INTERIOR DESIGN: IT *IS* ROCKET SCIENCE

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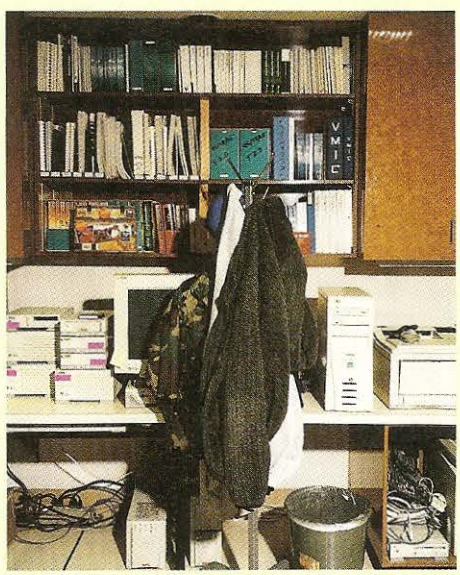

Beverly Hills interior designer Rosanne Sachson (above) surveys the results of her most unusual commission, the Jet Propulsion Lab's Flight System Testbed, where, collaboratively, rocket engineers plan and design outerspace missions. Sachson's program is occasionally undermined (right) by the engineers who work with the testbed.

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Most people know the Jet Propulsion Laboratory in Pasadena, California, through its triumphs, like the Mars Pathfinder spacecraft, which landed on Mars in 1997, or through its equally spectacular failures, like the Mars Climate Orbiter, whose disappearance in 1999 was blamed on a confusion of metric and U.S. measurements.

I've known it since the late 1960s as a place my father briefly worked and, through his eyes, as a fortress of logic and order. But Daddy, I discovered, while researching a book on cold war–era aerospace culture, failed to see the total picture. JPL's founders, Frank Malina and John Parsons, for example, were far from lockstep, plastic-pocket-protector types. Malina, according to his FBI file, was a member of the Communist Party, and Parsons headed the Pasadena chapter of the Ordo Templi Orientis, a pagan cult established by *Diary of a Drug Fiend* author and alleged Satanist Aleister Crowley. Yet the strangest tale I stumbled upon took place in 1993, when Rosanne Sachson, an interior designer based in Beverly Hills, was brought in to implement a radical transformation in the way JPL designs its space missions.

Sachson created a Flight System Testbed—FSTB to the acronym crowd—that was as revolutionary as its name is unenlightening. Before we look at Sachson's role, we have to understand what an FSTB is, and how it changed traditional practices. Until the 1990s, spacecraft were built according to an entrenched formula. Teams of engineers for each subsystem holed up in private to perfect their individual parts. Then they got together to see if their parts, or subsystems, would work with the other parts. When, finally, the parts were integrated as a whole, they called that whole a "spacecraft" and tried to figure out what they could do with it. In fancier terms, they "designed a mission" around the spacecraft's strengths and limitations.

In 1993, however, Kane Casani, a 30-year JPL veteran and former head of NASA's New Millennium Program, had a radical idea. What if engineers actually talked to each other during the earliest design process? What if they didn't wait until their subsystems were finished to plan missions? By the early 1990s, advances in computer modeling had made it possible to hook up a mechanical model of one component—say, an optical system—to a computer simulation of another component—say, the radio system—to see how they worked together. Why couldn't engineers use this technology to refine their subsystems while they were building them?

The idea of a testbed was not new. In the past, each subsystem had a work area where its components could be tested. But to transform the design process, projects needed a work area for trying out combinations of subsystems, where designers could talk.

"We wanted to create a testbed that was designed not just around a spacecraft, but around the whole project, including the spacecraft's mission," Casani explains. "If you were building a spacecraft that would go to Mars, for example, you could simulate the flight to Mars. You could make the landing rockier. Or smoother. Anything in the environment that was important you could simulate"—which is exactly what the FSTB did for its first tenant, the wildly successful Mars Pathfinder team.

Although the wisdom of Casani's idea now seems self-evident, it was initially so strange that JPL's facilities staff opposed it. They couldn't imagine a workspace without cubicles or similar warrens in which engineers could hide. "This was why we brought in Rosanne," Casani tells me. "I wanted someone who knew nothing about what we did here but who knew about design. Somebody not from our culture."

Sachson definitely fit that bill. After working with hotel designer Howard Hirsch Associates, she independently executed homes and offices for such Los Angeles luminaries as *Friends* star David Schwimmer. She is fiercely committed to access for the physically challenged—a consequence of designing a barrier-free house for actor Larry Pressman (*Doogie Howser, MD*) and his wife, actress Lanna Saunders (*Days of Our Lives*), whose mobility has been impaired by multiple sclerosis. (The FSTB is wheelchair accessible.)

Casani and Sachson clicked at first sight. "I gave away my whole idea," she admits, instead of revealing only a tiny bit, as a tease. Casani, too, swiftly dropped his poker face. "I love it," he blurted when she described a key feature: a "wave" wall, whose curve would set the FSTB apart from the lab's other rectilinear spaces and evoke the vapor trail of a rocket. She also proposed a warm wood—birdseye maple—for the wall and a conference table in front of it. The idea, foreign to engineers, was to make the space inviting.

The facilities staff did not make Sachson's job easy. Even choosing the paint was an ordeal. NASA has a warehouse of colors, none of which, she recalls, "looked good"; but she had to prove it. "I put up a warm white next to the NASA yellow-beige and made everybody come see," she says. Even the engineers shrank from the bilious beige.

Casani, a fan of the Italian Renaissance (he has a bronze copy of Verrechio's *David* in his garden), quoted Machiavelli to Sachson when she felt besieged: An "innovator" makes "enemies for all those who have done well under the old" and "lukewarm defenders amongst those who may do well under the new."

Upon completion, the testbed was criticized for its "opulent look," Casani recalls, but its actual price was modest. "We spent an extra $30,000 on what was a $900,000 project," an increase of a mere 5 percent. Its savings, however, were immense: "It reduced the costs of projects by hundreds of thousands of dollars. A project that cost $150 million"—the Mars Pathfinder, for example—"probably saved $10 or $20 million" thanks to simulations that the testbed made possible.

In its way, this encounter between an interior designer and the rocket engineers has been as odd and daring as any executed in outer space. And its results, like those in the search for Martian water, are promising but mixed. After use by dozens of missions, the materials Sachson chose for the FSTB have, for the most part, held up. True, many of her color-coordinated chairs have vanished. "They were uncomfortable," Nick Thomas, former testbed manager, reluctantly admits. And engineers have stacked noisy computer components on her countertops instead of in the storage areas below. But a new testbed just constructed at JPL copies nearly every detail of Sachson's design, right down to its wave wall—the sincerest form of approval.

On a recent visit to the FSTB, Sachson politely suggested that system administrator Eugene Ramos keep his earsplitting computer components in the cabinets she had designed to hold them.

"If somebody doesn't keep telling the next group why it was done a certain way, how will they know?" she asks. With residential clients, she anticipates problems and isn't above intervening to prevent them: "I always take photographs and make a booklet so the housekeeper will know where things go."

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