NPS Form 10-900-a
(8-86)

OMB Approval No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 97000443 **Date Listed:** 5/29/97

Douglas DC-3 Airplane, N-34	Oklahoma	OK
Property Name	**County**	**State**

Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Carol D Shull 5-29-97

Signature of the Keeper **Date of Action**

==========

Amended Items in Nomination:

The period 1946-1956 and the area "military" should be deleted because they refer to this type of aircraft (DC-3) rather than to this specific airplane. The significance of N-34 in representing an exceptionally important type of plane, in both military and civilian use, is conveyed through Criterion C.

Correct period of significance is: 1945; 1957-1981.
Correct areas of significance are: Engineering; Transportation.

This information was confirmed with Ann Hooker, FAA FPO.

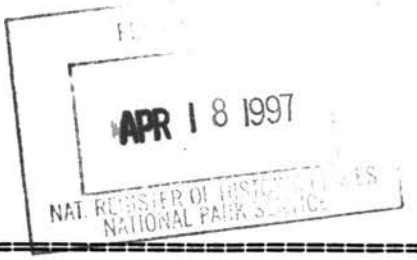
DISTRIBUTION:
National Register property file
Nominating Authority (without nomination attachment)

NPS Form 10-900
(Rev. 10-90)

OMB No. 1024-0018 443

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM



1. Name of Property

historic name Douglas DC-3 Airplane , N-34

other names/site number Douglas serial # 33359 - Navy BuNo 99856

2. Location

street & number 6500 S. MacArthur Blvd., Hangar 10 not for publication n/a
city or town Oklahoma City vicinity n/a
state Oklahoma code OK county Oklahoma code 109
zip code 73169

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this ✓ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ✓ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant ✓ nationally ___ statewide ___ locally. (___ See continuation sheet for additional comments.)

Signature of certifying official — Date 4/18/97

Federal Aviation Administration
State or Federal agency and bureau

In my opinion, the property _x_ meets ____ does not meet the National Register criteria. (N/A See continuation sheet for additional comments.)

Signature of commenting or other official — Date November 20, 1995

Oklahoma Historical Society, SHPO
State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

✓	entered in the National Register ___ See continuation sheet.	Carol D. Shull	5-29-97
____	determined eligible for the National Register ___ See continuation sheet.		
____	determined not eligible for the National Register		
____	removed from the National Register		
____	other (explain): _____		

_____ _____ _____
Signature of Keeper Date of Action

5. Classification

Ownership of Property (Check as many boxes as apply)
X public-Federal
Category of Property (Check only one box)
X structure
Number of Resources within Property

Contributing	Noncontributing	
0	0	buildings
0	0	sites
1	0	structures
0	0	objects
1	0	Total

Number of contributing resources previously listed in the National Register 0 .
Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.) N/A

6. Function or Use

Historic Functions (Enter categories from instructions)
Cat: Defense Sub: Air Facility
Current Functions (Enter categories from instructions)
Cat: Recreation/Culture Sub: Museum

7. Description

Architectural Classification (Enter categories from instructions)
OTHER: Transport Airplane
Materials (Enter categories from instructions)
foundation N/A
roof N/A
walls N/A
other Metal: aluminum
Metal: steel
Synthetics: glass cloth
Other: plexiglas
Narrative Description (see continuation sheets).

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)
X A Property is associated with events that have made a significant contribution to the broad patterns of our history.
____B Property is associated with the lives of persons significant in our past.
X C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
____D Property has yielded, or is likely to yield information important in prehistory or history.
Criteria Considerations (Mark "X" in all the boxes that apply.)
____ A owned by a religious institution or used for religious purposes.
____ B removed from its original location.
____ C a birthplace or a grave.
____ D a cemetery.
____ E a reconstructed building, object, or structure.
____ F a commemorative property.
X G less than 50 years of age or achieved significance within the past 50 years.
Areas of Significance (Enter categories from instructions)
TRANSPORTATION
MILITARY
ENGINEERING

Period of Significance 1945 - 1956
1957 - 1981
Significant Dates 1945
1957

Significant Person N/A (Complete if Criterion B is marked above)
Cultural Affiliation N/A
Architect/Builder Douglas Aircraft Company

Narrative Statement of Significance (see continuation sheets).

SUMMARY

The Douglas DC-3, N-34 is a monoplane aircraft built as a TC-47B for the U.S. Navy by the Douglas Aircraft Company in Oklahoma City, Oklahoma in 1945. General features of Douglas DC-3s include all metal fuselage and cantilevered low wing, all metal vertical and horizontal stabilizer, two reciprocating radial engines, fabric covered control surfaces (ailerons, rudder, and elevators), and two main landing gear consisting of wheels and tail wheel (tail dragger). The Douglas DC-3, N-34 is in operable condition and is housed at Hangar 10, Federal Aviation Administration, Mike Monroney Aeronautical Center, Oklahoma City, Oklahoma when not in use.

DESCRIPTION

Fuselage: The all aluminum metal monocouque structure of the fuselage consists of outer skin riveted to stringers and belt frames. It is unpressurized and oval in shape - it is literally a long metal tube. There are five cabin windows and an airstair entry door on the left side. There are seven cabin windows on the right side. There are cockpit front windscreen windows and openable side windows for the pilot and co-pilot.

Interior: The interior cabin arrangement is essentially that which was installed in the late 1950s with the same equipment: the cockpit has the standard two seats for the pilot and co-pilot; directly behind the co-pilot on the right side is the flight inspection console with a seat for the technician; avionics equipment rack; two passenger seats (in-line); a bulkhead partition with a door; storage compartment which includes the auxiliary power unit; and in the aft end of the cabin is the storage room - lavatory compartment with a relief tube and honey bucket; directly behind the pilot on the left side is a fold down jump seat; storage cabinet with a counter top; avionics equipment rack; open space for securing any carry-on cargo or equipment (directly across the isle from the two passenger seats); and the airstair entry door aft of the bulkhead partition. Cabin ceiling and side walls are upholstered with carpeted flooring.

Exterior: The livery is early 1950s Civil Aeronautics Administration paint scheme with a white fuselage top and each side of the vertical stabilizer; orange lightning strikes on top and bottom of the cabin window line the length of the fuselage; orange lightning strike on the outboard side of each engine nacelle; orange leading edge ring of each engine nacelle; silver fuselage lower surface, wing, and horizontal stabilizer; and orange control surfaces (ailerons, rudder, and elevators); black "US" on top of left wing and bottom of right wing; and black "N34" on top of right wing and bottom of left wing as well as on each side of the vertical stabilizer. N-34's early 1950s paint scheme was changed slightly when the CAA became the FAA in 1958 but was basically the same orange trim over white and silver surfaces.

Wing: The all aluminum metal low wing is a multi-spar, internally-braced rib, and cellular multi-web construction with skin riveted to the spars, ribs and webs. It is built in three sections with the stub-wing center section integrated into the lower fuselage and supports the engines, nacelles, and landing gear on each side of the fuselage. Metal fairings provide the transition between the wing and fuselage. The wing two outer panels are attached to the stub-wing center section just outboard of the engines using a carpenter's butt joint (a continuous flanged bolted joint). The leading edge of the outer panels are covered with rubber deicer boots. Four metal tanks with a total capacity of 804 gallons of fuel are housed in wing center section compartments. Split flaps hinge down from the lower surface and the ailerons are attached to and hinges from the trailing edge portion of the outer wing panels.

Stabilizer: The vertical and horizontal stabilizer tail surfaces are cantilevered and attached to the top and each side of the aft fuselage. They are multi-cellular aluminum metal structures with skins riveted to spars, ribs, and webs similar to the wing construction. The leading edges are covered with rubber deicer boots. The rudder is attached to and hinges from the vertical stabilizer rear spar. The elevators are attached to and hinges from the horizontal stabilizer rear spars.

Engines: Power for flight was originally provided by two reciprocating supercharged Pratt & Whitney Twin Wasp R-1830-90C, 14 cylinder air cooled radial engines, each rated at 1,200 hp on a standard day. P&W R-1830-92 engines were installed when received from Navy storage in 1957. Currently N-34 has P&W R-1830-94 engines rated at 1350 hp and these were installed by the FAA in 1959 to increase reliability and payload carrying capacity as well as for

standardization purposes. The -94 engine incorporated improved ignition and carburetion systems with the two-speed type supercharger found in earlier engines. The -94 engine utilizes a spline coupled reduction gear assembly to drive a single three bladed aluminum propeller with a hydomatic steel hub. The Hamilton Standard 11˝ ft. diameter propellers are controllable from the cockpit with full feathering capability. Engine lubrication oil is contained in nacelle mounted tanks located behind each engine with a total system capacity of 29 gal. per engine. The engines are mounted to the wing center section front spar on each side of the fuselage and are encased in cowlings and nacelles. The nacelles also house the landing gear when in the up position.

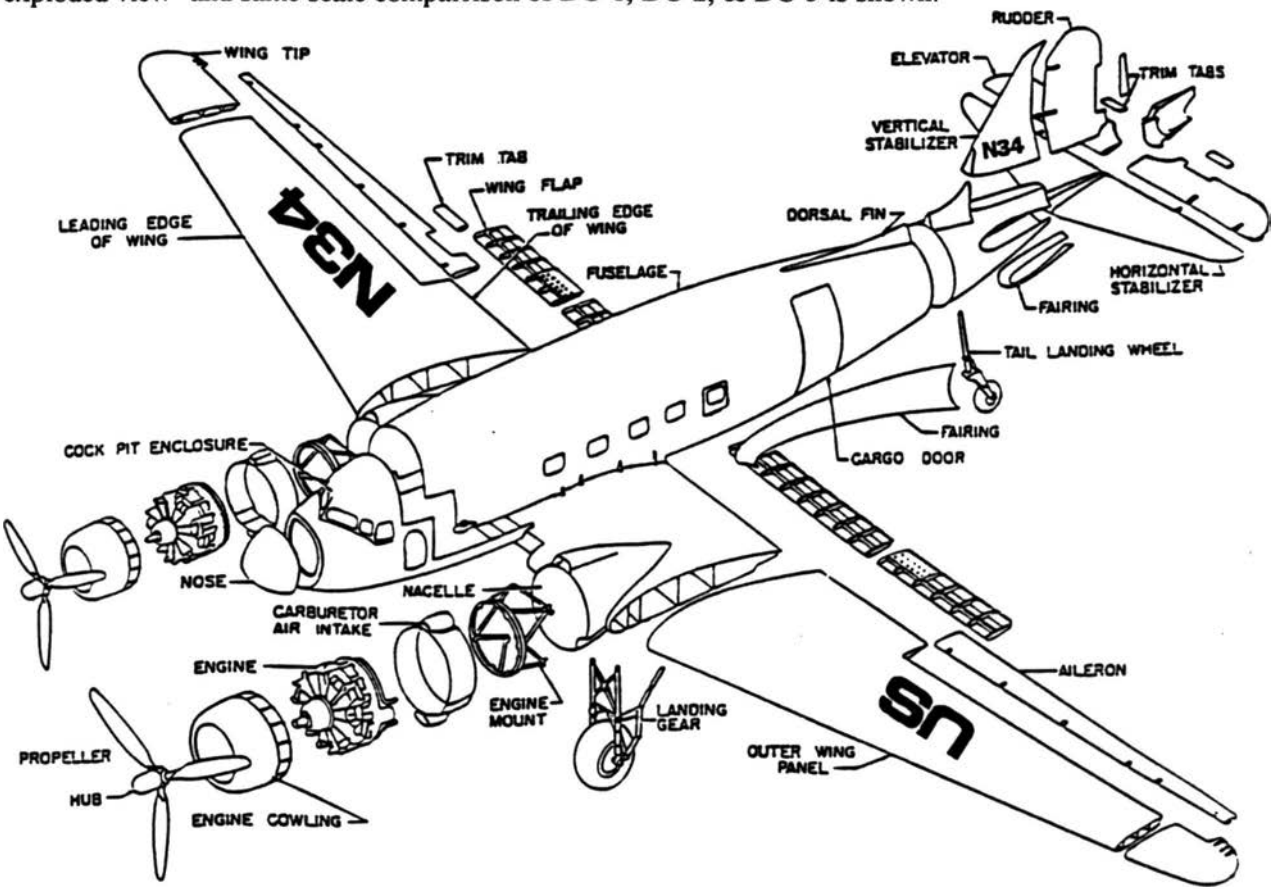
Control Surfaces: The control surfaces consist of two ailerons, two elevators and a rudder. They are aluminum metal frames of spars, ribs, and formers covered with synthetic fabric. The fabric is Ceconite, a polyester fabric that is glued to the frame, heat shrunk, and then doped and painted. The 1930s and 1940s fabrics of choice were either cotton muslin or Irish linen. Increased cost and short life span for natural fabrics were the driving factors to change to man-made polyester fabrics. N-34's original control surfaces were more than likely covered with the less expensive cotton fabric.

Landing Gear: The landing gear consists of two main gears/wheels and a tail wheel - commonly referred to as a "tail dragger". The main gears are hydraulically activated and retract into the wheel wells which are located in the aft portion of the engine nacelles. The main wheels incorporate hydraulic brakes activated by foot pressure to the rudder petals. The wheels are partially exposed when retracted - there are no wheel well doors. The smaller tail wheel is fixed (always down) but swivels when unlocked to assist in directional ground control.

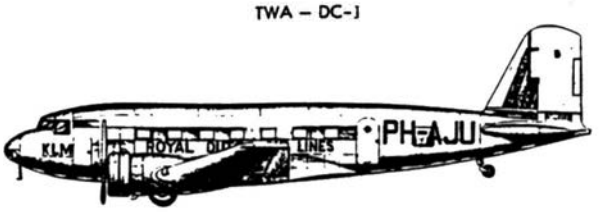
Crew: The crew consists of pilot, co-pilot, and two display/information specialists in N-34's role as an educational airshow display airplane. Original crew for DC-3 airliner or military versions consisted of pilot, co-pilot, and generally a cabin attendant or load master. The crew for the N-34 in the flight inspection role consisted of pilot, co-pilot, and a flight inspection technician seated at the console. An additional crew member was carried to operate a theodolite on the ground when required for flight inspection of specific navigational/landing aids.

Integrity: N-34's integrity is exceptional as it is either operational during the airshow season or housed in an enclosed hangar when in storage. It is maintained and operated by experienced FAA crew members, mechanics, and technicians to the same high standards and criteria that the FAA requires of the aviation public and industry.

Typical DC-3/C-47 "exploded view" and same scale comparrison of DC-1, DC-2, & DC-3 is shown.



