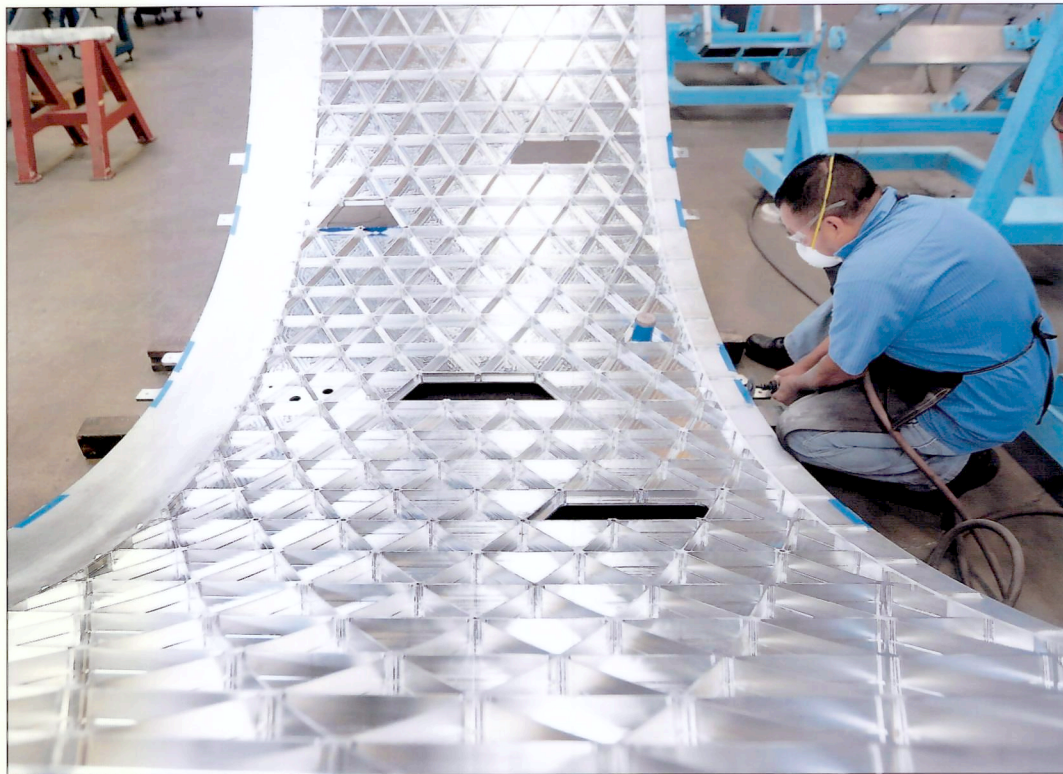


CALIFORNIA

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MISSION TO MARS



TECHNICIAN Thomas Lopez moves a panel at AMRO Fabricating Corp. in South El Monte. It is here that NASA is getting the walls built for its powerful new heavy-lift rocket, called Space Launch System.

Photographs by FRANCINE ORR Los Angeles Times

SMALL SHOP, BIG PLAYER

A family-owned business in South El Monte is an integral part of the Space Launch System

BY HAILEY BRANSON-POTTS

Mankind's path to Mars winds through a small machine shop in South El Monte.

It is there, in the unassuming shops of AMRO Fabricating Corp., that NASA is getting the walls built for its powerful new heavy-lift rocket, called Space Launch System, that's set to blast beyond low-Earth orbit within a few years to explore deep space and send humans to an asteroid and, ultimately, the Red Planet.

The three-generation family-owned metal fabricating business is making the enormous aluminum panels that will constitute much of the rocket's body, as well as major parts of the Orion crew capsule astronauts will ride in.

AMRO sits on a quiet industrial stretch of Adelia Avenue, where men walk down the street in hard hats and coveralls. On an employee's car parked outside AMRO recently, a bumper sticker proclaimed: #MarsOrBust.

"We're building history," said Aquilina Hutton, the president of the company. It's just that most people, she said, don't know it.

A working-class city of just over [See Shop, B6]



CARLOS LOPEZ is a welder at AMRO, which sits on a quiet stretch of Adelia Avenue, where men walk down the street in hard hats.

Council says no to Cahuenga development

City officials last year OK'd 250-apartment plan. Landowner now is seeking \$30 million in damages.

BY EMILY ALPERT REYES

The Los Angeles City Council on Friday reversed a decision that could have allowed hundreds of apartments to be built along the Cahuenga Pass, to the chagrin of a local landowner seeking more than \$30 million in damages from the city.

