

EMS Chariots



PHOTOS: BARRY D. SMITH

REMSA TESTS T3 MOBILE UNITS IN RENO

>> BY BARRY D. SMITH, EMT-P

High-performance REMSA takes on Reno in a Roman chariot-style module built to enhance response capabilities.

Large crowds in confined areas have always proven difficult for EMS agencies. Maneuvering through a crowd and finding a patient takes precious time. Most agencies have tried bicycles, golf carts, motorcycles and other vehicles to rapidly respond to patients.

Each year, the Regional EMS Authority

(REMSA) in Reno, Nev., a public utility model EMS system, conducts a large number of standbys for special events. Location venues include an indoor convention center, outdoor events on closed streets, PGA golf tournaments, remote vehicle race sites, the National Championship Air Races and even the Burning Man counterculture event



The large, lockable glovebox and shelf above the battery allows crews to carry equipment they would normally use on an ambulance.

in the Black Rock Desert. REMSA has recorded several cardiac-arrest saves due to the quick response of its standby event crews. Recently, the agency participated in a trial of a new device called the T3, three-wheeled, roman chariot-style vehicle built by T3 Motion Inc. of Costa Mesa, Calif.

Looking for an EMS agency to test the T3,

the company turned to their California Nevada distributor, WATTCO, which represents several emergency equipment manufacturers. David Noe, territory manager, decided to approach REMSA about conducting a trial with the vehicles.

"We were looking for a high-performance EMS system that's known for trying new

things and likes to stretch the boundaries of patient care," states Noe. "Having dealt with them before, I thought REMSA would be a perfect fit for the T3."

VEHICLE SPECS

According to T3 Motion President Neil Brooker, the company initially developed the brushless electric motor to be used by auto manufacturers for cars, "We discovered that the auto builders weren't ready to adopt the technology back then," says Brooker.

T3 Motion began researching small electric traction vehicles with a focus on law enforcement and private security as a potential market. "We found there was a gap in what traditionally would be done with bicycle/foot patrol and motorcycle/auto patrol," says Brooker. "Having identified the need, we began developing prototype vehicles in 2003."

After finalizing the T3 design around the beginning of 2006, the company introduced the T3 at the International Association of Police Chiefs convention in Boston in

October 2006. The company conducted field tests and began selling the vehicles at the beginning of 2007.

"We designed it to have a substantial feel," Brooker says. "The feedback we received through our research was that other vehicles looked too gadgety or weren't substantial [in construction]." The T3 has a tubular steel frame and a composite body that measures 53.5" by 34.6" by 53.3". It weighs 300 lbs. with batteries and can carry a total of 450 lbs.

The batteries, also called "power modules," are encased in steel boxes within the chassis and can be moved in and out of the vehicles with ease. Additional power modules on charge can be exchanged in just a few minutes.

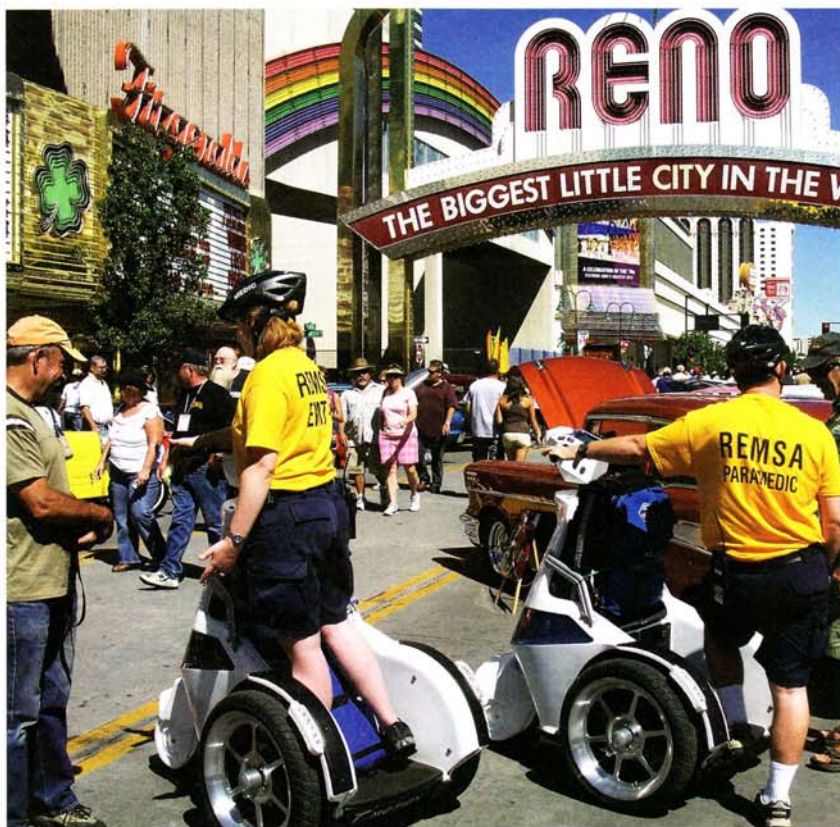
The T3 has four types of power modules. The Type As are lead-acid batteries with a range of 15 miles. Type Bs are lithium-polymer with 25–30 miles of range. Type C and D enable a range of 50–75 miles. Brooker says as new battery technology develops, the company plans to integrate the modules into the vehicle without modifications and extend the range on a single set.

