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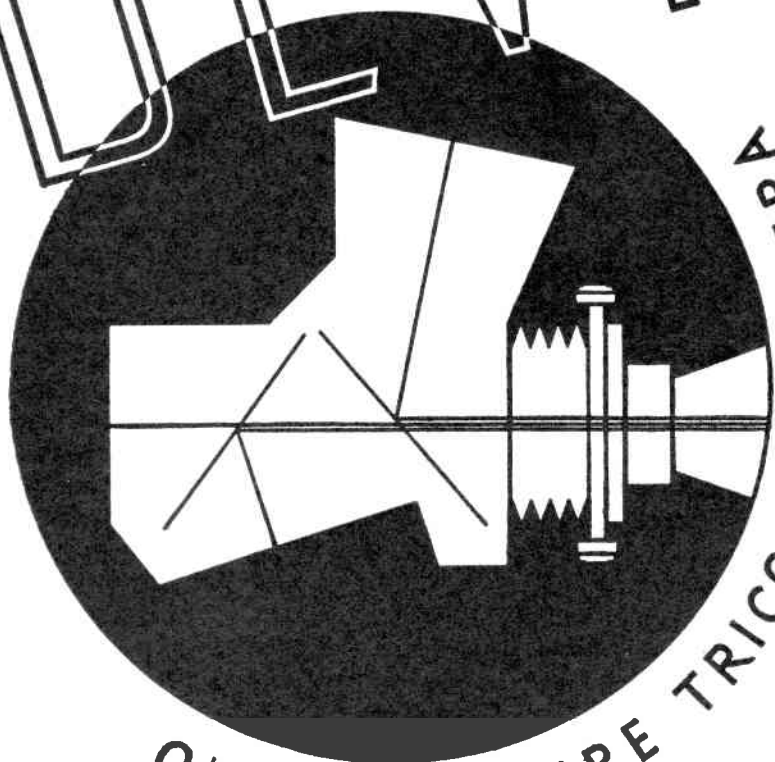
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# DEVIN



ONE EXPOSURE TRICOLOR CAMERA

6.5 x 9 cm. PROFESSIONAL HAND MODEL

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

## A NOTE ABOUT THIS BOOKLET

Since the construction and operation of the one-exposure tricolor camera is relatively new to most readers, we have, in this booklet, gone beyond a mere listing of the features of the Devin Camera, and have included material not ordinarily found in descriptive booklets. Our purpose in doing so is to provide the reader with an adequate understanding of the nature of the one-exposure tricolor camera and its use in color photography.

It is also true that just because the subject is so new, a discussion of any phase of color photography today must be, to a large extent, comparative. To the average photographer for instance a mere listing of the technical features of a tricolor camera is meaningless. Justice cannot be done to a description of the two-mirror construction without comparison with the alternative single-mirror construction. And the superior quality of color separation negatives made by exposure on the subject itself cannot be explained without comparison with the type of separation negatives made by rephotographing a transparency.\*

It is therefore inevitable that in a description of the two-mirror one-exposure tricolor camera, reference must often be made to alternative systems of color photography. We wish to make it clear, however, that any such references are purely general and should not be construed as a disparagement of any process as such, or of the product of any particular manufacturer. Different systems satisfy different needs, and each method has earned whatever popularity it has achieved by the satisfaction it has given to its users. This booklet, on the other hand, like the Devin Camera which it describes, is intended for the serious worker who is interested in obtaining in his color prints the finest technical quality it is possible to achieve with existing methods. Its frank aim is to draw your attention to the superiority of the two-mirror one-exposure tricolor camera over ANY alternative method of color photography, and particularly to describe the advanced features of the new Devin 6.5 x 9 cm. one-exposure tricolor camera.

We make no claim for our camera, however, which cannot be verified by reference to the methods and equipment NOW used by EVERY leading professional color photographer in America. There is no better guide to color photography than the work of such men.

\* In order to give a compact and unified description of the new Devin camera, we have reserved detailed comparisons and other material of a general nature for a special section at the end of this booklet. Numbers throughout text refer to notes in that section.

# THE DEVIN COLORGRAPH COMPANY

The growth and development of the Devin Colorgraph Company has been one of the major factors in the progress of color photography in America. This company was the first, and even now is the only company in the U. S. to manufacture and market a practical and successful professional one-exposure tricolor camera. It was the first company in the world to manufacture a genuinely non-frill carbon tissue for tricolor carbro printing; and it has been largely due to its efforts that carbro printing has been changed from a difficult art practised only by experts, to a simple technique easily mastered by any serious worker.

The Devin products now include:

5" x 7" professional one-exposure tricolor camera (two-mirror)

5" x 7" Bipac tricolor camera (single mirror)

6.5 x 9 cm. (2½" x 3½") professional one-exposure tricolor hand camera (two-mirror)

Tricolor Carbon Tissue and Soluble Support

Accessories for color photography

Our outstanding position in the field of color photography is best indicated by a partial list of the users of the Devin Camera.

Nickolas Muray

Robert E. Coates

R. R. Donnelley & Sons Co.

Grancel Fitz

General Motors Corporation

Arthur Gerlach

Jam Handy Pictures

Fidelis Harrer

Paul Hesse

George Hurrell

Victor Keppler

Martin Munkacsy

Anton Bruehl

Manz Corporation

Montgomery Ward

Omnicolor Pictures

Paul Outerbridge, Jr.

Pagano, Inc.

Schmidt Lithograph Corp.

Valentino Sarra

Underwood & Underwood

Clarence Welsh

Zeese-Wilkinson Lithograph Corp.

H. I. Williams

Devin carbon tissue is used for the production of color prints by practically all leading professional color photographers in America.

We have enjoyed the confidence of these individuals and firms solely because we have continued to offer to them products that measured up to their high standards—products that helped them to make better pictures.

The views of our offices, shops, and laboratories on the following page can give only an inadequate idea of the size and extent of our manufacturing facilities. We have without question the largest, best-equipped, and most advanced plant in this country devoted exclusively to the production of materials and equipment for color photography.

