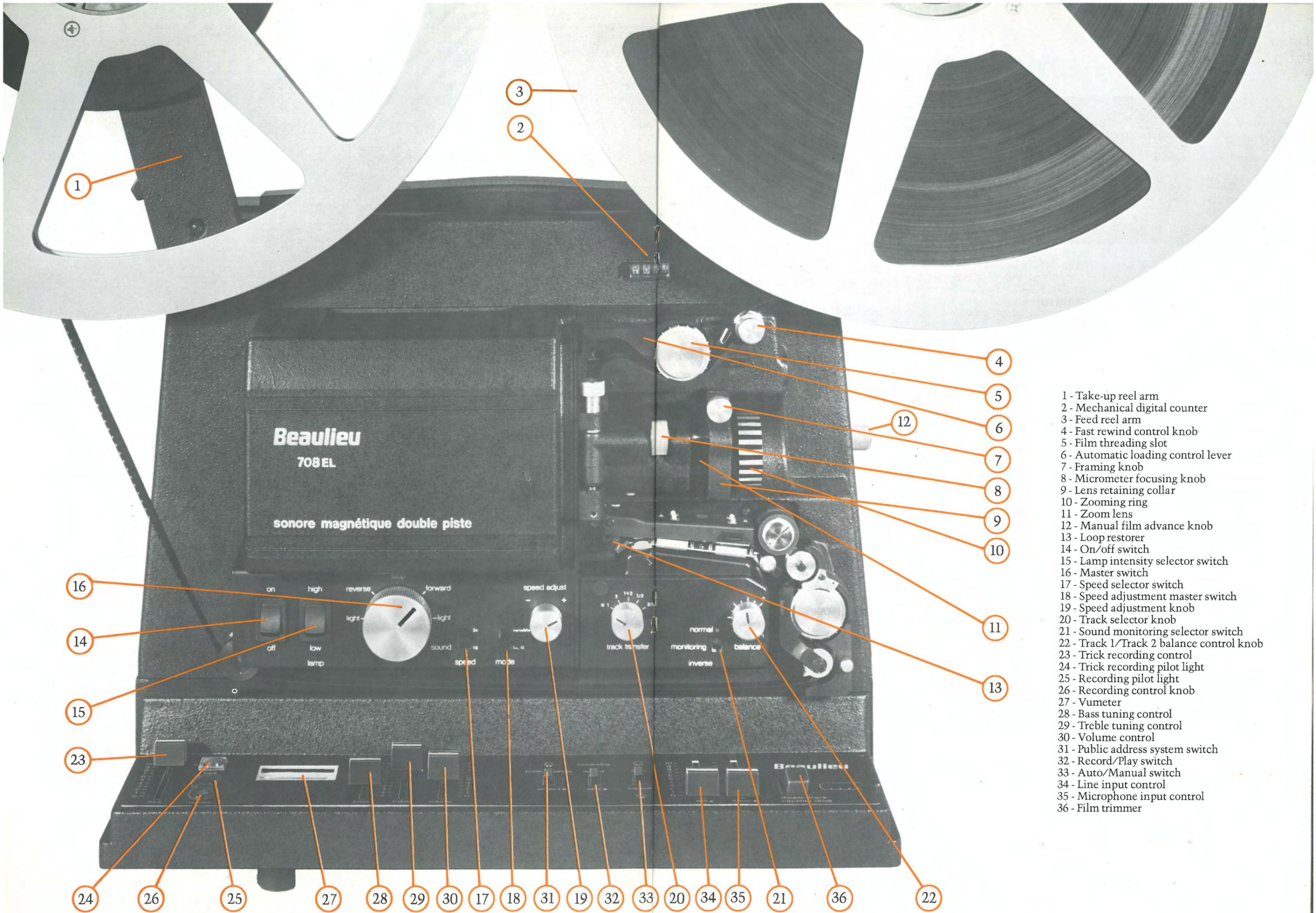


Beaulieu

708 EL



SUPER 8 SOUND PROJECTOR



- 1 - Take-up reel arm
- 2 - Mechanical digital counter
- 3 - Feed reel arm
- 4 - Fast rewind control knob
- 5 - Film threading slot
- 6 - Automatic loading control lever
- 7 - Framing knob
- 8 - Micrometer focusing knob
- 9 - Lens retaining collar
- 10 - Zooming ring
- 11 - Zoom lens
- 12 - Manual film advance knob
- 13 - Loop restorer
- 14 - On/off switch
- 15 - Lamp intensity selector switch
- 16 - Master switch
- 17 - Speed selector switch
- 18 - Speed adjustment master switch
- 19 - Speed adjustment knob
- 20 - Track selector knob
- 21 - Sound monitoring selector switch
- 22 - Track 1/Track 2 balance control knob
- 23 - Trick recording control
- 24 - Trick recording pilot light
- 25 - Recording pilot light
- 26 - Recording control knob
- 27 - Vumeter
- 28 - Bass tuning control
- 29 - Treble tuning control
- 30 - Volume control
- 31 - Public address system switch
- 32 - Record/Play switch
- 33 - Auto/Manual switch
- 34 - Line input control
- 35 - Microphone input control
- 36 - Film trimmer



Project with the same top quality image and sound as recorded by your cine-camera.

With the advent of Super 8 sound, modern cameras are improving fast.

They have, ultra-fast lenses for filming in very low light, and sound recording systems which many hi-fi tape recorders might envy.

But so far, except for a few rare exceptions, this quest for perfection has not made such headway where projectors are concerned.

Isn't it a pity that you should not when projecting enjoy the exact quality of the picture you filmed and the sound you recorded with your excellent cine-camera?

The Beaulieu 708 EL projector has been designed specifically to reproduce the high quality of the sound and picture recorded by the best Super 8 sound cameras, available now or yet to come.

It meets three basic requirements:
– projecting perfectly clear, steady and luminous pictures;
– hi-fi reproduction of sound;
– allowing amateurs to monitor the mixing of the sound they add to their original film.

To achieve these results Beaulieu have, as in their cine-cameras, used sophisticated technological solutions, most of them derived from professional techniques.

A variety of exclusive technical advances have been applied in the Beaulieu 708 EL to guarantee bright, clear and stable pictures.

Brightness

The brightness of a projector depends primarily on its lamp, on its projection window and on its lens.

A halogen lamp with a dichroic mirror
Beaulieu wanted it powerful: it is a 15 V, 150 W halogen lamp with a dichroic mirror. Absorbing part of the filament's heat, it only emits a "cold" light which cannot overheat the film. It is perfectly centered on all axes.

