Mission Creep

To make the jump from driving schools to club racing, Mark Amarandos needed a dedicated track car. Here's what happened when his E30 M3 met a stratospheric budget on its way to Willow Springs.

By Jay Jones Photography by Jay Jones

Like Porsche Club racing, BMW CCA Club Racing has seen an infusion of big-budget privateers and high-dollar race cars. Although a number of racers still compete in cars licensed for the highway, plenty of club racers have bought second cars as dedicated track machines. At the extreme end of the scale are the race cars that have experienced "mission creep" during the course of their construction and/or evolution. "Mission creep" is defined as "the process by which a mission's methods and goals change gradually over time," and it's something that BMW club racer Mark Amarandos knows quite a bit about.

Amarandos is the owner of Split Second *(www.splitsec.com)*, a Santa Ana, California company that specializes in proprietary systems and components designed for calibrating fuel and timing on high-performance cars, trucks and motorcycles. He introduced us to the term "mission creep" while referencing his E30 M3 racer, the car you see on these pages. On the outside, his white car looks like a highly prepped street car. Underneath, however, the amount of preparation and money visible in the construction of this machine is jaw-dropping.

Before we get to the development of this incredible M3, we must first understand the evolution of Amarandos the driver. Like so many of us, Amarandos joined the BMW CCA and began going to high-performance driving events in BMWs that included a 535i, various 3 Series and E28 and E34 M5s. After he earned a place in the A group, he was asked to become a driving instructor, which he also did for the Pantera Club thanks to a business connection.

In 2000, Amarandos decided to make the transition from driving schools to club racing. He purchased a street-driven E30 M3 and began updating it into a pure racer. He'd chosen the earlier car for its superior "feel," which he heightened through a conversion to unassisted steering (similar to the system on a European

E30 320i) and unassisted brakes. He also made it as low as possible and stripped off its street-related amenities.

Beyond the norm

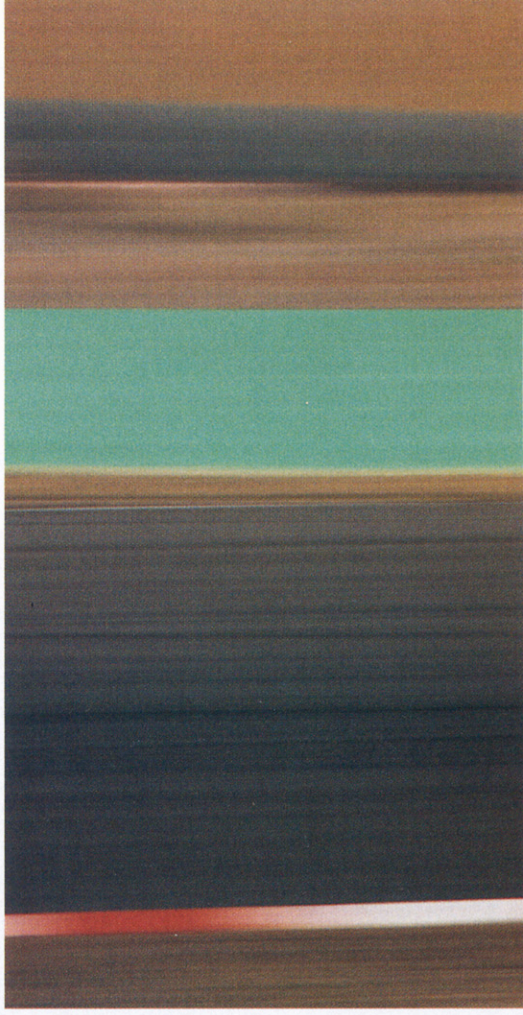
At that point, things began to get interesting. The car was taken to Tim L'Ecluse of DT Rollcages in neighboring Costa Mesa. L'Ecluse resides in the world of steel tubing and molten metal, and he's renowned for his fabrication of chassis components as well as exhaust systems. Since Amarandos wanted a car with fully adjustable rear suspension—including both toe and camber—L'Ecluse took his plasma cutter to the M3's sheet metal floorpan and replaced it with steel tubing that continued from the integrated roll cage and merged at a junction constructed to mount a BMW differential.

