

United States Department of the Interior
 National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

DRAFT

Historic name: Willows-Glenn County Airport

Other names/site number: _____

Name of related multiple property listing: N/A

(Enter "N/A" if property is not part of a multiple property listing)

2. Location

Street & number: 353 County Road G

City or town: Willows State: CA County: Glenn

Not For Publication: Vicinity:

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, 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 at the following level(s) of significance:

national statewide local

Applicable National Register Criteria:

A B C D

_____ Signature of certifying official/Title:	_____ Date
_____ State or Federal agency/bureau or Tribal Government	

In my opinion, the property <u>meets</u> does not meet the National Register criteria.	
_____ Signature of commenting official:	_____ Date
_____ Title: State or Federal agency/bureau or Tribal Government	

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

4. National Park Service Certification

I hereby certify that this property is:

- entered in the National Register
- determined eligible for the National Register
- determined not eligible for the National Register
- removed from the National Register
- other (explain:) _____

Signature of the Keeper

Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

- Private:
- Public – Local
- Public – State
- Public – Federal

Category of Property

(Check only **one** box.)

- Building(s)
- District
- Site
- Structure
- Object

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Number of Resources within Property

(Do not include previously listed resources in the count)

Contributing	Noncontributing	
<u>4</u>	<u>16</u>	buildings
<u>1</u>	<u> </u>	sites
<u>1</u>	<u>1</u>	structures
<u> </u>	<u> </u>	objects
<u>6</u>	<u>17</u>	Total

Number of contributing resources previously listed in the National Register 0

6. Function or Use

Historic Functions

(Enter categories from instructions.)

TRANSPORTATION: air-related

GOVERNMENT: fire station

Current Functions

(Enter categories from instructions.)

TRANSPORTATION: air-related

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

7. Description

Architectural Classification

(Enter categories from instructions.)

NO STYLE

EARLY MODERN

MID-20TH CENTURY

Materials: (enter categories from instructions.)

Principal exterior materials of the property: wood, steel

Narrative Description

(Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable. Begin with a **summary paragraph** that briefly describes the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Summary Paragraph

Willows-Glenn County Airport is a 320-acre general aviation airport on the western edge of the city of Willows, the Glenn County seat. The airport is located near the intersection of California State Route 162 and Interstate 5, known locally as Westside Highway. The district includes two runways, taxiways, hangars, aircraft parking areas, aircraft fueling area, a helicopter pad and vehicle roadways. Six contributing resources—four buildings, one site, and one structure—include three multi-plane hangars and the former Airport Administration Building, the paved flight apron, and a steel tower with rotating beacon. Seventeen noncontributing resources—sixteen buildings and one structure—include a restaurant, an irrigation district office, six aircraft hangars, two industrial buildings, two Glenn County agency offices, a tractor and agricultural equipment dealer, three agricultural equipment sheds and an aircraft fuel tank and pumps. The district retains all aspects of historic integrity.

Narrative Description

Setting

Willows-Glenn County Airport is a county-owned general aviation airport, used primarily by agricultural aviation aircraft that sow rice seed and dispense fertilizer and other agricultural products. Buildings on the northern and eastern sides of the airport serve other Glenn County

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

agencies, private businesses, and the Kanawha Water District Office. Nancy's Airport Café is located north of the aircraft parking area. The northern boundary of the airport is California State Route 162. The state highway right-of-way predates the airport. At the time of original construction there were few buildings in the area as it was approximately one mile from the urban area of Willows. In the early 1970s, Interstate 5 was built along the eastern edge of the airport, with a carve out of the northeastern portion of the airport property for the highway right-of-way. The intersection of a state highway and a major interstate highway brought restaurants, motels, gas stations, and other businesses. Development also took place westward from the older part of Willows so that the airport feels more a part of the town than when it was built. The southern and western neighbors remain as agricultural land. The businesses, both airport-related and non-related, on the airport property reflect the agricultural economy of the North Sacramento Valley. The Kanawha Water District office, an agricultural water supplier, is at the north end of the airport and the local John Deere tractor dealer is on the east side. Three agricultural aviation businesses occupy hangar space at the airport. These companies provide services, primarily to rice growers, the largest crop in the region. The Glenn County Mosquito Vector Control District operates from space at the airport as they mitigate the mosquito problem arising from the standing water in rice fields, canals, and ditches.

Individual Resource Descriptions

Progression of resources is from north to south and west to east. Contributing buildings and structures are followed by noncontributing resources; the contributing site listed last.

1. Steel Tower 1928

**One Contributing Structure
Photos 1-6**

The steel tower with lighted rotating beacon is located on the northern edge of the airport, adjacent to State Route 162. This 51' tower was erected by the U.S. Department of Commerce Aeronautics Bureau in 1928 when Willows-Glenn County Airport was built as an Intermediate Landing Field along the Seattle to Los Angeles Air Mail route.¹ The tower is one of the few surviving examples of the structures erected as part of the Federal Lighted Airway Beacon System, beginning in the mid-1920s, to support navigation beacons in the early days of contracted air mail routes.² At the time of construction, a rotating beacon was mounted atop the tower, along with a fixed flashing light, used to identify the tower. There is a yardarm on the east side of the tower for a windsock. The original rotating beacon has been updated to reflect the type of airport (public land airfield and military field). The tower was constructed by the International Derrick and Equipment Company of Columbus, OH (IDECO) and retains the original manufacturer's plaque on the west side of the standard 51' tower used throughout the United States. An original plaque from the Department of Commerce Aeronautics Branch is affixed to the north side of the tower. The shed and concrete directional arrow that originally accompanied the tower are gone. Originally painted in alternating aviation orange and aviation

¹ "Huge Beacon for Airport is Complete for Aviators." *The Morning Times and Red Bluff Sentinel*, 20 July 1928, 1.

² U.S. Centennial of Flight Commission,

https://web.archive.org/web/20070930032413/http://www.centennialofflight.gov/essay/Government_Role/navigation/POL13.htm (accessed September 15, 2021).

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

white sections, the entire structure is painted pink. The base of the tower is approximately 6' by 6' wide and 51' high.

**2. Fifteen-plane Hangar
1947**

**One Contributing Building
Photo 7**

This fifteen-plane interlocking-T hangar was the first construction at the airport after the U.S. Army Air Forces returned the airport in 1945 to Glenn County.³ The hangar is constructed of a wood frame covered by corrugated steel panels forming the walls and roof. The floor is a concrete pad at grade level. Each hangar has two sliding doors, made of the same materials, which open to either side, forming an opening in which to back a small airplane into the hangar. Interior walls are plywood. The hangar is oriented north-south, almost parallel with the main runway. Eight of the hangars face west and seven face east. There is no known record of the architect or builder. The building retains its original materials and there are no apparent alterations from the original construction. The building is approximately 442' long by 45' wide.

**3. Fifteen-plane Hangar
1952**

**One Contributing Building
Photos 8-11**

This building, constructed in 1952, is almost identical to the 1947 hangar except for a small office at each end of the building. The hangar is constructed of a wood frame covered by corrugated steel panels forming the walls and roof. The floor is a concrete pad at grade level. Each hangar has two sliding doors, made of the same materials, which open to either side, forming an opening in which to back a small airplane into the hangar. Interior walls are plywood. The hangar is oriented north-south, parallel to the 1947 hangar. Eight of the hangars face west and seven face east. There is no known record of the architect or builder. The building retains its original materials and there are no apparent alterations from the original construction. The building is approximately 442' long by 45' wide. The most northerly hangar facing east was occupied by Harold Hendrickson when the Mendocino Air Tanker Squad (MATS) was formed in 1956. Hendrickson had an existing agricultural aviation services business and was an original MATS pilot. Frank Prentice, another original MATS pilot, leased the east-facing hangar next to Hendrickson's. Gary Hendrickson, Hal's son, also a former aerial tanker pilot, still owns the aviation service that occupies the same hangar and adjacent office. The 1952 hangar is east of the 1947 building. There are no known records listing the architect or builder.

**4. Six-plane Hangar
Circa 1960**

**One Contributing Building
Photo 12**

Constructed sometime after the 1952 hangar, there is no known record of the exact date. The six-plane, interlocking-T building is similar in design and construction to the 1947 and 1952 hangars except for deeper eaves and a more modern sliding door design. The hangar is constructed of a wood frame covered by corrugated steel panels forming the walls and roof. The floor is a

³ "15-Plane Hangar Being Built at Willows Port," *Chico Record*, 16 January 1947, 5.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

concrete pad at grade level. Each hangar has three overlapping sliding doors, made of the same materials, which open wide enough to back a small airplane into the hangar. Interior walls are plywood. The hangar is oriented north-south, parallel to the 1952 hangar. Six of the hangars face west and six face east. There is no known record of the architect or builder. The building retains its original materials and there are no apparent alterations from the original construction. The building is approximately 200' long by 45' wide. The hangar is to the east of the 1952 hangar.

5. Former Airport Administration Building **One Contributing Building**
1952 **Photo 13**

The former Airport Administration Building was built in 1952, south of the fifteen-plane hangar built the same year.⁴ The Modern-style one-story building is constructed of wood and stucco built on a concrete pad. The peaked roof covered with composite shingles is not original, although there is no known record of alterations. There is also no known record of the architect or builder. The building has served more than one purpose including as the Glenn County Animal Shelter as evidenced by the concrete pad on the south side of the building that was the location of the dog runs. The building is vacant. The building is 65' wide and 36' deep.

6. Nancy's Airport Café **One Noncontributing Building**
Circa 1982 **Photo 14**

This one-story Modern-style building houses the fly-in restaurant popular with pilots, passing travelers, and the local population. The building is one-story wood frame with walls of wood siding and a peaked composite roof. The L-shaped building is 90' wide and 72' deep. The resource post-dates the period of significance.

7. Mann & Sons Hangar **One Noncontributing Building**
Circa 1985 **Photo 15**

This Modern-style steel industrial building serves as the hangar and offices for the Mann & Sons Ag Flying Service, one of three agricultural (ag) flying services based at Willows-Glenn County Airport. The building is a one-story industrial building with a steel frame, wall and roof. There are a series of steel sliding doors on the east side which open to allow access for aircraft. It is 128' wide by 50' deep. The resource post-dates the period of significance.

8. Regenal Michaud Hangar **One Noncontributing Building**
Circa 1985 **Photo 16**

This Modern-style steel industrial building serves as the hangar and offices for Regenal Michaud Aviation, a multi-generational agricultural flying service. The building is a one-story industrial building with a steel frame, wall and roof. There are a series of steel sliding doors on

⁴ "Sheriff's Unit Will Play Host." *Sacramento Bee*, 5 June 1952, 8.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

both the east and west sides which open to allow access for aircraft. It is a square building with each side being 106' long. The resource post-dates the period of significance.

9. Fuel Station **One Noncontributing Structure**
Unknown **Photo 17**

This structure consists of an above-ground fuel storage tank and card-lock pump. The area dedicated to fueling is 54' wide and 75' deep. The resource was not present during the period of significance.

10-13. Individual Hangars **Four Noncontributing Buildings**
Unknown **Photo 12**

Four individual T-shaped hangars are grouped together just south of the 1960s six-plane hangar (Resource #4). Each hangar is constructed of steel walls and roofs and built on a concrete pad at grade level. The four hangars together are 135' wide and each is 45' deep. The resources were not present during the period of significance.

14. Kanawha Water District Office **One Noncontributing Building**
Unknown

This is a one-story Modern style building with high roll-up doors to provide access for the water district's trucks and equipment. The building has steel walls with panels of cultured stone. The flat roof is covered with white rock. It is 118' wide by 52' deep. The resource does not relate to the documented significance of the property.

15-16. Industrial Buildings **Two Noncontributing Buildings**
Unknown

Two one-story Modern-style steel industrial buildings are vacant. Each building is constructed of steel sides and roofs. The building to the north is 60' wide and 76' deep. The other building is 102' wide and 45' deep. The resources do not relate to the documented significance of the property.

