

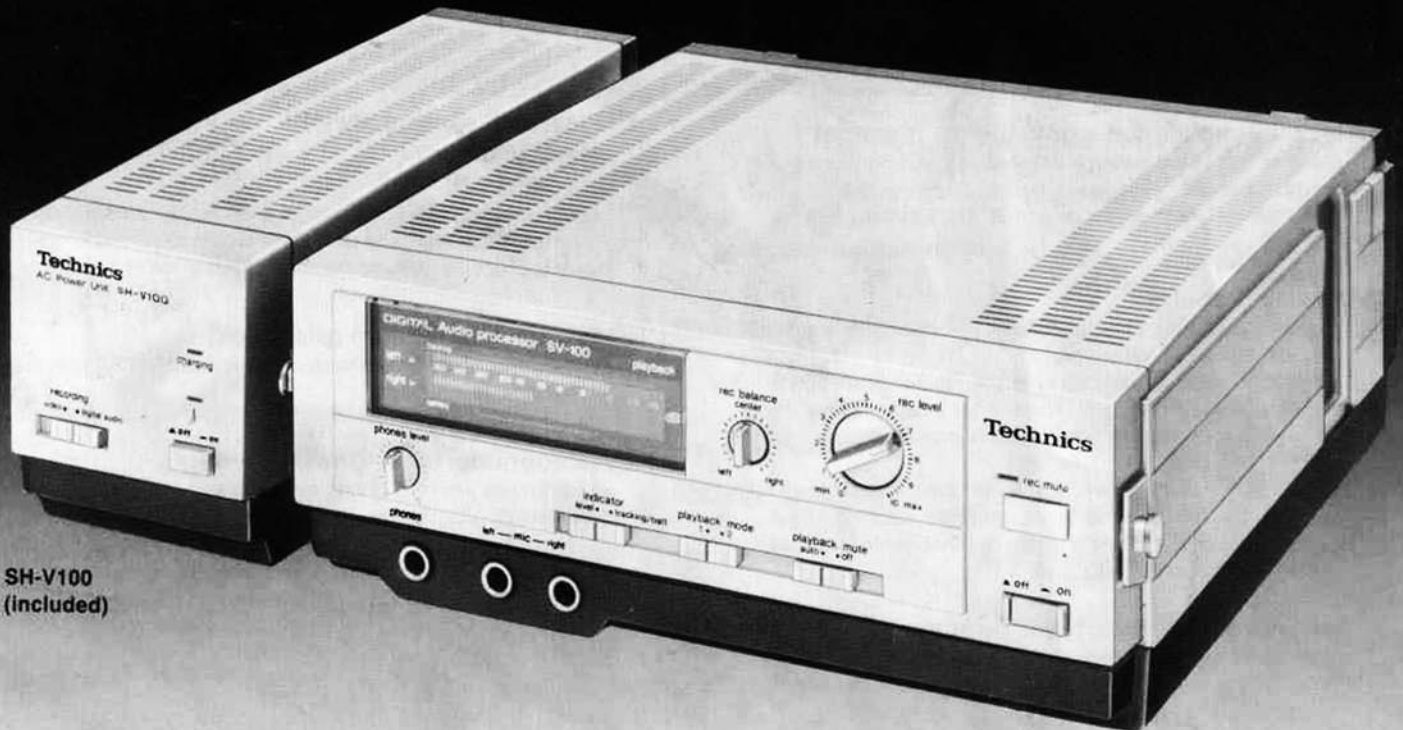
Technics

Digital Audio Processor

SV-100

Operating Instructions

DIGITAL



SH-V100
(included)

SV-100

Caution

For PCM recording and playback, this unit must be used together with a VCR.

The VCR must be of the NTSC format.

PCM recording and playback are not possible if this unit is used with a PAL/SECAM format VCR, the main type used in Europe.

“Warning: To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.”

Before operating this product, please read these instructions completely.

Thank you for choosing the SV-100.
 For optimum performance and safety, please read
 these instructions carefully.

Dear Stereo Fan

Technics. The science of sound. Our name represents
 over 100 high quality audio products, in every price
 range.

From our revolutionary direct drive turntables to our
 highly acclaimed linear phase speakers, Technics quality
 and value have become almost legendary among
 audio enthusiasts.



Our truly complete selection of turntables (including
 belt-drive, direct-drive, and quartz-locked models with
 varying degrees of automation) now includes an exciting
 line of linear tracking turntables with zero tracking error.
 Another innovation, direct drive cassette decks, in
 available in both slim and micro formats. In fact, with
 Technics micro series, you can assemble an entire
 system of the highest quality with truly compact dimensions.
 And our receivers, which combine new class A
 amplification with quartz synthesizer tuning, have created
 tremendous excitement among reviewers and
 customers alike.

Amplifiers, tuners, headphones, microphones, car-
 tridges, openreel decks, sound processors—we are
 proud of all our high quality equipment and we are
 constantly seeking to improve our products, in terms of
 performance and handling ease. In addition, our confidence
 in the reliability of our merchandise (demonstrated by our
 warranties) and the reasons for our enormous and rapid
 growth become obvious.

The model number and the serial number of this product may
 be found on the bottom of the unit. Please note the model and
 serial numbers of this unit in the space provided and retain this
 booklet as a permanent record of your purchase to aid
 identification in the event of theft.

MODEL NUMBER SV-100

SERIAL NUMBER

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
<p>CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE SCREWS. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.</p>		



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

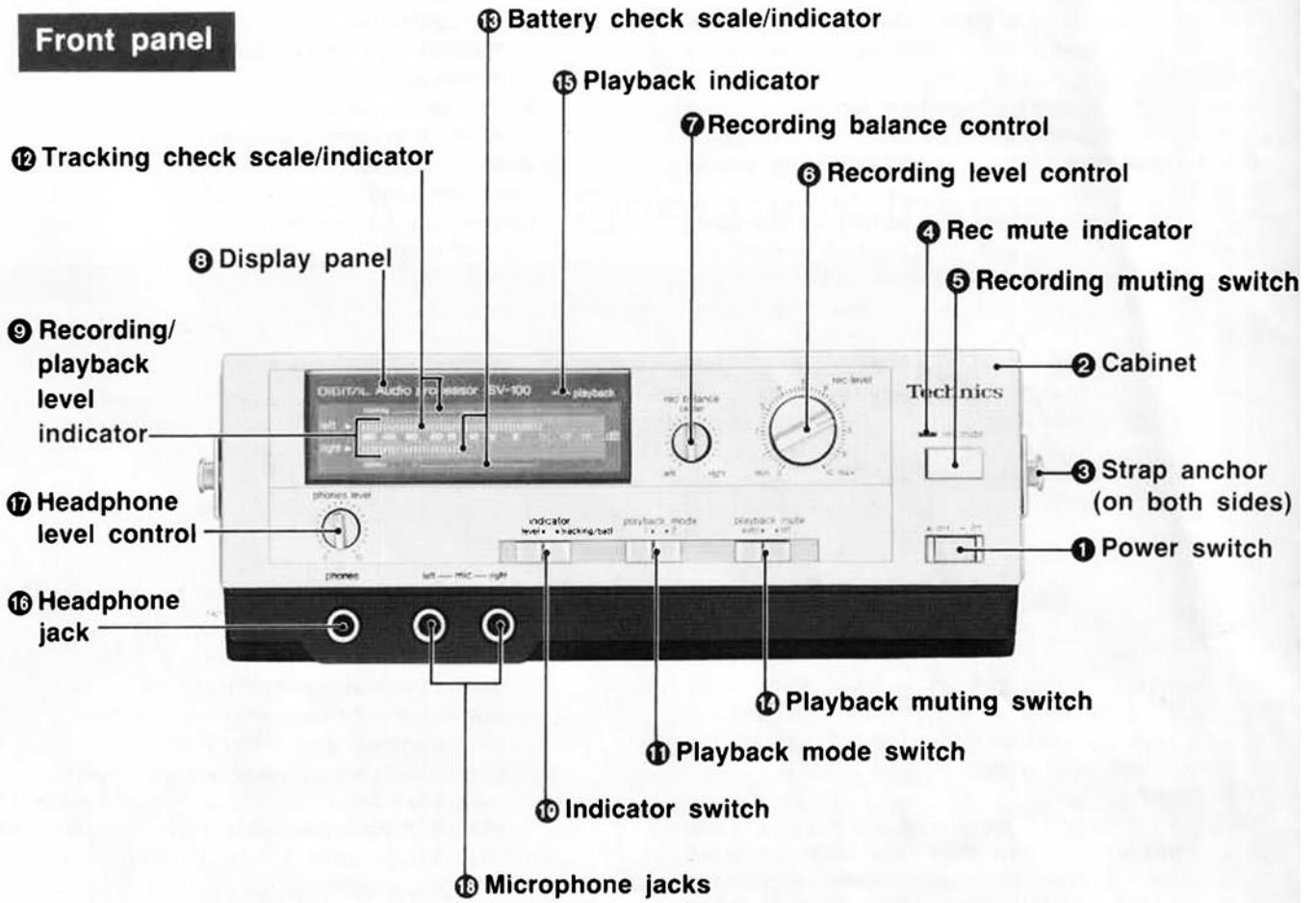
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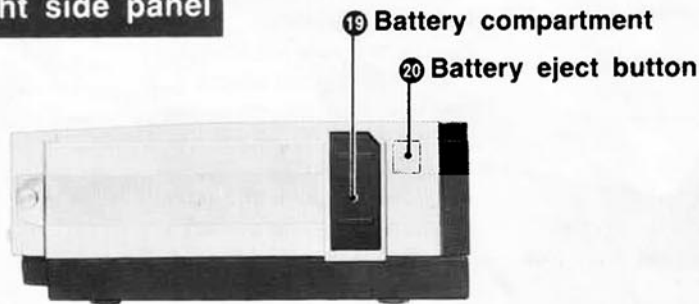
Nomenclature

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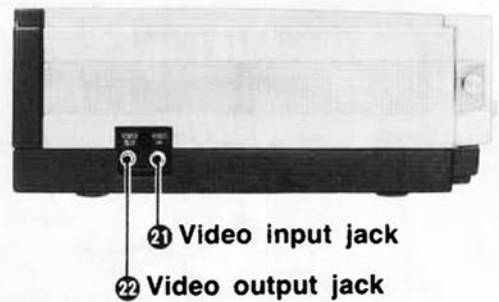
Front panel



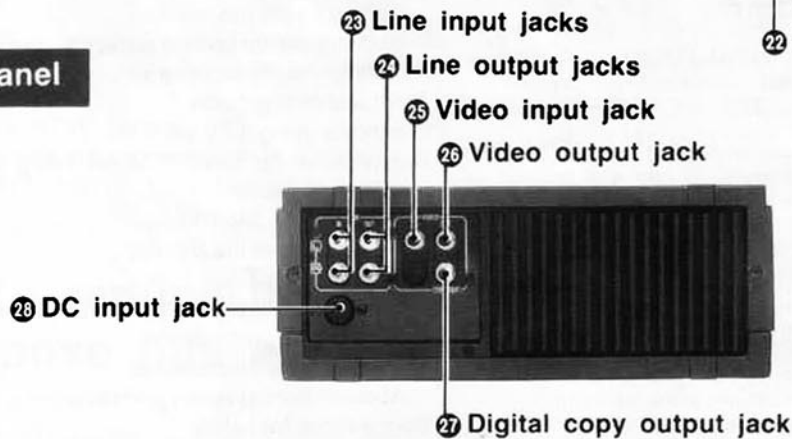
Right side panel



Left side panel



Rear panel



Nomenclature and functions

Front panel

1 Power switch (off on)

- Press once to turn on; press again to turn off.
- The recording/playback level indicator 9 in the display panel lights up when the power is turned on.

2 Cabinet

3 Strap anchor (both sides)

- Supplied shoulder strap attaches to these anchors.

4 Rec mute indicator

- This lights up (to indicate that a no-signal area is being recorded) while recording muting switch 5 is depressed.

5 Recording muting switch (rec mute)

- Press when you want to record a blank space on the tape.
- Recording muting (no-signal recording) only takes place as long as this switch is kept depressed during recording.

6 Recording level control (rec level)

- Use to adjust recording level.

7 Recording balance control (rec balance)

- Used to adjust the balance between left and right channel recording level.
- The "center" click-stop position is the standard setting.

8 Display Panel

- Depending on operating condition, the display gives the following kinds of indication.

When the indicator switch 10 is at the "level" position, the display shows recording/playback level indicator 9 for the left and right channels. The playback indicator 15 lights up during playback.

When this indicator switch 10 is at the "tracking/batt" position, the left channel scale provides tracking check scale/indicator 12, while the right channel scale provides battery check scale/indicator 13.

9 Recording/playback level indicator

- This shows recording level during recording, and playback level during playback. Indication is of peak level (not average or VU level).
- Indication range extends from -50 dB to +6 dB for each channel. Indication changes to orange color above 0 dB.
- Besides instantaneous peak level indication, there is an extra cursor (for each channel) showing the highest peak reached in each 2-second period. This "peak hold" indication makes it easier to set recording level accurately.
- During recording, this indicator shows signal level right before PCM (analog-to-digital) conversion. During playback, it shows level right after conversion back to an analog signal.

10 Indicator switch

(indicator
level ■ ■ tracking/batt)

- Used to change display function.

11 Playback mode switch

(playback mode
1 ■ ■ 2)

- Used to select the demodulation mode that best matches the playback signal characteristics of the VCR being used.

12 Tracking check scale/indicator (tracking)

- Shows VCR tracking condition during playback.
- When the indicator switch 10 is at the "tracking/batt" position, the display shows tracking level in the left channel section.

13 Battery check scale/indicator (battery)

- Shows battery pack power depletion.

14 Playback muting switch

(playback/mute
auto ■ ■ off)

- For normal playback, this switch is left at the "auto" position so that it automatically mutes the signal to minimize noise when dropouts (dirt or damage) appear on the tape.

15 Playback indicator (playback)

- This lights up when the system (VCR and SV-100) is in the playback mode.

16 Headphone jack (phones)

- For private listening during playback and monitoring during recording, plug stereo headphones into this jack.

When listening to music with stereo headphones, remember to keep the volume level down since prolonged listening at a high volume level can affect your hearing.

17 Headphone level control (phones level)

- Use to adjust headphone volume.

18 Microphone jacks (left-mic-right)

- Plug microphones into these jacks for live recording.

Right side panel

19 Battery compartment

- The optional battery pack (LCS-2012P) is inserted into this compartment.

20 Battery eject button (BATT EJECT)

- Press to release battery pack.
When this button is pressed, the battery pops out slightly so that it can be easily removed.

Left side panel

21 Video input jack (VIDEO IN)

- Connect to VCR's video output jack.
For convenience, there is also a video input jack on the rear panel.

22 Video output jack (VIDEO OUT)

- Connect VCR's video input jack.
For convenience, there is also a video output jack on the rear panel.

Rear panel

23 Line input jacks (LINE IN)

- These are the audio input jacks for PCM recording.
- Connect to the REC OUT or LINE OUT jacks of your amplifier (or receiver).

24 Line output jacks (LINE OUT)

- These are the audio output jacks for PCM playback.
- Connect to the PLAYBACK, LINE IN, or AUX jacks of your amplifier (or receiver).

