SIEMENS

2000
PROJECTOR

Including the next manuals

as Single-System Magnetic Sound Projector
with Universal Amplifier

with 12-Watt Reproduction Amplifier
for 16-mm Optical and Magnetic Sound Films

Service Manual

SIEMENS AKTIENGESELLSCHAFT
Berlin · München

28 pages

SIEMENS

2000
PROJECTOR

as Single-System Magnetic Sound Projector
with Universal Amplifier

Service Manual

Applies only in connection with Instruction Manual
to 2000 Projector

SIEMENS AKTIENGESELLSCHAFT
Berlin · München

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General

The 2000 projector is a single-system magnetic sound model permitting the dubbing of amateur films and their subsequent projection as sound films.

The projector is mechanically and electrically linked with an amplifier by a simple plug connection. The two units may be taken apart at any time.

The single-system projector for magnetic sound may be converted into a double-system model at any time through the addition of a double-system sound attachment (Page 20).

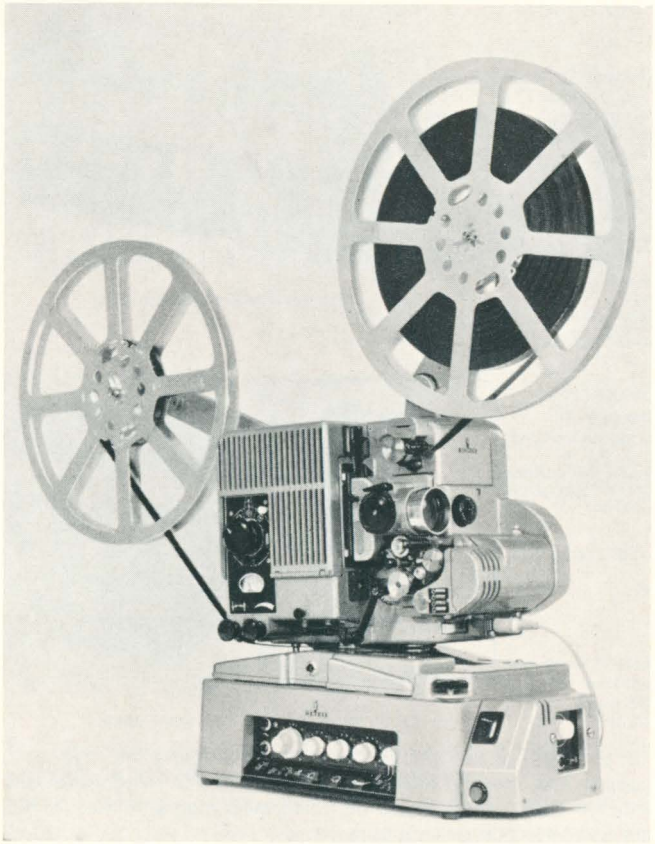


Fig. 1
2000 projector
as single-system
model for magnetic
sound

15-watt universal amplifier Sf. V 6.7

Construction and specifications
Power supply: 110, 130, 220, 240 volts a-c
Microphone input: High impedance · Pickup input · Tape recorder input
Loudspeaker output: 15 ohms
Classes of operation: Optical sound reproduction, magnetic reproduction, Magnetic recording, optical-to-magnetic rerecording } using recording stage Sf. MZ 6.3
Tube complement: 2×EF 86, 2×ECC 83, 2×EL 84
Voltage selector with fuse holder
0.8-amp fuse for 220 (240) v a-c; 1.6-amp fuse for 110 (130) v a-c

a masterswitch (○ off, ⊙ on)
b exciter lamp switch (○ off, ⊙ on)
c bass control
d treble control
e volume control for pickup
f volume control for microphone
g volume control for sound film reproduction
h class-of-service switch for
- optical sound reproduction
- magnetic reproduction
- magnetic recording
- optical sound rerecording
- other classes of operation

i setscrew for elevation adjustment of projector base
k terminal strip
l interlocking pawl
m interlocking control button
n connection jacks for magnetic head cables:
upper jack for magnetic rerecording,
lower jack for magnetic reproduction and recording
o amplifier inputs for:
- HI microphone, high impedance
- tape recorder
- pickup

p amplifier output loudspeaker terminals 15 ohms
q voltage selector with fuse
r cover plate installed when record stage is detached

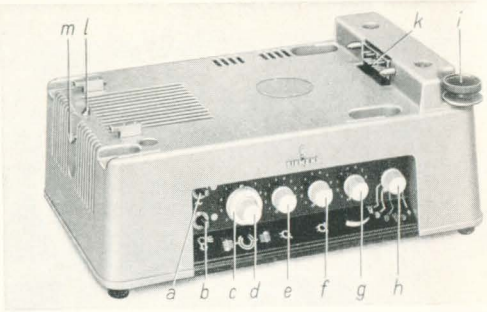


Fig. 2a Universal amplifier, control side

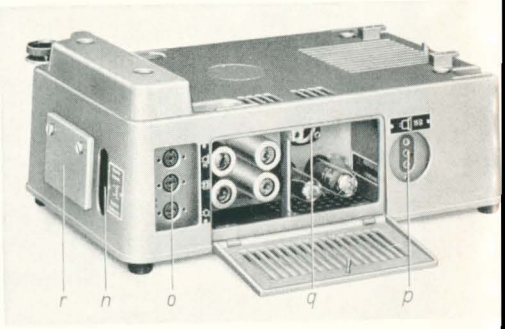


Fig. 2b Universal amplifier, rear – open

Two 6-point jacks at the front of the amplifier are for connecting the magnetic head cables. The upper jack marked MAGNETIC RERECORDING (Magnetton-Umspielen) is used only for transferring sound on perforated magnetic film to the magnetic edge track of 16 mm film or vice versa.

