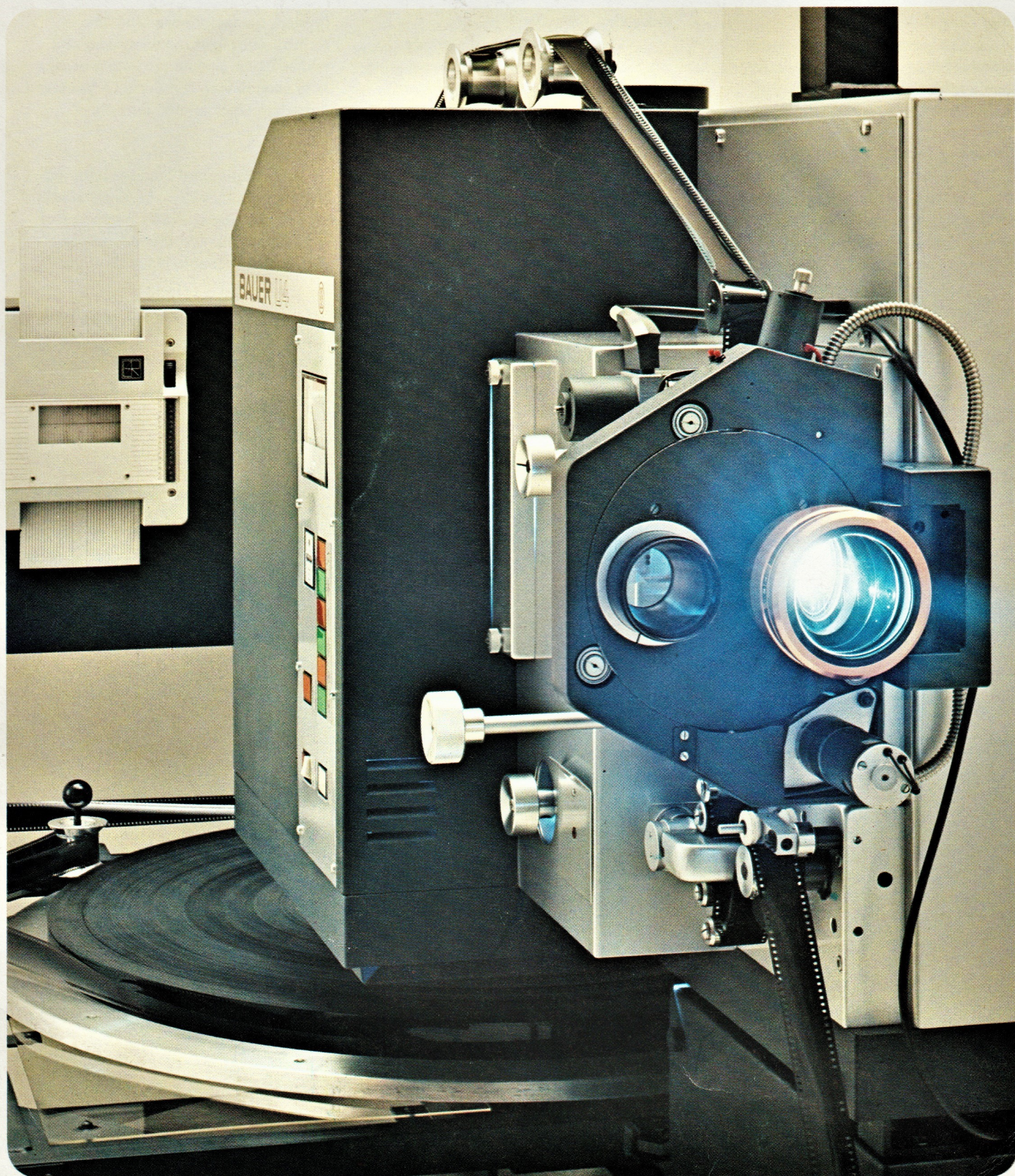


Bauer Cinema Projectors for Conventional and Automatic Film Projection.



Optimum use of Bauer Projectors in the Modern Cinema.

Some years ago it seemed that development and design of cinema projectors had reached their ultimate stage. Nothing more nor less was expected from a movie projector than simple operation with high projection and replay quality, minimum maintenance with high-precision design.

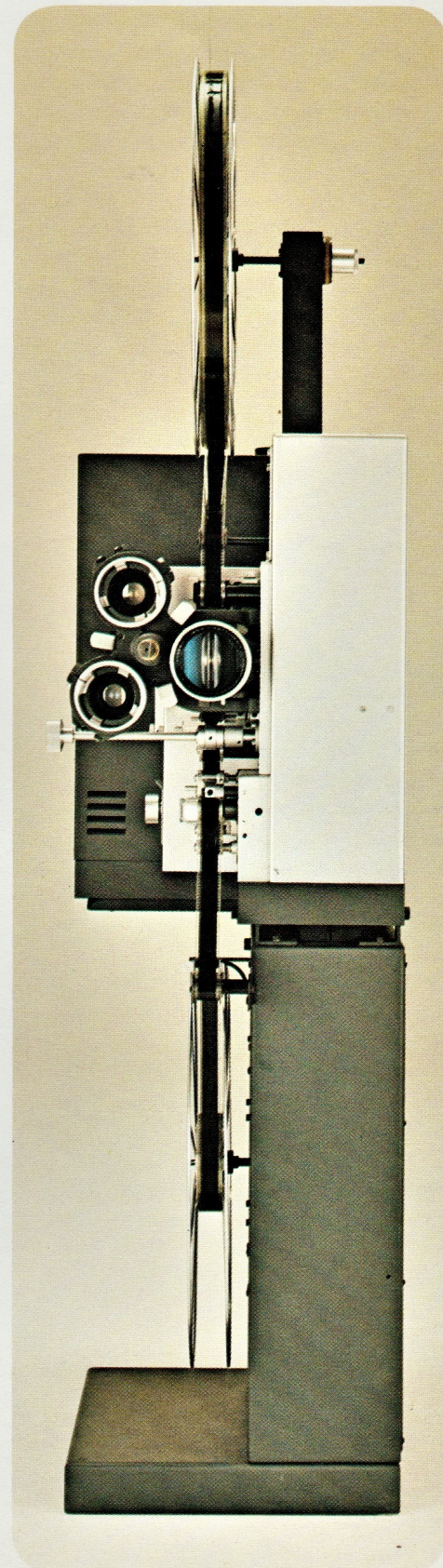
Bauer cinema projectors have always fully complied with these requirements, for example projecting daily for three hours the Maltese cross movement executes in 10 years 933,120,000 — that is to say almost a thousand million — film transport operations. For Bauer Cinema projectors this is, of course, nothing out of the ordinary.

