

25¢

PICTURES

from the air



... with your camera

Kodak
PUBLICATION



Aerial view of Kodak Park, world's largest producer of photographic materials.



CONTENTS

	Page
Problems in Aerial Photography	2
Cameras for Aerial Photography	4
Films for Aerial Photography	5-7
Filters for Black-and-White Films	10
Table	10
Photographs from Airliners	11
Photographs from Chartered or Private Planes	12
Shutter Speed	13
Table	Inside Back Cover
Lens Settings	14
Table	Back Cover
Processing Film and Making Prints	14
Movies from the Air	16

EASTMAN KODAK COMPANY • ROCHESTER 4, N. Y.

COPYRIGHT 1947, EASTMAN KODAK COMPANY • PRINTED IN THE UNITED STATES OF AMERICA

PICTURES FROM THE AIR

With Your Camera

Unfettered by the limitations of the land traveler, and freed from most of the wartime controls over aerial photography, airborne photographers are rediscovering the photogenic world in which they move. They are finding that old, familiar subjects acquire new beauty when viewed from aloft. Professionals are exploiting more and more the commercial possibilities of aerial photography as it serves business and industry, and an increasing number of amateurs are learning that pictures taken from this fresh viewpoint command more than a passing glance. Although the equipment used by the professional aerial photographer is, of necessity, elaborate and rather expensive, any photographer can obtain quite satisfactory results with an ordinary camera.

PICTORIAL POSSIBILITIES

Excellent subjects for the aerial photographer abound in every section of the United States. Prominent landmarks, National Parks, mountains, rivers, lakes, unusual buildings, dams, cloverleaf intersections, and many other works of nature or man are good scenic material. Ships and sailboats are apt subjects for close-ups, since the plane may be safely flown at low altitude over open water. Scenes with high-towering clouds as a background have a stately quality that is hard to duplicate from the ground. Clouds alone offer countless varied possibilities.

Kodak color films—Ektachrome, Kodachrome and Kodacolor—are exceptionally fine films for aerial photography if properly used. The contrast produced by natural colors in a scene eliminates the need for shadows, giving the photographer a freedom in selecting his shooting angle and time of day limited only by considerations for proper exposure. Geometrically designed fields of brown earth and golden grain, spotted here and there by green grass and forests, and blue lakes; the changing pattern of industrial, seashore, and mountain landscapes—all of these offer an ever new panorama, the full beauty of which can be captured on Kodak color films.

Real estate companies, farmers, estate owners, industrial firms, and construction engineers are a few of the many prospective purchasers of aerial photographs, either black-and-white or color. Aerial photography offers a profitable sideline for professional and amateur alike.

PROBLEMS IN AERIAL PHOTOGRAPHY

In general, pictures taken from the air can be classed with distant landscapes taken from the ground, and many of the same photographic rules apply. In addition, the aerial photographer must take into consideration certain other factors peculiar to aerial picture taking.

Haze

Haze, always present to some degree in the atmosphere, exerts a veiling effect which increases with distance, and this factor, together with the inherent low brightness range of most aerial views, tends to create negatives of low contrast in black-and-white photography unless corrective measures are taken. In color photography, the presence of haze tends to cause an over-all bluish cast in transparencies. The problem of haze is discussed further in the sections on Films and Filters.

