



A QF-4 returns from a routine manned sortie. For unmanned operations the aircraft is stopped on the 'droneway' by an arrestor wire system. This, however, takes some time to reset before another drone can be recovered.

fly the aircraft according to a pre-programmed profile or the controller will do so by the use of his joystick, throttle and other instruments placed on his console.

"Once the mission profile has been accomplished, the drone is recovered back to Holloman AFB and landed hands-off by the DFCS computers using its auto-land feature. The pilot's only control of the aircraft is when they are taxiing it to and from the ramp."

The most renowned use of the QF-4 is when it is flown so that a weapon can be fired against it. For this type of missions, the FSAT is usually given a certain profile to fly, meaning it has to be at a certain altitude, maintain a certain airspeed and, if required, execute a specific manoeuvre. When another aircraft is involved, depending on the profile and the specific test that is being performed, the QF-4 and the test

aircraft will do a so called engineering test, something like a pre-dress rehearsal prior to the actual test itself. This entails the drone being flown manned over the predetermined profile so that the test people can gather data and determine the operational limitations of both the aircraft and the weapon being tested. This is then followed by the dress rehearsal itself, again flown manned. The actual test is then done with the FSAT being without a pilot, or Not Under Live Local Operation (NULLO), and is flown remotely.

Unmanned procedures

Jeff Ault explains: "Unmanned missions are similar to the manned ones, except that the ground checks are significantly more extensive. These checks begin about four to five hours prior to take-off. Once everything is set and the

chase pilots have received their final briefing on the test parameters, the NULLO aircraft receives a final check on the taxiway before gets towed to the drone runway. In addition to the checks previously mentioned, the DFCS and mobile unit controllers perform a series of explosive checks on each drone to make sure that range safety personnel can destroy the drone in the event of an airborne malfunction.

"Once these tests are complete, the drone is armed on the runway with a Sidewinder warhead located inside the aircraft's main bulkhead. There's a 2,000-ft safety bubble around the aircraft with no access to anybody other than for those who arm the aircraft. This missile head will self-destruct the drone in case of a communication loss between the QF-4 and the controller, or if the aircraft becomes unstable in flight. Once the drone is cleared for take-off, the manned chase aircraft is launched first, making a turn to follow the drone through the take-off phase. The pilot ensures that everything proceeds normally and then informs the controller that he is cleared to arm the drone self-destruct feature (Fail Safe). The chase aircraft then leaves the drone and holds at a safe distance until the mission is over to avoid becoming a potential target itself.

F-4 Drone Regeneration Program



Phantoms awaiting or undergoing regeneration are seen at the AMARC facility at Davis-Monthan AFB. Above is an aircraft wearing the 'GA' tailcode of the 35th Fighter Wing, while below is an F-4E from the 4th FW in the foreground, with RF-4Cs from the 67th TRW in the row behind.

Before an F-4 is converted for drone operations, the aircraft has already passed an extensive inspection and overhaul process at the Aerospace Maintenance and Regeneration Center (AMARC). Adjoining Davis-Monthan AFB at Tucson, Arizona, AMARC is America's main aerospace storage and maintenance facility and is managed by the US Air Force Materiel Command (AFMC). AMARC is responsible for storing, preserving, spares reclamation and the eventual disposal of spent airframes. The Center however, also brings back stored aircraft to operational status. AMARC's biggest regeneration programme currently is that of the Phantom for the drone programme.

The process begins with a Lot Review at DM, in which the next group of Phantoms considered for drone modification are inspected. Obviously the first aircraft that are considered are those which were built most recently or have the lowest airframe time. Headed by the Special Program Officer (SPO) from Hill AFB, representatives of the different organisations involved in the drone project spend time going through the maintenance logbooks to examine the history of every aircraft.

These forms tell a whole lot more than just the amount flight hours, as they will reveal whether the aircraft had an unusual high rate of ground or air aborts, or if it suffered from recurring problems. Only Air Force Phantoms are considered, as the USAF does not have ownership of Navy and Marine aircraft.

Before the aircraft is subjected to the regeneration cycle, the pre-selected aircraft undergoes three standard checks: starting with the main rib keel fitting across the bottom of the wing being checked for cracks. This is followed by checking the engines and engine bay for cracks, for which the engines are

removed. Then the gun is removed and the gun lugs are checked for cracks. At this stage the ejection seats are taken out as well.

If no cracks are found in any of the above, the aircraft goes into the full renovation cycle, starting with the removal of the three layers of Spraylat vinyl compound that was applied to protect the aircraft when stored, which takes about 8 to 12 hours depending on how long it has already been on the aircraft. This is followed by a pre-lubrication of the fuel systems, which takes place at 'Flush Farm'. Here the aircraft's empty fuel systems are filled using NATO grade 1010 preservation oil, which is pumped through the entire fuel system. Depending on the type of engine it is either motored or run to fully circulate the pure oil. The surplus oil is then removed and recovered for future use. This process takes about an hour.

Next comes a thorough wash, which takes about 12 hours in the 'Wash Rack'. After washing, the aircraft is further inspected for possible corrosion or deterioration to the airframe that may have occurred during its time in storage. Each component is inspected and, if any problem is encountered, it gets documented in detail for remedial action.

