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NAT. REGISTER OF HISTORIC PLACES
NATIONAL PARK SERVICE

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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. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name Site 32 SL-O (Salt Lake – Omaha) Intermediate Field Historic District

other names/site number Medicine Bow Airport

2. Location

street & number .9 miles southeast of Medicine Bow off of County Road 1 [ ] not for publication

city or town Medicine Bow [X] vicinity

state Wyoming code WY county Carbon code 007 zip code 82329

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X_ 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 _X_ 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 _X_ local

Mary M. Hopkins, WYSHPO 1/6/2012
Signature of certifying official/Title Date

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official Date

Title State or Federal agency/bureau or Tribal Government

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:) _____

for Edson H. Beall 2.29.12
Signature of the Keeper Date of Action

Site 32 SL-O Airway (Salt Lake – Omaha) Intermediate Field Historic District
Name of Property

Carbon County, WY
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply.)

- [ ] private
- [X] public - Local
- [X] public - State
- [ ] public - Federal

Category of Property
(Check only **one** box.)

- [ ] building(s)
- [X] district
- [ ] site
- [ ] structure
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
1	2	buildings
		district
5		site
1		structure
47	35	object
54	37	**Total**

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

N/A

Number of contributing resources previously listed in the National Register

N/A

6. Function or Use

Historic Functions
(Enter categories from instructions.)

Transportation: Air-related

Current Functions
(Enter categories from instructions.)

Transportation: Air-related

7. Description

Architectural Classification
(Enter categories from instructions.)

Other: Airfield

Materials
(Enter categories from instructions.)

foundation: Concrete
walls: Other
roof: Shake
other: Metal

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The Medicine Bow intermediate field, situated on a nearly level plain at an elevation of 6,500 feet above sea level, is located nine-tenths of a mile southeast of the Town of Medicine Bow, Wyoming and can be accessed via route U.S. 30-287. The Union Pacific railroad is located a short distance to the north and Carbon County Road 1 is located one quarter mile to the southwest. The field is under dual ownership, 17 acres are owned by the Town of Medicine Bow and 130 acres are owned by the State of Wyoming all of which are incorporated into the Medicine Bow airport.

The Medicine Bow intermediate field, an emergency landing field located between major terminal points, was an integral part of Route "T", the New York to San Francisco transcontinental airway. Terrain was selected if possible to be level or devoid of sharp breaks in grade and to be well drained naturally, or by artificial means. Selected areas, if at all possible were to be improved as little as possible in keeping with the fluctuating design of the airway. In keeping with the general design of intermediate fields, the Medicine Bow plan form was laid out to afford pilots the opportunity to land in any direction. As such, this intermediate field does not have a formal runway. Officially referred to as Site 32 on the Salt Lake to Omaha airway it originally comprised 140 acres.[1] An additional seven acres were added at a later date[2] for construction of the low frequency radio range. The historic district went through several use classifications until 1958 when it was turned over to the Town of Medicine Bow by the Department of Commerce.

Narrative Description

Buildings:

Teletype Office (first powerhouse), Contributing

A wood frame building with the exterior dimensions of 22 by 14 feet sits on a raised concrete foundation and is located in the extreme north-west corner of the district. Horizontal siding is painted white with a 20 inch red band surrounding the exterior three feet above ground level. The roof is of medium pitch and covered with shake shingles. The building has been subdivided into two rooms. The larger room has the dimensions of 13 feet four inches by 14 feet. The smaller room has the dimensions of 13 feet four inches by seven feet and is furnished with various sizes of cabinetry. The walls and ceiling of both rooms are finished with Celotex fiberboard sheathing. The north side has one wood door at the north-west end of the building measuring 81 inches high by 31 inches wide. The east end of the building has one door (frame only) centered in the structure and measures 81 inches high by 31 inches wide. Two double hung windows are located on the south side of the building, each measuring 34 inches wide by 53 inches high. One window of the same construction and dimensions is located on the north side east of the door way. The building initially served as the powerhouse and at a later date was converted to the teletype office. The exterior has suffered from extreme effects of weather, particularly on the northwest exposures, causing paint peeling and warping of exterior siding. The interior has been heavily vandalized with ceiling and wall covering torn down and glass broken from windows. The building is also infested with birds and rodents.

T Hangers, Noncontributing

Two 'T' hangers one located in the northwest corner of the district and the other located approximately midfield along the north fence line comprise the noncontributing buildings. Both are of wood construction and are of the plan form of a 'T' for the purpose of storing small light aircraft. The aircraft are stored tail first so that the fuselage is parallel to the vertical axis of the letter 'T' and the horizontal component of the 'T' providing the space for the wings. Both are presently used to store various miscellaneous and valueless items.

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[1] *Airway Bulletin No.786,* (Washington, D.C.: GPO, October 15, 1929),1.

[2] Based on labor time sheets, *Form 46, Department of Commerce,* August-December, 1930, Private Collection, Steve Wolff, Laramie, Wyoming.

The 'T' hanger nearest the entrance is of plywood construction open to the southwest. The opening is 39 feet wide and 12 feet high. The roof slopes to the north giving the rear wall a dimension of 39 feet wide by nine feet six inches high. The length is 28 feet. The rear wall parallels the drive that gave access to the Airway Keeper's residences (no longer extant).

The second 'T' hanger is approximately 1200 feet from the entrance along the north boundary of the district and partially occupies the former site of the radio range. Of plywood construction, it opens to the east. The opening has the dimensions of 43 feet in width and a height of 12 feet. The rear wall has a height of eight feet. The overall length from opening to rear wall is 28 feet.

Structure:

Tower, Contributing

A 51 foot skeletal galvanized steel tower is located in the northwest corner of the district. Atop the tower is a six foot square maintenance platform which provided space for technicians performing beacon maintenance. The platform also provided mounting attachments for the two 18 inch diameter green course lights and a 36 inch diameter Crouse-Hinds airway beacon. A 36 inch high safety railing surrounds the platform. The platform is accessible via a ladder and trap door in the platform floor on the north side of the tower. The tower, manufactured by the International Crane and Derrick Company, is constructed of two and half inch by two and half inch angle iron bolted together in 12 foot sections and is painted in alternate bands of white and International Orange. The legs of the tower are set in concrete on nine foot four inch centers. Horizontal and vertical cross bracing provides additional rigidity. Although the tower has not been vandalized, extreme weathering of the painted surfaces has exposed the galvanized metallic surfaces. Cracking of the tower foundation is evident due to vegetation encroachment.

Objects:

Boundary Marker, Contributing

One Federal property boundary marker of cast concrete 72 inches high and six inches square is located in the northwest corner of the historic district. Corners are chamfered one and one-quarter inch. The upper ten inches are not chamfered and have three inch high letters **U S** cast in relief on one side. The upper portion of the marker has been broken off.

Light Standards, Contributing

Thirty-five light standards, 45 inches tall, were topped by prismatic globes which outlined the field for night operations. Below each globe socket is a galvanized sheet metal cone painted in International Orange and white. The colored cones aided in delineating the boundaries of the field for day operations. Spacing varies from 390 feet along the southwest fence line, to 310 feet along the east fence line and 350 feet along the northeast fence line east of the Airway Keeper's quarters. The boundary cone is an integral part of the light standard. All of the light standards have been vandalized, with globes broken out, and cones showing the effect of gunfire. Paint has weathered over most of the surface to the point of exposing the sheet metal.

Ground Directional Arrow, Contributing

One ground directional arrow is positioned below the base of the tower. It consists of a poured concrete slab in the shape of an arrow pointing in a southeasterly direction. The apex of the arrowhead expands to a width of 11 feet. The base of the arrowhead is connected to the shaft, a four foot wide strip of concrete extending to the tower slab and beyond to the teletype building. The length, discounting the teletype building and tower slab, is 24 feet. The concrete arrow shows the effects of weathering and vegetation encroachment.

Fence Markers, Contributing

Seven fence markers delineate the boundaries of the field. These are constructed of one by six inch western or Idaho white pine with sides and edges painted in alternate bands of International Orange and white fastened horizontally on galvanized steel stanchions. The cross-section is triangular and each marker has an overall length of 62 feet. These are placed at the interior angles of the field and at 600 foot intervals along straight sides. Three sets of markers are missing. Existing markers exhibit the effects of heavy weathering. Wood is weather checked and warped and the paint is faded.

Obstruction Light Pole, Contributing

One 20 foot obstruction pole to warn of the proximity of power lines for night approaches is located at the northeast boundary of the northeast-southwest landing area. Of standard wood pole construction with six climbing stanchions, it is one of four that supported red obstruction lights. Two are on the ground and one lies outside the district. The poles are heavily weathered and globes have been vandalized.

Wind Sock Pole, Contributing
One steel pole six inches in diameter and 20 feet high is located at the intersection of the northeast-southwest and northwest-southeast landing strips. This pole originally supported a wind sock, now missing.
Airway Beacon, Contributing
One Crouse-Hinds 36 inch double ended airway beacon sits atop of the tower. The beacon is primarily cast aluminum and glass. The glass lenses, one green and one clear, disposed at opposite ends, are designed in three pieces. The center circular lens had a diameter of 20 inches. Two semi-circular lenses surround the center section, which give the lens a total diameter of 36 inches. Additional framing elements bring the total exterior dimensions of the aluminum housing to 40 inches. Two 36 inch parabolic mirrors behind each lens projected the beam outward. Between the mirror and the lens was a 1000 watt bipost mogul bulb which provided the illumination. The interior is accessed by two exterior doors located midway between the ends of the beacon. All glass has been vandalized and the aluminum casing shows the effects of gunfire. The drive gearbox is missing.

Polyethylene Runway Cones, Noncontributing
The objects consist of 34 portable polyethylene cones, yellow in color with the dimensions of 38 inches at the base tapering to four and half inches at the top. The height is 23 inches. The cones are presently used to delineate the boundaries of the east-west runway.

Electric Power Pole, Noncontributing
One electric power pole is located several feet west of the ground directional arrow tip. Wires lead to the “T” hanger located nearest the entrance.

Sites:
Assistant Airway Keepers quarters foundations, Contributing
Two concrete foundations, which are located along the east-west fence line just east of the beacon tower, outline the cellars and mark the former location of Assistant Airway Keeper’s quarters. Dimensions of each are 22 by 28 feet and conform to the standard size of the “K” quarters provided for Airway Keepers. Depth of cellars is indeterminate at this time due to filling. The foundations are heavily obscured with sage with visible portions showing the effects of frost heaving.

Garage Pad, Contributing
One concrete pad with the dimensions of 12 by 18 feet is located along the east-west fence line east of the Assistant Airway Keeper’s quarters marks the location of the two car garage. The pad shows the effects of frost heave and encroachment of vegetation.

