

# Aircraft Operations

## *The Wings of JSC's Space Flight Readiness Program*

**E**nvision going to work each day to an aircraft hangar, where your view is filled with sleek, glistening jets lined up for duty, and the sounds of the office aren't so much telecons and the clicking of keyboards, but rather, weather briefings, pilot reports and the roar of jet aircraft taking off in the background.

Sound exciting? It is! Those are the sights and sounds for the many employees who staff JSC's Aircraft Operations Division at Ellington Field. Combined, they ensure our astronaut corps maintain their flying proficiency and that shuttle pilots and commanders are beyond prepared when it comes to landing the orbiter.

There are 80 civil servants in AOD, ranging from simulation engineers and aircraft mechanics to quality inspectors and documentation specialists, plus more than 300 contractors from Dyncorp, Lockheed Martin and SAIC who ensure operations run smoothly.

"We execute more than 15,000 plane operations a year," said NASA Division Chief Bob Naughton who oversees the activities at Ellington. "I am very proud of our safety record. It takes the commitment and professionalism of everyone out here to maintain that level of safety."

Naughton has a right to be proud. AOD has enjoyed more than 20 years of injury-free flight operations. "The professionalism here is the highest you'll find anywhere," continued Naughton. "And I'd be willing to say it's the best flying operation in the world."

Obviously, a workplace sprinkled with the blue suits of astronauts and gleaming white jets seems a glamorous place to be but, according to Naughton and those who work with him, it takes a lot of work to make it all happen.

Keeping 43 aircraft in top condition and risk-free is a continuous cycle of training, inspection, upgrades, maintenance and documentation.

One example is NASA's 31 T-38N "Talons" used to keep pilot and commander astronauts proficient with aviation skills and to introduce new mission specialist astronauts, who may have no flight experience, to high performance aircraft.

At any given time, about 24 T-38s are actively scheduled for flights to destinations throughout the U.S. This flight activity requires AOD staff to support 200 T-38 flights a week or 13,000 flight hours per year.

Each jet gets a daily preflight inspection, plus a more comprehensive inspection every 450 flying hours.

Every five years, the plane is disassembled and checked for wear, corrosion or component replacement.

That is just the T-38s. AOD is also responsible for the KC-135A, a



**Bud Meins and Johnny LeMaster inspect the landing gear of a KC-135 as part of the preflight aircraft check. An average preflight examination for this plane takes an hour and a half.**

Gulfstream I (also known as NASA II), the Super Guppy, two Boeing 747s modified as Shuttle Carrier Aircraft, two WB-57F high-altitude aircraft and five Gulfstream II [four used for Shuttle Training Aircraft (STA) and one serves as a spare STA asset].

"We have to be much more resourceful now," said

Ace Beall, Flight Operations branch chief, who has been with the operation since 1981. "The astronaut corps is four times as large as it was when I began and we have less financial resources. We have to be much more efficient."

Beall oversees the 22 instructor pilots for the above aircraft, ensures their proficiency is maintained and tracks their flight records, training and flight currency. Although his instructor team represents the "cream of the crop," all of which are former military pilots with 3,000 - 5,000 hours of flight time, the constant upgrades of the NASA fleet dictate that the crew receive ongoing training.

Safety is the driving force behind the division's success. "It's a key element in our operation," said Charlie Hayes, STA manager. "We recognize that anything that goes wrong will get lots of visibility, so our rules of operation have been developed to guarantee a safe and effective training environment."

Hayes, a 30-year veteran of the division, directs the STA activities. The STAs are modified to be high-fidelity shuttle simulators and allow pilot and commander astronauts to train for the

unique approach and landing scenarios of the orbiter. Usually, an astronaut flies a minimum of 500 landings before ever flying the orbiter itself.

"Normally, two STAs fly twice each day, four days a week," said Hayes. "Since many shuttle landing opportunities occur at night, a significant portion of the training occurs after dark and on weekends to avoid conflicting with Edwards Air Force Base activities."

Nine STA instructor pilots and eight flight simulation engineers assure the safe operation of the aircraft, but Hayes says six simulation software engineers have the difficult task of incorporating shuttle modifications into the STA six months before launch so that the crew has an opportunity to train on their mission configuration.

"It is recognized that this training is a major contributor to the successful landings the shuttle program has enjoyed to date," added Hayes. "We are intensely aware of the importance of our jobs to the success of shuttle missions."

The STA is only one example of how NASA has customized commercial vehicles to help train astronauts for shuttle activities. Essentially all NASA aircraft are modified to some extent for their specific mission. For example, the STAs, the Super Guppy, KC-135 and WB-57s are unique aircraft, flown only by NASA. That requires an immense amount of specialized know-how and technical documentation to assure that work on the aircraft is done correctly and safely. The quality assurance branch, headed by Harry Drottz, takes care of that.

"We want each individual that flies in one of our aircraft to feel they are climbing into a piece of equipment that will get the job done and return them safely," said Drottz.

