

ARRIFLEX 16SR

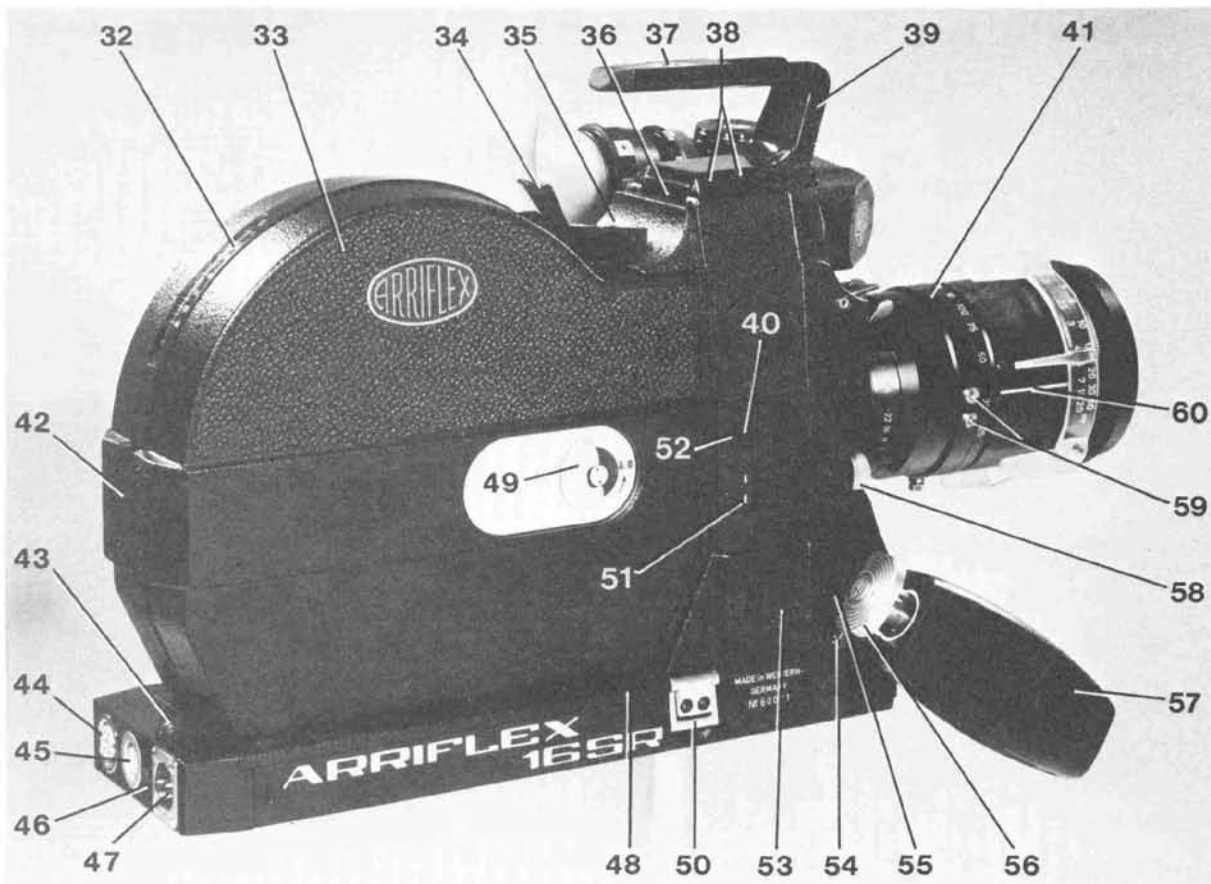
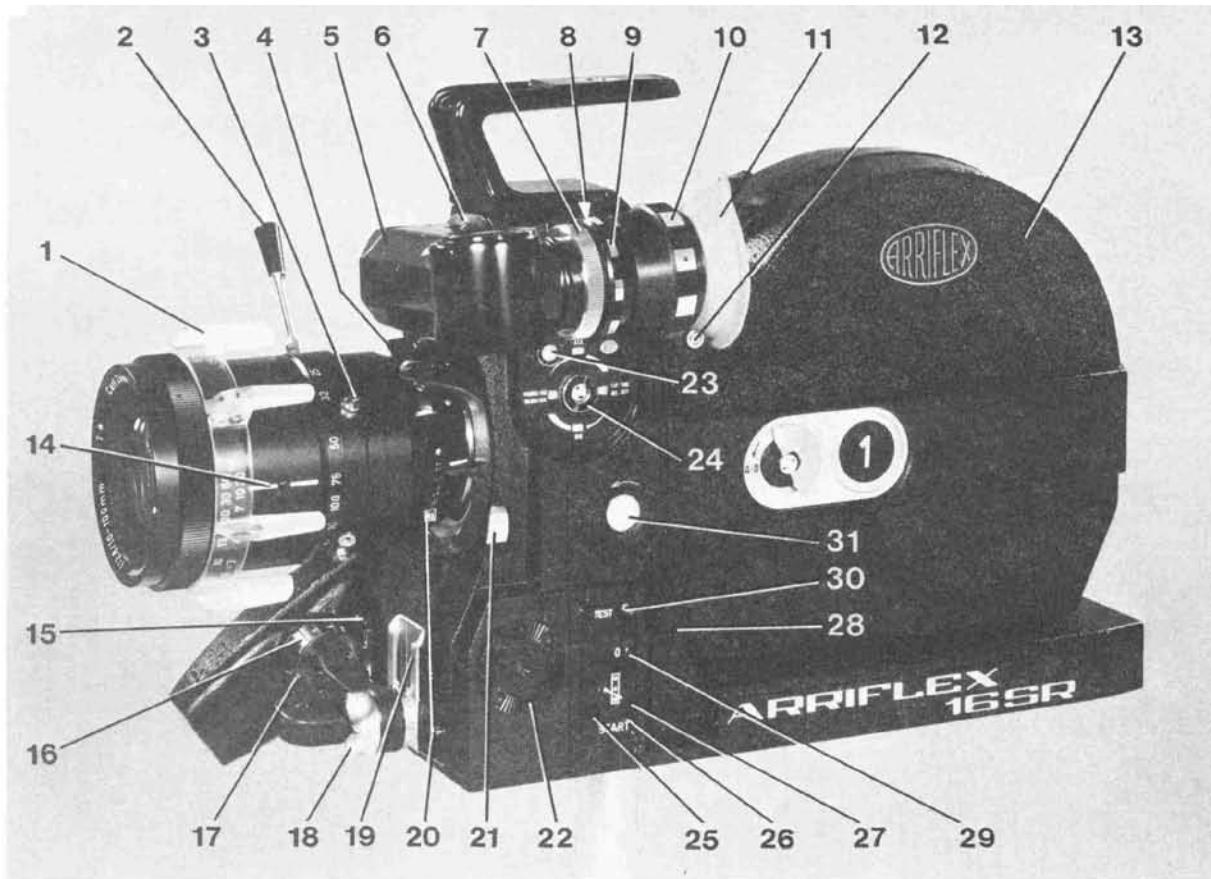
Instruction Manual



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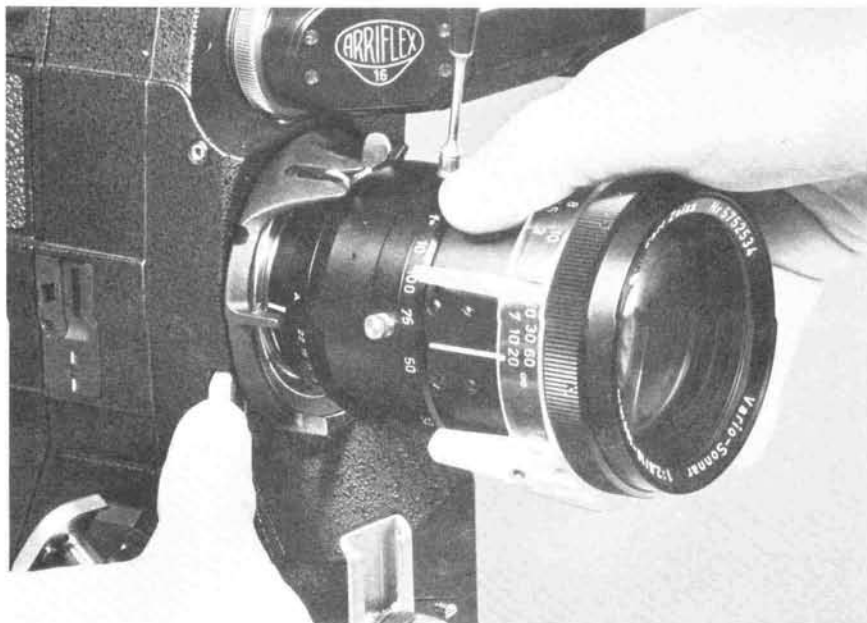
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Mounting Lenses

A complete program of lenses is available for the ARRIFLEX 16 SR. It includes zoom lenses with automatic diaphragm, a complete set of high speed ZEISS lenses and all zoom and fixed focal length lenses with normal or ARRI bayonet mount suitable for the ARRIFLEX 16 BL.