Powerhouse Site, Contributing
One concrete pad with the dimensions of 10 by 14 feet is located along the east-west fence line, east of the garage and marks the remains of the powerhouse. Two concrete footings approximately three feet apart with the dimensions of one foot wide by six foot long immediately north of the pad mark the position of the cradle that held a fuel tank. The concrete pad is heavily fractured and encroached upon by vegetation.

Flag Pole Site, Contributing
This area is outlined by an oval concrete footing. The footing has a width of six inches and is located across the driveway from the former site of the Airway Keeper’s quarters. The oval is 70 feet long by 30 feet wide. A 12 by three foot wide walkway, centered, projects to the south and terminates in five foot square concrete pad that formerly supported a five and one-half inch flagpole.

Supervisors Quarter’s Site, Contributing
One rectangle delineated by six inch wide concrete footings with the dimensions of 37 by 36 feet with rounded corners is located approximately 1200 feet east of the teletype office. The enclosed area marked out the grounds for the supervisor’s quarters. The longest axis, 37 feet is oriented east-west. All other references to the dwelling have been eradicated by individuals converting the site for parking of small aircraft.

Integrity:
The Medicine Bow intermediate field was one of 15 constructed in Wyoming to supplement the transcontinental airway. It is the most intact remaining facility of its type in Wyoming and possibly the U. S. Despite neglect and vandalism, it retains

integrity of most aspects. Integrity of location, setting, feeling, and association are strongest because the intermediate airfield remains in its original location and within its original boundaries. The relative isolation of the Town of Medicine Bow and the lack of funding for modernization, are the likely reasons much of the historic district remains. The historic district retains a rural setting that has changed little since the late 1920's. The largest modern intrusion, located outside the district, is the water storage tank for the Town of Medicine Bow. Open rangeland covered with sagebrush encompasses the airfield instilling a sense of timelessness to an observer. The area is still enclosed by its original fenced boundaries and retains its original function as an airfield which instills a strong sense of feeling and association. The integrity of the ground directional arrow, fence markers and unaltered airfield plan form, is such that former users of the transcontinental airway from its historic era would find themselves in familiar surroundings. Many of the noncontributing resources postdate the period of significance, but still relate to the airfield. Overall, the integrity of feeling and association are very good.

The district's unaltered landscape retains the integrity of design and materials that is in keeping with the original engineering specifications and many of the original resources remain *in situ* conveying the purpose of the airfield. As was common government practice after decommissioning, equipment was relocated and buildings were auctioned. All but one building has been removed from the district; however, the concrete foundations and driveways remain in place. The exterior and interior materials of the sole remaining building are relatively unaltered and exemplify construction practices for Federal Airway facilities during this period. The completeness of the ground directional arrow provides a stark physical example of a bygone era of air navigation and can only leave an observer in awe of the Federal Airways primitive beginnings.

Site 32 SL-O Airway (Salt Lake – Omaha)
Intermediate Field Historic District
Name of Property

Carbon County, WY
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.)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [ ] 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.)

Property is:

- [ ] 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.

Areas of Significance
(Enter categories from instructions.)

Transportation

Period of Significance
1929-1958

Significant Dates
1929, 1931, 1941, 1958

Significant Person
(Complete only if Criterion B is marked above.)

N/A

Cultural Affiliation

Architect/Builder
Department of Commerce, Bureau of Lighthouses

Period of Significance (justification)
The present configuration of the historic district extends from 1929 to 1958. The original 140 acres of the historic district are representative of early Federal Airway system design and construction methods for intermediate fields until their abandonment in 1965. The construction of the low frequency radio range on an additional seven acres beginning August 1930 signified the beginning of a new era in air transportation in which aircraft could transverse the entire continent from New York to San Francisco navigating by radio independent of weather conditions. With the advent of faster and reliable aircraft, the radio range and weather reporting facility was decommissioned circa 1938. The historic district was returned

to the Town of Medicine Bow in 1941 as a municipal airport; however, the Bureau of Commerce continued to operate and maintain its intermediate field status until 1958 when it was deemed surplus and all Federal interest was relinquished.

Criteria Considerations (explanation, if necessary)

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance and applicable criteria.)

The Medicine Bow intermediate field is being nominated at the local level under Criterion A for its association with and representation of aviation history of the United States Federal Airway development during its formative years. It is one of 15 intermediate fields in Wyoming built during the 1920's by the Bureau of Commerce, Lighthouse Division and one of 90 along Route "T" or the Columbia route as it was sometimes referred to. Fourteen additional intermediate fields supplementing the Columbia route in Wyoming were located at: Pine Bluffs, Burns, Federal, Laramie, Rock River, Dana, Parco, Cherokee, Red Desert, Bitter Creek, Granger, Lyman, Leroy, and Knight. All except Medicine Bow have been upgraded to modern municipal airports or razed as per agreement with the Bureau of Land Management. The property, developed by the Bureau of Commerce during the 1920's, represents an era of technical uncertainties when air transportation was experiencing a period of rapid advancement. The period of significance extended until 1958 when the field was deemed surplus by the Department of Commerce.

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

The airplane which invokes the ultimate image of freedom is inexorably tied to the ground over which it flies. This seemly incongruity was best exemplified by Colonel Paul Henderson, Second Assistant Postmaster General under the Harding administration and recognized as the father of the night mail. Colonel Henderson put the idea of an airway in the form of a paradox. 'An airway exists on the ground, not in the air.' [3] A paradox that characterized one of the greatest unheralded technological achievements of the 20th Century. From its rudimentary beginnings as ground directional arrows to the present day use of Global Positioning Systems, the Federal Airways emerged as, although not without trials and tribulations, the world's safest and most expeditious means of transportation. The research, development, and construction of the Federal Airways had no Ames Brother's or Big Four, only penurious funds awarded by a reluctant Congress. None the less, the ingenuity, dedication and perseverance of salaried Federal employees, equaled or surpassed those of private enterprise. It was America's seminal technology at its best.

Only an occasional contrail seven miles high, gives evidence to the airways existence; however, its imperceptible nature does not diminish its distinction as an integral part of the American transportation system. Just as the burgeoning Federal and state highway system of the mid 1920's facilitated the growth of the automobile industry, a synergy also developed between airplane and airway. The aircraft's speed, coupled with the airways inherent characteristic of connecting points in a straight line, altered forever our concept of distance and time. The national network of airways stitched together America and opened up the abundant commercial possibilities of aviation to the nation's business community, and filled a technological void as the emphasis of railroads on passenger traffic began to wane.

Site 32 SL-O, significant in the area of transportation, represents air transportation technology inclusive of the periods between ground embracing daytime only contact flying, the superlative night airway and the all weather low frequency radio range. The significance of Site 32 is that, with the exception of the missing radio range, it encompasses the complete transitional periods of air navigation methods from the Wright Brothers to jets and remains possibly the only representative example of early and mid-twentieth century air navigational facilities.

Developmental history/additional historic context information (if appropriate)

The exigencies of WW 1 brought about rapid advances in aircraft design and engine reliability: advances which did not go unnoticed by two visionaries within the Wilson administration. In the fiscal year 1917-1918, Postmaster General Albert Sidney Burleson and Second Assistant Postmaster General Otto Praeger along with a congressional appropriation of

[3] Colonel Paul Henderson in Nick A. Kommons, *Bonfires to Beacons,* (Washington, D.C.: Smithsonian Institution Press 1989), 125.

$100,000, embarked on a *bold experiment* to sponsor the growth of commercial aviation through federal benefice. As a prelude to a national network of national airways, a short 218 mile section between Washington D.C and New York City with a stop at Philadelphia was selected for trial flights. The beginning was less than auspicious.

On May 15th, young 2nd Lieutenant George L. Boyle took off from the Polo Grounds, Washington, DC for Bustleton airfield, Philadelphia, amid much fanfare and hope. Dignified onlookers included President Woodrow Wilson and his wife Edith, Postmaster General Albert S. Burleson and Second Assistant Postmaster General Otto Praeger. Swooping low over the field with confidence, Boyle and the Curtiss JN-4, carrying several thousand letters, turned north, then inexplicably south, where Boyle - now hopelessly lost - touched down near Waldorf, Maryland, some 25 miles from his starting point, breaking the propeller in the process.[4]

Two days later, given a chance to redeem himself, Lt. Boyle departed again, this time with an escort and having been briefed to keep the Chesapeake Bay shoreline on his right. Shortly into the flight, engine trouble forced the escort to drop out. Undeterred, Boyle pressed on, discovering that the Delaware River, which he was supposed to follow to Philadelphia, was now on his left. Believing he was still following the Chesapeake Bay, did a 180° turn and continued to follow the shoreline to Cape Charles, Virginia, where he ran out of gas, land and airspeed simultaneously.[5] All of which served to dramatically underscore the difficulties facing pilots trying to fly cross-country with unreliable compasses and without adequate maps or ground-based navigational aids.

For the next five years, without manmade navigational aids, radios and maps, airmail pilots resorted to "contact" flying by which visual contact was maintained with geographic features such as rivers, shorelines and the "Iron Compass" as railroads were referred to by airmail pilots. By 1921 the U.S. Airmail Service had firmly established itself as a day-time only operation between New York and San Francisco. Sometimes referred to as the "Columbia" or transcontinental route, mail planes were flown to selected points along the railroad where the airplane would land in the evening and transfer the mail to a waiting train, which would move the postal cargo further down the line to be picked up in the morning by another aircraft. This 'leapfrogging' of the mail across the continent drew the ire of Congressional appropriation committees and the scorn of rail officials, as it yielded only a minute commercial advantage.

To overcome the limitations imposed by night-time operations, in mid-1923 the Post Office, improving on marine technology developed by General Electric and American Gas Accumulator Company, began to construct a series of lighted airway beacons between Cheyenne, Wyoming, and Chicago, Illinois. This particular section was chosen because of its relatively flat terrain and proximity to commercial power. Also, and more importantly, mail planes leaving New York westbound could reach Chicago before nightfall, while eastbound departures from San Francisco could land in Cheyenne before dark. Supplementing the beacon system were intermediate landing fields spaced every thirty to fifty miles to provide a safe haven in the event of difficulties. Regular night service began on July 1, 1925[6] and by January 1929 the entire transcontinental route was lighted with the turning on of beacon number 25 at Miriam, Nevada.[7] Westbound flights could now traverse the continent in 34 hours while eastbound services took only 29 hours, besting the railroads by some two days.