Ben Forat had planned to construct roughly 250 apartments on empty land he owned near Lake Hollywood. But he needed a zoning change to make it hap-

pen. So two years ago, he worked out a plan with then-City Councilman Tom LaBonge. Forat said he offered to give roughly 10 acres of the land to the city to preserve as green space. LaBonge, in turn, kicked off the process of rezoning the lower stretch of the land along Cahuenga Boulevard.

The City Council unanimously backed the plan last year, asking L.A. officials to look into the zoning change that would allow Forat to build hundreds of apartments instead of a much smaller number of larger homes. The council also asked the planning department to start the process of considering an amendment to the city general plan that could allow the imagined project.

[See Apartments, B5]

Gov. Brown plans for a rainy day

Revised spending plan expects tax receipts to shrink. Aides warn of \$4-billion deficit by '20 if ballot item fails.

BY JOHN MYERS

SACRAMENTO — Gov. Jerry Brown on Friday insisted that California lawmakers hold overall spending flat in the next fiscal year, even while endorsing a \$2-billion bond to help the homeless.

"We have the money, and it's a serious problem," Brown said at a news conference as he sent legislators a revised version of his state budget.

The support for a housing bond, which still would face sizable legal and political hurdles, was the most high-profile proposal in a \$173.1-billion spending plan that otherwise holds the line on new programs and confirms a noticeable erosion in state revenue compared with estimates from January.

Overall, tax receipts are now expected to shrink by \$1.9 billion. And Brown's budget team continues to say that California could face as much as a \$4-billion deficit by the summer of 2020.

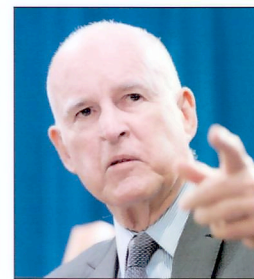
"Right now, the surging tide of revenue is beginning to turn," he said.

The budget revision boosts overall spending by \$2.4 billion relative to Brown's January proposal, a reflection of new healthcare costs covered by a tax on insurance plans enacted by lawmakers in January—one that does not depend on general taxpayer funds to administer.

Analysts said weakening tax revenue was the result of a tumultuous winter on Wall Street and the subsequent effect on capital gains earned by some of California's wealthiest taxpayers.

The state's high-income earners provide the largest single share of tax revenue, and changes in the value of their stock portfolios have often meant steep peaks and valleys in available budget dollars.

That may help explain Brown's endorsement of the bond measure to help tackle homelessness among the mentally ill. The borrowing plan would require a biparti-



THE GOVERNOR'S budget holds the line on new programs.

san vote in both houses of the Legislature. The bond would be paid off with money from an existing mental health tax on Californians who earn more than \$1 million a year.

In the months since his initial budget proposal, Brown has left some Demo-

[See Budget, B7]

AUDIT SLAMS BACKLOG AT STATE BAR

Victims of attorney theft see long delays in compensation while executives get high pay, review finds.

BY MATT HAMILTON

The agency charged with regulating California's attorneys has failed to be fully transparent about its finances while its top executives have enjoyed higher salaries than the governor and attorney general, according to a scathing state audit.

The review of the State Bar of California also questioned spending by a special nonprofit set up under a previous state bar executive, and the audit faulted the agency's leadership for long delays in compensating those who are swindled by corrupt and dishonest lawyers.

At the end of 2015, the review found, the state bar had about 5,500 pending claims by victims of attorney theft — with an estimated \$16-million shortfall for the payments. Some victims of misconduct could wait up to five years before receiving reimbursement, the review said.

"The State Bar's long delays in paying claims harm the people who are waiting and who may be counting on these resources to meet basic needs," according to the report released Thursday by State Auditor Elaine Howle.

The 68-page document is the latest setback for the nation's largest state bar, which oversees more than 250,000 attorneys and is funded mostly by annual dues. The quasi-public agency, considered an arm of the state Supreme Court, oversees the licensing of attorneys, imposes continuing education on active lawyers and intervenes when people have disputes with their legal counsel. The bar also metes out discipline for misconduct, subject to the approval of the state Supreme Court.

The organization has long been bedeviled by con-

[See State bar, B5]



AL SEIB Los Angeles Times

NEW GRADUATES

Students cheer at USC's 133rd commencement. Oracle founder Larry Ellison, who has pledged \$200 million to the school, was the speaker. **B3**

Resetting the U.S. prehistory timeline

Remains of 14,550-year-old mastodon in Florida fills in a picture of the earliest Americans. **B2**

Pot delivery company is shut down in L.A.