17. Mosquito Control District Building **One Noncontributing Building**
Unknown

This is a one-story building with corrugated steel walls and roof with sliding door to accommodate the storage of vehicles. It is used by the Glenn County Mosquito Vector Control District. It is 106' wide by 26' deep. The resource does not relate to the documented significance of the property.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

**18. Retail Service Building
Unknown**

One Noncontributing Building

This is a cluster of attached steel buildings that house the retail, parts, and service functions of Papé Machinery Agriculture & Turf, the local John Deere equipment dealer. The one-story building is constructed of steel roof and walls with brick accent and a glass front entrance for customers on the east side. It is 92' wide by 132' deep. The resource does not relate to the documented significance of the property.

**19. Airport Administration Building
Circa 1985**

One Noncontributing Building

This is a one-story steel building with a brick façade entrance. It is 58' wide by 124' deep. The resource is used as the Airport Administration Building and post-dates the period of significance.

**20-22. Storage Sheds
Unknown**

Three Noncontributing Buildings

Three agricultural storage sheds with steel roofs and open sides. The north shed is 100' long by 42' wide. The other two sheds are next to one another. The shed to the west is 154' long by 42' wide and the shed to the east is 97' long by 37' wide. The resources do not relate to the documented significance of the property.

**23. Flight Apron
Circa 1941**

**One Contributing Site
Photos 7-10, 12, 17**

The concrete and tarmac-paved flight apron lies between the runways and the hangars, north and south of the hangars, and the areas between the 1947, 1952 and the 1960s hangars. This area encompasses approximately 10.75 acres of flight apron, less the space taken up by the multi-plane hangars, the Mann & Sons hangar and the Reginald Michaud hangar.

Alterations

The Depression-era hangar is visible in photos taken as late as 1957 (Figures 13, 16). There is no known record of when it was demolished. Anecdotal references indicate that the flight apron evolved over the years from grass in 1929, to gravel in the early 1930s, and then to pavement by 1942 when the Army Air Forces took control of the airport.

Integrity

Willows-Glenn County Airport retains all aspects of integrity.

Location

The airport remains in the same location where it was originally built by the U.S. Department of Commerce Aeronautics Branch in 1928. The site was chosen as it met the criteria of being at a

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

40-mile interval with the Intermediate Landing Fields to the north (Corning) and south (Williams).⁵ The City of Willows and Glenn County were each willing to pay for half the land.⁶ When the Department of Commerce no longer needed the airport as an Intermediate Landing Field, it was sold to two local service organizations and became a public general aviation airport.⁷ All of the historical resources remain in their original locations.

Design

The first runway, 16/34, was laid out in a general north-south orientation. It remains the main runway. The runway has been lengthened and over the years the original grass surface was replaced by gravel, oiled gravel, and pavement. The Department of Commerce erected a 51' steel tower to the northeast of the north end of the runway, adjacent to the State highway. That tower supported a lighted beacon and additional signaling lights to advise Air Mail pilots of their location and the existence of an emergency landing field. Those two elements were the extent of the original design features as that was all that was needed to quickly build a series of emergency landing fields as Air Mail service began operation. A flat unobstructed runway, a windsock, and a series of lights constituted the technologies of the era. After the transition to public general aviation airport, the first hangar and aircraft parking areas were located to the northwest of the runway, adjacent to the entrance from the state highway. All historical resources maintain their original design.

Setting

Urban encroachment and an Interstate highway have not changed the character of Willows-Glenn County Airport. The view south or west crosses the agricultural land of the North Sacramento Valley to the majestic rise of the Northern Coast Ranges, just as it did in 1928.

Materials

Promotional materials by the International Derrick and Equipment Company noted that their steel towers were, "hot dipped galvanized," for weather protection. Despite years of wind, sun, rain, dust, and agricultural chemicals the tower stands complete with original manufacturer's plaque. The corrugated steel hangars have also maintained their original materials, even without the benefit of a coat of paint.

Workmanship

Credit for the longevity of the steel tower must be given to the engineers who designed it, and the factory workers who cut, formed, and drilled the steel at the International Derrick and Equipment Company factory. Although simple in design, the tower is an example of product quality from the American Industrial Age. The hangars are also simple in design and materials, and durable.

⁵ "Willows Selects Airport Site," *Chico Enterprise*, 22 May 1928, 7.

⁶ "Purchase of Willows Airport Finished," *Chico Record*, 4 October 1928, 4.

⁷ "Willows Airport to be Improved," *Sacramento Bee*, 10 September 1932, 9.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Feeling

Most airports began as Willows Airport did with a runway, an aircraft parking area, and a tower with a windsock and maybe a beacon. Many added a hangar, some added a passenger terminal, and some kept growing into large international airports. Willows Airport added the hangars, and then changed very little, so retains integrity of feeling.

Association

The tower and hangars are in the same location, they look the same, the view is the same, and the runways and tarmac are in the same location. As a property that retains all other aspects of integrity, and continued to function as an airport, the property retains integrity of association.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

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.)

- 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.
- 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 grave
- D. A cemetery
- E. A reconstructed building, object, or structure
- F. A commemorative property
- G. Less than 50 years old or achieving significance within the past 50 years

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Areas of Significance

(Enter categories from instructions.)

TRANSPORTATION

Period of Significance

1928-1982

Significant Dates

1928

1956

Significant Person

(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation

N/A

Architect/Builder

U.S. Department of Commerce Aeronautics Bureau

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

Willows-Glenn County Airport is eligible for the National Register of Historic Places at a local level of significance under Criterion A, in the areas of Transportation and Military. Constructed in 1928 as an Intermediate Landing Field along the Seattle to Los Angeles Air Mail route, the airport was used by the U.S. Army Air Forces during World War II. In 1956, the U.S. Department of Agriculture National Forest Service Fire Control Officer for the Mendocino National Forest created an air tanker squad composed primarily of veterans, and their biplanes, to fight forest fires from the air. The successful use of aircraft by the U.S. Forest Service to drop water and fire-retardant compounds on wildlands fires was used throughout California during 1956 and was soon adopted by state and local agencies in the United States, as well as internationally. Willows-Glenn County Airport continued to be the regional base of operations for the Forest Service until 1982. For its exceptional significance as the base of operations for the first air tanker squad to be formed in the United States, the property satisfies Criteria Consideration G: Properties That Have Achieved Significance within the Last Fifty Years.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

The tower and beacon, constructed in 1928, are a link to the heyday of the growth of aviation in the United States. The Air Mail Act of 1925 gave the Postmaster General the authority to sign contracts with private companies to fly mail and thereby replace government pilots and aircraft. The Air Commerce Act of 1926 gave the government responsibility for fostering air commerce and establishing airways and aids to navigation.⁸ The Department of Commerce Aeronautics Bureau fulfilled that directive by building an infrastructure that included primary airports, Intermediate Landing Fields (ILF), lighted beacons, and concrete arrows on the ground to aid navigation. A series of beacons and concrete arrows were planned approximately every ten miles and an airport, or Intermediate Landing Field located every forty miles. Willows-Glenn County Airport was located approximately forty miles north of Williams (Colusa County), and forty miles south of Corning (Tehama County), the adjacent Intermediate Landing Fields. The Aeronautics Bureau contracted with the International Derrick and Equipment Company (IDECO) of Columbus, OH for hundreds of a standard 51-foot steel tower with a rotating beacon, other lighting equipment, and a windsock to provide aids to navigation along the air mail routes. Construction of the 51-foot steel tower and beacon preceded work on the airport itself.⁹

Following World War II, Willows-Glenn County Airport became the base for the Mendocino Aerial Tanker Squad in 1956. This unit, consisting of eight local agricultural pilots, flying their own military trainer biplanes, and organized by Mendocino National Forest Fire Control Officer

⁸ "The Origins of the FAA and the First 'AGC-1,'" https://www.faa.gov/about/history/people/media/First_AGCI.pdf (accessed August 20, 2022).

⁹Untitled, *Red Bluff Tehama County Daily News*, 6 June 1928, 2.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Joe Ely, was the first of its kind in the United States.¹⁰ This unit perfected the use of water drops, and then retardant drops, to assist in fighting wildlands fires. From the beginning, the unit assisted in fighting fires throughout California, and within the first year, other firefighting agencies were gathering at Willows-Glenn County Airport to learn, and improve, on these techniques. The small biplanes were soon augmented, and then replaced, by larger aircraft, many models of which were surplus World War II fighters and bombers. Willows-Glenn County Airport remained the base of regional operations for the Forest Service until 1982 when larger aircraft, requiring a longer runway, forced a relocation to the Chico Municipal Airport.¹¹

In the years following the Wright Brothers first flight, flying was very dangerous and remained the purview of daredevils and military pilots. That was the case even after World War I, when barnstorming pilots would put on demonstrations and a few fearless people would venture aloft. When air mail service began, it utilized government pilots in government-owned planes who only flew during daylight hours. On cross country routes, the mail would be flown during the day, put on trains to keep it moving at night, and then put back on planes the next day as there was no way to safely navigate at night. Daylight navigation was done by following visual references. Even as flights became longer, pilots continued to use landmarks, waterways, railroad tracks, and highways to navigate. Some towns helped by painting the name of the town on the roof of a barn. Pilots used roadmaps and hand-drawn maps with no formal aids to navigation.

The common methods of maritime navigation—Dead Reckoning (estimating position by speed, direction and course over time and then confirming with fixed points), and Piloting (using fixed points with reference to a chart)—require visual confirmation with fixed points that are not visible at night. Celestial Navigation (establishing lines of position using planets and stars) requires too many calculations and reference tables for a lone pilot and was not utilized until navigators were added to flight crews. In 1919, the Army experimented with airways lit by bonfires and the first lighted beacons to enable nighttime air mail flights. After the Army completed an experimental 72-mile lit course in 1923, the Post Office began construction of a transcontinental air mail route deploying beacons visible from fifteen to twenty-five miles. Regularly scheduled flights on that route began in 1924.¹²

In order to expand air mail routes around the country, airports were located every 200 miles and Intermediate Landing Fields were built every forty miles. The U.S. Department of Commerce erected a series of lighted beacons mounted atop steel towers to provide navigational aids to the pilots. The beacons had directional lights and flashing lights that blinked a light code to identify the tower. Intermediate Landing Fields also had field lighting installed. The ILFs and the 10-mile

¹⁰ Carl C. Wilson, "A Brief History of the Use of Aircraft on Forest Fires in California," Unpublished Document in the USFS Mendocino National Forest Archives, Willows, CA., 1980.

Cermak, Robert W., *Fire in the Forest: A History of Forest Fire Control on the National Forests of California 1898-1956*, U.S. Department of Agriculture Forest Service, R5-FR-003, July 2005, 332-333.

¹¹ Ted Atlas, "A Baptism by Fire," *Aviation History*, May 2022, 45.

¹² U.S. Centennial of Flight Commission.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

waypoints had concrete directional arrows on the ground pointing in the direction of the next higher number.¹³

The 1929 Department of Commerce Air Commerce Bulletin described the towers, beacons, and field lighting:¹⁴

The beacon is mounted on a skeleton steel tower, the standard height of which is 51 feet. At the top of each tower is a 6-foot square platform with guard railing, providing an opportunity for airway mechanics to work on the lights with ease and safety.

On the ground at each tower base is constructed in concrete a directional arrow 54 feet in length which points to the next higher numbered beacon. The tower rises in the center of the arrow, the length of which varies with the height of the tower. On the chrome-yellow feather end of the arrow the beacon-light site number is painted in black characters. At all fields and at beacon lights where local generating sets are required a small powerhouse 10 by 14 feet forms the feather end of the arrow. At fields which do not require local generators the houses provide storage facilities for emergency equipment.

Astronomic electrically driven time clocks are installed at all beacon lights, to switch on the commercial current or start the engine generator at sunset and switch off the current or generator at sunrise.

