Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.
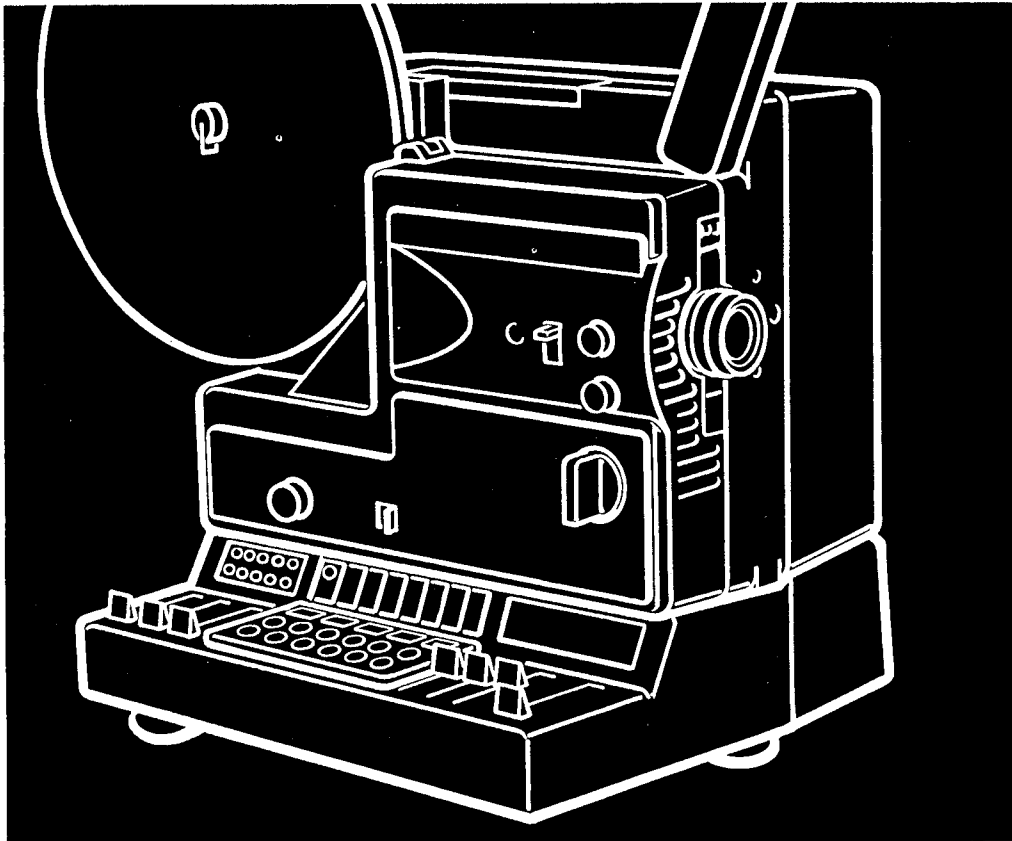
If you are not a qualified technician, please make no adjustments to anything you may read about in these Adobe manual downloads.

Instruction Manual

OTC

INCORPORATING OLDTIMER CAMERAS

eumig ®

S 940

Stereo multiprocessor

Instruction manual

IMPORTANT SAFEGUARDS

When using your projector, basic safety precautions should always be followed, including the following:

1. Read and understand all instructions.
2. Close supervision is necessary when any appliance is used by or near children. Do not leave appliance unattended while in use.
3. Care must be taken as burns can occur from touching hot parts.
4. Do not operate appliance with a damaged cord or if the appliance has been dropped or damaged — until it has been examined by a qualified serviceman.
5. Do not let cord hang over edge of table or counter or touch hot surfaces.
6. If an extension cord is necessary, a cord with a suitable current rating should be used. Cords rated for less amperage than the appliance may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
7. Always unplug appliance from electrical outlet when not in use. Never yank cord to pull plug from outlet. Grasp plug and pull to disconnect.
8. Let appliance cool completely before putting away. Loop cord loosely around appliance when storing.
9. To protect against electrical shock hazards, do not immerse this appliance in water or other liquids.
10. To avoid electrical shock hazard, do not disassemble this appliance, but take it to a qualified serviceman when some service or repair work is required. Incorrect reassembly can cause electric shock hazard when the appliance is used subsequently.

SAVE THESE INSTRUCTIONS

VALID FOR UK ONLY!

This apparatus must be earthed.

The equipment should be disconnected from the mains when not in use.

Live parts inside — disconnect from mains before removing the cover.

Important: When operating the projector, do not obstruct the air stream emerging from the ventilation slots.

IMPORTANT: The wires in the mains lead are coloured in accordance with the following code:

> Green-and-yellow: Earth
> Blue: Neutral
> Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

The apparatus must be protected by a 3 A fuse if a 13 A (BS 1363) or another type of fused plug is used.

Contents

Items supplied with projector

1 Microphone (mono)
Mains supply lead
Universal 240 metre (800 foot)
   film reel (can be used as auto-
   matic take-up and library reel),
   Order No. 0931036/8
Socket spanner to open sound head
   pressure pad
Film trimmer
Reel holder (fits compartment 58 in
   back cover)
Start lead
Test certificate
Test film

Optional accessories available separately:

Stereo microphone adaptor
Universal stereo re-recording lead
Daylight viewer
Music and special effects record
   or cassette
Carrying case

This product is manufactured to comply with the
Radio Interference Requirements of EEC Directive
76/889/EEC.

eumig S 940 stereo multiprocessor
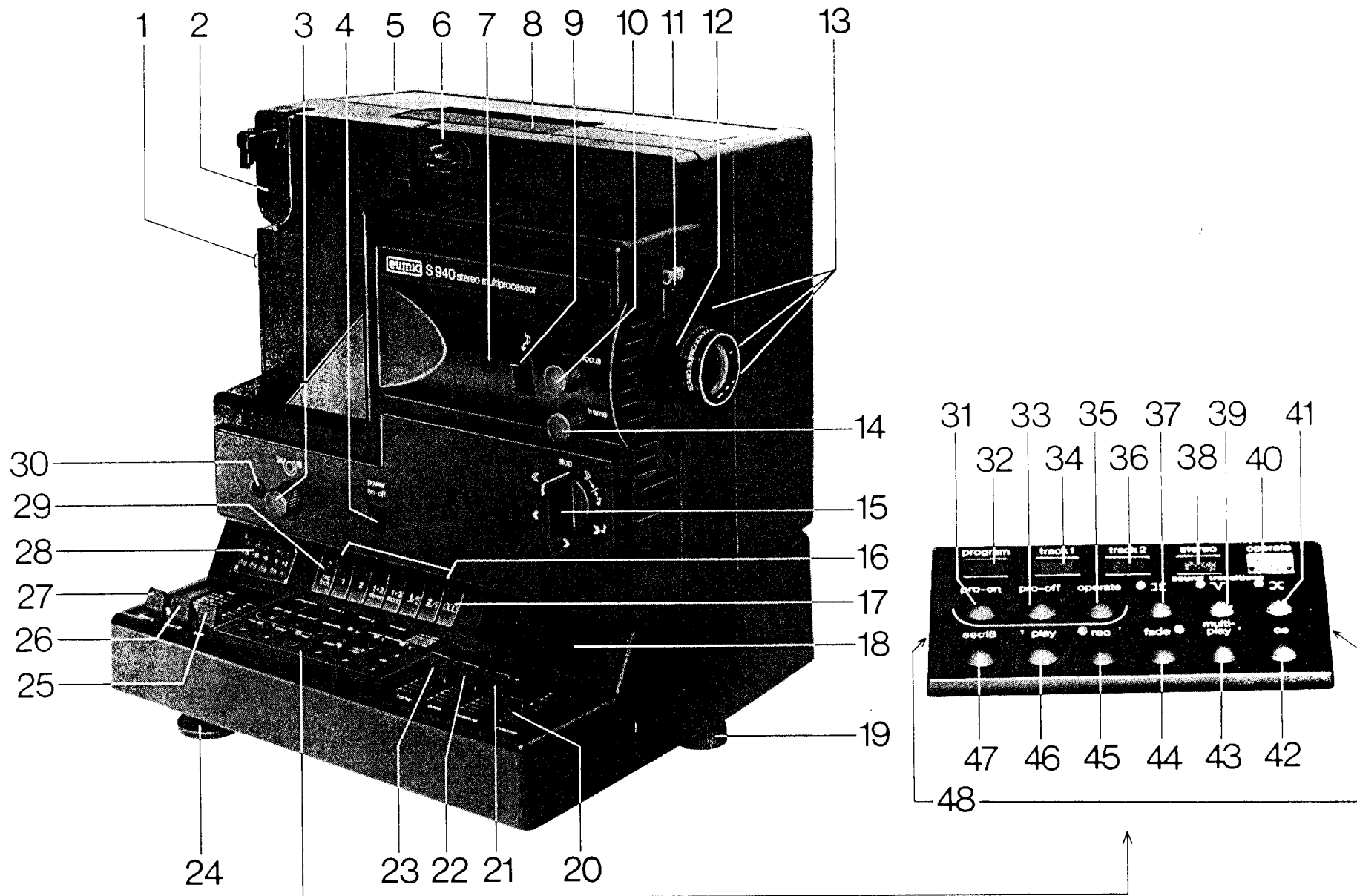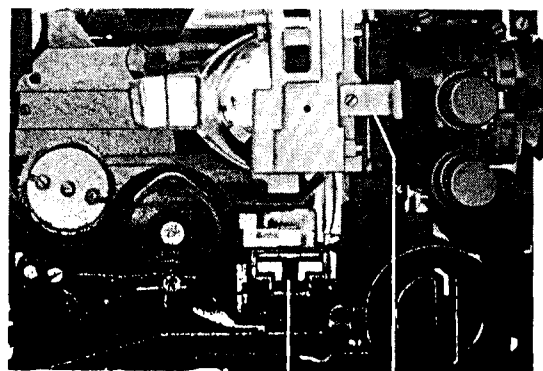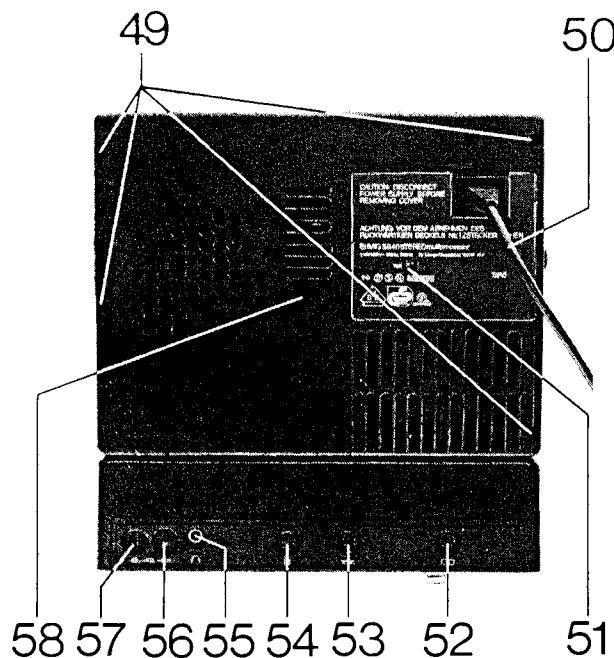
Description of the projector

1 Inching knob
2 Rear reel arm
3 Running speed adjustment
4 Mains switch
5 Swing-open lid of storage compartment for mains lead etc.
6 Front reel arm
7 Front cover fixing screw
8 Pull-out carrying handle
9 Film loop restoring key
10 Focusing knob
11 Threading slot
12 Zooming ring on lens
13 Mounting holes for daylight viewer (extra)
14 Frame line control
15 Rotary selector switch
16 Sound track selector keys
17 Reset key for electronic frame counter
18 Electronic frame counter
19 Front levelling adjustment
20 Volume control ("volume")
21 Balance control ("balance")
22 Bass control ("bass")
23 Treble control ("treble")
24 Lateral levelling adjustment
25 Mixing control ("fade")
26 Right-hand recording level control ("level R")
27 Left-hand recording level control ("level L")
28 Recording level indicator
29 Recording lock ("rec lock")
30 Front cover fixing screw
31 Program input key ("pro-on")

32 Program mode signal ("program")
33 Program clear key ("pro-off")
34 Track selection signal ("track 1")
35 Program execution key ("operate")
36 Track selection signal ("track 2")
37 Transition selector key "⊐⊏" for abrupt fades in and out
38 Track selection signal ("stereo")
39 Transition selector key " V " for soft fades in and out
40 Execution signal ("operate")
41 Transition selector key " X " for dissolves
42 Clear entry key ("ce")
43 Multiplay key
44 Mixing key ("fade")
45 Recording key ("rec")
46 Playback key ("play")
47 Running time display key ("sec 18")
48 Pilot lights at both sides of keyboard
49 Back cover fixing screw
50 Mains lead
51 Voltage selector window
52 Input socket for phono/tape/microphone
53 Auto start socket for remote tape recorder control
54 Line output socket
55 Earphone socket
56 Socket for right-hand external speaker
57 Socket for left-hand external speaker
58 Compartment for reel holder
59 Sound head pressure pad
60 Film pressure pad lock

3

Before switching on
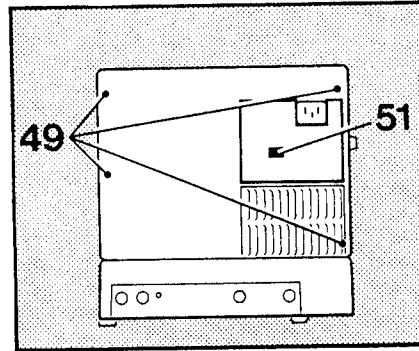
Checking the voltage

Check that your projector's mains voltage and frequency specifications match the values on your mains supply meter. The voltage setting of the projector is quoted on the data panel or is visible in the window (51). If the voltage setting does not match your mains supply, ask your movie dealer or an authorised servicing centre to adjust it.

For the servicing engineer:

Unscrew the fixing screws (49) and remove the back. **Take care not to damage the loudspeaker lead between the back and the projector.**
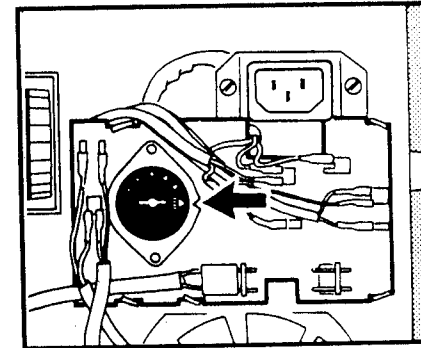
Changing the voltage
(Only by a servicing engineer)

Turn the voltage selector to the appropriate position. The set voltage appears on the selector at the right next to the setting index.

Note: Local mains voltage fluctuations may cause premature projection lamp failure. In that case switch to the next higher voltage setting (for instance 240 volts instead of 220 volts). That extends the burning life of the lamp with only a slight loss in light output.
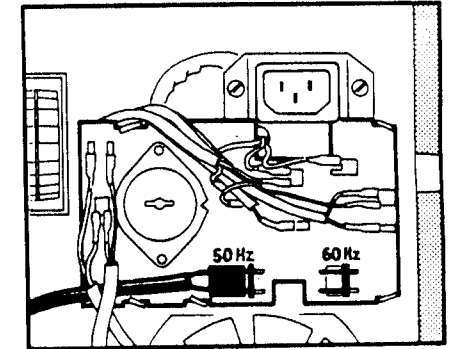
Changing the supply frequency
(Only by a servicing engineer)

A version of this projector is available with a frequency adjustment for countries with different supply frequencies. Changing the frequency involves refitting the drive belt and plugging the transformer plug into the appropriate socket for 50 or 60 Hz. One of our servicing centres will do this for you.

Running the show

Important: When the projector is running take care not to obstruct the air stream through the ventilating slots.

Connecting to the mains supply

Connect the projector to the mains supply with the lead (50). Push the mains switch (4) to the left to "on"*).