Motion

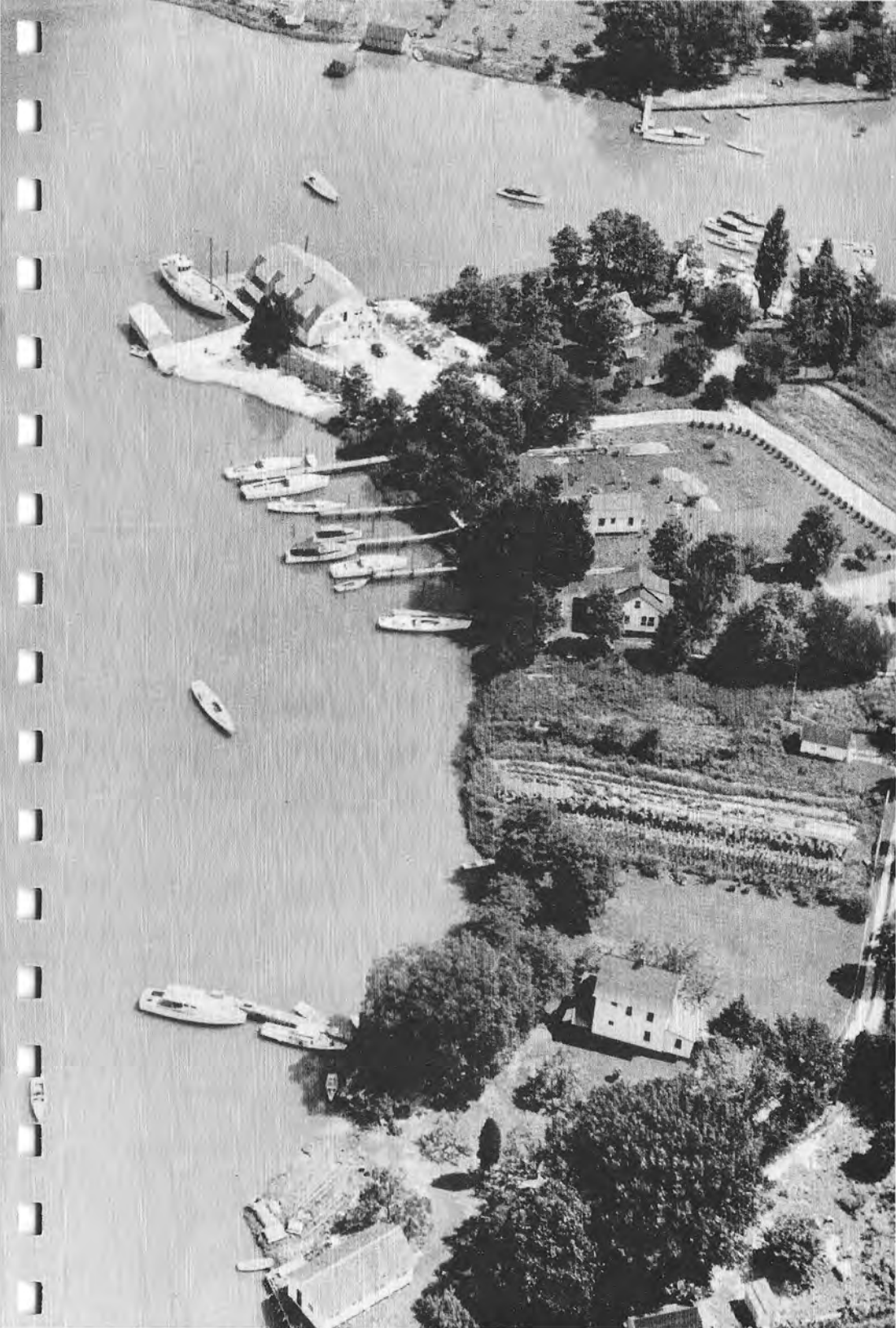
The apparent movement of the landscape when viewed from an aircraft in flight is directly proportional to the speed of the aircraft at a given altitude, and is inversely proportional to the distance between the aircraft and the subject at a given speed. The problem of stopping this apparent motion is not a serious one except at extremely low altitudes (or with very long focal length lenses) and high aircraft speeds. A more serious problem is that of camera motion during the exposure. Camera motion can be caused by vibrations transmitted from the aircraft or by vertical air currents.

Angle and Perspective

Angle refers to the degree of downward tilt of the camera. Shadows are practically the only clue to terrain contours and object height in aerial views taken with the camera aimed vertically downward or at more than 60 degrees below the horizon. Such photographs are classified as "verticals" and "low obliques." Pictures which include the horizon, or are taken at less than 60 degrees below the horizon are "high obliques."

Except at low altitudes, foreground objects are usually absent in aerial photographs. This may leave the viewer of the picture without any feeling of perspective or proper support for his viewpoint. All pictorial aerial views should have an easily recognizable object or feature of terrain as a center of interest. It is sometimes desirable to include in the picture the tip of a wing or some other familiar portion of the airplane to add reality. Pictures showing other aircraft in the air are always interesting; the other aircraft gives depth to the scene by providing a foreground object.





Lighting

During the summer months the most interesting black-and-white pictorial views can be obtained from an hour after sunrise to two hours before noon, and from two hours after noon to an hour before sunset. At these times, shadows of ground objects are long enough to add effective contrast to the picture, and are helpful in identifying objects. During the middle of the day, shadows are shorter, yielding better ground detail but lowering contrast considerably. During the winter months, of course, excellent scenes can be obtained at almost any time of day—even at midday—because of the low position of the sun at this season of the year. Color photography is not limited as much as black-and-white by the need for shadows since colors in the scene will ordinarily provide effective contrast.

CAMERAS FOR AERIAL PHOTOGRAPHY

A simple box camera will yield good pictures from the air if the photographer understands the limitations of his equipment and attempts pictures only when atmospheric conditions, air stability, altitude, and speed are ideal. Unfortunately, ideal combinations of these factors rarely exist, and the photographer who relies on a box camera for aerial picture taking should be prepared for many disappointments. Five thousand feet is about the minimum altitude from which pictures should be attempted with a box camera, and then only from airplanes flown at comparatively low speed.