The Medicine Bow intermediate field was one of 90 established along the Columbia route from New York to San Francisco.[8] One twenty-four inch rotating drum beacon of 1000 watts was installed atop the 51 foot skeletal steel tower. Rotating at six RPM, the drum housed a 24 inch parabolic mirror with a 1000 watt Mazda lamp projecting 1,000,000 candlepower. Inside the drum was an automatic lamp changer with a spare lamp.[9] Should the lamp burn out, the replacement could be installed and in focus in a matter of seconds. Flashing every ten seconds for one-tenth of a second, the beam was elevated about one degree above the horizon and could be seen at a distance of 40 miles on a clear

[4] Barry Rosenberg & Catherine Macaulay, *Mavericks of The Sky*, (HarperCollins: New York, 2006), 42.
[5] *New York Times*, May 18, 1918. A1.
[6] Komons, *Bonfires to Beacons*, 131.
[7] *Domestic Air News*, No.49, (Washington, D.C.: GPO, March 30,1929).
[8] *Ibid.*, June 30,1927.
[9] Heister, "*Airways*"- *End of Seat- of –The- Pants Flying*,(self-published: Los Angles 1978)37.

night.[10] Below the beacon were two course lights, mounted on a six foot square maintenance platform, pointing forward and backward along the airway. Each of these lights contained a 500 watt projector lamp with 100,000 candle power, and were fitted with specially designed mirrors of a cylindro-spherical shape behind an 18 inch doublet lens.[11] Equipped with red or green lenses, the course lights would denote the presence of a beacon only (red) or landing field within two miles of the beacon (green). Amber colored course lights denoted a landing field suitable for day time operations only. Using a system of flashing codes, each course light alternately flashed its characteristic code, while the main beam swung 180 degrees opposite. By observing the coded flash, which corresponded to its mileage position along the airway, the pilot determined his position.

Airways were designated by the first letters of their terminal cities and read from west to east and south to north, thus, SL –O for the Salt Lake to Omaha airway. In the interest of bookkeeping, the beacons were numbered based on mileage from a terminal point west to east and south to north with the unit digit dropped. The airways were designed so that no segment exceeded a distance of 1000 miles and were further subdivided into 100 mile sections. Thus, Medicine Bow, along the SL-O (Salt Lake-Omaha) airway at 325 miles from Salt Lake City, Utah was designated Site 32.

Associated with the beacons were ground directional arrows consisting of a 54-foot concrete arrow pointing to the next higher numbered beacon and were originally painted chrome yellow with an eight inch black border. During the night this arrow was lit from above by high intensity lights mounted on the beacon tower frame. At the 'feather' end of the arrow was a 22 foot by 14 foot power shed housing a Kohler or Westinghouse generator if no local power was available. On the roof of the power shed was painted the airway route and beacon site number.[12] Between the shed and arrow was the beacon tower, painted with alternating chrome yellow-and-black bands if in the wooded terrain of the east or red-and-white in the sparse desert regions of the west. By 1932, towers were painted with alternating bands of white and International Orange.[13]

The lighted airways were constructed in every conceivable type of terrain and pushed contemporary technology to its limits. They crossed Georgia swamps, Allegheny mountain tops, and remote western deserts, and were even located along the walls of the Columbia River Gorge.[14] At extremely remote sites without commercial power, beacons were powered by two gasoline generators, one used as a standby and supplied by two 515 U.S. gallon fuel tanks. At night, with the aid of an astronomical clock - or a photo-electric cell during inclement weather - a generator would start to crank. If it failed to come online the other would automatically crank repeating the process until one ran. Generators were thermostatically controlled and would automatically shutdown if they became too hot, or if too cold in freezing temperatures, would automatically start at intervals throughout the day to keep the oil warm.[15]

The airway beacon system, albeit primitive and hampered by reduced visibilities, laid the ground work for the modern Federal Airway system. "Of all American contributions to the technique of air transport operations," Edward P. Warner noted, "[flying at night by beacons] was the greatest. How great it was, and how far it put the United States ahead of the rest of the world, was attested to by the fact that, as late as the early 1930's, when Americans were flying more or less routinely at night, Europeans were still fingering the hem of the idea of night flying."[16] In 1923, the U.S. Airmail Service was awarded the prestigious Collier Trophy for its contribution to night flying technology.

Lasting almost 50 years, these luminous sentinels crisscrossed the Unites States, guiding airmen through myriad weather conditions and potentially perilous aerial pathways. The lighted airway reached its zenith in 1946 when more than 2000 beacons were in use, the last one being decommissioned in 1972 on Whitewater Hill near Palm Beach, California.[17]

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[10] D.C. Young, *Airways Lighting,*(Paper to be Presented before the Silver Anniversary of The Illuminating Engineering Society, Pittsburgh: October 13-16, 1931),5.
[11] Ibid., 5.
[12] Heister, "*Airways"-End of The Seat-of-The Pants Flying.*, 22.
[13] H.A. Wells to All Sites, April 4, 1932.
[14] *Air Commerce Bulletin, Vol.2, No.17,* (Washington, D.C.: GPO, March 2, 1931), 439.
[15] Heister, "*Airways"-End of The Seat-of-The-Pants Flying.*, 38.
[16] Edward P. Warner, *Early History of Air Transportation,*(York: Pennsylvania,1937),26-28.
[17] Larry Cheskaty, *FAA Aviation News,* (Oklahoma City: 1977), 18-19.

Although the lighting of the Federal Airways was a profound success for night navigation it fell far short of the requirements for an all-weather network. The beacon system still required pilots to navigate by the 'contact' method and was virtually useless when it was needed most, in times of low or non-existent visibility. Commercial aviation had to compete with existing forms of transportation on a reliable basis and it was toward this goal that researchers and engineers began to experiment with a technology that would revolutionize scheduled commercial flying: Radio!

As early as 1916, engineers at the National Bureau of Standards recognized the value of radio for marine and aircraft guidance and at the time two technologies were available: the German designed Telefunken[18] and the Bellini-Tosi[19] radio compasses. At the behest of the U.S. Post Office, research continued until 1919, which proved the practicality of the Bellini-Tosi system. By 1921 the U.S. Post Office had lost interest; however, the U.S. Bureau of Standards at College Park, MD and the U.S. Army Signal Corps during the next four years continued to refine the Bellini-Tosi system along with incorporating several European patents.[20] Two Bureau of Standards physicists, F.W. Dunmore and F.H. Engle, at McCook Field, Dayton, OH conducted experiments with two rectangular loop antennas set at 45° to each other and transmitted two signals which could be heard as *equisignals*. The signals formed two range legs which bisected the two antennas and radiated a distance of 25 miles from Dayton to Eaton, OH where U.S. Army pilots conducted some of the earliest test flights.

After much experimentation the definitive version that emerged was a radio range that transmitted four courses. The range operated on frequencies between 200 - 415 kilocycles and had an effective range of about 100 miles.[21] Morse coded letters, 'N' (dash dot) and 'A' (dot dash) were alternately sent through their respective loops at a rate of 22 signals per minute in groups of four, with the 'N' sent first, then the 'A', then the 'N', and then the 'A', this pattern formed two distinct quadrants, two 'N's and two 'A's.[22] In the interest of uniformity and pilot orientation, quadrants north of northwest had 'N' signals. The field intensity of each antenna formed a figure eight pattern and where they overlapped was the area of *equisignals* which was identified by a steady monotone or the Morse code 'T'. This was the 'beam' or on course area and was approximately three degrees wide near the station. Directly above the intersection of the loops was an area with no signals called the *cone of silence* which aided the pilot in determining his exact position along the airway. If a pilot flying the 'beam' drifted off course, an 'N' or 'A' would predominate in his headsets and warn him to make the necessary corrections. Every 20 seconds, the signals were interrupted for station identification and every 15 minutes for weather information.

By 1926, the four course aural range had come into technical maturity and was only awaiting practical application along the Federal Airways. The physical characteristics of the range consisted of four wooden poles disposed about the corners of a square and supported two 300 hundred foot long by 30-foot high vertical rectangular antennas ideally at 90° to each other. A fifth pole at the intersection of the loops provided additional support for the antenna array and connected the antennas to the equipment below, a 2 kilo-watt transmitter, goniometer, and keying device housed in a 18 by 21 foot wood frame building. (See Figure 1)

On July 1, 1927 the Department of Commerce, Aeronautics Branch took over the U.S. Post office's existing infrastructure and began fulfilling its Congressional mandate to upgrade the nation's airways.[23] Six aural ranges were already operating or under construction these being: McCook Field, Dayton, OH, and Ford Field near Detroit, MI, both of which were operating before 1926. Under construction was another Ford range near Chicago, IL. General Electric sponsored two experimental ranges at College Park, MD and Bellefonte, PA. The sixth was located at New Brunswick, NJ at Hadley field.[24] The Aeronautics Branch selected the existing route from New York to Cleveland, to be upgraded first because of its importance and the fact that the Allegheny mountain portion was still not ideally lighted.

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[18] *Popular Science Monthly*, April, 1918, 632-634.
[19] William P. Jackson, ed. *The Federal Airways System, Four Course Range*,(Institute of Electrical and Electronic Engineers,Inc.,1970), 219.
[20] Henry Roberts, *Aviation Radio,*(New York: William Morrow & Company, 1945), 132.
[21] Jackson, ed. *The Federal Airways System, Four Course Range.*, 220.
[22] Heister, *"Airways" End of The Seat-of-The-Pants Flying.*, 41.
[23] *Domestic Air News*, No. 7,(Washington, D.C.: GPO, June 30,1927).
[24] Heister, *"Airways" End of The Seat-of-The-Pants Flying.*, 15.

The eastern terminus of the route was Hadley Field, NJ which had its four courses "squeezed" so as to not only serve the New York - Cleveland route but also the New York - Atlanta route. The west course of the Hadley Field range converged with the east course of the Bellefonte, PA range over Numidia, PA[25] and the west course of the Bellefonte range and the east course of the Cleveland, OH range intersected over Brookville, PA. Low power non-directional beacons serving as mile posts were placed at the intersections of these range courses and eventually every thirty miles along the Federal Airways. In 1928 the Bellefonte range became the first four course aural range to be commissioned on the Federal Airways. Three years later, on February 12, 1931 with the commissioning of the Medicine Bow, Wyoming radio range on the Salt Lake - Omaha airway, the entire Route "T" was now completely navigable under instrument conditions and ushered in the world's premier commercial airway.[26]

The implications were profound. Now for the first time, an airliner could traverse the entire continent on schedule, without regard to the limitations of adverse visibilities. Airlines now had a commodity, service, that they could sell with confidence, and passengers could purchase a ticket with the reasonable expectation of arriving at their destination on time. As the cabins of airliners filled with passengers and gradually replaced the mail as source of revenue, aviation grew to a self sustaining commercial enterprise fulfilling the vision of the *bold experiment*.

