Presented at the Conference of Historic Aviation Writers XI
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Business Productivity and History of Three Standard Air Lines Transport Aircraft: Davis-Monthan Aviation Field December 11, 1927-March 4, 1930

By G.W. Hyatt

Davis-Monthan Aviation Field in the early 1920s. View to the southeast. The current Davis-Monthan Air Force Base is contiguous at the top of the photo. Note aircraft aligned at lower right. *Photo from Reinhold, 1982, p. 75.*

Davis-Monthan Aviation Field in 1939. View to the north northeast. The hangar building facing the paved ramp was built in 1932. Remnants of the asphalt runway are visible today. Note "spots" at photo center where aircraft were parked. *Photo from Bednarek, 2001, p. 95.*

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Introduction

Findings about Standard Air Lines operations described in this paper come mainly from the vintage transient register of the Davis-Monthan Aviation Field, Tucson, AZ. Founded by the city of Tucson in 1919 (*Bednarek, 2001, p. 33*), the Field was the first municipal aviation field in the United States. The Field register is a large, leather-bound tome, which lived for over a decade in the terminal buildings visible in the photographs on the cover page of this manuscript. It now lives protected in a glass case in the Operations Office of the contemporary Davis-Monthan Air Force Base.

The Davis-Monthan Aviation Field transient register is a robust United States regional aviation artifact. Meticulously handwritten are the historically significant pilot names and their airplanes, tens of thousands of destinations, dates, passengers and events. To this day, many of the pilots, passengers and aircraft have achieved continuing national and global importance and impact.

The author constructed a computerized database from all the information in the register. The register is only 218 pages. Yet, it reports 3,691 landings between February 6, 1925 and November 26, 1936. The database contains 110,780 elements, which can be sorted, filtered and queried. Manipulating the database compels questions, and enables answers, about the people, aircraft, places and events recorded in the log.

Specific to this paper, several early air transport companies frequented the Field. Among them American Airlines (the inaugural sleeper service landed there), Scenic Airways (later Grand Canyon Airlines), and Standard Air Lines.

How is the Davis-Monthan Aviation Field transient register used to analyze Golden Age commercial transport activity? Although several Standard Air Lines aircraft landed at the Davis-Monthan Aviation Field, three of them (NC3317, NC8011, NC9724, all single-engine Fokkers) landed with sufficient frequency to provide meaningful samples of passenger loadings and pilot duty cycles. Queries of the database revealed the values used in calculations and graphs.

Passenger loadings, along with data about scheduled routes, aircraft speeds, and recorded arrival and departure times, are used to derive three measures of economic performance. First, **load factor,** is a measure of percentage of seats occupied. Second, **seat-miles**, is measured from estimates of aircraft speed, multiplied times estimated hours of use, times number of passengers carried. This figure, generally, is annualized. Third, **punctuality**,

a factor not necessarily connected to passenger load, but with economic impact all the same, is considered.

A unique feature of the log is that pilots of transport aircraft routinely listed the numbers, as well as names, of their passengers during their scheduled stops at Tucson. Since the early airlines did not retain this kind of information in formal records, the transient register enables us uniquely to know passenger manifests, and database analysis allows us to reconstruct approximate economic efficiencies for these airlines that are available nowhere else.

Standard Air Lines

Standard Air Lines began in Los Angeles, CA as a subsidiary of Aero Corporation of California, which was formed in 1926 by William John "Jack" Frye and two associates. "Aero", as it was called, was a distributor for Eaglerock airplanes, with sales of sixty planes in the first year of operation (*Reinhold, p. 152*). Aero also offered flight training and charter flights. During the summer of 1927, Frye made several goodwill flights to Phoenix and Tucson, assessing the need for aerial passenger and freight services. In September, Aero acquired a freight contract with the American Express Company, and Frye made his final survey flight on November 15. On November 28, 1927, Standard Air Lines began operations as Arizona's first inter- and intrastate scheduled air carrier (*www.geocities.com/nas51st/Jack-Frye.html*).

Standard Air Lines remained in business for about 30 months. Jack Frye, as well as being the founder of the company, was also a pilot of the line (see tables, below). Because of the Great Depression, Frye and his associates sold the airline to Western Air Express in March 1930. Concomitant with the sale, Frye joined Western Air Express on the Board of Directors and as Chief of Operations.

Standard Air Lines began business as a three-times a week passenger and express service between Los Angeles, Phoenix and Tucson. The initial fleet (**Figure 1**) consisted of two Fokker airplanes (NC7713 and NC8011) and seven OX5-powered Eaglerock airplanes. Standard carried 61 passengers during it first month of operations in December 1927 (*Aircraft Yearbook, 1928, p. 85*). According to the register, only four of these passengers were recorded at Tucson that month.

INSERT FIGURE 1

Initially, aircraft left Los Angeles on Monday, Wednesday and Friday at 10:00 AM Pacific Time (PT), arrived in Phoenix at 3:30 PM Mountain Time (MT), and at Tucson at 5:00 PM MT. For the return trip, aircraft left Tucson at 8:00 AM MT on Tuesday, Thursday and Saturday, arriving at Phoenix at 9:25 AM MT and Los Angeles at 1:30 PM PT.

Passenger fares were, for Los Angeles to Phoenix $47.50; Los Angeles to Tucson $60.00; Phoenix to Tucson $12.50. Express rates per pound were, for Los Angeles to Phoenix

$1.30; Los Angeles to Tucson $1.60; Phoenix to Tucson $.50 (*Aviation Yearbook, 1928 p. 85*).