Folding Kodak cameras having shutter speeds of 1/100 second or faster and lens openings of $f/6.3$ or larger will produce good aerial pictures if the simple rules and suggestions given in this book are followed.

Miniature cameras are satisfactory for casual aerial photography, and many beautiful Kodachrome transparencies have been made with Kodak 35's, Kodak Bantams, and similar cameras. Most aerial pictures are characterized by a great amount of fine detail, however, and for this reason negative sizes larger than miniature yield noticeably better prints. Larger color photographs are also preferable in detail rendering. For these reasons, and in view of the cost of flying time, it pays to obtain a suitable camera if the photographer does not already have one.

The Kodak Medalist II is a most versatile and efficient camera, using a $2\frac{1}{4} \times 3\frac{1}{4}$ -inch (620) roll film. An accessory back accepts sheet film and permits the use of Kodachrome Professional Film, Ektachrome Sheet Film, film packs, and plates. The lens is a Kodak Ektar 100mm, $f/3.5$ Luminized lens in a Flash Supermatic Shutter with speeds to 1/400 second. The lens mount is fitted with a screw-in thread accepting any of the Series VI

Kodak Combination Lens Attachments. Filters thus mounted cannot be lost in the air. A double-telescopic, helical-screw, metal lens tube is an important feature, since it eliminates the folding bellows ordinarily found on cameras of this size and ability.

If a camera having a bellows is to be used from an open cockpit airplane or where it will be exposed to the slipstream of the airplane, it should be protected by a metal shield to prevent the bellows from being collapsed by the air blast. Such a shield can be constructed of light sheet metal or aluminum, and attached to the camera at the tripod socket by inserting into the socket, through $\frac{1}{4}$ -inch holes in the shield, a Kodak Hand Strap or Kodak Neck Strap. These accessories will provide comforting insurance against having the camera torn out of the operator's hands by air blast and lost. If the lens mount is not fitted with a screw-in thread for lens attachments, some provision should be made for securely fastening filters over the lens.

The professional photographer who intends to take many aerial photographs on a commercial basis should invest in a camera designed specifically for this purpose such as those manufactured by the Fairchild Camera and Instrument Corporation, Jamaica, N. Y.

FILMS FOR AERIAL PHOTOGRAPHY

There is a Kodak color film for almost every kind of still camera: *Ektachrome Sheet Film*, and *Kodachrome Professional Sheet Film* for press, view, and similar cameras; *Kodachrome Roll Film* for miniature cameras, and *Kodacolor Film* for most cameras accepting the popular sizes of roll film such as 620 or 120.

Kodak Ektachrome and Kodachrome Films

Kodak Ektachrome and Kodachrome Films are unsurpassed for brilliant, full-color transparencies. Ektachrome Film is processed by the user in his own darkroom, or by some commercial photofinishers. It requires only ordinary darkroom equipment, and processing chemicals which are available in convenient kit form. Kodachrome Film is processed at Kodachrome Processing Laboratories, the processing price being included in the purchase price of Kodachrome Film. Kodachrome Prints are made from Ektachrome and Kodachrome transparencies upon order through Kodak dealers. Color prints from transparencies can also be made by the Kodak Dry Transfer Process, details of which may be obtained by writing to the Eastman Kodak Company, Rochester 4, N. Y.

Kodachrome and Ektachrome Films, Daylight Type, will yield satisfactory results at low altitude on clear days, with the Kodachrome Haze Filter



Scenes like this one of mid-town Manhattan need lots of room, and good negatives should be enlarged to at least 8 x 10" to reveal the detail which might be lost in a small print.

over the lens. Slightly warmer results, with less bluishness, can be obtained by using the Kodak Color Compensating Filter CC15 over the lens. If it is necessary to take aerial pictures on days when there is a slight amount of haze in the atmosphere, use of the following film and filter combinations is recommended:

Ektachrome Sheet Film, Type B, with Wratten Filter 85B.

Kodachrome Professional Sheet Film, Type B, with Wratten Filter 85B.

Kodachrome Roll Film, Type A, with Kodachrome Type A Filter for Daylight.

When exposed with the recommended filter over the camera lens, these films, which ordinarily are for use with artificial illumination only, afford better rendition of color and distant objects in aerial views when haze is noticeable. The bluishness caused by haze is reduced, since the Wratten Filter 85B and the Kodachrome Type A Filter for Daylight absorb much of the blue and ultraviolet light scattered by haze while changing the color quality of the daylight illumination to approximately that for which the films are color balanced.

It should be noted, however, that the speed of the above films is considerably less when exposed outdoors with the appropriate filter than it is when the films are exposed under the illumination for which they are

intended. Ektachrome and Kodachrome Films, Type B, have an exposure index of 10 for tungsten light and 6 for daylight. Cameras with lenses having a relatively large maximum effective aperture are therefore necessary. Correct exposure is best assured by making three exposures of each subject: (1) the estimated exposure, (2) $\frac{1}{2}$ stop more, and (3) $\frac{1}{2}$ stop less, since the exposure latitude of color films is critical.