25 Video input jack (VIDEO IN)

- Input jack for video signal used for PCM reproduction.
- Connect to VCR VIDEO OUT jack.

26 Video output jack (VIDEO OUT)

- Output jack for video signal used for PCM recording.
- Connect to VCR VIDEO IN jack.

27 Digital copy output jack (COPY OUT)

- PCM video signal output jack for digital dubbing (copying).
- To make a digital copy, connect the supplied video cord from this jack to the video input jack of the VCR that you will use for recording.

28 DC input jack (DC IN 12 V)

- Connect supplied AC adaptor (SH-V100) output cord to this jack.
- Also use this jack for connection of the car battery cord (PV-C34; optional).

Power Supply

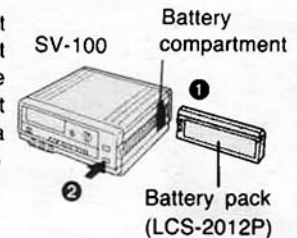
As a portable unit that can be used indoors, outdoors, or in a car, the SV-100 has a 3-way power supply. Please select the appropriate power supply for each application.

1. For outdoor use

■ Obtain the optional battery pack (LCS-2012P)

■ Inserting the battery pack

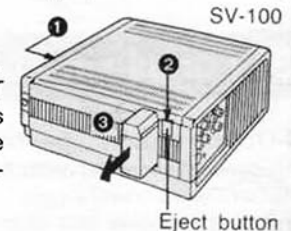
- 1 With the battery pack the right way up and facing the right direction, insert it into the battery compartment. (Push it in all the way so you hear a click as it locks into place.)
- 2 Turn on the SV-100 power.



CAUTION: Use only the battery pack Panasonic LCS-2012P.

■ Removing the battery pack

- 1 Turn off the SV-100 power.
- 2 Press the battery eject (BATT EJECT) button; this releases the battery pack so that the end protrudes from the compartment.
- 3 Remove the battery pack.
Recharge the battery pack before using it again.



Battery pack precautions

■ Recharge the battery pack after use; for dependable operation, be sure that the battery pack is recharged before use.

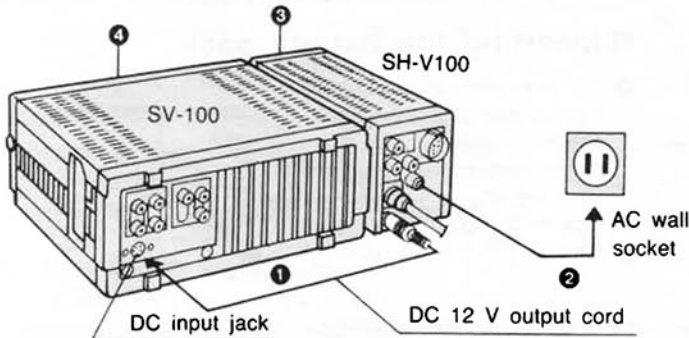
- A completely recharged battery pack will provide about one hour of continuous operation at normal 77°F (25°C) temperature.
- Operating time is shorter at lower temperatures.
- If not using the battery pack for extended periods, nevertheless be sure to recharge it once every six months.
- After use, be sure to turn off the SV-100 power.
- If not using the SV-100 for an extended period of time, remove the battery pack and store it in a cool, dark place.
- This battery pack (LCS-2012P) is exclusively for the SV-100 and PV-5000; do not use it with other units.
- To avoid danger, please note the following precautions:
 - Never put the battery pack in a fire or incinerator.
 - Never connect (short circuit) the + and - battery terminals.
 - To prevent damage or degraded performance, note the following precautions:
 - Do not drop the battery pack or subject it to physical shock.
 - Do not use it in other equipment.
 - Do not use it if ambient temperature is 14°F (-10°C) or less or 104°F (+40°C) or more.
- At high temperatures, the protection mechanism may prevent operation.
- If the battery pack is ever broken open and electrolyte contacts skin or clothing, Flush immediately with water.

2. Indoor use

■ Use supplied AC power unit (SH-V100)

Turn off the power switches on SV-100 and AC power unit.

- 1 Line up the AC power unit's DC 12 V output cord plug with the SV-100 DC input jack (DC IN 12 V) and insert firmly.
- 2 Plug AC power unit into AC wall socket.
- 3 Turn on AC power unit's power switch.
- 4 Turn on SV-100's power switch.



Car battery cord precautions

● Use only in cars having 12 V battery with negative (-) ground.,
Never use in cars having DC 24 V battery or positive (+) ground.

● Always start engine before connecting battery cord.
Engine may not start if connection is made while engine is not running.

● During use, leave the engine idling.

Recording or playback may be interrupted or the SV-100 power may be cut off if headlights are turned on or brakes used during SV-100 operation. This results from SV-100 protection circuit operation. In such a case, turn off the SV-100 power switch, wait about 10 seconds, and then turn the power on again.

● If the battery cord is connected while a battery pack is in the SV-100, power will not be supplied from the battery pack.

● For safety, follow these steps, in numerical order, after you finish using the car battery cord.

1. First, turn off the SV-100 power switch.
2. Unplug the battery cord's 4-pin plug from the SV-100.
3. Finally, unplug the cord from the car cigarette lighter socket.

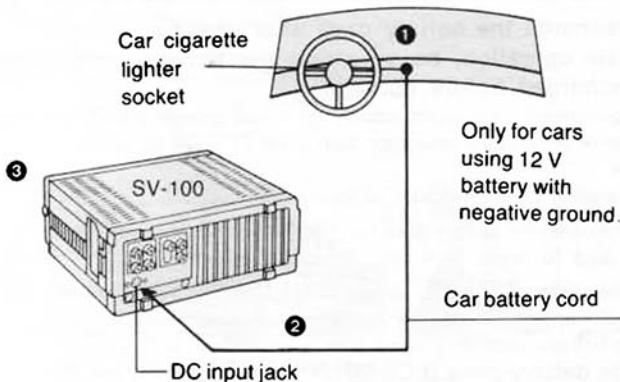
3. For use in a car

■ Obtain optional car battery cord (PV-C34)

(Proceed in numerical order listed below.)

Turn off SV-100 power switch.

- 1 Start car engine and plug cord into car cigarette lighter socket.
- 2 Insert car battery cord 4-pin plug into SV-100 DC input (DC IN 12 V) jack, being careful to align the plug and jack.
- 3 Turn on SV-100 power switch.



CAUTION: Use only the car battery cord Panasonic PV-C34.

Supplied AC power unit (SH-V100)

Nomenclature and functions

Besides functioning as the power supply for the SV-100, the AC power unit is also used to recharge battery packs and it has a switch for selection of PCM recording or video recording.

●Recording mode switch

- For PCM recording:
Set the switch to the "digital audio" position.
- For video recording:
Set the switch to the "video" position.
- For playback, it does not matter which position the switch is set to.

Charging indicator

This indicator lights up when a battery pack is being recharged. It goes out when recharging is completed.

Power indicator

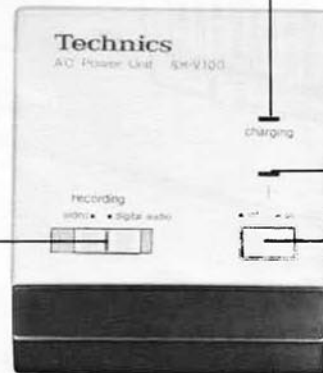
Lights up when power is on. Goes out when power is turned off.

Power Switch

Press to turn on; press again to turn off.

Note:

When the unit is not going to be used for a long period of time, turn off the AC power unit and SV-100 power switches and unplug the AC power cord (holding it by the plug, not the cord). If the unit is not unplugged, about 1.3 watts of power is used even when the power switch is off.



Video input jack [IN (SV-100)]

Connect to SV-100 video output (VIDEO OUT) jack.

Video output jack [OUT (VCR)]

If using a VCR other than the PV-5000, use the supplied video cord to connect this jack to the VCR's video input jack.

Video tuner input jack [IN (TUNER)]

If using a video tuner other than the PV-A200X or PV-A500, connect this jack to the tuner's video output jack.

Video tuner input jack [IN (TUNER)]

Connect PV-A200X or PV-A500 video output cable to this jack.

Video output cable [OUT (VCR)]

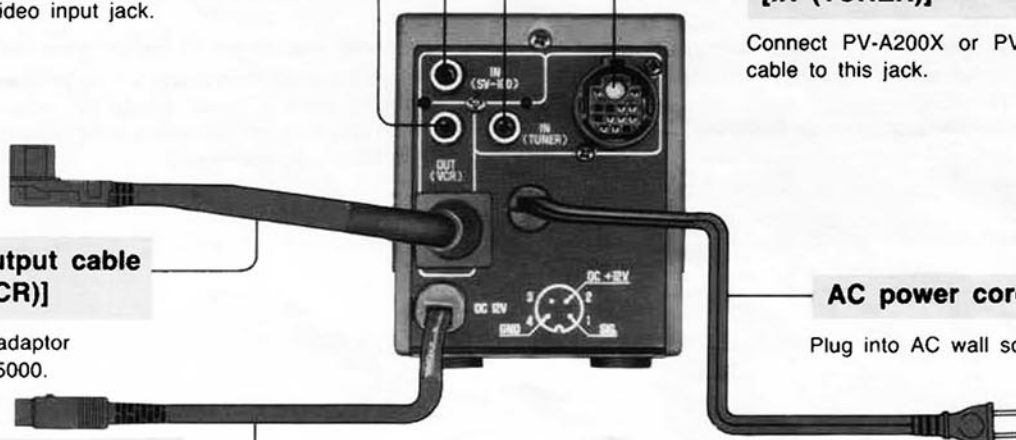
Connect to adaptor jack on PV-5000.

DC 12 V output cord

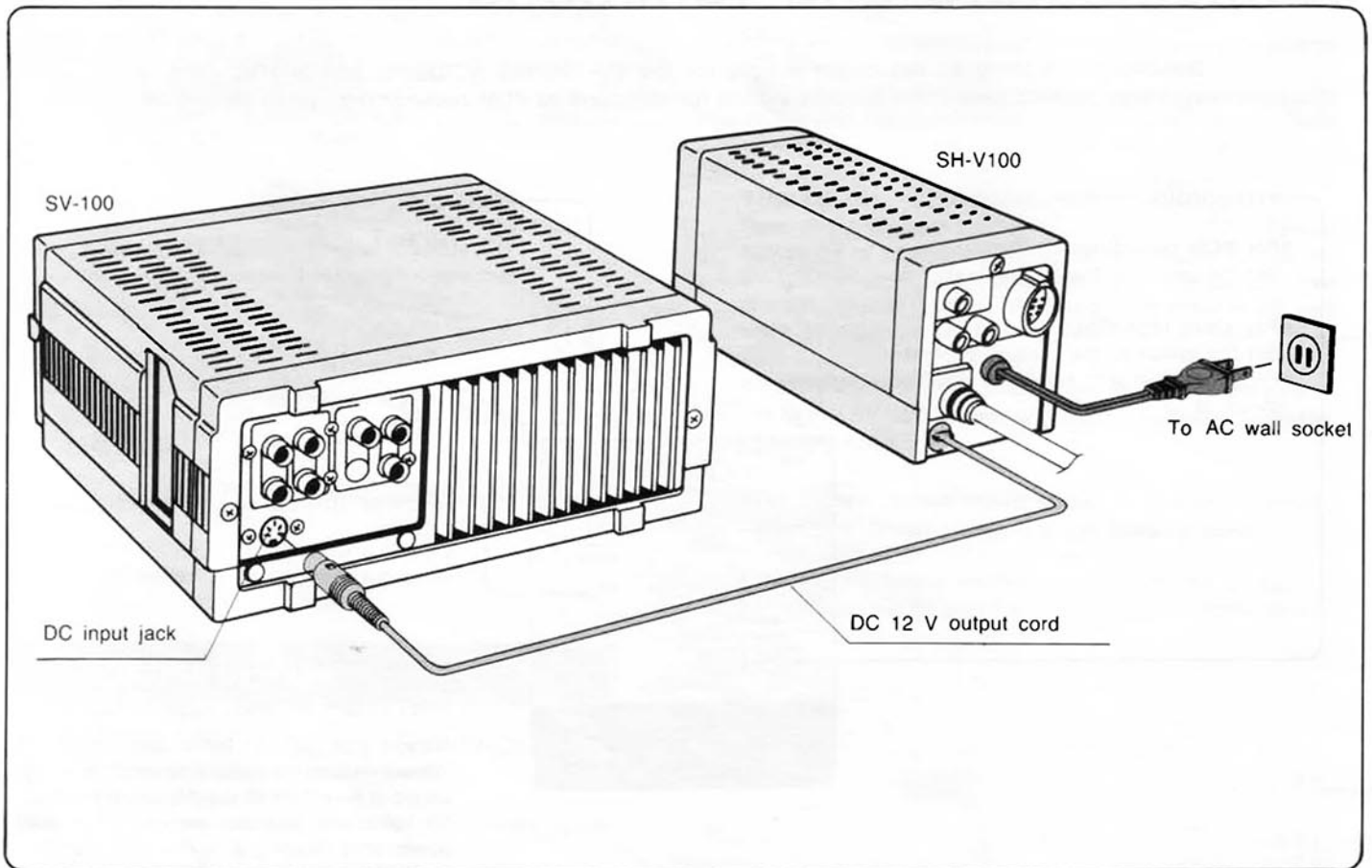
Connect to SV-100 DC input jack (DC IN 12 V).

AC power cord

Plug into AC wall socket.



Connections for use as power supply for SV-100



Caution

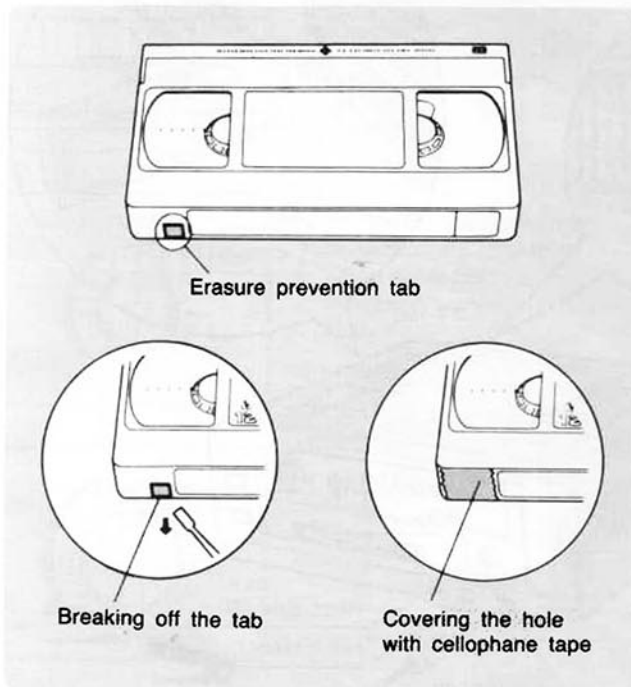
- Turn off power on all units before making connections.
- Do not use both the video output jack [OUT (VCR)] and the video output cable [OUT (VCR)] at the same time. Use one or the other.
- If a video tuner is connected to the video tuner input jack [IN (TUNER)], do not connect anything to the video tuner input jack [IN (TUNER)].
- "VCR" stands for "Video Cassette Recorder".

