

# We climbed the highest mountains

by Albert Arnst  
CD-Rom of images by Rob Hoeye



*AUTHOR ALBERT ARNST looks at set of three oriented panoramic photos he took in 1933. They are on display at Visitors Information Center at Lava Butte, Deschutes National Forest, south of Bend, Oregon.*

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IamWho Panoramic Imaging

[www.iamwho.com](http://www.iamwho.com)

*Cover photo: USDA, Forest Service (Jim Hughes)*

## **Forest Journalist Al Arnst...**

Al is a 1931 graduate of the School of Forestry at what is now Oregon State University. He is an active 50-year Golden Member and Fellow in the Society of American Foresters.

He was for nine years editor of both *The Lumberman* and *The Timberman*, publications later merged into *Forest Industries* magazine by Miller Freeman Publishing Co. He left Miller Freeman in 1962 for a position with the Forest Service in Washington, D.C., where he

served as a public information officer for 13 years.

When he retired from the Forest Service in 1975, he became managing editor of the *Western Conservation* journal, published by Juanita Gallaher, the grand "Lady Logger" of the Western forest industry.

Al also served six years with the Forest Service, and eight years with the Soil Conservation Service of the U.S. Department of Agriculture, both in the Pacific Northwest. He was with the

Weyerhaeuser Company for six years as public relations representative for Oregon and Washington.

Arnst edited the 50-year (1956) and 75-year (1981) histories of the School of Forestry at Oregon State University, and has served three different terms as President of the Portland, Oregon, and Washington, D.C. chapters of the International Association of Business Communicators. He has received several editorial awards for distinguished service.

# Foreword

Although Albert is no longer with us, the effects of his efforts are still being felt today. He and fellow Forest Service employee, W. B. Osborne, pioneered what is now known as “remote sensing” and Geographic Information Systems (GIS). The photos and map overlays created from the inspiration of these men were essential for fire suppression planning. Current fire risk assessments include methods pioneered by Albert and team (associated fire management personnel). Contemporary GIS systems use layers of information about the Study-Area to help planners assign various kinds of risk. Currently, the information includes much more than the “seen area.” Included now are layers of fire history, species, slope, rainfall, and others which are used to predict the volatility of forest stands.

Albert and team did the initial “remote sensing” of the Pacific Northwest’s newly formed national forests and generated what might be called the first GIS of the region’s terrain. Though “seen area” has become a commercial application for radio communications coverage analysis, this may be the the first GIS application ever used.

The panorama photographs served as an information repository and communications tool for nearly five decades. Initially, the images were being used to generate the “seen area” maps, as described within, which enabled the “response analysis” for early forest management. Next, they were used as a communications tool for the lookout and dispatcher to coordinate the positions of potential fires by simultaneous view of the photo in hand. Equally beneficial was the lookout’s ability to use these panoramas as learning tools. Since the job of lookout had an intrinsically high turnover rate, each new lookout went through the effort to learn the names of all the hills and valleys seen from each vantage point. Encouraged by management, the photos were often hand annotated with the names of the peaks and drainages.

In the 1960’s, when fixed-point observation platforms (lookouts) were being replaced by satellite and aerial observation techniques, the panoramic photos were set aside, some falling into obscurity. Aerial photography, infrared especially, was proving its effectiveness as a source of remote sensing. Mounds of aerial, and later, satellite images helped to map human effects on the forests. These “top down” images were comprehensive and uniform across the region. The technique was refined to the point where simple photographic processing could be used to contrast the changes. This data has been used to create digital layers of the current GIS systems.

But then it was discovered that for lightning strikes, fire lookouts are of utmost importance. Since surveillance flights are grounded for storms, crews often are assigned to staff these otherwise abandoned structures. Satellites, though able to detect ground strikes, may not detect the one that actually causes the fire. Flight surveillance for detecting fires are often infrequent, sometimes less than a few times a week. Because of the regular vigilance from staffing a lookout, some forest management personnel are pushing for the re-staffing of lookouts, because of the catastrophic wild fires that have recently occurred due to *too much* suppression in the past. Further, there is a trend of home building that puts homes adjacent to forests, putting the public

and their homes at high risk.

In the mid 1980's, when many recognized that the destruction of lookouts by the government, for economic and liability sake, seemed such a travesty, and so, for history and utility's sake, ex-lookouts and archeologists rose to the challenge of preserving the small, unique structures as a national heritage. Today, an international non-profit organization, the Forest Fire Lookout Association (FFLA), provides a network for lookout enthusiasts to draw encouragement from to support the valid mission of promoting the utilization and preservation of lookouts.

And many enthusiasts do abound. An enigma within the FFLA, Ray Kresek, is one, having published a book on lookouts of the Northwest, painstakingly locating over two thousand of them. The book's colorful tales of the photographers challenged Albert to document and clarify the facts, figures, and details of the process.

Since the 1990's, the panoramic photos were relegated to being "art" hanging on the walls of various forest management offices. Others were placed in boxes and shipped to the U.S. government's archives for preservation (at least those persons who saw their intrinsic value did the right thing). Most forest workers today do not know of their existence.

In the late 1990's, the photos are seeing renewed use in other non-fire related applications. This could be called an "adaptive reuse" of sorts. Biologists wishing to show the changes in vegetation over the last 70 years turn to the photos for comparisons. Aerial photographs cannot generate the visual impact that contrasting oblique angle "snap shots" can. To help present arguments of sound forestry practices the photos serve as an initial reference point.

In 2000, IamWho Panoramic Imaging along with publishing their own CD-ROM full of most of the images, obtained the rights to republish Albert's work. Come join Albert as he recants his and his teams' efforts to capture the views from the highest mountains in the Pacific Northwest in the 1930's. Although non-eventful and somewhat dry, he enlightens us by "telling it like it was."

Enjoy  
Rob Hoeye  
Carrol Neuhart-Hoeye

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# WE CLIMBED THE HIGHEST MOUNTAINS

by Albert Arnst

## Introduction

In his recently published book "Fire Lookouts of the Pacific Northwest", author Ray Kresek\* recalls a colorful and perhaps romantic era in the history of the Forest Service, U.S.D.A. The chapter on "Panoramic Photos" describes an exciting period in the development of an efficient fire detection system in Region Six (Oregon and Washington) during the 1930s.

The chapter correctly refers to me as the person in charge of the detection planning project. However, the description includes several inaccurate statements relating to the operation and use of the photo-recording transit, designed by the late W. B. Osborne, inventor of the widely used Osborne fire-finder.

The following report presents a more complete summary of this unusual Region Six project, on which intensive field and office work was carried on from June 1933 through December 1935. During that period oriented panoramic photos were obtained from 813 lookout stations - federal, state and cooperative - that provided fire detection coverage on the national forests in Oregon and Washington (Table 1).

## Project Had Three Phases

The detection planning project consisted of three separate but overlapping phases:

1. Securing oriented panoramic photos from existing lookout stations, as well as from supplemental points being considered for use as fire detection stations. The crew also obtained photos from stations operated by State Foresters, The National Park Service, Bureau of Indian Affairs, and other Forest Service regions (Regions One and Five), if the station provided supplemental detection coverage within Region Six.

2. Providing mounted sets of the photos to all field personnel with fire control responsibilities. Each set included three 5" x 13" prints, each showing a 120° sector of the azimuth circle as seen from the observation point. Each print contained imprinted identification data, name of station, national forest, photographer, date taken, printed and numbered azimuth scale, and level line., A separately furnished vertical angle scale indicated plus and minus angles with respect to the imprinted level line,

Personnel in Civilian Conservation Corps camps, particularly at Zig Zag Ranger Station on the Mt. Hood National Forest, furnished valuable assistance in mounting the photos in three-fold cardboard "albums" for forest use.

The panoramic photos had many other important uses: preliminary location of roads and trails; comparison of changes in cover types if photos are taken at periodic yearly intervals; visual reference for other management and administrative purposes.

3. Mapping onto half-inch base and topographic maps the "seen areas" as shown on each photo. Photographic data for each seen area map were mapped out to three radii - 15 mile, 8 mile and 5 mile - and so indicated by circles on the map. The 15 mile radius indicated maximum visibility attained during pre- and post-fire season conditions. The 8 mile radius indicated visibility during normal summer or fire season conditions. The 5 mile radius indicated visibility during emergency or bad fire-weather conditions.

