

Reverse-Scan Sound Device



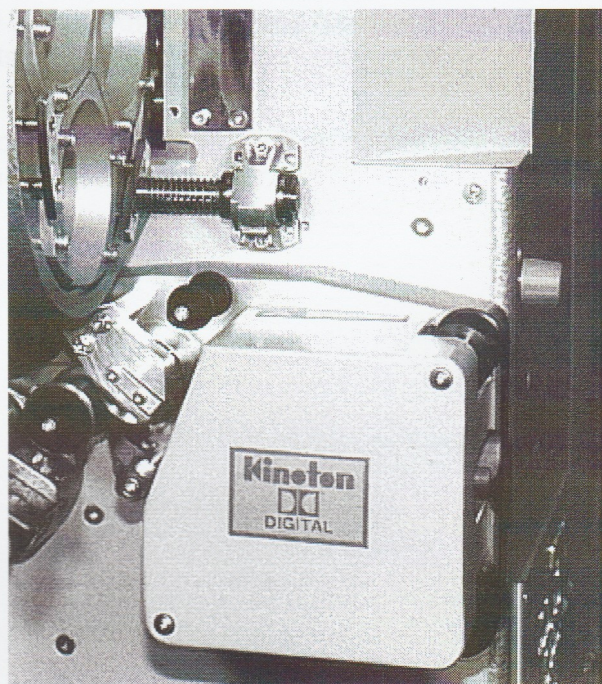
Kinoton GMBH
Filmtheater- und Studiotechnik





Kinoton GMBH
Filmtheater- und Studioteknik

Operating Manual



Reverse-Scan Sound Device

Imprint

All rights reserved

© Copyright by KINOTON Filmtheater- und Studiotchnik GmbH,
Industriestraße 20a
D - 8 21 10 Germering

Printed in Germany, issue September 2000

This operating manual – even in extracts – may only be reprinted or otherwise copied with special, written permission from KINOTON GmbH.

Editor responsible for the contents: KINOTON GmbH

Editing and layout: KINOTON GmbH, -ca-, Industriestr. 20a, Germering



Preface

Dear customer,

Thank you for your decision to buy the new Reverse-Scan Sound Device and for your confidence in our product.

This operating manual will help you get acquainted with the Reverse-Scan Sound Device and to make use of its possible applications in accordance with the requirements.

This operating manual includes important hints for a safe, proper, correct and economic operation.

It will also help you to avoid danger, to reduce failures and to increase life and reliability of the Reverse-Scan Sound Device.

This operating manual includes useful hints for proprietor and personnel obligations. It does not substitute, but supports, a thorough training period.

All information in this manual is given by best knowledge and has been checked carefully. However, KINOTON accepts no liability for the accuracy of this information.




Subject to technical changes. Technical changes depending on further development do not enable for free retrofitting of the delivered projector.

Changes and Notes

Issue of this manual: September 2000



Contents

Chapter	Page
1 Safety 	1-1
1.1 Safety Notes	1-1
1.2 Electric Power Hazards	1-2
1.3 Modification of Reverse-Scan Sound Device Construction.....	1-2
1.4 Copyright.....	1-2
2 Delivery and Mounting 	2-3
2.1 Delivery	2-3
2.1.1 Reverse-Scan Sound Device (analog sound only)	2-3
2.1.2 Reverse-Scan Sound Device (analog and digital sound)	2-3
2.2 Mounting.....	2-4
2.2.1 Installing the Reverse-Scan Sound Device.....	2-4
2.2.2 Mounting the Power Supply Unit Board	2-5
2.2.3 Connections	2-6
2.2.3.1 Installing the 5pole Plug for Sound Output	2-6
2.2.3.2 Connecting Cables to Reverse-Scan Sound Device	2-6
3 Function / Operation and Adjustments 	3-9
3.1 Function / Operation	3-9
3.2 Adjustments	3-11
3.2.1 Pre-adjusting the Analog Sound Device	3-11
3.2.2 Adjusting Digital Sound Device.....	3-13
3.2.3 Fine-Adjusting Analog Sound Device	3-15

4 Repair and Lists of Parts and Wearing Parts 4-19

4.1 Repair 4-19

4.1.1 General Hints..... 4-19

4.1.2 Exchanging the Sound Optics..... 4-19

4.1.3 Exchanging the p. c. Boards 4-20

4.1.4 Exchanging the LEDs Holder 4-20

4.2 List of Parts and Wearing Parts..... 4-21

5 Technical Data and Circuit Diagram 5-23

5.1 Data of Reverse-Scan Sound Device 5-23

5.2 Circuit Diagram of Power Supply Unit Board..... 5-24



1 Safety

1.1 Safety Notes

General Hints

- The operating manual is to be kept with the Reverse-Scan Sound Device at all times.
- Precondition for the safe running and trouble-free operation of Reverse-Scan Sound Device is working knowledge of the basic safety regulations and agreed use.
- In addition, all current and valid regulations and measures concerning accident prevention must be observed.

Proprietor Obligations

The proprietor is obliged to allow only those persons to work and / or operate the Reverse-Scan Sound Device who are familiar with safe working and accident prevention along with complete working knowledge of the projector and all additional machines and pieces of system

Personnel Obligations

Those persons who work with the projector are obliged to observe the regulations appertaining and prevention of accident.

Danger when Working with the Reverse-Scan Sound Device

Projectors and equipment are constructed according to the latest engineering and state-of-the art safety standards. The Reverse-Scan Sound Devices are only to be employed for their **intended purpose** and are only used when **functioning absolutely perfectly**.

Intended Purpose

The Reverse-Scan Sound Device is suitable to read the analog and the digital track on film.

Any other or further use is not classified as "intended purpose". KINOTON GmbH cannot be held liable for any damage resulting from different or extended operation.

Defined intended purpose also includes:

- the observance of all instructions contained in the manual
- adherence to the inspection
- implementation of maintenance and repair work.



Guarantee and Liability

On principle the "General Terms of Business" of KINOTON GMBH apply. They are available to the customer on conclusion of sale at the latest.

Guarantee and liability claims for damage to persons and property are invalid if due to one of the following causes:

- improper use of Reverse-Scan Sound Device
- improper assembly, commissioning, operating and maintenance of Reverse-Scan Sound Device
- modification of Reverse-Scan Sound Device without authorization from the manufacturer
- faulty monitoring of parts subject to wear and tear
- improperly effected repair work
- emergencies due to influence from outside bodies or force majeure.

1.2 Electric Power Hazards

Allow work on the electrical supply to be carried out by competent electricians only. The sound device electronics must be checked regularly. Loose connections must be restored immediately.

The access to the control cabinet must always be closed. Only authorized staff have access to the control cabinet.

When working on life parts, switch off main switch and put out the corresponding fuse.

1.3 Modification of Reverse-Scan Sound Device Construction

No alterations, additions or modifications may be made to Reverse-Scan Sound Device without consent of KINOTON GmbH. This also includes welding of bearing parts.

Only use original spare and wear parts. Parts obtained from third party manufacturers cannot guarantee strain and security standards.

1.4 Copyright

Copyright of this manual remains in possession of KINOTON GmbH.

This manual is intended for the user company and its staff only.

It contains regulations and operating notes that must not be copied, reproduced or otherwise transmitted, in whole or in part.

