

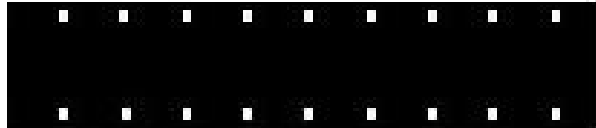
## Common Formats



Standard 8



Super 8



16mm  
Silent



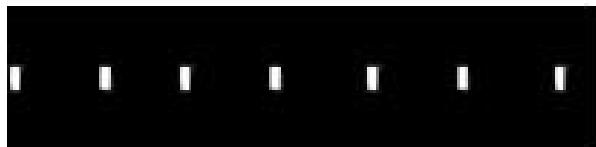
16mm  
Sound

+ 35mm -what is this picture thinking?

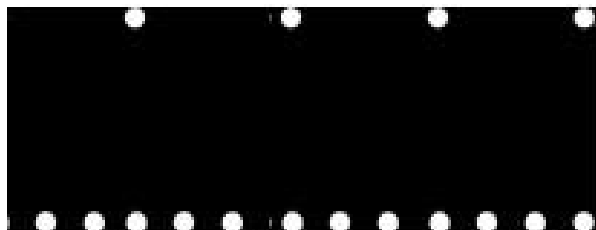
## Uncommon Formats



9.5mm



17.5mm



28mm

# PROPERTIES OF THE FILM STOCK:

**EMULSION** - light-sensitive

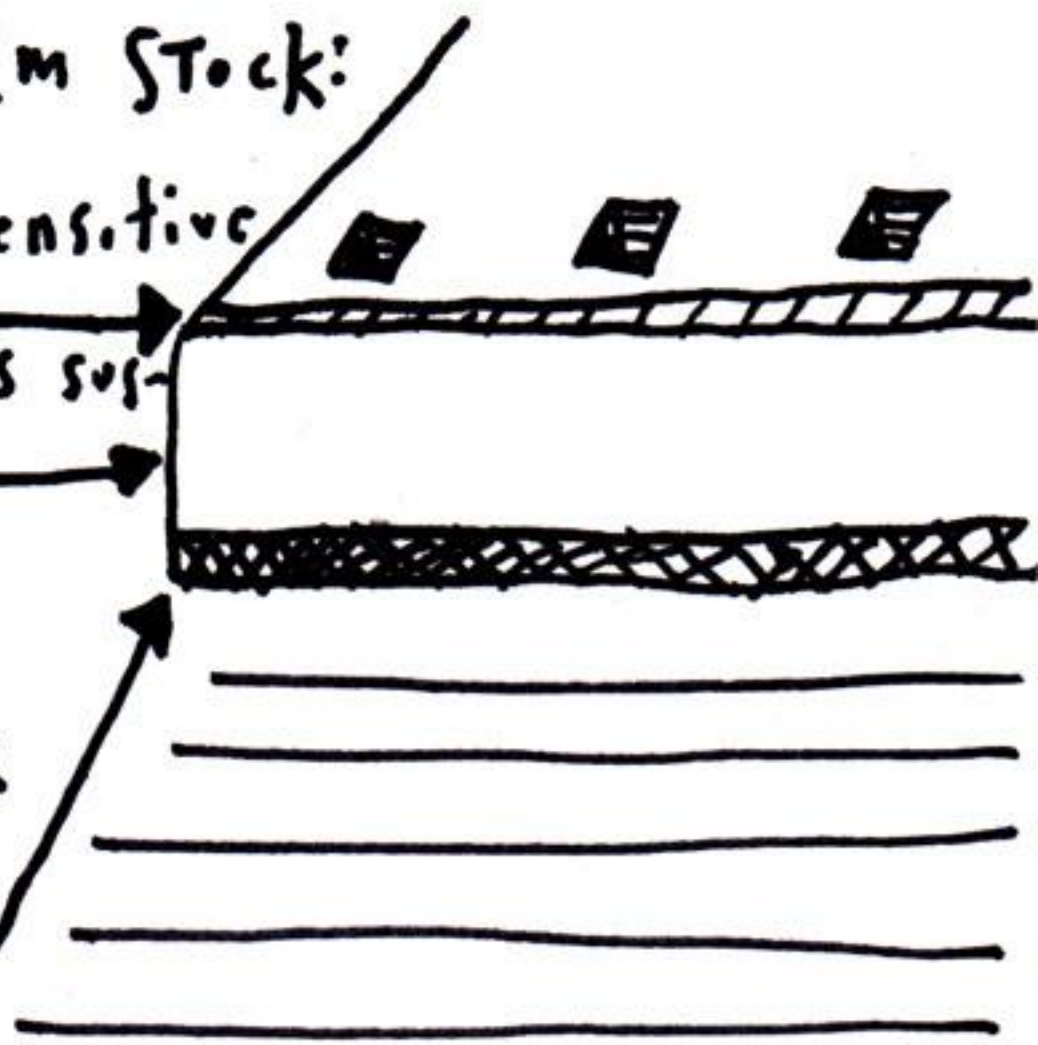
Silver halide crystals suspended in gelatin

