

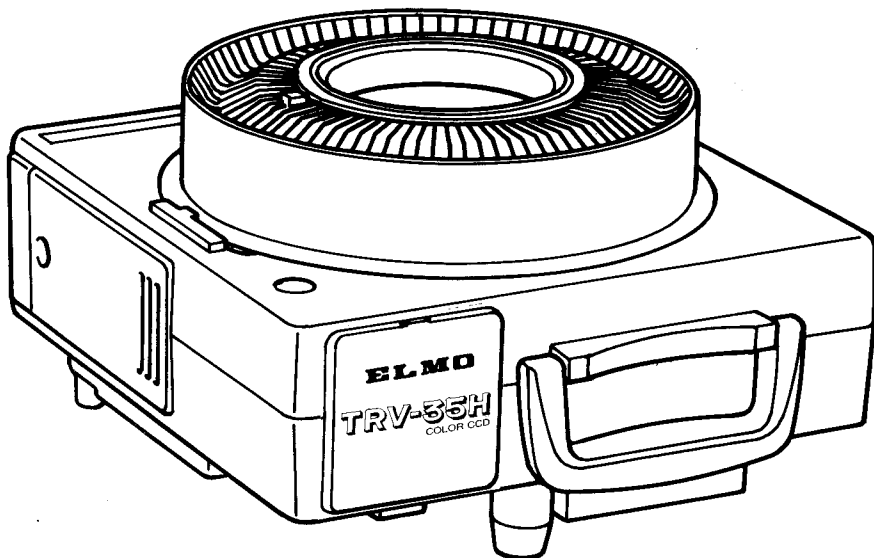
ELMO

SLIDE FILM-TO-VIDEO CONVERTER WITH GEN-LOCK

TRV-35H

INSTRUCTION MANUAL

CCD



IMPORTANT SAFEGUARDS

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

1. Read and understand all instructions before using.
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. Position the cord so that it will not be tripped over, pulled, or contact hot surfaces.
6. If an extension cord is necessary, a cord with a suitable current rating at least equal to that of the appliance should be used.
Cords rated for less amperage than the appliance may overheat.
7. Always unplug appliance from electrical outlet before cleaning and servicing and 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. Store cord in a manner provided.
9. To reduce the risk of electric shock, do not immerse this appliance in water or other liquids.
10. To reduce the risk of electric shock, do not disassemble this appliance, but take it to a qualified serviceman when service or repair work is required. Incorrect reassembly can cause electric shock when the appliance is used subsequently.
11. The use of an accessory attachment not recommended by the manufacturer may cause a risk of fire, electric shock, or injury to persons.
12. Connect this appliance to a grounded outlet.
13. Disconnect this unit from its source of supply before replacing the projection lamp.
14. The appliance switch is provided with the symbols **O** indicating off and **I** indicating on. The symbols and may be used for this purpose.

SAVE THESE INSTRUCTIONS

INFORMATION

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

USER-INSTALLER CAUTION: Your authority to operate this FCC verified equipment could be voided if you make changes or modifications not expressly approved by the party responsible for compliance to Part 15 of the FCC rules.

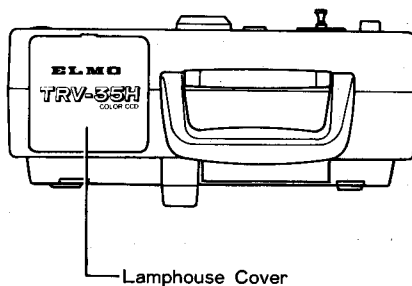
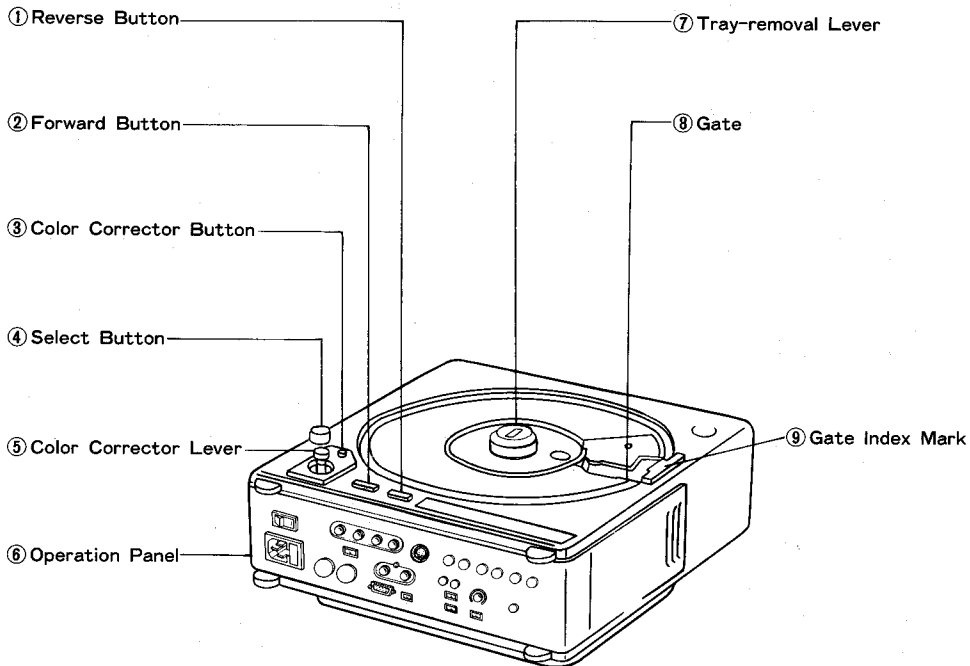
INTRODUCTION

Thank you for purchasing the ELMO Slide Film-To-Video Converter TRV-35H. To use the unit properly, carefully read this operation manual before use. After reading the manual, keep it in a convenient place for quick reference.

