FLYIN' FINISH

Keith Tanner builds the ultimate Miata

BY JEFF ZURSCHMEIDE

PHOTOS BY KEITH TANNER & JEFF KOCHEVAR

ONE OF THE oldest traditions in racing and road-tripping is Targa competition. Invented in Italy in 1906 as the Targa Florio, a Targa is an extended road trip with speed competition sections mixed with transit and endurance sections. The "Targa" name comes from the Italian word for a crest, or plate — the emblem traditionally bestowed on the winner. After the Targa Florio became famous, other nations took up the practice of high-speed races over public roads. Thus, the event was imitated in Britain, Mexico, Australia, Tasmania, New Zealand, and on the Canadian island of Newfoundland.

You might wonder what a 102-year-old Italian goat-trail race has to do with us? Just ask any racer or rallyist for a short list of the races he or she hopes to enter in this lifetime, and you'll get your answer. Targa Newfoundland is one of the most exhilarating challenges in the world, and it's tailor-made for a Miata.

Targa Newfoundland is a week-long high-speed tour of the rocky Canadian island in the North Atlantic. While it is primarily designed for classic cars, you can enter any year, make, or model. The complete circuit involves about 1400 miles of winding roads, and about 350 of those miles are run wide open, as fast as you dare go.

So if we have to explain the appeal of speeding along a high cliff road with the raging Atlantic on one side and the rugged hills on the other, why did you buy a Miata anyway?

But as much as every racer dreams of making the Targa, very few actually achieve the goal. Keith Tanner of Flyin' Miata has decided to wait no longer, and has built the perfect car for the task.

Tanner is an accomplished authority on Miatas, to say the least. He is the author of *Mazda Miata Performance Projects*, How to *Build a Cheap Sports Car* and *Miata: Find It, Fix It, Trick It*. His day job is spent working as a technician for Flyin' Miata. So he knows his stuff when it comes to building a go-fast MX-5.

"For some reason, Miatas have never played a serious role in the Targa Newfoundland. The car should be ideally suited to the task, combining agility with predictable handling. I'm out to build a car that could win the event. I don't expect to actually win, but I'm going to build the best tool I can for the job. The ideal Targa car is a fantastic road car. Not one that is compromised by a stiff suspension or a peaky powerband, but one that offers lots of suspension travel and a wide spread of torque. So that's what I decided to build," Tanner says.

Tanner based his project on a basic 1994 1.8-liter Miata because of the car's generally great handling and large catalog of available upgrades. Using a Frankenstein approach, Tanner picked the best parts from a variety of damaged and ruined Miatas to build his perfect ride. Then he built and painted the car with his own hands, in his own garage. "People always assume I have access to all sorts of wonderful toys but that's rarely the case. There's very little on this car that couldn't be done by someone else equally motivated," he says.

STURDY PLATFORM

The Targa Miata chassis is a 1994 R package car that had previously been destined for a rotary swap that never materialized. The previous owner of the car did Tanner a favor, though, and stripped the whole thing down. "He even seam-welded the chassis. Even better, it's never been damaged. It was a perfect start," Tanner says.

For a racing car, every ounce of weight counts, and you have to spend precious

STEP ONE: PREPARE THE CHASSIS

The engine started life in a 1999 Miata. Wait until you see what we did with it (see Page 16.)

Some of the parts of the car had been sitting outside for 5 years before being used on the racer.

The first step in reassembling the car was to weld in the Hard Dog roll cage.

Painting involves a lot of chemistry. This is what was needed simply to change the car to white.

The first step in painting was to clean the car completely and scuff up the original red paint.

A high-tech paint booth was made out of plastic sheeting. Time for the first coat!

Even though it's just the primer coat, the car looks much better when it's all the same color.

Another view of the chassis in primer. Trying to paint all of the tubes in the cage was quite a challenge.

The 2005 master cylinder didn't quite line up with the 1994 brake lines. This is the sort of challenge involved in making a Frankenstein.

The initial reassembly work was very gratifying as there was a lot of fast visible progress.

It's always important to label everything in a project like this! This turned out to be a cruise control brain.

With the chassis prepared it was time to put the interior back together again.

PHOTO: JEFF KOCHEVAR

torque and horsepower dragging it around. So Tanner borrowed a page from Mazda's design team and went on his own "gram strategy" to reduce weight. This included gutting the innards of the lightest-weight dashboard he could find and eliminating 20 pounds of unused wires from the stock looms.