- This unit cannot be used as the power supply for the VCR (PV-5000). Use the VCR's own power supply unit (AC adaptor) or a video tuner (having VCR power supply function). (For details, refer to the VCR's operating instructions.)
- If this jack is used, then power will be supplied from the connected external power supply (AC adaptor or car battery) and not from the battery pack (assuming one is in the battery compartment).

Video Cassette precautions

• Avoiding erasure of valuable recordings . . .

- To protect valuable recordings from accidental erasure, break off the erasure prevention tab (using a screwdriver, etc.) located on the rear of the cassette shell.
After this tab has been broken off, the cassette cannot be recorded on; therefore, accidental erasure is prevented.
- When you do want to record on a tape that has had its erasure prevention tab broken off, cover the hole with a strip of cellophane tape.



Handling precautions

- There is a danger of moisture condensing on tape brought directly from a cool location into a warm location, as frequently happens when taken from outdoors to indoors. In such cases, the tape should be left for about two hours in the warm location before use. The tape will be damaged if it is used when condensation is present.
- Do not use a hair dryer or other appliance to dry out tape which has condensation on it.
- Do not open the front cover or touch the tape.
- Avoid dropping, banging, or otherwise causing physical shock to the cassette.
- Do not take apart the cassette; the inside contains a precision mechanism.
- The video cassette is usable in one direction only; it has only one side for recording and playback and it cannot be used upside down.

Storage precautions

- To protect the tape from dust, put the cassette in its case and store standing upright.
- Do not leave or store the cassette in the following kinds of places:

- 1) Near strong magnetic fields (speakers, television, transformers, motors, magnets, etc.)
- 2) Dusty or humid places.
- 3) In direct sunlight or places exposed directly to heat sources.
[Optimum tape storage conditions are said to be 50% humidity and 75°F (24°C)]
- 4) Never leave a cassette on a car's dashboard, in the glove compartment, on the rear deck, or near the rear window.

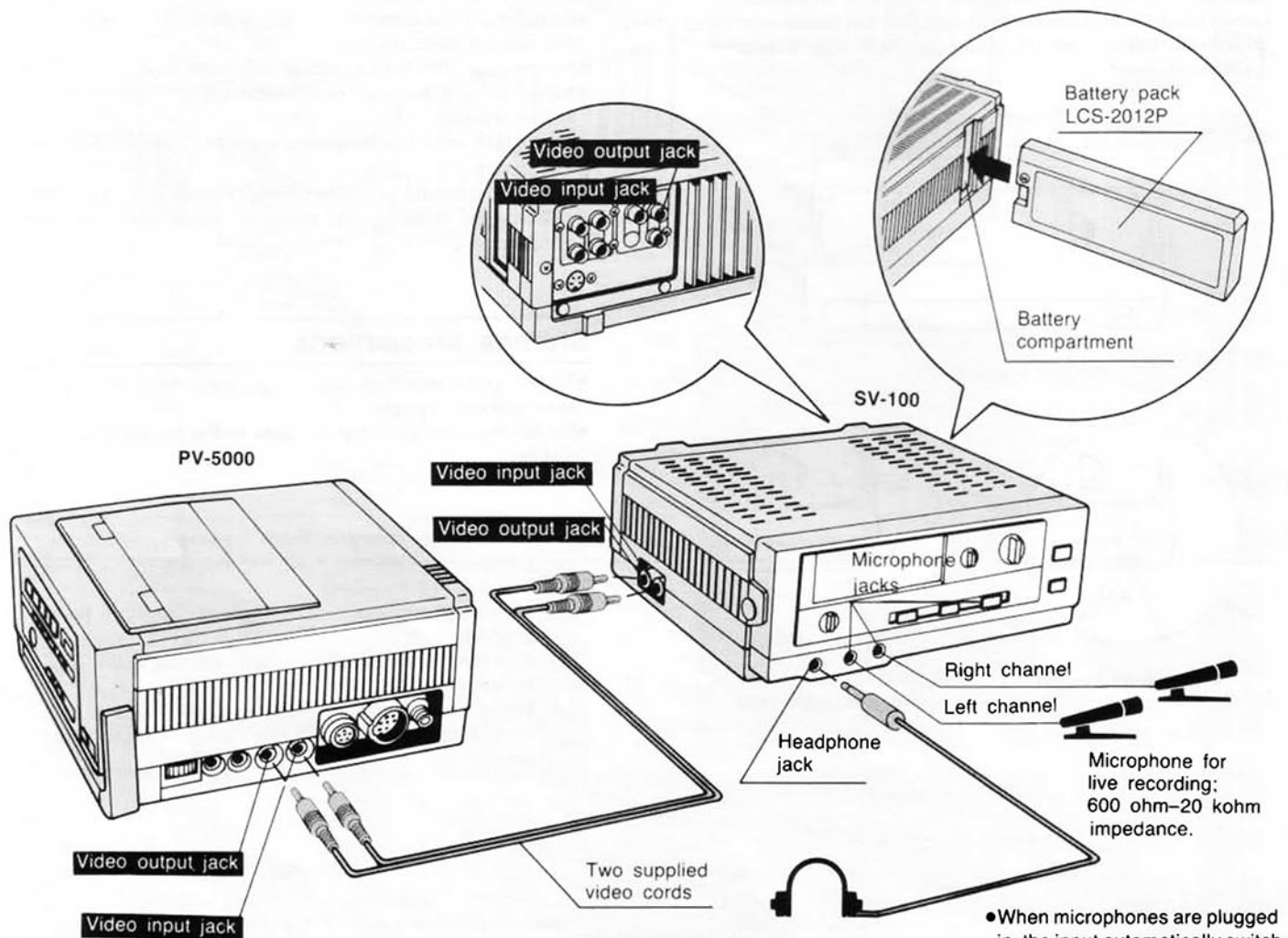
Connections and operation

Important notes:

- The following explanations apply to connections with the Panasonic PV-5000 VCR and PV-A200X video tuner.
- Be sure to turn off power on all units before making connections.

- Be sure to read the operating instructions for all units connected.
- With the exception of the SV-100 and SH-V100, all units shown in the diagrams are optional.
- Make sure your hands are dry when making connections.

1. Connections for outdoor use



- The headphone amp circuitry is designed to provide optimum volume for listening with typical headphones.
- However, volume may not be sufficient if you use headphones having an impedance of 100 ohms or more.

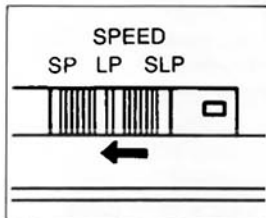
- When microphones are plugged in, the input automatically switches from line to microphone.
- For stereo recording, use two of the same microphones or use two microphones having the same performance characteristics.
- If only one of the jacks has a microphone plugged into it, then that channel will receive a microphone input, but the other channel will receive a line input. This is convenient for special situations such as mixing a live input with a recorded input from another source (mic mixing).

Caution

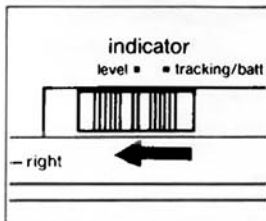
1. Always recharge the battery pack.
2. A battery pack must also be inserted in the PV-5000 VCR. Always turn off power before inserting battery pack.
3. Video input and video output (VIDEO IN; VIDEO OUT) jacks are located on both the side and rear panels of the SV-100. Use the jacks which are most convenient for your purposes. Do not use both sets of jacks at the same time.

Operation for live recording

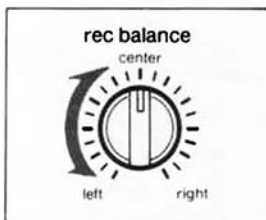
1. Turn on the SV-100 and PV-5000 power.



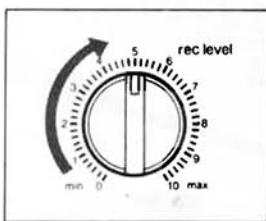
2. Put the VHS video cassette in the PV-5000. Set the PV-5000 video recording time switch to the "SP" position. Using the longer "LP" or "SLP" position is not recommended for optimum sound quality.



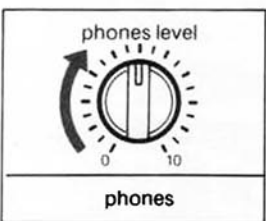
3. Set the SV-100 indicator switch to the "level" position.



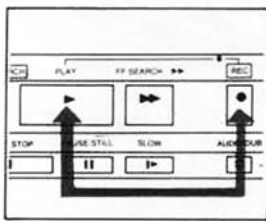
4. Use the SV-100 recording balance control knob to adjust stereo balance between left and right channels.



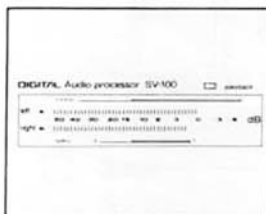
5. Adjust the SV-100 recording level.



6. Adjust the SV-100 headphone level control knob.



7. To begin recording, press the PV-5000 recording and playback buttons at the same time.



8. Check actual input signal level on recording/playback level indicator; use headphones to monitor sound.

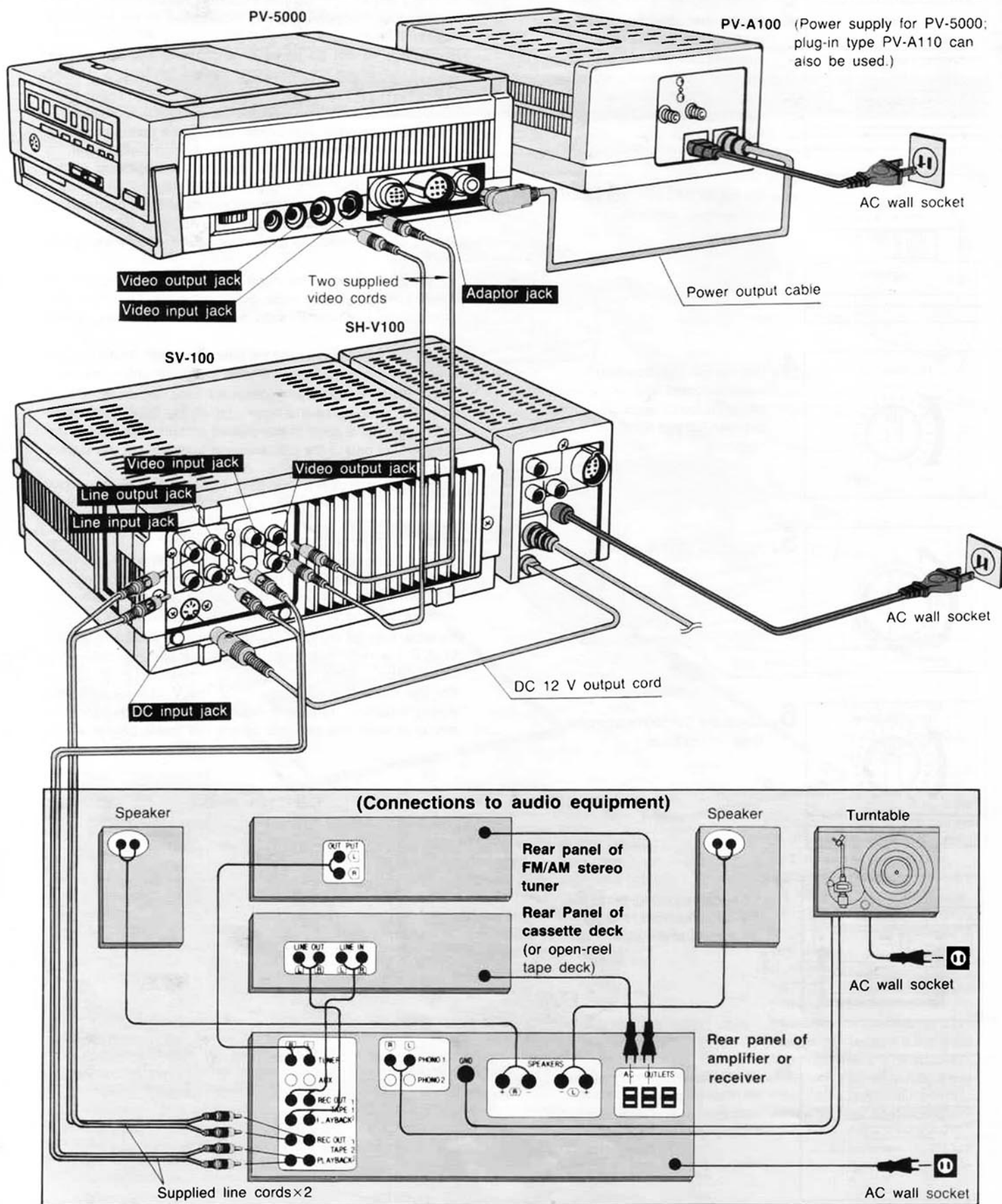
Important notes and cautions concerning recording:

- **Copyright** (concerning use of tape recordings): Other peoples works (audio or video) may be copied onto tape for one's private entertainment but may not be used for other purposes without permission as established by the applicable copyright laws.
- Recordings cannot be made on a cassette that has had its erasure prevention tab broken off (unless the hole is covered with cellophane tape).
- To avoid the possibility of missing a recording due to improper connections or other overlooked factors, we recommend that you make a test recording and play it back beforehand.
- To test playback, rewind the tape to the beginning of the recording and then press the PV-5000 play button. If the level indicators show playback level and you hear normal sound on the headphones, then everything is okay.
- Always use headphones to monitor sound when making live recordings.
- The very beginning of the video tape is prone to dropouts and creases that can cause noise during playback. Therefore, you should wind the tape forward a bit before beginning actual recording. The further forward you wind the tape, the better. As a rule, let it advance for one to three minutes in the recording mode.
- When using a previously recorded tape to make a new recording, first erase the beginning of the tape, then begin recording from a point in the erased portion. This avoids the possibility of part of the old recording appearing at the start of the new recording.
- Always set the VCR's recording time selector to the "SP" position. LP and SLP positions will not produce optimum sound quality.
- Since the very beginning of the cassette tape is prone to dropout noise caused by creasing and winding irregularities, wind the tape forward a bit before beginning recording. The further forward you wind the tape, the better. As a rule, let it advance for one to three minutes in the recording mode.
- To allow time for the tape speed to become stabilized, set the VCR in the recording mode at least five seconds before the music begins. For the same reason, if you press the VCR's pause button during recording, release it (so the VCR is in the recording mode) at least five seconds before the music begins again.

2. Connections for indoor recording and playback

Note:

- Diagram shows connections using optional PV-A100 AC adaptor used for PV-5000 power supply.
- Read each unit's operating instructions for details on connections.

