

Operating Instructions

NATIONAL

V. T. R.

NATIONAL



MODEL **NV-3020E**

Before operating this set, please read these instructions completely

INTRODUCTION

The NATIONAL model NV-3020E is expertly designed ½" CCIR/EIAJ industry standard video tape recorder incorporating the most recent technological advances to help you produce tapes of outstanding quality.

FEATURES

1. CCIR/EIAJ standard ½" format (625 lines, 50 fields)
2. Exclusive HPF* heads for extra life and fidelity
3. Precision inscribing of tape path on head drum insures 100% tape interchangeability with all NATIONAL NV-3000 series VTRs
4. Stop action
5. Audio dubbing
6. Automatic end of tape shutoff
7. Horizontal resolution greater than 300 lines gives outstanding picture clarity

* Trade Mark

Note:

Four models available due to power requirement

MODELS	POWER SOURCE	AC PLUG	POWER CORD	AREA
NV-3020E1	220V 50Hz	C-2	VJA24	EUROPE
NV-3020E2	240V 50Hz			
NV-3020E3	240V 50Hz	C-2	VJA24	ENGLAND, KUWAIT
NV-3020E4	200V 50Hz	C-2	VJA24	HONG KONG

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MAJOR OPERATING COMPONENTS

TOP VIEW

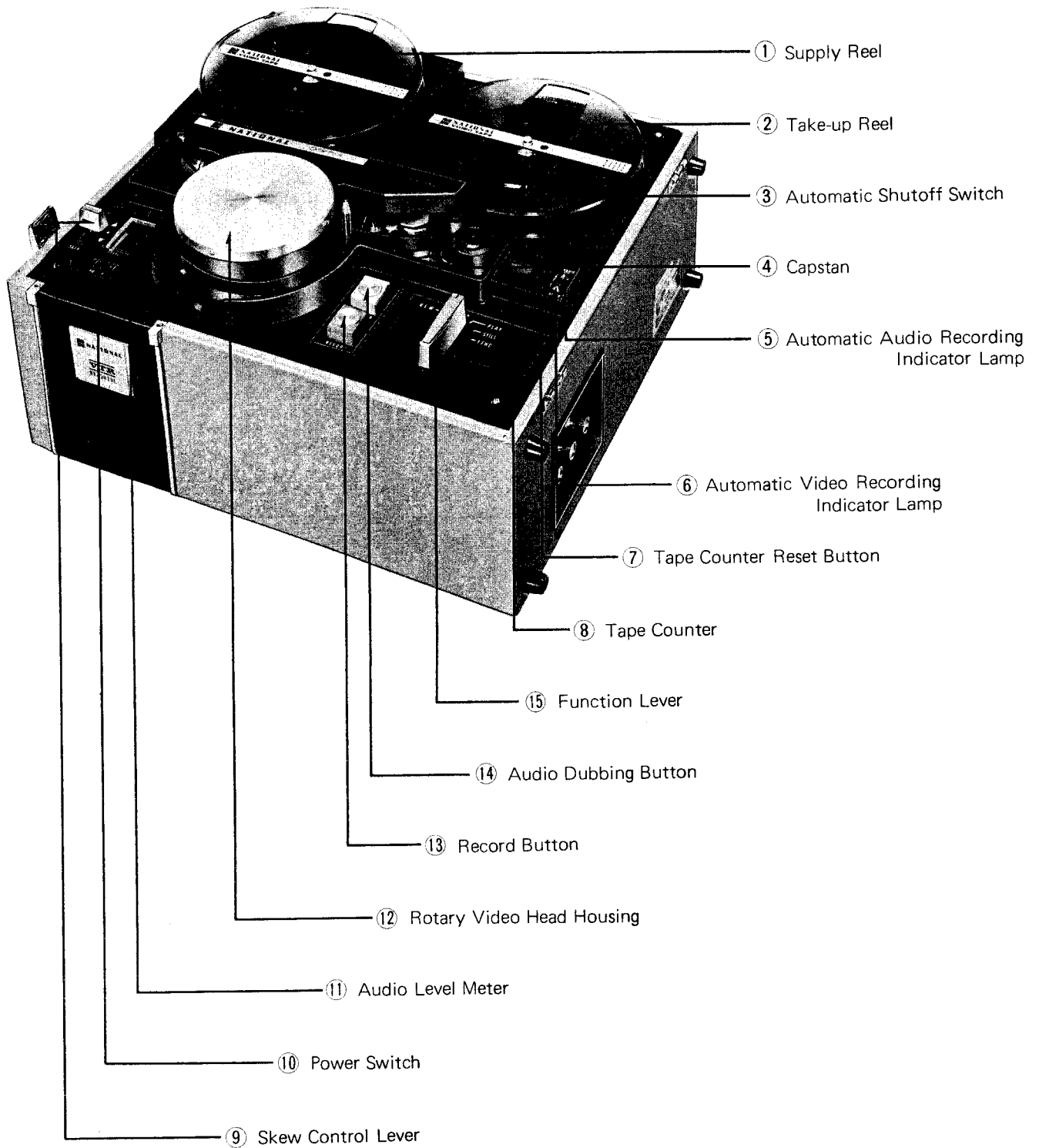


Fig. 1

JACK PANEL

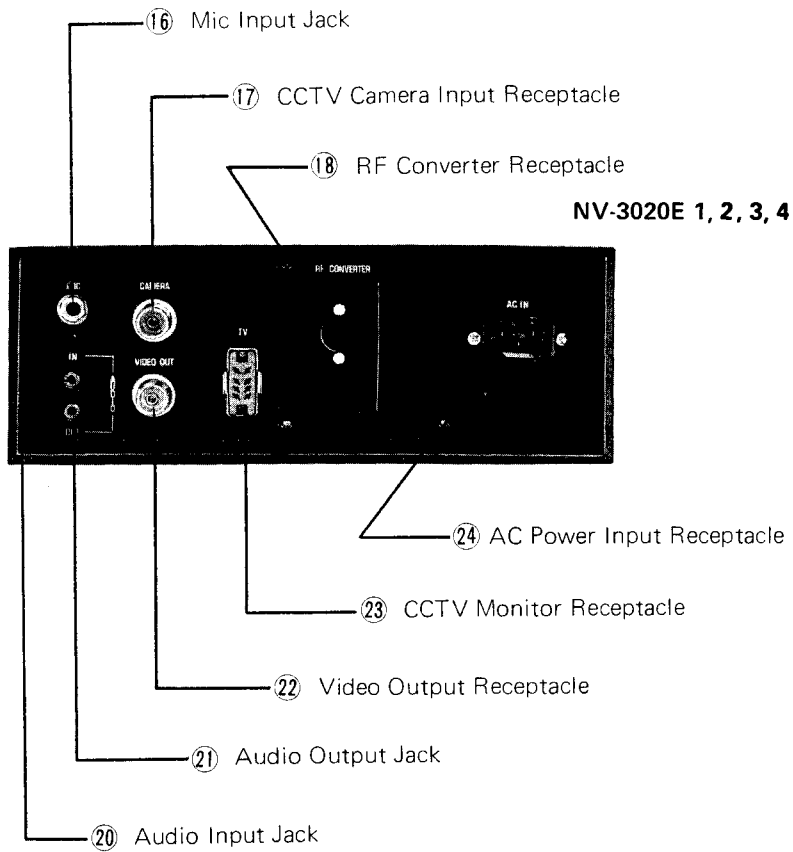


Fig. 2

RIGHT SIDE PANEL

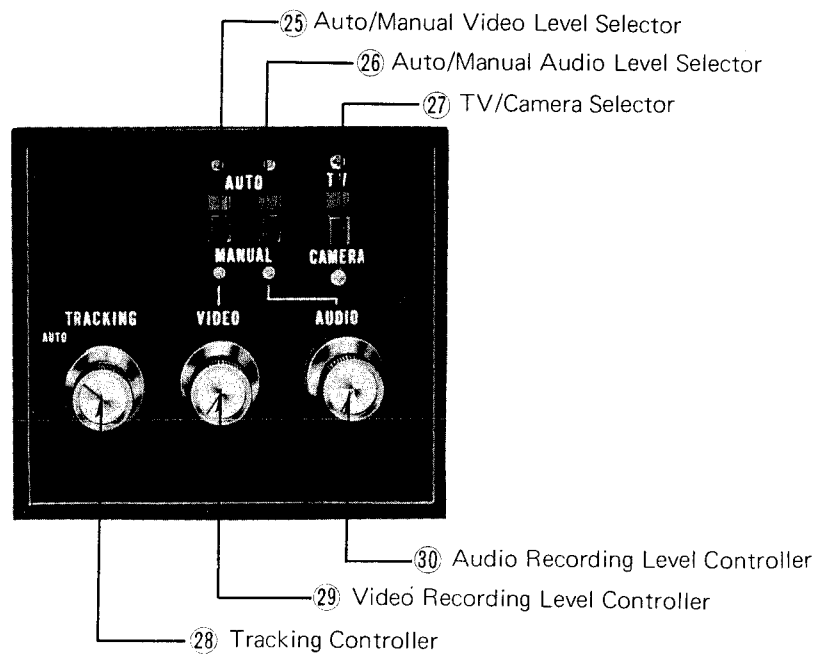


Fig. 3

CONTROLS AND THEIR FUNCTIONS

⑤ AUTOMATIC AUDIO RECORDING INDICATOR LAMP

Lights up when audio recording level is adjusted automatically. Refer to Auto/Manual Audio Level Selector ②⑥.

⑥ AUTOMATIC VIDEO RECORDING INDICATOR LAMP

Lights up when video recording level is adjusted automatically. Refer to Auto/Manual Video Level Selector ②⑤.

⑦ TAPE COUNTER RESET BUTTON

⑧ TAPE COUNTER

This tape counter indicates the relative point of the tape and may be used for the future reference to the program recorded on the tape. To reset the counter to zero, push the Reset Button.

⑨ SKEW CONTROL LEVER

Playback image distortion in the upper portion of the monitor screen can be eliminated by adjusting this control. See page 12.

⑪ AUDIO LEVEL METER

Shows both audio recording and playback levels, but primarily designed for audio recording level. Refer to MANUAL RECORDING (page 10).

⑬ RECORD BUTTON

By pressing the Record Button, both video and audio recording levels can be checked (shown on the Audio Level Meter ⑪) without running the tape. To start recording, turn the Function Lever ⑮ to the PLAY position while holding the Record Button down.

⑭ AUDIO DUBBING BUTTON

To replace the audio recording with another, press this button and record. Refer to AUDIO DUBBING (page 13).