"I'm going through the car front to back looking for little places to save weight. There's more to come out of the dashboard as well despite the previous work. The 1991 dash is significantly lighter than the 1994 dash. It's difficult to say why. The only big difference between the two appears to be the thickness of the plastic," Tanner says.

One place where Tanner decided to add a little weight was in the frame rails. "The Flyin' Miata frame reinforcement kit slips over the frame rails and provides a surprising improvement in stiffness of the chassis. An added bonus for us — beyond the fact that our 200,000+ mile chassis could use all the help it can get — is that it also armors the underside of the car somewhat and allows us to use the entire length of the frame rail as a jacking point. It's an extra 14.5 lbs, but worthwhile. At least the weight is very low and centered between the wheels!" he says.

But even if you're looking for the last gram to take out of a race car, you have to remember that the Targa is run for a week in whatever weather the North Atlantic might throw at you. So creature comforts like a defroster and side windows are critical to getting the team through the event.

THE HEART OF THE MATTER

Forced induction is prohibited in the Miata's competition class, so Tanner has to make his power the old-fashioned way.

The engine is a 1.8 liter unit from a 1999 Miata, equipped with a better cylinder head than the one originally used on the 1994. Pistons weigh just 260 grams each and together with the extra stroke from the Flyin' Miata stroker kit, achieve 11.5:1 compression.

"Flyin' Miata is using our car as a testbed for a high-end naturally aspirated powerplant, a change from the usual turbocharged beasts. This engine is going to sing," Tanner says.

Old school engine builders know that power is made in the head, so Tanner did all the right moves for the top end — having the chambers relieved to unshroud a set of oversize valves and having all the passages ported and smoothed for maximum flow.

To actuate the valves, Tanner chose a set of custom cams. The big sticks are mated to adjustable cam gears for precise tuning. "The cams are designed for a good torque spread, and I will have the ability to wind out the engine to about 9000 rpm if it proves worthwhile," Tanner says.

Engine control is provided courtesy of a Hydra Nemesis standalone ECU.

"The engine has a 2001-05 main bearing support plate and oil pan, a 1999 1.8-liter block and head, 1990-93 cam angle sensor, hydraulic lifters from a 1990-97, valve keepers from a 1999-05, oil pressure senders from both a 1990 and a 1995, cams originally designed for a 1994-97, a 1994-97 valve cover, 1994 coils, a 1999-05 starter, and a 1994-97 alternator," Tanner says.

When push came to shove, Tanner de-

STEP TWO: LOAD IT UP WITH GOOD STUFF

The brakes are a big brake kit from Flyin' Miata. They're lighter than the factory parts and the pads can easily be changed.

The engine is controlled by a Hydra Nemesis ECU from Flyin' Miata. This gives full control over every aspect of the motor and unlocks a lot of power.

The car was built with an open differential originally, but a Torsen unit from a 2000 Miata was eventually installed.

20-odd pounds of wire was removed from the car. A long job, it also simplified future troubleshooting.

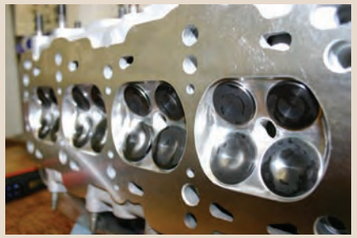
A carefully cleaned and bored engine block, ready for the build.

The pistons in the Flyin' Miata stroker kit are fairly exotic, very light with a short compression height.

The Flyin' Miata stroker crankshaft started life as a 350 lb billet of steel. It helps increase displacement to 2020cc.

The oil pump was packed with assembly lubricant to ensure lots of oil pressure on startup.

The Main Bearing Support Plate from a 2001 Miata was installed on the bottom of the engine.



The head was ported and polished before being fitted with oversize valves and stiffer valve springs.

A 9.5 lb flywheel and a prototype clutch from Flyin' Miata take care of the power transfer.

Brandon from Flyin' Miata helped out with the engine installation. It took about 5 minutes.

cided to create a completely custom exhaust system to suit the unique engine. "I used pool hose to work out the basic routing, then improved on that with a header prototyping system from Icengineworks that I like to call "header Lego". It's 1-inch pieces of tube that snap together into whatever shape I need," he says.

