The heart of Raveon's Real-time Tracking Solution is the M7 GX GPS transponder—a ½ - 5 watt UHF wireless modem with built-in GPS, NMEA input/output, and radio modem. 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 programmable intervals, when it has moved a certain distance, 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 4800 to 19200bps. 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 a www.raveon.com.

For details on all of Raveon's AVL and Tracking products, please visit our RavTrack web site at www.ravtrack.com.

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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 4-10-times that speed using CPFSK2/4 modulation for data rates as high as 19.2K over the air.
TDMA Channel Access	TDMA (Time-Division Multiple Access) 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 true 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.

Email: sales@raveon.com

General Specifications

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

Size:
4.60" X 2.60" X .956 (11.7cm X 6.6cm X 2.43cm)

Weight: 6 oz

Input Voltage: 9.5 – 16 VDC

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 Bands:

A	*403-434*MHz	(for export)
B	*419-440*MHz	(for export)
C	450-480MHz	(for US channels)
D	470-512MHz	(for export)

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, 5142, 8K,9.6k
-W 4.8k, 8k, 9.6k, 14.4k, 19.2k

Operating Mode
Simplex or Half-duplex

Full Spec Operating Temperature range
-30°C to +60°C

TX-RX and RX-TX turn-around time
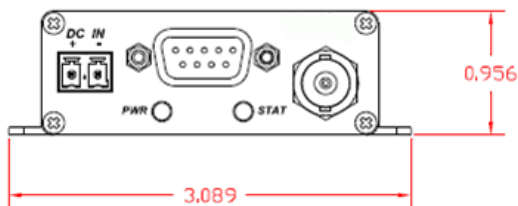<3mS

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
programmable*

Maximum Duty Cycle ....*100% @ 2W to 40C, 25% @5W
(100% w/ optional heat sink)*

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
4800bps < -116dB

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)

Set odometer reading at install for tracking	
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 Meters*
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 TLL, or Lowrance Plotter*)