\*FIRE LOOKOUTS of the NORTHWEST, by Ray Kresek. 412 pages, illustrated, with 90-page index to Oregon lookout stations, past and present. Available from *Historic Lookout Project, West 123 Westview, Spokane, WA 99218.*

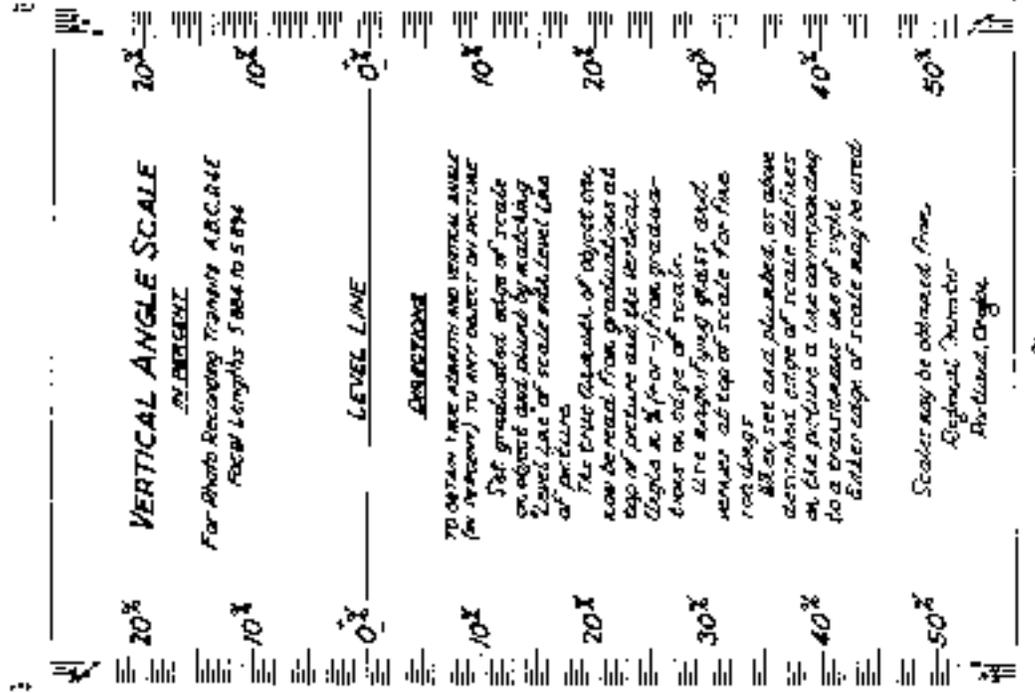


PHOTO of 120° sector from 300° to 60° azimuth indicates principal features of oriented panoramic photos used in both fire suppression and seen-area mapping for detection planning purpose. Each photo measured 14-1/4" wide by 5-1/2" high. Data on left edge included name of lookout station, national forest, and elevation of lookout station plus elevation of camera above ground level.

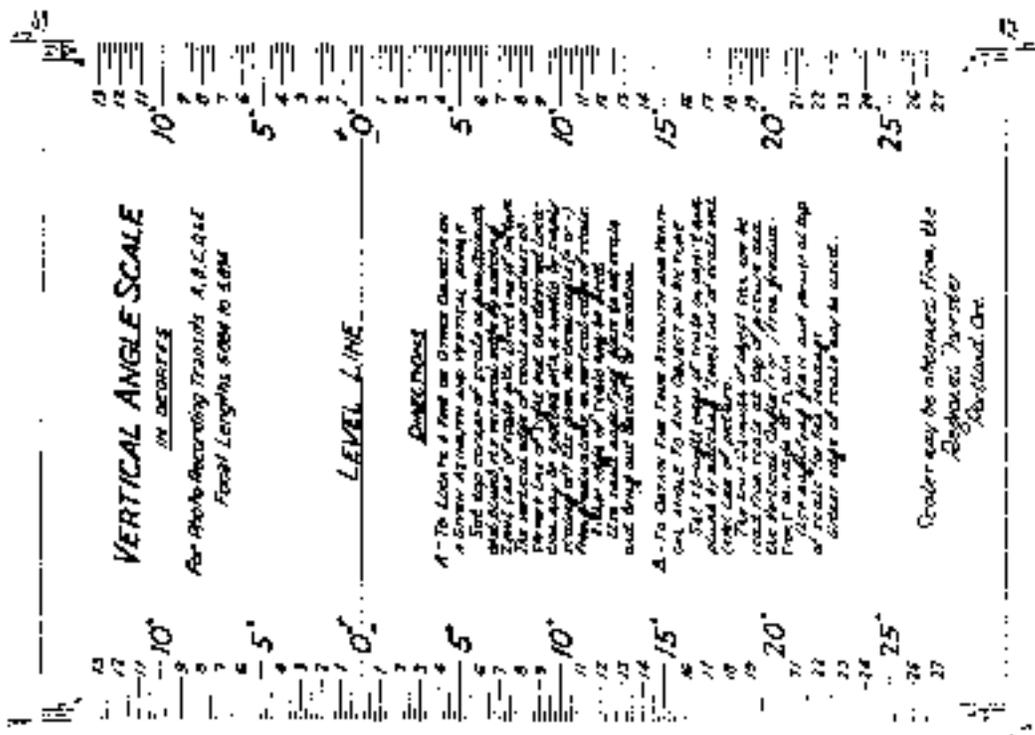
Name(s) of photographer(s) and date of

photographic setup were indicated on bottom edge. Level line, indicated by projections at 0° point on both left and right sides of photo, was etched on negative in office before print was made. Azimuth angles, photographed directly on negative, were indicated on both top and bottom edges of photo. Plus and minus angles, also photographed on negative, were indicated on both left and right side of photos.

Photos used were contact prints, not enlargements.



Use straight edge and sharp knife or sand to trim scale. Use cuts showing scale markings and must be straight and parallel. Ends should be cut back to mark graduations of picture. Strips of paper, scale and picture correspond. Over and under size scales are available if needed.



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These three radii had been established by the Pacific Northwest Forest and Range Experiment Station, based on field tests and research conducted under the direction of Richard McArdle.

Lage Wernstedt, Associate Topographic Engineer, R-O, furnished professional assistance in developing techniques and instruments for profiling seen areas on half-inch contour maps.

In turn, the seen areas so mapped were traced onto clear, transparent plastic discs. The seen areas then were painted in with transparent colors, available in 11 tints. A separate set of discs was prepared for each of the three radii of visibility.

The center-drilled discs, one for each lookout station, included in either the 15 mile, 8 mile or 5 mile system, were placed on small rivets projecting through a mounted half-inch forest base map, each rivet marking the location of a lookout point. When all the discs were in place for each of the three radii of visibility, the forest planner could see the composite coverage obtained. Vellum overlays of this composite coverage, used with forest cover, hazard and risk maps, indicated either "blind spots" or excessive duplication in coverage obtained from the respective combination of lookout stations used.

### How It Started

My association with the project began in June 1931 when I received a temporary appointment as Junior Forester. Out of a forestry senior class of 24 at Oregon State University, I was one of four who secured permanent employment during the severe economic slowdown of the Great Depression. The appointment became permanent in August 1931 when the Civil Service certified that I had passed the Junior Forester examination.

My duty station was in the Regional Office of Region Six, at that time located in the old Post Office Building at N. W. Broadway and Glisan Streets in Portland, Oregon; C. J. Buck was regional forester. My assignment was in the Division of Fire Control, headed by Fred H. Brundage. My immediate supervisors were Ray F. Grefe and R. A. Bottcher. They directed activities in the Transportation-Suppression planning of the region's Protection Planning project, as prescribed in the Regional Memorandum issued as a policy statement on March 11, 1931. Our secretary was Mildred Sinnott, who later became secretary to Regional Forester C. J. Buck.

The Protection Planning project had as its objective the determination of the appropriate speed-of-attack or hour control required to hold annual burned acreage to an acceptable minimum in various forest cover types, each with defined hazard and risk zones as related to lightning and man-caused fires.

Logically considered, Protection Planning consisted of three distinct but correlated phases: detection planning, transportation-suppression planning, and communication planning. Although detection planning should have been the initial step, our office concentrated on transportation-suppression planning because we had insufficient data on detection coverage.

My initial assignment was to indicate on standard half-inch forest base maps for each national forest - the forest cover types, classified as to hazard and risk zones. These type areas would indicate the rate of fire spread in each of the fuel types and hence would influence hour control standards.

Vellum overlays were made from these maps, each indicating the existing road and trail system, with each road or trail rated according to attainable speed of travel. Another vellum overlay indicated how far out first-attack forces could reach from each protection station on the road and trail system, using standard fire suppression equipment (pickups, tank trucks, sedans, etc.); each class of vehicle was rated according to its travel speed.



