

WOODWORK

A MAGAZINE FOR ALL WOODWORKERS

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Chairmaker
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Building a
Campaign Chest

Michael Cooper's
Tour de Force

Hand Plane
Edge Jointing

The Sector:
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Hardly Davidson

BY DAVID COLMAN



PHOTO BY K.L. MUNA

■ "Gunshy"—a woodworking tour de force—was built from more than four thousand pieces and forty-eight types of wood.

"I love anything where people get obsessed," says 53-year-old Michael Cooper as he surveys the monumental obsession that has consumed him for the last 16 months. Intricately crafted from over 4,000 pieces of wood, Cooper's visionary motorcycle, titled "Gunshy," is almost big enough to ride. On display for its first showing at the 48th Annual Oakland Roadster Show in January 1997, the fantasy chopper knocked 'em dead for five solid days. In the blasé world of custom bikes and cars, where craftsmanship is the norm, one-upsmanship is expected. However, no one thought a static display bike

made of wood would become the most talked about exhibit at this prestigious *mechanized* forum. But it was, much to the everlasting gratification of its creator, Michael Cooper.

Displayed right next to the dreamy heavy metal choppers of master builders like Arlen Ness and Bob Lowe, Cooper's trike looked improbably out of place. Hardly Davidson, and so much more. Using 48 different types of wood, Cooper was able to simulate everything from tire rubber to braided steel fuel lines without even resorting to stain. The natural patina of all that wood endows the sculpture with a unity of design that differentiated it from even

the most creative metalwork displayed at the show.

In a way, "Gunshy" reminded me of an intricate model Ferris wheel that captivated my attention as a child. Displayed in the front window of a seafood restaurant in Boston, the 3-foot high wheel had been fashioned by a convict from nothing but toothpicks during his lifetime incarceration. I marveled at that feat, just as I marveled at Cooper's relentless fanaticism. I'm sure there were times when "Gunshy" seemed like a lifetime sentence to Cooper. Just what possessed him to devote more than a year of his life to this creation?



PHOTO BY MICHAEL COOPER

■ A Bridgeport-style vertical milling machine is the choice for high-precision work.

A culmination of lifelong dreams, fears and ambitions coalesced into this expressionistic assemblage. The dreams started early, and bad dreams they were. "I had a BB gun when I was a kid," says Cooper, "and I used to shoot at tin cans. Years later I finally shot a bird. I ran over and watched it die, and nothing has had a more negative effect on me!" It wasn't long after that episode that Cooper himself nearly rolled over and died when assailed by a gunman in his father's grocery store. The shaking robber put a revolver to the boy's forehead, and Cooper never doubted for an instant his life was about to end. "I was shaking worse than he was, and he was shaking pretty bad," says the artist of that epochal experience. As a result of those encounters, Cooper became fascinated and repelled by the power of the gun in American society. It's a conviction that permeates much of his work.

If you look closely beneath the gas tank of "Gunshy," you'll find a .38 caliber revolver instead of a knucklehead Harley engine. Not only is this gun perfectly realistic, but it's integrated into the frame of the bike so ingeniously that you hardly even notice it at first glance. I know I didn't! The snub-nosed gun is turbo-supercharged, moreover, with lots of imaginary but convincing plumbing connecting it to a

huge Weber carburetor and turbocharger snail. It's Cooper's own private joke about the devastation wrought by firepower. The lethal aspect

of the sculpture contradicts the inherent beauty of the piece. The lurking evil of the revolver contrasts with the giddy wood parquets and infuses the bike with an inner tension.

Once you notice that .38 magnum opus under the tank, you begin to realize that there's more to this piece than just surface finish. The disc brakes, calipers, plumbing, teardrop tank, spoked and nipped wire wheels are all startlingly accurate reproductions of the real thing. But on the other hand there's a subtle satire going on here, as Cooper undercuts his endorsement of reality by making the whole bike out of wood.