**BASE**

the material itself - acetate or polyester

**ANTI-HALATION BACKING**

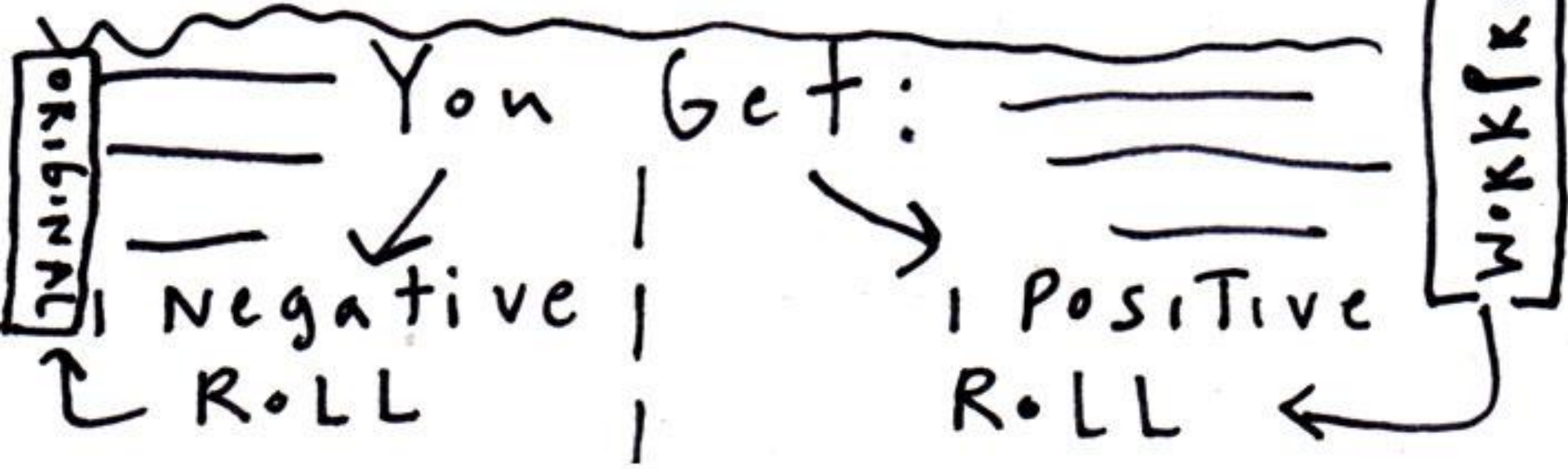
absorbs UN-wanted LIGHT RAYS (sometimes btwn emulsion + base)



THE MAGIC OF FILM: EXPOSURE  
to Light FORMS LATENT IMAGE IN THE  
EMULSION → IMAGE BECOMES VISIBLE  
when FILM goes through DEVELOPER  
(chemical solution that converts exposed  
silver halide crystals into metallic silver  
(OPAQUE) → FILM THEN GOES THROUGH FIXER,  
which removes crystals NOT EXPOSED TO  
LIGHT. → AREAS MOST EXPOSED =  
MOST OPAQUE; AREAS LEAST EXPOSED =  
MOST TRANSPARENT.

# NEGATIVE/POSITIVE PROCESS

-exposed raw stock becomes negative image in processing, which is then PRINTED TO POSITIVE.



# ReVeRsAL PRoCeSS

Extra processing steps (bleach, re-exposure, second developer) result in a positive image

You Get:

1 ORIGINAL, POSITIVE — FROM

which you can make

INTERNEGATIVE / NEW ORIGINAL

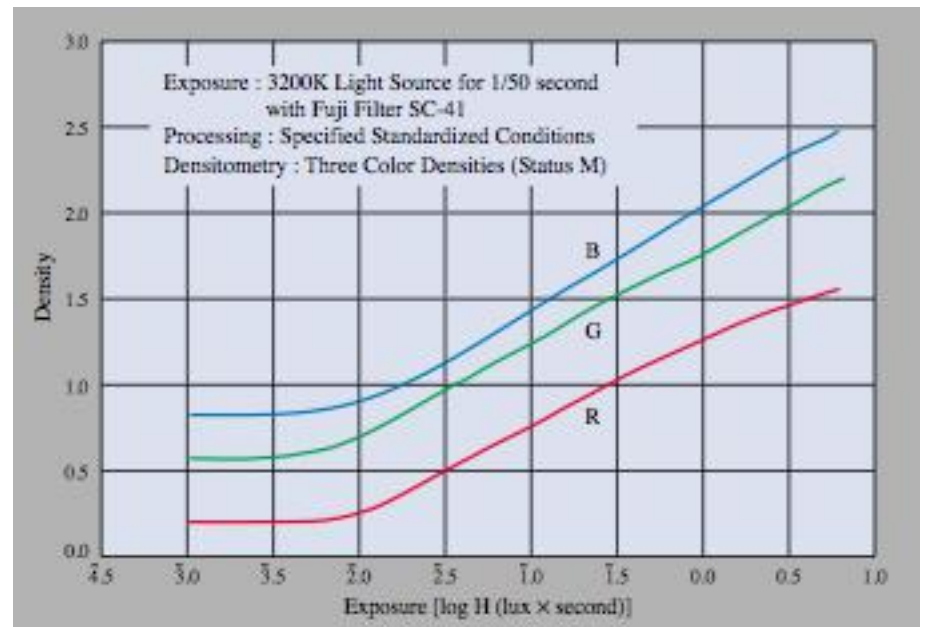
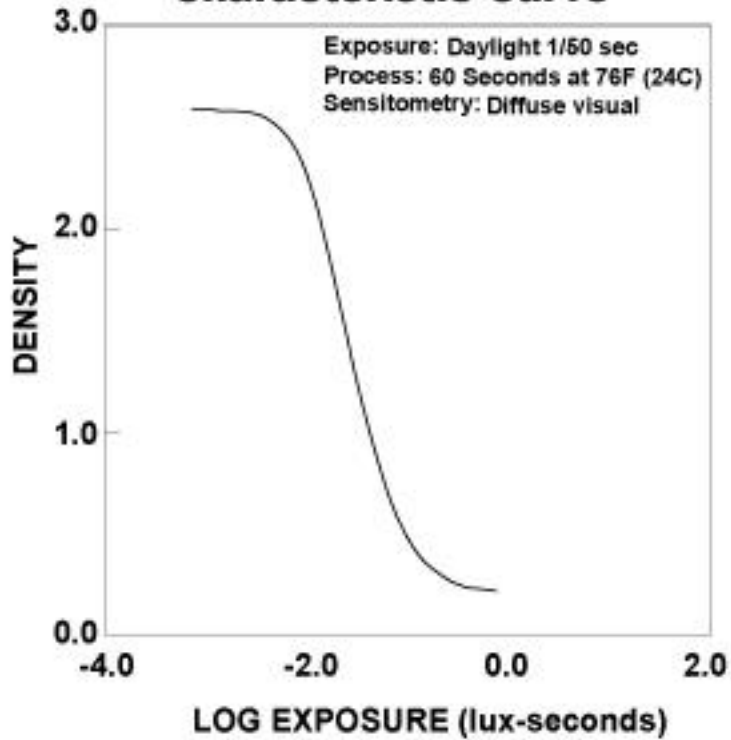
## The CHARACTERISTIC CURVE:

(FOR VARYING EMULSIONS) - a graph that shows the relation between the amount of light that exposes the film and the corresponding density built up in the film. Exposure is bracketed, and densities are recorded.

## B/W REVERSAL (KODAK 7266)

## COLOR NEGATIVE (FUJI 8652)

### Kodak TRI-X Reversal Film 7266 Characteristic Curve



# GAMMA

a measure of the steepness of the straight-line section of the characteristic curve.