For magnetic recording and reproduction, only the lower socket marked MAGNETIC RECORDING and REPRODUCE (Magnetton-Aufnahme und -Wiedergabe) should be used.

Recording stage for universal amplifier

For dubbing work on magnetic sound film, the recording stage should be screwed to the front of the amplifier. Universal amplifier and recording stage are electrically interconnected by blade contacts b (Fig. 3 a).
The magic-fan tuning indicator c is for checking the modulation of the recording. An automatic record lockout d prevents inadvertent erasure. The recording stage is automatically disconnected by a relay every time the masterswitch of the projector is switched on or off.

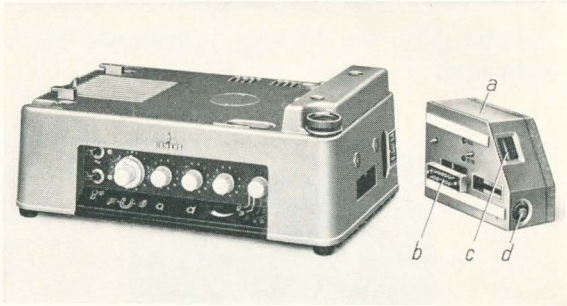


Fig. 3a
Universal amplifier
with recording stage

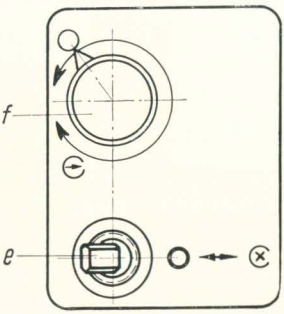


Fig. 3b
Front of recording
stage

a recording stage
b blade contact strip
c tuning indicator
d record lockout button
e switch for erase head
f record control

The red pushbutton d must be pressed prior to each magnetic recording. The projector will thereupon be ready for service.
When mounting or dismounting the recording stage, make sure that master-switch a (Fig. 2 a) of the universal amplifier is switched off.

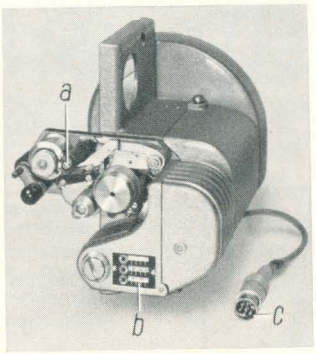
Assembly of projector and amplifier

Place projector with sound head on amplifier so that front side of projector comes above that of amplifier (Fig. 1). The supports of the projector should enter the four recesses in the top of the amplifier case. There should be an initial clearance of approx. 2 cm between terminal block b (Fig. 2 a) of amplifier and the front edge of the projector base. Press projector against terminal block until interlocking pawl l on side of amplifier that faces terminal block is heard to click into the recess at rear edge of projector base. Projector and amplifier will now be both mechanically and electrically interlocked. Interlocking can be disabled by gently pressing button m (Fig. 2 a).

Optical/magnetic sound head

The 2000 sound film projector is fitted with the following optical/magnetic sound head:

Fig. 4



Sf. TL 6.8 – Optical/magnetic sound head for optical sound reproduction, magnetic recording and reproduction of 2.5 mm track

a head selector
b inscription plate with symbols explaining positions of selector a
c magnetic head connecting cable

The symbols on inscription plate b (Fig. 4) indicate the positions to which head selector a should be set for the various tracks.

This position is for scanning a 2.5 mm magnetic track. Magnetic head c (Fig. 7) will here lie against the track.

This position is for scanning optical sound. All magnetic heads are pivoted away from the film so that they cannot scratch the optical track.

In this position magnetic head c (Fig. 7) lies against the film and the exciter lamp is switched on for optical/magnetic transfer.

Caution

To prevent damage to the optical sound track, optical sound film must not be projected unless the white index mark is on the right.

Magnetic sound tracks

The magnetic tracks depicted below in Fig. 5 are customary for dubbing 16 mm film.

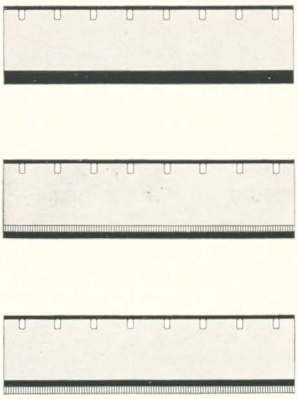


Fig. 5
Magnetic sound tracks on 16 mm film

As shown in Fig. 7, the magnetic head for the 2.5 mm track is arranged succeeding the optical sound head (looking in the direction of film travel) in order to conform to the international standard specifying a lead-lag relation between sound and picture of 28 frames in the case of 16 mm film with a full-width magnetic track. (The standard lead-lag relation between picture and sound for optical sound film is 26 frames.) Feature films with a magnetic sound track may thus be projected with the standard lead-lag relation.

The 1.3 mm magnetic track is used when it is desired for certain reasons to retain the optical sound track, or when the optical sound track is to be transferred to the half-width magnetic track with the possible addition of sound from other sources as well. It may be recorded and reproduced with the magnetic head for the 2.5 mm track. To insure uniform wear upon the head, the inside half-width track and the outside half-width track should be used alternately.

Optimum tonal quality is obtained at a frame frequency of 24 frames per sec. This corresponds to a tape speed of approx. 18.3 cm per sec.