The cinema owner will certainly still expect today the proverbial Bauer quality. But it is becoming increasingly important for him to make the best use of this quality. A Bauer projector when properly treated will function troublefree year after year.

Personnel reduction is an important factor in the present trend towards the small cinema. Anyone who makes three cinemas out of a large one and has to engage additional personnel to run them is certainly on the wrong track.

The right way of balancing expense and profit is rationalization. This does not necessarily mean that the timer replaces the projectionist in cinema operation. But the more one expects from rationalization and the more radical the modifications are (for example as regards programm arrangement as well), the closer one comes to full automation.

This publication, therefore, not only gives all the important information on Bauer cine equipment, but also ideas for their optimum use in modern cinema operation.



The A to Z of Bauer Perfection in Every Detail.

Bauer cinema projectors are equipped in standard form for projection and replay of optical sound films and provision is made for incorporation of a magnetic sound replay unit. They can be equipped with a remote control unit for focusing and frameline adjustment either at the works or subsequently as required.

Drive

The speed of the non-synchronous single-phase AC motor is not affected by voltage fluctuations and operating temperatures. Quiet and vibrationfree power transmission is assured by the use of synchroflex belts.

Film Transport

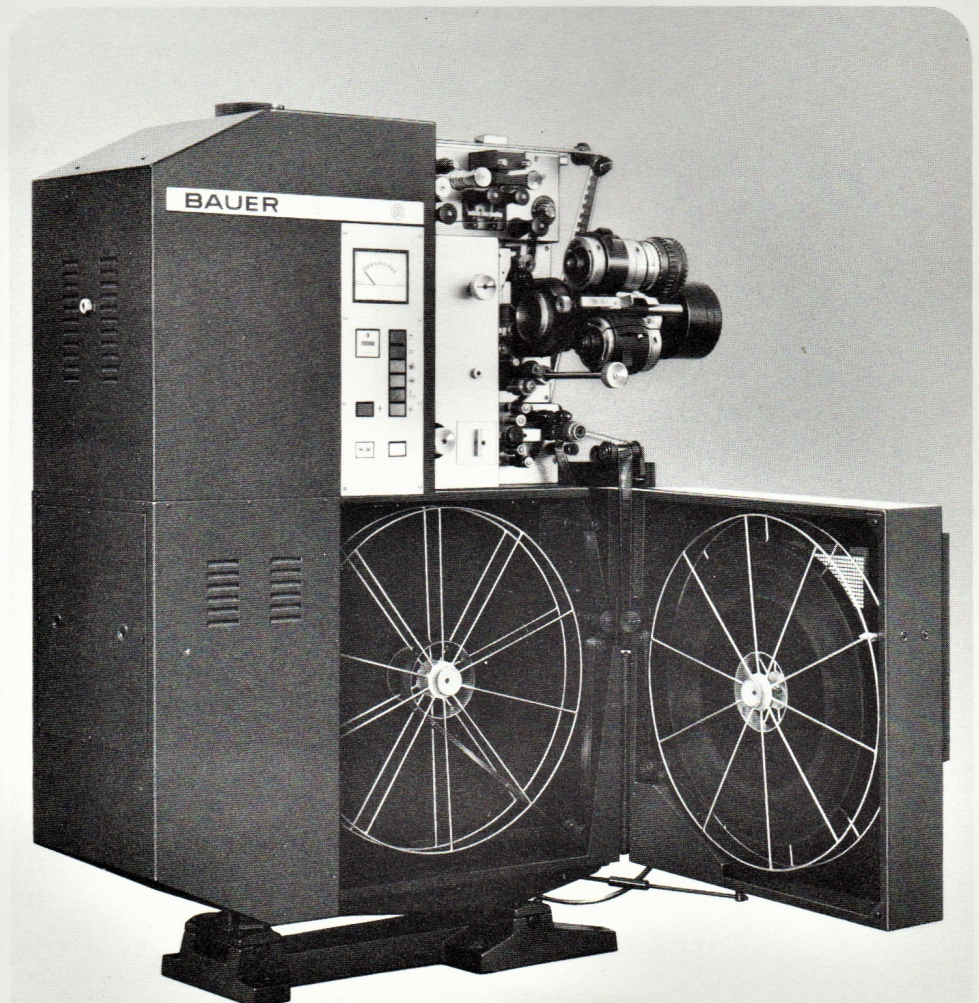
The projector mechanism with a 4-part Maltese cross movement running in an oil bath and a 16-tooth sprocket transports the film accurately with a minimum of wear. Picture steadiness is outstanding; weave lies within very narrow tolerances.

The Bauer U 3

A modern compact twin format cinema projector. Conversion from 35 mm to 70 mm and vice versa is possible within minutes. The film reels are housed in the projector base. They hold a maximum of 2000 m of 35 mm film or 1300 m of 70 mm film. For maximum film preservation the U 3 has a special speed-regulated drive motor for the feed reel. In conjunction with a scanning device it maintains film tension at 350—450 g.

The lamphouse is designed for 900, 1600 and 2500 W xenon lamps (special version also for 4000 or 6500 W).

If required the projector can be supplied with a built-in, power-driven film rewind (special equipment).



Film Gate Assembly

The specially hardened, interchangeable film gate is curved to flatten the film. The pressure of the plastic tension bands is adjustable.

Change of Format

The film format is changed manually by moving the film gate slide and by selecting the appropriate lens on the turret.

Frameline Adjustment

Central frameline adjustment permits frameline correction even during projection; the optical axis and thus the location of the film remain unaffected.

Light Source

Xenon lamps of differing strength are used as a light source. They are ignited automatically by pushbutton. A manual re-ignition if necessary is possible.

A dichroic cold light mirror system separates the thermal radiation of the xenon lamp from the optically useful light. The majority of the heat passes through the mirror and is removed

through the lamphouse vent. The dichroic cold light mirror system also makes Bauer cinema projectors particularly economical. It reflects 15 % more light than conventional mirrors.