TWA – DC-1



PH-AJU DC-2

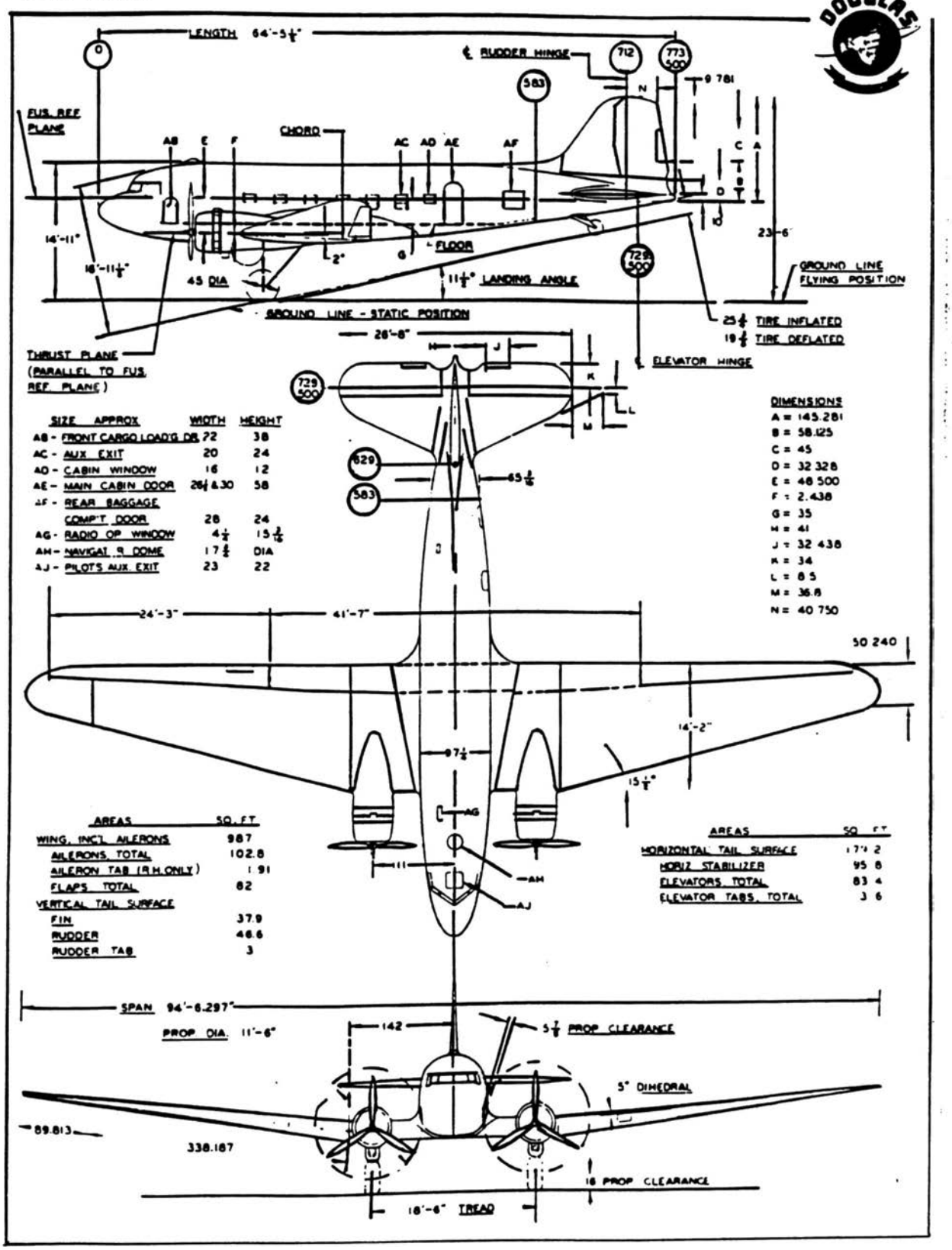
HAWAIIAN DC-3

DOUGLAS TRANSPORT DEVELOPMENT

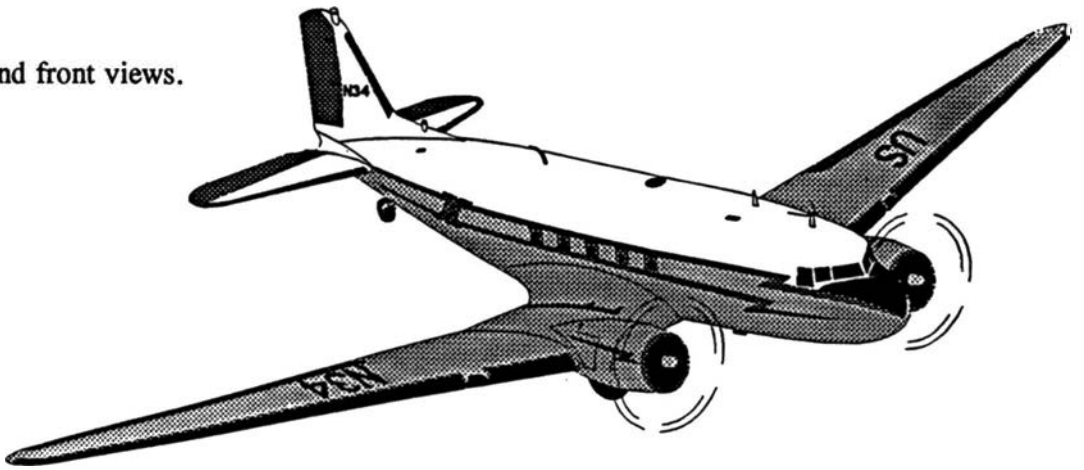
drawn to the same scale

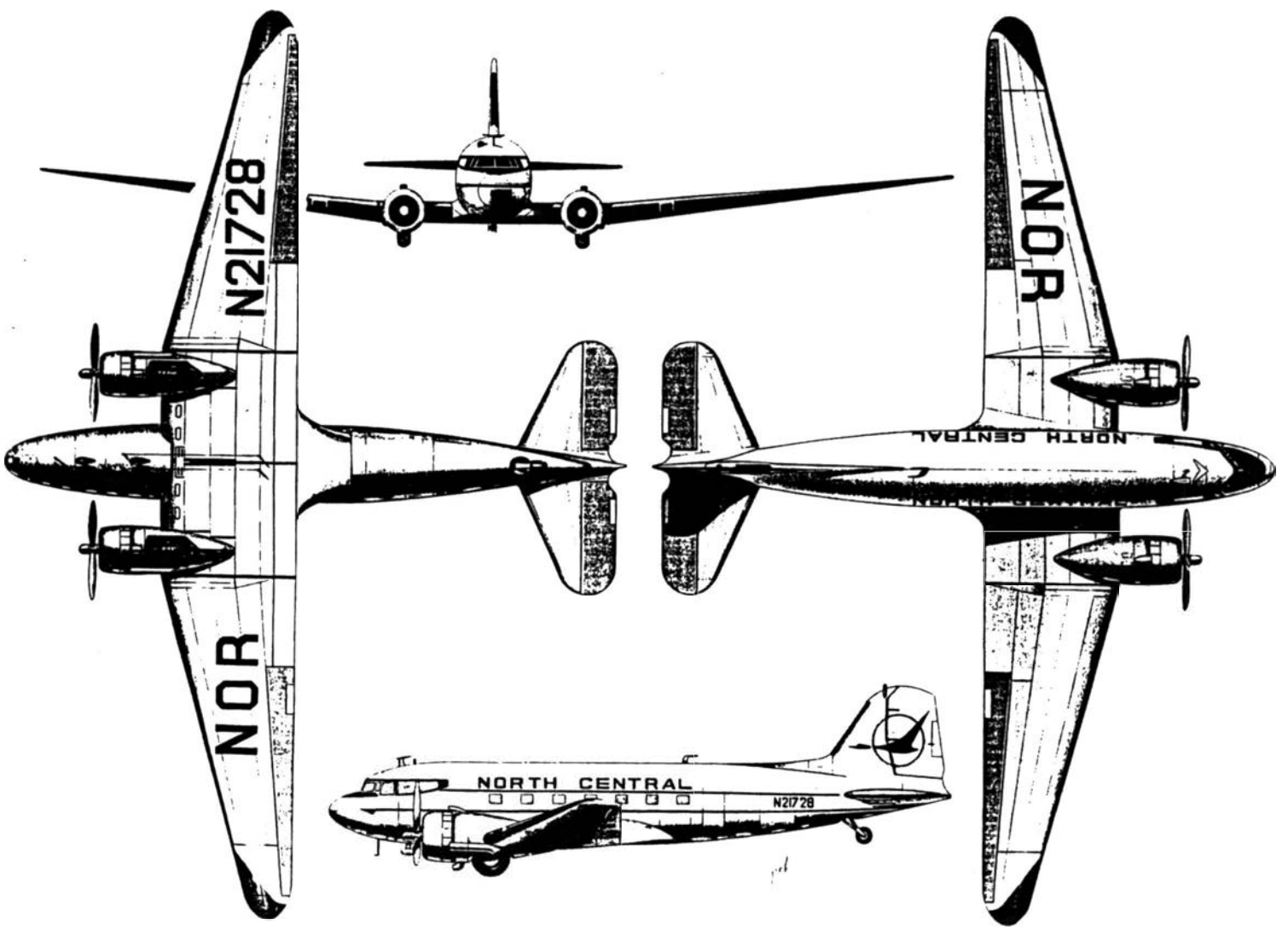
(1) Original DC-1
(2) DC-2 in K.L.M. colors as it appeared in 1934.
(3) DC-3 with "panoramic" windows added for Hawaiian tourists.

Typical DC-3/C-47 dimensions.



Typical DC-3/C-47 plan, side and front views.





Summary

The Douglas DC-3 Airplane, N-34 is eligible for the National Register of Historic Places under Criterion A (significant contribution to history) in the area of transportation and military history. It is representative of an aircraft type that revolutionized the commercial airline industry and made a significant contribution to the evolution of military aviation during World War II. From 1957-1981, under the Civil Aeronautics Administration/ Federal Aviation Administration (CAA/FAA), it played a significant role in the development and modernization of flight inspection standards which was essential to the safety of the airspace system. Over 60 DC-3s were modified by the CAA/FAA for this purpose but N-34 is the last type still in the FAA's inventory. It is a significant link to the FAA history of flight inspection, and is still in operable condition. Over 10,000 DC-3s were manufactured by the Douglas Aircraft Company but only 410 are still registered in the United States. As such, it is a rare survivor of a once common aircraft type.

The Douglas DC-3 Airplane, N-34 is also eligible under Criterion C (distinctive characteristics of a type, period, or method of construction) as a significant engineering aircraft design and meets Criterion Consideration G (achieved significance within the past 50 years). Although much of the airplane's significance has been achieved within the last fifty years, it meets Criterion Consideration G because of its rarity and is best evaluated for its national significance. Sufficient data and information has been assembled to assess the role of the DC-3 in the development of the nation's flight inspection standards.

TRANSPORTATION

Designed and initially built in the mid-1930s, the DC-3 first flew on Dec. 17, 1935 -- exactly 32 years after the Wright brothers made the first powered flight of an airplane. While this first flight attracted as little attention as the Wright brothers' achievement, it would later be regarded as a turning point in the history of aviation. It revolutionized the air transport industry with generally all airlines using this type of airplane at some point in their development.

The early airplanes were built by the Douglas Aircraft Company at its Santa Monica, California plant and they proved economical, practical, reliable, safe, and durable. These attributes enabled the using airlines to return a profit without the support of mail contracts or other forms of government subsidies. The excellent performance, easy maintenance, and a large modern manufacturing facility that could assure prompt delivery to any customer made the DC-3 the world's best selling airliner. Between 1936 and 1942, Douglas built more examples of a single airliner model than any other aircraft in history. In fact, throughout its 60-year service the DC-3 has had no direct comparable competitive design. "The only replacement for a DC-3 is another DC-3". This aircraft also proved immensely popular with air travelers and thereby introduced a whole new segment of the population to this then still new mode of transportation.

The DC-3 became such a popular airliner before World War II that Douglas issued licenses to manufacture it to three countries; Holland, Japan, and the Soviet Union. The Dutch licensee was Fokker but it actually was only a distributor of DC-3s until the war ended the operation. Japan and the U.S.S.R. became major producers of prewar civil models but developed and manufactured their own military equivalents once the war started.

1945 - Postwar

At the end of World War II, the prewar civil DC-3s that were pressed into service for the duration of the war were returned to the airlines. Additionally, thousands of surplus low cost military airplanes were sold and found their way into commercial, private, and government aviation throughout the world (which now also had hundreds of new airfields built for the war effort). The need was so urgent for these aircraft that many were put into commercial service still with their military interiors, including the folding seats along the sides. However, many more ex-military

aircraft were quickly brought up to airline standards at minimum cost. A few other uncompleted or surplus airframes were produced or assembled for the civil market at Douglas's plant in Oklahoma City. The last DC-3 produced was for Sabena (Belgium airlines) and was delivered on March 21, 1947.

Douglas attempted to modernize the DC-3 by developing the Super DC-3 but it failed to succeed with the airline industry. Other companies have mated turboprop engines to surplus airframes with the first being in 1949. This arrangement of equipping the old DC-3 with updated powerplants has proved successful and a turboprop DC-3 could still be purchased in 1995. In 1977 a trimotor (three engines) DC-3 was built by putting an additional turboprop in the nose along with the turboprops on each wing but the selling of this idea was in vain.

While most surplus DC-3s were used commercially with only a minimum of modifications, the more postwar stringent certification standards imposed by the Civil Aeronautics Administration (CAA -- predecessor to the FAA) were hard to impossible to meet. In the late 1940s the CAA considered withdrawing the existing type certificate approval for the DC-3, but the impracticality of such a decision was obvious. A sober analysis of the civil aviation scene revealed that grounding of a major portion of the existing general aviation fleet would have a drastic impact on the transport industry. A "Grandfather Clause" was written into the regulations for the DC-3 and they went on flying safely even though they did not meet the new CAA standards. In 1953 the CAA declared the DC-3s Airworthiness Certificate was "good until it wore out" (one wonders if they meant the piece of paper or the airplane itself).

While the postwar commercial passenger DC-3 operations were initially assigned to major short to medium range routes, as more modern airplanes became available, the type was delegated to less important routes. However, as late as early 1972 the international aviation organization reported the world's airlines were still flying more DC-3s than any other type aircraft (1,470 DC-3s to 2nd place - 831 Boeing 727s).

Virtually all nations (at some point in time they were registered in at least 159 separate countries) utilized this airplane in a vast array of duties from luxury transcontinental passenger transport including sleeper aircraft to tramp cargo, from smuggling to corporate flying office, from movie prop to crop spraying, and from the routine to borate bomber fighting fires.

This epitome of aviation received many names and designations (only some listed here): DC-3, C-47, R4D, PS-84 and Li-2 (Soviet built), Skytrain, Dakota, Skytrooper, Dak, L2D-Tabby (Japanese built), Spooky, and Puff the Magic Dragon but it is recognized with affection and reverently referred to the world over as a Gooney Bird. It was the right airplane at the right time that would surpass and do more to advance air commerce with achievements and dedication than any other single airplane ever built.

MILITARY

This airplane has been used by the U.S. military in three major wars (World War II, Korea, and in 1965 this old faithful allegedly obsolete 30 year old airplane became a highly effective multi-gunship when it was used in Southeast Asia) and it proudly stood guard during the Cold War. It was also used by all allied and axis forces during World War II. In addition to the U.S., the armed forces of 105 countries have used the DC-3 in military services.

Prewar - 1945

The Army Air Corps (later, the USAAF) acquired (from Douglas's original plant in Santa Monica) its first and only (due to funding restraints) military derivative of the DC-3 (a C-41A) in Sept. 1939 and it was used as a command transport. Just a year later the first contract for fully militarized versions (C-47s) was awarded to Douglas at its new Long Beach plant. Because of the demand, another new plant was built a year later in Oklahoma City and it started

producing C-47s (major military derivative of the DC-3). By now (1941), most airline operations and DC-3s became mere extensions or were pressed into service by the military and government transports systems throughout the world. Whereas the Army Air Corps (AAC) had been only a nominal customer, it became the largest purchaser of DC-3 military derivatives at the outbreak of World War II. In addition to handling lend lease contracts and Navy orders, the AAC acquired thousands built at the three Douglas plants by direct contracts, purchase of civil orders then in production, and impressment of existing civil airliners into military service.

The military derivative of the DC-3 has been used in a variety of roles: staff, troop, and cargo transport; training; communications and electronic reconnaissance; airborne operations (glider towing as well as parachuting troops and cargo); medical evacuations; dropping of flares to support night operations; psychological warfare roles; and as an attack gunship. A unique operation was the towing of a large glider loaded with vaccines across the North Atlantic from Canada to England in 1943.

A prime example of a successful military operation by airlift of essential materials in the face of determined opposition was aerial supply of China from India over the famous "Hump". When the Japanese closed the Burma Road in 1942, the only remaining supply gateway to China was by air over the Himalayan Mountains, highest in the world and home of some of the worst flying weather. The route quickly came to be regarded as the world's most hazardous as supplies were flown in and return trips made with wounded and other personnel. From its inception in 1942 until mid-1945, the faithful C-47s were the mainstay of this operation as the only source of military and civil necessities for war-torn China.

One of the most interesting wartime modifications of the C-47 was installation of twin floats which also served as extra fuel cells. At least two were modified but this amphibious development was not that successful and saw only limited service. Another extreme wartime variation was converting an airframe to a cargo-troop glider in 1944. This was accomplished by removing the engines and fairing over the nacelles. Although successful, the combat glider was no longer needed by this time and the aircraft was put into storage. Other C-47s were equipped with a combination ski-wheel arrangement that permitted operation from either snow or hard ground and used effectively in frozen territory.

In early 1938 the U.S.-based subsidiary of a Japanese company obtained the license rights to build and sell DC-3s in Japan and Manchukuo. Although outwardly this operation was for civil airlines, the production was sponsored by the Japanese Navy. The almost 500 built L2Ds became the standard wartime transport for the Japanese Navy and was known to the Allies as Tabby. Wartime materials shortages in Japan caused some components and coverings to be made of wood but apparently this version was unfinished at war's end.

Another Axis combatant, Germany, impressed DC-3s that were available in Europe at the start of the war into the Luftwaffe. These aircraft had been sold and handled by the prewar European dealer, Fokker.

The Soviet Union also obtained prewar manufacturing rights to the DC-3 and built their first versions in 1940 (known initially as PS-84s and later as Li-2s). They built between 2000 and 3000 versions between 1940 and 1945. A unique feature on some of the Japanese and Soviet Union derivatives was the installation of bomb racks and a powered machine gun turret in the top of the fuselage.

The importance of the DC-3 to World War II was emphasized by General Dwight D. Eisenhower, Commander in Chief of the Allied Forces in Europe by stating that although it was not designed for combat, most senior officers came to regard the C-47 airplane as one of the most vital pieces of equipment to the success in Africa and Europe.

1945 - Postwar

As previously stated, thousands of surplus military versions of the DC-3 were available to the civil market after the war, but there were numerous others that remained in military and government service for years. Others were transferred to organizations such as the Coast Guard and this airplane also became mainstays of the Air National Guard and Reserve transport squadrons. It carried on in the routine and even developed new missions. It served as a test bed for new equipment and mechanical features as well as soldiering on in several subsequent official and unofficial wars. While their postwar routine activities did not attract much attention, there were some noteworthy achievements made by the military DC-3s.

A number of ski equipped Navy R4Ds were used to support the US Antarctic expeditions from Little America on the edge of the Antarctic continent. In January 1947 another first was achieved when a group of six R4Ds took off from the deck of an aircraft carrier for Little America. Other R4Ds were used in support of Operation Deep Freeze and one of these airplanes became the first aircraft to land at the South Pole in October 1956. This airplane is now in the Smithsonian Institution's National Air & Space Museum along side an ex-Eastern Airlines DC-3. A US Air Force C-47 had previously made the first landing at the North Pole in May 1952.

A C-47 was used as a guinea pig test bed in the late 1940s when a small manned airplane was attached to its wing tip and towed. This was to develop a system for the long range missions of the B-36 bomber whereby a small jet fighter could be towed and used in defense.

1945 - N-34

N-34 was built at the Douglas Aircraft Company plant in Oklahoma City and came to life as a TC-47B-DK in 1945. As previously noted, the AAC handled the manufacturing contracts with Douglas for all of the DC-3 military derivatives. Consequently, this is how the FAA's DC-3, N-34 evolved from Douglas S/N 33359 and AAC C-47B, S/N 44-77027, but was delivered to the Navy on May 26, 1945 as a R4D-7 and was assigned Navy BuNo 99856. The "T"C-47B-"DK" denotes a trainer (T) version that was built in Oklahoma City (DK) and TC-47B's obtained by the Navy were denoted R4D-7s.

This airplane was placed into storage until December 1945 (due to less demands because of the lateness of the war). The Navy then used it at various worldwide locations as a transport airplane (among the assignments were London, Rome, Naples, Paris, Algiers, Frankfurt, Brussels, Oslo, Stockholm, Dublin, Cairo, Kuwait, and Baghdad). It was later converted to a R4D-6.

1947 to 1949 - N-34

R4D-6 Navy BuNo 99856 (N-34) was assigned to U.S. Navy Utility Transport Squadron Four (VRU-Four) from February 26, 1947 until March 1949 when it was detached from the squadron and returned to the U.S. VRU-Four was commissioned on December 3, 1946 at London, England and was based on the Royal Air Force Station, Hendon. The squadron had a detachment at the Naval Air Station, Port Lyautey, French Morocco but R4D-6 BuNo 99856 spent all of its assigned time flying from the base in England. The squadron's designation was changed to Air Transport Squadron 24 (VR-24) on September 1, 1948. On April 8, 1947 R4D-6 BuNo 99856 had the distinction of being the squadron's "accident number one" when it nosed over in the mud while being taxied out of the only parking area available at London. Both engines had to be changed.

The Berlin Airlift, Operation VITTLES, was conducted from June 26, 1948 to September 30, 1949. Dwarfing the famous and massive "Hump" service to China in 1942/45, this was the most prodigious airlift operation of all times. This cold war crisis was caused by the Soviet's political maneuver of closing the three ground routes to West Berlin

through East Germany. No personnel or supplies could move into or out of the city except by air. Neither the Soviets or anyone else believed that a major city could be supported for any length of time (15 months) exclusively by air. The blockade was lifted only after the amazing airlift overflew it. The faithful old C-47s were once again the right equipment in the right place at the right time. The U.S. Air Force and Royal Air Force quickly mobilized those cargo planes readily available in service or storage in Europe - C-47s. Although supplemented by faster and larger capacity transports as they became available, the C-47s were there at the start, served to the very end, and actually carried the last official load into the city.

While VR-24 was not officially assigned to the Berlin Airlift, the squadron did actually fly missions into Germany during this time. The records are not of sufficient detail, but it is highly probable that R4D-6 BuNo 99856 flew into Berlin in support of Operation VITTLES, as most anything that flew in that area of the free world during that time was pressed into support of the airlift operation.

Transportation Significance under the CAA/FAA

One of the Federal Aviation Administration's (FAA) charges is to provide for the safe and efficient use of the airspace shared by the military and civil aircraft. To that end, the FAA operates the world's largest and most sophisticated flight inspection fleet of airplanes. The flight inspection role is the airborne evaluations and systematic analysis of the various navigational aids, facilities, and flight procedures used exclusively in the U.S. along with others throughout the world but it is seldom seen and little noted . Today's highly automated and modern FAA fleet is operated around the world and around the clock to ensure the integrity of air navigation by certifying that the underlying structure of the airspace is safe, usable, and accurate.

The innovative technological means to conduct flight inspection of the airways was essentially dreamed up, designed, developed, built, and implemented internally by the CAA/FAA from scratch. There were no engineering schools or training programs that gave guidance. It was trial and error or what-works-best or lets-try-something-different. It had never been done before but the American ingenuity made the evolution successful. This historical technology is preserved in the FAA's DC-3, N-34.