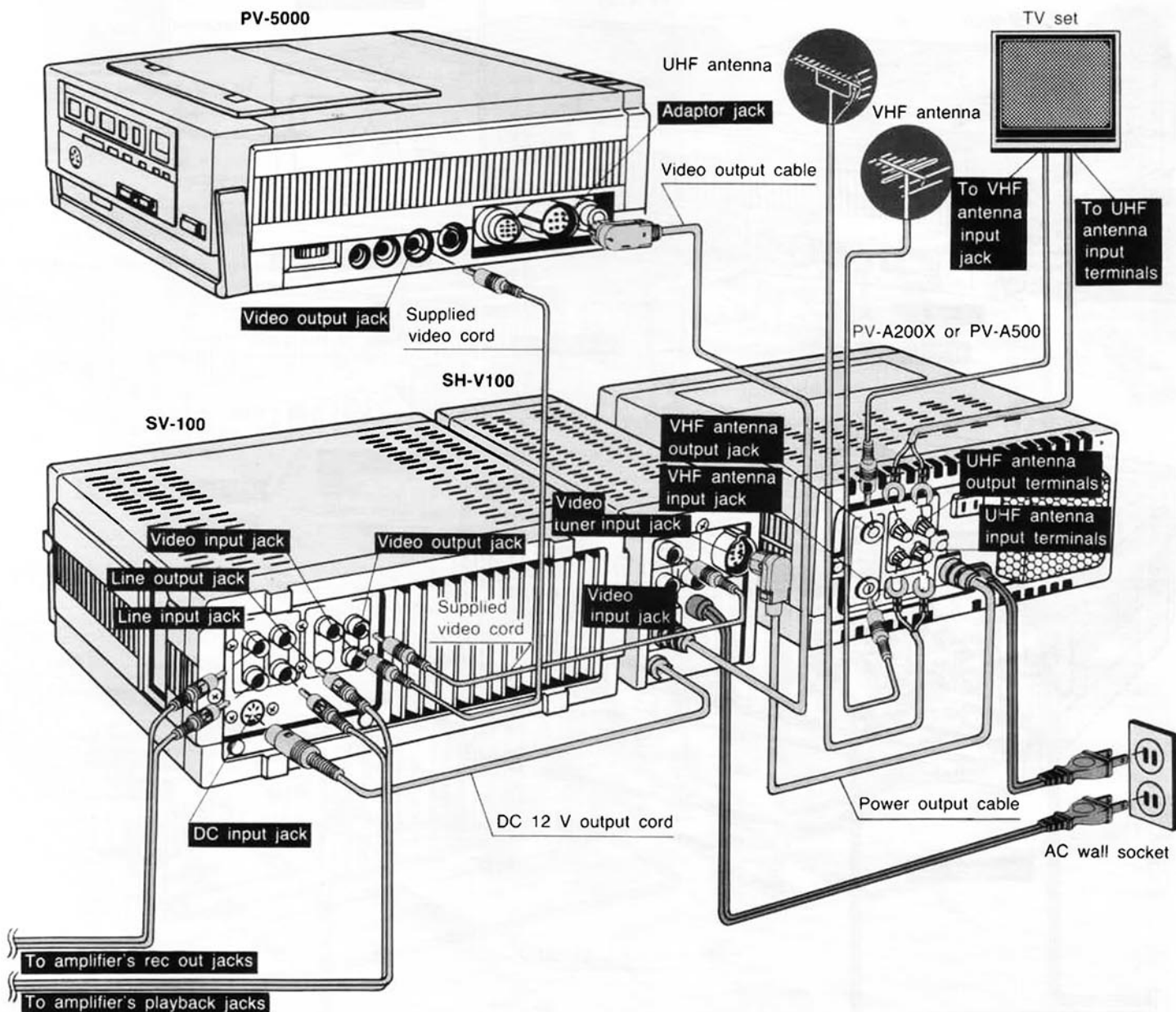


3.

Connection for recording and playback/TV program recording and playback

Note:

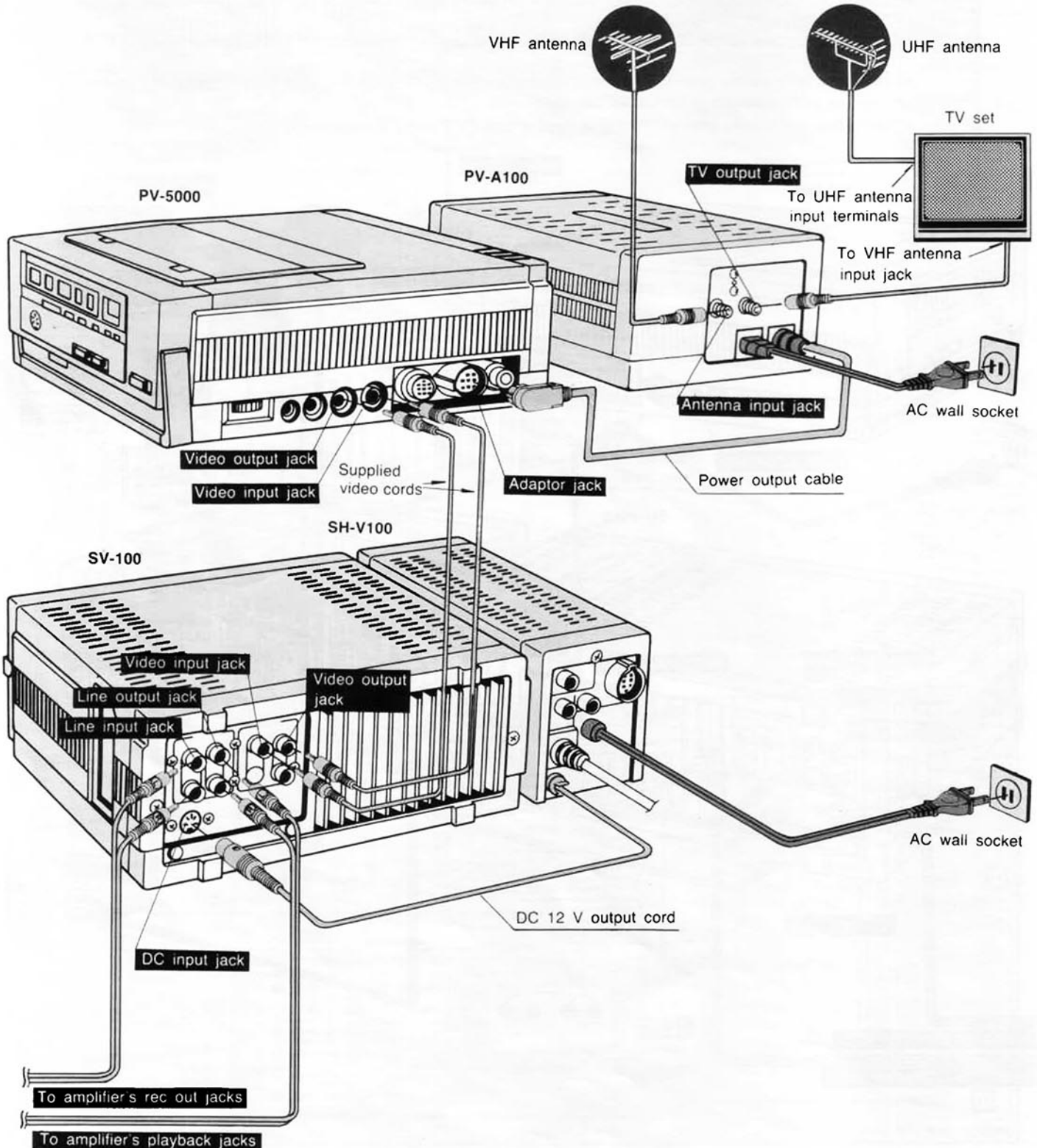
- Audio connections are omitted since they are the same as in "2".
- In the connection diagram shown below, PV-5000 power is supplied from the PV-A200X or PV-A500 video tuner's power output cable, via the SH-V100 AC power unit's video output cable.
- The AC power unit has a recording mode switch that lets you switch between PCM recording and video (TV) recording without having to change any connections.
- For recording TV programs, set the SH-V100 AC power unit's front panel recording mode switch to the "video" position and then operate the video tuner and VCR as usual.
- For video playback, set the PV-A200X or PV-A500 video tuner's antenna switch to the "video" position and press the VCR's play button.
- To view TV programs, set the PV-A200X or PV-A500 video tuner's antenna switch to the "TV" position and turn on the TV.
- If you do not have a video tuner, you can use the optional PV-A100 AC adaptor to allow PCM recording and playback as well as video playback (of recorded cassettes).
- Connections are slightly different if using a monitor type TV (having a video output).



4. Connections for recording and playback/playback of recorded video cassettes

Note:

- Audio connections are omitted.
- For video playback, set the PV-A100 AC adaptor's antenna switch to the "video" position and press the VCR's play button.
- To view TV programs, set the PV-A100 AC adaptor's antenna switch to the "TV" position and turn on the TV.
- TV programs cannot be recorded with the connections shown here.

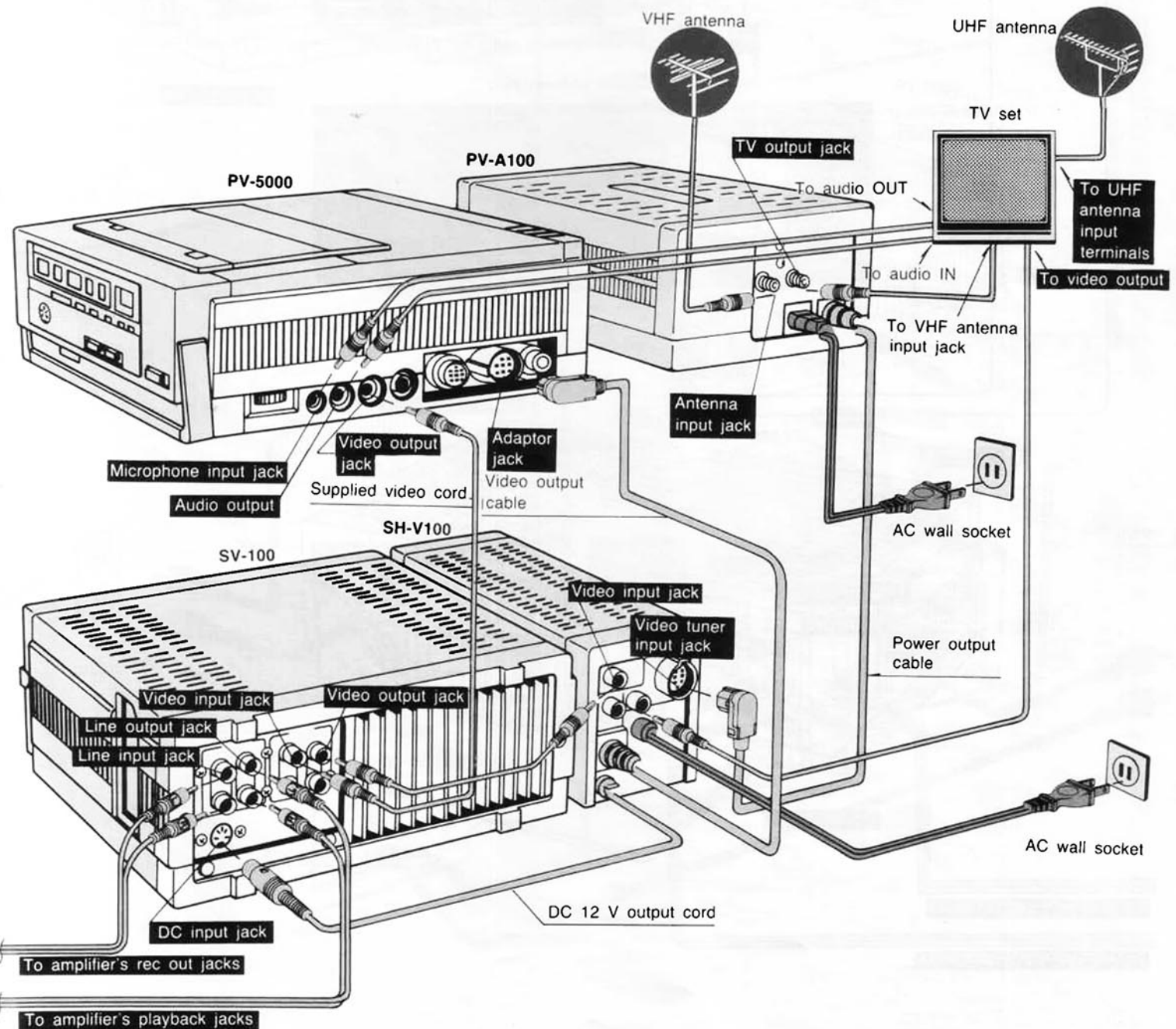


5.

Connections for recording and playback/recording and playback using a TV having a video output terminal

Note:

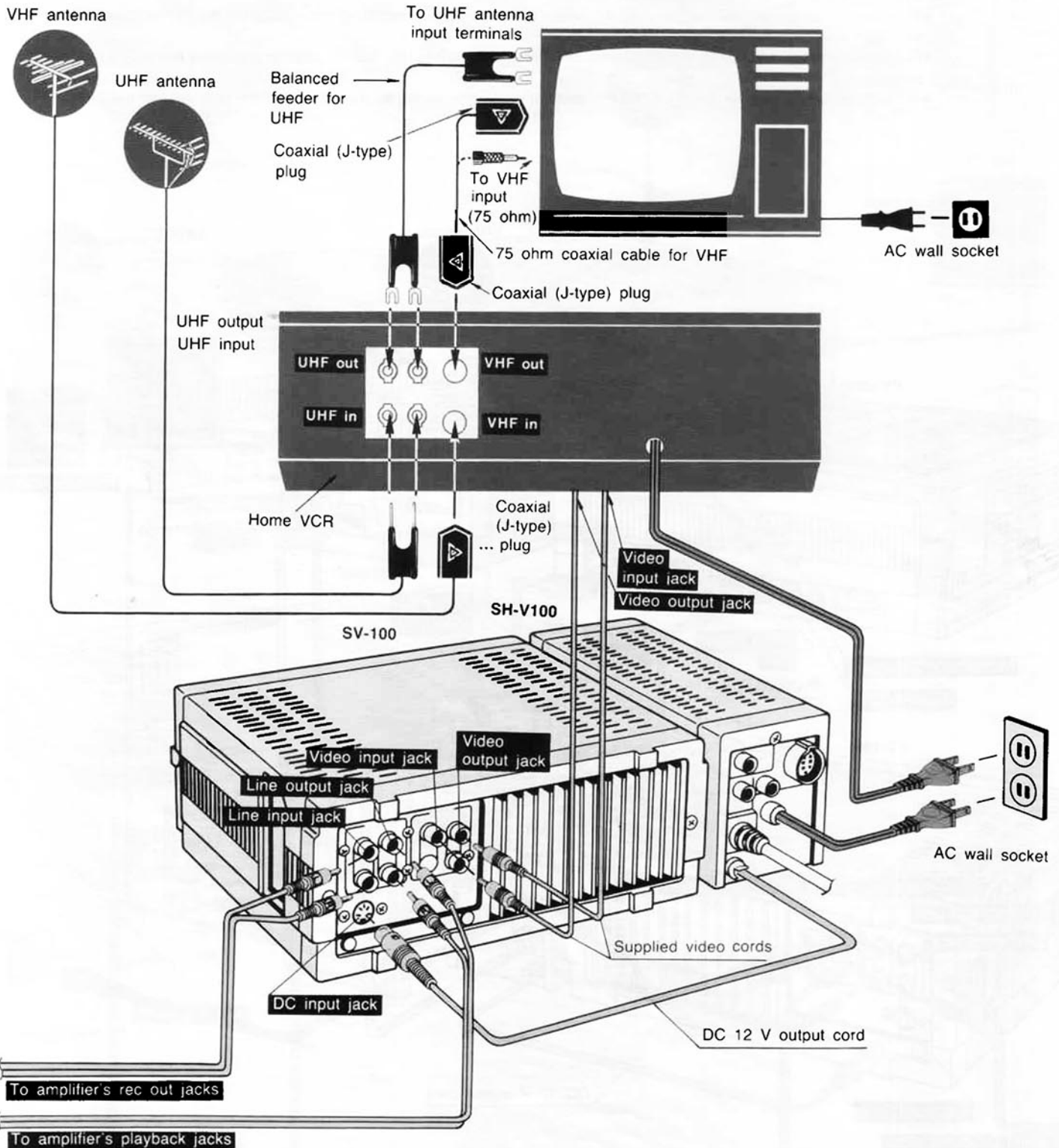
- Audio connections are omitted.
- This diagram applies only to monitor type TV sets.
- In the connection diagram shown below, PV-5000 power is supplied from the PV-A100 AC adaptor's power output cable, via the SH-V100 AC power unit's video output cable.
- The AC power unit has a recording mode switch that lets you switch between PCM recording and video (TV) recording without having to change any connections.
- To record TV programs, set the SH-V100 AC power unit's front panel recording mode switch to the "video" position and then operate as usual.
- For video playback, set the PV-A100 AC adaptor's antenna switch to the "video" position and press the VCR's play button.
- To view TV programs, set the PV-A100 AC adaptor's antenna switch to the "TV" position and turn on the TV.