⑮ FUNCTION LEVER

Turn this lever for REWIND, STOP, PLAY, STILL and FAST FORWARD.

- * Always make sure the Function Lever is correctly positioned for mode desired and not half-way between positions.
- * Always turn the Function Lever slowly with a deliberate pause at each mode to give the tape time to stop or start smoothly.

⑯ MIC INPUT JACK

For connection with a microphone (optional). Impedance: 10 K Ω or higher.

⑰ CCTV CAMERA INPUT RECEPTACLE

For connection with the video output connector on a NATIONAL CCTV camera (optional).

⑱ RF CONVERTER RECEPTACLE

For connection with a NATIONAL RF converter (optional) when playing back on regular television. See PLAYBACK ON REGULAR TELEVISION (page 12.)

⑳ AUDIO INPUT JACK

For direct recording from auxiliary sound source, such as radio tuner, hi-fi system, audio tape recorder, etc.

- * When using this recording method, make sure that the volume control on the external sound source is set at a low level. Over-driving this input may result in damage to the preamplifier circuit.

㉑ AUDIO OUTPUT JACK

For additional audio output connection with an external power amplifier or a speaker system.

㉒ VIDEO OUTPUT RECEPTACLE

For playback on an extra CCTV monitor.

㉓ CCTV MONITOR RECEPTACLE

For connection with a CCTV monitor using the attached 8-pin VTR-monitor connection cable.

㉔ AC POWER INPUT RECEPTACLE

For connection with the attached AC power cord.

㉕ AUTO/MANUAL VIDEO LEVEL SELECTOR

When this selector is set at AUTO, the video recording level is adjusted automatically. At MANUAL, the video recording level is adjusted manually with the Video Recording Level Controller ㉙.

㉖ AUTO/MANUAL AUDIO LEVEL SELECTOR

When this selector is set at AUTO, the audio recording level is adjusted automatically. At MANUAL, the audio recording level is adjusted manually with the Audio Recording Level Controller ㉚.

㉗ TV/CAMERA SELECTOR

Selects the CCTV monitor (connected with the CCTV Monitor Receptacle ㉓) or the CCTV camera (connected with the CCTV Camera Input Receptacle ㉑) as a recording source.

㉘ TRACKING CONTROLLER

Turn this controller to remove the tracking noise in the picture which may appear when the tape recorded on another recorder is played back. Can be turned to the AUTO position for tapes recorded on and played back on this unit. See page 12.

㉙ VIDEO RECORDING LEVEL CONTROLLER

Turn this controller to control the video recording level manually. The Auto/Manual Video Level Selector ㉕ must be set at MANUAL.