Efficiency

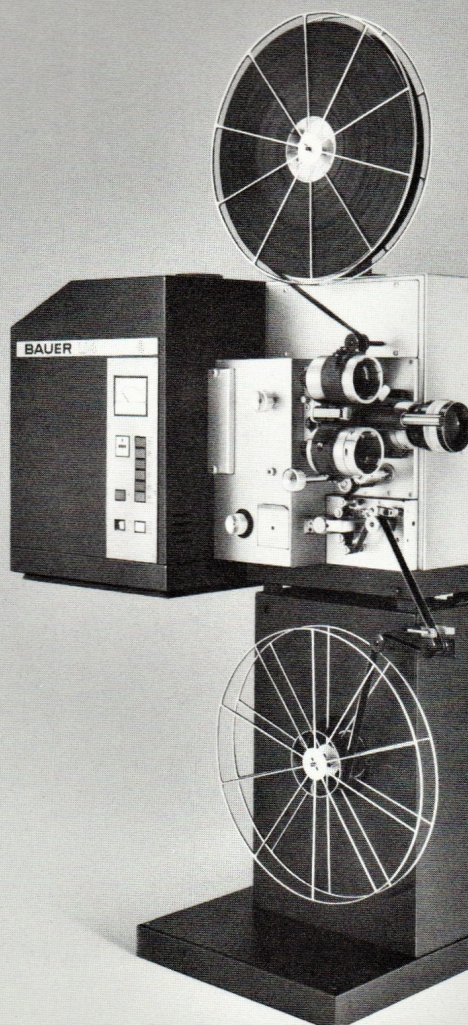
In addition, the higher light output is used rationally: the single-blade shutter rotating at 2880 r.p.m. reduces the light output considerably less than conventional double-blade shutters.

The Bauer U 4

The modern cinema projector for projection of 35 mm film (maximum reel capacity 1800 m) can be equipped according to requirements with 900, 1600 and 2500 W xenon lamps.

As model U 4 R, this projector is also available in a special version enabling rewinding of threaded film for "rock & roll" operation. The U 4 must always be used in conjunction with a Bauer twin deck film carriage (see page 6).

Bauer U 4 projectors are also available with protective drums for 1800 m film reels.



The light cut-off for changeover to another projector is operated electromagnetically.

Film Take-up

On types U 3 and U 4 the film tension necessary for take-up of the film is limited to a maximum of 500 g by loadcontrolled friction devices. A new film break and splitting sensor scans the film edges and switches off the projector if the film breaks or splits down lengthwise. The projector also switches off automatically at the end of the film.

The Bauer U 5 R

The latest Bauer 35 mm cinema projector is also capable of running in reverse (without light), maximum reel capacity 3200 m. The reels are offset in relation to one another on the projector pedestal. Feed and take-up reels are each driven by an electrically controlled winding motor; the film tension is constantly maintained below 400 g on both the feed and take-up side. The light source is the same as for the Bauer U 4.

Operation

Bauer cinema projectors are operated by a control panel on the lamp-house. The electrical operating system is fed from a built-in power supply unit with a control voltage of 24 V DC; all important functions are controlled by relays. Remote control is also possible.

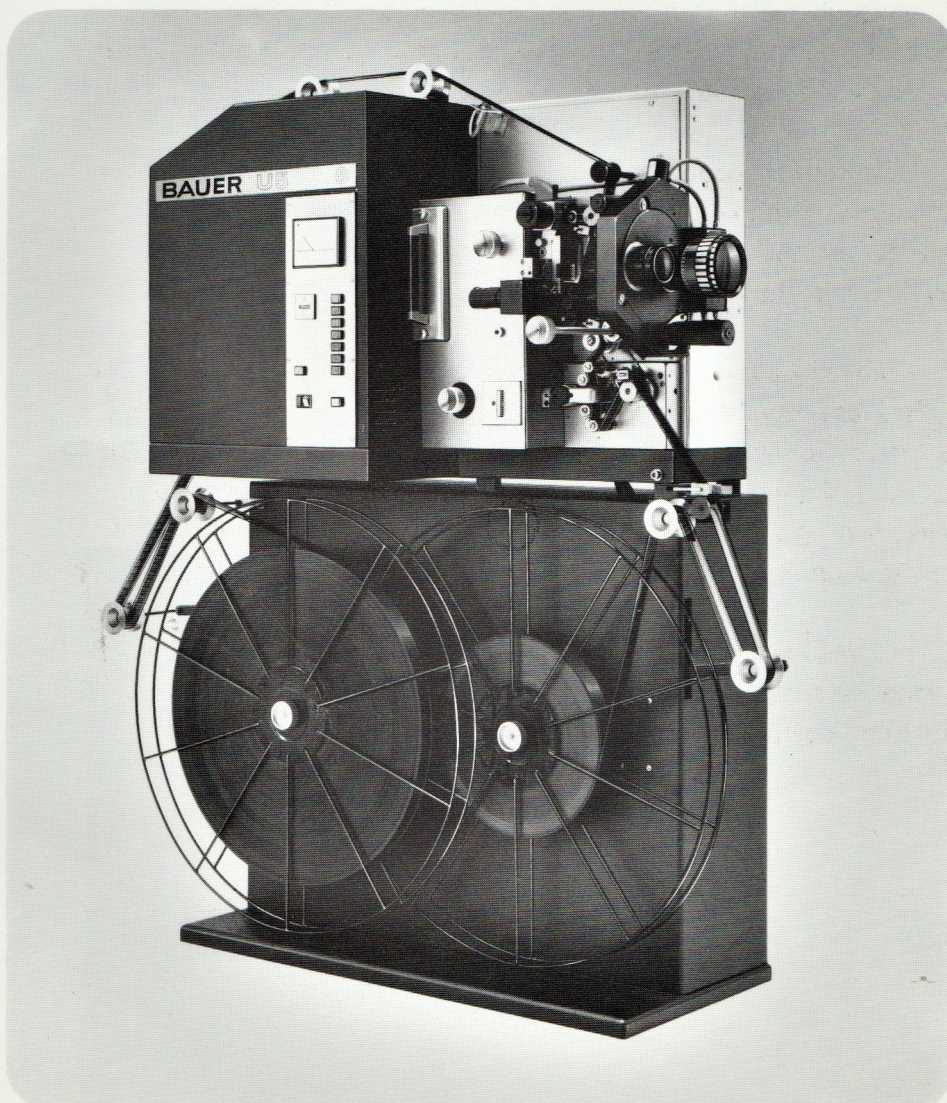
Optical Sound Unit

The optical sound unit integrated in the projector mechanism is distinguished by short run-up time, minimum wow and flutter and wide frequency range. The silicon solar cell is practically

not subject to normal wear. The exciter lamp can easily be replaced. The slit optic is adjustable.

Automation Accessories

See next page.