DEVIN COLORGRAPH COMPANY

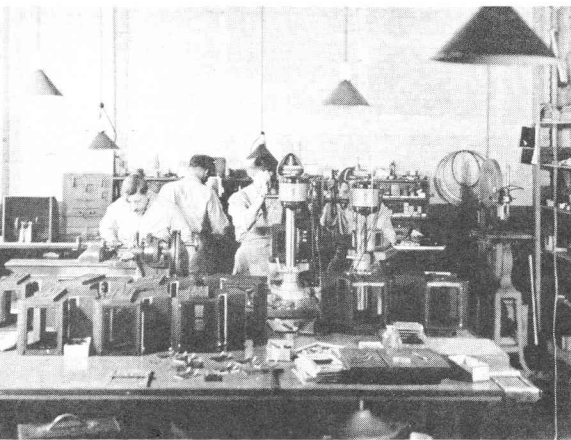
305 East 43rd Street

New York City

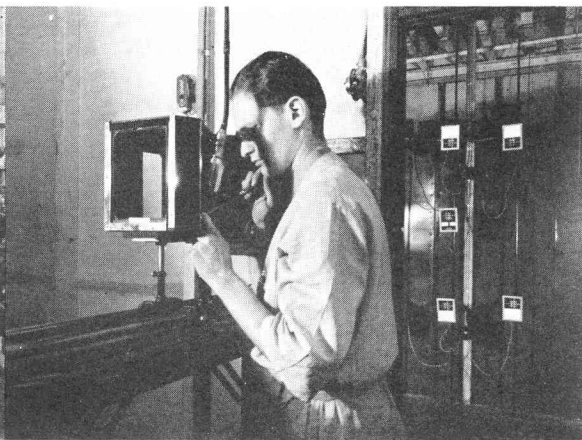


One of the modern Offices

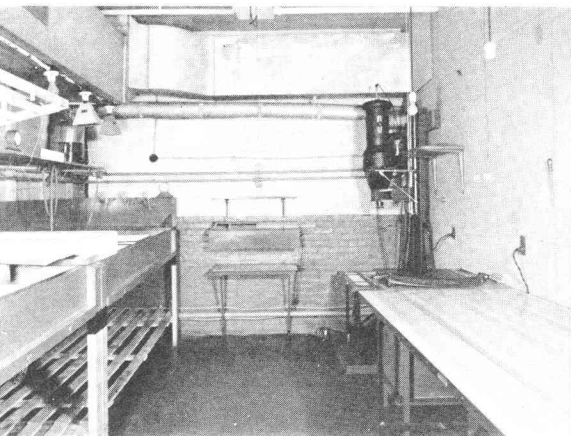
# THE DEVIN COLORGRAPH COMPANY



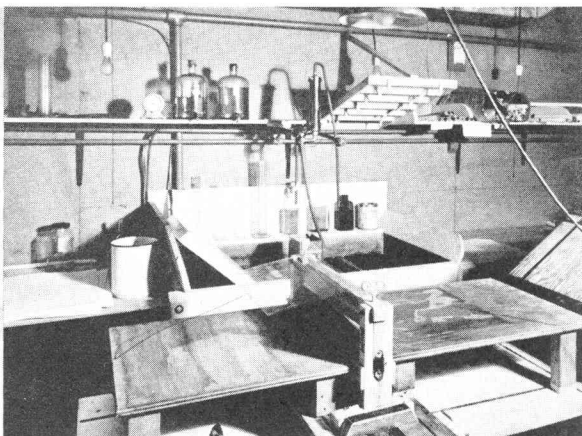
A section of the Machine Shop for assembling cameras



One of the Registration Laboratories



The Bromide Print Laboratory



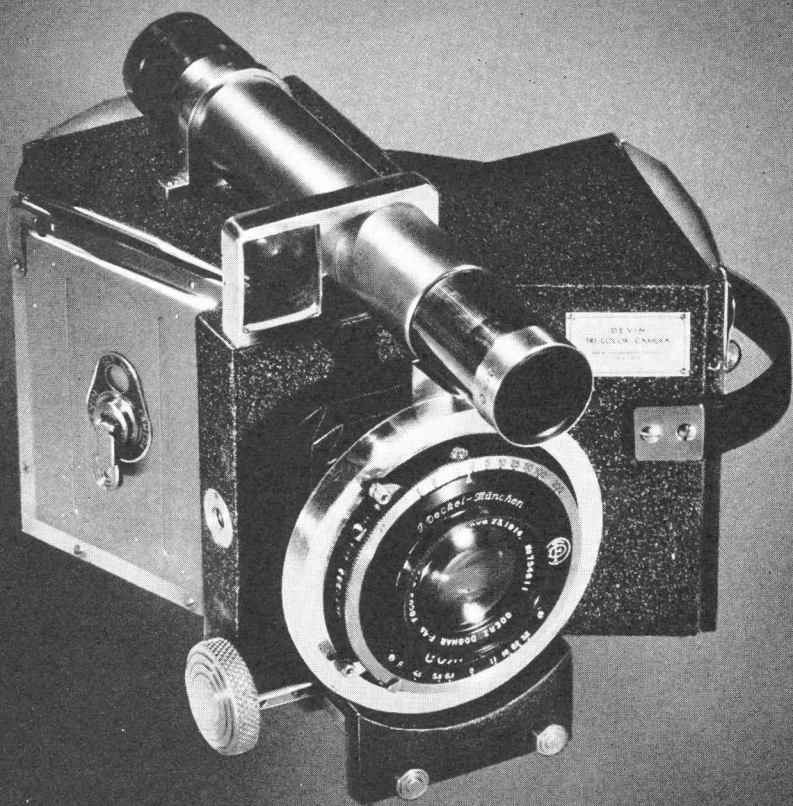
Corner of the Model Carbo Print Laboratory

# THE DEVIN TRICOLOR CAMERA

The Devin 6.5 x 9 cm. tricolor camera is new in size and new in many of its features. But behind this new camera are the years of experience and research of the Devin Colorgraph Company, manufacturers of the Devin professional two-mirror one-exposure tricolor camera. This larger Devin camera has played a major part in the tremendous advances made by professional color photography during the past few years. In the hands of leading color photographers, it has helped to make the most superb examples of color photography yet produced. Its pre-eminent position in this field is unquestioned. There has never been previously available in America a color camera of this professional type adapted to the needs of the advanced amateur photographer, and to the requirements of the professional photographer who desires a smaller camera similar to the larger studio models. The two-mirror cameras offered have been large and expensive instruments; while the hand cameras offered have been uniformly of the less expensive, but less satisfactory, single mirror (bipack) type.