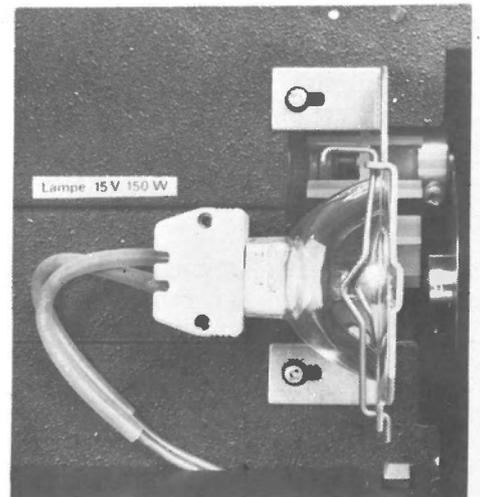
And an extra refinement: according to the film's general brightness and to screen distance, the lamp's power can be modulated (low-high). This makes for longer lamp life.

A wide-aperture lens

The professional-type specifications of the Beaulieu projector allow it to take a very fast lens.

Beaulieu have the multi-coated Schneider Xenovaron 11-30 mm f/1,1 lens. It is interchangeable, without modifications, with any present-day Ø 32.5 mm mount projection lenses (for instance for projecting in large halls).

These characteristics make the Beaulieu 708 EL projector astoundingly luminous, even at the edges of the picture: 264 lux on a 1-metre screen at a distance of 3 metres (39-inch screen, 9 ft 10 ins from the projector)!



Bright, clear, stable pictures

Pinpoint focusing

The clearness of projected pictures naturally depends on the quality of the camera, but also on how flat the film is pressed in the projector.

A pressure plate on the right side

A film is made up of a transparent base coated on one side with an emulsion. Throughout the film run, the emulsion must remain at the same distance from the lens.

But, in a film made up from different cartridges, with splices, the thickness of the base will vary.

On most projectors, the pressure plate is applied to the emulsion side of the

film, so that when extra thicknesses are involved, the frame-lens distance varies, throwing the picture out of focus and making it blurred.

The Beaulieu 708 EL is one of the rare projectors to have its pressure plate on the base side. It will therefore absorb its irregularities, and always maintain the emulsion pressed tight against the film path.

The picture thus retains pin-point sharpness throughout.

This is why it has proved possible to fit the Beaulieu 708 EL projector with a very fast ($f/1,1$) lens, whose depth of field is correspondingly small, without any danger of going out of focus.

Stability

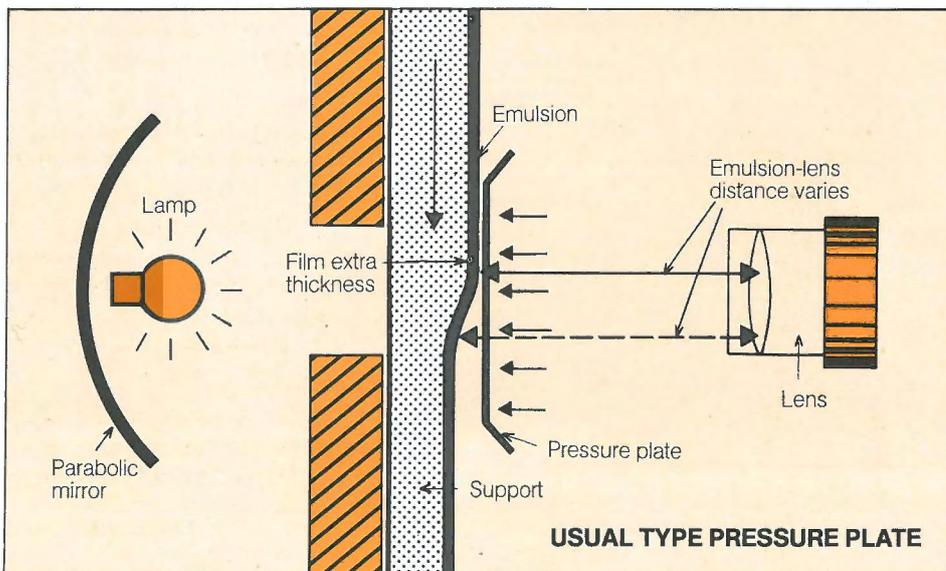
To avoid "film jitter", particularly when the perforations are in poor condition; Beaulieu have taken their inspiration from professional film-advance systems.

A double claw

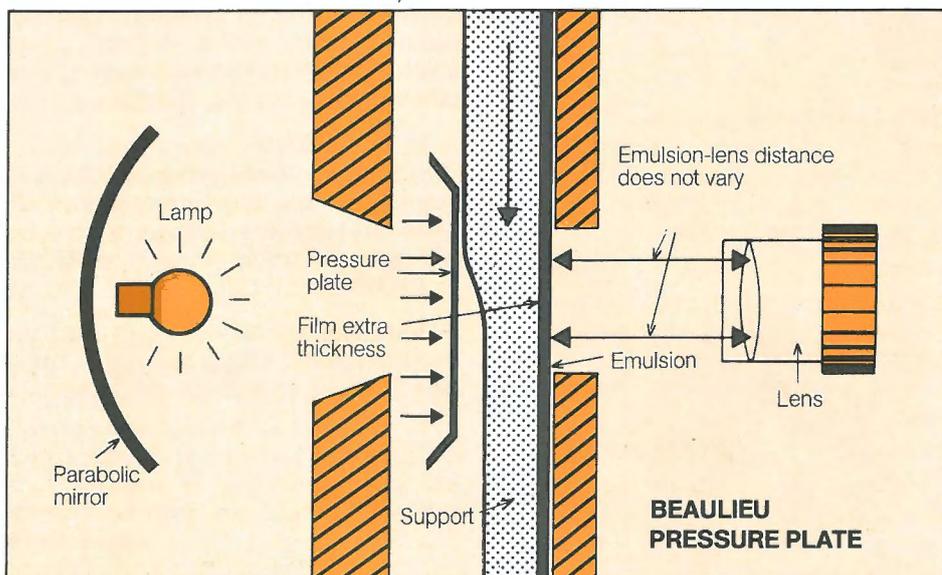
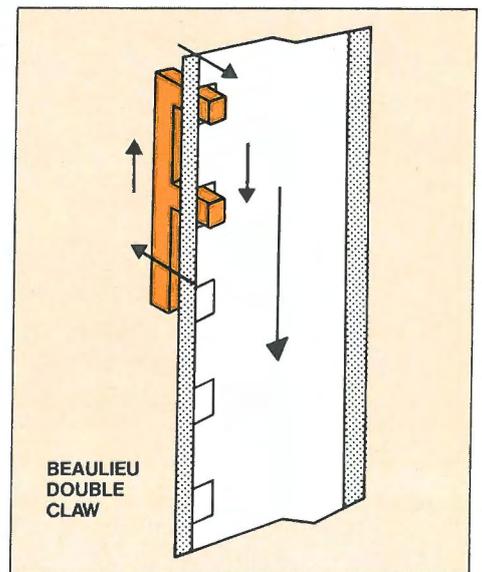
Instead of a single claw advancing the film perforation by perforation, Beaulieu have fitted their projector with a double claw entering 2 perforations at once. This makes for smoother film advance.