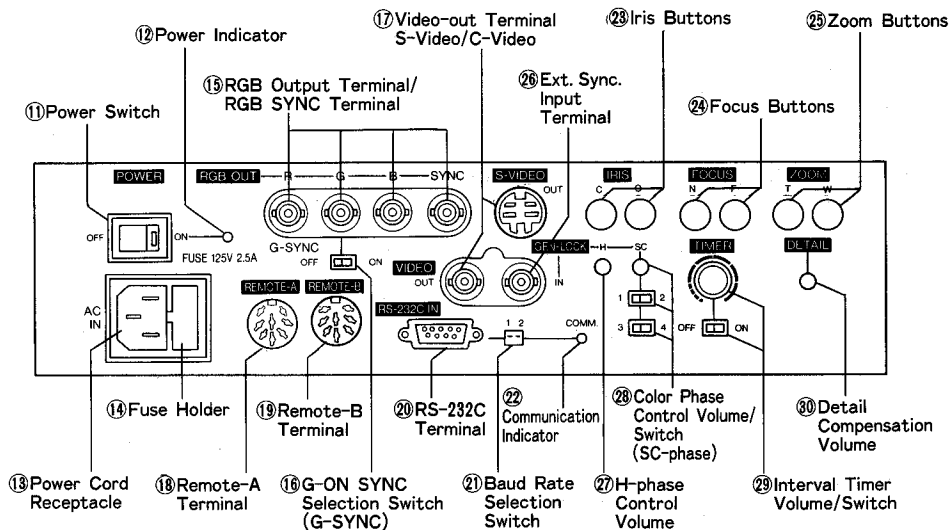
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MAJOR PARTS DESCRIPTIONS



● Operation Panel



	Part Name	Function	Reference Page
⑪	Power Switch	To turn the power on and off.	—
⑫	Power Indicator	It lights up when the power is turned on.	—
⑬	Power Cord Receptacle	Connected to power cord connector.	—
⑭	Fuse Holder	Fuse 125V 2.5A	—
⑮	RGB Output Terminal/ RGB SYNC Terminal	Independently of the input selection, outputs the RGB and its sync. signal.	8
⑯	G-ON SYNC Selection Switch (G-SYNC)	Turned ON when using the monitor TV without sync. signal input terminal.	8
⑰	Video-out Terminal S-Video/C-Video	Connected to monitor TV, etc.	8
⑱	Remote-A Terminal	For dissolving or multi-slide presentation.	23
⑲	Remote-B Terminal	Input terminal for external control signal.	23
⑳	RS-232C Terminal	Controlled by general purpose personal computer.	16~19
㉑	Baud Rate Selection Switch	Changes transmission speed of personal computer.	17
㉒	Communication Indicator	Turned ON when external control is carried out through personal computer from the RS-232C terminal.	16
㉓	Iris Buttons	To adjust the brightness of image.	11
㉔	Focus Buttons	To adjust focus.	11
㉕	Zoom Buttons	To adjust the image size.	11
㉖	Ext. Sync. Input Terminal	GEN-LOCK terminal for external synchronization.	13
㉗	H-phase Control Volume	To adjust the horizontal sync. phase.	14
㉘	Color Phase Control Volume /Switch (SC-phase)	To adjust the sub carrier phase.	14
㉙	Interval Timer Volume/Switch	For automatic interval playback.	12
㉚	Detail Compensation Volume	To adjust the detail (contour) of the image.	12

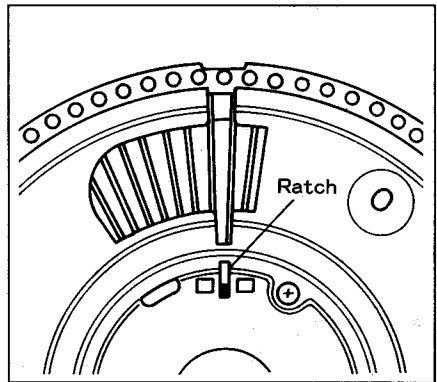
CONDENSED OPERATING PROCEDURES

- 1** Plug the power cord into the power cord receptacle.
- 2** Install a loaded slide tray on the TRV-35H.
- 3** Connect the TRV-35H and a monitor TV with the BNC video cable (optional).
- 4** Turn on the power switch.
- 5** Press the forward button, so that a slide in the tray drops into the gate for playback.

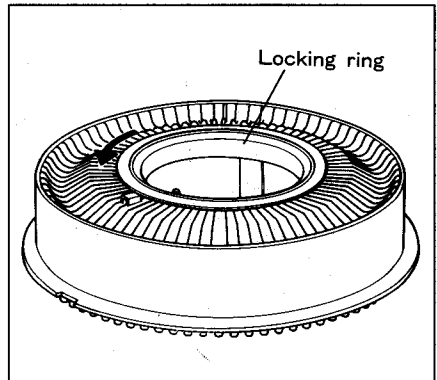
SETTING SLIDE TRAY

● Loading slides

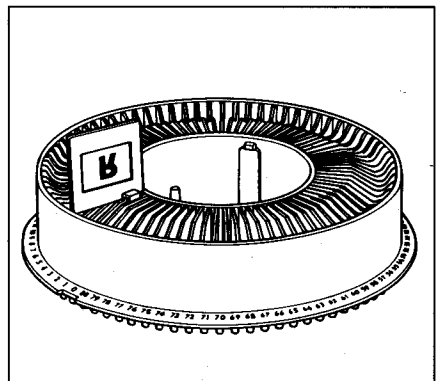
- 1 Make sure that the bottom plate of the slide tray is locked with the ratch. If unlocked, rotate the bottom plate of the slide tray so that the ratch will properly engage with the bottom plate notch.



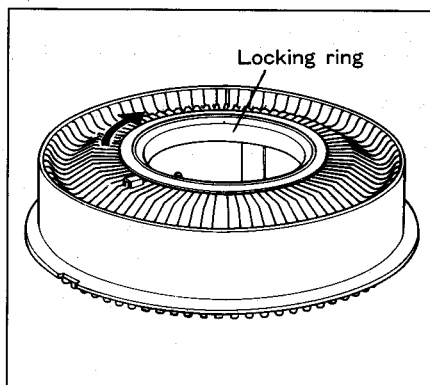
- 2 Turn the locking ring on the slide tray counterclockwise, and take it out.