This switches on the projector: the motor starts and the projection lamp pre-heats. The pilot lamps (48) at the two sides of the keyboard and the electronic frame counter (18) light up.
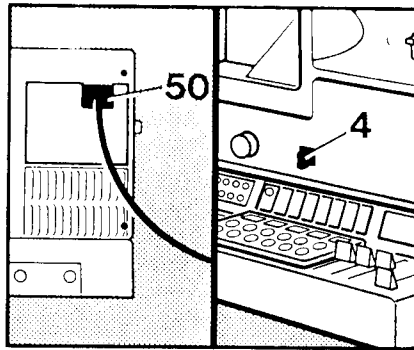
Moreover, the keyboard also indicates the operating mode of the sound section which on switching on assumes the following basic settings:

The green "play" LED indicates playback;

The yellow "][" LED indicates an abrupt sound transition;

The green illuminated panels "track 1" (34), "track 2" (36) or "stereo" (38) indicate the selected sound track. (If none of the track selector keys is pressed, the projector automatically selects "track 1".)
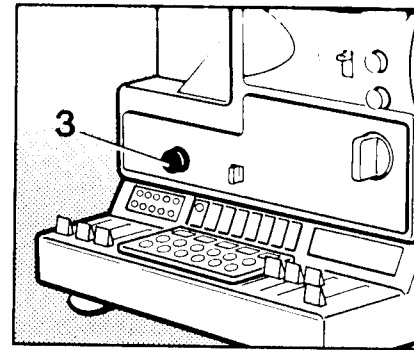
Setting the running speed

To set the running speed — 18 or 24 frames/second or any intermediate position — turn the knob (3) to the appropriate position. You can change the running speed even during projection.
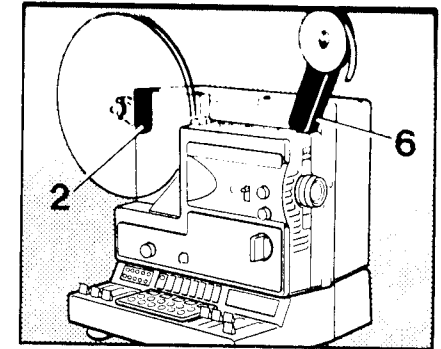
Fitting the reels

Swing up the front reel arm (6) and place the full reel on its shaft so that the film runs off the reel clockwise towards the front. Turn over the reel lock on the shaft.

Swing out the rear reel arm (2) and place the empty reel supplied on the rear reel arm shaft. The reel supplied holds up to 240 metres (800 feet) of film. If you use a 180 metre (600 foot) reel, do not swing up the rear arm.

Turn over the rear reel lock.

Note: When you are looking from the rear of the projector towards the screen, the perforations must be at the right.

*) The mains switch and the rotary selector switch (15) are interlocked you can only turn the selector switch when the mains switch is on and you can only switch off the mains switch when the rotary selector is at "stop".
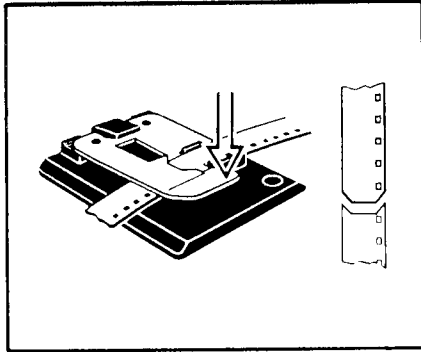
Trimming the film leader

Check the state of the film leader. It must be free from kinks and creases, should curl clockwise and should have a cleanly trimmed end. · Use the film trimmer supplied to trim the film end as follows: Push the film end into the trimmer so as to engage a perforation hole in the tooth of the film guide, then push down the trimming lever (see arrow).

Note: If you peel off the protective film from the trimmer base, the trimmer will adhere to any convenient spot on the projector.

Threading

Turn the rotary selector swich (15) **from the "stop" position** to the threading position ⫸/♪ . (You cannot thread the film if you have not turned the selector from "stop".) Push the film leader into the threading slot (11) until the mechanism seizes the film. Threading then proceeds automatically to the take-up reel. to the takeup reel.
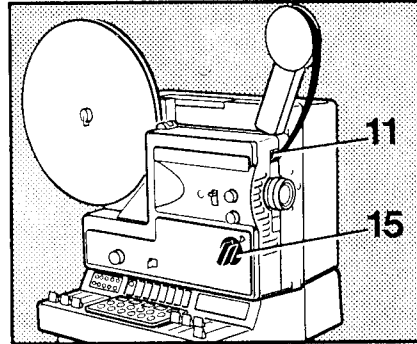
Note: Thin-base films may not always attach themselves automatically to the take-up reel. In that case guide the beginning of the film into the reel core by hand. If the film fails to advance correctly during threading (for instance if the film end was badly trimmed) the film emerges from an opening below the lens to avoid damage. In that case turn the rotary selector switch (15) to reverse "≪", retrim the film and repeat the threading procedure.
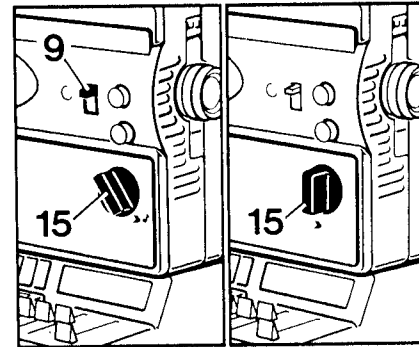
Projection

Once the film has run onto the take-up reel, turn the rotary selector switch (15) further:
— to " ⫸♪ " for sound projection of sound films
— to " ⫸ " for silent projection of silent films — to protect the sound heads.

Note: If the image jitters or the film rattles (or both) during projection, briefly depress the loop restoring key (9). The likely cause may be a faulty splice or damaged perforation holes.
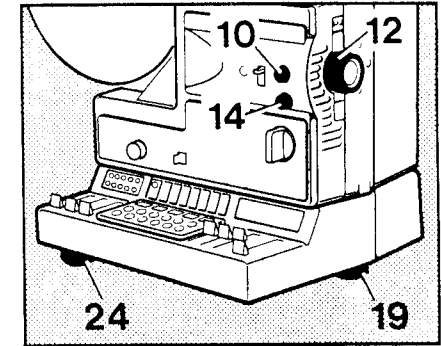
Adjust the projected **image size** with the zooming ring (12) on the lens and focus the **image with** the focusing knob (10). If the frame line between frames appears on the screen, adjust the **frame line control** (14). Adjust the **image height** with the levelling adjustment (19). Correct any **lateral inclination** of the image with the lateral level adjustment (24).

Note: Switching on the projector starts the fan motor which cools the 150 watt lamp. Check its correct operation by noting whether it blows warm air out of the upper ventilating slots in the back. In case of failure of the fan see page 31 for changing the fan fuse.
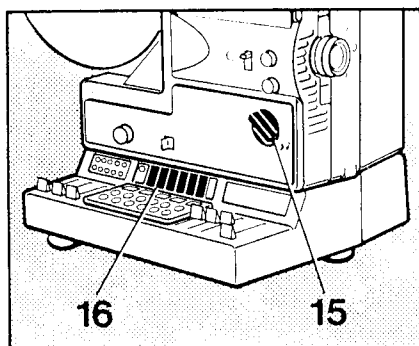
Sound projection

Turn the rotary selector switch (15) to " ❯♪ " for sound projection.
Press the appropriate sound track selector key (16):
Key "1": Playback of main stripe (normal sound films, live sound films, library films etc).
Key "2": Playback of balancing stripe.
Key "1+2 stereo": Playback of main stripe through left-hand channel and of balancing stripe through right-hand channel.
Key "1+2 mono": Combined playback of main and balancing stripe through both channels.
Keys "1/2" and "2/1": Duoplay automation. Playback of both sound tracks through both channels with automatic mixing. For further details see section "Duoplay automation" on page 20.

Set the **volume with** the sliding volume control (20) and adjust **tone rendering** with the treble control (23) and the bass control (22). Use the balance control (21) to adjust the **balance** (relative volume) of the two sound tracks. The balance control is however not operative when track selector key "1" or "2" (16) is depressed.
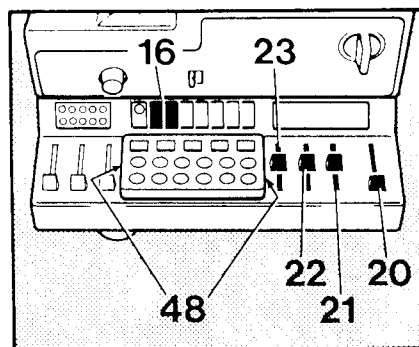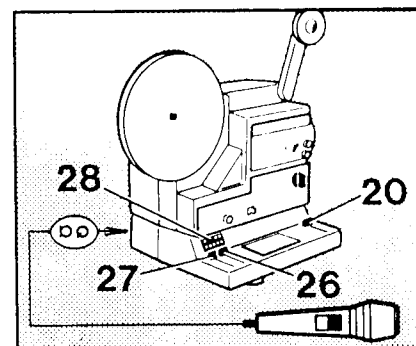The sliding control range at the left and right of the keyboard is lit up by the pilot lights (48) in all operating modes of the projector. This helps you to locate the various controls on the unit.

Note: On switching on, the sound section reverts to the following basic modes: Playback ("play"), abrupt sound transition ("⎵⎴⎵") and — when no track selector key was pressed — track No. 1.

Public address

You can make direct announcements through the microphone while the projector is stopped or running in forward or reverse.
Switch on the projector and plug the microphone into the "DQ" socket (52). If you now switch on the microphone switch ("on") and speak into the microphone, you can adjust the level with the two sliding controls "lev L" and "lev R" (27, 26) by pushing the control from "0" towards "10" until the corresponding red LED of the recording level indicator (28) just begins to blink.
As soon as you push the volume control (20) towards "10" the announcement becomes audible in the loudspeaker.
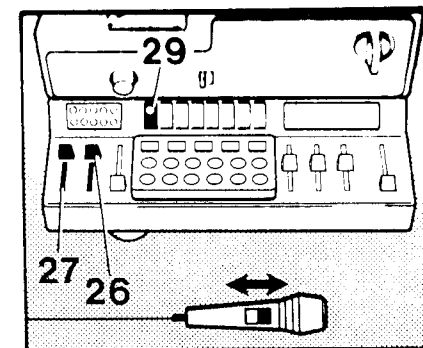
Whenever you want to make an announcement through the microphone, push the microphone switch to "on" and then back to "off". Do not point the microphone towards the loudspeaker as this could cause acoustic feedback between the microphone and speaker (whistling). If necessary, eliminate feedback by slightly moving down the volume controls "lev L" and "lev R" (27, 26).
Proceed in the same way if you want to make an announcement while projecting a sound film. Whenever you switch on the microphone switch ("on") the sound of the film track is automatically attenuated so that your announcement comes through clear. On switching off the microphone the playback resumes its normal volume.

Important: "Public address" is immediately available on switching on but is blocked as soon as the recording lock key (29) is depressed. So if the red LED of this key is lit, first extinguish it by pressing the key once more.
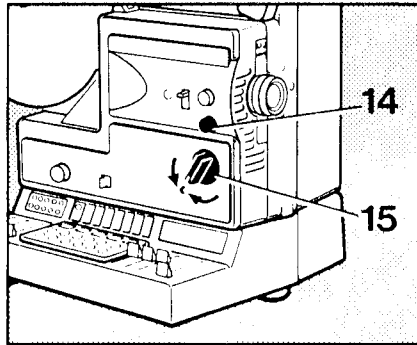
Reverse projection

Turn the selector switch (15) —
from either direction — to reverse
projection "❮"; the film now runs
backwards and all movement on
the screen appears reversed.
When changing the running direc-
tion you will usually have to correct
the frame line setting (14).

Note: You cannot play back sound
during reverse projection.
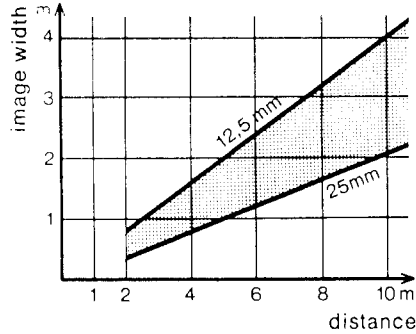
Screen image sizes

This graph shows the relationship
between image width, focal length
and projection distance. It applies
to the multicoated Eumig
12.5 — 25 mm Suprogon Zoom f/1.2.
For instance with the projector
4 metres from the screen, the image
width may range between 0.8 and
1.6 metres. Within this range you
can select any image width with the
zoom lens.
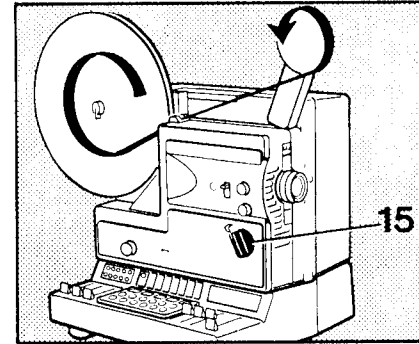
Rapid rewinding

Run the end of the projected film
directly to the front reel and attach
it there.
Turn the selector switch (15) to
rewind "❮❮". The film now rewinds
onto the front reel.
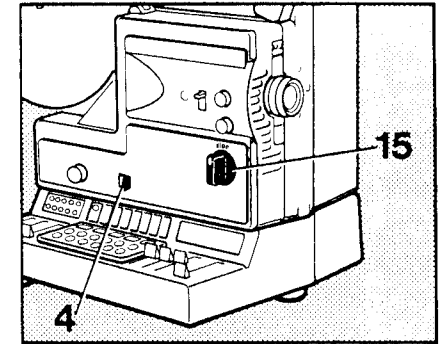
Switching off

After the end of the show turn the
rotary selector switch (15) to
"stop".

Push the mains switch (4) to the
right to "off". This switches off the
projector.*)

*) The mains switch is interlocked
with the rotary selector switch: you
can only turn the selector switch
when the mains switch is on, and you
can only switch off the mains switch
when the selector switch is at "stop".

Sound recording

The Eumig S 940 Stereo Multi-processor projector brings a completely new approach to sound recording with a microprocessor controlled sound section. This offers a unique range of recording modes from simple adding of sound as familiar from other sound projectors to computerised recording. The built in computer can store a wide range of shot-synchronised and frame-synchronised recording instructions and then carry them out precisely.

That makes the whole recording procedure supremely reliable and convenient, for you no longer have to worry over starting the recording at the right point. You can instead devote your attention to making the most of the sound effects.

First however the fully edited film must be striped. If you propose to record sound in a normal single-track mode, a single main stripe on the film is sufficient:

Stripe (track) 1

If you want to record in twin track mode or stereo, have the film striped with a main and a balancing stripe:

Stripe (track) 1
Left-hand channel

Stripe (track) 2
Right-hand channel
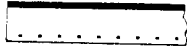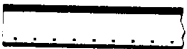
With this twin track striping you can utilise all recording modes of the projector
Live sound films already carry both stripes

Now for the other special features of the projector in a nutshell

Automatic or manual level control option

Automatic recording level control ensures all-over optimum quality of the sound recording from the start without volume fluctuations.
The rows of LEDs show correct operation of the automatic control. Use manual recording level control for specially high quality in music reproduction. In this case set the correct level with the two sliding controls while observing the recording level indicator.

Subsequent automatic or manual mixing

By mixing it is possible to super-impose a new recording over an existing recording on the same track, controlling the relative modulation levels on the two recordings with the "fade" control.

Recording on two parallel sound tracks — Twin track procedures

With this recording mode you can for instance produce a film with two independent sound versions — possibly in two different languages. Or you can improve a live sound recording (made in a sound camera) by additionally recording on the balancing stripe and then play back both tracks together. You can also record commentary and music separately on one track each, again playing back both together. This makes it easy to correct fluffed lines, as the background music is on the other stripe and therefore not affected by any correction in the speech recording
In this context a further automatic mode of this projector is of interest
Duoplay automation where one track controls the playback volume

of the other. There you only have to record in succession the commentary on one track and then the music on the other in the normal way without worrying over the relative volume levels of the two recordings. During playback the commentary then automatically attenuates the music.