A steel film path

In order to increase stability yet further, Beaulieu have adopted a special steel film path which reduces both path wear and film wear.



Pressure plate on wrong side, emulsion-lens distance varies. Each time extra thickness occurs, focus is lost.



Pressure plate on correct side, emulsion-lens distance does not vary. Picture remains in perfect focus.

A micrometric focusing system

Finally, focusing is extremely accurate and smooth. Once the picture size has been chosen, fine focusing is done with a geared down micrometric screw.

High-fidelity sound

The important thing when projecting is accurate reproduction of the sounds faithfully recorded by your camera on the film's magnetic track. This sound is all the more precious when it is a dialogue between two people you love, or

typical music brought back from distant places.

We here enter the field of High-Fidelity and its standards: frequency range, distortion, signal/noise ratio, etc.

The Beaulieu projector is beyond question up to Hi-Fi standards.

Frequency range: 50 to 12,000 Hz
Signal/noise ratio: 45 dB, unweighted
Distorsion: 0.2%.

How are such high standards secured?

2 synchronized motors

Most present-day projectors have only one motor, supposed to fulfil a dual function: advancing the film with intermittent motion (18 or 24 times per second) in front of the projection window; and, at the same time, drawing it as smoothly as possible over the magnetic head.

A difficult compromise to achieve. Not to mention unavoidable wow and flutter on starting (inertia), there will be further wow and flutter caused by splices, differences in bases, damaged perforations, etc.

It is thus impossible, using this classic system, to approximate to Hi-Fi standards or to reduce the wow and flutter to less than 0.4%, in the case of the finest projectors.

In contrast, Beaulieu have fitted two motors on the 708 EL projector: one for picture, one for sound.

Electronically synchronized with the first, the "sound" motor draws the film past the magnetic heads, very soon assuming perfectly smooth, absolutely regular motion.

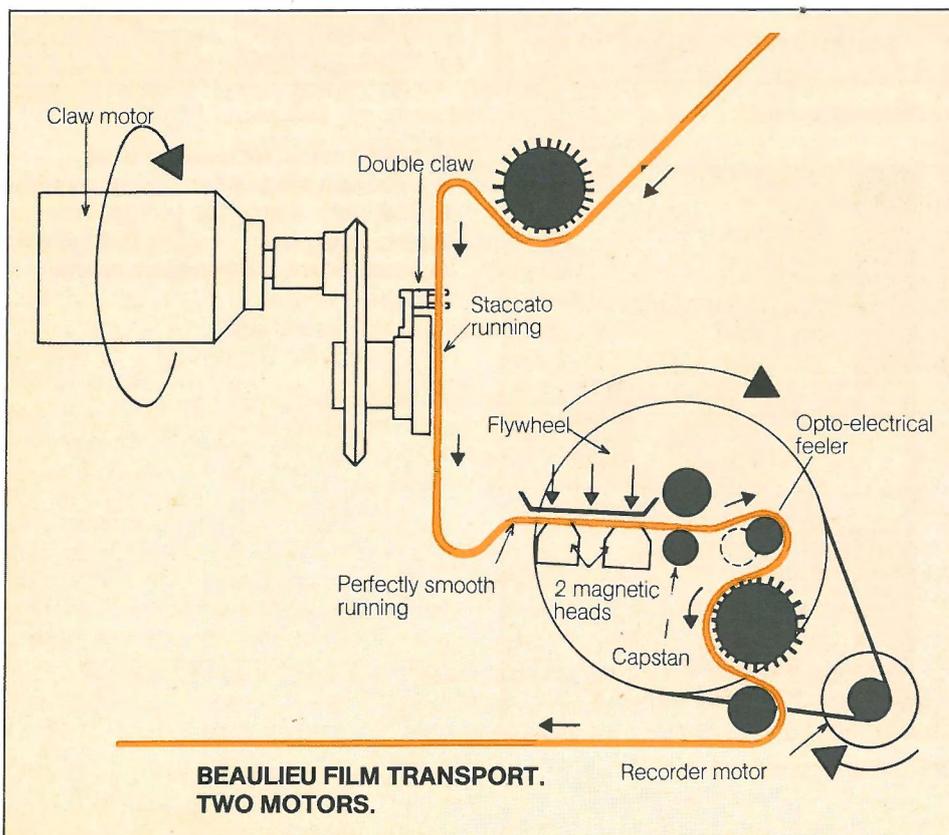
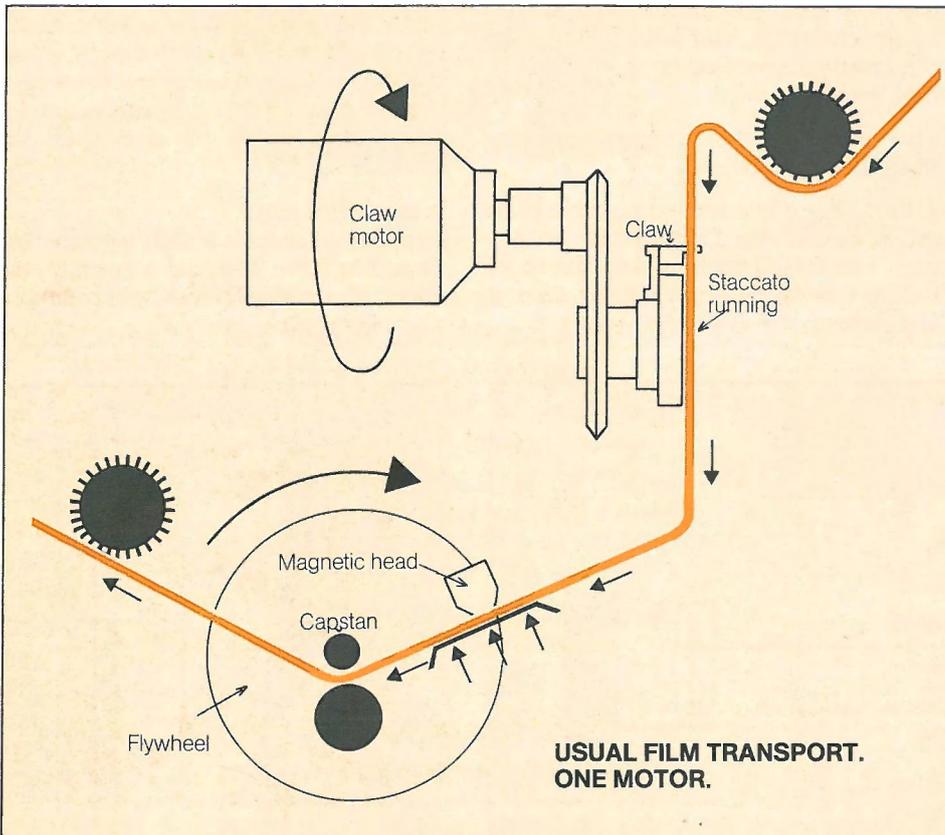
Results:

Wow and flutter of less than 0.2%, a standard worthy of fine Hi-Fi tape recorders. Thus accidental speed variations at claw level have no repercussions whatever at the magnetic head level. An opto-electrical captor also takes up any possible variation.