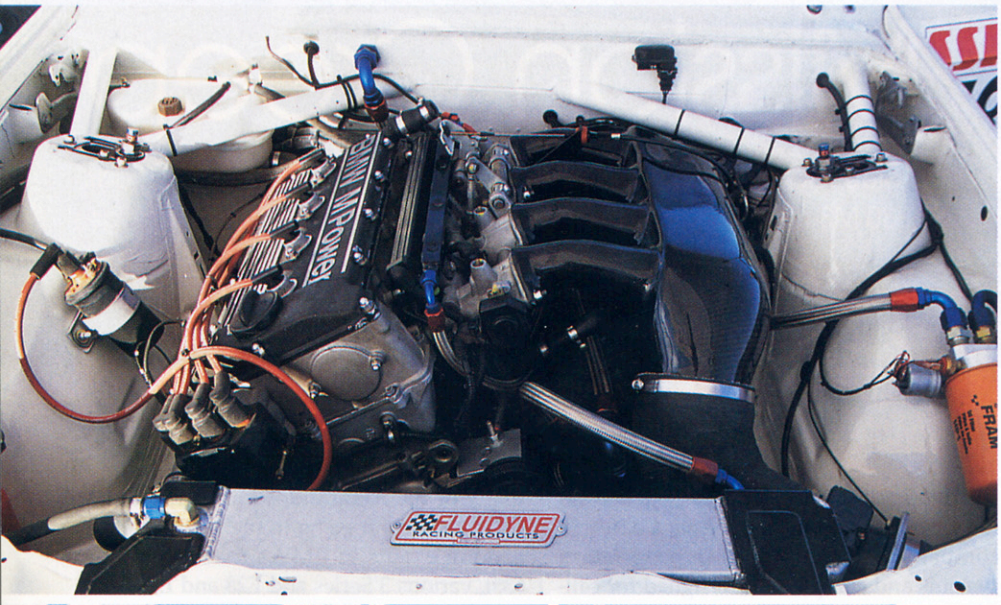
This would provide room to attach inboard rear disc brakes as well as providing a platform for auxiliary belts, pulleys and pumps for recirculating transmission and differential fluids. In order to draw air through the rear brake rotors, a sheet aluminum tunnel attaches inside the car while a special composite rear floorpan directs the air in the proper manner while also reducing drag underneath the car. For additional airflow efficiency, a hole was cut in the rear apron between the taillights where a mesh screen was installed. Behind the screen lie two electric exhaust fans, designed to help evacuate heated air from the brakes and the transmission and differential coolers.

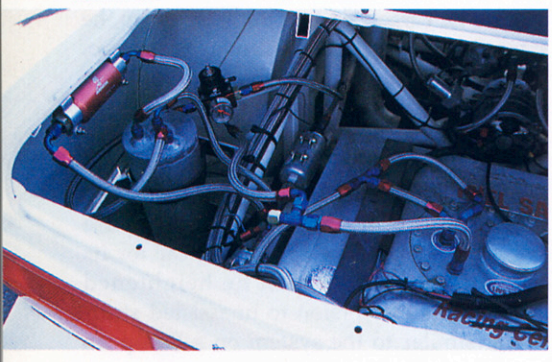
Although Amarandos went flat out on the rear suspension, he decided to retain a more conventional front chassis. His reasoning was that the driver would be less likely to be hurt in a frontal impact if the traditional sheet metal structure of the car was retained on the front end. Due to this philosophy, the car is an interesting blend of both tube frame and tub (sheet metal) structure.