"By having power modules that can be swapped out, you eliminate the perception of electric vehicles having a limited range," says Brooker. "We tested the modules extensively, discharging them completely and recharging them, over and over." The company had 50 prototypes, frames and pre-production vehicles used on inclines and maneuverability courses to test their durability. It also conducted static testing on dynamometers.

T3 Motion uses front-wheel drive for simplicity and ease of maintenance and service. An electric motor drives the small, wide front wheel via a belt. According to Brooker, no maintenance is required with the belt drive system, other than normal daily operational wear and tear, such as tire tread and brakes.

The throttle is located on the right handlebar. It's spring-loaded, so if the operator lets go, electricity to the motor shuts off. The brake handle is mounted on the left handlebar and has a lock that acts as a parking brake. The key that turns on the unit also adjusts the maximum speed. An instrument panel is mounted between the handlebars and includes a speedometer, odometer with a trip meter and a battery-life indicator.

An LED headlight is mounted on the front of the handlebars and can be adjusted up and



Clockwise from top: Crowds gather around REMSA during downtown Reno events. This T3 is equipped with a regular first-aid bag. Raised platforms allow teams to see over crowds, anticipate where they may be needed and decrease response times.



CINDY ELBERT Insurance Services

Over 25 Years of Experience

INSURANCE PROGRAMS FOR AMBULANCE SERVICES

- Professional, General, Auto Liability
- Workers Compensation
- Best service, coverage and prices available, and much more!

Call Today **888-681-1020**
www.ambulanceinsurance.com

CINDY ELBERT INSURANCE SERVICES



Choose 45 at www.jems.com/rs

EXPECT MORE FROM YOUR ONLINE UNIVERSITY

B.S. in Fire Science **B.S. in Occupational Safety & Health**



CSU offers completely online accredited associates, bachelors, and masters programs.

EXPECT

- Affordable Tuition • Fast Tracked Education
- Maximum Credit Transfer • Flexible Learning
- Textbooks at No Cost

GET

- Personalized Service • Quality Education
- Convenience • Uninterrupted Lifestyle
- Personal Satisfaction

IS YOUR ORGANIZATION A LEARNING PARTNER?
 Benefits: 10% Tuition Discount for Employees and their Family, Application Fee Waived, No Obligation to Enroll

Visit www.columbiasouthern.edu/learningpartners, call 800.344.5021 or e-mail us at learningpartners@columbiasouthern.edu to learn more about this opportunity.

www.columbiasouthern.edu/jems 1.800.349.4202
COLUMBIA SOUTHERN UNIVERSITY
ORANGE BEACH • ALABAMA 36561

Choose 46 at www.jems.com/rs



The T3s are taken up the cart paths on the PGA golf course to test how well they would handle the steep terrain.

down to light a scene. A siren and emergency light package are also installed on the vehicle.

The 17" rear wheels are aluminum and use motorcycle tires. The T3 is equipped with large disc brakes and currently don't have a suspension system. Because the ride can be rough at higher speeds, T3 Motion is currently researching suspension systems for future models.