- 3 Put slides into the slots of the tray in order, according to the numbers on the tray, referring to the illustration. For example, put a slide into the tray so that "R" letter on the slide film can be seen as illustrated.



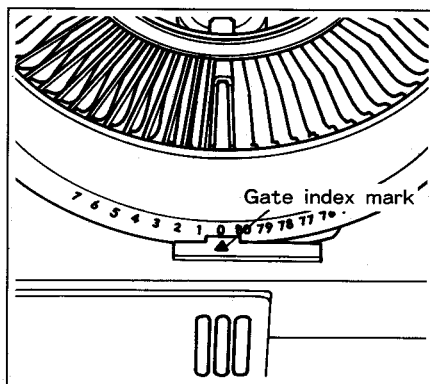
- 4** When all slides are loaded into the tray, attach the locking ring onto the tray and turn the locking ring clockwise until it locks.



● **Installing slide tray**

Position a loaded slide tray over the center post of the TRV-35H, and rotate the tray until it fits snugly at the position where the "0" mark slot of the tray meets the gate index mark.

NOTE : Do not use damaged slide mounts because they may cause some troubles such as a jam in slide transport.

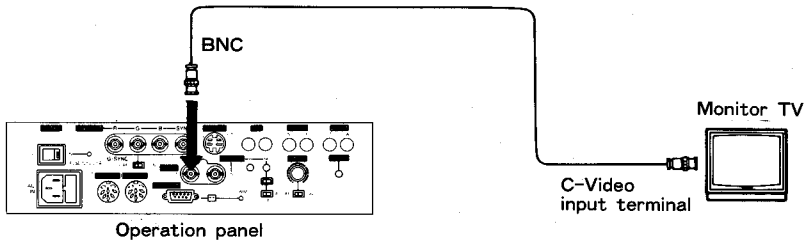


CONNECTION TO MONITOR TV

- Be sure to turn the power off before making connections (in order to protect the TRV-35H and the other connected machines).
- Hold the cable plug firmly when disconnecting the video cable.

● Connection to composite video-in terminal

Connect the BNC video cable to the video-out terminal of the TRV-35H and to the video-in terminal of the monitor TV.

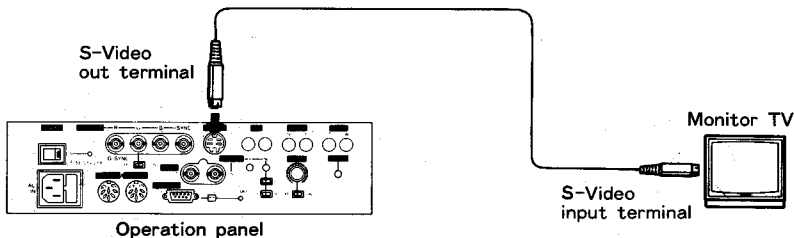


● Connection to S-video in terminal

S-video out terminal (mini DIN 4P) of the TRV-35H is connected to the S-video in terminal of the monitor TV/video.

For S-video mode, use a commercially-available S-video connection cable.

If the device to be used is provided with a Y/C separate connector, a conversion adapter is necessary.



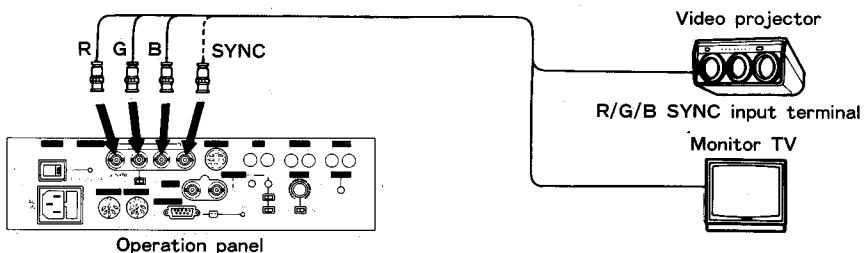
● Connection to RGB input terminal

Use a commercially-available BNC cable.

• G-SYNC Selection Switch

ON : The sync. signal is added to the G signal output of the BNC terminal of the RGB.

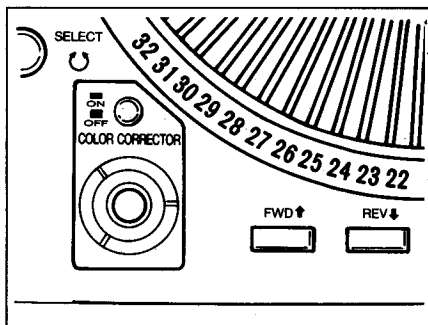
OFF : The sync. signal is not added to the G output (Original setting).
Set at OFF for normal use.



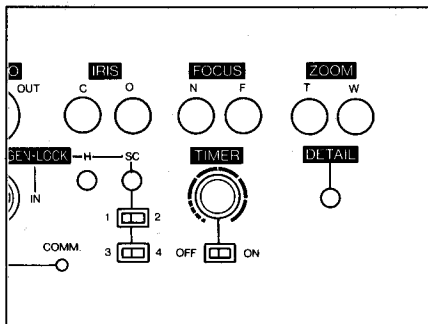
PLAYBACK ON MONITOR TV

- 1 Press the forward button so that the No.1 slide loaded in the tray drops into the gate to start playback of the slide image on a monitor TV.

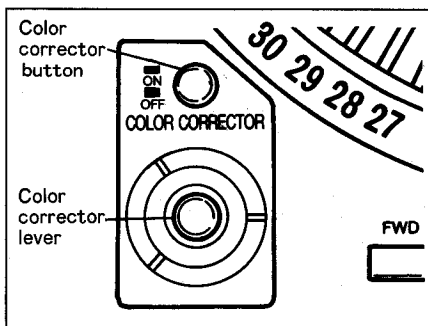
For reverse playback, press the reverse button so that the tray turns clockwise to start reverse playback.