The Devin Colorgraph Company now offers, for the first time in this country, a professional type two-mirror camera expressly designed for those serious amateur and professional photographers who desire to be free from the restrictions imposed by the transparency processes or by compromise forms of the one-exposure camera. It will bring to the kind of color pictures you like, the same technical perfection achieved by the top advertising and illustrative photographers. It is, in fact a duplicate of the large professional two-mirror camera made by this company and used by leading color photographers throughout the country.

In addition to the features of the larger camera, the 6.5 x 9 cm. size has new features which give it much of the versatility of the finest smaller monochrome cameras—compact, easy-to-hold shape; automatic focussing; eye-level direct view-finder; fast anastigmat lens in compur shutter. It is easily the most advanced tricolor camera ever built.



# THE CAMERA FOR THE COLOR PRINT

Nothing in photography gives greater satisfaction than the finished print on paper. If your pictures are made only as a personal record of people and places, your prize possession is an album of prints. If you like to hang your finest pictures on the wall, this is possible only with the paper print. If you get a thrill from the tags which certify that your pictures have been hung at an important salon, it is the paper print you present. Outside of certain highly specialized fields of work, few photographers would consider monochrome pictures which had to be viewed by holding up to the light. And practically none care to show their work by the more clumsy method of projection.

Then why be satisfied with anything less than the print on paper in **color** photography? The new Devin Tricolor camera offers you the possibility of making color prints of the finest professional quality—prints that are technically perfect and true to the colors of the original subject. It frees you from dependence upon any sort of transparency process at all. It is an instrument designed expressly for the color print.

While the production of a color print presents some new technical problems, there is nothing that cannot be mastered by serious workers. Two basic steps are necessary:

**One** • Making a set of separation negatives by means of three exposures on the same subject, made either consecutively or simultaneously, through red, green, and blue-violet filters. These negatives are a record of the relative amounts of the three primary colors reflected from all parts of the subject photographed.

**Two** • A color print is secured from these negatives by producing transparent blue-green, magenta, and yellow **positives** from the red filter, green filter, and blue-violet filter **negatives**, respectively; then superimposing these color images onto a single sheet of white paper.

As in the case of monochrome photography, step No. 2, the making of the print, is a separate procedure having no direct relationship to the **method** by which the separation negatives were secured. The popular printing systems used today are Carbro, Wash-off relief, and Chromatone. Many mechanical aids, such as the Densitometer, have been suggested for simplifying the production of prints. While such instruments are valuable for general test work, they are rarely used during the actual making of a print in practical professional laboratories. But if they are utilized they are applicable to printing from any set of separation negatives, regardless of how the negatives were obtained. The quality of the final print is another matter. You know how the quality of a black and white print depends upon the negatives. This is even more true in color photography. The key to fine color photographs are fine sets of separation negatives.

The one-exposure tricolor camera **with two mirrors** is unquestionably the finest instrument for the production of color separation negatives. It makes the three negatives with a single exposure, so that life and action can be recorded in your color photographs. It makes the negatives **directly by exposure on the subject itself**—eliminating dependence upon the extra step of a color transparency which can never be a truly accurate representation of the original subject. It makes negatives that are **critically sharp** and free from the diffusion associated with one-exposure cameras of the single-mirror type.

The New Devin camera is the first two-mirror one-exposure tricolor camera offered in this small size. It is **the** camera for the color print on paper.



# SIMPLICITY

The demand in color photography today is for greater simplicity.

This demand has been well met in the production of color transparencies, where even the processing is often left to the manufacturer. If you are satisfied with the color transparency as the final result, it offers the simplest and easiest road to color.

But for the photographer who wants a color **print**, no other process affords the simplicity and operating ease of the Devin two mirror tricolor camera.

As we pointed out above, every color printing process requires a set of three color separation negatives. Other than the use of three plates, the production of color separation negatives with the Devin one-exposure tricolor camera is just as simple as making a monochrome negative in an ordinary camera. Plateholders are loaded; exposure is made directly on the subject itself; the negatives are processed in standard developing and fixing solutions; and after processing is completed, the negatives are ready for printing **immediately**. All the important problems of color separation negatives have been taken care of by that single exposure in the camera—sharp definition of detail, balanced exposures on the three plates, exact registration of the three images, and accurate color separation.

Compare this simplicity of the Devin Tricolor Camera with alternative methods of securing color separation negatives.

Negatives of excellent quality may, for instance, be secured by changing plates and filters in an ordinary camera. The operations are not only complicated, but require an amount of time which precludes photography of live subjects altogether.

For live subjects a great deal of hope has been placed in the possibility of securing separation negatives from transparencies made in an ordinary camera. But the transparency processes are simple only so long as the transparency is the end result. Making separation negatives from the transparency is an involved technical process. The transparency must be rephotographed three times through three separate filters, operations which, to be done well, require elaborate equipment and technique. You then have the problem of balancing the relative exposures; the problem of development to uniform contrast; and the problem of securing accurately registered images. The masking methods recommended for printing from such negatives involve still more complicated procedures. As a matter of fact, the process has become so involved that special instruments for production of separation negatives from transparencies are now on the market which cost more than a fine one-exposure camera!

Even compromise forms of the one-exposure camera add complications to color printing. Bipacks and tripacks require the use of film, which varies in size during processing, making it more difficult to register the positive color images. The diffusion inherent in these cameras also makes printing a great deal more difficult.

As compared with any other instrument or method, the Devin one-exposure tricolor camera brings a simplicity to the production of separation negatives that is your best guarantee of finer color photographs.

# COLOR THAT IS TECHNICALLY PERFECT

Among the dominant qualities of modern photography are its faithful rendition of texture and detail, and its reproduction of the most subtle variations of light and shade. Now added to these qualities is **color**.

Not only is color a new element in photography, but it can, properly used, enhance those very qualities associated with the finest monochrome photography. To give but one example: our entire personal perception of surface texture and detail is closely associated with color, and many otherwise great photographs fail to really impress us because they lack that element of color.