+  
G  
A  
M  
M  
A

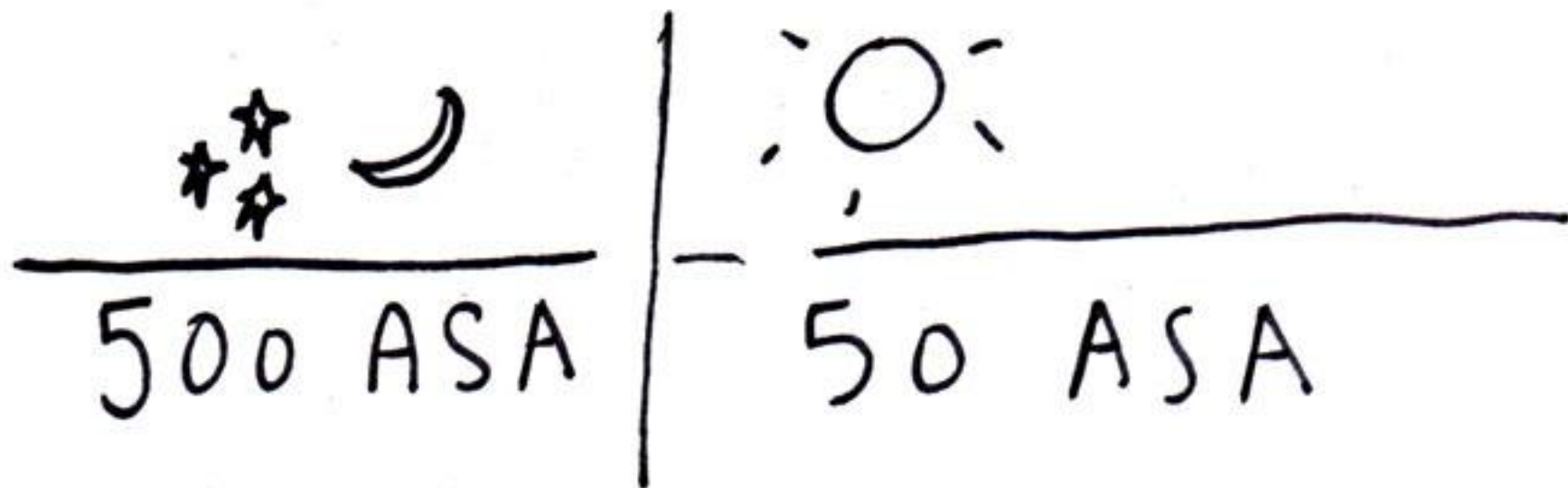
=

+  
C  
O  
N  
T  
R  
A  
S  
T



# FILM SPEED/EXPOSURE INDEX

- THE FASTER THE STOCK (i.e. the higher the ASA) THE LESS LIGHT IT NEEDS TO PRODUCE AN ACCEPTABLE IMAGE.



ASA

ISO

AMERICAN  
STANDARDS  
ASSOCIATION

INTERNATIONAL  
STANDARDS  
ORGANIZATION

SLOW = 50 >

FAST = 200 < (→ 500)

MEDIUM = 100 -  
200



DOUBLING ASA MEANS THE FILM IS  
TWICE AS SENSITIVE TO LIGHT.

ASA 100 Needs half of the  
exposure (1 stop less) than  
ASA 50.



# DAYLIGHT vs. TUNGSTEN



5500° K

D



3200° K<sup>KELVIN</sup>



When using tungsten  
IN DAYLIGHT, use  
AN 85 FILTER (ORANGE)

When using daylight  
in tungsten, use  
an 80A filter.  
(BLUE)



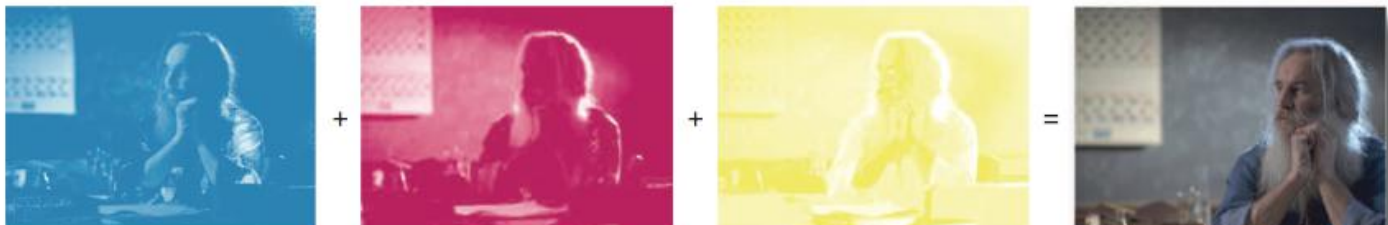
C O L O R

---

ADDITIVE = R + G + B = white!  
PRIMARIES

SUBTRACTIVE = C = B + G = W - R

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# FILTERS!!!!!!

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COLOR CONVERSION - TUNGSTEN/DAYLIGHT; ALSO FOR EFFECTS.

NEUTRAL DENSITY (ND) - REDUCE LIGHT PENETRATING LENS

- 1 ND =  $\frac{1}{3}$  STOP
- 3 ND = 1 STOP

POLARIZING - REDUCE GLARE

---

\*MOST FILTERS WILL CALL FOR AN EXPOSURE ADJUSTMENT.