Preparations for film projection

(see Instruction Manual for 2000 projector).

Connection of projector to power supply

Before inserting connecting plug of projector into power outlet, check whether amplifier is set to correct voltage. On connection of the projector to the power supply, the amplifier is also energized via the plug connection in the projector base. The amplifier operates on a-c only.

Voltage selection

If setting to other voltage is required, unscrew fuse holder q (Fig. 2 b), remove cover plate and set to appropriate value.

Select proper fuse: 0.8 Amp. fuse for 220 (240) v a-c
1.6 Amp. fuse for 110 (130) v a-c.

Before each projection

Check whether current of power supply is correct, whether correct resistor has been inserted in projector, and whether voltage selector on amplifier is correctly set.

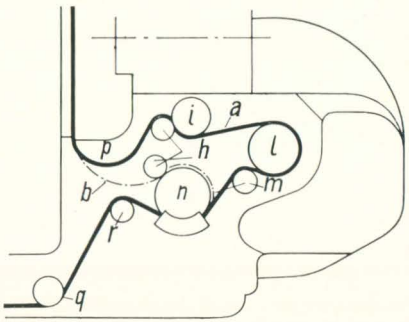
Threading film for sound projection

See under "Threading the film" in Instruction Manual for 2000 Projector.

1. Press down spindle k of pressure roller h (Figs. 6 and 7) and lock in axial direction.

Fig. 6
Path of film through sound head

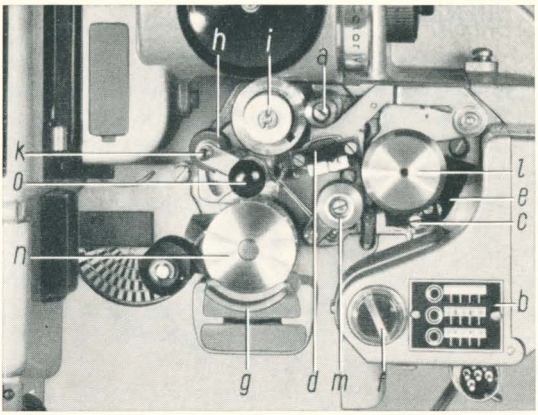
a sound film
b silent film
h pressure roller
i loop stabilizer
l sound drum
m filter roller
n lower sprocket
p film loop
q guide roller
r guide roller



2. Thread film end p (Fig. 6) emerging from film channel between loop stabilizer i and pressure roller h, around sound drum l, over filter roller m and under sprocket n.
3. Close sprocket contact lever g.
4. Take film end over guide roller r and under guide roller q (Fig. 6) to take-up reel and thread film in reel.
5. Press release button o (Fig. 7) to enable pressure roller h (Figs. 6, 7).
6. Pull film loop below lens holder downward so that film lies smoothly between sound drum l and loop stabilizer i (Figs. 6, 7). If lower loop is too small, pull more film down through film channel and enlarge upper loop by pulling more film from supply reel.
7. Check running of film by briefly switching on projector using the automatic inching button.

Threading film for silent projection

With silent projection, the film is not passed through the sound head as in the case of sound film projection. The film is threaded around lower sprocket n (Fig. 6) so that sprocket teeth mesh with sprocket holes in film by pressing down pressure roller h (Fig. 6) and locking in axial direction.



a selector for the various sound tracks
b inscription plate with symbols explaining positions of selector a
c magnetic head for 2.5 mm track
d erase head
e sound head lens
f slit image adjusting screw
g sprocket contact lever
h pressure roller
i loop stabilizer
k spindle of pressure roller h
l sound drum
m filter roller
n lower sprocket
o release button

Fig. 7 Optical/magnetic sound head
Roller plate with magnetic head assembly

Switching on amplifier

Switch on amplifier by means of masterswitch a (Fig. 2 a). The amplifier is ready for service after a warm-up period of approx. 30 sec.

Fig. 8 Portable loudspeaker

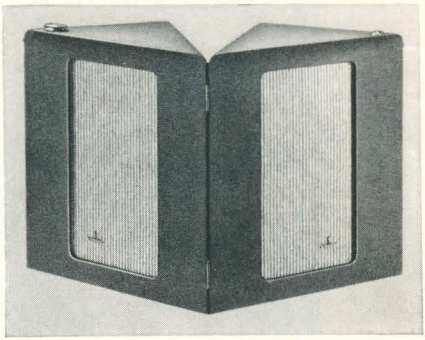


Fig. 9 20-watt loudspeaker combination

Loudspeaker connection

Connect loudspeaker to amplifier output p (Fig. 2 b).

For sound film projection in very large rooms with poor acoustic conditions, the 20-watt loudspeaker combination Sf. L 6.4 (Fig. 9) should be used. The units should be placed side by side and angled for any desired direction of projection, or located separately at each side of the projection screen for sound projection with spreading effect.

For large auditoriums and theatres up to approx. 1,000 seats, the 15-watt portable loudspeaker Sf. L 6.1 (Fig. 8) should be employed, and for auditoriums and theatres of medium size for an audience of up to 700, the tweeter-woofer loudspeaker system Sf. L 6.2 (Fig. 8) should be chosen. The connecting lead is coiled up inside the case.

As a nonperforated projection screen is generally used for 16 mm film in order to avoid loss of brightness, the loudspeaker should be placed close to the side of the screen and, where possible, on the same level as the screen.

The volume can be increased by opening up rear of loudspeaker case (Fig. 8) and lifting it out sideways.

The amplifier may also be operated in connection with a 50-watt power stage and a loudspeaker array.