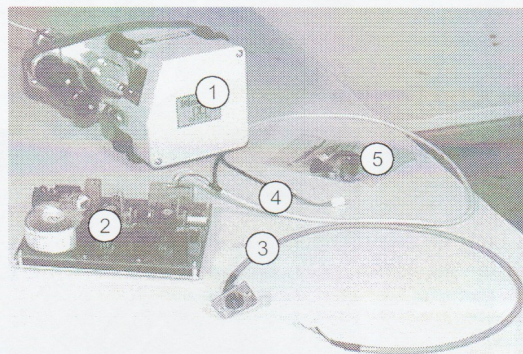
Infringement of copyright laws may lead to prosecution.



2 Delivery and Mounting

2.1 Delivery

2.1.1 Reverse-Scan Sound Device (analog sound only)



- ① Reverse-Scan Sound Device
- ② board with power supply unit and LED supply (analog)
- ③ sound output cable
- ④ plugged cable to sound device and LED
- ⑤ bag with plugs and screws

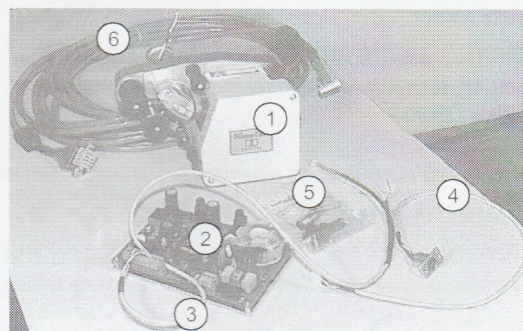
Figure 2-1 Delivery sound device (analog)



NOTE

The Reverse-Scan Sound Device is equipped with an analog LED and board with solar cell. It is possible to backfit a digital sound device.

2.1.2 Reverse-Scan Sound Device (analog and digital sound)



- ① Reverse-Scan Sound Device
- ② board with power supply unit and LED supply (analog and digital)
- ③ plugged cable to sound device and LED
- ④ sound output cable
- ⑤ bag with plugs and screws
- ⑥ SRD cable for connecting DOLBY processor CP500 or DA20 with digital board

Figure 2-2 Delivery sound device (analog and digital)



NOTE

The Reverse-Scan Sound Device is equipped with an analog and a digital LED and one board with a solar cell and another board with a CCD unit.



2.2 Mounting



ATTENTION

All works on electrical supply are to be carried out by competent electricians or service men from KINOTON only.

2.2.1 Installing the Reverse-Scan Sound Device

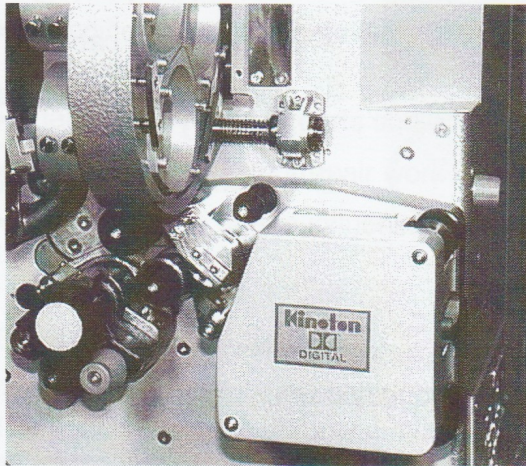


Figure 2-3 Sound Device on projector

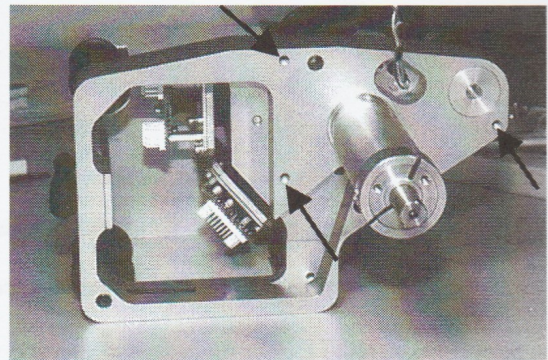


Figure 2-4 Sound Device (backside)

1. Remove the old sound device:
 - Remove disk flywheels from axis.
 - Remove electrical connection.
 - Loosen fixing screws of sound device from the inside of projector.
 - Pull sound device out of projector.
2. Thread Reverse-Scan Sound Device with sound shaft through projector opening.
3. Fasten sound device with three screws (screws which are used before) through the threading holes (see arrows, figure 2-7) from the projector inside.
4. Put disk flywheels onto shaft again.



2.2.2 Mounting the Power Supply Unit Board

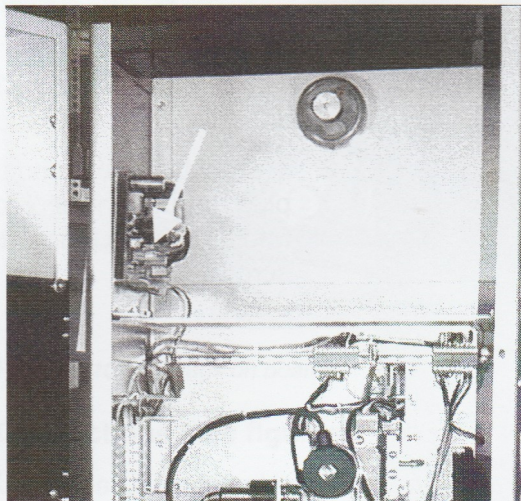


Figure 2-5 Place of installation

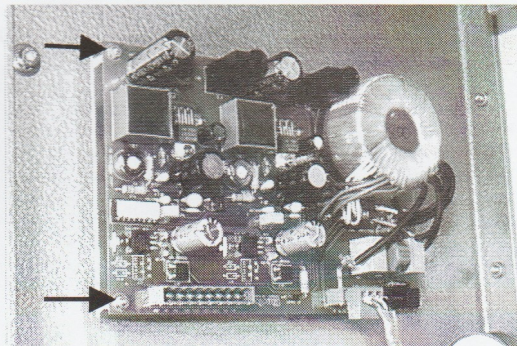


Figure 2-6 Power supply unit board on holder

1. Loosen board from holder (black arrows, 2 of 4 fixing screws) and remove board.
2. Thrill two fixing holes \varnothing 5.5 mm into projector housing side (if necessary):
- Use holder as a template and mark two holes through template on projector housing (use holes in the middle of template for projectors with standard size and lower holes for shorter projector housings).
3. Fasten holder with two delivered screws and nuts from the projector outside.
4. Fasten board on holder again.

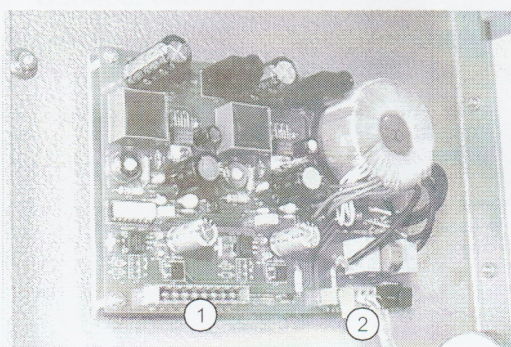


Figure 2-7 Connections on board

① connection: power supply
→ LEDs and sound device

② mains connection

5. Connect plug of power supply.

6. Connect plug of mains supply.



NOTE

Projectors which are produced from 09/98 on are equipped with the completely wired mains plug (in cable channel).
In the case that there is no mains plug ② separated out of cable tree you have to make a new mains connection (from main board).