The dyes in the Wratten Filter 85B are only moderately stable and may, in time, change color. Unless the color is correct, unsatisfactory transparencies will result. If the suitability of a filter is doubtful, it should be replaced.

Kodacolor Film

Kodacolor Film offers the user of the popular size roll film cameras a means of obtaining color photographs. Processed by the Eastman Kodak Company at no extra charge, a Kodacolor negative looks much like a black-and-white negative, but contains colors complementary to the colors of the original scene. From these negatives, Kodacolor Prints can be ordered through any Kodak dealer, or satisfactory black-and-white prints can be made in the normal manner.

Black-and-White Films

Although Kodak Aero Films for aerial cameras have emulsions which are highly sensitive to the yellow-orange and red part of the spectrum, the emulsions of the ordinary panchromatic roll and sheet films are suitable for amateur aerial photography. For most black-and-white aerial photography with roll-film cameras, Kodak Plus-X Film is recommended. This film has fine grain and sufficient speed for most photographic work from the air. When atmospheric conditions demand a higher-speed film, particularly when extreme haziness or high altitude requires the use of a deep filter, Kodak Super-XX is recommended. Users of sheet film will find Kodak Super Panchro-Press, Type B, well suited to aerial photography.

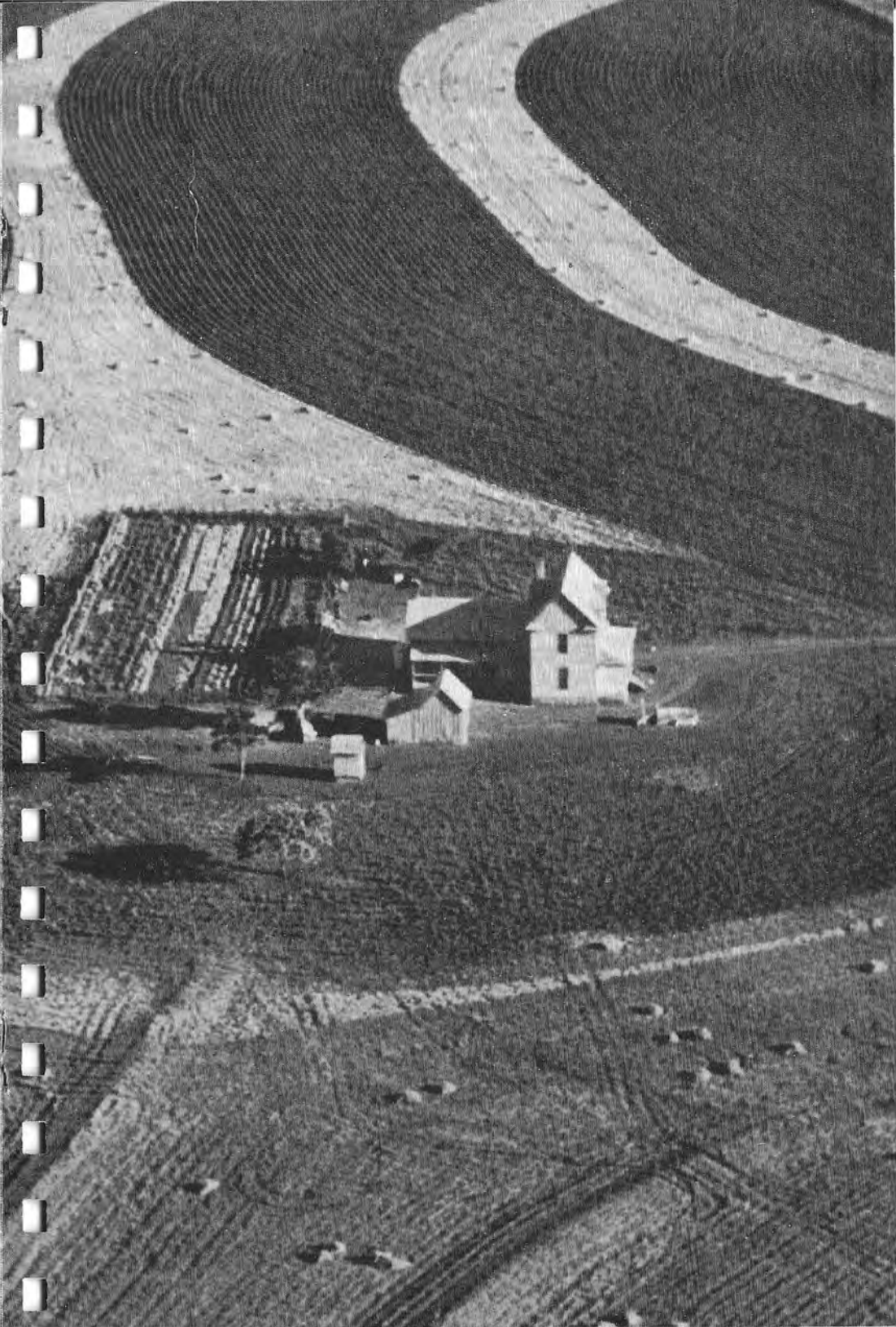
Infrared Film

Infrared film is frequently used in long-range aerial photography. The outstanding characteristic of infrared film is its power to penetrate atmospheric haze, sometimes farther than the eye can see. Its greatest use is in oblique aerial photography when photographs at extreme distances are required. The use of infrared film results in peculiar black-and-white tone rendition. In the finished print, blue sky and water appear almost black; fields and trees appear white because of infrared reflection by the

Pictorialism and utility are combined in the farm scene by the Department of Agriculture on the next two pages.







chlorophyll in the leaves. Some evergreens, which are rendered black, are the exception. In high-altitude pictures, cities appear as dark patches against a lighter countryside. The Wratten A Filter or any filter which absorbs blue (such as Wratten No. 15, 23, or 25) must always be used.

Kodak Infrared Materials are available as sheet film, plates, and miniature and roll film. The average aerial exposure for bright sunlight for any of these materials with the Wratten A Filter is approximately 1/100 second at $f/4.5$ over industrial areas and 1/100 at $f/5.6$ to $f/8$ over the countryside in bright sunlight. While lens types vary in their infrared focusing correction, as a general rule, sharper aerial infrared pictures are obtained if the lens is extended by about $\frac{1}{4}$ of 1 per cent of its focal length after being focused at infinity. It is well to make photographic focusing tests on the ground beforehand, using a very distant object as a subject.

FILTERS FOR BLACK-AND-WHITE FILMS