Flight Inspection & Airways

Flight inspection is essential to the safety of the airspace system. There is a wide variety of navigational aids (navaids) each with their own specific function and acronym. This document will not attempt to discuss these functions but simply to lump them all together as "navaids". Some are used to guide airplanes on specific cross country airways and to land safely and accurately on the end of a runway. Flight inspection encompasses the initial site survey for new navaids by making detailed measurements of transmitted signals and then periodical checks for function, reliability, and accuracy. Navaids are routinely checked by ground-based monitoring systems to prevent transmitting errant signals. But far beyond the ground-based monitors the radiated signals emanating from the transmitters can be bent by interference or reflected from nearby objects. These signals must perform as advertised. Without regular, accurate, and airborne measurements of navaids there would be no way of knowing if the navigation system is performing safely. The airborne measurements are obtained by flight inspection airplanes that are instrumented with specially calibrated radio receivers and a computer system which is capable of analyzing the wide variety of navaids. Another important part of flight inspection is the developing of procedures for instrument flying that utilizes the accurate navaids. Instrument procedures must be developed and flight inspected to accommodate a wide variety of aircraft performances as well as the average pilot. The roots of this present day proven and successful process are found in the 1950s and 1960s developmental work done by FAA's engineers, pilots, technicians, and specialists and their use of the DC-3 airplane.

Flight inspection essentially began in function in the 1920s with the development of the airway system created by the U.S. Air Mail Service. Carrying the mail by air was attempted as early as 1911 but Post Office funds were non-existing or very limited to develop air mail routes. In 1918 funds were authorized for the purchase, operation, and maintenance of airplanes for experimental air mail service. The end points (cities) were selected but the routes could hardly be called "airways" as there were no actual routes specified, no means of navigation, no radios, no terrain or obstructions information, and no charts or maps. However, from this beginning, in 1920 a route was established for coast-to-coast mail between New York and San Francisco. This route allowed flying the mail between New York and Chicago by day, overnight by train between Chicago and Cheyenne, and then flying again between Cheyenne and San Francisco. A method of aerial navigation at night was needed to make this an effective "airway". Initial nighttime navigation was demonstrated in 1921 by dead reckoning and bonfires lit along a selected route. Though successful, funding for bonfire lighting of civil airways was not approved.

The first "flight inspection" was probably conducted by air mail pilots as they flew the routes and passed any noted discrepancies along to the next landing site for attention. In the early 1920s there was growing thought of creating some form of federal regulation of aviation. The documented beginnings of airways and flight inspection are found in the establishment of the Air Commerce Act of 1926 and the creation of the Aeronautics Branch within the Department of Commerce in 1927. From this beginning, the Aeronautics Branch evolved into the Bureau of Air Commerce (1934), the Civil Aeronautics Authority (1938), the Civil Aeronautics Administration (1940), the Federal Aviation Agency (1958), and finally to today's Federal Aviation Administration (1967).

The Air Commerce Act of 1926 empowered the Secretary of Commerce to establish and maintain airways including airway lighting, radio facilities, and any other means which might be developed to aid aerial navigation. As bonfire lighting of civil airways was not pursued, the airways were lit with light beacons. As the Department of Commerce now had jurisdiction over the nation's airways, those airways previously established by the Post Office were transferred to the new Airways Division within the Department of Commerce's Bureau of Lighthouse - for the obvious reason that the airways were lit with a type of lighthouse. The first flight inspectors flew surplus open-cockpit biplanes and watched over a steadily growing airway system predicated on airway light beacons to provide navigation guidance. An increased importance of the flight inspector came about with the advent of radio navigation as his rickety old airplane was the only platform which could evaluate the radio transmissions from where they were used - in the air. The airways first light beacon was installed in December 1926. By mid-1929 there were 10,183 miles of lighted airways utilizing 1,399 beacons with an additional 2,065 miles and 209 beacons under construction.

Significant in the history of flight inspection is that by the end of 1929 there were at least 11 airplanes and probably in excess of 20 pilots engaged in the work. Two of the radio equipped airplanes were routinely used for what would be considered as flight inspection today. The combining of radios and airways can be traced to installations made by the U.S. Air Mail Service as early as 1919. Air-to-ground two-way radio was becoming essential to take advantage of the mushrooming weather reporting capabilities. By 1927 the airway radio stations were broadcasting scheduled weather information. Within a year air-to-ground communications were becoming routine as rudimentary air traffic information and emergency messages could also be relayed.

In 1932 the first formal system of dedicated airways flight inspection was established when six pilots from the Department of Commerce were assigned as airway patrol pilots. Simultaneously, a program was initiated whereby users of the airways (particularly air mail carriers) would monitor the airways and report any discrepancies found. The new patrol pilots and user monitoring supplemented those earlier means employed to assure the safety of the airways: the airways mechanicians, reports from caretakers and radio operators, and observations of federal aeronautical inspectors in the course of their work. The developing mission of the flight inspection pilot can be seen

in the 1933 description of their responsibilities including; "...their chief duties are concerned with such matters as checking relative brightness and elevations of beacon light beams; orientation of radio range courses and transmission of proper signals; correctness of speech and transmission of weather broadcasts to planes in flight; operating principles and procedure of airways radio stations in carrying on communications with aircraft; reception of marker beacons and 2-way radio communication service from the marker beacon stations; the functioning of the facilities and condition of landing areas at Department of Commerce intermediate landing fields, and investigation work pertaining to all phases of aeronautic facilities on the Federal airways system...." The patrol pilots were to cover their assigned airways as often as time and weather permitted with the emphasis placed on ensuring safety. Since much of the airway navigation aids were lighting, most of the patrol flying had to be done at night. Night patrols concentrated on the beacon lights such as distance seen as well as proper elevation and flash rate. Daytime patrols checked ground markings used to assist navigation such as painted markings on buildings, airport markings, and markings on beacon lights. The radio ranges were monitored constantly during all flights.

However, without the bucks there are no Buck Rogers. The new Roosevelt Administration drastically reduced the 1933 and 1934 budgets and the casualties included the six patrol pilots. Routine airborne flight inspection was essentially eliminated during 1934 and 1935. A dramatic increase in airline activity (as previously mentioned - the cause was new DC-3s), a number of air crashes, and a reorganization and revitalized Bureau of Air Commerce and budget convinced Congress to infuse money back into the system in 1937 and 1938.

The developing flight inspection functions were transformed from something of a castoff luxury of the mid-1930s to a required element of air safety by the mid-1950s. The advent of new navaids (Instrument Landing System and VHF Omnidirectional-Range) had much to do with this change as did the increasing capabilities of aircraft in speed, range, and altitude. And as previously noted, the skyrocketing effect of World War II had a major impact on the aviation industry, with the increased air traffic, thousands of surplus airplanes (DC-3s), and the development of airports, radar (another navaid), all-weather flying, and air traffic control. The prewar CAA airplanes were not DC-3s and were barely able to perform the flight inspection functions. The wartime fleet was not DC-3s and was woefully inadequate to perform the job and was described as "...entirely unsatisfactory, and in some cases, actually extremely dangerous to use in this kind of work (flight inspection functions)...." The end of World War II allowed the CAA to obtain much needed modern equipment from the surplus military stocks and soon each region had been assigned war surplus airplanes, one of which was the military derivatives of the DC-3. Whereas civil aviation was pretty much along for the ride during the war with major advances taking place within the military sphere, the CAA grew to accept greater authority over civil air commerce. The greatly expanded international needs of the military for airways, navaids, airports, pilots, technology, and equipment essentially reverted to the CAA's authority at war's end.

While flight inspection became an essential element of air safety, there remained many CAA organizational problems to impede the development of an effective service. There were seven CAA regions (established in 1938 along with the CAA) throughout the country and this regional autonomy created seven battlefields to fight over appropriations and each had their own way of doing things. The lack of standardization in aircraft, equipment, criteria, methods, and training promoted a system which produced widely varying results of flight inspection and instrument procedures. The CAA was directly addressing these problems by 1955 as it sought to standardize flight inspection aircraft and criteria.

FAA & DC-3s

The CAA received its first and only new DC-3 in April 1941 direct from Douglas (all subsequent others were military surplus derivatives). This first was a DC-3A, Douglas S/N 4080, registered as NC14 and used until 1945 as a flying laboratory and for aircraft safety inspector training. The second wasn't obtained until 1946 when the military surplus

aircraft became available. It was a C-48A, Douglas S/N 4146, USAAF S/N 41-7682, and registered at one time as N1 (one) for use of the CAA/FAA Administrator and this airplane was retained until 1975.

After World War II the CAA took the opportunity to equip its fleet with some modern aircraft through the 1944 Surplus Property Act that allowed civil government agencies first choice of surplus military equipment. Due to the dictates of Congress, the CAA had little choice in some cases as to the type of equipment it received. However, at least 28 surplus military derivatives of the DC-3 were obtained between 1945 and 1949. It is debatable as to how many of these were used in flight inspection work before 1956. Each of the eight regions (Alaska had been added by now) welcomed the assignment of at least one surplus DC-3 and by 1951, there were at least 12 DC-3s assigned to flight inspection within the CAA. Others were used for inspectors' proficiency programs, logistics, test programs, or simply put into storage and scrapped later for parts. Nonetheless, the CAA got into the big airplane business with the DC-3s.

With the addition of the DC-3s to the regional flight inspection fleets, the airway flight inspectors finally had a suitable airplane to perform their jobs. With each region providing the necessary equipment and radios on the new airplanes, diversity in the installations was the rule with standardization still to come. An attempt at some measure of standardization across the regions was the first flight inspection manual in 1946. However, the regions continued to operate in a largely autonomous fashion with little or no direction from Washington headquarters staff. All but one region crewed their DC-3s with two pilots and no electronic technicians (yet to come in the early 1950s). One region's Administrator felt it was sufficient to have only one pilot on their DC-3 flight inspection missions and he was evidently one busy pilot as flight inspections were performed manually. The pilot would position his airplane over predetermined ground landmarks or checkpoints and compare his course to the intended course plotted on a map or refer to gauges and instruments or listen to transmitted tones over his headphones or all three methods of cross-referencing depending on the navaid being checked. Flight inspection was very time consuming, the pilots stayed busy, and the flying was often dependent upon good visibility and weather and was done at low level. High altitude airways could not be checked accurately because of the difficulties encountered in fixing aircraft position exactly. Changing criteria, increased navaids and facilities, and time consuming procedures all contributed to additional workload that was not being compensated with additional manpower and equipment. In early 1949, of the 260 VOR's (one type of navaid) that were operating, only 26 had been commissioned due to the lack of airplanes and pilots. Standardization was ripe for fruition.

Where improvements were made in budget, staffing, and training in the early 1950s, there was still the major problem of no two regions operating flight inspection airplanes with similar radio installations and there was no established standards for calibrating the equipment. Additionally, procedures and criteria were applied differently. A serious effort was made in 1951 to provide one standard flight inspection DC-3 configuration. The prototype airplane, N-27, was brought into the FAA's engineering and overhaul facilities in Oklahoma City, re-engineered, reworked, overhauled, and modified as the standardized DC-3 (later called a Type I DC-3). All other flight inspection DC-3s were rotated through the shops as quickly as possible to receive the Type I standardized modifications.

By 1955, the changing face of civil aviation required additional flight inspection transitions. The jet airliner, higher altitudes, broader missions, airway expansions, and development of new navaids was pushing flight inspection toward the front of the line for budgets, staffing, and equipment. The CAA's problems were literally shoved to the front by the notoriety of the airliner midair collision over the Grand Canyon in June 1956. Among the major CAA faults were: constant infighting with the Department of Commerce over budgets; continuing problem of cooperation with the military over jurisdiction, policy, technological direction, and the inability to decide upon a common aerial navigation system; and the lack of cohesive, forward-thinking planning that would assure a single direction of civil aviation. The

tumultuous summer of 1956 resulted in numerous changes and the Federal Aviation Act of 1958 that created the Federal Aviation Agency. As a footnote in the major planning and acquisition avalanche following that summer was the acquisition of surplus Navy R4Ds.

A loan agreement between the Navy Department and the CAA in 1956 resulted in 40 surplus Navy R4Ds being transferred to the CAA as additions to the flight inspection fleet. These airplanes slowly trickled out of the Navy's storage facility at Litchfield Park, Arizona and were ferried to the CAA's overhaul and maintenance base in Oklahoma City. There they were modified during the late 1950s prior to assignment to the field. This major modification program was yet another effort toward standardization of the flight inspection fleet. It resulted in Type II DC-3 flight inspection airplanes with new avionics and calibration equipment. They remained as the standard low-level flight inspection airplane for the agency for the next 20 years until replaced by new modern jet airplanes. Whereas these new jets had new and smaller avionics equipment (smaller black boxes due to technology innovations in sizing), there remained some of the same equipment and internal functions that were developed and proofed on the DC-3s in the 1950s.

The loan agreement between the Navy and the CAA was Revocable Permit NAER 01782, issued in September 1956, and allowed the CAA to do anything with two surplus airplanes but the ownership remained with the Navy. Amendments to this permit over the next few years would loan the remaining 38 airplanes. Most of these were modified as Type II DC-3s as were numerous other DC-3s (including Type I's) operated by the CAA. An Executive Determination Order in July 1966 formally transferred title of these 40 Navy airplanes to the FAA as of August 1, 1966.

FAA & N-34

As previously noted, this airplane was built in Oklahoma City, used, and sometimes prior to 1956 was put into storage by the Navy. The earliest N-34 FAA record reflects that nine CAA registration numbers were requested "(in person)" and set aside in October 1956 to be applied to the anticipated loaned Navy aircraft - one of these was N-34. Amendment No. 3 to the Navy Revocable Permit was issued in August 1957 that loaned BuNo 99856 (N-34) along with four others to the CAA. In May 1957, a temporary registration number, N7091C, was issued for the ferry flight from Litchfield Park, AZ to Oklahoma City. After Type II modifications, it was re-registered as N-34. The initial FAA assignment as a flight inspection airplane was to the Southwest Region in Fort Worth, Texas and later to various other FAA regions. This airplane was operational and photographed with its first CAA livery paint scheme on the ramp at Oakland in August 1958. In 1981 N-34 was withdrawn from flight inspection and assigned to the training program in Oklahoma City. The registration number, N-34, was canceled in June 1983 when this DC-3 was declared surplus. During the early stages of disposing of the DC-3s in 1976 (as new jets were taking over the functions), initial efforts by an FAA employee to preserve one for its historical value (and with his renewed and desperate efforts in 1983) finally cumulated in this last FAA DC-3, N-34, being reinstated by the FAA Administrator in 1985.

Since the 1983 retirement and 1985 restoration, N-34 has been used in the FAA's aviation educational programs as a promotion of aviation with this historical example, and as a display of FAA's historical heritage as well as the historical flight inspection technology, function, and mission. Although restored, it retained the same equipment, furnishings, and arrangement that were originally installed in 1957. In N-34's activities of flying the air show circuit, special events, and aviation education related functions around the country (including Alaska) and Canada, it has been seen and visited by hundreds of thousands of aviation enthusiasts. Numerous "war stories" have been shared with N-34 crew members from: veterans that flew in, crewed, or were medically evacuated by DC-3s during the wars; former flight attendants and crew members that flew in DC-3s in airline operations during the old days; retired FAA crew members that flew flight inspection missions or other FAA personnel that remember seeing FAA DC-3's flying

around; and the general public that remembered this being the first type of airplane that they ever saw, went aboard, or flew in. N-34 brought back fond memories to many people who had to share them with the crew. Some stories were very emotional, poignant, and very dear to the story teller. This airplane also has provided the first opportunity for youngsters to go aboard a real airplane -- it has truly proven to be a historical magnet for a large part of the population.

The FAA modified over 60 DC-3s (surplus C-47s and R4Ds) in the late 1950s and used them, including N-34, as flight inspection airplanes throughout the world until 1981 when N-34 was retired as the last flight inspection airplane of its type. This innovative technology was designed and developed by the FAA, installed in their DC-3s, and used in establishing the national and international airspace criteria and safety standards. Other DC-3s were modified by the FAA and furnished to numerous foreign governments for use in developing their flight inspection functions. These efforts resulted in the calibration standards used internationally and in today's modern flight inspection airplanes by numerous countries. The FAA's DC-3s have been used in calibration of the navigational aids at most of the free world's airways and airports.

ENGINEERING

The DC-3 revolutionized the commercial airline and air transport industries and made a significant contribution to the evolution of military aviation. The engineering and innovative design features resulted in attributes of economical, reliable, and safe operations; excellent performance parameters; easy and practical maintenance practices; and construction durability that has lasted over 60 years with no end in sight. As previously noted, the CAA declared in 1953 that the DC-3s Airworthiness Certificate was "good until it wore out". While the DC-3 was the culmination of many and invaluable contributions to the science of aviation as it sold air travel and gave millions of land-lubbers the confidence to try their wings, some of the innovations were engineered and developed in the two prototype versions of the DC-3 -- the DC-1 and DC-2.

The evolution of the DC-3 is directly traced back from the Douglas Sleeper Transport (DST) to the DC-2 and finally to the DC-1. Although they were different in size, it was not apparent or important to the layman; outwardly they all looked the same. Each derivative had innovations and design features that carried on up the line to the next model that finally resulted in the DC-3, "the plane that changed the world".

Douglas DC-1

The inception of the DC-1, the progenitor of the world's most famous commercial and military transport aircraft (DC-3s), was dictated by two important instruments of progress in the air transport industry - technical obsolescence of existing equipment and competitive pressures.

Most of the airliners of the 1920s were Fokker models with one, three, or four engines and with wooden wings. One of the trimotors crashed in March 1931 killing airline passenger Knute Rockne of Notre Dame resulting in a staggering blow to the struggling and infant airline industry. Newspapers blamed the airline and the manufacturer relentlessly with some condemning air travel and aviation in general. The Bureau of Air Commerce directed airline operators to periodically inspect the internal wing structures of all types of wooden wings. Such inspections were excessively costly and time consuming for the fledgling airlines and resulted in early phasing-out of most airliners with wooden wings. United Airlines (UAL) opted for Boeing to design and build the all-metal twin-engined monoplane Model 247 as an updated transport. Transcontinental & Western Airlines (TWA) attempted to purchase the ten passenger Model 247 but Boeing insisted on first completing the delivery of UAL's 60 airplanes that were on order. UAL was partially owned by Boeing and was TWA's prime competitor. TWA elected to initiate the design of a comparable aircraft and in August 1932 sent its specifications to various airplane manufacturers including Douglas Aircraft. Generally the

specifications called for an all metal, trimotored monoplane, with a crew of two, enough gasoline to carry 12 passengers 1,080 miles, radio, navigational aids, and latest instruments for night flying. The most stringent requirement was to be able to take off fully loaded under good control at any of their airports with any combinations of only two of the three engines. With one of TWA's major airports at Albuquerque at 4,954 ft of elevation and with summertime temperatures often exceeding 90 degrees F, this requirement appeared difficult to meet.

With the depression on and the state of confusion in the air transport industry, Douglas thought this might be the right time to get into the commercial transport field for the first time. However, to improve their competitive chances and achieve performance superior to that of the Boeing 247, the Douglas team departed somewhat from the specifications. They would offer a low-wing monoplane using a modified version of the Northrop wing, two engines using the NACA cowlings and nacelles with the landing gear retracting into the nacelles, and wing flaps. While all of these major design features had been tried before on different airplanes, this was the first time that all of them had been incorporated into a single airplane. These far-reaching decisions during the early design phase were innovations that carried through into the very successful DC-3s.