SET OF THREE panoramic photos covered 360° azimuth sector. Three 120° views included: 300° to 60°; 60° to 180°; and 180° to 300°.

The completed set of overlays indicated the hour control attainable by first-attack forces, using the existing protection stations and transportation system. By correlating these overlays with the forest cover map, planners could revise the first-attack organization. Several options were available: improve existing roads for faster travel; construct additional roads and trails; change the location of protection field stations; add more protection stations, such as guard stations; beef up forces at district ranger stations.

### First Cameras Arrive

In the early summer of 1932, W. B. Osborne, Senior Regional Forest Inspector, received delivery of four units of the photo-recording transit he had designed. The precision instrument was developed for the specific purpose of securing oriented panoramic photos from lookout stations. The sophisticated cameras were manufactured to Mr. Osborne's specifications by Leupold-Volpel & Company (now doing business as Leupold & Stevens, Inc.) in Portland, Oregon, an established supplier of precision optical and surveying equipment.

During most of that summer I worked with Mr. Osborne in testing each of the four camera units for accuracy of exposure, mechanical specifications, adjustment of lenses, correct positioning of azimuth scales and a variety of other tests.

We ran these tests by establishing a permanent camera hub on the roof of the Post Office building, setting up each camera on its tripod legs, and then orienting the camera and taking the three 120° photos required to complete the 360° horizon. Transit readings in azimuth degrees related to true north had previously been taken to all prominent city landmarks visible within the 360° circle.

When prints were secured from the negatives, Mr. Osborne, using a high-power magnifying lens, would carefully check the precise transit readings against the azimuth readings recorded on each of the prints. By the end of the summer four accurate photo-recording transits were ready for field use.

### Visibility Tests Conducted

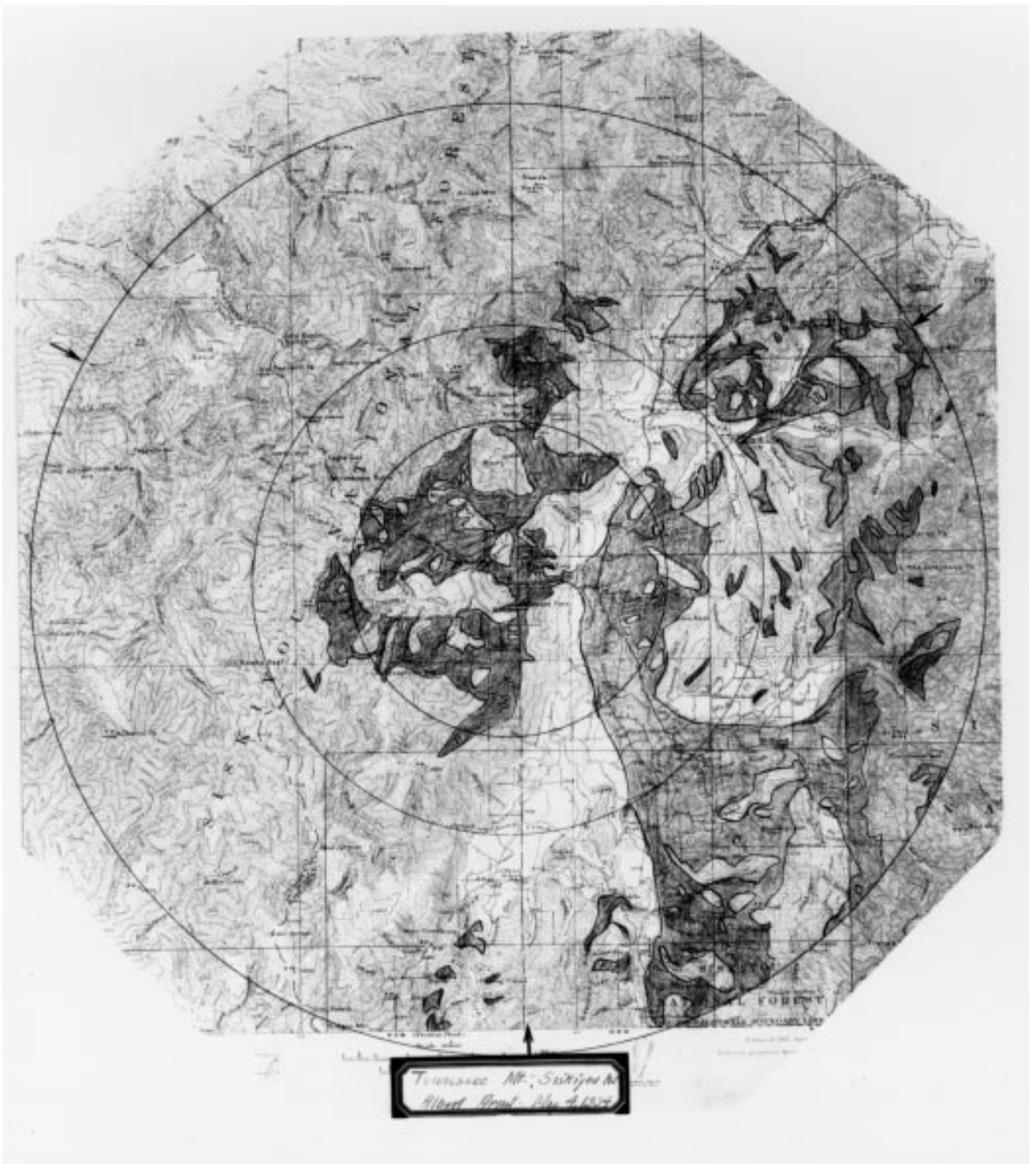
Also during the summer of 1932, Mr. Bottcher and I cooperated with Richard McArdle of the Pacific Northwest Forest and Range Experiment Station in conducting field tests to determine the effective visibility obtained from lookout stations under various atmospheric conditions.

This was done by setting off smoke bombs calibrated to emit volumes of smoke equal to small, medium and large fires. The bombs were detonated at various radii from a network of lookout stations. Through telephone communication we could determine how soon and at what distance each lookout observer was able to see the smoke.

The results of these field tests and related research by the PNW Experiment Station were the basis for establishing the 15-mile, 8-mile, and 5-mile limits of visibility used in preparing "seen area" maps from panoramic photos. Mr. McArdle was also testing the Byram haze meter at the same time.

### First Camera Field Test

The first field trial of the Osborne photo-recording transit was made in early 1933. I was detailed to the Deschutes National Forest to test the cameras in a typical operational set-up. Supervisor Carl B. Neal suggested Lava Butte south of Bend, Oregon because the station had road access. Cold winter conditions prevailed during our test runs, which were successful.



PREPARATION of individual seen-area maps from panoramic photos was important part of detection planning project. Camera crew members did this work during winter months when field work was impossible. Visibility mapping on topographic base maps was relatively simple; techniques and devices developed by Lage Wernstedt in Engineering Division were used. Mapping on half-inch base maps depended mostly on visual identification of topography shown in panoramic photo. By transferring seen-area data from individual maps to transparent celluloid discs, composite coverage obtained from a combination of stations could be obtained for each of three visibility conditions: 5-mile, 8-mile, and 15-mile.

Visitors to the present day Visitors Center on Lava Butte can see among the various exhibits a set of three mounted panoramic photos showing the 360' horizon as it looked in 1933; my name appears on the prints.

### First Field Season; 1933

The panoramic photo project became operational on June 11, 1933 when funds became available from Civilian Conservation Corps appropriations. The six-person crew recruited as “enrollees” consisted of Lester M. Moe, Robert M. Snyder, Robert L. Cooper, James D. Rittenhouse, William Birchall and Reino R. Sarlin. With the exception of Mr. Birchall, these men were forestry students at either Oregon State University or University of Washington, all eager to earn enough money to continue their education.

During the field season from June 11 until November 15, we operated four cameras. Efficient field work was restricted because CCC funds financed only the salaries of our “enrollee” crew members; payments for either mileage or per them were not authorized. Although I was on per them and operated a government- owned vehicle, crew members were required to obtain food and lodging at established CCC camps on national forests (35 in Oregon and 20 in Washington). Some of these camps were not fully organized, and many were remote from areas in which our cameras were operating. As a result, much of the summer was spent in my shuttling crew members to lookout stations in the morning and then picking them up in late afternoon.