A 24 W amplifier

The Beaulieu 708 EL projector's built-in amplifier is the most powerful of all: 24 W effective into 4 Ohms - with separate bass and treble controls (at 100 Hz or 10,000 Hz: + 12 dB - 16 dB).

A loud speaker is also built into the projector. But if a large hall has been fitted up for sound, an outside speaker can be used.



Permanent sound-monitoring while recording or mixing



When you have made a film, no matter how good, you will inevitably feel the urge to improve it, either with background music if it is silent, or with commentary to situate the scene. You might also wish to insert a number of sounds by mixing them with the original recording, or to cut-out certain musical or spoken parts and to replace them with something else.

To achieve these procedures, a good projector must behave like a miniature recording and mixing studio. It must in particular have two essential features: "track transfer" and a "monitoring head".

Track transfer

Super 8 sound films have two magnetic sound tracks: one wider, known as the "main track", on which the camera records sound in synchronism with the pictures; the other, or "balance track", also able to receive a commentary or even music.

The Beaulieu 708 EL projector makes it possible to record on both these tracks and to play them both back:

- separately (recording and playing)

- together (playing only) with control of the sound level of each of them; - and to transfer sound from one track to the other (The sound on the main track can be transferred to the balance track - while still remaining recorded on the main track - and vice versa). The sound transferred in this way remains synchronous with the pictures.

Transfer of sound from one track to the other is a most important feature, more especially transfer, from main track to balance track, of the original - and often irreplaceable - sound recorded by the camera.

It then becomes possible to add or to wipe sounds on the main track with perfect safety. The original sound runs no risk of being lost for good, since it has been preliminarily "stored" on the balance track.

If the mixed sound recorded on the main track is unsatisfactory, it can be renewed as often as required, the original sound being each time transferred from the balance to the main track.

Monitoring

During recording and mixing procedu-

res, it is of the utmost importance to check permanently on the result achieved, as recording proceeds, in particular to modify sound volume or to correct a commentary.

The Beaulieu projector is fitted with a special monitoring head.

This is an extra magnetic head placed immediately after the recording heads. It allows you to listen in on the headphones, to hear the result of the recording or mixing, and to make any desirable changes according to what you hear. Most present-day Super 8 sound projectors are not fitted with both track transfer and monitoring head. Whence a risk of losing the original sound on the main track if the result of mixing is not satisfactory at the very first attempt, and the impossibility of permanently checking the result of mixing as the operation proceeds.

The Beaulieu projector is the only Super 8 sound projector to offer both track transfer (while still keeping the original sound in synchronism with the pictures) and monitoring.

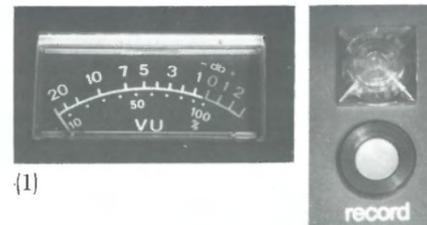
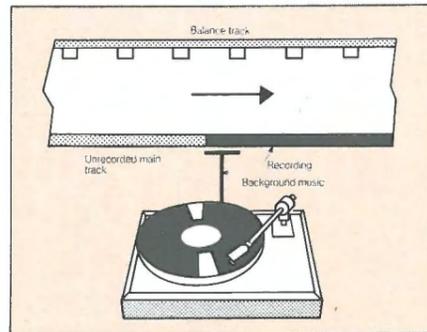
Ring the changes on Beaulieu's versatile sound system

Here are 5 examples of what you can do with sound when using the Beaulieu 708 EL projector.

Case N° 1: Recording on main track

You shot your film silent. On the main track you can record incidental music (by connecting the projector to a record player or tape recorder) or commentary (by connecting a microphone to the projector).

The sound level can be regulated either



(1)

(2)

automatically, or manually, by using the corresponding controls.

You can even record music and commentary on the same track, either automatically or by adjusting both sound levels manually (using the line and mike controls).

The vumeter (1), the digital counter and permanent monitoring allow you complete, accurate control throughout the recording.

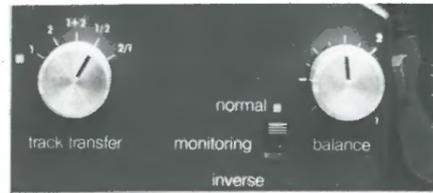
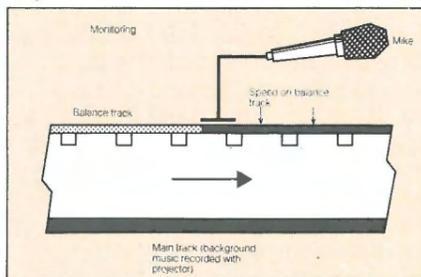
While you are recording, the pilot light (2) stops blinking and stays on permanently - yet another safeguard for your sound.

Case N° 2: Recording on both tracks

The balance track allows you to record without interfering with what you have just recorded on the main track.

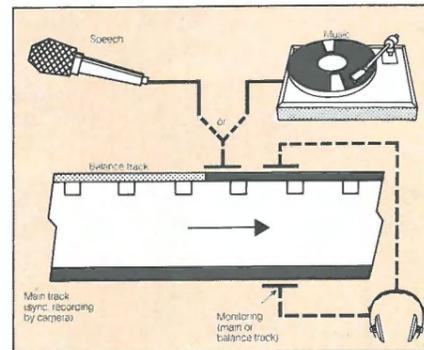
Example:

- As the pictures run through, you can record incidental music on the main track.
- You can now record your commentary on the balance track to fit in with the pictures, while also monitoring the music in the headphones.
- Playback can then be simultaneous, and perfectly synchronized on both tracks (3) (and, if necessary, you can adjust the track-to-track volume ratio).