The contradictions in "Gunshy" come as no surprise, because Michael Cooper is far from your average woodworker. Religiously schooled in the trade by an uncle and grandfather who ran a cabinet shop in Lodi, California, and by a father who worked



PHOTO BY R. J. MURRAY

■ "Captain's Chair" from 1975, an early experiment in bent-wood lamination.

on wooden boats for the Navy during wartime and later built architectural models, Cooper became an inveterate tinkerer before he turned twelve. Uncle Ralph Joines worked the shop, Tony and Joines Cabinets, with Cooper's granddad. Together, the elders taught young Michael how to manipulate wood. He learned to sand, nail, countersink holes, and most of all he specialized in doing "all the grunt work

One of the side benefits to working in his father's grocery store was access to its magazine rack, which contained a variety of how-to-do-it journals: "When I was younger I made Tommy guns and slingshots from plans in *Popular Mechanics*. I used to love looking at that magazine." Today, when nosy critics inquire about the source of Cooper's motivation, he tells them his ideas "come from *Popular Mechanics*,"

cart frame. By the age of fifteen, Cooper had become a "hot rodder." At the same time, he also became proficient with the coping saw and the drill press in the cabinet shop. He was permitted to use these power tools because they presented minimal danger to him, unlike the table saw. By his freshman year at Lodi High School, Cooper had, as he puts it, "a real good sense of how things worked.



PHOTO BY MICHAEL COOPER

■ A multitude of clamps and forms are used to create some of the many components used in just one piece.

and clean-up." But for safety reasons, he was never permitted to use the table saw or most of the other power equipment.

"I was always making stuff, from balsa airplanes onwards. Paper covered with silkspan and dope. When I was twelve, I made a go-cart out of angle iron that was like a slingshot dragster." Cooper didn't know it at the time, but with its elongated frame and convoluted power source, that go-cart was the first in a long line of prototypes for "Gunshy."

even though he hasn't looked at an issue for ages. But it helps confuse the art world press, and Cooper loves to keep his critics at bay.

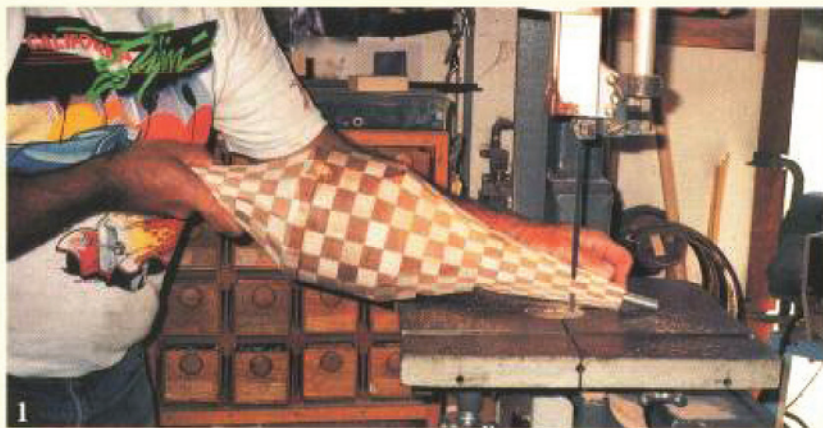
If there was one lesson he learned from the early years at the shop and the grocery, it was the art of self-sufficiency. He found he could make just about anything he wanted with enough practice and the right tools. Cooper and his brother Charles bought a welding kit at that time, and one of their first projects was the go-

I could look at somebody using a tool and then use it myself."

Although his curriculum at Lodi included shop, he didn't really focus much on craft again until he reached college. Providing the motivation was a "Sculpture of the 60's" show he attended in Los Angeles, where he saw the kinetic sculpture of Fletcher Benton, then a teacher at San Jose State. The exposure was enough to draw Cooper back to San Jose for a graduate program in Sculpture under Benton's

METHOD

One Woodworker's Stock In Trade



Most of my sculptures are composed of various organic forms which do not lend themselves to traditional woodworking techniques and methods. I tend to be drawn to complex pieces with highly condensed details. The work most often has groups of sub-assemblies, from hundreds to thousands of pieces, that bolt or screw together internally. I prefer fasteners over glue to hold different elements. My methods have evolved over thirty years of building and acquiring better tools, machines, and skills for various tasks. It is not uncommon for a sculpture to take six months to a year and a half to complete, partly because the piece will evolve and grow during construction. I love the process and the day-to-day battles to make the work better. The following are some of the most common methods that I use:

■ A great deal of rough “carving” and shaping can be accomplished on the bandsaw (Photo 1).

■ Shaping is almost always done with a Bosch 4-1/2" diameter right-angle grinder using 36 to 80 grit sandpaper. This tool can be used aggressively and grain direction is a non-issue with abrasives. With some practice, I have used this tool to eliminate most hand methods of shaping larger pieces.