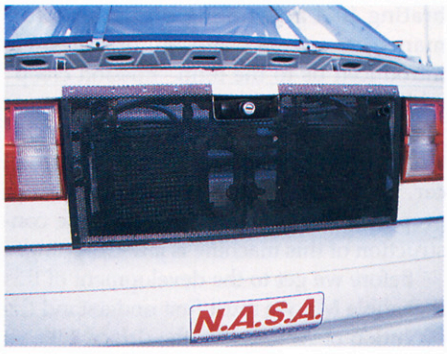
Next to join the party were Chris Welch and crew from independent BMW service facility Bullet Performance Engineering in Costa Mesa. Bullet is a Dinan installation center and serves as the keeper of several customer and employee race cars. Welch, Mickey Miller and crew contributed to the refinement and development of this machine.

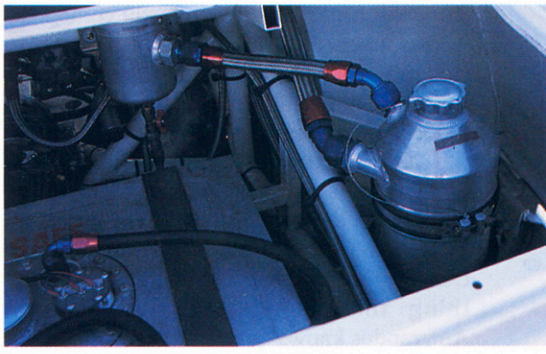
According to Welch, the horsepower department was handled via the purchase of a 300-horsepower 2.5-liter race engine assembled by Frank Fahey Motorsports in



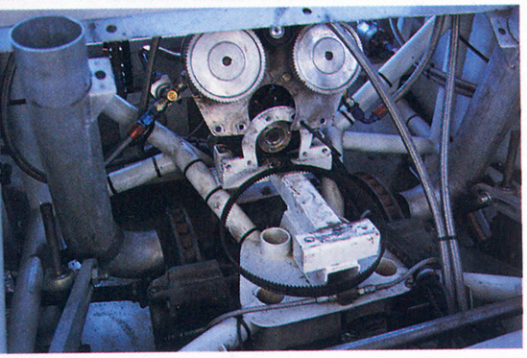








(Left) The Frank Fahey-built racing engine breathes through a carbon fiber airbox while getting fuel through a Split Second system that features larger-than-stock injectors and twin fuel pumps. (Below, from left) Things are even more custom in the trunk, which houses the fuel cell, a surge tank, a rear-mounted alternator and twin recirculating pumps for the transmission and differential oil coolers. An 8-gallon aluminum oil tank feeds the dry-sump engine. (Right, from top) With the aluminum cover removed, the rear pumps and alternator are visible—note, too, the aluminum air ducts that cool the brake rotors. A NASCAR-style oval exhaust exits on the side of the M3. The car is slowed by massive AP Racing brakes behind lightweight SSR Comp wheels.



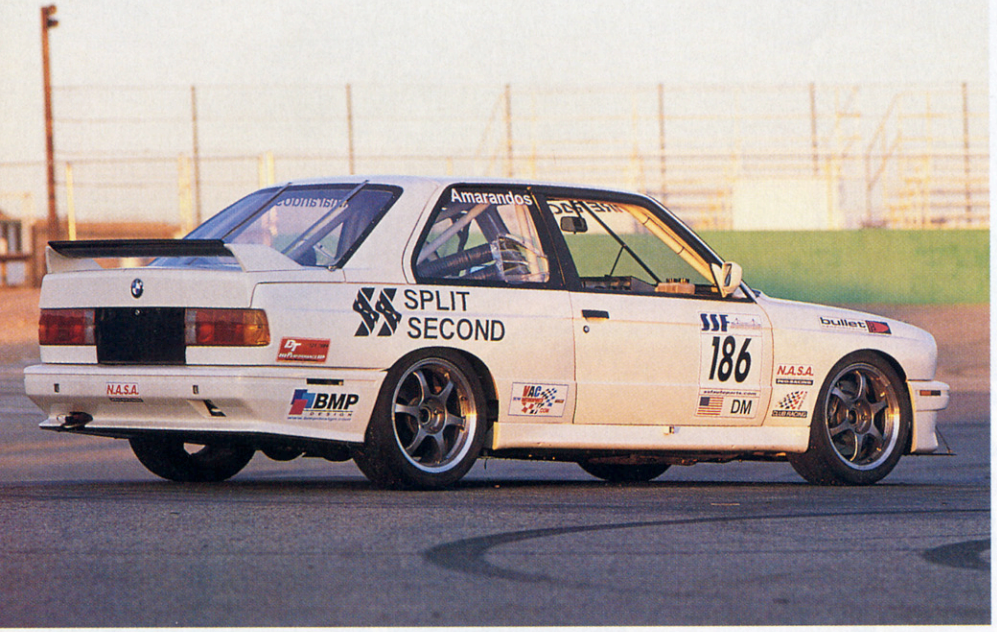
Beneath the bodywork, the level of preparation—and money—invested in this M3 is simply jaw-dropping...