- 2 Adjust focus with the focus buttons, brightness with the iris buttons and the image size with the zoom buttons respectively.

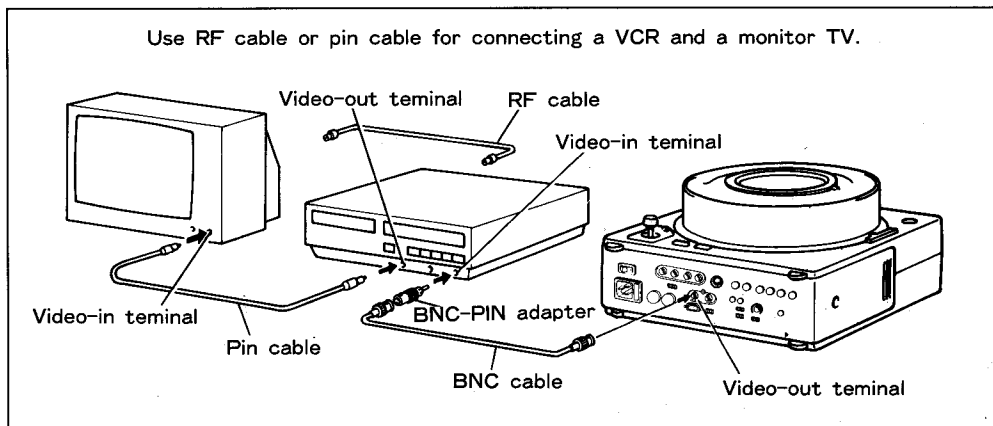


- 3 Adjust color tones as you desire by operating the color corrector lever with the color corrector button on. With the color corrector button off, color tones are adjusted at factory pre-set position.



RECORDING WITH VCR

Connect the TRV-35H and a video cassette recorder (VCR) with BNC video cable and BNC-PIN adapter (optional).

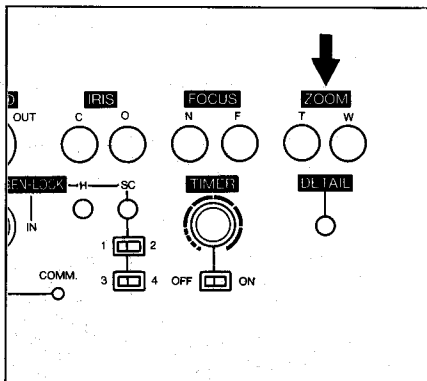


VARIOUS FUNCTIONS

● Zoom

When the zoom button is pressed to select [T], the image gets larger.

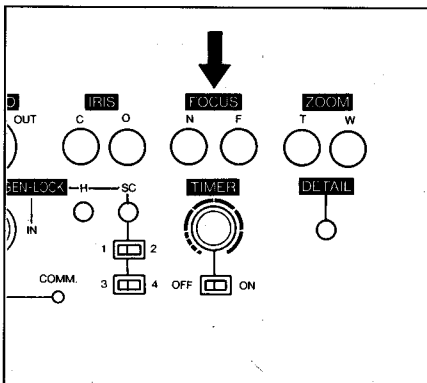
When the zoom button is pressed to select [W], the image gets smaller.



● Focus

Adjust focus by pressing the focus buttons [N], [F].

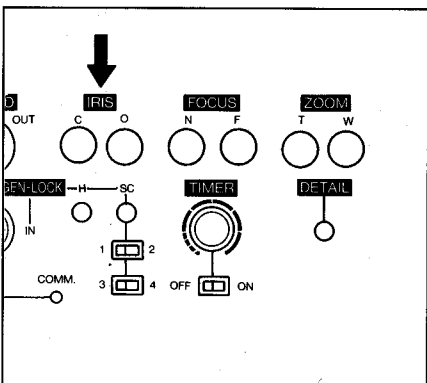
For better adjustment, press the zoom [T] button to get the larger image before focusing.



● Iris

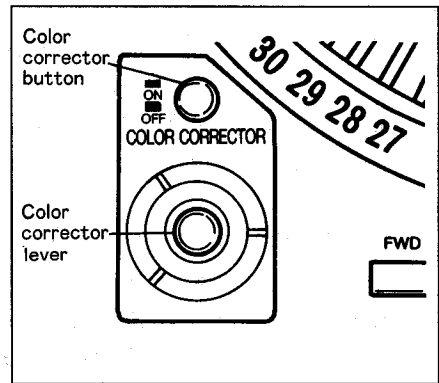
When the iris button [C] is pressed, the image becomes darker.

When the iris button [O] is pressed, the image becomes brighter.



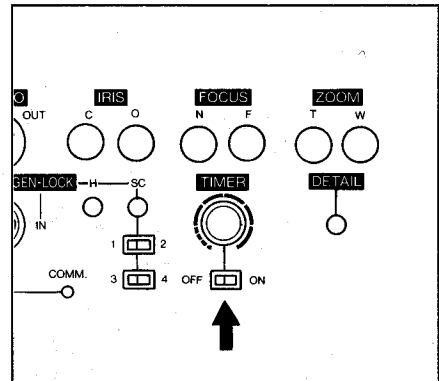
● White balance (Color corrector)

Adjust color tones as you desire by operating the color corrector lever. With the color corrector button off, color tones are adjusted at factory pre-set position.



● Interval Timer

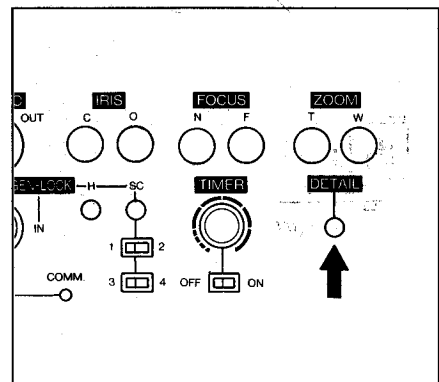
Adjust interval timer volume/switch, the automatic interval playback is possible. The interval time is varied from approx. 1.5 seconds to 30 seconds as desired.