㉚ AUDIO RECORDING LEVEL CONTROLLER

Turn the Audio Recording Level Controller to control the audio recording level manually. The Auto/Manual Audio Level Selector ㉖ must be set at MANUAL.

BASIC CONNECTIONS

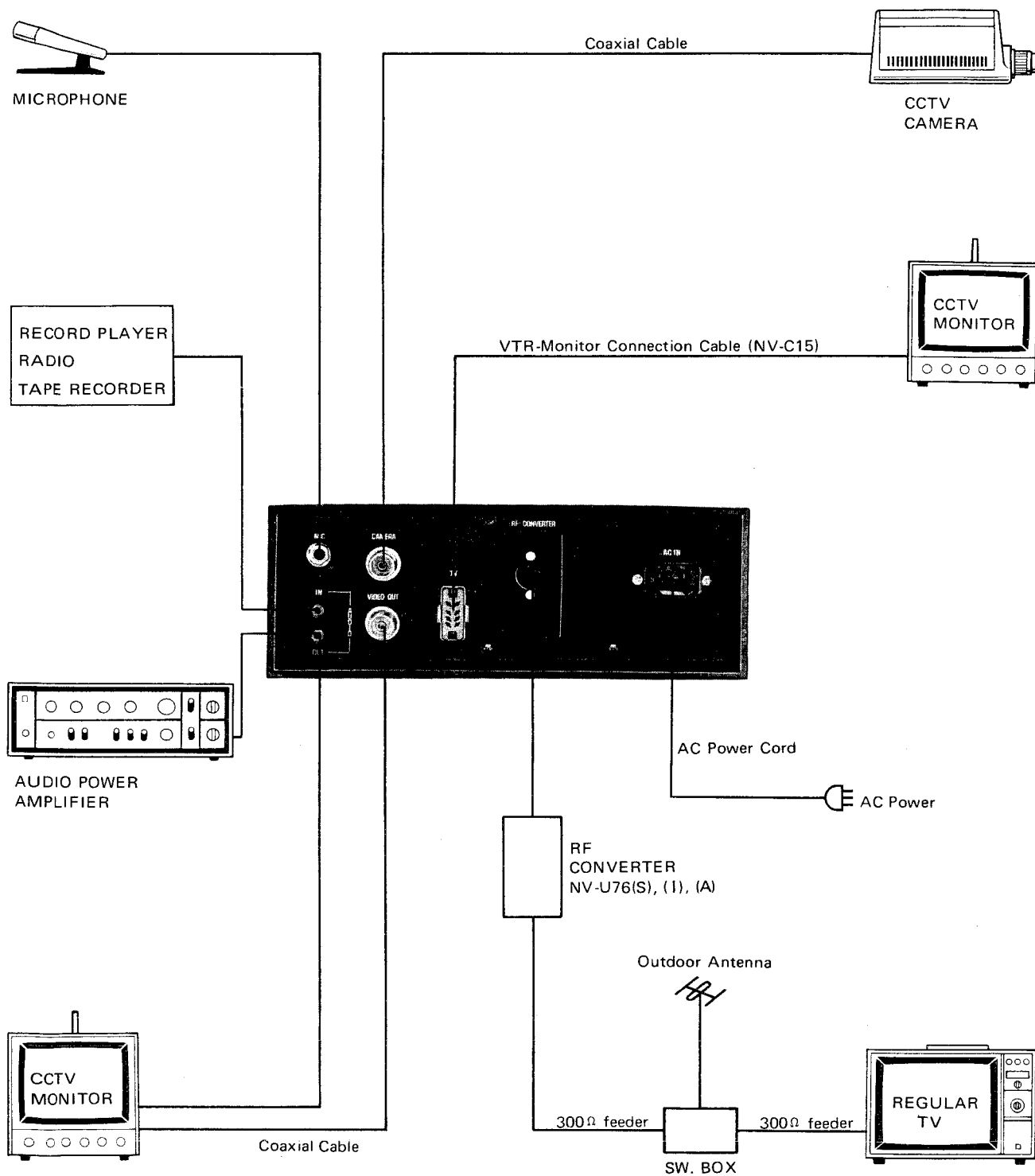


Fig. 4

TAPE THREADING

1. Turn off the recorder before threading a tape. It may damage the rotary heads to thread a tape while the heads are rotating.
2. Place the full reel on the left reel table and the empty reel on the right.
3. Unwind two feet or so of tape from the full reel. Hold the unwound portion of tape with both hands, and thread it exactly as shown in Fig. 5.
4. This recorder is designed for full-track recording (70 minute recording time with NATIONAL video tape NV-P71). Rewind when the supply reel becomes empty.

IMPORTANT

The video tape must always be placed on the left side of the Tension Arm when threading the tape, otherwise a very unstable recording and playback will be made.

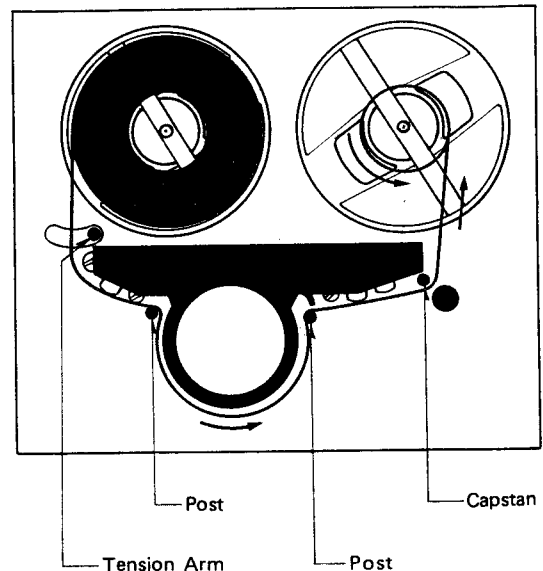


Fig. 5

FUNCTION LEVER OPERATION

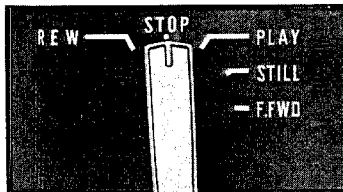


Fig. 6

STOP

In this position, the tape stops. When recording is over, turn the Function Lever to this position. (Fig. 6)

To protect the tape and the rotary heads, the head motor stops in the STOP position.

