

EVOLUTION OF THE No. 10 CIRKUT CAMERA

By Bill McBride

The most widely used large-format panoramic camera in America has been the No. 10 Cirkut Camera for 10" wide film. Invented in Wyoming and manufactured in Rochester, N.Y., from 1904 to 1940, this "field-camera-on-a-turntable" remains the choice of many leading panoramic professionals. Today's working Cirkuts often employ electric motors and other modern adaptations.

Just how many No. 10 Cirkuts were manufactured is unknown due to incomplete company records. The author estimates that 390 fan-type No. 10 Cirkuts and 1,093 governor-type No. 10 Cirkuts were produced for a total of 1,483. The last year that the No. 10 Cirkut was manufactured by the Folmer Graflex Company, in quantity, was 1931 when 60 were made. From then on, anywhere from 0 to 5 cameras were built per year. Folmer Graflex manufactured the last No. 10 Cirkut Camera in 1940. In 1945 Folmer Graflex became Graflex, Inc., which handled the sales of the remaining few No. 10 Cirkuts in the company's inventory, until 1949.

The camera serial number location for Models I and II is visible when the Cirkut back is removed. The serial number is stamped on the camera body and the Cirkut back on the interior black-painted wood on the bottom left. The serial number range for Model I was approximately 110 through 175 and Model II 176 through 225. On all models there will be another set of numbers stamped on the interior bottom center on the body and back, that is less than 100, which may be the number of the person who handcrafted that particular camera. On Models III through VI, the serial number is located inside on the body frame top board. To see the serial number, open the camera bed all the way, then turn the camera body upside down. Using a good light source, the serial number will be visible on the body wood at the right-side front edge.

The following is an account of the author's research into the early manufacturing history of the No. 10 Cirkut, including a detailing of at least six different models. To help clarify the chronological order, the author has assigned his own model numbers (I-VI), as listed in the following table. Basically, there were two types of No. 10 Cirkut Cameras produced: fan speed-control type and the governor speed-control type. A future article will cover the Nos. 6 and 8 Cirkut Outfits.

The Cirkut Camera probably obtained its name from photographing military units. In the early days, a photographer made a circuit of the area to take photographs of tents and troop maneuvers. The



Figure 1. The first No. 10 Cirkut manufactured by Rochester Panorama. Note scissors mechanism to raise or lower the lensboard, which identifies it as an earlier fan type (Model I or II).

circuit here refers to traveling around a periphery of tents. Since the Cirkut panoramic camera did a better job of covering the periphery than the conventional view camera, it was given the name "Cirkut" by its inventors Johnston, Reavill and Brehm. The camera could not be named "Circuit," which was already a registered name, so they used "Cirkut" for their camera.

The early No. 10 Cirkut Cameras used air-resistance fans to control camera speed of rotation, while the later Cirkuts employed a variable-speed internal governor for speed control. The Cirkut Camera is built with an internal clockwork motor that pulls the film past the vertical exposure slot counterclockwise at a pre-selected speed. At the same time, the motor rotates the camera in the opposite direction (clockwise) on the geared tripod at the same relative speed that the roll film is moving past the exposure slot. Thus, that portion of the film being exposed is, in effect, stationary. The standard camera is capable of taking pictures of different angles of view, including a 360° single exposure, 12.5 feet long, using a 24" focal length lens. The camera film drum can hold up to 20 feet of roll film. The overall length of the negative is determined by the focal length of the lens and the desired horizontal angle of view. A distance scale on the tripod head gives the inches of film required for the angle of view selected. By using the longest focal length of the lens, the longest negative is obtained and, at the same time, the largest image of the subject. The camera was utilized to photograph hotels to hang in other hotels, interesting features of railroad lines, panoramic views of real estate development projects, views of manufacturing plants, and, most of all, groups of people.

The Cirkut-type panoramic camera design was first patented November 29, 1904, (No. 776,403) by William J. Johnston of Rock Springs, Wyoming. On January 17, 1905, Johnston also obtained a "Camera Revolving Apparatus" (patent No. 780,351) to improve the first design by simplifying the gear train to make the camera work more smoothly.