6. Connection for recording and playback using a home (not portable) VCR

Note:

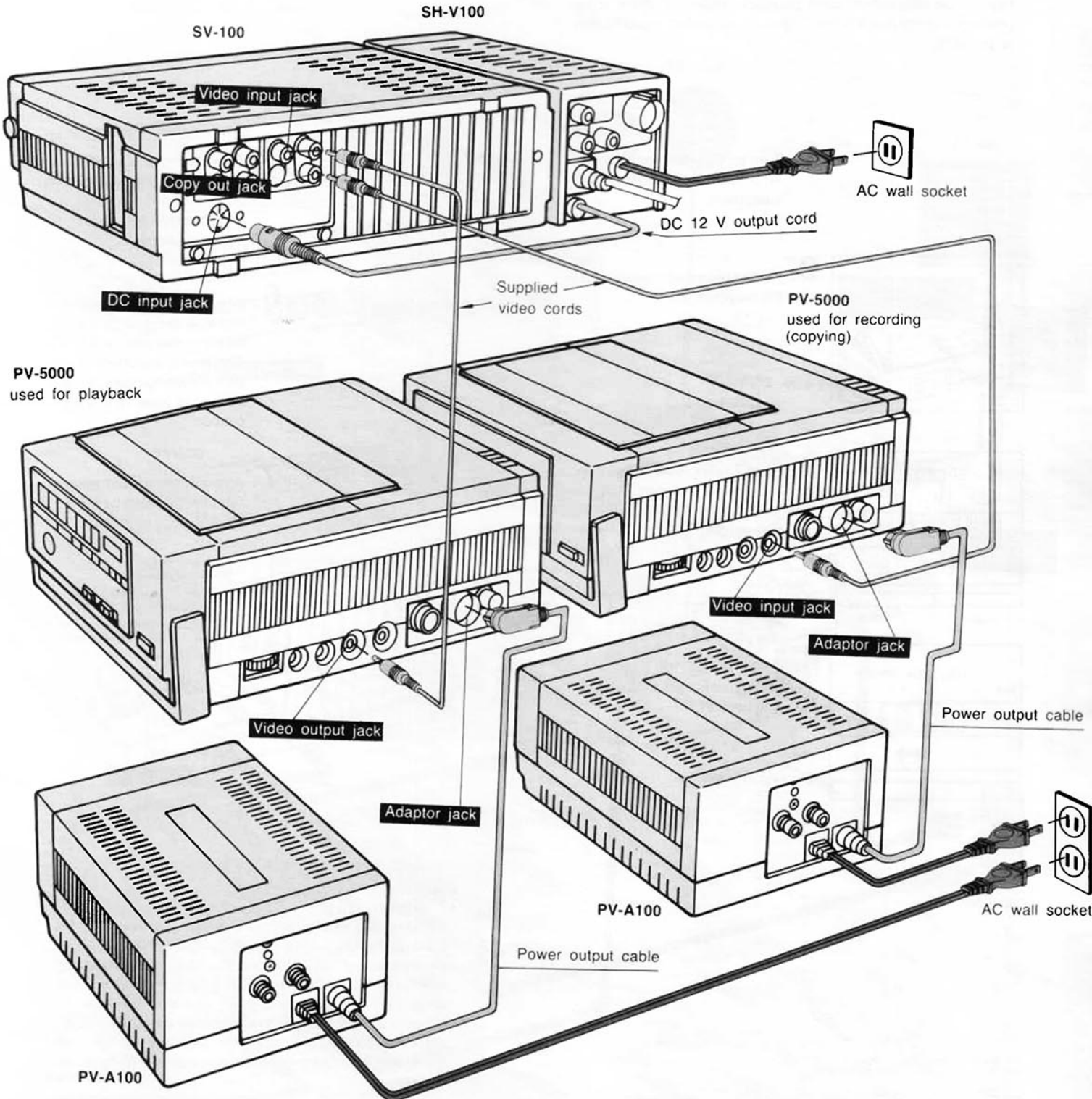
- Use VCR's video input selector to switch between video (TV program) recording and PCM recording. Set to "camera" position for PCM recording. Set to "tuner" position for TV program recording. For details, see your VCR's operating instructions.
- Some VCRs do not have a video input selector; instead, switching (to external input) is automatic when a plug is inserted in the VCR's video input jack. In this case, you must remove the plug from the video input jack if you want to record TV programs.



7. Connections for digital dubbing (copying) using two VCRs

Note:

- There is no need to adjust recording level when performing digital dubbing using the SV-100 "copy out" jack; the signal is copied in digital form.
- When not performing digital dubbing, be sure to unplug the video cord from the SV-100 copy out jack. Noise may occur during normal PCM playback operation if the cord is left plugged in.

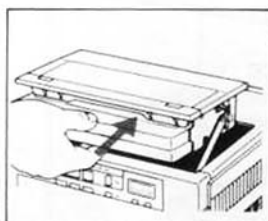


Digital dubbing procedure

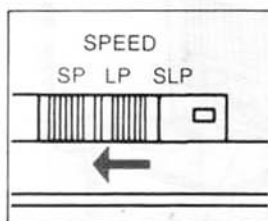
■ About digital dubbing (copying)

- With digital dubbing you can make tape copies having exactly the same sound quality as the original. There is no increased noise or distortion and there is no degradation of frequency response.
- Perfect digital copies cannot be made from tapes recorded using equipment different from the SV-100, particularly if pre-emphasis was not applied to the recording. Since pre-emphasis data is not copied, the copied tape will exhibit slight high range attenuation upon playback. However, there is no problem with playback of the original tape; perfect reproduction is possible.

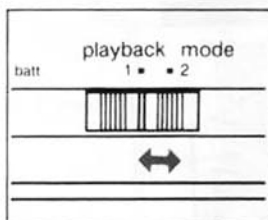
1. Turn on the power on the amplifier and other connected equipment.



2. Put the recorded master tape in the playback VCR.



3. Put the new (blank) video cassette in the recording VCR. Be sure to set the VCR's recording time selector to the "SP" position.



4. Select the SV-100 playback mode that is best suited to the playback VCR.

5. To begin digital dubbing, press the recording and playback buttons on the recording VCR and press the playback button on the playback VCR.

6. When dubbing is completed, first stop the recording VCR, then stop the playback VCR. This is very important to prevent switching noise. Please be sure to observe this precaution.

7. After completion, be sure to remove the video cord from the SV-100 copy out jack.

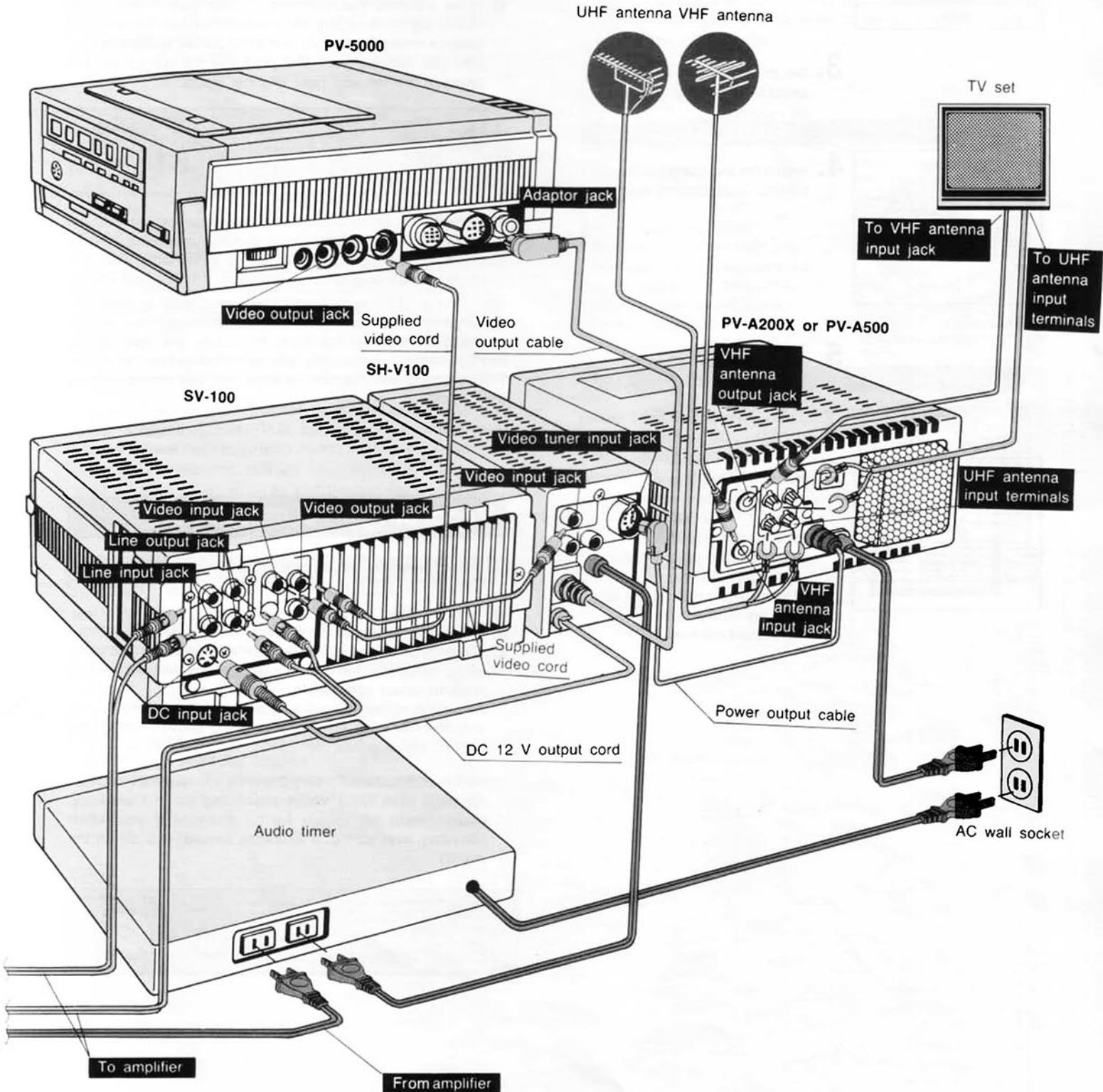
Caution:

- A large amount of noise may be generated if you leave the playback VCR's video input jack connected to the SV-100's video output jack (22) or (26) (VIDEO OUT).
- Be sure to set the SV-100's playback muting switch (14) (playback mute) to the "auto" position; if set to "off" noise may be generated when you stop the tape.
- When a VCR is connected to the copy output jack (copy out), the SV-100 automatically switches to the copy mode and the front panel playback indicator (15) lights up.

8 Connections using a timer for unattended recording and playback

Note:

- For unattended recording, be sure to adjust the audio timer and video tuner time displays so that they match.
- Before actual use, check to see that all equipment is automatically switched on and off according to preset time.
- In the connection diagram shown below, PV-5000 power is supplied from the PV-A200X or PV-A500 video tuner's power output cable, via the SH-V100 AC power unit's video output cable.
- For timer recording of TV programs, set the SH-V100 front panel recording mode switch to the "video" position and then perform video timer operations as usual.



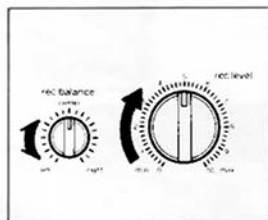
Recording procedure

1. Turn on the power on all connected equipment.



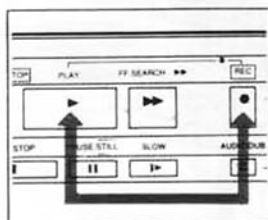
2. Set the SH-V100 AC power unit recording mode switch to the "digital audio" position.

3. Set the amplifier's input selector to desired source to be recorded.



4. Adjust the SV-100 recording balance and recording level.

5. Put the recorded video cassette in VCR (PV-5000).

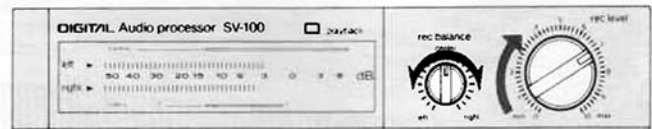


6. Press recording button together with playback button on the VCR (PV-5000). PCM recording will begin.
 - Use headphones to monitor the PCM recording.
 - Press the rec mute button to prevent recording of undesired material.

Recording balance adjustment

The recording balance control knob is set to the center click-stop position when the unit leaves the factory. The "center" click-stop position is the standard setting.

- 1 Turn on power on connected equipment.
- 2 Connect headphones and monitor the recording.
- 3 While watching the recording playback level indicator and monitoring the recording with headphones, turn the recording balance control to the right and left of center, a little at a time, until you find the point that produces the correct balance between the left and right channel inputs.



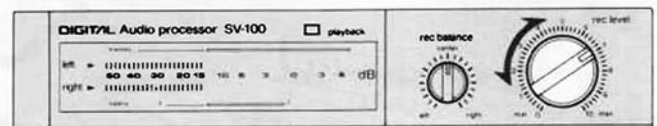
Once recording balance has been obtained, you can use the recording level control knob alone to adjust recording level for both the left and right channels at the same time. This also makes it possible to achieve clean fade-in and fade-out effects. Alternatively, you can first adjust recording level to obtain the correct level for the weaker of the two channels, then use the recording balance control knob to reduce the level of the stronger channel. Either way, you only have to turn two knobs. The recording balance control knob and the recording level control knob.

Recording level adjustment

Perform balance adjustment first.

- 1 Turn on power on connected equipment. Begin recording.
- 2 Connect headphones to monitor the recording.
- 3 While watching recording/playback level indicator and monitoring signal over headphones, adjust recording level control knob to obtain appropriate recording level. Adjust the recording level control knob to obtain the highest possible recording level without going above 0 dB on the highest signal peaks.