2.2.3 Connections

2.2.3.1 Installing the 5pole Plug for Sound Output

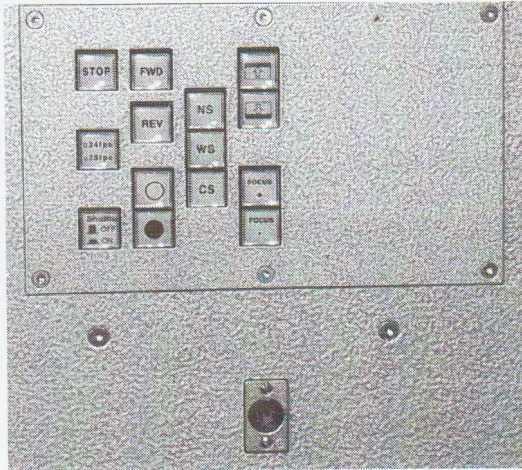


Figure 2-8 5pole plug for sound output

1. Remove the old plug (3pole) with cable from projector housing.
2. Thread the cable and the new 5pole plug through the projector opening and fasten the plug with two screws.

2.2.3.2 Connecting Cables to Reverse-Scan Sound Device

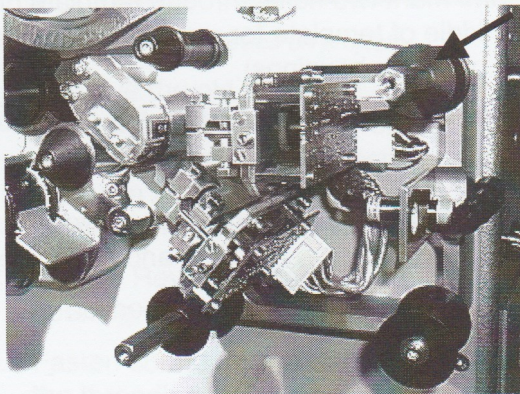


Figure 2-9 Sound device without cover

1. Remove cover of Reverse-Scan Sound Device.
2. Remove the upper guide roller (arrow).

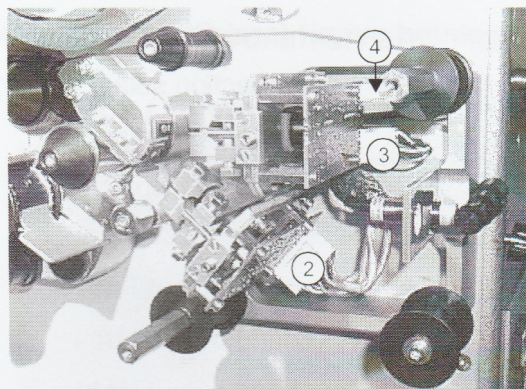


Figure 2-10 Plugs on boards

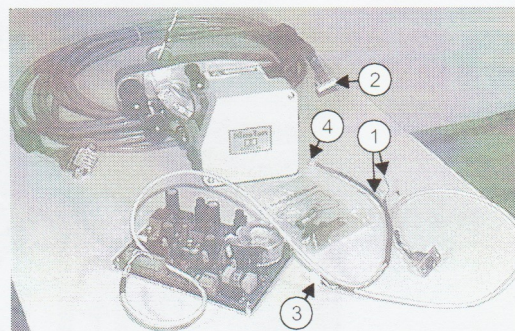


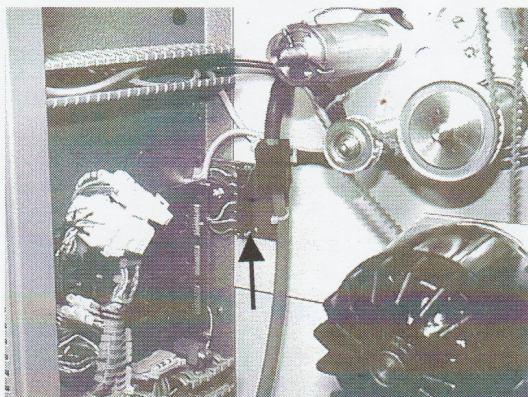
Figure 2-11 Cables and plugs (delivered)

Connections (see figures 2-10 → 2-11)

- | | |
|---|--|
| ① wires LEDs supply
(not visible in figure 2-10) | → ① wires for power supply on board |
| ② plug on digital board | → ② cable with plug (processor CP500
or DA20) |
| ③ plug on analog board (6pole) | → ③ plug on sound output cable |
| ④ plug on analog board (3pole) | → ④ power supply cable to board |
-
1. Solder the three LED wires, which are coming from sound device, to the wires ① of power supply cable.
 2. Connect cables ② to ④ to analog board and digital board (if available), see also figure 2-11.
 3. Connect plug of power supply cable ①/④ (power supply for LEDs and sound device) to power supply unit board.



Installing the terminal strip for sound output (projectors from 11/98 on)



- connection solar cell
- connection solar cell
- connection solar cell
- shield
- sound output **left -** (yellow)
- sound output **left +** (brown)
- sound output **right -** (white)
- sound output **right +** (green)

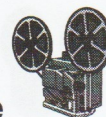
Figure 2-12 8pole terminal strip

Connect the five wires of the sound output cable with the 8pole terminal strip (arrow). If necessary, remove the 5pole plug on the one end of sound output cable.



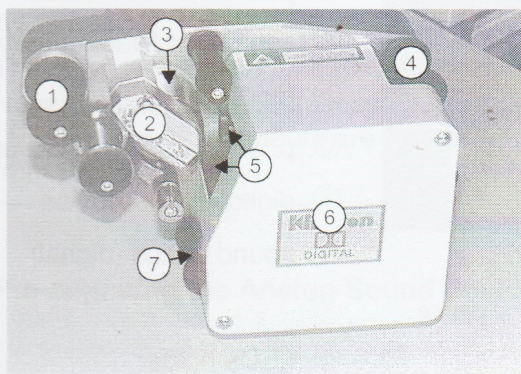
NOTE

Plan of terminal connection and colour of wires, see table beside figure 2-12.



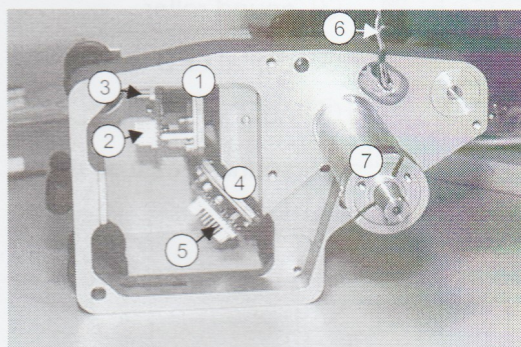
3 Function / Operation and Adjustments

3.1 Function / Operation



- ① guide roller
- ② LED holder with analog LED and holder with digital LED
- ③ sound roller
- ④ guide roller
- ⑤ sound optics (analog and digital)
- ⑥ housing
- ⑦ guide roller

Figure 3-1 Revers-Scan Sound Device



- ① board with solar cell (analog)
- ② 3pole plug: output signal
- ③ 6pole plug: power supply
- ④ board with CCD unit (digital)
- ⑤ plug: connection SR•D cable
- ⑥ wires: LED power supply
- ⑦ sound shaft

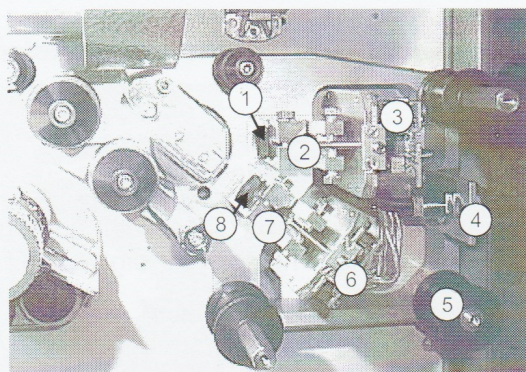
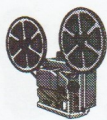
Figure 3-2 Revers-Scan Sound Device (backside)

The Reverse-Scan Sound Device is suitable to reproduce analog sound and digital DOLBY SR•D sound. Both sound format readers are combined in one unit (see figure 3-2).