Tape recorder connection

Connect tape recorder output with terminal ⊣□ (o in Fig. 2b) if the pickup input is used otherwise.

Reproduction

Optical sound reproduction

Set head selector a (Fig. 7) to optical sound scanning (see under "Sound heads"), set class-of-service switch h (Fig. 2a) to position ☼ and exciter lamp switch b (Fig. 2a) to position ⊙. Actuate volume control g (Fig. 2a).

Microphone reproduction

Set class-of-service switch h (Fig. 2a) to position ○.

Actuate microphone volume control f (Fig. 2a).

Disk reproduction

Set class-of-service switch h (Fig. 2a) to position ○.

Actuate volume control for pickup e (Fig. 2a). All other controls must be in the zero position.

Magnetic reproduction

Connect magnetic head cable of sound head to connection jack ⊃[(n in Fig. 2b) at front of amplifier (Fig. 1).

Set class-of-service switch h (Fig. 2a) to position ⊃ and actuate volume control g (Fig. 2a).

Tape reproduction

Set class-of-service switch h (Fig. 2a) to position ○. The volume is controlled by means of the appropriate control of the tape recorder.

Tone control

Turn knob cd (Fig. 2a) to normal position (index comes at top). Adjust tone control according to personal taste when film is running.

Instructions for film projection

PREPARATION

1. Set up projector, plug in and switch on.
2. Adjust size of frame by choice of correct focal length for lens.
3. Align frame.
4. Adjust speed.
5. Switch off projector.
6. Set up loudspeaker and plug in.
7. Connect microphone and pickup.
8. Thread film.
9. Switch on projector, set selector a (Fig. 7) for the various sound tracks to required position.
10. Switch on amplifier and adjust reproduction.
11. Switch on lamp current.
12. Adjust focus.
13. Adjust frame-line.
14. Check film speed.
    For optical sound film projection the film speed must be exactly 24 frames per sec. The correct speed is obtained when the inner ring of the stroboscopic disk appears to remain stationary when illuminated by the pilot lamp. For silent and magnetic sound film projection lower film speeds are admissible.
    If a 750-watt lamp is used, the film speed must be at least 20 frames per sec.
15. Check volume control.
16. Feed film in reverse.
17. Switch off projector.
18. Switch off amplifier.

Do not make any other adjustments on projector

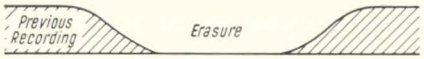
PROJECTION

1. Switch on amplifier.
2. Switch on pilot light.
3. Switch off room lighting.
4. Switch on projector and turn main knob slowly clockwise until ammeter reads figure specified for particular lamp used.
5. Adjust volume.
6. Readjust tone control.
7. When film transportation, film speed and volume are found correct, switch off pilot lamp.

Classes of magnetic sound operation

The universal amplifier permits any of the following classes of recording:

General magnetic recording in one operation (erase head enabled).



Erasure of section of an existing recording (erase head enabled).

New section added to existing recording; old recording is completely erased (erase head enabled).

Rerecording or mixing of existing recording; old recording remains in background.
(Trick circuit; erase head disabled)

The diagram applies to all magnetic tracks.

All transitions from or to erasure, mixing and rerecording are infinitely adjustable.

Magnetic recording

1. Set function switch h (Fig. 2 a) of amplifier on red ↻. Press button d (Fig. 3 a).
2. Turn tone control cd (Fig. 2 a) to midposition (index points to 5–6).
3. Turn record control f (Fig. 3 b) clockwise as far as it will go (↻) and switch on erase head (switch e Fig. 3 b ↻).
4. Adjust volume control for pickup e or microphone f (Fig. 2 a) according to loudest passage of performance so that bright segments of magic-fan indicator c (Fig. 3 a) come together with a clearance of approx. 1 mm.
   Recordings of phonograph records or live recordings using the microphone may be made individually or mixed. For live recordings, switch off loudspeaker to prevent feedback. The recording can be monitored with the aid of a set of high-impedance headphones that may be connected to the output terminal of he loudspeaker.
5. On completion of these preparations, thread film.
6. Switch on projector. To begin recording, press button d of recording stage. The renewed illumination of the magic-fan indicator denotes that recording may begin.

Checking recordings just made

1. Set function switch h (Fig. 2 a) to ⊖.
2. Run film in reverse to wanted section.
3. Run film forward and monitor recording by loudspeaker or with set of high-impedance headphones.

Sectional erasure of a recording

1. Determine section to be erased by reference to frame counter or to scene cue marks.
2. Run film back past starting cue of the section to be erased.
3. Set function switch h (Fig. 2 a) to red ⊖
4. Switch on erase head (set switch e, Fig. 3 b, to ⊂).
5. Turn record control f (Fig. 3 b) counterclockwise as far as it will go (zero position).
6. Switch on projector and press button d (Fig. 3 a) of recording stage.
7. On reaching section to be erased, turn record control clockwise as far as it will go (⊂).
8. At the end of the section to be erased, turn record control f counterclockwise as far as it will go.
9. Switch off projector.

Sectional new recording

1. Note setting of control for proper modulation of microphone and tone arm (see Magnetic recording, section 4).
2. Proceed as in case of erasure of indivual sections.
   On reaching the point where the new section is to begin, turn record control f (Fig. 3 b) clockwise as far as it will go and volume control e or f (Fig. 2 a) to position noted.
   When the new section has been added, turn record control counterclockwise as far as it will go.