The Medicine Bow Intermediate Field

The State of Wyoming was surveyed by ground and air in the summer of 1923 for routing the airway with construction beginning in the summer of 1924.[27] Fifteen intermediate fields located at Pine Bluffs, Burns, Federal, Laramie, Rock River, Medicine Bow, Dana, Parco, Cherokee, Red Desert, Bitter Creek, Leroy, Lyman, Granger, and Knight[28] spanned the state. Sites located in the absence of nearby municipalities were named for the closest rail siding. Land was leased based on prevailing land values, from private individuals, the state, or commercial entities and leases could run anywhere from year to year or up to ten years. The Bureau of Commerce was prohibited by law to maintain public airports and as a consequence, intermediate fields had strict guidelines as to their usage. These were: all intermediate fields shall be available for emergency use at anytime, all fields shall be available for noncommercial flying activities provided aircraft are housed outside field premises, and all fields shall be available for occasional commercial use provided no local commercial airport is available.[29]

The Medicine Bow intermediate field was initially located one mile west of its present position. It was relocated to its present position in circa 1929 to take advantage of the proximity to local utilities. The historic district while under the administration of the Federal government had several different classifications. Earliest records list the property with a type "**C**" classification.[30] This was an intermediate airfield with boundary lighting, a rotating 24 inch beacon and primary power supplied by an onsite gasoline generator with an extra generator for stand-by. Records show the facility was reclassified as a type "**D**" airfield as early as June of 1931 in which the primary source of power was commercially provided by the Cooper family in the Town of Medicine Bow.[31] A separate building was then constructed for the two generators which only functioned in the standby capacity. The district was again reclassified in 1941 a type "**PD**" airfield when the Department of Commerce granted authority to the Town of Medicine Bow to operate the field as a municipal airport while the Department of Commerce retained the rights to maintain and install the lighting equipment.[32]The Department of Commerce relinquished all interest in the property on March 1, 1958 and transferred all existing airport equipment to the Town of Medicine Bow.[33]

Intermediate fields above the elevation of 4000 feet sea level had standard runway lengths of 2500 to 3000 feet. Runways formed a **T**, **L**, or **X** with the inner angles at the intersections of the runways beveled off to provide additional landing

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[25] Henry Roberts, *Aviation Radio*,(New York: William Morrow & Company,1945),134.
[26] *Air Commerce Bulletin, Vol.2., No.17,* (Washington, D.C.:GPO, March 2,1931), 437—438.
[27] *Rock River Review*, July 3,1924,1.
[28] *Air Commerce Bulletin, Vol. 1,(*Washington, D.C.:GPO, December 16,1929),20.
[29] C.C. Lange to 5th District,(Department of Commerce, January 2, 1936),Wolff, Collection.
[30] *Airway Bulletin, No.786* (Washington, D.C.: GPO, October 15,1929).
[31] C.A. Brunner, *Daily Radio Report, Form 68,*(Department of Commerce, June 30,1930),Wolff, Collection.
[32] W.E. Kline, to Town of Medicine Bow,(Civil Aeronautics Administration, August 21, 1941),Wolff Collection.
[33] John T. Renfroe to E.D. Cronberg, (Civil Aeronautics Administration, February 7, 1958), Wolff Collection.

space under conditions of strong crosswinds.[34] The boundaries of the field were marked by sheet metal cones 30 inches in diameter and 24 inches in height, painted International Orange. The cones were installed immediately below the boundary lights and attached to the boundary light standards. In addition, special fence-type day markers in 60 foot sections were installed at each interior angle in the field boundary and at 600 foot intervals on long straight sides.[35]

The boundary lights and their associated cones were spaced approximately every 300 feet to enclose the perimeter of the field and were connected by over 12,000 feet of underground Parkway armored cable. These lights consisted of waterproof clear prismatic globes and fittings mounted on iron pipe standards 30 inches above ground or higher in the case where snow fall of a greater depth was anticipated. In each light standard, a 15 watt electric bulb was installed if commercial power was available or a ten watt bulb if only the onsite generator was only available.[36] Range lights, similar to boundary lights except that the clear globes replaced green globes, were installed at opposite ends of principle runways to aid pilots in night landings. Two range lights were used at each end of the best or prevailing wind runway, and single lights marked the center lines of other runways. Twenty-five watt red obstruction lights, housed in lighthouse globes were placed at the ends of runways over which approaches and landings were to be made. On obstructions in the approach lanes, double obstruction lights were installed and equipped with relays which placed the standby lights in operation in case the operating lamps burned out.[37]

An illuminated wind indicator was supported on the beacon tower and attached by brackets which allowed it to swivel in any direction. The indicator was of a porous weave fabric colored chrome yellow eight foot long and 18 inches in diameter at the mouth. A 150 watt electric bulb was installed at the mouth with a chrome plated reflector that directed the entire output of the light into the sock. A skeleton metal framework extended inside for a distance of four feet to hold the sock horizontal, which increased the effectiveness of the lighting.[38]

A standard 51 foot tower built by the International Derrick and Crane Company was erected in the northwest corner and initially supported a 24 inch drum style airway beacon. The 24 inch beacon was replaced with 36 inch Crouse-Hinds double ended beacon circa 1934. Atop the tower is a six foot square maintenance platform which allowed airway mechanics to service the beacon and course lights. The platform also served as attachment points for two 18 inch green airway course lights, one light faced southeast, and pointed to Site 33, Rock River, Wyoming and one facing northwest and pointed towards Site 31, Old Carbon, Wyoming. At two diagonal corners of the platform, were horizontal ten foot poles from which red flags were flown during the day in case the field was unsafe for use.[39] Unsafe field conditions at night were indicated by the illumination of two red ganged obstruction lights set at opposite corners on the tower platform.

The tower was originally painted in alternating bands of black and yellow and later in 1932 International Orange replaced the yellow band and white replaced the black band.[40] The tower is located astride a 54 foot ground directional arrow which points southeast, to the next higher numbered beacon in Rock River, Wyoming Site 33. The arrow surface was originally painted chrome yellow with an eight inch black border. This color scheme also changed in 1932, had white replacing black and International Orange replacing chrome yellow.[41]

A rectangular 14 by 22 foot raised foundation supported a wood frame building whose initial purpose was to house a small capacity gasoline generator to power the beacon and boundary lights and formed the *feather* end of the ground directional arrow. In the late 1920's, this building began serving as a communications office containing a teletype machine, radio transmitter and receiver. A six by ten foot coal bin with a capacity of six tons adjoined the west end of the building.

Two Assistant Airway Keeper's residences each with its own separate septic system, were built along the northwest boundary line approximately 100 feet east of the teletype office. A third residence, the supervisor's, was located

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[34] *Air* Commerce *Bulletin, Vol.1, No.8.*,(Washington, D.C.: GPO, October 15, 1929),3.
[35] *Air Commerce Bulletin, Vol.4, No.9.*,(Washington, D.C.: GPO, November 1, 1932),219.
[36] *Ibid.*, 219.
[37] *Ibid.*, 219.
[38] *Air Commerce Bulletin, Vol. 1, No. 8*,(Washington, D.C.: GPO, October 15, 1929),5.
[39] H.A. Wells to All Field Sites, March 26, 1932, Wolff Collection.
[40] F.C. Hingsburg to All Assistant Airways Traffic Supervisors, March 7, 1932, Wolff Collection.
[41] *Ibid.*

approximately 1200 feet east of the teletype office in the seven acres allocated for the radio range. These residences were referred to "K" quarters and were prefabricated wood frame construction. Often designated as a numbered series (e.g. 513, 518D, 536, 571 and 572) the buildings conformed to standardized plans with minor embellishments such as window awnings, fan attic windows and porticos. Built over a 22 by 28 foot raised foundation, each residence also contained a cellar of which the northeast corners were partitioned into a compartment for coal storage. Each house was allocated ten tons of coal.[42] Water was supplied from the Town of Medicine Bow.

Seven acres were allocated for the radio range plot which was located 1200 feet east of the teletype office. Construction of the radio range began in August 1930.[43] Four wooden poles 55 feet high were erected at the corners of a square which was 350 feet on a side. These poles supported two crossed loop antenna arrays which were connected diagonally at opposite corners of the square forming an **"X"**. At the intersection of the antennas was a fifth pole which provided support for the antenna array and lead-in connectors to the transmitter house below. The radio range upon completion in December 1930 was tested in January and February of 1931 and became fully operational on February 12, 1931[44] and was designated as type MRL-DT station: Medium-power radio range with loop antenna distantly controlled, with teletype.[45] The radio call letters were KCAL and the transmitter which could be controlled from the teletype office, operated on frequency of 344 kilocycles.[46] Site 6, Knight, Site 24, Cherokee and Site 32 Medicine Bow were unique in that the power output of the radio range was 125 watts which limited the use to the following: the radio range was to be turned on when visibility was less than two miles, when cloud ceiling was less than unlimited or on request from aircraft. Only two courses at Medicine Bow were used and were aligned with the opposite ends of the east-west landing area.

Additional structures included wood frame shed with gabled roof to store hydrogen gas for weather balloons, and an outhouse both of which were located in the northwest corner of the district behind the teletype office. A wood frame two car garage was along the northwest fence line just east of the second Assistant Airway Keeper's quarters. The next structure to the east was an 18 by 21 foot wood frame power house with gabled roof containing a five kva (kilovolt amp) Kohler generator which was supplied with a single 550 gallon gasoline tank located behind and supported on a wood cradle.

Intermediate fields were an integral part of the early Federal Airway system and played an important role in the development of U.S. commercial aviation. At its peak in 1931, the intermediate field system offered 385[47] landing fields throughout the U.S. to airmen in distress. Initially constructed under the auspices of the Bureau of Commerce, Lighthouse Division, intermediate fields were spaced every thirty to fifty miles apart, varied in acreage and plan form depending on terrain and elevation.