Later in 1933 this situation was remedied when the Regional Office secured the discharge of our six “enrollees” from the Civilian Conservation Corps. We then financed our operation from IMPNIRA appropriations and were authorized to operate privately-owned cars on mileage and to pay per diem. Crew members were reclassified as SP-4, Assistant to Technician. Two private cars operated on mileage, but the official vehicle chalked up most of the travel.

Our unusual project received widespread publicity during 1933. One syndicated news service supplied its newspaper members with a story and photo showing the camera in operation at a lookout station. Local newspapers were always interested in our work.

In August 1933 the big Tillamook fire smoked out our camera crews west of the Cascades. We moved the one-man crews to eastern Oregon and Washington. After the fall rains in September, the crews returned to the “west side”.

Federal office space was not available in Portland to accommodate our “seen area” mapping work during the winter months of 1933-1934. The Regional Office offered our seven-person crew the rent-free use of the newly constructed and still unoccupied Summit Guard Station on the Mt. Hood National Forest, located one mile east of the village of Government Camp on the Mt. Hood loop highway. Facilities included a large office suitable for our mapping work, a completely equipped kitchen, a large living room with massive fireplace, and bunk space in the upstairs loft.

Our Yuppie crew members plumped for this arrangement because it saved them money and offered fringe benefits - skiing on weekends and social life at Government Camp. The set-up worked out satisfactorily, with our cooking, housekeeping, and wood supply details handled by rotating assignments. The winter of 1933-1934 was a “no-snow” year; bare ground showed at Government Camp in January 1934.

A dramatic highlight of the winter was the daytime destruction by fire of the 25-year-old Government Camp Hotel, on October 11, 1933. Fire crews dispatched by District Ranger Huck Hiatt at Zig Zag Ranger Station, state highway crews, and crews from the Summit CCC camp were unable to squelch the flames. I furnished a story and photos of the fire to the Oregon Journal, in Portland; I published two photos - one four-column and one three-column.



EQUIPMENT used in preparing seen-area maps. Top photo: photo stand with light; large celluloid protractor for transferring azimuth angles to base map; profile indicator or "harp" used only on topog maps; vertical angle scale; pencils. Bottom photo: close-up view of homemade stand for mounting panoramic photo during mapping process.





**Camera captures scenic splendors**





*MT. HOOD, Oregon's highest peak (11,235), as seen from Tom Dick Pt. on Mt. Hood National Forest in Oregon. At far left is former torturous Laurel Hill grade on Highway 26. At right center is Government Camp colony on Highway 26; this was winter sports headquarters for the Mt. Hood area before construction of Timberline Lodge in 1937. Burned area in foreground is now restocked with trees. On distant skyline to left of Mt. Hood, from left, are Mount St. Helens and Mt. Rainier in Washington.*

## s in Northwest

*(Photos taken in 1933)*



*CRATER LAKE as seen from Watchman Peak (elevation 8025') on west rim of 6 mile diameter Crater Lake in Oregon (elevation 6176'). Wizard Island, foreground, is accessible by tour boat. High point on horizon is Mt. Scott (elevation 8926') lookout station on east rim of Crater Lake; it is accessible by 2-1/2 mile trail. Entire lake is circled by 33-mile rim drive that provides exciting views of Cascade Range.*

## Second Field Season 1934

Field season for the entire crew started in April and ended October 25. However, earlier in the year, two cameras had been dispatched to the Umpqua and Siuslaw National Forests respectively, to take advantage of favorable weather for photography. Mr. Cooper worked on the Siuslaw from February into April. Mr. Rittenhouse worked on the Umpqua from February into April. Mr. Sarlin was detailed to the Siskiyou in March. Mr. Snyder worked intermittently on the Mt. Hood National Forest.

In July George B. Clisby replaced Robert M. Snyder as camera operator.

Highlight of the year was availability of infra-red sensitive film, spooled in six-exposure rolls by Eastman Kodak Co.; Eastman had also supplied the original Panchromatic film, spooled in four-exposure rolls. However, we used only 50 rolls of the infra-red film because a large supply of the four-exposure film was on hand. The exposures made with the infra-red film and red filters produced spectacular results in penetrating extremely hazy and smokey atmosphere.

In August Leupold-Volpel completed a fifth camera for field use. The company also built a sixth camera for the National Park Service; the firm borrowed one of our four cameras from May 28 until August 7 to use as a model for manufacturing the NPS camera. Both the fifth and sixth cameras had to be tested and adjusted by our crew before the cameras could be released for field service. These temporary diversions of equipment resulted in loss of valuable field time.

However, 1934 was still our best field season. Excellent visibility prevailed in the region. During the season we secured panoramic photos from 427 lookout stations. Mr. Rittenhouse was our top operator - he occupied 116 stations; Mr. Cooper occupied 114 stations. I occupied only 49 stations because of my responsibilities as crew chief.

## Third Field Season: 1935

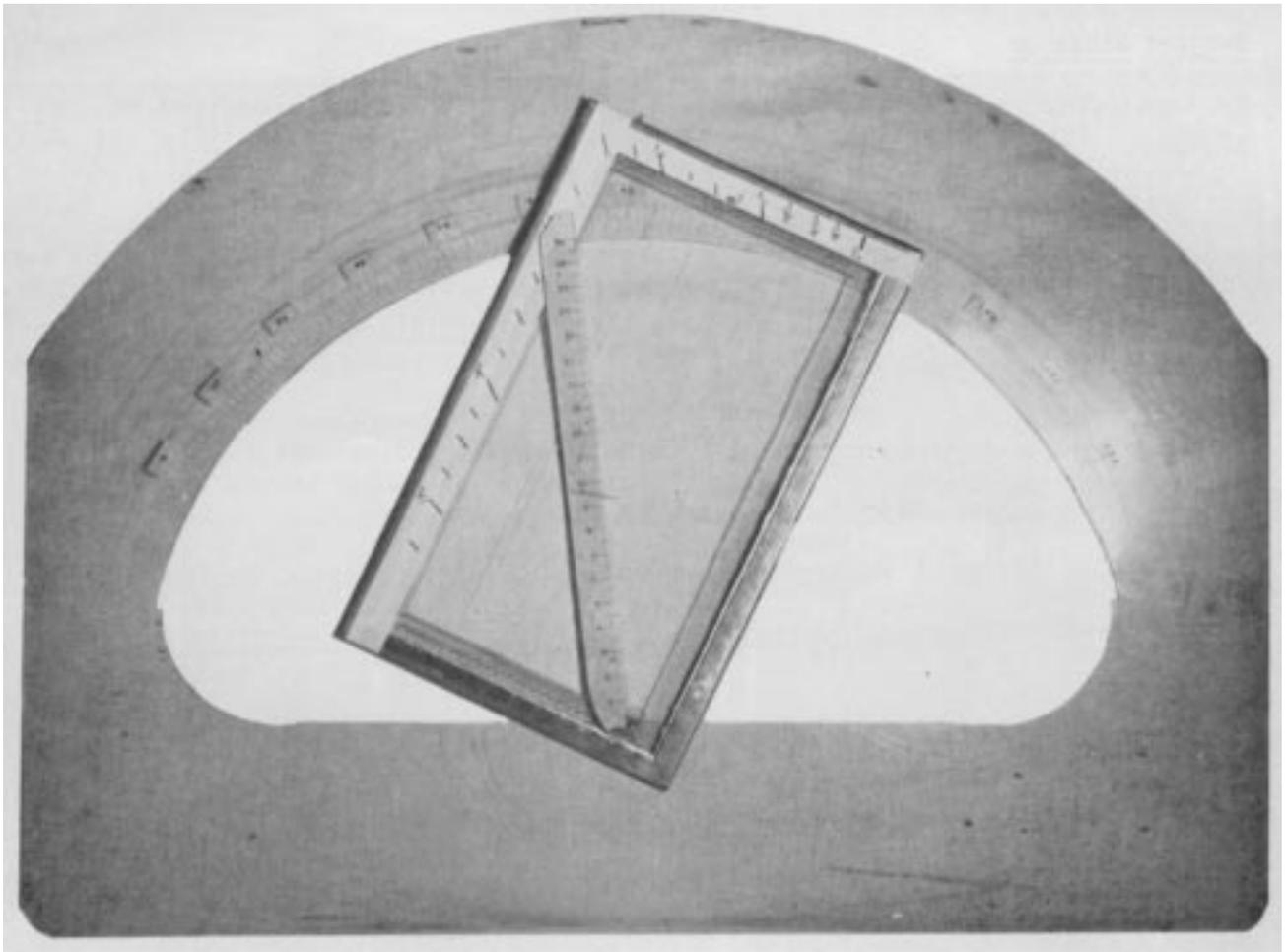
The 1935 season was our upset year. Project funds ran out; we furloughed Messrs. Cooper, Rittenhouse and Sarlin in late June. As a result we lost three weeks of field time in late June and early July while we regrouped for the season.

