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Specifications are subject to change without notice
This catalog supersedes all previous Fastax catalogs. For the purpose of clarifying the listing of Fastax products, consolidations were made, items discontinued, and new stock numbers assigned.
Fastax Applications Unlimited

High-speed photography has almost unlimited applications. A variety of studies in the electrical, mechanical, chemical, medical, and physical fields have been notably successful. For example, a study of aircraft wing tips, made by a prominent research laboratory, showed that at supersonic velocities, structural weaknesses resulted. Analysis of the projected film pointed to the elements needing redesign. A medium-sized tool company studied cracking of rapidly moving metal cans. “Seeing” the problem made the solution easy. A small ruler-manufacturing company cut printing rejects to a fraction of a percent by using high-speed photography, which reduced the blur of speed to action the eye could follow and provided a solution to what had been an unsolvable problem.

High-speed motion-picture photography can help many types of businesses, both large and small. It will pay you to investigate.

Fastax high-speed motion-picture studies have been successfully made in the following fields:

MILITARY AND NAVAL STUDIES

Bomb releases
Effect of impact and pressure waves on various materials
Ejection of torpedoes from both deck tubes and underwater tubes
Explosive effect of bombs, shells, rockets, and grenades
Flight-of-projectile studies

Impact of incendiary bullets and shells
Jamming actions on machine guns
Measurement of acceleration of missiles
Measurement of muzzle velocities
Power units of torpedoes
Rocket studies
Wind tunnel studies

Preface

Fastax photography is the taking of high-speed motion pictures to record permanently, for study and analysis, phenomena too fast for the human eye to discern.

Just as a micrometer is used to measure space in terms of thousandths of an inch, the Fastax Camera is used to measure action in thousandths of a second. The Fastax Camera is, in effect, a time microscope, designed to “stop” motion, thereby magnifying space and time.
The Camera

Fastax Cameras are not complex instruments. They can be operated by almost anyone with some knowledge of photography and a little training. Fastax Cameras differ from ordinary motion-picture cameras in that the film is pulled past the aperture in a continuous motion. Instead of using a shutter to expose each film frame during a stationary cycle, Fastax frames are exposed through a rotating prism traveling in synchronism with the film. By this method, speeds of up to 18,000 pictures per second are obtained.

8mm, 16mm, and 35mm Fastax Cameras with 100', 400', and 800' film capacities and speeds of from 150 to 18,000 pictures per second are available in both motion-picture and combined motion-picture-oscillographic models.

In the Fastax Camera, light from the subject passes through the taking lens, through a rotating prism and then onto the film. Two motors are used—one to drive the film-sprocket-prism mechanism and the other to take up the exposed film.

Designed to operate on full initial voltage impact of up to 140 volts, the Fastax does not require preliminary accelerating equipment. Above 140 volts a Goose Control Unit is recommended to secure the higher speeds.

The 4- or 8-sided prism is used in Fastax Cameras. Intermittent cameras start and stop the film at the camera aperture; however, intermittent motion pictures in excess of 200 pictures per second are not feasible. Use of these precision-made rotating prisms permits the extremely high picture-taking rate.

The Fastax Camera is used to study motion too fast for the eye to catch. The camera expands the viewing-time cycle of an event. Recording an event of 16,000 P.P.S., 1/100 of a second of the completed action can be viewed and analyzed in 10 seconds at a projected speed of 16 P.P.S.

The 8mm and 16mm combined motion-picture-oscillographic cameras give a picture on which the oscillographic trace is superimposed on the subject image. On the 35mm model the oscillographic trace is adjacent to the subject image, which occupies approximately one-half the 35mm frame area. With either of the combined motion-picture and oscillographic cameras, the trace enters through a lens mounted in the door. The light passes through the lens, then through a right-angle prism, and is recorded on the film. This system permits the simultaneous high-speed photography of a mechanical action and its related electrical characteristics. Nonelectrical problems such as strain, vibration, pressure, and acceleration can also be studied when photographing the tube of a cathode-ray oscilloscope.

Timing Light

Depending upon the model, Fastax Cameras are equipped with either a single or double externally activated, neon gas timing light. It is mounted to project its light on the edge of the film, exposing small marks, or "pips." The timing light is used for accurate determination of the speed of a moving subject by computing the film rate in terms of P.P.S. at any point during the film run. The "pips" are exposed at the rate of 120 per second when 110-volt 60-cycle current is applied. The Crystal Control Pulse Generator is used to obtain 100 or 1000 pips per second for measurements of movement when extreme accuracy is required.

The double timing light is available as an accessory for cameras normally supplied with a single timing light. This timing light is used to determine zero time on the film if needed and the other side is free for the regular time base.

Fastax Cameras are precision instruments and are manufactured to exacting tolerances. They are engineering tools designed to assist in solving the most difficult engineering problems.
**WF1-8mm Fastax Camera 100' capacity**

**Viewfinder**

Fastax Cameras are supplied with an erect-image viewfinder. Various types of finders are supplied, depending upon the camera model.

**Viewfinder, Integral.**

The Integral Viewfinder is a part of the camera body and is sighted at the rear of the camera.

**Viewfinder, Removable.**

The Removable Viewfinder is attached to the camera door and is sighted through and from the side of the camera at 90° to the subject.

Lenses for use with the Integral and the Removable Viewfinders have a focusing scale in white. Basic catalog numbers such as WF105 are used for lenses in this category.

**Viewfinder, Removable Reflex.**

The Removable Reflex Viewfinder is placed between the taking lens and the camera. It is supplied in addition to the viewfinder where the field of view is restricted. This finder is used to compose accurately the picture area desired and can be used for focusing. The Reflex Finder is also used on the combined motion-picture and oscillographic camera to compose and focus the oscillographic trace.

Removable Reflex Finders are made in four types, as follows:

- Viewfinder, Removable Reflex, Type I, A-7106, supplied with Fastax Cameras WF5 and WF7.
- Viewfinder, Removable Reflex, Type II, A-12714, supplied with Fastax Camera WF9.
- Viewfinder, Removable Reflex, Type III, A-13665, supplied with Fastax Cameras WF14 and WF15.