Many intermediate fields were staffed on site by Department of Commerce personnel who were fortunate enough to be provided prefabricated accommodations referred to as "K" quarters, at a nominal fee. [48] Assistant Airway Keeper, Edwin Crucikshank, who had an annual salary of $1,200,[49] was charged $20 per month for his quarters. Bachelor quarters were fully furnished while families had to provide their own furnishings. Residences were of wood frame simple in design with Celotex sheathed interior walls and asphalt shingle roofs. Roofs painted in red served as aeroglyphs with the name of the field, airway route, elevation and site number painted with yellow letters and numbers outlined in black.[50] Families took advantage of the markings to identify their residences by referring to the roof markings: In the case of Site 32, Medicine Bow or Wyoming house.[51] Betty Jean Cruickshank recalls "each house had two bedrooms, a very small kitchen with built in cupboards, the dining room and living room were combined. The greatest thing about the new house was the indoor

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[42] Airways keeper in charge to W.E. Kline, Airways Engineer, January 26, 1933, Wolff Collection.
[43] Based on time sheets, *Form 46, Department of Commerce,* August-December,1930, Wolff Collection.
[44] *Air Commerce Bulletin, Vol.2, No.17,* Department of Commerce,(Washington, D.C.: GPO, March 2, 1931),437.
[45] Department of Commerce, *Bureau of Commerce Radio Facilities,*(Washington, D.C.: GPO, March 5,1935),1. Wolff Collection.
[46] *Ibid.*,8.
[47] Jackson, ed., *The Federal Airway System, Intermediate Fields.*,4.
[48] Heister, *"Airways"-End of The Seat-of-Pants Flying.*, 39.
[49] Betty Jean Crucikshank Cole-Keller, (Hudsonville, MI, Self published, *Edwin M. Cruickshank, Airways Keeper Site 32, Medicine Bow, Wyoming,* 2007),3.
[50] H.A. Wells to All sites, April 4, 1932, Wolff Collection.
[51] Cole-Keller, (*Edwin M. Cruickshank, Airways Keeper Site 32.*,12.

plumbing! It was a very small bathroom, but we had a toilet, a bathtub, a sink, a medicine cabinet and a linen closet-which I was quite impressed with as we had never had a linen closet in our other homes. We also had hot and cold running water. By today's standards, it was a very small house, but to us it was a castle!"[52]

Although many sites were isolated, site personnel often led idyllic lives. Generous leave schedules, of up to 93 days per annum, 15 days annual leave and 78 days compensatory time for working half days on Saturday and Sundays[53] allowed personnel to take advantage of areas that abounded with fish, game and pristine forests. Robert Crucikshank, oldest son of Assistant Airway Keeper Edwin Crucikshank, said "we learned to drive up there on the range. My aunt in Nebraska gave us an old Chevy coupe and our job was to go around and change all the burned out light bulbs. I can remember my younger brother, Edwin Jr. and myself getting in a fight about who was going to drive back that day. We were at the far end of the field and he took the steering wheel off and started walking back towards town. Well, I put a wrench on the shaft and boy was he surprised when I passed him. I had many chores to do around the site besides changing out light bulbs. My dad used to have me put out red lanterns at night to mark the soft spots in the field and during the day, I had to fill in Badger holes which were a big hazard to planes on landing. My scariest job was to climb up on the tower and change the light bulb inside the windsock."[54]

Airway Keepers took care of necessary field work, range work, and relief duties which started at 8am and lasted until 5pm. Assistant Airway Keepers stood teletype watches from midnight until noon and from noon until midnight.[55] Airway Keepers and Assistant Airway keepers were required to transcribe 35 words per minute on the teletype circuit which connected all the sites throughout the nation. Information transmitted included hourly weather reports, planes crossing or PX reports, field conditions and any unusual events.

The Department of Commerce, realizing the uniqueness of living on intermediate fields, asked Airway Keepers to share any unusual experiences throughout the month. These were published in the Air Commerce Bulletin's section called "Along the Airways." The following occurred at Medicine Bow in October 1933, "The Rescue":

> During the month of October 1933, a pilot landed his small one passenger plane at the Medicine Bow field. The landing was very necessary as the plane was about out of gas from bucking a fifty-five mile an hour headwind, which was plenty gusty. His landing was hurried and the motor shutoff, with a mad dash to one of the wings to attempt to hold his sole possession from kiting out into space. Each gust of wind would lift the plane some ten to fifteen feet into the air and carry it back a hundred, until, the tail skid would dig into the ground and hold it for a few minutes.
>
> The keeper on duty had noticed the dispatch covering the movement of this ship, and as it was destined for a station west he had been on the look-out for it to pass, but later noticed it landing on the far end of the field. He immediately proceeded in its direction with stakes and ropes. Before reaching the ship he could see the pilot being lifted ship in all into space and carried away about hundred feet where the tail skid would dig into the ground, and bang the pilot back to the ground with no mean consideration. When the keeper arrived the pilot stated he was about to turn the plane loose, as it seemed that he could hold it no longer, and also seemed hours since he landed. The keeper started to put a stake into the ground and when he turned around for the plane, it moved off another hundred feet and he immediately proceeded to drive the second stake under a wing. It was soon found that this was impossible, and the pilot's appearance showed that he was more in favor of his first conclusion, for with both men hanging on to the plane it continued to have its own way and was headed for a crack-up, unless some means could be invented to hold it down.
>
> The second keeper noted the struggle from his home and drove his car to the scene of action, and after some time managed to secure one wing of the ship to the rear bumper of the car. After that the first keeper brought his car and the other wing was attached to its rear bumper, then with a rope from the rear of one car back around the tail skid and to the second car, it was possible to move the small plane to the most favorable place away from the

[52] *Ibid.*
[53] W.E. Kline to All Airways Keepers and Assistant Airways Keepers, June 19,1933, Wolff Collection.
[54] Robert Crucikshank, interview with Steve Wolff, Basin, Wyoming, March 2006.
[55] W.E. Kline to Al Airways Keepers and Assistant Airways Keepers, June 24, 1932, Wolff Collection.

wind and properly stake it down. Not until the following day had the wind receded enough for the pilot to continue on his way, after the plane was gassed and the pilot climbed into his cockpit, waved his adieu, and that's all.[56]

Although isolated, life at Site 32 was rarely dull particularly in view of the fact it was part of America's premier airway. In the first week of June, 1931 a strange aircraft fluttered out of the sky and landed at Site 32 causing a flurry of excitement.[57] The craft, an autogiro was piloted by none other than Amelia Earhart who was on a cross country flight to the West coast and had planned on stopping at Parco, Wyoming fifty miles further west, after departing Laramie earlier that morning. Apparently the limited range of the autogiro and strong westerly headwinds necessitated the unscheduled stop.

Intermediate fields were open to all aircraft and Airway Keepers were required to extend aid and hospitality to all aircraft and their occupants as the following two incidents reveal.

"On August 3, 1933, Pilot Jack Huff in NC215M enroute form Tulsa, Oklahoma to Riverton, Wyoming with two expert nitroglycerin men and three hundred pounds of nitro for shooting a burning oil well at Riverton, landed at Medicine Bow for an overnight stay. On August 8th while on another trip on the same type Huff said that due to the excellent condition of the Medicine Bow field he decided to land for another night stay with three hundred more pounds of nitro for the same well at Riverton. On both visits the crew at Medicine Bow field was more than glad when the above part[ies] were safely in the air."[58]

In February 1934, the Army began flying the airmail after President Roosevelt issued an executive order canceling all existing commercial airmail contracts. The following illustrates the degree of ingenuity exhibited by airway personnel. "One Army pilot landed at night and shut off his motor. [T]he next morning the weather was very cold, and with the aid of a large size blow torch, borrowed from the local garage, and a stove pipe, inserted through the motor cover, along with heating the oil, the motor started almost immediately. Several trips were made to town and to the post office with the mail, and transporting the pilot. For which no one was compensated for."[59]

By the early 1930's with the introduction of all metal monoplanes - such as the Boeing Model 247 and the Douglas DC-2, which were faster, more reliable and along with budget cuts demanded by President Roosevelt's economic measures, there was a substantial decrease in the intermediate field network. Intermediate fields were reduced from a high of three hundred and eighty-five in 1931 to two hundred and fifty in 1934. Medicine Bow survived the budget cuts until circa 1938 when the radio range, communications station and weather reporting capabilities were deactivated; however, the intermediate field still remained as a Department of Commerce operated facility until March 1, 1958 when stewardship was assumed by the Town of Medicine Bow, Wyoming.[60]

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[57] Cole-Keller, *Edwin M. Cruickshank, Airways Keeper Site 32 Medicine Bow.*, 21.
[58] Assistant Airways Keeper Acting to Acting Superintendent of Airways, September 1,1933, Wolff Collection.
[59] Karl G. Schoewe to Superintendent of Airways, February 28, 1934, Wolff Collection.
[60] John T. Renfroe to E.D. Cronberg, February 7, 1958, Wolff Collection.

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Interview, Robert Cruickshank Basin, Wy. March 2006.

The following documents are in the private collection of Steve Wolff, Laramie, Wyoming.

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Letter, H.A. Wells, April 4, 1932.
Letter, C.C. Lange, Department of Commerce, January 2, 1932.
Letter, W.E. Kline, Civil Aeronautics Administration, August 21, 1941.
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Letter, Airways Keeper in charge, Department of Commerce, January 26, 1933.
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Letter, W.E. Kline, Department of Commerce, June 19, 1933.
Letter, W.E. Kline, Department of Commerce, June 24, 1932.
Letter, Assistant Airways Keeper, September 1,1933

Site 32 SL-O Airway (Salt Lake – Omaha) Intermediate Field Historic District
Name of Property

Carbon County, WY
County and State

Letter, Karl G. Schoewe, February 28, 1934.

All photos from the collection of Mrs. Betty Cole-Keller.

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
X Other
Name of repository: _____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of Property 147
(Do not include previously listed resource acreage.)

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

	Zone	Easting	Northing		Zone	Easting	Northing
1	13	401264	4637939	3	13	402183	4636901
2	13	401259	4637689	4	13	402429	4637834

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

The boundary of the historic district is marked on the USGS map.

Boundary Justification (Explain why the boundaries were selected.)

The boundary includes the land historically associated with the intermediate field. It encompasses the original 140 acres and the additional seven acres of the low frequency radio range.

11. Form Prepared By

name/title Steve Wolff
organization _____ date _____
street & number 2359 Jefferson Street telephone 307-399-0077
city or town Laramie state WY zip code 82070
e-mail swolff3@uwyo.edu

Site 32 SL-O Airway (Salt Lake – Omaha) Intermediate Field Historic District
Name of Property

Carbon County, WY
County and State

Additional Documentation

Submit the following items with the completed form:

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

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Site 32 SL-O (Salt Lake – Omaha) Intermediate Field Historic District
City or Vicinity: Medicine Bow
County: Carbon
State: Wyoming
Photographer: Richard Collier
Date Photographed: 6-22-2011

Description of Photograph(s) and number:

1 of 11: Teletype office, tower, and arrow, view to north
2 of 11: Teletype office and tower, view to east
3 of 11: Overview, view to north
4 of 11: Overview, view to southeast
5 of 11: Flag pole site, view to southeast
6 of 11: Fence markers and light standard, view to northwest
7 of 11: Fence markers and light standard, view to southwest
8 of 11: Fence markers and light standard, view to south, southeast
9 of 11: Fence markers and light standard, view to northwest
10 of 11: T-hanger, view to east
11 of 11: Overview, view to northwest

Property Owner:

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

name

street & number telephone

city or town Cheyenne state zip code

Paperwork Reduction Act Statement: This information is being collected for applications 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.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management. U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

UTM References

UTM	Zone	Easting	Northing
5.	13	402134	4637905
6.	13	402056	4637610
7.	13	401733	4637742
8.	13	401730	4637958
9.	13	401577	4637960
10.	13	401573	4637811

Figures

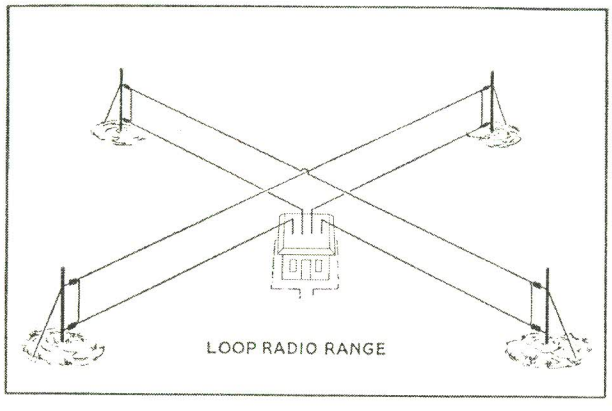


Figure 1. Electrical schematic of early style radio range. Actual range had a fifth pole at the intersection of the antenna array. Building in center contains transmitter and goniometer. Goniometer was used to effect alignments of the four courses. Roberts, *Aviation Radio,* 139.