Although the eye and panchromatic film are both sensitive to all colors of the visible spectrum, they do not respond to these colors in the same manner. Panchromatic film is far more sensitive than the eye to blue and violet light, and it is also sensitive to the invisible ultra-violet. Yellow* or red filters must be used since the particles which form atmospheric haze scatter and reflect blue, violet, and ultra-violet strongly while partially transmitting green and red light. The blue-absorbing filters enhance the contrast of distant detail by reducing the veiling effect of haze. Over-all brilliance and clarity are improved.

The more haze present or the higher the altitude, the deeper the color of the required filter. The deeper the color of the filter, the more blue rays are absorbed. With the increase in absorption of light by a filter, a proportional increase in exposure is necessary.

The following table lists the filters commonly used for black-and-white aerial photography according to their increasing haze-cutting ability:

Filter	Wratten Filter No.	Filter Factor Panchromatic Sheet Film and Roll Film	Aero Film
Aero 1	3	1.5	1.5
Aero 2	5	2	2
K2	8	2	2
Minus Blue	12	2	2
G	15	3	2.5
A	25	7	4

* Yellow filters transmit green and red light.

PHOTOGRAPHS FROM AIRLINERS

Because airlines in the United States cover many of the scenic landmarks in the country, many air travelers make good use of their cameras during cross-country trips by air.

Photographs from airliners must be taken through glass or plastic windows. The side curtains can be used to reduce reflections and the camera should be held close to the window without actually touching it. No part of the camera should touch the window, nor should any part of the arm rest solidly on structural parts of the plane. A slight amount of dirt on the window may not affect the picture appreciably.

The best seat for aerial photographs is in the rear, away from the wing. The side which will be away from the sun during the flight should be chosen because the effect of haze is less with the sun behind the camera. The shady side is also desirable since direct sunlight on the window will increase the possible effect of scratches, flaws, and dirt. The airline hostess or steward will know which side of the plane will be in shadow over any point on the trip, or can get this information from the pilot. As a general rule, when flying east, sit on the left side; when flying west, sit on the right. For views of an airport while the plane is landing or taking off, a seat on the left side of the plane is usually necessary because normal traffic around a flying field is counter-clockwise.

Airline attendants are thoroughly familiar with the routes over which they fly and can give the photographer details of the best scenic possibilities and ample warning as they are approached. They will usually be most helpful in making any desired temporary change in seating arrangements, in the air as well as on the ground.

Basic shutter speeds of $1/100$ and $1/200$ second can be used while the airliner is at its cruising altitude. The lower the plane is flying, the greater is the apparent speed of the landscape; a shutter speed of $1/200$ second or faster should therefore be used when the plane is approaching or leaving the airport.