# LENS ME A HAND

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- KEEP IT CLEAN, PEOPLE
- AVOID SCRATCHES, DUST, LIQUIDS, ~~AND~~ FINGERPRINTS, etc.
- CLEAN DUST w/ BLOW BRUSH OR CANNED AIR (w/ LENS POINTING DOWN)
- CLEAN FINGERPRINTS BY DUSTING ↑ + THEN w/ LENS TISSUE + SOLUTION

# F O C A L      L E N G T H

- Measures power of lens to bend light rays coming from the subject.

- THE SHORTER THE FOCAL LENGTH, THE GREATER THE BENDING POWER + THE CLOSER THE ~~FOCAL~~ FOCAL PLANE IS TO THE REAR OF THE LENS

- SHORTER THE FOCAL LENGTH, THE WIDER THE LENS



# PRIME LENSES

fixed FOCAL  
Length - must  
move closer  
to get  
closer

# ZOOM LENSES

RANGE  
OF FOCAL  
LENGTHS

# P E R S P E C T I V E

DISTORTION - extremely wide lenses sometimes create fish eye effect



DEPTH OF FIELD - THE ABILITY TO CREATE LARGE DIFFERENCES IN FOCUS BETWEEN FOREGROUND AND BACKGROUND (FUN TRICK = FOCUS PULL)

- LENSES GENERALLY HAVE BEST DEPTH OF FIELD WITH A HIGHER F-STOP # (11 1/3) AS IT'S LETTING LESS LIGHT IN THE CAMERA.

# EXPOSURE

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THE AMOUNT OF LIGHT  
PENETRATING THE FILM RELATED  
TO HOW OPEN OR CLOSED THE  
CAMERA'S APERTURE IS -

CONTROLLED BY F-STOP  
(higher the fstop # (16), the less light)   
(lower the fstop # (1), the more light) 

THE F-STOPS HERE: F-STOP =  
THE RATIO btwn the focal LENGTH OF  
THE LENS + ITS DIAMETER (APERTURE)

$$\text{F-STOP} = \frac{\text{FOCAL LENGTH}}{\text{LENS DIAMETER}}$$

FAST LENSES ALLOW FOR MORE  
LIGHT THAN SLOW LENSES.

# STANDARD F-STOP #s

1 — 1.4 — 2 — 2.8 — 4 — 5.6 — 8 — 11 — 16 — 22 — 32

✓ distance between two numbers equals 1 stop

- each stop lets in twice as much light as the previous stop.

- 1/3rds of stops come in handy...