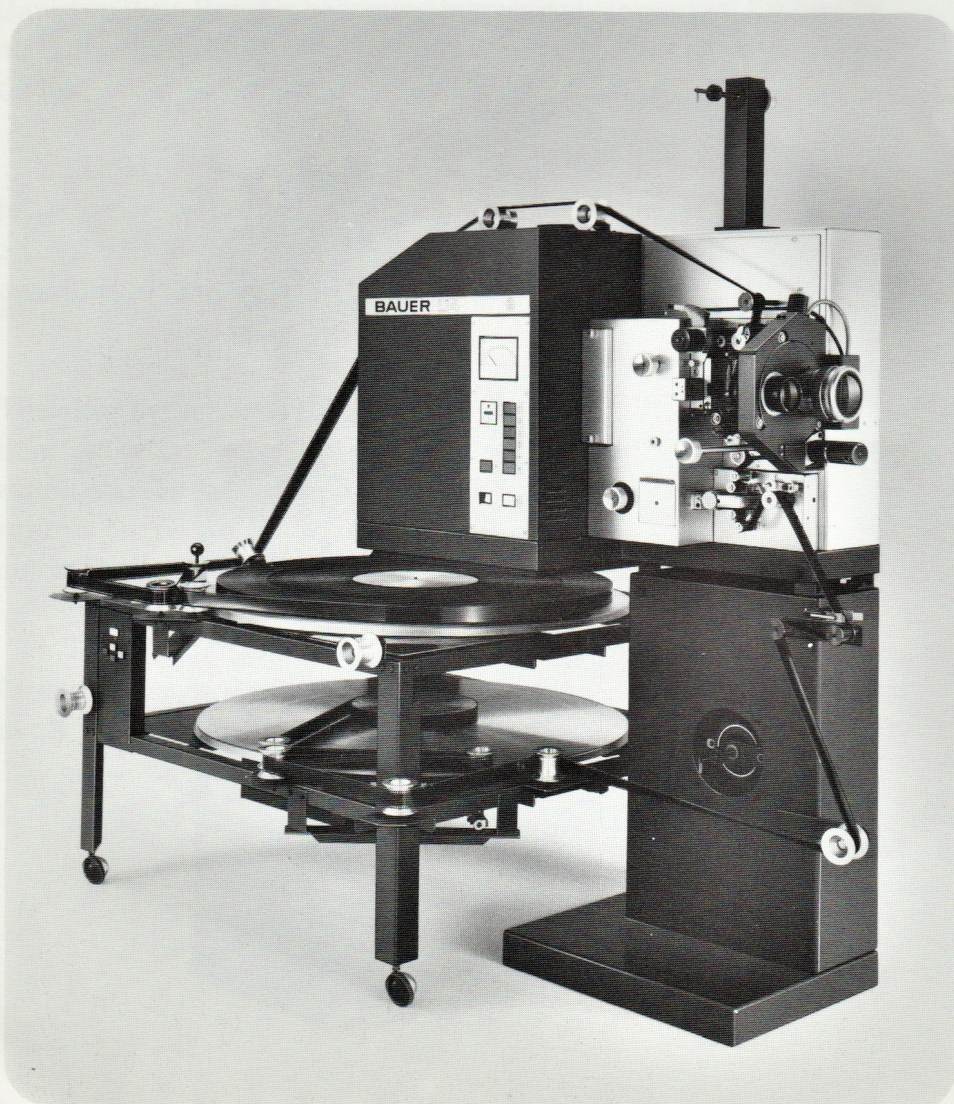


Automation of cinema operation with Bauer Equipment.

The cinema owner who wishes to rationalize the operation of his cinema by either re-equipping or by introducing modern methods often finds himself faced with a multitude of questions, the best solutions to which may not be immediately apparent.

The cinema that shows three different programs in three different performances a day and changes these every other day requires a different operating technique from one that shows one and the same program for weeks and months, although with constantly changing "shorts". Similar differences will

exist between a cinema operated by two people and a chain of cinemas employing a large staff.



The Bauer Twin Deck Film Carriage

is a mobile supplementary unit with two horizontal decks (shown on the left with the Bauer U 4) for automated projection up to 4800 m of film. It facilitates continuous projection of a program lasting almost three hours. Each deck is driven by its own motor; electrical control maintains the film tension constantly below 300 g. The horizontal position of the film coil prevents imbalance, squeezing and buckling of the film, ensuring minimum film wear if any.

The films received on hire are wound onto the film carriage from the bobbin, spliced together and coded for automatic projection. After projection the film can be rewound at a maximum of 15 times the normal projection speed (i. e. less than 10 minutes for normal length feature films). The top film deck is detachable to facilitate program changing.

Proceeding on the basis of this consideration two types of automation are shown in the table opposite: **automated projection**, that is to say, automatic operation of one showing with subsequent non-automatic preparation of the next; and **full automation** whereby repeated showings run automatically for the desired period of time after being suitably pre-programmed.

Both automation systems have been compared here for the maximum possible length of single showings. In the two outer columns are listed the equipment combinations best suited for the purpose (continued on page 8).

Equipment necessary for automated projection	Max. film length (m)	Equipment necessary for full automation
2 x Bauer U 4	3600	
2 x Bauer U 3	4000	
1 x Bauer U 4 + 1 x twin deck film carriage	4800	
1 x Bauer U 4 + 1 x Bauer U 4 + 1 x twin deck film carriage	6400	2 x Bauer U 5 R
	6600	1 x Bauer U 5 R + 1 x Bauer U 4 R + 1 x twin deck film carriage
	8000	
2 x Bauer U 4 + 2 x twin deck film carriages	9600	