(3)

Case N° 3: Recording on balance track



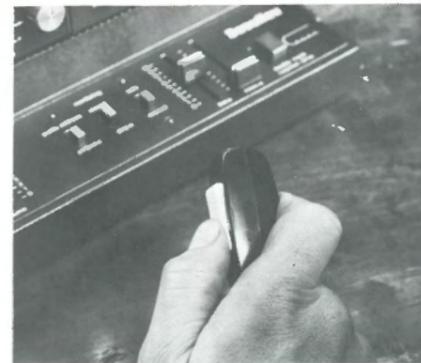
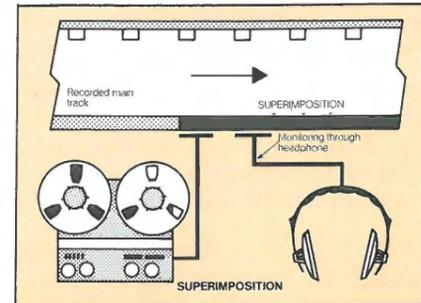
You shot your film with sound. Your camera recorded the actual music accompanying the scene, or a dialogue synchronized with the pictures.

You can back the recording on the main track with a commentary or with incidental music on the balance track.

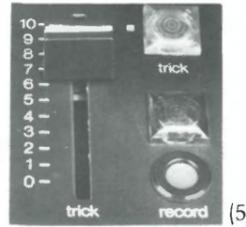
By monitoring either the main or the balance track, you can keep a running check on the result.

Playback is then simultaneous on both tracks. (3)

Case N° 4: Superimposed recording



(4)



(5)

With your cine-camera, you have shot a sound film; sound and pictures are synchronous.

You would like to add a musical background in order to highlight certain portions of your film.

Connect an outside sound source (record player or tape recorder).

The remote control (4) lead set to "fix" and the trick recording control allow you to "overprint" the original sound.

With monitoring facility and headphones, you can follow the sound already recorded on the main track.

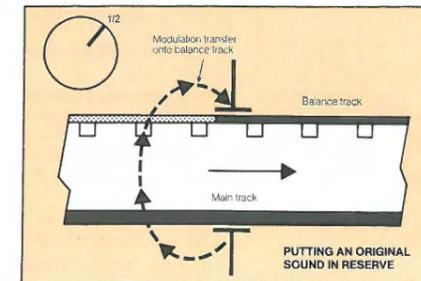
At the opportune moment, you insert the new sound by setting the "trick" control (5) to the desired intensity, wiping the original sound to a greater or lesser extent.

Once again, you can monitor this superimposition in the headphones.

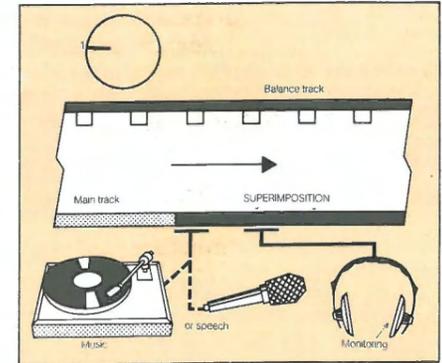
If you wish, you can alter the volume intensity of the added sound by varying the setting of the line control and thus achieve very professional-sounding fade-in/out effects.

Case N° 5: Transferring sound from one track to the other

From distant lands you have brought back a sound track you will never be

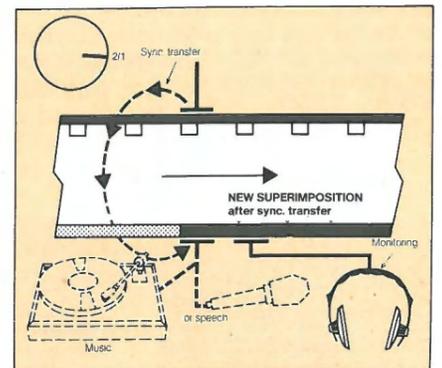


able to duplicate. You wish to add a few comments or a musical passage or two. However, if the mixed sound you are about to produce turns out unsatisfactory, you will have lost your original sound.



You must therefore start by "storing" the original sound by transfer to the balance track.

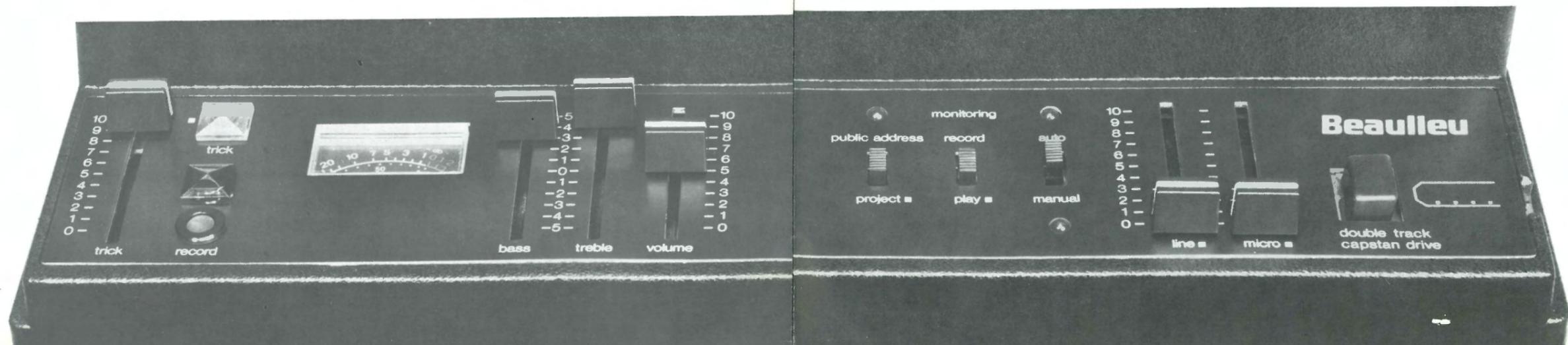
On the main track, using the monitoring facility, you can record background



music or commentary which will be superimposed on the original sound.

Should you not be satisfied with the result, you can backtrack and reintroduce the original sound at the required moment, and start mixing once again.

These few examples demonstrate the enormous recording possibilities of the Beaulieu 708 EL projector, without your having an acoustical engineering degree, handling being so simplified, and monitoring so easy and accurate.