Magnetic mixing

(Mixing of sound from additional sources)

1. Switch off erase head (set switch e in Fig. 3 b to ○).
2. Proceed as when adding new section to an earlier recording.

Transferring optical sound to magnetic track

The universal amplifier permits the transfer of optical sound to a 1.3 mm magnetic track or a separate magnetic film if the projector is additionally equipped with a double-system sound attachment. Set function switch h (Fig. 2 a) for this purpose to OPTICAL RERECORDING (Lichtton-Umspielen). The index of the head selector a (Fig.7) should come at the bottom. The sound lamp is switched on. The recording may be adjusted with the aid of the optical sound reproduction control o (Fig. 2 a) and the red button d (Fig. 3 a) with the film running. Modulation can be checked by observing the magic-fan indicator c (Fig. 3 a).
Sound from one or more additional sources may be added during rerecording in the manner described. For reproduction on completion of rerecording, set function switch h (Fig. 2 a) to MAGNETIC REPRODUCE (Magnetton-Wiedergabe) and turn head selector a (Fig. 7) so that index comes on left.

Servicing the projector

(see instruction Manual for 2000 Projector).

Servicing the sound head

Remove emulsion particles from sound head with a fine-haired brush prior to each performance. Make sure that loop stabilizer and filter roller turn during film travel.

Servicing the magnetic heads

Particles that have worn off the magnetic layer should be removed from the magnetic heads at intervals with the aid of a fine-haired brush or hardwood sliver in order to prevent any reduction in tonal quality.
Do not allow magnetic heads to come into contact with metal (e. g. screwdrivers) or chemicals (e. g. acetone).

Slit image definition

This is adjusted at the factory and should not be readjusted later. However, if the projectionist should consider readjustment necessary on account, say, of poor speech intelligibility or poor treble rendition, readjustment should be entrusted to qualified personnel only.

Exchanging the exciter lamp

Loosen locking screw c (Fig. 11) of cover of sound head unit and open housing. Turn lever a (Fig. 12) in direction of arrow and take out exciter lamp by turning it counterclockwise. Insert new lamp turning it in opposite direction. When arresting pins are properly engaged and exciter lamp has been turned as far as it will go, return lever a to initial position. The lamp will now be in its correct position.

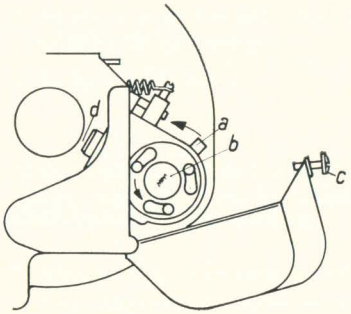


Fig. 11
Position of exciter lamp

a lever
b exciter lamp
c locking screw
d scanning point

Frame counter

For quick location of desired sections in dubbing operations, the frame counter Sf.Z 6.1 has proved of great use, which can be easily mounted on the front of the 2000 projector.

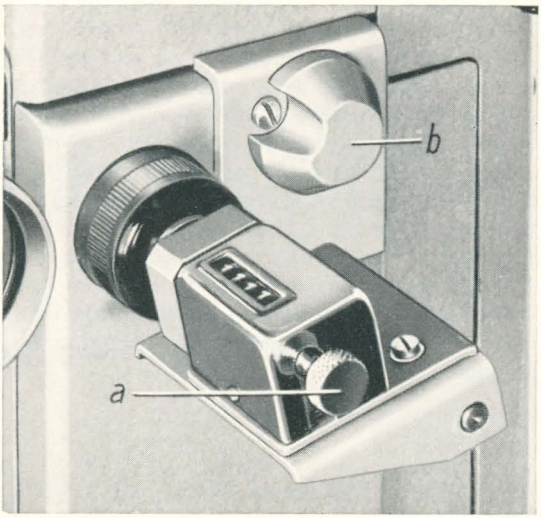


Fig. 12
Frame counter
in operate position

a Zero-setter
b Receptacle for frame counter when in idle position

Conversion to double-system operation

The single-system magnetic sound projector may be further additionally equipped with a double-system attachment. With double-system operation, a separate 8 or 16 mm magnetic film runs in synchronization with the picture film. The double-system sound attachment is mechanically interlocked to the projector, thus insuring complete synchronization. The 2000 projector 16/16 makes an excellent preview projector. Workprint and separate 16 mm magnetic track may be interlocked and screened at almost any location. Original picture and original recording can be interlocked for "quick access" films: Multi-lingual, or other multi-track films may be recorded and projected, easily and inexpensively. Double-system operation is suitable for many other applications. A sound-on-picture film or an old silent film with sprocket holes along both edges can, for instance, be provided with a foreign-language or other special track on a separate magnetic film. It is possible to transfer recordings on separate magnetic film to sound-on-picture film and vice versa, and also to add and mix new sound form phonograph records, magnetic tape or microphone; the projector can thus be used for a variety of studio-type mixing operations. It may also be used as a small sound copyingmachine; in fact, there are more than 9 ways of recording and rerecording. Our agents will be glad to supply information on the additional equipment of a single-system magnetic sound projector with a double-system sound attachment.