Multiplay mode

With Multiplay you can transfer sound from one track to the other. There you can manipulate and mix at will without affecting the original recording. During such a track transfer you can also mix in a new recording.

Stereo sound recording

Stereo sound recording is particularly easy with this projector as the automatic recording level control, mixing features and computer control are of course equally effective in stereo mode. (However the sound recording procedures listed under twin track recording and Multiplay are not possible in stereo, as twin-channel sound recordino of course needs both tracks at the same time.)

Flying start

"Flying start" is switching to sound recording while the sound projector is running. At the same time you can preselect an abrupt sound transition (JC), a soft sound transition (V) or a dissolve (X).
At the beginning of the recording the projector also starts the tape recorder from which the recording is transferred.
On the following pages we present the operating controls of the sound section and their effects. This is followed by a summary of the various sound recording modes which are then explained in greater detail.

Note: A useful aid in all sound recording modes is the Eumig accessory daylight viewer. We would also recommend the Eumig universal stereo re-recording lead to avoid connecting and patching problems with different sound sources. This also is available separately as an optional accessory.

The sound section controls

Recording lock ("rec lock")

To prevent accidental erasure of a sound film recording, the projector is locked against recording on switching on; only the playback and public address functions are available.
Pressing the "rec lock" key cancels this lock. At the same time the red LED in the key lights up.

Recording level indication

The rows of LEDs show the peak recording level of the channel in use. With correct level control, the red "+3" LEDs should just flicker at the loudest points of the recording

Recording level control
(level L/R)

One control is provided for each of the two sound tracks:
L = track 1 — Main stripe or left-hand stereo channel
R = track 2 — Balancing stripe or right-hand stereo channel
In the "aut" position the automatic recording level control is engaged; in the range from 0 to 10 you control the level manually.

Mixing control ("fade")

If you subsequently mix sound into an existing recording, this control sets the mixing ratio of the new recording to the existing recording. It is only operative once you have pressed the "fade" key.

Track selector keys

The track selector keys select the required operating mode for recording and playback:
"1": Track 1 (main stripe) or left-hand channel (green "track 1" signal lights up)
"2": Track 2 (balancing stripe) or right-hand channel (green "track 2" signal lights up)
"1+2 stereo": Track 1 and track 2 simultaneously, through separate channels (green "stereo" signal lights up)

"1+2 mono": Track 1 and track 2 together (green "track 1" and "track 2" signals light up)
"1/2" and "2/1": Duoplay automation keys. This automation acts during playback: Both tracks are played back together but mixed automatically so that the sound signal of one track controls the playback volume of the other. To indicate this function, both the "track 1" and the "track 2" signals light up together.
"1/2": track 1 controls track 2;
"2/1": track 2 controls track 1.
(During recording both keys act like the "1+2 mono" track selector key.)

Reset key ("000")

This resets the frame counter display to 0 and cancels all stored functions. It also switches the projector to playback.

Counter

5-digit electronic frame counter. The counter is reset to 0 by pressing the reset key or switching off the projector.

Treble control ("treble")

In its mid position this control yields level tone reproduction. Pushing the control towards "+" boosts the high frequencies, pushing it in the direction "−" attenuates the high notes. The control does not affect sound recording.

Bass control ("bass")

In its mid position this control yields level reproduction. Pushing the control towards "+" boosts the low frequencies, pushing in direction "−" attenuates them. The control does not affect sound recording.

Balance control ("balance")

This control adjusts the relative playback volumes of the two stereo channels or the two tracks when playing back in twin track mono mode. The control does not affect sound recording. If only one of the two tracks is selected (key "1" or "2") the balance control is not operative.

Volume control ("volume")

This controls the playback volume and the monitoring volume during recording. The control does not affect the recording itself. When recording with a microphone however there is a risk of acoustic feedback (whistling); in that case reduce the volume or monitor with the earphones.

The keyboard

Program execution key ("operate")

The "operate" key releases the entered instructions for execution. The red "operate" lamp then signals execution; it goes out as soon as the last instruction is executed.

Program clear key ("pro off")

The "pro off" key cancels input readiness as well as all previous instructions entered in the memory; the latter is thus free for new instructions.

Sound transition keys ("sound transition")

The "sound transitions" keys select the sound transition between an existing recording and the new recording. (In practical sound recording this means switching between playback and recording and vice versa.)

"][": Abrupt start or end of a recorded section (cut in or out).

"V": Gradual start or end of a recorded section (fade in or out).

"X": Dissolve, i e the end of the first and the start of the second sound section merge into each other.

The selected sound transition is indicated by the yellow LED of the appropriate key.

Program input key ("pro on")

The "pro on" key readies the memory for entering control instructions that the projector is to carry out on its own later on. This stand-by condition is signalled by steady lighting of the yellow "program" lamp. (Once the memory is full, this lamp begins to blink.)
The instructions are entered with the keys "][", "V", "X", "play", "multiplay", "rec" and "fade".

Multiplay key ("multiplay")

The "multiplay" key re-records one track onto the other. First however one of the two track selector keys "1" or "2" must be pressed — this is the key for the track on which the signal is to be recorded. The signal of the other track is then re-recorded onto this track. This function is signalled by the appropriate red LED.

Clear entry key ("ce")

The "ce" key clears any single erroneous instruction when entering the program in the memory. The instructions can be cleared individually on stepping forward or backwards to the appropriate point or cleared in sequence forward or in reverse as long as the key is depressed.

Running time display key ("sec 18")

The "sec 18" key converts a current frame counter display into corresponding running time; the display is in minutes and seconds and refers only to a framing rate of 18 frames/second. (The computer advances by 1 second for every 18 frames.)
The time display remains as long as the "sec 18" key is depressed. On releasing the key, the current position of the frame counter reappears on the display.

Playback key ("play")

Pressing the "play" key switches the projector from recording or mixing modes ("fade") to playback. With normal sound projection there is no need to specially press this key after switching on. Playback mode is signalled by the appropriate LED lighting up.

Recording key ("rec")

The key "rec" prepares the projector for recording; this state is indicated by the yellow LED (backwards at the left). The red LED next to the rec-key indicates that the recording procedure is in operation. Any old recording is automatically extinguished. (During programming the red LED indicates storage of the recording order.)

Mixing key ("fade")

The "fade" key automatically fades or mixes a new recording onto an existing recording on the same track but keeps the latter more or less intact. The "fade" control sets the mixing ratio between the new and existing recording. The yellow LED indicates standby for mixing.

Input and output sockets

Loudspeaker outputs

Use the loudspeaker output sockets to connect external speakers, for instance to set them up near the screen so that the sound comes from the front as in a cinema.

Connecting modes:

– One speaker plugged into the left-hand socket: you hear both tracks through the external speaker, the built-in speaker is switched off.
  One speaker plugged into the right-hand socket: you hear the main stripe (left-hand channel) through the built-in speaker and the balancing stripe (right-hand channel) through the external speaker.
– One speaker plugged into the left-hand socket, one into the right-hand socket: you hear the main stripe recording (left-hand channel) through the left speaker and the balancing stripe recording (right-hand channel) through the right speaker. The built-in speaker is switched off.

With stereo operation each signal is played back through its appropriate channel; in all other cases the same signal comes through both speakers.

Important: If you want to connect several speakers in parallel, note that the output impedance must not become less than 4 ohms per channel. (Two speakers of 4 ohms connected in parallel yield an effective impedance of only 2 ohms.)

Earphone socket

The earphone socket takes all stereo headphones with 6.3 mm (¼ inch) diameter jack plug. This switches off all speakers. Adjust the volume with the volume control (6).

Tape start and stop socket

The projector can precisely start and stop a remote-controlled tape recorder or cassette recorder connected to this socket. The recording instruction signal starts the tape machine, the playback instruction stops it.

Line output

The line output can feed into an amplifier or a stereo hi-fi unit. The connecting lead must however be correctly wired.

For a replay unit we recommend a tape recorder with a fast or instant start-up, for instance eumig's fl 1000 µF cassette recorder.
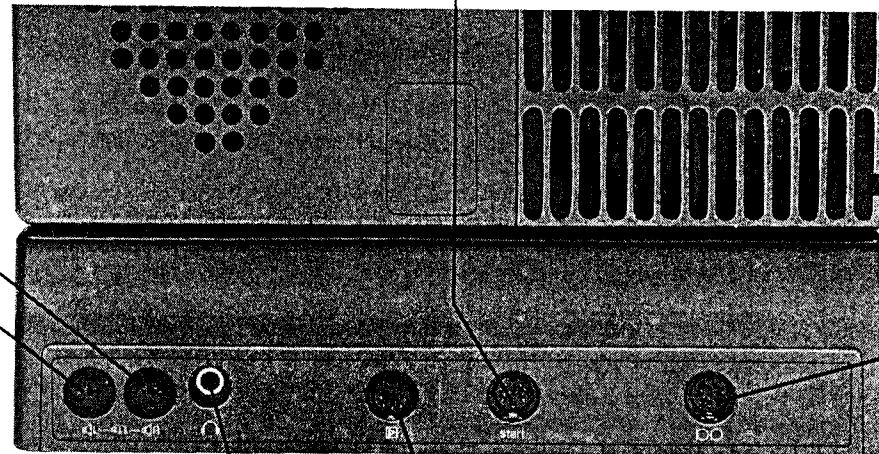
Input

Plug the sound playback unit (record player, tape recorder etc.) or microphone into the input socket.
A stereo microphone can be connected directly to this socket; when using two mono microphones for stereo recording, you need a stereo microphone adapter (special accessory, see page 36).

In view of the range of different plugs and connecting modes of external playback units we recommend the use of the Eumig universal stereo re-recording lead

Sound recording methods

A

B

C

1 — Main stripe

2 — Balancing stripe
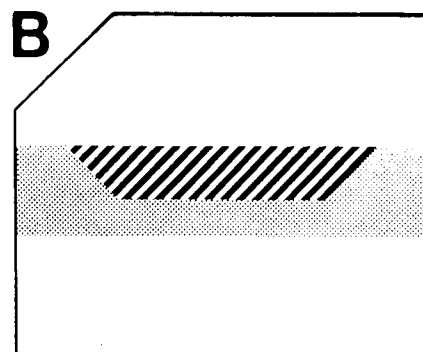
1+2
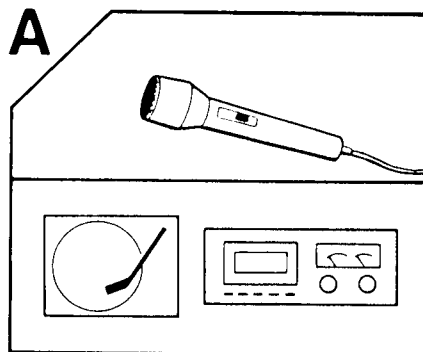
Straightforward recording

Speech

Speech is recorded with the micro-phone. Select this recording method when you merely want to add a commentary to the film.

See page 15

Music

Music is directly re-recorded via a lead directly from a cassette recorder, record player, tape recor-der etc. You can make music transitions soft or abrupt.
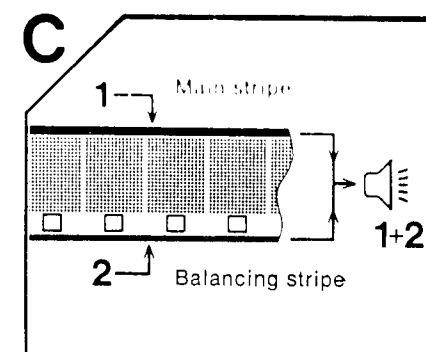
See page 16

Mixing procedures

You can mix a new recording into an existing sound recording on the same track during a second run through of the film. This new recording can be a commentary, sound effects, music etc. Depend-ing on the setting of the "fade" control, the first recording is then attenuated to a greater or lesser degree.

See page 18

Twin track recording

Twin track recording offers a number of further sound recording modes.

— Two completely different sound versions of the same film (for instance in different languages);

— Separate recordings of com-mentary and music on separate tracks followed by combined playback — with Duoplay auto-mation if required;

— Easy correction of slips of the tongue, fluffed lines etc. with separate recording of speech and music (a correction on one track does not affect the signal on the other);

— Adding to live sound recordings without risk of spoiling the original recording (for instance with Multiplay).

The film must of course carry a main and a balancing stripe.

See page 20

D

left
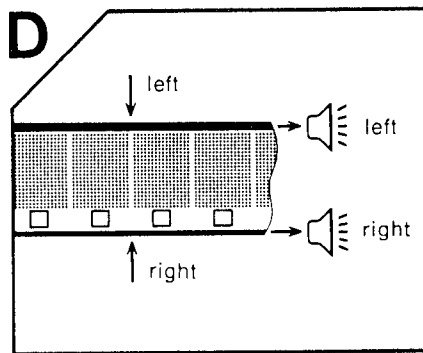
left

right

right

Stereo

Stereo implies hearing with spatial orientation — you distinguish between left and right and hear the instruments of an orchestra from the direction where they were during the recording (even from the centre between the speakers).
For this the film must have a main and a balancing stripe.
The sound record (disc, tape recording or cassette) and the playback unit must of course also be stereophonic.
As stereo uses both sound tracks at the same time, the recording methods listed under "C — Twin track recording" cannot be used for stereo. The procedures listed under "A", "B", "E" and "F" are of course usable.
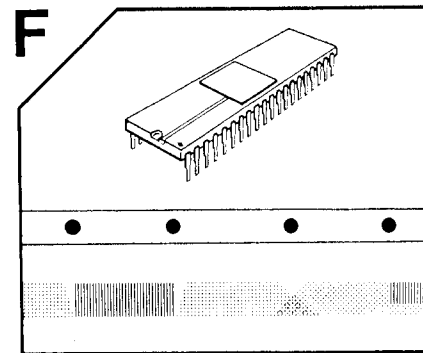
E
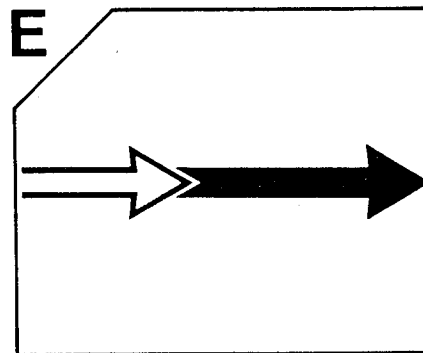
Flying start recording

This is a procedure where recording starts while the projector is running. The exact start of the recording is located by previously storing the required point in the memory: that way the projector can start the recording at the precise frame required.
In addition the projector can also automatically start the tape or cassette recorder that provides the re-recorded sound —·which greatly simplifies sound recording.

For a replay unit we recommend a tape recorder with a fast or instant start-up, for instance eumig's fl 1000 μF cassette recorder.

F

Frame synchronised sound recording

Microprocessor control of the sound section relieves you of many jobs during sound recording. As already indicated for the "flying start", the processor looks after correct timing of the start of the recording, the way in which it is to start (abruptly, fading in or fading over) and — if you want it — it can start the tape recorder from which a signal is to be re-recorded. The microprocessor further looks after stopping the recording at the end of the shot, complete with fading out or dissolves and stops the tape recorder. You first store the appropriate instructions in the processor which can memorise up to sixteen such instructions. That way you do not have to program each shot separately.

1.

2.
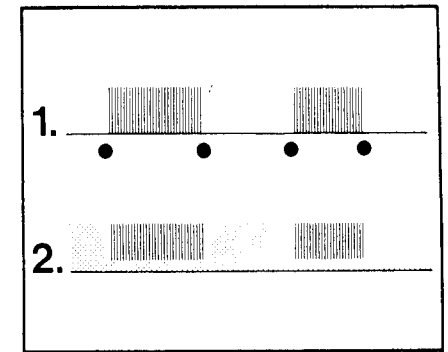
Apart from the individual programming just described, the projector also has a programmed mixing mode useful for sound recording with music and commentary:
Here the commentary is first recorded on the sound track. The processor stores the switching on and off of the microphone switch at the beginning and end of the individual stretches of commentary as a sequence of instructions. This in turn controls the music recording during a second run through, so that the music is attenuated during the commentary sections or fades out completely — depending on the position of the "fade" control.
This programming mode also can store up to 16 instructions.