Our reorganized camera crews consisted of Lage Wernstedt, Associate Topographic Engineer, R-0; W. B. Osborne, Sr. Regional Forest Inspector, R-0; George B. Clisby and myself. Mr. Moe had terminated his services to resume college; Mr. Birchall had resigned.

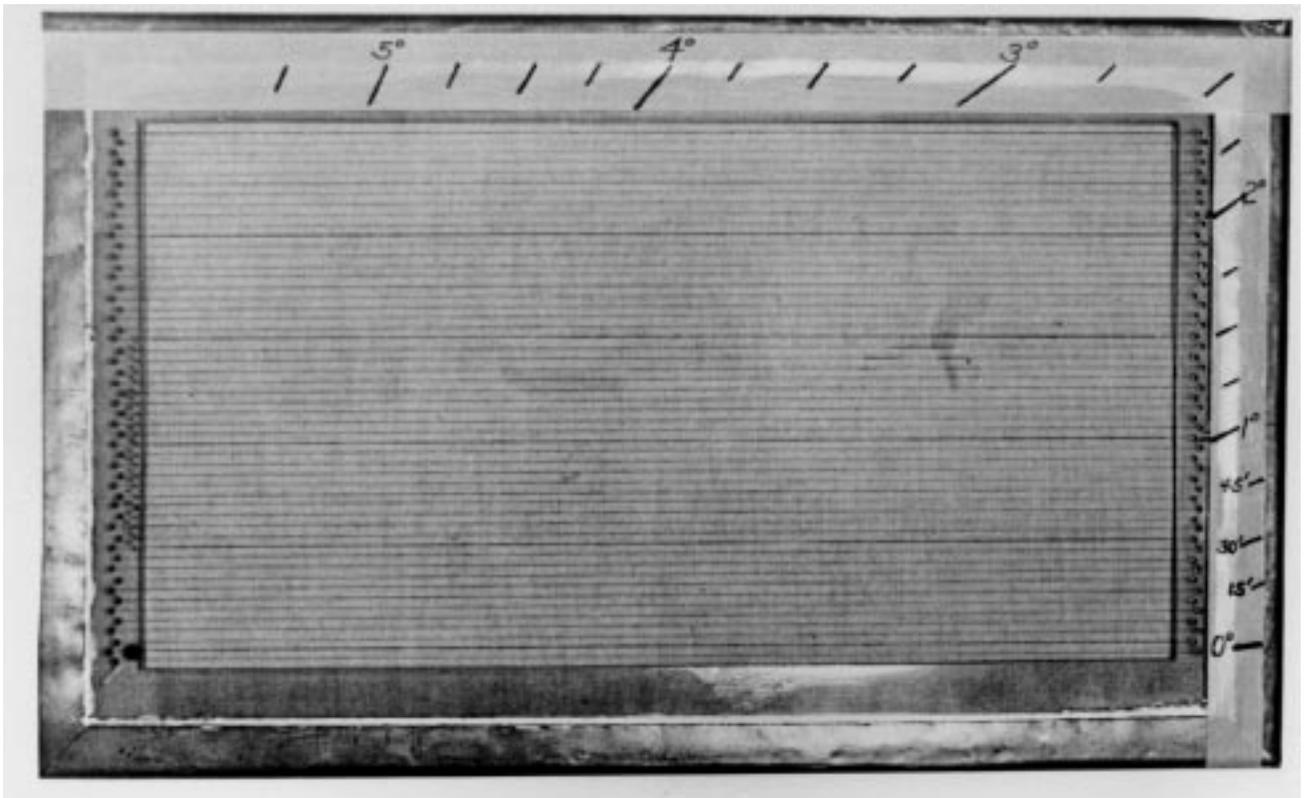
Our four-person battalion operated largely as single operators, without, the crew organization we had in 1933 and 1934. During the field season from June 8 to October 31, the camera operators, with limited assistance in June from the furloughed personnel, spent 378 field days in securing panoramic photos from 190 lookout stations. Mr. Clisby and Mr. Osborne each occupied 36 stations; I occupied 98 stations.

Season highlights for me included two pack string trips. The first was with W. G. (Grady) Miller, district ranger on the Imnaha District on the Wallowa National Forest. In October we travelled north along the backbone of the high ridge between the Imnaha River and the grand canyon of the Snake River; our trip ended at Hat Point.

Immediately after this back-country safari, I headed for Riggins, Idaho on the east side of the Snake River. From that base I spent another week with a pack string and packer securing panoramic photos from seven lookout stations along the craggy Seven Devils Range, overlooking the Snake River canyon. Three of the stations were on the Weiser National Forest and four on the Nez Perce National Forest.



PROFILE indicator, called “harp” by mappers, was de v iced designed by Lage Wernstedt for use in mapping seen areas on topographic maps. With harp centered (lower left) on lookout location on map, celluloid ruler was used with harp indicated where line of sight from lookout elevation intersected contour elevation beyond an obstructing ridge or mountain top. Vertical angles are indicated on outside edge of harp.



## Project Winds Up

My concluding report on the detection planning project was submitted to Jack F. Campbell, head of Fire Control, on January 16, 1936. George Clisby and Junior Forester Robert Reinhardt completed office and field work in 1936; only scattered lookout stations remained to be photographed.

Early in 1936, I transferred from the Regional Office to field duty status. My first assignment was as a member of a three-man timber cruising party based at Prospect, Oregon on the Rogue River National Forest. Bill Wakefield was party chief, operating under direction of Fred Matz, in charge of timber surveys, Regional Office.

Our assignment was to cruise national forest timber for volumes and values involved in a timberland exchange agreement with private owners of timber flanking both sides of the ten-mile strip of highway between Prospect and Union Creek. The exchange was being made to maintain the timber corridor as a scenic strip.

Later in the spring I was appointed assistant district ranger on The Dead Indian Ranger District, Rogue River National Forest, with summer headquarters at Lake-Of-The-Woods. Karl L. Janouch was supervisor and Hugh A. Ritter was district ranger.

On September 26, 1936, I accompanied Sim Jarvi, district ranger at Butte Falls, Rogue River National Forest, to Bandon, Oregon to become part of the overhead organization on this blow-up fire. Edward Cliff and M. M. Nelson served on the overhead staff at Coquille, Oregon. My tour of duty lasted over a month.

Upon my return to the Rogue River National Forest, I was assigned as a member of a two-man team to scale logs on a Pelican Bay Lumber Co. timber sale west of Chemult, Oregon. We ate and bunked with the loggers at the company's logging camp.

In January 1937, I was appointed District Ranger on The Warner District on the Fremont National Forest at Lakeview, Oregon; P. V. Ingram was assistant ranger. On the supervisor's staff at the same headquarters were J. B. Hogan and John G. Clouston; W. O. Harriman was supervisor.

## Personnel Contacts

During my three-year assignment on the detection planning project, I did field work on every one of the then 20 national forests in Region Six. I also met and worked with each of the forest supervisors and many district rangers. As party chief I made advance arrangements for the camera crews' duties on each forest; this required daily contacts. I also remained in almost daily contact with the Regional Office; Harry White, was my liaison officer.

Another one of my assignments while in the Regional Office was a one-month tour of duty as assistant on Olie Fuller's travelling "Show-Boat", operated by the Oregon State Department of Forestry to present forestry programs at CCC camps, grange halls, and before civic organizations. I also worked with George E. Griffith and contributed articles to "R-6", the regional newsletter to Forest Service employees.

Officers who served during those formative years in the Forest Service's colorful history were outstanding and dedicated individuals. Everybody worked long hours by the month and not by the clock. The list of people who enriched the early years of my forestry career is much too long to itemize, but my memories of their professionalism and loyalty to a great cause will never be erased.



PHOTO-RECORDING transit set up for operation, without use of tripod legs. Ground setups like this could be made only on unimproved points being considered for use as a possible site for lookout location. Most camera setups were made with tripod on catwalks of stilt-mounted lookout stations. For ground stations camera could be set up on rooftop. For tall-tower stations rooftop setups were considered too dangerous. Most precise part of camera operation was leveling the instrument on the graduated azimuth ring, as operator is doing in photo. Camera was then oriented by sighting alidade on camera top to azimuth-identified topography on horizon.