When using the Removable Reflex Viewfinder, the camera lens is removed and replaced by the Reflex Viewfinder. The camera lens is then inserted into the finder for viewing and focusing purposes. Lenses supplied for use with these Reflex Viewfinders have a focusing scale in color and another in white. Since the lens is now in a different position, it is focused by using the colored scale. After focusing and composing the picture, the Reflex Viewfinder is removed and the taking lens replaced in its normal position in the camera. The focus ring is now adjusted by taking a reading of the footmark indicated on the colored scale and transposing it to the white scale.

**Double Focusing Scales**

Fastax Raptar Lenses in focusing mounts are supplied with double focusing scales for use with Removable Reflex Finders.

Lenses for use with the Removable Reflex Viewfinder, Type I or Type II, have a red and white focusing scale. Catalog numbers of lenses in this category are followed by the letter R, as, for example, in "WF100R.

The 35mm f/2 yellow and white focusing-scale lens supplied with the WF14 and WF15 cameras is used with the Removable Reflex Viewfinder, Type III, for recording the oscillographic image. If other focal length lenses are used, it is necessary to measure the distances and set the focusing mount accordingly.

The white focusing scale, whether on a double focusing-scale lens or not, can be used to focus the image with any Fastax Camera when the lens is positioned to the camera lens seat.

All lenses in focusing mounts can be furnished with focusing scales calibrated in meters. Order by appropriate catalog number and specify that the focusing scale is to be marked in meters.

**TECHNICAL SPECIFICATIONS**

- **Film Capacity**—100' daylight loading spool.
- **Film**—16mm with 8mm perforations.
- **Frame Size**—8mm, single width (A) or 8mm, double width (B).
- **Aperture**—Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B).
- **Speed**—300 to 16,000 P.P.S. (pictures per second).
- **Lens—**2 1/2" (50mm) / 3.0 Fastax Raptar in focusing mount
- **Lens Mount—**FX1 Fastax Bayonet Mount.
- **Viewfinder—**Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.
- **Timing Light—**Single timing light—120 "pipes" or "marks," per second when energized by 60-cycle current, or 100 or 1000 "pipes" per second when activated by WP21 Timing Light Generator.*
- **Pips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.
- **Cutoff Switch—**Automatically cuts off power to camera at the end of the film run.

**PHYSICAL CHARACTERISTICS**

- **Size—**12" x 12" x 12".
- **Camera Weight—**25 lbs.
- **Shipping Weight—**Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
- **Size of Shipping Carton—**17" x 16" x 16".
- **Camera Color—**Fastax Gray.

**ADDITIONAL ITEMS FURNISHED WITH CAMERA**

Comparted, fiber carrying case with metal-reinforced corners.

Camera test film, and focusing film.

Camera speed characteristic chart.

2-source bottle of camera lubricant.

20-foot power cord.

Plug, for timing light.

Instruction book.

One dust cap.

Lubricant atomizer.

100' film spool, for daylight loading.

100' film-spool can.

Warranty card.

*Available as an accessory.*
WF3 8mm Fastax Camera 400' capacity

TECHNICAL SPECIFICATIONS
Film Capacity—400' daylight loading spool.
Film—16mm with 8mm perforations.
Frame Size—8mm, single width (A) or 8mm, double width (B).
Aperture—Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B).
Speed—760 to 18,000 P.P.S. (pictures per second).
Lens—2" (50mm) f/2.0 Fastax Raptar in focusing mount.
Lens Mount—FX1 Fastax Bayonet Mount.
Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

WF3 16mm Fastax Camera 100' capacity

TECHNICAL SPECIFICATIONS
Film Capacity—100' daylight loading spool.
Film—16mm.
Frame Size—16mm, full frame.
Aperture—16mm, full frame.
Speed—150 to 8000 P.P.S. (pictures per second).
Lens—2" (50mm) f/2.0 Fastax Raptar in focusing mount.
Lens Mount—FX1 Fastax Bayonet Mount.
Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

PHYSICAL CHARACTERISTICS
Size—14" x 17" x 13".
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17" x 16" x 20".
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA
Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film.
Two ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Five speeds, for daylight loading.
Instruction book.
Two dust caps.
Lubricant atomizer.
400' film-speed can.
5/32" Allen wrench.
9/16" open-end wrench.
Warranty card.
Film-speed gauge.

PHYSICAL CHARACTERISTICS
Size—12" x 12" x 12".
Camera Weight—28 lbs.
Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.
Size of Shipping Carton—17" x 16" x 16".
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA
Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film.
Two ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Speed, for daylight loading.
Instruction book.
One dust cap.
Lubricant atomizer.
100' film-speed can.
Warranty card.
**TECHNICAL SPECIFICATIONS**

**Film Capacity**—400' daylight loading spool.

**Film**—16mm.

**Framed Size**—16mm, full frame.

**Aperture**—16mm, full frame.

**Speed**—350 to 9000 P.P.S. (pictures per second).

**Lens**—2" (50mm) /2.0 Fastax Raptar in focusing mount.

**Lens Mount**—FX1 Fastax Bayonet Mount.

**Viewfinder**—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full frame for composition.

**Timing Light**—Supplied with double timing light installed as standard equipment:

1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time.

Timing light exposes 120" "pips," or "marks," per second when energized by 60-cycle current, or 100 or 1000 pips per second when activated by WP31 Timing Light Generator.

Pipe, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

**Cut-off Switch**—Automatically cuts off camera at the end of the film run.

**Power Requirements, Recommended—**

Minimum—12 volts DC, 2.4 amps approx.

Maximum—28 volts DC, 3 amps approx.

Minimum—33 volts AC, 2.5 amps approx.

Maximum—280 volts AC, 16 amps approx.

**Motors—Two motors (115-volt AC-DC 60-cycle).**

One for drive, one for take-up.

**Tripod Socket—Thread size, 3/4" x 16 NC.**

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**PHYSICAL CHARACTERISTICS**

**Size**—14" x 17" x 13.5".

**Camera Weight**—38 lbs.

**Shipping Weight**—Approximately 75 lbs.

**Size of Shipping Carton**—15" x 19" x 20".

**Camera Color**—Fastax Gray.

**ADDITIONAL ITEMS FURNISHED WITH CAMERA**

Compartmented fiber carrying case with metal-reinforced corners.

Camera test film, and focusing film.

Camera speed characteristic chart.

2-ounce bottle of camera lubricant.

20-foot power cord.

Plug, for timing light.

**Power Requirements, Recommended—**

Minimum—8 volts DC, 2.5 amps approx.

Maximum—30 volts DC, 3.0 amps approx.

Minimum—30 volts AC, 2.5 amps approx.