The standard beacon consists of a 1000-watt searchlight fitted with a 24-inch precision parabolic mirror giving 2,000,000 beam candlepower. An electric motor on one-sixth horsepower rotates the searchlight at six revolutions per minute. Each beacon is fitted with an automatic lamp changer and two electric bulbs. In case one lamp burns out, the stand-by lamp is automatically placed in circuit and its focus within a fraction of a second. Two course lights are mounted on the tower platform just below each searchlight, one pointing forward and one pointing backward on the airway course. These course lights are 500-watt searchlight projectors fitted with special cylindro-spherical mirrors and 18-inch doublet lenses, giving a beam of 15° horizontal and 8° vertical spread with a beam candlepower of 100,000 when fitted with lighthouse red or green lenses. Red lenses are used at beacon sites and green lenses are used at intermediate landing fields. Each course light, in alternation (while the main beam of the beacon is swinging through the opposite 180° of arc), flashes its code signal which corresponds to its number on the airway. Code signals run from 0 to 9 and then recommence. The pilot must know on which 100-mile section of the airway he is flying in order positively to identify the site.

Numerals in Morse Code are five dots or dashes while letters are three or four. To simplify the number of flashes, a series of letters (W, U, V, H, R, K, D, B, G or M) was substituted for the

¹³ "ARROWS ACROSS AMERICA: Transcontinental Air Mail Routes."
http://www.dreamsmithphotos.com/arrow/airmail_routes.html (accessed June 4, 2021).

¹⁴ *United States Department of Commerce Aeronautics Branch Air Commerce Bulletin Vol. 1 No. 8* (Washington, D.C. 15 October 1929), 5-6.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

numerals 0 to 9. The information was available on aeronautical charts and guidebooks. The pilots remembered it by, “When Undertaking Very Hard Routes, KeeP Direction By Good Methods.”¹⁵

Willows-Glenn County Airport dates to October 1928 when the Airways Division of the U.S. Department of Commerce selected a location west of Willows as an Intermediate Landing Field.¹⁶ The County of Glenn purchased an 80-acre tract of land for approximately \$2000 and the City of Willows purchased the adjoining 80-acre tract of land for \$2092.80.¹⁷ The land was leased to the Commerce Department Airways Division, which put up an additional \$8000 for construction and equipment. Willows-Glenn County Airport was part of the San Francisco to Redding section of the Los Angeles-Seattle Contract Air Mail Route 8 (CAM-8). As the twelfth beacon north of San Francisco/Oakland it was designated as Beacon #12, “12 SF-S Willows DOCILF.”¹⁸

As an Intermediate Landing Field, the airport originally consisted only of this tower, with an adjacent shed and concrete directional arrow, a primitive north-south grass runway, and field lighting. The airport lighting was completed by January 10, 1929.¹⁹ There is no known record of when the concrete arrow and shed were removed.

Illumination at the Willows Airport was the same as described in the *Airways Guide*, provided by a 1000-watt lightbulb and a two-foot in diameter mirror producing 1,000,000 candlepower of light, capable of being seen for fifteen to forty miles. Many beacons operated with power from a generator housed in the adjacent shed. The Willows Airport beacon and field lights were powered by electricity from Pacific Gas & Electric Company.²⁰

Intermediate Landing Fields were intended to be emergency landing fields should the air mail pilots encounter engine or weather problems. Rules published in the Airway Guide prohibited aircraft other than air mail planes from using ILFs.

The original rotating beacon at the Willows Airport was 24 inches in diameter and flashed a single clear light every six seconds. In addition to the beacon, the tower was also equipped with green course lights. Willows is located about 120 miles north of San Francisco, putting it in the second 100-mile section between San Francisco and Redding so it was assigned the designation “2.” Accordingly, the course lights at Willows flashed “U” (dot, dot, dash) representing “2.”

Located every ten miles between airports and Intermediate Landing Fields were the same steel towers with an equipment shed and a large concrete arrow. Ten miles south of Willows, near Delevan, was Beacon #11 and ten miles north, near Greenwood, was Beacon #13. Those lights flashed a clear light every six seconds, and the corresponding Morse Code produced by the red course lights identified the tower. A pilot flying a course of 337° (Northbound) or 157°

¹⁵ “Beacon House was part of changes in air transportation,” *OakRidger.com* 7 July 2009.

¹⁶ “Willows Selects Airport Site.”

¹⁷ “Purchase of Willows Airport Finished.”

¹⁸ “ARROWS ACROSS AMERICA: Transcontinental Air Mail Routes.”

¹⁹ “Willows Airport Now Completely Lighted,” *Sacramento Bee*, 11 January 1929, 9.

²⁰ “Huge Beacon For Airport is Complete For Aviators.”

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

(Southbound) would fly either directly over, or just abeam, of these lights. During the day, they would use the large concrete arrows and large numbers to stay on course.

As an Intermediate Landing Field, the Willows Airport was also equipped with 15-watt clear bulbs fixtures placed every 300 feet along the edge of the runway and green lights at opposite ends of the runway to aid pilots in a nighttime landing.

Willows Airport was described in the 1931 *DOC Airways Guide*:

Willows—Department of Commerce Intermediate Landing Field site 12 San Francisco to Seattle Airway. One and one-half miles W. Altitude. 140 feet. Irregular shape, 85 acres, 2,781 by 2500 feet, sod, level, natural drainage. Directional arrow marked “12 SF-S.” Pole line to N. Beacon, boundary, approach and obstruction lights. Beacon 24-inch rotating, with green course lights flashing characteristic “2” (. . -). No servicing facilities.²¹

The Mt. Diablo beacon did not conform to the Aeronautics Branch standards and was not part of the numbering system. It was critical to airmen. The 10,000,000-candlepower light atop Mt. Diablo in Contra Costa County was placed into service on April 15, 1928. Although it was installed under the direction of the Department of Commerce, it was built by the Standard Oil Company.²² 12-foot letters, “S_D” (Standard Diablo), in neon lights, adorned the 75’ steel tower. The clear beacon flashed six times per minute. The beacon, which could be seen for 150 miles, guided pilots on the Reno-San Francisco section of the Transcontinental Air Mail Route as well the Seattle-Los Angeles Air Mail Route.²³

The U.S. Lighthouse Service, part of the Department of Commerce, employed a keeper at each ILF to maintain the lights and assist any pilots who were forced to land. “Airway equipment, after installation by the airways division, is assigned to the Lighthouse Service district offices for maintenance. To these district offices are assigned associate and assistant airways engineers, of extensive aeronautical experience in addition to engineering qualifications, who, under the general supervision of the lighthouse superintendents, maintain the airways.”²⁴

As further described in the 1931 *DOC Airways Guide*:²⁵

Airway mechanics are assigned to patrol 175-mile sections. They are provided with one-half to 1¼ ton panel body motor trucks of the speed-wagon type, equipped with spare parts and tools for taking care of practically any service on any type of airway lighting equipment. Airway mechanics must make their rounds at least twice per month. Landing-field caretakers are required to assist in any reasonable manner air travelers who

²¹ U.S. Department of Commerce Aeronautics Branch Airways Bulletin #1 Washington, DC USGPO, 1931, 24.

²² “Giant Beacon on Diablo to Flash April 15.” *Oakland Tribune*, 25 March 1928, A-15.

²³ “ARROWS ACROSS AMERICA: Transcontinental Air Mail Routes.”

²⁴ *United States Department of Commerce Aeronautics Branch Air Commerce Bulletin Vol. 1 No. 8*, 8.

²⁵ *Ibid.*

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

make emergency landings on fields in their charge. Caretakers were employed at all fields and attendants at most beacons.

At the close of 1929, 20 airways engineers, 72 airways mechanics, and 782 caretakers and attendants were employed in the maintenance of 10,183 miles of airways.

A personnel change at the Willows Airport in 1929 provides an example of this close correlation between the airway beacons and maritime lighthouses. It was reported in the July 3, 1929, *Sacramento Bee* that Harry E. Ahlstrom, who had served the prior three months as the mechanic in charge of beacon lights in the Sacramento Valley, had been promoted to mechanic at Goat Island.²⁶ In 1915, the Lighthouse Service established a repair and support depot on Goat Island, the name of Yerba Buena Island in use from 1895 to 1931. That facility is still used by the Coast Guard, which merged with the Lighthouse Service in 1939.

Even before the northern sections of lights were completed, the beacons already completed on the Los Angeles-San Francisco route earned the praise of the pilots. Vance Breese, a veteran airmail pilot for Pacific Air Transport said, "We certainly appreciate those lights. Although it is almost always possible to pick out roads and railroads from the air, even on the darkest nights, these beacons tell us which way to head, and about how high to fly, for most of them are on the highest point in each beacon section."²⁷

The Willows Airport tower, completed in late 1928, was manufactured by the International Derrick and Equipment Company (IDECO) of Columbus, OH. A company sales brochure described their product:²⁸

These towers are especially constructed to resist high winds and storms. They are protected against the weather, rust and corrosion by hot dipped galvanizing and are fire and lightning proof—essential requirements for structures of this type.

All members have been standardized and are built over jigs and dies, insuring [*sic*] absolute interchangeability and eliminating any cutting or fitting in the field. The best quality of structural steel is used, conforming to the specifications of the American Society for Testing Materials. Hot dip galvanized after fabrication, there are no exposed surfaces for rust and corrosion to attack and weaken the structure. Erection diagrams showing both the foundation plans and erection details are furnished with each tower. All members and parts of the structure have erection numbers permanently stamped into the steel.

The IDECO sales material notes they also make other airport towers, light supports, hangars and mooring masts. The company also made oil derricks and other oil field drilling equipment. It was

²⁶ "Willows Beacon Light Mechanic Is Promoted," *Sacramento Bee*, 3 July 1929, 16.

²⁷ "Seattle-Los Angeles Air Mail Route 'All Lit' Up Now," *Oxnard Daily Courier*, 9 December 1926, 3.

²⁸ *International Derrick and Equipment Company* advertisement or sales brochure, late 1920s, found online, website no longer active.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

based in Columbus, OH and had facilities in many of the major oil producing regions of the country including Shreveport, Houston, Dallas, Tulsa, and Torrance, California.

Although planes did not usually stop at Willows Airport, the presence of the beacon allowed flights to pass safely overhead, building confidence among the public that flying was safe. Boeing used the Airway System of beacons and landing fields in their timetables to assure the public of the safety of flying.²⁹ The beacons helped flying transition from an air mail service with a few passengers, to passenger service that also carried mail.

In 1926, the Postmaster General awarded the contract for the air mail route between Los Angeles and Seattle to Vern Gorst of North Bend, Oregon. Gorst, a pilot himself, owned motor stage lines in Oregon and California. He founded Pacific Air Transport at the same time as he received the federal contract, requiring him to quickly find airports, pilots, and airplanes. Gorst's biggest challenge was getting over the 7,000-foot Siskiyou Mountains on the border of California and Oregon. He found the aircraft he needed in the Ryan M-1, a single-engine monoplane which could carry two passengers. Pacific Air Transport, with a fleet of ten Ryan M-1 airplanes, began flying in early autumn of 1926.³⁰

The Ryan M-1 had a good reputation among air mail pilots. So much so, that in February 1927, a mid-West air mail pilot ordered a variation of the Ryan M-2, its close successor, from the San Diego company. In May 1927, Charles Lindbergh flew the Ryan-built *Spirit of St. Louis*, on the first solo transatlantic flight. Lindbergh's flight was among many to capture the public imagination. It was an era of many firsts and record-breaking flights. Four months after Lindbergh's flight, the newly opened Oakland Airport was the center of the aviation world as the starting point of the Dole Race, which offered a \$25,000 prize to the first plane to fly from Oakland to Honolulu. In May 1928, the focus was again on Oakland as Australian Charles Kingsford-Smith led a team of four in the first flight (completed in four legs over 83 hours) from the United States to Australia.