# Majestic peaks crown summit Of Cascade Range

*MT. JEFFERSON and  
Pamelia Lake (Willamette  
National Forest in Oregon)*



*MT. ADAMS and Council  
Lake from Council Bluff  
(Gifford Pinchot National  
Forest in Washington)*

*ALL PHOTOS taken in  
1933 and 1934*



*MT. RAINIER from Fre-  
mont Point (Rainier National  
Park in Washington)*

## PHOTO-RECORDING TRANSIT

### Mechanical Specifications

The Osborne photo-recording transit was a precision instrument combining all the features of an engineering surveyor's transit with added photographic capabilities. The complete unit consisted of three parts with a total weight of 75 pounds; each part had its own carrying case to protect the sensitive equipment while in field travel:

1. Camera housing or body, constructed of duraluminum and brass. This body had four door openings: the hinged-on-top lens door in front; a narrow removable door on each of the two sides for use in loading and unloading film; and a removable back door opened when a new roll of film was being tracked into place along the circular azimuth-angle track. The back door had a red peep-hole for positioning each exposure number when the film was advanced for another exposure.

The camera also included these accessories: a three-piece demountable alidade, with built-in magnetic compass; four flutter-type exposure fans, with removable metal housing put in place when fans were in use; a key to wind the clock motor that moved the lens through its 120° arc - and was also used to advance and rewind the film on the spools; a one-minute base level for levelling the camera in operating position.

A unique feature of the camera was its reversability in use. Both the top and bottom of the camera had a 180° half-circle vernier scale for placing on the azimuth ring on the tripod head. The reverse position, with the front camera door opening down instead of up, was used to secure a plus angle of elevation larger than the 10° to 15° taken with the camera in normal position. The larger plus angle would extend to 30°.

The camera also had a wheel-moved azimuth tape that could be adjusted to photograph on the negative the azimuth readings for the 120° sector being photographed.

2. Tripod head, with movable azimuth ring, graduated in degrees from 0° to 360°. The head was equipped with four levelling screws, in opposing pairs, for levelling the camera in operating position. The head also had a three-hole lugged base so it could be anchored on a wooden base if tripod legs were not used.

3. Tripod legs, telescoping and heavy duty. These were bolted to the tripod head if legs were used on a camera set-up.

Lens: Bausch & Lomb, approximately 5.9" focal length. F/stops from F/8 to F/32. Lens had no shutter. Light travelling through open lens passed through a narrow vertical and rectangular funnel. It exposed a narrow strip of the stationary film in the locked-in-place camera as the lens travelled 120° from right to left. Thus the lens was always at the same focal length on every portion of the film.

### Exposure Controls

Exposures. Controlled by small flutter type metal fans; these were inserted on a shaft projecting from the clock motor, through top of camera in normal position. Four fans were furnished; these provided exposures ranging from about 1/5 second to 2 seconds. Most photos were taken on long exposures and small F/openings to obtain sharpness in detail.

Exposure Calculations. Made from a printed Harrold Exposure Scale, which contained tabular listings of cloud and sunlight conditions to match with film speeds to obtain F/openings for various fan speeds. Four filters were available: K2, #12 deep amber, "A" red and "F" red. Red filters were used with infra-red film.

Film Used. Aero Type 2, four-exposure, panchFoma film emulsion. In 1934, this emulsion was replaced with six-exposure rolls of infra-red sensitive film. Supplier: Eastman Kodak Co.

### Camera Set-Ups

The camera was seldom placed on the cupola roof of a lookout station unless the building had no catwalk. Older stations were ground based, with a small cupola on top. We could remove or open windows on these to photograph each 120° sector.

Newer buildings of the Alladin type usually had a catwalk. Most of the time we could obtain two of the 120° exposures from one camera set-up. Most Alladin units were on 14-foot legs. Tall towers usually had catwalks. It would have been dangerous to try a roof set-up on a 110-foot tower. Tree towers were the great-

est problem.

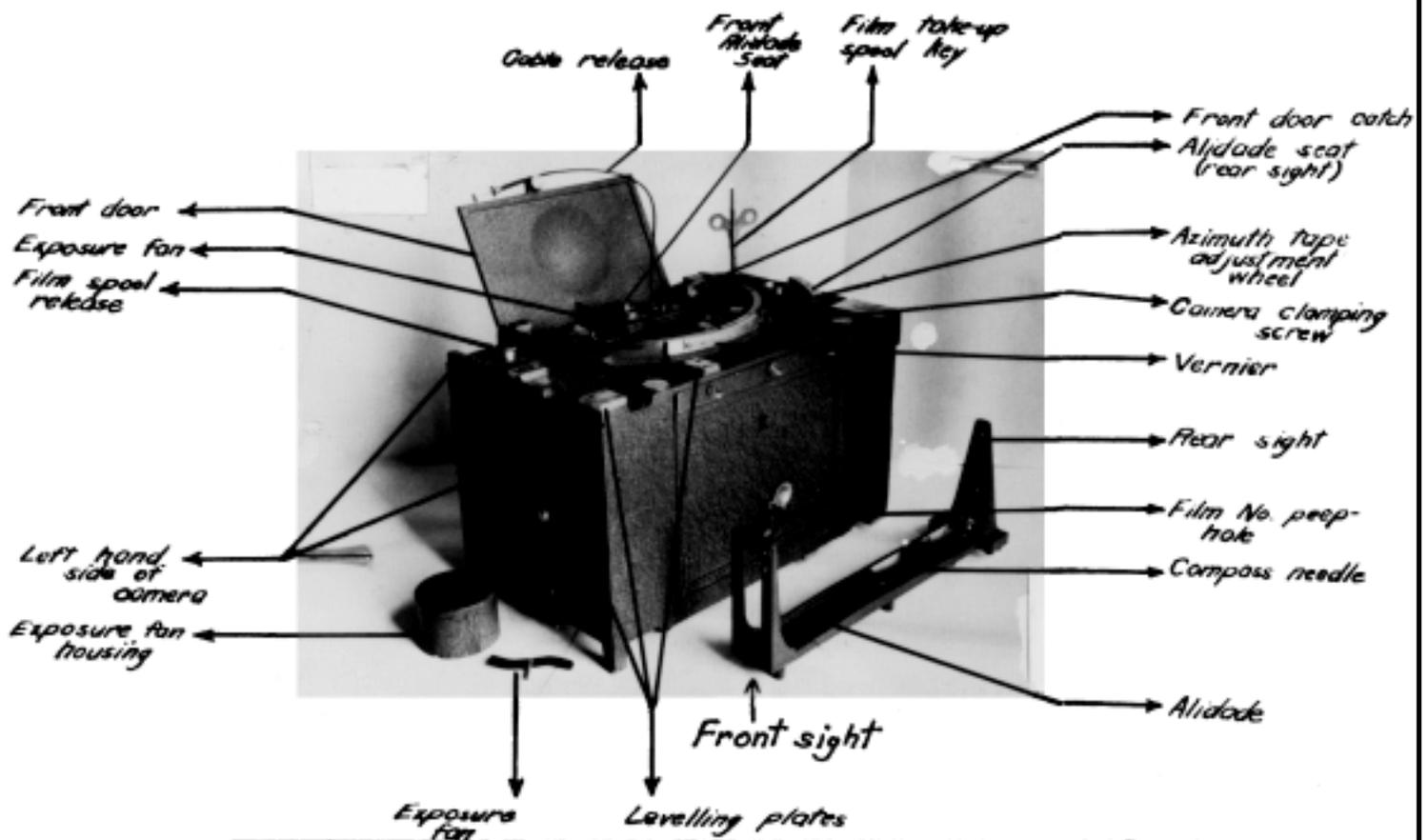
Exposure Routine. Time of day and the sun's position determined the most favorable clock time for taking each of the 120° sectors. Normally, the 60°-180° arc was taken at about 3:00 P.M.; the 180°-300° arc was taken at about 9:00 A.M.; the 300°-60° arc could be taken sometime around noon. We saved time by making one camera set-up for taking the 300°-60° arc first and then the 60°-180° arc. We lowered overhanging shutters when necessary.

If this routine was followed closely, the camera operator had to spend almost a full day at the station. If the equipment had been back-packed to the station, travel time up to the point and back to the trailhead spelled out a long day's work.

On each camera set-up, the camera was oriented by using the camera's sighting alidade and azimuth readings from the station's Osborne fire finder. Two exposures were made for each 120° arc, varying the exposure time to assure a choice between processed negatives. Each exposure was made by raising the front door and fastening it with a small chain, thus providing a sun shade. The clock motor was tripped with a cable release to avoid disturbing the camera set-up in its locked position. Complete exposure records were made on each occupied station.