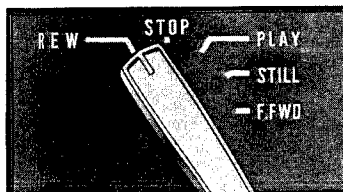


Fig. 7

REWIND

The tape is rewound rapidly. The Tape Counter ⑧ helps you locate any recorded portion on the tape. When completely rewound, the tape stops automatically, then reset the Lever to the STOP position. (Fig. 7)

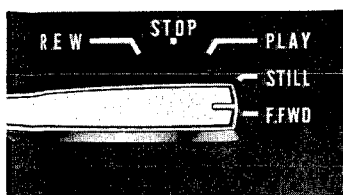


Fig. 8

FAST FORWARD

The tape runs rapidly. (Fig. 8)

IMPORTANT:

- * Do not turn the Function Lever rapidly from REWIND, PLAY, or FAST FORWARD to another mode.
- * Be sure to stop at each mode before turning the lever to any other mode. Otherwise the tape may be crinkled, torn, stretched or irrecoverably damaged.

RECORDING

RECORDING FROM NATIONAL CCTV MONITOR

NATIONAL carries a full line of high performance CCTV monitors—with or without VHF/UHF tuners. The monitor with VHF/UHF tuners is designed for use with a video tape recorder and may be used as a conventional TV. The monitor without tuners is designed exclusively for use with a video tape recorder.

1. Connect as shown in Fig. 10 the recorder and the NATIONAL CCTV monitor with VHF/UHF tuners using the attached VTR-Monitor connection cable.
 - * The monitor may be supplied with unswitched AC power from the AC Outlet (19) on the jack panel of the recorder.
(NV-3020E2 only)
 - * Either plug at the ends of the VTR-Monitor connection cable fits the 8-pin receptacles on the recorder and the monitor.
 - * When disconnecting the VTR-Monitor connection cable, always press the release buttons on the sides of the plug.
2. Turn on the recorder, and the Pilot Lamp inside the Audio Level Meter (11) will light up.
3. Slide the TV/Camera Selector (27) to the TV side.
4. Turn on the monitor, set the TV/VTR selector on the monitor at TV, and choose the TV program you wish to record.
Then switch the TV/VTR selector back to the VTR side.
A random noise will appear on the TV screen. (Fig. 9)
5. Then proceed as instructed in I or II on the following page according to the method of recording.

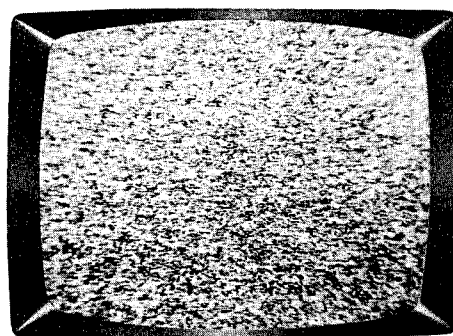


Fig. 9

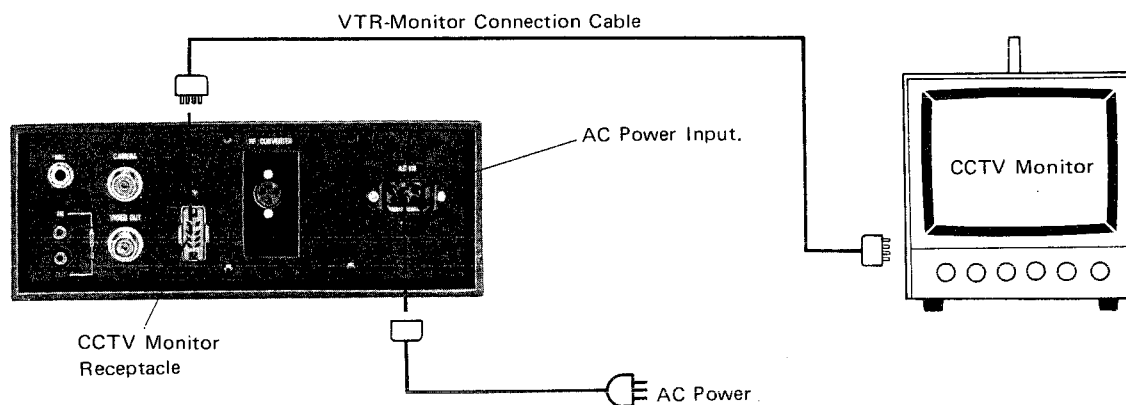


Fig. 10

I. AUTOMATIC RECORDING

1. Slide both Auto/Manual Video Level Selector (25) and Auto/Manual Audio Level Selector (26) to the AUTO side.
2. Turn the Function Lever (15) to the PLAY position while holding the Record Button (13) down. (Fig. 11) The Automatic Audio Recording Indicator Lamp (5) and the Automatic Video Recording Indicator Lamp (6) will light up (Fig. 12), which means both audio and video recording levels are adjusted automatically. At the same time, the tape starts running, and audio/video recording begins.

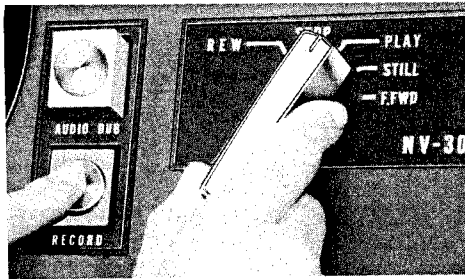


Fig. 11

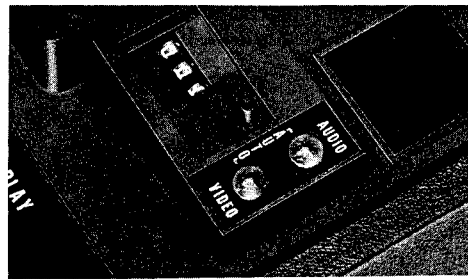


Fig. 12

II. MANUAL RECORDING

1. Slide both Auto/Manual Video Level Selector (25) and Auto/Manual Audio Level Selector (26) to the MANUAL side.
2. Press the Record Button (13).
3. Adjust video recording level by turning the Video Recording Level Controller (29) (Fig. 13). To get the best video recording level, stop turning the controller right before a striped pattern appears on the screen. (Fig. 14).
4. Adjust audio recording level by turning the Audio Recording Level Controller (30) (Fig. 13). The needle of the Audio Level Meter (11) should peak just below the red zone. (Fig. 15)
5. Hold the Record Button (13) down, and turn the Function Lever (15) to the PLAY position (Fig. 11). Then the tape starts running, and audio/video recording begins.