■ For finer work or concave surfaces, air tools give me a great range of carving options. I have several right angle tools set up with 3/4", 1", 2" and 3" diameter abrasive discs of 80 grit. The straight hand die grinder is best for rotary grinding and drum or tapered cone sanding. Fast, aggressive sanding can be accomplished with a high-quality dual-action rotary sander; final sanding is with a Dynabrade 5" random orbit sander. For precision fine shaping I use a series of hand files. Unfortunately, some hand sanding is always necessary (Photo 2).

■ I now use a metal lathe almost completely for all types of turning. Precise fitting is made much easier with the normal options a metal lathe provides. A remov-

able heavy tool rest can be fabricated and mounted on the saddle for traditional turning with hand-held tools. My large lathe has many shop-built holding fixtures. This one has reversible wooden jaws to hold donut shapes for inside and outside sanding (Photo, page 74).

■ A Bridgeport-style vertical milling machine is the best choice for all high precision work. Here the head is tilted for plunge cutting to a set depth. Small work is normally held in a 6" vise, while larger pieces can be easily held to the slotted table with a hold-down set (Photo, page 70).

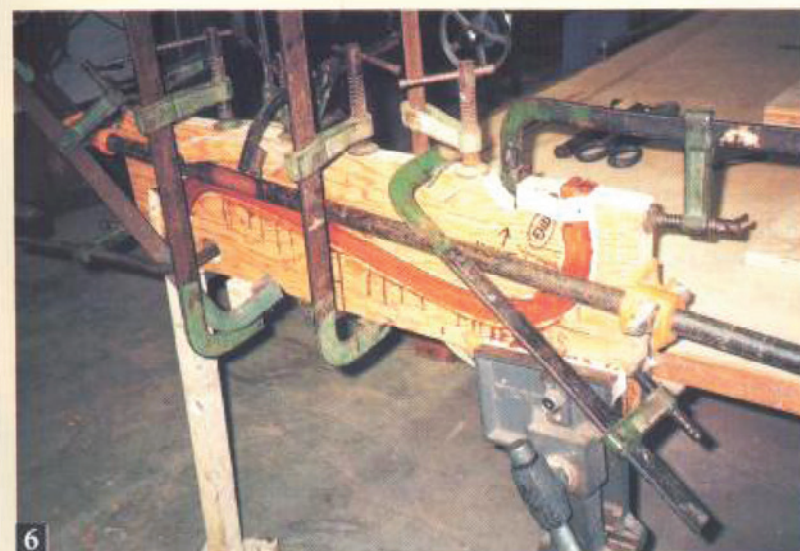
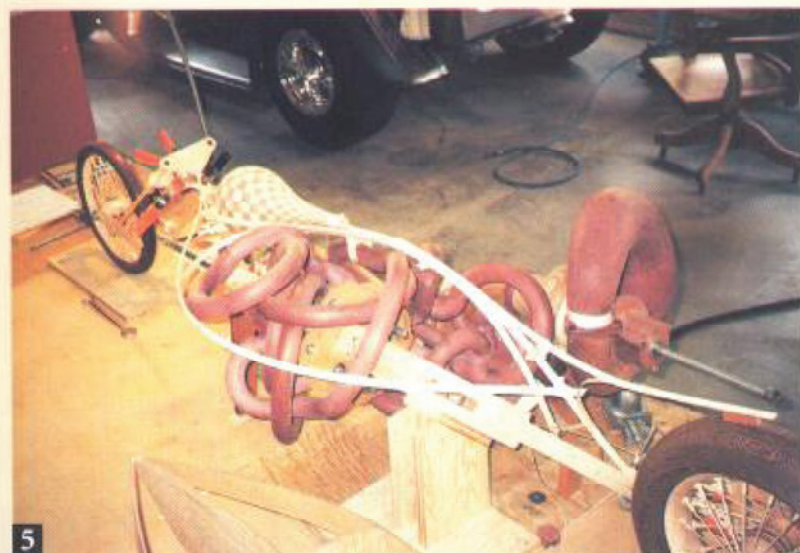
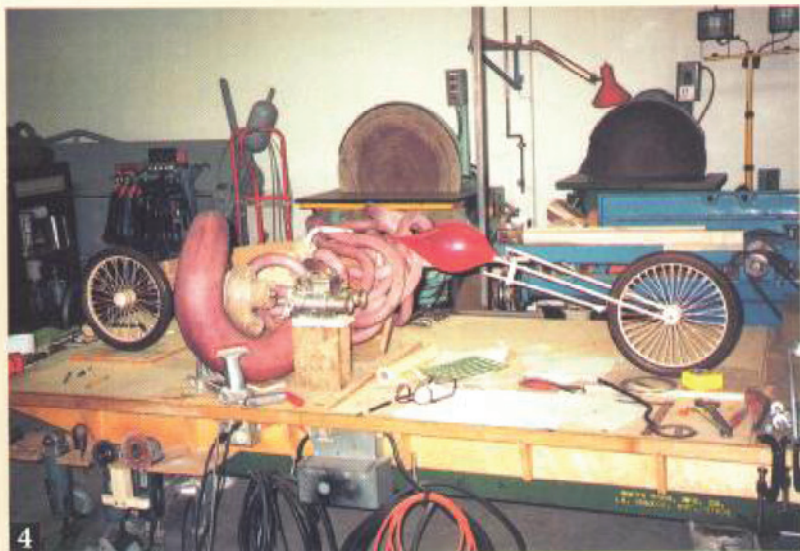
■ The Weber carburetor was a wonderful challenge. It was roughed out on the mill with several different set-ups. The piece was held with the vise on a rotary table. My hands controlled the feed rate of the X, Y, and Z axis of the table (and part) movement. I could easily see what I was doing and my hands were safely away from the cutter.