Important: Unlike all other ARRIFLEX cameras, lenses are put into the 16 SR with the white index to the right side when looking from the front (exposure meter side).

To mount lenses with ARRI steel bayonet mount, the focus (with fixed focal length lenses or with zoom lenses) is engaged into the slotted coupling of the driver ring (4) while the lens, white index line facing exposure meter side, is carefully inserted into the camera. Once the lens is seated, rotate it clockwise until it stops.



To remove lenses with ARRI steel bayonet mounts, depress the lens release button (58). Then rotate the lens counterclockwise and pull it out of the camera flange.

To mount zoom lenses with standard mounts, the diaphragm lever, or in the case of fixed focal length lenses the focussing lever, is inserted into the slotted coupling of the ring (4). The lens release buttons (21, 58) are pressed together and the lens (with the white index to the exposure meter side) pushed carefully into the lens flange, so that the lens guide in the camera engages the guide groove in the lens mount. Test that the lens is seated firmly.

To remove lenses with standard mounts, the lens release buttons (21, 58) are pressed together.



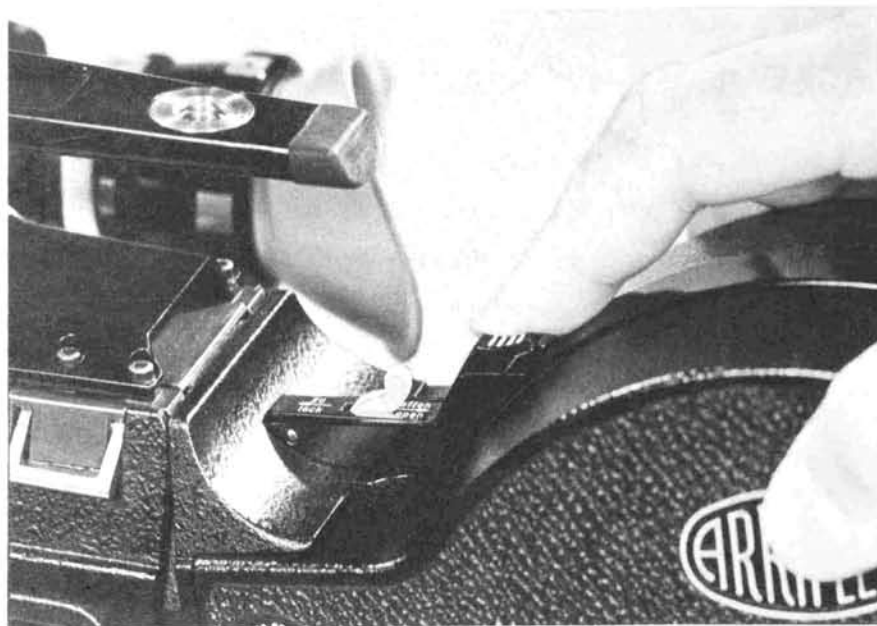
Caution! All lenses listed in the price lists as of 1.4.76 for ARRIFLEX 16 SR and 16 BL, plus Angénieux 5,9mm R 7, 1:1,8 may be used. Furthermore, all lenses for ARRIFLEX 35 cameras can be employed.

Automatic Mirror Shutter Stop

The 16 SR is equipped with an automatic shutter stop circuit. Every time the camera is switched off, the quartz controlled motor brings the mirror shutter to the precise position in which the finder is open for viewing. When no power is connected to the camera, the mirror shutter can be positioned by turning the coin slotted knob (31).

Exchanging the 400 ft (120 m) Coaxial Magazine

ARRIFLEX 16 SR magazines can be changed in seconds. Move the safety lock (35) to the open position, depress the release lever (34) and raise the rear of the magazine until it can be pulled out of the locating guide of the camera.



When mounting a magazine, first engage the hinge pin from above into the locating guide (36) on the camera. Then swing the magazine downwards until it clicks into the locking device. When the magazine is seated, flip the safety lock (35) to the "lock" position. Before running the camera, depress the red "test" knob (30) so that the film transport can safely engage the perforation.

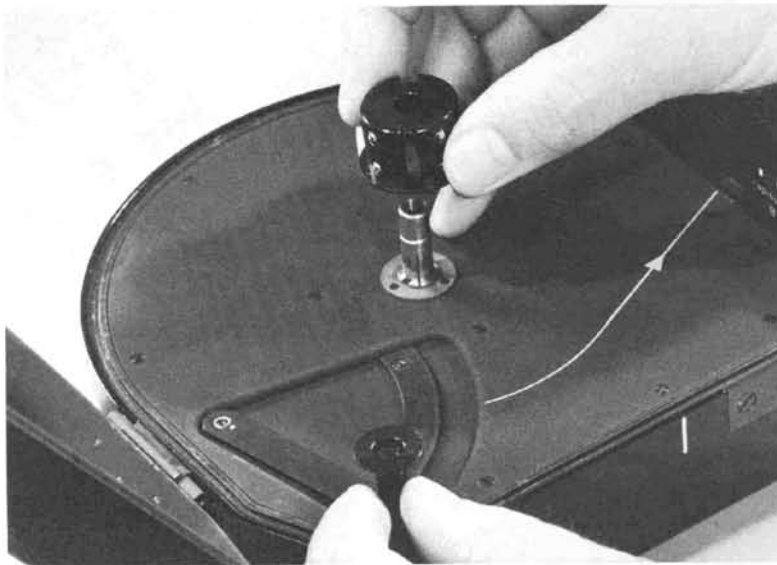


Magazine Loading

The coaxial magazine of the ARRIFLEX 16 SR has a maximum capacity of 400 ft (120 m) of darkroom load film (core-wound). It also accommodates 100 ft or 200ft daylight spools.

As with all other ARRIFLEX cameras, the film must be threaded with the emulsion inwards (with single perforated film always use winding B).

To load the magazine, open the compartment cover on the film supply side. Swing the guide arm down until it is arrested.



When using film on a plastic core, simply slide it onto the magazine core adapter so that the film unwinds counterclockwise, emulsion in, in the direction of the arrow.

Once the film roll is seated, release the guide arm so that the roller guides the film and at the same time functions as an accurate film supply indicator.

When using daylight spools on the supply side, remove the core adapter by pressing the button in the centre of the shaft sideways. Then put the spool on the shaft. The guide arm remains latched away from the spool! For daylight spools, a separate film counter (12) indicates the amount of film used. This counter must be set to zero once the magazine cover is closed.

The film head must always run in the direction of the arrow. Single perforated film is threaded with the perforation to the outside, as shown by the symbol under the threading slot.

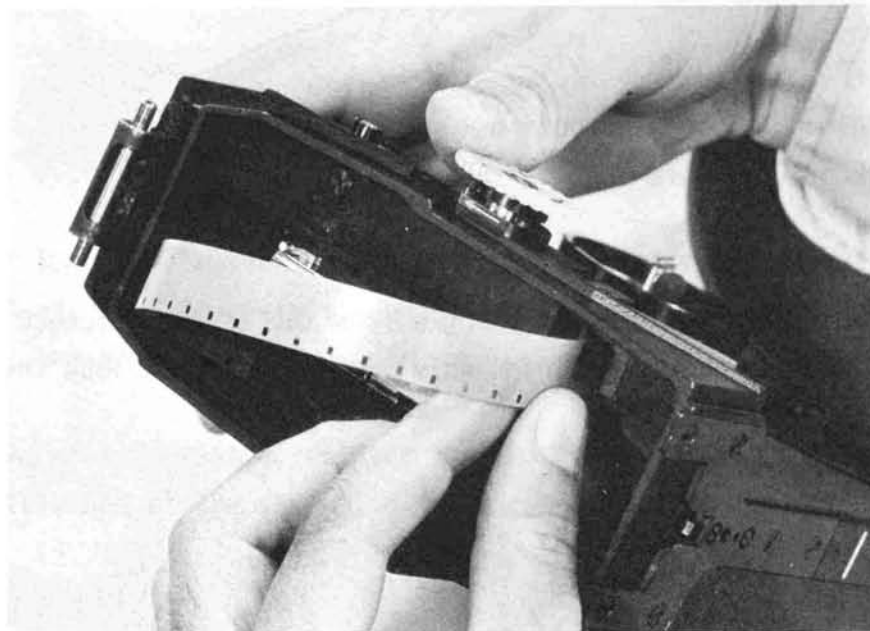
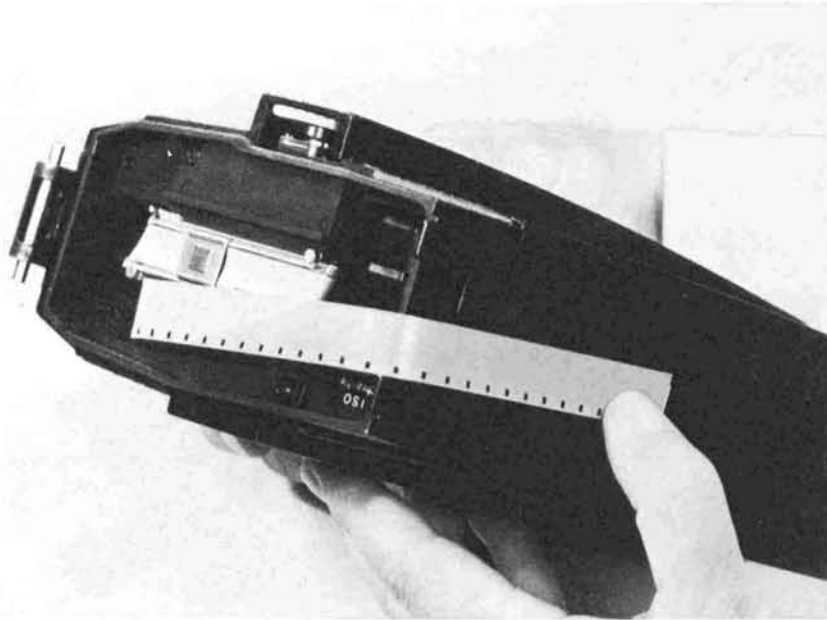
Slide the leading end of the film, which should be cut straight through the middle of a perforation hole, into the feed slot of the magazine until it emerges at the top of the magazine throat.