Late in its life, Standard Air Lines extended its range to other cities. Its western terminus was Los Angeles, and it ultimately served Phoenix, Tucson, and Douglas, AZ, with El Paso, TX as its eastern terminus. Route mileages are in Table 1.

On August 4, 1929, eight months before its demise, Standard Air Lines became the western link in an air-rail transcontinental schedule. Passengers traveled from New York to St. Louis by rail, connected with a Southwest Air Fast Express Ford Trimotor to Sweetwater, TX, then took an overnight train, "The Texan", to El Paso. In El Paso, passengers connected with Standard Air Lines for Los Angeles. Under ideal conditions, the coast-to-coast voyage took 43 hours and 40 minutes, a savings of about 16 hours over the all-train routing.

The airline was described in advertising brochures as "The Fair Weather Route", with the pleasant desert terrain beneath used as a marketing point. Advertised flight duration from Los Angeles to El Paso was 8 hours and 45 minutes (this timing is used to calculate **seat-miles**, in the Results section, below).

Table 1: **Service Legs for "The Fair Weather Route"**

Leg	Distance (Statute Miles/Nautical Miles)
Los Angeles to Phoenix	373/324
Phoenix to Tucson	112/97
Tucson to Douglas	89/77
Douglas to El Paso	191/166
Total Miles	765/664

Aircraft Information

The three aircraft considered in this paper are a Fokker Universal and two Super Universals. The Fokker Universal was certificated in June 1927 (A.T.C. #9). The pilot sat in an open cockpit forward of the wing's leading edge. The 765 miles from Los Angeles to El Paso must have been a refreshing trip for the pilot. The enclosed cabin below and to the rear of the pilot held 4-6 passengers. It had a service ceiling of 12,000 feet and a cruise speed of 105 statute miles per hour (SMPH). They sold new at the factory in 1927 for $14,200 (*Juptner, vol. 1, p. 33*).

The Super Universal was certificated in July 1928 (A.T.C. #52). The cockpit and cabin were enclosed, and there was room for seven passengers. It had a service ceiling of 18,000 feet and a cruise speed of 118 SMPH. They sold new at the factory in 1928 for $17,500 (*Juptner, vol. 1, p. 137*).

Analysis of Register Data

NC3317

Fokker Universal NC3317 appears in the Field register 97 times between December 16, 1927 and March 4, 1930. Nine pilots, eight of them Standard Air Lines pilots, as shown in Table 2, flew it.

Table 2: **Pilots of NC3317**

Pilot Name	Number of Flights	Inclusive Dates
Willey, Lee	36	12/23/27-10/9/28
Russell, Hap	34	7/11/28-10/3/28
Widmer, Chas. E.	14	5/2/28-6/13/28
Richter, Paul E., Jr.	6	12/21/27-6/30/28
Brooks, Eddie	2	9/20/28-6/7/29
Smedley, Harry*	2	3/1/30-3/4/30
Kiley, Lee	1	12/16/27
Frye, Jack	1	12/28/27
Talbot, Jay	1	12/31/29
TOTAL FLIGHTS	97	

*May not be a Standard Air Lines pilot.

NC3317 flew the longest for the airline (December 1927 to December 1928), and was the poster aircraft (**Figure 2**) for a contemporary advertisement. According to the transient register, **punctuality** for this airplane over 97 flights to the Field was exemplary. For the year of the airplane's service life the majority of flights to Tucson landed at 5:00 PM, or slightly later, and departed the next day for Phoenix and Los Angeles between 7:00 and 8:00 AM.

INSERT FIGURE 2

The graph in **Figure 3**, derived from the register database, shows passenger carriage by NC3317. Only one of the flights carried the full six-passenger load, and 22 flights were empty. Thus, the overall **load factor** (number of seats filled, 173, vs. the number that could be filled, 582) was about 30%.

INSERT FIGURE 3

Annualized **seat-miles** for NC3317 are determined from the data to be 158,944 (173 passengers X 105 MPH X 8.75 hours LA to El Paso/about 1 year).

Note: one year was chosen as the period, since only four flights occurred in 1929 and 1930: the rest occurring between December, 1927 and October, 1928.

NC8011

Fokker Super Universal NC8011 (**Figure 4**) appears in the register 81 times between September 28, 1928 and September 6, 1929. It was flown by seven pilots, as shown in Table 3.

INSERT FIGURE 4

Table 3: **Pilots of NC8011**

Pilot Name	Number of Flights	Inclusive Dates
Russell, Hap	31	10/5/28-4/17/29
Kelsey, Harold	27	12/31/28-3/31/29
Kingsley, Wm.	12	2/23/29-4/8/29
Kinsley, Wm.	6	2/4/29-2/15/29
Richter, Paul E., Jr.	2	10/26/28-10/29/28
Frye, Jack	2	9/29/28-9/30/28
Hershey*	1	9/6/29
TOTAL FLIGHTS	81	

*Probably not a Standard Air Lines pilot.

From September 1928 to early February 1929. NC8011 landed within 30 minutes of its scheduled times in a little over half of its 81 flights. Interestingly, the worst westbound time was an hour overdue. Pilot Kinsley noted simply in the remarks column of the register, "Headwinds", a terse observation to which all westbound pilots can relate!

In February 1929, the schedule changed. According to a route itinerary of the same year, Standard Air Lines' service through Tucson specified landings at 2:30 PM east bound, and at 11:50 AM west bound. Logged arrival and departure times in the transient register mirror this change for NC8011, which continued its moderate level of punctuality.

