History of Anamorphic Lenses

- 1926 - Professor Henri Chrétien applied for a patent on the “Hypergonar anamorphic lens system” (he had developed the idea for tanks in WW I)
- 1929 - First film was “Construire un feu” The aspect ratio was 2.66:1
- 1937 – He demonstrated it at the Paris World Fair on a 6,500 square foot screen
The Chretien Patent

- Patent for:
  Combined Picture and Sound Recording and Projection in Motion Pictures
CINERAMA

- Used three synchronized 35mm projectors
- Deeply curved wide screen image
- 6 track magnetic sound
Cinemascope

- 1952 – 20th Century Fox acquired the patent
- Lenses were made by Bauch & Lomb
- The 20th Century Fox process for 35mm film was called “Cinemascope”
CINEMASCOPE Competitors

- AgaScope (a form of CinemaScope from Sweden and Hungary)
- ArriScope (a form of CinemaScope from the Arriflex Camera Corp.)
- ArriVision (2.35:1 in 3-D)
- Cinepanoramic (a form of CinemaScope from France)
- CinemaScope (some early titles were 2.66:1 and 2.55:1)
- CinemaScope 55 (a form of CinemaScope using 55mm film)
- Cinerama (2.6:1 to 2.8:1)
- Cinéscope (a form of CinemaScope from Italy)
- Colorscope (various ratios used under this umbrella name)
- Cromoscope (a form of Techniscope)
- Daisecope (a form of CinemaScope from Japan)
- Dimension 150 (2.2:1)
- Duo-Vision (2.35:1 in split-screen)
- Dyaliscope (a form of CinemaScope from France)
- Europeana (a form of CinemaScope)
- Frescope (a form of CinemaScope from France)
- Grandeur (2:1 approximately)
- Grandscope (a form of CinemaScope from Japan)
- HammarScope (a form of CinemaScope from Sweden)
- J-D-C Scope
- Megascopescope (a form of CinemaScope from England)
- Metroscope (1.66:1 to 2:1)
- MGM Camera 65 (2.75:1)
- Natural Vision (2:1 approximately)
- Naturama (a form of CinemaScope)
- Nikkatsu Scope (a form of CinemaScope from Japan)
- Panascopescope (2:1)
- Panavision (pre-1971: 2.35:1 / post-1971: 2.4:1)
- Panavision Super 70 (2.35:1 for 35mm prints, 2.2:1 for 70mm)
- Panoramic(a) (a form of CinemaScope from Italy)
- Realife (2.1 approximately)
- Regalscope (a form of CinemaScope)
- RKO-Scansoscope (a form of CinemaScope)

- Shawscope (a form of CinemaScope from Hong Kong)
- Sovscope (a form of CinemaScope from the U.S.S.R.)
- Space-Vision (2.35:1 in 3-D)
- Spectrascope (a form of CinemaScope)
- SuperCinecope (a form of CinemaScope from Italy)
- Superpanorama 70 (2.2:1 in 70mm; a form of Todd-AO from Europe)
- Super Panavision 70 (2.35 for 35mm prints; 2.2:1 for 70mm)
- Superscope (2:1)
- Superscope 235
- Super Techniscope 70 (2.2:1 in 70mm)
- Super Techniscope (1.85:1 to 2.35:1; a variable process - same as Super 35)
- Super 35 (1.85:1 to 2.35:1; a variable screen-size process)
- SuperTotalscope (a form of CinemaScope from Italy)
- System 35 (1.85:1 to 2:35:1; a variable process - same as Super 35)
- Technirama
- Techniscope
- Technovision
- Todd-AO (2:2:1)
- Todd-AO 35
- Toeiscope (a form of CinemaScope from Japan)
- Tohoscope (a form of CinemaScope from Japan)
- Totalscope (a form of CinemaScope from Italy)
- Totalvision (a form of CinemaScope from Italy)
- Ultra Panavision 70 (2.75:1)
- Ultrascopescope (a form of CinemaScope from Germany)
- Vistarama (a form of CinemaScope)
- VistaScope (a form of Superscope)
- VistaVision (ranges from 1.66:2 to 2:1; a variable ratio)
- Vitascopescope (2:1 approximately)
- WarnerScope (a form of CinemaScope)
- Warwickscope (a form of CinemaScope from England)
Two Types of Anamorphics

- Cylindrical Anamorphic System (Schneider Type) Focusable
- Prism Anamorphic System (Panamorph Type) Not Focusable
Cinemascope Camera Lenses

- A 35mm Motion Picture Camera is equipped with a cylindrical lens (anamorphic lens) which squeezes the image horizontally 2 to 1 onto the film. These are often zoom lenses with built in anamorphic sections.

A cylindrical lens element – good anamorphic lenses have at least 4 of these lens elements.

Panavision anamorphic camera lenses
“Filmed in Panavision”
Anamorphic Projection Lenses
for 35mm Film projection

- People are thinner on the film, cars are shorter by 2x.
- A cylindrical lens (anamorphic lens) is used on the 35mm film projector to unsqueeze the image.
- The aspect ratio on the screen is 2.39:1; common usage is 2.35:1. 2.4:1 is NOT correct.
Aspect ratio (image)
From Wikipedia

The aspect ratio of an image is its displayed width divided by its height (usually expressed as “x:y” or “x×y,” with the joining colon or multiplication symbol articulated as the preposition “by” or sometimes “to”). For instance, the aspect ratio of a traditional television screen is 4:3, or 1.33:1.

High-definition television and European digital television use an aspect of 16:9, or about 1.78:1. Aspect ratios of 2.39:1 or 1.85:1 are frequently used in cinematography, while the aspect ratio of a sync-sound 35 mm film frame is 1.37:1 (also known as “Academy Aperture” ratio). Silent films, which used the full frame, were shot in 1.33:1.
Common Aspect Ratios

- Cinemascope
- Widescreen 1.85:1 "Flat"
- 2.35:1
- 1.85:1
- 1.33:1
- 1.78:1
- High Definition 16x9 1.78:1
- 4x3 Standard Def Television
Silent
Academy
1.85 Widescreen
Cinemascope
2x Horizontal Expansion of Cinemascope in Projector
Cinemascope Letterboxed on 16x9 Display
Pixel Loss – Wasted Image Area

- 1080p image – 16x9  1.78:1
  1080 x 1920 = 2,073,600 pixels

- Letterboxed Cinemascope image – 2.35:1
  832 x 1920 = 1,597,440 pixels

- 33% of the pixels are WASTED!

- 33% of the brightness is wasted