The low-wing monoplane would incorporate the wing center section right into the monocouque fuselage and thereby eliminate the need for a long main wing spar obstructing the cabin. The Boeing 247 wing spar passed right through the cabin and passengers had to step over it. The fuselage would be of sufficient diameter to enable the taller passengers to stand upright and pass down the aisle without stooping as required in the 247. The fin and horizontal stabilizer tail surfaces were cantilevered and attached to the fuselage and were multi-cellular metal structure similar to the wing construction. The metal selected to build this airplane was a new aluminum alloy having a thin coating of pure aluminum. This metal selection and other design features have essentially given the DC-3 and derivatives a corrosion and fatigue free life for over 60 years.

The multi-spar, internally-braced rib, cellular multi-web, aluminum wing was inspired by the work of John Northrop and offered exceptional strength, simplicity of production, and fatigue-free life. The wing would be built in three sections with the stub-wing center section integrated into the fuselage and supporting the engines, nacelles, and landing gear on each side of the fuselage. The wing two outer panels would be attached to the stub-wing center section just outboard of the engines using a carpenter's butt joint (a continuous flanged bolted joint) making assembly, maintenance, inspection, and repair simpler.

The coming availability of improved and greater horsepower supercharged engines enabled the use of two instead of the three engines that TWA had specified. With the arrangement of engines located in the stub-wing center section, the engine mounts could be extended and protrude forward of the wing and thereby get more direct benefit of the propeller thrust airflow over the airfoil. By wrapping the engines in the new NACA cowlings and retracting the landing gear into the engine nacelles, the streamlining was improved, the drag was reduced, and the speed was increased.

To meet the specified landing speed, some type of air brake would be required to slow the airplane down. This resulted in the designing and incorporation of wing split flaps. These were metal panels that hinged down from the lower surface trailing edge portion of the wing. In addition to providing lower landing speeds, the flaps increased the wing area and provided greater lift on takeoff enabling the carrying of bigger payloads. The split flap pioneering effort was a design feature that carried on directly into the DC-3s which gave it great versatility during wartime operations and peacetime smaller airports.

Notable other features included a rear cabin lavatory, buffet (galley), hand held fire extinguishers, and more than 900

other items were listed in the proposal in a late summer 1932 cross country train ride to New York by Douglas officials to present their bid to TWA. On their return trip, they flew back in TWA's then in-service airliners where they were exposed to the real conditions of airline travel. This included hand outs of cotton to stuff in the ears to help dampen the noise; required shouting to communicate across the aisle; vibrations that shook eye glasses off of the nose; nearly frozen feet from the cold; small lavatory door that required squeezing through; narrow wicker-back chairs that pinched the fanny; and a splattering of mud sucked in through the air vents when the airplane landed on puddle-splotched runways. This trip was described to Donald Douglas in disgust with the desire to avoid the same mistakes in the DC-1 and the requirement to build comfort and put wings on it.

This philosophical attitude caused their creators to approach the design with the human touch as well as the cold scientific facts which led credence to the belief that airplanes are born and not made. They were determined to not copy the Boeing 247 but make it better. Innovations that were engineered and built into the DC-1 included: effective cabin soundproofing; cabin temperature control; improved plumbing; interior and decor considerations; and more comfortable seats.

The Douglas design appeared sufficiently promising for TWA to sign a contract in September 1932 for the DC-1. Detailed engineering work began at once and several new techniques were utilized to optimize the design including; extensive wind-tunnel tests; building a full scale fuselage mock-up; and independent test models for various systems such as fuel and hydraulics. Because a wing of this magnitude and area had never been built before using the multi-cellular construction, extreme strength tests were required as well as new testing techniques had to be devised. One devised strength test of the new wing construction proved no failures or even wrinkles when a steamroller was repeatedly driven over it.

A remarkably silent airplane was achieved by accomplishing acoustical tests in-flight to establish the optimum sound suppressing materials and placement. A sound deadening bulkhead was located between the forward baggage compartment and the cockpit. Special sound deadening cements, filters, and rubber spacers were located at critical points. Engines and seats were mounted on special rubber insulators or supports. Engine exhaust noises were reduced by deflecting them down and under the wing. Wing structural members were designed so as not to transmit vibrations to the passenger compartment. An engineering report summed it up by stating that for the first time in aeronautics and maybe in any moving vehicle, the principle of balanced acoustics had been successfully accomplished. The DC-1 was not only the quietest airplane but seemed to be less fatiguing to passengers. Of all the advantages that the DC-1 offered, this was one of the most important contributions to air transportation from a passenger standpoint and the DC-3 would expose the world aviation public to this improvement.

The full scale fuselage mock-up was utilized to develop the cockpit, controls, and passenger cabin layouts and innovations such as floor carpets; wall and ceiling insulation and outer finish decor; comfortable upholstered seats with each having adjustable reclining backs, footrests, safety belts, ash trays, air vents, reading light, and airsickness cup; a lavatory with a call button, wash basin, and an all metal toilet that was removable for ease of cleaning; a buffet or galley with a semi-sealed space for dry ice for cooling of refreshments, serving shelf with enclosed cupboard beneath with space for thermos jugs, an electric hotplate, box lunches, and a trash container; and a storage trough the length of the cabin for hats and other items of apparel. The designers had accomplished their desire to build comfort with wings. All of these items carried over into the DC-3 and eventually into today's latest jet airliners.

The DC-1 first flew on July 1, 1933, a mere nine months after the contract signing. To meet the single engine take off specification at high altitude on a hot day, the newly developed adjustable pitch propeller and gear box was installed which greatly increased propeller efficiency. This test flight was accomplished on September 4, 1933 when the DC-1

took off from Winslow, Arizona, climbed to altitude, flew 280 miles, and landed in Albuquerque using only one engine. Within a few days and based on the engineering innovations as well as the successful tests results, TWA ordered DC-2s, the production derivative of the DC-1.

The only DC-1 built was delivered to TWA in December 1933. They used it as a flying laboratory over their entire network with a few occasional passenger service runs pending delivery of DC-2s. This TWA airplane is best remembered for the spectacular February 19, 1934 Los Angeles to Newark coast to coast record flight in 13 hours and 4 minutes. Jack Frye (TWA Vice President and later President) and Eddie Rickenbacker (then Vice President with Eastern Airlines) were dramatizing the airlines' ability to carry mail rapidly on the eve of the 1934 Air Mail Emergency when private air mail contracts were canceled. During 1935 numerous U.S. and world speed, distance, and weight carrying records were attempted and/or set with the DC-1. It was acquired by Howard Hughes in 1936 for various record attempts including his round-the-world speed attempt, but he lost interest in the DC-1 and eventually chose another type of airplane. In 1938 the airplane was acquired by an Englishman, shipped to England, then to France, and finally to Spain where it was used in the Spanish Civil War as a reconnaissance warplane as well as transporting and evacuating members of the Republican Government. In April 1939 the leaders of the collapsed Republican Government escaped over the Pyrenees into France in the DC-1. During this flight, it was shot at by Nationalists airplanes but outsped them. The war over, it was turned over to the Nationalists as a war prize. In December 1940 it was damaged beyond repair in a crash landing at Malaga, Spain.

Douglas DC-2s

When in 1933 TWA ordered the production models of the DC-1, they and Douglas had agreed on lengthening the fuselage by two feet and thereby adding two seats (plus another window on each side) for a total of 14 passengers as well as more powerful engines and this production model was called a DC-2. Stretching the fuselage of an airliner to increase its accommodations and payload is a technique that is still practiced by generally all airliners and some corporate airplane manufacturers today.

The DC-2 first flew in May 1934 and within a few days it was delivered to TWA who promptly put it into service. Within the span of eight days it broke the New York to Chicago speed record four times. TWA was advertising coast to coast flights in 18 hours with a New York 4:00 P.M. departure and a Los Angeles arrival of 7:00 A.M. For the first time the air traveler could fly coast to coast without losing any part of a business day. TWA also inaugurated in-flight movies on their DC-2s in 1934. Shades of things to come. There was nothing in the skies that could match it for comfort and speed.

Many of the DC-2s saw World War II service similar to the DC-3s. In fact, in the Spring of 1941 these two models had a closer relationship than just the DC-3 being a direct descendant of the DC-2. Japanese fighter planes had destroyed a China National Airways (CNA) DC-3's wing while the airliner was at a remote ground site in China. A check with the CNA home base revealed no spare DC-3 wings or where one might be found. They did, however, have a spare DC-2 wing which was secured to another DC-3's underbelly and ferried across 900 miles of mountainous terrain to the crippled DC-3. Although 10 feet shorter and not designed to carry the loads of the larger DC-3, the DC-2 wing was successfully installed on the damaged airliner and flown to safety. They called it a DC-2˝.

There was a total of 198 DC-2s and derivatives built. Douglas suspended DC-2 production in July 1937 and concentrated on the DST/DC-3s as almost all of the DC-2 customers were signing up for the newer, larger, and more economical airplanes.

Douglas Sleeper Transport

May 1934 was the month that the DC-2 first flew and TWA put it into operation and American Airlines (AA) pioneered Curtiss Condor sleeper plane service between Los Angeles and Dallas. The Condor was a cloth covered twin-engine 12-passenger biplane that was substantially slower than the DC-2. Once again as TWA had found itself in a poor competitive position with UAL's Boeing 247s, AA found itself in a poor competitive position with TWA's DC-2s. In the summer of 1934 their President, C.R. Smith, was on a Condor flight and reflected that what AA needed was a DC-2 sleeper plane. He reasoned that the DC-2 was big enough, it had the power, it had been stretched from 12 to 14 passengers (DC-1 stretched to the DC-2), and with a larger wing and fatter fuselage this "rubber airplane" could be stretched again into a sleeper.

AA already had DC-2s on order but their engineers defined their need for an aircraft that combined the economics and performance of the DC-2 with the comfort and roominess of the Condor. They specified more payload, more cabin volume for berths, more range, and better directional control to correct the DC-2's fishtailing tendencies. They envisioned a wider fuselage for double berths on each side or three seats abreast and stretched the equivalent of one row of seats for a maximum of 21. It was to use 85% parts and components common to the DC-2. Douglas engineers and their detail design work soon established the need for a major redesign of the DC-2. Thus was born the Douglas Sleeper Transport (DST) project.

Outwardly the DST looked like the DC-2 but their were big differences. The fuselage was lengthened and widened with the sides rounded. The wing was strengthened and made longer of greater area (but a DC-2 wing could be attached if anyone ever wanted to make a DC-2˜). The modified wing with a slightly changed airfoil shifted the plane's center of gravity. This aerodynamic change made the DST one of the most stable aircraft ever flown. The larger wing also provided additional space for fuel tanks. The tail surfaces were redesigned and enlarged and the landing gear was strengthened but made less stiff. The net result was an almost completely new design with slightly less than 10% of DC-2 interchangeable parts.

In Douglas's attempts to make the most luxurious transport ever built, they invested many hours of virgin research and built the most thorough mock-up ever made. AA's general specifications interjected a new psychological approach to the concern with the physical and mental reaction of air travelers to the environment. It was called "human engineering". Studies showed color and decoration were closely tied in with uneasiness and could effect passenger balance and air-sickness. Ceiling, wall, and floor colors and materials as well as lighting were selected to minimize any uncomfortable feelings of confinement.

Other improvements were a duplicate set of instruments for pilot and co-pilot for added safety (this feature continues in today's airplanes with two pilots). A new system of cockpit and instrument panel lighting was introduced for night flying. The DC-2's hand cranked and stiff legged landing gear was redesigned with a fully automatic hydraulic and softer system that was a boon to sleeping passengers who often times never even woke up during take-off or landing. The DC-2's hand lever operated brakes were replaced with hydraulic automobile type brakes that were operated by foot brake mechanisms in connection with the rudder pedals (essentially the same system as used in all of today's airplanes).

The DST could accommodate 14 passengers in the night configuration and 21 (3 seats in 7 rows) or up to 28 (4 seats in 7 rows) passengers for day operation. Each seat now had a removable table and space underneath for luggage in-addition to all the items noted for the DC-2 seats. The fact that the DST could carry more payload faster and farther and more economical than any other airliner was a boon to air travel.

As previously noted, the first DC-3 flight took place on December 17, 1935 but in fact this was actually the first DST.

However, the same model in the 21 or 28 passenger day transport configuration was designated DC-3A and this narration has come full circle.

Douglas DC-3s

This first DC-3 (a DST) was officially accepted by AA in April 1936 but was immediately returned to Douglas for tests, and eventually taken over in July 1936. AA operated it until February 1942 when it was sold to the USAAF who used it as a C-49E until it crashed at Chicago's Midway airport in bad weather in October 1942. AA received other DC-3s and began scheduled operations with them in June 1936. They inaugurated DST sleeper coast-to-coast service in September 1936 between New York and Los Angeles. The impact of the DST upon this very competitive route is judged from a comparison of AA's 1934 and 1937 schedules. In 1934 the NY to LA flight required 25 hours and 55 minutes, a change of airlines, two changes of aircraft, and fifteen stops. Following the DST introduction, AA offered a single-plane three-stop 17 hour and 30 minute service in 1937.

In the United States AA was followed as a DST/DC-3 operator by Eastern and UAL in 1937; TWA and Western in 1938; Braniff, Canadian Colonial, Northwest, and Pennsylvania Central in 1939; and Chicago & Southern, Delta, and Northeast in 1940. Thus, by December 1941 and World War II, 260 of the 322 aircraft operated by US domestic airlines were DSTs or DC-3s. The engineering innovations of the DC-1, DC-2, and DST evolved directly into air transportation's new look with the DC-3.

==========9

9. Major Bibliographical References

(For other sources used in preparing this form - see continuation sheets.)
Previous documentation on file (NPS)
_____ preliminary determination of individual listing (36 CFR 67) has been requested.
_____ previously listed in the National Register
_____ previously determined eligible by the National Register
_____ designated a National Historic Landmark
_____ recorded by Historic American Buildings Survey #
_____ recorded by Historic American Engineering Record #

Primary Location of Additional Data
____ State Historic Preservation Office
____ Other State agency
__X__ Federal agency
____ Local government
____ University
____ Other
Name of repository: FAA Aircraft Registration & Naval Historical Center

10. Geographical Data

Acreage of Property less than one acre

UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	14	625820	3917780	2	_	___	___

N/A See continuation sheet
Verbal Boundary Description: (Describe the boundaries of the property on a continuation sheet)

Boundary Justification: (Explain why the boundaries were selected on a continuation sheet).

11. Form Prepared By

name/title Jerry Searcy: Aerospace Engineer/Program Manager (3/97)

organization FAA, AFS-610 date 12/03/94

street & number P.O. Box 26460 telephone (405) 954-4103

city or town Oklahoma City state OK zip code 73125

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name Federal Aviation Administration (FAA)

street & number Box 25082 telephone (405) 954-7500 (Public Affairs)

city or town Oklahoma City State OK zip code 73125

Bibliography

Bowers, Peter M. The DC-3: Fifty Years of Legendary Flight. Blue Ridge Summit, PA: Tab Books Inc., 1986.

Federal Aviation Administration, Aircraft Specification No. A-669 Rev. 29, Feb. 8, 1974.

Federal Aviation Administration, FAA DC-3C Type II Flight Manual No. TI 4040.1A, February 23, 1965.

Francillon, Rene J. McDonnel Douglas Aircraft Since 1920, Volume I. Annapolis, MD: Naval Institute Press, 1988.

Ingells, Douglas J. The Plane That Changed the World. Fallbrook, CA: Aero Publishers, Inc. 1966.

Jupter, Joseph P. Civil Aircraft Series, Volume 7. Blue Ridge Summit, PA: Tab Aero, 1994.

Thompson, Scott A. Flight Check: The Story of FAA Flight Inspection. Oklahoma City, OK: Federal Aviation Administration, 1993.

Verbal Boundary Description

The boundary is the nominated aircraft housed at Hangar 10, Federal Aviation Administration, Mike Monroney Aeronautical Center, Oklahoma City, OK.

Boundary Justification

This is the hangar where the nominated airplane is stored when not in use.

Although the photographs are several years old, the DC3/N-34 is in the same condition and is stored in the same place, Hangar 10, at Will Rogers International Airport, Oklahoma City, Oklahoma.

U S Department
of Transportation

Federal Aviation Administration

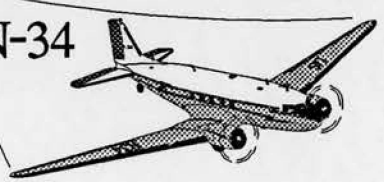
Mike Monroney Aeronautical Center
P O Box 25082
Oklahoma City OK 73125

AC Form 4570-36 (2/91) (NSN 0052-00-575-6009)

#1

Photos for National Registry of Historic Places
Douglas DC-3, N-34 Okla Co, OK
Jerry Searcy, FAA, AFS-610, Okla City
3 photos taken Oct. 1993
#1 is at Will Rogers Airport OKC looking West
#2 is at Will Rogers Airport OKC looking East
#3 is at Joplin, MO Regional Airport looking East

DC-3, N-34




US

U S Department
of Transportation

**Federal Aviation
Administration**

Mike Monroney Aeronautical Center
P O Box 25082
Oklahoma City OK 73125

AC Form 4570-36 (2/91) (NSN 0052-00-575-6008)

#2

Photos for National Registry of Historic Places
Douglas DC-3, N-34 Okla Co, OK
Jerry Searcy, FAA, AFS-610, Okla City
3 photos taken Oct. 1993
#1 is at Will Rogers Airport OKC looking West
#2 is at Will Rogers Airport OKC looking East
#3 is at Joplin, MO Regional Airport looking East

DC-3, N-34

#2

NPS
11


N34

U S Department
of Transportation

**Federal Aviation
Administration**

Mike Monroney Aeronautical Center
P O Box 25082
Oklahoma City OK 73125

AC Form 4570-36 (2/91) (NSN 0052-00-575-6000)

#3

Photos for National Registry of Historic Places
Douglas DC-3, N-34 Okla Co, OK
Jerry Searcy, FAA, AFS-610, Okla City
3 photos taken Oct. 1993
#1 is at Will Rogers Airport OKC looking West
#2 is at Will Rogers Airport OKC looking East
#3 is at Joplin, MO Regional Airport looking East

DC-3, N-34

#3

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OKLAHOMA CITY QUADRANGLE
OKLAHOMA
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 OKLAHOMA CITY 15' QUADRANGLE

Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Oklahoma State Highway Department

Topography by photogrammetric methods from aerial photographs taken 1954. Field checked 1956. Revised from aerial photographs taken 1984. Field checked 1985. Map edited 1986

Projection: Oklahoma coordinate system, north zone
(Lambert conformal conic)
10,000-foot grid ticks based on Oklahoma coordinate system, north and south zones
1000-meter Universal Transverse Mercator grid, zone 14
1927 North American Datum
To place on the predicted North American Datum 1983, move the projection lines 3 meters south and 28 meters east as shown by dashed corner ticks

Red tint indicates areas in which only landmark buildings are shown

UTM GRID AND 1986 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND OKLAHOMA GEOLOGICAL SURVEY, NORMAN, OKLAHOMA 73069
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

OKLAHOMA
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

OKLAHOMA CITY, OKLA.
NE/4 OKLAHOMA CITY 15' QUADRANGLE
35097-D5-TF-024

1986

DMA 6454 I NE–SERIES V883

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1987

National Register of Historic Places

Note to the record

Additional Documentation: 2014

UNITED STATED DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: ADDITIONAL DOCUMENTATION

PROPERTY NAME: Douglas DC-3 Airplane, N34

MULTIPLE NAME:

STATE & COUNTY: TEXAS, Potter

DATE RECEIVED: 07/25/14 DATE OF PENDING LIST: 08/22/14
DATE OF 16th DAY: 09/08/14 DATE OF 45th DAY: 09/10/14

REFERENCE NUMBER: 97000443

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	N
OTHER:	N	PDIL	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	Y	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

✓ ACCEPT ___ RETURN ___ REJECT 9.10.14 DATE

ABSRACT/SUMMARY COMMENTS:

Additional Documentation Approved

RECOM./CRITEREA Accept

REVIEWER Edson Beall DISCIPLINE History

TELEPHONE ___ DATE 9.10.14

DOCUMENTATION see attsched comments Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

U.S. Department
of Transportation
**Federal Aviation
Administration**

July 21, 2014

Carol D. Shull
Keeper of the National Register of Historic Places
National Park Service
1201 Eye Street, NW
Washington, DC 20005

RE: Relocation of Douglas DC-3 Airplane, N34

Dear Ms. Shull:

The Federal Aviation Administration (FAA) is the owner of a 1945 Douglas DC-3 Airplane, Registration No. N34 ("N34"). N34 was listed in the National Register in 1997 under Criterion A, for its role in the development and modernization of flight inspection standards and Criterion C, as an example of a significant aircraft design. This letter is to notify you, in accordance with 36 CFR § 60.14(b)(5), of the relocation of this aircraft and to provide the documentation specified in 36 CFR § 60.14(b)(4).