A

Straightforward recording

Speech

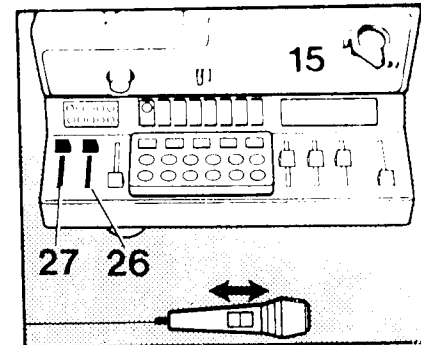(For speech recording in stereo see page 22.)

Initial settings:

- Connect the microphone to the "DQ" input socket (52), with the microphone switch at "off".
- Turn the volume control (20) to "0" to avoid acoustic feedback (whistling). Plug in the earphone for monitoring and adjust the monitoring volume with the volume control.
- Press the required track selector key (16):
  Mono: Key "1", "2" or "1+2 mono";
  Stereo: Key "1+2 stereo".
- The red LED in the "rec lock" key (29) should be on. (If it is not, press this key to release the projector for recording standby.)
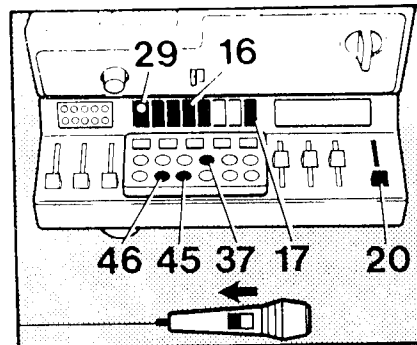
Note: Check by switching on the microphone (switch to "on") that the projector switches from "play" to "rec" — the appropriate LEDs in the keyboard should light up. If the "fade" signal also lights up, push the microphone switch to "off" (the projector signals "play") and on the projector first press the "rec" (45) and then the "play" (46) key — or*) simply press the "000" key (17) if you are not concerned with having a frame counter indication.
Now press the "][" key (37) for abrupt transitions — if its LED is not already alight anyway — and select automatic or manual recording level control.

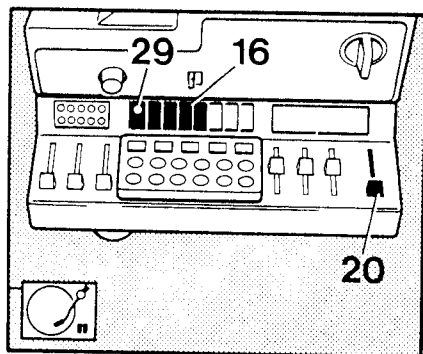**Automatic recording level control**
(Particularly recommended for speech recordings)

- Push the sliding controls (26, 27) to "aut".
- Turn the rotary selection switch (15) all the way to sound projection " ▶♩ ".
- Before speaking your commentary, move the microphone switch to "on".
- Speak your commentary.
- During speech intervals move the microphone switch to "off" to avoid recording ambient noises. The special automatic gain and frequency control (AGFC) ensures a correct audio effect even at varying distances between the microphone and sound source.
- To conclude the recording turn the selector switch (15) to "stop".
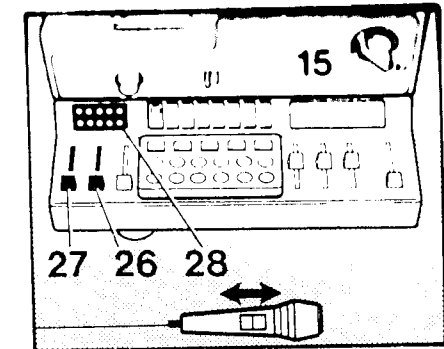
Manual level control

- Push the sliding controls (26, 27) to "0" and the microphone switch to "on".
- Make a trial recording run: Speak into the microphone and adjust the appropriate sliding control ("lev L", 27, for track 1; "lev R", 26, for track 2; both controls for tracks 1+2) towards the setting "10" until the red LED of the matching LED row (28) just begins to blink. Leave the sliding control in this position and push the microphone switch to "off".
- Turn the rotary selector switch (15) all the way to sound projection " ▶♩ ".
- At the required point push the microphone switch to "on", speak your text and push microphone switch to "on", speak your text and push the microphone switch back to "off".
- To conclude the recording turn the selector switch (15) to "stop".

*) If you want to record your commentary into an already existing music section, press the "X" key (41) instead; this fades the music out or in. If the music is to remain attenuated during the commentary, read section B on page 18 ("Mixing in speech").
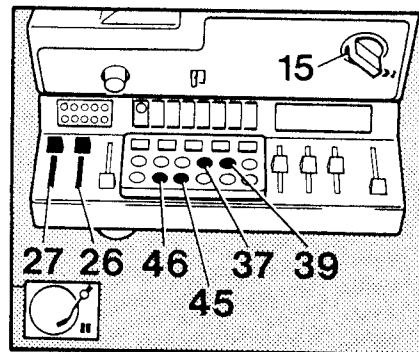
Music

Initial settings:

- Plug the music playback unit (record player, tape recorder etc.) into the input socket (52).
- Press the appropriate track selector key (16):
  Mono: Key "1", "2" or "1+2 mono";
  Stereo: Key "1+2 stereo"
  Press the "rec lock" key (29) to prepare the projector for recording standby (the red LED in the key lights up).

You can control the monitoring volume (via the loudspeaker or plugged-in earphone) with the volume control (20).

Now select automatic or manual recording control:

Automatic level control

- Push the sliding controls (26, 27) all the way to "aut".
- Press the "rec" recording key (45). The yellow LED immediately signals the recording mode.
- Select the type of transition to start the music recording — abrupt (key "][", 37) or soft ("V", 39). The appropriate yellow LED shows the selected transition.
- Start the sound playback unit and turn the rotary selector switch (15) to sound projection " ♪". The red LED next to the recording key signals that the recording is running.
- To conclude the recording either press the "play" (playback) key (46) — the music then stops or fades out according to the selected transition mode (abrupt or soft) — or turn the selector switch (15) to "stop". (In this case the music stops abruptly.)
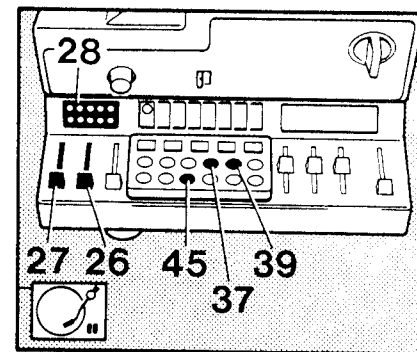
Manual level control

- Push the sliding controls (26, 27) to "0".
- Press the "rec" recording key (45). The yellow LED immediately lights to signal recording mode.
- Select the type of transition for the start of the music recording — abrupt (key "][", 37) or soft (key "V", 39). The appropriate yellow LED shows the selected transition.
- Make a trial recording run: Start the playback unit and adjust the appropriate controls ("lev L", 27, for track 1; "lev R", 26, for track 2; both controls for tracks 1+2) towards "10" until the red LED of the matching LED row (28) just begins to blink at the loudest passages. Leave the controls in this position and return the sound playback unit to its starting point.
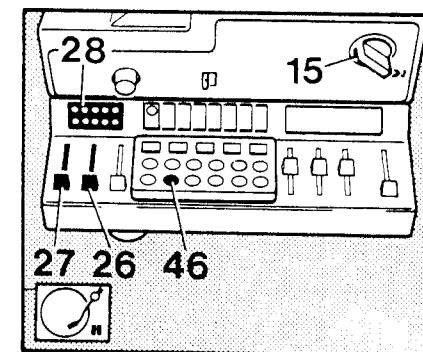
- Restart the sound playback unit.
- Turn the rotary selector switch (15) all the way to sound projection " ♪". The red LED next to the "rec" recording key indicates that the recording is running*).
- Observe the LEDs of the recording level indication (28) and if necessary correct the recording level with the controls (26, 27).
- To stop the recording either press the playback key ("play", 46) — this stops the music according to the selected kind of transition (abrupt or soft) — or turn the selector switch (15) to "stop" (this abruptly stops the music).

If the recording level LEDs constantly show a level below −10 dB, the output of the playback unit is insufficient or the plug polarity needs reversing. If the red diodes (+3) light up all the time, the playback unit output voltage is too high or the plug again needs reversal in polarity.

*) For sound recordings where you need no projection lamp, turn the selector switch back to the position "♪". This switches off the projection lamp to prolong its life but maintains all other functions.
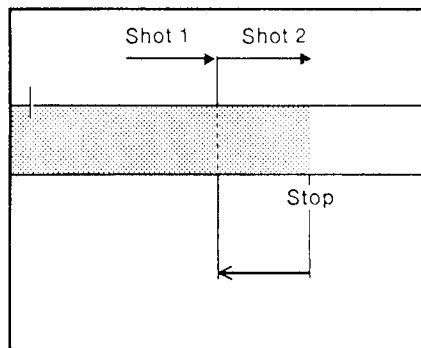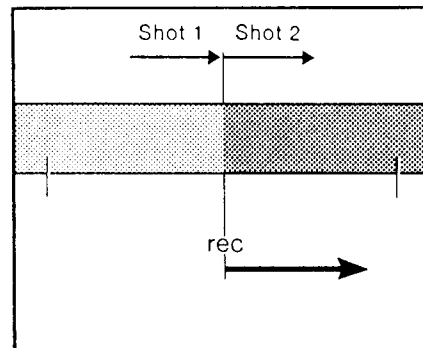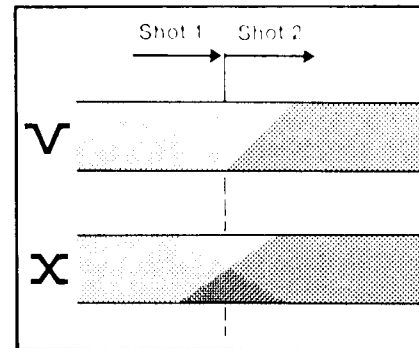
Abrupt music transitions

At certain scene changes it may be desirable to change the music, too. If the shots are radically different in nature, an abrupt music cut is recommended.
Suppose you want to place the music change exactly at the picture cut between shot 1 and shot 2:
— First record the music for shot 1.
— Stop the recording after the cut between the shots.
— Bring the point of the cut exactly into the film gate with the inching knob (1) — push it in gently and turn. With the preheated lamp a faint projected image remains visible.
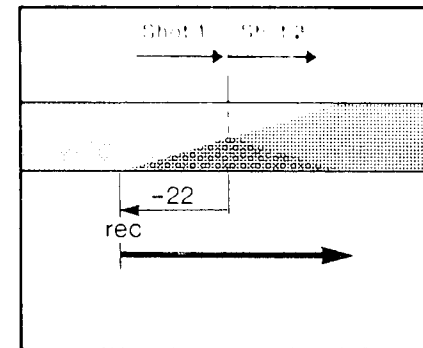
— Press the "rec" recording key (45). The yellow LED signals recording mode.
— Start the sound playback unit with the music that is to continue after the first shot, and
— turn the selector switch (15) all the way to sound projection " ♪ ".

Soft music transitions

A soft music transition is recommended for cuts between scenes of similar nature.
— Record the music for the first shot.
— A few seconds past the picture cut stop the projector.
— Return the projector to the shot change and bring the point of the cut exactly into the film gate.
If you now only want to fade in the music that follows the previous recording:
— Press the "V" key (39).
If however you want to dissolve from music No. 1 to music No. 2:
— Instead of the "V" key press the "X" key (41) and let the projector run back once more through 22 frames. (That ensures that the picture cut is located in the middle of the sound dissolve.)

— Now press the "rec" recording key (45).
— Start the playback unit with the music that is to follow the previously recorded music, and
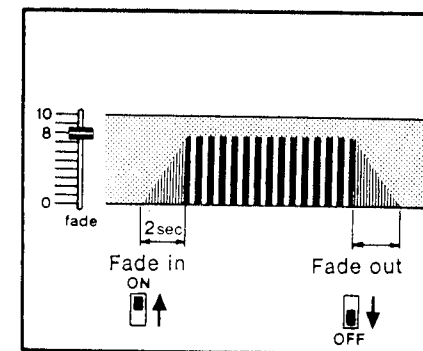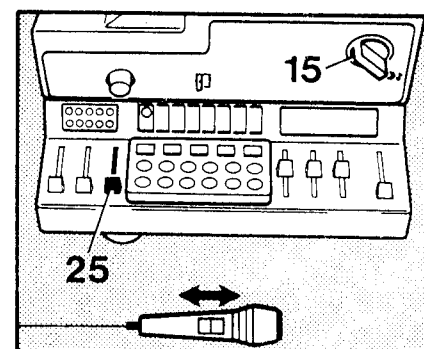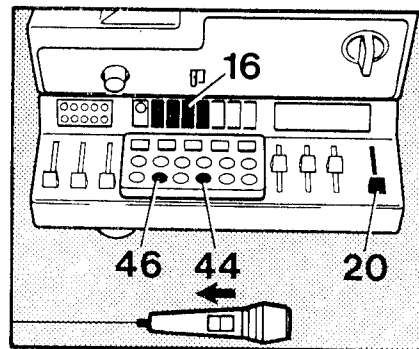— turn the selector switch (15) all the way to sound projection " ♪ ".

Note: See also section "E: Flying start recording" on page 23.

The Eumig daylight viewer available as an optional extra particularly useful for all sound recording operations.

B

Mixing procedures

Superimposing a new recording on an existing recording on the same track

Mixing in speech

For this recording method of music and commentary first record the music (see page 16). Then mix in the commentary during a second run through.

After recording the music:
— Rewind the film and rethread it.
— Keep the same track selector keys (16) depressed.
— Plug the microphone into the " DQ " input socket (52) and move the microphone switch to "off".
— Push the volume control (20) to "0" to avoid acoustic feedback (whistling).

After these preparatory steps enter the recording mode in the projector's memory:
— Press the "fade" key (44) and then the "play" key (46). (From this point on you only have to operate the microphone switch to fade the recording in or out.)

— Preset the degree of attenuation of the music already recorded and the volume of the commentary to be mixed in with the "fade" control (25): The further the control is pushed towards "10", the more the music is attenuated and the commentary enhanced. (The best way is to establish the setting by trial — usually just below "7" is a suitable point.)

Now you can start:
— Turn the rotary selector switch (15) all the way to sound projection " ➤♩ ".
— As soon as a scene appears to which you propose to add a commentary, push the microphone switch to "on". Wait for about two seconds*) and
— speak the commentary into the microphone.
— Then switch the microphone off again, moving the switch to "off".

Repeat this for every speech passage: Switch the microphone to "on", wait a moment, speak, switch the microphone switch to "off".


Here is the sequence shown diagrammatically.
As long as the microphone switch is at "off", the first recording — in our case the music — remains unaffected.
You have already preset the music/commentary level ratio with the "fade" control.
On switching the microphone to "off", fading out begins.