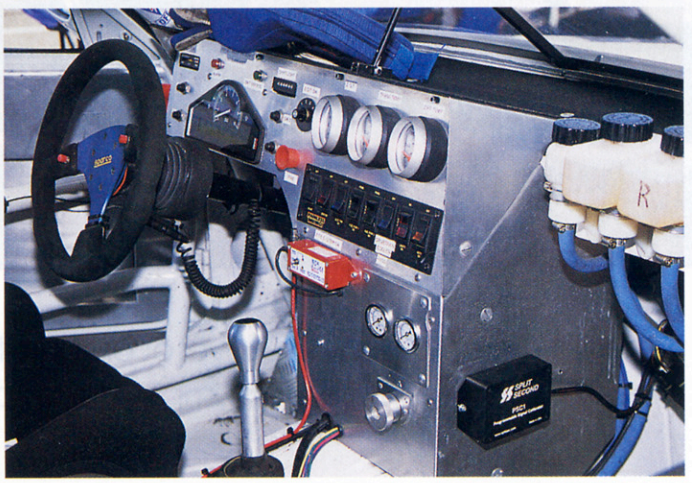
San Diego *(www.frankfaheymotorsports.com)*. The high-compression S14 motor was secured in the chassis using fabricated tubular motor mounts, eliminating the flexible OE mounting system. Due to the anticipated high cornering forces, a Pauter Machine Co. *(www.pauter.com)* dry-sump system incorporating a three-stage pump was installed.

Engine management and fueling are handled by a full complement of Split Second components, including the company's MAF (Mass Air Flow) meter conversion for more power and driveability. Due to the larger fuel injectors used for the racing engine, Welch scoured the "performance aftermarket planet" to locate a fuel pump able to deliver the required volume for sustained periods. Nothing suited his needs, including purportedly massive electric pumps for nitrous drag racing applications.

Eventually, Welch settled on a pair of Porsche 996 RSR pumps, the ones used on a Porsche GT3 race car. An 18-gallon Fuel Safe fuel cell with dual fuel pickups was mounted in the rear section of the car. Sustained g-loading still posed a concern, so the double fuel pump system was devised by Welch as a "closed loop" system. In order to accomplish this task, a secondary one-gallon tank was mounted next to the cell. This specially fabricated tank uses thick-wall aluminum tubing with machined end plates to allow it to handle the pressure fed to the tank by the primary pump. Essentially, the concept works like a dry-sump oiling system, providing a continuous source of fluid to avoid momentary cavitation. In this case, a hiccup in the fuel supply could result in a lean condition and a torched bank of expensive forged pistons.