Table of No. 10 CIRKUT CAMERA CHRONOLOGICAL ORDER

Model No.	Manufacturer	Years of Production	Speed Control	Remarks
I	Rochester Panoramic Camera Co.	1904-1905	Fan	The first No. 10 Cirkut made, and the one that had the most features for the photographer.
II	Century Camera Company	1905-1907	Fan	Similar to Model I minus several features. Two film pressure plates added.
III	Century Camera Division of Eastman Kodak Company	1907-	Fan	New camera lens-frame, and new tripod head design.
IV	"	-	Fan	Same as Model III but with improved motor start lever mechanism.
V	"	-1915	Governor	The first governor-type No. 10 Cirkut. A completely new camera.
V-A	Folmer & Schwing Division of Eastman Kodak Company	1915-1917	Governor	Same as Model V except for the nameplate.
V-B	Folmer & Schwing Department of Eastman Kodak Company	1917-1926	Governor	Same as Model V-A except for the nameplate.
V-C	Folmer Graflex Corporation	1926-1929	Governor	Same as Model V except for the nameplate.
VI	"	1929-1940	Governor	Same as Model V except for the nameplate, and the new lens of 10", 15.5" and 20" focal lengths.

David A. Reavill of Rock Springs, Wyoming, and Rochester, New York, was granted two patents on January 17, 1905, (Nos. 780,381 and 780,382) for a panoramic design which he assigned to the Rochester Panoramic Camera Company, of Rochester, New York, a Corporation of Wyoming. During this time, William J. Johnston also assigned his camera patent designs to the Rochester Panoramic Camera Company. The Rochester Panoramic Camera Company was incorporated on May 16, 1904, in Wyoming with the company location on South Front Street in Rock Springs. For the company's first year, the following persons were the corporate officers: A. Kendall, President; Burt Smith, Secretary; and Lloyd P. Thomas, Trustee. These Rock Springs investors appear to be only financial backers for Johnston and Reavill, as their names were not shown on the Panoramic Camera patents. The Cirkut type panoramic designs as patented by Johnston and Reavill were not commercially produced.

The first commercially manufactured No. 10 Cirkut panoramic camera (Model I in Table) made by the Rochester Panoramic Camera Company was (Figure 1) designed by Frederick Brehm of Rochester, New York, and patented on January 17, 1905 (No. 780,406). The camera was constructed of prime mahogany wood with the wood exterior covered with high quality leather, and the interior wood varnished beautifully natural. The exposed metal hardware parts were brightly nickel plated, and the camera had high quality red leather bellows 27" long.

The lensboard for this first Cirkut No. 10 was 3¾" square. The lens could be tilted and/or raised up or down, with an adjustable screw on top of the camera lens frame. This camera had three rollers on the bottom of the camera (Figure 2) for camera rotation on the brass ring-gear on the wood tripod



Figure 2. Bottom view, showing three rollers, tripod gear and tripod gear. Hinge on left for tilting front bed.



Figure 3. Side door opens to assist photographer when inserting film. Note adjustable slot knob on top and 120 film spool in place.

top. The Rochester camera (Model I) was the only No. 10 Cirkut built that had an adjustable exposure slot of 1/8", 1/4" or 1/2" (Figure 3). This model used air-resistance fans of different sizes to control the speed of camera rotation on the tripod. The five fans that came with the camera gave exposure times (equivalent shutter speeds) of 1/3, 1/6, 1/10, 1/25 and 1/30 of a second using the 1/4" exposure slot. If the 1/8" exposure slot was used, the exposure time was half of the time of the particular fan selected. If the 1/2" exposure slot was used, the exposure time was double the time of the particular fan selected.

For focusing the No. 10 Cirkut

Camera, the film box is removed, and the ground glass focusing back is pulled out and locked in place (Figure 4). This is the way all No. 10 Cirkuts are focused.



Figure 4. Ground glass in position for focusing, shown folded back and hinged over prior to film box placed on camera body.