Photographs taken inside the cabin of an airliner in flight should be exposed in the same manner as ground shots in deep shade. Best results can be obtained when the plane is flying in or near light clouds, which reflect sunlight into the cabin. For views of the full length of the cabin, or close-ups of passengers, an exposure of $1/25$ second at $f/4.5$ on Kodak Plux-X Film will be sufficient. These pictures, of course, should be attempted only in very smooth air.

Travelers making pleasure trips by air can make a complete picture story of their journey, starting with a few shots at the airport of departure. Sug-

gested subjects are attendants loading baggage into the plane, passengers boarding, the crowd at the airport, the control tower, etc. Later on, these pictures can be placed in sequence along with aerial shots en route and pictures at the destination.

PHOTOGRAPHS FROM CHARTERED OR PRIVATE AIRPLANES

Good pictures can be made from any aircraft, although pictorial opportunities and choice of the best view of a particular subject will naturally be limited by obstructions to the photographer's view and the amount of direct or indirect control he has over his "flying platform." If different types of planes are available, inspection on the ground will readily indicate which will offer the photographer unrestricted views most favorable for his mission. A high-wing monoplane usually is best. An airplane which can be cruised safely at low speed is desirable, but not absolutely necessary. A slow-flying plane is a definite aid in getting sharp pictures at any altitude, especially below one thousand feet. (Also, the rental cost of low-powered, slow-flying light planes is considerably less than that of higher-powered, faster planes.)

If an airplane and pilot are chartered for the purpose of obtaining aerial photographs of specific areas or subjects, much flying time can be saved and better results obtained if the pilot is thoroughly briefed before take-off. Time of arrival over the area to be photographed should be planned to coincide with the most favorable light and atmospheric conditions. Having ascertained the minimum safe cruising speed for the particular airplane being flown, the pilot should maintain that speed while the photographs are being taken. The pilot should be instructed as to the altitude and direction of approach to the subject, with reference to the sun. Civil Air Regulations governing minimum altitudes should always be observed.

Unlike the airline passenger, photographers in private or chartered planes can select the lighting angle which is best for their purpose. When shadows are fairly long and well defined, 45-degree backlighting seems to give a more natural appearance to the final photograph, especially in low oblique or vertical views.

For vertical or near-vertical views from biplanes or low-wing monoplanes, it sometimes is necessary to place the airplane in a steep bank in order to obtain an unobstructed view of the ground below. By planning these and other maneuvers with the pilot before take-off, the photographer can obviate a great deal of confusion in the air, especially if airplane noise prevents easy communication between photographer and pilot. If the pilot knows exactly what sort of a picture the photographer has in



"Over the top" scenes require much less exposure than the average ground scene, due to the high reflecting power of the clouds. Taken with a converted 616 roll-film camera.

mind, he will be able to maneuver the airplane into the best position for the picture. Many pilots have photographic experience and can offer helpful advice.

Rough air, and airplane vibrations are ordinarily more important than ground speed in the problem of obtaining sharp pictures. Whenever possible, "bumpy" days should be avoided. Morning hours afford the smoothest flying, especially during the summer months, although ground haze is usually more prevalent during the early part of the day. To eliminate blurred pictures due to airplane vibration, the camera should be hand-held with both the camera and all parts of the body from the waist up free from uncushioned contact with any part of the plane.

TECHNIQUE

Shutter Speed

Shutter speeds of $1/100$ or $1/200$ second will be adequate for average use, provided every precaution is taken against camera movement. These shutter speeds will allow for ground speeds up to 120 miles per hour at altitudes above one thousand feet. Subjects photographed at close range or with telephoto lenses will require faster shutter speeds, but the ground movement in such cases can be minimized by banking the plane in a turn so that the change in view is primarily angular. Since the blurring effect of motion is greatest at right angles to the course of the plane, taking pictures of a subject as the plane is approaching or leaving will also allow slower shutter speeds.

Focus

The problem of focus is a simple one in aerial photography; the lens is set at infinity and left there. However, the infinity setting should be checked photographically for accuracy on the ground by making pictures of a distant object, such as a skyline or prominent object at least one thousand feet away.

Lens Settings

The table at the back of this book gives basic aerial exposures for various Kodak Films. It will be noted that the basic aerial exposures for the color films are greater than the basic exposures for these same films when they are exposed on the ground. This is due to the fact that average aerial views, which contain large areas of green foliage, grass, and dark soil, have a lower total reflectance than do average ground scenes, which normally contain prominent objects of fairly high reflectance. Since the exposure of color films is more critical than that of ordinary black-and-white films, it is necessary to take into consideration this difference in average scenes when establishing basic exposures.

In all cases, it is wise to use the fastest shutter speed permissible under existing light conditions, within the limitation of the camera lens.