Although the route was known as San Francisco-Seattle, flights operated from Oakland Airport initially and later, Mills Field (later San Francisco International Airport). The next airport to the north was Redding. A 1926 timetable showed that the San Francisco to Redding flights took place during daylight hours while flights between San Francisco and Los Angeles were flown during nighttime hours as the beacons along that route were already completed.³¹ On December 29, 1929, the *Los Angeles Times* published an article stating that work was continuing to complete the beacons on the Redding to Portland section. The article noted the San Francisco to Redding section was fully operational, allowing the northbound flight to depart Oakland at midnight and enabling the passengers, "...to see the sun rise on Mt. Shasta."³²

²⁹ *The Aircraft Year Book for 1934 Vol 16* (New York, The Aeronautical Chamber of Commerce of America, Inc., 1934), 30.

³⁰ "Air Mail Firm is Formed in S.F." *Fowler Ensign*, 7 January 1926, 2.

³¹ United States Congressional Serial Set #183, P 177,

<https://babel.hathitrust.org/cgi/pt?id=uc1.b3994941&view=1up&seq=183&skin=2021> (accessed August 23, 2021).

³² "Sixty Days to See Airway Lights," *Los Angeles Times*, 29 December 1929, 69.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

The Ryan M-1 was not very comfortable as the two passengers had to sit with the mail bags. Vern Gorst wanted to upgrade to the four-passenger Boeing Model 40C. The four passengers sat in the compartments with the windows under the wing, while the pilot sat in the open cockpit. Gorst was not able to strike a financing deal with Boeing. On January 1, 1928, William Boeing acquired Pacific Air Transport and supplied the airline with six of his four-passenger Model 40C biplanes. In December 1928, Pacific Air Transport merged with Boeing Aircraft & Transport Co. and continued to operate as Pacific Air Transport.³³ In 1929, the airline upgraded to the 18-passenger tri-motor Boeing Model 80A, which had a heated cabin, hot and cold running water, forced-air ventilation, leather upholstery, reading lamps, and an enclosed flight deck, a feature not well received by the pilots who had always flown in open cockpits.³⁴ The Boeing Aircraft & Transport Co. merged with Pratt & Whitney Aircraft to form the United Aircraft & Transport Co. (UATC). On March 31, 1931, UATC formed United Air Lines Inc. to manage all their airlines, including Pacific Air Transport, which ceased to exist as a separate name.³⁵

In 1930, Boeing Air Transport was the first airline to add stewardesses, all of whom were registered nurses, to the flight crew. A 1932 feature article in the *Los Angeles Times* noted there were five stewardesses working the Los Angeles-Seattle routes.³⁶

From 1926 to 1931, aviation in the United States quickly changed from daredevil pilots—only two of the eight entrants in the Dole Race made it to Hawaii with three lost at sea—and air mail routes utilizing a lone pilot in an open cockpit to 18-passenger luxury-appointed airplanes. In addition to United Airlines, other airlines including Delta, Western Airlines, and TWA began, often starting with contracted air mail routes. In 1929, there were 165,000 air passengers in the United States. The next year it more than doubled to 386,000 passengers.³⁷ The strong growth in airline passenger traffic led to a parallel growth in U.S. aircraft manufacturing. This was particularly true in California, where by 1935, the Douglas Aircraft Company of Santa Monica designed and began production of the DC-3, an aircraft, which is widely regarded as the most significant passenger airliner of the pre-jet age.

This embrace of air travel was not universally accepted. In 1929 Boeing engineer, Thorpe Hiscock, asked Western Electric, AT&T's manufacturing division, to provide two-way radio equipment for their new passenger airplanes as William Boeing felt they could only attract passengers if flying was viewed as safe. Western Electric turned him down stating they saw no future in passenger air travel. It was only after Hiscock purchased the necessary equipment from

³³ "Boeing Acquires P.A.T." *Popular Aviation*. March 1928, 54.

<https://books.google.com/books?id=mgD0DWLXwn4C&lpg=PA1&pg=PA54#v=onepage&q&f=false> (accessed August 23, 2022).

³⁴ "Boeing Model 80 Transport" <https://www.boeing.com/history/products/model-80.page> (accessed August 23, 2022).

³⁵ Stanley I. Weiss, and Amir R. Amir, "Boeing Company" *Encyclopedia Britannica*, 19 April 2021, <https://britannica.com/topic/Boeing-Company> (August 23, 2022).

³⁶ "Airline Stewardess," *Los Angeles Times*, 24 Jan 1932, 96.

³⁷ *The Aircraft Year Book for 1934 Vol 16*, 30.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

the Heintz & Kaufman Company, a boutique manufacturer of radio equipment in South San Francisco, that Western Electric agreed to supply Boeing.³⁸

Radio equipment was beginning to be installed on airplanes in order to transmit weather updates. The technology to use radio waves as an aid to navigation did not exist, so the lighted beacons were needed to make night flights possible. The network of beacons and emergency landing fields served to assure the safety of flying to the public.

The growing interest in aviation prompted Glenn County citizens to embrace the idea of the Department of Commerce funding an airport in Willows. It was with a great deal of pride that they dedicated their airport with a two-day celebration in June 1929.³⁹

From the outset, the Aeronautics Branch was unhappy with the Willows Airport runway because it was subject to flooding during the winter, prompting the DOC to threaten to move the airport elsewhere. Not wanting to lose their airport, Glenn County citizens held fundraisers, including a local production of Gilbert & Sullivan's *The Mikado*, to improve the runway.⁴⁰ Concern also prompted the Achean Club of Willows (a Kiwanis-like service club) and the local American Legion post to raise enough funds to purchase the airport from the federal government.⁴¹

As an Intermediate Landing Field, use of the airport was limited to emergency landings. After the service clubs took over in 1932, the airport was open to all aviation uses.⁴² The change in status was reflected in the *Department of Commerce Airways Guide*. The 1931 edition listed Willows Airport as a "Department of Commerce intermediate landing field," changed to "Municipal" in the 1932 edition.⁴³ The airport was officially dedicated on September 9, 1933.⁴⁴

The first decade for Willows Airport was closely connected to Floyd "Speed" Nolta, a local civic leader, businessman, and pilot. He was selected by the Aeronautics Bureau as the manager of the airport. He served as the President of the Achaean Association and was Glenn County's first Flying Officer.⁴⁵

In 1928, Nolta perfected a method to drop rice seed and fertilizer from an airplane.⁴⁶ The cultivation of rice in the Sacramento Valley began in 1908 near Biggs (Butte County) when it was determined that a Japanese variety of medium-grain rice would do well in the region.

³⁸ "Oral History of Ralph M. Heintz," Douglas Perham Collection, History San Jose 7 June 1977.

³⁹ "Willows Airport Dedicated with Parade, Programs," *Appeal-Democrat* (Marysville), 3 June 1929, 8.

⁴⁰ "Opera Given to Raise Funds For Willows Airport," *The Sacramento Bee*, 20 April 1929, 11.

⁴¹ *Oakland Tribune*, 28 June 1932, 28.

⁴² "Willows Airport to be Improved." *Sacramento Bee*, 10 September 1932, 9.

⁴³ *U.S. Department of Commerce Aeronautics Branch Airways Bulletin #1* Washington, DC USGPO, 1931, 24; *U.S. Department of Commerce Aeronautics Branch Airways Bulletin #2* Washington, DC USGPO, 1932, 26.

⁴⁴ "Willows Holds Airport Fiesta." *Sacramento Bee*, 11 September 1933, 9.

⁴⁵ "Floyd Nolta Appointed Manager of Willows Field," *Sacramento Bee*, 13 Feb 1929, 23; "Achaean Ass'n Picks Officers," *Appeal Democrat* (Marysville, CA), 16 July 1931, 8; "Glenn Co. Appoints Flying Officer," *Appeal Democrat* (Marysville, CA), 17 April 1930, 5.

⁴⁶ Anne Curran, "Machinery Comes to Rice Fields," *Christian Science Monitor*, 13 May 1936, 19.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Cultivating rice was very labor-intensive, requiring the field to be prepared and then rice seed and dry fertilizer spread by tractor or animal-drawn farm implements. The field was flooded, hopefully before migratory birds ate the rice seed.

Nolta mounted a hopper in the cockpit of his Jenny JN-4 biplane. A sliding valve with a threaded knob allowed him to measure precise amounts of fertilizer and seed that dropped from the hopper into a box. The wash from the propeller spread the product over a 50-foot swath. Nolta's method vastly improved rice propagation, leading to an entire industry of ag pilots seeding and fertilizing rice and other crops throughout the North Sacramento Valley. Nolta's method allowed the field to be flooded before the seed was dropped, preventing any loss to birds. It also allowed a field to be planted much more quickly and economically than the previous labor-intensive method. By 1937, there were 130,000 acres of rice under cultivation.⁴⁷ Modern ag pilots still use the same device perfected by Nolta in 1928. In addition to remaining as the airport manager, Nolta, along with his brothers, established the Willows Flying Service, which operated from the first hangar built at the airport. They were soon joined by other agricultural flying services.

With the extensive use by agricultural and other types of aviation, Willows Airport was able to thrive, even during the depths of the Great Depression. It became the busiest airport in northern California, other than those with passenger service.⁴⁸ Air shows became annual events and were some of the largest held in northern California.⁴⁹

Willows Airport was a beneficiary of the Roosevelt Administration's investments in public works. In 1934, the airport received \$5,000 in funds from the short-lived Civil Works Administration (CWA) to build a hangar.⁵⁰ In 1935, Willows Airport was among 250 airports to receive funds from the Public Works Administration (PWA) with the \$10,819 going towards hangar and runway improvements.⁵¹ There are no Depression-era buildings extant at the airport.

An additional 125 acres were added in 1940, and a second runway was built by the Army Air Forces in 1941 in preparation for taking over the airport as an auxiliary airfield during World War II. At 5000 feet, it would be the longest runway in northern California.⁵² In October 1941, the Sacramento construction firm, A. Tiechert & Sons Inc., was awarded a \$140,000 contract by the Army to build the new runway.⁵³

After the airport converted from an ILF to a general aviation airport, the clear rotating beacon and green course lights were changed to a rotating beacon flashing "clear-green," indicating a civilian lighted land field. That remains the configuration of the rotating beacon at Willows

⁴⁷ "Time And Cost Of Planting Rice Are Cut By Airplanes," *Sacramento Bee*, 26 June 1937, 8.

⁴⁸ "Willows to Open Aviation Fete Saturday," *San Francisco Examiner*, 25 September 1937, 13.

⁴⁹ Paid Display Advertisement. *Chico Record*, 6 September 1933, 3; "Eighth Annual Airshow is Underway in Glenn County," *Sacramento Bee*, 24 September 1938, 21.

⁵⁰ "Willows Airport to be Improved," *Oroville Mercury Record*, 2 March 1934, 1.

⁵¹ "Big Airport Program Seen," *Oroville Mercury Record*, 30 October 1935, 1.

⁵² "To Extend Airport," *Appeal Democrat* (Marysville, CA), 25 September 1940, 1.

⁵³ "Contract Let for Willows Airport," *Red Bluff Tehama County Daily News*, 31 October 1941, 1.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Airport. From 1942 to 1945, when the airport was under the control of the U.S. Army Air Forces, the light flashed “clear-clear-green,” indicating a military field.

The use of the “clear-green” light configuration is an extension of the Air Mail route lighting scheme. Every beacon, whether at an airport, an Intermediate Landing Field, or a free-standing beacon was clear. The course lights, which flashed the Morse Code letter designation unique to that location, were green at airports and Intermediate Landing Fields, letting pilots know they could land there, while the course lights at the beacon sites were red, indicating there was no landing field available. Civil land airports continue to use alternating clear and green lights.⁵⁴

In April 1942, the Army Air Corps took over the airport for use as a training base for ordnance and quartermasters’ personnel.⁵⁵ The airport also served as an Auxiliary Landing Field for pilot trainees stationed at the Chico Army Air Forces Field.