*) This delay time is necessary to avoid speaking your commentary into the fading in sound.
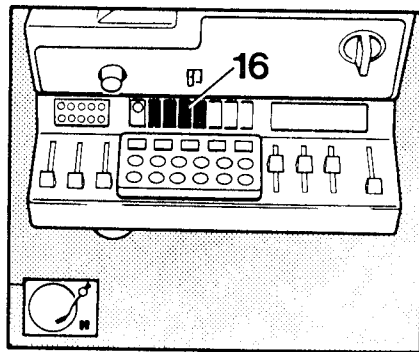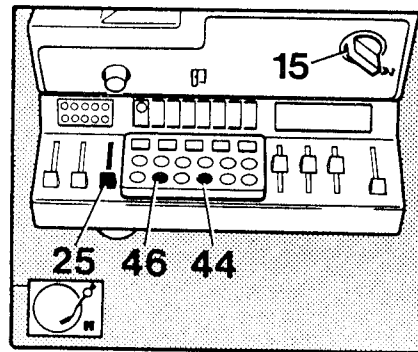
Mixing in music and special effects

After recording the first recording:
- Rewind the film and rethread it.
- Keep the same track selector keys (16) depressed.
- Plug the playback unit with the sound to be faded in (tape recorder, record player etc.) into the "DQ" input socket (52).

So much for the preparations. You can now mix in the new recording automatically or manually:
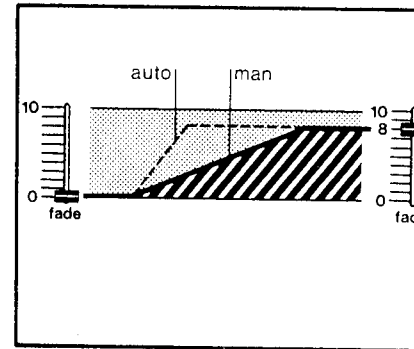
Automatic mixing

- First use the "fade" control (25) to preselect the attenuation of the first recording and the volume of the new recording to be mixed in: The further the "fade" control is pushed towards "10", the more the first recording is attenuated and the new recording enhanced. (The best way is to establish this setting by a trial run.)
- Turn the rotary selector switch (15) all the way to sound projection "▶♪" and start the playback unit either now or just before the shot into which the sound is to be faded in.)
- When this shot appears, press the "fade" key (44). This triggers the fading in process.

The duration of the fade in depends on the position of the "fade" control: at "10" it takes 2.5 seconds, and "5" only half as long and so on.

Press the "play" key (46) to start the fade out.

Manual mixing

You may sometimes want a longer fade in and fade out time than the fixed 2.5 seconds provided by the automatic control. In that case:
- Move the "fade" control (25) to "0".
- Press the "fade" key (44).
- Turn the selector switch (15) all the way to sound projection "▶♪" and start the playback unit either now or just before the shot into which you want to fade in the sound.
- When this shot appears, slowly push the "fade" control (25) from "0" towards "10"*).
- To fade out, push the "fade" control back to "0".

*) To fade out the first recording, push the fade control to "0" and then press the rec key. However, in that case you again have to press the fade key before you fade out the second recording with the fade control.

C

Twin track recording
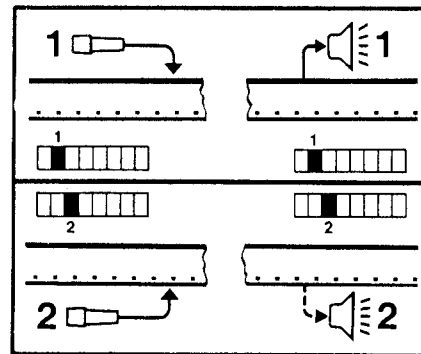
Two sound versions

If you need two sound versions for a film (for instance two separate commentaries or two different languages) first prepare a complete sound recording for the first version on the main stripe (track selector key "1").
Then rewind the film, press track selector key "2" (16) for the balancing stripe and record version No. 2. You can use any of the recording methods for either track. On playback you can then select two different sound programs.
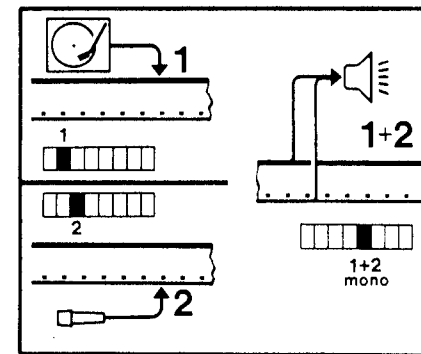
Splitting the sound between two tracks

It may be useful to plan the recording rightaway for two tracks, for instance the commentary on track 2 and music on track 1. To play back both together you then press the "1+2 mono" track selector key (16).
This has the advantage that you can correct either track separately without affecting the other. Thus you can replace a part or the whole of a faulty commentary without interfering with the music on the other track.
If you want to enhance the music for dramatic effect in selected sequences or attenuate it in others, adjust this with the manual recording level control (page 16).
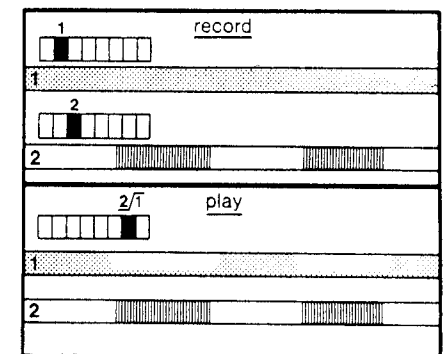
Duoplay automation

A very simple way of controlling the sound allocation between the tracks is to record the music, for instance, on track 1 and speech on track 2 completely normally at full level and then replay with Duoplay automation by pressing one of the keys "1/2" or "2/1" (16) -- in our case key "2/1". The automatic system then attenuates the music during the speech passages and restores it to full volume during speech intervals: the speech controls the playback level of the music.
The basic level ratio of the two tracks is preset by the "balance" control (21).
The symbols indicate:
"1/2": track 1 controls track 2
"2/1": track 2 controls track 1

Live sound

1

Commentary

2
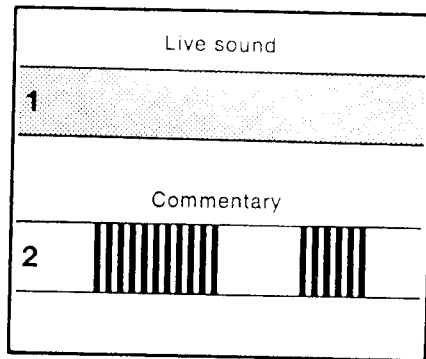
Adding to live sound recordings

Sometimes you may want to add a commentary to a shot with live sound. With twin track recording you can record this commentary on the balancing stripe. Simply press track selector key "2" (16).
This preserves the live sound recording unchanged and later plays it back together with the commentary. (Press the "1+2 mono" track selector key or the "2/1" Duoplay automation key — see page 20, column 4.)
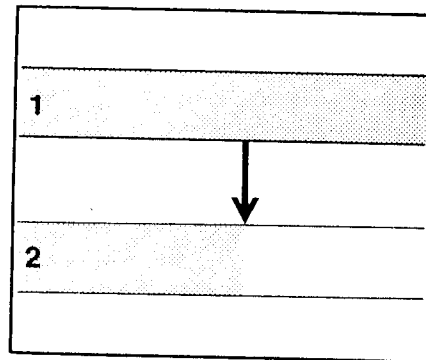

Multiplay technique

With Multiplay you can directly re-record either track on the other. That way you can add special effects or commentary to the re-recorded track, using the mixing techniques already described (page 18) without any risk to the original sound. But you can also mix during re-recording, for instance add the recording of track 2 to the recording of track 1. The position of the "fade" control (25) in this case establishes the mixing ratio.
For Multiplay you must select either track 1 or track 2. The track selected is that onto which the recording is to be re-recorded. If you press any other track selector key — say "1+2 mono" — the projector cannot function in Multiplay mode. (This arises from the fact that Multiplay switches one track to recording and the other to playback. By pressing the "1" or "2" rack selector key you tell the projector on which track the recording is to take place.)
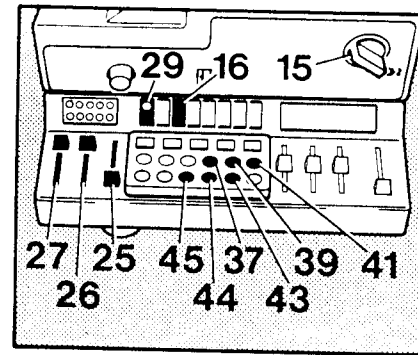

Example 1: Preparing for additions to a live sound film — you re-record from track 1 to track 2.
- Thread the film and press the "rec lock" key (29) if necessary — the red LED of this key must be lit.
- Select the track on which you want to record, in this case track 2, by pressing track key "2" (16).
- If required, press one of the three sound transition keys "][", "V" or "X" (37, 39, 41).
- Press the "Multiplay" (43) and "rec" keys (45).
- Set the recording level controls (26, 27) to "aut", and
- Turn the selector switch (15) to sound projection "♪".
The re-recording is now running.

Example 2: You want to mix the sound recording from track 1 into an existing recording on track 2.
- Follow preparatory steps as above.
  Press the "2" track selector key (16) — this is the track on which you are recording
  Press the "Multiplay" (43) and "fade" (44) keys
  Move the recording level controls (26, 27) to "aut" and the "fade" control (25) to "0"
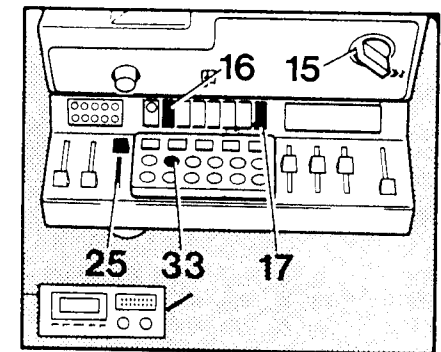
- Turn the selector switch (15) to sound projection " ".
- At the point where you want to start mixing in, push the "fade" control (25) towards the setting "10". To fade out, push it back again to "0".

Example 3: Mixing music or sound effects during re-recording. Proceed as for example 1 or 2, but connect a sound playback unit to the "DQ" input socket (52). (The mixing ratio between the re-recorded and the new signal is automatically fixed; this depends on the input signal from the playback unit.)

The Multiplay mode can be cancelled in four ways: By pressing
- the "pro off" key (33);
- the "000" key (17) (but that also clears the frame counter);
- the already depressed track selector key (16); or
- any other track selector key (16).

D

Stereo
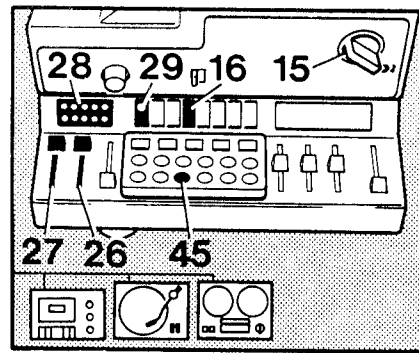
Stereo music recording

A stereo music recording is as easy as mono recording, as described on pages 16 and 17. The difference is that you record on both tracks at the same time: The left-hand channel on track 1 and the right-hand channel on track 2. The film must thus carry both a main and a balancing stripe.
- Plug the sound playback unit into the "DQ" input socket (52)*).
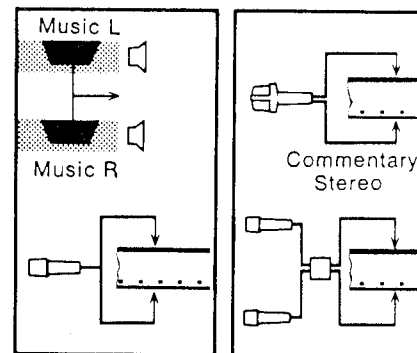- Press the "1+2 stereo" track selector key (16) and if necessary the "rec lock" key (29) — the red LED must light up.
- Select automatic or manual recording level control (26, 27).
- Press the "rec" key (45).
- Start the sound playback unit.
- With manual level control adjust the controls (26, 27) according to the recording level indication (28).
- Turn the selector switch (15) to sound projection "♪♪".

Commentaries

As stereo microphone recordings need some practical experience, we suggest that for recording commentaries you use the mono microphone supplied with the projector (see page 15 or — if you want to mix the commentary into a music recording — page 18). On stereo playback the speech appears to come from the centre, which is usually best, anyway.
For microphone recordings in stereo you need either a special stereo microphone or — available separately — a second mono microphone and the stereo microphone adapter.
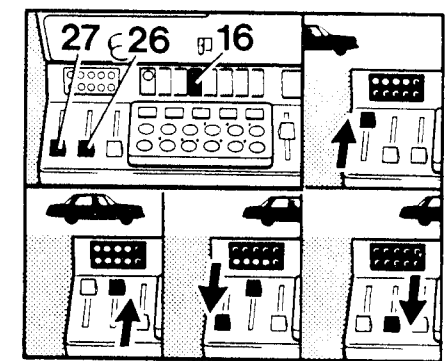
Directional stereo recordings

You may want to make such recordings to move the apparent origin of a sound from left to right (or rigth to left), for instance a passing car.
- Plug the playback unit into the "DQ" input socket (52);
- Press the "1+2 mono" track selector key (16).
- Push the recording level controls (26, 27) to "0".

During the recording you can then control the sound according to its direction of movement — for instance in this example from left to right. Slowly adjust the left-hand level control (27) upwards till the upper LED row indicates maximum 0 dB level (the sound approaches from the left), then push the right-hand control (26) to the same level and immediately after that pull back the left-hand control (the sound moves from left to right). Finally pull the right-hand control slowly back to "0" (the sound disappears at the right).
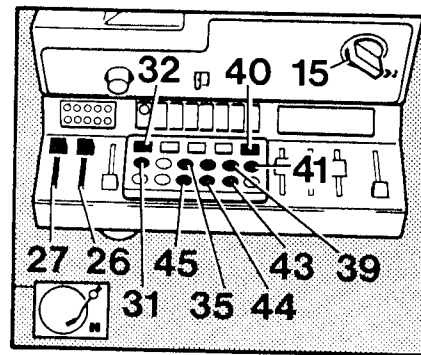Use the earphones or two speakers to monitor the recording.

Note: The recording modes listed under "E" and under "F" are also usable in stereo — except for Multiplex.

*) To avoid connection or patching

E

Flying start recording

Flying start recording can start the actual recording while the projector is running. This has the advantage of avoiding the usual acceleration phase of the mechanism.
Plug the sound playback unit into the "**DQ**" input socket (52).
- The red LED in the "rec lock" key (29) must be lit (if it is not, press this key).
- Now move to the point where the recording is to be cut in. If you want to define the spot exactly, use the inching knob (1) to bring the required frame of the film precisely into the gate.
- Press the "pro on" key (31); the yellow "program" signal (32) lights up and the processor is ready to accept instructions.

- Selec the sound transition: Abrupt ("][", key 37), soft ("V", 39) or dissolve ("X", 41).
- Press the "rec" (45) or "fade" (44) key: This stores this position in the memory. (If you also want to store a Multiplay instruction — see page 21 — press the "multiplay" key 43 before the "rec" or "fade" key.)
- Press the "operate" key (35): The processor is now ready to execute the program and the red "operate" signal (40) blinks.
- Let the projector run back a few seconds, at least until the "operate" signal is lit with steady light.
The projector on its own allows for the fact that the recording has to start 22 frames ahead with the "X" sound transition mode.
- Start the sound playback unit and turn the selector switch (15) all the way to sound projection "▶J". Don't worry; the recording only starts at the preset point — you can watch this by the lighting of the "rec" or "fade" signal and the extinguished "operate" signal.
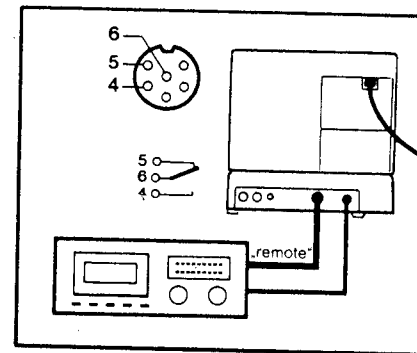
Remote tape start

With the remote tape start you can begin for instance a shot with a precisely defined beat of the music. For that you need of course a tape deck or recorder with remote control. Connect its remote control socket (usually marked "remote") with the start lead supplied to the auto start socket (53) of the projector. This connection is in addition to the normal sound connecting lead.
Store the position at which the recording is to start in the projector memory exactly as described before. But after running the projector back, bring also the tape to the exact starting position you want on the recorder. When you switch to sound projection, the projector not only starts recording at this point but it also starts the tape recorder at the correct instant, namely two frames before the start of the recording to allow the tape recorder to reach its full running speed. When you stop the projector or switch to playback ("play") the external sound replay unit also stops.