The analog sound, figure 3-1 ①, is read after projection via a solar cell, the digital sound ④ is read via a CCD-unit. The lighting of both sound tracks are effected with LEDs, figure 3-1 ②, and slit optics, figure 3-1 ⑤.

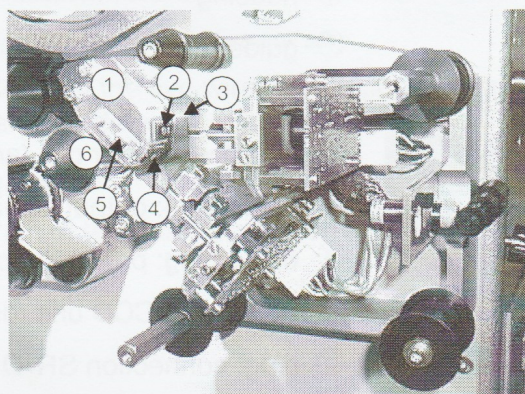
The soundhead can be equipped with a pressure roller lifter for reverse running of the film.

A sensor can be installed in the soundhead for reading metal foil tape for automation.



- ① sound optics (analog)
- ② analog sound device
- ③ p. c. board with solar cell
- ④ sensor for reading metal foil tape
- ⑤ guide roller
- ⑥ p. c. board with CCD unit
- ⑦ digital sound device
- ⑧ sound optics (digital)

Figure 3-3 Analog and digital sound device



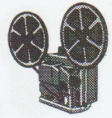
- ① LEDs holder
- ② analog LED
- ③ sound roller
- ④ digital LED
- ⑤ holder of digital LED
- ⑥ sound pressure roller

Figure 3-4 LEDs



NOTE

- Allow change and adjustments to be carried out by experts or service men from KINOTON only.
- For adjusting sound devices see chapter 3.2.
- A sensor (option) can be mounted on the Reverse-Scan Sound Device. This sensor reads metal foil tape for automatic functions.



3.2 Adjustments



ATTENTION

The Reverse-Scan Sound Device is factory-set. Nevertheless it can be necessary to adjust the sound device, e. g. after exchanging LEDs. These adjustments are to be carried out by competent expert or service men from KINOTON only.

3.2.1 Pre-adjusting the Analog Sound Device

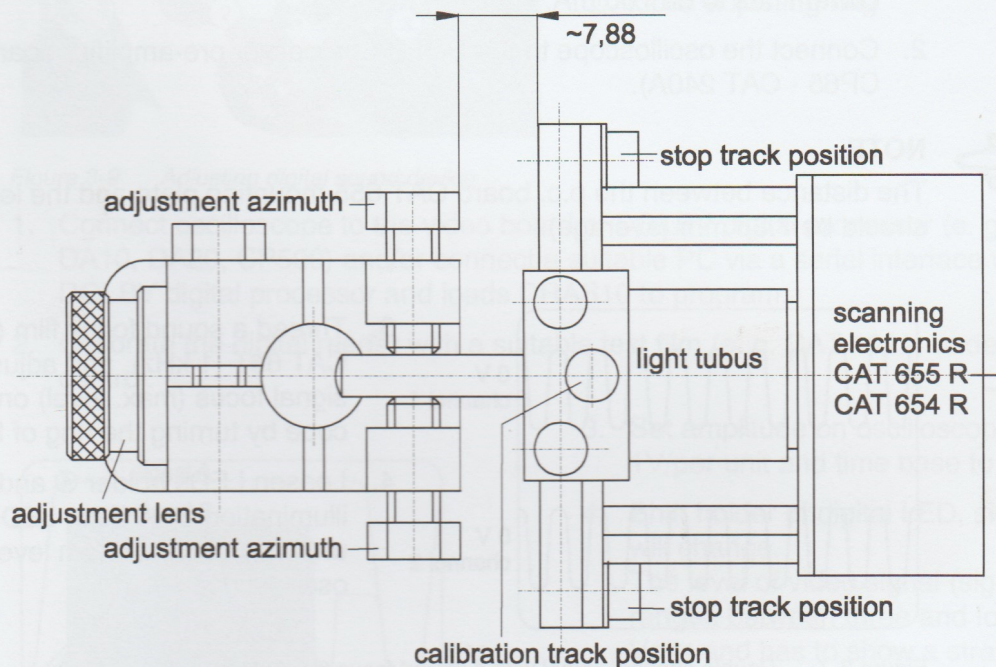
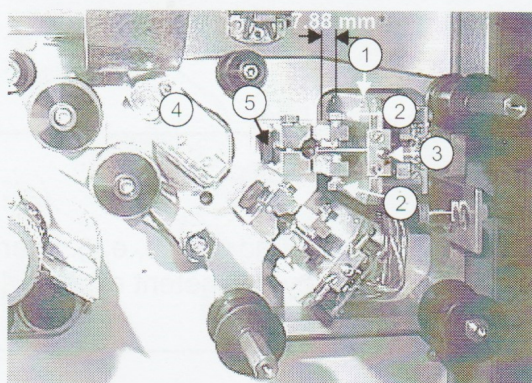
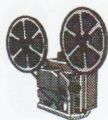


Figure 3-5 Sound device and adjustments



- ① mounting plate
- ② azimuth adjusting screws
- ③ lateral position adjusting screw
- ④ LEDs holder
- ⑤ focus adjusting ring

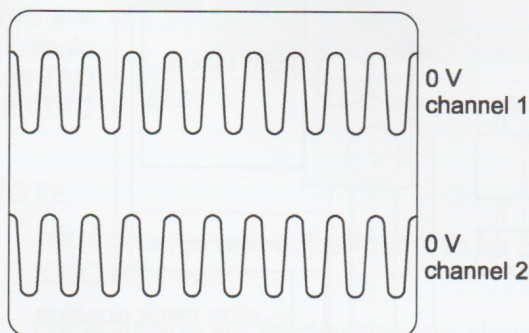
Figure 3-6 Adjusting analog sound device

1. Switch on sound. Check current at terminal of power supply. The range of current has to be 700 mA.
2. Connect the oscilloscope to the DOLBY processor pre-amplifier board (e.g. CP65 - CAT 240A).



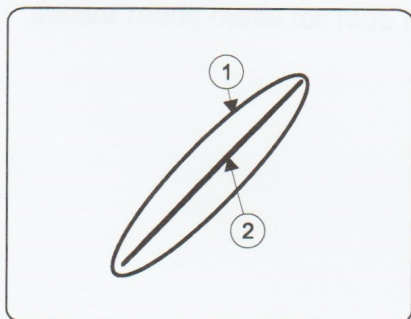
NOTE

The distance between the p.c. board CAT 655 mounting plate and the lens holder should be 7.88 mm (average).