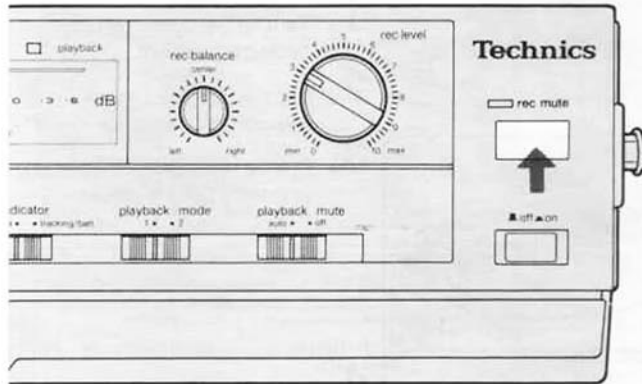
Note that distortion will be generated if level exceeds 0 dB. Although peak level varies depending on the recording source, there will usually be no problems if you adjust recording level so that it averages around -15 dB on the display.



Rec mute operation

● Muting means that the input signal is cut so that no sound is recorded on the tape. This is useful for cutting out undesired program material (such as commercials) during recording. It is also convenient for creating blank spaces between pieces of music.

- 1 Turn on the power on connected equipment to begin recording.
- 2 Connect headphones to monitor the recording.
- 3 Depress the rec mute button whenever you want to cut out undesired program material.
Muting is applied only as long as the recording muting switch is kept depressed.



The rec mute indicator lights up when the recording muting switch is pressed. Note that the recording/playback level indicator shows recording level during rec mute operation. Input signal monitoring through headphones is maintained, making it easy to tell when to end the rec mute operation.

Special rec mute application

● By using the VCR's pause button while depressing the SV-100 recording muting switch, you can make smooth connections between recordings so that playback will be free from switching noise.

Note:

● This is possible only on VCRs like the PV-5000 which have "fine editing" or similar functions. The beginning of the following recording may be cut off if this procedure is used on VCRs without "fine editing".

Fade-in & fade-out effects

Fade-in applications

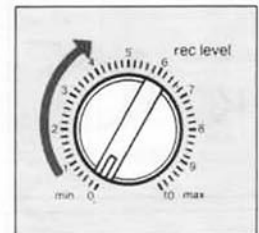
This is particularly useful for giving a smooth beginning to a live performance. For example, you begin turning up the level as applause begins, reaching the "0" point before the music starts.

Fade-out applications

This is most commonly used as a way to end recordings of pop music, but it is also useful for gradually attenuating the level when it appears that you are going to run out of tape before the end of the performance.

For fade-in effect:

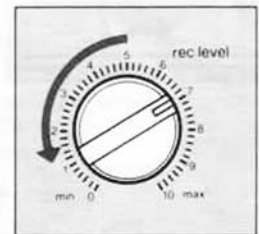
- Start with recording level control knob turned down to "0".
- As you begin recording, gradually turn up the recording level control knob until you reach the correct setting obtained beforehand according to the instructions above.



Rec level control knob

For fade-out effect:

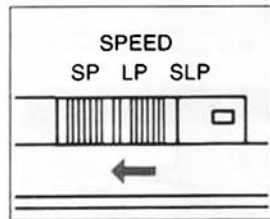
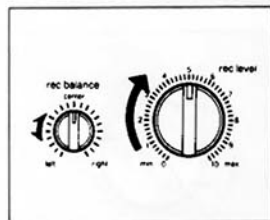
- When the recording nears the end, gradually turn down the recording level control knob until it reach "0".



Rec level control knob

Timer operated recording

(for taping FM broadcasts)



1. Turn the on power on all connectd equipment.
Note:
• Turn off the video tuner's timer set switch.
Also turn off the audio timer.
2. Set the SH-V100 AC power unit recording mode switch to the "digital audio" position.
3. Set the amplifier's input selector or recording selector to "tuner".
4. Tune in the desired radio station.
5. Adjust the SV-100 recording balance and recording level.
6. Put the recorded video cassette in the VCR (PV-5000).
7. Set the VCR (PV-5000) recording time selector to "SP" position.
8. Confirm the correct present time on the video tuner display. Set the desired recording time on the video tuner.
9. Turn on the video tuner's timer set switch. Turn on the audio timer.
10. Adjust the audio timer to match the present time on the video tuner. Set the audio timer to the same recording time as the video tuner.
11. Turn on the video tuner's timer set switch. Turn on the audio timer.
• On some audio timers, connected equipment power will be turned off when the timer is turned on.
12. Recording will begin automatically set at the preset recording time.

Note:
• Take the tape length into account when setting recording time; leave some space between the end of the recording and the end of the tape.
When using NV-T120E or NV-T120HG VHS video cassettes, maximum recording time is two hours.

Caution:

• If using a VCR other than the PV-5000, please refer to the VCR's operating instructions for steps 8 and 9 above.

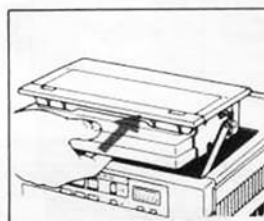
Playback procedure

(Turn down amplifier volume.)

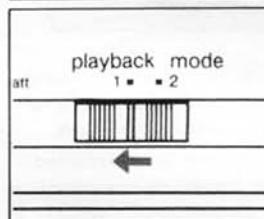
Important notes and cautions concerning playback:

- Valuable playback features of the SV-100 include:
 - 1) Tracking check function that lets you check playback quality.
 - 2) Playback mode switch that lets you choose the demodulation mode best suited to the VCR being used.
 - 3) Playback muting switch for automatic muting in case playback quality is particularly bad in parts of the tape. These features contribute to outstanding PCM recording quality.

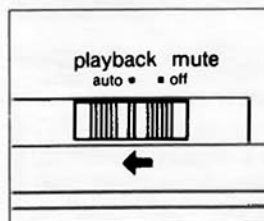
1. Turn on the power on connected equipment.
2. Set the amplifier input selector to "tape".
3. Put the recorded video cassette in the VCR (PV-5000).



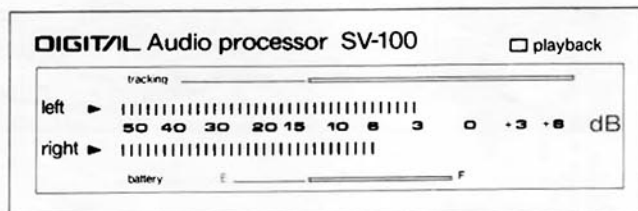
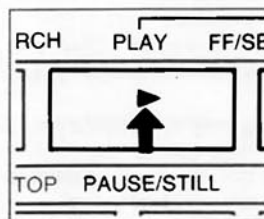
4. Set the playback mode switch to "1".



5. Set the playback muting switch to "auto".



6. Press the VCR (PV-5000) playback button. The SV-100 playback indicator will light up and PCM playback will begin. Playback level will be shown on the display panel.



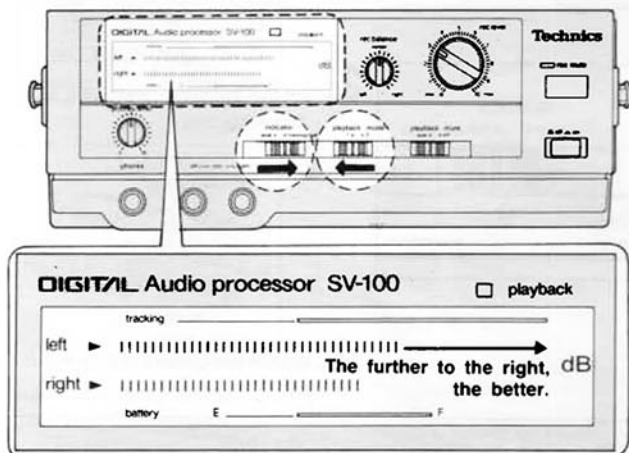
7. Adjust the amplifier volume to a suitable listening level.

Playback mode selection

- This lets you select the demodulation mode that is most suitable for the playback signal of the VCR being used.
- Although there is no problem when the same VCR is used for recording and playback, it may be difficult to obtain the same sound quality when a different VCR is used for playback. In such cases, playback quality can be optimized by using the playback mode switch and adjusting VCR tracking.

- 1 Turn on the power on connected equipment and begin playback.
- 2 Set the indicator switch to "tracking/batt".
- 3 Watch the tracking check scale/indicator and switch the tracking mode back and forth between "1" and "2".
- 4 Choose the position that gives the furthest indication to the right.

As a rule, optimum results will be obtained if the switch is set to "1" for VCRs like the PV-5000 which have an SLP (extended play) mode.



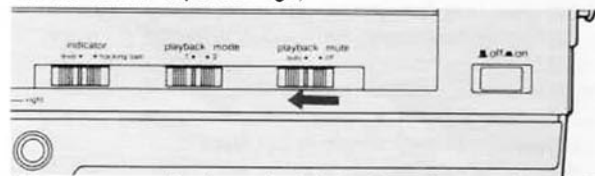
For greatest effectiveness, perform tracking adjustment along with playback mode selection.

Note:

- Other display panel indications go out when the indicator switch is set to "tracking/batt".

Playback muting

- Normally, the playback muting switch is left at the "auto" position. This automatically mutes the playback signal to prevent noise when portions of the tape are reached which have particularly poor playback quality (caused by dropouts due to dirt or tape damage).



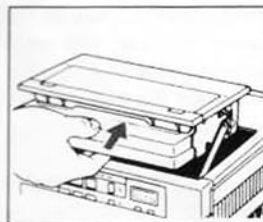
- When tape quality is particularly bad, muting may be applied often, thereby interrupting playback continuity. Therefore, if you want to hear all of the recording, regardless of noise, set the playback muting switch to the "off" position.
- When playback muting is off, sound will be produced in all VCR modes (fast-forward, rewind, slow motion, and frame advance). In this case, the signal is not being played back at normal speed, so it will sound more like noise than like music. However, this is useful for finding the gaps between songs. With some practice, you may also be able to distinguish musical contents as well.
- It is recommended that you leave the playback muting switch at the "auto" position for normal use. At the "off" position you may be bothered by noise when the VCR starts or stops playback.

Timer operated playback

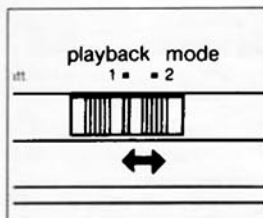
(Adjust amplifier volume to a suitable level.)

1. Turn on the power on connected equipment.
 - Note:**
 - Turn off the video tuner's timer set switch.
 - turn off the audio timer.

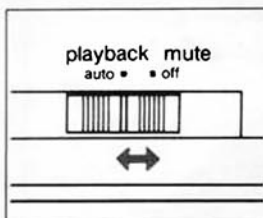
2. Set the amplifier's input selector to "tape".



3. Put the recorded video cassette with erasure prevention tab broken off into the VCR (PV-5000).



4. Set the playback mode switch to "1" or "2".



5. Set the playback muting switch to "auto" or "off".

6. Confirm the correct present time on the video tuner display. Set the desired on/off times on the video tuner. (Refer to tuner's operating instructions for details.)

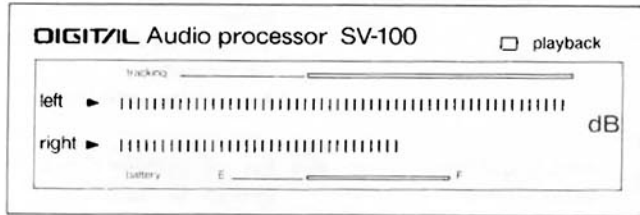
7. Adjust the audio timer to match present time on the video tuner. Set the audio timer to same desired on/off times as the video tuner.

8. Turn on the video tuner's timer set switch. Turn on the audio timer.
 - On some audio timers, connected equipment power will be turned off when the timer is turned on.

9. Connected equipment power will be turned on and PCM playback will begin at the present time.

Video tracking adjustment

Watch the indication on the left channel section of the display panel and switch the playback mode back and forth between "1" and "2", while gradually turning the VCR's tracking adjustment knob back and forth. Select the playback mode and VCR tracking knob setting that gives the furthest indications to the right.

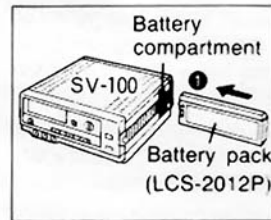


• Optimum results are obtained if the indication reaches all the way into the orange section; however, you can still enjoy satisfactory playback if indication remains in the blue section. Tracking is poor if indication does not reach the blue section.

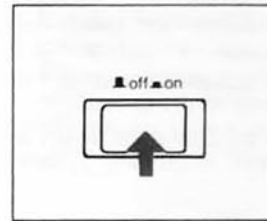
Note:

- If you cannot obtain good tracking by adjusting the VCR's tracking control and selecting optimum playback mode, the VCR's heads may be dirty or the cassette tape may be damaged. In this case, clean the video heads or try using a different cassette.
- When tracking is poor, playback muting will operate often, interrupting the playback sound; static-like noise may also occur.
- In extremely rare cases, noise may occur even if tracking is good. This is not necessarily a malfunction; it means that the limits of error correction function capability have been exceeded. To minimize the chances of such a problem, take good care of your VCR and video cassettes.

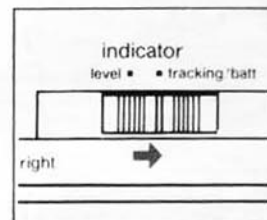
Battery check procedure



1. Put the battery pack in the battery compartment.

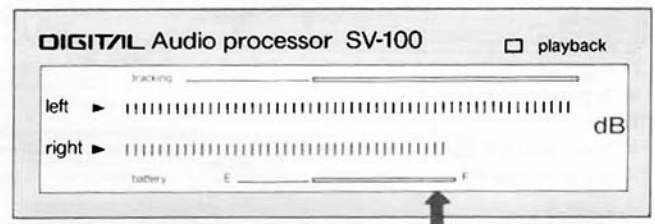


2. Turn on the SV-100 power.



3. Set the indicator switch to "tracking/batt".

4. Watch the battery check display.



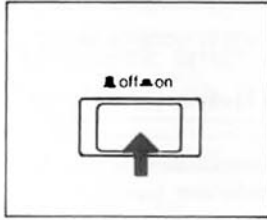
- The scale is divided into orange and blue sections.
- If indication reaches into the orange section, the battery is going dead. Replace it with another battery pack or use the AC power unit to recharge it.

Note:

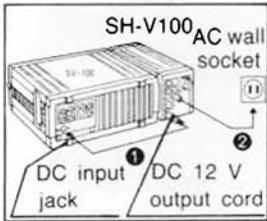
- If the display does not light up when you put in a battery and turn on the power, then the battery pack is completely discharged. Recharge it using the AC power unit.
- Other power sources have priority over the battery. Therefore, if the AC power unit or car battery cord is connected, battery power is not used. When checking the battery, be sure that nothing is plugged into the rear panel DC input (DC IN 12 V) jack.

Attaching the shoulder strap

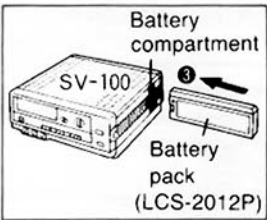
Recharging the battery pack



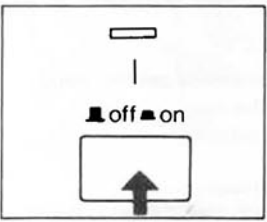
1. Turn off the SV-100 power.
Caution:
If the SV-100 power switch is turned on during recharging, recharging will stop and the battery will be used to power the SV-100.