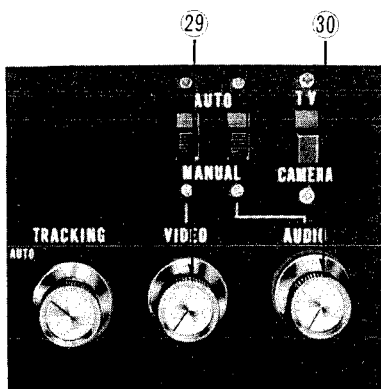


Fig. 13



Fig. 14

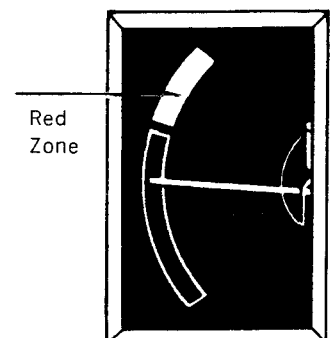


Fig. 15

RECORDING FROM NATIONAL CCTV CAMERA

1. Connect the recorder, the CCTV camera and the CCTV monitor as shown in Fig. 16.
2. Turn on the recorder, and the Pilot Lamp in the Audio Level Meter ⑪ will light up.
3. Slide the TV/Camera Selector ⑳ to the CAMERA side.
4. Turn on the monitor and set the TV/VTR selector on the monitor at VTR.
5. For simultaneous audio recording, connect a microphone to the Mic Input Jack ⑫, or an audio tape recorder or a record player to the Audio Input Jack ⑬.
6. Then proceed as instructed in I or II on page 10 according to the method of recording.

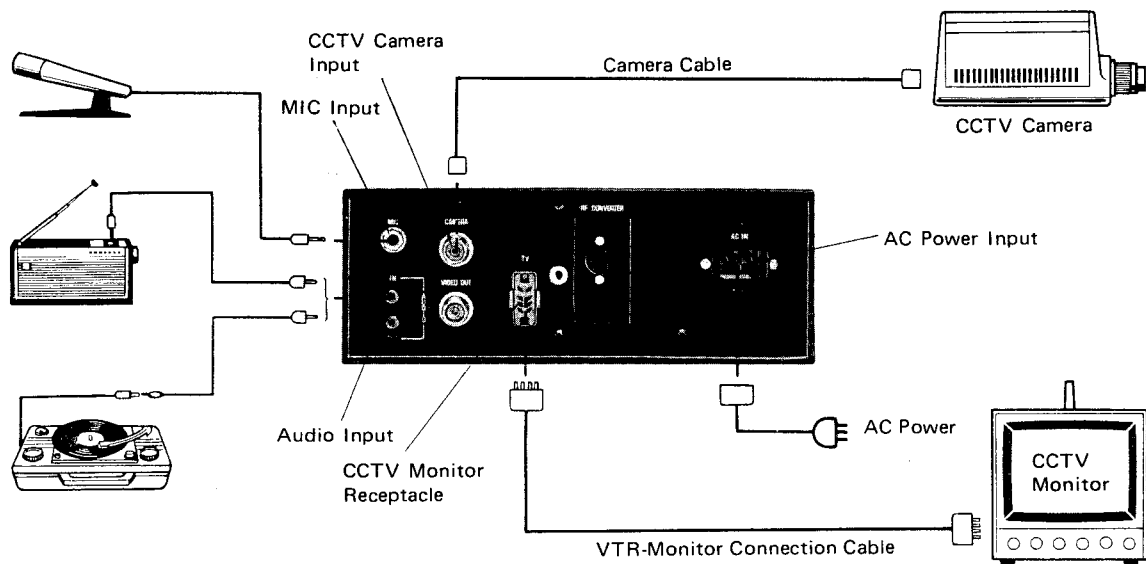


Fig. 16

PLAYBACK

PLAYBACK ON NATIONAL CCTV MONITOR

1. Connect the NATIONAL CCTV monitor with the recorder by means of the VTR-Monitor connection cable provided. This provides for both video and audio signals in recording and playback.
2. Set the TV/VTR selector on the monitor at the VTR position.
3. Rewind the tape to the beginning and turn the Function Lever ⑮ to the PLAY position.
4. Adjust the picture with the Tracking Controller ⑳ and the Skew Control Lever ⑨ if necessary. See page 12.
5. Adjust the picture and sound on the monitor.

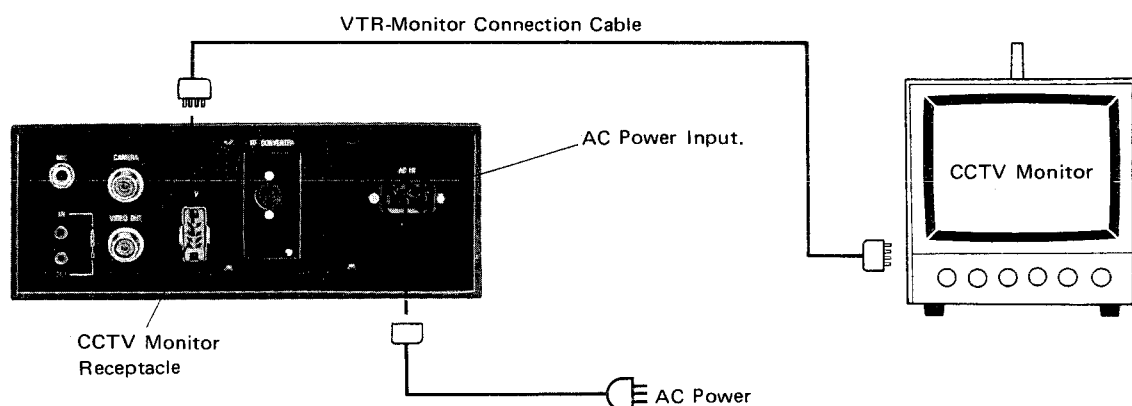


Fig. 17

PLAYBACK ON REGULAR TELEVISION

The NATIONAL NV-3020E video tape recorder has an output receptacle for the NATIONAL radio frequency converter (an optional accessory). The RF converter enables a regular television to work as a monitor television as well as a regular television receiver.

1. Plug the converter into the RF Converter Receptacle ⑱ on the recorder.
2. Connect the switch box with the RF converter, the regular television and the external antenna as shown in Fig. 18.
3. Set the switch on the switch box at VTR when playing back a tape. Set it at ANT when receiving a regular television broadcasting.
4. Turn the channel selector on the television to the same channel as the RF converter. The RF converter is designed to be used on a channel which is not used for a regular television broadcasting.
5. Play back the tape.
6. For further instructions, read the instruction book for the RF converter.