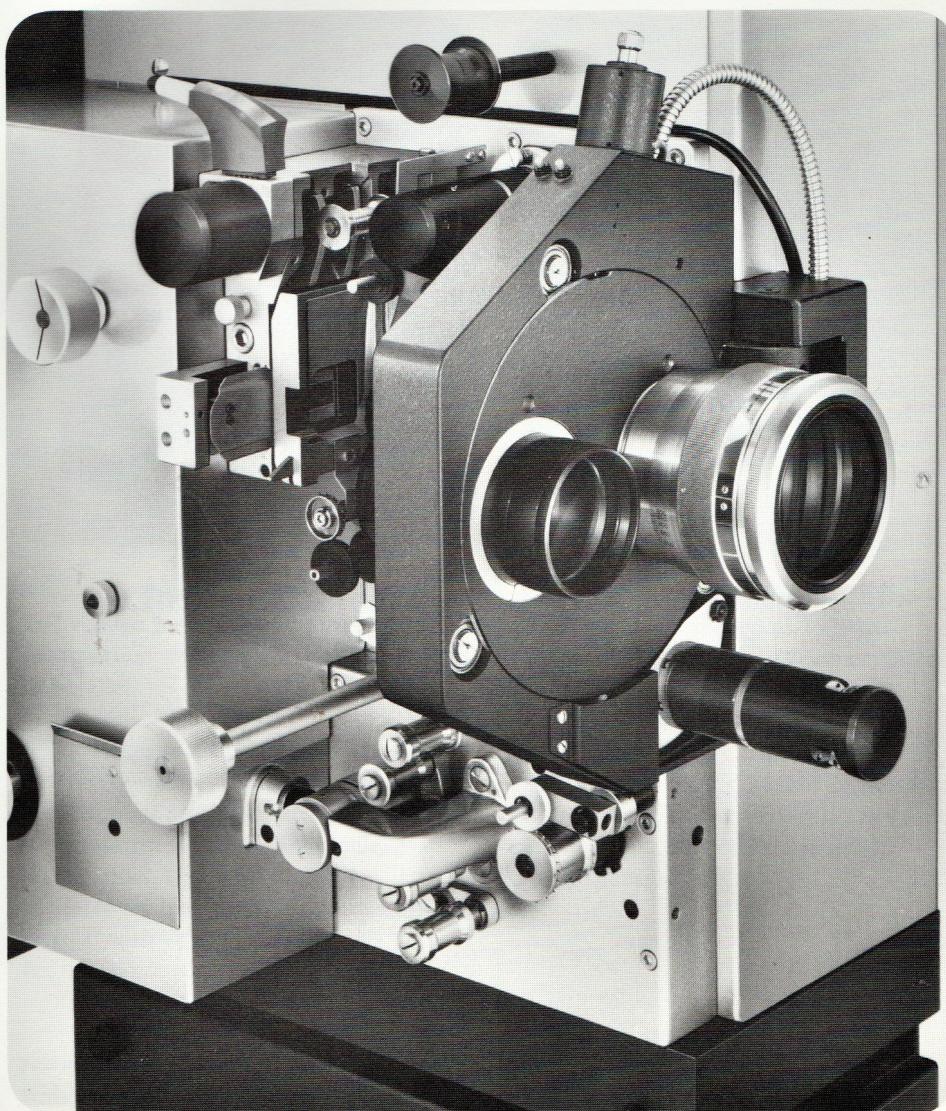
The Bauer Automatic Format Changer

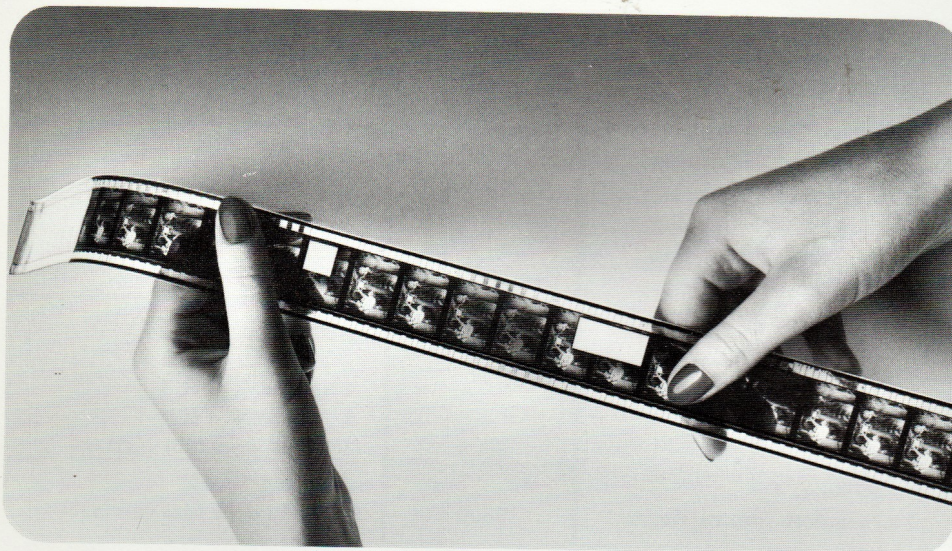
During automated projection of a program consisting of different film formats, one projector must be equipped with an automatic format changer. Existing Bauer U 3 and U 4 projectors can subsequently be fitted with the automatic format changer which further serves to considerably simplify conventional cinema operation.

The Bauer automatic format changer (see photo right) consists of a motor-driven twin-lens turret, an automatic film gate slide and a remote control for focusing. In addition a frameline adjustment control can be supplied. With automatic operation the format changer is controlled by the Bauer automatic program control unit. According to requirements either the widescreen attachment or the anamorphic lens (for CinemaScope) is moved in front of the prime lens.

At the same time the corresponding film gate mask is moved into the light path.

Changeover only takes place if the turret is not already set to the correct format.

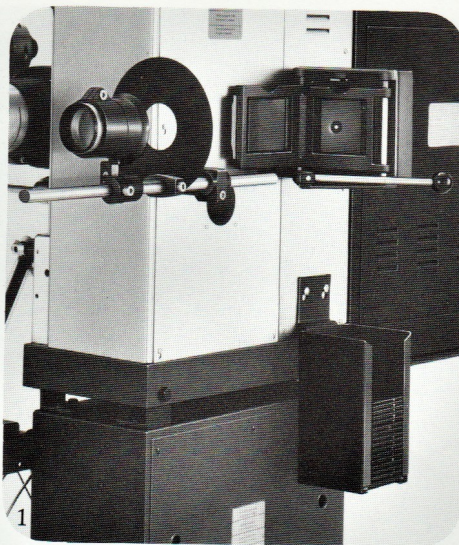




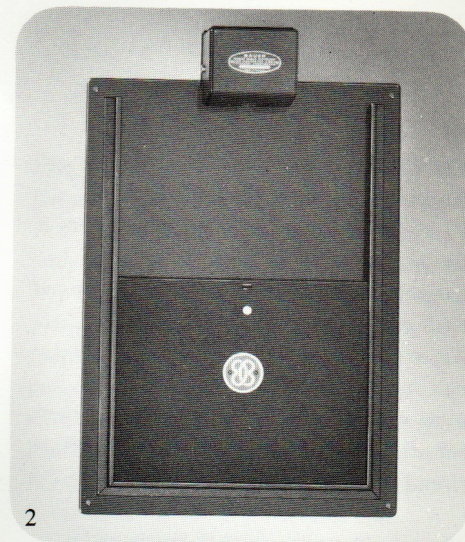
(Continued from page 7)

For the projectors and auxiliary equipment mentioned in the table the **Bauer automatic program control unit** is necessary in every case. To obtain the maximum benefit of automation this unit controls not only the projection equipment but all operations ranging from positioning of the curtain, interval music and screen masking to auditorium lighting.