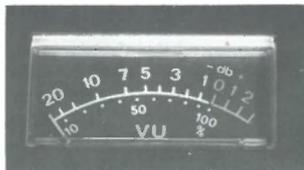
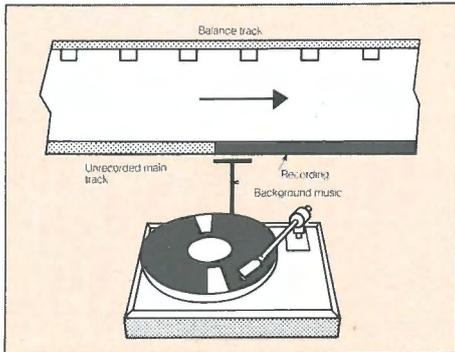
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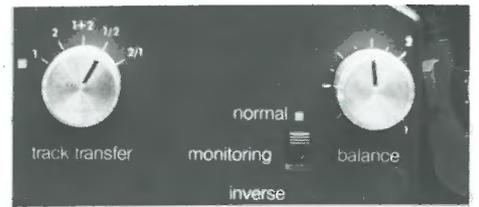
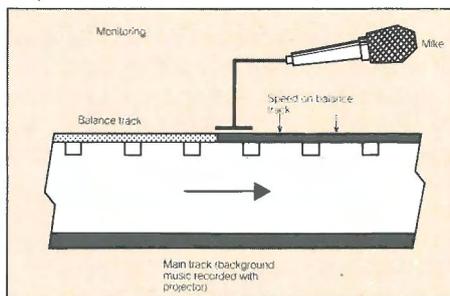
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Case N° 2: Recording on both tracks

The balance track allows you to record without interfering with what you have just recorded on the main track.

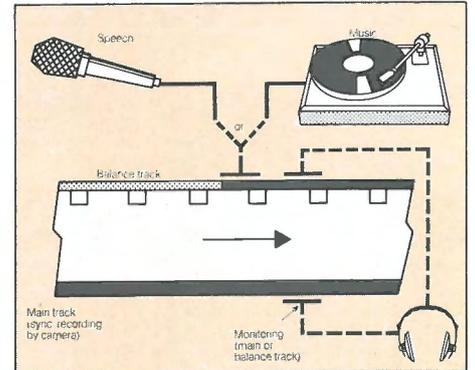
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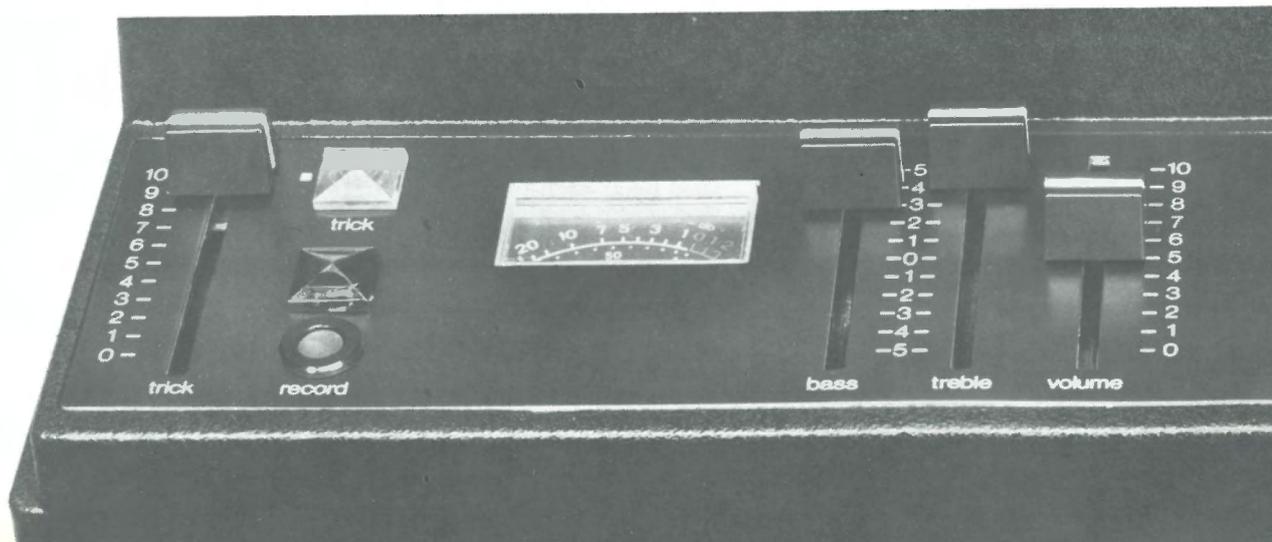


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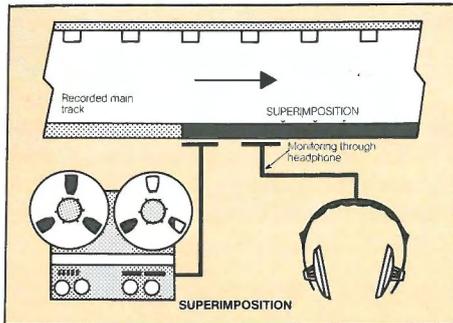
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versatile sound system

Case N° 4: Superimposed recording



Connect an outside sound source (record player or tape recorder).

The remote control (4) lead set to "fix" and the trick recording control allow you to "overprint" the original sound.

With monitoring facility and headphones, you can follow the sound already recorded on the main track.

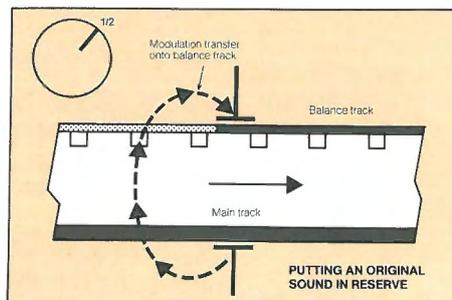
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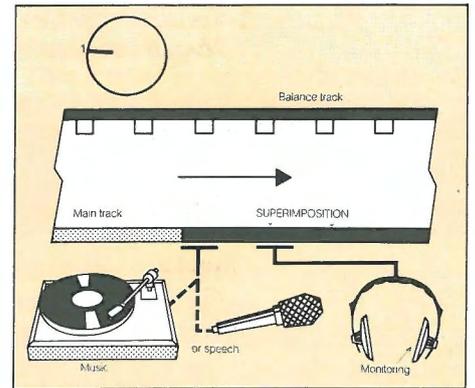
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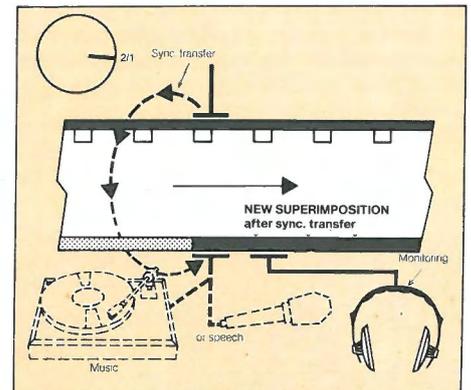