The indispensable prerequisite to the development of fine color photography is that it shall be possible to achieve, in color, the same technical perfection we take for granted in monochrome photography. Color need not, and should not, entail the sacrifice of a single quality we have come to regard as essential in monochrome. But the achievement of this technical perfection demands an approach entirely different from that for monochrome photography, where wide variations in procedure often lead to the same result. There are fundamental differences in the results achieved by different methods of color photography, and the quality of **your** work will be greatly influenced by your choice of methods and equipment.

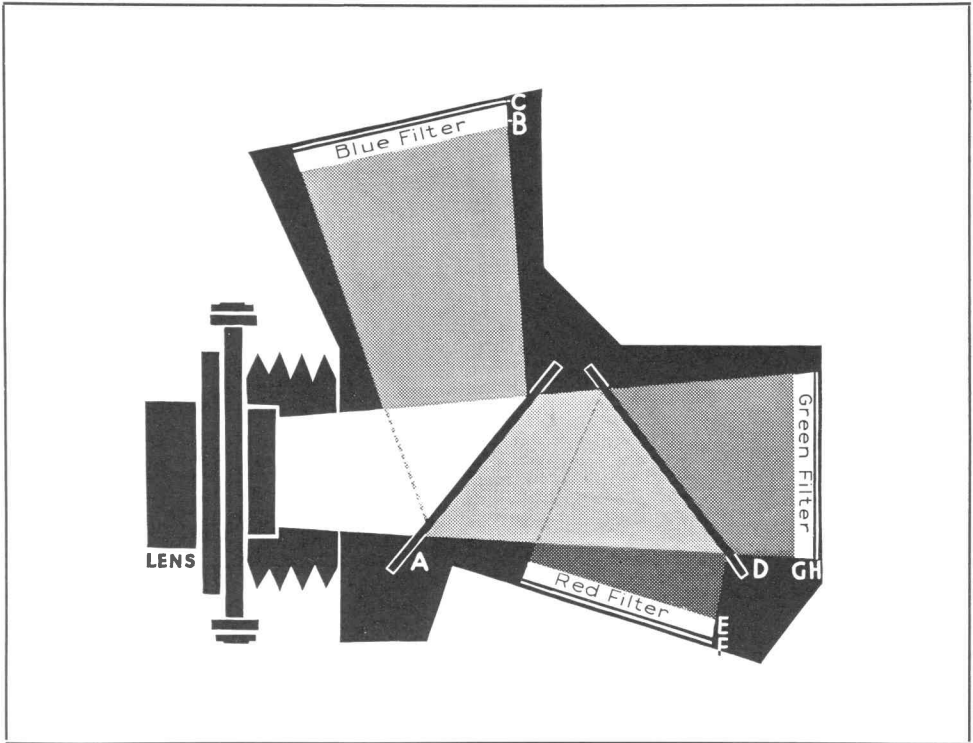
The finest color printing processes have already reached a stage of development which enables them to reproduce and retain the essential qualities of the separation negatives. The most important problem faced by the color photographer today is the method of producing these separation negatives. They should be in every way as technically perfect as the best negatives for monochrome photography.<sup>1</sup>

Negatives meeting these requirements have for years been made of still life subjects by advanced workers with an ordinary camera and a set of tricolor filters.

With the New Devin one-exposure tricolor camera the same perfect separation negatives can be made of subjects with **life and action**. In fact, the negatives made with the Devin camera differ in no essential detail from those produced by making successive exposures through the tricolor filters in an ordinary camera. This is an important and significant achievement. It gives color to photography, and yet retains every bit of the technical excellence of modern monochrome photography.

Succeeding pages will tell the story of how this is accomplished.

# HOW THE CAMERA GETS THE PICTURE



1. The light image formed by the lens reaches the first semi-transparent pellicle mirror (A) which reflects a portion of the light toward the blue filter (B), and transmits the balance to the second mirror (D).
2. The second mirror reflects a portion toward the red filter (E) and transmits the balance to the green filter (G) at the rear of the camera.
3. The result of this division by the mirrors is that the one beam of light containing the image has been divided into three beams. Because of the nature of light, each of the three beams is identical to the original beam except in intensity, and each beam contains all the colors reflected by the subject.
4. The light reflected by the first mirror reaches the blue filter (B) which permits only the blue rays to pass through. These blue rays expose the photographic plate (C) to form the blue record.
5. The light reflected by the second mirror passes through the red filter (E) and exposes the plate (F) to form the red record.
6. The light **transmitted** by the second mirror passes through the green filter (G) and exposes the plate (H) to form the green record.

## COLOR THAT IS SHARP

The outstanding feature of the Devin tricolor camera is its two-mirror construction. We particularly stress this feature because it has, more than anything else, distinguished the professional tricolor camera from those available to the amateur photographer.

**WHY TWO MIRRORS** • The illustration on page 8 tells the story of how the color separation negatives are made in the Devin Camera. Note that the image from the single lens is divided by the mirrors into **three separate beams**, each of which is directed to a separate plate. Observe particularly that the only elements placed between the lens and the photographic plates are transparent pellicle mirrors and tricolor filters. **Neither the mirrors nor the filters affect the definition of the image.** When the image reaches each of the three plates, it is still critically sharp.

This is possible only with the one-exposure camera constructed with **two non-distorting** mirrors, such as the Devin pellicle mirrors.

It is possible to make a variation of the one-exposure tricolor camera known as the single-mirror or bipack type. It is also possible to secure color separation negatives by rephotographing a color transparency. Because of diffusion in the first case, and loss of detail in the copying processes in the other case, the rendering of texture and detail is definitely inferior to that secured with the Devin two-mirror tricolor camera.<sup>2</sup>

The development of the modern miniature camera has shown the importance of critical definition for small negatives. The 6.5 x 9 cm. negative of the Devin tricolor camera is larger than the negatives made with many miniature monochrome cameras, but these color separation negatives will just as often be subjected to extreme enlargement. They will stand such enlargement because they have a crisp, critical sharpness that is unequalled by any other camera or any other method of color photography.

## COLOR THAT IS TRUE

The value of any system of color photography depends, in the final analysis, upon the accuracy with which it can reproduce the colors of the original subject.

All methods of color reproduction are based on the same fundamental principles, though in actual practice the results may be widely different. The colors reflected from the subject are analyzed or "separated" into three primary colors—red, green, and blue-violet—by a combination of (1) filters, and (2) photographic emulsions. This process is known as color separation; and where a color print is wanted, the analysis must be recorded on three color separation negatives.