● Detail compensation

To adjust the detail (contour) of the image.

By adjusting the detail compensation volume [DETAIL], the softer or harder image will be available on the monitor screen. Use an adequate (–) screwdriver or the like for adjusting the detail of the image.

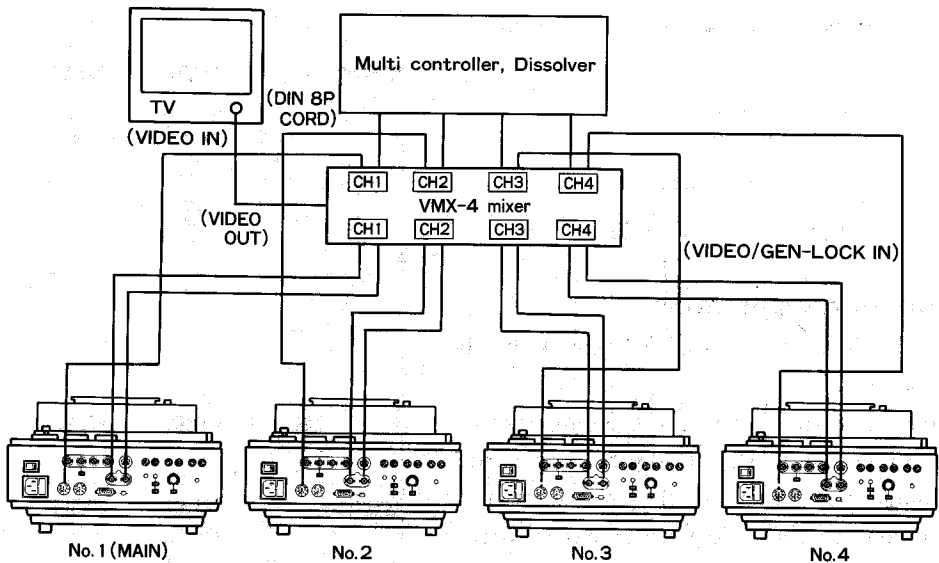


EXTERNAL SYNC.

Gen-Lock circuit is built in the TRV-35H to allow combination use of TRV-35H's, video cameras, etc. Optional Elmo Video Mixer, type VMX-4 is additionally required to coordinate TRV-35H's and video cameras. (For dissolving or multi-slide presentation, dissolver or multi controller is also required.)

● Connection Example (Video mixing with four units of TRV-35H):









- 1 Connect TRV-35H's and VMX-4 with BNC video cables (optional).
Connect VMX-4 (BNC video-out terminal provided) and a TV set with suitable video cable (optional) as well.
- 2 Turn on the power switch of TRV-35H.
Before operation, please read through operation manuals for VMX-4 and multi-controller to be combine-used with.

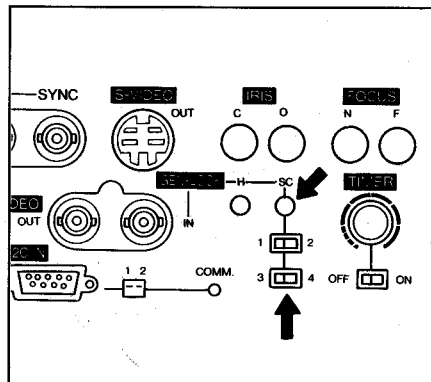


●How to adjust SC-phase :

In case color phases of two or more TRV-35H's do not match when video images are overlapped on a TV screen, adjust the SC-phase (subcarrier phase) in the following procedures.

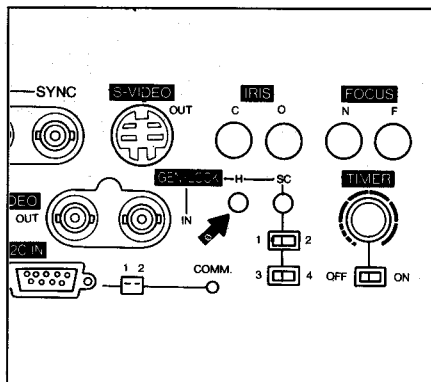
1. Put the slide films with similar patterns into every TRV-35H.
2. Simultaneously play back No.1 (main) TRV-35H and No.2 TRV-35H on a TV screen through video mixer, VMX-4. (Turn off the power switch of No.3 and No.4 TRV-35H's.)
3. Select the SC-phase switch of No.2 TRV-35H so that the nearest color tone with that of No.1 (main) TRV-35H is obtained. Then make fine adjustment with the volume control nearby the SC-phase switch, by comparing with color tones of two TRV-35H's on a TV screen. (For comparison, it is recommended to switch over two TRV-35H's.)
4. Then play back No.3 TRV-35H, if to be combine-used. (Turn off the power switch of No.2 TRV-35H.) Adjust the SC-phase of No.3 TRV-35H as above procedures.
5. Adjust the SC-phase of No.4 TRV-35H in the same manner.

SC-Phase	0°	90°	180°	270°
Switch position	1  2 3  4	1  2 3  4	1  2 3  4	1  2 3  4



●How to adjust H-phase :

Set the H-phase (horizontal sync. phase) volume on the rear panel of No.1 (main) TRV-35H at the middle position. While simultaneously playing back No.1 and No.2 TRV-35H to adjust image position. Do the same adjustment with No.1 and No.3 TRV-35H's and also No.1 and No.4 TRV-35H's as well.