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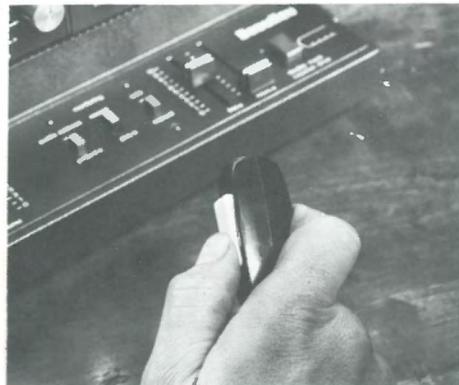
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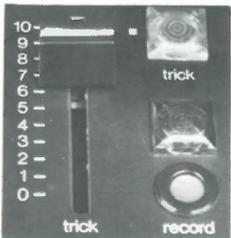
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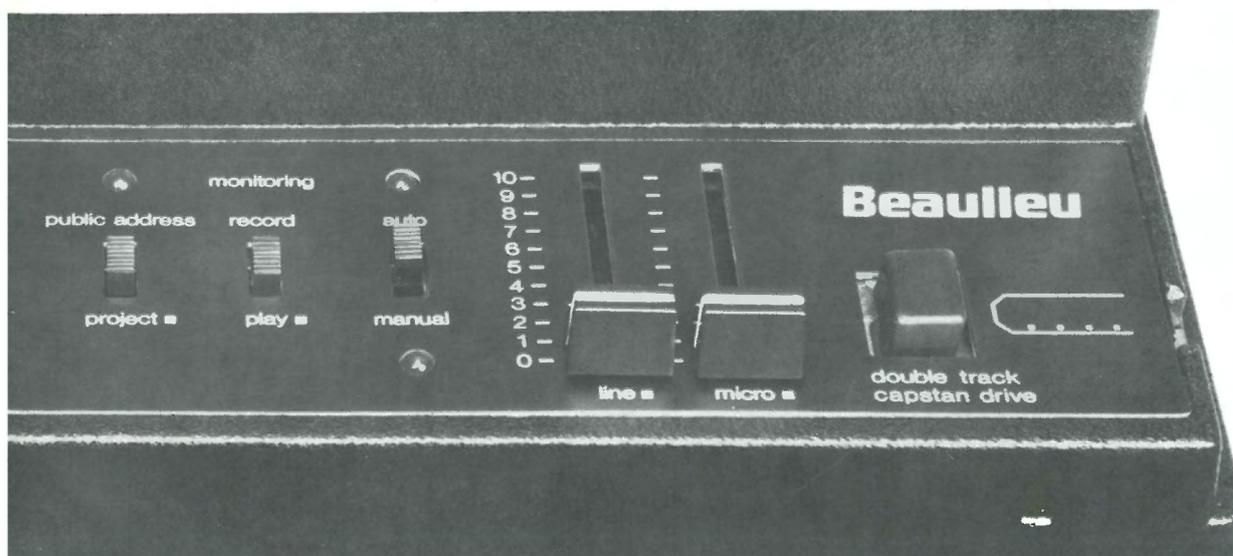
(4)



(5)

With your cine-camera, you have shot a sound film; sound and pictures are synchronous.

You would like to add a musical background in order to highlight certain portions of your film.



Specifications

Format: Super 8 - Single 8
Maximum film capacity: 700m (2300ft)

Lamp: 15 V 150 W
Lens: Schneider MC Xénovaron 11-30 mm f/1.1 zoom
Lens mount: \varnothing 32.5 mm
Geared-down focusing system

Fixed speeds: 18 and 24 fps
Speed adjustment range: $\pm 1/3$ or $2/3$ fps
Electronic regulators - Two DC motors

Automatic loading with automatic loop system
Manual loop take-up system
Manual unloading possible
Fast rewind available
Additive and subtractive digital counter (1 digit = 6 frames)

Magnetic playback on both tracks
Simultaneous playback of both tracks possible, with balance
Automatic and manual recording on main track (1) or balance track (2).
Recording can be monitored with vu-meter
Track transfer (track 1 \rightarrow track 2, and vice versa)
Sound superimposition from external modulation or through transfer
Monitoring head with track selector

Mike input adjustable with slide control
Line input adjustable with slide control
Manual or automatic mixing of inputs
Public address
Built-in loudspeaker
External loudspeaker or headphone output socket
External amplifier output socket
External sync output socket (1 contact per frame)
Built-in amplifier: 24 W eff into 4 Ω

Separate bass/treble tuning with slide controls
Powering: 110 V - 127 V - 220 V - 240 V;
50 or 60 Hz

Accessories available with the projector

Plastic cover
Mains power lead
Remote control lead for sound superimposition
Line input lead
External amplifier output lead
Unidirectional dynamic mike
240 m/800 ft reel

Optional accessories

100 m/2300 ft reels
Mixing box

Amplifier

Frequency range, recording/playback:
• 18 fps: 50 Hz - 10 kHz
• 24 fps: 50 Hz - 12 kHz
Bass and treble tone control

Input sensitivities
Mike: 200 μ V eff. min. - 10 mV eff. max.
Line: 28 mV eff. min.

Modulation output
160 mV eff. with volume control in position 10

Wow and flutter
Less than 0.25% weighted peak, typical: 0.2%

Noise/sound ratio: 48 dB (weighted)

Headphone output socket: 4 Ω min.

Sync. output socket

Switched power: 10 W
Switched voltage: 100 V eff.
Switched current: 400 mA

Illumination

On a 1 metre base screen, at a distance of 3 m, with the standard lens, values are

"Low" setting: 224 Lux
"High" setting: 264 Lux

Dimensions

With arms folded:
370 mm x 232 mm x 315 mm
14 1/2 in. x 9 in. x 12 1/2 in. approx.
With 700 m/2300 ft reels:
770 mm x 232 mm x 650 mm
25 1/4 in. x 9 in. x 21 1/3 in. approx.

Other advanced features of the Beaulieu 708 EL projector

Automatic loading

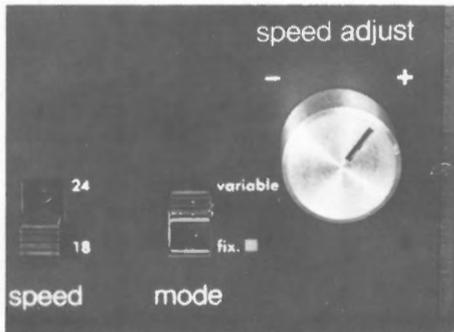
A simple pressure on a small lever threads film into the projector. Electronic systems ensure that sound start immediately, without wow or flutter.

Partial projection

You no longer have to unwind the entire film after viewing a sequence. All you need do is free the film from its path and pressure plate, and rewind at full speed.

Speed adjustment

The Beaulieu 708 EL projector operates



at 18 or 24 fps, and in reverse.

To compensate irregularities in filming, or with commercial films for purchase or hire, the speed can be manually adjusted by $\pm 1/3$ or $2/3$ fps.



700 m (2,300 ft) reels

The Beaulieu 708 EL projector can take specially designed 700 m (2,300 ft) reels for 2 hours' uninterrupted projection.