When all this (and plenty more) is done, Tanner's Targa Miata engine should produce around 200 hp at the wheels on a car weighing about 2100 lbs, ready to race.

KEEPING THE CAR OFF THE FLOOR

Consistent with his gram strategy, Tanner chose the lightest possible wheels and tires to get the job done right, and put them under a well-designed, comprehensive suspension package.

Tanner chose a set of SSR wheels shod with Toyo RA-1 tires, and a set of shocks by AFCO, a U.S. company that has experience in both road and dirt track racing. "They're pretty exotic and have a number of features designed for maximum durability and traction. These shocks will become part of the Flyin' Miata lineup, and they are definitely a custom item built to the Miata's needs," he says. Maximizing wheel travel was a big priority, and the car has nearly 7" of travel in the rear.

"It's come alive with a great handling balance and excellent adjustability."

With a pair of sways measuring 22mm in the front and 14mm in the rear, Tanner felt like he had his basic suspension needs covered. "The car feels great. It's got a very nimble feel and it just glides over imperfections in the road," he says. "The ride target was a set of Ohlins shocks, but with double the wheel travel."

OUTFITTING THE OFFICE

For anyone planning to spend a week in a car driving at top speed, interior comfort and functionality is a crucial consideration. So Tanner has carefully planned and executed the inside of the Targa Miata.

"I've planned on running a hardtop right from the beginning. While it would be fun to run as a convertible, I know what the weather in Newfoundland can be like in September," he says.

Corbeau has supplied a pair of seats and harnesses for the car. "I approached them because we found their seats were the most comfortable of all the ones I've tried — and I've tried quite a few. The FX1 Pro seat is also very compact and will fit well in the small car while providing us the comfort and support we'll need for a full week of racing," Tanner says. Safety is provided by a Hard Dog cage originally intended for a Spec Miata.

SKIN DEEP

If you start a car from the most basic components and build it up yourself, you won't get away without painting it. And that's a good thing, because a car built this carefully deserves to be a head-turner.

Tanner had never painted a car before,

STEP THREE: GIVE IT A CUSTOM TOUCH

The car spent weeks covered in masking tape to determine the best stripe arrangement.

A rough test of the first colors for the stripes. Not quite right!

With the layout of the stripes determined, the car was masked off and prepared for paint again.

Once the base color was down, masking started for the cyan and orange sections. Lots of masking.

The moment of truth. Did the masking work?

Laying out the Martini logos. The colors for the stripes are the same ones used on the Lancia rally cars: VW blue, Opel red and Innocenti cyan.

The springs and shocks underwent a lot of street and track testing before the final specification was decided.

A hand-made switch plate. Nobody's dared try the red switch yet.

The header had to fit over 10' of fat tubing in the engine bay, making it a challenging job to squeeze in.

The Icengineworks pieces made it easy to build the complex piping.

Halfway through building the header. The steel pipes are a good copy of the plasic.

After the pipes were cut, the long process of TIG welding the header together began.

PHOTO: JEFF KOCHEVAR

but he was determined to learn and give this car an outside that was just as nice as its insides. The most amazing part is how little he spent on the project. The materials for the paint job totaled about $330, including a gallon of reducer, solvent for cleanup, a breathing mask, lint-free towels, 5 quarts of paint in various colors with hardener, and a quart of primer with its hardener. He used a pair of inexpensive Harbor Freight HVLP paint guns and a 60 gallon 3.2 horsepower Porter Cable compressor.

"At first, I figured that changing the color of a complete car was a tough way to start — but really, it's a pretty good one. I can easily see where I've missed a spot or where coverage is uneven," he says.

But this is not a car to be satisfied with a basic single-color paint job. What this project needed was something with panache!

"I'm a big fan of the classic Martini livery so I decided to make a version of it for myself. There is no standard Martini paint job anyhow, they were always designed to suit the car," Tanner says.

After spending uncountable hours in testing, masking and painting, Tanner spent more hours laying down the several colors in their parallel rows all the way around the car. After all that work, he stripped the tape and stepped back to appraise his results.

"Sex on wheels," he said. "I love the look, it's just what I'd hoped. The stripes just leap out at you. The shape works with the shape of the car and there are no major snafus. It's not perfect — there are a couple of tiny little lines of colors that got through my masking, a few small rough edges and a couple of spots where the line width wavers slightly. But it's unlikely you'll ever see them and they give the car some personality. No

PHOTOS: JEFF KOCHEVAR

soulless, computer-cut stripes here!"

