



A Basic Aerial Target drone developed by the Ryan Aeronautical Co. of San Diego, Calif., beginning in 1958. All photos courtesy Red Smith.

## Where We've Been

# From U-2 to UAS: Vietnam, the Cold War and the Founding of AUVSI

By Harold F. "Red" Smith

The watchword from the 1960s to the early 1970s was crisis response. The downing of U-2 pilot Francis Gary Powers over Russia and Maj. Rudolph Anderson Jr. over Cuba and the beginning of the Vietnam War contributed to a decade of turbulence.

Powers began his ill-fated flight on 1 May 1960, reaching past 30,000 feet altitude before even exceeding the length of the runway due to the U-2's impressive climb rate. The aircraft encountered difficulty over Sverdlovsk, USSR, which was defended by a USSR army antiaircraft battalion employing the newly developed SA-2 Guideline missile. The U-2 was hit, forcing Powers to bail out to land safely by parachute. He was arrested, brought to trial and sentenced to hard labor.

Meanwhile in Washington, the U.S. government issued a hastily prepared story claiming, "a U-2 weather reconnaissance aircraft was lost." A flood of serial USSR news releases followed, stating, "We have the aircraft," "We have the pictures," "We have the pilot, and he is alive and kicking." The response was due to years of pent-up frustration from the USSR over four years of secret U-2 flights conducted by the CIA. The flights had been detected, but the Russian military was unable to stop them until the Powers crash.

The Powers incident signaled the end of those secret flights, as did the mid-May Summit Conference in Paris between USSR leader Nikita Khrushchev and U.S. President Dwight Eisenhower, driving the two countries into a cold war. As a result, the headquarters of the U.S. Air Force became interested using in pilotless aircraft for aerial reconnaissance flight.

## The Move to Unmanned

U.S. Air Force reconnaissance personnel were located in the basement of the Pentagon at the time, but despite this status, they persevered enough to begin a pilotless program to evaluate the potential of unmanned aircraft to successfully replace the U-2 in areas of high risk.

The Ryan Aeronautical Co. of San Diego now enters the picture. The company had been pursuing an unmanned, jet-propelled aerial target aircraft, which could vastly outperform the propeller-driven aerial targets in use in all U.S. military services since World War II. The new jet target, the BQM-34A Firebee, could achieve more than 50,000 feet altitude and greatly increased air speed over the old propeller-driven target fleet.

Air Force Pentagon colonels succeeded in placing a contract for seven modified targets equipped with a larger wing and a stretched fuselage for an increased fuel capacity and designated the model 147A. A test program began in the summer of 1962 at Tyndall Air Force Base in Florida, where a BQM-34A target unit was based and operated by the Air Defense Command. Several sorties were flown out of Tyndall, flying away from the Florida Gulf Coast and returning to the U.S. by penetrating the U. S. Air Defense Interception Zone (ADIZ), all the while taking photographs before being recovered by parachute.

Air Defense Command interceptor aircraft were tasked to locate the 147A aircraft and shoot it down. Several successful sorties were flown, though the Air Defense Command pilots were frustrated at their failure to consistently get the targets. Regardless, the 147A program was a success with excellent photography results.

By October 1962, the 147A evaluation was virtually forgotten. The contract was completed, the ADIZ was successfully penetrated and excellent photographs were taken, but no Air Force sponsor came forward to move to an expanded drone reconnaissance capability. Then the loss of Maj. Rudolph Anderson Jr. in a U-2 over Cuba in 1962 resulted in a potential nuclear war over the location of a USSR medium-range, ground attack, nuclear-capable, missile battalion in Cuba.

After the loss of Anderson, President John F. Kennedy asked the military if there was some other way to take photographs to monitor the missile activity in Cuba. Gen. Curtis E. LeMay, Air Force Chief of Staff, responded to the president that there was a small pilotless drone program available, which was located in Florida. Two 147A drones were left over from the earlier test of the pilotless capability evaluation, though the meager number of systems disappointed Kennedy. Photographic reconnaissance flights over Cuba would continue by U-2 and low-altitude Air Force and Navy aircraft.