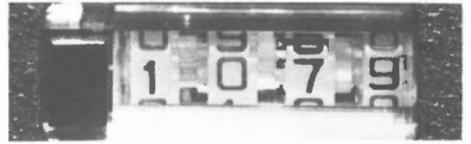
Additive or subtractive digital counter

A digital counter (1 digit = 6 frames) makes for easy, quick identification of the filmed sequence to which you wish

to put sound or commentary.

Fast rewind

This feature is particularly useful with



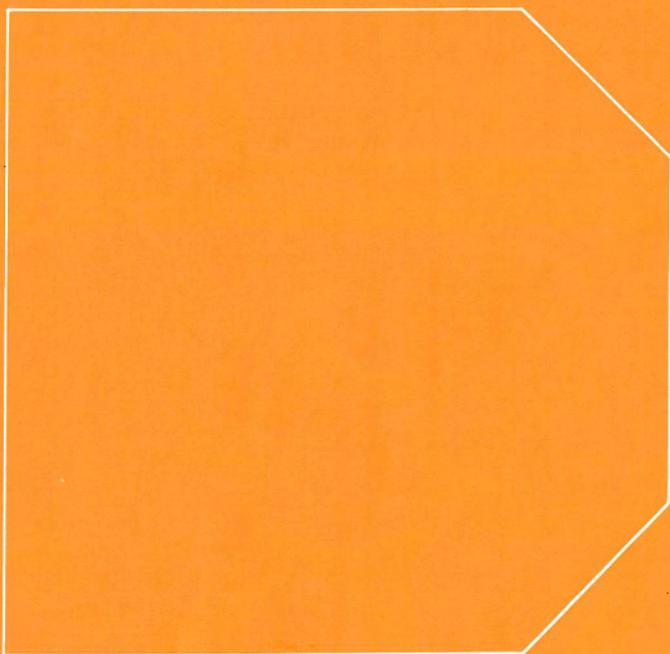
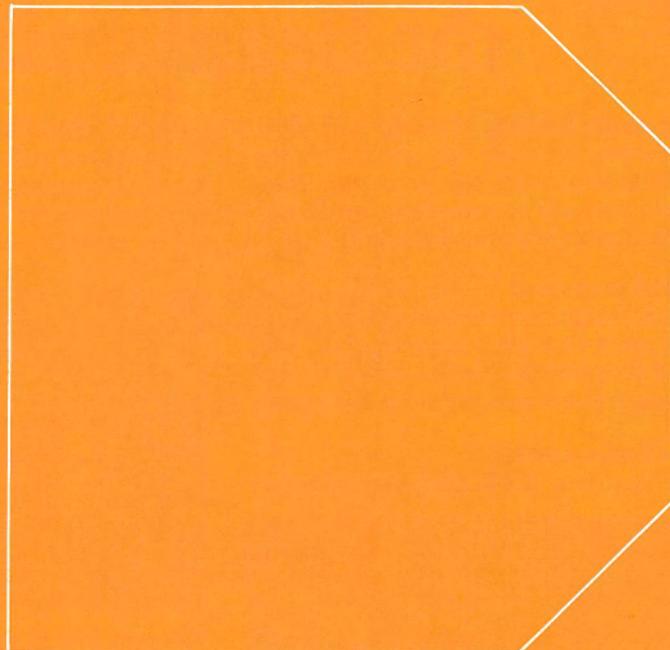
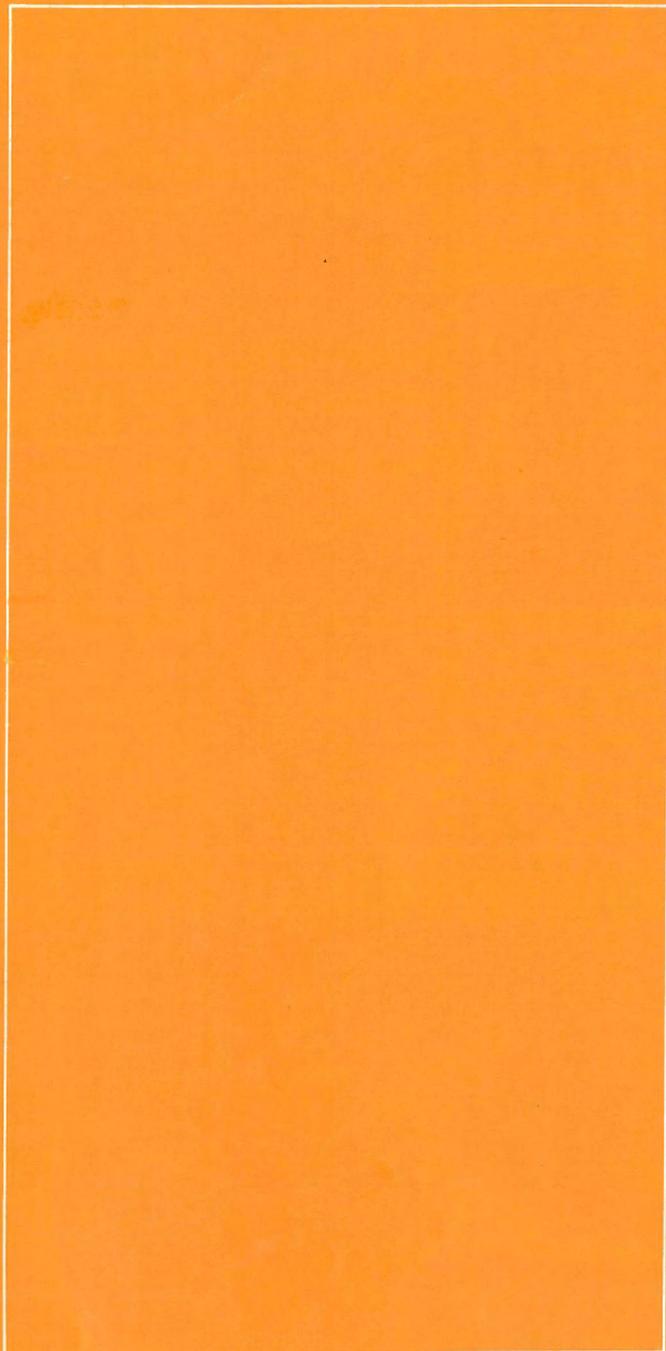
large-size reels.

Public address system

The P.A. system allows you to speak to the spectators while the projection is on, through a mike connected to the projector. You can use either the projector's amplifier loud speaker or an outside amplifier and loudspeaker.

- Green pilot lights to show if functions are operating.
- Orange indexes on most usual control settings.
- Line input socket for outside sources: record player, tape recorder or amplifier-tuner.
- Microphone input socket.
- Output sockets (headphones, modulation for system amplifier, external speaker (25 W) and external synchronization control by tape recorder with a timed tape).





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