The Devin Tricolor Camera affords an accuracy and simplicity in color separation not achieved by any other method of color photography. The separation negatives are produced by a single direct exposure **on the subject itself**. All problems of color separation are taken care of by this simple operation. Yet it is this very simplicity that makes the two-mirror one-exposure camera superior in **color rendition** to alternative systems of color photography. This is especially true when comparison is made with those processes which necessitate the copying of a color transparency. In that case the transparency is used as a substitute for the original subject in making the color separa-

tion negatives. Since the transparency itself cannot, by the very nature of the photographic processes, be a perfect reproduction of the subject,<sup>3</sup> such separation negatives cannot, of course, equal those made with the one-exposure camera, which does not require this extra step.

While the bipack camera shares some of the simplicity of the two-mirror camera, there are many factors which make it difficult to secure accurate color rendition with such a camera.<sup>3</sup>

The color separation of the Devin camera is unequalled by **any** other camera.

**FILTERS AND EMULSIONS** • The Devin camera utilizes the combination of filters and emulsions which has, in the experience of both the best professional workers and the great research laboratories, proven to offer the maximum accuracy in color separation. This combination consists of the standard Wratten A (red), B (green), and C5 (blue-violet) tricolor filters, together with panchromatic plates sensitive to all colors. To insure even greater accuracy in color separation, two special types of panchromatic plates are used. They are made for the Devin Camera by the Eastman Kodak Company.

The filters are the same size as the plates used, are cemented between two pieces of polished optical glass, and are positioned directly in front of and parallel to the focal plane.

All plates are fully panchromatic. The exact color sensitivity of the plate used for the blue and green record, differs, however, from the color sensitivity of the plate used for the red record. The purpose of this difference is to provide the correct and necessary overlap between the different color records, without sacrifice of speed. There must be, for instance, a relatively small overlap between the green and red records, which calls for the use of a fully panchromatic plate with the green filter. But when some modern highly red sensitive plates are used with the green filter, the effect is to broaden this overlap and falsify the color rendering in the finished print. This danger is avoided in the Devin camera by the use, for the blue and green records, of a panchromatic plate having its maximum sensitivity in the green region of the spectrum. On the other hand, it is still desirable to take advantage of the speed and high red sensitivity of some of these more recent panchromatic emulsions. We therefore use a highly red sensitive plate with the red filter.

These two kinds of panchromatic plates differ only in their color sensitivity. They are made from the same "mother" emulsion, which ensures that the character of the tone reproduction will be uniform on all three negatives, not only when the plates are fresh and new, but also when they have aged over a period of time.<sup>4</sup>

Such careful control over the color sensitivity of the emulsions is possible only because special plates are made for the Devin camera by the Eastman Kodak Company. The color sensitivities of the standard plates commonly available on the market are unsatisfactory for use in tricolor cameras because they have been developed primarily to meet the requirements of monochrome photography. The Devin plates are designed for **color photography**.

This combination of two types of panchromatic plates with the standard tricolor filters represents the greatest advance made during recent years in accurate color reproduction by photography.

The Devin camera is **the** camera for color that is true.

## BALANCED NEGATIVES

A one-exposure camera is spoken of as "balanced" when it will produce three separation negatives having approximately uniform density in those areas where a neutral gray object has been recorded. When the camera is balanced it automatically provides for the exposure factors of the different tricolor filters.

The Devin camera is balanced for use with both the two most commonly used light-sources—sunlight and incandescent. Note the diagram on page 8. It shows the tricolor filters in position for exposure with incandescent light. The adjustment for a change from incandescent to daylight is accomplished by a simple exchange in the positions of the red and blue filters. No loss of camera speed is involved in this adjustment, and no additional compensating filters are necessary.

The above adjustment provides for the very wide difference between the two major light-sources—sunlight and incandescent. Within each of these two light-sources there are variations in color quality. The Devin camera is therefore balanced to a **specific** type of light in each case. In the case of incandescent light, the camera is balanced to the photo flood type lamps. Light of practically the same quality can be secured by using normal incandescent lamps of 100 or 105 volt rating, on 115 volt lines. With the filters in the daylight position, equally good balance is achieved to light of average sunlight quality. Compensating filters are available for unusual incandescent and sunlight conditions, and for flashlight exposures.

The use of special plates assures the user that sudden changes will not be made in color sensitivity. This point is of no little importance, since a change in the color sensitivity of the plates to which a tricolor camera is originally balanced will throw the camera out of balance. This will either render the camera useless or it will necessitate the substitution of plates of widely different characteristics, making it impossible to produce prints of top quality.<sup>4</sup>

Since uniform contrast is in some respects even more important to good color photography than is exposure balance, correct development times are furnished for all Devin plates sold by this company.

## REGISTRATION

So many statements have appeared in recent photographic literature about the possibility of obtaining accurate registration in a one-exposure camera, that we wish to emphasize our **guarantee that the Devin one-exposure camera will produce three undistorted images of exactly the same size.**

Much of this discussion about tricolor camera registration has been based on the familiarity of the writers with the odds and ends of cameras produced by individual

workers—made by hand with inadequate equipment—rather than upon familiarity with the commercial production of tricolor cameras by standardized and highly specialized engineering methods. Registration defects associated with poorly constructed cameras are too often generalized into inherent defects of the one-exposure camera as such. The Devin professional camera has shown that it **is** possible to get exact registration in a one-exposure camera—registration that is not only adequate for the needs of practical commercial photography, but exact enough to meet the stringent demands of engravers and lithographers who make enormous enlargements from the negatives by processes which permit of no correction for faulty registration.

The new 6.5 x 9 cm. Devin Tricolor Camera embodies the same accuracy of registration which has made the larger camera the leader in its field.

The exact registration of the three **developed** separation negatives depends upon many factors: the mechanical adjustment of the mirrors in relation to each other and to the three focal planes (internal mirror adjustment); the character of the mirrors themselves; the accuracy with which the plateholders bring the emulsion surfaces into the correct focal planes; and the possibility of variations due to processing.