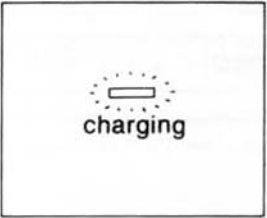
2. Make connections.



3. Put in the battery pack.



4. Turn on AC power unit's power switch.

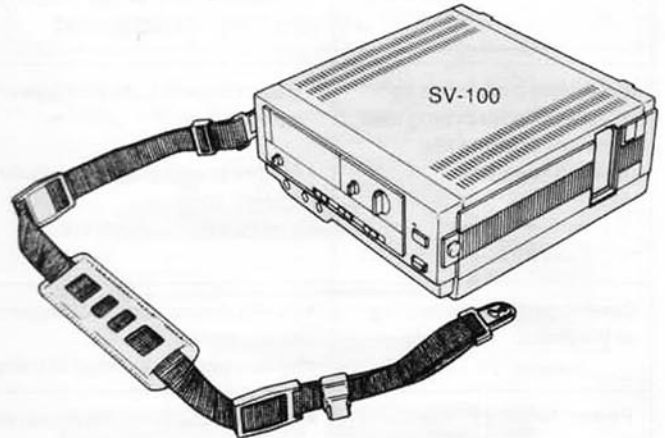


5. "Charging" indicator lights up during recharging. Although the indicator goes out after about 4 hours of recharging, it is recommended that you continue recharging for another 3 to 4 hours to obtain the longest useful battery life. This indicator gives a general idea of when the battery is fully recharged. However, recharging continues even if the indicator goes out.

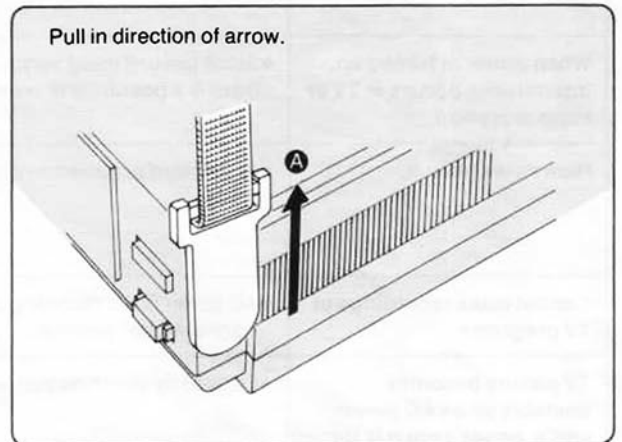
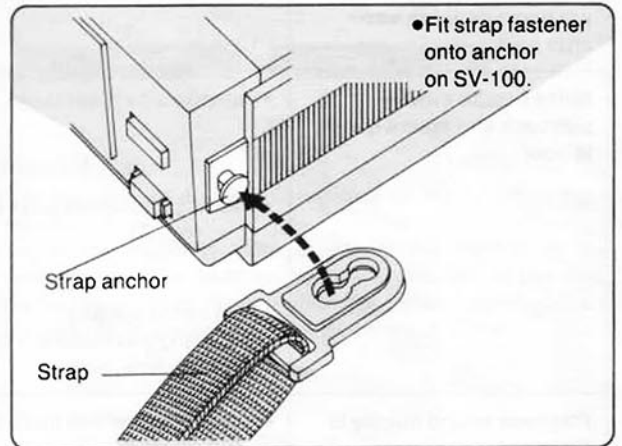
Caution:

1. This unit is equipped with an overcharging protection circuit. However, to protect the battery, do not leave it connected for recharging for longer than 24 hours.
2. The AC power unit heats up considerably during operation. Therefore, do not block the air vents on the top and bottom of the cabinet. Be especially careful not to leave it on a carpet, blanket, or other surface that could block the bottom vents.
3. For safety, do not leave inflammable items near the unit during recharging.
4. To keep the electrolyte surface in the normal condition during recharging, always set the SV-100 horizontally.

- The shoulder strap is convenient for portable use, particularly when recording outdoors.



Attachment



Follow reverse procedure to remove strap.

Troubleshooting guide

Before taking this unit in for servicing because of a suspected malfunction, please check this chart as well as system connections and control settings on other equipment. If you are not able to correct the problem with the aid of this chart, please consult your dealer.

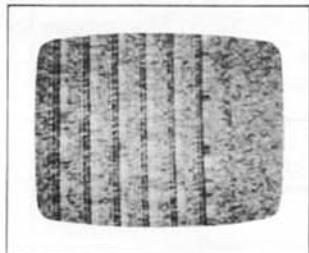
Problem	Cause	Solution
No power when SV-100 power switch is turned on.	<ul style="list-style-type: none"> ● Battery pack is dead (if using battery pack). ● AC power unit is not properly connected. 	<ul style="list-style-type: none"> ● Use supplied AC power unit to recharge battery pack. ● Plug in DC 12 V cord firmly.
Recording does not begin when VCR's recording and playback buttons are pressed together.	<ul style="list-style-type: none"> ● Video cassette's erasure prevention tab is broken off. ● AC power unit's recording mode switch is at "video" position. ● Recording level is too low. 	<ul style="list-style-type: none"> ● Use a cassette with intact erasure prevention tab or cover the hole with cellophane tape. ● Set to "digital audio" position. ● Adjust recording level while watching the recording/playback level indicator.
Cannot perform recording or playback.	<ul style="list-style-type: none"> ● PV-5000 remote control pause or stop button has been pressed. ● Battery pack is depleted (if using battery). 	<ul style="list-style-type: none"> ● Release pause or stop. ● Use AC power unit to recharge battery pack.
Power turns on but recording or playback does not begin.	<ul style="list-style-type: none"> ● VCR or video tuner protection mechanism is operating. 	<ul style="list-style-type: none"> ● Turn off power on VCR or tuner (or AC adaptor). Wait about two minutes, then turn power on again.
Power turns and but recording or playback does not begin or stops soon after beginning.	<ul style="list-style-type: none"> ● Battery pack is depleted (if using battery). ● There is condensation inside the VCR. 	<ul style="list-style-type: none"> ● Use AC power unit to recharge battery. ● Wait until dew indicator stops flashing. (See VCR operating instructions for details.)
Noise occurs during playback and sound quality is poor.	<ul style="list-style-type: none"> ● Cassette tape is damaged. ● Tracking adjustment is not correct. ● VCR heads are dirty. ● Recording was made at VCR's EP or LP (long recording time) setting. 	<ul style="list-style-type: none"> ● Try playing a different tape. If playback quality is good, then the other tape is old bad or was not well recorded. Make a new recording. ● Try changing the playback mode switch setting. Adjust tracking on VCR. ● Clean the VCR's video heads. ● Make a new recording with the VCR set to the SP position.
Playback sound quality is distorted.	<ul style="list-style-type: none"> ● Recording level was much too high or low. 	<ul style="list-style-type: none"> ● Make a new recording with correct recording level setting.
When power is turned on, interference occurs in TV or radio reception.	<ul style="list-style-type: none"> ● Since this unit using very high frequency signals, there is a possibility of some slight signal leakage. 	<ul style="list-style-type: none"> ● Move this unit further away from TV or radio. ● Use an outdoor antenna.
Hum noise occurs.	<ul style="list-style-type: none"> ● Power cord or fluorescent light is near connection cords. 	<ul style="list-style-type: none"> ● Keep this unit away from other electrical appliances. ● Try reversing amplifier or AC power unit plug in AC wall socket.
Cannot make recordings of TV programs.	<ul style="list-style-type: none"> ● AC power unit's recording mode switch is at "digital audio" position. 	<ul style="list-style-type: none"> ● Set to "video" position.
TV picture becomes unstable when AC power unit's power switch is turned on and off.	<ul style="list-style-type: none"> ● Caused by switching transients. 	<ul style="list-style-type: none"> ● Leave power switch off when watching TV.

Diagnosis using a TV set

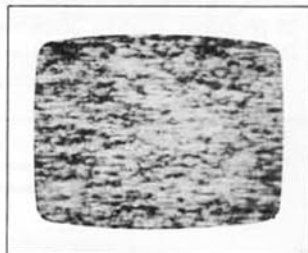
If a problem occurs when using this unit, you may be able to find out what it is by playing the tape and viewing the picture on a TV set. Please try this method.

To check whether the tape has a PCM recording on it:

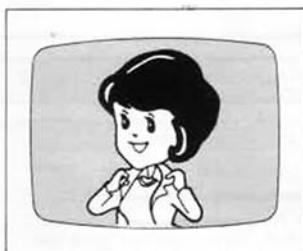
- Put cassette in VCR, begin playback, and view picture on TV.



This kind of picture will appear if there is a PCM recording on the tape.



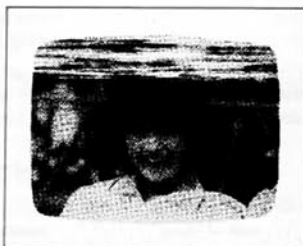
This kind of picture will appear if the tape is blank.



Tape with video picture (TV program, etc.) recorded on it.

Checking video cassette quality

- Record video picture (TV program or from camera) and play it back.

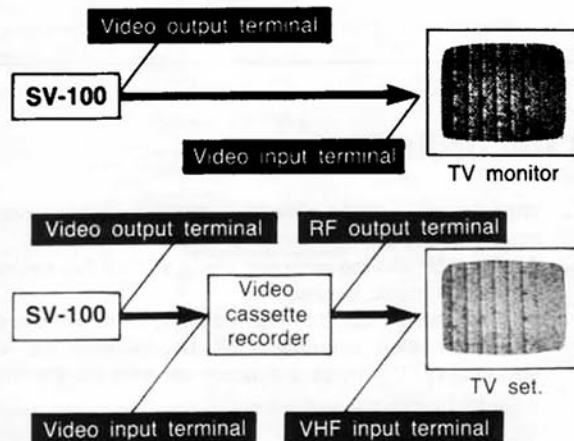


Tape is damaged if this kind of picture appears and cannot be corrected using tracking adjustment.

To check whether the SV-100 is recording properly:

- There are two connection methods that can be used to check whether this unit is recording signals properly.

[How to connect]



[Procedure]

- Use the LINE IN or microphone input for the recording input signal.
- Adjust the recording level control of the SV-100 so the recording/playback level indicators rise and fall. At this time, the television screen should show the pattern shown above if the SV-100 is properly recording the input signal.

Suggestions for best PCM recording and playback results

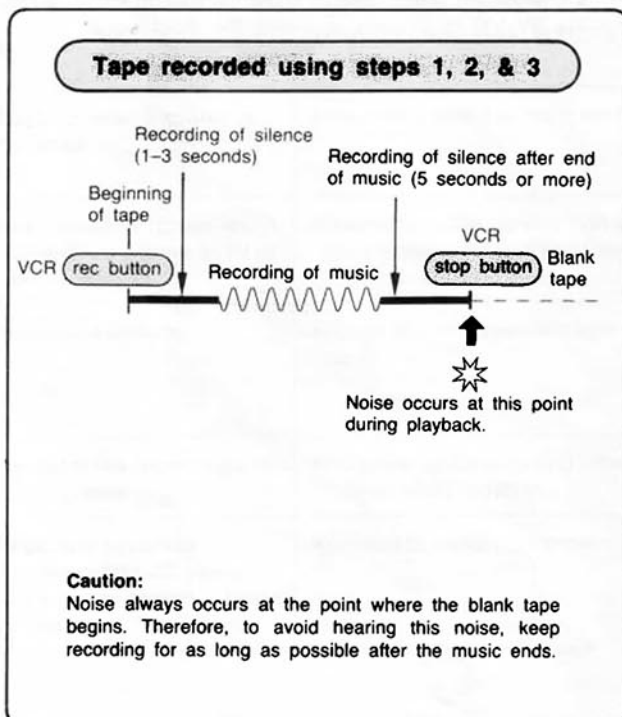
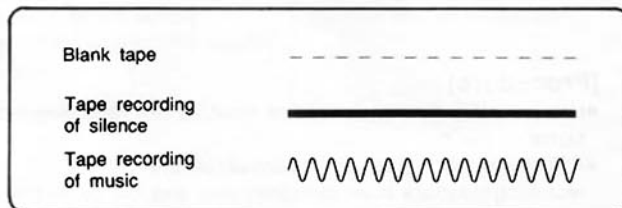
In PCM recording, noise is caused when there is discontinuity in the data. This problem can be avoided by taking sufficient precautions during recording to prevent discontinuity on the tape.

Data discontinuity occurs at the intersection between recorded areas and blank areas of the tape, and at the point where one recording ends and another begins. This phenomenon can also occur during playback.

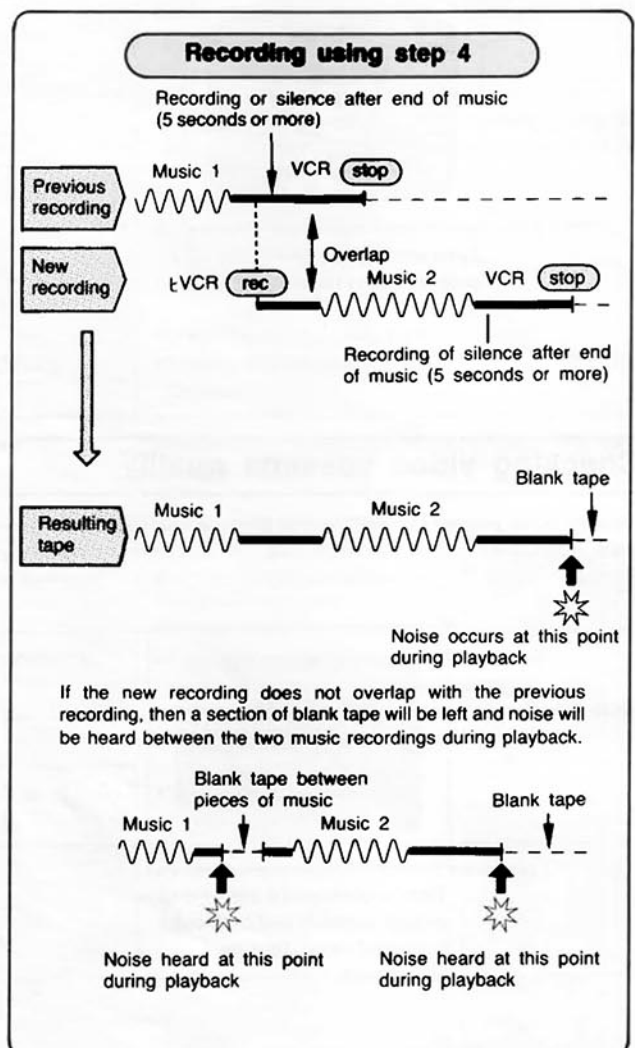
When the VCR is not in the playback mode, the signal going to the video input jack (in other words, the signal being recorded) is sent directly to the video output jack. Therefore, if you press the VCR's stop button during playback, a signal from the processor (SV-100) will be returned to the processor so that it receives its own output instead of the tape playback signal. At this point, noise will occur because of the data discontinuity. To avoid this kind of problem, please observe the following precautions for PCM recording and playback.