The starting lead supplied has at one end a plug to fit the projector; the other end has bare wires to which you should solder a suitable plug to fit your playback unit. The wiring of the auto start socket (53) is shown in the diagram above. If in doubt, ask your retailer and indicate the make and type of your tape or cassette recorder.

Note: A wrongly entered recording start instruction can be cleared immediately with the "cu" key (42)

F

Frame synchronised sound recording

If you have read this instruction booklet so far, you will already have met some aspects of micro-processor control, for instance with the flying start.
However till now this always involved entering a single instruction in the memory for subsequent execution. However, the processor can do much more — it can store up to sixteen such instructions in its memory and then execute them. Entering these instructions (i. e. programming) is quite straightforward as you will see below. Note however two basic rules:

First: The processor always operates with reference to the electronic frame counter display. During processor-controlled sound recording the film there-fore must neither be removed from the projector nor break, otherwise you have to re-program.

Second: After entering instructions in the memory, never press the reset key of the counter as this clears not only the counter display but also the program memory.
Now for the procedures themselves:



29 31 32
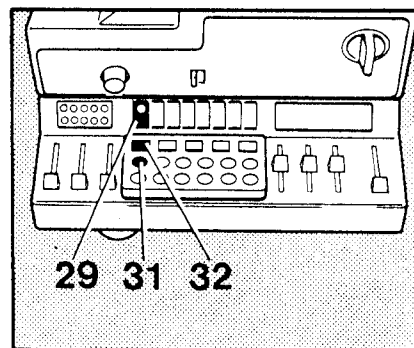
Programming preparations

First — as before every recording — you have to clear the recording lock before programming. So press the "rec lock" key (29) if necessary; the red LED in the key must be lit.
— Pressing the "pro on" key (31) tells the projector that you want to store a program of one or more instructions. The projector indicates that it is in standby programming mode by lighting the "program" signal lamp (32). From this point on pressing any of the "][", "V", "X", "play", "multiplay", "rec" or "fade" keys is assumed to be a pro-gramming instruction to be stored in the memory and is not therefore executed yet.
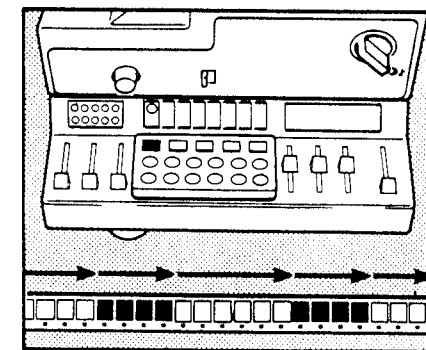
Starting the projector

To enter the instructions, run the projector to the various points on the film where the instructions are to apply, stop the projector and enter the instruction while the projector is stationary. The proces-sor allocates every instruction to the appropriate position of the frame counter.
(You could of course also enter instructions while the projector is running. But that way it becomes impossible to control sound record-ing with precise frame synchroni-sation, as different people have different anticipation times in selecting the exact timing point for such a "flying" instruction.)
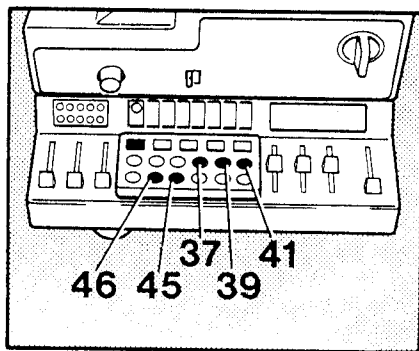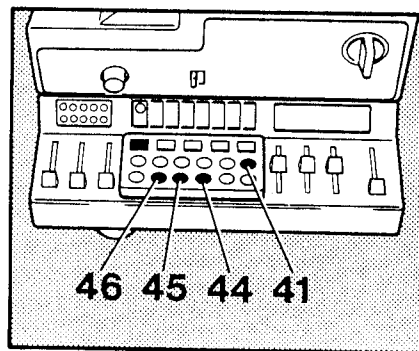
Programming

Programming — in other words entering instructions for the start and end of recording with the appropriate transition positions and for fade and multiplay modes — is simply carried out with the appropriate keys.

So when a shot appears where you want to begin the recording, press the "rec" key (45) and when the end of a sequence appears where the recording is to stop, press the "play" key (46) at the correct point.

If you want to fade in a recording, first press the "V" key (39) and then at the required point the „rec" (Were the projector starts with a soft fade-in later.)

Mixing procedures — superimposing a new recording on an already existing one — are programmed equally simply:

*) When switching to „play" you can of course use a different sound transition from that used at the beginning of the recording. In that case simply press the required || V or X transition key (37, 39 or 41) before pressing the „play" key

You will find programming examples on pages 28 and 29.

At the beginning of a shot press the "fade" key (44). (Here you do not need to press any of the sound transition keys, for "fade" is automatically coupled with a "X" transition.) And where you want to leave the mixing mode press the "play" key (46)*).

To program a dissolve from an existing into a new recording with a shot change, proceed as follows: First press the "X" key (41) and at the exact point of the picture cut the "rec" key (45). (It doesn't matter how much sooner you press the "X" key as the computer automatically allows for the dissolve period before and after the picture cut.) Hence a music dissolve is easier by this method than described on page 17 under "Soft Music Transition".
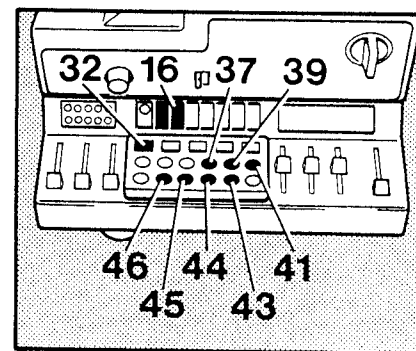

To program Multiplay (re-recording from one track to the other) proceed as follows:
First select the required sound transition ("][", "V", "X" — keys 37, 39 or 41), press the "multiplay" key (43) and finally — at the point where the recording is to start — the "rec" recording key (45).

Store the end point of the re-recording in the memory by first pressing once more the track selector key (16) you already had depressed ("1" or "2"); the red LED of the "multiplay" key now goes out. Then press the "play" key (46) at the exact point where you want to stop the re-recording. You can also use Multiplay to mix into an already existing recording: First press the "multiplay" and then the "fade" key.

To stop the mixing run, press again the already pressed track selector key "1" or "2" and then "play" key. If the "program" lamp (32) starts to blink after you have entered an instruction sequence, this signals that the memory is full and cannot accept any further instructions. The program stored so far is still available for execution.

Correction: Clear a wrongly entered instruction with the "cc" key (42) and then re-enter it correctly
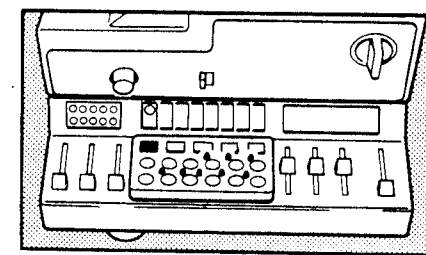
Checking the program

It can of course happen that you have made a mistake with one or more program instructions. If you are not quite sure where, this doesn't matter much for you can check or edit the entered instructions as long as the "program" lamp is still alight.

So run back to the beginning. You will notice that some of the LEDs light up briefly. These are the control instructions you have programmed which show up in this way at the point where they were entered.

Next switch to sound projection " ♪ ": Now every instruction appears as long as it is valid, in other words from its start to its end or till the beginning of the next instruction. That way you can conveniently check the entire program entered: The projector simulates visually and acoustically (if you monitor and have switched on the playback unit for the rehearsal) the program execution without actually executing it.

Acoustic simulated operation does not take note of the "V" and "X" sound transitions.

Moreover, acoustic simulated operation is not possible as soon as the yellow "program" signal starts to blink, as the processor is then already full up with data.
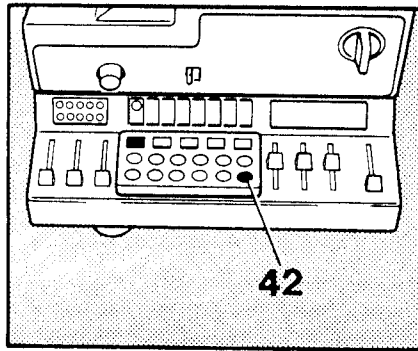
Corrections

As already mentioned briefly under "programming" on page 25, the "ce" input clearing key is used for correcting individual input errors. While the film is running through (forward or in reverse) this key clears all passing instructions while it is depressed. If for instance you want to cancel a single input instruction, bring the film near the beginning of the instruction, press the "ce" key and run forward or in reverse across the instruction point. If however you want to replace one instruction by another, bring that position exactly into the film gate with the inching knob (1). During running backwards, the LEDs of this instruction light up precisely only at this point*).
Stop here, press the "ce" key and replace the cancelled instruction by the new one.

*) If you run the film forward with the inching knob, the LEDs light up from this point onwards. Thus if you cannot clear the instruction with the "ce" key, you are not exactly at the programmed point and you have to run back a little further.
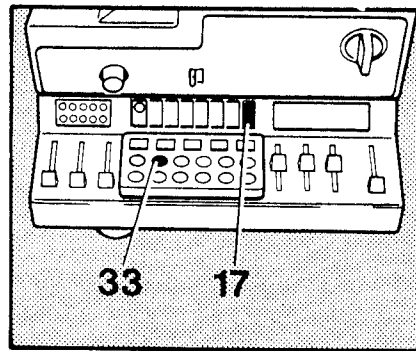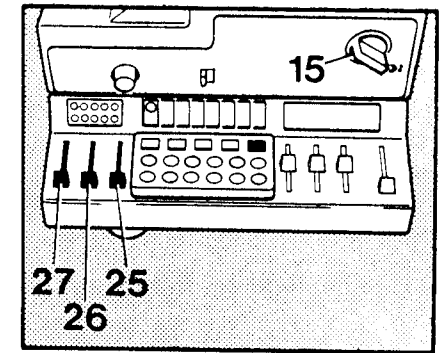
If however you decide that you don't like the whole program or have changed your mind about its form, you can clear it all with a single key: Either press the "pro off" key (33) specially provided for this purpose, or press the "000" reset key of the frame counter (17) Here however you loose the frame counter setting and display. Then you can proceed with re-programming.
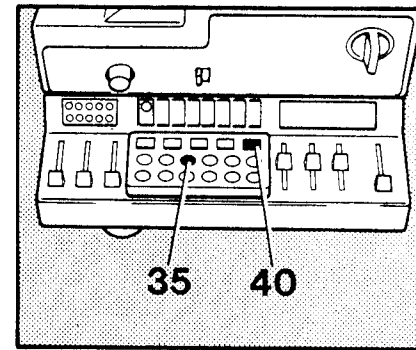
Program execution

If the program as entered is right, press the "operate" key (35) which releases the program for execution*). The "program" signal then goes out and instead the "operate" signal (40) lights up. If this signal lamp blinks, this means that the film is not yet located ahead of the first program instruction. In that case switch the projector to reverse running and stop it only when the lamp stops to blink and becomes steady. If you want to monitor any recording before the first instruction, press the "play" key (46). But do not press any other key.
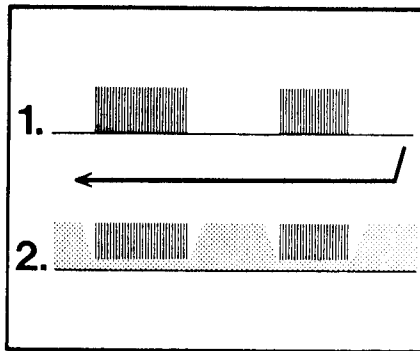
*) For further technical details see the appendix. But here is broadly what happens: As with the "flying start" the projector again calculates the exact start and stop locations of the different sound transitions to the nearest frame. That way you can program precisely at the picture change — irrespective of the type of transition — without having to worry about fading in, fading out or dissolves. One further point: Do not place "V", "X" and "fade" instructions too close to each other (minimum separation 50 frames) as otherwise their execution could get mixed up because of the

As soon as you turn the selector switch (15) to sound projection " ♪ ", the projector on its own carries out all the memorised operations. And as long as it does that, the "operate" signal stays alight.
All you really have to do now is to look after the correct setting of the level controls (26, 27) and if necessary the "fade" control (25). Occasionally you may also have to change the material being played by the external playback unit. As soon as the "operate" signal goes out, you can stop the projector for it has now carried out all programmed instructions. No further instructions are left in the memory. Naturally you can also use the remote start in program operation. Whenever the projector switches to recording, it starts the remote-controlled tape playback unit; when it switches to playback, the tape recorder is stopped. This also allows for fades in and out. (See section "E" under "Remote tape start".)

Note: Every instruction executed is automatically cleared. If you want to repeat a recording, you have to store the appropriate instructions afresh in the memory.

Programmed mixing

Recording a commentary and then a music background

Programmed mixing is somewhat different in principle from the procedures described so far. That is also why we are treating it separately.

This is a kind of reversal of the mixing-in procedure of speech described in the "Mixing procedures" section. For here you are recording the commentary on the film first and the music during the second run through. The projector automatically attenuates the music during the speech passages.
Here is how it works:

Note: Programmed mixing as described here is suitable for straightforward sound recording. For more advanced recording we suggest that you first record the commentary without programming and enter the program for the subsequent music recording during a separate run through with the normal program input keys (with the microphone plug disconnected). This not only permits easy text corrections but also provides all programming possibilities.
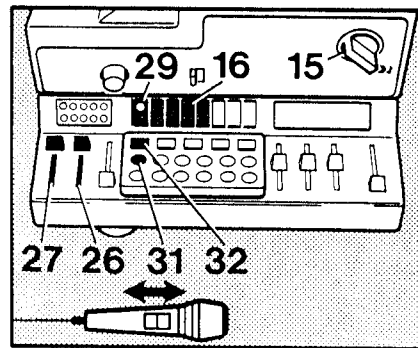
- Plug in the microphone (with the microphone switch at "off") and thread the film.
- Press the "rec lock" key (29) to make the red LED light up.
- Press one of the track selector keys (16) to select the track or tracks on which you want to record the commentary.
- Push the recording level controls (26, 27) to "aut".
- To avoid acoustic feedback (whistling) push the volume control (20) to "0".
- Now press the "pro on" key (31); the "program" signal (32) lights up.
- Start the projector: Turn the selector switch (15) to sound projection " ♪♩ ".
- Each time you want to speak commentary, move the microphone switch to "on";
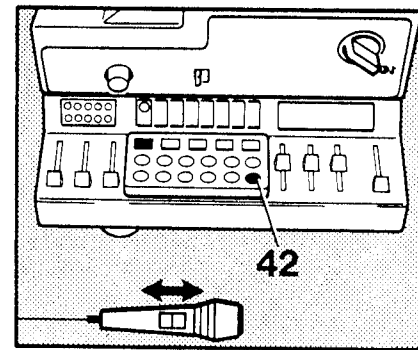
- Wait for one second*) and then speak your commentary.
- Then wait again for a second*) before pushing the microphone switch to "off".