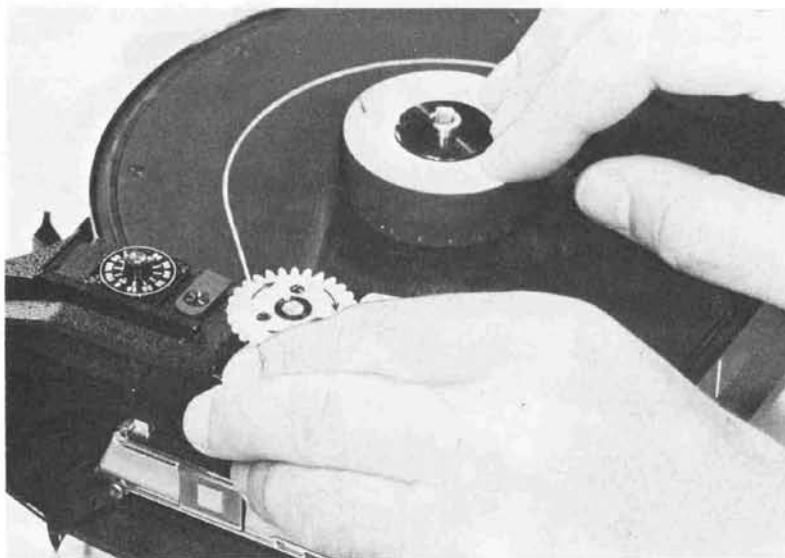
In pushing the film through these guide channels, very little resistance should be felt. If the film does not feed through freely, do not force it! Pull it back out, be sure the loading end is undamaged and start the procedure again.

Once the leading end of the film emerges from the throat, recheck if guide arm is released (for darkroom loads only), then close and lock the magazine cover.

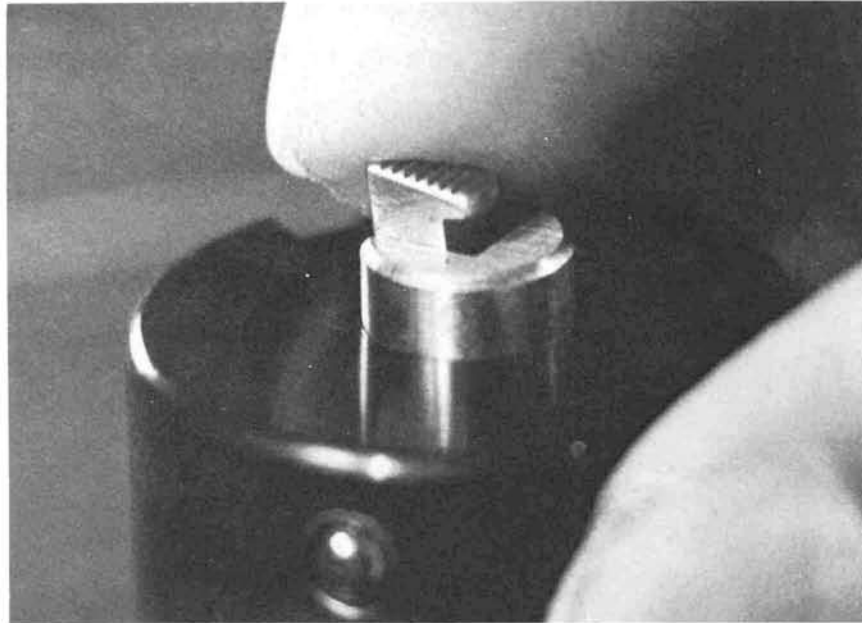
All further loading steps can be carried out in the light. Pull the film from where it emerges down to the loop length marker at the base of the magazine. Then slide the film leader down along the curved guide into the take-up slot until the plastic magazine drive gear starts moving. Continue turning the drive gear in the direction of the arrow by hand until the film emerges in the take-up compartment.



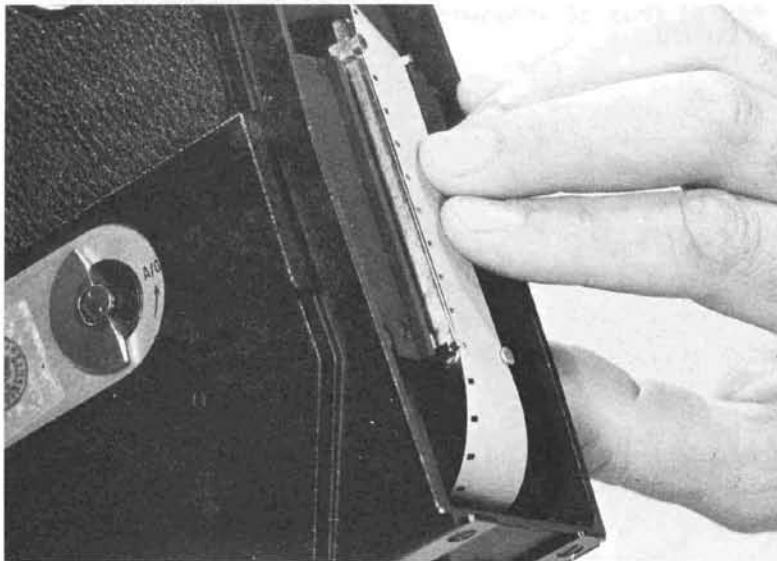
To fasten the film on the take-up shaft, use either a plastic film core over the standard ARRI core adapter or the convenient collapsible core. If using a plastic film core, put it onto the core holder so that the acute angle of the retaining slot points in the direction of running. The film is attached to either core in the usual manner. Be sure the film is firmly engaged on the core and wound tightly several complete turns. The film winding can be tightened by holding the magazine drive gear while turning the core clockwise. Release the film guide arm and make sure it is in proper alignment with the film. Close and lock the compartment cover.



When using daylight spools on the take-up side, remove the core adapter by pressing to the side the button in the centre of the shaft. Engage the film in the slot of the spool and wind a few turns clockwise. Then put the spool on the take-up shaft and tighten the film. The guide arm remains latched away from the spool!



The final step in loading is to slide the film loop under the four retaining hooks, then distribute the film until each side of the loop is of equal size.



Loop Protector

A combination loop protector / magazine cover must be with every magazine to protect the film loop, the magazine throat and the guide rail from damage. To attach it, press it lightly upwards against the magazine hinge and push it onto the casting.

The cover should always be left on until the magazine is placed on the camera.



The Film Aperture Cover

A similar cover is provided to protect the camera aperture. It is mounted the same way as a magazine, and should always be on the camera when no magazine is attached.

Removing the Exposed Film from the Magazine

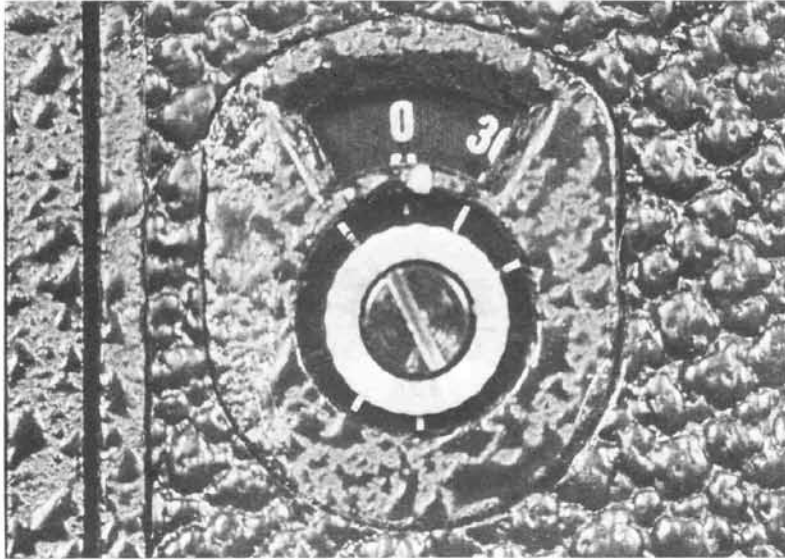
In the darkroom or changing bag, open the take-up compartment cover. Swing the guide arm to its stop position. Lift the film which is wound on a plastic core off the core adapter. The film core adapter cannot be accidentally pulled off with the core because it is locked on the shaft. As with the daylight spool and the collapsible ARRIFLEX take-up core, the core adapter can only be removed when the retaining latch on the take-up shaft is pushed to the side.