**INTERNAL MIRROR ADJUSTMENT** • The combination of a lens, two mirrors, and three focal planes necessary for the production of three images identical in size, constitutes an exceedingly complex optical system. The sound construction of such an optical system requires a highly specialized organization equipped with the most advanced precision instruments obtainable.

The Devin Colorgraph Company has spent years building just such an organization, and behind the new 6.5 x 9 cm. camera is the experience and skill developed from the manufacture of America's finest professional color camera. The cameras are adjusted with the precision characteristic of a fine microscope. A final and thorough check on the registration of each camera is made **photographically**.

Permanent positioning of the mirrors is ensured by a **flexible** three-point suspension, so that the normal slight contraction or expansion of the case due to temperature changes will not throw them out of line.

**THE DEVIN MIRRORS** • The best guarantee of exact registration in the Devin Camera are its two Pellicle mirrors. The Devin mirror is a thin membrane, about five ten thousandths of an inch in thickness, cast onto an optically flat metal frame. It is so extremely thin that it does not bend the light as it passes through, thus eliminating all registration troubles due to such bending.

The thickness of the glass mirrors sometimes used in experimental one-exposure cameras leads to uneven refraction (bending) of light, and therefore, to a variation in the sizes of the three images produced. The thickness of glass mirrors also gives rise to images reflected from the back surface of the glass, a phenomenon with which photographers are familiar as halation when a photographic emulsion is coated on an unbacked glass plate.

The Devin mirrors are metallized by the vacuum evaporation process. This is the most advanced method known, and is used in silvering the mirrors of the world's finest telescopes.

The pellicle mirror, **only**, meets the requirements of the most efficient optical system. Its advent paved the way for really practical color cameras of advanced design.

**Temperature and humidity do not adversely affect the Devin pellicle mirror.**

These mirrors have been subjected to tests in humidifying chambers far more rigorous than they will ever encounter under the most extreme climatic conditions. Not all makes of pellicle mirrors are the same. We know of pellicle mirrors which have broken because of sudden changes in temperature and humidity. No Devin mirror has ever had to be replaced for that reason. We guarantee the mirrors unconditionally on this point, and will replace any mirrors without charge if they become damaged other than by mechanical means.

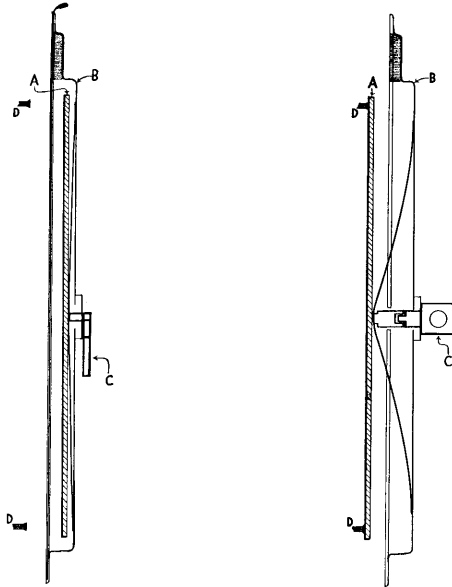
The Devin mirrors are made by the Devin Colorgraph Company in the United States. The method of manufacture of these unusually high quality mirrors was developed by Mr. H. O. Klein, British research chemist, and this company owns the sole rights to the process in America. The Devin Camera is, therefore, the only camera available in the United States equipped with these mirrors.

**WHY PLATES** • A tricolor camera, no matter how perfectly its mirrors are adjusted, cannot produce three developed negatives in perfect register if there is any variation in the base of the photographic emulsion during processing. Glass is the only emulsion base available which will not buckle, expand, or contract. It is, therefore, ideal for use in one-exposure tricolor cameras. This tremendous advantage is far more important than the slight inconvenience of glass as against film. While extreme—and somewhat impractical—precautions may minimize the variations of film during the developing, washing, and (especially) drying operations, such variations have not been completely eliminated even in the finest topographical films for aerial mapping.\* Since in many cases "hairline" registration is needed, the emulsions made for the Devin camera are coated only on glass plates.

**PLATEHOLDERS** • We include on the 6.5 x 9 cm. camera, as standard equipment, a plateholder system which is provided on the professional model only at an extra cost. This consists of a new and unique type of metal plateholder, which ensures perfect registration at all times, irrespective of slight variations which usually exist in individual holders. The positioning of the plate into the focal plane is not accomplished by the plateholder alone, as with other cameras, but with the aid of four metal pins built into each plateholder panel of the camera. The accompanying drawing shows the operation of the new plateholder. With such a plateholder no concern need to be felt about big enlargements from the small negatives.

\* R. Davis and E. J. Stovall, Jr.: Journal Research National Bureau of Standards, 19: 613-37, December 1937





The illustration to the left shows the loaded plateholder closed, with the slide inserted. The plate (A) is held in a metal septum, which in turn is attached to springs (represented by the curved black line). The toggle lever (C), when drawn into the position shown, holds the septum and plate inside of the plateholder pan. The plateholder is held in the plateholder panel of the camera a short distance from the pins (D), which are situated at the four corners. These pins are set with a high degree of precision into the focal plane.

The illustration to the right shows how the plateholder positions the plate into the focal plane, ready for exposure. After the slide is pulled, the toggle lever (C) is lifted and turned through a right angle. This allows the lever to move into the plateholder, releasing the springs. The springs press the septum and plate against the pins (D) so that the emulsion surface of the plate rests against the pins. The plate is now exactly positioned into the focal plane.

Any possible variation in different plateholders will not affect this positioning of the plate into the focal plane, since the surfaces of the pins are always in the focal plane, and the pressure exerted by the springs is in excess of that necessary to press the plate against the pins. Every plateholder brings the plates to exactly the same position, because that position is determined by the pins rather than by the plateholder.

**CAMERA CONSTRUCTION** • The all-metal construction of the Devin Camera protects the exact registration achieved in the optical system against temperature and humidity changes and the usual knocks which occur in normal usage. The camera box is a machined casting of aluminum alloy. This metal is particularly valuable in a tricolor camera because of its light weight.

# THE CAMERA IN OPERATION

Pictures of lively, unposed subjects demand the utmost speed and simplicity of camera operation. The constructional features of the Devin 6.5 x 9 cm. Tricolor Camera were designed to meet just such demands.