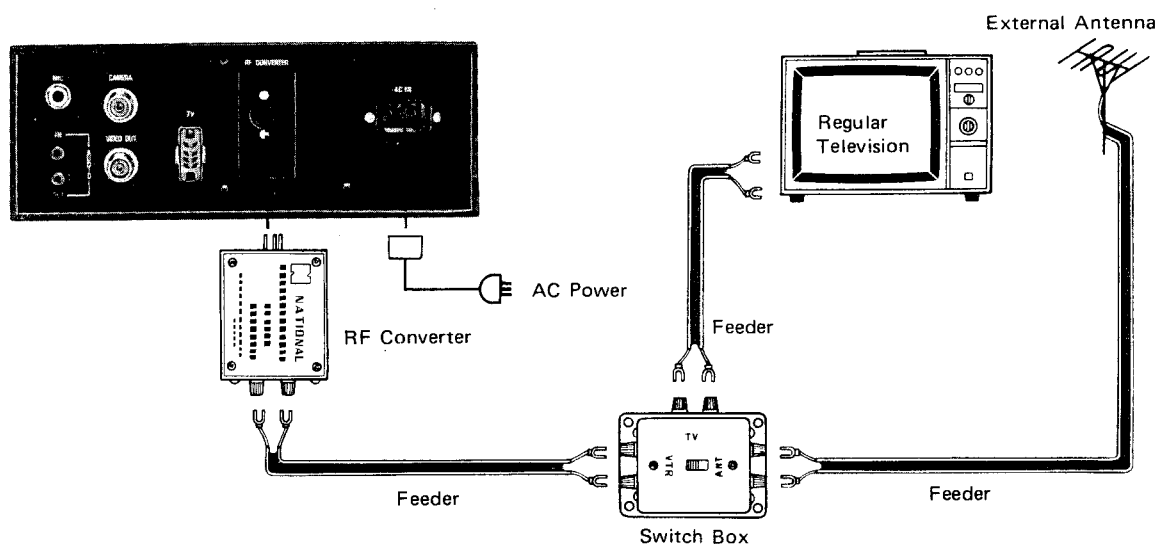


Fig. 18

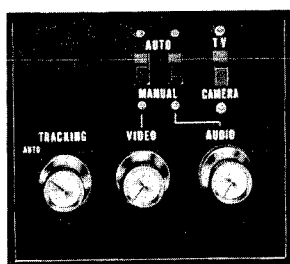
TRACKING CONTROL ③①

1. Turn this controller to the AUTO position when playing back the tape recorded on this unit (Fig. 19).
2. When noise appears in the picture (Fig. 20), turn this controller to remove it. This may be required when playing back the tape recorded on another recorder of CCIR/EIAJ Standard 1/2" format.

SKREW CONTROL ⑨

When the upper portion of the playback image is pulled or bent leftwards as illustrated in Fig. 22, move the Skew Control Lever towards the RIGHT marking on the panel to eliminate the distortion. Move the lever slowly towards the LEFT marking when the image is bent rightwards.

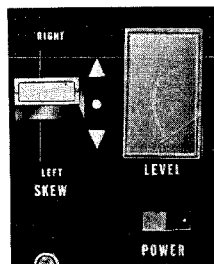
* These phenomena sometimes happen at the beginning and the last portion of the tape due to the difference in tape tension.



Tracking Controller
Fig. 19



Fig. 20



Skew Controller
Fig. 21

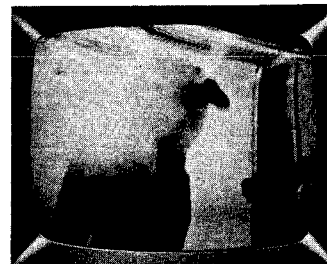


Fig. 22

STILL

1. To reproduce still images, turn the Function Lever ⑮ to the STILL position (Fig. 23).
2. When the still image has a noise shown in Fig. 24, lessen it by turning the Take-up Reel ② slowly with your hand.

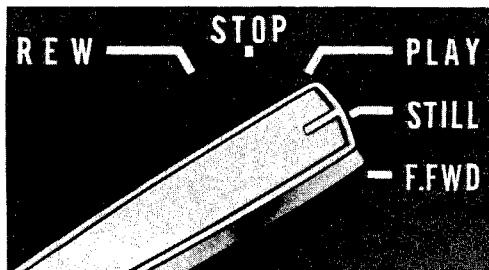


Fig. 23

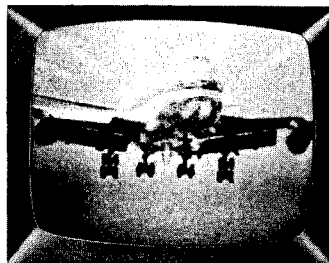


Fig. 24

AUDIO DUBBING

Audio dubbing is to make another recording on the recorded tape to replace the previous recording.

1. Connect audio recording source(s) as shown in Fig. 26.
2. Slide the TV/Camera Selector ⑳ to the CAMERA side.
3. Adjust the audio recording level with the Audio Recording Level Controller ㉑. Or slide the Auto/Manual Audio Level Selector ㉒ to the AUTO side for automatic recording.
4. Play back the tape and press the Audio Dubbing Button ⑭ when you wish to record sound while monitoring playback pictures (Fig. 25).
5. Turn the Function Lever ⑮ to the STOP position to finish audio dubbing.

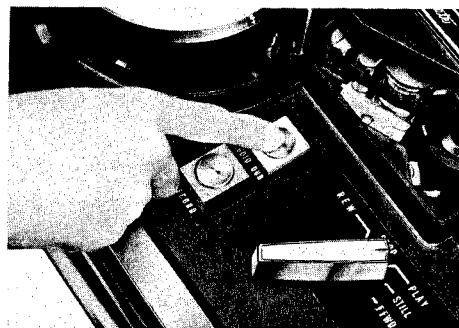


Fig. 25

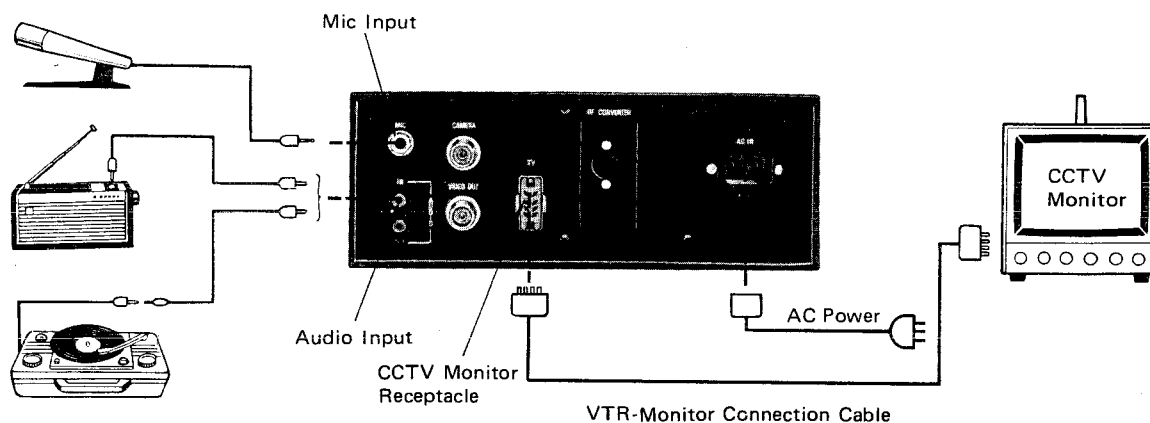


Fig. 26

AUDIO PLAYBACK THROUGH SEPARATE AMPLIFIER

Connect Audio Output Jack ②① with the amplifier.