When preparing the program (splicing together lengths of film or program sections and rewinding onto reels or onto the feed deck of the twin deck film carriage) the sequence of operation is coded on the film.



Special Equipment and Accessories.



Bauer cinema projectors can also be supplied with built-in silicon pre-amplifier and exciter lamp rectifier if they are to be used with existing amplifier or P. A. systems.

The magnetic sound unit is available with a 4-track magnetic head block for replay of 35 mm magnetic sound films or (for the Bauer U 3) with a 6-track magnetic head block for sound replay on 70 mm films.

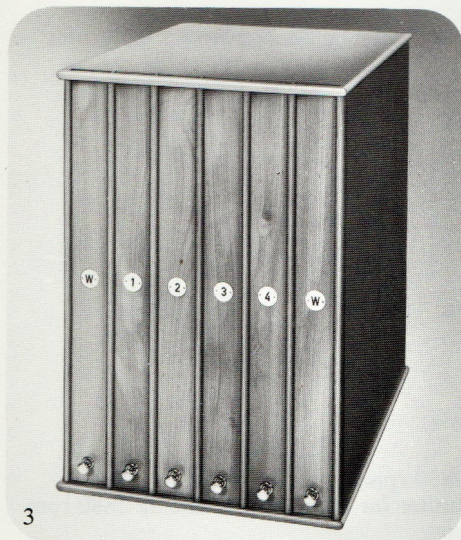
The loop former makes it possible to alter the size of the film loop on the take-up sprocket both after loading and also during projection (not for projectors featuring reverse running).

For this purpose markers of adhesive metal strip are stuck to the back of the film, their significance depending on their length (see photo left).

The advantage of this system is that, as the control instructions come directly from the film, operating errors, for example during program change, are eliminated.

The instructions are read by an inductive, non-contact scanning system on the projector. Several functions can be assigned to each of the instructions, so that for example the instructions "projector off", "curtains closed", "auditorium lighting on" and "interval music on" can be given by a single marker.

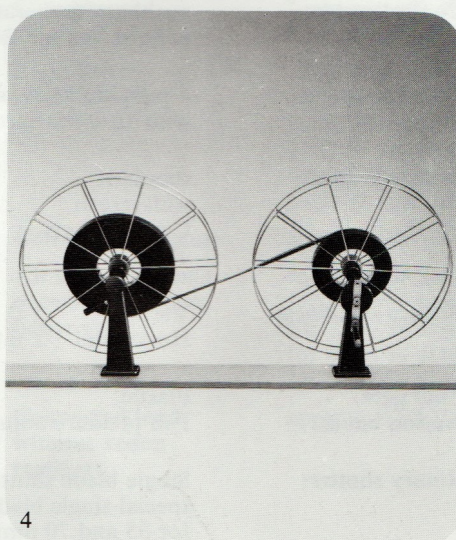
The Bauer automatic program control unit is suitable both for automated projection and for full automation (even using a timer if desired).



Using the Bauer Dialux IV slide attachment (Fig. 1) the full projection light is used for showing advertising slides.

For operation of the projectors on power supplies other than 220 V there is a power transformer with inputs from 110—255 V.

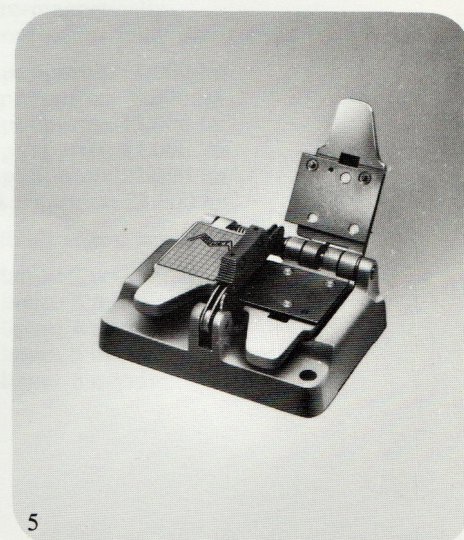
Bauer projection room windows are available in three sizes (Fig. 2: standard version). They are built into the finished projection room wall. The window shutters can be controlled electromagnetically and manually.



The shutter rectifier supplies the DC voltage for a maximum of 15 projection room window magnets connected in parallel.

Bauer film cabinets are available in two versions: 6 compartments for 2000 m reels of 35 mm film (Fig. 3), 8 compartments for 1300 m reels of 70 mm film. The cabinets can be mounted on the projection room walls or used with an adapter plate as a base for the Bauer rewinder.

The standard version of the Bauer rewinder is equipped for 35 mm reels with a capacity of up to 2000 m of film (Fig. 4). With special spindles it can also



be used for 70 mm reels up to 1300 m and for 16 mm reels up to 1500 m. Power-operated rewinders are available on request.

Bauer splicers can be supplied in three versions for 16, 35 and 70 mm film (Fig. 5 shows 35 mm version). They are simple to operate and ensure good, strong splices.

The illustrations in this brochure are not necessarily reproduced on the same scale.

Technical Data

Subject to modification without notice

Projectors

Weight:	U 3:	0.9—2.5 kW	280 kg net
	4	—6.5 kW	310 kg net
		70 mm conversion set	18 kg net
	U 4:		225 kg net
	U 4 R:		220 kg net
	U 5 R:		300 kg net
	Magnetic sound unit:		13 kg net
	Dialux IV slide attachment		8 kg net
Dimensions:	See drawings on pages 12 and 13		
Drive motor and supply voltage:	non-synchronous single-phase A. C. motor 220 V, 50 (60) Hz or 117 V, 60 Hz; also available with power transformer for other voltages		
Projection speed:	24 f. p. s.		
Control system:	pushbutton operated, control voltage 24 V DC from built-in power supply unit		
Film transport:	4-part Maltese cross movement in oil bath with 16-tooth sprocket		
Picture formats:	standard	1 : 1.37	
	widescreen	1 : 1.66	
	CinemaScope	1 : 2.35	
	Todd-AO	1 : 2.20 (U 3 only)	
Picture steadiness:	Vertical	± 0.15 %	
	Horizontal	± 0.08 %	
Film gate tension bands:	Plastic		
	Pad pressure adjustable		
Rotary shutter:	Single blade shutter 2880 rpm, special single blade shutter for U 3 drive-in cinema 2880 rpm for 35 and 70 mm film		
Lens mounts:	3-lens turret:		
	101.6 mm Ø: turret mounts		
	70.6 mm Ø: additional mount 101.6 x 70.6 x 79.4 mm		
	62.5 mm Ø: ditto, plus adapter (special accessory)		
	70.6 x 62.5 mm		
	79.4 mm Ø: for anamorphic lens		
	Automatic format changer:		
	Prime lens	70.65 mm Ø	
Film feed:	U 3:	by electrically controlled, maintenance-free non-synchronous single-phase motor, film tension 350—450 g	
	U 4:	film tension limited by adjustable friction brake	
	U 5 R:	by electrically-controlled, maintenance-free non-synchronous single-phase motor, max. film tension 450 g	