■ The three different donut sizes were cut into a wide range of arcs from 15° to 180°. They were reassembled using 1/4-20 threaded rod and glue at the joints after the right shape was established. Preliminary drawings might be useful but can also be restrictive (Photo 3).

■ With enough parts made I can do a mock up to decide where this thing is headed; some planning is good! I move the parts around a lot to see various possibilities and options. The stretched balloon seemed like a good shape for the gas tank. Quick and simple (Photo 4).

■ In this sculpture, the frame shape and structure came well into the construction process. A single thin piece of ash was bent and held in place by masking tape and hot melt glue to study the form. Some bent laminations were set around the core elements and glued using plastic resin glue and a variety of methods, such as masking tape, string, rope, and small C-clamps (Photo 5).

■ Two-part lamination forms are excellent for bends in a single plane. Careful drawing, cutting, and sanding of the forms will give very pleasing results and great strength (Photo 6).





■ All moving parts on "Gunshy," including the trigger mechanism, fully operate.

tutelage: "Though I didn't know him at the time of the LA show, he became one of the people on my graduate committee." In 1968, the committee awarded Cooper a Master's degree in Sculpture. During that program, Cooper refined his woodworking technique: "My MA degree at San Jose was in kinetic sculpture, and what I did were lots of wood constructions skinned in aluminum. But there was also one major piece, done mostly in wood. And I did my first bent wood laminations there. I did lots of work with wood there, but they were sometimes covered with other materials. It wasn't until a few years later that I started working in wood more exclusively. I love wood for a variety of reasons. Number one is the speed you can work it, and the forms you can make. It's really versatile."

Cooper served as a mentor to undergraduates in the San Jose State shop, dispensing tools, advice and caution to his students just as his uncle and grandfather had done for him in Lodi. All the while, he learned new techniques, not by taking classes, but by teaching himself. He began turning out a series of wood-based automotive artworks that appeared, not in art galleries, but at custom car shows. Not

satisfied with just an MA in Sculpture, Cooper undertook further graduate work in the field at UC Berkeley, where he earned an MFA degree in Sculpture by studying under Peter Voulkos. Cooper admires Voulkos, terming him a "world-renowned sculptor because he broke ceramics away from function." Cooper has adopted that philosophy as his own, flatly stating that conventional functionality is of little concern to his woodworking ethos: "I'm not

interested in straight furniture. I can't make things with four regular legs. If it's got three wheels and a peg leg, then that's a regular chair for me." Thus, his works are not particularly concerned with function. Their main purpose is to make you think. And provocation is often the hardest task of all for the artist.

By 1977, Cooper was teaching sculpture at DeAnza College in Cupertino, California. It's a job he still holds, and one he credits as a source of continuing inspiration for his own work: "I try to teach people to stretch themselves and think as individuals, not to copy others. Even from the beginning, I think that copying comes from not pushing yourself hard enough. What's great about teaching is, if you get a beginner, they're not encumbered with the problems of technique, so they'll just design stuff that interests them. Girls are great, especially if they've never had a wood class, because they're not encumbered by the problems of technique. You get some great stuff happening with beginners. But the problem is, now that you've sold them on an interesting way to start, you've got to teach them how to develop the idea to the point where they can pull it off. It's tricky, but it's really exciting."