**THE CAMERA IN THE HAND** • The Devin camera is essentially a hand camera. In spite of the fact that it is really three cameras in one, it is remarkably compact and easy to handle. It is, in fact, more compact than many single mirror cameras making the same size negative. Its overall dimensions are 6" x 6" x 5".

**AUTOMATIC FOCUSING** • Automatic range-finder focusing is now considered one of the indispensable requirements of a fine small camera. The focusing device of the Devin Camera is in reality an extremely small camera. It is a narrow metal cylinder with an eye-piece and ground glass at the rear; at the front is an adjustable lens which forms an image on the ground glass. The lens of the range-finder is of the same focal length as the lens that takes the picture, and the two lenses are coupled together, so that when the image on the ground glass of the finder is sharp, the camera is automatically focused. That means critically sharp negatives under any conditions. Moving subjects can be kept in focus right up to the instant the picture is snapped. The range-finder of the Devin Camera is built especially for the camera. The lenses used in the range-finder are manufactured by the makers of the camera lenses, and are matched with extreme precision to those lenses.

**THE VIEW-FINDER** • The view-finder of the Devin Camera is the full vision type. It is placed directly alongside the range-finder, enabling the eye to shift rapidly from one to the other. This type of view-finder permits the operator to see both the area that will be photographed and the action taking place near this area.

**THE CAMERA ON THE TRIPOD** • For extreme accuracy in determining the field and focus, especially in taking close-ups, the camera is provided with a full size ground glass focusing panel. The focusing panel replaces the plateholder at the rear of the camera, the image being viewed through the green filter. The camera will fit the usual U. S. standard tripod heads.

**CHANGING FILTER POSITIONS** • Changing the positions of the red and blue filters, to adjust the camera to a different light-source, is a quick and simple operation, requiring only a few seconds.

**THE LENS** • The Devin Tricolor Camera is fitted with highly corrected F4.5 anastigmat lenses of standard make. The lenses currently being fitted to the camera will be found in our latest price leaflet. There is some variation in the focal length of the lenses with which the camera is equipped. The minimum focal length is 135 mm. Some of the lenses are of 140 mm. focal length. The maximum focal length is 150 mm. Since all of these lenses have a focal length that is relatively long in relation to the 6.5 x 9 cm. plate size, the camera is particularly well adapted to close-up portraits as well as practically every other subject.

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# ADDENDA

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### Note 1—Negative Requirements

Color separation negatives should contain all the qualities of the best black and white negatives—some deposit in the deepest shadows, good gradation in the highlights, a long scale of half-tones, and sharp detail. Since there are three negatives, the relation between them should be characterized by:

1. DEFINITION • Each negative should be critically sharp, and all three should be equally sharp.
2. BALANCE • A scale of neutral grays should be recorded by the same density and contrast on all three negatives.
3. ACCURATE COLOR SEPARATION • Each negative should be an accurate record of one primary color.
4. ACCURATE REGISTRATION • The images on all three plates should be of exactly the same size.

### Note 2—Definition in negatives from bipack cameras and transparencies.

As pointed out in this booklet, it is possible to make a variation of the one-exposure camera which utilizes only one mirror. The relatively simple problems involved in its manufacture make it a somewhat less expensive instrument. Because of this, and because, at least in the larger sizes, it is fairly satisfactory for some types of work, these single mirror cameras are sometimes used in limited fields of color photography. We ourselves manufacture a bipack camera in the larger 5" x 7" size.

But the bipack camera, whether it is made by our company or any other manufacturer, is essentially a compromise form of the one-exposure camera. Color separation negatives made in such a camera can in no way compare to those produced by a two-mirror camera. The single mirror of the bipack camera divides the image into two beams only (instead of three as in the two-mirror camera), and to get **three** negatives from the **two** beams it is necessary to use a pack of two films exposed face to face. Hence the word "bipack." The image formed by one of the two beams must pass **through** the relatively opaque emulsion of the front element to reach the rear element of this bipack. While the amount of diffusion and loss of definition created at this point may vary in different pictures, no manufacturer can truthfully claim to make a bipack camera which will overcome this diffusion of the image. It is inherent in the very nature of the bipack construction.

Color separation negatives made from transparencies also leave much to be desired from the standpoint of critical definition. In another part of this booklet we discuss in greater detail the possibility of securing accurate color rendition with such negatives. Here we wish to point out that negatives so made are essentially **copy** negatives. There is an inevitable loss of definition, detail, and all around quality in the copying process, whether it be in monochrome or color photography.

### Note 3—Color rendition in separation negatives from transparencies.

Reference has previously been made to the deficiencies of the transparency processes, when they are used in the production of prints on paper. We do not, however, question the fact that prints of fairly good quality have been made in this way. On the contrary, such prints may well be adequate and satisfactory, especially when prints are made at infrequent intervals. As we have pointed out before, however, this booklet is addressed to the photographer who is seriously interested in better color prints, and will accept nothing less than the finest quality obtainable. That negatives made by direct exposure on the original subject, with the one-exposure camera, are superior to those made by rephotographing a color transparency will be made clear by a review of the methods by which the negatives are secured in each case.

COLOR RENDITION IN THE TRANSPARENCY • Since the color transparency is used as a substitute for the original subject, it is the colors of the **transparency** that are "separated" when making the negatives. It is obvious that the transparency would have to be a perfect reproduction of the subject to be even a reasonably adequate substitute.

That color transparencies are often very poor reproductions of the original subject is all too apparent to anyone who consistently uses them. That color transparencies, at their best, **cannot** be perfect reproductions, no matter how nice they may look, is a fact well established by color experts. As a matter of fact, **no** photograph, monochrome or color, is a perfect reproduction of the original subject either in the rendition of detail, the recording of the full range of tones from shadows to highlights, or in the reproduction of color. And color transparencies have their own particular deficiencies. One of the most

commonly recognized is the small exposure latitude which not only necessitates critical exposure, but also limits the range of brightness values which can be satisfactory reproduced. The degree of accuracy attainable in color rendition is further limited by the nature of the filters used, and of the dyes from which the colors are formed. So that while it is possible to produce pleasing color transparencies, they will not be perfect reproductions of the original subject, and their deficiencies will be intensified if separation negatives are made from them.