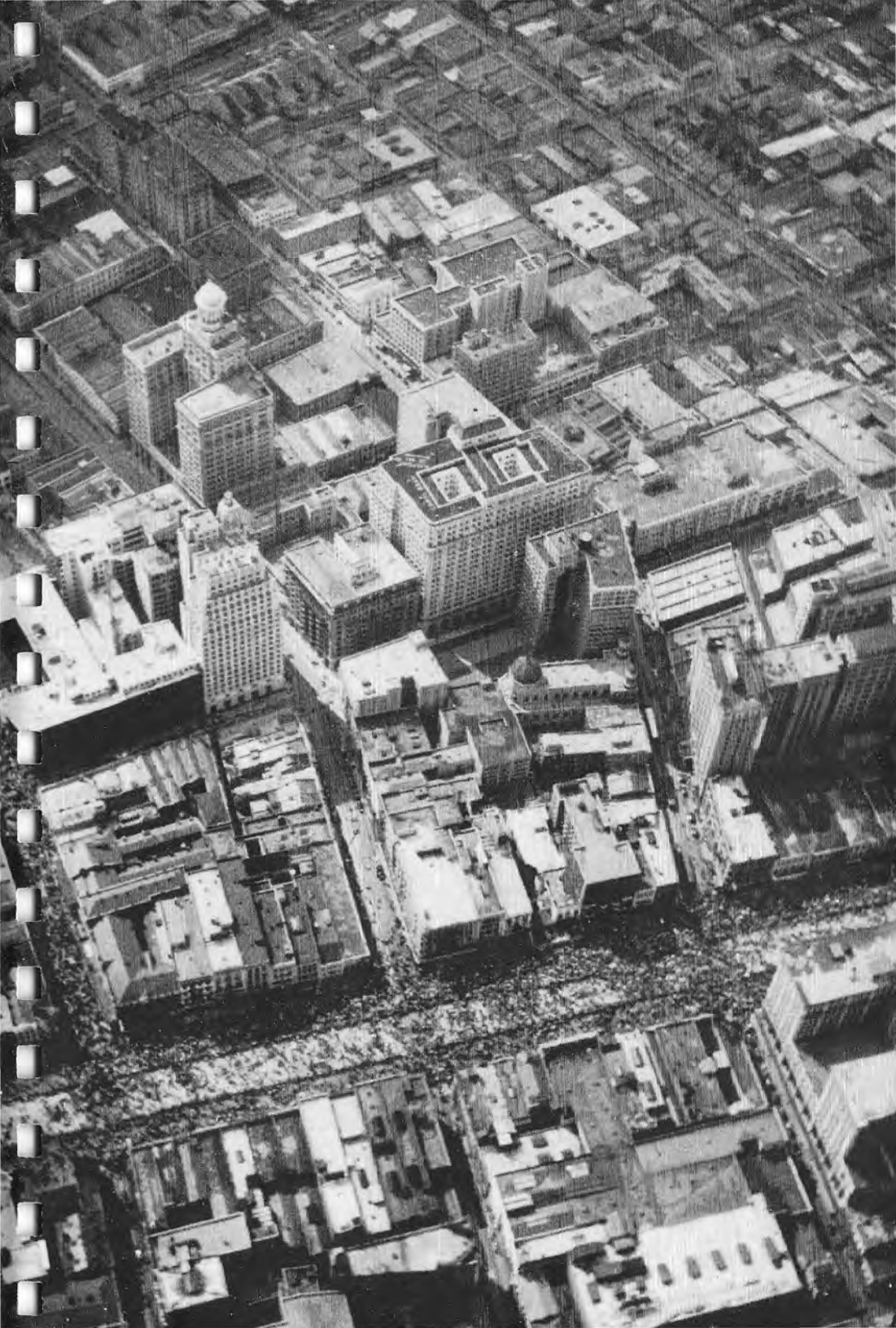
Exposure Meters

Exposure meters should not be used for aerial work unless the photographer is familiar with their use aloft. In some cases their response is influenced more by haze than by light reflected from the ground. As a result the exposure settings indicated by photoelectric meters may lead to underexposure, particularly when a filter is used.

Processing Films and Making Prints

The contrast of black-and-white negatives of aerial views from medium or high altitudes should be increased somewhat by the use of contrasty developers or by increasing the development time in normally recommended developer. Such processing may result in some loss of detail in shadow areas, but since shadow areas usually are small and unimportant, the loss is not serious. For miniature films, it is recommended that the development time be increased about one third over normal, using the normally recommended developer for the film being used. Sheet film can be developed in a more vigorous developer, such as Kodak D-19. Additional contrast in the final print can be obtained by using a short-scale paper, such as Numbers 3, 4, or 5.