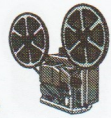
3. Thread a sound focus film (9 kHz) or a CAT 69T (1 kHz), and adjust the best signal focus (max. level) on oscilloscope by turning the ring of lens ⑤.
4. Loosen LEDs holder ④ and optimize illumination by shifting LEDs holder until you get maximum level on oscilloscope.

Figure 3-7 Double channel signal with a sound focus film (9 kHz)



- ① phase (azimuth) is not correct
- ② phase is correct
5. Adjust azimuth via XY mode on oscilloscope when turning adjusting screws (see figure 3-5 and 3-6).

Figure 3-8 Phase position azimuth

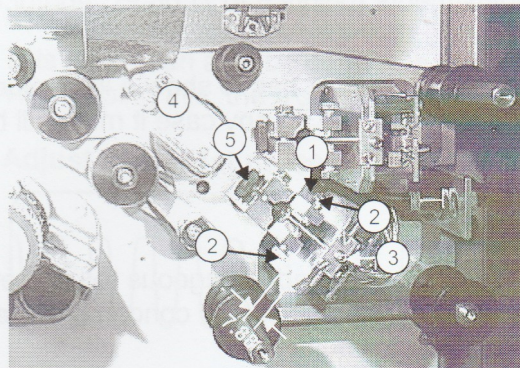


3.2.2 Adjusting Digital Sound Device



NOTE

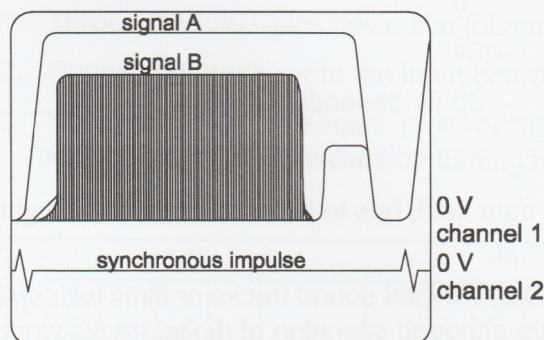
The distance between the mounting plate ① and the lens holder ④ should be 7.88 mm (average).



- ① mounting plate
- ② azimuth adjusting screws
- ③ lateral position adjusting screw
- ④ LEDs holder
- ⑤ focus adjusting ring

Figure 3-9 Adjusting digital sound device

1. Connect oscilloscope to the video board of DOLBY digital processor (e. g.: DA10, DA20, CP500) and/or connect a suitable PC via a serial interface with DOLBY digital processor and loads DRAS10 to program.
2. Calibrate the digital reader with a suitable test film (e. g. CAT 1011) under PC control.



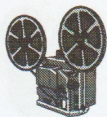
3. Set amplitude on oscilloscope to 1V/per unit and time base to 2 ms.
4. Shift holder of digital LED, signal B will change.
The level of video signal (signal B) ranges between three and four Volts and has to show a straight top edge.

Figure 3-10 Video signal of Dolby SR•D pattern



NOTE

- Signal A represents the perforation holes.
- If position of LED is inaccurate scalloping on the signal can be caused.
- Do not move the digital LED holder to its end position.



5. Adjust focus and picture width by turning focus adjusting ring ⑤.
6. Adjust azimuth with both adjusting screws ②.
7. Adjust lateral position by turning adjusting screw ③ at the p. c. board movement guide pins.



NOTE

- Check and observe these adjustments (points 5 to 7) on PC and/or on video signal.
- The digital error rate of the digital processor has to show a low value. The value depends on quality of film in use. In any case it must fall below 6.



NOTE

Because each film provides various values it is advantageous to use several test film loops and then average the results. This particularly concerns the lateral and vertical position, the track width and the azimuth.

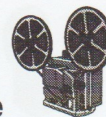
Carry out these adjustments with projector running and with a test film loop. You should see the following values after your adjustments:

lateral position	=	~ 0,5
vertical jitter	=	< 0,5 (is depending on film)
track width	=	100
azimuth	=	0
corner found	=	~ 94
focus	=	~ 80 (is depending on film)



NOTE

- The rectangle, symbol for data field, has to be centered with straight edges/lines.
- Several older films with DOLBY digital sound tracks or films with splices cause the DA20 to show „F“ (fault) although scanning of digital tracks works well. In such cases the DA20 is not defective, but there is an incompatibility between the new data format and the older control functions. Dolby assumes that only new film prints will be shown.



3.2.3 Fine-Adjusting Analog Sound Device

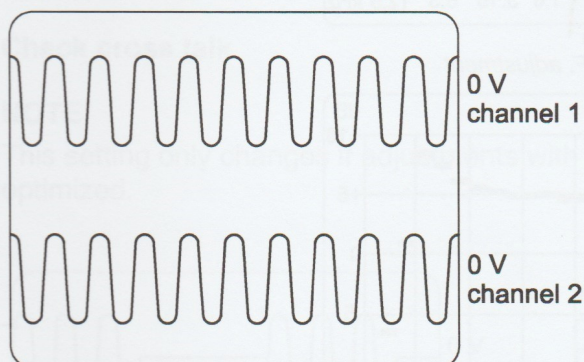
1. Thread a Buzz track film SMPTE-P35-BT. By running this center position of the LED is checked.
2. Shift mounting plate with p. c. board CAT 655 and adjust focus.
On an oscilloscope 300 Hz and 1 kHz signals have become almost invisible.



NOTE

This check can also be done with the monitor loudspeaker in the amplifier rack. When doing this, the signals become almost inaudible.

Adjust focus (1st procedure)

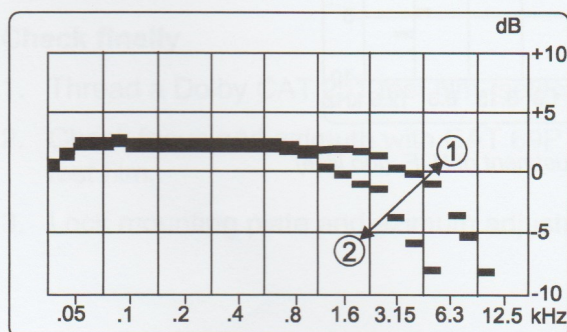


Thread a sound focus film (9 kHz) or CAT 69T (1 kHz) and sharpen the signal (max. level) on oscilloscope by turning the focus adjusting ring.

Figure 3-11 Double channel signal with a sound focus film (9 kHz)

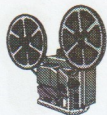
Adjust focus (2nd procedure)

1. Thread CAT 69T pink noise film (observe direction of run).
2. Connect an analyser to the input board of the sound processor.
3. Set analyser on "line input" ("left" or "right"). Observe display and adjust focus for maximum (H.F.) values by turning the lens.



- ① maximum H.F.
- ② minimum H.F.

