMA, 100 vehicles may be tracked with 10-second updates, and no RF interference. Even when using a repeater!

- **Data Compression:** All location transmissions are compressed, allowing not only location to be sent, but also voltage, temperature, input status, speed, direction, and time — and do this with less air-time than most radios use to simply transmit their location.

- **Fast Switching:** The M7 transceiver has a fast-lock PLL with a lock-time of only 1mS, and a T-R turn-around time of less than 3mS. This enables the radio to make real-time transmissions in TDMA or conventional modes.

**Easy to use, and the M7 GX does it all.**

The M7 GX Transponder may be user-configured for a variety of applications. One simple command is used to program it to work in any of these configurations:

- **Transponder:** The M7 GX will periodically transmit its location, along with voltage, temperature, input status, speed, direction, and UTC time. It powers-down the radio and GPS when not in use, reducing its average current draw to less than 30mA.

- **GPS Display:** The M7 GX will periodically transmit its location, along with voltage, temperature, input status, speed, direction, and UTC time. It will also receive the location of other M7 GX radios in its radio range for display on a GPS plotter or hand-held GPS connected to the M7 GX’s NMEA RS-232 interface.

- **RavTrack PC:** The RV-M7 will periodically transmit its location. It will also output the location of other RV-M7 radios in its radio range for display on the RavTrack PC software program.

- **Plotter Display:** If you already have a gps plotter, you may connect it to the RV-M7 with the −LX option. This gives the unit all the features of the −GX version with the GPS, but uses your GPS NMEA data feed as the source for its GPS signal. It will output the location of other M7 GX radios in its radio range for display on a GPS plotter or hand-held GPS connected to the RV-M7’s NMEA RS-232 interface.

- **Repeater:** Any M7 GX may also be a store-and-forward repeater. With a 3mS attack time, the repeated signal has only milliseconds of latency, and coverage can be 10s of miles.
## General Specifications

Model: RV-M7-Ux-GX (x=band) (oo=options)

- **Size:** 4.60” X 2.60” X .956 (11.7cm X 6.6cm X 2.43cm)
- **Weight:** 9.5 – 16 VDC
- **Input Voltage:** 6 oz
- **Current draw:**
  - GPS tracking, 2min updates: <25mA
  - GPS tracking, 10sec updates: <80mA
  - GPS and radio receiving data: <120mA
- **Transmitting data:**
  - (2.7A @ 5W, 1.2A @ 2W typical)
  - Sleep (<25mA), Ignition off: (<10mA)
- **Frequency Band:** 450-480MHz (for US channels)
- **Serial Port Baud Rates** (programmable)
  - 1.2k, 2.4k, 4.8k, 9.6k, 19.2k, 38.4k, 57.6k, 115.2k
- **Over-the-air baud rates** (programmable)
  - N 4.8k, 512, 8K, 9.6k
  - W 4.8k, 8, 9.6k, 14.4k, 19.2k
- **Operating Mode**
  - Simplex or Half-duplex
- **Full Spec Operating Temperature range**
  - -30°C to +60°C
- **RX and TX turn-around time**
  - <3mS
- **Wake-up time**
  - <500mS from OFF
  - <5mS from Sleep
- **Front Panel LEDs**
  - Power
  - Status (Carr Det, TX, mode...)
- **RF I/O Connector**
  - BNC (Female) (TNC on –WX version)
- **Power Cable**
  - Raveon P/N: 1C738-1
- **Addressing**
  - Individual address: 65,536
- **Options:**
  - Waterproof Enclosure -WX option

## Transmitter Specifications

- **RF Power Output** ........................................ 500mW – 5.0 W
- **Maximum Duty Cycle** ............................. 100% @ 2W to 40C, 25% @5W
- **RF Bandwidth** ........................................... 20MHz no-tune
- **TX Spurious outputs** ................................. < -70dBc
- **Occupied Bandwidth** .............................. Per FCC
- **FCC Emissions Designator** ....................... 11K0F1D (-N)
- **Frequency Stability** ................................. Better than ±1.5ppm

## Receiver Specifications

- **RX sensitivity (.1% BER)** .......................... 9600bps < -108dBm
- **RF No-tune bandwidth** ............................. 20MHz
- **Alternate Channel Selectivity** .............. -65dB
- **Blocking and spurious rejection** ............ -75dB

## Interface Specifications

### Serial Interface Port

- **Connector Type:** DB-9
- **IO Voltage Levels:** RS-232
- **RX and TX data:** Transparent Async
- **Word length:** 7 or 8 bits
- **Format:** N, O, or E
- **Modem handshake signals:** RTS, CTS, CD
- **NMEA messages:** TTL, GLL, GGA, WPT

### User Configurable Parameters (overview)

- **Channel Number and Operating Frequency**
  - **Unit Address:** 0001 thru 9999
  - **Baud Rate, parity, stop bits**
  - **GPS Update Rate:** 1 – 9999 Seconds
  - **GPS report on movement:** 0 – 9999 Seconds
  - **GPS report on digital in:** Enable/disable
  - **Digital Inputs** (Gen Purpose or alarm) 3
  - **Digital Outputs** 1
  - **Store-and-forward Repeating configuration**
  - **Encryption:** 128 bit AES
  - **LEDs operation or disabled**
  - **Auto Status report on/off and interval**
  - **Read DC voltage, current, forward RF power, VSWR**
  - **Remote PING**
  - **Serial Port Format:** (NMEA, RavTrack PC, RADAR TTL, or Lowrance Plotter)