INSERT FIGURE 5

The graph in **Figure 5** shows loading schedules for NC8011. Only two of the flights carried the full seven-passenger load, and 15 flights were empty. The **load factor** was about 38%. **Seat-miles** for NC8011 are 221,988 (215 passengers X 118 MPH X 8.75 hours LA to El Paso/about 1 year), slightly more efficient than NC3317.

NC9724

Figure 6 shows Standard Air Lines Super Universal NC9724 on the ground at Tucson (exact date unknown). Displayed in front of the airplane is the first United Air Express

INSERT FIGURE 6

merchandise from Los Angeles to reach Tucson for Albert Steinfeld & Co. This photo was donated to the Arizona Historical Society in 1969 by Mary Hughston, who was the advertising manager for Albert Steinfeld & Co. She identified Jack Frye as the man in the suit to the left of the merchandise. Comparing the fees for freight listed above, if the displayed merchandise weighed 50-75 lbs., then the freight bill for this flight was around $100-$150. It cost more to ship freight than it did to fly a person. In fact, during the late 1920s, chief revenue for airlines came from postal and cargo contracts that paid by weight (Bilstein, 2001, p. 56). It was not unusual for passengers to have to sign a proviso that allowed the airline to dump them anywhere along the line if the company could pick up a more cost-effective cargo of mail. There is no indication that Standard Air Lines adhered to this practice!

NC9724 appears in the register 57 times between January 24, 1929 and September 6, 1929. Six pilots, as shown in Table 4, flew it. The airplane is noted as being under "Ferry" on January 14, 1929, piloted by Hap Russell from New York (probably from the Fokker factory in New Jersey).

Table 4: **Pilots of NC9724**

Pilot	NameNumber of Flights	Inclusive Dates
Kelsey, Harold	21	1/16/29-3/28/29
Kingsley, Wm.	18	3/5/29-4/1/29
Russell, Hap	10	1/14/29-3/24/29
Kinsley, Wm.	5	2/4/29-2/9/29
Frye, Jack	2	1/24/29-2/18/29
McGehee*	1	9/6/29
TOTAL FLIGHTS	57	

*Probably not a Standard Air Lines pilot.

Punctuality for NC9724 was about 67%, with 38 out of 57 flights landing within 15 minutes of scheduled time.

The graph in **Figure 7** shows loading schedules for NC9724. None of the flights carried the full seven-passenger load, and 10 flights were empty. The **load factor** was about 29%.

INSERT FIGURE 7

Seat-miles for NC9724 are 170,363 (165 passengers X 118 MPH X 8.75 hours LA to El Paso/about 1 year).

Pilot Duty Cycles

Figure 8 graphs the duty cycles of all the pilots during the time they flew for Standard Air Lines. Over the short period it was in business, no fewer than 14 separate pilots flew the three Fokkers (Tables 2-4). Hap Russell was by far the busiest pilot, with 75 flights

logged in the three aircraft (32% of all flights). He is also the only pilot, besides Jack Frye, to fly all three airplanes.

INSERT FIGURE 8

Besides these three airplanes, Russell landed at the Davis-Monthan Airfield 6 additional times flying two different Fokker F-VII's, and two different F-10A trimotors. One F-VII, NC7888, was a Standard Air Lines airplane. It is not clear if the others were with Standard Air Lines, but the dates roughly coincide with the dates he landed shown in Tables 2-4. Regardless, Russell's passenger loads on these aircraft (a total of just 20 passengers over the six flights) were too small to allow meaningful comparisons with the other three airplanes he flew. He also landed twice in aircraft he did not identify. These flights are not included in the calculations.

Airplane Duty Cycles

Figure 9 shows the Standard Air Lines duty cycles for our three Fokkers. Like many of the aircraft that landed at the Davis-Monthan Aviation Field during the decade of the register, the three Fokkers worked hard and died young. Aircraft records at the National Air and Space Museum (NASM) for Golden Age aircraft registration numbers are rife with examples of accidents, aggressive airframe modifications that pushed the boundaries of airworthiness, stressful work duties and harrowing record attempts. Occasionally, chains of custody were long and tortuous, with airplane ownership transiting back and forth across the country, and alternating between private and commercial duties.

Specific to our aircraft, Fokker Universal NC3317 (C/N 426) was manufactured in October, 1927 by Atlantic Aircraft Corporation, Teterboro Airport, Hasbrouck Hgts., N.J. It was fitted with a Wright J-5 engine (S/N 8096). It sold on November 23, 1927 to Aero Corporation of California, the parent of Standard Air Lines.

NC3317 lived for six years and one month. Between November 1927 and January 1930, NC3317 changed hands five times. On July 9, 1930, with the Great Depression on the upswing, it was repossessed by the California Standard Finance Corporation and sold again on the same day to Aero Corporation of California with the, "wing being in poor condition." Standard Air Lines had been taken over by Western Air Express the previous May.

INSERT FIGURE 9

After its airline duties, NC3317 went through three private owners. Then, on July 14, 1932 it was purchased by J. Karl Williams of Norwalk, CA, reregistered as NR3317, and used September 28-30, 1932 for a landplane endurance record (with air-to-air refueling) by Evelyn "Bobbi" Trout, herself an aviation pioneer (*Veca & Mazzio, p. 233*). She also signed the Davis-Monthan Aviation Field register in 1929.