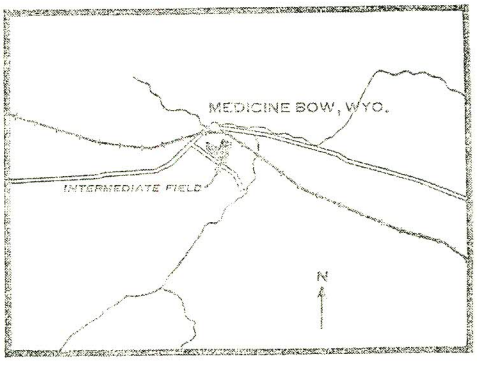
DEPARTMENT OF COMMERCE
AERONAUTICS BRANCH

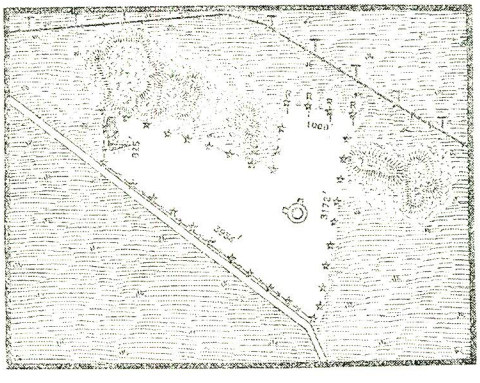
Airway Bulletin

No. 786, Washington, October 15, 1929

WYOMING MEDICINE BOW

Site 32, Type C, Salt Lake–Omaha Airway





77287—29

Figure 2. 1929 plan view of Site 32. Stars along the periphery represent boundary lights. Concentric circle with the two small stub arms is the ground marker. Arms indicate the best direction for landing. Large star at the west end of plan view, enclosed within a circle represents the beacon light. Cone immediately below represents the wind indicator. Airway Bulletin No. 786, GPO.

Figure 3. Site 32 office building and tower looking north. The office formed the "feather" end of the ground directional arrow (circa 1933). Cole-Keller Collection.

Figure 4. Site 32 power house and beacon tower looking north. Note the presence of the two 515 gallon fuel tanks between the tower and power house. White lean-to structure attached to the west end of power house held coal (circa 1929). Cole-Keller collection.

Figure 5. Site 32 Supervisor's house and radio range transmitter building looking northeast (circa 1933). Dimensions of the house were 22 x 28 feet and referred to as "K" quarters. The striped wooden poles, of which there were five, supported the antenna array of the low frequency radio range. Cole-Keller Collection.

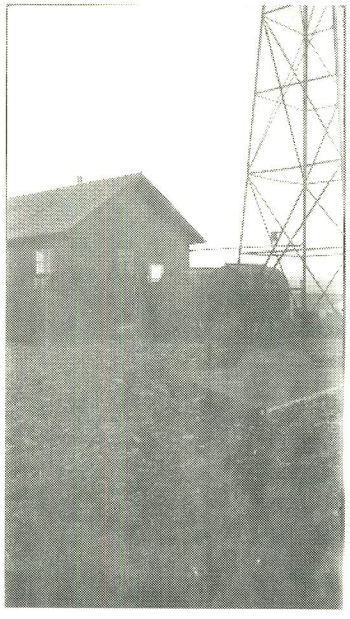
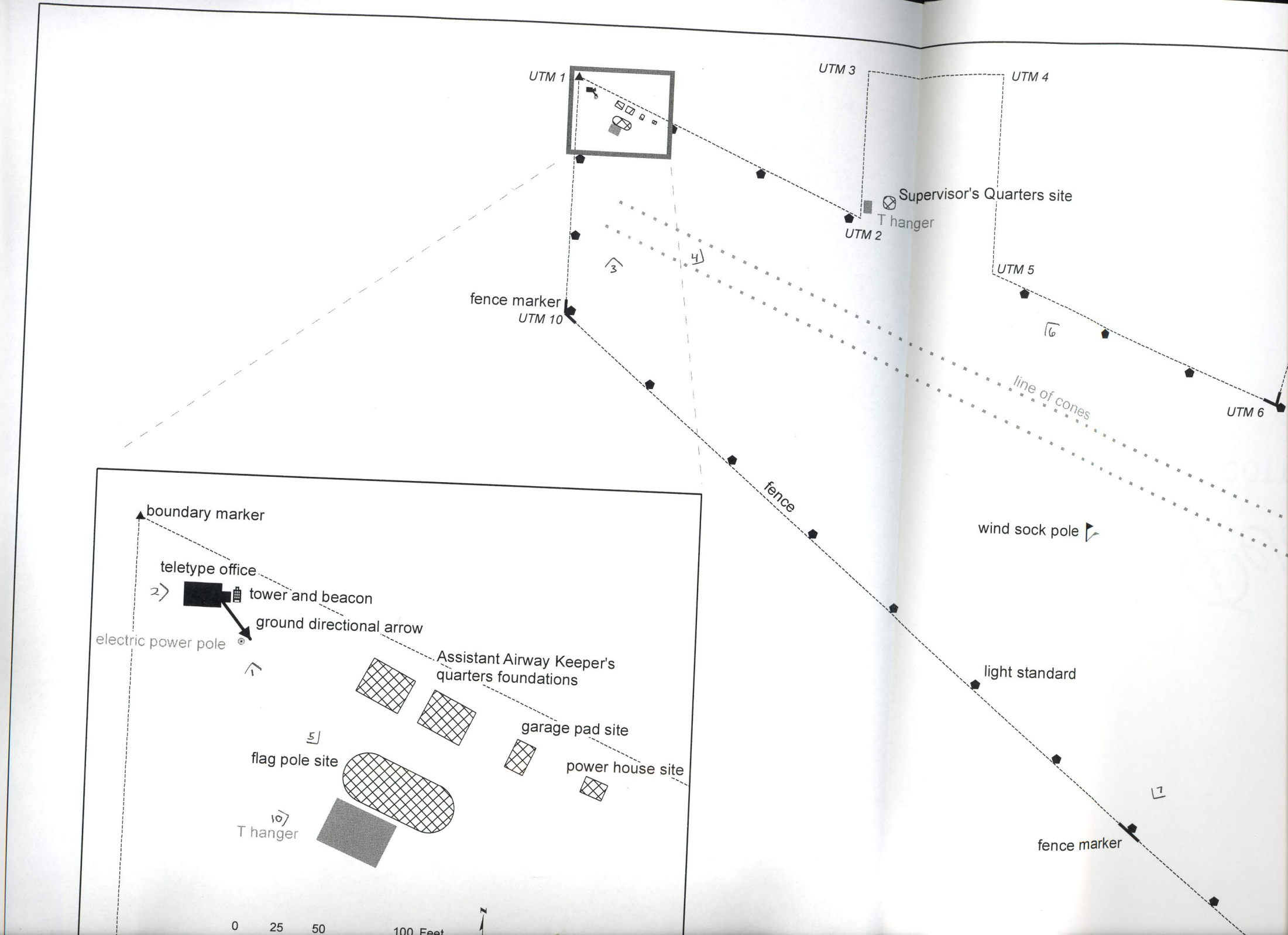


Figure 6. Site 32 Power house with the ground directional arrow visible in the foreground looking northwest (circa 1929). Arrow is pointing southeast towards Site 33, Rock River. Cole-Keller Collection.

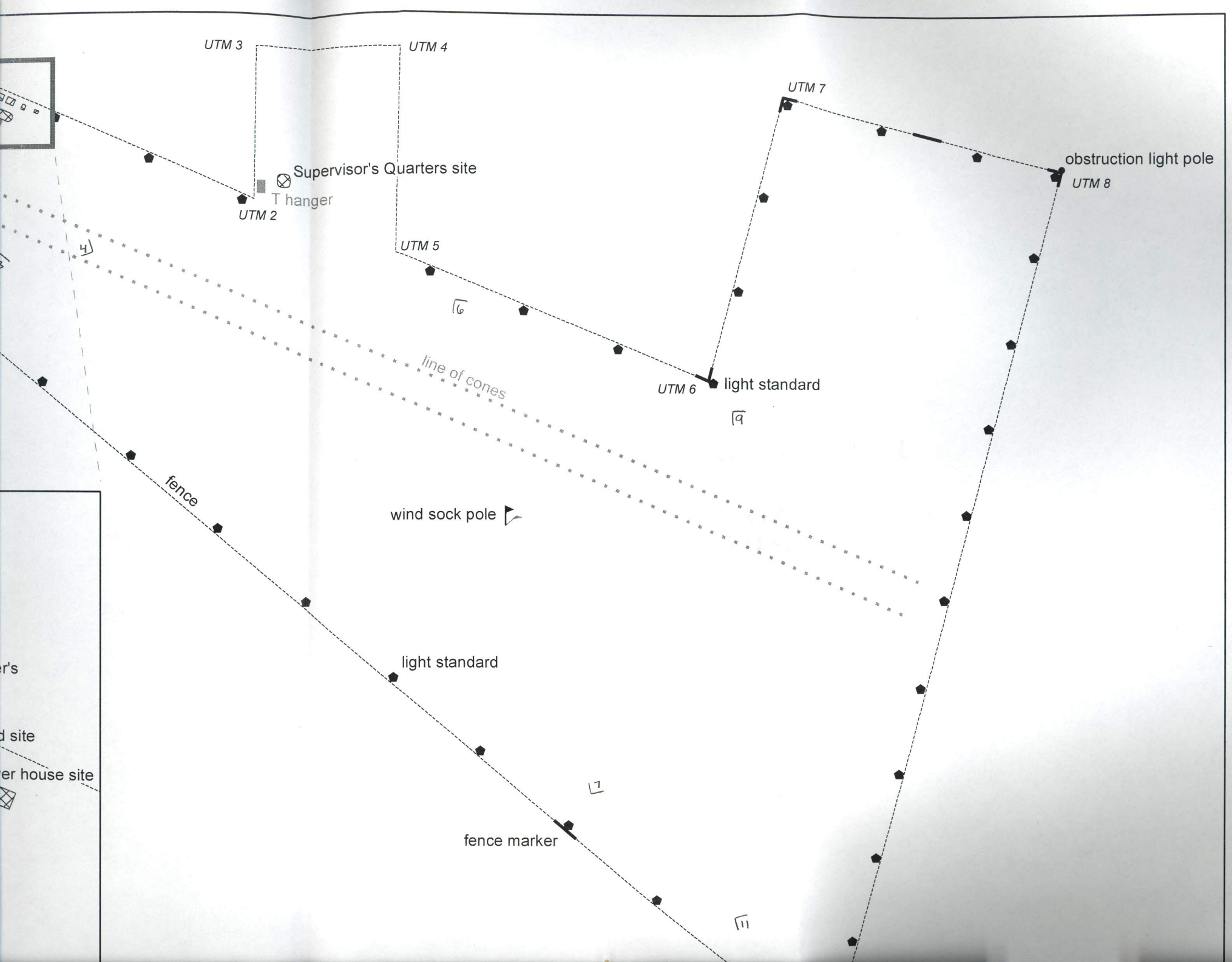
Figure 7. Site 32 interior of the two room office looking northeast .The teletype machine is against the east wall. The barometer, and wind speed and direction indicator are circular objects above the teletype machine. Above the telephone are bells to alert the operator when to begin entering station conditions after previous station was through transmitting. Airway Keepers were certified weather observers and were required to have a teletype capability of 35 words per minute. The presence of the telephone indicates this photo was taken about 1935. Cole-Keller Collection.