### Field Travel

Road access to lookout stations was limited in the 1930s; eastern Oregon and Washington had most of those stations. For stations within about four miles of a trailhead, the camera operator would backpack the 75-pound load. If the distance was a little more but could be covered within a day, we hired a pack horse but not a saddle horse. To reach rugged back country, such as the northern Cascades in Washington, we hired a pack string, packer and saddle horses to reach a string of lookout stations.



**Panoramic Camera in Normal Position**

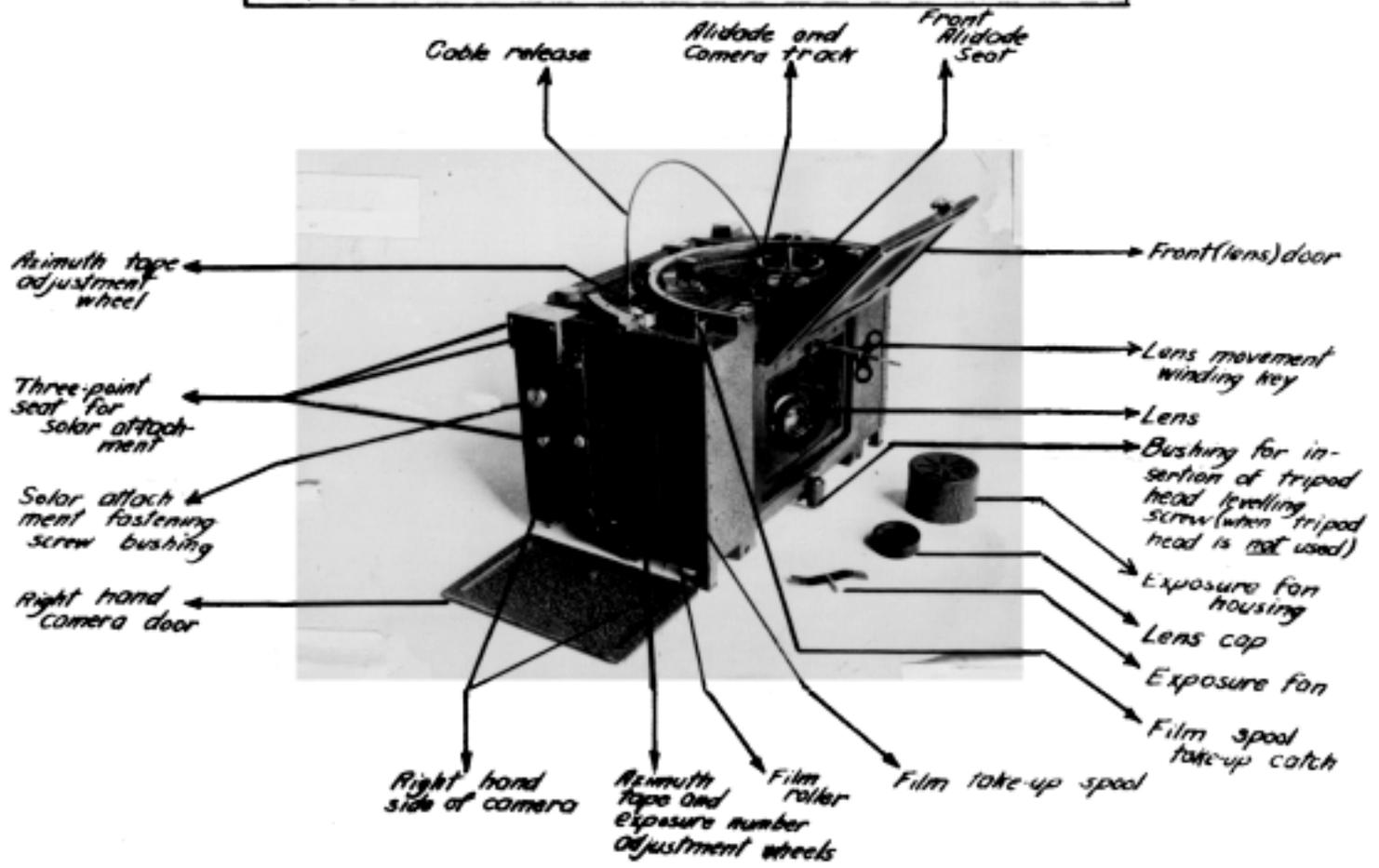


TABLE I - Summary of Detection Planning Project

<u>Year</u>	<u>Man-Days In Field</u>	<u>No. Stations Photographed</u>	<u>Aver. Days Per Station</u>	<u>Total Cost</u>	<u>Aver. Cost Per Station</u>
1933	624	196	3.18	\$ 6,634.16	\$33.84
1934	921	427	2.16	\$ 9,430.13	\$21.93
1935	<u>378</u>	<u>190</u>	<u>1.99</u>	<u>\$ 4,773.15</u>	<u>\$25.12</u>
TOTALS	1923	813	2.37	\$20,837.44	\$25.63

Summary:

Total number of stations photographed - 1933, 1934 & 1935 .....	813
Average number of field days per station .....	2.37
Average cost per photographed station .....	\$25.63

Preparing "Seen-Area" Maps

Cost of Materials .....	\$ 5.25	
Labor Costs .....	<u>\$15.00</u>	
Total Cost, Per Station .....	\$20.25	(Seen Area mapping and discs)
Cost of Securing Photos .....	<u>\$25.63</u>	(See above)
Total Cost, Per Station .....	\$45.88	(Panoramic photos and mapping)

Cost of Film

Six-exposure infra-red film .....	\$ 3.30 per roll
Four-exposure Panchromatic film .....	\$ 2.20 per roll
(All film furnished by Eastman Kodak Company)	

Photo-Processing

Originally by L. C. Jones, later by A. L. Ransford; both located in Portland, Oregon.

Camera Manufacturer

Leupold-Volpel Co., Portland, Oregon.

Approximate Travel Mileages (for three seasons)

By automobile - official car and mileage contracts .....	100,000 miles
By horseback, either pack string or single day .....	3,000 miles
Back-packing to lookout stations .....	<u>700</u> miles
Total Mileage .....	103,700 miles

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IamWho Panoramic Imaging: <http://www.iamwho.com>

# Afterword

Now that you have read about how and why the panoramic photographs were taken, lean back and take a tour of the landscape, as it was, by viewing the photos. Included is a CD-ROM produced by IamWho Panoramic Imaging, full of 3000 images taken by Albert and team in 1933-1943. It requires a PC or Mac with a CD-ROM or DVD player, an HTML 3.0 compatible Web Browser (Netscape 4.0 or Internet Explorer 4.0 or later) and Quicktime 3.0 or later (free download) from Apple.®

In 1995, I became interested in panoramic photography as it relates to “virtual reality,” interactive digital movies. Being a hiker, I began trekking to old lookout sites in the Northwest to take panoramic photos of the landscape. After visiting my father’s lookout some 40 years after I refused to stay overnight as a two-year old (what a shame!), I learned that many of the best viewpoints in Oregon had been occupied by fire watchers. Soon I discovered that a few of the old buildings had survived and even fewer were in active use.

Initiating the idea to create a digital “virtual tour” of all the lookout sites of Oregon, I set out to catalog the sites. First, I sat with an atlas and flagged all the “lookout” sites of each page. Then I searched the Internet for the word “lookout.” Finding little, I turned to the Library of Congress Web site and found Ray Kresek’s book, *Fire Lookouts of the Northwest*. Determined to have my own copy, I searched diligently, but without luck. However, Portland State University had a copy, so I had my fiancée and student, Carrol, borrow it.

In his book, Ray has created a comprehensive anthology of lookout stories and database of lookout site information about each building. Over 800 sites are in Oregon alone! It was going to take a long time to go to each one and take a picture. Better get started. So I set out to categorize each site as to its photographic ability. Those without trails not currently maintained would have to wait. I noticed many of the same names also appeared in William L. Sullivan’s hiking books and correlated the two. More than half of Sullivan’s hikes are trails or paths to old lookout sites. Now I had instructions on how to get to many of the old locations. While glancing through the Washington section of Ray’s book, I noticed a picture of a man with a camera standing on top a lookout, with the caption, “Panoramic Photographs.”

