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# HISTORY OF

# AIRCRAFT MAINTENANCE TRAINING

CSA-13

SMSgt Bruce A. Voigt

Seminar 28

Class 94-D

In his far sighted report on aircraft maintenance training, the Assistant Chief of Air Staff, Intelligence Historical Division said,"In popular imagination it is the members of the aircrews--particularly the pilots--who are the heroes of aerial warfare. Yet everyone familiar with the reality of the situation--especially pilots and their fellow crew members--realizes his dependence upon the glamorless airplane mechanic, the lowly grease monkey." As early as World War I Air Service officials were declaring that "without efficient mechanics the pilot's wings would soon be clipped and there would be few, if any, ships available with which they could take to the air." (4:1) Without properly trained mechanics there wouldn't be any need for pilots because airplanes could not fly. Training is the lubricant used to grease the wheel of aircraft maintenance. Incredible as it may seem, our ancestors in the aircraft maintenance business understood this very well. They laid the foundation for which our very effective military aviation training program is built.

In this paper I will discuss the methods and philosophy of aircraft maintenance training through three periods of military aviation. The period between the World Wars, the World War II years, and finally the modern period. How did our Air Service ancestors set up maintenance training in the World War I era? Let's take a look.

When the United States entered World War I, it needed not only great numbers of men, but also a great variety of them. Why a great variety? Well at the time aircraft were a conglomeration of wood, metal, fabric, rubber, and instruments. "Airplane mechanicians," as they were called at the time; blacksmiths, cabinetmakers, carpenters, coppersmiths, electricians, fabric workers, sail makers, instrument repairmen, metal workers, "motor mechanicians," machinists, propeller makers, vulcanizers,

and welders needed to be molded into a team and shown the "Air Service way". (4:4)

The Air Service trained its men by using several different methods. There were schools in factories operated in cooperation with aircraft manufacturers; schools overseas conducted by the British and French governments, and courses in civilian technical schools, colleges, and universities. Additionally, some men were taught "on-the-job" (OJT) in two ways: formally, in classes conducted at their air bases and informally, as they performed their duties on the lines. However, the bulk of airplane mechanics were trained at two locations: Camp Kelly in San Antonio, Texas, and the other in rented buildings in St. Paul, Minnesota. Perhaps the biggest challenge to the Air Service pioneers was to get as many men trained as quickly as possible. Two notable methods were developed and are sill in use today: the use of specialization on particular types of aircraft, and the emphasis on "practical" over "theoretical" in conducting instruction. (4:5-6)

The signing of the Armistice brought a quick closing down of all technical schools except for the one at Kelly field. In January 1921, the school was moved into improvised buildings at Chanute field. During this period the school was conducted on a small scale and in an informal fashion. Classes began at any time a group of students were detailed to attend them. The length of the course was set at a maximum of six months; students were advanced as rapidly as possible and graduated before the end of the period if they were able to complete the work satisfactorily. During the mid to late 1930s Chanute Field expanded. In order to make room for the aircraft mechanic courses, the armament,

photography, and clerical departments were moved to new training facilities at Denver, Colorado.

In 1938, with the activities of Germany, Italy, and Japan growing more menacing, the Army Air Corps (as the Air Service was now called) took stock of its situation. What it discovered was very disturbing. As of 1 July 1938, the Air Corps was authorized to have a strength of 25,000 officers and enlisted men to operate 2,320 projected aircraft. It was estimated that of the enlisted personnel 16,250 ought to be trained technicians. Incredible as it may seem the Air Corps only had about 3000 trained technicians! (4:9) Truly a massive buildup was needed to prepare for war and head into the World War II era.

The World War II era for all enlisted career fields was a period of massive buildup and aircraft maintenance was no exception. In the beginning years the philosophy was, as in World War I, to get as many trained as possible for the emergency. This was done by sending recruits to one of six fields that had basic training centers. The men were given written mechanical aptitude tests and sent off to the appropriate technical school. Shortly after Pearl Harbor, all schools switched from five instructional days a week to a six-day week. Additionally, the schools went to a three-shift operation to maximize training capacity and efficiency. In the summer of 1942, instruction at the basic mechanics schools was reorientated to emphasize maintenance of a particular type of aircraft rather than the problems incident to all types.

Some understanding of the extent and variety of the newly named Army Air Force (AAF) aircraft mechanics training at the height of the expansion period can be gained by reviewing the state of AAF training only one year after Pearl Harbor. At that time the basic mechanics

course was given at six AAF schools and 24 civilian schools. Eight types of advanced specialists courses were being offered at Chanute and 22 civilian schools. Forty-seven factories were being utilized. Twenty-four mobile training units were touring tactical units and schools in the continental United States. Incredibly enough during December 1942, 98,162 men were receiving aircraft maintenance training! Compare that to the earlier estimation of 16,250. (4:16) These statistics point out the amazing capacity for the military and civilian communities to work together in time of national emergency. They also give strength to the credence of flexibility for military operations whether they be dropping bombs or providing trained mechanics to the field.