T3S ON TRIAL

REMSA debuted the units during Hot August Nights, a 10-day event that draws more than 10,000 vintage and custom cars, and almost 800,000 visitors to the Reno area. Two T3s were stationed downtown, where some of the largest crowds gathered during the event.

The crews operating the T3s had no prior training; however, it took only 15 minutes to familiarize themselves with how the vehicles functioned and to become comfortable riding them. The two T3s replaced the two-bike ALS team that would've normally worked the downtown area.

The crew found the most stable position is with feet spread apart in a football-like stance, one foot positioned slightly ahead of the other. This stance allows them to lean into turns and maintain good balance.

The riding platform is 9" off the ground, which gives the rider an excellent view over crowds. Crews are able to see what's going on and anticipate where they may be needed. The platform also permits first responders to see other crews from a greater distance as



Logging a combined total of more than 100 miles on two T3s, crews test for maneuverability, turn radius and braking power.

they move through the crowd. Once on scene, the T3 could also be used to screen the patient and divert the crowd.

The T3 has a large, lockable glovebox and a small shelf above each battery storage area, which REMSA used to hold a regular first-out bag on one unit, and a ZOLL M Series cardiac monitor and an oxygen bag on the other. The crews found it easy to carry equipment they'd normally use on their ambulances. On bikes used previous to the T3s, the small panniers needed to be reorganized to carry just an AED, and a limited amount of ALS drugs and equipment.

Unlike bicycles or golf carts, which are common at special events, the T3s caused crowds to readily move out of the way. Bicycles, especially with heavily loaded panniers, can be unstable at low speeds, but the T3s excelled at these speeds and were found to be highly maneuverable.

Because the front tire can be turned 95°, the units have a 0° turning radius of just 28". This efficient turning radius enables the T3 to move in and out of tight places, including elevators, without the reverse mode.

The T3 reduced fatigue, which is a common issue for a bike team. Reno has an elevation of 4,500 ft. and summer temperatures of 100°F. Patrolling a large venue on a hot summer day for 10–12 hours can be exhausting, and riding hard to a scene can leave a crew out of breath. The REMSA crews were able to log a combined total of more than 100 miles on two T3s. They drove up and down multi-level parking garages, testing the ability to go up inclines and brake power, which were both excellent.

Because the front wheel is the power wheel, crews had to lean forward when going up inclines to get more weight over the drive wheel. But once they learned this technique, they were able to handle the inclines.

Reno hosts an annual PGA golf tournament, which mandates the use of bikes or electric vehicles near the course so the golfers aren't distracted by noise. REMSA next took the T3s to the golf course and drove the steep cart paths to see how they would perform. The T3s

A Disaster Strikes...

Where's Your Oxygen Source?

ULTROX

Medical Grade Oxygen Cylinder Filling System

A secure source for oxygen ... **ULTROX** by **AirSep** is a self-contained, free-standing **Medical Grade Oxygen Cylinder Filling System**. Its robust, transportable design can be placed where needed for any medical application!

The microprocessor is controlled by a touch screen and offers built-in diagnosis for unattended operation using 120VAC. **ULTROX** fills an "E" cylinder in less than 2 hours with USP Medical Grade "93 percent Oxygen", and will shut down once charge is complete.



When Lives Depend On A Reliable Supply...

Emergency Medical Service • Hospitals • Military • Civilian

800-320-0303

www.airsepcpd.com

AIRSEP®

Choose 47 at www.jems.com/rs

WWW.JEMS.COM | JANUARY 2008 | **JEMS 71**

handled all but one short, very steep section of the course that even bike teams have difficulty traversing. By stepping off the T3 and slowly opening the throttle, the crew was able to "walk up" this section and didn't need to push the unit.

END RESULTS

The public relations benefit was an unexpected bonus. People gathered around the crews at the events. They would ask questions about the T3, and then about REMSA, which had never happened when crews were on bike or in carts. With such public interest, the T3s can be great ice-breakers when educating the community about health and safety issues.

The final proof of the T3's value to REMSA was demonstrated at the National Championship Air Races held in September 2007. REMSA purchased two T3s, which were delivered the week before the races, which typically draws the largest crowd, a visitor in the grandstands went into cardiac arrest.