Named the "Spirit of 76" for the record attempt, Bobbi Trout and Fred Murillo departed Grand Central Air Terminal, Glendale, CA at 2:48 PM and flew NR3317 for 40 hours

before being forced down by a damaged propeller. Finally, on February 7, 1933 the Fokker sold to James R. Hadley of Los Angeles. It was wrecked in Los Angeles on November 17, 1933 (NASM records).

Super Universal NC8011 (C/N 812) was manufactured in July 1928 by Atlantic Aircraft, and fitted with a Pratt & Whitney Wasp engine (S/N 836). It sold to Aero Corporation of California on September 28, 1928. Compared to NC7713, NC8011 lived a short and mundane five years and four months. After its sale to Aero Corporation of California, it transferred on February 4, 1929 to Standard Air Lines. On August 31, 1929 it was sold to Mid-Continent Air Express, Inc. It suffered an accident in El Paso on November 29, 1931 and was repaired and resold to Western Air Express, Inc. on April 16, 1932. On December 3, 1933, it suffered another accident in Las Vegas, NM and was "washed out" (NASM records).

NC9724, by far, led the longest life of the three Fokkers: just shy of 15 years. Fokker Aircraft Corporation of America manufactured Super Universal NC9724 in December 1928. It was fitted with a Pratt & Whitney Wasp engine (S/N 1014) of 400 HP. It sold to Aero Corporation of California on January 1, 1929. It went through a series of sales between Aero Corporation of California, Mid-Continent Air Express and Western Air Express in the early 1930's. Between 1934 and 1942, it passed to five private owners, with at least one engine change (to another Wasp, S/N 1009) in September 1934.

Finally, it sold to the War Department, Corps of Engineers, "Sometime in 1942/43…for operation outside the Continental Limits of the U.S." It did not get to see foreign lands, because on October 10, 1943 it burned beyond repair in a hangar fire at Van Nuys, CA (NASM records).

The Pilots

Figure 10 shows three of our pilots. Second from the left is Jack Frye, barely past 21 years old. Fifth and sixth from the left are Lee Willey and Paul Richter, Jr., respectively. As testimony to the growing reputations of Jack Frye and Paul Richter, both are cited in "The Blue Book of Aviation" (*Hoagland, 1932*).

INSERT FIGURE 10

Jack Frye was born on March 18, 1904 in Texas. In 1921, he enlisted in the U.S. Army and was discharged the following year as a corporal. He joined the reserves, and in 1925 was commissioned as 2nd lieutenant in the Air Corps Reserve. He earned transport license #933, and held pilot's license #1 in the state of Arizona. He was at the time probably the youngest aviation corporation executive. His experience, however, belied his age. In his flying career to-date, he flew more than 60 types of aircraft in the United States, Canada and Mexico. He made over a dozen transcontinental flights. He was also an airframe and engine mechanic.

After Standard Air Lines was taken over, Frye, along with Charles Lindbergh and

some others, were tasked to evaluate and order a modern airliner according to Transcontinental and Western Air's (eventually TWA) specifications. This led to the prototype DC-1 produced by Douglas. At the end of 1934, Frye was elected president of TWA, and Paul Richter was made VP Operations.

Although WWII intervened, Frye worked with Howard Hughes and Lockheed to produce the 300 MPH Constellation. On April 17, 1944, he and Hughes set a new cross-country speed record of six hours and 58 minutes in the Constellation. Soon after, Frye and Richter resigned from TWA and Frye became president of General Aniline and Film Corporation. He resigned from General Aniline in 1955 to form a new aircraft manufacturing company to produce a STOL airframe called the Safari, based on the Helio Courier design. Ironically, Jack Frye died in 1959 in a two-car accident at the intersection of Palo Verde Blvd. and Ajo Way in Tucson, very near the entrance to the old airport. He was age 54 (*Tucson Star Citizen, 1959*).

Paul E. Richter, Jr. served in WWI as 2nd Lieutenant, Field Artillery. At the end of the war, he operated a ranch in Colorado until 1924 when he took up flying and moved to California. He became a commercial pilot at Burdette Airport in Los Angeles and became associated with Jack Frye in 1925 when they teamed up and bought the flight training operation there. When they organized Aero Corporation of California in 1926, Richter was general manager of the company until it and Standard Air Lines sold. He then joined Transcontinental & Western Air as Superintendent of the Western Region (San Francisco to Kansas City). He went on to work with Jack Frye at TWA. Born in Denver, CO on January 20, 1896, he died May 15, 1949 of a cerebral hemorrhage in Berkeley, CA at age 53 (*http://www.msu.edu/~daggy/cop/bkofdead/obits-3.htm*).

INSERT FIGURE 11

The other pilots are less easy to research. All the author knows of Lee L. Willey is that he gave his address for pilot license purposes as 1447 W. 103rd St., Los Angeles (*Aircraft Year Book, 1928, p. 511*). Pilot William Kingsley (**Figure 11**) piloted the three Fokkers to Davis-Monthan 31 times in 1929. Earlier, in May 1928, he served as pilot for the first photographic survey of Arizona sponsored by the *Arizona Republican* newspaper. He and photographer E.D. Newcomer (with camera) spent two weeks and flew 3,160 miles over the state photographing mining complexes, industrial plants, resorts, ranches, dams and airports. In mid-June, they landed at Phoenix with 203 pictures of "remarkable quality" (*Reinhold, p. 116*).