HITTING THE ROAD

After months of design, preparation, and assembly, the Targa Miata was ready for its first road tests. A few bugs are to be expected in any shakedown, and Tanner found his share, but overall, this Miata's hitting all the right notes.

"The car is conspicuously light. It's surprising just how much difference an extra 300 lbs can make to a car, but it will happily surge forward on even just a tickle of the throttle. In short, the car is a ball to drive. It's a reminder that it's not just a Miata with a cool paint job," he says.

After a couple hundred miles on the road, it was time to test the car's racing abilities. So Tanner loaded up and went to a series of track days to test the car at full speed. After working out a few more kinks, he's pleased with his progress.

"At first, the car was a handful. It would understeer on corner entry then light up the rear wheels and oversteer on the exit. It was a bit of a challenge. The one thing that did stand out, however, was the engine. It's a hero. Sharp throttle response, lots of torque from deep down and a killer top end," Tanner says. "Since then, the car's been given a Torsen and a lot of suspension tuning. It's come alive with a great handling balance and excellent adjustability. It can dance. The long suspension travel makes it amazingly stable regardless of the surface, which is really going to help on those battered roads."

But the stopwatch doesn't lie, and if Tanner expects this car to make it in Newfoundland, he'll have to do it on the clock.

"1:07.977 was my fastest time on the first day, and it was a pretty good one. By comparison, the fastest Miata was a turbo car with 225/45-15 Toyos (well scrubbed in) and the JIC shocks that turned a 1:07.119. Another turbo Miata was close behind with a 1:07.337. The Targa Miata was third, ahead of another 45 Miatas including a bunch of turbocharged and supercharged models. It was an excellent first day out, especially considering the car had an open differential and couldn't put any power down" He says.

YOU'RE ONLY AS GOOD AS YOUR NAVIGATOR

Janel Tanner is Keith's better half, and she'll be his Navigator on the Targa. The event will be her rally debut, and she's looking forward to seeing Newfoundland as much as Keith is.

"It took some careful consideration on her part. Personally, I'm very happy with her decision. Her organizational skills are far better than mine and she's good under pressure. In short, she has the potential to be an excellent co-driver. Both of us are excited about the prospect," Tanner says.

BEAUTY AND THE BEAST

We chose Keith Tanner's Targa Miata as our feature car for the first issue of Forever MX-5 because it embodies the very best of the Miata world. It's a top-notch sports car, built for speed, handling, and all-around performance. And it's a beautiful work of art, painted and polished with care and attention to detail. Finally, it's a car built for a lively purpose — running flat out on the open road, having the time of your sweet life with your best friend by your side. ■

KEITH TANNER'S TARGA MX-5 MIATA

Here's what Keith thought was right to put into his Targa Miata. The car has to survive a week of grueling competition, so reliability is just as important as performance. To keep costs down, most of the non-essential parts on the car were scavenged from the extensive Flyin' Miata spare parts piles and salvage cars.

Target Weight: 2070 lbs wet

ENGINE AND DRIVETRAIN
2020cc displacement (courtesy of the Flyin' Miata stroker kit)
11.5:1 compression
1999 head, ported and polished
Oversize valves
Custom 4 into 1 header
Individual throttle bodies (under evaluation)
Fast road cams
Flyin' Miata high performance valve springs
Hydra ECU
Prototype clutch
Torsen rear end with a 4.30 ratio
Factory 5-speed transmission

SUSPENSION
NB series (1999-05) front subframe, steering and uprights
NA series (1994-97) rear uprights
Flyin' Miata big brake upgrade
Cockpit-adjustable proportioning valve
Custom-valved AFCO shocks, 300 lb/in front and 225 lb/in rear springs
Flyin' Miata 22mm front sway bar
2004 Mazdaspeed MX-5 14mm factory rear sway bar
SSR Competition 15x7 wheels
Toyo RA-1 205/50-15 tires

BODY AND INTERIOR
Stripped interior for weight reduction
Hard Dog roll cage
Coralba C-Giant rally computer
3-inch Corbeau harnesses
Corbeau FX1 Pro race seats
MOMO mod.07 wheel
Skid plates
1991 dashboard