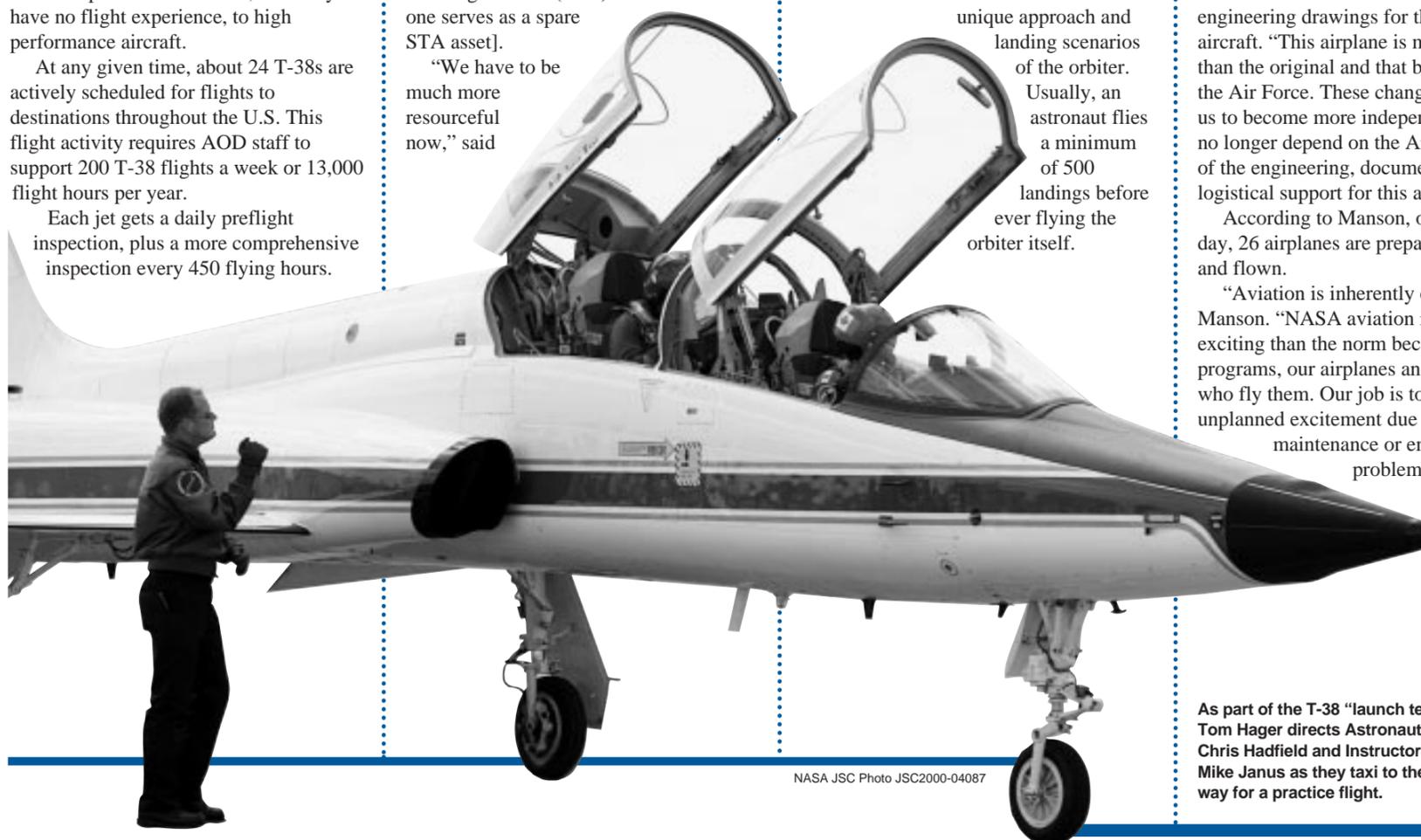
"For the STA alone, we have between 6,000 and 7,000 documents," said Martin Lewis, document management project manager.

The maintenance team, the keystone of AOD, relies heavily on this documentation. Under Al Manson's leadership, it's this team of 18 engineers and maintenance officers that keep the fleet in such remarkable condition.

"Modifications to our T-38s have altered the scope of our work significantly," said Manson, branch chief. Manson's branch maintains more 500,000 engineering drawings for the various aircraft. "This airplane is much different than the original and that being flown by the Air Force. These changes have forced us to become more independent. We can no longer depend on the Air Force for all of the engineering, documentation and logistical support for this airplane."

According to Manson, on a typical day, 26 airplanes are prepared for flight and flown.

"Aviation is inherently exciting," said Manson. "NASA aviation is even more exciting than the norm because of our programs, our airplanes and the people who fly them. Our job is to minimize any unplanned excitement due to aircraft maintenance or engineering problems for our aviators." ■



**As part of the T-38 "launch team," Tom Hager directs Astronaut Chris Hadfield and Instructor Pilot Mike Janus as they taxi to the runway for a practice flight.**