I read this section several times. My hair was on fire. I just had to find these photos. My call to the history officer at Region-6 USFS headquarters in Portland revealed that the pictures had been moved to the Seattle National Archives regional repository. Back to the Web I went. The on-line holdings document for the Seattle Archives referenced 19 cubic feet of “panoramic photographs.” Now my hair was really on fire. The project just got easier. I no longer needed to go to all of the sites. I could mix and match my photos with the “originals.” Oh boy, what a find! “Calm down now, you are about to talk to one of the curators of the national assets,” I told myself. The archivist, Laura, in Seattle, was gracious enough to scan three images, one full set, and e-mailed them to me. This was in August of 1996.

About this time I had visited Dome Rock, just north of Detroit, along the North Santiam River, east of Salem, Oregon. The pictures I took were elevated 15 feet from the ground using a panning-head tripod contraption, I had designed and built. The resulting image was intended to be the same height as the archived originals. Ray’s book had claimed that ALL the photos were taken atop lookouts. So I was set - with new comparison shots. I asked Laura to scan “Dome Rock” in the Willamette National Forest and she e-mailed me the JPEG files. I couldn’t wait to see the views and match them to mine.

Fortuitously, the original photos were taken just four feet above ground level - a height difference nearly unnoticeable. Using these images, I created a QTVR movie of Dome Rock (included on the CD) which toggles between the 1932 and 1996 views.

After receiving several images from Laura, I began prototyping what would become the contents of the Osborne CD. At our 1996 Christmas gathering, I demonstrated the prototype to my brother-in-law, a Forest Service biologist. Ecstatic about the views and potential uses, he encouraged us to continue.

Laura graciously demounted and scanned 26 sites and e-mailed them to me over a period of three months in late 1996. Realizing the inefficiency, we were granted permission to come to Seattle to scan them ourselves, following handling instructions by Laura. Meanwhile, at home, I modeled the scanning process, determined the storage requirements and settled on a resolution. Four trips and eight "scan" days later, we had demounted and photographed every last panoramic photo of that 19 cubic feet. Over 3000 images were collected - each taking at least one minute to demount, scan and return to its place in the container.

In June 1997, I met Mike Hanemann, a fellow lookout enthusiast and panoramic photographer, at a camera swap meet. We spoke for an hour about the photographs, but it seemed like minutes. It turned out that Mike had a set of old forest maps annotated with each photographed site. He also had the galleys of this booklet, which we copied along with most of his cache, including loaned maps. I promptly translated this data onto current forest maps. Mike later loaned us one of the cameras, which we documented into a QTVR object movie (included on the CD).

The weekend we met Mike, Carrol and I went to the Bull of the Woods lookout and created a prototype QTVR object movie of the lookout (included on the CD). From then on, every spare hour of time was dedicated to the creation of the CD. We geographically referenced the sites, extracted "seen object" data, designed graphics, corrected gross scanning errors, built an application to generate the maps, created HTML, configured the maps and laid out the file system. We burned the CD, checked for errors and spent weeks repairing them. Next, beta testers (we gratefully acknowledge) found other bugs that we cleaned up. Later, we hunted down Arnst's heirs, who gave us permission to republish this booklet.

In June 1999, IamWho Panoramic Imaging shipped the first production copies of the academic version of the CD. Because the images are large files, they were split into three groups: Eastern Oregon, Western Oregon and Washington. Since then, we prepared the second version of the CD. All images (half-sized) are on one CD, with updated pages, new graphics, more corrections and a unified look and feel. We also added ten "tours" of objects seen. The slide-show tours sequence through each subject area (lookouts, people, scenic, etc.) at a ten-second pace.

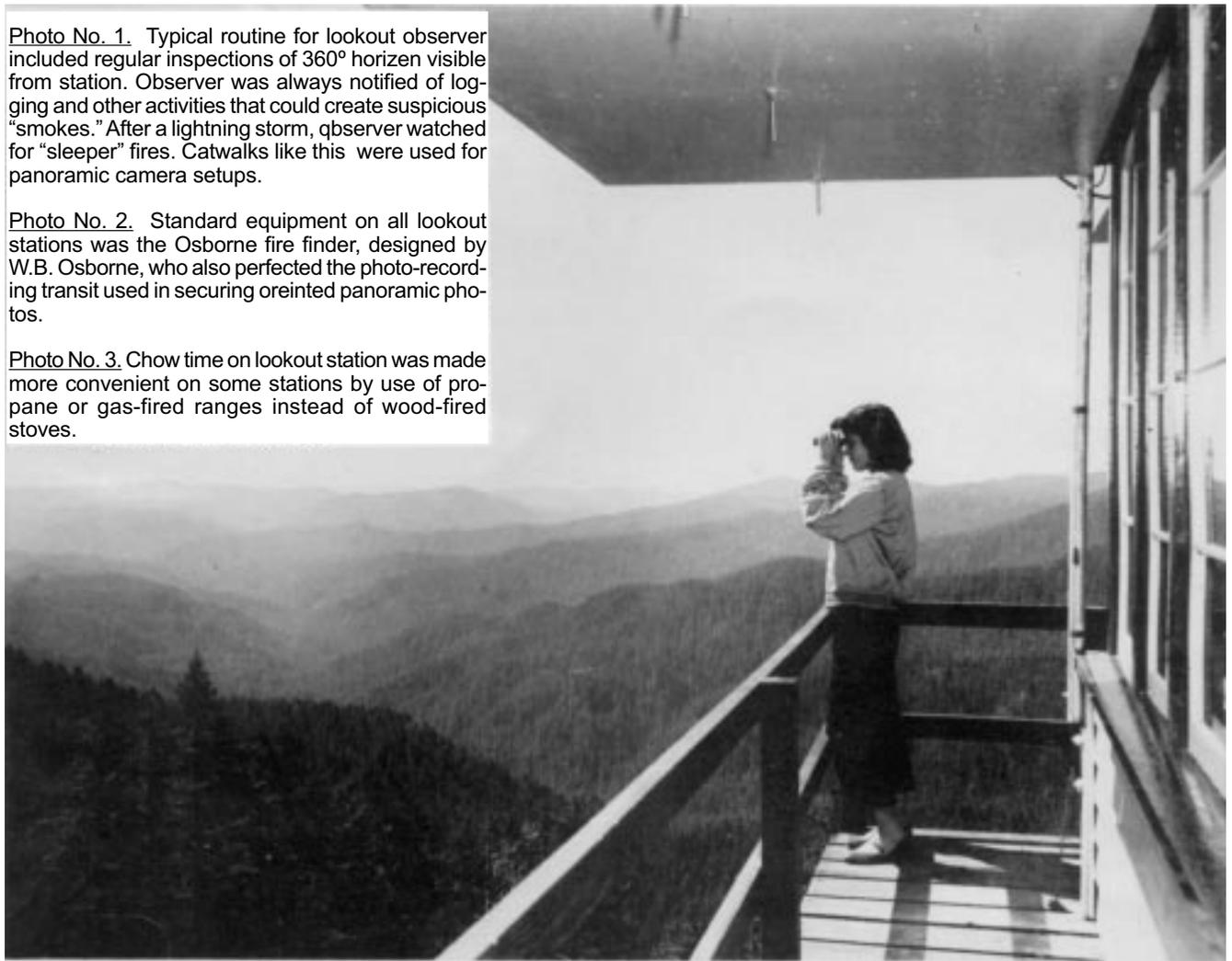
After looking at each image we feel like we have been to each site. You, the virtual tourist, can travel back to a time when the forests were much larger and grander in terms of Northwest landscape. Though pristine in the true sense of the word, you will also see man's efforts to grapple with a sustainable resource that is subject to fires. We hope you find these landscapes and the men's efforts, tools, emerging technology, and hardships as interesting and appreciated as we have.

Enjoy,  
Rob and Carrol Neuhart Hoeye

Photo No. 1. Typical routine for lookout observer included regular inspections of 360° horizon visible from station. Observer was always notified of logging and other activities that could create suspicious "smokes." After a lightning storm, observer watched for "sleeper" fires. Catwalks like this were used for panoramic camera setups.

Photo No. 2. Standard equipment on all lookout stations was the Osborne fire finder, designed by W.B. Osborne, who also perfected the photo-recording transit used in securing oriented panoramic photos.

Photo No. 3. Chow time on lookout station was made more convenient on some stations by use of propane or gas-fired ranges instead of wood-fired stoves.



(all by author)





TYPICAL forest lookout station in southwestern Oregon, accessible by road. Most stations occupied by camera crew were on wood stilts up to about 40 feet high. Taller towers, usually constructed of steel, ranged up to 110 feet high. Catwalk on lookout station shown here was used for making camera setup for panoramic photos. Sometimes two 120° sectors could be photographed from one setup. (Photo by author).