Reasons for the Move

N34 has been moved to the Texas Air & Space Museum, located at the Amarillo International Airport in Amarillo, Texas, pursuant to a cooperative agreement for long-term loan of the aircraft. This arrangement was necessitated by the FAA's determination that it could no longer financially support N34's mission as an outreach and educational tool.

The FAA's precursor, the Civil Aeronautics Board (CAA), acquired N34 in 1957 for use in its flight inspection program. The FAA continued to use the aircraft for this purpose until 1981, when it was withdrawn from flight inspection and assigned to the training program. In 1983, N34 was declared surplus. Due to the efforts of an FAA employee to preserve a DC-3 for its historical value, N34 was reinstated in 1985. It was restored and used by the FAA as an outreach and educational tool at air shows around the country until 1993, when Congress recommended that it be retired as a cost-saving measure. The aircraft was restored to an airworthy condition in 2003 so that it could participate in the celebration of the Centennial of Flight, and was operated for the next nine years at a cost of $80,000 -100,000 per year, including annual maintenance, repairs, and seasonal storage. Since February 2012, N34 has been stored in a hangar at the Mike Monroney Aeronautical Center (MMAC), Oklahoma City, Oklahoma. The FAA has determined that it no longer has the maintenance expertise to maintain the aircraft in airworthy condition or DC-3 qualified pilots to operate N34. Although the FAA wishes to preserve N34 and showcase its heritage, the agency does not have hangar space to properly store the aircraft or a facility where it could be displayed to the public.

In 2013, the FAA entered into discussions with the Texas Air & Space Museum about the possibility of loaning them N34 for preservation and display at their facility in Amarillo, Texas. The FAA recognized that moving N34's permanent base to a new location was an 'undertaking' subject to Section 106 of the National Historic Preservation Act (NHPA), as implemented by regulations in 36 CFR part 800. In December 2013 the FAA entered into formal consultation with the Oklahoma Historical Society. At that time, I contacted the National Register staff reviewer for Oklahoma, Paul Lusignan, and informed him of our intent to move N34 in accordance with the Section 106 procedures, and to rely on 36 CFR § 60.14(b)(5) to keep it listed in the National Register, subject to post-relocation notification of the Keeper. We also discussed the timing for such notification and Mr. Lusignan advised waiting until the aircraft was installed in its new location so that it could be evaluated in that setting.

The FAA and the Oklahoma Historical Society developed a Memorandum of Agreement (MOA), in consultation with the Advisory Council on Historic Preservation (ACHP), which incorporates the Cooperative Agreement with the Texas Air & Space Museum including legally enforceable restrictions and conditions to ensure long-term preservation of N34's historic significance. The Texas Air & Space Museum is a signatory to the MOA. The executed MOA was filed with the ACHP on February 7, 2014. The relevant correspondence is attached to this letter. N34 was flown to the Amarillo International Airport on February 13, 2014 and taxied to its current location at the Texas Air & Space Museum facility located at the airport.

Effect on the DC-3's historical integrity

N34 meets National Register Criterion C as a rare survivor of a once common aircraft type which revolutionized the air transport industry; and Criterion A, for its significant role in the development and modernization of flight inspection standards from 1957-1981.

Relocation of N34 does not in any way compromise its ability to convey the significance of its design and construction. The 1997 National Register nomination notes that N34 retained exceptional integrity, due to its continued operation and maintenance by experienced crew members, mechanics and technicians, and the fact that it was housed in an enclosed hangar when in storage. At the time of its relocation to the Texas Air & Space Museum, it was still in operable condition. Under the terms of the Cooperative Agreement, the Texas Air & Space Museum may not modify the aircraft in any way that would alter the original form, design, or the historical significance without the prior permission of the FAA. The Museum also committed to display N34 in a careful and prudent manner and use its best efforts to ensure that the aircraft is protected from damage by the general public. The FAA will conduct bi-annual inspections and identify annual maintenance needs. N34's retirement from active use reduces the likelihood that it will need modification or replacement parts in order to maintain it to current airworthiness standards, and its distinctive 1950s livery (white with orange accents) will be preserved by its indoor location.

Relocation of N34 also does not negatively affect the aircraft's ability to convey its significance under Criterion A, which is based on its historic role in the FAA's Flight Inspection Service. Although N34 was built by the Douglas Aircraft Company in Oklahoma City (now Building 3001 at Tinker Air Force Base) and was housed in Oklahoma City at the time of its nomination to the National Register in 1997, it was not continuously located there through the period of significance or since then. After the aircraft was completed in 1945, it was commissioned by the Navy in London, England and based on the Royal Air Force Station in Hendon. It served in the Navy in various transport squadrons at Norfolk, Virginia, Quonset Point, Rhode Island and the Naval Air Station at Glenview, Illinois.

In 1957 the aircraft was flown from Arizona, where it had been decommissioned and stored, back to Oklahoma City as part of a transfer of surplus property to the CAA. Its initial assignment as a flight inspection airplane was to the FAA's Southwest Region in Fort Worth, Texas, and later it was assigned to other regions. Between 1966 and 1979, it spent most of its time operating out of California. In 1980-81, it returned to Oklahoma City as the main flight inspection training aircraft. After its restoration in 1985, it flew on the air show circuit throughout the U.S. and Canada. In 1993, it was placed in storage in Hangar 10 at MMAC (on the property of Will Rogers International Airport), where it was located at the time of its listing in the National Register. Following its most recent restoration in 2003, N34 was once again flown around the country to participate in air shows and other public events; during the off-season it was stored in Oshkosh, WI. In February 2012 N34 was flown to Oklahoma City and put back in storage at MMAC in Hangar 8 (constructed in the 1950s and otherwise used to store mission-ready aircraft).

N34 was not in its original location at the time of its nomination, and its location was not integral to its significance. As a transportation vehicle designed to be moved, N34 did not need to meet Criteria Consideration B (moved properties) when it was listed in 1997. The nomination does not describe the hangar in which N34 was then housed or discuss its location other than to note in the boundary justification that this was the hangar where the nominated aircraft was stored when not in use.

N34 retains integrity of design, materials, workmanship and feeling. Its association with the FAA and its role in the development of flight inspection standards will be preserved as part of the interpretive display at the Texas Air & Space Museum.

New Location and Setting

The new location at the Texas Air & Space Museum provides a setting appropriate to the character of the aircraft. N34 currently is on display in the English Field Aviation Hangar at the Amarillo International Airport. The 110' by 140' hangar also houses a P51 Mustang, a "Bearcat" Reno Racing Biplane, a Bell 47 "Mash" Helicopter and a Balloon Basket. (The attached photographs depict N34 in its new location, as well as its previous location in Hangar 10 at MMAC.)

In its new location, N34 is part of a collection displayed in a setting appropriate to aircraft, located near the runways of a functioning airport. As documented in its original nomination,

N34 is important under the National Register criteria, and as demonstrated above it retains integrity of materials, design, workmanship, feeling and association. Under the Guidelines for Evaluating and Documenting Historic Aviation Properties, N34 remains eligible for the National Register.

Conclusion

The FAA has moved N34 in a manner consistent with the comments of the ACHP, pursuant to 36 CFR § 60.14(b)(5), and as such the move is an exception to the automatic deletion of moved properties from the National Register. N34 remains eligible for the National Register of Historic Places in its new location. Therefore, we respectfully request that you confirm that N34 will remain listed in the National Register and update your records to reflect its new location at 1001 American Drive, Amarillo, Texas.

If you have any questions, please contact me directly at 202-267-9548, or by e-mail at katherine.andrus@faa.gov.

Sincerely,

Katherine Andrus
Federal Preservation Officer
Office of Environment and Energy
800 Independence Ave. SW
Washington, D.C. 20591

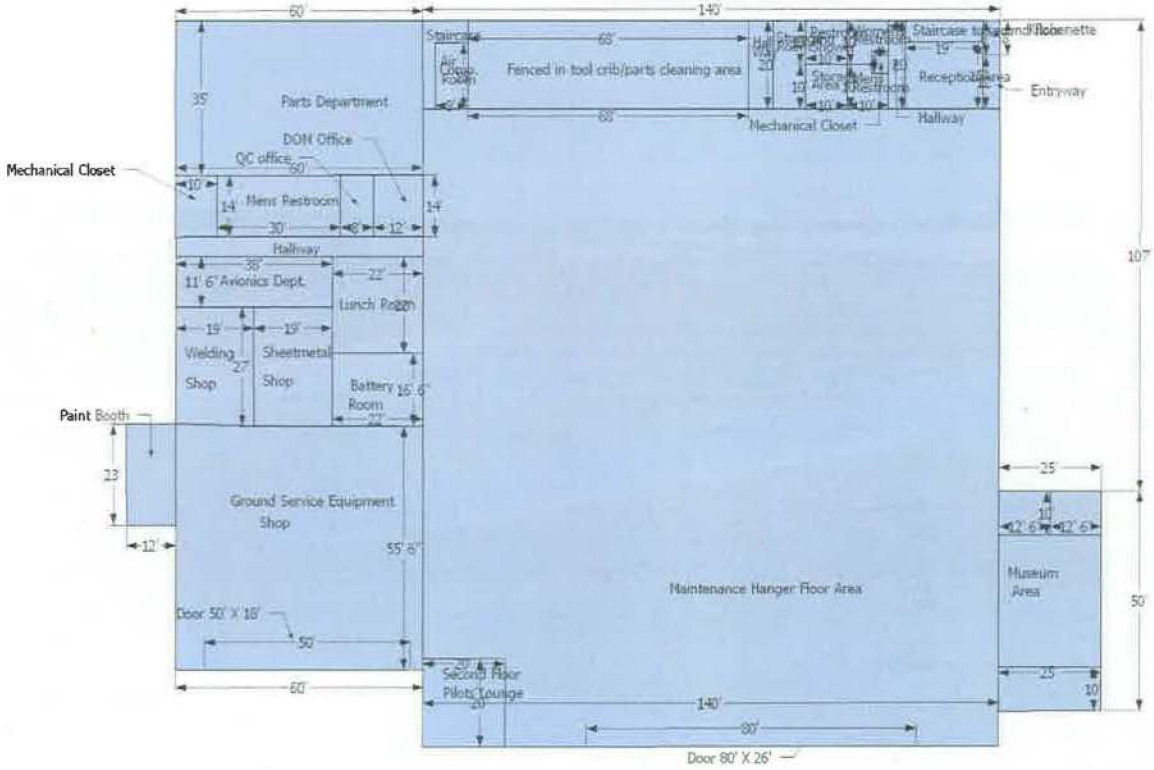
Enclosures

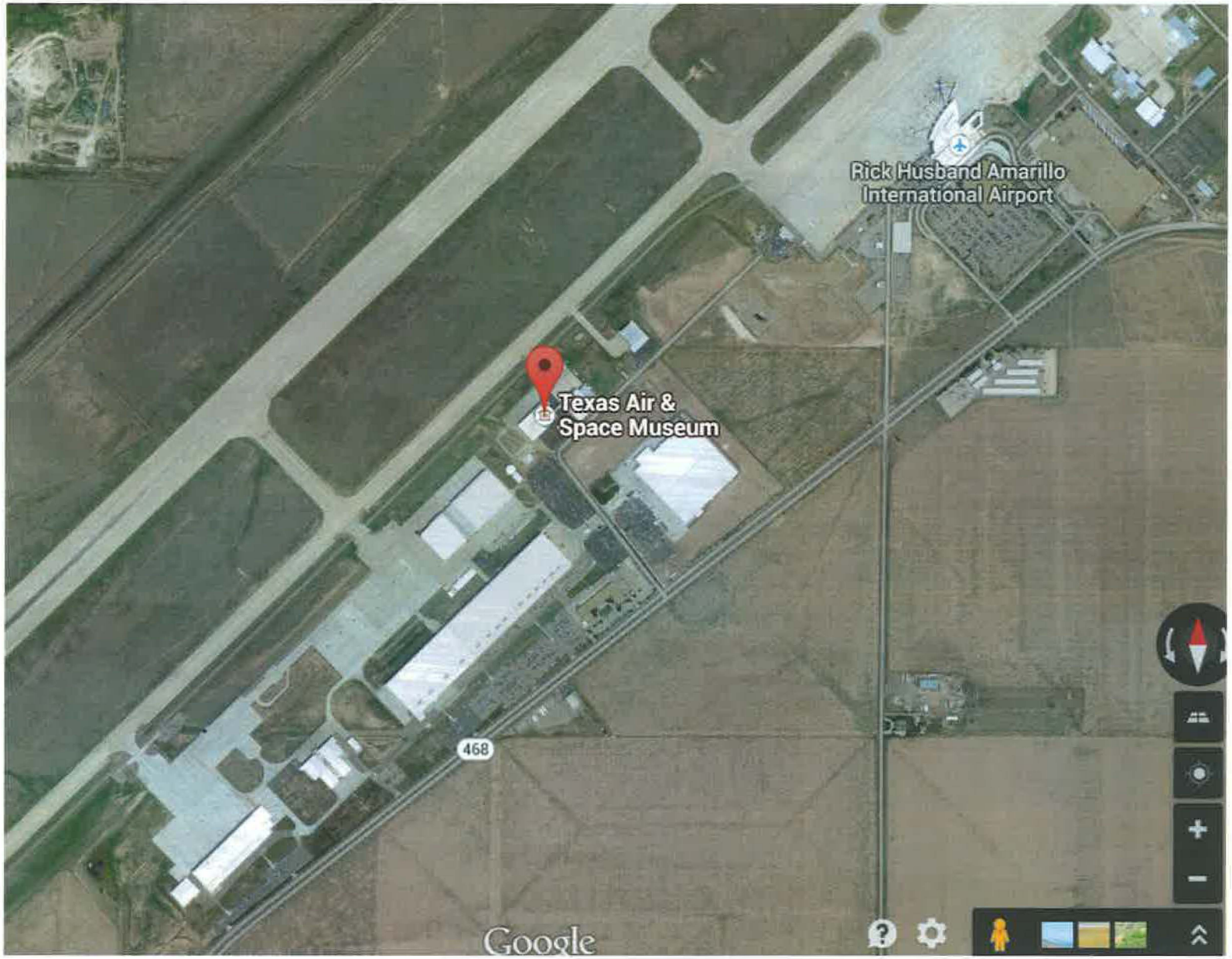
Cc: Melvena Heisch, Oklahoma State Historic Preservation Office
Linda Henderson, Texas Historical Commission
Najah Duvall-Gabriel, Advisory Council on Historic Places

N34 Arrives at English Field, February 13, 2014

Photo: Chuck Accurso, courtesy of Texas Air & Space Museum

Hangar at Texas Air & Space Museum currently housing N34




Rick Husband Amarillo
International Airport
Texas Air &
Space Museum
468
Google

N34 in its new location (hangar at the Texas Air & Space Museum)

N34 in its new location (hangar at the Texas Air & Space Museum, Amarillo International Airport)

N34 in its previous location (Hangar 8 at MMMAC, Oklahoma City, OK)

National Register of Historic Places
Memo to File

Correspondence

The Correspondence consists of communications from (and possibly to) the nominating authority, notes from the staff of the National Register of Historic Places, and/or other material the National Register of Historic Places received associated with the property.
Correspondence may also include information from other sources, drafts of the nomination, letters of support or objection, memorandums, and ephemera which document the efforts to recognize the property.

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Douglas DC-3 Airplane, N-34

MULTIPLE NAME:

STATE & COUNTY: OKLAHOMA, Oklahoma

DATE RECEIVED: 4/18/97 DATE OF PENDING LIST: 4/30/97
DATE OF 16TH DAY: 5/16/97 DATE OF 45TH DAY: 6/02/97
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 97000443

NOMINATOR: FEDERAL

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	Y
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	Y	NATIONAL:	Y

COMMENT WAIVER: N

___ACCEPT ___RETURN ___REJECT _____DATE

ABSTRACT/SUMMARY COMMENTS:

OK basically, but needs an SLR to correct the periods and areas of significance. 1945 covers Crit. C, engineering (for the date of construction), and 1957-81 is appropriate under Criterion A, transportation (association w/ FAA's safety inspection program). The period 1946-1956, and the area of "military" are unsubstantiated for this particular plane.

RECOM./CRITERIA Accept - A, C

REVIEWER Boland DISCIPLINE Historian

TELEPHONE _____ DATE 5/29/97

DOCUMENTATION see attached comments Y/N see attached SLR (Y)/N

U.S.Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

November 13, 1995

J. Blake Wade
State Historic Preservation Officer
State Historic Preservation Office
Oklahoma Historical Society
2100 N. Lincoln
Oklahoma City, OK 73105

Dear Mr. Wade:

I am forwarding to you the completed nomination package for the DC-3/N-34 airplane located in Hangar 10 at the Federal Aviation Administration's (FAA) Mike Monroney Aeronautical Center for your review and signature as a commenting agency. On August 28, 1995, I sent letters to local officials in Oklahoma City notifying them of the FAA's intent to nominate the DC-3/N-34 to the National Register. We did not receive any comments. Once we receive your comments, we will forward the nomination to the Historic Preservation Officer in the U.S. Department of Transportation for transmittal to the Keeper of the National Register.

I have worked with Susan Allen in your office to process this nomination and appreciate her help. Please do not hesitate to call me at (202) 493-4018 for more information.

Sincerely,

Ann M. Hooker

Dr. Ann M. Hooker
FAA Federal Preservation Officer

Enclosure

Oklahoma Historical Society *Founded May 27, 1893*

2100 NORTH LINCOLN BLVD. • OKLAHOMA CITY, OKLAHOMA 73105 • (405) 521-2491

November 20, 1995

Dr. Ann M. Hooker
FAA Federal Preservation Officer
Federal Aviation Administration
U.S. Department of Transportation
800 Independence Avenue, S.W.
Washington, D.C. 20591

Dear Dr. Hooker:

We are pleased to transmit the National Register of Historic Places nomination for the Douglas DC-3 Airplane, N-34 back to you. Mr. J. Blake Wade, Oklahoma State Historic Preservation Officer, has signed the form in support of the nomination.