Figure 3-12 Range of focus on analyser's display



4. Compensate for slit losses by means of H.F. control on the input board of processor (e. g. CAT No. 510).

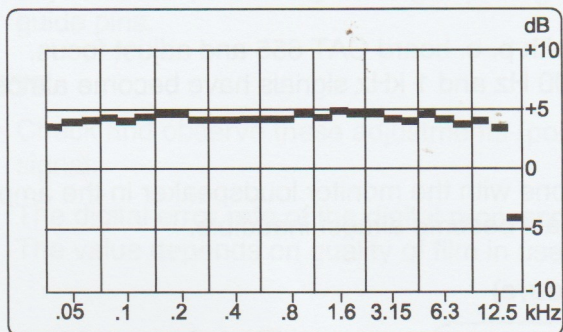


Figure 3-13 Correct H.F. adjustment

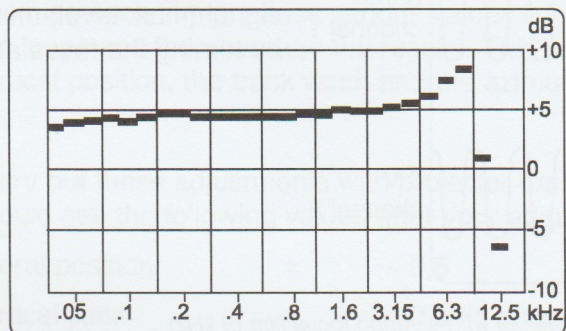


Figure 3-14 Possible adjustment of H. F. (too much)

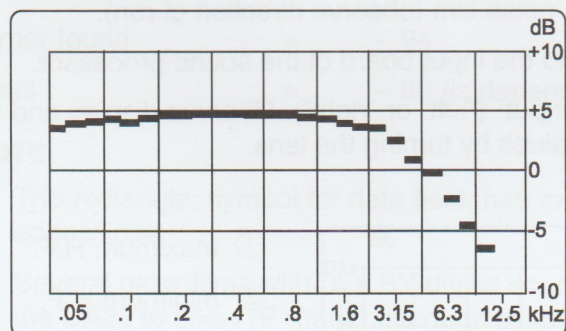
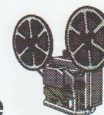


Figure 3-15 Possible adjustment of H. F. (too little)



Adjust azimuth

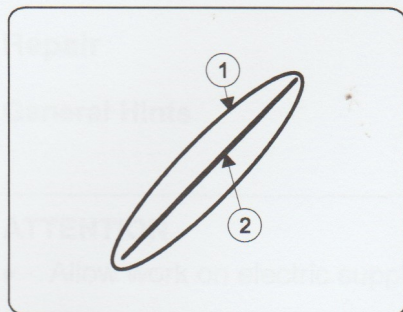


Figure 3-16 Phase position azimuth

① phase (azimuth) is not correct

② phase is correct

Adjust azimuth via XY mode on oscilloscope when turning adjusting screws.

Check cross talk



NOTE

This setting only changes if adjustments with buzz track film has not been optimized.

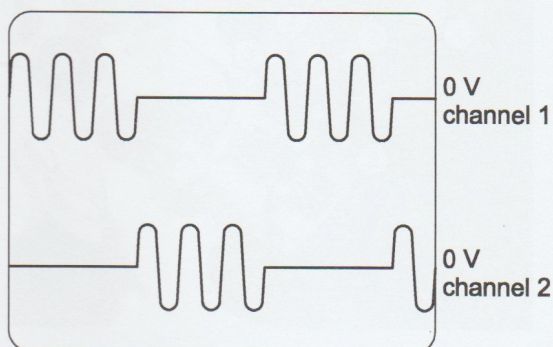


Figure 3-17 Alternating double channel signals

With channel separation film CAT.97 running the center position of the DOLBY sensor is checked.

Set amplitude to 0,5V/per unit and time base to 2 ms on oscilloscope.

When the sine wave is visible on channel 1 it must not be visible on channel 2 and vice versa.

Check finally

1. Thread a Dolby CAT 251 test film (select format 10) and run an audio test.
2. Check focus and azimuth with CAT 69P test film and check level with CAT 69T test film.
3. Lock mounting plate and azimuth adjustment.



4. To check the phase of the audio signal, the phase control of the audio amplifier should be set to the "0" position. The phase control should be set to the "0" position. The phase control should be set to the "0" position.

① phase (azimuth) is not correct

② phase is correct
Adjust azimuth via XY mode on oscilloscope
when tuning station correctly

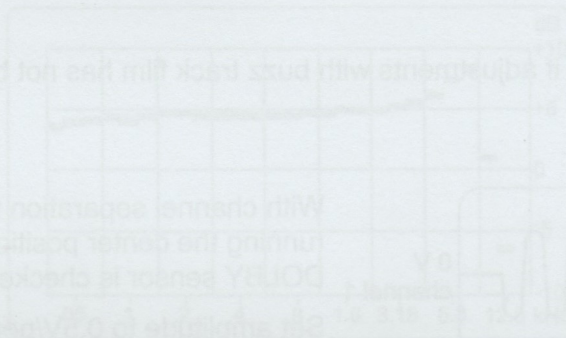


Check cross talk

NOTE

This setting only changes if adjustments with buzz track film has not been optimized.

With channel separation film CAT 97
turning the center position of the
DOLBY sensor is checked.
Set azimuth to 0.5Vpk and time
base to 5 ms on oscilloscope.
When the sine wave is visible on
channel 1 it must not be visible on
channel 2 and vice versa.



Check finally

1. Thread a Dolby CAT 97 test film (check timing 10) and run an audio test.
2. Check focus and azimuth with CAT 97P test film and check level with CAT 97T test film.
3. Lock mounting plate and azimuth adjustment.



4 Repair and Lists of Parts and Wearing Parts

4.1 Repair

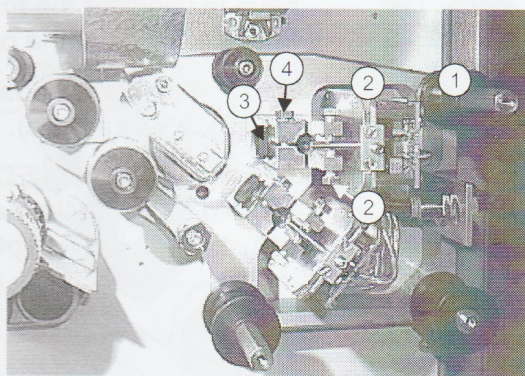
4.1.1 General Hints



ATTENTION

- Allow work on electric supply to be carried out by competent electricians only.
- Make sure that nobody starts projector while you are working on it.
With all maintenance and cleaning work you must separate projector from power supply (switch off main switch).
- All adjustments to be carried out by experts.

4.1.2 Exchanging the Sound Optics



- ① guide roller
- ② adjusting screws of azimuth
- ③ sound optics
- ④ fixing screw of sound optics

Figure 4-1 Exchange sound optics

1. Remove the guide roller.
2. Unplug the connections.
3. Loosen the azimuth adjusting screws.
4. Loosen fixing screws of sound optics.
5. Pull out backwards p. c. board with mounting plate and optics.
6. Screw out the optics and screw in a new one.
7. Mount sound optics in reversible way.
8. Adjust sound optics, see chapter 3.2.