● How to adjust image position

Inclination :

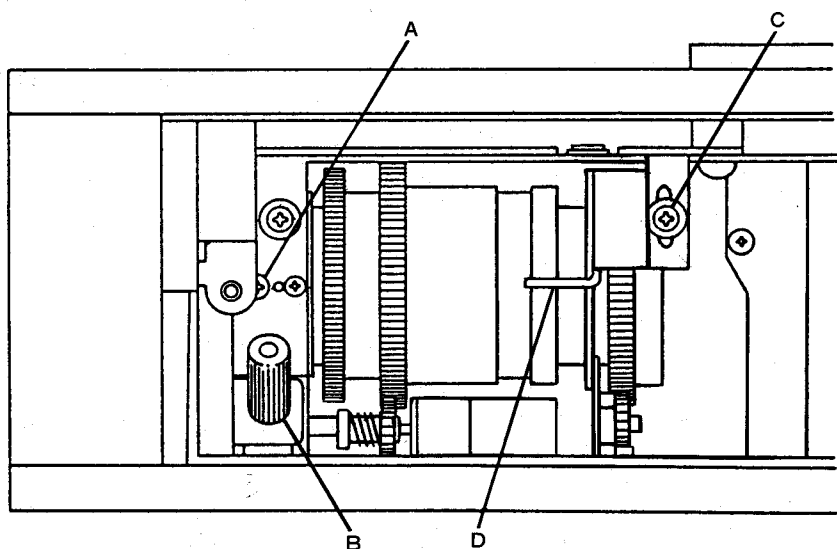
As is the case with the H-phase adjustment, playback No.1 and No.2 TRV-35H's simultaneously, open the lens compartment of No.2 TRV-35H and adjust the inclination by turning the knob (B) clockwise or counterclockwise after loosening the screw (A). Tighten the screw (A) after adjustment.

Do the same adjustment with No.1 and No.3 TRV-35H's and also No.1 and No.4 TRV-35H's as well.

Up and down :

As is the case with the H-phase adjustment, play back No.1 and No.2 TRV-35H's simultaneously. Open the lens compartment of No.2 TRV-35H and slightly loosen the screw (C). Adjust the up and down by sliding the lever (D), and then securely fix screw (C).

Do the same adjustment with No.1 and No.3 TRV-35H's and also No.1 and No.4 TRV-35H's as well.



RS-232C SPECIFICATIONS

The TRV-35H can be operated with the personal computer (IBM/PC or compatible) with connecting it to the RS-232C terminal.

● Set up

1. Connect the TRV-35H to the personal computer with the RS-232C connection cable (Optional).

Refer to the following connection diagram. When using a commercially available RS-232C cable, make sure that it is connected as described below.

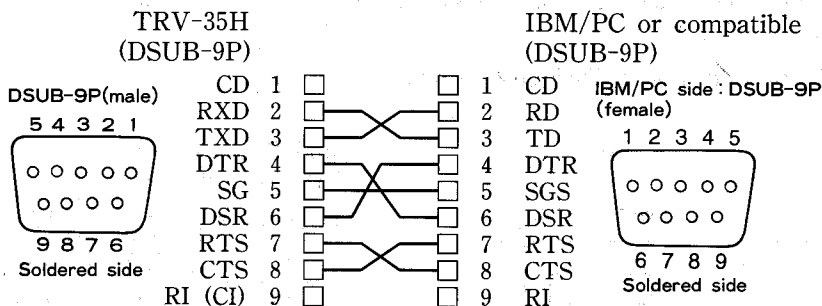
2. Start the personal computer to set the RS-232C mode same as that of the communication mode of the TRV-35H.

Refer to the instruction manual of the personal computer for setting the RS-232C mode.

3. Set the transmission speed same as that of the personal computer. Then turn the power ON.
4. Start the program of the personal computer to operate the TRV-35H. Then open the communication line.
5. Controlling with RS-232C starts.

Note : Make sure to take the above steps for communication control.

● Cable connection



●RS-232C connector specifications (DSUB-9P)

Pin No.	Code	Direction of data TRV-35H PC	Comments
1	CD	—	CD : Carrier Detect
2	RXD	←	RXD : Received Data
3	TXD	→	TXD : Transmitted Data
4	DTR	→	DTR : Data terminal Ready
5	SG	—	SG : Signal Ground
6	DSR	←	DSR : Data Set Ready
7	RTS	→	RTS : Request To Send
8	CTS	→	CTS : Clear To Send
9	RI	—	RI : Ring Indicator

●Transmission mode

Half duplex start-stop sync. mode

Start bit : 1 bit

Data bit : 8 bit

Stop bit : 1 bit

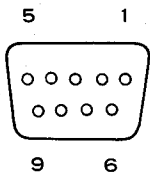
Parity bit : none

Baud rate

(Transmission speed) : 600, 1200, 2400, 4800 bps……DIP-SW selection

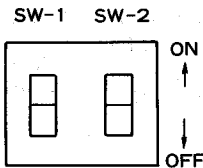
●RS-232C terminal and DIP-SW position

DSUB-9P(female)



Receptacle side

DIP-SW



Baud Rate Setting
(DIP-SW selection)

Baud Rate	SW-1	SW-2
600	OFF	OFF
1200	ON	OFF
2400	OFF	ON
4800	ON	ON

* Factory set at : 4800 bps

Viewed from rear panel

LIST OF TRANSMISSION COMMANDS

Function	Command	Parameter	Data	Comments
Foward	FW	0	<input type="checkbox"/> <input type="checkbox"/>	
Reverse	RE	0	<input type="checkbox"/> <input type="checkbox"/>	
Zoom selection	ZO	TELE= + WIDE= -	<input type="checkbox"/> <input type="checkbox"/>	
Focus selection	FO	NEAR= + FAR= -	<input type="checkbox"/> <input type="checkbox"/>	
Iris selection	IR	OPEN= + CLOSE= -	<input type="checkbox"/> <input type="checkbox"/>	
Power source of light	LA	ON= 1 OFF= 0	<input type="checkbox"/> <input type="checkbox"/>	
"0" mark reset	ZR	FWD= F REV= R	<input type="checkbox"/> <input type="checkbox"/>	The slide tray is turned rotates forward with the parameter "F". (reversely with "R").
Frame number setting	NS	0	00~80	This command becomes effective after the "0" mark reset is carried out.
Frame number inquiry	NQ	0	<input type="checkbox"/> <input type="checkbox"/>	This command becomes effective after the "0" mark reset is carried out.

Note : "☐☐" means transmitting SPACE [20H] twice.