■ Recording

1. Wind the tape forward (away from the beginning) for one to three minutes in the recording mode.
2. Put the VCR into the recording mode at least five seconds before the music begins.
3. After the music ends, continue recording about five seconds of silence, then stop the VCR. (If you stop the VCR immediately, the noise will occur as soon as the music ends.)

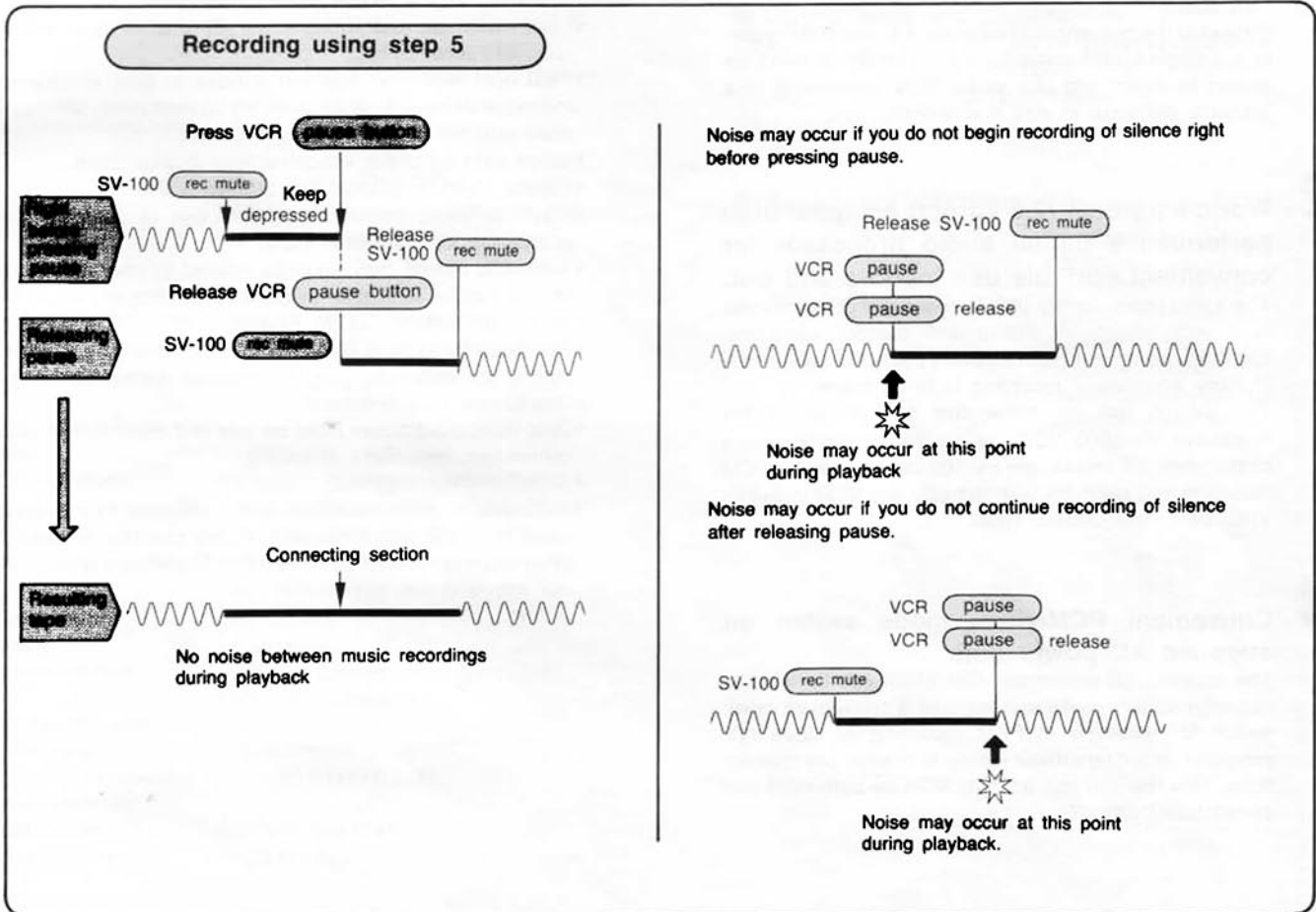


4. When making successive recordings, being the new recording within the section where you recorded silence at the end of the previous recording. (Noise occurs during playback if a section of the tape is blank.)



5. Always turn down the rec level control all the way or press the rec mute switch before pressing the VCR's pause button during recording. After releasing the pause button, allow the VCR to achieve stable tape speed while maintain-

ing recording of silence, then turn up the rec level control or release the rec mute switch. (If this precaution is not observed, noise will occur during playback at the point where the pause button was pressed.)



■ Playback note

Turn down amp volume before stopping VCR playback.

Features of the SV-100

1. Light and compact, thanks to 3 new LSIs and high speed 14-bit AD/DA converter.

The PCM signal processing LSI (MN6601) contains about 10,000 elements in a 6.08×5.58 mm chip; the playback LSI (MN6602) has about 15,000 elements in a 6.46×6.18 mm chip; the recording/playback control LSI has about 6,000 elements in 4.48×3.62 mm chip.

Together, these three LSIs are equivalent to about 320 logic ICs.

Instead of the conventional separate A/D and D/A converters, a single AD/DA converter is used for conversion from analog to digital and vice versa, thus contributing to a dramatic decrease in size and weight.

2. World's lightest (2.9 kg net) compact high performance digital audio processor for convenient portable use indoors and out.

The 3-way power supply (AC/DC/car battery) permits use in a wide variety of indoor and outdoor situations. Especially when used with a battery pack, this unit is easy to carry wherever a recording is to be made.

The SV-100 has the same size and design as the Panasonic PV-5000 VCR, so the two make a perfect combination. Of course, the SV-100 can be used for PCM recording and playback with virtually any VCR including VHS, beta, and U-matic types.

3. Convenient PCM/video mode switch on supplied AC power unit.

The supplied AC power unit (SH-V100) can be used to recharge battery packs and features a convenient mode switch for selection of PCM recording or video (TV program) recording without having to change any connections. This lets you use a single VCR for both PCM and conventional video recording.

Other Features

- Digital dubbing function for making perfect copies using two VCRs.
- Built-in high performance microphone amplifier for live recording.
- Convenient balance control and master recording level control for one hand operation.
- Easy-to-read 2-color FL display for recording/playback level indication. Highly legible even outdoors.
- Level indication extends up to +6 dB to allow more accurate recording level setting.
- Peak-hold indication has two cursors to give simultaneous indication of instantaneous peak signal level along with highest peak reached in each 2-second period.
- Video tracking check indication with 2-color scale.
- Battery check indication with 2-color scale.
- Playback mode switch allows selection of optimum signal processing for connected VCR.
- Automatic muting cuts out noise caused by poor tape quality. Muting can be cancelled to allow monitoring during all VCR modes (FF, REW, SLOW, FRAME ADVANCE, PAUSE).
- Rec mute for making no-signal areas on the tape. Useful for cutting out undesired program material during recording.
- Headphone volume control.
- Dual video input/output jacks on side and rear panel for easier connection, regardless of setting.
- Shoulder strap supplied.
- Automatic mic/line switching. Input switches to microphone when mic. is plugged into jack. If only one mic. is used, the other channel remains as a line input. Therefore it is possible to mix mic. and line inputs.

Specifications of the SV-100

■ General

Power supply: 3-way power supply (operating voltage DC 12 V)
120 V, AC, 60 Hz (using supplied AC power unit SH-V100)
DC 12 V (using optional battery pack LCS-2012P)
DC 12 V (using optional car battery cord PV-C34)
(only for cars with negative grounded 12 V battery)

Power consumption: 14 W
(DC 12 V) (SV-100)
40 W (using SH-V100)
With SH-V100 power switch off: 1.3 W

Dimensions: SV-100: 23.8 W × 24 D × 9.2 H cm
(9³/₈" × 9⁷/₁₆" × 3⁵/₈"")
SH-V100: 7.8 W × 24 D × 9.2 H cm
(3¹/₁₆" × 9⁷/₁₆" × 3⁵/₈"")

Weight: SV-100: 2.9 kg (6.41 lbs) (net)
SH-V100: 2.3 kg (5.1 lbs)

■ System type

Type: Digital audio processor

PCM standard: Consumer PCM encoder/decoder standards file STC-007 of the EIAJ stereo technical committee, video technical committee.
(with recording pre-emphasis)

Quantization: 14-bit linear

Coding: 14-bit linear

Recording time: maximum 2 hours (using NV-T120E VHS video cassette.)

Number of audio channels: 2 (L, R stereo)

Frequency response: 2 Hz ~ 20 kHz (±0.5 dB)

Total harmonic distortion: 0.01% or less (1 kHz, 0 dB)

Dynamic range: 86 dB or more

■ Input level and impedance

Line: 30 mV [at reference input level (-15 dB indication)]/50 kohm

Microphone: 0.7 mV [at reference input level (-15 dB indication)]/600 ohm

Video: 1 Vp-p/75 ohm

■ Output level and impedance





Line: 400 mV [at reference input level (-15 dB indication)]/600 ohm

Video: 1 Vp-p/75 ohm

Digital dubbing (copying): 1 Vp-p/75 ohm

■ Accessory functions: VTR tracking check
Battery check
Rec mute
Rec/pb level indication
Playback mode switch
Playback muting
Playback indicator
Headphone level control
Digital copy jack

■ Supplied accessories

SH-V100 AC power unit	Line cords ×2	Video cords ×2	Shoulder strap
			

Precautions

Outdoor use and safety precautions

To prevent performance degradation and possibly dangerous situations, avoid using this unit in the undesirable conditions and locations described below.

- **In a closed vehicle or other interior where temperature could rise to a level of 104°F (40°C) or higher.**

(Be especially careful in summer.)

- **In the rain.**
- **In electrical storms.**
- **For long periods in direct sunlight.**
- **In very cold places.**

(41°F; 5°C or below)

- **In dusty or smoky locations.**
- **In highly humid locations.**
- **Shaky or vibration prone locations.**
- **Near heaters or heat sources.**
- **In unstable locations.**
- **Near sources of magnetism.**
- **Within the reach of children.**

Operational precautions

- **Do not obstruct air vents**

The SV-100 and companion model SH-V100 AC power unit employ ultra high density circuitry and precision parts to achieve their very light weight and compact dimensions. Therefore, the cabinets have many air vents to avoid excessive internal temperature rise.

These air vents must be kept open and unobstructed. Do not use or place these units in such a way that the air vents are blocked.

- **Do not place heavy objects on top of this unit.**
- **Handle with care to avoid physical shock to the unit during handling or storage.**

Maintenance precautions

- **Wipe the cabinet with a soft, dry cloth.**

To avoid harming the cabinet finish, do not clean this unit with solvents or volatile compounds such as alcohol, benzene or paint thinner. Do not use treated dust cloths. Insecticide sprays can also cause cracks and loss of luster in the finish.

In case of sticky, oily, or other substances that cannot be removed with a dry cloth, dip a soft cloth in weak soapy water, wring it out well, and wipe clean. To avoid danger of moisture contacting the circuitry, the unit must be unplugged. Finally dry the unit using a soft, dry cloth.

About video cassettes and recorders

- **For best results, use the same VCR (video cassette recorder) for both recording and playback.**

The SV-100 is a digital audio processor. For PCM recording and playback, the SV-100 must be used with a VCR.

VHS, Beta, and U-vision (or U-matic) type VCRs can all be used. However, new VCR models keep appearing on the market and there may be some that do not provide satisfactory performance in combination with this unit. Therefore, we recommend that you consult with your dealer and, if possible, try using the VCR with the SV-100 before making any buying decisions. For optimum results, the same VCR should be used for recording and playback.

- On the average, a typical video cassette tape can be used about 300 times (for recording and playback).

If the same tape is used too many times, magnetic surface wear and tape stretch may interfere with normal playback. However, how many times a tape can be used depends on tape quality, VCR used, and the environment.

- Because video playback is seen by the human eye as a continuously moving picture, dropouts are rarely noticeable. However, in PCM recording and playback, dropouts can cause noise because they interfere with correct retrieval of the digital signal information.

Of course, error correction circuitry and playback muting serve to minimize this problem. But the point is that tape quality is much more important for PCM recording and playback than it is for video.

- Therefore, for PCM recording it is recommended that you use the best quality video cassettes possible and if they are not new they should have been used only a few times.
- Clean the video heads from time to time. Good PCM recordings cannot be made if the heads are dirty.
- For best PCM recording and playback results, it is recommended that you use HG (high grade) VHS video cassettes.

Suggestions for safety

Before using this unit, be sure to read applicable items of the operating instructions and these safety suggestions carefully; and afterwards keep them handy for future reference. Take special care to follow the warnings indicated on the unit itself as well as in the operating instructions.

1. **Avoid places where there is water or humidity.**
Do not use this unit near a bathtub, washbasin, swimming pool, or the like. Damp basements should also be avoided.
2. **Don't allow water or any foreign object to get inside this unit.**
Don't place small metal objects or anything containing liquid on or near the unit.
3. **Avoid placement of the unit where it will be exposed to the direct rays of the sun, or where ventilation is inadequate.**
Don't place this unit in a bookcase or between cabinets, unless proper ventilation is provided, or where curtains or furniture may obstruct the ventilation holes.
4. **Place this unit away from heat-emitting appliances.**
Never place this unit on or near a radiator, heat register, stove, or any other heat-emitting equipment. (Including Amplifiers).
5. **Placement**
Place the unit on a stable, vibration-free, level shelf or stand.
6. **Use of a cart or stand.**
When deciding on a cart or stand, be sure to use only with the cart or stand recommended by the manufacturer.
7. **Wall or ceiling installation.**
If the unit is to be mounted on a wall or ceiling, be sure to do so only as recommended by the manufacturer.
8. **Check the voltage rating of this unit before connecting the unit to a power supply.**
Be sure to connect the unit only to the type of power supply indicated in the operating instructions, or as indicated on the unit itself.
9. **Care of the power cord and plug.**
Take care that the cord is not bent sharply (especially near its connection to the unit or near the plug), that nothing is placed on it, and that it is not pinched, or crushed. Never take hold of the plug or cord if your hand is wet, and always be sure to grasp the plug body when connecting or disconnecting it.
10. **If the unit will not be used for a long period of time:**
Be sure to disconnect the power cord.
11. **Maintenance**
Refer to the operating instructions for details.
12. **Never attempt repairs yourself:**
 - (a) If the power cord or plug is damaged.
 - (b) If a foreign object or liquid falls into the unit.
 - (c) If the unit is exposed to rain.
 - (d) If the unit does not function normally, or if operation shows an unusual change.
 - (e) If the unit has been dropped and the cabinet or chassis is damaged... etc.Unplug the power cord and consult with a qualified technician (or the dealer from whom the unit was purchased or the nearest Service center).
13. **Repairs**
Except for adjustments explained in the operating instructions, do not attempt any repairs yourself. Be sure to request service from a qualified technician (or your dealer or nearest Service center).

Note:

This equipment generates and uses radio frequency energy and should be installed and used properly, that is, in strict accordance with the manufacturer's instructions. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that the computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the

US Government Printing Office,
Washington, D.C., 20402,
Stock No. 004-000-00345-4.

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