What if you have made a mistake?
If the replacement text is longer than the one with the mistake (which is often the case), clear both instructions relating to this text section with the "ce" key (42) — see last page under "Corrections" how to do that — and speak this text afresh while switching the microphone on and off. If however the replacement text is shorter, you first have to erase the text with the mistake: Switch the microphone to "off", return to the "on" instruction of the wrong text (locate the exact frame in the gate — see "Corrections"), move the L/R level controls to "0", turn the microphone swich to "on" and run the projector (swiched to sound projection " ♪♩ ") past the end of the text passage. Then use the "ce" key to clear the "on" instruction and all following instructions. Now proceed as above.
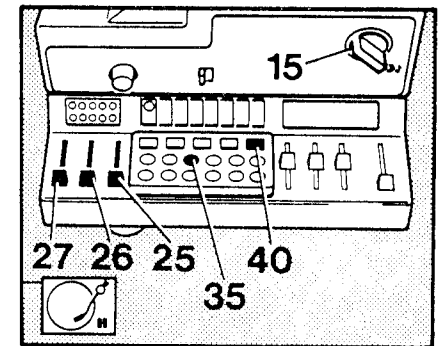
Once you have recorded all your commentary sections:

- Rewind the film to the beginning;
- Remove the microphone plug and plug the replay unit into the " " input socket (52).
- Push the "operate" key (35). The "operate" signal (40) should now light up.
- Adjust beforehand the degree of music attenuation during the speech passages with the "fade" control. For mere background music the setting 2 to 3 should be about right.
- Set the sliding level controls (26, 27) for automatic or manual level control.
- Start the playback unit (if this is not done by the projector via the automatic tape start system), and —
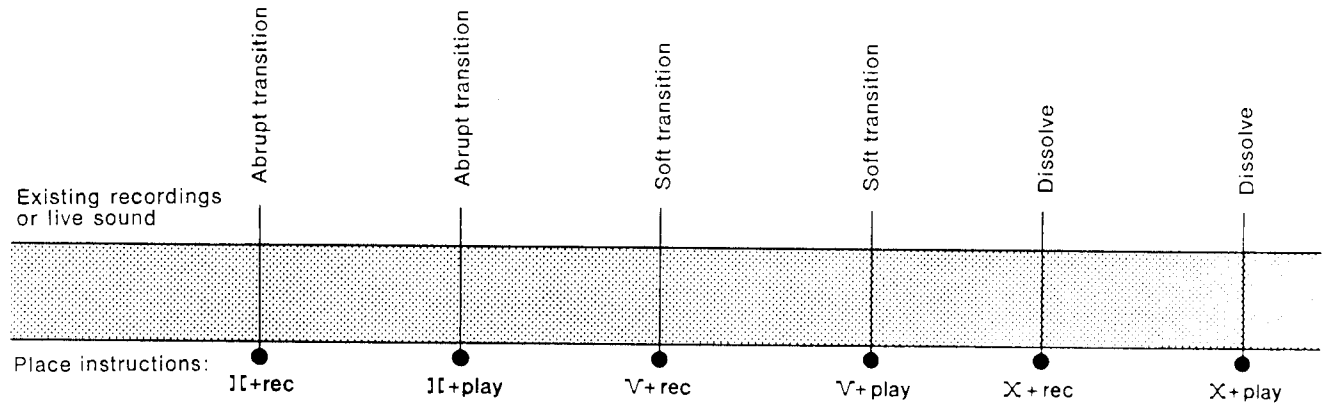- Turn the rotary selector switch (15) all the way to sound projection " ♪♩ "

Now the projector looks after the music recording. At the same time it automatically attenuates the music during the text sections and restores it to full level in the intervals.

*) This is to avoid running your commentary into the fade in or fade out period of the subsequent music recording
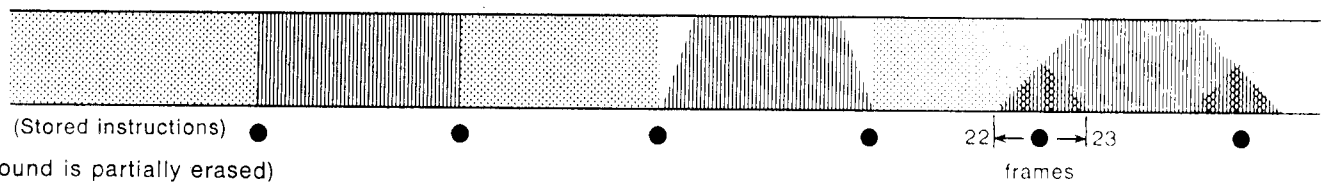
Examples of frame-synchronised programmed recordings

If after programming the "rec" instruction you want to listen to the sound recorded on the film stripe (for instance during intervals between commentary sections), advance the inching knob (1) by one frame after entering the "rec" instruction and then press the "pro on" key (31). The projector then switches back to "play" (replay) without storing any replay instruction.

First run through

"program"

Existing recordings or live sound

Abrupt transition | Abrupt transition | Soft transition | Soft transition | Dissolve | Dissolve

Place instructions:

][+rec   ][+play   V+rec   V+play   X+rec   X+play

Second run through

"operate"

(Stored instructions)

22 ←●→ 23
frames

Mixing music into live sound (Live sound is partially erased)

First run through

"program"

Existing recording (live sound)

fade   rec   fade   rec   fade   rec
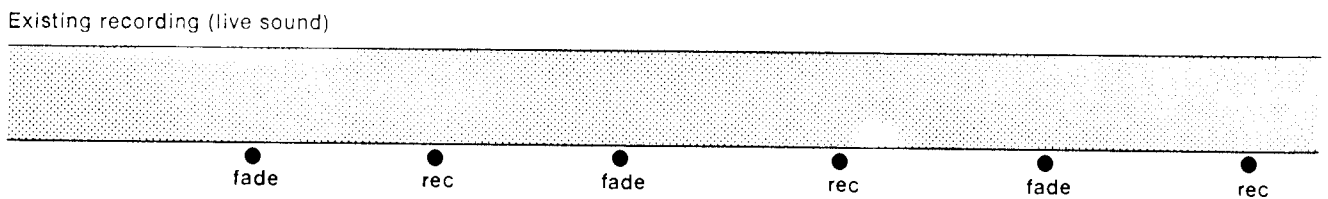
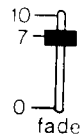**Second run through**

"program"

10
3
0
fade
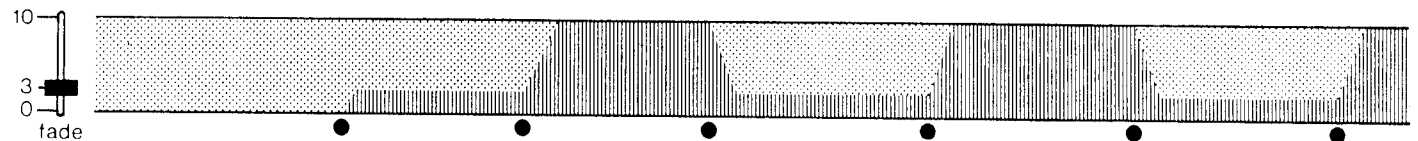
Mixing live sound into music (Multiplay) (Live sound remains intact)

First run through
"program"

Existing music recording

Place
instructions: multiplay+fade clear Multiplay +play multiplay+fade clear Multiplay*) +play

Second run through 10 — 7 —
"operate"

0 —
fade (Stored instructions)

Mixed sound recording
*) Clearing Multiplay: Press same track selector key a second time.

10 —
5 —
0 —
fade

X+rec][+play fade rec fade play X+multiplay+rec multiplay löschen*)
+play
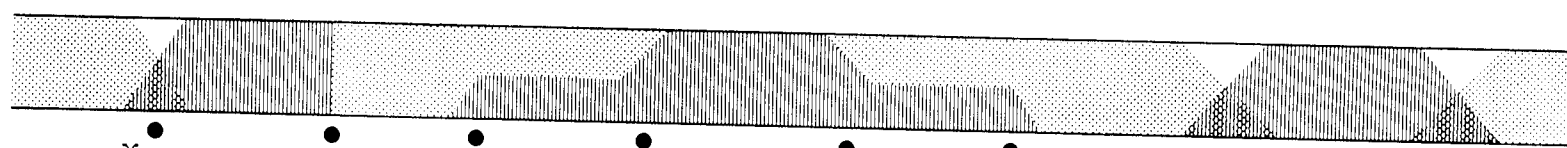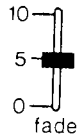
Programmed mixing
First run through
"program"

1 sec speak 1 sec *) Clearing Multiplay: Press same track selector key a second time.
speak

Commentary

Place instructions: ON ON
OFF OFF

Second run through
"operate"

Music

fade

Stored instructions

rec
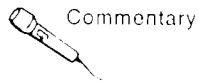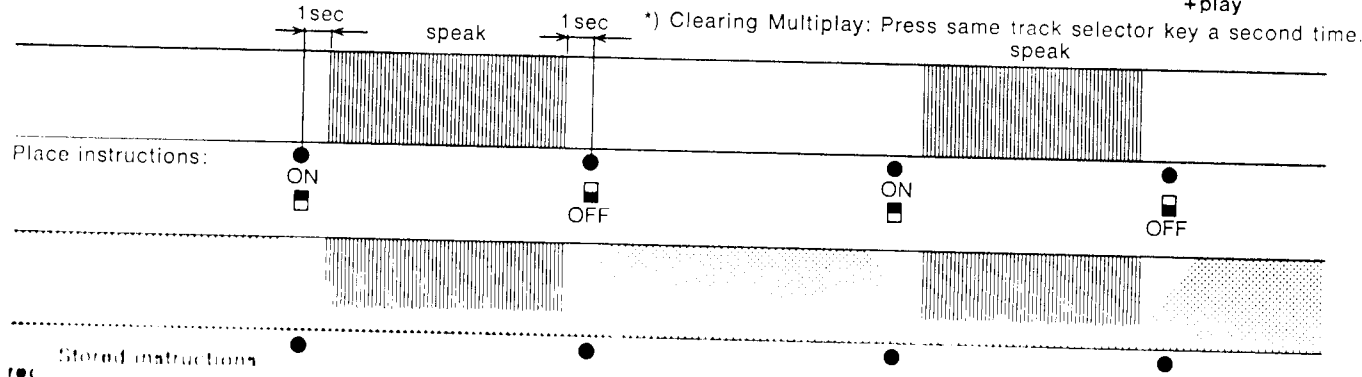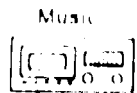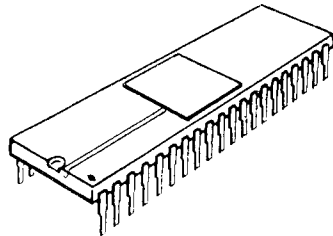
For those who still want to know more

The heart of this projector is a single-chip microprocessor which in conjunction with the electronic frame counter programs the control of the sound section.

Pressing the "pro on" key switches the memory of the microprocessor to standby for accepting programming instructions — in the order in which they are entered. Together with each programming instruction, the memory records the current position of the frame counter. This is stored together with the instruction as a complete information block. (The memory also records the location of the first instruction unit.) The memory can hold up to 16 such information blocks or "instruction units".

A program instruction can consist of up to three part instructions. An example is a faded in start to a re-recording from one track to another, in other words the instruction sequence "V — multiplay — rec".

Such instruction sequences are stored only on pressing the "rec" or "fade" key. This is of some importance if you enter instructions while the projector is running.

It is the instant of pressing the "rec" or "fade" key which determines the point on the film where the operation is later executed. (In some cases it is however not sufficient to store these locations for the processor — as we shall see below.)

Once a program is stored and you have not yet pressed the "operate" key, you can check the entered program at any time. You can do this both visually by checking which LED lights up next to the appropriate instruction input key — and acoustically by the appropriate playback unit being switched to the monitoring speaker or earphone. In this case however the required sound transition is not simulated; that is only shown by the LEDs.

During this operation the sound track of the film is not yet affected. Apart from that the processor does virtually the same as it does later during execution: It constantly compares the current counter position with the stored counter position of the next instruction. When this counter setting is reached, the corresponding instruction is signalled or simulated. (That is why we also call this procedure "simulated operation mode".)

As soon as you press the "operate" key, various other things happen. The processor first expects you (by the blinking "operate" signal) to run back to the first instruction. For it cannot execute the program until you have done so. In addition, it starts various calculations which are necessary wherever you have programmed a dissolve "X" or a fade "V".

For — with for instance a dissolve — the projector has to switch in the sound playback unit not just at the point of the picture cut where the instruction was located, but appropriately earlier, namely 22 frames sooner*). The sketch below illustrates the problem.

Change of shot

Start of tape
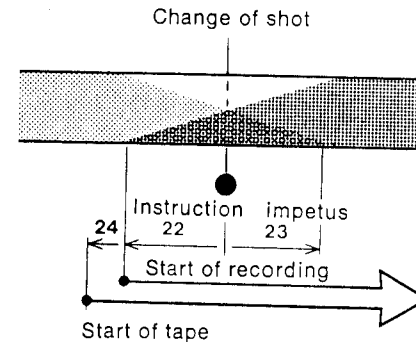
This applies also if the dissolve is at the end of a shot — or with a fade out — except that the sound playback unit can only be switched off after the picture change (in this case 23 frames later).
As you can see, the microprocessor takes over a lot of figuring and work: You need never again miss a sound recording point.

For remote tape start we recommend the use of a tape recorder with fast start-up, for instance Eumig's fl 1000 µP cassette recorder.

*) The projector precisely keeps to these fade in, fade out and dissolve times, provided that the instructions are not too close to each other. Otherwise it may happen that the required calculations in the processor shift the instructions or even reverse their sequence.
Here is an example: With the frame counter at 00000 you enter a "V+rec" instruction and at counter position 00025 (i. e. much too soon) a "V+play".

Here is how they are executed: The "play" instruction is processed at the frame counter position 00980

Care of the projector

Eumig sound movie projectors require no maintenance, for all moving parts are permanently lubricated.
However, dust and film debris deposits in the film path and the film gate could be a nuisance during projection and also cause score marks on your valuable films.

Important: Never touch the rubber linings of the drive wheels (at the left of the projector next to the running speed adjustment) with the fingers, as any grease could cause uneven running. If necessary clean these linings with alcohol.
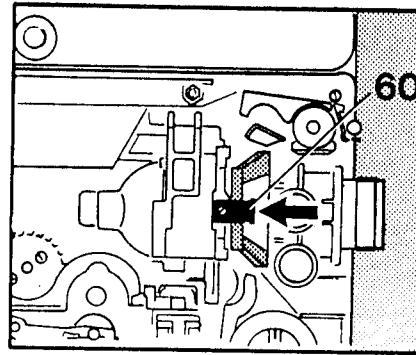
Cleaning the film track

- **Disconnect the mains plug.**
- Unscrew the fixing screws (7, 30) and remove the front cover.
- Remove the lens (see "cleaning the lens" in next column but one).

Now press the red key (60) in the direction of the arrow and swing aside the film pressure pad to open the film track. Clean the film gate and track with a soft cloth or camel hair brush; remove caked-on deposits with a matchstick (but never with any metal object).
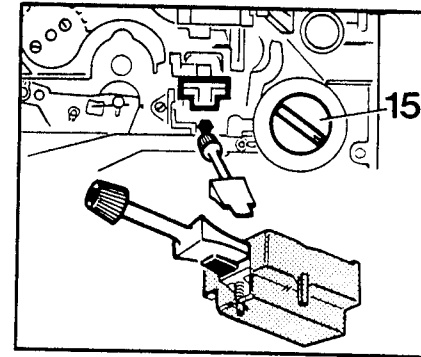
Removing film deposits from the sound head pressure pad

- **Disconnect the mains plug.**
- Unscrew the fixing screws (7, 30) and remove the front cover.
- Turn the mains switch (4) to "on".
- Turn the selector switch (15) to sound projection "➤♪".
- Fit the box spanner supplied as shown in the illustration and turn clockwise as far as it will go.
- Remove the box spanner.
- Pull the pressure pad from its fitting.
- Push the handle of the box spanner into the pressure pad as shown to take up the pressure.

After cleaning refit in the reverse sequence.
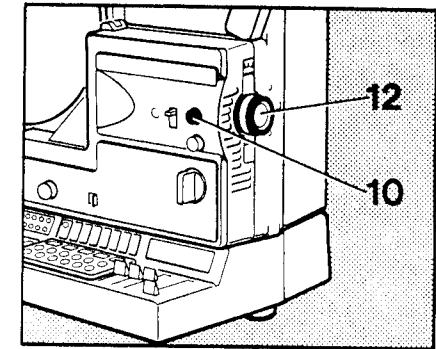
Cleaning the lens

This entails removal of the lens as follows:
- Turn the focusing knob (10) anticlockwise as far as it will go.
- Press the lens (12) inwards.
- Continue turning the focusing knob anticlockwise.
- Remove the lens.