The author found no background on the lives of the other pilots who flew the three Fokkers. Curiously, their names were conspicuously absent from the list of Licensed Pilots in the Aircraft Year Book (*1928, pp. 491-512*). One resource contacted by the author (*Miller, 2003, personal communication*) was a signer of the register, and, although a transport pilot later in his aviation career, was familiar only with Jack Frye. John M. Miller landed at Tucson on May 28 and June 21, 1931 while on his way to becoming the first person to fly an autogiro (Pitcairn NC 10781) roundtrip across the continent. His tales of personal flying experiences during the Golden Age are heartwarming and

harrowing (*Miller, 2002*). Refer to the text of his 2003 email in the References. It is a pleasure and an inspiration to know such a warm and unique pilot, who is so willing to share his expertise and observations.

Discussion

The transport activity described in this paper was at the leading edge of an international transition that saw commercial air travel become more cost-effective. Indeed, the growth in air transport miles for the period, just in the United States, spanned three orders of magnitude. For 1927, aerial air transport miles totaled 3.9 million (*Aircraft Yearbook, 1928, p. 421*). In 1932 the figure was 95 million, in 1935 270 million, and 677 million in 1939 (*Bilstein, 2001, p. 104*).

OTHER EARLY TRANSPORT OPERATORS Two additional air transport operators landed at the Davis-Monthan Field, and their passage is recorded in the register. From the database, Scenic Airways' Stinson SM-1 NC1517, flown by J. Parker van Zandt, landed ten times carrying 40 passengers between November 1927 and March 1928. Scenic Airways flew its first paying sightseers over the Grand Canyon on October 4, 1927. Later, in 1928, Van Zandt helped create Sky Harbor Airport in Phoenix as a winter base for Scenic Airways. Scenic Airways evolved into the contemporary Grand Canyon Airlines. Van Zandt began an industry that now carries nearly 800,000 visitors a year over the Grand Canyon.

WHAT'S IN A NUMBER? Clearly, the flights and passenger numbers entered in the Davis-Monthan transient register by Standard Air Lines pilots represent a fraction of the total service extended over the life of the airline's business tenure. For example, in 1928, Standard Air Lines is cited as carrying 1,003 passengers and 2,000 pounds of express in *four* airplanes during 154,000 miles of flying (*Aircraft Yearbook, 1929, p. 33*). Compare this "official" passenger count with the counts from the register shown in Figures 3, 5 and 7 for the three Fokkers.

It is not clear what the fourth airplane was (it could have been the Fokker F-VII, NC7888, flown to Tucson four times in January 1929 by pilot Russell, carrying 14 passengers). What is clear is that logged in the register are 553 passengers, about half of the "official" sum. At 765 miles one way from Los Angeles to El Paso (Table 1), that turns out to be (154,000÷765) about 200 trips for 1928, or about 50 trips per airplane (including the fourth airplane). This is in the ballpark, considering the 235 visits recorded by the three Fokkers alone in the register over the entire period the line was in business.

Indeed, in aggregate, assuming each of the 235 trips recorded was over the complete LA to El Paso route, the three Standard Air Lines Fokkers flew 179,504 miles (Table 5). Given the short times each airplane was on the line (Tables 2-4), they show up as real workhorses, flown reliably by their pilots, during all seasons, through the period they were in service.

"IDEAL" SEAT-MILES? What if all seats were filled every trip? Table 5 calculates "ideal" seat-miles for the three Fokkers. Were all seats filled, seat-miles would be 1,532,108. Actual total seat-miles for the three Fokkers is 551,295 (35.9% of the "ideal" seat-miles). This calculation for Standard Air Lines transports compares favorably to the value calculated for trimotor aircraft by Davies (*2000*) for commercial air transport during the late 1920's. His figure for trimotor aircraft, which carried roughly double the number of passengers, is about 1,400,000 seat-miles annually. His excellent graph (Figure 14 in his manuscript) compares seat-miles through the years for several categories of transport aircraft, including contemporary jets.

Table 5: **Trip Data for "Ideal" Seat-Miles**

Aircraft	Airspeed MPH	Number of Trips	Total Miles @ 765/Trip	Total Hours @ 8.75/Trip	"Ideal" Seat Miles*
NC3317	105	97	74,204	848.75	534,713
NC8011	118	81	61,965	708.75	585,428
NC9724	118	57	43,605	498.75	411,968
Totals		235	179,504	2056.75	1,532,108

*All seats filled, every trip. Seat-miles=aircraft speed x usage hours x number of passengers (6 passengers for NC3317; 7 for the other two).

If one prefers the glass half full, the raw calculations for **load factor** and **seat miles**, based upon the actual passenger data in the register, are probably low estimators. The reason for this, besides the fact that probably not all flights are recorded in the register, is that passengers on board at Tucson are just snapshots of passengers that may or may not have been on board over the whole route. If, for example, a full load of passengers boarded at Los Angeles and half deplaned at Phoenix, only half a planeload would show up in the register at Tucson. Likewise, passengers may have boarded in Douglas on the way to El Paso who were not tallied on a trip eastbound through Tucson. Standard Air Lines' records for 1928 corroborate a glass half full.

If one prefers the glass half empty, then, regardless of the measure, with values of load factor and seat miles hovering hear 30%, it is little wonder many early commercial air transport companies, even before the Great Depression, and even with mail and freight contracts, went bankrupt, or were bought out and merged with other, larger concerns. Standard Air Lines appears to be one of them, with its 30-month business life ending early in the Great Depression with its purchase by Western Air Express.