Maximum—280 volts AC, 13.5 amps approx.

**Motors—Two motors (115-volt AC-DC 60-cycle).**

One for drive and one for take-up.

**Tripod Socket—Thread size, 3/4" x 16 NC.**

---

**TECHNICAL SPECIFICATIONS**

**Film Capacity**—100' daylight loading spool.

**Film**—35mm, standard perforation and pitch.

**Frame Size**—35mm, half frame.

**Aperture**—35mm, half frame.

**Speed**—100 to 6000 P.P.S. (pictures per second).

**Lens**—1" (35mm) /2.8 Fastax Raptar in focusing mount, with double focusing scale. (Scale in color is used for focusing when using the Removable Reflex Finder behind the lens. After focusing, using the colored scale, the footage indicated is transposed to the white scale and the Reflex Finder is removed and replaced by the lens.

**Lens Mount**—FX1 Fastax Bayonet Mount.

**Viewfinder**—Integral Viewfinder and Removable Reflex. Finder are furnished with the camera.

1. Integral Viewfinder. It is primarily used for critical focusing through the camera aperture.

2. The Removable Reflex Finder, Type I.

**Power Requirements, Recommended—**

Minimum—8 volts DC, 2.5 amps approx.

Maximum—30 volts DC, 3.0 amps approx.

Minimum—30 volts AC, 2.5 amps approx.

Maximum—280 volts AC, 13.5 amps approx.

**Motors—Two motors (115-volt AC-DC 60-cycle).**

One for drive and one for take-up.

**Tripod Socket—Thread size, 3/4" x 16 NC.**

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*Available as an accessory.*
TECHNICAL SPECIFICATIONS

Oculars—Similar in design to the WFS Camera except rotating prism is not supplied. (Installation of the rotating prism can be made if high-speed motion-picture photography is required. Quotation on request.)

Film Capacity—100' daylight loading spool.

Film—16mm.

Frame Size—None—continuous recording of streak or oscillographic image.

Aperture—16mm, full frame.

Speed—(Recording) 4 feet to 206 feet per second.

Lens—2" (50mm) f/2.0 Fastax Raptar in focusing mount.

Lever Mount—FX1 Fastax Bayonet Mount.

Viewfinder—Integral Viewfinder. For critical focusing and viewing through the camera aperture—covers the full image area for composition.

Timing Light—Single timing light—120 "pips," or "marks," per second when energized by 60-cycle current, or 150 or 1800 pips per second when activated by WFP11 Timing Light Generator.

Fips, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended:

Minimum—8 volts DC, 2.8 amps. approx.
Minimum—28 volts DC, 3.0 amps. approx.
Minimum—30 volts AC, 3.0 amps. approx.
Maximum—250 volts AC, 115.5 amps. approx.

Motors—Two motors (115-volt AC-DC 60-cycle). One for drive, one for take-up.

Tripod Socket—Thread size, 1/4" x 16 NC.

PHYSICAL CHARACTERISTICS

Size—12" x 12" x 12".

Camera Weight—25 lbs.

Shipping Weight—Approximately 50 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17" x 16" x 16".

Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA

Compartemented fiber carrying case with metal-reinforced corners.

Camera test film, and focusing film.

Camera speed characteristic chart.

2-ounce bottle of camera lubricant.

20-foot power cord.

Plug, for timing light.

Spool, for daylight loading.

Instruction book.

One dust cap.

Lubricant atomizer.

100' film-spool can.

Warranty card.

*Available as an accessory.
TECHNICAL SPECIFICATIONS
Film Capacity—500' daylight loading spool.
Film—35mm, standard perforation and pitch.
Frame Size—35mm, full frame.

Aperture—35mm, full frame.
Speed—200 to 2500 P.P.S. (pictures per second).

Magazine—One external magazine furnished—
Loads with 500' daylight loading spool.

Lens—4" (101mm) f/2.3 Fastax Pro-Raport in
focusing mount.
Lens Mount—FX2 Fastax Bayonet Pro Mount.
Viewfinder—Removable. Finder. View is through
the camera aperture and from the side of the
camera at 90° to the subject. For critical
focusing and viewing—covers the full image
area for composition.

Timing Light—Supplied with double timing light
installed as standard equipment.
1. One light to indicate rate of film travel
   in terms of P.P.S.
2. Second light to indicate zero time.
Timing light exposes 120 "pips," or "marks," as
per second when energized by 60-cycle current,
or 100 or 1000 pips per second when activated
by WF811 Timing Light Generator.*

Pips, or marks, exposed on edge of film
indicate rate of film travel in terms of pictures
per second.

Cut-off Switch—Automatically cuts off camera at the
end of the film run.

Power Requirements, Recommended—
Minimum—10 volts DC, 0.05 amps. approx.
Maximum—30 volts DC, 0.5 amps. approx.

Motors—Two motors (115-volt AC-DC 60-cycle).
One for drive, one for take-up.

Tripod Socket—Thread size, 3/8" x 16 NC.

PHYSICAL CHARACTERISTICS
Size—17" x 22" x 26".
Camera Weight—62 lbs.
Shipping Weight—Approximately 150 lbs.
in carrying case packed in carton for
domestic shipment.

Size of Shipping Carton—28½" x 21¼" x
18¼".
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA
Compartmented fiber carrying case with
metal-reinforced corners.
Camera test film, and focusing film.
Camera speed characteristic chart.
3-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Screws, for daylight loading.
Instruction book.
Large dust cap.
Small dust cap.
Lubricant atomizer.
500' film-speed ran.
1/2" Allen wrench.
9/16" open-end wrench.
Film-speed gage.

PHYSICAL CHARACTERISTICS
Size—12" x 12" x 12".
Camera Weight—39 lbs.
Shipping Weight—Approximately 60 lbs.
in carrying case packed in carton for
domestic shipment.

