

# Photogrammetric Pioneers

## Park Aerial Surveys, Inc.

FRANK RILEY, FORMERLY VICE PRESIDENT AND GENERAL MANAGER  
PARK AERIAL SURVEYS, INC.

**P**ARK AERIAL SURVEYS, INC. of Louisville, Kentucky is the successor to Bowman-Park Aero Co., which was formed by W. Sidney Park and A. H. Bowman in 1920. Sid Park had just completed his flight training in the U.S. Army Corps. The first airplane used was a Canadian Jennie and the camera was a 4- by 5-inch hand held. Later, K-5 cameras were used, with 7- by 9-inch format and focal-plane shutters. The early projects consisted of progress photos of the construction of a utility plant, right-of-way of utility lines, subdivisions, etc.

The first topographic maps in which the company was involved were produced under a contract with the Louisville District, Corps of Engineers, for mapping approximately 1500 square miles of the White, Wabash, and Eel Rivers in Indiana, in 1928. The contract was awarded to W. N. Brown and Bowman-Park Aero Co. Brown was a Washington, D.C. engineer and surveyor and was one of the founders of the American Society of Photogrammetry. The procedures used in compiling these maps were, briefly, to photograph the area; establish horizontal and vertical control; make scaled, rectified, enlarged negatives to map publication scale on film; and plot a grid and the horizontal control on ground glass. Film negatives were cut as necessary and combined in mosaic form, so that the photo image matched the plotted control on the ground glass. Rubber cement was used. This assembly was then used to print a blue-line image on sensitized aluminum-mounted plane table sheets, for field development of the contours. The final maps were standard U.S.E.D. sheets in color.

In 1935, Frank Riley, a civil engineer, joined the Bowman-Park Aero Company. He had been an observer and computer on a Coast and Geodetic Survey sixty-five-man triangulation party establishing primary horizontal control throughout the Tennessee Valley Authority area. He was Vice President and General Manager of Park Aerial Surveys until 1976. He and Sid Park were associated in business for 47 years.

In the 1930's, as more aerial photography was used by the Geological Survey and the Department of Agriculture, there was a demand for more accurate cameras. Because none were available, Sid Park decided to design and build his own. He equipped a machine shop and hired a tool and die maker. The patterns and castings were made in a local foundry while stop watches, counters, and lenses were bought. All other parts were made and assembled

in the shop. The new cameras had a 9- by 9-inch format and rotary shutters. At that time, the Agriculture Department required principally, an 8 $\frac{1}{4}$ -inch lens and occasionally a 12-inch lens, while the Geological Survey required 5.2- and 6-inch lenses. Therefore, different focal length cones had to be made. However, all Park cones and magazines were interchangeable and light-tight, so that a crew could take an extra loaded magazine for a quick change, or load and unload in flight. Early magazines had a 250-foot roll capacity but later, 500-foot roll capacity magazines were built, so that it was seldom necessary to change while airborne.

All cameras were required to be calibrated and tested, usually by the National Bureau of Standards. At one time more than 50 percent of the cameras approved by that agency and in use in the United States were Park cameras.

As the quality of the lenses was improved, mostly by the foreign manufacturers, Park bought Wild Heerbrugg UAG lenses and installed them in Park cameras. (Park cameras were used in the early days of Tennessee Valley Authority mapping.)

Into the early 1930's, aerial film was usually processed using the wind-and-rewind system, which produced negatives with uneven density. To produce uniform negatives throughout Sid Park had built four stainless steel tanks, 3 feet in diameter and 12 inches deep. These were put into a larger tank containing temperature-controlled water. Also built was a stainless steel involute reel that held a 250-foot roll of film. After the film was loaded on the involute, it was immersed in a water bath, then the developer, short-stop, and hypo. The involute was transported by a hoist on an overhead movable crane. After the hypo bath, the film was removed and washed. This system was used with excellent results for several years.

As the company was operating as many as nine aircraft, it was necessary to increase film processing and paper printing and processing capacity, so Park bought the first commercially-used LogEtronic strip printer. The company also obtained several PAKO processors and modified them to accommodate 9 $\frac{1}{2}$ -inch film (black and white and color) and 500-foot rolls of 10-inch paper, also both color and black and white. For a number of years we were photographing more area for the U.S. Department of Agriculture than any other company.