DATA FORMAT SPECIFICATIONS

This command is in accordance with the form of 1-command/1-packet.
The next key input is not received until the one processing is executed.

●File open and file close

Communication will be carried out in ASCII code according to the following format.

ENQ [05H] : Inquiry for connecting the line (PC→TRV-35H)

ACK [06H] : Sent upon normal acknowledgment (TRV-35H→PC)

NAK [15H] : Sent upon negative acknowledgment (TRV-35H→PC)

EOT [04H] : Sent upon end of the line (PC→TRV-35H)

ACK [06H] : Sent upon normal acknowledgment (TRV-35H→PC)

Transmit format (PC→TRV-35H)

[STX]	command	parameter	data	[ETX]
02H	□□	□	□□	03H
2×20H				

Notes :

1. Make sure that the transmit format starts with STX (Start of Text) and ends with ETX (End of Text).
2. If the transmit format or command name is wrong, NAK (Negative Acknowledgment) is sent from the TRV-35H as a result of failing to receive correctly.
3. If the send format is correctly sent, the TRV-35H sends ACK (Normal Acknowledgment).
4. If the connector cable is not correctly connected to the TRV-35H and personal computer, no answer is obtained.

Connect the connector cable correctly with screws for operation.

5. The above data format is not supported by operation commands.

Input SP [20H] for sending.

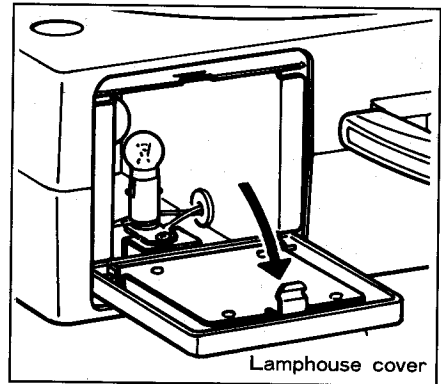
Receive format (personal computer→TRV-35H)

[ACK]	[NAK]
06H	15H

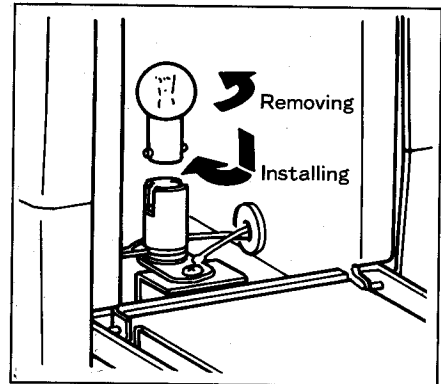
6. Carry out the operation commands for iris selection/focus selection/zoom selection successively.

REPLACING LAMP

- 1 Open the lamphouse cover.



- 2 Remove the lamp from the lamp socket by turning the lamp counterclockwise.
- 3 Insert a new lamp to the lamp socket and turn the lamp clockwise until it locks while pressing it.
Use ELMO 24V-6W lamp.



- 4 Close the lamphouse cover.

REMOVING SLIDE TRAY

When the "0" mark of the tray meets the gate index mark, the tray will be taken out easily.

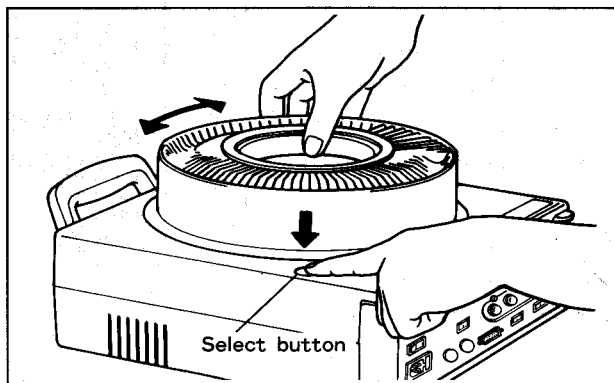
In case the playback is over with the "0" mark slot out of the gate index mark, use the select button to remove the tray.

When the select button is pressed, a lever pushes up a slide from the gate to the tray and the tray can be freely turned.

Therefore, in such a case as above or if you want to remove the tray during midway playback, rotate the tray until the "0" mark slot is aligned with the gate index mark while pressing the select button. Then remove the tray.

NOTE : Press the select button with the power switch on.

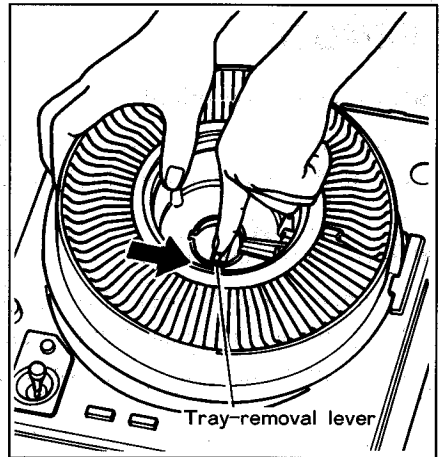
In case a slide mount is caught in the gate and the tray jams, remove the tray by the following steps.



1 While pushing the tray-removal lever in the groove of the center post, lift off the tray.

2 Take out the jammed slide in the gate.

3 Make sure the tray's locking ring is tightly closed. Invert the tray and turn the bottom plate until it locks.



4 Turn the tray upright and take out the locking ring.

5 If the slide is not damaged, put it back and attach the locking ring.

While pressing the select button, rotate the tray so that the slide which you want to play back is aligned with the gate index mark.

REMOTE

● Remote-A terminal

Terminal for video mixer type VMX-4.

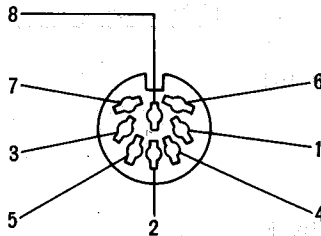
For multi-slide presentation, connect to the DIN8P plugs of VMX-4.

● Remote-B terminal

Terminal for wired remote.

The remote receptacle comes with a DIN8P (round type) connector outlet.