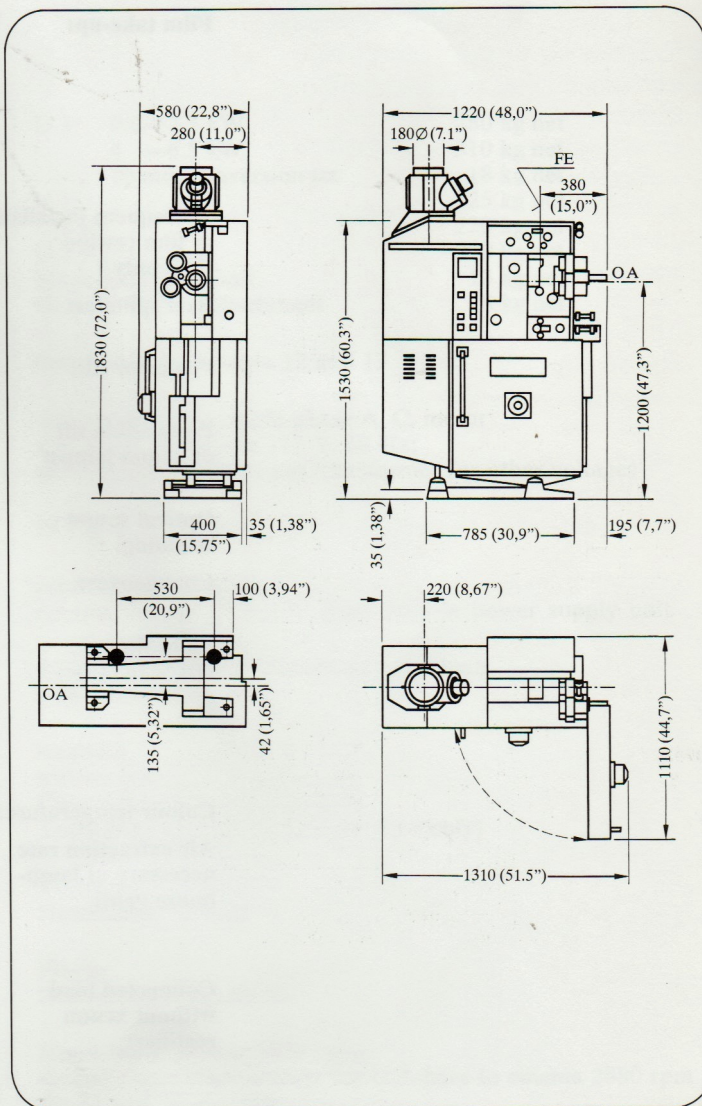
Film take-up:	U 3: film tension limited to 500—600 g by load-controlled friction clutch U 4: ditto, max. 500 g U 5 R: by electrically controlled, maintenance-free non-synchronous single-phase motor, max. film tension 450 g
Subsequent installation of film rewind (U 3 only):	electrically controlled non-synchronous single-phase motor, film end cut-out for 600 or 2000 m reels. Film tension 350—450 g
Reel spindles:	35 mm film: 9 mm Ø, optionally $\frac{5}{16}$ " or $\frac{1}{2}$ " 70 mm film and U 5 R: 12.5 mm Ø ($\frac{1}{2}$ ")
Projector tilt:	Upwards 3° — U 3: 6° Downwards 15°
Permissible tilt of xenon lamps:	900—2500 W: $\pm 30^\circ$ 4000 W: $\pm 15^\circ$ 6500 W: $\pm 10^\circ$
Optical sound scanning:	Silicon solar cell, exciter lamp 6 V, 5 A
Changeover:	Light cut-off: electro-magnetically, Sound: operating contact for relay changeover
Light flux: (DIN 15749)	900 W xenon lamp: approx. 4.000 lm 1600 W xenon lamp: approx. 9.000 lm 2500 W xenon lamp: approx. 13.000 lm 4000 W xenon lamp: approx. 14.000 lm 6500 W xenon lamp: approx. 22.000 lm 6500 W xen. Autok.: approx. 23.000 lm
Colour temperature:	approx. 6000 K with all xenon lamps
Air extraction rate necessary at lamp- house vent:	for 900 W xenon lamp: 2 m ³ /min. for 1600 W xenon lamp: 3 m ³ /min. for 2500 W xenon lamp: 4 m ³ /min. for 4000 W xenon lamp: 5 m ³ /min. for 6500 W xenon lamp: 6 m ³ /min.
Connected load without xenon rectifier:	approx: 0.5 kVA

Bauer twin deck film carriage

Weight:	approx. 150 kg net
Dimensions:	see drawing Bauer U 4
Supply voltage:	220 V/50—60 Hz or 117 V/60 Hz } single-phase AC
Power fuse:	220 V supply 10 A 117 V supply 16 A
Control voltage:	24 V DC from built-in rectifier
Film capacity:	Feed and take-up reel with 30 cm bobbin up to 4800 m of 35 mm film
Rapid film rewind:	Max. 15 times projection speed
Rewind time:	4000 m in approx. 10 minutes
Film tension:	max. 300 g for all operating modes, electronically controlled.

Technical Data Dimensions

Subject to modification without notice.