Clean the lens with a soft cloth or camelhair brush. Before replacing the lens check that the engagement key of the lens faces you and that the focusing knob is engaged. Now push the lens fully into the mount and turn the focusing knob (10) clockwise.
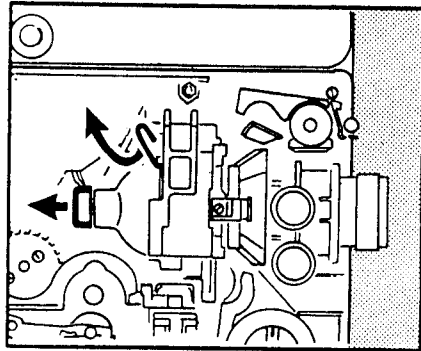
Changing the projection lamp
- **Disconnect the mains plug.**
- Unscrew the fixing screws (7, 30) and remove the front cover.
- Press down the lamp retaining spring and disengage by swinging to left (top in illustration).
- Remove the lamp and pull off the lamp fitting.
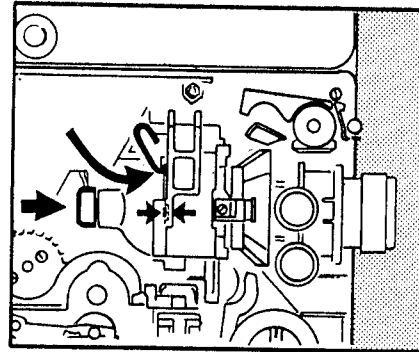
Replace with a new 15 volt 150 watt tungsten-halogen lamp with diathermic reflector Order No. 790.0410/6. When inserting the new lamp take special care never to touch the bulb or inside of the reflector with the bare fingers. (If you accidentally touch these areas, clean with alcohol.)
- Push the lamp fitting over the lamp base.
- Raise the lamp retaining spring.
- Locate the lamp in its seating so that the centering key of the lamp engages the notch provided for it (top illustration). Be careful not to pinch the lower spring when doing this.
- Re-engage the lamp retaining spring at the top.
- Refit the front cover.
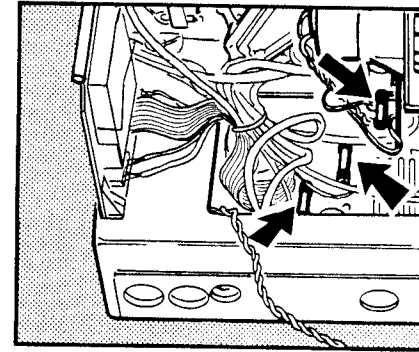
Changing the fuse
Only for the specialist
- **Disconnect the mains plug.**
- Unscrew the fixing screws (49) of the back.
- Remove the back.

Amplifier fuse*):

The fuse is mounted at the left of the amplifier circuit board. Replace wih a 3.15 amp slow-blow 5 x 20 mm cartridge fuse, Order No. 0790.308/4 (for USA: 3.2 amp slow-blow No. 0790.309/6).

Fan fuse:

The fuse is mounted at the top on the fan panel (see upper arrow in illustration). Replace by a slow-blow 5 x 20 mm 1 amp fuse, Order No. 790.0301/1 (USA: 1 amp, 906.727/9)

Processor fuse:

The fuse is located at the right next to the amplifier fuse. To replace you need a fuse 5 x 20 mm/1 A (slow-blow), order no. 790.0301/1.

*) The fuse protects the amplifier against overloading, but not the projector against damage when connected to a wrong supply voltage.

General hints

To get the most out of your films for as long as possible treat them from time to time with a film cleaner, available from photographic retailers. The best way is to run the film during rewinding through a soft cloth soaked in the film cleaner.

Good sound quality from your magnetic sound films depends on the condition of the projector and the sound film itself. So take special care over splices: These must be clean, precise and preferably within the film thickness, for thickness variations can cause audible clicks on playback.

Do not use any anti-static agent before striping a film, otherwise the stripe may not adhere well. Clean such films only with a soft, fluffless linen rag moistened with surgical spirit.

Fully edit and splice your films before you have them striped. That way you avoid noises at the splices. Be sure to order a high-quality stripe for your films, for instance Agfa F5. To utilise the twin track recording scope of your projector order the film to be provided with a main and a balancing stripe. Preferably store films protected against dust in film cans. Humidifier in the cans prevents the film from becoming brittle.

To make the most of the sound quality of your projector use only high-quality playback units for the sound input.

To utilise the full dynamic range of the projector, connect two external speakers and locate these next to or below the screen during the show.

Apparent troubles may have simple causes . . .

. . . frequently projector failure may be due to a wrong operation or a similar minor point. The examples below may help you to put things right yourself on the spot.

Problem	Cause	Remedy
Unsteady image, rattling noise	Faulty splice or damaged perforation	Briefly press loop restoring key (9)
Image unsharp towards one edge and unsteady	Film pressure pad loose	Push film pressure pad to left to engage red lock (60)
Film won't thread	Rotary selector switch turned to " >♩ " from ">♩"	Turn rotary selector switch to " >> " only from "stop" position
Film emerges below lens during threading	Film leader not properly trimmed	Turn rotary selector switch to reverse "≪ ", cleanly trim film with film trimmer and repeat threading sequence
Cleanly trimmed film still emerges below lens	Film debris in sound section blocks film	Clean sound section (see page 30)
Weak or uneven image illumination	Projection lamp not straight in fitting	Check correct location of lamp when fitting; do not clamp lower spring; centering key of lamp must engage corresponding notch in fitting
No projection light despite lamp in order	Contact problems in lamp fitting; dirty or oxidised pins	Clean contact pins of lamp by repeatedly pulling off and refitting lamp socket
Projector functions only in playback and public address modes	"rec lock" key (29) was not pressed	Press "rec lock" key (29); the red LED in this key must light
Sound recording faint	Incorrect polarity of re-recording lead	Use Eumig re-recording lead with correct adapter or resolder connections on plug
With microphone plugged in, projector fails to switch between "rec" and "play" on operating microphone switch	1. Failure to press "rec lock" key 2. Projector in "rec" or "fade" mode	1. Press "rec lock" key (29); the red LED in this key must light 2. Press "play" key (46) to allow processor to accept instruction pulses from microphone
No acoustic check of entered program (acoustic simulated operation)	Processor memory is full (yellow "program" signal blinks)	Either clear the last instruction with the "ce" key (42) — see page 26 or check the program only visually (visual simulated operation remains active)
Frame counter shows no figures but only bars; the "program" and "operate" indicator blinks	You have accidently strayed into the servicing test program (this should not happen in normal operation)	Press "000" reset key (17) or switch the projector off and on again with mains switch (4)
Wrong execution of instructions	Instructions were entered too close together	Rerecord and reprogram: There must be an interval of at least 50 frames between succeeding "V", "X" and "fade" instructions

Technical data

Projector

Film gauge
Super-8, Single-8

Lens
Multicoated Eumig 12.5 – 25 mm
Suprogon Zoom f/1.2

Lighting system
15 volt, 150 watt tungsten-halogen
lamp wih diathermic reflector and
lamp preheating as aid to sound
recording.

Mains switch
Double-pole sliding switch;
switched on state indicated by
various operating signals (frame
counter, track indication etc.).

Running speed
18 and 24 frames/second and any
intermediate speed.

Frame counter
Electronic 5-digit frame counter,
can be switched to time display in
minutes and seconds.

Special features
Longitudinal and lateral levelling;
automatic film threading through to
take – up reel; fitting for daylight
viewer; fine focusing knob; frame
line adjustment knob; maximum
reel capacity 240 metres (800 feet).

Weight
Approx 11 kg (24'/₄ lbs).

Size
350 x 272 x 320 mm
(13.8 x 10.7 x 12.6 inches.)

Sound section

Amplifier
Separate recording and playback
amplifiers, controlled by one single-
chip microprocessor.

Output
2 x 14 watts rms, 2 x 20 watt music.

Frequency range
40 – 11.000 Hz (at 18 frames/second,
according to DIN 15 868).

Flutter and wow
Below 0.4% (DIN 45 507).

Signal/noise ratio
Better than 50 dB, weighted
according to DIN 45 405.

Automatic recording level control
Automatic gain and frequency
control (AGFC). Input level range
up to 50 dB (1 : 300). With micro-
phone recording the audio effect is
largely independent of the speaking
distance into the microphone.

Inputs
Microphone: 0.3 – 100 mV into 9 K;
Contacts: 1 and 2 (mono); 1, 4 and 2
(stereo);
Phono: 50 mV to 3 volts into 470 K;
Contacts 3 and 2 (mono); 3, 5 and 2
(stereo).

Outputs
Two external speakers, 4 – 6 ohms;
Line output for external amplifier:
47 K; contacts 3, 5 and 2;
Earphone socket for 6.3 mm dia
stereo jack.

Picture/sound separation
18 frames.

Signals
Red warning signal for release of
recording lock ("rec lock"); green
signal of selected track or tracks;
Playback ("play"): green; recording
("rec"): yellow plus red; mixing
("fade"): yellow; multiplay: red;
program input ("pro on"): yellow;
program execution ("operate"): red;
sound transitions "][", "V", "X":
all yellow;
Two rows of LEDs (one for each
channel) as recording level
indicators.

Sound head
Combined record/playback and
erasing head; increased cross-talk
attenuation for Multiplay operation.
HF premagnetisation and erasing
65 kHz.

Special features
Tone control; twin track recording;
Multiplay without external link;
separate manual recording level
control for each channel; sound
recording without lamp to save lamp
burning life; monitoring during
recording with adjustable volume;
remote microphone control of
recording and of public address
function; Duoplay automation;
preprogrammable sound recording
(up to 16 instructions at beginning
and end of shots, choice of "][",
"V", "X", "fade"); automatic start
by projector of external tape play-
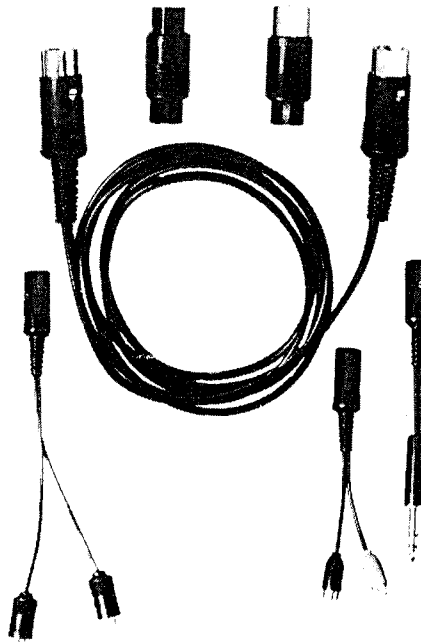back unit.

Recommended accessories

Daylight Viewer
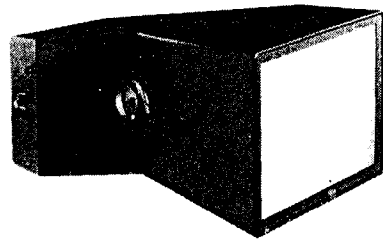
The daylight viewer shows a brilliant image even in daylight on a screen 100 x 75 mm. similar to an animated editing viewer.
Simply plug it onto the projector and you can preview your film. The daylight viewer is particularly useful for editing and sound recording.

EUMIG Universal Recording Lead stereo

EUMIG helps you to link your EUMIG sound movie projector to any sound source. This is straight-forward with EUMIG's Universal Recording Lead including various special adapters. Available from your movie dealer.
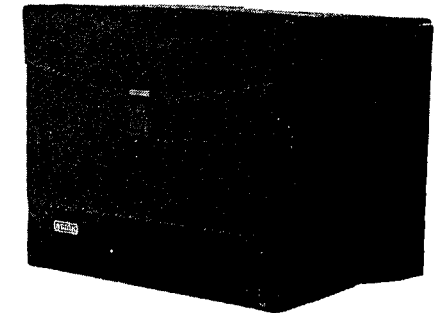
EUMIG stereo microphone adapter

The EUMIG stereo microphone adapter makes it possible to connect two mono microphones for a stereophone recording.
The thick section of the cable is for connection to the left channel (main track). This connection is for the EUMIG microphone supplied, which can be remotely controlled.
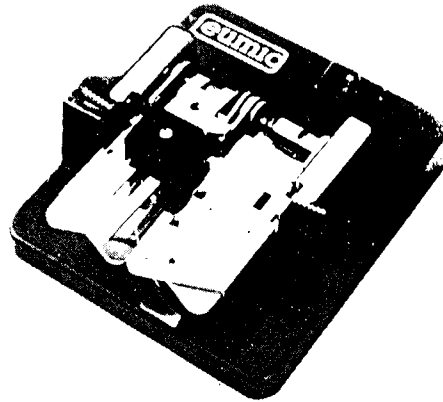
Folding case for Eumig sound projectors

This durable cover protects your projector during storage and has compartments for accessories and films.
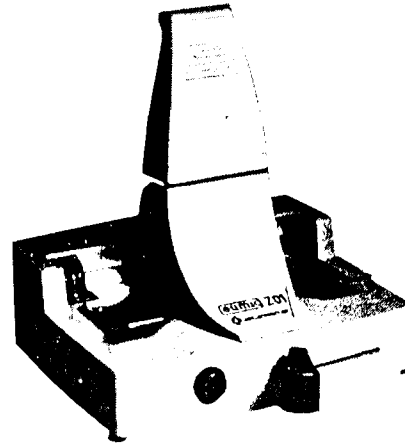
Order No. 790.0296/1

Order No. 790.0120/8

Order No. 790.0130/0

Order No. 790.0402/7

Bevel edge splicer

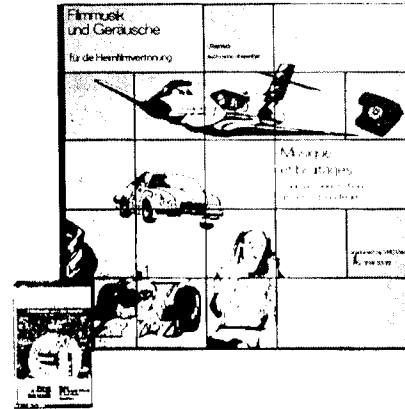Simple bevel edge splicer for easy normal splices.

Order No. 781 0010 0

Chemo splicer

The simplest splicing system ever: The EUMIG Chemo splicer system interlocks the film ends with a serrated edge.
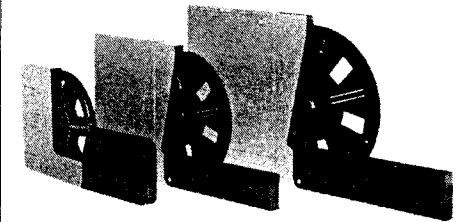
Order No. 781 0020 3

Eumig music and effects record
Eumig music and effects cassette

Film music and effects for adding sound to home movies. A wide selection of music sections and everyday background sound effects the ideal aid for your own sound movie recordings.

Order No. 930 0077 6 (record)
Order No. 930 0078 8 (cassette)

Eumig film reels

A selection from the wide range of EUMIG reels:

Universal AS 18 take-up and library reels, 120 metres (400 feet); order No. 790.0320/5.
AS 21, 180 metres (600 feet), order No. 596.0270/3.
For both Super-8 and Standard-8 film, boxed EUMIG self-threading reel in library case, 60 and 120 metres (200 and 400 feet) for Super-8 and Standard 8.

EUMIG EUROPA universal reel in library case 60, 120, 180 and 240 metres (200, 300, 600 and 800 feet) for Super-8 and Standard-8 film.

OTC

INCORPORATING OLDTIMER CAMERAS

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