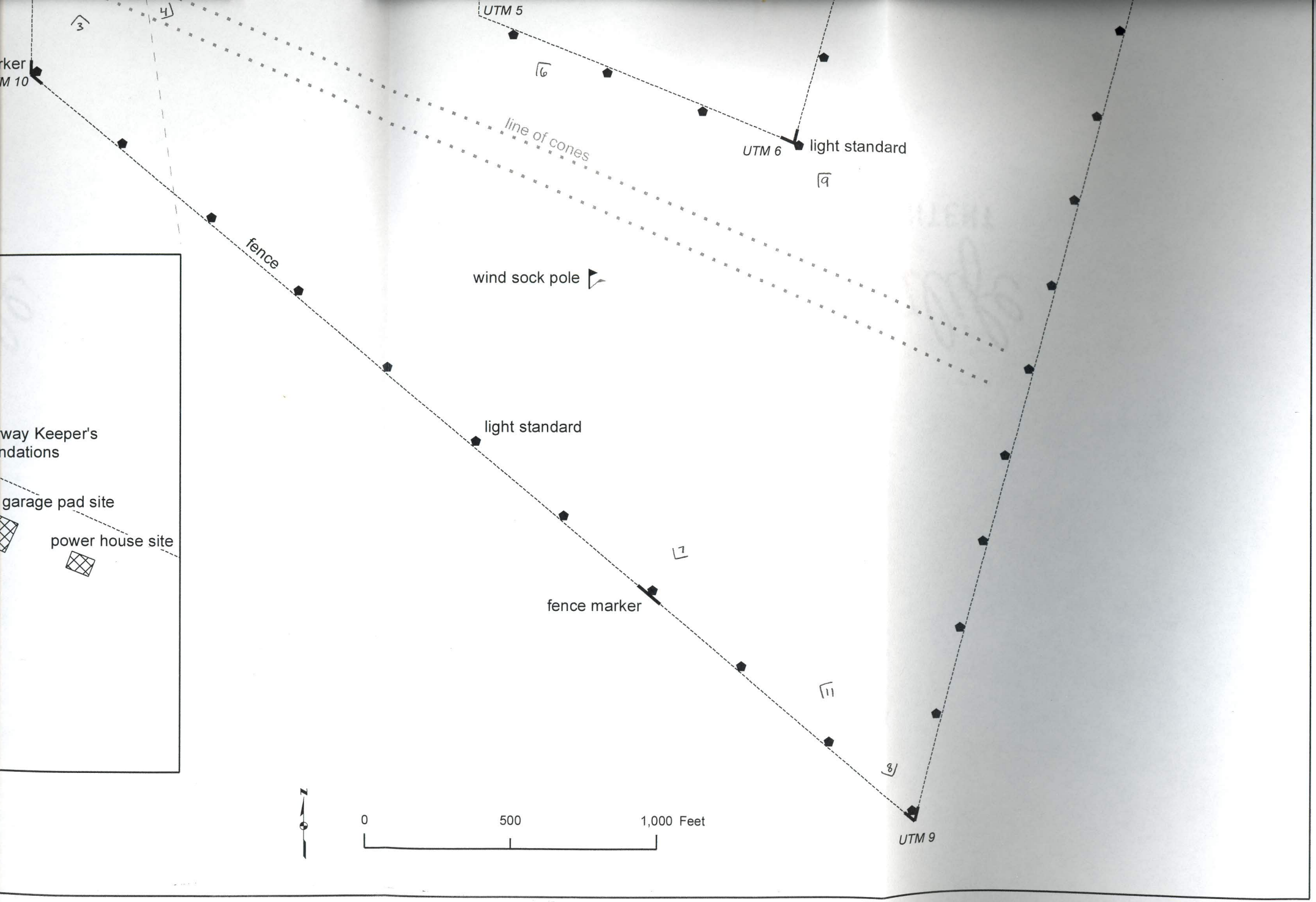
Figure 8. Site 32 office, tower, Airway Keeper's quarters, and flag pole looking northwest (circa 1933) Note well kept grounds and roof lettering to identify the site to pilots. Airway patrol pilots would often note the condition of the site in addition to the operation of the beacon and radio range and report such things as unmown lawns and weeds against buildings to district headquarters.

Figure 9. Site 31 Medicine Bow– between 1924-1929 one mile west of Site 32 and partially located on the present site of the Wyoming Department of Highways maintenance facilities. U.S. Highway 30 bisects the former site.

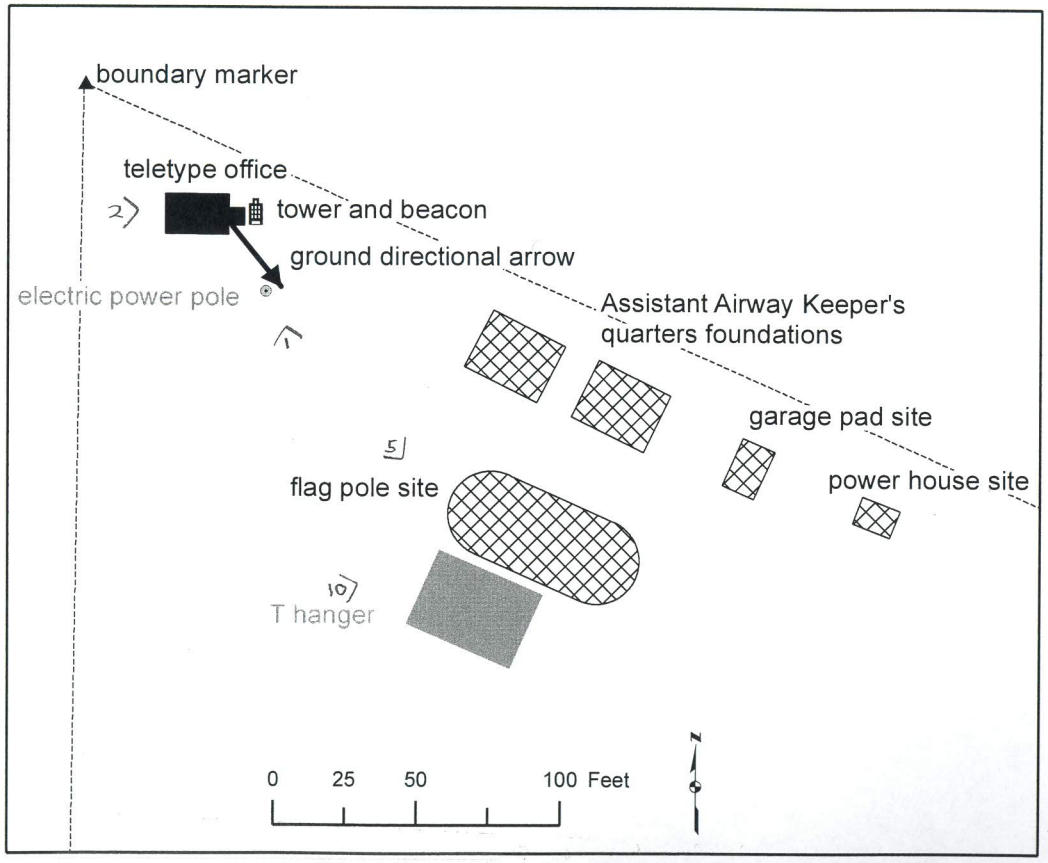

UTM 1
UTM 3
UTM 4
Supervisor's Quarters site
T hanger
UTM 2
UTM 5
fence marker
UTM 10
line of cones
UTM 6
fence
wind sock pole
light standard
fence marker
boundary marker
teletype office
tower and beacon
ground directional arrow
electric power pole
Assistant Airway Keeper's quarters foundations
garage pad site
flag pole site
power house site
T hanger
0
25
50
100 Feet

6-22-2011
Site 32-SL-O (Salt Lake - Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Overview of Site
Located .9 mi. South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View is NW
Photographer: Richard Collier


UTM 3
UTM 4
UTM 7
obstruction light pole
UTM 8
Supervisor's Quarters site
T hanger
UTM 2
UTM 5
line of cones
UTM 6
light standard
wind sock pole
fence
light standard
fence marker
d site
er house site