↑  
open  
↓  
more light

↓  
closed  
↓  
less light

**f/16**



**f/11**



**f/8**



**f/5.6**



**f/4**



**f/2.8**



**f/2**



**f/1.4**

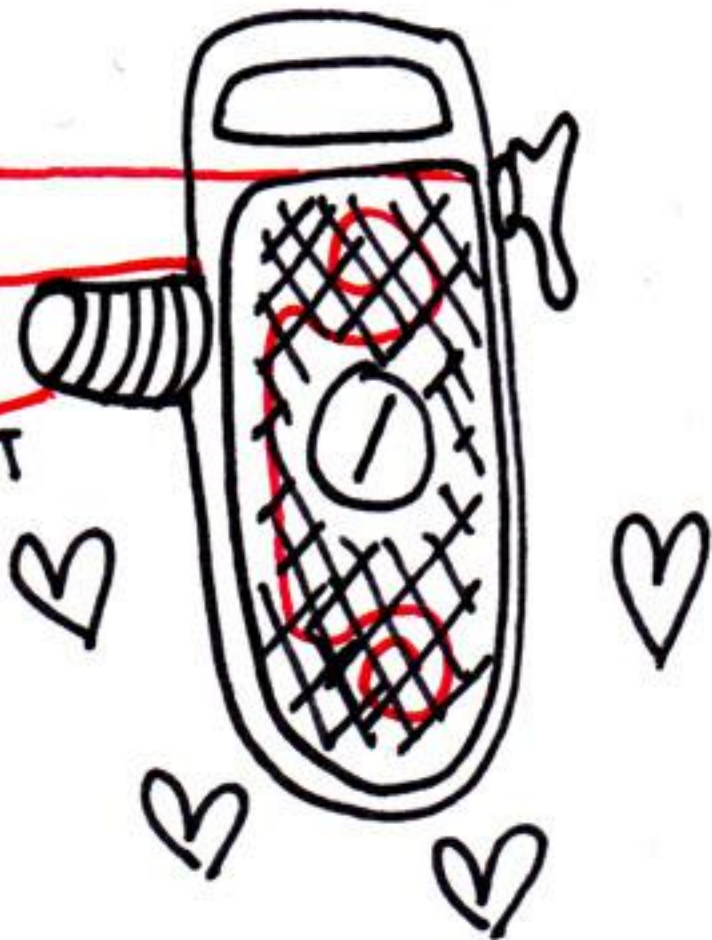


# THE FILM CAMERA

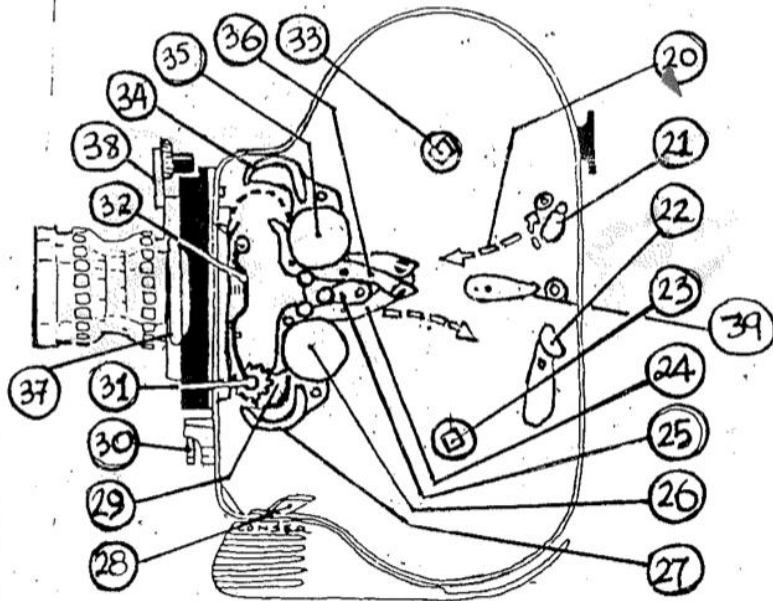
viewfinder / ~~viewfinder~~

filter slot

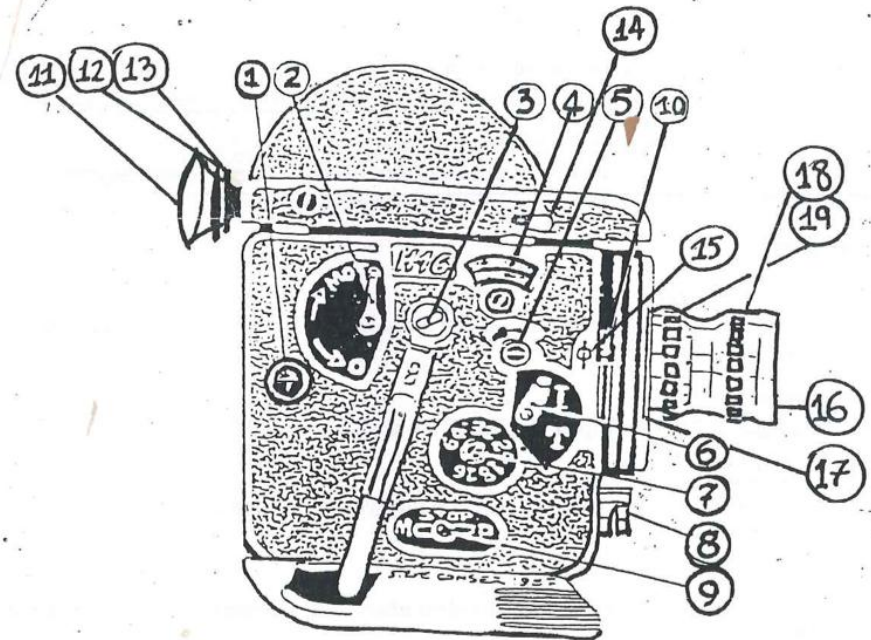
LENS / LENS  
MOUNT



## Interior View

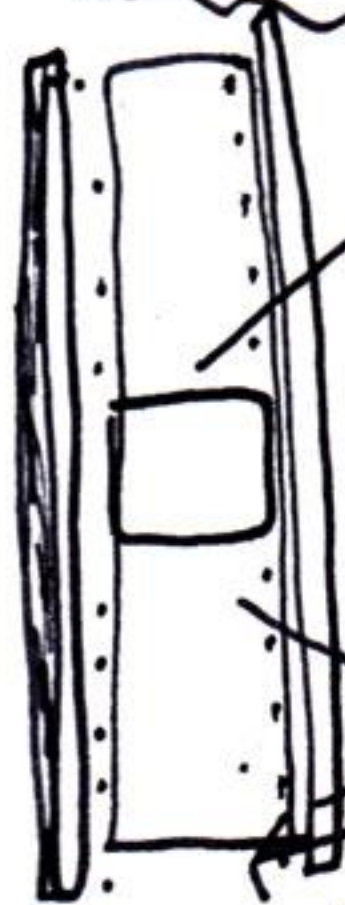


## Bolex 16mm Camera: EXTERIOR VIEW





# THE FILM GATE




APERTURE PLATE - rectangle


cut out of plate through which light shines to expose your film-emulsion out


PRESSURE PLATE - HOLDS FILM

FLAT DURING EXPOSURE.