Unfortunately the magnificent coalition forged between the military and civilian community worked too well. In the spring of 1943, two years before the war ended, the AAF approached 2.5 million men in uniform, the number estimated as necessary to win the war in the air. Because losses among maintenance technicians were light, the number of recruits needed was reduced significantly. By May 1944, only about 20,000 men were being trained per month compared to over 98,000 just 5 months earlier. (4:17)

The new situation (less recruits needed) led the AAF to change its mechanics training program in several important respects. Emphasis was placed on quality rather than quantity. Experienced mechanics were given refresher courses on the new aircraft coming out of the factories. On-the-job training was used more extensively along with more mobile training units deploying to the field. The great curtailment of the influx of men and increase on quality led the AAF to drastically reduce the number of schools and courses in mechanics training. As the war

wound down, aircraft maintenance training took on the shape that it would remain in for the next 46 years.

Possibly the most important single course offered by the AAF to train its aircraft mechanics was the basic maintenance course. In theory it was given to every man earmarked for any type of aircraft maintenance duty followed by OJT on the specific aircraft that the mechanic would be assigned to. The course consisted of teaching a curriculum generic to all types of aircraft such as technical orders, mechanical and physical principles, and general systems knowledge. This general structure of aircraft maintenance training would remain in effect until 1990.

The modern period saw very little change in philosophy from 1944 until 1990, however there were several minor changes through these years. Keesler Field, Mississippi, taught the primary aircraft and engine mecahnic courses in the immediate postwar years. (3:153) Later the basic course would be taught according to aircraft type; fighter mechanics were taught at Sheppard AFB, Texas, and large aircraft mechanics were taught at Chanute. (6:-) Today, all aircraft maintenance training is taught at Sheppard, AFB. Let's review some interesting events that have taken place during the modern era.

One interesting development, which occurred in 1955, was the advent of manipulative tests to predict success in the aircraft maintenance field. Before this, all the recruits were tested by means of a written aptitude test. Air Force researchers hypothesized that manipulative tests would do a better job of predicting success than written tests. They based their conclusion on the fact that aircrews had been tested this way since early World War II and if it worked for them, it should work for mechanics. According to a 1955 report by the Air Force

Personnel & Training Research Center, "It has been shown that for such jobs as pilot and bombardier, a battery which includes both apparatus and printed tests achieves a prediction higher than that achieved by either kind of test alone". (7:1) These tests were laborious, extremely complicated, and as the Air Force found out, not very effective. Shortly thereafter, the written aptitude tests were reinstated and remain today as a means of classifying airmen into specialties.

On-the -job training remained a force throughout the modern era. Retired CMSgt Stan Bujak, who spent over 20 years in aircraft maintenance, learned the B-29 bomber strictly by OJT in 1947. In 1951 Chief Bujak retrained to B-47 bombers. He attended a short course at Sheppard AFB, and then went into the field for extensive OJT. (2:-) Mr. Robert Mitchell, a retired MSgt and currently single point manager for F-16 and B-52 training at Sheppard AFB, remembers spending 15 weeks at Chanute AFB followed by almost a year of OJT on the KC-153 tanker. Later on, he switched to B-52 bombers and was trained entirely by OJT. (6:-) Retired SMSgt Robert Maddox, who has 24 years as an aircraft mechanic and is currently a C-141 training certifier at Sheppard AFB, spent 12 weeks at Sheppard AFB and then about 8 months of OJT on the F-4 fighter. (5:-) Throughout the years OJT has remained an important method for training mechanics.

Throughout the postwar period the basic course remained at a length of between 12 and 15 weeks with only one exception. In 1978, budgetary constraints led to development of a 4-week basic course called Able Chief. After Able Chief, the mechanic was sent through a field training detachment (FTD) and then received OJT. The new approach for Able Chief was to get the mechanics to their duty sections sooner and at far less

cost. (1:14) Able Chief was abandoned around 1983 because the major commands were not happy with the status of knowledge their new mechanics had. (5:-) The basic course was expanded from 4 weeks to 6 at this time and remained in effect until 1994.

What is happening in aircraft maintenance training today? As always, funding is the major impetus for change, but this time the Air Force is attacking the problem differently. The courses have been expanded and are entirely aircraft specific. For example, if you were selected to become an F-16 mechanic, you would be enrolled in the F-16 aircraft mechanic course. Once finished, you are awarded a 3-skill level. There is no need for an FTD or that old training war horse, OJT. Mission Ready Training is what the Air Force calls it, and it will carry us into the 21st century. (5:-,6:-)

Our ancestors in the Air Service did a magnificent job of gazing into the future and building a training structure which has stood the test of time. The incredible programs they developed; aircraft specific training, quality reinforced training, and mobile training units, to mention a few, are all lasting legacies of their efforts. Their efforts have been the framework in building the most powerful air force the world has ever seen. We must endeavor to continue their far reaching efforts, and at the same time preserve our history, for that is what makes the United States Air Force great.

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