Size of Shipping Carton—17" x 16" x 16".
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA
Compartmented fiber carrying case with
metal-reinforced corners.
Camera test film, and focusing film.
Camera speed characteristic chart.
3-ounce bottle of camera lubricant.
20-foot power cord.
Plug, for timing light.
Screws, 100' for daylight loading.
Instruction book.
One dust cap.
Lubricant atomizer.
100' film-speed ran.
Warranty card.
Focusing film.
Dental mirror.
WF14·16mm Fastax Camera
Combined Motion-Picture and Oscillographic Superimposed
400' capacity

TECHNICAL SPECIFICATIONS
Film Capacity—400' daylight loading spool.
Film—16mm.
Frame Size—16mm, full frame.
Aperture—16mm, full frame.
Speed—650 to 8000 P.P.S. (16 ft. per second to 200 ft. per second).
Lenses—Two lenses furnished. One, a 50mm f/2.0 Fastax Raptor in focusing mount, is mounted on the front of the camera to record the picture image; the other, a 35mm f/2.0 Fastax Raptor Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

The 35mm lens is used with the Removable Reflex Finder, Type III, for composition and focusing the oscillographic trace. After focusing, remove the Reflex Finder and replace it with the lens, transferring the reading obtained on the yellow scale to the white scale. If other focal length lenses are used, it is necessary that the distances be measured and the focusing mount set accordingly.

Lens Mount—FX1 Fastax Bayonet Mount.
Viewfinder—Removable Finder and Removable Reflex Finder, Type III, are furnished with the cameras.

1. Removable Viewfinder. View is through the camera aperture and from the side of the camera at 90° to the subject for critical focusing and viewing—covers the full image area for composition.

2. The Removable Reflex Finder, Type III. Used between the 35mm f/2.0 lens and the camera to compose and focus the oscillographic trace.

Timing Light—Supplied with double timing light fusion as standard equipment.
1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time.

Timing light exposes 120 "pipes," or "marks," per second when energized by 60-cycle current, or 100 or 1000 pipes per second when activated by WF31 Timing Light Generator.

Pipe, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended—
Minimum—16 volts DC, 2.5 amps. approx.
Maximum—28 volts DC, 5.0 amps. approx.
Minimum—25 volts AC, 2.5 amps. approx.
Maximum—250 volts AC, 16 amps. approx.

Motors—Two motors (115-volt AC-DC 60-cycle).
One for drive, one for take-up.

Tripod Socket—Thread size, 3/4" x 16 NC.

PHYSICAL CHARACTERISTICS
Size—14" x 17" x 13/".
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17" x 19" x 20".
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA
Compartmented fiber carrying case with metal-reinforced corners.
Camera test film, and focusing film.
Camera speed characteristic chart.
3-ounce bottle of camera lubricant.
20-foot power cord.

Plug, for timing light.
Speed, 400'/4 daylight loading.
Instruction book.
Two dust caps.
Lubricant canister.
400' film-spool can.
16/16" open-end wrench.

WF15·8mm Fastax Camera
Combined Motion-Picture and Oscillographic Superimposed
400' capacity

TECHNICAL SPECIFICATIONS
Film Capacity—400' daylight loading spool.
Film—16mm with 8mm perforations.
Frame Size—8mm, single width (A) or 8mm, double width (B).
Aperture—Interchangeable masks furnished with each camera, one for 8mm, single width (A) and one for 8mm, double width (B). (8mm single width for motion pictures only; 8mm double width for motion-picture, oscillographic-trace recording, and combined motion-picture, oscillographic-trace photography.)

Speed—1000 P.P.S. to 16,000 P.P.S. (16 ft. per second to 200 ft. per second).

Lenses—Two lenses furnished. One, a 50mm f/2.0 Fastax Raptor in focusing mount, is mounted on the front of the camera to record the picture image; the other, a 35mm f/2.0 Fastax Raptor Lens in focusing mount, mounted on the camera door to record the oscillographic trace simultaneously with the picture image.

The 35mm lens is used with the Removable Reflex Finder, Type III, for composition and focusing the oscillographic trace. After focusing, remove the Reflex Finder and replace it with the lens, transferring the reading obtained on the yellow scale to the white scale. If other focal length lenses are used, it is necessary that the distances be measured and the focusing mount set accordingly.

Lens Mount—FX1 Fastax Bayonet Mount.
Viewfinder—Removable Finder and Removable Reflex Finder, Type III, are furnished with the cameras.

1. Removable Viewfinder. View is through the camera aperture and from the side of the camera at 90° to the subject for critical focusing and viewing—covers the full image area for composition.

2. The Removable Reflex Finder, Type III. Used between the 35mm f/2.0 lens and the camera to compose and focus the oscillographic trace.

Timing Light—Supplied with double timing light fusion as standard equipment.
1. One light to indicate rate of film travel in terms of P.P.S.
2. Second light to indicate zero time.

Timing light exposes 120 "pipes," or "marks," per second when energized by 60-cycle current, or 100 or 1000 pipes per second when activated by WF31 Timing Light Generator.

Pipe, or marks, exposed on edge of film indicate rate of film travel in terms of pictures per second.

Cutoff Switch—Automatically cuts off camera at the end of the film run.

Power Requirements, Recommended—
Minimum—16 volts DC, 2.5 amps. approx.
Maximum—28 volts DC, 5.0 amps. approx.
Minimum—25 volts AC, 2.5 amps. approx.
Maximum—250 volts AC, 16 amps. approx.

Motors—Two motors (115-volt AC-DC 60-cycle).
One for drive, one for take-up.

Tripod Socket—Thread size, 3/4" x 16 NC.

PHYSICAL CHARACTERISTICS
Size—14" x 17" x 13/".
Camera Weight—38 lbs.
Shipping Weight—Approximately 75 lbs. in carrying case packed in carton for domestic shipment.

Size of Shipping Carton—17" x 19" x 20".
Camera Color—Fastax Gray.

ADDITIONAL ITEMS FURNISHED WITH CAMERA
Compartmented film carrying case with metal-reinforced corners.
Camera test film, and focusing film.
Camera speed characteristic chart.
3-ounce bottle of camera lubricant.
20-foot power cord.

Plug, for timing light.
Speed, 400'/4 daylight loading.
Instruction book.
Two dust caps.
Lubricant canister.
400' film-spool can.
16/16" open-end wrench.

Available as an accessory.

Available as a component.

Raptor lenses are designed to meet the highest standards of performance. Each lens has high resolution without the sacrifice of contrast. It is color corrected and provides full coverage to the edge of the film. Each Fastax camera is supplied complete with a standard focal length lens.

A series of Fastax Raptars in focal lengths from 23mm to the 80° Morroolid and extension tubes are available to meet each high-speed requirement. In order to improve the adaptability of Fastax Cameras for general laboratory and field use, a lens kit is available as an accessory for the camera.