CLAW - ADVANCES THE FILM VIA SPROCKET ENGAGEMENT

SHUTTER -  $360^\circ$   - opens + closes  
as each frame  
passes

SHUTTER OPENING - # of degrees open  
in the disc  $180^\circ$  

VARIABLE SHUTTER - 

NARROWS SHUTTER ANGLE TO CHANGE  
SHUTTER SPEED - REDUCES exposure time  
(COULD DO THIS INSTEAD OF NDS in high-light)

# SHUTTER SPEED AND EXPOSURE



$$\text{exposure Time} = \left( \frac{1}{\text{speed in FPS}} \right) \times \left( \frac{\text{angle of shutter opening}}{360} \right)$$

Bollex =  
145° =  
1/60 @  
29 FPS

$$\frac{1}{29} \times \frac{135^\circ}{360} = 1/64$$

ASA

ISO

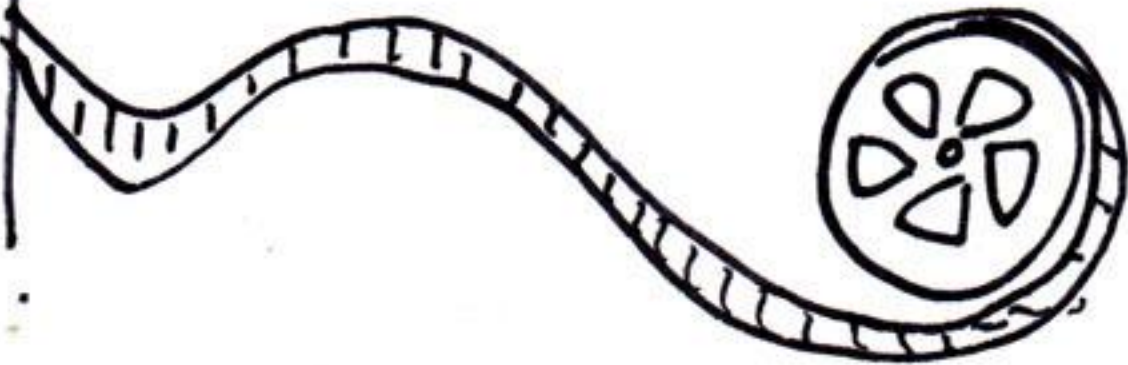
AMERICAN  
STANDARDS  
ASSOCIATION

INTERNATIONAL  
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ORGANIZATION

SLOW = 50 >

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MEDIUM = 100 -  
200



# To LOAD CAMERA

1. CLEAN camera body + gate
2. check pressure plate
3. engage LOOP FORMERS
4. send feed roll through roller
5. engage motor; attach film to take-up, disengage LOOP FORMERS, RUN CAMERA, close + lock.

# WHEN FOCUSING THE BoLeX.

1. Focus THE TURRET (eyepiece) to your eye (remove lens, look through viewfinder, focus ground glass).
2. Focus THE LENS TO YOUR PREFERENCE BY OPENING THE LENS ALL THE WAY UP, TURNING THE FOCUS RING, AND THEN STOPPING DOWN TO DESIRED EXPOSURE.

# WHEN FOCUSING W/ A ZOOM LENS

- FOCUS THE TURRET
- OPEN THE LENS ALL THE WAY UP
- ZOOM ALL THE WAY IN
- FOCUS W/ RING
- STOP DOWN TO DESIRED EXPOSURE
- ZOOM TO DESIRED FRAMING

# READING THE LIGHT METER

1. SET ASA

2. ZERO COUNTER AND THEN TAKE YOUR READING

(3. IF IT IS TOO BRIGHT, ADD HIGH SLIDE)