We wish to commend the work of Mr. Jerry Searcy of the FAA in Oklahoma City for his work on this nomination. His enthusiasm for this project is inspiring and we appreciate his dedication and patience.

If you should have any questions, please contact me at 405/522-4484. Thank you for allowing our office to comment on this nomination.

Sincerely,

Melvena Heisch
Deputy State Historic
Preservation Officer

Enclosures

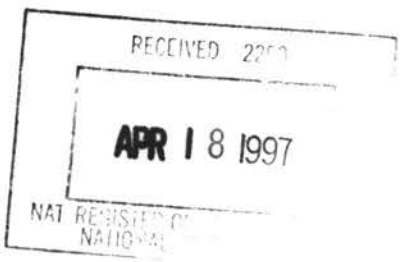
cc: Mr. Jerry Searcy

U.S.Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

4/18/97

Ms. Carol D. Shull
Keeper of the National Register of Historic Places
National Park Service
P.O. Box 37127
Washington, DC 20013-7127



Dear Ms. Shull:

I am sending to you the nomination package for FAA's DC-3/N34 which includes a transmittal letter from Barry L. Valentine, Certifying Federal Official. I have also included a copy of my letter to the Oklahoma State Historic Preservation Office (SHPO) indicating that we had notified local officials and that they had not objected. Further, I have included the Oklahoma SHPO's reply indicating that the SHPO had agreed to the nomination.

Please call me if you have any questions or comments. My telephone number is (202) 493-4018 and FAX is (202) 267-5594. My e-mail address is ann.hooker@faa.dot.gov. This is FAA's first nomination and I appreciate the assistance of Edson Beall and Patrick Andrus during the past two years in answering questions related to the nomination process.

Sincerely,

Ann M. Hooker

Dr. Ann M. Hooker
FAA Federal Preservation Officer
Office of Environment and Energy, AEE-300

Enclosures

U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

APR 18 1997

Ms. Carol D. Shull
Keeper of the National Register
National Park Service
P.O. Box 37127
Washington, DC 20013-7127

Dear Ms. Shull:

The Federal Aviation Administration (FAA) has identified a DC-3/N34, which it owns, as eligible for listing in the National Register of Historic Places. Enclosed are the completed nomination forms which were prepared by an employee of the FAA's Mike Monroney Aeronautical Center (MMAC) in cooperation with the Oklahoma State Historic Preservation Office (SHPO).

Although the FAA had scheduled the N34 for disposal, the FAA removed it from the disposal list. Thereafter, the FAA signed a cooperative agreement for display of the N34 with the Oklahoma Air and Space Museum (the Museum) located at the Kirkpatrick Center in Oklahoma City. The FAA will continue to house the N34 in Hangar 10 at the MMAC until the Museum builds an appropriate display structure. The FAA will then move the aircraft to the Museum. If the Keeper determines the N34 is eligible for listing in the National Register and if the Museum proceeds with its plans, the FAA will consult with the Oklahoma SHPO, and if needed, develop a Memorandum of Agreement to avoid damage to the aircraft during the move and during the period of the cooperative agreement.

There is considerable support within the community and the FAA for this nomination, since the N34 is very popular and is the only aircraft of that type and vintage that the FAA owns.

For more information, please call Dr. Ann M. Hooker, FAA Federal Preservation Officer, Office of Environment and Energy, at (202) 493-4018.

Sincerely,

Barry L. Valentine
Acting Administrator and
Certifying Federal Official

Enclosure

cc: Ms. Melvena Heisch, Deputy Oklahoma State Historic Preservation Officer

NEWS RELEASE

u.s. department of the interior

national park service

For Release: July 8, 1997

Program Contact: Beth Boland 202-343-3545
Public Affairs: Jacqui Handly 202-208-4989

DOUGLAS DC-3, N-34 AIRPLANE
NOMINATED TO NATIONAL REGISTER OF HISTORIC PLACES

The Douglas DC-3, N-34, listed in the National Register of Historic Places on May 29, 1997, is a monoplane aircraft built in 1945 for the U.S. Navy by the Douglas Aircraft Company in Oklahoma City, Oklahoma. The plane has been in continuous use since then, first as a Navy plane and later as a transport plane associated with the Federal Aviation Administration's safety inspection program. Today, the Douglas DC-3, N-34, in operational condition, is housed at Hangar 10, Federal Aviation Administration, Mike Monroney Aeronautical Center, Oklahoma City, Oklahoma when not in use.

"The Douglas DC-3, N-34 Airplane is important in the area of transportation and military history," announced Denis Galvin, Acting Deputy Director of the National Park Service. "It is representative of an aircraft type that revolutionized the commercial airline industry and made a significant contribution to the evolution of military aviation during World War II. Over 10,000 DC-3s were manufactured by the Douglas Aircraft Company but only 410 are still registered in the United States, making this plane a rare survivor of a once common aircraft type."

The DC-3 was designed and built in the mid-1930's. The first one flew on Dec. 17, 1935, exactly 32 years after the Wright brothers made the first powered airplane flight. While attracting little attention at first, the DC-3's later revolutionized the air transport industry. Built by the Douglas Aircraft Company at its Santa Monica, California plant, the planes were remarkably economical and reliable. Soon the world's best selling airliner, the DC-3 had no direct comparable competitive design. Before World War II, Douglas issued licenses to manufacture the plane in Holland, Japan, and the Soviet Union. During World War II Germany pressed DC-3s into the Luftfaffe, while Japan and the U.S.S.R. manufactured their own military equivalents once the war started. The Army Air Corp (later the USAAF) acquired its derivative of the DC-3 (a C-41A), which was used as a staff, troop and cargo transport; communications and electronic reconnaissance, medical evacuations and the dropping of flares to support night operations.

The DC-3, N-34 came to life in 1945 and was modified throughout its life span. The plane was built as a TC-47B for the U.S. Navy. The "T"C-47B-"DK" denotes a trainer (T) version that was built in Oklahoma City (DK) and TC-47B's obtained by the Navy were denoted R4D-7s.

-more-

The airplane was placed into storage until December 1945, due to the end of World War II. The navy then used it at various worldwide locations as a transport airplane. Among the assignments were London, Rome, Naples, Paris, Algiers, Frankfort, Brussels, Oslo, Stockholm, Dublin, Cairo, Kuwait and Baghdad. Later converted to a R4D-6, it was assigned to the U.S. Navy Utility Transport Squadron Four (VRU-Four) from February 26, 1947 until March 1949 when it was detached from the squadron and returned to the U.S. On April 8, 1947, N-34 nosed over in the mud while being taxied out of the only parking area available in London, and both engines had to be changed. While not officially assigned to the Berlin Airlift (1948-9), it is highly probable that N-34 flew into Berlin in support of Operation VITTLES, as most anything that flew in that area of the free world during that time was pressed into support of the airlift operation. Sometime prior to 1956 the plane was put into storage by the Navy.

Jim Cloud, a former FAA employee and volunteer at the Oklahoma Historical Society, commented, "The DC-3, used by the Army Air Corp, was a work-horse, pulling gliders, delivering supplies and evacuating wounded soldiers." Cloud himself was injured, placed on a DC-3 during the Battle of the Bulge, and flown to London to receive medical attention. Jerry Searcy, an Aerospace Engineer and Program Manager for the FAA, wrote that the FAA's testing of navigational aids (navaids) began "...in the 1950's and 1960's developmental work done by FAA's engineers, pilots, technicians, and specialists and their use of the DC-3 airplane." Searcy said, "The FAA has two missions, one as safety and the other is the promotion of aviation. The DC-3 deserves promotion due to its long history and as the backbone of the FAA flight inspection work from the 50's to the mid 70's." Searcy prepared the National Register form for the N-34, and has been involved in trying to gain recognition for the DC-3's since the mid 1970's.

The Navy loaned N-34 along with four other DC-3's, to the Civil Aviation Administration (CAA), later the Federal Aviation Administration (FAA). The initial FAA assignment as a flight inspection airplane was to the Southwest Region in Fort Worth, Texas, and later to various other FAA regions. This airplane was operational and photographed with its first CAA livery paint scheme on the ramp at Oakland in August 1958. In 1981 N-34 was withdrawn from flight inspection and assigned to the training program in Oklahoma City. During the early stages of disposing of the DC-3's in 1976 (as new jets were taking over the functions), initial efforts by the FAA employees to preserve one for its historical value finally cumulated in this last FAA DC-3, N-34, being restored and then reinstated by the FAA Administrator in 1985.

Since 1985, N-34 has been used in the FAA's aviation educational programs as a promotion of aviation and as a display of the FAA's historic heritage. Although restored, the plane retains the same equipment, furnishings and arrangement that were originally installed in 1957. The N-34 has been seen and visited by hundreds of thousands of aviation enthusiasts as it has been flown to air shows, special events, and aviation education related functions around the country (including Alaska) and Canada.

The DC-3 was the right airplane at the right time that would surpass and do more to advance air commerce with achievements and dedication than any other single airplane ever built.

-NPS-

Daily Oklahoman
Sunday, Jan. 19, 1986

FAA's Restored DC-3 Embarks On Assignment as Flying Exhibit

By James Johnson

The Federal Aviation Administration's new attention-getter is a 40-year-old, Oklahoma City-built Douglas DC-3.

FAA employees at the Mike Monroney Aeronautical Center at Will Rogers World Airport were given a first chance to see at close range the agency's new flying ambassador last week.

Smart in its old-fashioned, orange, white and gray livery, the FAA's last DC-3 has been restored to promote the FAA and aviation education at air shows.

It is an eye-catcher with a 1930-ish trim of orange lightning zigzagging the length of the fuselage.

The plane is unsentimentally called the N-34 from its registry number. Beneath the beautiful paint is an old workhorse which is equipped as an aviation standards check plane.

Properly calibrated, it could fly into an airport to check electronic navigation and takeoff and landing aids with its mid-1950s equipment.

The DC-3 is revered as the plane which first made passenger airliners profitable.

Last month a ceremony at the Douglas plant at Santa Monica, Calif., commemorated the first flight 50 years ago of a plane of the design which quickly passed through the DC-1 and DC-2 stages to stabilize as the efficient DC-3.

By May 1964, the FAA was flying 63 DC-3s, many of them on loan from the military.

The only DC-3 remaining in the FAA fleet today was manufactured for the Navy at the old Douglas plant at Tinker Air Force Base in 1945.

More than half of the 10,000 or so DC-3s built were constructed there.

Although Douglas no longer operates it, the plant is in use today as Building 3001, the Oklahoma City Air Logistics Center's main industrial building.

Designated as an R4D rather than as a C-47, as its counterparts built for the Army were called, the plane flew the world for the Navy until 1957. Then it was designated a civilian DC-3 and was turned over to the Civil Aeronautics Administration (CAA) in Oklahoma City.

Painted CAA orange, white and gray, it flew for 25 years from coast to coast checking the accuracy and reliability of the government's electronic navigation and landing aids.

When it was retired Sept. 9, 1982, the plane had logged 23,228 flying hours and made almost 4,000 landings in the service of the FAA and its predecessor CAA.

The FAA had tried once during the mid-1970s to retire its DC-3s.

The plane was pressed back into service when the fuel crisis made the fuel-efficient DC-3 attractive as a cargo carrier.

— Staff Photo by Paul Hellstern

Robert S. Barrigan stands in front of the "new" pride of the Federal Aviation Administration: the DC-3.

The regulatory agency also needed similar planes to train flight inspectors.

Jerry Searcy, an aircraft maintenance supervisor at the aeronautical center, proposed in January 1976 that the agency should save and restore one of its DC-3s.

Nothing came of it at first, but Searcy renewed his suggestion in 1982 when time and the newer Sabreliner combined to force the FAA to retire the DC-3 once and for all.

The head office in Washington approved the idea, but FAA administrator Donald Engen insisted on an economical job with other projects getting preference.

Robert S. Barrigan, a project officer in the aircraft maintenance division, was put in charge of the restoration.

Having sat on the apron for three years, the plane needed a thorough inspection to catch possible corrosion and other defects.

Fabric surfaces were rejuvenated and the engines, which had been pickled, were put back in running conditioning.

The aeronautical center still had DC-3 parts left over from the days when the plane was in active use, including orange material from which new window curtains were made.

"We still need better de-icer boots," Barrigan noted. "Right now it is a fair-weather plane."

Barrigan, who accompanied the DC-3 to Washington, D.C., noted the different reactions when the plane was on public display next to a space shuttle.

"The kids would go look at the space shuttle first," he said.

"But people my age would go over to the DC-3 and walk around it and smile."

HISTORY OF N34

This DC-3 aircraft was built at the Douglas Plant located on Tinker Air Force Base, Oklahoma City, Oklahoma, and was delivered to the U. S. Navy as R4D-7, Bureau of Aeronautical Number (BuNo) 99856, on May 26, 1945.

It was immediately placed in storage at Clinton, Oklahoma, until December 1945, when activated and assigned to the Naval Air Station, Norfolk, Virginia. In June 1946, it was assigned to a transport squadron at the Naval Air Station, Quanset Point, Rhode Island.

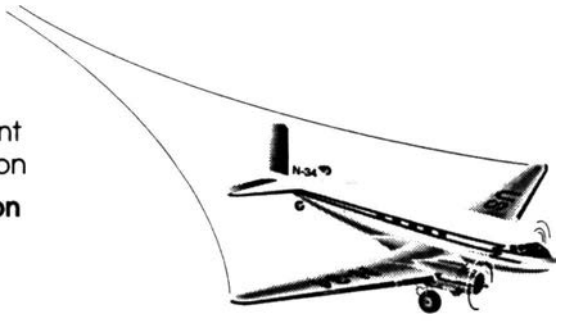
In February 1948, the aircraft was assigned to England and modified to an R4D-6R, transport category, followed by designation as an R5D-6V, indicative of assignment as a VIP transport. During its tour in the Navy it was assigned duty in Rome, Naples, Paris, Algiers, Frankfurt, Brussels, Oslo, Stockholm, Dublin, Cairo, Kuwait, Baghdad, and other interesting foreign locations.

Early in 1956, the aircraft was transferred to the Civil Aeronautics Administration (CAA) along with eight other R4D's. On May 14, 1957, it was assigned registration number N7091C for the ferry flight to Oklahoma City, Oklahoma, and registered as N34 on August 22, 1957. It was processed through the Federal Aviation Administration (FAA) modification shops in May 1959, for conversion to the FAA standard Type II flight inspection DC-3C. The initial FAA assignment as a flight inspection aircraft was to the Southwest Region and later to various other FAA regions.

On August 1, 1966, ownership of this aircraft was transferred from the U.S. Navy to the FAA. In 1981, it was withdrawn from flight inspection and assigned to the Aeronautical Center in Oklahoma City, and used in the training program.

The aircraft was declared excess to FAA needs on January 1, 1983. It was proposed that the aircraft be released to the General Services Administration (GSA) but instead was placed into storage at Oklahoma City.

U.S. Department
of Transportation
**Federal Aviation
Administration**



From:
Jerry Searcy, AFS-610
Aerospace Engr/ Program Manager
Engineering & Manufacturing Br.
PO Box 26460
Oklahoma City, OK 73125-0460
Phone: (405) 954-6897
FAX: (405) 954-4104
04/19/97

Subject: FAA's DC-3, N-34 Photo Over Oklahoma City

To:

Enclosed is the picture(s) per your request. (Info per The Sunday Oklahoman; 3/31/96)

In Remembrance of April 19, 1995

Murrah Federal Building
Of 358 people in the building, only 32 escaped injury:
163 dead: 166 injured. Building was destroyed - has been removed.

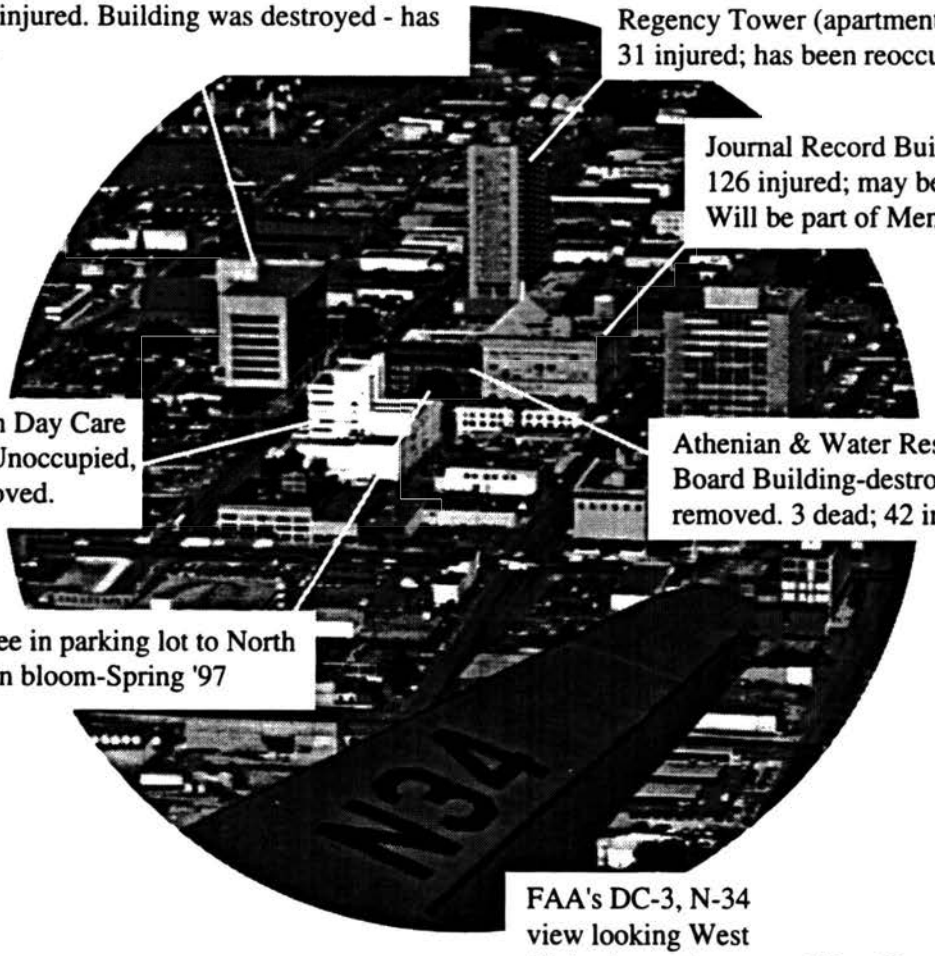
Regency Tower (apartments)
31 injured; has been reoccupied.

Journal Record Building
126 injured; may be restored.
Will be part of Memorial Property.

YMCA With Day Care
77 injured. Unoccupied, may be removed.

Athenian & Water Resources Board Building-destroyed will be removed. 3 dead; 42 injured.