**Fastax Raptar Lenses**

**WF105**

2" (50mm) f/2.0 Fastax Raptar in focusing mount

- **Equivalent Focal Length**: The exact measured value is engraved on the lens mount.
- **Click Stops**: Yes.
- **Focusing Scale**: 21" to infinity.
- **Aperture**: f/3.0 to f/22.
- **Horizontal Angular Coverage**: For 8mm — 6.7°.
- For 16mm or double width 8mm — 11.4°.

B为了更好 results will be obtained at reduced lens apertures.

**WF106**

50mm f/2.7 Fastax Raptar Lens in focusing mount

**WF107**

2 1/2" (63mm) f/2.7 Fastax Raptar in focusing mount

- **Equivalent Focal Length**: The exact measured value is engraved on the lens mount.
- **Click Stops**: Yes.
- **Focusing Scale**: 31/2" to infinity.
- **Aperture**: f/3.5 to f/22.
- **Horizontal Angular Coverage**: For 8mm — 4.6°.
- For 16mm or double width 8mm — 9.1°.

**WF108**

3" (75mm) f/2.5 Fastax Raptar in focusing mount

- **Equivalent Focal Length**: The exact measured value is engraved on the lens mount.
- **Click Stops**: Yes.
- **Focusing Scale**: 5" to infinity.
- **Aperture**: f/3.5 to f/22.
- **Horizontal Angular Coverage**: For 8mm — 3.8°.
- For 16mm or double width 8mm — 7.6°.

**WF109**

4" (101mm) f/3.5 Fastax Raptar in focusing mount

- **Equivalent Focal Length**: The exact measured value is engraved on the lens mount.
- **Click Stops**: Yes.
- **Focusing Scale**: 8" to infinity.
- **Aperture**: f/3.5 to f/22.
- **Horizontal Angular Coverage**: For 8mm — 2.8°.
- For 16mm or double width 8mm — 5.7°.

**WF110**

6" (152mm) f/4.5 Fastax Raptar in focusing mount

- **Equivalent Focal Length**: The exact measured value is engraved on the lens mount.
- **Click Stops**: Yes.
- **Focusing Scale**: 20" to infinity.
- **Aperture**: f/4.5 to f/22.
- **Horizontal Angular Coverage**: For 8mm — 1.9°.
- For 16mm or double width 8mm — 3.8°.

*Available for Kodak High Speed Cameras. Quotation on request.*

*All lenses in focusing mounts are available with scales marked in meters when specified.*
**Fastax Raptar Lenses (Cont.)**

**WF113** 10" (254mm) f/4.5 Fastax Raptar in focusing mount

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Scale—50" to infinity.
Aperture—f/4.5 to f/22.
Horizontal Angular Coverage:
For 8mm—11°.
For 16mm or double width 8mm—2.3°.

**WF115** 15" (381mm) f/5.6 Fastax Raptar Fixed-Focus

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Range—Fixed focus, 418 ft. to inf., at f/5.6.
Aperture—f/5.6 to f/22.
Horizontal Angular Coverage:
For 8mm—56°.
For 16mm or double width 8mm—1.5°.

*Available for Kodak High Speed Cameras. Quotation on request.*

**Fastax Raptar Lenses**

for use with Fastax Cameras WF5, WF7, WF9

**WF100R** 1" (25.4mm) f/2.5 Fastax Raptar, for WF9 camera only, in focusing mount with red and white double focusing scale.

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Scale—12° to infinity.
Aperture—f/2.5 to f/22.
Horizontal Angular Coverage:
For 16mm width—22.6°.

**WF102R** 1½" (35mm) f/2.0 Fastax Raptar in focusing mount with red and white double focusing scale.

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Scale—1.5" to infinity.
Aperture—f/2.0 to f/22.
Horizontal Angular Coverage:
For 16mm width (WF9)—16.5°.
For 1/4-frame 35mm—9.9°.

**WF105R** 2" (50mm) f/2.0 Fastax Raptar in focusing mount with red and white double focusing scale.

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Scale—28" to infinity.
Aperture—f/2.0 to f/22.
Horizontal Angular Coverage:
For 16mm width (WF9)—11.4°.
For 1/4-frame 35mm—26.1°.

**WF107R** 2½" (63mm) f/2.7 Fastax Raptar in focusing mount with red and white double focusing scale.

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Scale—31½" to infinity.
Aperture—f/2.7 to f/22.
Horizontal Angular Coverage:
For 16mm width (WF9)—8.1°.
For 1/4-frame 35mm—22.6°.

**WF108R** 3" (75mm) f/2.5 Fastax Raptar in focusing mount with red and white double focusing scale.

Equivalent Focal Length—The exact measured value is engraved on the lens mount.
Click Stops—Yes.
Focusing Scale—5" to infinity.
Aperture—f/2.5 to f/22.
Horizontal Angular Coverage:
For 16mm width (WF9)—7.6°.
For 1/4-frame 35mm—18.9°.

*For use with Removable Reflex Viewfinder, Type I (No. A-7104), supplied with Fastax Cameras WF5 and WF7.
OF for use with Removable Reflex Viewfinder, Type II (No. A-12714), supplied with Fastax Camera WF9.*
Fastax Raptar Lenses (Cont.)

WF110R 4" (101mm) f/3.5 Fastax Raptar in focusing mount with red and white double focusing scale

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Focusing Scale — 8" to infinity.
Aperture — f/3.5 to f/22.
Horizontal Angular Coverage:
For 16mm width (WF9) — 5.7°.
For 3/4-frame 35mm — 14.2°.

WF111 6" (152mm) f/4.5 Fastax Raptar in focusing mount

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Focusing Scale — 20" to infinity.
Aperture — f/4.5 to f/32.
Horizontal Angular Coverage:
For 16mm width (WF9) — 3.8°.
For 3/4-frame 35mm — 9.5°.

WF113 10" (254mm) f/4.5 Fastax Raptar in focusing mount

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Focusing Scale — 50" to infinity.
Aperture — f/4.5 to f/32.
Horizontal Angular Coverage:
For 16mm width (WF9) — 2.3°.
For 3/4-frame 35mm — 5.7°.

WF115 15" (381mm) f/5.6 Fastax Raptar Fixed Focus

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Focusing Range — Fixed focus.
418 ft. to inf. — at f/5.6.
Aperture — f/5.6 to f/32.
Horizontal Angular Coverage:
For 16mm width (WF9) — 1.5°.
For 3/4-frame 35mm — 3.8°.