ALTERNATIVE SEAT-MILES? Assuming the advertised (and probably wishful) 8.75-hour duration for each trip is accurate, then passengers traversed the desert at an average speed of 87 MPH. Perhaps it is better to calculate seat-miles using the actual miles flown, rather than usage hours. Table 6 demonstrates the difference. The measure for **seat-miles** then becomes 423,045, probably a more accurate estimate of productivity, given the relatively "harder" value of miles per trip. Thus, the glass empties further.

Table 6: **Alternative Seat-Miles Calculation**

Airplane	No. Trips	Mileage/Trip	No. Passengers	Miles Flown Seat-Miles
NC3317	97	765	173	132,345
NC8011	81	765	215	164,475
NC9724	57	765	165	126,225
Totals	235	765	553	423,045

Conclusions

Historian Henry Ladd Smith wrote in 1942, "It was fear that rode in the empty seats during the early days of air transportation." In the mid-1930's, flying on a commercial airliner was estimated to be eight times as hazardous as a trip by car (*cited by Blakey, 2003*).

Given the stresses and pressures on the pilots, the many discomforts placed upon the passengers, and the vagaries of official record keeping by a nascent industry, the estimates for load factors and seat-miles presented in this paper, carved from a dusty, natural artifact of Golden Age aviation, turn out to be accurate well within an order of magnitude.

The good news for Standard Air Lines was punctuality. Standard Air Lines aircraft routinely met their schedules in what was, by all measures, a harrowing transport environment. A Standard Air Lines pilot (unidentified) wrote about flying the, "…single-engine Super Universals. One pilot, seven seats but seldom seven passengers, no water, no toilet, no food, no nothin'." (*cited by Reinhold, 1982, p. 153*). During hot weather pilots spoke of, "wishing the early models over the trees." The punctuality reflected in the register under those conditions would be the envy of contemporary carriers.

Of the Standard Air Lines pilots, only Jack Frye and Paul Richter went on to bigger, better careers in the air transportation industry. The other pilots of the line, while intrepid pioneers in early air transport, left few marks other than their signatures in the Davis-Monthan Aviation Field register.

Finally, and most important, we must not lose track of the fact that the travelers and machines of the Davis-Monthan Aviation Field register were more than just aviators, passengers, and their airplanes going places. From our vantage point in the early 21st century, they were the people and technologies that ultimately moved the world in profound ways. We have yet to know where their 75-year legacy finally will take us. The author welcomes information on, especially photographs of, the airplanes, pilots and passengers described in this paper. This story is for John M. Miller.

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Miller, John M. 2003. Personal Communication via email.
"Dear Gary: I am sorry to say that I do not recognize a single name of the pilots you listed except Jack Frye. I did not know him, but he interviewed me for a job on TWA in 1936 and offered to put me on in May, but UAL offered to start me in April, so I took it. Later, Frye was killed in an automobile …. Too bad. He was an able man from all I have heard. I do not remember Standard Airline [sic] either. I'm really sorry that I am of no help to you. I was just not in airline operation at that time but totally absorbed with the autogiro development. All is well with me. I went to OSH for the 33rd time…. Flew my Bonanza. … Then to Kitty Hawk … on my 98th birthday, Dec.15 (3rd time in a row) for the Wright anniversary…. John".

Reinhold, Ruth. 1982. Sky Pioneering: Arizona in Aviation History. University of Arizona Press, Tucson, AZ. 232 pp.

Tucson Star Citizen. 1959. Jack Frye killed in auto accident. February 4.

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Website: www.geocities.com/nas51st/Jack-Frye.html.

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Website: http://home.att.net/~jbaugher.html

Website: www.msu.edu/~daggy/cop/bkofdead/obits-3.htm

Website: www.timetableimages.com

Conference of Historic Aviation Writers XI
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Figures and Captions for:

Business Productivity and History of Three Standard Air Lines Transport Aircraft: Davis-Monthan Aviation Field December 11, 1927-March 4, 1930

By G.W. Hyatt

Figure 1: Initial Standard Air Lines Fleet. One Fokker in livery, and at least six Eaglerocks, are visible in this photo taken in 1927 at Gardena, CA.
Photo from: www.geocities.com.

Figure 2: 1929 advertising poster featuring NC3317.
Image from: www.timetableimages.com

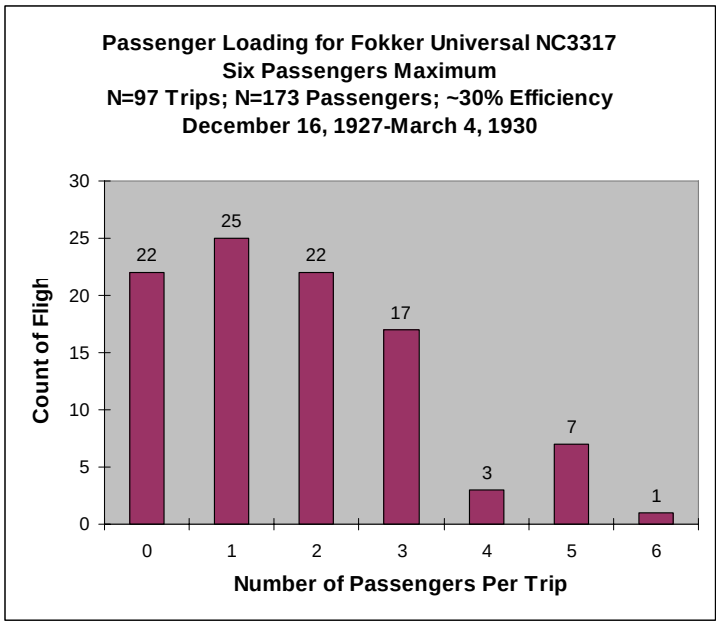

Figure 3: Passenger loads for NC3317. Author's analysis of register data.