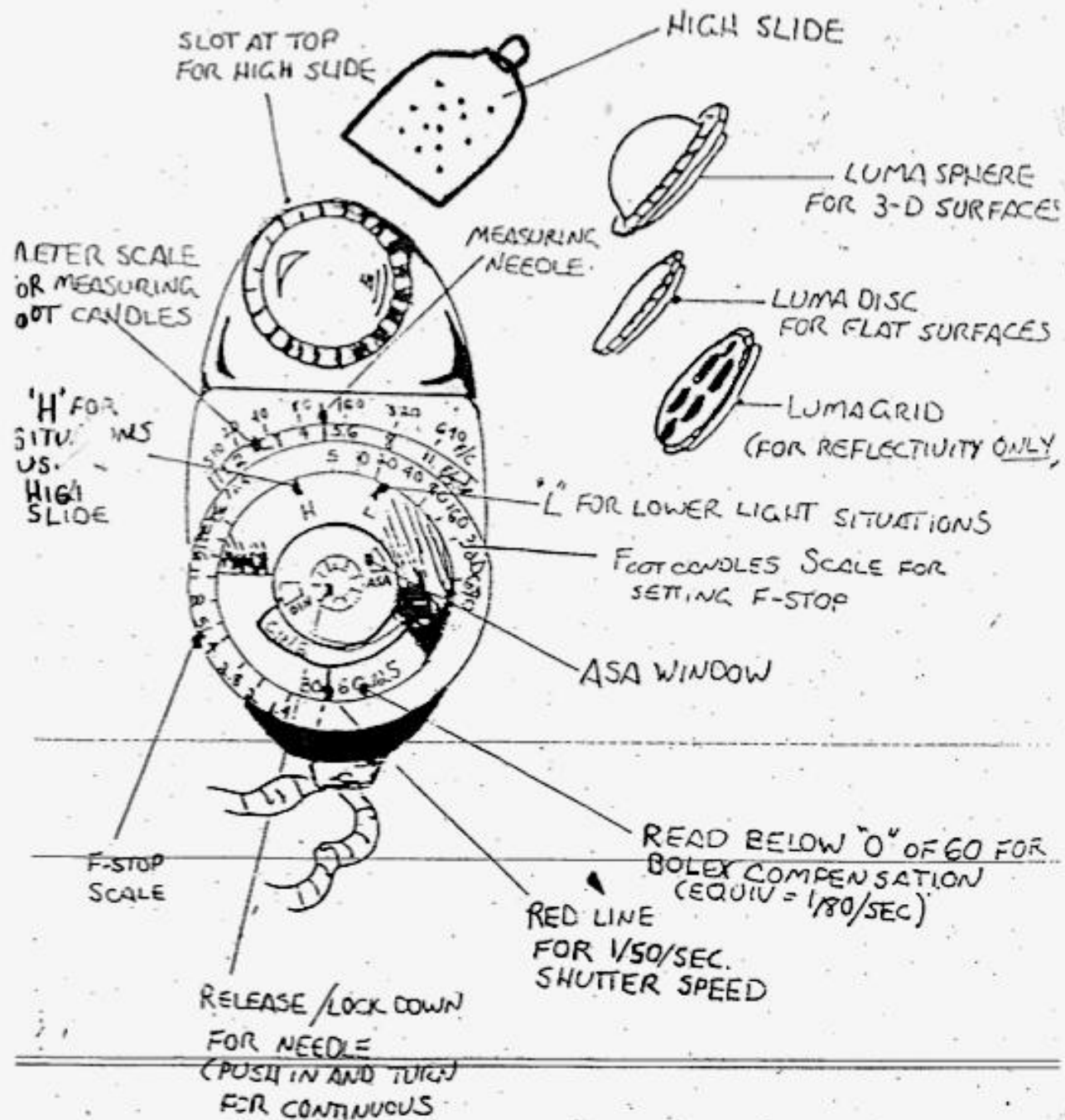
4. IDENTIFY FOOTCANDLES IN UPPER SCALE

~~FOOTCANDLES~~

5. LINE UP BLACK/RED (IF USING HIGH SLIDE) ARROW w/ FOOTCANDLE #

6. LOOK BELOW AND READ THE F-STOP AT THE ZERO OF THE 60 (FOR 24 FPS)





INCIDENT



AMOUNT OF  
LIGHT FALLING  
ON THE SUBJECT



HALF-SPHERE  
METER  
ATTACHMENT

REFLECTED



AMOUNT OF LIGHT  
REFLECTED BY  
THE SUBJECT



HONEYCOMB  
METER  
ATTACHMENT

FOR SCENES WITH A GREAT  
RANGE OF LIGHT SOURCES / QUALITIES /  
READINGS, TAKE  
AN AVERAGE OF  
YOUR READINGS



# BACKLIGHT

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exposing for  
subject = dark  
background

- expose  
for the back-  
ground =  
silhouette


Take

AN

Average!!!

F (feet + frames; focus)

A P E R T U R E 

S H U T T E R (Speed +  
NO RED TRIANGLE 

T A C H O M E T E R (24 FPS = STRAIGHT  
UP)