4.1.3 Exchanging the p. c. Boards

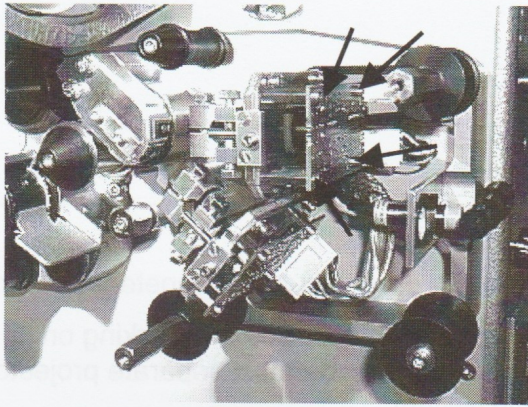


Figure 4-2 Exchange p. c. boards

1. Remove the upper right guide roller.
2. Disconnect all plugs on board.
3. Remove the four hexagon socket screws (arrows) of each board to exchange them.
4. Mount the board in reversible way.
5. Carry out the necessary adjustments, see chapter 3.2.

4.1.4 Exchanging the LEDs Holder

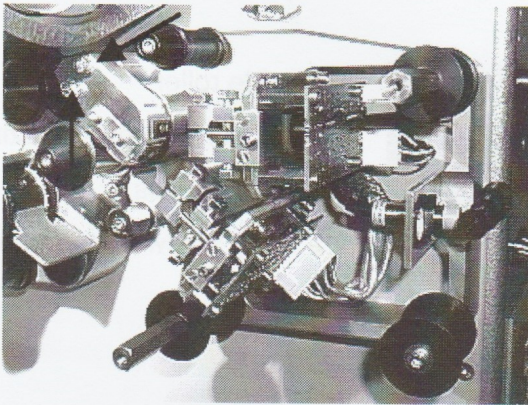


Figure 4-3 Exchange LEDs holder

1. To exchange LEDs holder you have to unsolder the three wires from the inside of the projector.
2. Remove holder by loosening the two fixing screws (arrows).
3. After mounting the LED holder you have to carry out the necessary adjustments, see chapter 3.2.



4.2 List of Parts and Wearing Parts

Part	Figure	Pos.	Piece	Item No.
analog LED	4-4	1	01	0080 500 32063
digital LED	4-4	2	01	0080 500 32063
LEDs holder with 2 LEDs	4-4	3	01	1000 212 97001
digital LED holder	4-4	4	01	1000 212 97002
analog sound optics	4-4	5	01	1000 380 27005
digital sound optics	4-4	6	01	1000 380 27005
digital p. c. board	4-4	7	01	0080 500 00654
analog p. c. board	4-4	8	01	0080 500 00655
sensor	4-4	9	01	1000 282 67001

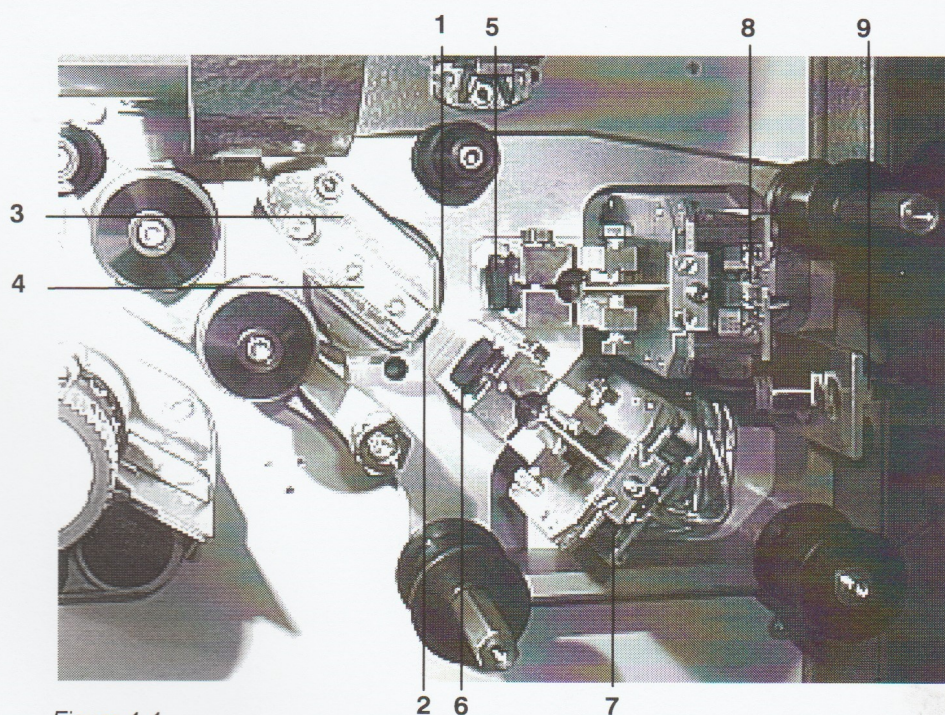


Figure 4-4



List of Parts and Wearing Parts

Part	Material	Quantity	Unit	Part	Material	Quantity	Unit
1	Steel	1	PC	1	Steel	1	PC
2	Steel	1	PC	2	Steel	1	PC
3	Steel	1	PC	3	Steel	1	PC
4	Steel	1	PC	4	Steel	1	PC
5	Steel	1	PC	5	Steel	1	PC
6	Steel	1	PC	6	Steel	1	PC
7	Steel	1	PC	7	Steel	1	PC
8	Steel	1	PC	8	Steel	1	PC
9	Steel	1	PC	9	Steel	1	PC
10	Steel	1	PC	10	Steel	1	PC
11	Steel	1	PC	11	Steel	1	PC
12	Steel	1	PC	12	Steel	1	PC
13	Steel	1	PC	13	Steel	1	PC
14	Steel	1	PC	14	Steel	1	PC
15	Steel	1	PC	15	Steel	1	PC
16	Steel	1	PC	16	Steel	1	PC
17	Steel	1	PC	17	Steel	1	PC
18	Steel	1	PC	18	Steel	1	PC
19	Steel	1	PC	19	Steel	1	PC
20	Steel	1	PC	20	Steel	1	PC
21	Steel	1	PC	21	Steel	1	PC
22	Steel	1	PC	22	Steel	1	PC
23	Steel	1	PC	23	Steel	1	PC
24	Steel	1	PC	24	Steel	1	PC
25	Steel	1	PC	25	Steel	1	PC
26	Steel	1	PC	26	Steel	1	PC
27	Steel	1	PC	27	Steel	1	PC
28	Steel	1	PC	28	Steel	1	PC
29	Steel	1	PC	29	Steel	1	PC
30	Steel	1	PC	30	Steel	1	PC
31	Steel	1	PC	31	Steel	1	PC
32	Steel	1	PC	32	Steel	1	PC
33	Steel	1	PC	33	Steel	1	PC
34	Steel	1	PC	34	Steel	1	PC
35	Steel	1	PC	35	Steel	1	PC
36	Steel	1	PC	36	Steel	1	PC
37	Steel	1	PC	37	Steel	1	PC
38	Steel	1	PC	38	Steel	1	PC
39	Steel	1	PC	39	Steel	1	PC
40	Steel	1	PC	40	Steel	1	PC
41	Steel	1	PC	41	Steel	1	PC
42	Steel	1	PC	42	Steel	1	PC
43	Steel	1	PC	43	Steel	1	PC
44	Steel	1	PC	44	Steel	1	PC
45	Steel	1	PC	45	Steel	1	PC
46	Steel	1	PC	46	Steel	1	PC
47	Steel	1	PC	47	Steel	1	PC
48	Steel	1	PC	48	Steel	1	PC
49	Steel	1	PC	49	Steel	1	PC
50	Steel	1	PC	50	Steel	1	PC
51	Steel	1	PC	51	Steel	1	PC
52	Steel	1	PC	52	Steel	1	PC
53	Steel	1	PC	53	Steel	1	PC
54	Steel	1	PC	54	Steel	1	PC
55	Steel	1	PC	55	Steel	1	PC
56	Steel	1	PC	56	Steel	1	PC
57	Steel	1	PC	57	Steel	1	PC
58	Steel	1	PC	58	Steel	1	PC
59	Steel	1	PC	59	Steel	1	PC
60	Steel	1	PC	60	Steel	1	PC
61	Steel	1	PC	61	Steel	1	PC
62	Steel	1	PC	62	Steel	1	PC
63	Steel	1	PC	63	Steel	1	PC
64	Steel	1	PC	64	Steel	1	PC
65	Steel	1	PC	65	Steel	1	PC
66	Steel	1	PC	66	Steel	1	PC
67	Steel	1	PC	67	Steel	1	PC
68	Steel	1	PC	68	Steel	1	PC
69	Steel	1	PC	69	Steel	1	PC
70	Steel	1	PC	70	Steel	1	PC
71	Steel	1	PC	71	Steel	1	PC
72	Steel	1	PC	72	Steel	1	PC
73	Steel	1	PC	73	Steel	1	PC
74	Steel	1	PC	74	Steel	1	PC
75	Steel	1	PC	75	Steel	1	PC
76	Steel	1	PC	76	Steel	1	PC
77	Steel	1	PC	77	Steel	1	PC
78	Steel	1	PC	78	Steel	1	PC
79	Steel	1	PC	79	Steel	1	PC
80	Steel	1	PC	80	Steel	1	PC
81	Steel	1	PC	81	Steel	1	PC
82	Steel	1	PC	82	Steel	1	PC
83	Steel	1	PC	83	Steel	1	PC
84	Steel	1	PC	84	Steel	1	PC
85	Steel	1	PC	85	Steel	1	PC
86	Steel	1	PC	86	Steel	1	PC
87	Steel	1	PC	87	Steel	1	PC
88	Steel	1	PC	88	Steel	1	PC
89	Steel	1	PC	89	Steel	1	PC
90	Steel	1	PC	90	Steel	1	PC
91	Steel	1	PC	91	Steel	1	PC
92	Steel	1	PC	92	Steel	1	PC
93	Steel	1	PC	93	Steel	1	PC
94	Steel	1	PC	94	Steel	1	PC
95	Steel	1	PC	95	Steel	1	PC
96	Steel	1	PC	96	Steel	1	PC
97	Steel	1	PC	97	Steel	1	PC
98	Steel	1	PC	98	Steel	1	PC
99	Steel	1	PC	99	Steel	1	PC
100	Steel	1	PC	100	Steel	1	PC