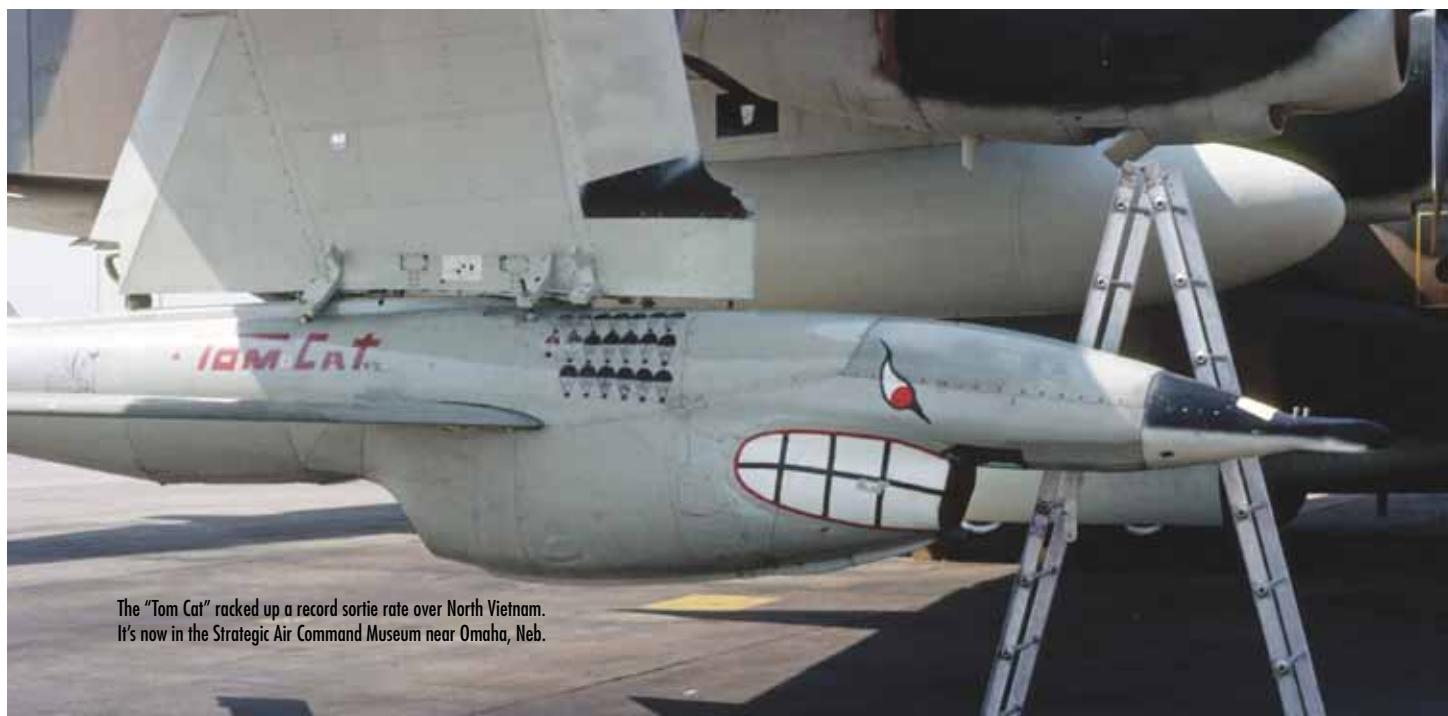
The Cuban Missile Crisis was settled when the USSR withdrew its missiles from Cuba and the U.S. withdrew its Jupiter missiles from

Turkey. Meanwhile the Air Force began an expanded effort, again classified, to field an improved high-altitude, photo-capable drone. The new 147B continued with an enlarged wing and fuel tank and with added navigation improvement. The flight control system was improved using modulated radar on the DC-130 to update the unmanned plane's preplanned mission profile during flight, enhancing the navigation accuracy. Testing was scheduled to begin at Holloman Air Force Base in Arizona and continue later off the coast of Florida. While the 147B test and evaluation flights were underway the following appeared in newspapers, via The New York Herald-Tribune news service: "There is still considerable controversy both within the administration and the Pentagon as to whether pilotless spy flights would produce the quality of photographs that high-altitude U-2s and low-level RF-101 Voodoo and RF-8 Crusader jets are getting."

Despite the underwhelming support in Washington, the test flights of the 147B were successfully concluded. Despite the Air Force personnel's extended temporary duty during the 147B flight, the unit was then scheduled for immediate departure to Operating Location Eight in Okinawa, Japan.

The Operations Order from Headquarters Strategic Air Command directed temporary duty orders for 11 flights for Operation Blue Springs, with a program name of Lightning Bug. Early flights from Okinawa were directed over China, an enigmatic route since the country came under communist rule after World War II.

Not long after arriving in Okinawa, the systems were relocated to Bien Hoa Air Base in South Vietnam, where a contingent of U-2 aircraft was already located. Unforeseen at the time, the unmanned systems would continue to support the Vietnam War for 11 years until March 1975. With the advent of the 147B program, Air Force Logistics Command in Dayton, Ohio, ran the acquisition management as a classified program. The location's Big Safari Program was geared to quick response for urgent programs. Operational control was vested in Strategic Air Command in Omaha, Neb.



The "Tom Cat" racked up a record sortie rate over North Vietnam. It's now in the Strategic Air Command Museum near Omaha, Neb.



The "Flying Circus" introduced real-time video, relayed from the drone to the DC-130 orbiting offshore. In March 1973 it took real-time video of North Vietnamese Army tanks at the Da Nang Airport.



AQM-34/147NC, a chaff-dispensing drone which became known as the Bull Crap bomber (this is the polite version of the phrase) over Vietnam for its prowess in dispensing propaganda leaflets.

