



BY ALLEN ST. JOHN PHOTOGRAPHS BY MICHAEL EDWARDS



# MASTER CLASS



## Bike-Frame Builder

The Richard Sachs formula: steel, silver flux and a 6000 F flame—plus lots of hours set aside for riding.

At a time when many high-end bicycles are made from materials worthy of a Pentagon wish list, Richard Sachs builds his frames the old-fashioned way. At his Chester, Conn., shop, Sachs silver brazes chromemoly steel tubes into ornate cast lugs, in the classic style of the frames made in Europe a half-century ago. For Sachs, it's not a retro thing—steel possesses a suppleness that gives his updated classics a smooth, distinctive ride. Add in Sachs's uncanny ability to fit the frame to the rider in size, geometry and flex, and the result is a bicycle considered by many to be the best in the world. The soul of each Richard Sachs frame is a series of perfectly brazed joints. Here's how he does it.

[ STATS ]

WAITING LIST FOR A SACHS FRAME: 52 months BUILD TIME: Three to four days  
PRICE: \$3000 and up WHEN HE STARTED: In 1972, at age 19 TOTAL OUTPUT TO  
DATE: 3500 HOW MUCH SACHS RIDES: 250 miles per week; 40 to 50 races per year





**Tools vs. Technique:** Richard Sachs's bike-building shop is rather small, a bit messy and notably devoid of techy gadgets. "People throw all sorts of money at tooling—mills and lathes and fixtures and dial indicators," he says. "What they don't realize is that all that stuff can't do the work for them."

**Made to Measure** "The most important work comes in the beginning," Sachs says. Before he picks up the torch, he picks up the phone to interview the client about his riding style, his other bikes and the intended use for the frame. Combining that info with the rider's body measurements, Sachs decides on the frame's proportions and materials, aiming for a precisely tailored fit. When the tubes have been measured and hand-mitered so that each end fits perfectly against the adjacent one, Sachs dry fits the pieces in a jig to make sure that he's not building tension into the frame (**right**). "You have to make sure the tubes aren't fighting each other," he says. "Steel has a memory, and even if it looks straight, it can have inherent stresses that work themselves into the bike down the road." When he's satisfied with the tolerances throughout, he pins each joint with ordinary finishing nails.



### Crafted With Fire

Cleanliness is critical if you want 56 percent silver brazing material to flow easily around steel lugs and tubes. Sachs removes traces of oil from the joint with an 80-grit aluminum oxide cloth (**above**), first stropping the tube—"It gives it tooth"—then finishing by sanding. "I work everything in the direction I want the capillary action to flow." Then, he slathers the joint with Type U silver brazing



flux (**below**) and removes the frame from the jig before doing the brazing. He heats each joint to around 800 F using an acetylene torch that itself hits 6000 F, keeping his eye not on the regulator setting but on the color and the behavior of the materials (**opposite**). "When you heat metal it's like a plant growing toward the sun," Sachs says. "You just need to know which way it's going to move." The heat pulls the silver under the lug, around the nail that's pinning the joint and out the other side of the joint.

### Finished Lightly

The end result of painstaking effort—and a 34-year learning curve: a perfect joint (**right**). Sachs's final, somewhat stern note: While it's easy to clean up messy brazing after the fact, a quality joint requires little finishing work. "You have to be good with the torch," he says. "Not the file."