To remove film which is wound on a collapsible take-up core, the clamping lever must be released first. This frees the film from the core and at the same time decreases the diameter of the collapsible core so that the film roll can easily be removed. The best way to remove the film is to turn the magazine over and let the film roll drop into the flat hand. If this cannot be done, lift the film carefully out of the compartment, lay it on a flat surface and insert a plastic core into the centre of the roll. A few turns of the core are recommended to mate the film with core.

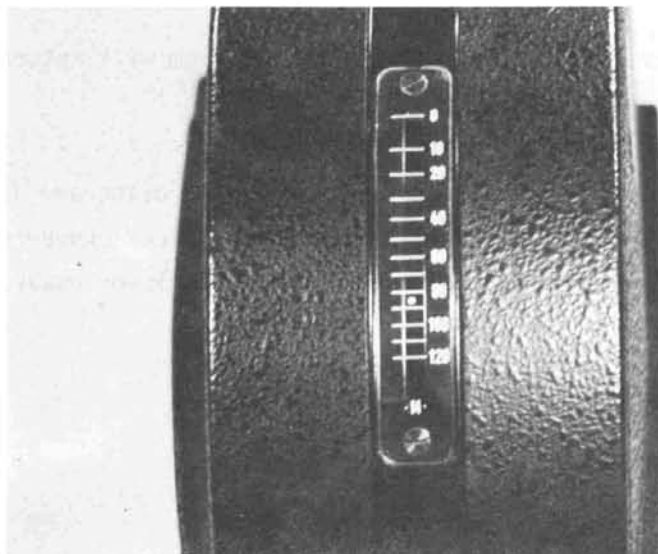
Film Counter for Exposed film

This exposed film meter/foot counting mechanism works with either daylight spools or with darkroom loads on cores. However, it must be set to zero every time the magazine is loaded.



Film Supply Indicator

The film supply indicator on the back of the magazine is controlled via the guide arm in the film feed compartment. As the core-wound film supply decreases, the arm rides down with it and indicates the amount of film left in the compartment. This indicator is inoperative with daylight spools.



Functions of the Main Camera Switch

The ARRIFLEX 16 SR is equipped with a multi-duty main switch that integrates the various camera functions into three basic steps.

Since the camera is usually equipped with one of the auto iris type lenses, we will first describe the switch function based on this camera/lens combination.

In the zero position (29) all electrical systems including the exposure meter and control are switched off and the lens diaphragm is fully opened regardless of the setting of the diaphragm ring.

In the exposure measuring position (27), the exposure meter is activated and the lens diaphragm will close to the pre-selected value on the diaphragm ring.

AT THIS POINT THE EXPOSURE ADJUSTMENT, i.e. TURNING THE DIAPHRAGM RING UNTIL THE EXPOSURE INDICATOR NEEDLE IN THE VIEWFINDER IS CENTRED ON ZERO, IS PERFORMED.

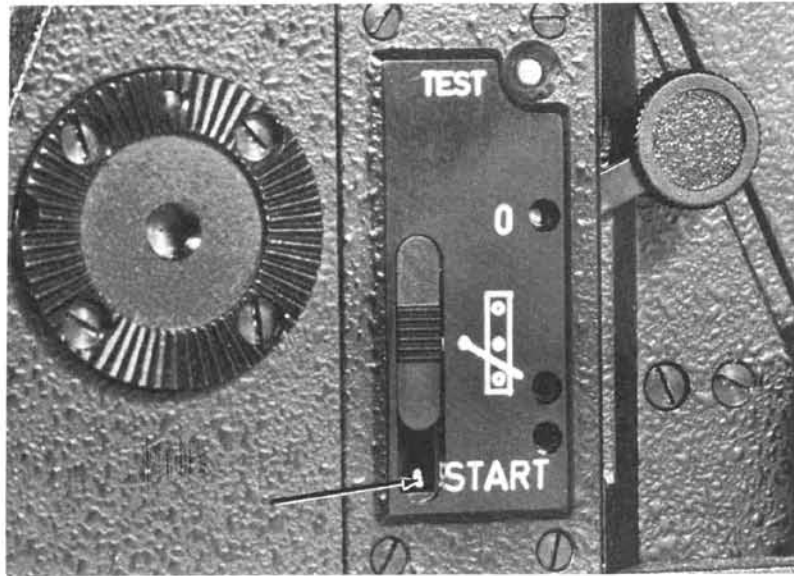
(On cameras equipped with the optional servo exposure control, the proper setting is automatically selected if the lens has been switched to A on the diaphragm ring.)

The start position (26) is the camera run position.

Of course, any exposure changes can be monitored while the camera is running and corrections are made by adjusting the lens diaphragm.

Whenever the camera is switched off, the lens diaphragm will return to the fully open position.

When using lenses which are not equipped with the auto diaphragm, it is possible to restrict the switch travel to within positions exposure control (27) and start (26). This is done by moving the small lever upwards while the main switch is in position 26 or 27.



The slow speed electronic inching system can be activated by depressing the small red button marked "test" (30).

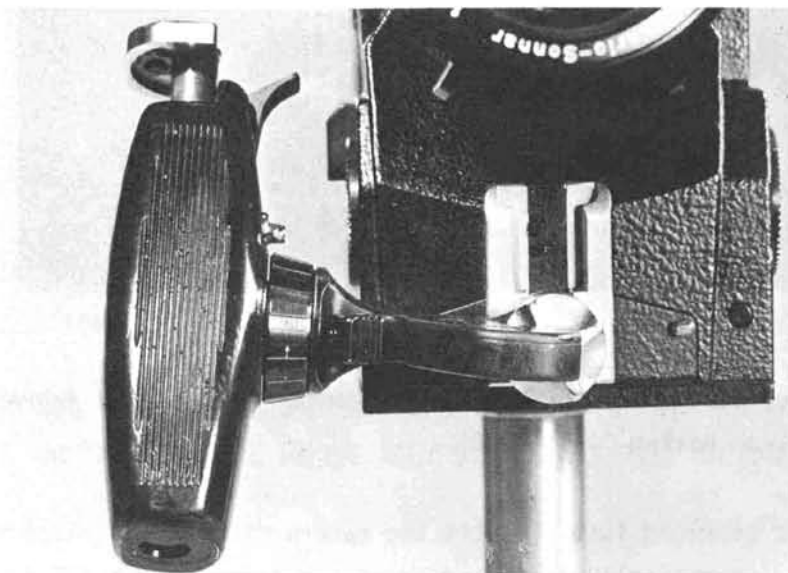
An electronic overload fuse protects the camera circuit and disconnects the power supply automatically if the power consumption exceeds 4.5 A.

If this happens, the camera must be switched off (29) and the cause for the overload should be found and eliminated. The electronic overload protection will reset automatically after a few seconds.

HAND GRIPS FOR THE ARRIFLEX 16 SR

There are three different hand grips for the 16 SR. These can be used either alone or combined, as required.

A Universal Hand Grip



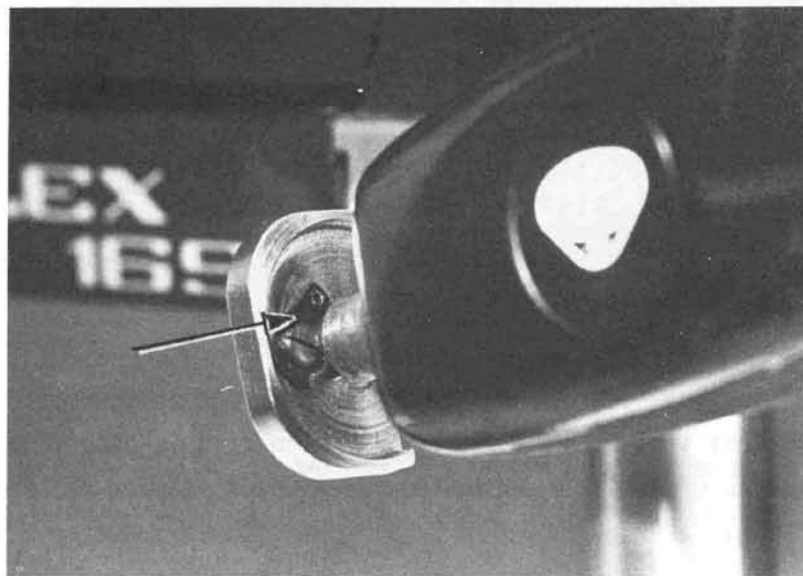
The universal hand grip is the most useful and adaptable of the three grips available. All camera controls can be operated right from the grip, and the grip can be positioned to either the right or the left hand side of the camera. It is mounted to the centrally located accessory shoe (19) on the front of the camera. No cable connections are needed.