Sketch Map of Site 32 SL-O (Salt Lake – Omaha) Intermediate Field Historic District



fence marker
UTM 10

UTM 5

3

4

6

line of cone

fence

wind sock pole

light standard

fence

Photo # and direction of view

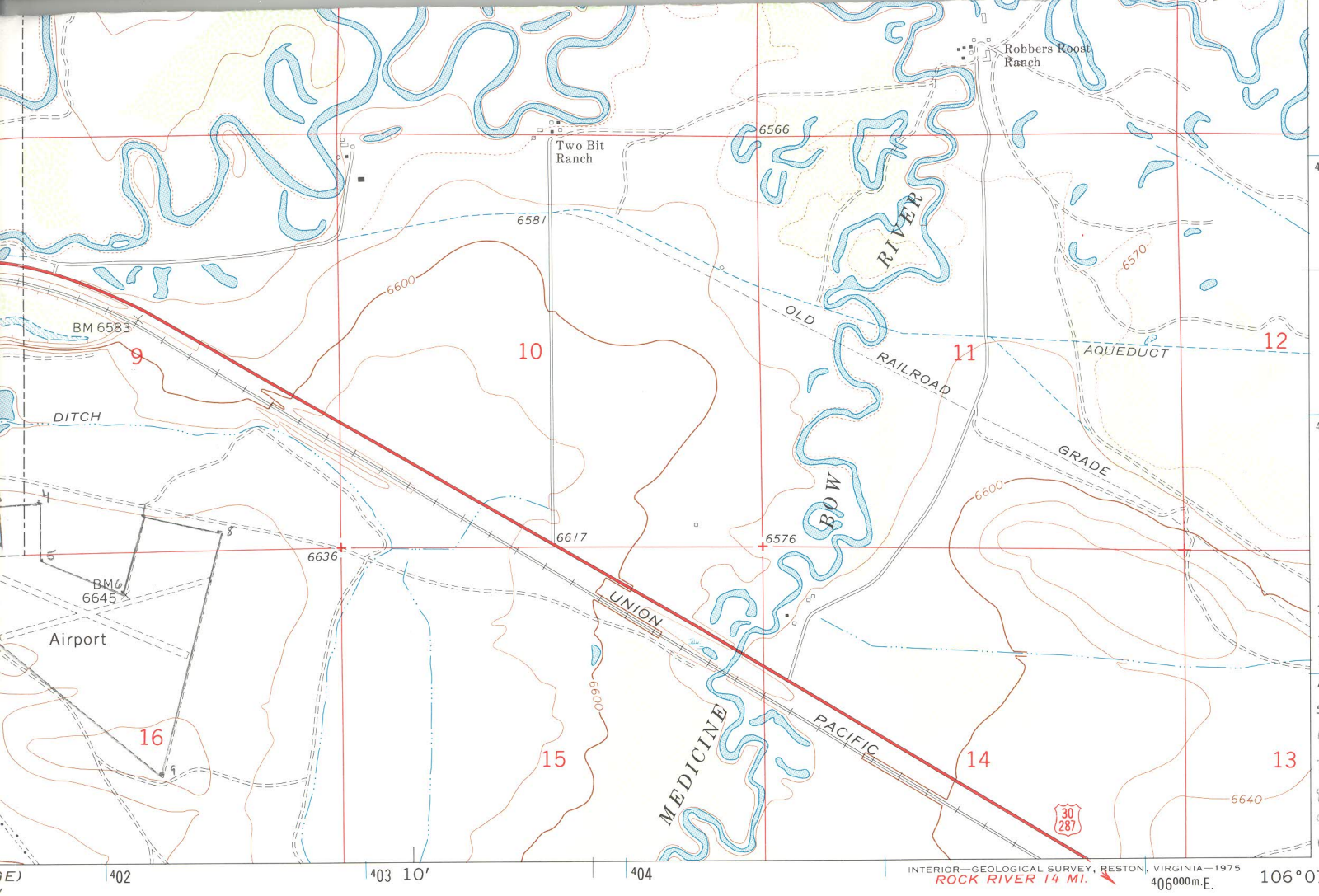
Features in black are contributing

Features in gray are noncontributing

N

0 500

Sketch Map of Site 32 SL-O (Salt Lake – Omaha) Intermediate Field



Site 32 SL-O Airway (Salt Lake - Omaha) Intermediate Field Historic District

Medicine Bow, Carbon County, WY

UTM References:

1.	13	401264	4637939
2.	13	401259	4637689
3.	13	402183	4636901
4.	13	402429	4637834
5.	13	402134	4637905
6.	13	402056	4637610
7.	13	401733	4637742
8.	13	401730	4637958
9.	13	401577	4637960
10.	13	401573	4637811

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1975

ROCK RIVER 14 MI.

(FOOTE CREEK LAKE) 4767 I SE

000

1 MILE

4000 5000 6000 7000 FEET

1 KILOMETER

L 20 FEET

10-FOOT CONTOURS

AL DATUM OF 1929

AL MAP ACCURACY STANDARDS

O. BOX 25286, DENVER, COLORADO 80225

AND SYMBOLS IS AVAILABLE ON REQUEST

WYOMING

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface

Secondary highway, hard surface

Light-duty road, hard or improved surface

Unimproved road

Interstate Route U. S. Route State Route

MEDICINE BOW, WYO.

NW/4 COMO RIDGE 15' QUADRANGLE

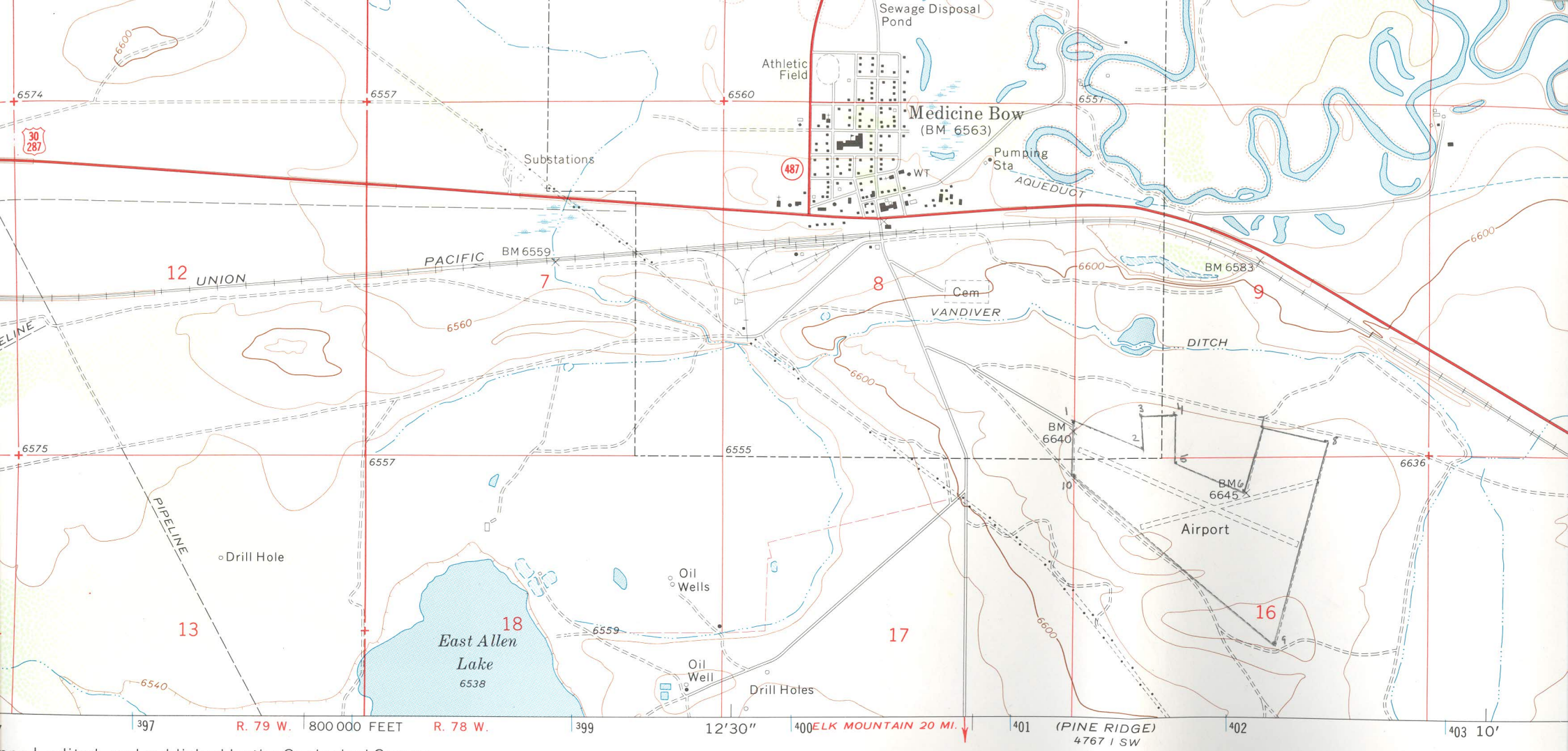
N4152.5—W10607.5/7.5

1971

AMS 4767 I NW—SERIES V874

ISBN 0-607-60886-2

9 780607 608861



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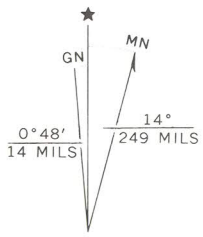
ography by photogrammetric methods from aerial tographs taken 1970. Field checked 1971

ection and 10,000-foot grid ticks: Wyoming dinate system, east central zone (transverse Mercator) 0-meter Universal Transverse Mercator grid ticks, e 13, shown in blue. 1927 North American datum

e red dashed lines indicate selected fence lines



UTM GRID AND 1971 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

6-22-2011

Site 32 SL-O (Salt Lake-Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Teletype Office & Tower & arrow
Located .9 mi. South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View to North
Photographer: Richard Collier

AIRPORT WATCH
REPORT SUSPICIOUS ACTIVITY
1-866-GA-SECURE
FOR EMERGENCIES
911

6-22-2011
Site 32 SL-O (Salt Lake – Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Teletype Office + Tower
Located .9mi. South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View is East
Photographer: Richard Collier

6-22-2011

Site 32 SL-0 (Salt Lake-Omaha) Intermedite Field

Historic District (Medicine Bow Airport)

Overview of Site

Located .9 mi. south of Medicine Bow, Wyoming

just off of County Rd. 1

Carbon County

View is North

Photographer: Richard Collier

Overview & telotypes Bldg. & Tower

6-22-2011
Site 32SL-0 (Salt Lake - Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Overview of Site + Runway Cones
Located .9 mi South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View to SE
Photographer: Richard Collier

6-22-2011

Site 32 SL-O (Salt Lake - Omaha) Intermediate Field

Historic District (Medicine Bow Airport)

Flag Pole Site

Located .9 mi South of Medicine Bow, Wyoming

just off of County Rd. 1

Carbon County

View to SE.

Photographer: Richard Collier

6-22-2011
Site 32 SL-O (Salt Lake - Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Fence marker & Light Standard (North Fence)
Located .9mi. South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View to NW
Photographer: Richard Collier

6-22-2011
Site 32SL-O(Salt Lake-Omaha) Intermediate Field
Historic District (Medicine Bow Airport),
Fence Markers & Light Standard
Located .9 mi south of Medicine Bow, Wyoming just off
County Road 1
Carbon County
view is SW
Photographer: Richard Collier

6-22-2011

Site 32 SL-O (Salt Lake - Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Fence markers & Light Standards
Located .9 mi. South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View to SSE, SE Corner
Photographer: Richard Collier

6-22-2011
Site 32SL-O (Salt Lake-Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Light Standard + Fence Markers
Located .9 mi South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View to NW
Photographer: Richard Collier

6-22-2011
Site 32SL-0 (SaltLake-Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
T-Hangers (NoN-Contributing)
Located .9 mi South of Medicine Bow, Wyoming
just off of County Rd. 1

View is East
Photographer: Richard Collier

6-22-2011
Site 32-SL-0 (Salt Lake - Omaha) Intermediate Field
Historic District (Medicine Bow Airport)
Overview of Site
Located .9 mi. South of Medicine Bow, Wyoming
just off of County Rd. 1
Carbon County
View is NW
Photographer: Richard Collier