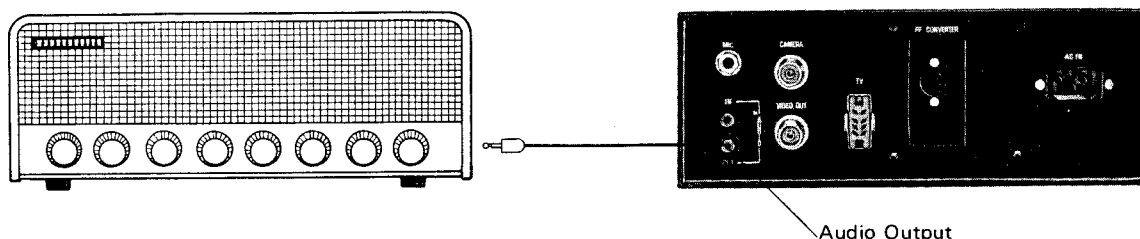


Fig. 27

PLAYBACK ON TWO OR THREE TELEVISION SETS

To play back on two CCTV monitors, connect one monitor with the Video Output Receptacle ②② and the Audio Output Jack ②①, and the other monitor with the CCTV Monitor Receptacle ②③.

To play back on three television sets, add a regular television by means of the RF converter. (See page 12)

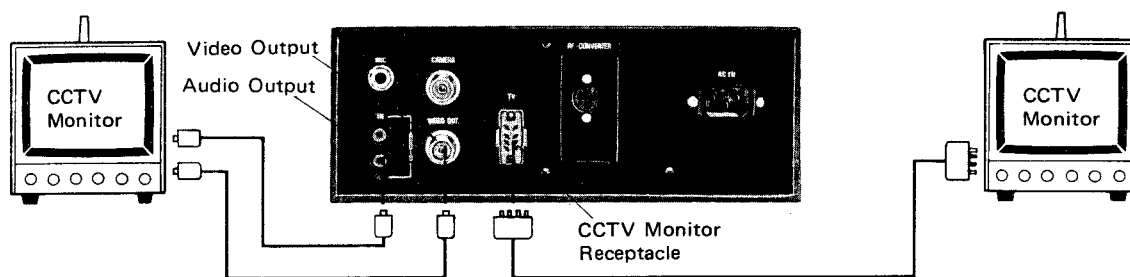


Fig. 28

HOW TO SPLICE TAPE

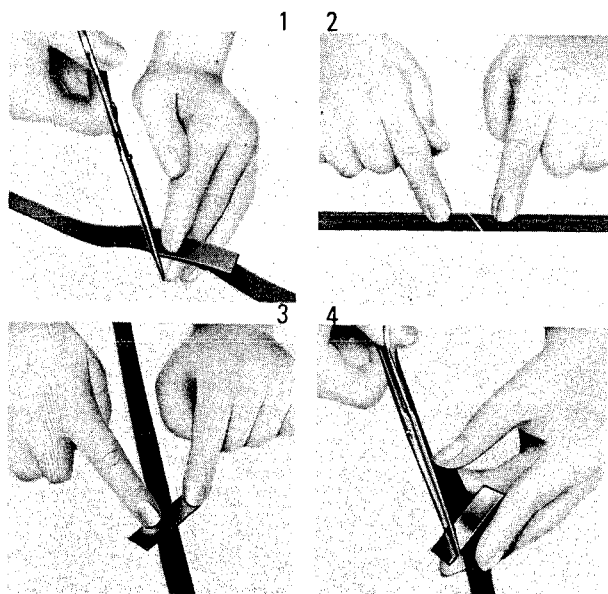


Fig. 29

Although magnetic video recording tape is durable, it can be broken or torn. When this happens, it is simple to fix.

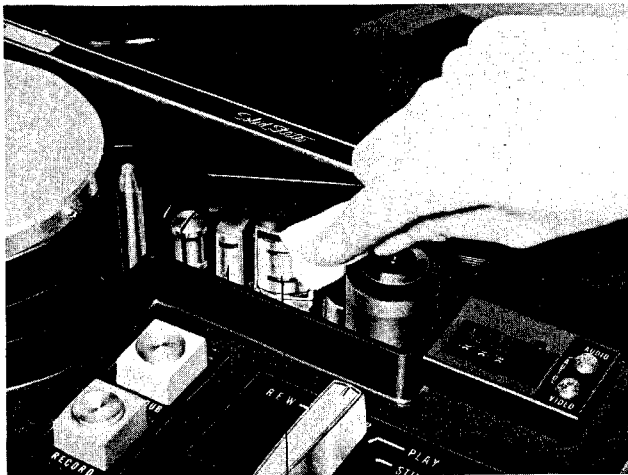
1. Overlap the ends of the broken tape and cut.
2. Put the cut ends of the tape together on a flat surface, with the inside (dull side) of the tape facing down.
3. Connect the two ends together with a piece of splicing tape.
4. Trim the splicing tape even with the edge of the recording tape, cutting very slightly into the tape.

CAUTION: USE ONLY NATIONAL VIDEO SPLICING TAPE (PART NO. VFSI). DO NOT use ordinary cellulose tape. It may severely damage the rotary heads.

MAINTENANCE

HEAD CLEANING

Clean the erasing heads and the audio/control heads periodically. Dirty heads may damage the tape and cause troubles with recording and playback. Use soft cloth moistened with commercial freon head cleaner only.



Audio Dubbing
Erasing Head

Audio Control Head

Fig. 30

LUBRICATION

NATIONAL VTR mechanism needs oiling periodically. Be sure to oil the following parts **every five hundred hours** of usage.

1. Take-up Idlers
2. Capstan Shaft
3. Tape Roller Shafts
4. Take-up Reel Pulley
5. Supply Turn Table Assembly
6. Levers, Rods, Arms, etc.