■ Metal lathe fitted with a fixture using reversible wooden jaws to hold the work.

During his sabbatical from DeAnza in 1996, Cooper set out to craft a modest sidecar chopper for a good friend of his. At least that was the plan at the outset. By the time he had finished the project over a year later, it had grown from its planned footprint of 36" to a length of 98", a height of 43" and a width of 50". With over 4,000 separate pieces of wood in the mix, "Gunshy" assumed mythic proportions upon completion. It consists of 48 different types of wood, with 550 pieces alone in the teardrop gas tank. Each link of the chain takes 12 pieces of wood to construct, and there are two chains with 40 links in each chain! Every time I think about all this, it reminds me of the convict's toothpick Ferris wheel in Boston. Cooper spent more than 2,200 hours building "Gunshy." The friend who had originally expected to buy a small display piece has long since bailed out of ownership, and "Gunshy" remains available to the first collector with \$100,000.

Cooper dislikes the restrictions imposed on his work by preliminary sketches, feeling that they tend to limit his creativity. And if there's one thing he's learned from his years of teaching, it's that the primacy of creativity determines the value of the finished product. "What I enjoy about my work is that because there's no sketch, you feel much freer about experimenting with where something might go, or how the thing might look. Because now you're thinking fresh about it again."

When it was time to lay out "Gunshy," Cooper mocked up his vision with miniature wheels and cardboard cutouts to simulate the major sub-groups. As the work progressed from vision to wood, he allowed his imagination to adjust, realign and improve things. "Originally, it was going to have a gun which was going to be the body of the piece. I decided to mock up the rear wheel and the front wheel, did a little paper sidecar, then mocked up the gun clamped to a wooden form. Once the wheel was made and the gun body was made, I



PHOTO BY R. L. LUNA

■ "Checks and Balances" (1991), a meditation on the ravages of corporate America.

started working on the more spaghetti-like part of the exhaust."

He crafted the intricate exhaust tubing not from bent wood, but from solid blocks cut with doughnut holes and formed to shape. Even at this point, Cooper continued to recalibrate the balance of his piece: "When the exhaust collector got big, it sort of moved the sidecar from one side to the other. Then the rear wheel looked too

small, and I had to make the front wheel taller. I work by the seat of my pants. Sometimes the mock-up takes just a matter of minutes. I don't know how it's going to metamorphose, but I have faith that it can be interesting."

The next time you head into your shop to craft some wood, try reaching for a block of amaranth or a scrap of bocote. Or perhaps you'd rather delve into your stash of cocobolo, iroko or