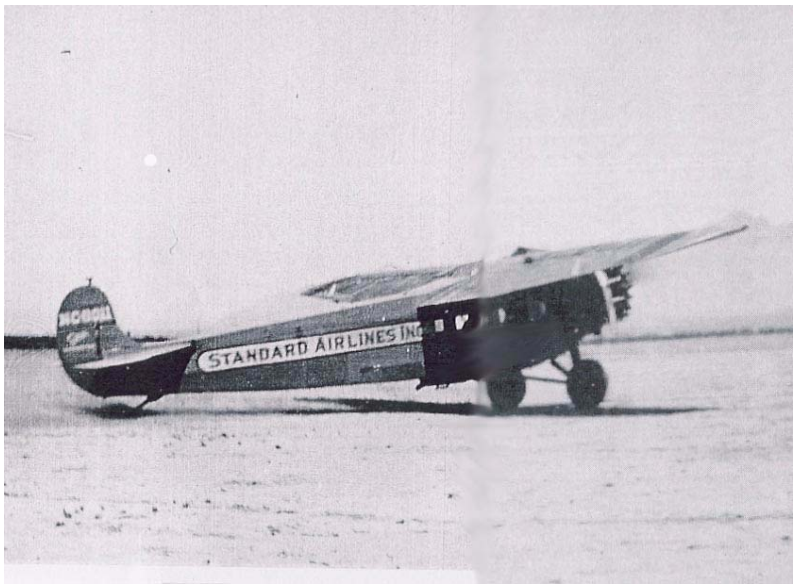

Figure 4: NC8011 at Tucson, exact date unknown. Photo from Arizona Historical Society.

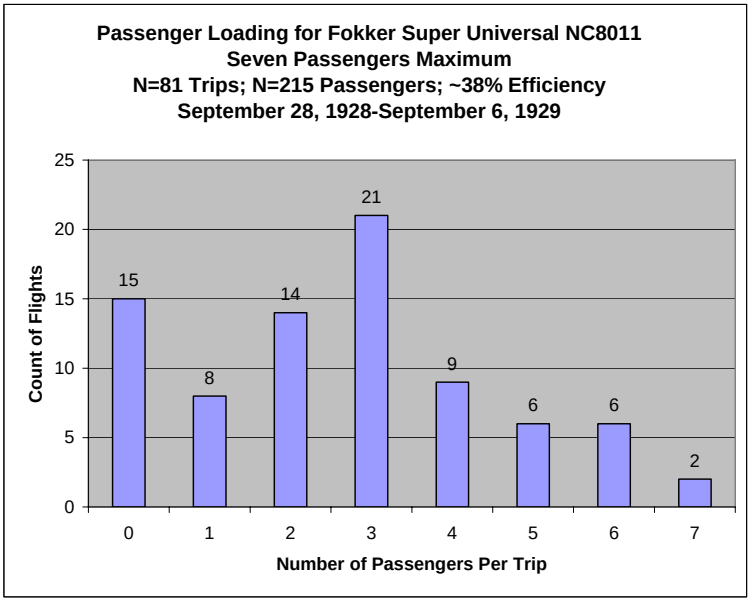

Figure 5: Passenger loading for NC8011. Author's analysis of register data.

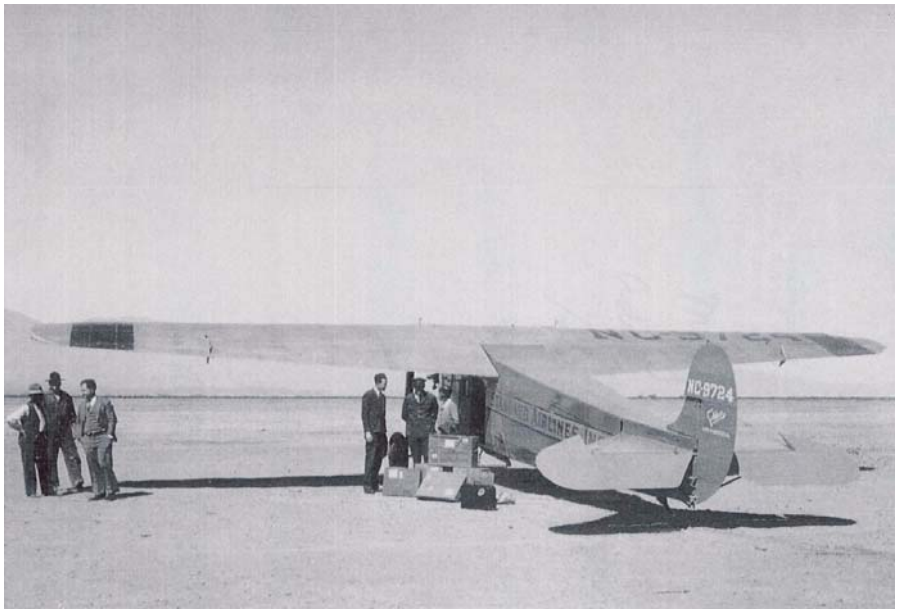

Figure 6: Fokker Super Universal NC9724. Photo from the Arizona Historical Society, Mary Hughston Collection. Another view, *probably* of NC9724, can be found in Juptner, vol. 1, p. 137.