**LOSS OF VALUES IN COPYING** • Every worker in monochrome photography is familiar with the inevitable loss of quality that results from copying photographs. No one will venture to assert that a copy negative can in any way compare to an original negative made by direct exposure on the subject itself. Color separation negatives made by rephotographing a transparency are essentially copy negatives. And the transparency itself being an imperfect reproduction, the copying of the transparency removes us still further from the original subject.

In addition to the difficulties normally associated with copying, making separation negatives from transparencies causes a considerable loss of the color saturation (purity) which exists in the transparency, even when special sharp-cutting filters are used in making the separations. Subtle differences between various shades of color are lost, and adequate compensation for these deficiencies cannot be made when printing from the separation negatives so made.

The poor quality of separation negatives made from transparencies is indirectly acknowledged by the transparency manufacturers themselves. They insist upon the necessity of negative color correction (masking methods) in producing prints from negatives made by rephotographing the transparencies, and cite the deficiencies of three-color photography as the reason. While it is true that absolutely perfect facsimile color reproduction cannot be achieved by a three color process (only charlatans would claim such perfection), it is still true that first class, reasonably accurate, and superbly beautiful color reproductions are being obtained every day by top professional color photographers, **without the use of any masking method at all**. These photographers, who produce America's finest advertising and illustrative photography, depend upon the one-exposure camera with its separation negatives made from the original subject.

Some fine color pictures made from transparencies have been shown in reproduction. That a large part of this quality is due to the fine-etching of the engraver is indicated by the fact that engravers charge 25% to 60% more for engravings made from transparencies.

We do not claim perfection for the one-exposure camera, but in eliminating the additional step of copy negatives from a transparency, it makes possible an accuracy in color rendition that cannot be equalled by any other method.

**RELIABILITY** • The immediate processing of tricolor camera negatives in standard solutions offers not only simplicity, but even more important, reliability. When difficult subjects are encountered (impossible to rephotograph later in many cases), immediate tests can be made to determine whether the best exposure, contrast, and balance have been obtained. The photographer is then sure of what he has, **immediately**.

In the case of the best screenless transparency materials, on the other hand, processing is done by the manufacturer, entailing a long wait. Nothing can be done if the transparency is defective in exposure or contrast, or if it leans too much to one color because of processing variations or the quality of light received by the subject. This will not prevent the photographer from getting many good transparencies, but it does add an element of uncertainty that may cost a great deal in good pictures irretrievably lost. And the photographer cannot, in many cases, be positive that the pictures will even be returned to him. Some types of pictures are a matter of personal opinion, and the artist is never certain that the processing company will not exercise its own private ideas of censorship.

**COST** • While the first cost of the one-exposure camera is high as compared to transparency materials, the operating costs are far lower. Where prints are to be made, the separation negatives are necessary in either case. With the one-exposure camera, the only cost of these negatives is the price of the plates and developing solutions. The color transparency adds a cost over and above the cost of the plates or films for the separation negatives. In sizes comparable to the 6.5 x 9 cm. plate of the Devin camera, color transparency material is relatively expensive, and over a period of time might easily exceed the cost of the one-exposure camera, without offering any of its advantages.

**Note 4—Color Separations with Odd Plate Combinations**

While the standard tricolor filters and panchromatic plates offer the maximum accuracy in color separation, it is possible to secure some of the color records by other combinations of filters and emulsions. The green record, may, for instance, be secured by using a yellow filter with an orthochromatic plate. Since this emulsion is sensitive only to blue and green light, and the blue light is removed by the yellow filter, such a combination will give us some sort of a green record. It is possible to get the blue record without any filter at all, by using an ordinary emulsion sensitive only to blue light. It has often been suggested that one-exposure cameras might use, together, a color blind emulsion without a filter, an orthochromatic emulsion with a yellow filter, and a panchromatic emulsion with a red filter.

Such methods of securing the green and blue records are ordinarily resorted to only in an effort to get increased speed, and it is significant that they are never used or recommended when speed is not an important factor. But when such combinations of filters and emulsions are used, a very small amount of speed is gained at the expense of far more important qualities of the separation negatives.

The first objection to these compromise combinations is the difficulty of obtaining satisfactory color separation. Accurate color separation requires a small overlap between the different color records and the exact amount of this overlap is important. But an orthochromatic plate is seldom sufficiently sensitive to orange-red light to provide the correct overlap between the green and red records; and when such an emulsion is sufficiently sensitive in this region, with normal exposure, then overexposure will make the overlap too wide. There is practically no latitude whatever. A color blind emulsion with no filter presents the same difficulties.

Another objection to such compromise combinations of filters and emulsions is that they necessitate, in most cases, the use of plates of widely different basic emulsion characteristics. It is well known, for instance, that different types of plates differ particularly in tone reproduction (the characteristic curve). Different emulsions which give reasonably uniform reproduction of the half tones, may vary widely in their reproduction of the shadows and highlights of the same subject. This makes it impossible to secure with such a combination of plates an accurate rendition of color throughout the entire range of the tone-scale—shadows, half tones, and highlights. Even panchromatic plates with different basic emulsion characteristics will exhibit such differences. Every practical consideration in color photography points to the superiority of separation negatives made with plates of identical emulsion characteristics. That means panchromatic plates, with different color sensitivities when necessary, but from the same "mother" emulsion.

DEVIN COLORGRAPH COMPANY  
305 East 43rd Street New York City

John B. Watkins Co  
FINE PRINTING  
NEW YORK CITY

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Effective Nov. 15, 1938.

## PRICE LIST

### 6.5 x 9 cm. Hand Model

Camera, including lens, focusing panel, three plateholders, and gelatin compensating filter .....	\$365.00
Extra plate-holders, each .....	3.00
Carrying case for camera .....	10.00
Carrying case for 18 plateholders (six exposures) .....	7.25
Lens Shade (Worschung Counter-light cap) ..	4.50
Plates, per dozen .....	.80

Cameras manufactured as of this date are being equipped with either of two lenses:

Goerz Dogmar F4.5, 140 mm. focal length

Meyer Aristostigmat F4.5, 135 mm. focal length.

We do not offer a choice between these lenses. They are both highly corrected, and give negatives of exceptionally high quality. We cannot fit any other lenses to the camera, since the range-finder objectives must be matched to the camera lens.