Mounting and Adjusting. The mounting slide of the grip slips into the lower half of the mounting shoe (19), positioned as illustrated. It is locked into place by the large thumbscrew (18). To pivot the grip assembly to the left or the right side, depress the push button (17) and the assembly may then be rotated and locked on the preferred side. The position of the universal hand grip itself is also adjustable. The knurled ring (16) is loosened, the hand grip rotated to the position of greatest comfort and the ring is tightened again. This portion of the grip rotates a full 360°.

Camera Operation. The plunger (56) at the top of the grip controls the camera in much the same way as the camera main switch. Depressing the combined plunger to the first detent position switches on the built-in exposure control system, and the auto diaphragm mechanism stops the lens down to the value shown on the F-stop ring. When the outer plunger is pressed all the way down, it latches the camera in the RUN position. The exposure control remains in operation so that exposure can be monitored and changed if necessary while the camera is running.

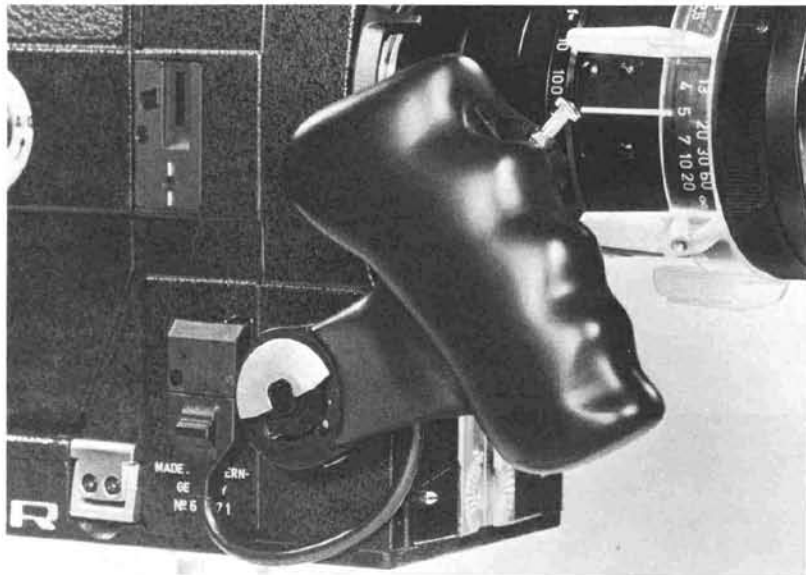
To stop the camera, the trigger release (55) is pushed down and toward the camera body. This allows the plunger to be released to the completely OFF position.

When using lenses without an automatic diaphragm, the plunger is locked by lever (15) into the position that turns on the built-in exposure control. Camera control from the grip is then the same as described on page . The plunger movement is restricted to two positions. In the released position, only the exposure control system is energized. In the down position, the camera is set to RUN.



The pivoted lever on the underside of the universal grip plunger finger pad, rotated into position as illustrated, will cause the plunger to operate only the exposure control and automatic diaphragm. It will not operate the start/stop mechanism of the camera. Camera start/stop must then be controlled from the main switch, or from the auxiliary hand grip if both grips are mounted for two-hand support. When removing the universal hand grip, the camera must be switched completely OFF at the grip, otherwise it cannot be removed from the accessory shoe.

B Standard Hand Grip



The standard righthand grip has particular application for the 16 SR when the camera is used with lenses that are not equipped with an auto diaphragm.

Mounting and Adjusting. The standard hand grip mounts on the special, toothed flange on the right side of the camera (54). The grip is positioned as illustrated and secured with the captive screw which is part of the grip assembly. No tools are needed. The grip's position is adjustable in the plane parallel to the side of the camera. Adjustments are made by loosening the retaining screw, rotating the entire grip assembly, and retightening the screw. Electrical connections are made by plugging the short cable into the adjacent, four-pin, flat socket. A wire spring retainer secures the connection.

Before the camera can be operated via the standard hand grip, the auto diaphragm lever (27) must be closed (see page 14). The start/stop function of the grip

can be operated only if this is done, thus making it impossible for the camera to start with a wide open diaphragm.

Camera Operation. With everything set as described, the plunger on the standard grip has two positions. One: with the plunger in the released position, the camera is stopped. However, the exposure control system is operative and the diaphragm may be stopped down for correct exposure. Two: with the plunger pressed and latched into its down position, the camera will RUN. Exposure may still be monitored and if necessary adjusted while the camera is running. The camera is stopped by depressing the plunger slightly below the bottom detent position and releasing it. The camera stops, but exposure control remains in operation.

C Auxiliary Hand Grip



A third hand grip is also available. It can be mounted on either the left or the right hand side of the camera, and is intended solely as a second hand grip for those camera operators who want two-hand grip camera support. Having no active elements, it serves only as a supplementary grip.

Mounting and Adjusting. The auxiliary hand grip is mounted and adjusted in a very similar way to the standard hand grip. It is secured to the special toothed flange on the left or right side of the camera and its position may be adjusted in a plane parallel to the side of the camera. There are no built-in controls or electrical connections.

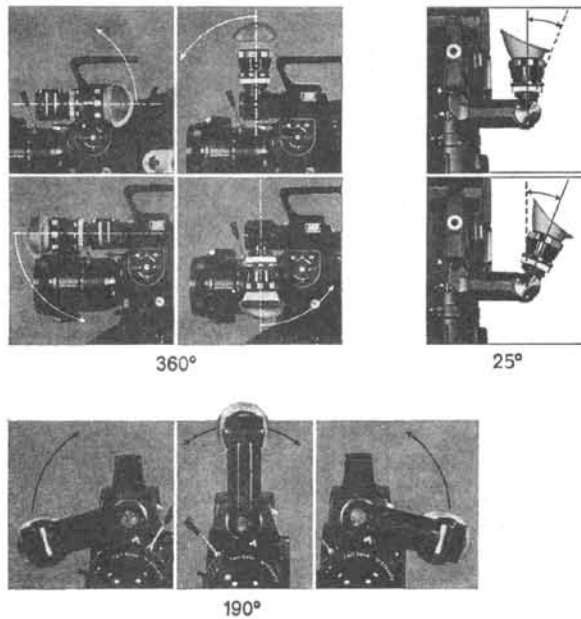
Viewfinder System

Fundamental to the revolutionary, symmetrical layout of the camera is its centre-mounted, fully orientable, swing-over viewfinder.

The finder tube is rotatable in three axes and maintains correct image orientation in every position. Among other advantages, the swing-over feature enables unrestricted camera operation from the left as well as the right side. It also accommodates a left eye position without the need for additional finder attachments.

Uninterrupted viewing is provided by an electronic sensor in a pulsing circuit on the motor, to stop the mirror shutter automatically in the viewing position every time the camera is switched off.

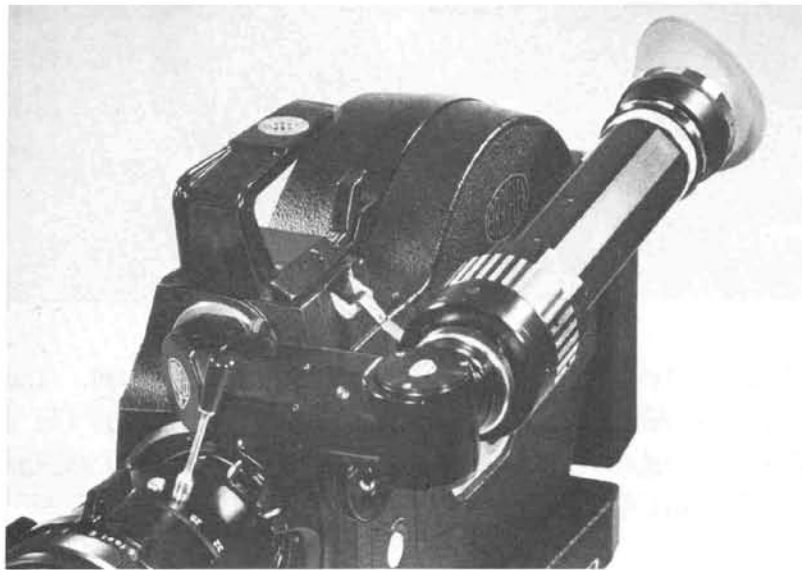
All optical components of the viewfinder are computed to accommodate a new series of lenses with speed values in the area of $f\ 1.2$ and faster. A fibre optic screen instead of the traditional ground glass is used as the focussing device to render a brilliant and critical finder image even under low available light conditions.