Just before the Army takeover, Willows Airport played a role in one of the most significant events of the early years of American involvement in World War II. During the final days of March 1942, the North American B-25B Mitchell bombers assigned to a squadron under the command of Lt. Col. James Doolittle were undergoing final preparations at McClellan Field in Sacramento. Lt. Henry L. Miller USN was the naval officer assigned to teach the Army Air Forces pilots how to conduct short take-off procedures. In 1971, Rear Admiral Miller USN (Retired) gave an oral history about his long career in the Navy. In his recollection of his time assigned to the Doolittle Raid, he said,

We put the planes in the depot there at Sacramento to get a recheck, get them all set to go aboard the carrier, and as one plane would come out of that sort of interim overhaul period there, I’d take it up with the crew to Willows, California, to a field there and give them take-offs at Willows. Then, the last day, Jimmy Doolittle said, “Well we’ll finish up at Willows then we’re going to fly down to Alameda and go aboard.”⁵⁶

It was not by chance that this final training session occurred at Willows Airport. During World War I, Jimmy Doolittle was an Army flying instructor at Rockwell Field in Coronado (later Naval Air Station North Island). Floyd Nolta was a mechanic in the same unit, and he and Doolittle became lifelong friends and bird hunting companions in the Willows area. These few days of training, a small part of an operation that stretched from Florida to the east coast of China, remains a source of civic pride for the citizens of Willows.

In September 1929, Army Lt. James Doolittle had become the first pilot to use only aircraft instrument guidance to take off, fly a set course and land. He used the radio range and radio marker beacons to indicate distance from the airfield, and an altimeter and a directional gyroscope as an artificial horizon to control his aircraft without being able to see the ground.

⁵⁴ Harvey Hartman, “The Story Behind Our “New Tower,” Zhanna’s Survey Station. <https://thesurveystation.com/2017/01/29/the-story-behind-our-new-beacon-tower/> (accessed April 8, 2022).

⁵⁵ “Willows Airport Taken Over by Government,” *Chico Record*, 30 April 1942, 8.

⁵⁶ “Oral History of Rear Admiral Henry L. Miller USN (Retired). U.S. Naval Institute, March 1971.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

In November 1945, the Glenn County Board of Supervisors voted to accept the return of Willows Airport ownership. Included in the vote was the acceptance of \$500,000 in repairs and improvements made by the Army while the airport was under their control. The contract signed in 1940 stated the airport would be returned in the original condition as it was at that time. The Board chose to not demand those improvements be removed.⁵⁷

After the airport was returned to Glenn County in 1945, a fifteen-plane hangar was built in 1947 and a second one in 1953. Those two buildings have changed very little over the years and are still in use. A single-story administration building built in 1952 remains on the property, vacant. A third long hangar was added in the late 1950s-early 1960s followed by other smaller hangars and ancillary buildings added after the period of significance.

Ag flying operations continued to be a major component at Willows. The post-war period also saw growth in general aviation as private planes became more affordable, and many who had their first exposure to flying in the military wanted to continue that pursuit in civilian life.

Willows Airport had a robust history in its first quarter century of existence. Its most important place in history was established in 1956 when it became the base of operations for the Mendocino Air Tanker Squad (MATS), the first squadron of air tankers anywhere in the world.

The impetus for this unit occurred about twenty-eight miles northwest of Willows Airport in the Alder Springs area of Mendocino National Forest. At 10:00 PM on July 9, 1953, twenty-four men were in a canyon taking a break from fighting the Rattlesnake Fire, when the wind suddenly kicked up from the opposite direction, causing a rapid flare up in the thick chaparral brush. Nine of the men used a rope to ascend the steep canyon, while the others ran down the slope. The flames raced down the canyon at fifteen miles per hour, overtaking and killing the fifteen trapped men.⁵⁸

The tragedy prompted foresters to look for better ways of fighting fires. Joe Ely, Mendocino National Forest Fire Control Officer, was fighting a fire in Angeles National Forest at the time of the Rattlesnake Fire. According to his son Frank, Joe became passionate about making firefighting safer for his men. The idea of dropping water from airplanes had been considered for many years and no experiments had successfully dropped enough water to be effective. Ely had the idea to use ag pilots who were adept at spraying liquids over crops.

He approached Floyd Nolta, already a highly experienced and innovative ag and stunt pilot. Within one-week Nolta cut a hole in the bottom of his Boeing-Stearman 75 bi-plane and installed a 160-gallon tank with a hinged gate, a snap, and a pull. His brother Vance flew the plane over a controlled burn for a demonstration with Ely later documenting the moment, "...Vance came over low and pulled the rope and put out the fire. The air tanker was born."⁵⁹

⁵⁷ "Glenn Will Accept U.S. Airport and Runways," *Sacramento Bee*, 7 November 1945, 9.

⁵⁸ "15 Firefighters Die In Mendocino Forest Blaze," *Visalia Times-Delta*, 10 July 1953, 1.

⁵⁹ Joseph B. Ely, "Air Tankers, How They Got Started," handwritten notes by Joe Ely, December 1965, 4.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

A few months later, on August 13, 1955, Vance Nolta became the first pilot to make a freefall water drop from an airplane when he assisted a crew on the Mendenhall Fire in Mendocino National Forest. Advances in logistics and techniques came quickly. The Forest Service learned to stage a water tender at a gravel or dirt strip near the fire so the plane could reload and quickly return to the fight. The Nolta brothers assisted the Forest Service on other fires that season. Other ag pilots expressed an interest in becoming aerial firefighters. Ely later recalled, “Local pilots were quick to respond. Ag pilots were the last of the silk-scarf and leather-helmet boys and they would try anything that was exciting.”⁶⁰

During the winter of 1955-56, Ely garnered support from the Forest Service regional office in San Francisco, including \$4,000 to pay pilots for stand-by time. Eight ag pilots from the Willows area formed the Mendocino Air Tanker Squadron (MATS). In addition to Floyd and Vance Nolta, their brother Dale was an original pilot, as were Harold Hendrickson and Frank Prentice of Willows, Ray Varney of Artois (Glenn County), L. H. McCurley of Corning (Tehama County), and Warren Bullock of Red Bluff (Tehama County). Willows Airport manager Lee Sherwood, who also owned an ag flying service, flew Ely or other Forest Service officers in an observation plane, referred to as the “Bird Dog.” The “Aerial Firewagons” were Boeing Stearman Model 75 and Navy N3N biplanes. The Boeing Stearman Model 75 was a primary trainer used by the U.S. Army Air Corps, from 1934 and continuing through World War II. The N3N was a Navy trainer built between 1936 and 1942 in the Naval Aircraft Factory adjacent to the Philadelphia Naval Shipyard.

The N3N biplanes, used by many of the air tanker pilots in the first years of operation, share a history with two other national historic places in California, specifically the remains of USS Macon (ZRS-5) (Monterey County) and the U.S. Naval Air Station, Sunnyvale Historic District (Santa Clara County). After the loss of USS Macon (ZRS-5) off Big Sur in 1935, the Navy ended their dirigible program and decided to use the remaining materials to build aircraft. The N3N biplane trainer was designed and built in the Naval Aircraft Factory in Philadelphia. Aviation writer Sparky Barnes described the construction of an N3N, “If you look inside the fuselage, it looks like a bridge truss because it’s all material left over from the dirigible program.”⁶¹

The squadron was based at Willows Airport and operated out of Corning and Red Bluff as well to shorten the initial response times. At times, planes were dispatched to remote airfields to stand by during the day and returned to Willows in the evening.

On July 12, 1956, three years and three days after the deadly Rattlesnake Fire, a letter was sent out to the sixteen other national forests in California, as well as the California Division of Forestry (CDF) stating, “Seven air tankers will be available for aerial assistance in fire control in the Northern California area during the months of August and September 1956... They will

⁶⁰ Joseph B. Ely, “A Whole New Way to Fight Fire: The Development of Air Tankers in California,” *Journal of Forest History*, April 1983, 81.

⁶¹ Sparky Barnes, “A Stearman on Steroids,” *General Aviation News*, June 20, 2021
<https://generalaviationnews.com/2021/06/20/a-stearman-on-steroids/> (August 20, 2022).

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

operate out of home airports at Willows, Corning and Red Bluff and are available to any fire control unit that wants them.”⁶²

Ag flying involves accurate flying very low over the terrain to properly disperse the seed or liquid in large flat areas where the only obstacles are trees and power lines. Drops over forest fires requires passes deep in canyons or towards high ridges, everchanging treetop heights, smoke-filled air, and rapidly changing air currents. An N3N weighs about 2000 lbs. so dropping a load of water results in an immediate fifty percent change in weight. The rapid rise was used to clear an approaching ridge or tree line. The original pilots had to learn how to fly in these conditions and how to apply the techniques to successfully deliver their load.

The water drops were used to make it safer for the crews on the ground. On hot days, even dropped at fifty feet, much of the water evaporated before it hit the ground, so the pilots liked to fly at five to ten feet above the treetops. The Forest Service wanted to maintain a safety margin of seventy-five feet above the trees.

The solution was to mix water with sodium calcium borate, producing a compound that made it to the ground with a melting point twice as high as the 900° ignition point of a forest fire. The white material stuck to brush and reflected heat, so it was employed on the flanks of fires to control spread. Sodium calcium borate was only utilized for a short time because, although it was white when it dropped, it quickly blended in with the vegetation so they could not see where it had been deployed. Borate also sterilized the soil so other compounds were found. The “Borate Bombers” nickname stuck.

Harold Hendrickson’s son, Gary, joined the field in 1972 as the co-pilot of a Boeing B-17 aerial tanker, later flying Grumman AF Guardians and TBM Avengers, as well as Douglas DC-6s during a forty-year career. He explained that the Forest Service required that retardants, “had to be viscous and bright colored in order to use prior drops as a reference point, still provide fireproofing up to three days after being dropped and contain fertilizer to promote regrowth.” Those requirements led to other compounds such as Bentonite, a clay that swelled up and stuck better, and sometimes came down in a chunk instead of a spray. By the 1960s, a retardant with diammonium phosphate was being used. In keeping with the family theme of those early years, Frank Ely spent one summer during college loading retardant at the Willows Airport.

The thick slurry of water and retardants were slow to load into the planes, so Joe Ely found another solution with Wim Lely of Orland (Glenn County) who manufactured specialized machinery. Lely built a machine that could mix 1000 gallons of retardant and pump it into the planes in a matter of minutes. Time was critical in trying to stop the spread of a fire. Lely provided mixing machines and services to the Forest Service for many years. Ely later related that water drops are not sufficient in the arid California climate and credited the use of retardants as being key in the effectiveness of aerial firefighting.⁶³

⁶² Ely, “A Whole New Way to Fight Fire,” 84.

⁶³ Ely, “A Whole New Way to Fight Fire,” 84.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

The MATS fought twelve fires during their first month of operation and were soon flying all over California. Some of the biggest fires they fought in their first year were in southern California including the Inaja Fire in San Diego County. Eleven firefighters were lost in that fire before the Willows-based pilots were dispatched to it. Not completely trusting their aircraft compasses, flying to southern California meant visually following Highway US 99.

In a study at the end 1956, the MATS were found to have assisted in twenty-three Forest Service fires. Of those incidents, aircraft were a deciding factor in assuring control in fourteen fires, a definite factor in assisting ground crews in four fires, did not affect the control in four, and were detrimental in one when a backfire was accidentally extinguished, which caused a loss of control.