All No. 10 Cirkuts had a film movement scale in inches and degrees mounted around the tripod head which gave the distance the film moved in inches on an exposure. On this model, and other fan models, the exposure slot opens when the camera film box is locked on the camera. The camera clockwork mechanism on the fan-type cameras is started and stopped with a hand-operated air pressure bulb after the motor spring is wound up. The film spool holder on this camera is adjustable from 2¼" to 10" roll film. Because the later models had larger upper film spool sprockets, the Model I camera is the only No. 10 Cirkut that can use today's 120 roll film without the use of an adapter. The lens originally furnished with this Cirkut was an 11" or 22" focal length doublet-convertible lens manufactured by the Gundlach Optical Company of Rochester, N.Y. Later, the Turner-Reich 10 7/8", 18", and 24" triple-convertible lens manufactured by the Gundlach-Manhattan Optical Company of Rochester, N.Y., was made available for the No. 10 Cirkut. This lens became the standard for the Model I and Model II cameras. This lens was patented by Henry H. Turner and John C. Reich on May 14, 1885 (No. 539,370). For each of the three focal lengths, there were three pinion gears provided, where one gear was for the subject 100 feet to infinity in distance away, another gear for 50 feet away, and a third gear for 25 feet. Some No. 10 Cirkut Cameras were modified so that the folding front on the camera could be dropped to keep the leading edge of the bed out of the picture when using a short focal length lens (Figure 5).



Figure 5. Model I with 6" auxiliary bed in place.

David A. Reavill, Vice President of the Rochester Panoramic Company, filed on August 28, 1905, an application for the name "Cirkut" to be used as the trademark for the company's panoramic cameras. On April 24, 1906, the Cirkut name was registered at the United States Patent Office (No. 51,824). This No. 10 Cirkut (Model I) was manufactured from 1904 to 1905. It came with two carrying cases, one for the camera and one for the tripod and gears.

The Century Camera Company

On July 15, 1905, the Rochester Camera Company entered into an agreement with the Century Camera Company, also of Rochester, for the sale to the latter of "Good will, Trademarks, and Trade-names and Personal Property." The Century Camera Company, whose stock had been purchased by Eastman Kodak in 1903, continued to manufacture the No. 10 Cirkut (Model II), at first on a royalty basis, and later by the right of purchase of the patents. This camera was produced the same as the Rochester Panoramic Company Cirkut (Model I) except that the exposing slot was fixed at 1/4" with no adjustable slot provision. At least one Model II camera has been observed to have a nickel-plated cover plate over the hole for the exposure slot adjustment knob, so Century Camera Company may have planned to have an adjustable exposure slot, but the decision was made to make the slot fixed at 1/4". On the Century No. 10 Cirkut (Model II), a 4-3/16" film pressure plate for the film spool and a full length film pressure plate over the exposure slot were added. The film winding drum was lengthened to 10", as compared with 9-3/8" on the Model I, to provide a more solid base for the film to wind onto. The Model II, and all later fan-type No. 10 Cirkut Cameras, could take 6" to 10" roll film. The Century Camera Company manufactured the No. 10 Cirkut (Model II) from 1905 to 1907.

In 1905 the Eastman Kodak Company purchased the Folmer & Schwing Manufacturing Company and shipped its machinery, fixtures, merchandise, etc. to Rochester, N.Y., where it was installed in the Century Camera Company building. The Century Camera Company and the Folmer & Schwing Manufacturing Company were operated as separate companies in the same building producing their own camera products. On January 2, 1906, Folmer & Schwing Manufacturing Company became the Folmer & Schwing Company. The Century Camera Company maintained the business records for both companies but kept them separate.

On May 22, 1907, the Century Camera Company was merged with the Eastman Kodak Company, then dissolved on July 1, 1907, becoming the Century Camera Division of the Eastman Kodak Company. Also on July 1, 1907, the Folmer & Schwing Company was dissolved and became the Folmer & Schwing Division of the Eastman Kodak Company. These two Eastman Kodak Divisions were managed together by William F. Folmer.