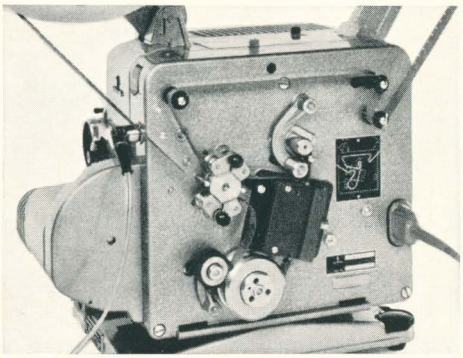


Fig. 13
Double-system sound attachment

SIEMENS

2000 Sound Film Projector

with 12-Watt Reproduction Amplifier

for 16-mm Optical and Magnetic Sound Films

Instruction Manual

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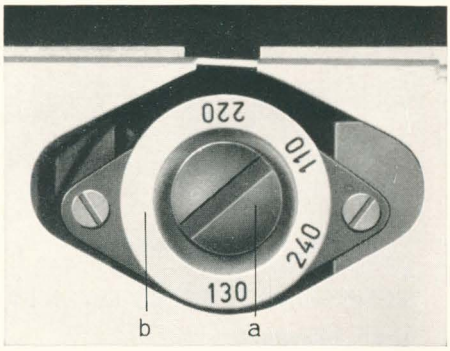
This instruction manual contains directions for using the 2000 sound film projector with 12-watt reproduction amplifier for showing 16-mm optical and magnetic sound film. It is intended as a supplement to the main instruction manual for the "silent" Siemens 2000 projector.

General

When reading the instruction manual, please unfold page 8 and consult Fig. 1.
This illustration shows the 2000 projector with an optical sound head unit and a fully transistorized 12-watt reproduction amplifier. Fig. 4 illustrates a sound head unit also capable of reproducing magnetic film.
Projector and amplifier are connected mechanically and electrically by a plug-in connection, detachable at any time. The amplifier (Fig. 2) may thus also be used separately for pick-up or microphone transmission. Connection to mains is effected by the supply cable S 27 439-A 5-A 1.

Fig. 3 Voltage selector



Preparing for projection

Place projector with sound head unit on the amplifier in such a way that the control panels are on the same side (Fig. 1). The feet of the projector are placed in matching recesses provided in the top face of the amplifier housing. Initially there is a distance of about 2 cm between the plug terminals 61 of the amplifier and the front edge of the projector base. Push the projector forward towards the terminal strips until the latch 63 snaps audibly into the recess at the back edge of the projector base.

(To unlatch, depress button 64).

Before inserting the plug of the supply cable of your 2000 sound projector in the mains socket, check the voltage and type of current of your mains supply. You will find the relevant information on the electricity meter. The sound projector may only be connected to A.C.-mains (~). The series resistance in the projector should correspond to the selected lamp and the supply voltage available. Set the voltage selector (Fig. 3) on the top surface of the amplifier accordingly. If the value indicated on the voltage selector does not correspond to the mains voltage, its setting must be altered. To do so, first unscrew the fuse element a. Then pull the contact ring b from its holder and turn it until the figure appearing in the lateral cutout corresponds to the mains voltage. Before re-inserting the fuse element, check whether the fuse has the appropriate rated value. A 200-mA fuse is suitable for 220 to 240-V supply voltages while a 400-mA fuse is intended for 110 to 130-V supply voltages. A replacement fuse will be found on the underside of the amplifier.

Owing to a special overvoltage protection device, incorrect setting of the voltage selector will not result in an undue increase of the transistor operating voltages and the attendant destruction of the transistors. Reference is also made to the remarks on pp. 3–6 of the main instruction manual.

To connect the loudspeaker, uncoil the cable provided in the carrying case and connect the plug with socket 74 of the amplifier. Place the cable in such a way that nobody can trip over it. Do not place the loudspeaker behind the projection screen but arrange it in a somewhat raised position, adjacent to the screen. Any portable loudspeaker supplied for use with Siemens sound projectors may be used, except No. Sf L 6. 1.

When using any other make, make sure that the unit employed is a 15-ohm loudspeaker.

If you wish to fill projection intervals with music from records, connect your record player to the socket 66. A low-impedance microphone may be connected to socket 65.

Threading the film

Thread the film around the upper sprocket 6 and into the film channel 13 in the same way as has been specified for the silent 2000 projector. Then insert the film emerging from the film channel 13 between brake roller 37 and pressure roller 39, leaving a loop according to the mark on the projector, in such a way that it is contained between the lateral guide flanges of the brake roller. If the pressure roller rests against the brake roller, move it down until, by pressure on the projecting pin, it locks in its central position.

When the film is in its proper position, let the pressure roller 39 engage by pressing the button 38. Pass the film around the sound drum 41, over the filter roller 42, below the sprocket 16 and over the idler roller 47. After checking that the teeth have engaged the sprocket holes in the film, hold the film and pivot the pressure pad 17 into its operative position. Now run the film under the idler rollers and thread the leading end into the empty reel. Pull down the loop formed between film channel 13 and brake roller, in order to straighten the film between the brake roller 37 and the sound drum 41. Should the loops now be considerably larger or smaller than shown in the illustration, open the pressure pad 7, remove the film from the upper sprocket 6, adjust the size of the upper and lower loops, re-apply film to sprocket 6 as specified and pivot pressure pad 7 into the operative position.

Check whether the film is fed properly and the loops maintain the specified size by brief depression of the button for short trial runs 46.

This completes the preparations for sound film projection in the case of the sound projector with optical soundhead. However, if your sound projector has a soundhead for both optical and magnetic sound reproduction (Fig. 4), the change-over switch 60 must be set in addition according to the type of sound track employed:


for reproducing magnetic sound film


for reproducing optical sound film


this setting is not required with a sound projector provided with a 12-W reproduction amplifier.

If silent film is to be shown in a sound projector, the film coming from the film channel 13 may be threaded directly around the lower sprocket 16, as shown in Fig. 5. In this case, the pressure roller 39 should be applied to the sprocket in addition to the pressure pad 17.

