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AUTHOR: SMSgt Mark Cummings, SNCOA Student, undtd, circa 1993

Reviewed by:

AFEHRI Representative G.R. Akin date 30 DEC 97

EPC Representative J. Ols date 7 Jan 98

Scanner Operator Sung Lee date 7 Jan 98

APPROVED BY: Gary R. Akin

GARY R. AKIN, CMSgt, USAF

Director

Air Force Enlisted Heritage Research Institute

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BACKGROUND PAPER

ON

THE HISTORY OF THE BOOM OPERATOR IN THE U.S. AIR FORCE

Enlisted members have played a key role in air refueling operations ever since the historic flight of the Question Mark in January 1929. This endurance flight proved the concept of keeping an airplane aloft for extended periods through in-flight refueling. Sergeant Roy Hooe, although not a boom operator by today's standards, assisted in the refueling as a crew member aboard the Question Mark. Refueling was done by a hand pump which employed gravity and vacuum to initiate the flow of fuel through a rubber hose dangling from the tanker aircraft.

Sgt Hooe, a mechanic and flight engineer by trade also had to repair the engines in-flight by crawling onto the wing via a narrow cat-walk. At one point in the flight, an engine quit, and Sgt Hooe crawled out, roped and tied the dead motor's propeller to prevent it from freewheeling, and repaired the motor with a parachute strapped to his back. Sgt Hooe was a remarkable early example of an enlisted leader. His reputation of being involved in historic aviation feats allowed him to fly and associate with future Air Force leaders like

Generals Ira Eaker and Carl "Tooe" Spaatz on the Question Mark flight, and General Billy Mitchell employed Hooe to prepare the MB-2 aircraft used in Projects "A" and "B," which demonstrated Mitchell's theory that airpower could sink a battleship. (1) (2)

In-flight refueling today is still very challenging but is vastly different and much safer than it was back in 1929. During refueling operations, the boom operator or "boomer" sits upright

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if in the KC-10 tanker, or lays on his stomach with his chin propped up if in the KC-135, while he flies a mechanical boom with two "ruddervators" that assist the boom's movements. The boom telescopes, and has horizontal and vertical motion capability also. (14:10) If this sounds too simplistic, let's see what an actual boom operator, SMSgt Jerry Sacre, of the 306th Strategic Wing had to say about the job.

"During an in-flight refueling, the "boomer" generally directs the entire show. That is, they guide the receiver into position, using both voice communications, and a series of director lights that tell the receiver aircraft to go up, down, right or left, and let him know when he's perfectly positioned. Once in a favorable position to refuel, the boomer inserts the boom into the refueling receptacle and initiates the transfer of fuel. If at any time, a receiver violates the safe operating distance, the boomer can terminate operations, and in extreme cases, can execute a brute force disconnect. All this is done while the two aircraft are travelling at 450 knots and are joined at a distance of approximately 30 feet." (5:48)

In addition to refueling operations, the boomer is involved in preflight planning for fuel, weight and balance requirements, cargo, passengers, and logistics, including food, and beverages. Boomers also assist the navigator in shooting dead reckoning positions, and help monitor engine indicators when in flight. (13)

Air refueling remained in the experimental stages until after World War II. One of the Air Force's first successful tanker aircraft was the KC-97, a propeller driven aircraft,

adapted from a cargo aircraft design. The KC-97 experienced a lot of problems in refueling SAC's then new bomber, the B-52. To link up for refueling the KC-97 had to use maximum speed, and the B-52 was nearly at stall speed. (14:13-14) This made the boom operator's task more difficult, due to the increased turbulence, especially from the lift and drag produced by the mammoth bomber. In one period between July and October 1958, there were four serious accidents involving B-52s refueling from KC-97s. One incident resulted in the boom being completely ripped out of the tanker, and four personnel, two boom operators and two observers were seriously injured. (8:22)

Where did the Air Force get boom operators from? In the early days volunteers into the career field came largely from other aircrew positions (gunners, loadmasters, radio operators), or from maintenance fields. However, an acute shortage of boom operators continued during the 1950s, and the situation was severe enough that units routinely requested permission from higher headquarters to retrain enlisted members involuntarily from support jobs. Radio operators were being replaced by more modern easy to use communication systems on new aircraft entering the inventory, and so naturally radio operators were prime candidates for retraining into the boom operator career field. (8:6) (9) (10)

These also were the early years of the Cold War, and Strategic Air Command (SAC) was in its fullest glory. Enlisted boom operators deployed frequently and often for several months at a time to refuel bombers in support of SAC's worldwide projection of power mission. From July to August 1958, 20

KC-97s and members of the 97th Air Refueling Squadron (97 AREFS) deployed to Elmendorf AFB, AK, and to Guam as part of a command wide exercise. On one of these refueling missions, MSgt Ed Brown and TSgt John Hock, both of the 97 AREFS, earned the Distinguished Flying Cross. Details of the mission remain a mystery though, as the citation states it was for "flying activities of a classified nature." (8:4)

With the advent of a standing nuclear alert force of bombers and tankers, boom operators pulled their fair share of alert time, usually a week at a stretch, living in the sometimes not too cozy confines of the alert facility. They trained hard, and deployed in times of crises, such as the 1962 Cuban Missile Crisis.

By the early 1960s, KC-135s had replaced all the KC-97s used to refuel bombers, and most of the propeller driven KB-29s and KB-50s used for tactical refueling also. (14:13) The boom operators on the new KC-135s saw their duties and responsibilities increase, as these modified Boeing 707s could also carry large amounts of cargo or personnel, in addition to their refueling mission. Logically, the boomer became the loadmaster, and was also responsible for the safety of any passengers.