Willows Airport became the de facto center of aerial firefighting. In 1980, Carl Wilson, Assistant Director of the Pacific Southwest Forest and Range Experimentation Station in Riverside, wrote,

In October 1956, after the spectacular success on 25 wildfires, a series of drop tests were conducted at the Willows Airport. The primary objective was to determine the best height and air speed for the Stearmans and N3Ns (Air Force and Navy planes, respectively) to fly to obtain optimum patterns of water and sodium calcium borate on a geometric grid on the surface of the airport. Also, it was necessary to determine the effect of wind and other meteorological variables on drop patterns. As was the case in most other air attack studies, this was an interagency operation involving the California Division (now Department) of Forestry, Los Angeles County Fire Department, U. S. Forest Service (R-5), Equipment Development Center at Arcadia, Forest Service Experiment Station, and private industry.⁶⁴

In 1957, Forest Service aerial assets increased from seven air tankers to twenty-six, including eight surplus Forest Service-owned Grumman TBM Avenger torpedo bombers fitted with 400-gallon tanks. Other larger airplane models soon joined the fight, including Grumman F7F Tigercats (800 gallons), Consolidated PB4Y Catalinas (1000 gallons) and PB4Y2 Privateers (2000 gallons), Douglas DC-6 (2800 gallons) and B-26 Invader (1200 gallons), and Boeing B-17 Flying Fortress (1200 gallons) and YC-97 Stratofreighter (5000 gallons.) North American B-25 Mitchell bombers, the same aircraft flown by the Doolittle Raiders, made a brief return to Willows Airport as aerial tankers. This aircraft was removed from the fleet after a series of fatal accidents.

The California Division of Forestry took advantage of the Service's offer to use the aerial tankers before establishing their own squadrons in 1958 and deploying them at five airports including Ukiah (Mendocino County), Placerville (El Dorado County), Chester (Plumas County), Oroville (Butte County), and Hoberg's Airport (Lake County).

Gary Hendrickson recalled they staged a double-wide trailer at the south end of the apron during the fire season. The U.S. Forest Service continued to base their regional operations at Willows

⁶⁴ Wilson, "A Brief History of the Use of Aircraft on Forest Fires in California."

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Airport until 1982. Larger aircraft required a longer runway, so operations were moved to Chico Municipal Airport (Butte County).

Willows Airport remains a location for ag flying services and other types of general aviation. The two fifteen-plane hangars built in 1947 and 1952 are still in use. Gary Hendrickson continues to occupy the same space in the 1952 hangar that his father used as an original air tanker pilot. One of the newer hangars is occupied by Reg Michaud Aviation. Frank Michaud, Jr. began the agricultural aviation company in 1949 and joined the Air Tanker Squad in 1957. His company remains in operation, owned and operated by his grandsons.

While the Department of Commerce was installing the towers and arrows, aircraft companies and airlines were also installing the first air-to-ground two-way radio systems to assist in navigation, systems not in widespread use until 1930. Aeronautical Radio Inc. was founded that year by a consortium of Boeing, American Airways, Western Air Express (later known as Western Airlines), Pan American World Airways, and Curtis-Wright, a major aircraft and engine manufacturer. The nonprofit organization administered radio operations and shared resources among the airlines. Herbert Clark Hoover Jr., Chief Engineer for Western Air Express, served in an advisory role as President. While only 26 years old at the time, he had been involved with ham radio while growing up on the Stanford University campus and then earning a BS in Engineering in 1925.⁶⁵ His father, President Herbert Hoover, while serving as the Secretary of Commerce, oversaw the beginnings of the Aeronautics Branch and established many of the regulations for aviation practices and radio communications.

The Aeronautics Branch and the Bureau of Standards were also busy in the late 1920s working on radio navigation and weather reporting systems. By 1929, there was a federal radio navigation beacon system that sent voice information to help pilots to navigate and pilots could request help through two-way radios. The Aeronautics Bureau continued to make advances in radio communications, weather information and aids to navigation. The Aeronautics Bureau underwent its first name change in 1934 when it became the Bureau of Air Commerce, later becoming the Civil Aeronautics Administration (CAA) in 1940 and the Federal Aviation Administration (FAA) in 1958.

The improvement of radio navigational systems did not lead to the immediate demise of the lighted airway beacons as the last of those was in use until 1973. Many of the aircraft based at Willows Airport lacked two-way radios for many years after they became common in commercial aircraft. In the first year of the Mendocino Air Tanker Squad, the simple ag planes did not have radios, so the pilots were given instructions about where to make their drops when they landed to take on water or retardant. In their debrief at the end of the first season in 1956, it was decided they needed radios and noise-cancelling headsets before the next fire season. Lacking radio communications also meant that when deploying to Southern California to assist on fires, the pilots had to visually follow Highway US 99 to find their way.

⁶⁵ "Aeronautics: Aeronautical Radio Inc." *Time*, 14 July 1930, 52.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

The Aeronautics Bureau placed 1,500 beacons along the 18,000 miles of air mail routes. The other air mail routes in California were the original transcontinental route (Reno-San Francisco), Los Angeles-Las Vegas, Los Angeles-Amarillo, and San Diego-Yuma. There were 133 beacons erected along these routes within California. Of those, twenty-three were at airports, twenty-four were at Intermediate Landing Fields and the other eighty-six were standalone beacons. Most of the towers were the standard 51-foot IDECO towers.

The tower at Willows-Glenn County Airport is the only original 51-foot IDECO tower still in use at its original airport in California, and one of the few anywhere in the United States. This simple utilitarian structure has stood through years of hot dusty summers and winter storms, lighting the way for aviators at night. Just as lighthouses lit the way for mariners transiting the waterways of our nation, the Air Mail beacons lit the way for airmen to safely navigate the skies.

In 1981, on the 25th anniversary of the founding of MATS, the Forest Service built a monument to Joe Ely and the pilots at Willows Airport. Two of the original airplanes are still in flying condition. Harold Hendrickson's N3N, is in Washington State. Lee Sherwood's N3N, flown starting in 1957 by Frank Prentice, is in Georgia. Tanker #1, Floyd and Vance Nolta's Stearman, was wrecked in an ag crash in the 1980s. A piece of the tail, with the aircraft number 75081, is in the National Museum of Forest Service History in Missoula, Montana.

Joe Ely put it best in 1983 when he wrote,

Our little tanker squad of half a dozen small planes, which began at the local airport at Willows, California, in the middle fifties, has grown, not only in the size of the ships, but has spread all over the world. Today air tankers are being used on fires in Australia and in the Mediterranean region. In Canada, they have been modified to scoop water out of a lake without even stopping.

The important thing about the original air tanker operation was its enthusiasm. The conviction that "this idea will work" spread from the dozen or so pilots to the Forest Service and state people, who call the pilots back again and again to help put out fires all over the state. It spread to fire fighters on the ground who kept saying, "Thanks, come back and help us again; you guys are great." It spread to the press and to the public, and to the people who would stop on the steps of the post office and tell us, "Hang in there."⁶⁶

⁶⁶ Ely, "A Whole New Way to Fight Fire," 85.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

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Name of Property

Glenn, California
County and State

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Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

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Name of Property

Glenn, California
County and State

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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 # _____
- recorded by Historic American Landscape Survey # _____

Primary location of additional data:

- State Historic Preservation Office
 - Other State agency
 - Federal agency
 - Local government
 - University
 - Other
- Name of repository: Glenn County Government Records

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property 320

Latitude/Longitude Coordinates

Datum if other than WGS84: _____

(enter coordinates to 6 decimal places)

- | | |
|------------------------|------------------------|
| 1. Latitude: 39.523888 | Longitude: -122.221111 |
| 2. Latitude: 39.523888 | Longitude: -122.207777 |
| 3. Latitude: 39.511944 | Longitude: -122.217777 |
| 4. Latitude: 39.511944 | Longitude: -122.221111 |

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Verbal Boundary Description (Describe the boundaries of the property.)

The district is bounded on the north by the California State Route 162 right-of-way and on the east by the Interstate 5 right-of-way. The south boundary is the fence line just north of County Road 53, which is also the southern boundary of Sections 8 and 9 of Township 19N, Range 3W of the Mount Diablo Meridian. The west boundary is the fence line bordering privately owned agricultural land.

Boundary Justification (Explain why the boundaries were selected.)

The original boundaries of the airport were the Eastern ½ of Section 8 of Township 19N, Range 3W of the Mount Diablo Meridian. Some acreage of the adjoining Section 9 was added by the Army Air Forces in 1940-1941 when they built Runway 13/31. A carveout along the northeastern/eastern section of the airport occurred in the 1960s with the establishment of the Interstate 5 right-of-way.

11. Form Prepared By

name/title: Edward Atlas, Historian
organization: N/A
street & number: 1264 S Baywood Ave
city or town: San Jose state: CA zip code: 95128
e-mail: ted.atlas@att.net
telephone: (408) 314-0829
date: July 2022; Revised October 2022, November 2022

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A USGS map or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.
- **Additional items:** (Check with the SHPO, TPO, or FPO for any additional items.)

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property: Willows-Glenn County Airport
City or Vicinity: Willows
County: Glenn County
State: California
Photographer: Edward Atlas
Date Photographed: August and October 2021

Description of Photograph(s) and number, include description of view indicating direction of camera:

- 1 of 19 Tower and north end of airport from SR162, view east
- 2 of 19 South elevation of tower, view north
- 3 of 19 Northwest elevation of tower and Mann & Sons Ag hangar, view southeast
- 4 of 19 Closeup of southwest leg of tower, view east
- 5 of 19 Original IDECO manufacturer's plaque on west side of tower, view east
- 6 of 19 Original Department of Commerce Aeronautics Bureau plaque on north side of tower, view south
- 7 of 19 1947 hangar, view southeast
- 8 of 19 Hendrickson Air Service at north end of 1952 hangar, view south
- 9 of 19 Hendrickson Air Service office and storage hangar in northeast corner of 1952 hangar, view southwest
- 10 of 19 East elevation of 1952 hangar, view west
- 11 of 19 Interior of hangar—used by Frank Prentice during his MATS service—in 1952 hangar building

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

- 12 of 19 Southwest elevation of east multi-plane hangar and individual T-shaped hangars, view northeast
- 13 of 19 Northeast elevation of former Airport Administration Building, view southwest
- 14 of 19 Northwest elevation of Nancy's Airport Café, view southwest
- 15 of 19 Rockwell International Turbo Thrush Commander ag plane in front of Mann & Sons Ag Flying Service hangar, view east
- 16 of 19 East elevation of Reg Michaud Aviation hangar, view west
- 17 of 19 Fuel storage tank and pumps, view west
- 18 of 19 Plaque dedicated to original Mendocino Aerial Tanker Service, view south
- 19 of 19 Closeup of plaque

Paperwork Reduction Act Statement: This information is being collected for nominations to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.). We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

Estimated Burden Statement: Public reporting burden for each response using this form is estimated to be between the Tier 1 and Tier 4 levels with the estimate of the time for each tier as follows:

- Tier 1 – 60-100 hours
- Tier 2 – 120 hours
- Tier 3 – 230 hours
- Tier 4 – 280 hours