Viewfinder Extension

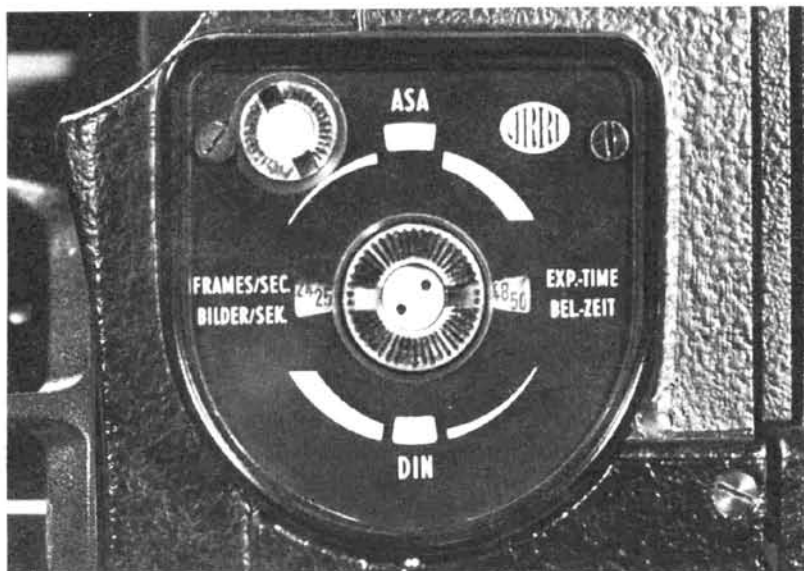
The extension tube is mounted between the camera and the viewfinder eyepiece. Its optical design is such that it does not affect the finder image in any way. The extension is nearly 9 inches long and brings the eye position far enough back to allow comfortable camera handling on a tripod, geared head, ground plate or in any situation where operational comfort and stability are impaired because of unusual camera positions.

As with the finder eyepiece itself, be careful not to cross-thread the large mounting ring when installing the extension and be sure to seat the locating nipples at either end before tightening.



ARRI Exposure Meter

The same well proven electro optical light sensing device which pioneered behind-the-lens measuring in professional motion cameras on our ARRIFLEX 16 BL and 16 St is used as the central component in the ARRIFLEX 16 SR's exposure control system.



The technical parameters of the exposure meter are unchanged. The light is measured behind the lens in the reflex finder system without the need for semireflecting surfaces between the lens and the film. The measuring area is one third of the total image area, centre weighted.

The exposure meter is programmed in the usual way.

The choice of fully automatic exposure control is made on the lens by pressing the locking key (62). The lens diaphragm ring is turned to index position A.

When the above procedures have been followed, the automatic exposure control (AEC) and exposure meter circuits are energised by moving the camera control switch, on the camera body, into the central position. A servomotor in the AEC system rotates the iris diaphragm of the lens until the correct exposure is achieved, which can be checked by seeing that the exposure meter needle, seen through the viewfinder, is in the central position. Please note that the iris control ring on the lens remains in the "A" position while using the AEC facility.

When the camera is stopped the lens iris diaphragm automatically returns to

the fully open position and the last exposure setting is stored. This information remains in memory indefinitely as long as the camera is switched "off" and will be retained until the AEC system receives new information.

The iris control ring cannot accidentally be moved into position "A". However, should it be desired to change from AEC to semi-automatic, the change-over can be achieved by rotating the lens iris control ring to f 22 without unlocking. In this way the camera operator can take instant advantage of any special lighting effects.

Fully Automatic Exposure Control

The ARRIFLEX 16 SR with built-in exposure meter is available in two basic versions, one with manual exposure control only, and the second with both manual control and fully automatic servo driven control. The automatic control system can also be added to the basic camera in our Service Department at any time. To get fully automatic exposure control, the use of one of the new 16 SR auto diaphragm lenses is necessary.

The change-over to fully automatic exposure control is made on the lens itself by pressing the locking key (20) and turning the diaphragm ring to index position A.

Once this is done, the automatic control circuit is activated when the main camera switch is in the measuring or run position. A servo motor in the system moves the iris diaphragm until the optimal setting for the film sensitivity, camera speed and light level is obtained.

When the camera is switched off, the diaphragm automatically opens fully again. Prefocussing can always be done with the lens wide open.

The automatic position A of the lens diaphragm ring is protected against accidental switching from manual exposure control to the fully automatic exposure control. On the other hand, the change-over from fully automatic operation to manual exposure measurement is simply achieved by turning the diaphragm ring manually, thus overriding the automatic quickly and without any special unlocking. This way the cameraman can react to special lighting conditions without delay.

Setting Exposure Meter for Film Speed and Framing Rates

The ARRI exposure meter must be pre-set correctly for the film speed and the camera framing rate to be used.

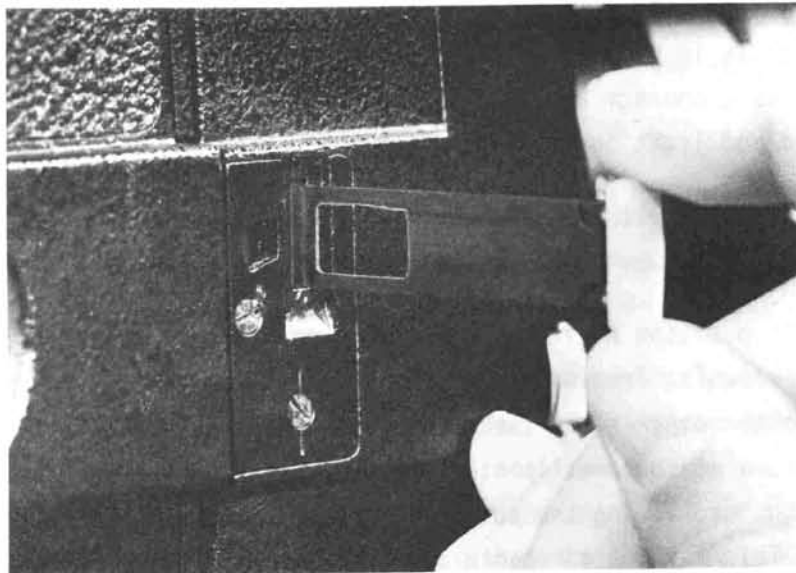
The exposure index number for the film is set by turning the upper knurled thumb wheel (23). The ASA number and the corresponding DIN numbers are shown in their respective display windows.

The framing rate to be used is set with the larger, centre thumb wheel (24). Fps information and the corresponding exposure time are displayed in the two marked windows, left and right respectively.

Behind-the-Lens Mask Holder

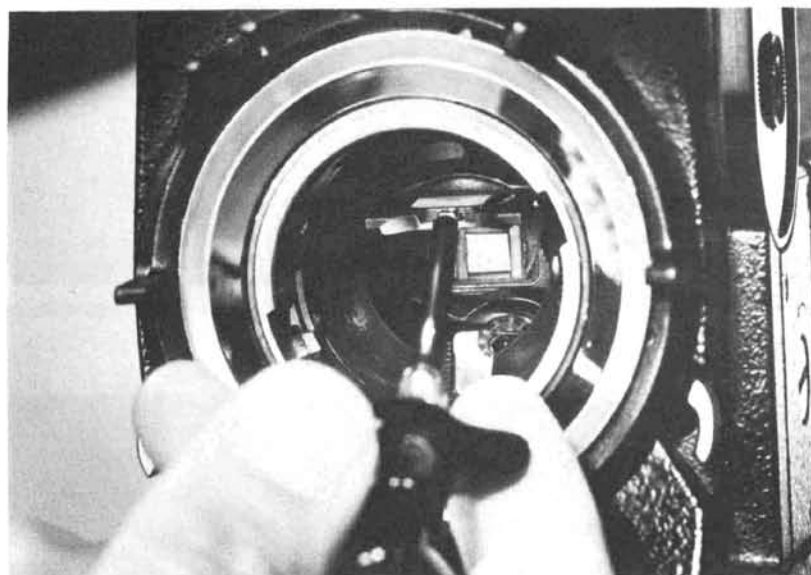
Despite certain technical reservations, the ARRIFLEX 16 SR was equipped with a behind-the-lens slot. With the light trap (52) pushed back, the mask holder can be taken out of the camera. The light trap is spring loaded and closes completely once the mask holder is removed. A precisely cut effects mask is clamped between the two tongues of the holder. After the light trap is slid open, the mask holder is reinserted.

In an emergency, this mask holder may be used with a gelatine filter. Due to the close proximity to the gate the gelatine must be kept scrupulously clean, since the slightest dust particle or smudge may be reproduced on the film.



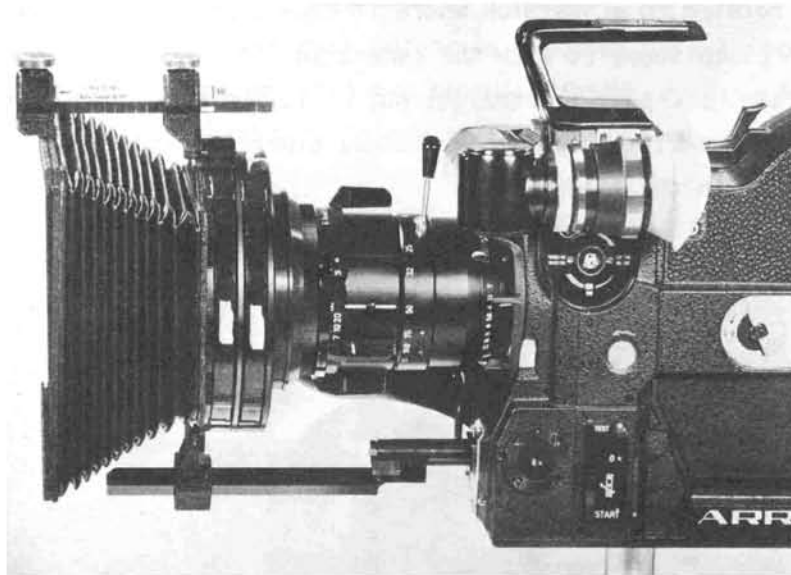
Fibre Optic Viewing Screen

The viewing system of the ARRIFLEX 16 SR uses a fibre optic viewing screen instead of the conventional ground glass to reproduce the reflex image. Fibre optic screens have several advantages over the conventional ground glass, the most prominent one perhaps being that they render greater image brilliance with stopped down lenses or with low light levels. The fibre screen is masked showing field markings for motion picture projection and television format as well as a centre cross hair. 16 SR fibre plates are precision mounted in their own locating frame and are easily exchangeable through the camera's lens opening. Should the fibre plate have to be removed or exchanged for any reason, it is recommended that the mirror shutter be manually rotated to a position where it cannot be damaged or scratched. Then use the clamp supplied with the camera to get a good hold on the front of the fibre plate, and pull it straight out of its holder. When reinserting the plate, be sure it is completely seated, otherwise it might introduce a framing error in the finder.