Important:

When the projector is not in operation, the pressure roller 39 should not rest against the brake roller 37, but should be locked in its center position.

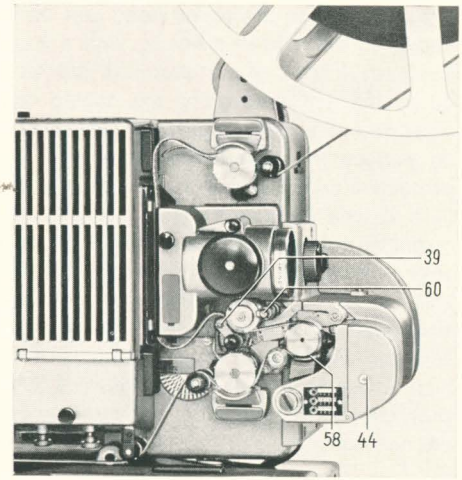
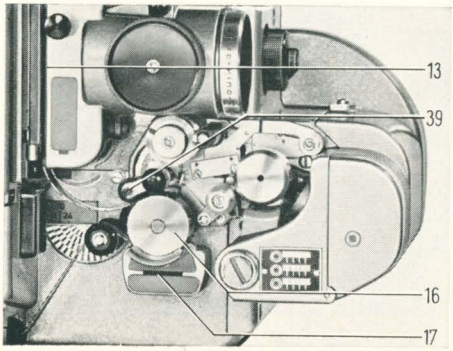


Fig. 4 Film path with sound head unit

Fig. 5 Film path for projecting silent film in a sound projector



Switch on the amplifier by depressing button 71. When showing film with optical sound track, depress button 70 and, when showing film with magnetic sound track, button 69 in addition. The pilot lamp for checking the running of the film, and the illumination of the stroboscopic disc are operated by switch 48.

Put the projector into operation as described in the main instruction manual for the 2000 projector. **During projection, make sure that the rollers 37 and 42 of the sound head unit rotate.**

This can easily be verified by watching the dots displayed on these rollers.

Adjust the sound volume by turning knob 68. The knob 72 permits tone control according to taste and in keeping with acoustic conditions.

When reproducing from records or microphone, leave the buttons 69 and 70 in their normal position. Knob 67 is the volume control for microphone and records.

Microphone announcements may be superimposed on optical or magnetic sound reproduction.

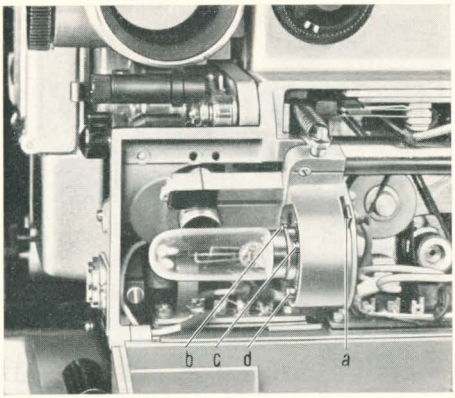
Slit image adjustment

The light beam (slit image) projected by the optical sound reproduction system can be shifted to the left or right by means of the setscrew 45. The slit image is factory-adjusted, and this position is marked by a red dot. Adjustment of the slit image becomes necessary only when the optical sound track is laterally displaced owing to faulty printing, which happens only very rarely.

Soundhead maintenance

Frequently clean the sound head unit, and above all the magnetic heads, with a fine hairbrush to remove dust particles deposited by the film. Preferably, this should be done each time before using the projector. To expose the sound head, pull off the protective cap 58 (Fig. 4) to the front. From time to time remove abrasive particles of magnetic coating from the magnetic heads with a small leather-covered wooden stick. This tool is part of the Siemens servicing kit. Never touch the magnetic heads with screwdrivers or other metallic objects. It is also advisable to make sure before a film projection that brake roller and filter roller are not jammed.

Fig. 6 Sound head unit open



Replacing exciter lamp

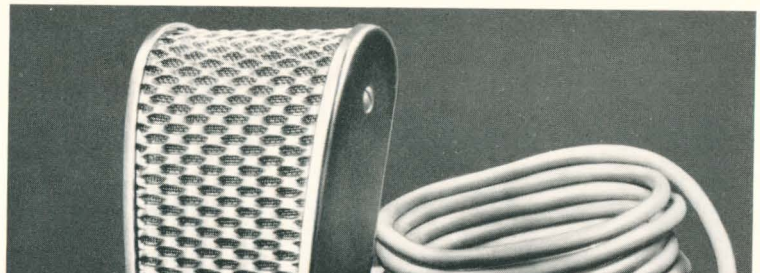
The front part 43 of the soundhead casing opens when the screw 40 is loosened. Lift the lever a, Fig. 6, turn the exciter lamp counterclockwise and withdraw it from its holder. Insert the new exciter lamp – again after lifting the lever a – in such a way that the positioning pins b, c and d pass through the holes provided in the flange of the lamp base. Then turn the lamp clockwise as far as it will go and press down the lever a.
With this amplifier the exciter lamp is supplied with pure direct current, due to a special electronic filter circuit. The voltage value set for the exciter lamp is 3.6 V, to provide for mains fluctuations.

Connection of microphone

The microphone is connected to socket 65. This is a low-impedance input suitable for the direct connection of microphone W 27 439-Z 1-A 2. The 1 $^1/_2$ m long connection lead may be extended by using the 7 $^1/_2$ m long microphone extension cable W 27 439-Z 5-A 1.