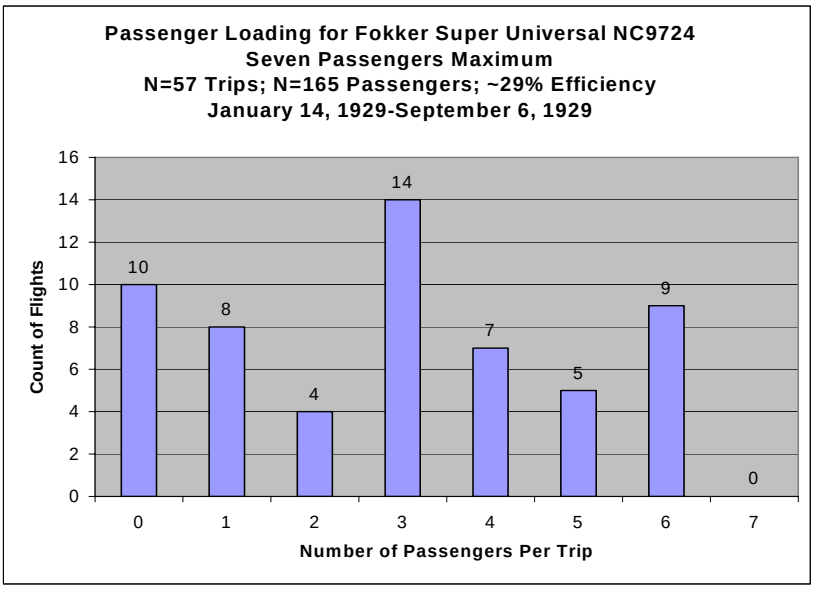

Figure 7: Passenger loading for NC9724. Author's analysis of register data.

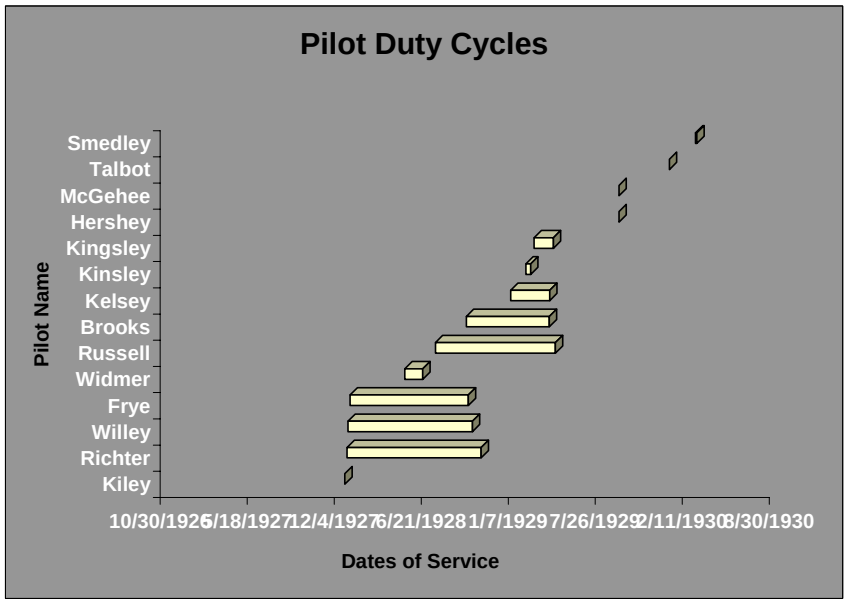

Figure 8: Distribution of flight operations, by pilot, for three Fokker aircraft. Author's analysis of register data.

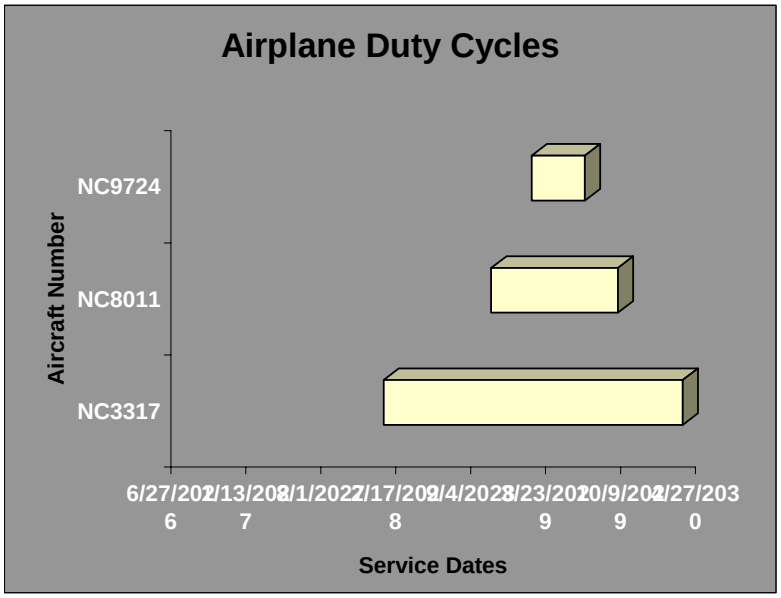

Figure 9: Distribution of aircraft duty for three Fokker aircraft. Author's analysis of register data.

Figure 10: This 1926 photograph, taken before Standard Air Lines started business, shows three of our Fokker pilots. From: www.geocities.com.

Figure 11: Pilot William Kingsley (left) and photographer E.D. Newcomer. Photo in Reinhold, p. 116.