5 Technical Data and Circuit Diagram

5.1 Data of Reverse-Scan Sound Device

Connecting data

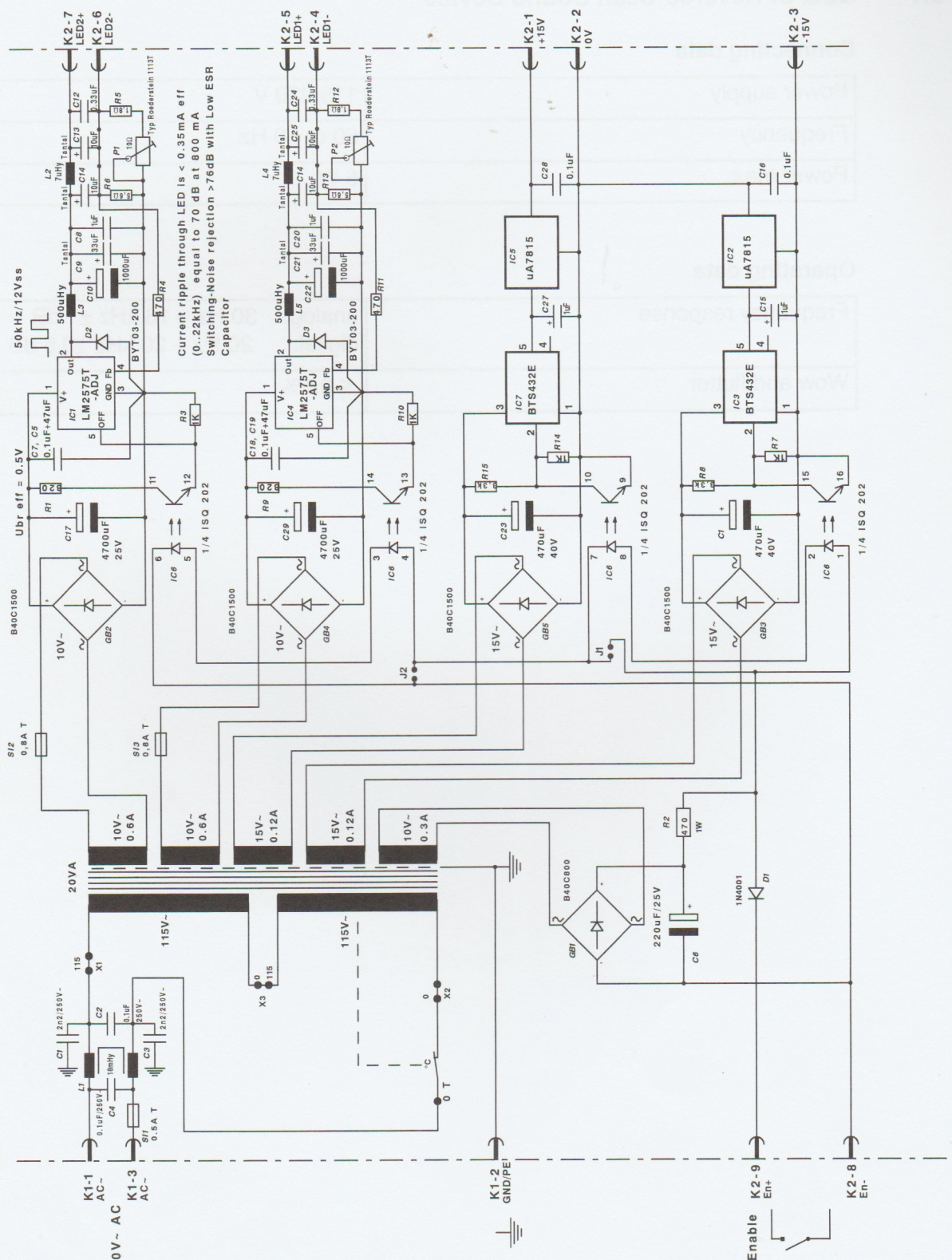
Power supply	115/230 V
Frequency	50 or 60 Hz
Power max.	6 W

Operating data

Frequency response	analog: 30 Hz – 16 kHz ± 1 dB digital: 20 Hz – 20 kHz ± 0.5 dB
Wow and flutter	$\leq 0.1\%$

幸	幸	幸	幸	幸
幸	幸	幸	幸	幸
幸	幸	幸	幸	

5.2 Circuit Diagram of Power Supply Unit Board





Kinoton GMBH
Filmtheater- und Studiotchnik

E-mail: welcome@kinoton.de
Tel. +49(0)89/89 44 46-0
Fax +49(0)89/8 40 20 02
Industriestrasse 20a
D-82110 Germering