These functions will work when the relative contacts are shorted.



○ Function between contacts

Close contact	Functions	
1 - 8	Foward	
2 - 8	Reverse	
3 - 8	Zoom	to WIDE
4 - 8		to TELE
5 - 8	Iris	to OPEN
6 - 8		to CLOSE
(While closing contact between 7 & 8, close another contact.)		
7 - 8 / 1 - 8	"0" mark reset	Foward
7 - 8 / 2 - 8		Reverse
7 - 8 / 3 - 8	Focus	to FAR
7 - 8 / 4 - 8		to NEAR
7 - 8 / 5 - 8	Lamp	ON
7 - 8 / 6 - 8		OFF

8 COMMON

"0" mark reset : By the operations mentioned above, the tray rotates automatically so that the "0" mark slot returns to Gate index mark position.

TROUBLE-SHOOTING HINTS

Symptom	Possible Cause/Countermeasure
When the fan motor/drive motor fail to turn.	<ul style="list-style-type: none"> • Check if the power switch is on. • Check if the power cord is properly plugged into the AC outlet.
When the lamp fails to light.	<ul style="list-style-type: none"> • Check if the power switch is on. • Check if the lamp is inserted to lamp socket firmly. • Check the lamp for blowout.
When the tray fails to turn.	<ul style="list-style-type: none"> • Check if the tray is properly installed on the TRV-35H.
When the slide mount fails to drop into the gate.	<ul style="list-style-type: none"> • Check if the slide mount is not damaged.
When no playback picture is reproduced.	<ul style="list-style-type: none"> • Check the video cable for proper connection. • Check if the brightness is properly adjusted with the iris buttons.

After checking the above items, if your trouble still persists, consult your nearest dealer or an authorized ELMO service center.

SPECIFICATIONS

■GENERAL

Power source	: 120V AC 60Hz
Power consumption	: 80W
Outside dimensions	: Approx. 284mm(W) 292mm(D) 126mm(H)
Weight	: Approx. 6.7kgs

■FILM TRANSPORTATION

Film	: 35mm slide film (2in.×2in. mount slide)
Slide tray	: Standard circular tray
Slide capacity	: 80 slides
Slide transportation	: Gate-in system
Foward/Reverse playback	: Possible
Remote playback	: Possible
Interval timer	: Built-in (1.5sec~30sec)
Dissolving	: Possible (With VMX-4 mixer+dissolver or multi controller)

■OPTICS

Lens	: F1.8 f=6.5mm~16.25mm zoom lens
Zooming range	: ×0.135~×0.338 (1 : 2.5)
Zooming	: Powered
Focusing	: Powered
Iris	: Powered
Light source	: 24V, 6W lamp

■VIDEO

Television system	: NTSC compatible
Image pick-up element	: 1/2" Interline-transfer CCD
Picture element	: 811(H)×508(V) (approx. 410,000 pixels)
Sync. system	: Internal/Extrenal Sync. (automatic changeover)
Resolution	: More than 450 TV lines (Y signal with horizontal) More than 350 TV lines (Vertical)
S/N ratio	: 50 dB (Min. setting with detail adjustment)
Output signal	: C-Video VBS 1.0 V(p-p)/75Ω unbalanced S-Video Y 0.714V(p-p)/75Ω unbalanced C 0.286V(p-p)/75Ω unbalanced RGB 0.714V(p-p)/75Ω unbalanced SYNC 2.5 V(p-p)/75Ω unbalanced G-SYNC 0.286V(p-p)/75Ω unbalanced
Ext. sync. input condition	: C-video VBS (75Ω unbalanced) Sync: 0.3V±0.1V, Burst: 0.3V±0.1V
Ext. sync. frequency range	: (against NTSC standard) H±20ppm, SC±50ppm

H-phase adjustment	: Manual ($0\mu\text{s} \sim 10\mu\text{s}$)
SC-phase adjustment	: Manual ($0^\circ \sim 360^\circ$)
Color corrector	: Joy-stick type control
Detail compensation	: Possible

■ INPUT/OUTPUT TERMINALS

Input terminal	: Ext. sync. input (BNC connector/ 75Ω , unbalanced)
Output terminal	: C-Video output (BNC connector/ 75Ω , unbalanced)
	S-Video output (Mini DIN 4P connector/ 75Ω , unbalanced)
	RGB output (BNC connector/ 75Ω , unbalanced)
	SYNC output (BNC connector/ 75Ω , unbalanced)
Ext. control terminal	: RS-232C (DSUB-9P)
	Remote-A terminal (DIN-8P)
	Remote-B terminal (DIN-8P)

■ SUPPLIED ACCESSORIES

Power cord	× 1
Instruction manual	× 1

*The design and specifications are subject to change without prior notice.

BEFORE YOUR USE

Follow the instructions in this section to ensure safe operation. (Failure to follow these instructions may result in incorrect operation or malfunction of the equipment.)

*Apply to the specified AC power source.

*Disassembling or modifying the equipment may result in electrical shock and machine malfunction.

We are not responsible for any deterioration or failure of the equipment caused by disassembling or modifying by the user.

*Connecting or disconnecting the power cord should be carried out while firmly holding the plug.

*If the equipment is left unused for a long period, disconnect the power cord for safety. Do not expose the equipment to direct sunlight, high temperature, high humidity, or dust.

*Avoid storing or using the equipment where vibration occurs.

*Install the equipment in the following conditions.

Temperature : $5^\circ\text{C} \sim 40^\circ\text{C}$ ($41^\circ\text{F} \sim 104^\circ\text{F}$)

Humidity : $30\% \sim 85\%$ (Avoid humid places, since humidity inside the products may cause failure of the set.)

*If the equipment is used for purposes other than specified, we cannot guarantee its performance, service life, or safety.

*Use only a soft, dry cloth for cleaning. Using benzine or thinner for cleaning may damage the coating or resin.

WARNING

Unauthorized recording of copyrighted films may infringe on the rights of copyright owners and be contrary to copyright laws.



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