Fig. 7 Dynamic microphone with cardioid characteristic, W 27439-Z 1-A 2

Contact	Pins 2–3 low-impedance
	Pins 1–2 high-impedance
Transmission range	60–12,000 cps
Discrimination at 180° incidence in the medium frequency range	12 db



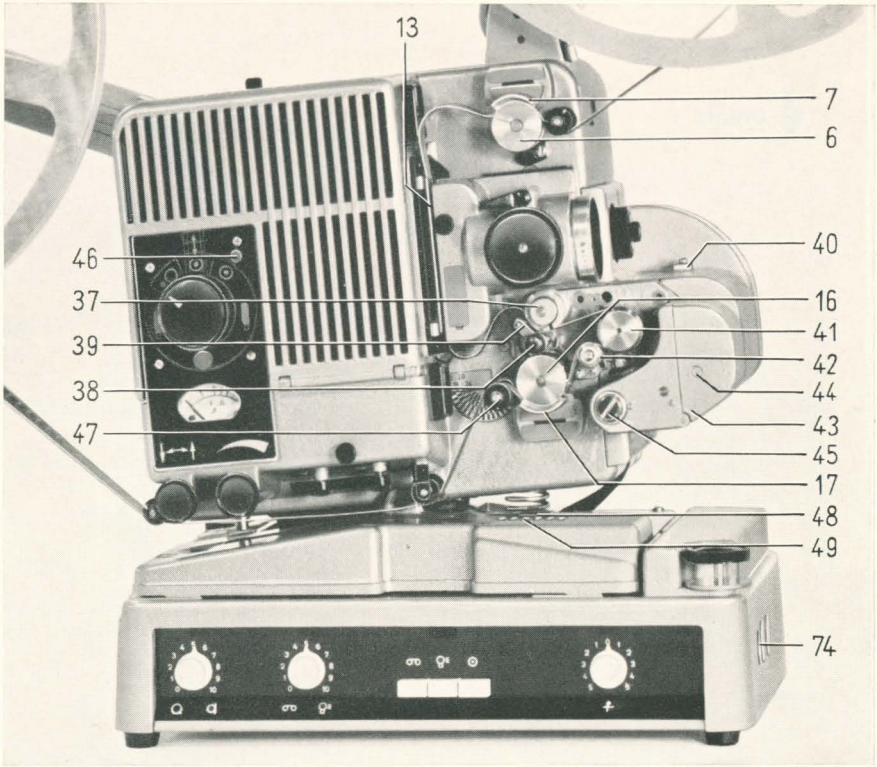


Fig. 1 2000 projector with optical sound head unit and 12-W reproduction amplifier

6 Upper sprocket
7 Upper pressure pad
13 Film channel
16 Lower sprocket
17 Lower pressure pad
37 Brake roller
38 Release button for pressure roller
39 Pressure roller
40 Locking screw for soundhead casing
41 Sound drum
42 Filter roller
43 Front part of soundhead casing
44 Pilot light for optical sound reproduction
45 Slit image adjusting screw
46 Button for short trial runs
47 Idler roller
48 Switch for pilot lamp
49 Pilot lamp

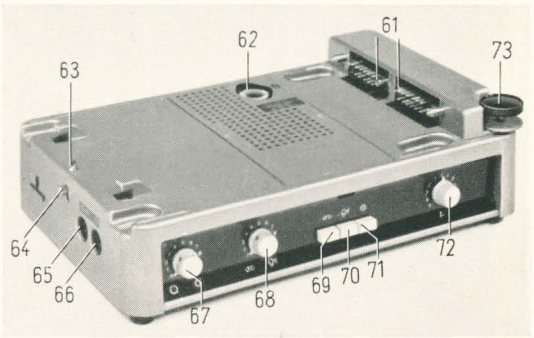


Fig. 2 12-W reproduction amplifier

61 Plug-in terminal strips
62 Voltage selector
63 Latch
64 Latch-actuating button
65 Microphone socket
66 Record player socket
67 Volume control for microphone and record player reproduction
68 Volume control for sound film
69 Pushbutton for magnetic sound reproduction
70 Pushbutton for optical sound reproduction
71 Mains switch
72 Tone control
73 Setscrew for elevation adjustment
74 Speaker outlet

Technical data

Unfold

Operating voltage ..... 110/130/220/240 V
Operating frequency ..... 50–60 cps
Sensitivity values for maximum output:
Microphone input ..... 0.3 mV
Pick-up input ..... 30 mV
Control margin
(film modulation/sensitivity)
Optical sound ..... ≧ 22 db
Magnetic sound ..... ≧ 13 db
Input impedances:
Microphone input ..... 3 kΩ
Pick-up input ..... 500 kΩ
Maximum output voltage .. 13.5 V / 15 Ω
Signal-to-noise ratio:
for optical sound, microphone, record player ... ≧ 56 db
magnetic sound ..... ≧ 41 db
Distortion factor at
1000 cps ..... < 2 %
Distortion factor at
60–10,000 cps ..... < 5 %
Exciter lamp ..... 4 V / 0.75 A
Transistor complement:
Amplifier: 5 × AC 151 Vr
1 × AC 153 VI
2 × AD 131, dual
Power supply: 2 × AD 148 V
Scale illumination lamp ... 7 V / 0.1 A
Microfuse in voltage selector
for 220–240 V 200 mA, medium-delay
for 110–130 V 400 mA, medium-delay
D. C. fuse
in the amplifier ..... 630 mA, medium-delay
Microfuse
for exciter lamp ..... 1 A, medium-delay
Speaker output ..... 15 Ω

Specifications subject to change