WF201 4" (101mm) f/2.3 Fastax Pro-Raptar in focusing mount

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Focusing Scale — 4" to infinity.
Aperture — f/2.3 to f/22.
Filter Size — No. 7 (drop in).
Horizontal Angular Coverage:
For full-frame 35mm — 14.2°.

WF202 6" (152mm) f/2.7 Fastax Pro-Raptar in focusing mount

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Focusing Scale — 8" to infinity.
Aperture — f/2.7 to f/32.
Filter Size — No. 8 (drop in).
Horizontal Angular Coverage:
For full-frame 35mm — 9.5°.

WF203 3" (75mm) f/2.3 Fastax Pro-Raptar in focusing mount

Equivalent Focal Length — The exact measured value is engraved on the lens mount.
Click Stops — Yes.
Horizontal Angular Coverage:
For full-frame 35mm — 18.9°.

* All lenses in focusing mounts are available with scales marked in meters when specified.
Wide-Angle Lenses

In order to meet the many needs of professional users of 35mm motion-picture cameras, Fastax cameras, 16mm cameras, and special applications of these cameras, several new series of wide-angle lenses have been developed by Wollensak. These wide-angle lenses have proved to be invaluable where an extreme field of view is required. The lens system is basically that of reversed telephotos in form. An extreme depth of field is possible for the lenses at the maximum apertures, because of the small residual aberrations with the exception of distortion. The resultant distortion is characteristic of extreme wide-angle lenses of high relative aperture.

The lenses can be used, for example, to record instantaneous instrument data shown on a variety of instruments over a large area where the distance from panel to camera is restricted. In many cases the instruments or objects must be located in azimuth and elevation within the distorted field, necessitating correction charts to compensate for the distortion present in the optical system. Distortion curves can be furnished if necessary.

*WF121 3.7mm f/1.5, 142 Wide-Angle Fixed Focus for Fastax Camera WF3

*WF122 5.3mm f/1.5 Fastax Raptor, 84 Wide-Angle Fixed Focus

*Available for Kodak High Speed Cameras. Prices on request.
Fastax Lens Kits

WF137
12.0mm f/1.5 Fastax Raptor, 60° Wide-Angle Fixed Focus

Click Stops - Yes.
Aperture - f/1.5 to f/16.
Image Circle - 12.0mm diameter.

Note: To be used with the following cameras:
WF1 - double width
WF2
WF3
WF4
WF5
WF6
WF137 - 60°
WF15 - double width
WF24
WFx

This lens (WF137) is available in either GSAP or C mounting. Prices on request.

WF138
8.3mm f/1.5, 142° Wide-Angle Fixed Focus for Fastax Cameras WF5, WF7, WF9

Click Stops - Yes.
Aperture - f/1.5 to f/16.
Image Circle - 18mm diameter.

Note: Angular coverage for lens WF138 when used with the WF9 Camera is 84°. Image circle, 16mm diameter.

WF139
8.3mm f/1.5, 142° Wide-Angle Fixed Focus for Fastax Camera WF8

Click Stops - Yes.
Aperture - f/1.5 to f/16.
Image Circle - 18mm diameter.

WF140
13.0mm f/2.0, 84° Wide-Angle Fixed Focus for Fastax Cameras WF5, WF7, and WF9

Click Stops - Yes.
Aperture - f/1.5 to f/16.
Image Circle - 24mm diameter.

Note: Angular coverage for lens WF140 when used with the WF9 Camera is 70°. Image circle, 16mm diameter.

WF141
13.0mm f/2.0, 84° Wide-Angle Fixed Focus for Fastax Camera WF8

Click Stops - Yes.
Aperture - f/1.5 to f/16.
Image Circle - 24mm diameter.

Note: Angular coverage for lens WF141 when used with the WF8 Camera is 70°. Image circle, 16mm diameter.

The following wide-angle lenses can be made available for special adaptations and mountings to various makes of cameras and instrument data recording devices other than Fastax.

<table>
<thead>
<tr>
<th>Focal Length</th>
<th>f/No.</th>
<th>Diagonal Coverage</th>
<th>No. of Elements</th>
<th>Image Circle</th>
<th>Circle of Illumination</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.7mm</td>
<td>f/1.5</td>
<td>142°</td>
<td>8</td>
<td>7.5mm</td>
<td>7.5mm</td>
</tr>
<tr>
<td>3.8mm</td>
<td>f/1.5</td>
<td>142°</td>
<td>8</td>
<td>7.5mm</td>
<td>7.5mm</td>
</tr>
<tr>
<td>12.0mm</td>
<td>f/1.5</td>
<td>60°</td>
<td>8</td>
<td>12.7mm</td>
<td>12.7mm</td>
</tr>
<tr>
<td>8.3mm</td>
<td>f/1.5</td>
<td>142°</td>
<td>8</td>
<td>18mm</td>
<td>18mm</td>
</tr>
<tr>
<td>8.3mm</td>
<td>f/2.0</td>
<td>142°</td>
<td>8</td>
<td>24mm</td>
<td>24mm</td>
</tr>
</tbody>
</table>

These lenses are made on special order. Prices and types of mountings are available on request. Specifications and other pertinent data should be included with the inquiry.

WF126
Fastax Lens Kit in compartment case consisting of one each of the following:
WF102 50mm f/2.0 Raptor
WF101 101mm f/2.0 Raptor
WF111 102mm f/4.5 Raptor
WF120 84° Extension Tube
WF130 84° Extension Tube
WF131 1.5 Extension Tube
WF142 2.0 Extension Tube

Note: Lens Kit WF126 for Fastax Cameras WF1, WF2, WF3, WF4, WF6, WF14, WF15.

WF126R
Fastax Lens Kit consisting of lenses with red and white double focusing scale in compartment case:
Includes same focal length lenses and tubes as for WF126.
Note: Lens Kit WF126R for Fastax Cameras WF5, WF7, WF9.

WF127
Fastax Lens Kit in compartment case consisting of one each of the following:
WF105 30mm f/2.0 Raptor
WF101 101mm f/2.0 Raptor
WF111 102mm f/4.5 Raptor
WF129 84° Extension Tubes
WF130 84° Extension Tubes
WF131 1.5 Extension Tube
WF142 2.0 Extension Tube

Note: Lens Kit WF127 for Fastax Cameras WF1, WF2, WF3, WF4, WF6, WF14, WF15.