The photo reconnaissance mission in South Vietnam evolved from a high-flying 147B into a high-speed, low-altitude unmanned Lightning Bug 147S, which successfully carried the two daily missions, which sometimes increased to four missions per day, for more than eight years. The latest version of the low-altitude Lightning Bug became the workhorse of the Bien Hoa reconnaissance effort. The cost from the Ryan Co. for the 147S was \$165,000 each, plus a \$40,000 government furnished engine for a total of \$205,000 cost for each. The 84 Air Force RF-4 manned aircraft lost in the war cost \$2 million to \$3 million each, rendering the Lightning Bug program an economically viable competitor in the aerial reconnaissance effort throughout Vietnam.

By 1973, a Lightning Bug with Flying Circus nose art was based at U-Tapao Air Base in Thailand, the new location of the Bien Hoa base. The Flying Circus was launched in March 1973 on a combat mission, which relayed video from the system to a DC-130 orbiting off the coast of Vietnam. Flying Circus documented the North Vietnamese Army capture of Da Nang Airport.

Quickly following the photo reconnaissance mission, the Combat Angel Program started up and produced an AQM-34H/147NC Firebee, each equipped with two chaff dispensing pods. Strategic Air Command had two DC-130A aircraft, which were equipped with four launch pylons to carry four 147NC drones at one time. The Angel program went through successful testing with a plan to simultaneously launch eight pod-equipped drones to deploy a wide and steady altitude run to provide a chaff cloud to protect fighter-bomber packages over North Vietnam. Although deployed to the Vietnam theater, sadly the Angel group was never tasked to accomplish the planned job of dispensing chaff from an unmanned drone.

The Angel Group's only mission in Vietnam was to drop propaganda leaflets. The G.I.s in the drone maintenance unit quickly dubbed the Angel 147NC the Bull Crap bomber. Other special missions successfully deployed electronic AQM-34 drones and communication intelligence using the AQM-34R/147T.

In 1970, Israeli Prime Minister Golda Meier came to the U.S. seeking help from President Richard Nixon. One item of great consterna-

tion to her was the loss of seven F-4 fighter aircraft in one day over Egypt, mostly due to the infamous SA-2 Guideline missile employed by Egypt with help from the Russians. Meier sought a way to attack the Egyptian missile sites without risking Israel's limited fighter aircraft fleet.

Project Have Lemon, directed by Nixon, was tasked to investigate help for the SA-2 missile defense suppression mission. Have Lemon, Task-05, was assigned to the Drone System Project Office at Wright-Patterson Air Force Base. Beginning in March 1971, Have Lemon-05 designed another BQM-34 aerial target modification to create the TV Guided Defense Suppression BGM-34A. Aeronautical Systems Division had one year to demonstrate that a TV-guided weapon could be launched from a TV-guided BGM-34A and successfully hit a simulated radar target on a range near Edwards Air Force Base, Calif.

The 05 task was successfully demonstrated in less than nine months on 17 Dec., 1971. Four days later, a Shrike Anti-Radiation weapon hit the target and a Homing Bomb System weapon also was successful, culminating a nine-month effort to prove unmanned defense suppression was a valid concept. The BGM-34A successes inspired the Air Force to advance a follow-on strike drone program with the BGM-34B. The improved aircraft was larger and incorporated a more capable set of steerable optics. Development and testing continued into 1972.

By the summer of 1972 discontent in the unmanned community at Wright-Patterson Air Force Base began to surface. It was obvious to a self-appointed group of six from that community that something was wrong. No Air Force activity had come forward to sponsor the

unmanned drone community, which had now become an orphan despite 11 years of multiple mission successes. These successes included photographic reconnaissance, the Combat Angel chaff dispensing program, communications and electronic intelligence missions' success and the TV-guided BGM-34A Strike Drone.

The committee of six members from the Dayton area organized. The group met at the Walnut Grove Country Club to formulate a plan to move forward with a nonprofit advocacy organization. The new drone association was modeled after the successful Old Crows Association. This electronic warfare was formed just after World War II, and was successful in furthering the EW mission in all of the U.S. military services. By December 1972 the charter for the non-profit National Association for Remotely Piloted Vehicles (NARPV) was completed and the first local chapter of NARPV was formed in Dayton, appropriately named the Kitty Hawk Chapter. NARPV was headquartered in Dayton, Ohio, from 1972 until 1982.

In 1982 the headquarters relocated to Washington, and soon began to embrace all unmanned disciplines in the military services to include Navy, Army and Marines along with the founding Air Force elements. Soon, the association was renamed the Association for Unmanned Vehicle Systems, AUVS, and quickly grew to international status with the new name of AUFSI.

*Lt. Col. Harold F. "Red" Smith, (ret.) USAF, is one of the six founders of NARPV, now AUFSI. This is excerpted from a history of the association presented at AUFSI's Unmanned Systems North America 2012 conference in Las Vegas. To read a longer version and see more images, visit our Flickr page at <http://www.flickr.com/photos/aufsi>.*