Matte Box

A new universal bellows matte box was designed especially for the ARRIFLEX 16 SR to cover very short focal length lenses and all conventional zoom lenses. Its bellows have an angular coverage that is suitable from the 8 mm Distagon up to lenses of 150 mm focal lengths including the Zeiss 10-100 and various Angénieux zoom lenses. It is designed for two filter stages that can accept filters of up to 4 inch square, the rear stage being rotatable for use with polarizing filters. For standard focal length lenses such as 16, 25, 50 mm, a standard ARRIFLEX 16 St matte box can be used as well. Both matte boxes are attached to the camera on the mounting shoe underneath the taking lens.



Camera Power Supply

To give the ARRIFLEX 16 SR unimpaired mobility, a special battery and battery adapter were designed which allow the power supply to be attached to the camera without a cable. This "on board" principle accepts a 12 volt 1.2 amp hour battery with an approximate film run capacity of six 400 ft (120 m) magazines at 72⁰F (20⁰C).

When using this battery, a special battery adapter is plugged into the power connection socket (47) and tightened with a coin slotted screw. The battery is then pushed onto the square, form-fitting adapter plug and pivoted towards the camera where it is magnetically held against the magazine hinges (42).

Of course, the camera can also be powered through a conventional power cable from any suitable 12 volt DC source.



Camera Speed Switch 24/25 fps or 50/60 Hz

The quartz crystal motor of the ARRIFLEX 16 SR is capable of running at two sync sound speeds. To switch from either 24 or 25 fps to 50 or 60 cycles pilotone output, remove the coin slotted clear plastic cover in the electronic compartment cover. The speed change itself is accomplished by replugging the small contact bridges according to the desired speed and frequency combination.

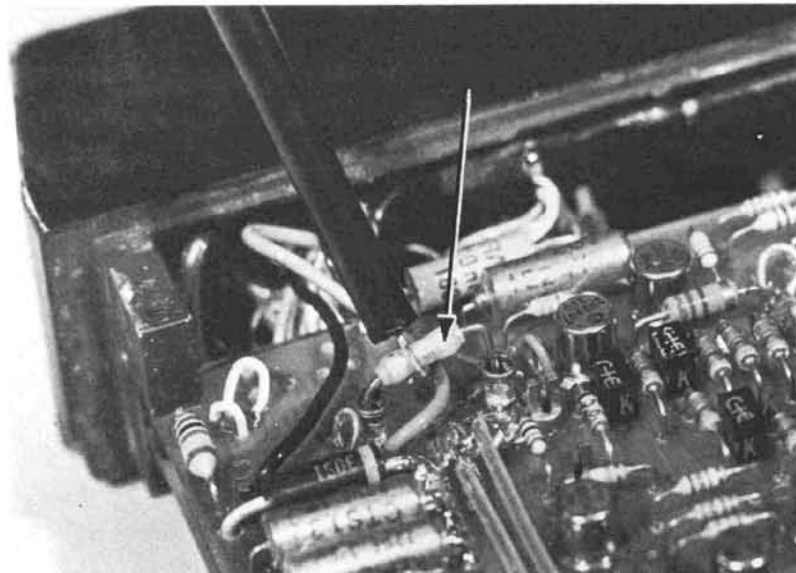


The camera is equipped with an out-of-sync indicator in the form of a light emitting diode which is visible in the camera viewfinder. Should there be a severe drop in voltage or anything to cause the camera to lose sync speed, this out-of-sync diode will light up. At the same time, the intermittent blinking running control lamp on the rear of the camera base will change to a weak continuous light.

Main Power Fuse

To protect all camera electronics against damage from external short circuits, external power overloads or other inexpert handling, a replaceable plug-in fuse is located on the right rear portion of the upper circuit board. This fuse is not to be confused with the automatic overload protection which protects the electronics against excessive current draw.

Should it be necessary to replace the power fuse, disconnect the battery and remove the magazine. Then remove six screws and take off the electronic cover (48). The fuse is located near the power connector in the rear and can easily be exchanged. Be sure to use only fuses of the same rating, do not bypass with improvised wire bridges. (In cameras up to serial No. 60030 this fuse is located on the bottom of the electronic printed circuit board.)



Pilotone Output

On the left side of the rear base is the standard 5-pin pilotone outlet (44). The wiring on this outlet conforms to all other ARRIFLEX pilotone outlets. The connecting plug is a standard 5-pin type, DIN 15575. The pins are connected as follows:

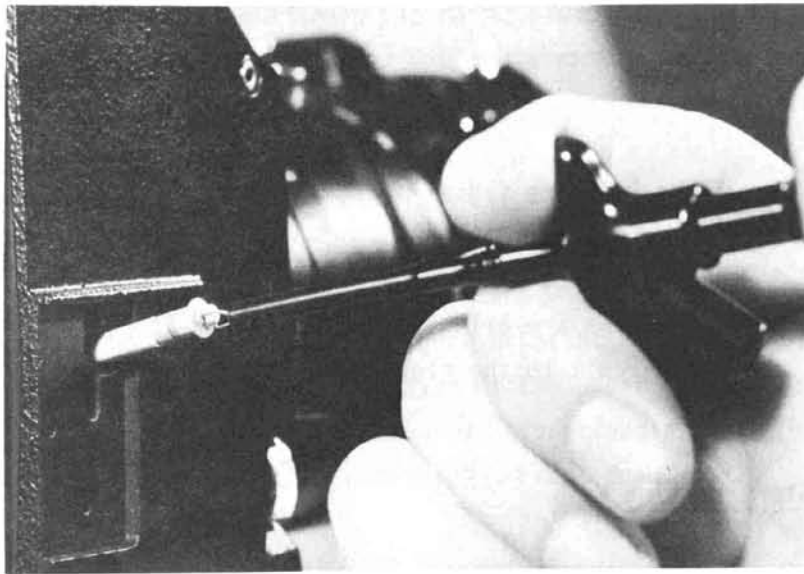
- Pin 1 - 60 Hz Pilotone signal
- 2 - Common Ground
- 3 - 12 volts, DC, +
- 4 & 5 - These pins are bridged in the plug to complete the circuit to the start mark lamp.

Full Frame Start Marking Lamp

The ARRIFLEX 16 SR is equipped with the standard full frame start mark system. This system is activated as soon as a pilotone cable has been plugged into the camera. In the event that it is required to replace the start mark bulb, remove the mask holder (40) and take out two screws (51) which hold down the cover plate for the mask slot. When lifting the cover plate, be careful not to lose the dark slide and the spring on the rear of this plate.



The entire start mark lamp assembly can be pulled out of the camera with the same tool which is used on the fibre optic viewing screen.



The start mark lamps in the 16 SR are operated below their rated voltage. They should normally have a service life of several hundred hours. Therefore, if a lamp has burned out, consider checking your power supply to see if it is properly rated for the camera.

16 SR Time Base Coding

The ARRIFLEX 16 SR is optically and mechanically fully prepared for installation of a time base code system (IRT). Physical layout is according to international standards in which the film is exposed on the opposite side of the claw two frames below the gate. Sockets and internal wiring are already built into the camera.

For connecting of any time base system to the ARRIFLEX 16 SR, contact your nearest authorized ARRIFLEX agent or Arnold & Richter direct.

ELECTRICAL ACCESSORIES

A Panhandle Switch (RCSR)

The Panhandle Switch may be used with the ARRIFLEX 16 SR and 35 BL as well as with the ARRIFLEX 16 BL and 16 St cameras when they are equipped with the latest ARRI crystal controlled motors. The panhandle switch functions as a start/stop control only.

Mounting. The switch fastens to the panhead handle by the spring tensioned clamps that are part of the assembly. The connecting cable is plugged into the 11-pin outlet (45) on the back of the camera base.

Operation. The 16 SR main switch (28) on the camera itself must be put in the exposure measuring position (27), otherwise the panhandle switch will be inoperative. This serves to prevent filming with a fully open auto diaphragm. As an alternative, the exposure measuring position on the universal handgrip may be used, as described on page 16. When the main switch is set correctly, the large black push button on the back of the panhandle switch is pushed IN to run the camera. The button will latch in the RUN position. To stop the camera, the button is pushed in again, just beyond the detent position, and released. The button pops out to the STOP position.