The Century Camera Division of Eastman Kodak Company made design changes to improve the No. 10 Cirkut and subsequently produced three different No. 10 Cirkut Cameras. There were two additional patents by Harvey W. Locke of Rochester, N.Y., used for the Century Camera Division Cirkut No. 10 Cameras besides the patents of November 29, 1904, and January 17, 1905, previously mentioned. One camera patent was No. 708,721 of September 9, 1902, and the other was No. 720,040 of February 10, 1903, which was assigned to the Century Camera Company. The Locke patents were for camera body design rather than the Cirkut mechanism as covered by the other patents.

The first No. 10 Cirkut produced by the Century Camera Division was

the Model III. The camera's wood lens frame was revised (Figure 6), as the lensboard tilt movement on the Models I and II was replaced with a right or left front adjustment. The up and down vertical movements of the lens were retained, and the lensboard size was changed to 3½" square. The brass base plate for the mechanical motor was made rectangular (4¼" x 7¼"), as compared to the oval shaped plate designed by the Rochester Panoramic Company.



Figure 6. Newly designed lens frame by Locke used on Model III and IV.

The Model III No.10 Cirkut had the usual bright red bellows, natural varnished red mahogany interior wood, nickel-plated metal hardware and high-quality leather covering on the camera exterior. The tripod head arrangement was redesigned so that the rotation movement of the camera on the tripod was one assembly. The rollers on the bottom of the previous Rochester (Model I) and Century (Model II) cameras were eliminated. The new tripod head was made on a cast-aluminum frame with an aluminum disk plate on top with six built-in rollers. The camera was mounted on top of this aluminum disk plate when taking a picture. This tripod head design became the standard one for all future No. 10 Cirkut Cameras.

The Model III and Model IV No. 10 Cirkuts came with three speed control fans (1/3, 1/6 and 1/10 second), instead of the five fans included on the previous models. The focal lengths of the triple-convertible Turner-Reich lens were changed to 10½" 18", and 24", which became the standard lens for all subsequent No. 10 Cirkuts produced until 1932.

The Century Camera Division manufactured another No. 10 Cirkut Camera (Model IV), like the one just described, except that it had a redesigned camera start-stop mechanism. This mechanism was simplified but still used an air bulb to operate the camera with the desired speed control fan.

The Century Camera Division manufactured the first governor speed-control type No. 10 Cirkut Camera (Model V), which was a completely new camera (Figure 7). This model is believed to have been developed by William F. Folmer about 1909, since the No. 5 Cirkut Camera with a similar governor speed-control was patented by him in 1918. The Model V No. 10 Cirkut was made all black with the wood painted black, black leather, black bellows, and black finished metal hardware. The earlier camera

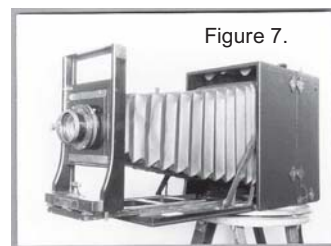


Figure 7.

speed control fans were eliminated, and a variable speed internal governor was added to the camera clockwork. The new camera speeds made available on the Model V were: 1/12, 1/10, 1/9, 1/8, 1/4 and 1/2 of a second. A lever on the side of the camera film box (Figure 8) is rotated to start and stop, and, at the same time, the lever opened and closed the exposure slot. The exposing slot was fixed at ¼", and the film spool bracket adjustment was for



Figure 8. Start-stop and speed selector levers on governor type cameras.

6"-, 8"- and 10"-wide roll film. The camera lensboard, now 4" square, could be raised up or down and/or tilted up or down. To accommodate the governor assembly, the brass motor plate was enlarged to 4.25" by 9".

The tripod head design and the triple-convertible lens remained the same as the previously described No. 10 Cirkut. The tripod for the Model V came with three-sectioned Eastman Professional Tripod legs. Thus, the tripod head for the Model V could be used with the 12" Century tripod legs to obtain a higher camera elevation, if needed by the photographer. This model could also be used on the No. 8 Cirkut Outfit Camera tripod, which had the four-sectioned Crown No. 4 tripod legs and is a little bit taller than the No. 10 Cirkut tripod.