In the 1950's, Russell Bean of the Geological Survey conceived the idea of the low-oblique con-



vergent photography. This concept produced greater vertical accuracy and required less field control. The B/H ratio was increased from 0.63 to 1.23, thereby decreasing the number of models by approximately 50 percent. This company and others built mounts to hold two standard 6 inch cameras, tilted to produce the 40° dihedral angle. This was cumbersome, requires a large hole in the aircraft, and it was very difficult to synchronize the shutters in two cameras. Sid Park then built a Twinplex camera which consisted of a single cone with two divided chambers with a lens in each and two magazines (a supply and take-up). One system tripped both shutters simultaneously. The magazines held a 500 foot roll of film. Park built four 6-inch and one 8¼-inch Twinplex cameras. For several years, it was not unusual for Park to have three or four Twinplex cameras in the air at one time, on Geological Survey contracts.

When Wild Heerbrugg built the RC-9, 3½-inch (88-mm) camera, the Geological Survey bought two of that type. They were required for use on some Geological Survey contracts. After one or more private companies bought this type camera, the Geological Survey advertised their two cameras for sale. Park Aerial Surveys was the highest bidder. Park used them extensively on Geological Survey and private contracts.

Over the years, Park used various types of aircraft. Before World War II, the company had a Canadian Jennie, Lincoln Standard, Curtiss Robin, Cessna J6-7, and, just prior to the war, six Cessna Airmasters. After the war, the company used whatever it could find such as an old Airmaster, several AT 6's, and then, when the Cessna 195 was built, it began using them and had as many as nine at one time. In order to get greater altitude and speed, Park modified four 195's by removing the Jacobs engines and replacing them with a Pratt and Whitney 450 hp engine. After the 195's, Park started using six Piper Twin Comanches. In spite of the many planes used and the thousands of hours flown, the company never had a fatality nor serious injury to its personnel, although it did lose two planes.

Park Aerial Surveys, Inc. was closed from 1942 through 1945. Sid Park had been ordered to active duty as a Colonel in the Air Corps (he served in England on the General Staff of European Theater of Operations) and Frank Riley joined the Marine Corps.

When Park closed in 1942, the military bought the airplanes and cameras. One of the pilots, who was called to Air Corps duty, flew for the military the same airplane he had flown for Park Aerial Surveys.

After the company reopened, it began using husband-and-wife photo crews. This proved to be very

satisfactory with people like the Tolers, Blantons, Sauers, and others who produced outstanding work. The pilot did not have to worry about finding his photographer in the morning.

Before the advent of the Interstate Highway System, and before a number of consulting engineering firms, realizing the great value of accurate photogrammetric maps, started buying equipment and doing their mapping in-house, Park Aerial Surveys had been in the Consulting Engineering business for several years. The company had designed and prepared plans and specifications for many miles of highways and railroads. Park was awarded, and successfully completed, a contract by the Kentucky Highway Department to establish geodetic control, horizontal and vertical, for more than 600 miles of highway. This work was all done in accordance with Coast and Geodetic Survey specifications and was published by that agency.

In 1967-1968, Park developed with and for Peabody Coal Co. a monthly inventory system with the aid of an in-house IBM 1130 computer. The company furnished the client the amount of overburden removed, the amount of coal removed by grade or seam such as #9, #11, #13, by mine and by owner, the area reclaimed, new haul roads, and other information. It required a year to develop the program. Park would start flying on the last day of each month and all work had to be delivered not later than the fifth of the next month. At times, two photo crews were used as the area involved approximately 35 pits in six states. It required seven plotting instruments, 24 hours per day. In a 13-year period, Park failed to complete the monthly work only two or three times due to adverse weather conditions. This was the most comprehensive such program at that time.

During the many years when the company was doing a lot of work for various United States Government agencies, it was the custom of the U.S. Geological Survey and Forest Service to make inspection in the contractors' plants. I would be remiss if I did not pay tribute to their representatives, who would come to our plant when called and spend many hours in our laboratory at night, on Saturdays and Sundays, inspecting the work to ensure timely completion. Park was very fortunate in having an excellent group of employees. There was a very small turnover and many of these employees had more than 25 years of service with Park Aerial Surveys.

Park's area of operation was throughout the lower 48 states and Alaska. The company did only a small amount of foreign work, but did have contracts in the Bahamas and Vietnam.

Park Aerial Surveys, Inc. was sold to J. Edwin Rankin in 1973.