B Variable Speed Control (VSU)

The variable speed control is designed to be used with the ARRIFLEX 16 SR, the 35 BL and the 16 BL equipped with the latest crystal controlled motor.

The control will provide variable speeds from 5 to 75 fps for the 16 SR.

Mounting. The variable speed control is secured to the panhead handle in the same way as the switch described above. The connecting cable plugs into the same 11-pin outlet (45) on the back of the camera base.

The start/stop push button of the variable speed control works exactly like the one on the panhandle switch. A separate rotary control provides speeds for the 16 SR, continuously variable from 5 to 75 fps. In addition, a separate selector switch makes it possible to switch instantly from crystal controlled sync speed to another, preselected non-sync speed, and back again. Detailed instructions for operation of the variable speed control

with the various cameras mentioned are supplied with the accessory.

Caution! Whenever variable speeds are used in conjunction with the built-in exposure control system, the cameraman must always remember that it is essential to adjust exposure to conform with the non-synchronous framing rate being used. Failure to do this will produce incorrectly exposed footage. Exposure correction for non-sync speeds can be made by compensation via the exposure display shown in the viewfinder, or by adjustment of the ASA setting on the exposure control input (25).

C External Sync Signal Attachment (EXS II)

With the external sync signal attachment, the 16 SR can be slaved to an external signal. Such a signal may originate from a prerecorded sound track, from other cameras, from (50 or 60 Hz) power lines, or from a TV display, providing only that the external signal conforms, or is processed to conform, to the frequency and voltage requirements of the 16 SR as listed in the Technical Data section of these instructions.

The external signal sync attachment connects to the 11-pin socket (45) at the back base of the camera. Complete instructions are supplied with the accessory.

D Phase Control Attachment (PHU)

To film the display of the TV monitor, it is necessary for the film camera to be in sync with the incoming TV signal. It is also essential to have the means of establishing a correct phase relationship between the camera shutter and the scanning rate of the monitor to eliminate a disturbing scanning bar from appearing in the film. The phase control performs this function. The attachment plugs into the 11-pin socket (45). Complete instructions are supplied with the accessory.

E Multiple Operating Mode Remote Control Unit (FSZ)

This accessory includes a lot of the features, as already described under paragraph A, B, C and D.

It is connected to the 11-pole socket (45) at the rear base of the camera. The unit provides four additional frame rates from 6...75 fps besides the basic (standard) speed. The additional frame rates and their accuracy relate to the basic speed being pre-set on the camera quartz-control. If the camera is pre-set to 24 fps, the FSZ allows 6,12,24,48 and 72 fps. If the camera is pre-set to 25 fps, the FSZ allows 6 1/4, 12 1/2, 25, 50 and 75 fps.

External Synchronisation of the 16 SR Camera can be accomplished from basic camera speed to maximum allowed frame rate. The external signal may originate from (50 or 60 Hz) power lines (1 V!), from a video-display, from other cameras (pilot signal) or pre-recorded sound - track (play - back). The unit is equipped with a camera remote On/Off-switch and a phasing control, which allows phasing in external as well as in quartz synchronized operating mode.

Phasing control allows to shift phase of camera shutter with respect to external periodical events.

Quick change-over switching between standard camera frame rate and pre-selected frame rate due to accessory-operating mode offers time-retarding or time acceleration effects.

Complete instructions are supplied with the accessory.

Preventive Maintenance

For reliable trouble-free camera operation, the first and most important rule remains overall cleanliness of the camera. This is particularly true with the film chambers of the magazine, the aperture plate of the camera and the back plates of the magazine. Be sure the camera aperture is clean and free of emulsion deposit. Under no circumstances ever clean the camera aperture or the magazine back plate with any metallic tools. Use only plastic or wood skewers to clean these surfaces.

Do not allow unauthorized or untrained personnel to disassemble any part of the camera or magazine. Do not allow anyone to oil or grease the camera. The ARRIFLEX 16 SR is basically without need of lubrication since all ball bearings are prelubricated and sealed. Internal cleaning, lubricating or servicing should be performed only by authorized ARRIFLEX service agencies.

The camera is equipped with an automatic overload protection. This overload switch will trip when a total current consumption of 4.5A is exceeded. Should this happen, switch the camera off and check for any probable cause such as film jamming, incorrect magazine loading, etc. The automatic overload device will reset after a few seconds and the camera is again ready for operation.

It goes without saying that the 16 SR has to be serviced from time to time, either in the factory or any other authorized service shop. The condition of the individual camera depending on the different kinds of operational use, we cannot quote certain service intervals, e.g. after a certain amount of footage or period of time. We therefore recommend, however, to have the 16 SR serviced before, respectively after every larger filming project.

TECHNICAL DATA

<u>Dimensions approx.</u> (without handgrip)	Length: (without lens) 305 mm (12") Height: (w. 400 ft magazine) 241 mm (9.5") Width: (finder in normal position) 160 mm (6.25")
<u>Weight</u>	Camera body only 3.2 kg (7 lb) 400 ft magazine 2.2 kg (5 lb)
<u>Film Movement</u>	ARRI Kinematic, jointed pulldown; frame registration ≤ 0.1 % of frame height.
<u>Shutter</u>	ARRI mirror-shutter; 180° opening; exposure = 1/48th sec $\dot{\sim}$ 24 fps; mirror-shutter intersects optical axis 9 mm (.360") in front of focal plane at 45° angle; image reflected upward; shutter always stops in viewing position.
<u>Lens Mount</u>	ARRI, steel bayonet lock type; flange focal distance = 52 mm (2.040"); clear bore = 41 mm (1.610")
<u>Lenses</u>	Accepts lenses in standard ARRI mount or bayonet lock mounts. (Fixed focal lens program identical to 16 BL.) See catalogues for exact listing.
<u>Viewfinder</u>	ARRI reflex system; eyepiece assembly universally adjustable with automatic image compensation; removeable eyepiece; magnification = 10 x.
<u>Focussing Screen</u>	Interchangeable; ultra-bright fibre-optic construction; marked for television and cinema formats.
<u>Auto Diaphragm</u>	Cameras are equipped for automatic diaphragm control; lens is wide open when camera is still, closed down to preselected stop when camera is started. (Requires 16 SR zoom lens models designed and equipped for this function.)
<u>Exposure Control</u>	TTL (through-the-lens) precision exposure meter with N.D. attenuated optical data input

Date input: ASA 16 to 500 (13 to 28 DIN)

Fps 24 to 80

Options include:

Manual control: (match needle) with range of plus/minus two stops shown in viewfinder. (Camera may be converted for fully automatic exposure control at later date.)

Noise

29 dBA \pm 1 dBA (1 m from lens)

Power Requirements

12 V DC, 1 A at 20⁰C (68⁰F). Connector = 4-pin DIN 15931 type.

Camera Motor

DC motor, electronically commutated and precision crystal controlled for cordless sync. 1440 RPM \hat{a} 24 fps, 1550 \hat{a} 25 fps. Accuracy = Variable speed attachment (optional accessory) provides rates from 5 to 75 fps.

Safety

Overload switch cuts off main power when load exceeds 4.5 A approx.

Main Switch

Provides detent positions for:

- a) OFF
- b) exposure setting only
- c) camera run.

Operating Range

Camera is designed to operate from -20⁰C to +50⁰C (-60⁰F to +122⁰F). (Consult service department for operation outside that range.)

Pilotone

Pilotone signal available from 5-pin socket, DIN standard 15575. Output frequency 50 or 60 Hz at approx. 1.5 V.

Start Marking

Automatic start marker built in; flashes full frames to indicate start mark.

Time Base Code

The 16 SR is prewired and ready for the installation of a module to apply timing code markings on the film, and for the attachment of an external time code generator.

ACCESSORIES

A Remote Control Switch Rearside (RCSR)

Requiring no external source.

B Variable Speed Control (VSU)

allows continuous variation of frame rate 5...75 fps. Includes remote On/Off switch and switch for quick change-over from crystal controlled mode to variable speed mode of operation.

C External Synch.Signal (EXS II)

is used for synchronization of the 16 SR Camera as slave to mains frequency (1 V!), to pilot and video or play-back signals.

External reference:

Frequency: 50 or 60 Hz
Tracking Range: \pm 20 Hz
Voltage: 1...10 Vpp, pulse, sinus or comp. video signal

Phase shift and remote On/Off switch is also included. Quick change-over from external to internal mode of operation.

D Phase Control Unit (PHU)

allows to shift phase of camera shutter with respect to external periodical proceedings which are of the same frequency accuracy as the camera frame rate.

E Multiple Operating Mode Remote Control(FSZ)

allows the control of speed in fixed steps from 6...72 (6 1/2 ...75) fps. All speeds crystal controlled. It allows external synchronization at 24...72 fps (25..75 fps) related to 50 or 60 cycles (signals equivalent to EXS II). Phase shift and remote On/Off switch is also included. Quick change - over possibility from programmed operation mode to internal quartz-controlled camera frame rate.

External reference:

Frequency: 50 or 60 Hz
Tracking Range: \pm 20 Hz
Voltage: 1...10 Vpp, pulse, sinus or comp. video signal