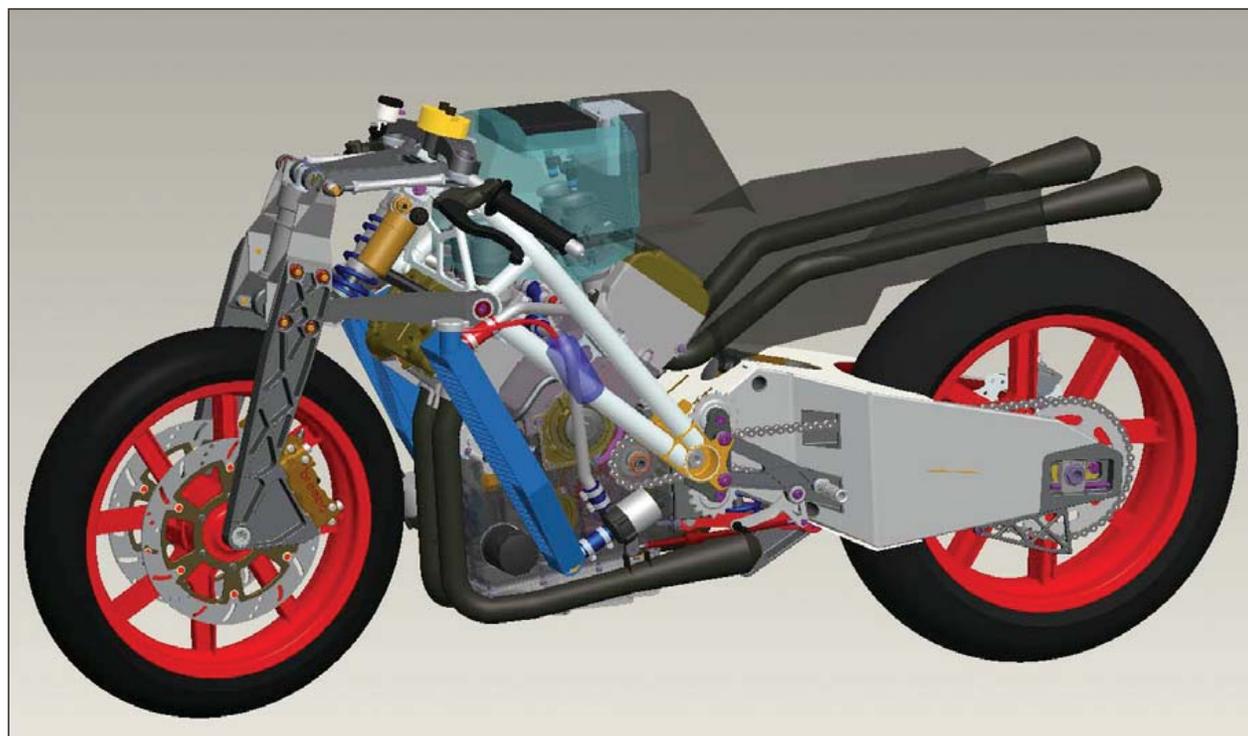


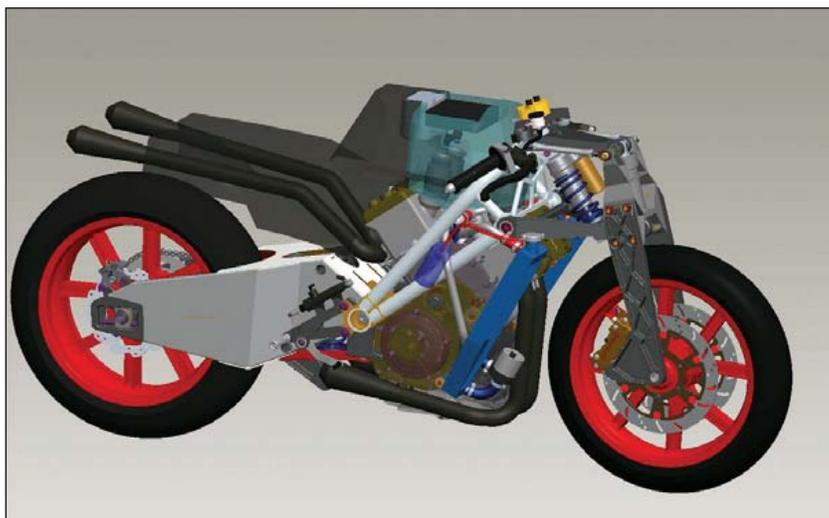
“I’m Not Stupid For Wanting To Build My Own Bike...”