Speed Weed is second marijuana firm forced to close for violating Proposition D, city attorney says. **B3**



Photographs by FRANCINE ORR Los Angeles Times

THOMAS LOPEZ smooths a panel at AMRO, which used to build pieces of the shuttles' external tanks but eliminated jobs after the program ended. But now, working on a Boeing subcontract, the shop is humming with work on the SLS. "Our country doesn't know that we're building a new rocket," said Vice President Steven Riley.

A big player in the push to Mars

[Shop, from B1]

20,000 people, South El Monte is sometimes mistaken for its much larger neighbor El Monte, population about 116,000, which calls itself "The End of the Santa Fe Trail" — but not the beginning of an interplanetary journey.

Aerospace once was a bright spot in the Southern California economy. NASA's decades-long space shuttle program underpinned the industry in the region, providing jobs for everyone from Ivy League-educated engineers to blue-collar machinists, and giving work to scores of mom-and-pop businesses like AMRO that supplied the parts.

But in recent years, aerospace giants such as Boeing and Lockheed Martin have slashed thousands of jobs and closed facilities across the region. And the space shuttle program that created so much work is now over.

A new mission

AMRO, which used to build pieces of the shuttles' huge external tanks, eliminated jobs after the program ended. But now, working on a Boeing subcontract, the little company is humming with work on the Space Launch System, or SLS.

"Our country doesn't know that we're building a new rocket," said Steven Riley, AMRO's vice president and Hutton's brother. "They think that once the space shuttle was done, we were done."

The first, and smallest, version of Space Launch System will stand 322 feet tall and produce 8.8 million pounds of thrust at liftoff — the equivalent of more than 160,000 Corvette engines, according to NASA. Its first fly test, carrying an unmanned Orion crew vehicle, is slated for 2018. NASA aims to send humans to Mars in the 2030s.

Work on the mega-rocket is spread throughout the country. In California alone, more than 700 suppliers and subcontractors are working on the Orion and Space Launch System, said Kimberly Henry, a NASA spokeswoman.

At AMRO, machinists are making the intricate curved aluminum panels that form the walls of the rocket's core stage — the main body that carries fuel, holds the twin solid rocket boosters and has engines affixed to its bottom. After liftoff, the core stage detaches and burns up in the atmosphere.

When finished, the panels are shipped to NASA's Michoud Assembly Facility in New Orleans, where the rocket will be put together.

"AMRO is probably making more primary structure on the Orion-SLS combined rocket than anybody else," said Steve Doering, who oversees the building of the core stage for NASA.

His life story

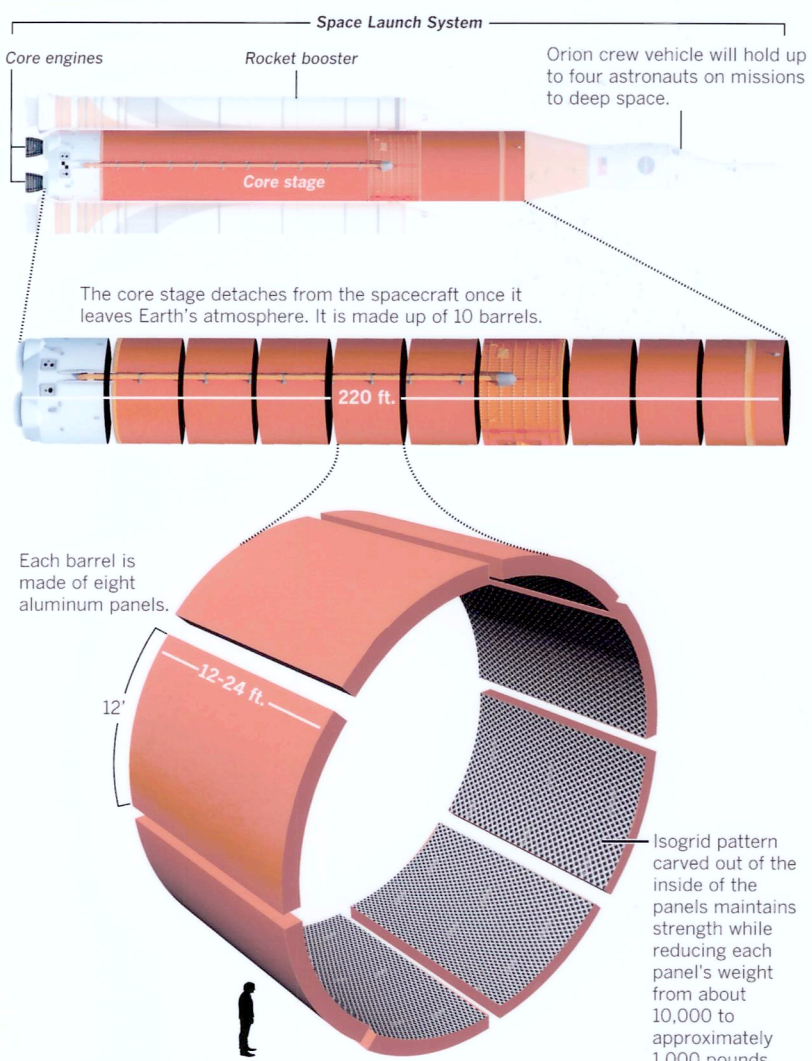
For Michael Riley, the company's 81-year-old founder, the story of AMRO