WF127R
Fastax Lens Kit consisting of lenses with red and white double focusing scale in compartment case:
Includes same focal length lenses and tubes as for WF127.
Note: Lens Kit WF127R for Fastax Cameras WF5, WF7, WF9.
Mirrotel Lenses are available for installation to the Fastax Cameras. These lenses are of the long-focus type to record phenomena where distance to subject is restricted by the terrain or because of the nature of the event. These lenses are available in focal lengths of 20", 40", and 80".

**THE MIRROTEL**: Probably the most important and obvious advantage of optical-mirror systems is the complete absence of chromatic aberration (no special focusing for infrared!). There are no secondary color and no lateral color to fuzz up the image. Because the light path is “folded” three times within the system, the length and weight are less than one-third those of an equivalent refractive telephoto objective, thereby permitting greater stability (extremely important for long-focus objectives), ease of operation, and superior performance. Example: a conventional 80" EFL refractive telephoto objective would be 68" long measured from focal plane to front lens. The 80" Mirrotel is only 20" from focal plane to front. This ratio is also true for the 20" and 40" Mirrotel.

The Mirrotels are concentric systems; therefore, the straight line containing the center of curvature parallel to any given ray of light may be regarded as an axis of the system. There is no coma, astigmatism, or distortion. This means that the high-quality axial image is maintained at all extra-axial image points.

The mirror surfaces and all glass-to-air surfaces are treated with Wollensak anti-reflection hard coating, Wocote. This coating effectively reduces internal reflections, bouncing light and flare . . . greatly increases image contrast and brilliance . . . sharpens detail . . . produces purer, richer colors in full-color photography. Wocoting is done by Wollensak, in the Wollensak factory, with the best precision equipment under rigidly controlled conditions to assure uniformity and highest possible performance.

Only with the Wollensak Mirrotels is the physical limit of resolution attained as defined by Lord Rayleigh on the basis of the Airy disc.

Every Mirrotel lens is individually assembled, adjusted, and tested to meet the standard of resolution defined by the design. A photograph is made with each lens, using a target one mile away. This photograph is furnished with the lens to prove its performance.

Mirrotel Lenses can be ordered for use with Fastax Cameras or for those cameras in the field. Prices for lenses and supporting bracket focusing mounts are available upon request. Additional technical data and specifications for Mirrotel Lenses are included in the Wollensak “Optical Instrumentation” Catalog. Catalog numbers WF10 through WF13, WF117 through WF120, WF207, and WF308 previously assigned to Fastax Cameras with Mirrotel Lenses and for Mirrotel Lenses only for use with Fastax Cameras have been eliminated. When ordering Mirrotel Lenses, it is necessary to specify the model of camera on which it is to be mounted.

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**FIDUCIAL MARKING ATTACHMENT**

The Fiducial Marking Attachment is an optical system used between the camera and the taking lens. It records simultaneously the subject image and reference marks in the form of cross hairs on each frame.

The image from the camera lens is focused on a collecting lens engraved with the cross-hair reticle. A 1:1 lens system then relays the image and reticle pattern to the film plane. It is designed for frame-by-frame analysis.

**SPECIFICATION**

The Fiducial Marking Attachment adds a fiducial mark to the image, thus eliminating the need for reference lines at the subject. The unit includes a bayonet-type mount, and is used between the lens and camera. Any Fastax Raptor lens in focal length from 1" to 15" can be mounted on the attachment.

**WF209**

Fiducial Marking Attachment for lenses used with Fastax Cameras WF8

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**Lens extension tubes and shims for all Fastax Cameras, except WF8**

Used to photograph objects at shorter distances than can be obtained with the lens without extension tubes. The longest tube permits the shortest working distance.

**WF129 Extension Tube 3/4"**

**WF130 Extension Tube 1"**

**WF131 Extension Tube 1 1/2"**

**WF132 Extension Tube 2"**

**WF134 Lens Plate Shim 1/4"**

**WF134 Lens Plate Shim 1/2"**
Power Control Units

1. GOOSE CONTROL UNIT

The Goose Control Unit permits the synchronization of the camera with the event being studied, remote-control operation, and regulation of the camera's speed. It incorporates a variable AC autotransformer with an output of up to 290 volts—the voltage required for maximum operating speed—and employs a set of electrical timers. Synchronization of the camera with the event can be controlled by means of a selector switch on the Goose. The event can be started before, simultaneously with, or after the camera has started. Camera speed is controlled by the voltage applied.

Since sprocket starting torque increases to the point that the sprocket tends to tear the film perforations, on application of voltages above 130 volts AC, the Goose acts as a time-delay mechanism which allows the camera to start under a maximum of 130 volts and, 70 milliseconds later, releases the higher voltage necessary to obtain the higher frame rate.

2. POWERSTAT

The Powerstat is a variable AC transformer with an output of up to 120 volts. It is used only when intermediate speeds are desired and controlled synchronization of the camera with the event is not required.

3. DC RECTIFIER

The Fastax Rectifier affords a DC power supply and is designed to operate the Fastax Cameras over their low-speed range. It is lightweight, portable, and delivers a continuous output, variable from 0 to 30 volts DC, controlled by a variable AC input.

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**WF301 Goose Control Unit, 115-volt AC 60-cycle, for Fastax Cameras**

**SPECIFICATIONS**

- Size: 12" x 18" x 10".
- Voltage Control: 0-280 volts output; 115 volts DC output at 60-cycle input.
- Weight: 60 pounds.
- Power Line Required: 30 amperes, with capacity to withstand 100-ampere momentary shock.
- *Timers Supplied: Two plug-in 6-second timers supplied for camera and event. 15-second, 30-second, 45-second, and 6-minute timers also available and are usually used on the camera circuit."

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**WF314 Powerstat AC Variable Transformer, Type 116**

**SPECIFICATIONS**

- Line Input: 115 volts AC, 50-60 cycle.
- Variable Range: 0 to 135 volts AC.
- Current Rating: 1000 ma.
- Output Power Rating: 1.0 KVA maximum.
- Size: 6 1/2" x 4 1/2" x 8 1/2".
- Weight: 10 lbs.

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**WF358 Goose Control Unit, 115/230-volt AC 50-cycle, for Fastax Cameras**

**SPECIFICATIONS**

- Size: 12" x 18" x 10".
- Weight: 60 pounds.
- Voltage Control: Toggle switch control 115/230 volts at 50-cycle input; 9-280 volts output.
- Power Line Required: 30 amperes, with capacity to withstand 100-ampere momentary shock.
- *Timers Supplied: Two plug-in 6-second timers supplied for camera and event. 15-second, 30-second, 45-second, and 6-minute timers also available and are usually used on the camera circuit."