By Michael Gougis

Chris Cosentino was all set to pull the trigger on the baddest Single ever to hit the U.S. motorcycle road racing scene: A custom-framed, alternative-front-end, Ducati 1098-headed monster. Then the FIM announced plans for the Moto2 series, and Cosentino



(Above and Below, Left) On the computer screen, Chris Cosentino’s racebike is a world-beater. Note the exhaust configuration, single-shock front end, and idler sprockets just before the massive swingarm. Illustrations courtesy Chris Cosentino.



thought he saw an opening to build his ultimate custom road racer, a world-beater created from first principles. “I did a little bit of thinking and I realized that a V-4 600 would fit basically into the chassis I had designed for a Single,” says Cosentino, 40, of Union City, New Jersey.

Cosentino rushed in where others feared to tread, only to find the door slammed in his face a few months later when the FIM announced that Moto2 would be a spec engine series. The engineer and designer was all dressed up for a wild, unlimited Formula middleweight contest, and wound

up with nowhere to go.

Yet Cosentino is not easily deterred. He has a plan and he’s forging forward.

“This bike I’m designing is the sh-t, and I’m f--kin’ gonna build it,” Cosentino says. “You get frustrated, you throw your hands up, but if you have a project in your hands and you want to push forward, you push forward. I’m going to make the bike I want to make, and I’ll find someplace to race it.”

Cosentino started racing in the late 1990s at Loudon. “A buddy of ours had an RD350 and an RS125, and I guess we picked the wrong bike,” Cosentino says.

“We bought boxes of parts purporting to be RD350 parts. The next year we picked 125s, and it was the right bike.”

Cosentino, Todd Bucket, and Gregor Halenda competed as “Team Incomplete” at Loudon for the next five or six seasons, and had “a very good time,” Cosentino says. But there was something about racing someone else’s motorcycle that left Cosentino unsatisfied.

“I’m a tinkerer and builder

at heart,” Cosentino says. “So I decided, ‘I have to build my own motorcycle—that’s what I need to do.’ I like to read and I like to build things. You read the John Britton story, you hear about Erik Buell, and you start to think, ‘I’m not stupid for wanting to build my own bike.’”

Cosentino drew a great deal of inspiration from the works of Tony Foale, who designed and built motorcycles with alternative front



Chris Cosentino (43) cut his teeth in the custom road racing motorcycle game by building a rapid Rotax-derived Single with a Hossack front end.

ends, handlebar locations, and other oddities, in Great Britain. Foale moved to Spain, and Cosentino tracked Foale down and met with him after attending a MotoGP race in Spain.

Cosentino came away inspired, flew home, drew up plans, and started cutting metal on his very own motorcycle.

A single-cylinder engine was almost mandatory. A big-bore Rotax 640 served as a simple, reliable starting spot, and racing in the Singles classes offered some unusual benefits for a racer at Loudon.

"LRRS had their own little tweaks in their classes, and I think because Jerry Wood had a Ducati Supermono, there were a few more classes that a Single could run in," Cosentino says. "And I wanted to build something that was different than anything else."

Cosentino fabricated a custom chassis with a Hossack-style single-shock front end and went LRRS Singles racing. After a while he found the limits of his personal riding abilities, he says, so he put Buckett on the bike to help develop it. As Buckett rode, Cosentino tinkered, and the bike started handling well enough that Cosentino turned his attention to the engine.

"We've gone through so many revisions to bore and stroke, and it seemed that the most we could get was 64 horsepower," Cosentino says. "For a while I thought that the dyno was limited to 64 horsepower! When it ran, it beat any Single in the country. But once we started racing against Twins, SV650s, Buells, we needed more power. We could corner faster than them, but they were killing us on the straights."

So Cosentino grafted a Ducati 999R cylinder head onto the Rotax bottom end, which by this point had been modified with custom cases, a custom slipper clutch, and enough other custom parts that there was very little Rotax actually left.

"We would make a lot of power," Cosentino says. "The engine would either blow up or we'd win the race by a mile."

And that still wasn't enough. Cosentino had acquired a Ducati 1098 engine, disassembled it, measured it, and had CAD/CAM'd a design for a custom bottom end to slide under the exquisite Italian cylinder head. "It was going to have billet cases, a billet crank, the whole nine yards," Cosentino says.