"Survivors" tree in parking lot to North survived and in bloom-Spring '97

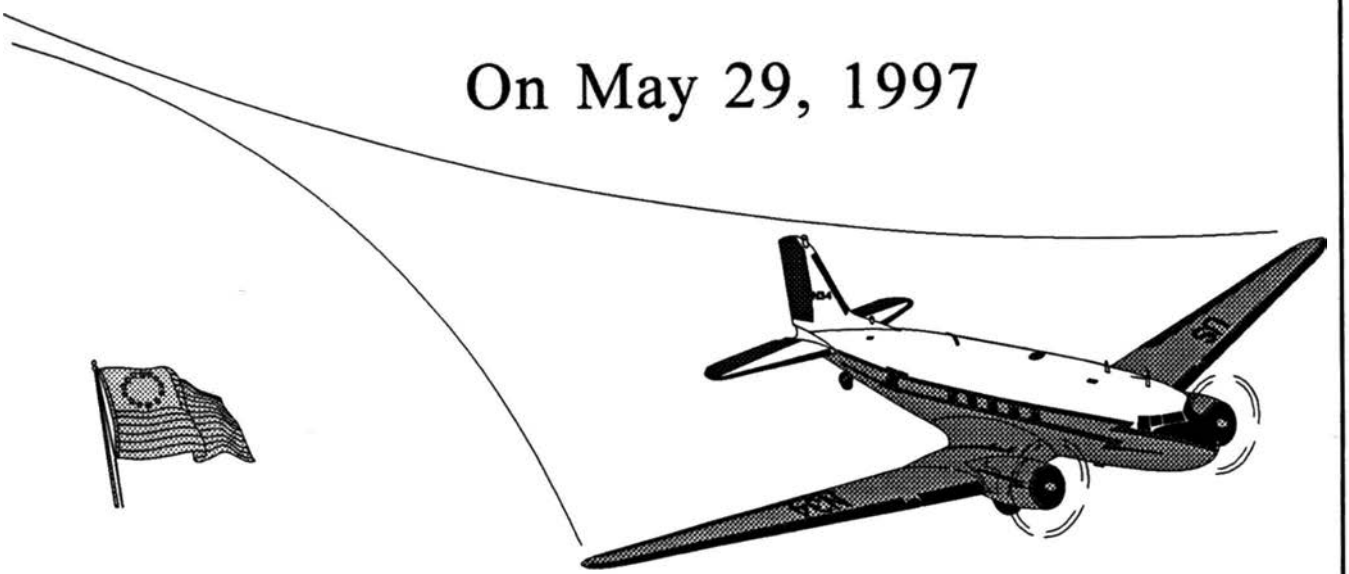


FAA's DC-3, N-34
view looking West
FAA photo taken over Okla. City - 2/19/87

More injuries in other buildings and dead on street and one in rescue attempt;
Total dead - 168 (98 were federal employees).

IT'S A DONE DEAL !

On May 29, 1997



N34 WAS LISTED ON

THE NATIONAL REGISTER

OF HISTORIC PLACES

There is re-Joy-cing throughout the land.

AFS-610
Jer 6/4/97

Oklahoma-Built Plane Lands in History

By Diane Plumberg
Staff Writer

The Gooney Bird has landed Oklahoma in the National Register of Historic Places for the 900th time.

The Oklahoma-built DC-3 recently was added to the register and is the only movable item out of the 900 from Oklahoma to be on the list.

The DC-3, registration N-34, was built at the Douglas Aircraft Co. plant, which is now Tinker Air Force Base, and was nicknamed the "Gooney Bird," since the plane did not have enough hydraulic pressure to lift both sides of the landing gear at the same time. One wheel would raise, then the other.

The airplane was partially disassembled and is stored in Hangar 10 at the Federal Aviation Administration's Mike Monroney Aeronautical Center in Oklahoma City.

"A lot of aviation folks have a very fond place in their heart for this particular airplane, not just because it's a DC-3, but because of where it was built, what it is, what it did and now what it represents," said Robert Hoppers with the Oklahoma City FAA center.

"Some of these guys ... that grew up working on it are just very passionate about that airplane."

The monoplane was used by the Navy to transport dignitaries and cargo in Europe during World War II. The plane is not pressurized, so it had to fly below 10,000 feet.

In 1958, the Navy loaned N-34 to the Civil Aeronautics Administration (now the FAA). It was used to inspect calibrations at airports and runways around the world.

The FAA gained ownership of the plane in 1966. Sixteen years later, there were only two DC-3s left with the FAA, including N-34.

The federal agency decided to trash the planes, but N-34 was saved after then-FAA Administrator Donald Engen said, "We all have great pride in our past, and this is one way to show others how we feel."

The FAA transferred the orange, silver and white plane to Oklahoma City.

From 1986 to 1993, the airplane was displayed in at least two dozen air shows nationwide to teach spectators about the historic plane's role in aviation safety.

It last appeared publicly in Oklahoma during Aerospace America '93.

"All the time it flew, it was a complete crowd stopper," said Roland Herwig with the FAA.

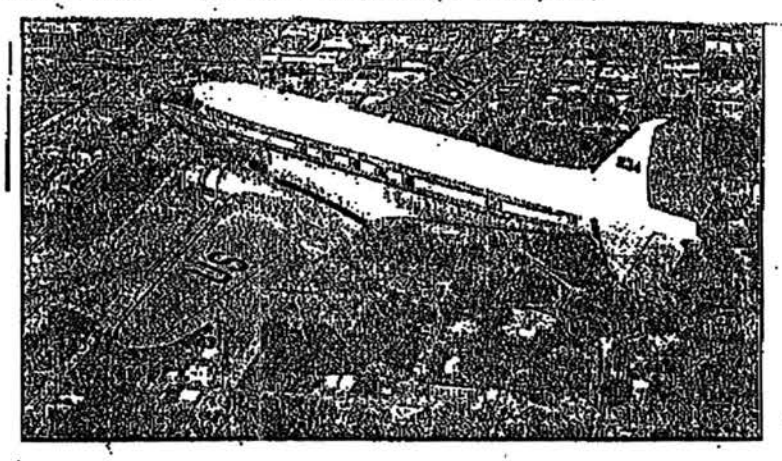
"We would touch down somewhere, and people would just gravitate to this airplane."

The plane was retired in 1993.

Hoppers said the plan is to keep the plane at the FAA center until a display building is built at the Kirkpatrick Air and Space Museum to house N-34 and other aircraft in storage.

The Douglas Aircraft Co. manufactured more than 10,000 DC-3s, but only 410 still are registered in the United States.

The first DC-3 was flown Dec. 17, 1935, exactly 32 years after the Wright Brothers made their first powered flight at Kitty Hawk, N.C.

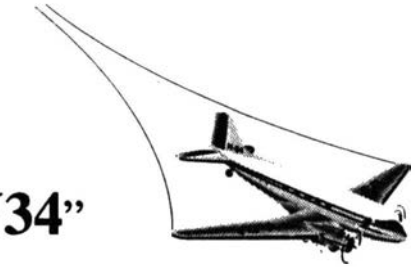


An Oklahoma-built DC-3 airplane flies over downtown Oklahoma City in 1987. The airplane recently was added to the National Register of Historic Places and is the only movable item on the list from Oklahoma.


N34
US
N34

U.S. Department
of Transportation
**Federal Aviation
Administration**

HISTORY of FAA's DC-3, "N34"



Mike Monroney Aeronautical Center
Oklahoma City, OK

1945 - 1957

Built at the Douglas Aircraft Company plant in Oklahoma City (now Tinker Air Force Base) as a TC-47B-DK (S/N 33359) but delivered to the Navy as an R4D-7 (Bu No 99856) on 5/26/45; put into immediate storage at Clinton, OK until activated (12/45) and assigned to Norfolk Naval Air Station. Used as a transport at various worldwide locations including assignment to Navy Squadron VR-24 at Hendon Royal Air Force Station, London between 2/47 & 3/49. At some point converted to an R4D-6 with missions flown throughout Europe and into Berlin. Although VR-24 was not officially assigned to the Berlin Airlift (Operation VITTLES - 6/48-9/49) and the records are not of sufficient detail, it is highly probable that this R4D-6 (N34) flew into Berlin in support of the airlift as most anything that flew in that area during that time was pressed into support of the operation. Put into storage by the Navy at Litchfield Park, AZ sometime prior to 1956 when it became one of the DC-3 types that was loaned to the Civil Aeronautics Administration (CAA - FAA's predecessor). Ferried to the CAA's overhaul and modification facilities in Oklahoma City (OKC) in 5/57 (N34 returned home) where it was modified; received the latest flight inspection equipment and instrumentation for checking the accuracy of navigational and landing aids; registered as N34; and initially assigned to the FAA Southwest Region in Fort Worth in 1958.

1958 - 1985

Served faithfully as a flight inspection airplane at various other FAA regions until 1981 when assigned to the training program in OKC. Official ownership transferred from the U.S. Navy to FAA in 8/66. In 1976 when the FAA started retiring the over 60 flight inspections DC-3s, there was growing concern that an important part of chronicled history would be lost so an initial suggestion was made that the FAA retain one for historical purposes. In 1982/3 when there were only two DC-3s left in FAA ownership, efforts began in earnest to save one, to no avail. Declared surplus to FAA needs in 1983 with the registration number canceled and prepared for disposition but fortunately placed into storage in OKC. Finally, in 1985, the last FAA DC-3, N34, was reinstated by the then FAA Administrator, Donald D. Engen who said of N34 "...We all have great pride in our past and this is one way to show others how we feel."

1986 - 1993

Restored to operate as an example of FAA's historical heritage and use in the aviation education related activities; repainted in a late CAA color scheme; and flown to and shown at airshows around the country which allowed numerous visitors to share their past experiences on DC-3/C-47/R4Ds. Many former veterans (of 3 major wars), crew members, or passengers shared their stories with N34 crew members on how their lives were saved, evacuated, transported, provided first flight experiences, or otherwise affected by this type of airplane. Nevertheless, N34 was deleted from the inventory and scheduled for disposition once again at the end of the '93 airshow season.

1994 - 1997

Continuing efforts to retain N34 as part of FAA's heritage met with success once again when the FAA was allowed to retain ownership. A loan agreement with an OKC museum was established in which N34 will be displayed in FAA colors and flight inspection configuration. A nomination for N34 to be listed on the National Register of Historical Places was also prepared, submitted, accepted, and passed on by the FAA to the Keepers Office of the National Park Service. Official notice has been posted in the Federal Register with final action pending (6/97).

Special Remembrance - April 19, 1995

This FAA photo of N34 was taken 2/19/87 over OKC with the Murrah Federal Building and bombing site prominently seen just above the right wing. There is a separate handout that provides details of this site and information on the tragic events of 4/19/95. The FAA pauses and remembers our fellow federal employees and citizens that lost their lives or were injured.

PAGE 1 NATIONAL REGISTER OF HISTORIC PLACES NEXT PAGE: [1]
Reference No. [97000443] Control No. [970504/sbd]
Resource Name: [Douglas DC-3 Airplane, N34]
Other Name/ Site Number: [Douglas serial #33359;Navy BuNO 99856]
Address/ Boundary: [6500 S. MacArthur Blvd., Hangar 10]
City: [Oklahoma City] Vicinity: [ ] Restrict Address: [ ]
State: [OK OKLAHOMA] County: [109 Oklahoma]
Ownership: -Private -Public(Local) -Public(State) X-Public(Federal)

Resource Type: [U] (B,D,S,U,O)	No. of Contributing	Noncontributing
	Bldgs [00000]	[00000]
	Sites [00000]	[00000]
	Structures [00001]	[00000]
	Objects [00000]	[00000]

-------Federal Agency-------
[FAA][ ][ ]
Prompt: MODIFY DATA AND PRESS 'ENTER' Reply:

Old Location

U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of Environment and Energy
800 Independence Ave. SW
Washington DC, 20591

December 12, 2013

Melvena Heisch
Deputy State Historic Preservation Officer
Oklahoma Historical Society
Oklahoma History Center
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

RE: Section 106 Consultation for Relocation of Douglas DC-3 Aircraft from Oklahoma City, OK

Dear Ms. Heisch:

The Federal Aviation Administration (FAA) is the owner of a Douglas DC-3 Aircraft, Registration No. N34 ("DC-3"), listed in the National Register of Historic Places in 1997. The DC-3 is based at the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma but is no longer being maintained in an airworthy condition and currently is stored in a hangar which is not publicly accessible. The FAA has been seeking to make the DC-3 available for public display. Previously, we entered into a Cooperative Agreement with the Oklahoma Air and Space Museum in Oklahoma City to display the aircraft, contingent upon funds becoming available to build an annex to house the aircraft, but the Museum was unable to raise the funds and the Cooperative Agreement was voided as of September 2012. More recently we have been in discussions with the Texas Air & Space Museum about the possibility of loaning them the DC-3 for display at their facility at Amarillo International Airport, Amarillo, Texas. The FAA would retain ownership of the DC-3. The proposed Cooperative Agreement that would govern the relocation and display of the DC-3 is attached.

We understand that this is an 'undertaking' subject to Section 106 of the National Historic Preservation Act (NHPA), as implemented by regulations in 36 CFR part 800. We also understand that moving the DC-3 to a new base without complying with the regulations in 36 CFR part 60 would result in its automatic deletion from the National Register of Historic Places. Those regulations allow properties that are moved in a manner consistent with the Section 106 procedures to remain listed, subject to post-relocation notification of the Keeper of the National Register (see 36 CFR § 60.14(b)(5)). Therefore, we intend to address any potential adverse effects associated with relocating the DC-3 through Section 106 consultation.

This letter is intended to formally initiate Section 106 consultation and solicit any comments you may have on the proposed undertaking. The Area of Potential Effect of the undertaking is limited to the DC-3 itself, the hangar at the Mike Monroney Aeronautical Center in which

it is currently housed and the Texas Air & Space Museum. The FAA is proposing a finding of "No Adverse Effect," based on the restrictions and conditions included in the Cooperative Agreement.

The FAA is also inviting the Texas Historical Commission, which serves as the State Historic Preservation Office, to participate in this consultation.

If you have any comments or questions on this undertaking, please contact me directly at 202-267-9548, or e-mail katherine.andrus@faa.gov.

Sincerely,

Katherine Andrus
Federal Preservation Officer

Preserving America's Heritage

February 7, 2014

Katherine Andrus
Environmental Protection Specialist and Federal Preservation Officer
Office of Environment and Energy, AEE-400
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Ref: *Proposed Relocation of the Douglas DC-3 Aircraft at the Mike Monroney Aeronautical Center Oklahoma City, Oklahoma*

Dear Ms. Andrus:

The Advisory Council on Historic Preservation (ACHP) has received the Memorandum of Agreement (MOA) for the above referenced project. In accordance with Section 800.6(b)(1)(iv) of the ACHP's regulations, the ACHP acknowledges receipt of the MOA. The filing of the MOA, and execution of its terms, completes the requirements of Section 106 of the National Historic Preservation Act and the ACHP's regulations.

We appreciate your providing us with a copy of the MOA and will retain it for inclusion in our records regarding this project. Should you have any questions or require additional assistance, please contact Ms. Najah Duvall-Gabriel at (202) 606-8585 or via e-mail at ngabriel@achp.gov.

Sincerely,

LaShavio Johnson

LaShavio Johnson
Historic Preservation Technician
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION

1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone:202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

U.S. Department
of Transportation
**Federal Aviation
Administration**

February 7, 2014

Najah Duvall-Gabriel
Historic Preservation Specialist
Advisory Council on Historic Preservation
1100 Pennsylvania Ave. NW
Suite 803
Washington, DC 20004

Dear Ms. Duvall-Gabriel:

Please find enclosed for filing with the Advisory Council a copy of the executed Memorandum of Agreement (MOA) among the Federal Aviation Administration, the Oklahoma State Historic Preservation Office (SHPO) and the Texas Air & Space Museum for the relocation of the FAA's DC-3 aircraft. The DC-3, which is listed in the National Register of Historic Places, will be moved in accordance with the MOA, and will remain listed pending post-relocation notification of the Keeper of the National Register, pursuant to 36 CFR § 60.14(b)(5).

There have been no substantive revisions or additions to the documentation provided in connection with our January 28, 2014 finding of adverse effect. We received no comments in response to the public notice which ran in the Oklahoman newspaper for seven days between January11 – 21, 2014. The Oklahoma SHPO has concurred that the MOA provides adequate and legally enforceable conditions to ensure long-term preservation of the DC-3's historic significance, and the Texas Air Space Museum has agreed to assume responsibility for relocating and displaying the DC-3 in accordance with the MOA and the Cooperative Agreement incorporated by reference in the MOA. Therefore, this MOA fully resolves the potential adverse effects of leasing the DC-3 out of federal control.

Sincerely,

Katherine Andrus
Federal Preservation Officer

Enclosure

Cc: Melvena Heisch, Oklahoma State Historic Preservation Office
Ron Fernuik, Texas Air & Space Museum

U.S. Department
of Transportation
**Federal Aviation
Administration**

January 28, 2014

Najah Duvall-Gabriel
Historic Preservation Specialist
Advisory Council on Historic Preservation
1100 Pennsylvania Ave. NW
Suite 803
Washington, DC 20004

RE: Finding of Adverse Effect for Relocation of DC-3

Dear Ms. Duvall-Gabriel:

The Federal Aviation Administration (FAA) is the owner of a Douglas DC-3 Aircraft, Registration No. N34 ("DC-3"). The DC-3 is based at the Mike Monroney Aeronautical Center, Oklahoma City, Oklahoma but is no longer maintained in an airworthy condition and currently is stored in a hangar which is not publicly accessible. The FAA has been seeking to make the DC-3 available for public display. We have been in discussions with the Texas Air & Space Museum about the possibility of loaning them the DC-3 for display at their facility. The proposed Cooperative Agreement that would govern the relocation and display of the DC-3 is attached. (See Attachment A)

Moving the permanent base of the DC-3 to a new location is an 'undertaking' subject to Section 106 of the National Historic Preservation Act (NHPA), as implemented by regulations in 36 CFR part 800. The FAA has been in consultation with the Oklahoma State Historic Preservation Office. The Texas State Historic Preservation Office was invited to participate in consultation but declined the invitation. This letter is intended to formally notify the Advisory Council on Historic Preservation of the FAA's finding of adverse effect, in accordance with 36 CFR § 800.5(d)(2), and to serve as the necessary documentation of that finding under 36 CFR § 800.11(e).

The Area of Potential Effect of the undertaking is limited to the DC-3 itself, the hangar at the Mike Monroney Aeronautical Center in which it is currently housed and its new location at the Texas Air & Space Museum. We have identified and evaluated properties within the APE as follows:

- The DC-3 was listed in the National Register of Historic Places in 1997 under Criterion A, for its role in the development and modernization of flight inspection standards and Criterion C, as an example of a significant aircraft design. (See Attachment B)

- Hangar 8 at the Mike Monroney Aeronautical Center, where the DC-3 has been stored since 2000, was constructed in the 1950s and is otherwise used to store mission-ready aircraft. (See Attachment C)

- The current Texas Air & Space Museum, where the DC-3 will be put on temporary display, is located at Amarillo International Airport. The Museum will permanently display the DC-3 in its new facility, also located adjacent to the airport, when renovations are complete in 6-8 months. (See Attachment C)

Other than the DC-3 itself, these properties do not appear to be eligible for the National Register. Even if they were, the undertaking will not have any effect on them as defined in 36 CFR § 800.16(i), because the presence or absence of the DC-3 will not alter their characteristics.

Lease of property out of federal control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance is an adverse effect under 36 CFR § 800.5(a)(2)(vii).1 The FAA proposed a finding of adverse effect for this undertaking, in which the Oklahoma SHPO concurred (see Attachment D).

The FAA informed the public of the proposed relocation of the DC-3 and invited comment through a public notice which ran in the Oklahoman newspaper for seven days between January11 – 21, 2014. We did not receive any comments or requests for further information.