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**WF300 Fastax Rectifier for Fastax Cameras**

**SPECIFICATIONS**

- Input: 115 volt AC.
- Output: DC full-wave rectified, 0 to 30 volts.
- Ampere: 4 amperes DC maximum.
- Meter: Panel-mounted DC output voltmeter.
- Size: 8" x 8" x 8 1/2".
- Weight: 75 lbs.

*Must be used with WF314 Powerstat.*
Fastax Exposure Meter

The Fastax Exposure Meter is manufactured for Wollen- sak by Weston Electric Instrument Corporation. Because of the extreme speed of the Fastax, a conventional exposure meter cannot be used, and the human eye is incapable of estimating the high light values employed. Improperly exposed film not only is film lost but may also mean hours of preparation time lost. This meter is made exclusively for use with the Fastax Camera and is made in accordance with Wollensak specifications. The meter has ranges of 0-3000, 0-30,000, and 0-300,000 foot-candles. These ranges cover all light conditions from normal sunlight to extremely high artificial-light levels, such as that obtained with multiple banks of high-intensity spotlights.

Fastax Tripod—portable tripod with table allowing 180° vertical and 360° horizontal swing.

Fastax Heavy-Duty Tripod—recommended for WF2, WF3, WF8, WF14, and WF15 Cameras.

Fastax measuring stand with bulb, stand, lamp, and meter.

Lighting Equipment

Fastax lighting equipment has been specially designed to cope with the illumination problems of high-speed photography. Photography at high speeds requires the subject to be well lighted. For portable use the 700-R Lamp has been developed. This is a prefocused lamp designed to be most effective at distances of from 14° to 18° from the subject. These lamps are used with alligator clamps made to clamp tightly on any surface. The High-Lo series-parallel switch should be used with these lamps to reduce the voltage in half while setting up and composing the picture.

Wollensak Fastlites are available when higher illumination is required. Fastlites are condensing projection-type lamps designed to cover a reasonable area with maximum illumination. In the Fastlite an image of the filament is projected through an aspheric condensing lens onto the subject. A spherical mirror is placed behind the lamp to reimage the filament for maximum light output. By moving the lamp back and forth the filament image can be focused on the subject. A water cell can be placed in front of the Fastlite to absorb the heat.

Clamp, Alligator, with porcelain socket and heavy-duty cord. Without lamps.

Fastlash Control Unit

WF328

Fastlash, complete with control unit and four reflectors.

Specifications

Fastlash Control Unit for firing in sequence twenty No. 11 photoflash lamps. Four reflectors, each holding five receptacles, are provided with plastic shield. Will operate off event circuit on WF301 Goose Control Unit. Carrying case furnished. (Lamps not furnished.)

Weight—75 lbs. Dimensions—28" x 24" x 9". Shipping Carton—29½" x 25½" x 10½".

Pulse Generator

WF311

Timing Light Pulse Generator.

Specifications

Power Input—115 volts AC. Frequency variable from 50 to 400 cycles. Power Output—100 or 1000 cycles per second square wave for operating timing light. Stability—1 part/million, crystal controlled.

pip Length—Approx. 40 microseconds. Weight—Approximately 15 lbs. Size—10" x 10" x 10" (approximate).

Timers for Goose Control Units

WF304 Timer, 5-Second; plug-in type.
WF305 Timer, 15-Second; plug-in type.
WF333 Timer, 30-Second; plug-in type.
WF306 Timer, 60-Second; plug-in type.
WF307 Timer, 5-Minute.

Miscellaneous Accessories

WF323 Lamp, 760-R.
WF324 Lamp, NE66 for Timing Light.
WF325 Lamp, 1000W for Fastlites.
WF315A High-Lo Switch, Heavy-Duty.
WF316 Carrying Case for Fastax Camera, Models WF1, WF3, WF6.
WF330 Carrying Case for Fastax Camera, Models WF2, WF4, WF14, WF15.
WF331 Carrying Case for Fastax Camera, Models WF3, WF7, WF9.
WF332 Carrying Case for Fastax Camera, Model WF5.
WF317 Oil (2-ounce bottle).
WF318 Atomizer.
WF319 Lens Plate Dust Covers for all Fastax Cameras except WF5.

WF316—Carrying Case for Fastax Camera.
Wollensak Fastax Film

Fastax Film is made exclusively for Wollensak by Du Pont and is made available to assure a source of supply of a film that is especially suitable for high-speed photography. Film pitch tolerances for Fastax Film are held to A.S.A. standards ± .0005.

Type 931 is a new high-speed panchromatic reversal film, designed to give a combination of highest picture speed and very rapid processing characteristics. Highly hardened emulsions characterize this film, making it very suitable for use at high temperatures and for ultrarapid processing without impairment of picture quality. A standard antihalation safety base contributes to the excellent definition of this film. Its emulsion and processing characteristics prove ideal for original reversals for immediate use where only one positive is required.

This film has good inherent contrast and will produce good brilliant pictures either by reversal or negative processing. It is a fast film with good grain characteristics when developed in normal fast-acting developers. The film has a wide exposure latitude and reacts very favorably when developed in fine-grain developers.

Superior 4 has an ultra high-speed and fine-grain emulsion, making it ideal for high-speed photography when processing to a negative only is required. Neither 931 nor Superior 4 suffers reciprocity law failure even at highest picture taking rates.

**Type 931 Reversal**

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<td>Daylight—ASA 89 Incandescent—ASA 64</td>
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<th>Film</th>
<th>Length in Feet</th>
<th>Perforation</th>
<th>Perforation Pitch</th>
<th>Pack</th>
<th>For Cameras</th>
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<td>WP406</td>
<td>Rev.</td>
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<td>16mm</td>
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<td>Rect.</td>
<td>.1870</td>
<td>D.L.</td>
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*16mm width perforated for 8mm D.L.—Daylight Loading L.P.—Laboratory packaging (for darkroom loading)

**Superior 4 Negative**

| Daylight—ASA 400 Incandescent—ASA 320 |

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*16mm width perforated for 8mm D.L.—Daylight loading L.P.—Laboratory packaging (for darkroom loading)
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