Then the Moto2 class was announced. "The original rules had an rpm limit, a weight limit, a displacement limit and that's about it," Cosentino says. "I have a friend who's a collector who agreed to back building a bike for the new formula. I wasn't trying to invent anything new with the engine. The V-4 fit into the chassis and suspension I wanted. And I loathe the genericism of production motorcycles," Cosentino says.

About three months later, with much of the design work for a V-4 complete, the reason for Cosentino's work went out the window. "I remember I was hiking with my friends. I get a call from my buddy Scott. He goes, 'They just changed the rules on the engine.' I—I sh-t my pants," Cosentino says. "What are you going to do? I mean, my stature in the MotoGP community

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Designing A V4 Racebike

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is—I'm a nobody. So I couldn't do anything."

But rather than toss the project into a lake, Cosentino says his benefactor and funder encouraged him to move forward. "The V4 has this cachet in racing," Cosentino says. "So many famous engines from so many famous motorcycles have been a V4."

Cosentino is this/close to having a running engine on the test bench. Most of the hard work is done. The cases are completed; the crank has been cut; cylinders bored. The transmission comes from a Kawasaki ZX-6R, as do the heads. However, the heads are not ordinary parts. Cosentino purchased them from Attack Kawasaki's AMA Pro Formula Xtreme program, and in a process that makes those with



Even Chris Cosentino admits that taking a bandsaw to a set of Attack Kawasaki cylinder heads was a little nerve-wracking.

any degree of mechanical sympathy wince, Cosentino bandsawed the gorgeous cylinder heads in half.

The clutch is a custom piece, as is the radiator, and Cosentino plans to use a Magneti Marelli ECU for engine management duties. "You want to use a known quantity," Cosentino says.

The chassis is equally unique. The CAD/CAM drawings indicate a tubular twin-spar frame with a



Owning your own milling and machining equipment allows you to make really cool stuff that looks like this.

Hossack-style single-shock front end. The shock is mounted close to vertical to eliminate linkages and improve front-end feel. The rear end features a massive swingarm with two idler sprockets; the upper idler sprocket, Cosentino says, can be adjusted to create the same effect as moving the swingarm pivot point.

The motorcycle will look nothing like any of the other bikes on the grid. That's to be expected from a guy who has not only asked the question, "Why?" but come up with answers of his own. Cosentino refuses to believe that engineering principles dictate the cookie-cutter appearance of modern sport-bikes, while at the same time he offers a measure of respect for the level of performance they offer at the price point they are manufactured at.



Letting the metal chips fly is always fun.

"The Japanese do this very well," Cosentino says. "I can buy a motorcycle for \$8000 that is f--king amazing. But when BMW came out with the S1000RR, I wanted to jump out of a window. They went and built a Suzuki. And in racing, they are reaping what you'd expect. They've got a couple of podiums. But Suzuki has spent three decades refining that design."

Cosentino's blog makes fascinating technical reading, and it gives you some insight as to the depth of thought that goes into his understanding of how motorcycles operate. And he's unafraid to slaughter entire herds of sacred engineering cows.

Check out the blog entry on the big-bang engine configuration theory and how it supposedly gives the rear tire a chance to "rest" between power pulses. It has been the topic of thousands of column-inches of technical articles, a belief widely accepted throughout the motorcycling community. Cosentino dismisses it by asking the question about how a rear tire can tell the difference between firing orders when those power pulses are delivered to the rear wheel via a shaking, stretching, constantly-changing-in-tension chain. "Go ahead and try to computer-model the behavior of a chain on a motorcycle in motion," Cosentino says.

"Michelin could tell which rider a tire came from (in the 500cc GP era)," Cosentino says. "But they could never tell which engine ("screamer" or "big-bang") a tire came from. If it was a matter of the tire responding to different power pulses, how is it possible that they could not tell which engine was being used?"

A link from his blog to a Yamaha site on engine design and torque characteristics offers an alternative explanation for the difference in feel between "screamer" and "big-bang" engine configurations—one that makes more sense to Cosentino. It's not an accident that Cosentino's Moto2 engine shares the 90° V-angle with a big Ducati V-Twin, a bike known for its tractable power delivery.

Right now, Cosentino says, the ultimate goal is a wildcard entry into a Moto2 race in 2013 or beyond. But even if that never comes to pass, Cosentino says all he wants is a chance to race the bike he built.

"If I wind up racing WERA, who cares?" Cosentino asks rhetorically. "I'm building my own racebike, I'm racing it, and that's all I ever wanted to do." **RW**