Under 36 C.F.R. § 60.14(b)(4), relocating the DC-3 without complying with the National Register regulations would result in its automatic deletion from the National Register of Historic Places. The regulations allow properties that are moved in a manner consistent with comments of the Advisory Council, in accordance with the Section 106 procedures, to remain listed, subject to post-relocation notification of the Keeper of the National Register (see 36 CFR § 60.14(b)(5)). We intend to rely on this provision to retain the DC-3's listing in the National Register through the relocation. If you have any questions, please contact me directly at 202-267-9548, or e-mail katherine.andrus@faa.gov.

Sincerely,

Katherine Andrus
Federal Preservation Officer

Enclosures

Cc (without enclosures): Melvena Heisch, Oklahoma State Historic Preservation Office

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[1] Removal of a property from its historic location is also an adverse effect under 36 CFR § 800.5(a)(2)(vii). However, the DC-3 is not currently in its historic location. In addition, because aircraft are structures designed to be mobile, the DC-3 need not be at its original location in order to retain integrity. *See* National Register Bulletin, Guidelines for Evaluating and Documenting Historic Aviation Properties (U.S. Department of the Interior, National Park Service, National Register of Historic Places, 1998).

Oklahoma Historical Society *Founded May 27, 1893*
State Historic Preservation Office
Oklahoma History Center • 800 Nazih Zuhdi Drive • Oklahoma City, OK 73105-7917
(405) 521-6249 • Fax (405) 522-0816 • www.okhistory.org/shpo/shpom.htm

January 27, 2014

Ms. Katherine Andrus
Federal Preservation Officer
FAA Office of Environment & Energy
800 Independence Ave. SW
Washington, DC 20591

RE: File #0453-14; FAA Proposed Relocation of Douglas DC-3 Aircraft

Dear Ms. Andrus

We are in receipt of your correspondence dated January 24, 2014, and the accompanying documentation. We concur with your finding that the relocation of the Douglas DC-3, N34, a property listed in the National Register of Historic Places (NRHP), has the potential to adversely affect the historic aircraft.

We further concur that there will be no effect on any other historic properties. We have no documentation on the 1950s era hangar that currently houses the historic aircraft. Therefore, we cannot concur with your opinion that it is ineligible for the NRHP. However, even if it is eligible, the removal of the DC-3 would have no effect on it.

We understand your time constraints and that you are consulting with the Advisory Council on Historic Preservation. As soon as you are in receipt of their comments and ready to execute the Memorandum of Agreement, we will be ready to assist you to expedite this step.

If you may have any questions, please do not hesitate to contact me directly at 405/522-4484 or mheisch@okhistory.org.

Sincerely,

Melvena Heisch
Deputy State Historic
Preservation Officer

MKH:pm

U.S. Department
of Transportation
**Federal Aviation
Administration**

January 24, 2014

Melvena Heisch
Deputy State Historic Preservation Officer
Oklahoma Historical Society
Oklahoma History Center
800 Nazih Zuhdi Drive
Oklahoma City, OK 73105

RE: Proposed Adverse Effect Finding for Relocation of DC-3 Aircraft

Dear Ms. Heisch:

As you are aware, the Federal Aviation Administration (FAA) is the owner of a Douglas DC-3 Aircraft, Registration No. N34 ("DC-3"), and is in discussions with the Texas Air & Space Museum about loaning them the DC-3 for display at their facility. Moving the permanent base of the DC-3 to a new location is an 'undertaking' subject to Section 106 of the National Historic Preservation Act (NHPA), as implemented by regulations in 36 CFR part 800. We formally initiated consultation with you by letter dated December 12, 2013. The Texas SHPO declined to participate as a consulting party but asked to be copied on pertinent documentation.

As we previously discussed, the FAA wishes to expedite this consultation by addressing multiple steps in this correspondence. The public has been informed of the proposed relocation of the DC-3 and invited to comment through a public notice which ran in the Oklahoman newspaper for seven days between January11 – 21, 2014. To date we have not received any comments or requests for further information.

Identification of Historic Properties:

The Area of Potential Effect (APE) of the undertaking is limited to the DC-3 itself, the hangar at the Mike Monroney Aeronautical Center in which it is currently housed and its new location at the Texas Air & Space Museum. We have identified and evaluated properties within the APE as follows:

- The DC-3 was listed in the National Register of Historic Places in 1997 under Criterion A, for its role in the development and modernization of flight inspection standards and Criterion C, as an example of a significant aircraft design.

- Hangar 8 at the Mike Monroney Aeronautical Center, where the DC-3 has been stored since 2000, was constructed in the 1950s and is otherwise used to store mission-ready aircraft.

- The current Texas Air & Space Museum, where the DC-3 will be put on temporary display, is located at Amarillo International Airport. The Museum will permanently display the DC-3 in its new facility, also located adjacent to the airport, when renovations are complete in 6-8 months.

Other than the DC-3, these properties do not appear to be eligible for the National Register. Even if they were, the undertaking will not have any effect on them as defined in 36 CFR § 800.16(i), because the presence or absence of the DC-3 will not alter their characteristics.

Assessment of Adverse Effects:

Lease of property out of federal control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance is an adverse effect under 36 CFR § 800.5(a)(2)(vii).[1] Therefore, the FAA is proposing a finding of "adverse effect" for the lease of the DC-3. Please let me know if you concur in this finding.

Resolution of Adverse Effects:

I am enclosing a revised MOA, which addresses your comments on the draft that we shared with you in December 2013. The MOA incorporates the Cooperative Agreement with the Texas Air & Space Museum, and we believe it fully resolves any potential adverse effects through legally enforceable conditions. Please let me know if you have any further comments on the proposed MOA.

Effect of Relocation on National Register Listing:

The National Register regulations allow properties that are moved in a manner consistent with comments of the Advisory Council, in accordance with the Section 106 procedures, to remain listed, subject to post-relocation notification of the Keeper of the National Register (see 36 CFR § 60.14(b)(5)). We intend to rely on this provision to retain the DC-3's listing in the National Register through the relocation, and will submit the appropriate documentation to the Keeper once the DC-3 is in its new location. We will copy you on that submission and inform you of the outcome.

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[1] Removal of a property from its historic location is also an adverse effect under 36 CFR § 800.5(a)(2)(vii). However, the DC-3 is not currently in its historic location. In addition, because aircraft are structures designed to be mobile, the DC-3 need not be at its original location in order to retain integrity. *See* National Register Bulletin, Guidelines for Evaluating and Documenting Historic Aviation Properties (U.S. Department of the Interior, National Park Service, National Register of Historic Places, 1998).

If you have any questions, please contact me directly at 202-267-9548, or e-mail katherine.andrus@faa.gov.

Sincerely,

Katherine Andrus
Federal Preservation Officer

Enclosures

Cc: Linda Henderson, Texas Historical Commission

Relocation of DC-3 N34

Section 106 Documentation

MEMORANDUM OF AGREEMENT
AMONG
THE FEDERAL AVIATION ADMINISTRATION,
THE OKLAHOMA STATE HISTORIC PRESERVATION OFFICE, AND
THE TEXAS AIR & SPACE MUSEUM
REGARDING THE
RELOCATION OF A DOUGLAS DC-3-R1830-94, SERIAL NUMBER: 33359,
US AIRCRAFT, REGISTRATION No. N34

WHEREAS, the Federal Aviation Administration (FAA) is the owner of a Douglas DC-3-R1830-94, Serial Number: 33359, US Aircraft, Registration No. N34 ("DC-3"), which was listed in the National Register of Historic Places in 1997; and

WHEREAS, the DC-3 can no longer be maintained in an airworthy condition and currently is being stored in a hangar which has limited public access; and

WHEREAS, the FAA has determined that relocation of the DC-3 to a museum setting is the best means of providing public access and ensuring the long-term preservation of the aircraft; and

WHEREAS, the FAA entered into a Cooperative Agreement with the Oklahoma Air and Space Museum in Oklahoma City on December 30, 1996 to display the aircraft, contingent upon funds becoming available to build an annex to house the aircraft; and

WHEREAS, the Oklahoma Air and Space Museum has been unable to construct an annex or otherwise obtain a suitable display space for the DC-3 and the Cooperative Agreement was rescinded in September 2012 due to the passage of time; and

WHEREAS, the FAA plans to enter into a Cooperative Agreement with the Texas Air & Space Museum (Museum) for the historical and educational display of the DC-3 under a long-term lease, as described in Attachment A; and

WHEREAS, the agreement would involve moving the DC-3 from its present location at the FAA's Mike Monroney Aeronautical Center, in Oklahoma City, Oklahoma to the Museum at Amarillo International Airport; and

WHEREAS, the FAA has determined the relocation a federal undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulations, 36 C.F.R. § 800; and

WHEREAS, the FAA, in consultation with the Oklahoma State Historic Preservation Office (SHPO) has considered the potential effects of the relocation on the characteristics of the DC-3 that qualify it for inclusion in the National Register of Historic Places, as provided in 36 C.F.R. § 800.5(a); and

WHEREAS, the FAA is cognizant that the lease or transfer of property out of Federal control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's significance could be an adverse effect under 36 C.F.R. § 800.5(a)(2)(vii); and

WHEREAS, the FAA has included such conditions in the Cooperative Agreement with the Texas Air & Space Museum, which is included as Attachment A and incorporated into this Memorandum of Agreement; and

WHEREAS, the FAA has determined that the relocation will not have an adverse effect on the DC-3 based on the conditions imposed in the Cooperative Agreement, and the Oklahoma SHPO has been consulted pursuant to 36 C.F.R. § 800.5(b); and

WHEREAS, in accordance with 36 C.F.R. § 800.6(a)(1), the FAA has notified the Advisory Council on Historic Preservation (ACHP) of its initial adverse effect determination with specified documentation and the ACHP has chosen not to participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

WHEREAS, the FAA will notify the Keeper of the National Register of the new location and provide documentation in accordance with 36 C.F.R. § 60.14(b)(5); and

NOW, THEREFORE, the FAA, the Oklahoma SHPO and the Texas Air & Space Museum agree that the relocation will be implemented in accordance with the Cooperative Agreement in Attachment A and the following Stipulations in order to preserve the historic significance of the DC-3.

STIPULATIONS

I. MONITORING AND REPORTING

a. Once the DC-3 has been relocated to the Texas Air & Space Museum, the FAA shall provide the National Register of Historic Places with documentation in accordance with 36 C.F.R. § 60.14(b)(5) and will provides copies of all such documentation to the Oklahoma SHPO.

b. The Texas Air & Space Museum will monitor the DC-3 and promptly report to the FAA any changes in its condition or setting.

c. FAA Flight Inspection Services will visit museum on an annual basis to audit condition of aircraft. FAA will, each year, identify the annual maintenance required to be completed on the DC-3 and will assume the responsibility for its completion.

d. The FAA will report to the Oklahoma SHPO any changes in the condition, setting or National Register status of the DC-3.

II. DISPUTE RESOLUTION

a. If any Signatory objects to the manner in which the terms of this Agreement are implemented, the objecting party should provide written notice to the FAA.
b. The FAA will take the objection into account and consult with the Signatories to resolve the objection.

III. DURATION, AMENDMENT, AND TERMINATION

a. This Agreement will become effective upon execution by the FAA, the Oklahoma SHPO and the Texas Air & Space Museum and will remain in effect for a term of five (5) years from its date of execution, at which time the FAA or the Texas Air & Space Museum may seek to extend this Agreement for an additional period of time.

b. Any Signatory to this Agreement may request the other Signatories consider amending it, whereupon the parties will consult in accordance with 36 CFR Part 800.6(c)(7) to consider such an amendment.

c. If any Signatory to this Agreement determines that its terms will not or cannot be carried out, that party will immediately consult with the other parties to attempt to develop an amendment per Stipulation III.b. If within thirty (30) calendar days (or another time period agreed to by all Signatories) an amendment cannot be reached, any Signatory may propose that this MOA be terminated per Stipulation III.d

d. Any Signatory to this agreement may propose at any time that this MOA be terminated. The Signatory proposing to terminate this MOA shall notify the other parties to this MOA, explaining the reasons for termination and affording them at least thirty (30) calendar days to consult and seek alternatives to termination. Should such consultation fail, the FAA or SHPO may terminate this MOA by so notifying all parties.

e. Should this MOA be terminated, the FAA shall either consult in accordance with 36 CFR Part 800.6 to develop a new MOA, or request the comments of the Council pursuant to 36 CFR 800.7.(a)

Execution of this Programmatic Agreement by the FAA, the Oklahoma SHPO and the Texas Air & Space Museum, and implementation of its terms by the Signatories is evidence the FAA has taken into account the effects of the undertaking on historic properties.

SIGNATORIES

FEDERAL AVIATION ADMINISTRATION

By: Edward W. Luckel

Date: JAN 31, 2014

OKLAHOMA STATE HISTORIC PRESERVATION OFFICE

By: [signature]

Date: 2-3-14

TEXAS AIR & SPACE MUSEUM

By: Ron Jerrold

Date: FEB 03, 2014

COOPERATIVE AGREEMENT FOR DISPLAY OF AIRCRAFT

This agreement, entered into on this ___ day of _____, 20__, between the U.S. Department of Transportation, Federal Aviation Administration ("FAA"), Mike Monroney Aeronautical Center, P.O. Box 25082, Oklahoma City, Oklahoma 73125-4901, and Texas Air & Space Museum, 10001 American Drive, Amarillo, Texas 79111.

AUTHORITY

1. Legal authority for this Agreement is established by 41 C.F.R. Section 101-43.001-4 pertaining to cooperative agreements.
2. Museum qualifies as an "other recipient" pursuant to 41 C.F.R. Section 101-43.001-4.

RECITALS

1. FAA is the owner of a Douglas DC-3C-R1830-94, Serial Number: 33359, US Aircraft, Registration No. N34 ("DC-3").
2. Museum maintains a gallery at the above address for the exhibition of air and space related articles and for education of the general public in matters pertaining to history and future of the air and space industry.
3. FAA desires to entrust possession of the DC-3 to the Museum for historical and educational display purposes.
4. FAA and Texas Air & Space Museum understand and agree that N34 (DC-3) is a historic property listed in the National Register of Historic Places and will be maintained as such.

For these reasons and for other good and lawful reasons and in consideration of the covenants set forth below, the parties agree as follows:

SECTION ONE
TERM

For a term of five (5) years, beginning the ___ day of _____, 20__, FAA does agree to provide Museum one (1) Douglas DC-3 airplane, Registration No. N34 for public display at Museum's new facility located at 280 Airport Drive, Amarillo, Texas.

SECTION TWO
CANCELLATION AND TERMINATION OR RENEWAL OPTIONS

This Agreement shall be non-cancelable for the first (1) year of the term hereof. Following the expiration of said first (1) year of the term hereof, either party may cancel and terminate this Agreement upon one (1) year written notice to the other party. On termination of this Agreement, FAA will be responsible for and will bear the cost of disassembling, packing, crating, handling, transporting, and other actions incidental to the

movement of the DC-3 from the Museum site back to the FAA. FAA shall also complete and fund its reassembly upon its return to FAA. If both parties wish to renew the agreement, an updated Cooperative Agreement may be completed prior to expiration of the current Agreement.

SECTION THREE
MOVEMENT, REASSEMBLY, AND DISPLAY COSTS

Museum agrees to accept physical custody of the DC3, and FAA agrees to deliver and to reassemble the same, within 90 days after execution of this agreement. FAA will disassemble, pack, crate, handle, transport, and any other actions incidental to the movement of the DC-3 from its present location temporary storage at the existing museum on ~~1001~~ 10001 American Drive, Amarillo, Texas and will pay all costs associated with its movement, reassembly, and display setup, provided said costs do not exceed the sum of $20,000. Museum will pay any movement, reassembly, and display setup costs that exceed the sum of $20,000. Museum will have the opportunity to review all costs involved if the sum exceeds $20,000 and will have the opportunity to seek donations to offset its responsibilities. FAA will be responsible for the storage and maintenance of the DC-3 pending its transportation to the Museum's temporary storage location. The Texas Air & Space Museum will be responsible for movement of the DC-3 to the permanent location in the museum facilities at Amarillo International Airport, 280 Airport Drive, Amarillo, Texas.

SECTION FOUR
DISPLAY OF AIRCRAFT

Museum agrees to place the DC-3 on exhibit within 180 days of accepting the physical custody of the DC-3. Museum will provide an adequate area to display the DC-3. The said temporary and permanent display area must be indoors. The DC-3 will be displayed with its existing FAA markings and in a manner which best promotes its historical and educational value.

SECTION FIVE
USE OF AIRCRAFT

Museum shall obtain no interest in the DC-3 by reason of this Agreement, and title shall remain vested in the FAA at all times.

Museum agrees to display the DC-3 in a careful and prudent manner. Museum agrees not to modify the DC-3 in any way which would alter the original form, design, or the historical significance, without prior permission of FAA.

Museum agrees not to use the DC-3 as security for any loan, not to sell, lease, rent, lend, or exchange the property for monetary gain or otherwise under any circumstances without prior written approval of FAA.

SECTION SIX
MAINTENANCE

FAA will, in consultation with the Museum, each year, identify the annual maintenance required to be completed on the DC-3 and will assume the responsibility for its completion. FAA will pay all annual maintenance costs for the aircraft while on static display at the Museum provided said costs do not exceed the sum of $5,000 annually. Museum will pay any maintenance costs that exceed the sum of $5,000 annually.

SECTION SEVEN
FUNDING OF MOVEMENT, RESASSEMBLY, SETUP DISPLAY, AND ANNUAL MAINTENANCE

Subject to the monetary limits set out in Section Three above, FAA will ensure that monies necessary to complete the proposed disassembly, packing, crating, handling, transporting, and other actions incidental to the movement, reassembly, and setup display of the DC-3 at the Museum, are available.

Subject to the monetary limits set out in Section Five above, FAA will ensure monies are available for annual inspections and maintenance of the DC-3 for the term of this Agreement.

SECTION EIGHT
FUDING OF MOVEMENT FROM MUSEUM TO FAA

At the termination of this Agreement, FAA agrees to fund and complete the disassembly, packing, crating, handling, transporting, and other actions incidental to the movement of the DC-3 to FAA.

SECTION NINE
RISK OF LOSS

Museum will use its best efforts to ensure the DC-3 is protected from abuse by the general public while on display and will make said aircraft available to FAA at the termination of this agreement, normal wear and tear accepted. However, FAA assumes all risk of loss for the aircraft while in the possession of Museum and will hold Museum harmless from liability for partial or total loss or destruction of the aircraft, other than Museum's gross and intentional negligence. Museum will hold FAA harmless for any loss to person or property or the aircraft, other than FAA's gross and intentional negligence.

SECTION TEN
APPLICABLE LAW

This Agreement shall be governed by the Laws of the United States of America and the State of ***Texas,*** where applicable.

SECTION ELEVEN
BINDING EFFECT

This agreement shall inure to the benefits of both parties and shall be binding on the representatives, agents, trustees, successors and assigns of the respective parties.

IN WITNESS WHEREOF, the undersigned have set their hands and seals the year first written above.

Department of Transportation
Federal Aviation Administration
Mike Monroney Aeronautical Center

Edward W. Lucke

Edward W. Lucke, Jr.
Director, Flight Inspection Services
AJW-3, ARB Room 200
6500 S. MacArthur Blvd.
Oklahoma City, OK 73169

24 JAN 2014
Date

Texas Air & Space Museum
Amarillo, Texas

Ron Fernuik

Ron Fernuik
President
Texas Air and Space Museum, Inc.
10001 American Drive, Amarillo, Texas 79111
P.O. Box 31535, Amarillo, Texas 79120-1535

03 FEBRUARY 2014
Date