The Century Camera Division of the Eastman Kodak Company manufactured the No. 10 Cirkut Cameras until 1915, when the governor type No. 10 Cirkut was priced at \$290.

From 1915 to 1917, the Folmer & Schwing Division of Eastman Kodak built the same governor-type No. 10 Cirkut Camera (Model V-A), except for a new name plate and a slightly higher price of \$300. In 1917 the Folmer & Schwing Division became the Folmer & Schwing Department of Eastman Kodak, and this change was reflected in the name plate on the No. 10 Cirkut (Model VVB). This model was produced without any further changes until 1926. The 1920 Graflex catalog listed the No. 10 Cirkut Camera (Model V-B) for \$385.85 and a 6 ft. roll of 10" film for \$2.90.

The Century Camera Division, Folmer & Schwing Division and Folmer & Schwing Department all published the booklet, "The Cirkut Method", which described the different model Cirkut cameras available. Typical Cirkut photographs were shown in the booklet. Also available from the Folmer & Schwing Department was a booklet titled "Profitable Pictures with a Cirkut."

The Folmer Graflex Corporation

In 1926 Eastman Kodak sold Century Camera, Folmer & Schwing, and the Rochester Optical Divisions, and together they became the Folmer Graflex Corporation of Rochester, N.Y. Folmer Graflex manufactured the same black governor type No. 10 Cirkut Camera (Model V-C) as previously produced, changing only the name plate. In 1927 the Graflex catalog listed the No. 10 Cirkut camera for \$405.

A Folmer Graflex No. 10 Cirkut (Figure 9) has been observed to have the Turner-Reich Anastigmat f6.8 Series II triple-convertible lens made by the Seebold Invisible Camera Corporation of Rochester, N.Y., instead of being made by the usual Gundlach-Manhattan Optical Company, also of Rochester. Imagine the Seebold Invisible Camera Company manufacturing a lens for the not-so-invisible No. 10 Cirkut Camera!



Figure 9.

In 1926 the Gundlach-Manhattan Optical Company changed its name to Gundlach Manufacturing Company. In 1928 it was taken over by John E. Seebold, who changed the name to Seebold Invisible Camera Company. Mr. Seebold left the company the following year. By 1931

the company name was changed back to Gundlach Manufacturing Company.

In mid-1929 the Folmer Graflex No.10 Cirkut Camera (Model VI) was provided with a new Wollensak Velostigmat Series 1A f6.8 lens with 10", 15½", and 20" focal lengths. This lens became the standard for all subsequent No. 10 Cirkuts. The configuration of the Model VI was the same as the Model V-C, except for the new lens. The 1936 Folmer Graflex No. 10 Cirkut Camera was listed for \$429.50 and came with the usual two carrying cases, one for the camera and the other for the tripod and gears.

The last year that the No. 10 Cirkut was manufactured in any quantity was 1931 when 60 cameras were made. For the rest of the 1930s, Folmer Graflex built 0 to 5 cameras per year. Folmer Graflex manufactured the last No. 10 Cirkut in 1940. In 1945 Folmer Graflex became Graflex, Inc., which handled the sales of the remaining No. 10 Cirkuts in the company's inventory until 1949.

The text is based on the best information and material currently available. The writer would appreciate any additional information available and/or comments on the article. Bill McBride, (805) 648-7268 or ramabill@cox.net.



Panorama by Frederick W. Brehm titled "Kodak Group Portrait", courtesy of George Eastman House, International Museum of Photography and Film. This 24.3 x 179.0 cm gelatin silver print shows George Eastman and William Folmer (twice). As was fairly common, on a dull day and with slow film, a person could be photographed at one end of a picture then run around to the other end, and be photographed again. Pulling this stunt with the boss in the group is an interesting statement about Folmer's status and/or his temperament.

Although little information has survived about the picture, it is interesting to note that four of the five cameras are accordion-hood Auto Graflexes. Based on advertisements and Graflex catalogs, this Auto model was produced between 1905 and 1909, suggesting a date for the picture. The picture undoubtedly was made with a No. 10 Cirkut camera.

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