REMSA teams enhance first-responder capabilities by using the highly maneuverable T3s in addition to carts and ambulances they would normally have on scene at Reno's larger venues.

BATTERY CHARGER AUTO CHARGE SD 150 SELF DIAGNOSTIC BATTERY CHARGER

AUTOMATIC DIAGNOSTIC FOR :
POOR CONNECTIONS, OVERHEATING,
HIGH TEMPERATURE,
HIGH VOLTAGE,
& LOW OUTPUT

50 AMPS OUTPUT

**1-HOUR
AUTO EQUALIZE
FOR FASTER
RECHARGE**

**PATENTED CHARGING WIRE
RESISTANCE COMPENSATION**

AURAL MALFUNCTION INDICATOR

3 YEAR WARRANTY



MODEL 091-168

\$795.00



KUSSMAUL
ELECTRONICS CO., INC.

MADE IN
USA

170 CHERRY AVENUE WEST SAYVILLE, NY 11796-1221
TEL: 631-567-0314, FAX: 631-567-5826, TOLLFREE 800-346-0857
WORLD WIDE WEB: www.kussmaul.com/ad.html E-MAIL: sales@kussmaul.com

Choose 48 at www.jems.com/rs

From the Name
in Safety, Rescue
and Survival...

JSA-365 Plastic Backboard



The Junkin Plastic Backboard consists of a rugged one piece lightweight polyethylene spineboard, twelve large hand holes for easy handling and built in runners. It has a low profile and is X-ray translucent.

The Model JSA-365-S Plastic Backboard with speed clip pins is also available.

Dimensions

Length:	72"
Width:	16"
Load Capacity:	400 lbs.
Shipping Weight:	16 lbs.
Color:	Bright Yellow

JUNKIN

SAFETY APPLIANCE COMPANY

502-775-8303, fax: 502-772-0548
3121 Millers Lane, Louisville, KY 40216

www.junkinsafety.com

Choose 49 at www.jems.com/rs



During the National Championship Air Races, crews were able to quickly move through crowds.

On T3s, the responders quickly moved through the crowd and reached the patient in a matter of minutes. The patient was defibrillated and had a return of spontaneous circula-

tion (ROSC). By the time the patient was packaged for transport (on a Gator) to a waiting Care Flight helicopter, the patient was conscious enough to fight the endotracheal tube.

For an EMS agency that does a lot of special events, the T3 has proven to enhance response capabilities. JEMS

Barry D. Smith, EMT-P, has been a paramedic for more than 20 years and currently works for the Regional EMS Authority, Reno, Nev. He has also worked as a volunteer firefighter and as a member of SAR and Civil Air Patrol rescue teams. He has published numerous EMS articles and books and is a frequent contributor to *JEMS*. Contact him at bsmith@remsa-cf.com.

A T3 with two Type B lithium-polymer power modules and a charger is \$7,988; an extra set of two Type B batteries are \$1,700 (power modules must be run in pairs). T3 Motion offers a one-year or 2,500-mile warranty as a standard option, with an extended warranty package available at an additional cost. For more information, visit the T3 Web site at www.t3motion.com or contact Alan Tom at atom@remsa-cf.com.

Looking for flexibility in your emergency care training?

The American Safety & Health Institute offers flexible alternatives for your CPR, AED, First Aid, and ACLS/PALS training needs.

- **FLEXIBILITY** – Various training course options with a flexible, toolbox approach allow you to teach to your specific audience. Certify your students when they complete the course.
- **EASE OF USE** – Straightforward administration; certification cards issued at completion of class.
- **BECOME YOUR OWN TRAINING CENTER** – It's easy with a simple application, and instructor reciprocity.
- **HIGH QUALITY** – Programs feature full-color student materials and various multimedia options that reflect the new 2005 guidelines.
- **HIGH VALUE** – Our training materials are even more affordable than our competitors — generally 30–60% less.



For more information or to place an order, call
AMERICAN SAFETY & HEALTH INSTITUTE
 800-246-5101 • ashinstitute.org
 Please mention EMSMAG0108.



We Make Learning to Save Lives Easy™

Choose 50 at www.jems.com/rs