In order to get proper exhaust extraction from this potent engine, the car went back to DT, where L'Ecluse fabricated a set of 4-into-1 headers using OE-style flanges at the cylinder head. These flow to a merge collector fabricated by Jack Burns of Burns Stainless *(www.burnsstainless.com)* to provide a venturi effect through a 2.5-inch





The M3's custom dash was fabricated by Tim L'Ecluse of DT Rollcages while Chris Welch of Bullet Performance laid out the gauges. The knob down below is for brake bias adjustment, while the gauges measure front and rear line pressures.

diameter orifice. Rather than use the four-cylinder M3's typical pair of parallel exhaust pipes, L'Ecluse fabricated an oval-shaped exhaust pipe similar to that found on NASCAR racers and equating to a roughly 4-inch diameter tube. The system is exotic in appearance and provides plenty of ground clearance.

As custom as it gets

The drivetrain includes a close-ratio 5-speed gearbox reconditioned by Jim Blanton of Blanton Transmissions in Kansas City, Missouri. Paddling the gearbox is accomplished with a UUC aluminum shift knob mounted atop an OE M3 shifter fitted with Delrin® bushings for a more positive shift. A 3.64:1 limited-slip differential is currently used on the rear, but other ratios are being considered for various tracks.

One challenge in this area was the need to machine the drive flanges for the differential in order to fit the 12-inch diameter AP inboard rear disc brakes. (The front end also sports AP rotors and four-piston calipers with 30mm piston diameters.) The nose of the differential was also modified for a cog belt drive pulley, thus providing power to a jackshaft system that spins the dual oil recirculating pumps—one for the transmission and one for the differential. In the center of this sea of rotating parts is a GM-style alternator that provides electrical juice to the car while helping to move the weight away from its nose.

Suspension includes an Ireland Engineering *(www.bmw2002.com)* 25mm hollow-tube front sway bar which mounts in the OE location. The rear sway bar is a pure racing torsion bar-style contraption with flat end blades for mounting the end links. The rear sway bar mounts on the tubular chassis for an immediate response to roll changes. Custom-valved Advanced Design shocks by Ground Control are used on all four corners, matched to a set of racing springs. Four 9 x 17-inch SSR Comp wheels, which weigh only 17 lbs. apiece, are shod with 245/40ZR17 Hoosier R-compound radials.

A battery box was fabricated to house a small dry cell racing battery underneath the former location of the rear passenger seat. Welch also custom-fabricated the entire wiring harness to eliminate unwanted weight while including additional leads for the operation of devices such as the SPA Design electric fire system.

The driver compartment boasts a custom fabricated dash with a Stack racing gauge cluster and Split Second Air/Fuel Ratio Meter, while remaining electronics include a transponder for lap times and an onboard radio system. A Cobra racing seat and a Schroth racing harness help to secure the driver during aggressive maneuvering made available through the car's design and suspension. Welch also noted that roughly $1,000 was spent on constructing the custom flush-mounted Lexan® windows which look almost factory-stock.

Working out the bugs

We followed the car to Willow Springs for a test session prior to a BMW CCA Club Racing event. As with any car this radical in technology, some bugs must be discovered and eradicated before it's really ready to go. Amarandos heard a noise in the belt drive system for the rear-mounted pumps and alternator, and it was discovered that a jackshaft pulley component, designed to help center a cog-style belt, had separated from its welds.

Miller decided that the pulley could be used without its outer ring and the car was reassembled, the problem solved. A bigger problem surfaced later that precluded a test drive by this author, but not before we were able to watch the car turn a few laps prior to its retirement to the pits. The white M3 appeared to be stable in the turns thanks to its stiff chassis and suspension, and its distinctive four-cylinder engine sounded great mixed in with the six-cylinder BMWs that shared the track that day.

We look forward to seeing this car running to its full potential in the near future, and can only wonder if it will inspire another competitor to "build a better mousetrap."

It is rumored that this E30 M3 has cost nearly six figures to produce, making it a truly exotic competition machine. Machines such as the Split Second car provide an interesting showcase for spectators at the events, and BMW CCA Club Racing's class system gives them a place to run. That's fine with us, so long as the door remains open for the little guys. Not everyone's bank account—or marriage—can survive "mission creep"!