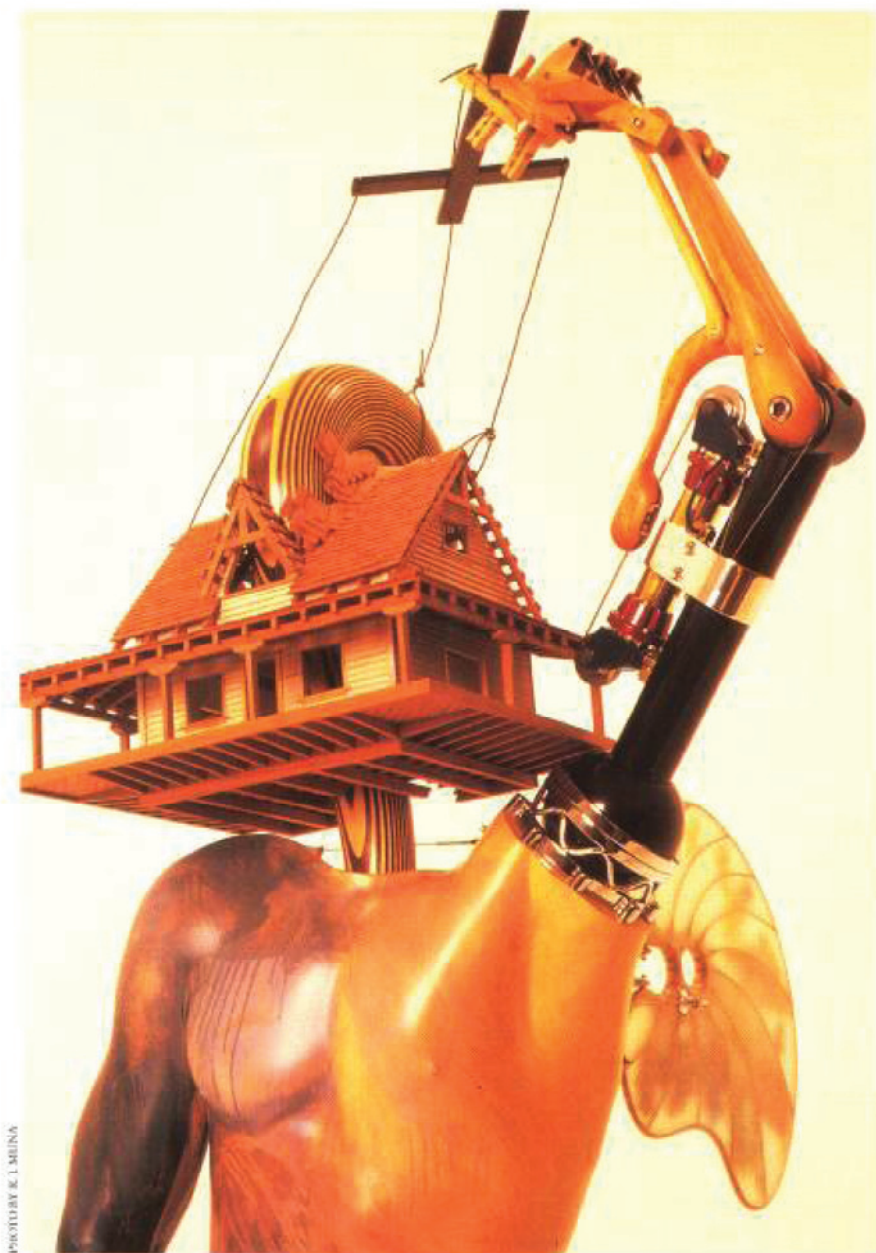


PHOTO BY R. L. MENA

■ Detail of "Self Portrait", Cooper's humorous take on classical Greek sculpture.

makore? Out of those varieties? Then reach for your stockpile of ramin, reed, wenge or ziricote. Yes, all these rare woods play bit parts in "Gunshy," interwoven somewhere between the laminated ash frame and the Philippine mahogany handlebars. The bundle-of-snakes exhaust is made from purple heart, the tires fashioned from wenge, rubber grommets from Macassar ebony, and the chain links from birch and maple. Cooper couldn't get enough of the exceptionally white English holly to use in the laminated gas tank, so he

settled for other, less ivory woods in the 550-piece laminate.

His technique for laying up the checkerboard tank and rear fender is worthy of scrutiny by all woodworkers. Cooper set up his matrix so that all pieces of the laminate radiate out from a central spine. Thus, no matter how he tools the laminate, the same pattern of squares predominates. "There are a lot of steps involved. For the tank, I did about four different diameters, then just glued them together and offset them. If they're set up real accurately, then you'll

get accurate meeting lines, and most of them are. As you carve or turn your shape, the pattern always looks exactly the way it should at the intersections." Cooper has learned that grain direction is not critical in laminate work. He carves his laminates with an air tool and a power grinder, only using non-powered hand tools towards the end of the process. As he says, "It's a matter of overcoming limitations with the tools. You do a certain amount of carving with a mechanical process, then you use an air tool, a hand tool, and one week later you have a carburetor. For me, the fun part is discovering what the process is that's going to make this work."

Cooper excels at deceiving you into thinking you're looking at one thing when it's really something else. Take the fuel lines, which appear to be made of braided aluminum "Aeroquip" hose material. In reality, they're crafted from a veneer of Philippine mahogany and curly maple which provides the three-dimensional braiding effect of Aeroquip. As Cooper says, "I wanted to do what I could in my design so that it would have the feeling of a braided hose. Of course, I couldn't quite do that, but I like the effect. I just wanted to try something different."

Most hot rodders strive to build the nastiest, most earth-shaking lead sled ever seen. But Michael Cooper marches to the beat of a different exhaust note. He has invested enough time and money in "Gunshy" to have built himself a Roadster Show grand champion. Instead, he ended up constructing a tribute to rodding that doesn't even run. But then, Mike Cooper isn't your average hot rodder either. He's an introspective, pensive and brilliant sculptor with a vital interest in mechanical apparatus. And he's also got an important statement to make about the control guns exert over our society. "Gunshy" proves that Cooper has masterfully married his medium to his message in a manner worthy of Marshall McLuhan.

David Colman writes from northern California.