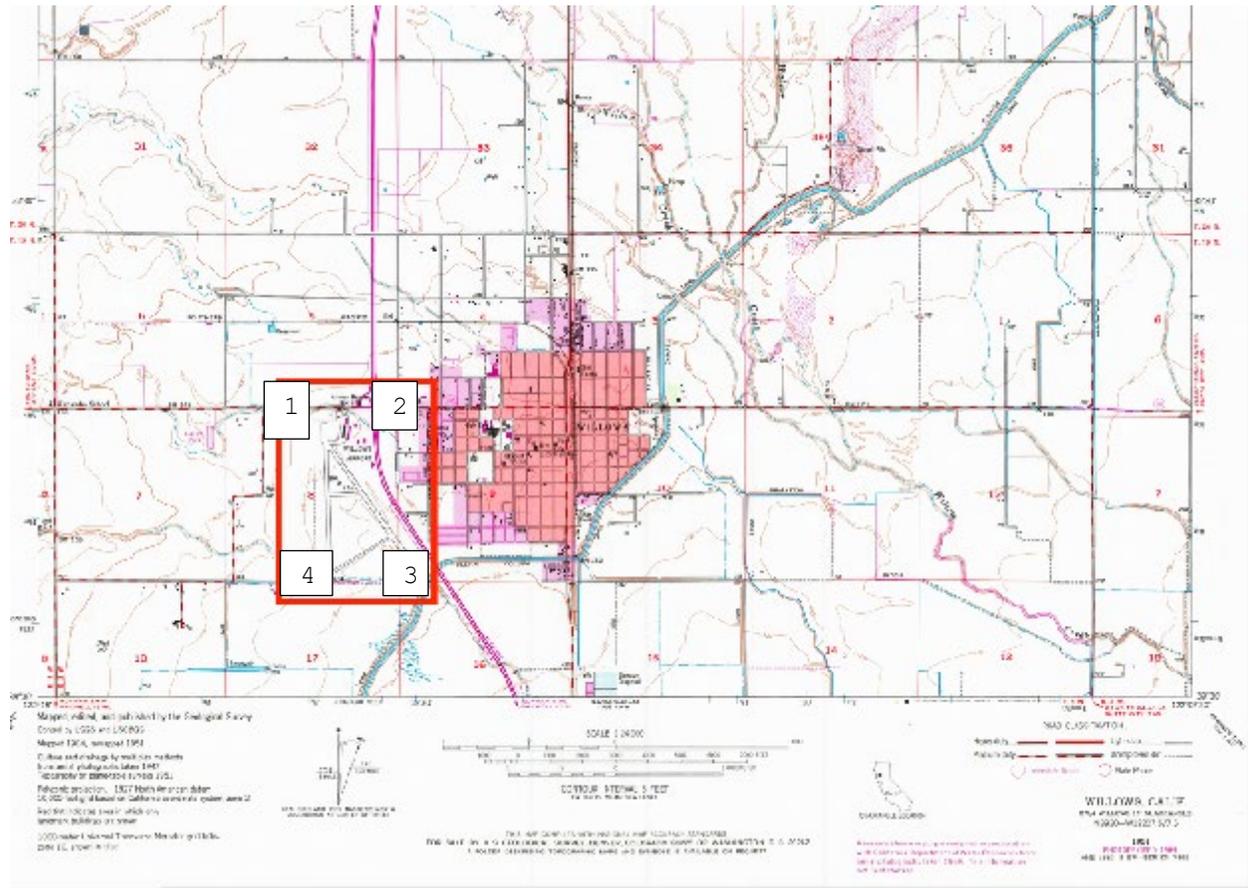
The above estimates include time for reviewing instructions, gathering and maintaining data, and preparing and transmitting nominations. Send comments regarding these estimates or any other aspect of the requirement(s) to the Service Information Collection Clearance Officer, National Park Service, 1201 Oakridge Drive Fort Collins, CO 80525.

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Location Map

- 1. Latitude: 39.523888 Longitude: -122.221111
- 2. Latitude: 39.523888 Longitude: -122.207777
- 3. Latitude: 39.511944 Longitude: -122.217777
- 4. Latitude: 39.511944 Longitude: -122.221111



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

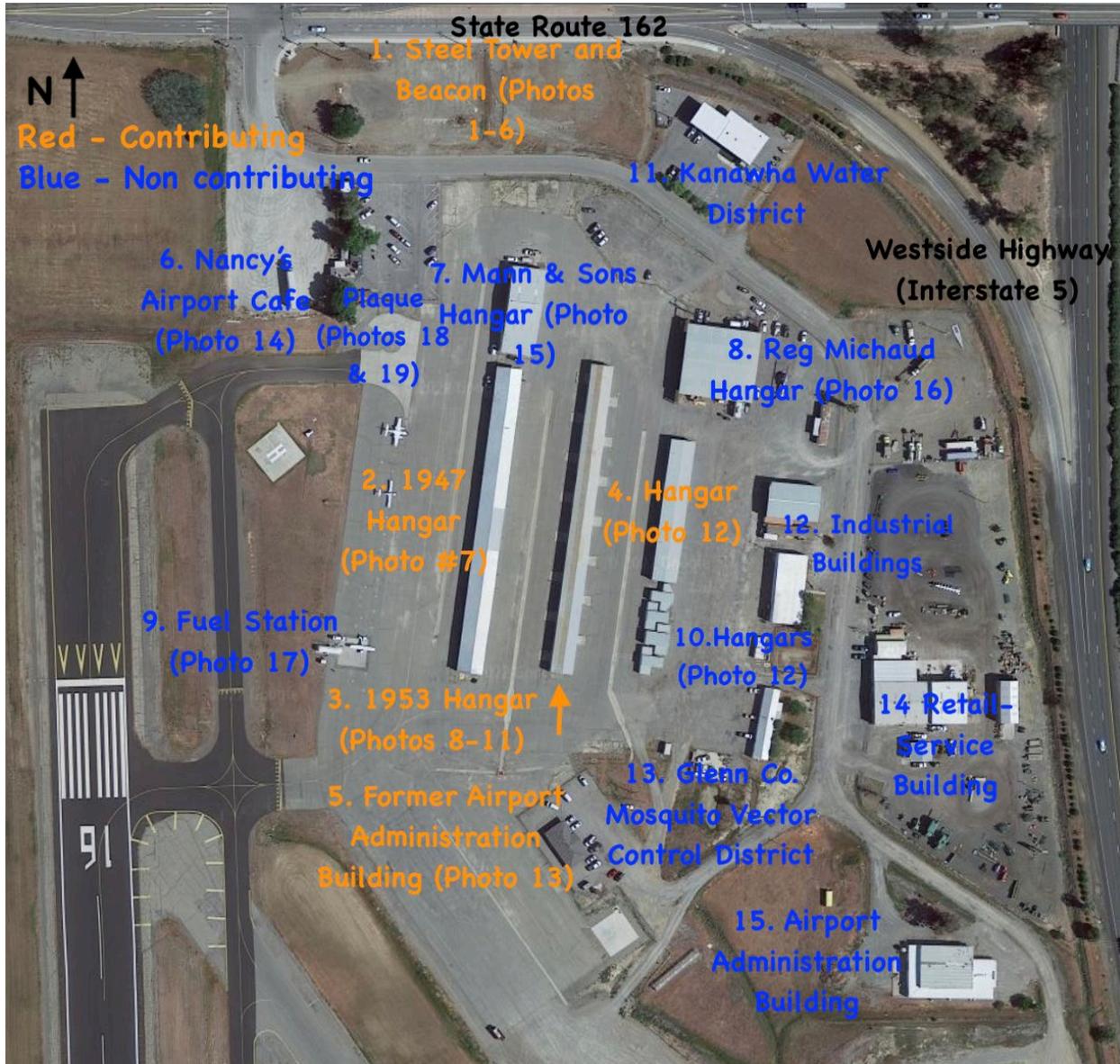
Vicinity Map



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Sketch Map/Photo Key 1 of 2



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Sketch Map/Photo Key 2 of 2



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 1 Pacific Air Transport Ryan M-1, circa 1926; San Diego Air & Space Museum Pacific Air Transport Collection.



Figure 2 Pacific Air Transport Boeing Model 40, circa 1927; National Postal Museum



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 3 Boeing Air Transport Boeing Model 80 Trimotor at Grand Central Airport in Glendale, Los Angeles County, circa late 1928; Museum of Flight.



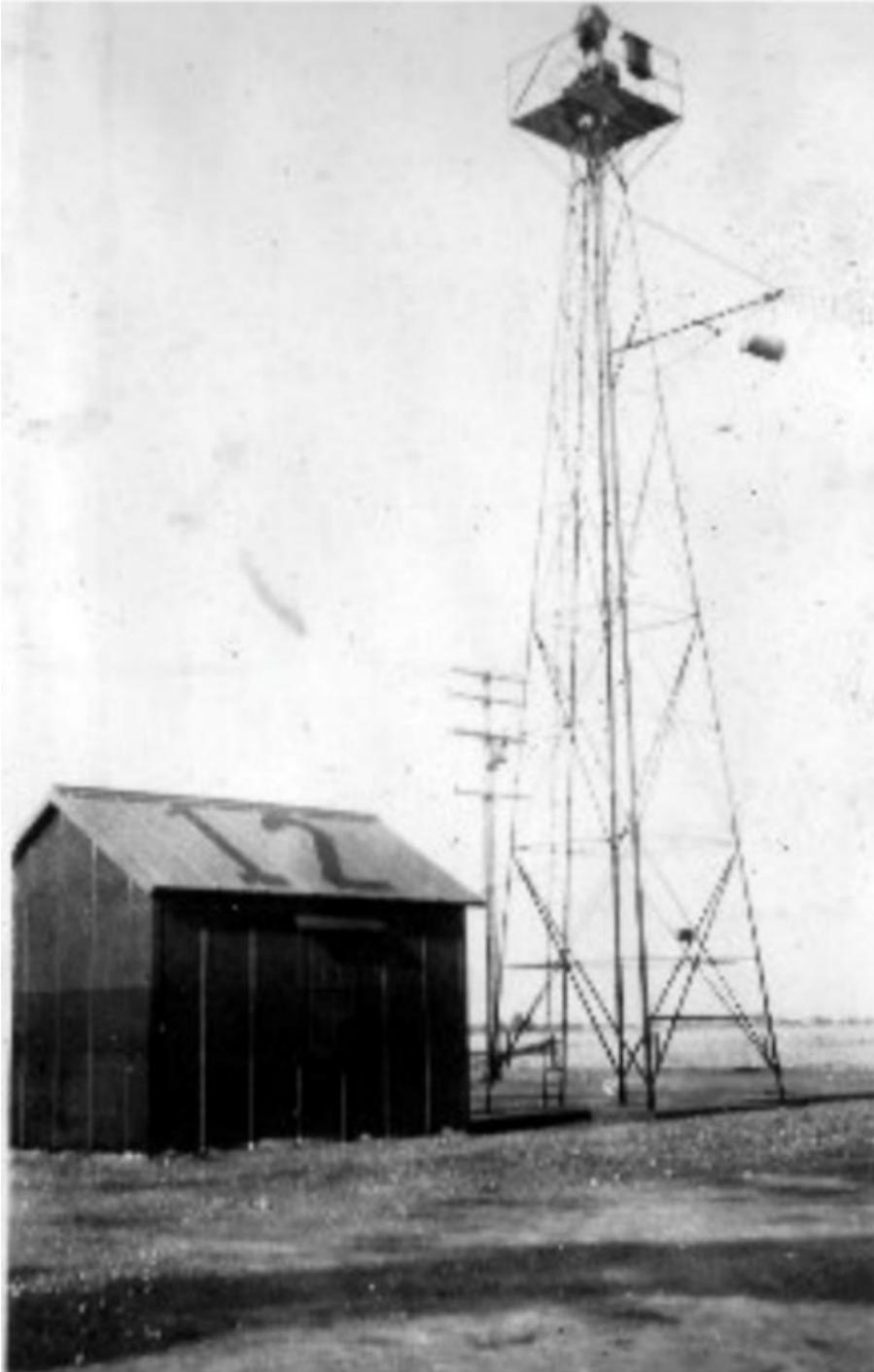
Figure 4 Floyd Nolta next to his Hisso Travel Air rice seeding airplane, April 4, 1929; location unknown, possibly Willows-Glenn County Airport; Gary Hendrickson Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