Aerial views are always more effective when enlarged to 8x10 inches or larger. The feeling of freedom and expanse which characterizes many good aerial photographs is often lost when the scene is restricted to a small print. For maximum detail, smooth or glossy paper should be used. For some pictorial and "atmosphere" subjects, the rougher surfaces are suitable.

MOVIES FROM THE AIR

The fact that movement enhances motion pictures makes this medium ideal for many interesting sequences that are difficult to capture as still pictures. Whether a flight is being made in a private or commercial aircraft, the flight itself provides a complete shooting scenario for a record of the trip. Good introductory shots can be made of the plane coming in to land, and being loaded with cargo and passengers, and a sequence can be made of the airport as the plane takes off. The body of the movie may consist of scenes taken in flight, followed by the final approach, landing, and disembarkation.

Movie makers will appreciate the advantages offered by Kodachrome for aerial photography. The sparkle and reality of Kodachrome movies is not dependent on shadows for depth and contrast because Kodachrome captures the natural color contrast of the terrain itself. Pictures from the air on Kodachrome Film, Daylight Type, are improved by the use of the Kodachrome Haze Filter. The remarks on pages 6 and 7 regarding the use of Kodachrome Roll Film may also be applied to Kodachrome Film for 8-mm and 16-mm movie cameras.

Cine-Kodak Super-X Films (16mm and 8mm) are recommended for black-and-white pictures. Such pictures from the air are improved by the use of a CK-3 (yellow) filter.

When a Cine-Kodak is used at low altitude, as in approaching or leaving the airport, there is an advantage in smoothness of results by photographing at 32 or 64 frames per second if the resulting impression of low speed is acceptable. The lens diaphragm must be opened correspondingly. The high speed tends to reduce jerkiness due to bumping in the air. Practically all air views seem to look better when taken at higher speeds than 16.

WARNING ON PHOTOFLASH LAMPS IN AIRCRAFT

Recent experiments have established that Photoflash Lamps, with the exception of the primer type (SM), can be ignited by high-energy, short-wave, electromagnetic radiation such as is encountered from radar transmitters. This may constitute a fire hazard in aircraft operating near or equipped with radar transmitters. Photographers are warned not to ship Photoflash Lamps by air. Airline authorities or regulations should be consulted regarding the personal possession of Photoflash Lamps in aircraft.

SLOWEST RECOMMENDED SHUTTER SPEEDS

For Amateur Aerial Photography

VERTICALS OR LOW OBLIQUES*

ALTITUDE (FT.)	GROUND SPEED IN M. P. H.				
	75	100	125	150	200
4,000	1/50	1/50	1/50	1/50	1/100
3,500	1/50	1/50	1/50	1/100	1/100
3,000	1/50	1/50	1/100	1/100	1/100
2,500	1/50	1/100	1/100	1/100	1/200
2,000	1/100	1/100	1/100	1/100	1/200
1,500	1/100	1/100	1/200	1/200	1/200
1,000	1/200	1/200	1/200	1/400	1/400
500	1/400	1/400	1/400	—	—

* Taking pictures obliquely as the aircraft approaches or leaves the subject may permit slower shutter speeds, provided the slower speed is adequate to counteract camera movement caused by rough air, airplane vibrations, etc.

BASIC AERIAL EXPOSURES WITH KODAK FILMS

Scenes In Bright Sunlight	Kodachrome Daylight Type or Type A with Type A Filter— 35mm, Bantam	Ektachrome or Kodachrome Prof. Daylight Type*	Kodacolor	Plus-X	Super Panchro- Press, Type B	Infrared with Wratten A Filter
Average Scenes with houses, trees, fields. No important shadows.	1/100 sec. f/4	1/50 sec. f/4.5	1/100 sec. f/5.6	1/100 sec. f/8	1/200 sec. f/8	1/100 sec. between f/5.6—f/8
Bright Scenes— Deserts, Beaches.	1/100 sec. f/4.5	1/50 sec. f/5.6	1/100 sec. f/6.3	1/100 sec. between f/8—f/11	1/200 sec. between f/8—f/11	1/100 sec. between f/5.6—f/8
Dark Scenes—Winter Scenes without Snow.	1/100 sec. f/3.5	1/50 sec. f/4	1/100 sec. f/4.5	1/100 sec. f/6.3	1/200 sec. f/6.3	
High Obliques for Cloud Detail. (Use filter with Black and White Films. Increase exposure accordingly.)	1/100 sec. f/6.3	1/50 sec. f/8	1/100 sec. between f/8—f/11	1/100 sec. between f/11—f/16	1/200 sec. between f/11—f/16	1/200 sec. between f/5.6—f/8

*For Type B Films with Wratten 85B Filter, give 1/2 stop more exposure.

Note: First determine necessary shutter speed from table on preceding page, then calculate equivalent exposure from the above table.