Bauer U 3 with 4 or 6.5 KW lamphouse. With 0.9—2.5 KW lamphouse, overall height 1560 mm (61.3")

Bauer U 4 with twin-deck film carriage,

Bauer U 5 R

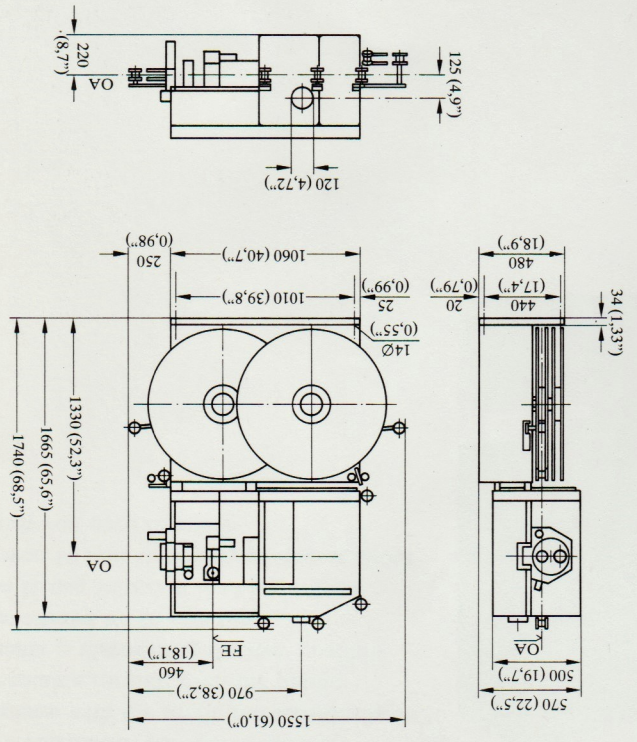
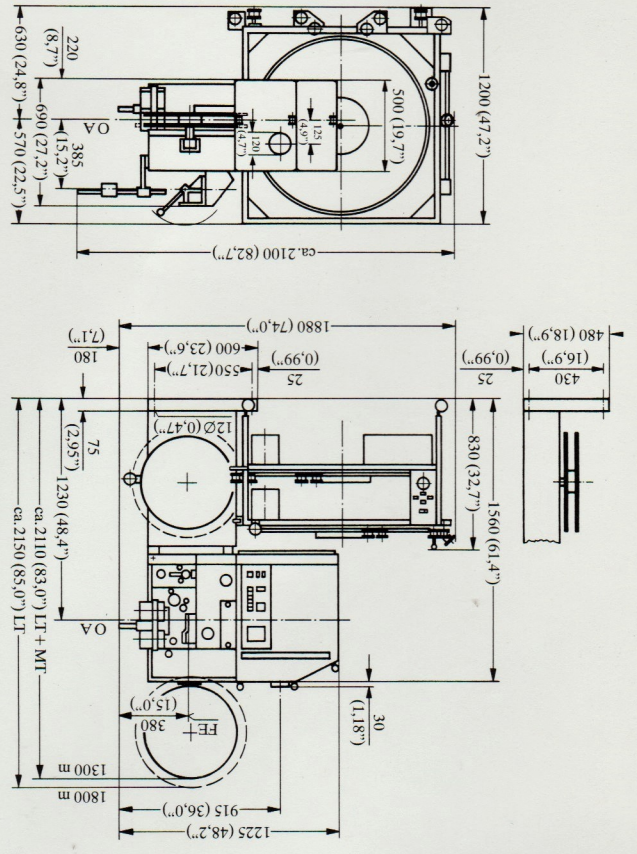
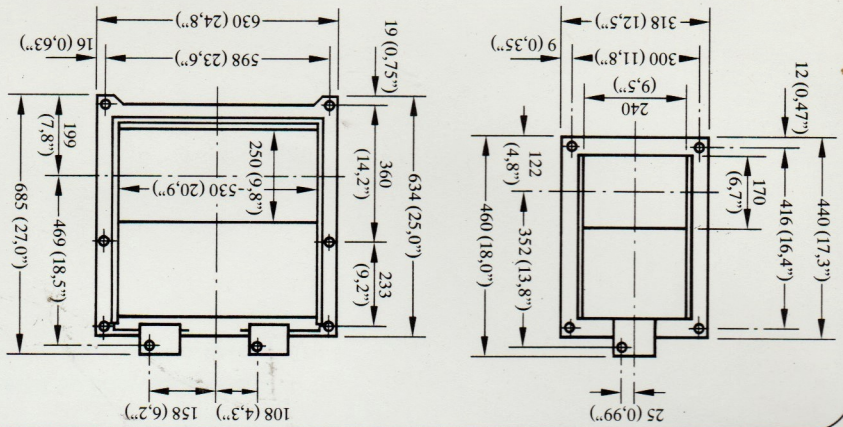
FE = film plane

OA = optical axis

LT = optical sound

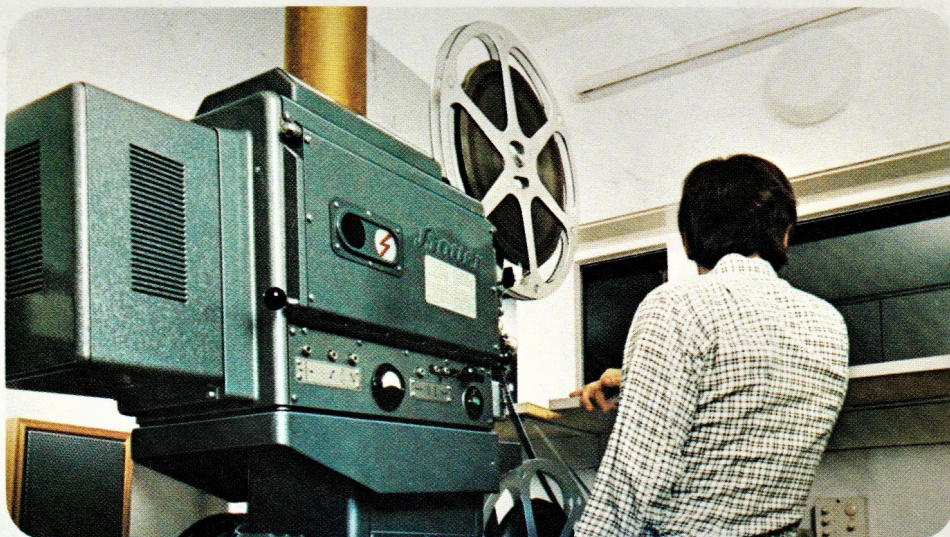
MT = magnetic sound

Drawings on right: Bauer projection room windows
standard version, wide version, special version.



... and for projection of 16 mm films: the Bauer Selecton.

16 mm films have long been accepted by the far-sighted cinema owner. Film club cinemas in particular cannot dispense with the small, but technically acceptable format; even the public cinema is discovering the new possibilities offered by 16 mm film. The Bauer Selection II O is a robust, proven 16 mm stationary projector about which you need to know.



BAUER

BOSCH Group

Presented by your authorized
Bauer cinema projector specialist:

Robert Bosch GmbH
Geschäftsbereich Photokino
7 Stuttgart 60
Beim Inselkraftwerk 10