In 1961, SAC became the Air Force's single manager for all aerial tankers, and began supporting tactical units on deployments. The tactical workload of the KC-135 increased steadily throughout the decade as new fighters such as the F-100F, F-101, F-104, F-105, F-4, and F-5 entered the inventory, as well as the F-111 and SAC's nuclear version, the FB-111.

(14:13) Some of these aircraft had boom receptacles and others had to be refueled by configuring the boom with a drogue that mated with a probe on the receiver aircraft. (13)

The first tanker employment in support of a Southeast Asia (SEA) tactical strike mission occurred in January 1964.

(14:13,29) Permanently assigned tankers were never based in SEA, rather both aircraft and crews were rotated in temporary duty (TDY). (14:14) A larger tanker force was developed once B-52 Arc Light missions began in 1965. (14:15)

In SEA, prevailing summer thunderstorms and clouds often made rendezvous between tanker and receiver very difficult. With a Ground Controlled Intercept (GCI) operator trying to vector the two together, and usually only five to ten minutes of fuel left after a mission, things could get a bit hairy. KC-135 crews use the term "save" in reference to an air refueling with a receiver with insufficient fuel to return to his base. One rather unusual save was credited to a tanker crew from the 4252nd Strategic Wing, who were refueling a battle damaged fighter that was losing more fuel than the tanker was offloading to it. The tanker towed the fighter back to his base with its boom, unlatching him on final approach. The following is paraphrased from another fighter pilot who was indeed thankful for the air refueling support provided.

"I had 1000 lbs. fuel remaining, declared an emergency and asked GCI at Udorn for a vector to a tanker. I was given a vector of 250 degrees at 90 miles, and I thought I would probably flameout before I could hit the tanker. At four miles, I found myself in trail with the tanker and approaching thunderstorms. I was down

to 100 lbs. and I asked the tanker to come up to FL 300, (the same elevation as me), and slow down as much as possible and start descending. This took the tanker from full military climb and red line airspeed to minimum power and a rapid descent. They did this perfectly and immediately, and I required no power from three miles in trail to hookup, as I just glided in. I overshot the tanker once and as I approached the boom, I encountered vertigo and disorientation due to the darkness and haze. The boom operator fearlessly and expertly connected with my receptacle, no small task as I was very erratic in my initial contact attempts. I estimate that I had less than 30 seconds fuel remaining when I got on boom." (14:19-20)

One other spectacular refueling that reinforces the skill and daring of boom operators and tanker crews in SEA was the refueling of a U.S. Navy aircraft in what is thought to have been the first tri-level hookup ever conducted. A KC-135 with two F-104s as escort were vectored towards two Navy A-3 tankers. The F-104s were refueled twice en route. Upon rendezvous with the A-3s, the tanker refueled the lowest, who had about three minutes of fuel left. Both A-3s continued taking turns refueling when the cell was given another vector for two Navy F-8s, low on gas. One F-8 had only 300 lbs. left when the tanker arrived, and he couldn't wait for the A-3 that was still refueling from the KC-135, so he made contact with the A-3 while the A-3 was hooked up and taking fuel from the KC-135. A third emergency was called in from GCI, this time two Navy F-4s too low on fuel to reach their carrier, the Constellation, GCI vectored the whole cell toward the F-4s and contact and

refueling was made with both F-4s. The original two F-104s flying cover refueled a third time and the KC-135 diverted to Da Nang with only 10,000 lbs. of fuel remaining. Six Navy aircraft were saved that day. (14:26-28)

During the period 1964-1971, KC-135 crews flew 129,929 sorties, 568,360 refueling were conducted and more than six billion pounds of fuel was offloaded to receiver aircraft in support of the effort in SEA. Also, those boom operators in SEA were part of history, as SEA provided the first air refueling of fighters employed in combat operations. (14:39)

The boomer's primary job of downloading fuel to receivers requires short bursts of incredible concentration and accuracy. Boom operator fatigue has continued to be a problem when in flight. In the days of the KC-97, you rarely had more than one boomer for a sortie. During some deployments in SAC in the late 1950s, bomber units were flying four receivers against one KC-97, with one hour refueling time each. This pressed the test in regards to flight safety, as four hours is a very long time to have to monitor another aircraft less than 30 feet away. Even in the KC-135, one boomer per crew is the standard. A tanker unit in Spain in the early 1980s reported that it was not uncommon to schedule a single KC-135 against 20 receivers, usually F-4s, during a refueling period of less than two hours. The prescribed maximum rate was nine per hour. Eventually, SAC limited receivers to 16 per hour during daytime and 12 at night. (5:48-49) (8)

There have been many awards for tanker aircrews, from the Eighth Air Force Richard T. Rausher Trophy to the Golden Boom

Trophy. But in the eyes of the boom operator, none could compare with the Clancy Club. This club, started in the 1950s was limited to boomers. To join this elite few, a boom operator had to possess a seven skill level Air Force Specialty Code (AFSC), have four years boom operator experience, a minimum of 500 contacts, and transfer a minimum of two million lbs. of fuel. (12)

Air refueling has come a long way since the Question Mark loitered over southern California in January 1929. Through the Cold War, Vietnam, and the challenges that followed, enlisted boom operators have repeatedly proven themselves to be a professional, integral part of their aircrews, and the United States Air Force.

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