Please contact authorized NATIONAL Servicenter when oiling is required.

CAUTION: All surfaces which come in contact with tape and all rubber parts must be kept clean and free from oil.

WHEN NOT IN USE FOR LONG PERIOD

When you do not use the video tape recorder and the tape for a long while, note the following.

VIDEO TAPE RECORDER

1. Avoid an extremely hot or cold place.
2. Do not leave the unit outdoors.
3. See to it that the function lever be placed in the STOP position.
4. Put the cover.
5. Take out the tape and keep it separately.

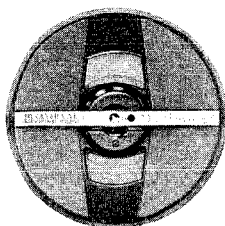
VIDEO TAPE

1. Put the tape in a sealed plastic bag, and put it in the attached plastic case.
2. Avoid an extremely hot, cold, or damp place.
3. Keep the tape away from magnetic material.

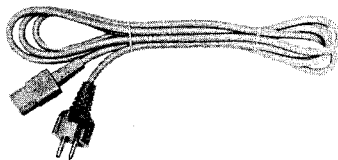
SPECIFICATIONS NV-3020E (SUBJECT TO CHANGE WITHOUT NOTICE)

Power Source:	NV-3020E1, 220V/50Hz. NV-3020E2, E3, 240V/50Hz. NV-3020E4, 200V/50Hz
Power Consumption:	Approx. 60 Watts
Video Recording System:	2 rotary heads, CCIR/EIAJ: standards (625 lines, 50 fields)
Video Modulation System:	Both sideband FM
Tape Speed:	16.322 cm/sec. (6-27/64 i.p.s)
Reel Size:	7 inches
Tape Width:	1/2 inch (12.7mm)
Heads:	Video: 2 rotary heads Audio/Control: 1 stationary Erase: 1 full track Erase: 1 for audio dubbing
Recording Time:	70 min. with NV-P71 (2,400 ft.)
Horizontal Resolution:	More than 300 lines (on monoscope test pattern)
Active Elements:	Fully transistorized
Frequency Response:	Video: Greater than 2.5 MHz Audio: 80 ~ 10,000 Hz
Signal-to-Noise Ratio:	Video: Better than 40 db Audio: Better than 40 db
Input Level:	Video: 1.0Vp-p Audio: MIC. 0.001 V (−60 db) AUX. 0.1 V (−20 db)
Input Impedance:	Video: 75Ω unbalanced Audio: MIC. 10kΩ unbalanced AUX. 1MΩ unbalanced
Output Level:	Video: 1.0 Vp-p (0 db) Audio: 0.1 V (−20 db)
Output Impedance:	Video: 75Ω unbalanced Audio: 600Ω unbalanced
Dimensions:	402 (W) x 374 (D) x 250 (H) mm
Weight:	17.5 kg

STANDARD ACCESSORIES



7" Empty Reel
NV-R71



AC Power Cord
VJA 24



VTR-Monitor Connection Cable
NV-C15



Splicing Tape
VFS1



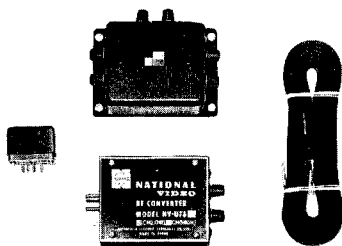
Head Cleaner
VFK27

OPITIONAL EQUIPMENTS



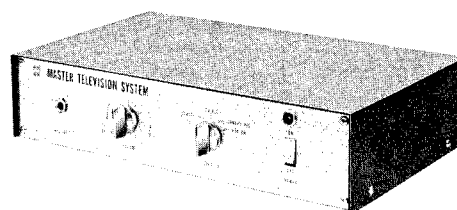
Video Tape

NV-P71 (2,400 ft)
NV-P72 (1,200 ft)
NV-P73 (600 ft)



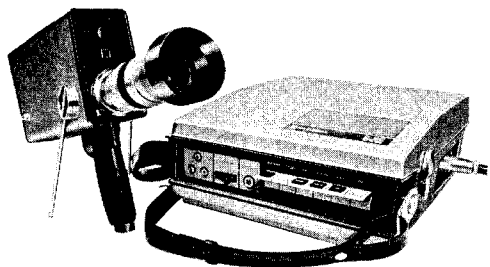
RF Converter

NV-U76(S), (Swedish channels 3 & 4)
NV-U76(I), (Italian channels A & B)
NV-U76(A), (Australian channels 4 & 5)



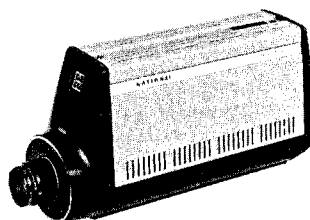
Master Television Adaptor

VY-908N



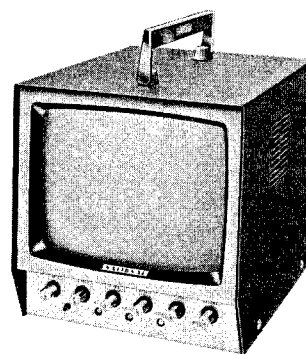
1/2" Portable VTR & CAMERA

NV-3082 & WV-82



CCTV Camera

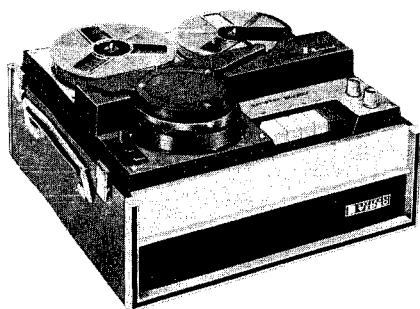
WV-240N



B/W High Resolution

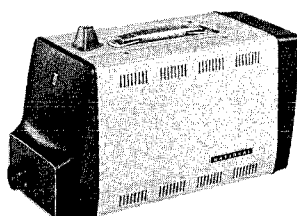
CCTV Monitor

TN-95E



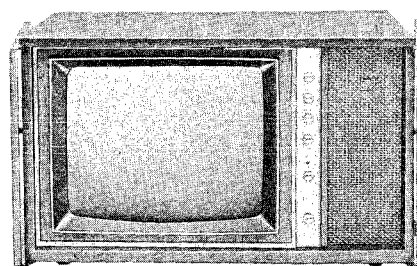
1/2" B/W Time Lapse VTR

NV-1070E



6" View Finder Camera

WV-360N



B/W CCTV Monitor

TN-202E