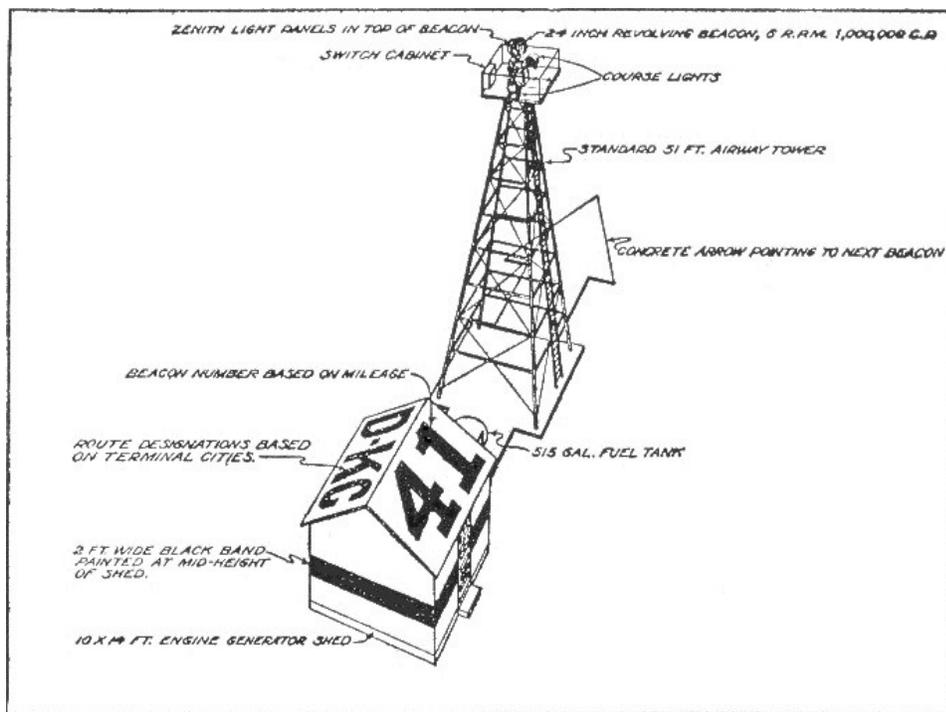
Figure 5 Steel tower and adjacent shed (no longer extant), circa 1930; Nolta Family Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 6 Representative configuration of beacon tower and arrow; the shed in this drawing, with notations for a generator and fuel tank, was for remote location Beacon #41 on the Dallas to Kansas City airway at the Cassoday Intermediate Landing Field in Kansas (no longer extant); Abandoned and Little Known Airfields http://www.airfields-freeman.com/ks/Airfields_KS_C.htm#cassoday



Notations transcribed:

ZENITH LIGHT PANELS IN TOP OF BEACON
24 INCH REVOLVING BEACON, 6 R.P.M. 1,000,000 C.P.
SWITCH CABINET
COURSE LIGHTS
STANDARD 51 FT. AIRWAY TOWER
CONCRETE ARROW POINTING TO NEXT BEACON
BEACON NUMBER BASED ON MILEAGE
515 GAL. FUEL TANK
ROUTE DESIGNATIONS BASED ON TERMINAL CITIES.
2 FT WIDE BLACK BANK PAINTED AT MID-HEIGHT OF SHED.
10 X 14 FT. ENGINE GENERATOR SHED

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 7 U.S. Army Air Corps Aeronautical Chart, prepared 1930, revised 1933; Air Mail Route identifiers for Willows Airport include “12,” “dot dot dash” (Morse Code for “U”), and “G” (green course lights); chart also shows Beacon 11 to the south near Delevan with an “R” (red course lights) that flashed “W” (dot dash dash) and Beacon 13 to the north, which flashed “V” (dot dot dot dash), also in red



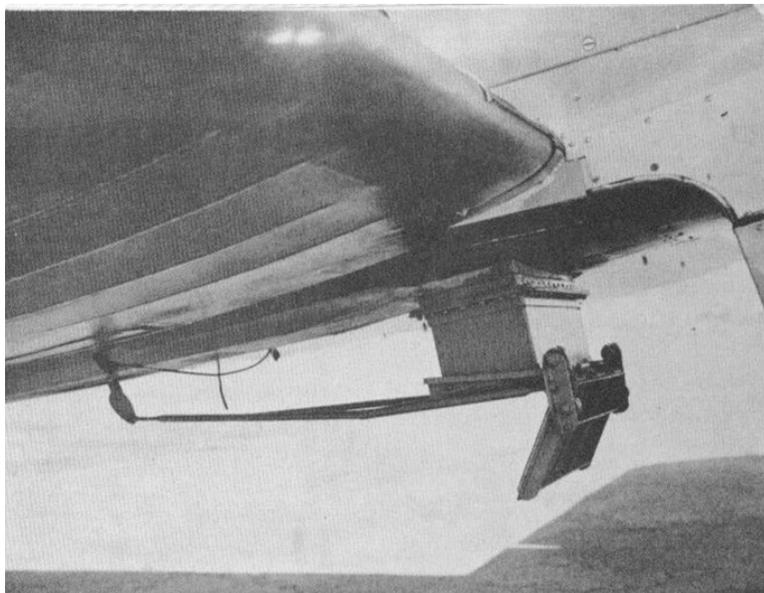
Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 8 Practice Water Drop at Willows-Glenn County Airport, 1955; U.S. Forest Service Mendocino National Forest Collection



Figure 9 Release valve, also identified as “special tank outlet” on Tanker #1, Floyd Nolta’s Boeing Stearman Model 75, location unknown, 1955; George Nolta Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 10 Vance Nolta next to Tanker #1, a Boeing Stearman Model 75, 1956; George Nolta Collection



Figure 11 Joe Ely, Floyd Nolta, and Mendocino NF Supervisor Robert Dasman next to Air Tanker #1, 1956; George Nolta Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 12 Original MATS pilots in front of their airplanes, from left, Dale Nolta, Warren Bullock, Floyd Nolta, Harold Hendrickson, Mac McCurley, Ray Varney, Frank Prentice, Vance Nolta; Lake Elsinore, CA, 1956; George Nolta Collection



Figure 13 Ray Varney climbing in to his N3N air tanker, 1956, Gary Hendrickson Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 14 Aerial tankers with steel tower in background, 1956, Gary Hendrickson Collection



Figure 15 Frank Prentice conducting a practice water drop during a meeting of firefighting agencies including USFS, California Division of Forestry, Los Angeles County Fire Department, and private industry, October 1956; Gary Hendrickson Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 16 Mechanics work on a USFS Grumman TBM Avenger (WWII Navy Torpedo-Bomber); the “Z” in the aircraft number indicates government-ownership whereas most of the air tankers were privately owned, 1957; Gary Hendrickson Collection



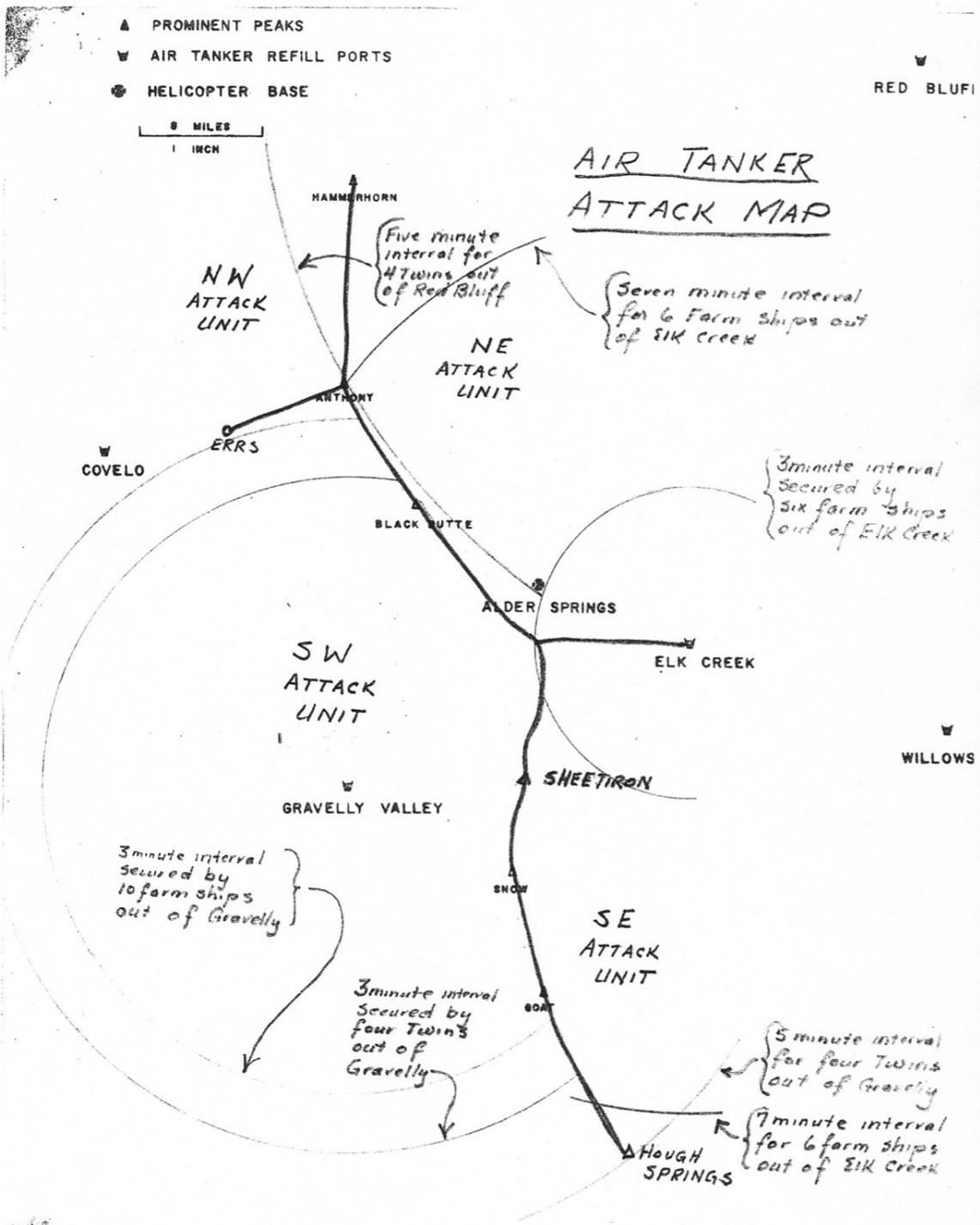
Figure 17 North American B-25 Mitchell (WWII Army Air Forces bomber) being loaded with retardant, circa 1960, Gary Hendrickson Collection



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Figure 18 Hand drawn map by Joe Ely, circa 1957



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Photo 1 Tower and north end of airport from SR162, view east



Photo 2 South elevation of tower, view north



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Photo 3 Northwest elevation of tower and Mann & Sons Ag hangar, view southeast



Photo 4 Closeup of southwest leg of tower, view east



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Photo 5 Original IDECO manufacturer's plaque on west side of tower, view east



Photo 6 Original Department of Commerce Aeronautics Bureau plaque on north side of tower, view south



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County and State

Photo 7 1947 hangar, view southeast



Photo 8 Hendrickson Air Service at north end of 1952 hangar, view south



Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Photo 9 Hendrickson Air Service office and storage hangar in northeast corner of 1952 hangar, view southwest



Photo 10 East elevation of 1952 hangar, view west



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Name of Property

Glenn, California
County and State

Photo 11 Interior of hangar—used by Frank Prentice during his MATS service—in 1952 hangar building



Photo 12 Southwest elevation of east multi-plane hangar and individual T-shaped hangars, view northeast



1

Willows-Glenn County Airport
Name of Property

Glenn, California
County and State

Photo 13 Northeast elevation of former Airport Administration Building, view southwest



Photo 14 Northwest elevation of Nancy's Airport Café, view southwest



Willows-Glenn County Airport
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Glenn, California
County and State

Photo 15 Rockwell International Turbo Thrush Commander ag plane in front of Mann & Sons Ag Flying Service hangar, view east



Photo 16 East elevation of Reg Michaud Aviation hangar, view west



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Glenn, California
County and State

Photo 17 Fuel storage tank and pumps, view west



Photo 18 Plaque dedicated to original Mendocino Aerial Tanker Service, view south



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Glenn, California
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Photo 19 Closeup of plaque