AMRO is a three-generation family business. At left, Michael E. Riley, director of space flight hardware; his father, Steven Riley, vice president; and his grandfather, company founder Michael Riley.

Made in South El Monte

The enormous aluminum panels that will constitute much of the Space Launch System's body, and major parts of the Orion crew capsule that will ferry the astronauts, are being built by AMRO Fabricating Corp., a three-generation family-owned metal fabricating business.



Sources: NASA, Amro Fabricating. Graphics reporting by HAILEY BRANSON-POTTS, RAOUL RANOA Los Angeles Times

Michael and Thora decided to open their own metal fabricating shop. They figured the business should start with an "A" so it would appear at the top of the phone book. They settled on AMRO — A Michael Riley Operation.

In 1977, AMRO opened an 8,000-square-foot shop in South El Monte with six employees. One of their biggest jobs was making metal frames that held HEPA filters.

Under the leadership of their daughter and son, Hutton and Steven Riley, AMRO for years made the panels that made up the space shuttles' super-lightweight external tanks.

Empty and quiet

When the shuttle program ended, they were told to destroy all the remaining panels, and major parts of their shop were empty and quiet, said Michael E. Riley, AMRO's 31-year-old director of space flight hardware and Steven's son.

When the retired shuttle Endeavour flew overhead atop a Boeing 747 aircraft in 2012 en route to its new home at the California Science Center, AMRO workers watched sadly in the parking lot with a truckload of cut-up tank panels sitting nearby.

Space Launch System, Riley said, was a godsend. In the AMRO shops on a recent day, curled aluminum shavings from the machines covered the floor like glimmering sawdust.

The panels start as flat aluminum plates weighing about 10,000 pounds. Using milling machines, workers carve out pockets in intricate isogrid designs, reducing the plate to about 1,000 pounds, he said. Every pound matters in space, so the goal is to make the plates as light as possible while still being strong. Each is ultrasonically checked for impurities and cracks.

"There's no room for error," he said.

Workers use laser trackers to show the exact spot of each isogrid rib, which can't be off by even as much as the width of a piece of paper, Riley said. The panels are curved in an enormous press brake that applies around 1,000 tons of force, Riley said.

Andres Martinez, a press brake operator who's been with AMRO for 30 years, said he was proud of his work.

"It takes a lot of patience," he said. "Every piece is different."

Every once in a while, an astronaut walks through the shop, shaking the machinists' hands, telling them they're important.

"For the guys that are on a mill or on a press brake, it's no longer just a piece of aluminum that they're building," Steven Riley said. "If you mess up your part, astronauts are going to lose their lives."

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is the story of his life. He fell in love with a pretty little lady, they opened a shop, and their kids and grandkids helped grow it into a NASA darling.

"It's the American dream," he said. "Two kids got married at 19 and started a business, and now we're going to Mars."

As a teenager in the early 1950s, Riley worked as a service boy at a gas station frequented by a young lumber company bookkeeper named Thora. Pretty soon, they started dating.

He was a Catholic whose mother wanted him to become a priest. She was a Mormon who'd grown up in church.

"Both sets of parents just knew that it was doomed for failure from the get-go," Riley said, holding his wife's hand. "But we knew better."

So they ran off to Reno and eloped. Their families learned about the marriage when, unbeknownst to Michael and Thora, it was listed in the Sacramento Bee. They'd raise their kids as what one son called "Cat-Mor," going to the Catholic church one week, the Mormon church the next.

In the mid-1950s, Michael started working in an Aerojet plant in Rancho Cordova, mixing thick, dough-like solid rocket propellant for the Navy's submarine-launched Polaris missile.

"At that point, there was no space concept," Riley said. "We were in the Cold War. Their primary target was Russia."

The Rileys moved to Southern California in the 1960s. Michael took an engineering job, building submarine parts, and eventually managed a metal fabricating division.

With their kids in college,